Using the Huntsville Operations Support Center (HOSC) Application Software

Rev 1
Software Build 4.2-10

June 2001

Using the Huntsville Operations Support Center (HOSC) Application Software

HOSC-EHS-1650

Revision 1
Software Build 4.2-10
June 2001

Prepared in support of:
NAS8-44000

Prepared by:
HOSC Training Team

Prepared for:
Mission Systems Operations Group
Ground Systems Department
Flight Projects Directorate
Marshall Space Flight Center

Approved by:

_____

Nathaniel A. Boclair
FD43 Group Lead/4663

Using the HOSC Application Software
Table of Contents

Chapter 1:
About this User Guide 1

1.1 Getting Started 2
1.2 Working with Windows 2
1.2.1 Application Main Windows 3
1.2.2 Database Applications 4
1.2.3 Mini-Applications 6
1.2.4 Application Dialog Boxes 6
1.2.5 Message Dialog Boxes 7
1.3 Standard Menu Bar Items 8
1.3.1 Using the File Menu 8
1.3.2 Using the View Menu 8
1.3.3 Using the Help Menu 10
1.3.3.1 On Window 10
1.3.3.2 On Keys 11
1.3.3.3 Index 12
1.3.3.4 Table of Contents 13
1.3.3.5 On Version 14
1.4 Wildcard Characters 14
1.5 System Initialization 15
1.6 The Launchpad 17
1.6.1 File Menu 19
1.6.1.1 File Manager 20
1.6.1.2 Store UDE 20
1.6.1.3 Retrieve UDE 20
1.6.1.4 Setup Print 20
1.6.1.5 Print Screen 21
1.6.1.6 Print Window 21
1.6.1.7 Print Status 21
1.6.1.8 Logoff 21
1.6.2 Generation Menu 21
1.6.2.1 Display Generation 22
1.6.2.2 Computation Generation 22
1.6.2.3 Script Generation 22
1.6.2.4 Command Update Form Generation 22
1.6.3 Operation Menu 23
1.6.3.1 Display Operation 23
1.6.3.2 Computation Operation 23
1.6.3.3 Script Operation 23

1.6.3.4 Scratchpad Line . . . 24
1.6.3.5 Command Operation . . . 24
1.6.3.6 Command System Management . . . 24
1.6.3.7 Command Track . . . 24
1.6.3.8 Command Delog . . . 25
1.6.3.9 Command User Enable . . . 25
1.6.3.10 Downlink Management . . . 25
1.6.3.11 Downlink Request . . . 25
1.6.3.12 NRT Data Requests . . . 26
1.6.3.13 GSE Packets . . . 26
1.6.3.14 Exception Monitor . . . 26
1.6.3.15 Local Table Operation . . . 27
1.6.3.16 EHS Data Generation . . . 27
1.6.4 Database Menu . . . 27
1.6.4.1 Telemetry Database . . . 27
1.6.4.2 Command Database . . . 28
1.6.4.3 Database Change Request . . . 28
1.6.4.4 UDE Database . . . 28
1.6.4.5 Database Monitor & Control . . . 28
1.6.5 PIMS Menu . . . 29
1.6.5.1 To Do List . . . 29
1.6.5.2 Documents . . . 30
1.6.5.3 Operation Change Requests . . . 30
1.6.6 PPS Menu . . . 30
1.6.6.1 Payload Planning System . . . 30
1.6.7 OCMS Menu . . . 31
1.6.7.1 File Ground Management Tool . . . 31
1.6.7.2 OSTP Ground Management Tool . . . 31
1.6.7.3 Reference File Editor . . . 32
1.6.8 Utilities Menu . . . 32
1.6.8.1 Framemaker . . . 32
1.6.8.2 Spreadsheet . . . 33
1.6.8.3 Pixmap Editor . . . 33
1.6.8.4 xv . . . 33
1.6.8.5 G2 Express Rack Tool . . . 34
1.6.8.6 Login To EHS . . . 35
1.6.8.7 Login To Non EHS . . . 35
1.6.8.8 File Transfer . . . 35
1.6.8.9 Process Manager . . . 35
1.6.8.10 Workstation Monitor . . . 35
1.6.8.11 DOSH Table . . . 35
1.6.8.12 Playback Status . . . 35
1.6.8.13 Bulk Validate . . . 36
1.6.8.14 Greenwich Mean Time (GMT) . . . 36
1.6.8.15 Mission Elapsed Time (MET) . . . 36
1.6.8.16 Actual GMT . . . 36

1.6.8.17 Screen Lock . . . 36
1.6.8.18 Change Password . . . 36
1.6.8.19 Workstation Preferences . . . 36

Chapter 2:
Message Handler . . . 37

2.1 Overview . . . 37
2.1.1 Menu Bar . . . 39
2.1.2 Work Area . . . 39
2.1.3 Control Panel . . . 42
2.1.4 Application Essentials . . . 42
2.1.4.1 Configure Columns . . . 43
2.1.4.2 Set Column Width . . . 44
2.1.4.3 Generate Report . . . 45
2.1.4.4 Setup Message Filter . . . 47
2.1.4.5 **Setup Message Scrolling . . . 50**

Chapter 3:
File Manager . . . 51

3.1 Overview . . . 51
3.1.1 Menu Bar . . . 52
3.1.2 Work Area . . . 53
3.1.3 Control Panel . . . 53
3.1.4 Application Essentials . . . 53
3.1.4.1 Rename . . . 54
3.1.4.2 Copy . . . 54
3.1.4.3 Delete . . . 54
3.1.4.4 String Search . . . 55

Chapter 4:
Store/Retrieve UDE . . . 57

4.1 Store UDE Overview . . . 58
4.1.1 Menu Bar . . . 59
4.1.2 Work Area . . . 60
4.1.3 Control Panel . . . 60
4.1.4 Store UDE Application Essentials . . . 60
4.1.4.1 Store . . . 61
4.2 Retrieve UDE Overview . . . 62
4.2.1 Menu Bar . . . 63
4.2.2 Work Area . . . 63
4.2.3 Control Panel . . . 64
4.2.4 Retrieve UDE Application Essentials . . . 64
4.2.4.1 Retrieve . . . 64

Chapter 5:
Print Operations 67

5.1 Setup Print Overview 67
5.2 Print Screen Overview 69
5.3 Print Window Overview 69
5.4 Print Status Overview 69
5.4.1 Menu Bar 70
5.4.2 Work Area 70
5.4.3 Control Panel 71
5.4.4 Print Status Application Essentials 71
5.4.4.1 Show Print Jobs 71
5.4.4.2 Remove Print Job 71

Chapter 6:
Display Generation/Operation. 73

6.1 Display Generation Overview 73
6.1.1 Menu Bar 74
6.1.2 Drawing Tools Palette 75
6.1.2.1 Primitive Objects Drawing Tools 76
6.1.2.2 Output Objects Drawing Tools 77
6.1.2.3 Input Objects Drawing Tools 78
6.1.3 Attribute Defaults Bar 79
6.1.3.1 Text Default Attributes 79
6.1.3.2 Line Default Attributes 79
6.1.3.3 Fill Default Attributes 80
6.1.4 Work Area 80
6.1.5 Application Essentials 81
6.1.5.1 Set Object Attributes... 82
6.1.5.2 Create Pulldown Menu... 85
6.1.5.3 Define Operation Startup List... 86
6.1.5.4 Set Operation Defaults... 87
6.1.5.5 Fit Display to Objects 88
6.1.5.6 Define Display Settings... 88
6.1.5.7 Validate... 90
6.1.5.8 Check for UDEs 91
6.1.5.9 Generate MSID Text Objects... 92
6.2 Display Operation Overview 95
6.2.1 Menu Bar 95
6.2.2 Status Bar 96
6.2.3 Work Area 97
6.2.4 Application Essentials 97
6.2.4.1 Set Data Mode and Database Version... 98
6.2.4.2 Show Recall Text 99
6.2.4.3 Disable and Enable Object LES Sensing 100

6.2.4.4 Enable All LES Sensing 102

Chapter 7:
Computation Generation/Operation Software 103

7.1 Computation Generation Overview 105
7.1.1 Menu Bar 105
7.1.2 Work Area 106
7.1.3 Application Essentials 106
7.1.3.1 Source Editor Mini-Application 107
7.1.3.2 Input MSID Editor Mini-Application 112
7.1.3.3 Output MSID Editor Mini-Application 115
7.1.3.4 Build Computation Mini-Application 124
7.2 Computation Operation Overview 133
7.2.1 Menu Bar 134
7.2.2 Work Area 134
7.2.3 Output Area 135
7.2.4 Application Essentials 135
7.2.4.1 Start... 135
7.2.4.2 Pause 137
7.2.4.3 Resume 138
7.2.4.4 Stop 138

Chapter 8:
Script Generation/Operation Software 139

8.1 Script Generation Overview 139
8.1.1 Menu Bar 141
8.1.2 Work Area 141
8.1.3 Application Essentials 141
8.1.3.1 Find... 142
8.1.3.2 Find Next 143
8.1.3.3 Replace... 143
8.1.3.4 Validate... 144
8.1.3.5 Check for UDEs 145
8.2 Script Operation Overview 147
8.2.1 Menu Bar 148
8.2.2 Work Area 149
8.2.3 Application Essentials 150
8.2.3.1 Clear Standard Output Log 151
8.2.3.2 Goto... 151
8.2.3.3 Hold At... 151
8.2.3.4 Pause Until... 152
8.2.3.5 Position... 152
8.2.3.6 Resume At... 152
8.2.3.7 Echo... 153

8.2.3.8 Start . . . 153
8.2.3.9 Step . . . 154
8.2.3.10 Step Off . . . 154
8.2.3.11 Manual Scroll . . . 154
8.2.3.12 Auto Scroll . . . 154

Chapter 9:
End-User Command Application Software . . . 155

9.1 Command Group Generation Overview . . . 157
9.1.1 Menu Bar . . . 158
9.1.2 Work Area . . . 159
9.1.3 Application Essentials . . . 163
9.1.3.1 Validate . . . 163
9.1.3.2 Find Command Inventory Mnemonic . . . 165
9.2 Command Update Form Generation Overview . . . 166
9.2.1 Menu Bar . . . 167
9.2.2 Tool and Attribute Bar . . . 168
9.2.3 Work Area . . . 168
9.2.4 Application Essentials . . . 170
9.2.4.1 Generate Command Form . . . 171
9.2.4.2 Generate Header Form . . . 174
9.2.4.3 Regenerate . . . 175
9.2.4.4 Bulk Generate Command Forms . . . 177
9.2.4.5 Bulk Generate Header Forms . . . 179
9.2.4.6 Add Predefined Fields . . . 181
9.2.4.7 Redraw . . . 182
9.2.4.8 Set Object Attributes . . . 182
9.3 Command Operation Overview . . . 186
9.3.1 Menu Bar . . . 186
9.3.2 Status Bar . . . 187
9.3.2.1 Uplink: . . . 187
9.3.2.2 User: . . . 188
9.3.2.3 System: . . . 188
9.3.2.4 Connection: . . . 188
9.3.2.5 MCC-H: . . . 188
9.3.2.6 Comm Path . . . 188
9.3.2.7 ISS Mode: . . . 189
9.3.2.8 Filter: . . . 189
9.3.2.9 Last Refresh Time: . . . 189
9.3.3 Inventory Selection Radio Buttons . . . 189
9.3.4 Work Area . . . 190
9.3.4.1 Command Inventory Work Area . . . 190
9.3.4.2 Header Inventory Work Area . . . 191
9.3.4.3 Group Inventory Work Area . . . 193
9.3.4.4 File Inventory Work Area . . . 194

9.3.4.5 Inventory Popup Menus . . . 195
9.3.5 Application Essentials . . . 196
9.3.5.1 Filter... . . . 196
9.3.5.2 Sort... . . . 198
9.3.5.3 Update... . . . 199
9.3.5.4 Uplink . . . 200
9.3.5.5 Uplink Time-Tag Command... . . . 205
9.3.5.6 Control Group Uplink... . . . 205
9.3.5.7 Delete From Drop Box... . . . 205
9.3.5.8 Stop File... . . . 206
9.3.5.9 Refresh . . . 206
9.3.5.10 Configure Command System... . . . 207
9.3.5.11 Process GSE File... . . . 210
9.3.5.12 Command Summary... . . . 211
9.3.5.13 Find Mnemonic/Group/File Name... . . . 213
9.3.5.14 Show Technical Name and Show Description . . . 214
9.4 Update Command Mini-Application Overview . . . 215
9.4.1 Menu Bar . . . 217
9.4.2 Status Bar . . . 218
9.4.3 Work Area . . . 219
9.4.4 Conversion Area . . . 220
9.4.5 Application Essentials . . . 220
9.4.5.1 Show User Defined Form . . . 220
9.4.5.2 Show Binary Form . . . 221
9.4.5.3 Show Character Form . . . 221
9.4.5.4 Show Decimal Form . . . 222
9.4.5.5 Show Hexadecimal Form . . . 222
9.4.5.6 Show Octal Form . . . 223
9.4.5.7 Update . . . 224
9.4.5.8 Define Variable Field Length... . . . 224
9.5 Downlink Request Overview . . . 225
9.5.1 Menu Bar . . . 227
9.5.2 Downlink Type Panel . . . 227
9.5.3 File Downlink Work Area . . . 228
9.5.4 Memory Dump Work Area . . . 228

Chapter 10:
Scratchpad Line Software . . . 229

10.1 Overview . . . 229
10.1.1 Menu Bar . . . 230
10.1.2 Work Area . . . 230
10.1.3 Application Essentials . . . 231
10.1.3.1 Buffer . . . 232
10.1.3.2 Start . . . 233
10.1.3.3 Stop . . . 234

10.1.3.4 Update 237
10.1.3.5 Uplink 238

Chapter 11:
Command Utilities Software 241

11.1 Command Track Overview 242
11.1.1 Menu Bar 243
11.1.2 Status Bar 244
11.1.3 Work Area. 244
11.1.4 Application Essentials. 247
11.1.4.1 View Time-Tag Queues... 248
11.2 Command Delog Overview 251
11.2.1 Menu Bar 252
11.2.2 Work Area. 252
11.2.3 Application Essentials. 255
11.2.3.1 Define Report Sort Criteria... 255

Chapter 12:
Near Real-Time (NRT) Data Request Software. 257

12.1 NRT Request Output Files. 258
12.2 NRT List Request Overview 262
12.2.1 Menu Bar 264
12.2.2 Work Area. 264
12.2.3 Application Essentials. 270
12.2.3.1 Validate... 271
12.2.3.2 Select MSID... 272
12.2.3.3 Set Data Processing 273
12.2.3.4 Set Data Representation... 274
12.2.3.5 Set Sample Thinning... 276
12.2.3.6 Set Limit/ES Sensing 277
12.2.3.7 Set Filter Test. 278
12.2.3.8 Show NRT Directory... 278
12.2.3.9 Show NRT Output... 282
12.3 NRT Snapshot Request Overview 285
12.3.1 Menu Bar 286
12.3.2 Work Area. 286
12.4 NRT Data Capture Request Overview. 289
12.4.1 Menu Bar 290
12.4.2 Work Area. 291
12.5 NRT Playback Request Overview 293
12.5.1 Menu Bar 294
12.5.2 Work Area. 294
12.5.3 Application Essentials. 298
12.5.3.1 Set Protocol 298

12.5.3.2 Set APID Extension . . . 299
12.5.3.3 Set Source Data Mode... . . . 300

Chapter 13:
Fault Summary Software . . . 303

13.1 Overview . . . 304
13.2 Fault Summary Application (FSA) . . . 304
13.2.1 Menu Bar . . . 305
13.2.2 Status Bar . . . 306
13.2.3 Work Area. . . . 306
13.3 Application Essentials . . . 308
13.3.1 Set Message Filters... . . . 308
13.3.2 Set Data Mode and Database Version... . . . 309
13.3.3 Pause Cyclic . . . 310
13.3.4 Resume Cyclic . . . 311

Chapter 14:
Ground Support Equipment (GSE)
Packets Software . . . 313

14.1 Overview. . . . 313
14.2 GSE Packets. . . . 314
14.2.1 Menu Bar . . . 315
14.2.2 Work Area. . . . 315
14.2.3 Application Essentials. . . . 316
14.2.3.1 Start... . . . 317
14.3 GSE Display Overview . . . 323
14.3.1 Menu Bar . . . 324
14.3.2 Status Bar . . . 324
14.3.3 Work Area. . . . 325
14.3.4 Application Essentials. . . . 326
14.3.4.1 Set Packet Retrieval Parameters... . . . 327
14.3.4.2 Show GSE Packet Definition... . . . 328
14.3.4.3 View Stream... . . . 330

Chapter 15:
Exception Monitor Software . . . 339

15.1 Exception Monitor Overview . . . 339
15.1.1 Menu Bar . . . 341
15.1.2 Status Bar . . . 342
15.1.3 View Selection Radio Buttons . . . 342
15.1.4 Work Area. . . . 343
15.1.4.1 MSIDs Table . . . 343
15.1.4.2 Groups Table . . . 347

15.1.5 Message Area . . . 348
15.1.6 Application Essentials . . . 350
15.1.6.1 Create . . . 350
15.1.6.2 Validate . . . 351
15.1.6.3 Start EM . . . 353
15.1.6.4 Stop EM . . . 354
15.1.6.5 Edit EM Attributes . . . 354
15.1.6.6 Enable . . . 355
15.1.6.7 Disable . . . 356
15.1.6.8 Refresh . . . 357
15.1.6.9 Disable/Enable Acknowledge Messages . . . 357
15.1.6.10 Set Data Mode and Database Version . . . 357

Chapter 16:
EHS Data Generation (EDG) Software . . . 359

16.1 MSID Data Generation Overview . . . 359
16.1.1 Menu Bar . . . 361
16.1.2 Work Area . . . 361
16.1.3 Application Essentials . . . 363
16.1.3.1 Update MSID . . . 363
16.1.3.2 Reset MSID . . . 363
16.2 Serial Data Generator Overview . . . 364
16.2.1 Menu Bar . . . 365
16.2.2 Work Area . . . 366
16.2.3 Application Essentials . . . 367
16.2.3.1 Add Stream . . . 367
16.2.3.2 Delete Stream . . . 368
16.2.3.3 Define Stream Format . . . 368
16.2.3.4 Set Stream Transmission . . . 370
16.2.3.5 Start . . . 371
16.2.3.6 Stop . . . 371
16.2.3.7 Resume . . . 371
16.2.3.8 Pause . . . 372
16.2.3.9 View Stream . . . 372
16.2.3.10 Reinitialize MSID Data File . . . 372
16.2.3.11 View Start Stream Status . . . 373
16.2.3.12 Set Database Version . . . 375
16.3 HOSC Packet Data Generator Overview . . . 375
16.3.1 Menu Bar . . . 376
16.3.2 Work Area . . . 377
16.4 CCSDS Packet Data Generator Overview . . . 378
16.4.1 Menu Bar . . . 379
16.4.2 Work Area . . . 380
16.4.3 Application Essentials . . . 381
16.4.3.1 Add Packet . . . 382

16.4.3.2 Delete Packet . . . 383
16.4.3.3 Set Packet Transmission... . . . 383
16.4.3.4 Define Packet Format... . . . 384
16.4.3.5 Define Random Subset... . . . 386
16.4.3.6 Set LOS Packet Transmission.... . . . 387
16.4.3.7 Modify Primary Header... . . . 387
16.4.3.8 Modify Secondary Header... . . . 389
16.4.3.9 Modify CCSDS Header... . . . 393
16.4.3.10Start . . . 395
16.4.3.11Stop . . . 395
16.4.3.12Pause . . . 395
16.4.3.13Resume. . . . 396
16.4.3.14View Stream... . . . 396
16.4.3.15Reinitialize MSID Data File... . . . 398
16.4.3.16View Start Packet Status.... . . . 398
16.4.3.17Set Database Version... . . . 399

Chapter 17:
EHS Databases . . . 401

17.1 Telemetry Database Overview. . . . 403
17.1.1 Menu Bar . . . 404
17.1.1.1 Database Menu . . . 404
17.1.1.2 Query/Update Menu . . . 406
17.1.1.3 Report Menu . . . 410
17.1.1.4 Options Menu . . . 410
17.1.1.5 Help Menu . . . 420
17.2 Telemetry Database Local Table Overview . . . 420
17.2.1 Menu Bar . . . 421
17.2.1.1 Query/Update Menu . . . 422
17.2.1.2 Report Menu . . . 423
17.2.1.3 Options Menu . . . 423
17.3 Common Form Functions . . . 425
17.4 Telemetry Database Forms . . . 428
17.4.1 MSID List - Query Only Form . . . 429
17.4.2 MSID Detail Form . . . 429
17.4.3 Packet MSID List - Query Only Form . . . 429
17.4.4 Stream List Form . . . 430
17.4.5 Block Detail Form . . . 430
17.4.6 Packet Detail Form . . . 430
17.4.7 Subset List - Query Only Form. . . . 431
17.4.8 Subset Detail Form . . . 431
17.4.9 TDM Detail Form . . . 431
17.4.10Decommutation Detail Form . . . 432
17.4.11Decommutation List Form . . . 432
17.4.12Counter Detail Form . . . 433

17.4.13Calibration Detail Form 433
17.4.14Calibration List Forms 434
17.4.15Limit Sensing Detail Forms 434
17.4.16Limit Sensing List Forms 435
17.4.17Group List - Query Only Form 435
17.4.18Group Detail Form 435
17.4.19Non-Configuration Controlled GSE Form 436
17.4.20Configuration Controlled GSE Form 436
17.4.21GSE Packet Assignment Form 437
17.4.22Packet Destination Information Form. 437
17.4.23OI Format Form 438
17.4.24GPC Format Form 438
17.4.25OI PDI Allocation Form 438
17.4.26PDI List Form 439
17.4.27Owner List Form. 440
17.4.28Owner Authorization List Form 440
17.4.29Engineering Unit - Query Only Form. 440
17.4.30Data Type - Query Only Form 441
17.4.31Conversion Matrix - Query Only Form 441
17.4.32Error Log - Query Only Form. 441
17.4.33Initial Load Data - Query Only Form 442
17.4.34SDT OD Build List Form 442
17.4.35MBF MSID List Form 443
17.4.36MBF State Code Form 443
17.4.37MSID List - Query Only (Local Table) Form 444
17.4.38Group List - Query Only (Local Table) Form 445
17.5 Local Table Operation Overview 445
17.5.1 Menu Bar 446
17.5.2 Database Selection Radio Buttons 447
17.5.3 Work Area. 447
17.5.4 Application Essentials. 447
17.5.4.1 Apply Change File... 447
17.5.4.2 Remove Change File.... 448
17.5.4.3 View MSID Information.... 448
17.5.4.4 View Group Information... 449
17.5.4.5 Activate Group... 450
17.5.4.6 Set LES Processing.... 450
17.6 User-Generated Data Element (UDE) Database Overview 450
17.6.1 Menu Bar 451
17.6.1.1 Database Menu 452
17.6.1.2 Query/Update Menu 452
17.6.1.3 Report Menu 456
17.6.1.4 Options Menu 457
17.6.1.5 Help Menu 459
17.7 Database Change Request Overview 459
17.7.1 Menu Bar 460

17.7.1.1 Database Menu . . . 461
17.7.1.2 Query/Update Menu . . . 462
17.7.1.3 Report Menu . . . 473
17.7.1.4 Help Menu . . . 478

Chapter 18:
Payload Information Management System (PIMS) . . . 479

18.1 PIMS To Do List Overview . . . 481
18.1.1 Menu Bar . . . 483
18.1.2 Work Area . . . 483
18.1.3 Application Essentials . . . 486
18.1.3.1 Complete Task... . . . 486
18.1.3.2 Modify Group Lists... . . . 533
18.2 Documents Overview . . . 538
18.2.1 Menu Bar . . . 539
18.2.2 Work Area . . . 540
18.2.3 Application Essentials . . . 541
18.2.3.1 New . . . 542
18.2.3.2 Copy... . . . 546
18.2.3.3 Move... . . . 547
18.2.3.4 Retrieve Copy... . . . 547
18.2.3.5 Compare Files... . . . 549
18.2.3.6 Transfer File(s) To HOSC Drop Box... . . . 550
18.2.3.7 Delete File(s) From HOSC Drop Box... . . . 551
18.2.3.8 View Document Properties... . . . 553
18.2.3.9 Edit Document Properties... . . . 554
18.3 Operations Change Request (OCR) Overview . . . 556
18.3.1 Menu Bar . . . 559
18.3.2 Work Area . . . 560
18.3.3 Application Essentials . . . 563
18.3.3.1 New OCR... . . . 564
18.3.3.2 Copy... . . . 578
18.3.3.3 View... . . . 579
18.3.3.4 View Printable OCR... . . . 580
18.3.3.5 Delete . . . 583
18.3.3.6 Facility Review Status . . . 583
18.3.3.7 POIC Review Status . . . 584
18.3.3.8 Actionee Status . . . 586
18.3.3.9 Modify Action Descriptions... . . . 587
18.3.3.10 Modify Group Lists... . . . 588
18.4 Timeliner Overview . . . 589
18.4.1 Menu Bar . . . 595
18.4.2 Work Area . . . 596
18.4.3 Application Essentials . . . 601
18.4.3.1 Compile... . . . 602

18.4.3.2 Set Compiler Options... 606
18.4.3.3 Validate... 609
18.4.3.4 View Document Properties... 612

Chapter 19:
Payload Planning System (PPS) Software ... 615

Chapter 20:
Command Plan Management Tool (CPMT) Software ... 617

20.1 Overview ... 617
20.2 Command Plan Management Tool ... 620
20.2.1 Menu Bar ... 622
20.2.2 Status Bar ... 623
20.2.3 Legend/Window Status Area ... 623
20.2.4 CPMT Graph Area ... 625
20.2.4.1 Day/Time Scale ... 625
20.2.4.2 TDRS Information Bar ... 626
20.2.4.3 User Information Area ... 626
20.2.5 Control Panel ... 627
20.3 Mouse and Keyboard Procedures ... 628
20.3.1 Mouse Procedures ... 628
20.3.1.1 Command Window Selection ... 628
20.3.1.2 EHS User ID Selection ... 628
20.3.1.3 Command Window Graphical Editing ... 629
20.3.1.4 Graphically Adding a Command Window ... 630
20.3.1.5 Time Scale Slider ... 630
20.3.2 Keyboard Procedures ... 631
20.3.2.1 Up Arrow ... 632
20.3.2.2 Down Arrow ... 632
20.3.2.3 Right Arrow ... 632
20.3.2.4 Left Arrow ... 632
20.3.2.5 Space Bar ... 632
20.4 Application Essentials ... 632
20.4.1 Filter Preferences... 633
20.4.2 The Edit Menu ... 634
20.4.2.1 Assign Activities... 635
20.4.2.2 Add User... 636
20.4.2.3 Delete User ... 637
20.4.2.4 Add Window... 637
20.4.2.5 Delete Window ... 638
20.4.2.6 Modify Window... 638
20.4.2.7 Undo Edit ... 639
20.4.2.8 Clear All Edits... ... 639
20.4.2.9 Commit Edits... ... 640
20.4.2.10Extract Activity Plan... 640

20.4.2.11Merge Activity Plan . . . 641
20.4.3 The Options Menu . . . 641
20.4.3.1 Activate All Users . . . 641
20.4.3.2 Deactivate All Users . . . 641
20.4.3.3 Activate User . . . 641
20.4.3.4 Deactivate User . . . 642
20.4.3.5 Activate Window . . . 642
20.4.3.6 Deactivate Window . . . 642
20.4.3.7 Start/Stop Execution . . . 642
20.5 Asynchronous Arrival of New TDRS Data . . . 643
20.6 Asynchronous Commanding Status from an External Source . . . 643

Chapter 21:
File Ground Management Tool (FGMT) Software . . . 645

21.1 File Ground Management Tool (FGMT) Overview . . . 646
21.1.1 Menu Bar . . . 649
21.1.2 Status Bar . . . 650
21.1.3 Work Area . . . 651
21.1.4 Application Essentials . . . 652
21.1.4.1 Find... . . . 653
21.1.4.2 Downlink... . . . 654
21.1.4.3 Load... . . . 654
21.1.4.4 Delete... . . . 655
21.1.4.5 Copy... . . . 656
21.1.4.6 Change Attributes... . . . 656
21.1.4.7 Create Directory... . . . 658
21.1.4.8 Delete Directory... . . . 658
21.1.4.9 Update Ground Model... . . . 659
21.1.4.10Refresh . . . 660
21.1.4.11Compare Directories... . . . 660
21.1.4.12Update Disk Status... . . . 661
21.1.4.13View Schedule... . . . 661
21.1.4.14Generate MSD Schedule... . . . 662
21.1.4.15Execute Schedule... . . . 662
21.2 View Schedule Mini-Application . . . 662
21.2.1 Menu Bar . . . 663
21.2.2 Status Bar . . . 663
21.2.3 Work Area . . . 665
21.2.4 Application Essentials . . . 667
21.2.4.1 Open... . . . 667
21.2.4.2 Filter... . . . 669
21.2.4.3 Late Files Report... . . . 669
21.2.4.4 MSD Utilization Report... . . . 671
21.2.4.5 TDRS Utilization Report... . . . 672
21.3 Generate Schedule Mini-Application . . . 674

21.3.1 Menu Bar . . . 675
21.3.2 Status Bar . . . 676
21.3.3 Work Area . . . 676
21.3.4 Application Essentials . . . 677
21.3.4.1 Generate . . . 678
21.3.4.2 Open... . . . 681
21.3.4.3 Merge... . . . 682
21.3.4.4 Delete... . . . 683
21.3.4.5 Modify Entry... . . . 684
21.3.4.6 Add Entry... . . . 685
21.3.4.7 Delete Entry... . . . 686
21.3.4.8 Validate Schedule... . . . 686
21.3.4.9 Configure... . . . 687
21.4 Execute Schedule Mini-Application . . . 689
21.4.1 Menu Bar . . . 690
21.4.2 Status Bar . . . 690
21.4.3 Work Area . . . 692
21.4.4 Application Essentials . . . 695
21.4.4.1 Execute . . . 695
21.4.4.2 Execute Now . . . 696
21.4.4.3 Halt . . . 696
21.4.4.4 Select All . . . 696

Chapter 22:
Onboard Short-Term Planning (OSTP) Ground Management Tool (OSTPGMT) . . . 697

22.1 OSTP Ground Management Tool (OSTPGMT) Overview . . . 698

Chapter 23:
Reference File Editor (RFE) Software . . . 699

23.1 Reference File Editor (RFE) Overview . . . 699
23.1.1 Menu Bar . . . 701
23.1.2 Status Bar . . . 702
23.1.3 Work Area . . . 702
23.1.4 Application Essentials . . . 702
23.1.4.1 Find... . . . 703
23.1.4.2 Find Next . . . 704
23.1.4.3 Replace... . . . 704
23.1.4.4 Validate... . . . 705

Chapter 24:
Automated Procedures Ground Management Tool (APGMT) . . . 707

24.1 Overview . . . 709
24.1.1 Menu Bar . . . 711

24.1.2 Status Bar . . . 712
24.1.3 Work Area. . . . 713
24.1.4 Application Essentials. . . . 714
24.1.4.1 Freeze Executor . . . 714
24.1.4.2 Reset Freeze . . . 715
24.1.4.3 Install Bundle... . . . 716
24.1.4.4 Remove Bundle . . . 718
24.1.4.5 Halt Bundle . . . 719
24.1.4.6 Monitor Bundle... . . . 720
24.1.4.7 View Listing... . . . 720
24.2 Monitor Bundle Mini-Application . . . 721
24.2.1 Menu Bar . . . 722
24.2.2 Work Area. . . . 723
24.2.3 Application Essentials. . . . 724
24.2.3.1 Halt Bundle . . . 724
24.2.3.2 Remove Bundle . . . 725
24.2.3.3 Start Sequence . . . 726
24.2.3.4 Stop Sequence . . . 727
24.2.3.5 Resume Sequence . . . 728
24.2.3.6 Trace Sequence... . . . 729
24.2.3.7 View Sequence... . . . 730
24.3 View Sequence Mini-Application . . . 731
24.3.1 Menu Bar . . . 732
24.3.2 Status Bar . . . 733
24.3.3 Work Area. . . . 734
24.3.4 Application Essentials. . . . 735
24.3.4.1 Start . . . 736
24.3.4.2 Stop . . . 737
24.3.4.3 Resume. . . . 737
24.3.4.4 Step . . . 738
24.3.4.5 Hold . . . 739
24.3.4.6 Jump. . . . 740

Chapter 25:
Utilities Menu Applications . . . 743

25.1 COTS . . . 743
25.1.1 FrameMaker Application . . . 744
25.1.2 Spreadsheet Application . . . 744
25.1.3 Pixmap Editor Application . . . 745
25.1.4 xv Application. . . . 745
25.2 G2 Express Rack Tool . . . 746
25.3 Login to EHS Application . . . 746
25.4 Login to Non EHS Application . . . 747
25.5 File Transfer Application. . . . 748
25.5.1 Menu Bar . . . 749

25.5.2 Status Bar . . . 750
25.5.3 Work Area. . . . 750
25.5.4 Application Essentials. . . . 752
25.5.4.1 Send . . . 753
25.5.4.2 Send As... . . . 754
25.5.4.3 Retrieve . . . 754
25.5.4.4 Retrieve As... . . . 754
25.5.4.5 Setup File List Options... . . . 755
25.5.4.6 Filter. . . . 756
25.5.4.7 Select All . . . 756
25.5.4.8 Deselect All . . . 756
25.5.4.9 Filter (Remote). . . . 756
25.5.4.10 Select All (Remote) . . . 756
25.5.4.11 Deselect All (Remote) . . . 756
25.5.4.12 Create Directory... . . . 757
25.5.4.13 Remove Directory... . . . 757
25.5.4.14 Up Directory . . . 758
25.5.4.15 Down Directory . . . 758
25.5.4.16 Remove File... . . . 758
25.5.4.17 Change File Properties... . . . 758
25.6 Workstation Monitor Application . . . 759
25.7 DOSH Table Application. . . . 761
25.8 Playback Status Application . . . 762
25.8.1 Work Area. . . . 763
25.9 Bulk Validate Application . . . 766
25.9.1 Menu Bar . . . 767
25.9.2 Work Area. . . . 767
25.9.3 Application Essentials. . . . 768
25.9.3.1 Validate... . . . 768
25.9.3.2 Check for UDEs. . . . 769
25.9.3.3 View Validation Report . . . 769
25.9.3.4 View UDE Report . . . 770
25.10 Greewich Mean Time (GMT) Application . . . 771
25.11 Mission Elapsed Time (MET) Application . . . 771
25.12 Actual GMT Application . . . 771
25.13 Screenlock Application . . . 771
25.14 Change Password Application . . . 772
25.15 Workstation Preferences Application . . . 772

Appendix A: Conventions . . . 775

A.1 Typographical Conventions . . . 775
A.2 Key Definitions . . . 776
A.3 Accelerator Keys . . . 776
A.4 Mouse Basics . . . 778

Appendix B:
Remote Access to EHS Services. 781

B.1 X-Window Access Requirements 781
B.2 X-Window Access Procedures 783
B.3 Procedure for Logging Out of an X-Window Session. 784
B.4 Web Launchpad Access Requirements 784

Appendix C:
UDE Types, Workstation Directory Structure and Available Functions 789

Appendix D:
Message Types and Examples 793

Appendix E:
Message Code Index 795

Appendix F:
Status Characters and Their Definitions 797

Appendix G:
MSID LES Colors 799

Appendix H:
Invalid MSID Indicators 801

Appendix I:
Project LES Configurations. 803

Appendix J:
Display Data Type Conversion Matrix 805

Appendix K:
Computation Legal & Illegal Functions 807

K.1 Legal Functions 807
K.2 Illegal Functions 813

Appendix L:
Computation Pre-Compiler Functions 851

Appendix M:
User Computation Example. 853

M.1 Input MSID Example. 853
M.2 Output MSID File Example 854

M.3 Main Source File Example 855
M.4 Subroutine File Example 864
M.5 Include File Example 865

Appendix N:
Available Libraries - Computations 867

Appendix O:
Computation Data Type Conversion Matrix 869

Appendix P:
Computation Services Validation Warning Matrix 871

Appendix Q:
Example Script 873

Appendix R:
Script Data Type Conversion Matrix 879

Appendix S:
Status Codes 881

Appendix T:
Report Previewer 887

T.1 Overview 887
T.2 Main Window Components 887
T.2.1 Application Title Bar 888
T.2.2 Menu Bar 888
T.2.2.1 File Menu 889
T.2.2.2 Edit Menu 890
T.2.2.3 View Menu 891
T.2.2.4 Windows Menu 891
T.2.2.5 Help Menu 891
T.2.3 Tool Bar 892
T.2.4 Work Area 892

Appendix U:
Command Delog Report Example 895

Appendix V:
Acknowledgement Codes 897

Appendix W:
Status Character Definitions 905

Appendix X:
Protocol Descriptions 907

Appendix Y:
Valid Entries for Each Native Data Type 909

Appendix Z:
Creating NRT Time Plots 919

Appendix AA:
Filter Test Options 927

Appendix AB:
Telemetry Database NRT
Cross-Reference 929

AB.1 Stream List Form 929
AB.2 Packet Detail Form 931
AB.3 Packet MSID List Form 933

Appendix AC:
Limit/Expected State Sensing Set Activation Criteria 935

Appendix AD:
PIMS Account Privileges 937

Appendix AE:
PIMS HOSC Drop Box Privileges 939

Appendix AF:
PIMS Folder Types and Icon Representations 943

Appendix AG:
PIMS Workflow Diagrams 947

Appendix AH:
Example Reference File 951

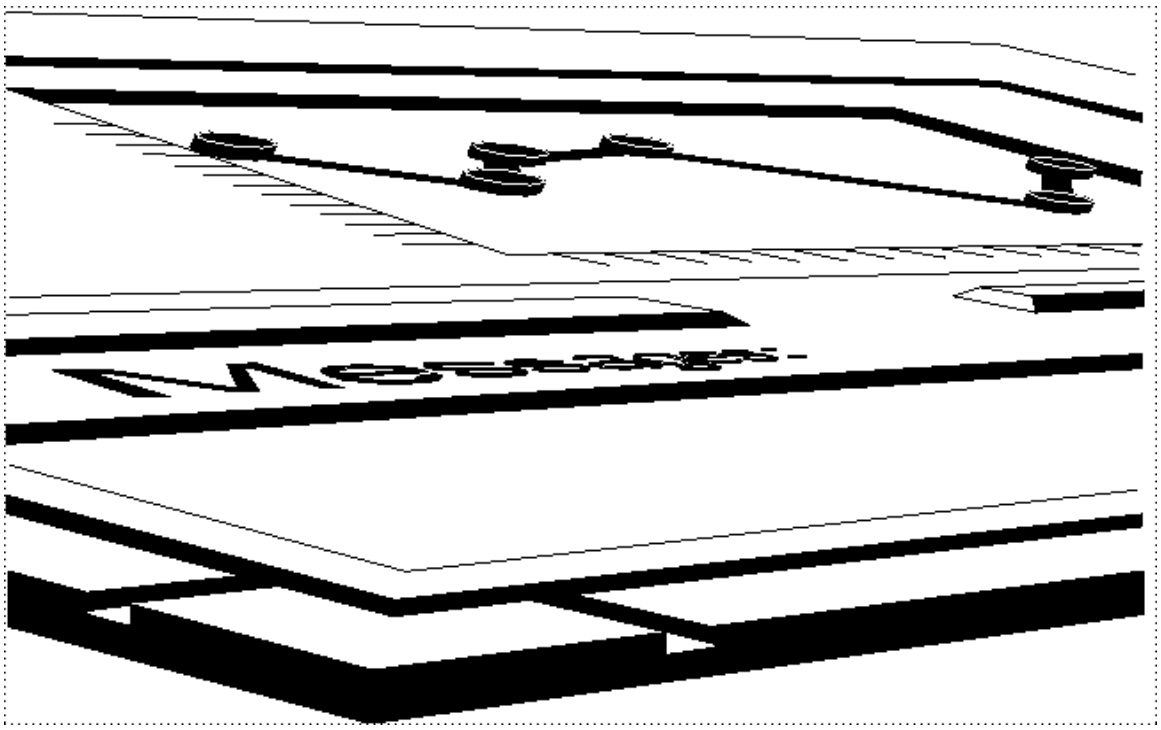
Appendix AI:
EHS Data Modes 957

Appendix AJ:
GSE Display Overall Status Codes 959

Appendix AK:
GSE Display Status Characters 963

Abbreviations and Acronym List 967

Glossary: 983



Chapter 1:
About this User Guide

This user guide describes the entire collection of unrestricted software that comprises the HOSC Application Software. It has been written in a style designed to minimize the number of required pages without impacting the information content of the material. Specifically, only information peculiar to individual software applications has been included in this manual. Excluded information, such as common user interfaces or software that is considered to be intuitive, may be accessed using the online help function that is included in all of the EHS software applications.

In order to fully understand and use the EHS applications software, you may also need to reference the user guides on RESTRICTED DISTRIBUTION:

- Using the HOSC Privileged Command Applications (HOSC-EHS-1139)
- Using the HOSC Command Database Software (HOSC-EHS-1189)
- Using the HOSC Database Monitor and Control (DMC) Software (HOSC-EHS-1170)
- Using the HOSC Configuration Manager Software (HOSC-EHS- 1174)
- Using the HOSC User Configuration Manager Software (HOSC-EHS-1176)
- Using the HOSC System Monitor and Control Status and Control (SMSC) Software (HOSC-EHS-1175)

To obtain a copy of a RESTRICTED DISTRIBUTION user guide, contact the HOSC Computer Security Official.

Help: All information (included in and excluded from this user guide) concerning EHS application software is available via online help. Online help may be accessed in any of three ways:

- the **Help** menu on the Launchpad
- individual HOSC application **Help** menu items
- selection of the Help pushbutton on windows, forms, and dialog boxes

1.1 Getting Started

Welcome to the Huntsville Operations Support Center (HOSC) Application Software. This complement of full-featured software programs was developed at NASA's Marshall Space Flight Center (MSFC). The software was developed for use by Space Shuttle and International Space Station (ISS) scientists, engineers, and support personnel. It provides the basic tools needed to control, monitor, and analyze data from space vehicles and payloads. It also provides tools needed to control and administer processes required to manage space vehicle operations and payloads.

Given the extensive technical requirements, extreme effort has been taken to make the software as intuitive and user-friendly as possible. Hopefully, your experience with the software will be rewarding, and you'll find it satisfies your individual needs. A comment form is included as the last item in this document. If you have comments regarding this software or its documentation, please complete the form and mail it to the address specified.

1.2 Working with Windows

The backdrop on which all windows are opened is referred to as the desktop. A typical HOSC workstation screen is shown in Figure 1-1, with several windows open. You can move windows to different locations on the desktop, you can resize them, or you can place them on top of each other. To "raise" a window to the top level so you can see and work with all of it, you position the mouse pointer over the window you want and click the left mouse button. This brings that window to the top of all other windows and makes it active. The active window is distinguished from other windows by color.

There are several types of windows:

- Main application - these windows serve as the "home" window for each application. This is the window from which all associated application functions are initiated.
- Database application - these windows function the same as main application windows, except they were created using a commercial database application, Oracle®. They present a different look by not adhering to the standard user interface, and having a unique menu bar.

- Mini-application - these windows are identical to main application windows except that they are invoked from an application main window. These windows may also be closed without it closing (exiting) the originating application.
- Dialog boxes - these windows do not have menu bars and are used to solicit additional information prior to implementing the specific function.
- Message dialog boxes - these windows are like dialog boxes except they are used to warn you of errors or conditions which might impact your work. They may also be used to confirm your desire to implement the selected function.

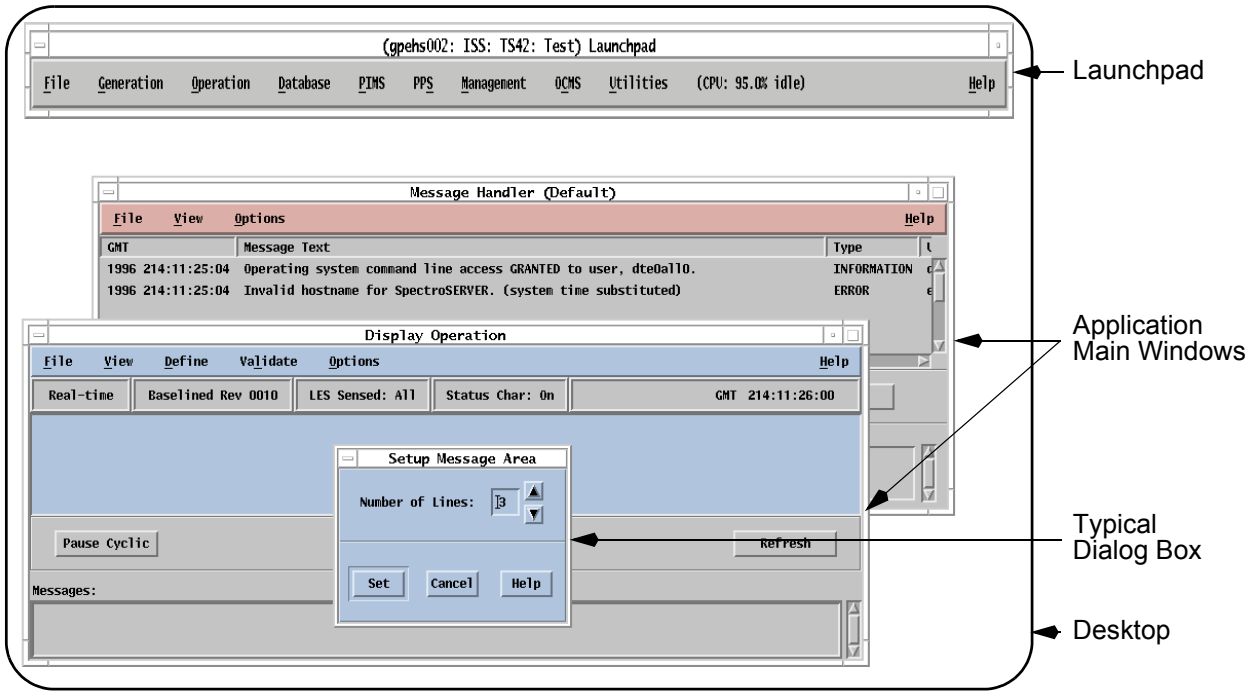


Figure 1-1, Typical workstation screen.

1.2.1 Application Main Windows

Application main windows are different from dialog boxes in that they have minimize and maximize buttons and a menu bar which, at a minimum, includes **File**, **View** and **Help** as depicted in Figure 1-2, Standard main window features. Dialog boxes, on the other hand, are invoked from main application windows and may or may not have minimize and maximize buttons depending on their content and function. A dialog box does not have a menu bar and its window resize functions may be restricted.

The application main window depicted in Figure 1-2, Standard main window features, shows those elements that are common across many HOSC applications.

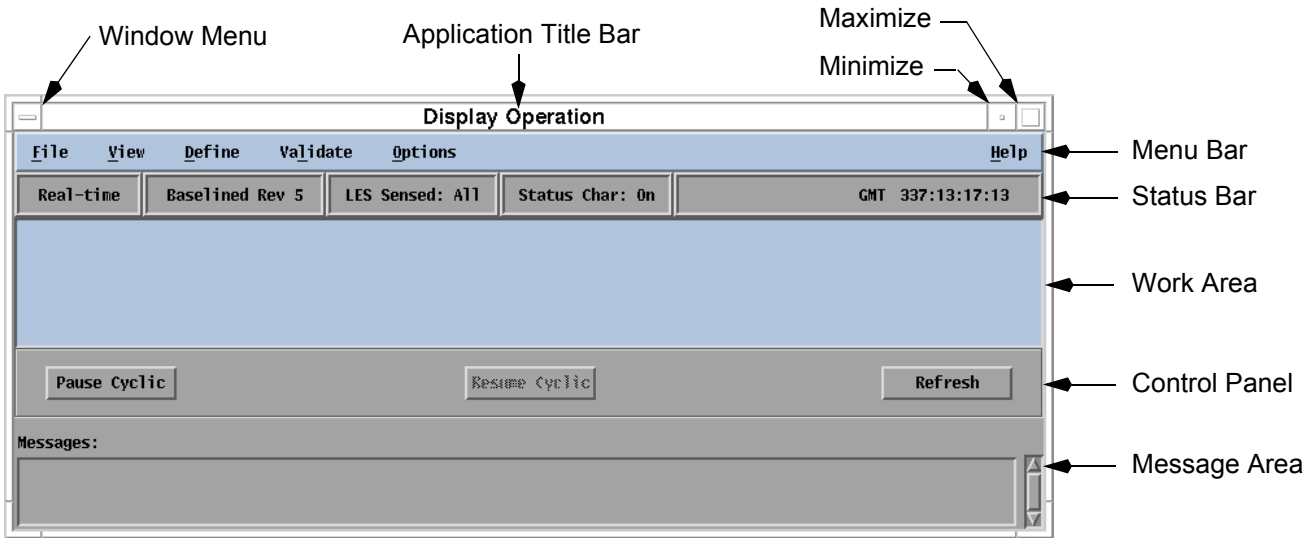


Figure 1-2, Standard main window features.

1.2.2 Database Applications

The HOSC database applications (Telemetry Database, Command Database, and UDE Database) use Oracle® Forms as their basis (other EHS applications such as Database Change Request and Local Table Operations information windows also interface with the database applications and present users with Oracle forms). As a result, these applications present a slightly different look from standard HOSC Motif compliant applications. Database application main windows are invoked with no work area (see Figure 1-3, Typical database application main window). These main windows are comprised of three major components:

- Title bar
- Menu bar
- Message area

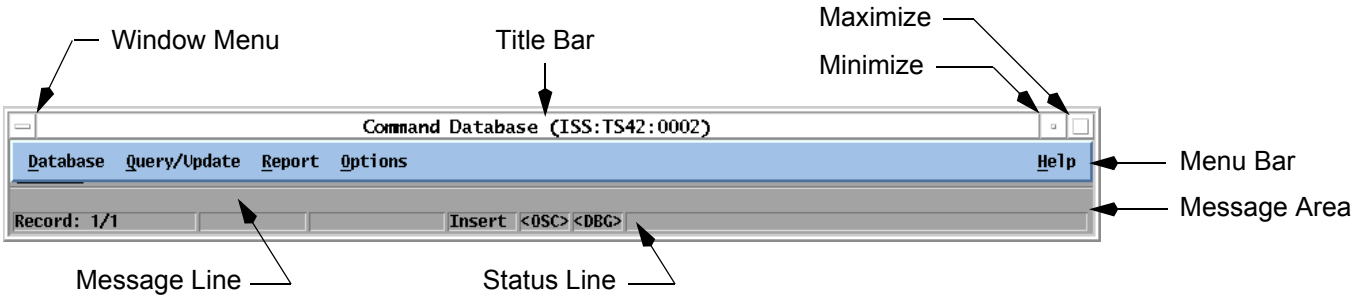


Figure 1-3, Typical database application main window.

The title bar displays the name of the application and within parentheses, may contain information such as the project, the mission, etc.

The database application menu bar is unique in that it doesn't contain the standard HOSC application menus. Database applications include as their standard set of menus: **Database**, **Query/Update**, **Report**, **Options**, and **Help**.

Database forms are selected through cascade menus available off the **Query/Update** menu. Forms are the tools used to both query and update specific items available in the respective databases. Each form allows you to search and update different information. All forms have common characteristics, menus, and menu items (see Figure 1-4, Typical database application form).

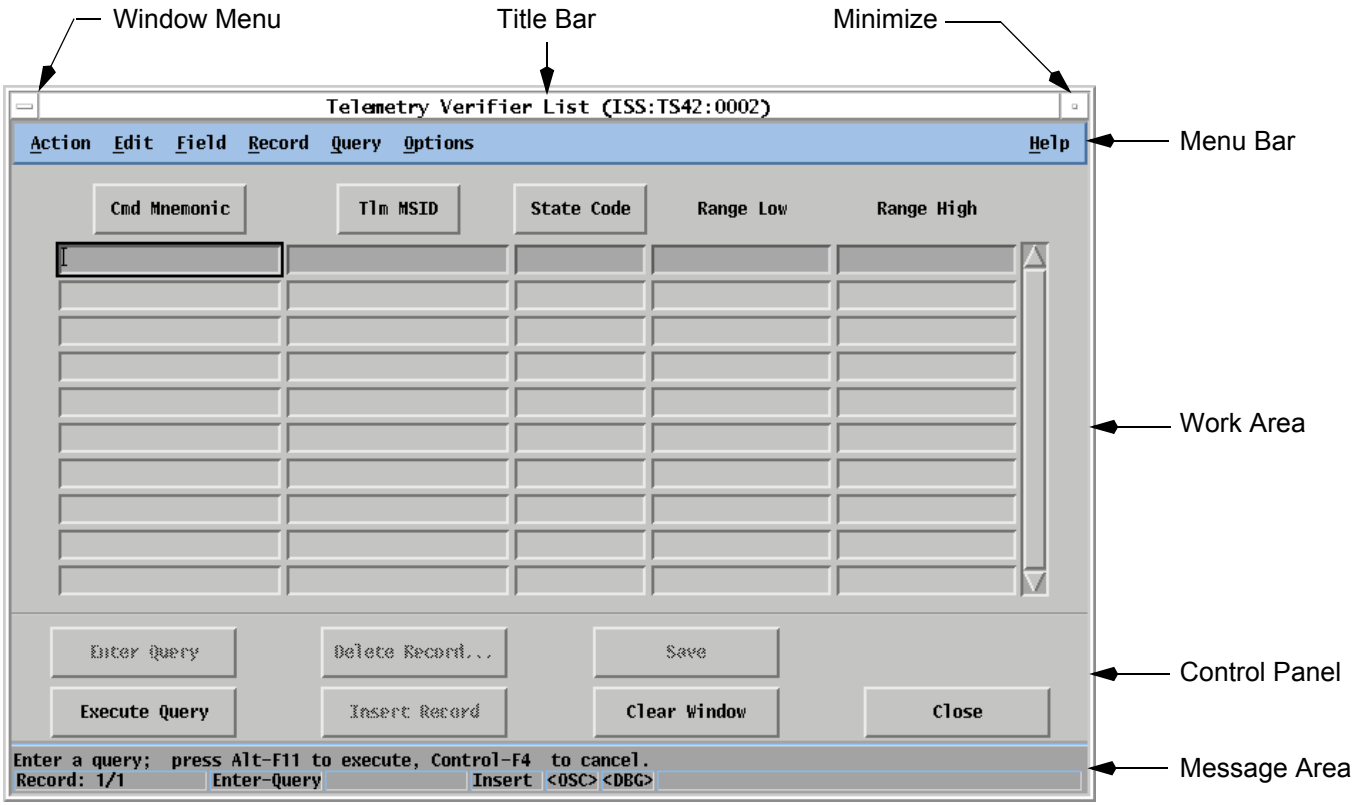


Figure 1-4, Typical database application form.

Help: Forms include a control panel which contains a set of pushbuttons relative to each form. For information on form-specific control panel pushbuttons, see the Online Help topic for each respective database application.

The status line for forms is the same as that of main windows for both the **List** and the **Insert** and **Replace** indicators. The status line for forms is different from application main windows because it is through forms that you execute database queries.

Prior to using a form to execute a query, the **Count:** will show ***0** and the status line will include the phrase **ENTER QUERY**, which is intended to prompt you to enter relevant search criteria on the first line of the form. After you execute a query that results in matching records being found, the **ENTER QUERY** indicator goes away. The **Record:** will show you the number of records retrieved. If there are additional records matching your search criteria above and/or below the selected record you can use the keyboard arrow keys to move from one selected row to the next.

1.2.3 Mini-Applications

In some cases, applications are complicated enough to warrant having more than one main application window. These secondary main windows or mini-applications are just like main window applications except that a **Close** function is provided under the **File** menu rather than **Exit** (see Figure 1-5, Edit Schedule mini application file menu). If you select **Close** in a mini-application, it closes only the mini-application window and does not close or stop the main application that spawned it. In addition, mini-applications can be iconified separately from their originating application main window.

CAUTION: If you exit an application that has mini-application windows open or iconified, the mini-application windows will also be closed and all their processes halted.

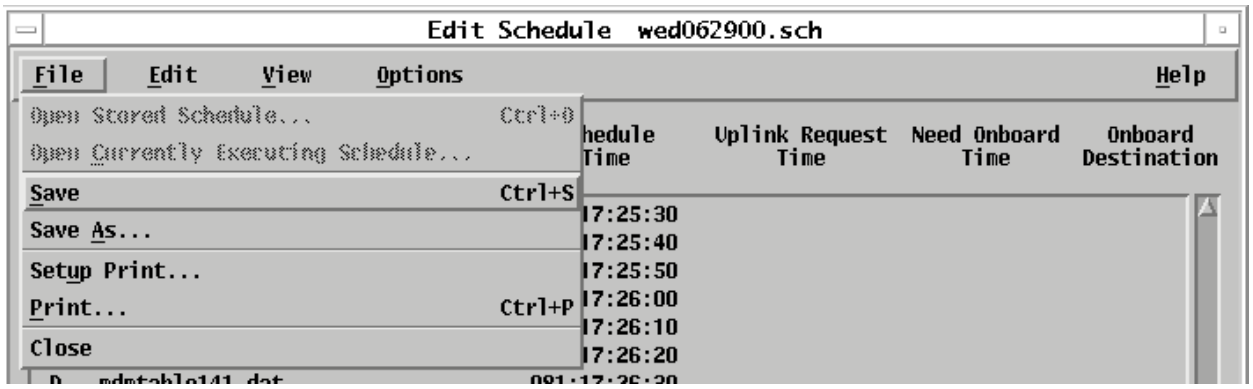


Figure 1-5, Edit Schedule mini-application file menu.

1.2.4 Application Dialog Boxes

Within applications, dialog boxes provide the means for you to supply information necessary to perform various application functions (see Figure 1-6, Dialog box example).

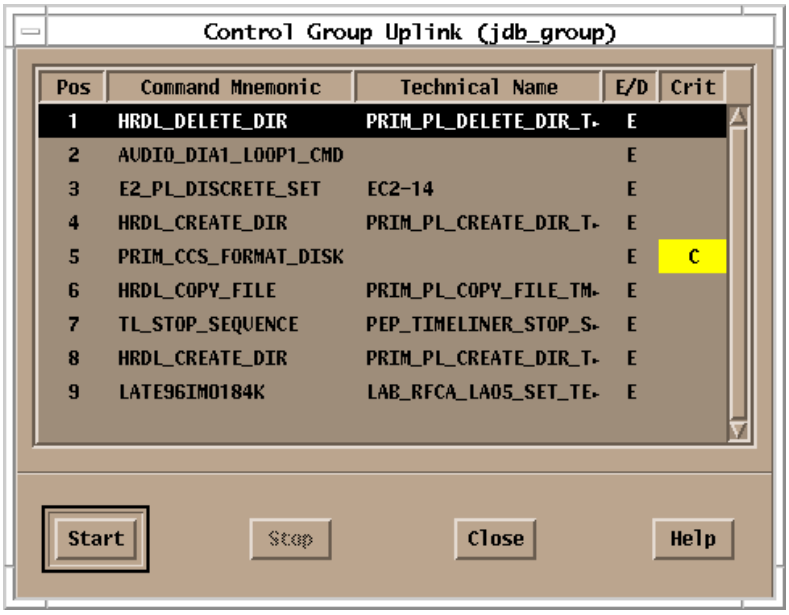


Figure 1-6, Dialog box example.

Dialog boxes are organized such that they follow a logical, easy to understand, real-life sequence from left to right and top to bottom. This sequence is intended to help you understand and logically approach application issues. Dialog boxes can include both graphic and text elements.

Dialog boxes are invoked from application main windows and typically, they cannot be moved lower than (behind) their parent application window. They may or may not have minimize and maximize buttons depending on if they are transitory or needed for quick access. A dialog box does not have a menu bar and its window resize functions may be restricted.

Note: If a dialog box is permitted to be lowered beneath its parent window, you can bring it back to the top by selecting the option that initiated it.

1.2.5 Message Dialog Boxes

A message dialog box is used to deliver important messages to the user or to indicate an error or exception condition. The message dialog box is displayed on top of the active window and usually will not go away until it is acknowledged. A typical message dialog box is shown in Figure 1-7, Typical message dialog box.

Figure 1-7, Typical message dialog box.

1.3 Standard Menu Bar Items

All application main windows have a menu bar. The menu bar is located just below the application title bar and at a minimum includes **File**, **View** and **Help**. The following sections will address the generic components of each of these menus.

1.3.1 Using the File Menu

The **File** menu is typically where you go to perform file operations like opening a new file, opening a saved file, saving a file, etc. (see Figure 1-8, Typical application File menu). The **File** menu is located farthest to the left on the menu bar and is most significant because it contains the **Exit** menu item. **Exit** should be used to terminate all main window application processes. Mini-applications will have a **Close** menu item instead of **Exit**.

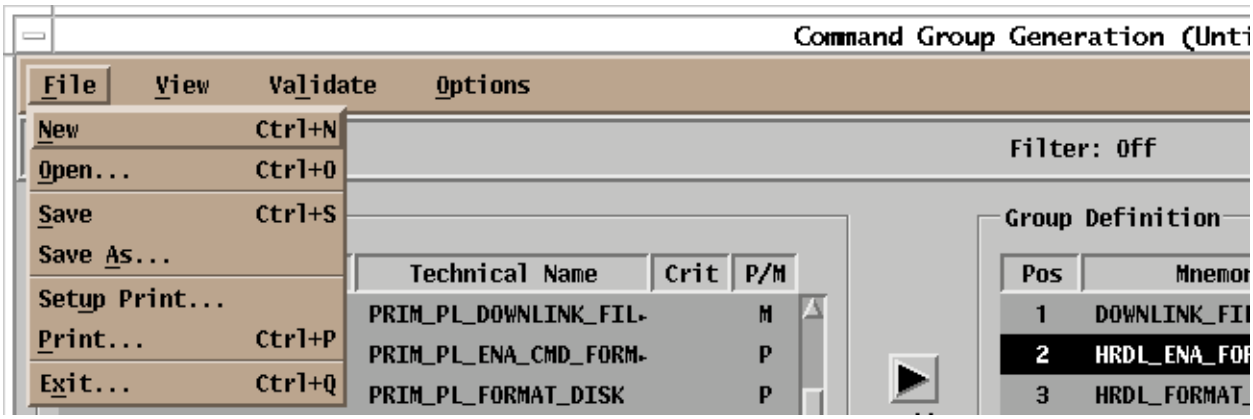


Figure 1-8, Typical application File menu.

1.3.2 Using the View Menu

The **View** menu allows you to identify what and how data is displayed without altering it. Common options under the **View** menu include: **Clear Messages**, **Setup Message Area...**, **Set Time**

Reference..., **Hide/Show Control Panel**, and **Hide/Show Status Bar** (see Figure 1-9, Typical application View menu).

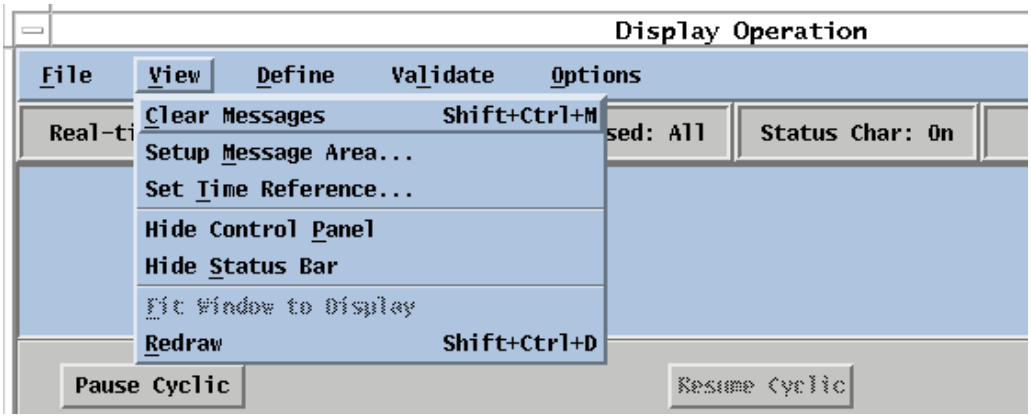


Figure 1-9, Typical application View menu

The **View** menu of most HOSC applications allows you to modify the way application messages are displayed. These messages are written to the message area at the bottom of application main windows. By default, the message area displays three lines at a time.

The **Clear Messages** menu item under the **View** menu, allows you to clear all messages displayed in the message area. The **Setup Message Area...** menu item is used to change the number of message lines displayed, and the **Set Time Reference...** menu item changes the way the time tag associated with each message is displayed. The time displayed shows you when specific events occurred.

Help: For information on how to use the **Setup Message Area** dialog box and the **Set Time Reference** dialog box consult the applicable Online Help item or reference the HOSC Common User Interface Standard (MSFC-STD-1956).

The **View** menu also allows you hide or show the control panel and the status bar. The control panel and status bar are optional main window features, but if used, they adhere to a standard design and location format. These elements can either be hidden from view or displayed. If the control panel and status bar are available, you can elect to either hide or show them using the **Hide Control Panel** and **Show Control Panel** and **Hide Status Bar** and **Show Status Bar** menu items available under the application's **View** menu. The hide/show menu items for both the control panel and status bar toggle, depending on whether they are currently hidden or not. For example, if the control panel is showing, then the menu item available under **View** is **Hide Control Panel**. If the control panel is hidden, the menu item will say **Show Control Panel**. For information about a particular application's control panel or status bar, see that application's user guide. If an application doesn't have a control panel or status bar, then these items won't be included on the **View** menu.

1.3.3 Using the Help Menu

The final standard menu item included with the various HOSC applications is the **Help** menu. Located flush right on the menu bar, the **Help** menu provides the means to access information specific to the application you are using. The items available off the **Help** menu include **On Window**, **On Keys**, **Index, Table of Contents,** and **On Version** (see Figure 1-10, Typical application Help menu).

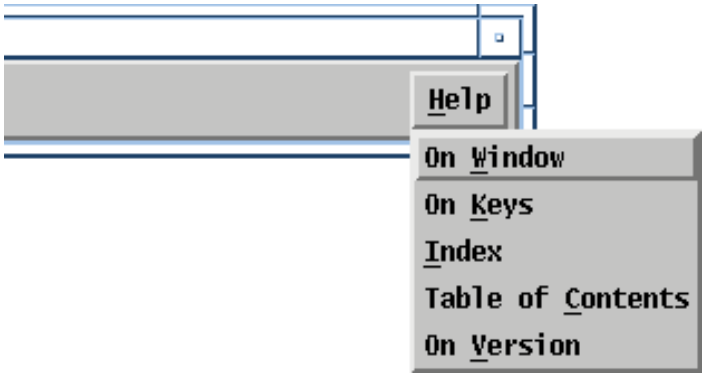


Figure 1-10, Typical application Help menu.

1.3.3.1 On Window

The **On Window** menu item available under **Help** provides information relevant to the Mission, Operational Mode, and Project (MOP), the workstation you are using, as well as an application description and a user scenario (see Figure 1-11, On Window dialog box). The application description explains the main purpose of the application and the major functions that can be performed. The user scenario is a step-by-step example of how you would perform the main functions addressed in the application description.

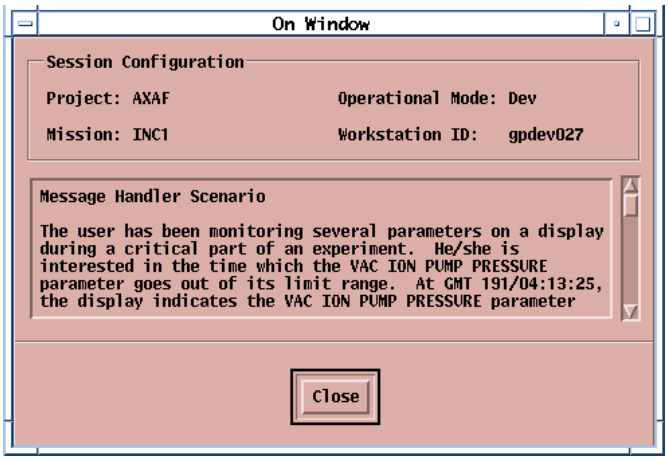


Figure 1-11, On Window dialog box.

1.3.3.2 On Keys

The **On Keys** menu item available under **Help** provides you with an Internet online help window that lists the specific application's keyboard accelerators and mnemonics (see Figure 1-12, On Keys Online Help window).

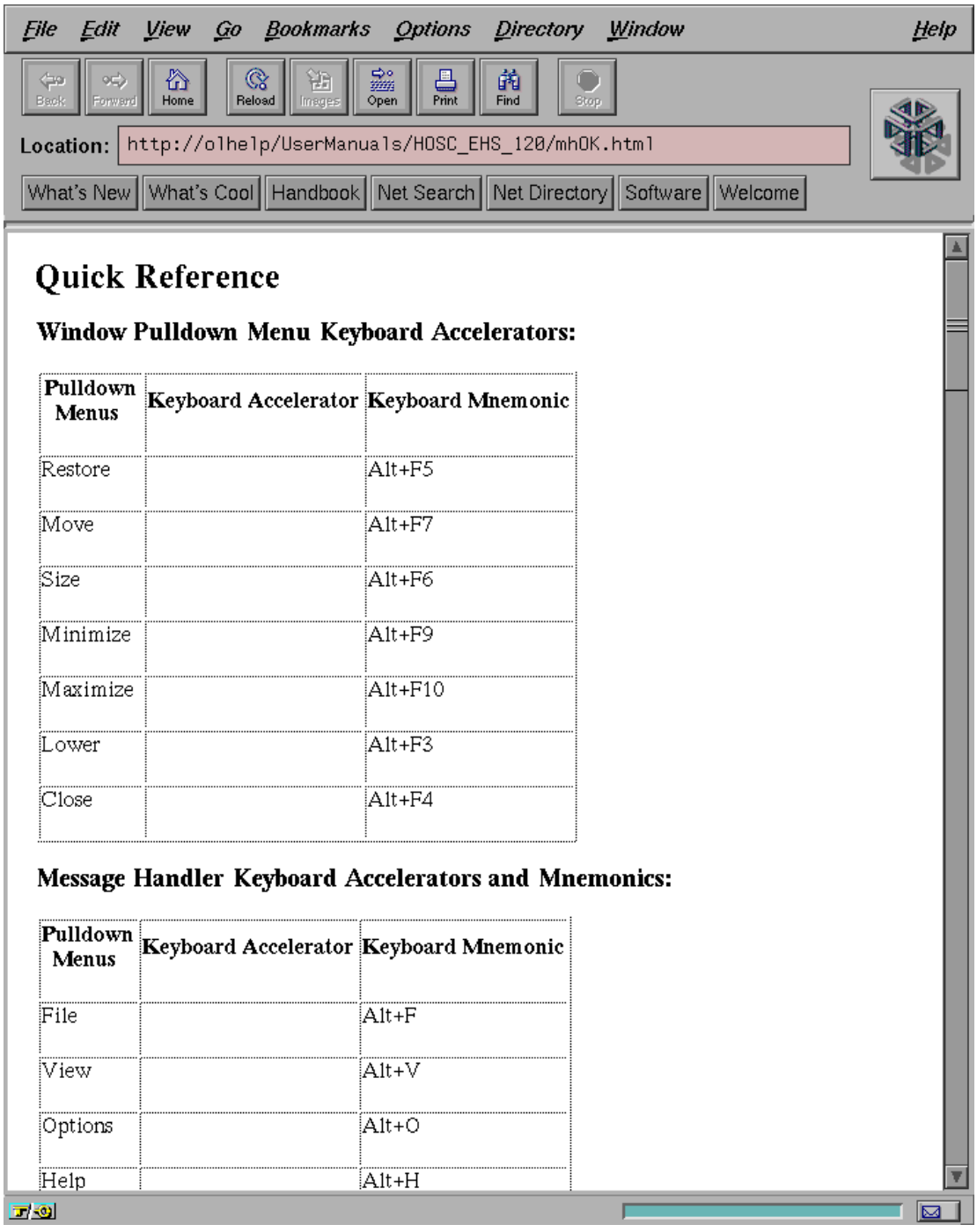


Figure 1-12, On Keys Online Help window.

1.3.3.3 Index

Clicking on the **Index** menu item under **Help** invokes an Internet online help window that provides an alphabetical listing of topics for the specific application for which help text is available (see Figure 1-13, Index Online Help window).

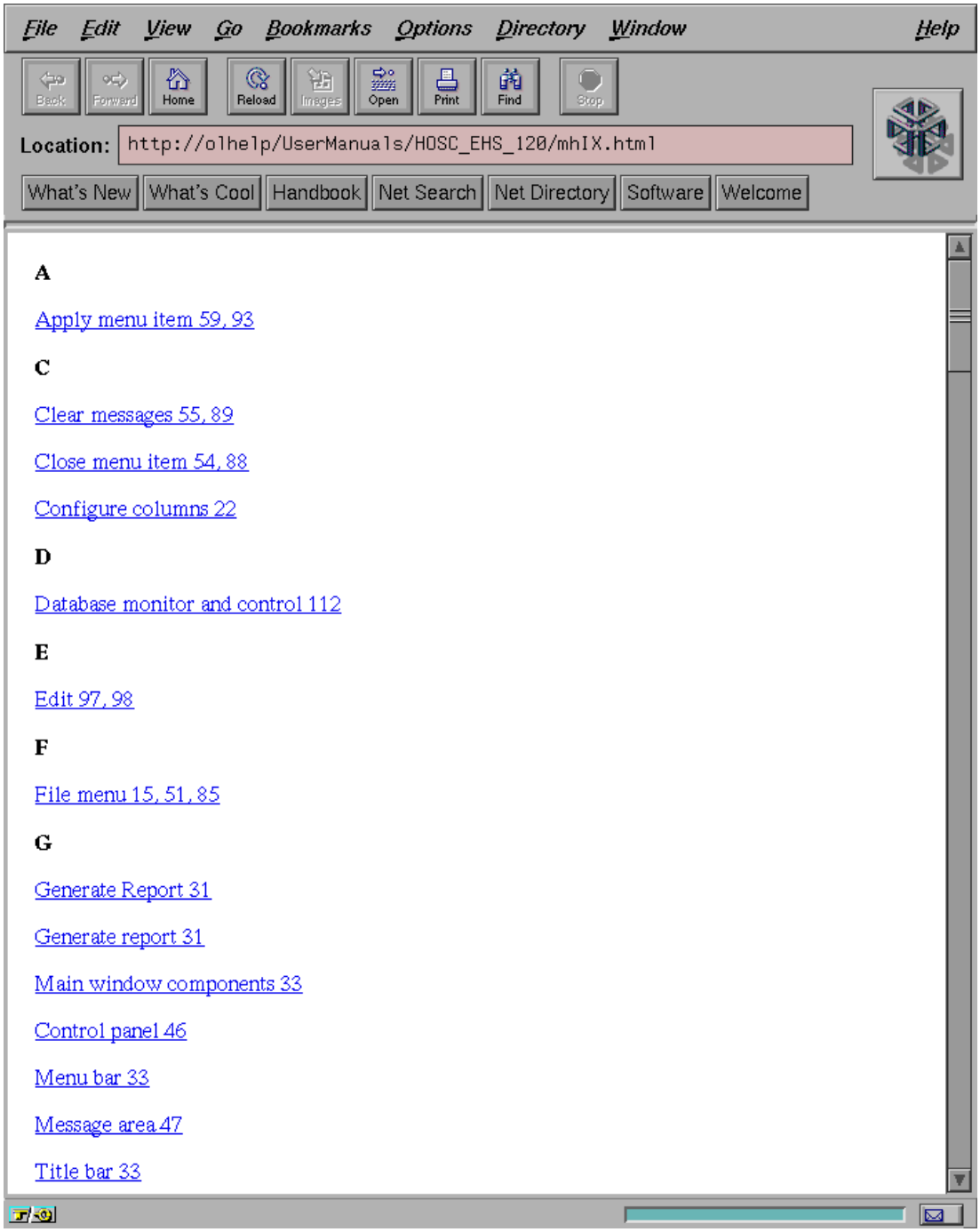


Figure 1-13, Index Online Help window.

1.3.3.4 Table of Contents

Clicking on the **Table of Contents** menu item under **Help** invokes the Internet online help window (see Figure 1-14, Table of Contents Online Help window). This window provides a table of contents for the User Guide relevant to the current application.

Figure 1-14, Table of Contents Online Help window.

1.3.3.5 On Version

Selecting **On Version** off the **Help** menu invokes the **On Version** dialog box which displays the name of the application, the version release number, and the release date. The **On Version** dialog box is not resizeable and contains only a single Close pushbutton as shown in Figure 1-15, On Version dialog box.

Figure 1-15, On Version dialog box.

1.4 Wildcard Characters

The default wildcard character throughout most of the HOSC application software is the asterisk (*****). The asterisk by itself is used to indicate that you'd like all available files displayed. In conjunction with other characters or other wildcards, the asterisk is used to represent any single or string of characters.

A second wildcard character that is standard across most HOSC applications is the question mark (**?**). The question mark is used to represent any single character. The question mark can be used in conjunction with other characters or other wildcards to more narrowly define the information you'd like displayed. The question mark represents a single character.

HOSC database application user interfaces are derived from Oracle® and therefore use different wildcard characters. In the database applications, the **%** is synonymous with the ***** and the underline character (_) is the same as the **?**. A blank is also used in the database applications to indicate "all". The blank is only valid when no **%** is provided as a single character.

Table 7-1 Wildcard characters.

Typical HOSC Application Wildcard	HOSC Database Application Wildcard	Meaning
*	% or (blank)	Represents any string of characters and when used alone indicates that all files or records are to be displayed.
?	_ (underline)	Represents any single character and is usually used in conjunction with other known characters.

1.5 System Initialization

When you obtain the necessary HOSC account you'll be provided a username and a temporary password. These two items are required before you can login and begin using the HOSC software. When you're presented the EHS login screen, click with the left mouse button in the **Login:** text field and type your username. Press Enter, type your temporary password, and press Enter again. Once you've logged in, you can change your password by clicking on the **Utilities** menu off the **Launchpad** and then initiating the **Change Password** application.

In addition to having an appropriate HOSC account, remote users X-windowing into an EHS platform must have the appropriate software running on their system prior to login.

Help: For remote system software and hardware requirements and specific instructions for remotely logging into and accesssing EHS applications, see "Appendix B: Remote Access to EHS Services."

Note: If your system responds with: `Login incorrect,` then repeat the login procedure, making sure that you type your username and password exactly as provided. These fields are case sensitive. If you still can't gain access to the system, contact your system administrator.

Once you successfully log into an EHS system, two EHS applications are invoked, Launchpad and Message Handler. In addition, login initiates both Netscape and Keep Alive. Netscape is shown as an icon (typically hidden behind the Message Handler application) and Keep Alive is shown as a window (see Figure 1-16, Startup applications).

Note: If you decline the Netscape License, you won't be able to start EHS web applications. A list of web applications is provided in the following section (1.6, The Launchpad).

Note: The login process can take several minutes. Allow all login processes to fully execute before attempting to initiate additional EHS applications.

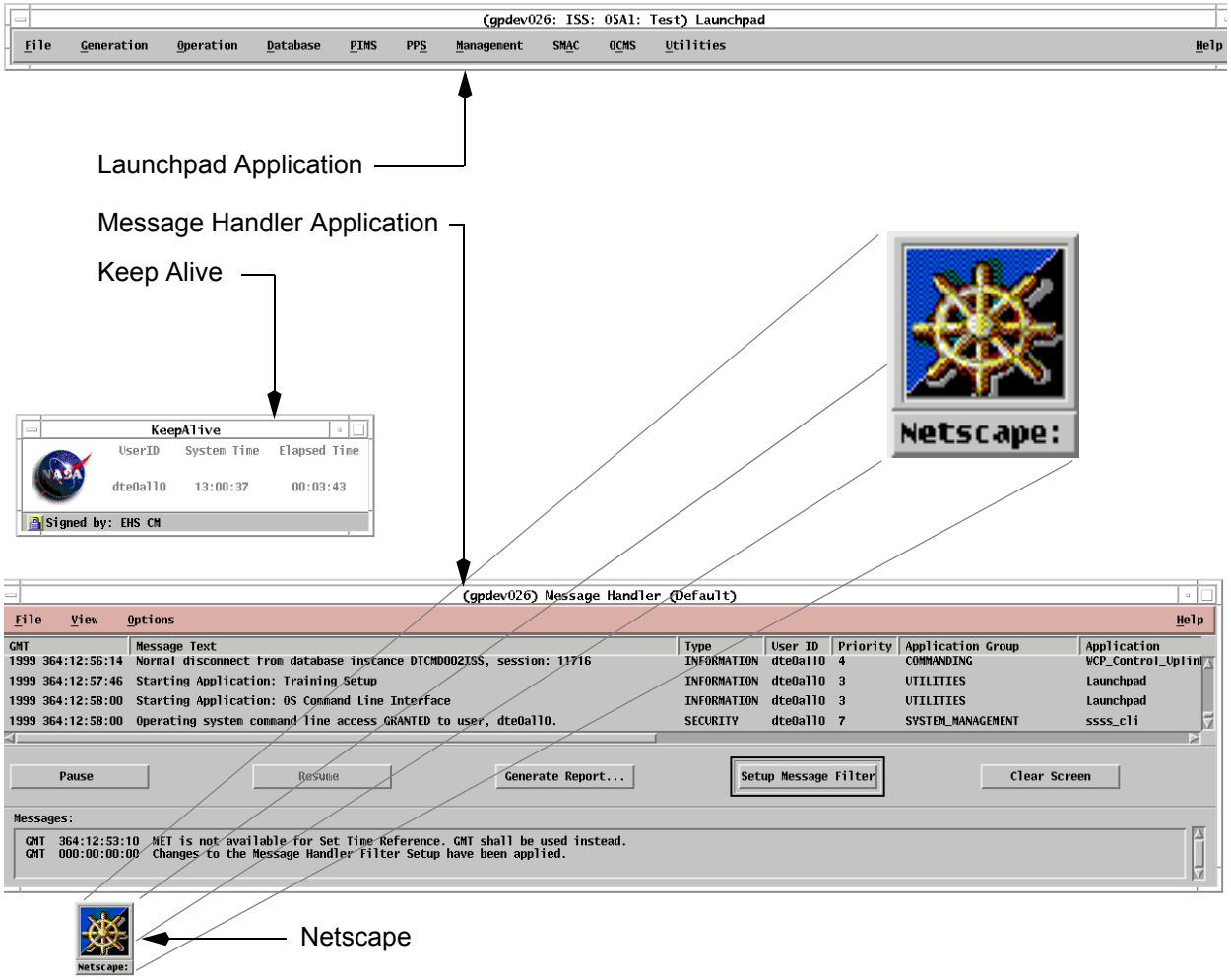


Figure 1-16, Startup applications.

Keep Alive ensures that EHS web application cookies remain active on your system. The Keep Alive window is shown in detail in Figure 1-17, Keep Alive dialog box.

Figure 1-17, Keep Alive dialog box.

Note: If you dismiss the Keep Alive application, EHS web applications will not function correctly. Remote users will access EHS web applications via their browser. For information about accessing web applications through a browser see "Appendix B: Remote Access to EHS Services."

1.6 The Launchpad

The Launchpad is the umbrella application from which all other HOSC applications are invoked. Essentially, it is a main application window. Just like other windows, it can be iconified. The Launchpad, however, has nothing displayed in its work area. It is initiated at system startup and cannot be closed without exiting the EHS software. In the title bar of the Launchpad is included the name of the platform you are using (logged into), the Mission, Operational mode, and Project (MOP), and the name of the application (**Launchpad**).

Note: While the title bar of the Launchpad does include the Mission, Operational mode, and Project (MOP), the actual ordering of these items on the title bar is Mission, Project, and Operational mode. An example MOP might be "ISS:6A1:Flight" to indicate that you are operating in the International Space Station project, the 6A1 Flight, and the Flight mode. Other operational modes might include "Test" or "Sim" (simulation). User-generated data elements (i.e., scripts, computations, displays, etc.) built in one MOP are not automatically available in another MOP. The capability to move UDEs from one operational mode to another is available through the UDE Database application.

The suite of applications available from the Launchpad are organized by function under several menus. The menus, applications, and the privileges/configurations available to you depend on three things:

- The operational support mode you are using
- Your user profile
- The Platform Mode Attribute Table (PMAT) file

Note: All available platform modes are listed in the Launchpad configuration file.

Based on the above criteria, your Launchpad may have up to eleven menus. The possible menu items available under each of these menus and their function is addressed in the remainder of this chapter.

- **File**
- **Generation**
- **Operation**
- **Database**
- **PIMS**
- **PPS**
- **OCMS**
- **Utilities**
- **Help**

Note: By design, the EHS **Launchpad** menu bar can be manually resized so that menus are hidden.

Essentially there are three types of EHS applications. Efforts have been taken to standardize the look and feel of these applications, but you will notice some differences. The three types of applications are:

- Standard Motif-compliant applications
- Oracle Forms Database applications
- EHS web-based applications

Standard Motif-compliant applications make up the bulk of the EHS software and were addressed earlier in this document. Oracle Forms database applications were covered in this document in section 1.1.2 Database Applications. EHS web-based applications are designed to function in conjunction with a Netscape browser and are accessible through EHS platforms, as well as from remote user systems. Remote users accessing EHS through a Uniform Resource Locator (URL) will be presented a web Launchpad from which they select the desired web application (see Appendix B: Remote Access to EHS Services).

From an EHS platform, web applications are invoked from the Launchpad just like other EHS applications. Web applications and their location on the Launchpad are:

- **GSE Packets** off the **Operation** menu
- **To Do List** off the **PIMS** menu
- **Documents** off the **PIMS** menu
- **Operations Change Request (OCR)** off the **PIMS** menu

If you select an EHS web application from the Launchpad, a **Java Security** dialog box will be invoked (see Figure 1-18, Java Security dialog box). You must grant permission for the web server to install certificates on your platform in order for web-based applications to function. The number and types of certificates that need to be installed depends on the web application being invoked.

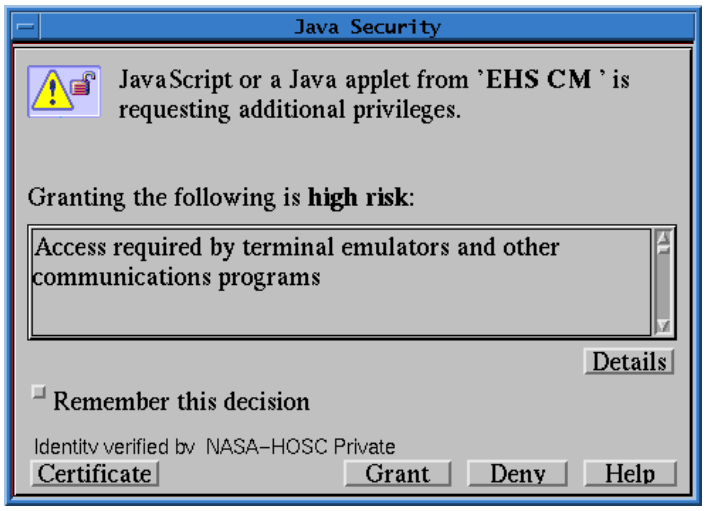


Figure 1-18, Java Security dialog box.

To grant the web server with the required privileges, you must click on Grant. To obtain details about the privilege being requested, you can click on Details. To get information about the certificates currently installed on your system you can click Certificate. On an EHS platform, Help on the Java Security dialog box does not provide any additional information because it requires access to the Internet, which is not accessible from an operational platform. Once you have granted the appropriate permissions for the EHS web-based applications to function, they will be invoked and should behave similar to other EHS applications.

Note: If you exit Netscape you will exit all web-based EHS applications. This is particularly relevant since on-line Help is also a web-based application. To quit a single web application without quitting all web-based applications, you must use the **Close** menu item found under the **File** menu off the Netscape Navigator window.

The remainder of this chapter provides a description of all EHS applications, where they are located, and how they are accessed from the Launchpad. Remember, you may or may not have access to all of these applications or to specific functions within an application depending on your account privileges. If you need to access additional EHS capabilities, you must modify and submit another EHS Account Request Form.

1.6.1 File Menu

The **File** menu includes those applications dealing with workstation file manipulations such as opening, storing, printing, etc..

1.6.1.1 File Manager

The File Manager application allows you to perform routine file maintenance functions like copy, rename, delete, etc., for files located on your workstation. You can use this application to view User-generated Data Element (UDE) filenames, dates, and sizes.

1.6.1.2 Store UDE

The Store UDE application allows you to copy UDEs from your local workstation to the UDE database. Since workstations may be reconfigured between activities, this function allows you to store UDEs so that they will be available to you during a later activity. When the UDE is stored, a copy of the UDE is transferred to the UDE Database.

Note: When files are stored to the UDE database, filenames are forced to uppercase and remain uppercase if retrieved. If you reference these filenames in other applications, you must rename the files to lowercase or their references within other applications to uppercase.

1.6.1.3 Retrieve UDE

The Retrieve UDE application allows you to request that UDEs be retrieved from the UDE database to your local workstation. You can retrieve UDEs that you created or any UDEs marked as sharable within the same project and mission. When the UDE is retrieved, a copy of the UDE is transferred to your local workstation.

1.6.1.4 Setup Print

The Setup Print application allows you to set print options which apply to the Print Screen and Print Window applications. You can specify a printer, set the paper orientation to portrait or landscape, and set the paper size to letter (standard 8.5in. x 11in.) or legal (8.5in. x 14in.).

Note: Changes made using this application do not affect Setup Print choices made within other applications.

Tip: If you select the **File Name:** radio button indicating that you want your output printed to a file, then you must provide a name for that file. The maximum number of characters allowed for a filename is 20. After the print function is performed, the file is saved in Postscript and stored in the **pof** directory. The file then becomes a **Printer Output File** type UDE, and you can subsequently print it using the File Manager application.

1.6.1.5 Print Screen

The Print Screen application allows you to send the information displayed on the monitor's screen to either a printer or a file.

1.6.1.6 Print Window

The Print Window application allows you to send the information displayed in a selected window to either a printer or a file.

1.6.1.7 Print Status

The Print Status application allows you to check the status of the print queue for a given printer. Print status information includes the file name, order in the queue, owner, job number, and total size.

1.6.1.8 Logoff

The **Logoff** menu item is used to quit all application processes and exit the HOSC application software.

1.6.2 Generation Menu

The **Generation** menu includes those applications, usually executed pre-mission, to create UDEs such as:

- Displays
- Computations
- Scripts
- Command Update Forms

These UDEs allow you to view and manipulate telemetry data and to initiate command updates and uplinks. The following sections contain a brief description of each application.

Help: For a complete list of UDE types see "Appendix C: UDE Types, Workstation Directory Structure and Available Functions."

1.6.2.1 Display Generation

The Display Generation application allows you to build a customized display that can be executed using the Display Operation application. You can create a display that, when invoked in Display Operation, allows you to view the values for selected telemetry parameters. Numerical values may be plotted on various graphs or on a scale. Discrete values may be represented by buttons and graphical shapes. Some objects on a display may have a Scratchpad Line (SPL) directive associated with them. When these objects are activated during operation, the SPL directive is initiated. SPL directives provide the capability to start and stop scripts, displays, or computations; update and uplink commands; and generate pseudo telemetry.

1.6.2.2 Computation Generation

The Computation Generation application allows you to create, save, open, and modify user or mission computations. Using Computation Generation, you can select Measurement/Stimulus Identifiers (MSIDs) to be used as inputs to the computation and pseudo parameters to hold the output values. You are provided the capability to enter source code to perform operations on the input MSIDs which produce the output pseudo MSIDs.

Computation Generation provides you with the capability to use either the “C” or “FORTRAN” programming language to transform input MSIDs into output pseudo MSIDs.

1.6.2.3 Script Generation

The Script Generation application provides you with the capability to write and validate scripts. A script is a set of high-level, English-like, interpreted instructions called directives. Scripting directives support the monitoring of telemetry, updating and uplinking commands, and executing computations and displays. Scripts also support limited mathematical, logical and conditional functions. Script Generation provides a text editor for writing the script. Scripts created using the Script Generation application are executed using the Script Operation application.

1.6.2.4 Command Update Form Generation

The Command Update Form Generation application allows an authorized command user to generate and customize update forms for project-defined command header and command mnemonics. A form is generated based on the database information for a command and its associated fields. A command update form can be opened to allow you to modify command field labels and rearrange the display characteristics (e.g., move field locations, modify the display data type for command fields, and remove fixed (non-modifiable) command fields). One form per command mnemonic can be saved.

1.6.3 Operation Menu

Generally, you create UDEs using the **Generation** menu applications. The **Operation** menu is where you go to initiate and execute those UDEs (displays, computations, scripts, etc.) you've created. The **Operation** menu applications provide you with the mission support tools you need to process telemetry, update/send commands, retrieve stored data, etc.

1.6.3.1 Display Operation

The Display Operation application provides you with the capability to operate a display created by the Display Generation application. By operating a display, you can view telemetry values and graphical representations of data (bar charts, scrolling line plots, toggle buttons). Input objects (pushbuttons, SPL line fields, slider scales) defined on a display are mechanisms for activating SPL line directives. Scratchpad line directives provide you with the capability to start and stop scripts, displays, and computations; to uplink and update commands; and to update pseudo MSIDs. Display Operation allows you to select the data mode (real-time, playback, or dump), the update mode (cyclic rate, single shot, or pause), and to turn the data status characters on and off.

1.6.3.2 Computation Operation

The Computation Operation application provides you with the capability to execute, terminate, and monitor mission or user computations. Before you can execute a computation, it must be validated and the source code compiled in the Computation Generation application.

Computations can receive telemetry data as input and generate pseudo telemetry data as output. Pseudo MSIDs generated by a computation can be used locally by other processes on the same workstation or distributed to other workstations across the network. Computations may use a Near Real-Time (NRT) data file as input.

1.6.3.3 Script Operation

The Script Operation application provides you with the capability to execute a script. A script is a set of high-level, English-like, interpreted instructions called directives. Scripting directives support the monitoring of telemetry, updating and uplinking of commands, and executing computations and displays. Scripts also support limited mathematical, logical and conditional functions.

Once a script has been written and validated in Script Generation, it can be executed in Script Operation. The script's execution can be controlled with script control directives. Script Operation also provides the currently executing script's name and a line number to allow easy control of the script. Script Operation runs in either step mode or continuous mode. Step mode requires that you

approve each directive as it's being executed. Continuous mode executes each directive as soon as possible.

1.6.3.4 Scratchpad Line

The Scratchpad Line application allows you to quickly perform time critical functions using a command-line rather than using the Graphical User Interface (GUI). For example, you may send a command from the SPL instead of starting the Command Operation application. Other capabilities available from the SPL are starting and stopping displays, computations, and scripts; updating external pseudo MSIDs; and modifying and uplinking commands. The SPL is used as a complement to the other applications in the Enhanced HOSC system (EHS).

1.6.3.5 Command Operation

The Command Operation application allows an authorized command user to send commands to a spacecraft or payload. You can uplink commands, chains, and files. You are also able to update modifiable commands with forms that were previously generated with the Command Update Form Generation application. Command Operation shows you the command status for both the system and users.

1.6.3.6 Command System Management

The Command System Management application is used to manage and control the HOSC command system. Only individuals who have the responsibility to manage a project's command system have access to the CSM application. The main functions available from Command System Management include:

- Enabling/disabling the project's command system
- Enabling/disabling project users for commanding activities
- Enabling/disabling individual commands that belong to a specific user
- Setting specific command system configuration variables such as CAR processing, FSV processing, CRR processing, maximum number system retries, etc.

1.6.3.7 Command Track

Command Track is a real-time display of the commands that have been issued by all commanding users. Command Track shows a list of information for each command, such as the mnemonic, technical name, and the time the command was sent. In addition, Command Acceptance Response (CAR), Flight System Verifier (FSV), and Command Reaction Response (CRR) are displayed. Command Track also provides you with the capability to filter command transmissions.

1.6.3.8 Command Delog

The Command Delog application provides the capability to view a list of past commanding activities that occurred within a specified time period. The privilege required to access Command Delog is independent of the privilege required to access other commanding applications. The specific contents of the command delog report varies by project, but generally contains the following information:

- Command mnemonic of the uplinked command
- Command uplink format
- Group ID of the command initiator
- Time the command was initiated
- Associated command responses received as a result of the command's uplink

You have the option of saving the generated report to a named text file which can be printed or transferred to other users.

1.6.3.9 Command User Enable

The Command User Enable application provides privileged commanding users with the ability to enable users for commanding. It is similar to the Command System Management application except that no command system configuration capabilities are provided.

1.6.3.10 Downlink Management

The Downlink Management application is used to manage and prioritize the downlink of files or memory dumps from the International Space Station (ISS) Payload MDM (Multiplexer/ Demultiplexer). The application allows you to:

- Display all requested file downlinks
- Select either the primary or backup payload MDM for Ku-band downlinks
- Perform a Ku-band downlink
- Remove a downlink request from the display
- Stop a file downlink
- Retry a Ku-band downlink if data errors are encountered

Note: Downlink Management is a privileged application. Therefore, it will only be made available on certain workstations and with certain user accounts.

1.6.3.11 Downlink Request

The Downlink Request application allows the user to submit requests for file downlinks or memory dumps from the International Space Station (ISS). The application allows you to:

- Transmit Downlink Requests
- Receive approval responses
- Receive status updates for downlinks in progress

Requests are submitted from EHS workstation users and remote users via a web browser.

1.6.3.12 NRT Data Requests

During a mission, all data configured for logging is stored to the NRT Data Log (NDL) as soon as it is received in the EHS. The NRT Data Requests applications provide you with the capability to request a copy of the telemetry data and pseudo telemetry that is in the NDL. There are four types of NRT Data requests:

- NRT List Request
- NRT Snapshot Request
- NRT Data Capture Request
- NRT Playback Request

Once an NRT request has been defined, it can be submitted for processing. The data returned as a result of the request is placed in the output file that you specify. The data can then be examined using other applications, such as a computation or the Commercial-Off-The Shelf (COTS) spreadsheet package.

1.6.3.13 GSE Packets

The GSE (Ground Support Equipment) Packets application is used to activate predefined packets built using the Telemetry Database application. Activated packets can be sent to specified ground systems in realtime, playback or dump mode. Once a packet is activated, telemetry is acquired to build the packet and then the packet is transmitted to the specified equipment at the rate configured by the project. Telemetry continues to be acquired, packets built and transmitted, until the user requests to deactivate the packet.

Note: You must define the contents of a GSE Packet prior to activating the packet. An APID assignment is required as part of the packet definition process. The Account Request Form is the mechanism you use to request an APID assignment.

1.6.3.14 Exception Monitor

The Exception Monitor application provides a background data limit monitoring capability. The Exception Monitor application provides project wide monitoring (run on the project server) and local monitoring (run on the workstation) for various data modes. Exception Monitor sends a notification when a monitored value is outside a defined range and when the value returns within range.

1.6.3.15 Local Table Operation

The Local Table Operation application allows a user to apply local table change files to the associated local table. The Local Table Operation application displays to the user a list of local table change files that can be applied. The local table change file can only be used with a local table created from the same database version. If the user has the capability, he can also manually activate and deactivate groups, and set the processing type for limit sensing in the Local Table Operation application. The Local Table Operation provides the user the capability to operate with processing information different from the TDB defaults.

1.6.3.16 EHS Data Generation

The EHS Data Generation (EDG) suite of applications may be used for troubleshooting the system, training support, and producing data for advanced analysis. The EDG applications include:

- MSID Data Generation Editor
- Serial Data Generator
- HOSC Packet Data Generator
- CCSDS Packet Data Generator

1.6.4 Database Menu

The **Database** menu is where you go to view information in the various databases. Databases that may be available to you include telemetry, command, and UDE. Database developers also use this menu to access functions that allow them to control and populate these databases.

The **Database** applications perform two major functions: they allow you to view the information available in databases and they allow database developers to populate the databases. Each section below contains a brief description of the **Database** menu applications.

1.6.4.1 Telemetry Database

The Telemetry Database application provides you with the capability to access the TDB which contains the telemetry definitions needed to drive HOSC telemetry processing. The TDB is the source of the real-time telemetry processing tables (i.e., the telemetry local tables). Specific capabilities that are provided by the TDB include the ability to:

- Convert data from an external facility and load it into the TDB
- Edit copies of a TDB through the GUI
- Generate products from the TDB for delivery to external facilities
- Incorporate changes associated with database change requests (DBCRs) into the TDB
- View database data based upon search criteria.

1.6.4.2 Command Database

The Command Database application provides you with the capability to access and manipulate command characteristics and data maintained within the Project Command Database (PCDB) which contains the command definitions needed to drive HOSC command processing. The PCDB is the source of the real-time command processing tables (i.e., the Operational Command Database (OCDB)). Specific capabilities that are provided by CDB include the ability to:

- Convert data from an external facility and load it into the PCDB
- Edit copies of a PCDB through the GUI
- Generate products from the PCDB for delivery to external facilities
- Incorporate changes associated with DBCRs into the PCDB
- View database data based upon search criteria

1.6.4.3 Database Change Request

The Database Change Request application provides an online form for tracking and submitting changes to the TDB, CDB, and UDE Databases.

1.6.4.4 UDE Database

The UDE Database application provides for centralized storage of UDEs developed by other HOSC applications. These UDEs can include displays, computations, scripts, command update forms, etc.

Help: For a complete list of UDE types, see " Appendix C: UDE Types, Workstation Directory Structure and Available Functions."

The UDE Database application allows database personnel to perform storage and retrieval to/from media; to copy UDEs between users and between missions for a given project; to delete UDEs from the UDE Database; and to view and print a UDEs attributes listing. The UDE Database application will also allow you to access for viewing and printing a UDEs attributes listing, as well as the capability to update the shareability status and delete data elements which belong to them, and the capability to perform a copy between missions.

1.6.4.5 Database Monitor & Control

The Database Monitor and Control (DMC) application provides an interface to the Oracle Relational Database Management System (RDBMS) residing on the central database, command and Payload Information Management System (PIMS) servers to perform the database administration functions required to create and manage EHS databases. Oracle is the COTS RDBMS product that is used to store EHS databases and to develop client and server database applications. DMC also provides connection services to the RDBMS for EHS applications, user

authorization services to verify user access to EHS databases, and database access error logging services.

DMC manages database connections and database access for all EHS applications. It maintains the user session information needed to control access to EHS database systems and validates user access to EHS databases. It maintains status information on EHS databases, including the states of telemetry and command database revisions and supplies this information to EHS applications. It logs database system errors, invalid access attempts and other information centrally in the DMC database and locally through the Message Handler application.

1.6.5 PIMS Menu

PIMS is a multiproject electronic information management system used by the payload user, POIC cadre, and mission managers for International Space Station (ISS) mission preparation and execution. The primary purpose of the PIMS is to provide centralized payload operations information management for controlling changes to payload experiments, and spacecraft support for ISS. Real-time mission operations, simulations, and short term planning cycles are supported simultaneously by PIMS. PIMS also provides a pre-mission functionality in support of mission document preparation and configuration management (CM).

PIMS software also includes a utility for developing approval process flows for a work group that can be applied to an object under CM. All PIMS applications are Web based, share a common database vault, and interface to routines that provide real-time status messaging to actionees with CM responsibilities.

PIMS integrates FrameMaker and FrameViewer Commercial-Off-The-Shelf (COTS) software for the purpose of creating and viewing documents and bulletins associated with the PIMS Database. For information on these commercial products, refer to the FrameMaker and FrameViewer documentation.

Currently, there are three PIMS applications:

- To Do List
- Documents
- Operation Change Requests (OCRs)

1.6.5.1 To Do List

The **To Do List** applet is a web-based, distributed architecture, user interface that provides MOP-dependent accessibility to documentation and configuration management workflow tasks. Configuration management is implemented through a centralized “vault” where configuration managed documents, change requests, etc. are stored. The web server provides workflow and status information to the user’s workstation acting as the connection between the workstation and the PIMS vault. Requests for data are put into a format that the PIMS Database can interpret. The

web server also sends notification messages to users when changes are detected in the data within the PIMS vault.

To Do List enables individual PIMS users to determine which OCR or document requires an action by the user, the due date for the action, and document properties for the selected task.

1.6.5.2 Documents

The Documents application has the capability to access folders and their component files from the Payload Information Management System (PIMS) database. This "vault" provides centralized storage for Operations Control Mission Software (OCMS) files and payload command files intended for uplink. The Documents application also allows you to manage the configuration of books by applying a book management process. This permits you to identify a book approver, a book manager, writers and book reviewers. The capability is also available for the non-EHS user to log into the PIMS Database and store or retrieve documents and files.

1.6.5.3 Operation Change Requests

An Operation Change Request (OCR) is an electronic form that is used to request changes to planned mission operations. These forms have associated configuration management/workflow processes that are imposed depending on the content of the change and its originator. The OCR workflow process is initiated when a user creates a new OCR and ends once the requested change is approved, disapproved, or withdrawn. All users in the designated workflow can be sent the status of an OCR as it progresses through the approval process. The OCR application also supports requests for assessments and comments to the proposed change. Approved OCR changes may impact documents, mission timelines, etc.

1.6.6 PPS Menu

The **PPS** menu includes one menu item: **Payload Planning System**.

1.6.6.1 Payload Planning System

The Payload Planning System (PPS) is a set of software tools used to automate the planning, scheduling, and integration of payload operations during pre-increment planning, weekly planning, and real-time execution. The suite of Payload Planning System tools being developed at MSFC and JSC consist of:

- User Requirements Collection
- External Data Repository
- Data System Routing and Configuration
- Planner

- Consolidated Planning System
- Flight Dynamics Planning and Analysis
- Product Generation

The External Data Repository is the central database of planning data within the PPS. The EHS launchpad provides users with access to the User Requirements Collection function and the Product Generation function. Remote users will have access to the Product Generation function through the EHS web interface. Planning functions will be performed by individuals and organizations at various geographical locations. The Payload Information Management System (PIMS) EHS software provides file transfer capabilities to support the sharing of planning data with remote sites.

1.6.7 OCMS Menu

The **OCMS** menu includes three tools intended to help selected users manage files and schedules on the Payload Multiplexer/Demultiplexer (MDM). The following sections provide a brief description for each of these applications.

1.6.7.1 File Ground Management Tool

The File Ground Management Tool (FGMT) application provides you with the capability to manage files on the Payload MDM Mass Storage Device (MSD) onboard the International Space Station (ISS).This tool can be run by multiple non-privileged users in view-only mode, but only a single privileged user is allowed to access all functions. The privileged user is permitted to uplink files to, and delete onboard files from, the PLMDM MSD. The privileged user may generate a MSD disk management schedule, which uplinks auto-procedure and other payload related files to the onboard system. These files must be onboard the Payload MDM MSD at the appropriate time to support planned payload operations. Reports and plots are displayed through a View Schedule function, which informs the user of the Payload MDM MSD directory contents.

1.6.7.2 OSTP Ground Management Tool

The Onboard Short-Term Plan Ground Management Tool (OSTPGMT) application provides you with the ability to graphically view the short term plan file, which represents three days of planned payload and core activities onboard the International Space Station. The plan itself contains the activities of the previous day, the current day, and the next day. The OSTP is a binary representation of the short term plan. It contains time-tagged activities associated with the manual procedures executed by the crew, as well as automated activities. Privileged users may also make changes to the OSTP using this application.

1.6.7.3 Reference File Editor

Reference File Editor (RFE) application provides you with the capability to edit and validate an OCMS reference file. These reference files contain the references to telemetry and command database information used by the OCMS. By using reference files, OCMS tools can be used to look up MSID and command information that changes as databases are modified. Without reference files, OCMS tools would be hardcoded with database references and would require code modification with each database release. RFE allows you to modify the way OCMS tools extract information from telemetry and command databases as MSIDs and commands change over time.

1.6.8 Utilities Menu

The **Utilities** menu includes COTS software applications that have been integrated into the suite of HOSC applications. These software packages include a word processor, a spreadsheet, an electronic mail utility, etc. This menu also includes utilities needed to set workstation attributes and to monitor your workstation's performance. The following sections provide a brief description for each of these applications.

1.6.8.1 Framemaker

FrameMaker is a COTS product which provides you with word processing and graphics processing capabilities. FrameMaker is a complete desktop publishing system packaging together a word processor, page designer, graphics editor and book builder. FrameMaker provides the text editing, spell-checking, and search capabilities usually provided in a word processor. FrameMaker allows you to specify the number of columns in the text and integrate graphics within the text. Graphics objects can be created and edited or imported into the document. FrameMaker provides a book building feature that lets you manage multiple files as a single document. Tables can be included in the document with any combination of ruling lines and shading. Portrait and landscape pages can be mixed for any of the above objects. Finally, hypertext commands are available to allow you to input active links into a document.

Note: You must select the appropriate storage directory when saving a FrameMaker file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a FrameMaker file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the FrameMaker application, see the user documentation supplied with the software.

1.6.8.2 Spreadsheet

Spreadsheet is an Applixware COTS product which provides you with spreadsheet capabilities. Spreadsheet provides powerful numeric calculation capabilities and versatile presentation formatting, along with the ability to easily add graphics, text, and sophisticated charts to your worksheets. Spreadsheet also provides a macro capability which makes it easy to automate repetitive tasks or build custom applications. A NRT data file, created by the NRT Data Request application or a computation, can be analyzed in an Applixware spreadsheet.

Note: You must select the appropriate storage directory when saving a spreadsheet file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a spreadsheet file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the Spreadsheet application, see the user documentation supplied with the Applixware commercial software.

1.6.8.3 Pixmap Editor

The Pixmap Editor is a COTS product which provides you with the capability to create and modify pixmaps. A pixmap is a bitmap (a mapping of each individual pixel) with colors. You can create pictures or images by using the drawing tools and by defining each individual pixel (point). Pixmaps can be associated with an object in a display using the Display Generation application.

Note: You must select the appropriate storage directory when saving a pixmap file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a pixmap file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the Pixmap Editor application, see the user documentation supplied with the commercial software.

1.6.8.4 xv

xv is an interactive image manipulation program for the X Window System. It can operate on images in the GIF, JPEG, TIFF, PBM, PGM, PPM, XPM, X11 bitmap, Sun Rasterfile, Targa, RLE, RGB, BMP, PCX, FITS, and PM formats on all known types of X displays.

xv lets you do a large number of things, including, but not limited to, the following:

- display an image in a window on the screen
- display an image on the root window, in a variety of styles
- grab any rectangular portion of the screen and turn it into an image
- arbitrarily stretch, compress, rotate or flip the image
- crop or pad images
- view files as ASCII text or hexadecimal data
- magnify any portion of the image by any amount, up to the size of the screen
- determine pixel values and x,y coordinates in the image
- adjust image brightness and contrast with a gamma correction function
- apply different gamma functions to the Red, Green, and Blue color components, to correct for non-linear color response
- adjust global image saturation
- perform global hue remapping
- perform histogram equalization
- run a number of image-processing algorithms on any rectangular portion of the image
- edit an image's colormap
- reduce the number of colors in an image
- dither in color and b/w
- crop off solid borders automatically
- convert image formats

Help: For detailed information about the *xv* application, see the user documentation supplied with the commercial software.

1.6.8.5 G2 Express Rack Tool

The G2 Express Rack Tool provides a rule-based, expert system for monitoring and commanding up to eight ISS EXPRESS (EXpedite the PRocessing of Experiments to Space Station) Racks. Only specified cadre positions will have the privilege needed to access this tool.

The G2 Express Rack Tool monitors telemetry for the following Express Rack subsystems:

- Electrical power system
- Thermal control system
- Command and data handling system
- Vacuum exhaust system
- Gaseous/nitrogen system

You can display animated schematics for each of the EXPRESS Rack subsystems. In addition, telemetry is available for payload experiments installed in an EXPRESS Rack. You can install/ uninstall payloads in an EXPRESS Rack to maintain the same configuration as onboard.

The G2 Express Rack Tool includes the capability for you to execute EXPRESS Rack Subsystem malfunction procedures. The tool provides reasoning on the telemetry data to determine which troubleshooting path to take when executing a malfunction procedure.

1.6.8.6 Login To EHS

The Login To EHS application provides you with the capability to remotely log into other EHS systems.

1.6.8.7 Login To Non EHS

The Login To Non EHS application provides you with the capability to remotely log into other Non-EHS systems. This application is only available to users who have been approved access to remote systems.

1.6.8.8 File Transfer

The File Transfer application allows you to transfer files between platforms inside and outside the HOSC.

1.6.8.9 Process Manager

The Process Manager application allows you to monitor currently running processes on your local workstation.

1.6.8.10 Workstation Monitor

The **Workstation Monitor** menu item invokes a COTS product that graphically shows usage of certain types of system resources.

1.6.8.11 DOSH Table

The **DOSH Table** menu item invokes a dialog box that contains a history of recommended Project Telemetry Databases available for use when selecting a database for processing stored telemetry data. For example, you may look at the Database Operational Support History (DOSH) table to determine which database to use for a specific time slice when validating a NRT data request.

1.6.8.12 Playback Status

The Playback Status application provides you with the list of telemetry playback channels currently available in the EHS. The application provides status for each playback channel, such as the source of the playback, the telemetry packets available on the channel, the time the playback was started, and the amount of time remaining for the playback.

1.6.8.13 Bulk Validate

The Bulk Validate application allows you to validate all of the UDEs on your local workstation that require validation. There are two types of validate functions that can be performed from the Bulk Validate application: Check For UDEs and Validate All. You can perform only one validation function at a time. The results of the validate function are displayed using the View Validation Report function.

1.6.8.14 Greenwich Mean Time (GMT)

The Greenwich Mean Time (GMT) application allows you to monitor time in the GMT format. The time displayed will be configured based on the operational mode you are supporting.

1.6.8.15 Mission Elapsed Time (MET)

The Mission Elapsed Time (MET) application allows you to monitor time in the MET format.

1.6.8.16 Actual GMT

The Actual GMT application allows you to monitor the current GMT time.

1.6.8.17 Screen Lock

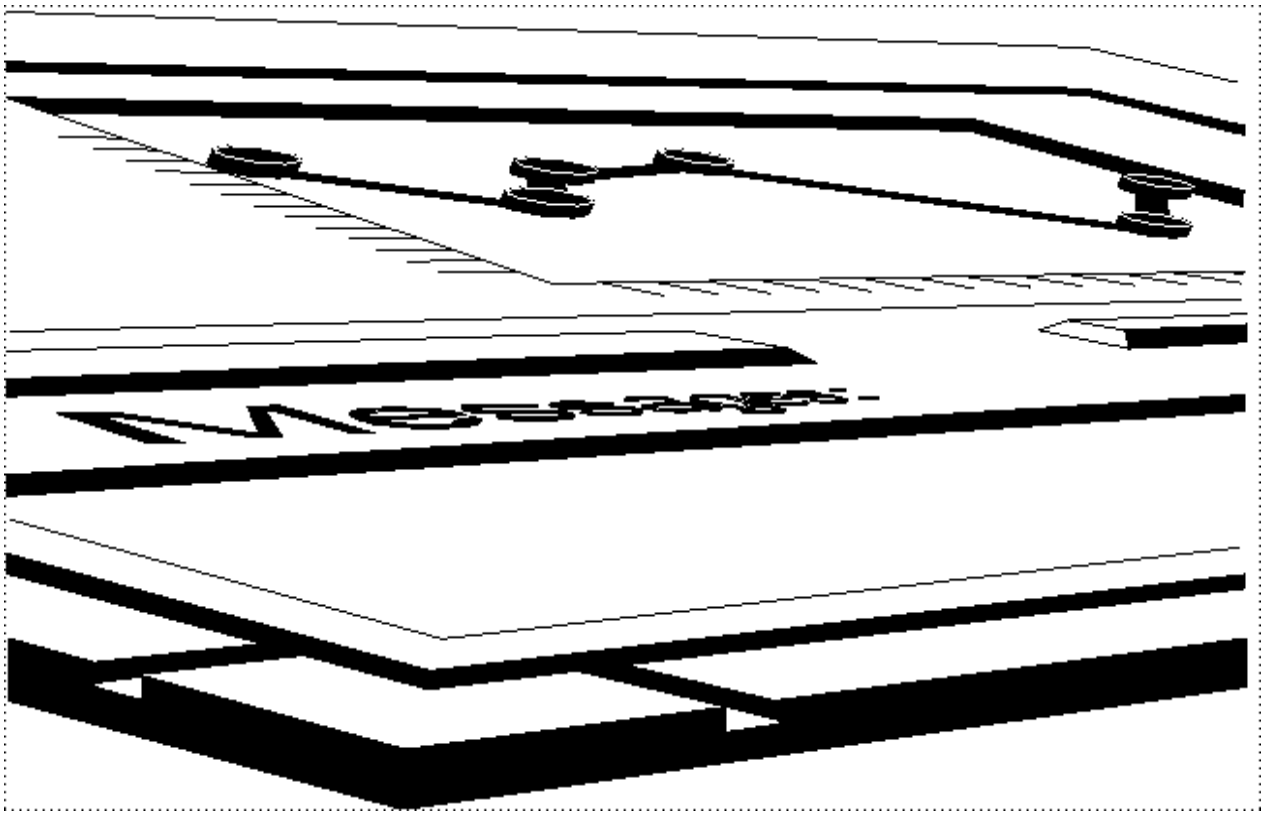
The Screen Lock application allows you to lock your screen. Your password is required to unlock it.

1.6.8.18 Change Password

The Change Password application allows you to change your login password.

1.6.8.19 Workstation Preferences

The Workstation Preferences application allows you to customize the workstation. You can set the mouse focus policy to either implicit (a window is active if the mouse resides within the window boundaries) or explicit (a window is active when the mouse is clicked within the window boundaries). You can set the colors for active and inactive windows and you can set your mouse preferences to either left or right handed. These preferences can be set for your current session or set for always.



Chapter 2: Message Handler

2.1 Overview

The Message Handler application provides you with the capability to view messages generated by applications currently running for a particular project and mission. The Message Handler application is started when you log in and cannot be exited, although it can be resized and iconified (see Figure 2-1, Message Handler main window). All messages have several components describing the message including the time, the user Identification (ID), the message priority, the message type, and the source of the message. The Message Handler application reads application messages from a buffer, applies the message selection criteria, and displays them so that you can selectively view them.

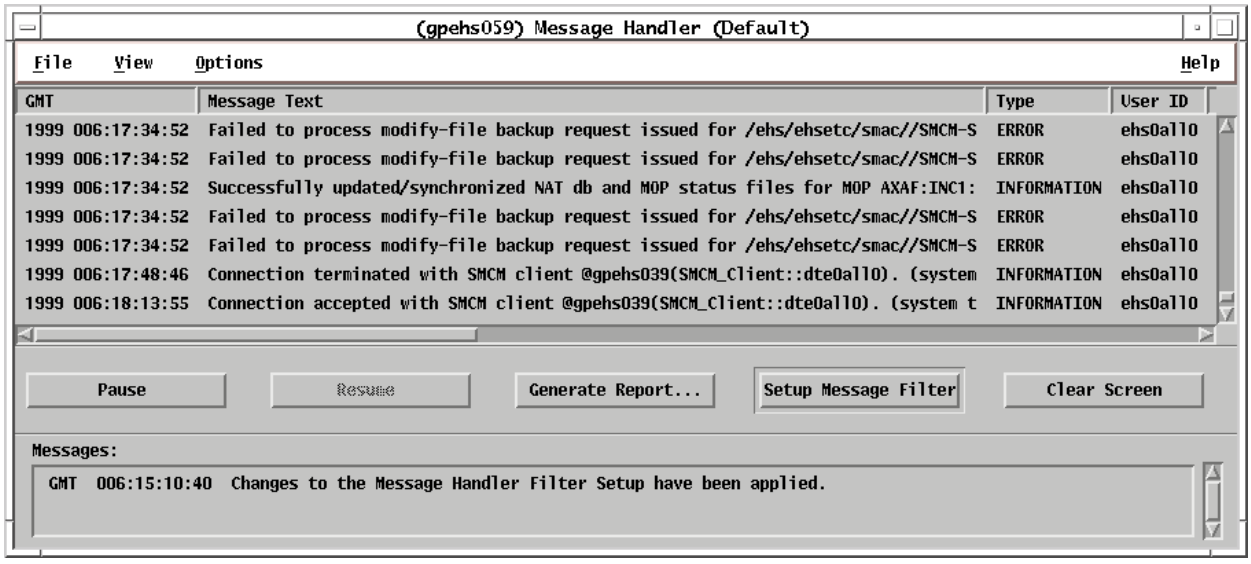


Figure 2-1, Message Handler main window.

In some instances you may be required to acknowledge the receipt of messages. These critical messages will be displayed within a message dialog box as shown in Figure 2-2, Acknowledge Message dialog box.

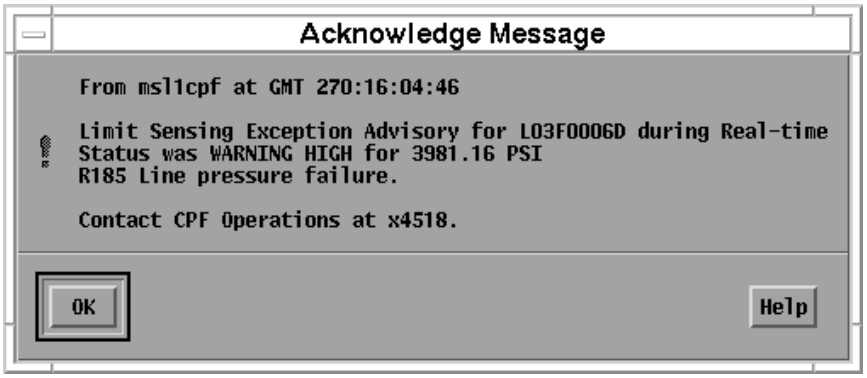


Figure 2-2, Acknowledge Message dialog box.

The **Message Handler** main window allows you to view system and application messages generated by the various Huntsville Operations Support Center (HOSC) applications. Within the main window you can:

- Manipulate message filters so you see only those messages of particular interest
- Configure the display columns so that you only see those aspects of messages with which you are most concerned
- Pause or control the number of messages that are displayed
- Clear the messages currently displayed

The main window contains several distinct features:

- Menu Bar
- Work Area
- Control Panel

2.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Message Handler** menu bar includes the **File**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **View** Menu
  Configure Columns...
  Set Column Width...

- **Options** Menu
  Generate Report...
  Setup Message Filter...
  Setup Message Scrolling...

2.1.2 Work Area

The work area (sometimes referred to as the client area) is where the Enhanced HOSC System (EHS) system level messages and information about each message are displayed. Once the work area is filled, it will scroll to permit additional messages to be displayed. Use the vertical scroll bar to move the slider up so you can see older messages. Messages are displayed in chronological order with the most recent message being placed at the bottom of the list.

Information about each message is available in user-selectable columns. If you elect to display multiple columns (the system default shows all columns) within the **Message Handler** work area, it may result in some of the columns being hidden from view. In this case, a horizontal scroll bar will be provided so that you can scroll across the work area to see all columns of information. You can also resize the window to see more columns.

GMT column

This column identifies the time in Greenwich Mean Time (GMT) format that each message was logged to Message Handler.

Message Text column

This column displays the actual message that was logged.

Type column

This column identifies the type of message that was logged. These types include advisory messages, information messages, error messages, warning messages, exception monitoring messages, and project exception monitoring messages.

Help: Messages requiring a response, messages resulting from compilation or validation, and data entry error messages are not necessarily logged to the Message Handler. See “Appendix D: Message Types and Examples” for a list of message types, a description of each message type, and examples of each.

User ID column

This column identifies the user, whose messages are being logged to Message Handler.

Priority column

This column displays the message priority. Priorities are integer values from 1 to 9, with 9 being the highest priority and 1 being the lowest.

Application Group column

This column identifies the group from which application messages originate.

Application column

This column identifies the application that generated each message.

Function Name column

This column identifies the specific function within the application that issued the message. This helps to specifically isolate application anomalies.

Process ID column

This column identifies the process that generated the message. This information is helpful in the event you need to kill a process using the Process Manager application from the **Launchpad**. Processes are referenced by their process ID.

Platform column

This column identifies the workstation that issued the message.

Data Mode column

This column identifies the data mode of each application submitting messages to Message Handler. The data modes available are: **All**, **Real-time**, **Playback 1 - 11**, **Dump 1 - 3**, and **Mode-independent**.

Code column

This column identifies the code for each message being submitted to Message Handler.

Help: See "Appendix E: Message Code Index" for information about message codes.

MET column

This column identifies the time in Mission Elapsed Time (MET) format that each message was logged to Message Handler.

Actual Time column

This column displays the GMT time of when the message occurred. The actual time displayed is independent of any simulation time being used.

Operational column

This column identifies the operational mode in which the application was running when the message was generated.

Destination column

This column identifies the destination for the message. There are nine destination codes:

0 - Local - Message distributed to your local node
1 - MOP - Message distributed to all nodes defined in a specific Mission, Operational mode and Project (MOP)
2 - Subnet - Message distributed to all nodes in a subnet
3 - All - Message distributed to all available EHS nodes
10 - Local - Message received by your local node
11 - MOP - Message received by all nodes defined in a specific MOP
12 - Subnet - Message received by all nodes in a subnet
13 - All - Message received by all available EHS nodes
14 - Central - Message exceeded System Monitor and Control (SMAC) central server priority threshold

Project column

This column identifies the project being supported.

Mission column

This column identifies the mission being supported.

2.1.3 Control Panel

The Pause, Resume, Generate Report, Setup Message Filter, and Clear Screen pushbuttons that comprise the Control Panel are used to control various aspects of messages displayed in the main window. Their function and sensitivity are identical to the corresponding **Options** menu items that will be discussed later in this chapter.

2.1.4 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Message Handler. The **Configure Columns...** and **Set Column Width...** options from the **View** menu will be discussed as well as the **Generate Report...**, **Setup Message Filter...**, and **Setup Message Scrolling...** options from the **Options** menu (see Figure 2-3, View and Options menus).

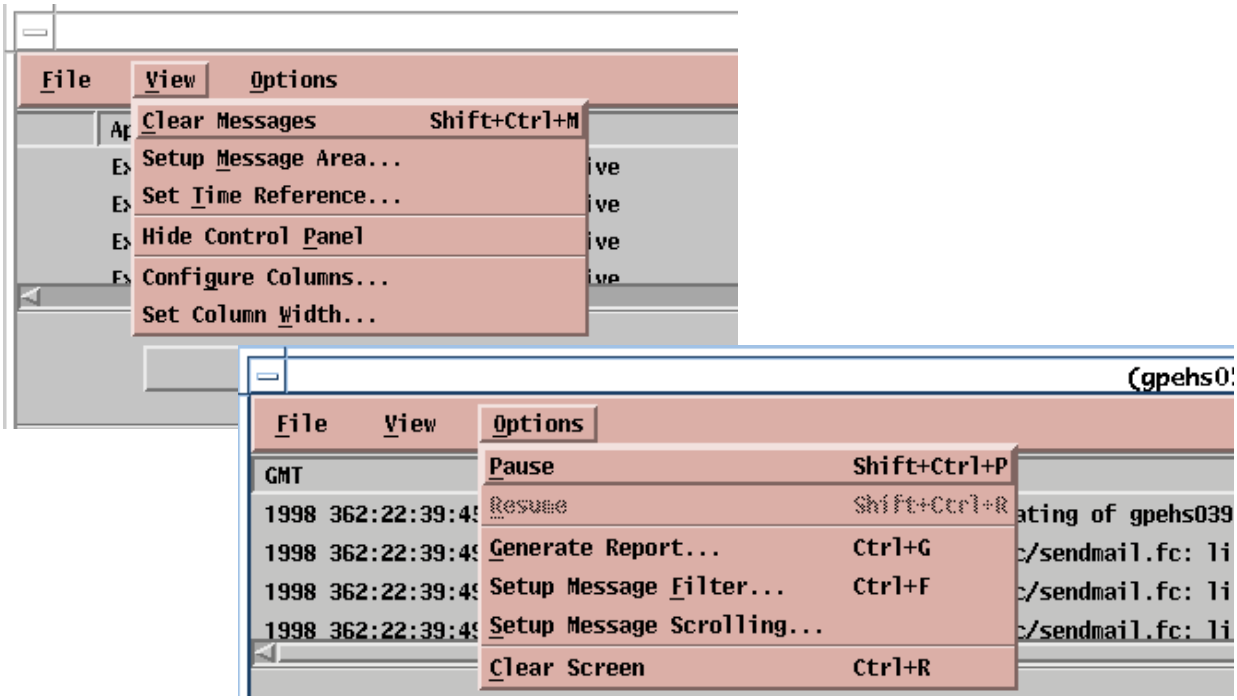


Figure 2-3, View and Options menus.

2.1.4.1 Configure Columns...

The **Configure Columns...** menu item invokes the **Configure Columns** dialog box. This dialog box provides you with the means to define what columns you'd like displayed within the work area of the application main window. You can also rearrange the column order (see Figure 2-4, Configure Columns dialog box).

The box contains two selection lists, **Columns Visible:** and **Columns Hidden:**. You can make visible columns hidden by clicking on the column name in the **Columns Visible:** list and clicking **Add**. Hidden columns can be made visible by clicking on the column name in the **Columns Hidden:** list and clicking **Remove**.

To rearrange the order in which the columns appear on the main window, click on the column you wish to move in the **Columns Visible:** list and click on **Shuffle** and to switch places with the column above or below it.

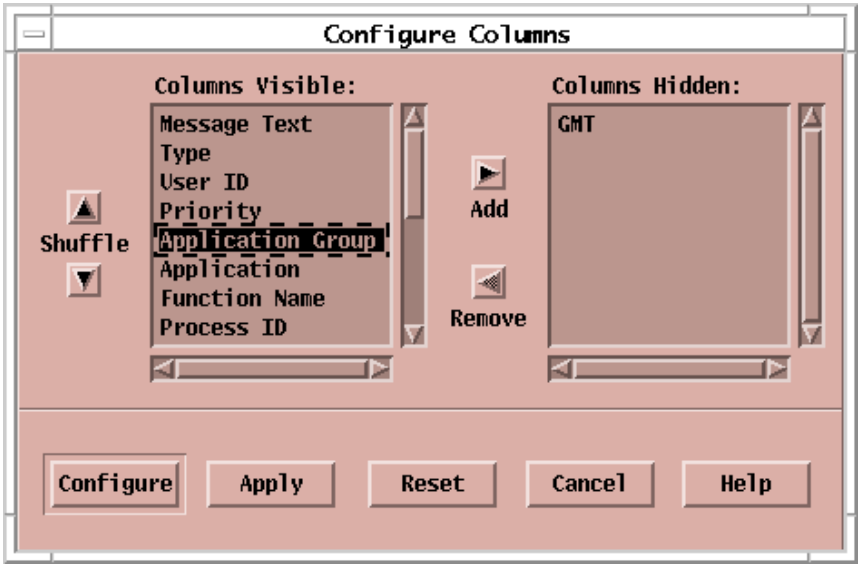


Figure 2-4, Configure Columns dialog box.

The Configure applies the column configuration you have defined to the main window, closes the **Configure Columns** dialog box and returns you to the application main window. This is the default pushbutton. The Apply applies the selected column configuration to the main window without closing the **Configure Columns** dialog box. This permits you to observe the changes and continue to implement additional changes without having to invoke the dialog box again.

2.1.4.2 Set Column Width...

The **Set Column Width...** menu item invokes a dialog box, which allows you to set the width of column margins within the work area. Using the **Set Column Width** dialog box, you can set the character width of each column by either entering a value to specify the character width or by using the up and down arrow buttons (see Figure 2-5, Set Column Width dialog box).

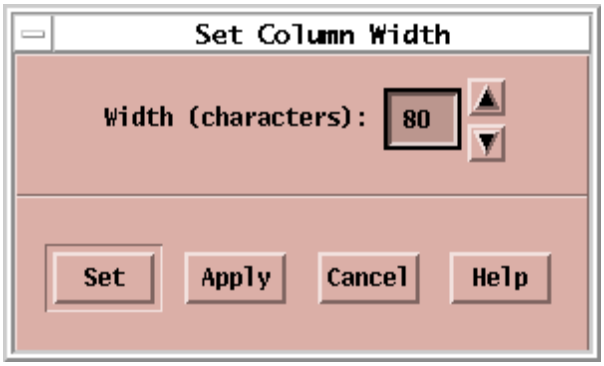


Figure 2-5, Set Column Width dialog box.

Note: You must have a column heading selected in order for this menu option to become sensitive.

The Set implements the column widths you've defined, closes the **Set Column Width** dialog box, and returns you to the application main window. This is the default pushbutton. The Apply implements any changes you've made but leaves the **Set Column Width** dialog box open. This permits you to observe the changes and continue to implement additional changes without having to invoke the dialog box again.

2.1.4.3 Generate Report...

The **Generate Report...** menu item invokes the Generate Report mini-application. This mini-application allows you to set up, save, and apply filter files to the reports displayed in the **Show Report** dialog box. The **Generate Report** main window consists of a title bar, a menu bar, a work area with five frames, a control panel, and a message area (see Figure 2-6, Default Generate Report main window).

Note: The Generate Report mini-application functions the same as any other application except that it is invoked from within another application and has a **Close** rather than an **Exit** menu item. **Close** affects the Generate Report mini-application and does not affect the **Message Handler** main window. Message Handler cannot be closed or exited.

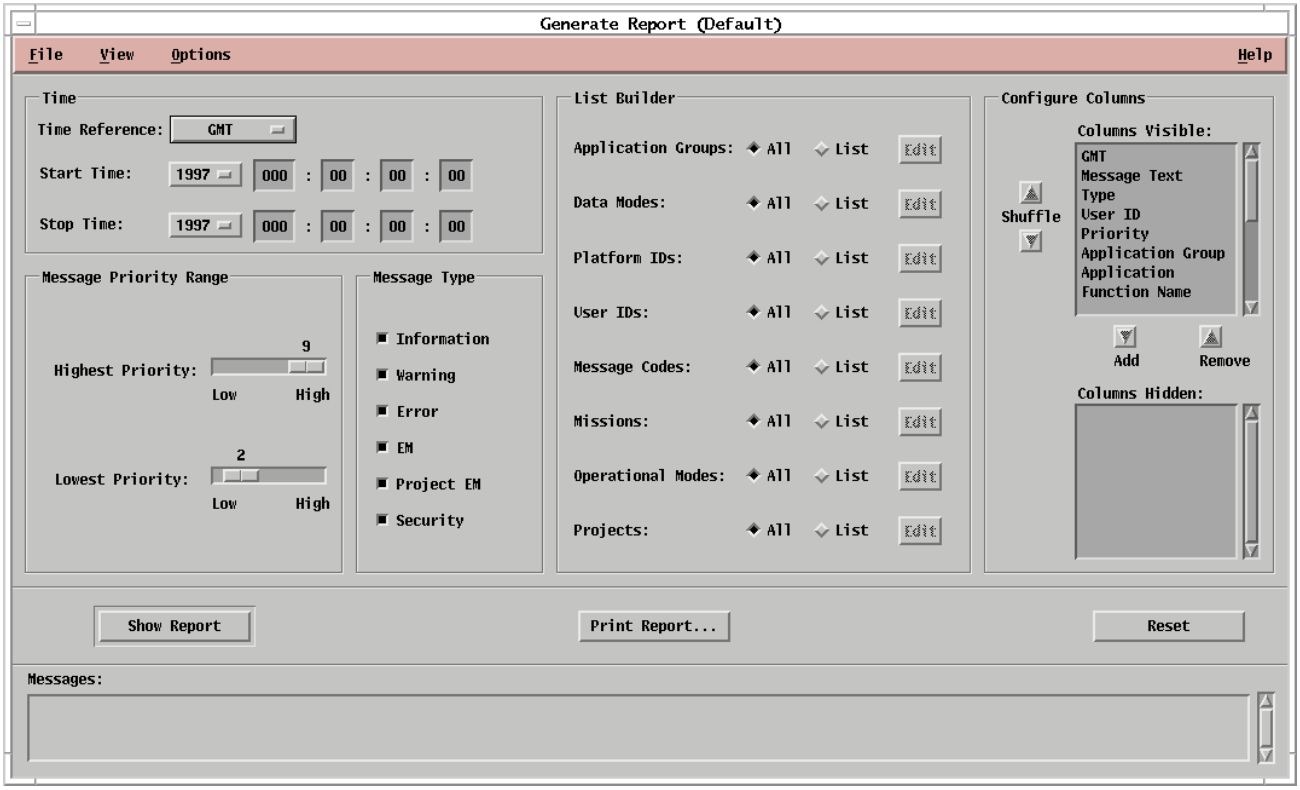


Figure 2-6, Default Generate Report main window.

2.1.4.3.1 Work Area

The work area consists of five frames:

- **Time**
- **Message Priority Range**
- **Message Type**
- **List Builder**
- **Configure Columns**

These frames and their components are described below (reference Figure 2-6, Default Generate Report main window).

The **Time** frame allows you to generate reports based on selected time criteria. You can filter messages over a certain period of time by selecting a **Time Reference:** option (either **GMT** or **MET**) and specifying the **Start Time:** and **Stop Time:** for the desired time slice.

The **Message Priority Range** frame allows you to set a priority range for messages that you want included in the report. Priority settings are integer values ranging from 1 to 9 with 9 being the highest priority and 1 the lowest. The priority range is inclusive, such that if you define the range as having the highest priority of 9 and the lowest priority of 7, you'll display messages having priorities of 7, 8, and 9. Message Handler searches for all messages within the priority range you define and allows you to filter each in descending order. **Highest Priority:** will default to 9 and **Lowest Priority:** will default to 2.

The **Message Type** frame allows you to specify the types of messages that you want included in the report.

Note: By default, the **Message Handler** application is configured so that all types of messages are displayed.

- **Information** — Information messages indicate that functions have been performed. They provide application status and indicate when actions are performed.
- **Warning** — A warning message indicates something has or is about to go wrong, but the function issuing the message can proceed.
- **Error** — An error message indicates that something has gone wrong while a function was being performed. The function cannot continue until the error has been corrected.
- **EM** — Exception Monitoring (EM) messages are caused by events that exceed levels you established using the EM application.
- **Project EM** — Project EM messages are identical to those generated by individuals except that they deal with parameters relevant to the project as a whole, rather than an individual or group.

- **Advisory** — System level, advisory messages, cannot be filtered out and are not included as an option within the Message Type frame. An example advisory message would be: "`System shutdown in 10 minutes`."

The **List Builder** frame allows you to build lists in order to more narrowly refine your filter criteria for the report you wish to generate. Based on your project, mission, and user profile, by default you receive messages from all **Application Groups**, **Data Modes**, **Platform IDs**, **User IDs**, **Message Codes**, **Missions**, **Operational Modes**, and **Projects** to which you are entitled. You can elect to reduce the number of messages shown in your report by building a list. To build a list, click on the **List** radio button. Edit becomes active. If you click on Edit, the **Edit** dialog box for that particular category is invoked. You may use **Edit** dialog boxes to identify the exact messages you want displayed.

The **Configure Columns** frame provides a means of saving the order of columns of parameters in the filter file used to generate a report. The order of columns can be changed or columns can be made invisible to suit the purposes of the report. The **Configure Columns** frame is composed of a **Columns Visible:** and a **Columns Hidden:** list along with pushbuttons to facilitate the moving of information within and between the lists.

Shuffle and become sensitive when an item is selected in the **Columns Visible:** list and are used to change the order in which the columns are presented in the report.

Add and **Remove** are used to move selected items between the **Columns Visible:** and **Columns Hidden:** lists. **Add** becomes sensitive when an item is selected in the **Columns Visible:** list and **Remove** becomes sensitive when an item is selected in the **Columns Hidden:** list.

2.1.4.4 Setup Message Filter...

The **Setup Message Filter...** menu item invokes the Setup Message Filter mini-application. Not only does this mini-application allow you to set up filter files, but it also allows you to save and apply them to the messages being displayed in the **Message Handler** main window. The **Setup Message Filter** main window consists of a title bar, a menu bar, a work area with four frames, a control panel, and a message area (see Figure 2-7, Default Setup Message Filter main window).

Note: The Setup Message Filter mini-application functions the same as any other application except that it is invoked from within another application and has a **Close** rather than an **Exit** menu item. **Close** affects the Setup Message Filter mini-application and does not affect the **Message Handler** main window. Message Handler cannot be closed or exited.

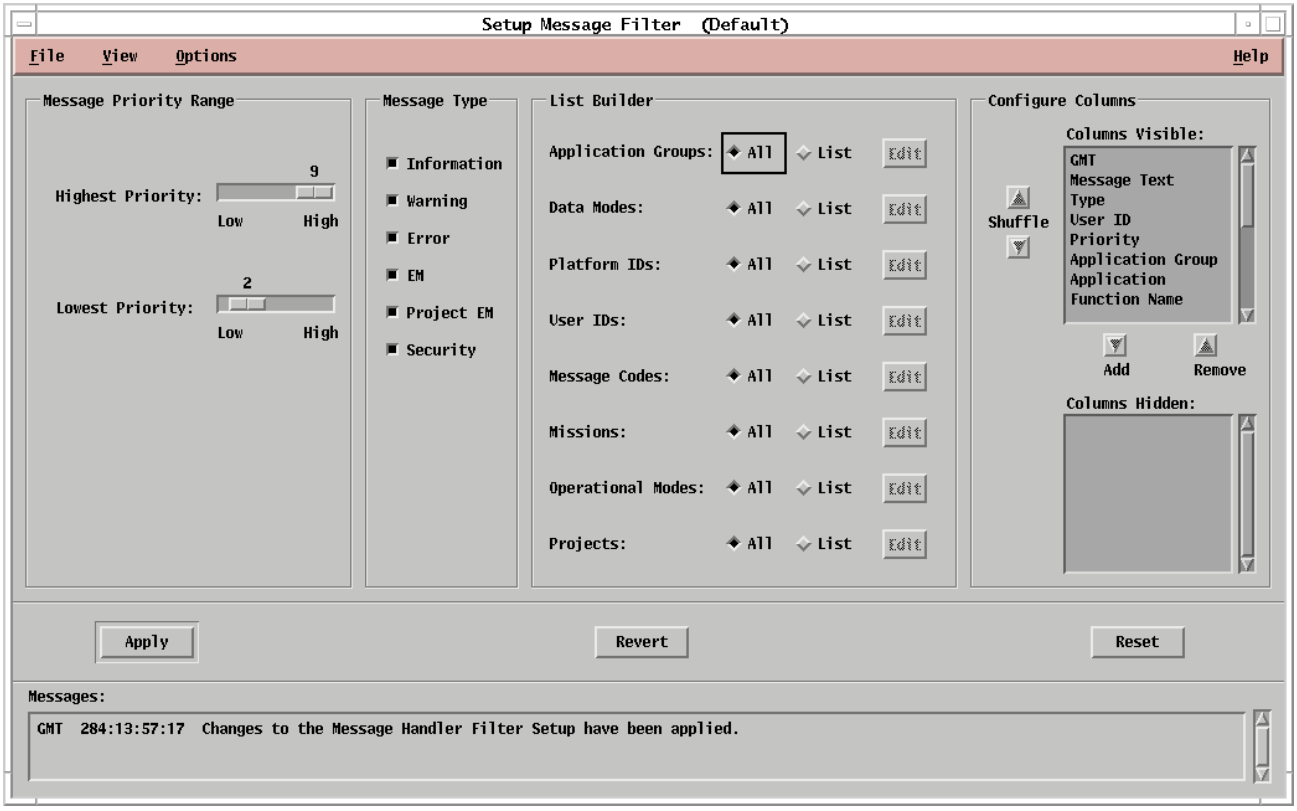


Figure 2-7, Default Setup Message Filter main window.

2.1.4.4.1 Work Area

The work area consists of four frames:

- **Message Priority Range**
- **Message Type**
- **List Builder**
- **Configure Columns**

These frames and their components are described below (reference Figure 2-7, Default Setup Message Filter main window).

The **Message Priority Range** frame allows you to set a priority range for messages you want displayed. Priority settings are integer values ranging from 1 to 9 with 9 being the highest priority and 1 the lowest. The priority range is inclusive, such that if you define the range as having the highest priority of 9 and the lowest priority of 7, you'll display messages having priorities of 7, 8, and 9. Message Handler searches for all messages within the priority range you define and allows you to filter each in descending order. **Highest Priority:** will default to 9 and **Lowest Priority:** will default to 2.

The **Message Type** frame allows you to filter messages according to the type of message they represent.

Note: By default, the **Message Handler** application is configured so that all types of messages are displayed.

- **Information** — Information messages indicate that functions have been performed. They provide application status and indicate when actions are performed.
- **Warning** — A warning message indicates something has or is about to go wrong, but the function issuing the message can proceed.
- **Error** — An error message indicates that something has gone wrong while a function was being performed. The function cannot continue until the error has been corrected.
- **EM** — Exception Monitoring (EM) messages are caused by events that exceed levels you established using the EM application.
- **Project EM** — Project EM messages are identical to those generated by individuals except that they deal with parameters relevant to the project as a whole, rather than an individual or group.
- **Advisory** — System level, advisory messages, cannot be filtered out and are not included as an option within the Message Type frame. An example advisory message would be: "`System shutdown in 10 minutes`."

The **List Builder** frame allows you to build lists in order to more narrowly refine your filter criteria. Based on your project, mission, and user profile, by default you receive messages from all **Application Groups**, **Data Modes**, **Platform IDs**, **User IDs**, **Message Codes**, **Missions**, **Operational Modes**, and **Projects** to which you are entitled. You can elect to reduce the number of messages shown in your report by building a list. To build a list, click on the **List** radio button. Edit becomes active. If you click on Edit, the **Edit** dialog box for that particular category is invoked. You may use **Edit** dialog boxes to identify the exact messages you want displayed.

The **Configure Columns** frame provides a means of saving the order of columns of parameters in the filter file used to be displayed in the main window. The order of columns can be changed or columns can be made invisible to suit the purposes of the report. The **Configure Columns** frame is composed of a **Columns Visible:** and a **Columns Hidden:** list along with pushbuttons to facilitate the moving of information within and between the lists.

Shuffle and become sensitive when an item is selected in the **Columns Visible:** list and are used to change the order in which the columns are presented in the report.

Add and **Remove** are used to move selected items between the **Columns Visible:** and **Columns Hidden:** lists. **Add** becomes sensitive when an item is selected in the **Columns Visible:** list and **Remove** becomes sensitive when an item is selected in the **Columns Hidden:** list.

2.1.4.5 Setup Message Scrolling...

The **Setup Message Scrolling...** menu item invokes the **Setup Message Scrolling** dialog box. It allows you to configure Message Handler so that it automatically pauses the displaying of messages after a certain number of them have been received. You specify the number of messages. The default **Setup Message Scrolling** dialog box is shown in Figure 2-8, Setup Message Scrolling dialog box.

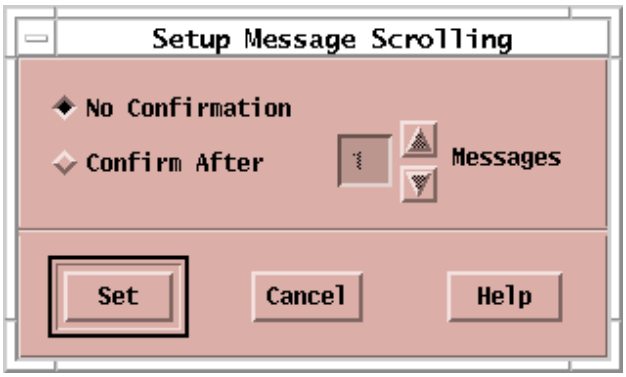
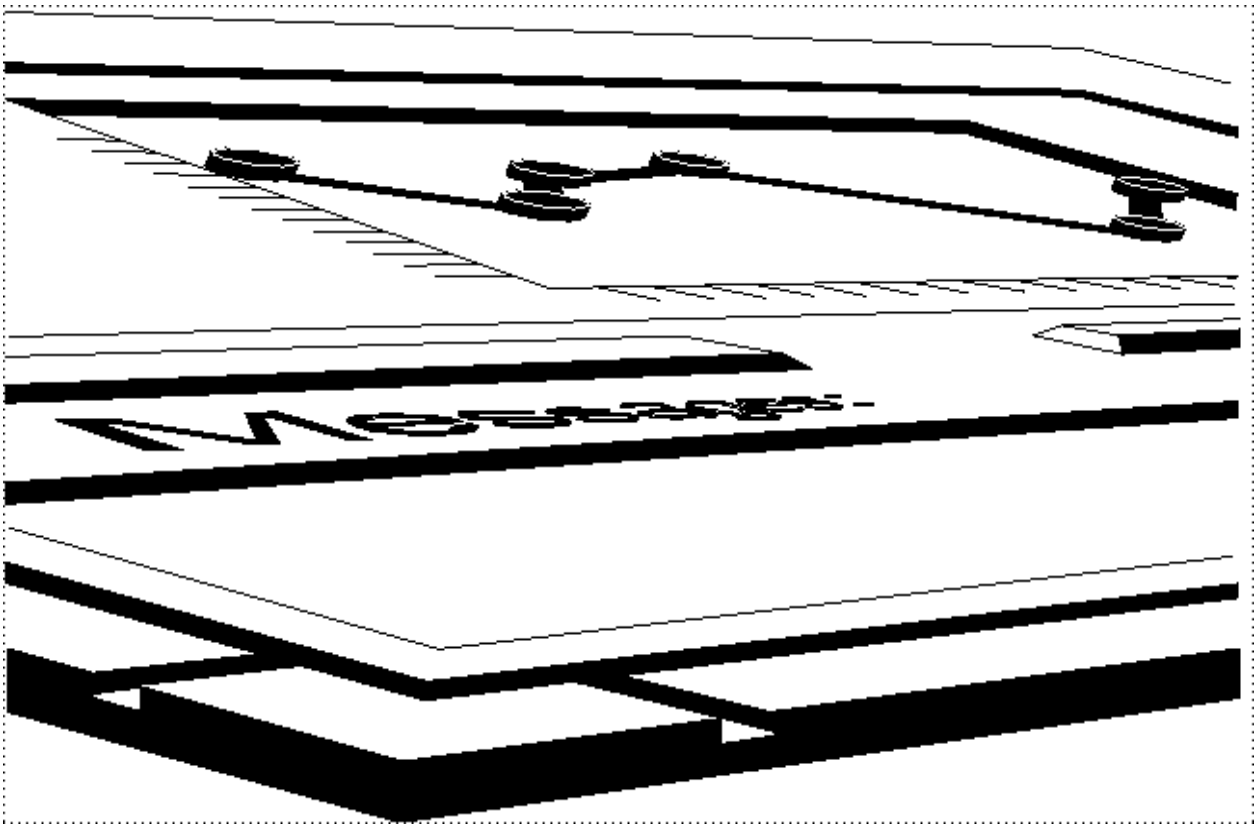


Figure 2-8, Setup Message Scrolling dialog box.

The Set implements choices you've made on the **Setup Message Scrolling** dialog box and returns you to the **Message Handler** main window.

Tip: You restart the scrolling of messages by clicking Resume on the **Message Handler** main window.



Chapter 3: File Manager

3.1 Overview

The **File Manager** application provides you with the capability to copy, rename, delete, and print specified UDEs on your local workstation. It also provides the capability to perform a string search on the files. A directory listing and print option are also available.

Selection of **File Manager** from the **File** menu on the **Launchpad** invokes the **File Manager** main window (see Figure 3-1, File Manager main window).

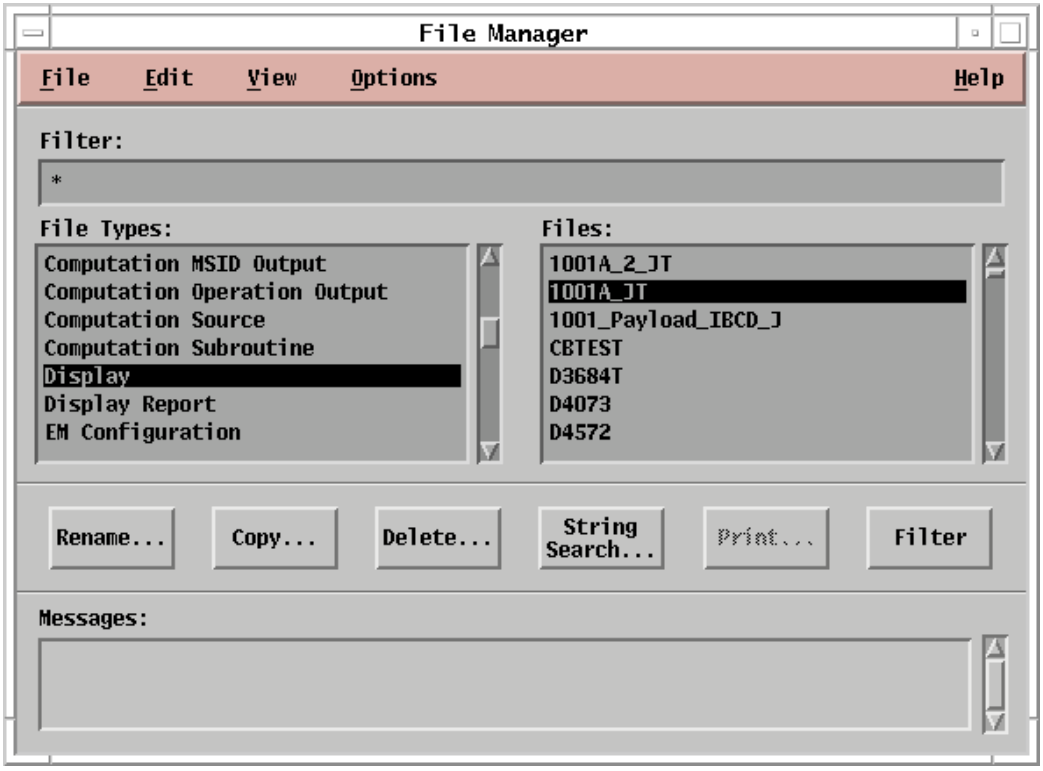


Figure 3-1, File Manager main window.

The main window contains several distinct features:

- Menu Bar
- Work Area
- Control Panel

3.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **File Manager** menu bar includes the **File**, **Edit**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Rename...**
  - **Copy...**
  - **Delete...**
  - **String Search...**

3.1.2 Work Area

The work area contains a **Filter:** input text field and two selection lists, **File Types:** and **Files:**.

Within the **Filter:** input text field, you can specify a search criteria for **Files:** of the selected **File Types:** located on your local workstation. The result from the filter will be displayed in the **Files:** selection list.

Within the **File Types:** selection list, you can select the type of UDE files you wish to see. This list will always have an element chosen and will only let you choose one element at a time.

Help: For a complete list of **File Types:**, see "Appendix C: UDE Types, Workstation Directory Structure and Available Functions."

Within the **Files:** selection list, you can select the file(s) you wish to manipulate.

To select file(s), click on the ones you want. Another click on the file will deselect the file.

3.1.3 Control Panel

The Rename..., Copy..., Delete..., String Search..., Print..., and Filter pushbuttons that comprise the Control Panel are used to manipulate selected files. Their function and sensitivity are identical to the corresponding **File**, **View** or **Options** menu items that will be discussed later in this chapter.

3.1.4 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the File Manager application. The **Rename...**, **Copy...**, **Delete...**, and **String Search...** options from the Options menu will be discussed (see Figure 3-2, File Manager Options menu).

Note: Functions available under this menu only apply to UDEs located on your local workstation. UDEs stored in the UDE database are not affected by these functions.

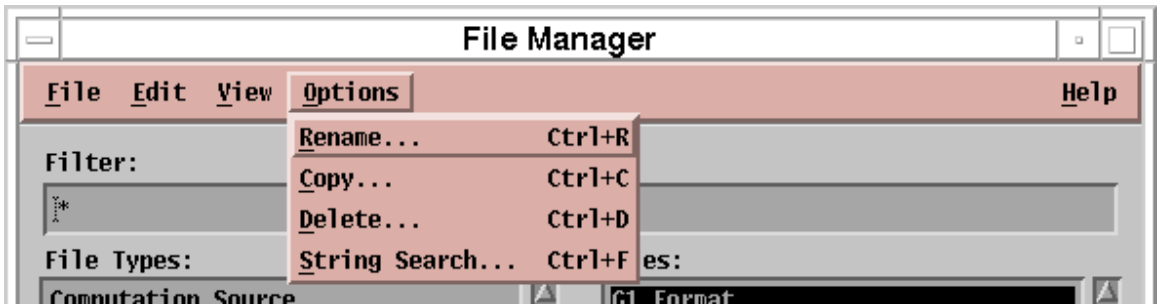


Figure 3-2, File Manager Options menu.

3.1.4.1 Rename...

With the **Rename...** menu item, you can give the selected file a new name (see Figure 3-3, Rename dialog box).

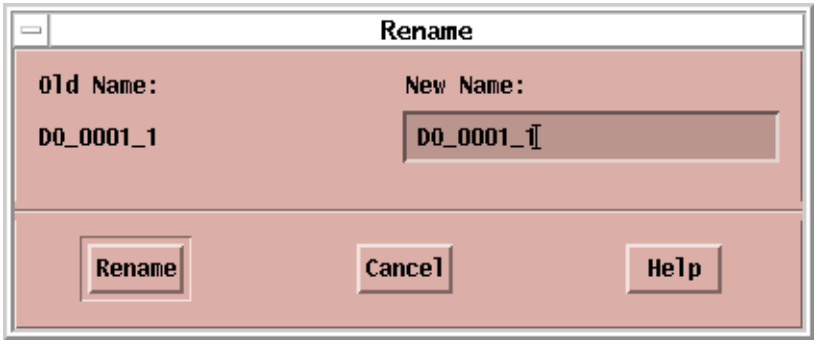


Figure 3-3, Rename dialog box.

The Rename renames the selected file and closes the **Rename** dialog box. This is the default pushbutton.

3.1.4.2 Copy...

The **Copy...** menu item invokes the **Copy** dialog box, which allows you to duplicate the selected file (see Figure 3-4, Copy dialog box).

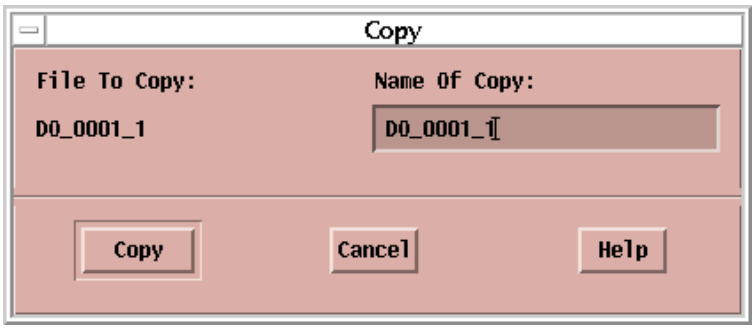


Figure 3-4, Copy dialog box.

The Copy duplicates the selected file and closes the **Copy** dialog box. This is the default pushbutton.

3.1.4.3 Delete...

The **Delete...** menu item invokes the **Delete** dialog box which allows you to delete selected file(s). An example of this dialog box is shown in Figure 3-5, Delete dialog box.

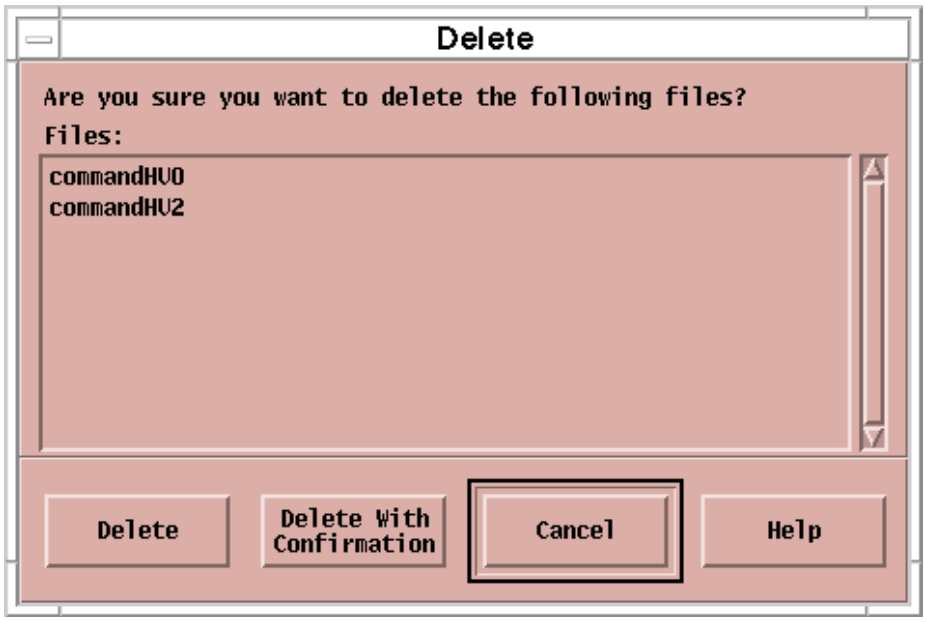


Figure 3-5, Delete dialog box.

The Delete deletes the file(s) shown in the list, closes the **Delete** dialog box, and returns you to the **File Manager** main window. If you select Delete With Confirmation a confirmation dialog box is invoked (see Figure 3-6, Delete (Delete Confirmation) dialog box) for each file in the list.

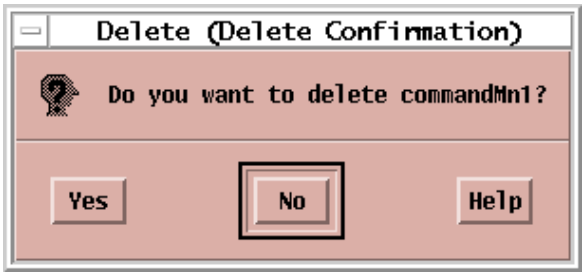


Figure 3-6, Delete (Delete Confirmation) dialog box.

3.1.4.4 String Search...

The **String Search...** menu item invokes a dialog box that allows you to search for a specific character string in the selected files (see Figure 3-7, String Search dialog box).

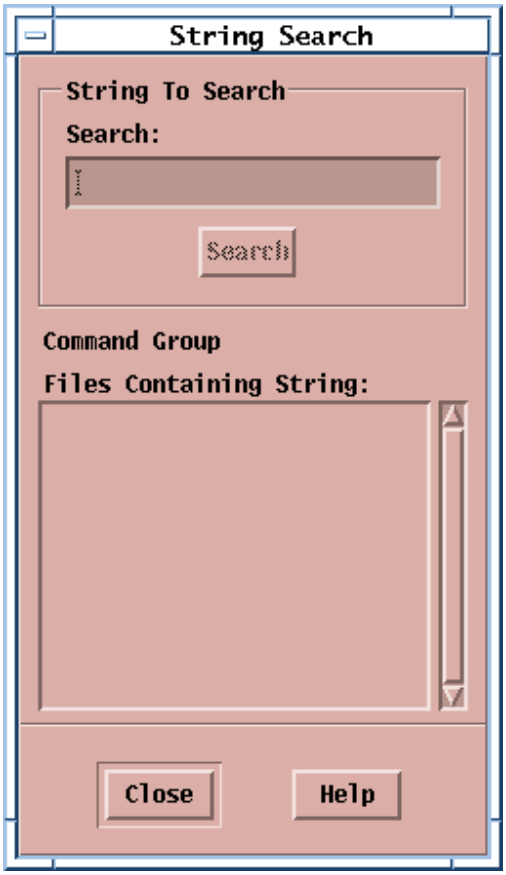
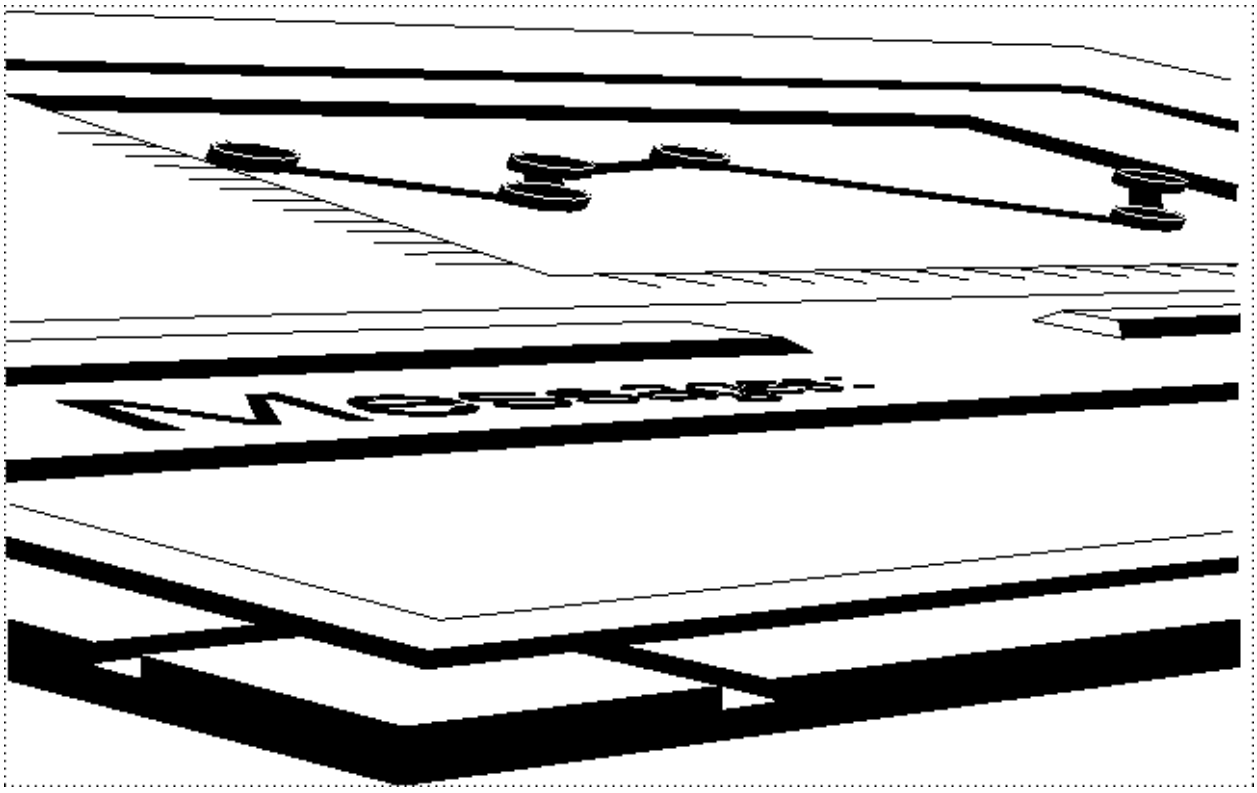


Figure 3-7, String Search dialog box.

The Search initiates the character string search. This is the default pushbutton and becomes active once a string is entered in the **Search:** input data field.



Chapter 4:
Store/Retrieve UDE

A User-Generated Data Element can be a display, computation, script, change file, etc., that is developed by an EHS application for use during operations. Because of the diversity of applications involved, a practical consideration was to store all these diverse elements in one UDE Database instead of a number of individual databases.

Aside from a UDE's purpose during operations, there are only a couple of ways to manipulate them; we can store or retrieve them to the database, or we can edit their attributes. UDEs are accessed via the **File** menu on the **Launchpad**. Retrieve UDE simply retrieves the UDE from the database for use in generation or operation applications. If it is being used in a generation application the UDE itself is being developed or edited. If it is being used in an operation application the UDE is being used for the purpose that it was developed for. Store UDE simply puts the UDE away in the UDE Database.

UDEs are stored to or retrieved from the UDE Database (via the DB Central Server) from/to your EHS Workstation (see Figure 4-1, UDE Concept).

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for additional information on UDEs.

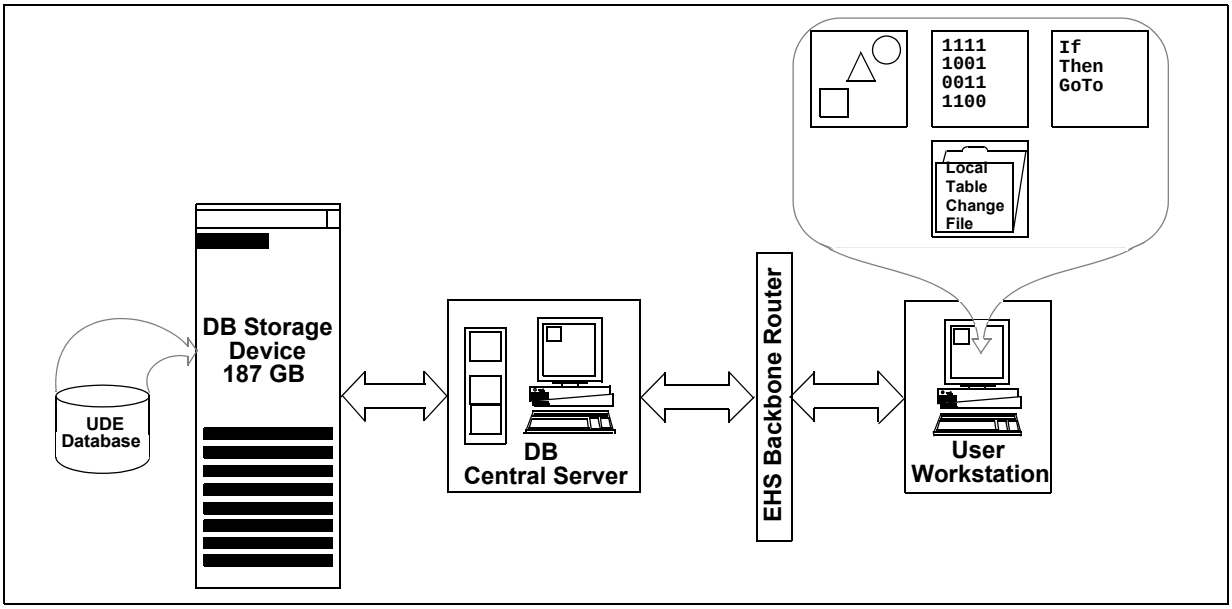


Figure 4-1, UDE Concept.

4.1 Store UDE Overview

The **Store UDE** application allows you to copy UDEs from your local workstation to the UDE database. Since workstations may be reconfigured between activities, this function allows you to store UDEs so that they will be available to you during a later activity. When the UDE is stored, a copy of the UDE is transferred to the UDE Database.

Note: When files are stored to the UDE database, filenames are forced to uppercase and remain uppercase if retrieved. If you reference these filenames in other applications, you must rename the files to lowercase or their references within other applications to uppercase.

Note: UDEs that you create and save on your workstation are stored to unique directories within the **/ehs/usr/*mission_ID*/*user_name*** directory. Most HOSC applications automatically store the UDE files in the appropriate directory when the save function is performed. When using the COTS products (e.g., FrameMaker, Applix Spreadsheet) to create UDEs, you must select the appropriate storage directory to view the UDEs using the Store UDE application.

The **Store UDE** menu item available under the **File** menu off the **Launchpad** invokes the Store UDE main window (see Figure 4-2, Store UDE main window).

Figure 4-2, Store UDE main window.

The main window contains several distinct features:

- Menu Bar
- Work Area
- Control Panel

4.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Store UDE** menu bar includes the **File**, **Edit**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Store...

4.1.2 Work Area

The work area contains the **Store Mode** frame; the **Filter:** input text field; and two selection lists, **UDE Types:** and **Files:**

The Store Mode frame contains two radio buttons: **Store All** and **Store Selected**. **Store All** - stores all UDEs of all UDE types to central storage. This is the default mode. **Store Selected** - stores selected UDEs of a selected UDE-type to central storage.

Note: Store Selected store mode must be selected before any other area becomes active.

Tip: To select all of a specific UDE type, select **Store Selected** in the **Store Mode** frame and the desired UDE type. Then select the **Select All** menu item from the **Edit** menu off the **Store UDE** main window.

Within the **Filter:** input text field, you can specify a search criteria for **Files:** of the selected **UDE Type:**. The result from the filter will be displayed in the **Files:** selection list.

Within the **UDE Types:** selection list, you can select the type of UDE whose files you want to see.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for information about the available UDE types.

Note: You must have the **Store Selected** radio button in the **Store Mode** frame selected if you wish to select a UDE type from this list.

Within the **Files:** selection list, you can select the file(s) you wish to store. To select file(s), click on the ones you want. Another click on the file will deselect the file.

4.1.3 Control Panel

Two pushbuttons are available. The Store... is available as a menu item under the **Options** menu and Filter is available as a menu item under the **View** menu. Only the function of the Store... and it's corresponding Options menu item will be discussed in the following section.

4.1.4 Store UDE Application Essentials

The **Store...** option from the **Options** menu is unique to the Store UDE application.

4.1.4.1 Store...

Selection of **Store...** from either the **Options** menu or the control panel invokes a confirmation dialog box depending on which **Store Mode** you select. If you select **Store All**, a confirmation dialog box (see Figure 4-3, Store (all) UDE confirmation dialog box) will be displayed.

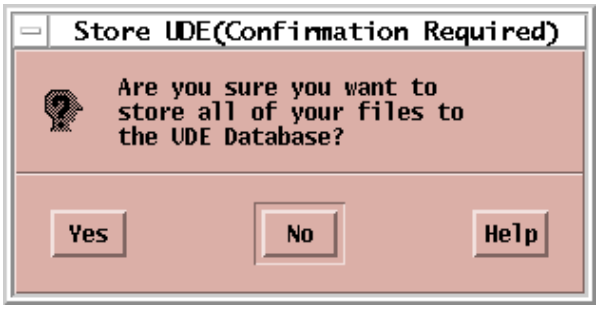


Figure 4-3, Store (all) UDE confirmation dialog box.

If you select **Store Selected**, a confirmation dialog box will be displayed (see Figure 4-4, Store (selected) UDE confirmation dialog box).

Figure 4-4, Store (selected) UDE confirmation dialog box.

CAUTION: If you are storing UDEs that have the same name as a UDE already stored on the central server, this action will overwrite the stored UDE. Use caution when performing this action.

4.2 Retrieve UDE Overview

The Retrieve UDE application allows you to request that UDEs be retrieved from the UDE database to your local workstation. You can retrieve UDEs that you created or any UDEs marked as shareable within the same project and mission. When the UDE is retrieved, a copy of the UDE is transferred to your local workstation.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for information on which UDE types may be stored and retrieved from the UDE database.

Note: When a UDE is retrieved from the UDE Database, it is copied to its unique directory within the **/ehs/usr/*mission_ID*/*user_name*** directory. Most HOSC applications will automatically open a UDE from its unique directory. When using the COTS products (e.g., FrameMaker, Applix Spreadsheet) to open a UDE file retrieved from the UDE Database, you must select the appropriate storage directory.

The **Retrieve UDE** menu item, located under the **File** menu off the **Launchpad** invokes the Retrieve UDE main window (see Figure 4-5, Retrieve UDE main window).

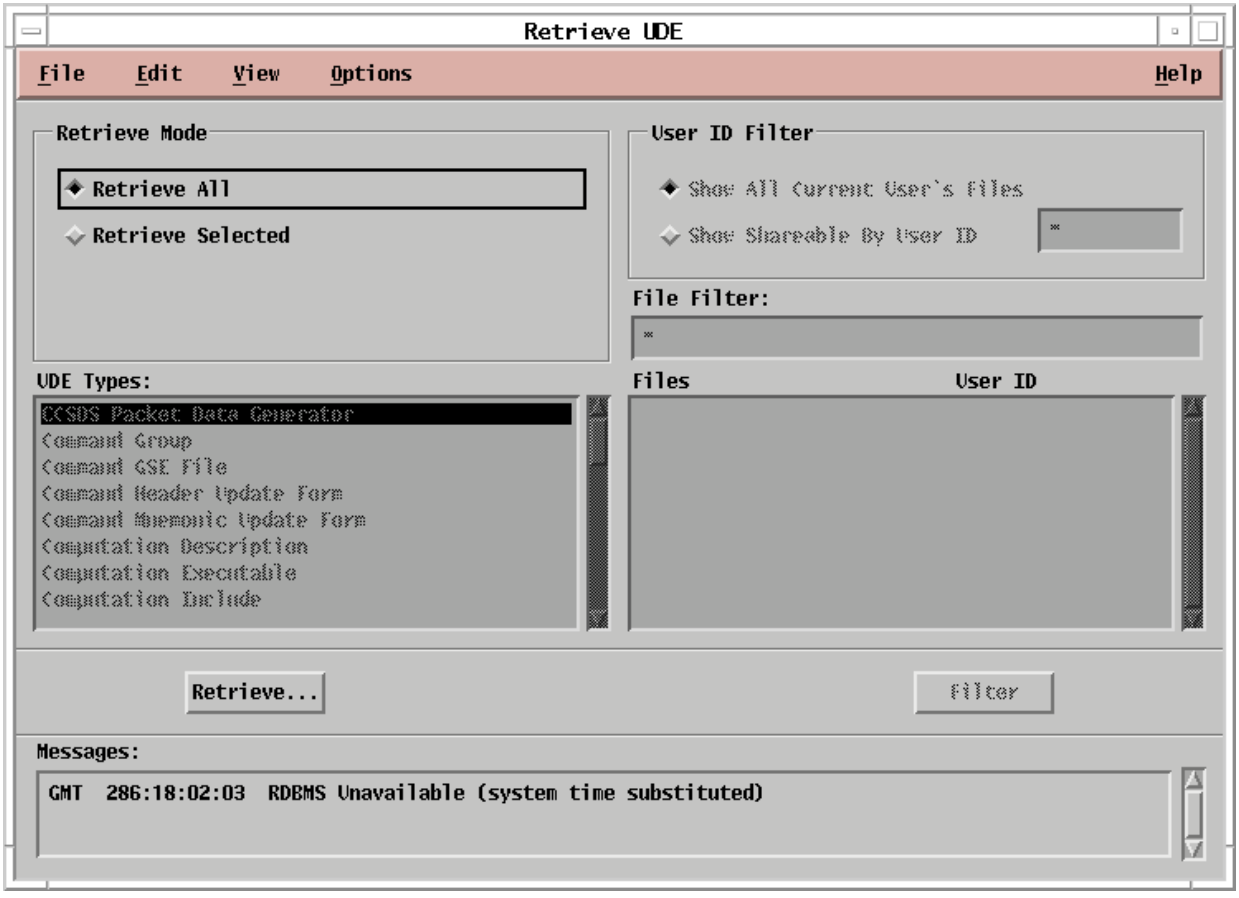


Figure 4-5, Retrieve UDE main window.

The main window contains several distinct features:

- Menu Bar
- Work Area
- Control Panel

4.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Retrieve UDE** menu bar includes the **File**, **Edit**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Retrieve...

4.2.2 Work Area

The work area contains a **Retrieve Mode** frame; a **User ID Filter** frame; a **File Filter:** input text field and two selection lists, **UDE Types:** and **Files**.

The **Retrieve Mode** frame contains two radio buttons, **Retrieve All** and **Retrieve Selected**. **Retrieve All** - retrieves all UDEs for all **UDE Types:** from central storage under your user ID. This is the default mode. **Retrieve Selected** - retrieves selected UDEs of the selected UDE type from central storage.

Note: Retrieve Selected must be selected before all the other areas become active.

Tip: To select all of a specific UDE type, select **Retrieve Selected** in the **Retrieve Mode** frame and the desired UDE type. Then choose **Select All** from the **Edit** menu.

The **User ID Filter** frame contains two radio buttons, **Show All Current User's Files** and **Show Shareable By User ID**. If you choose the **Show Sharable By User ID** radio button, you must specify the user ID in the input data field. A user ID can be up to eight characters.

Help: In order for files to be listed, the user must have marked the files shareable using the UDE Database application. See Chapter 16, EHS Databases for more information.

Note: The retrieve mode must be set to **Retrieve Selected** before this frame can be made available. The **Show Shareable By User ID** input text field can handle either the asterisk (*) wildcard or the single character wildcard (?).

Within the **File Filter:** input text field, you can specify a search criteria for **Files** of the selected **UDE Types:**. The result from the filter will be displayed in the **Files** selection list.

Note: The filter can handle either the asterisk (*) wildcard or the single character wildcard (?).

Within the **UDE Types:** selection list, you can select the type of UDE files you wish to see.

Help: The available types are shown in "Appendix C: UDE Types, Workstation Directory Structure and Available Functions".

Within the **Files** selection list, you can select the file(s) you wish to retrieve. To select file(s), click on the ones you want. Another click on the file will deselect the file.

4.2.3 Control Panel

Two pushbuttons are available on the control panel. The Retrieve... option is available as a menu item from the **Options** menu and the Filter option is available as a menu item from the **View** menu. Only the function of the Retrieve... and it's corresponding Options menu item will be discussed in the following section.

4.2.4 Retrieve UDE Application Essentials

The **Retrieve...** option from the **Options** menu is unique to the Retrieve UDE application.

4.2.4.1 Retrieve...

Retrieve... initiates the download from the central server. It invokes a confirmation dialog box depending on which **Retrieve Mode** you select. If you select **Retrieve All**, a confirmation dialog box asking you if you want to retrieve all of your files from the UDE Database will be invoked (see Figure 4-6, Retrieve (all) UDEs Confirmation dialog box).

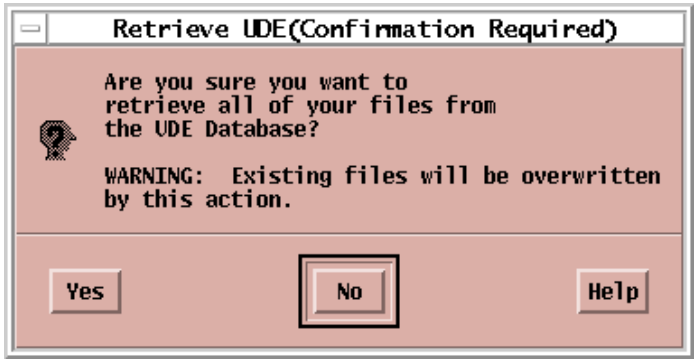


Figure 4-6, Retrieve (all) UDEs Confirmation dialog box.

If you select **Retrieve Selected**, a confirmation dialog box will be displayed asking if you want to retrieve the indicated files (see Figure 4-7, Retrieve (selected) UDEs Confirmation dialog box).

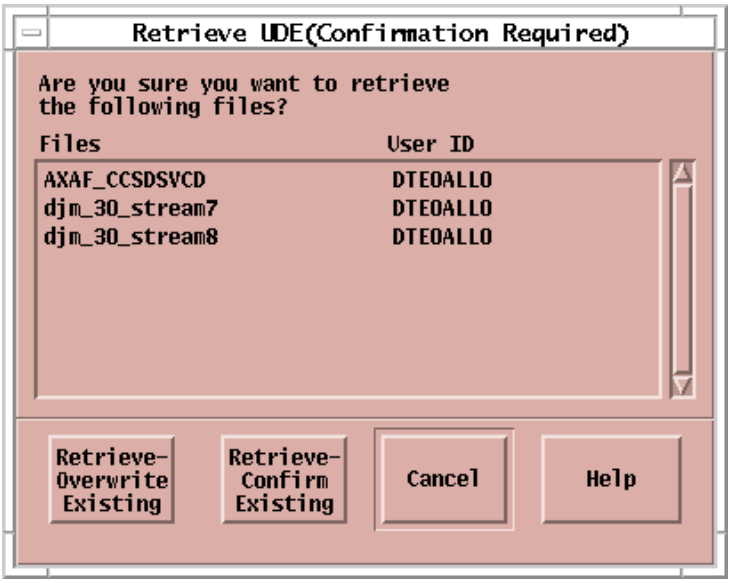


Figure 4-7, Retrieve (selected) UDEs Confirmation dialog box.

The Retrieve-Overwrite Existing retrieves the selected UDEs from central storage, overwriting any that may already exist on the workstation. The Retrieve-Confirm Existing retrieves the selected UDEs from central storage. If the file is already resident on the workstation, a confirmation dialog box is invoked (see Figure 4-8, Retrieve UDE (File Already Exists) confirmation dialog box).

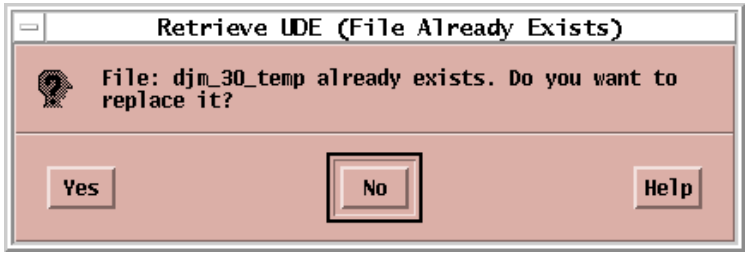
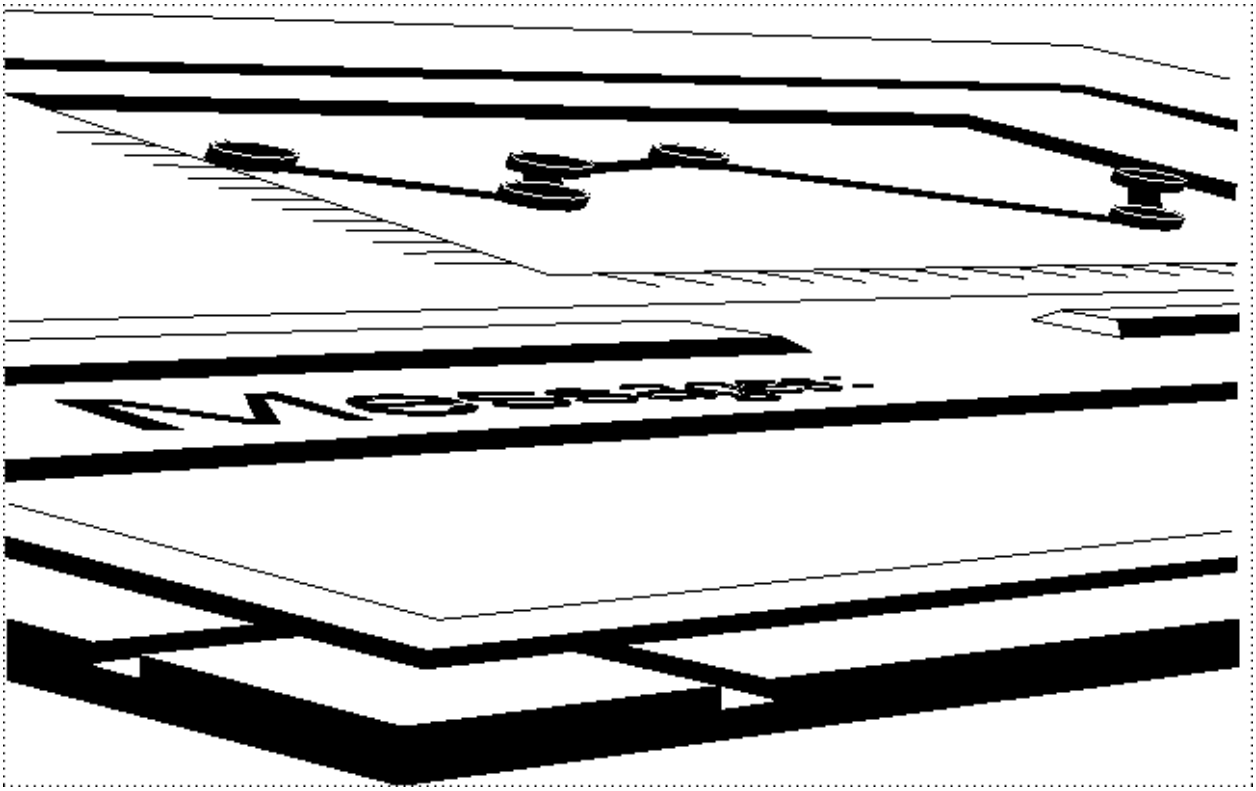


Figure 4-8, Retrieve UDE (File Already Exists) confirmation dialog box.



Chapter 5:
Print Operations

Print Operations as discussed in this chapter will encompass the following applications:

- Setup Print
- Print Screen
- Print Window
- Print Status

These applications appear as common functions in the **File** menu across most of the Enhanced HOSC System (EHS) software. Their use is fairly intuitive and as a result the discussion concerning them will be brief.

5.1 Setup Print Overview

The Setup Print application allows the user to specify the printer, set the paper orientation to portrait or landscape, and set the paper size to letter or legal for the Print Screen and Print Window applications.

The **Setup Print...** menu item invokes a dialog box that allows you to set print options that will be implemented when the print function is invoked (see Figure 5-1, Setup Print dialog box). The default settings are listed in Table 5-1, Printer Option Defaults.

Table 5-1, Printer Option Defaults.

Print Option	Default Setting
Paper Orientation	**Portrait**
Paper Size	**Letter**
Paper Source	**Paper Tray**
Print To	*Default printer*

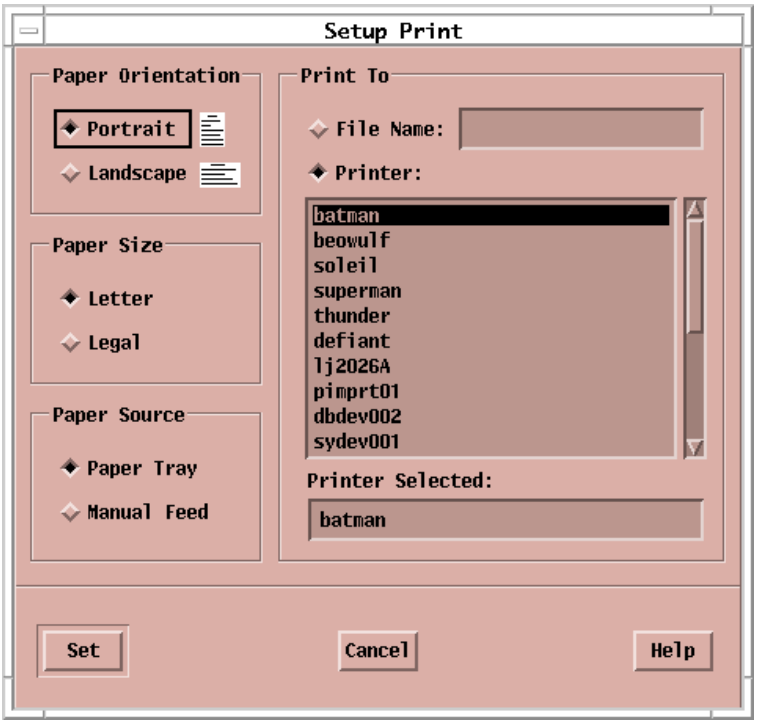


Figure 5-1, Setup Print dialog box.

Tip: If you select the **File Name:** radio button indicating that you want your output printed to a file, then you must provide a name for that file. The maximum number of characters allowed for a filename is 20. After the print function is performed, the file is saved in postscript and stored in the **pof** directory. The file then becomes a **Printer Output File** type UDE, and you can subsequently print it using the File Manager application invoked from the **Launchpad**.

5.2 Print Screen Overview

The **Print Screen** menu item under the **File** menu off the **Launchpad** provides the means to print the entire workstation screen. It uses the printer configuration defined in the **Setup Print** dialog box.

Note: This function only prints one copy of the screen to the selected printer.

5.3 Print Window Overview

The **Print Window** menu item under the **File** menu off the **Launchpad** provides the means to print any selected window.

When this menu item is selected, the select arrow changes shape. Click in the window you want to print. The screendump of the selected window will be printed to the printer designated with the **Setup Print...** menu item.

Note: This menu item only prints one copy of the window to the selected printer.

5.4 Print Status Overview

The **Print Status** menu item under the **File** menu off the **Launchpad** provides you with the status of submitted print jobs (see Figure 5-2, Print Status main window).

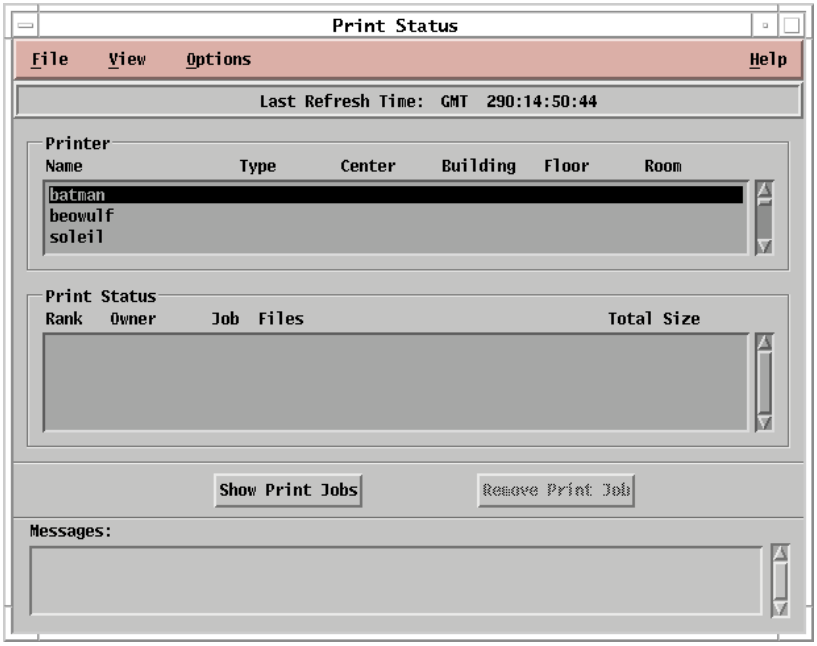


Figure 5-2, Print Status main window.

The main window contains several distinct features:

- Menu Bar
- Work Area
- Control Panel

5.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Print Status** menu bar includes the **File**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Show Print Jobs
  Remove Print Job

5.4.2 Work Area

The work area contains a **Printer** frame and a **Print Status** frame.

The **Printer** frame shows the location of available printers and highlights the one currently selected. The frame contains six columns:

Name Printer Name

Type Type of Printer

Center Facility where printer is located

Building Building number where printer is located

Floor Floor where printer is located

Room Room number where printer is the located

The **Print Status** frame shows print job(s) currently queued to the selected printer. The frame contains five columns:

Rank Order of print job(s) in queue

Owner Owner of the print job(s)

Job Number of the print job

Files Name of the file to be printed

Total Size File size in bytes

5.4.3 Control Panel

The Show Print Jobs and Remove Print Job pushbuttons that comprise the Control Panel are used to manage the print jobs as displayed in the main window. Their function and sensitivity are identical to the corresponding **Options** menu items that will be discussed next in this chapter.

5.4.4 Print Status Application Essentials

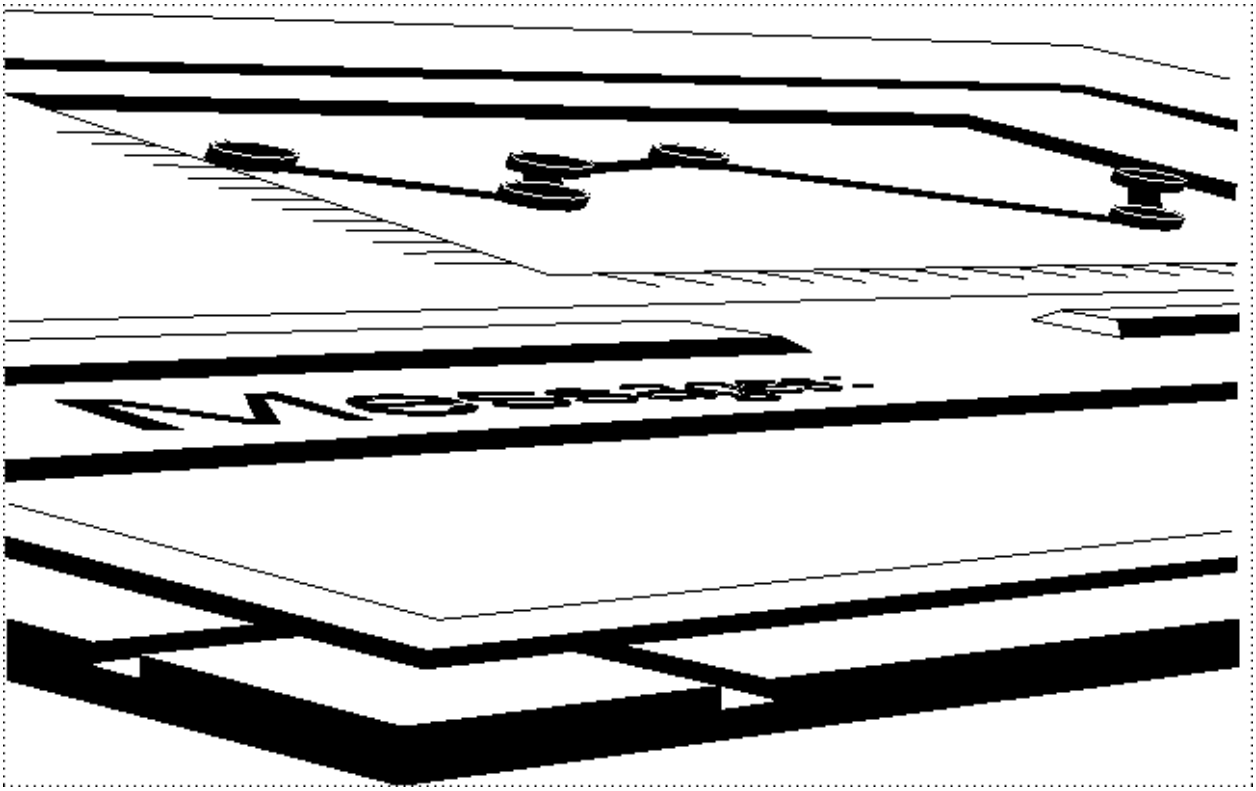
The following sections will discuss the menu items presented by the Menu Bar that are unique to the **Print Status** application. The **Show Print Jobs** and **Remove Print Jobs** options from the **Options** menu will be discussed.

5.4.4.1 Show Print Jobs

Since the **Print Status** main window does not dynamically update, selecting **Show Print Jobs** or clicking Show Print Jobs refreshes the window and shows newly submitted jobs. Prior to making this selection, select the printer whose jobs you want to view from the **Printer** frame of the **Print Status** main window and then select **Show Print Jobs** or click Show Print Jobs.

5.4.4.2 Remove Print Job

Selecting **Remove Print Job** or clicking Remove Print Job cancels the selected job(s) from the print queue and refreshes the window.



Chapter 6:
Display Generation/Operation

6.1 Display Generation Overview

The Display Generation application provides you with the capability to create, modify, and save customized displays to view and manage space vehicle telemetry data. The application provides drawing tools that allow you to create various objects on a display. These objects may include plots, data fields, pie charts, pushbuttons, etc. Objects may be built to display data, enter values, or send commands.

The **Display Generation** main window is both your drafting table and your configurable electronic grid paper (see Figure 6-1, Display Generation main window). Drawing tools permit you to construct sophisticated graphic screens to display telemetry data, initiate commands, and start scripts and computations. The Drawing Tools palette can be a part of the **Display Generation** main window or remain a separate entity.

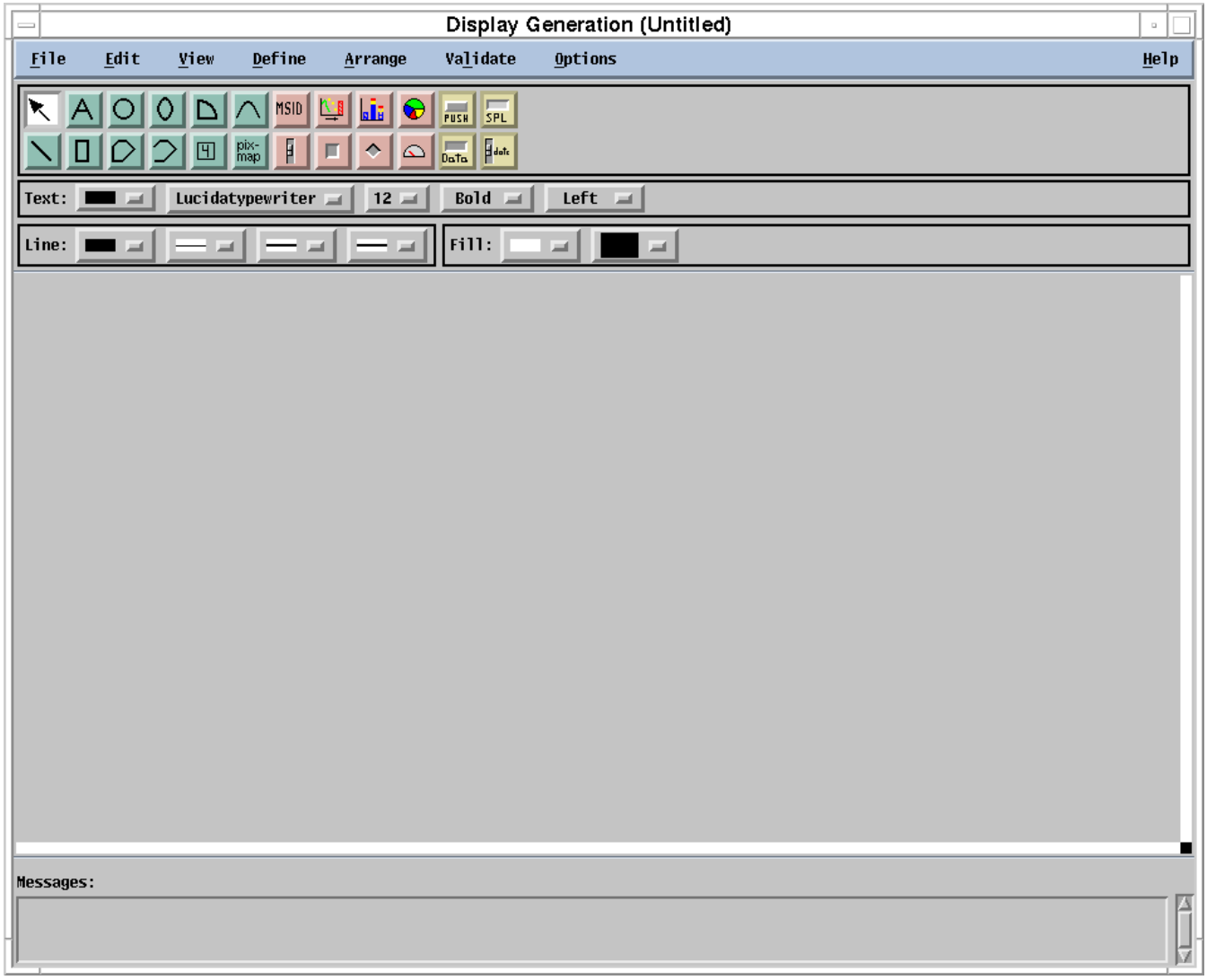


Figure 6-1, Display Generation main window.

The main window contains several distinct features:

- Menu Bar
- Drawing Tools Palette
- Attribute Defaults Bar
- Work Area

6.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Display Generation** menu bar includes the **File**, **Edit**, **View**, **Define**, **Arrange**, **Validate**, **Options**, and **Help** menus. Certain menu options listed

under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Define** Menu
  - **Set Object Attributes...**
  - **Create Pulldown Menu...**
  - **Define Operation Startup List...**
  - **Set Operation Defaults...**
  - **Fit Display to Objects**
  - **Define Display Settings...**
- **Validate** Menu
  - **Validate...**
  - **Check for UDEs**
- **Options** Menu
  - **Generate MSID Text Objects...**

6.1.2 Drawing Tools Palette

The drawing tool palette provides 24 tools for building a display. The palette default location is on the main window (see Figure 6-2, Drawing Tools Palette). The tools allow you to draw shapes, such as lines, rectangles, squares, ellipses, and circles. Tools are also available for building input and output objects that display telemetry parameters or execute scratchpad line (SPL) directives, such as uplinking commands or starting computations.

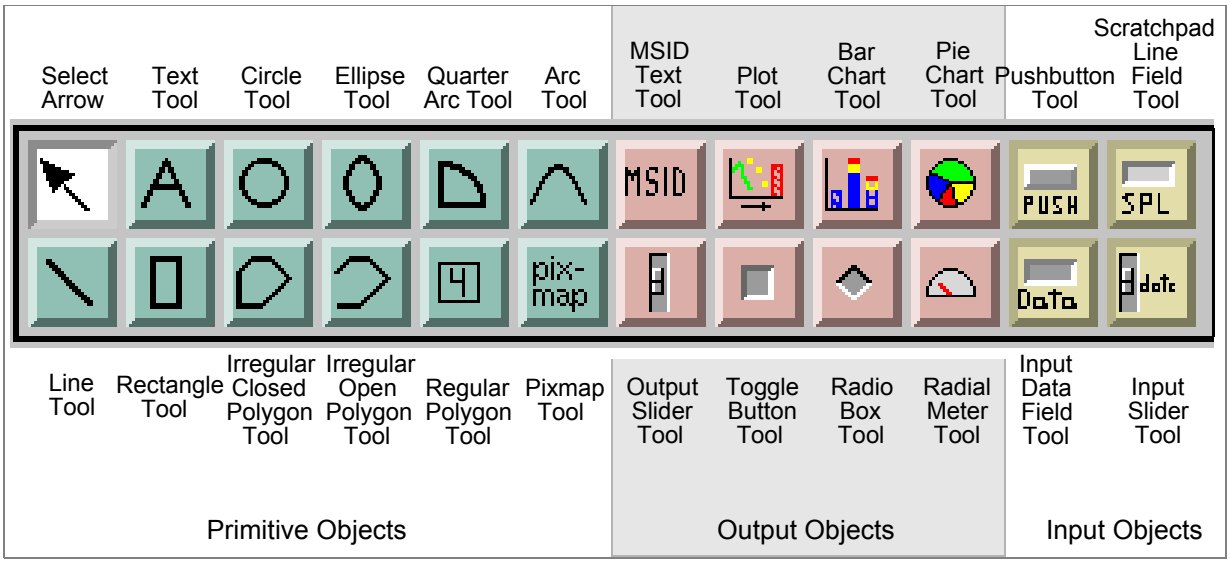


Figure 6-2, Drawing Tools Palette.

Each tool, except for the select arrow, can be configured for single or multiple drawing mode. A single click on the tool makes the tool look depressed and invokes the single draw mode. Once an

object is drawn, the tool is deactivated back into selection mode. You must select or reselect a tool to draw another object.

Double-clicking on a tool will invoke the multiple drawing mode. Once one object is drawn, another object of the same type can immediately be created without having to select the tool from the palette.

Note: Additional clicks on the tool will toggle the tool between single and multiple drawing mode.

6.1.2.1 Primitive Objects Drawing Tools

The **Primitive Object Drawing Tools** contain drawing widgets similar to those provided in other commercially available drawing applications. These tools allow you to type text, create geometric shapes or assign an image to an object. Primitive objects can either be **Static** or **Dynamic**.

Static objects can be used as building components in displays. These objects do not receive telemetry data. Dynamic objects are used to represent updating telemetry data.

Note: Static graphic objects should not be used behind MSID text objects, particularly when using fill patterns. The MSID fill color may not display properly in Display Operations.

The **Text Tool** allows you to create text objects. Text can be used for purposes such as column titles, paragraphs, or phrases.

The **Circle Tool** allows you to create circles**.**

The **Ellipse Tool** allows you to create various size ellipses.

The **Quarter Arc Tool** allows you to draw a 90^{o} elliptical quarter arc.

The **Arc Tool** allows you to draw arcs that are half an ellipse and that can have their straight edge rotated to any angle desired.

The **Pixmap Tool** allows you to draw a pixmap object. Once the object is drawn, an image can be assigned to it. The image (pixmap) is either created using the Pixmap Editor software available from the Launchpad **Utilities** menu or transferred to the local workstation. Pixmaps used within a display are located on the local workstation and can be defined as static or dynamic.

The **Line Tool** allows you to create lines of various lengths, widths, and styles. This tool also allows you to determine whether arrows will appear at the beginning or end of these lines.

The **Rectangle Tool** allows you to create rectangles of various sizes.

The **Irregular Closed Polygon Tool** allows you to draw shapes that are composed primarily of angles and straight lines. A polygon can have as many sides as you want. The system closes polygons created with the close polygon tool by connecting the first and last points.

The **Irregular Open Polygon** tool allows you to draw shapes that are composed primarily of angle and straight lines. The difference between the irregular open and the closed polygon is that the closed polygon has a line connecting the first and last points and the open one does not.

The **Regular Polygon Tool** allows you to draw equilateral polygons. A regular polygon can be created to have from three to eight equal sides. Clicking on the regular polygon tool with the right mouse button invokes a dropdown menu from which the number of sides may be selected.

6.1.2.2 Output Objects Drawing Tools

The **Output Object Drawing Tools** include tools that allow you to create objects with telemetry parameter values being represented by real-time data fields, time plots, XY plots, bar charts, pie charts, radial meters, sliders, toggle buttons, and radiobutton.

Note: Output objects cannot be created over other output objects or input objects. You will stay in creation mode until display space is found, or the creation is cancelled by pressing the right mouse button.

The **MSID Text Tool** allows you to create MSID fields for viewing telemetry data. An MSID is a unique parameter identifier assigned to each telemetered parameter. Its unprocessed, converted, or calibrated value can be shown using this object. This object consists of a label and a data field separated by a color and/or a status character.

The **Plot Tool** allows you to create either a time plot or an XY plot. A time plot has up to four Y-axis parameters plotted against a single X-axis time parameter. An XY plot contains one X-axis parameter and four Y-axis parameters. Plots can be configured to have the grid showing, a legend showing as well as labels for the X and Y axes. Each Y-axis parameter can have a color assigned for the **Nominal/Expected State:**. The default plot type created is a **Time**, **Line** plot.

The **Bar Chart Tool** allows you to create a bar chart using a maximum of five parameters. Each parameter can have a color assigned for the **Nominal/Expected State:**. The chart can be configured to have the grid and a legend showing, as well as a label for each bar and the X and Y axis.

The **Pie Chart Tool** allows you to create a pie chart using up to ten parameters. Each parameter is represented by a pie slice and can have a color assigned for the expected state or nominal value. The chart can be configured to have the grid and a legend showing, as well as labels for each slice.

The **Output Slider Tool** allows you to create a sliding scale (a scroll bar without arrows). A telemetry MSID may be assigned to the scale and the slider will move up and down based on the

current value of the telemetry parameter. You can configure the slider so that it is oriented horizontally or vertically.

The **Toggle button Tool** allows you to create a button that graphically represents the state of bit discrete MSIDs.

The **Radiobox Tool** allows you to create a radiobox that provides a graphic representation for the state of group discrete parameters.

The **Radial Meter Tool** is used to build a radial meter, an object resembling a speedometer, with a telemetry MSID assigned to it. The gauge will move from one side to the other based on the current value of the telemetry parameter assigned to the meter. The **Radial Meter Tool** creates a 180° or 360° radial meter with the default being 180°. To select the 360° meter, you must change the object attributes associated with the radial meter.

6.1.2.3 Input Objects Drawing Tools

Input Objects Drawing Tools are tools that allow you to create objects such as pushbuttons, SPL fields, input data fields, and input sliders. Within the Display Operation application, the pushbutton or SPL field allows you to initiate an action (SPL directive). SPL directives can start a script, start a computation, start a display, uplink a command, etc. Pushbuttons and SPL fields can be used for any SPL directive. Input sliders and input data fields can only be used for updating computation constants and external pseudos-MSIDs.

Note: Input objects cannot be created over other input objects or output objects. You will stay in creation mode until display space is found, or the creation is cancelled by pressing the right mouse button.

The **Pushbutton Tool** allows you to create a button with a text label or pixmap on it and an SPL directive associated with it. A pushbutton can be created to start a computation, start a script, start a display, uplink a command, etc.

The **Scratchpad Line Field Tool** allows you to create a labeled field and assign a SPL directive to start a computation, start a display, start a script, uplink a command, etc. This field is similar to a pushbutton, except that either a complete SPL directive, partial SPL directive or no SPL directive can be assigned to the SPL field.

The **Input Data Field Tool** allows you to create an object with a label and a text entry field. You can assign an **External Pseudo MSID:** or **Computation Constant:** to this field. The value you assign in Display Operation to the external pseudo MSID or constant, will then be used in its associated computation.

The **Input Slider Tool** allows you to create an input slider that has a computation constant or pseudo-MSID assigned to it. You can assign an **External Pseudo MSID:** or **Computation**

Constant: to this field. The value you assign in Display Operation, will then be used in its associated computation.

6.1.3 Attribute Defaults Bar

The next component of the **Display Generation** main window is the attribute defaults bar (see Figure 6-3, Attribute defaults bar). This bar shows the current attributes for **Text:**, **Line:**, and **Fill:**. This bar cannot be removed from the main window. It allows you to set defaults for creating new objects and to change attributes of selected objects.

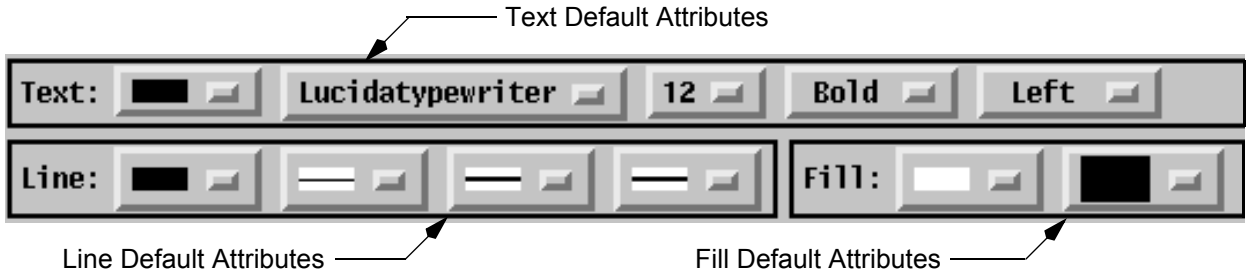


Figure 6-3, Attribute defaults bar.

6.1.3.1 Text Default Attributes

Text: default attributes include text color, font, font size, text style and text justification.

Note: The options you set on the attribute defaults bar are not saved when you exit the application.

Text default attributes are:

- Black text
- **Lucidatypewriter** font
- **12** point
- **Bold**
- **Left**-justified

6.1.3.2 Line Default Attributes

The **Line:** default attributes include line color, line width, line style, and arrows. These attributes affect the outline of an object or the characteristics of a line.

Note: The options you set on the attribute defaults bars are not saved when you exit the application.

The application defaults for the line are:

- Black line color
- Thin line width
- Solid line style
- No arrowheads

6.1.3.3 Fill Default Attributes

The **Fill:** default attributes include fill color and pattern. These attributes affect the background of an object. The fill color can be applied to any object but the fill pattern only affects primitive graphics. The default fill color is white and the default fill pattern is solid.

The application defaults for fill are:

- White fill color
- Solid fill pattern

6.1.4 Work Area

When you select **New** from the **File** menu, a blank display will be created that, when opened, will be approximately two-thirds the size of your screen (see Figure 6-4, Work area). This is only a default size and may be enlarged or reduced to fit your needs.

Tip: Recommend that you start with a large work space for laying out your display and then select the **Fit Display to Objects** menu item under the **Define** menu to shrink your display to the minimum size needed to accommodate all the objects on your layout.

Enlarging your work area is not the same as enlarging the window.

To enlarge the main window, click and hold on a resize border and drag it to the desired size. This allows you to see the display resize handle

You can use the display resize handle to enlarge the display work area. Select the display resize handle and drag the handle using the left mouse button until the work area is the appropriate size. You can also select the **Define Display Settings...** menu item under the **Define** menu.

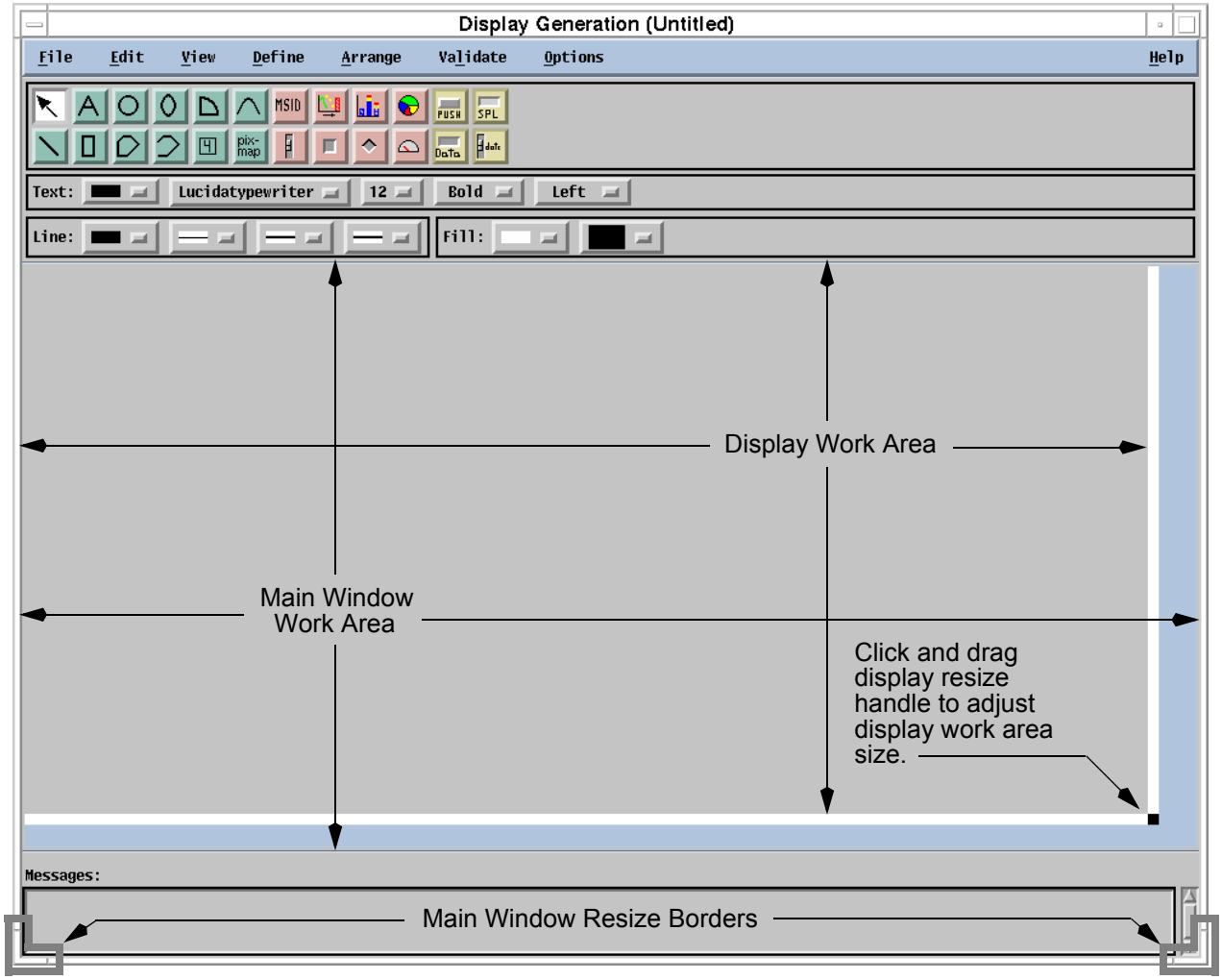


Figure 6-4, Work area.

The Display Generation application also provides the capability to display a grid. As the application default, the grid is not shown. To show the grid, select the **Setup Grid...** menu item from the **View** menu.

Tip: Turn on the **Show Grid** and the **Snap to Grid** toggle buttons, located on the **Setup Grid** dialog box, to make placing and aligning objects much easier.

6.1.5 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Display Generation application. All of the options from the **Define** and **Validate** menus as well as the **Generate MSID Text Objects...** option from the **Options** menu will be discussed (see Figure 6-5, Define, Validate, and Options menus).

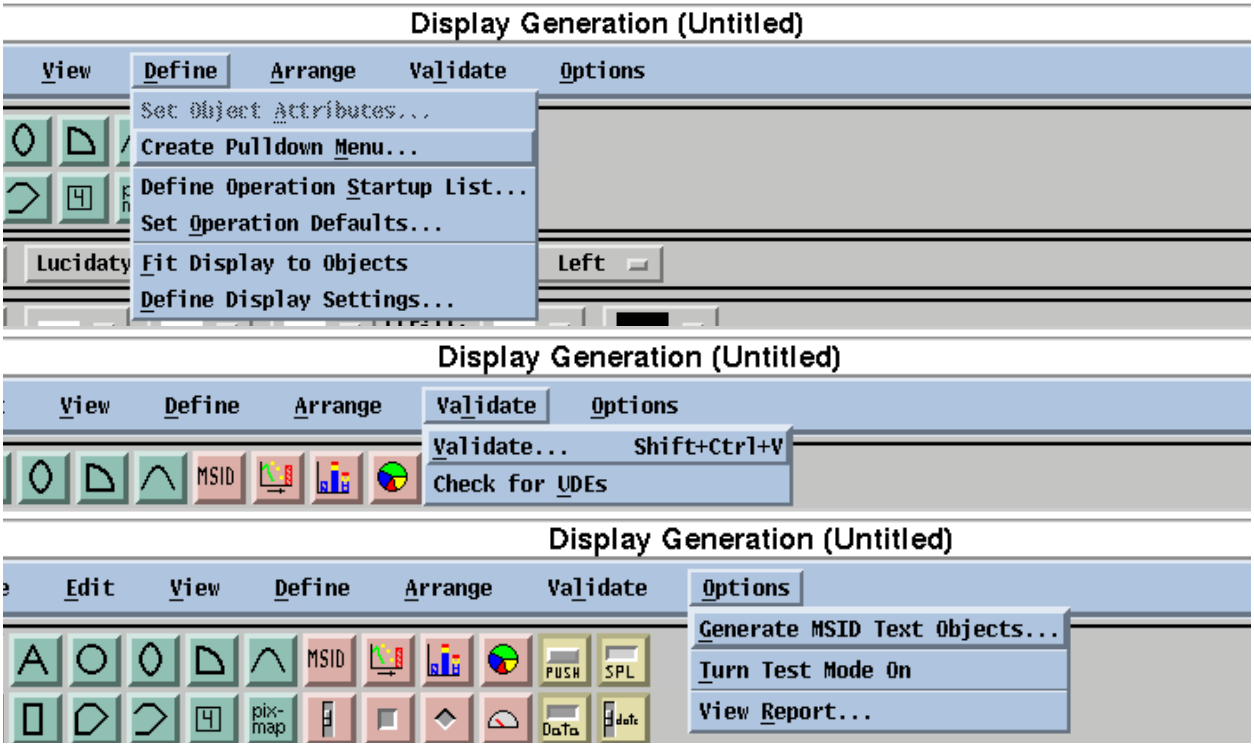


Figure 6-5, Define, Validate, and Options menus.

6.1.5.1 Set Object Attributes...

The **Set Object Attributes...** menu item accesses an attribute dialog box specific for the object type selected. From the dialog box, you can customize the look of the object and assign MSIDs or pseudo-MSIDs to primitive objects (text, circles, ellipses, etc.) and output objects (graphs, bar charts, meters, sliders, etc.). For input objects (input data fields, input sliders, pushbuttons, etc.), you can use the **Set Object Attributes** dialog box to assign pseudo-MSIDs, computation constants, or SPL directives.

The following sections will cover:

- How to access the **Set Object Attributes** dialog box
- The three common attribute frames and the buttons area

Help: For information concerning a specific attribute dialog box see the applicable Online Help topic for the object type selected.

6.1.5.1.1 Accessing the Set Object Attributes Dialog Box

There are three ways to access the **Set Object Attributes** dialog box:

- Select the object and click on **Set Object Attributes** from the **Define** menu

- Double-click on the object
- Select the object, then press the right mouse button and select **Set Object Attributes** from the **Display Popup Menu**

6.1.5.1.2 Common Set Object Attributes

The **Set Object Attributes** dialog box for all object types (primitive, output and input), except SPL field and pushbutton, contains at least three frames:

- **Object Attributes**
- **Data Attributes**
- **Recall Text**

Within the **Object Attributes** frame, you can define how you want your object to look. The contents of this frame depends upon the type of object selected (see Figure 6-6, Object vs. Text Object Attributes frame). For text, attributes include **Font:**, **Size:**, **Style:**, and **Justification:**. For lines and filled objects, such as circles, rectangles, etc., attributes include **Line Color:**, **Line Width:**, **Line Style**, **Fill Color:** and **Fill Pattern:**.

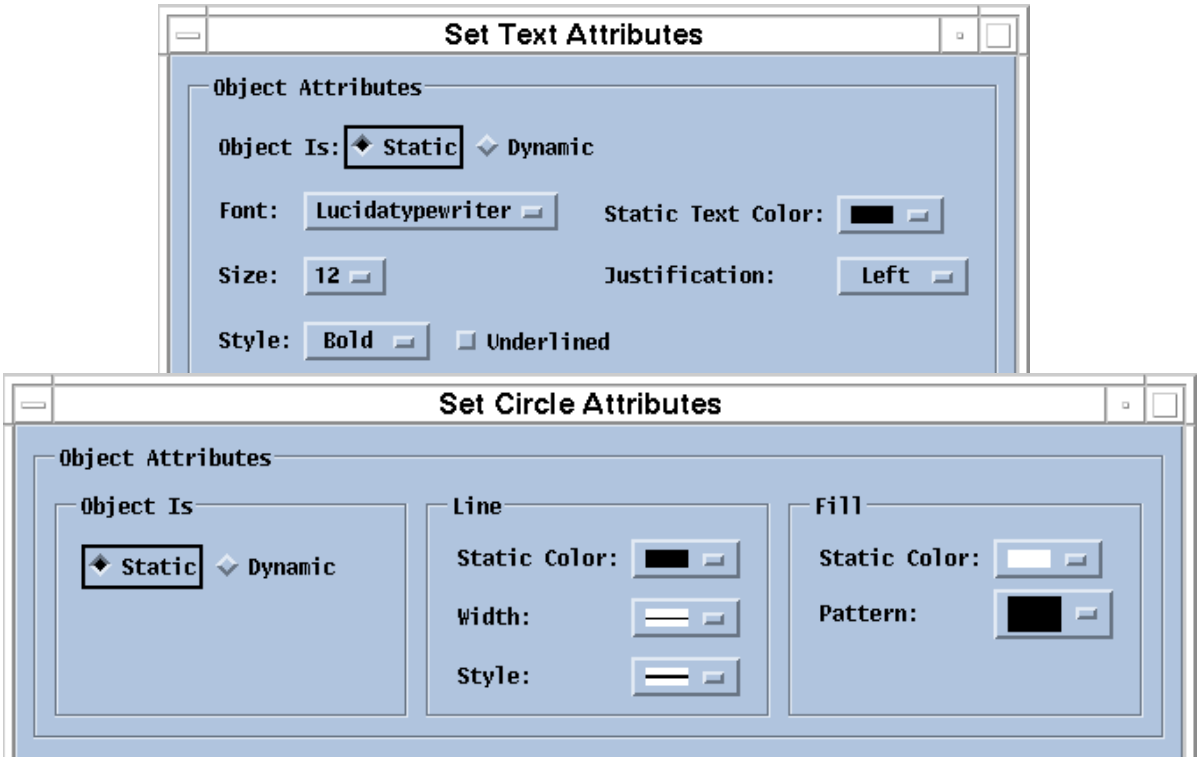


Figure 6-6, Object vs. Text Object Attributes frame.

Note: Attributes that have been set on the attributes default bar will be reflected on the **Set Object Attributes** dialog box.

Within the **Data Attributes** frame, you can define how you want your object to behave by assigning an MSID, pseudo-MSID, or SPL directive to it. The **Data Attributes Frame** contains a common element, MSID: which invokes the **Select MSID** dialog box (see Figure 6-7, Select MSID Dialog Box).

Within the **Recall Text** frame, you can input text that you can later access while in Display Operation. Any text can be entered here. This recall text is useful for keeping notes about the parameter and for describing what each assigned color represents.

The buttons available at the bottom of each **Set Object Attributes** dialog box include the Set and Apply. Clicking Set implements choices you've made on the **Set Object Attributes** dialog box and returns you to the application main window. This is the default pushbutton. Clicking Apply implements any changes you've made, but leaves the dialog box open. This permits you to observe the changes and continue to implement additional changes without having to invoke the dialog box again.

Select MSID Dialog Box

Most of the object attribute dialog boxes, excluding the pushbutton and SPL field, include MSID: which invokes the **Select MSID** dialog box. The **Select MSID** dialog box allows you to search the Telemetry Database (TDB) and select an MSID, to assign to the object. You can search the TDB by **Technical Name**, **MSID**, and **Owner ID** (see Figure 6-7, Select MSID dialog box). Wildcards are allowed.

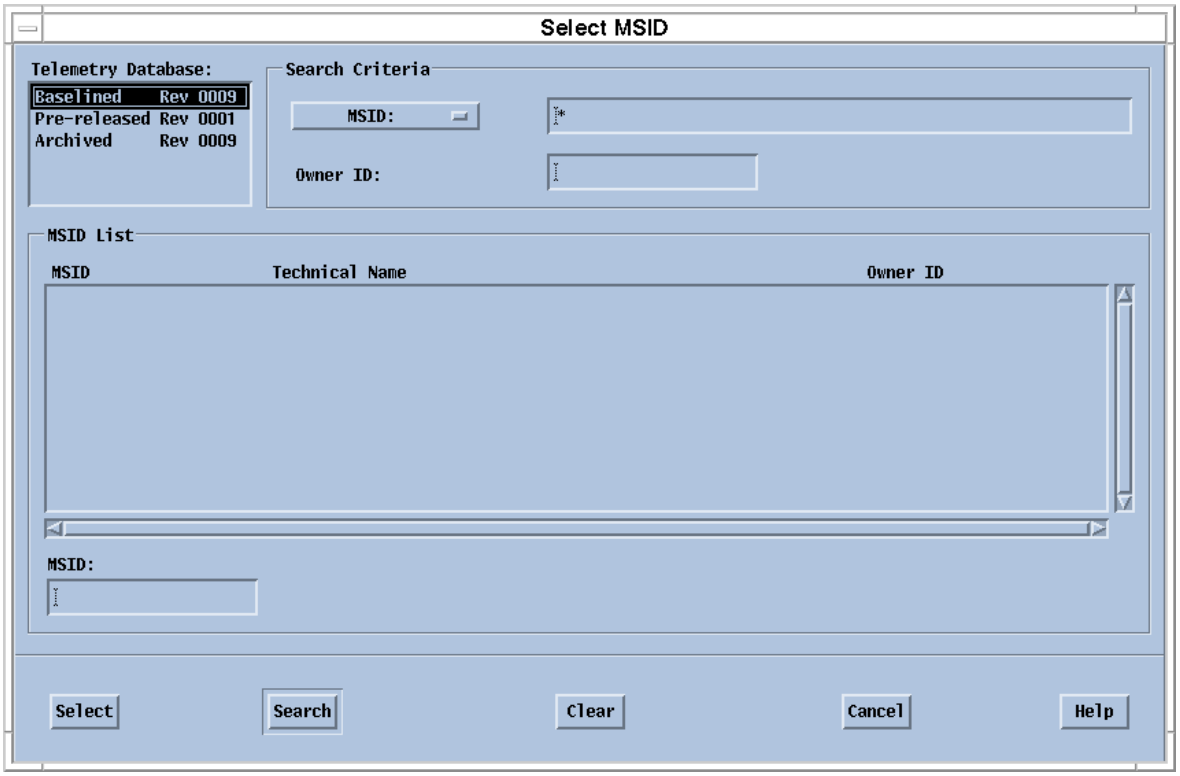


Figure 6-7, Select MSID dialog box.

The dialog box contains three frames of information. The **Telemetry Database**: selection list allows you to select the revision of the source TDB from which you wish to select an input MSID.

In the **Search Criteria** frame, you can decide whether you wish to search for the MSID by its mnemonic or technical name by clicking the option menu button. The initial label for this button is **MSID**. Click the button and select either **MSID:** or **Technical Name:**. You can also specify an **Owner ID**: as search criteria.

Note: The **MSID** option menu button label in the **Search Criteria** frame will reflect the type of MSID that you wish to search for. The type of MSID is based on the display object type from which this dialog box was initiated.

In the **MSID List** frame, the application will display all available MSIDs that meet your search criteria. You can either enter the name of the MSID you desire in the **MSID:** text field or position the mouse pointer over the desired MSID and click the left mouse button.

Note: The Display Generation application will recognize as valid MSIDs entered in either caps or lower case letters.

Clicking the Select adds the selected MSID to your input MSID list. This button is only sensitive when the cursor is inside the **MSID:** field.

The Search searches the selected TDB for all MSIDs that match your search criteria and displays them in the **MSID List** frame. This is the default pushbutton.

Help: For information on how MSIDs can be displayed, see Appendix J: Display Data Type Conversion Matrix.

6.1.5.2 Create Pulldown Menu...

The **Create Pulldown Menu...** from the **Define** menu allows you to define a customized menu with user-defined menu items, cascade menus, and separators (see Figure 6-8, Customized menu). The items on the menu and subsequent cascade menus, execute SPL directives. These directives may include starting scripts, starting computations, starting displays, initiating commands, etc.

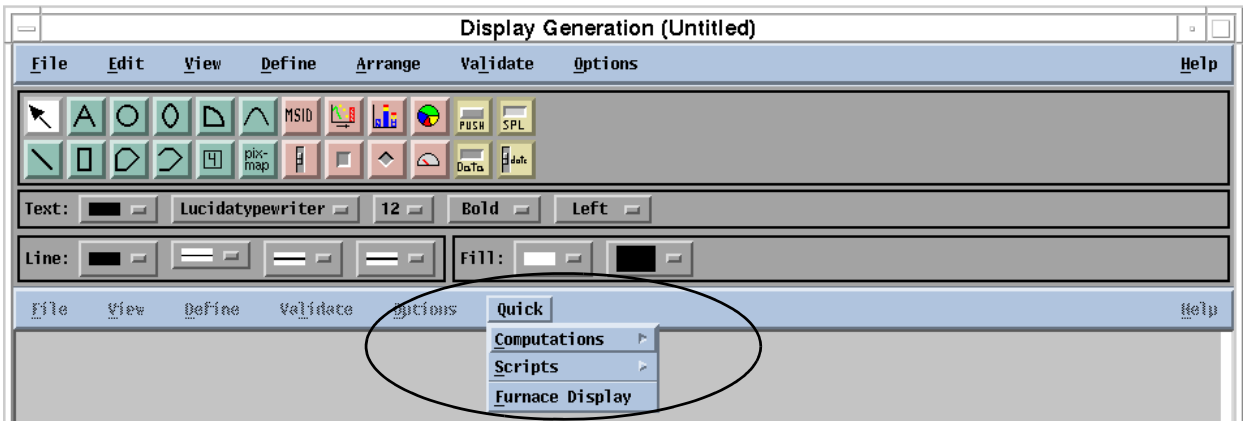


Figure 6-8, Customized menu.

Help: For information and a detailed procedure for creating a pulldown menu see the Online Help topic and "How To..." section for the **Create Pulldown Menu** dialog box.

6.1.5.3 Define Operation Startup List...

The **Define Operation Startup List...** allows you to select the computations and displays (elements) that you want to start when the display you are currently building is invoked in Display Operation (see Figure 6-9, Define Operation Startup List dialog box)

CAUTION: A snowball effect may occur if a display in the startup list starts another display, which in turn starts another display, etc.

Note: Displays, scripts and computations can only be running with a specific database version and data mode as a single instance. You can have the same display running using different modes or database versions.

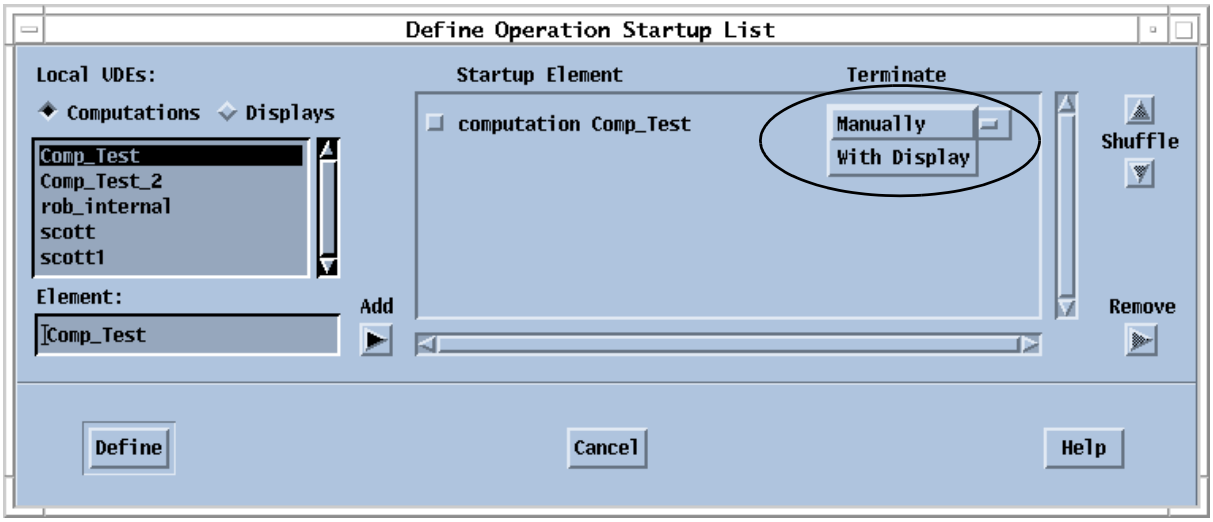


Figure 6-9, Define Operation Startup List dialog box.

Within the **Define Operation Startup List** dialog box, you also must choose how you want each computation or display terminated (**Manually** or **With Display**) (see Figure 6-9, Define Operation Startup List dialog box). If you choose **Manually**, you can stop the element using one of the following methods:

- Using the Scratchpad Line application
- Using the Process Manager application to stop the process
- From within the application that was invoked when the element started

If you choose **With Display**, the element will stop when you exit the Display Operation application that initiated the display. However, this does not prevent you from stopping it manually, before the initiating display terminates, using one of the methods described above.

6.1.5.4 Set Operation Defaults...

The **Set Operation Defaults...** menu item allows you to configure the **Display Update Mode:** for your display as well as the update rate (see Figure 6-10, Set Operation Defaults dialog box).

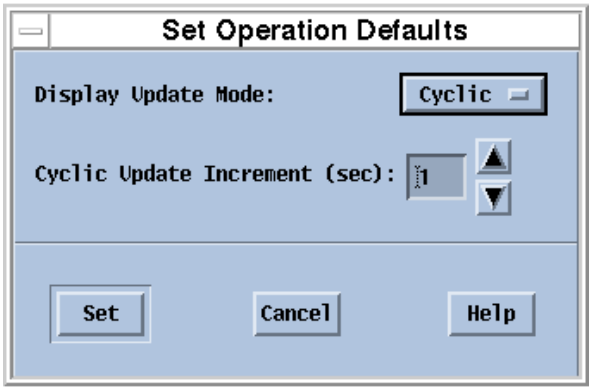


Figure 6-10, Set Operation Defaults dialog box.

The available update modes are: **Cyclic**, **Refresh**, and **Pause** with **Cyclic** being the default. A **Cyclic** display will be updated based on the update rate. A display set as **Refresh**, updates once when the display is opened and then only when Refresh is pressed. A display defined with an update mode of **Pause** will initialize as paused in the Display Operation application.

The **Cyclic Update Increment (sec):** value determines how often a cyclic display refreshes. The default is one second with a maximum update rate of 999 seconds.

CAUTION: You will have to click on Refresh or Resume Cyclic in Display Operation to have the display update with data when the display is defined with a **Pause** update mode.

If the **Operation Defaults** are not specified by the user, the system defaults to:

Update Mode:	**Cyclic**
Update Rate:	**1** second

6.1.5.5 Fit Display to Objects

The **Fit Display to Objects** item shrinks the display to the minimum size needed to show all display objects.

Note: If empty space exists on the left or top side of the display, the objects will not be moved to fill up the white space.

Note: You can also resize the display by dragging the resize handle to shrink or expand the display.

6.1.5.6 Define Display Settings...

The **Define Display Settings...** menu item allows you to select your display size using predetermined proportions or by pixel settings (see Figure 6-11, Define Display Settings dialog

box). These predetermined proportions are one-fourth, one-half, two-thirds, or whole screen. Two-thirds of the screen is the application default.

Tip: 1 inch = 90 pixels.

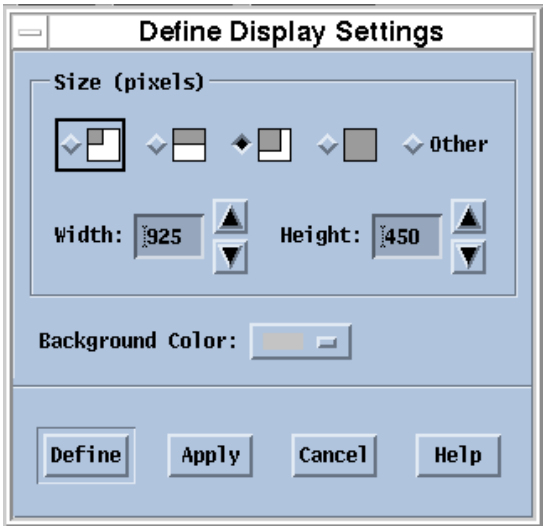


Figure 6-11, Define Display Settings dialog box.

From this dialog box, you can also select the background color for the display. The default color is light gray or gray77. Table 6-1, Available background colors, shows the available background colors.

Table 6-1, Available background colors

Black	Arizona
White	Gray77
Light Blue	Gray
Light Green	Dark Brown
Dark Blue	Brown

CAUTION: If display objects exist with a background color that matches the new display color, they will not be visible.

If you exceed the valid range for the width or height display settings, an informational dialog box will be invoked specifying the valid range.

6.1.5.7 Validate...

The **Validate...** menu item invokes the **Validate** dialog box as shown in Figure 6-12, Validate dialog box. This menu item checks:

- MSIDs against the TDB to verify they exist and that the user is authorized to use them
- Representation and processing of MSIDs to ensure they are valid
- Commands and command chains against the CDB to verify they exist
- To ensure that an invalid color representation has not been selected for MSIDs
- SPL directives for correct syntax
- Minimum and maximum values on plots, bar charts and sliders to ensure the maximum is greater than the minimum
- To ensure calibration sets are available if Calibrate is selected
- Scroll amounts is greater than Number of Samples on plots
- Ensures that any required field is not empty

Note: The last five items in the above list will not invalidate a display. A warning will only be given advising you of these problems.

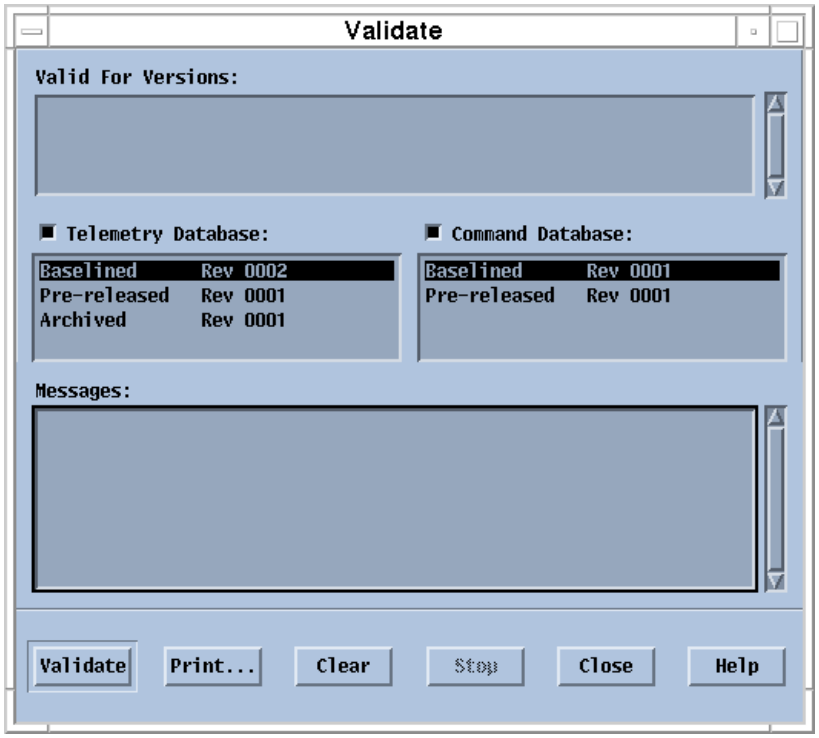


Figure 6-12, Validate dialog box.

If the display you are opening within Display Operation has not been validated, the application automatically validates your display before its execution. This validation process checks the selected TDB to ensure that all MSIDs associated with your display have valid data representation. If any invalid MSIDs are found in the display, they are provided in the view auto-validation report.

This dialog box includes the **Valid for Versions:**, **Telemetry Database:**, **Command Database:**, and **Messages:** sections.

The database versions against which this particular display has already been validated will be displayed in the **Valid for Versions:** area of the **Validate** dialog box. By looking at this section of the dialog box you can quickly identify whether or not this display has already been validated against a particular database.

Note: A maximum of 3 TDB versions and 1 CDB is maintained.

In the **Telemetry Database:** area of the **Validate** dialog box, you can select whether to validate this display against a TDB. The revision number of each of the available databases is shown. Clicking on the desired database will activate the selection.

In the **Command Database:** area of the **Validate** dialog box you can select whether to validate this display against a CDB. The revision number of each of the available databases is shown. Clicking on the desired database will activate the selection.

The results of the validation process are posted in the **Messages:** area of the **Validate** dialog box.

CAUTION: Once messages are cleared from the **Messages:** area of the **Validate** dialog box, they are no longer available for printing. You will have to re-run the validation process to get cleared validation messages back again.

Help: "Appendix H: Invalid MSID Indicators" shows how each object will be displayed if an invalid MSID is assigned to it.

Note: If you start validation for a display while messages are in the message area, the new messages will be appended to existing messages

6.1.5.8 Check for UDEs

The **Check for UDEs** (User-generated Data Elements) menu item verifies that the UDEs (such as displays, computations, and scripts) referenced in the file exist on your workstation (see Figure 6-13, Check for UDEs (Status UDE) dialog box). The dialog box contains two frames:

- **Found**
- **Missing**

The **Found** frame lists those UDEs referenced in the open file that exist on your workstation. The **Missing** frame lists those UDEs referenced in the open file that need to be found and copied to your workstation.

Note: A script must be open before this menu item is available. Also, scripts must be validated before this menu item becomes available.

Note: If referenced UDEs are not found on your workstation, you can use the Retrieve UDE application from the **File** menu on the **Launchpad** to download the required files.

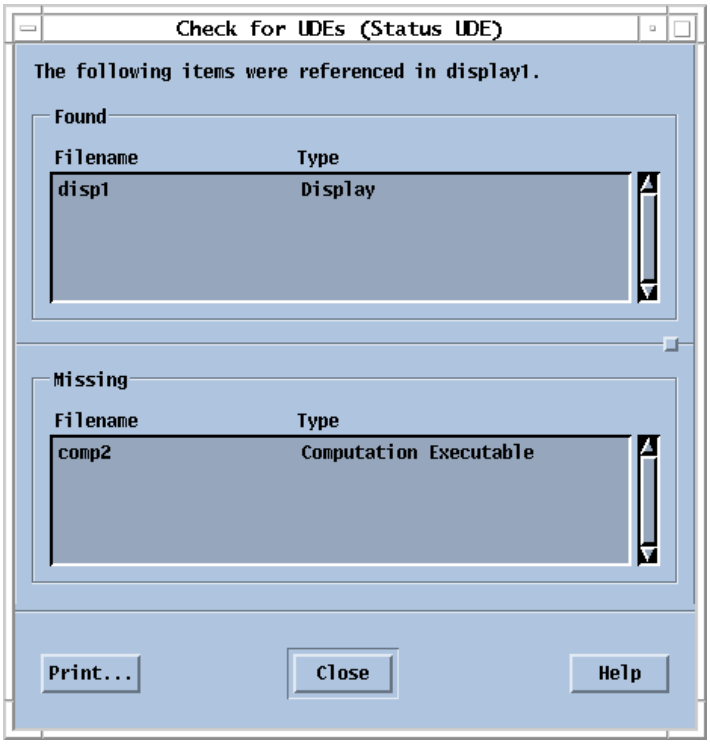


Figure 6-13, Check for UDEs (Status UDE) dialog box.

6.1.5.9 Generate MSID Text Objects...

This menu item allows you to generate MSID text objects for multiple parameters. They can be automatically or manually placed on your display.

The **Generate MSID Text Objects** dialog box has three frames (see Figure 6-14, Generate MSID Text Objects dialog box):

- **Create Generation List**
- **MSID Text Format**
- **Generate**

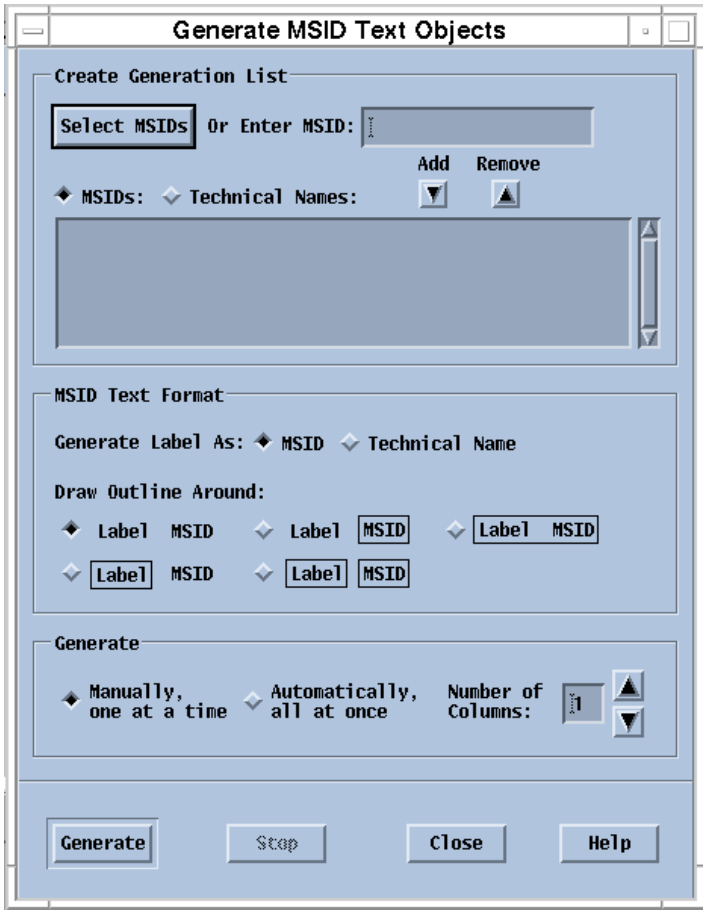


Figure 6-14, Generate MSID Text Objects dialog box.

Within the **Create Generation List** frame, you can create a list of MSIDs that will be used when you generate MSID text fields. The list can be viewed by **MSID:** or **Technical Names:**.

Within the **MSID Text Format** frame, you can define the look of the MSID text objects. The label for the field can be generated using the MSID or the technical name. A box can be automatically drawn around a component of the MSID text field.

Within the **Generate** frame, you can choose whether you want the system to automatically place all of the MSID text fields or if you want to manually place them. To automatically place the MSID text field, you must have a "new" or "empty" display (no other objects on the display). You can also configure how many columns of MSID text objects you want during automatic placement.

Note: When placing MSIDs on a display using the **Generate MSID Text Objects...** menu item, the default data representation and data processing for each MSID will be used. Once the MSIDs have been placed, attributes can changed for individual MSIDs by accessing the **Set MSID Text Attributes** dialog box.

Note: When automatic placement is selected, those MSIDs that cannot fit in the display area will remain in the list of MSIDs to be generated. When this happens, the following message will be displayed in the **Messages:** area of the Display Generation main window:

```
Ran out of display area while automatically generating MSID
Text objects, objects not created are still in list to be
generated.
```

If automatic placement is selected and Generate is clicked, the MSIDs will be placed in the order in which they appear on the list starting in the upper left-hand corner of the display and then in additional columns as defined.

If manual placement is selected and Generate is clicked, ╪ will appear when you move the mouse pointer to the display area. Place MSID text fields by clicking in the desired location. You must make sure there is enough room for the object's width.

The following maxims should be observed while manually placing MSIDs in a display:

- Text that is resized so that it would extend beyond the bounds of a display is not permitted.
- An MSID text object that is resized so that it would extend beyond the bounds of a display is not permitted.
- Within a display, if the numeric value received for an MSID text object exceeds the amount of space allocated, an overflow condition (#) will not be displayed.
- User-defined Time MSID representations will not result in a field overflow condition.
- All time string representations are supported within Display Generation to include those which display the year.
- Display objects grouped together and moved to a new location will retain their resize handles.

You can click on Stop or **Cancel Function** if you want to stop manual placement.

6.2 Display Operation Overview

Now that you have created your customized displays in the Display Generation application, Display Operation provides you with the means to view selected telemetry values and initiate Scratchpad Line (SPL) directives through these displays. Through displays, you can view telemetry values and graphical representations of data (i.e., circles, lines, and pixmaps). Numerical values may be plotted on various graphs or on a scale. Buttons and graphic objects can be used to represent various states. Colors are used to indicate caution and warning limit violations. For controlling these displays, the application provides options to change the data mode, the database version, the time reference, and to turn limit sensing and status characters on or off.

Only one display can be opened at a time within a single Display Operation application (see Figure 6-15, Display Operation main window). If you wish to open two displays simultaneously, you must launch two separate Display Operation applications.

Note: Multiple users can open the same display simultaneously.

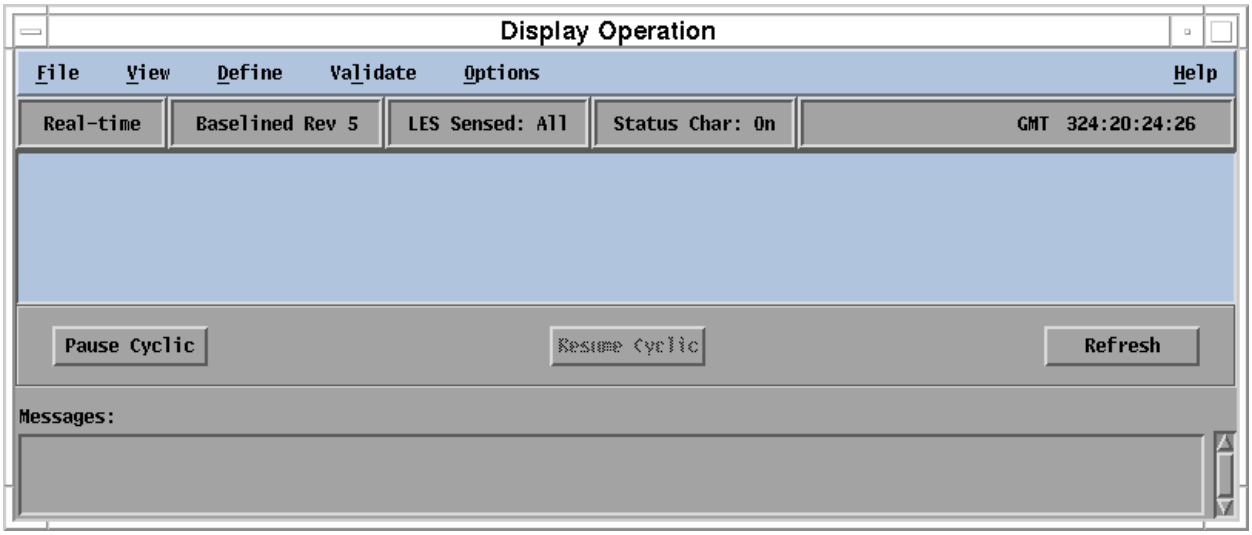


Figure 6-15, Display Operation main window.

The main window contains several distinct features:

- Menu Bar
- Status Bar
- Work Area

6.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The **Display Operation** menu bar includes the **File**,

View, **Define**, **Validate**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Define** Menu
  - **Set Data Mode and Database Version...**
- **Options** Menu
  - **Show Recall Text**
  - **Disable and Enable Object LES Sensing**
  - **Enable All LES Sensing**

6.2.2 Status Bar

The status bar provides information about the current configuration of the Display Operation application (see Figure 6-16, Status Bar components).

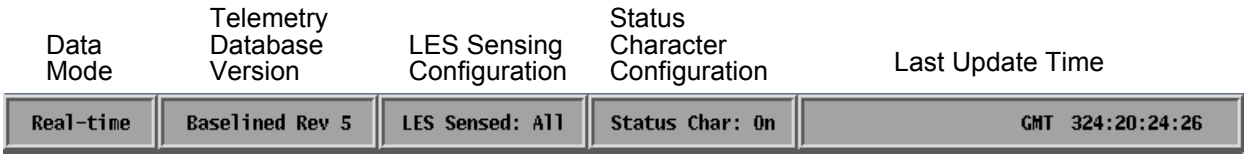


Figure 6-16, Status Bar components.

The data modes shown on the status bar include: **Real-time**, **Dump**, and **Playback** (channels 1-13). These modes are dependent on which ones are available for your project. The default data mode is **Real-time**. It can be changed anytime during the operation of your display.

The database version defaults to the current baselined TDB. If you open a display that has not been validated against the current database version, an automatic validation process is initiated. You can change the database version at any time during the operation of your display. If you select a database which is not recommended for use with the current data mode, you will be prompted to confirm this action.

The Display Operation application defaults to performing Limit/Expected State (LES) sensing on **All** display objects. You can turn LES sensing of each object on or off. The status bar will reflect **All**, **Some**, or **None** based on the LES sensing configuration.

The Display Operation application defaults to **On** for all Measurement/Stimulus Identifier (MSID) text objects. Status characters are not provided for other output objects like plots, charts, etc. The characters are located to the right of the data values and provide information such as:

- MSID existence
- Data condition
- Data quality

- Loss of signal

Note: Displays containing MSIDs whose data source terminates will no longer display a blank with an **"R"** status character. They will display an asterisk **"*"** with an **"R"** status character.

Help: For a complete list of status characters, see "Appendix F: Status Characters and Their Definitions."

This area of the status bar shows the last time the display received data. The time can be shown in either Greenwich Mean Time (GMT) or Mission Elapsed Time (MET).

Tip: If you change the way time is shown on the status bar by using the **Set Time Reference** dialog box, it will not affect the time appearing in your display objects. It only affects the way time is shown on the status bar and in the message area.

The displays update according to how they were configured in Display Generation. The three options are **Cyclic**, **Refresh**, and **Pause**. A cyclic display will be updated based on the update rate. A display set as **Refresh** updates once when the display is opened and then only when

is pressed. A display defined with an update mode of **Pause** will initialize with no data as paused in the Display Operation application and will be updated when the user selects

.

Tip: If the display has been configured to initialize as **Refresh** or **Pause**, the time displayed on the status bar will be labeled **Last Refresh Time**.

6.2.3 Work Area

The Display Operation application is initialized with an empty work area. When you open a display, it will be placed in this area. The size of the display is the one which you defined in the Display Generation application.

6.2.4 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Display Operation application. The **Set Data Mode and Database Version...** from the **Define** menu as well as the **Show Recall Text**, **Disable and Enable Object LES Sensing**, and **Enable All LES Sensing** menu options from the Options menu will be discussed (see Figure 6-17, Define and Options menus).

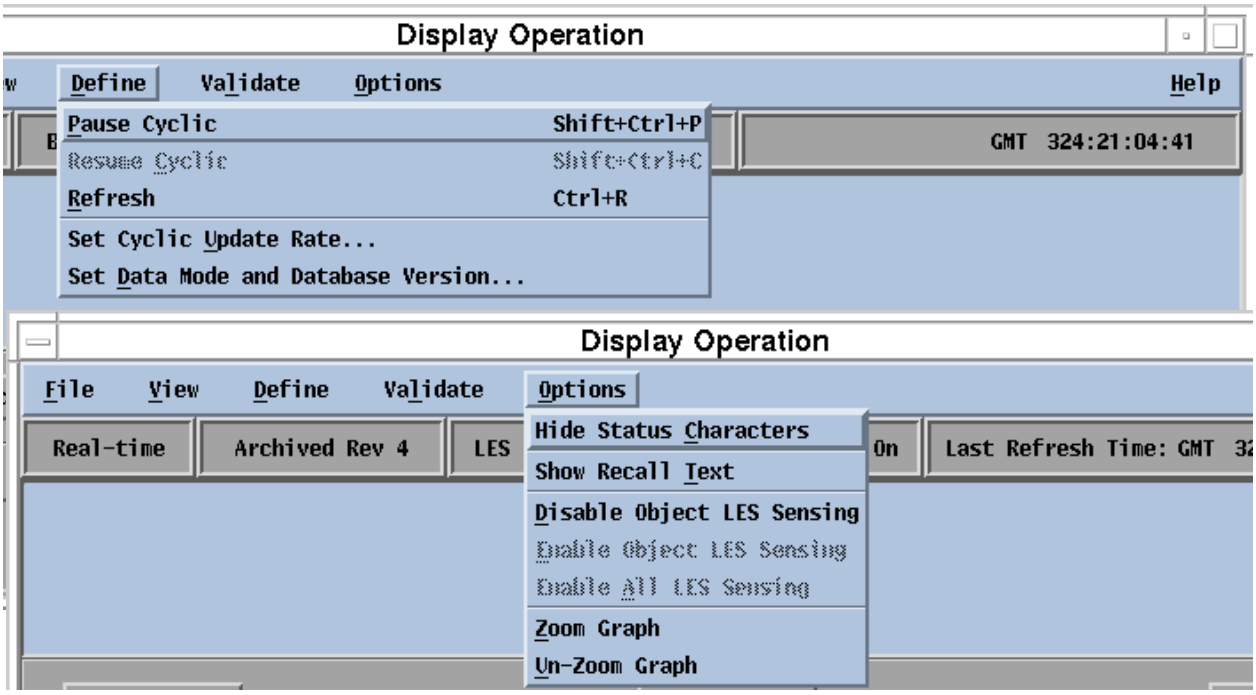


Figure 6-17, Define and Options menus.

6.2.4.1 Set Data Mode and Database Version...

This menu item invokes a dialog box which allows you to set the data mode (e.g., **Real-time**) and the database version (see Figure 6-18, Set Data Mode and Database Version dialog box).

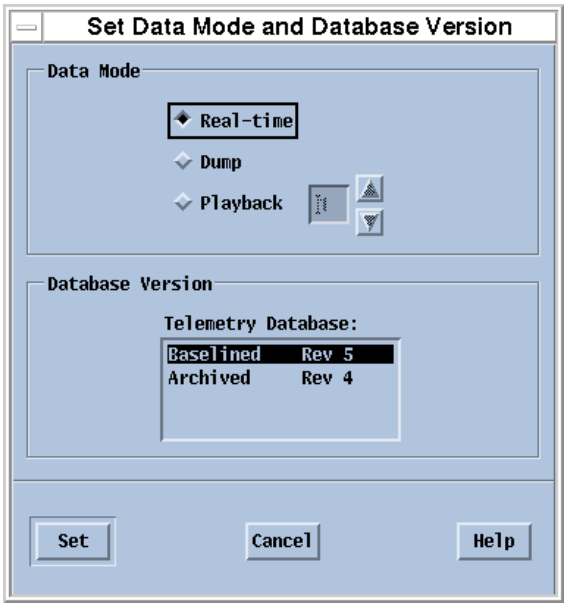


Figure 6-18, Set Data Mode and Database Version dialog box.

The **Data Mode** frame contains radio buttons that allow you to select a data mode by clicking the appropriate button.

If you select **Dump** for the data mode, you must choose between the three available dump data modes:

- Dump Mode **1** - S-Band Zone of Exclusion (ZOE)
- Dump Mode **2** - Ku-Band Communication Outage Recorder (COR)
- Dump Mode **3** - Ku-Band ZOE

If you select **Playback** for the data mode, you will need to also specify the playback channel (1-11).

Help: See the glossary for a definition of the available data modes.

The **Database Version** frame contains the **Telemetry Database:** selection list. You can select a database version from this selection list.

Note: Display validation data will be saved with the display so that you do not have to go back to Display Generation to revalidate it.

Note: The database version selected here will be reflected on the validate dialog box. If the currently opened file has not been validated against the selected database on the **Set Data Mode and Database Version** dialog box, the **Validate** dialog box will be invoked giving you the option to validate the configuration file.

The Set sets the data mode and database version to those specified in the dialog box and returns you to the application main window. This is the default pushbutton after the data mode is selected.

6.2.4.2 Show Recall Text

The **Show Recall Text** menu item allows you to view hidden text that has been defined for a particular display object. This hidden text is referred to as recall text and is defined in Display Generation using the **Object Attributes** dialog box. The recall text function allows you to write extended descriptions or procedures and to link this text to specific display objects. When you click on **Show Recall Text**, the following dialog box is invoked (Figure 6-19, Show Recall Text (Pick Object) dialog box).

To select a display object whose recall text you wish to see, position the pointer over the object and click with the left mouse button. If the **Show Recall Text (Pick Object)** dialog box obscures the desired object, move the dialog box and then click on the object. No selection handles will appear to identify the object you clicked on as being selected.

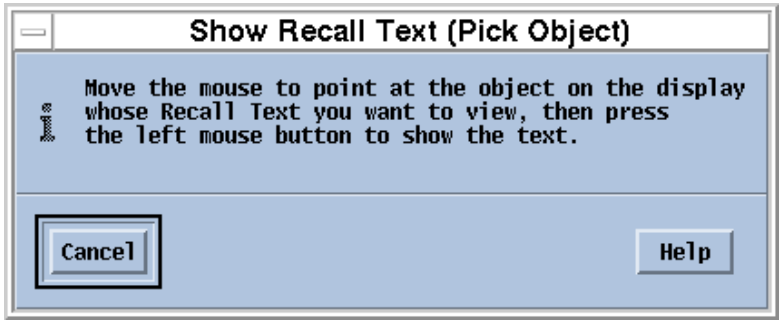


Figure 6-19, Show Recall Text (Pick Object) dialog box.

Once an object has been selected, the **Show Recall Text** dialog box will be invoked, and the recall text for the selected object displayed (Figure 6-20, Show Recall Text dialog box). You may leave the **Show Recall Text** dialog box open and initiate additional requests for recall text. The requested text will replace text currently displayed within the **Show Recall Text** dialog box. Only one **Show Recall Text** dialog box can be opened at a time.

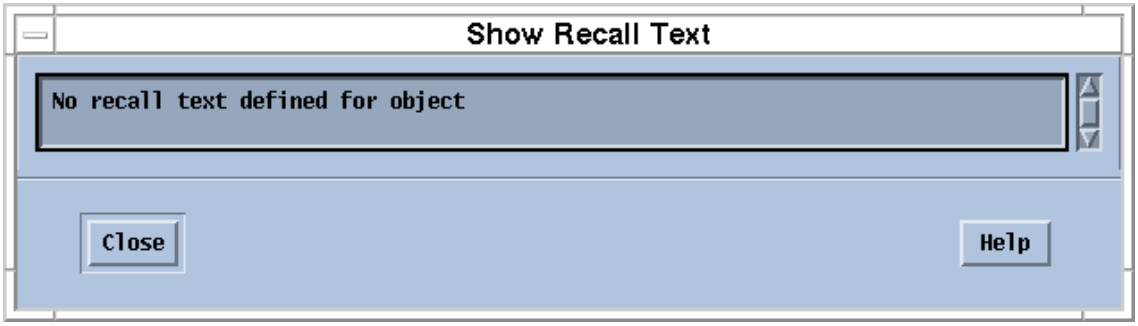


Figure 6-20, Show Recall Text dialog box.

Tip: You may resize the **Show Recall Text** dialog box so that you can see more lines displayed at one time.

Tip: You can also initiate the show recall text function by clicking the right mouse button while the pointer is positioned over any object within a display. This will invoke the **Display Popup Menu**. If you select **Show Recall Text** from this menu the **Show Recall Text** dialog box for the object you were over will be displayed. When you use this method to view recall text, no **Show Recall Text (Pick Object)** dialog box is invoked.

6.2.4.3 Disable and Enable Object LES Sensing

This menu item toggles between disable and enable LES sensing. Since both functions operate the same, they are addressed in this section as one item.

LES sensing determines which color to use when updating display values or objects. The colors yellow and red are reserved to indicate the violation of pre-defined caution and warning limits,

respectively. Nominal values and expected state values are shown in those colors that have been defined within the Display Generation application.

Help: See "Appendix G: MSID LES Colors" for information on how colors are used for LES sensing.

Note: If LES sensing is turned off, then all values are shown in the defined nominal color.

When you open a display in Display Operation, all applicable display objects default to having their LES sensing turned on. Within the Display Operation application, you can select objects and individually turn their LES sensing off using the **Disable Object LES Sensing** menu item. This menu item toggles between **Disable Object LES Sensing** and **Enable Object LES Sensing**. When you click on either Disable or Enable Object LES Sensing, a dialog box is invoked that allows you to identify the specific object you want to impact (see Figure 6-21, Disable and Enable Object LES Sensing dialog box).

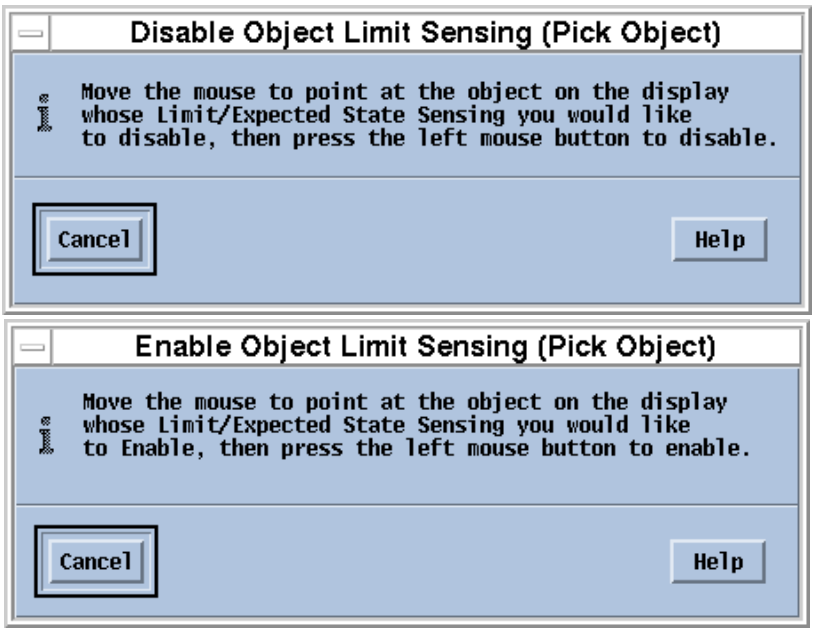


Figure 6-21, Disable and Enable Object Limit Sensing dialog box.

Note: If you turn LES sensing off on one display and then open another display, LES sensing defaults back to on for the newly opened display.

To disable or enable LES sensing for a specific display object, position the pointer over the object and click the left mouse button. No selection handles will appear to identify that an object has been

selected. A message will be shown within the **Display Operation** message area to indicate that LES sensing has been turned on or off for the display object.

CAUTION: Turning limit sensing off prohibits red (warning) or yellow (caution) colors; thus notification of conditions is also prohibited. You should use caution when implementing this function. If caution or limit values prove too sensitive or are ineffective and time permits, you should take steps to modify the limits either in the Telemetry Database (TDB) or within your local table.

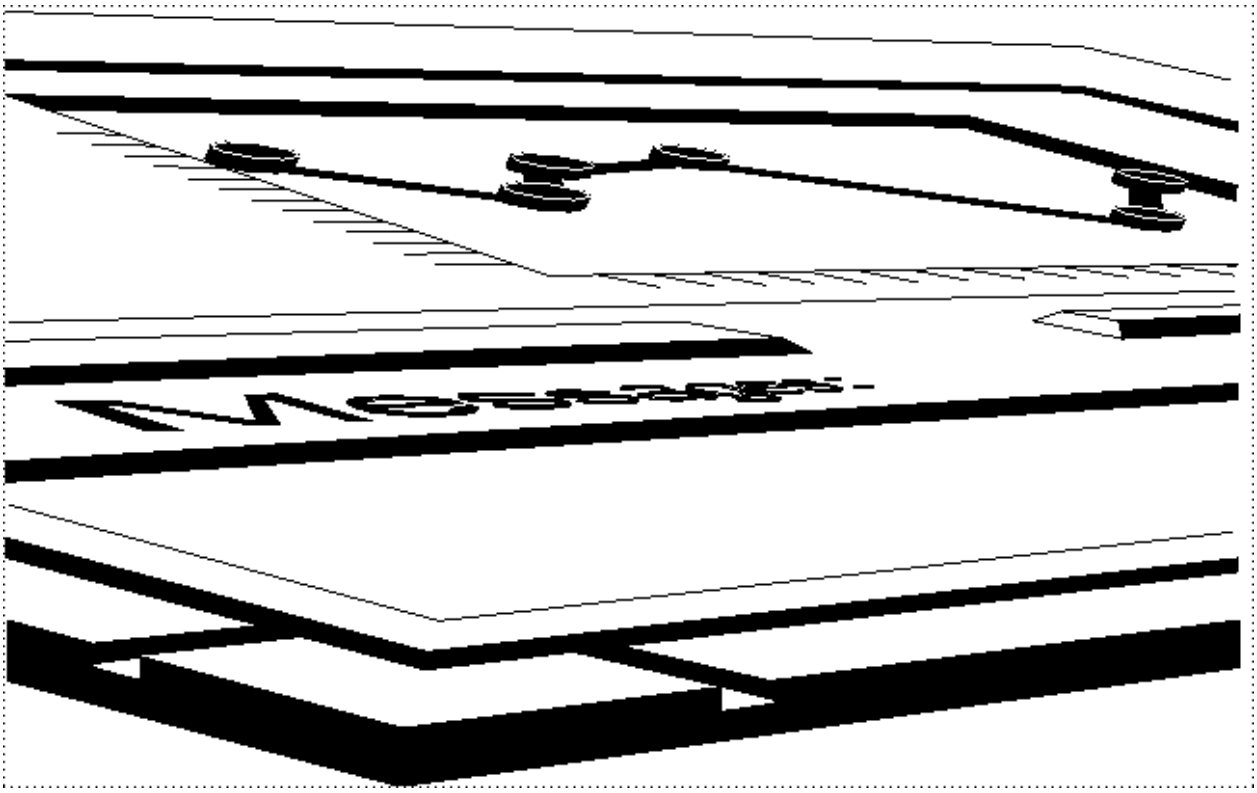
Note: If LES sensing is off, values will be shown in the nominal color. Projects may elect to use the select color to indicate when LES sensing is not being performed. Turning off LES sensing does not affect status characters.

Tip: You can also disable or enable LES sensing by clicking the right mouse button on the display object and selecting either **Disable LES Sensing** or **Enable LES Sensing** from the **Display Popup Menu**.

6.2.4.4 Enable All LES Sensing

The **Enable All LES Sensing** menu item allows you to turn on LES sensing for all objects within your display. Click on the **Options** menu and select **Enable All LES Sensing** to perform this function.

Note: The message area of the **Display Operation** main window will indicate that LES sensing has been enabled for all objects within your display.



Chapter 7: Computation Generation/Operation Software

This chapter describes two Huntsville Operations Support (HOSC) applications: Computation Generation and Computation Operation. These applications work in conjunction with one another to allow a user to create, edit, generate, and operate computations.

A computation is a C or FORTRAN executable created by users that can receive telemetry input data (either raw and/or pseudo data), perform operations on the input data, and then output the processed data (called pseudo data). This pseudo data can then be used by other applications internally on the same workstation or externally on different workstations.

There are two types of computations:

- User computation
- Mission computation

User computations are used to create pseudo Measurement/Stimulus Identifiers (MSIDs) which can be used on the same workstation or sent to other workstations on the project network. Users control the activation and deactivation of user computations.

Mission computations are used to create pseudo MSIDs (usually on the project server) which are then multicasted across the network to all project workstations. Most of the users for the project will be able to use the mission pseudos as needed. Only a user with a privileged account will be able to activate and deactivate mission computations.

Help: Mission computations are project-specific. For additional information, see ISS Mission Computation Requirements Document (MSFC-RQMT-2639).

The Computation Generation application includes four mini-applications:

- Input MSID Editor
- Output MSID Editor
- Source Editor
- Build Computation

Input MSID Editor Mini-Application

The Input MSID Editor mini-application allows you to create a list of input MSIDs that will be used in your computation.

Output MSID Editor Mini-Application

The Output MSID Editor mini-application allows you to create a list of output MSIDs that will be used in your computation. This list will be referenced to the Telemetry Database (TDB).

Source Editor

The Source Editor mini-application allows you to create source code for your computation in either C or FORTRAN programming languages.

Build Computation

The Build Computation mini-application allows you to assemble the components of your computation and build an executable from your sources.

Using the Input MSID Editor, you can create and edit a list of input MSIDs upon which the source code will perform operations. The Output MSID editor allows you to create a list of output MSIDs (pseudo MSIDs) which will carry the values produced by the operations performed upon the input MSIDs. By creating source code with the Source Editor (including optional header files and subroutines) and specifying an Input MSID file and an Output MSID file, you can build an executable of your computation. The Computation Operation application may then be used to start the computation executable in a real-time environment.

7.1 Computation Generation Overview

The Computation Generation application allows you to create and edit source code files, along with input Measurement/Stimulus Identifier (MSID) and output MSID files. These components of a computation are compiled into an executable. The executable is then used in the Computation Operation application.

The **Computation Generation** main window contains two distinct features that will be discussed in this chapter (see Figure 7-1, Computation Generation main window):

- Menu bar
- Work area

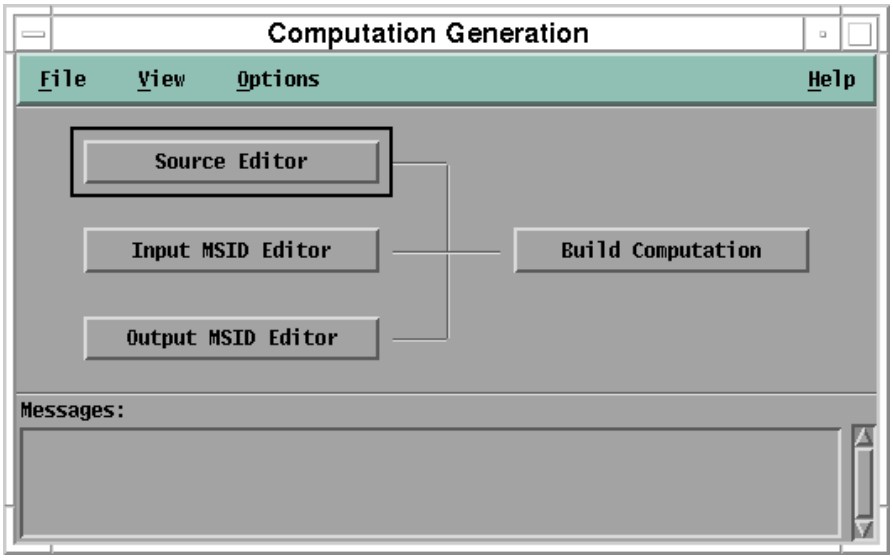


Figure 7-1, Computation Generation main window.

7.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar consists of the **File**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Source Editor**
  - **Input MSID Editor**
  - **Output MSID Editor**
  - **Build Computation**

7.1.2 Work Area

The work area contains a diagram which illustrates the work flow and the connection of the mini-applications invoked by the Computation Generation application. Each mini-application is invoked by clicking on the appropriate pushbutton.

Clicking Source Editor invokes the Source Editor mini-application which allows you to create source code for your computation in either C or FORTRAN programming languages.

Clicking Input MSID Editor invokes the Input MSID Editor mini-application which allows you to create a list of input MSIDs that will be used in your computation.

Clicking Output MSID Editor invokes the Output MSID Editor mini-application which allows you to create a list of output MSIDs that will be used in your computation.

Clicking Build Computation invokes the Build Computation mini-application which allows you to assemble the components of your computation and build an executable file from your sources.

The pushbutton functions are also available in a popup menu that is invoked by clicking the right mouse button while the mouse cursor is inside the work area. Additionally, any of the above mini-applications may be invoked via the **Options** menu.

7.1.3 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Computation Generation application. All of the options from the **Options** menu and therefore all of the mini-applications will be discussed (see Figure 7-2, Computation Generation Options menu).

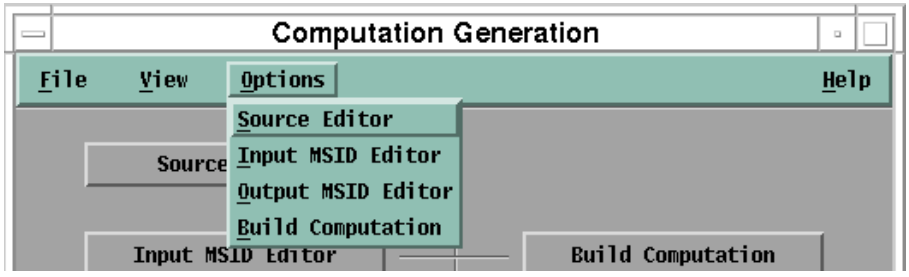


Figure 7-2, Computation Generation Options menu.

7.1.3.1 Source Editor Mini-Application

The Source Editor mini-application allows you to create a source code file that can be combined with an input Measurement/Stimulus Identifier (MSID) file and an output MSID file to generate a computation. You can develop your source code utilizing either the C or FORTRAN programming languages.

Note: If you are creating a source file utilizing the C programming language, keep in mind that the compiler used to build your computation requires that your code conforms to American National Standards Institute (ANSI) C standards.

A pre-compiler is provided that supplies source code which is needed to support data retrieval and decommutation, pseudo MSID initialization, and other pre-compilation functions.

Help: For a complete list of items provided by the pre-compiler, see "Appendix L: Computation Pre-Compiler Functions."

To use the pre-compiler, certain pre-compiler commands must be included in your source code.

7.1.3.1.1 Work Area

The work area changes based on the type of template selected from the **New** dialog box. A template specifies syntax for mandatory portions of the source code if you want the pre-compiler to supply code for areas like retrieving telemetry, setting up global data, etc. These pre-compiler commands will have the "@" preceding the command as shown in Figure 7-3, Source Editor main window.

Note: When the application is invoked, you may enter code into the work area using the provided line editor. You do not have to use the available templates; however, a template may reduce your coding time.

The template for **Main_C** and the **Main_FORTRAN** source files are exactly alike except for the file indicator. This template will be discussed first followed by the subroutine and include template.

Figure 7-3, Source Editor main window shows the template that is displayed when you are building the main source file for a computation.

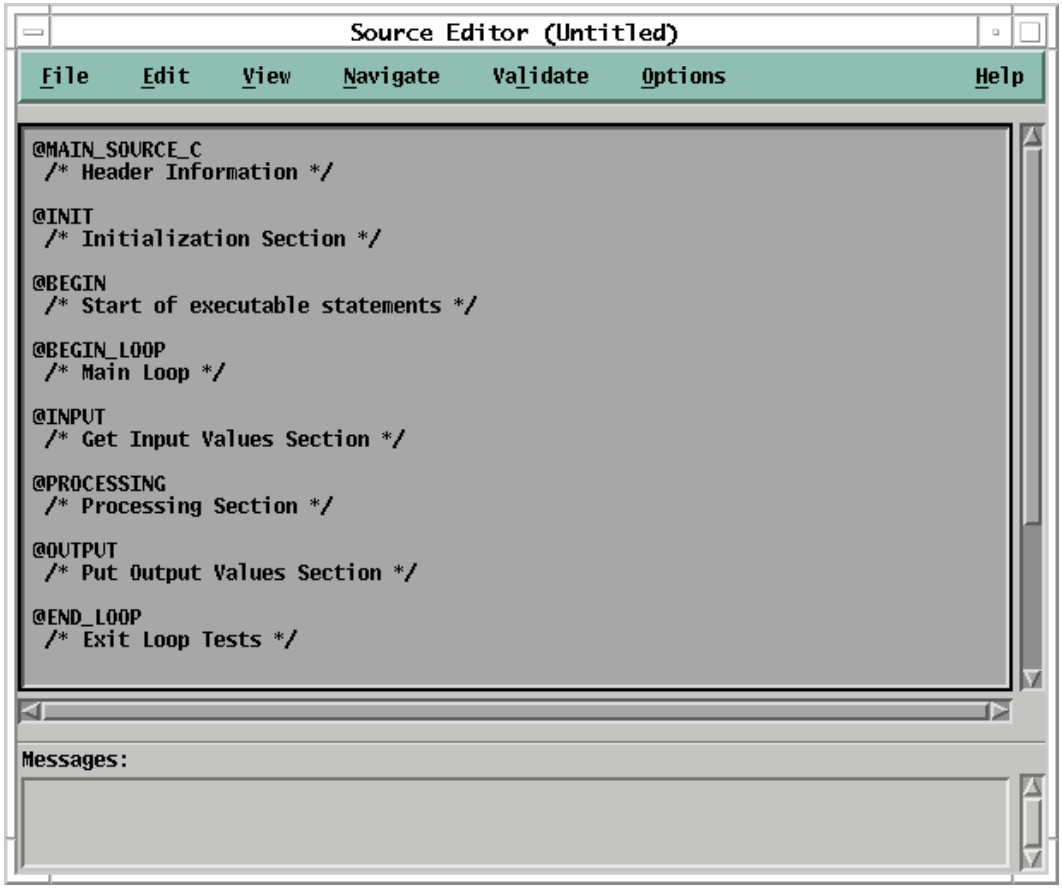


Figure 7-3, Source Editor main window.

@MAIN_SOURCE_C or **MAIN_SOURCE_FORTRAN**
File indicator

@INIT
Initialization section

@BEGIN
Start of executable statements

@BEGIN_LOOP
Main loop

@INPUT
Get the input values section

@PROCESSING
Processing section

@OUTPUT
Put output values section
Exit loop tests
End main loop

@END_LOOP
Termination section

@END
Ends computation
@FUNCTIONS
Subroutine section

The file indicator will indicate the type of source file that is contained within this file. The current choices are:

- **MAIN_SOURCE_C**
- **MAIN_SOURCE_FORTRAN**

The area between the file indicator and **@INIT** may be used to indicate information about the file (i.e., filename, description, date, author, group, etc.).

The pre-compiler will assume this section is made up entirely of comments and will place the appropriate comment directives around this section.

The **@INIT** section will contain the user-specified include files, any global variables, and any processing that must be done prior to beginning the main loop.

The pre-compiler will append the appropriate include files and declare all global data needed. It will also add any data structures required to support the input and output MSID lists.

The **@BEGIN** section of code will be the start of the main executable for the computation.

The pre-compiler will append the necessary main declarations and internal variables required for the executable.

This is the point where you begin writing executable statements that use either user-defined variables, variables defined by the pre-compiler, or MSID mnemonics.

The **@BEGIN_LOOP** section will contain the main loop of the computation. The main loop consists of three sections:

- **@INPUT**
- **@PROCESSING**
- **@OUTPUT**

The **@INPUT** section is one of the most important parts of the computation. It determines how the input MSID values are going to be obtained. The majority of the information needed is provided by the pre-compiler. You must specify one of the following for each of the input MSIDs:

- **CPS_Get_Newest_Value** - returns one or all samples from the “newest” packet at the time for the specified input MSID.
- **CPS_Get_Next_Value** - returns one or all samples from the “oldest” packet that has not been previously decommutated for the specified input MSID.

Help: See “Appendix M: User Computation Example” for an example of the syntax.

Note: The **CPS_Get_Newest_Value** function is not recommended for use by computation developers who wish to receive data from every packet**.**

The **@PROCESSING** section includes the process algorithm that performs the necessary calculations with the input MSIDs. You define these algorithms using either C or FORTRAN.

You will be able to use standard programming language library functions.

Help: See “Appendix N: Available Libraries - Computations” for a complete list.

When you are defining data types, you should follow the recommended data type assignments when programming their computation.

CAUTION: Any deviation from the recommended data type assignments may result in accuracy, precision, or out-of-range errors. Computation Generation allows any data type assignments deemed necessary to process the input data. It is your responsibility to determine if the assignments are correct.

Help: See “Appendix O: Computation Data Type Conversion Matrix” for this information.

The following call must be made at the end of the **@PROCESSING** section for each output MSID that needs to be updated:

CPS_Put_Pseudo_Value

This call places computed pseudo values into the write buffer for packet transmission or standard data file writing which will be used by the **@OUTPUT** section.

The **@OUTPUT** section indicates when the output from the computation should be written to the specified output MSIDs designated in the **Output MSID Editor** file. These outputs can be written to an output external pseudo, an output internal pseudo, or an output file.

Output external pseudos are multicast across the project network allowing other workstations and/ or servers to acquire the pseudo values that have been generated. These pseudos must be defined in the project database in order to build the packets prior to transmission.

An output internal pseudo is written to local memory on the workstation for use within other applications.

You can also elect to write the output of the computation to a file. When the computation is executed, the data values and corresponding time-tag will be included in the file.

The **@END_LOOP** section notifies the pre-compiler to include necessary code that must be performed prior to the computation terminating.

The **@END** section notifies the pre-compiler of the conclusion of the code for the computation and that subroutines may follow.

The **@FUNCTIONS** section will contain subroutines needed by this computation.

Tip: Developing subroutines in a separate file allow you to re-use them by other computations and may reduce your code development time.

When a **Subroutine_C** or **Subroutine_FORTRAN** is selected from the **New** dialog box, the template shown in Figure 7-4, is displayed.

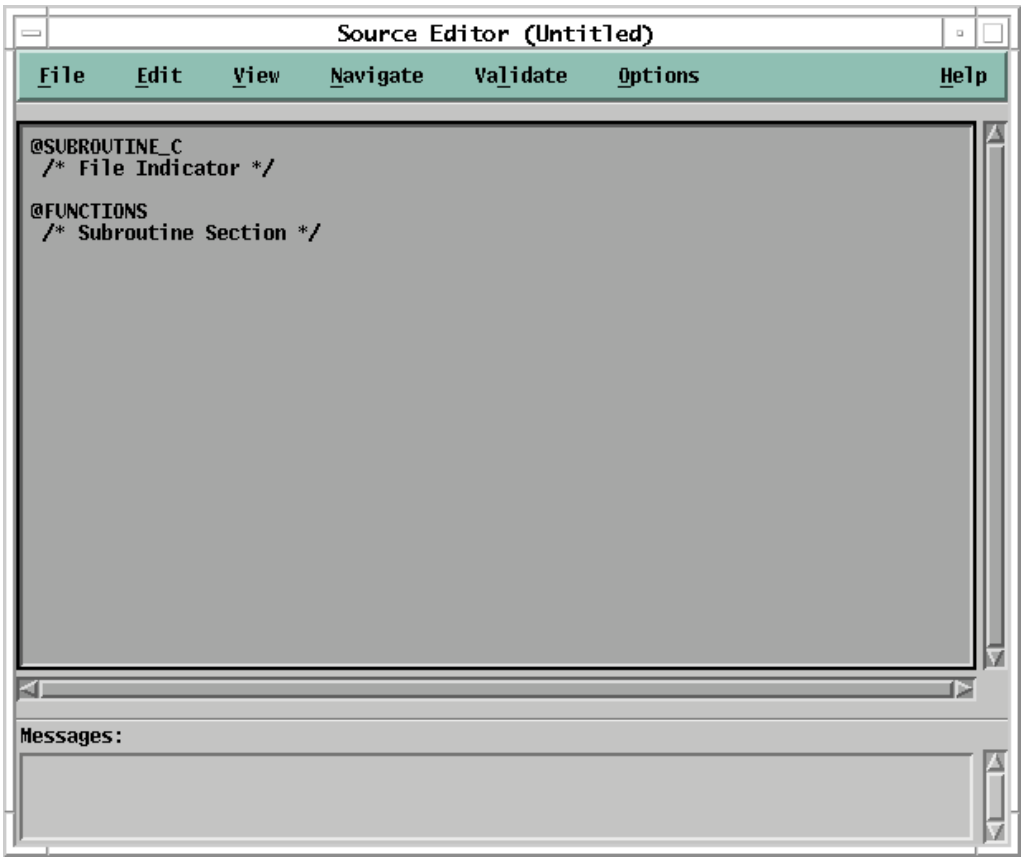


Figure 7-4, Source Editor main window subroutine template.

The file indicator will indicate the type of source file that is contained with this file. The current choices are:

- **SUBROUTINE_C**
- **SUBROUTINE_FORTRAN**

The area between the file indicator and **@FUNCTIONS** may be used to indicate information about the file (i.e., filename, description, date, author, group, etc.).

The pre-compiler will assume this section is made up entirely of comments and will place the appropriate comment directives around this section.

The **@FUNCTIONS** section will contain subroutines (i.e., functions and procedures) used by the main source file.

Help: See "Appendix M: User Computation Example" for an example of the syntax.

Another type of file that may be included in your computation is an include file. An include file contains definitions and declarations to be used by the main source file. The include file syntax is as follows:

@INCLUDE_FILE
File indicator
@INIT
Initialization section

The file indicator will indicate the type of source file that is contained within this file. The area between the file indicator and **@INIT** may be used to indicate information about the file (i.e., filename, description, date, author, group, etc.).

The **@INIT** section contains definitions and variables that will be used by more than one main source file. The advantage of creating the include information is that it allows you to collect all common definitions and declarations into a file(s) and then include them as needed when building the main source file by using the compiler directive `#include` statement.

7.1.3.2 Input MSID Editor Mini-Application

The Input MSID Editor mini-application allows you to create a list of input Measurement/Stimulus Identifiers (MSIDs) which, when used in conjunction with your source code, output MSID list and subroutines, can be used to generate a computation executable. This list should contain every MSID that the source code uses as input in order for it to operate successfully.

Input MSIDs can be a mixture of raw (downlinked), External ($E) or Internal ($I) pseudo MSIDs, and Input Computation Constants ($C). This allows the user to create a computation that obtains values from telemetry sources, computation sources, and/or application sources.

External pseudo MSIDs are multicasted on the network to be accessed by all applications on the project network. Using **$E** as the first characters of an MSID name signifies that it is an External MSID. These pseudos must be defined in the Telemetry Database (TDB).

Internal pseudo MSIDs allow local applications to share real-time pseudo data values without placing decommutation, conversion, and calibration information into the database. Using **$I** as the first characters of an MSID name signifies that it is an Internal MSID.

Note: Since internal pseudos are not multicasted to the network and are only available on your local workstation, they cannot be shared with other users.

The Input Computation Constant allows you to define global variables with default values. Using **$C** as the first characters of an MSID name signifies that it is a Computation Constant.

Note: Since input computation constants are not multicasted to the network and are only available on your local workstation, they cannot be shared with other users.

When the computation is executing, these computation constants as well as external pseudo MSIDs can be updated using one of the following three ways:

- Using a Scratchpad Line (SPL) field, an Input Slider, or an Input Data field defined on a display operating in Display Operation.
- Using the SPL application.
- Using a script to update the constant.

7.1.3.2.1 Work Area

The work area of the Input MSID Editor mini-application contains six columns of information in a list format (see Figure 7-5, Input MSID Editor main window). The columns include:

- **MSID**
- **Variable Name**
- **# Samples**
- **Data Processing**
- **Limit/ES Sensing**
- **Description**

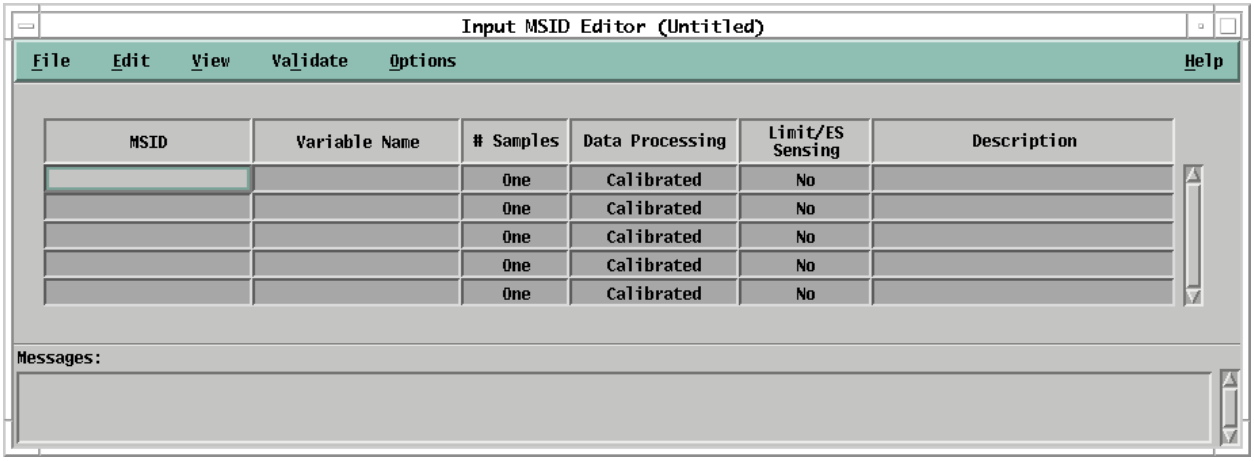


Figure 7-5, Input MSID Editor main window.

The **MSID** column is for defining the name of the MSID(s) that you wish to use as input to your computation. This can be either a raw (downlinked), Internal pseudo, External pseudo, or Input Computation Constant.

Help: For information on valid characters in an MSID name, refer to MSFC HOSC Database Definitions (MSFC-DOC-1949), Volume 4.

The **Variable Name** column is for defining the name that you will be using within your source code to reference the specified MSID. This must be a legal C or FORTRAN variable name, depending on the coding language you have chosen.

The **# Samples** column allows you to specify **One** and **All** samples to be used as input per MSID.

One	One sample per Packet is retrieved.
All	All samples per Packet frame are retrieved.

The **Data Processing** column identifies the type of processing to be performed on the MSIDs. Options are:

- **Converted**
- **Calibrated**
- **Unprocessed**

Help: For a definition of these terms, see the "Glossary."

The **Limit/ES Sensing** column allows you to select whether you want to turn on or off limit/ expected state (LES) sensing.

You can enter a description of the variable in the **Description** column. This would include any information that you may want to supply about the MSID.

7.1.3.3 Output MSID Editor Mini-Application

The Output MSID Editor mini-application allows you to create a list of output Measurement/ Stimulus Identifiers (MSIDs) which, when used in conjunction with your source code, input MSID list and subroutines, can be used to generate a computation executable. The list should contain every pseudo MSID that will be generated by the computation in order for it to operate successfully.

Output MSIDs can be either External ($E) or Internal ($I) pseudo MSIDs since only pseudo MSIDs can be produced as output from a computation.

External pseudo MSIDs are multicasted on the network to be accessed by all applications on the project network. Using **$E** as the first characters of an MSID name signifies that it is an External MSID. These pseudos must be defined in the Telemetry Database (TDB).

Internal pseudo MSIDs allow local applications to share real-time pseudo data values without placing decommutation, conversion, and calibration information into the database. Using **$I** as the first characters of an MSID name signifies that it is an Internal MSID.

Note: Since internal pseudos are not multicasted to the network and are only available on your local workstation, they cannot be shared with other users.

7.1.3.3.1 Work Area

The work area of the Output MSID Editor mini-application contains four columns of information in a list format (see Figure 7-6, Output MSID Editor main window). The columns include:

- **MSID**
- **Variable Name**
- **# Samples**
- **Description**

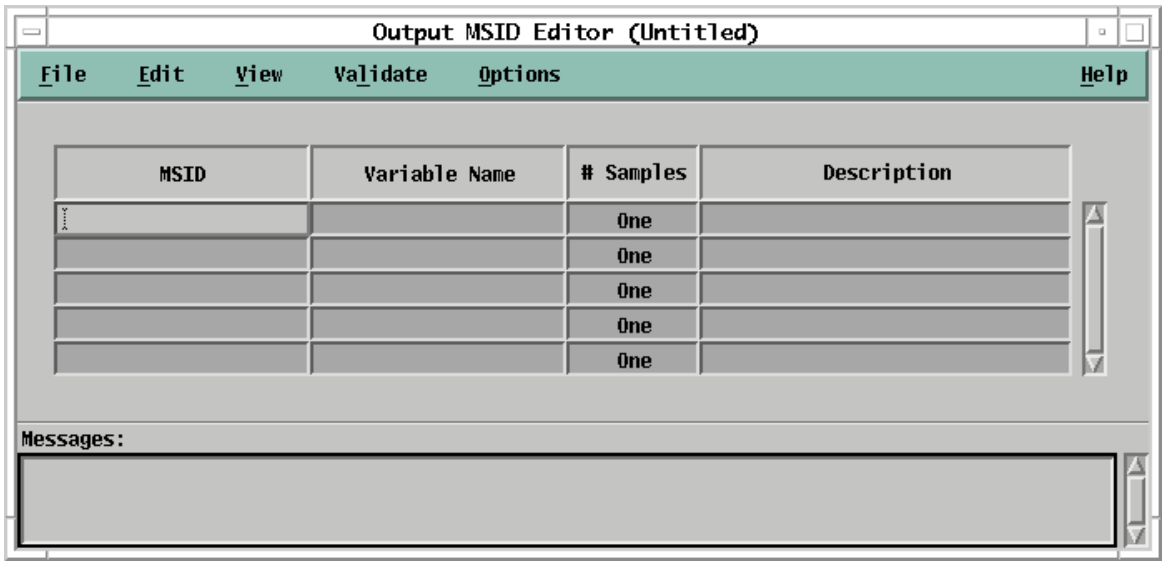


Figure 7-6, Output MSID Editor main window.

The **MSID** column is for defining the MSID(s) that you wish to output from your computation. This must be a pseudo MSID; therefore, the name of the MSID must begin with **$I** (for an Internal pseudo) or **$E** (for an External Pseudo).

The **Variable Name** column is for defining the name that you will be using within your source code to reference the specified pseudo MSID. This must be a legal C or FORTRAN variable name, depending on the coding language you have chosen.

The **# Samples** column contains an option menu button allowing you to specify **One** and **All** samples are output for each MSID.

One One sample per Packet is output.

All All samples per Packet are output.

You can enter a description of the variable in the **Description** column. This includes any information that you may want to supply about the MSID.

7.1.3.3.2 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Output MSID Editor mini-application. All of the menu selections from the **Options** menu will be discussed (see Figure 7-7, Output MSID Editor Options menu).

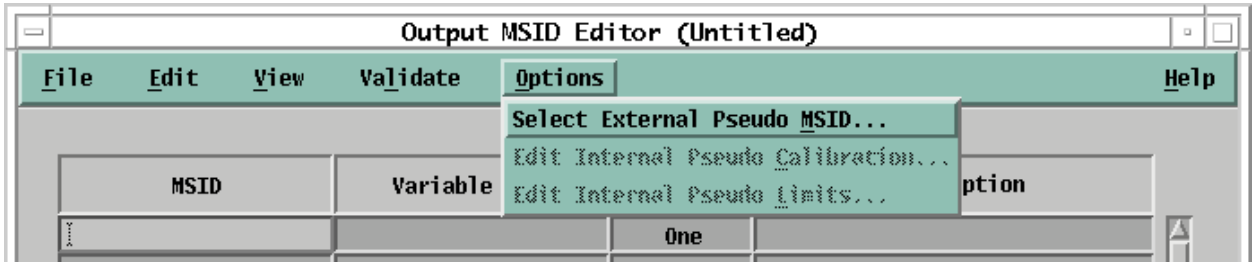


Figure 7-7, Output MSID Editor Options menu.

Select External Pseudo MSID...

The **Select External Pseudo MSID...** menu item invokes a dialog box that allows you to select an output pseudo MSID from a specific telemetry database to be included in your output MSID file (see Figure 7-8, Select External Pseudo MSID dialog box). When the dialog box is invoked, an automatic search has been performed displaying all external pseudo(s) ($E) defined for your user identification (ID).

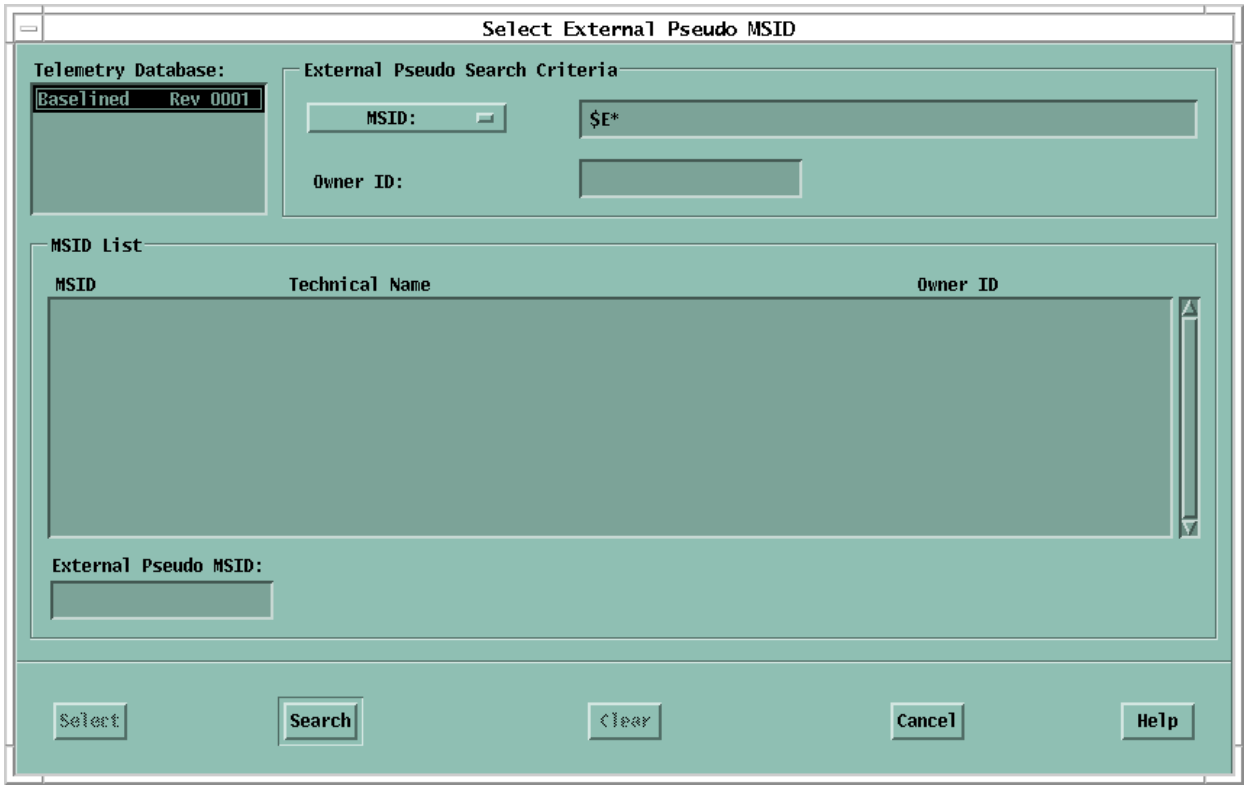


Figure 7-8, Select External Pseudo MSID dialog box.

The dialog box contains three frames of information. The **Telemetry Database**: selection list allows you to select the revision of the source TDB from which you wish to select an output External pseudo MSID.

In the **Search Criteria** frame, you can decide whether you wish to search for the MSID by its mnemonic or technical name by clicking the option menu button. The initial value for this button is **MSID**. Click the button and select either **MSID:** or **Technical Name:**. You can also specify an **Owner ID**: as search criteria.

In the **MSID List** frame, the application will display all available MSIDs that meet your search criteria. You can either enter the name of the MSID you desire in the **MSID:** text field or position the mouse pointer over the desired MSID and click the left mouse button.

Note: This option is only available when the cursor is placed in the **MSID** column of the **Output MSID Editor** main window.

Edit Internal Pseudo Calibration...

The **Edit Internal Pseudo Calibration...** menu item invokes a dialog box that allows you to edit the calibration coefficients for a selected internal pseudo (see Figure 7-9, Edit Internal Pseudo Calibration dialog box). When the dialog box is initially invoked, calibration for the selected internal pseudo is set to **None**.

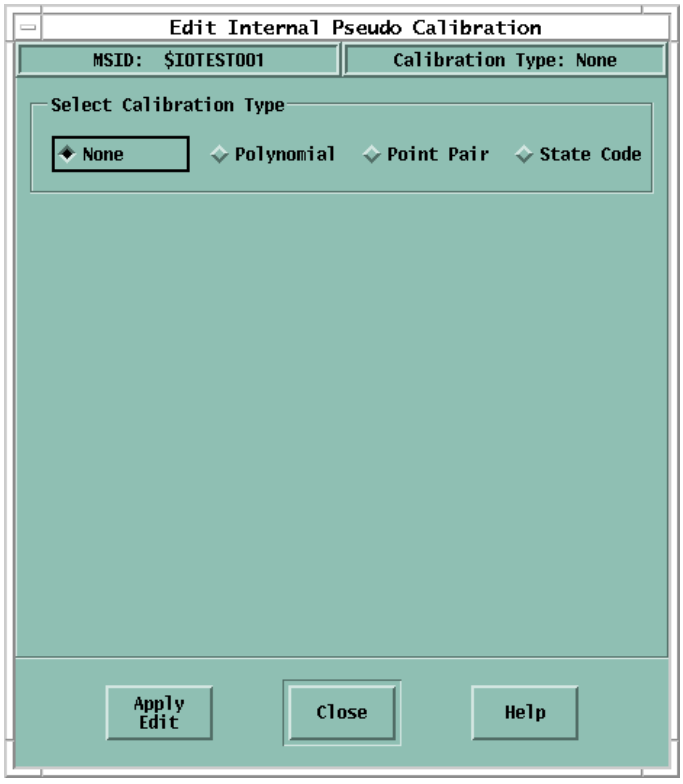


Figure 7-9, Edit Internal Pseudo Calibration dialog box.

Note: This menu item is available only when the cursor is in a cell under the **MSID** heading which contains an internal pseudo.

A status bar indicates the selected internal pseudo MSID for which you are defining calibration as well as the currently selected calibration type. The **Select Calibration Type** frame contains four radio buttons which allow you to select the calibration type of the selected pseudo:

- **None**
- **Polynomial**
- **Point Pair**
- **State Code**

Selecting the **Polynomial** radio button causes the dialog box to appear as follows (see Figure 7-10, Edit Internal Pseudo Calibration - Polynomial dialog box):

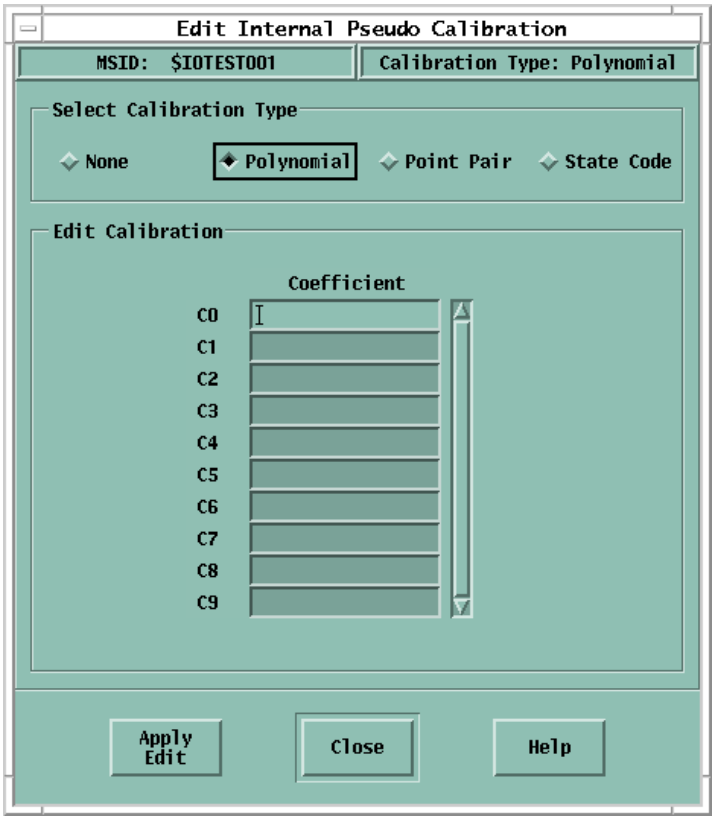


Figure 7-10, Edit Internal Pseudo Calibration - Polynomial dialog box.

The **Edit Calibration** frame allows you to define polynomial coefficients for the selected internal pseudo using a single-column table.

Help: See the glossary for a definition of polynomial coefficients.

Clicking the **Point Pair** radio button causes the dialog box to appear as follows (see Figure 7-11, Edit Internal Pseudo Calibration - Point Pair dialog box):

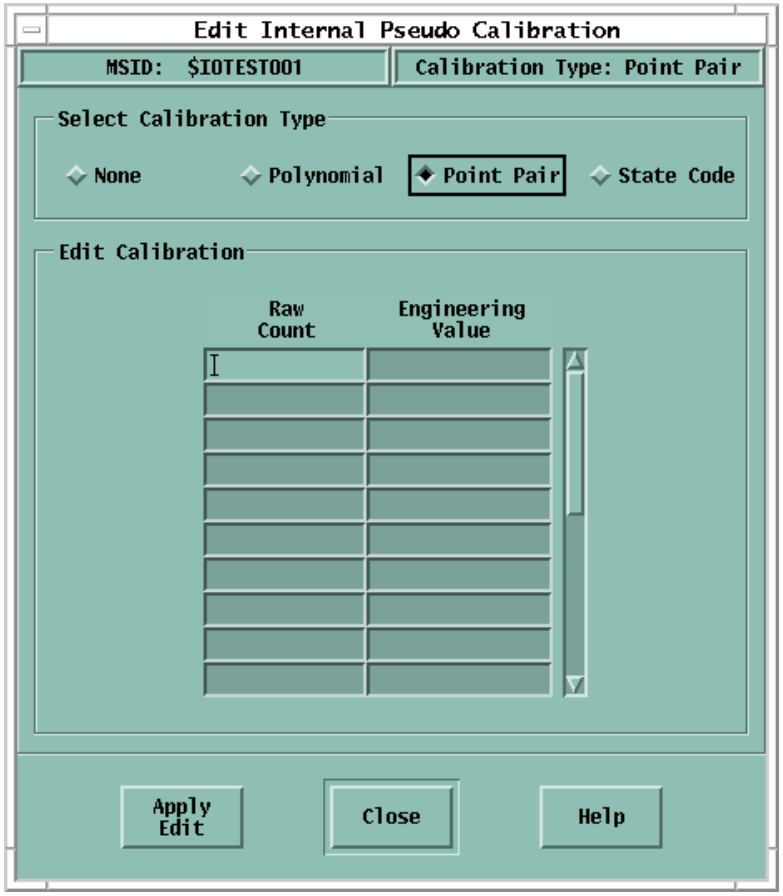


Figure 7-11, Edit Internal Pseudo Calibration - Point Pair dialog box.

The **Edit Calibration** frame now allows you to define the **Raw Count** and **Engineering Value** for each linear segment used to calibrate the data.

Help: See the glossary for a definition of point pairs.

Clicking the **State Code** radio button causes the dialog box to appear as follows (see Figure 7-12, Edit Internal Pseudo Calibration - State Code dialog box):

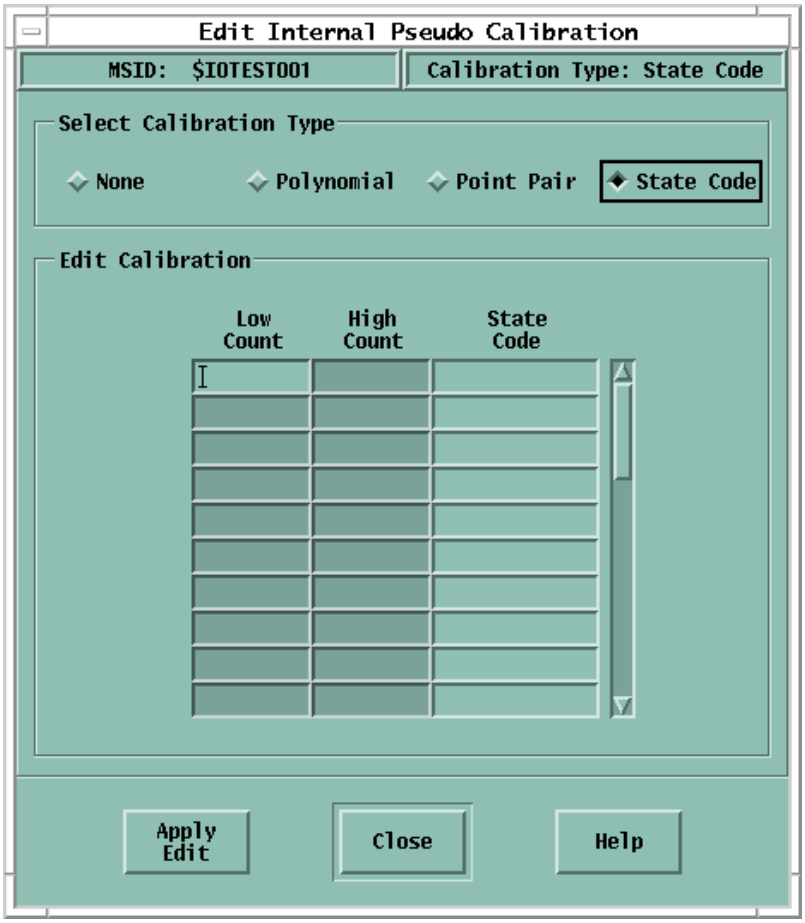


Figure 7-12, Edit Internal Pseudo Calibration - State Code dialog box.

The **Edit Calibration** frame now allows you to define the **Low Count**, **High Count** and **State Code** for each possible state for the selected internal pseudo. The **Low Count** and **High Count** values determine the range of values in which the associated state code is valid.

Help: See the glossary for a definition of state codes.

Edit Internal Pseudo Limits...

The **Edit Internal Pseudo Limits...** menu item invokes a dialog box that allows you to edit the limits for a selected internal pseudo (see Figure 7-13, Edit Limits dialog box). When the dialog box is initially invoked, the limit type for the selected internal pseudo is set to **None**.

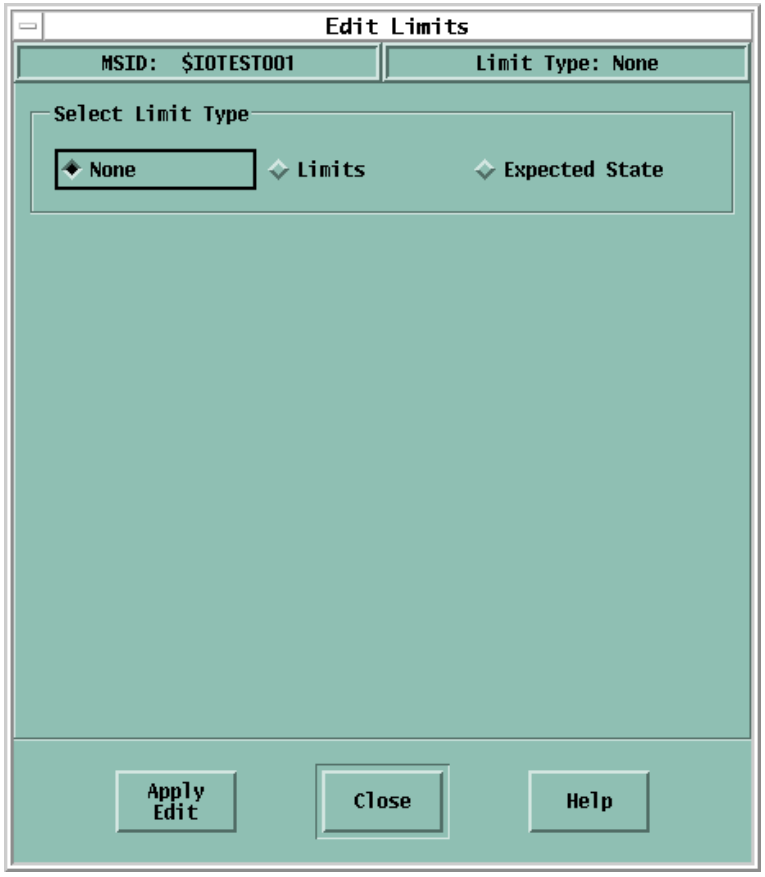


Figure 7-13, Edit Limits dialog box.

Note: This menu item is available only when the cursor is in a cell under the **MSID** heading which contains an internal pseudo.

A status bar indicates the selected internal pseudo MSID for which you are defining limits as well as the currently selected limit type. The **Select Limit Type** frame contains three radio buttons which allow you to select the limit type of the selected pseudo:

- **None**
- **Limits**
- **Expected State**

Selecting the **Limits** radio button causes the dialog box to appear as follows (see Figure 7-14, Edit Limits - Limits dialog box):

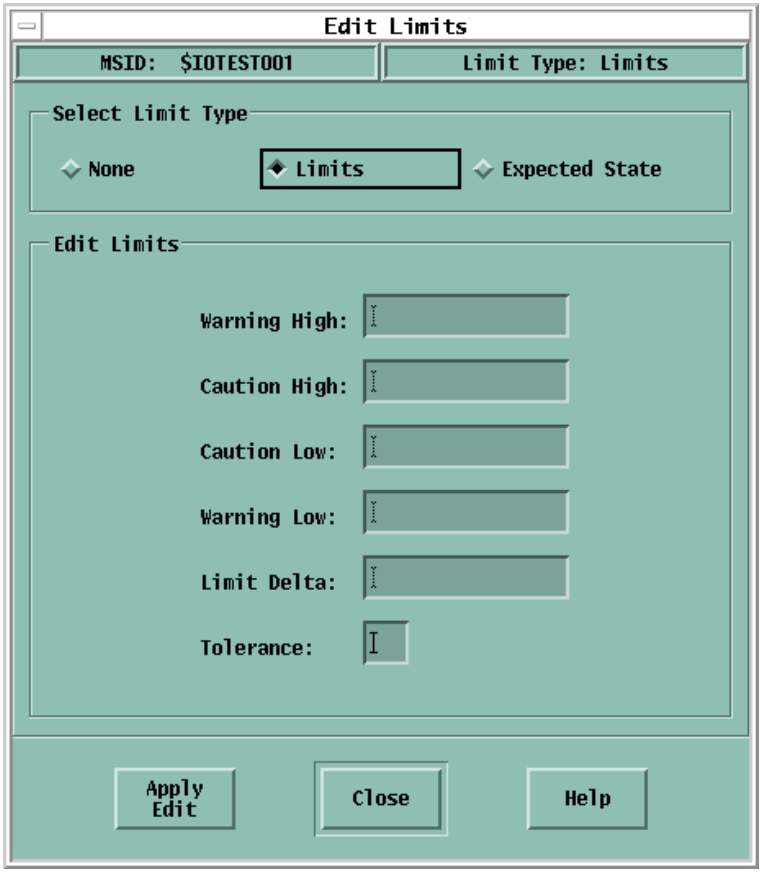


Figure 7-14, Edit Limits - Limits dialog box.

The **Edit Limits** frame allows you to define warning and caution limits for the selected internal pseudo as well as the limit delta and tolerance. using a single-column table.

Help: See the glossary for a definition of warning limits, caution limits, limit delta, and tolerance.

Clicking the **Expected State** radio button causes the dialog box to appear as follows (see Figure 7-15, Edit Limits - Expected State dialog box):

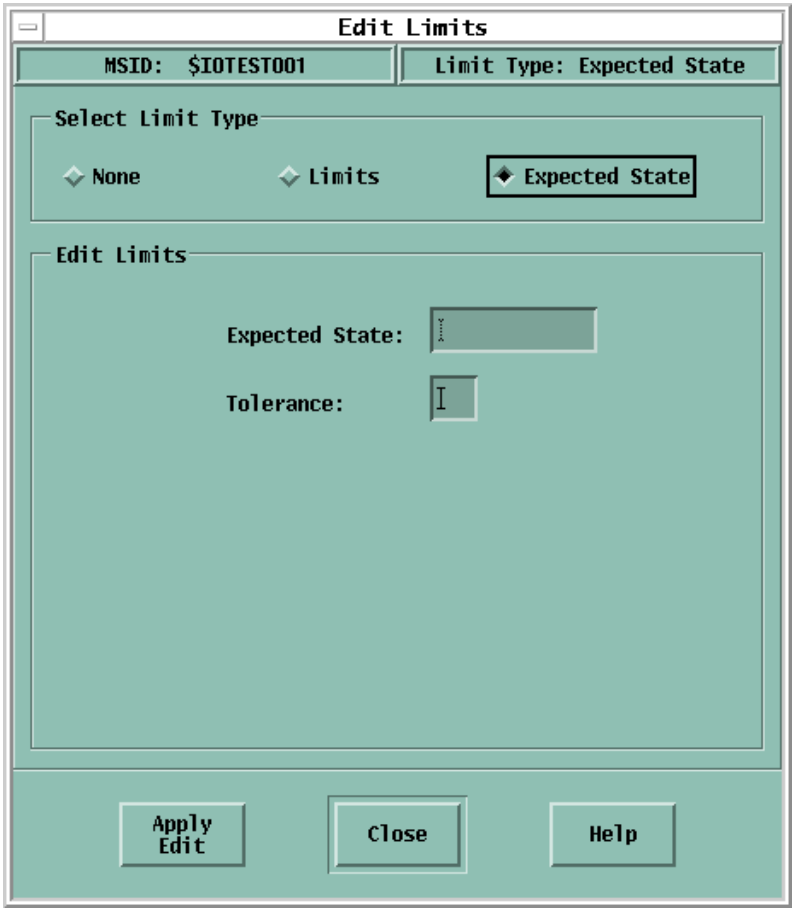


Figure 7-15, Edit Limits - Expected State dialog box

The **Edit Limits** frame now allows you to define the **Expected State** and **Tolerance** for the selected internal pseudo.

Help: See the glossary for a definition of these terms.

7.1.3.4 Build Computation Mini-Application

The Build Computation mini-application allows you to generate an executable file by selecting a source code file, an input Measurement/ Stimulus Identifier (MSID) file, an output MSID file, and any needed subroutines. This capability to create independent files and then link them together for building the computation allows you to use Input/Output MSID files with multiple computations.

Once you have selected your computation components and built it, the computation characteristics can be saved to a computation description file.

7.1.3.4.1 Work Area

The work area of the Build Computation mini-application contains five frames and a buttons area (see Figure 7-16, Build Computation main window). The frames include:

- **Main**
- **Input MSID**
- **Output MSID**
- **Subroutine**
- **Build Log**

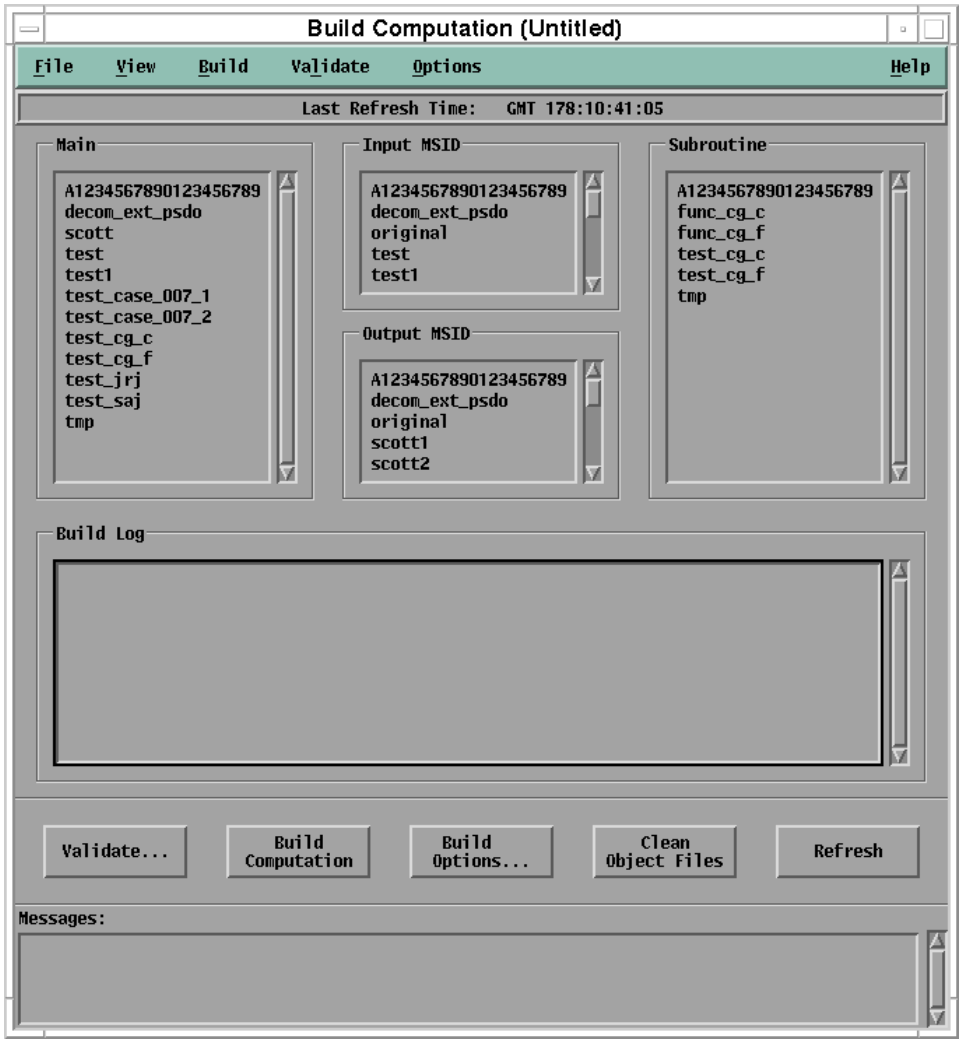


Figure 7-16, Build Computation main window.

The **Main** frame contains a selection list of source code files. You can select the file from which you want an executable created from this list.

The **Input MSID** frame contains a selection list of available **Input MSID** files.

Note: Only one input MSID file can be selected.

The **Output MSID** frame contains a selection list of available **Output MSID** files.

Note: Only one output MSID file can be selected.

The **Subroutine** frame contains a selection list of subroutines that you have written using the **Source Editor**. Unlike the other three components of a computation, you may need to select more than one subroutine to be compiled. To select multiple subroutines from this list, hold down Shift while clicking the left mouse button.

The **Build Log** frame will display any error or status messages that are received while your computation is being compiled.

Note: You may want to clear this frame prior to a build process so that new messages will not be appended to an old log. See **Clear Build Log** discussed later in this chapter for more information.

The following steps should be followed to build a computation:

1. Select the filename of the main source code for your computation from the **Main** frame. This is accomplished by positioning the mouse cursor over the name of the source code file in the list and then clicking the left mouse button.

2. Select the required input MSID list from the **Input MSID** frame in the same way you selected your main source code file.

3. Select the required output MSID list from the **Output MSID** frame.

4. If your computation contains any subroutines, select those subroutines from the list in the **Subroutines** frame. To make multiple selections from this list (in the event that your computation contains more than one subroutine), hold down Shift while clicking the left mouse button.

5. Click Validate... . If this is the first time you have attempted to validate the computation, you will need to provide a filename for the executable and description file at this point. Otherwise, the **Validate** dialog box is invoked. A second click of Validate... is required if you are validating the computation for the first time.

6. On the **Validate** dialog box, click Validate .

7. Close the **Validate** dialog box. If you have any specific build options that need to be set, click Build Options..., set the necessary options, and then close that dialog box.

8. Click Build Computation to build the computation.

7.1.3.4.2 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Build Computation mini-application. All of the menu selections from the **Build** menu and **Options** menu will be discussed (see Figure 7-17, Build and Options menus).

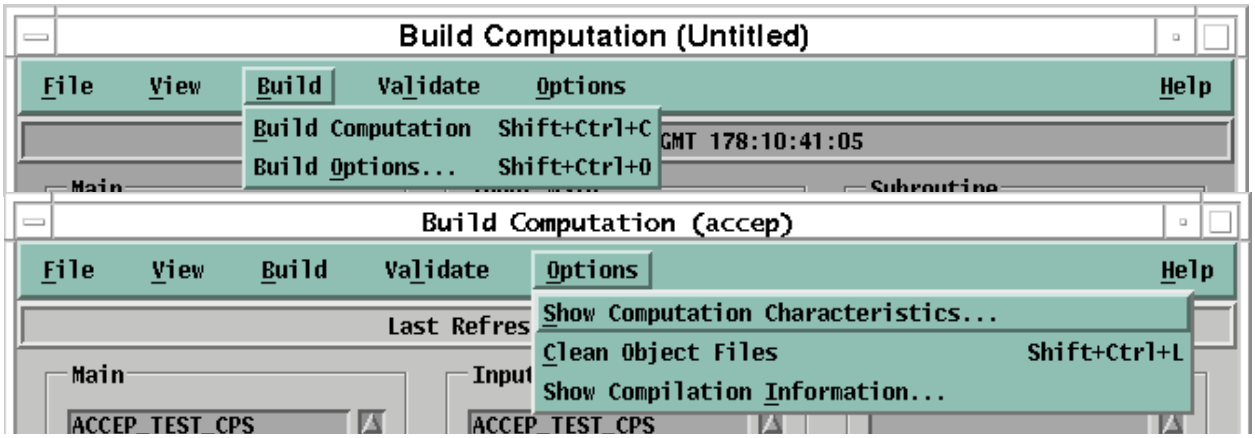


Figure 7-17, Build and Options menus.

Build Computation

The **Build Computation** menu item initiates the computation build (compile) process. Messages received while compiling will be displayed in the **Build Log** frame of the **Build Computation** main window.

This menu item performs the same function as Build Computation available on the **Build Computation** main window.

Build Options...

The **Build Options...** menu item allows you to select the compile and link options that will be used during the build computation process (see Figure 7-18, Build Options dialog box).

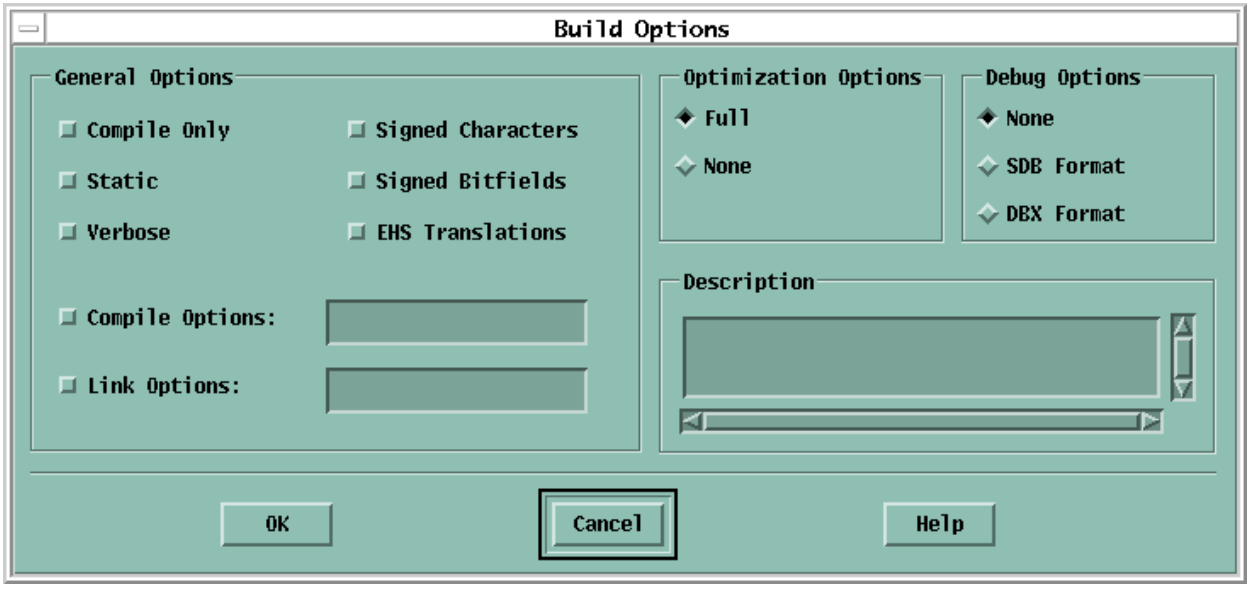


Figure 7-18, Build Options dialog box.

The dialog box contains four frames:

- **General Options**
- **Optimization Options**
- **Debug Options**
- **Description**

The **General Options** frame contains six toggles and two additional toggle buttons with associated input text fields.

Compile Only - allows you to build objects without linking. Use this function to make sure the source files can be compiled.

Static - forces the use of static (as opposed to dynamic) memory allocation.

Verbose - prints to the build log each pass of the compiler as it executes along with all arguments and their input and output files.

Signed Characters - causes all `char` declarations in the source code to be `signed char` declarations. The default is unsigned.

Signed Bitfields - causes all bitfields to be treated as signed. The default is unsigned.

EHS Translations - indicates whether the Enhanced HOSC System (EHS) code is added to the user source code. This allows you to pinpoint source problems.

Compile Options: - allows you to specify compiler options for the selected compiler.

Link Options: - allows you to specify linking options for the selected compiler.

Help: Refer to your compiler's documentation for information on options that can be used when compiling and linking source code.

The **Optimization Options** frame contain two radio buttons that allows you to select how you want to optimize your code.

Full - turns on all optimization, including global register allocation. This option produces the most streamlined and compact code but takes the most time to compile.

None - turns off all optimization. This option produces the largest and least efficient object code, but code is produced much faster than under other optimization options.

Help: If you require an optimization level between **None** and **Full**, you will need to enter the appropriate command line options in the **Compile Options:** text field.

The **Debug Options** frame contains three radio buttons that allow you select the interactive debugger that you wish to use while compiling. You can select **DBX Format** (not available in EHS), **SDB Format** or **None**.

An interactive debugger allows you to "single step" through the program, stop the program at any point, and examine and change variables.

Help: See Practical C Programming by Steve Oualline for information on using the DBX debugger. Other C programming references include:

B.W. Kernighan and D.M. Ritchie, The C Programming Language, Prentice-Hall, 1978

B.W. Kernighan, ANSI X3.159-1989, The ANSI C Standard. Programming in C - A Tutorial

D.M. Ritchie, C Reference Manual - Power C User's Guide.

The **Description** frame allows you to supply text that describes this computation.

Show Computation Characteristics...

The **Show Computation Characteristics...** menu item invokes a dialog box that allows you to view a computation description file (see Figure 7-19, Show Computation Characteristics dialog box). The computation description file contains build option information for the selected computation.

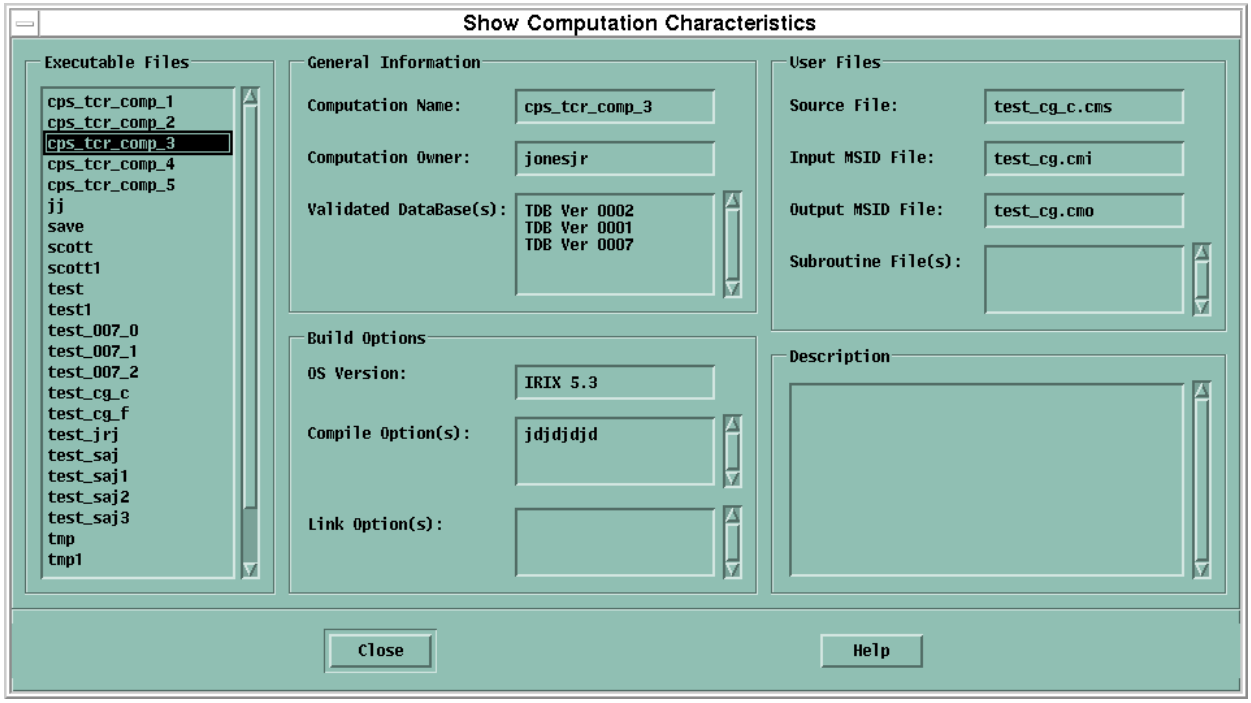


Figure 7-19, Show Computation Characteristics dialog box.

The dialog box contains five frames:

- Executable Files
- General Information
- Build Options
- User Files
- Description

The **Executable Files** frame contains a selection list that allows you to select the executable file for which you would like to view the associated description file.

The **General Information** frame contains three display-only fields:

- **Computation Name:** - displays the name of the computation description file
- **Computation Owner:** - displays the user identification (ID) of the computation's author
- **Validated Database(s):** - displays which databases that the selected computation has been validated against

The **Build Options** frame also contains three display-only fields:

- **OS Version:** - displays the version of Operating System (OS) being used when this computation was compiled
- **Compile Options:** - displays the compile options that were chosen when the computation was built

- **Link Options:** - displays the link options that were chosen when the computation was built

Help: See your compiler's documentation for detailed information on compile options and link options.

The **User Files** frame contains four display-only fields:

- **Source File:** - displays the source file(s) used in the build process
- **Input MSID File:** - displays the input MSID file used in the build process
- **Output MSID File:** - displays the output MSID file used in the build process
- **Subroutine File:** - displays the subroutines that were linked during the build process

The **Description** frame includes the description that was provided by the creator of the computation on the **Build Options** dialog box. It may include any information pertaining to the computation.

Clean Object Files

Each time a computation is compiled, an object (.o) file is created. This object file is used to link with selected subroutines. The **Clean Object Files** menu item allows you to remove files to ensure that you when you link, you are linking with the correct version of the computation. This menu item performs the same function as

available on the main window.

Show Compilation Information...

The **Show Compilation Information...** menu item invokes a dialog box that allows you to view the information received during the compile process (see Figure 7-20, Show Compilation Information dialog box).

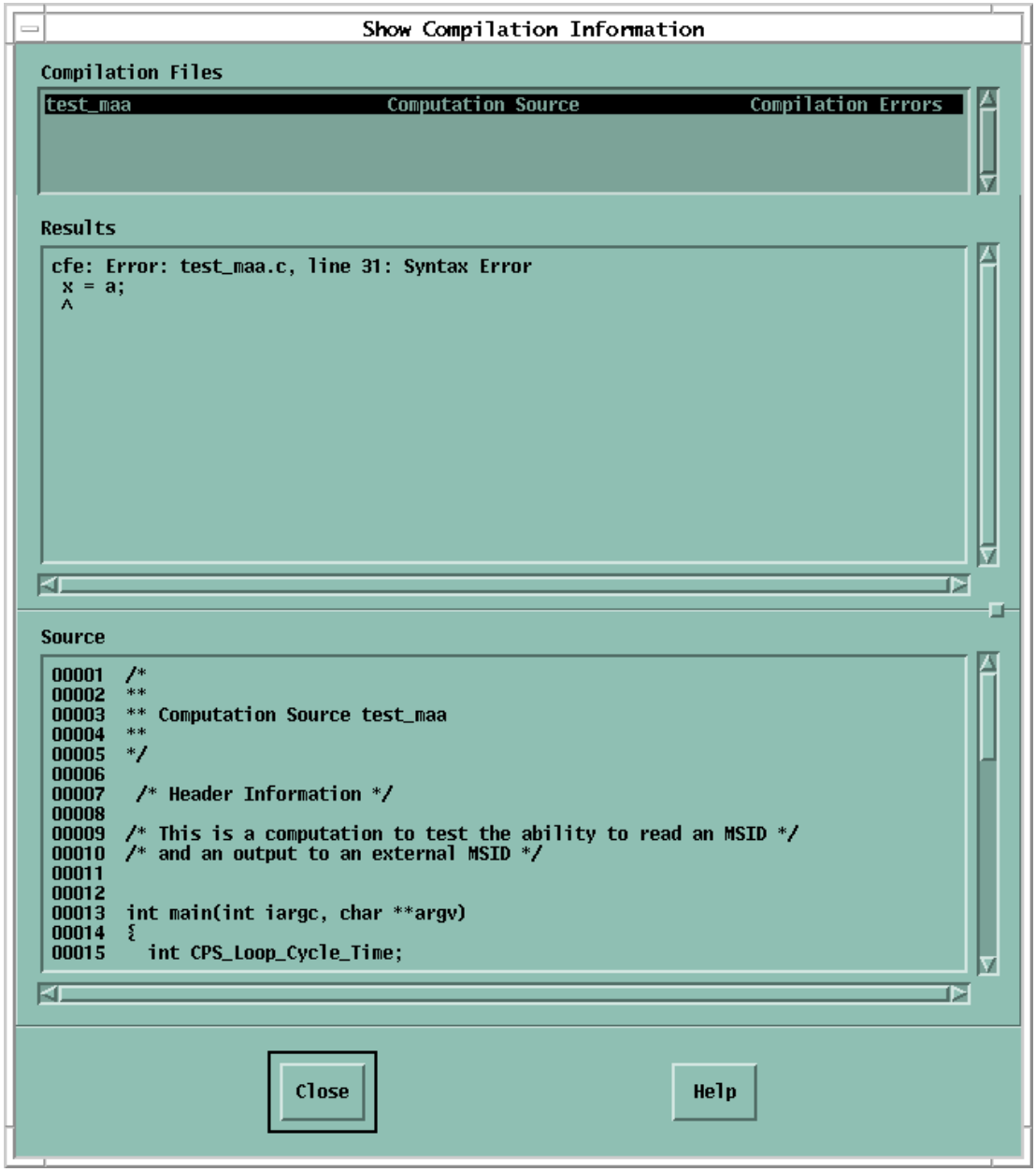


Figure 7-20, Show Compilation Information dialog box.

The dialog box contains two frames:

- **Results**
- **Source**

The **Results** frame contains any messages received during the compilation process.

The **Source** frame allows you to scroll through the source code.

7.2 Computation Operation Overview

The Computation Operation application provides the user the capability to retrieve, execute, terminate, and monitor mission or user computations. Computations may be saved on the local workstation or may be copied from the UDE database to local storage using the Retrieve application from the Launchpad. Computations may also be started and stopped upon a request from the user via a display or script. Before the user can execute a computation, it must be validated and source code compiled in the Computation Generation application.

The Computation Operation main window contains several destinct features (see Figure 7-21, Computation Operation main window):

- Menu Bar
- Work Area
- Output Area

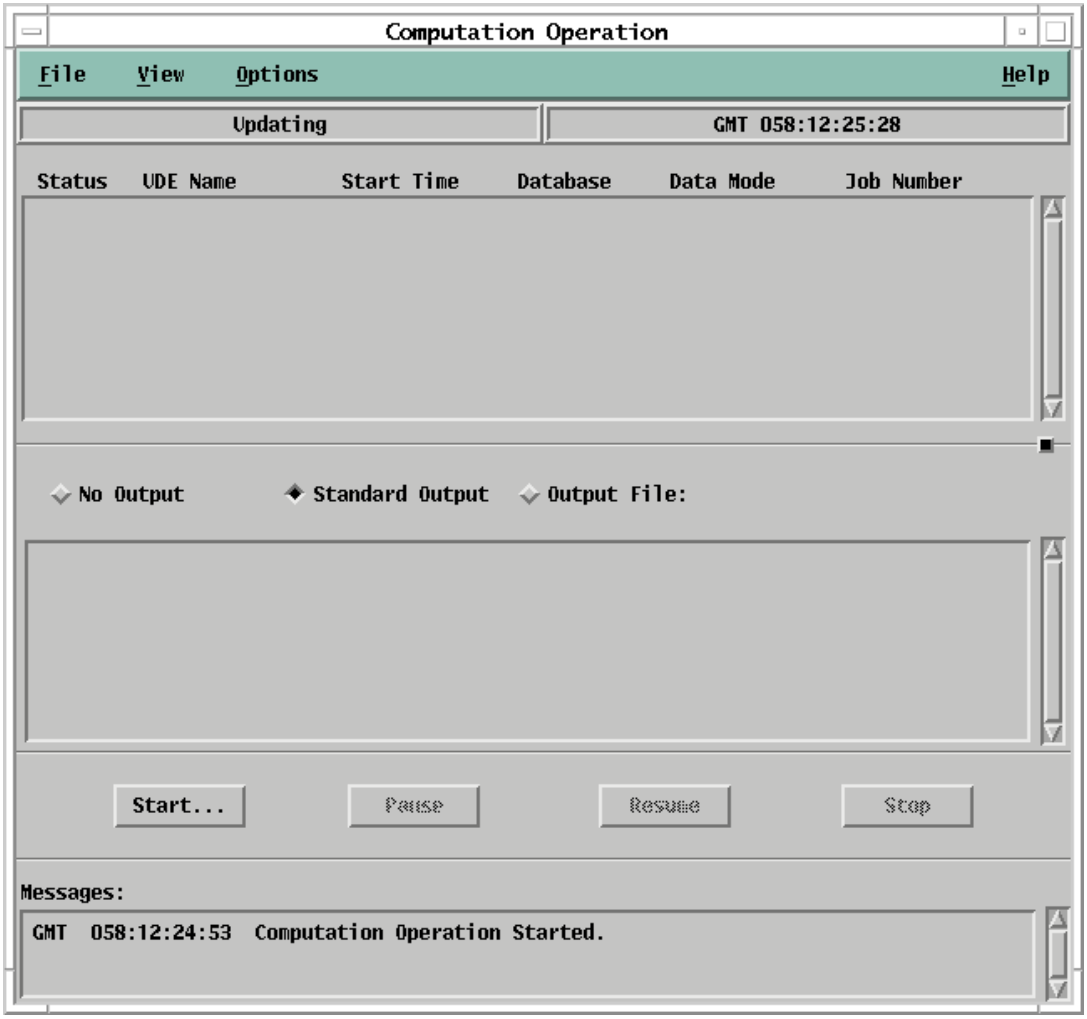


Figure 7-21, Computation Operation main window.

7.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to the computation applications. The menu bar for Computation Operation consists of the **File**, **View**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Start
  Pause
  Resume
  Stop

7.2.2 Work Area

The work area includes a paned area that displays all computations that are currently active or paused. The pane has six columns:

The **Status** column indicates the current condition of your computation. The valid options are:

- **Active** - the computation is currently computing information
- **Paused** - the computation is currently not computing information

The **UDE Name** column identifies the name of the computation executable.

The **Start Time** column shows when the computation was initiated.

The **Database** column indicates the database version that was selected from the **Start** dialog box when the computation was initiated.

Note: A computation can only be started using a database that it has been validated against.

The **Data Mode** column indicates the data mode that was selected from the **Start** dialog box when the computation was initiated.

The **Job Number** column shows the number assigned to the process when the computation was started.

7.2.3 Output Area

The output area contains three radio buttons, **No Output**, **Standard Output** and **Output File:** . If the **No Output** radio button is selected, nothing will be displayed in the standard output information area. If the **Standard Output** radio button is selected, information generated by active computations will be displayed in the standard output information area. Core dump information is also included in this area. If you select the **Output File:** radio button, a file selection dialog box will be displayed to choose the file for viewing. This feature provides a means for you to view a text file that is produced by a computation. Files that can be specified are contained in the **doc** directory. These files can be opened using the Framemaker application. In order to create the output file, you must append the Computation Operation output extension (.coo) to the text file created by your computation executable.

Note: The maximum output size is 10,000 bytes.

7.2.4 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Computation Generation application. All of the options from the **Options** menu will be discussed (see Figure 7-22, Options menu).

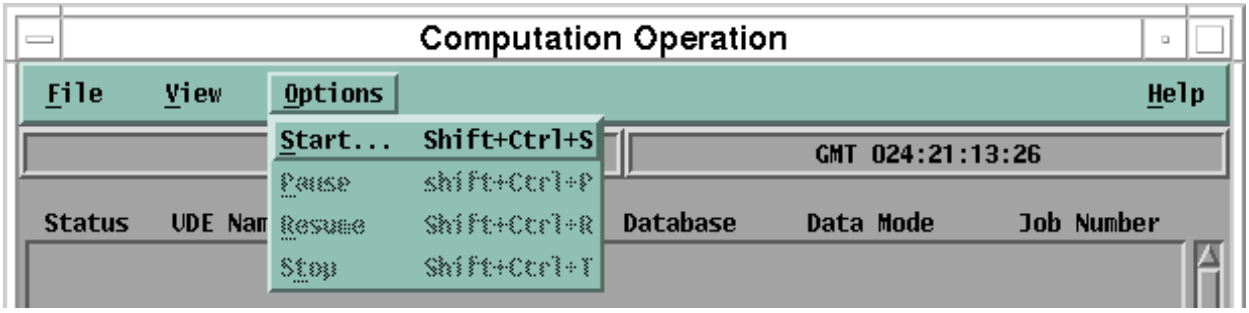


Figure 7-22, Options menu.

7.2.4.1 Start...

The **Start...** menu item invokes a dialog box that allows you to start a selected computation. Within the dialog box, you can specify whether the computation is to write its output to an output file or to an output packet. You can select the data mode that you would like to access (if you are accessing telemetry) or an input file (if you are using that as your data source). You can also specify which database you would like to use, as well as the type of processing priority that you want (see Figure 7-23, Start dialog box).

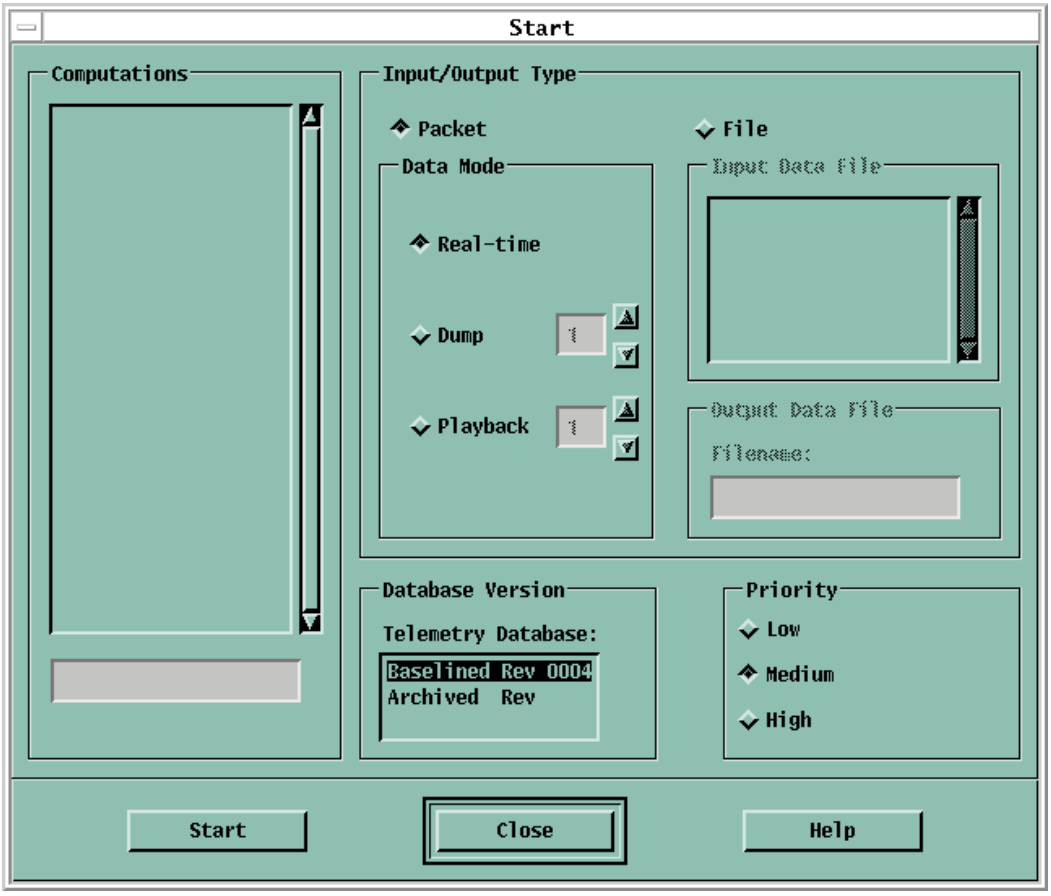


Figure 7-23, Start dialog box.

The dialog box contains four frames:

- **Computations**
- **Input/Output Type**
- **Database Version**
- **Priority**

The **Computations** frame provides a selection list and corresponding input data field that allows you to specify the computation with which you want to work.

The **Input/Output Type** frame contains two radio buttons, **Packet** and **File,** and corresponding subframes. If you select **Packet**, you are able to select the data mode that you want to use. The available options are:

- **Real-time** - data that is telemetered to the Huntsville Operations Support Center (HOSC) and distributed for immediate use
- **Dump** - data that is recorded onboard during periods when communications with the spacecraft are unavailable, and is transmitted during the next period when communications resume

Note: If you select **Dump** for the data mode, you must choose between the three available dump data modes:

- Dump Mode **1** - S-Band Zone of Exclusion (ZOE)
- Dump Mode **2** - Ku-Band Communication Outage Recorder (COR)
- Dump Mode **3** - Ku-Band ZOE

- **Playback -** data that is recorded on the ground either internally or at some other facility.

Note: If you select the **Playback** data mode, then you must specify a playback channel. You can accept the channel shown, type a new channel number, or use or to change the channel number displayed. Playback channels are numbered **1** to **11**.

Help: These terms are also included in the glossary.

If you select **File**, you are able to select the input data file from a selection list as well as an **Output Data File**. The input data for the computation is extracted from the specified input data file. Once the input data has been processed, the output data is placed into the specified output data file.

Note: These output data files can be used as input for other computations or by other applications (e.g., Applix spreadsheets).

The **Database Version** frame contains a list of databases that are available to use. Select the one that you want to access.

Note: You can only use a database that the computation has been validated against.

The Priority frame allows you to determine the processing priority of a computation in relation to all other active computations. The valid options are:

Low - Provides the least amount of processing time to the computation in regard to other computations that are simultaneously active.

Medium - Provides the average amount of processing time to the computation. This is the default setting.

High - Provides the most amount of processing time to the computation in regard to other computations that are simultaneously active.

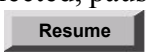
7.2.4.2 Pause

The **Pause** menu item allows you to temporarily suspend the selected computation from computing. This menu item performs the same function as

available on the **Computation Operation** main window.

Note: You will lose data by pausing a computation. However, to access the information you missed, a Near Real-Time (NRT) playback can be requested and you will need to re-run the computation using the playback channel as the data mode.

7.2.4.3 Resume

The **Resume** menu item allows a selected, paused computation to once again compute. This menu item performs the same function as 

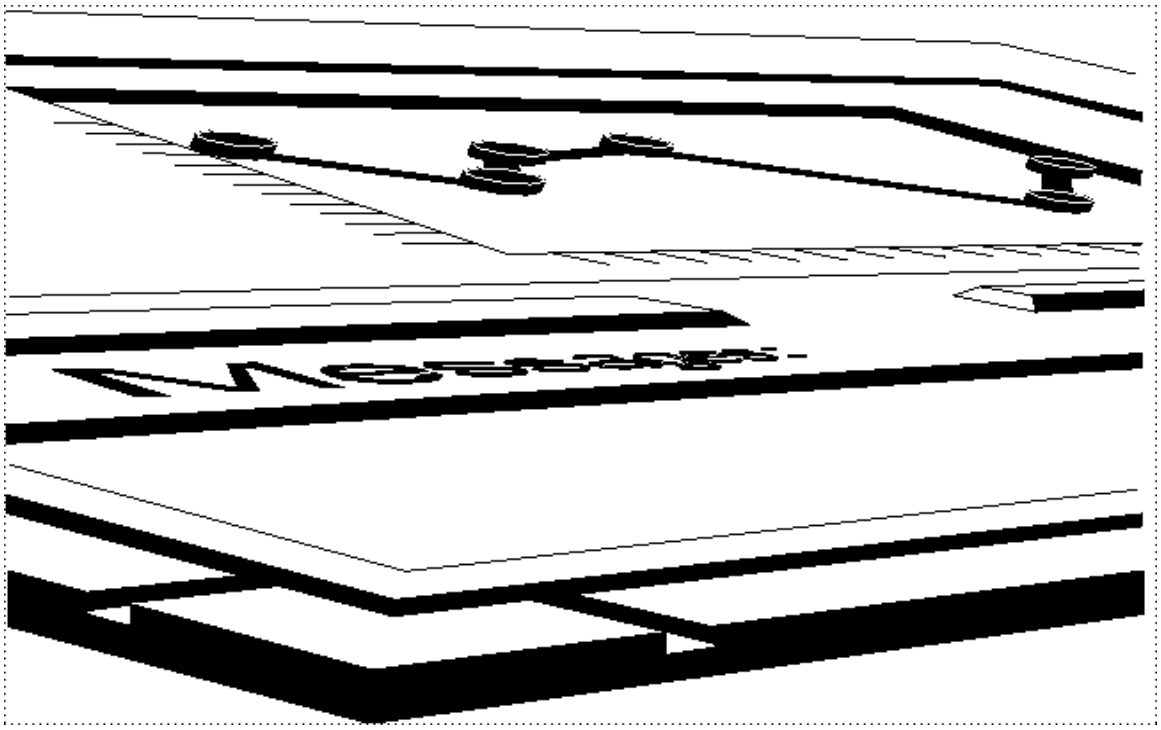
available on the **Computation Operation** main window.

Note: The computation will use the data that is currently available for computing. To access the information you missed, a NRT playback will have to be requested and you will need to re-run the computation using the playback channel as the data mode.

7.2.4.4 Stop

The **Stop** menu item terminates the selected computation. This menu item performs the same function as

available on the **Computation Operation** main window.



Chapter 8:
Script Generation/Operation Software

This chapter describes two Huntsville Operations Support Center (HOSC) applications: Script Generation and Script Operation. Scripts are essentially text files made up of statements (directives) which are interpreted from high level, English-like statements into a sequence of computer instructions. Script Generation allows the user to create, edit, and validate such scripts while Script Operation allows you to initiate, monitor, and control their execution.

8.1 Script Generation Overview

The Script Generation application provides the capability to create, edit, and validate scripts. Scripts are text files containing statements (or directives) which the script parser can recognize. Scripts can initiate computations, displays, command update forms, and other scripts. Scripts can also be used to uplink files and commands.

Help: For specific information on the directives provided by the Scripting Language, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

Unlike computations, which are compiled into the computer's machine language, scripts are interpreted from high level, English-like statements into a sequence of computer instructions.

Because scripts are interpreted rather than compiled, it is easier to control their operation although they do not have the power or speed of a full programming language such as C or FORTRAN.

Script Generation allows you to validate:

- the script directive syntax
- referenced database elements
- data type usage
- external pseudo MSIDs
- commands with state codes are valid

You may also optionally check to determine whether User-generated Data Elements (UDEs) referenced in a script are locally available to run on the workstation.

The Script Generation main window contains two distinct features that will be discussed in this chapter (see Figure 8-1, Script Generation main window):

- Menu Bar
- Work Area

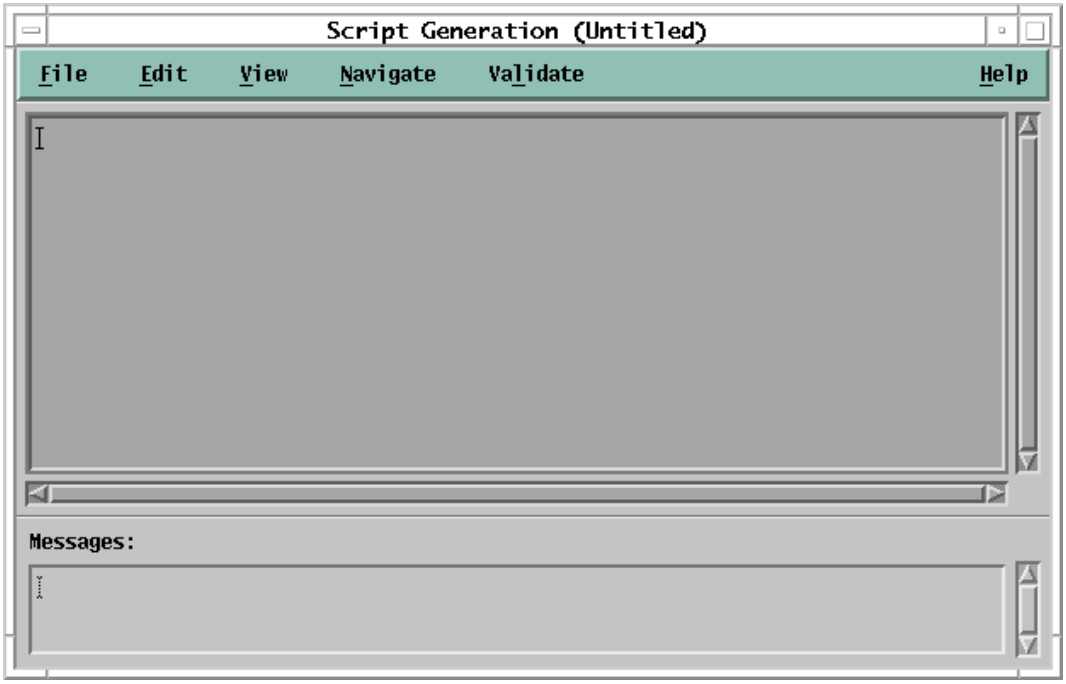


Figure 8-1, Script Generation main window.

8.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **Edit**, **View**, **Navigate**, **Validate**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Edit** Menu
  Find...
  Find Next
  Replace...

- **Validate** Menu
  Validate...
  Check for UDEs

8.1.2 Work Area

The work area of the **Script Generation** main window consists of a full screen editor with horizontal and vertical scrollbars to be used for creating and editing a script file.

The scripting language provides directives to sample telemetry data, update modifiable commands, uplink commands and command files, build command chains, and initiate command chain uplink. Directives are also provided to initiate execution of other UDEs such as displays and computations as well as to update pseudo telemetry Measurement Stimulus Identifiers (MSIDs) with data provided by the script. Control constructs, such as **if** statements and **do** loops, are provided to control the logical execution of the script.

Help: For specific information on the directives provided by the Scripting Language, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

8.1.3 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Script Generation application. The **Find...**, **Find Next**, and **Replace...** menu items from the **Edit** menu as well as the **Validate...** and **Check for UDEs** menu items from the **Validate** menu will be discussed (see Figure 8-2, Edit and Validate menus).

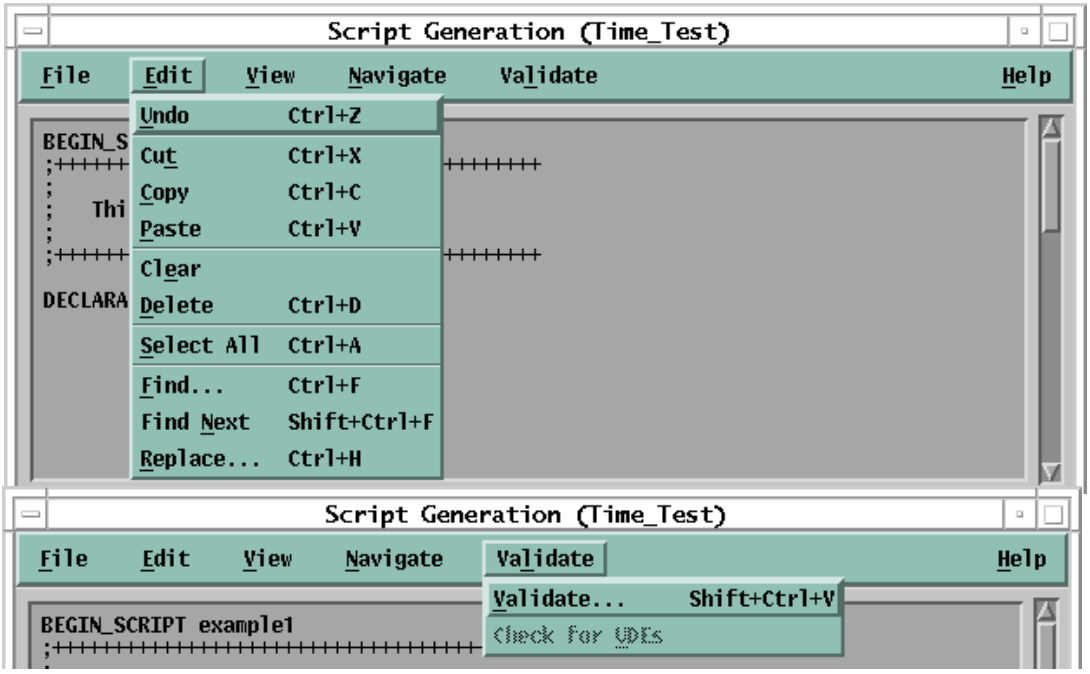


Figure 8-2, Edit and Navigate menus.

8.1.3.1 Find...

The **Find**... menu item invokes a dialog box which allows you to search for text within the opened file (see Figure 8-3, Find dialog box).

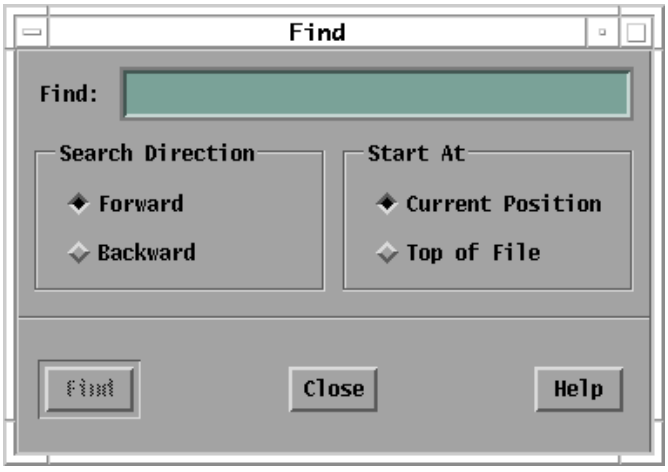


Figure 8-3, Find dialog box.

The dialog box contains a **Find:** input text field, two frames (**Search Direction** and **Start At**) and a buttons area.

The **Find:** input text field is where you enter the desired search criteria. No wildcard characters are permitted in the **Find:** input text field.

Note: The find function is case sensitive and text entered remains after the dialog box is closed, thus making it available for subsequent find operations.

The **Search Direction** frame contains two radio buttons (**Forward** or **Backward**) that allow you to choose the direction that you want the search to move through the file.

The **Start At** frame contains two radio buttons (**Current Position** or **Top of File**) that allow you to choose where you want to begin your search.

8.1.3.2 Find Next

The **Find Next** menu item searches for the next occurrence of the text you specified in the **Find** dialog box. The **Find** dialog box does not have to be open for this function to work.

8.1.3.3 Replace...

The **Replace...** menu item invokes a dialog box that allows you to search for text within the opened file and replace it with new text (see Figure 8-4, Replace dialog box).

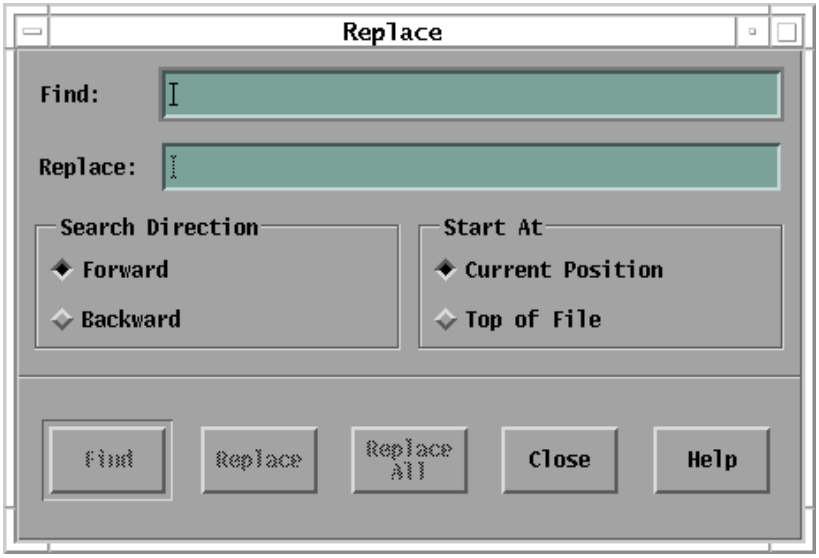


Figure 8-4, Replace dialog box.

The dialog box contains **Find:** and **Replace:** input text fields, two frames (**Search Direction** and **Start At**) and a buttons area.

The **Find:** input text field allows you to enter the desired search criteria. Wildcards cannot be used within this input text field.

The **Replace:** input text field allows you to enter the text that you want to take the place of that specified in the **Find:** input text field.

The **Search Direction** frame contains two radio buttons (**Forward** or **Backward**) that allow you to choose the direction that you want the search to move through the file.

The **Start At** frame contains two radio buttons (**Current Position** or **Top of File**) that allows you to choose where you want to begin your search.

8.1.3.4 Validate...

This menu item invokes the **Validate** dialog box which allows you to validate your script file for proper directive syntax. This function also validates the existence of the referenced Command Database (CDB) and Telemetry Database (TDB) elements and the consistency of data type usage (see Figure 8-5, Validate dialog box).

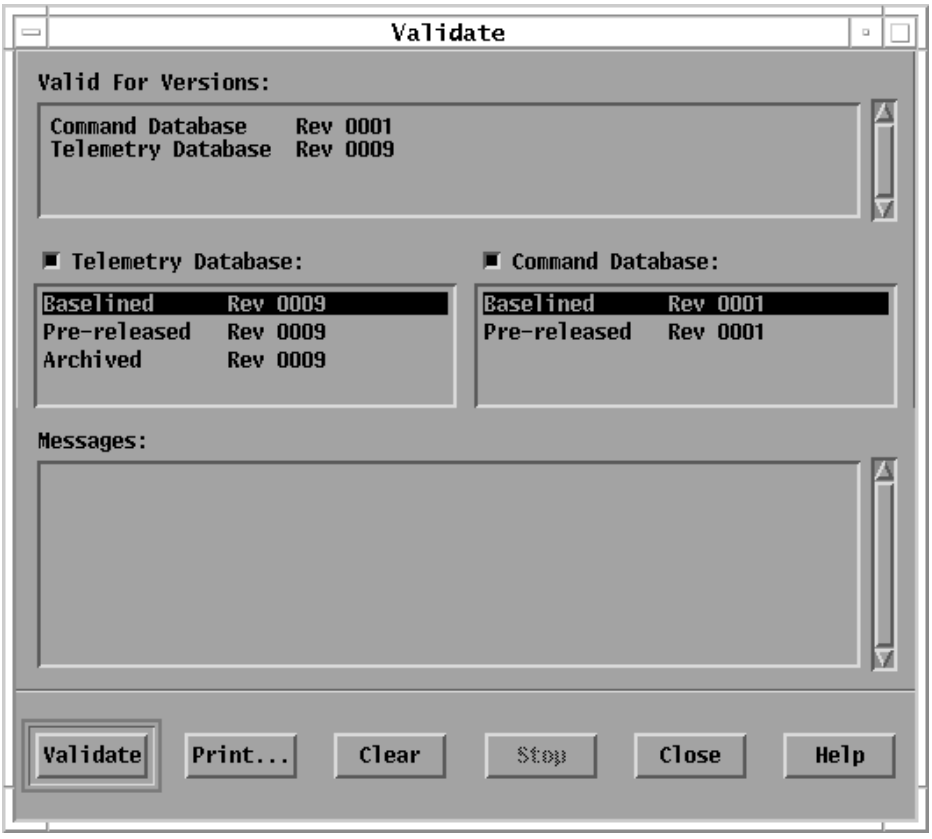


Figure 8-5, Validate dialog box.

The **Valid for Versions:** text field lists the versions of the TDB and CDB that the currently open script has been validated against.

You can validate the script against a TDB by clicking the **Telemetry Database** radio button and then selecting the TDB revision you wish to validate against.

You can also validate the script against a CDB by clicking the **Command Database** radio button and then selecting the CDB revision you wish to validate against.

Tip: Commanding entities such as command headers, command header fields, commands, and command fields are all database items which are checked in the Validate process.

Tip: The **Validate** dialog box may be left open while a script is being debugged. Selecting Validate will initiate a new validation process.

Scripts can be executed in three different data modes: real-time, dump, or playback. If the script is run in a real-time data mode, it must have been validated against the current baselined versions of the TDB and the CDB in order to run.

Scripts running in the real-time data mode can access the current spacecraft's telemetry data and execute commands as well as perform other commanding functions such as updating commands and command chains.

When a script is executed, it must have previously been validated against the TDB version selected. Also, any script that contains commanding functions cannot be executed in playback or dump mode.

A script must be saved prior to validating. If you have not saved the script, you will receive a confirmation dialog box (see Figure 8-6, Validate (Save Changes Confirmation) dialog box).

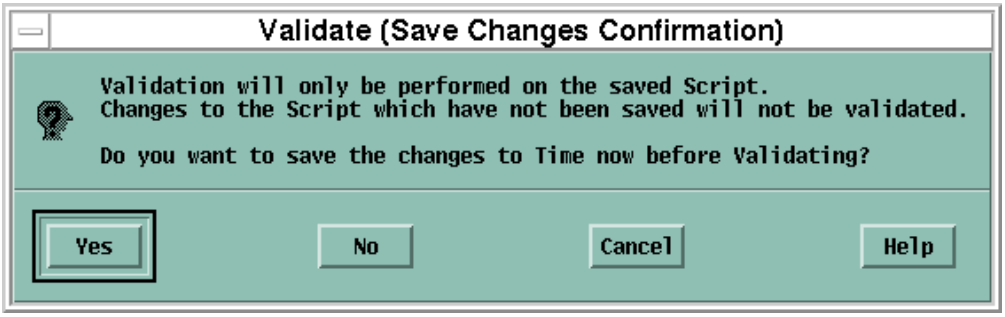


Figure 8-6, Validate (Save Changes Confirmation) dialog box.

8.1.3.5 Check for UDEs

The **Check for UDEs** (User-generated Data Elements) menu item verifies that the UDEs (such as displays, computations, and scripts) referenced in the file exist on your workstation (see Figure 8-7, Check for UDEs (Status UDE) dialog box). The dialog box contains two frames:

- **Found**

- **Missing**

The **Found** frame lists those UDEs referenced in the open file that exist on your workstation. The **Missing** frame lists those UDEs referenced in the open file that need to be found and copied to your workstation.

Note: A script must be open before this menu item is available. Also, scripts must be validated before this menu item becomes available.

Note: If referenced UDEs are not found on your workstation, you can use the Retrieve UDE application from the **File** menu on the **Launchpad** to download the required files.

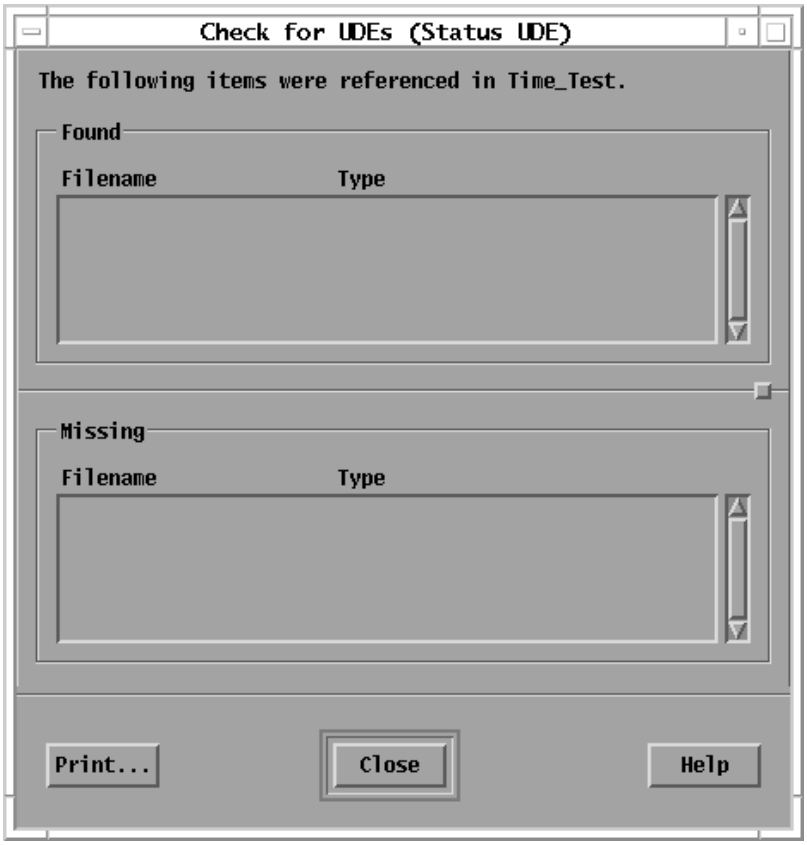


Figure 8-7, Check for UDEs (Status UDE) dialog box.

Note: This function does not check for UDEs referenced in nested scripts. Nested scripts need to be validated and checked on an individual basis.

Note: If any UDEs referenced by the script are missing from your local platform, the UDE's application will be invoked and an error message will be posted in that application's message area.

8.2 Script Operation Overview

The Script Operation application provides an environment in which you can monitor and control the execution of scripts that have been created and validated using the Script Generation application. Through the Script Operation user interface, you can observe the script's execution progress in real-time as each directive is highlighted upon its execution. You can also enter special control directives to alter the script's execution. For example, you can pause the script and then resume it. You could also start executing from a different directive than the next sequential directive in the script.

Note: Although the Script Operation application does provide the capability to monitor and control the execution of a script, you are not required to do so. You can initiate a script, iconify Script Operation, and allow it to execute while you perform other tasks.

The Script Operation main window contains two destinct features that will be discussed in this chapter (see Figure 8-8, Script Operation main window):

- Menu Bar
- Work Area

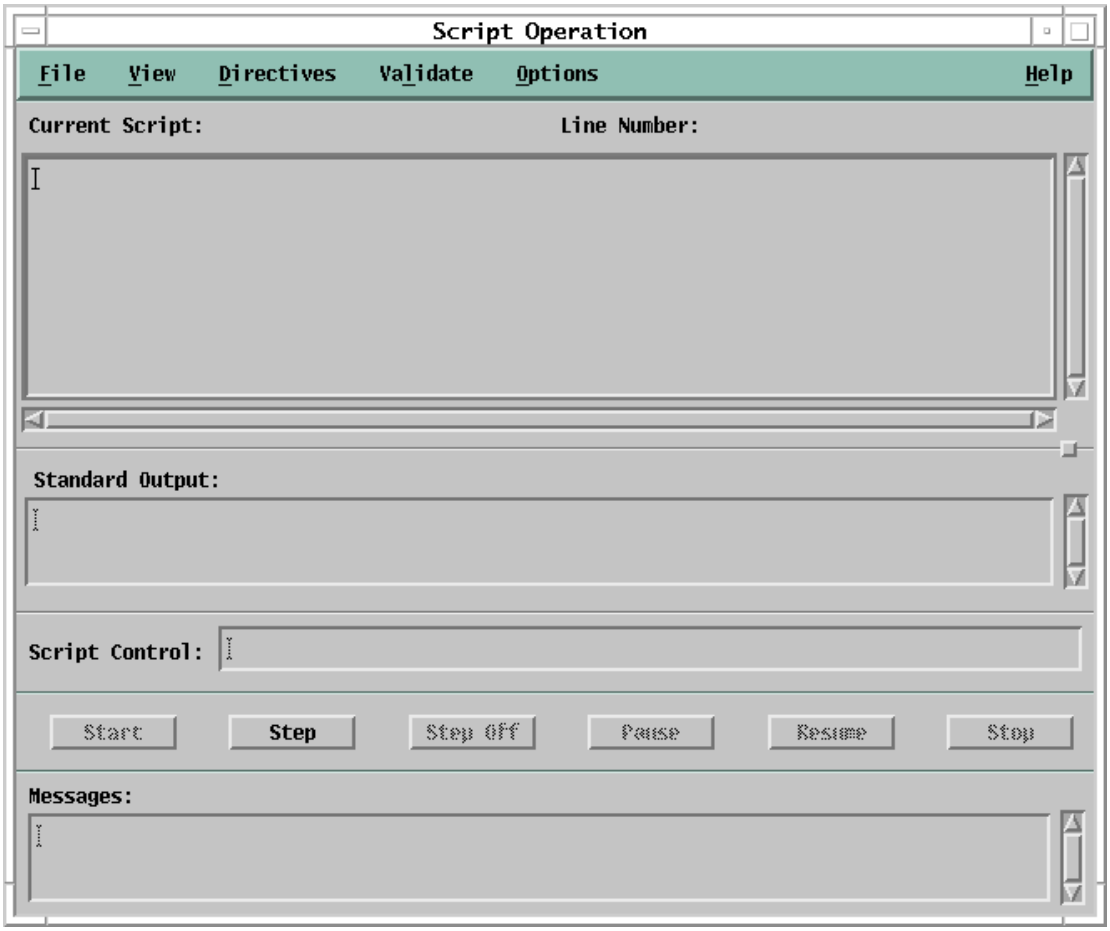


Figure 8-8, Script Operation main window.

8.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **View**, **Directives**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **View** Menu
  - **Clear Standard Output Log**
- **Directives** Menu
  - **Goto...**
  - **Hold At...**
  - **Pause Until...**
  - **Position**
  - **Resume At...**
  - **Echo...**

- **Options** Menu
  - **Start**
  - **Step**
  - **Step Off**
  - **Manual Scroll**
  - **Auto Scroll**

8.2.2 Work Area

The work area of the **Script Operation** main window consists of two display-only fields labeled **Current Script:** and **Line Number:**, a multi-line text area for displaying script files, a **Standard Output:** text display field, and a **Script Control:** text input field.

The **Current Script:** field displays the name of the currently open script file. If no file has been opened, this field is blank.

The **Line Number:** field displays the line number within the script file that is currently highlighted in the multi-line text area. If the script is executing, this field indicates which line number is currently being executed.

The **Standard Output:** text display field is a scrollable text field which will display any text output generated by the script as it executes.

The **Script Control:** input text field allows you to enter special control directives that change the way the script operates while the script is executing (e.g., **Pause**, **Resume**, **Step**, **Goto**, etc.)

Script control directives can be used during the execution of a script. For example, assume that a script has been created to execute a certain display when a Measurement Stimulus Identifier (MSID) goes out of state. If the display is not available on the local platform, a message "event" is generated within the Display Operation application. You may then retrieve the missing display from the User-Generated Data Element (UDE) database using the **Retrieve UDE** application from the **Launchpad**. Once the necessary file has been downloaded, you may execute the script again.

Tip: Although a script must be validated before it can be executed in Script Operation, checking for referenced UDEs is optional. However, it is a good idea to verify the existence of all referenced UDEs before executing a script to avoid having to restart the script.

Several useful script control directives are available from the **Directives** menu and from the control panel pushbuttons.

8.2.3 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Script Generation application. The **Clear Standard Output Log** menu item from the **View** menu as well as all the menu items from the **Directives** menu and the **Start**, **Step**, **Step Off**, **Manual Scroll**, and **Auto Scroll** menu items from the **Options** menu will be discussed (see Figure 8-9, View, Directives, and Options menus).

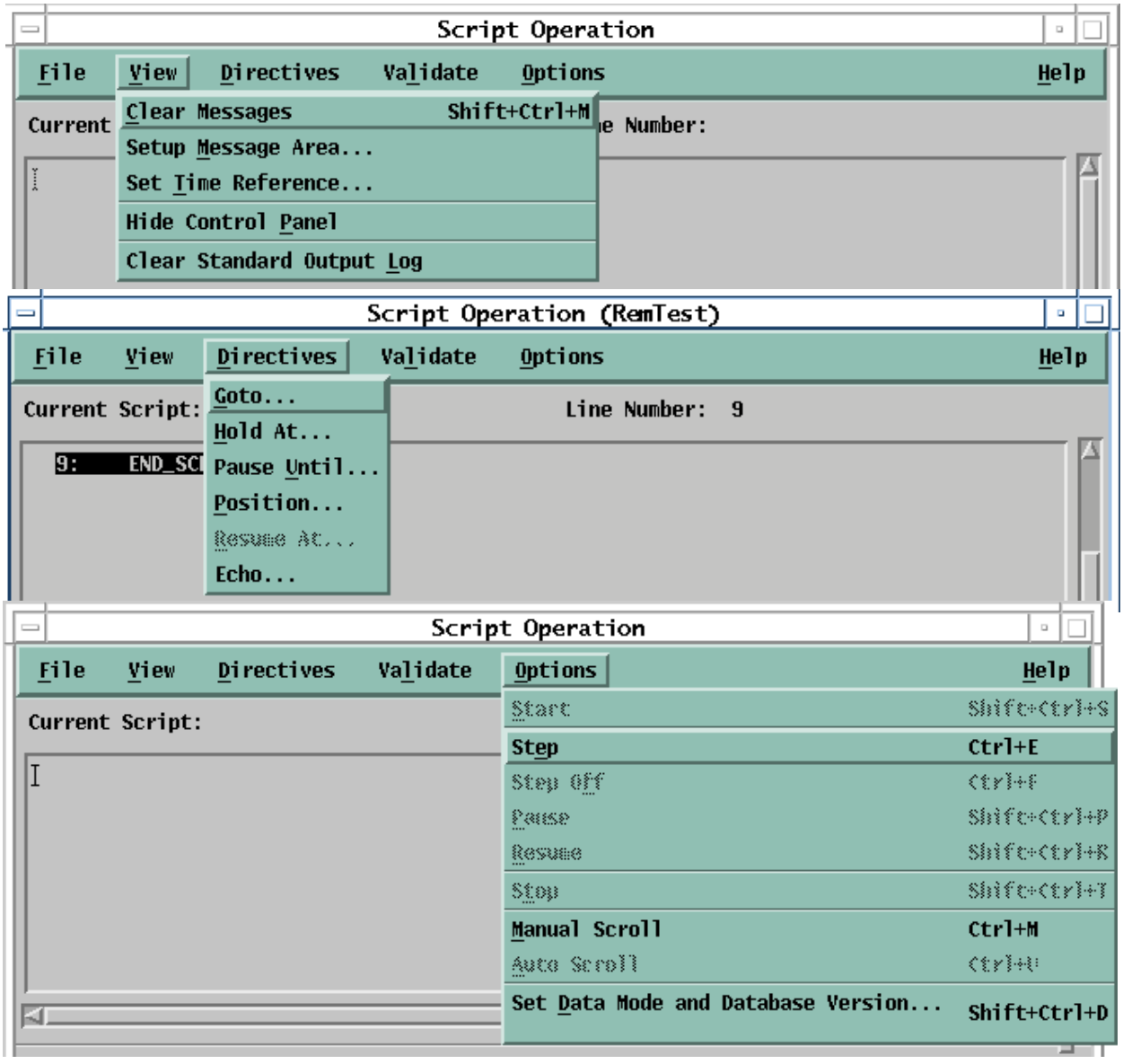


Figure 8-9, View, Directives, and Options menus.

8.2.3.1 Clear Standard Output Log

When you develop a script, you can have the script output written to the **Script Operation** main window's output area. The **Clear Standard Output Log** menu item removes the contents of this area.

CAUTION: If you clear the contents of the standard output log, the information will be lost and you will not be able to retrieve it using the **Print Output Log...** menu item.

8.2.3.2 Goto...

This menu item places the directive **goto** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify the script line number or label to which you wish to shift execution within the script file. After specifying the line number or label, press Enter to go to that line. This menu item is not available if the script is executing a for/while loop.

Example:

`goto 5` Enter (goto line 5)

`goto calculate:` Enter (goto label calculate)

8.2.3.3 Hold At...

This menu item places the directive **hold at** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify the script line number or label at which you wish to hold the execution of the script. After specifying the line number or label, press Enter to notify the application to pause execution at the designated line. This item is available only when the script is executing in step off mode. In addition, this menu item is not available if the script is executing a for/while loop.

Example:

`hold at 5` Enter (hold at line 5)

`hold at calculate:` Enter (hold at label calculate)

8.2.3.4 Pause Until...

This menu item places the directive **pause until** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify the time (in either GMT or MET format) at which you wish the script to resume executing. After specifying the time, press Enter to pause the execution of the script until the specified time. This item is available only when the script is executing. In addition, you can't execute this function if the script is stopped using the "wait" directive or if it is in a for/while loop.

Example:

`pause until 265:00:00:00` Enter (start re-executing script at time 265:00:00:01)

8.2.3.5 Position...

This menu item is available only when the script is executing. It is not available if the script is paused or in step mode. It places the directive **position** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify a line number or label. The script will branch to the specified line and await a **resume** directive before continuing the execution of the script. After entering the desired line number or label, press Enter.

Example:

`position 5` Resume (move to line 5. Once Resume is clicked, the script executes starting at line 5.)

8.2.3.6 Resume At...

This menu item is available only when the script is paused. It places the directive **resume at** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify the script line number or label at which you wish to resume execution of the paused script. After specifying the line number or label, press Enter to resume the execution of the script at that line.

Example:

`resume at 5` Enter (move to line 5. Once Enter is pressed, the script executes starting at line 5.)

8.2.3.7 Echo...

This menu item places the directive **echo** in the **Script Control:** text input field. A cursor will appear after the directive in the **Script Control:** text input field allowing you to specify either **off** or **on**. This directive inhibits or enables operator and script input from being displayed in the **Standard Output:** area of the main window. By default, echo is off.

Example:

`echo on` Enter (operator and script input will be output to the **Standard Output:** area)

8.2.3.8 Start

This menu item clears the **Standard Output:** and starts the execution of the currently open script. This menu item is not available if the script is executing or paused.

Note: To continue the execution of a paused script, use the **Resume** directive.

If the script contains hazardous and/or critical commands, a dialog box will be invoked alerting the user (see Figure 8-10, Start (Hazardous Script) dialog box). The dialog box lists the hazardous and/or critical commands according to its mnemonic and indicates whether it is hazardous (**H**) or critical (**C**).

The user will be required to select whether he wishes to continue executing the script containing the hazardous and/or critical commands.

Help: See the glossary for a definition of hazardous and critical commands.

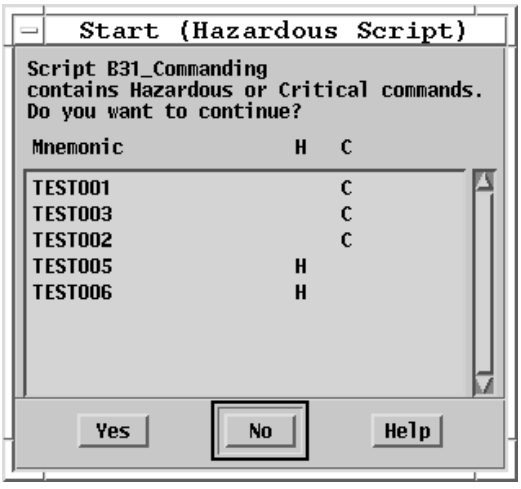


Figure 8-10, Start (Hazardous Script) dialog box.

Selecting Yes returns to the **Script Operation** main window and starts the execution of the hazardous script. Depending on your confirmation level, you may be prompted with this dialog box each time a hazardous or critical command is detected as the script executes.

Help: If you receive any status codes from the packet_status or sample_status items, refer to Appendix S: Status Codes for their meaning. Programmers Reference Manual (HOSC-EHS-067) has all codes defined.

8.2.3.9 Step

This menu item places the executing script in step mode, allowing you to control the rate of script execution. Entering the directive **step on** causes the script to pause after each directive is executed, requiring you to enter the **resume** directive before execution can continue with the next directive. If you enter the directive **step** *time*, where *time* is a number of seconds, the script will pause for *time* seconds after each directive is executed and does not require you to manually resume the script's execution.

This is useful for debugging a script since the results of each line of directives may be examined more closely. This item becomes available once the script has been started. It is also available when a script is paused and is not already executing in step mode.

8.2.3.10 Step Off

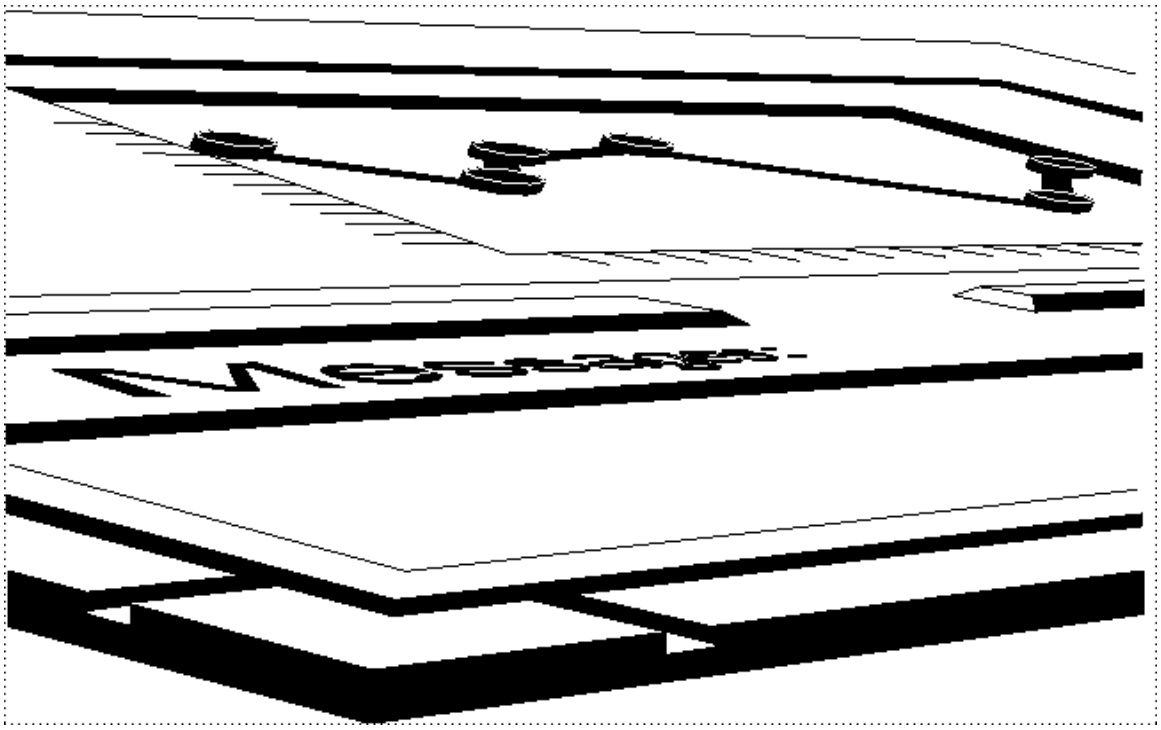
This menu item returns a script that is executing in step mode back to the normal execution (non-step) mode. This item is available only when the script is executing in step mode.

8.2.3.11 Manual Scroll

Selecting this menu item requires you to scroll the multi-line text fields containing the script file and output log as the script executes. This is useful when you wish to examine a section of the script or output log while allowing the script execution to continue. If you are manually scrolling through the output log, any new output will cause the log to jump to the bottom of the screen so that the new data can be displayed.

8.2.3.12 Auto Scroll

Selecting this menu item allows the multi-line text fields containing the script file and output log to scroll automatically as the next script line is executed and new output is placed in the output log.



Chapter 9: End-User Command Application Software

This chapter addresses four command applications:

- Command Group Generation application
- Command Update Form Generation application
- Command Operation application
- Downlink Request application

This chapter also covers the Update Command mini-application which can be invoked from the Command Operation, Script Operation, Display Operation or Scratchpad Line (SPL) applications.

The Huntsville Operations Support Center (HOSC) supports users in both operational and nonoperational support modes. During operational support modes, a command server is available to support mission and simulation activities. The applications in this document are for use during operational support activities. Any updates to commanding data made in an operational support mode will be made to data contained in the Operational Command Database (OCDB) which is hosted on the command server. During non-operational support modes, changes you make to command data are maintained in the Project Command Database (PCDB) which is hosted on a

project database server. Changes to the PCDB are implemented using the Command Database software. The transition of commanding-related data from the PCDB to the OCDB is performed by the Integrated Support Team (IST) and occurs prior to entering an operational support mode. The OCDB is created from and is identified by its parent PCDB.

Individual commands may be comprised of configuration-controlled and nonconfiguration-controlled data fields. Data fields that are configuration-controlled are defined by the project office and are changed through the submission of a Database Change Request (DBCR). Data fields that are not under configuration-control are called modifiable and authorized users (those with the appropriate owner and user ID) may use the applications identified in this document to update the modifiable portions (fields) of these commands.

Note: While individual commands may contain fields that are under configuration control, users may define command data sets, the definitions of which, are not under configuration control (except for preventing invalid data and unauthorized access).

Command Group Generation Application

Command Group Generation is an application which allows you to create a file which defines a group of commands that you can manipulate and uplink as a whole. This file is stored as one of your User-generated Data Elements (UDEs) and if you modify this file, it only impacts that UDE. The Command Group Generation application is available off the **Launchpad** from the **Generation** menu. This application provides you with the means to define, save, and validate command groups. This application utilizes the Update Command Group mini-application to modify individual commands in a group.

Command Update Form Generation Application

The Command Update Form Generation application provides you with the means to create and edit command update forms. Once created, these forms can be called from within Command Operation to change values in modifiable commands and headers and then subsequently, to uplink these commands. This application, available off the **Launchpad** through the **Generation** menu, allows you to generate forms for those commands and headers you are authorized to access.

Command Operation Application

The Command Operation application is available off the **Launchpad** from the **Operation** menu. This application provides you with the means to uplink your commands and to invoke the Update Command mini-application. You are provided with command, file, and header inventories that you can sort and filter. You can also use this application to configure certain aspects of your commanding environment.

Update Command Mini-application

The Update Command mini-application provides you with the means to view command and header data in the OCDB and then to alter those modifiable header and command fields within the forms. It also allows you to update variable length, variable data commands using system-provided update forms. System-provided command update forms can be used to view data for both predefined and modifiable commands. The Update Command mini-application is initiated from Command Operation, as well as through scripting, displays, and the scratchpad line to update commands and headers within the OCDB.

Downlink Request Application

The Downlink Request application is available to both EHS workstation users and remote users (via a web server) off the **Launchpad** from the **Operation** menu. This application provides the capability to submit a request for a file downlink from the International Space Station (ISS). It will support requests for a memory dump in a future software build.

9.1 Command Group Generation Overview

The Command Group Generation application allows you to build, update, and save command group definitions. The Update Command Group mini-application, invoked from Command Operation, allows you to update and save the selected command group which can then be uplinked through the Command Operation application. Both the Command Group Generation and the Update Command Group mini-application utilize the Update Command mini-application to define data for modifiable commands in a group. The Command Group Generation application is accessed through the **Launchpad**, whereas the Update Command Group mini-application is accessed through:

- Update in Command Operation
- a Scratchpad Line (SPL) directive in the Scratchpad Line application
- a SPL directive in the Display Operation application

Note: If you want to create a new command group, you must go through the Command Group Generation application. The Update Command Group mini-application only allows you to modify the selected existing command group. New, Open and Save As functions are not provided in the Update Command Group mini-application. This permits users to build groups without being privileged to uplink them.

A command group is a list of sequenced commands which are intended for uplink in response to a single user request. Group commands have the following characteristics:

- Contain no hazardous commands

- A single modifiable command may be listed within a command group many times, each instance of the command containing a different set of data stored within the group definition.
- Many command groups may be created by the user and stored as User-Generated Data Elements (UDEs).

Note: Command groups can only be created using the OCDB.

The Command Group Generation main window contains two distinct features that will be discussed in this chapter (see Figure 9-1, Command Group Generation main window):

- Menu Bar
- Work Area

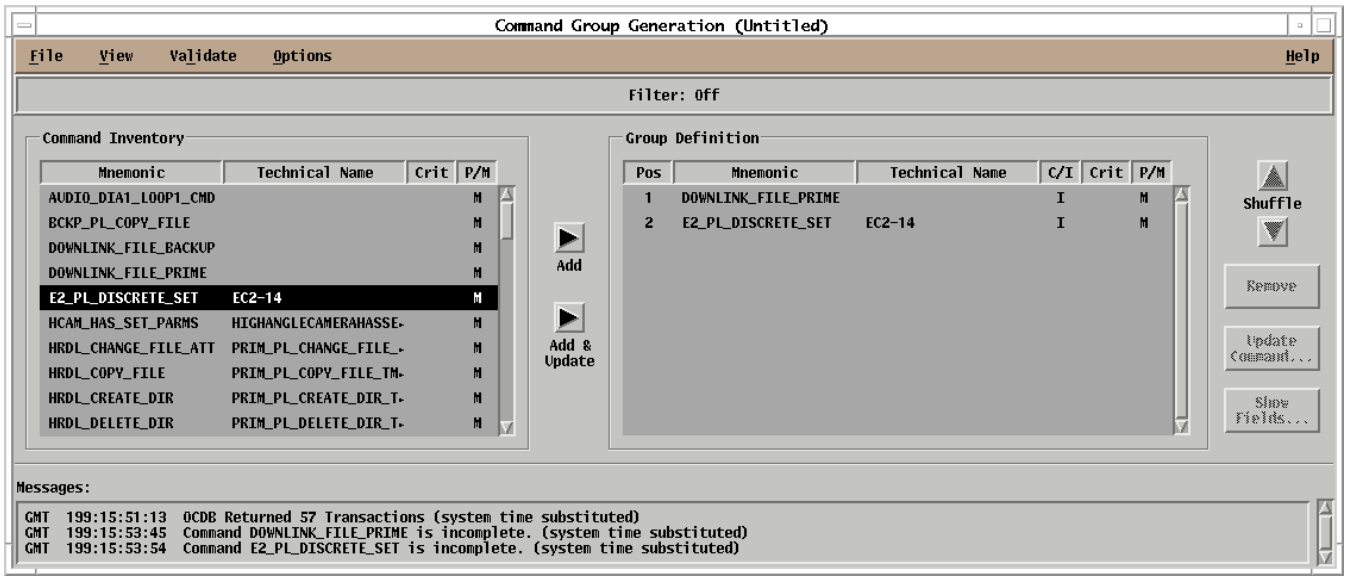


Figure 9-1, Command Group Generation main window.

9.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Validate** Menu
  Validate...
- **Options** Menu
  Find Command Inventory Mnemonic...

9.1.2 Work Area

The work area contains two frames: **Command Inventory** and **Group Definition**.

The **Command Inventory** frame consists of a selection list that contains all non-hazardous command mnemonics available to the current user (after applying any filter criteria) and their associated critical and predefined or modifiable flags as defined in the OCDB. The list is presented alphabetically by mnemonic.

The commands and their associated data are reconfigured when a filter is applied. The filter criteria is "anded" together and applied to the original Command Inventory list to determine the commands to list in the table.

The command list has four columns: **Mnemonic**, **Technical Name**, **Crit**, and **P/M**.

Mnemonic - contains the mnemonic of the command.

Technical Name - contains a unique name assigned to the command, it may be thought of as a long version of the command mnemonic.

If the entire technical name does not fit into the technical name cell of the table, an Inventory Tooltip will be invoked after the mouse pointer has been inside one of the technical name cells of the table for one and a half seconds (see Figure 9-2, Inventory Tooltip). The tooltip will be unmanaged after ten seconds or when the mouse pointer has moved out of the current technical name cell of the table.

Crit - indicates whether the command has been deemed critical. This column will be either blank or contain the letter **C** for critical. The background color of the cells containing critical flags will be yellow.

Help: See the "Glossary" for a definition of critical commands.

The **P/M** column is used to identify predefined and modifiable commands. A **P** in this column indicates that the command is predefined. Predefined commands are those which you cannot modify. An **M** in this column indicates that you can change data within the modifiable fields that comprise the command.

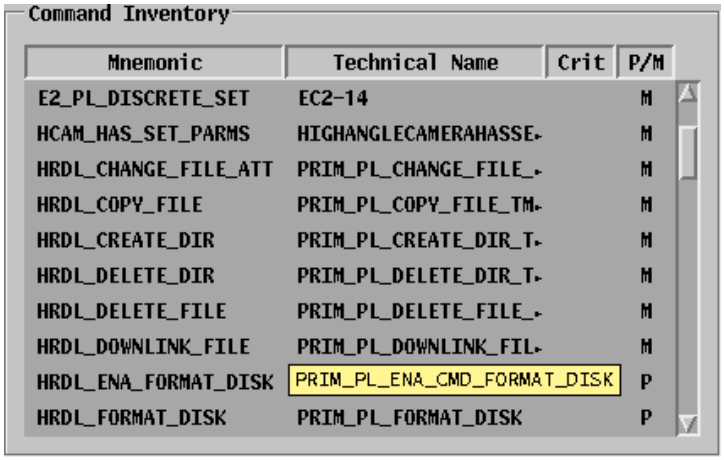


Figure 9-2, Inventory Tooltip.

Add and **Add & Update** are placed between the **Command Inventory** and **Group Definition** lists to facilitate adding command(s) from the **Command Inventory** list to the **Group Definition** list. **Add & Update** allows you to invoke the Update Command mini-application and update the command data before adding it to the group. **Add & Update** is insensitive when no row is selected or when multiple rows are selected in the Command Inventory table. **Add** adds the command to the group without data, unless the command is predefined, in which case its defined data is used. **Add** is insensitive when no row is selected in the Command Inventory table.

The **Group Definition** frame shows those commands that are currently included in the specified group. Commands are listed according to position in the group definition.

When the **Add** or **Add & Update** function is performed or when an item in the **Command Inventory** table is double-clicked, a new row is added to the bottom of the table, and the table is scrolled to the bottom so that the new row is visible. The row will contain the next position number, the command mnemonic selected from the command inventory, and the command's associated complete/incomplete status, critical status, and predefined/modifiable flags.

The list contains six columns: **Pos**, **Mnemonic**, **Technical Name**, **C/I**, **Crit**, and **P/M**.

Pos - indicates the position number of commands in the group.

Mnemonic - shows the command mnemonic.

Technical Name - contains a unique name assigned to the command, it may be thought of as a long version of the command mnemonic.

If the entire technical name does not fit into the technical name cell of the table, a Group Tooltip will be invoked after the mouse pointer has been inside one of the technical name cells of the table for one and a half seconds (see Figure 9-3, Group Tooltip). The tooltip will be unmanaged after ten seconds or when the mouse pointer has moved out of the current technical name cell of the table.

C/I - identifies complete and incomplete commands. This column shows a **C** if the command is complete and an **I** if the command is incomplete.

Crit - indicates whether the command has been deemed critical. This column will either be blank or contain the letter **C** for critical. The background color of the cells containing critical flags will be yellow.

Help: See the "Glossary" for a definition of critical commands.

The **P/M** column is used to identify predefined and modifiable fields. A **P** in this column indicates that the command is predefined. Predefined commands are those for which you cannot modify. An **M** in this column indicates that you can change data within the fields that comprise the command.

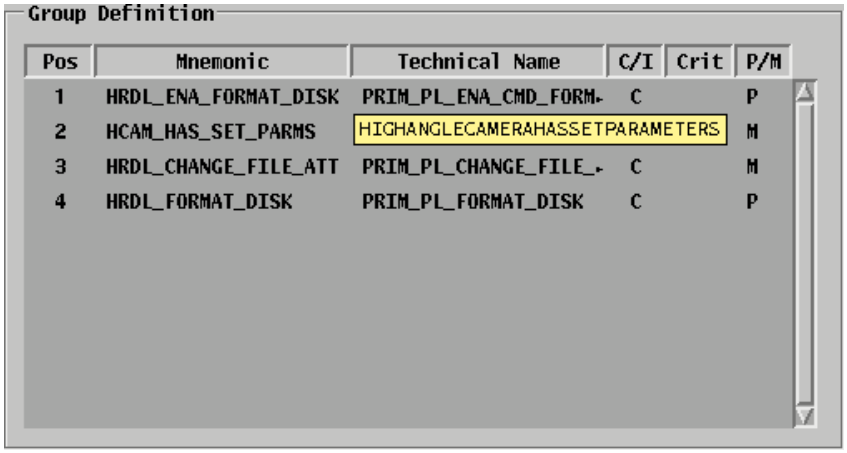


Figure 9-3, Group Tooltip.

Shuffle and allow you to rearrange the position of selected commands within the group. When the **Shuffle** is clicked the selected row exchanges places with the row above it. When the **Shuffle** is clicked the selected row exchanges places with the row below it. In either case, the Position numbers remain in place and only the contents of the row are moved. The **Shuffle** and are insensitive when any command's uplink date is being updated.

The Remove deletes the selected command from the group. This button is sensitive when a row is selected in the Group Definition table.

Note: You will need to save the group after changes are made.

The Update Command... invokes the Update Command mini-application to modify data for the selected command. This button is sensitive when a row is selected in the Group Definition table.

The Show Fields... invokes the **Show Fields** dialog box (see Figure 9-4, Show Fields dialog box). This button is sensitive when a row is selected in the Group Definition table and the command in that row of the table is modifiable.

The **Show Fields** dialog box contains the values of each of the modifiable fields of the command being viewed. No predefined field data is shown.

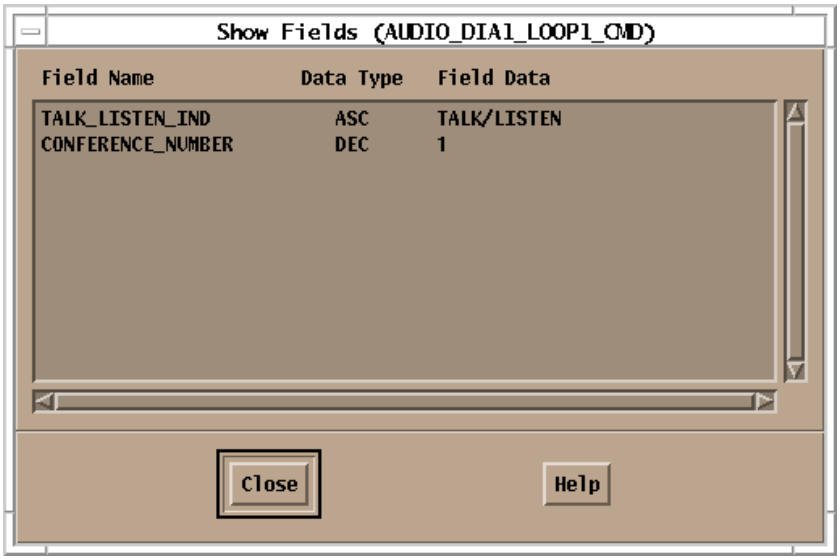


Figure 9-4, Show Fields dialog box.

Information is presented in the form of a scrollable list and is organized in columns labeled **Field Name**, **Data Type**, and **Field Data**.

The **Field Name** column identifies the user-friendly mnemonic for the modifiable command field.

The **Data Type** column identifies the input data type of the field data. The following table maps the input type displayed in the dialog box to the input data type defined in the OCDB:

Table 9-1 Input Data Types.

Display Input Type	OCDB Input Data Type	Description
ASC	A	ASCII
DEC	D	Decimal
BIN	B	Binary
HEX	H	Hexadecimal
OCT	O	Octal
SCI	G	Scientific Notation

The **Field Data** column contains the initial data for the field which may be modified during operational activities. The data is provided in the input data type specified for the field.

9.1.3 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Command Group Generation application. The **Validate...** menu item from the **Validate** menu as well as the **Find Command Inventory Mnemonic...** menu item from the **Options** menu will be discussed (see Figure 9-5, Validate and Options menus).

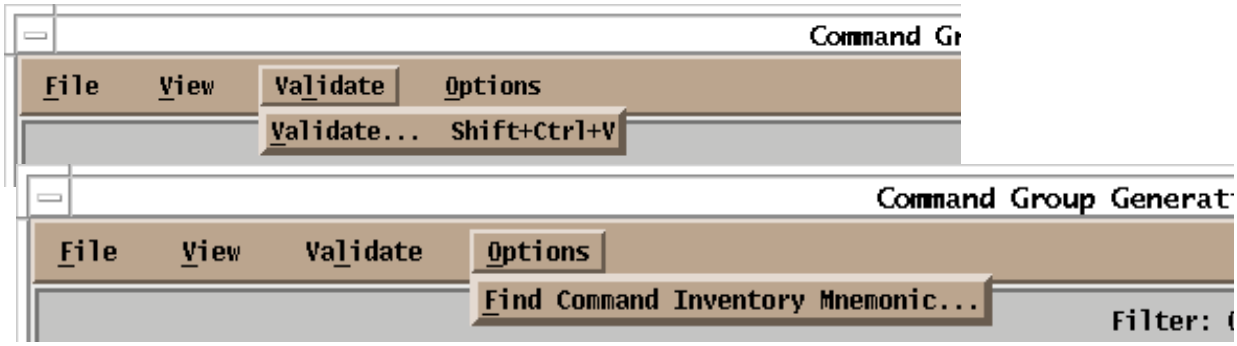


Figure 9-5, Validate and Options menus.

9.1.3.1 Validate...

The **Validate...** menu item invokes the **Validate** dialog box as shown in Figure 9-6, Validate dialog box).

Since command groups are built using commands from the Operational Command Database (OCDB), command groups, at the time they are built, are valid. Command groups however, are maintained outside the OCDB and therefore must be validated each time a new Project Command Database (PCDB) is baselined. The validation function verifies that the commands in a group are defined in the PCDB and are accessible to the user.

CAUTION: Groups may be valid against a database and not be complete. This means that groups that have been validated may still not be ready for uplink.

Note: Groups must be saved before validation can be performed.

Note: The **Validate** dialog box opens with the results of the last validation process displayed. This allows you to start the validation process, close the dialog box, and later to reopen it to view the results in the message area.

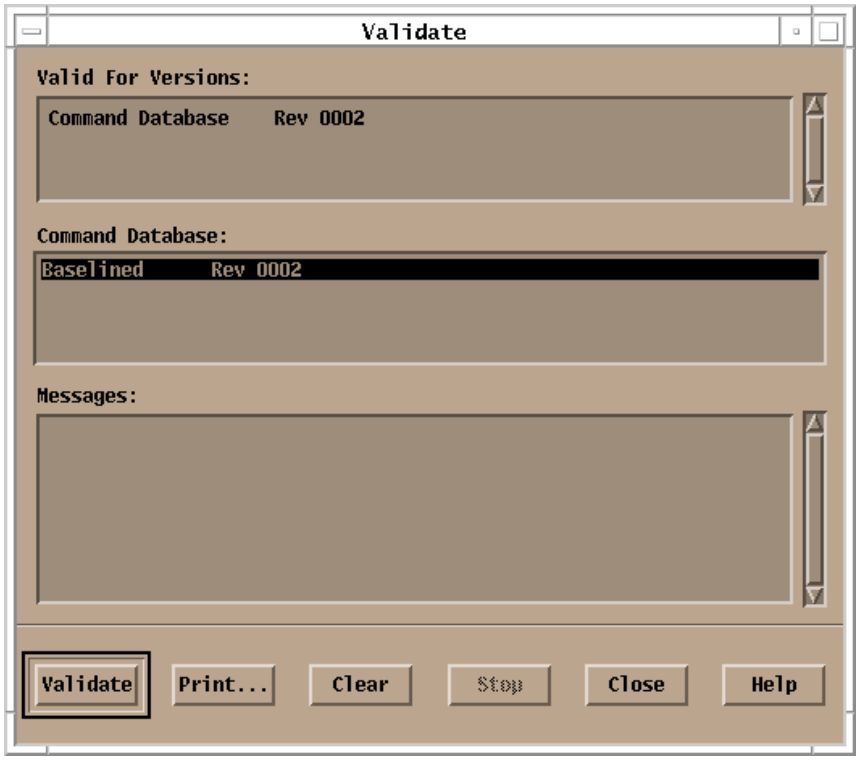


Figure 9-6, Validate dialog box.

This dialog box includes the **Valid for Versions:**, **Command Database**, and **Messages:** sections.

The database versions against which this particular command group has already been successfully validated will be displayed in the **Valid for Versions:** area of the **Validate** dialog box. By looking at this section of the dialog box you can quickly identify whether or not this command group has already been validated against a particular database.

In the **Command Database** area of the **Validate** dialog box, you can select whether to validate this command group against a particular PCDB. The revision number of each of the available databases is shown. Clicking on the desired database will activate the selection.

The results of the validation process are posted in the message area of the **Validate** dialog box.

Note: If you start validation for a command group while messages are in the message area, the new messages will be appended to the list of existing messages.

Tip: If you fix validation errors before a pre-released database is baselined, then the group may not be valid for current operational activities. You may need to wait until the database is baselined before correcting the validation error identified by the pre-released database.

9.1.3.2 Find Command Inventory Mnemonic...

The **Find...** menu item allows you to perform a search based on your inventory radio button selection.

Table 9-2, Find... matrix.

Inventory Selected	Options Menu Item	Dialog Box Invoked
Command	**Find Mnemonic...**	**Find Mnemonic** dialog box
Header	**Find Mnemonic...**	**Find Mnemonic** dialog box
Group	**Find Group Name...**	**Find Group Name** dialog box
File	**Find File Name...**	**Find File Name** dialog box

Depending on your inventory selection, the menu item will change and the labeling of the dialog box invoked will change, but, the basic construction and functionality of the dialog box will remain consistent. This find function is not case-sensitive. No wildcards are permitted and the found command, file, etc. will be highlighted within the inventory list.

For purposes of this discussion, assume that you have a Command Inventory radio button selected. Selecting the **Find Mnemonic...** menu item invokes the **Find Mnemonic** dialog box (see Figure 9-7, Find Mnemonic dialog box). You can specify the mnemonic for a command that you'd like to locate within the **Command Inventory** list on this window.

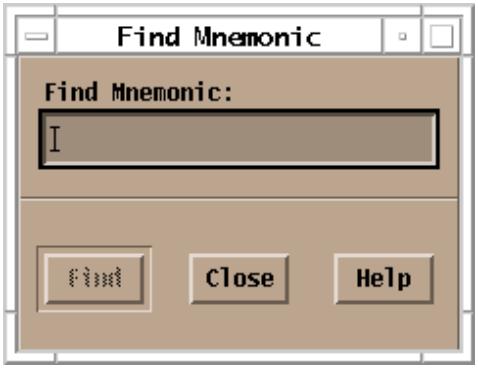


Figure 9-7, Find Mnemonic dialog box.

9.2 Command Update Form Generation Overview

The Command Update Form Generation application provides you with the means to create, edit, save, validate, and print command update forms used to update modifiable commands which you are authorized to access. Forms created with this application, while stored on your local platform, may also be stored in the User-generated Data Element (UDE) database like displays, computations, scripts, etc. System-provided, fixed-format forms are invoked for variable-length commands so that you can view and modify the information contained in the single, variable-length, modifiable field, but you can not customize how information on a system-provided form is displayed. System-provided forms may also be used to view data within predefined commands.

Note: You can have only one update form for each command or header. A bulk generation option is provided so that default forms may automatically be created for many commands at one time.

Note: Once you have created an update form, you use the Update Command mini-application (available through Command Operation, Script Operation, Display Operation, and the Scratchpad Line applications) to view, modify, and update the command in the Operational Command Database (OCDB). The Command Operation application is used to initiate the command uplink.

The Command Update Form Generation main window contains several distinct features that will be discussed in this chapter (see Figure 9-8, Command Update Form Generation main window).

- Menu Bar
- Tool and Attribute Bar
- Work Area

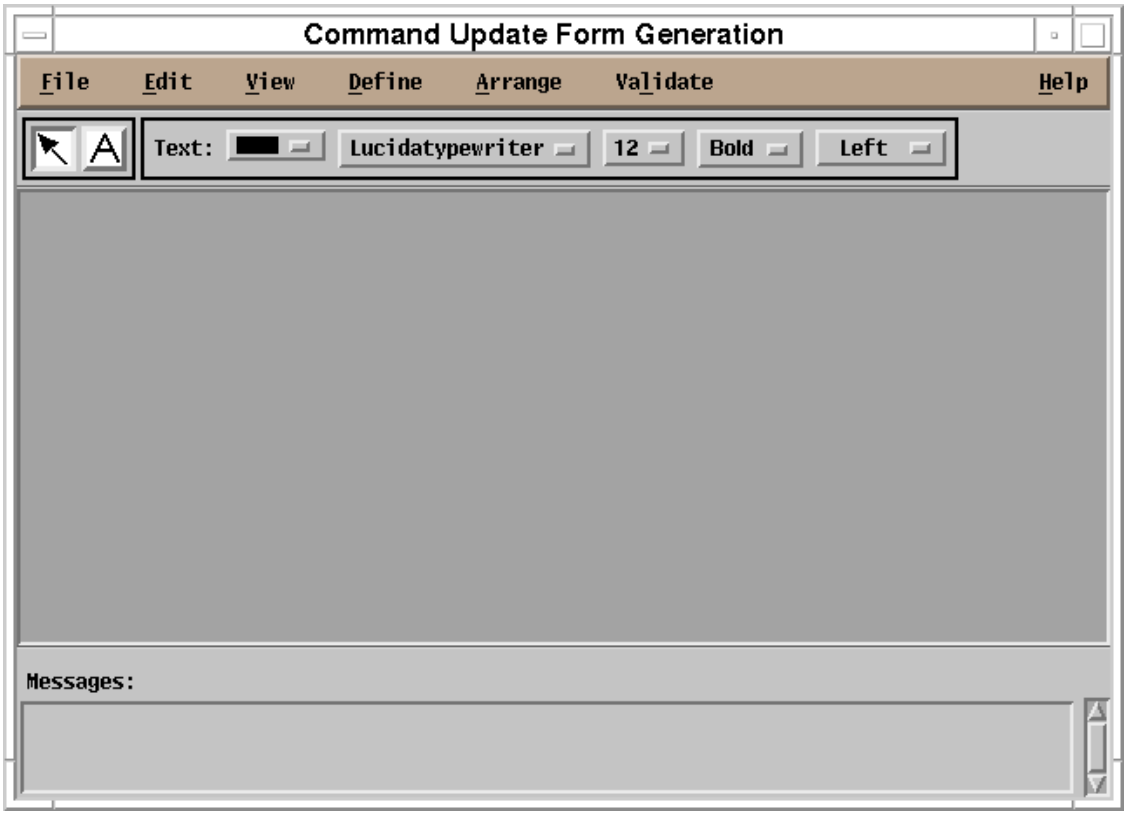


Figure 9-8, Command Update Form Generation main window.

9.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes seven menus: **File**, **Edit**, **View**, **Define**, **Arrange**, **Validate**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **Generate Command Form...**
  - **Generate Header Form...**
  - **Regenerate...**
  - **Bulk Generate Command Forms...**
  - **Bulk Generate Header Forms...**
- **Edit** Menu
  - **Add Predefined Fields...**
- **View Menu**
  - **Redraw**
- **Define** Menu
  - **Set Object Attributes...**

9.2.2 Tool and Attribute Bar

The tool and attribute bar provides you with the tools needed to create, edit, and change the appearance of text used in command update forms. The tool and attribute bar includes (see Figure 9-8, Command Update Form Generation main window):

- Select arrow
- Text tool
- Text color
- Font
- Text size
- Text style
- Text justification

This bar shows the current attributes for text and cannot be removed from the main window. It allows you to set defaults for creating new text and to change the attributes of selected text.

9.2.3 Work Area

The work area is initially blank, but will display the contents of a command update form when a new form is generated or a saved form is opened. A command update form shows the fields that comprise the referenced command. Command update forms can contain text, predefined fields, and modifiable fields (see Figure 9-9, Update form objects).

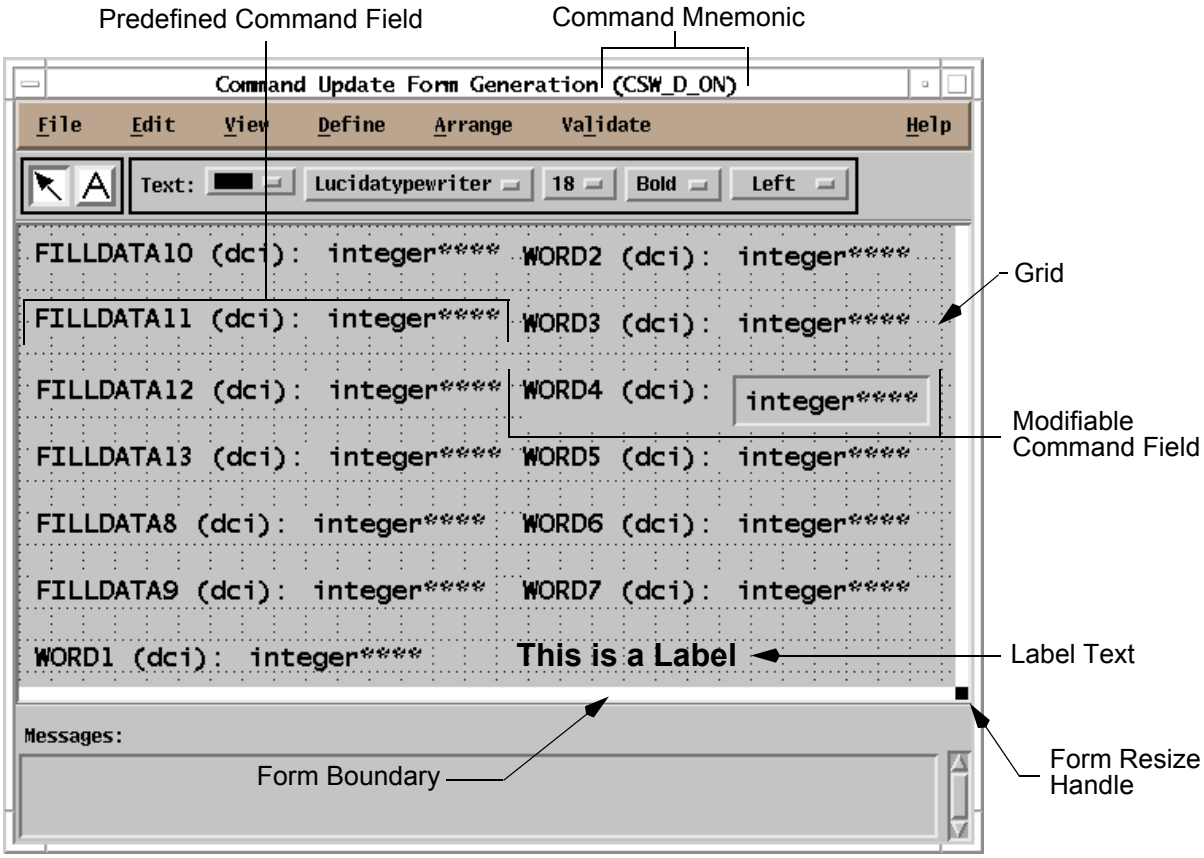


Figure 9-9, Update form objects.

Predefined and modifiable command field objects consist of a label and a data field. The label of these field objects defaults to the field mnemonic but you can change the label to whatever you want using the **Set Object Attributes...** menu item available under the **Define** menu. Text labels can be added to your forms using the text tool.

Because the data field for predefined field objects cannot be changed using the Update Command mini-application, the data field appears as a display-only label. On the other hand, the data field for modifiable field objects can be changed using the Update Command mini-application; therefore, the data fields appear as text entry fields. Data fields within the Command Update Form Generation application are shown using the data representation nomenclature and field length defined in the CDB for each field mnemonic. Available entries are:

- ascii
- binary
- decimal
- hexadecimal
- integer
- octal
- scientific notation

If the data field itself is shorter in length than the nomenclature used to describe it, the entry will be truncated to fit within the defined number of characters (i.e., bi, hexa, i). Conversely, if the data field is longer in length than the nomenclature used to describe it, the remaining characters will be filled by trailing asterisks (i.e., binary**, octal*******).

The **Command Update Form Generation** main window can be shown with a grid to help you align field objects displayed on the screen. As the application default, the grid is not shown. To show the grid, select the **Setup Grid...** menu item from the **View** menu.

Tip: Click on the **Show Grid** and the **Snap to Grid** toggle buttons, located on the **Setup Grid** dialog box, to make placing and aligning objects easier.

When you create a new command update form, the form will be created at the minimum size needed to accommodate all field objects. This is only a default size and it may be enlarged.

Note: You cannot shrink your form smaller than that needed to display all objects, but you can reduce the size of your window. Enlarging and reducing your form work area is not the same as enlarging and reducing the window.

You can use the form resize handle to resize the command update form's work area. Select the form resize handle and drag the handle using the left mouse button until it is the appropriate size. You can also select the **Define Form Size...** menu item under the **Define** menu.

Tip: It is recommended that you start with a large form for laying out your objects. When you are satisfied with the form layout, select the **Fit Form to Objects** menu item under the **Define** menu to shrink your update form to the minimum size needed to display all the objects on your layout.

Tip: You will be unable to resize the form's work area with Caps Lock depressed.

9.2.4 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Command Group Generation application. The **Generate Command Form...**, **Generate Header Form...**, **Regenerate...**, **Bulk Generate Command Forms...**, and **Bulk Generate Header Forms...** menu items from the **File** menu as well as the **Add Predefined Fields...** menu item from the **Edit** menu, the **Redraw** menu item from the **View** menu, and the **Set Object Attributes...** menu item from the **Define** Menu will be discussed (see Figure 9-10, File, Edit, View, and Define menus).

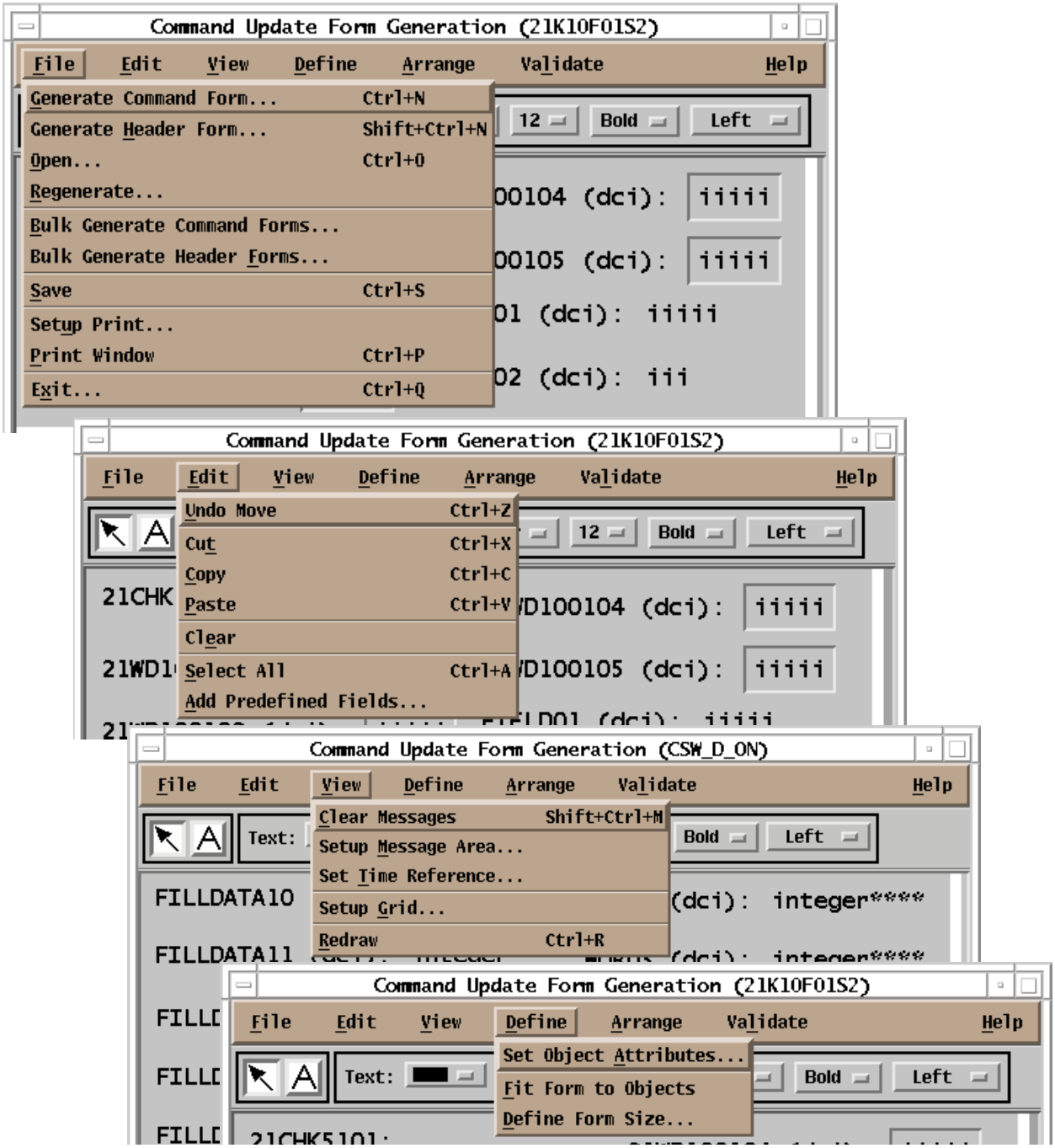


Figure 9-10, File, Edit, View, and Define menus.

9.2.4.1 Generate Command Form...

The **Generate Command Form...** menu item invokes the **Generate Command Form** dialog box (see Figure 9-11, Generate Command Form dialog box). This dialog box provides you with the means to create a command update form for those commands that do not have a command update form generated (stored locally on your workstation). Command update forms provide you with the

mechanism necessary to change data in modifiable fields using the Update Command mini-application invoked from within Command Operation. The **Generate Command Form** dialog box is comprised of four major areas:

- Database selection list
- Mnemonic selection list
- **Create:** options area
- Buttons area

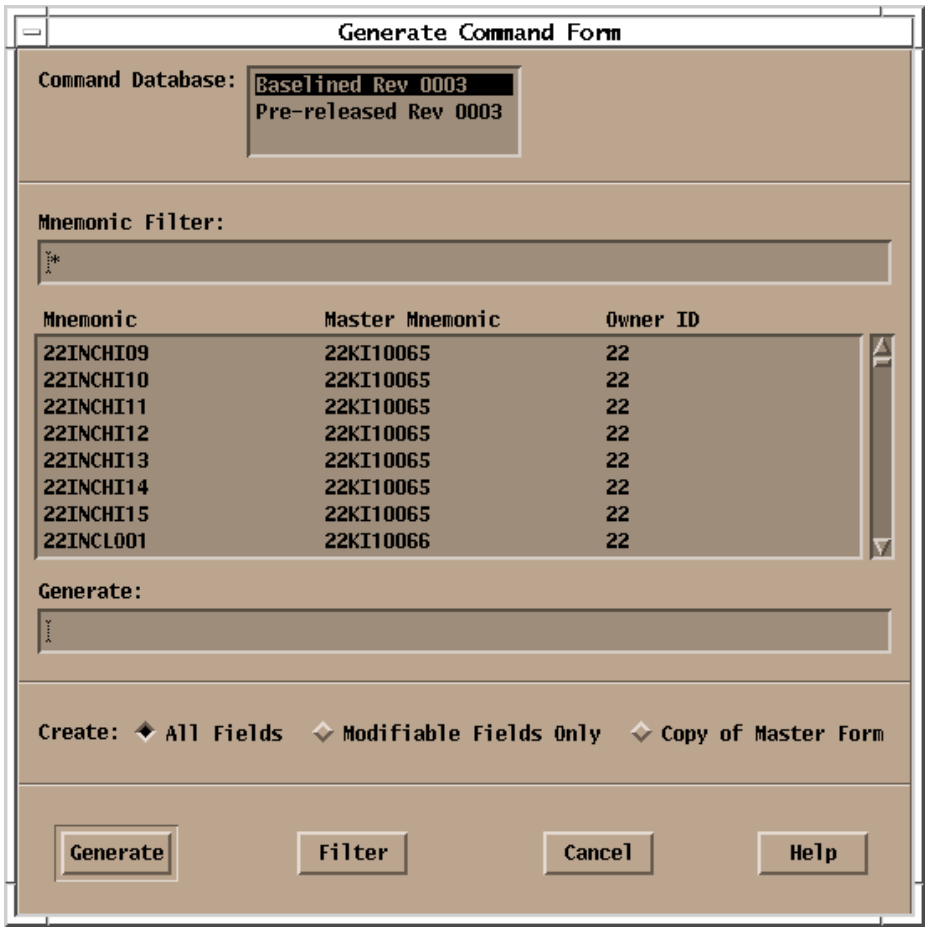


Figure 9-11, Generate Command Form dialog box.

Each area of this dialog box is unique and will be discussed in the following sections.

From the database selection list, you select the **Command Database:** you want to use to generate your command forms. **Baselined**, **Pre-released,** and **Delivered** databases are listed. Only one can be selected. Selection causes the mnemonic list to be populated.

Help: See the “Glossary” for a definition of **Baselined**, **Pre-released,** and **Delivered** databases.

The **Mnemonic Filter:** input text field, by default, contains the asterisk wildcard which results in all commands being listed that you are authorized to access and for which you do not already have a command update form stored on your local platform. To narrow this list, you can specify mnemonic filtering criteria (e.g., entering HEAT* as filter criteria will list all commands beginning with HEAT) and click Filter or press Enter to initiate the filter function.

The mnemonic selection list area will be populated with those commands you are authorized to access and which meet your filtering criteria. The command's **Mnemonic** is provided in the first column of this selection list.

If your project has defined modifiable commands which are copies of a master command (a command template), then not only is the copied command's mnemonic listed, but so is the master command's mnemonic from which it was built. The **Master Mnemonic** column allows you to easily identify commands that have the same structure. Commands with a master mnemonic may be updated with a master update form. The master/copy designations for commands are defined during project database definition, and as an end-user, you cannot change these designations online. The master/copy command designation carries through to update forms so that you can create and alter one form (the master form), which in turn, will be used by all commands which are copies of the master (unless the individual command already has its own unique form).

The final column of this list identifies the owner of each command by **Owner ID**. An owner ID may be a particular experiment, payload, or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users with their data.

Once you have filtered your command selection list, you then select the single command for which you want a new form generated. The selected command is displayed in the **Generate:** input text field.

Within the **Create:** area there are three radio buttons that allow you to select the type of command fields to be included in the generated form. The radio buttons are labeled as follows:

- **All Fields** (both predefined and modifiable)
- **Modifiable Fields Only**
- **Copy of Master Form**

Note: The **Copy of Master Form** radio button is insensitive when the selected command in the mnemonic list does not have an associated master mnemonic. The **All Fields** radio button is selected by default. If the master mnemonic form has not been created, you will receive a message in the message area and a command form will not be generated.

Clicking the Generate creates an update form for the command listed in the **Generate:** input text field using the database and creation option you selected. This dialog box will be closed and you will be returned to the **Command Update Form Generation** main window where the form is displayed. The form will be named the same as the command mnemonic from which it was generated. This is the default pushbutton when the cursor is in the **Generate:** input text field.

9.2.4.2 Generate Header Form...

The **Generate Header Form...** menu item invokes the **Generate Header Form** dialog box (see Figure 9-12, Generate Header Form dialog box). Generally, headers contain routing information, and like command update forms, they may be comprised of both predefined and modifiable fields. The header is appended as a preface to a command before it is uplinked. Each command may have only one header assigned to it. When a header form is opened within the Update Command mini-application, it will be displayed with the information relevant to its associated header.

Like the **Generate Command Form**, the **Generate Header Form** dialog box is comprised of four major areas:

- Database selection list
- Mnemonic selection list
- **Create:** options area
- Buttons area

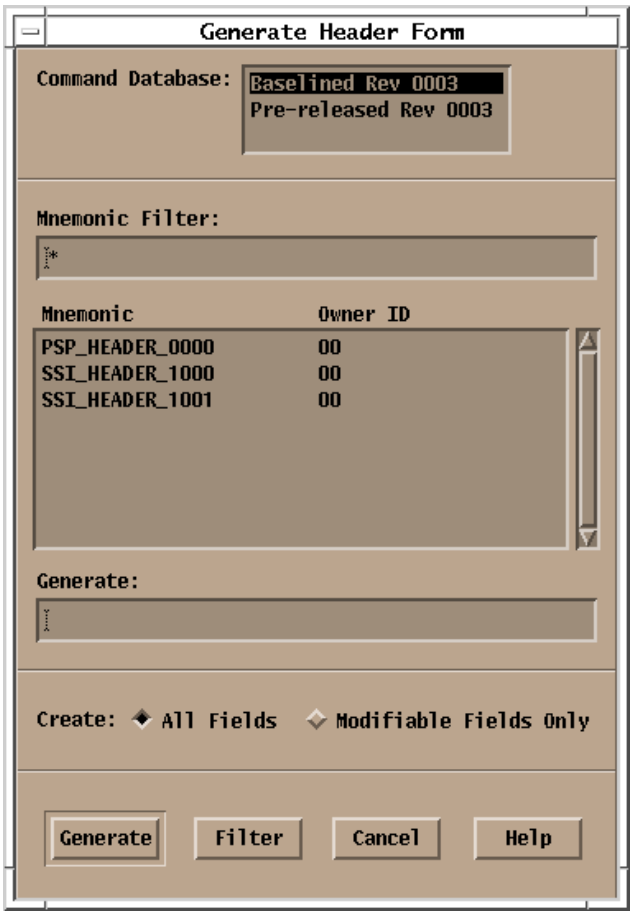


Figure 9-12, Generate Header Form dialog box.

Each area of this dialog box is unique and will be discussed in the following sections.

From the database selection list, you select the **Command Database:** you want to use to generate your header update form. **Baselined**, **Pre-released,** and **Delivered** databases are listed. Only one can be selected. Selection causes the mnemonic list to be populated.

Help: See the "Glossary" for a definition of **Baselined**, **Pre-released,** and **Delivered** databases.

The **Mnemonic Filter:** input text field contains the asterisk wildcard which results in all headers you have the privilege to access, and for which you do not already have a header form built, to be included in the mnemonic selection list. To narrow this list, you can specify header filtering criteria and click Filter or press Enter to initiate the filter function.

The header selection list identifies each header by its mnemonic. The header's **Mnemonic** is shown in the first column of this selection list.

The second column of this list identifies the owner of each header by **Owner ID**. An owner ID may be a particular experiment, payload, or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users with their data.

Once the header selection list has been populated, you select the header for which you want a new form generated. The selected header is displayed in the **Generate:** input text field.

Within the **Create:** area, there are two radio buttons. You select whether you want all fields (both predefined and modifiable) or just the modifiable fields included on your update form. Click on the appropriate radio button.

Note: The **All Fields** radio button is the default. If you generate a header update form that includes only modifiable fields, you can later add any predefined fields associated with the header using the **Add Predefined Fields** dialog box accessible from the **Edit** menu.

Clicking the Generate creates an update form for the header listed in the **Generate:** input text field using the database and creation option you selected. This dialog box will be closed and you will be returned to the **Command Update Form Generation** main window where the form will be displayed. The form will be named the same as the header mnemonic from which it was generated. The is the default pushbutton when the cursor is in the **Generate:** input text field.

9.2.4.3 Regenerate...

If you have already created an update form for a particular command or header mnemonic, the **Regenerate...** menu item allows you to revert back to the initial default form for that mnemonic. The **Regenerate...** menu item is available only if an update form is currently displayed in the work area. The **Regenerate...** menu item invokes the **Regenerate** dialog box (see Figure 9-13, Regenerate dialog box). This dialog box is comprised of three major components:

- Database selection list
- **Create:** options area
- Buttons area

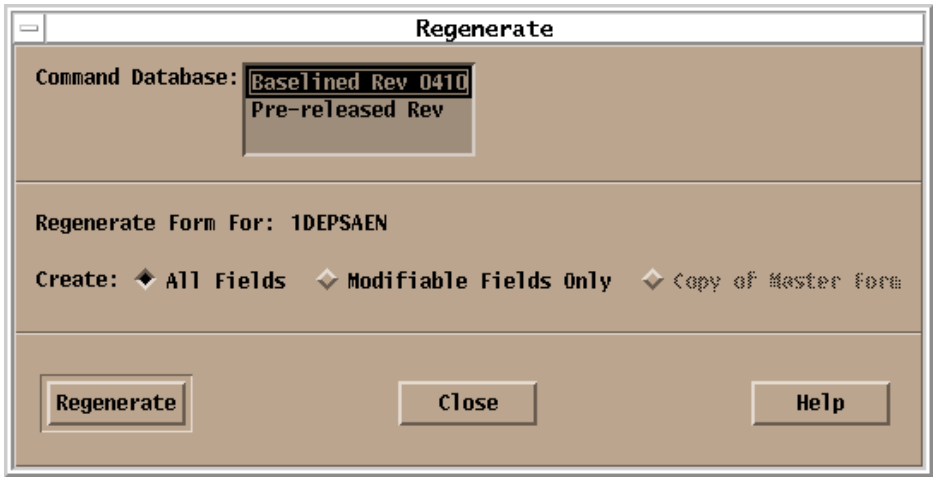


Figure 9-13, Regenerate dialog box.

Note: The default text attributes that are currently set will be used when the form is regenerated.

From the database selection list, you select the **Command Database:** you want to use to regenerate your form. **Baselined**, **Pre-released**, and **Delivered** databases are listed. Only one can be selected.

In the **Create:** options area, the first line identifies the command or header mnemonic for which the update form is being regenerated. This display-only text field is located to the right of the **Regenerate Form For:** label. Three **Create:** area radio buttons allow you to select whether you want all command fields included on your update form (both predefined and modifiable), just the modifiable fields, or a copy of a master form. Click on the appropriate radio button.

Note: The **Copy of Master Form** radio button is not available for headers and is insensitive when the identified command does not have an associated master mnemonic.

Clicking Regenerate recreates an update form for the mnemonic identified using database defaults associated with that command mnemonic. This dialog box will be closed and you will be returned to the **Command Update Form Generation** main window where the form will be displayed. This is the default pushbutton.

If you attempt to regenerate a form without saving changes to the currently opened form, you will receive a confirmation dialog box (see Figure 9-14, Regenerate (Save Changes Confirmation) dialog box).

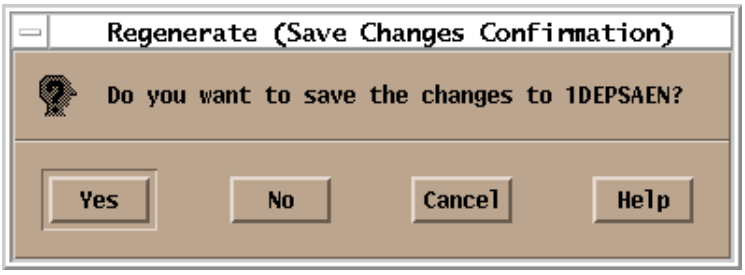


Figure 9-14, Regenerate (Save Changes Confirmation) dialog box.

The dialog box contains a informational message asking if you want to save changes. Clicking Yes saves changes to the current file prior to invoking the **Regenerate** dialog box.

9.2.4.4 Bulk Generate Command Forms...

The **Bulk Generate Command Forms...** menu item invokes the **Bulk Generate Command Forms** dialog box (see Figure 9-15, Bulk Generate Command Forms dialog box). This dialog box allows you to create multiple command update forms for either commands you can access that do not currently have an update form (stored on your local workstation) or for your master commands that do not have an update form (stored on your local workstation).

Tip: To save time, generate forms for master commands; then generate individual forms from the master.

The **Bulk Generate Command Forms** dialog box has four major areas:

- Database selection list
- Mnemonic list
- **Create On Form:** area
- Buttons area

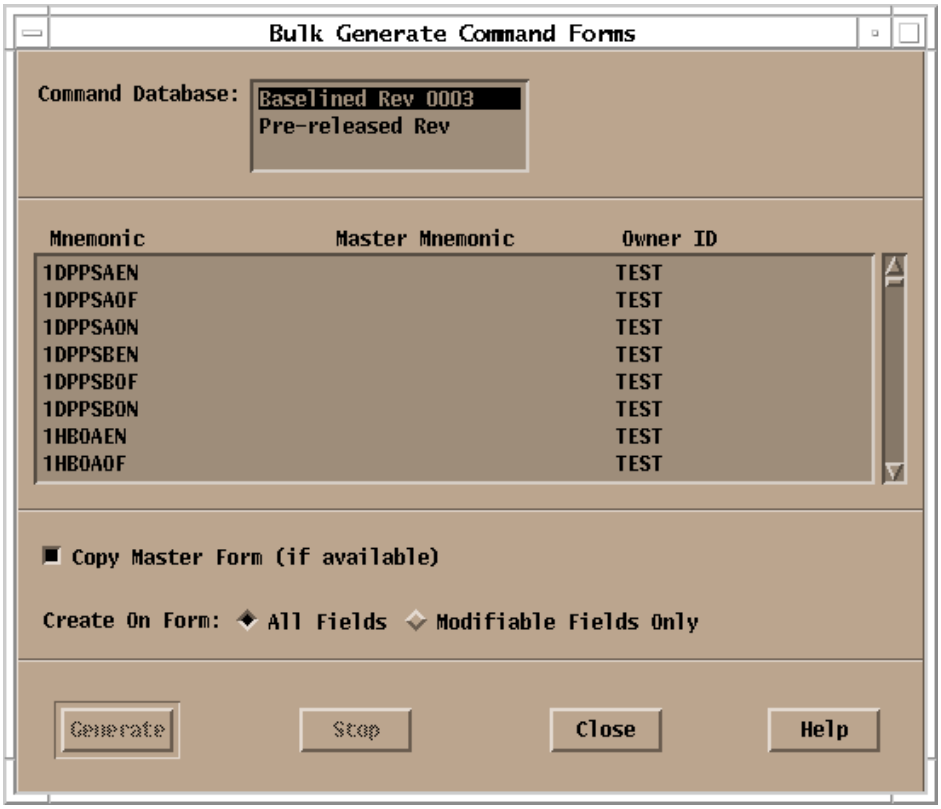


Figure 9-15, Bulk Generate Command Forms dialog box.

From the database selection list, you select the **Command Database:** you want to use to generate all your command forms. **Baselined**, **Pre-released**, and **Delivered** databases are listed. Only one can be selected. Selection causes the mnemonic list to be repopulated.

In the mnemonic list area, you will be provided a list of all commands that you have access to and for which update forms are not already created and stored on your workstation. The mnemonic list identifies each command by mnemonic. The command's **Mnemonic** is provided in the first column of this list. If your project has defined modifiable commands which are copies of a master command, then not only is the copy command's mnemonic included, but so is the master command's mnemonic.

The **Master Mnemonic** column of this list allows you to easily identify commands that have the same structure. Commands with a master mnemonic may be updated in Command Operation with a master update form. The master/copy designations for commands are defined during project database definition, and as an end-user, you cannot change these designations online. The master/copy command designation carries through to update forms so that you can create and alter one form (the master form), which in turn, will be used by all those commands which are copies of the master unless they have their own unique form.

The final column of this list identifies the owner of each command by **Owner ID**. An owner ID may be a particular experiment, payload, or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users with their data.

At this point you elect to either create command update forms for selected commands or master commands. Commands with the same master mnemonic may be updated from their individual form, or if one has not been generated, from their master mnemonic's form. To generate only master forms, you must toggle "on" the **Copy Master Form** toggle button. The **Create On Form:** radio buttons allow you to select whether you want all command fields included on your update forms (both predefined and modifiable), or just the modifiable fields.

Clicking the Generate creates update forms or master forms (depending on whether the **Copy Master Form** toggle button is "On" or "Off") for those commands and/or master commands you have selected in the mnemonic list. Selecting this function does not affect the work area. This is the default pushbutton.

Note: You must use the **Open...** menu item to see bulk-generated command update forms. They are not automatically displayed in the **Command Update Form Generation** main window.

9.2.4.5 Bulk Generate Header Forms...

The **Bulk Generate Header Forms...** menu item invokes the **Bulk Generate Header Forms** dialog box (see Figure 9-16, Bulk Generate Header Forms dialog box). This dialog box allows you to create command header update forms automatically for all commands you can access that do not currently have a header update form (stored on your local workstation). The **Bulk Generate Header Forms** dialog box has four major areas:

- Database selection list
- Mnemonic list
- **Create On Form:** area
- Buttons area

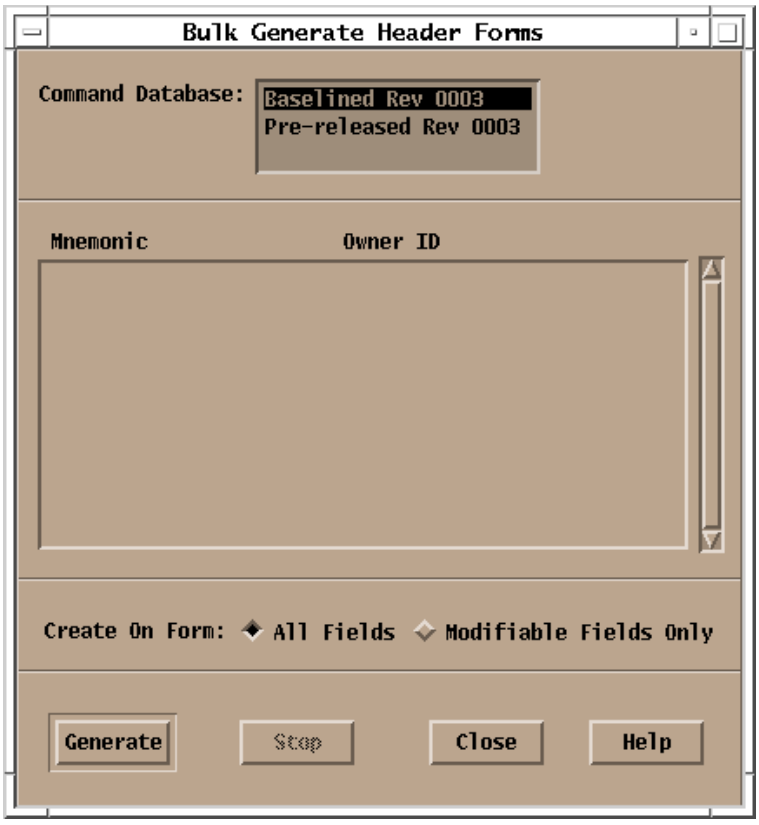


Figure 9-16, Bulk Generate Header Forms dialog box.

From the database selection list, you select the **Command Database:** you want to use to generate all your header forms. **Baselined**, **Pre-released**, and **Delivered** databases are listed. Only one can be selected. A new selection will repopulate the mnemonic list.

In the mnemonic list area, you will be provided a list of all headers that you have access to and for which header update forms are not already created and stored on your workstation. The list identifies each header by mnemonic. The **Mnemonic** is provided in the first column of this list.

The second column of this list identifies the owner of each header by **Owner ID**. An owner ID may be a particular experiment, payload, or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users with their data.

The **Create On Form:** radio buttons allow you to select whether you want all command header fields included on your update forms (both predefined and modifiable), or just the modifiable fields.

Clicking the Generate creates header update forms for all headers in the mnemonic selection list. This is the default pushbutton.

Note: You must use the **Open...** menu item to see bulk-generated header forms. They are not automatically displayed in the **Command Update Form Generation** main window.

9.2.4.6 Add Predefined Fields...

The **Add Predefined Fields...** menu item invokes the **Add Predefined Fields** dialog box (see Figure 9-17, Add Predefined Fields dialog box). In the event you created an update form which included only modifiable fields and then change your mind and want to also include predefined fields, the **Add Predefined Fields** dialog box allows you to selectively add predefined fields to your form. The **Add Predefined Fields** dialog box has two lists with arrow buttons between them to facilitate the movement of fields on and off the update form. The **Fields Not on Form:** lists those predefined fields not currently included on the form. The **Add to Form:** lists those predefined fields you would like to have included on the form.

- is located between the two extended selection lists. It is grayed out until a field in the **Fields Not On Form:** list is selected. Once a field has been selected, clicking this button will place the field on the **Add To Form:** list.

- is located between the two extended selection lists. It is grayed out until a field in the **Add to Form:** list is selected. Once a field has been selected in the **Add to Form:** list, clicking this button will place the field back on the **Fields Not On Form:** list.

An extended selection policy for this dialog box permits you to select multiple items from the **Fields Not On Forms:** list and then to add all of them at once to the **Add To Form:** list.

Note: Moving items from the **Add To Form:** list to the **Fields Not On Form:** list does not remove predefined fields already placed on the form.

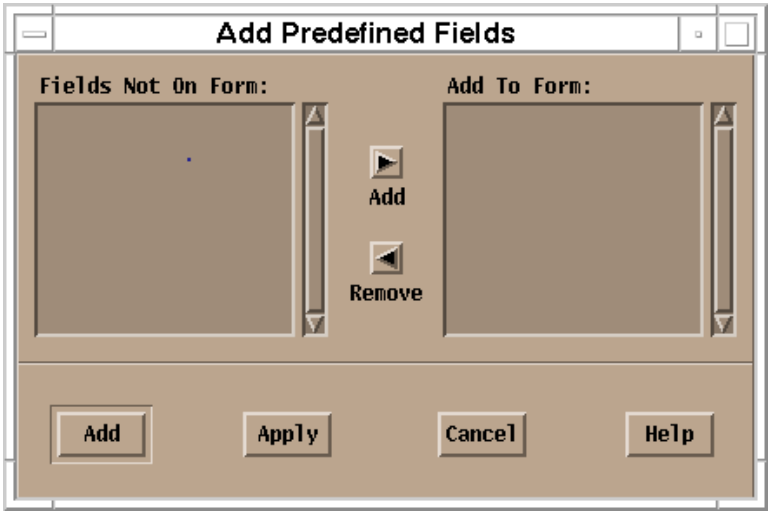


Figure 9-17, Add Predefined Fields dialog box.

Clicking the Add adds the selected field(s) on the **Fields Not On Form:** list to the **Add To Form** list and returns you to the **Command Update Form Generation** main window. This is the default pushbutton. Clicking the Apply adds the selected field(s) on the **Fields Not On Form:** list

to the **Add To Form** list and leaves the **Add Predefined Fields** dialog box open so that you can continue to add fields at your discretion.

Tip: Fields on the **Fields Not on Form:** list may be added to the **Add to Form:** list by double-clicking on the desired field name.

9.2.4.7 Redraw

If for any reason objects on your update form are not correctly shown, the **Redraw** menu item allows you to refresh the form.

To redraw, click on the **View** menu and click on **Redraw**.

9.2.4.8 Set Object Attributes...

There are only three types of objects available within this application: text, predefined field, and modifiable field. A field consists of a label and a data field. As a result, the **Set Object Attributes...** menu item invokes one of two dialog boxes, either the **Set Text Attributes** dialog box or the **Set Field Attributes** dialog box, depending on the type of object selected. Both of these dialog boxes will be addressed below.

9.2.4.8.1 Set Text Attributes Dialog Box

The **Set Text Attributes** dialog box is used to change the way your text is shown on an update form (see Figure 9-18, Set Text Attributes dialog box). You must have text (not a field or field label) selected in order for this dialog box to be invoked. This dialog box is comprised mainly of option menu buttons that provide you with your choices.

Text default attributes are:

- Black text
- **Lucidatypewriter** font
- **12** point
- **Bold**
- **Left**-justified
- No underline

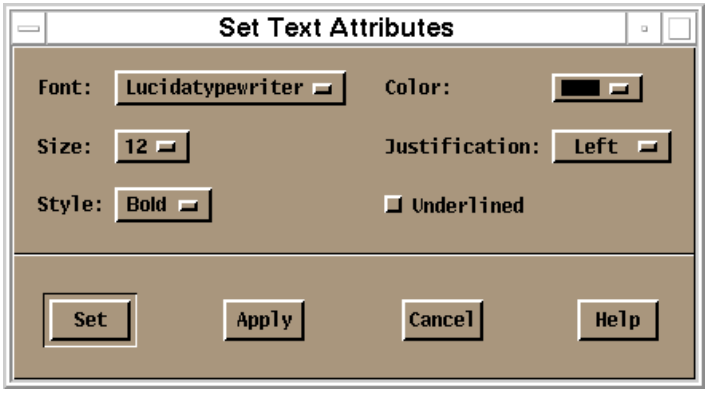


Figure 9-18, Set Text Attributes dialog box.

Clicking the Set implements choices you have made on the **Set Text Attributes** dialog box and returns you to the application main window. This is the default pushbutton. Clicking the Apply implements any changes you have made, but leaves the dialog box open. This permits you to observe the changes and continue to implement additional changes without having to invoke the dialog box again.

9.2.4.8.2 Set Field Attributes Dialog Box

The **Set Field Attributes** dialog box is used to change the way information within predefined and modifiable fields is shown on an update form (see Figure 9-19, Set Field Attributes dialog box). You must have a field selected in order for this dialog box to be invoked. The dialog box is comprised of two frames: the **Field Attributes** frame and the **Object Attributes** frame.

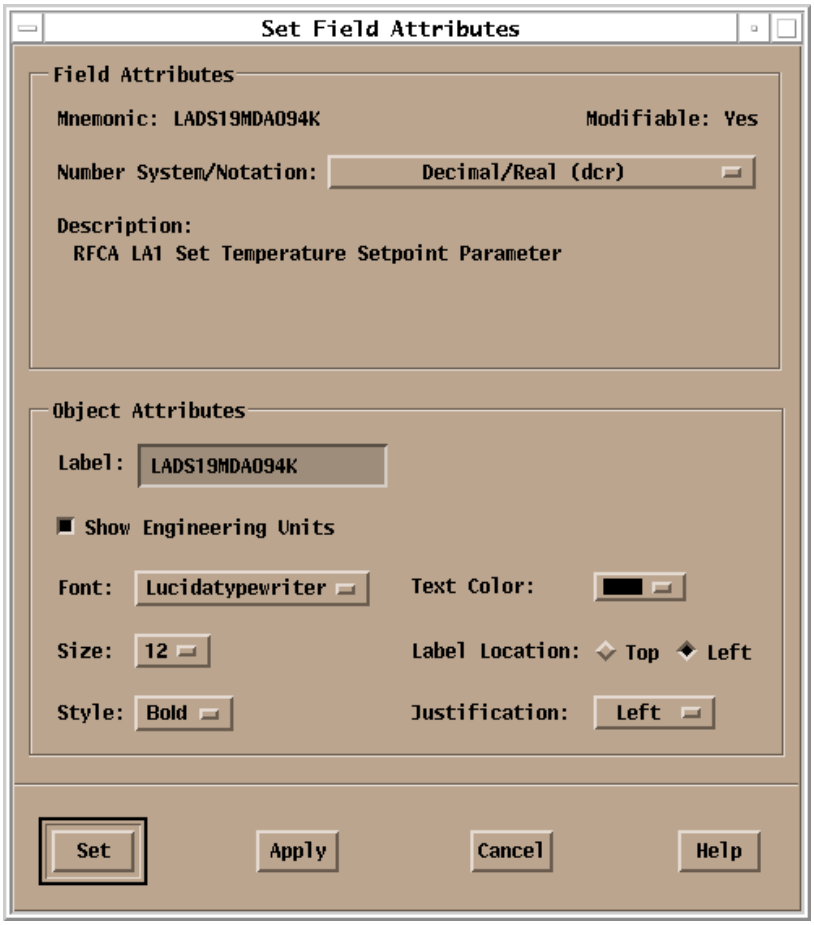


Figure 9-19, Set Field Attributes dialog box.

The **Field Attributes** frame identifies the command mnemonic associated with the selected field and whether the field is modifiable. This frame also shows how data will be displayed within the field. Data representation options available on the **Number System/Notation:** option menu button are based on the mnemonic's uplink data type as specified in the command database (see Table 9-3, Number System/Notation options). The Description entry provides a text description of the command.

Table 9-3, Number System/Notation options

This Option is Available When...	This Uplink Data Type is Specified
Binary/Integer Option**	Discrete Integer Unsigned Integer
Character/String Option	ASCII Character EBCDIC Character String Discrete Integer* Unsigned Integer*

This Option is Available When...	This Uplink Data Type is Specified
Decimal	Binary Coded Decimal Distended Signed Integer
Decimal/Integer Option**	Unsigned Integer
Decimal/Real Option	IBM Floating Point IEEE Floating Point Sign and Magnitude Signed Integer (2's Complement)
Decimal/Scientific Notation Option	IBM Floating Point IEEE Floating Point Sign and Magnitude Signed Integer (2's Complement)
Hexadecimal/Integer Option**	Unsigned Integer Undefined Byte String
Octal/Integer Option**	Unsigned Integer

* If state codes are defined in the database for these uplink data types then the only available option will be Character/String.

** Field width is based on Uplink Data type not Input Data type.

Help: For additional information on data types and their definition, see uplink_data_type and input_data_type on the Command Field Table Definition in MSFC HOSC Database Definitions (MSFC-DOC-1949).

Within the **Object Attributes** frame, you can specify a label for the selected field. If you choose not to provide a label, the label will default to the field mnemonic. All object attributes will be derived from those set in the main window except **Label Location:** which defaults to **Left**. You can change the attribute settings by using the option menu buttons provided.

Clicking the Set implements choices you've made on the **Set Field Attributes** dialog box and returns you to the application main window. This is the default pushbutton. Clicking the Apply implements any changes you've made, but leaves the dialog box open. This permits you to observe the changes and continue to implement additional changes without having to invoke the dialog box again.

9.3 Command Operation Overview

The Command Operation application allows you to see the current status of the command subsystem and supports the real-time uplinking of commands, command groups, and files to the spacecraft. You can use this application to create and customize command, command group, file, and command header inventories and you are also able to display command responses and general messages. Other features allow you to customize the manner in which information is displayed. Access to command update forms and files is provided.

The Command Operation main window contains several destinct features that will be discussed in this chapter (see Figure 9-20, Command Operation main window).

- Menu Bar
- Status Bar
- Inventory Selection radio buttons
- Work Area

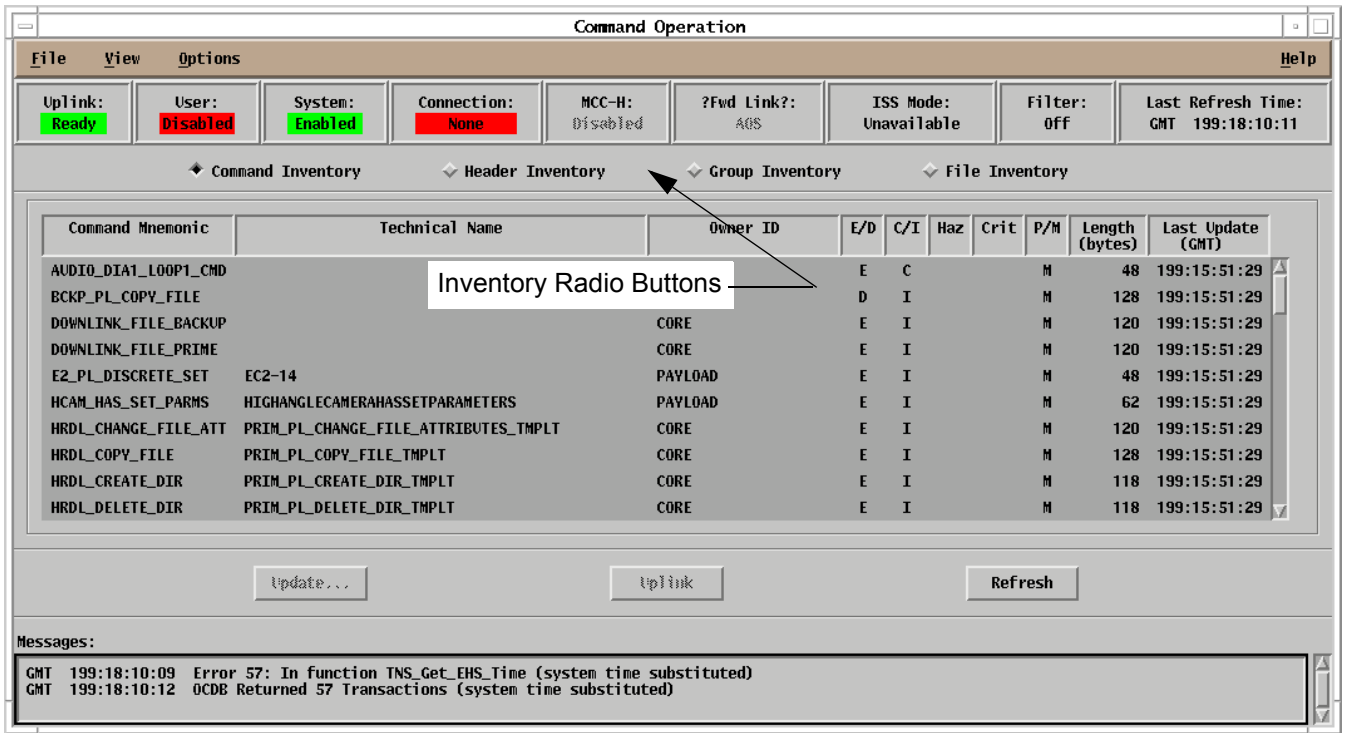


Figure 9-20, Command Operation main window.

9.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**,

Options, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **View** Menu
  - **Filter...**
  - **Sort...**
- **Options** Menu
  - **Update...**
  - **Uplink...**
  - **Uplink Time-Tag Command...**
  - **Control Group Uplink...**
  - **Delete From Drop Box...**
  - **Stop File...**
  - **Refresh**
  - **Configure Command System...**
  - **Process GSE File...**
  - **Command Summary...**
  - **Find Mnemonic/Group/File Name...**
  - **Show Description**

9.3.2 Status Bar

The status bar provides current information about the commanding system (see Figure 9-20, Command Operation main window). The status bar is automatically updated when information on the status bar changes. The status bar includes nine display-only fields:

- **Uplink:**
- **User:**
- **System:**
- **Connection:**
- **MCC-H:**
- Comm Path
- **ISS Mode:**
- **Filter:**
- **Last Refresh Time:**

9.3.2.1 Uplink:

This field will display **Ready** with a green background color when there is no uplink request being processed. It will display **Busy** with a red background color when an uplink request is being processed.

9.3.2.2 User:

This field will display **Enabled** with a green background color if you are enabled for commanding. It will display **Disabled** with a red background if you are disabled for commanding.

9.3.2.3 System:

When the commanding system is enabled for commanding, this field will display **Enabled** with a green background color. When the commanding system is disabled for commanding, it will display **Disabled** with a red background color.

Tip: In addition to the **Status Bar** indications there are two internal pseudo MSIDs generated for use in displays that indicate the status for **User:** ($I_USER_ENABLE) and **System:** ($I_CSS_ENABLE). These pseudo MSIDs are state calibrated to indicate "Enabled" or "Disabled" and are generated every 2 seconds.

9.3.2.4 Connection:

This field will display **None** with a red background color if the command system is not connected to an intermediate facility. It will display the currently configured command destination as shown in the **Configure Command System** dialog box if the command system is connected to the intermediate facility. If connected, it will contain a green background color.

9.3.2.5 MCC-H:

This field will toggle between **Enabled** and **Disabled** based on the ISS Health and Status. If a connection has been established and all Health and Status parameters are in a correct state, the word **Enabled** will be displayed on a green background. If any Health and Status parameter is in an incorrect state, the word **Disabled** will be displayed on a red background. If there is no connection established, this field will be grayed out.

9.3.2.6 Comm Path

The status label for the AOS/LOS status reconfigures to indicate the currently configured communications path. The valid values are:

- **EComm** Early Comm System
- **S HiRate** S-band Hi Rate
- **S Lo NCS** S-band Lo Rate Node Control Software
- **MCC-M** MCC Moscow
- **OIU** Shuttle Orbiter Interface Unit
- **S Lo CCS** S-Band Lo Rate Command Control Software

- **?Fwd Link?** Unknown

The status displayed in this field will toggle between **AOS** (Aquisition Of Signal) and **LOS** (Loss Of Signal) based on the ISS Command System Health and Status. If the connection has been established with an intermediate facility, **AOS** will be displayed with a green background or **LOS** will be displayed with a red background, as appropriate. If there is no connection established, this field will be grayed out.

9.3.2.7 ISS Mode:

This field will display one of the following station modes:

- **Standard**
- **Microgravity**
- **Reboost**
- **Proximity Ops**
- **External Ops**
- **Survival**
- **ACRV** (Assured Crew Return Vehicle)
- **Unavailable**

9.3.2.8 Filter:

This field will become grayed-out (insensitive) when the **Header Inventory** or **File Inventory** radio button is selected. If **Command Inventory** or **Chain Inventory** is selected, and filtering criteria have been applied, this field will display **On**. It will display **Off** if no filtering criteria has been applied.

9.3.2.9 Last Refresh Time:

This field will display the last time another inventory radio button was selected, or the last time the refresh, filter, or sort functions were performed.

9.3.3 Inventory Selection Radio Buttons

Inventory selection radio buttons are used to change the type of information displayed in the work area. Choices available include:

- **Command Inventory**
- **Header Inventory**
- **Group Inventory**
- **File Inventory**

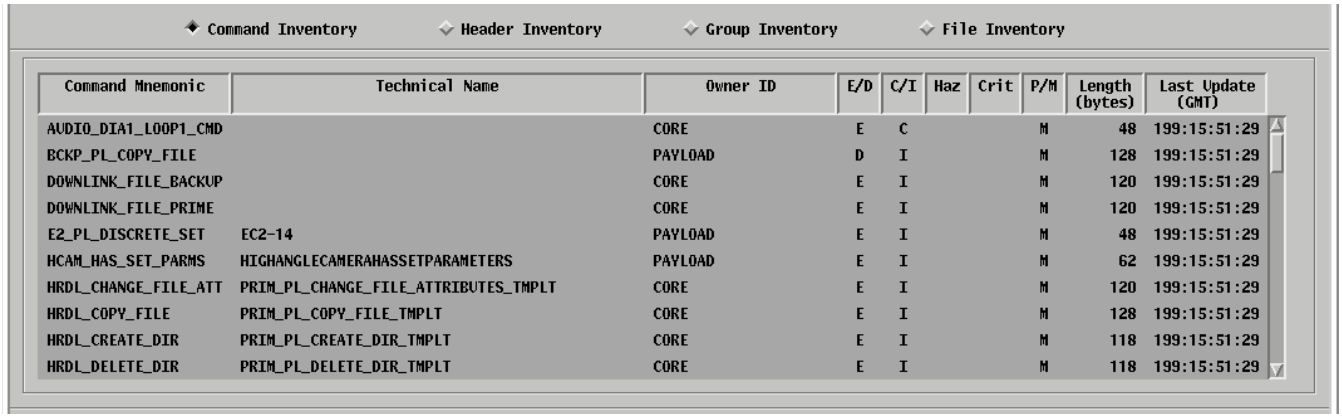
9.3.4 Work Area

Depending on your inventory radio button selection and any filter you have defined, the contents of the work area will change. If you change from one inventory to the next, the contents of the work area will automatically be updated with the filter or sort specified. Inventory configurations implemented through sort, filter, etc. are not saved when you exit the application. The following sections of this document will address each of the inventory work areas.

9.3.4.1 Command Inventory Work Area

Selecting the **Command Inventory** radio button will populate the work area with command mnemonics defined and available to you in the OCDB. The **Command Inventory** work area (see Figure 9-21, Command inventory work area) table columns include:

- **Command Mnemonic**
- **Technical Name**
- **Owner ID**
- **E/D**
- **C/I**
- **Haz**
- **Crit**
- **P/M**
- **Length (Bytes)**
- **Last Update (GMT)**



Command Mnemonic	Technical Name	Owner ID	E/D	C/I	Haz	Crit	P/M	Length (bytes)	Last Update (GMT)
AUDIO_DIA1_LOOP1_CMD		CORE	E	C			M	48	199:15:51:29
BCKP_PL_COPY_FILE		PAYLOAD	D	I			M	128	199:15:51:29
DOWNLINK_FILE_BACKUP		CORE	E	I			M	120	199:15:51:29
DOWNLINK_FILE_PRIME		CORE	E	I			M	120	199:15:51:29
E2_PL_DISCRETE_SET	EC2-14	PAYLOAD	E	I			M	48	199:15:51:29
HCAM_HAS_SET_PARMS	HIGHANGLECAMERAHASSETPARAMETERS	PAYLOAD	E	I			M	62	199:15:51:29
HRDL_CHANGE_FILE_ATT	PRIM_PL_CHANGE_FILE_ATTRIBUTES_TMPLT	CORE	E	I			M	120	199:15:51:29
HRDL_COPY_FILE	PRIM_PL_COPY_FILE_TMPLT	CORE	E	I			M	128	199:15:51:29
HRDL_CREATE_DIR	PRIM_PL_CREATE_DIR_TMPLT	CORE	E	I			M	118	199:15:51:29
HRDL_DELETE_DIR	PRIM_PL_DELETE_DIR_TMPLT	CORE	E	I			M	118	199:15:51:29

Figure 9-21, Command inventory work area.

The **Command Mnemonic** column displays the command's mnemonic as specified in the Operational Command Database (OCDB).

The **Technical Name** column displays a phrased description for each command. The technical name can have up to 89 characters. By default, only 45 characters are displayed in this column.

Note: If a command's technical name extends beyond the 45 characters available in the work area, and you wish to see the entire name, you can select **Show Technical Name** from the **Options** menu.

The **Owner ID** column displays an ID associated with a particular experiment, payload, or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users with their data.

The **E/D** column contains either **E** for an enabled command or **D** for a disabled command.

Note: If you are enabled to command but the status for the command you wish to uplink is disabled (**D**), you should contact the Command System Manager to have the command enabled.

The **C/I** column contains either **C** for complete or **I** for incomplete. Complete indicates that if there were any modifiable fields defined for this command, data for the modifiable fields was provided.

Note: If you select a command that is incomplete the **Uplink** pushbutton will not be sensitive.

The **Haz** column is used to identify hazardous commands. If a command is hazardous, an **H** will be displayed in this column.

The **Crit** column is used to identify critical commands. If a command is critical, a **C** will be displayed in this column.

Help: See the "Glossary" for a definition of Hazardous and Critical commands.

The **P/M** column is used to identify commands with modifiable fields. A **P** in this column indicates that the command is predefined and has no modifiable fields. An **M** in this column indicates that the command includes at least one modifiable field.

The **Length** column indicates the length of a command in bytes including the header and any check sum value.

The **Last Update** (GMT) column identifies when (in Greenwich Mean Time) a modifiable command was last updated in the database.

Note: You can arrange the columns in any order you desire.

9.3.4.2 Header Inventory Work Area

Each command can have only one associated header. The header typically includes command routing information and may include both predefined and modifiable fields. Selecting the **Header Inventory** radio button will populate the work area with header mnemonics defined and available to you in the OCDB. The **Header Inventory** work area (see Figure 9-22, Header inventory work area) table columns include:

- **Header Mnemonic**
- **Description**
- **Owner ID**
- **P/M**
- **Length (bits)**
- **Last Update (GMT)**

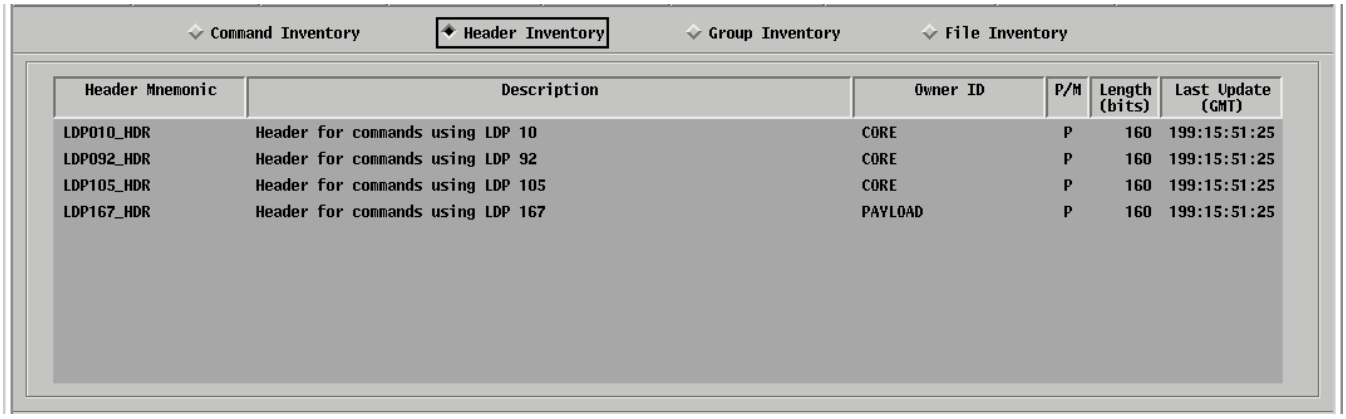


Figure 9-22, Header inventory work area.

The **Header Mnemonic** column displays the header's mnemonic as specified in the OCDB.

The **Description** column provides a brief summary for each header as specified in the OCDB. The description can have up to 100 characters. By default, only 67 characters are displayed in this column.

Note: If a header's description extends beyond the 67 characters available in the work area, and you wish to see the entire description, you can select **Show Description** from the **Options** menu.

The **Owner ID** column displays an ID associated with a particular experiment, payload or spacecraft function. An owner is not the same as a user ID. An owner ID is used to categorize users and their data.

The **P/M** column is used to identify headers with modifiable fields. A **P** in this column indicates that the header is predefined and has no modifiable fields. An **M** in this column indicates that the header includes at least one modifiable field.

The **Length** column indicates the length of the header in bits.

The **Last Update** (GMT) column identifies when (in GMT) a modifiable header was last updated in the database.

Note: You can arrange the columns in any order you desire.

9.3.4.3 Group Inventory Work Area

The **Group Inventory** is obtained by selecting the appropriate inventory selection radio button. A command group is a sequenced list of commands that ISS users will be able to uplink using a single uplink request. Command groups have the following attributes:

- command groups can have many commands packaged in one transmission
- command groups cannot include hazardous commands
- a single, modifiable command can be included many times in a command group, with each occurrence containing a different set of modifiable data
- you can create and store locally many command groups
- command groups may be created as needed using the Command Group Generation application

The **Group Inventory** work area (see Figure 9-23, Group inventory work area) table columns include:

- **Group Name**
- **C/I**
- **Crit**
- **# Cmds**
- **Last Update (GMT)**

The groups available on the user's workstation are listed in rows in this table. The table's data is refreshed when the user switches to this inventory or when the Refresh function is selected. The rows are listed alphabetically by group name.

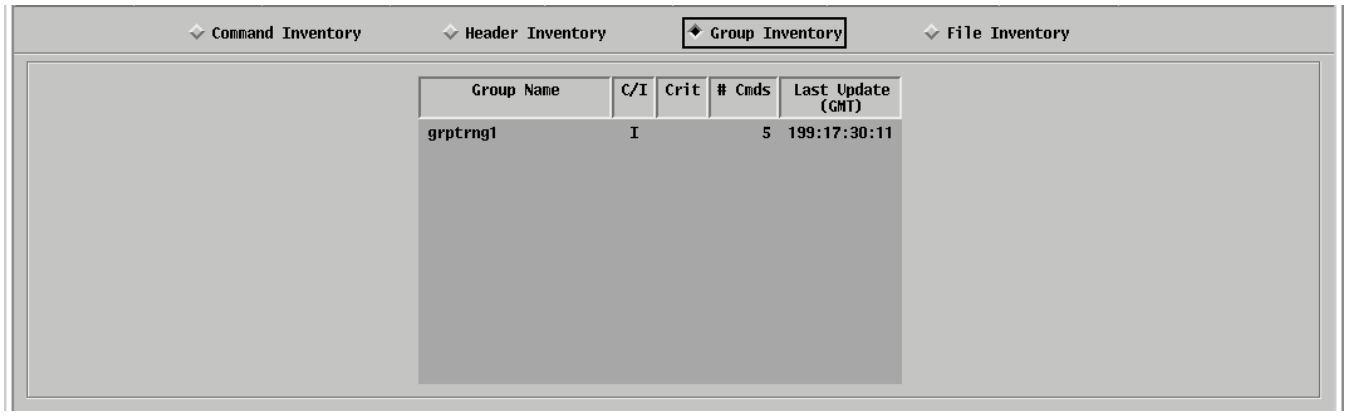


Figure 9-23, Group inventory work area.

The **Group Name** column displays each group's name.

The **C/I** column contains either **C** for complete or **I** for incomplete. Complete indicates that if there were any modifiable fields defined for commands that comprise the group, that data for the modifiable fields was provided.

Note: If you select a group that is incomplete the **Uplink** pushbutton will not be sensitive.

The **Crit** column is used to identify command groups that contain critical commands. If a command group contains a critical command, a **C** will be displayed in this column. The background color of the cells containing critical commands will be yellow.

The **# Cmds** column shows the number of individual commands included within each group.

The **Last Update** (GMT) column identifies when (in GMT) a modifiable command within a group was last updated.

Note: You can arrange the columns in any order you desire.

9.3.4.4 File Inventory Work Area

Space Station commanding provides for both uplink and downlink of program files. Program files are only exchanged with the Payload MDM. File uplink is a separate privilege within the Command Operations application; if you do not possess this privilege, you will not be able to see the file inventory.

Program files are not maintained or managed by the OCDB. For International Space Station (ISS) users, uplink files are hosted on the Payload Information Management System (PIMS) server. Selection of the **File Inventory** radio button will result in a list of the command files in PIMS which are marked as uplinkable being displayed within the work area. If all the files within a PIMS document have been marked uplinkable, then there will be an entry in the File Inventory that only contains the Document Name. The user may select this entry to uplink all the files within the document. Files only appear in the file inventory if they are staged for uplink at JSC (i.e., have been transfered to the intermediate facility's Drop Box).

The **File Inventory** work area table columns include (see Figure 9-24, File inventory work area):

- **Document Name**
- **Document File**
- **Document Class**
- **Revision**
- **Size (Kb)**
- Last Update (GMT)

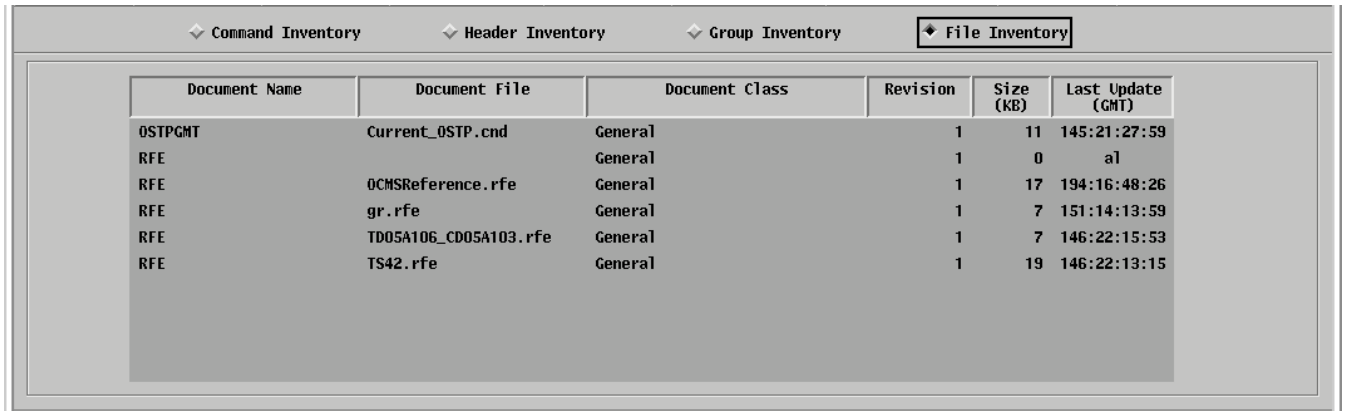


Figure 9-24, File inventory work area.

The **Document Name** column displays the name of a set of related files.

The **Document File** column displays the name of an individual file contained in the set of files.

The **Document Class** column displays the document type of the component file.

The **Revision** column displays the revision number of the component file.

The **Size (Kb)** column shows the size of the file in bytes.

The **Last Update (GMT)** column identifies when (in GMT) a file was last updated in PIMS.

9.3.4.5 Inventory Popup Menus

If you position the mouse pointer in the work area and press the right mouse button, you will invoke an **Inventory Popup Menu** (see Figure 9-25, Inventory Popup Menu). This menu provides an alternative means to perform the various listed functions.

Figure 9-25, Inventory Popup Menu.

Note: The **Inventory Popup Menu** changes based on the selected inventory.

9.3.5 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Command Operation application. The **Filter...** and **Sort...** menu items from the **View** Menu along with all the menu options from the **Options** Menu will be discussed (see Figure 9-26, View and Options menus).

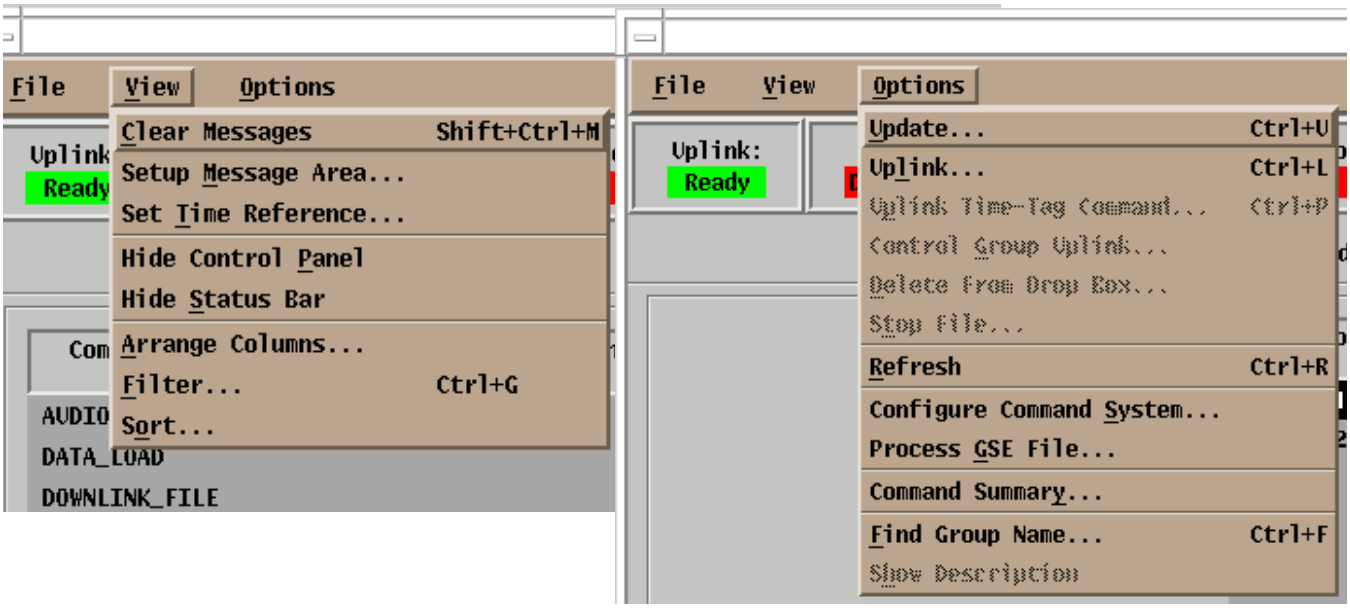


Figure 9-26, View and Options menus.

9.3.5.1 Filter...

The **Filter...** menu item invokes a dialog box that allows you to set criteria which determines which commands are displayed in the **Command Operation** work area (see Figure 9-27, Filter dialog box). This menu item is available only if you have selected the **Command Inventory** radio button. This menu item is insensitive (grayed out) when the **Header Inventory**, **Group Inventory**, or **File Inventory** radio button is selected.

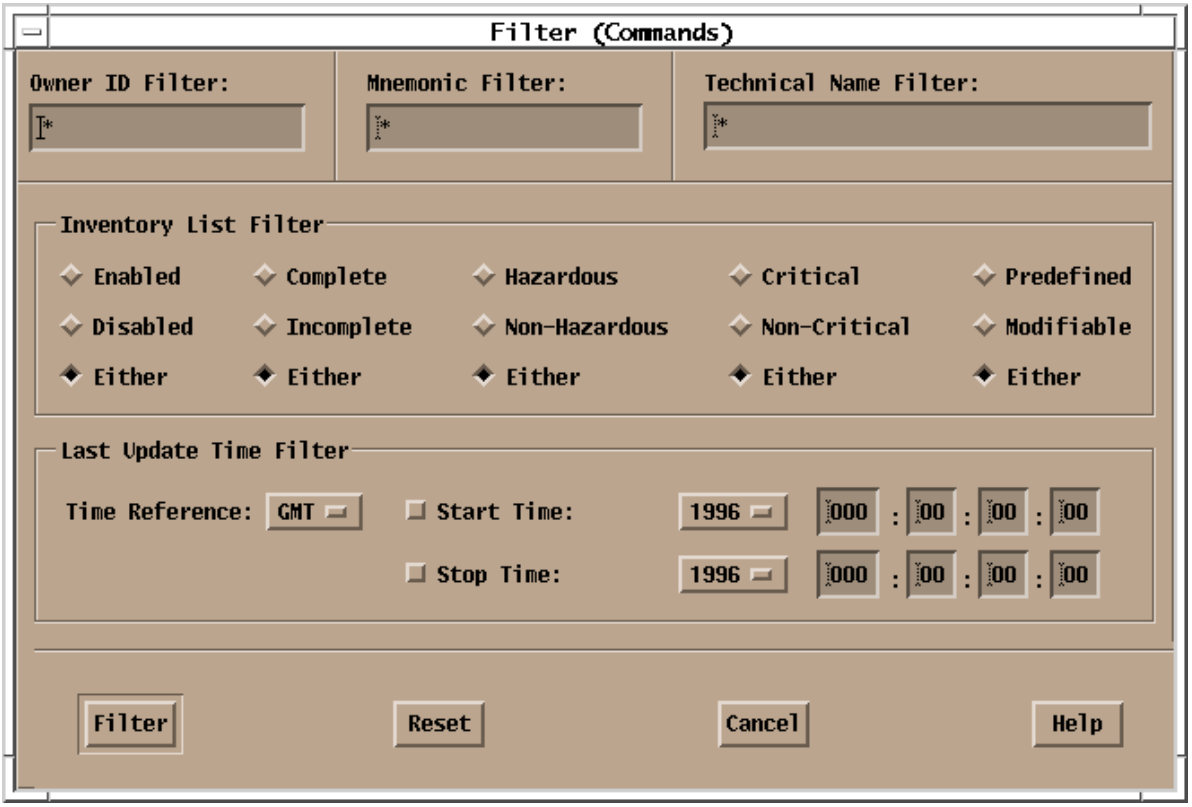


Figure 9-27, Filter dialog box.

The top row of the Command Inventory **Filter** dialog box has three text fields:

- **Owner ID Filter:**
- **Mnemonic Filter:**
- **Technical Name Filter:**

By default, each of these fields has an asterisk entered. This is the wildcard character which means "all". To narrow the number of commands displayed within the **Command Operation** work area, you can provide specific information in these fields or you can use a combination of real and wildcard characters.

The **Inventory List Filter** frame has radio boxes that can also be used to narrow the number of commands displayed within the work area. These sets include commands that are:

- **Enabled** and/or **Disabled**
- **Complete** and/or **Incomplete**
- **Hazardous** and/or **Non-Hazardous**
- **Critical** and/or **Non-Critical**
- **Predefined** and/or **Modifiable**

By default, the **Either** pushbutton is selected. In order to narrow the list or commands displayed within the work area you can select more specific criteria.

Note: The items selected within the **Inventory List Filter** frame are treated logically as if they were connected by an AND. For example, if the **Hazardous** and **Critical** radio buttons are selected, only those commands designated as both hazardous and critical will be listed in the inventory.

In the **Last Update Time Filter** frame you can have the system show only those commands that were last updated within a specific time range. All times must be entered in the *ddd*:*hh*:*mm*:*ss* format where:

- *ddd* = the day
- *hh* = the hour
- *mm* = the minute
- *ss* = the second

Clicking Filter implements the selected filter criteria and closes the dialog box. The results are displayed in the **Command Operation** main window. This is default pushbutton.

9.3.5.2 Sort...

The **Sort...** menu item invokes a dialog box (see Figure 9-28, Sort dialog box) that allows you to sort command inventories as displayed within the **Command Operation** work area. The **Sort...** menu item is unavailable (grayed out) when the **Header Inventory**, **Group Inventory**, or **File Inventory** radio button is selected. The sort is performed only on the inventory that is currently selected.

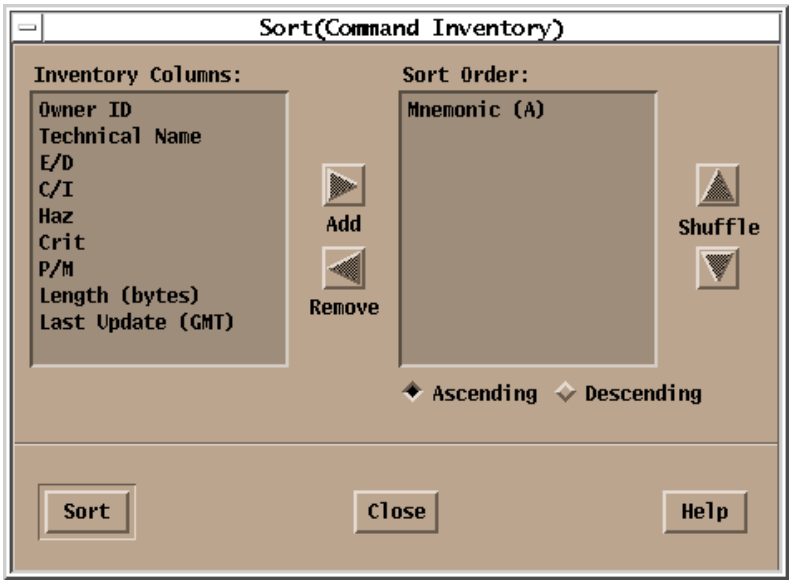


Figure 9-28, Sort dialog box.

The **Sort** dialog box has two lists: **Inventory Columns:** and **Sort Order:**. The **Inventory Columns:** list includes those columns from the command inventory. The **Sort Order:** list contains **Mnemonic (A)** as the default for commands.

Select from the **Inventory Columns:** list the column on which you'd like to sort next. Click **Add** to add the item to the **Sort Order:** list. Continue this same procedure until all items you want to sort on are listed in the **Sort Order:** list. If you make a mistake and wish to remove an item from the **Sort Order:** list, select it and then click on **Remove**. If you make a mistake and get the items listed out of the appropriate sort order, select the item that is out of order and use the **Shuffle** buttons to move the item up or down. Put each item in its appropriate place.

Use the **Ascending** and **Descending** radio buttons to specify whether you want to go from "A" to "Z" (ascending order) or from "Z" to "A" (descending order). Each item in the **Sort Order:** list can be either in ascending **(A)** or descending **(D)**.

Note: When an item is added to the **Sort Order:** list, it is tagged with either ascending **(A)** or descending **(D)** depending on what is currently selected. **Ascending** is the default radio button selection.

Clicking Sort implements the sort you have specified and closes the dialog box. The results are displayed in the **Command Operation** main window. This is the default pushbutton.

9.3.5.3 Update...

When you select an item from an inventory, the **Update...** menu item and Update... become functional (except when **File Inventory** is selected). The **Update...** menu item invokes different functions depending on the inventory you have displayed (see Table 9-4, Update functions).

Table 9-4, Update functions.

Inventory Selected	Update Function Invoked
Command Inventory	Update Command mini-application
Header Inventory	Update Command mini-application
Group Inventory	Update Command Group mini-application
File Inventory	Update function available through PIMS for Spacestation.

If you have the **Command Inventory** or the **Header Inventory** displayed, and a command within the work area selected, the **Update...** menu item initiates the Update Command mini-application which allows you to view and modify the contents of the selected command or command header.

Help: Space Station users will need to use software available through the Payload Information Management System (PIMS) to modify files.

Note: If you select a command or group which is predefined (non-modifiable) and invoke the **Update...** menu item, you will still invoke the appropriate update function, but you will not be able to modify the command or group. You will have read-only capability.

Note: If you select **File Inventory**, the **Update...** menu item is grayed out because Command Operation does not provide the means to edit these types of files.

9.3.5.4 Uplink

When the **Command Inventory** or **File Inventory** is displayed and an individual command or file from an inventory is selected, The **Options** menu displays an **Uplink** menu item. Clicking **Uplink** results in the selected command or file being uplinked to the space vehicle.

If the **Group Inventory** is displayed and a group is selected, the **Options** menu displays an **Uplink...** menu item. Clicking **Uplink...** results in a **Control Uplink** dialog box being opened from which you can initiate the uplink process.

When a command server receives an uplink request from a workstation, it verifies that:

- the command exists in the OCDB
- any modifiable fields associated with the command are complete
- you are authorized to access the command
- the command system is enabled for uplink
- you are enabled for uplink
- the selected command is enabled for uplink
- the submitting workstation is a valid source for commanding activities

If hazardous or critical command confirmation is enabled, you will have to confirm your uplink on the **Uplink (Command Confirmation)** dialog box (see Figure 9-29, Uplink (Command Confirmation) dialog box).

Figure 9-29, Uplink (Command Confirmation) dialog box

For an uplink to be successful, all of the previously stated conditions must be true. If any of the conditions prove false, the command server will abort the uplink and will generate an error message. If no errors are encountered during the uplink request, then the submitted command(s)

will be placed in the command queue. Commands in the command queue are “locked” and cannot be altered.

If for any reason a command is not successfully uplinked, you will receive a confirmation dialog box (see Figure 9-30, Uplink (Retransmit Confirmation) dialog box).

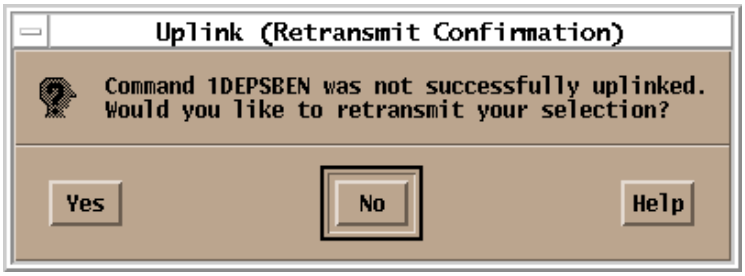


Figure 9-30, Uplink (Retransmit Confirmation) dialog box.

9.3.5.4.1 Uplink Group

If you display the **Group Inventory** and select a command group from the inventory, the **Options** menu will display the **Uplink** menu item. The **Uplink** menu item invokes the **Control Group Uplink** dialog box (see Figure 9-31, Control Group Uplink dialog box).

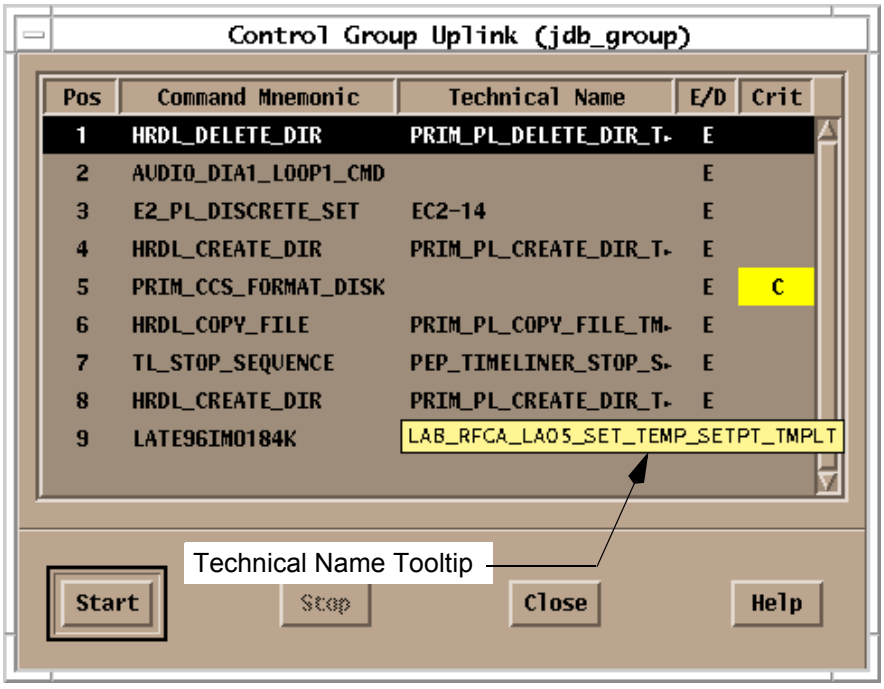


Figure 9-31, Control Group Uplink dialog box.

This dialog box consists of a group contents table and a buttons area. The group contents table allows you to look at information relative to the individual commands that comprise the group. The

commands are listed as they are positioned in the group definition and information displayed on each command includes:

- the command's relative position within the group (**Pos**). A **1** in this column indicates that this is the first command in the group.
- the command's mnemonic (**Command Mnemonic**).
- the command's technical name (**Technical Name**).
- the command's enabled/disabled status (**E/D**). An **E** stands for enabled and **D** stands for disabled.

Note: If you are enabled to command but the status for a command in the chain you wish to uplink is disabled (**D**), you should contact the Command System Manager to have the command enabled.

- an indication of whether the command is critical (**Crit**). A **C** in this command indicates that the command is critical. The background color of the cells containing critical flags will be yellow.

The contents of the Technical Name column may be be truncated due to the width of the column. A tooltip will become managed after the mouse pointer has been inside one of the technical name cells of the table for one and a half seconds (see Figure 9-31, Technical Name Tooltip). The tooltip becomes unmanaged after ten seconds or when the mouse pointer has moved out of the current technical name cell of the table.

Clicking the Start initiates the uplink of the group command. When the group uplink is initiated the Start becomes inactive. It becomes sensitive once the application is notified that the uplink of the group is complete or stopped. This is the default pushbutton. Clicking the Stop halts the uplinking of commands in a group. If activated during a command uplink, the command currently selected will be completed prior to stopping the uplink process. The next command in the group will become selected, but will not be uplinked. The Stop becomes sensitive when the start function is activated.

9.3.5.4.2 Uplink File

For a file uplink to the ISS to occur, the file must first be resident on the PIMS server. The PIMS server is the sole source of files uplinked from the EHS to the ISS. The EHS provides for file uplinks to the payload MDM only.

Prior to file uplink, the file intended for uplink must be transferred to Mission Control Center-Houston (MCC-H). This is typically accomplished through the File Ground Management Tool (FGMT), but can be accomplished directly through PIMS. Using the FGMT, the file is extracted from PIMS and placed in a file system outside the EHS firewall (HOSC Drop Box). MCC-H polls the HOSC drop box and transfers files when necessary. After MCC-H transfers a file from the HOSC drop box for uplink, an acknowledgement file is created and placed in the MCC-H drop box for retrieval by PIMS. After PIMS has retrieved the corresponding acknowledgement file, the

uplink file is marked with the “staged” indicator (a document is marked with the “staged” indicator if all the component files of the document are individually marked with the “staged” indicator). Users may view all files marked with the “staged” indicator through FGMT and the Command Operation application.

Files are typically uplinked using the FGMT. As a contingency, files may also be uplinked by properly privileged users using the file uplink capability in Command Operation (see Figure 9-32, File uplink example). Command Operation checks the user privilege to ensure the user may access the the File Inventory which displays all the files marked with the “staged” indicator in PIMS. Once the privilege is verified, the user may select a component file or document from the inventory and request the selected element to be uplinked. If a document is selected, the individual files that collectively make up the document will also be selected. Requests to uplink documents are broken down into individual uplinks of component files at this point. The request is sent to the Central Command Processor (CCP) where it is validated upon receipt. Validation includes checking that the Command System is enabled, the connection to MCC-H is active, MCC-H is enabled, and that the requesting user is enabled for commanding. If the uplink request is validated, it is formatted as a file transfer request message and submitted to the command queue. After the file transfer request is transmitted to MCC-H, MCC-H responds with file transfer status messages. Among the file transfer status messages returned from MCC-H are messages indicating when the file transfer request is received (CAR1), when the file uplink is started (CAR2), when the file uplink is complete (FSV1), when the onboard transfer is started (FSV2), and when the onboard file transfer is complete (FSV3). The “at MCC-H” indicator in PIMS is reset when FSV3 is received.

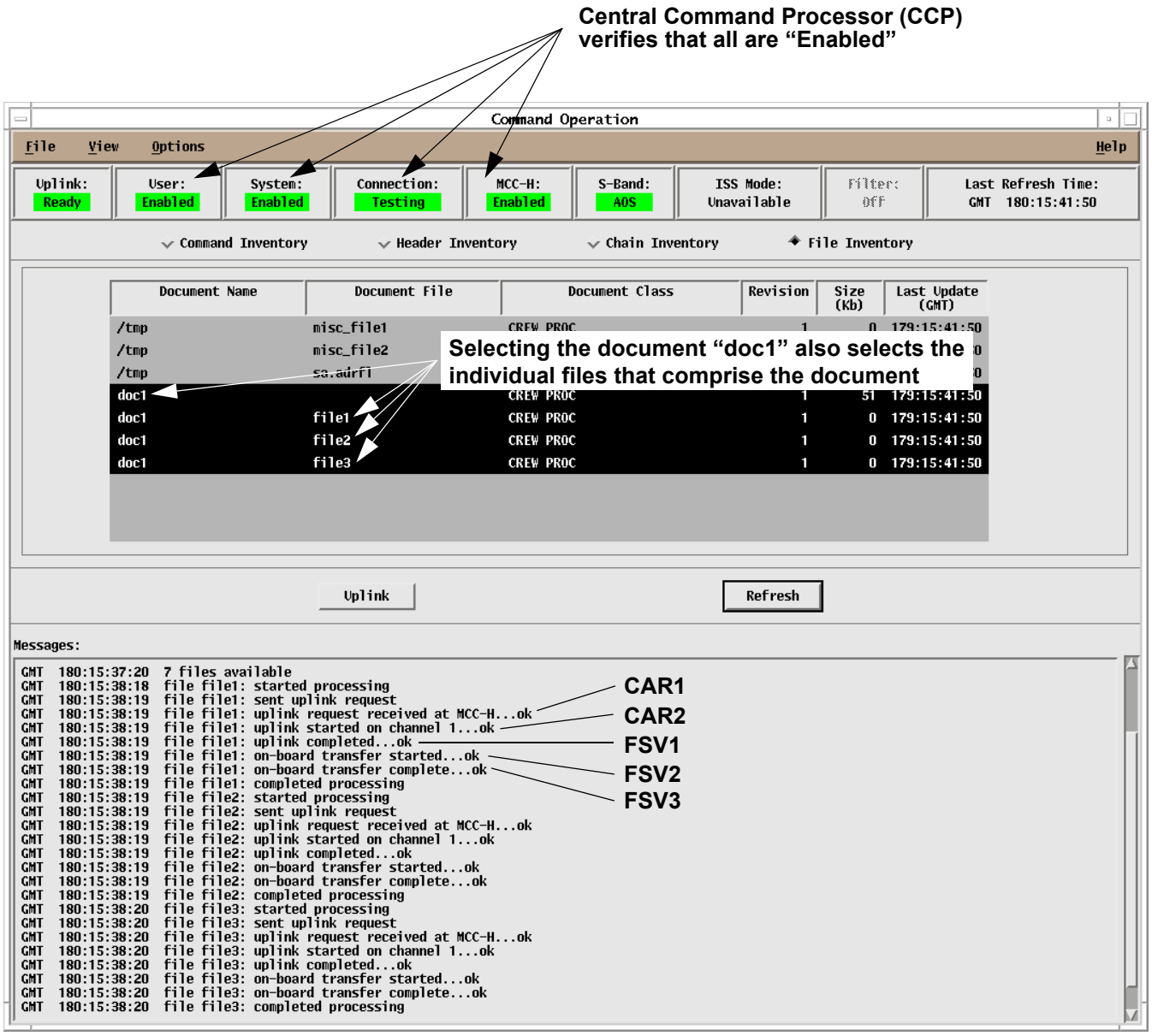


Figure 9-32, File uplink example.

Once initiated the document is uplinked beginning with the first file in the document and then continues through the document one file at a time. As each file is uplinked, the next one becomes selected for uplink. If at any time, the uplink process is stopped, the file currently being processed will be completed prior to stopping the uplink. If you start the uplink again, file processing will start at the beginning.

9.3.5.5 Uplink Time-Tag Command...

The **Uplink Time-Tag Command...** menu item is grayed out until you select a command from the command inventory that has an onboard queue identifier defined in the OCDB. Select this menu item to invoke the **Uplink Time-Tag Command** dialog box (see Figure 9-33, Uplink Time-Tag Command dialog box).

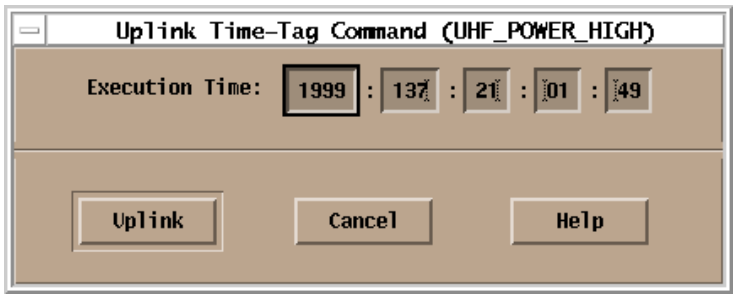


Figure 9-33, Uplink Time-Tag Command dialog box.

This dialog box contains an **Execution Time:** text entry field. The field defaults to the current GMT. Enter an execution time in *yyyy:ddd:hh:mm:ss*.

9.3.5.6 Control Group Uplink...

The **Control Group Uplink...** menu item is grayed out until you uplink a group from the current Command Operation session using the Uplink function. This menu item provides you with a quick way to access the **Control Group Uplink** dialog box. This dialog box will contain information relevant to the group that is currently being uplinked and is available regardless of the inventory currently displayed.

Help: See "9.3.5.4.1, Uplink Group" for information on this dialog box and how to uplink a command group for the first time.

9.3.5.7 Delete From Drop Box...

The **Delete From Drop Box...** menu item is grayed out until a command file is selected from the **File Inventory** work area. This menu item invokes the **Delete From Dropbox (Confirmation Required)** dialog box (see Figure 9-34, Delete From Dropbox (Confirmation Required) dialog box).

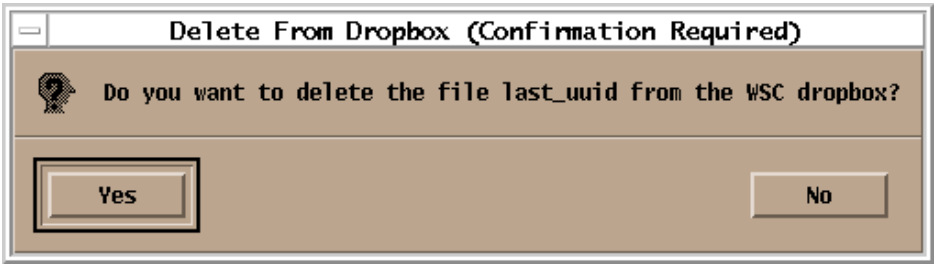


Figure 9-34, Delete From Dropbox (Confirmation Required) dialog box.

This dialog displays a message asking if you want to delete the selected file from the intermediate facility's dropbox.

9.3.5.8 Stop File...

The **Stop File...** menu item is grayed out until a file is selected from the **File Inventory** work area. This menu item invokes the **Stop File (Confirmation Required)** dialog box (see Figure 9-35, Stop File (Confirmation Required) dialog box).

Figure 9-35, Stop File (Confirmation Required) dialog box.

This dialog box displays a message asking if you want to stop the selected file from uplinking

9.3.5.9 Refresh

The **Refresh** menu item updates the work area with the latest information and enters a new **Last Refresh Time:** in the status bar.

Note: This menu item is useful when you want to see changes resulting from an update or an uplink, when command elements are enabled, when you've retrieved new groups from the User-Generated Data Element (UDE) database, etc.

9.3.5.10 Configure Command System...

The **Configure Command System...** menu item invokes the **Configure Command System** dialog box (see Figure 9-36, Configure Command System dialog box). This dialog box provides you with information regarding the current status of the commanding system.

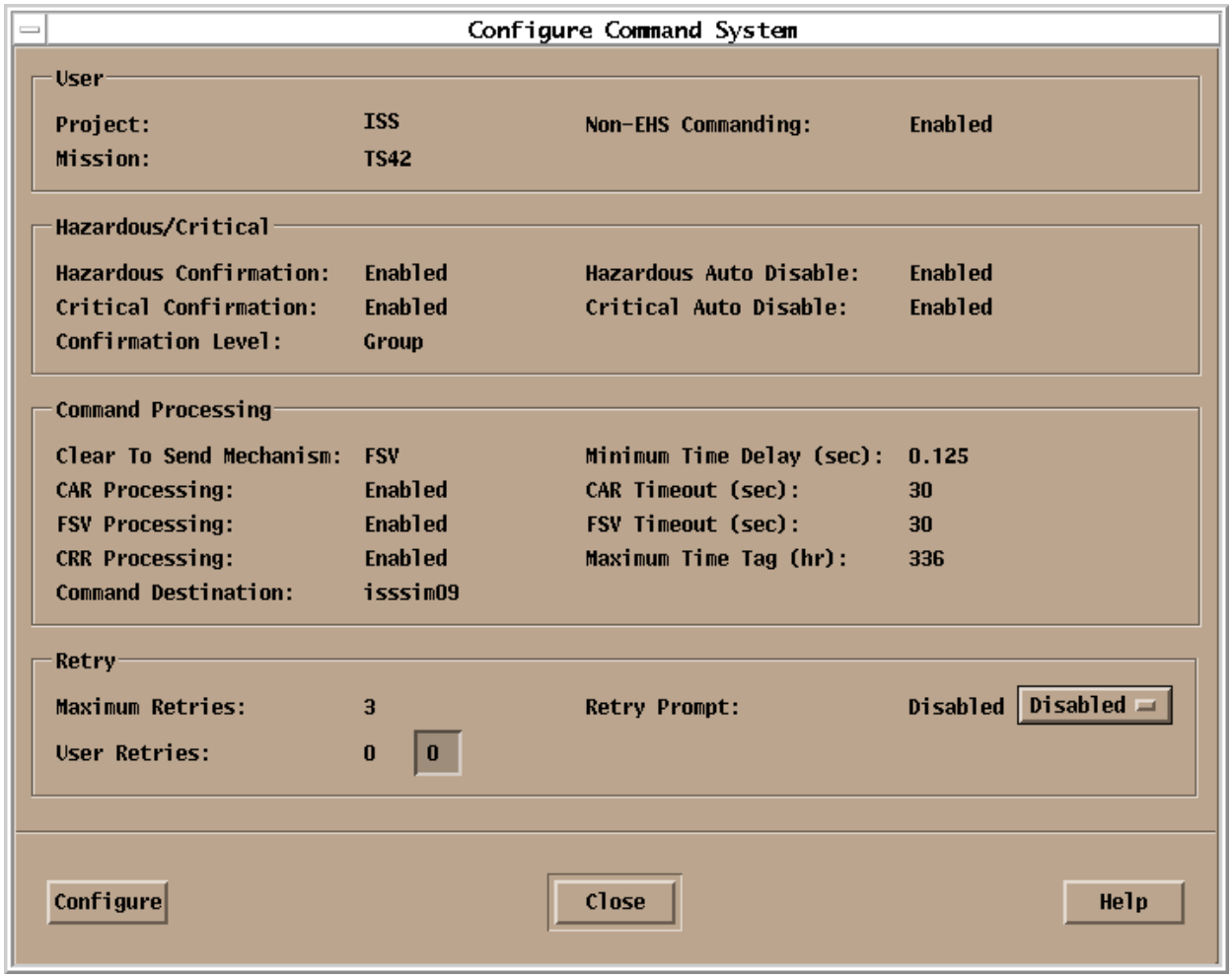


Figure 9-36, Configure Command System dialog box.

The **Configure Command System** dialog box consists of the following four frames and a buttons area:

- **User** frame
- **Hazardous/Critical** frame
- **Command Processing** frame
- **Retry** frame

The **User** frame, **Hazardous/Critical** frame, and **Command Processing** frame show the project-specific aspects of commanding which apply to everyone with commanding privileges. These

options can only be changed by the Integrated Support Team (IST) or Command System Managers.

The **User** frame identifies the project and mission with which your user ID is currently associated. It also provides you with information regarding whether users are authorized to send commands from outside the Huntsville Operations Support Center (HOSC) environment. Options available for **Non-EHS Commanding:** are **Enabled** or **Disabled**.

The **Hazardous/Critical** frame identifies whether or not you will receive a confirmation message for hazardous and critical commands. Confirmation must be **Enabled** for confirmation messages to be invoked. The **Confirmation Level:** can be set to confirm hazardous or critical commands before every **Command** or once, for critical commands before every **Group**. The **Auto Disable** feature for hazardous and critical commands identifies whether these commands will be automatically disabled after they have been uplinked. If the command is disabled, the Command System Manager will have to enable the command before it can be uplinked again.

The **Command Processing** frame contains several acronyms:

CAR (Command Acceptance Response)

A CAR is generated by an intermediate transmission facility such as the Mission Control Center (MCC), the Consolidated Control Center, or the Deep Space Network (DSN). A CAR indicates receipt of a command, a block of commands, or a file.

FSV (Flight System Verifier)

An FSV is generated onboard the spacecraft by a particular system. It indicates receipt of a command, a block of commands, or a file.

CRR (Command Reaction Response)

A CRR is telemetry data that have been associated with an uplinked command. The data is compared onboard against a set of expected data associated with the successful uplink of a command. This comparison results in a “pass” or “fail” CRR indication.

The first item in the **Command Processing** frame, **Clear to Send Mechanism:**, identifies how soon after a command is sent that a second command can be sent. Possible entries displayed in this field include:

- **Time**
- **CAR**
- **FSV**

If **Time** is shown in this field, then the next command will be sent after a specified amount of time has passed. This time is shown in the **Minimum Time Delay (sec):** field. If **CAR** or **FSV** are displayed in the **Clear to Send Mechanism:** field, then the next command will be sent after a CAR or FSV have been received. **CAR Processing:**, **FSV Processing:**, and **CRR Processing:**, can either be **Enabled** or **Disabled** depending on the project's configuration.

The **CAR Timeout (sec):** and **FSV Timeout (sec):** fields indicate how much time is allowed to pass before the system tries to resend the failed command.

The **Command Destination:** displays the currently configured primary destination. This destination is initially set through the Configuration Manager application and modified during realtime by the Command System Management application.

The **Maximum Time Tag (hr):** displays the maximum amount in hours from the current time that a command can be time-tagged for execution.

The **Retry** frame includes four items and is the only area on this dialog box that has user-defined fields. If CAR, FSV, or CRR processing is enabled and you uplink a command and do not receive confirmation that the command was sent successfully, then the **Maximum Retries:** field identifies how many times the system will permit you to resend the command.

In the **User Retries:** field you can define for yourself and your workstation the number of retries you want, up to the maximum. If you try to enter a number higher than the maximum, you will receive an informational dialog box (see Figure 9-37, Configure Command System (Invalid Data) dialog box).

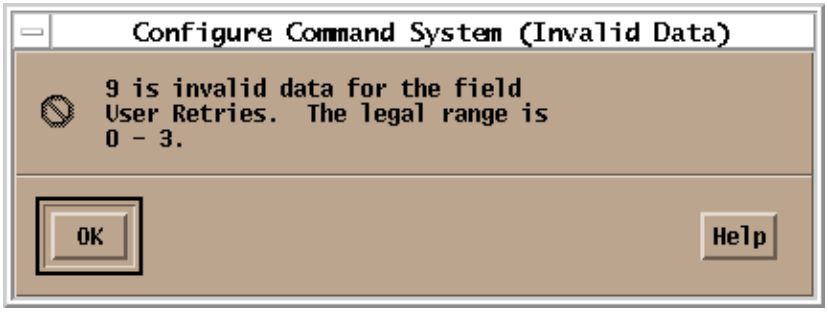


Figure 9-37, Configure Command System (Invalid Data).

The dialog box displays a message informing you that invalid data was entered for the **User Retries:** field and specifies the legal range.

The **Retry Prompt:** allows you to resend failed uplinks after the system has performed the number of **User Retries:** selected. If enabled, the **Uplink (Retransmit Confirmation)** dialog box (see Figure 9-30, for example) will be displayed for each failed uplink attempt. Selecting **Yes** on the confirmation dialog box will resend the original uplink request.

Clicking the Configure reconfigures the command system using the new information you provided within the **Retry** frame. This dialog box remains open. The statuses will be updated automatically when the system status is updated. This the default pushbutton after data is entered into the **User Retries:** field.

Note: If you wish to change information on this dialog box, other than information contained in the **Retry** frame, you should contact the Command System Manager on the voice loop.

9.3.5.11 Process GSE File...

The **Process GSE File...** menu item invokes the **Process GSE File** dialog box (see Figure 9-38, Process GSE File dialog box). GSE can be any data processing equipment that you have integrated into the HOSC system. You can use this equipment to generate and transfer files to a HOSC workstation, which can then be used to update data sets, commands and chains stored on the OCDB.

Note: The GSE file must have a name (20 characters or less) with an extension of *.gse. The format for GSE files is given in SSP 50305, Vol. 2, POIC to Generic User Interface Definition Document.

First, you must use the Retrieve UDE application available off the **Launchpad** under the **File** menu to download a GSE file to your workstation. Next, you use the **Process GSE File** dialog box to select a file and start a background process. This process reads and updates the OCDB with commands and chains as specified in the GSE file. Any errors encountered during processing are displayed in the message area.

The **Process GSE File** dialog box provides the means to search for, select, print, start, and stop GSE file processing on your local workstation.

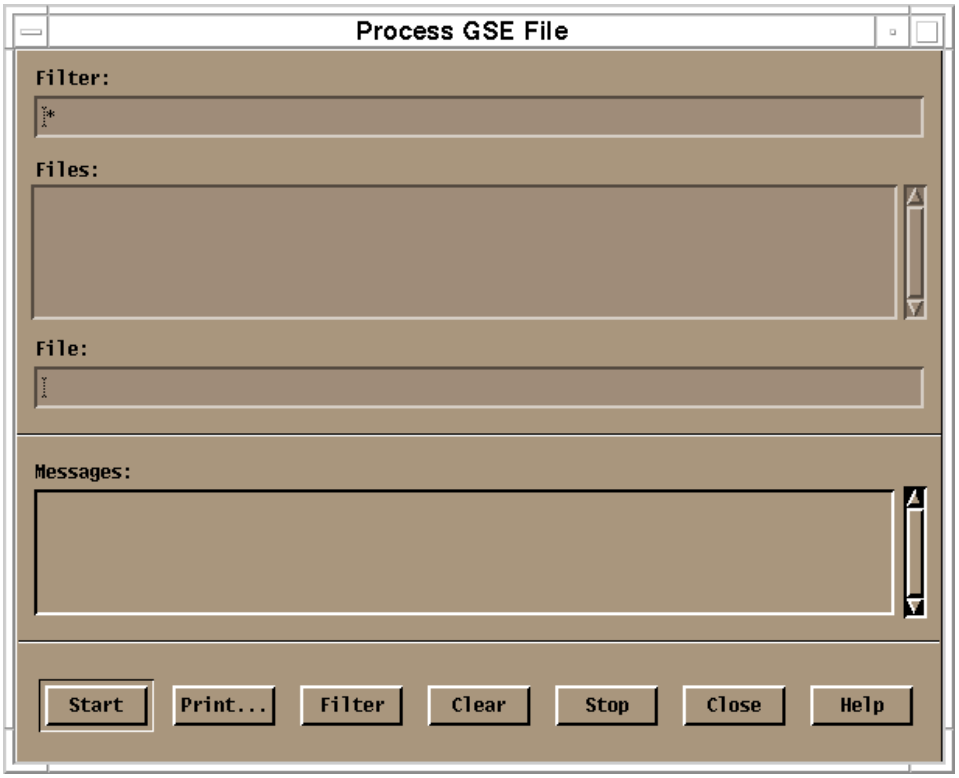


Figure 9-38, Process GSE File dialog box.

Note: Messages sent to the **Messages:** area of this dialog box will be appended to any messages leftover from previous processes.

Clicking the Start initiates GSE file processing using the file specified in the **File:** input text field. Processing errors are displayed in the **Messages:** area. This is the default pushbutton.

Note: The Command Operation application cannot be exited while GSE file processing is in progress.

Clicking the Clear clears the contents of the **Messages:** area.

Note: The message area does not automatically clear each time you initiate GSE file processing. Messages remain, even after this dialog box is closed and reopened and after the processing of another GSE file is initiated.

9.3.5.12 Command Summary...

The **Command Summary...** menu item invokes the **Generate Command Summary** dialog box (see Figure 9-39, Generate Command Summary dialog box). This dialog box allows you to generate a report summarizing command activity over a specified time period. The dialog box is comprised of a **Command Summary Criteria** frame, a **Summary:** area, and a buttons area.

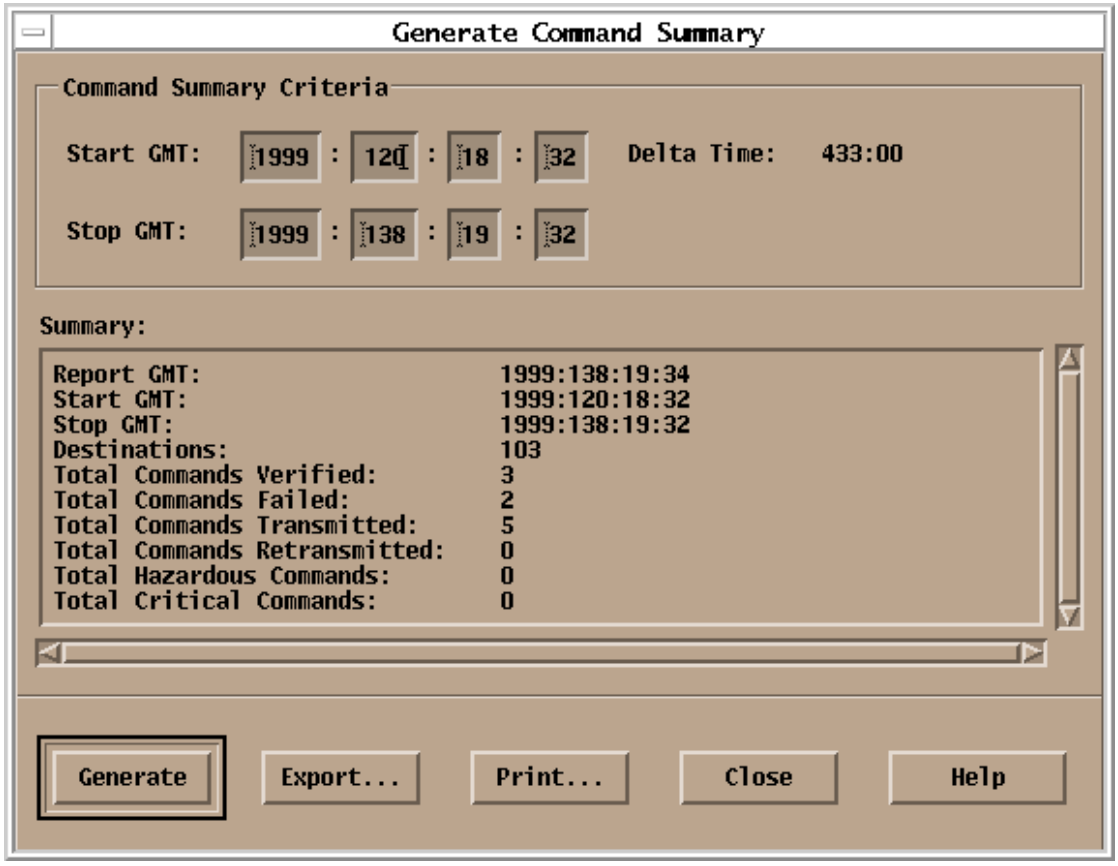


Figure 9-39, Generate Command Summary dialog box.

The **Command Summary Criteria** frame includes two time input text fields (**Start GMT:** and **Stop GMT:**) and a **Delta Time:** display-only field. The **Start GMT:** defaults to the current time minus one hour. The **Stop GMT:** defaults to the current time. The **Delta Time:** is recalculated when the user modifies the start or stop time. The **Summary:** area is a scrollable area displaying command data from the OCDB Command log that meets the start and stop time criteria.

9.3.5.12.1 Export Report Dialog Box

Selecting Export... from the control panel of the **Generate Command Summary** dialog box invokes the **Export Report** dialog box (see Figure 9-40, Export Report dialog box). The **Export...** function allows you to export the generated report to an ASCII text file. This ASCII file can then be imported into FrameMaker where it can be edited.

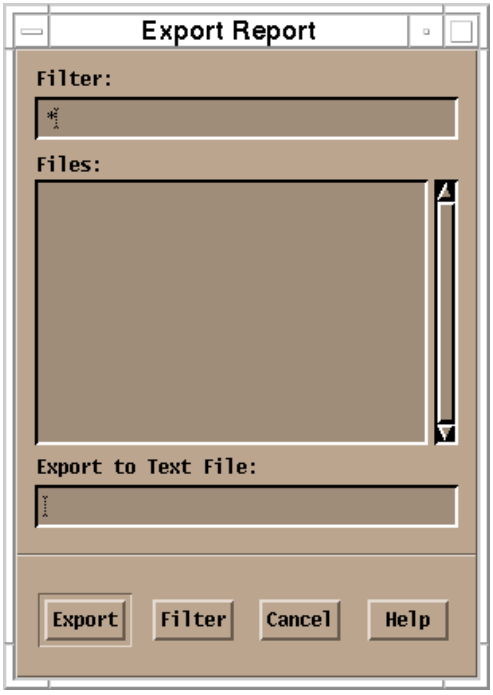


Figure 9-40, Export Report dialog box.

Clicking Export exports the file in an ASCII format to the **doc** directory that can then be accessed using FrameMaker, available under the **Utilities** menu from the **Launchpad**. This is the default pushbutton when the cursor is in the **Export to Text File:** input text field.

Clicking Filter filters files based on the criteria specified in the **Filter:** input text field. An asterisk in this field indicates that all report files are to be shown. This is the default pushbutton when the cursor is in the **Filter:** input text field.

9.3.5.13 Find Mnemonic/Group/File Name...

The **Find...** menu item allows you to perform a search based on your inventory radio button selection.

Table 9-5, Find...matrix

Inventory Selected	Options Menu Item	Dialog Box Invoked
Command	**Find Mnemonic...**	**Find Mnemonic** dialog box
Header	**Find Mnemonic...**	**Find Mnemonic** dialog box
Group	**Find Group Name...**	**Find Group Name** dialog box
File	**Find File Name...**	**Find File Name** dialog box

Depending on your inventory selection, the menu item will change and the labeling of the dialog box invoked will change, but, the basic construction and functionality of the dialog box will remain consistant. This find function is not case-sensitive. No wildcards are permitted and the found command, file, etc. will be highlighted within the inventory list.

For purposes of this discussion, assume that you have a Command Inventory radio button selected. Selecting the **Find Mnemonic...** menu item invokes the **Find Mnemonic** dialog box (see Figure 9-41, Find Mnemonic dialog box). You can specify the mnemonic for a command that you'd like to locate within the **Command Inventory** list on this window.

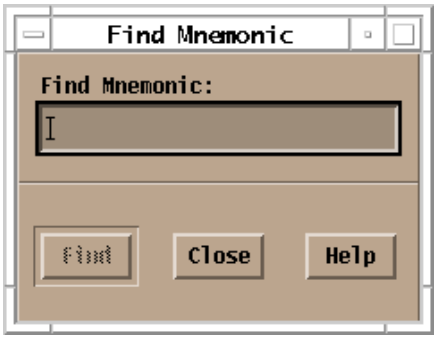


Figure 9-41, Find Mnemonic dialog box.

9.3.5.14 Show Technical Name and Show Description

The **Show Technical Name** or **Show Description** menu item is displayed depending on your inventory radiobutton selection. This menu item will display:

- **Show Technical Name** when the **Command Inventory** is selected
- **Show Description** when the **Header Inventory** is selected
- Be Grayed Out when the **File Inventory** is selected and if no row in an inventory is selected

This menu item provides the requested information within a dialog box as shown in Figure 9-42, Show Technical Name dialog box.

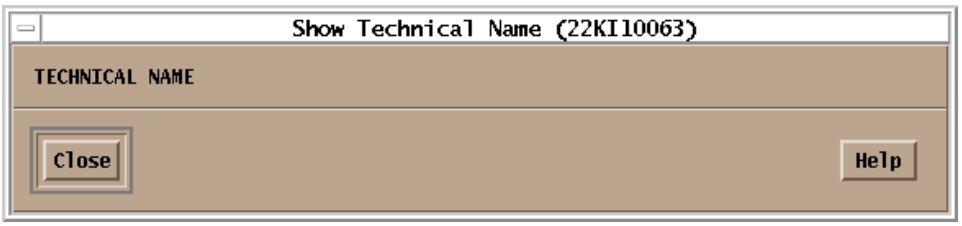


Figure 9-42, Show Technical Name dialog box.

9.4 Update Command Mini-Application Overview

Update Command is a mini-application which can be invoked from the Command Operation, Scripting, Scratchpad Line, or Display Operation applications to update a header or command in the Operational Command Database (OCDB). Within these applications, you must have already selected a mnemonic to update. This mnemonic can be:

- a command header
- a fixed-length modifiable command
- a fixed-length predefined command
- a variable-length modifiable command

The type of mnemonic you select will dictate the appearance of the **Update Command** main window. If you select a command header in the parent application, only the command header portion of the Update Command status bar and work area will display data. If you select a command mnemonic, then information relevant to the header and to the command will be displayed in the **Update Command** status bar and work area.

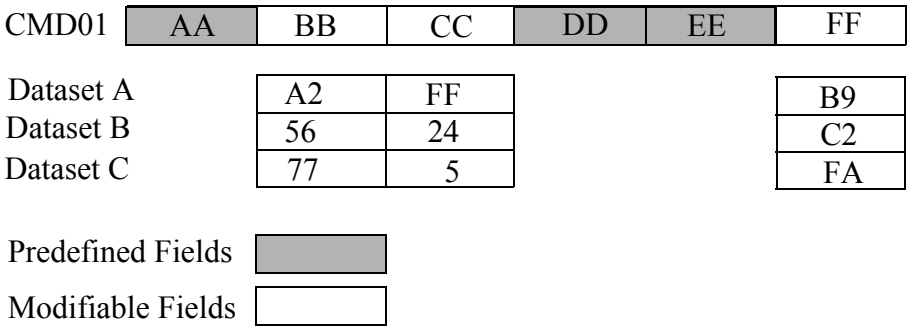
For example, if you select the **Command Inventory** radio button within the Command Operation application, all those commands which you can access are displayed in the **Command Operation** work area. If you then select a fixed-length modifiable command from the work area and click Update... or select **Update...** from the **Options** menu, the Update Command mini-application will be invoked and the selected command's update form will be displayed within its work area. If you have not defined an update form for the selected command and a master command exists, then the update form for the master command will be used, otherwise the Update Command mini-application will not be accessible. The current values from the OCDB associated with each field on the form will be displayed. You can either change the current values of the modifiable fields and update the command, or you can change the current values and save them as a named data set for that command. You can create as many data sets as you need for each fixed-length modifiable command.

A data set is:

- a copy of a command's modifiable field structure
- uniquely named
- associated with a single command

In the following illustration, a fixed-length, modifiable command (CMD01) with both predefined and modifiable fields is shown. Datasets A, B, and C have been defined in hexadecimal for each modifiable eight bit word of the command.

Example:



If you have built an update form for a fixed-length modifiable command, you can still invoke a system provided form. Menu items are available from the **Header** and **Command** menus which allow you to invoke a system-provided form. This form, however, is for viewing only and cannot be used to modify the command. You must use your custom form to modify fixed-length, modifiable commands.

For fixed-length, predefined commands, system-provided update forms allow you to view the command's uplink pattern. You can also develop your own display-only update forms which allow you to customize the way in which predefined commands are shown within the Update Command work area. Fixed-length, predefined commands cannot be modified.

For variable-length, modifiable commands, system-provided update forms are invoked when you initiate the update function. The default system-provided form type is **Hexadecimal**. You can change the form type by selecting one of the alternatives available from the **Command** menu. Other system-provided forms allow you to modify command data in decimal, octal, binary, or text. Any changes you make must be in the native format of the system-provided form. You use the **Define Variable Field Length...** menu item under the **Options** menu to define the number of bytes to be included in a variable-length command. If the data is undefined in the database, one blank byte will be shown on the system-provided update form.

Help: For information on how to define the length of variable-length commands, see "9.4.5.8 Define Variable Field Length..." later in this chapter.

Note: The implementation of system-provided forms shows the header values in the command form's uplink pattern. This was only implemented for fixed-length commands. Header data is not shown in the command form for variable-length, modifiable commands.

Note: System-provided forms cannot be used to view the uplink pattern of hazardous commands. Therefore, the user-defined form is the only option available for modifying hazardous commands.

Note: Datasets are not User-Generated Data Element (UDEs). They can be created using either the Project Command Database (PCDB) or OCDB. They become part of the OCDB.

The Update Command main window contains several destinct features that will be discussed in this chapter (see Figure 9-43, Update Command main window):

- Menu Bar
- Status Bar
- Work Area
- Conversion Area

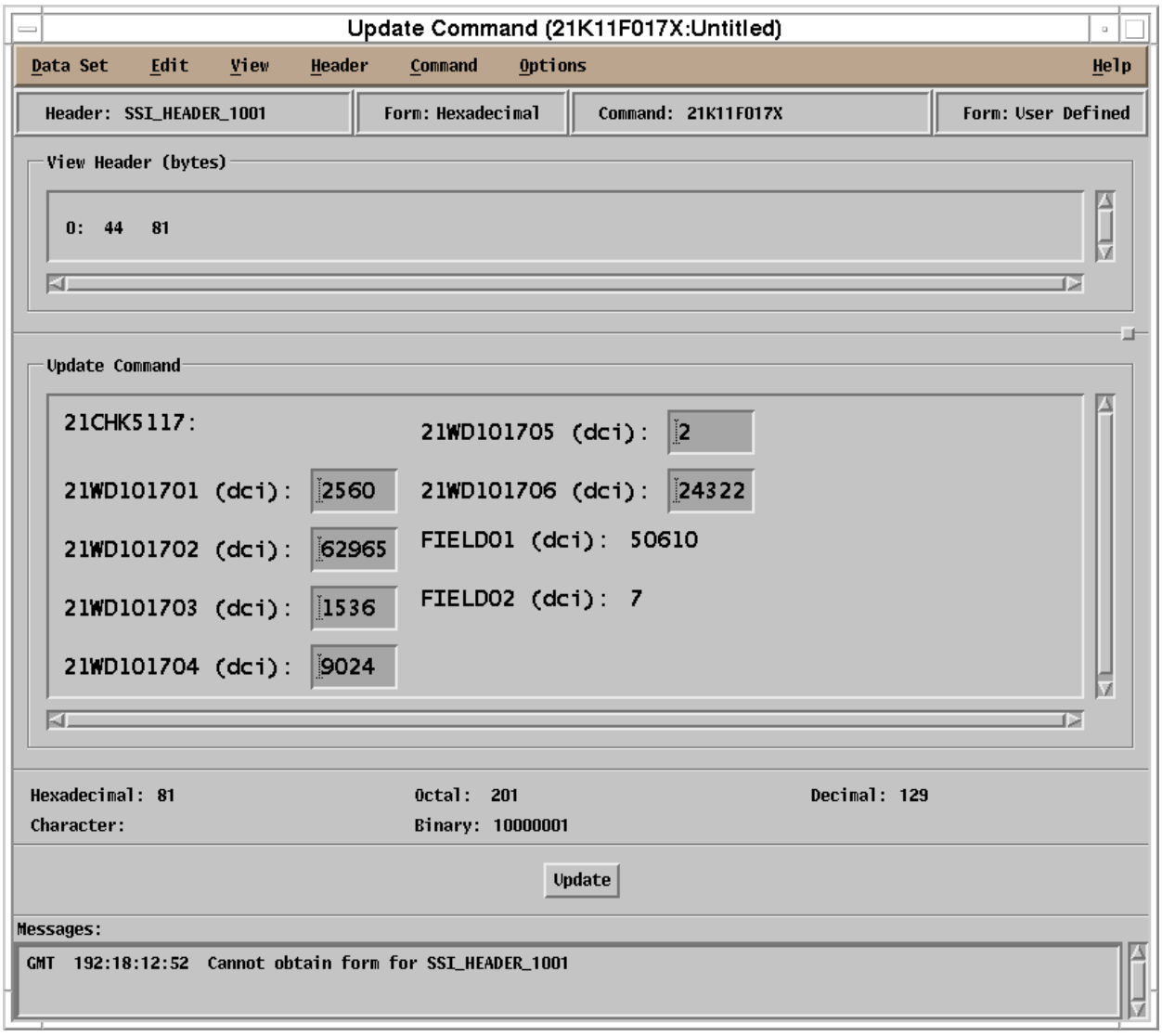


Figure 9-43, Update Command main window.

9.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes seven menus: **Data Set**, **Edit**,

View, **Header**, **Command**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Header** and **Command** Menus
  Show User Defined Form
  Show Binary Form
  Show Character Form
  Show Decimal Form
  Show Hexadecimal Form
  Show Octal Form
- **Options** Menu
  Update...
  Define Variable Field Length...

9.4.2 Status Bar

The status bar has four areas:

Header: contains the header mnemonic for the header whose update form is opened

Form: displays the type of update form being used. The valid form types are:

- **Binary**
- **Character**
- **Decimal**
- **Hexadecimal**
- **Octal**
- **User Defined**
- **None**

Note: If a header mnemonic was specified in the parent application and a user defined form is used, then this area will display **User Defined**. If a command mnemonic was specified in the parent application and its header does not have a user-defined form, then the hexadecimal form will be used.

Note: None is displayed if you hide the header form using the **Hide Header** menu item.

The following two items will not be visible if a header was specified to be updated.

Command: Mnemonic displays the command mnemonic for the command being updated.

Form: displays the type of update form being used. This area is updated when one of the **Header** or **Command** menu items is selected. The valid types are:

- **Binary**
- **Character**
- **Decimal**
- **Hexadecimal**
- **Octal**
- **User Defined**

9.4.3 Work Area

The work area contains two frames. The first frame changes its label based on the type of mnemonic selected in the parent application. The frame will be labeled **Update Header** if a header mnemonic is selected. The frame will be labeled **View Header** if a command mnemonic was selected. If you are not using a user-defined form, **(bytes)** will be appended to the frame label.

If the header frame label reads **View Header (bytes),** then this frame displays the command header beginning with byte **0**. The frame contains all header bytes including both those that are modifiable and those that are fixed. The field widths within this area change based on the type of header form selected:

- Binary form - fields are eight characters wide and valid entries for each byte range from **0** to **11111111**.

- Character form - fields are two characters wide. There are no valid entry ranges established for a character field; the only valid characters are those defined in MSFC HOSC Database Definitions Volume 5: Command Database (MSFC-DOC-1949) "Appendix G - ASCII and EBCDIC Character Translations."

Note: If Character form is chosen and the converted data translates to characters not valid in MSFC-DOC-1949, then this form cannot be used.

- Decimal form - fields are three characters wide and valid entries for each word range from **0** to **255**
- Hexadecimal form - fields are two characters wide and valid entries for each word range from **0** to **FF**
- Octal form - fields are three characters wide and valid entries for each word range from **0** to **377**

The **Update Command** frame is only shown if a command mnemonic was chosen to update. The **Update Command** frame resizes itself so that you can see all of the fields' data. Data bytes for the command are shown beginning with byte **0**. Within this frame, you supply the data for the VV-type command or change any modifiable data fields you wish.

Help: The two frames that comprise the work area are separated by a window pane. This pane may be used to allocate/deallocate frame space.

Note: The form types and valid data entry ranges that apply here are the same as those for the header frame discussed earlier.

9.4.4 Conversion Area

The conversion area displays the hexadecimal, octal, decimal, character, and binary conversions for the data you are entering in an updateable field.

9.4.5 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the Update Command mini-application. All of the menu items from the **Header** and **Command** menus as well as all of the menu items from the **Options** menu will be discussed (see Figure 9-44, File, Edit, and Define menus).

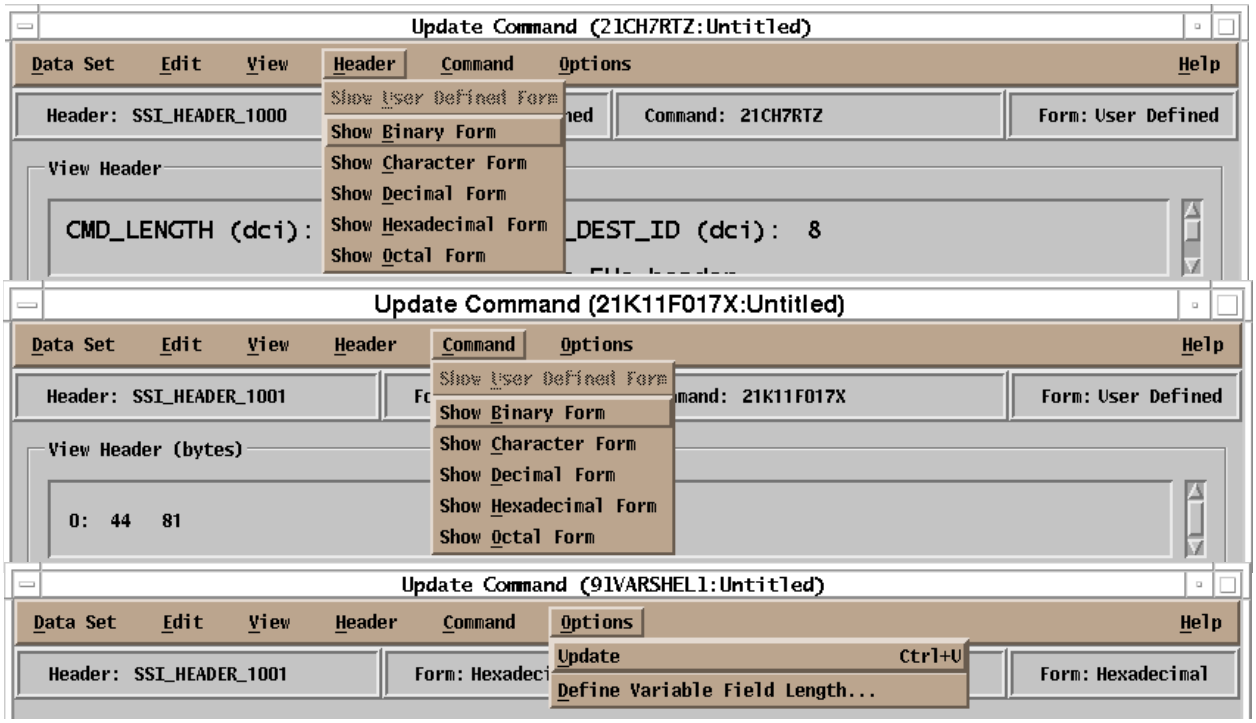


Figure 9-44, Header, Command, and Options menus.

9.4.5.1 Show User Defined Form

The **Show User Defined Form** menu item invokes the user-built form that you created in the Command Update Form Generation application for the selected fixed length command or header.

Note: This menu item is not available when a variable-length, variable format command is selected.

9.4.5.2 Show Binary Form

The **Show Binary Form** menu item allows you to view the selected command uplink pattern or variable length, variable format, modifiable fields in a binary format (see Figure 9-45, Binary form).

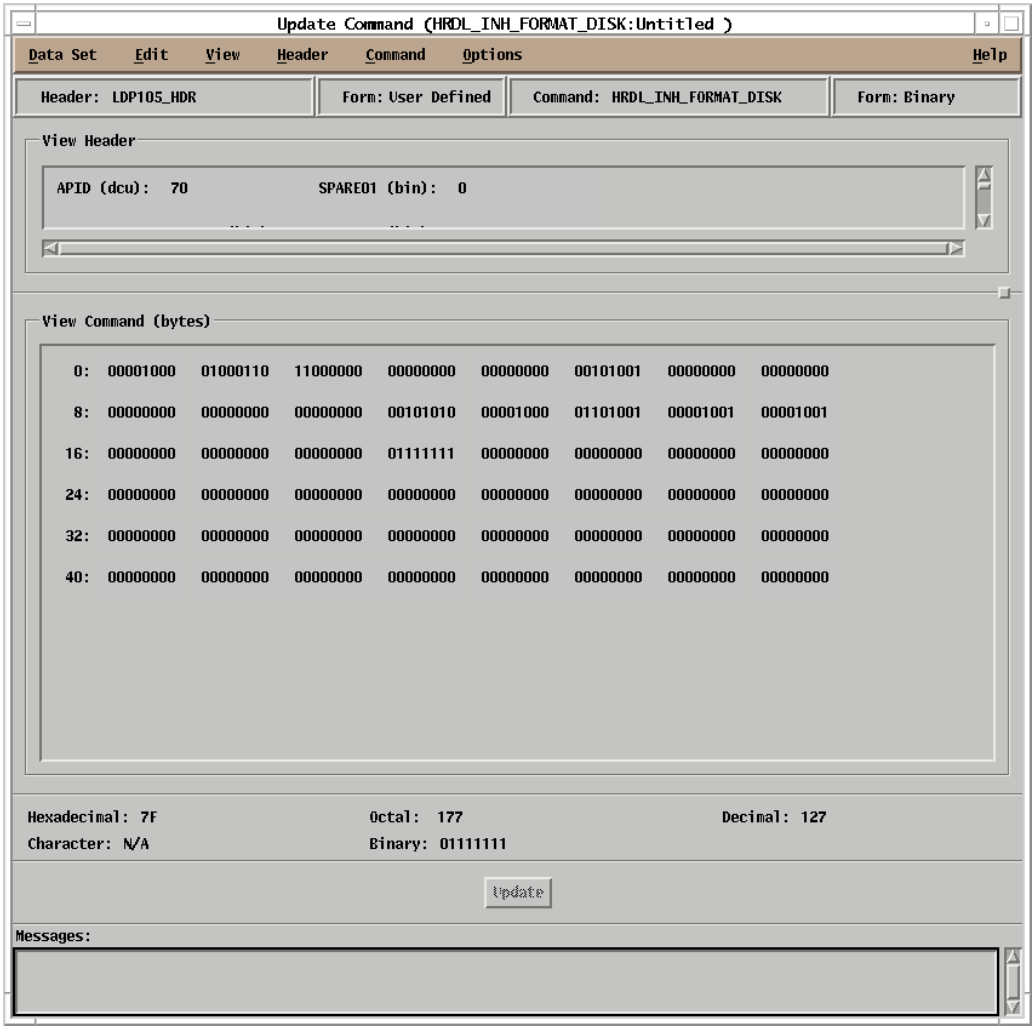


Figure 9-45, Binary form.

9.4.5.3 Show Character Form

The **Show Character Form** menu item allows you to view the selected command uplink pattern or variable length, variable format, modifiable fields in a character format.

9.4.5.4 Show Decimal Form

The **Show Decimal Form** menu item allows you to view the selected command uplink pattern or variable length, variable format, modifiable fields in a decimal format (see Figure 9-46, Decimal form).

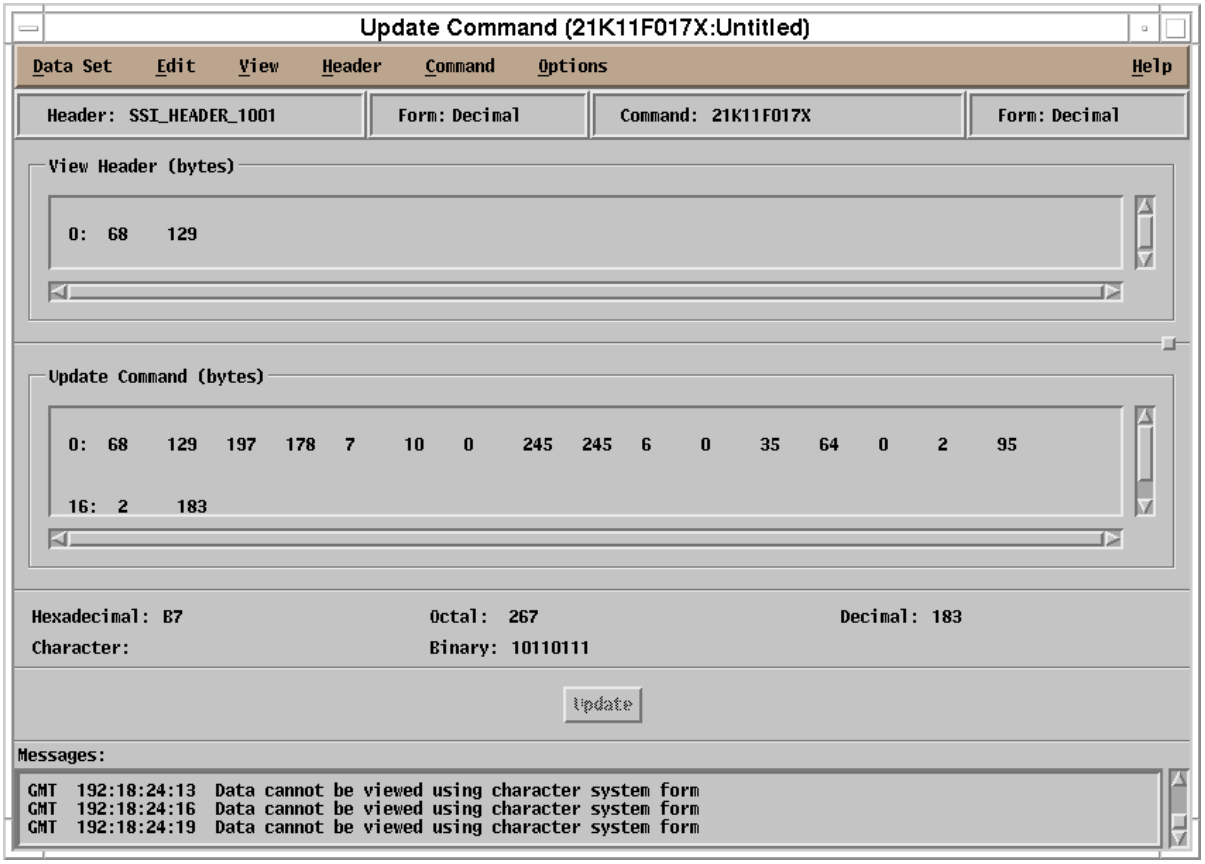


Figure 9-46, Deciimal Form.

9.4.5.5 Show Hexadecimal Form

The **Show Hexadecimal Form** menu item allows you to view the selected command uplink pattern or variable length, variable format, modifiable fields in a hexadecimal format (see Figure 9-47, Hexadecimal form).

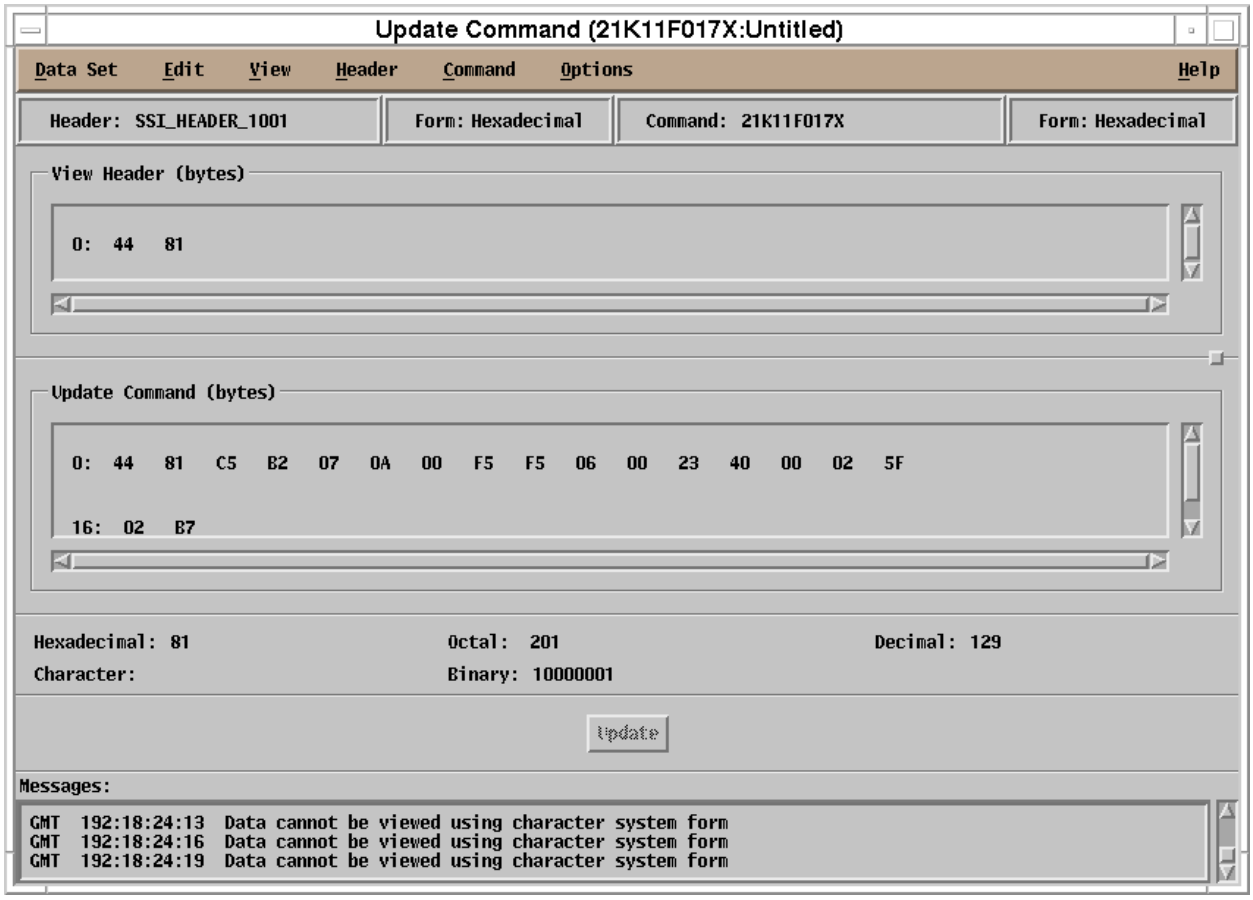


Figure 9-47, Hexadecimal form.

9.4.5.6 Show Octal Form

The **Show Octal Form** menu item allows you to view the selected command uplink pattern or variable length, variable format modifiable fields in an octal format (see Figure 9-48, Octal form).

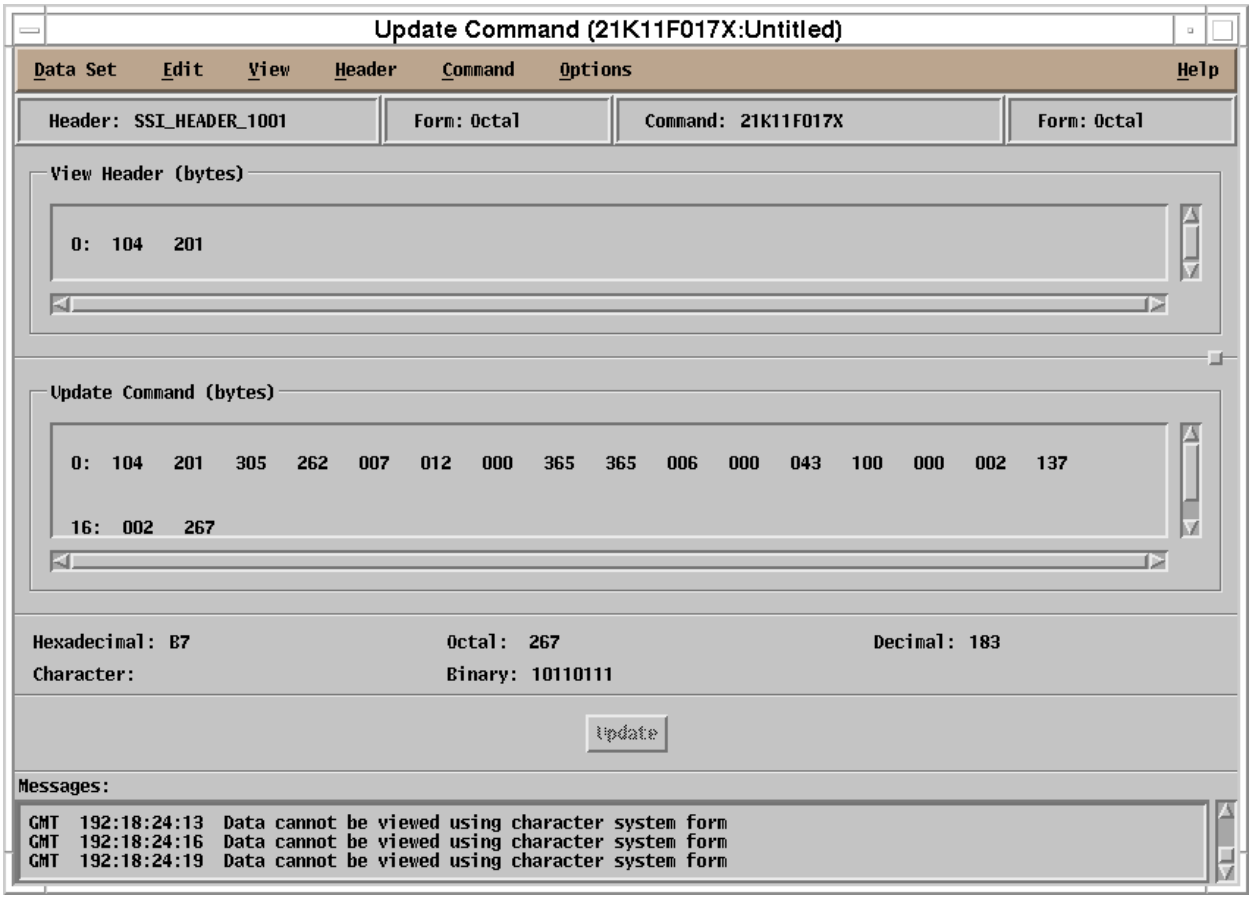


Figure 9-48, Octal form.

9.4.5.7 Update

The **Update** menu item provides a redundant action to Update on the **Update Command** main window. It submits updates to the OCDB or to a command's data when defining a command in a group.

9.4.5.8 Define Variable Field Length...

The **Define Variable Field Length...** menu item invokes a dialog box that allows you to specify the number of command data bytes for a variable length, variable format-type command (see Figure 9-49, Define Variable Field Length dialog box). This menu item is available only when updating VV-type commands.

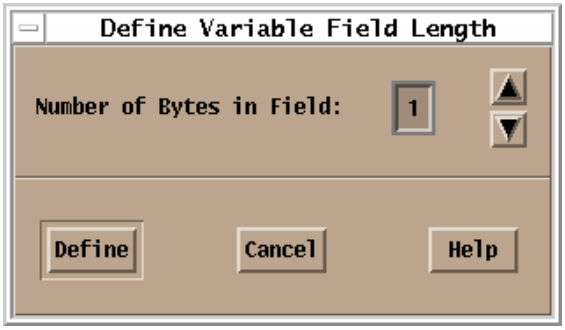


Figure 9-49, Define Variable Field Length dialog box.

9.5 Downlink Request Overview

The Downlink Request application allows the user to submit requests for file downlinks or memory dumps from the International Space Station (ISS). The application allows you to:

- Transmit Downlink Requests
- Receive approval responses
- Receive status updates for downlinks in progress

Requests are submitted from EHS workstation users and remote users via a web browser (see Figure 9-50, Downlink Request concept). Individual users are responsible for registering the ground filename for the requested onboard file in the Payload Information Management System (PIMS) database (using the Document Configuration Management (DCM) application) prior to requesting the file downlink. Registering a file in PIMS simply amounts to reserving a placeholder which represents the filename used to store the file in PIMS once the file has been successfully downlinked. The user then submits a downlink request to the command system using the Downlink Request application which is accessible through the EHS Web Server. The request is submitted to the Downlink Request (DLR) Router application on the EHS Command Server which verifies the ground file registration in the PIMS DCM. If the ground file information is not registered in the PIMS DCM, the requesting user is notified and no downlink request is submitted.

Once the request is verified, the DLR Router application submits an approval request to the Central Command Processor (CCP) which routes this request to the Downlink Management (DLM) application. The Downlink Manager has the option to approve the request and submit it for processing by the command system or to delete (reject) the request. Only one file downlink operation can be active at any given time; before a subsequent file downlink command can be sent, the current file downlink must be successfully completed (file completely reassembled and stored in the PIMS database) or terminated.

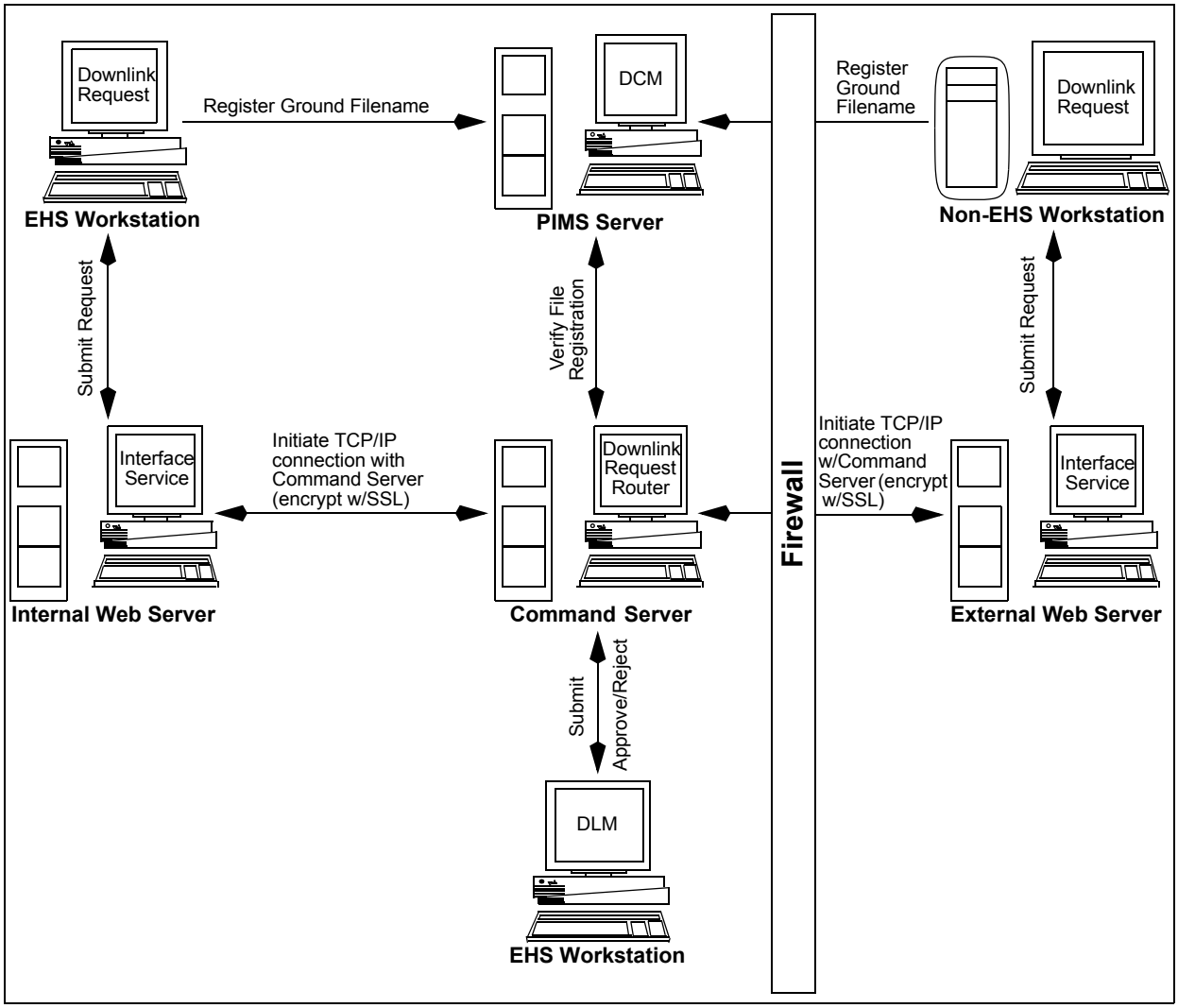


Figure 9-50, Downlink Request concept.

The Downlink Request main window contains several destinct features that will be discussed in this chapter (see Figure 9-51, Downlink Request main window):

- Menu Bar
- Downlink Type Panel
- Work Area

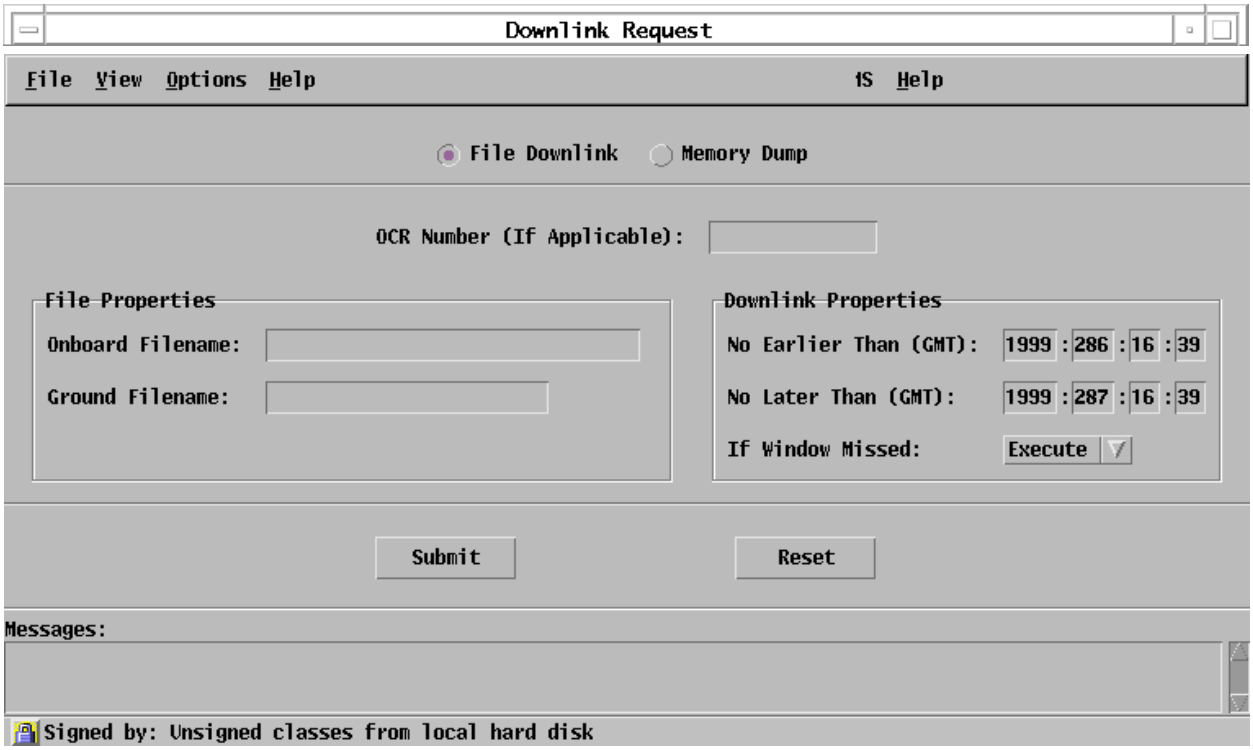


Figure 9-51, Downlink Request main window.

9.5.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed.

9.5.2 Downlink Type Panel

The Downlink Type Panel contains two toggle buttons:

- **File Downlink**
- **Memory Dump**

These toggle buttons select the type of downlink requested and the configuration of the Work Area. The **File Downlink** button is initially set at application startup causing the **File Downlink** work area to be displayed. When the **Memory Dump** toggle button is selected, the **File Downlink** work area is replaced with the **Memory Dump** work area. No information is lost when toggling between **File Downlink** and **Memory Dump**.

Note: The **Memory Dump** option will be delivered in a future build.

9.5.3 File Downlink Work Area

The File Downlink work area consists of an **OCR Number (If Applicable):** text entry field and two frames: **File Properties** and **Downlink Properties**. The main window cannot be resized, vertically or horizontally.

The **OCR Number (If Applicable):** text entry field is initially blank and is used to enter an Operations Change Request (OCR) number if an OCR is associated with the downlink request.

The **File Properties** frame contains two text entry fields for information relevant to the file being downlinked. The **Onboard Filename:** is the name of the the file as it appears onboard the payload MDM. The **Ground Filename:** is the filename that you used to register the downlink file in PIMS. Both of the above fields are initially blank.

The **Downlink Properties** frame contains information relevant to the actual file downlink. It is comprised of two time fields and the **If Window Missed:** option menu button.

The **No Earlier Than (GMT):** indicates the earliest time that the file can be downlinked. Operationally, it is interpreted as the “execute after” time. At application startup it defaults to the current GMT.

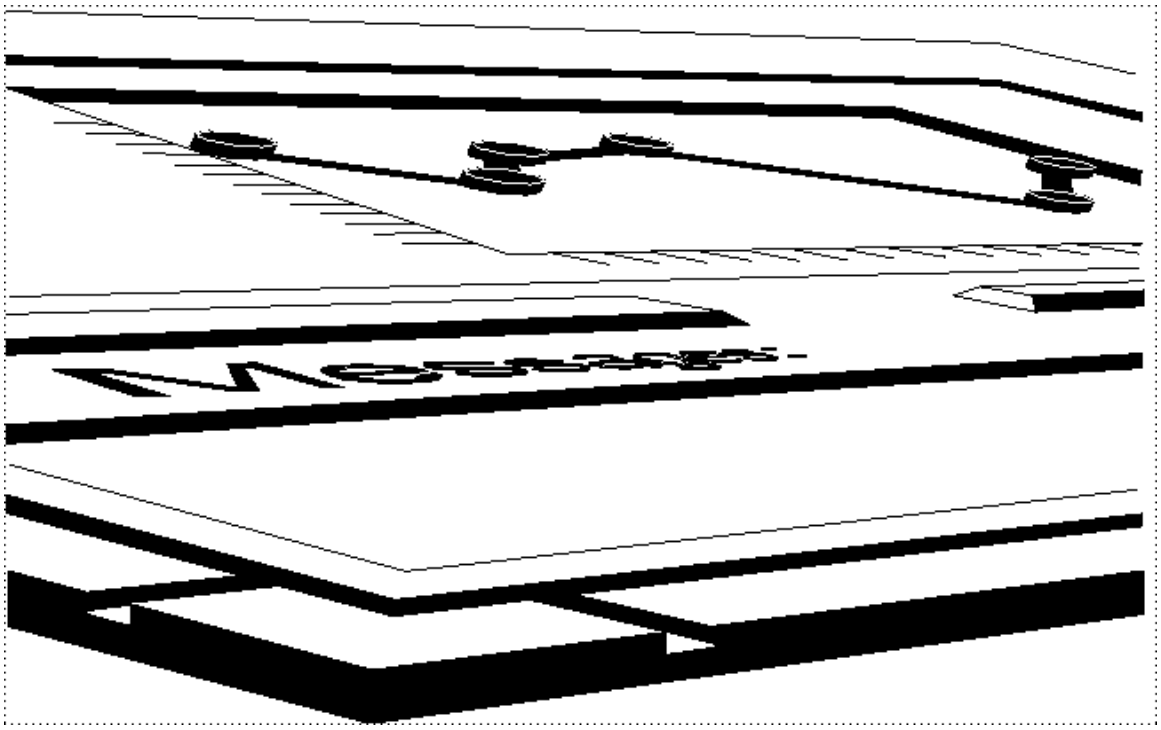
The **No Later Than (GMT):** displays the “no later than” time for downlink from the ISS. At application startup it defaults to the current GMT plus one day.

The **If Window Missed:** option menu button describes the action for the Downlink Manager to take if the file has not been downlinked by the no later than time. Options available are **Execute** or **Cancel** with the default being **Execute**.

Note: If a file is not downlinked, it is the responsibility of the user to delete the placeholder that was set in PIMS.

9.5.4 Memory Dump Work Area

TBD



Chapter 10:
Scratchpad Line Software

10.1 Overview

The Scratchpad Line application is an interactive command line which provides the user with a simple method of issuing directives based on the Enhanced Huntsville Operations Support Center (HOSC) System (EHS) Scripting Language supported by the Script Generation application. Scratchpad Line directives are designed to perform one specific task (e.g., starting a computation or uplinking a command). None of the logic and conditional directives or looping constructs supported by the Scripting Language are available in Scratchpad Line. Thus, there are fewer directives available in Scratchpad Line than in Script Generation.

The Scratchpad Line main window contains two distinct features that will be discussed in this chapter (see Figure 10-1, Scratchpad Line main window):

- Menu Bar
- Work Area

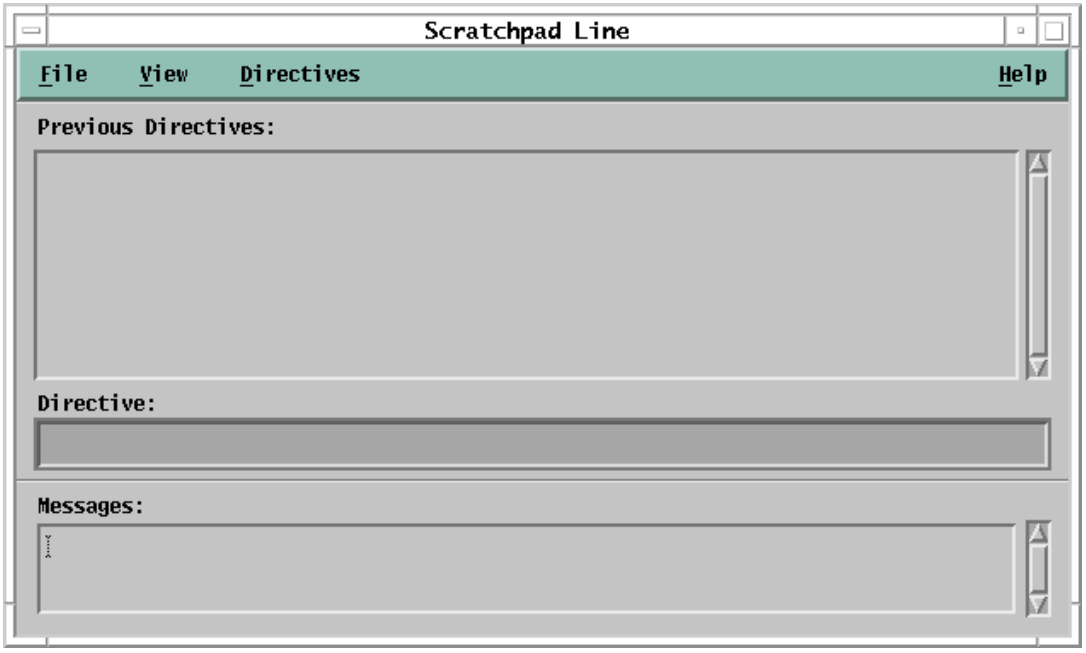


Figure 10-1, Scratchpad Line main window.

10.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar consists of the **File**, **View**, **Directives**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu Options that will be discussed later in this chapter are:

- **Directives Menu**
  - **Buffer**
  - **Start**
  - **Stop**
  - **Update**
  - **Uplink**

10.1.2 Work Area

The work area of the **Scratchpad Line** main window consists of a scrollable list labeled **Previous Directives:** and a **Directive:** text input field.

The **Previous Directives:** field displays a list of the last directives issued from the Scratchpad Line application in chronological order. This list will retain the last 100 directives with the oldest

directive at the top of the list. After 100 directives have been issued, the oldest directive will be removed from the list as each new directive is issued.

Tip: You may reselect a directive from the **Previous Directives:** list. Once selected, it will be displayed in the **Directive:** text input field. It can then be executed.

Note: The scroll bar to the right of the list can be used to view those directives that have scrolled out of the display area.

The **Directive:** input text field allows you to enter directives to be issued. These directives can be used to start or stop a computation, display, command form, or script. Other directives allow you to update computation constants, update external pseudos, and uplink commands, chains, and files.

Note: As an alternative to typing some directives into the **Directive:** input text field, you can select one of the directives available from the **Directives** menu.

10.1.3 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Scratchpad Line application. All of the options from the **Directives** menu will be discussed (see Figure 10-2, Directives menu).

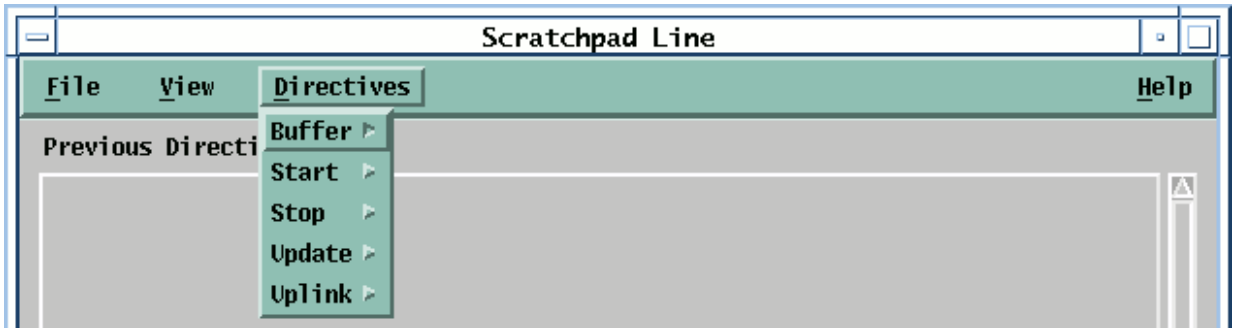


Figure 10-2, Directives menu.

The cascade menus available under the **Directives** menu provide access to the directives that can be executed within the Scratchpad Line application. Selecting an item from these cascade menus places the equivalent directive in the **Directive:** text input field so that you can then complete the directive by typing in any additional qualifiers.

Help: For complete information on the syntax and details of the directives available within the Scratchpad Line application, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.1 Buffer

10.1.3.1.1 Buffer Command

Syntax
`buffer command` *`mnemonic [sub-field1=value1 sub-field2=value2,...]`*

This menu item places the directive **buffer command** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the mnemonic you wish to buffer along with any subfield values (required for modifiable commands). After specifying the mnemonic and its subfields, press Enter to buffer the command. You will receive a message in the message area that the command has been inserted into the current dynamic command buffer. A popup window will appear the first time you issue this directive. The first command you buffer and each subsequently buffered command will appear in this window. This window closes upon clearing the buffer.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.1.2 Buffer Send

Syntax
`buffer send` *`[cmd_position_number_in_group]`*

This menu item places the directive **buffer send** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to initiate the uplink of the buffered command group. After specifying any optional arguments, press Enter to uplink the buffered command group. You will receive a message in the message area that the process has completed. The popup window that was invoked when you began buffering commands will remain open and the buffer will not be cleared automatically.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.1.3 Buffer Clear All

Syntax
`buffer clear all`

This menu item places the directive **buffer clear all** in the **Directive:** text input field. Press Enter to remove all commands from the dynamic command buffer. You will receive a message in the message area that the buffer has been cleared.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.1.4 Buffer Clear Last

Syntax
```
buffer clear last
```

This menu item places the directive **buffer clear last** in the **Directive:** text input field. Press Enter to remove the last command placed in the dynamic command buffer. You will receive a message in the message area that the last buffered command has been removed.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.2 Start

10.1.3.2.1 Start Comp

Syntax
```
start comp comp_name (datamode,tdb_version,
priority,tbs_1,tbs_2[,input_file,output_file])
```

This menu item places the directive **start comp** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the computation you wish to start and the required EHS arguments. After specifying the computation and any required arguments, press Enter to start the computation. You will receive a message in the message area that the computation has been started.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.2.2 Start Display

Syntax
```
start display disp_name [x_pos y_pos] [datamode tdb_version]
```

This menu item places the directive **start display** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the display you wish to start and any required arguments. After specifying the display and its arguments, press Enter to start the display. A new Display Operation application will be invoked with the specified display open in the work area.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.2.3 Start Script

Syntax
`start script` *`script_name [(arg1...argN)]`*
`[IN` *`filename`*`] [OUTPUT` *`output_filename`*`]` *`[datamode tdb_version]`*

This menu item places the directive **start script** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the script you wish to start along with any required arguments. After specifying the script and its arguments, press Enter to start the script. A new Script Operation application will be invoked with the specified script open in the work area.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3 Stop

10.1.3.3.1 Stop Chain

Syntax
`stop chain` *`chain_name`*

This menu item places the directive **stop chain** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the mnemonic of the chain whose execution you wish to stop. After specifying the chain, press Enter to stop the chain execution. You will receive a message in the message area that the chain has been stopped.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.2 Stop Group

Syntax
`stop group` *`group_name`*

This AXAF-specific menu item places the directive **stop group** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the group whose uplink you wish to stop. After specifying the group, press Enter to stop the group uplink. You will receive a message in the message area that the group has been stopped.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.3 Stop Comp

Syntax

```
stop comp comp_name(datamode,tdb_version,priority,
tbs_1,tbs_2[,input_file,output_file])
```

This menu item places the directive **stop comp** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the computation you wish to stop along with any arguments needed to uniquely identify the computation (e.g. the data mode). After specifying the computation, press Enter to stop the computation. You will receive a message in the message area that the computation has been stopped.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.4 Stop Comp All

Syntax

```
stop comp all
```

This menu item places the directive **stop comp all** in the **Directive:** text input field. Press Enter to stop all computations that you have started on your local platform. You will receive a message in the message area that all computations have been stopped.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.5 Stop Display

Syntax

```
stop display disp_name [datamode tdb_version]
```

This menu item places the directive **stop display** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the display you wish to stop along with any arguments needed to uniquely identify the display (e.g., the data mode). After specifying the display, press Enter to stop the display. This directive will terminate the Display Operation application where the specified display is currently shown.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.6 Stop Display All

Syntax
```
stop display all
```

This menu item places the directive **stop display all** in the **Directive:** text input field. Press Enter to stop all displays that you have started on your local platform. This directive will terminate all Display Operation applications.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.7 Stop Script

Syntax
```
stop script script_name [datamode tdb_version]
```

This menu item places the directive **stop script** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the script you wish to stop along with any arguments necessary to uniquely identify the script (e.g., the data mode). After specifying the script, press Enter to stop the script. This directive will terminate the Script Operation application that was invoked for the specified script.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.3.8 Stop Script All

Syntax
```
stop script all
```

This menu item places the directive **stop script all** in the **Directive:** text input field. Press Enter to stop all scripts that you have started on your local platform. This directive will terminate all Script Operation applications.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.4 Update

10.1.3.4.1 Update Command Form

Syntax
`update command form` *`command_mnemonic`*

This menu item places the directive **update command form** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the mnemonic associated with the command form you wish to update. This directive invokes the Update Command mini-application for the selected command.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.4.2 Update Header Form

Syntax
`update header form` *`command_header_mnemonic`*

This menu item places the directive **update header form** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the mnemonic associated with the header form you wish to update. This directive invokes the Update Command mini-application for the selected header.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.4.3 Update Constant

Syntax
`update constant` *`comp_constant_name comp_name datamode database value`*

This menu item places the directive **update constant** in the **Directive:** text input field on the main window work area. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the computation constant you wish to update along with its new value. After specifying the computation constant and its new value, press Enter to update the computation constant. You will receive a message in the message area that the constant has been updated.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.4.4 Update Pseudo

Syntax
`update pseudo` *`pseudo_msid`* `with` *`value`*

This menu item places the directive **update pseudo** in the **Directive:** text input field on the main window work area. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the external pseudo Measurement/Stimulus Identifier (MSID) you wish to update along with its new value. After specifying the pseudo and its new value, press Enter to update the pseudo. You will receive a message in the message area that the pseudo MSID has been updated.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.5 Uplink

10.1.3.5.1 Uplink Chain

Syntax
`uplink chain` *`mnemonic [command_pos_num_in_chain]`*

This menu item places the directive **uplink chain** in the **Directive:** text input field on the main window work area. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the command chain you wish to uplink. After specifying the chain, press Enter to initiate its uplink. You will receive a message in the message area that the chain has been initiated.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.5.2 Uplink Command

Syntax
`uplink command` *`mnemonic`*

This menu item places the directive **uplink command** in the **Directive:** text input field on the main window work area. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the command you wish to uplink. After specifying the command, press Enter to initiate its uplink. You will receive a message in the message area that the command has been uplinked.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.5.3 Uplink Group

Syntax
`uplink group` *`mnemonic [cmd_pos_number_in_group]`*

This AXAF-specific menu item places the directive **uplink group** in the **Directive:** text input field. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the name of the group you wish to uplink. After specifying the group name, press Enter to initiate its uplink. You will receive a message in the message area that the group has been initiated.

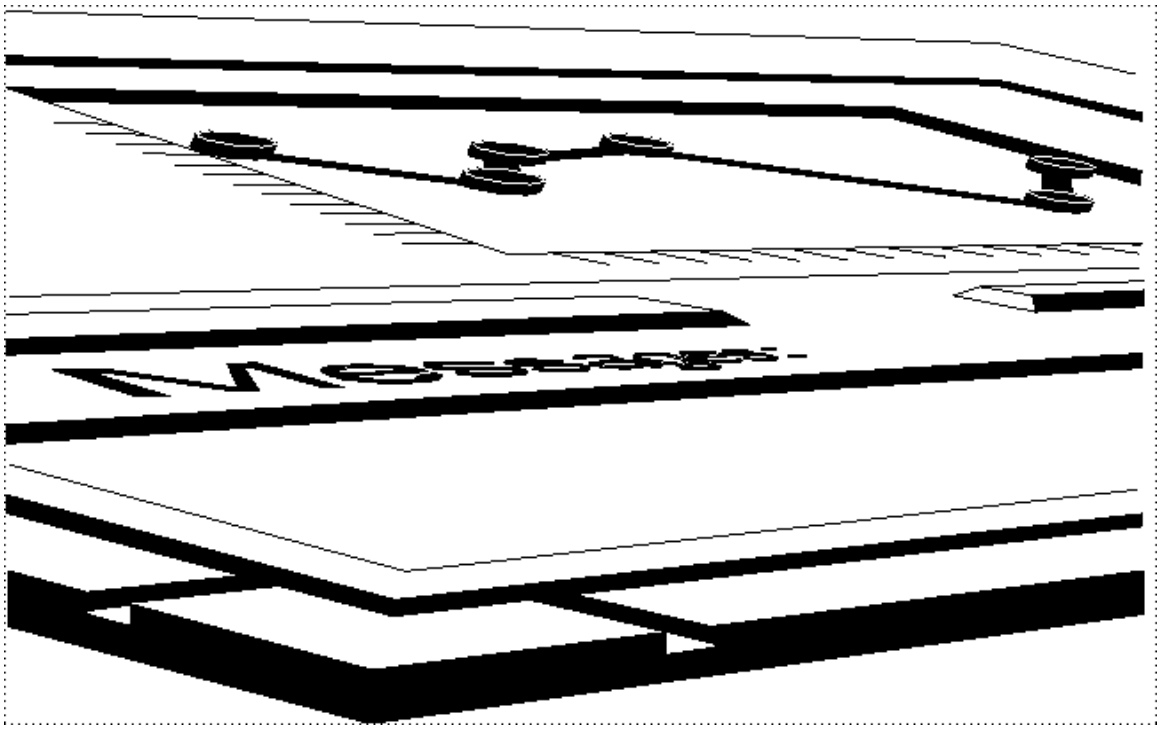
Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).

10.1.3.5.4 Uplink Timetagged Command

Syntax
`uplink timetagged command` *`mnemonic`*

This menu item places the directive **uplink timetagged command** in the **Directive:** text input field on the main window work area. A cursor will appear after the directive in the **Directive:** text input field allowing you to specify the timetagged command you wish to uplink. After specifying the timetagged command, press Enter to initiate its uplink. You will receive a message in the message area that the timetagged command has been uplinked.

Help: For complete information on the syntax and details of this directive, see Scripting Language and Scratchpad Line Detailed Specification (HOSC-EHS-2057).



Chapter 11:
Command Utilities Software

This chapter describes two Huntsville Operations Support Center (HOSC) applications: **Command Track** and **Command Delog**.

The **Command Track** application provides you with the current status of a command's execution as it progresses through the HOSC system to the spacecraft. You can monitor the real-time status of commands that have been issued by all command users or those issued from your workstation only.

The **Command Delog** application allows you to view a list of past commanding activities that occurred within a specific time frame. You can generate a command delog report by specifying a time frame for which you wish to view all logged commanding activities. The specific contents of the Command Delog report varies by project but generally contains the following information:

- The command mnemonic of the uplinked command
- The command uplink format
- The time the command was initiated
- Any responses received as a result of the command's uplink

The **Command Track** application, like all other HOSC application software, uses a windowing Graphical User Interface (GUI) similar to that used by Apple Macintosh© and Microsoft Windows©. As a result, you may consider some of the information included in this document as intuitive and "the normal way of doing things." For others, this may be your first attempt at using windowing software. In both cases, this document tries to address your needs. HOSC software is based on a GUI standard developed by Open Software Foundation, Inc. called OSF/Motif™. This document will introduce you to the OSF/Motif GUI and, in particular, will define how it has been implemented within the command utility applications.

Command Delog incorporates Oracle Forms as part of its report-generating facilities. This document will introduce the rudimentary elements of Oracle Forms which you will need to understand in order to work with **Command Delog**.

11.1 Command Track Overview

The Command Track application supports the real-time tracking of commands, groups, and files (as appropriate to the project) as they are uplinked by the command system to the spacecraft. The work area is updated each time an uplink transmission is issued from the Huntsville Operations Support Center (HOSC). All responses that correspond to each uplink are also displayed. You can configure the display to show data for all HOSC command users in a mission or for your User ID only.

The Command Track main window contains three distinct features that will be discussed in this chapter (see Figure 11-1, Command Track main window):

- Menu Bar
- Status Bar
- Work Area

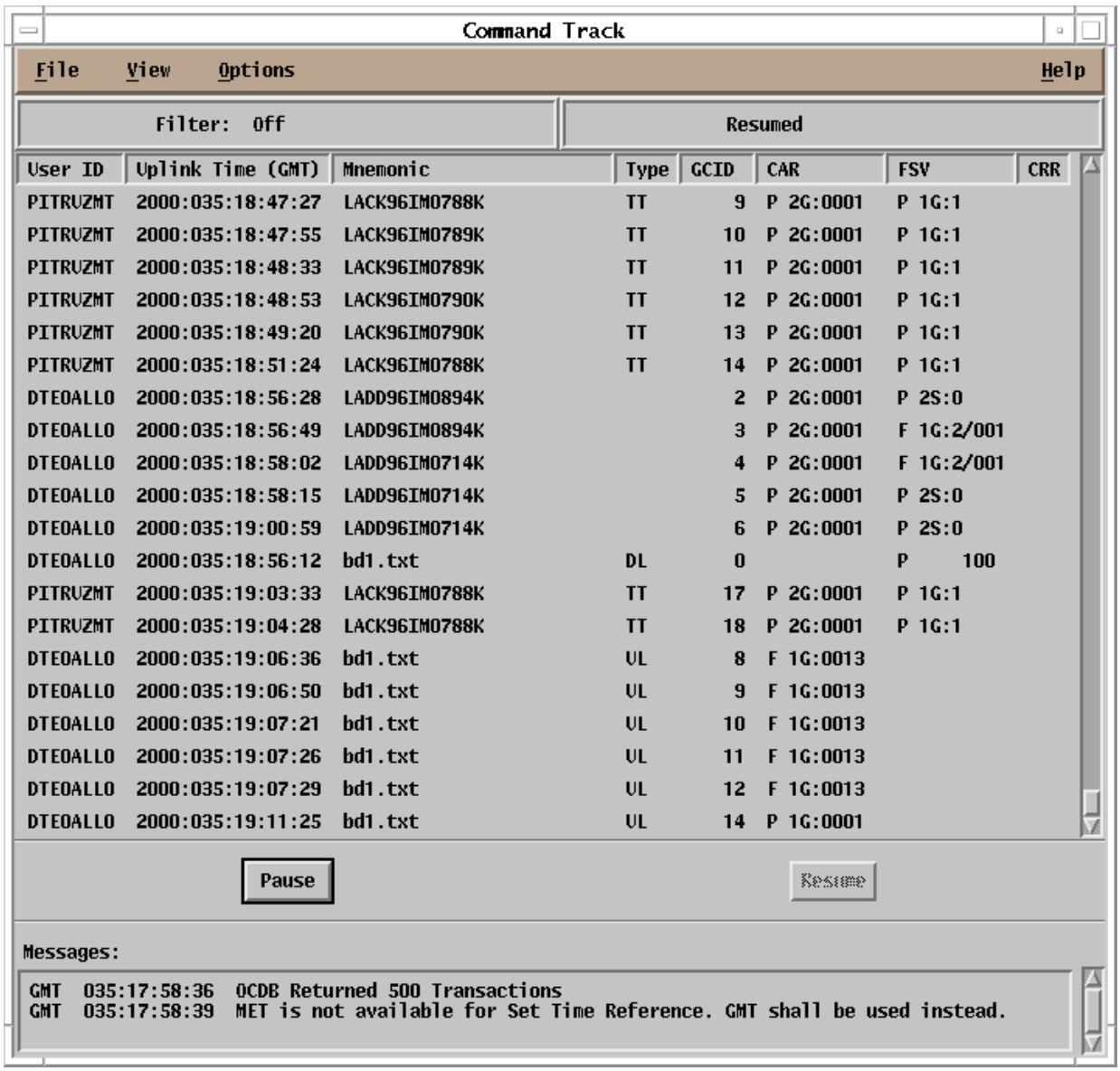


Figure 11-1, Command Track main window.

11.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  View Time-Tag Queues...

11.1.2 Status Bar

The status bar provides information about whether a user identification (ID) filter has been applied to the open command track and whether the application is currently updating (**Resumed**) or not updating **(Paused)**.

11.1.3 Work Area

The work area displays commands sent from the HOSC and their associated responses. These responses may not be displayed in Ground Correlation Identification (GCID) order. For example, the system may complete Flight System Verifier (FSV) processing for GCID 20 before the system completes Command Acceptance Response (CAR) processing for GCID 19.

When the Command Track application is initiated, the last 500 commands sent are listed in this window. If less than 500 commands have been transmitted, only those that have been sent will be listed. The most recent commands will appear at the bottom of the list. Use the vertical scroll bar at the right-hand side of the main window to scroll through the commands in the list. If scrolling back through a large number of commands use the Pause pushbutton on the Control Panel. Otherwise, the next uplink will cause Command Track to scroll to the bottom of the display.

Note: By default, only ten commands may be viewed at once. However, you may change the number of viewable commands by vertically resizing the **Command Track** main window. The horizontal size of the window cannot be modified.

The report header columns below the status bar describe the values listed in each column of the command window. The number of columns and the contents of each will vary depending on which project you are supporting. The columns visible, from left to right, are:

- **User ID**
- **Uplink Time (GMT)**
- **Mnemonic**
- **Type**
- **GCID**
- **CAR**
- **FSV**
- **CRR**

The contents of the **User ID** column contains the user ID of the user who initiated the uplink.

The **Uplink Time (GMT)** column contains the time that the command, group or file was initiated from the HOSC. The unit of measure is Greenwich Mean Time (GMT) and is not affected by the **Set Time Reference...** item from the **View** menu.

The command mnemonic is a user-friendly identifier assigned to a command in the Project Command Database (PCDB). The command mnemonic is the reference used by the HOSC for issuing commands.

For a file uplink, the **Mnemonic** column contains the name of the file being uplinked. For a file downlink, the **Mnemonic** column contains the previously registered, PIMS filename that indicates where the file will be stored in the PIMS database at the completion of the file downlink.

The **Type** column identifies the type of the request being sent. The types available are:

- **GR** - commands uplinked as part of a group
- **TT** - Time-Tag Command Uplink
- **UL** - File Uplink
- **DL** - File Downlink
- <Blank> - Real-Time Command Uplink

The **GCID** (Ground Correlation ID) is a unique ID generated when a command is transmitted to a ground facility such as the Mission Control Center (MCC). This ID allows the HOSC command server to match the transmitted uplink request with received CARs and FSVs.

The **CAR** (Command Acceptance Response) column identifies the type and status of the CAR received from the intermediate transmission facility. The following define the CAR Status for each uplink type:

- Command Uplink
  CAR1 - command received at MCC-H
  CAR2 - command uplinked to spacecraft
- File Uplink
  CAR1 - file uplink request received at MCC-H
  CAR2 - file uplink to spacecraft initiated

The CAR status is displayed in the following format:

<overall CAR status><CAR #><response source>:<acknowledgement code>

Example:

P 1G:0001
F 2G:0023

The overall CAR status will display a **P** for pass, an **F** for fail, or a **T** that no CAR was received within the time-out period.

The response source displays **G** if the response was generated on the ground (e.g., MCC-H) or an **S** for onboard the spacecraft. CAR1, CAR2, and FSV1 responses are logged from a ground source and all FSV2 and FSV3 responses are logged from a spacecraft source.

Help: See “Appendix V: Acknowledgement Codes” for a definition of CAR acknowledgement codes.

The **FSV** (Flight System Verifier) column identifies the type and status of the FSV received from the intermediate transmission facility. The following define the FSV Status for each uplink type:

- Command Uplink
  FSV1 - command received at Command and Control MDM
  FSV2 - command received at Payload MDM
- File Uplink
  FSV1 - file received by Command and Control MDM
  FSV2 - file download to Payload MDM initiated
  FSV3 - file download to Payload MDM complete

The FSV status is displayed in the following format:

<overall FSV status><FSV #><response source>:<acknowledgement code>

Example:

P 1G:1	**P 2S:0**	**P 3G:1**
F 1G:2/065	**F 2S:102**	**F 3S:22**

The overall FSV status will display a **P** for pass, an **F** for fail, or a **T** that no FSV was received within the time-out period.

The FSV # will indicate the applicable FSV number; 1, 2, or 3.

The response source displays **G** if the response was generated on the ground (e.g., MCC-H) or an **S** for onboard the spacecraft. CAR1, CAR2, and FSV1 responses are logged from a ground source and all FSV2 and FSV3 responses are logged from a spacecraft source.

Note: While the original source for an FSV3 is a spacecraft source, the FSV itself may be subject to interpretation at MCC-H which would result in the FSV3 indicating **G** for a ground source.

An acknowledgement code is used to identify the meaning of the command response message. Acknowledgement codes, in the event of an error, are displayed differently for an FSV1 as compared to an FSV2 or FSV3.

For an FSV1 there are 4 digits (1 - 4) that can be used to indicate an acknowledgement code:

- **1** - command successfully received by USOS
- **2** - error received from USOS
- **3** - command not received by USOS
- **4** - MCC-H could not determine command receipt at USOS

If the acknowledgement code is a 2 (indicating an error) the USOS command response code will be appended to it in order to further clarify the onboard error. A failure response indicates the first reason found for the commands failure.

Note: USOS command response codes are equivalent to the acknowledgement codes presented for FSV2 Real-Time Command Uplink types as presented in "Appendix V: Acknowledgement Codes".

For an FSV2 or FSV3 with an error condition the acknowledgement code appears as the only reason for the error.

The reporting of status for file downlinks is one exception to the above discussion concerning FSVs. The FSV for a file downlink is displayed in the following format:

<overall FSV status><percentage of downlink completed successfully>

Example:

P 100
F 25

The overall FSV status will display a **P** for pass or an **F** for fail.

The percentage of downlink completed successfully indicates the total progress of the downlink file reassembly within the Downlink Management process.

A **CRR** (Command Acceptance Response) is any telemetry data or group of telemetry data that has been associated with an uplinked command. The telemetry data that comprises a CRR for a particular command will be collected and evaluated against a set of expected values associated with the successful onboard execution of the uplinked command. A pass or fail indicator will be placed in the **CRR** column based on the results of this evaluation. If multiple values are evaluated, the evaluations are logically ANDed (i.e., even if only one value fails, the CRR is issued as a failure). A **P** in this column indicates pass, **F** indicates fail.

11.1.4 Application Essentials

The following section will discuss the options presented by the Menu Bar that are unique to the Command Track application. The **View Time-Tag Queues...** menu option from the **Options** menu will be discussed (see Figure 11-2, Options menu).

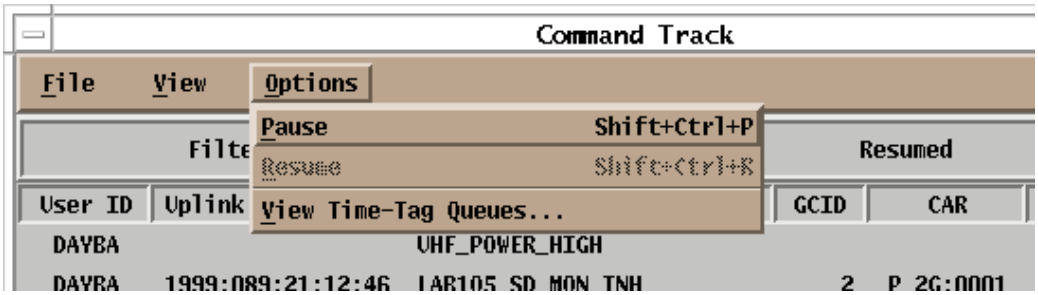


Figure 11-2, Options menu.

11.1.4.1 View Time-Tag Queues...

The **View Time-Tag Queues...** menu item invokes a dialog box that allows you to view the **General** or **Communication** time-tag queues (see Figure 11-3, View Time-Tag Queues dialog box).

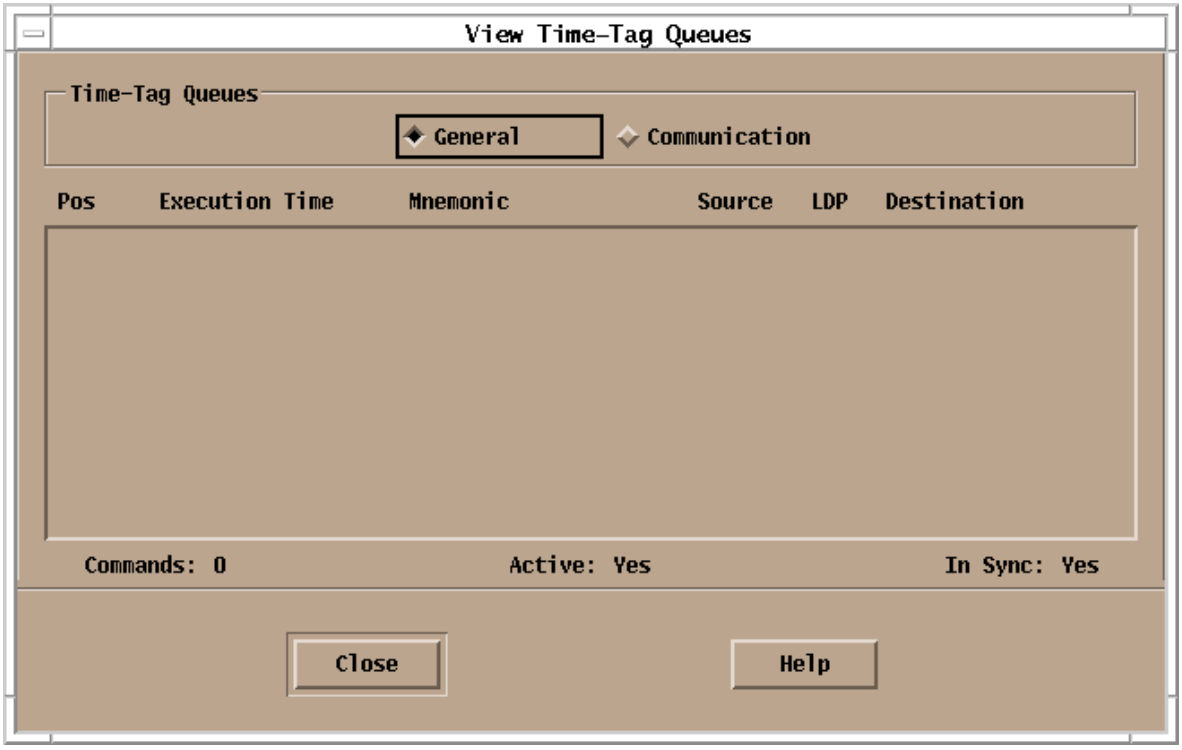


Figure 11-3, Time-Tag Queues dialog box.

The **Time-Tag Queues** frame contains two radio buttons:

- **General** (default)
- **Communication**

Select the **Communication** radio button to populate the command list area with the commands resident in the communication queue. These commands are designated for the communication and tracking system. All other commands are contained in the general queue. Select the **General** radio button to view the general queue. The Time Tag Queue for each command is defined in the PCDB.

The command list area contains six columns:

- **Pos**
- **Execution Time**
- **Mnemonic**
- **Source**
- **LDP**
- **Destination**

The **Pos** column displays the position number of the command based on the command's execution time. A command with a position of **1** is the next command to execute.

The **Execution Time** column displays the execution time of the command in GMT.

The **Mnemonic** column displays the command mnemonic. The mnemonic is an identifier assigned to a command in the Project Command Database (PCDB).

The **Source** column displays the origination of the command. The possible sources are:

- **POIC** - command originated from the Payload Operations Integration Center
- **NSOC** - command originated from the National Space Development Agency (NASDA) Space Operations Center
- **MCCH** - all other sources

The **LDP** column displays the Logical Destination Processor. This is an integer value from **0 - 255**.

The **Destination** column displays a textual value calculated by taking the LDP value in the CCSDS command packet and using the corresponding text value in the MCC command build products.

At the bottom of the command list area are three display-only fields:

- **Commands:**
- **Active:**
- **In Sync:**

The **Commands:** field displays the number of commands resident in the selected queue.

The **Active:** field displays the active status of the selected queue based on status received from the intermediate facility. A status of **Yes** indicates that the Command and Control MDM is retrieving and executing the command in the queue. A status of **No** indicates that the time-tag queue has been stopped, and the Command and Control MDM is not retrieving commands from the queue.

The **In Sync:** field displays the in sync status based on status received from the intermediate facility. A status of **Yes** indicates that the time-tag queue is in sync with the on-board time-tag queue. A status of **No** indicates that the time-tag queue model is out of sync with the on-board time-tag queue.

11.2 Command Delog Overview

The Command Delog application allows the user to generate a Command Delog report from the information maintained in the Operational Command Database (OCDB). The user can also filter and sort the data that is included in the report.

Help: To examine a sample Command Delog report, see "Appendix U: Command Delog Report Example."

The Command Delog main window contains two distinct features that will be discussed in this chapter (see Figure 11-4, Command Delog main window):

- Menu Bar
- Work Area

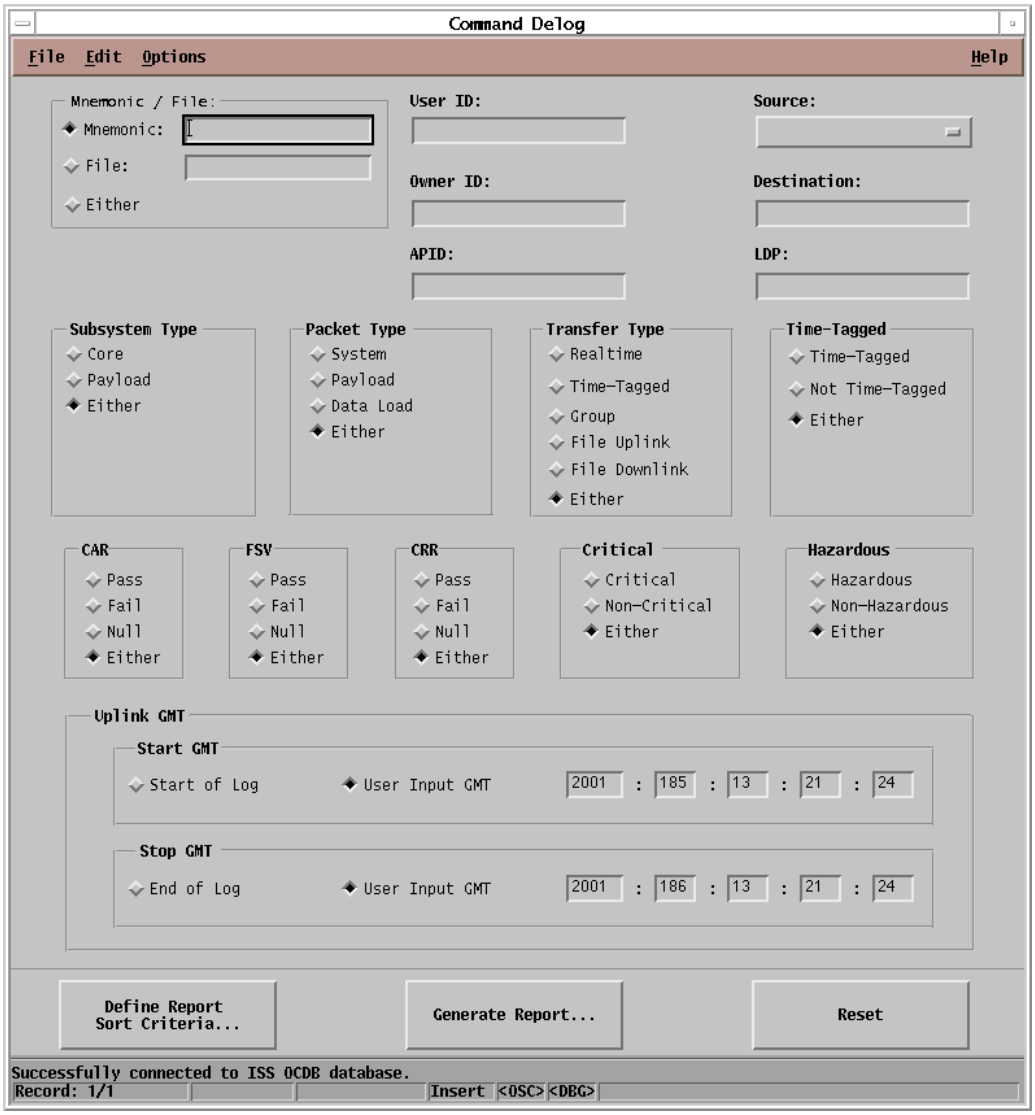


Figure 11-4, Command Delog main window.

11.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar consists of the **File**, **Edit**, **Options**, and **Help** menus. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. The **Define Report Sort Criteria...** menu item from the **Options** menu will be discussed later in this chapter.

11.2.2 Work Area

The work area contains twenty items of selection criteria that will be used in generating a Command Delog report. These items, which exist as editable text fields, radio buttons, or option menu buttons, are:

- **Mnemonic:**
- **File:**
- **Either:**
- **User ID:**
- **Source:**
- **Group Name:**
- **Owner ID:**
- **Destination:**
- **APID:**
- **LDP:**
- **Subsystem Type**
- **Packet Type**
- **Transfer Type**
- **Time-Tagged**
- **CAR**
- **FSV**
- **CRR**
- **Critical**
- **Hazardous**
- **Start GMT**
- **Stop GMT**

The command mnemonic is a user-friendly identifier assigned to a command in the Project Command Database (PCDB). The command mnemonic is the reference used by the Huntsville Operations Support Center (HOSC) for issuing commands. To generate a command delog report on commands with similar mnemonics, you can use standard Oracle wildcards.

The **File:** radio button allows you to generate a command delog report for a user-generated file stored in PIMS.

The **Either:** radio button permits filtering on command mnemonics and files simultaneously.

The **User ID:** item allows you to generate a report for commands issued by a specific user.

The **Source:** option menu button allows you to generate a report based on commands issued from the Command Operation, Command System Management, File Ground Management Tool, Display Operation, Scratchpad Line or Script Operation applications.

To generate a report for a specific command group, enter the appropriate group name in this field. A **Group Name:** is the mnemonic assigned to a command group. A command group is a list of sequenced commands which are intended for uplink in response to a single user request.

The **Owner ID:** item allows you to filter the output of a Command Delog report to include only commands issued by a specific owner identification (ID). An owner ID is associated with a particular experiment, payload, or spacecraft function. An owner ID is not the same as a user ID. An owner ID is used to categorize users with their data.

The **Destination:** text entry field allows you to filter the output of a Command Delog report to include only commands issued to a particular intermediate transmission facility. Each destination has been assigned a unique 3-digit hexadecimal destination code. These codes, which are set in the Configuration Manager Application, are the legal values to be entered in the **Destination:** text entry field. For ISS, the current list of codes and their corresponding destinations are listed in the following table:

Table 11-1, Destination codes.

Code	Destination
100	MCC-H Mission Control Center - Houston
101	UDC (Utilization Development Capability)
102	SSTC (Space Station Training Center)
103	iss_sim simulator
104	Spare 2
105	MCC-H Mission Control Center - Houston 2
106	UDC (Utilization Development Capability) 2
107	SSTC (Space Station Training Center) 2
108	Spare 3
109	Spare 4

The **APID:** item allows you to filter commands with a specific Application Process Identifier (APID).

The **LDP:** item allows you to filter commands with a specific Logical Destination Processor.

Select one of the radio buttons in the **Subsystem Type** radio box to filter commands with a **Core** or **Payload** subsystem type, or select the **Either** radio button to filter on both subsystem types.

Select one of the radio buttons in the **Packet Type** radio box to filter commands with a **System**, **Payload**, or **Data Load** packet type, or select the **Either** radio button to filter on all packet types.

Select one of the radio buttons in the **Transfer Type** radio box to filter commands with a **Realtime**, **Time-Tagged**, **Group**, **File Uplink**, or **File Downlink** transfer type, or select the **Either** radio button to filter on all transfer types.

Select one of the radio buttons in the **Time-Tagged** radio box to filter commands with a **Time-Tagged** or **Not Time-Tagged** type, or select the **Either** radio button to filter on both types.

A **CAR**, or Command Acceptance Response, is generated by an intermediate transmission facility and indicates the reception of a command, block of commands, or file by the intermediate transmission facility. Select one of the radio buttons in this radio box to filter commands with a **Pass Fail**, or **Either** Pass or Fail statuses. **Null** indicates that CAR processing has not been defined.

An **FSV**, or Flight System Verifier, indicates the receipt of a command, block of commands or file by an onboard system. Select one of the radio buttons in this radio box to filter commands with **Pass**, **Fail**, or **Either** Pass or Fail statuses. **Null** indicates that FSV processing has not been defined.

A **CRR**, or Command Reaction Response, is any telemetry data or group of telemetry data that has been associated with an uplinked command. Select one of the radio buttons in this radio box to filter commands with **Pass**, **Fail**, or **Either** Pass or Fail statuses. **Null** indicates that CRR processing has not been defined.

Selecting a button in the **Critical** radio box allows you to filter commands that are tagged **Critical**, **Non-Critical**, or **Either** Critical or Non-Critical. Critical commands are those commands whose initiation and execution could possibly cause damage to a payload or spacecraft and impair the mission.

Selecting a button in the **Hazardous** radio box allows you to filter commands that are tagged **Hazardous**, **Non-Hazardous,** or **Either** Hazardous or Non-Hazardous. Hazardous commands are those commands whose initiation and execution could pose a threat to human life or the entire mission.

You can choose to list all commands from the start of the log or only list those that were initiated after a specific GMT (Greenwich Mean Time). The **Start GMT** field can either be set to the beginning of the command log or to any specific GMT included within the log. The default value is 24 hours prior to the time Command Delog was initiated.

You can also set the **Stop GMT** field to the end of the command log or to any specific GMT included within the log. This, in conjunction with the **Start GMT** field, allows you to narrow your report to contain a specific timeframe of commands. The default value is the time at which Command Delog was initiated.

In this area of the main window, you can define filter criteria for a Command Delog report by working with the various information settings listed above.

11.2.3 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Command Delog application. The **Define Report Sort Criteria...** menu option from the **Options** menu will be discussed (see Figure 11-5, Options menu).

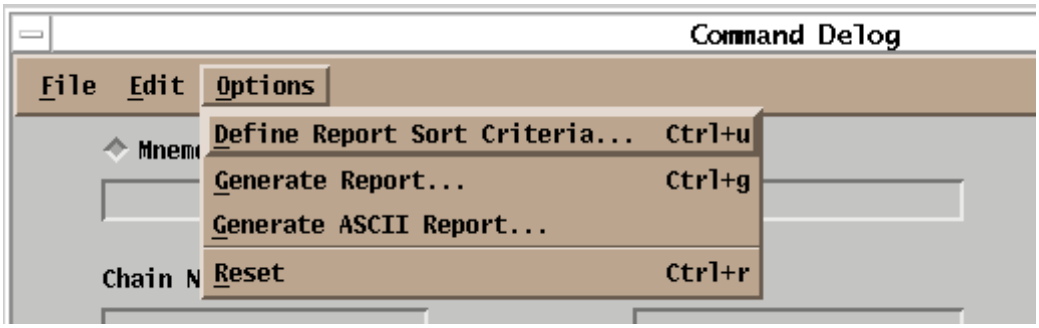


Figure 11-5 Options menu.

11.2.3.1 Define Report Sort Criteria...

Selecting the **Define Report Sort Criteria...** menu item invokes the **Define Report Sort Criteria** dialog box (see Figure 11-6, Define Report Sort Criteria dialog box). This dialog box allows you to select the criteria by which the report will be sorted and the order of sorting priority. You may sort the Command Delog report by mnemonic, owner identification (ID), uplink Greenwich Mean Time (GMT) and user ID.

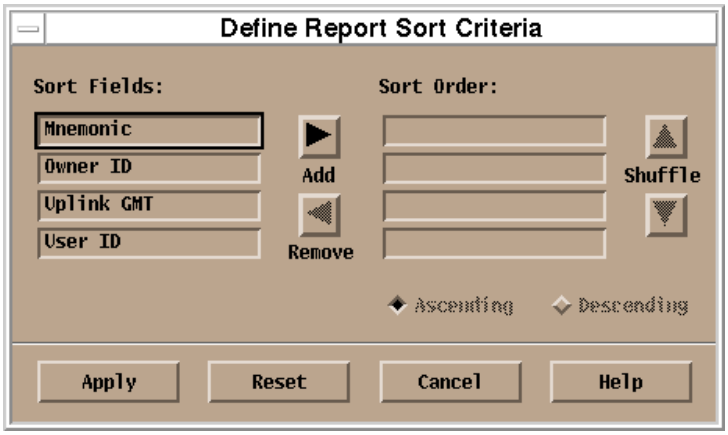
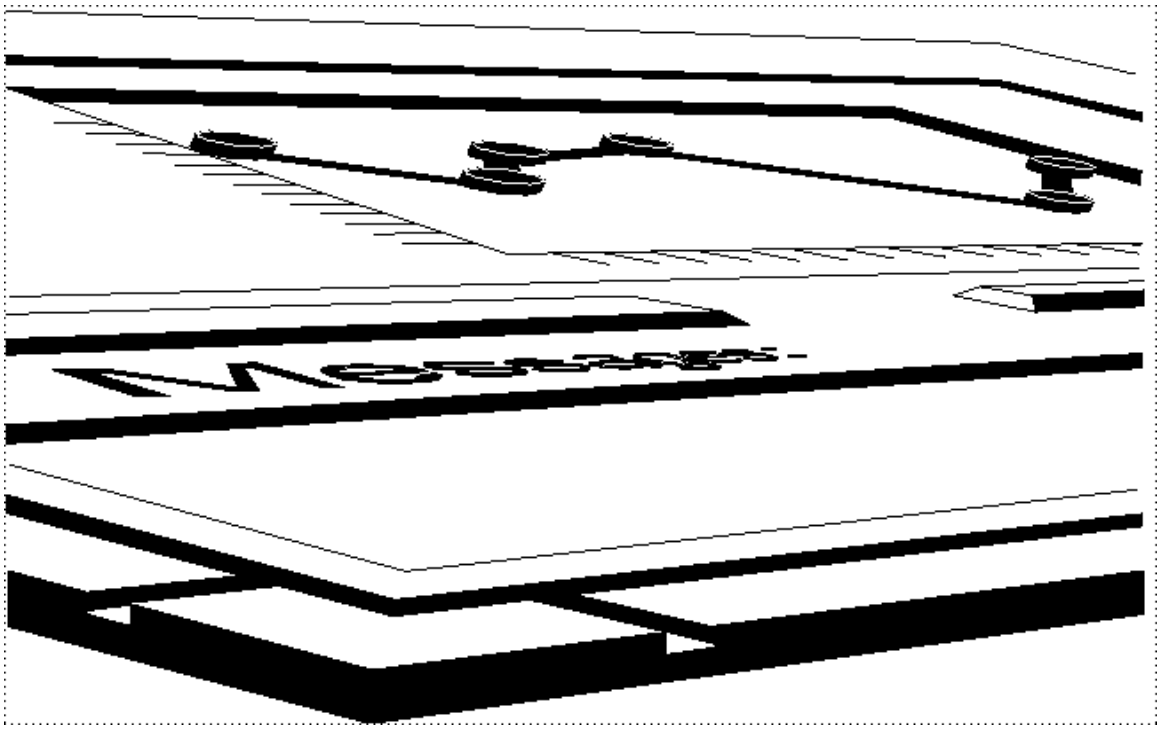


Figure 11-6, Define Report Sort Criteria dialog box.



Chapter 12:
Near Real-Time (NRT) Data Request Software

This chapter addresses the Near Real-Time (NRT) Data Request applications. During HOSC system initialization, data that is to be written to the NRT Data Log (NDL) is identified. This data is stored on optical disk and is available for retrieval. The NRT Data Request applications provide you with the means to create and define the contents of a file which contains data that was recorded by the NRT system. Data recorded by the NRT system may include data downlinked in real-time, as well as data dumped from an onboard recorder. NRT Data Requests result in the creation of output files that can be displayed and manipulated using other applications. You can also request that stored data be replayed into your workstation so that it can be viewed and manipulated just like real-time data.

Three NRT Request applications provide you with flexibility in defining exactly what data you need. This user guide covers how to use each of these applications. A fourth NRT application is used to initiate the playback of data. All of these NRT Request applications, like other HOSC applications, use a windowing Graphical User Interface (GUI) similar to that employed by Apple Macintosh© and Microsoft Windows©.

NRT List Request Application

NRT List Request is used to retrieve data samples for a specified list of Measurement/Stimulus Identifiers (MSIDs) over a specified time period. You must provide information such as the list of desired parameters and start and stop times. You specify whether to perform Limit/Expected State (LES) sensing, sample or output thinning, or other filtering criteria. This application culminates in the creation of an output file which can be viewed using the Show NRT Output function or Applix, a commercial spreadsheet application which has been integrated into the HOSC Application Software. These output files can also be transferred outside of the EHS using the File Transfer Application and viewed using other commercial spreadsheet programs such as Excel.

NRT Snapshot Request Application

NRT Snapshot Request is used to retrieve either the first or all samples for parameters from a specified packet or major frame. The snapshot represents a single instant in time. You can identify the time you want. You can also specify the data source and whether you want the system to perform sample thinning. This application culminates in the creation of an output file which can be viewed using Applix, a commercial spreadsheet application which has been integrated into the HOSC Application Software. In addition, computations can be created and executed against NRT Snapshot Request output files using the Computation Generation and Computation Operation applications.

NRT Data Capture Request Application

NRT Data Capture Request is used to retrieve whole data packets from a specified source over a specified time period. To use it, you must provide start and stop times and the data source. This application culminates in the creation of a binary file which can be exported for use within other user-provided applications.

NRT Playback Request Application

The final NRT Request application provides the means for you to request that data be played back into your workstation, just as if it was real-time data.

12.1 NRT Request Output Files

The NRT List Request, NRT Snapshot Request, and NRT Data Capture applications result in the creation of output files. NRT List Request and NRT Snapshot request output files are created in tab-delimited, ASCII format. These files are not available for viewing or manipulation within any of the NRT applications. They are intended for use within a commercial software package called Applix. Applix is available off the Launchpad from the **Utilities** menu. Clicking on **Spreadsheet** invokes the application and provides you with standard spreadsheet capabilities. NRT request output files are imported into predefined Applix templates which arrange the data into an

appropriate format for viewing depending on which NRT application generated the file. NRT List Request and NRT Snapshot Request output files can also be manipulated using computations created with the Computation Generation application and executed with the Computation Operation application. NRT Data Capture output files are in binary format and intended for use by applications outside the HOSC environment.

Help: For information on Applixware and available spreadsheet functions, see the Applix Users Guide. For step-by-step instructions on how to open an NRT Request within Applix, see the applicable Online Help topic.

Note: NRT requests do not have to be saved in order to generate these output files. Once an output file is created, you can discard the request and work strictly with the output file in Applix.

NRT List Request Output Files

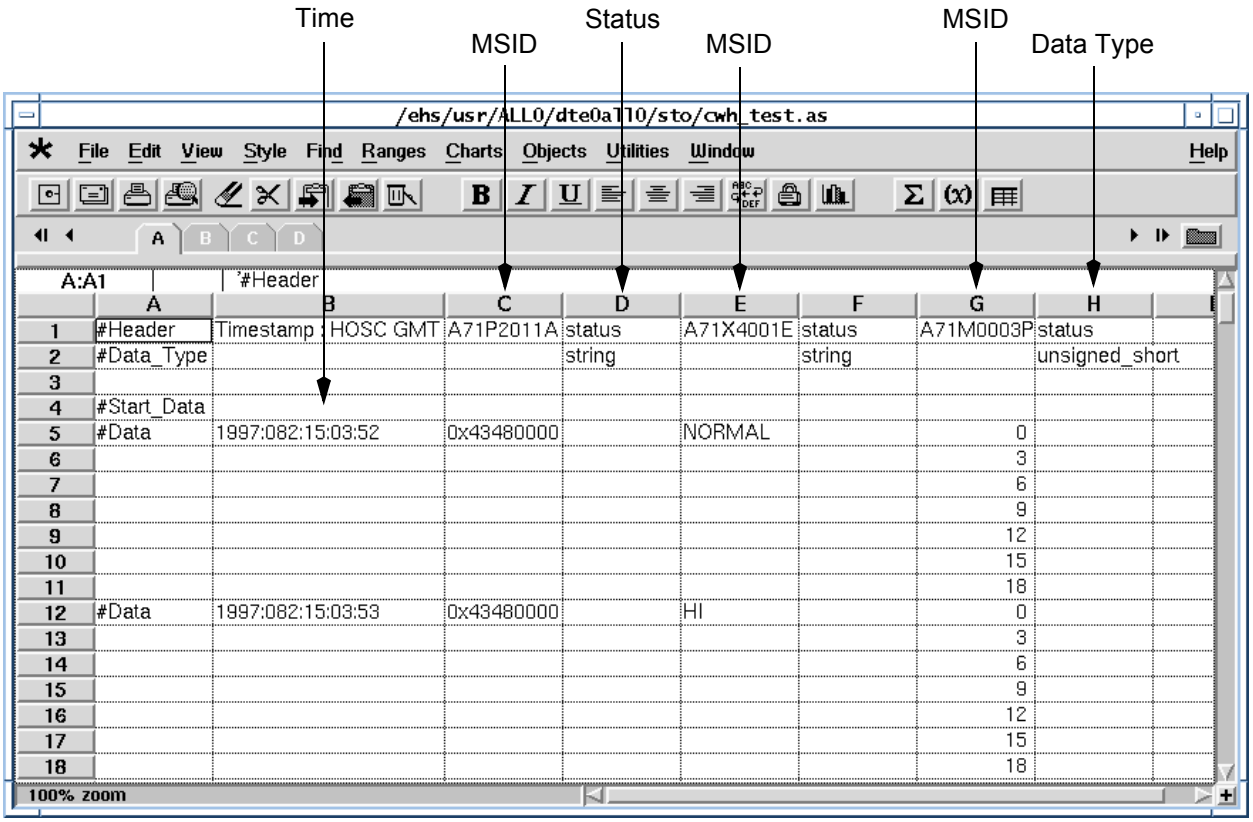
NRT List Request Output files are viewed from within the Applix application (see Figure 12-1, NRT List Request output file as viewed in Applix). Columns indicate the Time, MSID, and Status Character.

The Time column shows all times for which you requested data. The time reference shown on the output file is as defined in the request.

The MSID column identifies each MSID you included and its relevant data. This data is displayed in the format specified on the request and is also displayed on the output file. The number of samples received per second may vary depending on how many were available and how many were requested.

The Status Character column displays a code that represents the status of the data received. The list of possible status characters is included in “Appendix W: Status Character Definitions.”

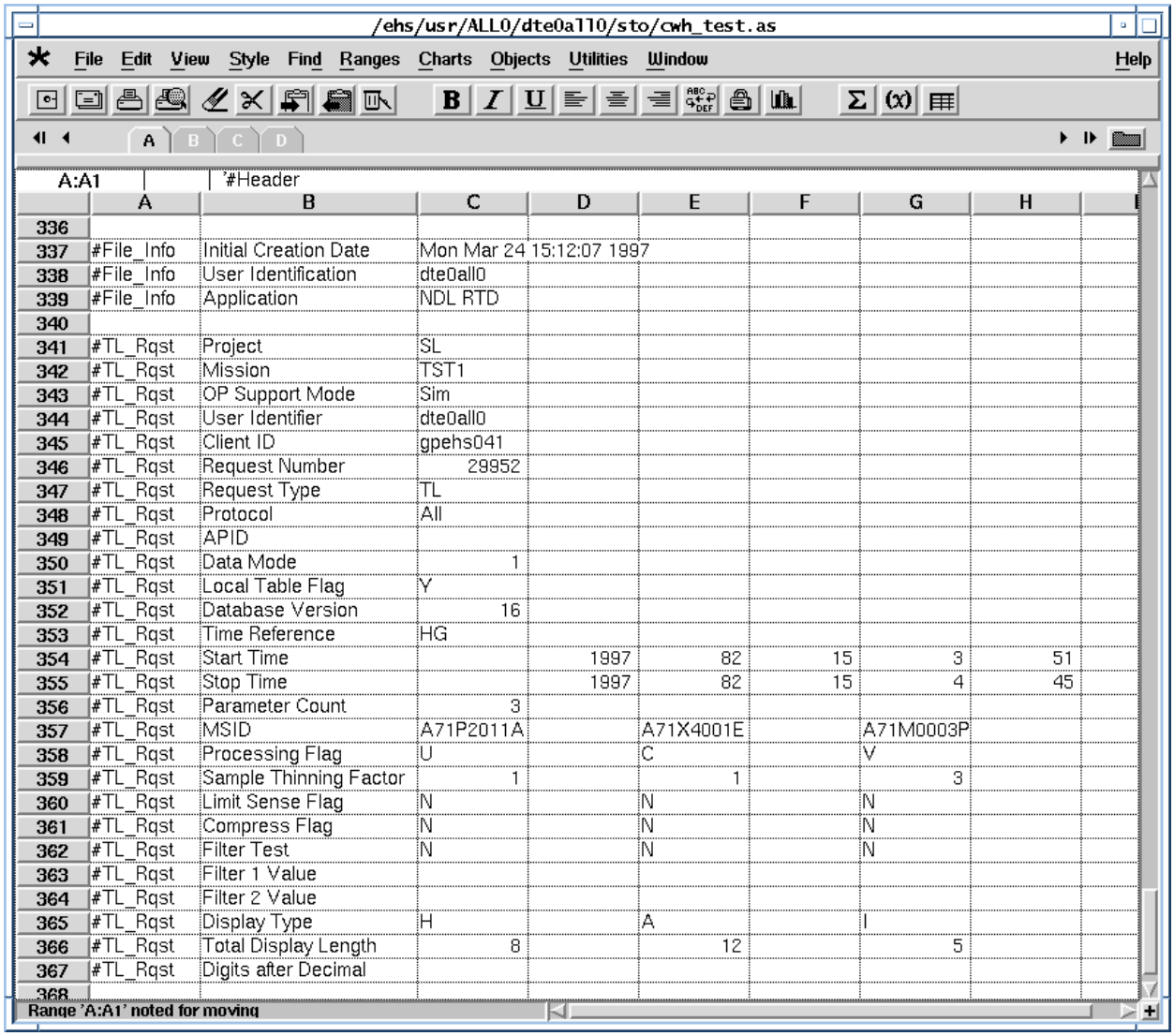
Note: These output files can also be transferred outside of the EHS using the File Transfer Application and viewed using other commercial spreadsheet programs such as Excel.



	A	B	C	D	E	F	G	H
1	#Header	Timestamp	HOSC GMT	A71P2011A	status	A71X4001E	status	A71M0003P	status
2	#Data_Type			string		string		unsigned_short
3								
4	#Start_Data							
5	#Data	1997:082:15:03:52	0x43480000		NORMAL		0	
6							3	
7							6	
8							9	
9							12	
10							15	
11							18	
12	#Data	1997:082:15:03:53	0x43480000		HI		0	
13							3	
14							6	
15							9	
16							12	
17							15	
18							18	

Figure 12-1, NRT List Request output file as viewed in Applix.

The **Request Summary** portion at the bottom of the output file identifies the requested options and the actual processing that was performed. An example of the summary portion of the output file is shown in Figure 12-2, Example NRT List Request output file summary.



	A	B	C	D	E	F	G	H
336								
337	#File_Info	Initial Creation Date	Mon Mar 24 15:12:07 1997					
338	#File_Info	User Identification	dte0all0					
339	#File_Info	Application	NDL RTD					
340								
341	#TL_Rqst	Project	SL					
342	#TL_Rqst	Mission	TST1					
343	#TL_Rqst	OP Support Mode	Sim					
344	#TL_Rqst	User Identifier	dte0all0					
345	#TL_Rqst	Client ID	gpehs041					
346	#TL_Rqst	Request Number	29952					
347	#TL_Rqst	Request Type	TL					
348	#TL_Rqst	Protocol	All					
349	#TL_Rqst	APID						
350	#TL_Rqst	Data Mode	1					
351	#TL_Rqst	Local Table Flag	Y					
352	#TL_Rqst	Database Version	16					
353	#TL_Rqst	Time Reference	HG					
354	#TL_Rqst	Start Time		1997	82	15	3	51
355	#TL_Rqst	Stop Time		1997	82	15	4	45
356	#TL_Rqst	Parameter Count	3					
357	#TL_Rqst	MSID	A71P2011A		A71X4001E		A71M0003P	
358	#TL_Rqst	Processing Flag	U		C		V	
359	#TL_Rqst	Sample Thinning Factor	1		1		3	
360	#TL_Rqst	Limit Sense Flag	N		N		N	
361	#TL_Rqst	Compress Flag	N		N		N	
362	#TL_Rqst	Filter Test	N		N		N	
363	#TL_Rqst	Filter 1 Value						
364	#TL_Rqst	Filter 2 Value						
365	#TL_Rqst	Display Type	H		A		I	
366	#TL_Rqst	Total Display Length	8		12		5	
367	#TL_Rqst	Digits after Decimal						
368								

Figure 12-2, Example NRT List Request output file summary.

The remaining sections in this chapter address how to define NRT requests and thus, how to alter the request summary included in the output file.

NRT Snapshot Request Output Files

The NRT Snapshot Request output file is similar to that of a NRT List Request output file except that rather than providing data for specific MSIDs, the output file contains data for all MSIDs for the time specified. NRT Snapshot Request output files can be opened with Applix in the same manner as NRT List Request files.

Note: Applix wraps the data making it unreadable after the first 350 MSIDs contained in the NRT Snapshot Request output file are displayed due to horizontal table limitations of the Applix

software. All additional MSIDs will be truncated when the maximum number of rows (samples) are exceeded.

NRT Data Capture Request Output Files

NRT Data Capture output files are in binary format and contain whole data packets from a specified source over a specified time period. These files may be used as input by other applications for further manipulation. These files are not intended to be opened using Applix.

12.2 NRT List Request Overview

To retrieve telemetry data written to the NRT data log, you need to create and submit a request specifying the parameters and the time slice you want. Your submitted request will initiate a process on the project server which builds an output file containing your requested data and sends it to your workstation. This output file can be viewed using the Show NRT Output menu item from the **Options** menu.

The NRT List Request main window contains two destinct features that will be discussed in this chapter (see):

- Menu Bar
- Work Area

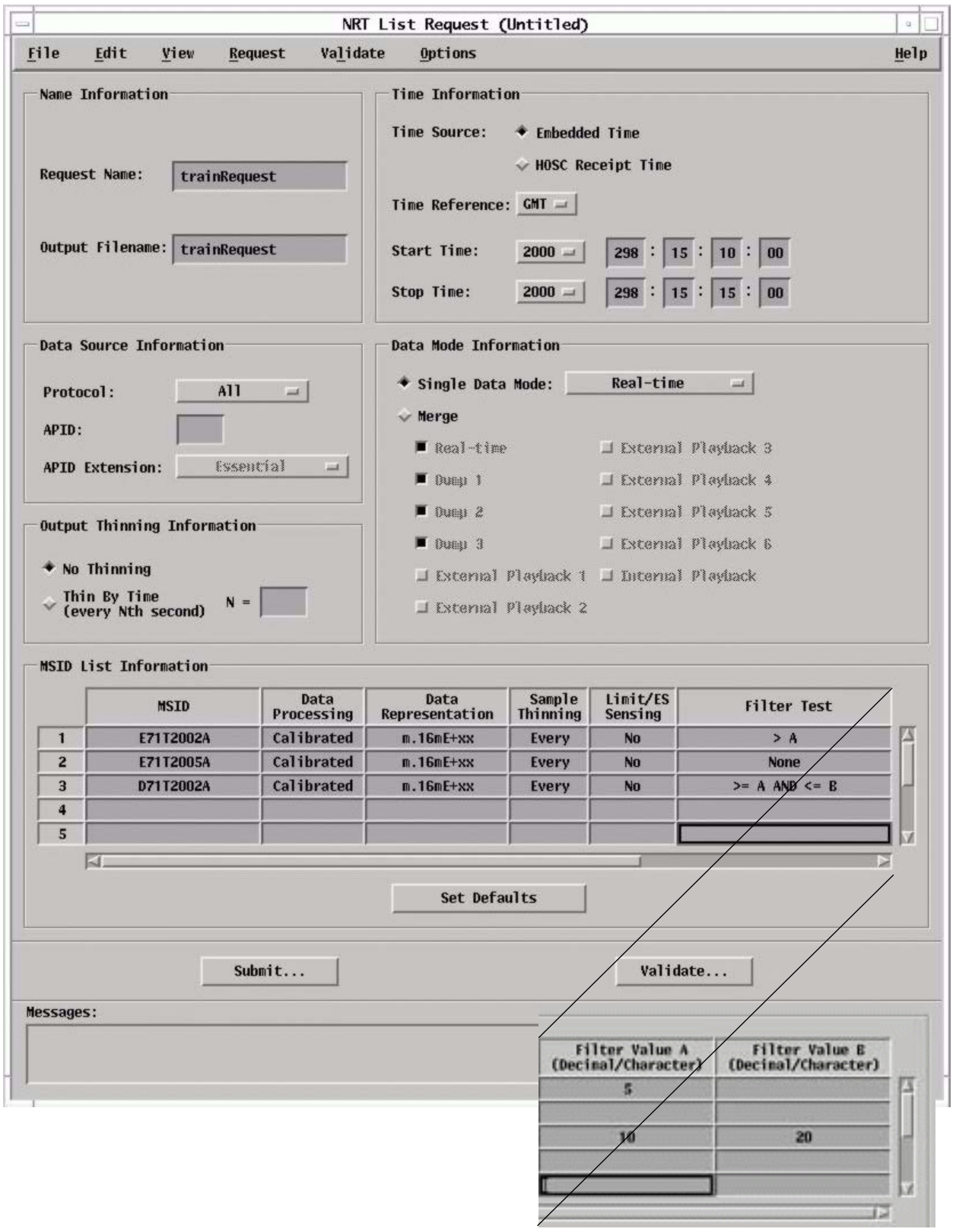


Figure 12-3, NRT List Request main window.

12.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes seven menus: **File**, **Edit**, **View**, **Request**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Validate** Menu
  Validate...
- **Options** Menu
  Select MSID...
  Set Data Processing
  Set Data Representation...
  Set Sample Thinning...
  Set Limit/ES Sensing
  Set Filter Test
  Show NRT Directory...
  Show NRT Output...

12.2.2 Work Area

The work area of the NRT List Request application is where you actually define the contents of your request. The work area is broken down and organized into logical units or frames. A frame is designated by a box that encompasses related items such as text fields, pushbuttons, tables, etc. There are six frames that comprise the **NRT List Request** work area. These frames are titled:

- **Name Information**
- **Time Information**
- **Data Source Information**
- **Data Mode Information**
- **Output Thinning Information**
- **MSID List Information**

The first work area frame, **Name Information**, includes two text entry fields labeled **Request Name:** and **Output Filename:**. In the **Request Name:** text field you identify a name for the request you are building. This is the same name that will be used within the **Control** dialog box to indicate the current status of your request. As you enter text in the **Request Name:** field, that same text is automatically entered in the **Output Filename:** field.

Note: The **Request Name:** identified within the work area is not the same as the file name. When you save a request, you'll still be required to enter a file name.

You can change the default entry provided in the **Output Filename:** text field. It does not have to match the request name. There is however, a 20-character limit to both the request name and output filename. If a file already exists with the same output file name, a confirmation dialog box will be invoked asking you whether you want to overwrite the existing file. The output file will be created by the project server and sent to your workstation when the request is fulfilled.

CAUTION: You must be careful when providing output filenames. If the filename you enter already exists and you confirm that you want to overwrite the existing file, you will lose the original request's data.

The second frame is labeled **Time Information**. Within this frame, you must first define the **Time Source:** you want to use in defining your request, either **Embedded Time** or **HOSC Receipt Time**. The default is **Embedded Time**. If you want to change the time to **HOSC Receipt Time**, click on the appropriate diamond-shaped radio button. A filled radio button indicates the option or characteristic in effect.

The next element in the **Time Information** frame is the **Time Reference:** option menu button. By clicking on this button you are able to change from one time reference (**GMT**) to another (**MET)** and vice versa. The button label shown is the time reference that is in effect for the current request.

The third element in the **Time Information** frame is **Start Time:** and the fourth is **Stop Time:**. These elements are used to define a valid time slice. The larger the time slice, the more time it will take to accommodate your request. You'll also notice that the year option menu buttons default to the current year, the day entry text fields default to **001**, and all time text entry fields default to **00**. You must change these fields to reflect valid start and stop times. To verify that a valid data segment exists for the time slice desired, invoke the **Show NRT Directory...** dialog box available from the **Options** menu.

The third frame in the work area of the **NRT List Request** main window is the **Data Source Information** area.Within the **Data Source Information** frame you can identify the specific protocol and APID for the data in which you are interested. If you select the PDSS Core protocol, you must also select an APID Extension for those PDSS Core streams in which you are interested. The default protocol option is for **All** data, regardless of protocol, to be included in the request. If you select **All** and an MSID appears in more than one APID, then data will be retrieved for the MSID from the APID (stream) with the highest data quality. The **Protocol:** option menu button allows you to retrieve data, regardless of data quality, from a specific APID. The following list identifies the protocols available under the **Protocol:** option menu button.

- **PDSS Core**
- **PDSS Payload**
- **PDSS BPDU**
- **PDSS UDSM**
- **TDM**
- **NASCOM**
- **PSEUDO**
- **HDRS_DQ**

- **GSE**
- **Time**

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

Note: If you specify a protocol, you must also specify an APID (and APID extension if supported). Currently the only protocol supporting APID extensions is PDSS Core. It is possible to use the Telemetry Database application to identify each protocol/APID/APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

The second element of the **Data Source Information** frame is the **APID:** text field. The APID is a number which can range from **0 - 2047** and is included in data packet headers. A protocol plus an APID (and APID extension if supported) is what uniquely identifies a data source.

The third element in the **Data Source Information** frame is the **APID Extension**: option menu button. This option menu button is available only if you elect the **PDSS Core** protocol. The following list identifies the extensions available under the **APID Extension:** option menu button.

- **Essential**
- **Housekeeping I**
- **Housekeeping II**
- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

The fourth frame on the **NRT List Request** main window is titled **Data Mode Information**. The **Single Data Mode:** option menu button provides you with the ability to request data logged in only one data mode (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback). The default single data mode is **Real-time**.

Help: For the definition of Real-time, Dump, and Playback data modes see the "Glossary" at the end of this document.

Merge provides you with the ability to request data logged in any or all of the available data modes (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback). To specify that you want more than one data mode included in your request, you have to click on **Merge** and then identify the data modes for which you are interested in receiving data by clicking on the appropriate toggle buttons. In instances where two modes have data for the same parameter at the same time, the system will select the mode with the highest data quality and provide that data. If **Merge** is selected, the default modes are for **Real-time** and **Dump** 1-3 to be selected.

The fifth frame within the **NRT List Request** main window is the **Output Thinning Information** frame. Within the **Output Thinning Information** frame you identify how much data you'd like to have included in your output file. The default is for no output thinning to occur, in which case all received samples will be returned in the output file. If you wish to thin the output based on time, you must identify the time interval in seconds, from 1 to 9999.

Tip: Output thinning allows you to reduce the size of the output file so that it is easier to work with in the spreadsheet application. For example, rather than getting four samples of data every second, you can use output thinning to return only one data sample for each MSID every ten seconds. The choice of whether to thin the output file depends on your need for data fidelity (i.e., how many data points you need). The more data points included in a NRT output file, the larger the file and the more system resources required to display, manipulate, and plot the output.

If no new data was received for the thinning interval you specified, the last received value for that MSID will be returned, and the status column of the output file will contain an S indicating that the returned value is stale. For example, if you have an MSID sampled once every 32 seconds, and you submit a NRT List Request which specifies that the output file should be thinned so that data is returned every 10 seconds, unless that MSID's new value was returned on that 10 second interval, you'll receive only stale values (indicated by an associated S status character).

Help: For information on valid status characters and their meaning, see "Appendix W: Status Character Definitions."

The final frame in the **NRT List Request** work area is **MSID List Information**. This frame is comprised of a table with numbered rows in which you:

- Specify the parameters in which you are interested (in the **MSID** column)
- Select whether you want calibrated, converted, or unprocessed data (in the **Data Processing** column)
- Define how you want the data to be depicted (in the **Data Representation** column)
- Select if you'd like to receive every sample or some smaller subset of the data (in the **Sample Thinning** column)
- Select whether you want to turn on or off limit/expected state (LES) sensing (in the **Limit/ES Sensing** column)
- Specify whether you want to use a filter to more narrowly define the data you want (in the **Filter Test** column)
- Specify appropriate values that work in conjunction with a selected **Filter Test** (in the **Filter Value A** and **Filter Value B** columns).

Note: This table should be completed from the left to right beginning with the **MSID** column because valid entries for each column depend on the previous column's entry. For example, if you complete all NRT List Request table entries and then go back and change the MSID, then the entries for the other columns (which were based on the original MSID) may be suspect.

Help: Tables illustrating valid Data Processing, Data Representation, Sample Thinning, Limit/ES Sensing, Filter Test options for each type of MSID are provided in "Appendix Y: Valid Entries for Each Native Data Type" later in this document.

A Measurement/Stimulus Identifier (MSID) is just another name for parameter. The MSID as entered in the **MSID** column is the way the parameter is referenced in the telemetry database and may include a combination of letters and/or numbers.

Help: For more information on how MSIDs are created and what each character of the MSID means, see MSFC HOSC Database Definitions (MSFC-DOC-1949, Vol. 4).

The **MSID** column of the **MSID List Information** table is where you identify the parameters for which you want data over the time period specified in the **Time Information** frame. Enter each MSID in the **MSID** column.

Tip: Clicking within a cell under the MSID column and then holding the right mouse button down invokes a popup dialog box from which you can access the **Select MSID** dialog box. You can also access this dialog box via the **Options** menu.

In the **Data Processing** column of the **MSID List Information** table you enter **Calibrated**, **Converted** or **Unprocessed.**

Tip: Clicking within a cell under the **Data Processing** column and then holding the right mouse button down invokes a popup dialog box from which you can select **Calibrated**, **Converted** or **Unprocessed**. You can also access this dialog box via the **Options** menu.

You use the **Data Representation** column to identify how you would like to have the data for a particular parameter displayed. Available numbering systems and an example of how each might appear within the **Data Representation** column is shown below:

- Binary/Integer (bin) Example: **bbbb**
- Character/String (chr) Example: **aaaaaa**
- Decimal/Integer (dci) Example: **iiiiiiiiiiiiii**
- Decimal/Real (dcr) Example: **dddd.d**
- Decimal/Scientific Notation (dcs) Example: **m.mE+xx**
- Hexadecimal/Integer (hex) Example: **hhhh**
- Octal/Integer (oct) Example: **oooooo**
- Time (tim) Example: **ddd:hh:mm:ss**

Only a limited number of characters can be displayed within the confines of the **Data Representation** column. The number of characters that can be shown depends on the numbering system that is selected. Data that is to be output with more than the number of characters that can be shown in the **Data Representation** column will be indicated using the following shorthand (These examples assume that you would like the requested data shown using 25 characters):

- Character/String (chr) Example: **25a**

- Binary/Integer (bin) Example: **25b**
- Decimal/Integer (dci) Example: **25i**
- Decimal/Real (dcr) Example (25 characters with 10 digits after the decimal): **14d.10d**
- Decimal/Scientific Notation (dcs) Example (25 digits after the decimal): **m.25mE+xx**
- Hexadecimal/Integer (hex) Example: **25h**
- Octal/Integer (oct) Example: **25o**
- Time (tim) Not applicable - you only have three choices available for depicting time.

Tip: Clicking within a cell under the **Data Representation** column and then holding the right mouse button down invokes a popup dialog box from which you can access the **Set Data Representation** dialog box. You can also access this dialog box via the **Options** menu.

The **Sample Thinning** column of the **MSID List Information** table allows you to specify for each packet whether you want to retrieve:

- **Every Sample**
- **One Sample**
- **Every Nth Sample**

Tip: Clicking within a cell under the **Sample Thinning** column and then holding the right mouse button down invokes a popup dialog box from which you can access the **Set Sample Thinning** dialog box. You can also access this dialog box via the **Options** menu.

The **Limit/ES Sensing** column of the **MSID List Information** table is where you specify whether you want Limit/Expected State (LES) sensing performed on the requested parameter and samples. If you want LES sensing, enter **Yes**. If you don't want it, enter **No**. You can also use the **Set Limit/ ES Sensing** menu item off the **Options** menu to enter this information.

Tip: Clicking within a cell under the **Limit/ES Sensing** column and then holding the right mouse button down invokes a popup dialog box from which you can select either **Yes** or **No**. You can also access this dialog box via the **Options** menu.

The next column on the **MSID List Information** table is labeled **Filter Test**. In this column you can identify a rule you would like to implement (a filter) in order to more specifically define the data written to the output file. For example, you might want only those samples for a particular MSID that have a value over 30. In this instance you would enter **> A** in the **Filter Test** column and then enter **30** in the **Filter Value A** column (see next section). You can either define a filter, or you can enter **None** so that no filtering is performed.

Help: All relational expressions are shown in "Appendix AA: Filter Test Options."

Tip: Clicking within a cell under the **Filter** column and then holding the right mouse button down invokes a menu from which you can select the desired filter function. You can also access this dialog box via the **Options** menu.

The **Filter Value A** and **Filter Value B** columns are obscured from view when the **NRT List Request** main window is invoked. You must use the horizontal scroll bar to see these additional columns. If values are required in order for the selected **Filter Test** to make sense, then these columns must be used to enter the desired values.

Example:

If the **Filter Test** was such that you wanted to retrieve all values for a parameter that were greater than 5, you would enter **> A** in the **Filter Test** column of the **MSID List Information** table and **5** in the **Filter Value A** column. The **Filter Value B** column would be left blank (see Figure 12-3, NRT List Request main window).

If you wanted to include in your request values that were greater than or equal to 10 but less than or equal to 20, then you would select the **>= A AND <= B** filter and enter **10** in the **Filter Value A** column, and **20** in the **Filter Value B** column (see Figure 12-3, NRT List Request main window).

Below the MSID List table is the Set Defaults pushbutton. Clicking on this pushbutton will populate the Data Processing, Data Representation, and Limit/ES Sensing columns with the telemetry database default information for the selected rows after an MSID is entered in the MSID column. The Sample Thinning will be set to Every, and the Filter Test will be set to None.

12.2.3 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the NRT List Request application. The **Validate...** menu item from the **Validate** menu as well as all the menu options available from the **Options** menu will be discussed (see Figure 12-4, Validate and Options menus).

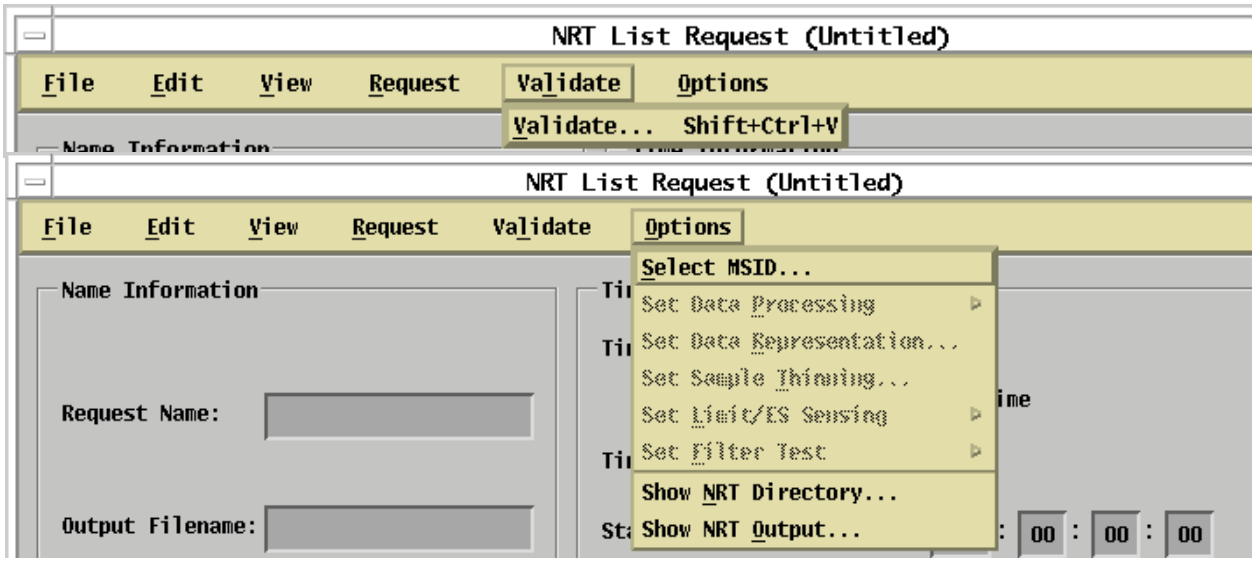


Figure 12-4, Validate and Options menus.

12.2.3.1 Validate...

Selecting the **Validate...** menu item invokes the **Validate** dialog box as shown in Figure 12-5, Validate dialog box. This dialog box has three frames: **Valid for Versions:**, **Telemetry Database**, and **Messages:**.

In order for an NRT List Request to validate, all fields within the **NRT List Request** work area (excluding the table) must be complete. If you select **Merge** within the **Data Mode Information** frame you must also select at least two data modes. For each MSID you enter in the **MSID List Information** table, you must provide entries within all subsequent columns except **Filter A** and **Filter B**. Entries in these columns are required if specified in your selected **Filter Test**. If your request includes blank rows within the **MSID List Information** table, the blank rows will be ignored.

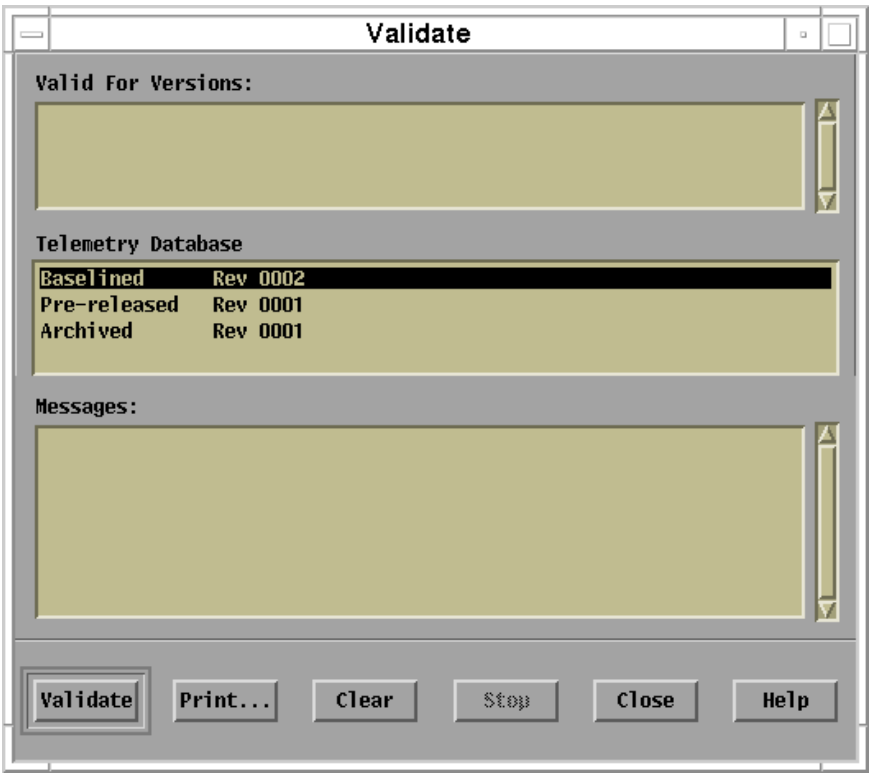


Figure 12-5, Validate dialog box.

In the **Valid for Versions:** area of the **Validate** dialog box, the database versions against which this particular request has already been validated will be displayed. By looking at this section of the dialog box you can quickly identify whether this request has already been validated against a particular database or not.

In the **Telemetry Database** area of the **Validate** dialog box, you can select which database, from a list of available databases, to validate this request against. The revision number of each of these databases is shown. Clicking on the desired database will activate the selection.

The results of the validation process are posted in the message area of the **Validate** dialog box.

Help: To identify valid data processing and data representation entries in the **MSID List Information** table, see "Appendix Y: Valid Entries for Each Native Data Type."

12.2.3.2 Select MSID...

This menu item is grayed out unless you click the mouse within the **MSID** column of the **MSID List Information** table. A blinking I-beam insertion bar in this column will activate the **Select MSID...** item under the **Options** menu. If you click on this menu item, the **Select MSID** dialog box will be invoked (see Figure 12-6, Select MSID dialog box). This dialog box allows you to search for and select specific MSIDs to include in your NRT request.

There are three frames that comprise the **Select MSID** dialog box: **Telemetry Database:**, **Search Criteria**, and **MSID List**.

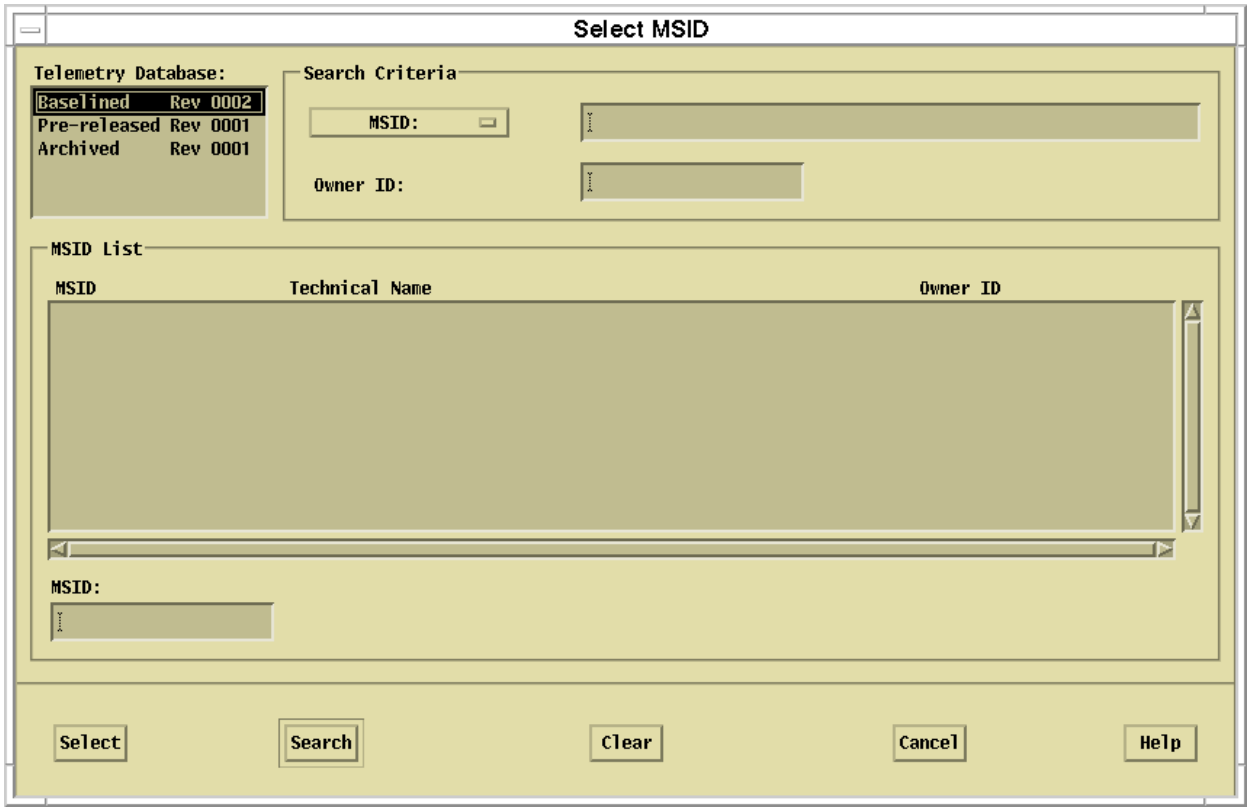


Figure 12-6, Select MSID dialog box.

The **Telemetry Database:** frame on the **Select MSID** dialog box allows you to specify the database that you want to search to find the MSIDs you're interested in. Click on one of the choices available.

The **Search Criteria** frame on the **Select MSID** dialog box allows you to establish parameter filtering criteria. The option menu button provided in this area toggles between **MSID:** and **Technical Name**. This permits you to search on either. For example, to search for an MSID that begins with the letter "L", ensure that the option menu button label reads **MSID:**. In the corresponding text field type: **L***

In the **Owner ID**: portion of the **Search Criteria** area, enter a complete or partial owner ID. You can use wildcards in this search text field. For example, to search for only MSIDs that have an Owner ID of 04, type ***04** in the associated text field.

Help: For information on how owner IDs and MSIDs are related, see MSFC HOSC Database Definitions (MSFC-DOC-1949, Vol. 4).

All MSIDs that match the search criteria you established will be displayed in the **MSID List** frame. After you have narrowed your search to elements within the **MSID List**, you can select an MSID to include in your request by clicking on it. This will highlight the MSID and put it in the **MSID:** text field. Click on

to incorporate this MSID into your request.

Tip: If you click your mouse within a cell under the **MSID** column of the **MSID List Information** table and press the right mouse button, you will invoke the **MSID** popup menu. This popup provides you with another way to access the **Select MSID** dialog box.

12.2.3.3 Set Data Processing

This menu item is grayed out unless you click the mouse within the **Data Processing** column of the **MSID List Information** table. The selected cell in this column will be highlighted which will activate the **Set Data Processing** cascade menu under the **Options** menu. If you click on **Set Data Processing**, the menu items **Calibrated**, **Converted** and **Unprocessed** will be available.

Help: To identify valid data processing and data representation entries in the **MSID List Information** table, see "Appendix Y: Valid Entries for Each Native Data Type."

12.2.3.3.1 Calibrated

If you select **Calibrated**, MSID values are calculated as defined in the telemetry database by either plugging the raw values into a polynomial equation, interpolating the values from a line defined by a point pair, or by changing the MSID value to some code or ASCII text, such as you might do with a discrete state parameter to indicate that "0" equals "OFF." If the calibration type is polynomial or point pair, a floating point value will be returned for each value. The precision of this value is determined by the precision of the sample.

12.2.3.3.2 Converted

Selecting **Converted** ensures that the raw telemetry sample is converted into a format that is recognizable by an SGI/UNIX platform. For example, for a native data type of IBM floating point to be processed in the HOSC, it must be converted to the IEEE-floating point which is a format recognized by SGI/UNIX. This process does not alter the actual value of the data, but converts it to something recognized by SGI/UNIX.

12.2.3.3.3 Unprocessed

Selecting **Unprocessed** provides the raw telemetry values for the MSID.

Tip: If you position your mouse pointer in a **Data Processing** field within the **MSID List Information** table and press the right mouse button, you will invoke the **Data Processing** popup menu. This popup provides you with another way to select **Data Processing** cascade menu items.

12.2.3.4 Set Data Representation...

This menu item is grayed out unless you click the mouse within the **Data Representation** column of the **MSID List Information** table. The selected cell in this column will be highlighted which will activate the **Set Data Representation...** item. Clicking on this item will invoke the **Set Data Representation** dialog box as shown in Figure 12-7, Set Data Representation dialog box. You can select to either use the **Defaults:** to display the data you are interested in or you can elect to display the data in a user-defined format by clicking on the appropriate radio button. If you elect to display the parameter using a user-defined format, then you can select a **Number System/Notation:** by clicking on the option menu button. Choices available for you to select from are shown in Table 12-1, Number system/notation examples.

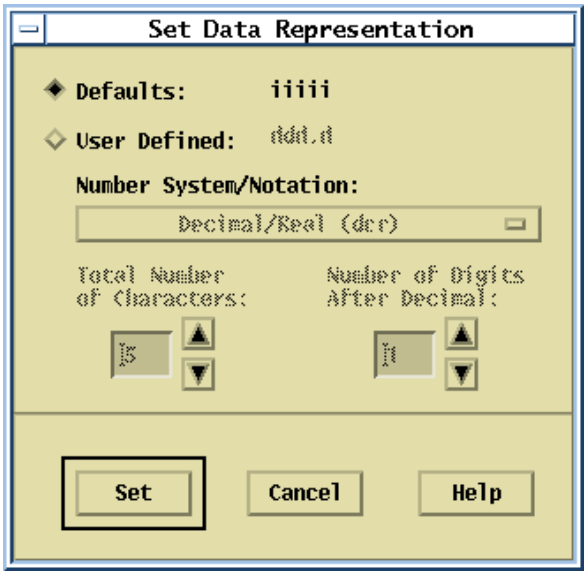


Figure 12-7, Set Data Representation dialog box.

Table 12-1, Number system/notation examples.

Format	Examples
Binary/Integer (bin)	1011, 1,0, etc.
Character/String (chr)	OFF, ON, RECORD, PAUSE, etc.
Decimal/Integer (dci)	3, 7, 76, etc.
Decimal/Real (dcr)	4.321, 6.789, etc.
Decimal/Scientific Notation (dcs)	3.2E+02, 4.78E-03
Hexadecimal/Integer (hex)	FFFF, F320, etc.
Octal/Integer (oct)	D3210, 00CDE, etc.
Time/String (tim)	123:13:54:06, 111:23:58:45.44, etc.

For all the formats other than **Time**, you will be provided the means to define the number of characters you want to display using the **Total Number of Characters:** text field. You can either type a value in this field, accept the default, or use and to increment the value displayed.

If you select the format **Decimal/Real** or **Decimal/Scientific Notation** you will get an additional text field titled **Number of Digits After Decimal:**. Enter a value in this field, accept the default value, or increase/decrease the value displayed by using and . This will allocate space for a specified number of decimal places.

If you select a **Time** format, the **Total Number of Characters** text field will be replaced with three time formats from which you can either accept the default or select one of the other options by clicking on the appropriate radio button. These other options allow you to specify time in hundredths or thousandths of a second (see Figure 12-8, Set Data Representation Time Options).

Once you've identified the **Number System/Notation:**, you need to define the number of characters you want to display. To set, use the **Total Number of Characters** text field and arrows.

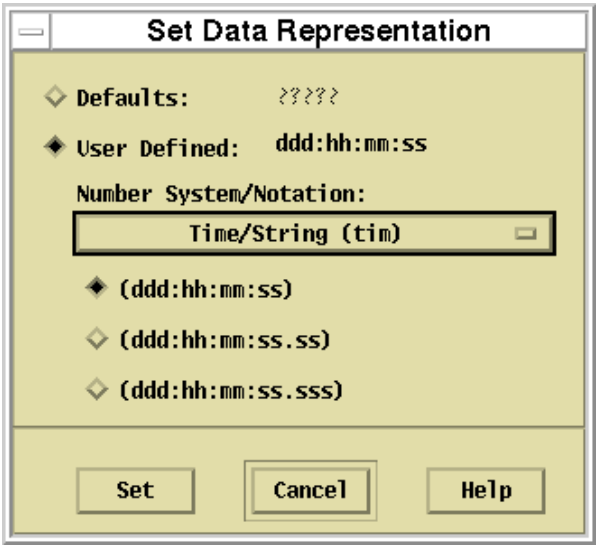


Figure 12-8, Set Data Representation Time options.

CAUTION: In the event you allocate insufficient space to accurately display the requested data in the output file, the parameters you've requested aren't available, etc., you will receive status characters rather than the expected values or text. To fix this problem, you'll need to return to this dialog box and increase the number of characters displayed. For a complete listing of status characters and their definition see Appendix W: Status Character Definitions.

Note: If you get **?????** displayed in the **Defaults:** label of this dialog box (as shown in Figure 12-8, Set Data Representation dialog box), it indicates that you have not provided a valid **MSID** and/or a valid **Data Processing** entry within the **MSID List Information** table. If **?????** occurs in the **User Defined:** label, it indicates that there are inconsistencies in the data representation format you've provided (e.g., you identified **Total Number Characters: = 3** and **Number of Digits After Decimal: = 4**).

Help: To identify valid data processing and data representation entries in the **MSID List Information** table, see "Appendix Y: Valid Entries for Each Native Data Type."

Tip: If you position your mouse pointer in a **Data Representation** field within the **MSID List Information** table and press the right mouse button, you will invoke the **Data Representation** popup menu. This popup provides you with another way to invoke the **Set Data Representation** dialog box.

12.2.3.5 Set Sample Thinning...

This menu item is grayed out unless you click the mouse within the **Sample Thinning** column of the **MSID List Information** table. The selected cell in this column will be highlighted which will activate the **Set Sample Thinning...** menu item. Clicking on this item will invoke the **Set Sample Thinning** dialog box as shown in Figure 12-9, Set Sample Thinning dialog box. There are three

options available within this dialog box that allow you to specify for each data packet whether you want to retrieve:

- **Every Sample**
- **One Sample**
- **Every Nth Sample**

The default option is to return **Every Sample** for the identified parameter. If you select **One Sample** then only the first sample per packet is returned even if 10 samples of data are available. If you select **Every Nth Sample,** then you must specify the value of **N:** in the field provided. The system will retrieve the data associated with **Every Nth Sample** of the specified parameter, per packet. For example, suppose there are 15 samples of the specified parameter in each data packet and you specify that you'd like every fifth sample. You'll get the first sample, sixth sample, eleventh sample, etc.

Note: If you specify that you'd like every fifth sample of data and there are only three samples per data packet, only the first sample from each packet will be returned.

Note: Notice in the description above that sample thinning is based on the number of samples contained in a data packet (NOT a major frame).

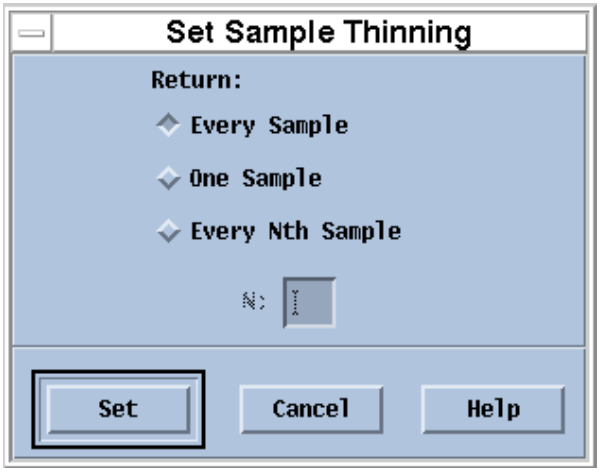


Figure 12-9, Set Sample Thinning dialog box.

Tip: If you position your mouse pointer in a **Sample Thinning** field within the **MSID List Information** table and press the right mouse button, you will invoke the **Sample Thinning** popup menu. This popup provides you with another way to invoke the **Set Sample Thinning** dialog box.

12.2.3.6 Set Limit/ES Sensing

This menu item is grayed out unless you click the mouse within the **Limit/ES Sensing** column of the **MSID List Information** table. The selected cell in this column will be highlighted which will activate the **Set Limit/ES Sensing** menu item. Clicking on this item will invoke a cascading menu

from which you can elect to turn limit sensing on by clicking on **Yes** or you can turn it off by clicking **No**. The default is **Yes**.

Note: If **Limit/ES Sensing** is turned on and you haven't changed the limits in your Local Table, the default database limits or expected state values will apply. If you changed the limits in Local Table, then those limits defined in the Local Table will be used.

Tip: If you position your mouse pointer in a **Limit/ES Sensing** field within the **MSID List Information** table and press the right mouse button, you will invoke the **Limit/ES Sensing** popup menu. This popup provides you with another way to select whether you want sensing turned on or off.

12.2.3.7 Set Filter Test

This menu item is grayed out unless you click the mouse within the **Filter Test** column of the **MSID List Information** table. A blinking I-beam insertion bar in this column will activate the **Set Filter Test** menu item. Clicking on this item will invoke a cascading menu. The filtering expressions found on the cascading menu are entered in the **Filter Test** column of the **MSID List Information** table. If you elect to include a filter test in your NRT request, you may also need to supply filter values. Example filter tests along and their result are provided in "Appendix AA: Filter Test Options" of this document.

When you click on an expression, it is entered into the selected **Filter Test** column on the **MSID List Information** table. If a value is required, you'll need to scroll the entire **MSID List Information** table to the left using the horizontal scroll bar so that you can see the **Filter Value A** column. Enter the desired value in the appropriate cell. If a second value is needed to complete the filter definition, enter the second value in the **Filter Value B** column.

Note: You must scroll the **MSID List Information** table to use the **Filter Value A** and **Filter Value B** columns. The filter name indicates whether values are required in the **Filter Value A** and **Filter Value B** columns (e.g., **>A** indicates that a value is required in the **Filter Value A** column and not in the **Filter Value B** column; **>= A AND <= B** indicates that values are required in both columns; and **Min/Max/Avg** indicates that no values are to be entered in either column). If required, filter values must be provided.

Tip: If you position your mouse pointer in a **Filter Test** field within the **MSID List Information** table and press the right mouse button, you will invoke the **Filter Test** popup menu. This popup provides you with another way to select a filter.

12.2.3.8 Show NRT Directory...

Clicking on this item will invoke the **Show NRT Directory** dialog box as shown in Figure 12-10, Show NRT Directory dialog box. This directory will list time segments of data that have been logged to either online or offline NRT storage devices. This information helps you build NRT

requests by allowing you to scan through the available NRT data segments to ensure that data is available for the desired time period.

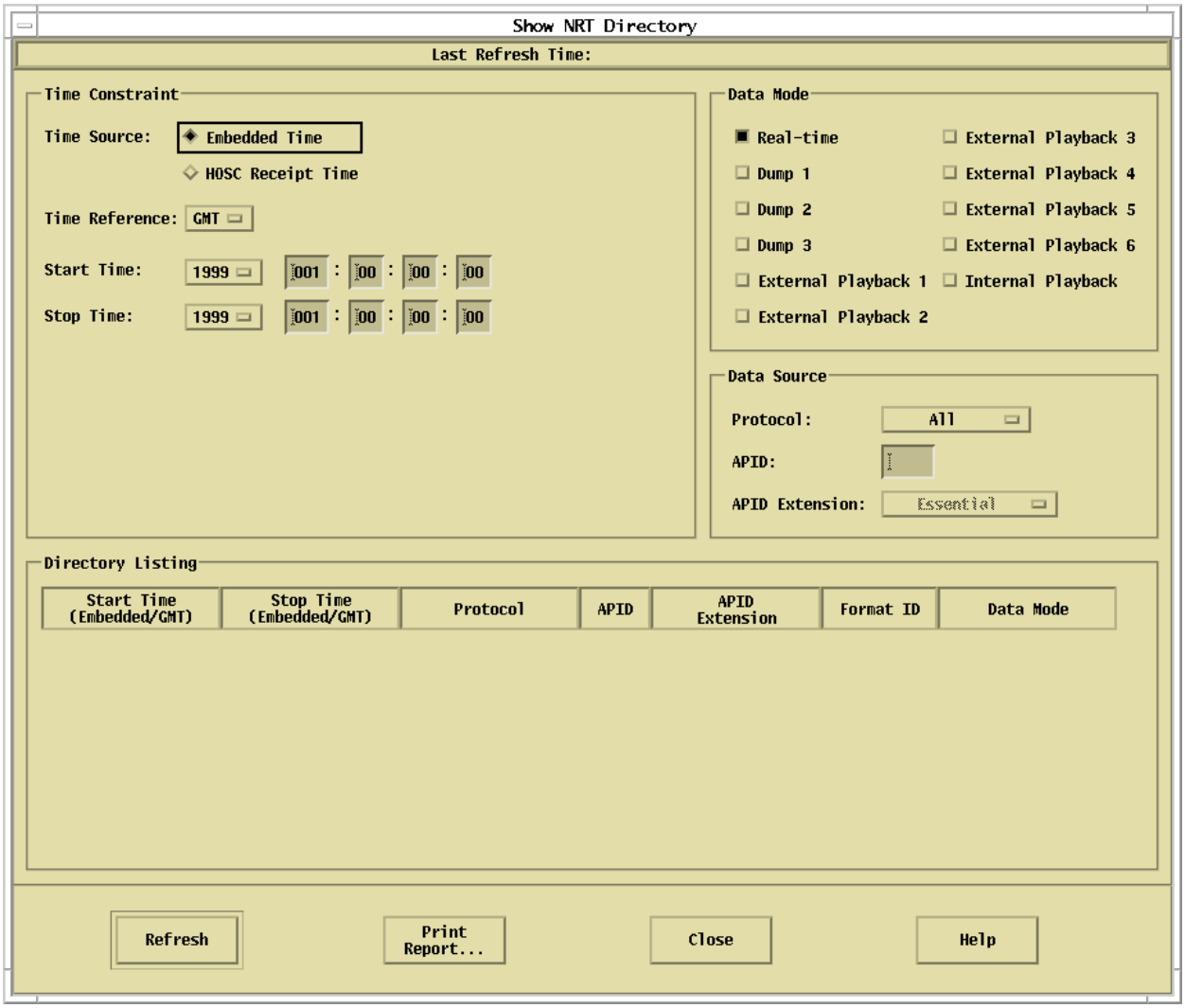


Figure 12-10, Show NRT Directory dialog box.

The **Show NRT Directory** dialog box is comprised of four frames:

- **Time Constraint**
- **Data Mode**
- **Data Source**
- **Directory Listing**

The first three frames are used to filter the NRT segments you want listed in the **Directory Listing** frame.

The **Time Constraint** frame contains:

- **Time Source:** radio buttons
- A **Time Reference:** option menu button
- A **Start Time:** option menu button and text entry fields
- A **Stop Time:** option menu button and text entry fields

The **Time Source:** radio button choices are **Embedded Time** and **HOSC Receipt Time**. The default is **Embedded Time.**

Note: You should use the same **Time Source:** within the **Show NRT Directory** dialog box as you plan to use within your NRT request.

The **Time Reference:** selections are **GMT and MET**. The default **Time Reference:** is **GMT**.

Note: You should use the same **Time Reference:** within the **Show NRT Directory** dialog box as you plan to use within your NRT request.

You must provide valid entries in the **Start Time:** and **Stop Time:** option menu buttons and text entry fields. The option menu buttons allow you to specify a year. Text field entries correlate to Julian day, hour, minute and second.

Note: A message dialog box will be invoked if you provide an invalid **Start Time:** or **Stop Time:**.

Once you've provided valid times within the **Time Constraint** frame, you can either proceed to change the default selections within the **Data Mode** and **Data Source** frames or you can accept the defaults and generate the NRT segment listing.

Within the **Data Mode** frame you identify the mode(s) of the data you're interested in by clicking on the associated toggle button(s). The default data mode is **Real-time** but you can include in your directory listing NRT segments in any of the available data modes:

- **Real-time**
- **Dump 1-3**
- **External Playback 1-6**
- **Internal Playback**

Help: For a definition of real-time, dump, and playback data modes, see the "Glossary" included in this document.

Note: If no data mode is selected, a message dialog box will be invoked indicating that you must specify a data mode.

Choices available within the **Data Source** frame permit you to identify a specific protocol using the **Protocol:** option menu button, an Application Process Identifier (APID) using the **APID:** text input field, and an APID extension using the **APID Extension:** option menu button. The default selection is to retrieve NRT segements from **All** data sources, but if you wish to include in your listing only NRT segments from a specific source, you must provide a protocol, an APID, and an

APID extension (if you selected the **PDSS Core** protocol). If you select **All** the NRT Show Directory dialog box will retrieve segments from all data sources.

The following list identifies the available protocols:

- **PDSS Core**
- **PDSS Payload**
- **PDSS BPDU**
- **PDSS UDSM**
- **TDM**
- **NASCOM**
- **PSEUDO**
- **HDRS_DQ**
- **GSE**
- **Time**

Help: For a brief description of each of the above protocols see "Appendix X: Protocol Descriptions." For more detailed information regarding protocols used within the HOSC, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237) or the POIC to Generic User Interface Definition Document (SSP 50305 Vol. I). For a brief definition of Bitstream Protocol Data Unit (BPDU) and User Data Summary Message (UDSM) see the Glossary in this document.

Entries in the **APID**: text entry field range from **0 - 2047**.

Note: A message dialog box will be invoked if you specify an APID that is out of range.

If you specify a protocol other than **All**, you must also specify an APID. If you select the PDSS Core protocol you must also provide an APID Extension. It is possible to use the Telemetry Database application to identify each protocol, APID, and APID Extension combination. You can also use the Telemetry Database application to determine what MSIDs are available in each APID.

Help: Appendix AB: Telemetry Database NRT Cross-Reference correlates the terminology used in the Telemetry Database applications with that used in the NRT applications to describe protocol, APID and APID extensions.

The following list identifies NRT APID extensions:

- **Essential**
- **Housekeeping I**
- **Housekeeping II**
- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

Once you've defined valid selection criteria within the **Time Constraint**, **Data Mode**, and **Data Source** frames, you populate the **Directory Listing** frame by clicking Refresh or pressing Enter. This updates the contents of the **Directory Listing** frame and puts the current time in the **Last Refresh Time:** area below the title bar. The **Last Refresh Time:** shows you when you last requested NRT directory information.

Note: The **Directory Listing** portion of the **Show NRT Directory** dialog box can only display 100 NRT segments at a time. If more than 100 segments are retrieved, a message dialog box will be invoked indicating that more segments were available for display than space allowed.

Note: If you close the **Show NRT Directory** dialog box and reopen it, it will contain the same information as displayed earlier. To update the listing using the same selection criteria you must click Refresh.

The **Directory Listing** frame displays the logged NRT segments. Information provided about each segment includes:

- **Start Time**
- **Stop Time**
- **Protocol**
- **APID**
- **APID Extension**
- **Format ID**
- **Data Mode**

Relevant entries for each segment in each of these columns were addressed above. Entries in the **Start Time** and **Stop Time** columns on the **Directory Listing** frame may not match the times you provided in the **Time Constraint** frame because segments are listed which contain either the start or stop time you specified. New NRT segments are generated each time that the protocol, APID, APID extension, format ID or data mode changes.

12.2.3.9 Show NRT Output...

Clicking on this menu item will invoke the Show NRT Output dialog box (see Figure 12-11, Show NRT Output dialog box). This dialog box allows you to view a NRT output file for the associated request.

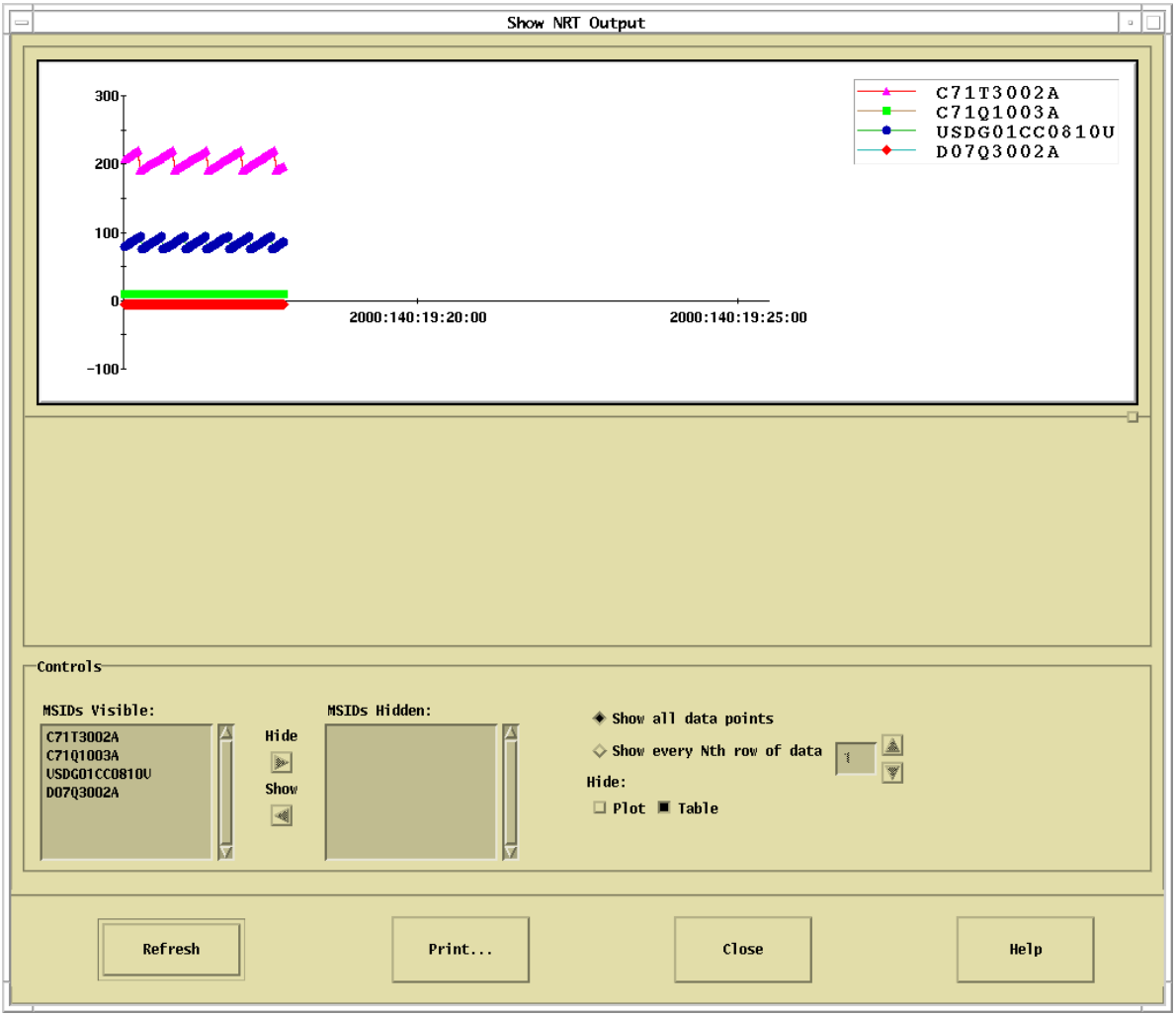
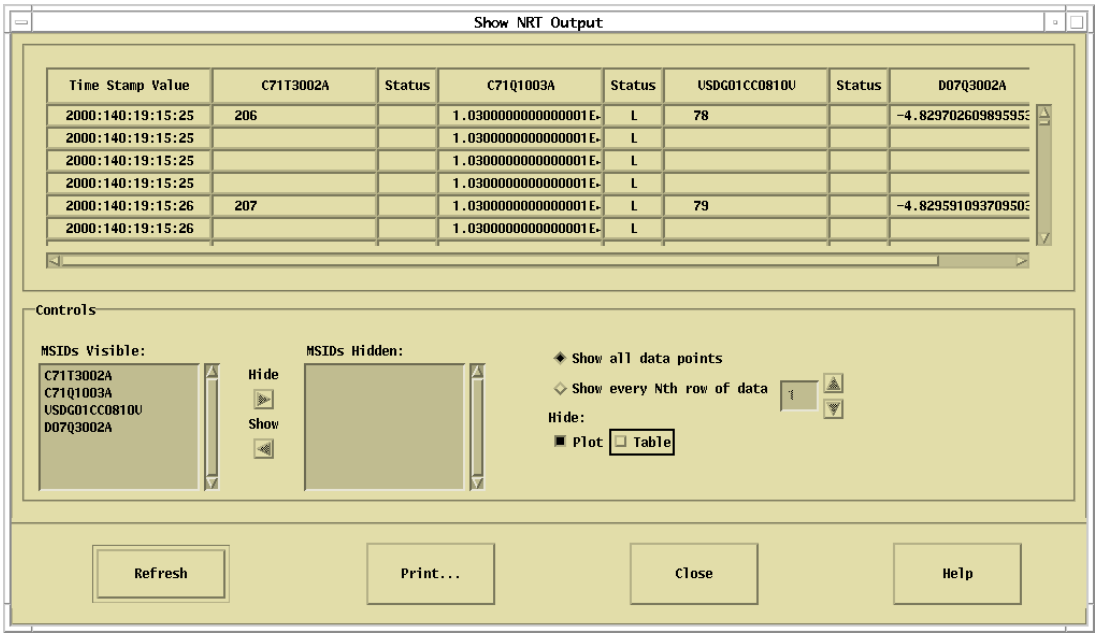


Figure 12-11, Show NRT Ouput dialog box.

At the top of the dialog box is a plot displaying the MSID data from the output file. In the upper right corner of the plot is a legend that identifies the MSIDs and their associated symbols.

At the bottom of the dialog box is the **Controls** frame. On the left side of this frame are two scrollable lists, **MSIDs Visible:** and **MSIDs Hidden:**. You can select to move highlighted MSIDs from one list to the other using the **Hide** or **Show** arrow buttons located between the two lists. These two lists determine what MSIDs are displayed in the plot at the top of the dialog box.

On the right side of the **Controls** frame are two radio buttons labeled: **Show all data points** and **Show every Nth row of data**. The default is for all MSID data points to be displayed in the plot. You can select to show every Nth row of data and enter the interval number in the input data field to the right by a keyboard entry or by using the up or down arrow buttons. Below these two radio buttons is the **Hide:** selection area which contains two toggle buttons: **Plot** and **Table.** The default is for the plot to be showing and the table to be hidden. You can toggle either button on or off (see Figure 12-12, Show NRT Output display options).



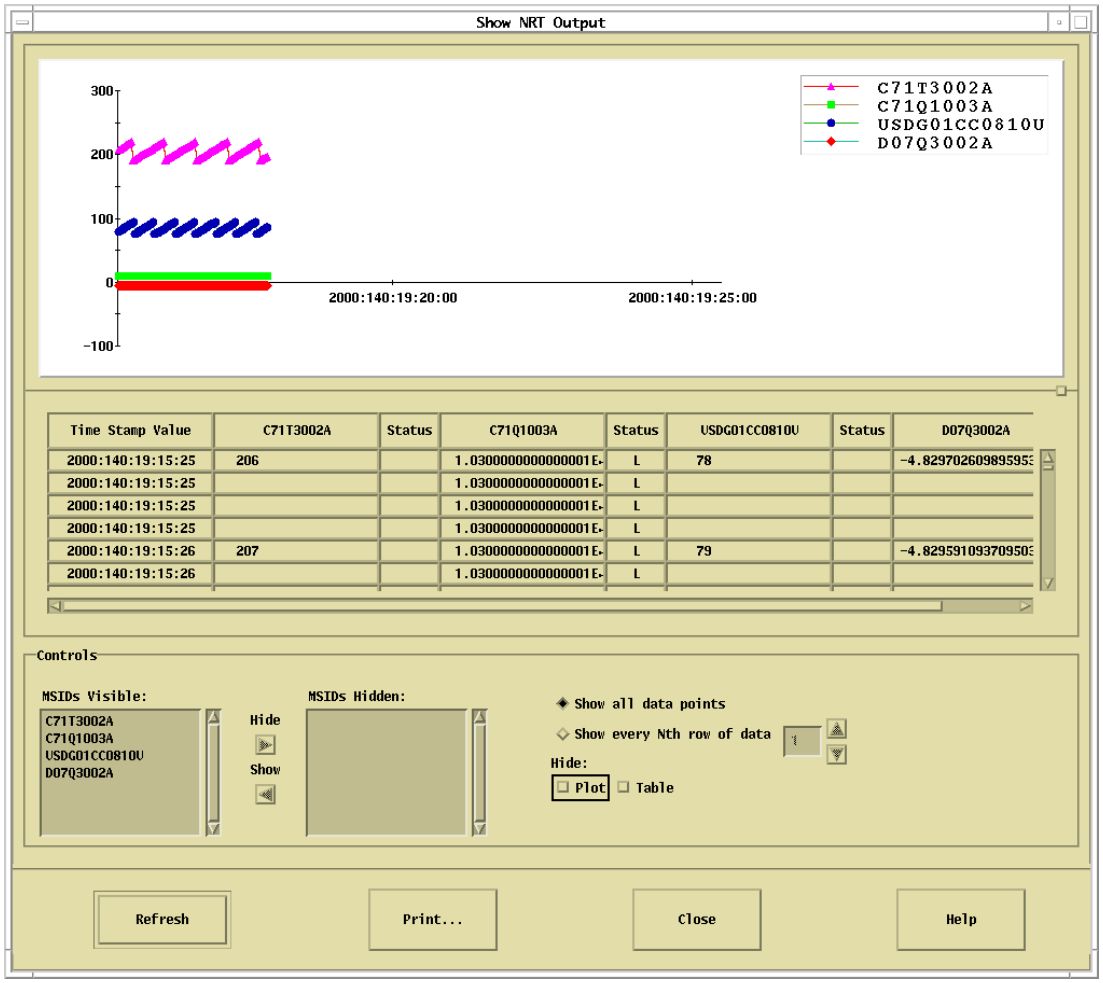


Figure 12-12, Show NRT Output display options.

12.3 NRT Snapshot Request Overview

An NRT Snapshot Request is a telemetry request that retrieves samples of every parameter in a packet or major frame for a particular time. To initiate an NRT Snapshot, you need to create and submit a request that identifies an output file where you want the sample data written. Your submitted request will start a process on the project server which builds the file containing your requested data. While your request is being fulfilled, you can continue to receive real-time data or use any of the other Huntsville Operations Support Center (HOSC) software applications. A **Control** dialog box provides you with the means to check the status of your request.

The NRT Snapshot Request main window contains two destinct featues that will be discussed in the following sections (see Figure 12-13, NRT Snapshot Request main window).

- Menu Bar
- Work Area

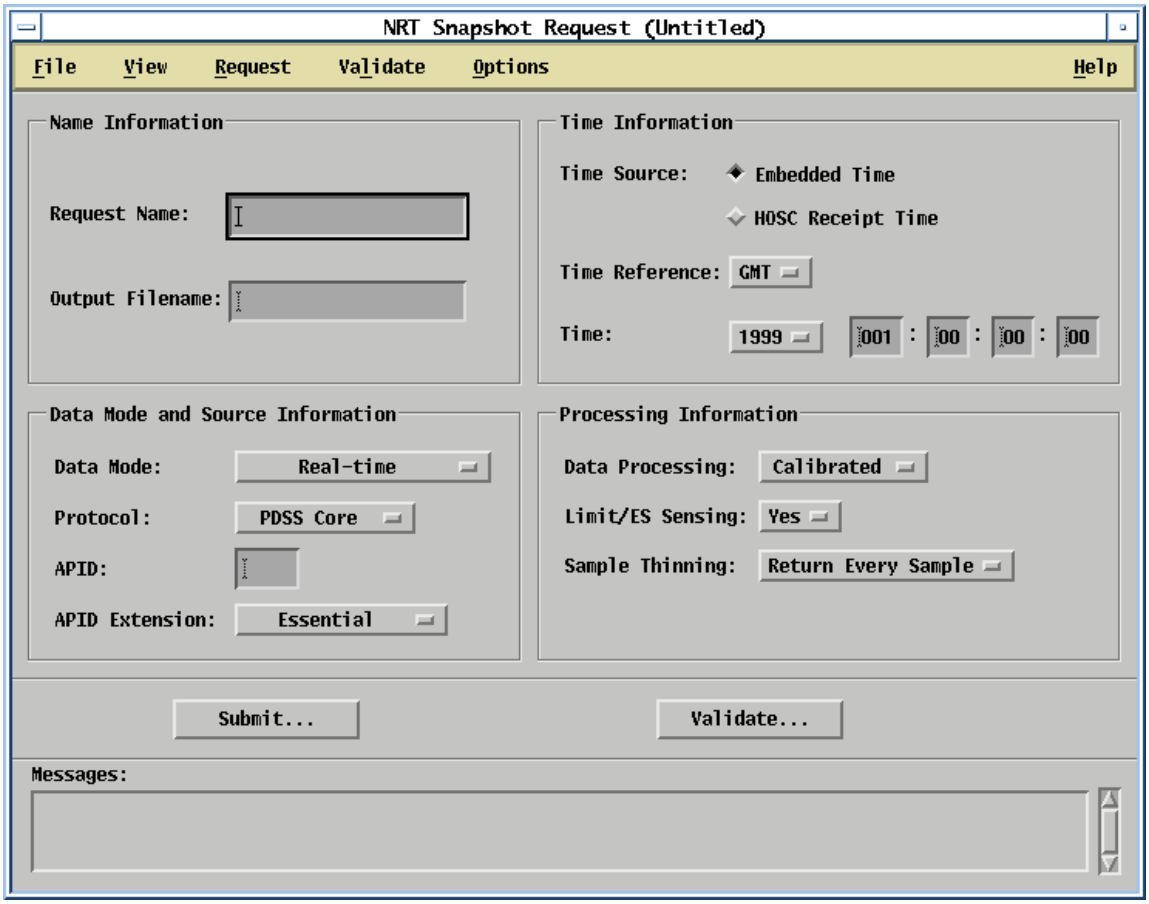


Figure 12-13, NRT Snapshot Request main window.

12.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **View**, **Request**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. A description of the menu items in the **Validate** and **Options** menus have been previously discussed in this chapter and will not be repeated.

12.3.2 Work Area

The work area of the NRT Snapshot Request application is where you actually define the contents of your request (see Figure 12-13, NRT Snapshot Request main window). The work area is broken down and organized into logical units or frames. A frame is designated by a box that encompasses related items. There are four frames that comprise the **NRT Snapshot Request** window. These frames are labeled: **Name Information**, **Time Information**, **Data Mode and Source Information**, and **Processing Information**.

The first work area frame, **Name Information**, includes two text entry fields labeled **Request Name:** and **Output Filename:**. In the **Request Name:** text field you identify a name for the request you are building. This is the same name that will be used within the **Control** dialog box to indicate the current status of your request. As you enter text in the **Request Name:** field, that same text is automatically entered in the **Output Filename:** field.

Note: The **Request Name:** identified within the work area is not the same as the file name. When you save a request, you'll still be required to enter a file name.

You can change the default entry provided in the **Output Filename:** text field. It does not have to match the request name. There is however, a 20-character limit to both the request name and output filename. If a file already exists with the same output file name, a confirmation dialog box will be invoked asking you whether you want to overwrite the existing file. The output file will be created by the project server and sent to your workstation when the request is fulfilled.

CAUTION: You must be careful when providing output filenames. If the filename you enter already exists and you confirm that you want to overwrite the existing file, you will lose the original request's data.

The second frame is labeled **Time Information**. Within this frame, you must first define the **Time Source:** you want to use in defining your request, either **Embedded Time** or **HOSC Receipt Time**. The default is **Embedded Time**. If you want to change the time to **HOSC Receipt Time**, click on the appropriate diamond-shaped radio button. A filled radio button indicates the option or characteristic in effect.

The next element in the **Time Information** frame is the **Time Reference:** option menu button. By clicking on this button you are able to change from one time reference (**GMT**) to another (**MET)** and vice versa. The button label shown is the time reference that is in effect for the current request.

The third element in the **Time Information** frame is **Time:**. This element identifies the specific time for which you'd like to see all available data. You'll notice that the year option menu buttons default to the current year, the day entry text field defaults to **001**, and all time text entry fields default to **00**. You must use these fields to define a valid time. To verify that a data segment exists for the time desired, invoke the **Show NRT Directory...** dialog box available from the **Options** menu.

Note: If the created output file has no data for the specified time, go to the **Options** menu and select the **Show NRT Directory...** menu item. Verify that data was logged for the time you specified.

The third frame is titled **Data Mode and Source Information**. This frame includes a **Data Mode:** option menu button, a **Protocol:** option menu button, an **APID:** input text field and an **APID Extension:** option menu button.

The **Data Mode:** option menu button allows you to include in your request either **Real-time**, **Dump** 1-3, **External Playback** 1-6 or **Internal Playback** data.

Help: For Real-time, Dump, and Playback data mode definitions see the "Glossary" at the end of this document.

The **Protocol:** option menu button works in conjunction with the **APID:** text entry field and the **APID Extension** option menu button (for those protocols supporting extensions). The following list identifies the protocols available under the **Protocol:** option menu button.

- **PDSS Core**
- **PDSS Payload**
- **PDSS BPDU**
- **PDSS UDSM**
- **TDM**
- **NASCOM**
- **PSEUDO**
- **HDRS_DQ**
- **GSE**
- **Time**

Note: If you specify a protocol, you must also specify an APID (and APID extension if required). It is possible to use the Telemetry Database application to identify each protocol/APID/APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol

Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

The third element of the **Data Mode and Source Information** frame is the **APID:** text field. The APID is a number which can range from **0 - 2047** and is included in data packet headers. A protocol plus an APID (and APID extension if supported) is what uniquely identifies a data source.

The fourth element of the **Data Mode and Source Information** frame is the **APID Extension**: option menu button. APID extensions are relevant only if you select the **PDSS Core** protocol. The following list identifies the extensions available under the **APID Extension:** option menu button.

- **Essential**
- **Housekeeping I**
- **Housekeeping II**
- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

The **Processing Information** frame has four option menu buttons:

- **Data Processing:**
- **Number System:**
- **Limit/ES Sensing:**
- **Sample Thinning:**

The **Data Processing:** option menu button allows you to select to display your data as **Calibrated** values, **Converted** values, or **Unprocessed** values.

If you select **Calibrated**, MSID values are calculated as defined in the Telemetry Database by either plugging the raw values into a polynomial equation, interpolating the values from a line defined by a point pair, or by changing the MSID value to some code or ASCII text, such as you might do with a discrete state parameter (e.g., to indicate that "0" equals "OFF"). If the calibration type is polynomial or point pair, a floating point value will be returned for each value. The precision of this value is determined by the precision of the sample.

If you select **Converted,** the raw telemetry sample is converted into a format that is recognized by an SGI/UNIX platform. For example, for a native data type of IBM floating point to be processed in the HOSC, it must be converted to IEEE-floating point format. This process does not alter the actual value of the data, but converts it to something recognized by SGI/UNIX.

If you select **Unprocessed,** raw telemetry values will be provided. If you select **Unprocessed** then you may define the **Number System:** to use to depict the data. For **Converted** and **Calibrated** data, the system will determine the appropriate data representation.

Note: If you select **Calibrated** from the **Data Processing:** option menu button, the system will calibrate every MSID that has calibration. For those MSIDs that don't have calibration, the system will perform conversion. For those MSIDs that can't be calibrated or converted, the system will provide unprocessed data.

Possible choices from the **Number System:** option menu button are:

- **Binary**
- **Decimal**
- **Hexadecimal**
- **Octal**

The **Limit/ES Sensing** option menu button is where you specify whether you want Limit/Expected State (LES) sensing performed on the requested parameters. If you want LES sensing, select **Yes**. If you don't want it, select **No**.

Note: If you've elected to implement **Limit/ES Sensing** the Telemetry Database default limits or expected state values apply. Limit or expected state changes applied through the Local Table Operations application will not be reflected in the NRT Snapshot output.

This **Sample Thinning** option menu button allows you to select whether you want to:

- **Return Every Sample**
- **Return One Sample**

The default option is to **Return Every Sample** for every parameter in the specified packet. If you select **Return One Sample,** then only the first sample for each parameter in the packet is returned, even if 10 samples of data are available.

12.4 NRT Data Capture Request Overview

An NRT Data Capture request retrieves whole packets of data for a specified time slice. NRT Data Capture Request output files are in binary format and may be used as input by other applications for further analysis and manipulation. Unlike NRT List Request, the output of a NRT Data Capture Request is not intended to be opened using the Applix spreadsheet software. To create this binary file, you must complete and submit a request specifying the time slice and data source that you want. Your submitted request will initiate a process on the project server which builds the file containing your requested data.

While your request is being fulfilled, you can continue to receive real-time data or use any of the other Huntsville Operations Support Center (HOSC) software applications. A **Control** dialog box provides you with the means to check the status of your request.

The NRT Snapshot Request main window contains two destinct featues that will be discussed in the following sections (see Figure 12-14, NRT Data Capture Request main window).

- Menu Bar
- Work Area

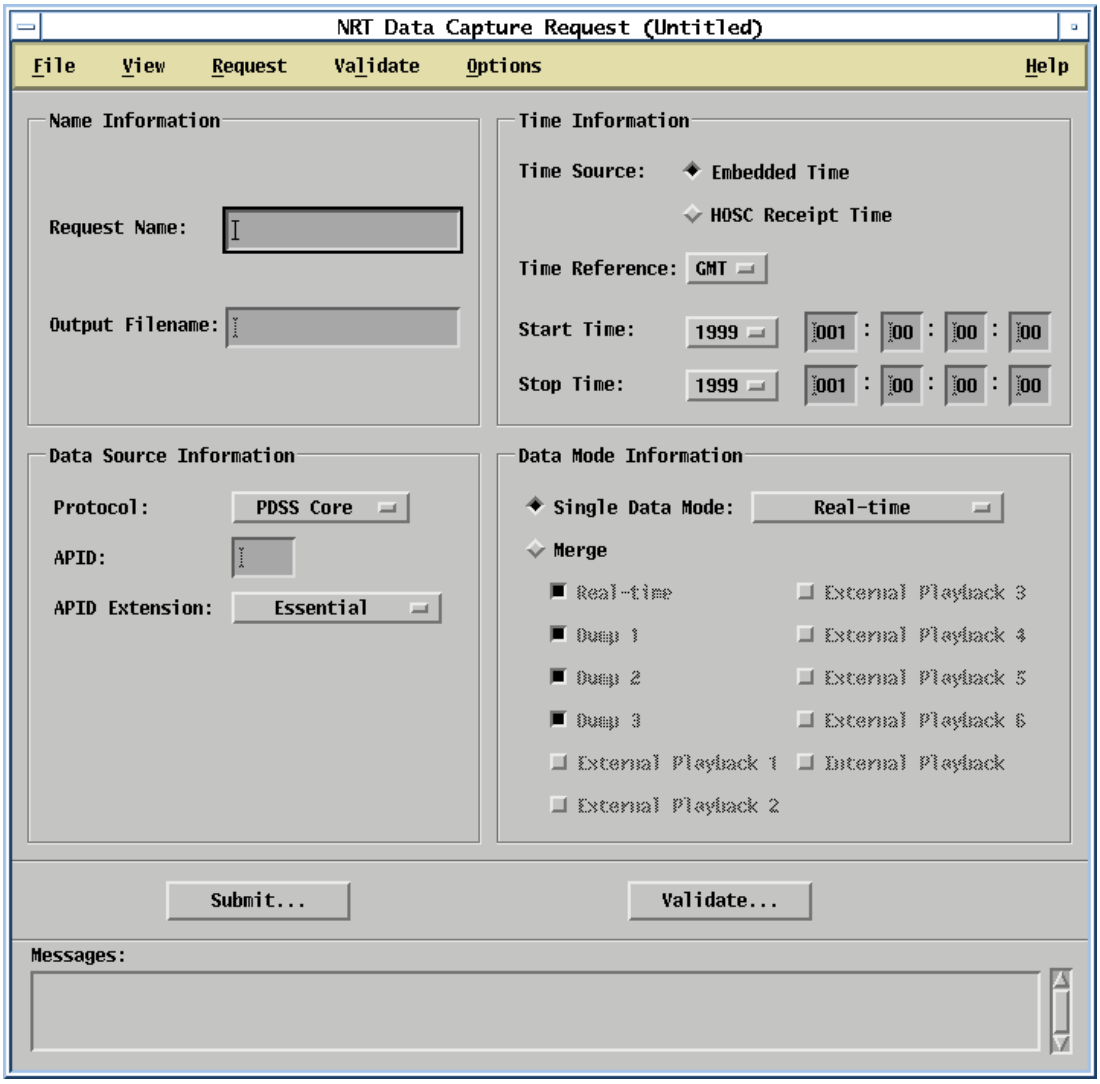


Figure 12-14, NRT Data Capture Request main window.

12.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **View**, **Request**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. A description of the menu items in the **Validate** and **Options** menus have been previously discussed in this chapter and will not be repeated.

12.4.2 Work Area

The work area of the NRT Data Capture Request application is where the contents of your request are defined (see Figure 12-14, NRT Data Capture Request main window). The work area is broken down and organized into logical units or frames. A frame is designated by a box that encompasses related items such as text fields, pushbuttons, tables, etc. There are four frames that comprise the **NRT Data Capture Request** application window. These frames are labeled: **Name Information**, **Time Information**, and **Data Source Information** and **Data Mode Information**.

The first work area frame, **Name Information**, includes two text entry fields labeled **Request Name:** and **Output Filename:**. In the **Request Name:** text field you identify a name for the request you are building. This is the name that will be used within the **Control** dialog box to indicate the current status of your request. As you enter text in the **Request Name:** field, that same text is automatically entered in the **Output Filename:** field.

Note: The **Request Name:** identified within the work area is not the same as the file name. When you save a request, you'll still be required to enter a file name.

You can change the default entry provided in the **Output Filename:** text field. It does not have to match the request name. There is however, a 20-character limit to both the request name and output filename. If a file already exists with the same output file name, a confirmation dialog box will be invoked asking you whether you want to overwrite the existing file. The output file will be created by the project server and sent to your workstation when the request is fulfilled.

CAUTION: You must be careful when providing output filenames. If the filename you enter already exists and you confirm that you want to overwrite the existing file, you will lose the original request's data.

The second frame is labeled **Time Information**. Within this frame, you must first define the **Time Source:** you want to use in defining your request, either **Embedded Time** or **HOSC Receipt Time**. The default is **Embedded Time**. If you want to change the time to **HOSC Receipt Time**, click on the appropriate diamond-shaped radio button. A filled radio button indicates the option or characteristic in effect.

The next element in the **Time Information** frame is the **Time Reference** option menu button. By clicking on this button you open the menu and are able to click on the option you want. This permits you to change from one time reference to another (**GMT** to **MET**) and vice versa. The time that is displayed on the button is the time reference that will be used for the current request.

The third element in the **Time Information** frame is the **Start Time:** and the fourth is the **Stop Time:** These elements are used to define a valid time slice. Obviously, the larger the time slice, the more time it will take to accommodate your request. You'll also notice that the year option menu buttons default to the current year, the day entry text fields default to **001**, and all time text entry fields default to **00**. You must change these fields to reflect valid start and stop times. To verify that

a valid data segment exists for the time slice desired, invoke the **Show NRT Directory...** dialog box available from the **Options** menu.

Note: If the created output file has no data for the specified time, go to the **Options** menu and select the **Show NRT Directory...** menu item. Verify that data was logged for the time in which you are interested.

The third frame in the work area of the **NRT Data Capture Request** main window is the **Data Source Information** area. Within the **Data Source Information** frame you identify the specific protocol and APID for the data in which you are interested. In addition, if you select the **PDSS Core** protocol, you must also select an **APID Extension**. The default protocol option is **PDSS Core**. The following list identifies the protocols available under the **Protocol:** option menu button.

- **PDSS Core**
- **PDSS Payload**
- **PDSS BPDU**
- **PDSS UDSM**
- **TDM**
- **NASCOM**
- **PSEUDO**
- **HDRS_DQ**
- **GSE**
- **Time**

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

The second element of the **Data Source Information** frame is the **APID:** text field. The APID is a number which can range from **0 - 2047** and is included in data packet headers. An APID plus a protocol is what uniquely identifies a data source. If you select the **PDSS Core** protocol, you must also provide an **APID Extension**.

Note: It is possible to use the Telemetry Database application to identify each protocol/APID/ APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

The third element of the **Data Source Information** frame is the **APID Extension**: option menu button. The **APID Extension:** is active if you use the **PDSS Core** protocol. The following list identifies the extensions available under the **APID Extension:** option menu button.

- **Essential**
- **Housekeeping I**
- **Housekeeping II**

- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

The fourth frame on the **NRT Data Capture Request** main window is titled **Data Mode Information**. The **Data Mode Information** frame allows you to include in your request either a **Single Data Mode** or **Merge** data mode.

The **Single Data Mode:** option menu button provides you with the ability to request data logged in only one data mode (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback) for your request. The default data mode is **Real-Time**.

Help: For Real-time, Dump, and Playback data mode definitions see the "Glossary" at the end of this document.

Merge provides you with the ability to request data logged in any or all of the data modes (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback). To specify that you want more than one data mode included in your request, you have to click on **Merge** and then identify the modes you are interested in receiving by clicking on the appropriate toggle buttons. In instances where two modes have data for the same parameter at the same time, the system will select the mode with the highest data quality and provide that data. If **Merge** is selected, the default modes are for **Real-time** and **Dump 1-3** to be selected.

12.5 NRT Playback Request Overview

To playback telemetry data written to the NRT data log just as if it was being received in real-time, you need to create and submit a request specifying the time slice you want. Your submitted request will initiate a process on the project server. While your request is being filled, you can continue to receive real-time data and use any of the other Huntsville Operations Support Center (HOSC) software applications.

Note: The ability to request playbacks may be restricted to specific users. This privilege is defined by each project office.

The NRT Playback Request main window contains two destinct featues that will be discussed in the following sections (see Figure 12-15, NRT Playback Request main window).

- Menu Bar
- Work Area

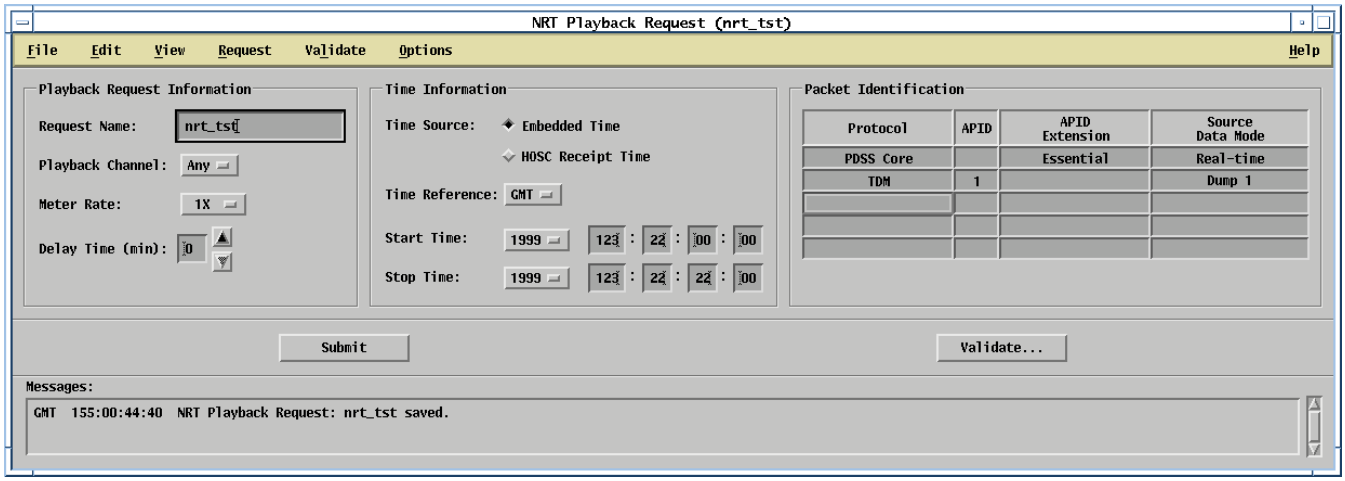


Figure 12-15, NRT Playback Request main window.

12.5.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes seven menus: **File**, **Edit**, **View**, **Request**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. A description of the menu items in the **Validate** menu have been previously discussed in this chapter and will not be repeated. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Set Protocol**
  - **Set APID Extension**
  - **Set Source Data Mode...**

12.5.2 Work Area

The work area of the NRT Playback Request application is where you actually define the contents of your request (see Figure 12-15, NRT Playback Request main window). The work area is broken down and organized into logical units or frames. A frame is designated by a box that encompasses related items such as text fields, pushbuttons, tables, etc. There are three frames that comprise the **NRT Playback Request** work area (see Figure 12-15, NRT Playback Request main window). These frames are titled:

- **Playback Request Information**
- **Time Information**
- **Packet Identification**

The first work area frame, **Playback Request Information**, includes a single text entry field labeled **Request Name:**. In the **Request Name:** text field you identify a name for the request you are building. This is the same name that will be used within the **Control** dialog box to indicate the current status of your request.

Note: The **Request Name:** identified within the work area is not the same as the file name. When you save a request, you'll still be required to enter a file name.

The next item within the **Playback Request Information** frame is the **Playback Channel:** option menu button. Choices available from this menu are **Any** and playback channels **1**-**11**. The default option is **Any**. Playback channels 1-6 are reserved for external playbacks defined by each project and are only available for privileged users. Playback channels 7-11 are intended for individual user requests.

Note: If you request a specific playback channel and that channel is currently in use, you'll receive a message stating:

```
NDL Playback Stream Service reported a failure while processing
this request.
```

To identify the playback channels currently in use you can invoke the Playback Status application available off the Launchpad under the **Utilities** menu.

If you select to receive your playback on **Any** (the default) playback channel, your request will be assigned an available channel. A message will be sent to the NRT Playback Request **Messages:** area stating:

GMT, Request Title, `successfully completed by NDL Playback Stream Service. The playback channel is` *x*.

Once this message has been received, you can then setup your displays, computations, etc. to use the identified playback channel.

The next item within the **Playback Request Information** frame is the **Meter Rate:** option menu button. This button allows you to select a rate at which you want data played back into your system. Options available on this menu include: **.25x**, **.5x**, **1x**, **2x**, and **4x**. A **1x** (the default) indicates that you want the data played back at the same rate as it was originally received.

Note: Dump data is typically received at higher data rates and for this reason, you may want to reduce the meter rate for requests containing this type data. On the other hand, if the only Operation application you want to run against the received playback data is Computation Operation and you're only interested in the final output of this computation, you may elect to increase the meter rate.

The next item in the **Playback Request Information** frame is the **Delay Time (min):** text entry field. This field allows you to specify a delay time in minutes for when you want the requested data

to begin playing back into your system (maximum of 30 minutes). This delay will commence once you receive a playback confirmation message in the **Messages:** area. You should estimate a delay time based on how long you think it will take to setup your Operation applications to use playback data on the designated playback channel.

CAUTION: The default delay time is **0** minutes. If you select the default, data will begin being played back into your system as soon as you submit your request and receive the confirmation message from NDL Playback Stream Service. You must identify a delay time in order for you to change data modes for displays, computations, etc.

Note: You must submit your playback request prior to initiating the Operation applications desired to view or manipulate playback data output.

Note: Scripts containing directives for uplinking commands will not function in playback mode. Displays that contain pushbuttons that uplink commands or scratchpad line text fields will open, but any effort to uplink commands while the display is in playback mode will result in an error.

The next frame within the NRT Playback Request application is the **Time Information** frame. Within this frame, you must first define the **Time Source:** you want to use in defining your request, either **Embedded Time** or **HOSC Receipt Time**. The default is **Embedded Time**. If you want to change the time to **HOSC Receipt Time**, click on the appropriate diamond-shaped radio button. A filled radio button indicates the option or characteristic in effect.

The next element in the **Time Information** frame is the **Time Reference:** option menu button. By clicking on this button you are able to change from one time reference (**GMT**) to another (**MET)** and vice versa. The button label shown is the time reference that is in effect for the current request.

The third element in the **Time Information** frame is **Start Time:** and the fourth is **Stop Time:**. These elements are used to define a valid time slice. The larger the time slice, the more time it will take to accommodate your request. You'll also notice that the year option menu buttons default to the current year, the day entry text fields default to **001**, and all time text entry fields default to zero. You must change these fields to reflect valid start and stop times. To verify that a valid data segment exists for the time slice desired, invoke the **Show NRT Directory...** dialog box available from the **Options** menu.

The next frame within the NRT Playback Request work area is **Packet Identification**. This frame contains a single table in which you identify the **Protocol**, **APID, APID Extension** and **Source Data Mode** for the data in which you are interested. For the first table column the valid protocols are:

- **PDSS Core**
- **PDSS Payload**
- **PDSS BPDU**
- **PDSS UDSM**
- **TDM**

- **NASCOM**
- **PSEUDO**
- **HDRS_DQ**
- **GSE**
- **Time**

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

Tip: Clicking within a cell under the **Protocol** column and then holding the right mouse button down invokes a popup dialog box from which you can select the desired protocol.

The second column in the **Packet Identification** frame table is **APID:**. The APID is a number which can range from **0 - 2047** and is included in data packet headers. An APID plus a protocol is what uniquely identifies a data source, except for protocols supporting extension, then an additional APID Extension is needed. You must enter the desired APIDs in the **Packet Identification** table.

Note: If you specify a protocol, you must also specify an APID (and APID extension if you select the **PDSS Core** protocol). It is possible to use the Telemetry Database application to identify each protocol/APID/APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

The third column of this table is titled **APID Extension**. The **APID Extension** is needed if you select the **PDSS Core** protocol. The following list identifies the extensions available under the **APID Extension** column.

- **Essential**
- **Housekeeping I**
- **Housekeeping II**
- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

Note: If you select a protocol other than **PDSS Core**, you should leave the **APID Extension** column within the **Packet Identification** table blank.

The forth column of this table is titled **Source Data Mode.** Valid entries in this column include **Real-time**, **Dump** 1-3, **External Playback** 1-6, or **Internal Playback**.

To include data from multiple sources within your playback, enter the information relevant to the second data source in the second row of the Packet Identification table. Continue entering

information relevant to any other desired sources within subsequent rows of the Packet Identification table.

Help: For data mode definitions see the “Glossary” at the end of this document.

Tip: Clicking within a cell under the **Source Data Mode** column and then holding the right mouse button down invokes a popup dialog box from which you can access the **Set Source Data Mode** dialog box.

12.5.3 Application Essentials

The following sections will discuss the menu items presented by the Menu Bar that are unique to the NRT Playback Request application. The **Set Protocol**, **Set APID Extension**, and **Set Source Data Mode...** menu items from the **Options** menu will be discussed (see Figure 12-16, Options menu).

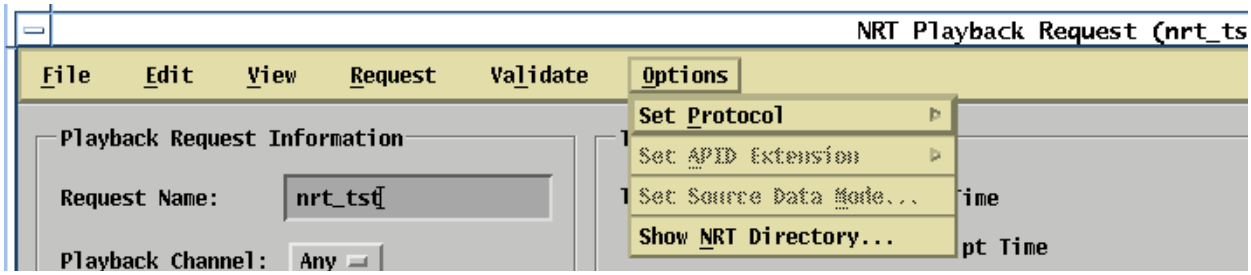


Figure 12-16, Options menu.

Note: In order to make an insensitive (grayed out) menu item active you must first click within a cell under the associated column on the **Packet Identification** table. Any selections you make from the **Set Protocol** cascade menu will be automatically entered into the selected cell. The **Set APID Extension** cascade menu will only activate if you first click within a cell under the associated column on the **Packet Identification** table. Any selections you make from the **Set APID Extension** cascade menu will be automatically entered into the selected cell. The only valid protocol that supports APID extensions is the **PDSS Core** protocol. Selections made using the **Set Source Data Mode** dialog box will also be entered in the **Packet Identification** table.

12.5.3.1 Set Protocol

This menu item is grayed out unless you click the mouse within the **Protocol** column of the **Packet Identification** table. A blinking I-beam insertion bar in this column will activate the **Set Protocol** cascade menu item under the **Options** menu. If you click on this menu item, a cascade menu shown in Figure 12-17, Set Protocol cascade menu, will be invoked. From this cascade menu, you select the protocol for the data you wish to receive. Your selection from the cascade menu will be reflected on the **Packet Identification** table.

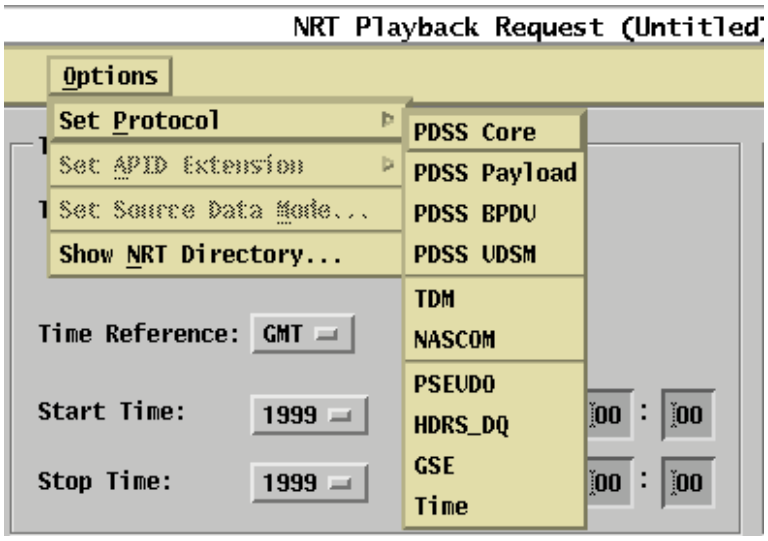


Figure 12-17, Set Protocol cascade menu.

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

Selection of a protocol and identifying an appropriate APID is what uniquely identifies a data source. If you select **PDSS Core** you should also identify an APID and APID Extension. You must enter the desired APIDs in the **Packet Identification** table.

Note: If you specify a protocol, you must also specify an APID (and APID extension if you select the **PDSS Core** protocol). It is possible to use the Telemetry Database application to identify each protocol/APID/APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

12.5.3.2 Set APID Extension

This menu item is grayed out unless you click the mouse within the **APID Extension** column of the **Packet Identification** table. A blinking I-beam insertion bar in this column will activate the **Set APID Extension** cascade menu item under the **Options** menu. If you click on this menu item, a cascade menu shown in Figure 12-18, Set APID Extension cascade menu, will be invoked. From this cascade menu, you select the extension for the data you wish to receive. Your selection from the cascade menu will be reflected on the **Packet Identification** table.

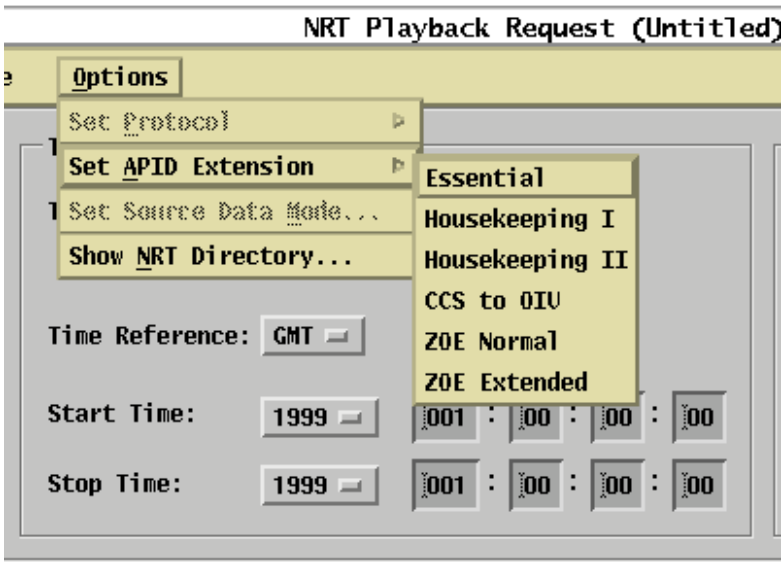


Figure 12-18, Set APID Extension cascade menu.

Help: For a brief description of each of the above protocols, see "Appendix X: Protocol Descriptions." For more detailed information, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237), MSFC Packet Telemetry Format Standard (MSFC-STD-1274), or Interface Control Document between the MSFC HOSC and the GSFC NCCDS (530-ICD-NCCDS/MSFC).

Selection of a protocol and identifying an appropriate APID is what uniquely identifies a data source except for protocols supporting extension then an APID Extension is needed. You must enter the desired APIDs in the **Packet Identification** table.

Note: If you specify a protocol, you must also specify an APID (and APID extension if you select the **PDSS Core** protocol). It is possible to use the Telemetry Database application to identify each protocol/APID/APID extension combination. You can also use this application to determine what MSIDs are available in each APID.

12.5.3.3 Set Source Data Mode...

The third menu item off the **Options** menu is **Set Source Data Mode...**. This menu item is grayed out unless you click the mouse within the **Source Data Mode** column of the **Packet Identification** table. A blinking I-beam insertion bar in this column will activate the **Set Source Data Mode...** menu item. If you click on this menu item, the **Set Source Data Mode** dialog box is invoked (see Figure 12-19, Set Source Data Mode dialog box). Your selections on this dialog box will be reflected on the **Packet Identification** table.

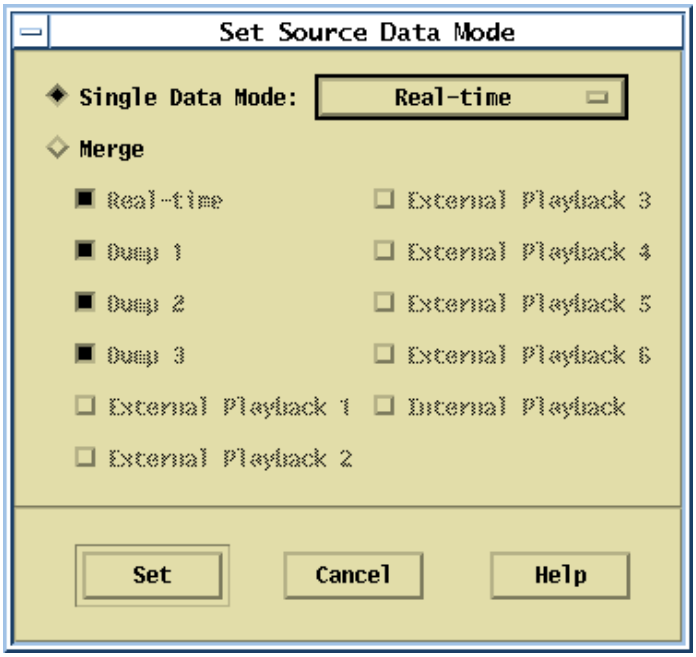


Figure 12-19, Set Source Data Mode dialog box.

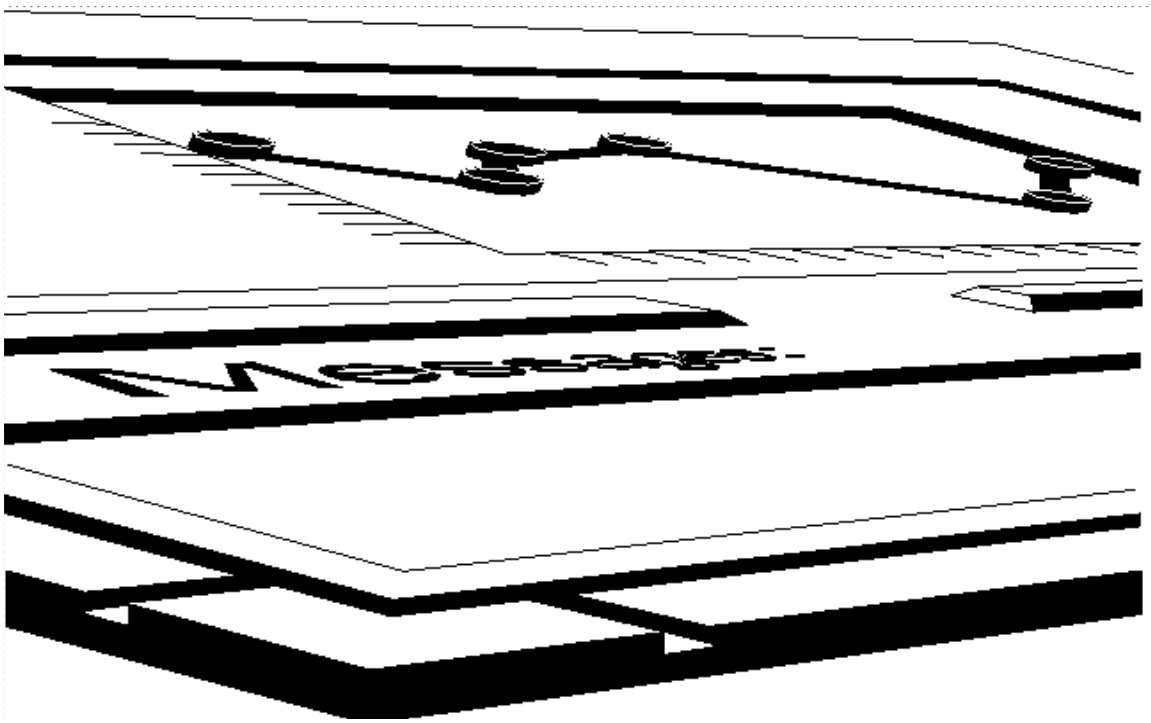
The **Set Source Data Mode** dialog box allows you to define the source data mode you wish included in your request to be either a **Single Data Mode** or **Merge** data mode.

The **Single Data Mode:** option menu button provides you with the ability to request data logged in only one data mode (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback) for your request. The default data mode is **Real-Time**.

Help: For Real-time, Dump, and Playback data mode definitions see the "Glossary" at the end of this document.

Merge provides you with the ability to request data logged in any or all of the data modes (Real-time, Dump 1-3, External Playback 1-6, and Internal Playback). To specify that you want more than one data mode included in your request, you have to click on **Merge** and then identify the modes you are interested in receiving by clicking on the appropriate toggle buttons. In instances where two modes have data for the same parameter at the same time, the system will select the mode with the highest data quality and provide that data. If **Merge** is selected, the default modes are for **Real-time** and **Dump 1**, **Dump 2**, and **Dump 3** to be selected.

Note: Multiple rows in the **Packet Identification Table** allow you to playback data from different sources. If you attempt to define two rows within the **Packet Identification Table** with the same Protocol/ APID/APID Extension, your playback request will not validate. The capability to playback data from the same source with different data modes is provided through the **Merge** function.



Chapter 13:
Fault Summary Software

This chapter describes the Huntsville Operations Support Center (HOSC) Fault Summary Application (FSA). The FSA displays Emergency, Caution, Warning, and Advisory messages downlinked in the S-band essential telemetry data. This application is used to notify the user of any International Space Station (ISS) core systems or payload messages which affect onboard operations. The user has the ability to select the data mode, filter messages, and generate reports of logged data.

13.1 Overview

The Fault Summary capability is provided to users through a mission computation and application. The Fault Summary Mission Computation receives core and payload Emergency, Caution, Warning, and Advisory (ECWA) event codes downlinked in the S-Band essential telemetry data and correlates these event codes with corresponding message codes. This information is then packetized as pseudo data and made available to the Fault Summary Application (FSA). The Fault Summary Application will allow users to view seperate time ordered lists of core and payload message events.

The Fault Summary Application provides a display of core and payload messages. The application is selected from the EHS Launchpad either on a local workstation or a remote workstation that has obtained EHS login. Once invoked, the user selects the data mode and database version prior to message reception. The ECWA Event Code, Time, Alarm State and Messages are displayed to the user in a scrollable window. The user can specify filtering on code, time, alarm, and message. The application holds at least 60 Core and 60 Payload messages allowing the user to scroll back to previously received messages. Emergency and Warning messages will be color coded on the display - red and yellow respectively. Caution and Advisory messages will be displayed in white text.

In order to view messages from different data modes (Real-time, Dump, Playback or Merged), the user is required to start another FSA for each additional data mode of interest. Once an application has been exited by the user all processing started to facilitate the message reception at the display will also be terminated.

13.2 Fault Summary Application (FSA)

The Fault Summary Application may be invoked by EHS workstation users or by remote users (via a web browser) by selecting **Fault Summary** from the **Operations** menu of either the EHS or EHS Web **Launchpad**. The Fault Summary Application main window contains several distinct features that will be discussed in this chapter (see Figure 13-1 , Fault Summary Application main window.):

- Menu Bar
- Status Bar
- Work Area

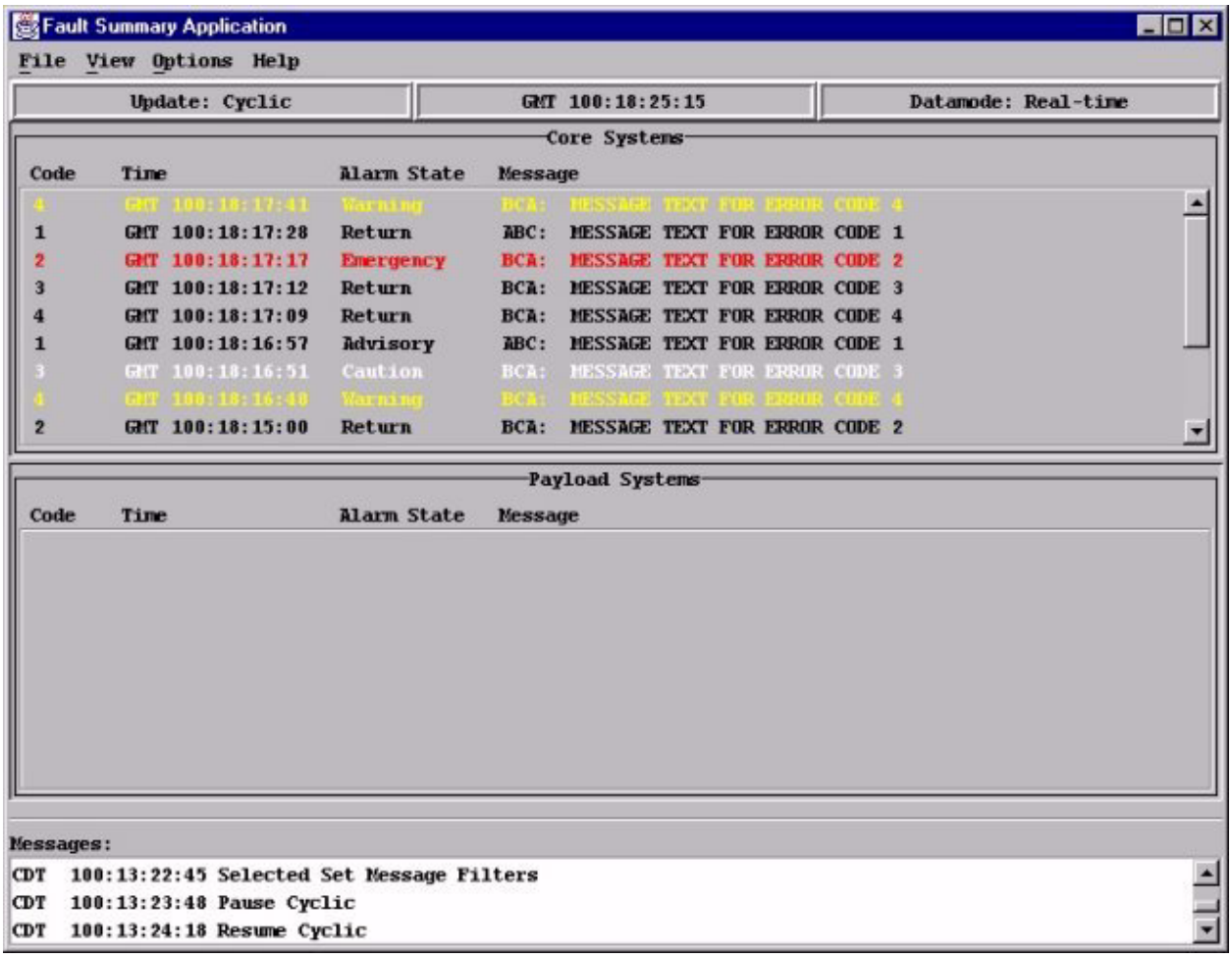


Figure 13-1, Fault Summary Application main window.

13.2.1 Menu Bar

The menu bar includes **File**, **View**, **Options**, and **Help** menu items. The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. Options listed in the **File**, **View** and **Help** menus are Common User Interface screens and will not be discussed (see Figure 13-2 , File and View cascade menus.). Descriptions of the **Options** menu items and the dialog boxes they invoke will be presented in later sections.

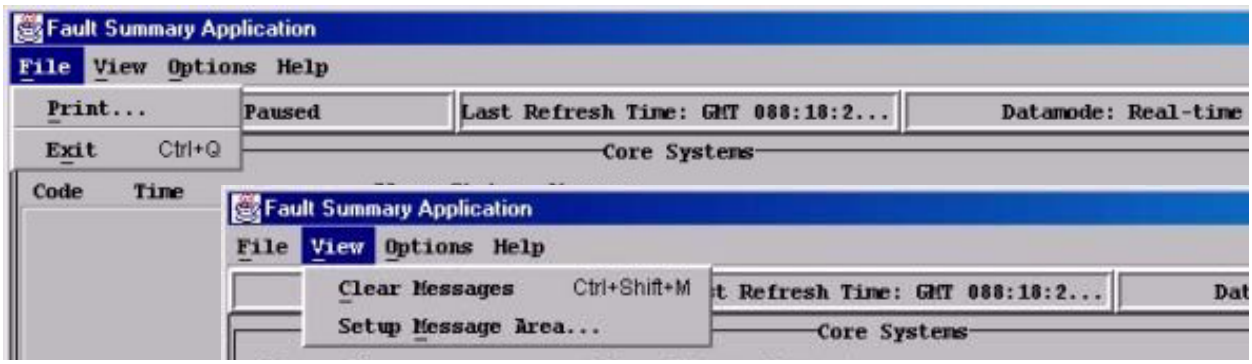


Figure 13-2, File and View cascade menus.

13.2.2 Status Bar

The Status Bar contains three fields of status information:

- **Update:**
- Time
- **Data Mode:**

The **Update:** display only field indicates the current update state of the Fault Summary Application. Possible entries for this field are **Cyclic** and **Paused**.

The center panel of the Status Bar indicates the time in GMT Format of DDD:HH:MM:SS. This time may represent either the current GMT or the Last Refresh Time depending on whether the application is cycling (updating) or not.

The **Data Mode:** field contains the data mode under which ECWA messages are currently being recieved. The data mode defaults to Real-time when the application is initially invoked. Possible entries for this field are:

- **Real-time**
- **Dump**
- **Playback**
- **Merge**

13.2.3 Work Area

The work area consists of two, resizable frames labeled Core Systems and Payload Systems which will contain the separate, time ordered message queues. The messages contained in the message queues are displayed with the most recent message at the top. Both Core Systems and Payload Systems message queues can contain up to 60 messages, however, the FSA main window defaults to frame heights of 10 messages when initialized.

The time ordered message queue displays the following data for each event in time sequential order:

- Event **Code**
- Event **Time**
- Event **Alarm State**
- Event **Message**

The **Code** portion of the message contains the event code representing the caution and warning event that occurred.

The inception of the ECWA event is signified by the **Time** segment of the message. Time is displayed in a GMT format of YYYY:DDD:HH:MM:SS.

The **Alarm State** is the ISS classification of the ECWA event where:

- Emergency (Class 1 event) - Any condition that threatens the life of the crew or Station and requires immediate action. Three specific conditions define the emergency class;
  - Fire/Smoke
  - Rapid Change in cabin Pressure
  - Toxic Atmosphere
- Warning (Class 2 event) - Any event that requires immediate correction to avoid loss of or major impact to the Station or potential loss of crew.
- Caution (Class 3 event) - Any event that is not time critical in nature but further degradation has the potential to threaten the loss of crew, or the loss of redundant equipment such that subsequent failure could result in a warning condition.

In addition there are two advisory events:

- Advisory - A non Caution and Warning message which provides information about systems status and processes.
- Robotics Advisory - An event which provides information about Robotics Workstation status and Processes.

The event **Message** is the actual message text associated with the event code which should be reported or displayed against the particular ECWA event.

The message queues also color code the messages based on the Alarm State as follows:

- Emergency - red
- Warning - yellow
- Caution - white

13.3 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to FSA. All the menu items presented by the **Options** menus (see Figure 13-3 , Options cascade menu.) will be discussed.

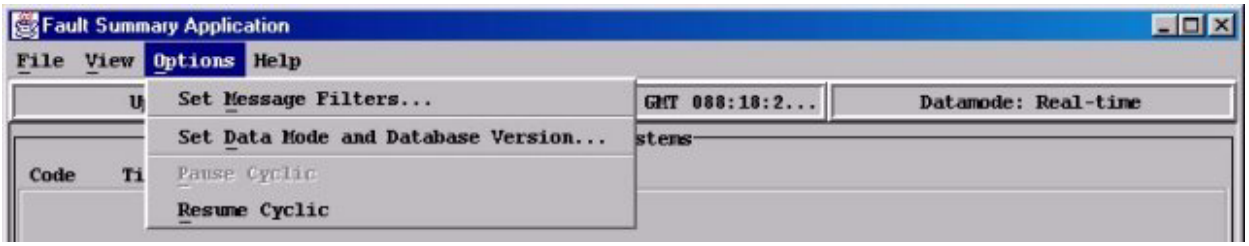


Figure 13-3, Options cascade menu.

13.3.1 Set Message Filters...

The Set Message Filters... menu item invokes the **Set Message Filters** dialog box, which allows you to specify message filtering. The **Set Message Filters** dialog box provides a message filtering capability to the user (see Figure 13-4 , Set Message Filters dialog box.). The dialog box consists of a **Core System Message Filter** frame, a **Payload System Message Filter** frame, and Filter Duplicate Messages: radio buttons.

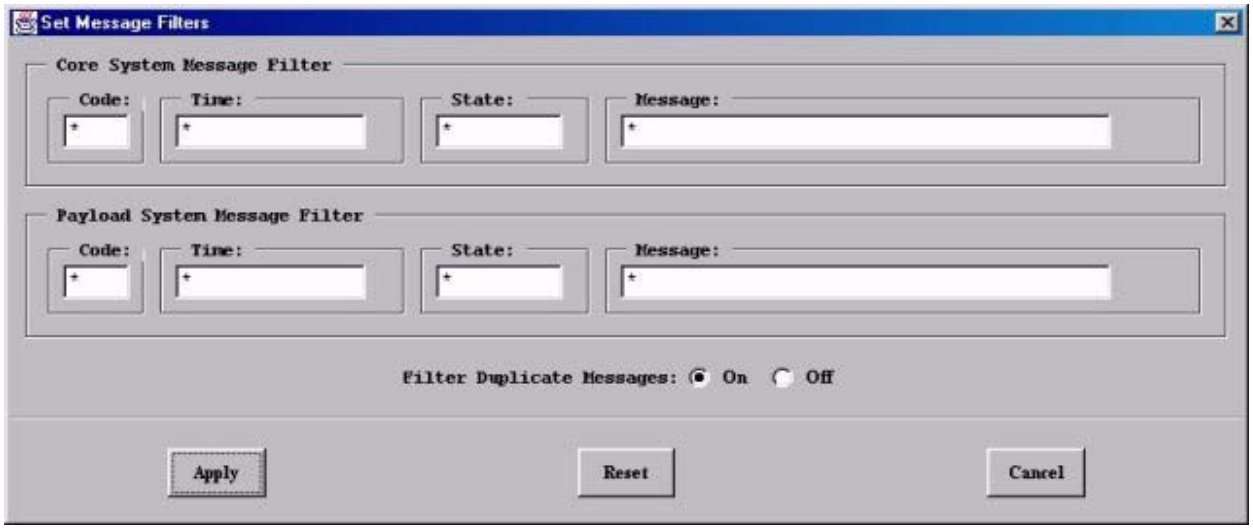


Figure 13-4, Set Message Filters dialog box.

Both filter frames provide for the selection of filtering in the following categories:

- **Code:**

- **Time:**
- **State:**
- **Message:**

The **Filter Duplicate Messages:** radio buttons provide a selection (On/OFF) of whether duplicate messages will be displayed in the Fault Summary Application main window.

Selecting Apply applies any filter criteria specified by the Set Message Filter dialog box to the messages displayed in the Fault Summary Application main window, closes the dialog box and returns the user to the Fault Summary Application main window.

Clicking Reset restores the wildcard (*) default to each filter option and sets the Filter Duplicate Messages to On (the default).

Clicking Cancel abandons any criteria selections that may have been made and returns the user to the Fault Summary Application main window.

13.3.2 Set Data Mode and Database Version...

The Set Data Mode and Database Version... menu item invokes the **Set Data Mode and Database Version** dialog box which allows you to select the data mode in which the Fault Summary Application operates (see Figure 13-5 , Set Data Mode and Database Version dialog box.).

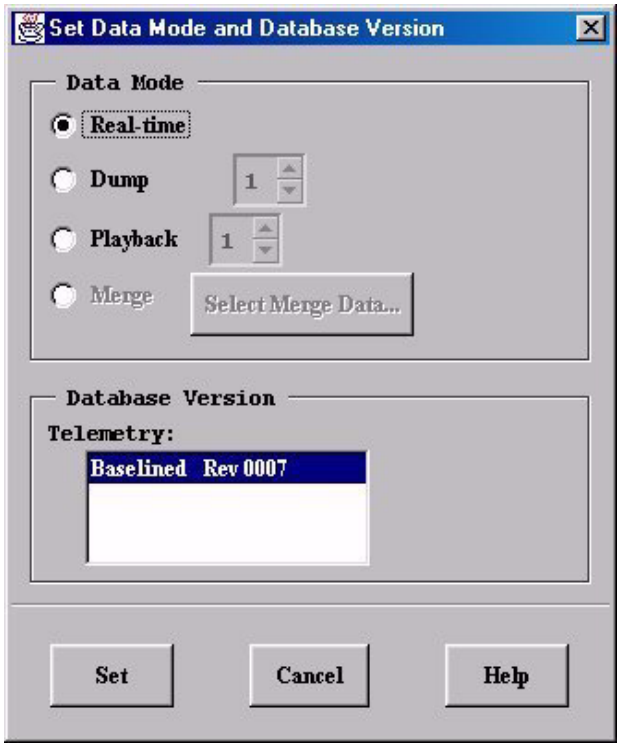


Figure 13-5, Set Data Mode and Database Version dialog box.

Note: In order to view messages from different data modes (Real-time, Dump, Playback or Merged), the user is required to start another FSA for each additional data mode of interest.

The **Data Mode** frame contains radio buttons that allow you to select a data mode by clicking the appropriate button.

If you select **Dump** for the data mode, you must choose between the three available dump data modes:

- Dump Mode 1 - S-Band Zone of Exclusion (ZOE)
- Dump Mode 2 - Ku-Band Communication Outage Recorder (COR)
- Dump Mode 3 - Ku-Band ZOE

If you select **Playback** for the data mode, you will need to also specify the playback channel (1-11).

If you select the **Merge** data mode, you will have to specify an Embedded Start Time and an Embedded Stop Time which will be used to make a NRT Data Request for merged dump data. **Merge** mode requires the user to select the data modes (at least two) that need to be merged.

Selection of the **Merge** radiobutton makes the

sensitive. Clicking

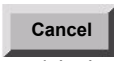
invokes the **Select Merge Data** dialog box which facillitates selection of the time interval and data modes.

Note: The ECWA messages obtained for the Merge data mode will be requested from NRT Log Files of the Fault Summary Mission Computation pseudo packets. The user must insure that message packets sent by the Fault Summary Mission Computation are logged to NRT allowing the merge to be performed.

The **Database Version** frame contains the Telemetry: database selection list. You can select a database version from this selection list. The Telemetry: database selection list contains three versions: Baselined, Archived, and Pre-Release. Baselined is the default.

Clicking

, sets the data mode and database version to those specified in the dialog box and returns you to the application main window. This is the default pushbutton after the data mode is selected.

Selecting the 

aborts all changes made to the dialog box and returns you to the application main window. This is the default pushbutton before the data mode is selected.

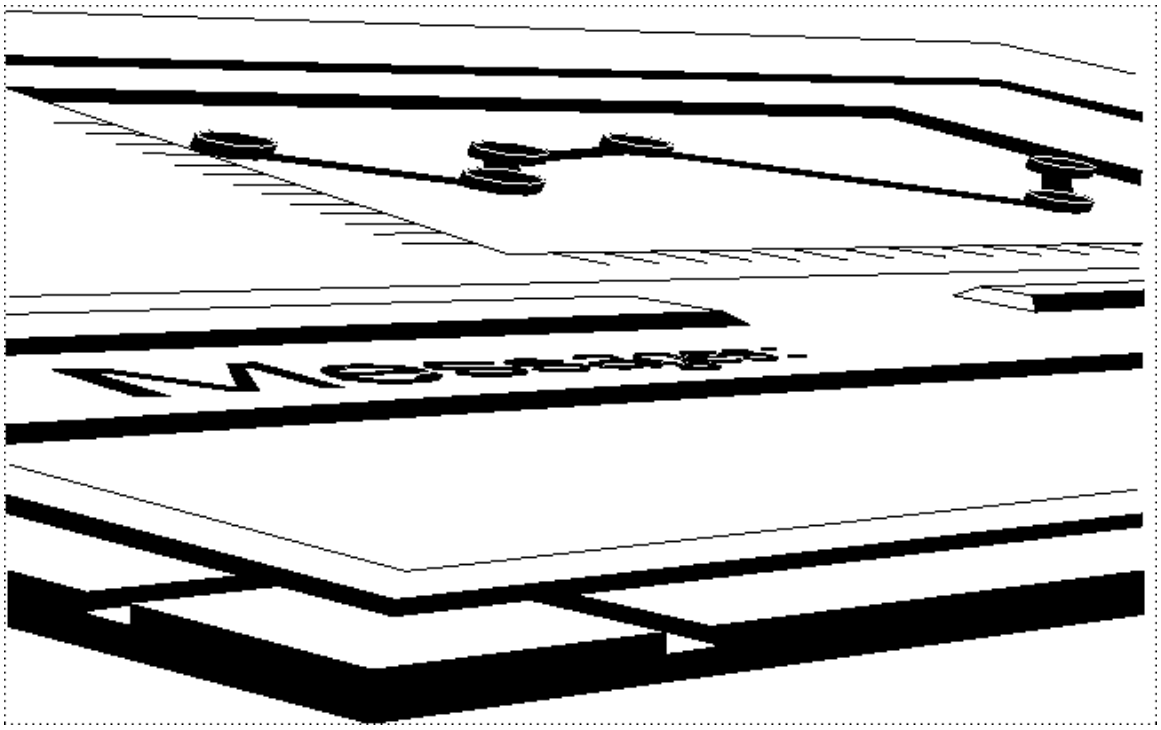
13.3.3 Pause Cyclic

Selecting the **Pause Cyclic** menu item stops the updating of Core and Payload Systems ECWA messages. When the application is paused, the time displayed in the center panel of the Status Bar

will display Last Refresh Time: GMT DDD:HH:MM:SS. This menu option will only be sensitive when the application is in the cyclic mode of operation.

13.3.4 Resume Cyclic

Selecting the **Resume Cyclic** menu item resumes the updating of Core and Payload Systems ECWA messages.While the application is cycling, the time displayed in the center panel of the Status Bar will be the current GMT in a DDD:HH:MM:SS format. This menu option will only be sensitive when the application is paused.



Chapter 14:
Ground Support Equipment (GSE) Packets Software

14.1 Overview

The Ground Support Equipment (GSE) Packet application provides for the packetizing and formatting of telemetry data that is sent to ground support equipment. In order to have Ground Support Equipment (GSE) data routed and displayed on your remote PC you must first have an assigned APID (packet). APIDs are assigned through the HOSC Account Request Form (HARF). You can verify that you have an APID (packet) assigned to you through the Telemetry Database application's Packet Assignment form.

Help: For complete information concerning the GSE Packet Assignment form see Chapter 17, EHS Databases, Section 17.4.21 GSE Packet Assignment Form.

Second, you must define the contents of your GSE packet. You define the contents of your GSE packet through the Payload Data Library (PDL) for Configuration Controlled GSE packets or through the Telemetry Database application for Non-Configuration Controlled GSE form.

Help: For further information concerning configuration controlled or non-configuration controlled GSE packets see Chapter 17, EHS Databases; Section 17.4.20 Configuration Controlled GSE Form or Section 17.4.19 Non-Configuration Controlled GSE Form.

For remote users to access the EHS Telemetry Database application they must x-window into their assigned EHS workstation using F-Secure Shell and Hummingbird Exceed. Once you initiate the EHS Telemetry Database application's Non-Configuration Controlled GSE form, you can define your assigned APID's contents.

Help: For a description of x-window login requirements and access procedures see Appendix B: Remote Access to EHS Services.

Once you've created and saved a GSE packet definition, it is stored on the database server at the HOSC. You can request an ASCII text file containing the packet definition by using one of the extract functions (**Extract Current Format** and **Extract All Formats**) available from the **Options** menu of the **Non-Configuration Controlled GSE** form. The ASCII definition (extract file) provides information necessary for you to appropriately decommutate data packets sent to your GSE. You must then contact (via phone) the HOSC Support Desk (256-544-5066) and arrange to have the definition sent to you via email or placed in the doc (Word Processing) directory on your assigned EHS platform. If you are a remote user and the ASCII definition is placed in the Word Processing directory, you can use x-windows to access the File Transfer application and ftp the file back to your PC.

The flow of data may be started from either an EHS Launchpad or to your remote PC (by accessing the EHS web launchpad) and initiating the **GSE Packets** application under the **Operation** menu. The GSE Packets application provides you with the tools needed to start data flowing for your defined packet formats in the specified data modes. To view the data being routed to your EHS workstation or remote PC, click on the **Management** menu from the applicable Launchpad. Select **Diagnostics** and then **GSE Display**. The GSE Display application shows you the data being received for the selected packet (format and data mode).

14.2 GSE Packets

The GSE Packets application is available from either an EHS Launchpad or the EHS Web Launchpad and allows you to start data flowing for your defined packet formats in the specified data modes on either an EHS workstation or your remote PC.

The GSE Packets application is used to activate predefined GSE packets. GSE packets can be defined using the Telemetry Database application's Non-Configuration Controlled GSE function or they can be defined within a delivered telemetry database (in which case they are called Configuration Controlled GSE packets).

Activated GSE packets can be sent to user-specified ground systems in realtime, playback or dump mode. Once a packet is activated, telemetry is acquired to build the packet and then the packet is transmitted to the specified equipment at the rate configured by the user. Telemetry continues to

be acquired, packets built and transmitted until the user deactivates the packet or the packet times out.

The Ground Support Equipment main window contains two distinct features that will be discussed in this chapter (see Figure 14-1, Ground Support Equipment main window):

- Menu Bar
- Work Area

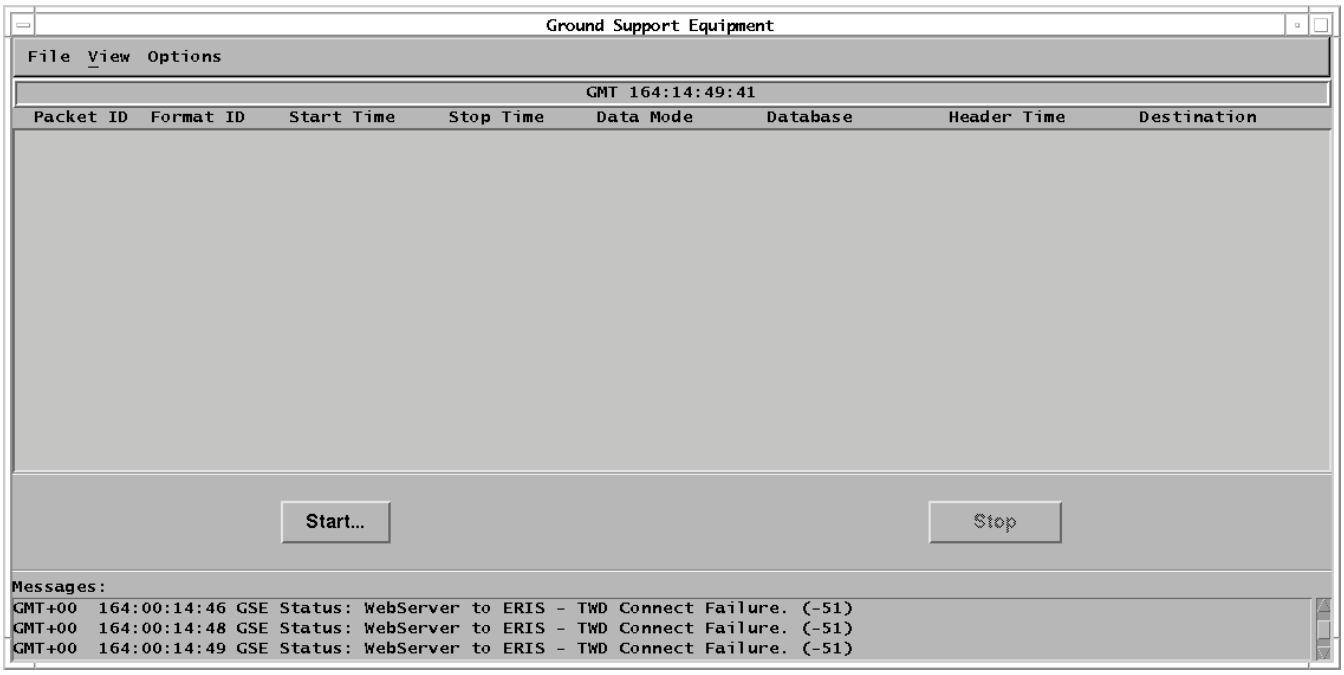


Figure 14-1, Ground Support Equipment main window.

14.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes three menus: **File**, **View**, and **Options**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are the **Start...** menu item from the **Options** menu.

14.2.2 Work Area

The work area of the Ground Support Equipment main window is initially empty. Once a packet has been started information regarding each packet is displayed in the eight columns

The columns in the work area are listed below.

- **Packet ID**
- **Format ID**
- **Start Time**
- **Stop Time**
- **Data Mode**
- **Database**
- **Header Time**
- **Destination**

The **Packet ID** is the APID or packet ID which was assigned to you through the HOSC Account Request Form (HARF) and which was either defined via PDL (for Configuration Controlled GSE Packets) or by (for) you using the Telemetry Database application's Non-Configuration Controlled GSE packet application.

The **Format ID** is a user assigned format identifier. You can have up to eight different formats (packet definitions) for each APID or Packet ID assigned to you. Formats are numbered 0-7 and may contain any combination of parameters.

The **Start Time** represents the time (GMT) when data for the packet was started.

The **Stop Time** field is calculated based on the user-defined Stop Time specified through the Start packet dialog box. It is the **Start Time** as defined above plus the Stop Time value provided through the Start packet dialog box.

The **Data Mode** identifies whether the started packet is returning Realtime, Dump, or Playback data.

The **Database** entry identifies the telemetry database against which the started packet was created.

The **Header Time** identifies the time (GMT) embedded in the packet's header.

The **Destination** identifies where the packet is being routed to, it includes the IP address and the port being used.

Together, the Packet ID, Format, Datamode, and Database uniquely identify a GSE Packet.

14.2.3 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the Ground Support Equipment Packets application. The **Start...** menu item from the **Options** menu will be discussed (see Figure 14-2, GSE Packets Options menu).

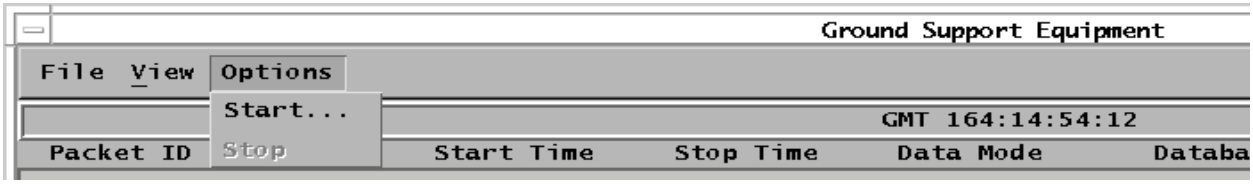


Figure 14-2, GSE Packets Options menu.

14.2.3.1 Start...

When selecting **Start...** from the **Options** menu or selecting Start from the control panel, the Start dialog box (see Figure 14-3, Start dialog box) is invoked. The Start dialog box is used to start data flowing for defined GSE packets. Once the data has been started, it will be reflected on the GSE Packets main window.

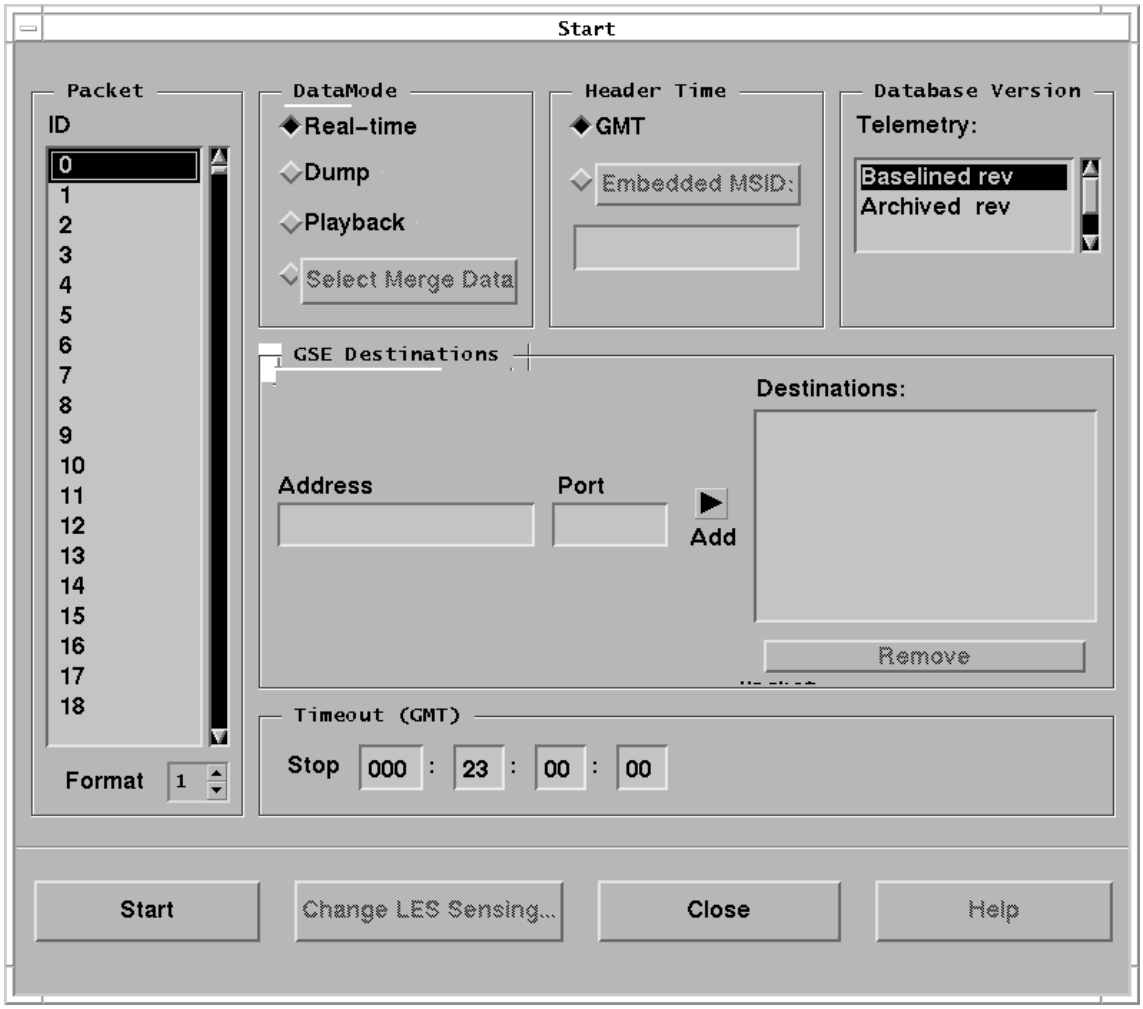


Figure 14-3, Start dialog box.

The **Start** dialog box consists of a buttons area and 6 frames labeled as follows:

- **Packet**
- **DataMode**
- **Header Time**
- **Database Version**
- **GSE Destinations**
- **Timeout (GMT)**

Together, the APID, format, datamode, and database version uniquely identify a packet. You can start multiple packets, but each must be unique (have a different value in at least one of the above fields) and must be started seperately. In the **Packet** frame you select the APID (packet) that was assigned to you and which you defined (either through the Payload Data Library or the Telemetry Database application). Once you've selected the APID, you must select the Format (0-7).

Note: The GSE Packet ID list is pulled from the Telemetry Database and will only display those packets associated with your User ID.

In the **DataMode** frame you select the data mode for which you would like to receive data. Options available are Real-time, Dump (1-3), Playback (channels 1-11) and Select Merge Data. Playback channels 1-6 are reserved for standard playback services. Clicking Select Merge Data invokes the **Select Merge Data** dialog box which allows the user to obtain Merge Dump data from NRT based on user specifications.

Help: For information concerning the Select Merge Data dialog box see Section 14.2.3.1.1 Select Merge Data.

Help: For information regarding the relationship between data paths/sources and data modes see Appendix AI: EHS Data Modes.

In the **Header Time** frame you identify whether you want the data to be tagged with the receipt GMT or if you want it to be tagged with time provided by an MSID embedded within the packet (to be delivered in Build 5.0). If you elect to have the data tagged with time as provided by an MSID, you must identify that MSID. The EmbeddedMSID: (is grayed out until Build 5.0) invokes a list of time-type MSIDs from which you can select one.

The **Database Version** frame allows you to identify the valid telemetry database against which your packet was defined.

In the **GSE Destinations** frame you identify the TCP/IP address to which you want the specified data sent. In addition, you must provide a free local port number for the data to be sent to. Clicking adds the designated platform to a list of those being routed the data. You can select multiple IP addresses to which to send the data.

Note: If no destination is selected the packet will automatically be PDSS routed. When a destination is selected by the user, that packet is considered User Routed

Note: PDSS routed GSE packets are limited to 16384 bytes of data. User routed GSE packets are limited to 61438

In the **Timeout (GMT) Stop** text field you identify when you want to stop the flow of data for your packet. The default is to stop the flow of data after 23 hours (000:23:00:00). Packets would flow indefinitely if not manually stopped by the user or set to stop by the Timeout Function.

Clicking

starts the GSE packet using the information you provided on this dialog box.

Clicking

invokes the **Change LES** dialog box.

Help: For information concerning the Change LES Sensing dialog box see Section 14.2.3.1.2 Change LES Sensing...

14.2.3.1.1 Select Merge Data

Merge Dump data allows GSE packets to be built using merged data from NRT. The **Select Merge Data** dialog box (see Figure 14-4, Select Merge Data dialog box) is used to specify the Start and Stop times for the NRT request and the Execution and Interval times to control packet processing.

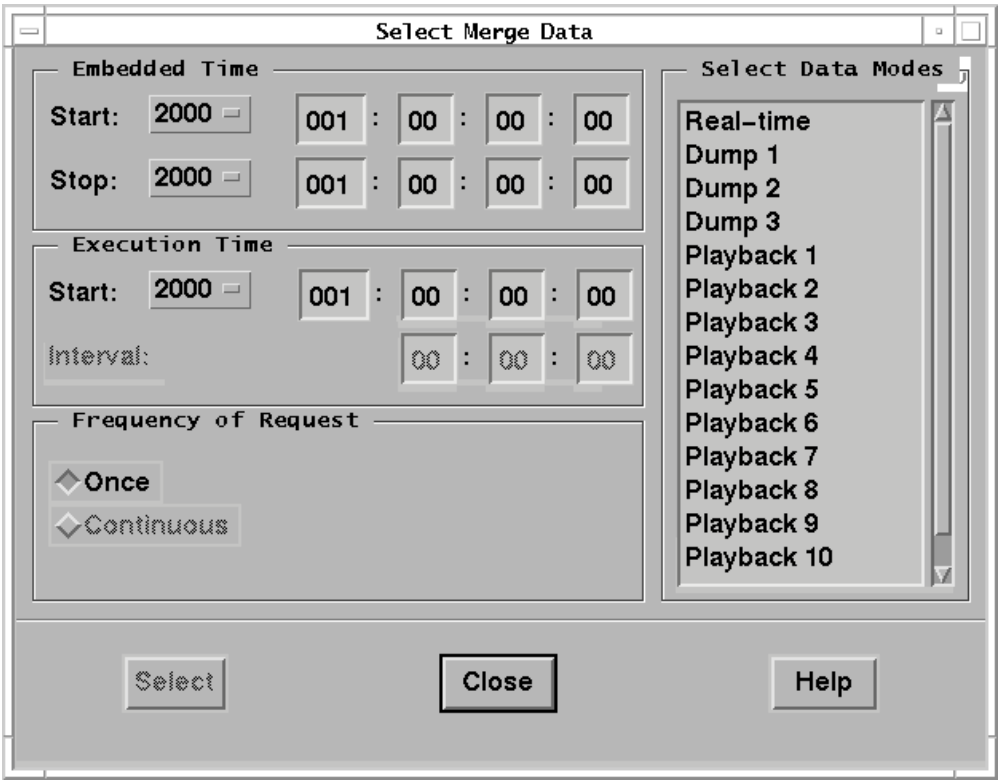


Figure 14-4, Select Merge Data dialog box.

Help: See the Glossary for a definition of Merged Data.

The Select Merge Data dialog box contains four frames:

- **Embedded Time**
- **Execution Time**
- **Frequency of Request**
- **Select Data Modes**

The **Embedded Time Frame** contains text entry fields for the **Start:** and **Stop:** times defining the data slice for the NRT Data Request. The GSE Packet application processes all data available from this request at the native data rate.

The **Execution Time** frame contains text entry fields for **Start:** Execution Time and the Execution **Interval:**.

The first (or only) NRT Data Request will not begin until the **Start:** Execution Time has occurred. This time is expressed in GMT format of YYYY:DDD:HH:MM:SS.

Subsequent (if requested) NRT request cycles begin at a rate specified by the Execution Time **Interval:** and will use calculated New Start and New Stop times. New Start and Stop times are calculated as follows:

- New Start Time = Stop Time + one second
- New Stop Time = (Stop Time - Start Time) + New Start Time

The **Frequency of Request** frame contains two radio buttons labeled **Once** and **Continuous**. If **Once** is selected, the **Execution Time Interval** text fields become grayed out. If **Continuous** is selected, the **Execution Time Interval** text fields become sensitive.

The **Select Data Modes** frame contains a list of all currently available data modes. The selection policy of the Data Modes list is multi-select. Zero or more rows may be selected at any one time. However, two or more rows must be selected in order for the Select to become sensitive.

14.2.3.1.2 Change LES Sensing...

The **Change LES Sensing** dialog box allows the user to enable/disable LES Sensing for selected MSIDs in the currently selected GSE packet (see Figure 14-5, Change LES Sensing dialog box). The dialog box consists of a list that is organized by five columns labeled:

- **MSID**
- **Processing**
- **Data Type**
- **LES Sensing**
- **Technical Name**

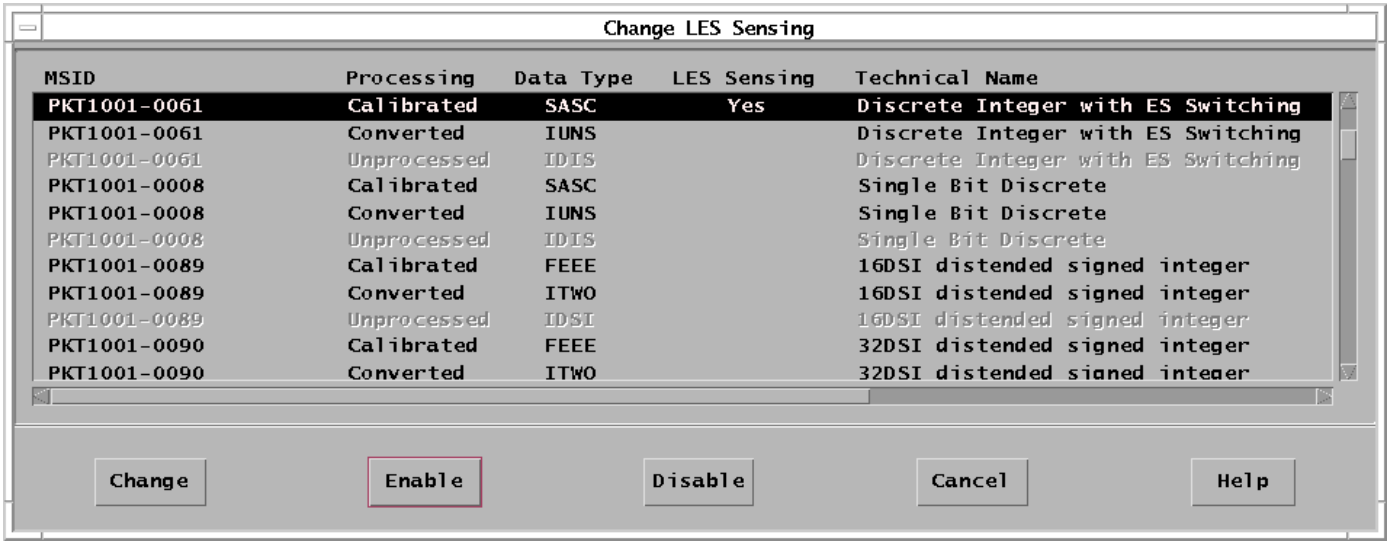


Figure 14-5, Change LES Sensing dialog box.

The **MSID** column lists all MSIDs in the currently selected packet. MSIDs that can not be limit sensed (e.g., string or time types) cannot be selected.

The **Processing** column indicates whether the MSID will be calibrated, converted, or unprocessed.

Help: See the Glossary for an explanation of calibrated, converted or unprocessed.

The **Data Type** column contains the data type code. This code identifies how data defined as this type will be interpreted in the HOSC.

Help: See MSFC HOSC Database Definitions (MSFC-DOC-1949) "Appendix G" for additional information regarding the data types supported by MSFC HOSC telemetry processing.

The **LES Sensing** column indicates if LES Sensing is enabled or disabled for the listed MSIDs. The default entry in this column is a blank indicating that LES Sensing is disabled.

The **Technical Name** column contains the technical names of the listed MSIDs.

Note: The selection policy of the MSID list is multiple select. Zero or more rows may be selected at any one time.

Clicking the Change saves the information contained in the list to the local copy of the currently selected GSE packet and closes the dialog box. This pushbutton will be grayed out until one or more MSIDs are selected.

Clicking the Enable sets the LES Sensing value of all selected MSIDs to Yes indicating that LES Sensing is desired for the selected MSIDs. This pushbutton will be grayed out until one or more MSIDs are selected.

Clicking the Disable sets the LES Sensing value of all selected MSIDs to a blank indicating that LES Sensing is not desired for the selected MSIDs. This pushbutton will be grayed out until one or more MSIDs are selected.

14.3 GSE Display Overview

The GSE Display application is available on either an EHS Launchpad or the EHS Web Launchpad from the Management menu and allows you to display EHS-processed data on either an EHS workstation or your remote PC. The GSE Display application is viable only after starting a GSE packet

The GSE Packets application is used to activate predefined GSE packets. GSE packets can be defined using the Telemetry Database application's Non-Configuration Controlled GSE function or they can be defined within a delivered telemetry database (in which case they are called Configuration Controlled GSE packets).

Activated GSE packets can be sent to user-specified ground systems in realtime, playback or dump mode. Once a packet is activated, telemetry is acquired to build the packet and then the packet is transmitted to the specified equipment at the rate configured by the user. Telemetry continues to be acquired, packets built and transmitted until the user deactivates the packet or the packet times out.

The GSE Display application allows you to view GSE packets being sent to your PC. It is initially invoked blank. To view a packet's data you must identify the specific packet whose contents you want to view by invoking the **Packet Retrieval Parameters** dialog box, available from the **Define** menu.

The Ground Support Equipment main window contains three distinct features that will be discussed in this chapter (see Figure 14-6, GSE Display main window):

- Menu Bar
- Status Bar
- Work Area

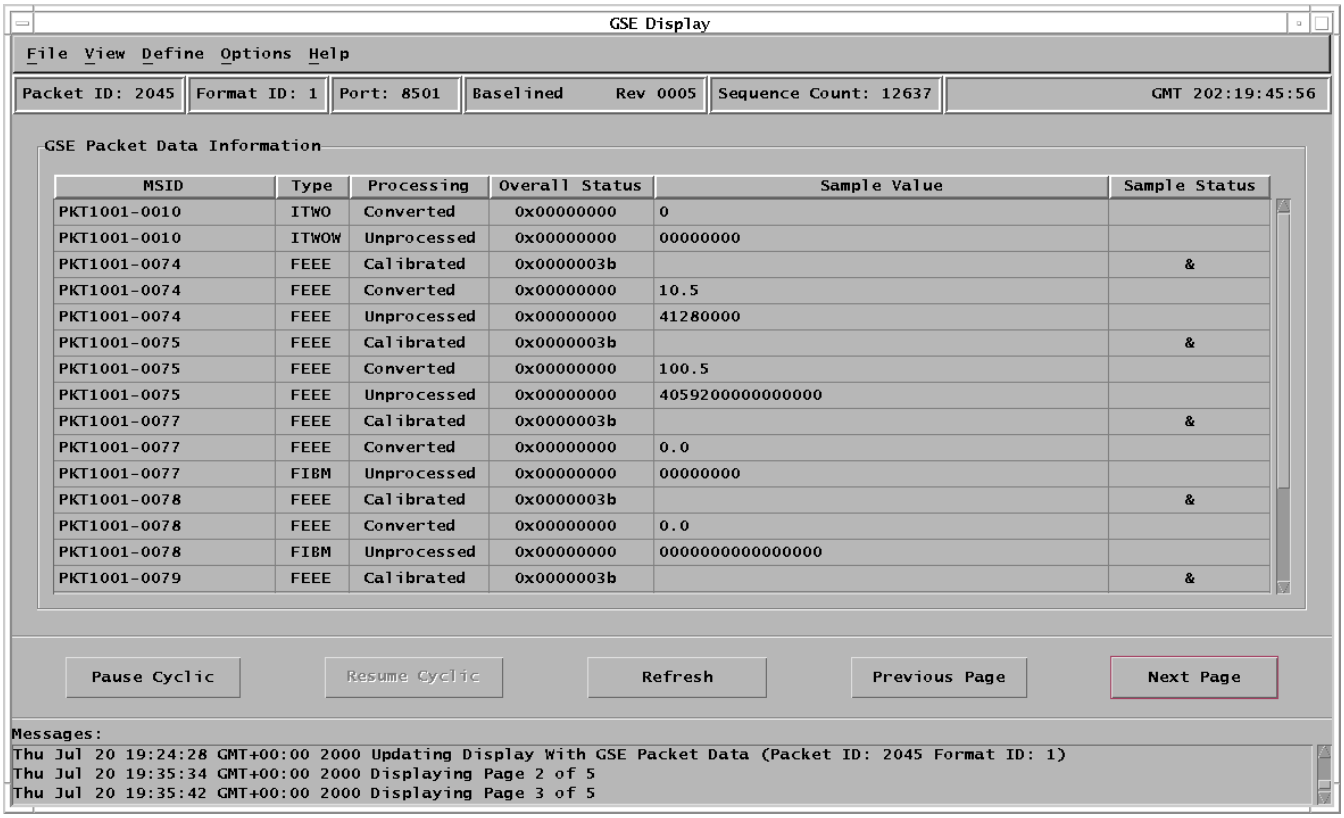


Figure 14-6, GSE Display main window.

14.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Define**, **Options,** and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are the **Set Packet Retrieval Parameters...** menu item from the **Define** menu and the **Show GSE Packet Definition...** and **View Stream...** options from the **Options** menu.

14.3.2 Status Bar

The status bar displays six data fields of information regarding the current packet that you are viewing:

- **Packet ID:**
- **Format ID:**
- **Port:**

- Database Version
- **Sequence Count:**
- **GMT**

Note: In order to populate the fields of the status bar you must have started a GSE packet and you must have identifed through the **Packet Retrieval Parameters** dialog box the packet whose data you wish to view. Together, the Packet ID, Format, Datamode, and Database uniquely identify a GSE Packet.

The **Packet ID:** field displays the packet ID currently being viewed. This is the APID or packet ID which was assigned to you through the HOSC Account Request Form (HARF) and which was either defined via PDL (for Configuration Controlled GSE Packets) or by (for) you using the Telemetry Database application's Non-Configuration Controlled GSE packet application.

The **Format ID:** field displays the format for the packet being viewed. You can have up to eight different formats (packet definitions) for each APID or Packet ID assigned to you. Formats are numbered 0-7.

The **Port:** field displays the port (on your PC) through which GSE packets are being routed. This value is the same as that identified through the GSE Packets application.

The Database Version field identifies the database state (archived, baselined, pre-released) and version number for the packet whose data you are flowing.

The **Sequence Count:** field displays the current packet counter value. It will increment sequentially as new packets are received.

The **GMT** field identifies the current GMT.

14.3.3 Work Area

Once you've identified the GSE Packet that you would like to see (through the Packet Retrieval Parameters dialog box) the GSE Packet Data Information table will be populated. This table has six columns:

- **MSID**
- **Type**
- **Processing**
- **Overall Status**
- **Sample Value**
- **Sample Status**

The **MSID** column lists the measurements included in the identified packet.

The **Type** column lists the data type associated with the MSID. With information is pulled from the applicable telemetry database.

Help: See MSFC HOSC Telemetry Format Standard (MSFC-STD-1274B) "Appendix B" for a complete listing and definition of the data types supported by MSFC HOSC telemetry processing.

The **Processing** column will display **Unprocessed**, **Converted**, or **Calibrated** depending on how the selected packet was defined.

The **Overall Status** column provides a code which can be associated with specific problems regarding the data returned for an MSID. When sample data are retrieved by POIC, an overall status value is used to reflect any errors the POIC may have encountered obtaining all of the data samples.

Help: For a list of GSE Display Overall Status codes and definitions see Appendix AJ: GSE Display Overall Status Codes.

The **Sample Value** column displays the returned value for each listed MSID.

The **Sample Status** column displays a single character identifying the status of returned MSID values. The character displayed is derived by examining the overall status value and the sample value. A status character other than ' ' (OK) indicates that an error occurred obtaining the data sample.

Help: For a list of GSE Display Sample Status codes and definitions see Appendix AK: GSE Display Status Characters.

14.3.4 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the GSE Display application. The **Set Packet Retrieval Parameters...** menu item from the **Define** menu and the **Show GSE Packet Definition...** and **View Stream...** options from the **Options** menu will be discussed (see Figure 14-7, Define and Options menus).

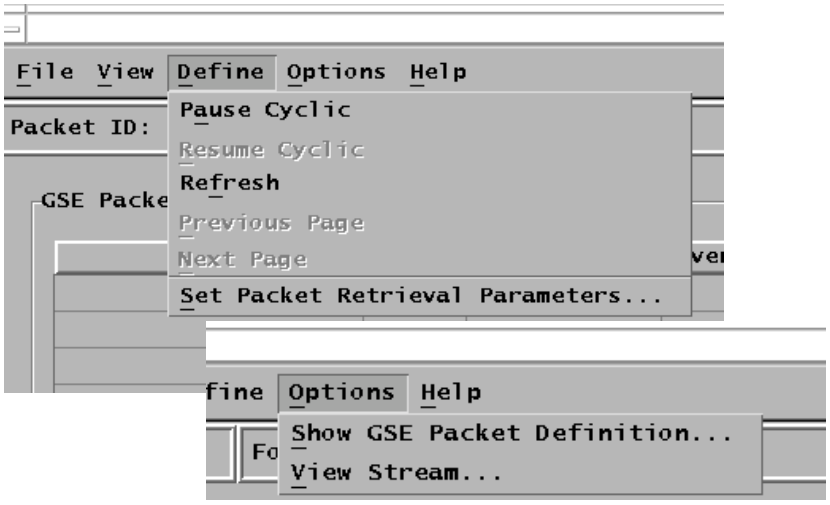


Figure 14-7, Define and Options menus.

14.3.4.1 Set Packet Retrieval Parameters...

The **Set Packet Retrieval Parameters** menu item invokes the Packet Retrieval Parameters dialog box (see Figure 14-8, Packet Retrieval Parameters dialog box). The GSE Display application's Packet Retrieval Parameters dialog box is used to identify a started GSE packet whose data you would like to see.

Together, an APID, format, datamode, and database version uniquely identify a packet. You can start multiple packets through the GSE Packets application, but each must be unique (have a different value in at least one of the above fields) and must be started seperately.

Once started, the GSE Display application is used to identify the unique packet whose data you would like to view. The Packet Retrieval Parameters dialog box consists of a **Packet ID:**, **Telemetry Database Version:**, and **Format ID:** selection lists. In addition, this dialog box includes a **Port:** text entry field.

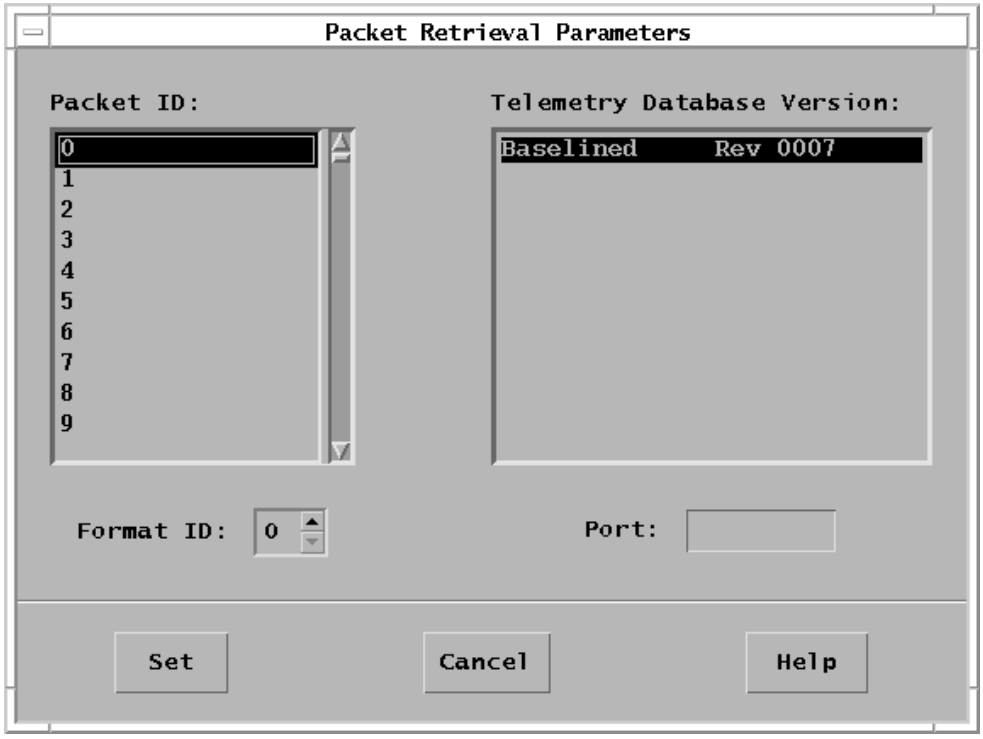


Figure 14-8, Packet Retrieval Parameters dialog box.

The **Packet ID:** selection list is where you identify an APID (which you have already started through the GSE Packets application) whose data you would like to see.

The **Telemetry Database Version:** selection list is used to identify the telemetry database against which the APID's parameter definitions apply.

The **Format ID:** selection list ranges from 0-7 and identifies the specific APID format you would like to see.

The **Port:** text entry field is where you identify the port on your PC through which the data you wish to see is being received.

14.3.4.2 Show GSE Packet Definition...

The **Show GSE Packet Definition** menu item invokes the **View GSE Packet Definition** dialog box which is used to display the definition of a GSE packet currently being viewed, as contained within the telemetry database.

The View GSE Packet Definition dialog box is static. The main window includes display text fields identifying the:

- **Packet ID:**
- **Format ID:**

- **Packet Length:**
- **Output Rate:**

The main window includes a table with eight columns identifying the:

- **MSID**
- **Position Number**
- **Start Octet**
- **Sample Flag**
- **Processing Flag**
- **Build Data Type**
- **Build Rate**
- **Build Length**

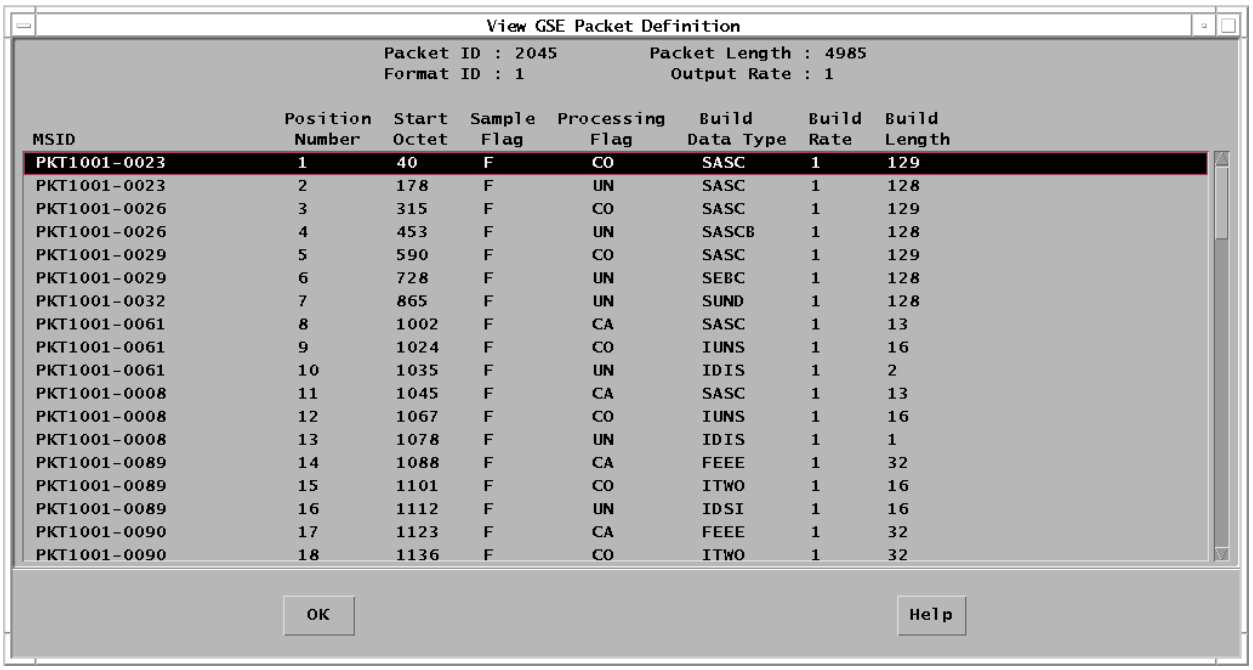


Figure 14-9, View GSE Packet Definition dialog box.

The **Packet ID:** text field identifies the APID whose contents you are currently viewing.

The **Format ID:** text field displays the format of the APID you are currently viewing. You can have up to seven different packet formats (values 0-6) for the same APID.

The **Packet Length:** text field displays the length of the entire packet in bytes. It is calculated by the system during the packet creation process and is based on the MSIDs, their length, etc.

The **Output Rate:** text field displays in seconds how often the packet being viewed is to be transmitted by the EHS system. For example, a "1" in this field indicates that the packet will be transmitted every second.

The **MSID** column displays the MSIDs currently included in the displayed packet.

The **Position Number** column identifies the sequential position of each MSID within the displayed packet.

The **Start Octet** column displays the starting octet for the first sample of each MSID in the displayed GSE packet. Starting octet entries are calculated by the system automatically during the GSE packet definition process once the MSID, Sample Flag, and Processing Flag entries are completed.

The **Sample Flag** column displays either an **A** or an **F** to indicate whether **A**ll samples in a packet or just the **F**irst data sample received per packet at the HOSC are being routed and displayed.

The **Processing Flag** column is a two character field that identifies how the data received for each MSID is to be displayed. Processing options can be verified through the Telemetry Database application. Valid entries in this column are:

- **UN** - Unprocessed
- **CO** - Converted
- **CA** - Calibrated

Help: Definitions are available in the **Glossary** for: unprocessed, converted, and calibrated data (polynomial coefficient, point pair, and state code).

The **Build Data Type** column displays the data type of each MSID included in the GSE packet.

Help: See MSFC HOSC Telemetry Format Standard (MSFC-STD-1274B, Volume 1, Time Division Multiplexed (TDM) Data) Appendix B: Data Types for definitions of each data type.

The **Build Rate** column displays the maximum sample rate for each MSID from the currently selected database.

The **Build Length** column displays the total length of each displayed MSID when built from the specified database. Entries in this column are calculated by the system automatically when the packet is defined and are based on the MSID, Sample Flag, and Processing Flag entries.

14.3.4.3 View Stream...

The **View Stream...** menu item invokes the **View Stream** dialog box which provides detailed information on the GSE Packet that is currently flowing, allowing the user to view the contents of the packet (see Figure 14-10, View Stream dialog box).

The View Stream dialog box is static except for the Stream Offset (in bytes) text entry field. It includes the main window and a buttons area. The main window is comprised of five major sections:

- **Primary EHS Protocol Header**
- **GSE Secondary Protocol Header**
- **CCSDS Primary Protocol Header**
- **GSE Secondary CCSDS Protocol Header**
- **Hex Data**
- **Stream Offset (in bytes)**

Valid entries in the main window are defined in the POIC to Generic User Interface Definition Document (PGUID) Chapter 8 and are extracted and correlated to the View Stream dialog box below.

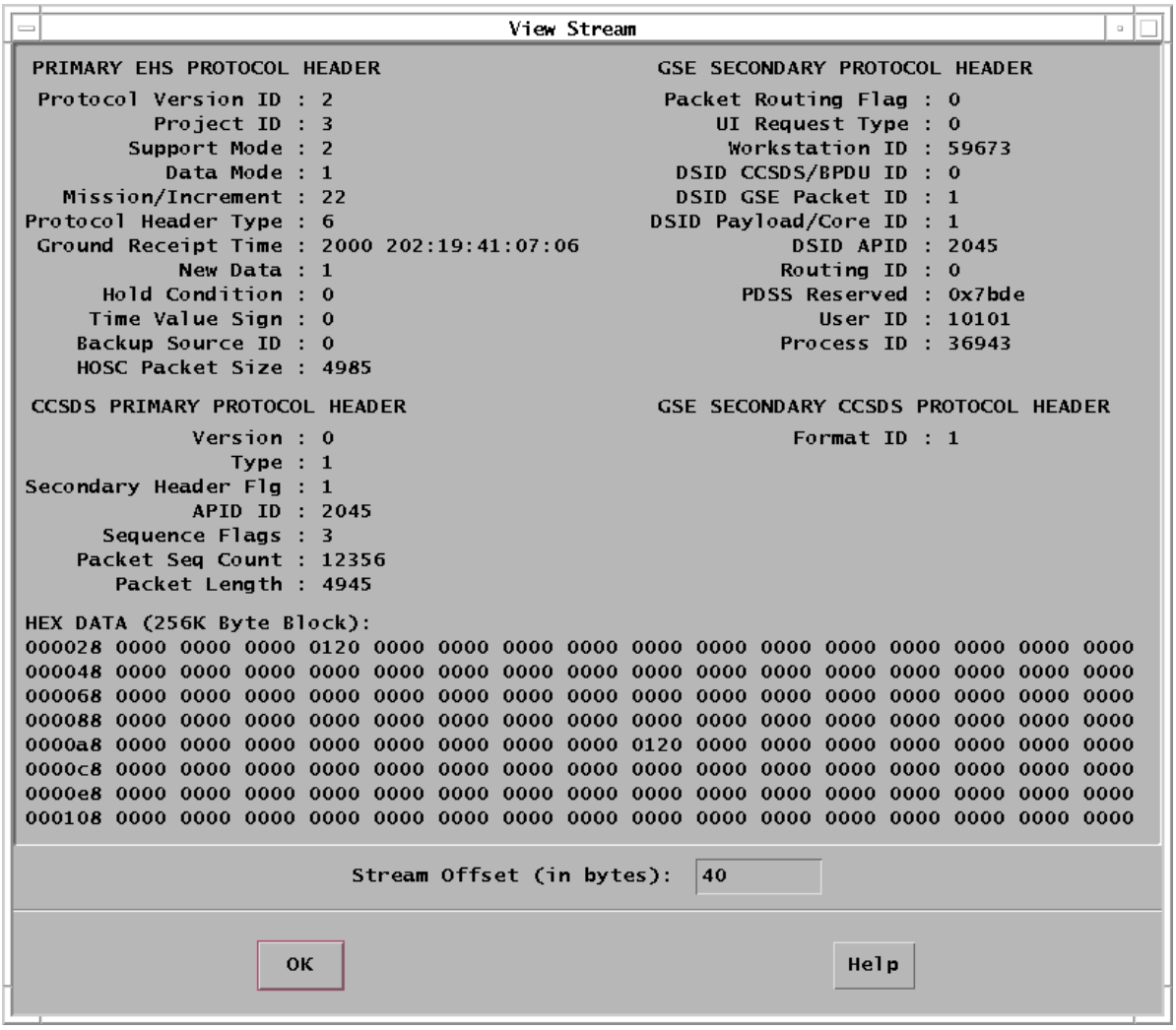


Figure 14-10, View Stream dialog box

14.3.4.4.3.1 Primary EHS Protocol Header

The **Primary EHS Protocol Header** has a fixed length of 16 bytes (128 bits) (see Table 14-1 , Primary EHS Protocol Header Contents).

Table 14-1, Primary EHS Protocol Header Contents

Field Name	Values	Description
EHS Protocol Version ID	0-15 (Decimal), Set to 2.	Identifies the version of the EHS protocol.
Project Identifier	0 - All projects 1 - STS[1] 2 - SL[1] 3 - ISS 4 - AXAF[1]	Identifies the originating project. ISS will be the only project identified for the remote user. Set to 2.
Operational Support Mode	0 - All support modes 1 - Flight 2 - Ground Test 3 - Simulation 4 - Verification/Validation 5 - Development 6 - Training 7 - Offline	Identifies the type of operation for which this data was generated.
Data Mode	0 - unused 1 - Real-Time 2 - Dump 1 3 - Dump 2 4 - Dump 3 5 thru 15 - Playbacks 1-11	Identifies the mode of the data for telemetry (unused for non-telemetry).
Mission/Increment	0 = All missions 1 thru 255 (decimal) = the Mission/Increment	ISS increment number.

Field Name	Values	Description
Secondary Protocol Header Type	0 - All Protocols[1] 1 - TDM Telemetry[1] 2 - 4800-bit NASCOM block[1] 3 - Pseudo Telemetry[1] 4 -TDS Packet (Time)[1] 5 - EHS Test Data[1] 6 - GSE Packet Data 7 - Custom Data Packet 8 - HRDS DQ[1] 9 - CSS[1] 10 - PDSS AOS/LOS Indicator Packet[1] 11 - PDSS Payload CCSDS Packet 12 - PDSS Core CCSDS Packet[1] 13 - PDSS Payload BPDU 14 - PDSS UDSM 15 - PDSS RPSM	Identifies the content of the EHS Protocol Data area.
Ground Receipt Time (GRT) year	yyyy:ddd:hh:mm:ss:hs	Time of packet origination. For PDSS this will be the time from the IRIG-B time signal received. Time EHS is the number of years since 1900.
New Data	0 - Old Data 1 - New Data	'New Data/Old Data' to indicate when a time has been updated or is stale.
HOLD condition	0 - No-HOLD 1 - HOLD	'No-HOLD/HOLD' to indicate a hold condition such as in a launch hold and the value is not updating.
Time Value Sign	0 = Positive 1 = Negative	'Sign' to indicate a normal time (positive) or a count down time (negative).
Backup Source ID	0 = Not Source Specific 1 = Source A 2 = Source B	Contains status fields used by multiple EHS protocols. Indicates for streams that are resundantly transmitted if it is from one source or the other. (Normally not used for PDSS telemetry data distribution.) Set to 0.
HOSC PAcket Size	16 - 61438 (Decimal)	The length of the entire HOSC packet (EHS protocol) in bytes including both the Primary EHS Protocol Header and EHS Protocol Data.

[1] Not applicable to ISS remote users.
The **EHS Protocol Version ID** is included in the Primary EHS Protocol Header to allow for future expansion of the Primary EHS Protocol Header. If a change occurs to the Primary EHS Protocol Header that would not be compatible with older versions of the Primary EHS Protocol Header, then this field value would be changed. When dealing with the Primary EHS Protocol Header it would be wise to check this value with your code that receives this Protocol Header and confirm that the header format has not changed.

The next element in the Primary EHS Protocol Header is the **Project ID** field. The Primary EHS Protocol Header is used for multiple projects within the POIC. Even though each individual project should only receive the data that are intended for them, it would not hurt to confirm that the value on the Project field always matched your project. The project field value is set to 0000 (All Projects) when the data message that is received applies to all projects.

The next three fields in the Primary EHS Protocol header are the **Operational Support Mode**, the **Data Mode** and the **Mission/Increment** field. These three fields when used together provide the configuration of the telemetry data that are being sent to the remote user. The **Operational Support Mode** will let the remote user know if the data being received are from the flight (e.g., on-orbit) data or whether these data are from a simulation or other activity from the POIC.

The **Data Mode** should be checked by the software interface from the remote user to confirm whether the data being received from POIC are real-time, dump, or a playback. The dump mode indicates that the packet has been stored in the Communication Outage Recorder (COR) onboard the ISS. Each type of dump mode is assigned to a particular type of packet. Dump1 indicates that the packet is an S-band Zone of Exclusion (ZOE) Dump packet that has been processed by the ZOE Dump process within the POIC. Dump 2 indicates that the packet is a Ku-Band packet that has been temporarily stored in the COR onboard the ISS. All Ku-Band packets generated by payloads (ie. Payload science packets), and the Payload MDM such as the payload health and status and flight ancillary packets that have been stored in the COR are assigned to this data mode. Dump3 indicates that the packet is an S-band ZOE packet that is transmitted via the Ku-band system and has been temporarily stored in the Communication Outage Recorder onboard the ISS.

The assigned data modes for playback packets are a combination of statically and dynamically assigned data modes. The first six playback channels are statically assigned. Playback channel number 1 is assigned to Orbiter Downlink telemetry from the Orbiter Interface Unit (OIU) and the Mini Pressurized Logistics Module (MPLM) that have been stored. Playback channel number 2 is assigned to S-band ZOE Dump packets that have been stored temporarily in a Line Outage Recorder at White Sands and sent to the POIC for ZOE Dump processing on the ground. Playback channel number 3 is assigned to Ku-Band packets that have been temporarily stored on the PDSS Line Outage Recorder. Playback channel number 4 is assigned to S-Band packets that have been stored temporarily in a Line Outage Recorder at White Sands and sent to the POIC. Playback channel number 5 is assigned to Ku-band packets that have been stored on the COR and then temporarily stored on the PDSS LOR. Finally, playback channel number 6 is assigned to S-Band packets that are transmitted via the Ku-Band system and then temporarily stored in the PDSS LOR.

The dynamically assigned playback channels, numbered 7 thru 11, are generated upon request by the remote user for playback of packets stored either in short term storage within EHS or long term storage within PDSS. The remote user will receive notification of the assigned playback channel number via the following applications:

- Message handler applicaton if using X-windows, or
- EHS playback status utility if using X-windows, or
- Playback Status application on the Web (available upon delivery of Build 5.1).

The **Mission/Increment** field can be arbitrarily assigned and is not required to be specifically tied to an increment .

It is important for the remote user to understand the importance of the (Secondary) **Protocol Header Type** field. The structure of the Secondary Headers of the EHS Protocol is not required to follow any format restrictions. Any similarities between protocols are purely coincidence and should not be relied upon when developing interfaces to the POIC. Another point to consider is that the Application Process Identifier (APID) within the CCSDS Primary Packet Header which ISS uses to uniquely identify elements are not guaranteed to be unique across POIC secondary header types. Secondary Protocol Header Types that are created at POIC are assigned a POIC-generated APID. There is no guarantee that this APID will be unique from ISS generated APIDs. This is because the Secondary Protocol Header Type combined with the APID uniquely identifies the elements. Thus, when interfacing with data received from the POIC, it is important for the remote user to check the Secondary Protocol Header Type field to determine the type of data being received from the POIC before continuing to process that data internal to their software.

The **Ground Receipt Time** fields are filled in by the receiving system to indicate the time that the data message was received at POIC. This allows the data message to be time ordered by POIC receipt time if desired when it is retrieved from the POIC long-term and short-term storage. This timeframe is not the same time that is in the CCSDS secondary header for the onboard time stamp.

The **New Data**, **Hold Condition**, **Time Value Sign**, and **Backup Source ID** fields are defined sufficiently by their description definitions provided above. The final field is the **HOSC Packet Size**. This value is set even if the "packet" is a BPDU that is not a packet. The value includes the header put on by the POIC and the original size of the CCSDS Packet or BPDU.

14.3.4.4.3.2 GSE Secondary Protocol Header

The Secondary EHS Protocol header for PDSS telemetry is 16 bytes (128 bits) in length (see Table 14-2 , GSE Secondary Protocol Header Contents). The **Workstation ID**, **User ID**, and **Process ID** fields in the Secondary EHS Protocol Header are meant to be used only by EHS software developers.

Note: Even though the Secondary EHS Protocol Header format contains a variable called **DSID Payload vs. Core Identifier**, this flag is always set by the PDSS at the POIC to "Payload".

However, GSE packets can include any combination of core, payload, and POIC-generated pseudo-telemetry data (including AOS/LOS indicators).

Table 14-2, GSE Secondary Protocol Header Contents

Field Name	Values	Description
Packet Routing Flag	0 - TNS Routed 1 - PDSS Routed	Bit set to PDSS Routed to distinguish which GSE Packets are distributed by PDSS.
User Interface Request Type	0 = POIC 1 = Remote User	
Workstation ID	0 - 65535 (Decimal)	Set to the Workstation numerical ID that is running the GSE process that created the GSE packet
Data Stream Identifier (DSID) CCSDS vs. BPDU Identifier	0 = CCSDS Packet 1 = BPDU Always set to zero	Fields from Bytes 4 -7 make up the Data Stream Identifier (DSID). This is a unique identifier for the data stream. This bit determines if the type of data contained therein is CCSDS packet data of BPDU.
DSID GSE Packet Identifier	Set to 1	Set to 1 to specify this is a POIC created GSE packet.
DSID Payload vs. Core Identifier	0 - Core (Systems) data 1 - Payload data Always set to 1.	Corresponds to the type bit and is set to 1 for payload data and set to 0 for core data.
DSID APID	0 - 2047 (Decimal)	The eleven bits correspond to the user's APID.
Routing ID	PDSS internal routing key	For Ground Ancillary GSE Packets: This is a routing key used internal to PDSS. This value will be of a dynamic nature. For User-Generated GSE Packets: nonused: Set to 0's.
PDSS Reserved	Set to 0111 1011 1101 1110 (or 7BDE hex)	This key is used internally to PDSS and should not be used by the remote user. This is a fixed 16-bit pattern.
User ID	0 - 65535 (Decimal)	Numerical internal representation of the User ID that executed the GSE process.
Process ID	0 - 65535 (Decimal)	Numerical internal representation of the process ID of the GSE process.

14.3.4.4.3.3 CCSDS Primary Protocol Header

Table 14-3 , CCSDS Primary Protocol Header Contents describes the contents of the information contained within the **CCSDS Primary Protocol Header** fields. The **APID** in the CCSDS Primary Header is assigned according to the GSE Packet Definition as specified in the GSE Packet

Definition File. The GSE Packet ID is used as an APID in the GSE Packet. The GSE Packet IDs are preassigned to the generic user through PDL and thus are unique within the GSE protocol. The POIC GSE Packet Definition File input restricts the user to these preassigned GSE Packet IDs. The combination of the Secondary Protocol Header Type field in the Primary EHS Protocol Header set to GSE Packet type and the APID guarantee a unique identifier across all packet types. The Packet Sequence counter will be incremented for each GSE Packet that corresponds with the same APID and Mission, Operational Support Mode and Project (MOP) combination that occurs after the GSE Packet has started transmission. Thus if the remote user stops the transmission of the GSE Packet and restarts it, the Packet Sequence Counter will reset to 0.

Table 14-3, CCSDS Primary Protocol Header Contents

Field Name	Value	Description
Version	Set to 000	Indicates CCSDS Version-1. Does not change.
Type	Set to 1	Set to 1 if packet type is payload. A GSE Packet is considered part of the Payload data.
CCSDS Secondary Header Flag	Set to 1	Secondary header is present.
Application Process Identifier (APID)	0 - 2047 (Decimal)	The APID is set to the APID value assigned in the POIC Telemetry Database for this GSE Packet.
Sequence Flags	Set to 11 (Binary)	Not used by POIC
Packet Sequence Count	0 - 16383	This 14-bit counter will be unique for each APID/MOP combination and will be incremented between successive packets belonging to the same APID.
Packet Length	0 - 61399 (Decimal)	This is the length of the data in bytes (octets) minus 1 that follows the CCSDS primary header. A zero packet length indicates that the length of the data in bytes is either 0 or 1. In this case, the packet size from the EHS Primary Header should be used.

14.3.4.3.4 GSE Secondary CCSDS Protocol Header

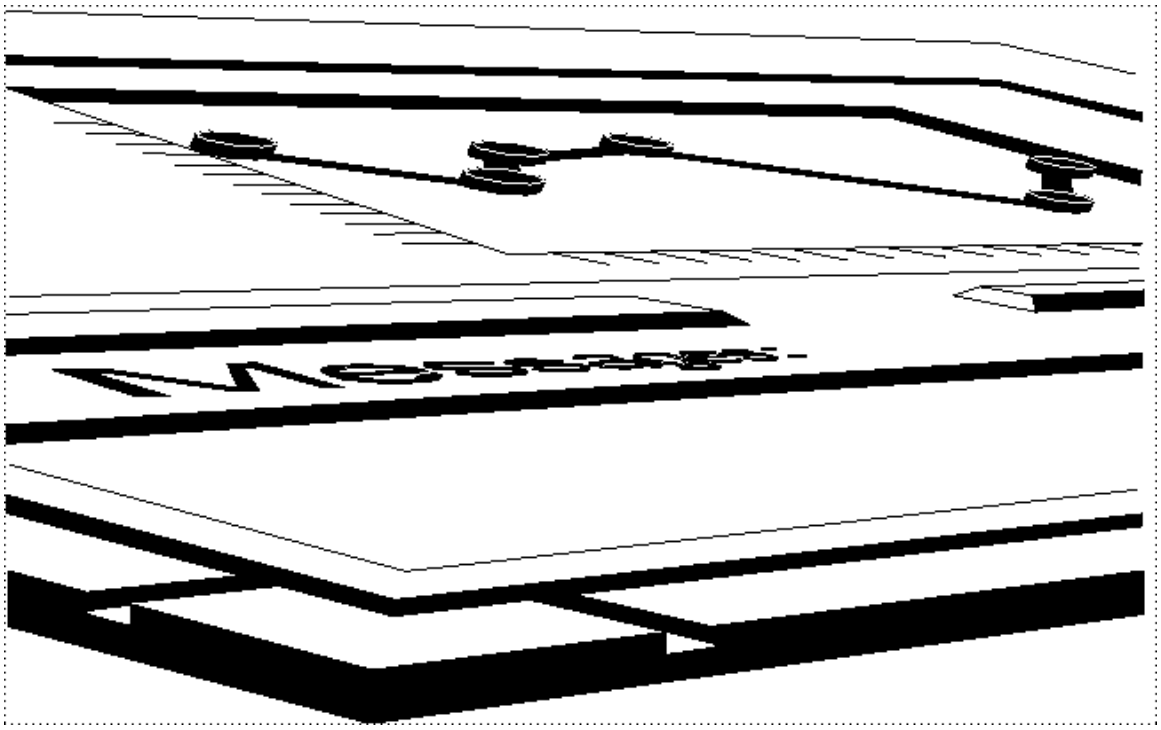
The CCSDS Secondary header for a GSE Packet consists only of a Format Identifier. MSFC-STD-1274 requires the Format ID to follow the CCSDS Primary Header, thus the GSE Packet contains a CCSDS Secondary Header. The format of the packet has a pre-established update cycle, a pre-established sampling sequence and a pre-established measurement set. The **Format ID** identifies which pre-established format is associated with this packet. The Format ID is identified in the Telemetry Database.

14.3.4.3.5 Hex Data (256K Byte Block)

The Hex Data portion of the View Stream dialog box shows a block of 256K data values received in hex for parameters included in the GSE stream. Change the Stream Offset (in Bytes) input text field to view another block of data.

14.3.4.3.6 Stream Offset (in Bytes)

The **View Stream Dialog** box only shows a single 256K block of data at a time (starting with 0). To view subsequent blocks of data, enter another value. The maximum value that can be entered in this text field is 61,437. If you enter a larger value, you'll receive an error.



Chapter 15:
Exception Monitor Software

15.1 Exception Monitor Overview

This application provides exception monitoring (EM) on selected Measurement/Stimulus Identifiers (MSIDs) for Limit/Expected State (LES) violations, issues exception advisory messages when LES violations occur, and prints a status report of monitored MSIDs.

EM is a process by which MSID values from telemetered data are checked for violations of previously set limits or states. For example, if the temperature of an on-board experiment is expected not to exceed 25 degrees Celsius, EM checks the MSID carrying the temperature of the experiment. If the value of the MSID exceeds the limit, the user is notified. This is known as a *limit violation*.

Another example might be an on-board heater that must be monitored to ensure whether it is on or off. If the heater is off (according to the MSID carrying this value) but it is expected to be on, the user is notified. This is known as a *state violation.*

Another type of limit sensing is *delta limit* sensing. Delta limit sensing checks consecutive samples to see if the value has changed by a defined delta. If so, the user will be notified.

Note: In order for delta limit sensing to be performed on an MSID, you must select **All** samples on the MSID's **Edit EM Attributes** dialog box.

In each of these cases, LES sensing is responsible for alerting the user that a violation has occurred. These messages will be displayed in the message area of the Message Handler application.

The current EM attributes for enabled MSIDs can be saved to an EM configuration file on your workstation for future EM sessions. Exception Monitor can be invoked on a workstation for local monitoring or on a project server for project-wide monitoring.

The Exception Monitor application provides you with the capability to:

- Monitor selected Measurement/Stimulus Identifiers (MSIDs) for Limit/Expected State (LES) violations
- Issue Exception Advisory Messages which alert you when LES violations occur
- Print a status report on monitored MSIDs
- Configure the Exception Monitor (EM) attributes for MSIDs
- Save the current EM attributes for enabled MSIDs on local storage for retrieval during future EM sessions

Project EM functions identically to User EM except that it monitors MSIDs on a project-wide basis and generates Exception Advisory Messages to all users associated with the project. Project EM's only limitation is that it cannot monitor proprietary MSIDs or MSIDs which are contained in proprietary sources. The telemetry database will indicate which MSIDs are being monitored by Project EM. IST members can also enable or disable additional MSIDs for monitoring.

The Exception Monitor main window contains several distinct features that will be discussed in this chapter (see Figure 15-1, Exception Monitor main window):

- Menu bar
- Status Bar
- View selection radio buttons
- Work area
- Message area

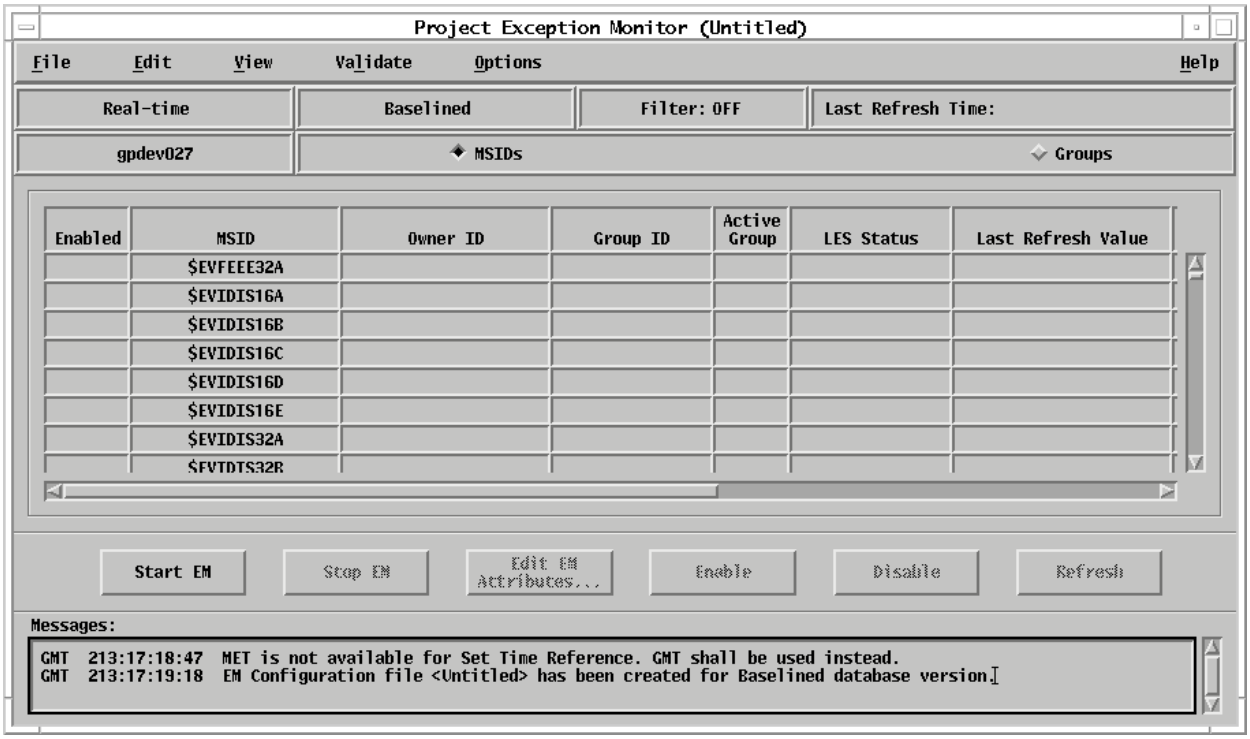


Figure 15-1, Exception Monitor main window.

15.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **Edit**, **View**, **Validate**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **Create...**
- **Validate** Menu
  - **Validate...**
- **Options** Menu
  - **Start EM**
  - **Stop EM**
  - **Edit EM Attributes...**
  - **Enable**
  - **Disable**
  - **Refresh**
  - **Disable Acknowledge Messages**
  - **Set Data Mode and Database Version...**

15.1.2 Status Bar

The status bar contains five elements of information:

- Data mode
- Database version
- Filter status
- Last refresh time
- Name of the workstation you are using

The data mode area may display one of the following three options:

- Real-time
- Dump
- Playback

Help: See the glossary for a definition of Real-time, Playback and Dump data modes.

The default data mode is Real-time .

The database version area may display one of the following two telemetry database options:

- Baselined
- Archived

Help: See the glossary for a definition of Baselined and Archived database versions.

The default database version is Baselined .

The **Filter:** area indicates if any filtering operations are currently applied. Filtering, in this application, is performed on the work area tables to show which MSIDs are enabled or disabled for EM by a combination of MSID name, Group ID, and Owner ID. If any MSID is being filtered, this field will display O N; otherwise, this field will display O FF (which is the default value).

The **Last Refresh Time:** field indicates the last time the work area was updated with new information. This time will update when an exception advisory message is issued for any MSID.

The workstation field displays the name of the workstation you are currently logged into.

15.1.3 View Selection Radio Buttons

The radio buttons located directly below the status bar allow you to change what is shown in the main window work area. You can choose to view:

- **MSIDs**
- **Groups**

MSIDs is the default. When this radio button is selected, the work area displays all MSIDs that have EM attributes defined in a tabular format. The table can be modified by configuring which columns of information are visible and their size.

Selecting the **Groups** radio button displays the groupings of MSIDs in which simultaneous activation or deactivation of LES sensing can occur. Groups are nothing more than MSIDs which have been grouped together primarily for activation in LES sensing. This view allows you to see the active status of groups and whether they are enabled.

15.1.4 Work Area

The contents of the work area is initially blank. You must choose **Create...** from the **File** menu to create a configuration file against a specific database or open a previously saved file. Once you have created or opened the EM configuration file, the work area can be toggled between the **MSIDs** table and the **Groups** table. This can be accomplished by selecting either the **MSIDs** or **Groups** radio buttons.

15.1.4.1 MSIDs Table

The **MSIDs** Table (see Figure 15-2, MSIDs Table), which is displayed by toggling the **MSIDs** radio button in the View Selection Radio Buttons area, is comprised of ten columns:

- **Enabled**
- **MSID**
- **Owner ID**
- **Group ID**
- **Active Group**
- **LES Status**
- **Last Refresh Value**
- **# Samples**
- **Ack Message**
- **User Advisory Message**

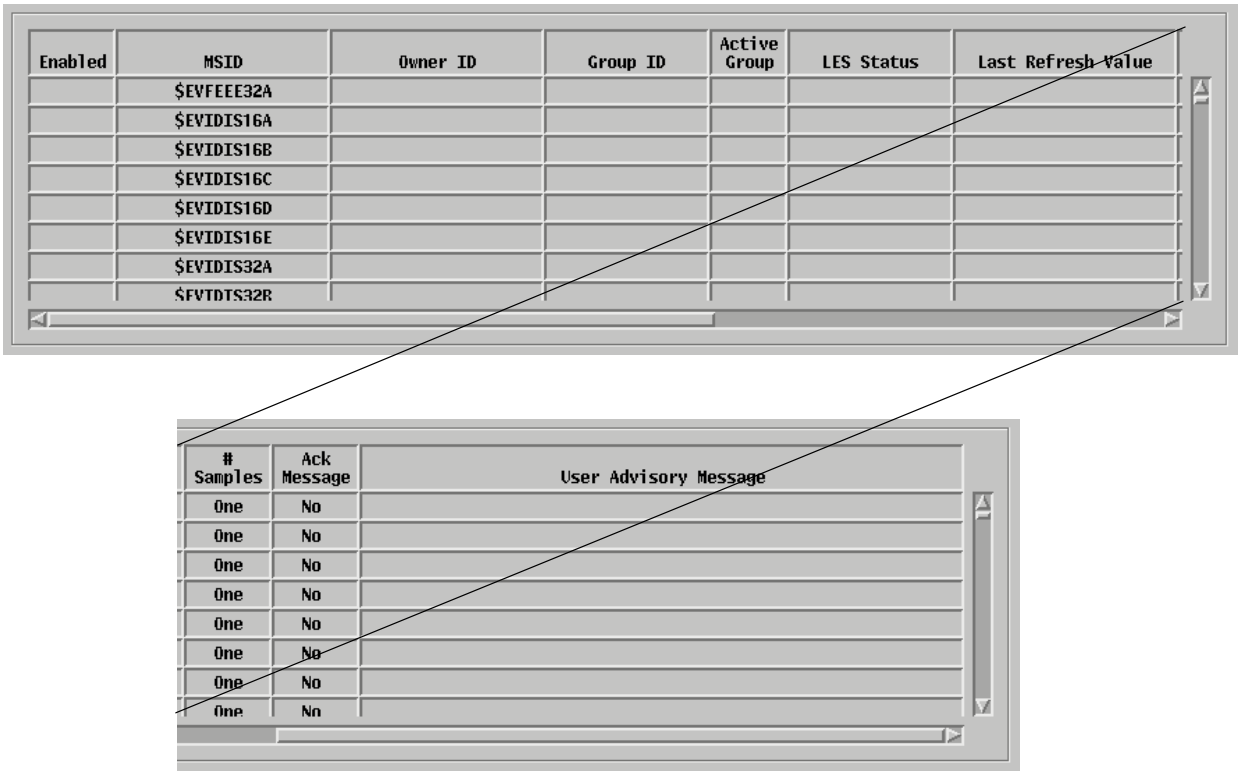


Figure 15-2, MSIDs Table.

The **Enabled** column indicates whether an MSID has been enabled for EM. If the MSID is enabled for monitoring, the column contains a **Yes**. Otherwise, the column is blank. When the EM configuration file is initially created, all MSIDs are disabled for monitoring.

The **MSID** column contains the mnemonic of the MSID which is being monitored for LES violations.

The **Owner ID** is used to group MSIDs together logically and to implement authorization.

The **Group ID** indicates to which group(s) the MSID belongs. Group IDs are identifiers in the telemetry database used to uniquely identify a group of measurements to be activated for LES sensing.

Note: If you receive a ► at the right-side of this column, it indicates that there is more data than will fit in the cells width. You will need to widen the column.

The **Active Group** column indicates the MSID's current active group ID. Because an MSID can be associated with multiple groups, this column indicates which groups are active.

Groups are activated by:

- The value of a control parameter with or without a delay time
- A start time
- Manually via the Local Table Operation (LTO) application

Tip: If an MSID is a member of multiple groups and multiple groups are active, the group that is defined in the Telemetry Database as having the highest precedence will be the one used. "Appendix AC: Limit/Expected State Sensing Set Activation Criteria" contains a table illustrating LES Activation criteria.

The **LES Status** column contains information regarding the LES sensing for the MSID. Possible values are:

- **OK** indicates that the latest sample is within limits or as expected
- **NO DATA** indicates data has not been available for this MSID
- **WARNING HIGH** indicates in red that a warning high limit exception has occurred
- **WARNING LOW** indicates in red that a warning low limit exception has occurred
- **CAUTION HIGH** indicates in yellow that a caution high limit exception has occurred
- **CAUTION LOW** indicates in yellow that a caution low limit exception has occurred
- **OUT OF STATE** indicates in red an expected state exception has occurred (e.g., **OFF** instead of **ON**)
- **DELTA EXCEEDED** indicates in red that the change in consecutive samples exceeded a delta value

The following examples may help you better understand when an EM message would be generated (see Figure 15-3, Limit example).

Example:

A parameter has the following limits defined:

Warning High: **50**

Caution High: **10**

Caution Low: **-5**

Warning Low: **-25**

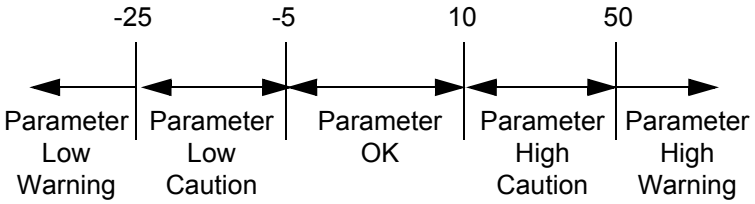


Figure 15-3, Limit example.

Example:

A parameter has the following items defined:

Warning High:	**30**
Limit Delta:	**5**
Tolerance:	**2**
MSID Sample #1	**25**
MSID Sample #2	**26**
MSID Sample #3	**20**
MSID Sample #4	**31**
MSID Sample #5	**32**
MSID Sample #6	**33**

An EM advisory would be generated when MSID Sample #3 was received because between Sample #2 and Sample #3 there was a delta of 6 exceeding the **Limit Delta:** of 5. A message would also be received when Sample #4 was received because the **Limit Delta:** was also exceeded.

Note: In order for delta limit sensing to be performed on an MSID, you must select **All** samples on the **Edit EM Attributes** dialog box.

An EM advisory would be generated when Sample #6 was received because the value exceeded the **Warning High:** limit more than twice consecutively (which was the **Tolerance:** set for the MSID).

The **Last Refresh Value** is a calibrated sample value of the MSID enabled for EM. This field is initially blank and is filled in when you click Refresh. In User EM, this field is automatically

updated each time the value for a monitored MSID changes. On Project EM, an IST member must click Refresh in order for this column to be updated.

The **# Samples** field indicates whether the first or all samples in a packet are to be monitored. This field will contain either **One** or **All**.

The **Ack Message** is a flag to indicate that you are required to acknowledge receipt of an Exception Advisory Message for the associated MSID. This column will contain **Yes** if an acknowledgment is required or **No** if acknowledgement is not required; however, the field will remain blank until one of these options are selected. Options are selected using the **Enable/Disable Acknowledge Message** menu option item under the **Options** menu and this information is saved with the EM Configuration file. If this flag is not set, the EM message is sent to the message area of the Message Handler application. If this flag is set, the message will be sent to an acknowledgment dialog box and to message handler.

The **User Advisory Message** is a user-defined message that is delivered as part of the Exception Advisory Message when an LES violation occurs. The message is displayed in the message area of the Message Handler application.

15.1.4.2 Groups Table

The **Groups** Table (see Figure 15-4, Groups Table) is comprised of four columns labeled as follows:

- **Enabled**
- **Owner ID**
- **Group ID**
- **Active Status**

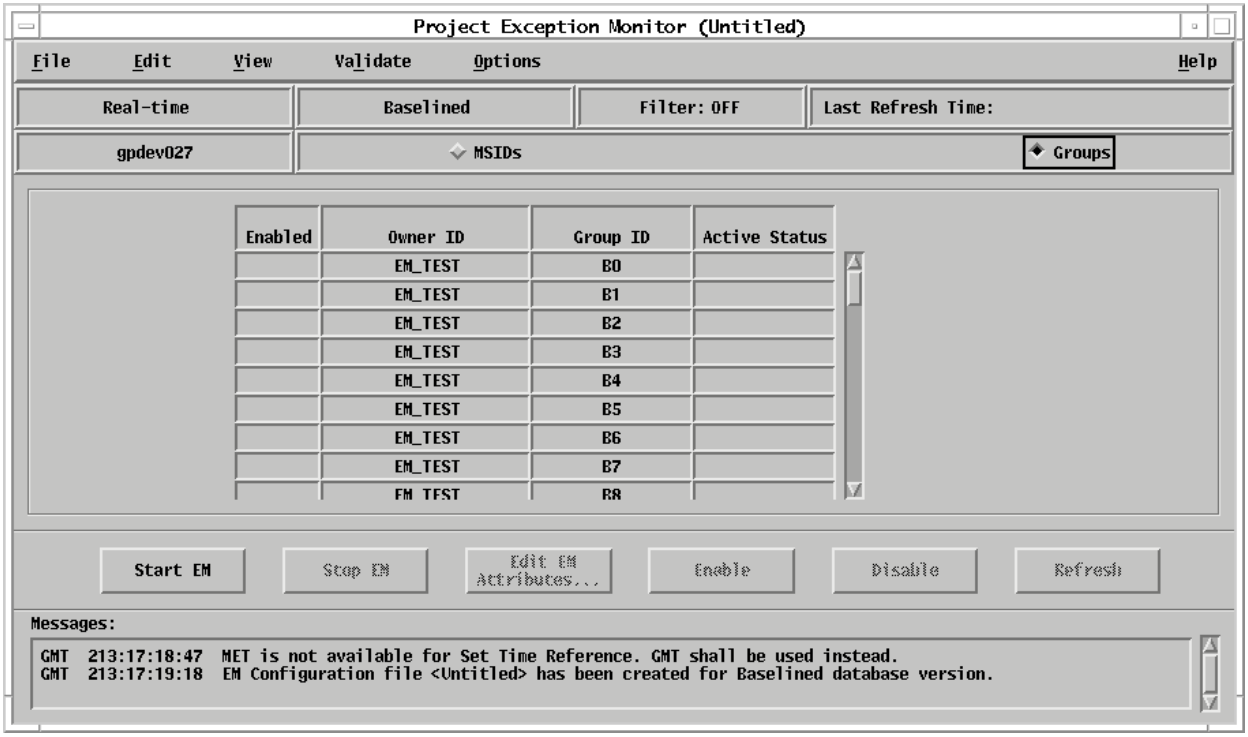


Figure 15-4, Groups Table.

The **Enabled** column indicates whether a group is enabled for EM.

The **Owner ID** is used to group MSIDs together logically and to implement authorization.

The **Group ID** is the identifier used to uniquely identify the group of measurements that has been defined for LES sensing.

The **Active Status** column indicates whether the associated group is active.

15.1.5 Message Area

The message area displays status or error messages originating from the application. The Exception Monitor application formats an Exception Advisory Message as follows:

```
[Exception Type] Sensing Exception Advisory for [MSID] during [Data
Mode] / Status was [LES Status] for [Last Refresh Value] / [EM Error
Description] / [User Advisory Message]
```

Some examples of an Exception Advisory Message might be:

```
Limit Sensing Exception Advisory for L01FK0021 during Real-time/
Status was WARNING LOW for 7.15 VDC/Heater VDC Temperature Exceeded
```

```
Nominal Limit During Phase 1/Start computation heater 1 to collect
data.

Expected State Sensing Exception Advisory for L81DZ0858 during
Dump/Status was OUT OF STATE for OFF/This MSID was out of limits
based on value of MSID L81DR0264/Monitor display FURNACE for
anomalies.
```

The definition and size formats of variable fields, enclosed in brackets ([ ]) above, are defined in Table 15-1, Exception Advisory Message formats.

Table 15-1, Exception Advisory Message formats.

Field	Definition	Max Length
Exception Type	Indicates **Limit**, **Expected State** or **Delta Limit**	14 char
MSID	Name of MSID causing the Exception	20 char
Data Mode	Current Data Mode for Monitoring Process	11 char
LES Status	**OK**, **CAUTION LOW**, **OUT OF STATE**,...	14 char
Last Refresh Value	Calibrated sample value and units	20 char
EM Error Description	As defined in the Telemetry Database	60 char
User Advisory Message	As defined by the user	60 char

If the **Acknowledge Message** attribute has been set for an MSID, then Exception Advisory Messages will be issued as notification messages that must be acknowledged by the user. Figure 15-5, Acknowledge Message dialog box, shows how a notification message is displayed when the **Acknowledge Message** attribute has been set for the MSID

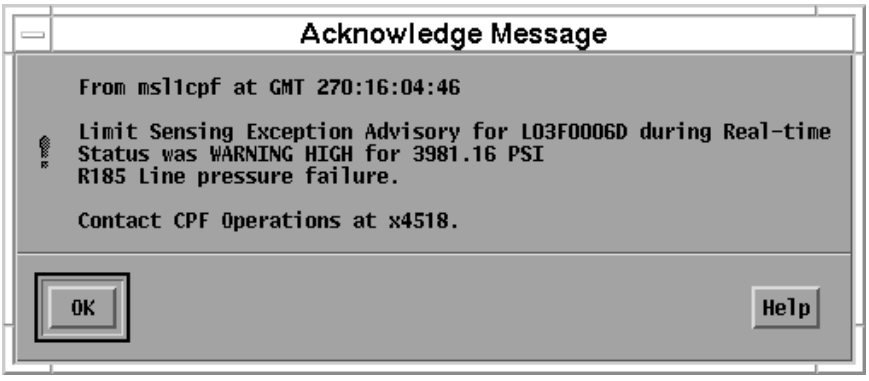


Figure 15-5, Acknowledge Message dialog box.

15.1.6 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Exception Monitor application. The **Create...** menu item from the **File** menu as well as all the menu options from the **Options** menu will be discussed (see Figure 15-6, File and Options menus).

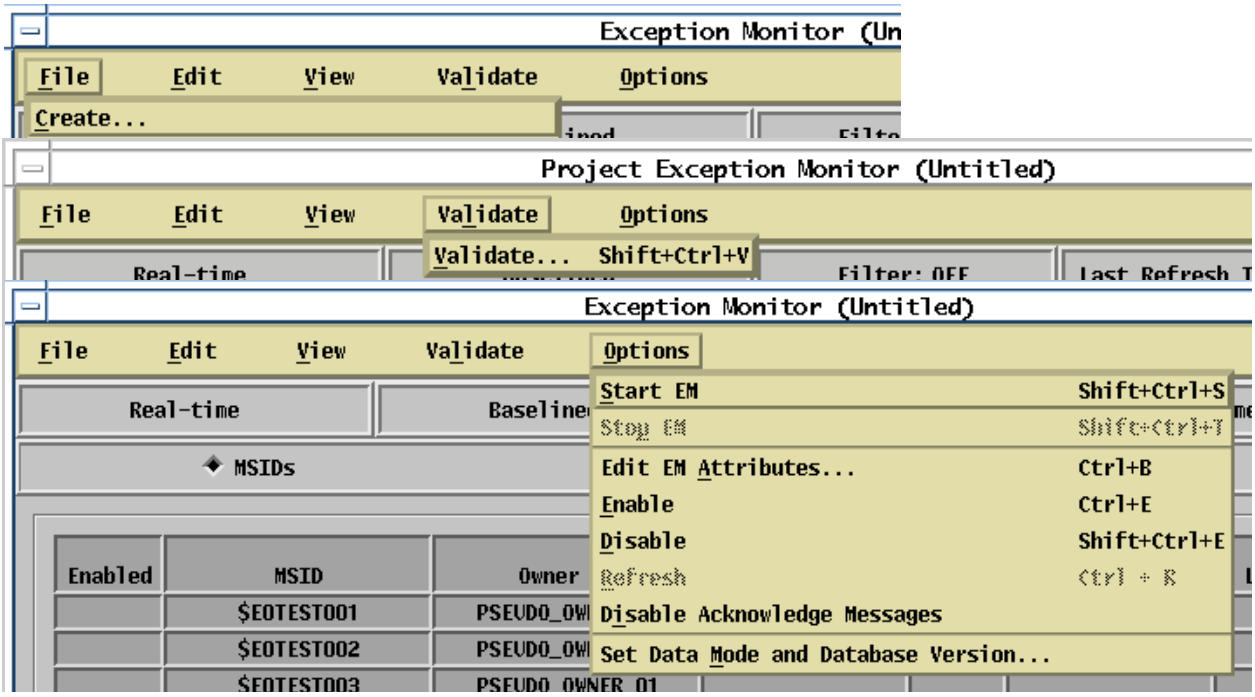


Figure 15-6, File and Options menus.

15.1.6.1 Create...

This menu item invokes a dialog box that allows you to create a new EM configuration file based on a **Baselined** or **Archived** database (see Figure 15-7, Create dialog box).

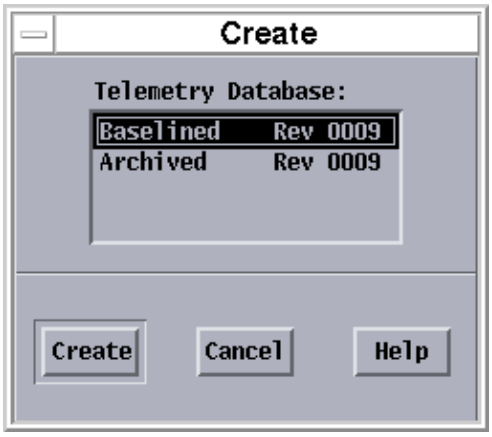


Figure 15-7, Create dialog box.

The databases are defined as:

Baselined - A project telemetry database (PTDB) that has passed Data Verification, Regression Testing, System Validation, and Operations Validation. This database is currently being used in the Huntsville Operations Support Center (HOSC) for a particular mission activity.

Archived - A PTDB currently loaded as an archive that no longer reflects the current PTDB information. Only one archive database is available online at a time.

Help: See the glossary for a definition of these terms.

A newly created Exception Monitor (EM) configuration file contains attributes for all MSIDs that are defined in your local table. The attributes of these MSIDs include:

MSID - the name of the MSID.

Enabled - an indication of whether the MSID is enabled for exception monitoring.

 # Samples - an indication of whether only the first or all samples of the MSID are to be monitored.

Ack Message - an indication of whether the user is required to acknowledge any exception messages for the MSID.

User Advisory - a user defined advisory message that will be appended to the EM exception advisory message.

EM configuration files can be valid for multiple versions of a telemetry database and attributes contained in the file will take precedence over the same information in the telemetry database.

15.1.6.2 Validate...

This menu item invokes the Validate dialog box which allows you to validate your configuration file against the database (see Figure 15-8, Validate dialog box). This dialog box will also be

invoked if you have set your database version to a version that the EM configuration file has not been validated against. This validation consists of verifying that the MSIDs in the configuration file are contained in the database and that the user has access privileges to them.

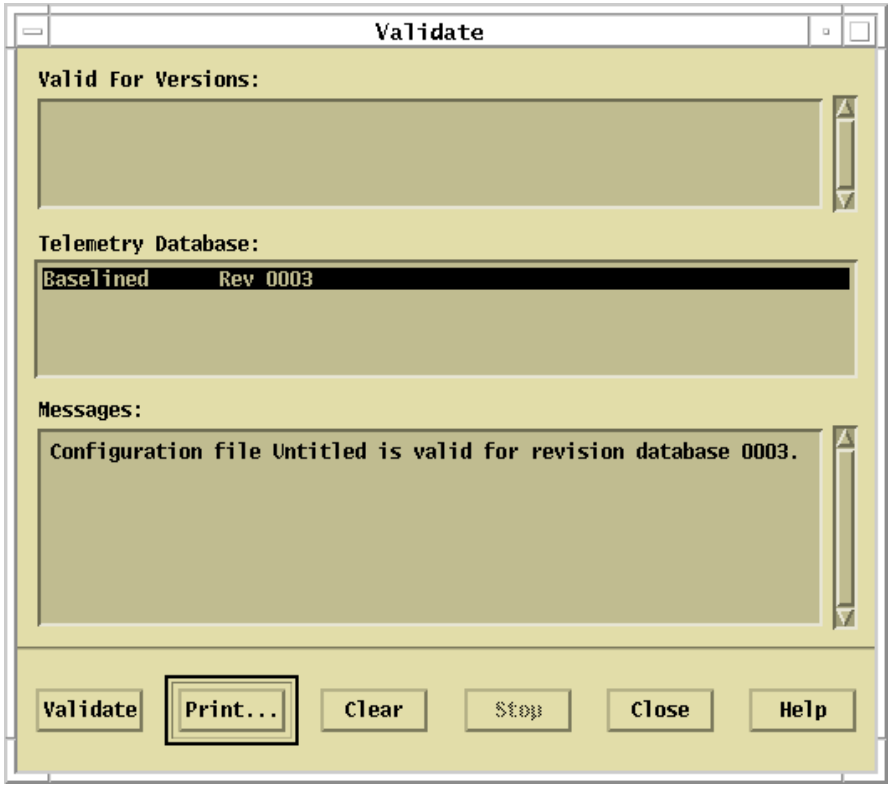


Figure 15-8, Validate dialog box..

This dialog box includes the **Valid for Versions:** list, the **Telemetry Database:** list, and a **Messages:** area.

The database versions against which this particular computation has been validated will be displayed in the **Valid for Versions:** list of the Validate dialog box. By looking at this section of the dialog box, you can quickly identify whether or not this file has been validated against a particular database. The list contains the most recent three versions that the file has been validated against.

You can select which TDB to validate this file against by making a selection from the **Telemetry Database:** list. The revision number of each of the available databases is shown. Clicking on the desired database will activate the selection.

The results of the validation process are posted in the **Messages:** area of the Validate dialog box.

CAUTION: Once messages are cleared from the message area of the Validate dialog box, they are no longer available for printing. You will have to re-run the validation process to regenerate cleared validation messages.

Note: If you start validation for a file while messages are in the message area, the new messages will be appended to existing messages.

If an EM Configuration file is validated against a telemetry database revision which is different from the current version and the file contains MSIDs not in the new database revision, then the MSIDs not in the new database will be removed and the EM Configuration file will be renamed "Untitled". This information will be displayed in the Validate dialog box. When you exit EM, you will have the opportunity to save the new EM Configuration file (with only valid MSIDs) using either the same or a different name.

If invalid MSIDs are encountered when validating a file already open, invalid MSIDs will be reported to the user along with the validation status.

Clicking Validate initiates the validation process of your configuration file against the selected database. This is the default pushbutton. A dialog box indicating the validation progress will appear.

Note: You can reopen this dialog box to see the progression of the Validate process.

15.1.6.3 Start EM

This menu item starts the monitoring process of exceptions to limits/expected state violations for all enabled MSIDs for your platform. A message will be sent to the message area notifying you that the process has started. A dialog box indicating the progress will appear (see Figure 15-9, Start (Working) dialog box).

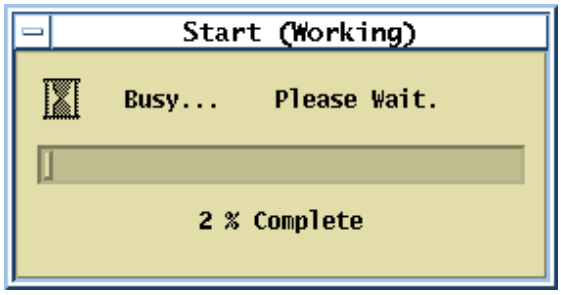


Figure 15-9, Start (Working) dialog box.

15.1.6.4 Stop EM

This menu item stops the monitoring process for your platform. A message will be sent to the message area notifying you that the process has stopped. A dialog box indicating the progress will appear (see Figure 15-10, Stop (Working) dialog box).

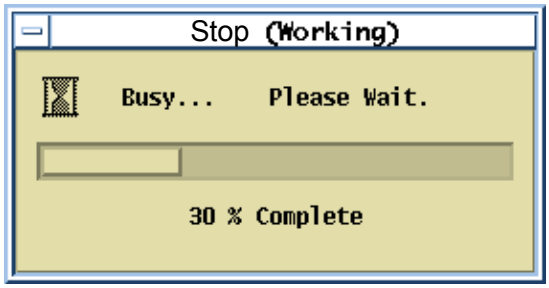


Figure 15-10, Stop (Working) dialog box.

15.1.6.5 Edit EM Attributes...

This menu item invokes a dialog box which allows you to edit the EM attributes for a selected MSID or group (see Figure 15-11, Edit EM Attributes dialog box).

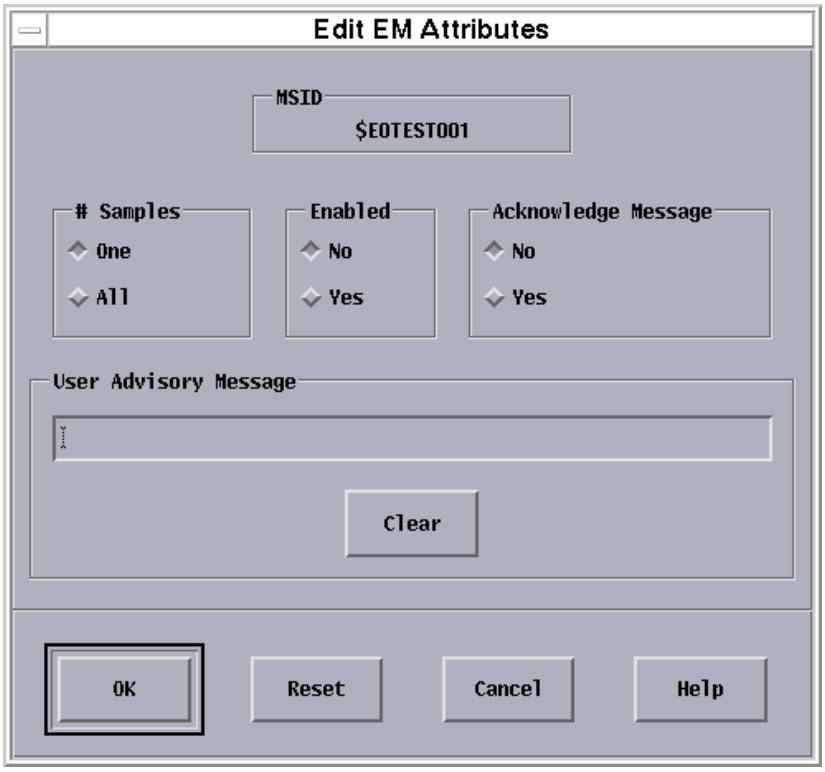


Figure 15-11, Edit EM Attributes dialog box.

The attributes contained in a configuration file for each MSID include:

- **MSID** mnemonic
- **# Samples** - indicates either the first or all samples in a packet are to be monitored
- **Enabled** status - indicates whether the MSID is enabled for LES sensing.
- **Acknowledge Message** - a flag to indicate whether the user is required to acknowledge receipt of an exception advisory message
- **User Advisory Message** - a user-defined message to be delivered with an Exception Advisory Message when LES violations occur

For groups, only the **Enabled** attribute may be edited.

The dialog box contains five frames of information corresponding to the five elements of each configuration file entry for an MSID.

The **MSID** frame contains the name of the selected MSID.

The **# Samples** frame contains two radio buttons (**One** and **All**). You can select whether only one sample of the MSID (the first in each packet) or all samples in each packet will be monitored. The default is **One**.

The **Enabled** frame contains two radio buttons (**Yes** and **No**). This selection determines whether the MSID or group is enabled or disabled. The default is the value that appears in the **Enabled** column on the main window for the selected MSID.

The **Acknowledge Message** frame also contains two radio buttons (**Yes** and **No**). This determines whether the user will be required to acknowledge receipt of an LES violation exception advisory message. The default is the value that appears in the **Ack Message** column on the main window for the selected MSID.

The **User Advisory Message** frame contains an input text field that allows you to enter a message which will be displayed along with an exception advisory message. You can enter a message of up to 60 characters. Clear erases the contents of the input text field, allowing you to start over quickly

15.1.6.6 Enable

This menu item enables the selected MSID(s) or group(s). After EM is started, monitoring is initiated for the enabled MSID(s)/group(s) and information about these MSID(s)/group(s) is included in the EM report. If the enabling process is expected to take between 2 and 10 seconds to complete, then the cursor will change to an hourglass. If it is expected to take more than 10 seconds to complete, a dialog box indicating the process is working will appear (see Figure 15-12, Enable (Working) dialog box). Otherwise, there will be no change to the cursor and no dialog box will appear.

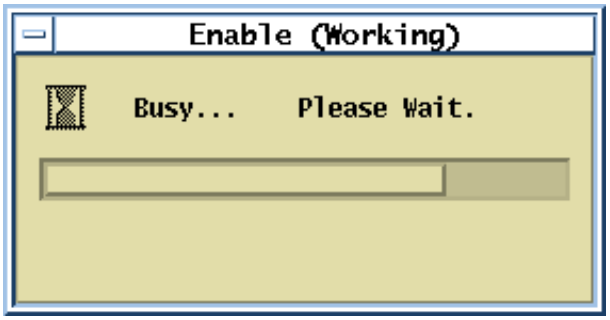


Figure 15-12, Enable (Working) dialog box.

Note: After EM is started, you can enable additional MSIDs and/or groups for monitoring.

15.1.6.7 Disable

This menu item disables the exception monitoring of selected MSID(s) or group(s). If EM is started, monitoring ceases for the disabled MSID(s)/group(s) and information about these MSID(s)/group(s) is not included in the EM report. If the enabling process is expected to take between 2 and 10 seconds to complete, then the cursor will change to an hourglass. If it is expected to take more than 10 seconds to complete, a dialog box indicating the process is working will appear (see Figure 15-13, Disable MSIDs (Working) dialog box). Otherwise, there will be no change to the cursor and no dialog box will appear.

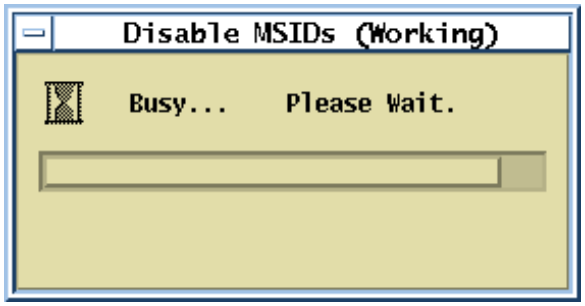


Figure 15-13, Disable MSIDs (Working) dialog box.

Note: After EM is started, you can disable any MSID and/or group that is currently being monitored.

Tip: To select/deselect multiple MSIDs for enabling or disabling, hold down Ctrl and select individual MSIDs. To select a group of MSIDs, hold down Shift, click on the first MSID you want in the group and then click on the last MSID. Click, drag, and release to select consecutive MSIDs on the list.

15.1.6.8 Refresh

This menu item refreshes the main window and gets the latest information for the enabled MSIDs. The **Last Refresh Time:** included on the status bar is also updated.

Note: This menu item is only available when EM has been started.

15.1.6.9 Disable/Enable Acknowledge Messages

This menu item toggles between **Disable Acknowledge Messages** and **Enable Acknowledge Messages**.

If the menu item reads **Disable Acknowledge Messages** and you select it**,** all messages that currently have the Acknowledge Message flag set will be disabled and will no longer invoke an acknowledge dialog box. These messages will still be sent to Message Handler.

If the menu item reads **Enable Acknowledge Messages** and you select it, all messages that originally had the Acknowledge Message flag set will be enabled and an acknowledge dialog box will be invoked. These messages will also be sent to Message Handler.

15.1.6.10 Set Data Mode and Database Version...

This menu item invokes a dialog box which allows you to set the data mode (e.g., **Real-time**) and the database version (see Figure 15-14, Set Data Mode and Database Version dialog box).

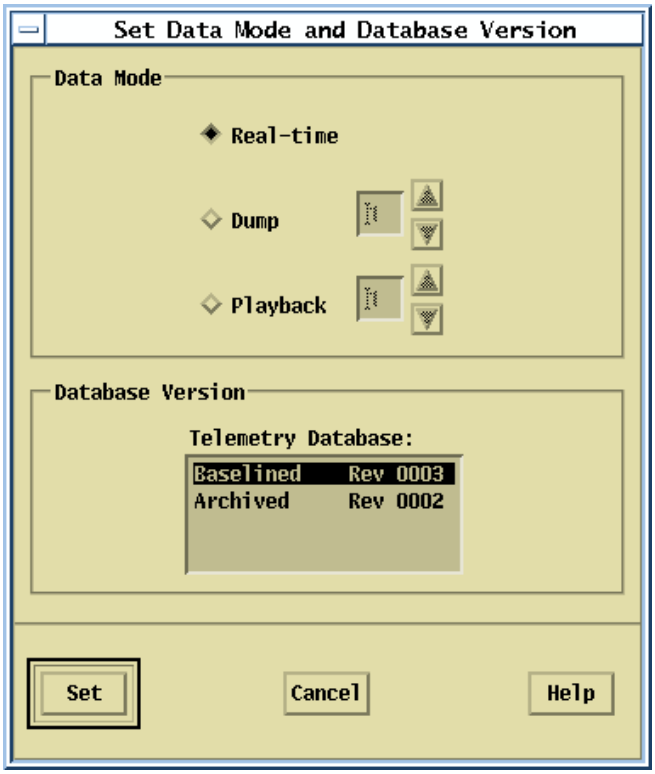


Figure 15-14, Set Data Mode and Database Version dialog box.

The **Data Mode** frame contains radio buttons that allow you to select a data mode by clicking the appropriate button.

If you select **Dump** for the data mode, you must choose between the three available dump data modes:

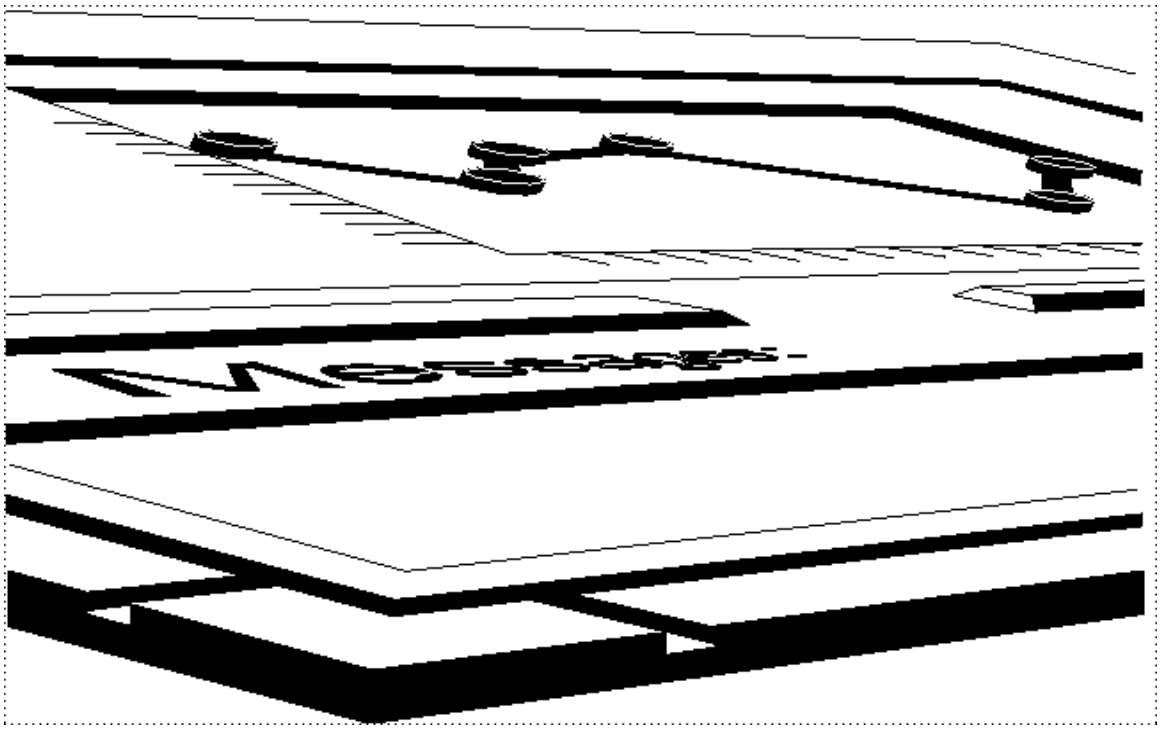
- Dump Mode **1** - S-Band Zone of Exclusion (ZOE)
- Dump Mode **2** - Ku-Band Communication Outage Recorder (COR)
- Dump Mode **3** - Ku-Band ZOE

If you select **Playback** for the data mode, you will need to also specify the playback channel (1-11).

Help: See the glossary for a definition of the available data modes.

The **Database Version** frame contains the **Telemetry Database:** selection list. You can select a database version from this selection list.

Note: The database version selected here will be reflected on the validate dialog box. If the currently opened file has not been validated against the selected database on the **Set Data Mode and Database Version** dialog box, the **Validate** dialog box will be invoked giving you the option to validate the configuration file.



Chapter 16:
EHS Data Generation (EDG) Software

This chapter describes the four Huntsville Operations Support Center (HOSC) applications which are part of the Enhanced HOSC System (EHS) Data Generation (EDG) software. The EDG suite of applications may be used for troubleshooting the system, training support, and producing data for advanced analysis. The EDG applications include:

- MSID Data Generation
- Serial Data Generator
- HOSC Packet Data Generator
- CCSDS Packet Data Generator

The MSID Data Generation application is used to create a file which identifies parameters whose values you would like to define and/or manipulate. The remaining applications are used to associate this file with a particular data stream and to identify the data stream's configuration.

16.1 MSID Data Generation Overview

The MSID Data Generation (MDG) Editor application provides the capability to build database-independent MSID files for any of the data generation applications in the EHS Data Generation

(EDG) software suite. For each MSID in the file, you can define an initial value, update feature, and delta value. You can also define the update rate, start time, and duration for each MSID. Once created, an MSID data file can be incorporated into any data stream or packet using the remaining EDG applications.

The MSID Data Generation Editor main window contains two distinct features that will be discussed in this chapter (see Figure 16-1, MSID Data Generation Editor main window):

- Menu bar
- Work area

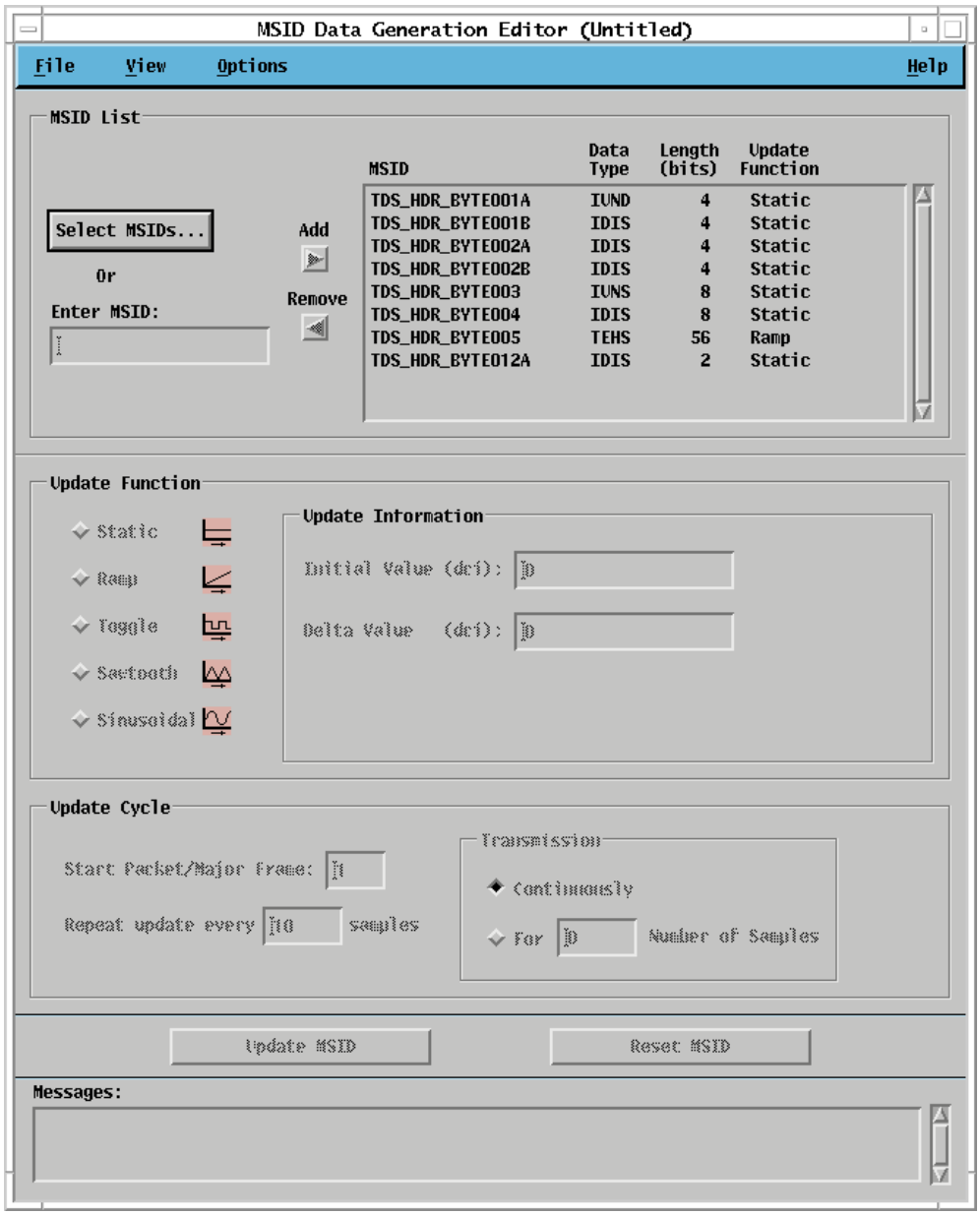


Figure 16-1, MSID Data Generation Editor main window.

16.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Update MSID
  Reset MSID

16.1.2 Work Area

The work area of the **MSID Data Generation Editor** main window contains several frames which allow you to define a list of MSIDs, their update functions, and the update cycle for the file.

The **MSID List** frame allows you to build a list of MSIDs to be defined and/or updated using one or more of the EDG applications. To enter an MSID into the list, you may either click Select MSIDs... or enter the MSID directly into the **Enter MSID:** input text field.

If you elect to click Select MSIDs... the **Select MSIDs** dialog box is invoked (see Figure 16-2, Select MSIDs dialog box).

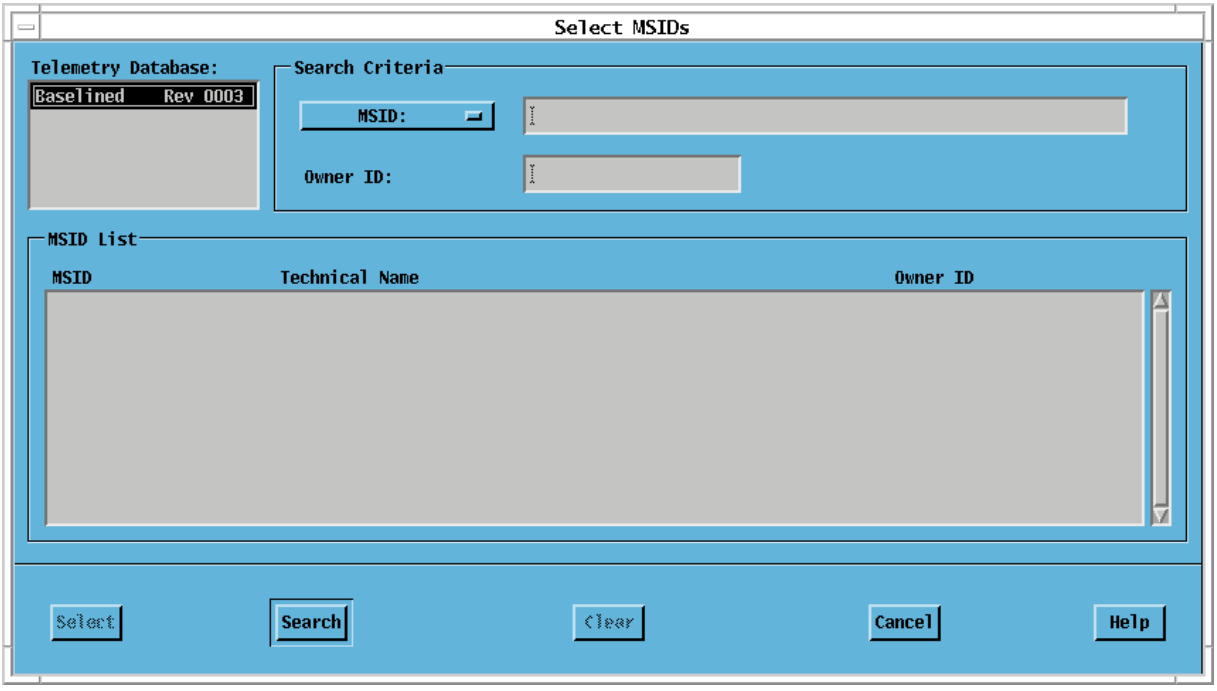


Figure 16-2, Select MSIDs dialog box.

The **Telemetry Database:** list defines all of the available telemetry databases (TDB) from which you may select your MSIDs. By default, the **Baselined** database is selected.

You can define criteria by which your MSID search is executed in the **Search Criteria** frame. You can search on the MSID name, the technical name, and/or the **Owner ID:**. You can select either **MSID:** or **Technical Name:** from the option menu button in this frame.

The **MSID List** frame on this dialog box will contain a list of MSIDs which match the search criteria you provide when you click

. Once a list is generated in this frame, you can double click on it to select it. You can also select multiple MSIDs in this frame by clicking on each MSID you wish to select.

Once you have selected an MSID either from the dialog box or by entering it directly, you can click on **Add** to add it to your list. The actual list contains four columns:

- **MSID** - the parameter you added to the list.
- **Data Type** - the data type of the parameter (e.g., IUNS). This information is extracted from the TDB.
- **Length (Bits)** - the length of the parameter in bits. This information is extracted from the TDB.
- **Update Function** - the update function defined for the parameter. You can change this function in the **Update Function** frame.

To remove a parameter from your list, click on the MSID in the list to highlight it and then click **Remove** .

The **Update Function** frame allows you to select an update function, an initial value, and an optional delta value (depending on the update function selected). Each of the functions will set the MSID to the **Initial Value** you supply and then updates the value accordingly. Each update function is associated with a icon that graphically demonstrates the purpose of the update function. The number of samples generated You can select from the following update functions:

- **Static** - causes the value of the MSID to remain at the initial value and neither increases nor decreases. The **Delta Value** component is unavailable when this update function is selected.
- **Ramp** - causes the value of the MSID to increment by the **Delta Value** until its positive peek is reached. The value then returns to its initial value and begins to ramp again. If the **Delta Value** is negative, the MSID value decrements until its negative peek is reached and then returns to the initial value.
- **Toggle -** causes the MSID to toggle between two values. The parameter toggles between the initial value and the **Delta Value**.
- **Sawtooth -** drives the value of the parameter in a sawtooth pattern from the initial value to the positive peek value, decrements to the peek negative value, and back again in increments determined by the **Delta Value**.

- **Sinusoidal -** drives the value of the parameter in a sine wave pattern from the initial value to the positive peek value, decrements to the peek negative value, and back again in increments determined by the **Delta Value**.

Note: Certain data types have limited update functions available to them. MSIDs which are defined as discrete integer (IDIS), undefined integers (IUND), and ASCII data types cannot use the Sawtooth or Sinusoidal update functions.

The **Update Cycle** frame allows you to provide the **Start Packet/Major Frame:** in which the first update takes place.

In the **Transmission** subframe, you can specify whether you want your update to be continuous or to terminate after a certain number of samples. To terminate the update, supply a value in the **For *xxxxxx* number of samples**. The default value is 0 (since **Continuously** is the default selection), but the number of samples can range from 0 to 999999.

16.1.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the MSID Data Generation application. The **Update MSID** and **Reset MSID** options from the **Options** menu will be discussed (see Figure 16-3, MDG Editor Options menu).

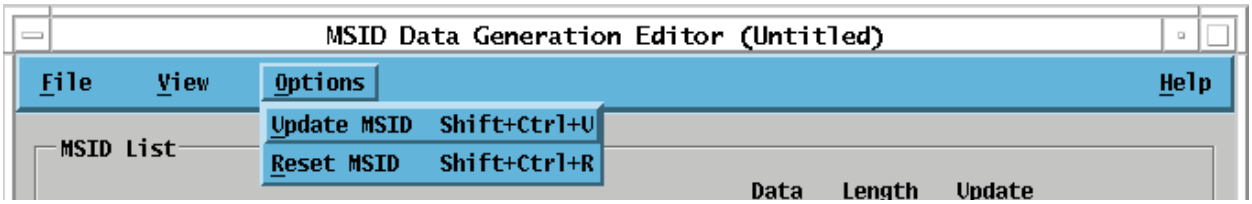


Figure 16-3, MDG Editor Options menu.

16.1.3.1 Update MSID

This menu item updates the currently selected MSID with the changes you made to the **Update Function** frame of the main window. The functionality of this menu item is reflected in the control panel pushbuttons.

Note: This item is only available when the an MSID is selected from the **MSID List** frame.

16.1.3.2 Reset MSID

Selecting this menu item resets the selected MSID to its original values. The update function will be come static and all initial and delta values will return to 0. The functionality of this menu item is reflected in the control panel pushbuttons.

Note: This item is only available when the an MSID is selected from the **MSID List** frame.

16.2 Serial Data Generator Overview

The Serial Data Generator (SDG) application provides the capability to generate Time Division Multiplexed (TDM), Operational Downlink (OD), and NASA Communications (NASCOM) 4800-bit block data streams and send this data to a front end processor via an Avtec serial device. SDG can incorporate data files created using the MSID Data Generation Editor to simulate changes in data. Streams generated by SDG are useful in testing, simulation, and training environments.

Although SDG can run on any workstation, you must execute the application on an EDG server or telemetry server (i.e., a system containing an Avtec serial device) in order for data to be distributed to workstations. If no Avtec device is present on the workstation running SDG, the stream can be written out to a file. A dialog box will appear when SDG is initiated alerting you to the lack of a Avtec serial device (see Figure 16-4, Avtec Device dialog box).

Figure 16-4, Avtec Device dialog box.

The Serial Data Generator main window contains two distinct features that will be discussed in this chapter (see Figure 16-5, Serial Data Generator main window):

- Menu bar
- Work area

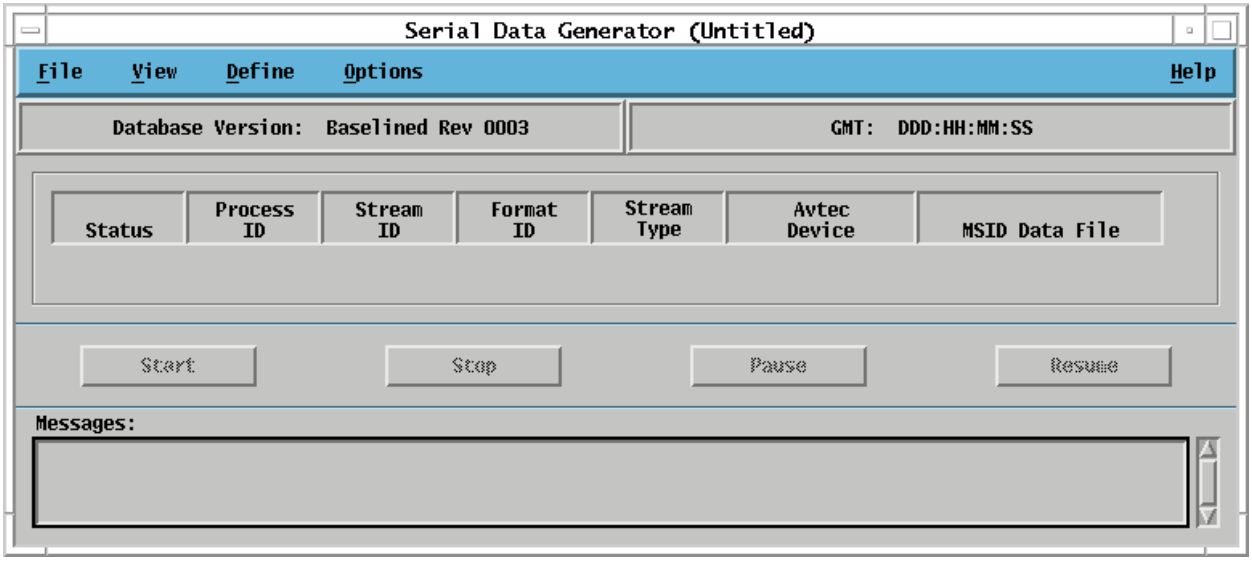


Figure 16-5, Serial Data Generator main window.

16.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Define**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Define** Menu
  - **Add Stream...**
  - **Delete Stream**
  - **Define Stream Format...**
  - **Set Stream Transmission...**
- **Options** Menu
  - **Start**
  - **Stop**
  - **Resume**
  - **Pause**
  - **View Stream...**
  - **Reinitialize MSID Data File...**
  - **View Start Stream Status...**
  - **Set Database Version...**

16.2.2 Work Area

The work area of the **Serial Data Generator** main window contains a stream list table. As you add streams to your SDG file, they will be displayed in this table. The table itself consists of seven columns:

- **Status**
- **Process ID**
- **Stream ID**
- **Format ID**
- **Stream Type**
- **Avtec Device**
- **MSID Data File**

The **Status** column indicates whether the stream is **Active** (i.e., the stream is flowing to the output device), **Inactive** (i.e., the stream is available but is not flowing to the output device) or **Paused** (i.e., active but not currently flowing data).

Streams are inactive by default and may be started by selecting the stream with your mouse and clicking

.

The **Process ID** column indicates the workstation process identification number that is generating the stream.

The **Stream ID** column indicates the stream identification number.

The **Format ID** column indicates the data format of the stream (e.g., OI data is format 129, OD data is format 102).

The **Stream Type** column indicates whether the stream is Time Division Multiplexed (**TDM**), Operational Downlink (**OD),** or NASCOM 4800-bit block (**NASCOM**).

The **Avtec Device** column indicates the Avtec serial board number on the telemetry server through which SDG will transmit its simulated stream. If no Avtec board is available on the workstation on which SDG is running, this column will remain blank.

The **MSID Data File** column indicates the filename of the MSID data file created with the MSID Data Generation Editor.

16.2.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Serial Data Generation application. All of the options from the **Define** and **Options** menu will be discussed (see Figure 16-6, Define and Options menus).

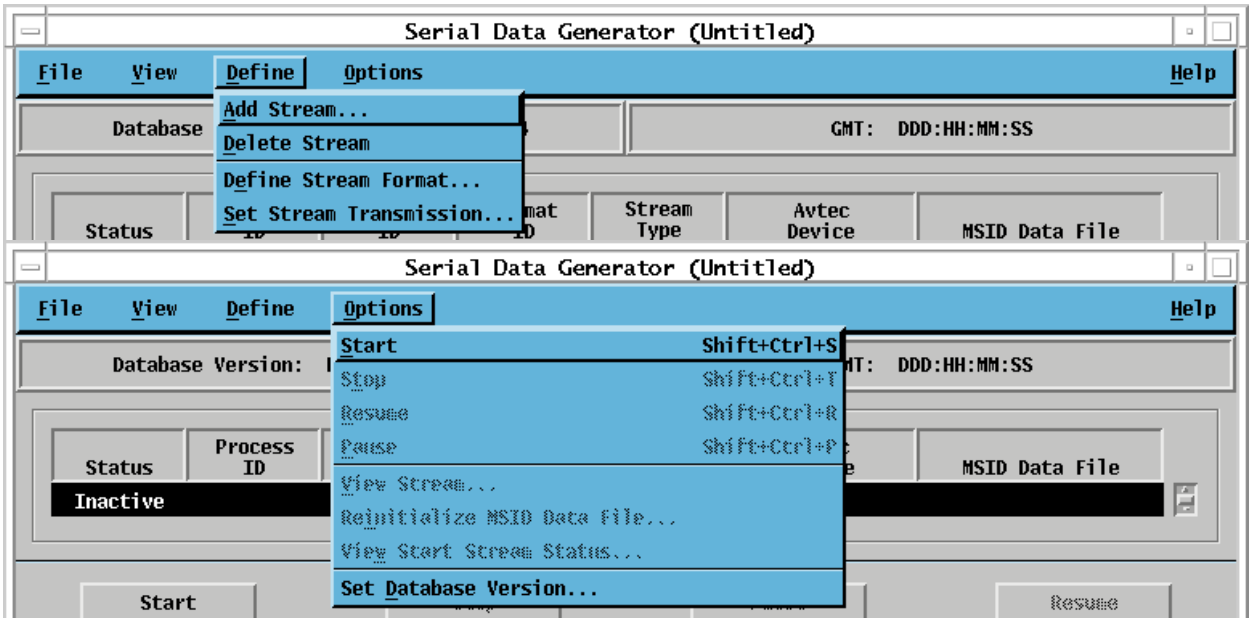


Figure 16-6, Define and Options menus.

16.2.3.1 Add Stream...

This menu item invokes a dialog box which allows you to select a stream and add it to your SDG file (see Figure 16-7, Add Stream dialog box). When the stream is selected, it is initially inactive. You may only select one stream at a time, but the dialog box does not close after you select a stream. This makes it easier for you to select multiple streams without having to re-invoke the dialog box itself.

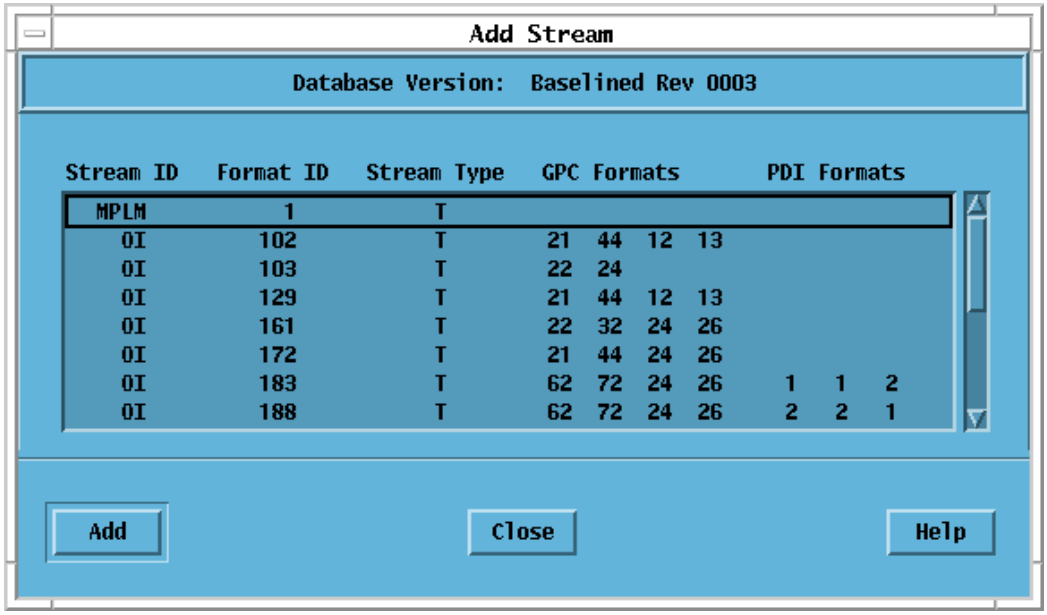


Figure 16-7, Add Stream dialog box.

The dialog box identifies the currently selected database version and contains a list of available streams. The list of streams contains the following information for each stream:

- **Stream ID** - identifies the stream by its content (i.e. OI, MPLM)
- **Format ID** - identifies the format of the stream (i.e. 102)
- **Stream Type** - indicates the type of data in the stream (i.e. TDM, OD, or NASCOM)
- **GPC Formats** - lists the General Purpose Computer (GPC) formats available in the stream
- **PDI Formats** - lists the Payload Data Interleaver (PDI) formats available in the stream

16.2.3.2 Delete Stream

Selecting this menu item deletes the selected stream from the SDG file. This menu item is insensitive until you select a stream from the **Serial Data Generator** main window's work area.

16.2.3.3 Define Stream Format...

This menu item invokes a dialog box which allows you to define the format data for a selected stream (see Figure 16-8, Define Stream Format Data dialog box). This allows you to modify the contents of a predefined stream.

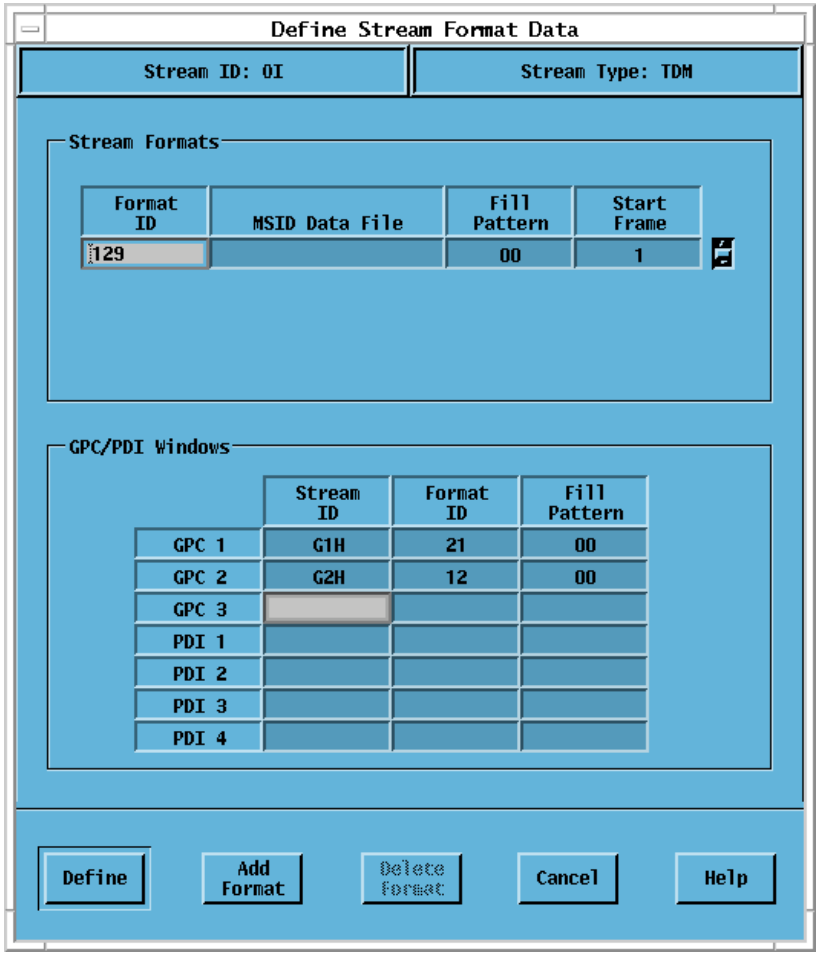


Figure 16-8, Define Stream Format Data dialog box.

The dialog box identifies the currently selected **Stream ID:** and **Stream Type:** in a status area. This information is reflected on the main window of the application as well.

The **Stream Formats** frame contains information about the data formats available in the selected stream. Some streams contain only one data format whereas other streams contain multiple formats. Four modifiable columns of information are displayed for each data format contained in the stream.

The **Format ID** column contains the stream format identification. By default this column will contain the stream format(s) that was predefined for the stream. You can enter an alternate stream format in this column to replace the default stream format.

The **MSID Data File** column identifies the MSID data file (if any) that is associated with the data format. By default, no data file is associated with the stream. You can create data files using EDG's MSID Data Generation Editor application.

Tip: Right-clicking your mouse with a cell in the **MSID Data File** column selected will open a list of MSID files from which you can select.

The **Fill Pattern** column identifies the value of the fill pattern that will be used to populate the values of the data stream. If no MSID data file is associated to ramp MSID values, then the stream generated by SDG will contain the fill pattern value. The fill pattern will be used as the value of any MSID in the stream that is not ramped by an MSID data file.

The **Start Frame** column indicates the starting major frame for which that data format will be added to the simulated stream.

If the selected stream contains General Purpose Computer (GPC) and/or Payload Data Interleave (PDI) windows, a second frame (the **GPC/PDI Windows** frame) will appear on the dialog box. This frame contains a 3-column modifiable table which contains **Stream ID**, **Format ID**, and **Fill Pattern** information about each GPC and PDI window.

16.2.3.4 Set Stream Transmission...

This menu item invokes a dialog box which allows you to set the stream transmission parameters for a selected stream (see Figure 16-9, Set Stream Transmission dialog box). You can determine the duration of the stream transmission, input to the stream, and stream destination information such as the target Avtec device.

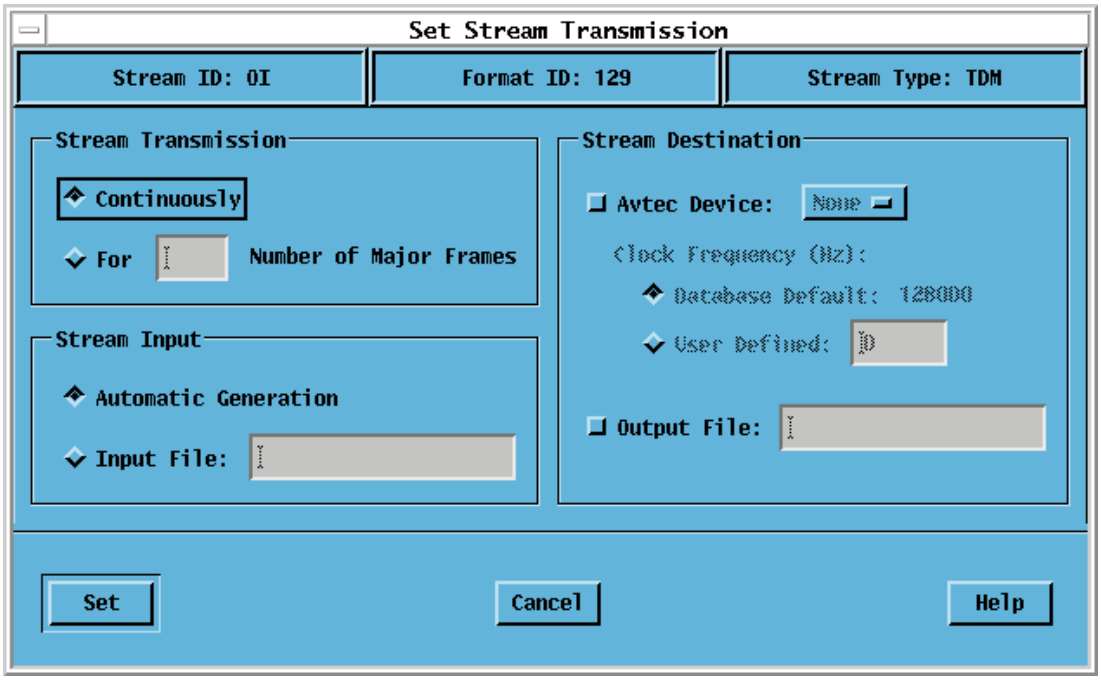


Figure 16-9, Set Stream Transmission dialog box.

The dialog box identifies the currently selected **Stream ID:**, **Format ID:**, and **Stream Type:** in a status area. This information is reflected on the main window of the application as well.

The **Stream Transmission** frame allows you to choose whether you wish to transmit the stream continuously or for a certain number of major frames. Select the **Continuously** toggle button to transmit the stream without terminating. Otherwise, you can supply a number of major frames in the **For** *x* **Number of Major Frames** toggle button and the stream will terminate transmission after that number of major frames has been transmitted.

The **Stream Input** frame allows you to choose whether you want your stream to be generated automatically or by using an input file. Selecting **Automatic Generation** causes the stream to be generated with a specific fill pattern. By selecting the **Input File:** toggle button and supplying a data input file, you can generate a stream with values pulled from the input file.

The **Stream Destination** frame allows you to select an Avtec device for transmission (when available), alter the transmission clock, or specify an output file to receive the output of the stream.

If no Avtec devices are available, the **Avtec Device:** toggle button will not be sensitive. If you toggle this selection, a pulldown menu containing a list of all available Avtec devices on the server will be available. You can choose the transmit board from this selection list. You may also elect to use the **Database Default:** clock frequency for this board or you can specify a **User Defined:** clock frequency.

If no Avtec device is available or if you wish to log a stream file directly, you can create an **Output File:** by selecting that toggle button and providing a file name.

16.2.3.5 Start

This menu item starts the transmission of the currently selected stream. A stream must be inactive in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.2.3.6 Stop

Selecting this menu item stops the transmission of the currently selected stream. A stream must be active in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.2.3.7 Resume

Selecting this menu item resumes the transmission of the currently selected stream. A stream must be paused in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.2.3.8 Pause

This menu item pauses the transmission of an active stream. Transmission may be resumed from the paused state without the timing and setup involved in starting a stream. Also, any MSID ramping controlled by an attached MSID data file will resume where it left off rather than reinitializing. This menu item is only available when the currently selected stream is active. The functionality of this menu item is reflected in the control panel pushbuttons.

16.2.3.9 View Stream...

Selecting this menu item invokes a dialog box which allows you to view the contents of the selected data stream (see Figure 16-10, View Stream dialog box).

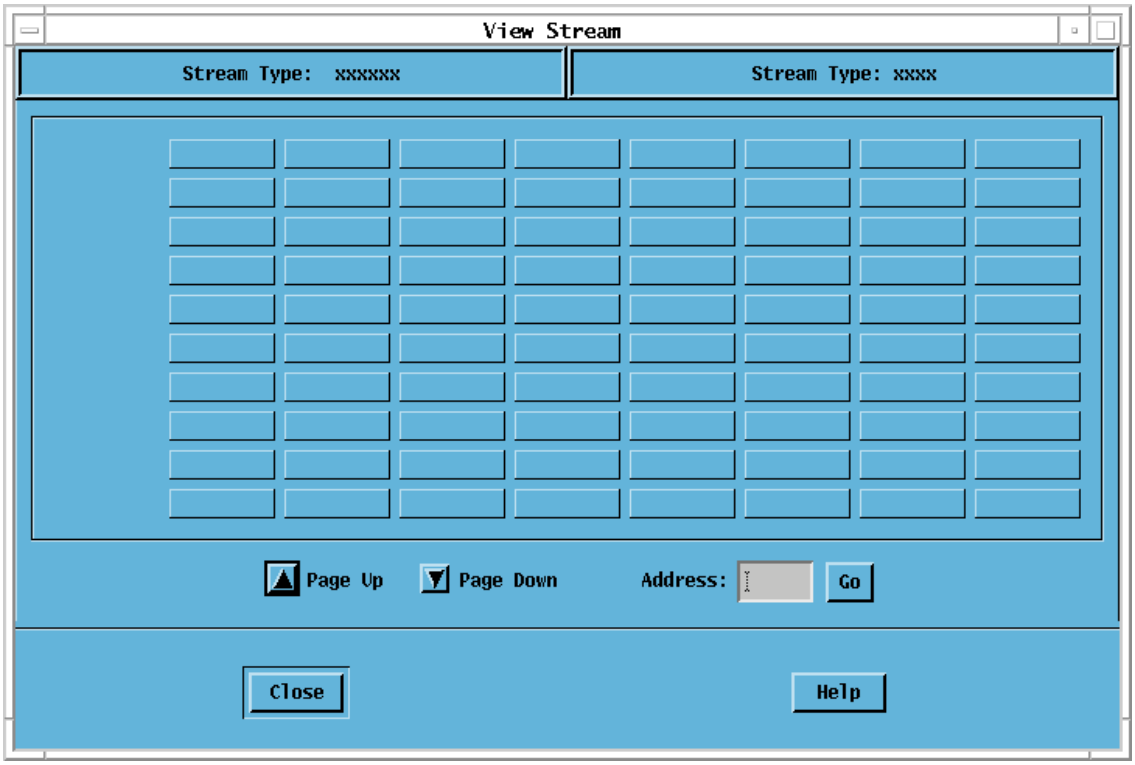


Figure 16-10, View Stream dialog box.

Dialog box description is TBS.

16.2.3.10 Reinitialize MSID Data File...

This menu item invokes a dialog box which allows you to select a new MSID data file or reinitialize the currently active MSID data file (see Figure 16-11, Reinitialize MSID Data File dialog box).

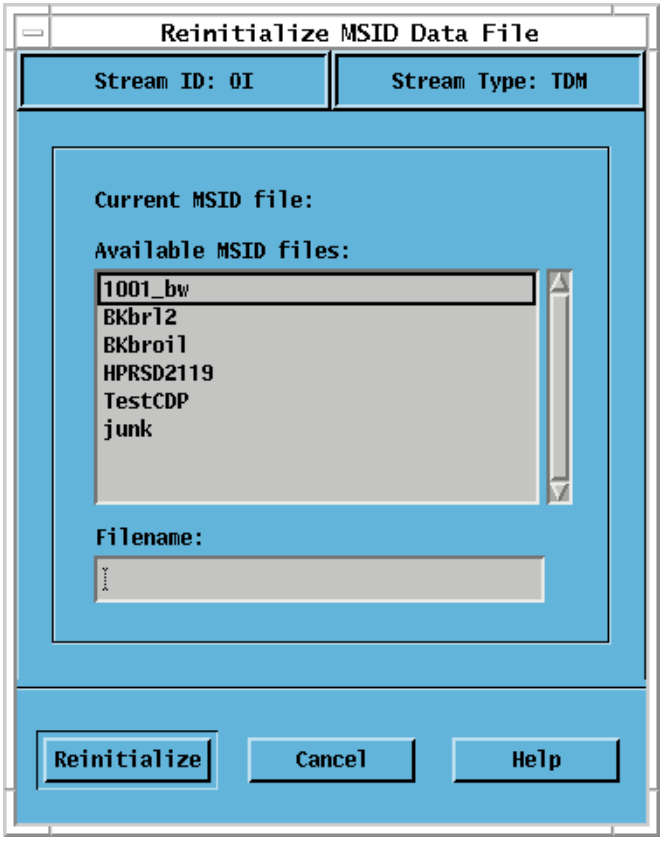


Figure 16-11, Reinitialize MSID Data File dialog box.

The dialog box identifies the currently selected **Stream ID:** and **Stream Type:** in a status area. This information is reflected on the main window of the application as well.

You can select the **Current MSID file:** from the list of **Available MSID files:** or by entering the filename in the **Filename:** input data field. You can either select the current MSID file or you can choose a new file.

16.2.3.11 View Start Stream Status...

This menu item invokes a dialog box which allows you to view stream startup information about the currently selected stream (see Figure 16-12, View Start Stream Status dialog box).

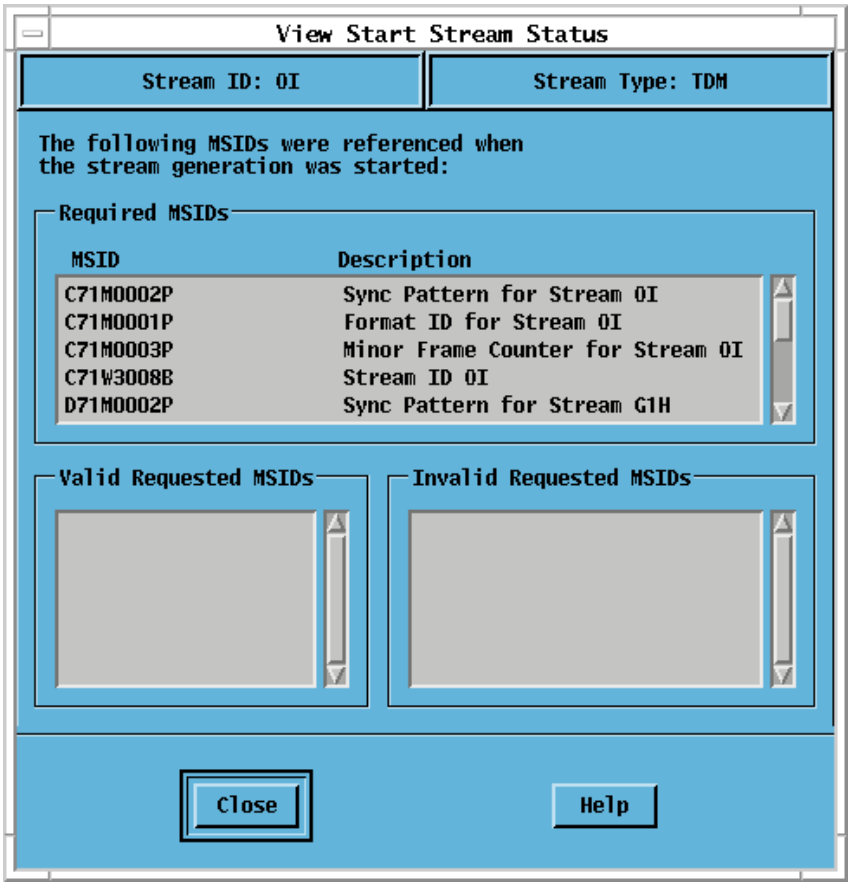


Figure 16-12, View Start Stream Status dialog box.

The dialog box identifies the currently selected **Stream ID:** and **Stream Type:** in a status area. This information is reflected on the main window of the application as well.

There are three lists of MSIDs which are referenced by a stream. These lists include:

- **Required MSIDs** - lists all MSIDs that are required for generating the selected stream. The table lists each MSID and its description or technical name. These MSIDs are automatically accessed when you select the stream.
- **Valid Requested MSIDs** - lists all MSIDs from the optional MSID data file that are valid for the selected stream and database. If you have not attached an MSID data file to the stream, this list will be blank.
- **Invalid Requested MSIDs** - lists all MSIDs from the optional MSID data file are not valid for the stream or database. If you have not attached an MSID data file to the stream, this list will be blank. If any MSIDs appear in this list, the parameters represented by those MSIDs are not generated as part of the data stream.

16.2.3.12 Set Database Version...

This menu item allows you to select the database version against which the data stream will run (see Figure 16-13, Set Database Version dialog box).

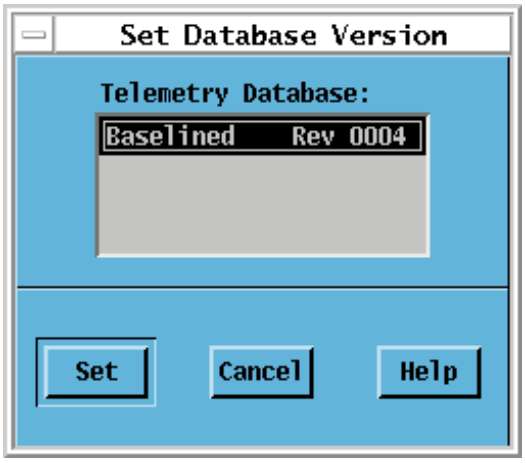


Figure 16-13, Set Database Version dialog box.

The dialog box contains the **Telemetry Database:** selection list from which you can choose a database version. By default, the **Baselined** database version is selected. When available, you can choose from an **Archived** database and/or a **Pre-released** database.

Help: See the glossary for a definition of these terms.

16.3 HOSC Packet Data Generator Overview

The HOSC Packet Data Generator (HDG) application provides the capability to generate encapsulated HOSC data packets, such as the encapsulated Time Division Multiplexed (TDM) major frame. HDG can then distribute (i.e., multicast) these packets amongst EHS workstations that are configured to a common project and operational mode. HDG can incorporate data files created using the MSID Data Generation Editor to simulate changes in data. Packets generated by HDG are useful in testing, simulation, and training environments.

The HOSC Packet Data Generator main window contains two distinct features that will be discussed in this chapter (see Figure 16-14, HOSC Packet Data Generator main window):

- Menu bar
- Work area

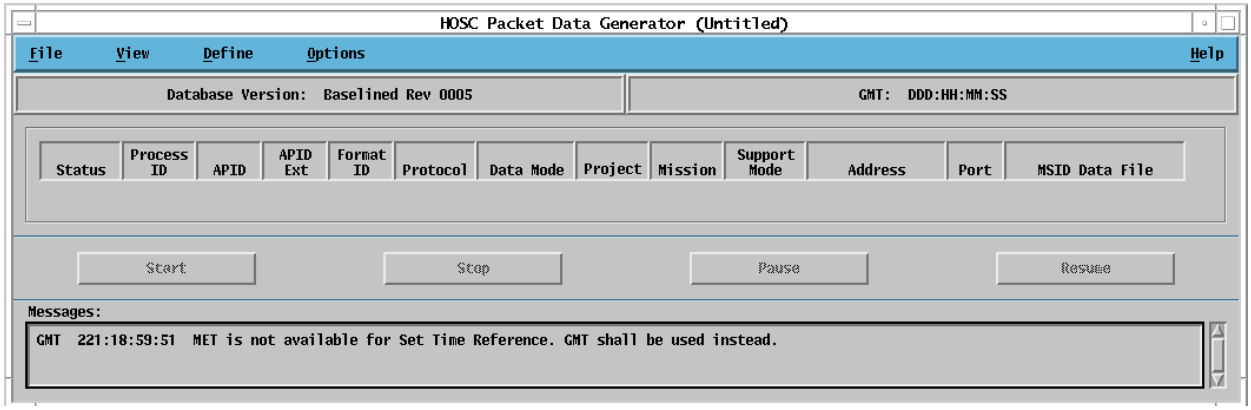


Figure 16-14, HOSC Packet Data Generator main window.

16.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Define**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in Section 16.4.3, Application Essentials are:

- **Define** Menu
  - **Add Packet...**
  - **Delete Packet**
  - **Set Packet Transmission...**
  - **Define Packet Format...**
  - **Define Random Subset...**
  - **Set LOS Packet Transmission...**
  - **Modify Primary Header...**
  - **Modify Secondary Header...**
  - **Modify CCSDS Header...**
- **Options** Menu
  - **Start**
  - **Stop**
  - **Pause**
  - **Resume**
  - **View Stream...**
  - **Reinitialize MSID Data File...**
  - **View Start Packet Status...**
  - **Set Database Version...**

16.3.2 Work Area

The work area of the **HOSC Packet Data Generator** main window contains a packet list table. As you add packets to your HDG file, they will be displayed in this table. The table itself consists of twelve or thirteen columns:

- **Status**
- **Process ID**
- **APID**
- **APID Ext** - not available when using EHS Protocol Version 1.
- **Format ID**
- **Protocol**
- **Data Mode**
- **Project**
- **Mission**
- **Support Mode**
- **Address**
- **Port**
- **MSID Data File**

The **Status** column indicates whether the packet is **Active** (i.e., the packet is being generated), **Inactive** (i.e., the packet is available but is not being generated) or **Paused** (i.e., active but not currently updating).

Packets are inactive by default and may be started by selecting the packet with your mouse and clicking

.

The **Process ID** column indicates the workstation process identification number that is generating the packet.

The **APID** column indicates the Application Process Identifier (APID). Used in CCSDS packet headers, the APID uniquely identifies the vehicle that creates the source packet.

The **APID Ext** column, which appears only when using EHS Protocol Version 2 packet transmission, indicates the APID extension associated with the packet.

The **Format ID** column indicates the data format of the packet (e.g., OI data is format 129, OD data is format 102).

The **Protocol** column indicates whether the stream is encapsulated Time Division Multiplexed (**T**), TDS time packets (**D**), encapsulated NASCOM 4800-bit block (**B**), CCSDS Core (**C**), or CCSDS Payload (**P**).

The **Data Mode** column indicates which data mode packets are being distributed under (i.e., Real-time).

The **Project** column indicates the project for which the packets are being generated (i.e., **ISS**).

The **Mission** column indicates the mission for which the packets are being generated (i.e., **TST1**).

The **Support Mode** column indicates the support mode under the current project and mission for which the packets are being generated (i.e., **Flight**).

The **Address** column indicates the IP address of the packet routing device to which the packets will be networked. Default packet routing is defined by the System Monitor and Control (SMAC) software.

The **Port** column indicates the network port through which the packet is to be generated.

The **MSID Data File** column indicates the filename of the MSID data file created with the MSID Data Generation Editor.

16.4 CCSDS Packet Data Generator Overview

The CCSDS Packet Data Generator (CDG) application provides the capability to generate Consultative Committee for Space Data Systems (CCSDS) core and payload data packets in a form acceptable by Payload Data System Services (PDSS). CDG can distribute (i.e., multicast) these packets to PDSS via the PDSS protocol converter, which is CDG's default target. CDG can incorporate data files created using the MSID Data Generation Editor to simulate changes in data. Packets generated by CDG are useful in testing, simulation, and training environments.

The CCSDS Packet Data Generator main window contains two distinct features that will be discussed in this chapter (see Figure 16-15, CCSDS Packet Data Generator main window):

- Menu bar
- Work area

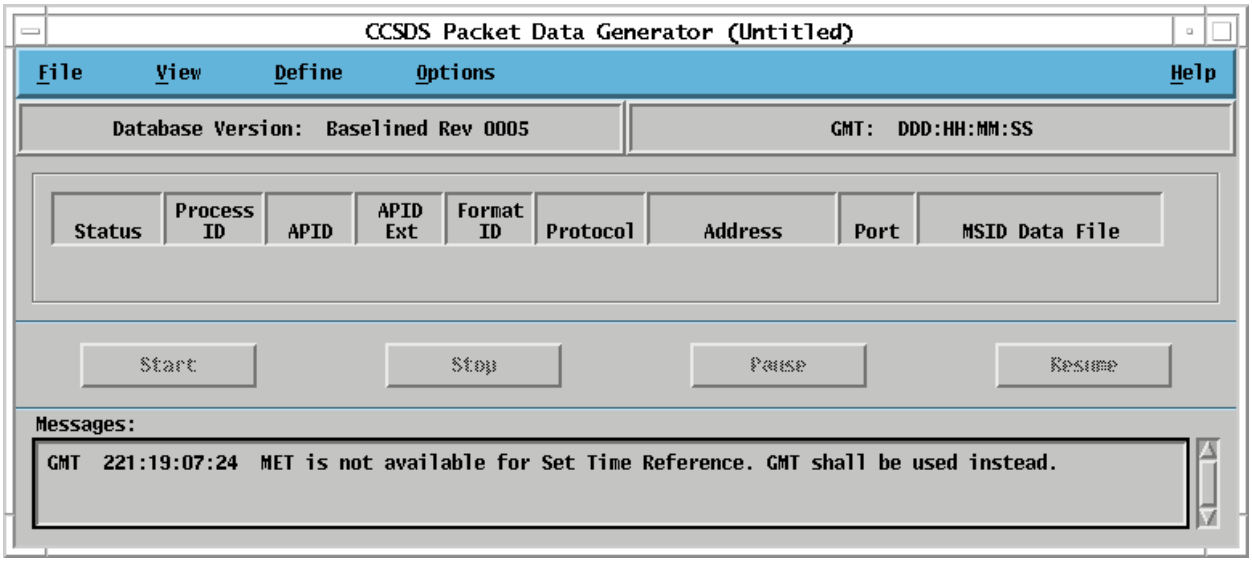


Figure 16-15, CCSDS Packet Data Generator main window.

16.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Define**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in Section 16.4.3, Application Essentials are:

- **Define** Menu
  - **Add Packet...**
  - **Delete Packet**
  - **Set Packet Transmission...**
  - **Define Packet Format...**
  - **Define Random Subset...**
  - **Modify CCSDS Header...**
- **Options** Menu
  - **Start**
  - **Stop**
  - **Pause**
  - **Resume**
  - **View Stream...**
  - **Reinitialize MSID Data File...**
  - **View Start Packet Status...**
  - **Set Database Version...**

16.4.2 Work Area

The work area of the **CCSDS Packet Data Generator** main window contains a packet list table. As you add packets to your CDG file, they will be displayed in this table. The table itself consists of nine columns:

- **Status**
- **Process ID**
- **APID**
- **APID Ext**
- **Format ID**
- **Protocol**
- **Address**
- **Port**
- **MSID Data File**

The **Status** column indicates whether the packet is **Active** (i.e., the packet is being generated), **Inactive** (i.e., the packet is available but is not being generated) or **Paused** (i.e., active but not currently updating).

Packets are inactive by default and may be started by selecting the packet with your mouse and clicking

.

The **Process ID** column indicates the workstation process identification number that is generating the packet.

The **APID** column indicates the Application Process Identifier (APID). The APID uniquely identifies the vehicle that creates the source packet.

The **APID Ext** column indicates the APID extension associated with the packet.

The **Format ID** column indicates the data format of the packet (e.g., OI data is format 129, OD data is format 102).

The **Protocol** column indicates whether the stream is CCSDS Core (**C**) or CCSDS Payload (**P**).

The **Address** column indicates the IP address of the packet routing device to which the packets will be networked. Because CDG is specifically designed for interfacing with the PDSS, the address is cannot be modified.

The **Port** column indicates the network port through which the packet is to be generated. This value, like the address, cannot be modified.

The **MSID Data File** column indicates the filename of the MSID data file created with the MSID Data Generation Editor.

16.4.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the HOSC Packet Data Generator and the CCSDS Packet Data Generator applications. All of the options from the **Define** and **Options** menus will be discussed (see Figure 16-16, HOSC Packet Data Generator Define and Options menus and Figure 16-17, CCSDS Packet Data Generator Define and Options menus).

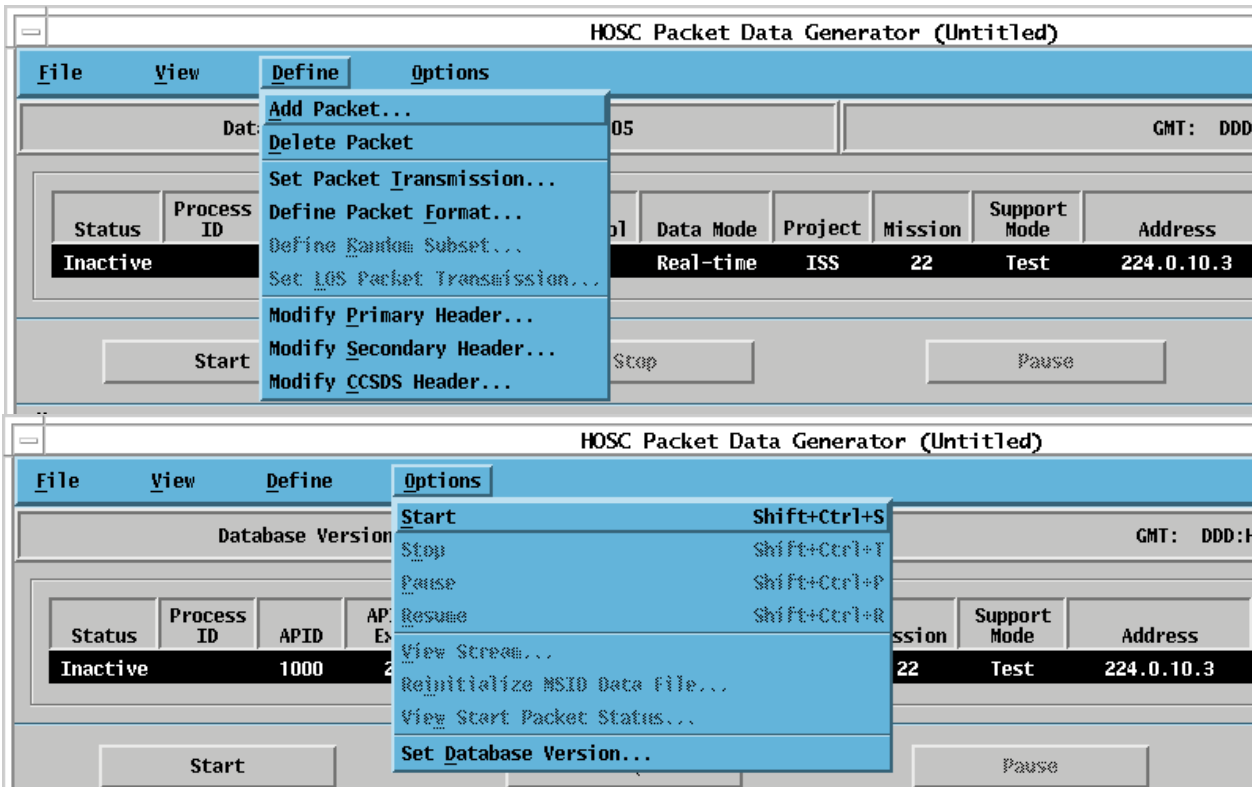


Figure 16-16, HOSC Packet Data Generator Define and Options menus.

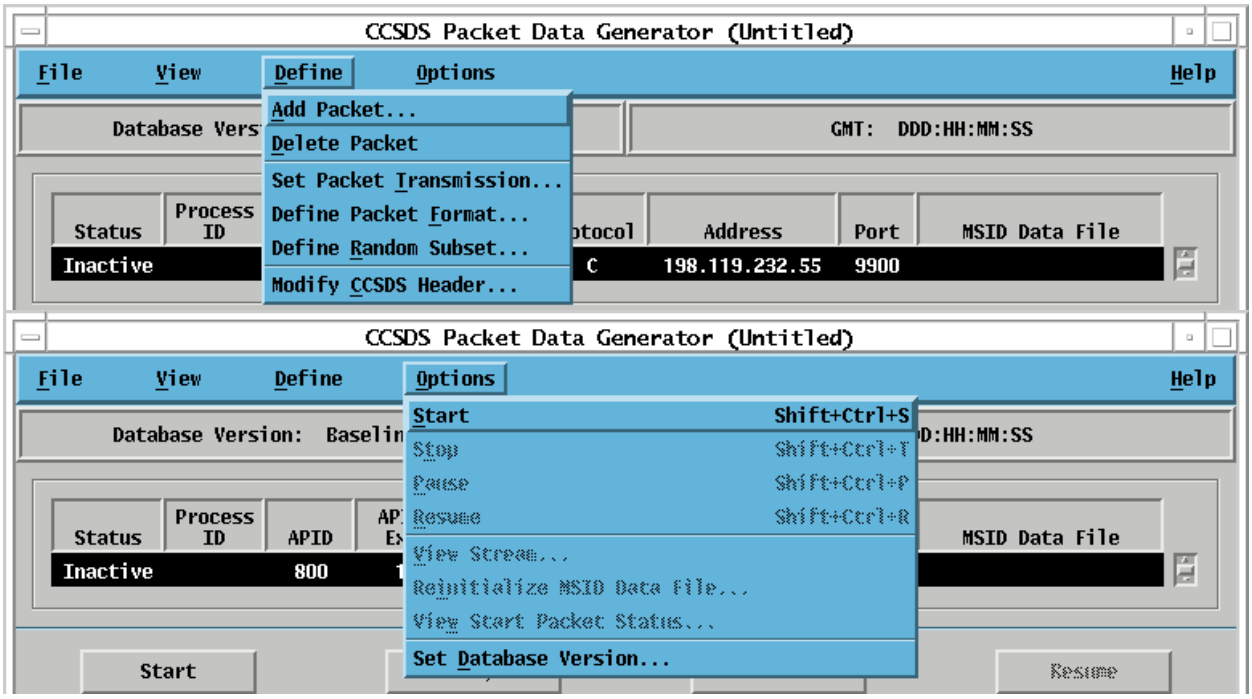


Figure 16-17, CCSDS Packet Data Generator Define and Options menus.

16.4.3.1 Add Packet...

This menu item invokes a dialog box which allows you to select a packet and add it to your HDG file (see Figure 16-18, Add Packet dialog box). When the packet is selected, it is initially inactive. You may only select one packet at a time, but the dialog box does not close after you select a packet. This makes it easier for you to select multiple packets without having to re-invoke the dialog box itself.

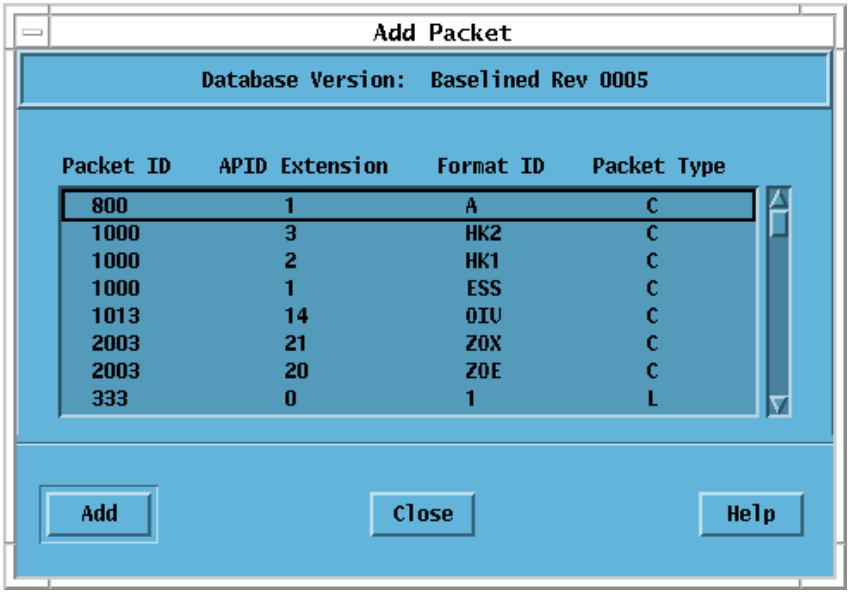


Figure 16-18, Add Packet dialog box.

The dialog box identifies the currently selected database version and contains a list of available packets. The list of packets contains the following information for each packet:

- **Packet ID** - identifies the packet by its content (i.e. OI, MPLM)
- **APID Extension** - identifies the APID extension associated with the packet (for EHS protocols other than version 1)
- **Format ID** - identifies the format of the packet (i.e. 102)
- **Packet Type** - indicates the type of data in the packet (i.e. TDM, NASCOM, CCSDS Core, or CCSDS Payload)

16.4.3.2 Delete Packet

Selecting this menu item deletes the selected packet from the HDG file. This menu item is insensitive until you select a packet from the **HOSC Packet Data Generator** main window's work area.

16.4.3.3 Set Packet Transmission...

This menu item invokes a dialog box which allows you to set the packet transmission parameters for a selected packet (see Figure 16-19, Set Packet Transmission dialog box). You can determine the duration of the packet transmission, input to the packet, and packet destination information such as the routing and port information.

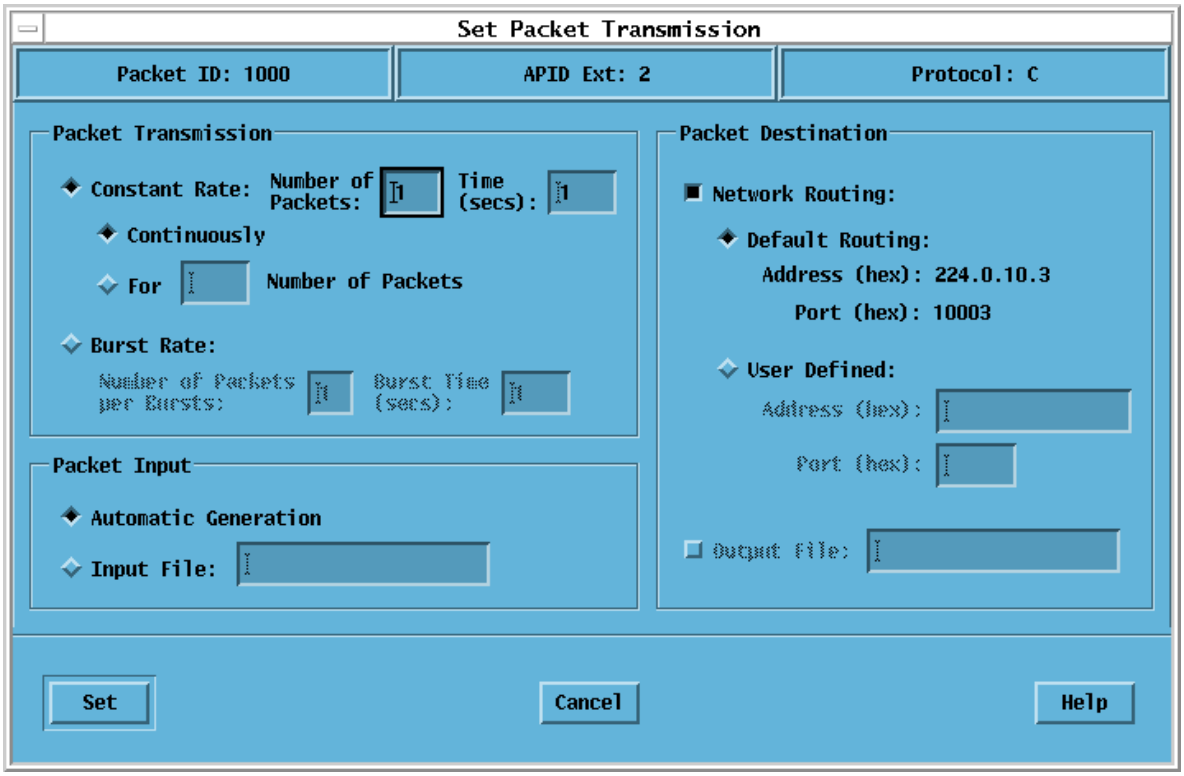


Figure 16-19, Set Packet Transmission dialog box.

The dialog box identifies the currently selected **Packet ID:**, **APID Ext:** (APID Extension), and **Protocol:** in a status area. This information is reflected on the main window of the application as well.

The **Packet Transmission** frame allows you to choose whether you wish to transmit the packet at a constant or burst rate. By toggling **Constant Rate:**, you can supply the **Number of Packets:** to be transmitted and the time interval (**Time (secs):**) in seconds during which those packets should be transmitted. For example, you can set HDG to transmit ten packets per second by entering **10** for **Number of Packets:** and **1** for **Time (secs):**.

You may also determine the duration of this constant rate transmission by selecting either a continuous transmission or for a certain number of major frames. Select the **Continuously** toggle button to transmit the packet without terminating. Otherwise, you can supply a number of major frames in the **For** *x* **Number of Major Frames** toggle button and the packet will terminate transmission after that number of major frames has been transmitted.

If you desire a **Burst Rate:** transmission, you can supply the **Number of Packets per Burst:** you wish to be transmitted along with the **Burst Time (secs):**. For example, to transmit fifty packets in five seconds, enter **50** for the **Number of Packets per Burst:** and **5** for **Burst Time (secs):**.

The **Packet Input** frame allows you to choose whether you want your packet to be generated automatically or by using an input file. Selecting **Automatic Generation** causes the packet to be generated with a specific fill pattern. By selecting the **Input File:** toggle button and supplying a data input file, you can generate a packet with values pulled from the input file.

The **Packet Destination** frame allows you to select an network routing address and port or to specify an output file to receive the output of the packet transmission.

If you choose to route the packets across the network, you can select the default routing information by toggling the **Default Routing:** button. The information for default routing is retrieved from the workstation's packet routing table. This information is set up by the Integrated Support Team (IST) using the System Monitor and Control (SMAC) software. Alternatively, you can provide a **User Defined:** IP address and port.

Selecting the **Output File:** toggle button and supplying a filename will allow you to record the packet transmission to a file on your workstation for further analysis.

16.4.3.4 Define Packet Format...

This menu item invokes a dialog box which allows you to define the format data for a selected packet (see Figure 16-20, Define Packet Format Data dialog box). This allows you to modify the contents of a predefined packet.

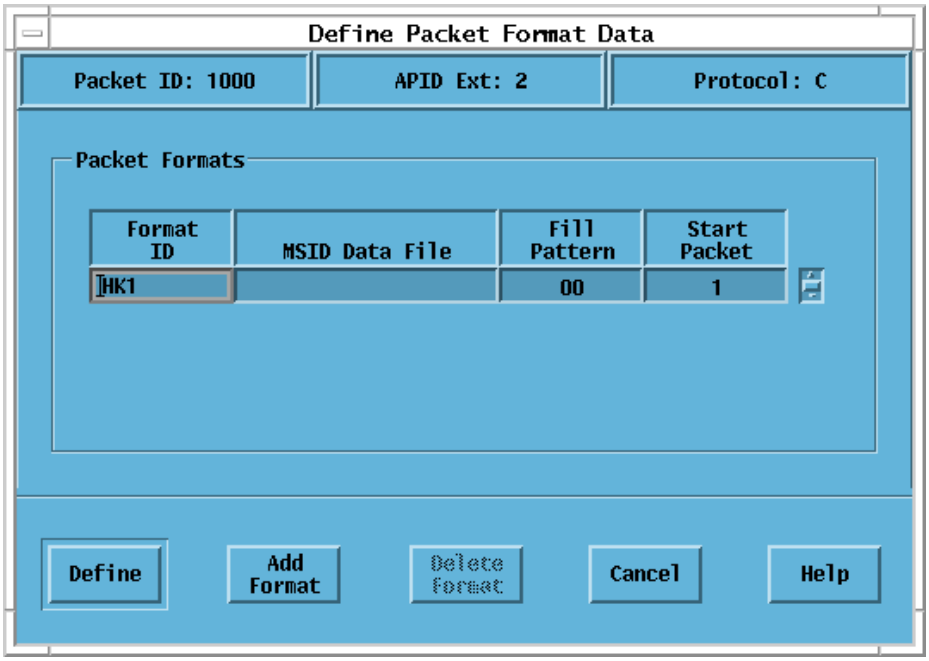


Figure 16-20, Define Packet Format Data dialog box.

The dialog box identifies the currently selected **Packet ID:**, **APID Ext:** (APID Extension), and **Protocol:** in a status area. This information is reflected on the main window of the application as well.

The **Packet Formats** frame contains information about the data formats available in the selected packet. Some packets contain only one data format whereas other packets contain multiple formats. Four modifiable columns of information are displayed for each data format contained in the packet.

The **Format ID** column contains the packet format identification. By default this column will contain the packet format(s) that was predefined for the packet. You can enter an alternate packet format in this column to replace the default packet format.

The **MSID Data File** column identifies the MSID data file (if any) that is associated with the data format. By default, no data file is associated with the packet. You can create data files using EDG's MSID Data Generation Editor application.

Tip: Right-clicking your mouse while in a cell under the **MSID Data File** column will open a list of MSID data files from which you can select.

The **Fill Pattern** column identifies the value of the fill pattern that will be used to populate the values of the data packet. If no MSID data file is associated to ramp MSID values, then the packet generated by HDG will contain the fill pattern value. The fill pattern will be used as the value of any MSID in the packet that is not ramped by an MSID data file.

The **Start Packet** column indicates the starting packet for which that data format will be added to the simulated packet.

16.4.3.5 Define Random Subset...

This menu item invokes a dialog box which allows you to set the random subset order for a selected packet (see Figure 16-21, Define Random Subset dialog box). This feature is available only for EHS protocols other than version 1 and if the packet/stream supports subsets.

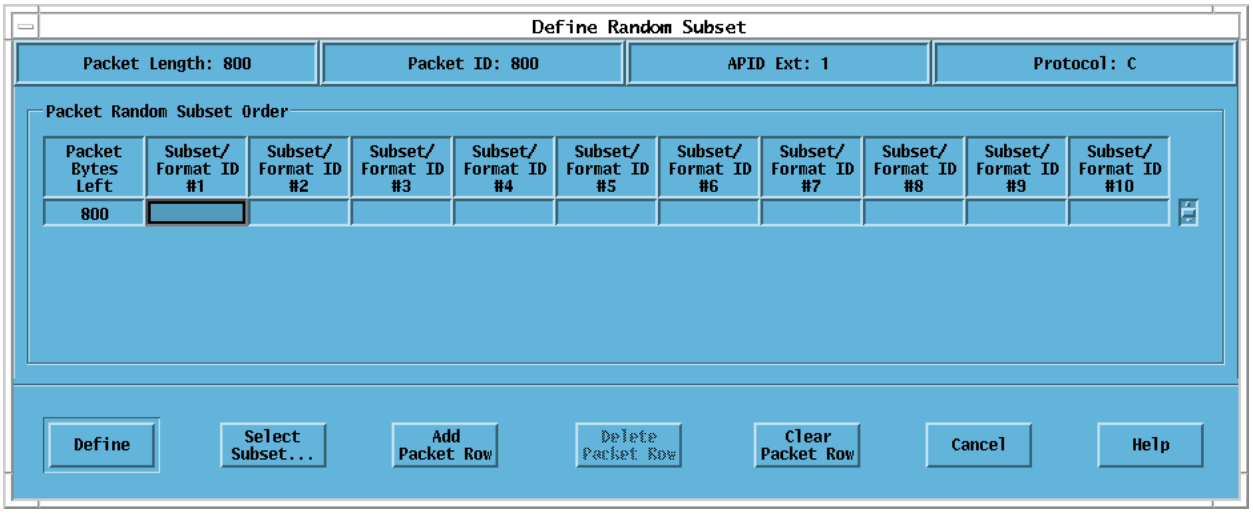


Figure 16-21, Define Random Subset dialog box.

The dialog box identifies the currently selected **Packet Length:**, **Packet ID:**, **Format ID:**, and **Packet Type:** in a status area. This information, with the exception of the packet length, is reflected on the main window of the application as well. The **Packet Length:** indicates the number of bytes contained in the packet.

The **Packet Random Subset Order** frame allows you to select a number of subsets for a selected packet, depending upon the size of the packet.

When the dialog box is first invoked, the **Packet Bytes Left** column contains the number of bytes in the packet. This number will be the same as the **Packet Length:**, which is identified in the status bar of the dialog box. As more subsets are defined for the packet, this number will decrement by the number of bytes contained in the subset. You may continue to define subsets until the packet bytes are exhausted.

To define a subset for the packet, click in the next available column labeled **Subset/Format ID #*x*** where *x* is a number from 1 to 10. With the cell selected, click your right mouse button to invoke a popup menu from which you can select a subset/format ID. You may also click

to make your selection.

Once a row if filled with subsets, you can click Add Packet Row to add another packet row to the table. There is a maximum of ten packet rows in the table.

16.4.3.6 Set LOS Packet Transmission...

Selection of the **Set LOS Packet Transmission...** menu option invokes the Set LOS Packet Transmission dialog box (see Figure 16-22, Set LOS Packet Transmission dialog box). This menu option provides the capability to transmit a Loss of Signal (LOS) packet when the selected data stream is stopped or paused.

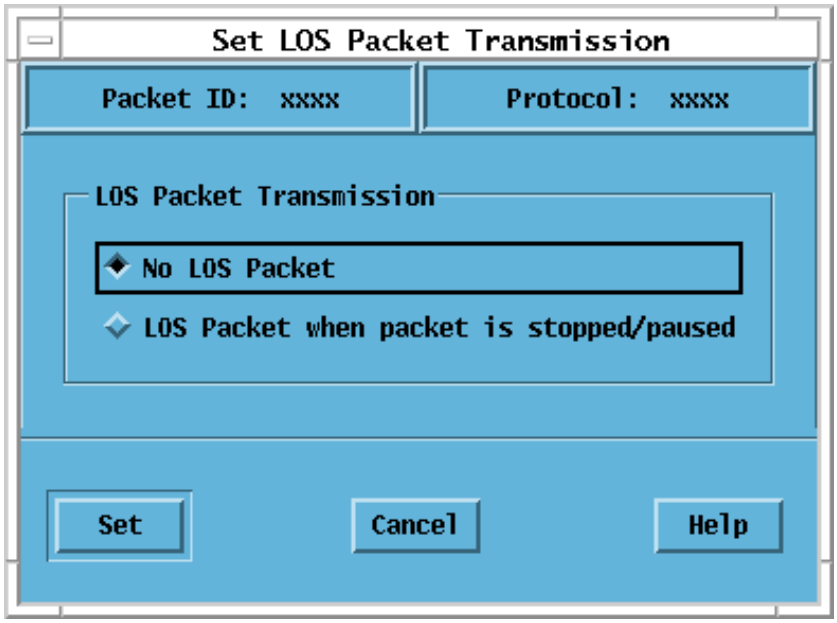


Figure 16-22, Set LOS Packet Transmission dialog box.

The Status Bar displays the **Packet ID:** and **Protocol:** for the packet selected on the Packet Data Generator main window.

The **LOS Packet Transmission** frame contains two radio buttons labeled **No LOS Packet** (the default) and **LOS Packet when packet is stopped/paused**. Selection of the latter will cause a LOS Packet to be transmitted when the selected packet transmission is either stopped or paused.

16.4.3.7 Modify Primary Header...

Selecting this menu item invokes a dialog box which allows you to modify the primary header information for the selected EHS packet (see Figure 16-23, Modify Primary Header dialog box).

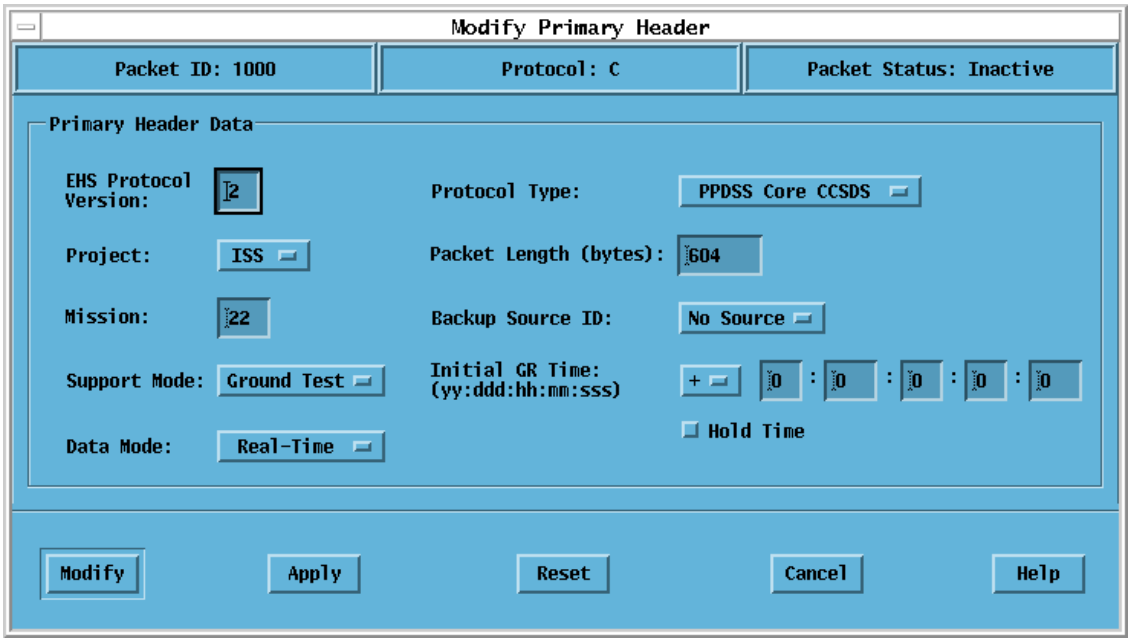


Figure 16-23, Modify Primary Header dialog box.

The dialog box identifies the currently selected packet's **Packet ID:**, **Protocol:**, and **Packet Status:**. This information is reflected in the main window's work area.

The **Primary Header Data** frame contains several input text fields and option menu buttons which allow you to view and modify primary header information for the selected packet.

You can select the **EHS Protocol Version:** for the packet by entering the version number in the associated input text field. Version 2 allows the use of APID extensions in a packet.

You can choose the **Project:** by clicking on the associated option menu button and making a selection from the popup menu that is invoked. Possible values include **All**, **STS**, **SL**, **ISS**, and **AXAF**.

The **Mission:** number can be entered in the associated input text field.

You can choose a **Development Mode:** by clicking on the associated option menu button and selecting from **All**, **Flight**, **Ground Test**, **Validation**, **Development**, **Training**, and **Off-line**.

The **Data Mode:** option menu button allows you to select the data mode in which the packet is transmitted. The possible values include **All**, **Real-Time**, **Dump 1-3**, and **Playback 1-11**.

You can click on the **Protocol Type:** option menu button to select the transmission protocol for the packet. Possible values include:

- **All**
- **TDM Telemetry**

- **NASCOM Block**
- **Pseudo Telemetry**
- **TDS Packet**
- **EHS Test Data**
- **GSE Packet**
- **Custom Data Packet**
- **HRDS DQ**
- **CSS**
- **AOS/LOS**
- **PDSS Payload CCSDS**
- **PDSS Core CCSDS**
- **PDSS BPDU**
- **PDSS UDSM**
- **PDSS RPSM**

The **Packet Length (bytes):** input text field is populated with the default length of the packet. You can modify the packet length by entering a new length value (in bytes) in this field.

The **Backup Source ID:** option menu button may be clicked on to select the backup packet source. Possible values include **No Source**, **Source A**, and **Source B**.

The initial ground receipt time for the packet can be defined in the **Initial GR Time: (yy:ddd:hh:mm:ss)** input text fields. The option menu button associated with this entry allows to you select a positive or negative time. You can supply the initial ground receipt time in the `yy:ddd:hh:mm:ss` format. Toggling the **Hold Time** button indicates TBS.

16.4.3.8 Modify Secondary Header...

Selecting this menu item invokes a dialog box which allows you to modify the secondary header information for a selected packet.

The features and contents of the dialog box varies depending on the type of packet selected. The following paragraphs describe the dialog box contents when you have selected a PDSS Core data packet (Protocol **C**) (see Figure 16-24, Modify Secondary Header - Protocol C dialog box).

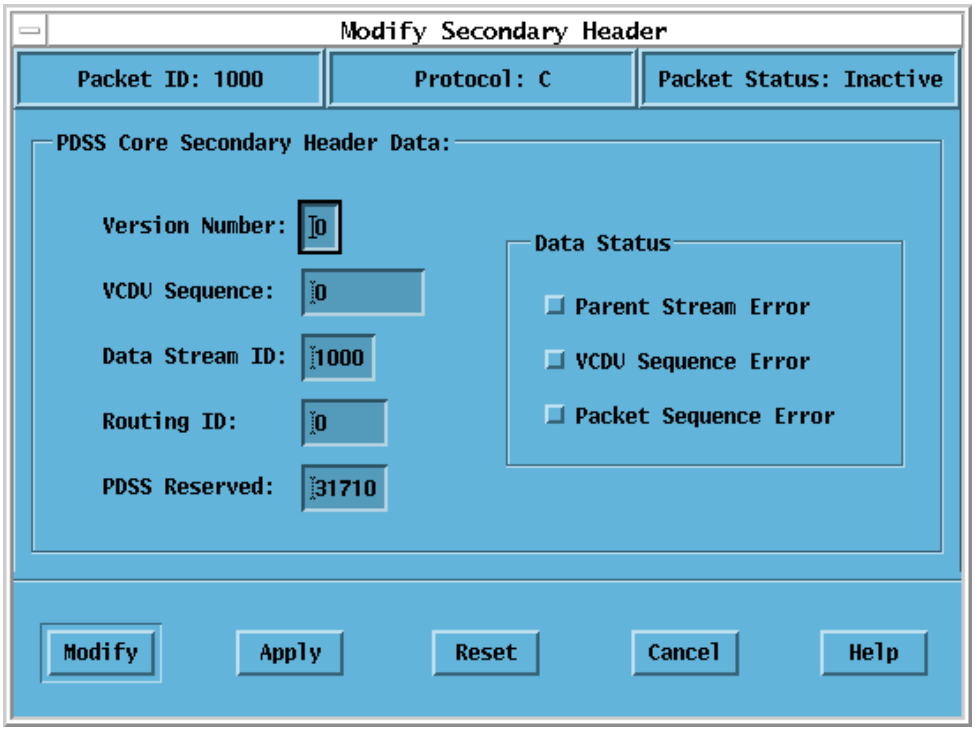


Figure 16-24, Modify Secondary Header - Protocol C dialog box.

The dialog box identifies the currently selected packet's **Packet ID:**, **Protocol:**, and **Packet Status:**. This information is reflected in the main window's work area.

The **PDSS Core Secondary Header Data:** frame contains five input text fields and the **Data Status** subframe, which contains three toggle buttons. Information that is default to the selected packet will populate the input text fields.

The five input text fields include:

- **Version Number:** - contains the version number of the packet. The default value is 0.
- **VCDU Sequence: -** indicates the sequence number of the packet in the counter. The default value is 0.
- **Data Stream ID:** - a four-digit data stream ID. The default value is 800.
- **Routing ID:** - indicates the routing ID for the packet. The default value is 0.
- **PDSS Reserved:** - a reserved piece of header information for PDSS. The default value is 31710.

The **Data Status** subframe allows you to select which error information should be included in the packet. You can select from **Parent Stream Error**, **VCDU Sequence Error**, and **Packet Sequence Error**.

The following paragraphs describe the dialog box contents when you have selected a NASCOM Block data packet (Protocol **B**) (see Figure 16-25, Modify Secondary Header - Protocol B dialog box).

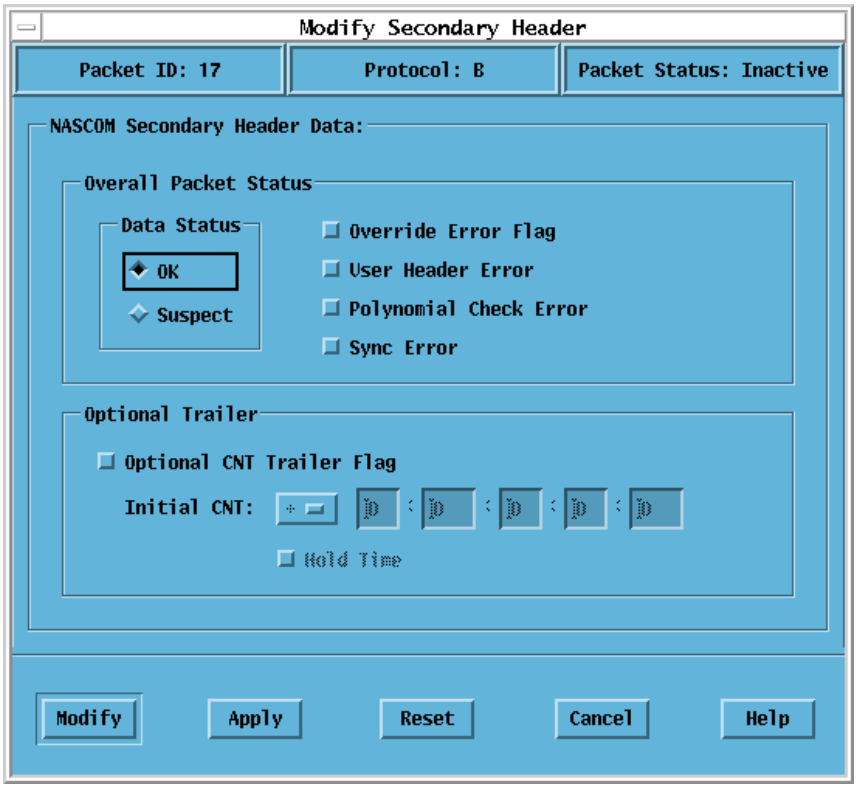


Figure 16-25, Modify Secondary Header - Protocol B dialog box.

The dialog box identifies the currently selected packet's **Packet ID:**, **Protocol:**, and **Packet Status:**. This information is reflected in the main window's work area.

The **NASCOM Secondary Header Data:** frame contains the **Overall Packet Status** and **Optional Trailer** subframes.

The **Overall Packet Status** subframe indicates whether the **Data Status** is **OK** or **Suspect**. Error status information can be toggled on or off, including:

- **Override Error Flag**
- **User Header Error**
- **Polynomial Check Error**
- **Sync Error**

The **Optional Trailer** subframe information includes the **Optional CNT Trailer Flag:**. When toggled, the optional countdown time trailer in the NASCOM protocol will be included in the header. If you toggle on this flag, you can supply an initial countdown time.

The following paragraphs describe the dialog box contents when you have selected a PDSS Payload data packet (Protocol **L**) (see Figure 16-26, Modify Secondary Header - Protocol L dialog box).

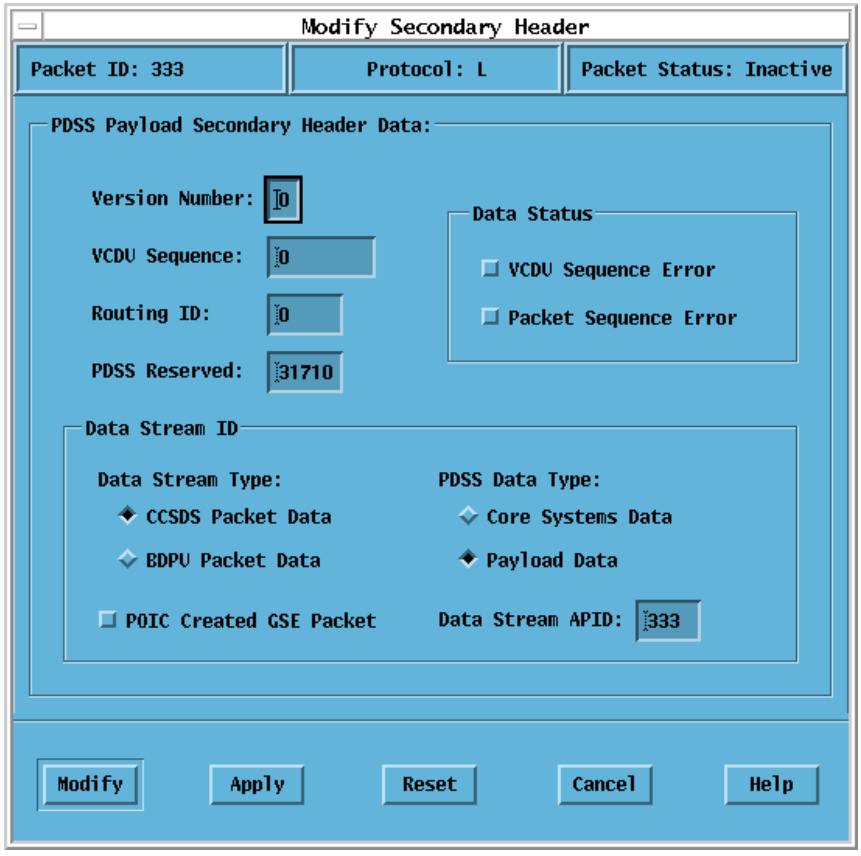


Figure 16-26, Modify Secondary Header - Protocol L dialog box.

The dialog box identifies the currently selected packet's **Packet ID:**, **Protocol:**, and **Packet Status:**. This information is reflected in the main window's work area.

The **PDSS Payload Secondary Header Data:** frame contains four input text fields and the **Data Status** subframe, which contains two toggle buttons. Information that is default to the selected packet will populate the input text fields.

The four input text fields include:

- **Version Number:** - contains the version number of the packet. The default value is 0.
- **VCDU Sequence: -** indicates the sequence number of the packet in the counter. The default value is 0.
- **Routing ID:** - indicates the routing ID for the packet. The default value is 0.
- **PDSS Reserved:** - a reserved piece of header information for PDSS. The default value is 31710.

The **Data Status** subframe allows you to select which error information should be included in the packet. You can select from **VCDU Sequence Error** and **Packet Sequence Error**.

The **Data Stream ID** frame allows you to select the **Data Stream Type:** (**CCSDS Data Packet** or **BDPV Data Packet**) and the **PDSS Data Type:** (**Core Systems Data** or **Payload Data**).

The following paragraphs describe the dialog box contents when you have selected a TDM data packet (Protocol **T**) (see Figure 16-27, Modify Secondary Header - Protocol T dialog box).

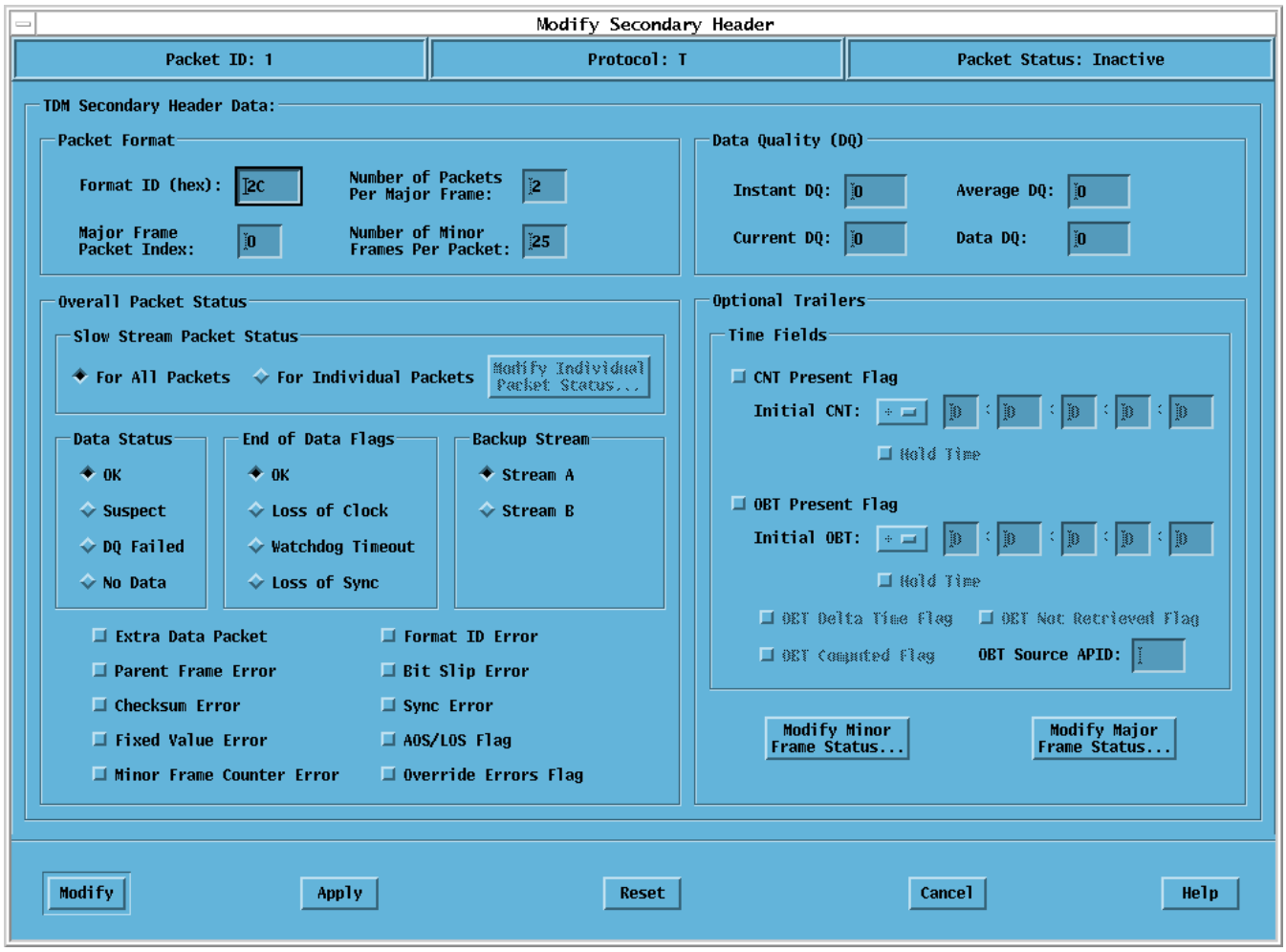


Figure 16-27, Modify Secondary Header - Protocol T dialog box.

Description of the above screen is TBS.

16.4.3.9 Modify CCSDS Header...

Selecting this menu item invokes a dialog box which allows you to modify the primary header information for the selected CCSDS packet (see Figure 16-28, Modify CCSDS Header dialog box). The dialog box functions somewhat differently for TDM packets. The following paragraphs describe the functionality of the dialog box for Payload (**L**) and Core (**C**) protocol CCSDS packets.

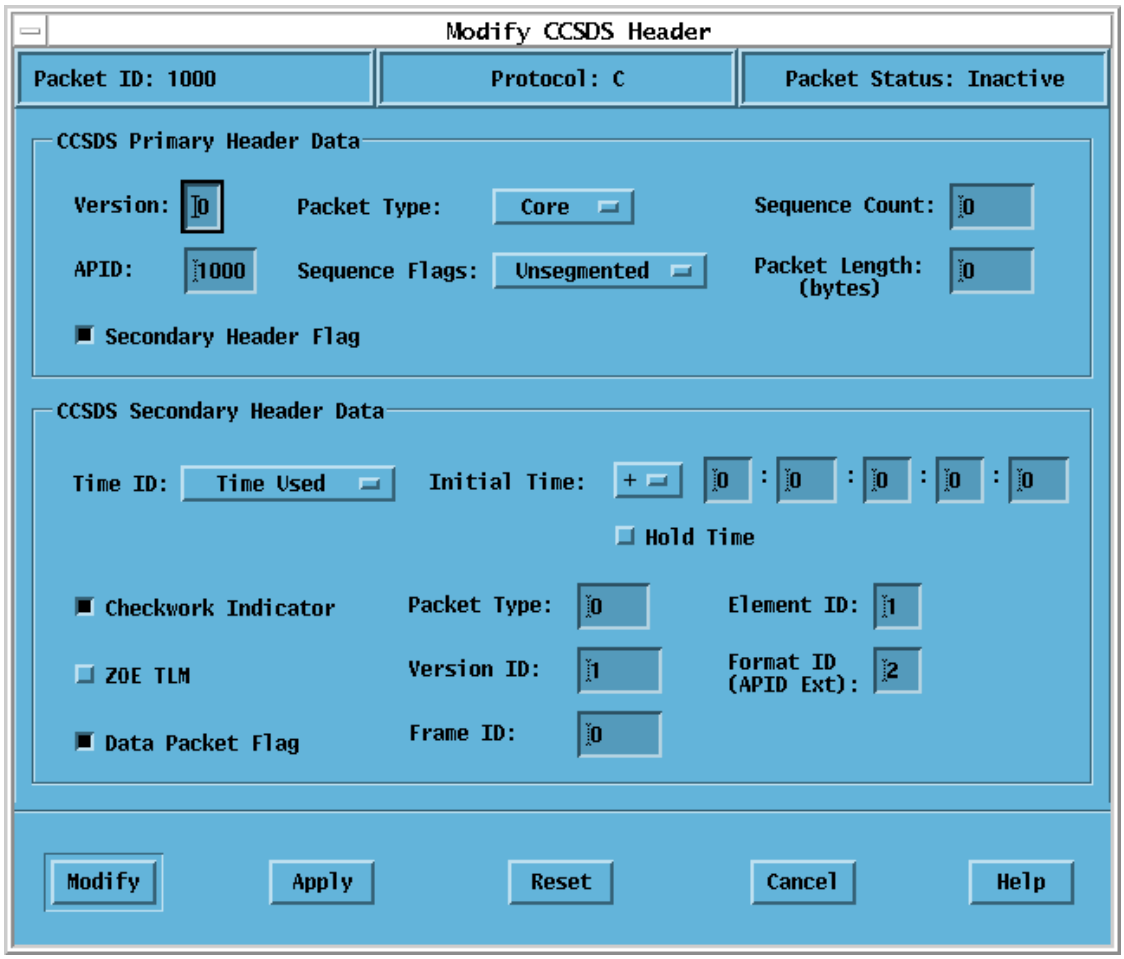


Figure 16-28, Modify CCSDS Header dialog box.

The dialog box identifies the currently selected packet's **Packet ID:**, **Protocol:**, and **Packet Status:**. This information is reflected in the main window's work area.

The **CCSDS Primary Header Data:** frame contains four input text fields, two option menu buttons, and a toggle button. Information that is default to the selected packet will populate the input text fields.

The following information is included on the dialog box:

- **Version:** - contains the version number of the packet. The default value is 0.
- **APID: -** indicates the APID associated with the packet.
- **Packet Type:** - identifies the packet protocol type. This option menu button can be used to select either **Payload** or **Core** protocols.
- **Sequence Flags:** - indicates the sequence in which the packet is transmitted. You can select from **Cont Segment** (continuous), **First Segment**, **Last Segment**, and **Unsegmented**.
- **Sequence Count:** - indicates the sequence count for the CCSDS packet.

- **Packet Length (bytes):** - indicates the length of the CCSDS packet in bytes.

If the CCSDS packet contains a secondary header, the **Secondary Header Flag** toggle button will be depressed.

The **CCSDS Secondary Header Data** frame allows you to determine the contents of the CCSDS packet's secondary header:

- **Time ID:** - indicates whether time is used in the secondary header information. Possible values on this option menu button include **Time Used** and **Time Not Used**.
- **Initial Time: -** indicates the initial time that the packet is generated in GMT format. If the **Hold Time** button is toggled, this time indicates the amount of time that should pass before the packet is generated. The option menu button associated with the initial time can be used to select a + or **-**.
- **Checkwork Indicator:** - when toggled on, indicates that a checksum will be built.
- **ZOE TLM:** - when toggled on, Zone of Exclusion telemetry is included in the CCSDS packet.
- **Data Packet Flag:** - when toggled on, indicates that the packet is a data packet.
- **Packet Type:** - indicates the CCSDS packet type.
- **Version ID:** - indicates the version of the CCSDS packet.
- **Frame ID:** - indicates the identity of the associated frame.
- **Element ID:** - indicates the element associated with the packet.
- **Format ID (APID Ext):** - indicates the APID extension of the CCSDS packet.

When a TDM protocol CCSDS packet is selected, the **Packet Type:** option pulldown menu in the **CCSDS Primary Header Data** frame is replaced by an input text field to reflect the multiple packet types associated with the TDM protocol.

16.4.3.10 Start

This menu item starts the transmission of the currently selected packet. A packet must be inactive in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.4.3.11 Stop

Selecting this menu item stops the transmission of the currently selected packet. A packet must be active in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.4.3.12 Pause

This menu item pauses the transmission of an active packet. Transmission may be resumed from the paused state without the timing and setup involved in starting a packet. Also, any MSID

ramping controlled by an attached MSID data file will resume where it left off rather than reinitializing. This menu item is only available when the currently selected packet is active. The functionality of this menu item is reflected in the control panel pushbuttons.

16.4.3.13 Resume

Selecting this menu item resumes the transmission of the currently selected packet. A packet must be paused in order for this item to be available. The functionality of this menu item is reflected in the control panel pushbuttons.

16.4.3.14 View Stream...

Selecting this menu item invokes a dialog box which allows you to view the contents of the selected data stream (see Figure 16-29, TNS View Stream dialog box).

The TNS View Stream dialog box continuously updates as packets are received. The main window contains the following information:

- **Multi-cast address**
- **Port**
- **Primary EHS Protocol Header**
- **Secondary Protocol Header**
- **CCSDS Primary Header**
- **CCSDS Secondary Header**
- **Hex Data**

Note: The information presented in the TNS View Stream dialog box will vary depending on the type of data constituting the data stream (for example, core data versus payload data).

Help: For a complete description of all the telemetry protocols associated with telemetry that is distributed by the Payload Operations and Integration Center (POIC) reference the POIC to Generic User Interface Definition Document (SSP 50305, Volume 1, Section 8.0, Telemetry Protocols).

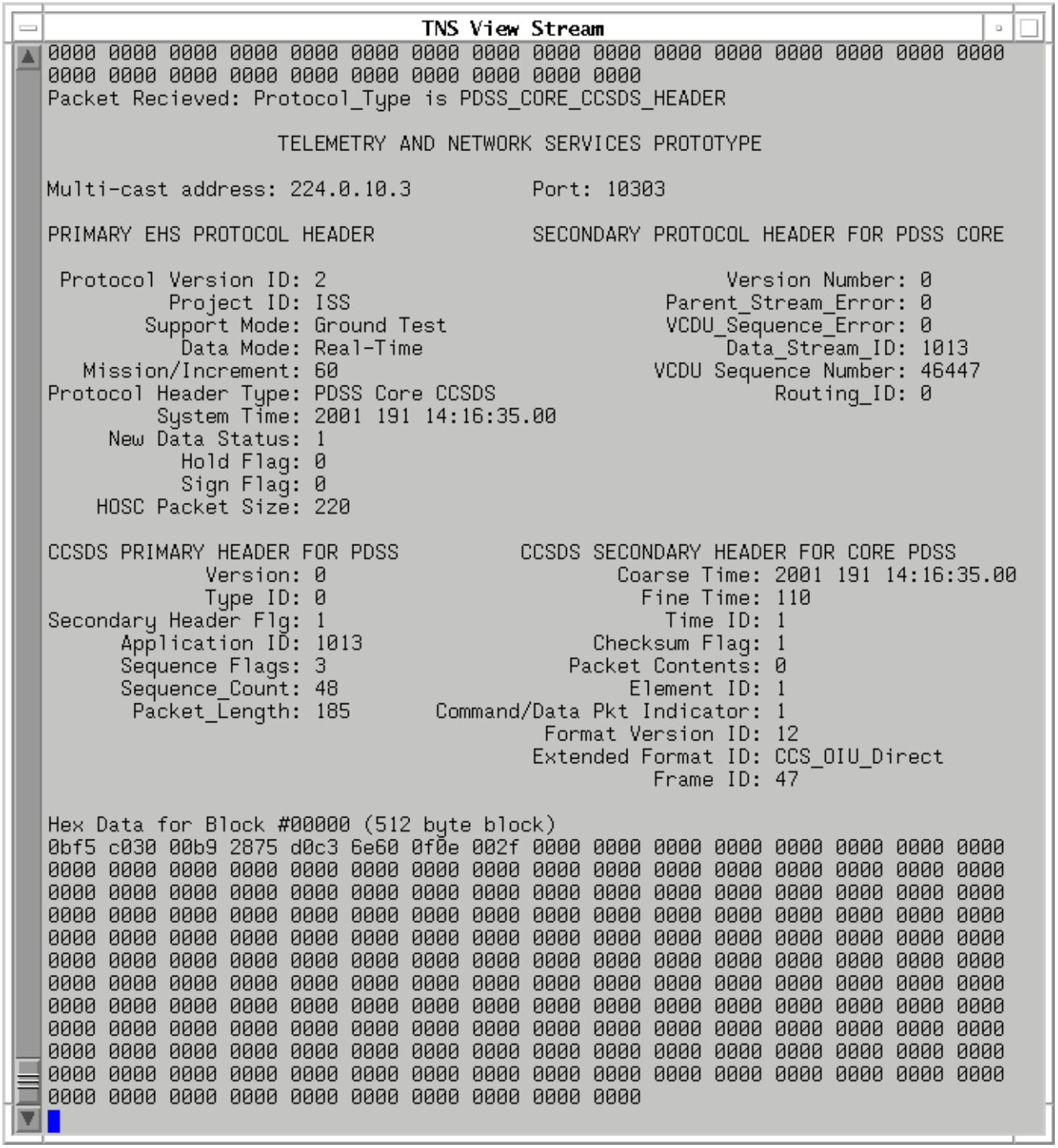


Figure 16-29, TNS View Stream dialog box.

16.4.3.15 Reinitialize MSID Data File...

This menu item invokes a dialog box which allows you to select a new MSID data file or reinitialize the currently active MSID data file (see Figure 16-30, Reinitialize MSID Data File dialog box).

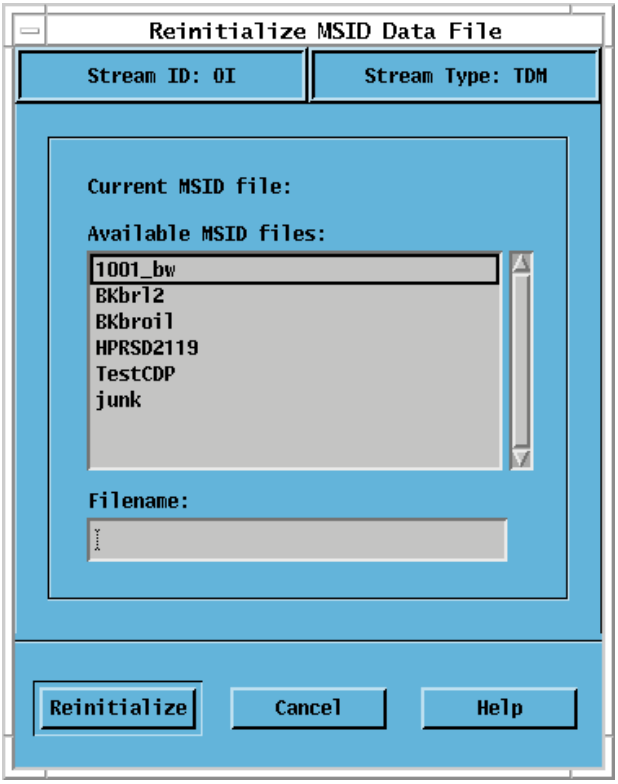


Figure 16-30, Reinitialize MSID Data File dialog box.

The dialog box identifies the currently selected **Packet ID:** and **Packet Type:** in a status area. This information is reflected on the main window of the application as well.

You can select the **Current MSID file:** from the list of **Available MSID files:** or by entering the filename in the **Filename:** input data field. You can either select the current MSID file or you can choose a new file.

16.4.3.16 View Start Packet Status...

This menu item invokes a dialog box which allows you to view packet startup information about the currently selected packet (see Figure 16-31, View Start Packet Status dialog box).

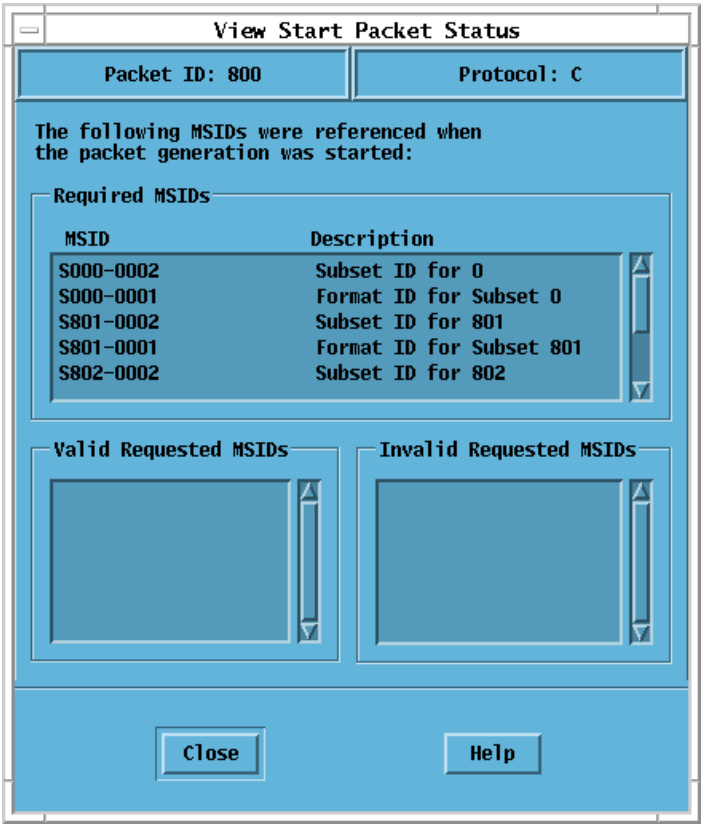


Figure 16-31, View Start Packet Status dialog box.

The dialog box identifies the currently selected **Packet ID:** and **Packet Type:** in a status area. This information is reflected on the main window of the application as well.

There are three lists of MSIDs which are referenced by a packet. These lists include:

- **Required MSIDs** - lists all MSIDs that are required for generating the selected packet. The table lists each MSID and its description or technical name. These MSIDs are automatically accessed when you select the packet.
- **Valid Requested MSIDs** - lists all MSIDs from the optional MSID data file that are valid for the selected packet and database. If you have not attached an MSID data file to the packet, this list will be blank.
- **Invalid Requested MSIDs** - lists all MSIDs from the optional MSID data file are not valid for the packet or database. If you have not attached an MSID data file to the packet, this list will be blank. If any MSIDs appear in this list, the parameters represented by those MSIDs are not generated as part of the data packet.

16.4.3.17 Set Database Version...

This menu item allows you to select the database version against which the data packet will run (see Figure 16-32, Set Database Version dialog box).

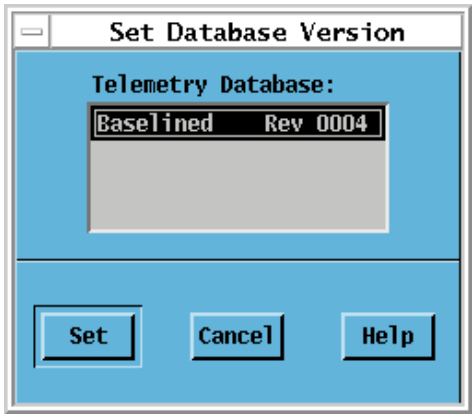
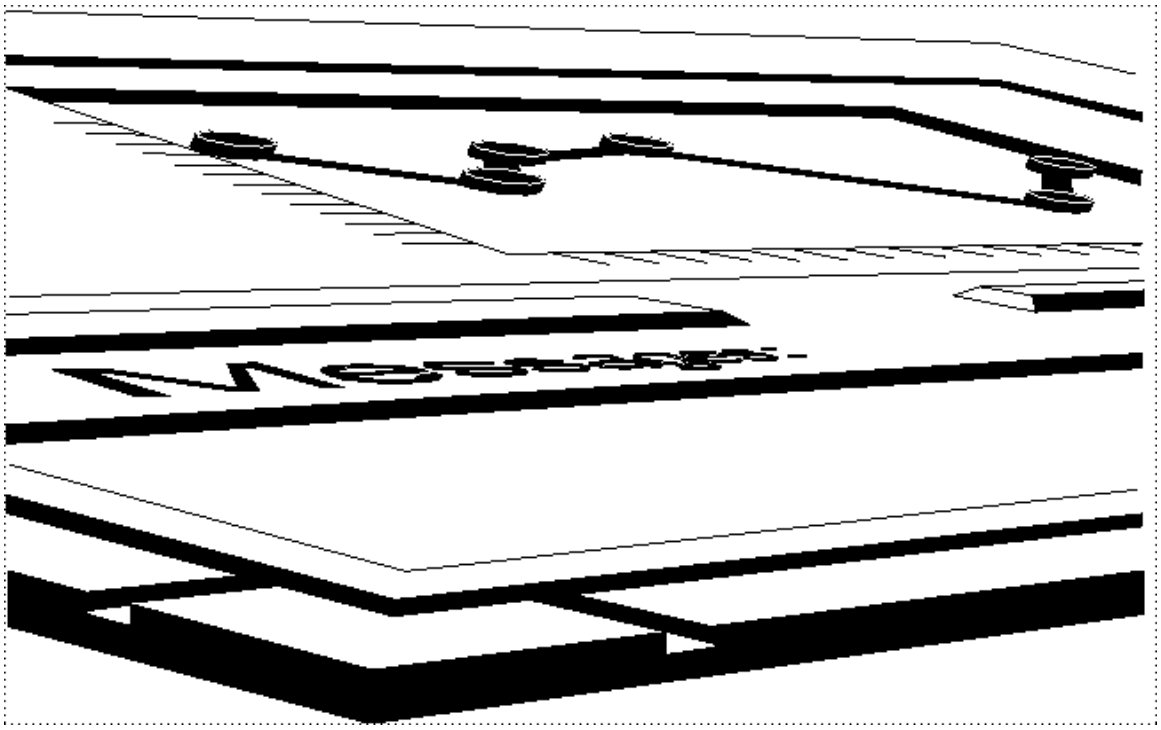


Figure 16-32, Set Database Version dialog box.

The dialog box contains the **Telemetry Database:** selection list from which you can choose a database version. By default, the **Baselined** database version is selected. When available, you can choose from an **Archived** database and/or a **Pre-released** database.

Help: See the glossary for a definition of these terms.



Chapter 17:
EHS Databases

This chapter describes the Telemetry Database application, Local Table Operation (LTO) application and the User-generated Data Element (UDE) Database application.

The Telemetry Database application provides you with the ability to access the telemetry database (TDB) which contains Measurement Stimulus Identifier (MSID) definitions needed to support Huntsville Operations Support Center (HOSC) telemetry processing. The TDB is the source for real-time telemetry processing tables.

Your capabilities within the Telemetry Database application depend on your account privileges. In other words, a database developer will have capabilities in addition to those available to a non-privileged user.

A local table is a personal subset of the telemetry database. It contains the information necessary for you to modify MSID definitions. When you initiate a HOSC software application that acquires telemetry, the information used to process MSID data is retrieved from the local table.

There is a unique set of local tables for each user ID database version. A local table can be created for the available **Pre-Released**, **Baselined**, and **Archived** telemetry databases. Database Developers may also have access to **Delivered** telemetry databases.

Help: See the Glossary for a definition of **Baselined**, **Pre-released**, **Archived,** and **Delivered**.

Using the Telemetry Database application's local table menus, a non-privileged user can:

- Change the existing limits for an MSID
- Add one set of limits for an MSID which has no limits defined
- Change the calibration type of an MSID from "(N)one" to "(P)olynomial (C)oefficient" or "(P)oint (P)air" (if the MSID data type is IUNS, ITWO, ITWOW, FEEE, FIBM, FNTL, FSPL, or FVAX)
- Change the existing calibration coefficients of an MSID
- Add one set of calibration coefficients for an MSID that has no calibration coefficients defined
- Change the existing point pairs of an MSID
- Add one set of point pairs for an MSID that has no point pairs defined
- Change the existing state codes for an MSID
- Change the existing expected state for an MSID
- Add an expected state for an MSID that does not have an expected state defined
- Reinitialize individual MSIDs, or the entire local table, so that it contains the same information as in the associated telemetry database

In addition to the above, database developers also have the ability within the Telemetry Database application's local table menus to:

- Change the existing decommuatation location for an MSID
- Add or delete MSIDs from an existing MSID group
- Start or stop MSID group initiation based on the returned value of a control MSID
- Start or stop MSID group initiation based on a specified time
- Change the method for initiating a group based on the start/stop time

Local table change files generated through the Telemetry Database application's local table menus may be applied using the Local Table Operation (LTO) application discussed later in this User Guide.

Local table change files are similar to displays, scripts, and computations in that they are standard user-generated data elements (UDEs) which can be managed on your workstation and thus stored, retrieved and/or shared through the User-generated Data Element (UDE) database.

In addition to viewing MSID database definitions and creating local table change files, you can also use the Telemetry Database application to create a subset of MSIDs that you own through the User Copy function. A user copy of the telemetry database can be attached to a Database Change Request for evaluation by the Database Coordination Group.

The Telemetry Database application, like all other HOSC database applications, uses as its foundation Oracle Forms and Oracle Reports commercial software products to access and update databases.

When using Telemetry Database application forms, you may need to be familiar with the fields defined in the database, their dependencies and restrictions. See MSFC HOSC Database

Definitions (MSFC-DOC-1949) for database field information and MSFC HOSC Telemetry Format Standard (MSFC-STD-1274B) for an understanding of telemetry.

The User-generated Data Element (UDE) database application allows you to manage UDEs, such as displays, computations, scripts, etc., that have been placed in central storage. UDEs are created using the various Huntsville Operations Support Center (HOSC) applications and are submitted to central storage using the Store UDE application available from the **File** menu off the **Launchpad**.

For those UDEs that you place in central storage (that have your user identification (ID) as the owner), you can use the UDE Database application to:

- View the attributes of these UDEs
- Mark the UDEs so that they can be shared with others
- Generate, view, and print a report of your UDEs based on specific search criteria
- Copy your UDEs from one mission to another
- Delete your UDEs

You can also generate, view, and print a report of other users UDEs that have been placed in central storage.

The UDE Database application, like all other HOSC database applications, uses as its foundation Oracle Forms and Oracle Reports commercial software products to access and update the database.

17.1 Telemetry Database Overview

The **Telemetry Database** main window provides you with the means to access a telemetry database (TDB), which contains the telemetry definitions needed to drive Huntsville Operations Support Center (HOSC) telemetry processing. The HOSC telemetry database is a “relational” database. In a relational database, the objects about which data are kept are called entities. Each table in the TDB contains data about a single type of entity. Some of the tables contain information about telemetry characteristics. Other tables are used to “lookup” valid values for a particular type of data. Still other tables contain data about the relationships between the entities that are represented by the other tables. You access information contained within the tables by initiating queries using the forms provided.

Selecting the **Telemetry Database** menu item from the **Database** menu on the **Launchpad** invokes the Telemetry Database main window (see Figure 17-1, Telemetry Database main window).

Help: Telemetry Database forms and reports are available to remote users utilizing EHS web applications. To access the EHS web applications see Appendix B: Remote Access to EHS Services.

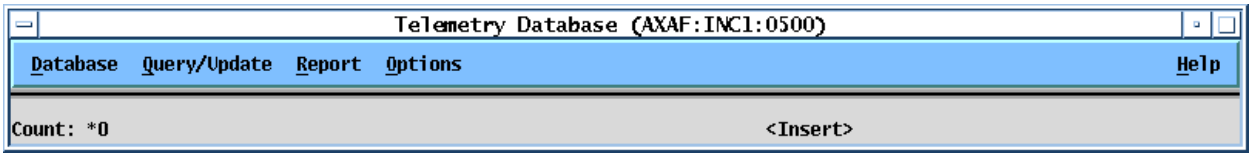


Figure 17-1, Telemetry Database main window.

17.1.1 Menu Bar

The menu bar provides access to the functions within the **Telemetry Database** application. These functions allow you to select a mission database, obtain and update telemetry processing information, generate reports, and access **Help**.

Options available from the **Telemetry Database** menu bar are organized by function under five menus: **Database**, **Query/Update**, **Report**, **Options**, and **Help.**

- The **Database** menu includes menu items that allow you to select a mission database with which you want to work. It also contains a menu item that allows you to exit the application.
- The **Query/Update** menu includes other cascade menus that allow you to access the forms that allow you to execute database queries, update your copy of the project telemetry database, and make changes to your local table database.
- The **Report** menu includes menu items that allow you to generate standard or project-specific reports.
- The **Options** menu includes menu items that allow you to incorporate Database Change Requests (DBCRs), accomplish database maintenance and access the Database Server Process Request Monitor.
- The **Help** menu provides an index of help topics and provides help on the **Telemetry Database** main window, defined keys, index, and the application version.

17.1.1.1 Database Menu

When you initiate the Telemetry Database application, the only menu bar items available are **Database** and **Help**. The menu items available under the **Database** menu allow you to select the specific mission database you want to work with as well as to exit the application.

17.1.1.1.1 Select Database...

The **Select Database...** menu item invokes a dialog box that allows you to specify the database with which you wish to work. The **Select Database** dialog box contains three input text fields and their associated List of Values (LOV): Mission :, DB State:, and Revision:.

When invoked, the **Select Database** dialog box displays information relevant to the default telemetry database. You can accept the default database by clicking on Select Database, Select User Copy, or Select Local Table. If you wish to use a different database you must define the mission, the database state, and the revision number to uniquely identify the database.

Local Table

Selecting Local Table will provide you with a personal copy of the telemetry database specified in the text entry fields. You can use this copy of the database to modify the way in which MSIDs are defined. Revised definitions are stored in Local Table change files which are applied through the Local Table Operations application.

Using the Telemetry Database application's local table a non-privileged user can:

- Change the existing limits for an MSID
- Add one set of limits for an MSID which has no limits defined
- Change the calibration type of an MSID from "(N)one" to "(P)olynomial (C)oefficient" or "(P)oint (P)air" (if the MSID data type is IUNS, ITWO, ITWOW, FEEE, FIBM, FNTL, FSPL, or FVAX)
- Change the existing calibration coefficients of an MSID
- Add one set of calibration coefficients for an MSID that has no calibration coefficients defined
- Change the existing point pairs of an MSID
- Add one set of point pairs for an MSID that has no point pairs defined
- Change the existing state codes for an MSID
- Change the existing expected state for an MSID
- Add an expected state for an MSID that does not have an expected state defined
- Reinitialize individual MSIDs, or the entire local table, so that it contains the same information as in the associated telemetry database

In addition to the above, database developers also have the ability within the Telemetry Database application's local table to:

- Change the existing decommutation location for an MSID
- Add or delete MSIDs from an existing MSID group
- Start or stop MSID group initiation based on the returned value of a control MSID
- Start or stop MSID group initiation based on a specified time
- Change the method for initiating a group based on the start/stop time

Note: Because local table is used as a tool for modifying existing telemetry database definitions, only those forms and menu items necessary to perform these modifications are displayed.

Local table change files generated through the Telemetry Database application's local table menus may be applied using the Local Table Operation (LTO) application discussed later in this User Guide.

Local table change files are similar to displays, scripts, and computations in that they are standard user-generated data elements (UDEs) which can be managed on your workstation and thus stored, retrieved and/or shared through the User-generated Data Element (UDE) database.

User Copy

Selecting **User Copy** will provide you with a copy of those items within the selected telemetry database that you own. You can make changes to your User Copy for subsequent submission to the Database Coordination Group (DBCG) for approval and inclusion in the next database revision. Using the Database Change Request application you can submit proposed database changes to the DBCG by attaching your user copy to the electronic form. Selecting **User Copy** provides you with the ability to define and request new data streams, MSIDs, etc. without going through the Payload Data Library (PDL) or Mission Build Facility (MBF) databases. Working with **User Copy** you can duplicate a record on the **State Code** and **Point Pair Detail** forms and the sequence number will not be duplicated allowing you to update and save the information. Within **User Copy** you have access to the full range of application capabilities to include **Insert** and **Save** functions not available within Local Table or mission telemetry databases.

17.1.1.1.2 Directory...

The **Directory...** menu item invokes a dialog box that allows you to specify directory selection criteria, execute a query, generate a report based on the contents of the work area, and select a mission database with which you want to work.

When the **Directory** dialog box is invoked, all input text fields are empty. You can enter specific selection criteria in the first row, or accept the default criteria and show all project telemetry databases (PTDBs). Once a query is executed, the work area will list the results.

Tip: When defining your query, wildcards (a blank, an underline character, or **%**) can be used to help narrow your selection criteria.

17.1.1.1.3 Exit...

The **Exit...** menu item allows you to exit the Telemetry Database application. You will be asked to confirm the exit.

17.1.1.2 Query/Update Menu

The menu items under the **Query/Update** menu are listed as follows:

- **Novice Information**
- **Stream Information**
- **MSID Information**

- **Group Information**
- **FEP Information**
- **Lookup Information**

17.1.1.2.1 Novice Information

The information accessible through the Novice Information cascade menu provide a quick look-up capability for information about MSIDs.

The **Novice Information** menu options are listed as follows:

- **MSID List - Query Only...**
- **MSID Detail...**
- **Packet MSID List - Query Only...**
- **GSE Detail...**

17.1.1.2.2 Stream Information

The **Stream Information** menu item lists forms for the various types of streams that are described by the telemetry database.

The **Stream Information** menu options are listed as follows:

- **Stream List...**
- **Block Detail...**
- **GSE Detail...**
- **Packet Detail...**
- **Packet MSID List - Query Only...**
- **Subset List - Query only...**
- **Subset Detail...**
- **TDM Detail...**

17.1.1.2.3 MSID Information

The forms invoked through the **MSID Information** menu item provide information for decommutation, calibration and limit sensing of measurements processed by Enhanced HOSC System (EHS) software.

The **MSID Information** menu options are listed as follows:

- **MSID List - Query Only...**
- **MSID Detail...**
- **Decommutation Detail...**
- **Decommutation List...**

- **Counter Detail...**
- **Calibration Detail - PC...**
- **Calibration Detail - PP...**
- **Calibration Detail - SC...**
- **Calibration List - PC...**
- **Calibration List - PP...**
- **Calibration List - SC...**
- **Limit Sensing Detail - Limits...**
- **Limit Sensing Detail - Expected State...**
- **Limit Sensing List - Limits...**
- **Limit Sensing List - Expected State...**

17.1.1.2.4 Group Information

The forms invoked through the **Group Information** menu item provide information necessary to drive exception monitoring of parameters on a group basis.

The **Group Information** menu options are listed as follows:

- **Group List...**
- **Group Detail...**

17.1.1.2.5 GSE Information

The forms invoked through the **GSE Information** menu item provide information necessary to create Ground Support Equipment (GSE) packet definitions. Remote users can use the non-configuration controlled GSE packet definition process to create their own packets containing only those MSIDs in which they are interested. Information is also available regarding packet assignments and packet routing.

The **Group Information** menu options are listed as follows:

- **Group List...**
- **Group Detail...**

17.1.1.2.6 FEP Information

The forms invoked through the **FEP Information** menu item provide descriptions used by the Front-End Processor (FEP) stream processors in the processing of the Operational Downlink (OD).

OD is a Pulse Code Modulated (PCM) serial data stream transmitted by the orbiter operational telemetry system. In very basic terms, processing of the OD stream at the HOSC involves the data being received by an Avtec serial board and then processed by a FEP OD stream process which

decommutates the individual components of the stream, encapsulates the data into packets and then distributes the packets on the EHS local area network (LAN).

OD contains data from several data sources which are interleaved into the constituent windows of the OD telemetry stream. The OD stream is a TDM (Time Division Multiplexed) stream with 100 minor frames of 160 bytes per minor frame (@ 128Kbps rate). One major frame is received per second.

The OD stream contains an OI portion (window) of data, up to three GPC windows, and up to four PDI windows.

The Operational Instrumentation (OI) window contains data from the orbiter (and Spacelab subsystems when applicable). The OI generally contains information about the health and status of the data bus to the Pulse Code Modulation Master Unit (PCMMU). The PCMMU commutates, or combines, the individual stream components into one stream.

The General Purpose Computer (GPC) windows contain data from the GPCs, including orbiter and payload caution and warning measurements, hard-wired payload parameters, navigation parameters, and other system management information. Within the OD stream, there can be up to three GPC windows active simultaneously.

The Payload Data Interleaver (PDI) windows contain data from payloads. Up to four PDI streams from individual payloads may be downlinked simultaneously with an aggregate data rate of 64Kbps or less.

The **FEP Information** menu options are listed as follows:

- **OI Format...**
- **GPC Format...**
- **OI PDI Allocation...**
- **PDI List...**

17.1.1.2.7 Lookup Information

The forms invoked through the **Lookup Information** menu item provide valid information for a particular type of data within the TDB tables. They also provide information relevant to the conversion of database inputs into an EHS format.

The **Lookup Information** menu options are listed as follows:

- **Owner List...**
- **Owner Authorization List...**
- **Engineering Unit - Query only...**
- **Data Type - Query Only...**
- **Conversion Matrix - Query Only...**

- **Error Log - Query Only...**
- **Initial Load Data - Query Only...**
- **SDT OD Build List...**

17.1.1.3 Report Menu

The menu items available under the **Report** menu allow you to access standard and project specific reports.

17.1.1.3.1 Select Standard Report

The **Select Standard Report** menu item invokes a cascade menu that contains the menu items as listed below:

- **Telemetry Database Listing Report...**
- **Telemetry Database Comparison Report...**
- **Telemetry Database Directory Report...**
- **Telemetry Database Error Log Report...**

17.1.1.3.2 Select Project Specific Report

The **Select Project Specific Report** menu item invokes a cascade menu that contains the **Telemetry Measurements Report...** menu item.

17.1.1.4 Options Menu

The **Options** menu includes the following listed menu items:

- **Incorporate DBCR...**
- **Reinitialize User Copy...**
- **Build Partial Database**
- **MBF Loader...**
- **Convert Database**
- **Generate External Data Products**
- **Manage Local Table**
- **Validate Database...**
- **Encapsulate TDM...**
- **Derive Context Dependent LVT...**
- **Derive Limit Sense LRVT...**
- **Build Pseudos...**
- **Database Server Process Request Monitor...**

17.1.1.4.1 Incorporate DBCR...

The **Incorporate DBCR...** menu item invokes a dialog box that allows an MOL developer to incorporate approved DBCRs into the database.

Prior to the building of a new revision of a PTDB, the Database Coordination Group (DBCG) will produce a list of the DBCRs approved for incorporation into the revision and assign them to an MOL database developer to perform the incorporations. A set of database tables are created for the new revision. These tables are initially empty, except for the Telemetry System table which contains information about the revision as a whole. The database developer proceeds to incorporate the approved DBCRs as specified by the DBCG into the empty database tables. In this way, the revision is actually built from the approved DBCRs.

A DBCR can be submitted by the user to change information about MSID(s). These changes could be anything pertaining to the MSID(s) or streams such as decom information, technical name, limit sensing information, etc. Data owners, project database developers, and MOL developers have the ability to incorporate their own DBCRs (whether or not approved) back into their own user copy databases. This allows users to retrieve their DBCR changes in order to revise them and resubmit a withdrawn DBCR, merge them with other DBCR changes for a comprehensive look at their changes, or simply to review their submitted changes.

17.1.1.4.2 Reinitialize User Copy...

The **Reinitialize User Copy...** menu item allows you to reinitialize your user copy to the default values defined in the selected database.

17.1.1.4.3 Build Partial Database

The **Build Partial Database** menu item invokes a cascade menu with menu items that allow you to create a partial database either by MSID or by packet. Remote users create and download partial databases to their PCs to work in conjunction with their TReK software. The **Build Partial Database** menu items are listed as follows:

- **Build PDB by MSID...**
- **Build PDB by Packet...**

Build PDB by MSID

The **Build PDB by MSID** dialog box is specifically designed to aid those remote users who plan to use the Telescience Resource Kit (TReK) software to interface with EHS. The TReK software is not delivered with an EHS telemetry database and therefore is dependent on EHS for the creation of this database. TReK users must login to an EHS platform and create a subset (partial database or PDB) of the EHS telemetry database. This database should include definitions for all MSIDs in

which they are interested. Once the partial database is defined, they must transfer the resulting tables to their TReK platform (Windows NT PC) for conversion to an Microsoft Access database.

The **Build PDB by MSID** dialog box (see Figure 17-2, Build PDB by MSID dialog box) is comprised of:

- four text fields used to query the selected database
- a query results table
- an **MSID List**

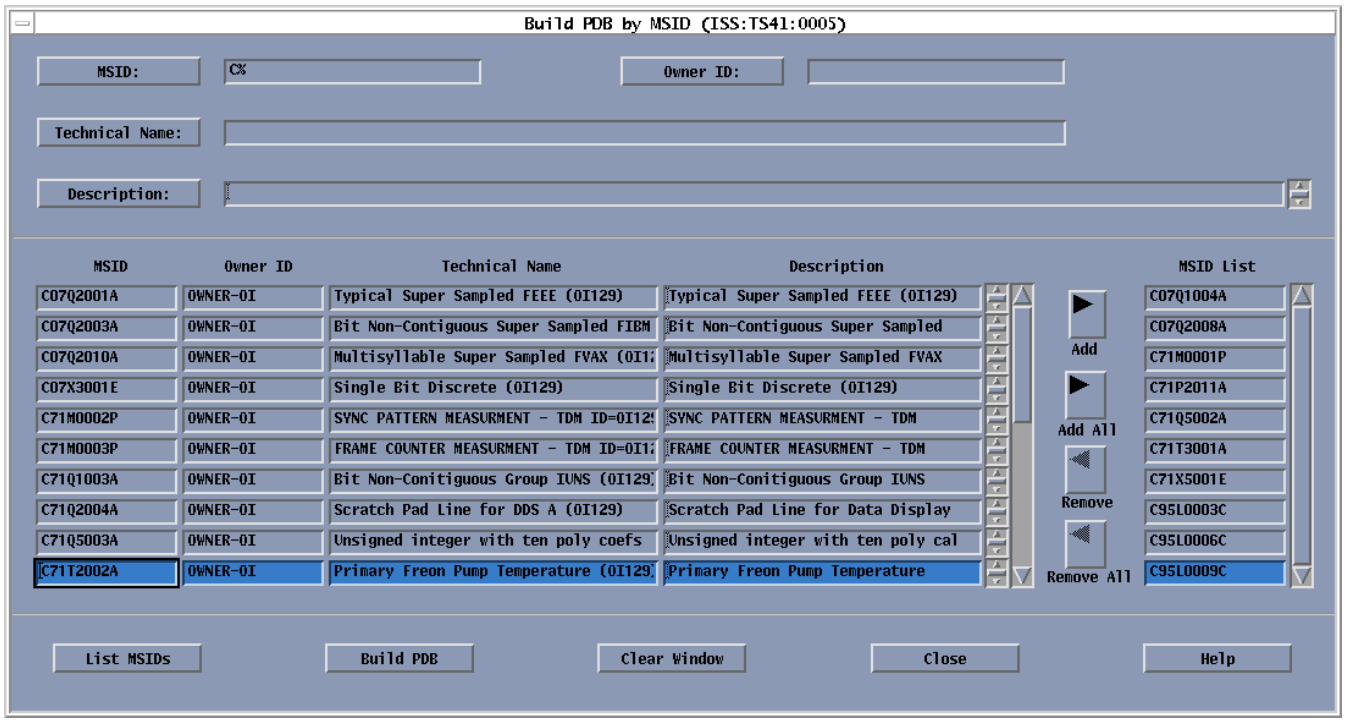


Figure 17-2, Build PDB by MSID dialog box.

The four text fields at the top of the dialog box are used to enter query criteria. These four text fields are:

- **MSID:**
- **Owner ID:**
- **Technical Name:**
- **Description:**

In the **MSID:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter specific MSIDs or you can use wildcard characters.

The **MSID:** text field can also be completed by clicking on MSID: to invoke the MSID LOV and selecting the desired MSID from the list. Click on OK to choose an MSID from the LOV.

In the **Owner ID:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter specific owner IDs or you can use wildcard characters. You can also click on Owner ID: to invoke the Owner ID LOV and selecting the desired owner from the LOV list.

In the **Technical Name:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter a specific technical name or you can use wildcard characters. You can also click on Technical Name: to invoke the Technical Name LOV and selecting the MSID technical name from the LOV list.

In the **Description:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter a specific description or you can use wildcard characters. You can also click on Description: to invoke the Description LOV and selecting the desired description from the LOV list.

The query results table will display the results of any query you initiate through the four text fields located at the top of the dialog box. You must click on List MSIDs to populate the query results table.

Once you have MSIDs listed in the query results table you can begin to build the list of MSIDs to include in your partial database. Select a desired MSID from the query results table and use the **Add** pushbutton to move the selected MSID to the **MSID List**. The **MSID List** is used to define your partial database. You can also use the **Add All** pushbutton to add all of the MSIDs from the query results table to the **MSID List**. You can remove MSIDs from the **MSID List** by selecting an MSID from the **MSID List** and clicking on the **Remove** pushbutton. The **Remove All** pushbutton will remove all of the MSIDs from the **MSID List**.

When the MSID List is defined, click on Build PDB to create your partial database. A dialog box will be invoked which includes a prefix (number) that will uniquely identify the files created during the partial database build process. You need to take note of this prefix so that you can contact the HOSC Support Desk (256-544-5066) and request that the files be placed in a directory on your workstation where you can access them using the File Transfer application.

You must transfer the database files with the prefix you noted during the database build process to your TReK workstation. When the files are on your TReK PC you must use the TReK database conversion process (converts the files to a Microsoft Access database) to use them.

Build PDB by Packet

The **Build PDB by Packet** dialog box is specifically designed to aid those remote users who plan to use the Telescience Resource Kit (TReK) software to interface with EHS. The TReK software is not delivered with an EHS telemetry database and therefore is dependent on EHS for the creation of this database. TReK users must login to an EHS platform and create a subset (partial database or PDB) of the EHS telemetry database. This database should include definitions for all MSIDs in

which they are interested. Once the partial database is defined, they must transfer the resulting tables to their TReK platform (Windows NT PC) for conversion to an Microsoft Access database.

The **Build PDB by Packet** dialog box (see Figure 17-3, Build PDB by Packet dialog box) is used to create a partial database using packets already defined within the EHS telemetry database. The MSIDs included in a packet can be determined using the **Packet MSID List - Query Only** form (see "Section 17.4.3, Packet MSID List - Query Only Form").

The **Build PDB by Packet** dialog box is comprised of:

- six text fields used to query the selected database
- a query results table
- a packet list table

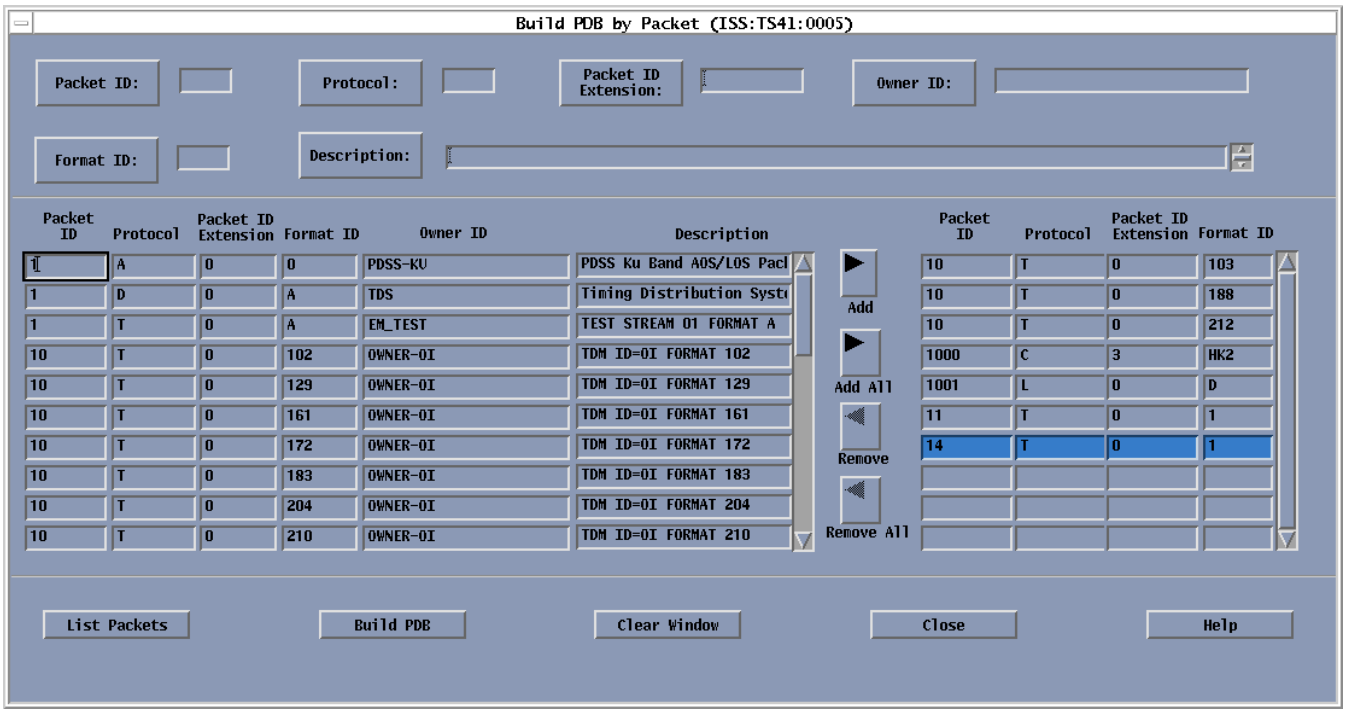


Figure 17-3, Build PDB by Packet dialog box.

The six text fields at the top of the dialog box are used to enter query criteria. These six text fields are:

- **Packet ID:**
- **Protocol:**
- **Packet ID Extension:**
- **Owner ID:**
- **Format ID:**
- **Description:**

In the **Packet ID:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter specific packet IDs or you can use wildcard characters.

The **Packet ID:** text field can also be completed by clicking on Packet ID: to invoke the Packet ID LOV and selecting the desired packet from the list. Click on OK to choose a packet from the LOV.

In the **Protocol:** text field you enter query criteria which will be used to populate the table located in the work area. You can enter a specific protocol using the following convention:

- **A** - AOS/LOS Packet
- **B** - Encapsulated Block Packet
- **C** - CCSDS Core Packet
- **D** - TDS Packet
- **L** - CCSDS Payload Packet
- **P** - Pseudo Telemetry Packet
- **R** - Retrieval Processing Summary Message
- **S** - Bitstream Protocol Data Unit Packet
- **T** - Encapsulated TDM Packet
- **U** - User Data Summary Message Packet

You can also click on Protocol: to invoke the Protocol LOV and select the desired protocol from the LOV list.

Note: The **Protocol** LOV is dynamic. Only those protocols currently available will be displayed within the list.

In the **Packet ID Extension:** text field you enter query criteria which will be used to populate the table located in the work area. Only data with a protocol of C (CCSDS Core Packet) can have a packet extension. You can leave this field blank or enter a specific packet extension using the following convention:

- **1** - Essential Packet
- **2** - Housekeeping I Packet
- **3** - Housekeeping II Packet
- **13** - NCS OIU Packet
- **14** - CCS OIU Direct Packet
- **20** - Normal ZOE Dump Packet
- **21** - Extended ZOE Dump Packet
- **26** - OIU UHF Packet

You can also click on Packet ID Extension: to invoke the Packet ID Extension LOV and select the desired extension from the LOV list.

The query results table will display the results of any query you initiate through the six text fields located at the top of the dialog box. You must click on List Packets to populate the query results table.

Once you have packets listed in the query results table you can begin to identify those packets to include in your partial database. Select a desired packet from the query results table and use the **Add** pushbutton to move the selected packet to the packet list table. The packet list table is used to define your partial database. You can also use the **Add All** pushbutton to add all of the packets listed in the query results table to the packet list table. You can remove packets from the packet list table by selecting a packet from the packet list table and clicking on the **Remove** pushbutton. The **Remove All** pushbutton will remove all of the packets from the packet list.

The packet list table identifies the selected packets, their protocol, protocol extensions if applicable, and their format ID.

When the packet list is defined, click on Build PDB to create your partial database. A dialog box will be invoked which includes a prefix (number) that will uniquely identify the files created during the partial database build process. You need to take note of this prefix so that you can contact the HOSC Support Desk (256-544-5066) and request that the files be placed in a directory on your workstation where you can access them using the File Transfer application.

You must transfer the database files with the prefix you noted during the database build process to your TReK workstation. When the files are on your TReK PC you must use the TReK database conversion process (converts the files to a Microsoft Access database) to use them.

17.1.1.4.4 MBF Loader

The MBF Loader dialog box provides privileged users the ability to load JSC Mission Build Facility (MBF) files into Oracle EHS database tables for subsequent conversion. MBF provides EHS Database Developers with the following files:

- CDHF04 (Telemetry)
- CDHF03 (Group)
- CDHF01 (Primitive)
- CDHF24 (Primitive Conversion)
- CDHF21 (State Conversion)
- CDHF22 (Polynomial Coefficient Conversion)
- CDHF23 (Piecewise [Point-Pair] Conversion)
- CDHF05 (Commands - IMARS used as EHS Command Database source rather than this MBF file)

These files are loaded into EHS-compatible Oracle tables. The MBF Conversion process extracts the data from these tables and puts it into the EHS Telemetry Database format.

17.1.1.4.5 Convert Database

The **Convert Database** menu item invokes a cascade menu with menu items that allow privileged users (Database Developers) to convert files that meet definitions specified in HOSC to Payload Data Library (PDL) ICD (ICD-3-60056), Mission Build Facility Standard Output Definition (D684-10177-01), MSFC HOSC Database Definitions (MSFC-DOC-1949) or MSFC POCC Telemetry and Command Database Definitions (MSFC-DOC-1149) into a Huntsville Operations Support Center (HOSC) project telemetry database. The **Convert Database** menu items are listed as follows:

- **Convert Shuttle Data Tape...**
- **Convert 1149 Telemetry File...**
- **Convert MBF File...**
- **Convert PDL File...**
- **Convert 1949 ASCII Files...**

Convert Shuttle Data Tape...

The **Convert Shuttle Data Tape...** menu item allows you to convert and load a Shuttle Data Tape (SDT) file into the MSFC-DOC-1949 Telemetry Database tables.

Convert MBF File...

The Convert MBF File application takes the Mission Build Facility (MBF) Oracle files created through the MBF Loader application and converts them into standard EHS Telemetry Database format. Only MSIDs identified in the **MBF MSID List** are converted. In addition, MSIDs with associated state codes are converted in accordance with Database Developer input on the **MBF State Code** form.

Convert PDL File...

The Payload Engineering and Integration function performed at JSC is responsible for collecting payload integration data from payload developers and for developing and managing the Payload Data Library (PDL). The PDL is transferred to the HOSC at launch -12 months and launch -7 months. The PDL is a fixed format, ASCII text file that contains CCSDS packet telemetry format, data type, calibration/conversion, limit definitions, and ground routing information for payload MDM health and status data, Timeliner Executor status, and payload science data to be processed by the POIC. The Convert PDL File application takes the PDL inputs and converts them into EHS-compatible, Oracle tables.

Convert 1949 ASCII Files...

The **Convert 1949 ASCII Files...** menu item invokes a dialog box that allows you to convert and load MSFC-DOC-1949 ASCII Telemetry files into the MSFC-DOC-1949 Telemetry Database tables.

The 1949 ASCII files are required by Advanced X-ray Astrophysics Facility (AXAF). The conversion processes for the 1949 ASCII files read data from the input files and build series of SQL input statements which are used to load the data into the database tables.

17.1.1.4.6 Generate External Data Products

The **Generate External Data Products** menu item invokes a cascade menu that allows you to generate data products by selecting the appropriate menu item. Available external data products are listed below:

- **Generate 1949 ASCII Files...**
- **Generate 1949 Export Files...**

Generate 1949 ASCII Files...

The **Generate 1949 ASCII Files...** menu item invokes a dialog box that allows you to generate a 1949 ASCII Telemetry file from the RDBMS MSFC-DOC-1949 Telemetry Database tables.

Generate 1949 Export Files...

The **Generate 1949 Export File...** menu item invokes a dialog box that allows you to export a 1949 Oracle Telemetry file from the RDBMS MSFC-DOC-1949 Telemetry Database tables.

17.1.1.4.7 Manage Local Table

The **Manage Local Table** menu item invokes a cascade menu with menu items that allow you to either create or remove a Local Table.

Create Local Table...

The **Create Local Table...** menu item invokes a dialog box that allows you to create a local table from a specified source database.

Remove Local Table...

The **Remove Local Table...** menu item invokes a dialog box that allows you to remove a local table for either a specified database revision or all revisions for a specified mission database.

17.1.1.4.8 Validate Database...

The **Validate Database...** menu item invokes a dialog box that allows you to retrieve data from the Project Telemetry Database Tables and perform checks to ensure that the data is compliant with MSFC-DOC-1949 database validation rules.

The validation process is used to enforce validation rules in the EHS Project Telemetry Database (PTDB) which cannot be enforced using integrity constraints and database triggers.

- Integrity constraint - a database mechanism that restricts the values of one or more columns in a database table
- Database trigger - a stored database procedure that is implicitly executed when an INSERT, UPDATE, or DELETE statement is issued against the associated database table

The validation process generates and logs validation errors for any data that does not conform to the validation rules.

Tip: Results of the validation process can be viewed in the Telemetry Database Error Log Report. See the section titled “Telemetry Database Error Log Report...” earlier in this chapter.

Help: Validation rules are defined in Section 4.0 of MSFC HOSC Telemetry Database Definitions (MSFC-DOC-1949, Volume 4, Telemetry Database).

17.1.1.4.9 Encapsulate TDM...

The **Encapsulate TDM...** menu item is used to change all Time-Division Multiplexed (TDM) streams to EHS packet streams.

17.1.1.4.10 Derive Context Dependent LVT...

The **Derive Context Dependent LVT...** menu item invokes a dialog box that allows you to create the Last Value Table (LVT) for each packet that contains a context dependent measurement.

17.1.1.4.11 Derive Limit Sense LRVT...

The **Derive Limit Sense LRVT...** menu item invokes a dialog box that enables you to initiate the building of the Last Refresh Value Table (LRVT) structure. This structure is used by telemetry processing software to construct the table in memory. During Exception Monitoring the contents of the LRVT table will contain the appropriate information to evaluate and determine when an Limit/Expected State (LES) advisory should be issued.

17.1.1.4.12 Build Pseudos...

The **Build Pseudos...** menu item invokes a dialog box that provides database developers a means to define and enter pseudo MSIDs into the Telemetry database. Once information has been entered into the form, it can be incorporated into a User Copy of the database and then attached to a Database Change Request (DBCR) for consideration by the Database Coordination Group (DBCG) for inclusion into the Telemetry database.

17.1.1.4.13 Database Server Process Request Monitor...

The **Database Server Process Request Monitor...** menu item invokes a dialog box that lists the status of all jobs submitted by database developers/administrators.

17.1.1.5 Help Menu

The **Help** menu is the last menu on the **Telemetry Database** menu bar. It provides the capability for users to access information that is specific to the current window. It includes the **On Window**, **On Keys**, **Index**, **Table of Contents**, and **On Version** menu items.

17.2 Telemetry Database Local Table Overview

A local table is maintained by user account for each Telemetry Database that is on-line for a given project, mission, and operational support mode. Thus, the user account ID, database version, and Mission/Operational Support Mode/Project (MOP) uniquely identifies a local table.

A local table is a personal subset of the telemetry database. It contains the information necessary for you to modify MSID definitions. When you initiate a HOSC software application that acquires telemetry, the information used to process MSID data is retrieved from the local table.

Using the Telemetry Database application's local table menus a non-privileged user can:

- Change the existing limits for an MSID
- Add one set of limits for an MSID which has no limits defined
- Change the calibration type of an MSID from "(N)one" to "(P)olynomial (C)oefficient" or "(P)oint (P)air" (if the MSID data type is IUNS, ITWO, ITWOW, FEEE, FIBM, FNTL, FSPL, or FVAX)
- Change the existing calibration coefficients of an MSID
- Add multiple sets of calibration coefficients for an MSID that has no calibration coefficients defined
- Change the existing point pairs of an MSID
- Add multiple sets of point pairs for an MSID that has no point pairs defined
- Change the existing state codes for an MSID
- Change the existing expected state for an MSID
- Add an expected state for an MSID that does not have an expected state defined

- Reinitialize individual MSIDs, or the entire local table, so that it contains the same information as in the associated telemetry database

In addition to the above, database developers also have the ability within the Telemetry Database application's local table menus to:

- Change the existing decommutation location for an MSID
- Add or delete MSIDs from an existing MSID group
- Start or stop MSID group initiation based on the returned value of a control MSID
- Start or stop MSID group initiation based on a specified time
- Change the method for initiating a group based on the start/stop time

Local table change files generated through the Telemetry Database application's local table menus may be applied using the Local Table Operation (LTO) application discussed later in this User Guide.

Local table change files are similar to displays, scripts, and computations in that they are standard user-generated data elements (UDEs) which can be managed on your workstation and thus stored, retrieved and/or shared through the User-generated Data Element (UDE) database.

17.2.1 Menu Bar

Options available from the **Telemetry Database (Local Table)** menu bar are organized by function under five menus: **Database**, **Query/Update**, **Report**, **Options**, and **Help** (see Figure 17-4, Telemetry Database (Local Table) main window).

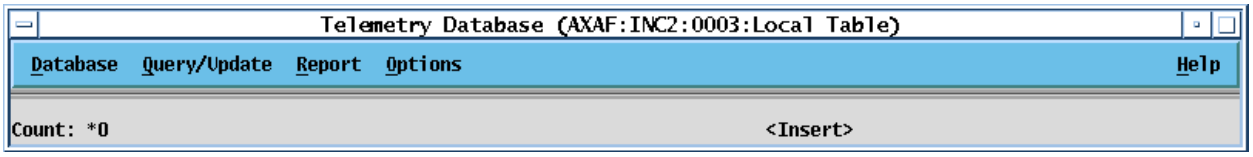


Figure 17-4, Telemetry Database (Local Table) main window.

- The **Database** menu includes menu items that allow you to select a mission database with which you want to work. It also contains a menu item that allows you to exit the application.
- The **Query/Update** menu includes other cascade menus that allow you to access forms as addressed in chapters 6 through 37 of this document. These forms allow you to execute database queries and make changes to your local table database.
- The **Report** menu includes menu items that allow you to generate standard or project-specific reports.
- The **Options** menu includes menu items that allow you to save change files, incorporate change files into the local table database, incorporate local tables into user copies, and to

reinitialize the local table copy. Each of these items and their purpose will be addressed later in this chapter.

- The **Help** menu provides an index of help topics and provides help on the **Telemetry Database** main window, defined keys, index, and the application version.

Each of the following menu bar items will be discussed in detail in the remainder of this chapter:

- **Query/Update menu**
- **Report menu**
- **Options menu**

17.2.1.1 Query/Update Menu

The menu items under the **Query/Update** menu are listed below:

- **MSID Information**
- **Group Information**

17.2.1.1.1 MSID Information

The forms invoked through the **MSID Information** menu item provide information for decommutation, calibration and limit sensing of measurements processed by Enhanced HOSC System (EHS) software. Available forms are listed below:

- **MSID List - Query Only...**
- **MSID Detail...**
- **Decommutation Detail...**
- **Decommutation List...**
- **Calibration Detail - PC...**
- **Calibration Detail - PP...**
- **Calibration Detail - SC...**
- **Calibration List - PC...**
- **Calibration List - PP...**
- **Calibration List - SC...**
- **Limit Sensing Detail - Limits...**
- **Limit Sensing Detail - Expected State...**
- **Limit Sensing List - Limits...**
- **Limit Sensing List - Expected State...**

This MSID information in local tables is initially created from the telemetry database. The typical user is only able to edit the calibration and limit/expected state sensing information for an MSID.

17.2.1.1.2 Group Information

A Group is a list of MSIDs which are to be limit/expected state sensed when a specific event has occurred. The event can be triggered by the value of an MSID, value of an MSID plus delay time, or a start/stop time.

The forms invoked through the **Group Information** menu item provide information necessary to monitor and edit active groups. Available forms are listed below.

- **Group List - Query only...**
- **Group Detail...**

17.2.1.2 Report Menu

The **Report** menu contains the **Select Standard Report** and **Select Project Specific Report** options.

Note: At this time there are no Project Specific Reports defined for ISS.

17.2.1.2.1 Select Standard Report

The menu items invoked through the **Select Standard Report** menu option are listed below:

- **Local Table Listing Report**
- **Local Table Changes Report**

Local Table Listing Report

The **Local Table Listing Report** menu item invokes a dialog box that allows you to generate a report based on the Local Table currently in use on your workstation.

Local Table Changes Report

The **Local Table Changes Report** menu item invokes a dialog box that allows you to generate a report which will contain any changes that have been made to the Local Table.

17.2.1.3 Options Menu

The **Options** menu includes those menu items as listed below:

- **Save Change File As...**
- **Incorporate Change File into Local Table...**

- **Incorporate Local Table into User Copy...**
- **Reinitialize Local Table...**

17.2.1.3.1 Save Change File As...

The **Save Change File As...** menu item allows you to save all local table changes to a file. This includes any changes you may have made to the local table during a previous editing session. As such, local table change files are accumulative. If you make changes and save them to a local table change file, exit, and then later go back and make additional local table changes and save them to a file, the last file will contain both sets of changes. You cannot apply, in Local Table Operations, change files with duplicate MSIDs and therefore you will not be able to apply both saved change files simultaneously. In order to apply multiple change files, you must eliminate any MSID duplications by using local table reinitialization options. When you click on the **Save Change File As...** menu item, you will invoke the **Save Change File As** dialog box.

Tip: Spaces are not allowed in Local Table Change File names, an underscore **"_"** may be used in place of a space.

The saved change file is stored on your local workstation. If you need to make the change file available from other workstations, or if you'd like to share the change file, use **Store UDE** available from the Launchpad **File** menu.

17.2.1.3.2 Incorporate Change File into Local Table...

The purpose of the **Incorporate Change File into Local Table...** menu item is to provide you with increased flexibility in editing and adding MSIDs to existing change files. The incorporate function allows you to modify the default local table with the information contained in existing change files so that you can then create a new change file which includes all changes, as well as any additional changes you make. The local table edit functions available through the Telemetry Database application are totally separate from the local table apply functions available through Local Table Operation. You must apply local table change files through the Local Table Operation application. Using the incorporate function, you reduce the number of change files you need to apply in order to effect the desired telemetry processing result.

If the local table change file you wish to incorporate is not available on your workstation you will need to retrieve it from the UDE database using **Retrieve UDE** available from the Launchpad **File** menu.

17.2.1.3.3 Incorporate Local Table into User Copy...

The **Incorporate Local Table into User Copy...** menu item incorporates the information contained within a users Local Table into a telemetry database user copy. This allows you to quickly create a user copy of the telemetry database with all local table modifications. The user

copy can then be attached and submitted with a DBCR for potential approval and implementation in the next telemetry database release.

Note: In order to have MSIDs available in your user copy, you must be identified as a data owner.

CAUTION: If you incorporate your local table into your user copy, previous changes made to your user copy will be lost.

17.2.1.3.4 Reinitialize Local Table...

The **Reinitialize Local Table...** menu item reinitializes all the MSIDs in the local table back to the database defaults.

CAUTION: Any changes made previously to your local table will be lost.

17.3 Common Form Functions

Forms are selected through the cascade menus available off the **Query/Update** menu of the **Telemetry Database** main window Forms are used to both query and update specific items available in the Telemetry Database. Though each form allows you to search and update different information, all forms have common characteristics, menus and menu items. This chapter describes the behavior that is common to all these windows.

Forms operate in one of two modes: **Enter Query** mode and **Normal** mode. Clicking Enter Query puts the window in Enter Query mode, and clicking Execute Query puts the window in Normal mode. In the Enter Query mode the form is initially blank and all fields in the first row of a form are enabled so that selection criteria may be entered. In the Normal mode, all fields with default values are populated with those values and, if you are a privileged user, all fields are enabled.

Just as the entities and tables in the databases are related so are many of the forms, since they are the means of populating the database tables. An example of this can be seen in the forms that are used to define an MSID The **MSID List - Query Only** form is used to enter MSIDs and their Technical Names into the Measurement Table of the database and in the query mode provides a complete list of all the MSIDs contained within a selected mission database.

Once an MSID has been selected (by executing a query) it can be further defined by either selecting the **MSID Detail...** option from the **Options** menu or clicking on MSID Detail... located on the Control Panel which will invoke the **MSID Detail** form. The **MSID Detail** form further defines the information contained in the Measurement Table by defining individual measurements and giving information on data and calibration type.

From the **MSID Detail** form a user can obtain further definition for an MSID by selecting (through the **Options** menu or pushbuttons) the **Decommutation Detail** form, **Calibration Detail** form, or **Limit Sensing Detail** form. If the **Limit Sensing Detail** form is selected, further information can be obtained by clicking on Switch MSID Detail... which will invoke the **MSID Detail** form for the Switch MSID that is used for limit switching.

In this manner, populated forms may be invoked in hierarchal fashion from one to another. As you close each form, the process reverses itself and you will retreat through the forms the same way in which they were invoked. The cascading of forms is depicted in Figure 17-5, Cascading forms. At any point during the process you can initiate a new query by clicking Enter Query which blanks out the contents of the current form and puts the window in Enter Query mode.

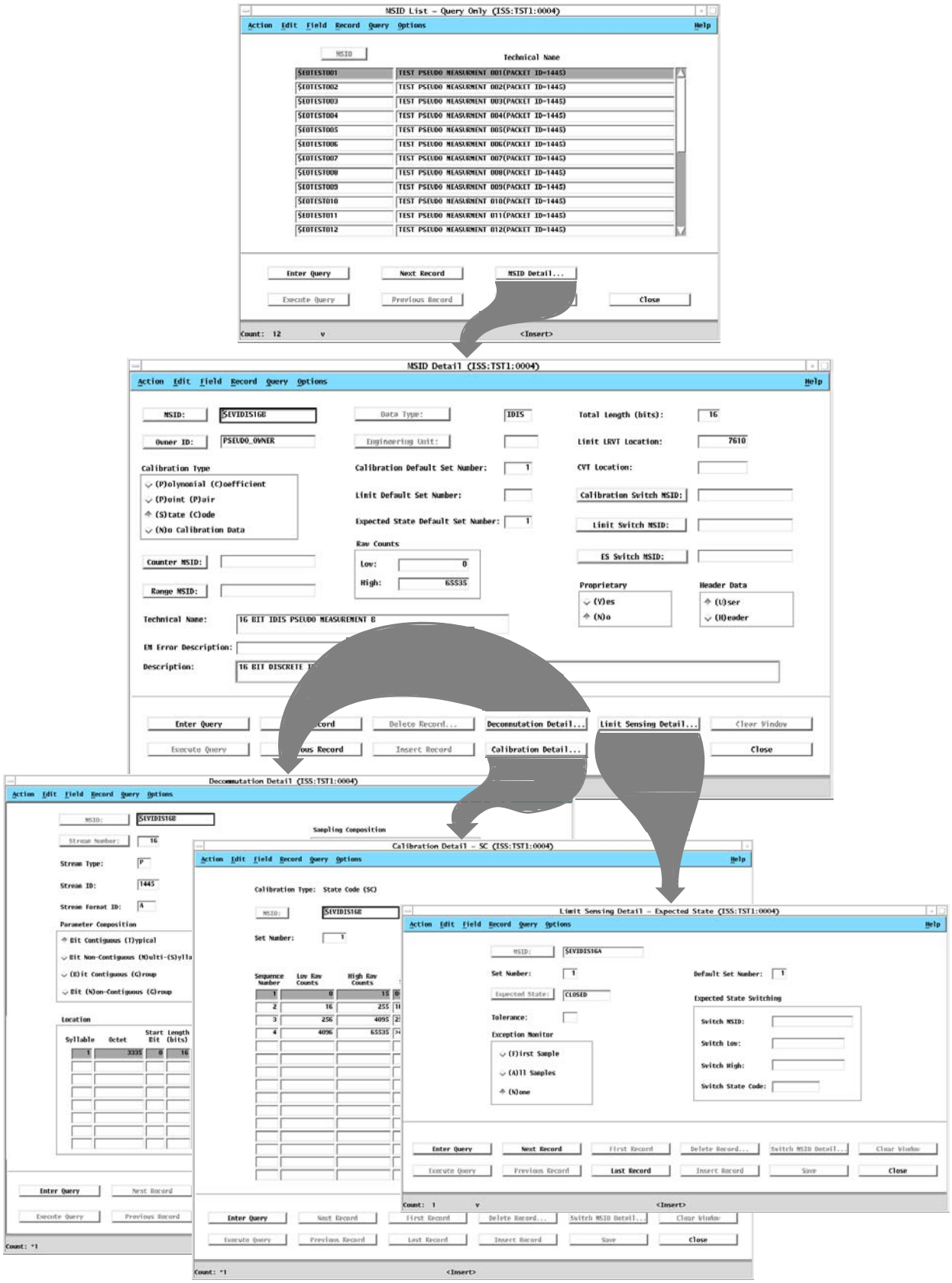


Figure 17-5, Cascading forms.

When forms are initially invoked, fields within the work area are empty. You enter search criteria on the first row of fields (or use the default) and execute the query. Once the query has been executed, the work area will reflect the results of your query.

Tip: Due to the large size of the Telemetry database, using wildcard characters to narrow your search will enhance application performance.

Tip: In using any of the database applications a wildcard character of particular interest is the colon (**:**). Using the colon as a wildcard invokes the **Query/Where** Oracle dialog box (see Figure 17-6, Query/Where dialog box).

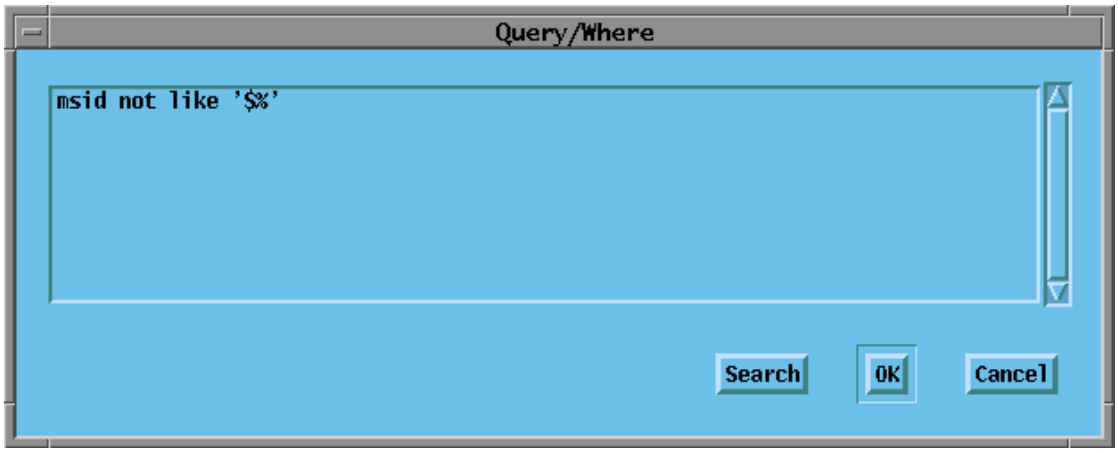


Figure 17-6, Query/Where dialog box.

The **Query/Where** dialog box allows you to be either inclusive or exclusive with respect to your search criteria. The text entry field of the dialog box allows you to enter a statement to define your search criteria. Inclusion of the terms "like" or "not like" in the search criteria make the statement either inclusive or exclusive. For example, using the statement **msid not like '$%'** will provide a list of all MSIDs that are not pseudo MSIDs. Conversely, the statement **msid like '$%'** will provide a list of all MSIDs that are pseudo MSIDs. The Query/Where dialog box implements a search based on table names defined for the particular database. In order to see the results of your query, click on OK, and then click on OK a second time (not a double click). The Search invokes a dialog box from which you can search for a string of text within the **Query/Where** window. The Cancel closes the **Query/Where** dialog box without implementing the query.

17.4 Telemetry Database Forms

Help: For information about appropriate entries for each field on the following forms, see MSFC HOSC Database Definitions (MSFC-DOC-1949, Volume 4: Telemetry Databases)

17.4.1 MSID List - Query Only Form

The **MSID List - Query Only** form contains a list of Measurement/Stimulus Identifiers (MSIDs) contained within the selected mission database. Each measurement in the database is accessed and referenced by an MSID. This form is used to provide a list of all MSIDs in the database. An option to obtain more in-depth information about any of the measurements is available by selecting a particular MSID and invoking the **MSID Detail** form

The **MSID List - Query Only** form allows you to:

- Enter and execute queries on MSIDs within the Telemetry Database
- Navigate to the **MSID Detail** form

17.4.2 MSID Detail Form

This form provides details for the MSIDs listed in the **MSID List - Query Only** form and, in doing so further defines the information contained in the Measurement table. The purpose of a telemetry database is to define the measurements to be processed by the HOSC. Central to this purpose is the MSID Detail form as it defines individual measurements, giving information on data and calibration type. The form provides the options to obtain further detailed information on decommutation, calibration and limit/expected state (LES) sensing.

This form allows you to:

- Define attributes of your Measurement/Stimulus Identifiers (MSIDs) (within your Local Table and User Copy)
- Enter and execute queries on MSIDs within the selected database
- Save changes made to your MSIDs attributes (within your Local Table and User Copy)
- Navigate to the following forms:
    - **Decommutation Detail**
    - **Calibration Detail**
    - **Limit Sensing Detail**

17.4.3 Packet MSID List - Query Only Form

The purpose of the **Packet MSID List - Query Only** form is to provide a list of MSIDs peculiar to a specified Packet ID. An option to obtain more in-depth information about any of the measurements is available by invoking the **MSID Detail** form

This form allows you to:

- Enter and execute queries on MSIDs for a selected Packet ID
- Navigate to the **MSID Detail** form

17.4.4 Stream List Form

A telemetry data stream is defined as a continuous single serial bit stream of telemetry data. There are different types of telemetry data streams for different types of telemetry data and a telemetry database is required to process any combination of them. The **Stream List** form contains basic stream identification information and provides the capability to navigate to a stream detail form.

This form allows you to:

- View stream attributes
- Enter and execute queries on streams within the Telemetry database
- Navigate to the **Stream Detail** form for the highlighted stream

17.4.5 Block Detail Form

The **Block Detail** form is one of the stream detail forms that can be invoked from the **Stream List** form. The information on this form is used to define the Block table and the Block Format table within the telemetry database. The **Block Detail** form defines a NASA Communication (NASCOM) 4800-bit block and provides packet encapsulation information for the block.

This form allows you to:

- Define attributes of NASCOM and DSN 4800-bit blocks (if working with a User Copy)
- Enter and execute queries on NASCOM and DSN 4800-bit blocks within the Telemetry database (TDB)
- Insert and delete NASCOM and DSN 4800-bit block records

17.4.6 Packet Detail Form

The **Packet Detail** form is one of the forms that can be invoked from the **Stream Information** cascade menu. The form provides packet identification and definition and indicates the type of data that is encapsulated in the packet. A packet differs from a stream in that it is not a continuous bit stream and is limited to a maximum packet length of 65535 octets. A packet consists of a primary header, an optional secondary header, and a user data field. Information from the **Packet Detail** form is used to populate the Packet and Packet Format tables of the database.

This form allows you to:

- Define attributes of CCSDS telemetry data packets (while working with a User Copy)

- Enter and execute queries on CCSDS telemetry data packets within the Telemetry database (TDB)
- Save changes made to your **Packet Detail** records (while working with a User Copy)
- Insert and delete **Packet Detail** records (while working with a User Copy)
- Navigate to the **Subset List - Query Only** form

17.4.7 Subset List - Query Only Form

The **Subset List - Query Only** form is one of the forms that can be invoked from the **Stream Information** cascade menu. A subset is a collection of measurements from the total measurement set that is bounded as an integer number of octets but does not constitute the packet itself. A subset can be thought of as a "mini-packet." A packet can contain up to 16 different subsets. The **Subset List - Query Only** form provides you with the means to identify defined subsets in a packet.

This form allows you to:

- Define subset attributes (while working with a User Copy)
- Enter and execute queries on subsets defined within the Telemetry database (TDB)
- Navigate to the **Subset Detail** form

17.4.8 Subset Detail Form

The purpose of the **Subset Detail** form is to provide a detailed description of a subset including its sampling composition and stream encapsulation information. Sampling composition describes how the samples of a subset are arranged in a packet. Stream encapsulation describes the data stream in which the subset is located.

This form allows you to:

- Define attributes of a subset (while working with a User Copy)
- Enter and execute queries on subsets defined within the Telemetry database (TDB)
- Save changes made to your **Subset Detail** records (while working with a User Copy)
- Insert and delete **Subset Detail** records (while working with a User Copy)

17.4.9 TDM Detail Form

All time division multiplexed (TDM) streams received at the Huntsville Operations Support Center (HOSC) will be encapsulated into packets for distribution and processing. The **TDM Detail** form defines the attributes of the TDM stream so that it can be processed and identifies the packet in which the stream is encapsulated. It contains information used to define data in the TDM table, TDM Format table, and Packet Format table of the Telemetry Database (TDB).

This form allows you to:

- View attributes of TDM telemetry data streams.
- Enter and execute queries on TDM telemetry data streams within the TDB
- Navigate to the following forms:
    - **Counter Detail**
    - **Packet Detail**

17.4.10 Decommutation Detail Form

If you picture a telemetry downlink data stream as being a string of numbers 1024 bits long, the problem and the purpose of this form become apparent. How do you find and then process a particular Measurement/Stimulus Identifier (MSID)?

The purpose of the **Decommutation Detail** form is to provide the information needed to define a single sample of data. Data contained in this form is used to enter data into the Stream ID table, MSID Location table and the MSID Sampling table within the telemetry database.

The Stream ID table defines a HOSC-unique stream number for each format and stream.

The MSID Location table defines the location of the first sample for each format of the data stream.

The MSID Sampling table defines the information required to define a single sample of data for a measurement.

This form allows you to:

- View attributes of the telemetry data.
- Enter and execute queries on MSIDs within the Telemetry database
- Navigate to the following forms:
    - **MSID Detail**
    - **Counter Detail**

17.4.11 Decommutation List Form

The **Decommutation List** form provides a tabular listing of MSIDs and their locations within a stream for all MSIDs available for decommutation. The information from this form will be used to define the MSID Sampling and MSID Location tables in a telemetry database.

The MSID Sampling table contains the information that describes the parameter composition type and the arrangement of the measurement samples in a telemetry stream.

The MSID Location table contains the information that is required by MSFC HOSC to define the start location of a measurement for each stream and format defined in the MSID Sampling table

This form allows you to:

- view a list of MSIDs available for decommutation
- enter and execute queries on MSIDs available for decommutation within a telemetry database
- insert and delete records from the **Decommutation List** form

17.4.12 Counter Detail Form

Within the different types of telemetry streams, various counters may be used in the construction of the data stream. For example, a Time Division Multiplexed (TDM) data stream requires a minor frame counter for checking data quality and a major frame counter for counter-dependent sampled data. A packet may require a counter for determining the sequence of data reception. Data composition/commutation can depend on counters. If a counter is used to determine the location/ occurrence of a measurement in a telemetry stream, the counter must be described. Normally, the packet or major/minor frame counters are specified, but other counters may be specified as necessary. The purpose of the **Counter Detail** form is to identify streams containing counters and describe and define the attributes of counters. This information is provided to the Stream ID and Counter tables of the Telemetry Database (TDB).

This form allows you to:

- View attributes of stream counters
- Enter and execute queries on counters within the TDB
- Navigate to the **Context MSID Detail** form

17.4.13 Calibration Detail Form

While some of the Measurement/Stimulus Identifiers (MSIDs) received in the downlink data stream represent static values (such as stream ID, format ID, etc.), other MSIDs represent parameters that have dynamic values (such as experiment oven temperature, main engine measurements, or whether a switch is ON or OFF). In order for the measurement in space to be meaningful at a console on earth, it must be calibrated to a known reference. The purpose of the **Calibration Detail** forms is to provide calibration information.

The **Calibration - PC** form is used to define the polynomial coefficients (PC) that are used to calibrate a measurement.

The **Calibration - PP** form is used to define point pairs (PP) for line segments that are used to calibrate a measurement.

The **Calibration - SC** form is used to convert a discrete measurement to state code (SC) text.

The information from the above forms is used to supply data to the respective tables in the Telemetry Database (TDB).

These forms allow you to:

- View attributes of the calibration details for PC, PP, and SC types of calibration
- Enter and execute queries on calibration details within the TDB
- Generate reports based on any of the calibration lists
- Navigate to the following forms:
    - **Calibration List**
    - **Switch MSID Detail**

17.4.14 Calibration List Forms

The Calibration List forms provide lists of calibration data for a particular MSID. The information from these forms will be used to define their respective calibration tables and the Measurement table in a telemetry database.

These forms allow you to:

- view a list of calibration sets for an MSID
- enter and execute queries on calibration lists within a Telemetry Database
- generate reports based on any of the calibration lists

17.4.15 Limit Sensing Detail Forms

Parameters can be monitored so that if they exceed a range or an expected state an application process is notified of the unexpected or out of limit condition. The **Limit Sensing Detail** forms provide the information necessary to identify the MSID to be monitored, the limits imposed on the MSID, how exception monitoring (EM) is to be employed, and whether or not any switching is necessary because of an out-of-tolerance condition. Information from these forms is used to define the Limit table, Limit Switch table, Expected State table, Expected State Switch table and the Measurement table in a telemetry database.

These forms allow you to:

- View attributes of the limit sensing detail for the limits and expected state options
- Enter and execute queries on limit sensing details within the Telemetry Database
- Generate reports based on any of the limit sensing details

- Navigate to the following forms:
    - **Limit Sensing List**
    - **MSID Detail**

17.4.16 Limit Sensing List Forms

The **Limit Sensing List** forms provide lists of Limit/Expected State (LES) data for a specified Measurement/Stimulus Identifier (MSID). The information from these forms will be used to define their respective Limit Sensing tables and the Measurement table in a Telemetry Database (TDB).

These forms allow you to:

- View attributes of the limit sensing list for the limits and expected state options
- Enter and execute queries on limit sensing within the TDB
- Generate reports based on any of the calibration lists

17.4.17 Group List - Query Only Form

MSIDs may be grouped together so that exception monitoring can be started or stopped for the group based on the value received for another MSID. A group is nothing more than MSIDs which have been grouped together primarily for activating and deactivating Exception Monitoring and Limit/Expected State (LES) sensing. A group can be activated and deactivated using start and stop times or based on the value received for another measurement.

The **Group List-Query Only** form allows you to:

- view a list of defined MSID groups
- enter and execute queries on group lists within a Telemetry Database
- generate reports based on any of the group lists

17.4.18 Group Detail Form

The **Group Detail** form defines the exact manner in which defined groups will be activated/ deactivated and lists all MSIDs that are grouped together under a Group ID. Information from this form is used to define the Group Content table and the Control Group table of the telemetry database (as specified in MSFC HOSC Database Definitions document, MSFC-DOC-1949, Volume 4). This form can be invoked from the **Group List-Query Only** form or directly from the **Group Information** cascade menu.

Using a local table copy of the database, you can modify the contents of a defined group, but you cannot create a group, change a group's owner, or identify a group for project-level exception monitoring. As a group owner, you can use your User Copy of the TDB to request that MSIDs be added or removed from a group. You can also negotiate to have your group exception monitored at the project-level.

Using the baselined TDB, this form allows you to:

- View attributes of defined groups
- Enter and execute queries on group details within the TDB
- Generate reports based on the group list

17.4.19 Non-Configuration Controlled GSE Form

The **Non-Configuration Controlled GSE** form allows users to define their own unique data stream. Once defined, GSE (Ground Support Equipment) packets can be routed to your platform where they can be decommutated. In order for you to create or modify a GSE packet definition, you must have an assigned APID. APIDs are assigned to users through the EHS Account Request Form.

Once you've created and saved a GSE packet definition, it is stored on the database server at the HOSC. You can request an ASCII text file containing the packet definition by using one of the extract functions available from the **Options** menu. You must then contact (via phone) the HOSC Support Desk (256-544-5066) and arrange to have the definition sent to you via email or placed in the doc (Word Processing) directory on your assigned EHS platform. If you are a remote user and the ASCII definition is placed in the **Word Processing** directory, you can use x-windows to access the **File Transfer** application and ftp the file to yourself.

The ASCII packet definition provides information necessary for you to appropriately decommutate data packets sent to your GSE. Once the GSE packet is defined using the Telemetry Database application, the **GSE Packets** application is used to activate the packet for transmission.

The **Non-Configuration Controlled GSE** form allows you to:

- View attributes of defined GSE packets
- Enter and execute queries on GSE packet definitions within the TDB
- Create/modify GSE packet definitions (for your APIDs)
- Generate reports based on the packet definition

17.4.20 Configuration Controlled GSE Form

The **Configuration Controlled GSE** form allows users to identify GSE packet definitions that have been pre-defined in the telemetry database. These GSE (Ground Support Equipment) packets

can be routed to your platform where they can be decommutated. You cannot add or modify configuration controlled GSE packet definitions. These definitions were created during the telemetry database build process. Users wishing to define configuration controlled GSE packets must define their packets through the Payload Data Library (PDL). You can request an ASCII text file containing the packet definition by using one of the extract functions available from the **Options** menu. You must then contact (via phone) the HOSC Support Desk and arrange to have the definition sent to you via email or placed in the doc (Word Processing) directory on your assigned EHS platform. If you are a remote user and the ASCII definition is placed in the Word Processing directory, you can use x-windows to access the File Transfer application and ftp the file to yourself. The **GSE Packets** application is used to activate GSE packets for transmission.

17.4.21 GSE Packet Assignment Form

The **GSE Packet Assignment** form associates user IDs with APIDs. It allows users to verify for themselves that they have been allocated an APID so that they can define their GSE packet. This form also indicates whether their GSE packet is configuration controlled (defined in the telemetry database) or non-configuration controlled.

This form allows you to:

- View GSE packet assignments
- Enter and execute queries on GSE packet assignments within the selected telemetry database
- Generate reports based on GSE packet assignments.

17.4.22 Packet Destination Information Form

The **Packet Destination Information** form associates destination information with all packets defined for a mission to include: Core, Payload, and GSE packets. Destinations are identified with specific static TCP/IP addresses. Destination information can be provided through the Payload Data Library (PDL), in which case it is delivered with the telemetry database, or it can be entered by the Ground Support Requirement Team (GSRT). For most users, the **Packet Destination Information** form is query only and can be reviewed to ensure that data packets are being appropriately routed to specific platforms.

This form allows you to:

- View packet destination assignments
- Enter and execute queries on packet destination assignments within the selected telemetry database
- Generate reports based on packet destination assignments.

17.4.23 OI Format Form

The Operational Instrumentation (OI) Format form describes the contents of the Operational Downlink (OD). The OD consists of one OI downlink, as many as three General Purpose Computers (GPC) downlinks, and as many as four Payload Data Interleaver (PDI) formats. This form lists all the available OI Format IDs available in a mission database and defines the complement of GPC windows supported by a particular OI format ID. Information from this form is used to define the OI Format table in a telemetry database.

This form allows you to:

- View details of OD streams and their descriptions
- Enter and execute queries on OD streams within the Telemetry database
- Generate reports based on any of the format descriptions
- Navigate to the following forms:
    - **GPC Format**
    - **OI PDI Allocation**

17.4.24 GPC Format Form

The General Purpose Computers (GPCs) receive data from onboard Data Processing Subsystems (DPS) onboard the Orbiter and format the measurements into a downlist which is combined with the OI and transmitted to the ground. The purpose of the **GPC Format** form is to list the GPC formats, define their location within the OI stream and define the size of the high and low rate formats. Information in this form is used to define the GPC Format table of a telemetry database.

This form allows you to:

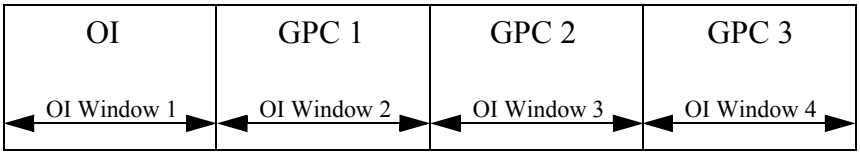
- View details of GPC streams and their descriptions
- Enter and execute queries on GPC streams within the Telemetry database
- Generate reports based on any of the GPC format descriptions

17.4.25 OI PDI Allocation Form

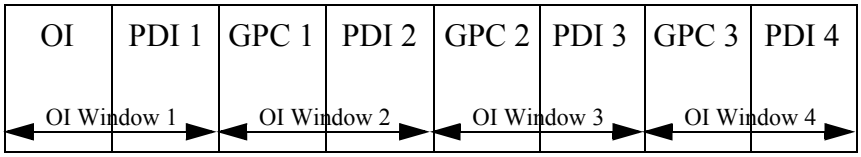
Operational Downlink is defined as the total Pulse Code Modulation (PCM) data stream that is transmitted by the Orbiter's operational telemetry system. The Operational Downlink stream consists of one Operational Instrumentation (OI) downlink, as many as three General Purpose Computer (GPC) downlinks, and as many as four Payload Data Interleaver (PDI) formats. The OI downlink primarily contains data that deals with the health and status of the data bus to the Pulse Code Modulation Master Unit (PCMMU). Payload Data Interleavers (PDIs) insert payload parameters into the PCMMU which then become part of the Operational Downlink data. The OD

data stream is a TDM stream with 100 minor frames of 160 bytes per minor frame (i.e., 128kbps). One major frame is received per second. The PDI data streams are asynchronous data streams within the OD data stream. The **OI PDI Allocation** form includes information relevant to the PDI formats and their location within the Operational Downlink stream. Data in the **OI PDI Allocation** form is used to define the PDI Format table within the selected telemetry database.

Example OD Data Stream with Three GPC Downlinks



Same OD Data Stream with Four PDI Formats Interleaved



This form allows you to:

- Cross-reference PDI streams and formats with OI windows
- Enter and execute queries on OI windows/formats and PDI streams/formats for the selected telemetry database
- Generate reports based on PDI allocations

17.4.26 PDI List Form

Operational Downlink is defined as the total Pulse Code Modulation (PCM) data stream that is transmitted by the Orbiter's operational telemetry system. The Operational Downlink stream consists of one Operational Instrumentation (OI) downlink, as many as three General Purpose Computer (GPC) downlinks, and as many as four Payload Data Interleaver (PDI) formats. The OI downlink primarily contains data that deals with the health and status of the data bus to the Pulse Code Modulation Master Unit (PCMMU). Payload Data Interleavers (PDIs) insert payload parameters into the PCMMU which then become part of the Operational Downlink data. The OD data stream is a TDM stream with 100 minor frames of 160 bytes per minor frame (i.e., 128kbps). One major frame is received per second. The PDI data streams are asynchronous data streams within the OD data stream. The **PDI List** form provides information relevant to each PDI stream and format.

This form allows you to:

- View defined PDI streams and formats for the selected telemetry database
- Enter and execute queries on PDI streams/formats for the selected telemetry database

- Generate reports based on PDI streams
- Navigate to the **OI PDI Allocation** form

17.4.27 Owner List Form

The **Owner List** form is used to cross-reference an owner identifier (ID) to a text description of the owner. Owners are the means by which telemetry measurements and streams are grouped so that privileges associated with the telemetry definition can be established. Information from this form is used to populate the Owner table of a telemetry database.

This form allows you to:

- View lists of Owner IDs and their descriptions
- Enter and execute queries on Owner Lists within the Telemetry database
- Generate reports based on any of the Owner ID descriptions

17.4.28 Owner Authorization List Form

The authorized owner of telemetry data can be several users who have the ability to view proprietary data or to update the definition of the telemetry data. A user may be a spacecraft subsystem or payload, a HOSC console position, or anything else that the project wishes to use. The Owner Authorization list form cross references user IDs and owner IDs so that appropriate data access and authorizations can be defined. The information in this form is used to populate the User Owner Table in a telemetry database.

This form allows you to:

- Cross-reference lists of User IDs and Owner IDs
- Enter and execute queries on User/Owner IDs within the Telemetry database
- Generate reports based on any of the User or Owner IDs

17.4.29 Engineering Unit - Query Only Form

The **Engineering Units - Query Only** form provides abbreviations and descriptions for engineering units associated with various physical dimensions being measured.

This dialog box allows you to:

- Associate engineering unit abbreviations with their descriptions
- Enter and execute queries on engineering units within a Telemetry database

17.4.30 Data Type - Query Only Form

This form allows you to:

- Cross-reference data types with their description
- Enter and execute queries on data types within the selected telemetry database

17.4.31 Conversion Matrix - Query Only Form

This form allows you to:

- Determine the possible ways that data may be converted and calibrated
- Enter and execute queries on data types within a Telemetry database

17.4.32 Error Log - Query Only Form

The **Error Log - Query Only** form provides you with the means to list conversion, incorporation, and validation errors that have occurred while using the TDB software. These errors originate as follows:

- Conversion errors are detected when files used to generate a database cannot be successfully converted or loaded.
- Incorporation errors are detected when incorporating Database Change Requests (DBCRs) into their Project Telemetry Database (PTDB). DBCRs are used to identify and request database modifications. Once a DBCR is approved, the changes specified on the DBCR must be incorporated in the PTDB.
- Validation errors are detected during the PTDB validation process. The validation process retrieves PTDB data to ensure it complies with specified validation rules. A list will be generated including the time the error occurred, its error code, and any associated error messages.

This form allows you to:

- Examine the contents of the Error Log
- Enter and execute queries on Error Log contents
- Generate reports based on any of the Error Log query results

17.4.33 Initial Load Data - Query Only Form

The **Initial Load Data - Query Only** form is used to log successful insert and update statements during the database conversion process. During a database conversion process, insert and update statements are used to load converted data into the database revision. The statements that are successfully executed are logged in the Initial Load Data table. Once the conversion process is complete, a DBCR can be submitted to cover the new data. When this DBCR is submitted, the logged insert and update statements are copied from the Initial Load table into the Database Change Request database and attached to the DBCR. This process allows the source of the new data to be tracked through a DBCR, and the new data can be applied to a database by simply incorporating the DBCR into the database.

This form allows you to:

- Examine the Load Sequence and Load Statement
- Enter and execute queries on the Initial Load Data
- Generate reports based on any query results

17.4.34 SDT OD Build List Form

The Shuttle Data Tape (SDT) originates at Johnson Space Flight Center (JSC) and is delivered electronically as a data set composed of seven files. The SDT is manually loaded by a Database Developer using the TDB_Convert_SDT_Process. The process will take the Data Integration Plan (DIP) Multifile Shuttle Data Tape Files and convert them to the EHS TDB tables. The process reads from the SDT OD Build Table the MSIDs that are to be processed. The SDT OD Build List form is used to create this table of MSIDs that need to be processed. This form is used to identify MSIDs that are to be converted from the Shuttle Data Tape (SDT) and loaded into MSFC-DOC-1949 formatted database tables. This form must be populated by a Database Developer before running the **Convert Shuttle Data Tape...** function available off the Telemetry Database application's **Options** menu, **Convert Database** cascade.

Help: For more information concerning the SDT, see Shuttle Data Integration Plan (JSC -18206, Volume 3, Revision G) "MAST II/STAR Deliverable Products."

This form allows you to:

- Examine the MSID Build List
- Enter and execute queries on the MSID Build List
- Generate reports based on any query results

17.4.35 MBF MSID List Form

The Mission Build Facility (MBF) database originates at Johnson Space Center (JSC) and is delivered electronically as a data set composed of eight files. The MBF is loaded by a Database Developer using the **MBF Loader** application. This process takes the MBF files and converts them into Oracle-compatible format. The Database Developer (or other privileged user) must then use the **MBF MSID List** form to identify the MSIDs within the MBF Oracle files to include in the EHS database. The MBF MSID List form does not display MBF MSIDs that can be converted, but rather, MBF MSIDs that will be converted the next time that the MBF conversion process is run. In addition, Database Developers must identify MSID state code conversions between the MBF and EHS databases using the **MBF State Code** form. The **Convert MBF File** function takes the intermediate MBF Oracle tables and converts the identified database and MSIDs into EHS database format.

This form allows you to:

- View/create a list of MBF MSIDs which will be (or were) converted into EHS database format
- Enter and execute queries on MBF MSIDs
- Generate reports based on any query results

17.4.36 MBF State Code Form

The Mission Build Facility (MBF) database originates at Johnson Space Center (JSC) and is delivered electronically as a data set composed of eight files. The MBF is loaded by a Database Developer using the **MBF Loader** application. This process takes the MBF files and converts them into Oracle-compatible format. The Database Developer (or other authorized user) must then use the **MBF MSID List** form to identify the MSIDs within the MBF Oracle files to include in the EHS database. In addition, Database Developers must identify MSID state code conversions between the MBF and EHS databases using the **MBF State Code** form. The reason for the **MBF State Code** form is that MBF allows MSIDs to have state codes up to 60 characters, while EHS allows state codes of only 12 characters in length. The **Convert MBF File** function takes the intermediate MBF Oracle tables and converts the identified database and MSIDs into EHS database format.

This form allows you to:

- Identify/view those MBF MSIDs with state codes which will be (or were) converted to EHS formatted MSIDs with state codes
- Enter and execute queries on MBF MSID state code conversions
- Generate reports based on any query results

17.4.37 MSID List - Query Only (Local Table) Form

A local table is maintained by user account for each Telemetry Database that is on-line for a given project, mission, and operational support mode. Thus, the user account ID, database version, and Mission/Operational Support Mode/Project (MOP) uniquely identifies a local table.

A local table is a personal subset of the telemetry database. It contains the information necessary for you to modify MSID definitions. When you initiate a HOSC software application that acquires telemetry, the information used to process MSID data is retrieved from the local table.

Using the Telemetry Database application's local table menus a non-privileged user can:

- Change the existing limits for an MSID
- Add one set of limits for an MSID which has no limits defined
- Change the calibration type of an MSID from "(N)one" to "(P)olynomial (C)oefficient" or "(P)oint (P)air" (if the MSID data type is IUNS, ITWO, ITWOW, FEEE, FIBM, FNTL, FSPL, or FVAX)
- Change the existing calibration coefficients of an MSID
- Add one set of calibration coefficients for an MSID that has no calibration coefficients defined
- Change the existing point pairs of an MSID
- Add one set of point pairs for an MSID that has no point pairs defined
- Change the existing state codes for an MSID
- Change the existing expected state for an MSID
- Add an expected state for an MSID that does not have an expected state defined
- Reinitialize individual MSIDs, or the entire local table, so that it contains the same information as in the associated telemetry database

In addition to the above, database developers also have the ability within the Telemetry Database application's local table menus to:

- Change the existing decommutation location for an MSID
- Add or delete MSIDs from an existing MSID group
- Start or stop MSID group initiation based on the returned value of a control MSID
- Start or stop MSID group initiation based on a specified time
- Change the method for initiating a group based on the start/stop time

The local table contains information needed to convert, calibrate, and limit sense MSIDs. The MSID information in local tables is initially created from the telemetry database. If a user wants to change information for specific MSIDs, then he/she creates a copy of the local table by selecting the desired database version. The application retrieves information from the local table and displays a list of MSIDs in the application work area. The user is able to browse the list and select the MSID to be edited. Once MSID editing has been completed, you can elect to save all changes made to the local table as a local table change file.

Local table change files generated through the Telemetry Database application's local table menus may be applied using the Local Table Operation (LTO) application discussed later in this User Guide.

The **MSID List - Query Only (Local Table)** form allows you to:

- View and edit MSIDs within your Local Table
- Navigate to the **MSID Detail** form

17.4.38 Group List - Query Only (Local Table) Form

MSIDs may be grouped together so that exception monitoring can be started or stopped for the group based on the value received for another MSID. A group is nothing more than MSIDs which have been grouped together primarily for activating and deactivating Exception Monitoring and Limit/Expected State (LES) sensing. A group can be activated and deactivated using start and stop times or based on the value received for another measurement. Using your local table you can make modifications to your defined group. The local table version of the **Group List-Query Only** form identifies which defined groups have been modified.

The **Group List-Query Only** form allows you to:

- view a list of defined MSID groups
- identify groups that have been changed through a local table change file
- enter and execute queries on group lists within a Telemetry Database
- generate reports based on any of the group lists

17.5 Local Table Operation Overview

The Local Table Operation application allows a user to apply change files to the runtime local table, based on either the **Baselined** or **Archived** database. Applications during operation cannot use the pre-released database for processing telemetry. The **Pre-released** local table, built from the **Pre-released** database, can only be accessed to create local table change files through the Local Table forms within the Telemetry Database application. This allows the user to prepare local table change files when the **Pre-released** database becomes the **Baselined** database.

The Local Table Operation main window contains several distinct features that will be discussed in this chapter (see Figure 17-7, Local Table Operation main window):

- Menu bar
- Database selection radio buttons
- Work area

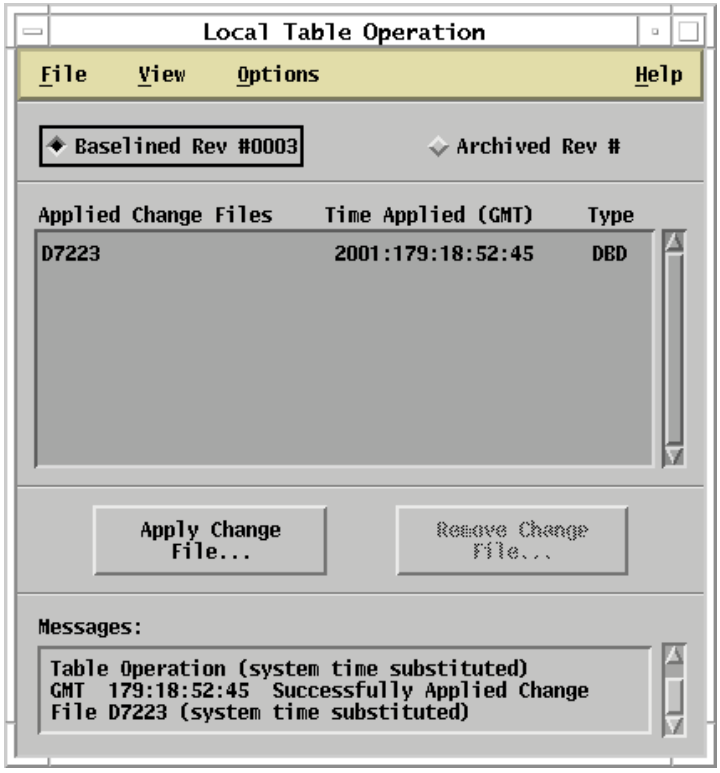


Figure 17-7, Local Table Operation main window.

17.5.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Apply Change File...**
  - **Remove Change File...**
  - **View MSID Information...**
  - **View Group Information...**
  - **Activate Group...**
  - **Set LES Processing...**

17.5.2 Database Selection Radio Buttons

The radio buttons located directly below the menu bar allow you to view, in the work area, the local table change files that have been applied to the **Baselined** or **Archived** database.

17.5.3 Work Area

The contents of the work area will change based on which radio button (**Baselined** or **Archived**), is selected. The area will display the name(s) of the applied change file(s), the time the change file was applied, and whether the change file was created by a **User** or Database Developer (**DBD**).

17.5.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Local Table Operation application. All the menu options from the **Options** menu will be discussed (see Figure 17-8, Options menu).

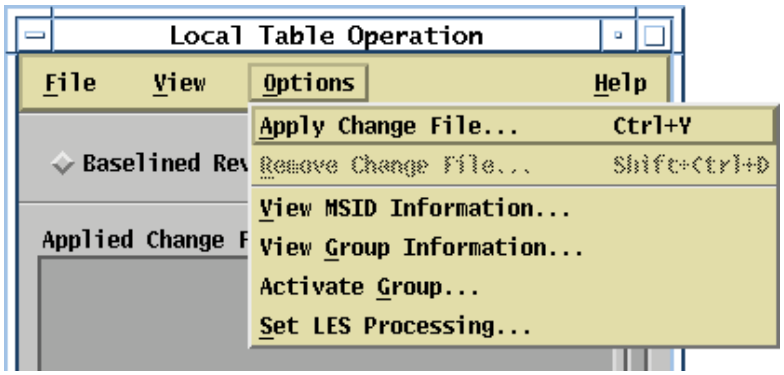


Figure 17-8, Options menu.

17.5.4.1 Apply Change File...

The **Apply Change File...** menu item invokes a dialog box containing all of the change files that are available for the selected database, their last modified date and an indication of the type of change file; either **User** or **DBD** (Database Developer) (see Figure 17-9, Apply Change File dialog box).

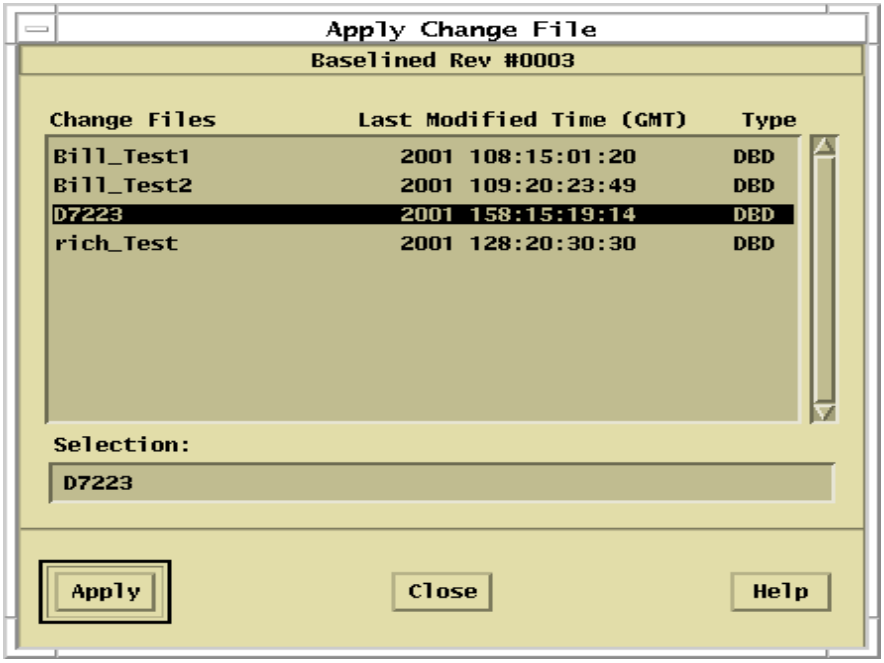


Figure 17-9, Apply Change File dialog box

17.5.4.2 Remove Change File...

The **Remove Change File...** menu item allows you to select a change file that is currently being applied and remove it from the list of those change files impacting the local table.

17.5.4.3 View MSID Information...

The **View MSID Information...** menu item invokes the **View MSID Information** form that allows you to look at each MSID in your local table and its source for calibration, limit, and group information. The information can be from the default local table or from an applied change file (see Figure 17-10, View MSID Information main window).

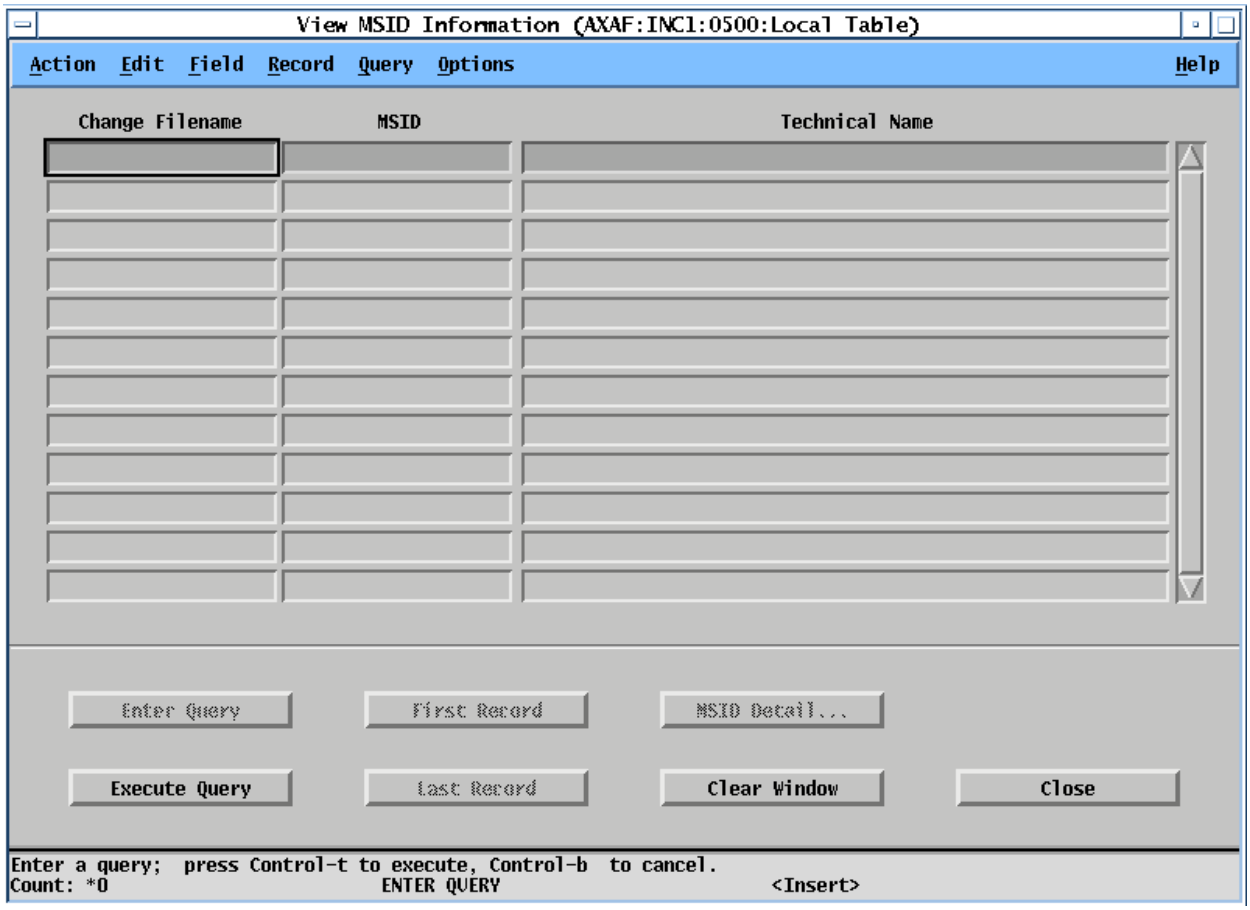


Figure 17-10, View MSID Information main window.

Note: The **View MSID Information** form is identical (with exceptions as noted below) in form and purpose to the **MSID List - Query Only (Local Table)** form discussed earlier in the Telemetry Database portion of this User Guide. Only the differences between the two forms will be discussed in this section.

When initially invoked, the work area fields of the form are empty. To obtain local table information you can enter selection criteria for a particular MSID or use the default and execute a query to obtain MSID information for the entire local table.

The **Change Filename** column is used to obtain a listing of MSIDs peculiar to a particular local table change file. Using a change file filename as selection criteria and then executing a query will result in a listing of MSIDs for that change file.

17.5.4.4 View Group Information...

The **View Group Information...** menu item invokes the **View Group Information** form that allows you to look at each Group in your local table.

Groups are used to activate/deactivate Exception Monitoring (EM) and are nothing more than MSIDs which have been grouped together primarily for activating and deactivating in Limit/ Expected State (LES) sensing. A group can be activated and deactivated by a start and stop time or by the value of another control measurement.

17.5.4.5 Activate Group...

The **Activate Group...** menu item invokes the **Activate Group** dialog box. This dialog box allows you to see which groups are currently active; then provides the means to manually activate or deactivate the groups, regardless of how the group's activation type was defined (i.e., **Control** or **Time**).

17.5.4.6 Set LES Processing...

The **Set LES Processing...** menu item allows you to choose whether LES processing of an MSID is, or is not, dependent on a group being active. If LES processing is dependent on groups, the processing will only be performed if the MSID is a member of a group that is currently active. If LES processing of an MSID is not dependent on a group being active, the processing will continue to be performed. The default is for LES processing to be dependent on a group being active.

When this item is selected, a Set LES Processing confirmation dialog box is invoked (see Figure 17-11, Set LES Processing dialog box).

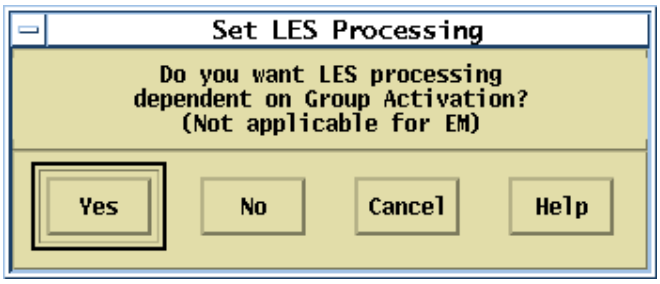


Figure 17-11, Set LES Processing dialog box.

17.6 User-Generated Data Element (UDE) Database Overview

This section describes the User-generated Data Element (UDE) database application. This database application allows you to manage UDEs, such as displays, computations, scripts, etc., that have been placed in central storage. UDEs are created using the various Huntsville Operations Support Center (HOSC) applications and are submitted to central storage using the Store UDE application available from the **File** menu off the **Launchpad**.

For those UDEs that you place in central storage (that have your user identification (ID) as the owner), you can use the UDE Database application to:

- View the attributes of these UDEs
- Mark the UDEs so that they can be shared with others
- Generate, view, and print a report of your UDEs based on specific search criteria
- Copy your UDEs from one mission to another
- Delete your UDEs

You can also generate, view, and print a report of other users UDEs that have been placed in central storage.

The UDE Database application, like all other HOSC database applications, uses as its foundation Oracle Forms and Oracle Reports commercial software products to access and update the database.

Help: For more information about Oracle Reports, see the documentation set provided by Oracle and published by Cooperative Development Environment for Developing Portable Applications.

Selecting the **UDE Database** menu item form the **Database** menu on the **Launchpad** invokes the UDE Database main window (see Figure 17-12, UDE Database main window).

Figure 17-12, UDE Database main window.

17.6.1 Menu Bar

The menu bar provides access to the functions within the UDE Database application. These functions allow you to select a mission database, edit your personal User-generated Data Element (UDE) attributes or view other users' UDE attributes, choose selection or filtering criteria, generate reports, and access Help.

- The **Database** menu includes a menu item that allows you to select a mission database with which you want to work. It also contains a menu item that allows you to exit the application.

Note: Only the **Database** and **Help** menus are available (not grayed out) until you select a mission.

- The **Query/Update** menu includes menu items that allow you to edit personal UDE attributes or view all users' UDEs.

- The **Report** menu includes a menu item that allows you to access UDE forms from which you can generate reports based on any specified filter criteria.
- The **Options** menu includes menu items that allow you to copy UDEs from one mission database to another.
- The **Help** menu provides an index of help topics and provides help on the **UDE Database** main window, defined keys, index, and the application version.

17.6.1.1 Database Menu

The menu items available under the **Database** menu allow you to select the specific mission database you want to work with, as well as to exit the application.

17.6.1.1.1 Select Database...

The **Select Database...** menu item invokes a dialog box that allows you to specify the mission database with which you want to work. The **Select Database** dialog box contains Mission:, an associated input text field, and applicable pushbuttons.

If you know the mission database you want to work with, you can enter the mission name or acronym in the input text field provided, or you can click on Mission: to invoke a List of Values (LOVs) from which you can choose your mission database.

17.6.1.1.2 Exit...

The **Exit** menu item allows you to exit the UDE Database application. You will be asked to confirm the exit.

17.6.1.2 Query/Update Menu

The menu items under the **Query/Update** menu include **Edit Personal UDE Attributes...** and **View All Users UDE Attributes...**.

17.6.1.2.1 Edit Personal UDE Attributes...

This menu item invokes a form that allows you to edit the shareable attribute of UDEs that you own. Making a UDE shareable allows other users to access your UDEs. You can also execute queries on those UDEs that you own (see Figure 17-13, Edit Personal UDE Attributes main window).

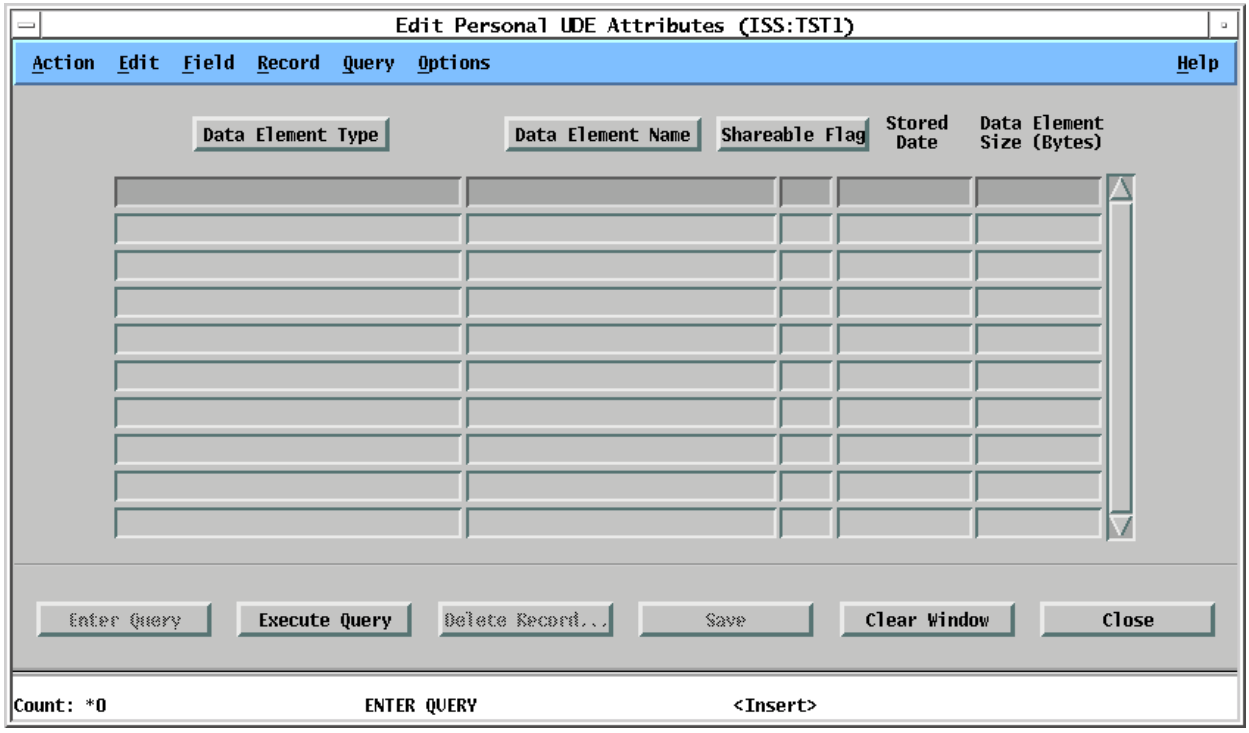


Figure 17-13, Edit Personal UDE Attributes main window.

Work area fields are empty when the **Edit Personal UDE Attributes** form is initially invoked. You can enter selection criteria or use the default and execute a query. Once the query has been executed, the work area will contain the results of your query. The work area is comprised of five columns:

- **Data Element Type**
- **Data Element Name**
- **Shareable Flag**
- **Stored Date**
- **Data Element Size (Bytes)**

Three of these columns (**Data Element Type**, **Date Element Name**, and **Shareable Flag**) contain a pushbutton that invokes a List of Values (LOV). These LOVs help identify the query selection criteria.

The **Data Element Type** column will contain the UDE type. If you click Data Element Type:, an LOV is invoked that allows you to select a UDE type on which you want to execute a query.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for a complete list of available UDE types.

The **Data Element Name** column will contain the UDE names of the specified UDE type. If you click Data Element Name, an LOV is invoked that allows you to select the UDE name on which you want to execute a query.

Tip: Wildcards can be used to help narrow your selection criteria.

If you click Shareable Flag, an LOV is invoked that allows you to choose **(Y)es** or **(N)o** as selection criteria. The **Shareable Flag** column identifies (**Y** or **N**) whether a UDE is shareable or not. After the query is executed, this is the only field that is modifiable.

(Y)es - Makes the selected UDE shareable so that other users can copy it.
(N)o - Other users cannot access it.

The **Stored Date** column displays when the UDE was submitted to central storage. The format for this field is `mmm-dd-yyyy`.

The **Data Element Size** column displays how large the UDE is in bytes.

Note: Any specified selection criteria will be displayed in the first line within the work area.

17.6.1.2.2 View All Users UDE Attributes...

This menu item invokes a form that allows you to see the name and attributes of other users' UDEs. Since you may edit only those attributes of UDEs that belong to you, this menu item allows read-only access and report generation of other users' UDEs.

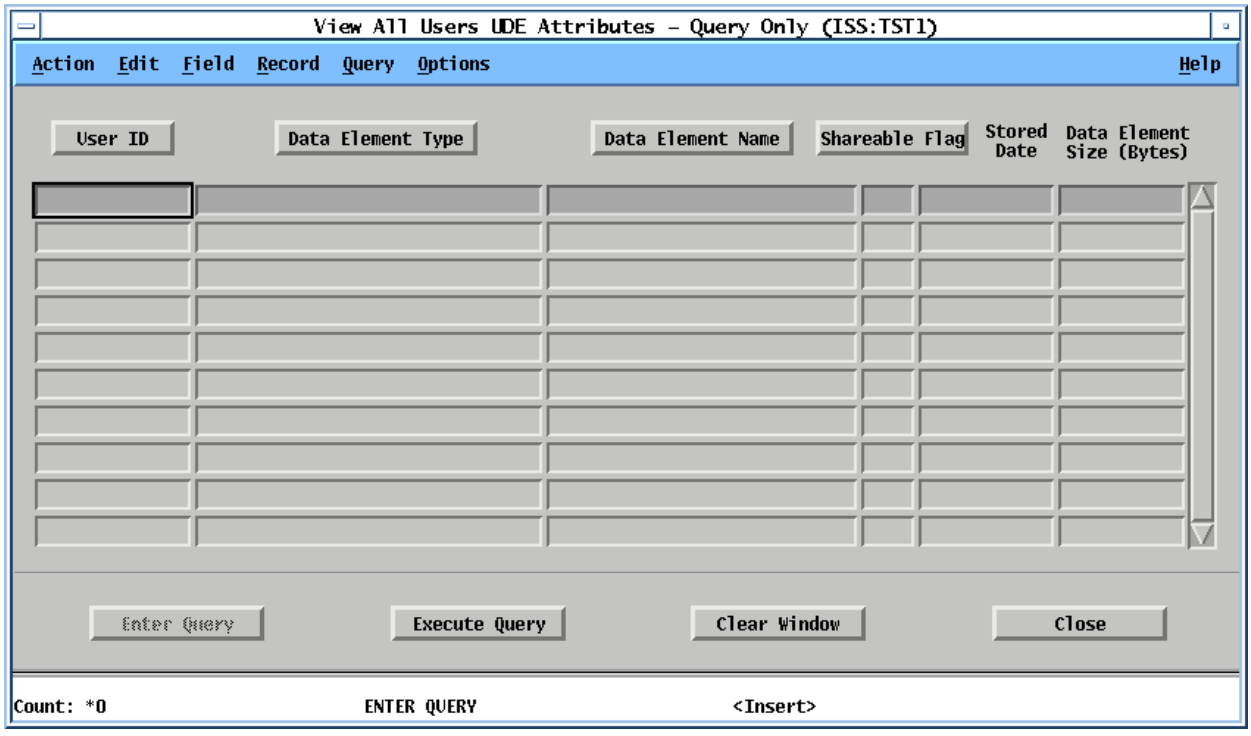


Figure 17-14, View All Users UDE Attributes - Query Only main window.

Work area fields are empty when the **View All Users Attributes** form is initially invoked. You can enter selection criteria or use the default and execute a query. Once the query has been executed, the work area will contain the results of your query. It is comprised of six columns:

- **User ID**
- **Data Element Type**
- **Data Element Name**
- **Shareable Flag**
- **Stored Date**
- **Data Element Size (Bytes)**

Four of these columns (**User ID**, **Data Element Type**, **Data Element Name**, and **Shareable Flag**) have pushbuttons that invoke a List of Values (LOVs). These LOVs help identify query criteria. After a query is executed, these pushbuttons become insensitive.

The **User ID** column will contain the name of the user who owns each UDE. If you click

, an LOV is invoked that allows you to select a user identification (ID) on which you want to execute a query.

The **Data Element Type** column will contain the UDE type. If you click

, an LOV is invoked that allows you to select a UDE type on which you want to execute a query.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for a complete list of available UDE types.

After a query is executed, the **Data Element Name** column contains the UDE names for the specified UDE type. If you click

, an LOV is invoked that allows you to select a UDE name on which you want to execute a query.

Tip: Wildcards can be used to help narrow your selection criteria.

The **Shareable Flag** column identifies (**Y** or **N**) whether a UDE is shareable. If you click

, an LOV is invoked that allows you to select **Yes** or **No** as selection criteria.

The **Stored Date** column displays when the UDE was stored to the UDE Database. The format for this field is `mmm-dd-yyyy`.

The **Data Element Size** column displays how large the UDE is in bytes.

Note: Any specified selection criteria will be displayed in the first line within the work area.

17.6.1.3 Report Menu

The menu item available under the **Report** menu allows you to access standard reports.

17.6.1.3.1 UDE Attribute Report...

The **UDE Attribute Report...** menu item invokes a dialog box that allows you to pick selection criteria from which a report is generated. The **UDE Attribute Report** dialog box consists of a **Personal UDEs** toggle button and a corresponding frame, an **Other Users' UDEs** toggle button and corresponding frame, Data Element Type: and associated input text field, a **Data Element Name:** input text field and a buttons area (see Figure 17-15, UDE Attribute Report dialog box).

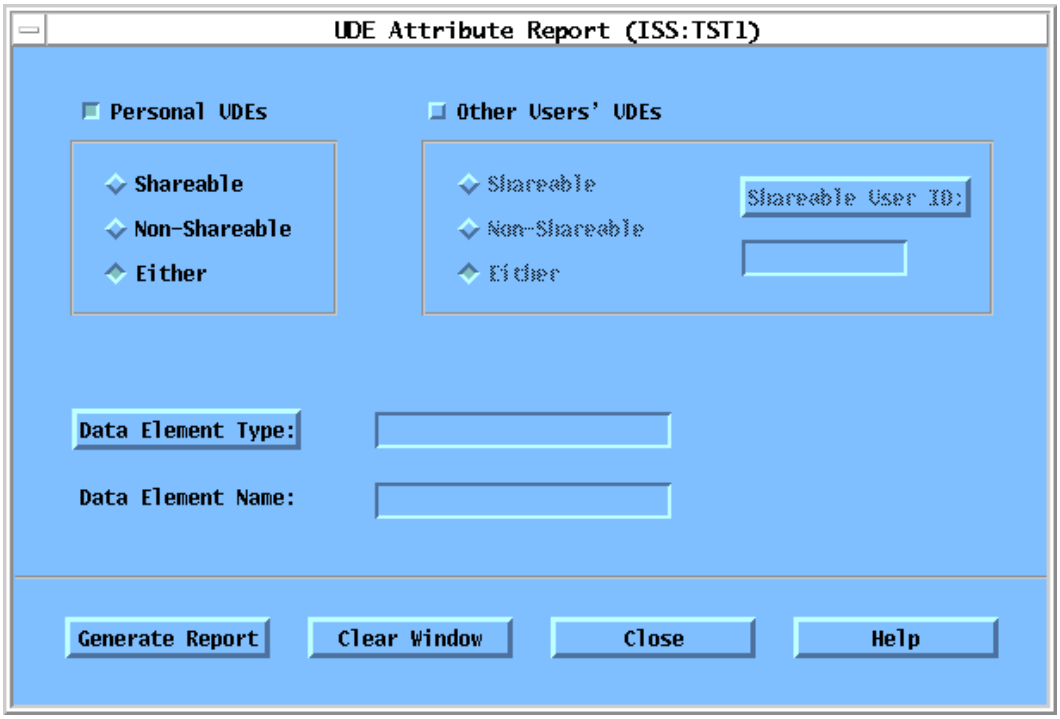


Figure 17-15, UDE Attribute Report dialog box.

If you select the **Personal UDEs** toggle button, the radio buttons **Shareable**, **Non-Shareable**, or **Either** become available. You can select to generate a report with your UDEs that have been marked **Shareable**, **Non-Shareable**, or **Either**.

Shareable - a flag has been set to allow other users to retrieve your UDE from the UDE Database and use it on their local workstation. The report will include those UDEs that have the shareable flag set to **Yes**.

Non-Shareable - a flag has been set to not allow other users to retrieve your UDE from the UDE Database and use it on their local workstation. The report will include those UDEs that have the shareable flag set to **No**.

Either - the report will include both those UDEs that are marked **Shareable** or **Non-Shareable** in alphabetical order based on data element type.

If you select the **Other Users' UDEs** toggle button, you can select to generate a report with UDEs of all users or UDEs of a certain user. For all users or a specific user, you can select whether you want the report to include those UDEs that have been marked **Shareable**, **Non-Shareable**, or **Either**.

Help: The definitions of these terms are defined in the glossary.

Note: You can generate a report containing both **Personal UDEs** and **Other Users' UDEs** by selecting both toggle buttons. This report may be very large.

If you want to see a list of available user IDs, you can click Shareable User ID: that invokes a Shareable User ID LOV

The Data Element Type: invokes a **Data Element Type** LOV and allows you to select the type of data element on which you wish to search. If you know the name of the data element type, you can type it in the input text field to the right of Data Element Type:.

The **Data Element Name:** input text field allows you to specify and include in the report, UDEs that follow a particular naming convention.

17.6.1.4 Options Menu

Copy UDEs... is the only menu item available under the **Options** menu.

17.6.1.4.1 Copy UDEs

The **Copy UDEs...** menu item invokes a dialog box that allows you to select a **Source Mission:,** a source **User ID:,** and source **Data Element Type:** from which you can copy UDEs to the mission database you selected when you first entered the application (see Figure 17-16, Copy UDEs dialog box).

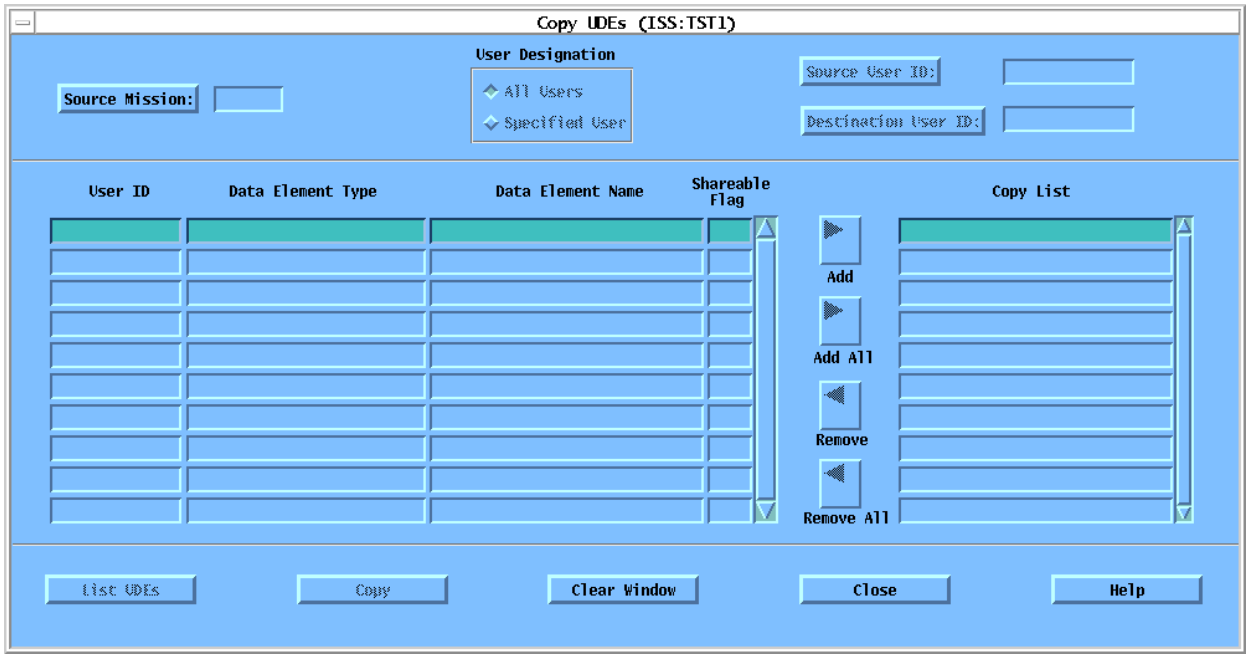


Figure 17-16, Copy UDEs dialog box.

The **Copy UDEs** dialog box consists of four areas:

- Source area
- Query results area
- **Copy List To *mission*** area
- Buttons area

The source area contains three pushbuttons and associated input text fields:

Clicking **Source Mission:** invokes an LOV from which you can select the mission database that you want to copy from. If you know the mission database, you can enter it in the provided input text field.

Note: This field is validated against a list of valid options. If an invalid entry is entered, the cursor will remain in the field until a valid entry is entered.

Clicking **User ID:** invokes an LOV from which you can select the source user ID for the UDEs. The source **User ID:** LOV will contain only those user IDs that have UDEs marked as shareable. If you know the user ID, enter it in the provided input text field.

Note: This field is validated against a list of valid options. If an invalid entry is entered, the cursor will remain in the field until a valid entry is entered.

Clicking **Data Element Type:** invokes an LOV from which you can select the data element type. If you know the data element type, enter it in the provided input text field.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for a complete list.

Note: This field is validated against a list of valid options. If an invalid entry is entered, the cursor will remain in the field until a valid entry is entered.

Note: The User ID: and Data Element Type: pushbuttons are grayed out until the source mission database is selected.

The query results area will contain a list of UDEs that match the criteria specified in the source area.

The **Copy List To *mission*** area will contain a list of the UDEs that you have selected to be copied to your current mission database.

Add, Add All, **Remove**, and **Remove All** are placed between the lists to facilitate moving UDEs from one list to the other.

Note: **Add** and **Add All** are grayed out when the query results area is empty, and **Remove** and **Remove All** are grayed out when the **Copy List To *mission*** area is empty.

17.6.1.5 Help Menu

The **Help** menu is the last menu on the **UDE Database** menu bar. It provides the capability for you to access keyboard accelerators and mnemonics, a table of contents, an index of help topics, and software release information. An on window function provides a brief overview of the application and a user scenario. It includes the **On Window**, **On Keys**, **Index**, **Table of Contents**, and **On Version** menu items.

17.7 Database Change Request Overview

This section describes the Database Change Request application. This application provides an online form for tracking and submitting changes to the Telemetry Database (TDB), Command Database (CDB), and User-generated Data Element (UDE) databases. Depending on the database being modified, the following mechanisms are available by which you can propose database changes:

- You can attach a modified, personal copy of the TDB or CDB to the electronic form
- You can describe the changes in the form's change description field
- You can attach initial load statements in Structured Query Language (SQL) format to the form.
- You can attach to the form, an external file which contains the database change information

The form, with the proposed changes, is submitted electronically to the Database Coordination Group (DBCG) or Huntsville Operations Support Center (HOSC) Management Coordination Group (HMCG) for approval. A privileged user will disposition the change request based on the DBCG directive. Submitted change requests cannot be edited or deleted, but forms which have yet to be acted upon may be withdrawn. You must submit a Database Change Request (DBCR) to change any EHS database information.

Help: For information regarding the DBCG and HMCG, their organization and responsibilities, see HOSC Functional Requirements and Implementation Plan (MSFC-PLAN-904).

The Database Change Request application, like all other HOSC database applications, uses as its foundation Oracle Forms and Oracle Reports commercial software products.

The DCR Database application facilitates the submission of proposed database changes to the Database Coordination Group (DBCG). Your ability to access certain DCR Database application functions depend on the privileges granted you when your account was established. End-users are permitted to create, edit, delete, submit, withdraw, and print Database Change Requests (DBCRs). Privileged users are able to provide disposition, assignment, and implementation information.

Note: If you are unable to access the functions necessary to perform your job, submit a revised account request form to your system administrator.

The **DCR Database** main window is primarily used to access menus which invoke, list, and report on current DBCRs for a particular project and mission (see Figure 17-17, Database Change Request main window).

Help: Database Change Request forms and reports are available to remote users utilizing EHS web applications. To access the EHS web applications see Appendix B: Remote Access to EHS Services.

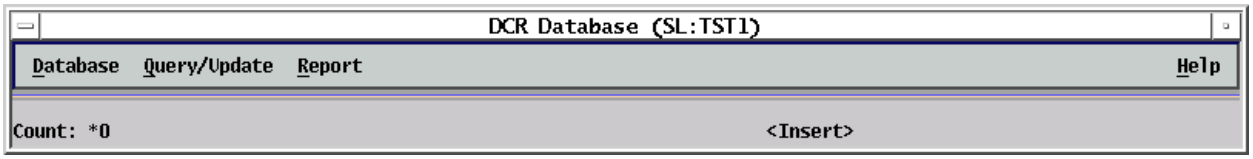


Figure 17-17, Database Change Request main window.

17.7.1 Menu Bar

The menu bar provides access to the functions within the Database Change Request (DCR) Database application. These functions allow you to access an existing Database Change Request (DBCR); initiate a new DBCR form; view, list or generate reports about existing DBCRs; and access **Help**.

The **DCR Database** menu bar is organized by function under four menus: **Database**, **Query/ Update**, **Report**, and **Help.**

- The **Database** menu includes a menu item that allow you to identify the mission database against which you would like to submit a proposed change (Database Change Request). It also contains a menu item that allows you to exit the application.

Note: No other menu bar items are available until a mission DCR database is selected using the **Select Database...** menu item.

- The **Query/Update** menu is used to invoke various forms. These forms provide you with the means to create and view data for individual DBCRs. You can also use this menu to see change data for DBCRs and to list all DBCRs present for the selected project and mission. A schedule of upcoming database events is accessible through this menu which identifies DBCR submission deadlines.
- The **Report** menu includes a cascade menu that allows you to access dialog boxes in which you specify information to include in your DBCR report. A second menu item allows you to generate a predefined project specific report.
- The **Help** menu provides an index of **Help** topics and provides help on the **DCR Database** main window, defined keys, index, and the application version.

17.7.1.1 Database Menu

When you initiate the DCR Database application, the only menu available on the menu bar is **Database**. The menu items available under the **Database** menu allow you to select the specific mission DCR database with which you want to work and to exit the application.

17.7.1.1.1 Select Database...

The **Select Database...** menu item invokes a dialog box that allows you to specify the mission database for which you would like to view information or submit a change (Database Change Request). The work area of the **Select Database** dialog box contains Mission and an associated input text field. This dialog box also has a buttons area.

Note: Like the **DCR Database** application main window, the title bar of the **Select Database** dialog box shows the project identification (ID).

If you know the mission database you want to work with, you can enter the mission name or acronym in the input text field provided, or you can click on Mission to invoke a List of Values (LOV) from which you can choose your mission database.

Note: Until you define the mission, the Select Database function will be unavailable (grayed out).

17.7.1.1.2 Exit...

The **Exit...** menu item allows you to exit the DCR Database application. You will be asked to confirm the exit.

17.7.1.2 Query/Update Menu

The menu items under **Query/Update** allow you to create and submit a new DBCR, or to query, select and view an existing DBCR. The **Database Schedule...** menu item allows you to see the anticipated schedule for upcoming database releases.

The menu items under the **Query/Update** menu are listed as follows:

- **List DBCRs...**
- **DBCR Form...**
- **View Change Data...**
- **Database Schedule...**

17.7.1.2.1 List DBCRs...

The **List DBCRs** form provides you with the means to list those Database Change Requests (DBCRs) with which you want to work. You can use this form to query the DCR database for DBCRs which match selected criteria. Once the form is populated and DBCRs are listed, options are available for you to select and display information relevant to individual DBCRs.

This form allows you to:

- List all DBCRs written against current project databases
- Execute queries for specific project DBCRs
- Generate a report of selected DBCRs

17.7.1.2.2 DBCR Form...

The **Database Change Request** form is the heart of the DCR application. It provides you with the means to create, modify, save, and delete Database Change Requests (DBCRs). It also allows you to query the various project databases for DBCRs that have been written, regardless of their current state. When invoked directly from the **Query/Update** menu, the **Database Change Request** form is blank. You can use this blank form to create a new DBCR, or you can use it to define and execute a query of project DBCRs by specifying selection criteria using the List of Values (LOVs) and text entry fields.

When the **Database Change Request** form is invoked from the **List DBCRs** form, the DBCR associated with the selected row (record) will be displayed. Once a query has been executed,

matching records will be displayed on the list form. Using the **Options** menu on the **List DBCRs** form to open a **Database Change Request** form will display the contents of the first DBCR returned by the query. You can then use the up and down arrows on your keyboard to display the next record (DBCR) matching your search criteria.

The **Database Change Request** form allows you to:

- Execute queries and view information about specific DBCRs that have been written against project databases.
- Edit DBCRs that you created and have yet to submit.
- Generate a report of selected DBCRs using the Report Previewer application.
- Invoke a separate form which allows you to view SQL statement change data.
- Create a new DBCR.

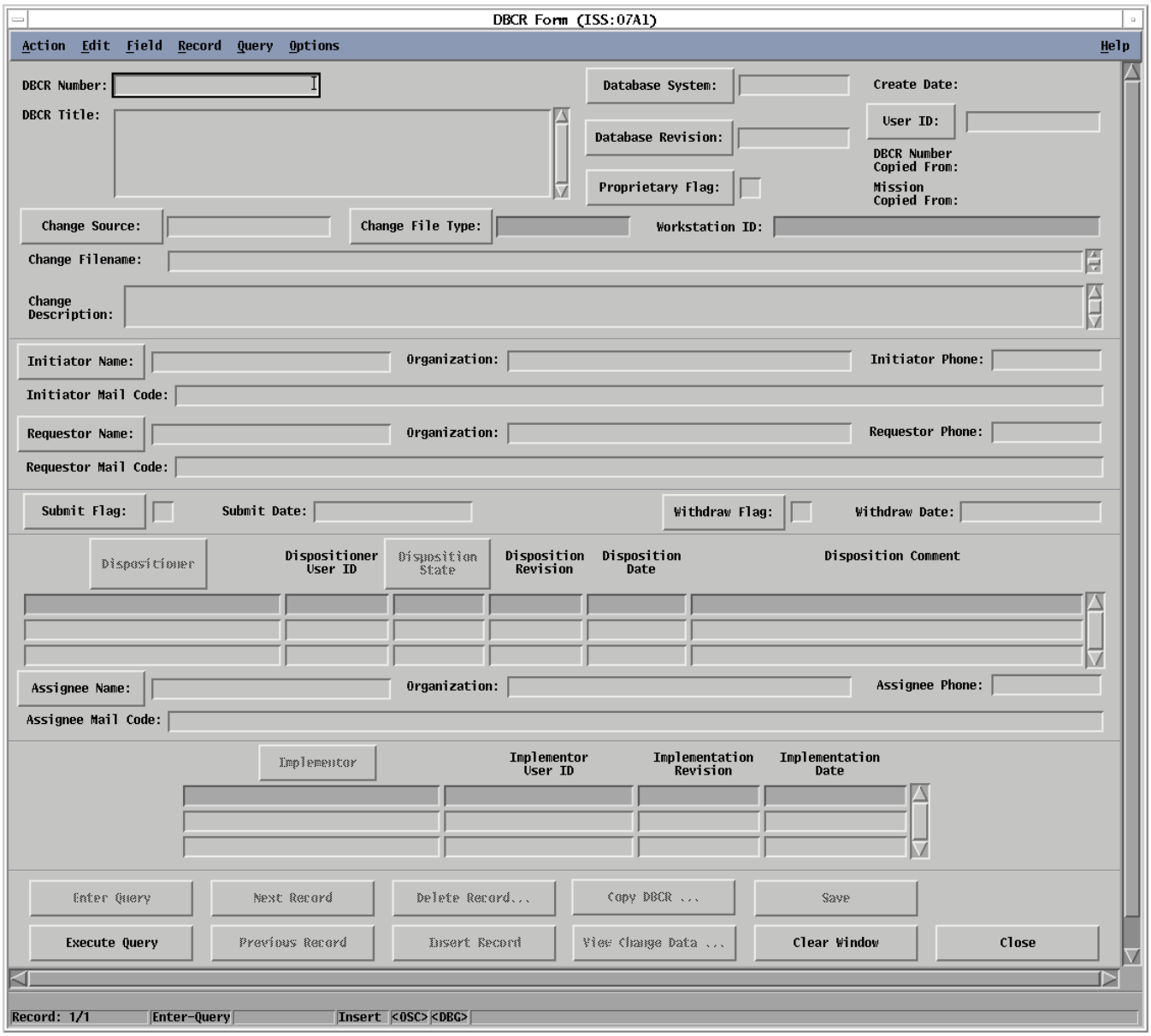


Figure 17-18, Database Change Request form.

The work area contains numerous text entry fields (see Figure 17-18, Database Change Request form). The work area can be divided into several sections and depending on your responsibilities and privileges, you may have the ability to modify information within these areas. Regardless of your privileges, you'll be able to execute a query and view information relevant to any submitted DBCR.

This form includes sections which are specific to the following types of users:

- Initiator - anyone can initiate and submit a DBCR. To do so, he/she must complete the top portion of the DBCR form and change the **Submit Flag:** to **Y**. Only an initiator of a DBCR form can submit or withdraw a DBCR. Once a DBCR has been submitted, it cannot be modified. It may however, be withdrawn.

- Dispositioner - is a member of the Database Coordination Group (DBCG). This individual's responsibility it is to designate someone to oversee the implementation of an individual DBCR. The Dispositioner uses his portion of the form to make those assignments. Once the assessment of a DBCR's impact is known, the DBCG or HMCG will either approve or disapprove the DBCR. The Dispositioner is responsible for updating this portion of the form.

Help: For information regarding the DBCG and HMCG, their organization and responsibilities, see HOSC Functional Requirements and Implementation Plan (MSFC-PLAN-904).

- Implementor - is a database administrator or database developer whose responsibility it is to implement any approved database changes. An implementor will also have the responsibility for updating implementation information within this portion of the form.

When you invoke the **Database Change Request** form directly from the DCR Database's **Query/ Update menu**, all of the fields are empty and the form is in the Enter Query mode. You can press Execute Query to execute the default query which shows detail information on all DBCRs for the selected database, or you can enter information in specific text entry fields and then execute a query. The following table identifies those fields on the **Database Change Request** form on which you can query, either through entering information directly into a text entry field or by selecting information from an LOV and having the system enter the information into the text entry field for you (see Table 17-1, Fields on which you can query).

Table 17-1, Fields on which you can query.

Field Titles	Text Entry Only	Text Entry with LOV Selection
DBCR Number: (Wildcards, while they can be entered, cannot be used here to retrieve a subset of DBCRs)	X	

Field Titles	Text Entry Only	Text Entry with LOV Selection
Database System:		X
DBCR Title:	X	
Database Revision: (TDB & CDB only)		X
Proprietary Flag:		X
User ID:		X
Change Source:		X
Change File Type:		X
Workstation ID:	X	
Change Description:	X	
Initiator Name:		X
(Initiator) Organization:	X	
Requestor Name:		X
(Requestor) Organization:	X	
Submit Flag:		X
Withdraw Flag:		X
Disposition State:		X
Assignee Name:		X
(Assignee) Organization:		X

Once a query is executed, the work area will display the information relevant for a single DBCR. If your query resulted in more than one DBCR matching your query criteria, the status bar will indicate how many records (DBCRs) have been retrieved. You can use the up and down arrow keys on the keyboard, or click Next Record and Previous Record to view detailed information about the other records (DBCRs) that met your search criteria.

Note: When executing a query, the **Database Revision:** field is available for entering data, but applies to only the Telemetry Database (TDB) and Command Database (CDB). If you wish to include UDE in your query, any entry in the **Database Revision:** text field will exclude these records (DBCRs).

Tip: Wildcards can be used to help narrow your selection criteria. Wildcards cannot be used within the **DBCR Number:** text entry field.

Tip: If you're trying to locate a particular DBCR by title, it might be easier to execute a query from the **List DBCRs** form, rather than from the **DBCR Form**. Using the **List DBCRs** form allows you to see all matching DBCR titles on a single form rather than having to page through all matches using the next and previous records functions.

Information on each of the **Database Change Request** fields and how to create, complete, and submit a new DBCR is described below.

When the **Database Change Request** form is initially invoked, you can create a new DBCR by going to the **Query** menu and clicking on **Cancel Query**. This gets you out of the Enter Query Mode and brings up a blank **Database Change Request** form in which you can enter and submit database changes.

If you are using the **Database Change Request** form and are currently viewing an existing DBCR, you are no longer in the Enter Query Mode and can invoke a new DBCR by going to the **Record** menu and clicking on **Insert Record**. You can also invoke this function by going to the control panel and clicking on

.

If you have an unsaved DBCR displayed and begin to invoke a new DBCR, you'll be prompted to save the current form

CAUTION: If you elect not to save the currently displayed DBCR, all information on the screen will be lost and a blank DBCR will be invoked.

When creating a new DBCR the fields specified in Table 17-2, (Initiator fields that must be completed for DBCR save and submission) must be completed by the initiator. The required fields on the DBCR form vary depending on how you elect to submit your proposed database changes. Available change submission methods are reflected in the **Change Source:** LOV**.** If you leave any of the required fields blank, you'll be prompted to provide the information before you can save (and therefore submit) the DBCR.

Table 17-2, Initiator fields that must be completed for DBCR save and submission.

	Change Source		
DBCR Text Entry Fields	**Attached User Copy**	**External File**	**External Media and Change Description**
DBCR Title:	X	X	X
Database System:	X	X	X

	Change Source		
DBCR Text Entry Fields	**Attached User Copy**	**External File**	**External Media and Change Description**
Database Revision: (Only if Database System is TDB or CDB)	X	X	X
Proprietary Flag: (Only if Database System is TDB or CDB)	X	X	X
Change Source:	X	X	X
Change File Type:		X	
Workstation ID:		X	
Change Filename:		X	
Change Description:	X	X	X
Initiator Name:	X	X	X
(Initiator) Organization:	X	X	X
Initiator Phone:	X	X	X
Initiator Mail Code:	X	X	X
Submit Flag:	X	X	X

In addition to the above required text entry fields, there are other optional and system completed text entry fields. The following paragraphs will address each of the text entry fields in the Implementor's section of the **Database Change Request** work area.

The **DBCR Number:** field will be completed by the system when you save a new DBCR. DBCRs are stored in the DCR database on the database server. There is a unique set of DBCR numbers assigned to each mission.

The next text entry field, **Database System:** is used to identify the database against which you'd like to create a DBCR. You can enter the database in the text field provided or you can click on Database System: to invoke a List of Values (LOVs) from which you can select the desired database.

The **Create Date:** item on the form is provided by the system and indicates the date on which the DBCR was initially created. This dated is provided automatically by the system when you save your newly created DBCR. You cannot enter a creation date.

The **DBCR Title:** text entry field allows you to provide a brief descriptive title of up to 256 characters for your DBCR.

If you select either **TDB** or **CDB** as your **Database System:**, the current baselined revision of the selected database is displayed in the **Database Revision:** text entry field. This field allows you to specify a database revision against which a particular DBCR applies. The User-generated Data Element (UDE) database does not use revision numbers. You can enter a database revision in the field provided or you can click on

to invoke a LOV from which you can select the database revision in which you're interested.

Note: When you create a DBCR and you select the UDE database system, the **Database Revision:** field is insensitive. This field is only applicable to TDB and CDB.

If you are creating a new DBCR, the **User ID:** text field won't display your user ID until you save the DBCR. This information is provided by the system automatically. You can not enter a user ID.

The **Proprietary Flag:** text field is used to identify DBCRs which contain proprietary data. This field is only applicable if you selected **TDB** as your **Database System:**. If you know whether the data within the proposed change is proprietary, you can enter either **Y** or **N**, respectively. The system will check and if necessary correct this response during the DBCR validation process. If data is proprietary, it will not be available to others (having a different TDB Owner ID) for viewing.

The **DBCR Number Copied From:** and the **Mission Copied From:** fields are provided by the system as information only. They identify whether some other DBCR was used to create this DBCR and what mission the copied DBCR came from. This information is provided when you close the **Copy DBCR** dialog box. You cannot enter a DBCR number or a mission acronym in these areas.

The **Change Source:** text entry field is used to identify where and how changes associated with this DBCR are defined. As a DBCR initiator you can:

- Define changes within the **Change Description:** area on the DBCR form itself
- Define the changes within an external file
- Define the changes within a file provided on some other media (not on a Huntsville Operations Support Center (HOSC) workstation)
- Identify the changes as being calculated by the CDB or TDB conversion routines and now stored as the initial load of Structured Query Language (SQL) statements in the DCR database
- Define the changes within a user copy of the Telemetry or Command databases

The following table (Table 17-3, Change sources) identifies the options available for DBCR originators.

Table 17-3,Change sources.

	TDB	CDB	UDE
Change Description	X	X	X
External File	X	X	X
External Media			X
Initial Load*	X	X	
User Copy	X	X	

* Only originators with appropriate privileges can use this method.

TDB and CDB files originally submitted to the HOSC on external media, are converted to a standard HOSC database format. If database changes are submitted in the original format using external media they will have to be converted again.

To reduce the risk of conversion errors, the preferred method is to open a DBCR and propose changes to the TDB or CDB by attaching a user copy of the modified database to the request. The TDB or CDB application will automatically store the change into the DCR Database with your corresponding DBCR number.

Note: A user copy is created using the Telemetry Database and Command Database applications available under the **Database** menu off the **Launchpad**.

If changes are already on-line in an initial load set of SQL statements, then these, too, are directly stored into the DCR Database with your corresponding DBCR number. All other methods of defining database changes require the assistance of a database administrator or database developer to identify the changes and to create a DBCR.

Note: If the proposed database changes are in an external file, you must identify the workstation on which the file is located, the directory, the type of file (i.e., Word Processor), and the filename.

The **Change Filename:** input text field is enabled only if you identified your **Change Source:** as an **External File**. You enter the name of the external file containing your database changes in the field provided.

If you know it, you can enter the **Change File Type:** in the field provided or you can click on Change File Type: to invoke an LOV from which you can select the appropriate file type.

In the **Workstation ID:** field, you enter the workstation ID (e.g., **gpehs032**) where the change file is stored. You may use this text field to query mission databases for other DBCRs with change files resident on matching workstations.

In the **Change Description:** input text field you can enter any information which will help you identify the changes being requested. Scroll bars are provided to allow you to create and view longer descriptions (up to 256 characters).

Within the next frame, the first input text field is **Initiator Name:**. You can enter your name in the field provided or if you have previously created a DBCR you can, click on Initiator Name: to invoke an LOV from which you can select your name. Instead of your name, you can specify a descriptive name for a group of individuals.

The **Organization:**, **Initiator Phone:** and **Initiator Mail Code:** input text field are provided so that other individuals may contact you with questions regarding this DBCR.

In some cases the individual initiating a DBCR is not the same as the individual requesting the database changes. The **Requestor Name:** input text field accommodates these situations and is provided so that if someone has questions regarding a DBCR's content, he/she can contact the requestor. If this is the case for the DBCR you are creating, you can enter the requestor's name, in the **Requestor Name:** input text field or if the requestor has previously been the requestor of a DBCR, you can click on Requestor Name: to invoke an LOV from which you can select the requestor.

The **Organization:**, **Requestor Phone:** and **Requestor Mail Code:** input text fields are provided so that individuals may contact the requestor with questions regarding this DBCR.

The next frame of the DBCR Form allows you to submit and withdraw DBCRs, as well as to see when DBCRs were submitted and withdrawn. To submit or withdraw a DBCR you must be the owner of the DBCR. Submitted DBCRs cannot be edited or deleted. DBCRs can only be withdrawn by the owner after they've been submitted to the DBCG for approval, but before any action (approval or disapproval) has taken place. DBCRs are submitted and withdrawn by changing their **Submit Flag:** or **Withdraw Flag:** text field entry from **N** to **Y.**

Note: DBCRs that are Withdrawn by the Initiator may be copied to a new DBCR using Copy DBCR ... . Changes can then be made to the copied DBCR and it can be resubmitted for approval.

When you save a DBCR the system will automatically complete the **Submit Date:** and/or **Withdraw Date:** fields.

The remainder of the **Database Change Request** work area cannot be completed except by privileged users and will be insensitive (grayed out).

The remaining text entry fields on the **Database Change Request** work area are reserved for Dispositioner and Implementor inputs. The content of these text fields is discussed below.

The dispositioner frame of the **Database Change Request** form includes a table which allows you to view information relevant to the dispositioner of any submitted DBCR. The disposition table has the following column headings:

- **Dispositioner**
- **Dispositioner User ID**
- **Disposition State**
- **Disposition Revision**
- **Disposition Date**
- **Disposition Comment**

The **Dispositioner** column identifies by name the individual responsible for updating the DBCR form with information regarding DBCR status and for assigning overall DBCR implementation responsibility.

The **Dispositioner User ID** column will contain the user ID for the dispositioner listed in the Dispositioner column.

The **Disposition State** column may contain an **A** (for approved), a **D** (for disapproved).

The **Disposition Revision** column identifies the Telemetry or Command Database revision to which the proposed changes will be applied. The **Disposition Date** column identifies when this particular DBCR was dispositioned. Information for this column is provided by the system when the DBCR has been successfully saved.

Note: The disposition table may include multiple entries for a single DBCR, because a DBCR can be dispositioned more than once. For example, this would occur if a DBCR issued for one database revision also applied to the next database revision. This prevents having to create new DBCRs for each database revision. Scroll bars are provided to allow you to view information about DBCRs that have been dispositioned more than three times.

The dispositioner frame also includes text fields that allow you to see who has been assigned overall responsibility for implementation of the DBCR (Assignee responsibility). Text fields include **Assignee Name:**, **Organization:**, **Assignee Phone:**, and **Assignee Mail Code:**.

Note: DBCRs that are Disapproved for implementation by the Dispositioner may be copied to a new DBCR using

. Changes can then be made to the copied DBCR and it can be resubmitted for approval.

The next frame in the DBCR work area includes a table that allows you to view information relevant to the implementation of an approved DBCR.

Column headings for the implementation table include:

- **Implementation Revision**
- **Implementation Date**

- **Implementor User ID**
- **Implementor**

The **Implementation Revision** column identifies the Telemetry or Command Database revision against which a DBCR's changes have been implemented.

The **Implementation Date** column identifies when the DBCR was implemented. The other two columns identify the Implementor's User ID and name.

Note: The implementation table may include multiple entries for a single DBCR, because a DBCR can be implemented more than once. For example, this would occur if a DBCR issued for one database revision also had changes which applied to the next database revision. Permitting multiple entries within the implementation table prevents you from having to create new DBCRs for each database revision. Scroll bars are provided to allow you to view information about DBCRs that have been dispositioned more than three times.

17.7.1.2.3 View Change Data...

The **View Change Data - Query Only** form provides you with the means to view the change data for Telemetry Database (TDB) and Command Database (CDB) Database Change Requests (DBCRs). This form is only valid for those DBCRs that have a **Change Source:** of **User Copy** or **Initial Load**. You must also have appropriate privileges to view change data of TDB DBCRs whose **Proprietary Flag:** is set to **Y**.

This form allows you to query the DCR database for a DBCR which includes change data. When invoked directly from the **Query/Update** menu, the **View Change Data** form is blank. If this form is invoked while a DBCR is displayed within the **DBCR Form**, then the change data for that DBCR will be shown.

If this from is invoked while viewing a DBCR (from the Database Change Request form), the change data for the selected DBCR will be shown. You will not be able to access this form for DBCRs which have no change data defined.

This form allows you to:

- Execute queries and view change data information for specific TDB and CDB DBCRs.
- Generate a report of TDB and CDB DBCR change data.

17.7.1.2.4 Database Schedule...

The **Database Schedule** form allows you to:

- Identify DBCR submission deadlines
- Access a schedule of upcoming database activities
- Execute queries to obtain the status and schedule for specific project database activities

- Generate a report of database activities

This information is useful in identifying anticipated database upgrades and change request submission deadlines.

17.7.1.3 Report Menu

A single menu item, **Select Standard Report**, is available from the **Report** menu. The **Select Standard Report** menu item invokes a cascade menu from which you can generate various types of reports.

17.7.1.3.1 Select Standard Report

The **Select Standard Report** menu item invokes a cascade menu. The menu items available from this cascade menu invoke dialog boxes that allow you to generate standard reports as listed below:

- **DBCR Attribute Report...**
- **DBCR Change Data Report...**
- **Database Schedule Report...**

DBCR Attribute Report...

The **DBCR Attribute Report...** menu item allows you to generate and print a report of DBCRs based on your specific database characteristics (see Figure 17-19, DBCR Attribute Report dialog box). Depending on your selections and the number of DBCRs in the system, this report may be quite extensive.

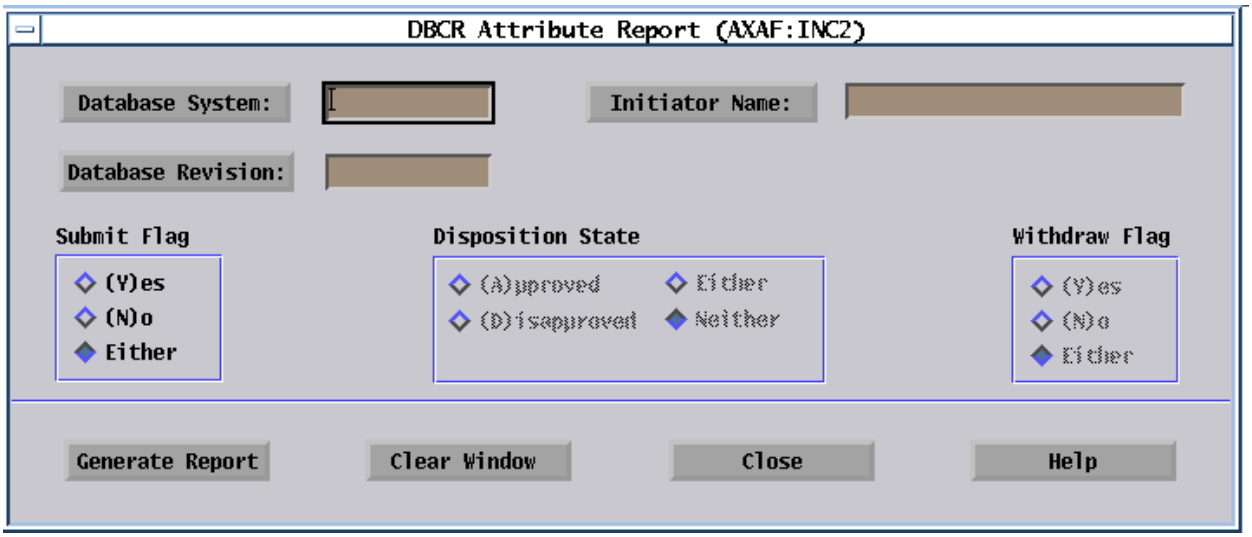


Figure 17-19, DBCR Attribute Report dialog box.

The **DBCR Attribute Report** dialog box allows you to define a report using:

- Three pushbuttons and their associated text fields (Database System:, Database Revision:, and Initiator Name:)
- Three radio boxes (**Submit Flag**, **Disposition State**, and **Withdraw Flag**)
- Buttons area

The pushbuttons available within the work area invoke LOVs to help you in defining your selections. Within the LOVs you can use the up and down arrow keys to highlight the next item within the list. Pressing the spacebar will select the highlighted item.

If you know the type of database you'd like, you may enter it in the associated input text field. By default this field is left blank, which means that DBCRs from all types of databases will be included in your report.

Note: If you select **UDE** as your database system, you should not enter anything in the **Database Revision** text field.

The **Submit Flag** radio box allows you to include only those DBCRs which have either been submitted to the Database Coordination Group (DBCG) for approval or those that have not been submitted to the DBCG. The default is for both submitted and unsubmitted DBCRs to be included in your report (**Either**).

The **Disposition State** radio box allows you to include in your report only those DBCRs which have been approved or disapproved by the DBCG. The default is for both approved and disapproved DBCRs to be included (**Either**), but you can also elect to generate a report of those DBCRs pending disposition (approval/disapproval) by selecting **Neither**.

The **Withdraw Flag** radio box allows you to include in your report only DBCRs which have been withdrawn or to include only those which haven't been withdrawn. Withdrawal is an action taken by a DBCR initiator prior to DBCR approval or disapproval. DBCR withdrawal halts further DBCR processing. The default is to include all DBCRs in the report, regardless of their withdrawal status (**Either**).

Help: For information regarding the database change request approval process see HOSC Functional Requirements and Implementation Plan (MSFC-PLAN-904).

DBCR Change Data Report...

The **DBCR Change Data Report...** menu item invokes a dialog box that allows you to generate a report identifying the change information for a specific DBCR (see Figure 17-20, DBCR Change Data Report dialog box). The change information is identified using Structured Query Language (SQL) statements.

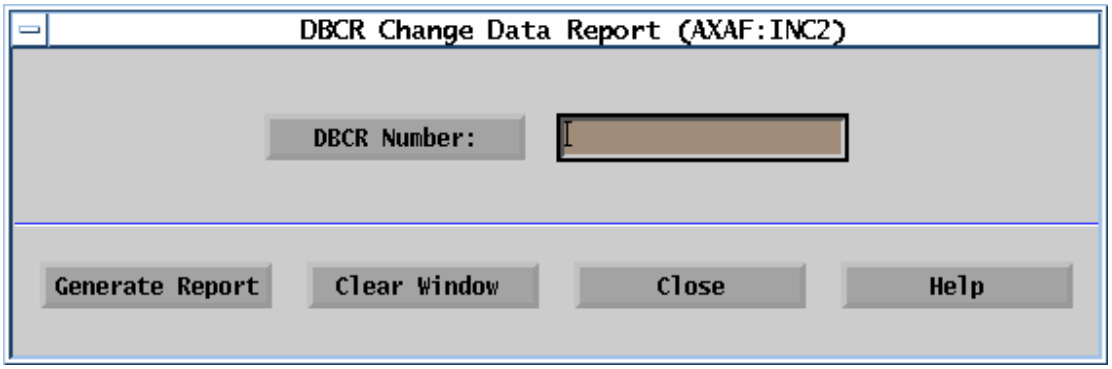


Figure 17-20, DBCR Change Data Report dialog box.

The **DBCR Change Data Report** dialog box is comprised of the DBCR Number: and its associated text input field

DBCR Number: invokes an LOV from which you can select a DBCR whose change data you'd like to include in your report. If you already know the DBCR number, you may enter it in the associated text field. By default, this field is left blank. Generate Report will be insensitive (grayed out) until an appropriate DBCR number has been identified.

Clicking Generate Report invokes a confirmation dialog box informing you of the number of records that will be contained in the report. Acceptance of the confirmation dialog box generates the report and invokes the Report Previewer that will display the report (see Figure 17-21, DBCR Change Data Report).

Help: For detailed information concerning the Report Previewer see Appendix T: Report Previewer.

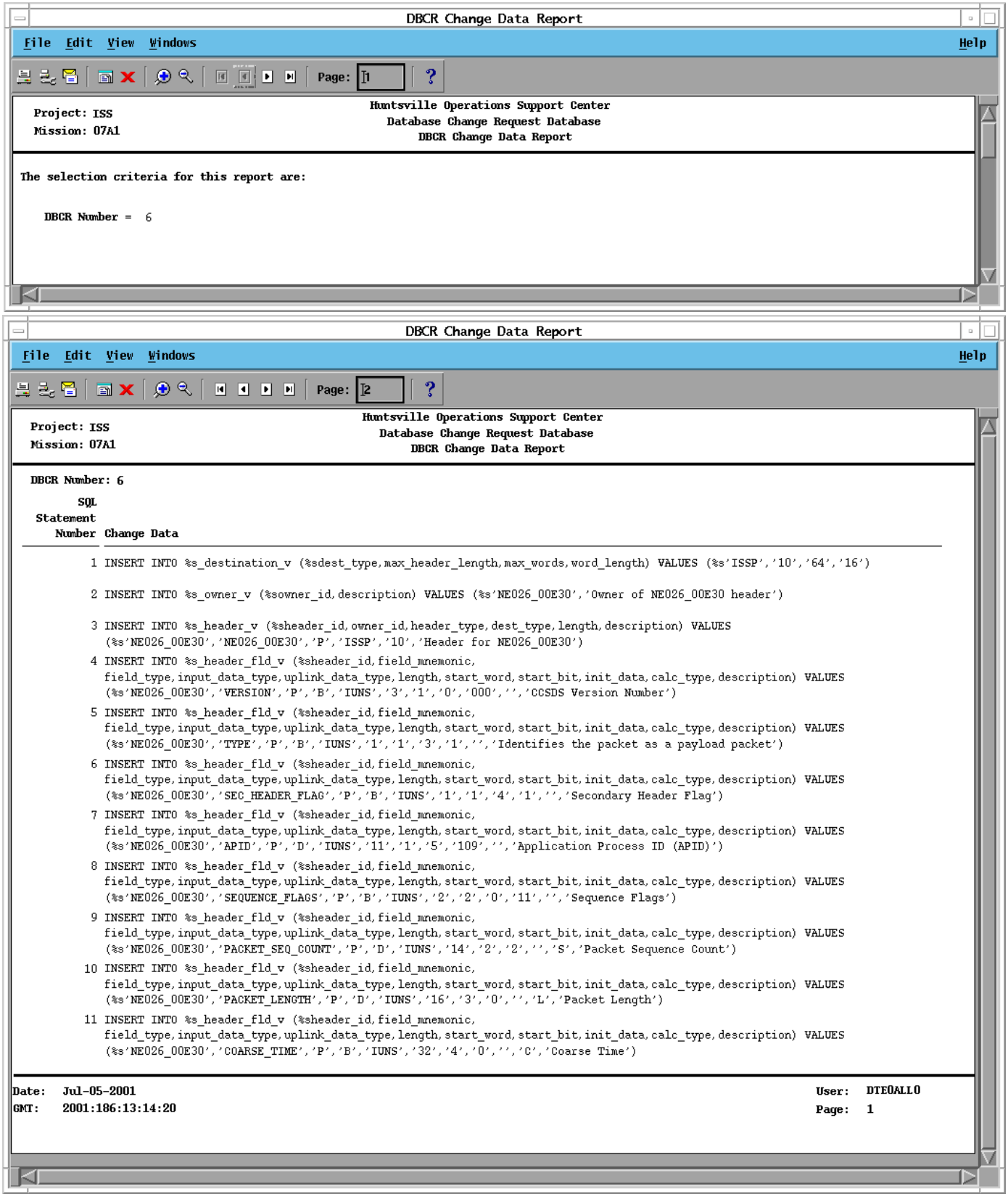


Figure 17-21, DBCR Change Data Report.

Database Schedule Report...

The **Database Schedule Report...** menu item invokes a dialog box that allows you to generate a report identifying database activities (see Figure 17-22, Database Schedule Report dialog box). This information is useful in identifying anticipated database upgrades and change request submission deadlines.

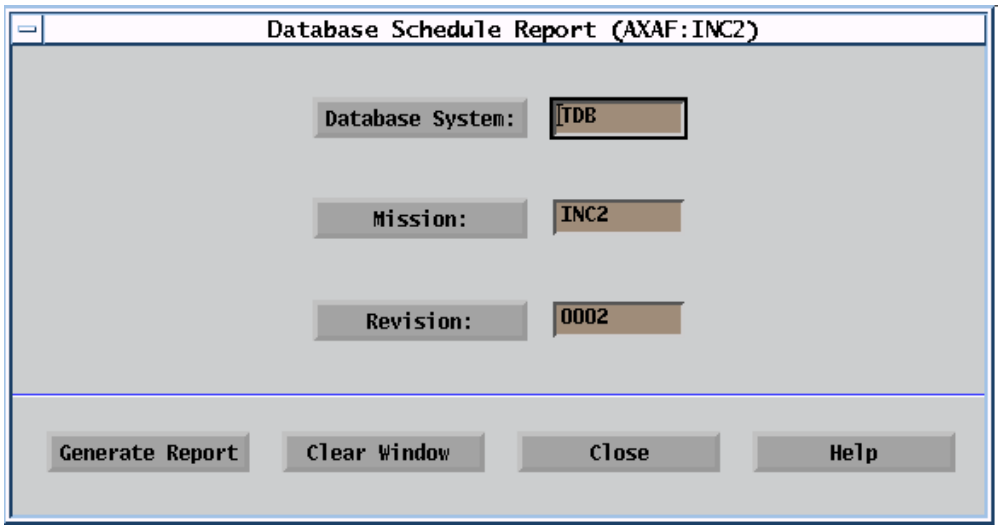


Figure 17-22, Database Schedule Report dialog box.

The **Database Schedule Report** dialog box is comprised of the following components:

- Database System: and its associated text input field
- Mission: and its associated text input field
- Revision: and its associated text input field

The Database System invokes an LOV from which you can select the type of database you'd like to use in generating the report. Available database options on this LOV include:

- **TDB** - Telemetry database
- **CDB** - Command database
- **UDE** - User-generated Data Element database

If you know the type of database you'd like, you may enter it in the associated input text field. By default this field is left blank, which means that DBCRs from all types of databases will be included in your report.

If you know the mission database you want to work with, you can enter the mission name or acronym in the input text field provided, or you can click on

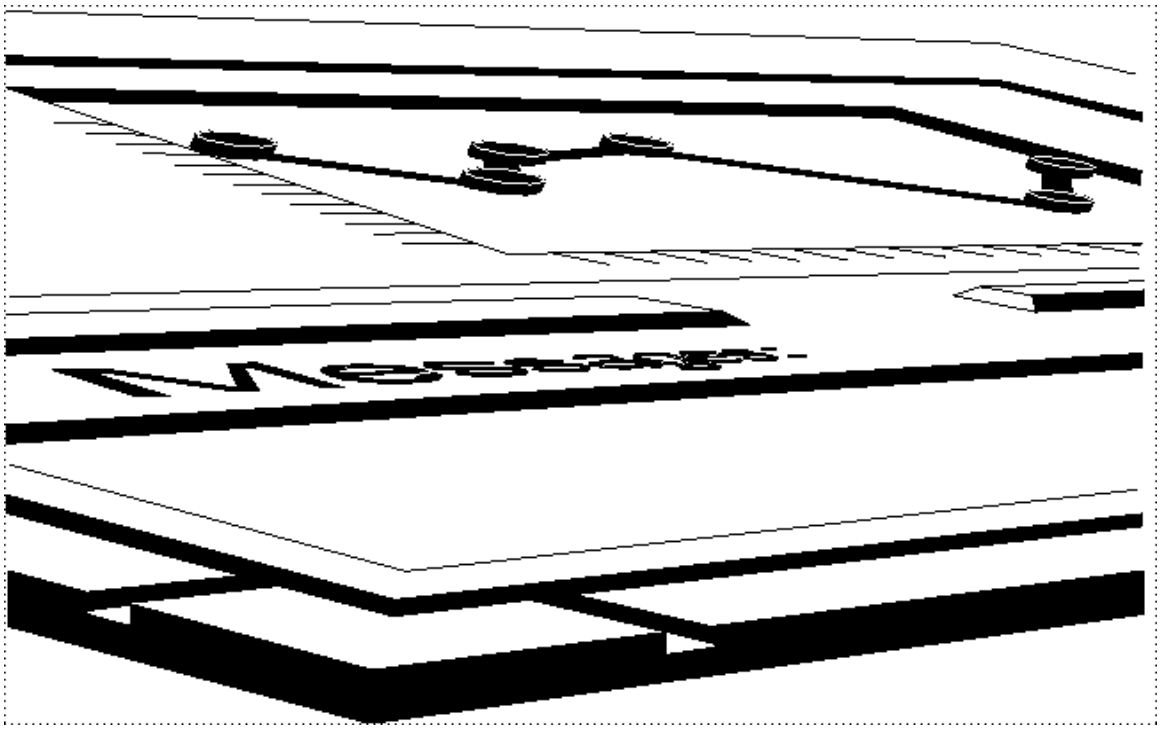
to invoke a List of Values (LOV) from which you can choose your mission database.

If you know the database revision you want to work with, you can enter it in the input text field provided; otherwise, you can click on

to invoke an LOV from which you can choose your revision number.

17.7.1.4 Help Menu

The **Help** menu is the last menu on the **DCR Database** menu bar. It provides you with access to information that is specific to the current window. It includes the **On Window**, **On Keys**, **Index**, **Table of Contents**, and **On Version** menu items.



Chapter 18: Payload Information Management System (PIMS)

This chapter describes the Huntsville Operations Support Center (HOSC) Payload Information Management System (PIMS) applications. PIMS is a multiproject electronic information management system used by the payload user, POIC cadre, and mission managers for International Space Station (ISS) mission preparation and execution. The primary purpose of the PIMS is to provide centralized payload operations information management for controlling changes to payload experiments, and spacecraft support for ISS. Real-time mission operations, simulations, and short term planning cycles are supported simultaneously by PIMS. PIMS also provides a pre-mission functionality in support of mission document preparation and configuration management (CM).

PIMS software also includes a utility for developing approval process flows for a work group that can be applied to an object under CM. All PIMS applications are Web based, share a common database vault (see Figure 18-1, Web/PIMS Architecture), and interface to routines that provide real-time status messaging to actionees with CM responsibilities.

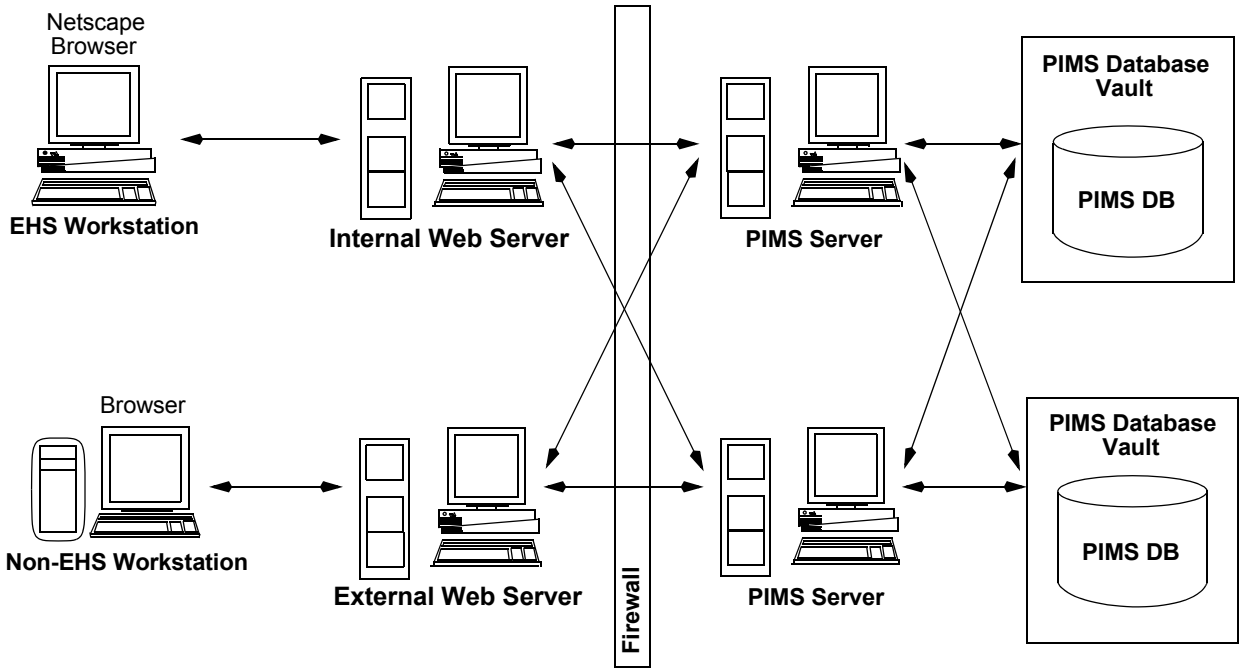


Figure 18-1, Web/PIMS Architecture.

18.1 PIMS To Do List Overview

The PCM **To Do List** Applet is a Web based, distributed architecture, user interface allowing consistent operations to users at the HOSC and remote locations (see Figure 18-2, To Do List Architecture). The To Do List provides MOP-dependent accessibility to tasks related to DCM and CRCM workflow processes.

The Web server provides workflow and status information to the user's workstation acting as the connection between the workstation and the PIMS vault. The Web server also sends notification messages to the users when changes are detected in the data within the PIMS vault.

The To Do List enables individual PIMS users to determine which OCR or document requires an action by the user and the due date for task completion.

Help: All To Do List assignments are derived from the Document Workflow Diagram and from the OCR Workflow Diagram, see "Appendix AG: PIMS Workflow Diagrams" Document Management Workflow Diagram and OCR Workflow Diagram.

The DCM Workflow process executes each time an authorized user selects to start a configuration management workflow on a document. Once a document enters the DCM Workflow process, it will remain on the To Do List of the initial user assigned by the workflow until that user has taken an action to change the state of the document. When the document has undergone a change of state, the document is removed from the To Do List of the initial user and will be added to the To Do List of the next user required to process the document.

Note: DCM workflow capability will not be available until a future s/w build.

Similarly, the CRCM OCR Workflow process executes each time a user creates a new OCR. Once an OCR enters the CRCM Workflow process, it will remain on the To Do List of the originator until that user has taken an action to change the state of the OCR. When the OCR has undergone a change of state, the OCR is removed from the To Do List of the originator and will be added to the To Do List of an approver required to process the OCR.

The PCM Status Update process provides a capability for the DCM and CRCM OCR workflow processes to send messages about changes to the status of a document or OCR as it progresses through the workflow process. Notification messages are sent to all workflow User IDs through the Message Handler for local EHS users and through e-mail to all users (local and remote).

Note: The PCM Status Update capability will not be available until a future s/w build.

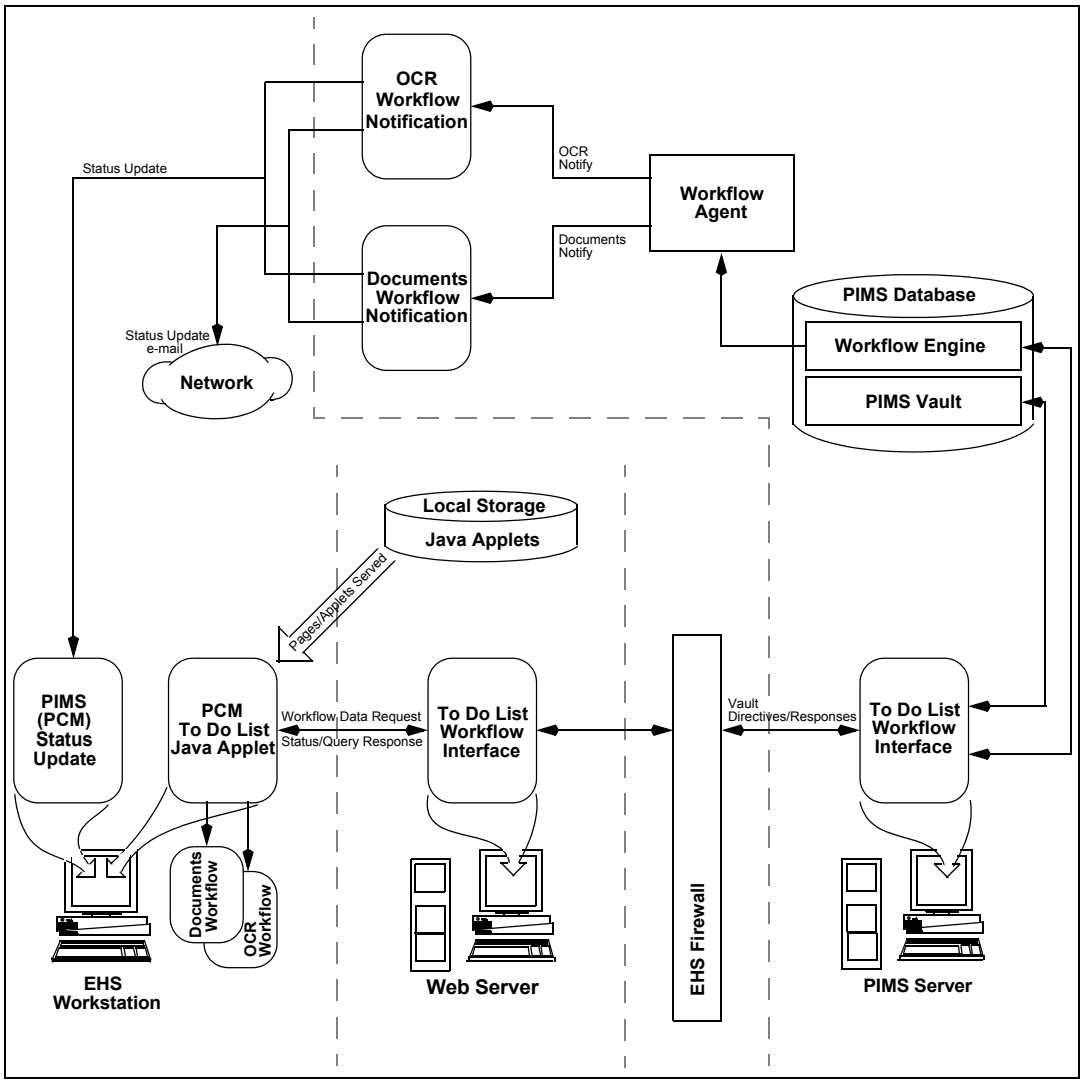


Figure 18-2, To Do List Architecture.

The PIMS To Do List main window contains two distinct features that will be discussed in this chapter (see Figure 18-3, To Do List main window):

- Menu Bar
- Work Area

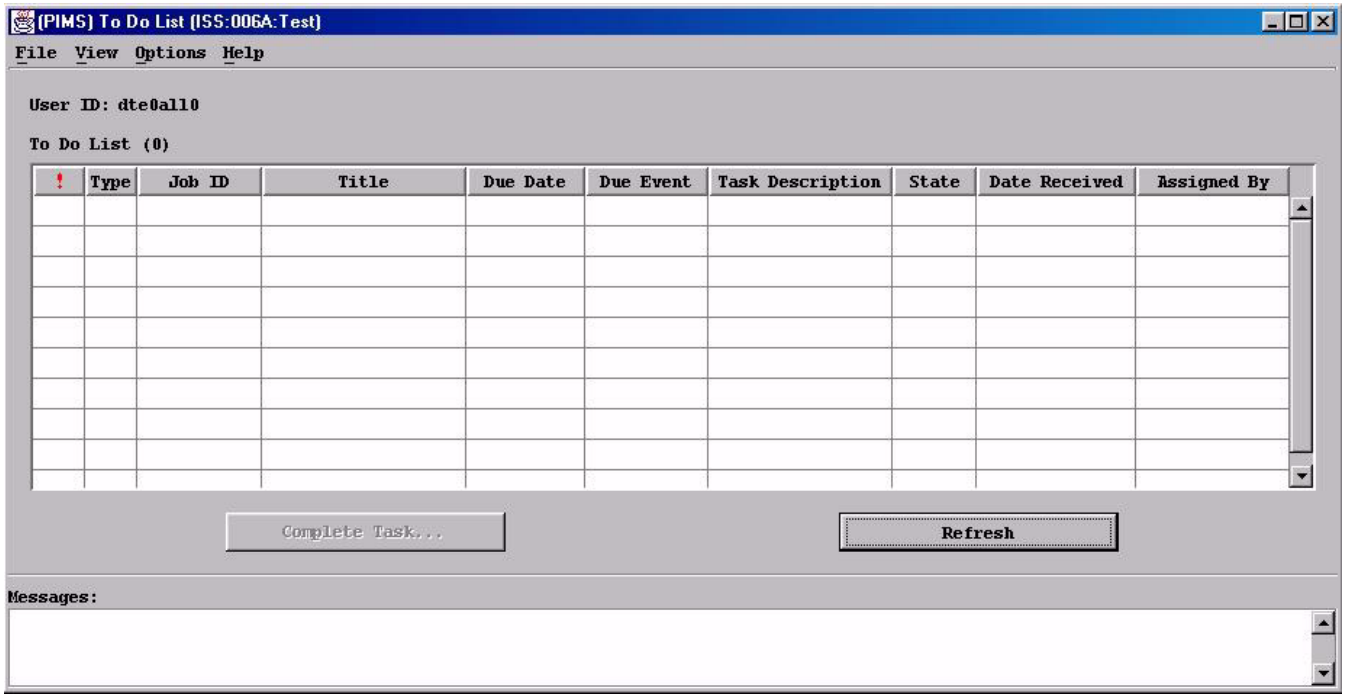


Figure 18-3, To Do List main window

18.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (Label implies function) and will not be discussed. The menu option that will be discussed later in this chapter are the **Complete Task...** and **Modify Group Lists...** menu items from the **Options** menu.

18.1.2 Work Area

The work area of the PIMS To Do List application contains a display-only **User ID:** field, and the tabular **To Do List**.

The To Do List table appears blank until a task is assigned to the user. Once the table is populated it may be manually refreshed to reflect current data. Only one row of the table may be selected at a time; selection of any item in the row selects the entire row. Double clicking on a selected row invokes a Complete Task dialog box.

By default the table is sorted by type, however, clicking once on any column heading sorts the column in ascending order. Click the same column heading again and the entire column is sorted

in descending order. Individual table columns may be resized by placing the cursor in the boundary between column headings to obtain a resizing tool ⇥. Movement to the left or right, decreases or increases the width of the column.

The **User ID:** field is configured to the user's login user ID, and will be used within the PIMS application as the name used for approval cycles, request form approvals, etc.

The **To Do List** appears as a table containing ten columns labeled as follows:

- **!** (Exclamation)
- **Type**
- **Job ID**
- **Title**
- **Due Date**
- **Due Event**
- **Task Description**
- **State**
- **Date Received**
- **Assigned By**

The **!** (Exclamation) column identifies the priority status of OCRs only. An **!** (Exclamation) icon in this column signifies high priority OCRs.

The **Type** column displays the icon associated with the document or OCR.

Help: For a description of folder types and a cross-reference list of icons and their corresponding descriptions see, Appendix AF: PIMS Folder Types and Icon Representations.

The **Job ID** column displays the number assigned to the job. If the job is an OCR, then this column will indicate the OCR number.

The **Title** column will contain the title of the document or OCR. The default width of the column presents the first 24 characters of the title, the column may be resized to view the title in it's entirety.

The **Due Date** column identifies the date that the user(s) have to complete the task by. The **Due Date** is displayed in Greenwich Mean Time (GMT) with a format of (YYYY DDD:HH:MM:SS).

The **Due Event** column identifies the corresponding event by which the task must be completed. If the task involves an OCR then this column will reflect the entry made in the Due Event field on the OCR. If the task relates to a document then this column will reflect an event specified by the Assigner of the task.

The **Task Description** column identifies the assigned task.

The **State** column identifies the Configuration Management (CM) state of the document or OCR.

Help: For a current listing of Task Descriptions and States see, Table 18-1, To Do List Task/State Values.

The **Date Received** column indicates the date the task was received. The **Date Received** is displayed in GMT format (YYYY DDD:HH:MM:SS).

The **Assigned By** column displays the User ID of the user that assigned the associated task.

Table 18-1, To Do List Task/State Values.

Task/State	Available Values
Task	Develop OCR
	Perform Facility Lead Screening
	Perform Facility Member Review
	Provide Facility Lead Approval
	Perform PCC Member Review
	Perform POIC POD Lead Screening
	Perform POIC Member Review
	Provide POIC POD Lead Approval
	Perform Actionee Implementation
	Modify OCR
	Start CM Workflow*
	Prepare Document and Submit for Baseline*
	Provide Document Approval*
	Provide Document Approval for Reviewed Document*
	Review Document Modifications and Submit for Baseline*
	Perform Writer Edit*
State (Documents)	Development*
	Submit*
	Review*
	Approved*
State (OCR)	Development
	Putback to Originator

Task/State	Available Values
	Submitted to Facility Lead
	Putback to Facility Lead
State (OCR)	Facility Review
	Submitted to POIC
	POIC Review
	Final Approval

* - indicates values that will not be available until a future s/w build.

18.1.3 Application Essentials

The following sections will discuss the menu bar items that are unique to the To Do List application. The **Complete Task...** and **Modify Group Lists...** menu items from the **Options** menu will be discussed (see Figure 18-4, Options Menu).

Figure 18-4, Options Menu.

18.1.3.1 Complete Task...

The first user to select an action item from the To Do List will acquire the task, receive the necessary workflow forms to complete the task (depending on the PIMS role of the user), and determine the subsequent routing of the workflow process based on the action taken. Once the task is completed, the task item is automatically removed from the **(PIMS) To Do List**.

The **(PIMS) Complete Task** dialog box allows the user to view the document or OCR in question, make notes concerning the document, add any relevant attachments to the document, view the Configuration Management (CM) Log for a concise CM history, and route the document or OCR to a list of selected reviewers for their concurrence or non-concurrence before he approves or disapproves the document.

The **(PIMS) Complete Task** dialog box can be navigated to in any of three ways:

- Double clicking a To Do List action item
- Clicking the To Do List

.
- Selecting the **Complete Task...** option from the **Options** menu.

The Complete Task dialog box for a document may be invoked in a “stateless” or “configuration management (CM)” configuration depending on the document that is the subject of the To Do List task. A stateless document refers to a document maintained in the PIMS database that has not been baselined through the Document Configuration Management workflow process. Both versions of the **(PIMS) Complete Task** dialog box will be discussed, in detail, in the following sections.

18.1.3.1.1 Complete Task Dialog Box - Stateless Document Configuration

The “stateless” version of the **(PIMS) Complete Task** dialog box (see Figure 18-5, Stateless Complete Task dialog box) allows a user to view or edit a document that is still in the process of being written. It provides a mechanism where a user can enter a one-step workflow for a stateless document without the document coming under Document Configuration Management (DCM) control. By assigning a To Do List task to himself, a user can invoke the Complete Task dialog box to gain access to his/her stateless document stored in the PIMS database.

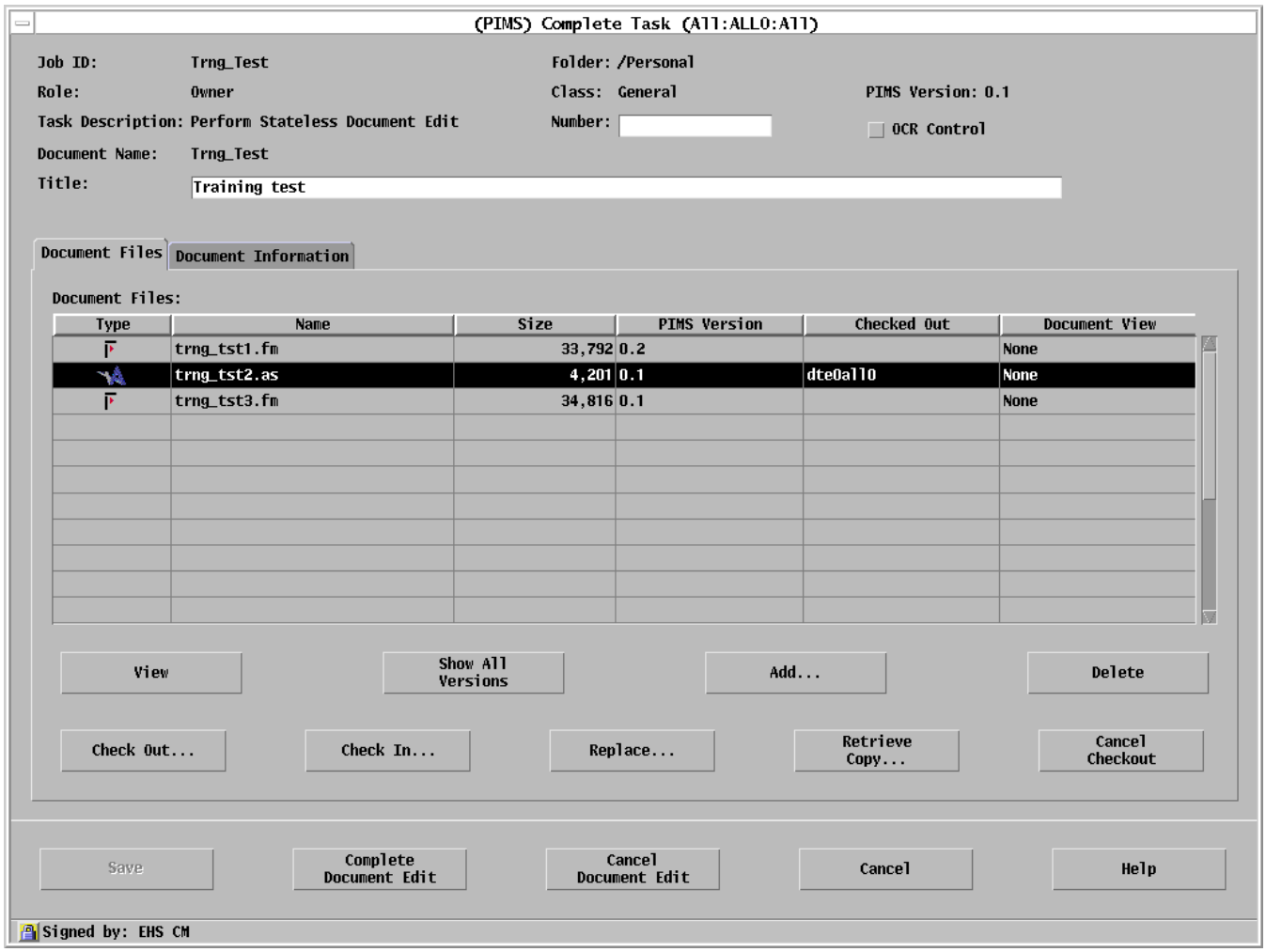


Figure 18-5, Stateless Complete Task dialog box.

The **(PIMS) Complete Task** dialog box consists of several text entry fields, a tabbed area, and a control panel. The configuration of the tabbed area dynamically changes depending on which tab is selected. Tab selection is accomplished by clicking on the desired tab.

18.1.3.1.1.1Common Elements

The text entry fields at the top of the screen and the control panel at the bottom of the screen remain unchanged when different tabs are selected. The **(PIMS) Complete Task** dialog box is initialized with the current Job ID and Task Description selected from the To Do List window.

The **Job ID:** text entry field is a non-editable field identifying the current job.

The **Folder:** text entry field is a non-editable field identifying the folder associated with the document.

The **Role:** text entry field is a non-editable field identifying the user. For a stateless document "owner" is the only role to be assigned to this field.

The **Class:** text entry field is a non-editable field identifying the class associated with the document. The PIMS database vault is organized based on the following document classes:

- Anomaly Logs
- Automated Procedures
- Crew Messages
- Crew Procedures
- Downlinked Files
- General
- Payload Planning Files
- Shift Reports

The **PIMS Version:** text entry field is a non-editable field identifying the version number associated with the document.

The **Task Description:** text entry field is a non-editable field identifying the task associated with the role of the user.

The **Number:** text entry is an editable field that is used to identify the number of the document. It is initially blank.

The **OCR Control** field is a check box indicating whether the document is OCR controlled or not. The **OCR Control** check box defaults from the PIMS database.

The **Document Name:** text entry field is non-editable, identifying the name of the document.

The **Title:** text entry field identifies the title of the document.

Clicking the Save saves any changes that were made while the **(PIMS) Complete Task** dialog box was open and does not remove the task from the To Do List.

Clicking the Complete Document Edit saves any edits made to individual files, increments the PIMS version of the document, and removes the task from the To Do List.

Clicking the Cancel Document Edit returns the document to it's pre-task PIMS version (does not save any individual file changes and deletes any changes that were made up to this point in the original task document) and removes the task from the To Do List.

Clicking the Cancel closes the **(PIMS) Complete Task** dialog box and returns you to the **(PIMS) To Do List** main window.

18.1.3.1.1.2Document Files Tab

The **Document Files** tab (see Figure 18-5, Stateless Complete Task dialog box) is selected as the default when the **(PIMS) Complete Task** dialog box is initially invoked. It displays associated file information for the document selected from the **(PIMS) To Do List**. Information is presented in the **Document Files:** Table. The Document Files Table defaults to selecting the first document file (row) in the list. Subsequent document files may be selected by clicking on any part of that file's row. Only one row in the Document Files Table may be selected at a time.

The **Type** column displays the icon associated with the document file.

Help: For a description of folder types and a cross-reference list of icons and their corresponding descriptions see, Appendix AF: PIMS Folder Types and Icon Representations.

The **Name** column identifies the name of the document file.

The **Size** column identifies the size of the document file.

The **PIMS Version** column identifies the version of the document file.

The **Checked Out** column identifies the User ID that has checked out the document file.

The **Document View** column designates if the selected file is to be transferred for view (**Transfer**) or marked as **Launch** (file to be displayed first). Only one document file of the document can be selected as the launch file. The default for this field is **None**.

Click on the entry under the **Document View** column to display a pulldown option menu that allows you to change the document view selection

The **Document Files:** tab also contains a buttons area containing nine pushbuttons used to manipulate selected files.

Clicking

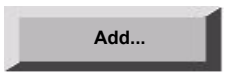
retrieves a copy of the selected document file to the user's local workstation. This pushbutton is insensitive if a document is not selected from the Document Files Table.

Clicking

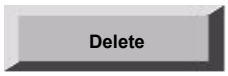
allows the user to view all versions of the document. The

is then reconfigured to display the

. The user may toggle between the two functions.

Clicking 

invokes the **(PIMS) Add File** dialog box.

Clicking 

invokes the **PIMS Confirmation Message** dialog box. This pushbutton is insensitive if a document file is not selected from the Document Files Table.

Clicking

invokes the **Check Out File** dialog box. It is insensitive if a document file that has been checked in the PIMS Database is not selected from the Document Files Table.

Clicking

invokes the **Check In File** dialog box. It is insensitive if a document file that is checked out is not selected from the Document Files Table.

Clicking

invokes the **Replace File** dialog box. This pushbutton is insensitive if a document file is not selected from the Document Files Table

Clicking

invokes the **Retrieve Copy** dialog box. This pushbutton is always sensitive.

Clicking

cancels the check out for the selected document file.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.1.3Document Information Tab

The **Document Information** tab (see Figure 18-6, Document Information tab) consists of a **General Information** frame and a **Description** frame.

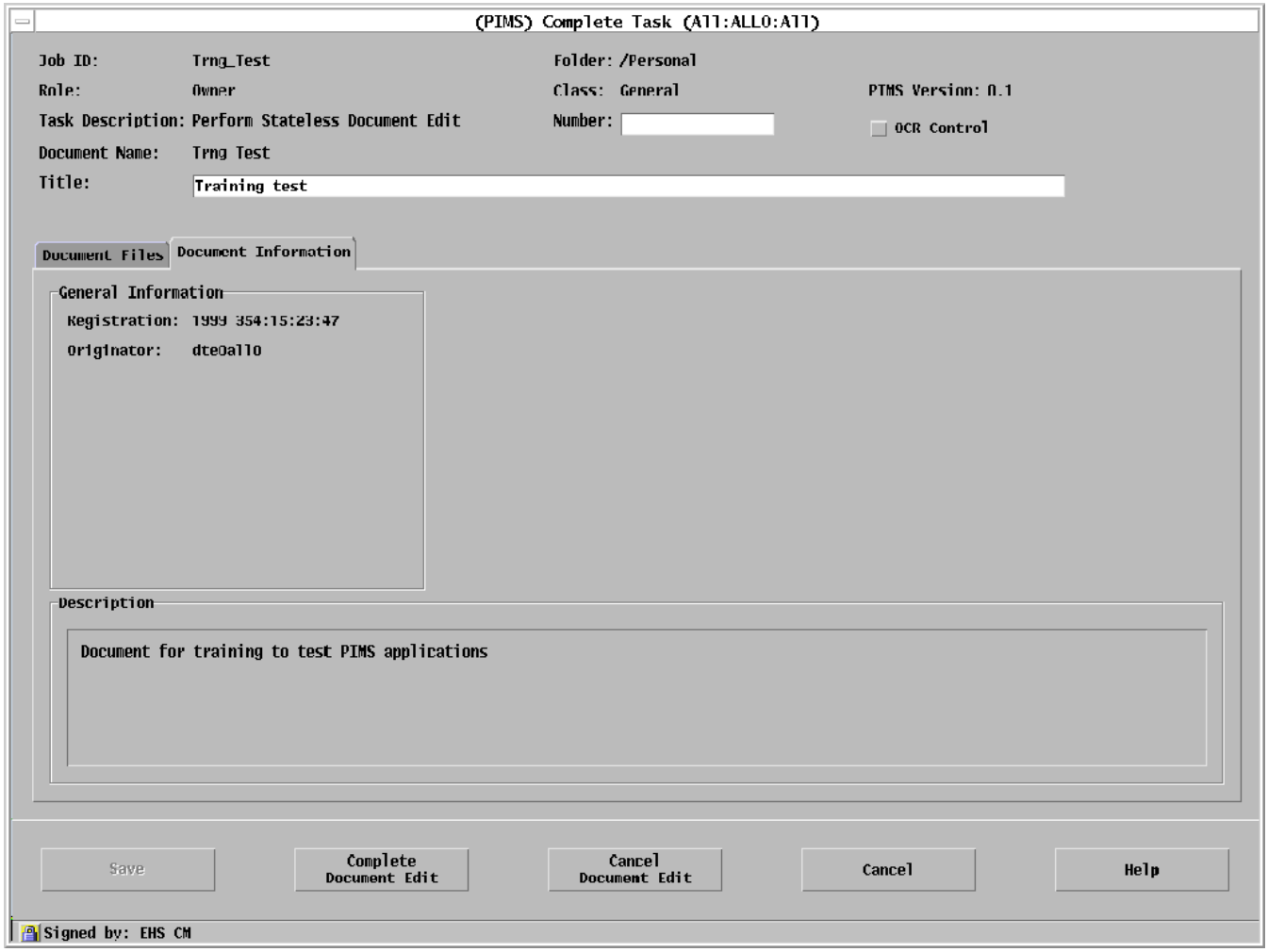


Figure 18-6, Document Information tab.

As the name implies, the **General Information** frame contains general information concerning the document specified in the **(PIMS) To Do List** task. For a stateless document there are two read-only fields that are populated from the PIMS Database.

The **Registration:** field identifies the date the document was registered. The date is displayed in GMT (format YYYY:DDD:HH:MM:SS).

The **Originator:** field identifies the User ID that registered the document.

The **Description** frame is an editable field that allows the user to provide a description of the document file. There is an 800 character limit for all Description text entry fields in all of the PIMS applications. After exceeding the 800 character limit, the excess characters are displayed in red type. If you extend beyond the 800 character limit and you try to save or submit the OCR you will receive a confirmation message dialog box informing you that the file will be truncated (see Figure 18-8, Description Exceeds Limit dialog box).

18.1.3.1.2 Complete Task Dialog Box - CM Configuration

This Section is **TBS**.

18.1.3.1.3 Complete Task Dialog Box - OCR Configuration

The Operations Change Request (OCR) configuration of the **(PIMS) Complete Task** dialog box (see Figure 18-7, OCR Configuration of the Complete Task dialog box) is invoked whenever the **Type** of task, as defined in the **(PIMS) To Do List**, is an OCR. The appearance, functionality, and user capabilities of this version of the **(PIMS) Complete Task** dialog box will vary and are determined by the CM State of the OCR and the user's role within the OCR Workflow.

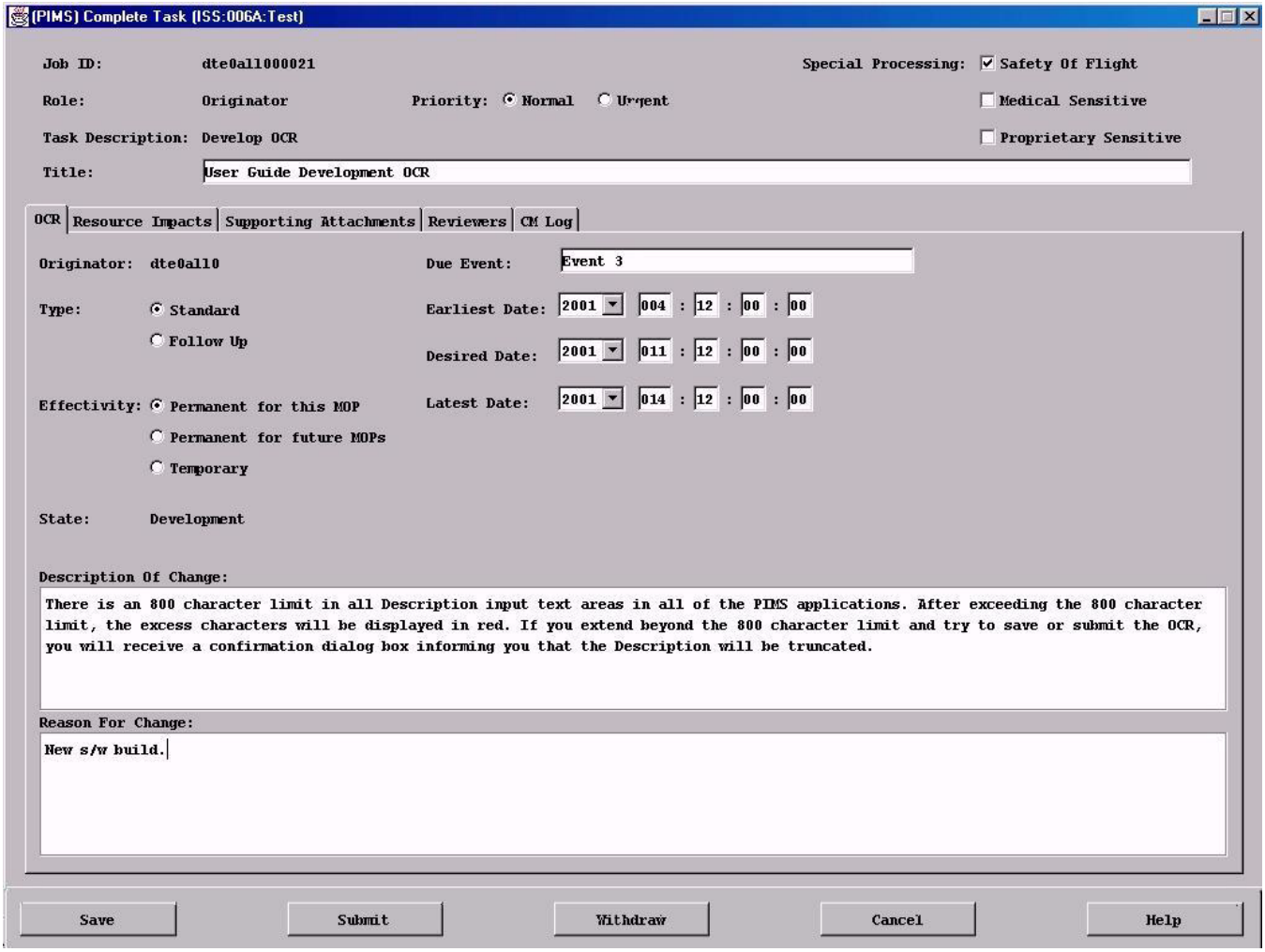


Figure 18-7, OCR Configuration of the Complete Task dialog box.

Change Request Configuration Management (CRCM) process flow consists of the development, submitted, review, approved, implemented, disapproved, withdrawn, and cancelled states.

The **development** state consists of a user or initiator requesting and providing the rationale for a change in procedure to any mode. When an initiator is satisfied with the change, the change request is made available for review by an approving position(s). The action to change a change request from the development state to the **submitted** state is called submit. If the initiator wishes to prohibit the change request from further processing, the change request may be **withdrawn**.

Once in the **submitted** state, an approver may approve the change request. The approver may assign an actionee (EHS User ID) to implement the change request. When the change request is approved, the approver must assign an actionee and the change request goes to the **approved** state.

The approver may also release the change request to review. The release makes the change request available to reviewing positions (reviewers) for their recommendation. Other approver actions include disapprove (no further processing) and putback which places the change request back into the development state.

Each reviewer may make his recommendation but the change request does not undergo a state change. Once in the **review** state, an approver may approve the change request. The approver may assign an actionee (EHS User ID) to implement the change request. When the change request is approved, the approver must assign an actionee and the change request goes to the **approved** state. Other approver actions include disapprove (no further processing) and putback which places the change request back into the development state.

When the actionee implements the change request, the change request goes to the **implemented** state where it is in its closed out state.

When no further processing is possible, the change request is considered in the **closed out** state. A change request will reach this state if the change request has been implemented, disapproved, withdrawn, or implemented.

Change Request Configuration Management (CRCM) supplies a default process flow for all change requests. All change request states and all actions within the states for the default process flow are predefined and may not be modified during a mission. The reviewer(s) must be assigned by the CRCM Approver before a change request is approved while the actionee(s) must be assigned by the Approver before the change request is implemented. The CRCM Approver may assign reviewers to assess the change request for technical concurrence. He may choose to accept or reject recommendations from the reviewers. Next, the Approver takes the appropriate actions to process the change request by assigning actionees to implement the approved request. The Approver, reviewers, and actionees are identified by EHS User ID within the Process Flow State. The following table defines the CRCM Process Flow definition.

Table 18-2, CRCM Process flow definition.

State	Actionee Privilege	Action	Next State
Development	Initiator (any user) Initiator (any user)	Submit Withdraw	Submitted Withdrawn
Submitted	Approver Approver Approver Approver	Release Approve Disapprove Putback	Review Approved Disapproved Development
Review	Reviewer(s) Reviewer(s) Approver Approver Approver	Concur Non-Concur Approve Disapprove Putback	No change No Change Approved Disapproved Development
Approved	Actionee Approver Approver Approver	Implement Implement Disapprove Putback	Closed out Closed out Disapproved Development

Help: Also see “Appendix AG: PIMS Workflow Diagrams”, OCR Workflow Diagram for an overview of the OCR Workflow.

As previously mentioned, the appearance, functionality, and user capabilities of the OCR Complete Task dialog box will vary depending on your role in the OCR workflow. The remainder of this chapter will discuss the similarities and disparities between the various invocations of the OCR Complete Task dialog box.

18.1.3.1.3.1Common Elements

The common elements of the OCR **(PIMS) Complete Task** dialog box (see Figure 18-7, OCR Configuration of the Complete Task dialog box) are comprised of the text entry fields and radio boxes above the tabbed area and the individual tabbed areas.

Note: For descriptive purposes the Complete Task dialog box for an Originator is used in this description as it represents a basic configuration.

The radio buttons and text entry fields at the top of the screen remain unchanged when different tabs are selected.

The **Job ID:** represents the OCR number and consists of the User ID of the originator and next sequential OCR number generated by Change Request Configuration Management (CRCM). This is a view only field corresponding to the selected **Job ID** from the **(PIMS) To Do List**.

The **Role:** view only field is the user's role in the OCR Workflow as assigned by CRCM.

The **Task Description:** view only field corresponds to the selected **Task Description** from the **(PIMS) To Do List** and is the assigned task to be completed through the Complete Task dialog box.

The **Title:** text entry field is an editable text field in which the user may enter up to 100 characters.

The **Priority:** radio button selections are **Normal** (default) or **Urgent** indicating the priority level of the OCR.

The **Special Processing:** radio buttons include:

- **Safety of Flight**
- **Medically Sensitive**
- **Proprietary Sensitive**

OCR Tab

The OCR Tab (Figure 18-7, OCR Configuration of the Complete Task dialog box) is initially visible when the **(PIMS) Complete Task** dialog box is invoked. The OCR Tab provides the means to enter general information concerning the OCR. Information is presented through two groups of radio buttons and numerous text entry fields.

The **Originator:** label is set to the User ID of the user.

The OCR **Type:** is denoted by radio button selection of either **Standard** (default) or **Follow Up**.

The **Effectivity:** radio buttons default to **Permanent for this MOP**. Other selections include **Permanent for future MOPs** and **Temporary**.

The **State:** label in this example is set to **Development**, however, this view only field will reflect the current CRCM state of the OCR.

The **Description of Change:** text entry field is initially blank and is used to record any explanatory remarks that the user feels are necessary concerning the OCR. There is an 800 character limit for all Description text entry fields in all of the PIMS applications. After exceeding the 800 character limit, the excess characters are displayed in red type. If you extend beyond the 800 character limit and you try to save or submit the OCR you will receive a confirmation message dialog box informing you that the file will be truncated (see Figure 18-8, Description Exceeds Limit dialog box).

Figure 18-8, Description Exceeds Limit dialog box.

The **Reason for Change:** text entry field is initially blank and is used by the user to provide any justification for the OCR.

The **Due Event:** text entry field is initially blank and is used to indicate an operational event or milestone associated with the initialization of the action described by this OCR.

The **Earliest Date:** text entry fields represent the earliest first opportunity time for the action(s) described in the OCR to take place while maintaining the intent of the OCR. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **Desired Date:** text entry fields represent the desired time for the action(s) described in the OCR to take place. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **Latest Date:** text entry fields represent the last opportunity time for the action(s) described in the OCR to take place while maintaining the intent of the OCR. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

Note: The **Earliest Date:**, **Desired Date:**, and **Latest Date:** entries are functionally independent of each other; a user may specify one, none, or all three times depending on operational requirements.

Resource Impacts Tab

As it's name implies, the **Resource Impacts** tab (see Figure 18-9, Resource Impacts Tab) indicates which POIC resources will be effected by the implementation of this OCR. This tab consists of five user-editable frames, labeled as follows:

- **Activity/Sequence**
- **Manual Procedures**
- **Commanding**
- **Downlink Data**
- **File Uplink Request (to PL MDM)**

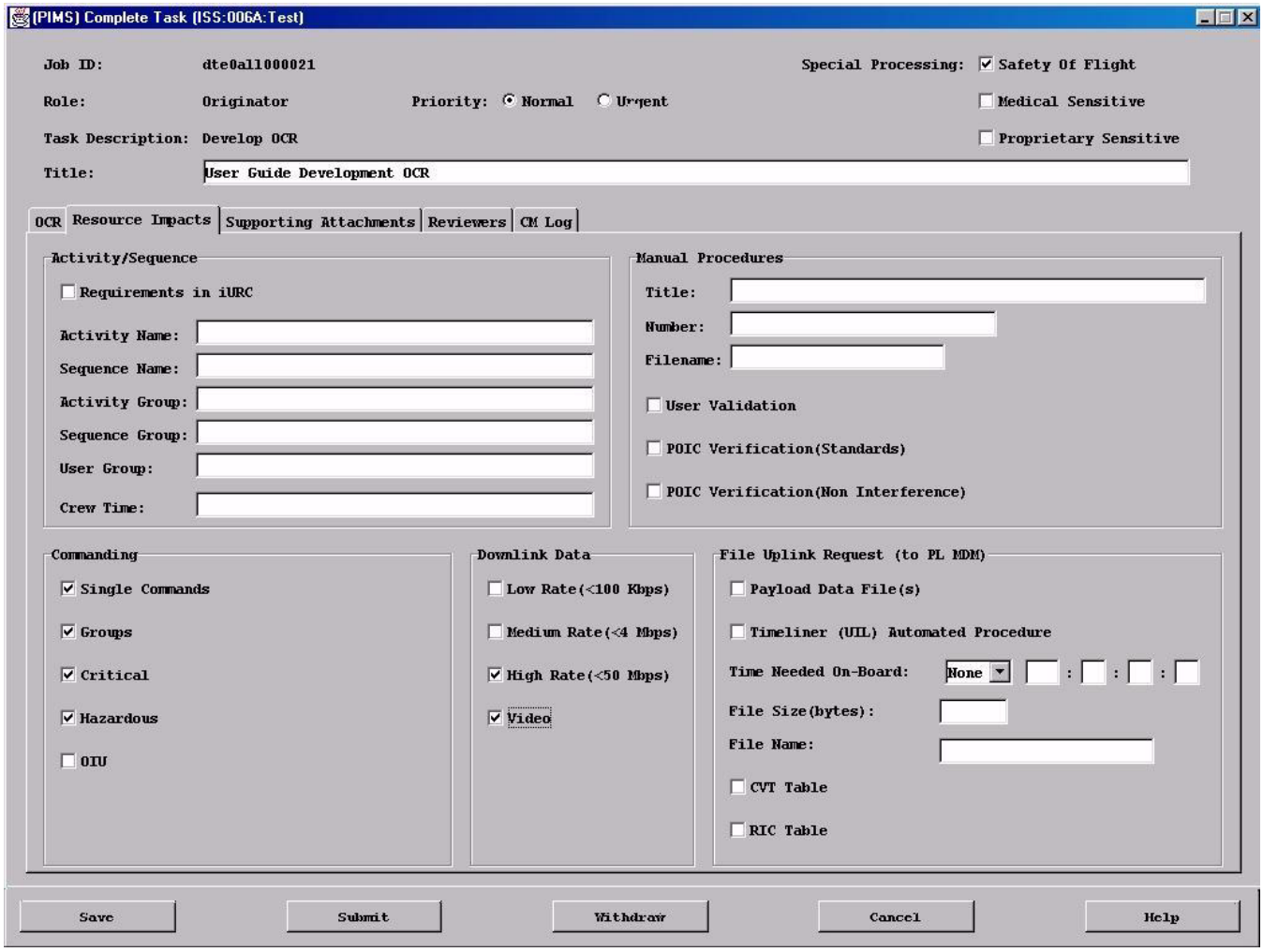


Figure 18-9, Resource Impacts Tab.

All the frames and text entry fields that comprise the **Resource Impacts** tab are initially blank for a new OCR but are all editable by the user.

The **Activity/Sequence** frame contains a **Requirements in iURC** checkbox, which (when selected) indicates that the interim User Requirements Collection is associated with this OCR. The interim User Requirements Collection is a tool used by the Payload Planning System (PPS) to collect payload planning requirements.

Text entry fields are provided to further specify these requirements by:

- **Activity Name:**
- **Sequence Name:**
- **Activity Group:**
- **Sequence Group:**
- **User Group:**
- **Crew Time:**

The **Manual Procedures** frame is used to specify any manual procedures that may be influenced by the implementation of this OCR.

Text entry fields are provided to define the **Title:**, **Number:**, and **Filename:** of the manual procedure.

Checkboxes are provided to specify if any validation or verification is to occur. These checkboxes are labeled:

- **User Validation**
- **POIC Verification (Standards)**
- **POIC Verification (Non Interference)**

The **Commanding** frame is used to enter any requirements for commanding and contains five checkboxes labeled:

- **Single Commands**
- **Groups**
- **Critical**
- **Hazardous**
- **OIU** (Orbiter Interface Unit)

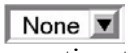
The **Downlink Data** frame provides selection of downlink data type through four checkboxes labeled:

- **Low Rate(<100Kbps)**
- **Medium Rate(<4Mbps)**
- **High Rate(<50Mbps)**
- **Video**

To allow maximum user flexibility and to accommodate those rare payloads that may require multiple options, multiple selections are permitted in the **Downlink Data** frame.

The **File Uplink Request (to PL MDM)** frame is used to specify the file type, on-board time and file specifics for any files that will be uplinked.

Two checkboxes are provided to indicate whether the file is a **Payload Data File(s)** or a **Timeline (UIL) Automated Procedure**.

The **Time Needed On-Board:** text entry fields are used to record the time when the file will be used for its scheduled activity. Clicking 

provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **File Size:** text entry field is used to specify the size of the file to be uplinked in bytes.

The **File Name:** text entry field is used to identify the name of the file to be uplinked.

Additionally, two checkboxes are provided to indicate selection of either **CVT Table** or **RIC Table**.

Supporting Attachments Tab

The Supporting Attachments tab allows the originator of the OCR to attach any pertinent, supporting files to the OCR (see Figure 18-10, Supporting Attachments Tab). When a file is attached to the OCR it is added to the PIMS database and becomes available for viewing by anyone within the OCR workflow.

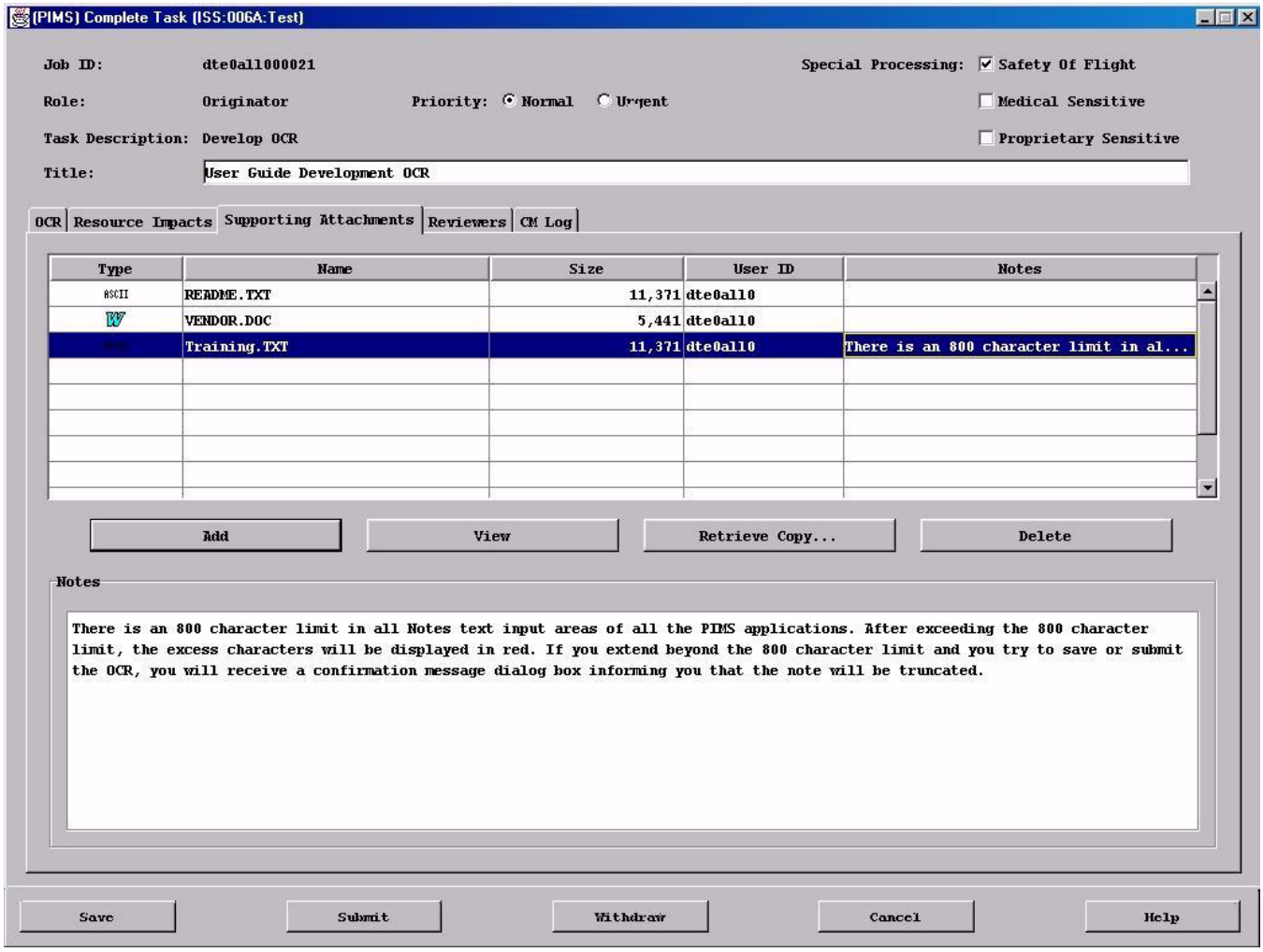


Figure 18-10, Supporting Attachments Tab.

This tab consists of a table, pushbutton area, and a **Notes** frame.

The table contains five columns labeled as follows:

- **Type** -indicates the document type (ASCII, Word, Excel, etc.)
- **Name** -name of the file added to the PIMS database
- **Size** -size of the file in bytes
- **User ID** -User ID of the individual who attached the file to the OCR
- **Notes** -any explanatory notes deemed necessary by the Originator

The **Notes** frame becomes active when a selection is made in the **Notes** column of the table. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-11, Notes Exceed Limit dialog box).

Figure 18-11, Notes Exceed Limit dialog box.

Clicking Add invokes the **Add Attachment** dialog box (see Figure 18-12, Add Attachments dialog box). This is the default pushbutton.

Clicking View provides a Netscape window that contains the contents of the selected document in the format described by the **Type** column in the table (if the **Type** column specifies , then an Excel spreadsheet will be displayed).

Clicking Retrieve Copy... copies the Metadata for the selected attachment to the local workstation.

Clicking Delete removes the selected attachment from the Supporting Attachments tab of the OCR and also removes the document from the PIMS database.

Note: Only the Originator, while in the Development state, can add or delete an attachment to the OCR. For all other users View and Retrieve Copy... will be the only active pushbuttons.

As previously mentioned, clicking Add invokes the **Add Attachment** dialog box (see Figure 18-12, Add Attachments dialog box).

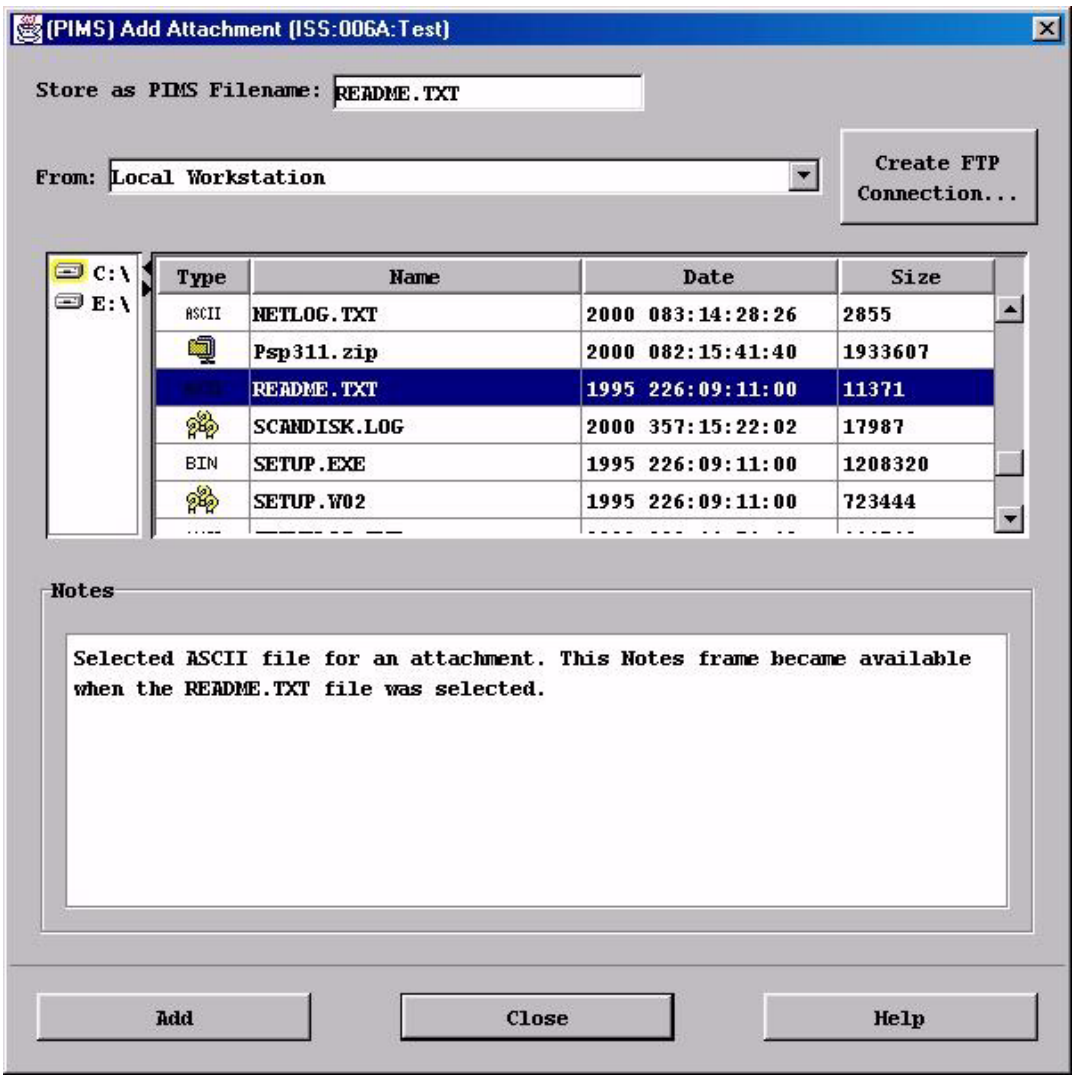


Figure 18-12, Add Attachment dialog box.

The **Store as PIMS Filename:** input text field allows you to enter the name for the file to be added as an attachment in the PIMS database. The maximum number of characters for a filename is 24.

Tip: If you don't want to change the name of the file to be stored, select the file from the file table frame on the **Add Attachment** dialog box, and the name will automatically be entered in the **Store as PIMS Filename:** input text field.

The **From:** field contains a pulldown option menu from which you select the location of the file that you want to add. The possible options include **Local Workstation**, or the IP address of a remote system that you have an FTP connection established.

To the right of the **From:** field is

. Selecting this pushbutton invokes the **Create FTP Connection** dialog box. This dialog box allows you to add a file residing on a remote system by

establishing an FTP connection to it. After an FTP connection has been established, the IP address of the remote system will be displayed as an option on the **From:** pulldown menu.

The next area of the **Add File** dialog box contains two frames. The frame on the left contains a directory structure, and the frame on the right contains a table. The frames can be resized by clicking and dragging on the bar between them.

The frame on the left initially contains folders that reside on the root level of the workstation selected on the **From:** pulldown option menu.

When you click once on any of the folders, the contents of the selected folder will be displayed in the file table frame to the right. The file table contains four columns:

- The **Type** column displays an icon depicting the file type
- The **Name** column displays the file name
- The **Date** column displays the date that the file was last revised
- The **Size** column displays the file size in bytes

Selection of any of the files from the file table frame results in the **Notes** frame becoming active. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-11, Notes Exceed Limit dialog box).

Clicking Add closes the **Add Attachment** dialog box and invokes a PIMS information message informing you that the Attachment has been added to the PIMS database (see Figure 18-13, PIMS Information Message dialog box).

Figure 18-13, PIMS Information Message dialog box.

Reviewers Tab

The **Reviewers Tab** (see Figure 18-14, Reviewers Tab) for a new OCR, in the development state, will contain only noneditable information concerning the Safety Of Flight Reviewer. The Safety of Flight reviewer is the only reviewer that can be affected by the OCR developer by selecting the

Safety Of Flight checkbox under **Special Processing:**. If the **Safety Of Flight** checkbox is selected, the Reviewer's User ID will appear on the tab vice **None**.

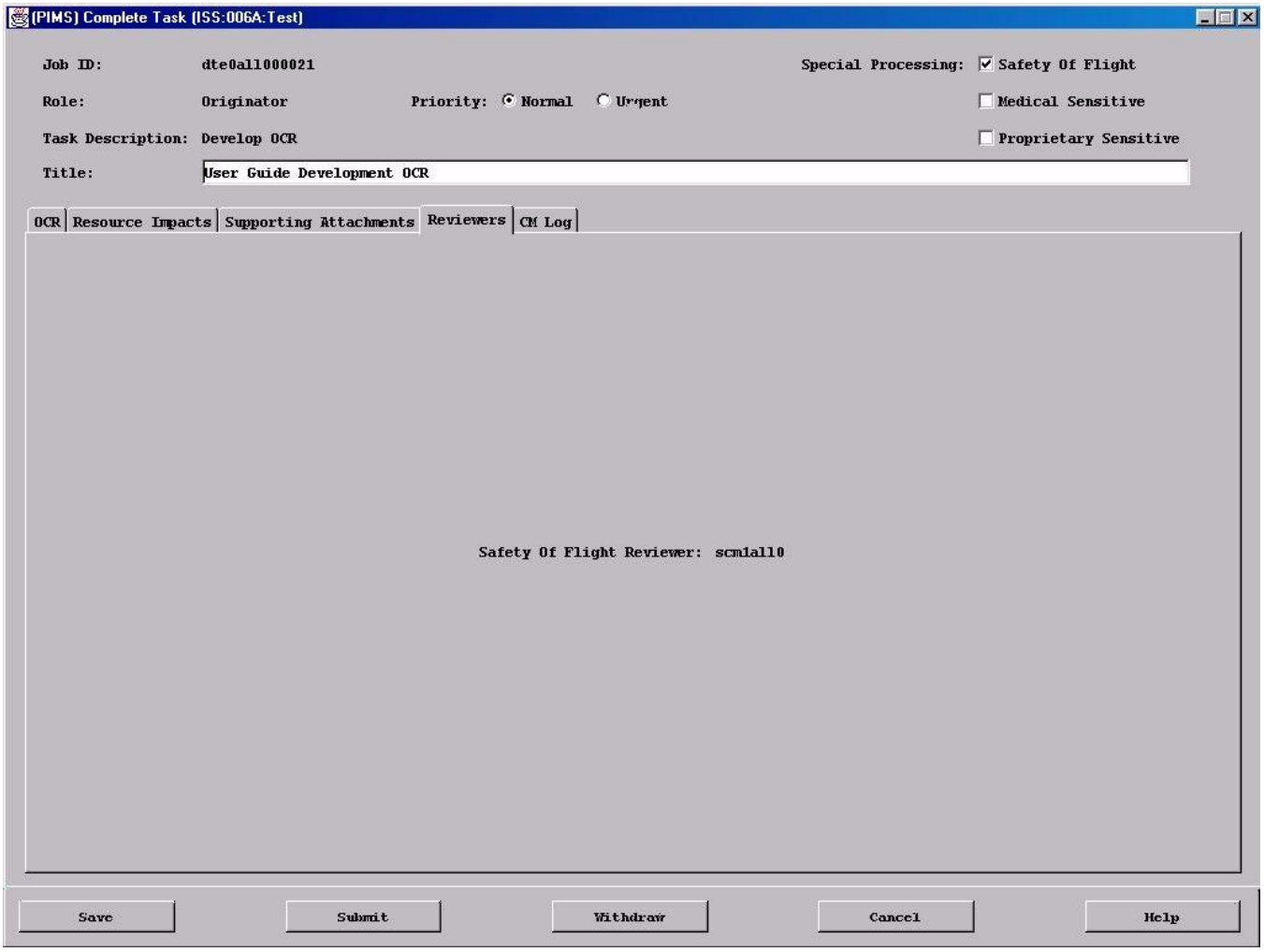


Figure 18-14, Reviewers Tab.

Note: The appearance and contents of the **Reviewers** Tab will change as appropriate with the CRCM Workflow **Role:** and **Task Description:**. Exceptions to the above description will be noted in the following sections.

CM Log Tab

The **CM Log** tab (see Figure 18-15, CM Log Tab) contains a Configuration Management history, in tabular form, for the OCR. The table consists of six columns labeled as follows:

- **Task**
- **Action**
- **User ID**

- **Notes**
- **State**
- **CM Date**

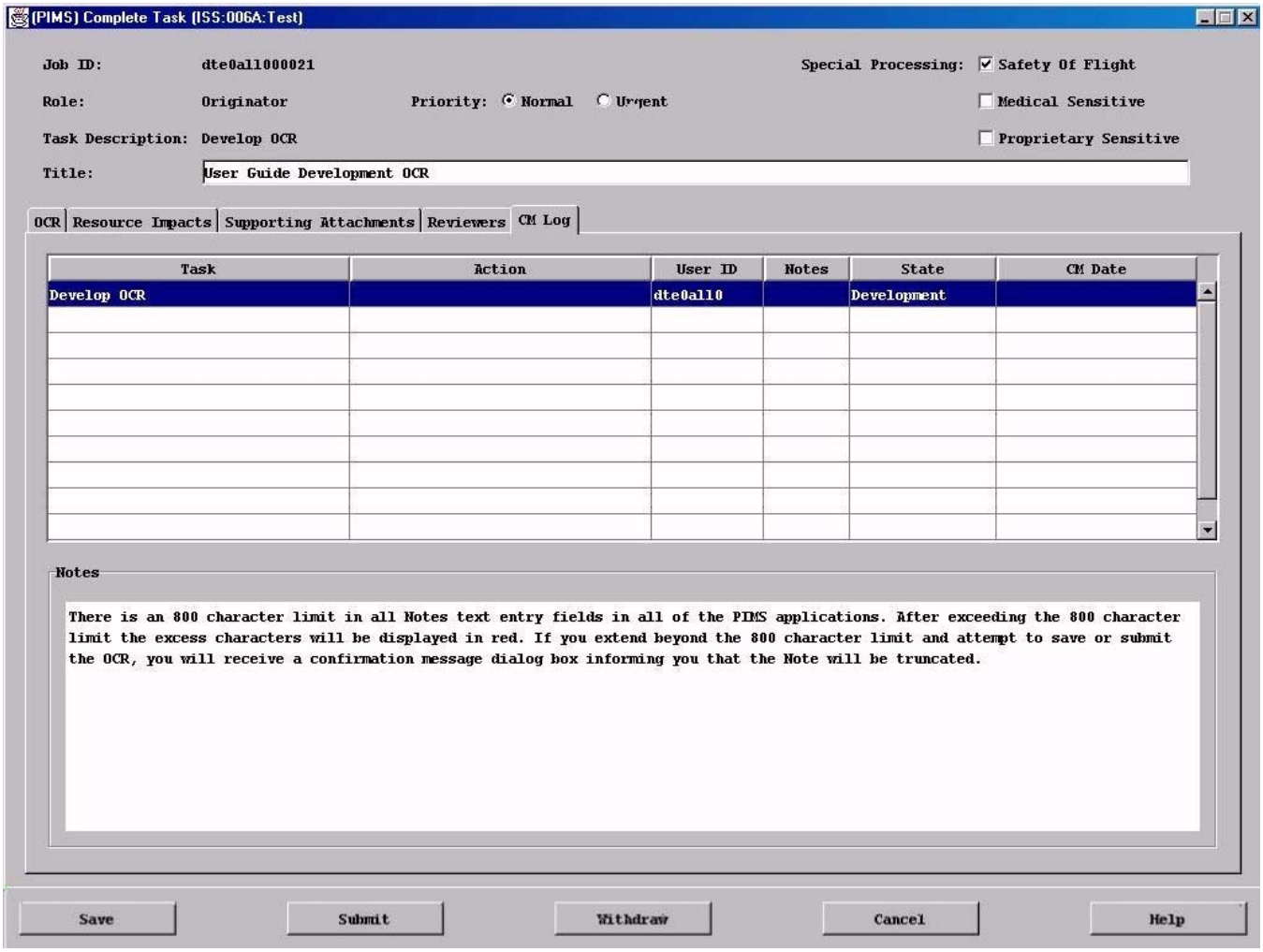


Figure 18-15, CM Log Tab.

Each row in the table represents an individual accession in the OCR workflow. For a new OCR the table will contain a single entry representing the development of the OCR.

The **Task** column represents the job assignment, in concise, descriptive terms for the specified User ID to accomplish. For a new OCR, the task is simply to "Develop OCR".

The **Action** column defines the workflow action accomplished when the **Task** is completed. For a new OCR entries could be Submit or Withdraw.

The **User ID** column identifies the entity to whom the task is assigned and is responsible for it's completion.

A check mark in the **Notes** column indicates that notes relating to the OCR were included by the actionee. Any notes will be contained in the **Notes** frame directly below the CM Log table when a table row is selected.

The **State** column shows the current CM state for the OCR. In the case of a new OCR this entry will be **Development**.

The **CM Date** column indicates the date and time when a change of state occurred due to a workflow **Action**. A new OCR, under development will not display a date until the OCR is submitted (change of state). The date is displayed in a YYYY:DDD:HH:MM:SS format.

The **Notes** frame contains any remarks that the actionee considered to be relative. Again, the **Notes** frame will not be displayed until a CM Log table row has been selected. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-11, Notes Exceed Limit dialog box).

18.1.3.1.3.2Originator

Items peculiar to the Originator's role and reflected in the Originator version of the **(PIMS) Complete Task** dialog box for an OCR are the pushbuttons that comprise the control panel.

Clicking Save saves the OCR to the PIMS database and invokes a Saved Information Message.

Note: In order to access a saved OCR, the initiator (or anyone with the same User ID) must select the OCR from the To Do List where the OCR will be listed as being in the development state.

Clicking Submit moves the OCR from the Development state to the Submitted state and invokes the Submit Confirmation Message dialog box. Once an OCR has been submitted it can no longer be edited (edits can only occur in the development state and after an OCR has been putback to the originator), it would be advisable to consider and ensure the accuracy and completeness of the OCR before taking the action to submit it.

Clicking Withdraw invokes a Withdraw Confirmation Message dialog box. Withdrawing an OCR is not synonymous with deleting it. When an OCR is withdrawn it is removed from further processing and is considered to be in a withdrawn state but is still maintained in the PIMS database.

Clicking Cancel closes the **(PIMS) Complete Task** dialog box, abandons any changes that may have been made to the OCR and returns the user to the **(PIMS) To Do List**.

Clicking Help provides access to information pertaining to the **(PIMS) Complete Task** dialog box.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.3.3Facility Lead Release for Review

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. As the Facility Lead you are assigned the To Do List task of screening the OCR and taking the appropriate actions to complete the task.

Several aspects of the (PIMS) Complete Task dialog box as presented for the Facility Lead Release for Review version (see Figure 18-16, Facility Lead Release for Review) differ from the previously discussed common elements.

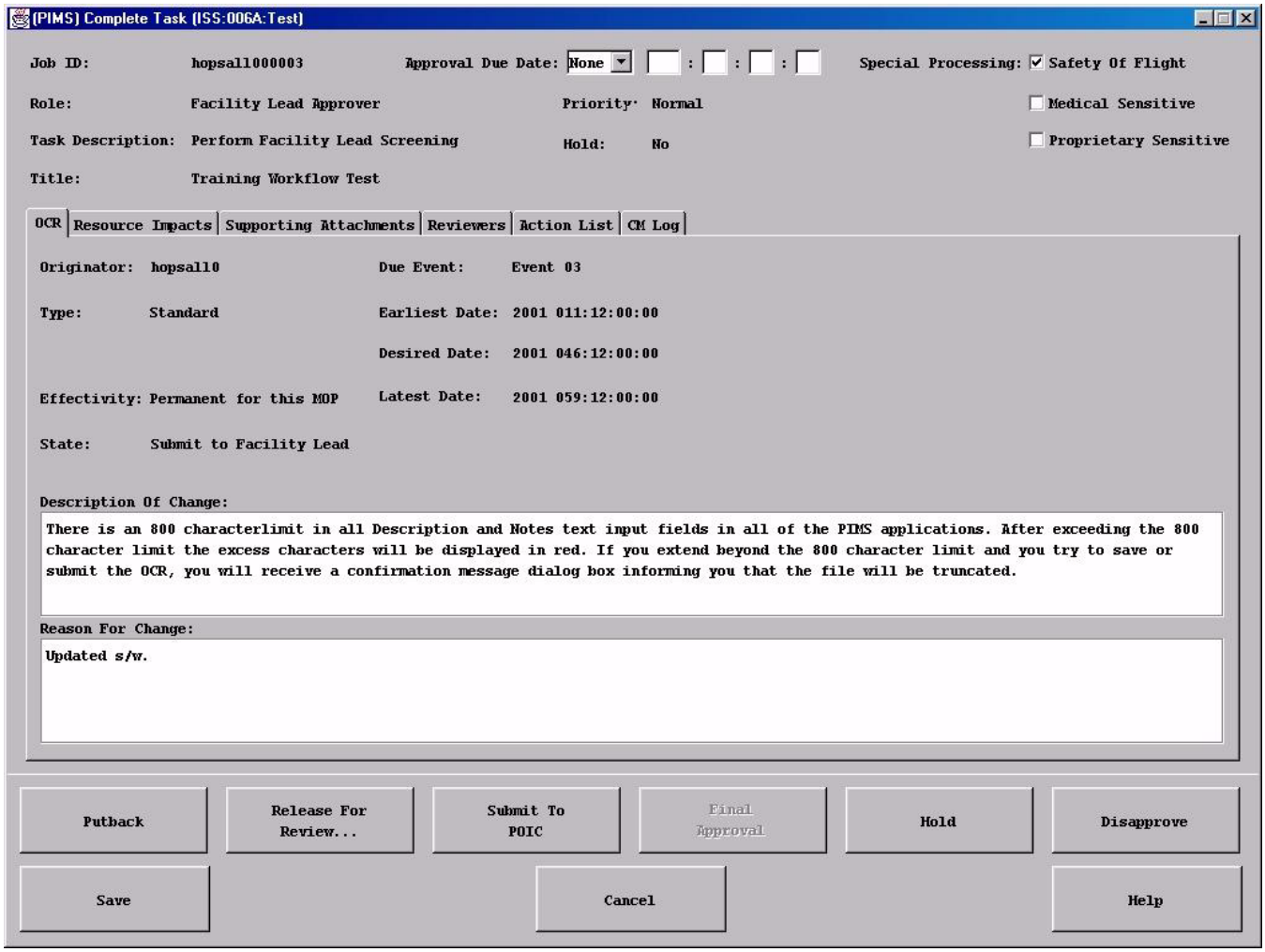


Figure 18-16, Facility Lead Release for Review.

General

The following components of the Complete Task dialog box for a Facility Lead Release for Review are unique and will be discussed in detail in the remainder of this section:

- Role and Task Description
- View only tabs
- Addition of Action List Tab
- Reviewers Tab - addition of Facilities Reviewers table
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:** and **Task Description:** entries. The CRCM **Role:** is now Facility Lead Approver and the **Task Description:** reads “Perform Facility Lead Screening”.

Since a review function is implied by the Task Description, the following tabbed areas are view only:

- OCR tab
- Resource Impacts tab
- Supporting Attachments tab
- CM Log tab

Note: The CM Log tab is view only for other users entries to the CM Log tab, however, you can edit the Notes frame for an entry in the log that is yours.

Help: For complete descriptions of the above tabbed areas, see the sections labeled: OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, and CM Log Tab.

Reviewers Tab

The **Reviewers** tab (see Figure 18-17, Reviewers Tab) has added a **Facility Reviewer(s)** frame so that the Facility Lead may assign reviewers to the OCR. The **Facility Reviewer(s)** frame contains a table consisting of three columns labeled:

- **User ID**
- **Response**
- **Date**

Also included in the **Facility Reviewer(s)** frame is a pushbutton area for selecting/deselecting reviewers.

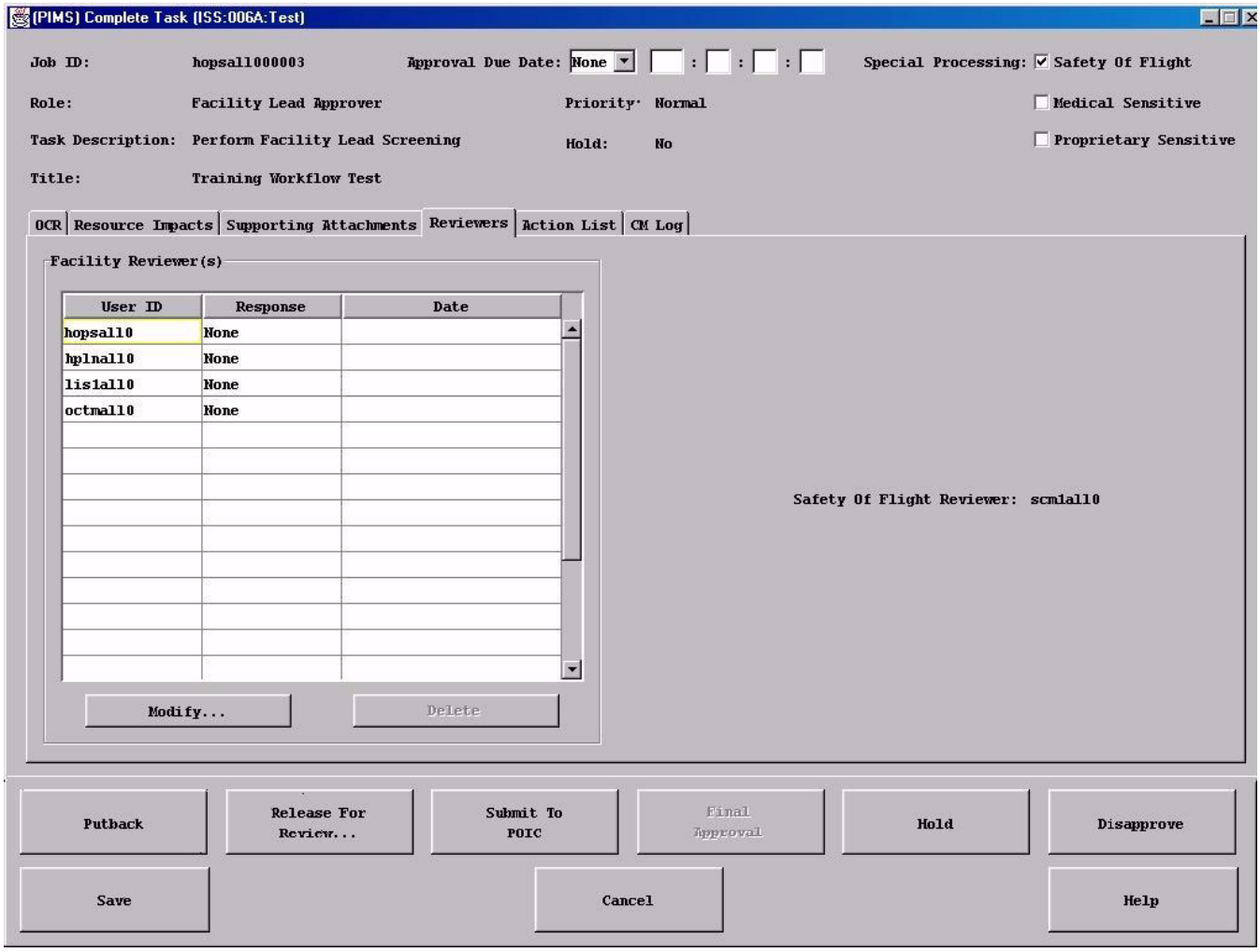


Figure 18-17, Reviewers Tab.

The **User ID** column is used to list those facility members that the facility lead wishes to review the OCR.

The **Responses** column will contain the action taken by the reviewers in response to their To Do List Task to review the OCR. Possible entries in this column are **None**, **Concur**, and **Non Concur**.

The **Date** column will contain the date that the action was taken by the reviewer expressed in a YYYY DDD:HH:MM:SS format. This field will be blank for a **Responses** entry of **None**.

The button area contains two pushbuttons:

Clicking Modify... invokes the **(PIMS) Modify Facility Reviewer List** dialog box which provides the means to add facility reviewers to the **Reviewers** Tab.

Clicking Delete deletes the selected reviewer from the list. This pushbutton is insensitive until a selection has been made from the list.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

Action List Tab

The Action List tab (see Figure 18-18, Action List tab) has been added within the tabbed area.The Action List tab will contain (by the time the OCR is approved) a complete list of the actions required to implement the OCR. Each row of the table represents a single task to be completed in the implementation of the OCR. When the OCR has been approved, the CRCM Workflow will begin to assign tasks to be implemented according to the information contained within the **Action List**.

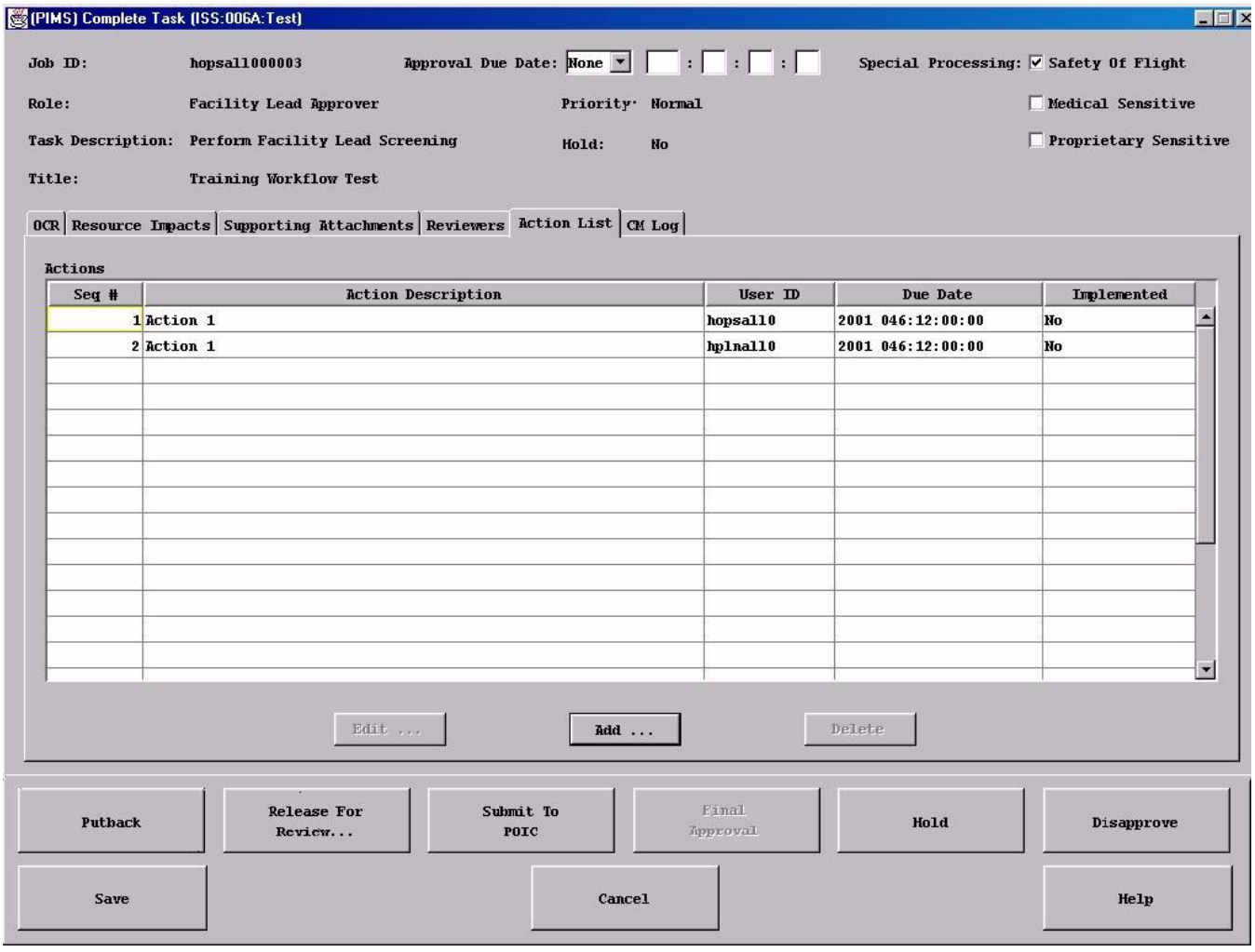


Figure 18-18, Action List tab.

Information is presented in tabular form with columns labeled as follows:

- **Seq #**
- **Action Description**
- **User ID**
- **Due Date**
- **Implemented**

The **Seq #** is assigned by the user with each **Seq #** representing a step in the implementation process. Seq #'s can be entered to provide serial tasking (Seq1, Seq 2, Seq 3, etc.) or parallel tasking (Seq1, Seq 2, Seq 2, Seq 3, etc.). In serial tasking the CRCM Workflow assigns tasks in a sequential order, one after the other, in order to implement the OCR. In parallel tasking the CRCM Workflow assigns divergent paths for tasks to be implemented. As in the example above, after Seq #1 is completed the workflow assigns Seq #2 tasks to two individual User IDs for completion at the same time before assigning the task for Seq #3.

The **Action Description** column describes the action to be completed. Action Descriptions are not restricted to any format or convention, but should be clear and concise as the text entry field is limited to 60 characters.

The **User ID** column will contain the User ID to whom the task has been assigned.

The **Due Date** column identifies the required task completion date presented in a YYYY DDD:HH:MM:SS format.

The **Implemented** column will contain either a **Yes** or **No** entry provided by the CRCM Workflow to indicate individual **Seq #** completions. Prior to OCR approval all entries in the table will default to a **No** value. The CRCM Workflow will enter **Yes** entries as each **Seq #** action is completed.

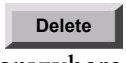
The **Action List** tab contains three pushbuttons for adding, editing, and deleting entries contained in the table.

Clicking

invokes the **(PIMS) Edit Action Item** dialog box which provides the means to edit all columns (except the **Implemented** column) on the **Action List** tab. This pushbutton will be insensitive until an Action has been selected to edit.

Clicking

invokes the **(PIMS) Add Action Item** dialog box which provides the means to add an action to the **Action List** tab.

Clicking 

deletes the selected Action Item from the table. Selection is accomplished by clicking anywhere in a table row.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

Control Panel

Selecting

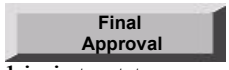
sends the OCR back to the originator which places the OCR back into the development state and invokes a **PIMS Confirmation Message**. This message queries the user as to his intent to putback the OCR.

Selecting

invokes the **(PIMS) Release for Review** dialog box. This dialog box provides the releasing authority with a means to assign a due date for the completion of the review by the reviewers.

Selecting

invokes a **PIMS Confirmation Message**. This message queries the user as to his intent to submit the OCR to the POIC POD.

Selecting 

invokes a **PIMS Confirmation Message**. This message queries the user as to his intent to approve the OCR.

Selecting

invokes a **PIMS Information Message**. The Hold pushbutton is initially sensitive and when toggled changes the Hold option from No to Yes. It acts as a reminder to the Facility Lead (in this instance) that he wishes to not take any further action on this OCR at this time. He may include a note to himself (in the CM Log tab) explaining the reason for the hold or specify a date for taking action on the OCR. A Hold on the OCR is actually superficial to the OCR itself and actions such as Release For Review or Final Approval can still be taken.

Selecting

invokes a **PIMS Confirmation Message**. This message queries the user as to his intent to disapprove the OCR.

Selecting

saves any changes you may have made to the OCR to the PIMS Database and invokes a **PIMS Information Message.**

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.3.4Facility Member Review

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR.

Several aspects of the (PIMS) Complete Task dialog box as presented for the Facility Reviewer version (see Figure 18-19, Facility Reviewer) differ from the previously discussed common elements.

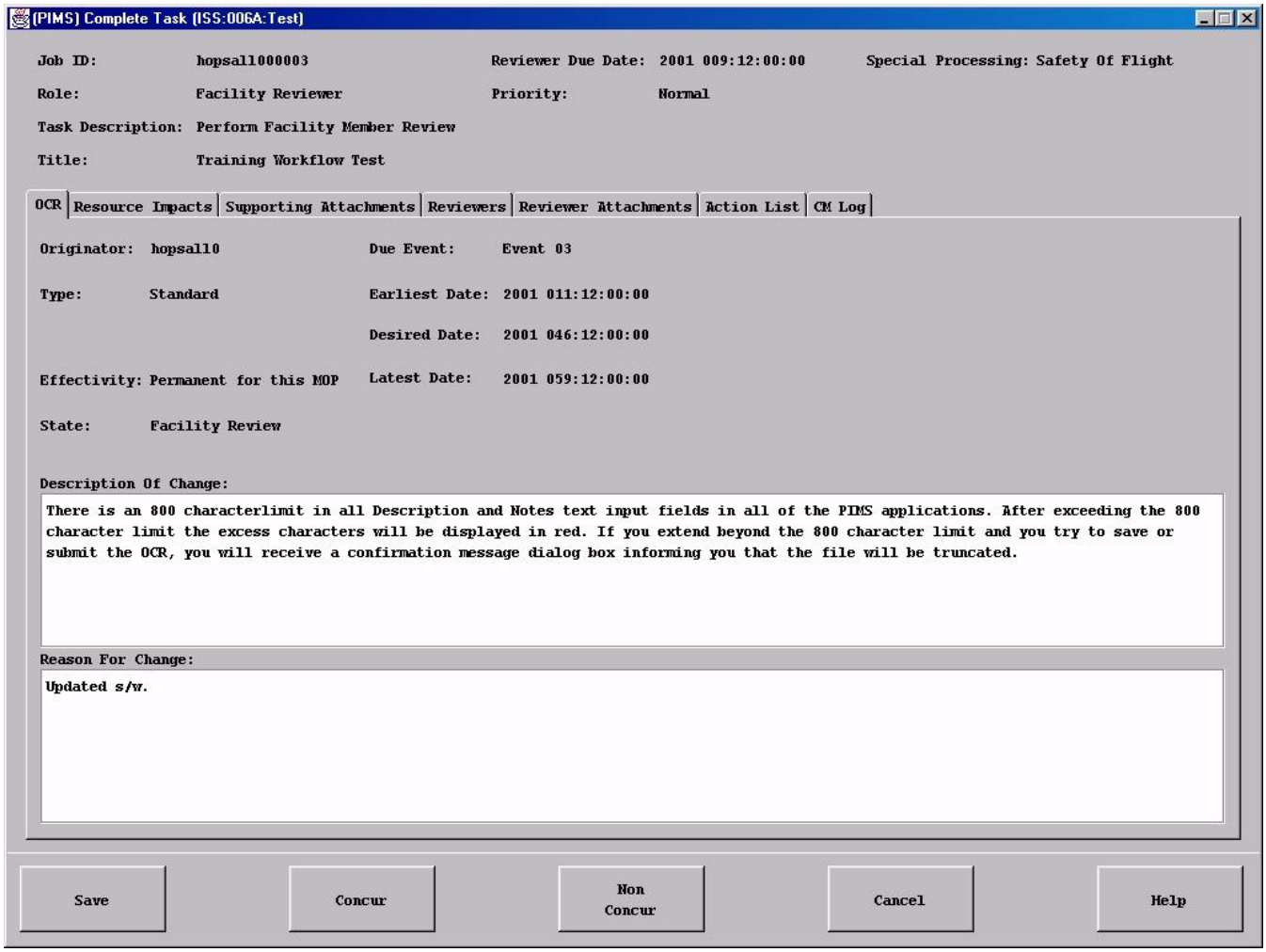


Figure 18-19, Facility Reviewer.

General

The following components of the Complete Task dialog box for a Facility Reviewer are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Addition of Reviewer Attachments Tab
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, **Task Description:**, and **Reviewer Due Date:** entries. The CRCM **Role:** is now Facility Reviewer and the **Task Description:** reads “Perform Facility Member Review”.

The **Reviewer Due Date:** entry reflects the date, assigned by the Facility Lead, for the completion of the OCR review. This date is expressed in a YYYY DDD:HH:MM:SS format.

All of the tabs are view only with the exception of the **CM Log** tab and the **Reviewer Attachments** tab. The **Notes** frame of the **CM Log** tab will be editable providing a means for the reviewer to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the Notes column for the applicable task.

Help: For complete descriptions of the individual tabbed areas see the sections labeled: OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, Reviewers Tab, Reviewer Attachments Tab, Action List Tab and CM Log Tab.

Reviewer Attachments Tab

The Reviewer Attachments tab allows the reviewer of the OCR to attach any pertinent, supporting files to the OCR (see Figure 18-20, Facility Reviewer - Reviewer Attachments Tab). When a file is attached to the OCR it is added to the PIMS database and becomes available for viewing by anyone within the OCR workflow.

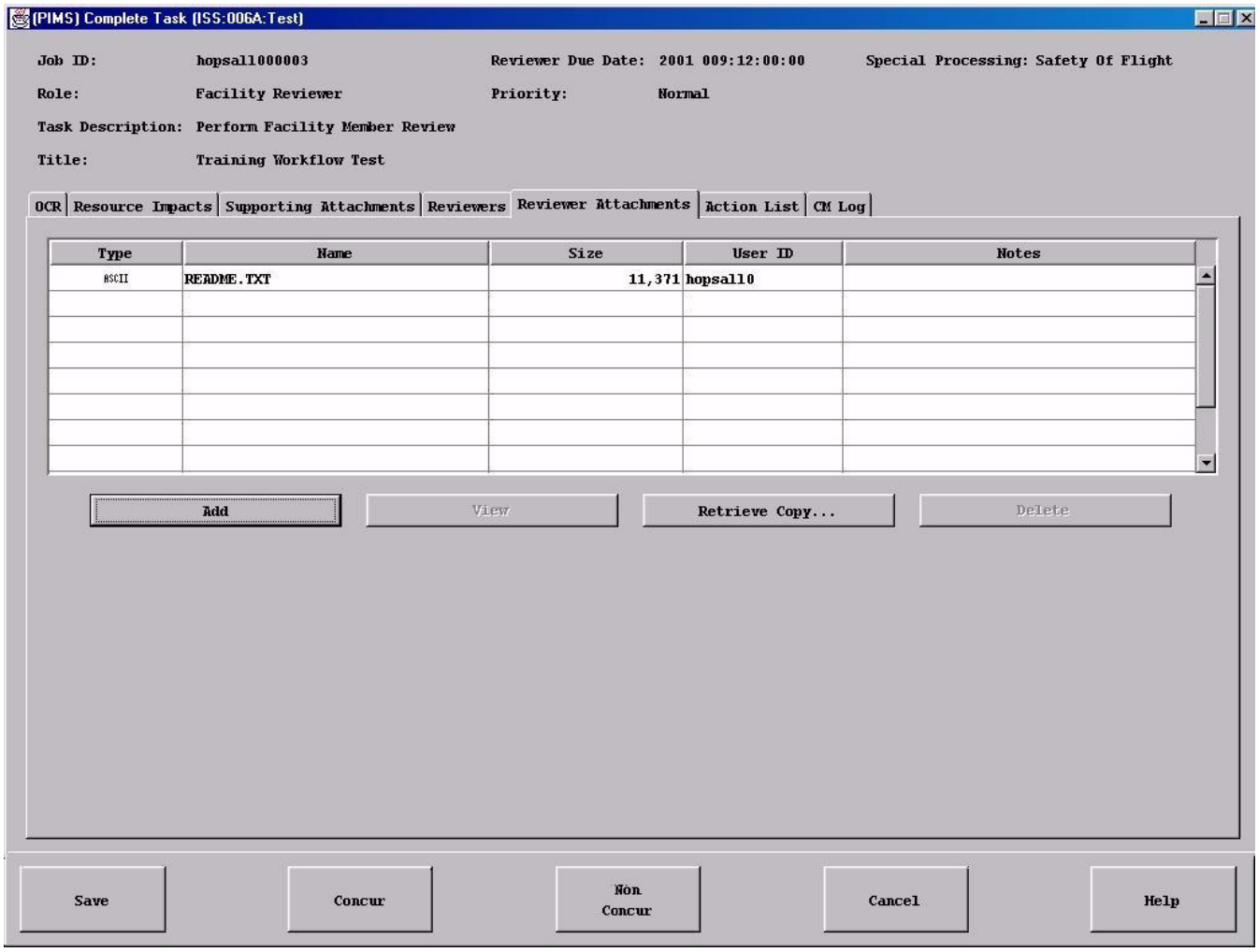


Figure 18-20, Facility Reviewer - Reviewer Attachments Tab.

This tab consists of a table, pushbutton area, and a **Notes** frame.

The table contains five columns labeled as follows:

- **Type** -indicates the document type (ASCII, Word, Excel, etc.)
- **Name** -name of the file added to the PIMS database
- **Size** -size of the file in bytes
- **User ID** -User ID of the individual who attached the file to the OCR
- **Notes** -any explanatory notes deemed necessary by the Originator

The **Notes** frame becomes active when a selection is made in the **Notes** column of the table. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-11, Notes Exceed Limit dialog box).

Clicking Add invokes the **Add Attachment** dialog box (see Figure 18-12, Add Attachments dialog box). This is the default pushbutton.

Help: For information concerning the **Add Attachments** dialog box, see the description accompanying Figure 18-12, Add Attachment dialog box.

Clicking View provides a Netscape window that contains the contents of the selected document in the format described by the **Type** column in the table (if the **Type** column specifies , then an Excel spreadsheet will be displayed).

Clicking Retrieve Copy... copies the Metadata for the selected attachment to the local workstation.

Clicking Delete removes the selected attachment from the Reviewer Attachments tab of the OCR and also removes the document from the PIMS database.

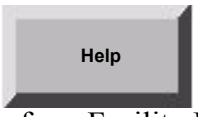
Control Panel

Selecting Save saves any changes you may have made to the OCR to the PIMS Database and invokes a **PIMS Information Message** confirming that the OCR has been saved. This pushbutton is always sensitive

Selecting Concur invokes a **PIMS Confirmation Message** that queries you as to your intent to concur with the OCR. The concurrence process is completed with a **PIMS Information Message** confirming that the OCR has been concurred. This pushbutton is always sensitive.

Selecting Non Concur invokes a **PIMS Confirmation Message** that queries you as to your intent to non-concur with the OCR. The non-concurrence process is completed with a **PIMS Information Message** confirming that the OCR has been non-concurred. This pushbutton is always sensitive.

Selecting Cancel abandons any changes that were made during this session, closes the **(PIMS) Complete Task** dialog box and returns you to the **(PIMS) To Do List** main window. This pushbutton is always sensitive.

Selecting 

provides access to information pertaining to the **(PIMS) Complete Task** dialog box for a Facility Reviewer.

18.1.3.1.3.5Facility Lead Approver (Facility Review)

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR. The Facility Reviewers have completed their reviews by either concurring or non concurring with the OCR. The Facility Lead Approver is now assigned the task of providing facility lead approval.

Several aspects of the (PIMS) Complete Task dialog box as presented for the Facility Lead Approver version (see Figure 18-21, Facility Lead Approver) differ from the previously discussed common elements.

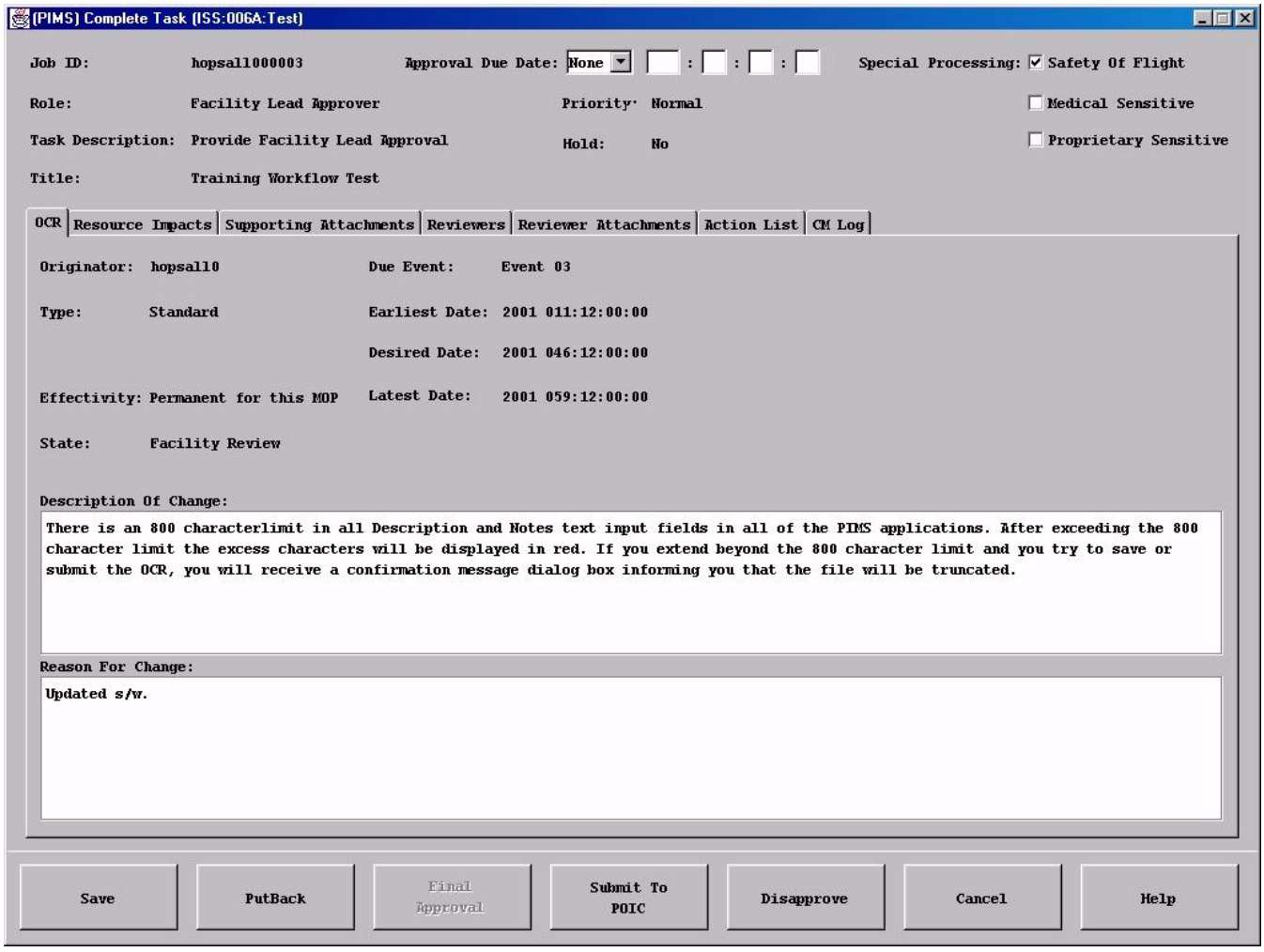


Figure 18-21, Facility Lead Approver.

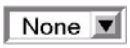
General

The following components of the Complete Task dialog box for a Facility Lead Approver are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, **Task Description:**, and **Approval Due Date:** entries. The CRCM **Role:** is now Facility Lead Approver and the **Task Description:** reads “Provide Facility Lead Approval”.

The **Approval Due Date:** entry displays when the user is assigned a date for the completion of this task. If a date is entered by the user, it will appear in the **To Do List** after this version of the

Complete Task dialog box has been saved. Clicking 

provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The following tabbed areas are view only:

- OCR tab
- Resource Impacts tab
- Supporting Attachments tab
- Reviewers tab

The **CM Log** tab is view only except for the **Notes** frame. The **Notes** frame of the **CM Log** tab will be editable providing a means for the reviewer to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the Notes column for the applicable task.

The **Reviewer Attachments** and **Action List** tabs are editable to facilitate changes by the Facility Lead Approver based on any of the Reviewer's remarks or at his own discretion.

Control Panel

Selecting

sends the OCR back to the originator which places the OCR back into the putback to originator state and invokes a **PIMS Confirmation Message** that queries the user as to his intent to putback the OCR.

Selecting

invokes a **PIMS Confirmation Message** which queries the user as to his intent to approve the OCR.

Selecting

invokes a **PIMS Confirmation Message** which queries the user as to his intent to submit the OCR to the POIC POD.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.3.6POIC POD (Submitted to POIC)

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR

(hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR. The Facility Reviewers have completed their reviews by either concurring or non concurring with the OCR. The Facility Lead Approver is now assigned the task of providing facility lead approval.

While evaluating the OCR, the Facility Lead has determined that the requirements of the OCR exceed the resources of his facility team and may impact other activities within the POIC. Instead of giving final approval to the OCR, he submits it to the POIC POD for review.

Several aspects of the (PIMS) Complete Task dialog box as presented for the POIC POD Release for Review version (see Figure 18-22, POIC POD Release for Review) differ from the previously discussed common elements.

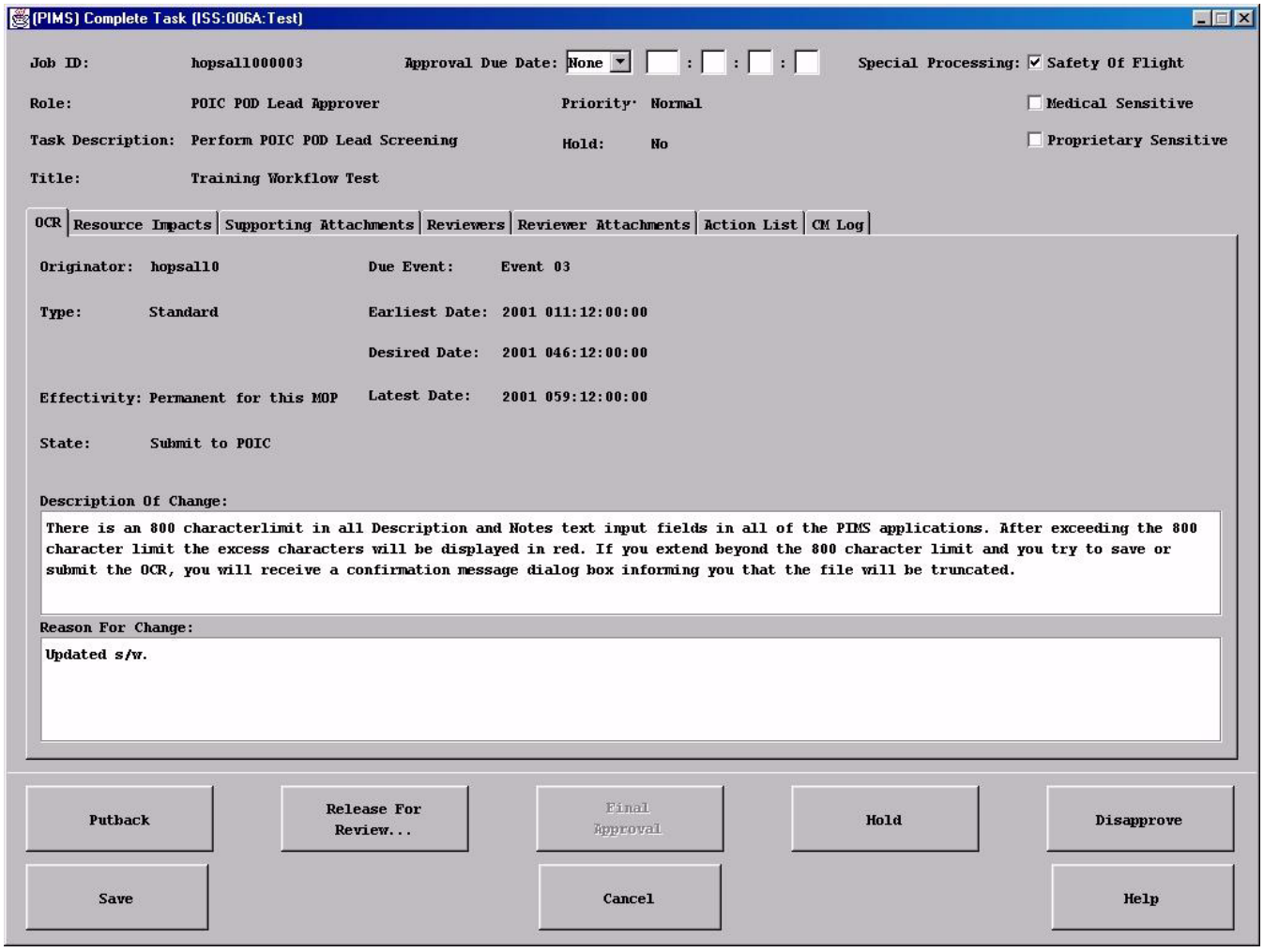


Figure 18-22, POIC POD Release for Review.

General

The following components of the Complete Task dialog box for a POIC POD Lead Approver are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, **Task Description:**, and **Approval Due Date:** entries. The CRCM **Role:** is now POIC POD Lead Approver and the **Task Description:** reads "Perform POIC POD Lead Screening".

The **Approval Due Date:** entry displays when the user is assigned a date for the completion of this task. If a date is entered by the user, it will appear in the **To Do List** after this version of the Complete Task dialog box has been saved. Clicking

provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The following tabs are view only:

- **OCR** tab
- **Resource Impacts** tab
- **Supporting Attachments** tab
- **Reviewer Attachments** tab

The **CM Log** tab is view only except for the **Notes** frame. The **Notes** frame of the **CM Log** tab will be editable providing a means for the approver to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the Notes column for the applicable task.

The **Action List** tab is editable to facilitate changes by the POIC POD Approver.

The Reviewers tab (see Figure 18-23, Reviewers tab) contains the following frames:

- **Facility Reviewer(s)**
- **Safety of Flight Reviewer(s)**
- **POIC Reviewer(s)**
- **PCC Reviewer(s)**

The POIC Reviewer(s) frame and PCC Reviewer(s) frame are initially blank. Reviewers are assigned by selecting the

pushbutton.

Note: Only the reviewer frames within this tier of authority are editable.

Help: For complete descriptions of the individual tabbed areas see the sections labeled: OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, Reviewers Tab, Reviewer Attachments Tab, Action List Tab, and CM Log Tab.

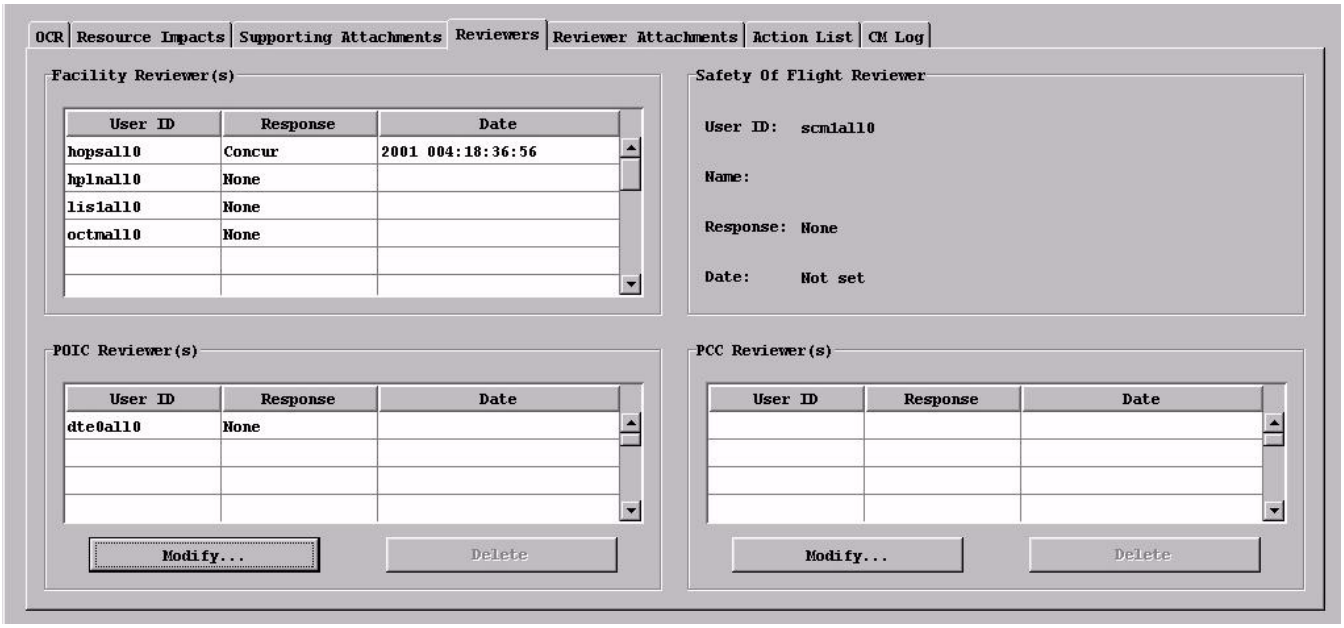


Figure 18-23, Reviewers tab.

Control Panel

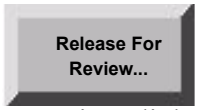
Selecting

sends the OCR back to the Originator which places the OCR into the putback to originator state and invokes a **PIMS Confirmation Message** that queries the user as to his intent to putback the OCR. This pushbutton is always sensitive.

Selecting

invokes a **PIMS Confirmation Message** which queries the user as to his intent to approve the OCR.

Note: The Final Approval pushbutton sensitivity is dependent on Safety of Flight (SOF) Special Processing Selection. If SOF is selected, Final Approval is insensitive.

Selecting 

invokes the **PIMS Release for Review** dialog box (see Figure 18-24, Release for Review dialog box). This pushbutton is always sensitive.

Note: IF a POIC POD attempts to release an OCR for review without selecting any reviewers or actionees, a confirmation dialog box will be invoked that queries his decision to Release for Review the OCR wihout any assigned reviewers.

Selecting

invokes a **PIMS Information Message** stating that the OCR has been put on hold. The Hold pushbutton is initially sensitive and when toggled changes the Hold option from No to Yes. It acts as a reminder to the POIC POD (in this instance) that he wishes to not take any further action on this OCR at this time. He may include a note to himself (in the CM Log tab) explaining the reason for the hold or specify a date for taking action on the OCR. A Hold on the OCR is actually superficial to the OCR itself and actions such as Release For Review or Final Approval can still be taken.

Selecting

invokes a **PIMS Confirmation Message** that queries the user as to his intent to disapprove the OCR. This pushbutton is always sensitive.

Selecting

saves any changes you may have made to the OCR to the PIMS Database and invokes a **PIMS Information Message** stating that all changes to the OCR have been saved. This pushbutton is always sensitive

Selecting

abandons any changes that were made during this session, closes the **(PIMS) Complete Task** dialog box and returns you to the (**PIMS) To Do List** main window. This pushbutton is always sensitive.

Selecting

provides access to information pertaining to the **(PIMS) Complete Task** dialog box for a POIC Pod Release for Review.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

Selecting

invokes the **(PIMS) Release for Review** dialog box (see Figure 18-24, Release for Review dialog box). This dialog box provides the releasing authority with a means to assign a due date for the completion of the review by the reviewers.

The **Reviewer's Due Date:** text entry fields are used to record the due date for the completion of the review. Clicking

provides a pulldown menu for selecting the year with the remaining

text entry fields representing the Julian day, hour, min, and sec (DDD:HH:MM:SS). The date is set, by default, to the current time.

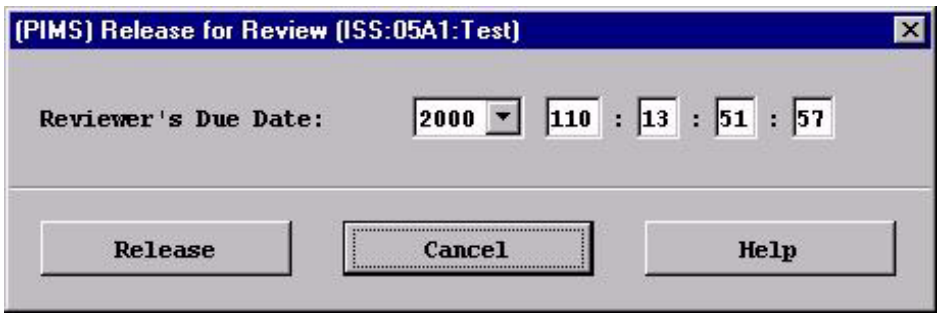


Figure 18-24, Release for Review dialog box.

Selecting Release sends the OCR to the reviewer(s) for review and invokes a PIMS Information Message that informs you that the OCR has been released for review.

18.1.3.1.3.7Safety of Flight Reviewer

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR. The Facility Reviewers have completed their reviews by either concurring or non concurring with the OCR. The Facility Lead Approver is now assigned the task of providing facility lead approval.

While evaluating the OCR, the Facility Lead has determined that the requirements of the OCR exceed the resources of his facility team and may impact other activities within the POIC. Instead of giving final approval to the OCR, he submits it to the POIC POD for review. The POIC POD reviewed the OCR and released it to POIC and PCC reviewers for their comments. Because the **Special Processing:** entry of the OCR indicated Safety Of Flight, the Safety of Flight Reviewer will be assigned the task: Perform Safety Of Flight Review, during the POIC review.

Several aspects of the (PIMS) Complete Task dialog box as presented for the Safety Of Flight Reviewer version (see Figure 18-25, Safety of Flight Reviewer) differ from the previously discussed common elements.

Help: For a discussion of the (PIMS) Complete Task dialog box for OCRs Common Elements see section 17.1.3.1.3.1 Common Elements.

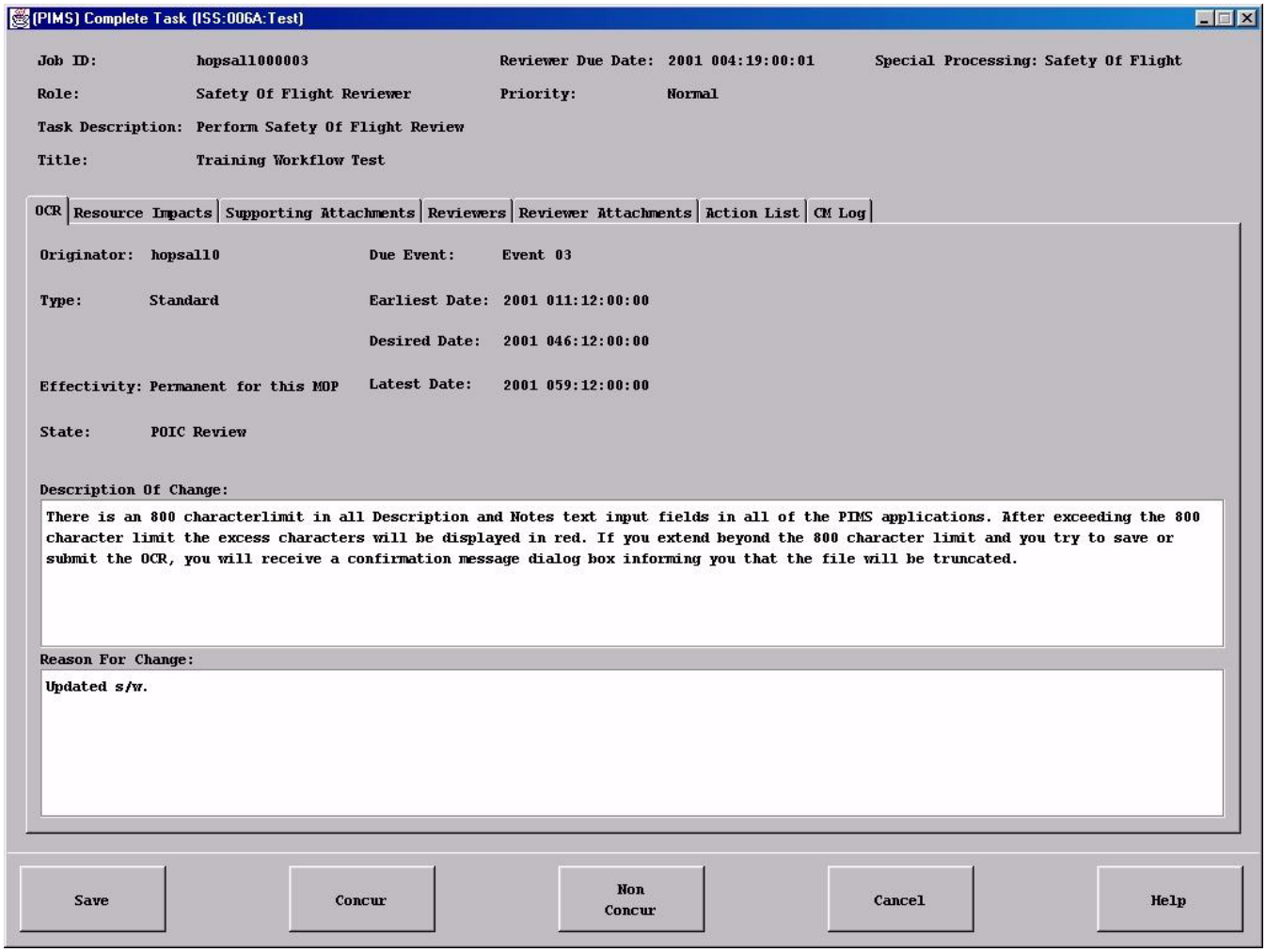


Figure 18-25, Safety of Flight Reviewer.

General

The following components of the Complete Task dialog box for a Safety Of Flight Reviewer are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, **Task Description:**, and **Reviewer Due Date:** entries. The CRCM **Role:** is now Safety Of Flight Reviewer and the **Task Description:** reads “Perform Safety Of Flight Review”.

The **Reviewer Due Date:** entry reflects the completion date for the SOF OCR review. This date is expressed in a YYYY DDD:HH:MM:SS format.

All of the tabs are view only with the exception of the **Reviewers** tab, **Reviewers Attachments** tab, and the **CM Log** tab. The **Notes** frame of the **CM Log** tab will be editable providing a means for the reviewer to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the Notes column for the applicable task.

Help: For complete descriptions of the individual tabbed areas see the sections labeled:OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, Reviewers Tab, Reviewer Attachments Tab, Action List Tab and CM Log Tab.

Reviewers Tab

The **Reviewers** tab (see Figure 18-26, SOF Reviewers tab) contains the Safety Of Flight Reviewer(s) frame which contains the only editable field on this tab.

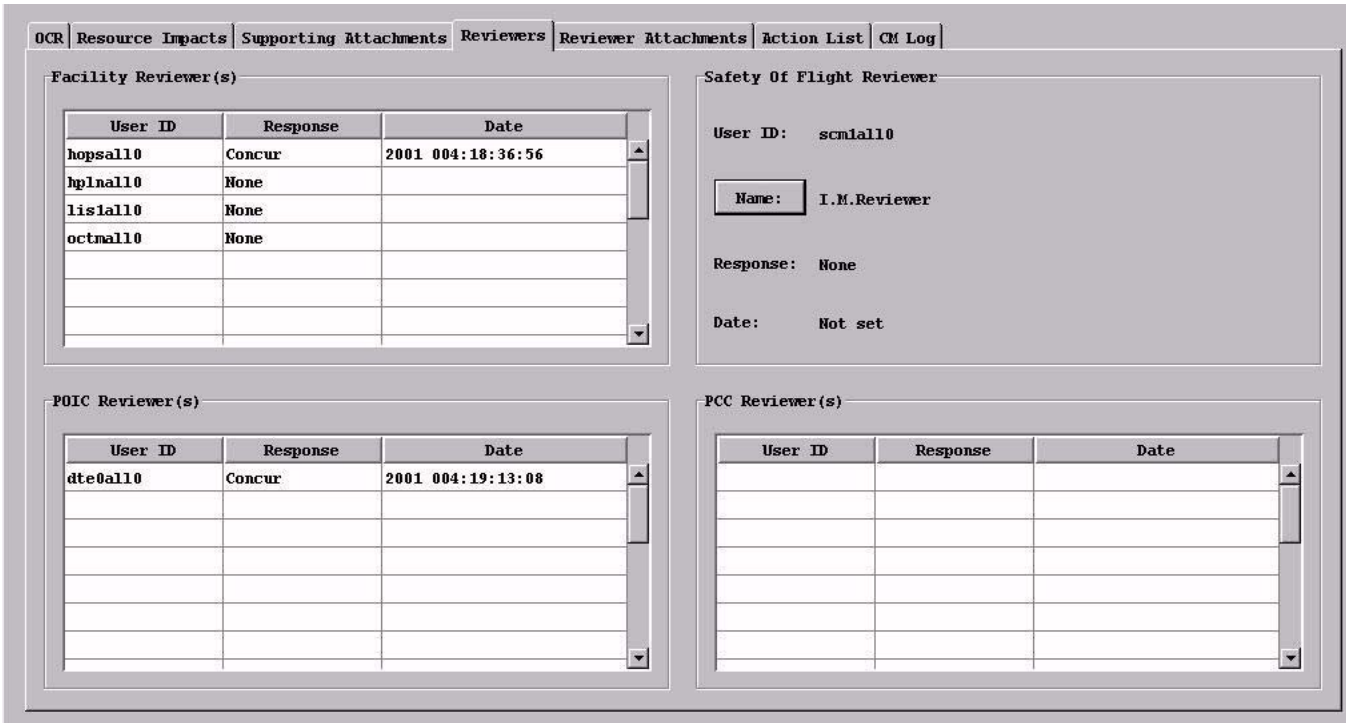


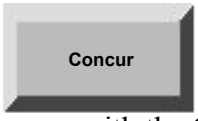
Figure 18-26, SOF Reviewers tab.

Up to this point in the CRCM Workflow if the **Special Processing:** entry required Safety of Flight the review responsibility was assigned to the Group ID for Safety of Flight (i.e., scm1all0). Now that the task of performing Safety Of Flight Review has been assigned, the user who elects to complete this task from To Do List enters his name into the Safety Of Flight Reviewer(s) frame for accountability purposes.

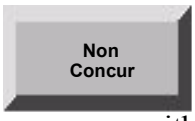
Control Panel

Selecting

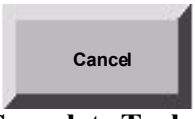
saves any changes you may have made to the OCR to the PIMS Database and invokes a **PIMS Information Message** confirming the save operation. This pushbutton is always sensitive

Selecting 

invokes a **PIMS Confirmation Message** that queries the user as to his intent to concur with the OCR. This pushbutton is insensitive until an entry is made in the **Name:** text entry field located on the **Reviewers** tab.

Selecting 

invokes a **PIMS Confirmation Message** that queries the user as to his intent to non concur with the OCR. This pushbutton is insensitive until an entry is made in the **Name:** text entry field located on the **Reviewers** tab.

Selecting 

abandons any changes that were made during this session, closes the **(PIMS) Complete Task** dialog box and returns you to the **(PIMS) To Do List** main window. This pushbutton is always sensitive.

Selecting

provides access to information pertaining to the **(PIMS) Complete Task** dialog box for a SOF Reviewer.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.3.8POIC POD Approver

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR. The Facility Reviewers have completed their reviews by either concurring or non concurring with the OCR. The Facility Lead Approver is now assigned the task of providing facility lead approval.

While evaluating the OCR, the Facility Lead has determined that the requirements of the OCR exceed the resources of his facility team and may impact other activities within the POIC. Instead

of giving final approval to the OCR, he submits it to the POIC POD for review. The POIC POD reviewed the OCR and released it to POIC and PCC reviewers for their comments. After the OCR is released for review the workflow assigns the POIC POD the task of providing POIC POD Lead Approval. The POIC POD may immediately approve or disapprove the OCR or wait for comments from the reviewers before approving/disapproving the OCR.

Several aspects of the (PIMS) Complete Task dialog box as presented for the POIC POD Approver version (see Figure 18-27, POIC POD Lead Approval) differ from the previously discussed common elements.

Help: For a discussion of the (PIMS) Complete Task dialog box for OCRs Common Elements see section 17.1.3.1.3.1 Common Elements.

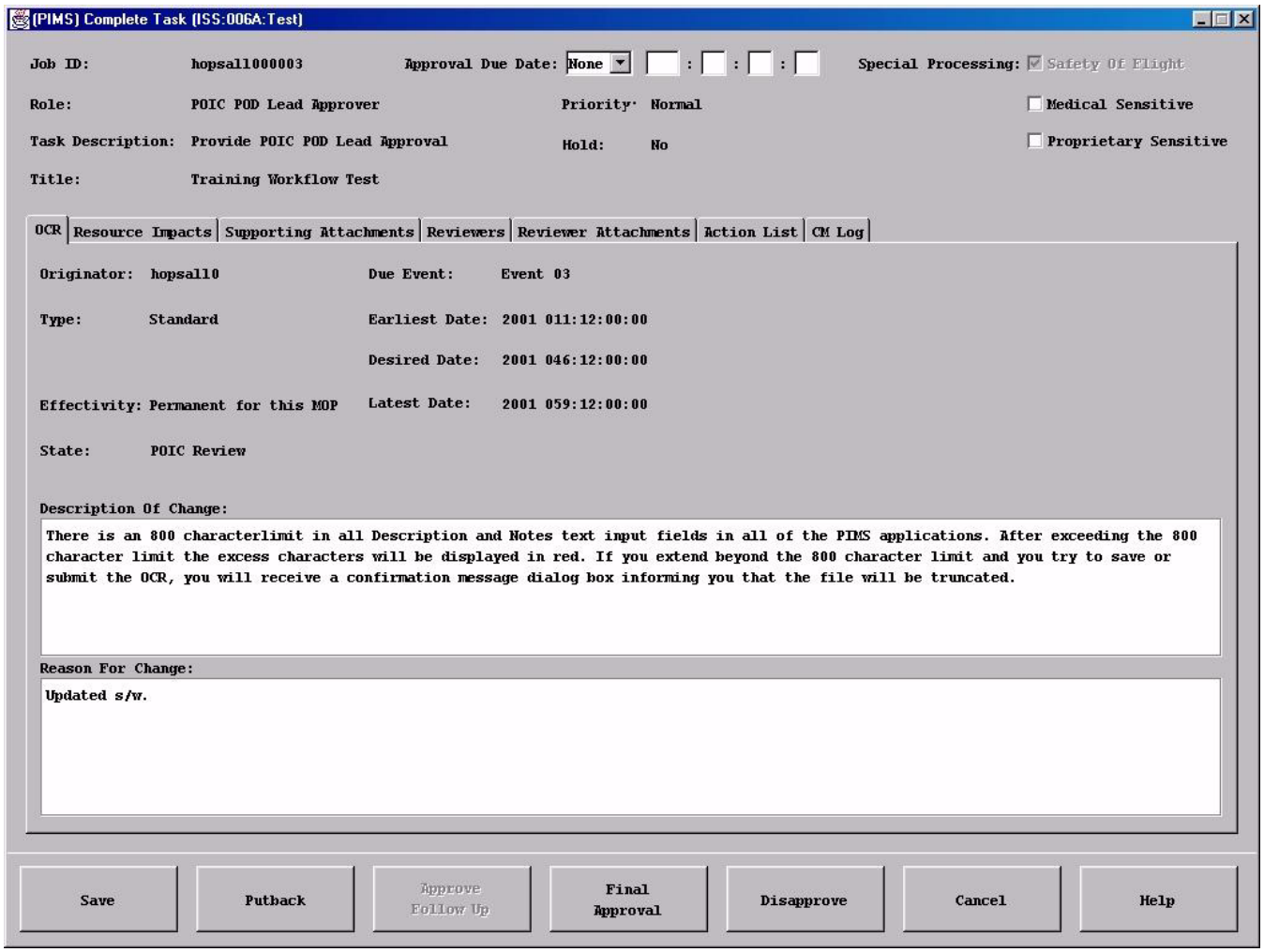


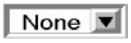
Figure 18-27, POIC POD Lead Approval.

General

The following components of the Complete Task dialog box for a POIC POD Lead Approver are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, **Task Description:**, and **Approval Due Date:** entries. The CRCM **Role:** is now POIC POD Lead Approver and the **Task Description:** reads "Provide POIC POD Lead Approval".

The **Approval Due Date:** entry displays when the user is assigned a date for the completion of this task. If a date is entered by the user, it will appear in the **To Do List** after this version of the Complete Task dialog box has been saved. Clicking 

provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The Special **Processing:** checkboxes for **Medical Sensitive** and **Proprietary Sensitive** are selectable at the POIC POD's discretion.

The following tabbed areas are view only:

- OCR tab
- Resource Impacts tab
- Supporting Attachments tab
- Reviewers tab
- Reviewers Attachments tab

The **Action List** tab is editable to facilitate changes by the POIC POD Lead Approver based on Reviewer's remarks or at his own discretion.

The **CM Log** tab is view only except for the **Notes** frame. The **Notes** frame of the **CM Log** tab will be editable providing a means for the POIC POD approver to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the **Notes** column for the applicable task.

Help: For complete descriptions of the individual tabbed areas see the sections labeled: OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, Reviewers Tab, Reviewer Attachments Tab, Action List Tab and CM Log Tab.

Control Panel

Selecting

saves any changes you may have made to the OCR to the PIMS Database and invokes a **PIMS Information Message** confirming the save operation. This pushbutton is always sensitive

Selecting

invokes a **PIMS Confirmation Message** quering your intent to putback the OCR. This pushbutton is always sensitive.

Selecting

invokes a **PIMS Confirmation Message** that queries the user as to his intent to approve the follow up OCR.

Note: This pushbutton will be sensitive only if the OCR is identified as a Follow Up OCR in the **Type:** entry on the OCR tab and there is no SOF assigned.

Selecting

invokes a **PIMS Confirmation Message** that queries the user as to his intent to approve the OCR.

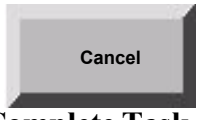
Note: This pushbutton will be insensitive if the OCR is identified as a Follow Up OCR in the **Type:** entry on the OCR tab. Otherwise, it is always sensitive. Also, in the case of a follow up OCR, the OCR must go through the POIC review cycle before the

becomes available.

Note: If a POIC POD attempts to give Final Approval on an OCR for which no actionees have been assigned, a confirmation dialog box will be invoked that queries his intent to give Final Approval.

Selecting

invokes a **PIMS Confirmation Message** that queries the user as to his intent to disapprove the OCR. This pushbutton is always sensitive.

Selecting 

abandons any changes that were made during this session, closes the **(PIMS) Complete Task** dialog box and returns you to the **(PIMS) To Do List** main window. This pushbutton is always sensitive.

Selecting

provides access to information pertaining to the **(PIMS) Complete Task** dialog box for a POIC POD Lead Approver.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.1.3.1.3.9Actionee

Considering the CRCM Workflow, the following is a brief synopsis of events that could have brought you to this dialog box. A Facility member (hopsall0) has generated an OCR (hopsall000003) and submitted it for approval. The Facility Lead has accomplished a screening of the OCR and assigned facility members to review the OCR. The Facility Reviewers have completed their reviews by either concurring or non-concurring with the OCR.The Facility Lead Approver is now assigned the task of providing facility lead approval.

While evaluating the OCR, the Facility Lead has determined that the requirements of the OCR exceed the resources of his facility team and may impact other activities within the POIC. Instead of giving final approval to the OCR, he submits it to the POIC POD for review. The Facility Lead may add a list of actions to be performed after the POIC POD approves the OCR. The actions are added to the Actions List tab. The POIC POD reviewed the OCR and released it to POIC and PCC reviewers for their comments. After the OCR is released for review the workflow assigns the POIC POD the task of providing POIC POD Lead Approval. The POIC POD may immediately approve or disapprove the OCR or wait for comments from the reviewers before approving/disapproving the OCR.

The POIC POD Lead Approver has given final approval to the OCR. At this point the CRCM Workflow will begin assigning tasks to the actionees listed in the Action List tab to be implemented. Tasks will be assigned according to their sequence numbers, with subsequent sequence numbers being assigned only after the current sequence number has been implemented.

Several aspects of the (PIMS) Complete Task dialog box as presented for the POIC POD Approver version (see Figure 18-28, Actionee Complete Task dialog box) differ from the previously discussed common elements.

Help: For a discussion of the (PIMS) Complete Task dialog box for OCRs Common Elements see section 17.1.3.3.1 Common Elements.

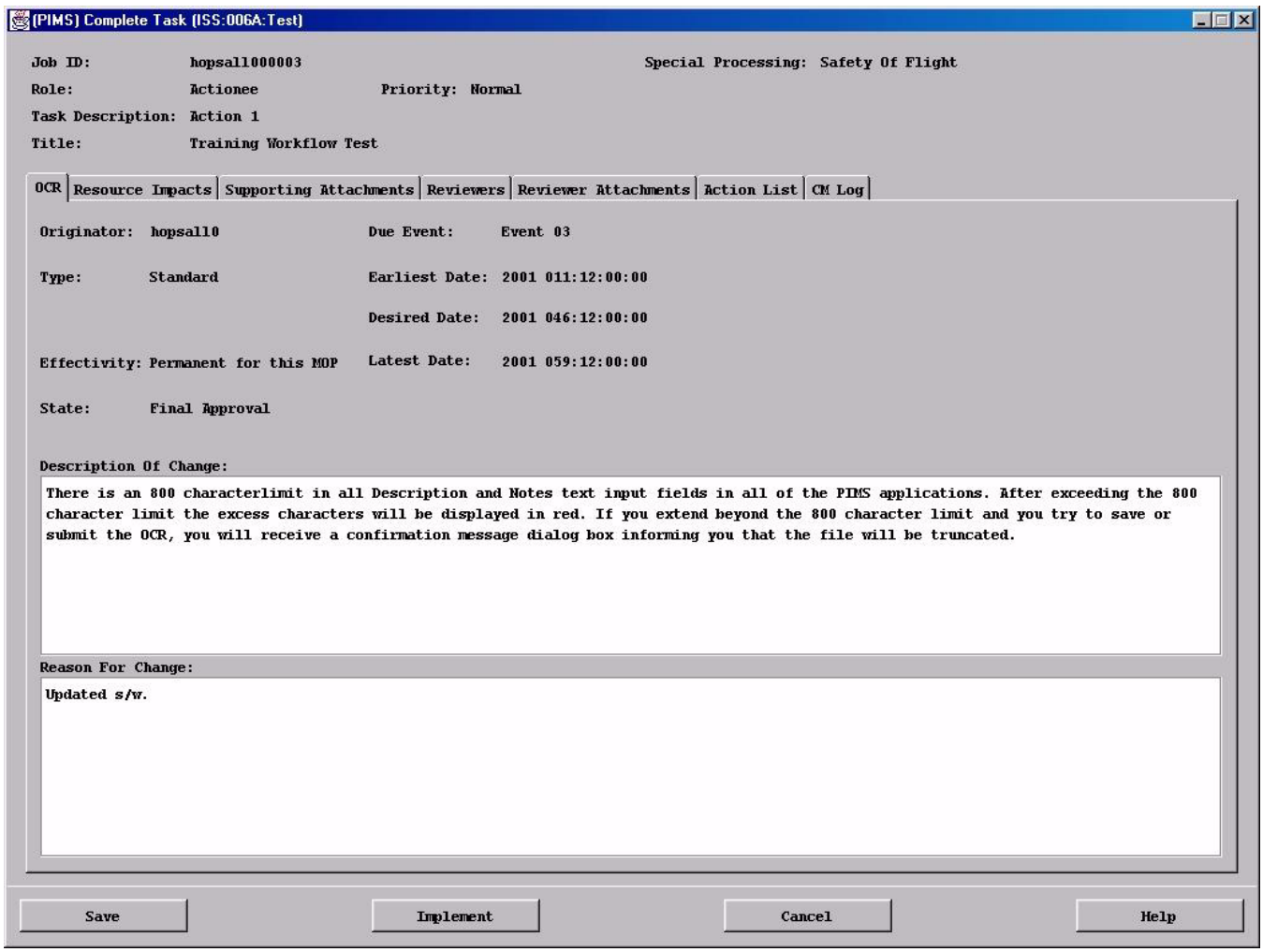


Figure 18-28, Actionee Complete Task dialog box.

General

The following components of the Complete Task dialog box for an Actionee are unique and will be discussed in the sections that follow:

- Text entry fields
- View Only tabs
- Control Panel

The first notable differences appear in the view only fields above the tabbed area for the **Role:**, and **Task Description:** entries. The CRCM **Role:** is now Actionee and the **Task Description:** entry will contain the task as written in the **Action List** tab for this Actionee to complete.

The **Hold:** and **Due Date** entries are conspicuous by their absence from this version of the dialog box.

All of the tabbed areas are view only, with exception of the **CM Log** tab which is view only except for the **Notes** frame. The **Notes** frame of the **CM Log** tab will be editable, providing a means for the Actionee to include any remarks he/she may have concerning the OCR. The **Notes** frame becomes sensitive by clicking in the **Notes** column for the applicable task.

Help: For complete descriptions of the individual tabbed areas see the sections labeled: OCR Tab, Resource Impacts Tab, Supporting Attachments Tab, Reviewers Tab, Reviewer Attachments Tab, Action List Tab and CM Log Tab.

Control Panel

Selection of the Implement signifies that the Actionee has completed his assigned action and invokes a **PIMS Confirmation Message** which queries the user as to his intent to implement the OCR.

18.1.3.2 Modify Group Lists...

The **Modify Group Lists...** menu item under the **Options** menu in all of the PIMS applications allows you to create new distribution group lists and edit or delete ones that you have previously created (see Figure 18-29, Modify Group Lists dialog box). There are two types of group lists that you can create: Public and Personal. When you create a Public list, other users have access to view and use it, but they cannot edit or delete it. Only you have access to your Personal group lists; other users cannot view or use any Personal group lists that you have created.

The Public and Personal group lists are displayed in the two list frames on the left side of the dialog box. Selecting a group from either of these list frames displays the users that are included in the selected group in the list frame to the right. Groups that are displayed in red indicate that at least one user within the group does not have access to the MOP that is currently being used. When the group displayed in red is selected, the invalid user ID(s) contained in the selected group are displayed in red in the frame to the right.

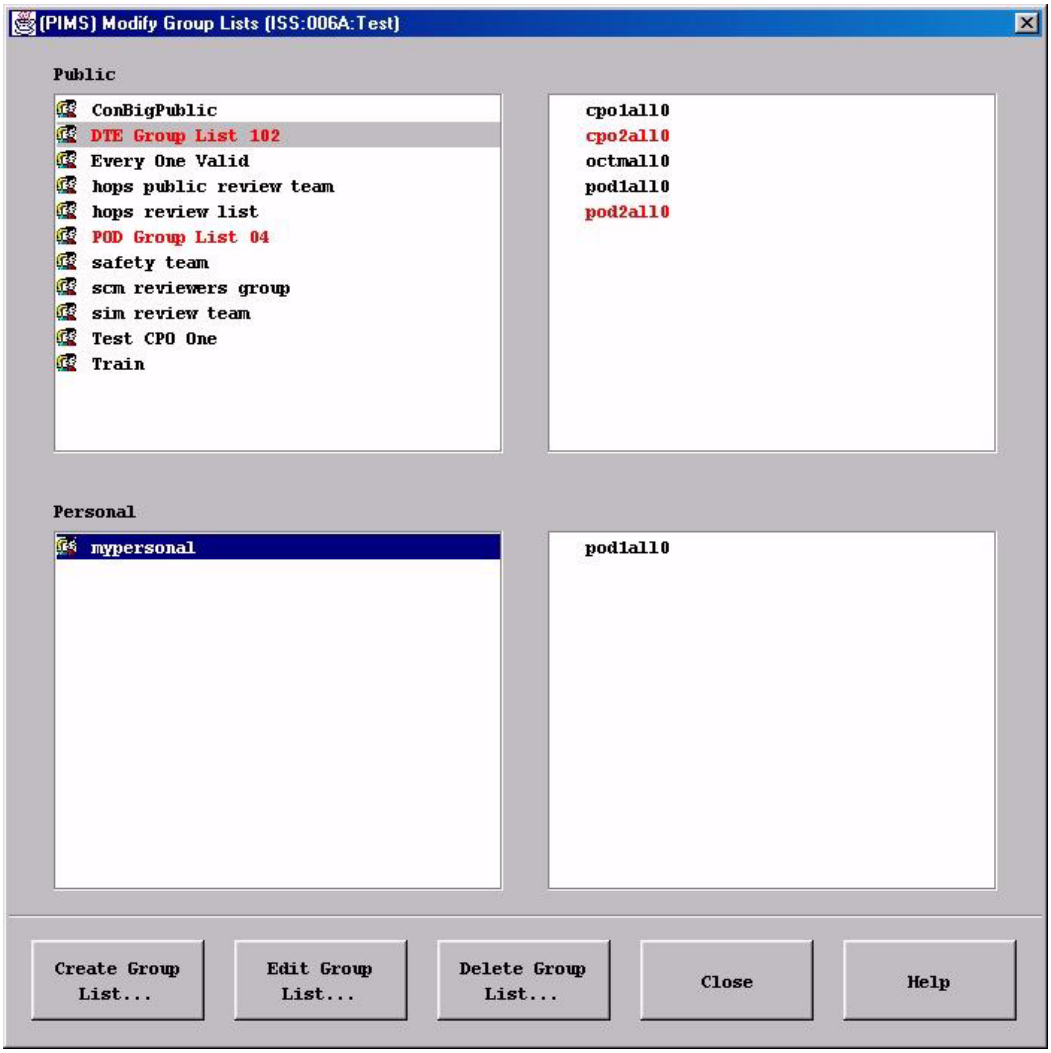
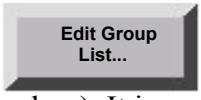


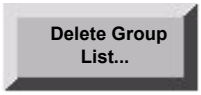
Figure 18-29, Modify Group Lists dialog box.

The

is always sensitive and invokes the **Create Group List** dialog box (see Figure 18-30, Create Group List dialog box) that allows you to create new group lists.

The 

invokes the **Edit Group List** dialog box (see Figure 18-31, Edit Group List dialog box). It is sensitive only when you have selected a group that you previously created.

The 

invokes the **Delete Group List** dialog box (see Figure 18-33, Delete Group List dialog box). It is sensitive only when a group list exists that you previously created.

18.1.3.2.1 Create Group List...

The **Create Group List** dialog box (see Figure 18-30, Create Group List dialog box) allows you to create new group lists.

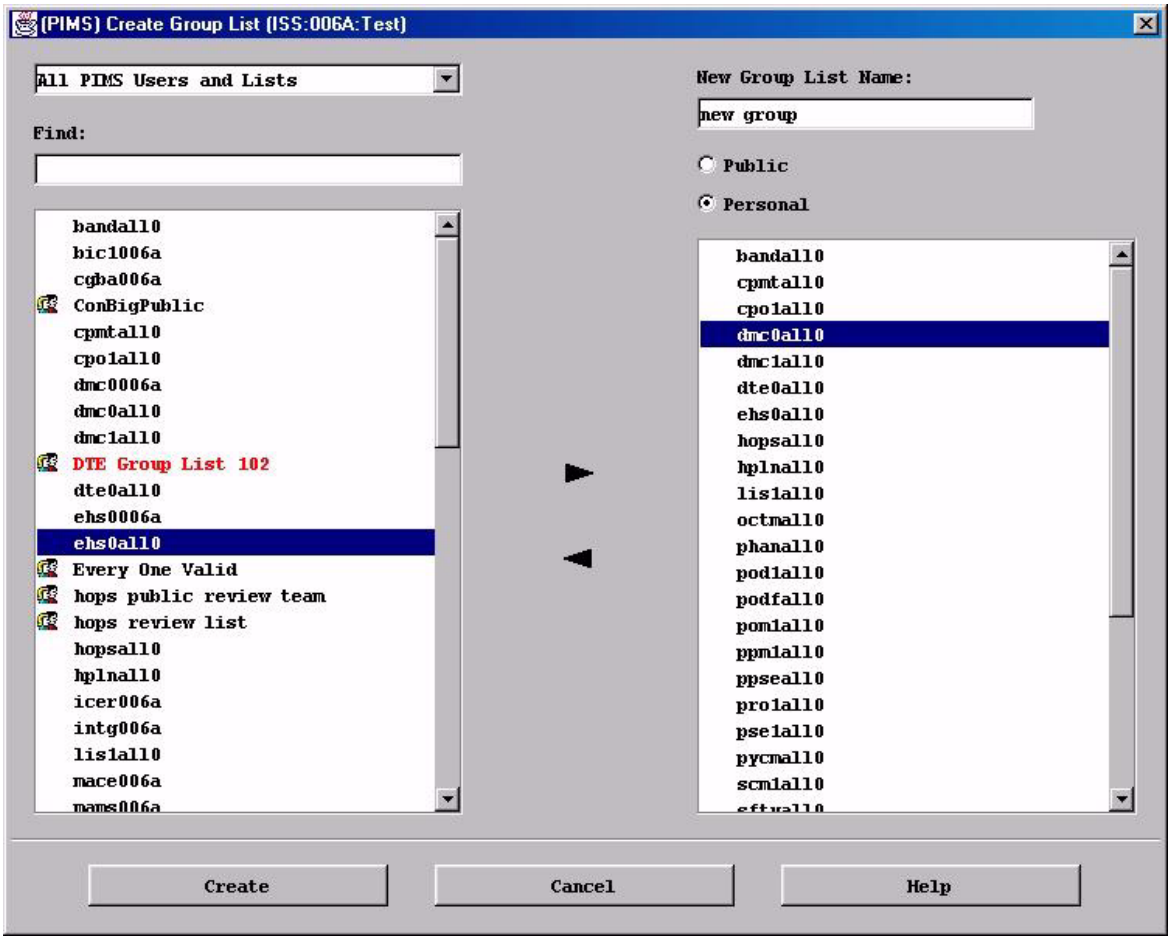


Figure 18-30, Create Group List dialog box.

The pulldown option menu in the upper left corner of the dialog box allows you to select what is displayed in the list in the lower left frame of the dialog box. This list is used to select user IDs when creating a new group list. Sometimes it may be quicker to use an already existing group instead of starting from scratch. The **Find:** text input field allows you to enter search criteria for finding user IDs within the list.

On the right side of the dialog box you must enter a name for the new group list in the **New Group List Name:** text input field. Below this field you must make a radio button selection to indicate whether your new group will be **Public** or **Personal**.

Select the desired user IDs in the frame on the left of the dialog box and click on the right arrow button between the two frames to add them to the new group list. You can also elect to remove any

user IDs from your new group list by selecting User IDs from the list frame on the right and clicking the left arrow pushbutton. All of the desired user IDs for the new group list should be displayed in the list frame on the right before clicking Create.

18.1.3.2.2 Edit Group List ...

The **Edit Group List** dialog box (see Figure 18-31, Edit Group List dialog box) allows you to edit an existing group list by adding or removing user IDs. You can also change the **Public**/**Personal** selection of the group list.

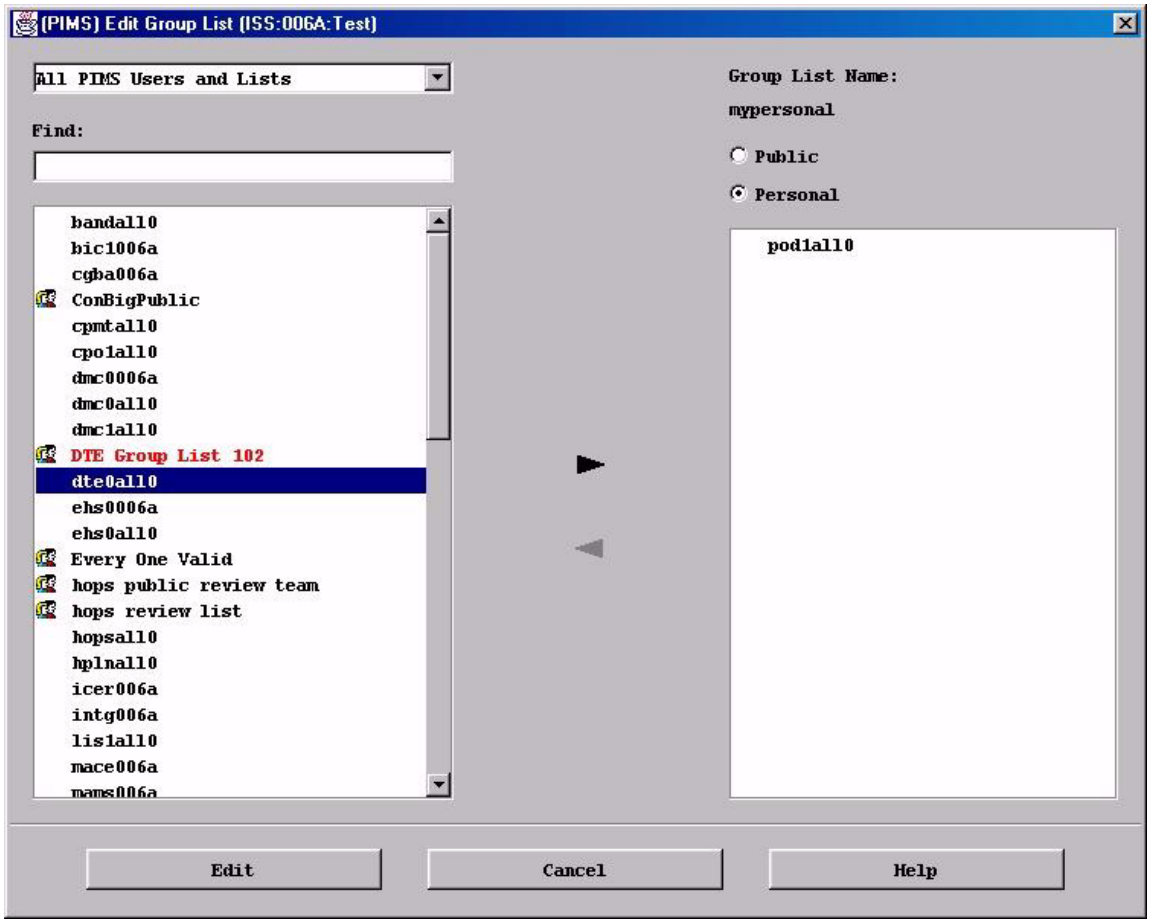


Figure 18-31, Edit Group List dialog box.

The **Group List Name:** display-only field in the upper right side of the dialog box displays the name of the group list that was selected for editing from the **Modify Group List** dialog box. You may change the **Public**/**Personal** radio button selection below this field. The list frame on the right side of the dialog box displays the user IDs currently included in the selected group list. You can remove users from this list by selecting the user ID and clicking on the left arrow between the two frame lists. Additional users can be added by selecting from the list frame on the left and clicking the right arrow button. When you are satisfied with the contents of the list frame on the right side

of the dialog box, clicking Edit closes the **Edit Group List** dialog box and returns you to the **Modify Group Lists** dialog box.

If you have included an invalid user (displayed in red) in the list frame on the right side of the dialog box and attempted to edit the group list, the **Select Invalid User Option** dialog box will be invoked (see Figure 18-32, Select Invalid User Option dialog box).

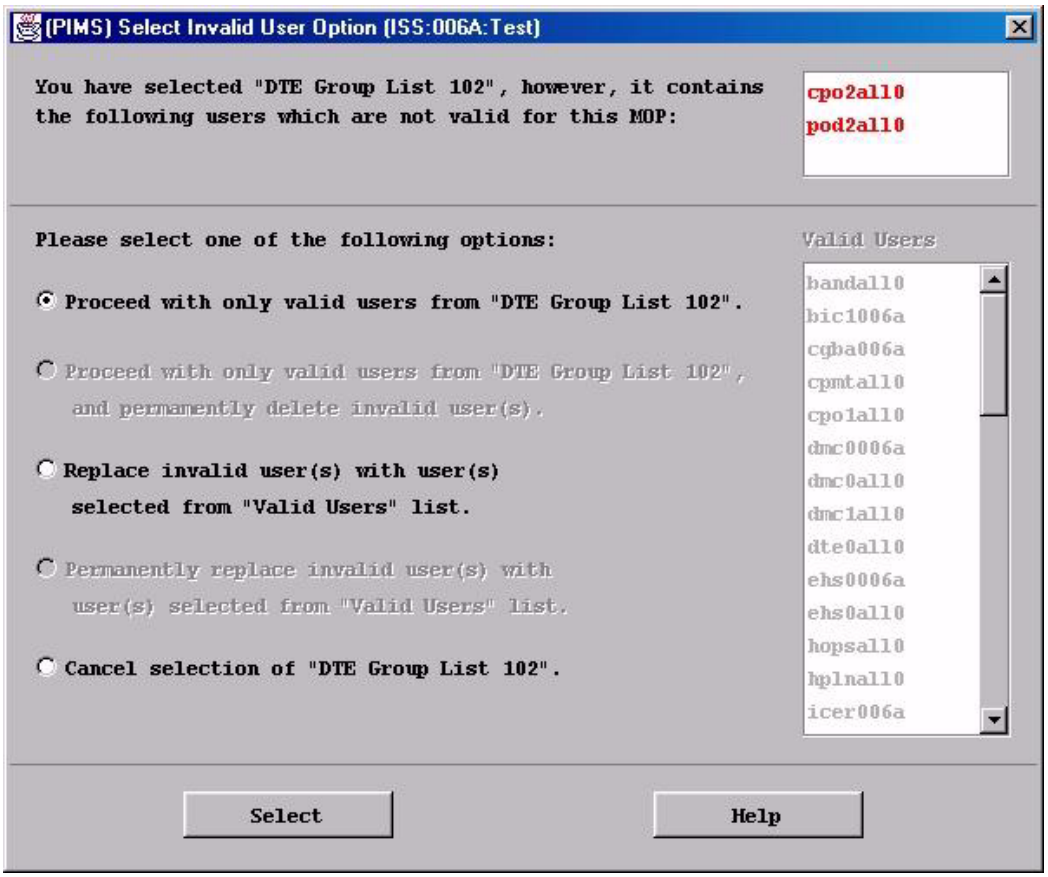


Figure 18-32, Select Invalid User Option dialog box.

The uppermost frame of the dialog box contains a message informing you that you have chosen a group that contains users who are not valid for this MOP and presents you with a list (displayed in red) of those users who are invalid.

The bottom frame contains a list of options for resolving the invalid users. **Proceed with only valid users from "`group list`"** is the default.

18.1.3.2.3 Delete Group List...

The **Delete Group List** dialog box (see Figure 18-33, Delete Group List dialog box) allows you to delete group lists that you had previously created.

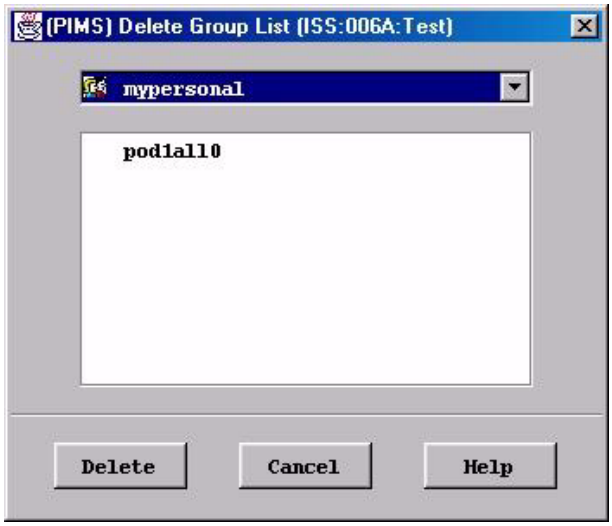


Figure 18-33, Delete Group List dialog box.

At the top of this dialog box is a pulldown option menu that contains all of the group lists that you have created. The user IDs of the selected group from the pulldown option menu are displayed in the list frame below. To delete a group, ensure that the desired group list is selected from the pulldown option menu and then click the Delete pushbutton.

18.2 Documents Overview

The Documents application has the capability to access folders and their files from the Payload Information Management System (PIMS) database. The application also allows you to manage the configuration of documents by applying a management process. This permits you to identify a document approver, a document manager, writers and document reviewers.

The **document approver** must assign a document manager before configuration management (CM) of the document can take place. The document approver is responsible for approving a document for baselining, disapproving a document under review, and releasing a baselined document back into development.

The **document manager** can assign an individual writer to each document file within a document. The document manager is also responsible for ensuring that all files are ready for review before he or she submits it for review.

Writers are authorized to modify a document file. Only one writer can be assigned to each file.

Document reviewers are authorized to edit and analyze a document under review and provide feedback to the document approver via comments and changes entered into the appropriate file. These comments and changes do not modify the original document. Reviewers may be assigned by either the document manager or approver.

The capability is also available for the non-Enhanced Huntsville Operations Support Center (HOSC) System (EHS) user to log into the PIMS Database and store or retrieve documents.

The **Documents** main window contains two distinct functions that will be discussed in this chapter (see Figure 18-34, Documents main window):

- Menu Bar
- Work Area

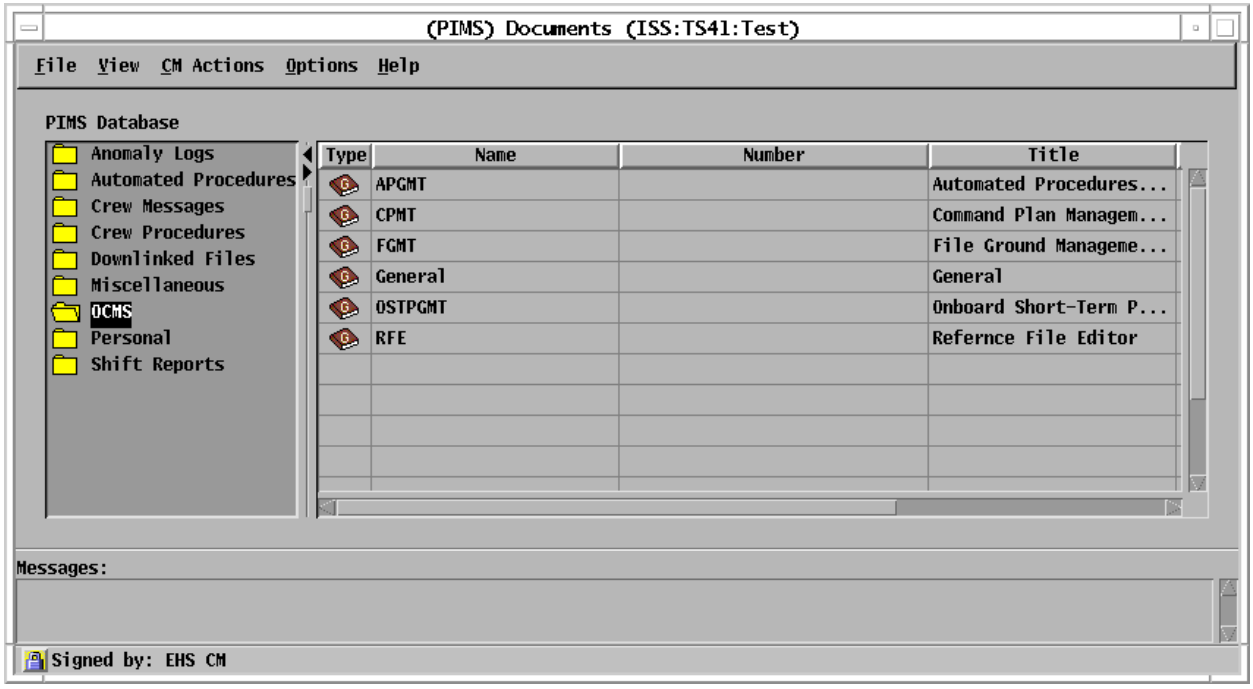


Figure 18-34, Documents main window.

18.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes six menus: **File**, **View**, **CM Actions**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **New**
  - **Copy...**
  - **Move...**
- **Options** Menu
  - **Retrieve Copy...**

Compare Files...
View Document Properties...
Edit Document Properties...

18.2.2 Work Area

The work area of the **Documents** main window contains two frames (see Figure 18-34, Documents main window). The frame on the left displays the **PIMS Database** document tree structure, and the frame on the right displays a document or file table. The document table will be displayed when a folder is selected from the document tree structure, and the file table will be displayed when a document is selected.

The frames can be resized horizontally by clicking and dragging on the bar between them or clicking on one of the black arrow symbols (▶ or ◀) located on the bar.

Both frames contain scroll bars to view portions of the lists that initially may not be visible.

The frame on the left, **PIMS Database**, contains a document tree structure. The document tree structure contains documents and folders that reside in the PIMS database.

Help: See "Appendix AF: PIMS Folder Types and Icon Representations" for a description of PIMS database folders.

When you click once any of the **PIMS Database** folders, the contents of the selected folder will be displayed in the document table frame to the right. The document table contains seven columns:

- The **Type** column displays an icon depicting the document or folder type

Help: See the "Appendix AF: PIMS Folder Types and Icon Representations" for a description of PIMS document types.

- The **Name** column displays the name of the document or folder
- The **Number** column displays the number of the document
- The **Title** column displays the title associated with the document or folder.
- The **CM Revision** column displays the revision of the document
- The **PIMS Version** column displays the version of the document.
- If the document has been checked out, the **Checked Out** column contains the ID of the user who checked the document out; otherwise, the field will be blank.

If you double-click on a folder in the document table, the document table will reconfigure to display the contents of the selected folder.

If you double-click on a document in the document table, the document table will reconfigure to the file table and will display the files associated with the selected document. The file table contains six columns:

- The **Type** column displays an icon depicting the file type

Help: See the "Appendix AF: PIMS Folder Types and Icon Representations" for a description of PIMS file types.

- The **File Name** column displays the name of the file
- The **CM Revision** column displays the revision of the file.
- If a file has been checked in, the **PIMS Version** column displays the version of the file; otherwise, the field will be blank
- The **Size** column displays the size of the file in bytes
- If the file has been checked out, the **Checked Out** column contains the ID of the user who checked the file out; otherwise, the field will be blank.

Note: The default sort order for the document table is in ascending order by the **Name** column. The default sort order for the file table is in ascending order by the **File Name** column. You can change the sort order by clicking once on any column heading. This will sort the table by the selected column's descending order. Click again to sort by ascending order.

18.2.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Documents application. The **New...**, **Copy...**, and **Move...** menu items from the **File** menu as well as the **Retrieve Copy...**, **Compare Files...**, **View Document Properties...**, and the **Edit Document Properties...** menu options from the **Options** menu will be discussed (see Figure 18-35, File and Options menus).

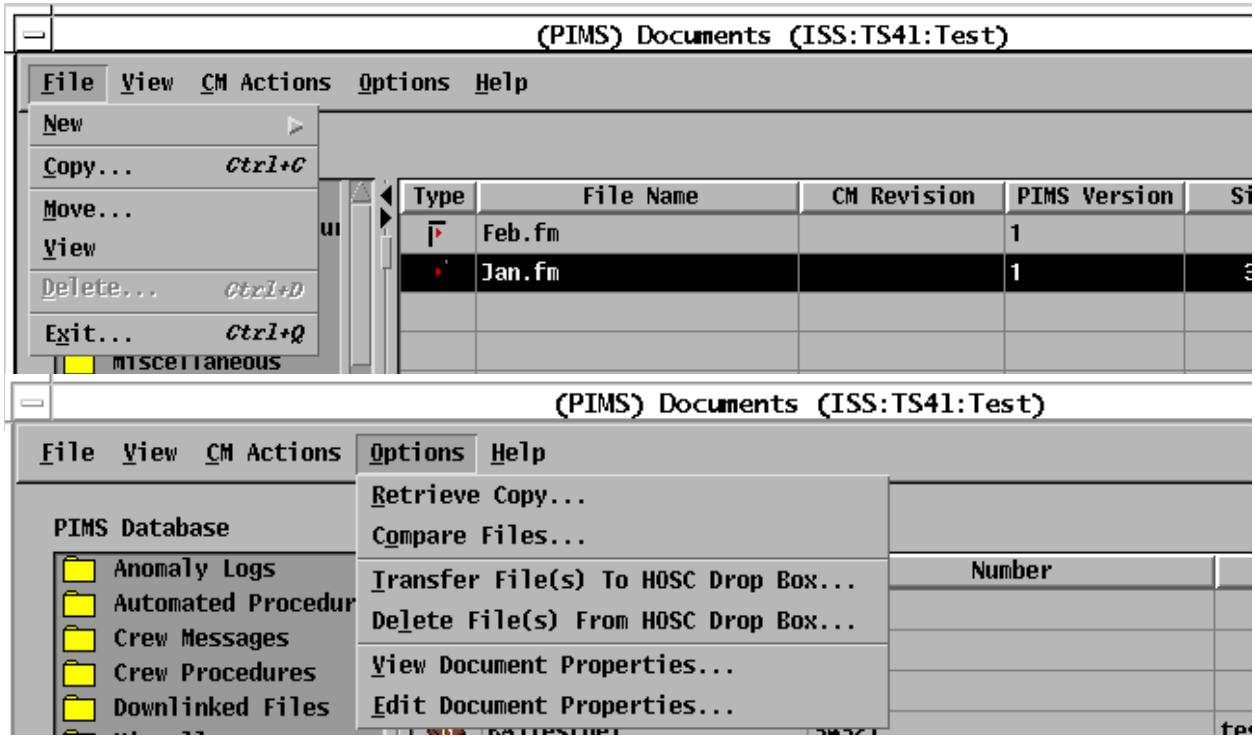


Figure 18-35, File and Options menus.

18.2.3.1 New

The **New** menu item allows you to create a new document or folder. When you select this menu item, a cascade menu will be invoked that contains the **Document...** and **Folder...** menu items.

18.2.3.1.1 Document...

The **Document...** menu item invokes a dialog box that allows you to create a new PIMS document (see Figure 18-36, New Document dialog box).

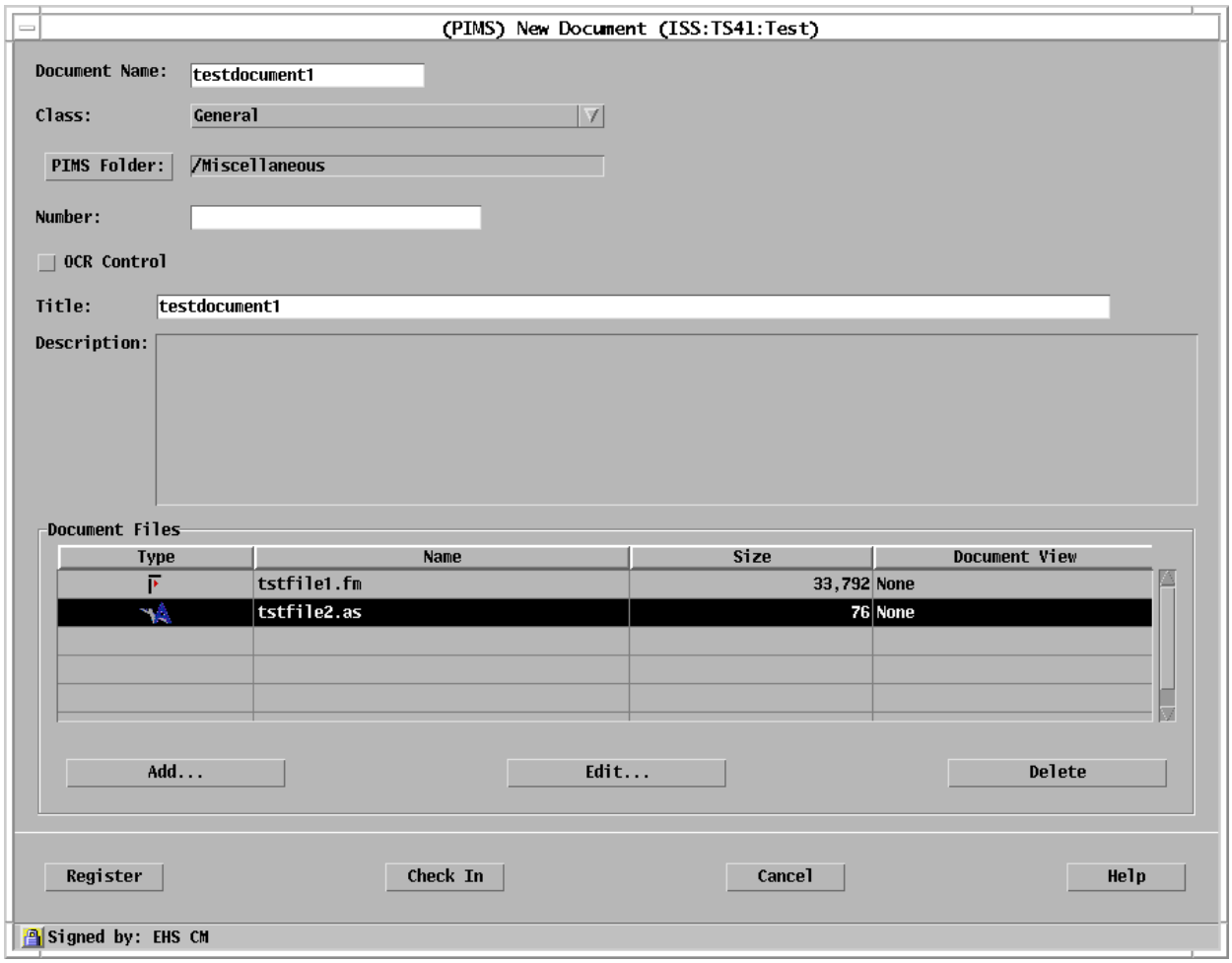


Figure 18-36, New Document dialog box.

In the **Document Name:** input text field, you identify the name of the document.

The **Class:** field contains a pulldown option menu from which you select the class associated with the document. The options available are determined by the type of PIMS folder selected for storage of the document.

Help: See "Appendix AF: PIMS Folder Types and Icon Representations" for information about which document classes can be stored in each PIMS folder type.

PIMS Folder: invokes a dialog box that allows you to select the PIMS storage folder for the new document. If you select a PIMS database folder from the **Documents** main window before invoking the **New Document** dialog box, this field will contain the path of that folder, otherwise, the field will be empty when this dialog box is invoked.

In the **Number:** input text field, you identify the document number.

The **OCR Control** area allows you to select a document for OCR control. When this function is selected, a checkmark will be displayed in the **OCR Control** selection box.

In the **Title:** input text field, you identify the document title.

The **Description:** frame allows you to enter a description of the document. Any text can be entered here.

The **Document Files** frame contains a table with four columns and three pushbuttons. Once a file is added to a document using Add..., it is displayed in the **Document Files** table. The **Document Files** table columns include:

- The **Type** column displays an icon depicting the file type

Help: See "Appendix AF: PIMS Folder Types and Icon Representations" for a description of PIMS file types.

- The **Name** column displays the name of the file
- The **Size** column displays the file size in bytes
- The **Document View** column identifies whether the file is designated as **None**, **Transfer**, or **Launch**. These options determine how the **View** menu item located under the **File** menu of the **Documents** main window functions.

  If the **Document View** column is set to **Transfer**, the file is copied to your local workstation in the C://tmp directory after selecting the document containing the file designated as **Transfer** and selecting the **View** menu item.

  If the **Document View** column is set to **Launch**, the file is copied to your local workstation and immediately launched using the associated application after selecting the document containing the file designated as **Launch** and selecting the **View** menu item. In order for the file to be launched, your local workstation must be loaded with the associated application. Only one file within a document can be designated as **Launch**. One file within a document must be designated as **Launch** for the **View** menu item to be available (sensitive).

  If the **Document View** column is set to **None**, the file is not copied or launched after selecting the document containing the file designated as **None** and selecting the **View** menu item.

  Click on the entry under the **Document View** column to display a pulldown option menu that allows you to change the document view selection.

The **Document Files** pushbuttons include:

The Add... invokes the **Add File** dialog box that allows you to add or register a file to the **Document Files** table.

The Edit... invokes the **Edit Document File** dialog box and allows you to change the filename of the selected file from the **Document Files** table.

The Delete deletes the selected file from the **Document Files** table.

Selecting the Register from the control panel of the **New Document** dialog box invokes the **Register New Document** dialog box which allows you to register a document in the PIMS database and assign a due date for it. Once a document is registered, it is displayed on the **To Do List** application main window.

Selecting the Check In from the control panel of the **New Document** dialog box checks the document and all files into the PIMS database. Once the document has been checked in to the PIMS database, you will receive an information message dialog box confirming the action.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.2.3.1.2 Folder...

Selecting this menu item invokes the **New Folder** dialog box. This dialog box allows you to create a new storage folder (see Figure 18-37, New Folder dialog box).

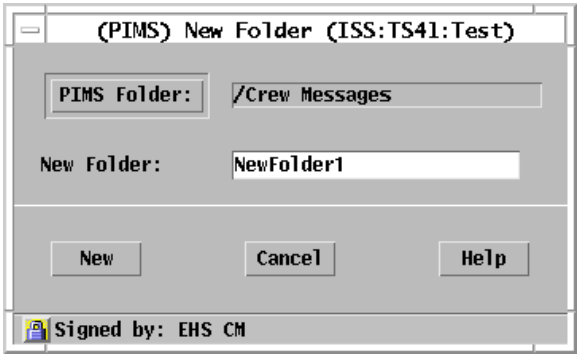


Figure 18-37, New Folder dialog box.

PIMS Folder: invokes a dialog box that allows you to select the PIMS database folder for storage of the new folder. If you select a PIMS database folder from the **Documents** main window before invoking the **New Folder** dialog box, this field will contain the path of that folder, otherwise, the field will be empty when this dialog box is invoked.

The **New Folder:** input text field allows you to enter a name for the new folder.

18.2.3.2 Copy...

The **Copy...** menu item allows you to copy documents from another MOP (source MOP) to the current one. When you select this menu item, the **Copy** dialog box is invoked.On the left side of the **Copy** dialog box is the **From: PIMS Database** display-only field. Below it is Source MOP:. Click on this pushbutton to invoke the **Source MOP** dialog box. After the source MOP has been selected, the **Copy** dialog box will display two frames under the Source MOP: (see Figure 18-38, Copy dialog box).

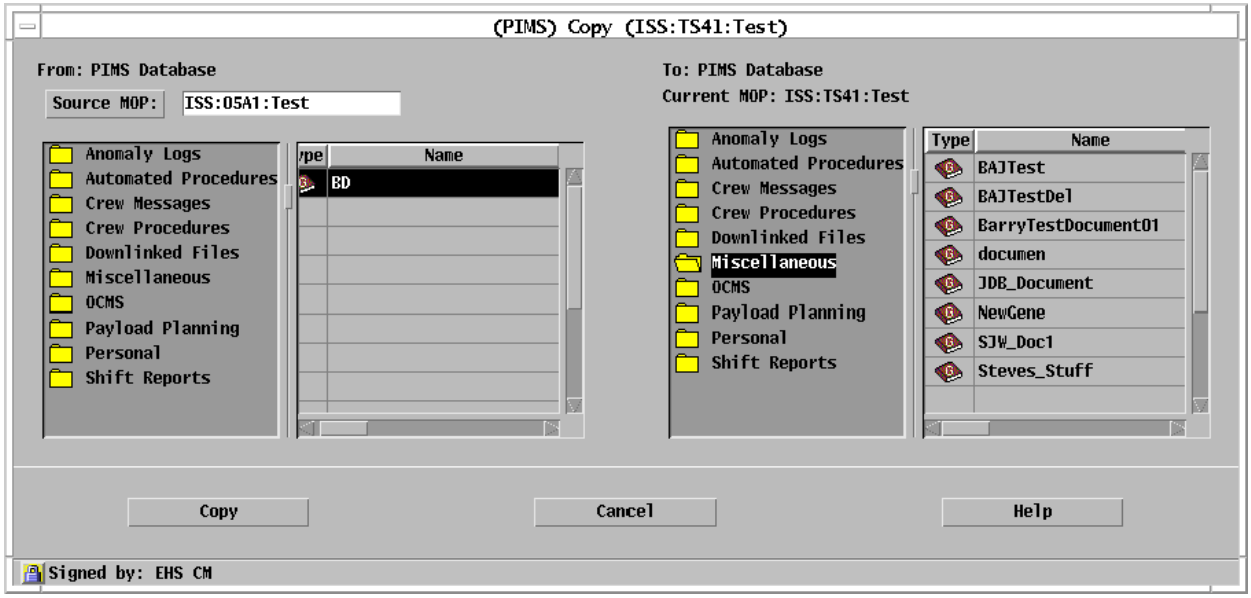


Figure 18-38, Copy dialog box.

The frame on the left displays the **PIMS Database** document tree structure for the selected source MOP, and the frame on the right displays a document or file table. The document table will be displayed when a folder is selected from the document tree stucture, and the file table will be displayed when a document is selected.

On the right side of the **Copy** dialog box are two display only fields: **To: PIMS Database** and **Current MOP:**. The **Current MOP:** field displays the name of the MOP that the document will be copied to.

Below the **Current MOP:** display-only field are two frames. The frame on the left displays the **PIMS Database** document tree structure for the current MOP, and the frame on the right displays a document or file table. The document table will be displayed when a folder is selected from the document tree stucture, and the file table will be displayed when a document is selected.

Selection of the Copy copies the selected document from the selected source MOP to the current MOP and invokes an information message confirming the action.

18.2.3.3 Move...

The **Move...** menu item allows you to move a selected document from one PIMS database folder to another. When you select this menu item, the **Move** dialog box is invoked (see Figure 18-39, Move dialog box).

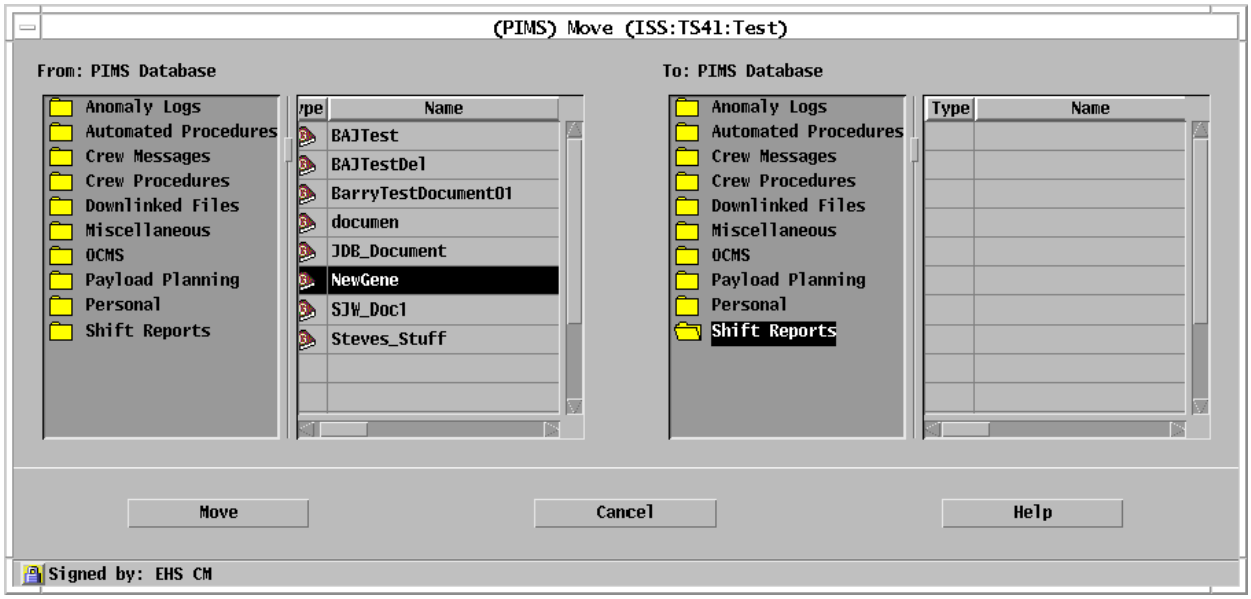


Figure 18-39, Move dialog box.

On the top left of the **Move** dialog box is the **From: PIMS Database** display-only field and on the top right is the **To: PIMS Database** display-only field. Below each of these fields are two frames.

The frame on the left displays the **PIMS Database** document tree structure, and the frame on the right displays a document or file table. The document table will be displayed when a folder is selected from the document tree stucture, and the file table will be displayed when a document is selected.

Selecting the Move moves the selected document from the current PIMS database storage folder to the newly selected one and invokes an information message that confirms the action.

18.2.3.4 Retrieve Copy...

Retrieve Copy... allows you to retrieve a copy of a file from the PIMS database to a selected workstation or FTP site. When you select this menu item, the **Retrieve Copy Of File** dialog box is invoked (see Figure 18-40, Retrieve Copy Of File dialog box).

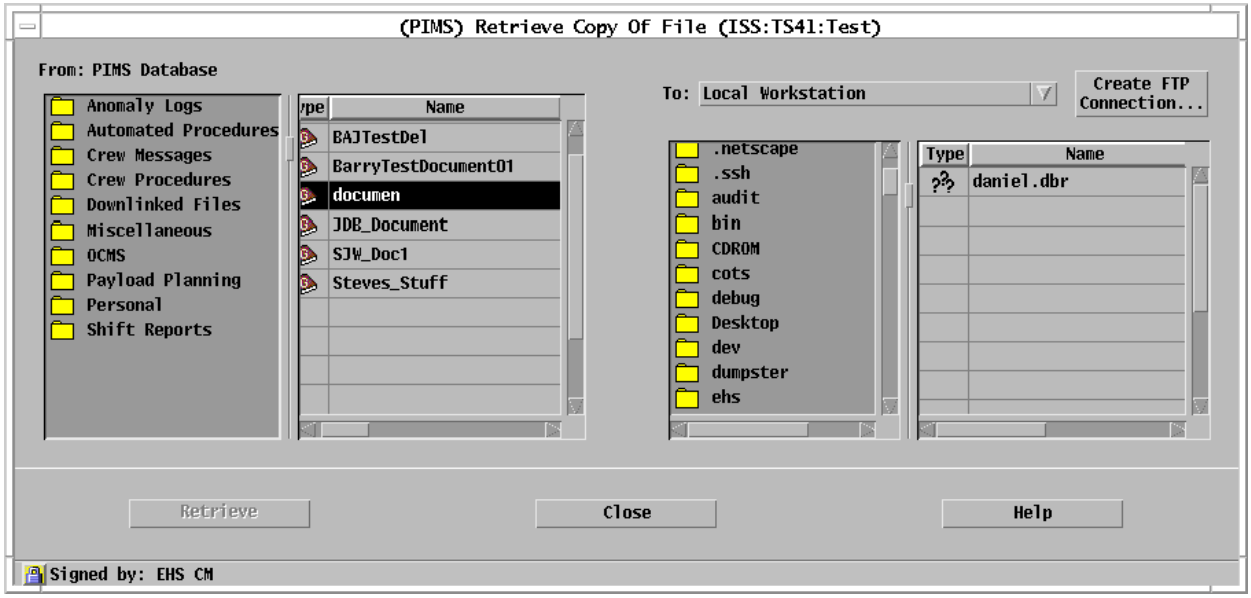


Figure 18-40, Retrieve Copy of File dialog box.

On the left side of the dialog box is the **From: PIMS Database** display-only field and corresponding frames below. The frame on the left contains folders within the **PIMS Database**, and the frame on the right contains a table. The frames can be resized by clicking and dragging on the bar between them. Both frames in the contain scroll bars to view portions of the lists that initially may not be visible.

The frame on the left contains a document tree structure. The document tree structure contains folders that reside on the PIMS database.

When you click once any of the **PIMS Database** folders, the documents of the selected folder will be displayed in the document table frame to the right. The document table contains seven columns.

If you double-click on a folder in the document table, the document table will reconfigure to display the contents of the selected folder.

If you double-click on a document in the document table, the document table will reconfigure to the file table and will display the files associated with the selected document. The file table contains six columns.

On the right side of the **Retrieve Copy Of File** dialog box is the **To:** pulldown option menu from which you select the location where you want to store the copy of the PIMS database file. The possible options on this pulldown option menu include **Local Workstation**, **PIMS Database**, and **IP Address** with the default as **Local Workstation**.

To the right of the **To:** field is

. Selecting this pushbutton invokes the **Create FTP Connection** dialog box. This dialog box allows you to store a file on a remote system by establishing an FTP connection to it.

Below the **To:** field are two frames. The frame on the left contains a document tree structure. The document tree structure contains folders that reside on the root level of the selection on the **To:** pulldown option menu.

When you click once any of the folders, the contents of the selected folder will be displayed in the frame to the right. The frame contains a table with four columns.

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.2.3.5 Compare Files...

Selecting the **Compare Files...** menu item invokes the **Compare Files** dialog box (see Figure 18-41, Compare Files dialog box).

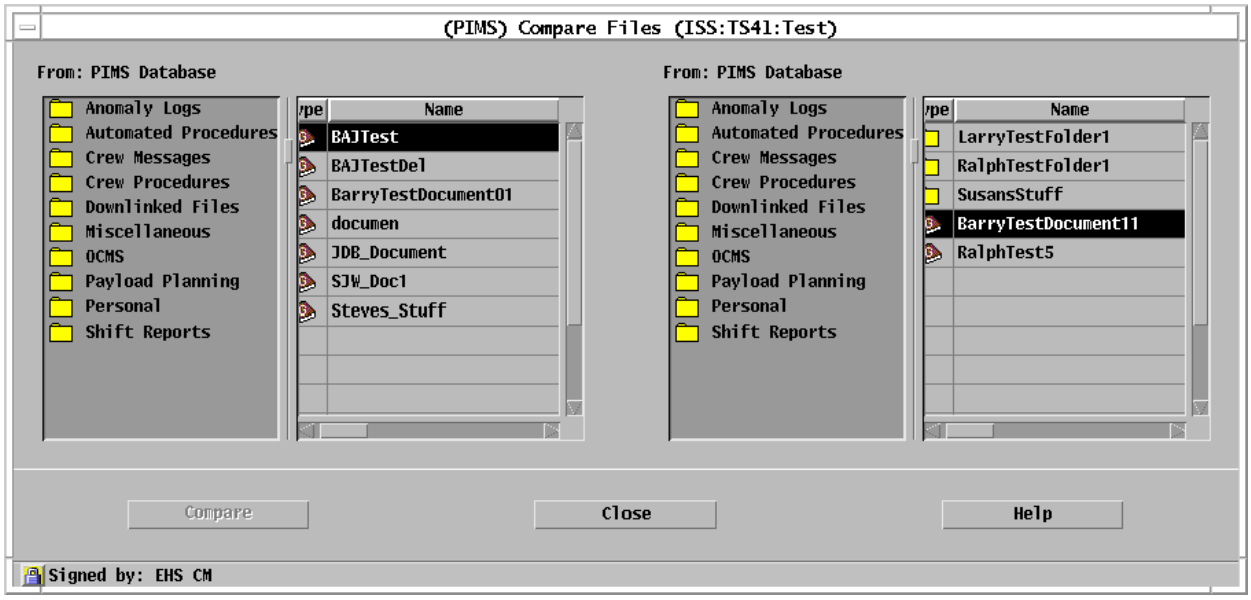


Figure 18-41, Compare Files dialog box.

On the left of the **Compare files** dialog box is the **From: PIMS Database** display-only field. On the right is the **From: PIMS Database** display-only field. Below each of these fields are two frames. These frames can be resized by clicking and dragging on the bar separating them.

The first frame below each **PIMS Database** field contains folders that reside on the PIMS database.

Help: See “Appendix AF: PIMS Folder Types and Icon Representations” for a description of PIMS folder types.

When you click once on any of the **PIMS Database** folders, the documents of the selected folder will be displayed in the frame to the right. The frame to the right consists of a seven column table.

If you click twice on any of the folders in the **PIMS Database** frame, the contents will again be displayed in the frame on the right. Additionally, the contents will also be displayed below the selected folder.

All frames contain scroll bars to view portions of the lists that initially may not be visible.

18.2.3.6 Transfer File(s) To HOSC Drop Box...

The Transfer File(s) To HOSC Drop Box dialog box allows you to transfer files from the PIMS database to the HOSC drop box (see Figure 18-42, Transfer File(s) To HOSC Drop Box dialog box) .

Note: Do not transfer files that contain spaces in the filename to the HOSC drop box. They will not be picked up by the JSC poller.

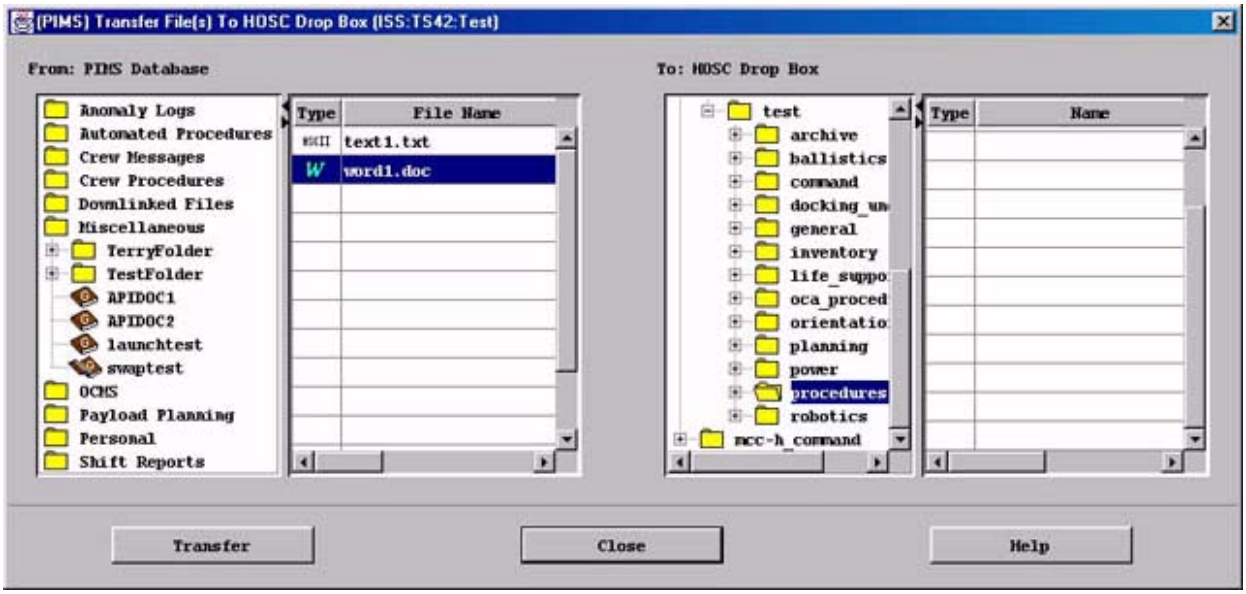


Figure 18-42, Transfer File(s) To HOSC Drop Box dialog box.

On the left side of the dialog box is the **From: PIMS Database** display-only field and corresponding frames below. The frame on the left displays the **PIMS Database** document tree structure, and the frame on the right displays a table. The frames can be resized by clicking and dragging on the bar between them.

Both frames contain scroll bars to view portions of the lists that initially may not be visible.

The frame on the left contains a document tree structure. The document tree structure contains folders that reside on the PIMS database.

When you click once any of the **PIMS Database** folders, the documents of the selected folder will be displayed in the document table frame to the right. The document table contains seven columns.

If you double-click on a folder in the document table, the document table will reconfigure to display the contents of the selected folder.

If you double-click on a document in the document table, the document table will reconfigure to the file table and will display the files associated with the selected document. The file table contains six columns.

On the right side of the **Transfer File(s) To HOSC Drop Box** dialog box is the **To: HOSC Drop Box** display-only field and corresponding frames below. The frame on the left initially displays the root level folders on the **HOSC Drop Box**, and the frame on the right contains a table. The frames can be resized by clicking and dragging on the bar between them.

Both frames contain scroll bars to view portions of the lists that initially may not be visible.

The frame on the left contains a document tree structure. The document tree structure contains folders that reside on the HOSC Drop Box.

When you click once any of the **HOSC Drop Box** folders, the documents of the selected folder will be displayed in the partitions table frame to the right. The partitions table contains four columns:

- The **Type** column displays an icon depicting the document type
- The **Name** column displays the name of the file
- The **Date** column displays the date the file was last modified
- The **Size** column displays the size of the file

Clicking Transfer transfers the selected file from the PIMS database to the selected folder on the HOSC Drop Box.

18.2.3.7 Delete File(s) From HOSC Drop Box...

The **Delete File(s) From HOSC Drop Box...** menu item allows you to delete files from the HOSC drop box. When you select this menu item, the **Delete File(s) From HOSC Drop Box...** dialog box is invoked (see Figure 18-43, Delete File(s) From HOSC Drop Box dialog box).

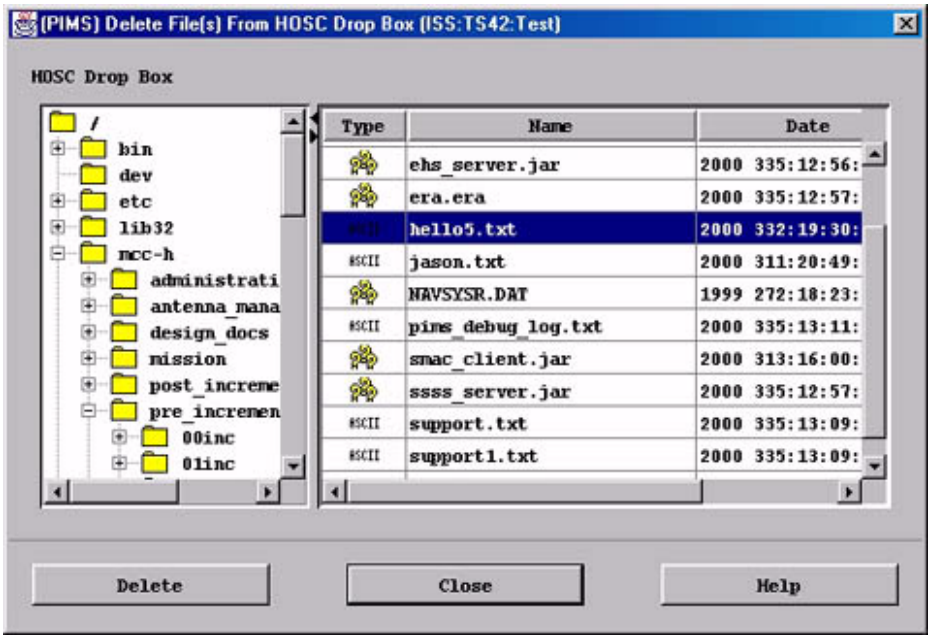


Figure 18-43, Delete File(s) From HOSC Drop Box dialog box.

At the top of the dialog box is the **HOSC Drop Box** display-only field. Below the **HOSC Drop Box** display-only field are two frames. The frame on the left initially displays root level folders on the HOSC Drop Box, and the frame on the right contains a table. The frames can be resized by clicking and dragging on the bar between them.

Both frames contain scroll bars to view portions of the lists that initially may not be visible.

The frame on the left contains a document tree structure. The document tree structure contains folders that reside on the HOSC Drop Box.

When you click once any of the **HOSC Drop Box** folders, the contents of the selected folder will be displayed in the partition table frame to the right. The HOSC Drop Box Partition table contains four columns:

- The **Type** column displays an icon depicting the document type
- The **Name** column displays the name of the file
- The **Date** column displays the date the file was last modified
- The **Size** column displays the size of the file

Clicking Delete deletes the selected file from the HOSC Drop Box and invokes a confirmation message dialog box that asks if you want to proceed with deletion of the selected file from the HOSC Drop Box.

18.2.3.8 View Document Properties...

Selecting this menu item invokes the **View Document Properties** dialog box (see Figure 18-44, View Document Properties dialog box).

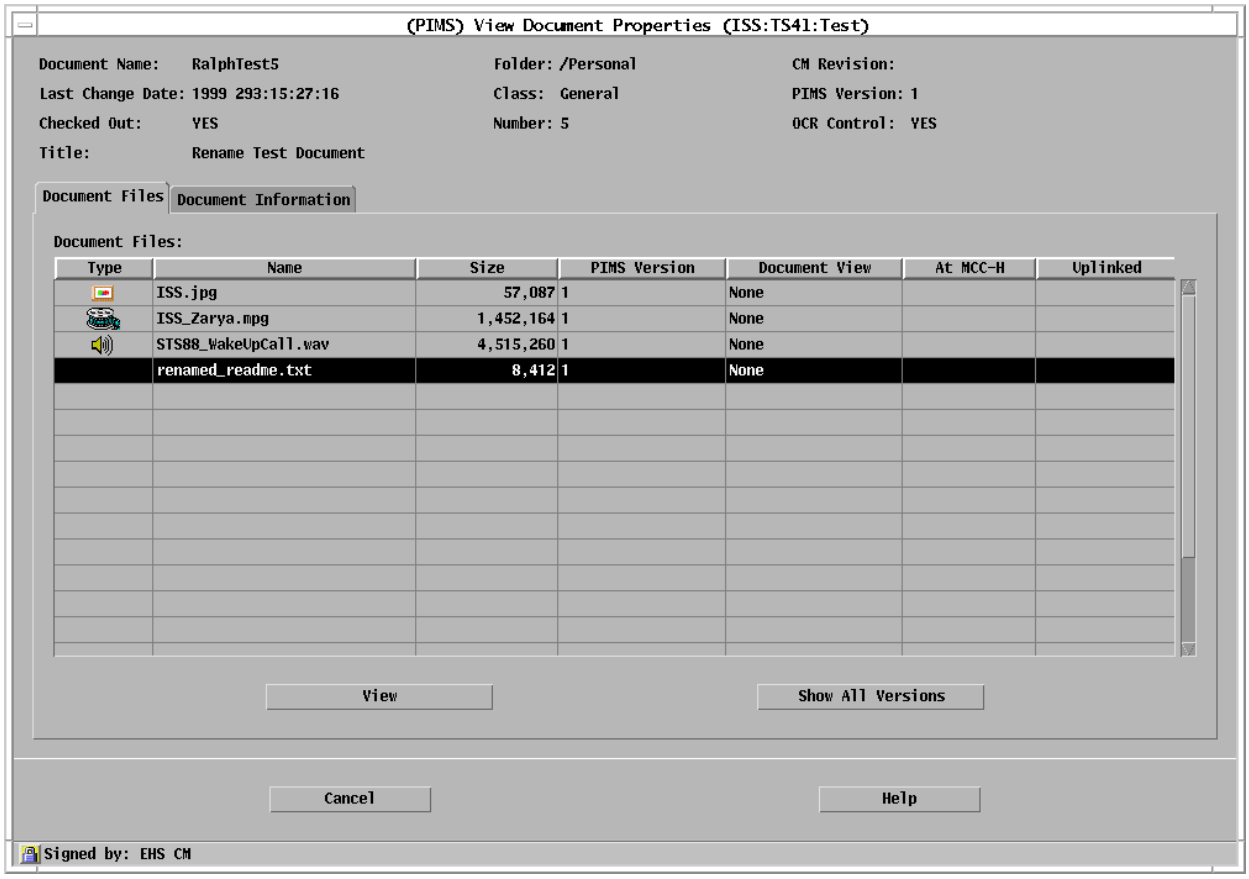


Figure 18-44, View Document Properties dialog box.

The top of the **View Document Properties** dialog box contains ten display-only text fields:

- The **Document Name:** field identifies the name of the document
- The **Last Change Date:** field identifies the last change date of the document
- The **Checked Out:** field whether the document is checked out or not
- The **Title:** field identifies the title of the document
- The **Folder:** field identifies the name of the folder where the document is stored
- The **Class:** field identifies the class associated with the document
- The **Number:** field identifies the number of the document
- The **CM Revision:** field identifies the revision number of the document
- The **PIMS Version:** field identifies the version of the document
- The **OCR Control:** field identifies whether the document is OCR controlled or not

The area below the display-only text fields contains a tabbed information area. When the **View Document Properties** dialog box is initially invoked, the **Document Files** tab is displayed (see Figure 18-44, View Document Properties dialog box).

The **Document Files** tab contains a **Document Files:** display-only text field with an associated seven column table:

- The **Type** column displays an icon depicting the file type
- The **Name** column identifies the name of the file
- The **Size** column identifies the size of the file
- The **PIMS Version** column identifies the version of the file
- The **Document View** column identifies whether the file is to be transferred for view or marked as launch (file to be displayed first). Only one file of the document can be selected as the launch file. The default is none.
- The **At MCC-H** column identifies whether a file is at MCC-H
- The **Uplinked** column identifies whether the file has been uplinked

The next tab located beneath the **Document Files** tab is the **Document Information** tab. Click on the **Document Information** tab heading to display the **Document Information** tab and associated data

The **General Information** area contains two display-only text fields:

- The **Registration:** field displays the date the document was registered. The date is displayed in GMT format (YYYY DDD:HH:MM:SS)
- The **Originator:** field identifies the user ID of the user that registered the document

Below the **General Information** area is the **Description** frame. The **Description** frame contains a display-only description of the file.

18.2.3.9 Edit Document Properties...

Selecting this menu item invokes the **Edit Document Properties** dialog box (see Figure 18-45, Edit Document Properties dialog box).

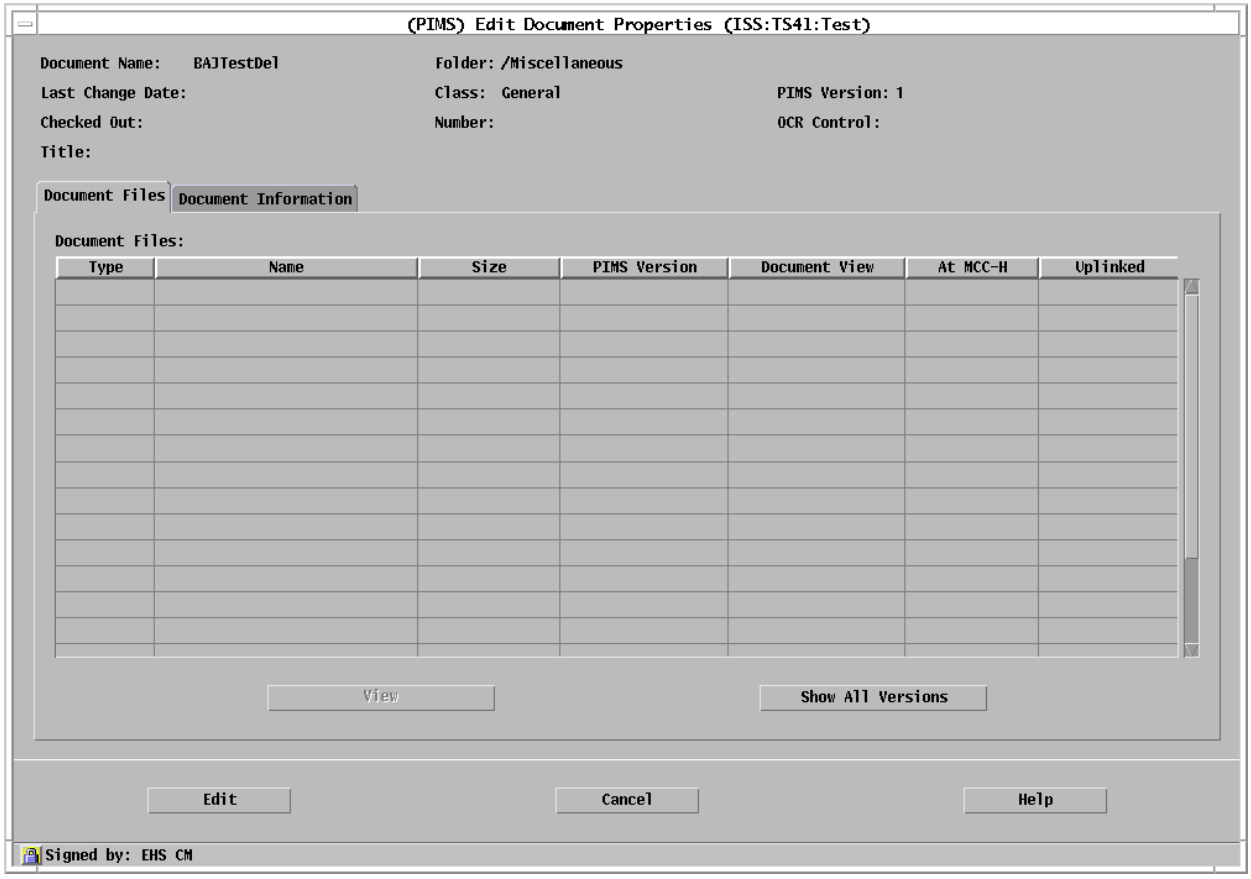


Figure 18-45, Edit Document Properties dialog box.

The top of the **Edit Document Properties** dialog box contains ten display-only text fields:

- The **Document Name:** field identifies the name of the document
- The **Last Change Date:** field identifies the last change date of the document
- The **Checked Out:** field whether the document is checked out or not
- The **Title:** field identifies the title of the document
- The **Folder:** field identifies the name of the folder where the document is stored
- The **Class:** field identifies the class associated with the document
- The **Number:** field identifies the number of the document
- The **CM Revision:** field identifies the revision number of the document
- The **PIMS Version:** field identifies the version of the document
- The **OCR Control:** field identifies whether the document is OCR controlled or not

The area below the display-only text fields contains a tabbed information area. When the **Edit Document Properties** dialog box is initially invoked, the **Document Files** tab is displayed (see Figure 18-45, Edit Document Properties dialog box).

The **Document Files** tab contains a **Document Files:** display-only text field with an associated seven column table:

- The **Type** column displays an icon depicting the file type
- The **Name** column identifies the name of the file
- The **Size** column identifies the size of the file
- The **PIMS Version** column identifies the version of the file
- The **Document View** column identifies whether the file is to be transferred for view or marked as launch (file to be displayed first). Only one file of the document can be selected as the launch file. The default is none.
- The **At MCC-H** column identifies whether a file is at MCC-H
- The **Uplinked** column identifies whether the file has been uplinked

The next tab located beneath the **Document Files** tab is the **Document Information** tab. Click on the **Document Information** tab heading to display the **Document Information** tab and associated data.

The **General Information** area contains two display-only text fields:

- The **Registration:** field displays the date the document was registered. The date is displayed in GMT format (YYYY DDD:HH:MM:SS)
- The **Originator:** field identifies the user ID of the user that registered the document

Below the **General Information** area is the **Description** frame. The **Description** frame contains a display-only description of the file.

18.3 Operations Change Request (OCR) Overview

The OCR application is used to get approval for and process real-time changes to payload experiments and their respective documents during current ground crew shift periods. The OCR application provides workflow capability (see Figure 18-47, OCR Concept) to create OCRs and manage them throughout the approval and implementation process. Like documents, OCRs are MOP dependent and are stored in the PIMS database vault.

ISS Operations are divided into three groups or tiers (see Figure 18-46, Sample 3-Tier Architecture).

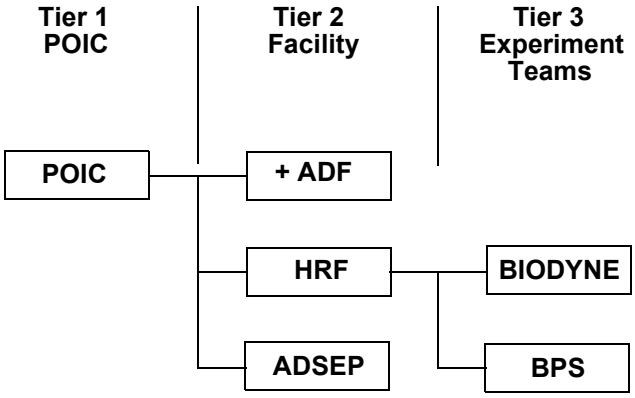


Figure 18-46, Sample 3-tier architecture.

Help: Refer to "Appendix AG: PIMS Workflow Diagrams" for a graphical representation of the tiers, actions, and states which are defined for OCR processes.

When an OCR is submitted, it is automatically distributed to the appropriate Control Authority for the tier of operations. OCR workflow actions include submittal, putback for rework, approve/ disapprove, withdraw, implement, put on indefinite hold, and distribution for review. Review list functions include the designation of reviewers and the collection of comments. Review disapproval does not prevent approval of an OCR.

Upon final approval of an OCR, implementation actions are also controlled as part of the OCR workflow. The Control Authority designates a list and sequence of implementation actions. The OCR is considered open until all implementation actions are complete. Throughout the approval workflow, actionees are notified of their required actions via their To Do Lists.

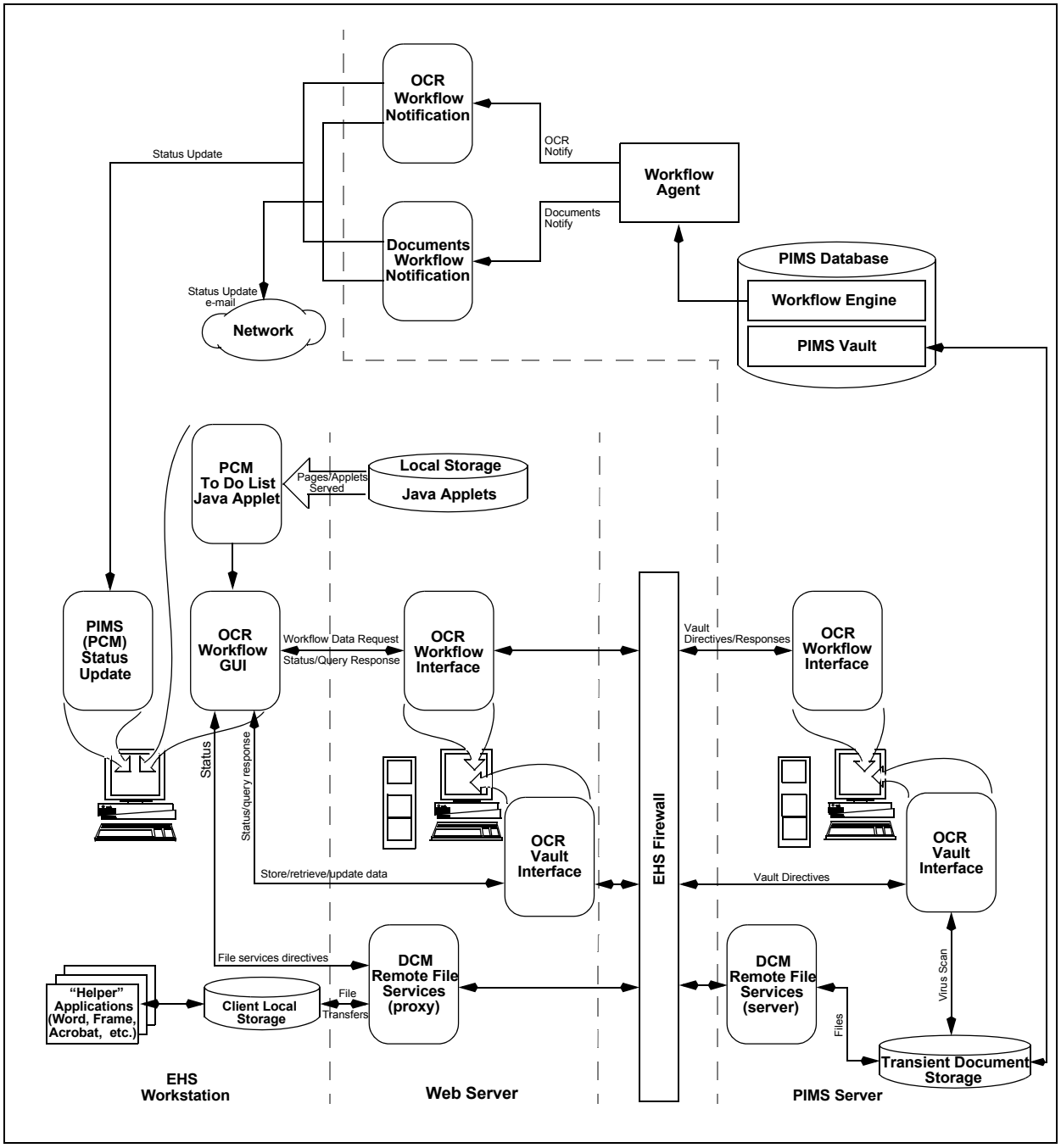


Figure 18-47, OCR Concept.

The Operations Change Request main window contains two destinct features that will be discussed in this chapter (see Figure 18-48, Operations Change Request main window):

- Menu Bar
- Work Area

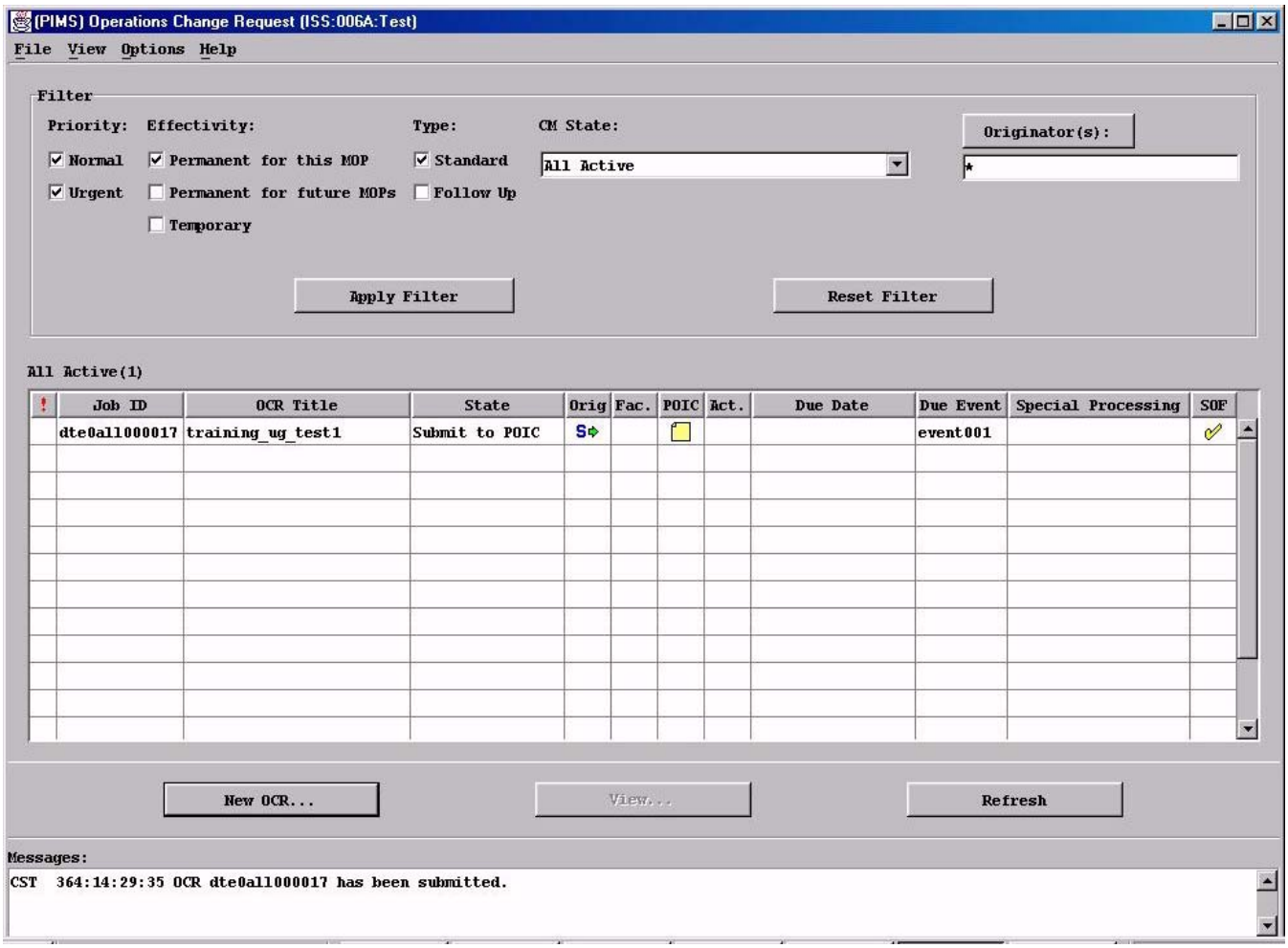


Figure 18-48, Operations Change Request main window.

18.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **New OCR...**
  - **Copy...**
  - **View...**
  - **View Printable OCR...**
  - **Delete**
- **Options** Menu
  - **Facility Review Status**
  - **POIC Review Status**

Actionee Status
Modify Action Descriptions...
Modify Group Lists...

18.3.2 Work Area

The work area of the PIMS Operations Change Request application contains a **Filter** frame and the **OCR** Table.

The **Filter** frame allows a user to select filtering criteria for listing Operations Change Requests (OCRs) in the **OCR** Table. The **Filter** frame is organized under the following headings:

- **Priority:**
- **Effectivity:**
- **Type:**
- **CM State:**
- **Originator(s):**

Two pushbuttons are provided for applying or reseting the filter criteria.

Under the **Priority:** heading are two checkboxes labeled **Normal** (default) and **Urgent**. A user may select one or both of the checkboxes by clicking on them with the left mouse button. Clicking again on a checkbox that has been selected, de-selects that checkbox. Urgent priority is noted in the **OCR** Table by a **!** in the **!** column.

Choices available under the **Effectivity:** heading further limit a user's search to OCR's that are **Permanent for this MOP** (default), **Permanent for future MOPs**, or **Temporary**. A user may select any combination of the checkboxes by clicking on them with the left mouse button. Clicking again on a checkbox that has been selected, de-selects that checkbox.

Under the **Type:** heading are two checkboxes labeled **Standard** (default) and **Follow-Up**. A user may select one or both of the checkboxes by clicking on them with the left mouse button. Clicking again on a checkbox that has been selected, de-selects that checkbox.

The text entry field for **CM State:** defaults to "All Active" until another selection is made from the drop down list. The drop down list becomes visible by clicking the . Items in the drop down list include all CM states possible for the processing of an OCR.

Note: A destinction has been made between "All Active" and OCRs in development. OCRs in development will not be listed with OCRs as a result of filtering on "All Active" for a **CM State:**. If you wish to view OCRs in the development state you will have to select **Development** from the **CM State:** drop down menu.

The **Originator(s):** text entry field defaults to * (wildcard) and will provide OCRs that were originated by all user IDs valid for this MOP. Clicking the Originator(s): invokes the **(PIMS) Select Originator(s)** dialog box. The **(PIMS) Select Originator(s)** dialog box provides filtering by either selecting a User ID (left side of dialog box) or by specifying a wildcard (right side of dialog box).

Selection of the **By User ID** radio button allows the user to provide selection criteria by User ID. The display only field below the radio button will contain the results of a find operation involving the **Find:** text entry field and the scrollable list below it.

The **Find:** text entry field is used as an expediant means to search the scrolled list below it as this list may be quite long. The scrolled list contains all User IDs that are valid for this MOP. Typing the first character of a User ID in this field will select the first User ID in the list beginning with that character, thus, decreasing the amount of list that you may have to scroll through. The User ID selected in this fashion is displayed in the **By User ID:** text entry field. To further narrow your search you may use additional characters in the **Find:** field. Searches are conducted in alphabetical order; if a User ID is not present for the characters entered, then the next User ID in alphabetical order is selected.

Selection of the **By Wildcard (*)** radio button will result in all OCRs originated by all the User IDs (referenced by the wildcard entered in the text entry field) being displayed in the All Active Table once the filter has been applied. If only an * is entered in the **By Wildcard (*)** text entry field then it is conceivable that all OCRs for the MOP will be displayed in the All Active Table (this would be limited only by the selection of other filter criteria specified in the **Filter** frame of the **(PIMS) Operations Change Request** main window).

The OCR Table defaults to display all active OCRs associated with the current User ID of the user logged into the account. Only one row of the table may be selected at a time; selection of any item in the row selects the entire row. Individual table columns may be resized by placing the cursor in the boundary between column headings to obtain a resize tool ↔. Movement to the left or right, decreases or increases the width of the column.

The All Active Table appears as a table containing twelve columns labeled as follows:

- **!** (Exclamation)
- **Job ID**
- **OCR Title**
- **State**
- **Orig**
- **Fac.**
- **POIC**
- **Act.**
- **Due Date**
- **Due Event**
- **Special Processing**
- **SOF**

The **!** (Exclamation) column identifies the priority status of OCRs only. An **!** (Exclamation) icon in this column signifies high priority OCRs.

The **Job ID** column displays the OCR number assigned by the system when the OCR form was generated..

The **OCR Title** column contains the title of the OCR.

The **State** column identifies the Configuration Management (CM) state of the OCR.

The **Orig** (Originator), **Fac.** (Facility Lead), **POIC** (POIC POD), and **Act.** (Actionee) columns contain icons to indicate the status of an OCR within the OCR workflow. Icons applicable to OCRs are contained in the following table:

Table 18-3, OCR Icons.

Icon	Description
	Used to represent an OCR that has been Approved.
	Used to represent the location of an OCR.
	Used to represent an OCR that has been Disapproved.
	Used to represent a Follow-Up OCR.
	Used to represent an OCR that has been put on hold.
	Used to represent an OCR that has been Putback.
	Used to represent an OCR that has been Released.
	Used to represent a Standard OCR.

Icon	Description
	Used to represent an OCR that has been Submitted.
	Used to represent an OCR that has been Withdrawn.

Help: For a complete cross-reference list of icons and their corresponding descriptions see, Appendix AF: PIMS Folder Types and Icon Representations.

The **Due Date** column identifies the date that the user(s) have to complete the OCR action by. The **Due Date** is displayed in Greenwich Mean Time (GMT) format (YYYY DDD:HH:MM:SS).

The **Due Event** column identifies the corresponding event by which the OCR action must be completed. This column will reflect the entry made in the Due Event field on the OCR.

The **Special Processing** column indicates if any special processing is required in the completion of the job action described by the OCR.

A check mark in the **SOF** column indicates that the OCR contains Safety of Flight sensitive issues and must be reviewed by the SOF Reviewer.

18.3.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Operations Change Request application. The **New OCR...**, **Copy...**, **View...**, **View Printable OCR...**, and **Delete** menu items from the **File** menu will be discussed as well as the **Facility Review Status**, **POIC Review Status**, **Actionee Status**, **Modify Action Descriptions...**, and **Modify Group Lists...** menu items from the **Options** menu (see Figure 18-49, File and Options menu).

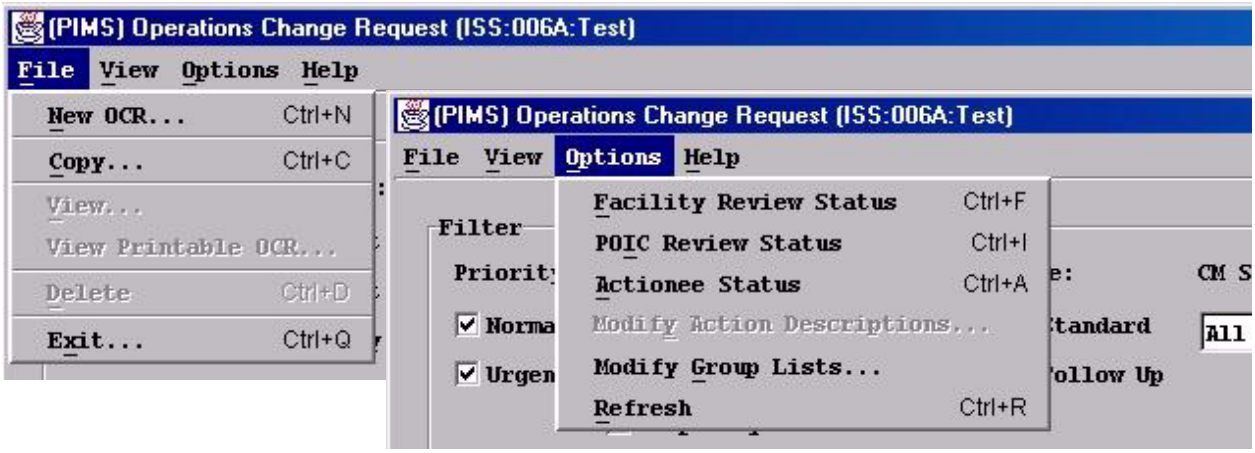


Figure 18-49, File and Options menu.

18.3.3.1 New OCR...

The **New OCR...** menu item invokes the **New OCR** dialog box (see Figure 18-50, New OCR dialog box). Any authorized user may create a new OCR at any time, no configuration management privileges are required. When the **New OCR** dialog box is invoked an OCR number is generated automatically and assigned to the new OCR.

Prior to the **New OCR** dialog box being invoked, the user is presented with a query concerning your intent to open a new OCR. OCRs are configuration managed documents, when an OCR number is generated it cannot be deleted (though the contents of the OCR may be deleted) if opened unnecessarily; OCRs may be withdrawn, but a record of the withdrawal is still maintained in the PIMS database.

The **New OCR** dialog box consists of radio buttons, text entry fields, a tabbed area, and a control panel. The configuration of the tabbed area dynamically changes depending on which tab is selected. Tab selection is accomplished by clicking on the desired tab. The dialog box common elements and individual tabbed areas will be discussed in the following sections.

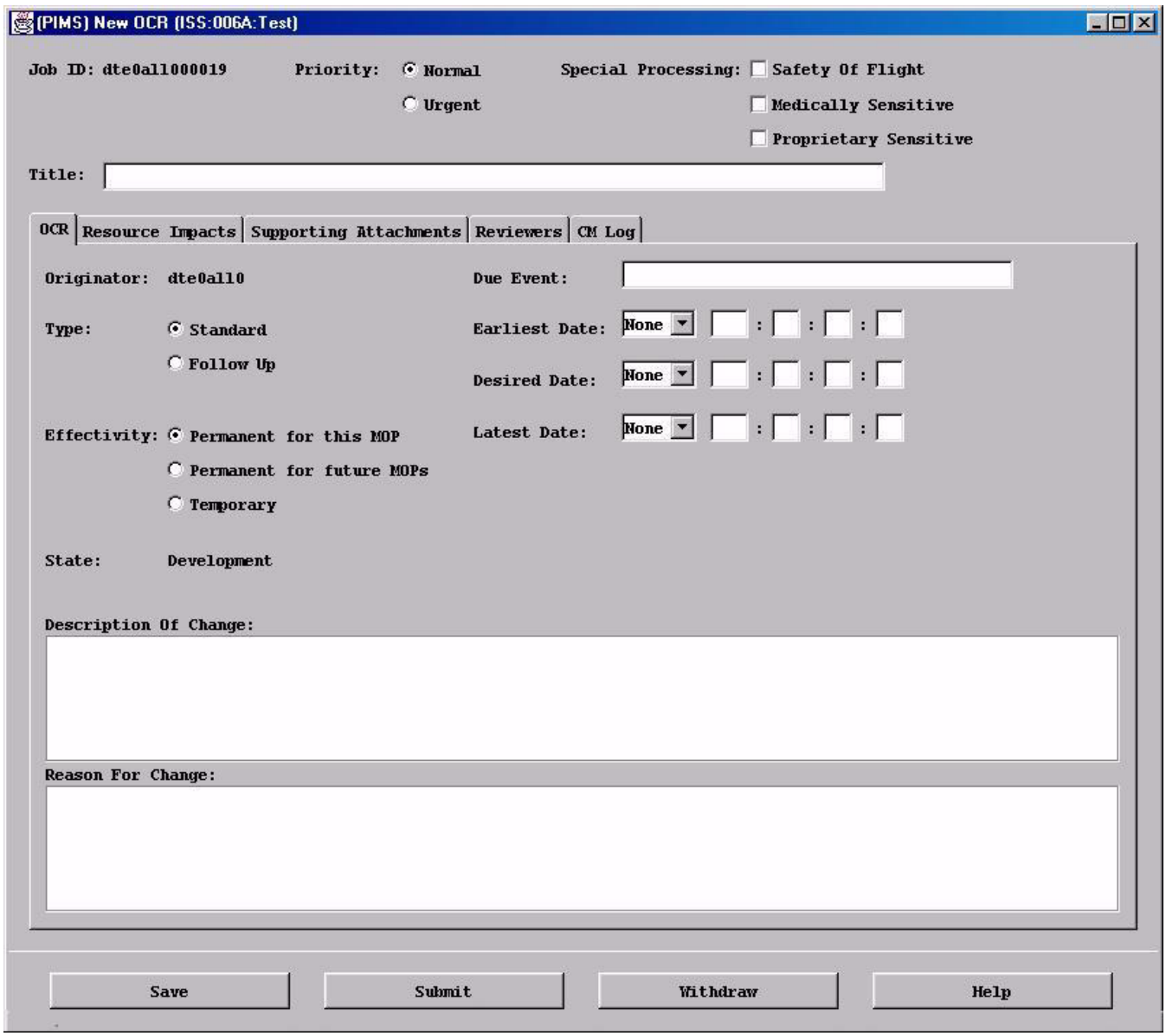


Figure 18-50, New OCR dialog box.

18.3.3.1.1 Common Elements

The radio buttons and text entry fields at the top of the screen and the control panel at the bottom of the screen remain unchanged when different tabs are selected. The **New OCR** dialog box is initialized with the new Job ID (OCR number) automatically assigned when **New OCR..** was selected from the **File** pulldown menu.

The **Job ID:** consists of the User ID and next sequential OCR number generated by Change Request Configuration Management (CRCM).

The **Priority:** radio button selections are **Normal** (default) or **Urgent** indicating the priority level of the OCR.

The **Special Processing:** checkboxes include:

- **Safety of Flight**
- **Medically Sensitive**
- **Proprietary Sensitive**

The **Title:** text entry field is an editable text field in which the user may enter up to 100 characters.

Selecting Save saves the OCR to the PIMS database, creates a task on the To Do List, and closes the **(PIMS) New OCR** dialog box.

Note: In order to access a saved OCR, the initiator (or anyone with the same User ID) must select the OCR from the To Do List where the OCR will be listed as being in the development state.

Selecting Submit moves the OCR from the Development state to the Submitted state and invokes the Submit Confirmation Message dialog box. Once an OCR has been submitted it can no longer be edited (edits can only occur in the Development and Putback to Originator states), it would be advisable to consider and ensure the accuracy and completeness of the OCR before taking the action to submit it.

Selecting Withdraw invokes the Withdraw Confirmation Message dialog box. Withdrawing an OCR is not synonymous with deleting it. When an OCR is withdrawn it is removed from further processing and is considered to be in a Withdrawn state but is still maintained in the PIMS database.

Note: A command line procedure was written to allow an orphaned (zombie) OCR to be moved to the withdrawn state and a message added to the OCR CM Log indicating this action was taken by pimsys (SYSCON).Once moved to the withdrawn state, the OCR is removed from any To Do List and may be copied, viewed, or deleted (POD function).

Help: For information concerning any of the dialog boxes invoked by the above listed pushbuttons see the applicable Online Help topic.

18.3.3.1.2 OCR Tab

The OCR Tab (see Figure 18-50, New OCR dialog box) is initially visible when the **New OCR** dialog box is invoked. The OCR Tab provides the means to enter general information concerning the OCR. Information is presented through two groups of radio buttons and numerous text entry fields.

The **Originator:** label is set to the User ID of the user.

The OCR **Type:** is denoted by radio button selection of either **Standard** (default) or **Follow Up**.

The **Effectivity:** radio buttons default to **Permanent for this MOP**. Other selections include **Permanent for future MOPs** and **Temporary**.

The **State:** label is set to **Development**.

The **Description of Change:** text entry field is initially blank and is used to record any explanatory remarks that the user feels are necessary concerning the OCR.

The **Reason for Change:** text entry field is initially blank and is is used by the user to provide any justification for the OCR.

Note: There is an 800 character limit in all Description and Notes text input fields in all of the PIMS applications. After exceeding the 800 character limit the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the file will be truncated (see Figure 18-51, PIMS Confirmation Message).

Figure 18-51, PIMS Confirmation Message.

Selecting No aborts the save or submit operation and affords you the opportunity to correct the description and avoid any loss of text due to truncation.

The **Due Event:** text entry field is initially blank and is used to indicate an operational event or milestone associated with the initialization of the action described by this OCR.

The **Earliest Date:** text entry fields represent the earliest first opportunity time for the action(s) described in the OCR to take place while maintaining the intent of the OCR. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **Desired Date:** text entry fields represent the desired time for the action(s) described in the OCR to take place. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **Latest Date:** text entry fields represent the last opportunity time for the action(s) described in the OCR to take place while maintaining the intent of the OCR. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

Note: The **Earliest Date:**, **Desired Date:**, and **Latest Date:** entries are functionally independent of each other; a user may specify one, none, or all three times depending on operational requirements.

18.3.3.1.3 Resource Impacts Tab

As it's name implies, the **Resource Impacts** tab (see Figure 18-52, Resource Impacts tab) indicates which POIC resources will be effected by the implimentation of this OCR. This tab consists of five user-editable frames, labeled as follows:

- **Activity/Sequence**
- **Manual Procedures**
- **Commanding**
- **Downlink Data**
- **File Uplink Requests (to PL MDM)**

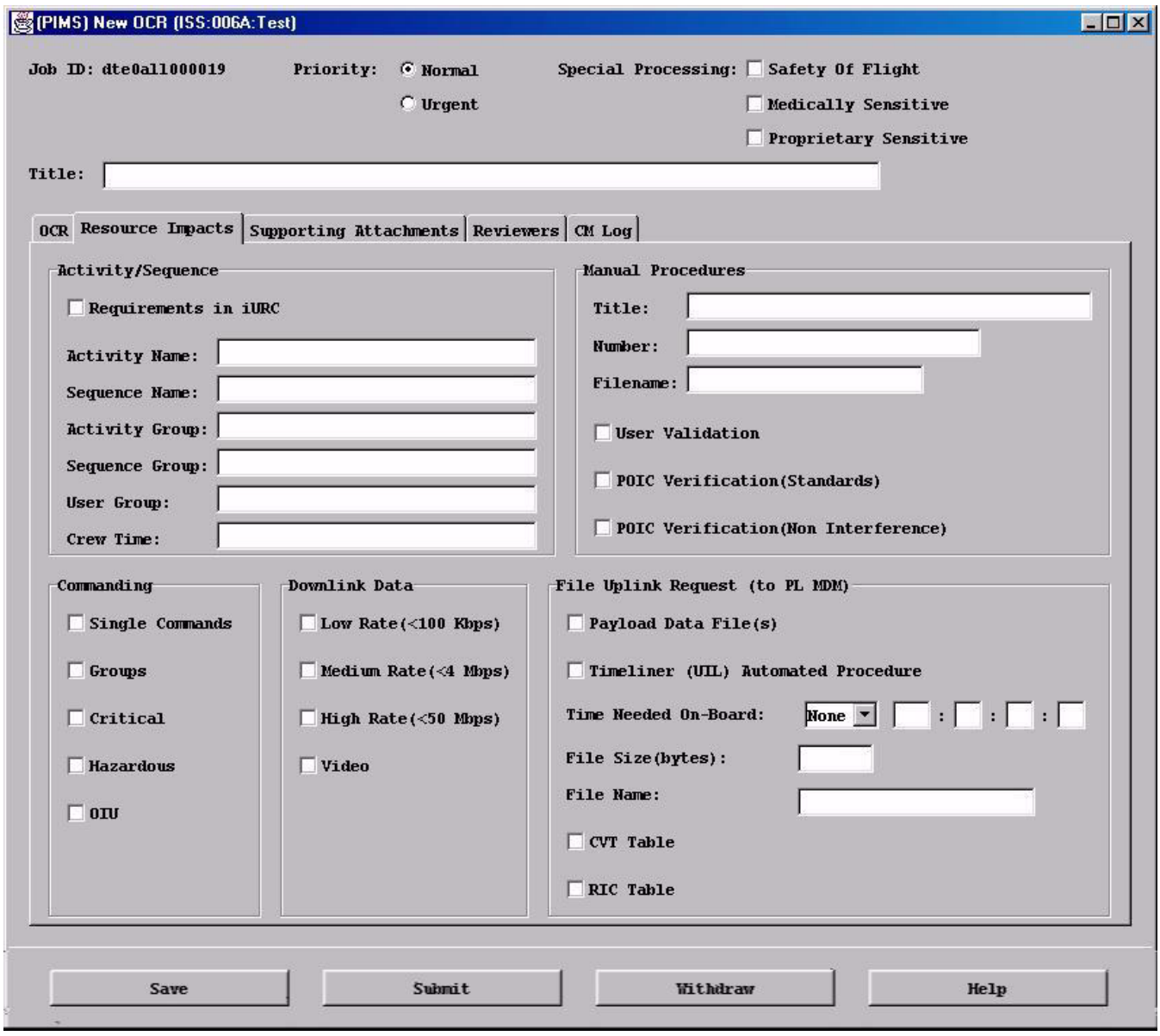


Figure 18-52, Resource Impacts tab.

All the frames and text entry fields that comprise the **Resource Impacts** tab are initially blank for a new OCR but are all editable by the user.

The **Activity/Sequence** frame contains a **Requirements in iURC** checkbox, which (when selected) indicates that the interim User Requirements Collection is associated with this OCR. The interim User Requirements Collection is a tool used by the Payload Planning System (PPS) to collect payload planning requirements.

Text entry fields are provided to further specify these requirements by:

- **Activity Name:**
- **Sequence Name:**
- **Activity Group:**
- **Sequence Group:**
- **User Group:**
- **Crew Time:**

The **Manual Procedures** frame is used to specify any manual procedures that may be influenced by the implimentation of this OCR.

Text entry fields are provided to define the **Title:**, **Number:**, and **Filename:** of the manual procedure.

Checkboxes are provided to specify if any validation or verification is to occur. These checkboxes are labeled:

- **User Validation**
- **POIC Verification (Standards)**
- **POIC Verification (Non Interference)**

The **Commanding** frame is used to enter any requirements for commanding and contains four checkboxes labeled:

- **Single Commands**
- **Groups**
- **Critical**
- **Hazardous**
- **OIU** (Orbiter Interface Unit)

The **Downlink Data** frame provides selection of downlink data type through four checkboxes labeled:

- **Low Rate(<100Kbps)**
- **Medium Rate(<4Mbps)**
- **High Rate(<50Mbps)**
- **Video**

To allow maximum user flexibility and to accommodate those rare payloads that may require multiple options, multiple selections are permitted in the **Downlink Data** frame.

The **File Uplink Request (to PL MDM)** frame is used to specify the file type, on-board time and file specifics for any files that will be uplinked.

Two checkboxes are provided to indicate whether the file is a **Payload Data File(s)** or a **Timeline (UIL) Automated Procedure**.

The **Time Needed On-Board:** text entry fields are used to record the time when the file will be used for its scheduled activity. Clicking None provides a pulldown menu for selecting the year with the remaining text entry fields representing the Julian date, hour, min, and sec (DDD:HH:MM:SS).

The **File Size (bytes):** text entry field is used to specify the size of the file to be uplinked in bytes.

The **File Name:** text entry field is used to identify the name of the file to be uplinked.

Additionally, two checkboxes are provided to indicate selection of either **CVT Table** or **RIC Table**.

18.3.3.1.4 Supporting Attachments Tab

The Supporting Attachments tab allows the originator of the OCR to attach any pertinent, supporting files to the OCR (see Figure 18-53, Supporting Attachments Tab). When a file is attached to the OCR it is added to the PIMS database and becomes available for viewing by anyone within the OCR workflow.

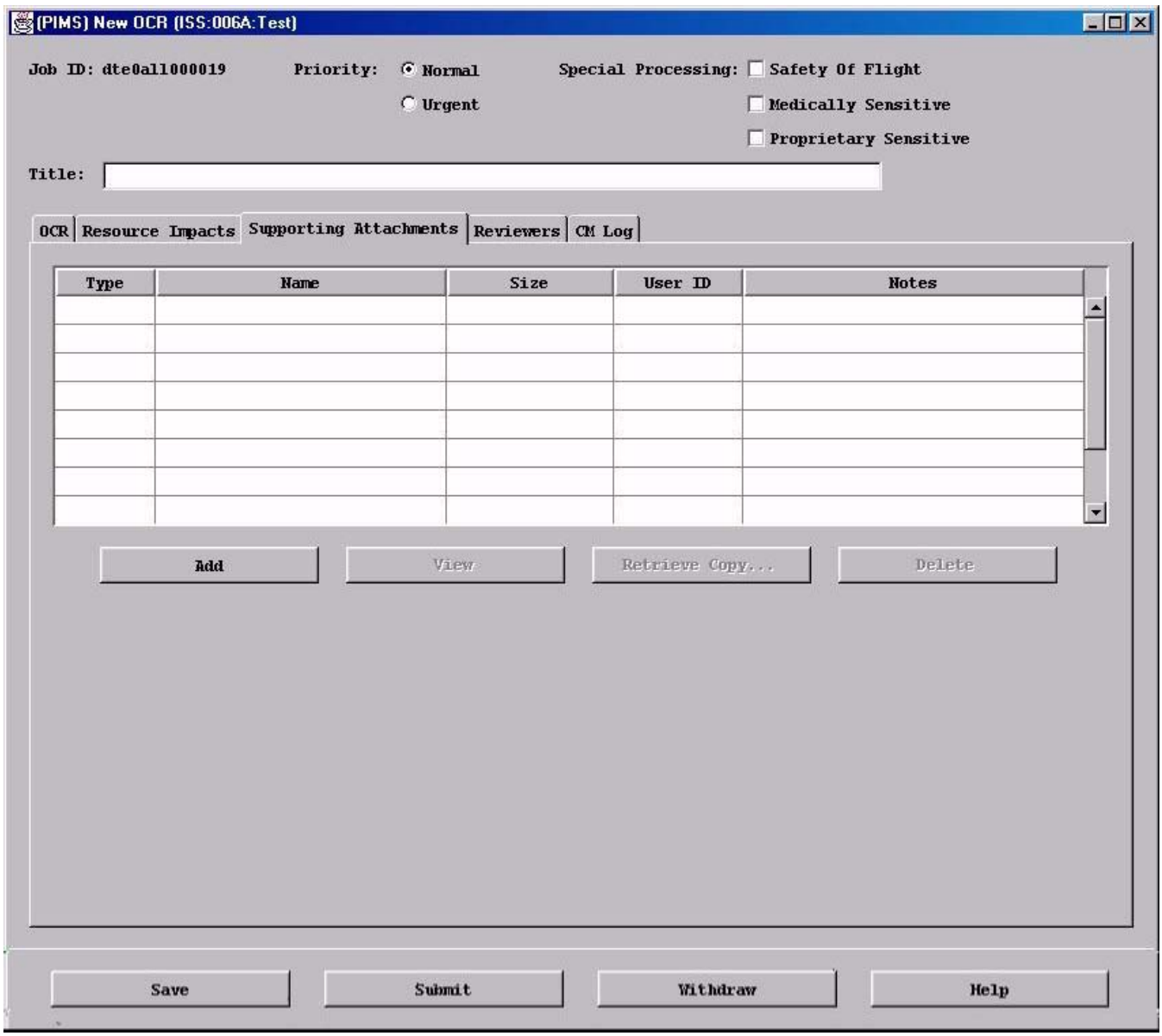


Figure 18-53, Supporting Attachments tab.

This tab consists of a table, pushbutton area, and a **Notes** frame.

The table contains five columns labeled as follows:

- **Type** -indicates the document type (ASCII, Word, Excel, etc.)
- **Name** -name of the file added to the PIMS database
- **Size** -size of the file in bytes
- **User ID** -User ID of the individual who attached the file to the OCR
- **Notes** -any explanatory notes deemed necessary by the Originator

The **Notes** frame becomes active when a selection is made in the **Notes** column of the table. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-54, Notes Exceed Limit dialog box).

Figure 18-54, Notes Exceed Limit dialog box.

Clicking Add invokes the **Add Attachment** dialog box (see Figure 18-55, Add Attachments dialog box). This is the default pushbutton.

Clicking View provides a Netscape window that contains the contents of the selected document in the format described by the **Type** column in the table (if the **Type** column specifies , then an Excel spreadsheet will be displayed).

Clicking Retrieve Copy... copies the Metadata for the selected attachment to the local workstation.

Clicking Delete removes the selected attachment from the Supporting Attachments tab of the OCR and also removes the document from the PIMS database.

Note: Only the Originator, while in the Development state, can add or delete an attachment to the OCR. For all other users View and Retrieve Copy... will be the only active pushbuttons.

As previously mentioned, clicking Add invokes the **Add Attachment** dialog box (see Figure 18-55, Add Attachments dialog box).

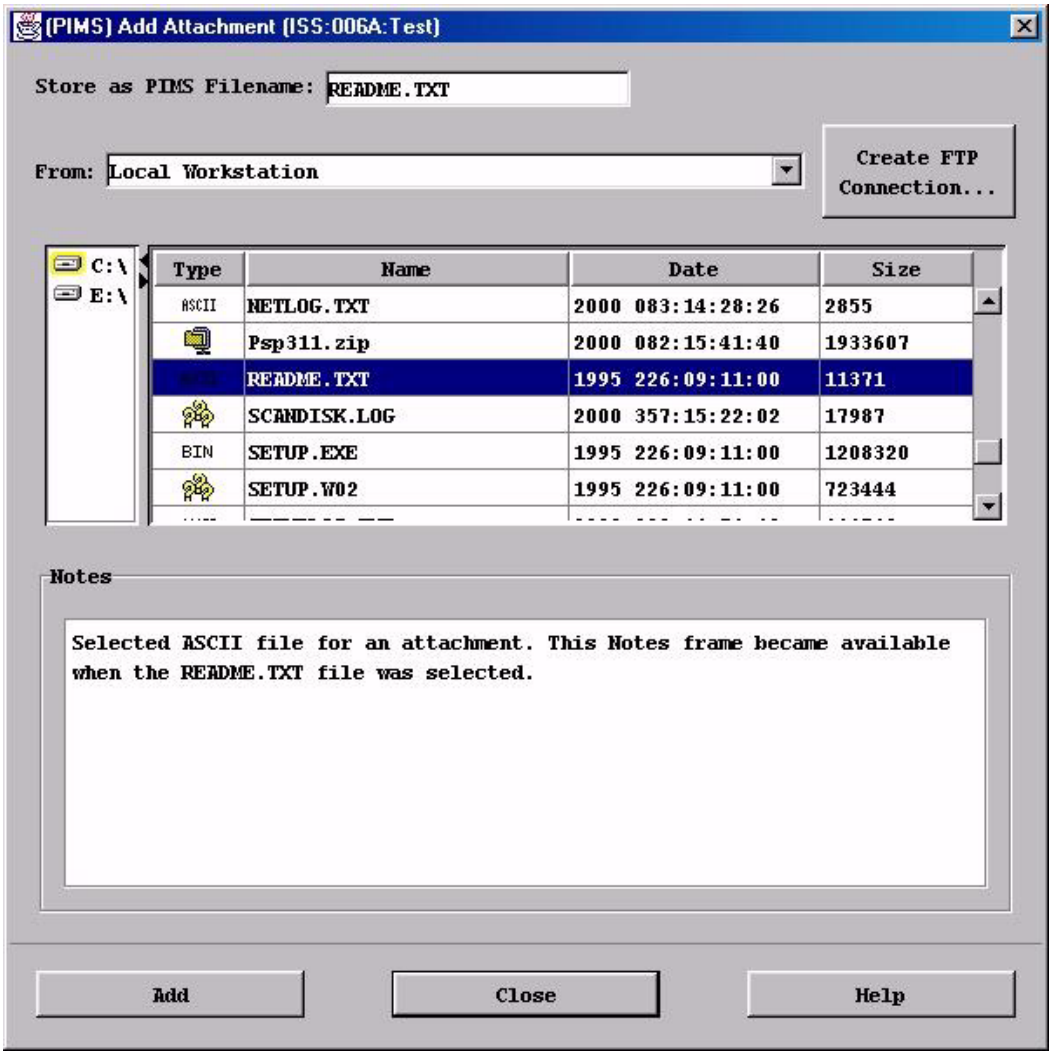


Figure 18-55, Add Attachments dialog box.

The **Store as PIMS Filename:** input text field allows you to enter the name for the file to be added as an attachment in the PIMS database. The maximum number of characters for a filename is 24.

Tip: If you don't want to change the name of the file to be stored, select the file from the file table frame on the **Add Attachment** dialog box, and the name will automatically be entered in the **Store as PIMS Filename:** input text field.

The **From:** field contains a pulldown option menu from which you select the location of the file that you want to add. The possible options include **Local Workstation**, or the IP address of a remote system that you have an FTP connection established with.

To the right of the **From:** field is

. Selecting this pushbutton invokes the **Create FTP Connection** dialog box. This dialog box allows you to add a file residing on a remote system by establishing an FTP connection to it. After an FTP connection has been established, the IP address of the remote system will be displayed as an option on the **From:** pulldown menu.

The next area of the **Add File** dialog box contains two frames. The frame on the left contains a directory structure, and the frame on the right contains a table. The frames can be resized by clicking and dragging on the bar between them.

The frame on the left initially contains folders that reside on the root level of the workstation selected on the **From:** pulldown option menu.

When you click once on any of the folders, the contents of the selected folder will be displayed in the file table frame to the right. The file table contains four columns:

- The **Type** column displays an icon depicting the file type
- The **Name** column displays the file name
- The **Date** column displays the date that the file was last revised
- The **Size** column displays the file size in bytes

Selection of any of the files from the file table frame results in the **Notes** frame becoming active. There is an 800 character limit in all the Notes text input areas in all of the PIMS applications. After exceeding the 800 character limit, the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the note will be truncated (see Figure 18-54, Notes Exceed Limit dialog box).

Clicking Add closes the **Add Attachment** dialog box and invokes a PIMS information message informing you that the Attachment has been added to the PIMS database (see Figure 18-56, PIMS Information Message dialog box).

Figure 18-56, PIMS Information Message dialog box.

18.3.3.1.5 Reviewers Tab

The **Reviewers Tab** (see Figure 18-57, Reviewers tab) for a new OCR, in the development state, will contain only noneditable information concerning the Safety Of Flight Reviewer. The Safety of Flight reviewer is the only reviewer that can be affected by the OCR developer by selecting the **Safety Of Flight** checkbox under **Special Processing:**. If the **Safety Of Flight** checkbox is selected, the Reviewer's User ID will appear on the tab vice **None**.

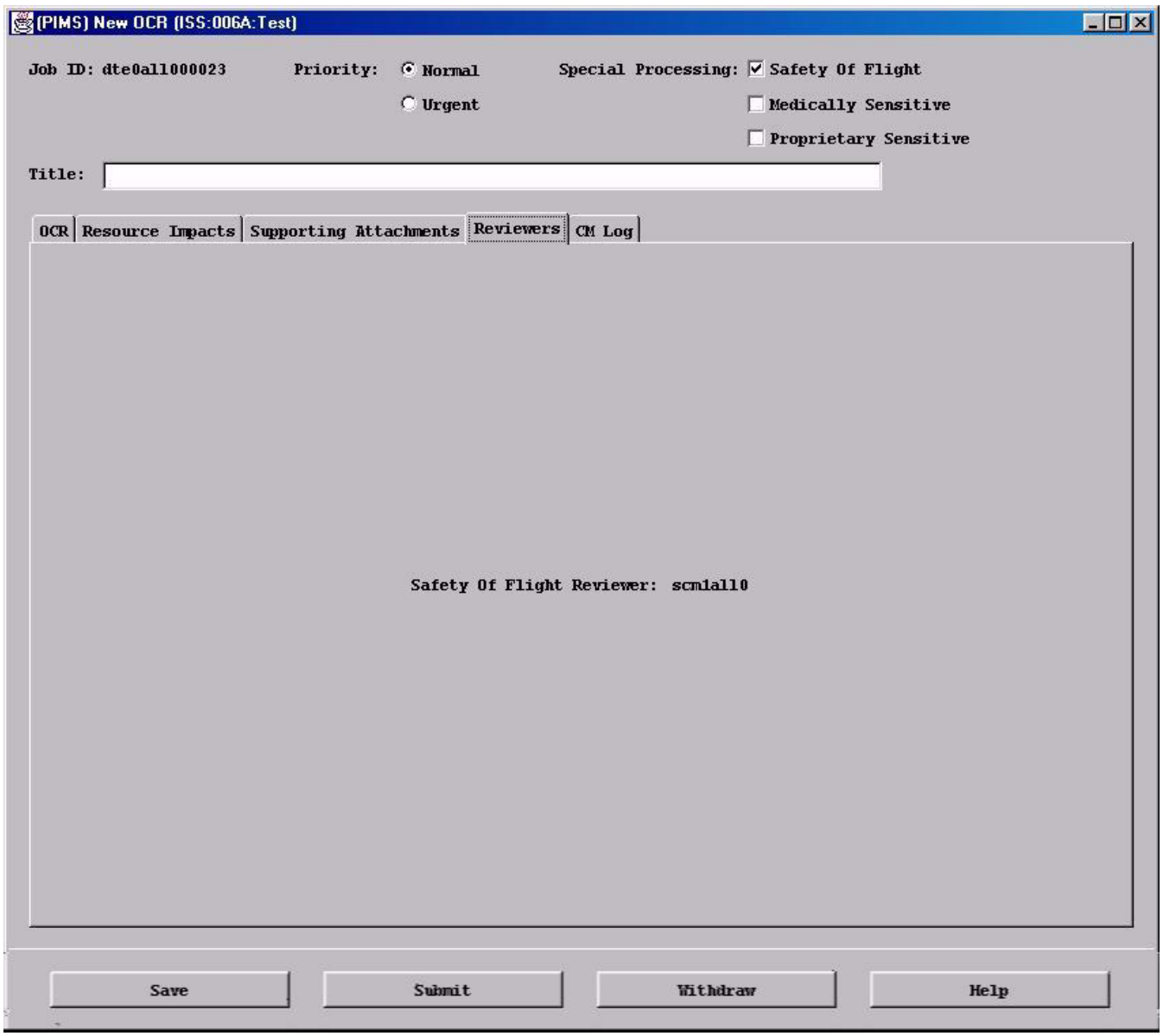


Figure 18-57, Reviewers tab.

18.3.3.1.6 CM Log Tab

The **CM Log** tab (see Figure 18-58, CM Log Tab) contains a Configuration Management history, in tabular form, for the OCR. The table consists of six columns labeled as follows:

- **Task**
- **Action**
- **User ID**
- **Notes**
- **State**

- **CM Date**

Note: The columns displayed in Figure 18-58, have been resized so that all columns could be displayed in this view, otherwise, a horizontal scroll bar is provided to access all information in all columns.

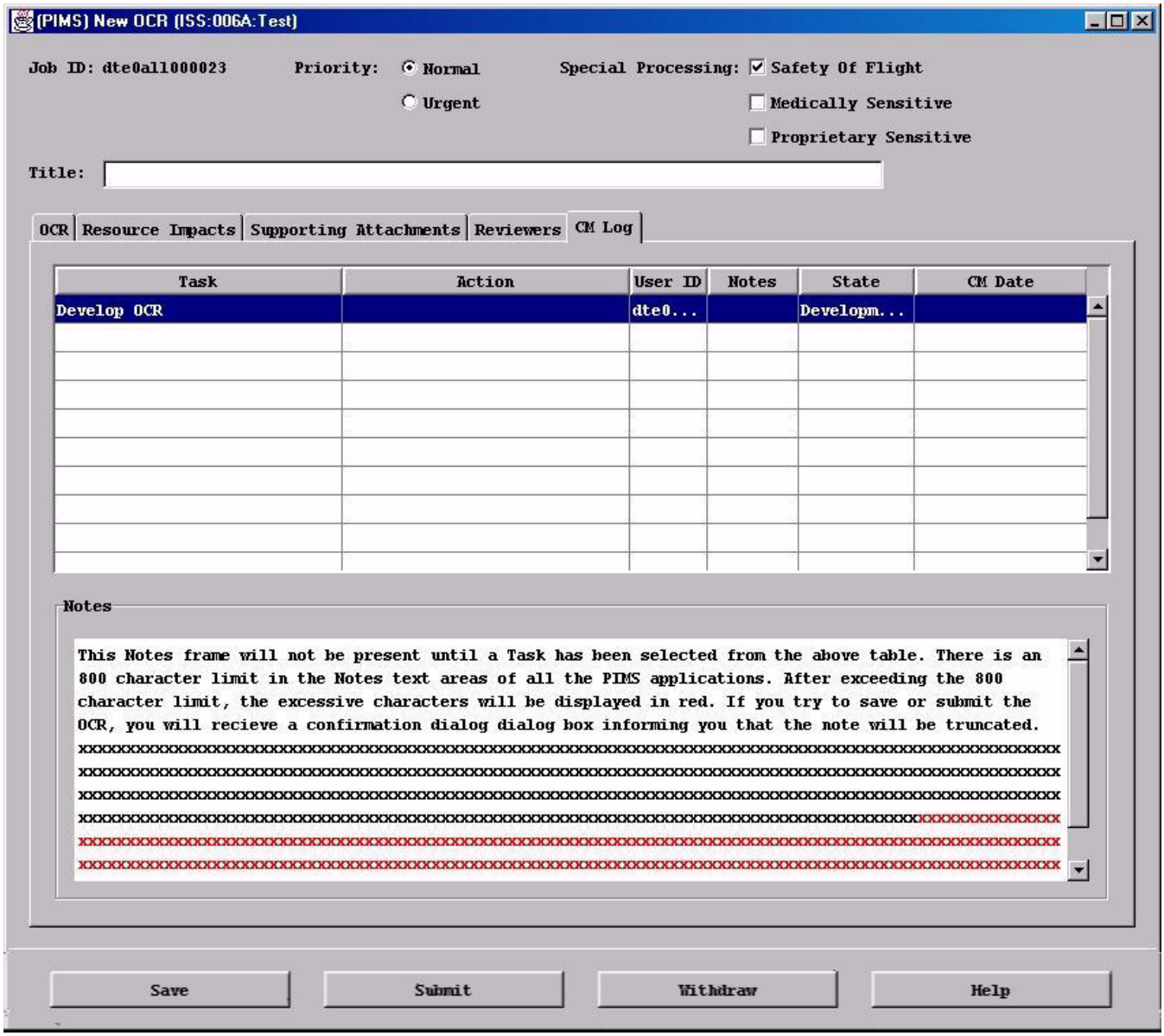


Figure 18-58, CM Log tab.

Each row in the table represents an individual accession in the OCR workflow. For a new OCR the table will contain a single entry representing the development of the OCR.

The **Task** column represents the job assignment, in concise, descriptive terms for the specified User ID to accomplish. For a new OCR, the task is simply to “Develop OCR”.

The **Action** column defines the workflow action accomplished when the **Task** is completed. For a new OCR entries could be Submit or Withdraw.

The **User ID** column identifies the entity to whom the task is assigned and is responsible for it's completion.

A check mark in the **Notes** column indicates that notes relating to the OCR were included by the actionee. Any notes will be contained in the **Notes** frame directly below the CM Log table when a table row is selected.

The **State** column shows the current CM state for the OCR. In the case of a new OCR this entry will be **Development**.

The **CM Date** column indicates the date and time when a change of state occurred due to a workflow **Action**. A new OCR, under development will not display a date until the OCR is submitted (change of state). The date is displayed in a YYYY:DDD:HH:MM:SS format.

The **Notes** frame contains any remarks that the actionee considered to be relative. Again, the **Notes** frame will not be displayed until a CM Log table row has been selected.

Note: There is an 800 character limit in all Description and Notes text input fields in all of the PIMS applications. After exceeding the 800 character limit the excess characters will be displayed in red. If you extend beyond the 800 character limit and you try to save or submit the OCR, you will receive a confirmation message dialog box informing you that the file will be truncated (see Figure 18-59, PIMS Confirmation Message).

Figure 18-59, PIMS Confirmation Message.

Selecting No aborts the save or submit operation and affords you the opportunity to correct the description and avoid any loss of text due to truncation.

18.3.3.2 Copy...

The **Copy...** menu item selected from the **File** menu invokes the **Copy** dialog box (see Figure 18-60, Copy dialog box). The Copy dialog box allows a user to create a new OCR from an existing OCR. When an OCR is copied, all of the notes and other CM data are omitted (not copied into the

new OCR). Further, the OCR number assigned to the new OCR and reflected in it's Job ID will begin with the current user ID and end with the next sequential number for that user ID (regardless of the Job ID of the OCR that was copied from).

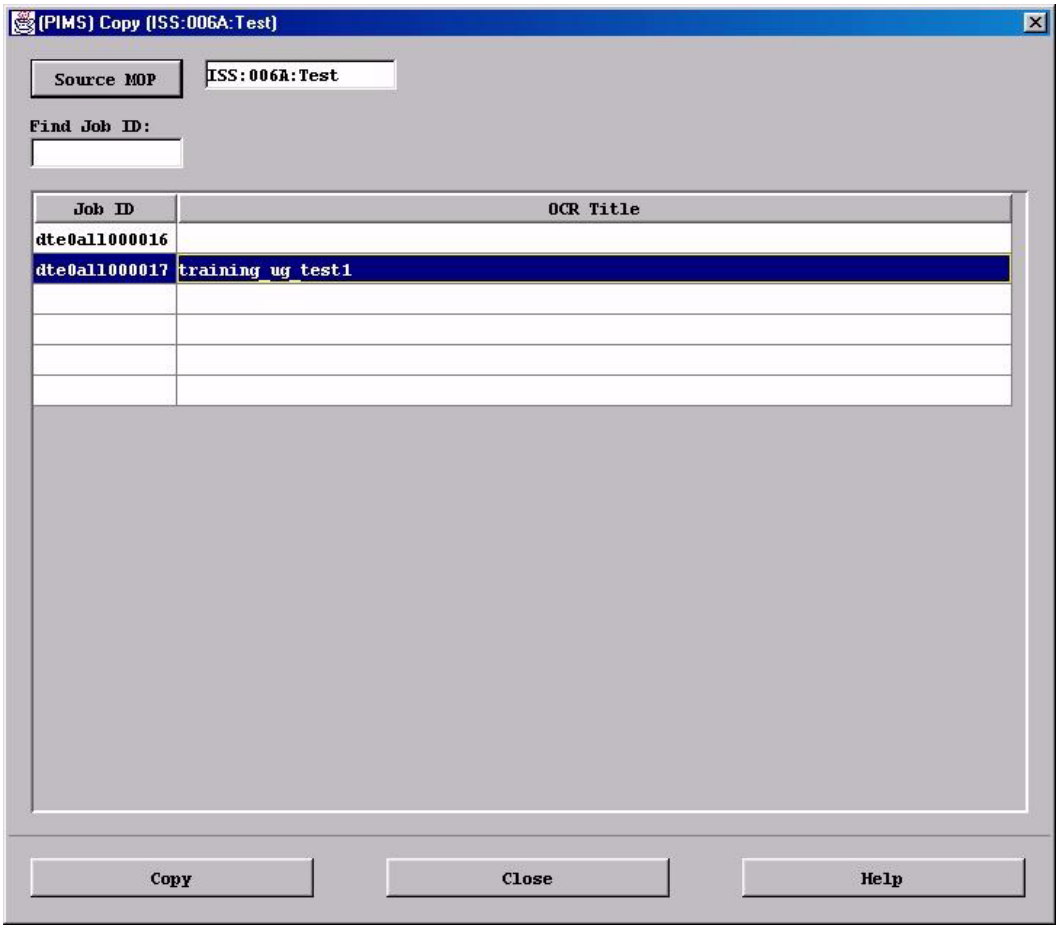


Figure 18-60, Copy dialog box.

The **Source MOP** defaults to the current MOP. Clicking Source MOP reveals a List of Values from which an alternative MOP may be chosen.

If known, a particular Job ID may be entered in the **Find Job ID:** text entry field to eliminate the need for scrolling through a long list of OCRs in the table beneath the **Find Job ID:** text entry field.

The table will contain a list of all the OCRs for the MOP identified by the **Source MOP** entry.

18.3.3.3 View...

The **View...** menu item invokes the **(PIMS) View OCR** dialog box (see Figure 18-61, View OCR dialog box). Any authorized user may select and view an OCR at any time from the **(PIMS) Operations Change Request** main window.

The **(PIMS) View OCR** dialog box is a view only screen and is not editable by the user. The configuration of the tabbed area dynamically changes depending on which tab is selected. Tab selection is accomplished by clicking on the desired tab.

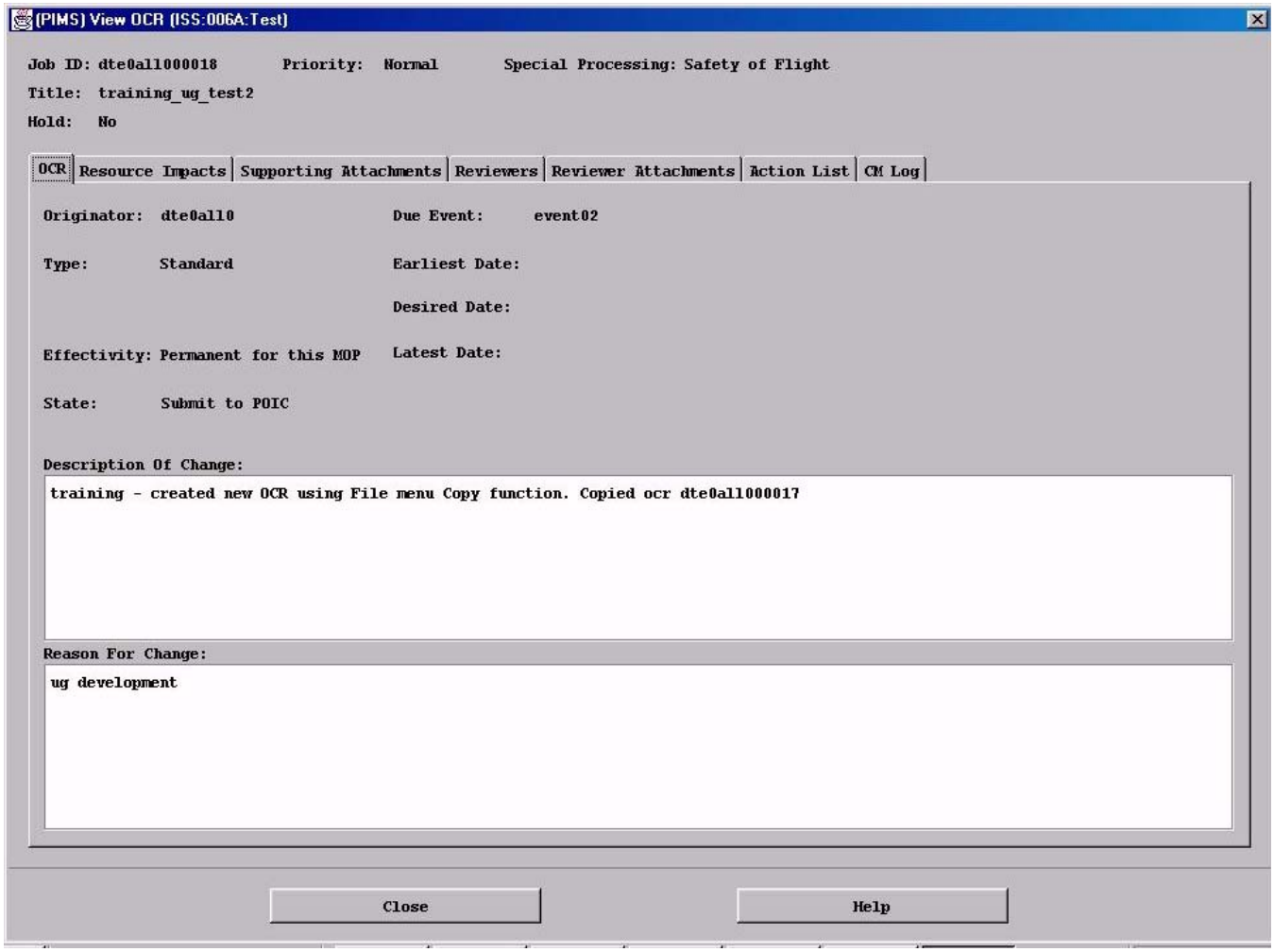
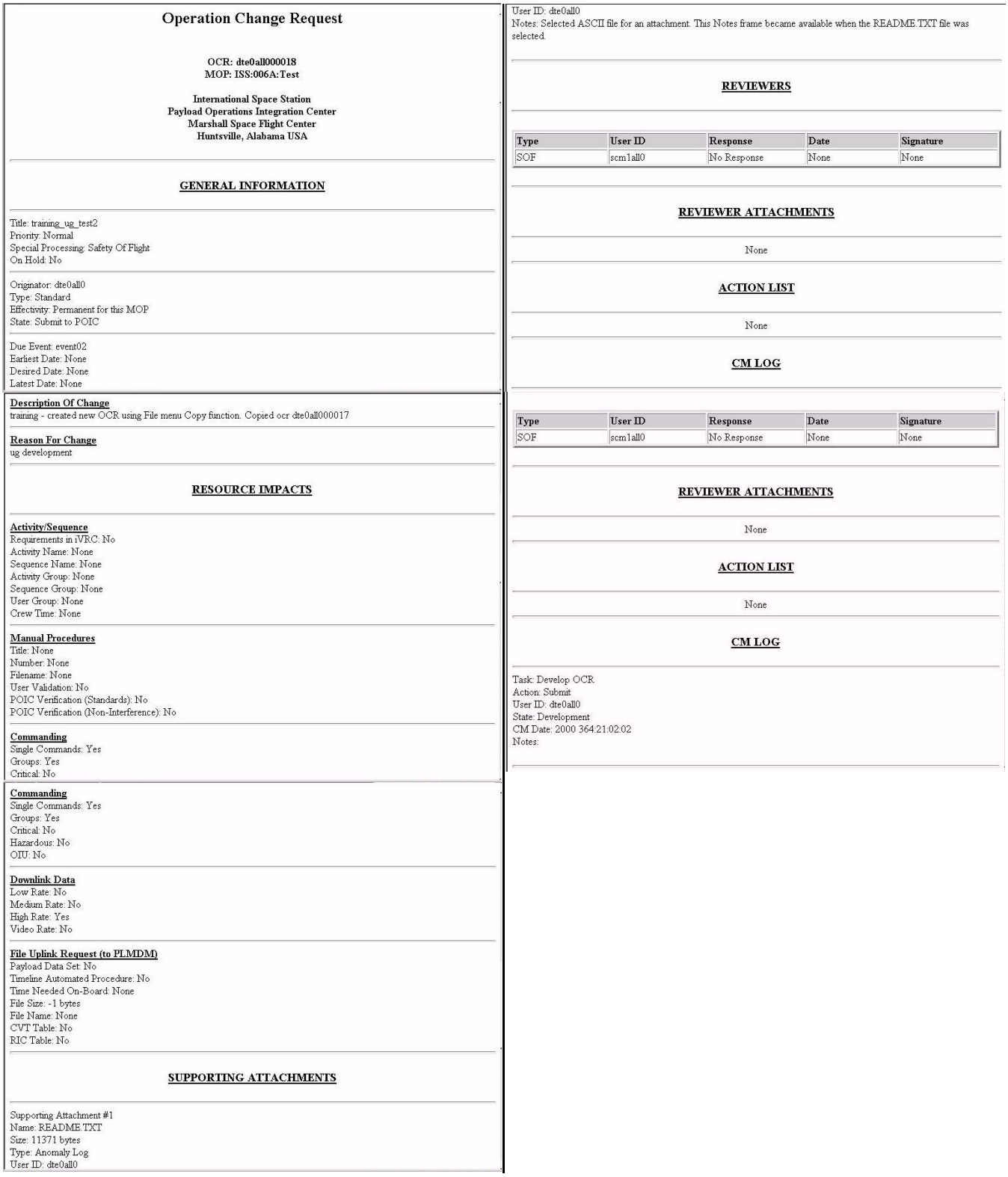


Figure 18-61, View OCR dialog box.

18.3.3.4 View Printable OCR...

Selecting the **View Printable OCR...** menu item from the **File** menu of the **Operation Change Request** application creates a printable file of the metadata contained in the selected OCR (see Figure 18-62, Sample Printable OCR). A Netscape window is invoked that contains the file. The text file retains the OCR number as the filename with a .html extension (dte0all000018.html). The file may be saved to an independent platform and then printed only if needed. Subsequent saves of the file allow the user to overwrite previous versions of the OCR. The creation of a text file using this option allows operating positions to create a PDF copy for distribution in the event of a PIMS failure.

Note: Current software only provides for the creation of the file in an html format. Future software will provide a pdf format that will be viewable using Acrobat Reader.



Operation Change Request

OCR: dte0all000018
MOP: ISS:006A:Test

International Space Station
Payload Operations Integration Center
Marshall Space Flight Center
Huntsville, Alabama USA

GENERAL INFORMATION

Title: training_ug_test2
Priority: Normal
Special Processing: Safety Of Flight
On Hold: No

Originator: dte0all0
Type: Standard
Effectivity: Permanent for this MOP
State: Submit to POIC

Due Event: event02
Earliest Date: None
Desired Date: None
Latest Date: None

Description Of Change
training - created new OCR using File menu Copy function. Copied ocr dte0all000017

Reason For Change
ug development

RESOURCE IMPACTS

Activity/Sequence
Requirements in iVRC: No
Activity Name: None
Sequence Name: None
Activity Group: None
Sequence Group: None
User Group: None
Crew Time: None

Manual Procedures
Title: None
Number: None
Filename: None
User Validation: No
POIC Verification (Standards): No
POIC Verification (Non-Interference): No

Commanding
Single Commands: Yes
Groups: Yes
Critical: No

Commanding
Single Commands: Yes
Groups: Yes
Critical: No
Hazardous: No
OIU: No

Downlink Data
Low Rate: No
Medium Rate: No
High Rate: Yes
Video Rate: No

File Uplink Request (to PLMDM)
Payload Data Set: No
Timeline Automated Procedure: No
Time Needed On-Board: None
File Size: -1 bytes
File Name: None
CVT Table: No
RIC Table: No

SUPPORTING ATTACHMENTS

Supporting Attachment #1
Name: README.TXT
Size: 11371 bytes
Type: Anomaly Log
User ID: dte0all0

User ID: dte0all0
Notes: Selected ASCII file for an attachment. This Notes frame became available when the README.TXT file was selected.

REVIEWERS

Type	User ID	Response	Date	Signature
SOF	scm1all0	No Response	None	None

REVIEWER ATTACHMENTS

None

ACTION LIST

None

CM LOG

Type	User ID	Response	Date	Signature
SOF	scm1all0	No Response	None	None

REVIEWER ATTACHMENTS

None

ACTION LIST

None

CM LOG

Task: Develop OCR
Action: Submit
User ID: dte0all0
State: Development
CM Date: 2000 364:21:02:02
Notes:

Figure 18-62, Sample Printable OCR.

18.3.3.5 Delete

Only the POIC POD can delete an OCR in the inactive state (and only in the Inactive state). Selection of the **Delete** menu item from the **File** menu by the POD after an Inactive OCR has been selected invokes a confirmation message that queries the POD as to his intent to delete the selected OCR (see Figure 18-63, Delete OCR Confirmation dialog box).

Figure 18-63, Delete OCR Confirmation dialog box.

Selection of the **Yes** pushbutton completes the delete process and invokes an information message (see Figure 18-64, Delete OCR Information dialog box).

Figure 18-64, Delete OCR Information dialog box.

18.3.3.6 Facility Review Status

Selection of the **Facility Review Status** menu item from the **Options** menu invokes the **Facility Review Status** dialog box (see Figure 18-65, Facility Review Status dialog box). This dialog box acts as a summary page to indicate the review and action status of all individual reviewers within the cycle to show when they have completed their action.

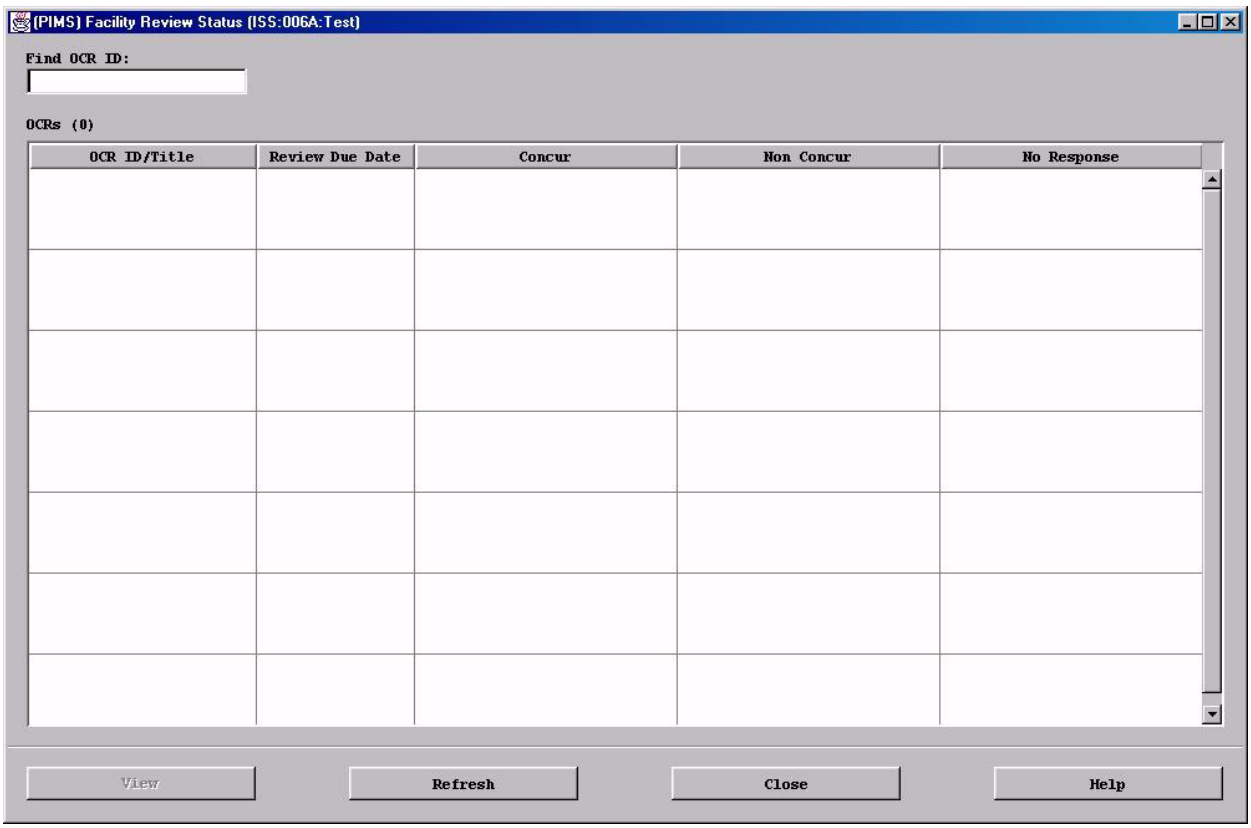


Figure 18-65, Facility Review Status dialog box.

The **Find OCR ID:** text entry field is handy when you are trying to isolate an OCR from within a very long list. As you type the OCR ID number into the text entry field the software will locate and highlight the OCR (or the OCR closest to the entered OCR number)

The OCRs table consists of five columns labeled as follows:

- **OCR ID/Title**
- **Review Due Date**
- **Concur**
- **Non Concur**
- **No Response**

The table has one row for each OCR and becomes scrollable when the number of rows required to be displayed exceeds the height of the window. All columns have the standard capability for the user to customize the width as required to see more or less data.

18.3.3.7 POIC Review Status

Selection of the **POIC Review Status** menu item from the **Options** menu invokes the **POIC Review Status** dialog box (see Figure 18-66, POIC Review Status dialog box). This dialog box

acts as a summary page to indicate the review and action status of all individual reviewers within the cycle to show when they have completed their action.

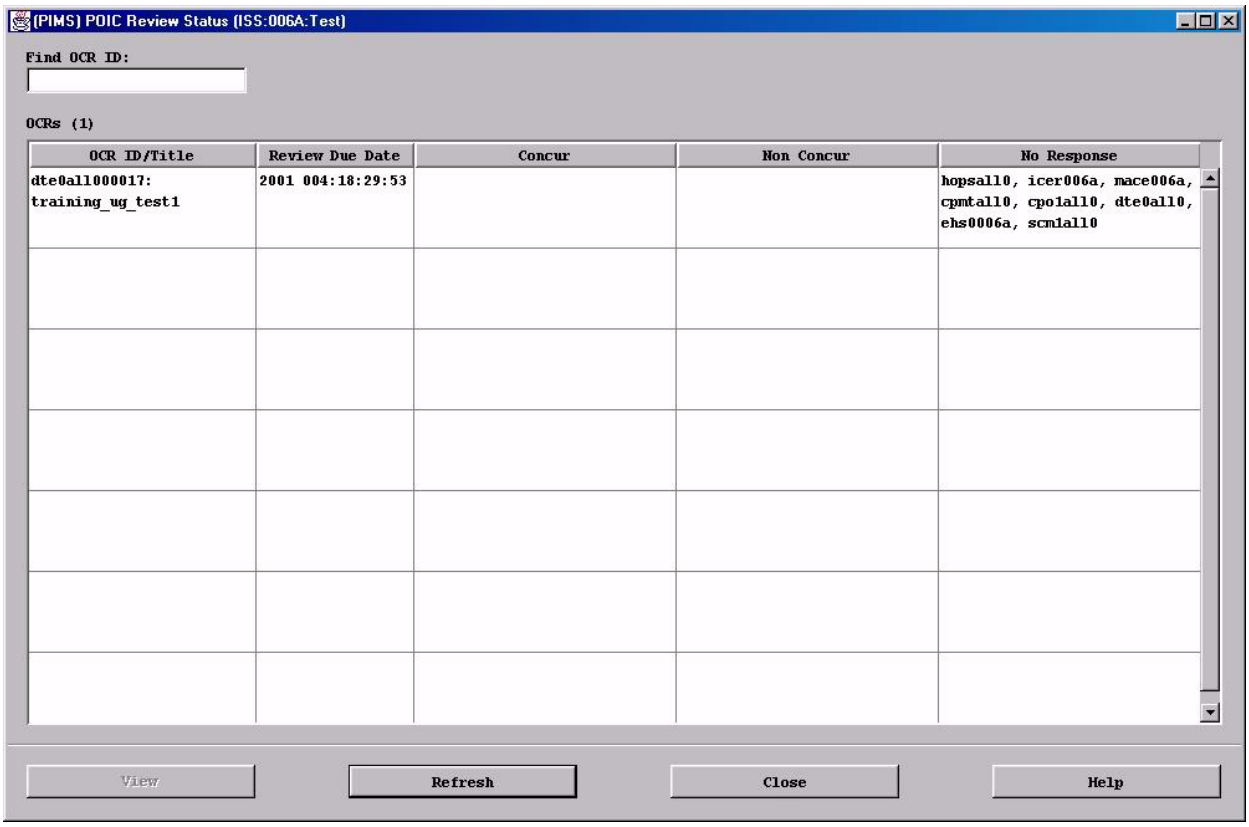


Figure 18-66, POIC Review Status dialog box.

The **Find OCR ID:** text entry field is handy when you are trying to isolate an OCR from within a very long list. As you type the OCR ID number into the text entry field the software will locate and highlight the OCR (or the OCR closest to the entered OCR number)

The OCRs table consists of five columns labeled as follows:

- **OCR ID/Title**
- **Review Due Date**
- **Concur**
- **Non Concur**
- **No Response**

The table has one row for each OCR and becomes scrollable when the number of rows required to be displayed exceeds the height of the window. All columns have the standard capability for the user to customize the width as required to see more or less data.

18.3.3.8 Actionee Status

Selection of the **Actionee Status** menu item from the **Options** menu invokes the **Actionee Status** dialog box (see Figure 18-67, Actionee Status dialog box). This dialog box acts as a summary page to indicate the action status of all individual actionees within the cycle to show when they have completed their action.

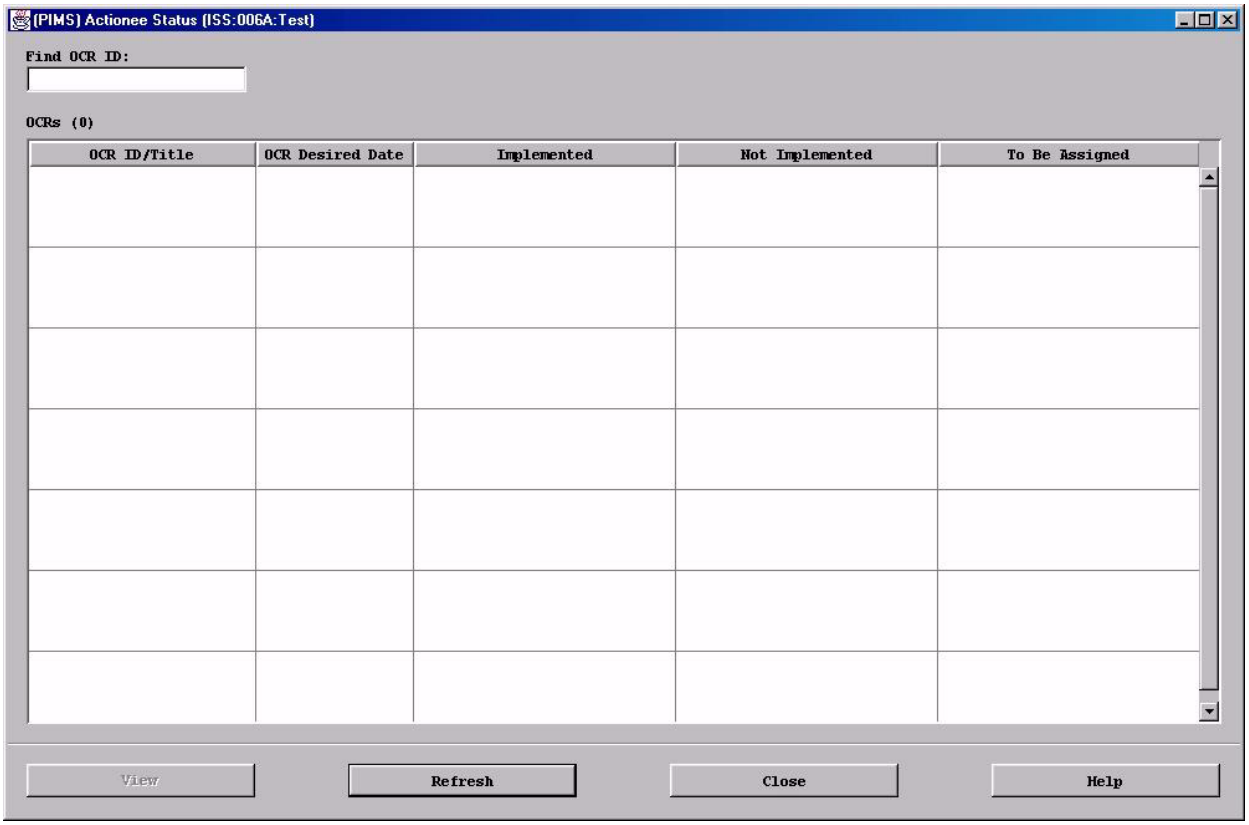


Figure 18-67, Actionee Status dialog box.

The **Find OCR ID:** text entry field is handy when you are trying to isolate an OCR from within a very long list. As you type the OCR ID number into the text entry field the software will locate and highlight the OCR (or the OCR closest to the entered OCR number)

The OCRs table consists of five columns labeled as follows:

- **OCR ID/Title**
- **OCR Desired Date**
- **Implemented**
- **Not Implemented**
- **To Be Assigned**

The **To Be Assigned** column displays Actionees who have not yet received the assigned task on their To Do List because of action sequencing.

The table has one row for each OCR and becomes scrollable when the number of rows required to be displayed exceeds the height of the window. All columns have the standard capability for the user to customize the width as required to see more or less data.

18.3.3.9 Modify Action Descriptions...

Selecting the **Modify Action Descriptions...** menu item from the Options menu invokes the **Modify Action Description** dialog box (see Figure 18-68, Modify Action Description dialog box). The **Modify Action Descriptions...** menu item is active only if the user is the POIC POD.

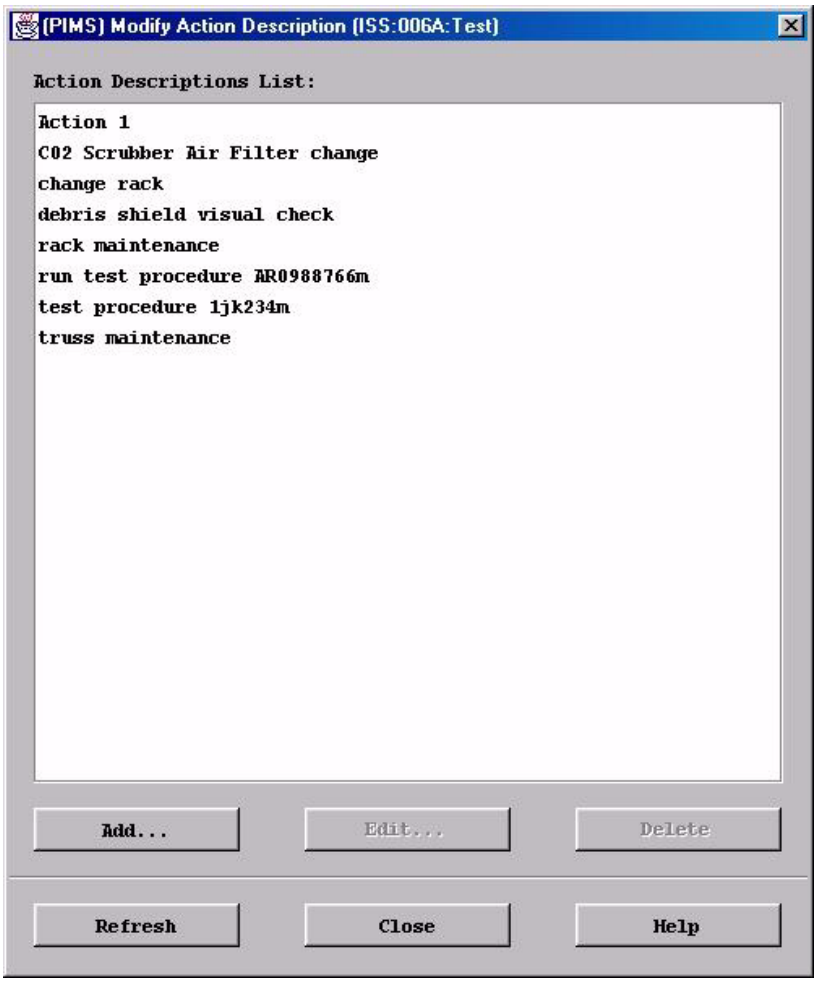


Figure 18-68, Modify Action Description dialog box.

Clicking Add... invokes the **Add Action Description** dialog box (see Figure 18-69, Add Action Description dialog box). This pushbutton is always sensitive.

Clicking Edit... Invokes the **Edit Action Description** dialog box (see Figure 18-70, Edit Action Description dialog box). This pushbutton becomes sensitive when one of the actions from the **Action Descriptions List:** is selected.

When the **Add Action Description** dialog box is invoked, the **Action Description:** text entry field is initially blank (see Figure 18-69, Add Action Description dialog box). The POIC POD can enter an action description of up to 60 characters in length. Clicking Add... places the new description in the **Action Description List:** of the **Modify Action Description** dialog box.

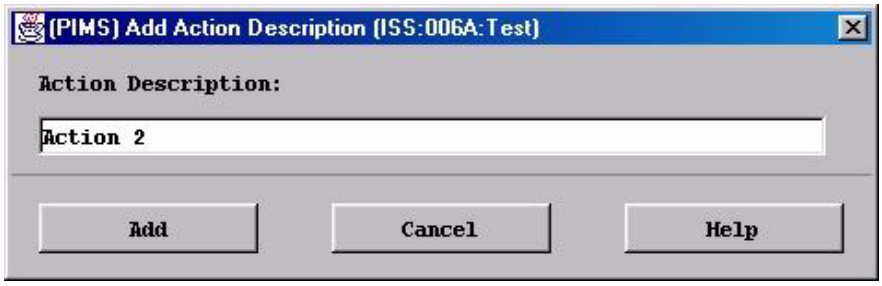


Figure 18-69, Add Action Description dialog box.

When the **Edit Action Description** dialog box is invoked, the **Action Description:** text entry field will contain the action description that was selected from the **Action Description List:** of the **Modify Action Description** dialog box (see Figure 18-70, Edit Action Description dialog box). When the POIC POD completes his/her edits to the action description (60 character limit), selection of Edit... places the modified description in the **Action Description List:** of the **Modify Action Description** dialog box.

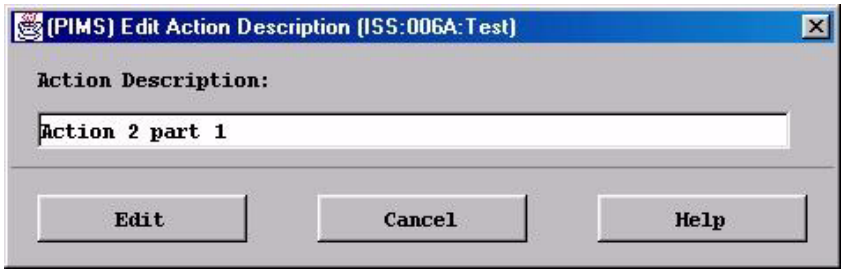


Figure 18-70, Edit Action Description dialog box.

18.3.3.10 Modify Group Lists...

The **Modify Group Lists...** menu item under the **Options** menu in all of the PIMS applications allows you to create new distribution group lists and edit or delete ones that you have previously created.

Help: For a complete description of the **Modify Group Lists...** menu item and the dialog boxes invoked through it see Section 18.1.3.2 Modify Group Lists....

18.4 Timeliner Overview

The PIMS Timeliner Compiler provides the EHS interfaces to the Draper Labs developed COTS Timeliner Compiler and Mapper software. The Timeliner Compiler is a ground based system used to compile automated procedures used by the Payload Operations and Integration Center (POIC) to control International Space Station (ISS) payloads or systems. Compiled automated procedure executables and support files are uplinked to the ISS and run on-board by the payload MDM (PL MDM) executor software.

Automated procedures used onboard ISS in the PL MDM are configuration managed by the PIMS Documents application and maintained in the PIMS database. The PIMS database is the sole source of automated procedures that may be uplinked from the POIC. As such, the PIMS Timeliner Compiler only operates on automated procedures stored in the PIMS database.

The PIMS/Timeliner Server hosts the Timeliner Compiler software that processes programmatic compile and validate requests from the EHS user applications (see Figure 18-71 , PIMS Timeliner Overview.) The PIMS Timeliner Compiler software retrieves requested automated procedures from the PIMS database and performs compilation or validation using the COTS Timeliner Compiler and Mapper software. Resultant compiler products and status information are stored in the PIMS database.

The COTS Timeliner Compiler has a direct, integrated interface into the EHS Command and Telemetry databases. The Command Database interface is for compiler verification of commands issued within automated procedures. The Telemetry Database interface is for compiler verification of automated procedure references to telemetry MSIDs (or Program Unique Identifiers (PUIs) in Timeliner terminology).

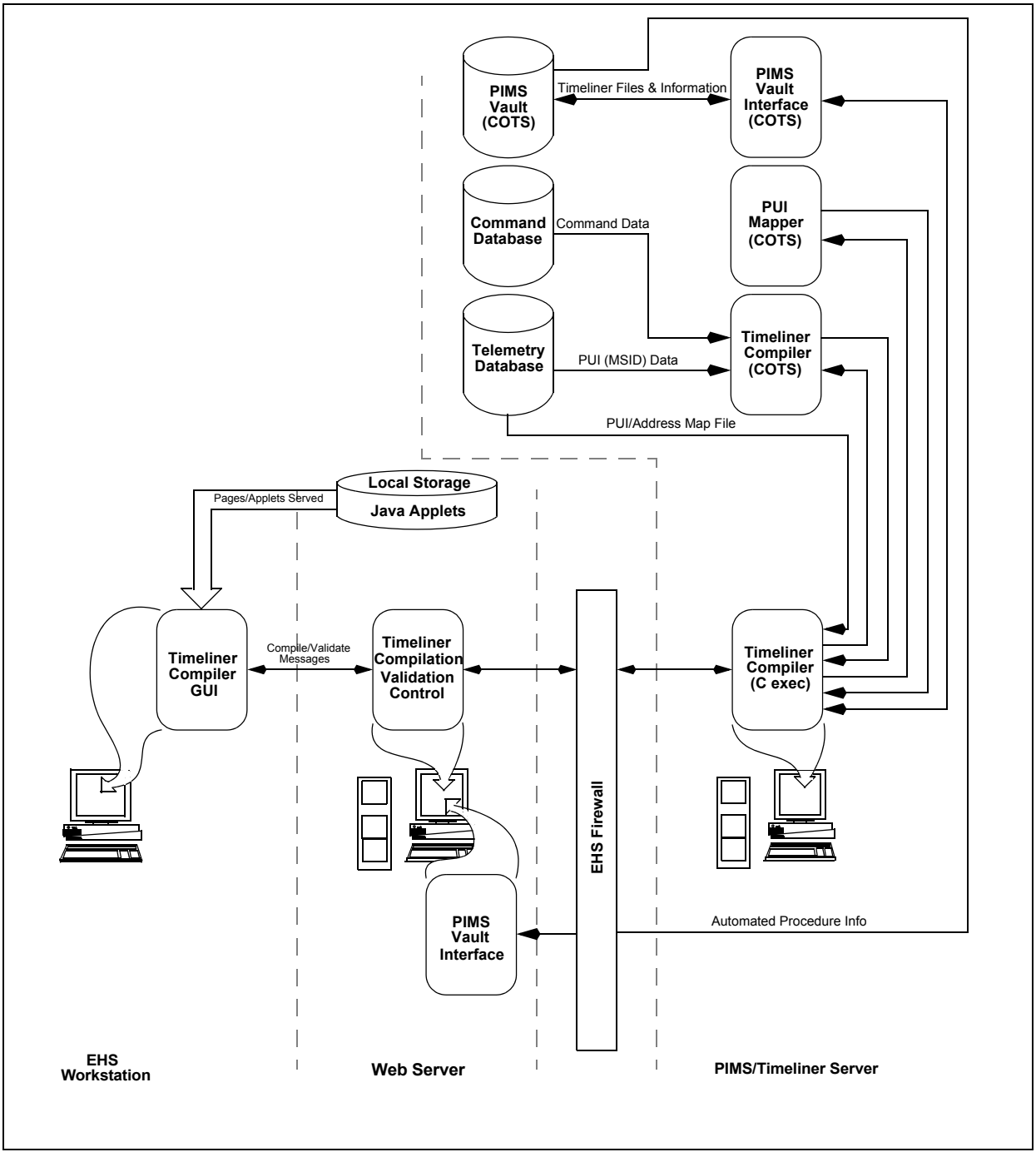


Figure 18-71, PIMS Timeliner Overview.

The functions performed by the PIMS Timeliner Compiler are:

- Semantic checking of the input bundle source file (.TLS). If semantic errors are found they will be listed in the Bundle ASCII Listing File (.TLL).
- Syntax checking of the of the input bundle source file (.TLS). If syntax errors are found they will be listed in the Bundle ASCII Listing File (.TLL).

- Resolve references to external components such as PUIs, commands, and onboard memory locations. This function is performed by the PUI Mapper software.
- Generate the output files. Note that the contents of the listing file will be different depending on whether the compilation was successful.

Note: For the remainder of this discussion reference Figure 18-72 , Timeliner Files Overview.

The compiler accepts a text bundle file (.TLS) as input and first checks for compiler directives. The compiler directives specify any required compiler options to control the compilation process. The compiler then parses each statement in the bundle input file and identifies language key words, operators, and components (semantic checking). References to external data such as telemetry and command mnemonics are resolved in the PUI Mapper software. If errors are encountered, then error messages are written to the listing file (.TLL). If no errors are encountered, the executable data is prepared for output. This includes conversion of numbers to the target machine type as needed. The compiler output files are then generated.

Four output files are created by a successful compilation, and one file is created for an unsuccessful compilation.

Bundle ASCII Listing File (.TLL)

An unsuccessful compilation results in a Listing file (.TLL file extension) which contains the compiler error messages. A listing file is also generated by a successful compilation, but it is an ASCII listing instead of error messages. The listing file contains a human readable ASCII file listing for each successfully compiled bundle. This file can be read by all ground controller software and can be read by the onboard crew using the Automated Procedure Viewer (APV) crew display. It can be used as the basis for monitoring and execution control of the automated procedures.

Configuration Summary File (.TLC)

This file is created by a successful compilation and will contain a list of command names and descriptive names. The purpose of the configuration summary file is to support ground-based configuration management and tracking functions. This file also captures any pertinent database product configuration information. Possible uses of the configuration summary file include verifying that the commands do not include any hazardous commands, categorizing bundles based on command or CVDT usage, and tracking command and telemetry database file changes and their effects on previously compiled and verified files.

Bundle PUI Name File (.TLP)

This file is created by a successful compilation and will contain all PUI names corresponding to the external variable references (CVDT data) in the input bundle source file. This file is used as an input file to the PUI Mapper software, which will use a mapping file to generate the absolute memory addresses for the CVDT data variables. The PUI Mapper software produces an output file called a PUI Address file (.TLA) based on this file. The PUI Address file is uplinked along with

the executable file (.TLX) created by the compiler. It is used to search a ground-based database file that serves as a PUI name to onboard address correlation file.

Bundle Executable File (.TLX)

This file is created by a successful compilation and will be read in by available Command and Data Handling (C&DH) file read services and executed by the onboard Timeliner Executor software. It requires the uplinked PUI Address file (.TLA) to resolve the external references to CVDT data.

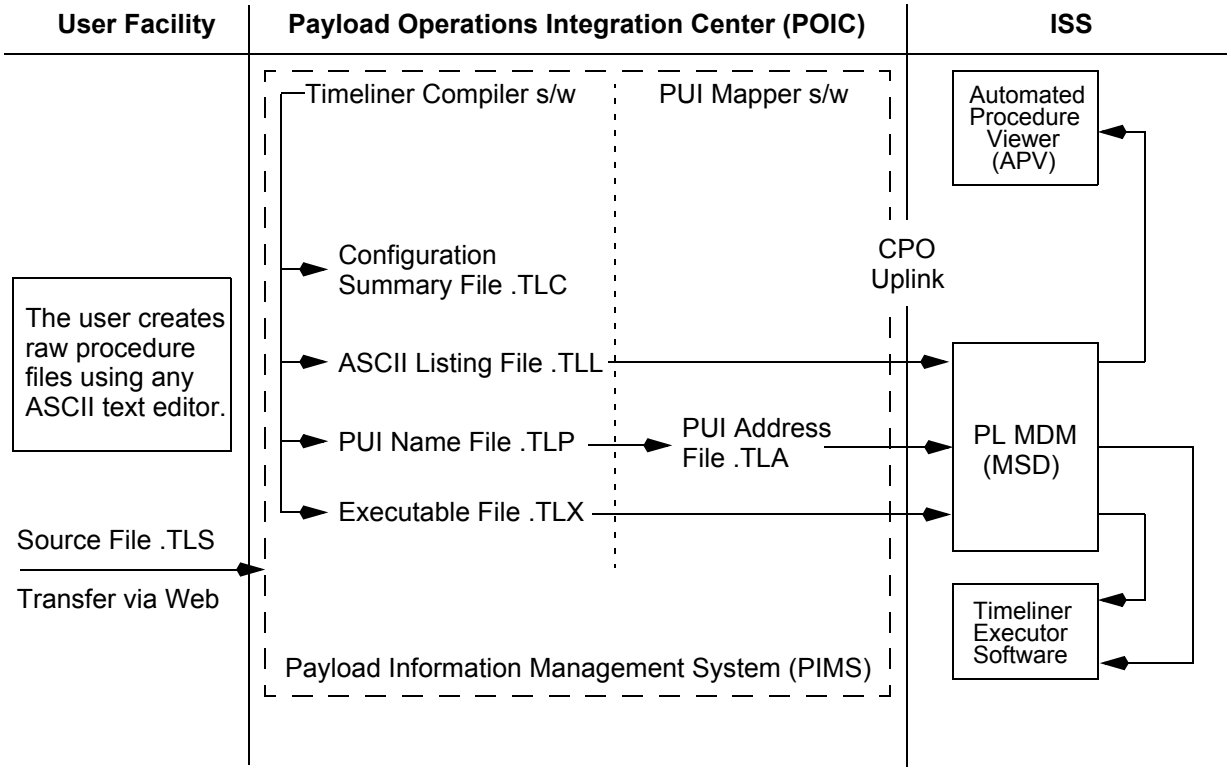


Figure 18-72, Timeliner Files Overview.

The Timeliner Compiler may be accessed directly from the **PIMS** menu on the **Launchpad** or it may be navigated to through the **(PIMS) Complete Task** main window for editing a stateless document, **Document Information Tab**. The Document Information Tab for an automated procedure contains an **Automated Procedure Information** frame (see Figure 18-73 , Automated Procedure Document Information Tab.)

Help: For complete information concerning the Complete Task dialog box for a stateless document see Section 18.1.3.1.1 Complete Task Dialog Box - Stateless Document Configuration.

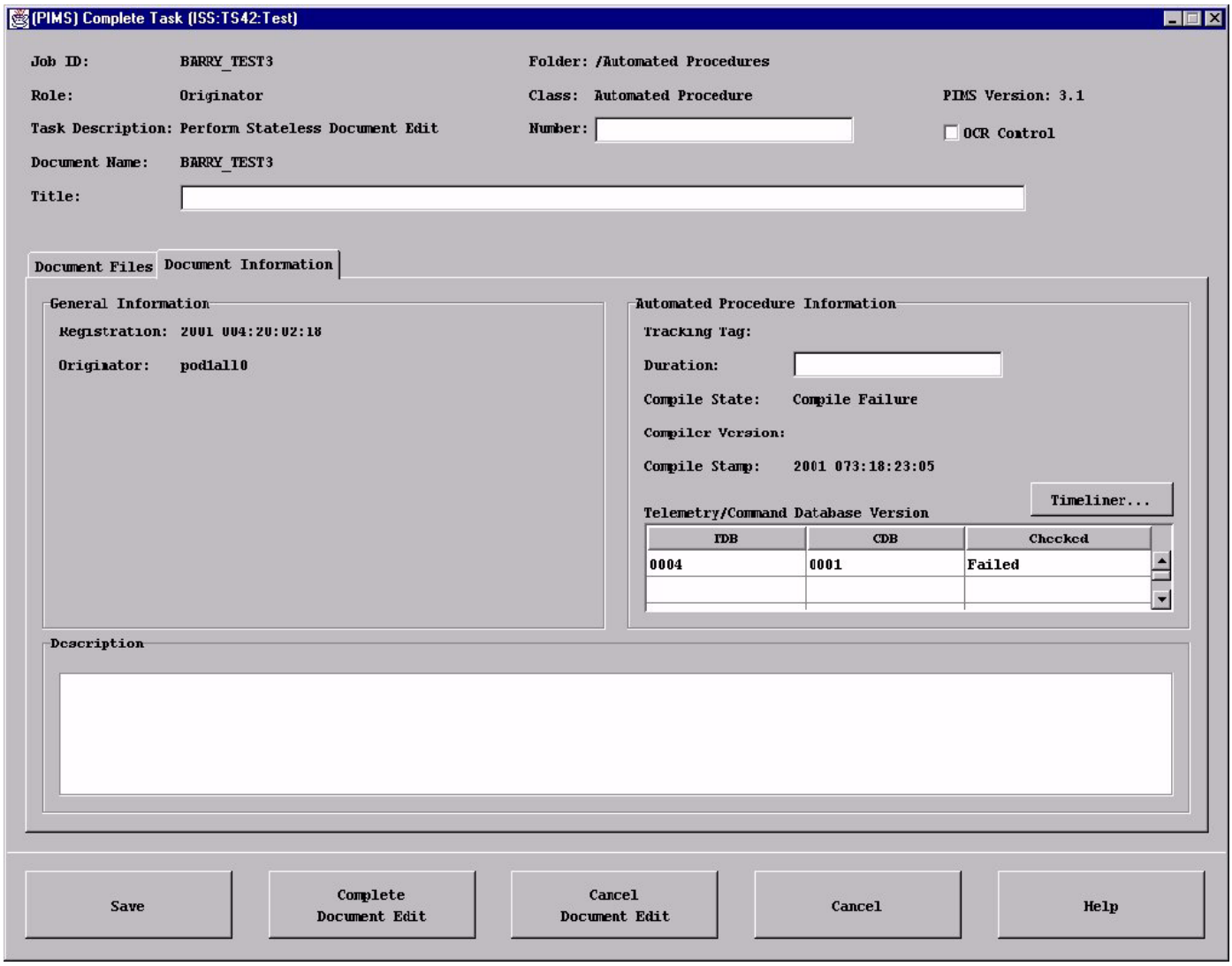


Figure 18-73, Automated Procedure Document Information Tab.

The **Automated Procedure Information** frame contains the following information:

- **Tracking Tag:**
- **Duration:**
- **Compile State:**
- **Compiler Version:**
- **Compiler Stamp:**
- **Telemetry/Command Database Version** (applicable to this MOP)

The **Automated Procedure Information** frame also contains Timeliner... which when selected invokes the **Timeliner Compiler** dialog box (see Figure 18-74 , Timeliner Compiler dialog box.)

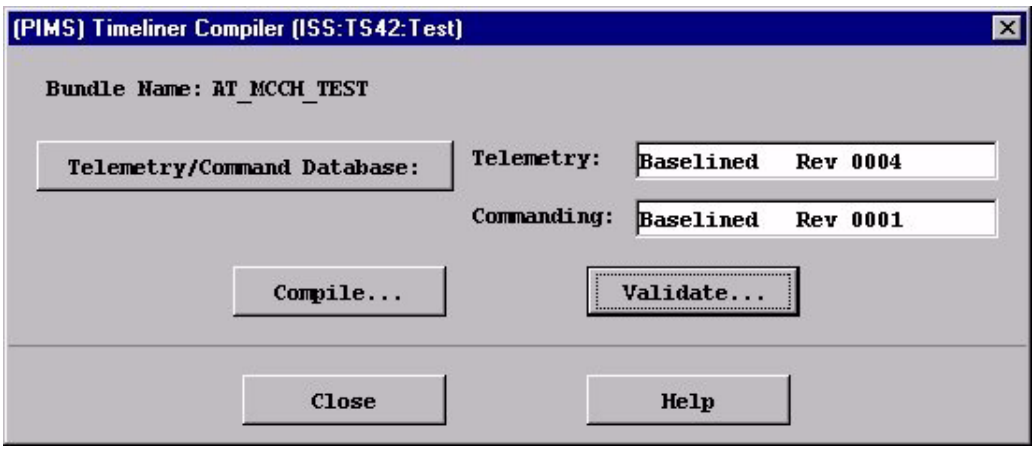


Figure 18-74, Timeliner Compiler dialog box.

The **Bundle Name:** text field displays the Document Name of the automated procedure from the **Complete Task** main window.

The **Telemetry:** and **Commanding:** text entry fields will contain the database versions that the automated procedure is to be compiled/validated against. If you want to compile/validate the automated procedure against a database version other than that displayed, clicking Telemetry/Command Database: invokes the **Set Database Versions** dialog box from which a selection may be made.

Help: For complete information concerning the **Set Database Versions** dialog box see Section 18.4.2 Work Area.

Clicking Compile... invokes the **Compile** dialog box.

Help: For complete information concerning the Compile dialog box see Section 18.4.3.1 Compile...

Clicking Validate... invokes the **Validate** dialog box.

Help: For complete information concerning the Validate dialog box see Section 18.4.3.3 Validate...

The remaining sections of this chapter will discuss the windows, dialog boxes, and menu items of the **Timeliner Compiler** application as they would appear if the Timeliner Compiler were accessed directly from the **PIMS** menu of the **Launchpad**.

The Timeliner Compiler main window contains two distinct features that will be discussed in this chapter (see Figure 18-75 , Timeliner Compiler main window.):

- Menu bar

- Work area

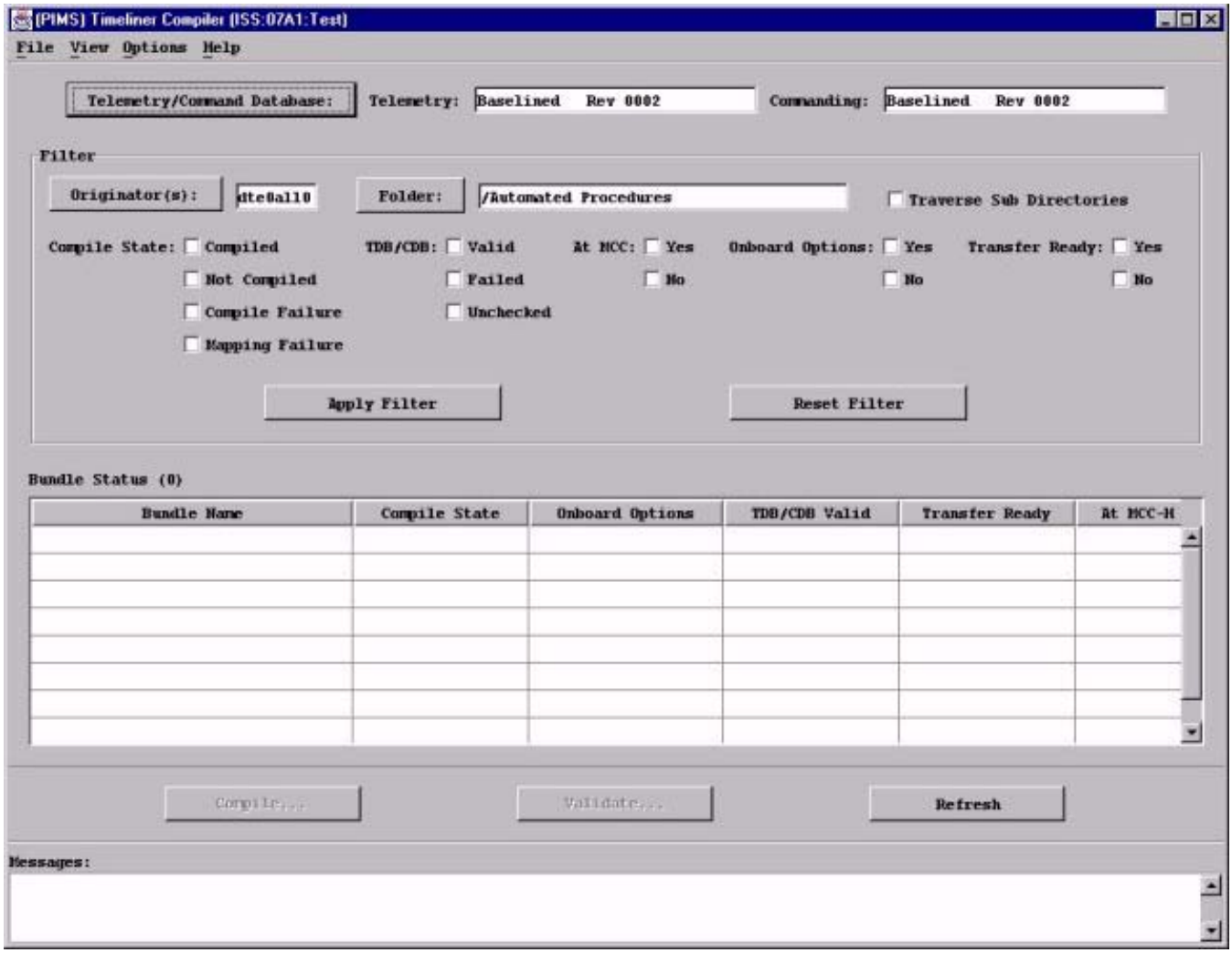


Figure 18-75, Timeliner Compiler main window.

18.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Compile...**
  - **Set Compiler Options...**
  - **Validate...**

View Document Properties...

18.4.2 Work Area

The work area provides for selection of a Command and Telemetry database other than the default, currently baselined version; selection of filter criteria; and a table that displays the results of completed searches.

The top of the work area contains the **Telemetry:** and **Commanding:** text fields which will contain the currently baselined version of the databases. If you want to validate or compile an automated procedure file against different versions of the databases, clicking Telemetry/Command Database: will invoke the **Set Database Versions** dialog box which allows you to specify a new database to use.(see Figure 18-76 , Set Database Versions dialog box.)

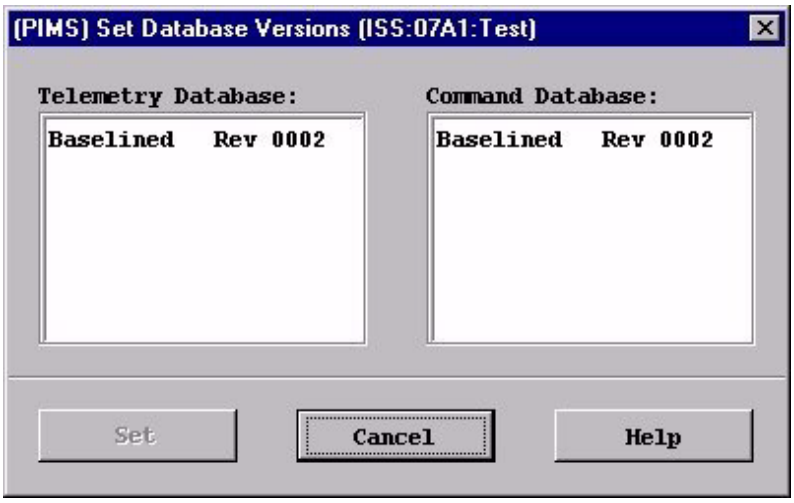


Figure 18-76, Set Database Versions dialog box.

The **Set Database Versions** dialog box is composed of a Telemetry Database: and a Command Database: list. Each list contains all the available databases for the current MOP.

Clicking Set changes the **Telemetry/Command Database:** entries on the Timeliner Compiler main window with selections made from either/both of the lists and returns the user to the main window. The Set remains inactive until a selection is made from either/both of the lists.

When the Timeliner Compiler is initially invoked the Bundle Status table will contain a default list of bundles. The default list represents all the automated procedure files belonging to the current EHS userid for the current versions of the Telemetry and Command databases. Filter criteria may be applied to this list using the options provided in the Filter Frame. The Filter frame consists of two pushbuttons with associated text entry fields, a host of checkboxes, and two pushbuttons.

The **Originator(s):** text field will default to the current userid. To change Originator, click Originators: to invoke the **Select Originator(s)** dialog box (see Figure 18-77 , Select Originator(s) dialog box.)

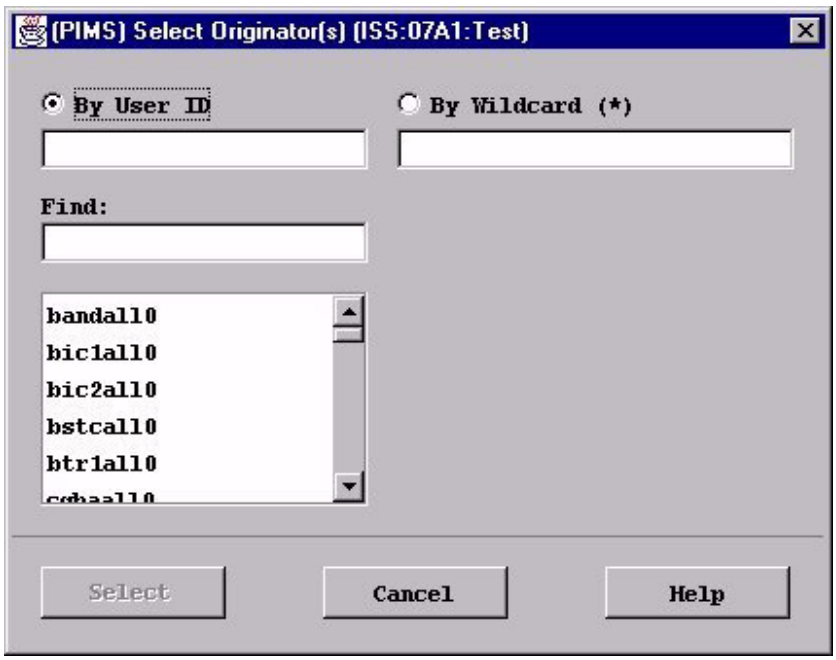


Figure 18-77, Select Originator(s) dialog box.

The **Select Originator(s)** dialog box provides filtering by either selecting a User ID (left side of dialog box) or by specifying a wildcard (right side of dialog box).

Selection of the **By User ID** radio button allows you to provide selection criteria by User ID. The display only field below the radio button will contain the results of a find operation involving the **Find:** text entry field and the scrollable list below it.

The **Find:** text entry field is used as an expediant means to search the scrolled list below it as this list may be quite long. The scrolled list contains all User IDs that are valid for this MOP. Typing the first character of a User ID in this field will select the first User ID in the list beginning with that character, thus, decreasing the amount of list that you may have to scroll through. The User ID selected in this fashion is displayed in the **By User ID:** text entry field. To further narrow your search you may use additional characters in the **Find:** field. Searches are conducted in alphabetical order; if a User ID is not present for the characters entered, then the next User ID in alphabetical order is selected.

Selection of the **By Wildcard (*)** radio button will result in all OCRs originated by all the User IDs (referenced by the wildcard entered in the text entry field) being displayed in the table once the filter has been applied. If only an * is entered in the **By Wildcard (*)** text entry field then it is conceivable that all OCRs for the MOP will be displayed in the table (this would be limited only

by the selection of other filter criteria specified in the Filter frame of the Operations Change Request main window).

Clicking Select replaces the current entry in the **Originator(s):** text entry field with selections made from either the **By User ID** or **By Wildcard (*)** fields and closes the **Select Originator(s)** dialog box.

The Folder: text field defaults to the Automated Procedures folder within the PIMS database. If you want to retrieve files from a folder other than the Automated Procedures folder, clicking Folder: will invoke the **Select PIMS Folder** dialog box (see Figure 18-78 , Select PIMS Folder dialog box.)

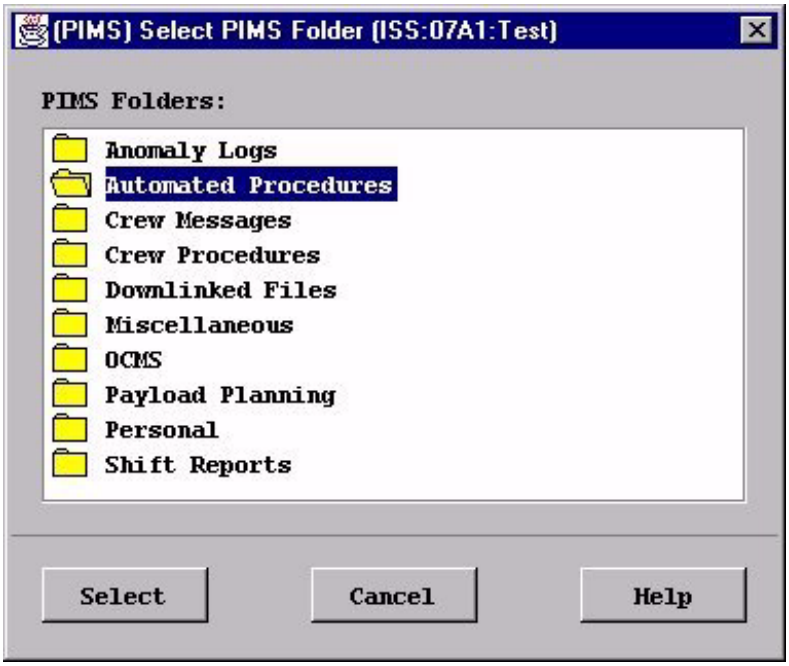


Figure 18-78, Select PIMS Folder dialog box.

The **PIMS Folders:** selection list displays the available storage folders in the PIMS database.

Note: Clicking once on a folder from the PIMS Folders: selection list highlights it for selection. Clicking twice highlights the folder for selection and also displays the contents of the selected folder.

Clicking Select closes the **Select PIMS Folder** dialog box and enters the name of the selected PIMS folder from the **PIMS Folders:** selection list into the appropriate input text field on the application main window/dialog box. The Select is unavailable (insensitive) until a folder is selected on the **PIMS Folders:** selection list.

Selection of the **Traverse Sub Directories** checkbox causes sub-directories within individual directory folders to be omitted during the filter process.

Checkboxes are organized under the following headings:

- **Compile State:**
- **TDB/CDB**
- **At MCC:**
- **Onboard Options:**
- **Transfer Ready:**

Multiple selection of checkboxes is permitted.

Clicking Apply Filter applies the selected filter criteria to the Bundle Status table.

Clicking Reset Filter disregards any selected filter criteria and applies the default criteria to the Bundle Status table.

The Bundle Status table consists of six columns labeled as follows:

- **Bundle Name**
- **Compile State**
- **Onboard Options**
- **TDB/CDB Valid**
- **Transfer Ready**
- **At MCC-H**

The **Bundle Name** column contains a list of bundles for which status is being displayed.

The **Compile State** column indicates if the bundle has successfully or unsuccessfully finished the compilation process. If the bundle failed the compilation process, the failure will be listed as a compile or mapping failure. The possible values for this column are:

- **Compiled**
- **Not Compiled**
- **Compile Failure**
- **Mapping Failure**

The **Onboard Options** column indicates if the bundle was compiled with uplinkable options. Even if a bundle has been compiled, it must have had the option set to produce an executable file. If there is no executable file, then the bundle is not ready to be transferred to MCC-H. The possible values for this column are **Yes** and **No**.

The **TDB/CDB Valid** column indicates if the bundle has been validated against the current Telemetry Database (TDB) and Command Database (CDB). The possible values for this column are **Valid**, **Failed** and **Unchecked**.

The **Transfer Ready** column indicates if the bundle has been transferred to MCC-H for Uplink. The possible values for this column are **Yes** and **No**.

The **At MCC-H** column indicates if the compiled bundle has been transferred to MCC-H and is or is not available for uplink. The possible values for this column are **Yes** and **No**. Note that values in other columns must also be considered prior to uplink.

Table 18-4 , Bundle status decision matrix displays possible column value combinations, their meaning, and a description of the action the user will need to take before the file may be considered available for uplink:

Table 18-4, Bundle status decision matrix

Compile State	Onboard Options	TDB/CDB Valid	Transfer Ready	At MCC-H	Meaning/Action
Compiled	Yes	Valid	Yes	Yes	Available for uplink
Compiled	Yes	Valid	Yes	No	Available for Transfer and subsequent uplink. **Solution: Transfer from PIMS Documents application.**
Compiled	Yes	Unchecked	No	No	Successfully compiled against some other combination of TDB/CDB, but has not been validated against the current TDB/CDB. **Solution: Validate**
Compiled	Yes	Failed	No	No	Successfully compiled against some other combination of TDB/CDB, but failed validation against the current TDB/CDB. **Solution: Recompile**
Compiled	No	Valid	No	No	Successfully compiled and valid - not Transfer Ready because of uplink options. **Solution: Recompile with uplinkable options.**

Compile State	Onboard Options	TDB/CDB Valid	Transfer Ready	At MCC-H	Meaning/Action
Compiled	No	Unchecked	No	No	Successfully compiled against some other combination of TDB/CDB, but has not been validated against the current TDB/CDB. Also lacks uplinkable compiler options. **Solution: Recompile with uplinkable options.**
Compiled	No	Failed	No	No	Successfully compiled against some other combination of TDB/CDB, but failed validation against the current TDB/CDB. Also lacks uplinkable compiler options. **Solution: Recompile with uplinkable options.**
Not Compiled	No	Unchecked	No	No	Never compiled. **Solution: Compile.**
Compile Failure	<any>	<any>	No	No	An attempt to compile the program has failed. **Solution: If the compilation window is available, errors can be viewed there. If not, the user must view the listing (.tll) file in PIMS Documents. Make corrections to the source file and recompile.**
Mapping Failure	<any>	<any>	No	No	Program compiled successfully, but failed during the mapping. Indicates system configuration error. **Solution: Contact System Administrator.**

18.4.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Timeliner Compiler Application. All of the menu items from the **Options** menu will be discussed (see Figure 18-79 , Timeliner Compiler Options menu.)

Figure 18-79, Timeliner Compiler Options menu.

18.4.3.1 Compile...

The **Compile...** menu item invokes the **Compile** dialog box (see Figure 18-80 , Compile dialog box.) Bundles to be compiled are selected in the Timeliner Compiler main window. The Compile dialog box allows you to compile the bundle(s) selected on the Timeliner Compiler main window. Following is a brief description of the Timeliner compilation process:

- the user optionally selects a command and telemetry database to compile against or proceeds with the default baseline versions.
- the user selects the automated procedure(s) to compile.
- the user sets compiler options or proceeds with the defaults.
- the source file(s) of the selected automated procedure(s) is retrieved from the PIMS database
- the source file(s) are compiled, commands are verified against the command database, and PUIs are verified against the telemetry database. Timeliner PUIs have a one-to-one relationship to EHS telemetry MSIDs.
- the compilation process produces the executable (.tlx), listing (.tll), PUI name (.tlp), and configuration summary (.tlc) files.
- PUI names are mappped to absolute addresses and stored in the address file (.tla) utilizing addressing information obtained from the telemetry database.
- all resultant files are stored in the PIMS database.
- status information generated by the compiler and mapper software is displayed to the user

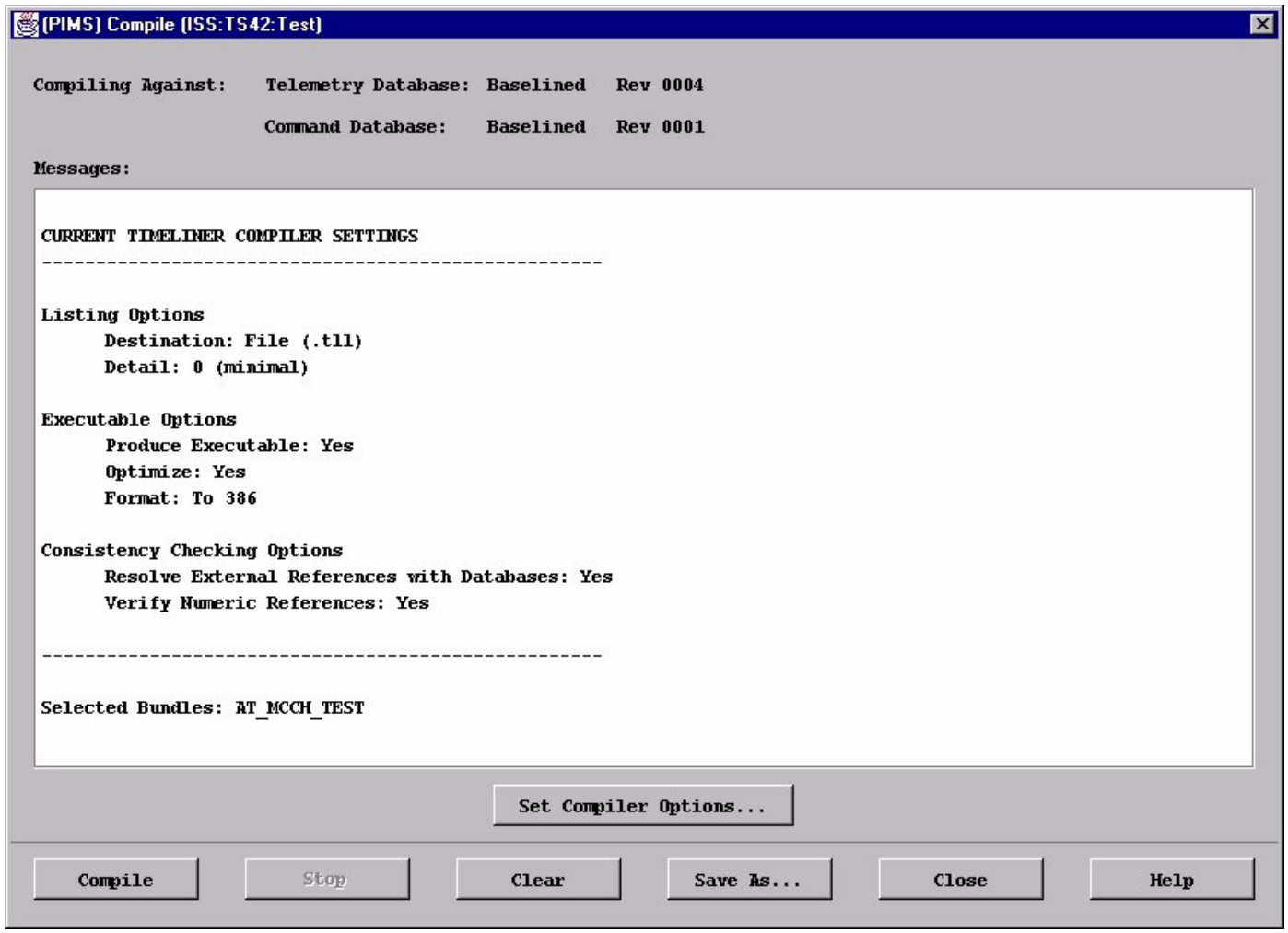


Figure 18-80, Compile dialog box.

The **Compiling Against:** display only fields indicate the current Telemetry and Command databases that the bundle(s) will be compiled against.

When the Compile dialog box is invoked the **Messages:** area will contain the Current Timeliner Compiler Settings. If necessary the current settings may be edited by clicking the Set Compiler Options... pushbutton which invokes the **Set Compiler Options** dialog box (see Section 18.4.3.2 Set Compiler Options...). The bundle file(s) that will be compiled is also listed in the **Messages:** area below the current Timeliner Compiler settings. The compilation software will not be initiated until Compile is selected. The indicated bundle file(s) will be compiled one at a time. All Unix standard out messages from the Timeliner Compiler software will be appended to the Messages area under the list of **Selected Bundles:**. At the end of the compilation of each bundle, a single summary status for the bundle is appended to the Messages area (see Figure 18-81 , Summary Status.)

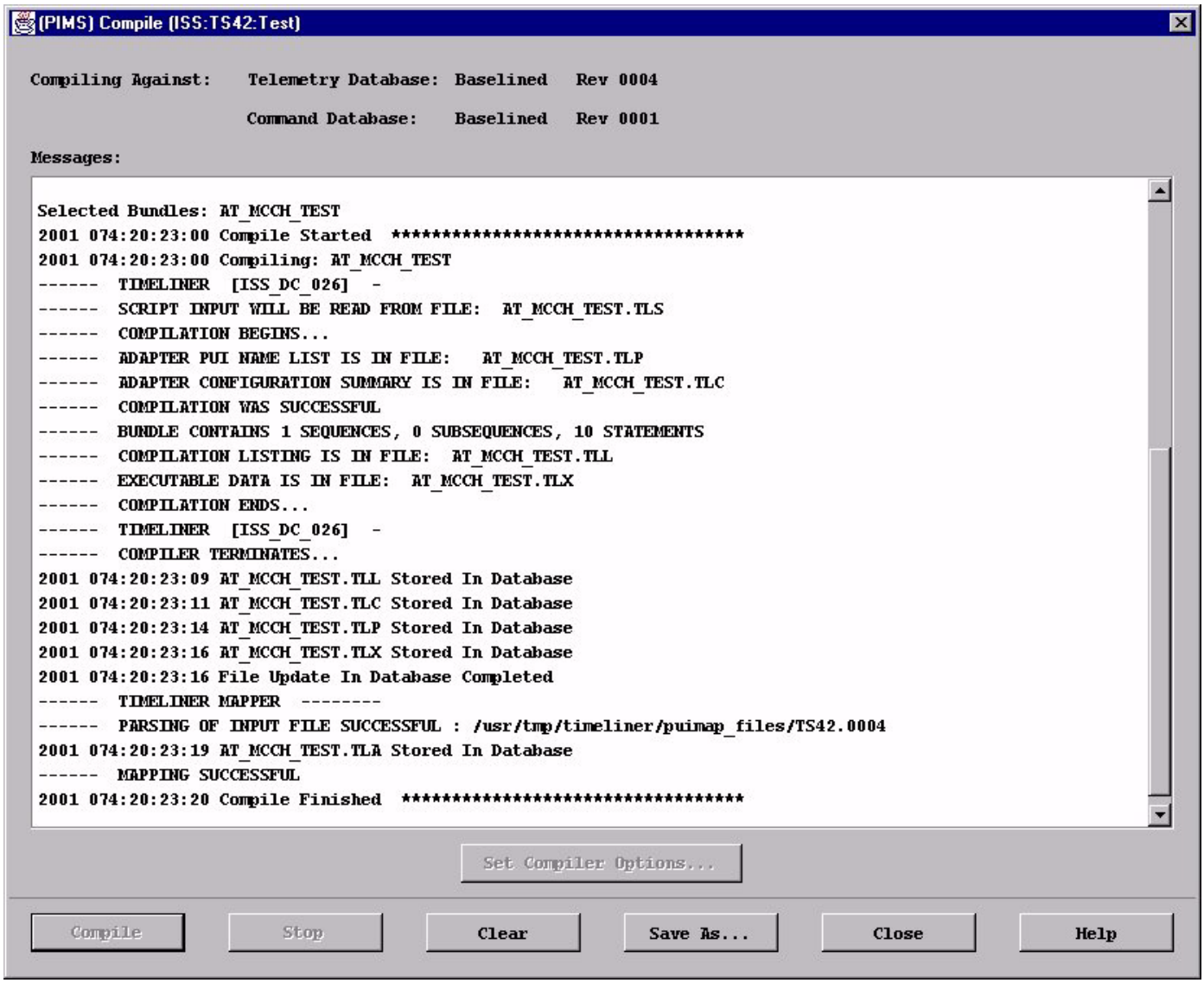


Figure 18-81, Summary Status.

Clicking Compile initiates the compilation process. This pushbutton will become insensitive once the compilation has been started.

If multiple bundles are being compiled, the Stop may be pressed to stop the compilation process after the current bundle. This pushbutton will only be sensitive while a compilation is in progress.

Clicking Clear clears all messages from the Message area.

Clicking Save As... invokes the Save As dialog box which allows you to save the standard output appearing in the Message area to a file of your choice (see Section 18.4.3.1.1 Save As...).

18.4.3.1.1 Save As...

The **Save As** dialog box allows you to save a file to your local workstation or a remote system (see Figure 18-82 , Save As dialog box.)

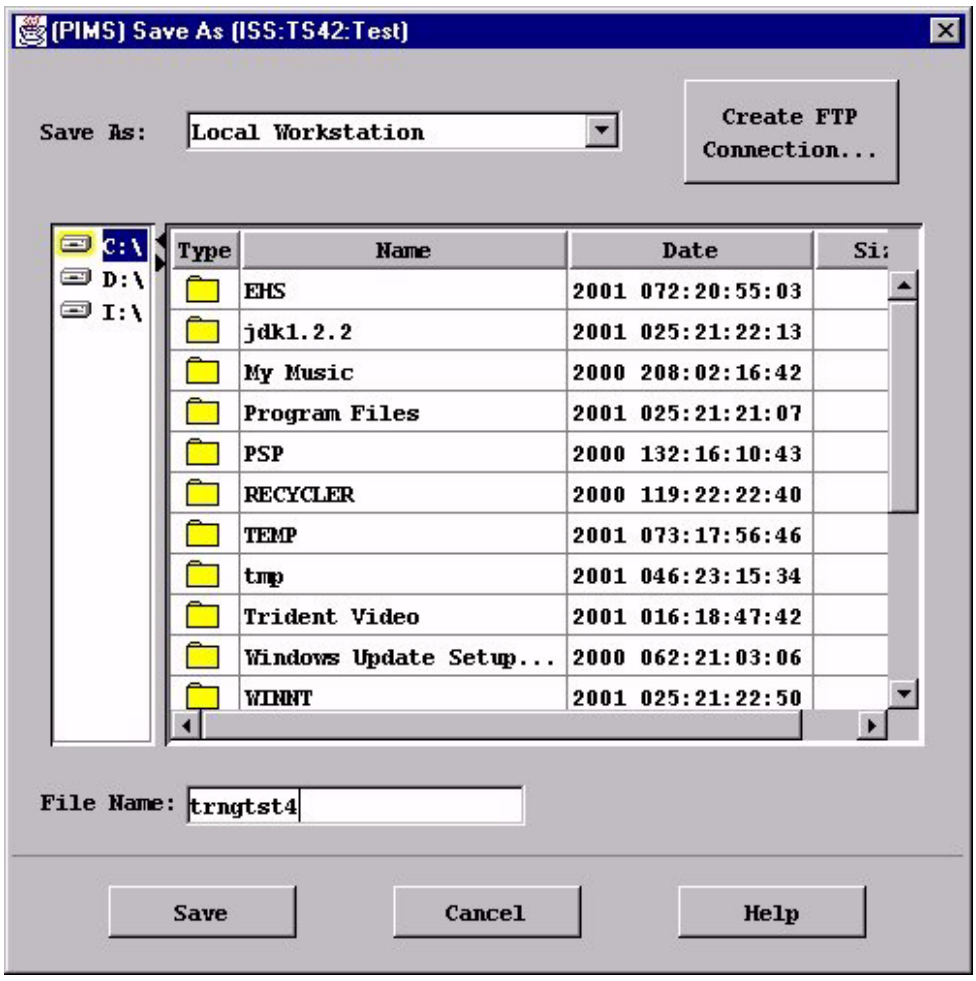
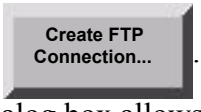


Figure 18-82, Save As dialog box.

The **Save As:** field contains a pulldown option menu from which you select the location of the system that you want to save the file on. The possible options include **Local Workstation** (default), or the IP address of a remote system that you have an FTP connection established with.

To the right of the **Save As:** field is 

. Selecting this pushbutton invokes the Create FTP Connection dialog box. This dialog box allows you to save the file to a remote system by establishing an FTP connection to it. After an FTP connection has been established, the IP address of the remote system will be displayed as an option on the **Save As:** pulldown menu.

The next area of the Save As dialog box contains two frames. The frame on the left displays the root level directories on your local workstation. Double-clicking on a folder will display the contents in the frame to the right. Both frames contain scroll bars to view portions of the lists that initially may not be visible.

The frames can be resized horizontally by clicking and dragging on the bar between them or clicking on one of the black arrow symbols located on the bar.

The frame on the right displays the contents of the folder selected in the left frame. This frame contains four columns:

The **Type** column displays an icon depicting the file type

Help: For a description of PIMS file types see Appendix AF: PIMS Folder Types and Icon Representations.

The **Name** column displays the filename

The **Date** column displays the date that the file was last revised

The **Size** column displays the file size in bytes

Below the two frames is the **File Name:** input text field. Enter the filename for the report to be saved on your local/remote workstation.

Clicking

invokes a message dialog box informing you that the report was successfully saved.

18.4.3.2 Set Compiler Options...

Transfer Ready automated procedures are available for retrieval and submission to MCC-H for subsequent uplink to the ISS via the commanding subsystem. Automated procedures are considered Transfer Ready if all of the following are true:

- The automated Procedure is in the Baselined state.
- The automated procedure is successfully compiled with uplinkable or "onboard" compiler options. The following, which are compiler options, must be true for a compilation to be considered uplinkable:
    - a listing file (.tll) is produced.
    - the level of detail of the listing file is set to the minimum value (0).
    - an executable file (.tlx) is produced.
    - source file object verification is performed against the TDB and CDB, as appropriate.
    - source file object validation is performed for numeric objects.
    - the executable is in the proper format for the onboard platform (386).

- The automated procedure is valid against the current Baselined versions of he TDB and CDB.

Automated procedures are considered "Uplinkable" if it has been transferred to MCC-H and is awaiting an uplink command

The **Set Compiler Options** dialog box allows the user to change the compiler default values (see Figure 18-83 , Set Compiler Options dialog box.)

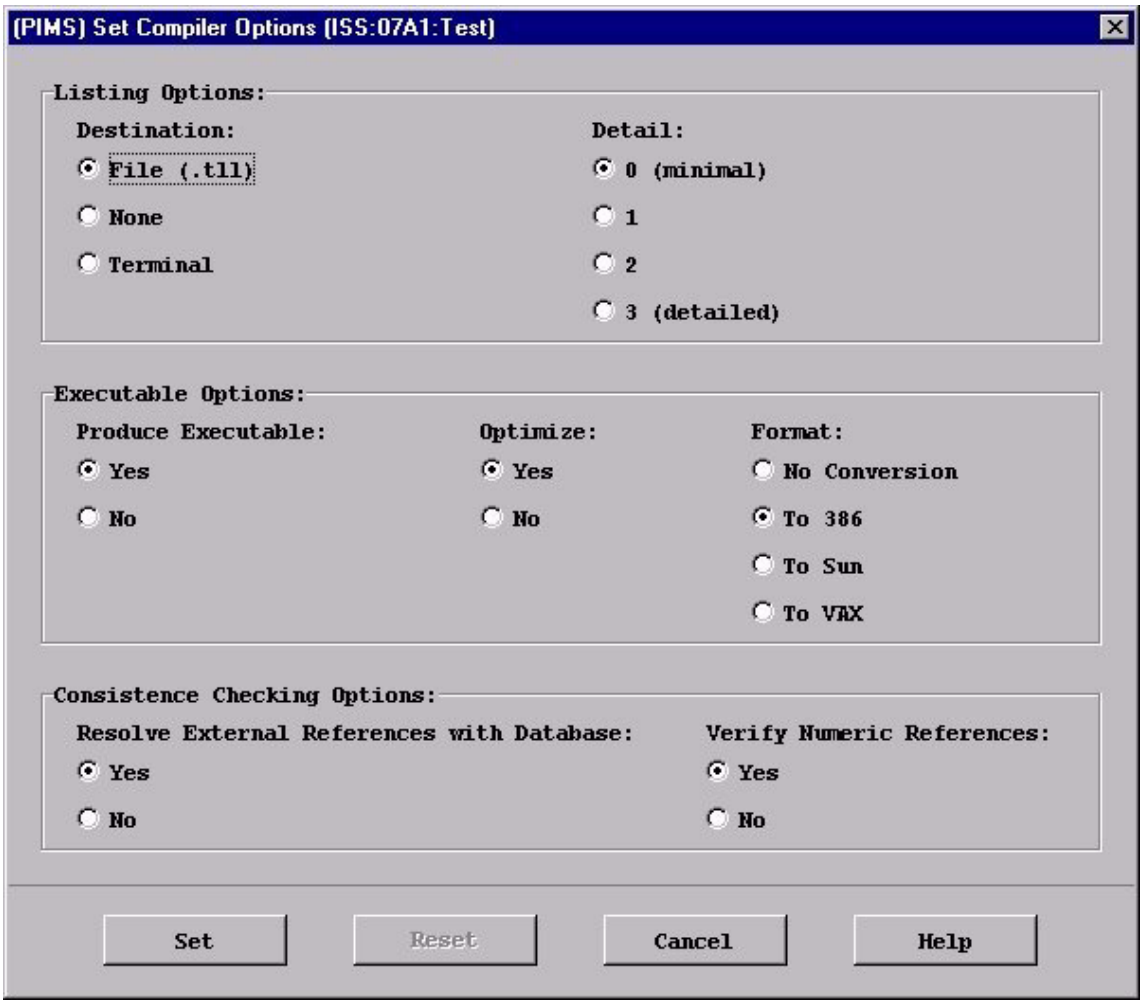


Figure 18-83, Set Compiler Options dialog box.

The dialog box consists of three frames and a control panel.

The **Listing Options:** frame contains a group of radio buttons labeled **Destination:** and another group labeled **Detail:**.

The selections made available under the **Destination:** heading determine whether a listing file is created by the compiler, and if it is created, what the destination of the listing file will be. The user

can choose not to create a listing file by specifying **None**. A listing file can also be created and displayed on the **Terminal** or sent to a listing **File (.tll)** within the PIMS database. The default option is for the listing file to be saved to the PIMS database. The default name for the listing file is the same as the input source file (.tls) but with the file name extension changed to .tll.

The choices made available by the **Detail:** option allow the user to specify the level of detail in the compiler listing, on a scale from **0 (minimal)** to **3 (detailed)**. The default level of detail is **0 (minimal)**.

The **Executable Options:** frame contains groups of radio buttons labeled as follows:

- **Produce Executable:**
- **Optimize:**
- **Format:**

The user can specify whether the compiler will generate an executable (.tlx) output file by selecting either **Yes** or **No** under the Produce Executable: option. The default value is **Yes**.

The **Optimize:** option allows the user to specify whether the compiler will perform optimization during compilation. If the user requests optimization (**Yes**), the compiler will ignore duplicate items and only store new data elements. The default value is **Yes**.

The user can specify the output of the executable file with the choices made available by the **Format:** option. This allows a user to compile on one host platform and produce an executable file that will execute on a different platform. The current platforms available are 386, Sun, and VAX. An executable file for the same platform is specified by **No Conversion**. To target a 386 family machine, use **To 386**; to target a Sun machine use **To Sun**; to target a VAX machine, use **To VAX**. Since the PL MDM is based on an Intel 386 architecture, the default setting is **To 386**.

The **Consistence Checking Options:** frame contains a group of radio buttons labeled **Resolve External References with Database:** and another group labeled **Verify Numeric References:**.

The **Resolve External References with Database:** option specifies whether the compiler will perform a database search to resolve references to external components used in the bundle file. If the search is requested (**Yes**), all external references will attempt to be resolved. If the search is not requested (**No**), then no executable file will be created if a data element cannot be resolved. The default value is **Yes**.

The **Verify Numeric References:** option allows the user to specify whether the compiler will check the validity of numeric values in the bundle file. If the user requests a numeric check (**Yes**), then the compiler will attempt to resolve all numeric references and ensure their proper usage. If a check is not requested (**No**), the compiler will ignore all numeric values. The compiler will also ignore all lines that start with ******, ######, or ------. These are symbols inserted by a previous compilation, and disabling the numeric check allows the compiler to recompile a listing file created by a previous compilation. The default is **Yes**.

Clicking Set selects any new options chosen by the user, and returns the user to the application that invoked the Set Compiler Options dialog box.

The Reset may be selected to restore all of the default value settings. This pushbutton will be insensitive until at least one of default Compiler options are altered.

18.4.3.3 Validate...

The **Validate...** menu item invokes the **Validate** dialog box (see Figure 18-84 , Validate dialog box.) Bundles to be validated are selected in the Timeliner Compiler main window. Actual control of the validation process is provided by the **Validate** dialog box.

Validation involves consistency checking against any available combinations of Baseline or Pre-Release versions of the Command and Telemetry databases. An automated procedure compilation will be considered valid against an alternate command and telemetry database version combination if all of the following are true:

- Command Database related conditions:
  - all of the commands used by the bundle are considered valid in the alternate release of the database.
  - all command parameters are valid and of the correct type and size in the alternate release of the database.
  - the automated procedure writer has privileges to issue the commands used by the bundle in the alternate release of the database.
- Telemetry Database related conditions:
  - all referenced variables or PUIs are considered valid and of the correct type and size in the alternate release of the database.
  - none of the referenced PUIs have different absolute addresses in the alternate release of the database.
  - the automated procedure writer has access privileges to all referenced PUIs in the alternate release of the database.

Validation will not result in updates to any automated procedure component files. The status of the validation is recorded in the PIMS database. The software will prohibit automated procedures that have either not been validated or have failed validation against the current command and telemetry database versions from being transferred and subsequently uplinked to the ISS. The user must initiate all corrective action for automated procedures which have failed validation. Corrective action for a failed validation involves recompilation and possible editing of the source file, should recompilation fail.

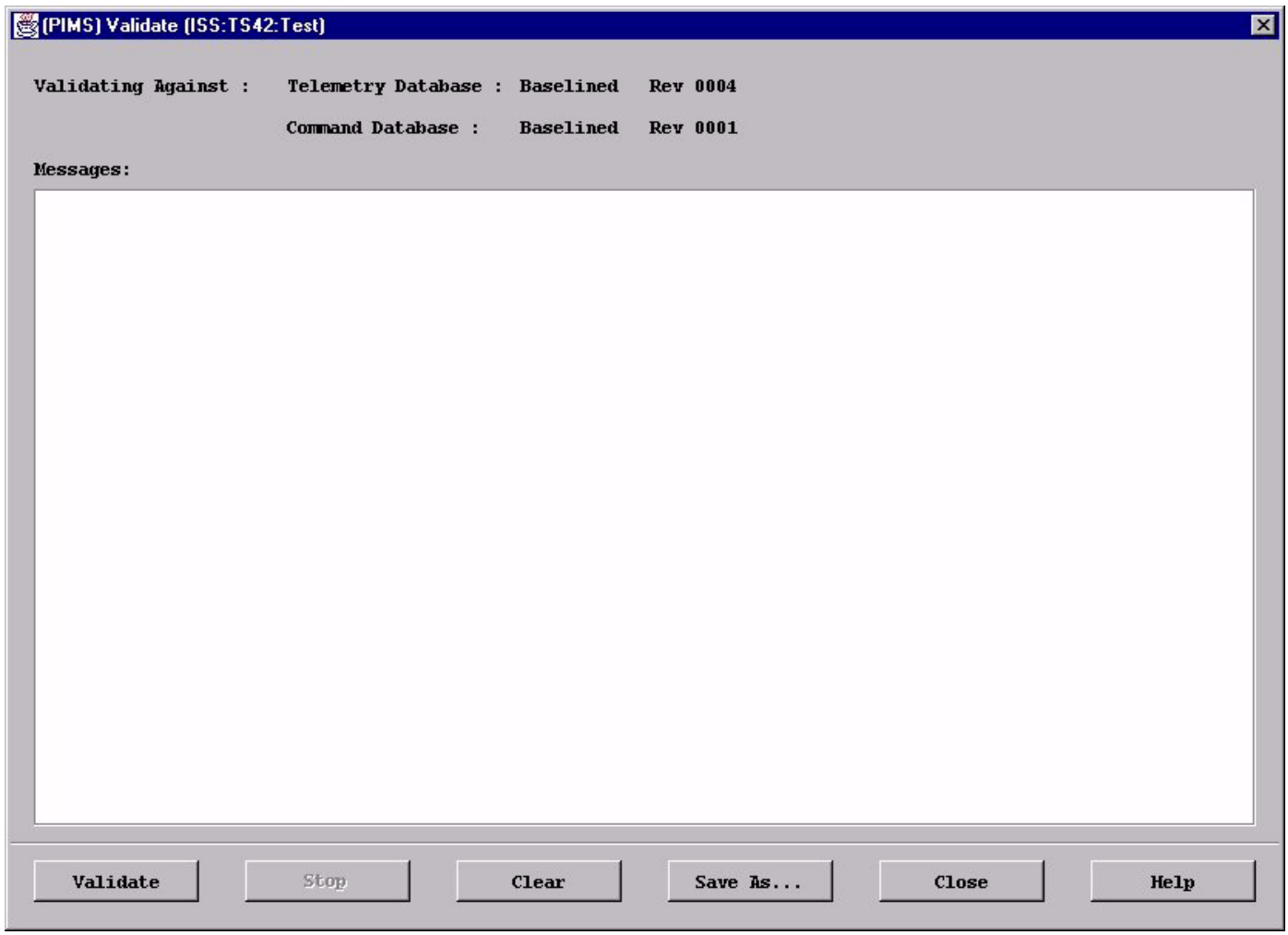


Figure 18-84, Validate dialog box.

The **Validating Against:** display only fields indicate the current Telemetry and Command databases that the bundle(s) will be validated against.

When the Validate dialog box is invoked the **Messages:** area will be blank. The validation software will not be initiated until Validate is selected. The indicated bundle file(s) will be validated one at a time. All Unix standard out messages from the validation software will be appended to the Messages area. At the end of the compilation of each bundle, a single summary status for the bundle is appended to the Messages area (see Figure 18-85 , Validate Summary Status Message.)

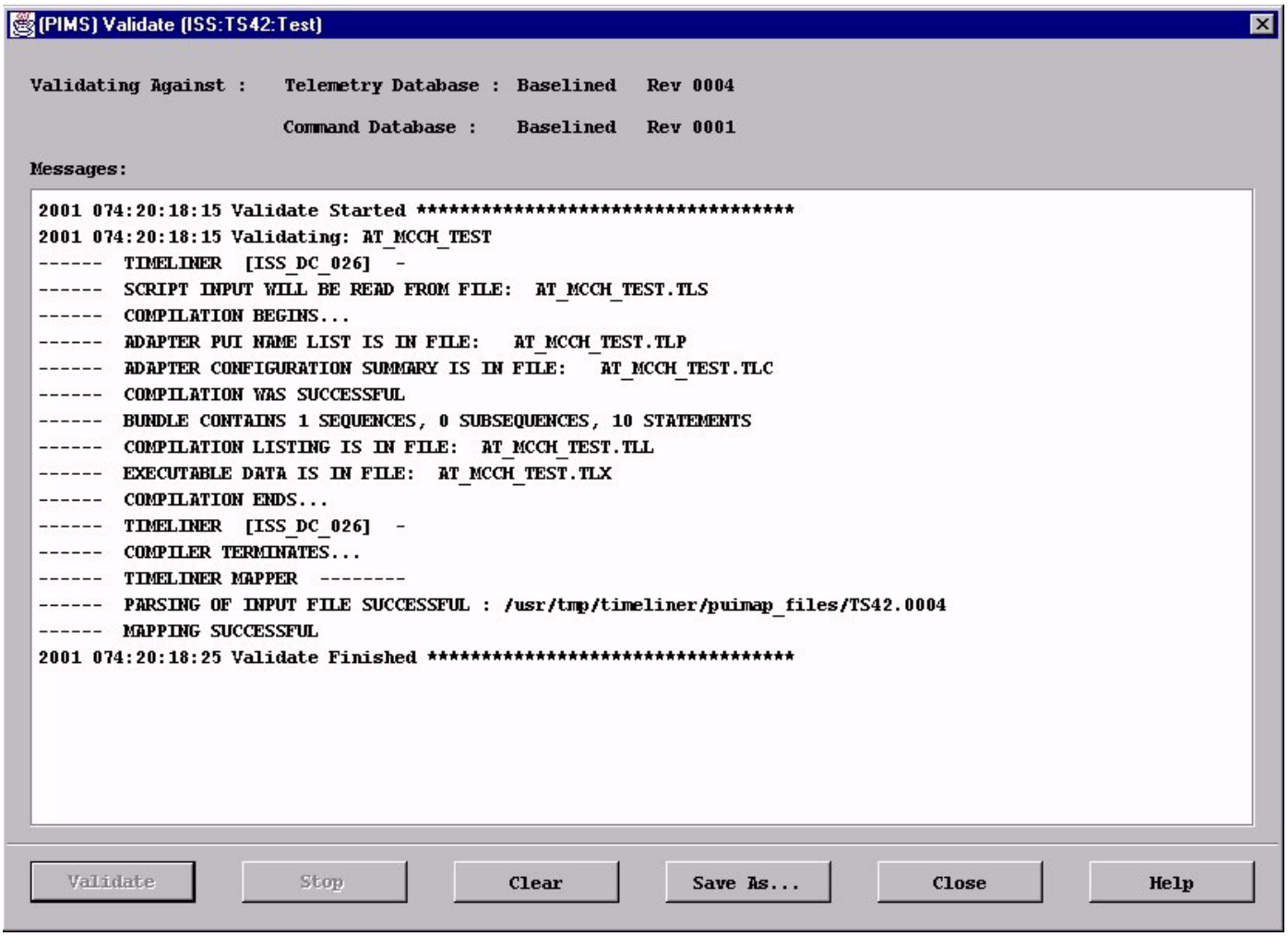


Figure 18-85, Validate Summary Status Message.

Clicking Validate initiates the validation process. This pushbutton will become insensitive once a validation has been started.

If multiple bundles are being validated, Stop may be pressed to stop the validation process after the current bundle. This pushbutton will only be sensitive while a validation is in progress.

Clicking Clear clears all messages from the Message area.

Clicking Save As... invokes the **Save As** dialog box which allows you to save the standard output appearing in the Message area to a file of your choice.

Help: For further information concerning the **Save As** dialog box see Section 18.4.3.1.1 Save As....

18.4.3.4 View Document Properties...

Selecting this menu item invokes the **View Document Properties** dialog box. This dialog box allows you to view information about any selected document.

Note: Only information peculiar to automated procedures and the Timeliner Compiler will be discussed in this section. For comprehensive information concerning the **View Document Properties** dialog box see Section 18.2.3.8 View Document Properties....

The Document Information tab of the **View Document Properties** dialog box contains an **Automated Procedures Information** frame (see Figure 18-86 , Automated Procedure Information frame.)

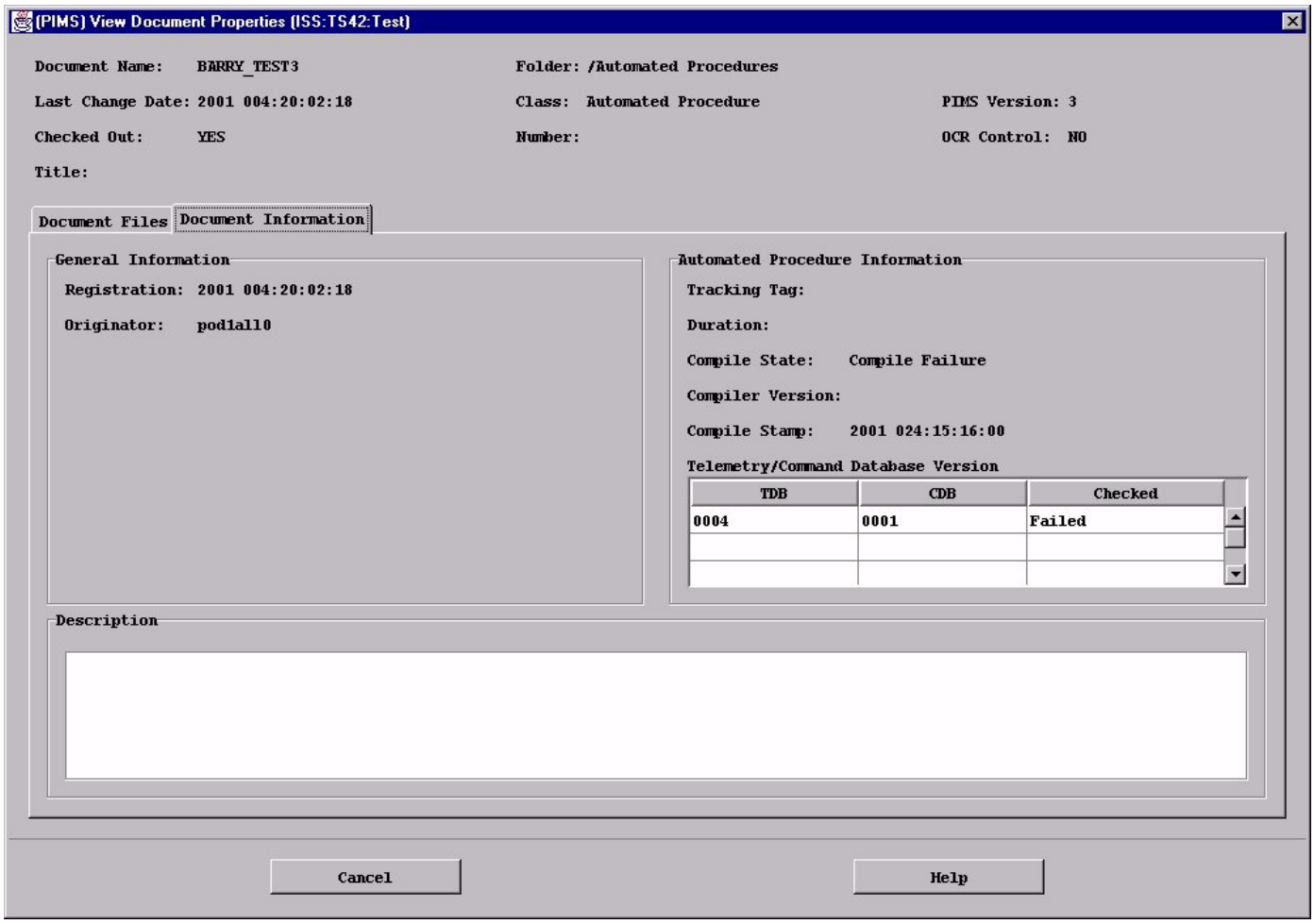


Figure 18-86, Automated Procedure Information frame.

The **Automated Procedure Information** frame contains the following information:

- **Tracking Tag:**

- **Duration:**
- **Compile State:**
- **Compiler Version:**
- **Compiler Stamp:**
- **Telemetry/Command Database Version**

The **Tracking Tag:** is a unique bundle identification tag that is generated by the Compiler for each bundle that is compiled. The **Tracking Tag**, readable in the ASCII files output by the compiler, includes the date and time of the compilation, a target Multiplexer/Demultiplexer (MDM) identifier, and a Timeliner software version identifier.

The **Duration:** field will contain the time duration for the automated procedure to be completed by the crew.

The **Compile State:** entry indicates if the bundle has successfully or unsuccessfully finished the compilation process. If the bundle failed the compilation process, the failure will be listed as a compile or mapping failure. The possible values for this column are:

- **Compiled**
- **Not Compiled**
- **Compile Failure**
- **Mapping Failure**

The **Compiler Version:** is the version number information for the Timeliner compiler software that provided the compilation/validation.

The **Compile Stamp:** represents the time the auto-procedure was either compiled/validated in YYYY DDD:HH:MM:SS format.

The **Telemetry/Command Database Version** table provides a listing of the database versions that the automated procedure was compiled against and the results of the compilation.

Clicking View on the **View Document Properties** main window, **Document Files** tab invokes a PIMS Confirmation Message dialog box that queries your intent to view an ASCII version of the auto-procedure (see Figure 18-87 ,PIMS Confirmation Message.)

Figure 18-87,PIMS Confirmation Message.

Clicking Yes invokes a Netscape Browser window of the ASCII listing file (see Figure 18-88 , ASCII Listing File.)

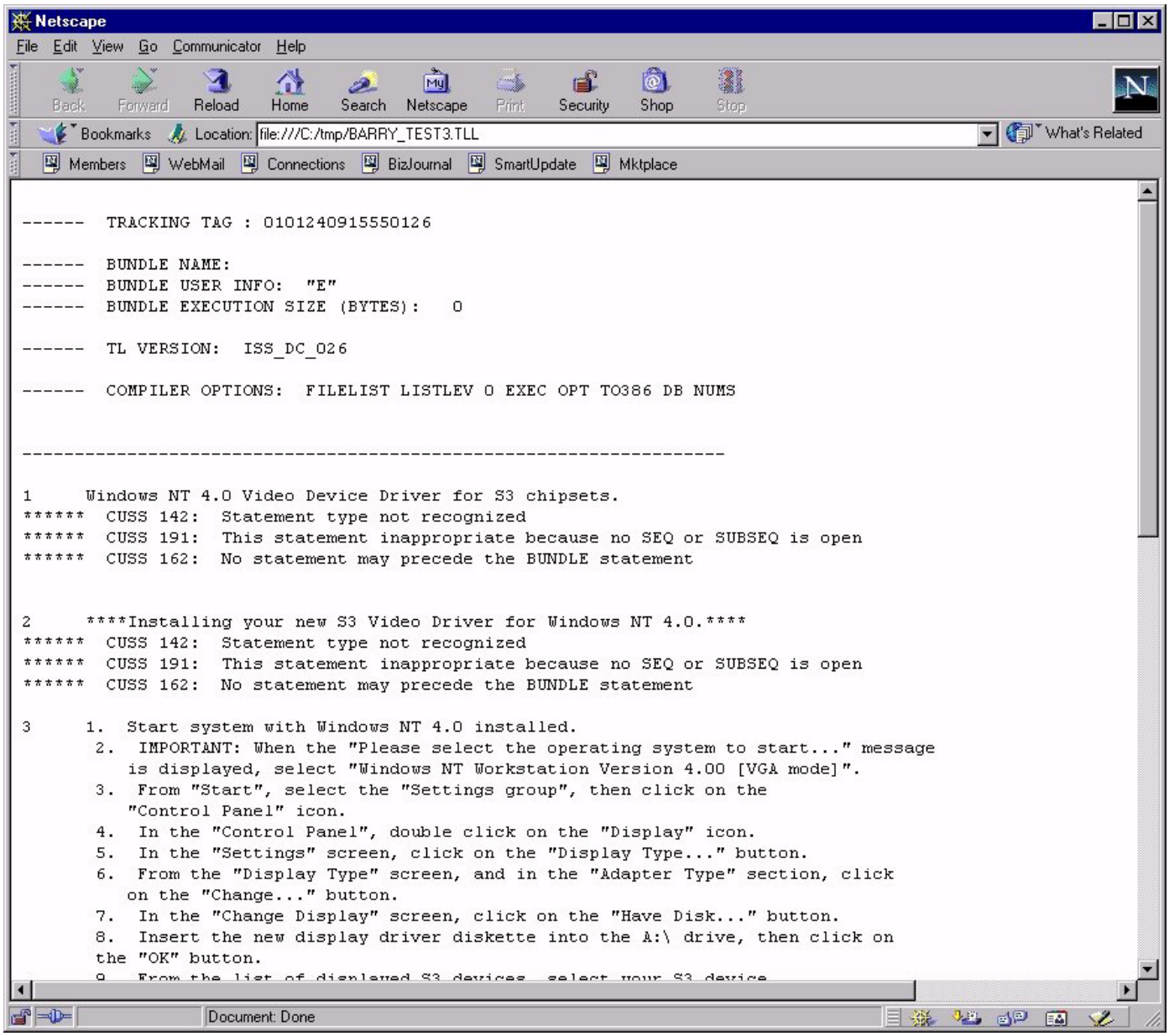
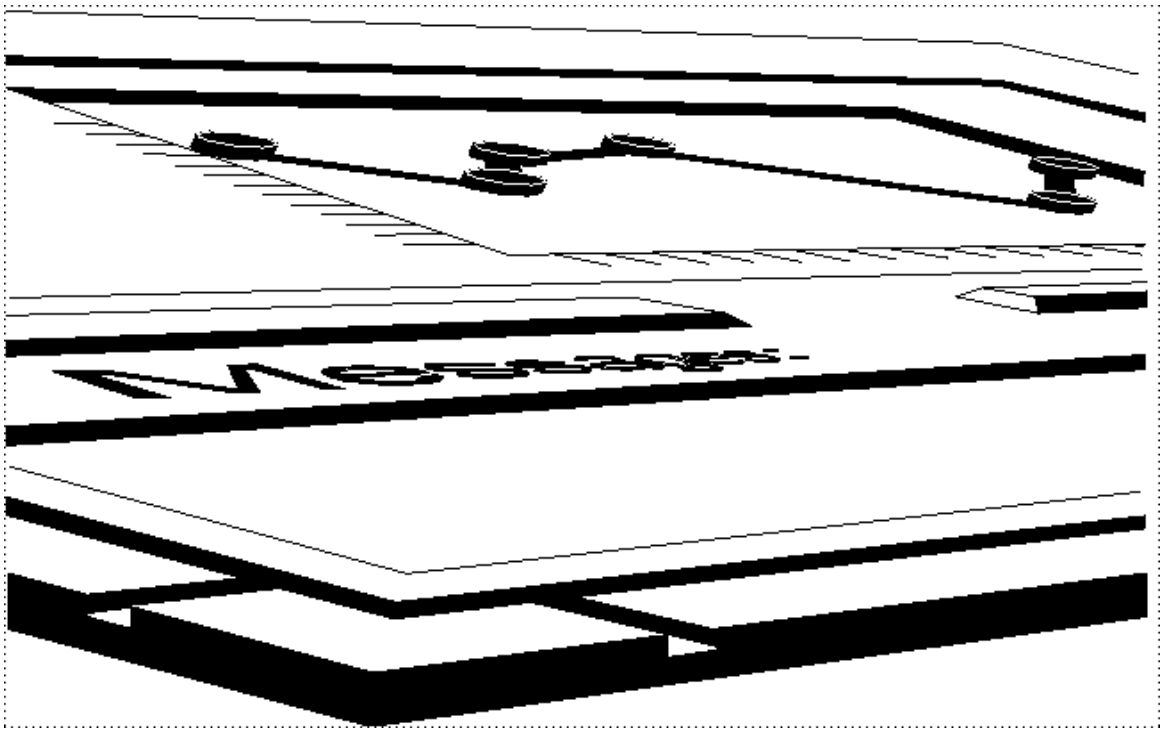


Figure 18-88, ASCII Listing File.

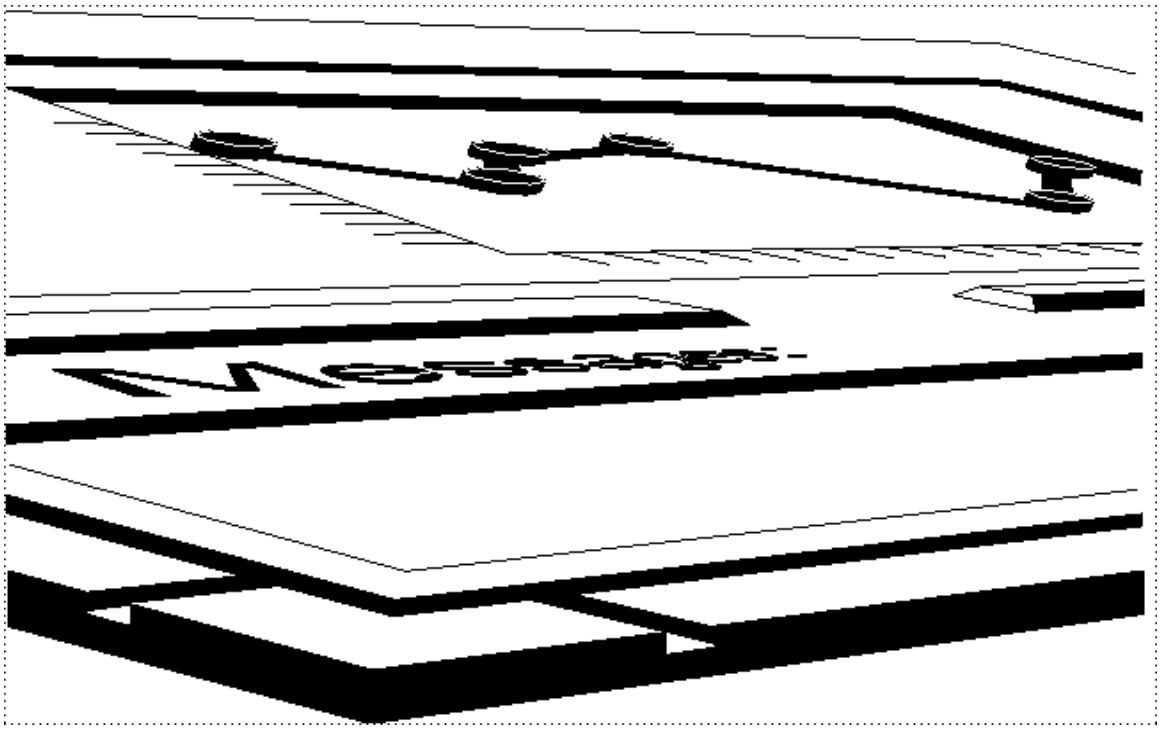


Chapter 19:
Payload Planning System (PPS) Software

The Payload Planning System (PPS) software provides a common access interface into the Payload Planning System (PPS) for generating and printing PPS display reports such as the Data Management Checklist, the Payload TimeLine, and the Payload Activity Plan. The capability is also provided for a remote transfer of PPS print files.

The PPS is a set of software tools used to automate the planning, scheduling, and integration of payload operations during pre-increment planning, weekly planning, and real-time execution. The PPS consists of components developed by MSFC/Boeing and components supplied by the Integrated Planning System (IPS) being developed by JSC/Lockheed-Martin.

Help: For further information see individual developer's documentation.



Chapter 20: Command Plan Management Tool (CPMT) Software

This chapter describes the Huntsville Operations Support Center (HOSC) Command Plan Management Tool (CPMT) application. CPMT is part of the Operations Control Mission Software (OCMS) suite of applications and provides the capability to generate, view, edit, and execute a "Command Plan". A Command Plan is the plan of control for authorized user commanding with start and stop times to enable their commanding capability. The main window of the CPMT graphically displays commanding windows and their associated EHS User ID or activity on a GMT time oriented graph. This tool can be run by multiple non-privileged users in view-only mode, but only a single privileged instance of the application is allowed to access all functions. The privileged user is allowed to generate, edit, and execute a Command Plan.

20.1 Overview

CPMT is an automated software tool that controls payload operations commanding for the International Space Station (ISS). CPMT requires interfaces to several software applications (see Figure 20-1, CPMT overview) to maintain it's functionality.

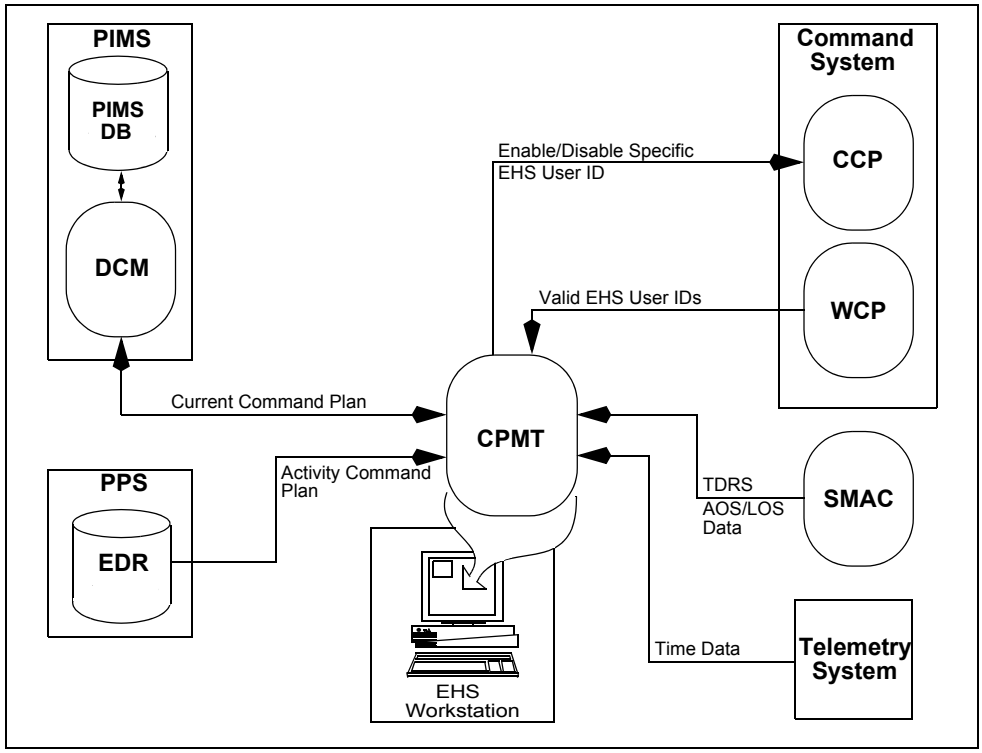


Figure 20-1, CPMT overview.

The EHS command system is required to allow the user to obtain a list of valid EHS User IDs from the Workstation Command Processor (WCP) and also enable/disable individual User IDs, as appropriate, for commanding via the Central Command Processor (CCP).

As part of generating a Command Plan, the CPMT extracts the current "Activity Command Plan" from the Payload Planning System (PPS) Electronic Data Repository (EDR). Only one Command Plan is stored in PIMS per Mission Operational Support Mode and Project (MOP). This stored Command Plan is replaced in its entirety when a privileged CPMT user commits edits to an existing Command Plan or when a new Command Plan is generated in the PPS EDR.

The interface to the System Monitor and Control (SMAC) software not only provides reconfiguration and termination notification but also provides the capability for CPMT to retrieve TDRS AOS/LOS data.

The Telemetry system provides a stable source of Greenwich Mean Time (GMT) timing data.

In general, CPMT:

- Provides a graphical aid in assigning EHS commanding responsibilities.
- Allows mapping of EHS User IDs to Activity/Originator pairs.
- Displays up to seven days of mission time.
- Enables/Disables commanding by EHS User ID or Start/Stop times.
- Stores/retrieves the Command Plan to/from the PIMS database.

The non-privileged user has the capability to:

- Configure printing and print an ASCII version of the Command Plan to a printer of file.
- Configure and apply user preferences to filter displayed information.
- Adjust the size of the Message Area
- Clear the Message Area.

The privileged user has the capability to:

- Perform all non-privileged capabilities
- Map EHS User IDs to activities.
- Add new EHS User IDs, Activities, and Originators.
- Delete EHS User IDs.
- Add, modify, or delete command windows for a specific EHS User ID.
- Undo specific edits or all edits to the Command Plan.
- Commit all edits to generate a new Command Plan in the PIMS database.
- Start/Stop execution of the Command Plan.
- Activate/Deactivate a specific EHS User ID for command enablement (this activates/ deactivates all command windows for that EHS User ID).
- Activate/Deactivate a specific EHS User ID command window for command enablement.
- Activate/Deactivate all EHS User IDs in the Command Plan for command enablement.
- Process updated TDRS S-band/Ku-band data.

When generating a Command Plan, the CPMT extracts the current Activity Command Plan from the PPS EDR. The privileged user assigns EHS User IDs to the activities in the Activity Command Plan and assigns start and stop times for commanding.

When the CPMT is editing a Command Plan, all command windows are restricted to be within a TDRS S-band, AOS period. Edit operations include deletion, changing the enabled start and stop times, adding a commanding window to an EHS User ID, or adding an EHS User ID to the Command Plan. Edits to commanding windows are shown as a separate color allowing the user to easily distinguish all edits. Multiple edits may be performed before the “committing” of the edits which results in the creation of a new Current Command Plan in the PIMS database. This overwrites any existing command plan for this MOP.

When the CPMT is executing a Command Plan, each user listed in the plan is enabled for commanding at their specified start time and disabled at their specified stop time. The privileged user may suspend or resume Command Plan execution for the application as a whole, by individual EHS User ID, or by individual EHS User ID commanding window.

Once a new Command Plan is committed, the CPMT stores the Command Plan in the PIMS database. Non-privileged instances of the CPMT are then notified via inter-process communication so they can retrieve the new Command Plan for display on their workstation.

20.2 Command Plan Management Tool

When an unprivileged user selects the **Command Plan Management Tool** from the **OCMS** menu of the **Launchpad** the unprivileged version of the **Command Plan Management Tool** main window is invoked (see Figure 20-2, Command Plan Management Tool main window - unprivileged version).

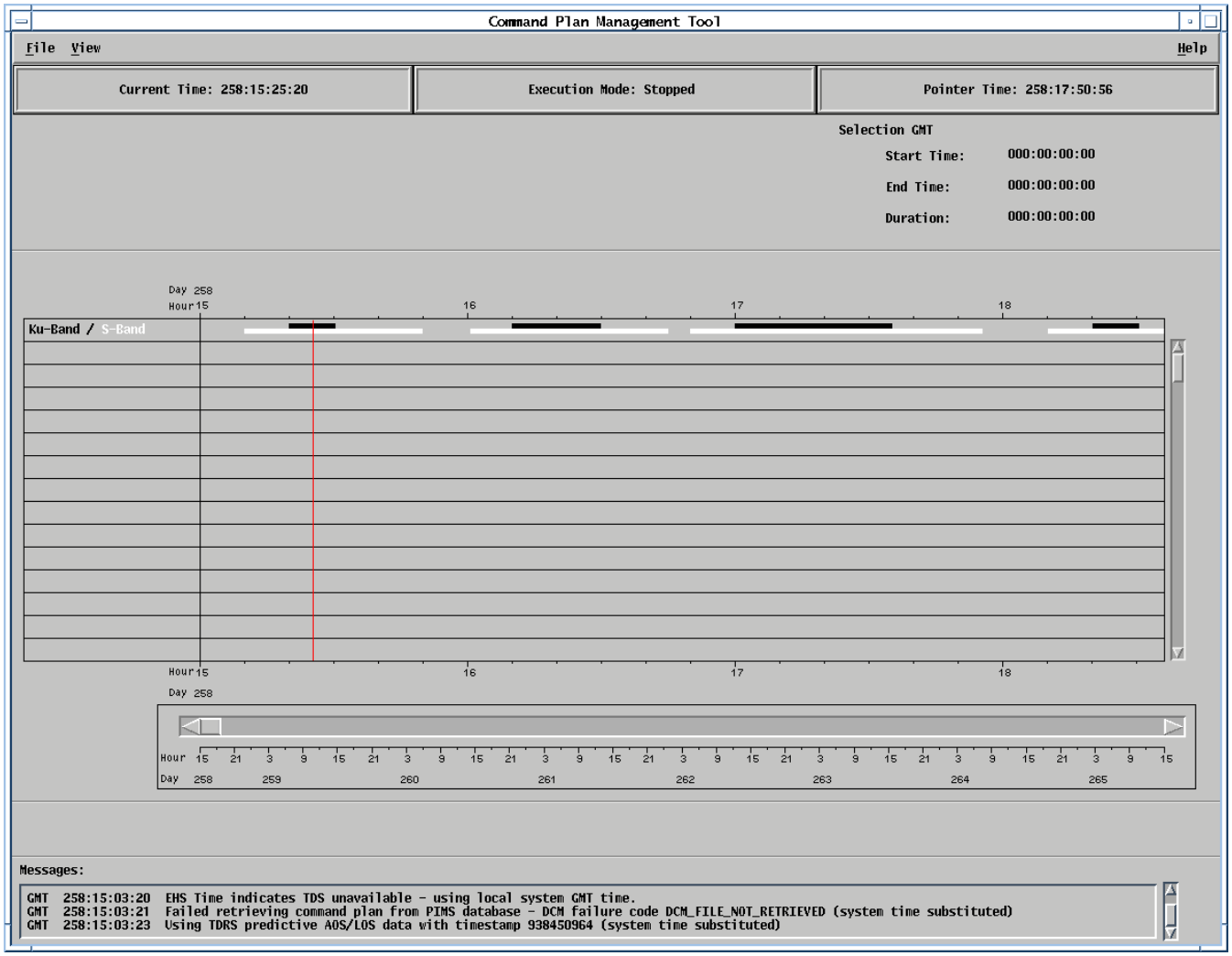


Figure 20-2, Command Plan Management Tool main window - unprivileged version.

When a privileged user selects the **Command Plan Management Tool** from the **OCMS** menu of the **Launchpad** the privileged version of the **Command Plan Management Tool** main window is invoked (see Figure 20-3, Command Plan Management Tool main window - privileged version).

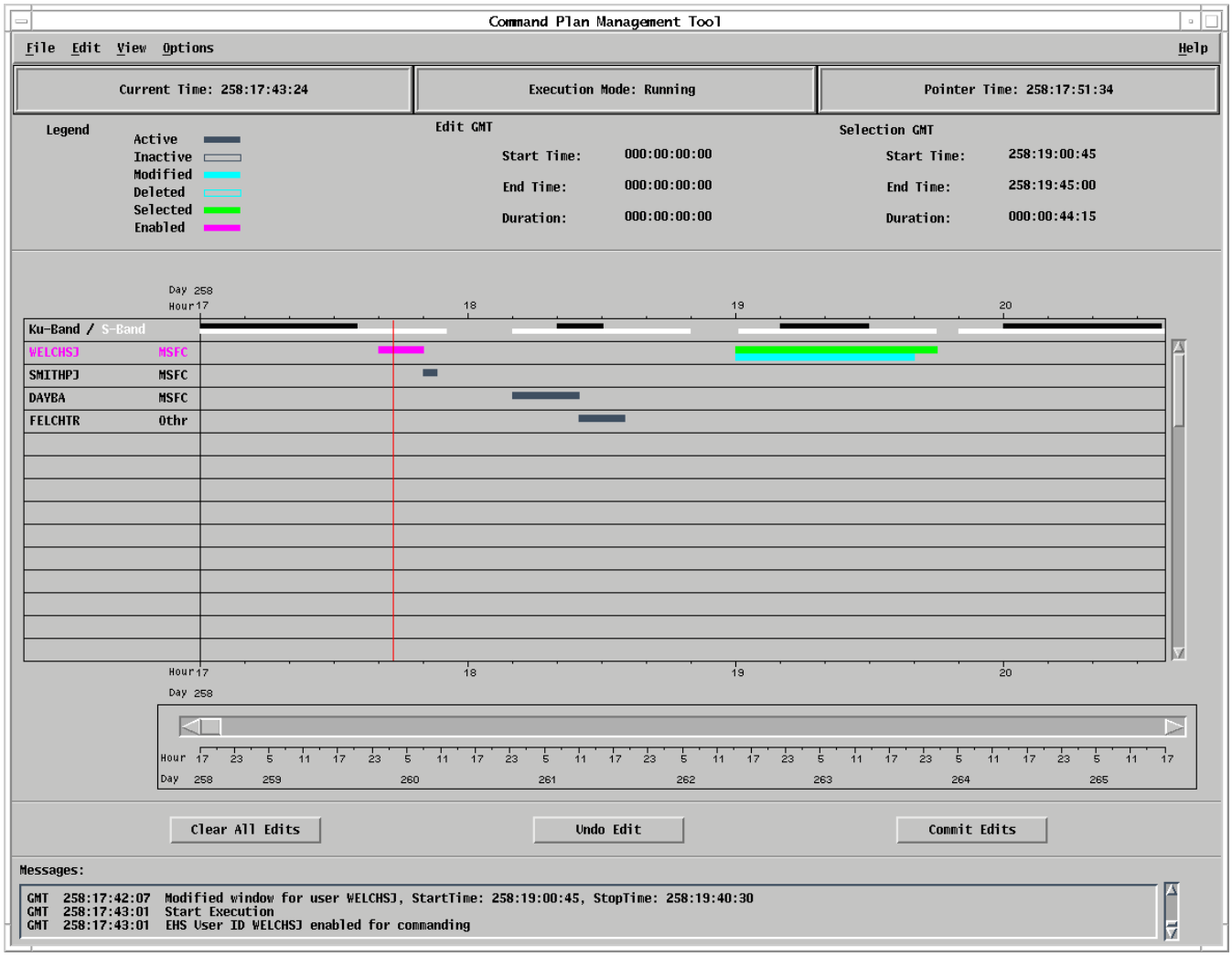


Figure 20-3, Command Plan Management Tool main window - privileged version.

The privileged user retains all the capabilities of the unprivileged user, however, because of the Command and Payload MDM Officer's (CPO's) real-time operational requirement to manage the Command Plan the main window of CPMT is noticeably augmented. Immediately noticeable on the main window is the addition of the Legend and Edit GMT headings to the Window Status Area. The Legend area is provided as an aid to discerning differences in Command windows as portrayed in the graph area. The Edit GMT entries provide a convenient reference for interpreting graphical changes made to commanding windows. Another main window addition is the inclusion of the Control Panel with pushbuttons that duplicate prime functions available in the Edit menu.

To increase functionality the **Edit** and **Options** menus are included in the Menu Bar for the privileged user. The Edit menu provides editing capabilities at the user and window level, duplicates control panel functions, and permits extraction and merging of the Activity Plan. The Options menu options provide capabilities to activate/deactivate for commanding; individual users, all users and the window; and also provides control over Command Plan execution.

Note: All further discussions concerning this application will be at the level of the privileged user. It is the responsibility of the individual user of this document to determine his/her level of privilege, which will in turn, determine the features presented by the application.

The main window contains several distinct features:

- Menu Bar
- Status Bar
- Legend/Window Status Area
- CPMT Graph Area
- Control Panel

20.2.1 Menu Bar

The menu bar includes **File**, **Edit**, **View**, **Options**, and **Help** menu items. The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. Options listed in the **File**, **View** (except the **Filter Preferences...** menu option) and **Help** menus are Common User Interface screens and will not be discussed (see Figure 20-4, File and View cascade menus). Descriptions of **Edit** and **Options** menu items and the dialog boxes they invoke will be presented in later sections.

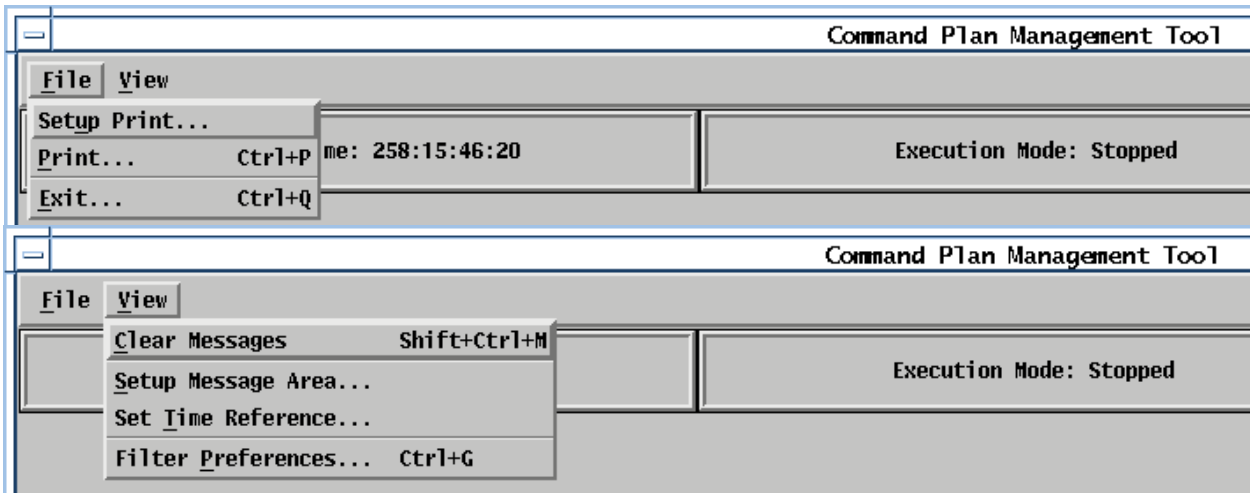


Figure 20-4, File and View cascade menus.

Note: After entering data into a plan (or if there already is a plan in PIMS), selecting the **Print...** menu item will print an ASCII version of the plan with all activities and associated command windows for all users.

20.2.2 Status Bar

The Status bar displays status information as defined in Figure 20-5, Status bar.

Current Time:
Displays the current GMT time.

Execution Mode:
Displays the execution status of the current Command Plan. Possible modes are:
- Stopped
- Running

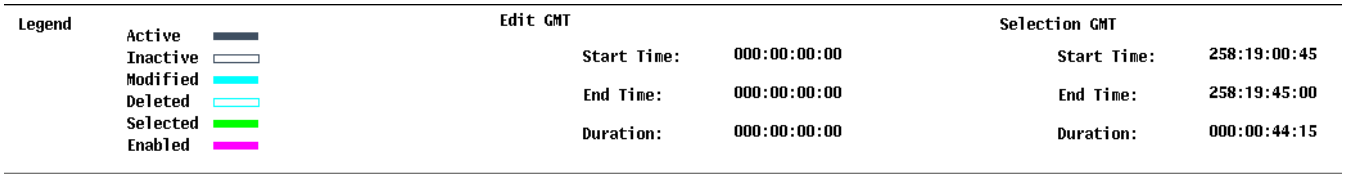
Pointer Time:
Displays the GMT graph time of the pixel currently below the mouse pointer.

Figure 20-5, Status Bar.

Note: When CPMT starts up, the **Current Time:** field should update at the rate specified in the parameter database entry. If the database entry is missing or invalid, the display should update at 5 second intervals. In addition, command windows that intersect or stop intersecting the current time bar should be enabled or disabled within the timer interval in use.

20.2.3 Legend/Window Status Area

The Legend/Window Status Area contains three headings labeled **Legend**, **Edit GMT**, and **Selection GMT** (see Figure 20-6, Legend/Window Status area).



Legend
Describes the possible display formats for commanding windows in the graph area

Edit GMT
Displays the GMT Start time, Stop time and duration of the commanding window currently being edited

Selection GMT
Displays the GMT Start time, Stop time and Duration of the commanding window currently selected

Figure 20-6, Legend/Window Status area.

The information provided under the Legend heading provides a visual key to the command window information displayed within the graph area. The graph area is intended to provide the CPO with a dynamic view of the command plan that can be visually assimulated at a glance. By keying the command windows to the information contained in the Legend/Window Status Area the user is provided with a wealth of information concerning individual windows and the Command Plan as a whole. Possible states for a command window as well as color-coding and definitions of the states are provided by the following table.

Table 20-1, Command window display formats

Window State	Color	Description
Active	Gray	Capable of being enabled for commanding when the Current Time Bar intersects the command window.
Inactive	Gray outline	Cannot be enabled/disabled; state cannot be changed until the user/window is made active.
Modified	Blue	Indicates an edited command window (edits not yet committed).
Deleted	Blue outline	Indicates a command window that has been selected for deletion (will not be deleted until edits have been committed).
Selected	Green	Highlighted command window; times will be indicated in Selection GMT entries within the Legend/Window Status Area. An EHS User ID can also be highlighted: e.g., to invoke the Add Window... dialog box.
Enabled	Purple	Command window that coincides with the position of the Current Time Bar indicating that the User ID associated with the command window is enabled for commanding.

The Edit GMT time entries display the **Start Time:**, **Stop Time:** and **Duration:** of the selected command window as a result of the edits that are being made to the window in the CPMT Graph Area (see Figure 20-7, Edit GMT and Selection GMT entries). Because of the graph resolution, the times that are displayed in the Edit GMT area are an accurate time reference compared to the graphic display.

Note: Command Window edits can also be made by selection of the **Modify Window...** menu item on the **Edit** menu.

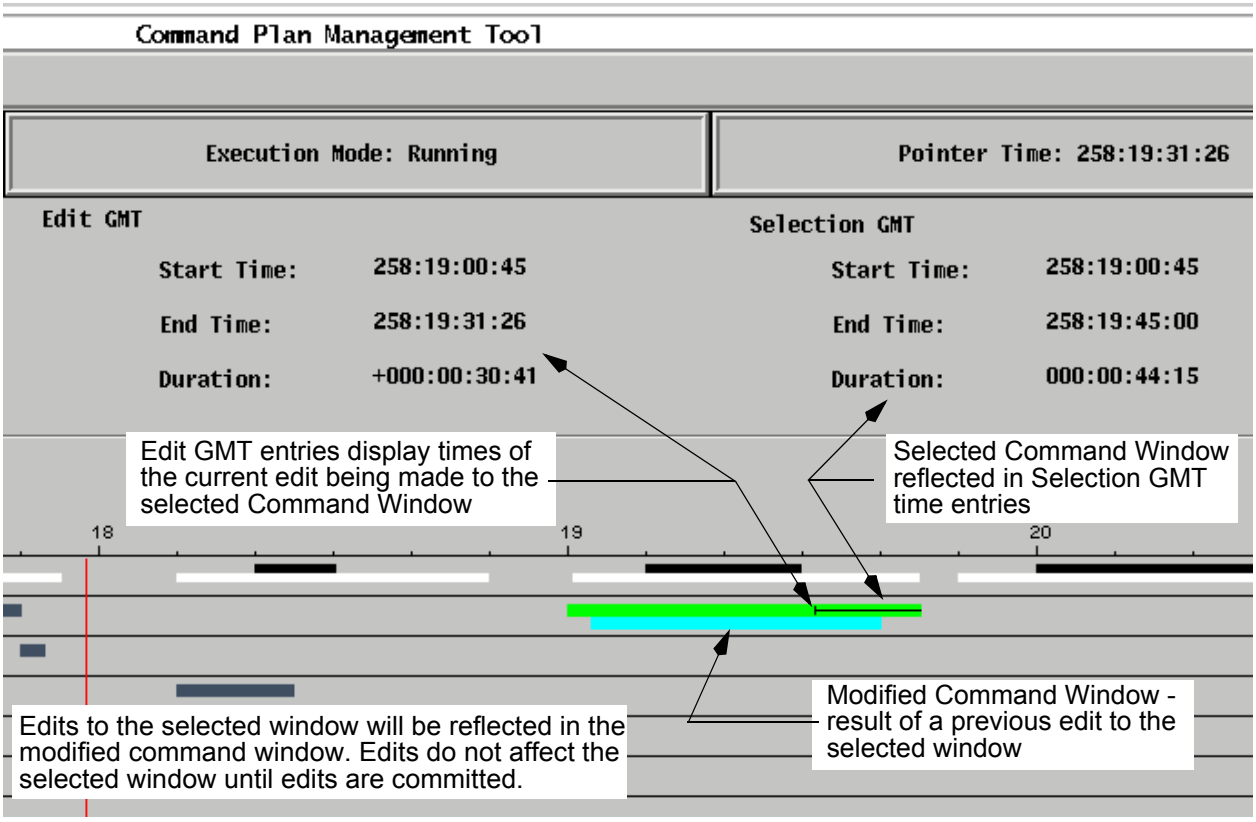


Figure 20-7, Edit GMT and Selection GMT entries.

20.2.4 CPMT Graph Area

The CPMT graph area contains three sections; the Day/Time Scale, the TDRS Information Bar and the User Information Area.

20.2.4.1 Day/Time Scale

The Day/Time Scale is used to graphically show GMT times for a portion (or all) of the seven day time period covered by the current CPMT Command Plan (see Figure 20-8, Day/Time scale). The user can adjust the scale anywhere from the minimum scale of a one minute interval to a maximum scale of a three hour interval. The scale is duplicated at the bottom of the User Information Area for additional reference.

Day/Time Scale as initialized (each minor increment = 10 minutes)

Day/Time Scale set to minimum scale (each minor increment = 1 minute)

Day/Time Scale set to maximum scale (each minor increment = 3 hours)

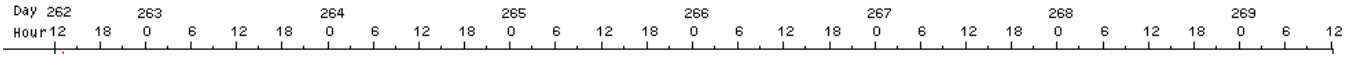


Figure 20-8, Day/Time scale.

Note: For information detailing Day/Time Scale adustment, see the section titled **Time Scale Slider**, later in this chapter.

20.2.4.2 TDRS Information Bar

The TDRS Information Bar displays the current Ku-Band/S-Band TDRS windows (see Figure 20-9, TDRS Information Bar). Each colored rectangle represents a subset of time in the 7 day Command Plan time period for which Ku-Band and/or S-Band data is valid.

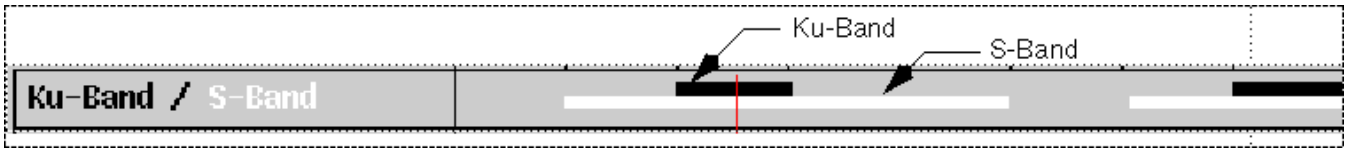


Figure 20-9, TDRS Information Bar.

Note: When TDRS data is not available (TDRS has not been downloaded from SMAC to the current workstation), a message is sent to the CPMT status area and to the system message handler.

20.2.4.3 User Information Area

Each row in the User Information Area is a graphical representation of the commanding status for a given EHS User ID/Originator/Activity triplet (see Figure 20-10, User Information Area). The left side of the area shows either a EHS User ID/Originator pair or the Activity associated with that pairing.

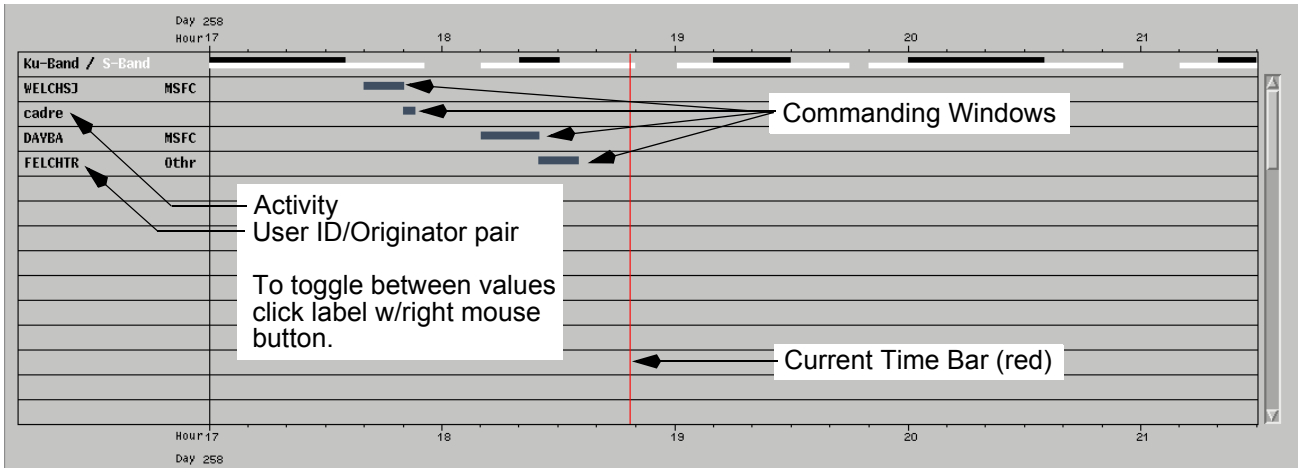


Figure 20-10, User Information Area.

The right side of the User Information Area contains graphical representations of the commanding times for the given EHS User ID for that row on the left side of the graph. The times are represented by small rectangles/windows that are bounded by TDRS S-Band times as shown in the TDRS information bar. Command windows may not extend beyond the valid S-Band TDRS coverage times. Each commanding window indicates the GMT times for which the EHS User ID in that row will be enabled or disabled for commanding by the Current Time Bar.

The red Current Time Bar automatically enables/disables particular EHS User IDs for commanding if CPMT is in execution mode and the bar intersects or leaves a commanding window. Upon CPMT startup, the bar is positioned at the left side of the User Information Area. The bar proceeds to the right at one-minute intervals. The bar will only be visible if the time period shown in the User Information Area coincides with the current time value of the bar.

Note: An assigned activity which has no associated command window will display a message about the EHS user ID and activity in the message area. An assigned activity that has a command window displays additional information about copied command windows in the message area.

20.2.5 Control Panel

The Clear All Edits, Undo Edit, and Commit Edits pushbuttons that comprise the Control Panel are used to control various aspects of the editing of command windows in the User Information Area of the CPMT main window. Their function and sensitivity are identical to the corresponding **Edit** menu items described in the **Undo Edit**, **Clear All Edits...**, and **Commit Edits...** sections that will be discussed later in this chapter.

20.3 Mouse and Keyboard Procedures

20.3.1 Mouse Procedures

The mouse procedures employed in CPMT provide the following functions:

- Command Window selection
- EHS User ID selection
- Command Window graphical editing
- Graphically adding a Command Window
- Time Scale Slider scaling and movement

20.3.1.1 Command Window Selection

The user can select a command window by moving the cursor over the window and clicking the left mouse button. The selected commanding window then changes to the color green and its start, stop, and duration GMT times are displayed in the **Selection GMT** area of the **Window Status Area**. When a command window is selected, the following **Edit** and **Options** menu options are made sensitive:

- Delete Window
- Modify Window...
- Activate Window
- Deactivate Window

Also, the following graphical editing functions are enabled for the selected command window:

- Extend Window Left
- Extend Window Right
- Move Window

20.3.1.2 EHS User ID Selection

The user can select a particular EHS User ID from the left side of the User Information Area by moving the cursor over the desired EHS User ID and clicking the left mouse button. A green frame then highlights the EHS User ID. When a EHS User ID is selected, the following **Edit** and **Options** menu options are made sensitive:

- Add Window...
- Delete User
- Activate User
- Deactivate User

Also, the right mouse button Add Window capability is made sensitive. Only one EHS User ID can be selected at a time.

20.3.1.3 Command Window Graphical Editing

A left mouse click and drag can expand, shrink, or move a command window (see Figure 20-11, Command window graphical editing). To expand or shrink a command window, place the cursor over the desired edge (left or right) then click and hold down the left mouse button. The **Edit GMT** area of the **Window Status Area** now becomes active and displays the GMT start, stop and duration times while the edit is in progress. Next, continue to hold the left mouse button down, drag the edge of the window to the desired location, then release the left mouse button. During the edit movement, a black indicator line is drawn from the start to end mouse position. Once the left mouse button is released the new commanding window is displayed below the original with the modified color as indicated in the Legend.

Note: When shrinking a command window, the minimum size for graphical editing is 10 pixels. When using the **Edit** menu, **Modify Window...** option, it is possible to create a commanding window that is too small for graphical editing. If this happens, the window can still be selected using the arrow keys as described under **Keyboard Operations**, then the **Modify Window...** option can be used again to resize the window.

To move a commanding window, position the cursor near the center of the desired command window, then press and hold down the left mouse button. As with expanding/shrinking, the **Edit GMT** status area activates. Next, hold the mouse button down and drag the commanding window to the desired location.

Note: Edit movement for any commanding window is graphically restricted to be within TDRS S-Band coverage as displayed in the TDRS Information Bar.

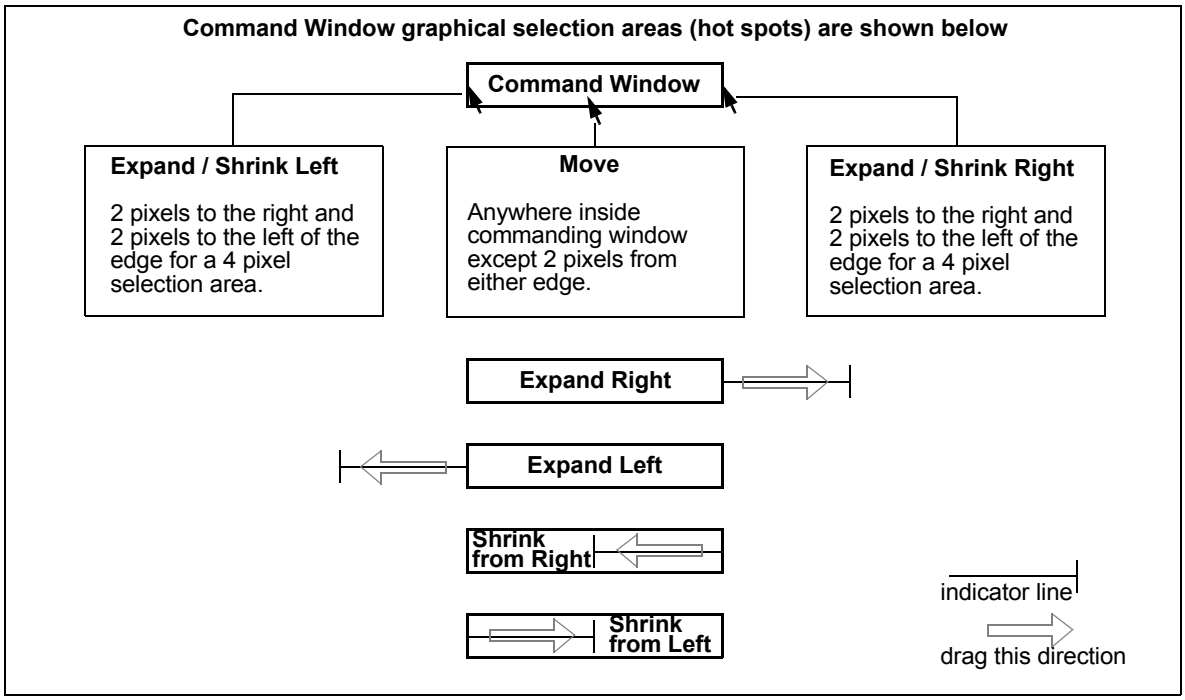


Figure 20-11, Command window graphical editing.

20.3.1.4 Graphically Adding a Command Window

The right mouse button can be used to add new commanding windows for a selected User ID. To add one or more commanding windows, place the cursor in the right side of the **User Information Area** at the desired starting position (**Pointer Time** on **Status Bar**) for the first command window, then click and hold the right mouse button. Next, drag the cursor to the **right** to the desired **end time** and release the right mouse button. A command window will be created and displayed in the modified color. Multiple commanding windows may be created if the mouse dragging operation spans across multiple S-Band coverage areas. In this case the individual command windows are clipped to the appropriate TDRS boundaries

20.3.1.5 Time Scale Slider

The Time Scale Slider and the left mouse button can be used for selecting and/or scaling the displayed time period of the Command Plan in the User Information Area. The Time Scale Slider can be resized according to the information presented in Figure 20-12, Time Scale slider operations.

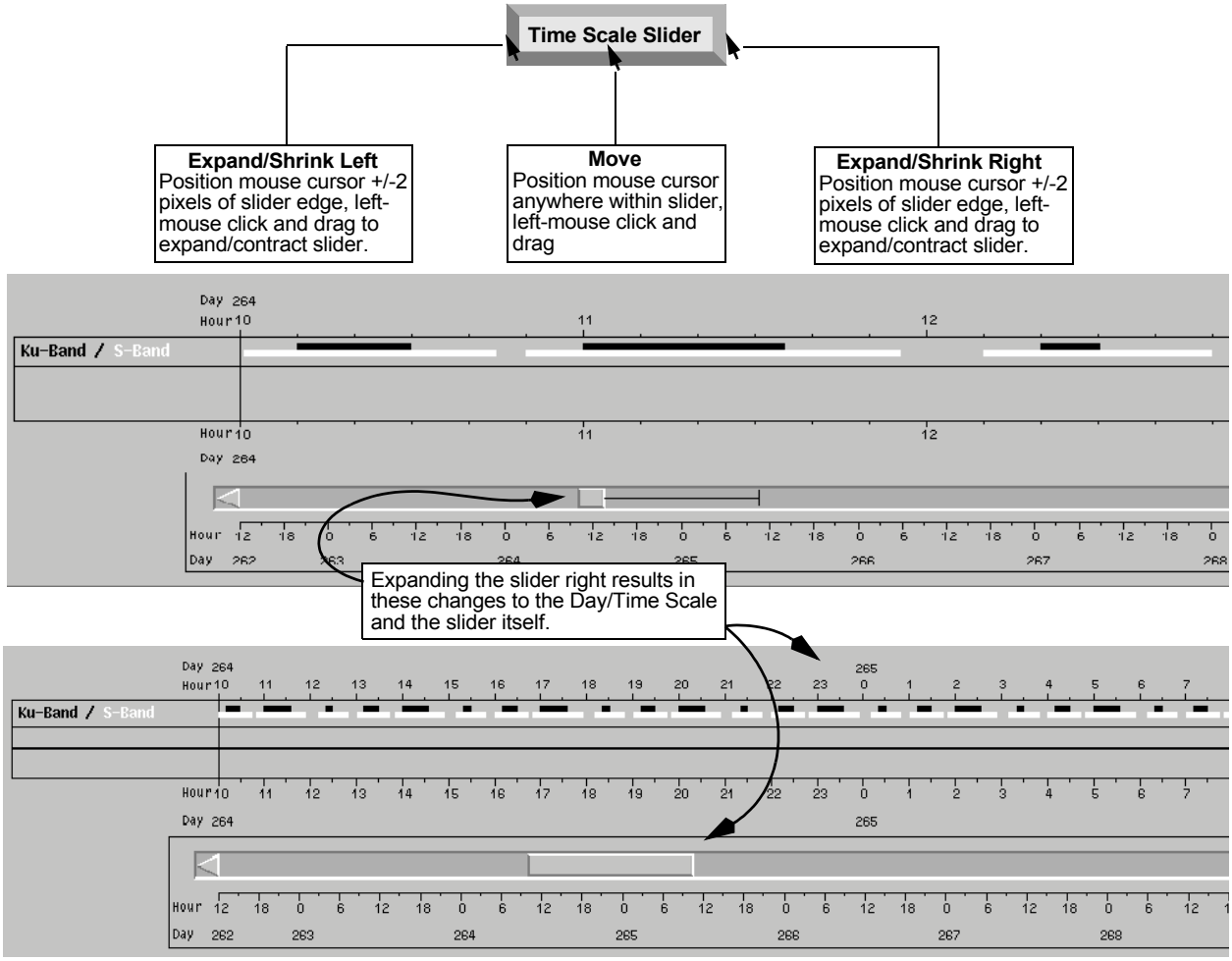


Figure 20-12, Time Scale slider operations.

The left most edge of the slider rectangle corresponds to the GMT start time of the graph and the right edge of the slider button corresponds to the end time of the graph. The slider may be moved left/right in any of three ways:

- left mouse click the left or right scroll arrows
- left mouse click and drag the slider to the desired location
- left mouse click anywhere within the bar that is in the horizontal path of the slider (but not actually clicking the slider itself or either scroll arrow)

20.3.2 Keyboard Procedures

Keyboard procedures in CPMT involve the following keys:

- Up Arrow
- Down Arrow

- Right Arrow
- Left Arrow
- Space Bar

20.3.2.1 Up Arrow

If the cursor is placed in the left side of the User Information Area (EHS User IDs/Activity Names), this key can be used to select the EHS User ID above the currently selected EHS User ID.

20.3.2.2 Down Arrow

If the cursor is placed in the left side of the User Information Area (EHS User IDs/Activity Names), this key can be used to select the EHS User ID below the currently selected EHS User ID.

20.3.2.3 Right Arrow

This key is used to move horizontally throught the User Information Area (much like a Tab key). If a User ID is selected, this key will select the first command window to the right of the User ID. If a command window is selected, this key will select the next command window to the right.

20.3.2.4 Left Arrow

This key is used to move horizontally throught the User Information Area (much like a Tab key). If a command window is selectred, this key selects either the next command window to the left or the User ID if no command windows are available to the left of the currently selected command window.

20.3.2.5 Space Bar

If an EHS User ID is selected in the User Information Area, this key will toggle from the display of EHS User ID to the display of the associated Activity Name. This capability is the same as that provided by the right mouse button (see Figure 20-10, User Information Area).

20.4 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to CPMT. The **Filter Preferences...** option from the **View** menu will be discussed as well as all the menu items presented by the **Edit** and **Options** menus (see Figure 20-13, Edit and Options menus).

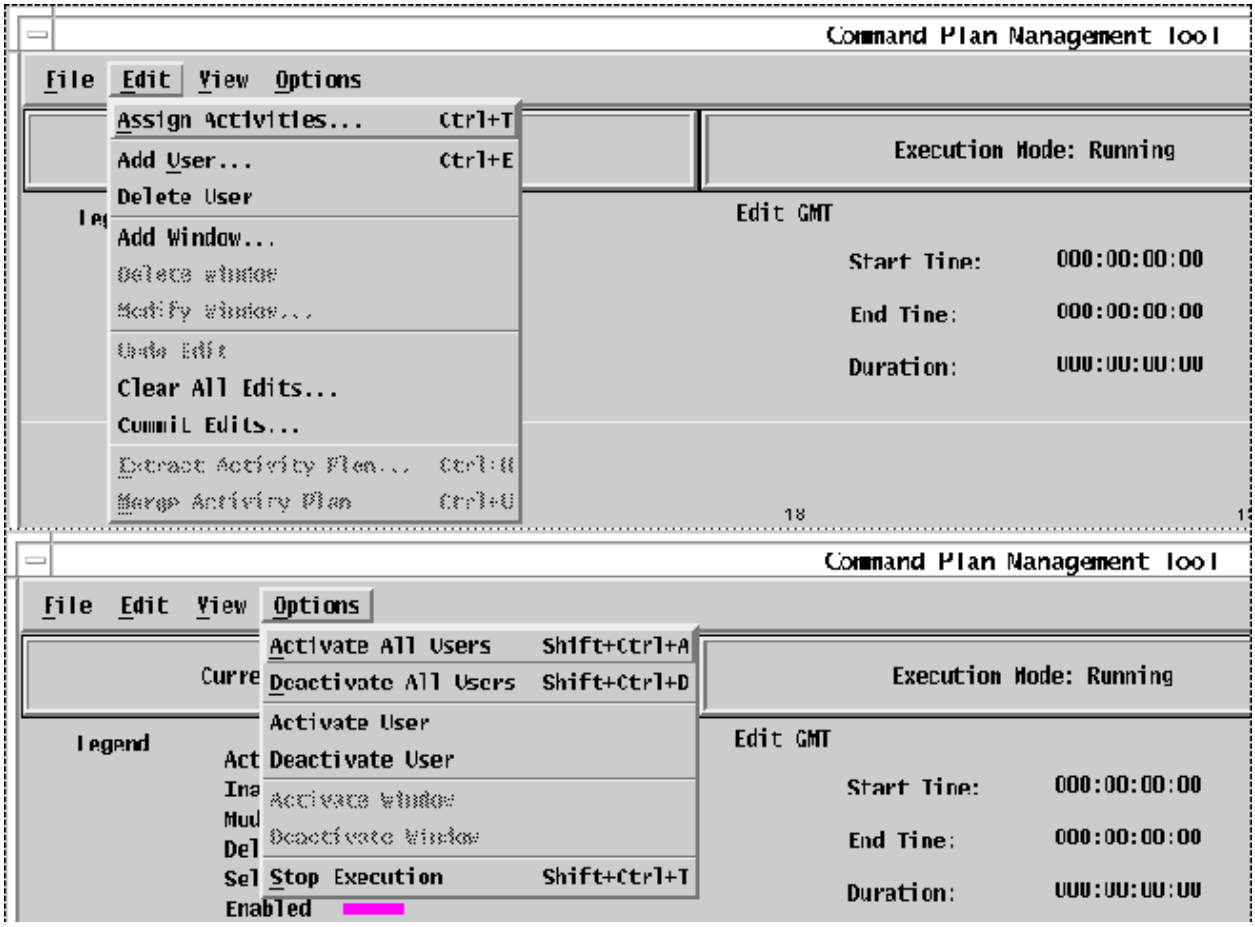


Figure 20-13, Edit and Options menus.

20.4.1 Filter Preferences...

Selection of the **Filter Preferences...** menu item from the **View** menu invokes the Filter Preferences dialog box (see Figure 20-14, Filter Preferences dialog box). In the event that the command plan, as displayed, contains more than 14 EHS User IDs, (requiring a large amount of scrolling up and down) the user may filter out the User IDs, Activities or Originators that are not of any concern. The **EHS User IDs**, **Activities**, and **Originators** frames are populated with information from the current Command Plan. Selections made in this dialog box will be applied to the current Command Plan and the display will be updated when the user clicks Filter. These preferences remain in effect for the current CPMT session only, they do not persist between different invocations of the program.

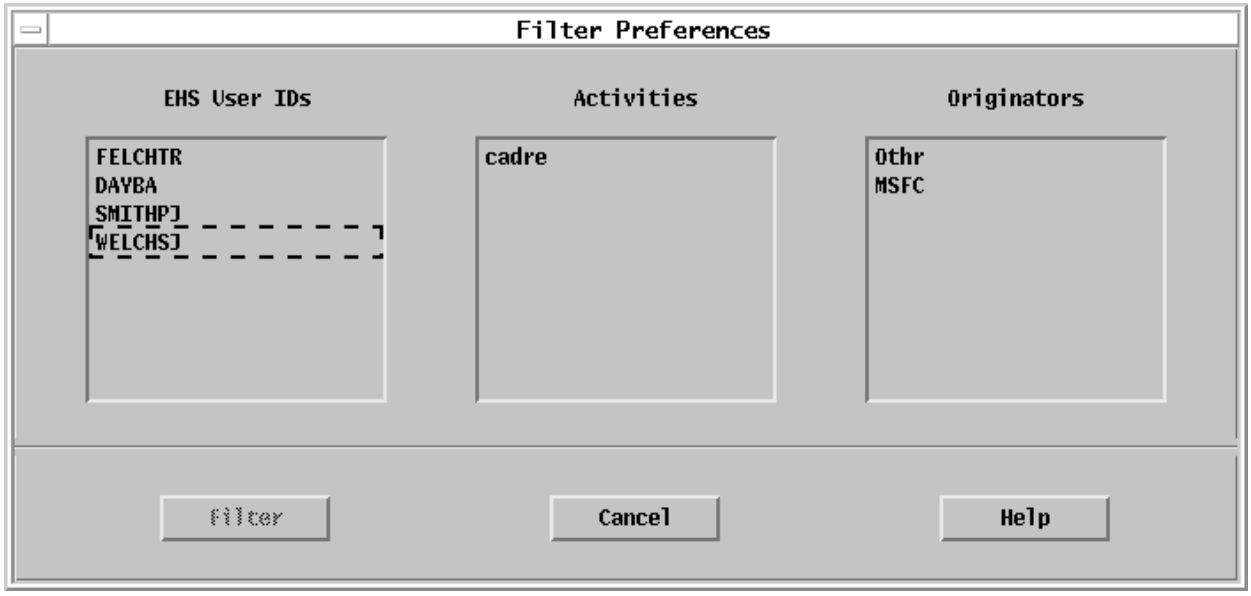


Figure 20-14, Filter Preferences dialog box.

20.4.2 The Edit Menu

The Edit menu provides options for the privileged user to modify the Command Plan at the Activity, User, and Window level. Further it provides options to undo individual edits, clear all edits, and commit edits to the Command Plan.

CAUTION: CPMT tracks all modifications (edits) to the command plan as they are done but does not actually apply these changes until the privileged CPMT user selects the **Commit Edits** option from the **Edit** menu or clicks the Commit Edit on the Control Panel. The user is then presented with a confirmation dialog box and if the Yes is selected the edits are committed to the PIMS Database in the form of a new Command Plan - **at this point the user cannot undo any of these edits**. Be sure that all the edits shown in the User Information Area are desired before performing this commit operation.

Note: Before committing the edits, you can always back out individual edits by selecting the item, then selecting the **Undo Edit** option from the **Edit** menu or clicking Undo Edit on the Control Panel. You can back out all edits by selecting the **Clear All Edits** option from the **Edit** menu or clicking Clear All Edits on the Control Panel. The user is also presented with a confirmation dialog box to prevent accidental erasure of all the edits.

20.4.2.1 Assign Activities...

Selection of the **Assign Activities...** menu option invokes the Assign Activities dialog box (see Figure 20-15, Assign Activities dialog box). This dialog box presents a list of activity names. When an acitivity is selected from the list a corresponding list of Assigned User IDs are listed.

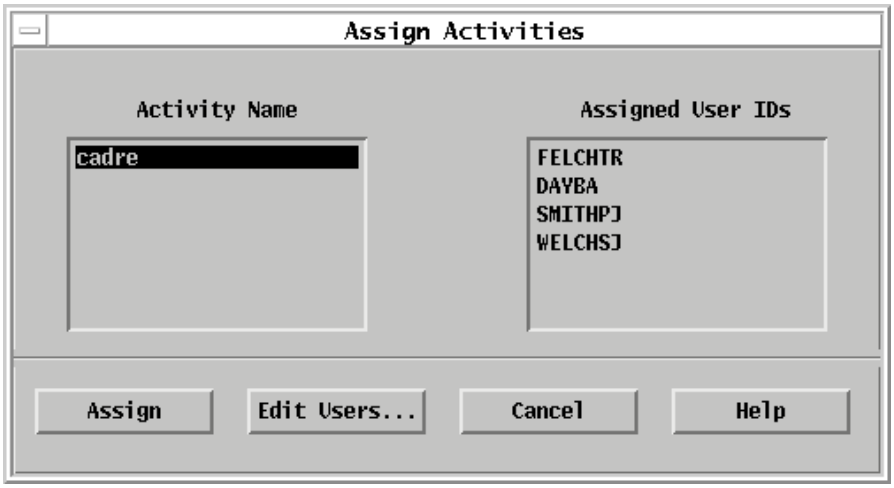


Figure 20-15, Assign Activities dialog box.

When an Activity is selected from the Activity Name list the Edit Users... is made sensitive. The Assign remains grayed-out until User IDs have been added or removed to the **Assigned User IDs** list via the **Edit Users** dialog box.

Note: CPMT sends a status message to the application message area when a new user is assigned to an existing activity through the **Assign Activities** dialog box. Status messages include the user name, new activity, and any newly created command windows.

20.4.2.1.1 Edit Users... Dialog Box

When Edit Users... is selected on the **Assign Activities** dialog box, the **Edit Users** dialog box is invoked (see Figure 20-16, Edit Users dialog box). The **Edit Users** dialog box shows information about the activity selected in the **Assign Activities** parent dialog box (the activity name appears in the dialog box title). The left list box contains a list of all possible User IDs which can be assigned to a particular activity. The right list box contains User IDs currently assigned to the selected activity. When a selection is made in the left list box, the **Add** arrow is made sensitive and can be used to move the selected User ID from the **Available User IDs** list box to the **Currently AssignedUser IDs** list box. When a selection is made in the right list box, the **Remove** arrow is made sensitive and can be used to move the selected item in the opposite direction. Changes made to the **Currently Assigned User IDs** list will be reflected in the **Assigned User IDs** list of the **Assign Activities** dialog box when the OK is selected.

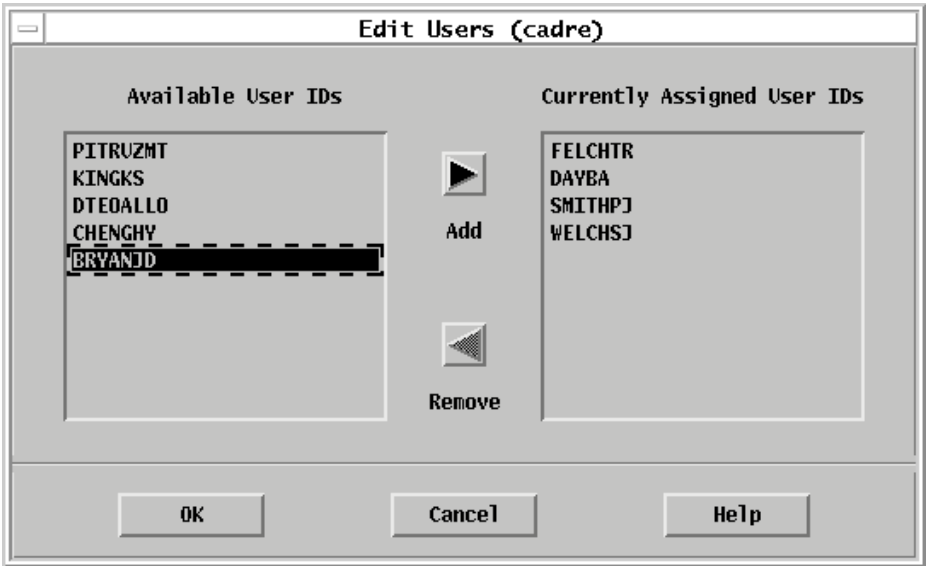


Figure 20-16, Edit Users dialog box.

Note: Clicking on Cancel will automatically undo any **Add** or **Remove** operations performed for the current instance of the dialog box

20.4.2.2 Add User...

Selecting the **Add User...** option from the **Edit** menu invokes the **Add User** dialog box (see Figure 20-17, Add User dialog box). The **Add User** dialog box enables you to add a new user and/or command windows to the User Information Area on the CPMT main window. New User IDs, Activities and Originators can be added by typing into the text entry fields labled **New EHS User ID**, **New Activity Name** and **New Originator** respectively. When the user selects the keyboard Enter while inside one of these text entry fields, the new text will be entered into the appropriate scroll list box directly above the text entry field.

To add a new User ID to the command plan, select one item from each of the list boxes which makes the Add User sensitive. Then, (you may optionally) fill in the GMT start and stop times to give the new user a starting window. (If these fields are left blank, the new User ID can still be added but will have no initial command windows assigned to it). Finally, click the Add User to actually insert the new User ID into the graphical command plan.

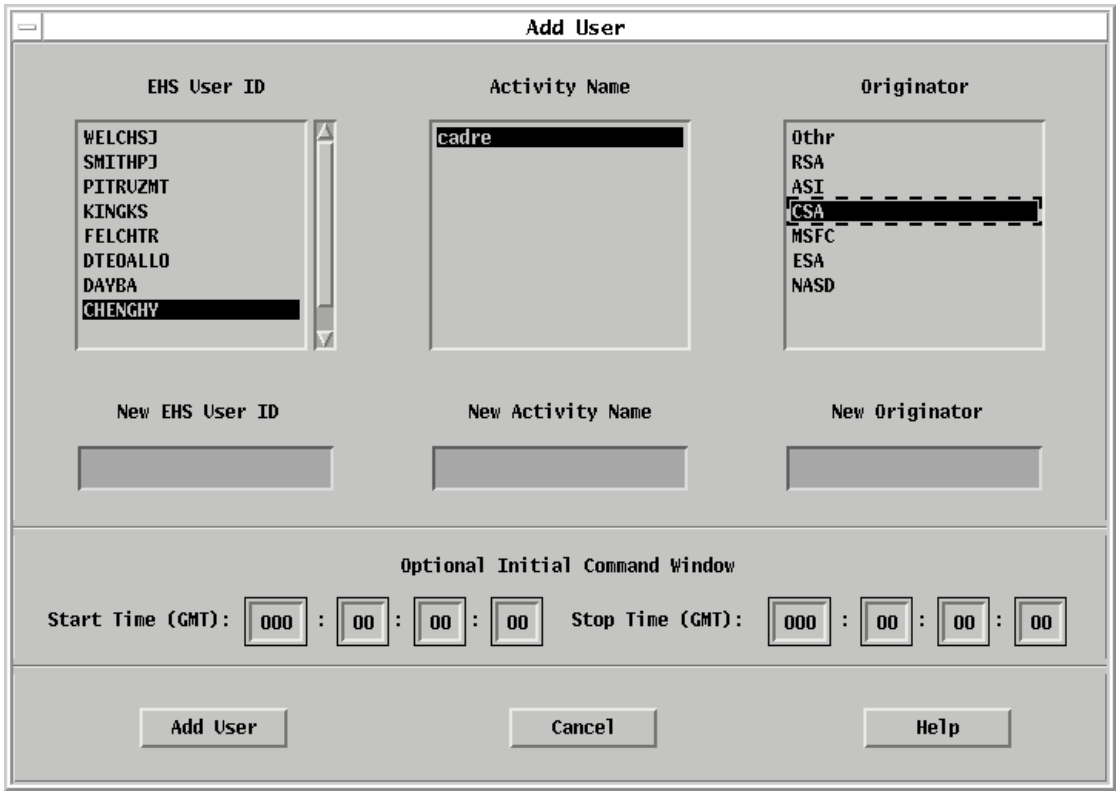


Figure 20-17, Add User dialog box.

20.4.2.3 Delete User

Once a User ID is selected the user can select the **Delete User** option from the **Edit** menu. This will mark the selected User ID as deleted (as as shown in the Legend area) although the actual removal of the User ID from the command plan will not occur until the edit is committed. Note that there is no confirmation before the User ID is marked as deleted, however the **Undo Edit** option is always available before the edits are committed.

20.4.2.4 Add Window...

Selection of the **Add Window...** menu item from the **Edit** menu invokes the **Add Window** dialog box (see Figure 20-18, Add Window dialog box). Once a User ID is selected in the User Information Area of the main window the user can select the **Add Window...** menu item. The **Add Window** dialog box has text entry fields for the GMT start and stop times for a new command window. The start and stop times will be clipped to a currently valid TDRS boundary as displayed in the TDRS Information Bar. If any of the times are invalid (not within the time period described by the current command plan), a red border is shown around the invalid entries and the Add Window is made insensitive.

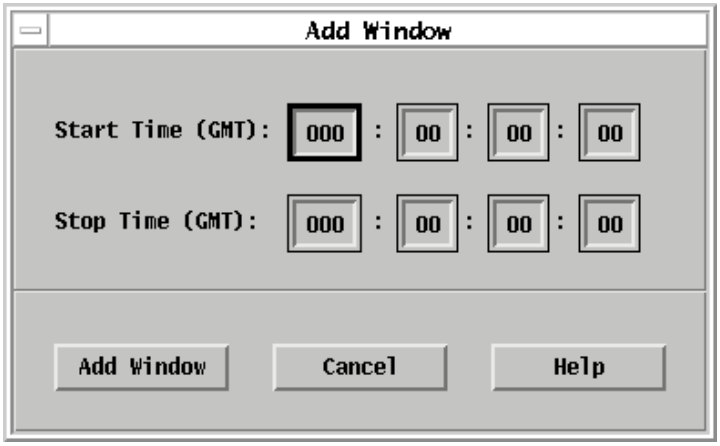


Figure 20-18, Add Window dialog box.

20.4.2.5 Delete Window

When a command window is selected (as evidenced by it's green color) the user may select the **Delete Window** option from the **Edit** menu. This marks the selected command window as deleted (color changes from green to a blue outline) although its removal from the Command Plan will not occur until the edits are committed.

20.4.2.6 Modify Window...

When a command window is selected (as evidenced by it's green color) the user may select the **Modify Window...** option from the **Edit** menu. This invokes the Modify Window dialog box that allows the user to enter new GMT times for the selected command window (see Figure 20-19, Modify Window dialog box). The start and stop times specified will be clipped to a currently valid TDRS boundary as displayed in the TDRS Information Bar. If any of the times are invalid (not within the time period described by the current command plan), a red border is shown around the invalid entries and the

is made insensitive.

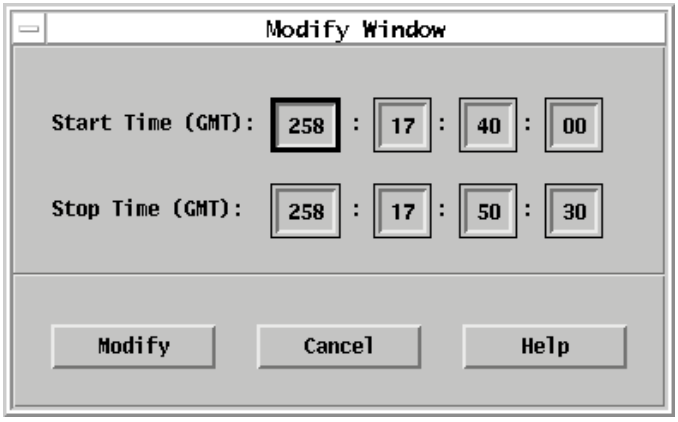


Figure 20-19, Modify Window dialog box.

20.4.2.7 Undo Edit

The privileged user selects the **Undo Edit** option from **Edit** menu to cancel an individual editing operation for the selected component (command window or User ID). First, select the component for which the edit is to be canceled, then choose this menu option. The component returns to the deselected color and the edit indication is erased. This option has the same functionality as the Undo Edit on the Control Panel. This option can be used to continually remove individual edits one at a time. The number of edits that can be canceled is equal to the number of edits currently outstanding.

20.4.2.8 Clear All Edits...

The privileged user selects the **Clear All Edits...** menu option from the **Edit** menu to cancel all modifications made to commanding windows or User IDs. Selecting this option invokes a confirmation dialog box and if the user selects the Yes all previously edited components return to their non-selected color and any edit indications are erased (see Figure 20-20, Clear Edits Confirmation dialog box). This option has the same functionality as the Clear All Edits in the Control Panel.

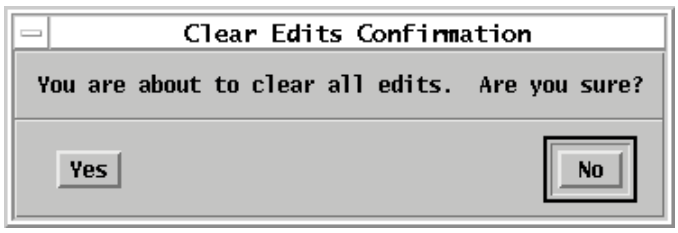


Figure 20-20, Clear Edits Confirmation dialog box.

20.4.2.9 Commit Edits...

The privileged user selects the **Commit Edits...** option from the **Edit** menu to incorporate all the current edits into a new Command Plan, then store it to the PIMS database. Selecting this option invokes the **Commit Edits Confirmation** dialog box and if the user chooses Yes all existing edits are processed to formulate the new Command Plan (see Figure 20-21, Commit Edits Confirmation dialog box). This option has the same functionality as the Commit Edits on the Control Panel.

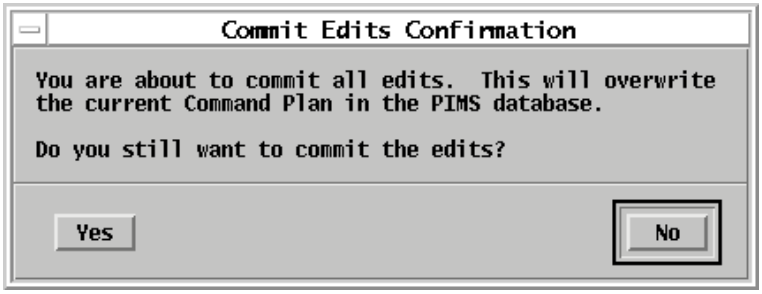


Figure 20-21, Commit Edits Confirmation dialog box.

CAUTION: This operation overwrites the current Command Plan in PIMS.

Note: If any commanding windows are adjusted during CPMT startup (or after the arrival of new TDRS data) or if a **Commit Edits** operation fails, then the **Commit Edits... Edit** menu option and the Commit Edits remain sensitive until the Command Plan is successfully written to the PIMS database. This can be confusing if the user has not made any edits to the Command Plan yet. Also, if the user attempts to exit CPMT in this situation, the **Commit Edits Confirmation** dialog box will be invoked.

20.4.2.10 Extract Activity Plan...

The Extract Activity Plan... option will be insensitive until S/W Build 5.0.

The privileged user selects the **Extract Activity Plan...** option from the **Edit** menu to begin the process of retrieving the Current Activity Plan from the PPS EDR. The user is notified upon completion of this operation via a message in the Message Area.

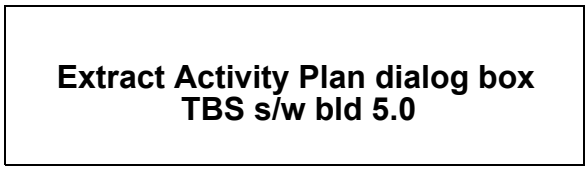


Figure 20-22, Extract Activity Plan dialog box.

20.4.2.11 Merge Activity Plan

The Merge Activity Plan option will be insensitive until S/W Build 5.0.

Once an Activity Plan has been extracted from the PPS EDR, the privileged user can select the **Merge Activity Plan** option from the **Edit** menu to combine the information from the retrieved Activity Plan with the current Command Plan as shown in the main CPMT window.

20.4.3 The Options Menu

The options available through the **Options** menu provide the privileged user with the capability to activate/deactivate all users, individual users and command windows. Finally, the user is also able to start and stop Command Plan Execution.

20.4.3.1 Activate All Users

The privileged user selects the **Activate All Users** option from the **Options** menu to activate all User IDs currently listed in the left side of the User Information Area. Choosing this option changes all the commanding windows to the active state as described in the Legend Area.

20.4.3.2 Deactivate All Users

The privileged user selects the **Deactivate All Users** option from the **Options** menu to deactivate all User IDs currently listed in the left side of the User Information Area. Choosing this option changes all the commanding windows to the inactive state as described in the Legend Area.

20.4.3.3 Activate User

The privileged user selects the **Activate User** option from the **Options** menu to activate all the commanding windows for the currently selected User ID in the left side of the User Information Area. Choosing this option changes all the commanding windows for the selected User ID to the active state as described in the Legend Area.

20.4.3.4 Deactivate User

The privileged user selects the **Deactivate User** option from the **Options** menu to deactivate all the commanding windows for the currently selected User ID in the left side of the User Information Area. Choosing this option changes all the commanding windows for the selected User ID to the inactive state as described in the Legend Area.

20.4.3.5 Activate Window

The privileged user selects the **Activate Window** option from the **Options** menu to activate the currently selected commanding window in the right side of the User Information Area. Choosing this option changes the selected command window to the active state as described in the Legend Area.

20.4.3.6 Deactivate Window

The privileged user selects the **Deactivate Window** option from the **Options** menu to deactivate the currently selected commanding window in the right side of the User Information Area. Choosing this option changes the selected command window to the inactive state as described in the Legend Area.

20.4.3.7 Start/Stop Execution

The privileged user selects the **Start/Stop Execution** option from the **Options** menu to toggle the execution of the Command Plan. This menu item is a toggle which defaults to **Stop Execution** if the current **Execution Mode:** is **Running** and **Start Execution** if the current **Execution Mode:** is **Stopped**. As the Current Time Bar moves from left to right, it may intersect one or more command windows. If the Command Plan is executing, then the User ID for any intersecting command windows is enabled for EHS commanding provided the command window was marked as activated according to the Legend Area.

Note: Stopping execution of the Command Plan does not disable User IDs that are currently enabled for commanding - those User IDs remain enabled for commanding until the command plan is put back in execution mode and the Current Time Bar ceases to intersect any of their command windows.

Note: When the execution status of a command plan is changed using the **Start/Stop Execution** menu items this information is reflected in all non-privileged CPMT instances within 30 seconds.

20.5 Asynchronous Arrival of New TDRS Data

When new TDRS information becomes available during the execution of the privileged instance of CPMT, the SMAC subsystem issues a reconfiguration signal to the CPMT process. Upon receipt of this signal, CPMT displays the **CPMT - New TDRS Data Available** dialog box (see Figure 20-23, CPMT - New TDRS Data Available dialog box). If the user chooses to process the new configuration data, then CPMT checks all existing command windows and adjusts them if necessary to fit into the new TDRS boundaries. Any commanding rectangles adjusted in this manner will lose any outstanding edits. Therefore, it is advisable to either commit or clear all edits prior to processing the new TDRS data.

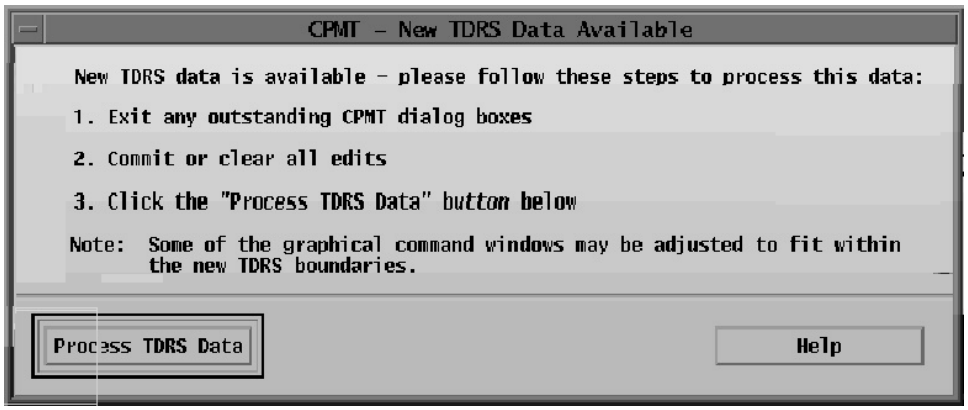


Figure 20-23, CPMT - New TDRS Data Available dialog box.

Note: The **CPMT - New TDRS Data Available** dialog box does not become unmanaged when the **Close** window option is chosen from the window manager menu (the in the upper left corner of the dialog box). The only way to dismiss this dialog box is to either click

or exit the CPMT application.

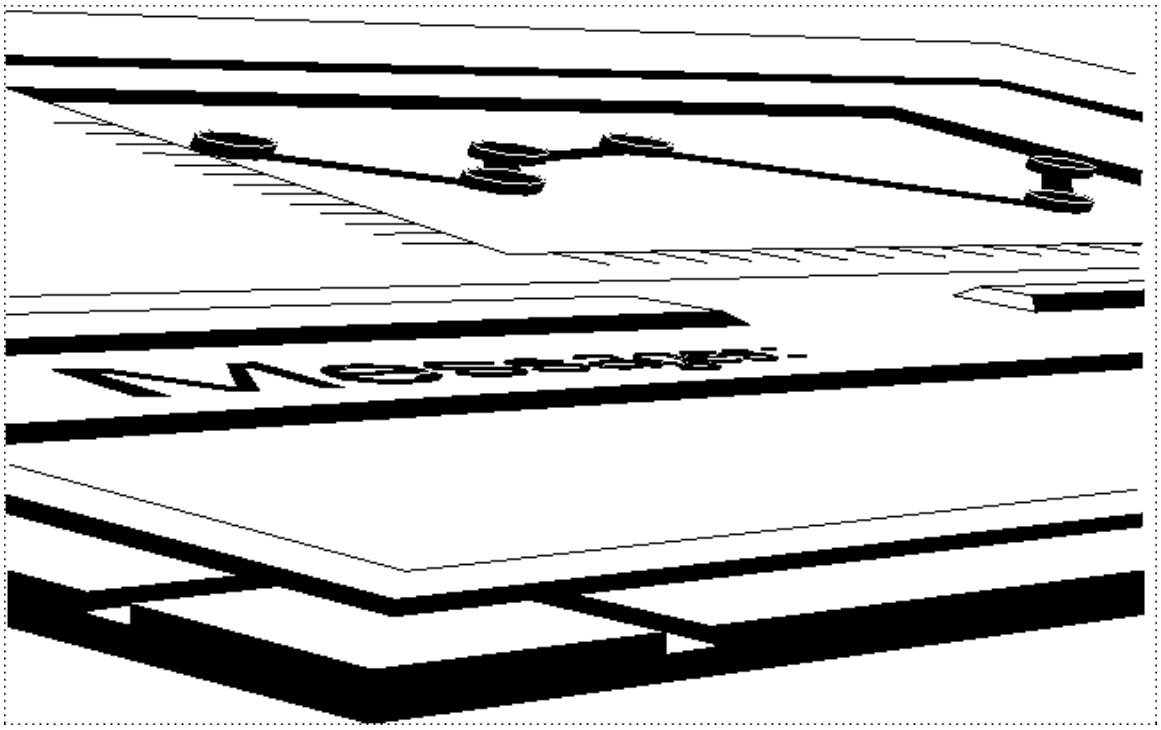
20.6 Asynchronous Commanding Status from an External Source

If the commanding status for a User ID that is in the Command Plan is changed from another application such as Command System Management or Command User Enable, the privileged CPMT instance receives immediate notification via the **CPMT - Status Change** dialog box (see Figure 20-24, CPMT - Status Change dialog box). A message is also sent to both the CPMT message area and the Sytem Message Handler.

Figure 20-24, CPMT - Status Change dialog box.

Note: No other interaction with the CPMT application is permitted until this dialog box is dismissed.

All occurrences of the User ID that changed status are marked as inactive in the Command Plan. To bring the affected User ID back under the control of the Command Plan, use either the **Activate User** or **Activate All Users** options from the **Options** menu.



Chapter 21: File Ground Management Tool (FGMT) Software

This chapter describes the Huntsville Operations Support Center (HOSC) File Ground Management Tool (FGMT) application. FGMT is part of the Operations Control Mission Software (OCMS) suite of applications and provides you with the capability to manage files on the Payload Multiplexer/Demultiplexer (PLMDM) Mass Storage Device (MSD) onboard the International Space Station (ISS).This tool can be run by multiple non-privileged users in view-only mode, but only a single privileged user is allowed to access all functions. The privileged user is permitted to uplink files to and delete onboard files from the PLMDM MSD. The privileged user is also allowed to generate a MSD disk management schedule which uplinks auto-procedure and other payload related files to the onboard system. These files must be onboard the PLMDM MSD at the appropriate time in order to support planned payload operations. Reports and plots are displayed through a View Schedule function which informs the user of the PLMDM MSD directory contents.

21.1 File Ground Management Tool (FGMT) Overview

File management is the key to the successful operation of payloads onboard the ISS. The primary environment is electronic for onboard flight procedures, the flight plan, command and control displays, and application software. All of these products generated by the ground take the form of computer files that are uplinked to the onboard systems, arriving on time to support planned payload operations. The FGMT provides the mechanism for uplinking these files.

The flight system architecture and capabilities drive the OCMS File Ground Management function requirements to a large degree. The flight system consists of the Command & Control MDM (C&C MDM), the Payload Multiplexer/Demultiplexer (PLMDM) Mass Storage Device (MSD), numerous portable computer systems (PCS), and payload provided storage devices. Any and all of these system elements may require files to support a payload operation.

The FGMT provides the unprivileged user the following capabilities:

- View the current Onboard File List and file attributes
- View a (MSD) Management Schedule
- View a MSD Utilization Report
- View MSD space statistics
- Initiate a file compare request on the ground

FGMT also notifies non-privileged users when an update is made to the PLMDM MSD (i.e., when a Copy, Delete, Create Directory, Delete Directory, Change Attributes, or Update Ground Model function is performed). Notifications are also sent during schedule execution as files are deleted and uplinked.

The privileged user retains all the capabilities of the unprivileged user plus the capability to perform the following tasks:

- Generate and edit an MSD Management Schedule
- Monitor and implement the MSD Management Schedule
- Uplink files on request
- Manage the onboard MSD

The FGMT allows the privileged user to employ a “Scheduled Mode” or an “On Request Mode” to uplink and delete files.

“Scheduled Mode” involves analyzing the Onboard Short Term Plan (OSTP) to generate a MSD Management Schedule for identifying the uplink times of files needed for planned payload operations. The schedule is processed to:

- Notify the user that it is time to uplink a file or group of files

- Notify the user that a file is not baselined in the PIMS database and is needed for uplink
- Perform a disk memory management activity

“On Request Mode” involves manual uplinking of the files by the user in response to unplanned onboard conditions. If time allows, the user edits the schedule by adding a schedule entry of the file to be uplinked. The edited schedule requires changes to account for the unplanned use of disk space.

The FGMT (see Figure 21-1, FGMT Concept - Scheduled Mode.) scans the OSTP for payload auto-procedure files only. All other files (manual crew procedures, procedure reference data, experiment software loads, for example) are included by editing the schedule. When the FGMT generates an uplink schedule, it checks to see if the OSTP-specified files are already onboard the PLMDM MSD. If they are, the FGMT checks their baseline state, Document Revision, and Onboard Revision as referenced in the PIMS database. A Document Revision identical to the Onboard Revision implies the onboard file is identical to its namesake in the database, so that an uplink is not required. A difference implies the onboard file is obsolete and the file in the PIMS database, if it is baselined, needs to be uplinked.

A file in the baseline state is the current configuration management (CM) version approved by the document manager. Only baselined files, and payload related files entered into the schedule through OCR actions, are uplinked. If the FGMT is enabled for file late monitoring and the files are not baselined, the FGMT issues a File Late message to the document writer and document manager through email, Message Handler Log, and on-line multi-cast notification, the latter via PIMS Configuration Management (PCM).

If the file is baselined before its Need Onboard Time, the FGMT requests Document Configuration Management (DCM) to transfer the file to the HOSC Drop Box Command Directory. DCM sets the “at MCC-H” indicator to “no” for each file stored in the HOSC Drop Box. MCC-H polls the Command Directory for the files and transfers them to the MCC-H Drop Box. The files reside in the drop box for an indeterminate time (24 hours to 2 days) before they are deleted By MCC-H housekeeping procedures. As the files are transferred from the Command Directory, MCC-H creates a File Transport Acknowledgement File in the File Transport Directory of the Commanding partition of the MCC-H Drop Box with the same filename as the file to be uplinked. The File Transport Acknowledgement File contains the file transport status. PCM polls the File Transport Directory for this File Transport Acknowledgement File and reads it to retrieve file transfer status information.

If a file is successfully transferred to the MCC-H Drop Box, the PCM sets the “at MCC-H” indicator to ‘yes”, to indicate that the file is ready for uplink. When the FGMT determines that the “at MCC-H” indicator is set to “yes”, it requests the Workstation Command Processor (WCP) to initiate an uplink of the file. The WCP sends an uplink request to the Central Command Processor (CCP). The CCP formats the uplink request as a file transfer message which is sent to the MCC-H Command Server. After receipt of the file transfer message, the MCC-H Command Server software will move the files from the MCC-H Drop Box to the Uplink Queue for uplink to the PLMDM MSD. If the file is successfully transferred onboard, the Central Command Processor (CCP) resets the “at MCC-H” indicator to “no”. If the file did not transfer to the Uplink Queue, the

FGMT notifies the document writer and manager, through email via PCM, that an error occurred in the uplink process.

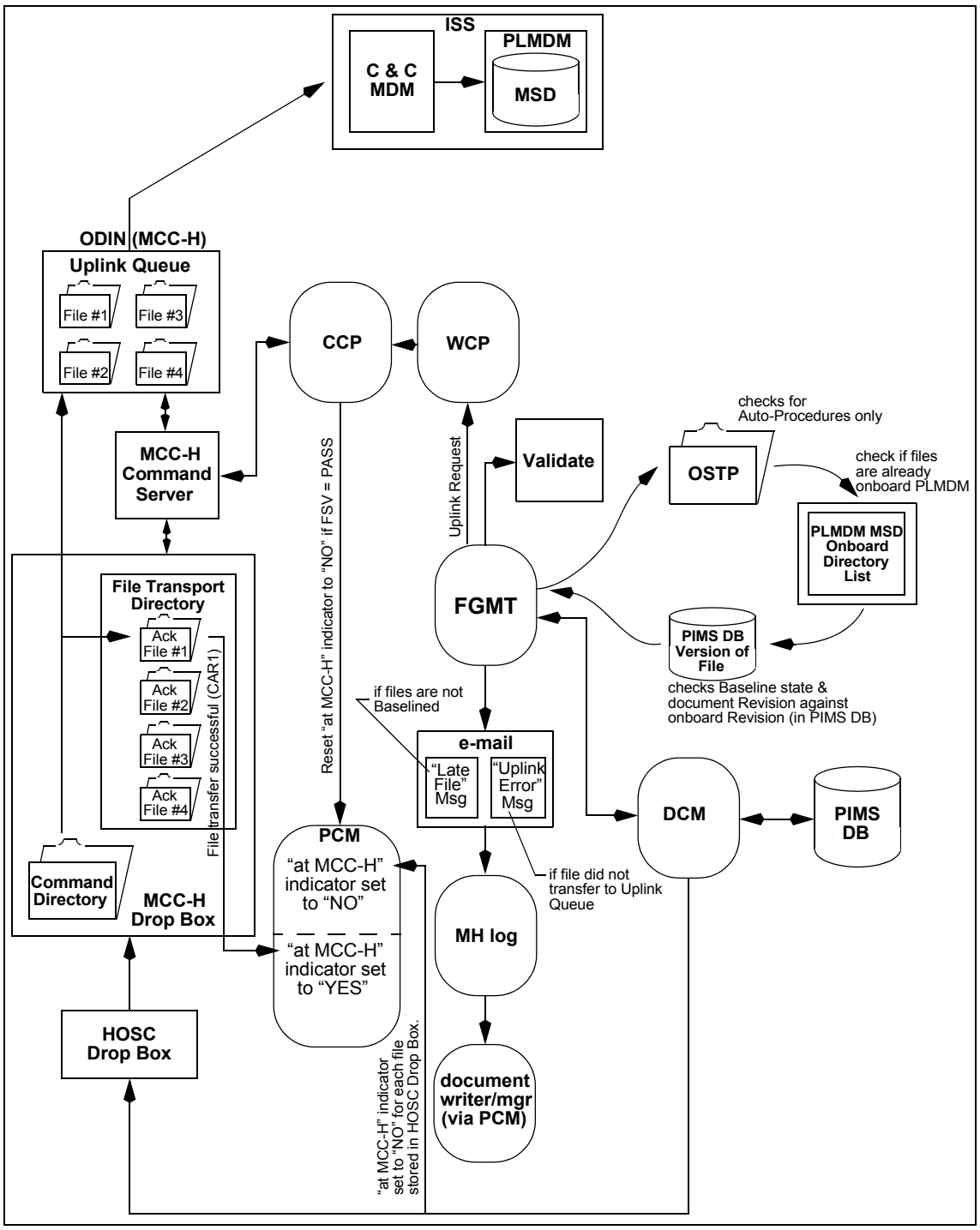


Figure 21-1, FGMT Concept - Scheduled Mode.

The File Ground Management Tool main window contains several distinct features that will be discussed in this chapter (see Figure 21-2, File Ground Management Tool main window):

- Menu bar
- Status bar
- Work Area

Note: The FGMT main window depicted in Figure 21-2, represents the privileged version of the main window which differs from the unprivileged version in that it contains a control panel composed of five pushbuttons.

Note: All further discussions concerning this application will be at the level of the privileged user. It is the responsibility of the individual user of this document to determine his/her level of privilege, which will in turn, determine the features presented by the application.

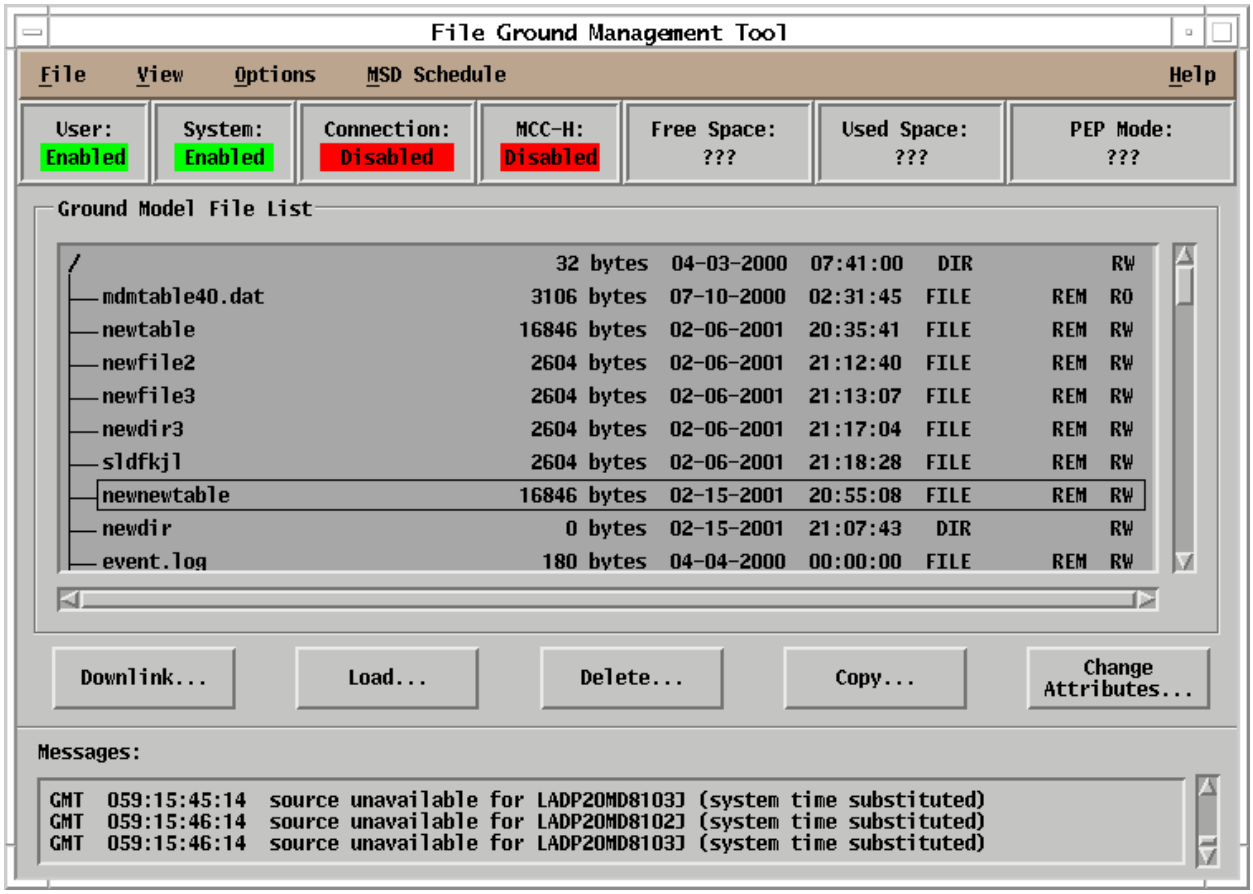


Figure 21-2, File Ground Management Tool main window.

21.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Options**, **MSD Schedule**, and **Help**. Certain menu options listed under the main menu headings

are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Find...** (privileged & unprivileged)
  - **Downlink...** (privileged)
  - **Load...** (privileged)
  - **Delete...** (privileged)
  - **Copy...** (privileged)
  - **Change Attributes...** (privileged)
  - **Create Directory...** (privileged)
  - **Delete Directory...** (privileged)
  - **Update Gound Model...** (privileged) / **Refresh** (unprivileged)
  - **Compare Directories...** (privileged & unprivileged)
  - **Update Disk Status...** (privileged)
- **MSD Schedule** menu
  - **View Schedule...** (unprivileged)
  - **Generate Schedule...** (privileged)
  - **Execute Schedule...** (privileged)

21.1.2 Status Bar

The status bar contains seven fields (see Figure 21-3 , Status Bar.):

- **User:**
- **System:**
- **Connection:**
- **MCC-H:**
- **MSD Free Space:**
- **MSD Used Space:**
- **PEP Mode:**

Figure 21-3, Status Bar.

The **User:** field will display **Enabled** with a green background color if you are enabled for commanding. It will display **Disabled** with a red background if you are disabled for commanding.

When the commanding system is enabled for commanding, the **System:** field will display **Enabled** with a green background color. When the commanding system is disabled for commanding, it will display **Disabled** with a red background color.

The **Connection:** field will display **Enabled** (green background) when the command system is connected to MCC-H for commanding. The field displays **Disabled** (red background) when the command system is not connected to MCC-H for commanding.

The **MCC-H:** field will toggle between **Enabled** and **Disabled**. The MCC-H status reconfigures to **Enabled** (green background) when MCC-H is enabled for commanding. It reconfigures to **Disabled** (red background) when MCC-H is disabled for commanding.

The **MSD Free Space:** field displays the existing amount of available (unused) space on the PLMDM MSD expressed in Megabytes. The **Free Space:** reconfigures as the MSD Free Space MSID telemetry values change.

The **MSD Used Space:** field displays the amount of PLMDM MSD memory currently being used to store files expressed in Megabytes. The **MSD Used Space (Mb):** reconfigures as the MSD Free Space MSID telemetry values change.

The **PEP Mode:** field displays the current status of the PEP. Possible entries in this field may be **Offline**, **Standby**, **Minimal Operations**, **Operational**, or **???** for undefined or no telemetry available. The Payload Executive Processor (PEP) is a software application executed within the PLMDM that provides monitoring, control, and coordination of US payload activities on the ISS. The PEP provides the following capabilities:

- Provides collection and downlink of low-rate telemetry data generated by payloads
- Provides collection and distribution of payload and payload-related equipment and software status
- Provides collection and downlink of predefined data packet sets to the ground
- Supports management of the PLMDM MSD

21.1.3 Work Area

The work area of the File Ground Management Tool main window defaults to display the current Onboard File List listing. The work area updates automatically as the content of the PLMDM MSD is modified.

Note: If the files PLMSD_DIR_List.dat or Curr_Onboard_Files.dat are not stored in PIMS prior to running the FGMT application, the application will initialize displaying the root directory only. As files are uplinked, the main window will update accordingly and an ASCII ground model will be generated. If a directory list file is downlinked, it can be incorporated using the Update Ground Model option.

Clicking the left mouse button on an individual listing entry selects it and the selection is denoted by a surrounding rectangle. Clicking the right mouse button within the work area expands the listing to include file/directory attributes.

The work area with file/directory attributes selected contains a list consisting of seven columns of information.

Note: Columns are enumerated from the leftmost column of the display.

The first column of the listing displays the file/directory name. This is a 32 character string containing the full path name and extension

The second column indicates the size of the file/directory in bytes.

The third column displays the creation date and time of the file/directory expressed as MM-DD-YYYY HH:MM:SS.

The fourth column indicates whether a particular entry is a directory or a file.

The fifth column indicates if the Cyclic Redundancy Check (**CRC**) has been performed. The CRC provides a data integrity check to detect single event upset (SEU) induced errors in either the Small Computer System Interface (SCSI) Controller chip or the electronics of the PLMDM MSD.If the check has not been performed this field will be blank.

Help: See the Glossary for a definition of Cyclic Redundancy Check.

The sixth column indicates **REM** if the file or directory can be removed or deleted from the PLMDM MSD. If the file or directory can not be removed, this field will be blank.

The seventh column displays the file read/write permission for the individual list entries. Possible entries in this field are:

- **RW** read/write permission
- **WO** write only permission
- **RO** read only permission

21.1.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the File Ground Management Tool. All of the menu options from the **Options** and **MSD Schedule** menus will be discussed (see Figure 21-4 , Options and MSD Schedule menus.).

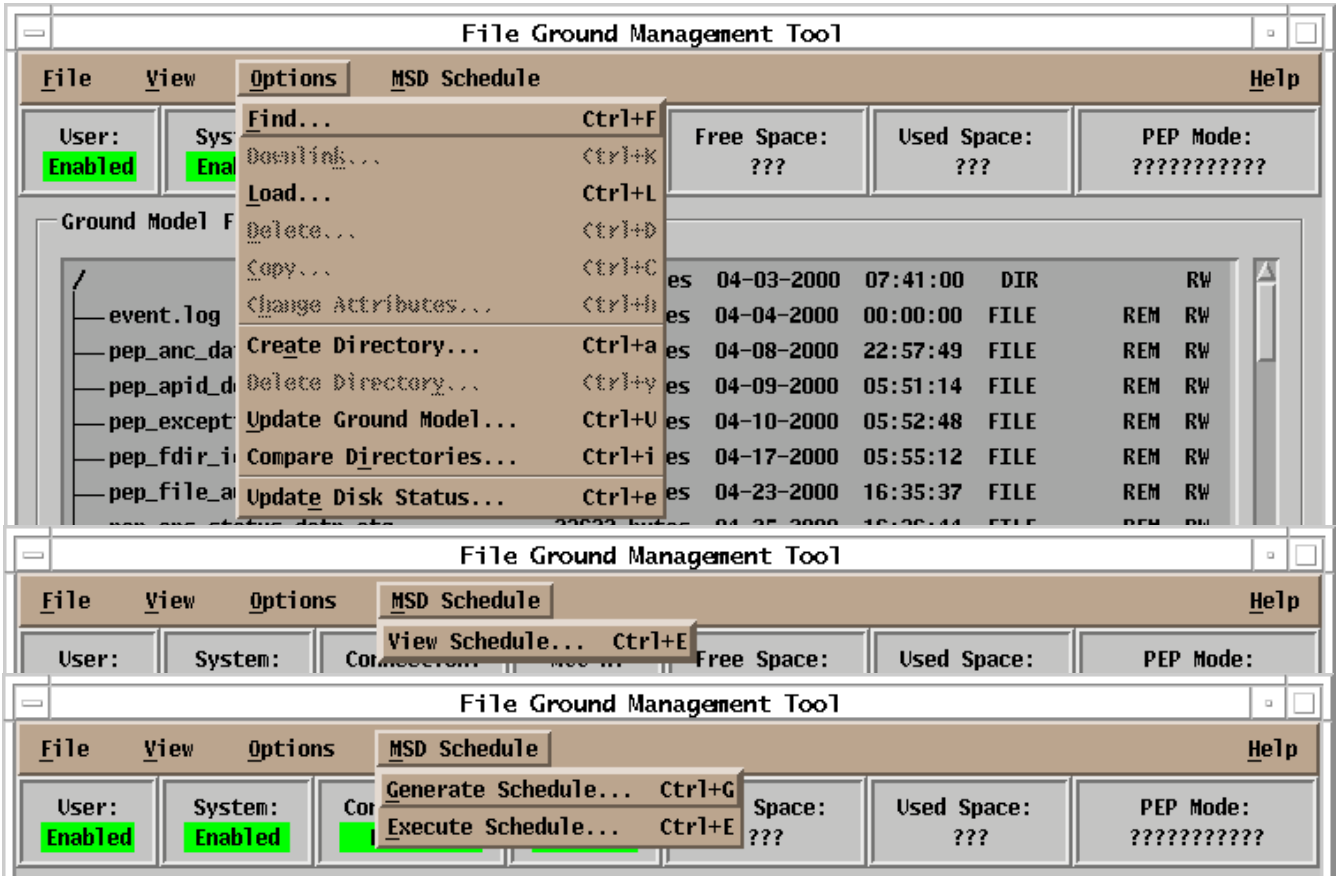


Figure 21-4, Options and MSD Schedule menus.

21.1.4.1 Find...

The **Find...** menu item invokes the **Find File** dialog box (see Figure 21-5, Find File dialog box). This dialog box may be used to locate a file in the current Onboard File List.

The **Find:** text entry field is used to enter the filename of the file in question. The length of the filename plus file extension is limited to 32 characters.

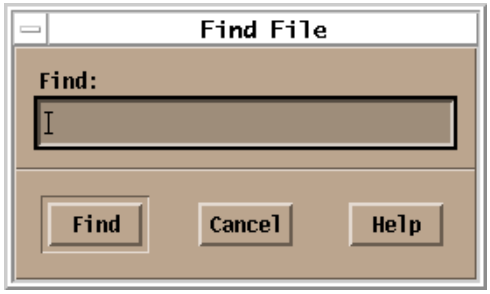


Figure 21-5, FInd File dialog box.

Clicking Find locates the file, displays the file entry at the top of the directory tree, denotes the file by enclosing it in a rectangle, and closes the **Find File** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.2 Downlink...

The **Downlink...** menu item invokes the **Downlink (Confirmation Required)** dialog box (see Figure 21-6, Downlink (Confirmation Required) dialog box). Selection of this option initiates a downlink request of the selected file.

Note: Selection of this menu option performs the same action as clicking Downlink... .

Figure 21-6, Downlink (Confirmation Required) dialog box.

Clicking Downlink issues a downlink request for the selected file and closes the **Downlink (Confirmation Required)** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.3 Load...

When the privileged user selects the **Load...** option, the **Load (Confirmation Required)** dialog box is invoked (see Figure 21-7, Load (Confirmation Required) dialog box). This dialog box provides the capability to load a file, specified by **Filename:**, from the PLMDM MSD to the PLMDM memory (DRAM). This allows PEP CSCI data tables to be stored on the PLMDM MSD and subsequently loaded to memory for use in PEP CSCI processing. Also, the privileged user must specify whether the file is to be stored in the Dynamic Random Access Memory (**DRAM**) (default) or the Electrically Erasable Programmable Read Only Memory (**EEPROM**).

Note: Selection of this menu option performs the same action as clicking Load... .

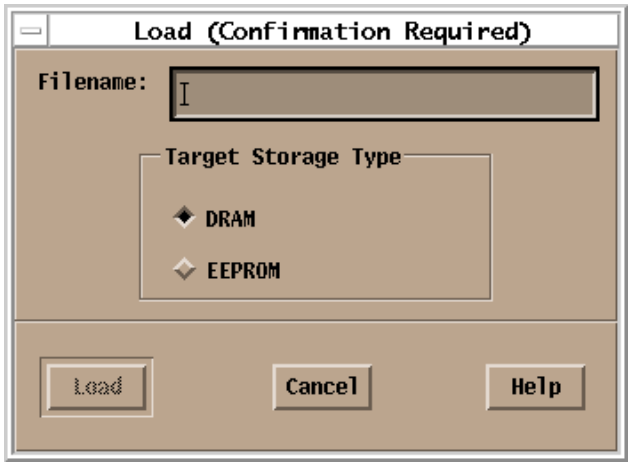


Figure 21-7, Load (Confirmation Required) dialog box.

Clicking Load initiates the file load to memory process and closes the **Load (Confirmation Required)** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.4 Delete...

The **Delete...** option invokes the **Delete (Confirmation Required)** dialog box (see Figure 21-8, Delete (Confirmation Required) dialog box). The **Delete (Confirmation Required)** dialog box enables the privileged user to delete a selected file from the PLMDM MSD. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

Note: Selection of this menu option performs the same action as clicking Delete....

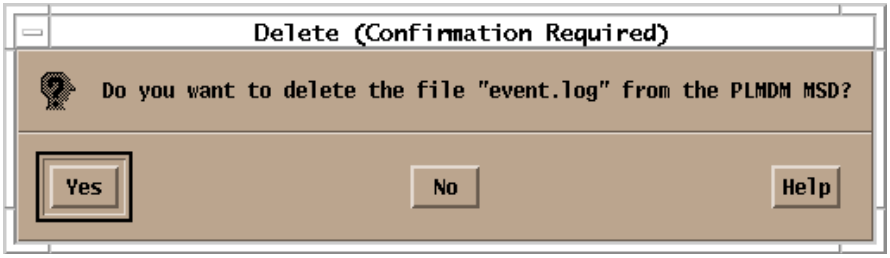


Figure 21-8, Delete (Confirmation Required) dialog box.

Clicking Yes issues a Delete File command to the PLMDM MSD for the selected file and closes the **Delete (Confirmation Required)** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.5 Copy...

The **Copy...** option invokes the **Copy (Confirmation Required)** dialog box (see Figure 21-9, Copy (Confirmation Required) dialog box). The **Copy** dialog box enables the privileged user to initiate a Copy File Command to the PLMDM MSD which copies a selected file to another file. When the FGMT receives confirmation that the command was successful, the FGMT Onboard Directory Listing is updated to reflect the change so that the ground Onboard Directory is identical to what is supposed to be onboard the PLMDM MSD. The copied file entry will be added to the end of the Onboard Directory List. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

Note: Selection of this menu option performs the same action as clicking Copy....

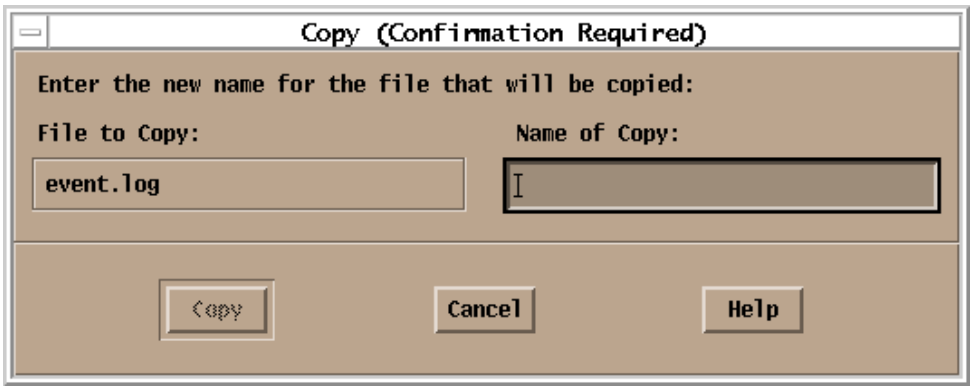


Figure 21-9, Copy (Confirmation Required) dialog box.

The **File to Copy:** text field defaults to the selected file's filename, the **Name of Copy:** text entry field will contain the user-defined filename for the duplicated file (up to 32 characters in length).

Clicking Copy issues a Copy File command to the PLMDM MSD for the selected file and closes the **Copy** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.6 Change Attributes...

The **Change Attributes...** option invokes the **Change Attributes** dialog box (see Figure 21-10, Change Attributes dialog box). The **Change Attributes** dialog box enables the privileged user to change the file permissions for a selected file in the PLMDM MSD.

Note: Selection of this menu option performs the same action as clicking Change Attributes....

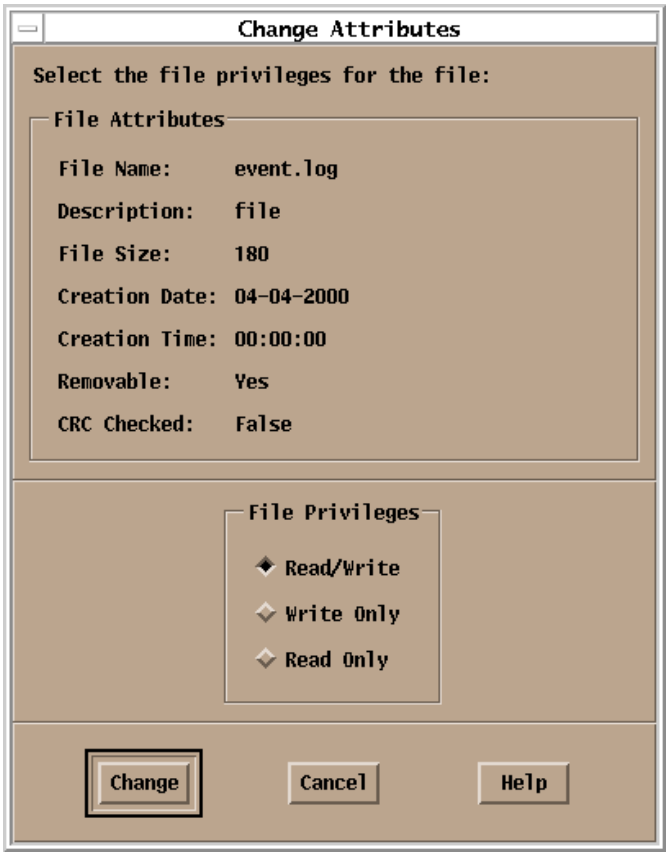


Figure 21-10, Change Attributes dialog box.

The **File Attributes** frame contains the default attributes for the selected file including:

- **File Name:**
- **Description:**
- **File Size:**
- **Creation Date:**
- **Creation Time:**
- **Removable:**
- **CRC Checked:**

The **File Privileges** frame contains three radio buttons labeled:

- **Read/Write**
- **Write Only**
- **Read Only**

The current, default file privilege for the selected file is indicated by the highlighted radio button. Changes to the file privileges are made by clicking on the radio buttton next to the appropriate privilege.

Clicking Change issues a Change File Attributes command to the PLMDM MSD for the selected file and closes the **Change Attributes** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.7 Create Directory...

The **Create Directory...** option invokes the **Create Directory (Confirmation Required)** dialog box (see Figure 21-11, Create Directory (Confirmation Required) dialog box). The **Create Directory (Confirmation Required)** dialog box enables the privileged user to initiate a Create Directory Command to the PLMDM MSD which creates a new directory entry on the PLMDM MSD. When the FGMT receives confirmation that the command was successful, the FGMT Onboard Directory Listing is updated to reflect the change so that the ground Onboard Directory is identical to what is supposed to be onboard the PLMDM MSD. The new directory entry will be added to the end of the Onboard Directory List. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

Figure 21-11, Create Directory (Confirmation Required) dialog box.

The dialog box consists of a **Directory:** text entry field and a control panel.

The **Directory:** text entry field is used to enter the name of the directory (up to 32 characters) that you wish to create.

Clicking Create issues a Create Directory Command to the PLMDM MSD and closes the **Create Directory (Confirmation Required)** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.8 Delete Directory...

The **Delete Directory...** option invokes the **Delete Directory (Confirmation Required)** dialog box (see Figure 21-12, Delete Directory (Confirmation Required) dialog box). The **Delete Directory (Confirmation Required)** dialog box enables the privileged user to initiate a Delete Directory Command to the PLMDM MSD which deletes the contents of a directory on the

PLMDM MSD. When the FGMT receives confirmation that the command was successful, the FGMT Onboard Directory Listing is updated to reflect the change so that the ground Onboard Directory is identical to what is supposed to be onboard the PLMDM MSD. The directory entry is removed from the directory tree of the Onboard Directory scroll list. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

Figure 21-12, Delete Directory (Confirmation Required) dialog box.

Clicking Yes issues a Delete Directory Command to the PLMDM MSD and closes the **Delete Directory (Confirmation Required)** dialog box returning you to the application main window. This is the default pushbutton.

21.1.4.9 Update Ground Model...

Selecting the **Update Ground Model...** menu option from the **Options** menu invokes the **Update Ground Model** dialog box (see Figure 21-13, Update Ground Model dialog box). This dialog box allows the user to update the **Ground Model File List** with the latest, downlinked version of the PLMDM MSD Directory List File. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

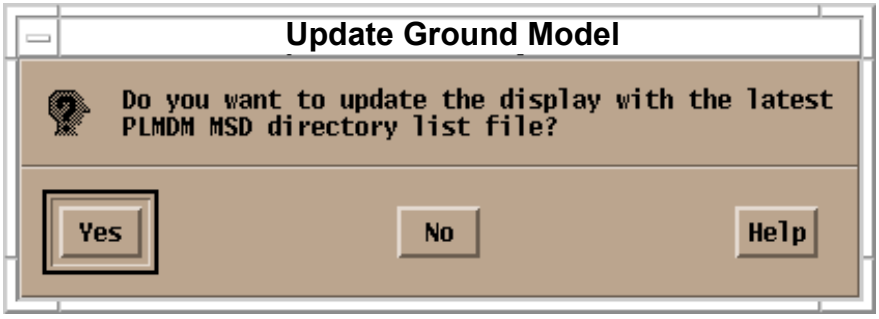


Figure 21-13, Update Ground Model dialog box.

There are three criteria considered when the **Ground Model File List** is/is not updated:

- if files are contained in the PLMDM MSD Directory List but not contained in the Ground Model File List the files are appended to the Ground File Model List.

- if files are contained in both the PLMDM MSD Directory List and the Ground Model File List the file attributes are compared and if there are any differences the Ground Model File List is updated.
- if files are contained in the Ground Model File List but not in the PLMDM MSD Directory List File, the Ground Model File List is left unchanged as the additional files may be in the process of a file uplink to the PLMDM MSD.

21.1.4.10 Refresh

Selecting the **Refresh** menu option from the **Options** menu allows the unprivileged user to refresh the main window by re-reading the current Ground Model file.

21.1.4.11 Compare Directories...

The **Compare Directories...** option allows the user to compare the Ground Model File List with the latest downlinked version of the PLMDM MSD Directory List file. Results of the comparison are presented to the user in the **Compare Directories** dialog box (see Figure 21-14, Compare Directories dialog box).

If differences exist between the two lists the **Compare Directories** dialog box will be invoked. This dialog box is composed of two lists: **Ground Model File List** on the left and the **Last Downlinked Directory List** on the right. Each list displays the Filename, Size and write permissions for their respective lists.

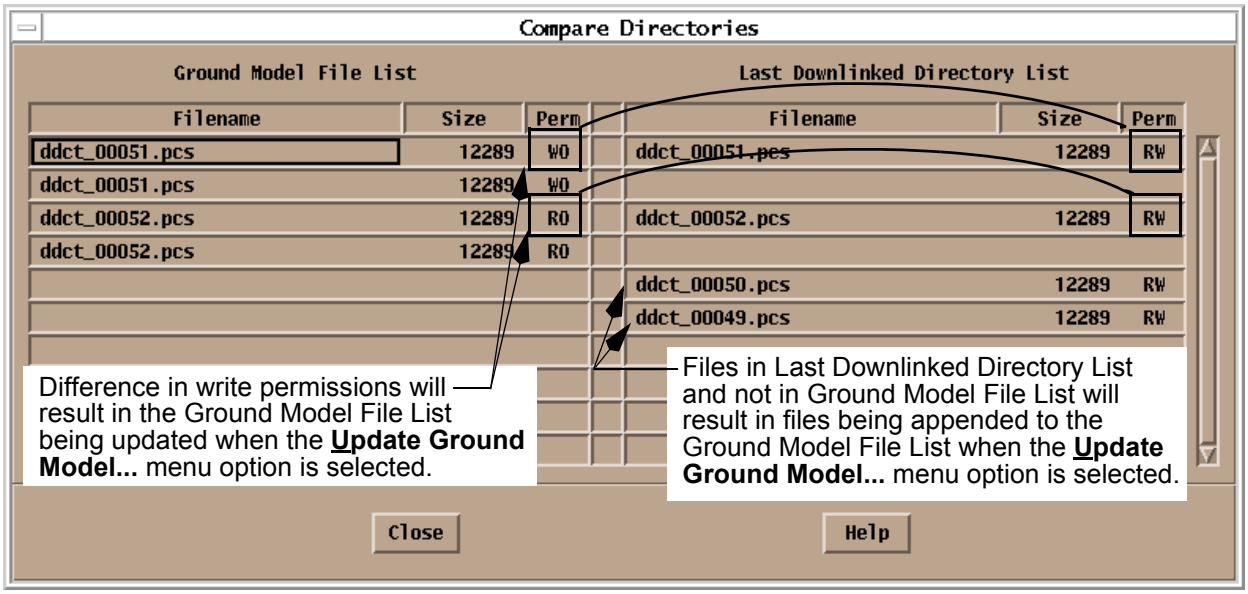


Figure 21-14, Compare Directories dialog box.

If no differences exist between the two lists the **No differences** dialog box will be invoked (see Figure 21-15, No Differences dialog box).

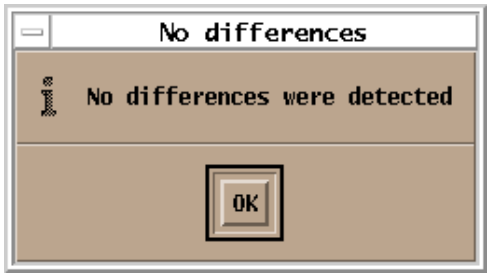


Figure 21-15, No Differences dialog box.

21.1.4.12 Update Disk Status...

The **Update Disk Status...** option invokes the **Update Disk Status (Confirmation Required)** dialog box (see Figure 21-16, Update Disk Status (Confirmation Required) dialog box). The **Update Disk Status (Confirmation Required)** dialog box enables the privileged user to obtain disk statistics information concerning defective cylinders and bad sectors of the MSD. The FGMT privileged user (usually the CPO) will check the status of this request through the Command Track application. Once the request has been initiated, the operator will need to set up the high rate data link (HRDL) profile for further processing of the resulting information, as the FGMT does not process this data.

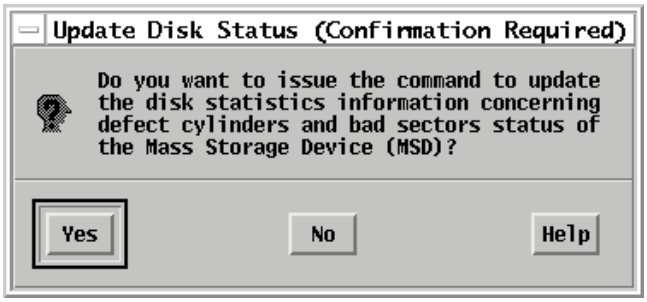


Figure 21-16, Update Disk Status (Confirmation Required) dialog box.

Clicking Yes initiates the request to update the MSD disk status. This is the default pushbutton.

21.1.4.13 View Schedule...

The **View Schedule...** menu option allows all FGMT users to view the currently executing MSD Schedule or stored MSD Schedules. A variety of reports concerning the MSD Schedule are also made available to users. Selection of the **View Schedule...** menu option invokes the View Schedule mini-application.

Help: For information on the View Schedule Mini-Application, see "Section 21.2, View Schedule Mini-Application".

21.1.4.14 Generate MSD Schedule...

The **Generate MSD Schedule...** menu option allows the privileged user to build, validate, view, edit, execute, or delete an MSD Schedule. The MSD Schedule is a file management schedule for the PLMDM MSD comprised of a time-ordered list of file uplink and onboard-file delete requests. Selection of the **Generate Schedule...** menu option invokes the Generate Schedule mini-application.

Help: For information on the Generate Schedule Mini-Application, see “Section 21.3, Generate Schedule Mini-Application”.

21.1.4.15 Execute Schedule...

The **Execute Schedule...** menu option allows the privileged user to execute a MSD Schedule. While executing the schedule, the user is able to perform schedule edits and merge a new schedule with the currently executing schedule in order to continue issuing additional uplink/downlink requests without interruption. Selection of the **Execute Schedule...** menu option invokes the Execute Schedule mini-application.

Help: For information on the Execute Schedule Mini-Application, see “Section 21.4, Execute Schedule Mini-Application”.

21.2 View Schedule Mini-Application

All File Ground Management Tool (FGMT) users can view the currently executing schedule or stored schedules. Additionally, all FGMT users can view and print the following reports related to the executing or stored schedules:

- Late Files Reminder Report
- MSD Utilization Report
- TDRS Utilization Report

The View Schedule Mini-Application main window contains several distinct features that will be discussed in this chapter (see Figure 21-17, View Schedule Mini-Application main window):

- Menu bar
- Status bar
- Work Area

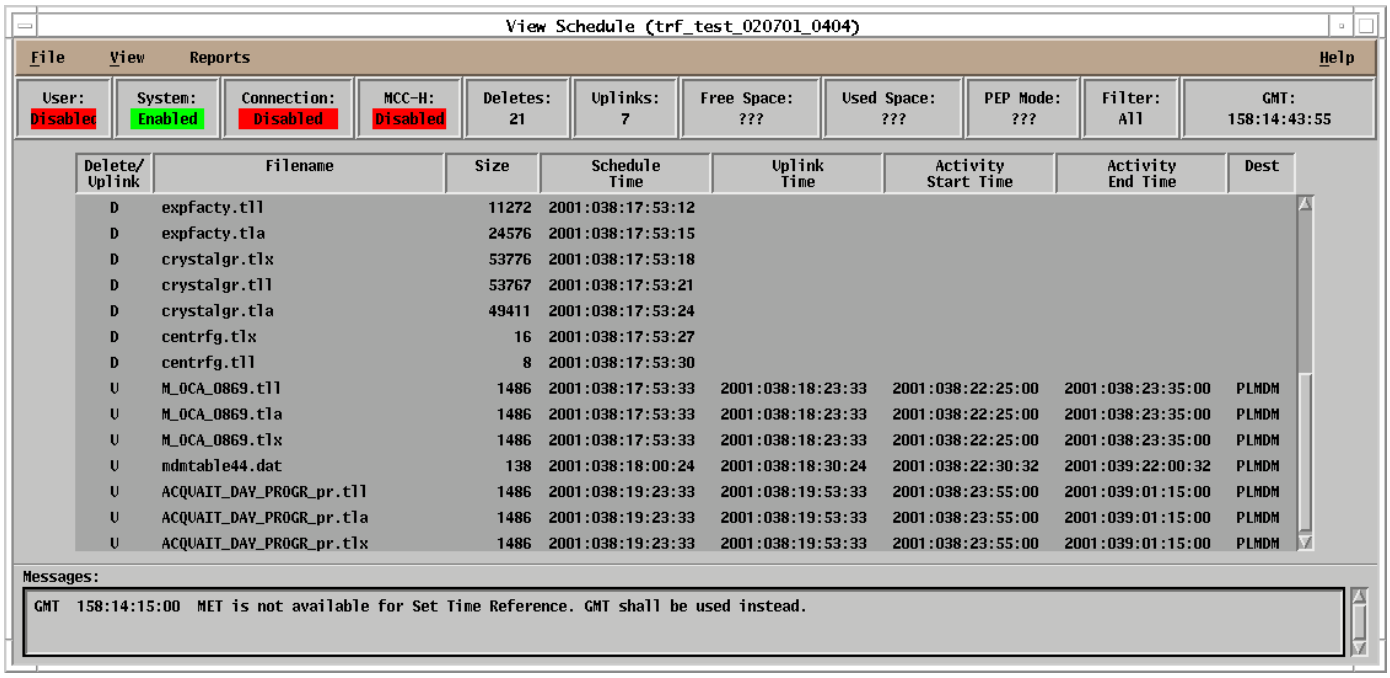


Figure 21-17, View Schedule Mini-Application main window.

21.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Reports**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **Open...**
- **View** Menu
  - **Filter...**
- **Reports** Menu
  - **Late Files Report...**
  - **MSD Utilization Report...**
  - **TDRS Utilization Report...**

21.2.2 Status Bar

The Status bar contains eleven fields of information (see Figure 21-18, View Schedule Status bar).

- **User:**

- **System:**
- **Connection:**
- **MCC-H:**
- **Deletes:**
- **Uplinks:**
- **Free Space:**
- **Used Space:**
- **PEP Mode:**
- **Filter:**
- **GMT:**

Figure 21-18, View Schedule Status bar.

The **User:** field will display **Enabled** with a green background color if you are enabled for commanding. It will display **Disabled** with a red background if you are disabled for commanding.

When the commanding system is enabled for commanding, the **System:** field will display **Enabled** with a green background color. When the commanding system is disabled for commanding, it will display **Disabled** with a red background color.

The **Connection:** field will display **Enabled** (green background) when the command system is connected to MCC-H for commanding. The field displays **Disabled** (red background) when the command system is not connected to MCC-H for commanding.

The **MCC-H:** field will toggle between **Enabled** and **Disabled**. The MCC-H status reconfigures to **Enabled** (green background) when MCC-H is enabled for commanding. It reconfigures to **Disabled** (red background) when MCC-H is disabled for commanding.

The **Deletes:** field contains the number of files in the schedule that are scheduled to be deleted.

The **Uplinks:** field contains the number of files in the schedule that are scheduled to be uplinked.

The **Free Space:** field displays the existing amount of available (unused) space on the PLMDM MSD expressed in Megabytes. The **Free Space:** reconfigures as the MSD Free Space MSID telemetry values change.

The **Used Space:** field displays the amount of PLMDM MSD memory currently being used to store files expressed in Megabytes. The **Used Space (Mb):** reconfigures as the MSD Free Space MSID telemetry values change.

The **PEP Mode:** field displays the current status of the PEP. Possible entries in this field may be **Offline**, **Standby**, **Minimal Operations**, **Operational**, or **???** for undefined or no telemetry available. The Payload Executive Processor (PEP) is a software application executed within the

PLMDM that provides monitoring, control, and coordination of US payload activities on the ISS. The PEP provides the following capabilities:

- Provides collection and downlink of low-rate telemetry data generated by payloads
- Provides collection and distribution of payload and payload-related equipment and software status
- Provides collection and downlink of predefined data packet sets to the ground
- Supports management of the PLMDM MSD

The **Filter:** field indicates if any filter criteria have been applied. Possible entries for this field are: **All**, **Deletes Only**, and **Uplinks Only**.

The **GMT:** field contains the updating Greenwich Mean Time (GMT) displayed in the format DDD:HH:MM:SS.

21.2.3 Work Area

The work area of the **View Schedule** main window is blank until a schedule is selected for viewing. A schedule is selected for viewing by using the **Open...** option from the **File** menu. After schedule selection the work area will contain the contents of the selected file which will include the following:

- **Uplink/Delete**
- **Filename**
- **Size**
- **Schedule Time**
- **Uplink Time**
- **Activity Start Time**
- **Activity End Time**
- **Destination**

The **Uplink/Delete** column will contain a **U** for uplink or **D** for delete to identify the action of the uplink request. **U** denotes that the file will be uplinked to the PLMDM MSD; **D** denotes that the file is already onboard the PLMDM MSD and is to be deleted.

Note: The listing of all entries in the schedule implies the Full View mode.

The **Filename** column contains the full file name and extension of all files making up the schedule. Filenames w/extensions are limited to 32 characters.

The **Size** column identifies the size of the file in bytes.

The **Schedule Time** column contains the time expressed in GMT format of YYYY:DDD:HH:MM:SS.

- If the schedule entry is for an uplink action, then this time represents when the FGMT requests the DCM to transfer the file from the PIMS Database to the HOSC Drop Box Command Directory for susequent polling and transfer by the MCC-H to the MCC-H Uplink Queue. This time is determined by the following algorithm:

Schedule Time = Uplink Request Time - Uplink Duration - File Uplink Standard Overhead parameter

Where: Uplink Duration = File Size / Standard Uplink Rate parameter

- If the schedule entry is a delete request, then this time represents the time when the delete request will be issued to delete an onboard file from the PLMDM MSD. This time is determined by the following algorithm:

Delete Time = First uplink entry Activity Start Time - (number of entries in Delete List * File Delete Overhead)

If there are no uplink request entries in the schedule, then its schedule time is set to:

Delete Time = current time + File Delete Overhead

The **Uplink Time** column contains the time expressed in GMT format of YYYY:DDD:HH:MM:SS. This time represents the time when the FGMT requests the WCP (Workstation Command Processor) to issue an uplink request for the auto-procedure file in the MCC-H Drop Box to be transferred to the PLMDM MSD. This value is determined by the following algorithm:

Uplink Request Time = OSTP specified activity start time - Safe Onboard Ready Time parameter

Note: This value is not displayed for a file that is to be deleted or for a file whose origin of activity is an International Partner.

The **Activity Start Time** represents the time when the file will be used for its scheduled payload activity. This time is determined by the following algorithm:

Activity Start Time = OSTP specified activity start time

The **Activity End Time** represents the time when the scheduled payload activity will be completed. This time is determined by the following algorithm:

Activity End Time = Activity Start Time + Activity Duration

The **Destination** column represents the location of the file onboard the PLMDM MSD or the origination of the activity if the file belongs to an International Partner (CSA, ESA, NASDA, RSA, etc.).

21.2.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the View Schedule mini-application. The **Open...** menu item from the **File** menu, the **Filter...** menu item from the **View** menu, and all of the menu options from the **Reports** menu will be discussed (see Figure 21-19, View Schedule menus).

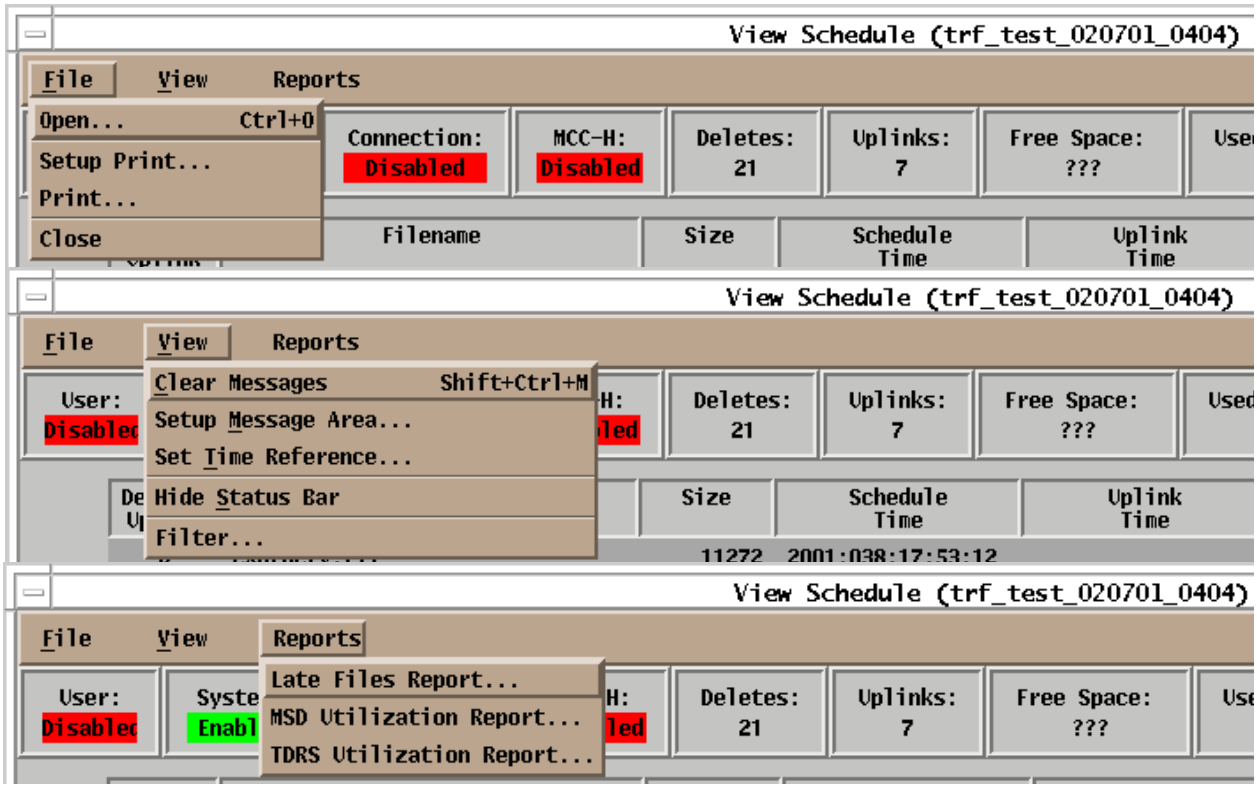


Figure 21-19, View Schedule menus.

21.2.4.1 Open...

The **Open...** menu item off the **File** menu invokes the **Open** dialog box (see Figure 21-20, Open dialog box). The **Open** dialog box will display all schedule files with extensions of *.sch that are located in the OCMS/FGMT folder in the PIMS Database.

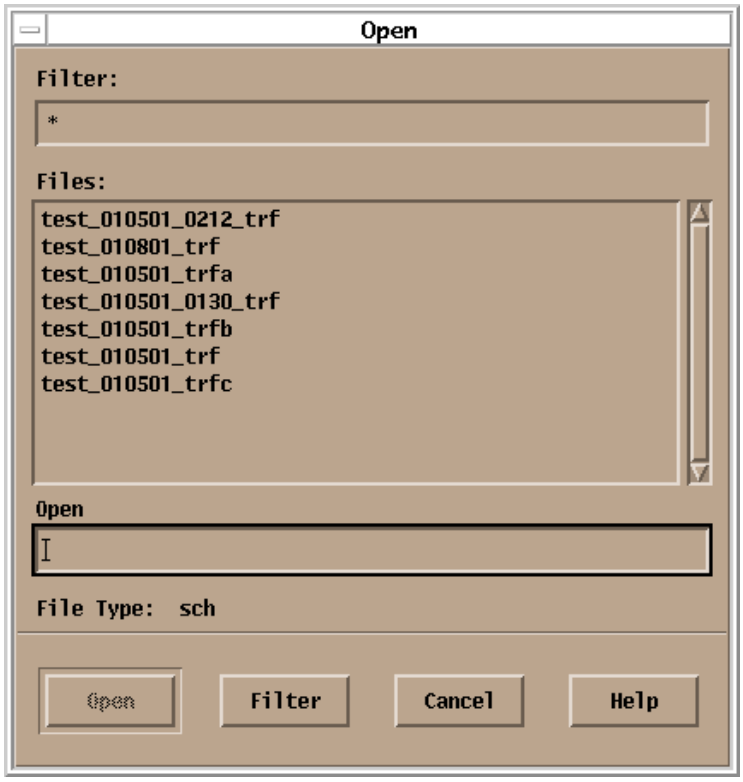


Figure 21-20, Open dialog box.

Clicking Open opens the file specified in the **Open** input text field and also invokes the **Disk Space Required** dialog box (see Figure 21-21, Disk Space Required dialog box). This is the default pushbutton when the cursor is in the **Open** input text field. Clicking Filter filters files based on the criteria specified in the **Filter:** input text field. An *.sch in this field indicates that all MSD Schedule files are to be shown. This is the default pushbutton when the cursor is in the **Filter** input text field.

Tip: You can also double-click on an item in the list to open a file.

After a user selects a schedule from the **Open** dialog box the name of the file will be appended to the right of the application title in the title bar and the contents of the schedule will be displayed in the work area of the View Schedule mini-application.

As previously mentioned, the **Disk Space Required** dialog box is invoked overlaying the displayed schedule to inform the user of any additional MSD disk space that would be required by the schedule.

Figure 21-21, Disk Space Required dialog box.

21.2.4.2 Filter...

Selection of the **Filter...** option from the **View** menu invokes the **Filter** dialog box (see Figure 21-22, Filter dialog box). This dialog box allows the user to select all files, only files to be deleted, or only files to be uplinked for viewing within the work area of the View Schedule main window.

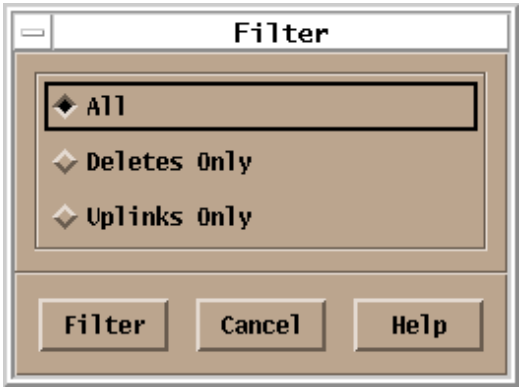


Figure 21-22, Filter dialog box.

21.2.4.3 Late Files Report...

The **Late Files Report...** menu option invokes the **Late Files Report** (see Figure 21-23, Late Files Reminder Report). If a procedure or payload-related file is not baselined in the PIMS Database and is scheduled for uplink, that file is marked late in the **Execute Schedule** mini-application and late file messages are broadcast via e-mail and the Message Handler to the document writer and document manager. The document writer will attempt to correct the file and baseline it through document manager approval before its scheduled uplink. If the file is baselined, but did not transfer to the HOSC Drop Box or to the MCC-H Uplink Queue, the file is marked late. The **Late Files Report** names the files that were not transferred from the ground (via the PIMS Database) to the PLMDM MSD (via the HOSC Drop Box and MCC-H Uplink Queue).

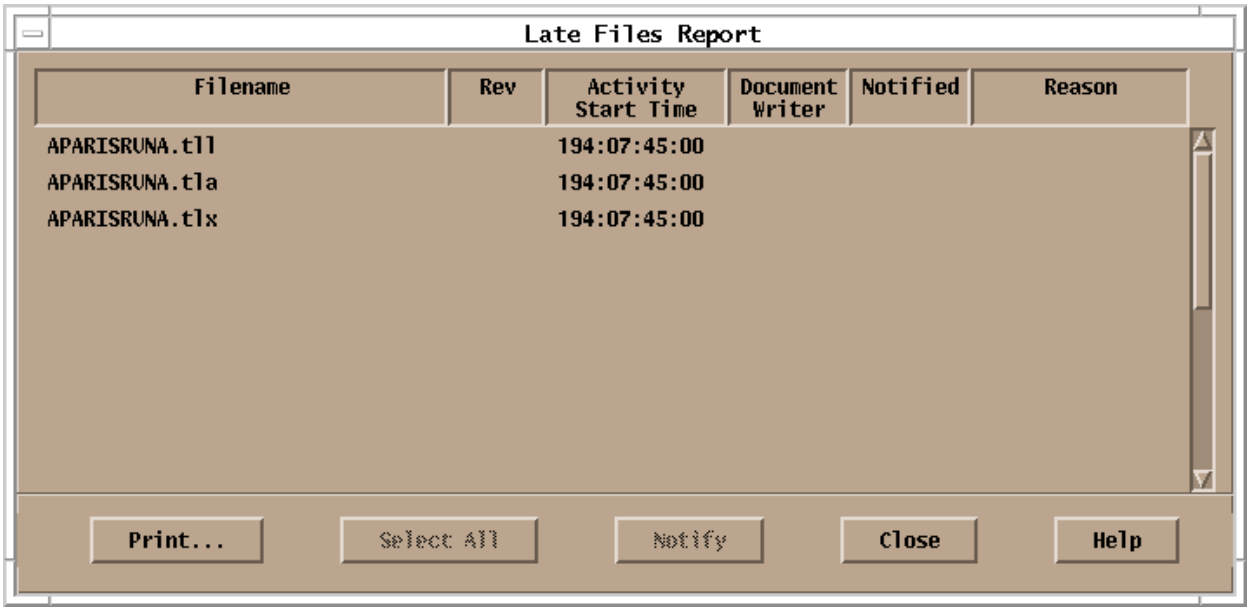


Figure 21-23, Late Files Reminder Report.

The work area contains a list consisting of six columns of information organized under the following headings:

- **Filename**
- **Rev**
- **Activity Start Time**
- **Document Writer**
- **Notified**
- **Reason**

The **Filename** column contains the full filename and extension of all files scheduled for deletion. Filenames w/extensions are limited to 32 characters.

The **Rev** column indicates the version of the document stored in the PIMS Database.

The **Activity Start Time** column contains the time expressed in GMT format of DDD:HH:MM:SS that represents the time when the file will be used for its scheduled payload activity.

The **Document Writer** column identifies the author or originator of the file.

The **Notified** column contains the time expressed in GMT format of DDD:HH:MM:SS that represents the time when an e-mail message was sent to the Document Originator indicating that the file could not be transferred to the PLMDM MSD during the uplink process.

The **Reason** column will contain a brief e-mail message that was sent to the Document Originator indicating why the file was late and could not be sent to the PLMDM MSD. This may be due to one of the following conditions:

- The file was not transferred from the PIMS Database to the HOSC Drop Box.
- The File was not transferred from the HOSC Drop Box to the MCC-H Drop Box.
- The file was prematurely deleted from the MCC-H Drop Box before its scheduled uplink.
- The file was uplinked to the PLMDM MSD, but after its scheduled activity start time.
- The file was not baselined.
- TDRS coverage was not available.

21.2.4.4 MSD Utilization Report...

The **MSD Utilization Report...** menu option invokes the **MSD Utilization Report** (see Figure 21-24, MSD Utilization Report). The MSD Utilization Report displays a histogram/bar graph which shows the PLMDM MSD disk space usage as a series of vertical bars connected over a series of time.

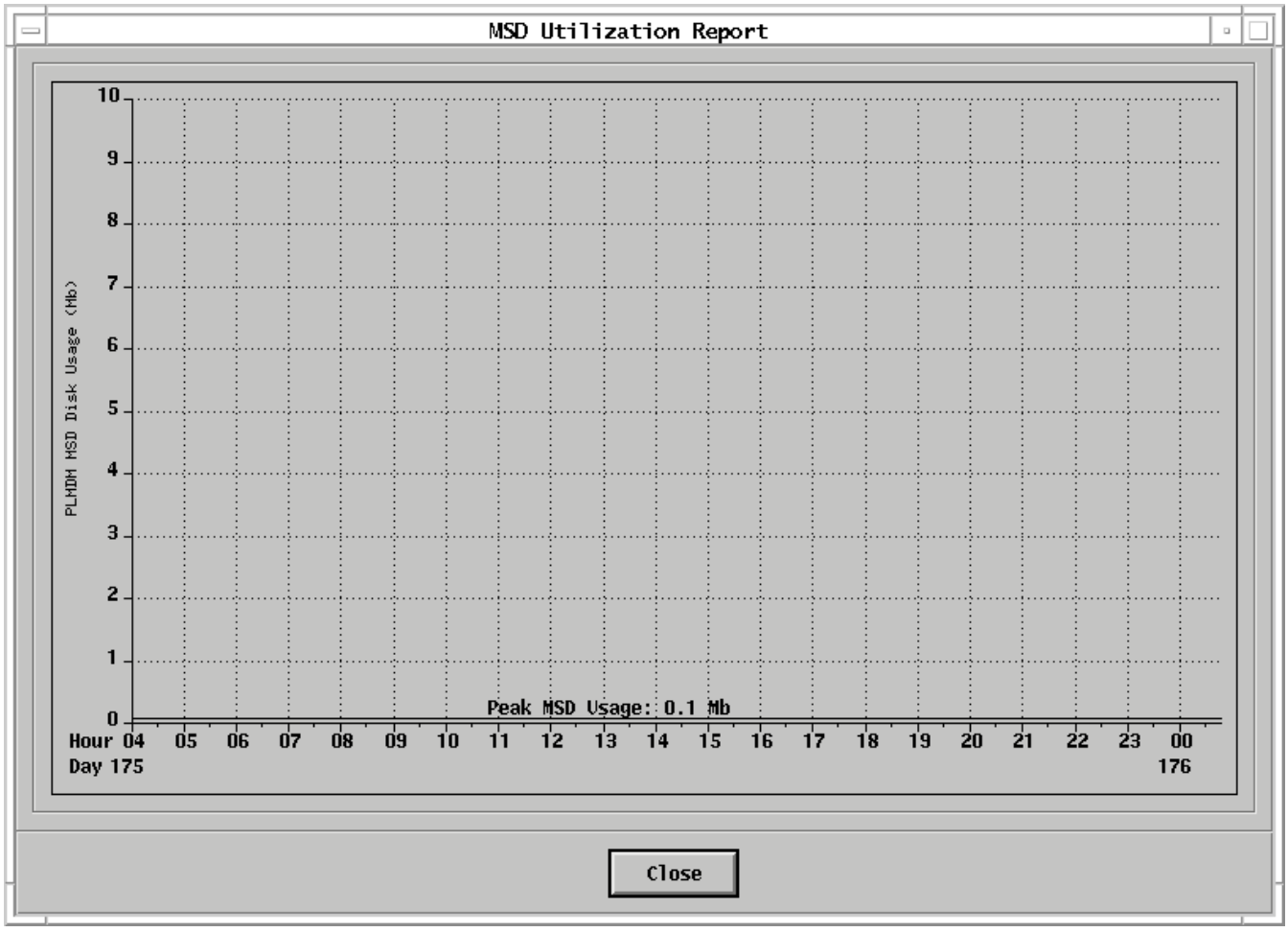


Figure 21-24, MSD Utilization Report.

The beginning of a horizontal line is plotted using the following data:

x coordinate = Need Onboard Time = OSTP specified activity start time
y coordinate = File Size in bytes

The end of the horizontal line is plotted using the next file's Need Onboard Time. The vertical lines reflect the difference in the file sizes of the files.

The maximum storage on the PLMDM MSD allowed for storage of uplink files is 300 megabytes. There is usually a parameter of storage alloted for emergency free space which is provided in case a file must be uplinked immediately.

The MSD Utilization Report displays data for a particular time period covered by the schedule that was generated based on the user's inputted start and stop times for the OSTP. If the user wishes to see plots for a different time period, then a new schedule reflecting that time period must be generated.

21.2.4.5 TDRS Utilization Report...

Though the TDRS Utilization Report is described in the following section, the software will not be available until a future s/w/ build.

The **TDRS Utilization Report...** menu option invokes the **TDRS Utilization Report** (see Figure 21-25, TDRS Utilization Report). The **TDRS Utilization Report** displays a series of horizontal bars which show the transfer times of the files specified in the schedule that are to be uplinked over a period of time. Above the **Files for Uplink** plot the TDRS coverage in terms of KuBand (black bars) and S-Band (cross-hatched bars) coverage are displayed.

The beginning of the horizontal bar (in the **Files for Uplink** plot) is plotted using the file's Schedule Time :

Schedule Time = Uplink Request Time - Uplink Duration - File Uplink Standard Overhead

Where:
Uplink Duration = File Size / Uplink Rate

The end of the horizontal bar is plotted using the file's Need Onboard Time:

Need Onboard Time = OSTP specified activity start time

The drawing area for the plot permits 16 files to be displayed vertically. If the transfer times are small, the next set of 16 files are plotted to the right and from top to bottom. Since the file uplink process occurs during S-Band coverage, the bars should appear under the cross-hatched bands indicating S-Band coverage.

The **TDRS Utilization Report** displays data for a particular time period covered by the schedule that was generated based on the user's inputted start and stop times for the OSTP. If the user wishes to see plots for a different time period, a new schedule reflecting that time period must be generated.

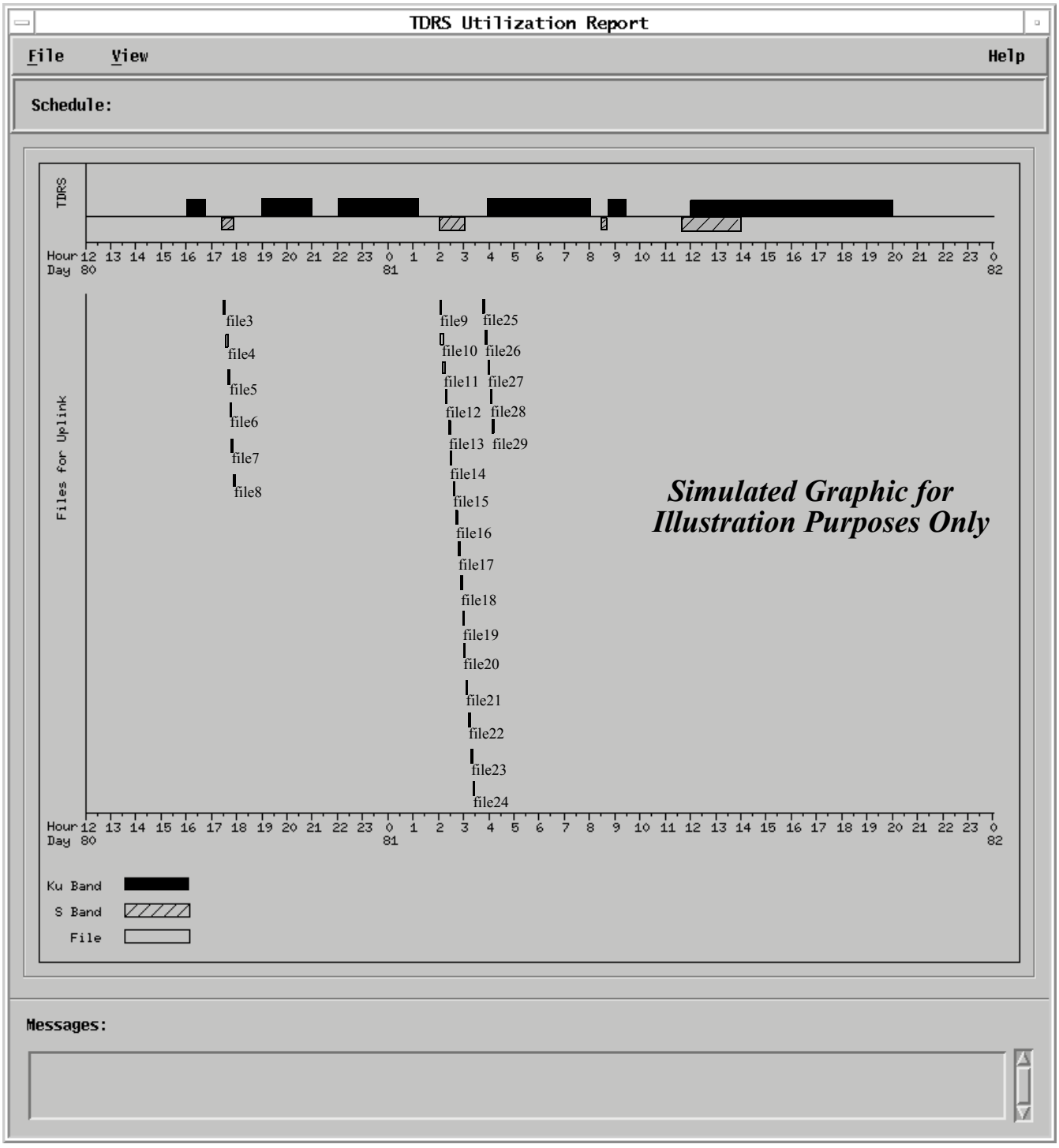


Figure 21-25, TDRS Utilization Report.

Help: For information concerning any of the **TDRS Utilization Report** menu options see the applicable Online Help topic.

21.3 Generate Schedule Mini-Application

The File Ground Management Tool (FGMT) allows the privileged user to generate a Mass Storage Device (MSD) Disk Management Schedule which is a time ordered list of file uplink and onboard file delete requests. When the privileged user receives an inter-process communication from the Onboard Short Term Plan Ground Management Tool (OSTPGMT) that a new Onboard Short Term Plan (OSTP) is available, he selects the Generate MSD Schedule mini-application. The user enters the start and stop time to limit the scan of the OSTP or he may elect to scan the OSTP in it's entirety (the default). To determine what files are needed onboard at a specified time, the FGMT scans the activity records of the OSTP for payload auto-procedure files that have a procedure location of "Payload MDM"..

Before the schedule is generated, the FGMT checks the Onboard File List to see what files are stored onboard. If any of the files are not needed according to the OSTP, delete entries for auto procedure files that are unnecessary are entered into the schedule. Files that are stored onboard and needed by the OSTP have their Onboard Revision and Document Revision values retrieved from the PIMS Database and compared. A Document Revision identical to the Onboard Revision implies that the onboard file has not changed, so that an uplink is not required. A difference implies that the onboard file is obsolete and the baselined file in the PIMS Database needs to be uplinked. If the revision values for the onboard file do differ, then a delete entry for the onboard file will be entered in the schedule and an uplink entry for the baselined version of that file in the PIMS Database will be entered in the schedule. A file in the baseline state is the current configuration management (CM) version approved by the document manager. Only baselined files are uplinked. Once the list of files in the schedule is complete and the transfer times for the files to be uplinked are time-sorted, the schedule is validated so that the transfer times fall within the TDRS coverage and command windows that are available. The user then saves the schedule to the PIMS Database.

The Generate MSD Schedule Mini-Application main window contains several distinct features that will be discussed in this chapter (see Figure 21-26, Generate Schedule mini-application main window):

- Menu bar
- Status bar
- Work Area

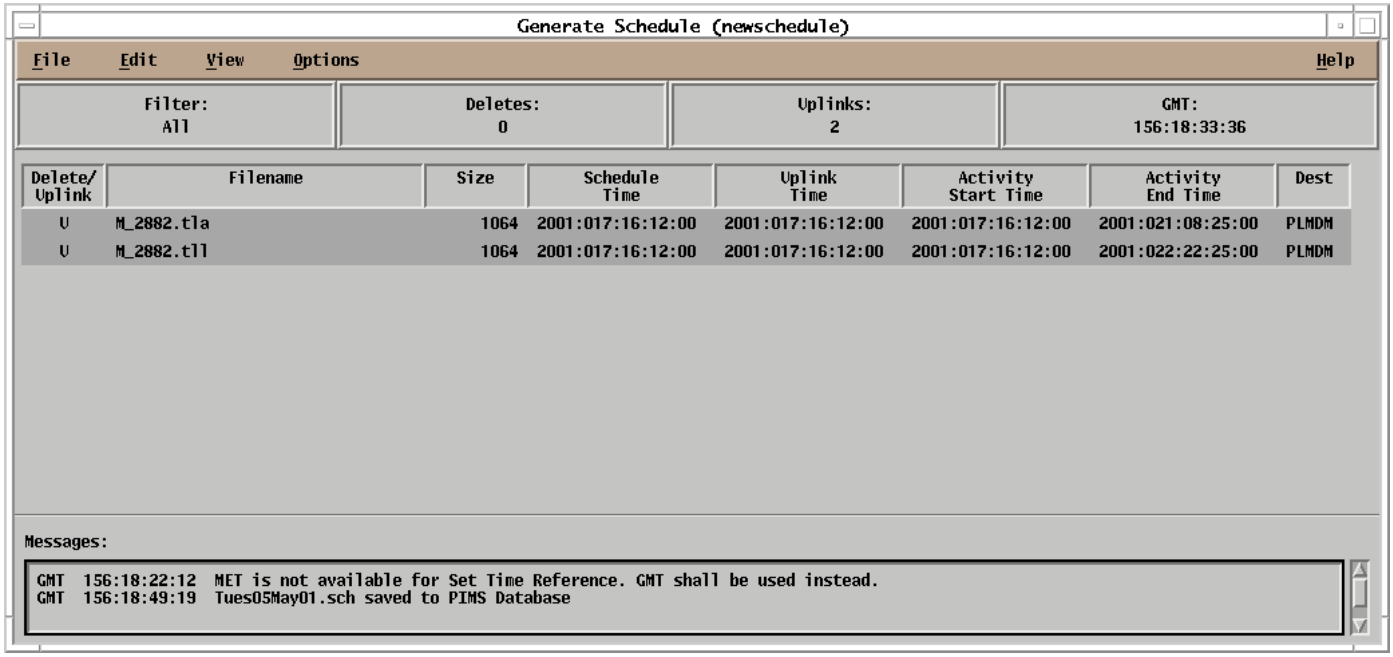


Figure 21-26, Generate Schedule mini-application main window.

21.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **Edit**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **Generate...**
  - **Open...**
  - **Merge...**
  - **Delete...**
- **Edit** Menu
  - **Modify Entry...**
  - **Add Entry...**
  - **Delete Entry...**
- **Options** Menu
  - **Validate Schedule...**
  - **Configure...**

21.3.2 Status Bar

The Status bar contains four fields of information (see Figure 21-27, Generate Schedule Status bar).

- **Filter:**
- **Deletes:**
- **Uplinks:**
- **GMT:**

The **Filter:** field indicates if any filter criteria have been applied. Possible entries for this field are: **All**, **Deletes Only**, and **Uplinks Only**.

The **Deletes:** field contains the number of files in the schedule that are scheduled to be deleted.

The **Uplinks:** field contains the number of files in the schedule that are scheduled to be uplinked.

The **GMT:** field contains the updating Greenwich Mean Time (GMT) displayed in the format DDD:HH:MM:SS.

Figure 21-27, Generate Schedule Status bar.

21.3.3 Work Area

The Work Area of the Generate Schedule mini-application consists of a scrollable list organized into eight columns labeled as follows (see Figure 21-26, Generate Schedule mini-application main window):

- **Delete/Uplink**
- **Filename**
- **Size**
- **Schedule Time**
- **Uplink Time**
- **Activity Start Time**
- **Activity End Time**
- **Dest**

The **Delete/Uplink** column will contain a **D** for delete or **U** for uplink to identify the action of the uplink request. **D** denotes that the file is already onboard the PLMDM MSD and is to be deleted; **U** denotes that the file will be uplinked to the PLMDM MSD.

The **Filename** colimn contains the full file name and extension of all files making up the schedule. Filenames with extensions are limited to 32 characters.

The **Size** column indicates the size of the file/directory in bytes.

The **Schedule Time** is the time expressed in GMT format:

- If the entry is an uplink action, the **Schedule Time** is the actual time when the FGMT requests the DCM to transfer the file from the PIMS database to the HOSC Drop Box Command Directory for subsequent polling and transfer to the MCC-H Uplink Queue.
- If the entry is a delete action, the **Schedule Time** is the actual time when the delete request is issued to delete an onboard file from the PLMDM MSD.

The **Uplink Time** is the time expressed in GMT format when the FGMT requests the WCP to issue an uplink command for a file in the MCC-H Uplink Queue for transfer to the PLMDM MSD. This value is not displayed for an entry in the schedule that is a Delete File request.

The **Activity Start Time** column represents the time expressed in GMT format when the file will be used for its scheduled payload activity. This value is not displayed for an entry in the schedule that is a Delete File request.

The **Activity End Time** column represents the time expressed in GMT format when the file will have completed its scheduled payload activity. This value is not displayed for an entry in the schedule that is a Delete File request.

The **Dest** (destination) column contains a 12 character string containing the location of the file onboard the PLMDM MSD or the origination of the activity if the file belongs to an International Partner (CSA, ESA, NASDA, RSA, etc.).

21.3.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Generate MSD Schedule mini-application. The **Generate...**, **Open...**, **Merge...**, and **Delete...** menu items from the **File** menu as well as all of the menu options from the **Edit** and **Options** menus will be discussed (see Figure 21-28, File, Edit, and Options menus).

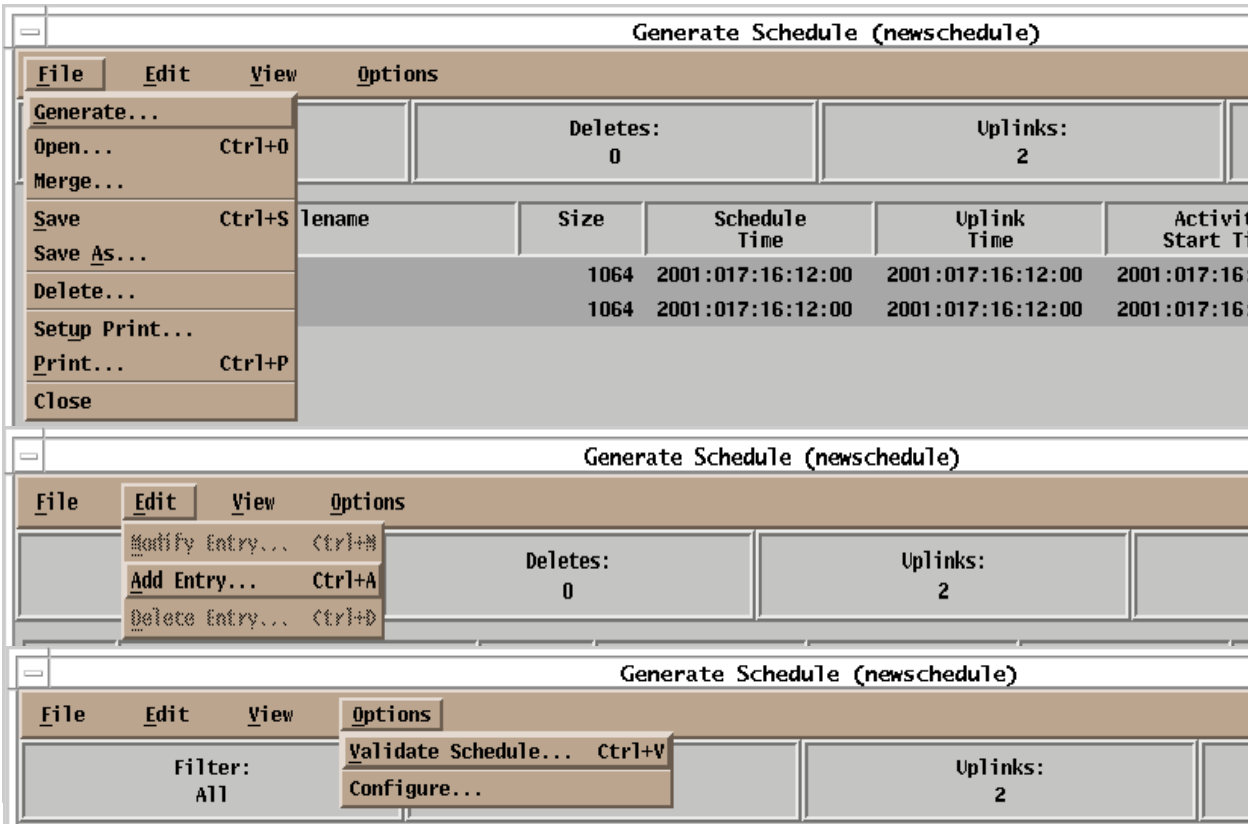


Figure 21-28, File, Edit, and Options menus.

21.3.4.1 Generate

Selection of **Generate...** from the **File** menu of the **Generate Schedule** mini-application invokes the **Generate** dialog box (see Figure 21-29, Generate dialog box). The Generate dialog box allows the privileged user to generate a schedule from any of the OSTPs stored in the PIMS database. The Generate dialog box will initially be blank and the text entry fields in the **Time Window** frame will be insensitive.

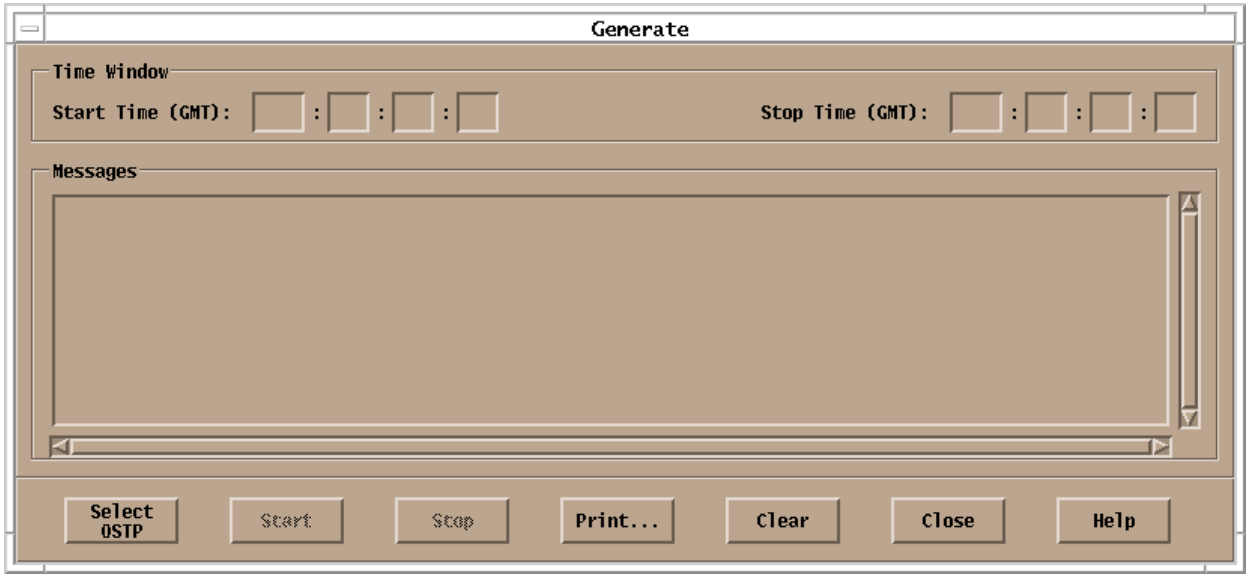


Figure 21-29, Generate dialog box.

The first step in generating a schedule is to select which OSTP will be used to generate the schedule. Clicking invokes the Select OSTP dialog box (see Figure 21-30, Select OSTP dialog box).

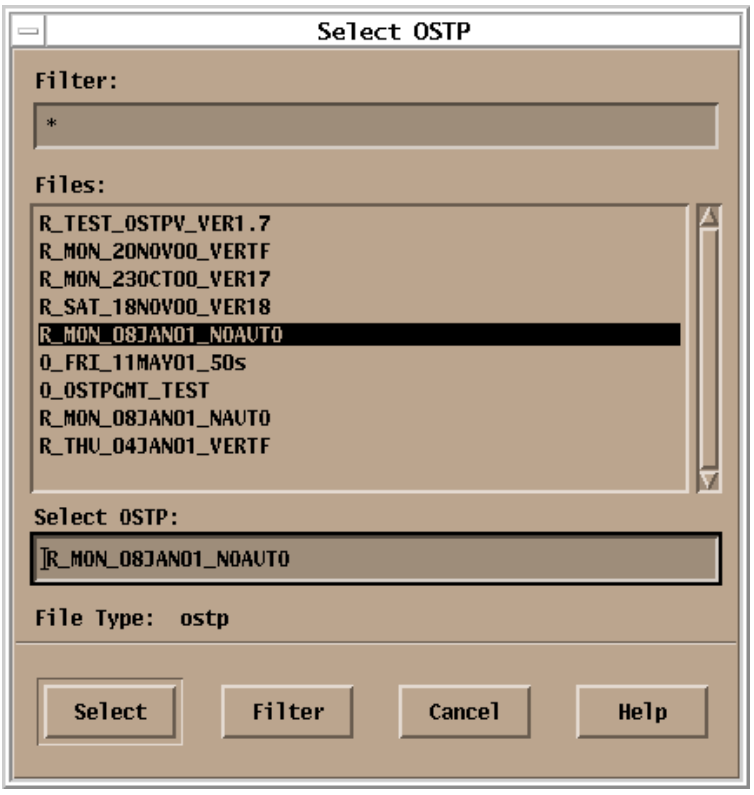


Figure 21-30, Select OSTP dialog box.

The Select OSTP dialog box contains a list of available OSTPs. After making a selection from the **Files:** list, clicking Select retrieves the file from the PIMS database, closes the Select OSTP dialog box and returns you to the Generate dialog box.

The Generate dialog box now contains (in parenthesis) the filename of the selected OSTP and the **Time Window** frame contains the Start Time and Stop Time in GMT format (see Figure 21-31, Generate dialog box with OSTP selected). At this point the start/stop times may be edited to limit the amount of the OSTP to be generated.

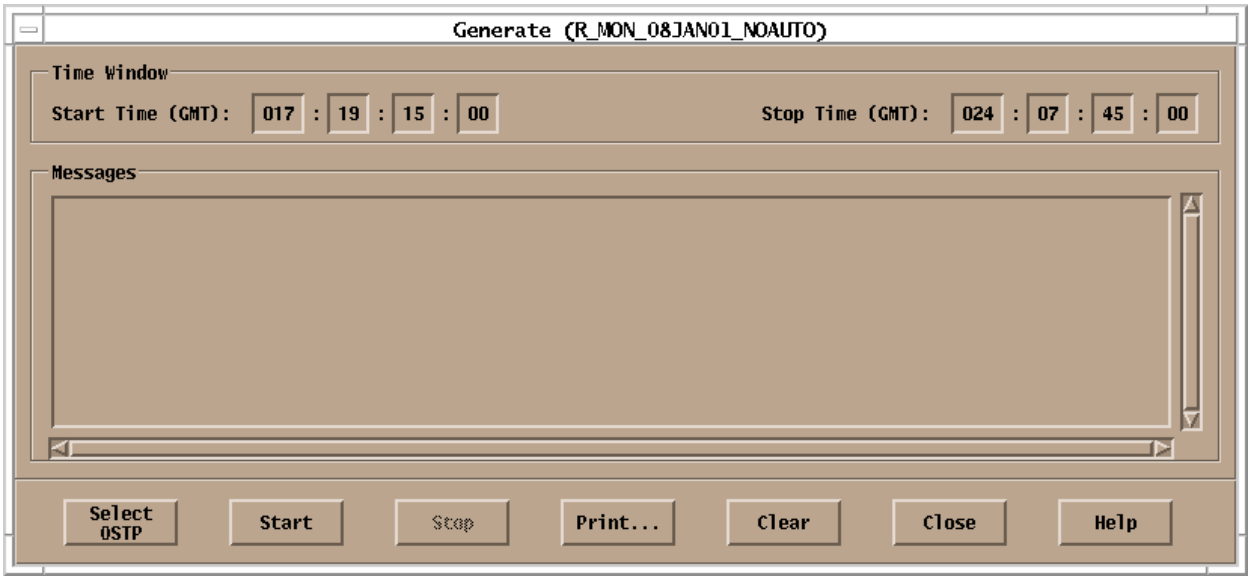


Figure 21-31, Generate dialog box with OSTP selected.

Clicking Start begins the generation of the schedule. As the schedule is generated, its progress is reported in the **Messages** frame of the Generate dialog box (see Figure 21-32, Generate dialog box with messages). When the schedule generation process is complete, clicking Close closes the Generate dialog box and returns the user to the Generate Schedule mini-application main window where the generated schedule will be displayed.

Note: If a schedule is generated that contains no entries, a message will be sent to the user indicating that no entries were added to the schedule and schedule generation will terminate gracefully.

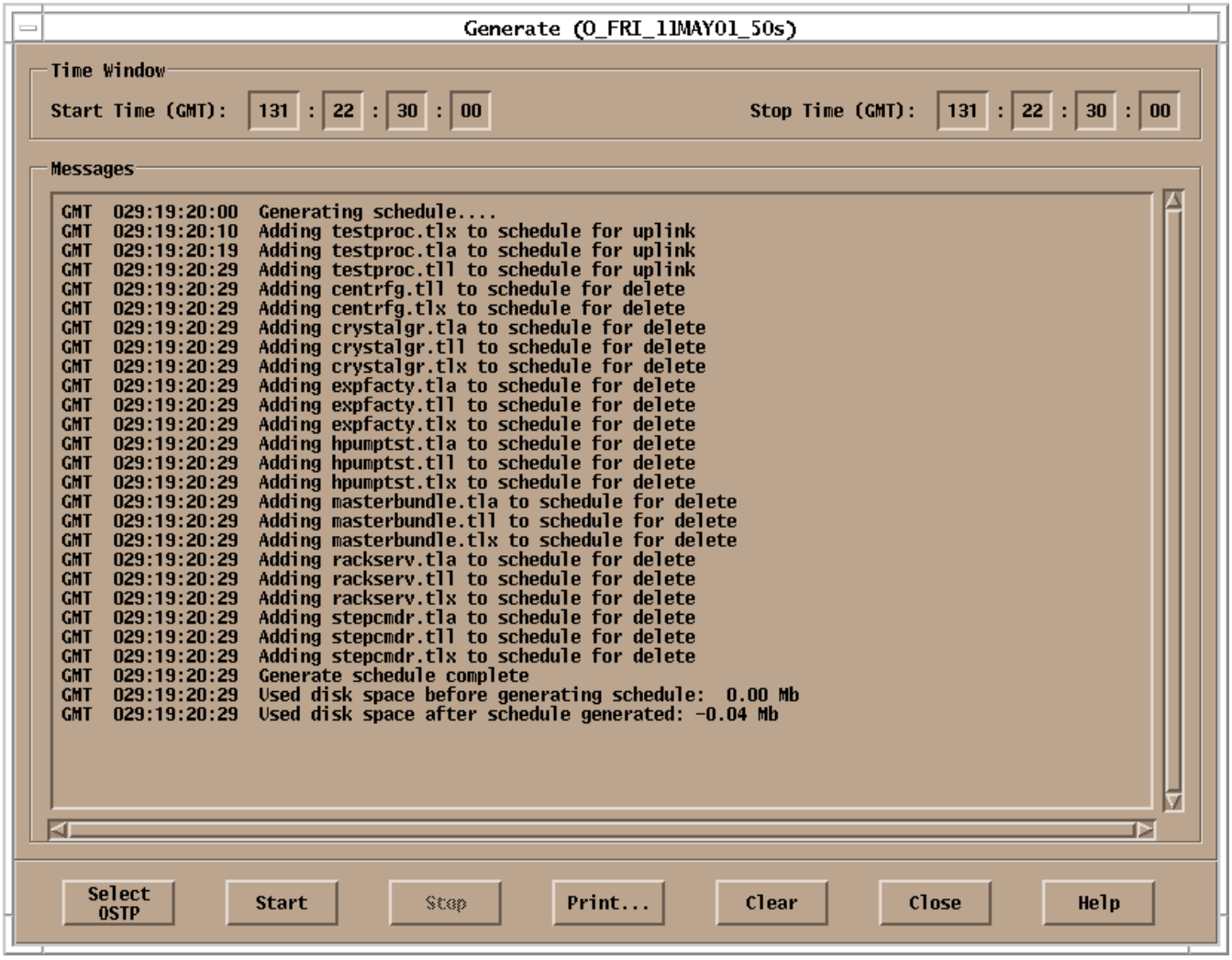


Figure 21-32, Generate dialog box with messages.

21.3.4.2 Open...

The **Open...** menu item off the **File** menu invokes the **Open** dialog box (see Figure 21-33, Open dialog box). The **Open** dialog box will display all schedule files with extensions of *.sch that are located in the OCMS/FGMT folder in the PIMS Database.

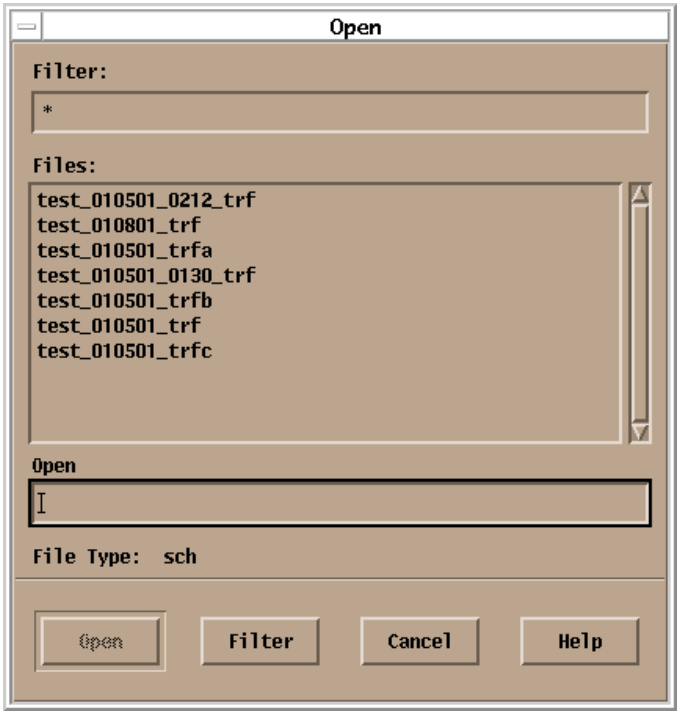


Figure 21-33, Open dialog box.

Selecting a file from the **Files:** frame highlights the filename and places it in the **Open** text entry field. Clicking Open opens the file specified in the **Open** input text field. This is the default pushbutton when the cursor is in the **Open** input text field.

Clicking Filter filters files based on the criteria specified in the **Filter:** input text field. An * in this field indicates that all MSD Schedule files are to be shown. This is the default pushbutton when the cursor is in the **Filter:** input text field.

21.3.4.3 Merge...

Selection of the **Merge...** menu item invokes the **Merge** dialog box (see Figure 21-34, Merge dialog box). A new schedule can be "merged" with the schedule currently executing in order to continue issuing additional uplink or delete requests without interruption.

The **Filter:** text entry field may be used to enter filter criteria to reduce the size of the list displayed in the **Files:** frame. An * in this field indicates that all MSD Schedule files are to be shown.

The **Files:** frame contains a scrollable list which displays all schedule files with extensions of *.sch that are located in the OCMS/FGMT folder in the PIMS Database.

The **Merge:** text entry field will contain the filename of the selected file from the scrolled list after a selection has been made.

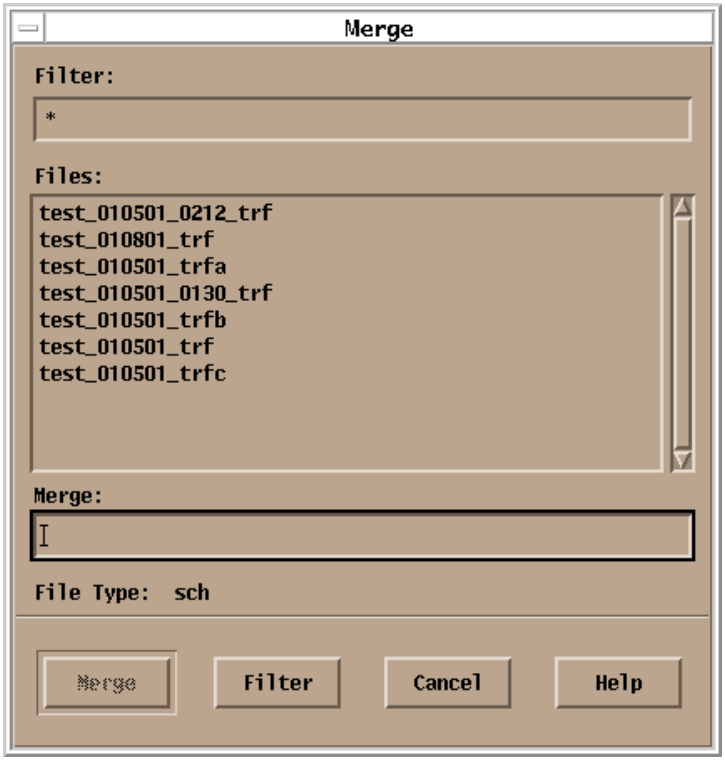


Figure 21-34, Merge dialog box.

Clicking Merge merges the selected schedule by concatening it to the end of the current schedule and closes the **Merge** dialog box. This is the default pushbutton.

Clicking Filter filters files based on the criteria specified in the **Filter:** input text field.

21.3.4.4 Delete...

The **Delete...** menu option allows the privileged user to delete schedule files that are stored in the OCMS/FGMT folder in the PIMS Database. Selection of the **Delete...** menu option invokes the Delete dialog box (see Figure 21-35, Delete dialog box). When selected, the user is presented with a scrolled list of schedule files (with extensions of *.sch) listed in alphabetical order from which single or multiple selections can be made.

The **Filter:** text entry field may be used to enter filter criteria to reduce the size of the list displayed in the **Files:** frame. An * in this field indicates that all MSD Schedule files are to be shown.

The **Files:** frame contains a scrollable list which displays all schedule files with extensions of *.sch that are located in the OCMS/FGMT folder in the PIMS Database.

The **Delete:** text entry field will contain the filename of the selected file from the scrolled list after a selection has been mad

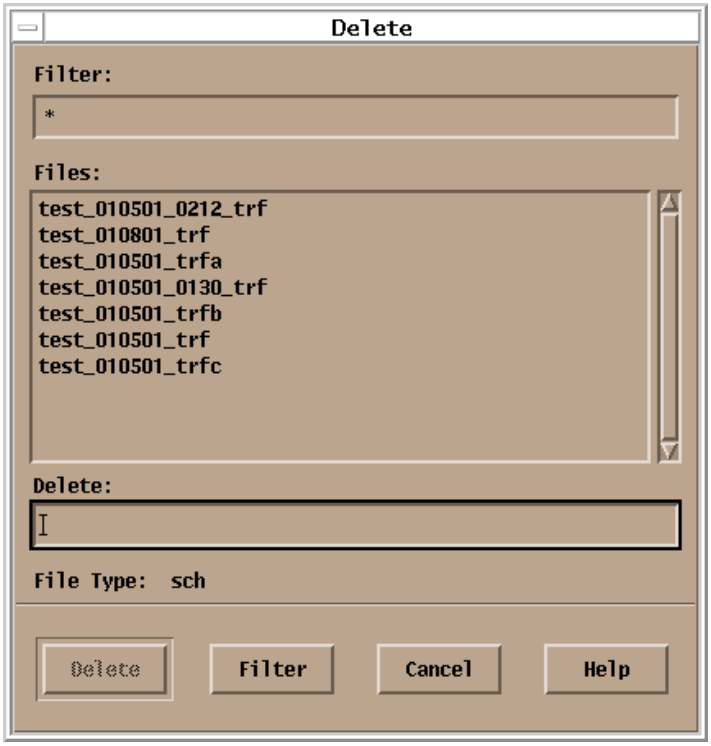


Figure 21-35, Delete dialog box.

Clicking Delete removes the selected file/files from the PIMS Database and returns you to the application main window. This is the default pushbutton.

Caution: Depressing **Delete** deletes the selected schedule without any following confirmation dialog box - once depressed the file is deleted from the PIMS Database.

21.3.4.5 Modify Entry...

Selection of the **Modify Entry...** menu item invokes the **Modify Entry** dialog box (see Figure 21-36, Modify Entry dialog boxes). The **Modify Entry** dialog box allows the privileged user to modify selected entries in the currently diplayed MSD Schedule. The **Modify Entry** dialog box may be invoked in one of two versions depending upon whether the schedule entry was for a delete or uplink action. All of the text entry fields default to the values for the selected entry from the MSD Schedule displayed in the Generate Schedule main window. Modifiable fields include:

- **Schedule Time (GMT):**
- **Uplink Time (GMT):**
- **Activity Start Time (GMT):**
- **Activity End Time (GMT):**
- **Destination:**

Note: The **Modify Schedule Entry...** menu item remains grayed out until an individual schedule entry is selected from the schedule.

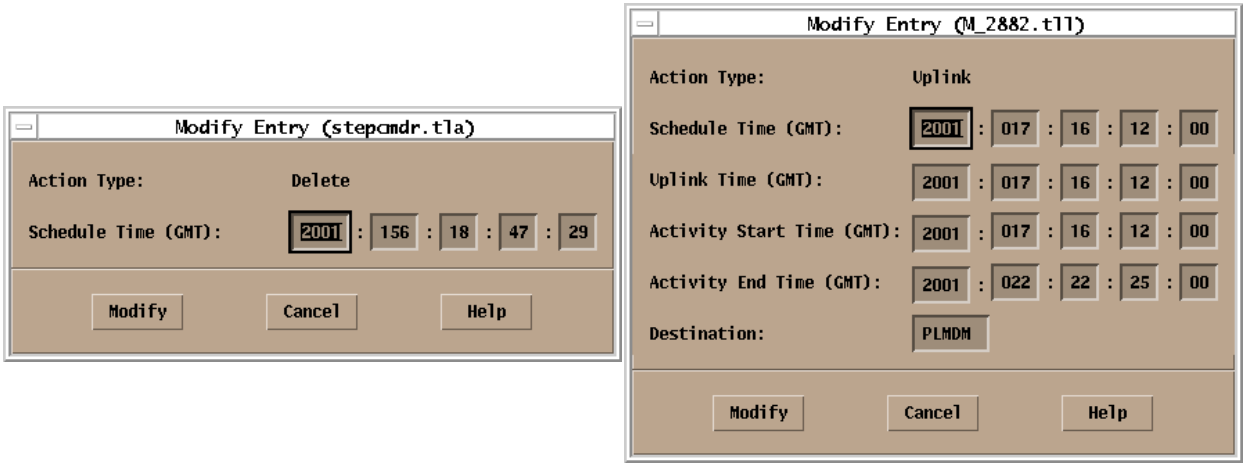


Figure 21-36, Modify Entry dialog boxes.

Clicking Modify applies the changed record to the schedule and closes the **Modify Entry** dialog box.

21.3.4.6 Add Entry...

Selection of the **Add Entry...** menu item invokes the **Add Entry** dialog box (see Figure 21-37, Add Entry dialog box). The **Add Entry** dialog box allows the privileged user to add Operation Change Request (OCR) files to the the currently displayed MSD Schedule. Examples of an OCR are: manual crew procedures, procedure reference data, or experiment software loads.

All text entry fields are initially blank and represent the minimum information required to calculate the schedule entry parameters. Text entry fields include the following:

- **Action Type:** (drop down menu)
- **Filename:**
- **Activity Start Time (GMT):**
- **Activity End Time (GMT):**
- **Destination:**

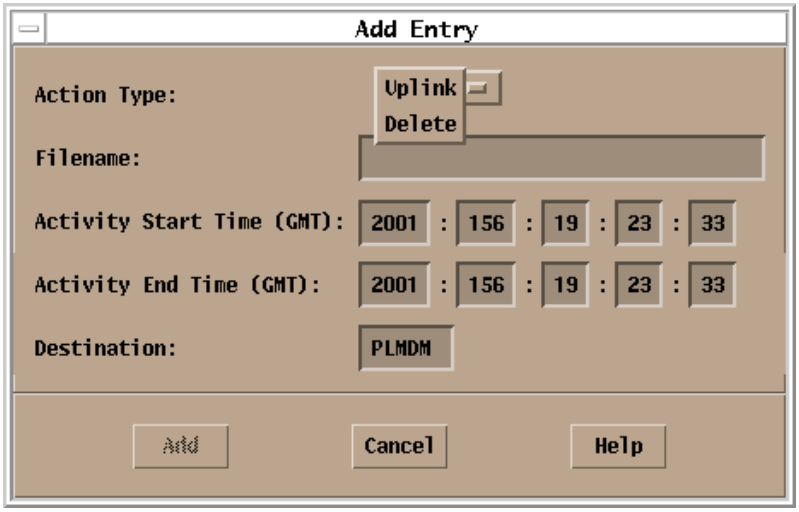


Figure 21-37, Add Entry dialog box.

Clicking Add applies the file entry to the schedule and closes the **Add Schedule Entry** dialog box.

21.3.4.7 Delete Entry...

Selection of the **Delete Entry...** menu item invokes the **Delete Schedule Entry** dialog box (see Figure 21-38, Delete Schedule Entry dialog box).

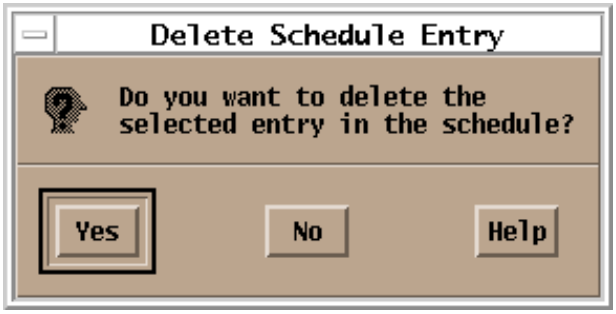


Figure 21-38, Delete Schedule Entry dialog box.

Clicking Yes removes the file entry from the schedule and closes the **Delete Schedule Entry** dialog box.

21.3.4.8 Validate Schedule...

The **Validate Schedule...** menu option allows the privileged user to validate a schedule against available command windows and TDRS coverage. When selected, the Validate Schedule information dialog box will be invoked. If the schedule was successfully validated, the dialog box

will inform the user that the schedule was validated. If the schedule was not successfully validated, the dialog box will inform the user the schedule was not validated due to either inadequate TDRS coverage or command windows. The **Validate Schedule...** menu option remains insensitive until a schedule is successfully generated.

21.3.4.9 Configure...

The **Configure...** menu option allows the privileged user to modify file properties of the MSD Schedule that are peculiar to the actual uplinking of the file. Selection of the **Configure...** menu option invokes the Configure dialog box (see Figure 21-39, Configure dialog box).

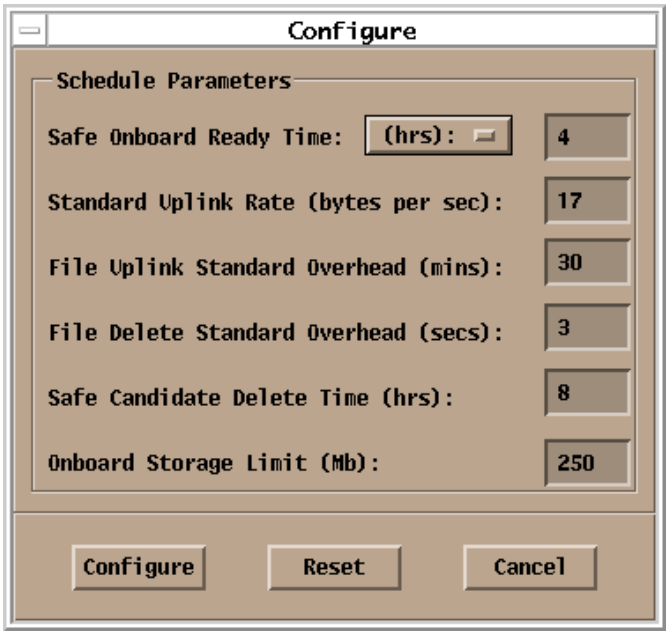


Figure 21-39, Configure dialog box.

The **Configure** dialog box consists of a **Schedule Parameters** frame and a control panel. The **Schedule Parameters** frame contains the following text entry fields:

- **Safe Onboard Ready Time:**
- **Standard Uplink Rate (bytes per sec):**
- **File Uplink Standard Overhead (mins):**
- **File Delete Standard Overhead (secs):**
- **Safe Candidate Delete Time (hrs):**
- **Onboard Storage Limit (Mb):**

The **Safe Onboard Ready Time:** text entry field defaults to 4 hours. This value represents the amount of time the auto-procedure file must be onboard before its specified OSTP start time begins in order to provide the ground operators with enough time to overcome any uplink anomalies. Examples of possible uplink anomalies are a “drop box” failure where the files cannot be

transferred between the HOSC and and the MCC-H and an uplink failure where the file cannot be transferred between the MCC-H and the PLMDM MSD. The field on the screen has an optional (hrs): for hours, minutes, or seconds.

The **Standard Uplink Rate (bytes per sec):** text entry field defaults to 17 bytes per second. This value represents the transmission rate of the S-Band Uplink telemetry which is 1024 bytes per minute or 17 bytes per second.

The **File Uplink Standard Overhead** defaults to 30 minutes. This value represents the amount of overhead time that is encountered for the following events:

- Transferring the file from the PIMS Database to the HOSC Drop Box.
- Polling the HOSC Drop Box for the file by the MCC-H.
- Transferring the file from the HOSC Drop Box to the MCC-H Drop Box by the MCC-H.
- Waiting in the MCC-H Uplink Queue before the file is uplinked onboard (assumes a 15 minute wait).
- Transferring the file from the C&C MDM to the PLMDM.

The **File Delete Standard Overhead** defaults to 3 seconds. This value represents the amount of time for the PLMDM to receive a delete file command. Any value between 2 and 30 seconds is sufficient.

The **Safe Candidate Delete Time** defaults to 8 hours. This value represents the amount of time after the file has completed its auto procedure activity that it will remain onboard before it is deleted. Given the provision that the file may be executed multiple times due to an experiment being repeated during the day, this value insures that the file will not be prematurely deleted before it is needed, based on small OSTP scans, within the next 8 hours.

The **Onboard Storage Limit** defaults to 250 Megabytes. This value represents the total storage size for auto-procedure and payload-related files. The maximum size of the Mass Storage Device is 300 megabytes but not all of this disk space is used for storage. The PEP History Log file consumes disk storage and an “emergency free space” is required for unplanned file uplinks. Setting the default to something less than 300 megabytes will provide sufficient emergency free space.

Clicking Configure updates the schedule parameters, closes the **Configure** dialog box and returns you to the **Generate Schedule** mini-application main window.

Clicking Reset reverts all schedule parameters to their default values, closes the **Configure** dialog box and returns you to the **Generate Schedule** mini-application main window.

21.4 Execute Schedule Mini-Application

Executing the MSD Schedule is one of the final actions that can be taken by the privileged user in the processing of an MSD Schedule. A schedule may be executed in Automatic or Manual mode to generate command requests for the file uplink or onboard file delete requests. Automatic mode allows command requests to be issued for all entries in the schedule at their planned uplink times. Manual mode allows the user to select single or multiple uplink/delete request entries in the schedule to be issued immediately. As the schedule executes, uplink and delete requests are performed programmatically with the current entry in the schedule being highlighted on the Execute Schedule main window. Only US auto-procedure files are commanded to be uplinked or deleted; International Partner files are only scheduled. As the uplink and delete requests are performed, the main window is updated, and the the Onboard File List is updated in memory and stored in the PIMS Database. A mult-cast message will also be sent so that all non-privileged instances can update their main window.

The Execute Schedule Mini-Application main window contains several destinct features that will be discussed in this chapter (see Figure 21-40, Execute Schedule mini-application main window):

- Menu bar
- Status bar
- Work Area

Note: When the **Execute Schedule** mini-application is initially invoked, the **Execute Schedule** main window is blank - does not contain an OSTP schedule (see Figure 21-40, Execute Schedule mini-application main window). In order to execute a schedule, it first must be opened through the **Open...** menu item from the **File** menu.

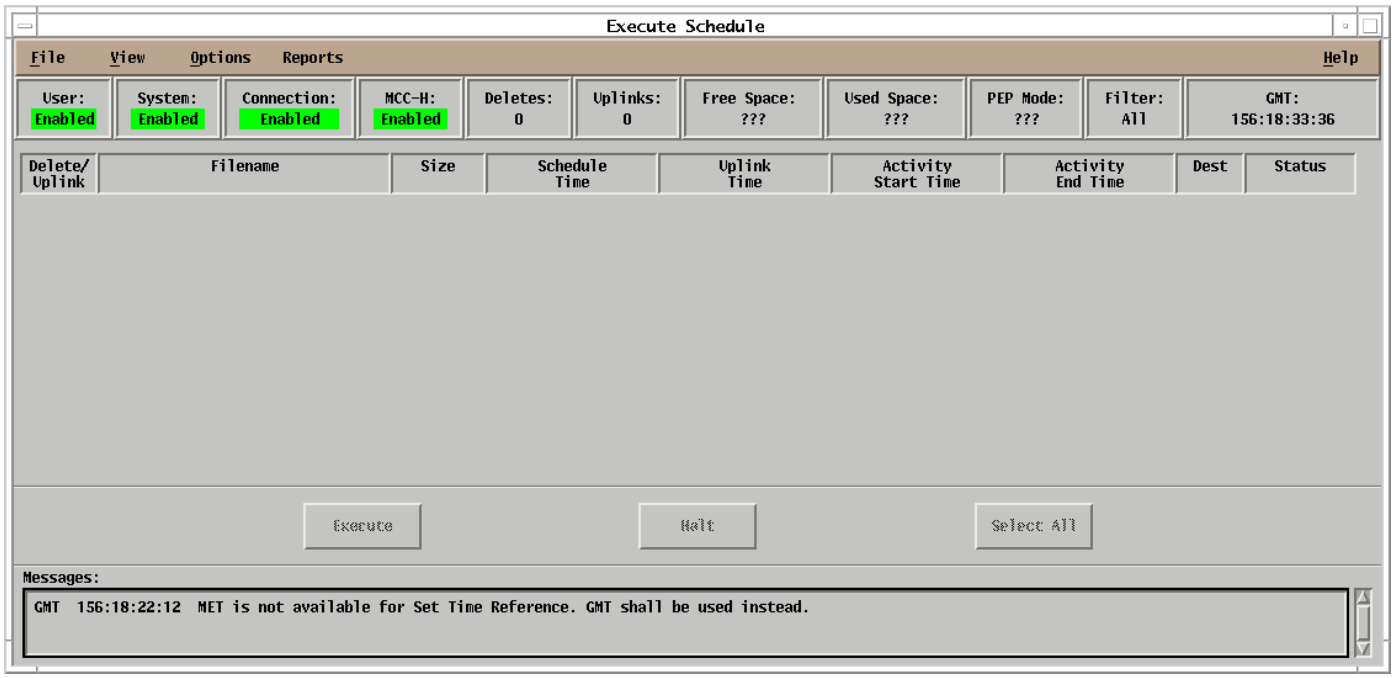


Figure 21-40, Execute Schedule mini-application main window.

21.4.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Options**, **Reports**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Execute**
  - **Execute Now**
  - **Halt**
  - **Select All**

21.4.2 Status Bar

The Status Bar contains eleven fields (see Figure 21-41, Execute Schedule Status Bar):

- **User:**
- **System:**
- **Connection:**
- **MCC-H:**

- **Deletes:**
- **Uplinks:**
- **Free Space:**
- **Used Space:**
- **PEP Mode:**
- **Filter:**
- **GMT:**

Figure 21-41, Execute Schedule Status Bar.

The **User:** field will display **Enabled** with a green background color if you are enabled for commanding. It will display **Disabled** with a red background if you are disabled for commanding.

When the commanding system is enabled for commanding, the **System:** field will display **Enabled** with a green background color. When the commanding system is disabled for commanding, it will display **Disabled** with a red background color.

The **Connection:** field will display **Enabled** (green background) when the command system is connected to MCC-H for commanding. The field displays **Disabled** (red background) when the command system is not connected to MCC-H for commanding.

The **MCC-H:** field will toggle between **Enabled** and **Disabled**. The MCC-H status reconfigures to **Enabled** (green background) when MCC-H is enabled for commanding. It reconfigures to **Disabled** (red background) when MCC-H is disabled for commanding.

The **Deletes:** field contains the number of files in the schedule that are scheduled to be deleted.

The **Uplinks:** field contains the number of files in the schedule that are scheduled to be uplinked.

The **Free Space:** field displays the existing amount of available (unused) space on the PLMDM MSD expressed in Megabytes. The **Free Space:** reconfigures as the MSD Free Space MSID telemetry values change.

The **Used Space:** field displays the amount of PLMDM MSD memory currently being used to store files expressed in Megabytes. The **Used Space (Mb):** reconfigures as the MSD Free Space MSID telemetry values change.

The **PEP Mode:** field displays the current status of the PEP. Possible entries in this field may be **Offline**, **Standby**, **Minimal Operations**, **Operational**, or **???** for undefined or no telemetry available. The Payload Executive Processor (PEP) is a software application executed within the PLMDM that provides monitoring, control, and coordination of US payload activities on the ISS. The PEP provides the following capabilities:

- Provides collection and downlink of low-rate telemetry data generated by payloads
- Provides collection and distribution of payload and payload-related equipment and software status
- Provides collection and downlink of predefined data packet sets to the ground

Supports management of the PLMDM MSD

The **Filter:** field indicates if any filter criteria have been applied. Possible entries for this field are: **All**, **Deletes Only**, and **Uplinks Only**.

The **GMT:** field contains the updating Greenwich Mean Time (GMT) displayed in the format DDD:HH:MM:SS.

21.4.3 Work Area

The work area of the **Execute Schedule** main window is blank until a schedule is selected for viewing. A schedule is selected for execution by using the **Open Stored Schedule...** option from the **File** menu. After schedule selection the work area will contain the contents of the selected schedule in list form with column headings labeled as follows (see Figure 21-42, Execute Schedule main window - populated):

- **Delete/Uplink**
- **Filename**
- **Schedule Time**
- **Uplink Request Time**
- **Need Onboard Time**
- **Destination**
- **Schedule Status**

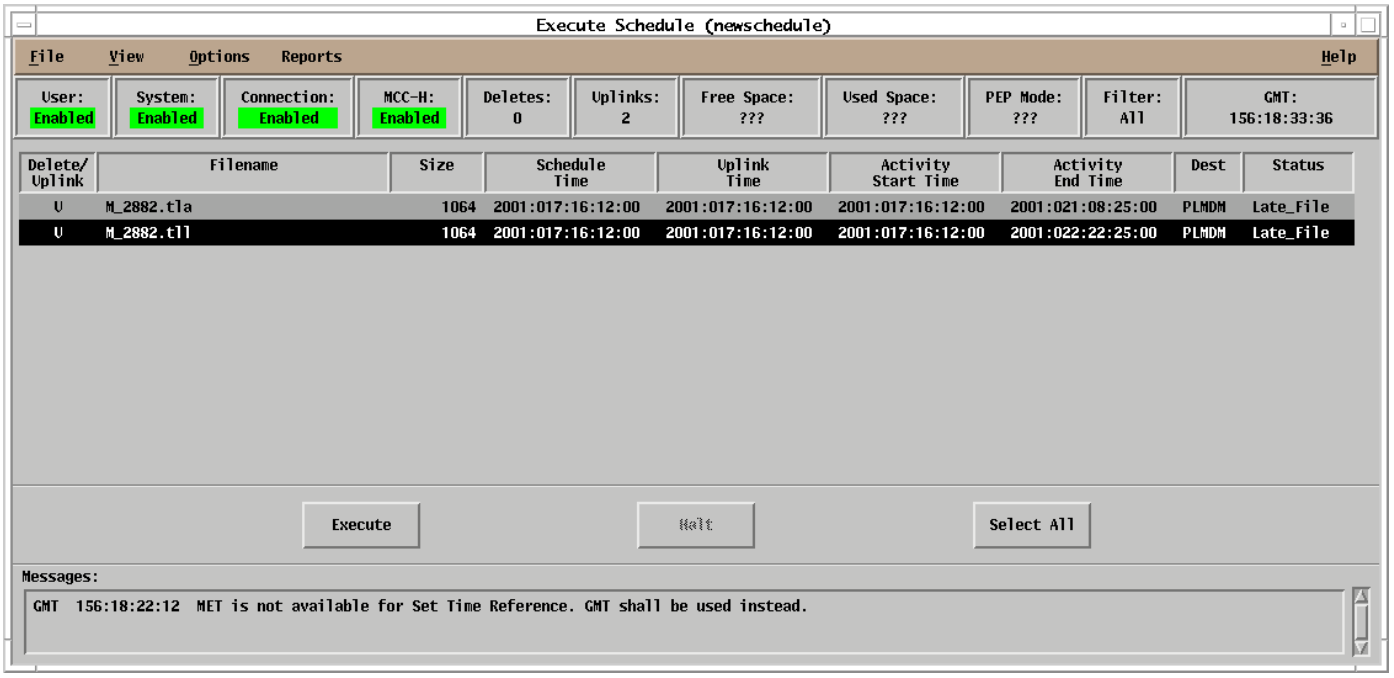


Figure 21-42, Execute Schedule main window - populated.

The **Delete/Uplink** column will contain a **U** for uplink or **D** for delete to identify the action of the uplink request. **U** denotes that the file will be uplinked to the PLMDM MSD; **D** denotes that the file is already onboard the PLMDM MSD and is to be deleted.

Note: The listing of all entries in the schedule implies the Full View mode.

The **Filename** column contains the full file name and extension of all files making up the schedule. Filenames w/extensions are limited to 32 characters.

The **Size** column identifies the size of the file in bytes.

The **Schedule Time** column contains the time expressed in GMT format of YYYY:DDD:HH:MM:SS.

- If the schedule entry is for an uplink action, then this time represents when the FGMT requests the DCM to transfer the file from the PIMS Database to the HOSC Drop Box Command Directory for susequent polling and transfer by the MCC-H to the MCC-H Uplink Queue. This time is determined by the following algorithm:

Schedule Time = Uplink Request Time - Uplink Duration - File Uplink Standard Overhead parameter

Where: Uplink Duration = File Size / Standard Uplink Rate parameter

- If the schedule entry is a delete request, then this time represents the time when the delete request will be issued to delete an onboard file from the PLMDM MSD. This time is determined by the following algorithm:

Delete Time = First uplink entry Activity Start Time - (number of entries in Delete List * File Delete Overhead)

If there are no uplink request entries in the schedule, then its schedule time is set to:

Delete Time = current time + File Delete Overhead

The **Uplink Time** column contains the time expressed in GMT format of YYYY:DDD:HH:MM:SS. This time represents the time when the FGMT requests the WCP (Workstation Command Processor) to issue an uplink request for the auto-procedure file in the MCC-H Drop Box to be transferred to the PLMDM MSD. This value is determined by the following algorithm:

Uplink Request Time = OSTP specified activity start time - Safe Onboard Ready Time parameter

Note: This value is not displayed for a file that is to be deleted or for a file whose origin of activity is an International Partner.

The **Activity Start Time** represents the time when the file will be used for its scheduled payload activity. This time is determined by the following algorithm:

Activity Start Time = OSTP specified activity start time

The **Activity End Time** represents the time when the scheduled payload activity will be completed. This time is determined by the following algorithm:

Activity End Time = Activity Start Time + Activity Duration

The **Destination** column represents the location of the file onboard the PLMDM MSD or the origination of the activity if the file belongs to an International Partner (CSA, ESA, NASDA, RSA, etc.).

The **Status** column contains the status of the uplink or delete request that is displayed after or when the schedule is executing the request. Examples of **Schedule Status** would be “Late File” if the file was not baselined in the PIMS database or could not be uplinked; or “Uplink” if the file successfully uplinked to the PLMDM MSD.

21.4.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Execute Schedule mini-application. All of the menu options from the **Options** menu will be discussed (see Figure 21-43, Options menus).

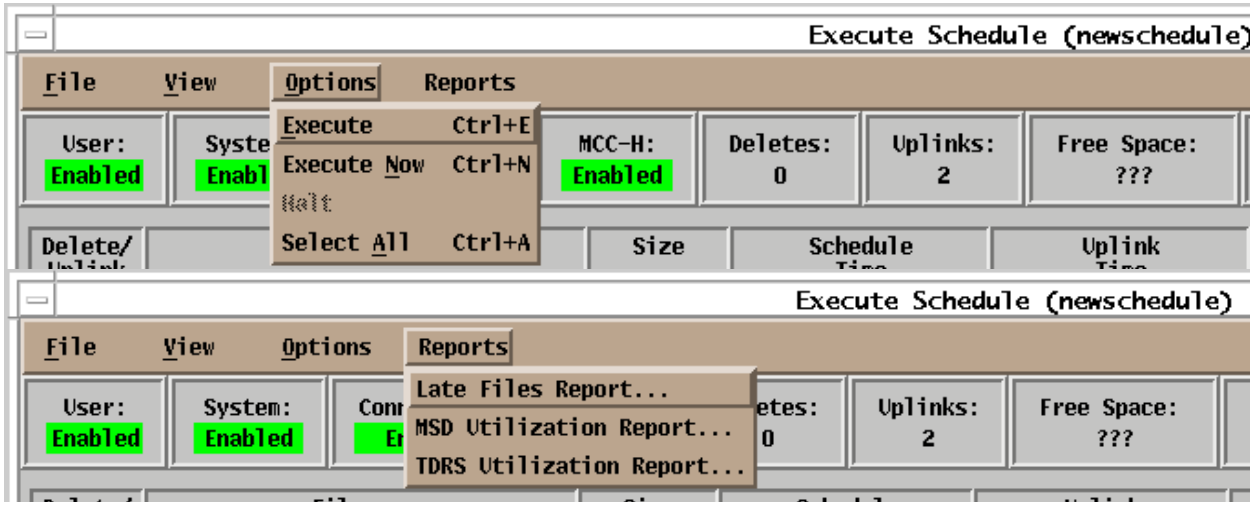


Figure 21-43, Options menu.

Help: For complete information concerning any of the **Reports** menu items see the following:

- Section 21.2.4.3 Late Files Report...
- Section 21.2.4.4 MSD Utilization Report...
- Section 21.2.4.5 TDRS Utilization Report...

21.4.4.1 Execute

The **Execute** menu item allows for the execution of schedule entries according to the requested **Schedule Time**. **Execute** remains insensitive (grayed out) until the user selects single or multiple entries in the schedule to be uplinked, which will become highlighted. When the user selects **Execute**, the execution process will initiate the MCC-H transfer and uplink requests or delete requests for only those entries that were selected according to the requested schedule time. Once the requests for the selected entries have been sent, the entries will lose their highlighted status, and a status will be displayed in the **Status** column denoting the result of the uplink request.

Note: Any attempt to execute a schedule uplink beyond the **Activity Start Time** stipulated in the schedule will result in a **Late File** status which will prevent the uplink of the file.

21.4.4.2 Execute Now

The **Execute Now** menu item allows for the execution of schedule entries regardless of the times stipulated by the **Schedule Time** column in the Execute Schedule main window (as long as the **Activity Start Time** has not been exceeded). **Execute Now** remains insensitive (grayed out) until the user makes a selection from the schedule. Once a schedule entry or multiple entries have been selected, selecting the **Execute Now** menu item results, spontaneously, with the execution process initiating the MCC-H transfer and uplink requests or delete requests for only those entries that were selected. Once the requests for the selected entries have been sent, the entries will lose their highlighted status, and a status will be displayed in the **Status** column denoting the result of the uplink request.

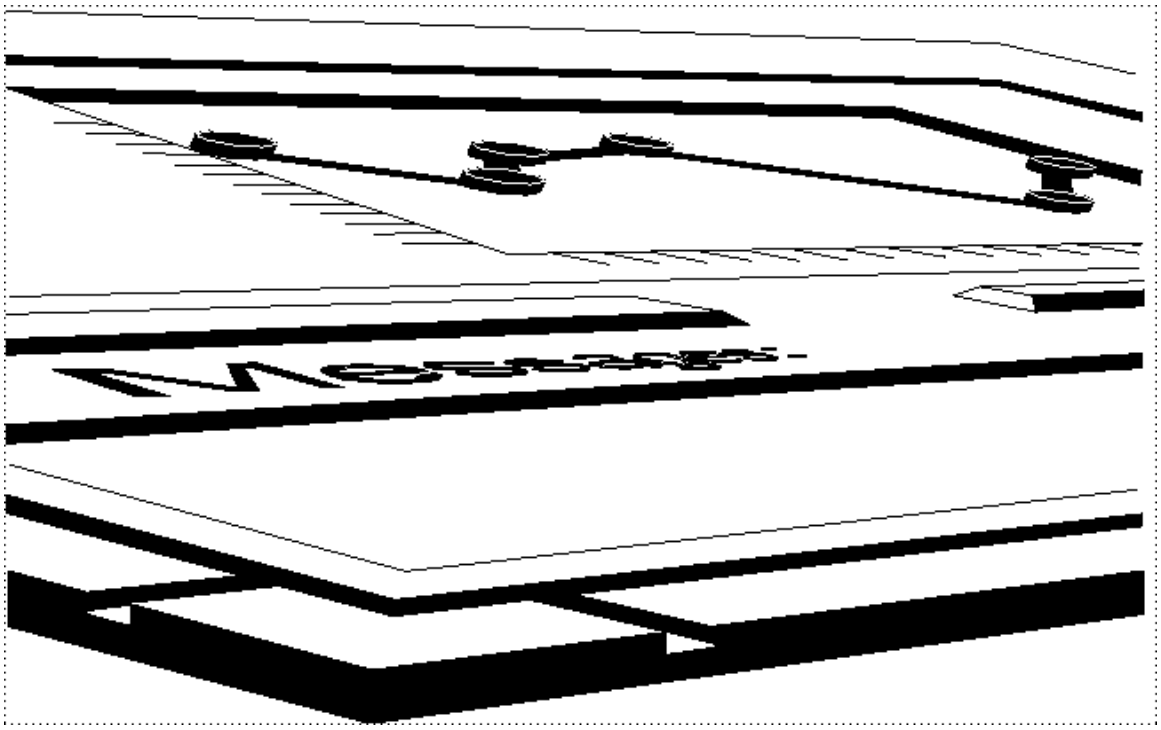
Note: Any attempt to execute a schedule uplink beyond the **Activity Start Time** stipulated in the schedule will result in a **Late File** status which will prevent the uplink of the file.

21.4.4.3 Halt

The **Halt** menu item will be sensitive only if the schedule is in the process of executing. Selection of the **Halt** menu item terminates the execute process. A termination message is posted to the Message Area of the Execute Schedule main window informing the user of the termination status.

21.4.4.4 Select All

Selecting the **Select All** menu item highlights all entries in the schedule enabling them for execution. The privileged user can then select either **Execute** or **Execute Now** from the **Options** menu to begin sequential execution of the schedule. As the uplink or delete requests are initiated, the entries will lose their highlight and a status will be displayed in the **Status** column of the schedule denoting the result of the uplink request. While the schedule is executing, the **Execute** and **Execute Now** menu items will be grayed out and the **Halt** menu item will be sensitive.



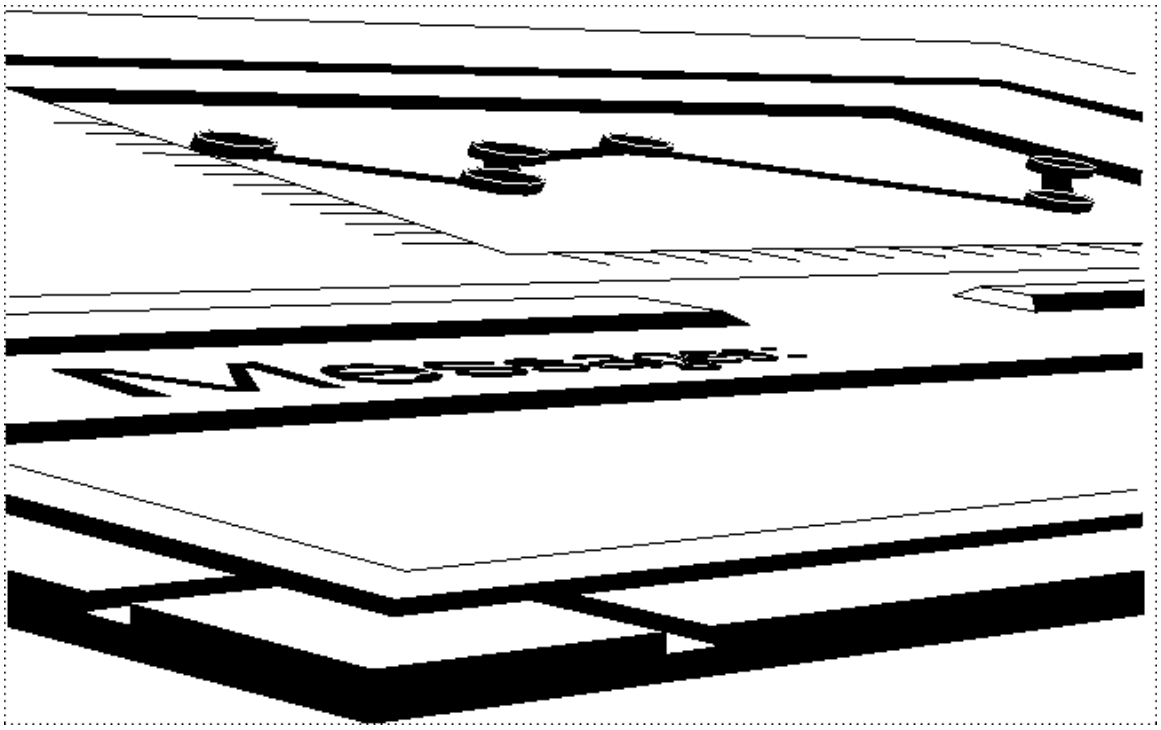
Chapter 22:
Onboard Short-Term Planning (OSTP) Ground Management Tool (OSTPGMT)

Note: *Although OSTPGMT appears on the Launchpad as a complete application, the cadre has opted to use the JSC product OSTPV for flight, therefore, a complete description of the OSTPGMT is TBD.*

This chapter describes the Huntsville Operations Support Center (HOSC) On-board Short Term Plan Ground Management Tool (OSTPGMT) application. OSTPGMT is part of the Operations Control Mission Software (OCMS) suite of applications and provides you with the capability to graphically view the short term plan file, which represents three days of planned payload and core activities on-board the International Space Station. The plan itself contains activities for one day only, however, the tool allows you to view multiple OSTPs at once. The OSTP is a binary representation of the short term plan containing time-tagged activities associated with the manual procedures executed by the crew as well as automated activities. Privileged users may also make changes to the OSTP using this application.

22.1 OSTP Ground Management Tool (OSTPGMT) Overview

The OSTPGMT application allows you to monitor the on-board short term plan and, as a privileged user, to perform edits to the plan. The short term plan itself is a representation of all International Space Station payload and core activities to be executed during a seven-day time period. The OSTP is a binary version of the short term plan and represents a one-day period contained within the seven-day period of the plan. The number of days which can be placed on-board at any given time is limited by the on-board system. Since the OSTP file size cannot exceed one thousand activity records, only a limited number of additional activities can be added to the OSTP. Both the privileged ground crew and the on-board crew are able to perform updates to the OSTP.



Chapter 23:
Reference File Editor (RFE) Software

This chapter describes the Huntsville Operations Support Center (HOSC) Reference File Editor (RFE) application. RFE is part of the Operations Control Mission Software (OCMS) suite of applications and provides you with the capability to edit and validate an OCMS reference file. These reference files contain the references to telemetry and command database information used by the OCMS. By using reference files, OCMS tools can be used to look up MSID and command information that changes as databases are modified. Without reference files, OCMS tools would be hardcoded with database references and would require code modification with each database release. RFE allows you to modify the way OCMS tools extract information from telemetry and command databases as MSIDs and commands change over time.

23.1 Reference File Editor (RFE) Overview

The Reference File Editor (RFE) application allows you to edit and validate the Operations Control Mission Software (OCMS) reference files that are used by OCMS tools to look up information about telemetry and command database data as MSIDs and commands change over time. RFE allows you to view, edit, and validate OCMS reference files by providing you with a suite of text editing functions and access to validation processes.

A reference file has a specific format that must be followed for proper validation and usage. The following describes the format of a typical OCMS reference file:

- Section 1: This section comprises the first three lines of the file. These lines are not validated and contain status information, such as revision numbers of the last telemetry and command databases validated against, the time of last validation (in GMT format), and the validation history.
- Section 2: The OCMS Key and Telemetry MSID association comprises the second section. The format is as follows: the OCMS Key (from 1 to 15 ASCII characters), a comma, the associated MSID, at least one space, a percent symbol (which serves as a comment delimiter), and a comment. The lines following this information specify the data type for the MSID and the length of the MSID value. This section is followed by a line of 80 dashes, which separates it from the third section.
- Section 3: The OCMS Key and Command data association comprises the third and final section, which is also validated for format. The format is as follows: the OCMS Key, a comma, the associated command mnemonic, the number of modifiable fields, and a comment. Additional lines follow for each update field in the following format: the field name, uplink data type, size, at least one space, a delimiter, and a comment.

Help: To view a sample Reference File see “Appendix AH: Example Reference File”.

Reference files are maintained within the Payload Information Management System (PIMS) database under the default filename OCMSReference.rfe. When telemetry and/or command databases are modified, the reference file must be modified to cross reference the new MSIDs and command mnemonics. Once you have corrected the new reference file, a reconfiguration signal is sent by the EHS system to all OCMS applications which require the reference file. At that point, those applications will retrieve the new reference file from PIMS, utilizing the new MSIDs and/or command mnemonics without interrupting the execution of the OCMS applications themselves.

You will be required to possess certain account privileges to modify the reference file. Although RFE does not transform any information that potentially impacts the safety of the International Space Station and its crew, safeguards are in place to verify that requests for data, submission of data, and attempts to modify data come from authorized sources.

When the file is validated, RFE ensures that all the MSIDs are valid and have the correct data type and length as specified in the telemetry database. Validation of command mnemonics in the file includes verifying the existence of the command, the correct number of update fields, the correct update field types, and that the command is not hazardous (RFE will reject entry of a hazardous command into a saved OCMSReference.rfe file).

The Reference File Editor main window contains several distinct features that will be discussed in this chapter (see Figure 23-1, Reference File Editor main window):

- Menu Bar

- Status Bar
- Work Area

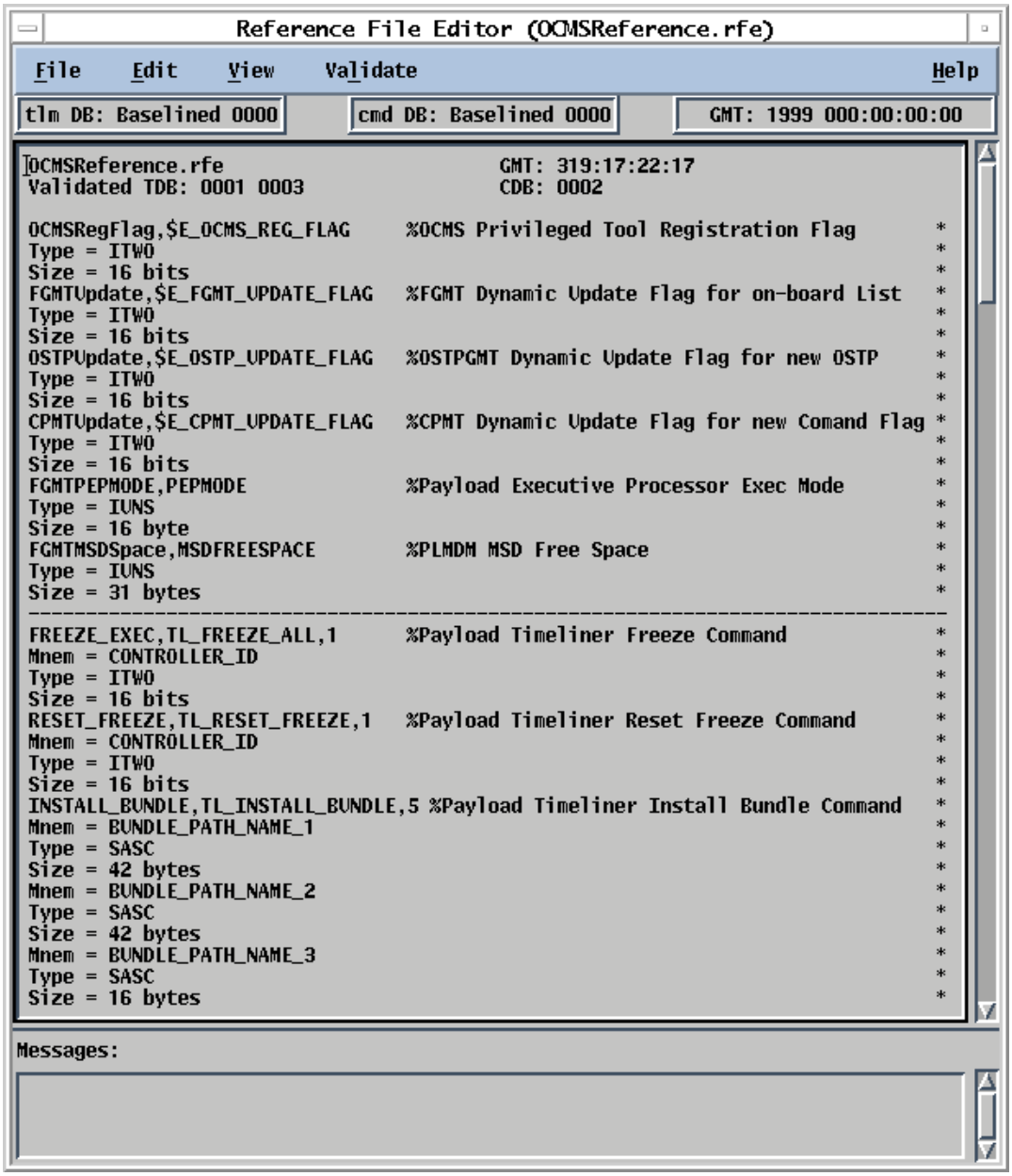


Figure 23-1, Reference File Editor main window.

23.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **Edit**, **View**, **Validate**, and **Help**. Certain menu options listed under the main menu headings are Common User

Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Edit** Menu
  - **Find...**
  - **Find Next**
  - **Replace...**
- **Validate** menu
  - **Validate...**

23.1.2 Status Bar

The status bar contains information about the currently selected telemetry and command databases as well as the current time in Greenwich Mean Time (GMT) format (see Figure 23-2, Status Bar).

Figure 23-2, Status Bar.

23.1.3 Work Area

The work area of the **Reference File Editor** main window is a text editor which allows you to create and edit an OCMS reference file. You can make changes to the content of a reference file through keystrokes and by using the editing functions available from the menu.

If you select the **Save As...** item from the **File** menu to save your reference file, you must provide a filename (24 characteres max.) other than OCMSReference.rfe. That is the default filename used for the current reference file.

Help: For complete information on the editing functions available in Reference File Editor, see Sections “23.1.4.1, Find...”, “23.1.4.2, Find Next”, and “23.1.4.3, Replace...”.

23.1.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Reference File Editor application. All of the menu options from the **Edit** and **Validate** menus will be discussed (see Figure 23-3, Edit and Validate menus).

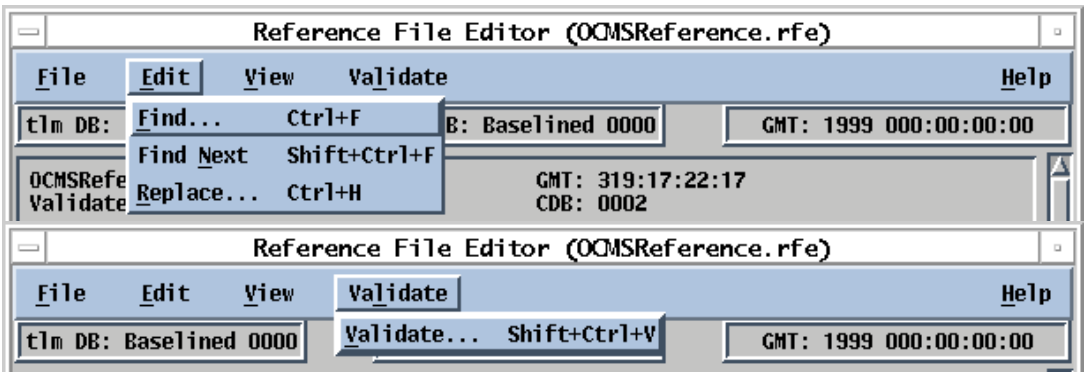


Figure 23-3, Edit and Validate menus.

23.1.4.1 Find...

The **Find**... menu item invokes a dialog box which allows you to search for text within the opened file (see Figure 23-4, Find dialog box).

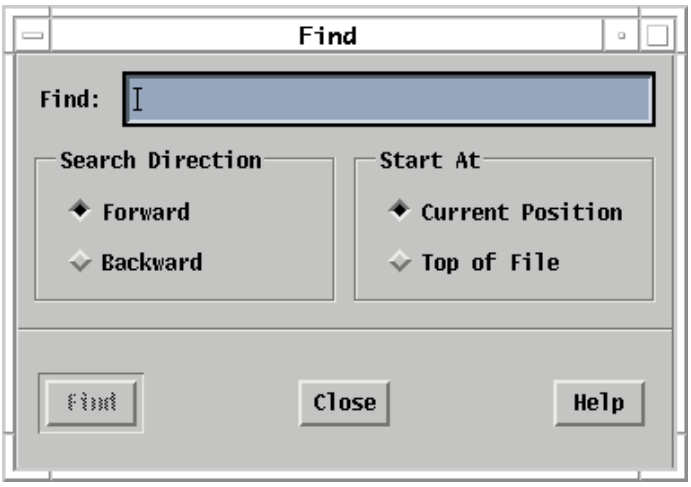


Figure 23-4, Find dialog box.

The dialog box contains a **Find:** input text field, two frames (**Search Direction** and **Start At**) and a buttons area.

The **Find:** input text field is where you enter the desired search criteria. No wildcard characters are permitted in the **Find:** input text field.

Note: The find function is case sensitive and text entered remains after the dialog box is closed, thus making it available for subsequent find operations.

The **Search Direction** frame contains two radio buttons (**Forward** or **Backward**) that allow you to choose the direction that you want the search to move through the file.

The **Start At** frame contains two radio buttons (**Current Position** or **Top of File**) that allow you to choose where you want to begin your search.

Clicking Find searches the file for the text entered in the **Find:** text field and leaves the dialog box open. This is the default pushbutton when you have entered information in the **Find:** text field

23.1.4.2 Find Next

The **Find Next** menu item searches for the next occurrence of the text you specified in the **Find** dialog box. The **Find** dialog box does not have to be open for this function to work.

23.1.4.3 Replace...

The **Replace...** menu item invokes a dialog box that allows you to search for text within the opened file and replace it with new text (see Figure 23-5, Replace dialog box).

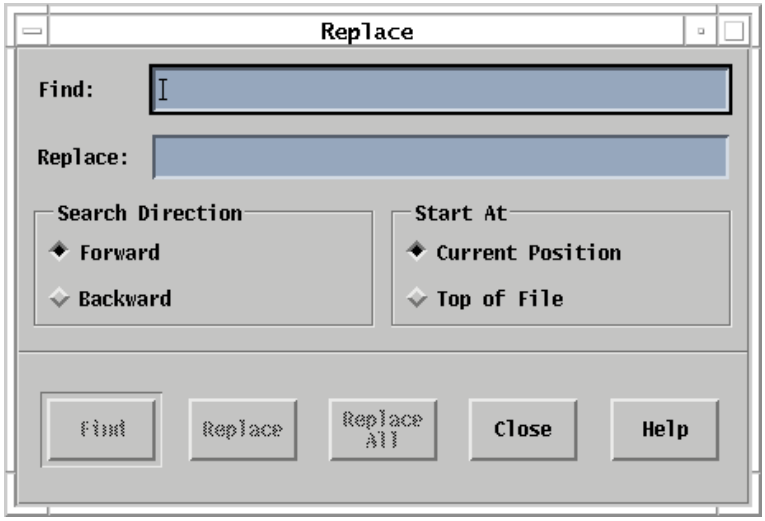


Figure 23-5, Replace dialog box.

The dialog box contains **Find:** and **Replace:** input text fields, two frames (**Search Direction** and **Start At**) and a buttons area.

The **Find:** input text field allows you to enter the desired search criteria. Wildcards cannot be used within this input text field.

The **Replace:** input text field allows you to enter the text that you want to take the place of that specified in the **Find:** input text field.

The **Search Direction** frame contains two radio buttons (**Forward** or **Backward**) that allow you to choose the direction that you want the search to move through the file.

The **Start At** frame contains two radio buttons (**Current Position** or **Top of File**) that allows you to choose where you want to begin your search.

Clicking Find searches for the text entered in the **Find:** text field. This is the default pushbutton when you have entered information in the **Find:** text field.

Clicking Replace replaces the text found by the **Find** function with the text specified in the **Replace:** text field.

Clicking Replace All replaces all occurrences of the text specified in the **Find:** text field with the text specified in the **Replace:** text field.

23.1.4.4 Validate...

This menu item invokes the **Validate** dialog box which allows you to validate your reference file for proper format and syntax. This function also validates the existence of the referenced Command Database (CDB) and Telemetry Database (TDB) elements and the consistency of data type usage (see Figure 23-6, Validate dialog box).

The **Valid for Versions:** text field lists the versions of the TDB and CDB that the currently open reference file has been validated against.

You can validate the reference file against a TDB by clicking the **Telemetry Database** radio button and then selecting the TDB revision you wish to validate against.

You can also validate the reference file against a CDB by clicking the **Command Database** radio button and then selecting the CDB revision you wish to validate against.

Tip: Commanding entities such as command headers, command header fields, commands, and command fields are all database items which are checked in the Validate process.

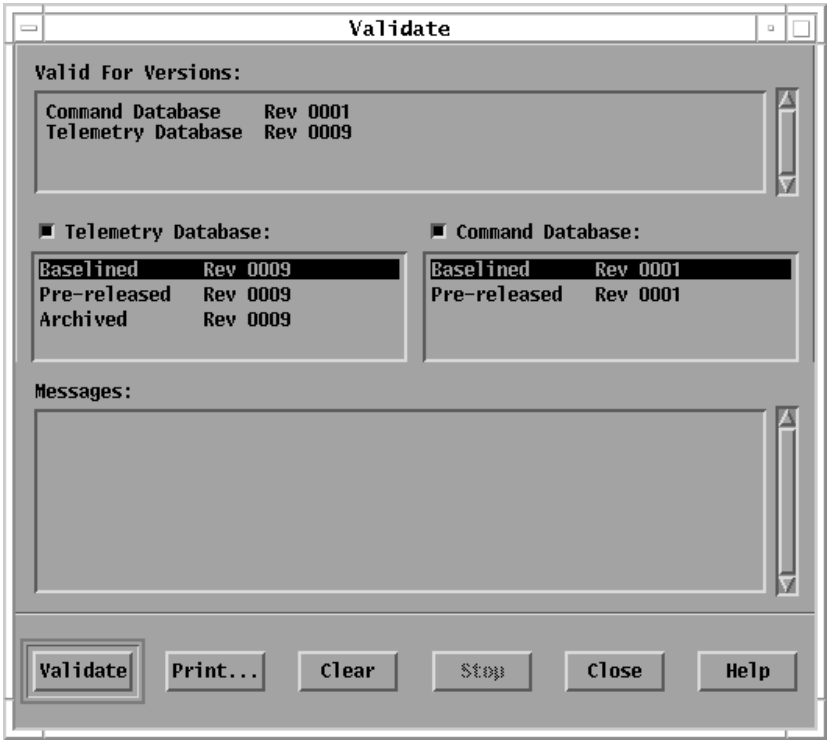
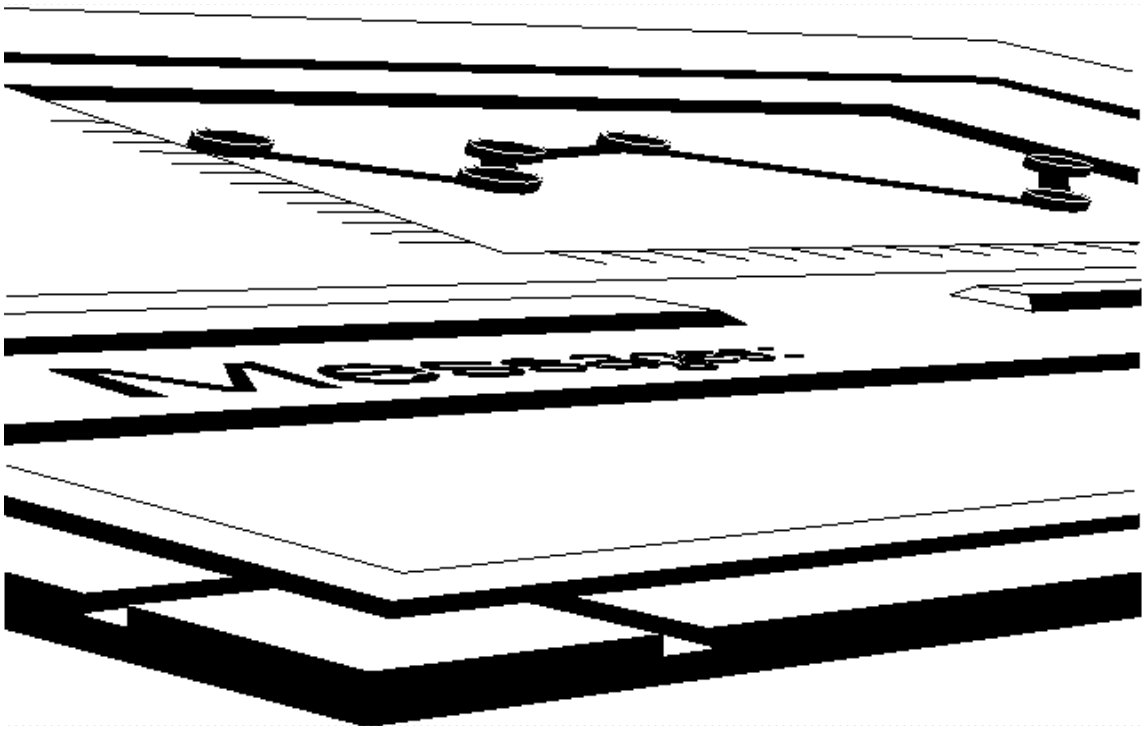


Figure 23-6, Validate dialog box.

Note: You can reopen this dialog box to see the progression of the Validate process.

Tip: The **Validate** dialog box may be left open while a reference file is being debugged. Selecting Validate will initiate a new validation process.



Chapter 24: Automated Procedures Ground Management Tool (APGMT)

This chapter describes the Huntsville Operations Support Center (HOSC) Automated Procedures Ground Management Tool (APGMT) application (see Figure 24-1 , APGMT Concept). APGMT is part of the Operations Mission Control Software (OCMS) suite of applications and provides the privileged user with the capability to command and control the Timeliner Executor and the auto-procedures executing within the Timeliner Executor on the International Space Station (ISS) Payload MDM (PL MDM). The Timeliner Executor is an engine that works as an interpreter to process executable data that has been compiled from scripts of Timeliner User Interface Language (UIL) code. These scripts of UIL code are generated by Payload Users using any standard ASCII text editor and stored in the Payload Information Management System (PIMS). Once in PIMS, the ASCII files must be compiled by the ground based Timeliner compiler into a binary file to be executed by the onboard Timeliner Executor. The compiled versions of these scripts are referred to as Timeliner Compiler executables or automated procedures. The compiler also produces a listing file that is used by the onboard viewing system to provide the crew with a means to monitor the automated procedure. The Executor provides downlinked telemetry status data on the onboard executing procedures.

Automated Procedures are utilized for command and control of payload experiments where actual CCSDS commands may be generated to the payload experiments and vacuum, thermal and power systems. Automated Procedures can also programmatically check the state of valves, temperatures of ovens and any other payload state written to the Current Value Table (CVT) which is kept in memory on the PL MDM. The Timeliner Executor produces automated procedure status telemetry for every automated procedure installed within the Executor. The Timeliner Executor also produces status telemetry on the executor itself. This status telemetry is downlinked via Ku-Band and processed at the Huntsville Operations Support Center (HOSC). The APGMT receives this status telemetry using the standard EHS Telemetry Network Services (TNS) function and displays the executor level status on the APGMT main window.

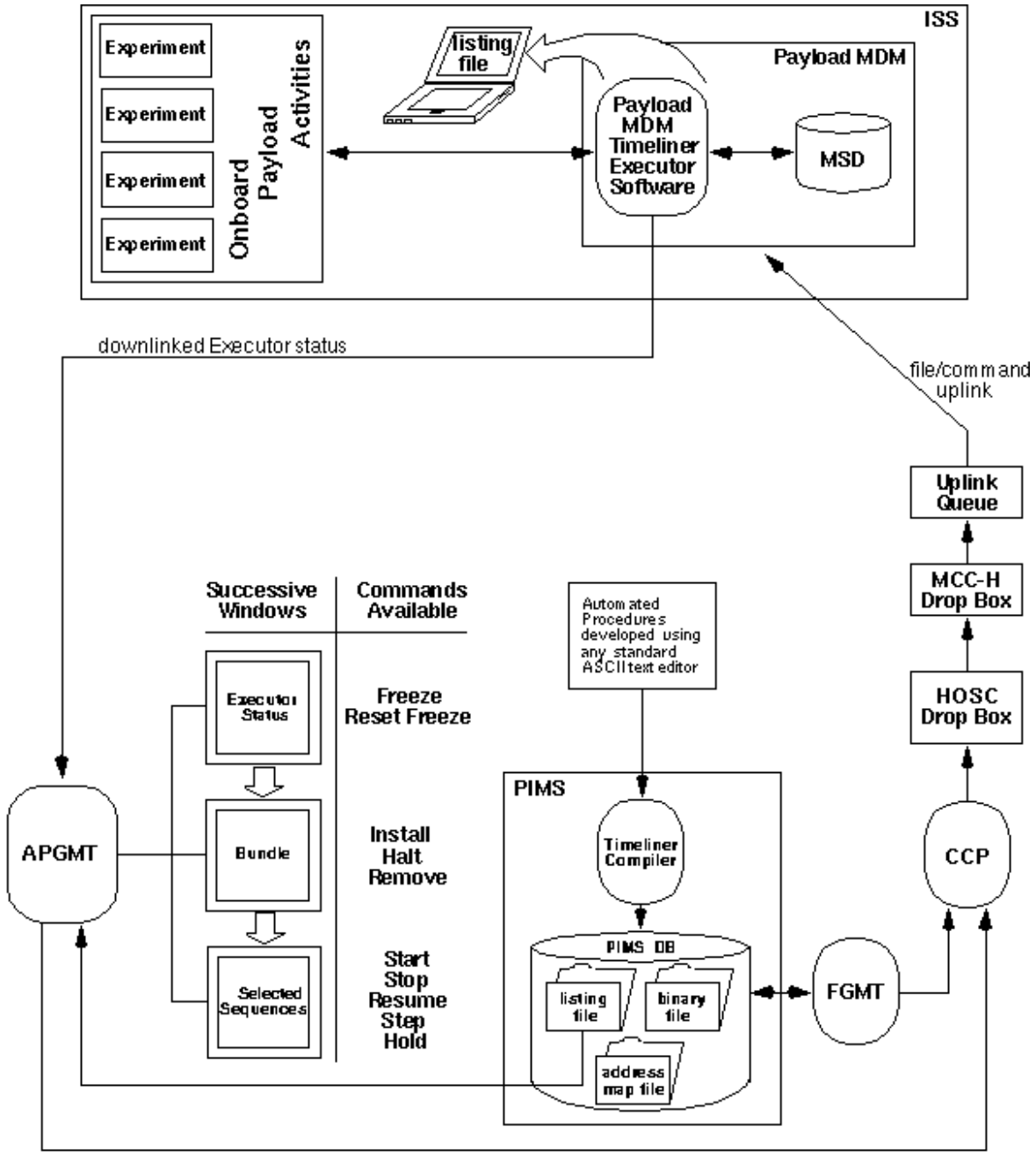


Figure 24-1, APGMT Concept

24.1 Overview

The Automated Procedure Ground Management Tool (APGMT) provides the capability to the Operations Control Team to install, control and remove automated procedures within the onboard Timeliner Executor. Ground personnel monitor and control these procedures by using this tool to view executing procedures by line and statement and issue commands to halt, install, remove

command bundles, and start, stop, resume, step, hold, and jump execution of individual sequences within the bundles.

This tool can be run by multiple non-privileged users in view-only mode, but only privileged users are allowed to access all functions.

The APGMT provides the unprivileged user the following capabilities:

- View the status of the Timeliner Executor
- View progress of currently executing bundle
- View status of all sequences within any selected bundle
- View status of any selected sequence

The APGMT provides the privileged user all unprivileged capabilities plus the capability to perform the following tasks:

- Command and control at the executor level
- Command and control at the bundle level
- Command and control at the sequence level
- Command and control at the statement level

The "bundle" is the uppermost hierarchical level of an automated procedure script, and the unit into which automated procedures are compiled. PIMS is used for retrieval of the compiler list files from which the bundles are extracted. A bundle is normally devoted to a particular, defined purpose that involves sequencing. Bundles contain sequences which can be thought of as seperate executable programs. These sequences may be run concurrently or independently depending upon the type of sequencing needed by the payload experiment. Sequences may start and stop other sequences in the bundle. The APGMT displays the execution status of sequences along with the overall bundle status. The capability to view the actual code lines within a bundle is also provided. A bundle may be selected for viewing the sequence status of sequences within a bundle. A sequence may be selected for viewing the line by line execution of the sequence. APGMT allows all users the ability to track the execution of selected sequences by displaying the sequence's code lines and highlighting the current line that is being reported for the selected sequence in telemetry. A trace of the last 50 "current" line numbers may also be displayed as a debugging feature if problems arise during sequence execution. This trace is performed by selecting the Trace Sequence pushbutton.

Note: All further discussions concerning this application will be at the level of the privileged user. It is the responsibility of the individual user of this document to determine his/her level of privilege, which will in turn, determine the features presented by the application.

The Auto-Procedures Ground Management Tool main window contains several distinct features that will be discussed in this chapter(see Figure 24-2 , Auto-Procedures Ground Management Tool main window.):

- Menu bar
- Status bar
- Work Area

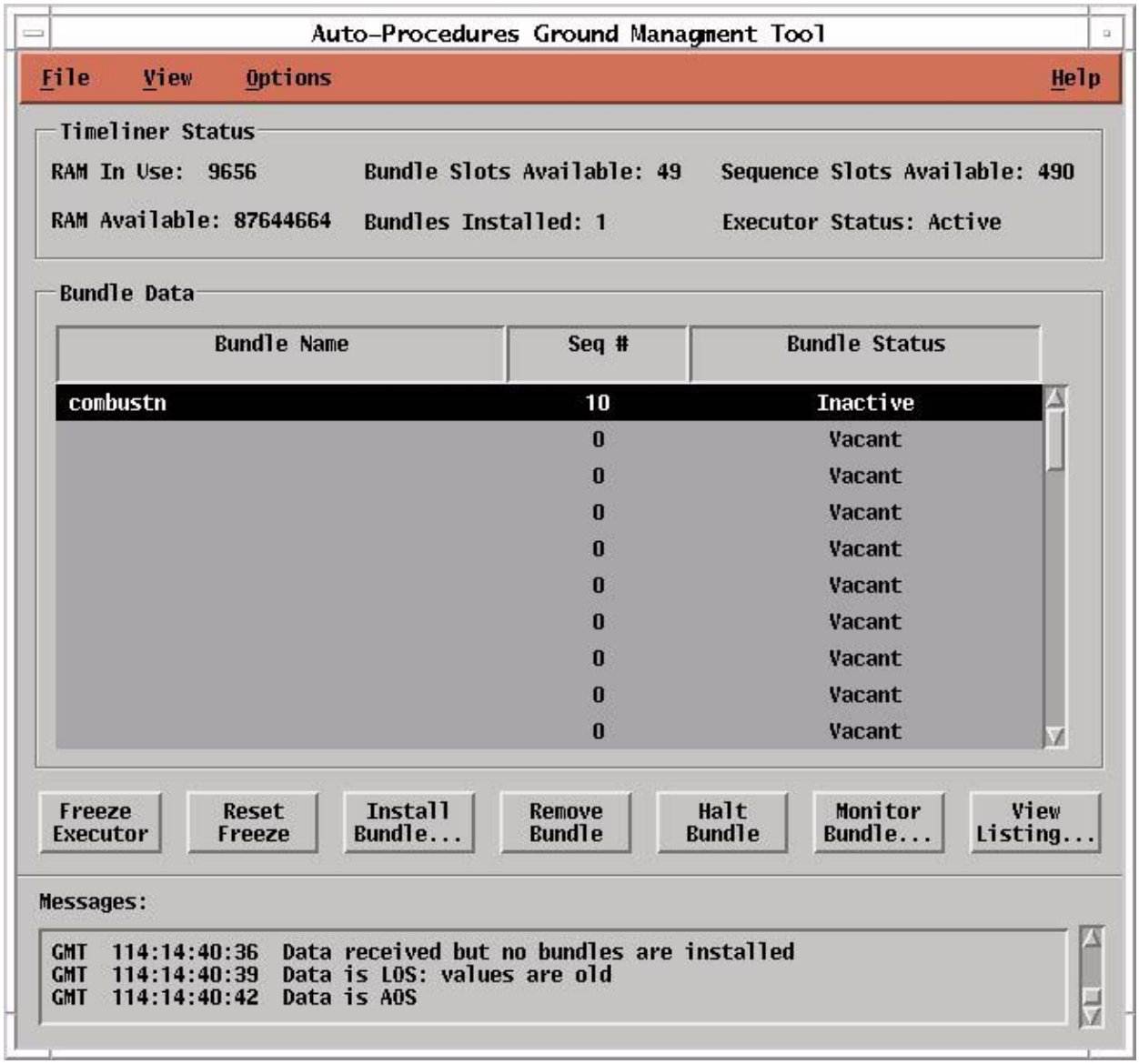


Figure 24-2, Auto-Procedures Ground Management Tool main window.

24.1.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  Freeze Executor

Reset Freeze
Install Bundle...
Remove Bundle
Halt Bundle
Monitor Bundle...
View Listing...

24.1.2 Status Bar

The APGMTs main window is initialized with the Timeliner Executor's Status information presented in the Status Bar. The status bar contains six fields:

- **RAM In Use:**
- **RAM Available:**
- **Bundle Slots Available:**
- **Bundles Installed:**
- **Sequence Slots Available:**
- **Executor Status:**

The **RAM In Use:** entry indicates the number of bytes in memory used by installed bundles.

The **Ram Available:** entry indicates the number of bytes in memory available for bundle installation.

The **Bundle Slots Available:** entry indicates the number of slots available in memory for bundle installation. There are a maximum of 50 slots available for bundle installation.

The **Bundles Installed:** entry reflects the total number of bundles currently installed in the Timeliner Executor.

The **Sequence Slots Available:** indicates the number of sequence slots available for bundle installation. A sequence is the functional building block for assembling bundles. A bundle may be considered to be a main program unit and sequences as subroutines or software procedure units. A sequence establishes an independent stream or thread of execution. The maximum number of sequences per bundle is set to ten, therefore, 50 bundles x 10 sequences/bundle = 500 total sequence slots available.

The **Executor Status:** entry defines the overall Timeliner Executor status. Possible statuses and their definitions are provided in Table 24-1 , Executor Status Descriptions:

Table 24-1, Executor Status Descriptions

Executor Status	Description
Uninitialized	The Executor has not yet been initialized.
Active	The Executor is running normally.
Frozen	The Executor has stopped execution due to a Freeze All Bundles command and is waiting for a Reset Freeze command.
Terminated	The Executor has stopped execution due to a call from the host system to terminate.

24.1.3 Work Area

The work area of the Auto-Procedures Ground Management Tool main window consists of the Bundle Data List. This scrollable list is initialized with a maximum of 10 bundle names to select from. The Bundle Data List follows a single selection policy with the selected bundle becoming highlighted. The Bundle Data List is organized into three columns labeled as follows:

- Bundle Name
- Seq #
- Bundle Status

The **Bundle Name** is the name of the bundle.

The **Seq #** column indicates the number of sequences contained within the bundle.

The **Bundle Status** column indicates the status of the bundle as defined in Table 24-2 , Bundle Status Descriptions:

Table 24-2, Bundle Status Descriptions

Bundle Status	Description
Vacant	No Bundle is installed in this slot.
Installing	A transient status indicating that the bundle has been assigned a slot but is not yet being executed.
Removing	A transient status indicating that the bundle is no longer being executed, but has not yet been removed from it's slot.

Bundle Status	Description
Active	The bundle is being executed, and at least one of its constituent sequences is currently active.
Inactive	The bundle is being executed, but none of its constituent sequences is currently active.

24.1.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Auto-Procedures Ground Management Tool. All of the menu items from the **Options** menu will be discussed (see Figure 24-3 , Options menu.)

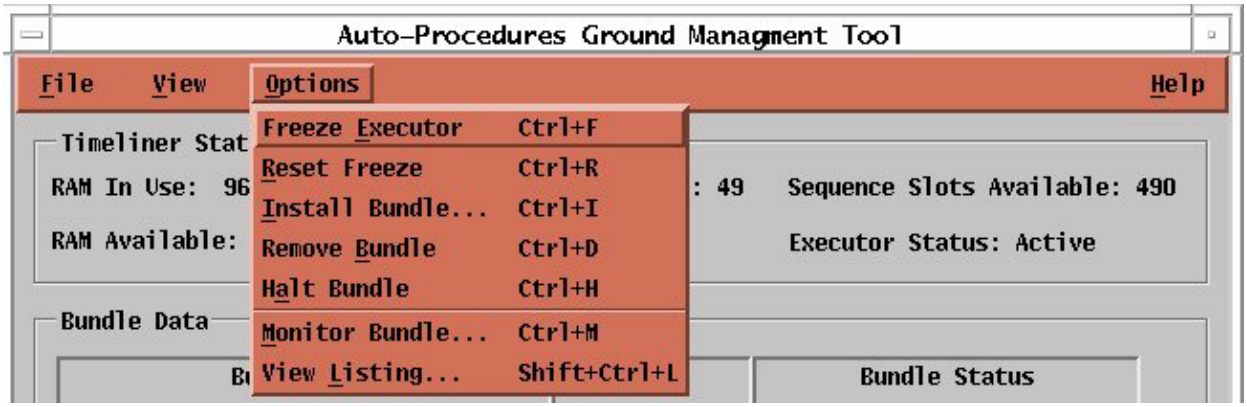


Figure 24-3, Options menu.

24.1.4.1 Freeze Executor

The **Freeze Executor** menu item invokes the **Freeze Executor** dialog box (see Figure 24-4 , Freeze Executor dialog box.) Selection of this option enables the user to uplink the command to freeze the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking

on the Control Panel.

Figure 24-4, Freeze Executor dialog box.

The Freeze Executor dialog box provides the privileged user the ability to freeze the Timeliner Executor. The Freeze All command is one of two commands that can target an entire Timeliner Executor. Its purpose is to serve as a "panic stop" capability by stopping the execution of all sequences and subsequences within all of the bundles currently installed in a Timeliner Executor.

The effects of issuing a Freeze All command are:

- Allow each currently active sequence to finish its current statement.
- Place all active sequences in an inactive state. The status of currently inactive sequences is not changed.
- Change the status for all sequences that were active to Stopped By Command.

The Timeliner Executor requires that a Freeze All command must be followed by a Reset Freeze command. Sequences stopped by the Freeze All command may be subsequently reactivated by issuing the Reset Freeze command and then Start, Resume, or Step commands

Clicking Yes will uplink the Freeze All command, close the dialog box, and return the user to the Auto-Procedures Ground Management Tool main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.1.4.2 Reset Freeze

The **Reset Freeze** menu item invokes the **Reset Freeze** dialog box (see Figure 24-5 , Reset Freeze dialog box.). Selection of this option enables the user to uplink the command to reset the freeze on the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking Reset Freeze on the Control Panel.

Figure 24-5, Reset Freeze dialog box.

The Reset Freeze dialog box allows the privileged user to uplink the Reset Freeze command. This command is used after a Freeze All command to allow processing to resume execution. It targets the entire Timeliner Executor and allows further processing of commands.

Clicking Yes will uplink the Reset Freeze command, close the dialog box, and return the user to the Auto-Procedures Ground Management Tool main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.1.4.3 Install Bundle...

When the privileged user selects the **Install Bundle...** option, the **Install Bundle** dialog box is invoked (see Figure 24-6 , Install Bundle dialog box.). This dialog box enables the user to make a bundle selection from the Onboard Directory Listing and install it on the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking Install Bundle... on the Control Panel.

Figure 24-6, Install Bundle dialog box.

The Install Bundle dialog box allows the privileged user to make a selection from the Onboard Directory Listing: for subsequent installation to the Timeliner Executor. The Install command causes the Executor to read in a bundle, prepare it for execution, and assign a memory slot for the bundle. If the bundle status is set to Active, the bundle begins execution.

The actions taken by the Timeliner Executor in response to an Install command are:

- Allocate a memory slot for the specified bundle.
- Set the bundle status to Installing.
- Prepare the bundle for execution
- When the bundle installation is completed, set the sequence status for each sequence in the bundle. If the sequence statement contains the word "Active", then the appropriate sequence status will be set to Active. If the sequence statement does not contain the word "Active" the sequence status is set to Never Started.
- Reset the bundle status from Installing to Active if one or more of the bundle's sequences is Active. If none of the sequences are Active, then set the bundle status to Inactive

When a bundle is selected from the Onboard Directory Listing: the bundle name will be placed in the **Bundle:** text field.

Clicking Install will uplink the Install command, close the dialog box, and return the user to the Auto-Procedures Ground Management Tool main window. Messages concerning the command

uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

Clicking Reload updates the Onboard Directory Listing with the latest, downlinked version of the Payload MDM Mass Storage Device (PLMDM MSD) Directory List File.

24.1.4.4 Remove Bundle

The **Remove Bundle** option invokes the **Remove Bundle** dialog box (see Figure 24-7 , Remove Bundle dialog box.). Selection of this option enables the user to uplink the command to remove a bundle from the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking Remove Bundle on the Control Panel.

Figure 24-7, Remove Bundle dialog box.

The Remove Bundle dialog box allows the privileged user to uplink the Remove command. The Remove command deletes an installed bundle from the Timeliner Executor's memory. A removed bundle can no longer be accessed and executed unless it is installed again.

The actions taken by the Timeliner Executor in response to a Remove command are:

- Begin the process of removing the specified bundle.
- Set the bundle status to Removing.
- When the removal process is finished, set the occupancy status of the bundle's memory slot to Vacant.

The Remove Bundle dialog box may be navigated to in either of the following manners:

- The **Remove Bundle** selection from the APGMT main window **Options** menu or Control Panel pushbutton.
- The **Remove Bundle** selection from the **Monitor Bundle** mini-application main window **Options** menu or Control Panel pushbutton.

Clicking Yes will uplink the Remove <bundle> command, close the dialog box, and return the user to the main window that invoked the dialog box. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.1.4.5 Halt Bundle

The **Halt Bundle** option invokes the **Halt Bundle** dialog box (see Figure 24-8 , Halt Bundle dialog box.). The Halt Bundle dialog box enables the privileged user to uplink the command to halt a bundle currently executing on the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking Halt Bundle on the Control Panel.

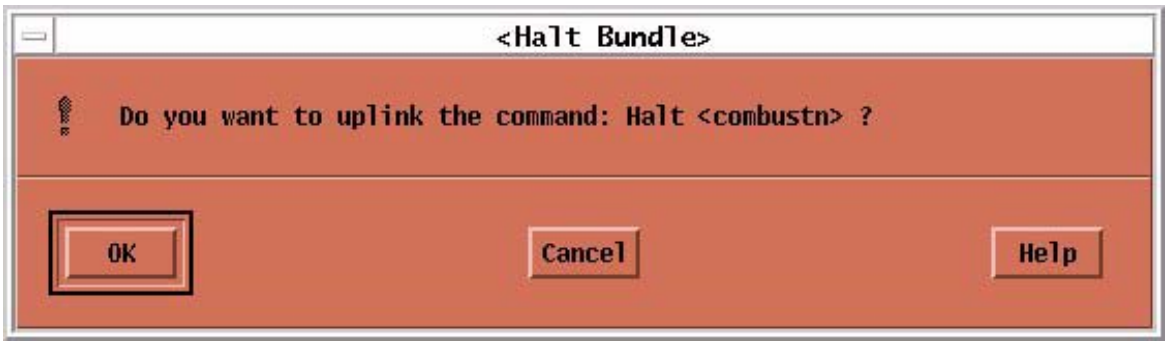


Figure 24-8, Halt Bundle dialog box.

The Halt Bundle dialog box allows the privileged user to uplink the Halt command. The Halt command stops the execution of all sequences within a specified bundle.

The actions taken by the Timeliner Executor in response to a Halt command are:

- Allow each active sequence to finish its currently executing statement
- Set the status of each sequence that was active to Stopped By Command.

The status of any inactive sequences is not changed. A sequence stopped by a Halt command may be reactivated by using the Start, Resume, or Step commands.

The Halt Bundle dialog box may be navigated to in either of the following manners:

- The **Halt Bundle** selection from the APGMT main window **Options** menu or Control Panel pushbutton.
- The **Halt Bundle** selection from the Monitor Bundle mini-application main window **Options** menu or Control Panel pushbutton.

Clicking OK will uplink the Halt <bundle>command, close the dialog box, and return the user to the main window that invoked the dialog box. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.1.4.6 Monitor Bundle...

The **Monitor Bundle...** option invokes the **Monitor Bundle** mini-application. The Monitor Bundle mini-application allows the user to:

- Halt or remove the current bundle
- Select a sequence to command
- Control sequence execution from the ground
- Monitor line-by-line execution of the sequence

Note: Selection of this menu option performs the same function as clicking Monitor Bundle... on the Control Panel.

Help: For information concerning the Monitor Bundle mini-application, see "Section 24.2 Monitor Bundle Mini-Application".

24.1.4.7 View Listing...

The **View Listing...** option invokes the **View Listing** dialog box which enables the user to view the selected bundle compiler listing (see Figure 24-9 , View Listing dialog box.).

Note: Selection of this menu option performs the same function as clicking View Listing... on the Control Panel.

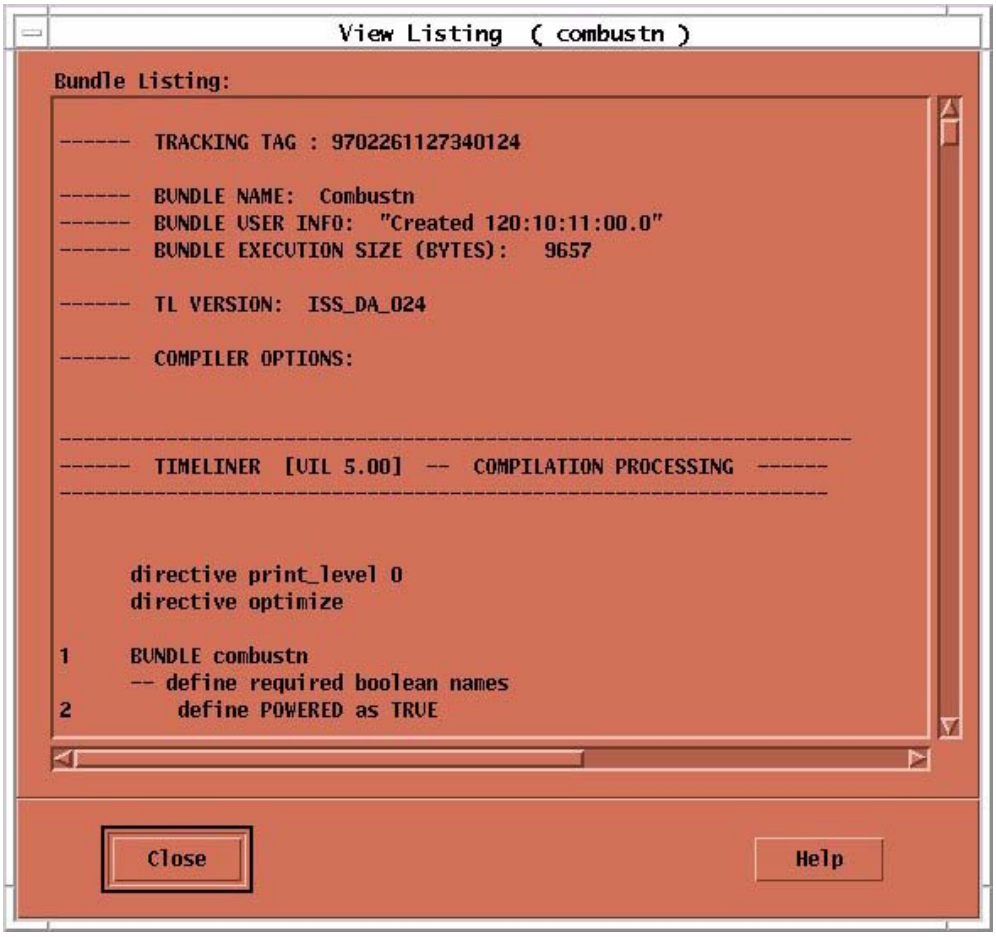


Figure 24-9, View Listing dialog box.

The View Listing dialog box allows the user to view the Bundle ASCII Listing File. The Timeliner Compiler will output a crew readable ASCII Listing File for each Bundle Source File compilation. It will contain an ASCII listing of the input bundle file with necessary header information and statement numbers, to be used both onboard and on the ground for real-time monitor and control of automated procedures.

24.2 Monitor Bundle Mini-Application

Through the Monitor Bundle mini-application the privileged and unprivileged user can monitor the sequence level status data provided for each sequence slot available for the currently selected bundle. Additionally, the APGMT privileged user can issue the following commands:

- Halt Bundle
- Remove Bundle
- Start Sequence
- Stop Sequence
- Resume Sequence

The Monitor Bundle Mini-Application main window contains several distinct features that will be discussed in this section (see Figure 24-10 , Monitor Bundle Mini-Application main window.).

- Menu bar
- Work Area

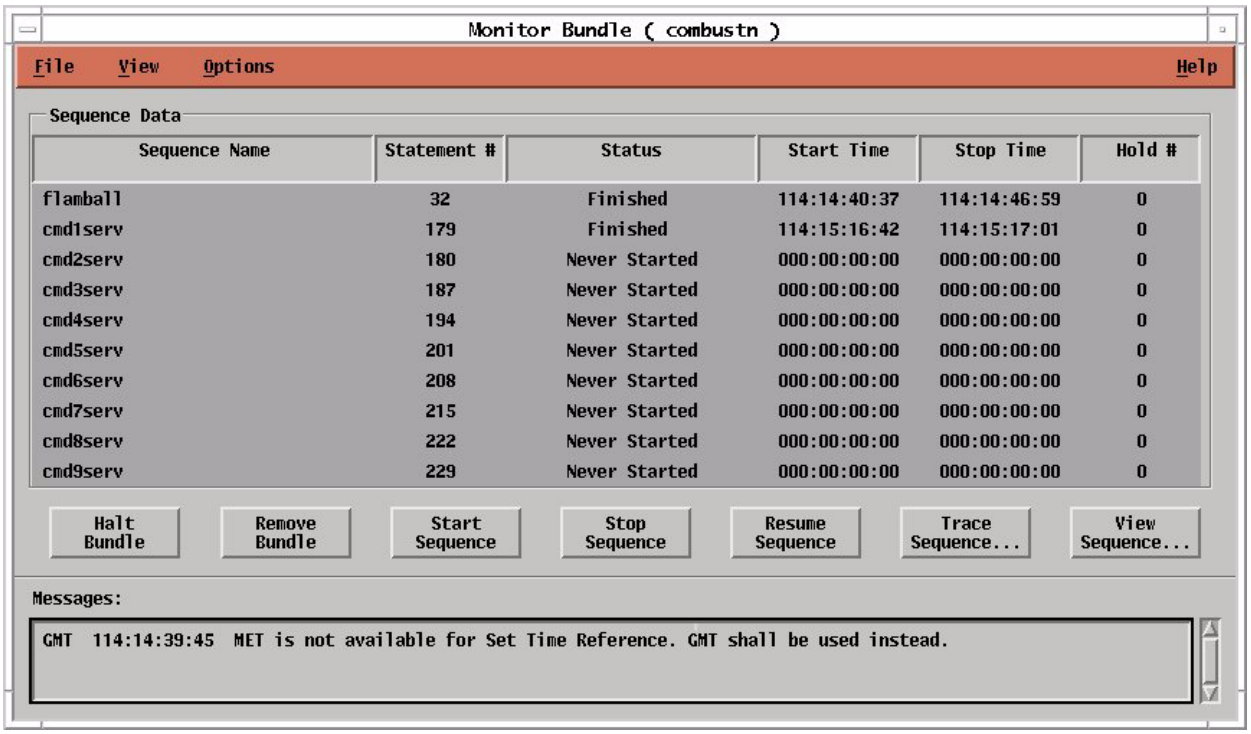


Figure 24-10, Monitor Bundle Mini-Application main window.

24.2.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Halt Bundle**
  - **Remove Bundle...**
  - **Start Sequence**
  - **Stop Sequence**
  - **Resume Sequence**
  - **Trace Sequence...**
  - **View Sequence...**

24.2.2 Work Area

The work area of the Monitor Bundle main window contains a **Sequence Data** listing for the bundle selected in the Auto-Procedures Ground Management Tool main window. The **Sequence Data** listing is divided into columns labeled as follows:

- **Sequence Name**
- **Statement #**
- **Status**
- **Start Time**
- **Stop Time**
- **Hold #**

The **Sequence Name** column will contain the sequence name.

The **Statement #** column contains the current starting statement number of the sequence

The **Status** column provides information about the current state of a sequence. The Timeliner Executor uses the sequence status to determine if an action is allowed. For instance, a sequence cannot be started, if its status is already ACTIVE. The sequence status values are described in Table 24-3 , Sequence Status Descriptions.

Table 24-3, Sequence Status Descriptions

Status	Meaning
Vacant	No sequence is installed in this slot.
Finished	The sequence is inactive. It has executed its CLOSE statement.
Never Started	The sequence is inactive. It has not been active since the bundle was installed.
Stopped By Command	The sequence is inactive. It was stopped by command from an authorized user.
Stopped By Message	The sequence is inactive. It was stopped by a MESSAGE, WARNING, CONFIRM, QUERY, or DISREGARD statement using the PAUSE option.
Stopped By Error	The sequence is inactive. It was stopped because it encountered an error during execution.
Active	The sequence is active.

Status	Meaning
Waiting For Subseq	A transient status indicating that the sequence is active, but is waiting for a subsequence to be finished with by another caller so that it can be called by the present sequence
Waiting For IO	A transient status indicating that the sequence is active, but it is waiting for an input/output operation to be finished.

The **Start Time** column indicates the time the sequence started.

The **Stop Time** column indicates the time the sequence stopped.

The **Hold #** column indicates the HOLD statement number as set by the Hold At command.

24.2.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Monitor Bundle Mini-Application. All of the menu items from the **Options** menu will be discussed (see Figure 24-11 , Monitor Bundle Options menu.).

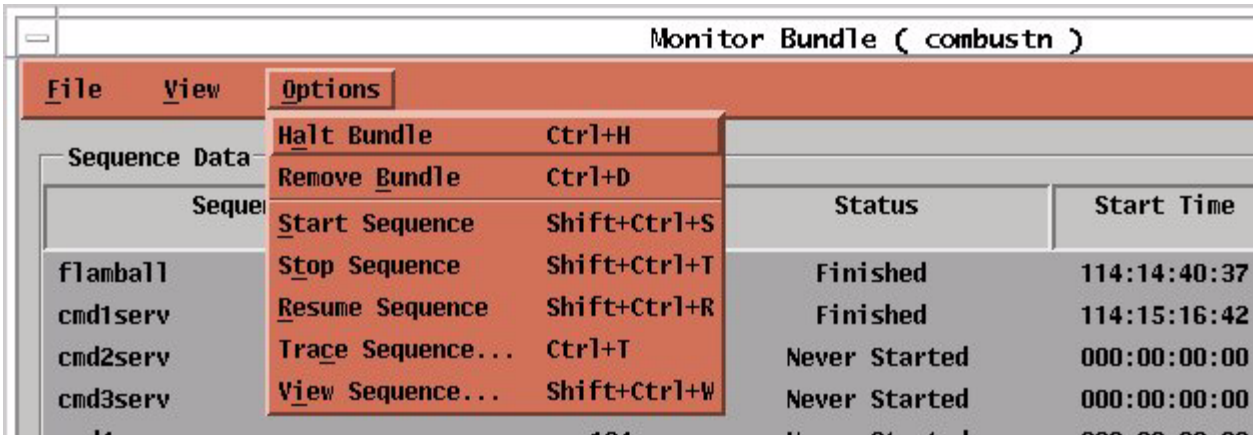


Figure 24-11, Monitor Bundle Options menu.

24.2.3.1 Halt Bundle

The Halt Bundle menu option invokes the Halt Bundle dialog box (see Figure 24-12 , Halt Bundle dialog box.) The Halt Bundle dialog box enables the privileged user to uplink the command to halt a bundle currently executing on the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking Halt Bundle on the Control Panel.

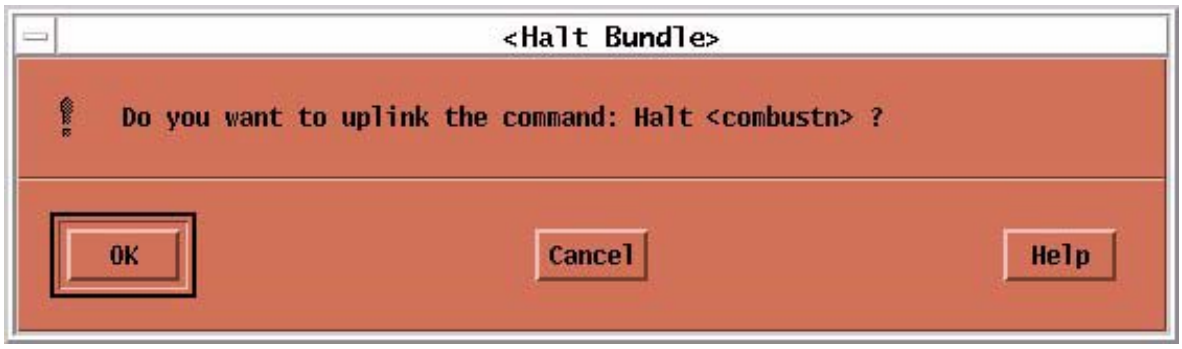


Figure 24-12, Halt Bundle dialog box.

The Halt Bundle dialog box allows the privileged user to uplink the Halt command. The Halt command stops the execution of all sequences within a specified bundle.

The actions taken by the Timeliner Executor in response to a Halt command are:

- Allow each active sequence to finish its currently executing statement
- Set the status of each sequence that was active to Stopped By Command.

The status of any inactive sequences is not changed. A sequence stopped by a Halt command may be reactivated by using the Start, Resume, or Step commands.

The Halt Bundle dialog box may be navigated to in either of the following manners:

- The **Halt Bundle** selection from the APGMT main window **Options** menu or Control Panel pushbutton.
- The **Halt Bundle** selection from the Monitor Bundle mini-application main window **Options** menu or Control Panel pushbutton.

Clicking OK will uplink the Halt <bundle>command, close the dialog box, and return the user to the main window that invoked the dialog box. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.2.3.2 Remove Bundle

The **Remove Bundle** option invokes the **Remove Bundle** dialog box (see Figure 24-13 , Remove Bundle dialog box.). Selection of this option enables the user to uplink the command to remove a bundle from the Timeliner Executor.

Note: Selection of this menu option performs the same function as clicking

on the Control Panel.

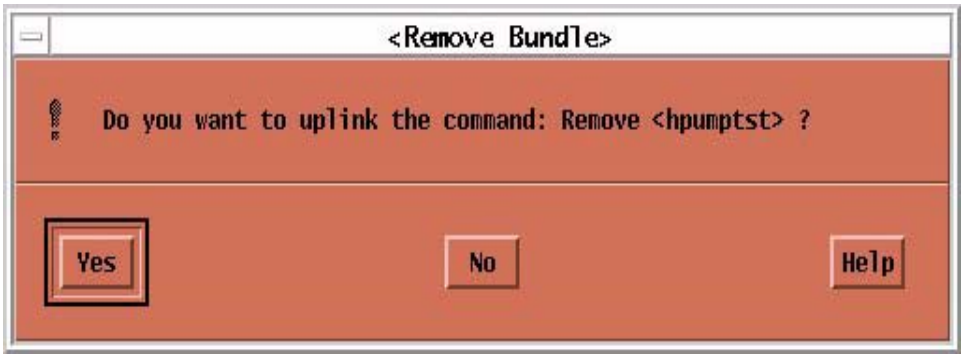


Figure 24-13, Remove Bundle dialog box.

The Remove Bundle dialog box allows the privileged user to uplink the Remove command. The Remove command deletes an installed bundle from the Timeliner Executor's memory. A removed bundle can no longer be accessed and executed unless it is installed again.

The actions taken by the Timeliner Executor in response to a Remove command are:

- Begin the process of removing the specified bundle.
- Set the bundle status to Removing.
- When the removal process is finished, set the occupancy status of the bundle's memory slot to Vacant.

The Remove Bundle dialog box may be navigated to in either of the following manners:

- The **Remove Bundle** selection from the APGMT main window **Options** menu or Control Panel pushbutton.
- The **Remove Bundle** selection from the **Monitor Bundle** mini-application main window **Options** menu or Control Panel pushbutton.

Clicking

will uplink the Remove <bundle> command, close the dialog box, and return the user to the main window that invoked the dialog box. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the APGMT main window.

24.2.3.3 Start Sequence

The **Start Sequence** menu option invokes the **Start Sequence** dialog box (see Figure 24-14 , Start Sequence dialog box.) Selection of this option enables the user to uplink the command to start the execution of a selected sequence.

Note: Selection of this menu option performs the same function as clicking Start Sequence on the Control Panel.

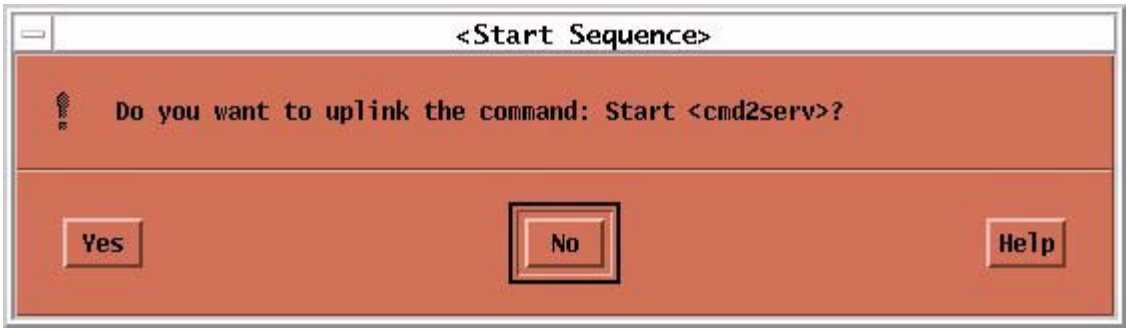


Figure 24-14, Start Sequence dialog box.

The Start Sequence dialog box allows the privileged user to uplink the Start <sequence> command. The Start <sequence> command starts execution of the specified sequence.

The actions taken by the Timeliner Executor in response to a Start command are:

- Set the current statement pointer to the first statement in the specified sequence.
- Set the status of the specified sequence to Active.

Clicking Yes will uplink the Start <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.2.3.4 Stop Sequence

The **Stop Sequence** menu item invokes the **Stop Sequence** dialog box (see Figure 24-15 , Stop Sequence dialog box.) Selection of this option enables the user to uplink the command that deactivates the specified sequence.

Note: Selection of this menu option performs the same function as clicking Stop Sequence on the Control Panel.

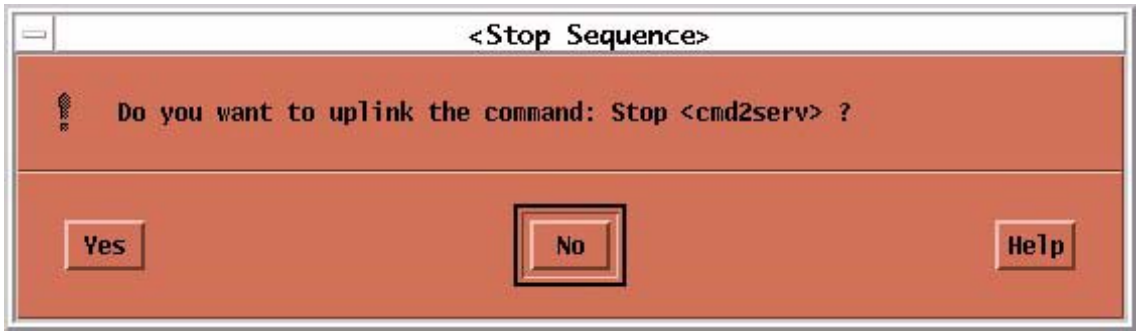


Figure 24-15, Stop Sequence dialog box.

The Stop Sequence dialog box allows the user to uplink the Stop <sequence> command. The Stop <sequence> command deactivates the specified sequence. The execution can start at the same point in response to a Resume or Step command.

The actions taken by the Timeliner Executor in response to a Stop command are:

- Allow a currently executing statement in the specified sequence to complete.
- Set the status of the specified sequence to Stopped By Command.

Clicking Yes will uplink the Stop <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.2.3.5 Resume Sequence

The **Resume Sequence** menu item invokes the **Resume Sequence** dialog box (see Figure 24-16 , Resume Sequence dialog box.) Selection of this option enables the user to uplink the command that reactivates the specified sequence.

Note: Selection of this menu option performs the same function as clicking Resume Sequence on the Control Panel.

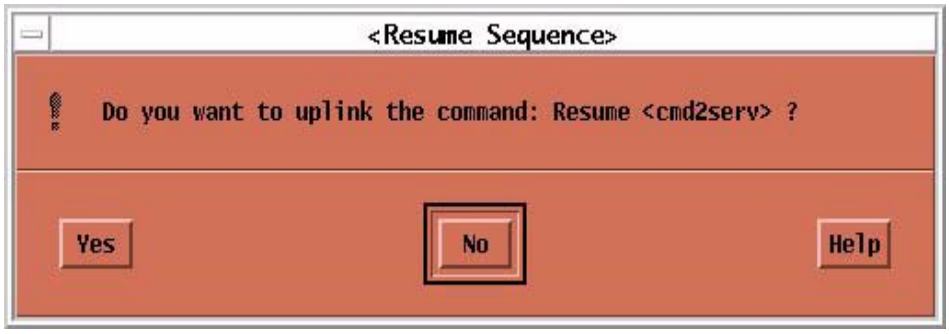


Figure 24-16, Resume Sequence dialog box.

The Resume Sequence dialog box allows the user to uplink the Resume <sequence> command. The Resume <sequence> command reactivates the specified sequence without altering the sequence's current statement pointer.

The actions taken by the Timeliner Executor in response to a Resume command are:

- Set the status of the specified sequence to Active.
- Continue execution at the appropriate statement. If the Resume command follows a Freeze All, Halt, or Stop command, then execution will begin again at the next statement after the last statement executed. The Resume command may also be used to switch to free-running operation following the Jump To or Hold At commands, or following Step operations.

Clicking Yes will uplink the Resume <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.2.3.6 Trace Sequence...

The **Trace Sequence** menu option invokes the **Trace Sequence** dialog box (see Figure 24-17 , Trace Sequence dialog box.) The Trace Sequence dialog box provides a trace of the last 50 current line numbers displayed as a debugging tool if problems arise during sequence execution.

Note: Selection of this menu option performs the same function as clicking Trace Sequence... on the Control Panel.

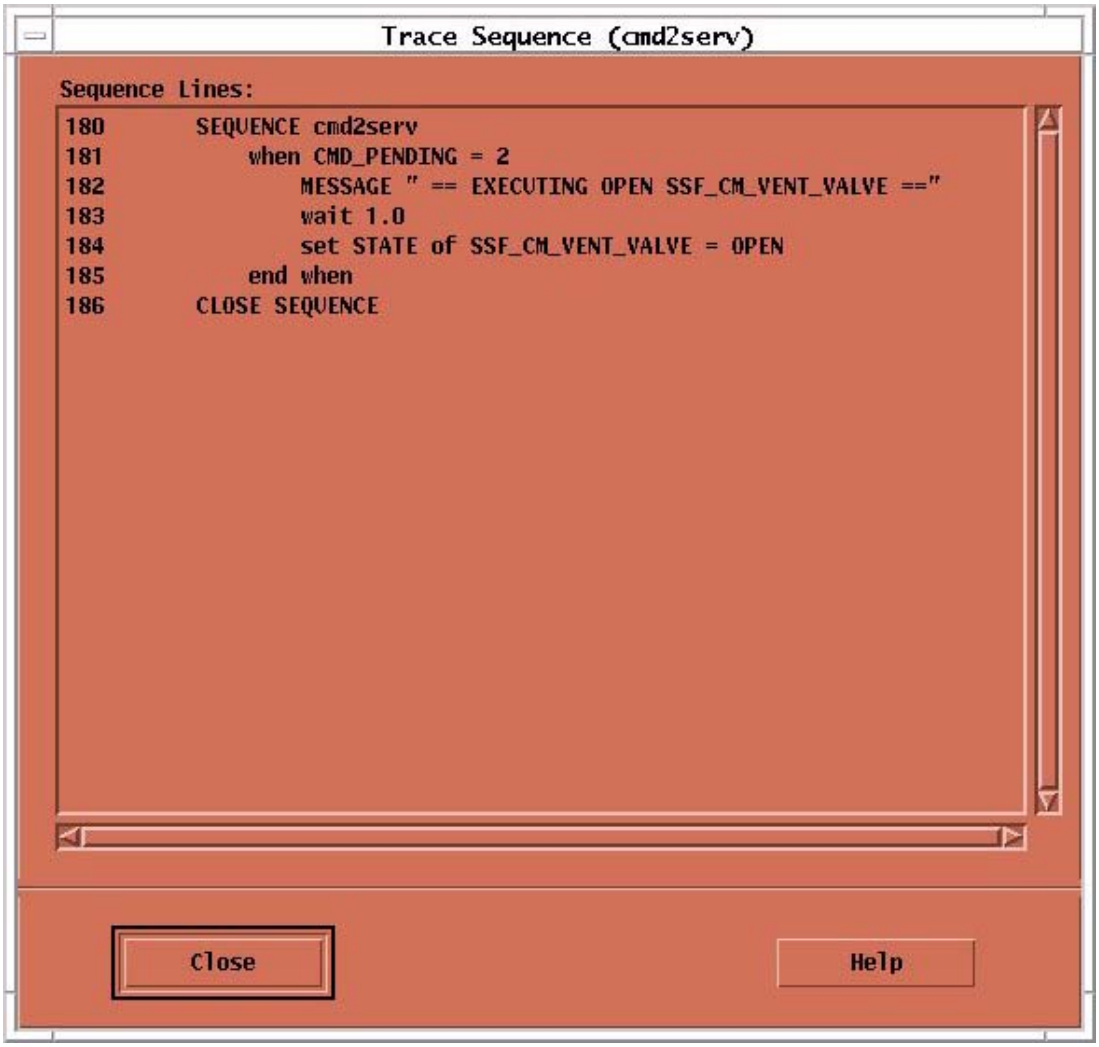


Figure 24-17, Trace Sequence dialog box.

24.2.3.7 View Sequence...

The **View Sequence** menu option invokes the **View Sequence** mini-application. The View Sequence mini-application allows all users to track the execution of selected sequences by displaying the sequence's code lines and highlighting the current line that is being reported for the selected sequence in telemetry.

Note: Selection of this menu option performs the same function as clicking

on the Control Panel.

Help: For information concerning the View Sequence mini-application, see “Section 24.3 View Sequence Mini-Application”.

24.3 View Sequence Mini-Application

The View Sequence mini-application provides status of any selected sequence. The main window displays lines of code belonging to the sequence selected on the Monitor Bundle mini-application main window.The privileged user can view the currently executing Sequence, statement by statement in the auto mode or one selected statement at a time in the manual mode. The user can exercise command and control at the sequence level by issuing the following commands:

- Start sequence command
- Stop sequence command
- Resume sequence command
- Step sequence command

The user can exercise command and control at the statement level by issuing the following commands

- Hold At Line number command
- Jump To Line number command

The View Sequence Mini-Application main window contains several distinct features that will be discussed in this section (see Figure 24-18 ,View Sequence Mini-Application main window.)

- Menu bar
- Status bar
- Work Area

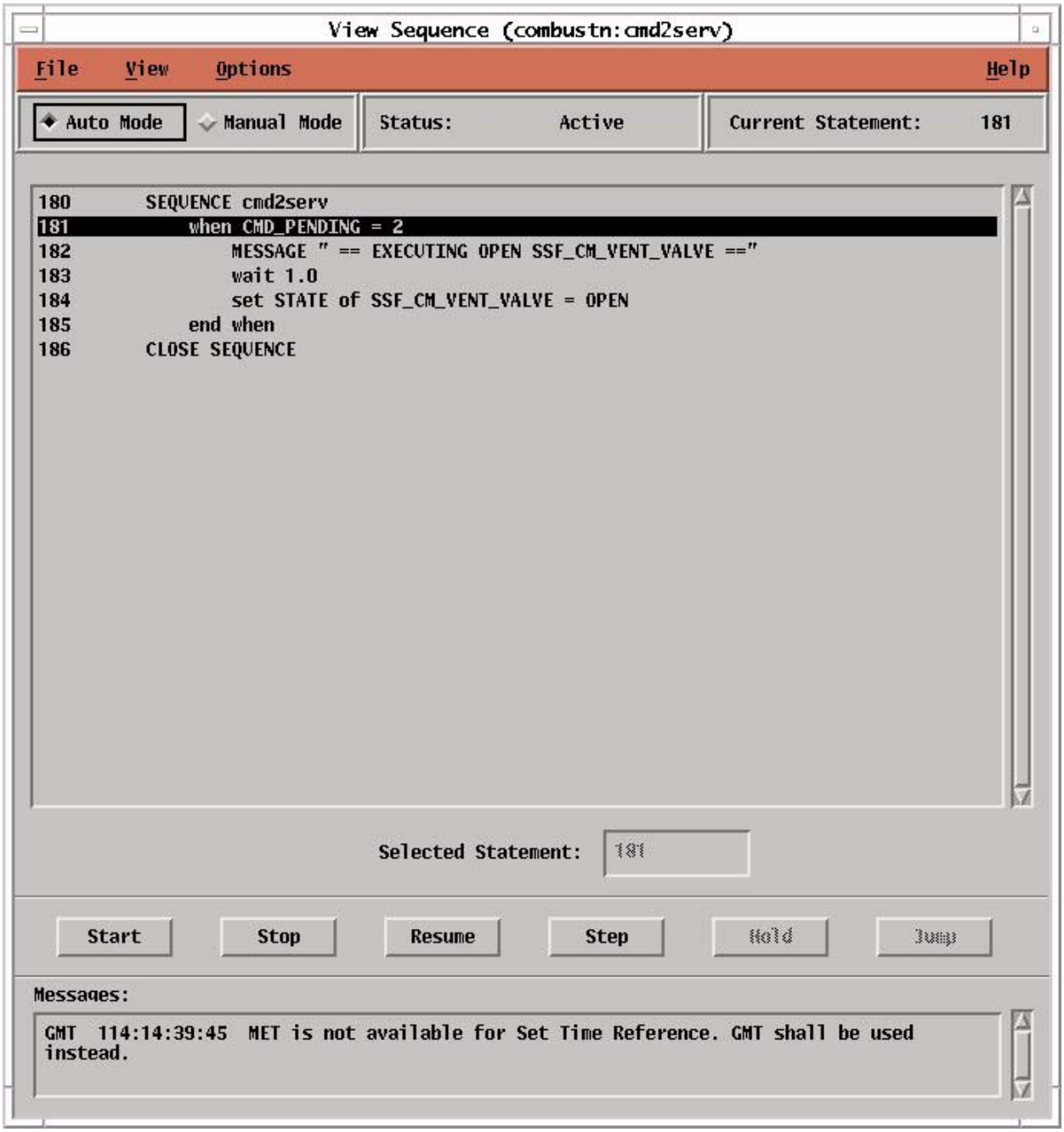


Figure 24-18,View Sequence Mini-Application main window.

24.3.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes four menus: **File**, **View**, **Options**, and **Help**. Certain menu options listed under the main menu headings are Common User

Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Options** Menu
  - **Start**
  - **Stop**
  - **Resume**
  - **Step**
  - **Hold**
  - **Jump**

24.3.2 Status Bar

The status bar contains an Auto Mode and Manual Mode radio button and two fields labeled Status: and Current Statement:.

In **Auto Mode** (the default) individual statements will become highlighted incrementally as the lines of the sequence increment and the line number of the current statement will be displayed in the **Selected Statement:** field.

Selection of the **Manual Mode** allows the privileged user interactive execution control at the code line level of any sequence. **Manual Mode** allows the user to enter a statement number in the **Selected Statement:** field. Once entered the user can initiate a Hold or Jump command, controlling the sequence at the statement level.

The **Status** field provides information about the current state of a sequence. The Timeliner Executor uses the sequence status to determine if an action is allowed. For instance, a sequence cannot be started, if its status is already ACTIVE. The sequence status values are described in Table 24-4 , Sequence Status Descriptions:

Table 24-4, Sequence Status Descriptions

Status	Meaning
Vacant	No sequence is installed in this slot.
Finished	The sequence is inactive. It has executed its CLOSE statement.
Never Started	The sequence is inactive. It has not been active since the bundle was installed.
Stopped By Command	The sequence is inactive. It was stopped by command from an authorized user.

Status	Meaning
Stopped By Message	The sequence is inactive. It was stopped by a MESSAGE, WARNING, CONFIRM, QUERY, or DISREGARD statement using the PAUSE option.
Stopped By Error	The sequence is inactive. It was stopped because it encountered an error during execution.
Active	The sequence is active.
Waiting For Subseq	A transient status indicating that the sequence is active, but is waiting for a subsequence to be finished with by another caller so that it can be called by the present sequence
Waiting For IO	A transient status indicating that the sequence is active, but it is waiting for an input/output operation to be finished.

The **Current Statement:** field indicates the line number for the currently executing sequence statement.

24.3.3 Work Area

The work area of the View Sequence main window contains the contents of the selected sequence's lines of code from the bundle compiler listing. In Auto Mode, the current execution line being reported in telemetry is highlighted in the displayed listing.

If the selected sequence contains any subsequences, the Sub-Sequence Monitor dialog box will appear when sequence execution increments to the subsequence and will disappear when the execution of the subsequence is complete (see Figure 24-19 , Sub-Sequence Monitor dialog box.)

The contents of the **Selected Statement:** field will vary depending on the mode of operation:

- In Auto Mode the contents of the **Selected Statement:** field will contain the line number of the currently executing statement, incrementing as the lines of the sequence increment.
- In Manual Mode the user can enter a statement number in the **Selected Statement:** text entry field for the Jump and Hold commands. This allows the privileged user interactive execution control at the code line level of any particular sequence.

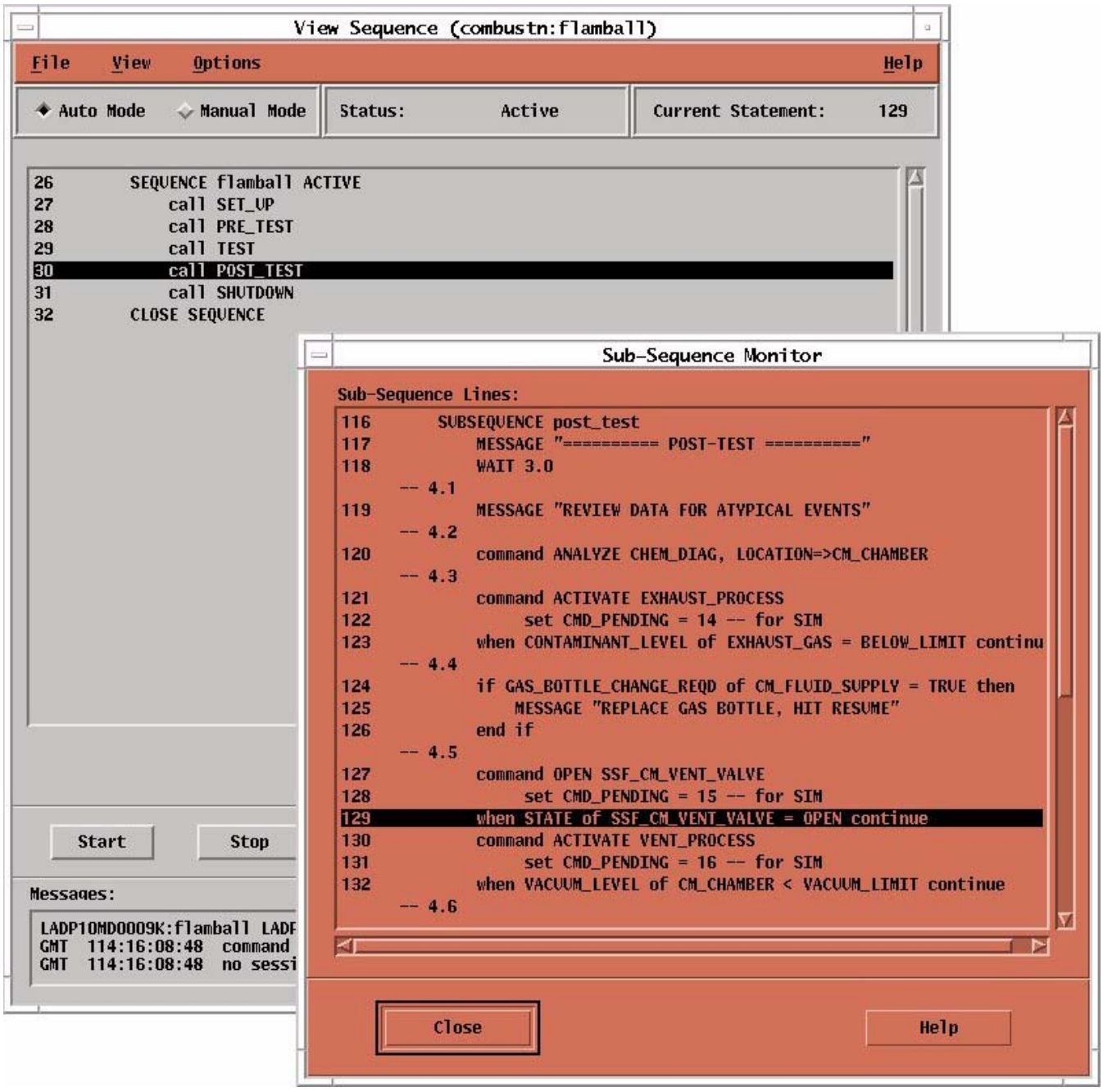


Figure 24-19, Sub-Sequence Monitor dialog box.

24.3.4 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Monitor Bundle Mini-Application. All of the menu items from the **Options** menu will be discussed (see Figure 24-20 , View Sequence Mini-Application Options menu.)

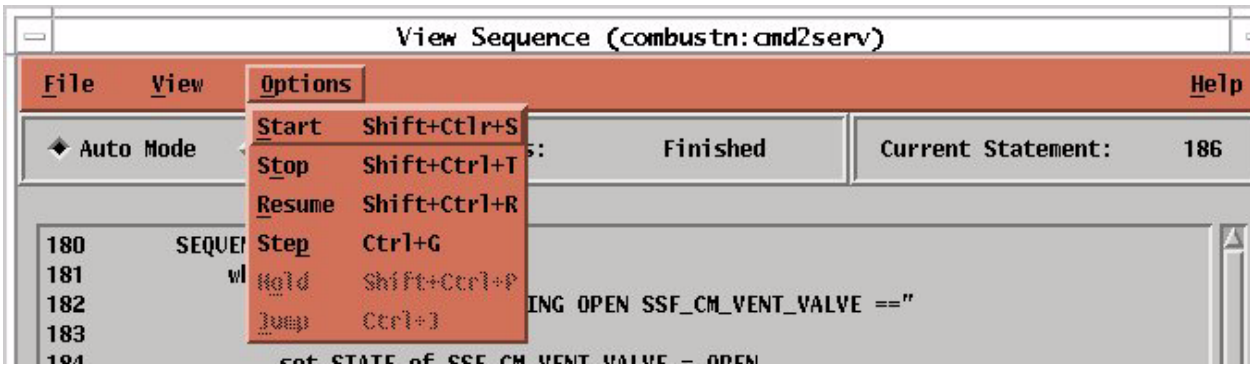


Figure 24-20, View Sequence Mini-Application Options menu.

24.3.4.1 Start

Selecting the **Start** menu item invokes the **Start Sequence** dialog box (see Figure 24-21 , Start Sequence dialog box.) Selection of this option enables the user to uplink the command to start the execution of a selected sequence.

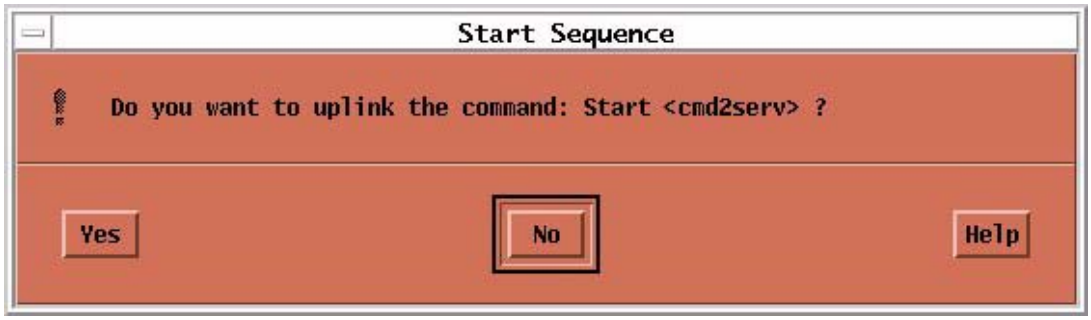


Figure 24-21, Start Sequence dialog box.

The Start Sequence dialog box allows the privileged user to uplink the Start <sequence> command. The Start <sequence> command starts execution of the specified sequence.

The actions taken by the Timeliner Executor in response to a Start command are:

- Set the current statement pointer to the first statement in the specified sequence.
- Set the status of the specified sequence to Active.

Clicking Yes will uplink the Start <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.3.4.2 Stop

Selecting the **Stop** menu item invokes the **Stop Sequence** dialog box. Selection of this option enables the user to uplink the command that deactivates the specified sequence.

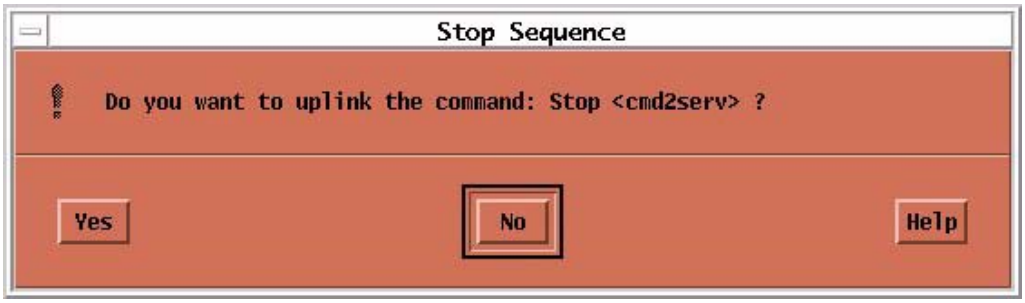


Figure 24-22, Stop Sequence dialog box.

The Stop Sequence dialog box allows the user to uplink the Stop <sequence> command. The Stop <sequence> command deactivates the specified sequence. The execution can start at the same point in response to a Resume or Step command.

The actions taken by the Timeliner Executor in response to a Stop command are:

- Allow a currently executing statement in the specified sequence to complete.
- Set the status of the specified sequence to Stopped By Command.

Clicking Yes will uplink the Stop <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.3.4.3 Resume

Selecting the **Resume** menu item invokes the **Resume Sequence** dialog box (see Figure 24-23 , Resume Sequence dialog box.) Selection of this option enables the user to uplink the command that resumes execution of a sequence at its current statement.

Figure 24-23, Resume Sequence dialog box.

The Resume Sequence dialog box allows the user to uplink the Resume <sequence> command. The Resume <sequence> command reactivates the specified sequence without altering the sequence's current statement pointer.

The actions taken by the Timeliner Executor in response to a Resume command are:

- Set the status of the specified sequence to Active.
- Continue execution at the appropriate statement. If the Resume command follows a Freeze All, Halt, or Stop command, then execution will begin again at the next statement after the last statement executed. The Resume command may also be used to switch to free-running operation following the Jump To or Hold At commands, or following Step operations.

Clicking Yes will uplink the Resume <sequence> command, close the dialog box, and return the user to the Monitor Bundle main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the Monitor Bundle main window.

24.3.4.4 Step

Selecting the **Step** menu item invokes the **Step** dialog box (see Figure 24-24 , Step dialog box.) Selection of this option enables the user to uplink the command that executes a single statement of a sequence.

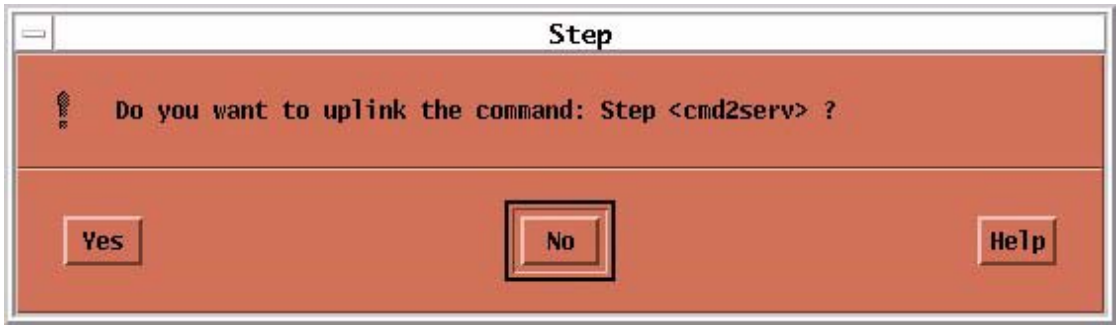


Figure 24-24, Step dialog box.

The Step dialog box allows the user to uplink the Step <sequence> command. The Step command executes the specified statement number in the specified sequence.

The actions taken by the Timeliner Executor in response to a Step command are:

If the specified sequence currently has a status of Active, then the sequence will be deactivated as though in response to a Stop command, in other words:

- Allow a currently executing statement in the specified sequence to complete.
- Set the status of the specified sequence to Stopped By Command.

If the specified sequence currently has a status of Inactive, then:

- Execute the next statement that would be encountered during free-running operation.
- Set the sequence back to the Inactive state.
- Set the status of the specified sequence to Stopped By Command.

Note that the single statement to be executed may have a time element that implies a pause, for example, the When, Whenever, Every, or Wait statements. In this case the step will not be completed until the implied pause is completed. The Jump To command can be used instead of the Step command to skip such a statement if necessary.

Clicking Yes will uplink the Step <sequence> command, close the dialog box, and return the user to the View Sequence main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the View Sequence main window.

24.3.4.5 Hold

Selecting the **Hold** menu item invokes the **Hold** dialog box (see Figure 24-25 , Hold dialog box.) Selection of this option enables the user to uplink the command that creates a "hold" at a particular statement in a sequence.

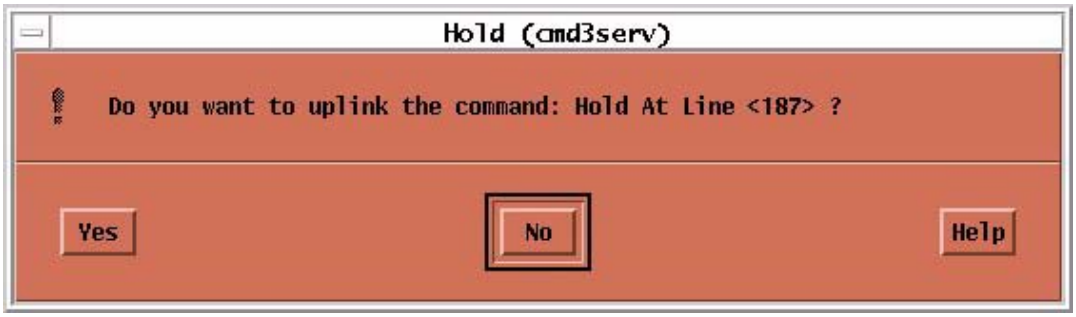


Figure 24-25, Hold dialog box.

The Hold dialog box allows the user to uplink the Hold At command. The Hold At command stops a specified sequence at a specified statement number.

The actions taken by the Timeliner Executor in response to a Hold At command are:

- Save the value of the specified statement number parameter for comparison.
- Compare each executing statement number with the Hold At saved value. Allow all statements to execute until the statement number matches the saved value. Do not execute the specified statement.
- Set the status of the specified sequence to Stopped By Command.
- Once the sequence has stopped, clear the saved statement value.

A Hold At command causes a one-time hold at the specified statement number because the saved value is cleared once the sequence has stopped. Only one Hold At command can exist for a particular sequence at a given time. A new Hold At command for the same sequence will overwrite any Hold At statement value in effect. The execution can be subsequently restarted at the held statement by a Resume or Step command.

Clicking Yes will uplink the Hold At command, close the dialog box, and return the user to the View Sequence main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the View Sequence main window.

24.3.4.6 Jump

Selecting the **Jump** menu item invokes the **Jump** dialog box (see Figure 24-26 , Jump dialog box.) Selection of this option enables the user to uplink the command that jumps to a new statement in a sequence.

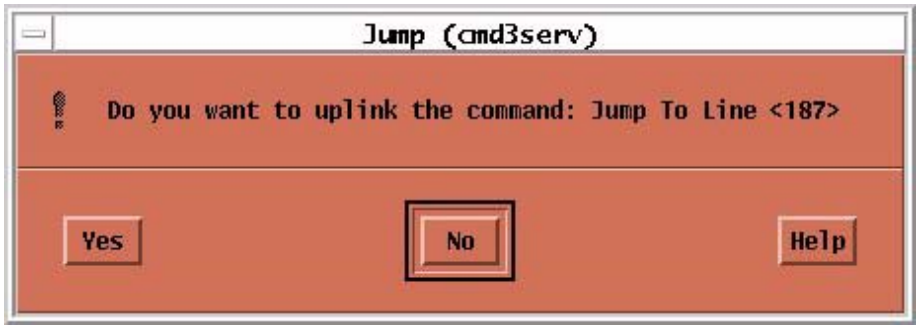


Figure 24-26, Jump dialog box.

The Jump dialog box allows the privileged user to uplink the Jump To command. The Jump To command resets the current statement pointer of a specified sequence to a new specified statement number.

The actions taken by the Timeliner Executor in response to a Jump To command are:

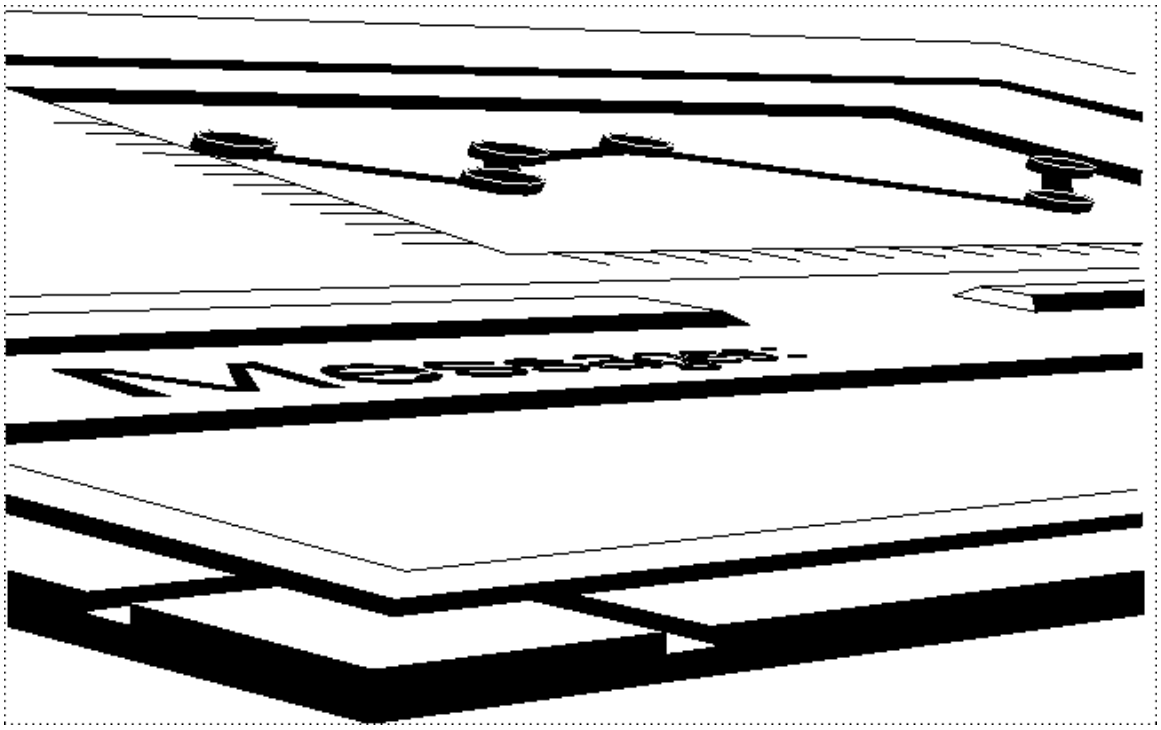
- Set the current statement number associated with the specified sequence to the requested Jump To statement number value.
- Do not automatically activate the specified sequence, The sequence must be explicitly activated using the Resume or Step command.

Note the statement number parameter in a Jump To command may point to a statement contained within a subsequence because the Timeliner Compiler embeds the statements of a subsequence inside the body of the calling sequence and includes the subsequence statements in the sequential numbering. If this is the case, a Jump To command can only transfer to another statement number contained within the subsequence. A Jump To command cannot be used to jump into or out of a subsequence.

A Jump To command may also be used when a Step command will execute a control type of statement that uses a time element (When, Whenever, Every, Wait). The Jump To command can be used to skip over the control statement.

Clicking

will uplink the Jump To command, close the dialog box, and return the user to the View Sequence main window. Messages concerning the command uplink and subsequent command acknowledgements will be displayed in the Message Area of the View Sequence main window.



Chapter 25:
Utilities Menu Applications

The **Utilities** menu applications include some Commercial Off-The-Shelf (COTS) software applications that have been integrated into the suite of Huntsville Operations Support Center (HOSC) applications. These software packages include a word processor, a spreadsheet, and an electronic mail utility. This menu also includes utilities needed to set workstation attributes, transfer files, and monitor your workstation's performance.

25.1 COTS

As mentioned above, the COTS products available are:

- **Framemaker**
- **Spreadsheet**
- **Pixmap Editor**
- **xv**

25.1.1 FrameMaker Application

FrameMaker is a COTS product which provides you with word processing and graphics processing capabilities. FrameMaker is a complete desktop publishing system packaging together a word processor, page designer, graphics editor and book builder. FrameMaker provides the text editing, spell-checking, and search capabilities usually provided in a word processor. FrameMaker allows you to specify the number of columns in the text and integrate graphics within the text. Graphics objects can be created and edited or imported into the document. FrameMaker provides a book building feature that lets you manage multiple files as a single document. Tables can be included in the document with any combination of ruling lines and shading. Portrait and landscape pages can be mixed for any of the above objects. Finally, hypertext commands are available to allow you to input active links into a document.

Note: You must select the appropriate storage directory when saving a FrameMaker file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a FrameMaker file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the FrameMaker application, see the user documentation supplied with the software.

25.1.2 Spreadsheet Application

Spreadsheet is an Applixware COTS product which provides you with spreadsheet capabilities. Spreadsheet provides powerful numeric calculation capabilities and versatile presentation formatting, along with the ability to easily add graphics, text, and sophisticated charts to your worksheets. Spreadsheet also provides a macro capability which makes it easy to automate repetitive tasks or build custom applications. A NRT data file, created by the NRT Data Request application or a computation, can be analyzed in an Applixware spreadsheet.

Note: You must select the appropriate storage directory when saving a spreadsheet file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a spreadsheet file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the Spreadsheet application, see the user documentation supplied with the Applixware commercial software.

25.1.3 Pixmap Editor Application

The Pixmap Editor is a COTS product which provides you with the capability to create and modify pixmaps. A pixmap is a bitmap (a mapping of each individual pixel) with colors. You can create pictures or images by using the drawing tools and by defining each individual pixel (point). Pixmaps can be associated with an object in a display using the Display Generation application.

Note: You must select the appropriate storage directory when saving a pixmap file in order to view it using the Store UDE application. You must also know the appropriate storage directory to select from when opening a pixmap file retrieved from the UDE Database.

Help: "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" contains a table that identifies the storage directories for the corresponding UDE types.

Help: For detailed information about the Pixmap Editor application, see the user documentation supplied with the commercial software.

25.1.4 *xv* Application

xv is an interactive image manipulation program for the X Window System. It can operate on images in the GIF, JPEG, TIFF, PBM, PGM, PPM, XPM, X11 bitmap, Sun Rasterfile, Targa, RLE, RGB, BMP, PCX, FITS, and PM formats on all known types of X displays.

xv lets you do a large number of things, including, but not limited to, the following:

- display an image in a window on the screen
- display an image on the root window, in a variety of styles
- grab any rectangular portion of the screen and turn it into an image
- arbitrarily stretch, compress, rotate or flip the image
- crop or pad images
- view files as ASCII text or hexadecimal data
- magnify any portion of the image by any amount, up to the size of the screen
- determine pixel values and x,y coordinates in the image
- adjust image brightness and contrast with a gamma correction function
- apply different gamma functions to the Red, Green, and Blue color components, to correct for non-linear color response
- adjust global image saturation
- perform global hue remapping
- perform histogram equalization
- run a number of image-processing algorithms on any rectangular portion of the image
- edit an image's colormap
- reduce the number of colors in an image
- dither in color and b/w

- crop off solid borders automatically
- convert image formats

Help: For detailed information about the *xv* application, see the user documentation supplied with the commercial software.

25.2 G2 Express Rack Tool

The G2 Express Rack Tool provides a rule-based, expert system for monitoring and commanding up to eight ISS EXPRESS (EXpedite the PRocessing of Experiments to Space Station) Racks. Only specified cadre positions will have the privilege needed to access this tool.

The G2 Express Rack Tool monitors telemetry for the following Express Rack subsystems:

- Electrical power system
- Thermal control system
- Command and data handling system
- Vacuum exhaust system
- Gaseous/nitrogen system

You can display animated schematics for each of the EXPRESS Rack subsystems. In addition, telemetry is available for payload experiments installed in an EXPRESS Rack. You can install/uninstall payloads in an EXPRESS Rack to maintain the same configuration as onboard.

The G2 Express Rack Tool includes the capability for you to execute EXPRESS Rack Subsystem malfunction procedures. The tool provides reasoning on the telemetry data to determine which troubleshooting path to take when executing a malfunction procedure.

25.3 Login to EHS Application

The **Login to EHS** menu item invokes a dialog box that allows you to remotely log into other EHS systems (see Figure 25-1, EHS Node Login dialog box).

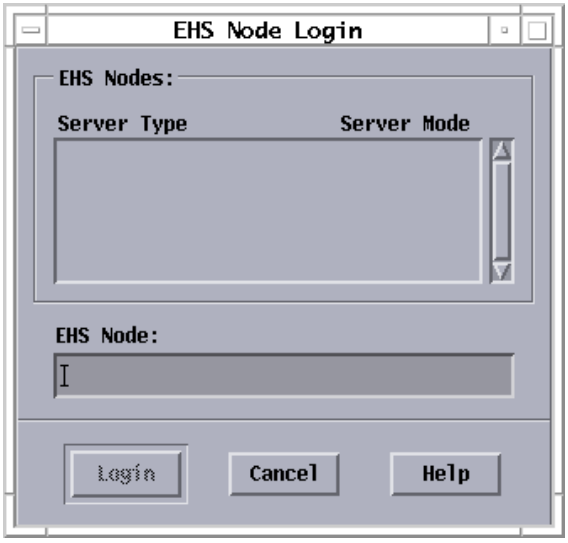


Figure 25-1, EHS Node Login dialog box.

The dialog box consists of an **EHS Nodes:** selection list, an **EHS Node:** input text field and a buttons area. The selection list will contain nodes that you are allowed to access. Once a node is selected, it will be displayed in the **EHS Node:** input text field.

Note: If you are a privileged user and the node is not displayed in the selection list, you can type it in the **EHS Node:** input text field. If you are not a privileged user, the **EHS Node:** input text field will not be available.

Clicking Login provides you with a **Launchpad** and **Message Handler** for the specified system. This is the default pushbutton.

25.4 Login to Non EHS Application

The **Login to Non EHS** menu item invokes a dialog box that allows you to remotely access other Non-EHS systems (see Figure 25-2, Non-EHS Node Login dialog box). This application is only available to those users who have the requirement approved to access remote systems.

Figure 25-2, Non-EHS Node Login dialog box.

The dialog box consists of a **Non-EHS Nodes:** selection list, a **Non-EHS Node:** input text field and a buttons area. The selection list will contain nodes that you are allowed to access. This list is based on your user profile. Once a node is selected, it will be displayed in the Non-EHS Node: input text field.

Selecting **Login** creates a telnet window into the selected system. This is the default pushbutton.

25.5 File Transfer Application

The **File Transfer** menu item allows you to transfer files between platforms inside and outside the HOSC.

The File Transfer main window contains several distinct features that will be discussed in this section (see Figure 25-3, File Transfer main window)

- Menu Bar
- Status Bar
- Work Area

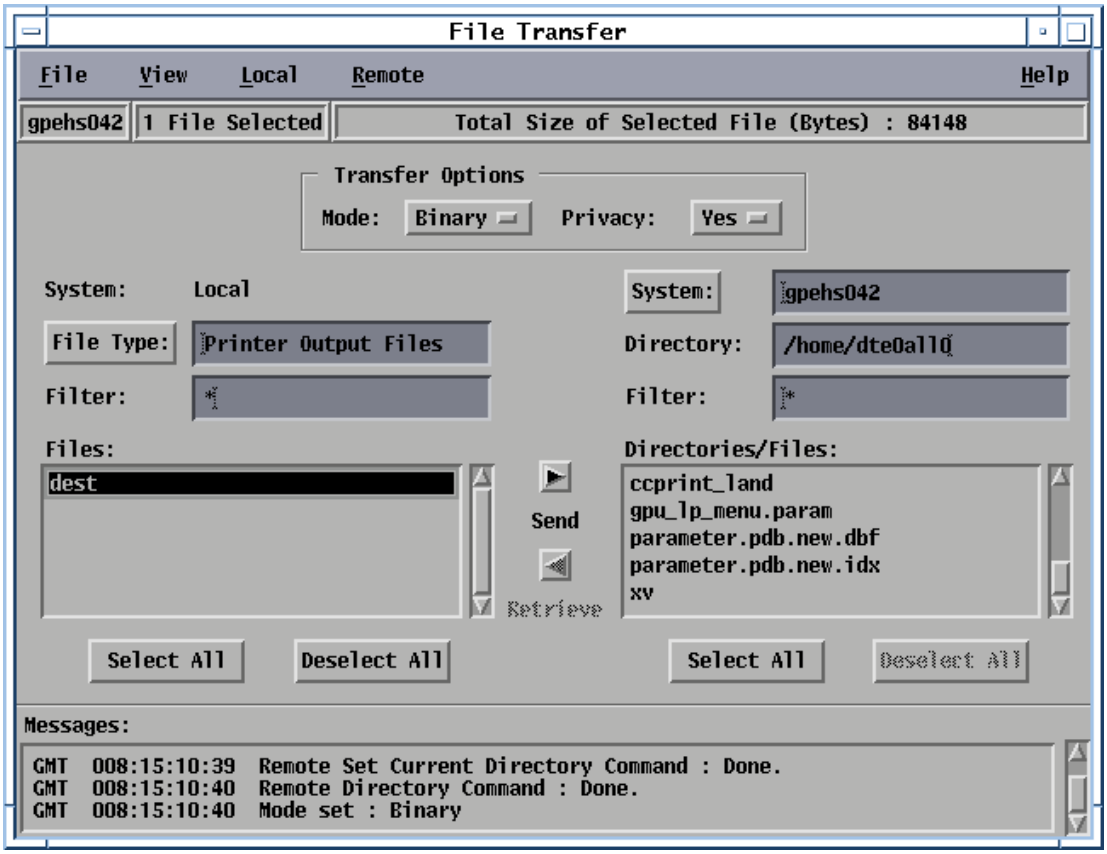


Figure 25-3, File Transfer main window.

25.5.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Local**, **Remote**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **File** Menu
  - **Send**
  - **Send As...**
  - **Retrieve**
  - **Retrieve As...**
- **View** Menu
  - **Setup File List Options...**
- **Local** Menu
  - **Filter**
  - **Select All**
  - **Deselect All**

- **Remote** Menu
  - **Filter**
  - **Select All**
  - **Deselect All**
  - **Create Directory...**
  - **Remove Directory...**
  - **Up Directory**
  - **Down Directory**
  - **Remove File...**
  - **Change File Properties...**

25.5.2 Status Bar

The **File Transfer** status bar contains information relevant to any file transfer currently in progress. It is divided into three areas (see Figure 25-4, Status Bar):

- Connection status
- Number of files selected
- Transfer completion data

Figure 25-4, Status Bar

The connection status shows the remote host name if you are connected; otherwise, it will contain **Not Connected**.

The number of files selected shows the number of files selected for transfer. This area of the status bar is updated continuously as the user selects and deselects files.

The transfer completion data provides the total size of the selected file. When actually performing a transfer, this data provides a percentage as well as the total number of bytes that have been transferred.

25.5.3 Work Area

The work area contains a **Transfer Options** frame, a local system area, and a remote system area (see Figure 25-3, File Transfer main window). Each system area contains a selection list and buttons area corresponding to the system.

Note: If you are not authorized to perform functions within the application, the item will not be available on the main window or under the menus.

The **Transfer Options** frame contains two option menu buttons, **Mode:** and **Privacy:**.

The available **Mode:** options are **Binary** and **Text**.

Binary - Transfer data as binary.
Text - Transfer data as American Standard Code for Information Interchange (ASCII) data.

The available **Privacy:** options are **Yes** and **No**.

Yes - data is encrypted during transfer.
No - data is not encrypted during transfer.

The local system area contains a **System:** display only field, File Type:, a **Filter:** input text field and a **Files:** selection list.

The File Type: invokes a dialog box that allows you to select the type of files that you want to view.

Within the **Filter:** input text field, you can specify a search criteria for files of the selected **File Type:**. The result from the filter will be displayed in the **Files:** selection list. To actually perform the filtering action, you can either press Enter while the cursor is in the **Filter:** text field or select **Filter** from the **Local** menu.

The **Files:** list will contain the files of the selected file type that matches the filter criteria.

The remote system area contains System:, a **Directory:** input text field, a **Filter:** input text field and a **Directories/Files:** selection list.

The System: invokes a dialog box that allows you to select from a list of remote nodes that you can access. If the remote platform that you want to transfer files to is not listed, you can type the name of the remote platform or it's IP Address into the text entry field to the right of the System: pushbutton. When you are done entering the name of the remote platform or it's IP Address, select Enter to invoke the Remote Password dialog box that prompts you to login to the remote platform.

The **Directory:** input text field will contain the name of the directory that you select from the **Directories/Files:** selection list. If you know the name of the directory, you may type the directory structure in the field provided.

Note: If you need to refresh the file list for the current directory, select the **Directory:** input text field and press Enter.

Within the **Filter:** input text field, you can specify a search criteria for files within the selected directory. The result from the filter will be displayed in the **Directories/Files:** selection list. To actually perform the filtering action, you can either press Enter while the cursor is in the **Filter:** text field or select **Filter** from the **Remote** menu.

Send and **Retrieve** are provided to facilitate transferring to/from the specified system. These functions are not available until you provide the directory information for both systems.

Note: There are several reasons why File Transfer will not allow a user to retrieve a file:

1. File Transfer will only allow a user to retrieve files from a node in the SSUP non-EHS node list.
2. File Transfer will only allow a user with the "File Transfer Import Allowed" capability to retrieve files.
3. File Transfer will only allow certain types of files to be retrieved.

25.5.4 Application Essentials

The following sections will discuss the options presented by the Menu Bar that are unique to the File Transfer application. Selected options from the **File** Menu, **View** Menu, **Local** Menu, and the **Remote** Menu will be discussed (see Figure 25-5, File Transfer menus).

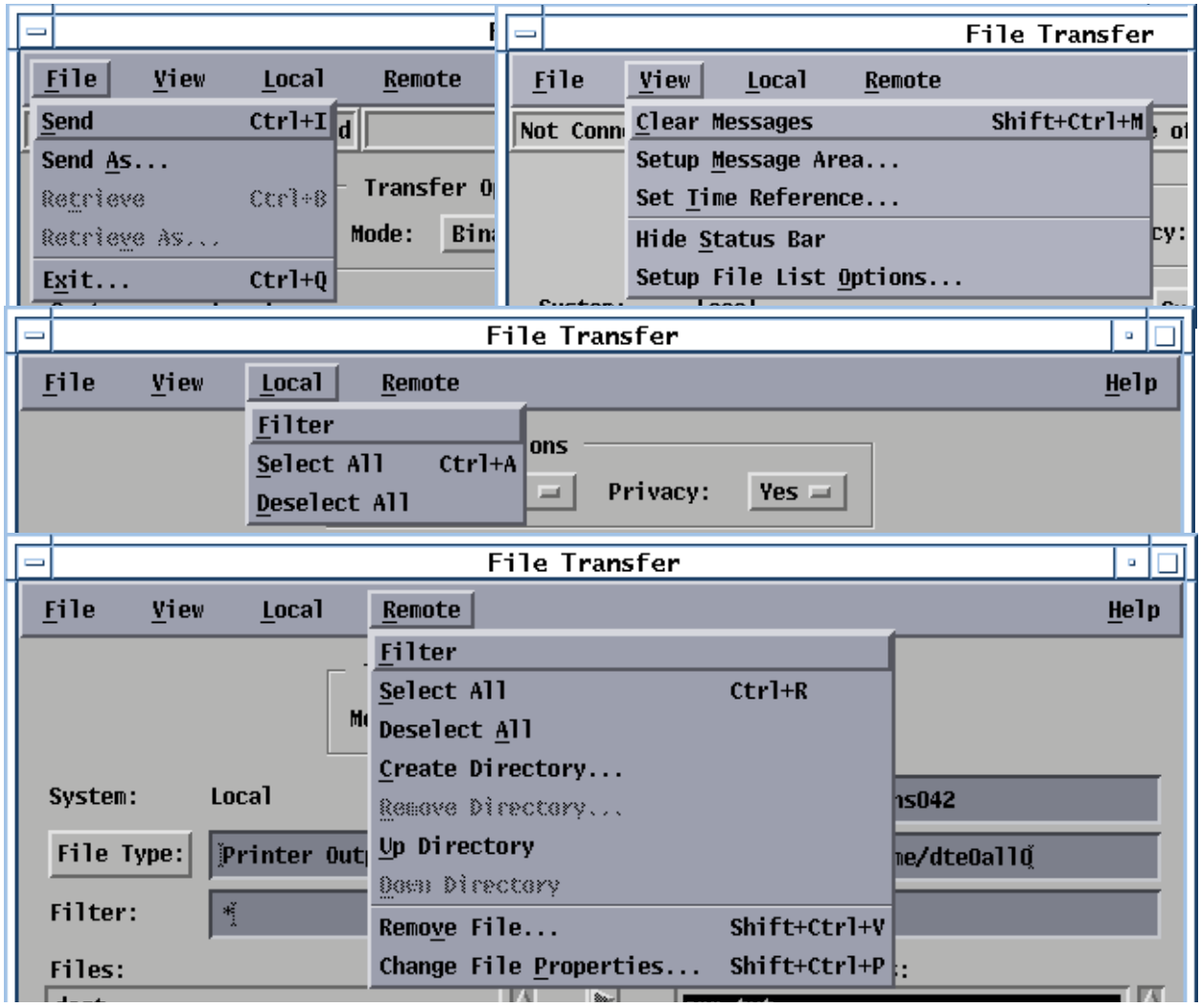


Figure 25-5, File Transfer menus.

25.5.4.1 Send

Send allows you to transfer files from the selected local directory to the selected remote directory. You must have one or more files selected in order for this function to be available. You cannot transfer an entire directory at once. This function is also available as **Send** .

Note: In order for this menu item to be available, the following items must be entered: the local directory, a local file, the remote system and the remote directory.

CAUTION: If you select a file that already exists in the remote directory, that file will be overwritten. You will be asked to confirm the transfer in the event that the file already exists.

25.5.4.2 Send As...

The **Send As...** menu item allows you to select a single local filename and send it with a new name to the remote host (see Figure 25-6, Send As dialog box).

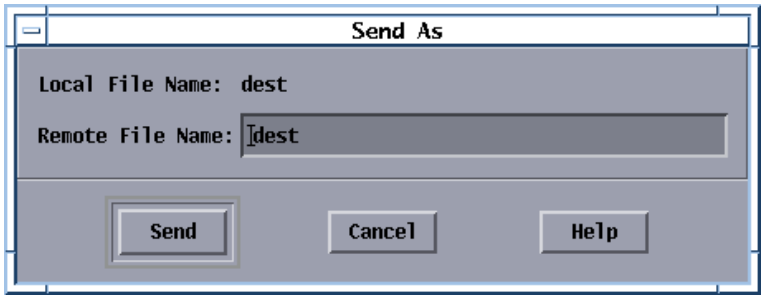


Figure 25-6, Send As dialog box.

Clicking Send transfers the file to the remote directory under the specified filename and closes the dialog box. This is the default pushbutton.

25.5.4.3 Retrieve

Retrieve allows you to transfer file(s) from the selected remote directory to a selected local directory. This function is also available with **Retrieve** in the work area.

Note: In order for this menu item to be available, the following items must be entered: the remote system, the remote directory, the remote file, and the local type. The remote file must be a file type that is allowed to be retrieved into the EHS system.

Note: All files transferred into EHS are virus scanned. If a virus is found, the file is quarantined by changing the file's owner/permissions and moving the file to the external quarantine area.

25.5.4.4 Retrieve As...

The **Retrieve As...** menu item allows you to select a remote filename and then store it with a new name on the local host (see Figure 25-7, Retrieve As dialog box).

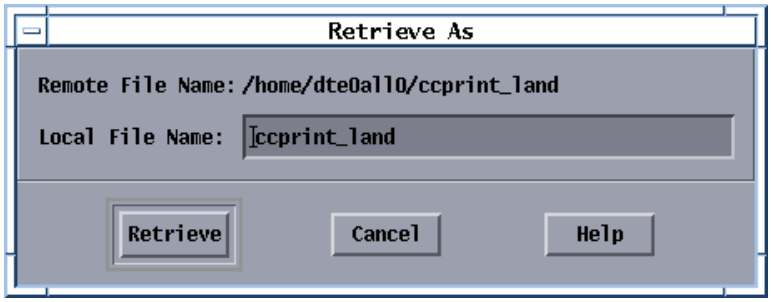


Figure 25-7, Retrieve As dialog box.

Clicking Retrieve transfers the file to the local directory under the specified filename and closes the dialog box. This is the default pushbutton.

25.5.4.5 Setup File List Options...

The **Setup File List Options...** menu item invokes a dialog box that allows you to configure information about the files displayed in the **Directories/Files:** areas of both the local and remote systems.

The dialog box contains five toggle buttons (see Figure 25-8, Setup File List Options dialog box).

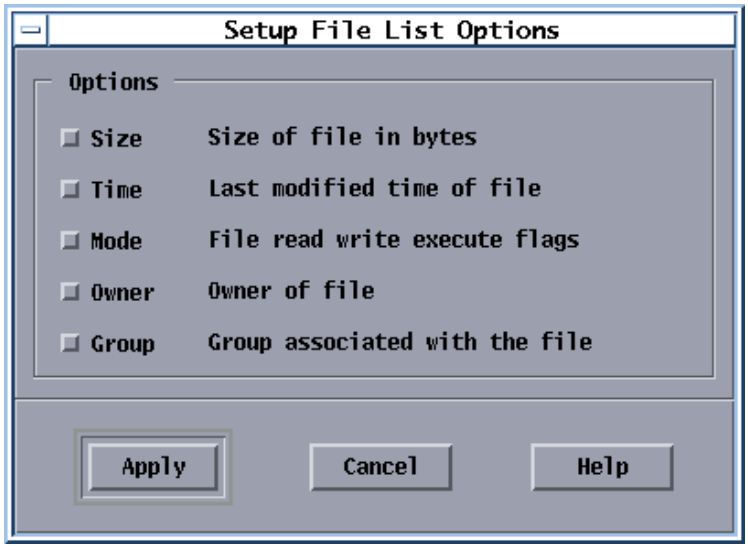


Figure 25-8, Setup File List Options dialog box.

To set the options, select the desired toggle buttons and click Apply.

25.5.4.6 Filter

If the **Filter** menu item is chosen, the files on the local system will be filtered according to the criteria specified in the work area. The results from this filter will be displayed in the local **Files:** selection list. This can also be performed by pressing Enter while the cursor is in the local **Filter:** text field.

25.5.4.7 Select All

The **Select All** menu item selects all files within the local **Files:** area. This function is also available by clicking Select All beneath the local **Files:** list. Directories are not selected by this menu item.

Note: You can only have files selected on either the **Local** or **Remote** side. Selecting files on one side will automatically deselect files on the other.

25.5.4.8 Deselect All

The **Deselect All** menu item deselects all files within the local **Files:** area. This function is also available by clicking Deselect All.

25.5.4.9 Filter (Remote)

If the **Filter** menu item is chosen, the files on the remote system will be filtered according to the criteria specified in the work area. The results from this filter will be displayed in the remote **Directories/Files:** selection list. This can also be performed by pressing Enter while the cursor is in the remote **Filter:** text field.

25.5.4.10 Select All (Remote)

The **Select All** menu item selects all files within the remote **Directories/Files:** area. This function is also available by clicking Select All beneath the remote **Directories/Files:** area. Directories are not selected by this item.

Note: You can only have files selected on either the **Local** or **Remote** side. Selecting files on one side will automatically deselect files on the other.

25.5.4.11 Deselect All (Remote)

The **Deselect All** menu item deselects all files within the remote **Directories/Files:** area. This function is also available by clicking Deselect All beneath the remote **Directories/Files:** area.

25.5.4.12 Create Directory...

Selecting the **Create Directory...** menu item invokes a dialog box allowing you to create a new directory (see Figure 25-9, Create Directory dialog box). The dialog box includes a **Current Directory:** area showing you the current directory path. A **New Directory:** input data field is provided that allows you to specify the new directory. If the directory you are creating already exists or you are not authorized to manipulate the remote directory, an error message will be generated.

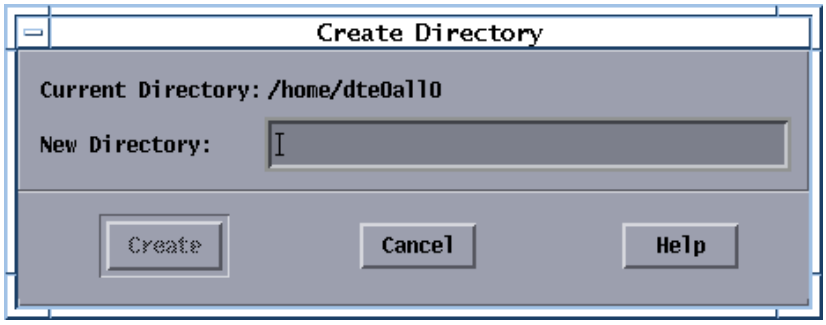


Figure 25-9, Create Directory dialog box.

Clicking Create creates the new directory, displays it in the application main window work area and closes the **Create Directory** dialog box. This is the default pushbutton.

25.5.4.13 Remove Directory...

Selecting the **Remove Directory...** menu item invokes a **Remove Directory** confirmation dialog box. You are asked to confirm the remove operation of the selected directory (see Figure 25-10, Remove Directory (Confirmation Required) dialog box). The ability to remove a directory will depend on the configuration of the system.

Note: This menu item is only available if you have selected a directory from the remote **Directories/Files:** list.

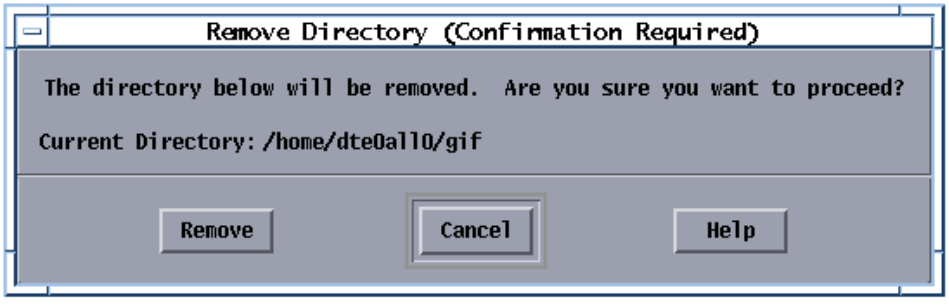


Figure 25-10, Remove Directory (Confirmation Required) dialog box.

Clicking Remove removes the selected directory and returns you to the application main window.

Note: The directory must be empty before it can be removed.

25.5.4.14 Up Directory

The **Up Directory** menu item will move you up one level in the currently selected remote directory. If you are at the top level directory that you are authorized to access, this option will not be available.

25.5.4.15 Down Directory

The **Down Directory** menu item will move you down into the selected remote directory. If you are at the lowest level that you are authorized to access, this option will not be available.

Note: This menu item is only available if you have selected a directory from the remote **Directories/Files:** list.

25.5.4.16 Remove File...

Selecting the **Remove File** menu item invokes a **Remove File** confirmation dialog box. You are asked to confirm the remove operation of the selected file (see Figure 25-11, Remove File (Confirmation Required) dialog box).

Note: One or more file(s) must be selected from the **Directories/Files:** list before this menu item is available.

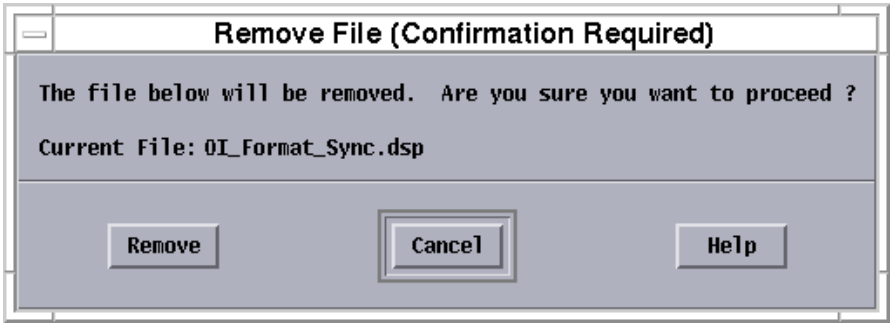


Figure 25-11, Remove File (Confirmation Required) dialog box.

25.5.4.17 Change File Properties...

Selecting the **Change File Properties...** menu item invokes a dialog box that allows you to change the protection (properties) of the selected file.

Note: One and only one file must be selected from the **Directories/Files:** list before this menu item is available.

The dialog box contains the selected file, an **Owner** frame, a **Group** frame, a **World** frame, and a buttons area (see Figure 25-12, Change File Properties dialog box).

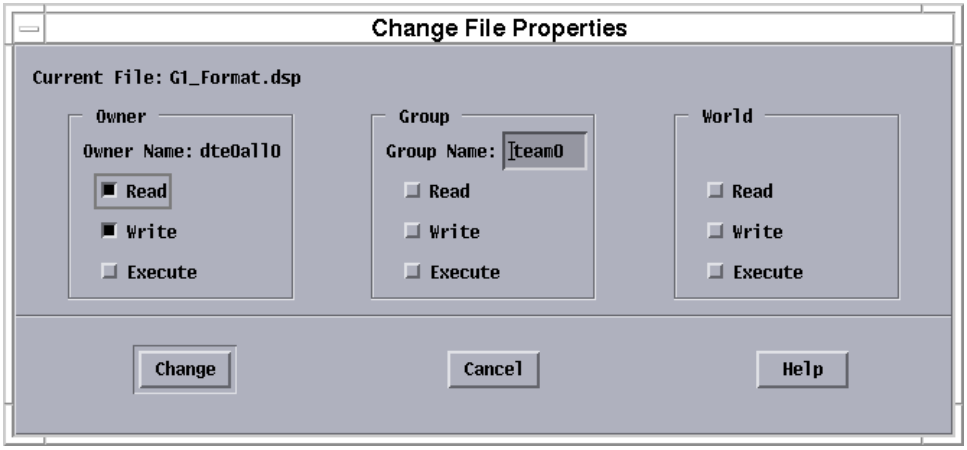


Figure 25-12, Change File Properties dialog box.

Within the **Owner**, **Group**, and **World** frames, you can change the **Read**, **Write,** and **Execute** privileges by toggling the applicable toggle buttons.

- **Owner** - individual that originated the file
- **Group** - a set of individuals requiring the same access to a set of files or performing the same task
- **World** - anyone that has access to the system can access the files

Under each frame, you can assign any combination of privileges. The available privileges are:

- **Read** - a file is set to be only viewed and copied only
- **Write** - a file is set so that individuals can write or save to the file
- **Execute** - a file is set so that individuals can run an executable file

Note: These properties will not be inherited by the transferred file when it is transferred to the local workstation.

The **Group** frame includes a **Group Name:** input text field. You can change the group to which the file belongs by entering the desired group within the field and clicking Change.

25.6 Workstation Monitor Application

The **Workstation Monitor** menu item invokes a COTS product that graphically shows usage of certain types of system resources (see Figure 25-13, Workstation Monitor main window).

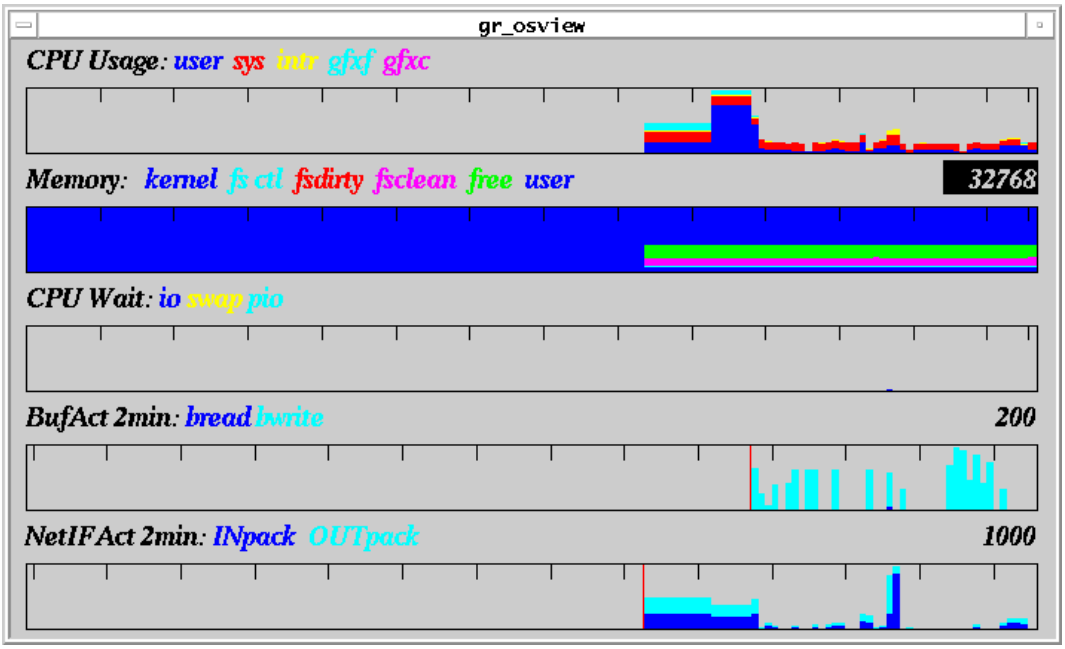


Figure 25-13, Workstation Monitor main window.

This display provides a real-time window into the overall operation of the system. The main display element is a rectangular area which is filled by uniquely colored bands. Each band signifying a sampled variable measuring system performance.

Each bar in a window has a header which consists of the bar title plus the names of each variable displayed, in colors to match those used for each band in the bar.

The bars that are displayed include:

- **CPU Usage**
- **Memory**
- **CPU Wait**
- **BufAct 2min**
- **NetIFAct 2min**

The **CPU Usage:** bar statistically monitors the distribution of the Central Processing Unit (CPU) cycles between user programs, the operating system, interrupt overhead, graphics, and idle time. It includes the following bands:

- **user** - measures your direct use of the cpu
- **sys** -measures the amount of cpu being used by the operating system
- **intr** - measures the interrupt rate in the system
- **gfxf** - use of the cpu to display graphics (graphics input)
- **gfxc** - use of the cpu to display graphics (context switching)

The **Memory:** bar measures real memory usage. It includes the following bands:

- **kernel** - memory allocated to the operating system and drivers
- **fs ctl** - memory used to store file system meta-data, that is, information such as modes, bitmaps, directories and the like that are used to manage file data
- **fsdirty** - memory occupied by modified file system pages which have not yet been written to backing store
- **fsclean** - memory occupied by unmodified file system pages which are currently attached to file system buffer headers
- **free** - memory not currently in use
- **user** - memory currently allocated to running processes

The **CPU Wait:** bar monitors the percentage of time that the system is idle due to waiting for outstanding Input/Output (I/O) requests. It includes the following bands:

- **io** - refers to time spent waiting for traffic related to file system accesses (including local, remote, and mapped files, and normal file read and write)
- **swap** - refers to time spent waiting for paging and swapping operations to and from any swap devices
- **pio** - refers to time spent waiting for physical I/O to complete; for example, direct Direct Memory Access (DMA) to user space

The **BufAct 2min:** bar monitors the I/O activity to block devices. Block devices are usually those which hold file systems, thus the bar measures file system throughput. It includes the following bands:

- **bread** - blocks read
- **bwrite** - blocks written

The values are given in blocks per second, each block being 512 bytes in length. If displayed as a numeric bar, then the logical read and write rates as well as the actual read and write rates, are displayed, as well as the hit ratio of logical to actual reads and writes and the rate at which delayed writes are cancelled (due, for example, to truncation requests).

The **NetIFAct 2min:** bar measures packet throughput for the Internet Protocol (IP). It includes the following bands:

- **INpack** - number of incoming packets
- **OUTpack** - number of outgoing packets

Note: To close this application, you need to use the **Close** option under the window menu.

25.7 DOSH Table Application

The **DOSH Table** menu item invokes a dialog box that contains a history of recommended Project Telemetry Databases (PTDBs) to be used when selecting a database for processing stored telemetry data (see Figure 25-14, DOSH Table dialog box). For example, you may look at the

Database Operational Support History (DOSH) table to determine which database to use for a specific time slice when validating a Near Real-Time (NRT) data request.

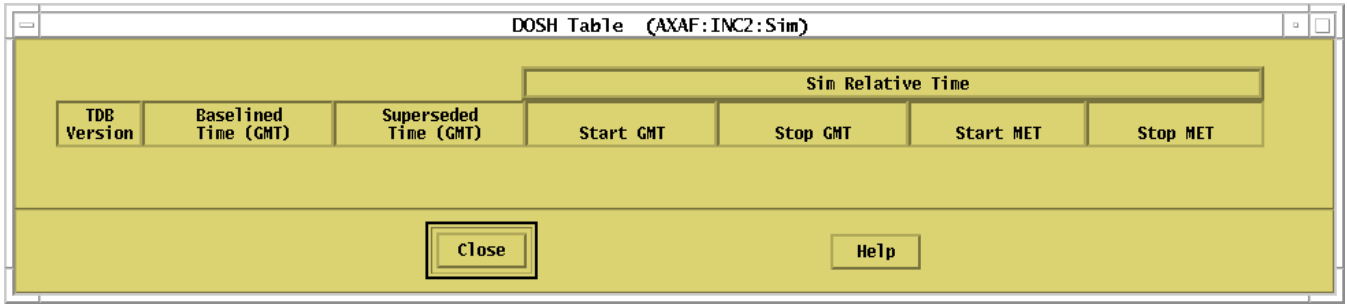


Figure 25-14, DOSH Table dialog box.

The table contains seven columns:

- **TDB Version**
- **Baselined Time (GMT)**
- **Superseded Time (GMT)**
- **Start GMT**
- **Stop GMT**
- **Start MET**
- **Stop MET**

The first three columns (**TDB Version**, **Baselined Time**, **Superseded Time**) can be filled in by the System Monitor and Control (SMAC) application or all values may be entered by a member of the Integrated Support Team (IST).

The last four columns are labeled with *Operational Mode* **Relative Time**, where *Operational Mode* is the operational mode of the Mission Operational Mode and Project (MOP). For example, if the *Operational Mode* is **Sim**, then the column heading would be **Sim Relative Time**. The Relative Times show the GMT and MET time slices which correspond to the Baselined and Superseded times if the time is being simulated and not the actual time.

25.8 Playback Status Application

The **Playback Status** menu item invokes an application that allows you to see current status information about requested playback data available within the HOSC. Playbacks are requested through the NRT Playback Request application available off the **Launchpad** through the **NRT Data Requests** cascade menu.

25.8.1 Work Area

The work area contains a table listing all the currently active, completed, and canceled playbacks. The table contains 14 columns. Some of these columns will not be visible when the application is initiated. You will need to resize the window to display all of the columns (see Figure 25-15, Playback Status main window).

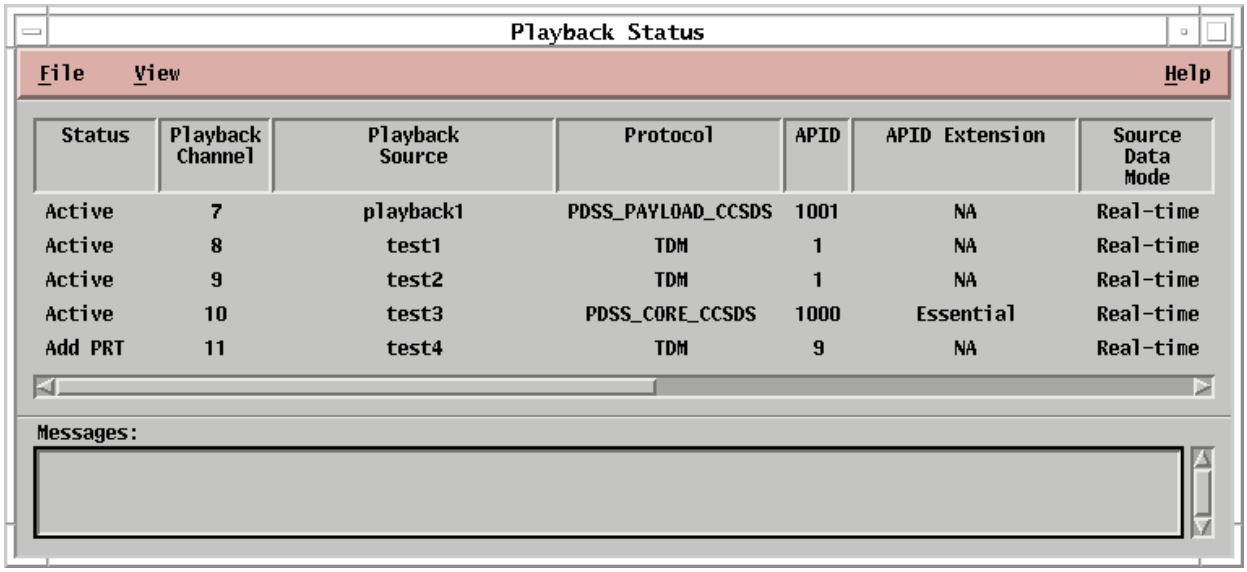


Figure 25-15, Playback Status main window.

The **Status** column contains the current state of the playback. The column will contain:

- **Active** - playback is in progress.
- **Completed** - playback has finished.
- **Canceled** - playback was canceled by the originator.
- **Add PRT** - currently in the process of adding the Packet Routing Table (PRT) to the workstation.
- **RemovePRT** - currently transitioning from an **Active** to a **Completed** or **Canceled** state.

The **Playback Channel** column contains the channel number. The channel numbers can be pre-assigned for channels 1-6 by the IST or the channel can be assigned based on available remaining channels by the software.

The **Playback Source** column identifies where the playback is originating. The valid options are either the requestor's user ID for an internal playback or a data source for an external playback. Internal playbacks are those from the Near Real-Time Data Logger (NDL) online data and are requested by a user with playback privilege using the NRT Playback Request application.

The **Protocol** column identifies the protocol for the data. Protocols available include:

- **PDSS Core**
- PDSS Payload
- PDSS BPDU
- PDSS UDSM
- TDM
- NASCOM
- PSEUDO
- HDRS_DQ
- GSE
- Time

Help: For more detailed information regarding protocols used within the HOSC, see Enhanced HOSC System (EHS) Protocol Requirements (HOSC-SYS-2237).

The **APID** column contains a number ranging from **0 - 2047**. Application Process Identifiers (APIDs) are included in data packet headers. An APID plus a protocol is what uniquely identifies a data source.

Note: You can look at the Telemetry Database (TDB) to identify APID/protocol pairs. You can also see what Measurement/Stimulus Identifiers (MSIDs) are available in each APID.

The **APID Extension** column identifies the APID extension. APID extensions available include:

- **Essential**
- **Housekeeping I**
- **Housekeeping II**
- **CCS to OIU**
- **ZOE Normal**
- **ZOE Extended**

The **Source Data Mode** column contains either:

- **Real-time**
- **Dump 1**
- **Dump 2**
- **Dump 3**
- **External Playback 1**
- **External Playback 2**
- **External Playback 3**
- **External Playback 4**
- **External Playback 5**
- **External Playback 6**
- **Internal Playback**
- **Merge**

Help: For a definition of each of the above data modes, see the "Glossary" included with this document.

The **Time Source** column contains the type of time-tag used to record the data (see Figure 25-16, Playback Status main window continued). The valid options are:

- **HOSC Rec** (HOSC Receipt) - time-tagged with HOSC system time when the data reaches the HOSC
- **Embedded** - time-tagged with a time extracted from within a telemetry stream

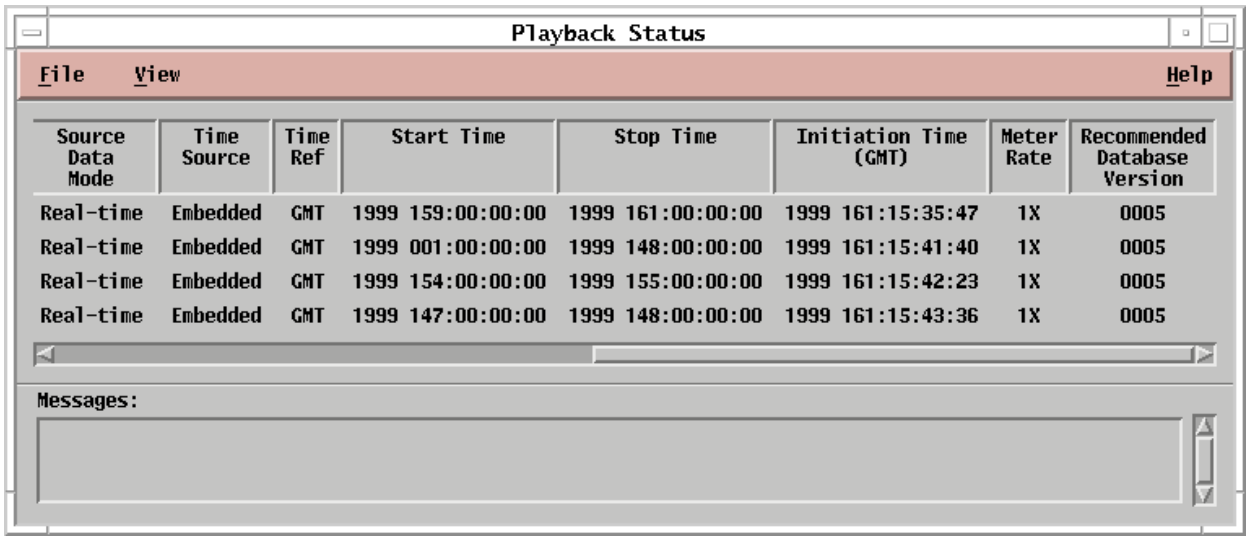


Figure 25-16, Playback Status main window continued.

The **Time Ref** (Reference) column indicates whether **GMT** or **MET** was used to time-tag the data.

Note: The **Set Time Reference...** menu item from the **View** menu will not affect this column and its contents.

The **Start Time** and **Stop Time** columns contain the requested time slice of the playback.

The **Initiation Time (GMT)** column contains the GMT time when the playback was started.

The **Meter Rate** column indicates the speed that the playback will be replayed. Valid entries are **1/4**, **1/2**, **1**, **2**, and **4** times (denoted by "X") the received rate.

The **Suggested Database Version** column indicates the PTDB version that is recommended for processing the data for a playback.

25.9 Bulk Validate Application

The **Bulk Validate** menu item available under the **Utilities** menu off the **Launchpad** menu bar allows you to validate all the UDEs on the local workstation when a CDB or the TDB is Pre-released.

Help: See “Appendix C: UDE Types, Workstation Directory Structure and Available Functions” for information on which UDE types may be validated.

Note: Timeliner files are a “special case” of UDE. Timeliner files fit the definition of a UDE in that they are developed by another EHS application for use during operations, however, Timeliner files are not stored in the UDE database. They are stored in the PIMS database. The distinction being made is that while Timeliner files may be bulk validated they are:

- stored in the PIMS database
- compiled and validated within the PIMS Timeliner Compiler application
- not subject to the information contained in Appendix C

The Bulk Validate application main window contains two distinct features that will be discussed in the following sections (see Figure 25-17, Bulk Validate main window):

- Menu Bar
- Work Area

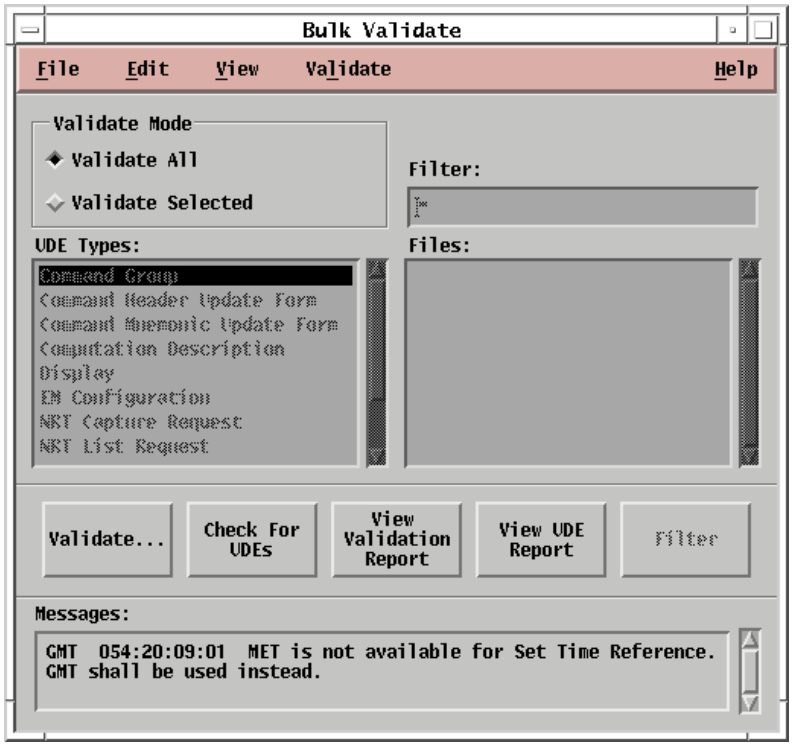


Figure 25-17, Bulk Validate main window.

25.9.1 Menu Bar

The menu bar for each application is color-coded so you can easily identify all the windows and dialog boxes belonging to this application. The menu bar includes five menus: **File**, **View**, **Local**, **Remote**, and **Help**. Certain menu options listed under the main menu headings are Common User Interface screens or are intuitive (label implies function) and will not be discussed. Menu options that will be discussed later in this chapter are:

- **Validate** Menu
  - **Validate...**
  - **Check for UDEs**
  - **View Validation Report**
  - **View UDE Report**

25.9.2 Work Area

The work area contains the **Validate Mode** frame, the **Filter:** input text field and two selection lists, **UDE Types:** and **Files:**.

The **Validate Mode** frame contains two radio buttons: **Validate All** and **Validate Selected**.

Validate All - Validates all UDEs of all UDE types.
Validate Selected - Validates selected UDEs of a selected UDE type.

Note: Validate Selected must be selected before any other area will become active. The elements contained in the other areas are not necessary if you are validating all UDEs.

Tip: To select all of a specific UDE type, choose the **Select All** menu item from the **Edit** menu off the **Bulk Validate** main window when that UDE type is selected in the **UDE Types:** list.

Within the **Filter:** input text field, you can specify a search criteria for **Files:** of the selected **UDE Type:**. The result from the filter will be displayed in the **Files:** selection list.

Within the **UDE Types:** selection list, you can select the type of UDE whose files you want to see.

Help: See "Appendix C: UDE Types, Workstation Directory Structure and Available Functions" for the UDE types which can be validated.

Within the **Files:** selection list, you can select the file(s) you wish to validate.

To select file(s), click on the ones you want. Another click on the file will deselect the file.

25.9.3 Application Essentials

The following sections will discuss the options presented by the Menu bar that are unique to the Bulk Validate application. All of the menu options from the **Validate** menu will be discussed (see Figure 25-18, Validate menu).

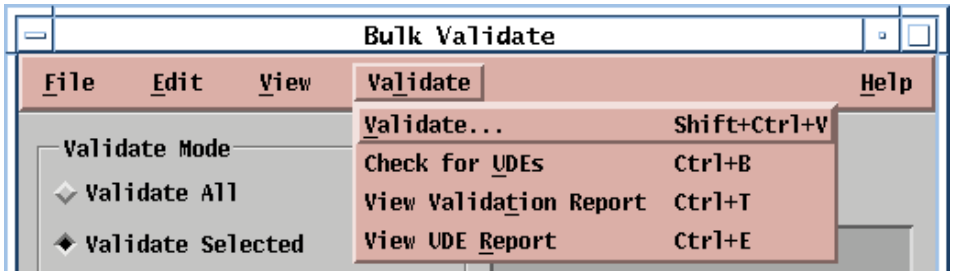


Figure 25-18, Validate menu.

25.9.3.1 Validate...

The **Validate...** menu item invokes the **Validate** dialog box (see Figure 25-19, Validate dialog box). The **Validate** dialog box allows you to select validation criteria and initiate the validation

process. This menu item provides a redundant action to

on the **Bulk Validate** control panel.

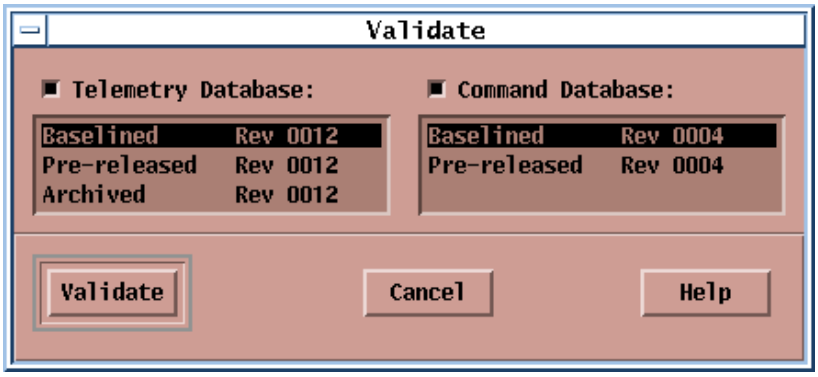


Figure 25-19, Validate dialog box.

The **Validate** dialog box contains **Telemetry Database:** and **Command Database:** toggle buttons and corresponding selection lists.

The **Telemetry Database:** selection list contains the available TDBs that you can validate your UDEs against.

The **Command Database:** selection list contains the available command databases (CDBs) that you can validate your UDEs against.

25.9.3.2 Check for UDEs

The **Check for UDEs** menu item verifies that the UDEs (such as displays, computations, and scripts) referenced within your UDEs exist on your workstation. The results of this check is written to the View UDE Report.

25.9.3.3 View Validation Report

The**View Validation Report** menu item invokes a dialog box that contains the results of the validation process (see Figure 25-20, View Validation Report dialog box). The report will contain any database problems that may have been found with your UDEs.

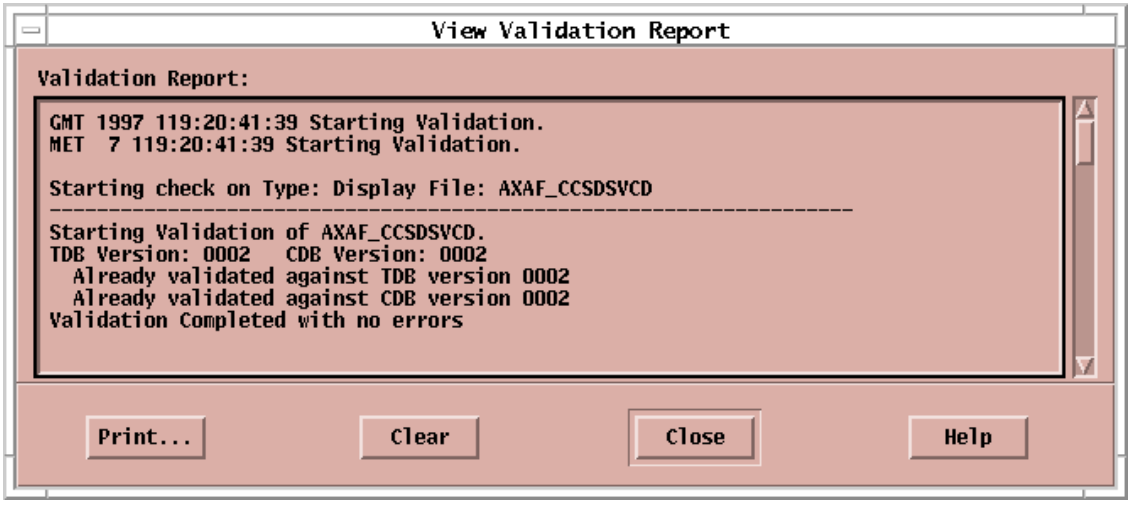


Figure 25-20, View Validation Report dialog box.

The **View Validation Report** dialog box contains a **Validation Report:** text field and a buttons area.

The **Validation Report:** list contains the results of the validation process.

25.9.3.4 View UDE Report

The **View UDE Report** menu item invokes a dialog box that contains the results of the check for UDEs process (see Figure 25-21, View UDE Report dialog box). The report will list for each UDE any referenced UDEs not available on the local workstation.

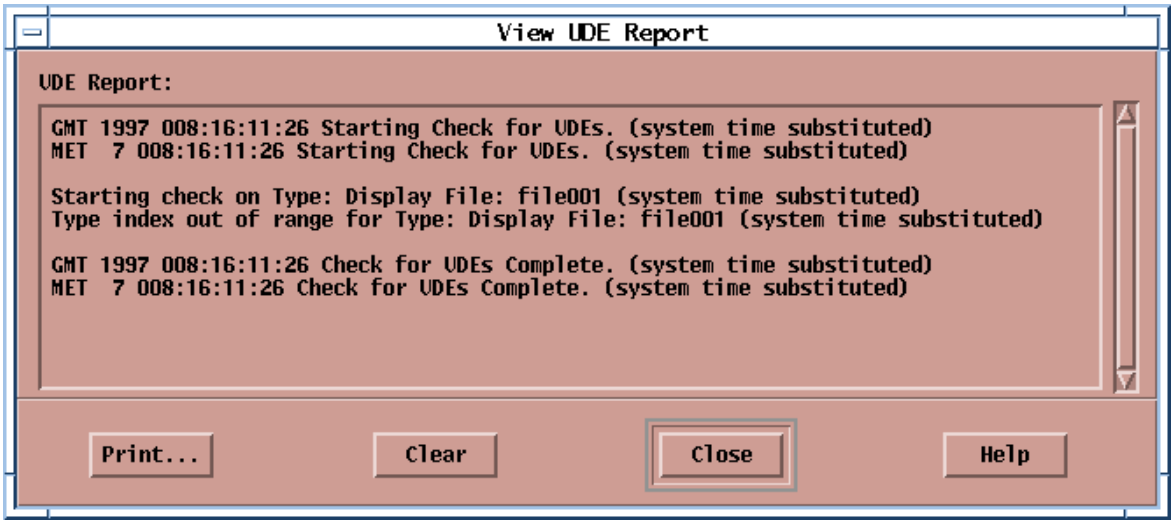


Figure 25-21, View UDE Report dialog box.

The **View UDE Report** dialog box contains a **UDE Report:** list and a buttons area.

The **UDE Report:** list contains the results of the check for UDEs process.

25.10Greewich Mean Time (GMT) Application

The **Greenwich Mean Time (GMT)** menu item invokes an information dialog box displaying the GMT time in the format `ddd:hh:mm:ss`. The time displayed within this dialog box will be configured based on the operational mode you are supporting. For example, if you are supporting a simulation, the time reflected in this dialog box will be the simulated GMT. If you are supporting a flight, the time reflected in the dialog box will be current GMT.

Note: If you are supporting a flight, the time reflected in this dialog box will be the same as the time displayed when the **Actual GMT** menu item is selected.

You can close the **GMT** dialog box by clicking the window menu button and selecting **Close.**

25.11Mission Elapsed Time (MET) Application

The **Mission Elapsed Time (MET)** menu item invokes an information dialog box displaying the MET time in the format `ddd:hh:mm:ss`. The time displayed within this dialog box will be configured based on the operational mode you are supporting. For example, if you are supporting a simulation, the time reflected in this dialog box will be the simulated MET. If you are supporting a flight, the time reflected in the dialog box will be current MET.

Note: If it is prior to launch, a minus sign will also be included in the time.

You can close the **MET** dialog box by clicking the window menu button and selecting **Close.**

25.12Actual GMT Application

The **Actual GMT** menu item invokes an information dialog box displaying the current GMT time in the format `ddd:hh:mm:ss.`

You can close the **Actual GMT** dialog box by clicking the window menu button and selecting **Close.**

25.13Screenlock Application

The **Screen Lock** menu item allows you to lock your screen so that it requires your password to unlock. When this application is selected, the screen will either become blank or transparent, depending on your Screen Setup under Workstation Preferences (see section 23.17, Workstation Preferences Application). When the screen is locked, the mouse pointer will change to a small red mouse shape. You must click the left mouse button to invoke the **Enter Password** dialog box. The

screen will then either re-appear with your applications as you left them (if the password is entered correctly) or return to locked (if the password is entered incorrectly.)

Note: If your screen is inactive for the time specified in your Screen Setup under Workstation Preferences (see section 25.15, Workstation Preferences Application), this Screen Lock application will be activated.

25.14Change Password Application

The **Change Password** menu item allows you to change your password whenever you desire; however, the system is configured so that your password expires and you will be prompted to change your password every 30 days.

Note: Your password can be from 6 - 8 characters and must contain at least one alphabetic and one numeric character. Your password must also not be a dictionary word and may not be a password that has been used in the last six months.

Note: If your password has expired, you will be prompted to change your password when you log in. If you change your password and log out of your current workstation, you will also be prompted to change your password on any other workstation you log into.

Password Restrictions

- The new password must 6 to 8 characters in length. If this is violated, a dialog box indicating that the new password is not within the required range will be displayed.
- The new password must not use information closely associated with the user such as name or user ID. If this is violated, a dialog box indicating this will be displayed.
- The new password must include at least one alphabetic and one numeric character. If this is violated, a dialog box indicating this will be displayed.
- The new password must not be based on a common word or project term. If this is violated, a dialog box indicating this will be displayed.
- The new password must not have been used recently. If the new password has been used within the last six months or ten password changes, a dialog box indicating this will be displayed.

25.15Workstation Preferences Application

The **Workstation Preferences** menu item available under the **Utilities** menu off the **Launchpad** menu bar customize your workstation. The items that you can customize include (see Figure 25-22, Workstation Preferences main window):

- Active window color
- Inactive window color

- Hue
- Mouse orientation - left or right-handed
- Window focus policy - explicit or implicit
- Icon manager
- Screen setup

The work area contains four frames:

- **Color Scheme Setup**
- **Mouse Setup**
- **Icon Box Manager**
- **Screen Setup**

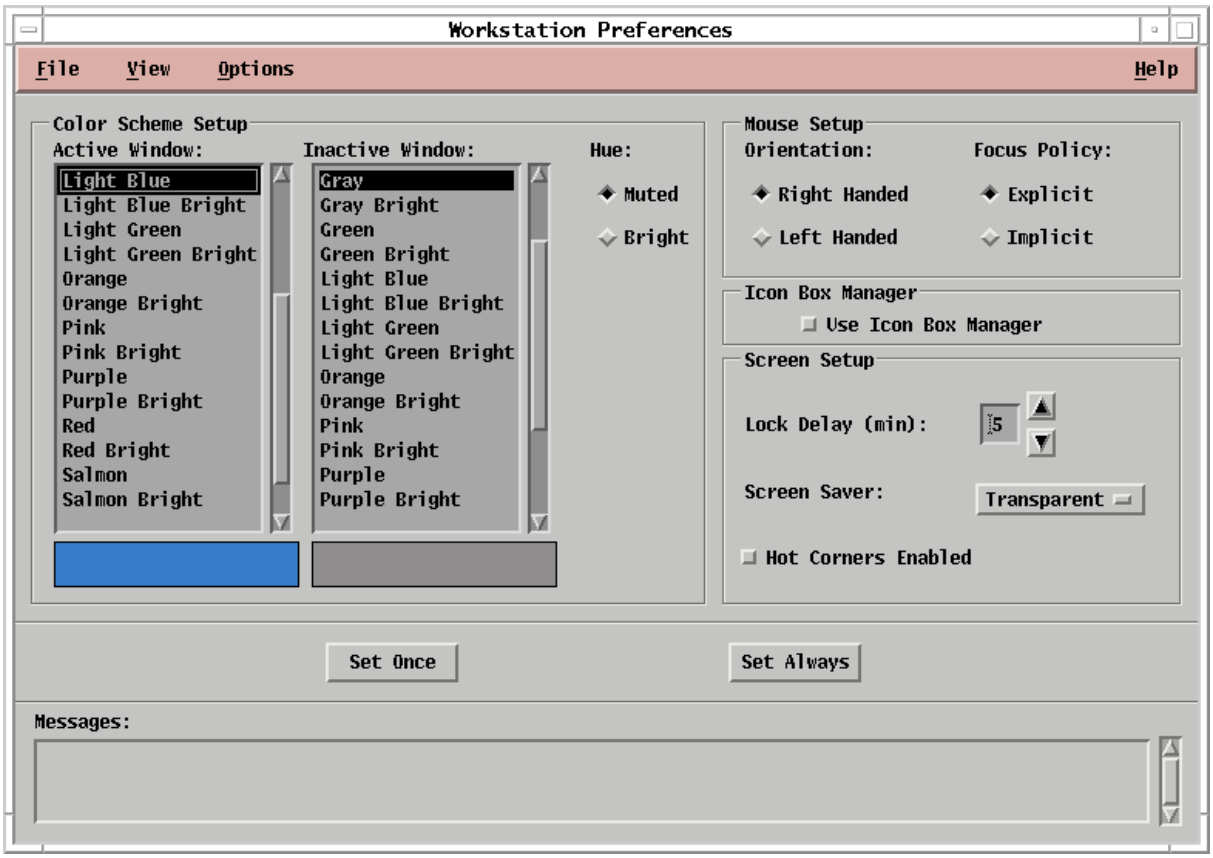


Figure 25-22, Workstation Preferences main window.

The **Color Scheme Setup** frame contains two selection lists, **Active Window:** and **Inactive Window:**, and **Hue:** radio buttons.

The **Hue:** radio buttons determine whether application colors will be **Bright** or **Muted**.

Note: The **Bright** selection is for those individuals who may have difficulty differentiating between colors.

The **Mouse Setup** frame contains two sets of radio buttons, **Orientation:** and **Focus Policy:**. For mouse orientation, you can choose for the mouse to be configured for a left-handed person or right-handed person. The default is right-handed orientation where the select function is on the left mouse button and popup menus are invoked with the right mouse button. If it is configured for a left-handed person, the select function is on the right mouse button and popup menus are invoked with the left mouse button. The middle mouse button is for moving windows and objects.

The **Focus Policy:** default is to use **Explicit** input focus. When the mouse is in **Explicit** mode, you must click with the select button on the window you wish to work with. When the mouse is set up in **Implicit** mode and you move your mouse pointer over a window, it automatically becomes active.

The **Icon Box Manager** frame allows you to select whether you want to use the icon box manager to organize your iconified applications. The frame contains one **Use Icon Box Manager** toggle button. By default, the button is toggled off. This indicates that the icons will be placed on the bottom of the screen. If you select this option, icons will be displayed within an Icons dialog box, which will also be located at the bottom left on the screen.

The **Screen Setup** frame contains three selections, **Lock Delay (min):**, **Screen Saver:** option menu button, and **Hot Corners Enabled** toggle button. The **Lock Delay (min):** allows you to specify the screen lock timeout, i.e., when the screen saver will be activated. The default number of minutes is **15**, but you can change this by either typing in a new value in the **Lock Delay (min):** text field or by clicking or to select a new value. The acceptable range is from 1 to 99 minutes. The **Screen Saver:** option menu button determines whether the screen will become **Transparent** or **Blank**. The **Hot Corners Enabled** toggle button allows you to choose whether the screen saver will be immediately activated when the mouse cursor is moved into any of the four corners on the screen.

Appendix A: Conventions

A.1 Typographical Conventions

Typographical conventions will be used to clarify keyboard actions, mouse actions, and system responses. The typographical conventions to be used throughout this user guide include:

Action	**Convention**
Individual keyboard entry (“Esc” key for example)	Esc
Literal entry (window, titles, menus, etc.)	**Bold text**
Variable keyboard entr	*Italic text*
System messages/responses	`Courier`
Pushbutton	Remove

Using the above conventions to show how you would enter the command “ls” and press the “Esc” key looks like:

ls Esc

To indicate that you are to provide an eight-letter filename of your choice, press the “Ctrl” and “X” keys simultaneously by using either of the following:

filename Ctrl + X

xxxxxxxx Ctrl + X

To indicate that you are to select “Exit” off the “File” menu could be written:

Select the **File** menu and then **Exit**.

To indicate that you are to click on the “Stop” pushbutton on the Operations dialog box and that the system will respond with “Operations have been stopped” could be written:

On the **Operations** dialog box click Stop.

System response:

```
Operations have been stopped.
```

A.2 Key Definitions

From within a window, users may use direction keys (↑, ↓, ←, →) to move from menu item to menu item and Tab from one user interface component to the next.

Enter - may be used to perform the selected or the default mouse action within any window. The default action is usually a pushbutton command and is shown highlighted.

Caps Lock - In order for HOSC application software to correctly interpret events, Caps Lock must be off.

Note: If you are experiencing problems, ensure that the **Caps Lock** light is turned off. The **Caps Lock** light is located on the right-hand side of your keyboard above the numeric keypad. If the **Caps Lock** light is on, press Caps Lock to turn it off.

Ctrl - is used as the first key in many of the common keyboard accelerator combinations. Caution should be taken when pressing this key because a concurrent keystroke may invoke an undesired action. This key may also be used when you want to select multiple items from a list.

Alt - is used as the first key in the keyboard accelerator combinations available off the window menu.

Shift - may be used as one of the keys in a keyboard accelerator combination. This key may also be used when you want to select multiple items.

Num Lock - In order for HOSC application software to correctly interpret events, Num Lock must be off.

Note: If you are experiencing problems, ensure that the **Num Lock** light is turned off. The **Num Lock** light is located on the right-hand side of your keyboard above the numeric keypad. If the **Num Lock** light is on, press Num Lock to turn it off.

A.3 Accelerator Keys

Accelerator or shortcut keys are keyboard combinations that can be pressed to immediately initiate the selected function. Accelerator keys are different from mnemonics in that a menu need not be open for accelerators to work. Accelerator keyboard combinations usually include at least two keys that must be pressed simultaneously. If a menu item has an accelerator, the keyboard combination is written to the right of the menu item. The "+" in the menu's accelerator description means that the two keys listed must be pressed at the same time.

Note: Although accelerators appear as capital letters, Shift is not required to initiate the accelerator unless explicitly stated. For all database applications, accelerators must be initiated in lower-case.

Note: While all menu items have keyboard mnemonics, not all menu items have accelerators. The purpose of accelerators is to permit experienced users to perform various functions more rapidly. Accelerators do not introduce additional capabilities. All functions that can be performed with accelerators can be performed using your mouse to select items off of menus. Likewise, functions that cannot currently be performed using your mouse because they are "grayed out," cannot be performed using accelerators either.

Accelerators are application-specific but some accelerator key combinations have been reserved and may apply across all HOSC applications, while others are application-unique. Those accelerators that are reserved across all HOSC applications include:

Ctrl + A	Select All
Ctrl + C	Copy
Ctrl + D	Delete
Ctrl + L	Uplink
Shift + Ctrl + M	Clear Messages
Ctrl + N	New
Ctrl + O	Open
Ctrl + P	Print
Ctrl + Q	Exit
Ctrl + S	Save
Ctrl + V	Paste
Shift + Ctrl + V	Validate
Ctrl + X	Cut
Ctrl + Z	Undo

In no instance is an accelerator used to create an object in one application, and used to destroy an object in another application.

A.4 Mouse Basics

The following section addresses how to use the mouse as an input device and more specifically, with the functioning of a three-button mouse. The following terminology is used throughout this user guide.

Click
To press and release one of the three mouse buttons.

Note: Throughout the HOSC application user guide, “click” by itself implies a left mouse button action. A click of a mouse button other than the left button will be plainly defined as a middle mouse button click or a right mouse button click.

Double-Click
To rapidly press and release the same mouse button twice.

Drag
To press and hold down a mouse button while moving the pointer to another location on the screen.

As the result of user suggestions, most mouse functions have been assigned to the left mouse button. In general, the left mouse button is used to select items. The middle mouse button is used for move functions, and the right mouse button is used to invoke popup menus containing the more frequently used functions.

Note: If you wish to have a left-handed mouse, you can reconfigure your mouse using the **Workstation Preferences** menu item under the **Utilities** menu from the **Launchpad**.

As you move the mouse on your desk, the mouse pointer on the computer’s screen should move similarly. Depending on the location of the pointer and the functions the system expects you to perform, the mouse pointer will change shape. The mouse pointer shape reflects its operational mode (text, selection, resize, etc.).

When the mouse pointer is over the standard screen backdrop on which all windows appear (also known as the “desktop”), the pointer is x-shaped. When you move the pointer over a window it changes to the arrow shape. The changing shape of the pointer provides a visual cue as to the mode in which the mouse is operating and the activity that the computer is expecting to be performed.

	indicates that the mouse is positioned in a text field and the system is expecting you to either enter text, or to drag and select additional text to edit.
	indicates that the system is expecting you to select an object or a user interface element.
	indicates that the mouse is positioned over the desktop and the system is expecting you to identify the window you want to work with.
	indicates that the system is processing data and is unavailable for additional input at this time.
	indicates that the system is expecting you to move the selected element or object.
	indicates that the mouse is positioned over a window border and the system is expecting you to resize the window to the right. An arrow facing the opposite direction indicates that you want to resize the window to the left.
	indicates that the mouse is positioned over a window border and the system is expecting you to resize the window up. An arrow facing the opposite direction indicates that you want to resize the window down.
	indicates that the mouse is positioned over a window border and the system is expecting you to resize the window up and to the right. Similar pointers are used to indicate that you want to resize the window up and to the left, down and to the right, and down and to the left.
	indicates that you are trying to move the mouse from a secondary system modal window. A system modal window forces you to interact with the current window before you're permitted to exit and interact with another window.

Appendix B:
Remote Access to EHS Services

Remote users can access EHS services through X-Windows and/or Internet web interfaces. X-Windows provides remote users with access to all EHS applications, but is of particular significance because of the commanding and file transfer capabilities it provides. Internet web interfaces allow remote users to initiate the routing of pre-defined Ground Support Equipment (GSE) packets, to access Telemetry Database (TDB) and Database Change Request (DCR) forms and database reports, to request the downlink of files from the onboard Payload Multiplexer/ Demultiplexer (MDM), and to access the suite of Payload Information Management System (PIMS) applications and their products. The following sections of this appendix address X-window and Internet access to EHS services.

B.1 X-Window Access Requirements

The next two sections identify what you need and how to access an Enhanced Huntsville Operations Support Center (HOSC) System (EHS) Launchpad via X-Windows from a remote user machine outside the EHS firewall. The EHS Launchpad is a graphical user interface application that provides access to EHS services. Users who X-Window into an EHS platform can initiate all EHS applications just as if they were located within the Payload Operations Integration Center (POIC), however telemetry display capabilities are limited because of anticipated display update rates. Remote users wishing to display telemetry on their local machine should either use the Telemetry Resource Kit (TReK) software or develop their own telemetry display software tools.

To X-Window into an EHS system, you must take the following steps:

1. Acquire and use a machine that meets the minimum system requirements as specified below.

Table B-1, Personal Computer

Operating System	Windows NT
CPU	300MHz Pentium II Processor or better
Storage Capacity	3.0 GB disk space or better
Memory	128 MB RAM or better
Display Requirements	1280 x 1024 pixels resolution
Color	8-bit graphics
Mouse	Required, 3-button mouse recommended
Fonts	TBD

Table B-2, Silicon Graphics Workstation

Operating System	IRIX 6.5
CPU	150 MHz
Storage Capacity	5.0 GB disk space or better
Memory	128 MB RAM or better
Display Requirements	1280 x 1024 pixels resolution
Color	8-bit graphics
Mouse	Required
Fonts	TBD

2. Ensure you have network connectivity and a static TCP/IP address.

To X-Window into an EHS platform, both X-Window server and secure shell software must be running on your system. The commercial PC software products recommended must run under Microsoft Windows NT Workstation 4.0. The X-Window software is Exceed for Win32 by Hummingbird Communications Ltd., version 6.1.1 and the secure shell software is F-Secure SSH for Windows, version 1.1 build 22.

For remote users with a Silicon Graphics workstation you will need the X-Windows client that comes bundled with the IRIX operating system and the SSH client application for Unix available from http://www.cs.hut.fi/.

Once you have procured the required software, setup procedures may be obtained by accessing the POIC website at:

https://aristotle.hosc.msfc.nasa.gov

3. To X-Window into an EHS platform, remote users must have an EHS account which includes an account on the EHS firewall. Remote users will be required to specify their static IP address on the Account Request Form. Account Request Forms are sent automatically to Lead Payload Developers as identified in the Payload Data Library's Ground Data Services Data Set. Accounts are established once request forms have been approved by the HOSC Security Officer.

B.2 X-Window Access Procedures

To login to an EHS platform using a personal computer (PC):

1. Start Hummingbird Exceed on your PC.

2. Start F-Secure SSH on your PC. When the **Connect Using Password Authentication** dialog box is invoked, enter **fw.hosc.msfc.nasa.gov** in the **Host Name** text field.

3. Click on the **Properties ...** button and then from the **Properties** dialog box, click on the **Connection** tab. Within the **Options** frame on the **Connection** tab, ensure that both **Compression** and **Forward X11** are checked. Return to the **Password Authentication** dialog box and enter your password. Click **OK**.

4. The Connect Using Password Authentication dialog box is dismissed. The bottom of the F-Secure SSH should reflect that you are logged onto the EHS firewall. From the F-Secure SSH main window **Destination>** prompt, telnet to the EHS platform to which you are assigned.

`Destination>` **telnet <***EHS platform***>**

5. Log into the target EHS system.

`Login:` *<your login name>*

`Password:` *<your password>*

6. If the target EHS system is configured for multiple MOPs (i.e., Mission, Operational Mode, and Project), you will be prompted to choose the MOP under which you want to run. Enter the number or title corresponding to the MOP of your choice from the menu of possible MOP selections. If there is only one MOP available for your mission, you will not be given a choice but will be automatically logged into that MOP.

```
Available MOPs into which to login
1  <MOP 1 Title>
2  <MOP 2 Title>

Enter the MOP (either number or text) into which to login.:
```

<MOP number desired>

After choosing a MOP (or having one automatically chosen if there was only one available), you will be notified of your MOP and receive an ERIS Shell prompt.:

User `'<your login name>'` will be working in MOP `'<your MOP>'`.
`eris_shell>`

7. At the ERIS Shell prompt, enter the "**launchpad**" command:

`eris_shell>` **launchpad**

You will be presented the standard EHS Launchpad. From this point, all EHS software applications should function the same as they would if you were sitting at an EHS platform.

Note: X-windows traffic consumes significant bandwidth. As a result, EHS applications may respond more slowly. Applications that update every second (like Display Operations) should not be used via X-windows. Poor response has also been noted on EHS applications that include a scrollable table widget.

B.3 Procedure for Logging Out of an X-Window Session

1. From the EHS **Launchpad**, press the **Logoff** menu item from the **File** menu.

2. From the ERIS Shell prompt, enter the **exit** command as shown in this example:

`eris_shell>` **exit**

When you disconnect from the EHS system, the firewall connection will also be dropped.

B.4 Web Launchpad Access Requirements

EHS web applications are available to users through the EHS web launchpad (see Figure B-1 , Web access.) In order to access the web launchpad, users must have an appropriate EHS account, user ID, and password. Remote users wishing to access the web launchpad and its applications through their browser must:

1. Acquire and use a machine that meets the minimum system requirements as specified below.

Table B-3, Personal Computer

Operating System	Windows NT
CPU	300 MHz Pentium II Processor or better
Storage Capacity	3.0 GB disk space or better
Memory	128 MB RAM or better
Display Requirements	1280 x 1024 pixels resolution
Color	8-bit graphics
Mouse	Required, 3-button mouse recommended
Fonts	MS Sans Serif, Bold, 12 point

Table B-4, Silicon Graphics Workstation

Operating System	IRIX 6.5 as a minimum
CPU	180 MHz
Storage Capacity	5.0 GB disk space or better
Memory	128 MB RAM or better
Display Requirements	1280 x 1024 pixels resolution
Color	8-bit graphics
Mouse	Required
Fonts	Lucidatypewriter, Bold, 12 point, Roman slant, Mono-spaced

2. To access the web launchpad and POIC software, it is recommended that remote users install and use Netscape Communicator 4.6.1.

3. Ensure you have network connectivity and a static TCP/IP address.

4. To access the web launchpad, remote users must have an EHS account and must specify their static IP address on an Account Request Form. Account Request Forms are sent automatically to Lead Payload Developers as identified in the Payload Data Library's Ground Data Services Data Set. Accounts are established once request forms have been approved by the HOSC Security Officer.

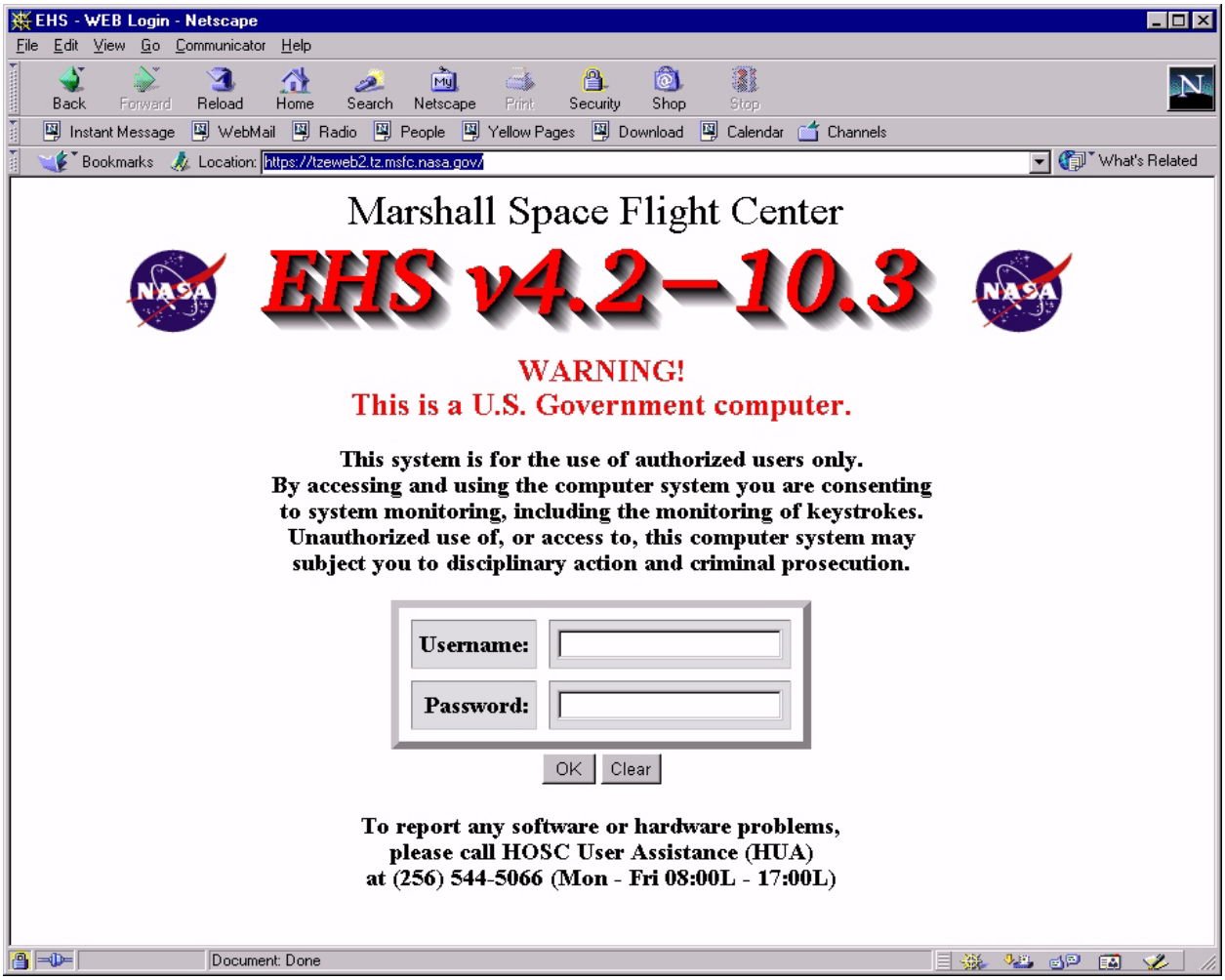


Figure B-1, Web access.

In order for the web launchpad to operate correctly, you must grant permission for Netscape application to install certificates and cookies on your platform. This permission is granted through the **Java Security** dialog box (see Figure B-2 , Java Security dialog box.).

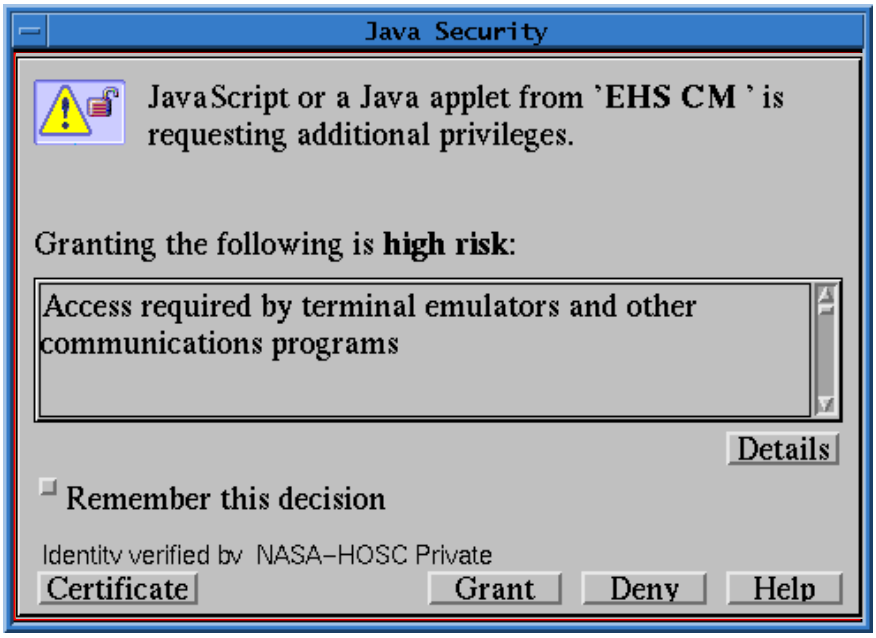


Figure B-2, Java Security dialog box.

The number of certificates installed depends on the applications and privileges to which you are entitled. To grant privileges, you must click on Grant

The HOSC Web Launchpad will be invoked once you've granted the required privileges.

Appendix C: UDE Types, Workstation Directory Structure and Available Functions

The following tables identify the User-generated Data Element (UDE) Types as they appear on the user interface (UI) and as they are passed between applications. UDEs that you create and save are stored under the **/ehs/usr/*mission_ID*/*user_name*** directory. The Storage Directory column identifies the storage directory for the corresponding UDE type. Table C-1 lists the UDE types may be stored to and retrieved from the UDE Databases.

Table C-1, UDEs that can be stored to the UDE Database.

UDE Type	Storage Directory
CCSDS Packet Data Generator	pdg
Command Group	cdg
Command GSE File	gse
Command Header Update Form	chu
Command Mnemonic Update Form	cmu
Computation Description	cdd
Computation Executable	cmp
Computation Include	cmh
Computation MSID Input	cmi
Computation MSID Output	cmo
Computation Source	cms
Computation Subroutine	csr
Display	dsp
EM Configuration	emc
HOSC Packet Data Generator	hdg
Local Table Change File	ltc
Message Handler Filter	mhf
Mission Profile	(hidden)

UDE Type	Storage Directory
Mission Profile ID	(hidden)
MSID Data Generation Editor	mdg
NRT Capture Request	ncr
NRT List Request	nlr
NRT Playback Request	npr
NRT Snapshot Request	nsr
NRT Usage Request	nur
Pixmap	xpm
Screendump	dmp
Script Source	ssc
Serial Data Generator	sdg
Spreadsheet	spr
Standard Output	sto
Validated Script	vsc
Word Processor	doc

Table C-2 identifies UDE file types that are not displayed in the Store UDE application:

Table C-2, UDE file types that are not displayed in the Store UDE application.

File Type	Storage Directory
Command History	ch
Command Report	doc
Computation Operation Output	doc
Display Report	doc
NRT Capture Output	nco
Printer Output Files	pof
TDM Generator Database File	tcd

Table C-3 identifies those functions that may be performed on each of the various UDE types. The table column headings are defined as follows:

C - The UDE may be copied using the File Manager application

D - The UDE may be deleted using the File Manager application

E - The UDE file extension is shown in the File Manager application

SS -A String Search may be performed on the UDE using the File Manager application

I - The UDE may be imported from outside the EHS system using the Import/Export File application

P - The UDE may be printed using the File Manager application

R - The UDE may be renamed using the File Manager application

SR - The UDE may be stored and retrieved from the UDE database using the Store UDE and Retrieve UDE applications

X - The UDE may be exported outside the EHS system using the Import/Export File application

V - The UDE may be validated

Within Table C-3 an "X" is placed in an individual cell to indicate that the specified characteristic or function applies

Table C-3, UDE types and the applications in which they are used.

UDE Types	C	D	E	SS	I	P	R	SR	X	V
CCSDS Data Packet Generator	X	X		X	X		X	X	X	
Command Group	X	X		X	X	X	X	X	X	X
Command GSE File	X	X		X	X	X	X	X	X	
Command Header Update Form		X		X				X	X	X
Command History		X		X		X			X	
Command Report	X	X		X	X	X	X		X	
Command Mnemonic Update Form		X		X				X	X	X
Computation Description		X		X		X		X	X	
Computation Executable		X						X		X
Computation Include	X	X		X	X	X	X	X	X	
Computation MSID Input	X	X		X	X	X	X	X	X	X

UDE Types	C	D	E	SS	I	P	R	SR	X	V
Computation MSID Output	X	X		X	X	X	X	X	X	X
Computation Operation Output	X	X		X	X	X	X		X	
Computation Source	X	X		X	X	X	X	X	X	X
Computation Subroutine	X	X		X	X	X	X	X	X	
Display	X	X		X	X		X	X	X	X
Display Report	X	X			X		X		X	
EM Configuration	X	X		X		X	X	X	X	X
HOSC Packet Data Generator	X	X		X	X		X	X	X	
Local Table Change File	X	X					X	X		
Message Handler Filter	X	X			X		X	X	X	
Mission Profile (hidden file)			X							
Mission Profile ID (hidden file)			X							
MSID Data Generation Editor	X	X		X	X		X	X	X	
NRT Capture Output	X	X			X		X		X	
NRT Capture Request	X	X		X	X	X	X	X	X	X
NRT List Request	X	X		X	X	X	X	X	X	X
NRT Playback Request	X	X		X	X	X	X	X	X	X
NRT Snapshot Request	X	X		X	X	X	X	X	X	X
NRT Usage Request	X	X		X	X	X	X	X	X	
Pixmap	X	X	X	X	X	X	X	X	X	
Printer Output Files	X	X		X	X	X	X		X	
Screendump	X	X		X	X	X	X	X	X	
Script Source	X	X		X	X	X	X	X	X	X
Serial Data Generator	X	X		X	X		X	X	X	
Spreadsheet	X	X	X	X	X	X	X	X	X	
Standard Output	X	X		X	X	X	X	X	X	
TDM Generator Database File	X	X		X			X			
Validated Script		X		X		X		X	X	
Word Processor	X	X	X		X		X	X	X	

Appendix D: Message Types and Examples

This appendix contains a table of the valid Message Handler message types. This table also provides a description and an example for each message type

Message Category	Description	Examples
Information	Message indicating function has been performed based on action or request or a message indicating status from an application.	`Display: Heat Pump has been opened`
Warning	Message indicating something went wrong performing function, but can still proceed.	`Proceeding with Archived Database Rev 3 not recommended for Data Mode: Playback 12.`
Error	Message indicating something went wrong performing function and cannot continue.	`Error forking process.`
Advisory	Messages that are from the system and not from the user's processes.	`MJOPS001 is being shut down in five minutes, please signoff.`
EM	Messages caused by events exception monitored from the user EM. These are not messages caused by events in the EM application code or UI.	`MSID: xyzmmm145 is out expected state: ON`
Project EM	Messages caused by events exception monitored from Project EM. These are not messages caused by events in the EM application code or UI.	`MSID: xyzmmm145 exceeded low caution limit of 14`
Security	Messages pertaining to security-type functions.	`Maximum number of login attempts exceeded.`

Appendix E:
Message Code Index

Codes	Application Type
1-9999	Common Messages
10000-19999	Command Central Process
20000-29999	Command Database Messages
30000-39999	Computation Messages
40000-49999	Change Request Configuration Manager
50000-59999	Common User Interface Messages
60000-69999	Documentation Configuration Management Messages
70000-79999	Database Change Request Messages
80000-89999	Database Monitor and Control Messages
90000-99999	Display Messages
100000-109999	Data Process Request Configuration Management
110000-119999	Exception Monitoring Messages
120000-129999	Front-End Processor Messages
130000-139999	General Purpose Utilities Messages
140000-149999	Ground Support Equipment Messages
150000-159999	Local Table Messages
160000-169999	Message Handler Application Messages
170000-179999	NRT Data Logger Messages
180000-189999	Near Real-Time Messages
210000-219999	PIMS Configuration Management Messages
230000-239999	Scripting Language Processor Messages
This column identifies message code numbers that have been allocated.	This column is provided for information purposes only and describes the application(s) associated with each code.

Codes	Application Type
240000-249999	System Services Monitoring and Control Messages
250000-259999	System Services Core Services Messages
260000-269999	System Services Process Manager Messages
270000-279999	System Services Security Messages
280000-289999	System Services User Profile Messages
290000-299999	Telemetry Database Messages
300000-309999	Telemetry Network Services Messages
310000-319999	User-Generated Data Element Messages
320000-329999	Workstation Command Processor Messages
330000-339999	EHS Data Generation Messages
340000-349999	Playback Configuration Messages
350000-359999	Payload Data System Services Messages
360000-369999	Custom Data Packet Messages
370000-379999	Operations Control Mission Software Messages
This column identifies message code numbers that have been allocated.	This column is provided for information purposes only and describes the application(s) associated with each code.

Appendix F:
Status Characters and Their Definitions

Status Character	Definition
a	CDD Process Not Responding
A	DP Process Not Responding
B	Common Configuration Error
c	Decom/Conv/Cal Status-Calibration Error
C	Decom/Conv/Cal Status-Conversion Error
d	Limits Not Defined in the Local Table
D	Decom/Conv/Cal Status-Decom Error
E	LES Status-Out of Expected State
f	Data Quality-DQ Failed (No data returned-old data is used)
F	Data Quality-DQ Failed with/Override (New data is used-bad data)
G	Packet Routing Table Configuration Error
H	LES Status-Warning High
K	Major Frame Parent Frame Error
L	LES Status-Warning low
M	Invalid Format for Data Type
N	Source Status-Loss of Signal (No data returned-old data used)
P	Telemetry Processing Discrepancies
Q	Major Frame Format ID Error
R	Source Status-Source Initialized/Unavailable
S	Data Condition-Old/Stale Data
T	Telemetry Database Discrepancies
U	Unrecognized/Invalid MSID

Status Character	Definition
W	Memory Error
x	Data Quality-Data is Suspect (No data returned-old data is used)
Y	MSID Not Initialized For Decom
Z	Unrecognized Status from TNS_Initialize_Decom
v	LES Status-Caution Low
~	Data Quality-No Data (No data returned-old data used)
$	Invalid Status Received from EML
#	Data Format Field Overflow
^	LES Status-Caution High
?	Data Quality-DQ Suspect w/Override (New data is used-suspect data)
‘’ (space)	Source Status-Acquisition of Signal (Parameter is okay-new data is returned)

Appendix G:
MSID LES Colors

OBJECT	LIMIT RANGE COLORS			NOTES
	Nominal	Caution	Warning	
Line	User defined color other than yellow or red	Yellow	Red	The line changes colors based on the value of the MSID.
Primitive Graphic (square, circle, etc.)	User defined border color other than yellow or red User defined fill color	Yellow border color User defined fill color	Red border color User defined fill color	The graphic's border colors and fill colors change based on the value of the MSID.
Text/ MSID Text	User defined color for the text other than yellow or red	Yellow	Red	The text changes color based on the value of the MSID.
Plots/ Chart	User defined color other than yellow or red	Yellow	Red	The lines, points, bars, or pieces of the plot/chart change colors based on the value of the MSID. Line styles or fill patterns are used to differentiate between MSIDs.
Pixmap	User defined pixmap with any colors No border	User defined pixmap with any colors Yellow border	User defined pixmap with any colors Red border	The pixmap changes based on the value of the MSID.
Output Slider	User defined color other than yellow or red	Yellow	Red	The slider value and handle change color based on the value of the MSID.

OBJECT	LIMIT RANGE COLORS			NOTES
	Nominal	Caution	Warning	
Radial Meter (180 & 360)	User defined color other than yellow or red	Yellow	Red	The needle changes color based on the value of the MSID.

OBJECT	EXPECTED STATE COLORS		NOTES
	in State	Out of State	
Line	User defined color other than yellow or red	Red	The line changes colors based on the state code of the MSID.
Primitive Graphic (square, circle, etc.)	User defined border color other than yellow or red User defined fill color for the state code	Red border User defined fill color	Border colors and fill colors change based on the state code of the MSID. The user can assign up to 32 different colors for the fill colors to an MSID and any color can be chosen.
Text/MSID Text	User defined color for the text other than yellow or red	Red text	The text changes color based on the state code of the MSID. The user can assign up to 32 different colors to an MSID.
Pixmap	User defined pixmap with any colors No border	User defined pixmap with any colors Red border	The pixmap changes based on the state code of the MSID. The user can assign up to 32 different pixmaps to an MSID.
Togglebutton	No border	Red border	The object border turns red when out of state.
Radiobox	No border	Red border	The object border turns red when out of state.

Appendix H:
Invalid MSID Indicators

Object	Invalid MSID Indicator
Line	Reserved pattern
Primitive Graphic (square, circle, polygon, etc.)	Reserved pattern
Text	Reserved pattern
MSID Text Object	Value field filled with asterisks followed by the invalid MSID data status character.
Plot/Chart	Value not plotted
Pixmaps	Reserved pattern
Radial Meter (180 & 360)	Needle not shown. Value filled with asterisks.
Togglebutton/Radiobox	Buttons unset. Labels filled with asterisks.
Output Slider	Value defaults to minimum value. Label filled with asterisks.
Input Slider	When the user attempts to operate the object, a message notifies the user that the associated MSID is invalid.
Input Data Field	When the user attempts to operate the object, a message notifies the user that the associated MSID is invalid.
Pushbutton	When the user attempts to operate the object, a message notifies the user that the associated MSID is invalid.

802

Appendix I:
Project LES Configurations

Object	LES Sensing On/Off and Limits not Defined Indicator
Line	Reserved color used for line only when the line is used to represent limit or state violations. If the line is used to represent state codes then LES sensing is not applicable and therefore no indicator is used.
Primitive Graphic (circle, square, polygon, etc.)	Reserved color is used for border.
Text	Reserved color used for text only when the text is used to represent limits or state violations.
MSID Text Object	Reserved color used for text
Plot/Chart	Reserved color used for individual line/pie pieces/ bars in the plot/chart.
Pixmaps	Reserved color used for border.
Radial Meter (180/360)	Reserved color used for needle color.
Togglebutton/Radiobox	Reserved color used for border.
Output Slider	Reserved color used for slider value and handle.

804

Appendix J:
Display Data Type Conversion Matrix

The table on the following page provides you with a display data type conversion matrix.

Table J-1. Display Data Type Conversion Table

Native Data Type	Valid Unprocessed Display Representation								Converted Data Type	Valid Converted Display Representation								Calibrated Data Type	Valid Calibrated Display Representation							
	char	bin	dci	dcr	dcs	hex	oct	tim		char	bin	dci	dcr	dcs	hex	oct	tim		char	bin	dci	dcr	dcs	hex	oct	tim
SASC - ASCII Character String		x				d	x		Null Terminated ASCII String	d																
SASCB - ASCII Character String		x				d	x		Null Terminated ASCII String	d																
SEBC - EBCDIC Character String		x				d	x		Null Terminated ASCII String	d																
SUND - Undefined Byte String		x				d	x																			
IDIS - Discrete Integer		x				d	x		Unsigned Integer			d	x	x				Null Terminated ASCII String	d							
IMAG - Signed Magnitude Integer		x				d	x		Two's Comp Integer			d	x	x				IEEE Floating Point			x	x	d			
IUND - Undefined Integer		x				d	x																			
IUNS - Unsigned Integer		x				d	x		Unsigned Integer			d	x	x				IEEE Floating Point			x	x	d			
ITWO - Two's Complement Integer		x				d	x		Two's Comp Integer			d	x	x				IEEE Floating Point			x	x	d			
ITWOW - Two's Complement Word Swapped		x				d	x		Two's Comp Integer			d	x	x				IEEE Floating Point			x	x	d			
FEEE - IEEE Floating Point		x				d	x		IEEE Floating Point			x	x	d				IEEE Floating Point			x	x	d			
FIBM - IBM Floating Point		x				d	x		IEEE Floating Point			x	x	d				IEEE Floating Point			x	x	d			
FNTL - Intel Floating Point		x				d	x		IEEE Floating Point			x	x	d				IEEE Floating Point			x	x	d			
FSPL - Spacelab Floating Point		x				d	x		IEEE Floating Point			x	x	d				IEEE Floating Point			x	x	d			
FVAX - VAX Floating Point		x				d	x		IEEE Floating Point			x	x	d				IEEE Floating Point			x	x	d			
TDMS - SSP Data Mgmt System Time		x				d	x		EHS Time Structure								d									
TECI - ECIO GMT		x				d	x		EHS Time Structure								d									
TECS - ECOS Binary GMT		x				d	x		EHS Time Structure								d									
TEHS - EHS Time Word		x				d	x		EHS Time Structure								d									
TGMT - GMT		x				d	x		EHS Time Structure								d									
TGPC - Orbiter GPC GMT		x				d	x		EHS Time Structure								d									
TIUS - IUS Floating Point Time		x				d	x		EHS Time Structure								d									
TOOI - Orbiter OI GMT and MET		x				d	x		EHS Time Structure								d									
TTSM - Time Since Midnight		x				d	x		EHS Time Structure								d									
TTWO - Count Time		x				d	x		EHS Time Structure								d									

char - Character/String
bin - Binary/Integer
dci - Decimal/Integer
dcr - Decimal/Real
dcs - Decimal/Scientific Notation
hex - Hexadecimal/Integer
oct - Octal/Integer
tim - Time/String
x - valid display representation
d - default display representation

Appendix K: Computation Legal & Illegal Functions

K.1 Legal Functions

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Get_Next_Value - user computation function to extract value(s) for the given MSID.

SYNOPSIS

int CPS_Get_Next_Value
(variable_name)
 (
variable_name - must be declared and associated with MSID in the Input MSID List.
  );

DESCRIPTION

User Computation Library Function:
The CPS_Get_Next_Value library will extract the samples of the
 requested MSID from the oldest available packet of the best available source which has not already had the MSID extracted by this computation. This function is best utilized when the computation desires to process every value for the set of MSIDs.
The CPS_Get_Next_Value library function accepts a variable name that must have a corresponding MSID association contained within the Input MSID List for the computation.

RETURN VALUE

 Upon successful completion CPS_Get_Next_Value function returns an integer status with specific bits of
 the status word indicating the data condition, source status, data quality of the MSID source, and an overall
 sample status. The values of the status elements are defined as follows:
 Data Condition (bit 30)
 0 - Indicates new data
 1 - Indicates old data
 Source Status (bits 29-28)
 0 - Indicates source is AOS
 1 - Indicates source is LOS
 2 - Indicates a new source has been initialized.
 Data Quality (bits 27-24)
 0x0 - Indicates data quality is OK.
 0x8 - Indicates data is Suspect.
 0x4 - Indicates DQ Failed.
 0x2 - Indicates No Data in packet.
 0x1 - Indicates override has been set (data is present but Suspect).
 Packet Status (bits 23-22)
 0x1 - Indicates a sequence count error.
 0x2 - Indicates a packet length error.
 0x3 - Indicates both sequence count and packet length errors.
 Limit/Expected State Sensing Status (bit 21)
 0 - Indicates LES status was Good.
 1 - Indicates an LES violation occurred.
 Reconfiguration Status (bit 20)
 0 - Indicates no reconfiguration detected.
 1 - Indicates reconfiguration detected (new PIT).

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)
 Overall Sample Status (bits 19-0)
 0 - Indicates samples are OK
 non zero - Indicates samples have errors as defined in extract.h

Individual sample status can be obtained using the CPS_Get_Status function.

SEE ALSO

CPS_Get_Newest_Value,
CPS_Get_Status,
CPS_Put_Pseudo_Value,
CPS_Get_Number_Samples,
CPS_Define_Output_Dependencies

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Get_Newest_Value - user computation function to extract value(s) for the given MSID.

SYNOPSIS

int CPS_Get_Newest_Value (variable_name)
  variable_name - must be declared and associated with MSID in the Input MSID List.
            );

DESCRIPTION

User Computation Library Function: The CPS_Get_Newest_Value library will extract the newest samples of the requested MSID from the best available source as they are received on the machine. This function is best utilized when the computation desires to process the latest values for a set of MSIDs on a periodic basis.

The CPS_Get_Newest_Value library function accepts a variable name that must have a corresponding MSID association contained within the Input MSID List for the computation.

RETURN VALUE

Upon successful completion CPS_Get_Newest_Value function returns an integer status with specific bits of the status word indicating the data condition, source status, data quality of the MSID source, and an overall sample status. The values of the status elements are defined as follows:

Data Condition (bit 30)
0 - Indicates new data
1 - Indicates old data

Source Status (bits 29-28)
0 - Indicates source is AOS
1 - Indicates source is LOS
2 - Indicates a new source has been initialized.

Data Quality (bits 27-24)
0x0 - Indicates data quality is OK.
0x8 - Indicates data is Suspect.
0x4 - Indicates DQ Failed.
0x2 - Indicates No Data in packet.
0x1 - Indicates override has been set (data is present but Suspect).

Packet Status (bits 23-22)
0x1 - Indicates a sequence count error.
0x2 - Indicates a packet length error.
0x3 - Indicates both sequence count and packet length errors.

Limit/Expected State Sensing Status (bit 21)
0 - Indicates LES status was Good.
1 - Indicates an LES violation occurred.

Reconfiguration Status (bit 20)
0 - Indicates no reconfiguration detected.
1 - Indicates reconfiguration detected (new PIT).

Overall Sample Status (bits 19-0)
0 - Indicates samples are OK
non zero - Indicates samples have errors as defined in extract.h
Individual sample status can be obtained using the CPS_Get_Status function.

SEE ALSO

CPS_Get_Next_Value,
CPS_Put_Pseudo_Value,
CPS_Get_Status,
CPS_Get_Number_Samples,
CPS_Define_Output_Dependencies

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Get_Status - user computation function to obtain sample status value(s) for the given MSID.

SYNOPSIS

int CPS_Get_Status (variable_name)
(
msid_variable - must be declared and associated with MSID in the Input MSID List.
);

DESCRIPTION

User Computation Library Function: The CPS_Get_Status library will obtain the sample status of the requested MSID. This function should only be called after the CPS_Get_Next_Value or CPS_Get_Newest_Value functions have been successfully performed.

The CPS_Get_Status library function accepts a variable name that must have a corresponding MSID association contained within the Input MSID List for the computation.

RETURN VALUE

Upon successful completion CPS_Get_Status function returns an integer status with specific bits of the status word indicating the following:

Parent Frame Error (bit 31)
Data Not Available (bit 30)
Check Sum Error (bit 29)
Fixed Value Error (bit 28)
Frame Counter Error (bit 27)
Format ID Error (bit 26)
Bit Slip Error (bit 25)
Sync Error (bit 24)
Delta Limit Error (bit 23)

Bits (22-0) may contain an LES status only if the LES status bit (bit 21) in the overall status word is set.

Possible LES status codes are:

Limit violation Caution High = EML_LES_LIMIT_SENSE_CAUTION_HI_EXCEEDED

Limit violation Warning High = EML_LES_LIMIT_SENSE_WARNING_HI_EXCEEDED

Limit violation Caution Low = EML_LES_LIMIT_SENSE_CAUTION_LO_EXCEEDED

Limit violation Warning Low = EML_LES_LIMIT_SENSE_WARNING_LO_EXCEEDED

Expected State Violation Out of State = EML_LES_OUT_OF_STATE

SEE ALSO

CPS_Get_Next_Value,
CPS_Get_Newest_Value,
CPS_Put_Pseudo_Value,
CPS_Get_Number_Samples,
CPS_Define_Output_Dependencies

EHS Release 3.1 Last change: 1 September 1997 1

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Get_Number_Samples - user computation function to obtain the actual number of samples returned by the Get_Next or Get_Newest calls.

SYNOPSIS

int CPS_Get_Number_Samples (variable_name)
(
variable_name - must be a declared variable and associated with MSID in the Input MSID
List.
);

DESCRIPTION

User Computation Library Function: The CPS_Get_Number_Samples library will return the varaible_name's number of samples obtained in the previous call to either Get_Next ot Get_Newest.

The CPS_Get_Number_Samples library function accepts a variable name that must have a corresponding
MSID association contained within the Output MSID List for the computation.

RETURN VALUE

Upon successful completion CPS_Get_Number_Samples function returns the number of samples
obtained from the previous call to Get_Next or Get_Newest.

SEE ALSO

CPS_Get_Next_Value,
CPS_Get_Newest_Value,
CPS_Put_Pseudo_Value,
CPS_Get_Status,
CPS_Define_Output_Dependencies

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Put_Pseudo_Value - user computation function to update output pseudo MSID value(s).

SYNOPSIS

int CPS_Put_Pseudo_Value (variable_name, number of samples)
(
variable_name - must be a declared variable and associated with MSID in the Output MSID
List.
int number_of_samples - specify the number of samples to be updated.
);

DESCRIPTION

User Computation Library Function: The CPS_Put_Pseudo_Value library will write the output pseudo
data values, associated with the variable name, into the pseudo data packet. The number of samples indi<hy>
cates how much of the data to write to the pseudo data packet.

The CPS_Put_Pseudo_Value library function accepts a variable name that must have a corresponding
MSID association contained within the Output MSID List for the computation.
Output pseudo status is obtained from the input msids that are used to create the output pseudo data value.
The function CPS_Define_Output_Dependencies must be called prior to the CPS_Put_Pseudo_Value in
order to define the output pseudo dependency on the input msids. If the output dependency is not defined
then status for the output pseudo will be defaulted to NO DATA.

RETURN VALUE

Upon successful completion CPS_Put_Pseudo_Value function returns CPS_TRUE to indicate that data
was successfully written to the pseudo data packet. The function will return CPS_FALSE upon failure.

SEE ALSO

CPS_Get_Next_Value,
CPS_Get_Newest_Value,
CPS_Get_Status,
CPS_Get_Number_Samples,
CPS_Define_Output_Dependencies

Comps(3) USER/MISSION COMPUTATION LIBRARIES Comps(3)

NAME

CPS_Define_Output_Dependencies - user computation function to specify output pseudo status dependencies.

SYNOPSIS

void CPS_Define_Output_Dependencies (output_variable, input_variable_1, input_variable_2, ...)
(
output_variable - must be a declared variable and associated with MSID in the Output
MSID List.

input_variable_1 - must be a declared variable and associated with MSID in the Input MSID List.
input_variable_2 - must be a declared variable and associated with MSID in the Input MSID List.
... more input variables can be defined.
);

DESCRIPTION

User Computation Library Function: The CPS_Define_Output_Dependencies library defines the output pseudo status dependency for output pseudo msids upon the input msid status'. This association allows the input status to be or'd together to produce an otutput status for the output pseudo msid specified.
The CPS_Define_Output_Dependencies library function accepts variable names that must have a corresponding MSID associations contained within the Input or Output MSID List for the computation.

RETURN VALUE

No Return value.

SEE ALSO

CPS_Get_Next_Value,
CPS_Get_Newest_Value,
CPS_Get_Status,
CPS_Put_Pseudo_Value,
CPS_Get_Number_Samples

NAME

DCM_Retrieve File - user computation function to retrieve a file from PIMS.

SYNOPSIS

void CPS_Define_Output_Dependencies (output_variable, input_variable_1, input_variable_2, ...)
(
output_variable - must be a declared variable and associated with MSID in the Output MSID List.
input_variable_1 - must be a declared variable and associated with MSID in the Input MSID List.
input_variable_2 - must be a declared variable and associated with MSID in the Input MSID List.
... more input variables can be defined.
);

DESCRIPTION

User Computation Library Function: The CPS_Define_Output_Dependencies library defines the output pseudo status dependency for output pseudo msids upon the input msid status'. This association allows the input status to be or'd together to produce an otutput status for the output pseudo msid specified.
The CPS_Define_Output_Dependencies library function accepts variable names that must have a corresponding MSID associations contained within the Input or Output MSID List for the computation.

RETURN VALUE

No Return value.

NAME

TNS_Get_EHS_Time - user computation function to retrieve the current EHS Time in GMT format from Telemetry Network Services.

SYNOPSIS

void CPS_Define_Output_Dependencies (output_variable, input_variable_1, input_variable_2, ...)
(
output_variable - must be a declared variable and associated with MSID in the Output MSID List.
input_variable_1 - must be a declared variable and associated with MSID in the Input MSID List.

```
  input_variable_2 - must be a
declared variable and associated with
MSID in the Input MSID
 List.
  ... more input variables can be
defined.
  );
```

DESCRIPTION

```
 User Computation Library Function:
The CPS_Define_Output_Dependencies
library defines the output
 pseudo status dependency for output
pseudo msids upon the input msid
status'. This association allows the
 input status to be or'd together to
produce an otutput status for the
output pseudo msid specified.
 The CPS_Define_Output_Dependencies
library function accepts variable
names that must have a corresponding
MSID associations contained within
the Input or Output MSID List for the
computation.
```

RETURN VALUE

```
 No Return value.
```

K.2 Illegal Functions

LIBC

```
BSD_getime
BSDalphasort
BSDchown
BSDclosedir
BSDdup2
BSDfchown
BSDgetgroups
BSDgetpgrp
BSDgettimeofday
BSDinitgroups
BSDlongjmp
BSDopendir
BSDreaddir
BSDscandir
BSDseekdir
BSDsetgroups
BSDsetjmp
BSDsetpgrp
BSDsettimeofday
BSDsignal
BSDsigpause
BSDtelldir
acalloc
accept
acct
acl
acl_getmax
acl_valid
aclmax
aclsort
acquire_lock
acreate
addexportent
addmntent
addsev
addseverity
adelete
adjtime
afree
aio_cancel
aio_error
aio_fsync
aio_init
aio_read
aio_return
aio_suspend
aio_write
amallinfo
amalloc
amallocblksize
amallopt
amemalign
arealloc
arecalloc
argvtostr
asctime_r
async_daemon
atomic_op
authnone_create
authunix_create
authunix_create_default
barrier
bclr
bfclr
bfset
bftstclr
bftstset
bind
bindresvport
blkclr
blockproc
blockprocall
cachectl
cacheflush
callrpc
catclose
catgets
catopen
cfgetispeed
cfgetospeed
cfree
cfsetispeed
cfsetospeed
chroot
clearerr_locked
clearerr_unlocked
clnt_broadcast
clnt_broadcast_exp
clnt_create
clnt_create_vers
clnt_multicast
clnt_multicast_exp
clnt_pcreateerror
clnt_perrno
clnt_perror
clnt_setbroadcastbackoff
clnt_spcreateerror
clnt_sperrno
```

clnt_sperror
clnt_syslog
clntraw_create
clnttcp_create
clnttcp_getreply
clntudp_bufcreate
clntudp_create
closelog
connect
crypt
ctermid_r
ctime_r
dlclose
dlerror
dlopen
dlsym
dn_comp
dn_expand
dn_skipname
ecvt_r
eicbusywait
eicclear
eicinit
encrypt
endexportent
endgrent
endhostent
endinvent
endinvent_r
endmntent
endnetent
endnetgrent
endprotoent
endpwent
endrpcent
endservent
endspent
endutent
endutxent
ether_aton
ether_hostton
ether_line
ether_ntoa
ether_ntohost
execl
execle
execlp
execv
execve
execvp
exportfs
fattach
fchdir
fchmod
fchown
fcvt_r
fdetach
feof_locked
feof_unlocked
ferror_locked
ferror_unlocked
fgetgrent
fgetpwent
fgetspent
fileno_locked
fileno_unlocked
finddatum
flock
flockfile
forder
fp_query
fpgetmask
fpgetround
fpgetsticky
fpsetmask
fpsetround
fpsetsticky
free_barrier
freelvent
fstat64
ftruncate64
ftrylockfile
ftw
funlockfile
fxstat
get_myaddress
getabi
getc_unlocked
getchar_unlocked
getcontext
getdate
getdate_err
getdents
getexportent
getexportopt
getfh
getgrent
getgrgid
getgrgid_r
getgrnam
getgrnam_r
gethostent
gethostid
getinvent
getinvent_r
getlogin_r
getlvent
getmntany

```
getmntent
getmsg
getnetbyaddr
getnetbyname
getnetent
getnetgrent
getnetname
getpass
getpmsg
getpw
getpwent
getpwnam
getpwnam_r
getpwuid
getpwuid_r
getrlimit64
getrpcent
getservent
getspent
getspnam
getutent
getutid
getutline
getutmp
getutmpx
getutxent
getutxid
getutxline
gmtime_r
grantpt
hasmntopt
hostalias
ia_audit
id2str
inf_dom
inf_dup
inf_equ
inf_invalid
inf_size
inf_strtolabel
initgroups
innetgr
insque
ioctl
is_mips2
issubdir
key_decryptsession
key_encryptsession
key_gendes
key_setsecret
kill
killpg
ksigaction
ksigqueue
lckpwdf
lio_listio
listen
localtime_r
lockf
lseek64
lstat64
lxstat
m_fork
m_get_myid
m_get_numprocs
m_kill_procs
m_lock
m_next
m_park_procs
m_rele_procs
m_set_procs
m_sync
m_unlock
mac_clearance_error
mac_cleared
mac_clearedlbl
mac_copy
mac_demld
mac_dom
mac_dup
mac_equ
mac_getlblcomp
mac_getlblname
mac_getname
mac_getvalue
mac_inrange
mac_invalid
mac_is_moldy
mac_label_devs
mac_labeltostr
mac_same
mac_set_moldy
mac_size
mac_strtolabel
makecontext
makeut
makeutx
memcntl
mkfifo
mknod
mlock
mlockall
mmap
mmap64
modut
modutx
moncontrol
mount
```

```
mpin
msgctl
msgget
msgrcv
msgsnd
munlock
munlockall
munmap
munpin
new_barrier
nfssvc
nftw
nuname
opendir
openlog
p_cdname
p_class
p_query
p_rr
p_time
p_type
pagelock
pclose
pcreatel
pcreatelp
pcreatev
pcreateve
pcreatevp
plock
pmap_getmaps
pmap_getport
pmap_rmtcall
pmap_set
pmap_setrmtcalltimeout
pmap_settimeouts
pmap_unset
popen
prctl
pread
priocntl
procblk
profil
ptrace
ptsname
putc_unlocked
putchar_unlocked
putlong
putmsg
putpmsg
putpwent
putshort
putspent
pututline
pututxline
quotactl
rcmd
readdir_r
reboot
recv
recvfrom
recvl
recvlfrom
recvlmsg
recvlu
recvlufrom
recvlumsg
recvmsg
recvu
recvufrom
recvumsg
registerhost
registerinethost
registerrpc
release_lock
remexportent
remque
renamehost
res_init
res_mkquery
res_query
res_querydomain
res_search
res_send
rexec
rpc_createerr
rresvport
ruserok
ruserpass
sat_close_filehdr
sat_eventtostr
sat_free_file_info
sat_free_header_info
sat_intrp_pathname
sat_read_file_info
sat_read_header_info
sat_strtoevent
sat_write_file_info
sat_write_filehdr
satgetid
satoff
saton
satread
satsetid
satstate
satvwrite
satwrite
scaninvent
schedctl
```

```
semctl
semget
semop
send
sendmsg
sendto
setblockproccnt
setblockproccntall
setchrclass
setcontext
setdomainname
setegid
seteuid
setexportent
setgid
setgrent
setgroups
sethostent
sethostfile
sethostid
sethostname
sethostresorder
setinvent
setinvent_r
setkey
setlabel
setlogmask
setmntent
setnetent
setnetgrent
setpgid
setpgrp
setprotoent
setpwent
setregid
setreuid
setrgid
setrlimit64
setrpcent
setruid
setservent
setsid
setsockopt
setspent
settimeofday
setuid
setutent
setutxent
sgi_acl_acltostr
sgi_acl_strtoacl
sgi_altersigs
sgi_cap_captostr
sgi_cap_cleared
sgi_cap_id_isset
sgi_cap_id_set
sgi_cap_request
sgi_cap_setproc
sgi_cap_strtocap
sgi_cap_strtocap_eag
sgi_cap_surrender
sgi_dumpset
sgi_eag_form_attr
sgi_eag_getattr
sgi_eag_getprocattr
sgi_eag_mount
sgi_eag_setattr
sgi_eag_setprocattr
sgi_getcapabilitybyname
sgi_getclearancebyname
sgi_getlabel
sgi_getplabel
sgi_getpsoacl
sgi_scanperms
sgi_scanugo
sgi_setlabel
sgi_setplabel
sgi_setpsoacl
sgi_sigffset
sgi_trrwx
sgidladd
sgidlopen_version
sgigetdsoversion
sgikopt
shmat
shmctl
shmdt
shmget
socket
socketpair
spin_lock
sproc
sprocsp
sprofil
stat64
stat_lock
strtok_r
svc_fdset
svc_getreq
svc_getreqset
svc_register
svc_run
svc_sendreply
svc_unregister
svc_versquiet
svcerr_auth
svcerr_decode
svcerr_noproc
svcerr_noprog
```

svcerr_progvers
svcerr_systemerr
svcerr_weakauth
svcfd_create
svcraw_create
svctcp_create
svcudp_bufcreate
svcudp_create
svcudp_enablecache
swapcontext
swapctl
symlink
synchutmp
sys_call
syscall
sysfs
sysinfo
syslog
sysmips
sysmp
syssgi
system
taskblock
taskcreate
taskctl
taskdestroy
tasksetblockcnt
taskunblock
tcdrain
tcflow
tcflush
tcgetattr
tcgetpgrp
tcgetsid
tcsendbreak
tcsetattr
tcsetpgrp
truncate64
ttyname
ttyname_r
ttyslot
uadmin
ulckpwdf
umount
unblockproc
unblockprocall
unlockpt
unregisterhost
updutfile
updutmp
updutmpx
updutxfile
updwtmp
updwtmpx
usadd
uscalloc
uscasinfo
usclosepollsema
usconfig
usctlsema
usdetach
usdumphist
usdumpsema
user2netname
usfree
usfreepollsema
usfreesema
usgetinfo
usinit
usinitsema
usmallinfo
usmalloc
usmallocblksize
usmallopt
usmemalign
usnewpollsema
usnewsema
usopenpollsema
usputinfo
usrealloc
usrecalloc
ustat
ustestsema
utime
utimes
utmpname
utmpxname
utssys
uuid_compare
uuid_create
uuid_create_nil
uuid_equal
uuid_from_string
uuid_hash
uuid_is_nil
uuid_to_string
vhangup
vsyslog
waitsys
xdr_accepted_reply
xdr_array
xdr_authdes_cred
xdr_authdes_verf
xdr_authunix_parms
xdr_bool
xdr_bytes
xdr_callhdr
xdr_callmsg

xdr_char
xdr_cryptkeyarg
xdr_cryptkeyres
xdr_datum
xdr_des_block
xdr_double
xdr_enum
xdr_float
xdr_free
xdr_getcredres
xdr_int
xdr_keybuf
xdr_keystatus
xdr_long
xdr_netnamestr
xdr_netobj
xdr_opaque
xdr_opaque_auth
xdr_pmap
xdr_pmaplist
xdr_pointer
xdr_reference
xdr_rejected_reply
xdr_replymsg
xdr_rmtcall_args
xdr_rmtcallres
xdr_short
xdr_string
xdr_u_char
xdr_u_int
xdr_u_long
xdr_u_longlong_t
xdr_u_short
xdr_uint32
xdr_uint64
xdr_union
xdr_unixcred
xdr_vector
xdr_void
xdr_wrapstring
xdr_yp_binding
xdr_yp_buf
xdr_yp_inaddr
xdr_ypall
xdr_ypbind_resp
xdr_ypbind_setdom
xdr_ypdelete_args
xdr_ypdomain_wrap_string
xdr_ypmap_parms
xdr_ypmap_wrap_string
xdr_ypmaplist
xdr_ypmaplist_wrap_string
xdr_ypowner_wrap_string
xdr_yppushresp_xfr
xdr_ypreq_key
xdr_ypreq_nokey
xdr_ypreq_xfr
xdr_ypresp_key_val
xdr_ypresp_maplist
xdr_ypresp_master
xdr_ypresp_order
xdr_ypresp_val
xdr_ypupdate_args
xdrmem_create
xdrrec_create
xdrrec_endofrecord
xdrrec_eof
xdrrec_readbytes
xdrrec_skiprecord
xdrstdio_create
xmknod
xprt_register
xprt_unregister
xstat
yp_all
yp_bind
yp_first
yp_get_default_domain
yp_master
yp_match
yp_next
yp_order
yp_unbind
yp_update
ypbind_resp_arms
yperr_string
ypprot_err

LIBCOMP

CPS_Allocate_Data_Storage
CPS_Assign_Constant_Info
CPS_Assign_Variable_Info
CPS_Cleanup_Computation
CPS_Cleanup_Constants
CPS_Cleanup_MSIDs
CPS_Cleanup_Pseudos
CPS_Convert_Data_Buffer
CPS_Convert_State_Code_Buffer
CPS_Copy_Data_From_EML
CPS_Copy_Data_To_EML
CPS_End_Pseudo_Data_Processing
CPS_Flush_Signals
CPS_Flush_Standard_Output

CPS_Get_Computation_Name
CPS_Get_Data_Address
CPS_Get_Dependency_Status
CPS_Get_Exec_Info_Address
CPS_Get_Input_Decom_Address
CPS_Get_Input_Decom_Length
CPS_Get_Input_Filename
CPS_Get_MSID_Runtime_Data
CPS_Get_Next_File_Value
CPS_Get_Output_Decom_Address
CPS_Get_Output_Decom_Length
CPS_Get_Output_Filename
CPS_Get_Output_MSID_Calibration_Data
CPS_Get_Output_MSID_LES_Data
CPS_Get_Output_Variable_EML_C_Type
CPS_Get_Request_Status
CPS_Get_Standard_Output_Redirect
CPS_Get_Type_Length
CPS_Init_Computation
CPS_Init_Constants
CPS_Init_File_Data
CPS_Init_Input_MSIDS
CPS_Init_Input_Pseudos
CPS_Init_Output_MSIDS
CPS_Init_Output_Pseudos
CPS_Init_Packet_Data
CPS_Init_Sleep
CPS_Initialize_Constants
CPS_Input_Pseudo_Data
CPS_Is_Input_Variable
CPS_Is_Output_Variable
CPS_Output_Pseudo_Data
CPS_Redirect_Standard_Output
CPS_Sleep
CPS_Update_Constants
CPS_Write
cps_Close_Standard_Data_File
cps_Get_Status_Char
cps_Open_Standard_Data_File
cps_Output_Computation_Footer
cps_Output_Computation_Header
cps_Read_Standard_Data_File
cps_Read_Standard_Data_File_Header
cps_Write_Standard_Data_File
cps_assign_constant_info_
cps_assign_variable_info_
cps_cleanup_computation_
cps_define_output_dependencies_
cps_end_pseudo_data_processing_
cps_flush_signals_
cps_flush_standard_output_
cps_get_data_address_
cps_get_newest_value_
cps_get_next_value_
cps_get_number_samples_
cps_get_standard_output_redirect_
cps_get_status_
cps_init_computation_
cps_init_constants_
cps_init_input_msids_
cps_init_output_msids_
cps_init_sleep_
cps_input_pseudo_data_
cps_log_message
cps_log_status
cps_output_pseudo_data_
cps_put_pseudo_value_
cps_redirect_standard_output_
cps_sleep_
cps_update_constants_
cps_write_
get_status_numeric

LIBEHS

APT_Record
ARGV_ALLOCATION_INCREMENT
Abort_After_Message
Add_To_Top_Of_List
Add_to_Packet_List
Allocate_MSID_Data_Memory
AosLos_Text
Attach_To_SCM_Status_Table
Build_OCDB_Flag_Text
Bulk_Validate_Config_File
CAR_Processing_Text
CDB_Connect
CDB_Disconnect
CDB_Get_Cmd_Chain_Status_Data
CDB_Get_Cmd_Field_Data
CDB_Get_Cmd_Field_List
CDB_Get_Cmd_List
CDB_Get_Cmd_Tlm_Verifier_Data
CDB_Get_Field_PP_Data
CDB_Get_General_Cmd_Data
CDB_Get_Hdr_Field_Data
CDB_Get_Hdr_Field_List
CDB_Get_Hdr_List
CDB_INT_Get_Prefix_Data
CDB_Store_Cmd_Chains
CDB_Store_Cmd_Data_Sets
CDB_Val_Cmd_Chain
CDB_Val_Cmd_Mnem
CDD
CDD_Source
CPS_Log_Message

CPS_Pause_Computation
CPS_Resume_Computation
CPS_Start_Computation
CPS_Stop_Computation
CPS_Validate
CRR_Processing_Text
CSS_Enable_Text
Check_Format_ID
Check_Local_Table_Revision
Check_for_des_file
Check_req_version
ChngNumCopies
Cleanup_Sources
Cleanup_Unneeded_Sources
Clear_To_Send_Text
Confirmation_Level_Text
Context_Dependent_Decom_Request
Continue_After_Message
Convert_ASCII_String
Convert_CDP
Convert_CNT
Convert_DM_System
Convert_EBCDIC_String
Convert_ECOS_BIN_GMT
Convert_ECOS_GMT
Convert_ERT
Convert_Float
Convert_GMT
Convert_Integer
Convert_OI_GMT_MET
Convert_ORB_GPC_GMT
Convert_Standard_EHS
Convert_String
Convert_TSM
Convert_Time
Convert_Value
Create_TDS_MSID_Array
Critical_Cmd_Auto_Disable_Text
Critical_Command_Prompt_Text
DCM_List_Uplinkable_Comps
DCM_List_Uplinkable_Docs
DCM_List_Uplinkable_Files
DMC_Access_Mission
DMC_Access_Revision
DMC_Access_User
DMC_Build_OCDB_Authorization
DMC_Check_Log
DMC_Check_Monitoring
DMC_Check_Privilege
DMC_Check_Server
DMC_Check_Terminate
DMC_Cleanup_Core
DMC_Cleanup_Temp
DMC_Clear_OCDB_Active
DMC_Complete_Request
DMC_Connect
DMC_Copy_File
DMC_Copy_File_To_Dir
DMC_Create_Account
DMC_DBA_Connect
DMC_DBA_Disconnect
DMC_DBS_privs
DMC_DB_Connect
DMC_Delete_Account
DMC_Disable_Account
DMC_Disconnect
DMC_Drop_OCDB_Users
DMC_Enable_Account
DMC_Error_Alert
DMC_Find_OCDB
DMC_Find_PDBS
DMC_Find_PIMS
DMC_Get_Archive_Path
DMC_Get_Backup_Path
DMC_Get_Bin_Path
DMC_Get_Config_Path
DMC_Get_DBS_Privilege_String
DMC_Get_DBS_Privileges
DMC_Get_DB_Device
DMC_Get_DB_Instance
DMC_Get_DB_Name
DMC_Get_DB_Path
DMC_Get_DB_State
DMC_Get_DB_Type
DMC_Get_Environment
DMC_Get_Interval
DMC_Get_Mission_Synonym
DMC_Get_OCDB_Users
DMC_Get_PIMS_Privilege_String
DMC_Get_PIMS_Privileges
DMC_Get_Parameter
DMC_Get_Request_Code
DMC_Get_Superseded
DMC_Get_System_Path
DMC_Get_Temporary_Path
DMC_Get_Versions
DMC_Getn_Parameter
DMC_Load_Archive
DMC_Log_Access_Error
DMC_Log_Account_Request
DMC_Log_Archive
DMC_Log_Connect
DMC_Log_DB_State
DMC_Log_Execute
DMC_Log_File_Error
DMC_Log_MH
DMC_Log_Mission_State
DMC_Log_Start

```
DMC_Log_Stop
DMC_Log_Table
DMC_Log_Table_Error
DMC_Lower
DMC_Make_Archive_Dirs
DMC_Make_Backup_Dirs
DMC_Make_DB_Dirs
DMC_Make_Dir
DMC_Make_System_Dirs
DMC_PIMS_privs
DMC_Put_Account_Request
DMC_Put_OCDB_Users
DMC_Put_PRM_Output
DMC_Put_Server_Message
DMC_Put_Terminate
DMC_Reap_Child
DMC_Reconfig
DMC_Register_Server
DMC_Release_Baseline
DMC_Remove_Server
DMC_Resync_Accounts
DMC_Server_Exit
DMC_Set_GID
DMC_Set_Mission_Roles
DMC_Set_OCDB_Active
DMC_Start_Request
DMC_Start_Server
DMC_Strncpy
DMC_Update_Monitoring
DMC_Update_Privileges
DMC_Upper
DMC_connect_flag
DMC_ins_name
DMC_line_number
DMC_output_text
DMC_process_name
DMC_request_number
DSP_Validate
Debug
Decom_Context_Dependent
Decom_From_AXAF_MJFB
Decom_From_DP_MJFB
Decom_From_MJFB
Decom_Group
Decom_Regular
Decom_Sample
Decom_Shotgun
Decom_Subset
Decom_Switch
Decom_Typical
Detach_From_SCM_Status_Table
Determine_First_AXAF_Sample
Determine_First_Sample
Determine_Last_AXAF_Sample
Determine_Last_Sample
Diagnostic
Disable_Message
Do_Limit_Sensing
EHSI_Get_String_Index
EHS_CDB_Version_Changed
EHS_Common_Init_Test
EHS_Common_Reinit
EHS_Compare_Strings_Without_Case
EHS_Core_Init
EHS_Free_Printer_List
EHS_Get_Application_Group
EHS_Get_Application_Name
EHS_Get_Boolean_Text
EHS_Get_Boolean_Text_Array
EHS_Get_Boolean_Value
EHS_Get_CDB_Delivered_Version
EHS_Get_CDB_Prerelease_Version
EHS_Get_CDB_Version
EHS_Get_Data_Mode
EHS_Get_Data_Mode_Text
EHS_Get_Data_Mode_Text_Array
EHS_Get_Data_Mode_Value
EHS_Get_Data_Mode_enum
EHS_Get_Last_MH_Return_Data
EHS_Get_MH_Msg_Ptr
EHS_Get_MH_Params
EHS_Get_Mission
EHS_Get_Mission_ID
EHS_Get_Platform_Text
EHS_Get_Platform_Text_Array
EHS_Get_Platform_Value
EHS_Get_Printers
EHS_Get_Project
EHS_Get_Project_Text
EHS_Get_Project_Text_Array
EHS_Get_Project_Value
EHS_Get_Project_enum
EHS_Get_Protocol_Text
EHS_Get_Protocol_Text_Array
EHS_Get_Protocol_Value
EHS_Get_Stream_Prime_Status_Text
EHS_Get_Stream_Prime_Status_Text_Arra
y
EHS_Get_Stream_Prime_Status_Value
EHS_Get_Support_Mode
EHS_Get_Support_Mode_Text
EHS_Get_Support_Mode_Text_Array
EHS_Get_Support_Mode_Value
EHS_Get_Support_Mode_enum
EHS_Get_TDB_Archived_Version
EHS_Get_TDB_Baselined_Version
EHS_Get_TDB_Delivered_Version
EHS_Get_TDB_Prerelease_Version
```

EHS_Get_TDB_Version
EHS_Get_User_ID
EHS_Init_Log_Message
EHS_Is_TNS_MET_In_Use
EHS_Log_Message
EHS_Log_Message_Int
EHS_Log_Message_Str
EHS_Log_Message_Str_Int
EHS_Log_Message_Str_Str
EHS_Mission_Changed
EHS_Mission_ID_Changed
EHS_Param_Args_Clear
EHS_Param_Args_Set
EHS_Param_Eval
EHS_Param_Get
EHS_Project_Changed
EHS_Put_Application_Group
EHS_Put_Application_Name
EHS_Put_CDB_Delivered_Version
EHS_Put_CDB_Prerelease_Version
EHS_Put_CDB_Version
EHS_Put_Data_Mode
EHS_Put_Data_Mode_enum
EHS_Put_Mission
EHS_Put_Mission_ID
EHS_Put_Project
EHS_Put_Project_enum
EHS_Put_Support_Mode
EHS_Put_Support_Mode_enum
EHS_Put_TDB_Archived_Version
EHS_Put_TDB_Baselined_Version
EHS_Put_TDB_Delivered_Version
EHS_Put_TDB_Prerelease_Version
EHS_Put_TDB_Version
EHS_Put_User_ID
EHS_Set_MH_Params
EHS_Support_Mode_Changed
EHS_TDB_Version_Changed
EHS_Time_Display_Conv
EHS_UDE_END_OF_LIST
EHS_UDE_Files
EHS_UDE_Is_Copyable
EHS_UDE_Is_Deletable
EHS_UDE_Is_Exportable
EHS_UDE_Is_Hidden
EHS_UDE_Is_Importable
EHS_UDE_Is_Printable
EHS_UDE_Is_Renamable
EHS_UDE_Is_Searchable
EHS_UDE_Is_Storable
EHS_UDE_Path_Name
EHS_UDE_Path_Type
EHS_UDE_Type_ID
EHS_UDE_Type_Name
EHS_UDE_Types
EHS_UDE_Uses_Extensions
EM
EML_Calibrate_Point_Pair
EML_Calibrate_Polynomial
EML_Calibrate_State_Code
EML_Calibrate_Value
EML_Get_Calibration_Set
EML_Last_PUC
EML_Promote_Integers
EML_Recursion_Counter
EML_Time_Ready
EML_uitm
EML_uitm_connect
EM_Validate
Enable_Message
Error
FEPSC_Build_Data_Mode_String
FEPSC_Get_Data_Mode_Enum
FEPSC_Get_Peer_Hostname
FEPSC_Net_Accept
FEPSC_Net_Close
FEPSC_Net_Connect
FEPSC_Net_Open
FEPSC_Net_Read
FEPSC_Net_Write
FEP_Calculate_SMAC_IDQ_Value
FEP_Calculate_TDM_DQ_Values
FEP_Check_NASCOM_Format_ID
FEP_DQ_Mess
FEP_Determine_AOS_LOS
FEP_Determine_NASCOM_DQ
FEP_Determine_TDM_DQ
FEP_Extract_NASCOM_Destination
FEP_Extract_NASCOM_Format_Code
FEP_Extract_NASCOM_Message_Type
FEP_Extract_NASCOM_Source
FEP_Get_NASCOM_Protocol_Ptrs
FEP_Get_TDM_Protocol_Pointers
FEP_Initialize_DQ
FEP_Log_Error
FEP_Mess_Values
FEP_Message_Lookup
FEP_Set_AOS_LOS
FEP_Stream_ID
FSV_Processing_Text
Fatal_Error
Find_Fields
FirstCopy
Free_Local_Table_Data
Free_MSID_Data_Memory
FtpAbort
FtpArchie
FtpBadReply550

```
FtpBye
FtpChmod
FtpClose
FtpCommand
FtpCommandI
FtpConnect
FtpCopy
FtpCreateObject
FtpData
FtpDebug
FtpDebugDebug
FtpDebugError
FtpDebugIO
FtpFilenameChecker
FtpFullClose
FtpFullOpen
FtpFullSyntax
FtpGetHost
FtpGetMessage
FtpGetc
FtpGood
FtpGood1
FtpHash
FtpHttpGet
FtpInit
FtpInitMessageList
FtpLog
FtpLogin
FtpMessage
FtpMove
FtpNumber
FtpOpenDir
FtpPort
FtpPutc
FtpPwd
FtpQuickBye
FtpRead
FtpReadBlock
FtpRetr
FtpSendMessage
FtpSize
FtpStat
FtpStatFree
FtpStor
FtpSyst
FtpType
FtpWrite
FtpWriteBlock
Ftpfclose
Ftpfopen
GAM
GPU_Get_Time
GPU_Print_File
GPU_Print_Window
Generate_Key
Get_CCSDS
Get_CDD_MSID_Value
Get_Data_Value
Get_Discrete_Components
Get_EHS_Header
Get_EHS_Headers
Get_EHS_Primary
Get_EHS_Secondary
Get_Expected_Size
Get_HDRS_DQ_Header
Get_Header_MSID_Value
Get_IBM_Components
Get_IEEE_Components
Get_INTEL_Components
Get_Key_ID
Get_Key_Path
Get_LES_Processing_Flag
Get_LVT_Availability
Get_Local_Table_Revision_Counter
Get_MIL_Components
Get_MJFB_Status
Get_MSID_Value
Get_Magnitude_Components
Get_NASCOM_Header
Get_PDSS_Header
Get_PLVT_Availability
Get_Packet_AOS_Status
Get_Packet_Availability
Get_Parm_Sel_Header
Get_Process_Name
Get_Pseudo_Header
Get_SL_Components
Get_Sample_Bit_Length
Get_Sample_End_Byte
Get_Sample_Start_Byte
Get_Source_From_Packet_List
Get_Source_PDB_Lock
Get_Source_Status
Get_Status
Get_TDM_Header
Get_Time_Type_Text
Get_Twos_Components
Get_Unsigned_Components
Get_User_Key_Path
Get_VAX_Components
Get_Whole_Packet_Functions
Hazardous_Cmd_Auto_Disable_Text
Hazardous_Command_Prompt_Text
Init_EHS_Packet_Header
Init_Output_Pseudos_for_Write
Initialize_Activity_Log
Initialize_Circular_List
Initialize_New_Source
```

Initialize_Sources
Is_Context_Value_Valid
Is_MSID_Context_Dependent
Is_Source_Context_Dependent
Justify_CDD_Samples
Justify_Samples
LES_Processing_Flag
LES_Value
LTG_Delete_LVU_Info
LTG_Delete_MSID_Info
LTG_Get_Counter_Data
LTG_Get_Group_Content_Data
LTG_Get_Group_ID_Data
LTG_Get_MSID_Cal_Switch
LTG_Get_MSID_Decom_Data
LTG_Get_MSID_ES_Switch
LTG_Get_MSID_Expected_State
LTG_Get_MSID_Group_ID_List
LTG_Get_MSID_Limit_Switch
LTG_Get_MSID_Limits
LTG_Get_MSID_Point_Pairs
LTG_Get_MSID_Poly_Cals
LTG_Get_MSID_State_Codes
LTG_Get_MSID_Stream_List
LTG_Put_Group_Content_Data
LTG_Put_Group_ID_Data
LTG_Put_MSID_Cal_Switch
LTG_Put_MSID_Data
LTG_Put_MSID_Decom_Data
LTG_Put_MSID_ES_Switch
LTG_Put_MSID_Expected_State
LTG_Put_MSID_Group_ID_List
LTG_Put_MSID_Limit_Switch
LTG_Put_MSID_Limits
LTG_Put_MSID_Point_Pairs
LTG_Put_MSID_Poly_Cals
LTG_Put_MSID_State_Codes
LTG_Put_MSID_Stream_List
LT_List
LT_Set_Cols_N_Place_Hldrs
LT_Subset_List
LVU_Set_Cols_N_Place_Hldrs
Last_Packet_Counter
Llmerge
Local_Table_Revision_Counter
Log_Message
Log_Message_With_MSID
Log_Message_With_MSID_And_Source
Log_Message_With_Source
MHI_Message_Type_Text
MH_Application_Group_Type_Text
MH_Get_Message_String
MH_Get_Message_Table_Entry
MH_Log_Message
Make_Double
Make_Float
Make_Group_Requests
Make_Integer
Make_Path
NASCOM_Header
NASCOM_Network_Header
NASCOM_UPD_Active_State_Text
NASCOM_User_Header_I
NDL_Add_File_List_Node
NDL_Bld_Major_Frame
NDL_CO_Buffer_Receive
NDL_CO_Buffer_Send
NDL_CO_Server_Accept
NDL_Common_Init
NDL_Convert_GMT_To_Seconds
NDL_Convert_MET_To_Seconds
NDL_Convert_MET_to_Str
NDL_Convert_Time_EHS_to_Seconds
NDL_Convert_Time_Seconds_to_Str
NDL_Determine_Curr_DQ
NDL_Find_Renamed_Curr_Log
NDL_Free_File_List
NDL_Get_Curr_Packet_Size
NDL_Get_Data_Status
NDL_Get_File_List
NDL_Get_First_LTD_Packet
NDL_Get_LTD_Packet_Ptr
NDL_Get_Log_Dir_Root
NDL_Get_Major_Frame_Index
NDL_Get_Max_Playback_Bandwidth
NDL_Get_Max_Tlm_Retrievals
NDL_Get_Max_Usage_Retrievals
NDL_Get_Next_LTD_Packet
NDL_Get_Num_Buffers
NDL_Get_Packet_EBT
NDL_Get_Packet_Format_ID
NDL_Get_Packet_MET
NDL_Get_Packet_Time
NDL_Get_Raw_TDM_Bit
NDL_Get_Requested_Time
NDL_Get_Temporary_Dir_Root
NDL_Is_File_In_Time_Range
NDL_Minor_Frames_Per_Packet
NDL_NS_Receive_Alarm
NDL_Open_LTD_File
NDL_Packets_Per_Major_Frame
NDL_Parse_APID
NDL_Parse_Close_Code
NDL_Parse_Data_Mode
NDL_Parse_Format_Id
NDL_Parse_Protocol
NDL_Parse_Start_Time
NDL_Parse_Stop_Time

NDL_Put_Log_Dir_Root
NDL_Put_Max_Playback_Bandwidth
NDL_Put_Max_Tlm_Retrievals
NDL_Put_Max_Usage_Retrievals
NDL_Put_Num_Buffers
NDL_Put_Temporary_Dir_Root
NDL_Read_LTD_Packet
NDL_Reset_Curr_File_Position
NDL_Slow_Stream_Packets
NRPT_Bulk_Validate_NDC_UDE
NRPT_Bulk_Validate_NLR_UDE
NRPT_Bulk_Validate_NSR_UDE
NRPT_Convert_GMTDate_To_Seconds
NRPT_Convert_METDate_To_Seconds
NRPT_Is_NDC_UDE_Valid_For_DBVer
NRPT_Is_NLR_UDE_Valid_For_DBVer
NRPT_Is_NSR_UDE_Valid_For_DBVer
NRPT_Read_NDC_UDE
NRPT_Read_NLR_UDE
NRPT_Read_NSR_UDE
NRPT_Update_NDC_UDE_Val_Info
NRPT_Update_NLR_UDE_Val_Info
NRPT_Update_NSR_UDE_Val_Info
NRPT_Validate_Data_Mode
NRPT_Validate_Data_Processing
NRPT_Validate_Data_Source
NRPT_Validate_Date
NRPT_Validate_Dec_Filter_Value
NRPT_Validate_Display_Format
NRPT_Validate_Display_Type
NRPT_Validate_Filter_Info
NRPT_Validate_Filter_Test
NRPT_Validate_Filter_Type
NRPT_Validate_Filter_Value
NRPT_Validate_LES_Sensing
NRPT_Validate_MSID
NRPT_Validate_MSID_Table
NRPT_Validate_NDC_UDE
NRPT_Validate_NLR_UDE
NRPT_Validate_NRTDir_Criteria
NRPT_Validate_NSR_UDE
NRPT_Validate_Name
NRPT_Validate_Representation
NRPT_Validate_Sample_Thinning
NRPT_Validate_Time_Filter_Value
NRPT_Validate_Time_Info
NRPT_Write_NDC_UDE
NRPT_Write_NLR_UDE
NRPT_Write_NSR_UDE
NRPT_Write_Validation_Message
NS_CL_Multicast_Source
NS_CL_Packet_Source
NS_CL_Unicast_Client
NS_CL_rec_multicast_group
NS_CL_rec_packet_receive
NS_CL_rec_unicast_server
NS_EhsServicename_Search
NS_Get_TNS_Param_Entry
NS_MH_Log_Message
NS_Release_Res
NS_Servicename_Search
NS_get_data_mode_offset
NS_get_number_of_data_source
NS_get_size_data_source
NS_nc_info_reset
NS_strncat
NS_strncpy
Non_EHS_Enable_Text
Number_Of_Available_Times
OCDB_Build_AXAF_Command
OCDB_Build_Hzrds_Cmd_List
OCDB_Build_Uplink_Format
OCDB_Chain_Enabled
OCDB_Cmd_Enabled
OCDB_Connect
OCDB_Delete_Dataset
OCDB_Disconnect
OCDB_Enable_Chain
OCDB_Enable_Cmd
OCDB_Enable_User
OCDB_Get_CSS_Config
OCDB_Get_Chain_Definition
OCDB_Get_Chain_Inventory
OCDB_Get_Cmd_Track
OCDB_Get_Cmd_Track_Init_Data
OCDB_Get_Command_Fields
OCDB_Get_Command_Inventory
OCDB_Get_Dataset_Fields
OCDB_Get_Dataset_Names
OCDB_Get_Header_Fields
OCDB_Get_Header_Inventory
OCDB_Get_Tlm_Timeout
OCDB_Get_Tlm_Verifier
OCDB_Get_Uplink_Data
OCDB_Get_Users
OCDB_INT_A_To_SEBC
OCDB_INT_B_To_IDIS
OCDB_INT_B_To_IPAR
OCDB_INT_B_To_IUNS
OCDB_INT_Compute_Byte_Sum_Checksum
OCDB_INT_Compute_Byte_XOR_Checksum
OCDB_INT_Compute_CRC_Checksum
OCDB_INT_Compute_Odd_Parity
OCDB_INT_Copy_Field_Uplink_Data
OCDB_INT_D_To_FIBM
OCDB_INT_D_To_IMAG
OCDB_INT_D_To_ITWO
OCDB_INT_H_To_IUNS

OCDB_INT_Insert_Uplink_Data
OCDB_INT_Move_Bits
OCDB_INT_O_To_IUNS
OCDB_Log_CAR
OCDB_Log_CRR
OCDB_Log_CRR_Data
OCDB_Log_FSV
OCDB_Log_Transaction
OCDB_Log_Uplink
OCDB_Save_Dataset
OCDB_Set_Active_Status
OCDB_Update_CSS_Config
OCDB_Update_Chain
OCDB_Update_Command
OCDB_Update_Header
OCDB_Validate_Chain
OCDB_Validate_Cmd
ODE_Connect
ODE_Database_Check_Name
ODE_Database_Delete
ODE_Database_Get_Names
ODE_Database_Get_SE_Names
ODE_Database_Get_Types
ODE_Database_Retrieve
ODE_Database_Retrieve_Sub_Element
ODE_Database_Store
ODE_Database_Store_Sub_Element
ODE_Database_Transfer_File
ODE_Disconnect
ODE_Get_CMD_Attributes
ODE_Load_CMD_Attributes
ODE_MH_Logger
ODE_Store
ODE_Store_Sub_Element
ODE_User_Retrieve
ODE_User_Retrieve_Sub_Element
OD_OI_Format_Rate_Text
PAL_Decrement_Service_Packet_Counter
PAL_Get_Burst_Length
PAL_Get_DP_PID
PAL_Get_Last_Write_MJFB
PAL_Get_Last_Write_PDB
PAL_Get_MC_Address
PAL_Get_MC_Index
PAL_Get_MJFB_ID
PAL_Get_MJFB_Length
PAL_Get_NPA_fifoname
PAL_Get_Num_Pkts
PAL_Get_PDB_ID
PAL_Get_PDB_Read_Lock
PAL_Get_PDB_Write_Lock
PAL_Get_PIT_Ptr_Semid
PAL_Get_PIT_Revision_Counter
PAL_Get_PLVT_ID
PAL_Get_Packet_Index
PAL_Get_Packet_Length
PAL_Get_Pkt_Info
PAL_Get_Pkt_Update_Counter
PAL_Get_Source_Info
PAL_Increment_Service_Packet_Counter
PAL_MH_Log_Message
PAL_Release_PDB_Read_Lock
PAL_Release_PDB_Write_Lock
PAL_Reset_BUFFinfo
PAL_Update_BUFFinfo
PAL_Update_Pkt_Updt_Ctr
PAL_Write_DPpid_NPAfifoname
PBC_Get_Playback_Channel
PBC_Get_Recommended_TDB_Version
PBC_Release_Playback_Channel
PBC_Request_Playback_Status
PBC_Validate_Request
PBC_channel_is_valid
PBC_get_channel_by_data_mode
PBC_packet_id_to_string
PBC_string_to_packet_id
PBC_string_to_time
PBC_time_to_string
PDI_GSE_Format_Code_Text
PM_MH_Log_Message
Perform_Telemetry_Processing
Pit_Info
Prime_Backup_Text
Pseudo_Log_Message
Read_Last_Value_Table
Read_Pseudo_Last_Value_Table
Reconfigure_DP
Register_Activity_Logger
Register_Activity_Logger_By_Name
Remove_Activity_Loggers
Remove_From_Bottom_Of_List
Remove_from_Packet_List
Request_New_Packet_Updates
Returned_Result
SCM_Status
SCR_Validate
SMCM_Build_EHS_Nodes_Buffer
SMCM_Build_FPT
SMCM_Build_IPT_Configuration_Buf
SMCM_Build_MOP_Info
SMCM_Build_MOP_Path
SMCM_Build_MOP_Support_Node_Buffer
SMCM_Build_MOP_Title
SMCM_Build_RoutingDB_Buffer
SMCM_Check_RoutingDB_MOP_Address
SMCM_Copy_MOP_Info
SMCM_Copy_Node_Op_List_Type
SMCM_DB_Close

SMCM_DB_Delete
SMCM_DB_Delete_Record
SMCM_DB_Fetch
SMCM_DB_Find
SMCM_DB_Find_Free
SMCM_DB_Hash
SMCM_DB_Lock
SMCM_DB_Next_Record
SMCM_DB_Open
SMCM_DB_Read_Data
SMCM_DB_Read_Index
SMCM_DB_Read_Pointer
SMCM_DB_Rewind
SMCM_DB_Store
SMCM_DB_Unlock
SMCM_DB_Write_Data
SMCM_DB_Write_Index
SMCM_DB_Write_Pointer
SMCM_Delete_MOP_Org_View
SMCM_Dwnld_Activate_PB_Routing
SMCM_Free_FPT
SMCM_Free_File_Info_List
SMCM_Free_File_Info_List_Data
SMCM_Free_File_List
SMCM_Free_IPT_Memory
SMCM_Free_MOP_List
SMCM_Free_Node_Op_Data
SMCM_Free_Node_Op_List
SMCM_Free_PID_List
SMCM_Free_PT_List
SMCM_Free_RoutingDB_Memory
SMCM_Free_Subnet_List
SMCM_Free_Support_Node_List
SMCM_Get_Active_Local_MOPs
SMCM_Get_Agent_Persistent_State
SMCM_Get_Backup_Op_Text
SMCM_Get_Backup_Op_Text_Array
SMCM_Get_Backup_Op_Value
SMCM_Get_Command_Array
SMCM_Get_Command_Error_Code
SMCM_Get_Command_Syntax
SMCM_Get_Command_Text
SMCM_Get_Command_Value
SMCM_Get_Error_Code_Text
SMCM_Get_FPT
SMCM_Get_File_Basename
SMCM_Get_File_Path
SMCM_Get_File_Prefix
SMCM_Get_IPT_Configuration_Data
SMCM_Get_Initialized_Local_MOPs
SMCM_Get_Local_MOPs
SMCM_Get_MOP_Status_Text
SMCM_Get_MOP_Status_Text_Array
SMCM_Get_MOP_Status_Value
SMCM_Get_PDB_Process_List
SMCM_Get_Peer
SMCM_Get_Peer_Address
SMCM_Get_Peer_Hostname
SMCM_Get_Playback_Parms_Text
SMCM_Initialize_FPT
SMCM_Initialize_Node_Op_Lists
SMCM_Load_Long
SMCM_Load_MOP
SMCM_Load_Short
SMCM_MOP_Path_To_Info
SMCM_MOP_Title_To_Info
SMCM_Make_Directory
SMCM_Net_Accept
SMCM_Net_Close
SMCM_Net_Connect
SMCM_Net_Open
SMCM_Net_Read
SMCM_Net_Receive
SMCM_Net_Send
SMCM_Net_Write
SMCM_PState_File_Path
SMCM_Parse_Agent_PState
SMCM_Parse_FPT
SMCM_Parse_FPT_Process_List
SMCM_Parse_IPT_Configuration_Buffer
SMCM_Parse_MOP_Support_Nodes
SMCM_Parse_RoutingDB
SMCM_Playback_Routing_Update
SMCM_Populate_PB_Routing_Table
SMCM_Purge_Net_Connection
SMCM_Read_Dir
SMCM_Realloc_Node_Op_List_Type
SMCM_Register
SMCM_Register_Peer
SMCM_Retrieve_Long
SMCM_Retrieve_MOP
SMCM_Retrieve_Short
SMCM_Send_Backup_Request
SMCM_Send_Status_Code
SMCM_Update_Failure_Node_List
SMCM_Update_PB_Routing_Table
SMCM_Validate_MOP
SMCM_Validate_Mission_Name
SMCM_Validate_PB_Routing_Table
SMCMclient_Activate_Configuration
SMCMclient_Activate_Failover
SMCMclient_Build_MOP_Org_View
SMCMclient_Close_File
SMCMclient_Copy_Files
SMCMclient_Delete_End_Node_MOP
SMCMclient_Delete_Files
SMCMclient_Delete_MOP
SMCMclient_Download_Activate_File

SMCMclient_Download_Files
SMCMclient_Get_EHS_Nodes
SMCMclient_Get_Spectrum_Subnet_Nodes
SMCMclient_Kill_PID
SMCMclient_Lock_Configuration
SMCMclient_New_File
SMCMclient_New_MOP
SMCMclient_Read_Directory
SMCMclient_Read_File
SMCMclient_Receive_File_Download_Status
SMCMclient_Receive_Node_Data
SMCMclient_Retrieve_Command_Status
SMCMclient_Retrieve_MOP_Config_Files
SMCMclient_Retrieve_MOP_Org_View_Nodes
SMCMclient_Retrieve_MOP_Status
SMCMclient_Retrieve_MOP_Support_Nodes
SMCMclient_Retrieve_MOPs
SMCMclient_Retrieve_Node_Data
SMCMclient_Retrieve_PIDs
SMCMclient_Retrieve_RoutingDB
SMCMclient_Retrieve_Subnet_Nodes
SMCMclient_Retrieve_Subnets
SMCMclient_Start_MOP
SMCMclient_Start_Processes
SMCMclient_Stop_MOP
SMCMclient_Sync_Servers
SMCMclient_Write_File
SMI_Append_String
SMI_Attach_Shared_Memory
SMI_Build_CCP_Configuration_Buf
SMI_Build_Common_Configuration_Buffer
SMI_Build_FEP_AGENT_Failover_Table_Buffer
SMI_Build_MH_Configuration_Buffer
SMI_Build_NASCOM_Configuration_Buffer
SMI_Build_NDL_Configuration_Buffer
SMI_Build_OD_Configuration_Buffer
SMI_Build_PDI_GSE_Configuration_Buffer
SMI_Build_SCR_Configuration_Buffer
SMI_Build_TDM_Configuration_Buffer
SMI_Build_TDM_DQ_Config_Buffer
SMI_Build_TDM_Initial_Config_Buffer
SMI_Build_TDM_Main_Config_Buffer
SMI_Build_TNS_AST_Configuration_Buffer
SMI_Build_TNS_GSE_Configuration_Buffer
SMI_Build_TNS_PRT_Configuration_Buffer
SMI_Build_TNS_Scalar_Configuration_Buffer
SMI_Build_WCP_Configuration_Buffer
SMI_Calculate_TDM_Location
SMI_Calculate_TDM_Locations
SMI_Check_Config_File_Version
SMI_Close_Semaphore
SMI_Create_NASCOM_Formats_Array
SMI_Create_OD_OI_Formats_Array
SMI_Create_OD_Streams_Array
SMI_Create_TDM_Format_Array
SMI_Decrement_Semaphore
SMI_Delete_Shared_Memory
SMI_Detach_Shared_Memory
SMI_FEPSC_Find_SP_Candidate
SMI_Find_Buffer_Section
SMI_Find_OD_Stream_Index
SMI_Free_FEP_AGENT_Failover_Table_Memory
SMI_Free_TNS_AST_Configuration_Memory
SMI_Free_TNS_GSE_Configuration_Memory
SMI_Free_TNS_PRT_Configuration_Memory
SMI_Get_Buffer_Section
SMI_Get_FEP_AGENT_Failover_Table_Data
SMI_Get_Key
SMI_Get_NASCOM_Max_Buffer_Size
SMI_Get_OD_Max_Buffer_Size
SMI_Get_SSSS_Login_MOP_Path
SMI_Get_Semaphore_Value
SMI_Get_String_Index
SMI_Get_TDM_Max_Buffer_Size
SMI_Increment_Semaphore
SMI_Initialize_OD_Config
SMI_Initialize_TDM_Config
SMI_Initialize_TNS_Configuration_Data
SMI_Lock_File
SMI_Open_Semaphore
SMI_Open_Shared_Memory
SMI_Parse_Buffer_Section
SMI_Parse_CCP_Configuration_Buf
SMI_Parse_CC_DOSH_MET_Format
SMI_Parse_CC_DOSH_Table
SMI_Parse_CC_DOSH_Time_Common_Format
SMI_Parse_Common_Config_With_DOSH_Table_Buffer
SMI_Parse_Common_Configuration_Buffer
SMI_Parse_FEP_AGENT_Failover_Table_Buffer
SMI_Parse_Integer_From_Row
SMI_Parse_Integer_Parameter
SMI_Parse_MH_Configuration_Buffer
SMI_Parse_MH_Message_Table
SMI_Parse_NASCOM_Configuration_Buffer
SMI_Parse_NASCOM_Formats
SMI_Parse_NASCOM_Parameters
SMI_Parse_NDL_Configuration_Buffer

SMI_Parse_OD_Configuration_Buffer
SMI_Parse_OD_General_Config
SMI_Parse_OD_OI_Format
SMI_Parse_OD_OI_Formats
SMI_Parse_OD_OI_TDM_Config
SMI_Parse_OD_Overall_TDM_Config
SMI_Parse_OD_Streams
SMI_Parse_PDI_GSE_Configuration_Buffe
r
SMI_Parse_SCR_Configuration_Buffer
SMI_Parse_String_From_Row
SMI_Parse_String_Parameter
SMI_Parse_TDM_Config
SMI_Parse_TDM_Configuration_Buffer
SMI_Parse_TDM_DQ_Info
SMI_Parse_TDM_Format
SMI_Parse_TDM_Formats
SMI_Parse_TDM_General_Config
SMI_Parse_TDM_Serial_Info
SMI_Parse_TDM_Stream_Info
SMI_Parse_TNS_AST_Configuration_Buffe
r
SMI_Parse_TNS_GSE_Configuration_Buffe
r
SMI_Parse_TNS_PRT_Configuration_Buffe
r
SMI_Parse_TNS_Scalar_Configuration_Bu
ffer
SMI_Parse_WCP_Configuration_Buffer
SMI_Read_Common_Configuration
SMI_Read_Configuration_File
SMI_Remove_Semaphore
SMI_Set_Base_SM_Config_Path
SMI_Set_SM_Config_Path
SMI_Terminated_Strncpy
SMI_Test_File_Lock
SMI_Trim_Leading_Blanks
SMI_Trim_Trailing_Blanks
SM_Build_Trap
SM_Config_Path
SM_FEPSC_Close_Agent_Fifo
SM_FEPSC_Open_Agent_Fifo_To_Write
SM_FEPSC_Write_Agent_Fifo
SM_Forwarding_Service_Type_Text
SM_Free_CCP_Configuration_Mem
SM_Free_Common_Config_With_DOSH_Table
_Memory
SM_Free_FEP_NASCOM_Configuration_Memo
ry
SM_Free_FEP_OD_Configuration_Memory
SM_Free_FEP_PDI_GSE_Configuration_Mem
ory
SM_Free_FEP_TDM_Configuration_Memory
SM_Free_MH_Configuration_Memory
SM_Free_NDL_Configuration_Memory
SM_Free_SCR_Configuration_Memory
SM_Free_TNS_Configuration_Memory
SM_Free_TNS_EHS_Service_List
SM_Free_WCP_Configuration_Memory
SM_Get_CCP_Configuration_Data
SM_Get_Common_Config_With_DOSH_Table_
Data
SM_Get_Common_Configuration_Data
SM_Get_FEP_NASCOM_Configuration_Data
SM_Get_FEP_OD_Configuration_Data
SM_Get_FEP_PDI_GSE_Configuration_Data
SM_Get_FEP_TDM_Configuration_Data
SM_Get_MH_Configuration_Data
SM_Get_MH_Source
SM_Get_NDL_Configuration_Data
SM_Get_Peer_Address
SM_Get_Peer_Hostname
SM_Get_Reconfig_Type
SM_Get_SCR_Configuration_Data
SM_Get_TNS_Configuration_Data
SM_Get_TNS_EHS_Service_List
SM_Get_WCP_Configuration_Data
SM_How_Many_Length_Bytes
SM_Is_Failover
SM_Is_Start_MOP
SM_Is_Stop_MOP
SM_Load_Long
SM_Load_Short
SM_MH_Destination_Type_Text
SM_MH_Message_Type_Text
SM_MH_Parameters
SM_MH_To_Spectrum
SM_MOP_Config_Path
SM_Net_Accept
SM_Net_Close
SM_Net_Connect
SM_Net_Open
SM_Net_Read
SM_Net_Receive
SM_Net_Send
SM_Net_Write
SM_PMAT_Query
SM_Retrieve_Long
SM_Retrieve_Short
SM_Send_Ack
SM_Send_Nak
SM_Send_Trap
SM_Set_Length_Byte
SM_WCP_Destination_Type_Text
SM_WCP_Primary_Type_Text
SSCS_Allocate_Async_IO_State_Structur
e
SSCS_Allocate_Device

```
SSCS_Allocate_Queued_Signal_State_Str
ucture
SSCS_Async_Cancel
SSCS_Async_Init
SSCS_Async_Read
SSCS_Async_Signal_Handler
SSCS_Async_Write
SSCS_Block_All_Signals
SSCS_Cleanup_Files
SSCS_Clear_Timer
SSCS_Deallocate_Device
SSCS_ER_Abort_After_Message
SSCS_ER_Continue_After_Message
SSCS_ER_Debug
SSCS_ER_Disable_Message
SSCS_ER_Enable_Message
SSCS_ER_Error
SSCS_ER_Fatal_Error
SSCS_ER_Info
SSCS_ER_Initialize
SSCS_ER_Register_Logger
SSCS_ER_Register_Logger_By_Name
SSCS_ER_Remove_Loggers
SSCS_ER_Trace
SSCS_ER_Warning
SSCS_Environ_Find
SSCS_Environ_Get
SSCS_Environ_Get_Value
SSCS_Environ_New
SSCS_Environ_Set
SSCS_Environ_Set_Entry
SSCS_Find_Queued_Signal_State_Structu
re
SSCS_Force_Error_Async
SSCS_Force_Error_Block_Signal
SSCS_Force_Error_Queued_Signal
SSCS_Force_Error_Timer
SSCS_Ftok
SSCS_Ftruncate
SSCS_Init_Timer
SSCS_Integer_Queued_Signal
SSCS_Integer_Queued_Signal_Init
SSCS_Integer_Signal_Handler
SSCS_Itoa
SSCS_MH_Acknowledge_Text
SSCS_MH_Destination_Text
SSCS_MH_Last_GMT
SSCS_MH_Last_MET
SSCS_MH_Last_Message
SSCS_MH_Last_Return
SSCS_MH_Log_Message
SSCS_MH_Severity_Text
SSCS_MH_Table
SSCS_Mem_Calloc
SSCS_Mem_Crc
SSCS_Mem_Declare
SSCS_Mem_Dump
SSCS_Mem_Examine
SSCS_Mem_Free
SSCS_Mem_Info
SSCS_Mem_Malloc
SSCS_Mem_Realloc
SSCS_Mem_Validate
SSCS_Nanosleep
SSCS_OS_chdir
SSCS_OS_chmod
SSCS_OS_chown
SSCS_OS_close
SSCS_OS_dup2
SSCS_OS_execl
SSCS_OS_execv
SSCS_OS_execve
SSCS_OS_fchmod
SSCS_OS_fchown
SSCS_OS_fgets
SSCS_OS_fopen
SSCS_OS_fork
SSCS_OS_fstat
SSCS_OS_getenv
SSCS_OS_gethostbyaddr
SSCS_OS_gethostbyname
SSCS_OS_getpeername
SSCS_OS_getpgid
SSCS_OS_getpwuid
SSCS_OS_getsid
SSCS_OS_initgroups
SSCS_OS_kill
SSCS_OS_link
SSCS_OS_lstat
SSCS_OS_mkdir
SSCS_OS_mmap
SSCS_OS_munmap
SSCS_OS_nice
SSCS_OS_open
SSCS_OS_pipe
SSCS_OS_read
SSCS_OS_read_full
SSCS_OS_rename
SSCS_OS_rmdir
SSCS_OS_schedctl
SSCS_OS_setgid
SSCS_OS_setpgid
SSCS_OS_setreuid
SSCS_OS_setsid
SSCS_OS_setuid
SSCS_OS_stat
SSCS_OS_tcsetattr
SSCS_OS_uname
```

SSCS_OS_unlink
SSCS_OS_waitpid
SSCS_OS_write
SSCS_OS_write_full
SSCS_PDB_Add_Entry
SSCS_PDB_Calculate_Key
SSCS_PDB_Close
SSCS_PDB_Delete_Entry
SSCS_PDB_Find_Entry
SSCS_PDB_Get_Entry
SSCS_PDB_Insert_Entry
SSCS_PDB_Lock
SSCS_PDB_Map_DB
SSCS_PDB_Open
SSCS_PDB_Process_Error
SSCS_PDB_Read_Entry
SSCS_PDB_Read_Next_Entry
SSCS_PDB_Remove_Entry
SSCS_PDB_Reset
SSCS_Pointer_Queued_Signal
SSCS_Pointer_Queued_Signal_Init
SSCS_Pointer_Signal_Handler
SSCS_Reserve_Device
SSCS_Select
SSCS_Sem_Acquire
SSCS_Sem_Create
SSCS_Sem_Create_Extended
SSCS_Sem_Key
SSCS_Sem_Kill
SSCS_Sem_Release
SSCS_Sem_Value
SSCS_Set_Signal_Mask
SSCS_Set_Timer
SSCS_Shm_Attach
SSCS_Shm_Create
SSCS_Shm_Create_Extended
SSCS_Shm_Detach
SSCS_Shm_Key
SSCS_Shm_Kill
SSCS_Status_Timer
SSCS_TSI_Allocate_Async_IO_State_Stru
cture
SSCS_TSI_Async_Cancel
SSCS_TSI_Async_Init
SSCS_TSI_Async_Init_File
SSCS_TSI_Async_Read
SSCS_TSI_Async_Read_With_Status
SSCS_TSI_Async_Read_With_Status_File
SSCS_TSI_Async_Write
SSCS_TSI_Blocked_Read
SSCS_TSI_Blocked_Read_With_Status
SSCS_TSI_Blocked_Write
SSCS_TSI_Check_NASCOM_CRC
SSCS_TSI_Close_Rcv
SSCS_TSI_Close_Rcv_File
SSCS_TSI_Close_Sim
SSCS_TSI_Close_Xmt
SSCS_TSI_Compute_Append_NASCOM_CRC
SSCS_TSI_Compute_NASCOM_CRC
SSCS_TSI_Get_Board_Status
SSCS_TSI_Get_Fsync_Error_Code
SSCS_TSI_Get_Fsync_Status
SSCS_TSI_Get_Subframe_Sync_Status
SSCS_TSI_Get_Telsim_Error_Code
SSCS_TSI_Get_Telsim_Status
SSCS_TSI_Insert_Bit_Slip_Errs
SSCS_TSI_Insert_Counter_Errs
SSCS_TSI_Insert_Data_Errs
SSCS_TSI_Insert_Sync_Errs
SSCS_TSI_Open_To_Rcv
SSCS_TSI_Open_To_Rcv_File
SSCS_TSI_Open_To_Sim
SSCS_TSI_Open_To_Xmt
SSCS_TSI_Read_Data_File
SSCS_TSI_Reset_Rcv
SSCS_TSI_Reset_Rcv_FIle
SSCS_TSI_Reset_Sim
SSCS_TSI_Reset_Xmt
SSCS_TSI_Signal_Handler
SSCS_TSI_Sim_Telemetry
SSCS_Time
SSCS_Unreserve_Device
SSCS_VMC_Lock
SSCS_VMC_Unlock
SSCS_VMC_Usage
SSPM_APT_Field_Lengths
SSPM_APT_Field_Str
SSPM_APT_Field_Str_Ext
SSPM_APT_Field_StrtoValue
SSPM_APT_Field_ValuetoStr
SSPM_APT_Filter_Compare
SSPM_Access_Priority
SSPM_Attribute_Str
SSPM_Attribute_StrtoValue
SSPM_Attribute_ValuetoStr
SSPM_Bitmask_To_Index
SSPM_Bitmask_To_Index_Word
SSPM_Bitmask_To_Str
SSPM_Build_VA_Argv
SSPM_CSCI_Class___311
SSPM_Cancel_Term_Notify___311
SSPM_Capability_StrtoValue
SSPM_Capability_ValuetoStr
SSPM_Catch_Signal_From_Watch___311
SSPM_Change_APT_Notify_Counter
SSPM_Change_APT_Servc
SSPM_Change_APT_Service
SSPM_Change_APT___311

SSPM_Change_Priority_Service
SSPM_Change_Priority___311
SSPM_Change_UDE___311
SSPM_Check_Host
SSPM_Class_Str
SSPM_Class_StrtoValue
SSPM_Class_ValuetoStr
SSPM_Clean_APT
SSPM_Close_APT
SSPM_Close_Ans
SSPM_Common_Config
SSPM_Compare_Longs
SSPM_Compare_Strings
SSPM_Copy_APT_Rec___311
SSPM_Current_Host
SSPM_Data_Mode
SSPM_Data_Mode_Enum
SSPM_Decode_APT_Str
SSPM_Decode_Msg
SSPM_Do_Stubs
SSPM_Dynamic_Strcpy
SSPM_Encode_APT_Str
SSPM_Encode_Msg
SSPM_Error_File
SSPM_Error_Str
SSPM_Error_StrtoValue
SSPM_Error_ValuetoStr
SSPM_Ext_APT_Field_StrtoValue
SSPM_Ext_APT_Field_ValuetoStr
SSPM_Filter_APT
SSPM_Filter_Optimize
SSPM_Find_End_Of_Expression
SSPM_Flags_Str
SSPM_Flags_StrtoValue
SSPM_Flags_ValuetoStr
SSPM_Fork
SSPM_Free_APT___311
SSPM_GUI_Error_Str
SSPM_Get_APT_Field_String
SSPM_Get_APT_Record
SSPM_Get_Config
SSPM_Get_Nice_Value
SSPM_Get_Nondegrading_Priority
SSPM_Get_OS_Ps
SSPM_Get_Proc_Pids___311
SSPM_Get_Proc_Status_Service
SSPM_Get_Proc_Status___311
SSPM_Index_To_Bitmask
SSPM_Index_To_Bitmask_Word
SSPM_Init_APT_Rec
SSPM_Init_APT_Rec_Strings
SSPM_Init_Bitmask
SSPM_Init_EHS
SSPM_Kill_Proc_Timed___311
SSPM_Kill_Proc___311
SSPM_Kill_Service
SSPM_MET_epoch
SSPM_New_APT
SSPM_Notify_Handler___311
SSPM_Open_APT
SSPM_Open_Ans
SSPM_Output_Message
SSPM_Output_Msg_Common
SSPM_Output_Pidlist_Msg
SSPM_Parse_Env_File
SSPM_Parse_Integer_From_Row
SSPM_Parse_String_From_Row
SSPM_Parser
SSPM_PriorityOp_Str
SSPM_Project
SSPM_Ptr_Array_Len
SSPM_Put_APT_Field_String
SSPM_Recv_Msg
SSPM_Recv_One
SSPM_Register_Proc___311
SSPM_Register_UDE___311
SSPM_Remove_Nondegrading_Priority
SSPM_Req_Term_Notify___311
SSPM_Resume_Proc___311
SSPM_Send_Msg
SSPM_Set_APT_Walk_Index
SSPM_Set_Nice_Value
SSPM_Set_Nondegrading_Priority
SSPM_Should_Force
SSPM_Sigdata_Proc___311
SSPM_Signal_Data_Service
SSPM_Signal_Proc___311
SSPM_Start_Proc_Service
SSPM_Start_Proc___311
SSPM_Start_UDE___311
SSPM_Status_Str
SSPM_Str_To_Bitmask
SSPM_Str_To_Value
SSPM_Stub_Control
SSPM_Support_Mode
SSPM_Suspend_Proc___311
SSPM_UDEType_StrtoValue
SSPM_UDEType_ValuetoStr
SSPM_UDE_Type_Str
SSPM_Update_Start_Time
SSPM_Validate_Host
SSPM_Validate_Unordered_Valstr
SSPM_Validate_Valstr
SSPM_Valstr_Array_Len
SSPM_Valstr_Compare
SSPM_Value_To_Str
SSPM_Version_Chk___311
SSPM_Watch_For_Termination_Service

SSPM_lladd
SSPM_lldel
SSPM_llfind
SSRM_Get_Peer_Address
SSRM_Get_Peer_Hostname
SSRM_Load_Long
SSRM_Load_Short
SSRM_Net_Accept
SSRM_Net_Close
SSRM_Net_Connect
SSRM_Net_Open
SSRM_Net_Read
SSRM_Net_Receive
SSRM_Net_Send
SSRM_Net_Write
SSRM_Purge_Net_Connection
SSRM_Retrieve_Long
SSRM_Retrieve_Short
SSRM_Status_Str
SSSS_ANS_Address_Node_Name
SSSS_ANS_Address_of
SSSS_ANS_Address_of_Host
SSSS_ANS_Address_of_NSAP
SSSS_ANS_Address_of_Service
SSSS_ANS_Endpoint_Connect
SSSS_ANS_Endpoint_Create
SSSS_ANS_Endpoint_Destroy
SSSS_ANS_Endpoint_Disconnect
SSSS_ANS_Get_File_Descriptor
SSSS_ANS_Read
SSSS_ANS_Result_Message
SSSS_ANS_Set_Confidentiality
SSSS_ANS_Write
SSSS_ANS_gethostbyname
SSSS_Add_Group
SSSS_Cap_Close
SSSS_Cap_Open
SSSS_Cap_Read
SSSS_Cap_Read_Any
SSSS_Comps_Function_Allowed
SSSS_DLM_Add
SSSS_DLM_Add_File_Entry
SSSS_DLM_Add_File_Entry_FT
SSSS_DLM_Create
SSSS_DLM_Destroy
SSSS_DLM_Get_Attr
SSSS_DLM_List
SSSS_DLM_List_Free
SSSS_DLM_Q_Dir
SSSS_DLM_Read_Dir
SSSS_DLM_Set_Attr
SSSS_DLM_Sort
SSSS_DLM_Sort_Ascending
SSSS_DLM_Sort_Descending
SSSS_DLM_UDE_Path
SSSS_DLM_UDE_Types
SSSS_DLM_UDEs
SSSS_DLM_UDEs_Full
SSSS_DLM_Update_File_Mode
SSSS_D_Monitor_Shutdown
SSSS_EFT_Command_Tokens
SSSS_EFT_Connect
SSSS_EFT_Dir_Contents
SSSS_EFT_Dir_Create
SSSS_EFT_Dir_Destroy
SSSS_EFT_Dir_Set_Current
SSSS_EFT_Dir_Share
SSSS_EFT_Disconnect
SSSS_EFT_File_Chmod
SSSS_EFT_File_Destroy
SSSS_EFT_File_Pull
SSSS_EFT_File_Pull_Unique
SSSS_EFT_File_Push
SSSS_EFT_File_Push_Unique
SSSS_EFT_File_Rename
SSSS_EFT_File_Share
SSSS_EFT_File_Status
SSSS_EFT_Option_Content
SSSS_EFT_Option_Feedback
SSSS_EFT_Option_Preserve_Mode
SSSS_EFT_Option_Quarantine
SSSS_EFT_Overwrite_Allowed_Function
SSSS_EFT_Overwrite_Denied_Function
SSSS_EFT_Response_Tokens
SSSS_EFT_Result_Message
SSSS_ERIS_Display_Message
SSSS_ERIS_Print_Env
SSSS_Env_Import
SSSS_Env_Load
SSSS_Env_Load_List
SSSS_Event_Ignore
SSSS_Event_User_Shutdown_Handler
SSSS_Event_User_Shutdown_Notify
SSSS_Event_User_Startup_Handler
SSSS_Event_User_Startup_Notify
SSSS_Fault_Disable
SSSS_Fault_Enable
SSSS_Fault_Enabled
SSSS_Fault_Malloc_Disable
SSSS_Fault_Malloc_Enable
SSSS_Fault_Malloc_Enabled
SSSS_Fault_Mode
SSSS_Fault_Set_Mode
SSSS_File_Change_Doit
SSSS_File_Change_File
SSSS_File_Change_Group
SSSS_File_Change_List
SSSS_File_Copy

SSSS_File_Copy_If_Newer
SSSS_File_Dir_Create_Hier
SSSS_File_Dir_Create_List
SSSS_File_Directory_Create
SSSS_File_Duplicate
SSSS_File_Lock
SSSS_File_Path_Write_Protected
SSSS_File_Temp_Name
SSSS_File_Unlock
SSSS_File_Write_Protected
SSSS_Fit_X_Directory
SSSS_Free
SSSS_Get_Firewall_Address_Str
SSSS_Get_Firewall_Node
SSSS_Get_Host_Address_Str
SSSS_Get_Node_By_Platform
SSSS_Get_Platform_Node
SSSS_Get_XAUTOLOCK_Params
SSSS_Gooey_EFT_Connect
SSSS_Gooey_IFT_Chgrp
SSSS_Gooey_IFT_Connect
SSSS_Gooey_IFT_Data_Current_Dir
SSSS_Gooey_IFT_Data_File_Exists
SSSS_Gooey_IFT_Data_File_Group
SSSS_Gooey_IFT_Data_File_Mod_Time
SSSS_Gooey_IFT_Data_File_Owner
SSSS_Gooey_IFT_Data_File_Permissions
SSSS_Gooey_IFT_Data_File_Size
SSSS_Gooey_IFT_Data_Status
SSSS_Gooey_IFT_Data_Update
SSSS_Gooey_IFT_Dir_Contents
SSSS_Gooey_IFT_Dir_Create
SSSS_Gooey_IFT_Dir_Destroy
SSSS_Gooey_IFT_Dir_Set_Current
SSSS_Gooey_IFT_Disconnect
SSSS_Gooey_IFT_File_Chmod
SSSS_Gooey_IFT_File_Destroy
SSSS_Gooey_IFT_File_Pull
SSSS_Gooey_IFT_File_Push
SSSS_Gooey_IFT_File_Status
SSSS_Gooey_IFT_Init
SSSS_Gooey_IFT_Option_Binary
SSSS_Gooey_IFT_Option_Preserve_Mode
SSSS_Gooey_IFT_Option_Quarantine
SSSS_Gooey_IFT_SPD_Destroy
SSSS_Gooey_IFT_Set_App_Context
SSSS_IFT_Command_Tokens
SSSS_IFT_Connect
SSSS_IFT_Dir_Contents
SSSS_IFT_Dir_Create
SSSS_IFT_Dir_Destroy
SSSS_IFT_Dir_Set_Current
SSSS_IFT_Dir_Share
SSSS_IFT_Disconnect
SSSS_IFT_File_Chmod
SSSS_IFT_File_Destroy
SSSS_IFT_File_Pull
SSSS_IFT_File_Pull_Unique
SSSS_IFT_File_Push
SSSS_IFT_File_Push_Unique
SSSS_IFT_File_Rename
SSSS_IFT_File_Share
SSSS_IFT_File_Status
SSSS_IFT_Option_Content
SSSS_IFT_Option_Feedback
SSSS_IFT_Option_Preserve_Mode
SSSS_IFT_Option_Quarantine
SSSS_IFT_Overwrite_Allowed_Function
SSSS_IFT_Overwrite_Denied_Function
SSSS_IFT_Response_Tokens
SSSS_IFT_Result_Message
SSSS_Init
SSSS_Init_Core
SSSS_Init_Default_App_Name
SSSS_Init_Oracle
SSSS_Init_Signals
SSSS_Initialize_Privileged_Environmen
t
SSSS_LL_Add
SSSS_LL_Add_Sorted
SSSS_LL_Create
SSSS_LL_Delete
SSSS_LL_Destroy
SSSS_LL_Element
SSSS_LL_Front
SSSS_LL_Is_Empty
SSSS_LL_Is_Last
SSSS_LL_Marker_Append
SSSS_LL_Next
SSSS_LL_Ordinal
SSSS_LL_Sort
SSSS_Lists_Close
SSSS_Lists_Entity_In_List
SSSS_Lists_Get_Entity
SSSS_Lists_Get_List
SSSS_Lists_Get_Tuple
SSSS_Lists_Open
SSSS_Lists_Reset
SSSS_Login_Access_Port
SSSS_Login_Display
SSSS_Login_Free_Mission_List
SSSS_Login_Group_ID_To_Name
SSSS_Login_Group_Name_To_ID
SSSS_Login_Identifier
SSSS_Login_Is_Local
SSSS_Login_Is_Permanent
SSSS_Login_Mission
SSSS_Login_Mission_List

SSSS_Login_Mode_Text_To_Mode
SSSS_Login_Mode_To_Text
SSSS_Login_Network_Id
SSSS_Login_Nodename
SSSS_Login_Nodename_Canonical
SSSS_Login_Nodename_Get
SSSS_Login_Nodename_Server
SSSS_Login_Permanent_Id
SSSS_Login_Platform_Acceptable
SSSS_Login_Platform_Get_Modes
SSSS_Login_Platform_Modes
SSSS_Login_Position
SSSS_Login_Previous_Node
SSSS_Login_Project
SSSS_Login_Session
SSSS_Login_Session_Convert
SSSS_Login_Session_Free
SSSS_Login_Session_Get
SSSS_Login_Session_Get_Buffer
SSSS_Login_Session_ID
SSSS_Login_Session_Id
SSSS_Login_Session_Identifier
SSSS_Login_Session_Initial
SSSS_Login_Session_Is_Valid
SSSS_Login_Session_Log
SSSS_Login_Session_Project
SSSS_Login_Session_Refresh
SSSS_Login_Session_Set
SSSS_Login_Session_Support_Mode
SSSS_Login_Session_Valid
SSSS_Login_String_Free
SSSS_Login_Support_Mode
SSSS_Login_Umask_Set
SSSS_Login_User_ID_To_Name
SSSS_Login_User_Name_To_ID
SSSS_Login_WM_Get
SSSS_Login_WM_Restart
SSSS_Login_WM_Set
SSSS_Login_WM_Start
SSSS_Login_WM_Stop
SSSS_Login_getgrgid
SSSS_Login_getgrnam
SSSS_Login_getpwnam
SSSS_Login_getpwuid
SSSS_MH_Acknowledge_Text
SSSS_MH_Destination_Text
SSSS_MH_Last_GMT
SSSS_MH_Last_MET
SSSS_MH_Last_Message
SSSS_MH_Log_Message
SSSS_MH_Severity_Text
SSSS_Malloc
SSSS_Misc_Signal
SSSS_Net_Peer_Is_Local
SSSS_Net_Peer_Is_Privileged
SSSS_Net_TCP_Create
SSSS_Net_TCP_Open
SSSS_Net_UDP_Create
SSSS_Net_UDP_Open
SSSS_OS_chdir
SSSS_OS_chmod
SSSS_OS_chown
SSSS_OS_close
SSSS_OS_dup2
SSSS_OS_execl
SSSS_OS_execv
SSSS_OS_execve
SSSS_OS_fchmod
SSSS_OS_fchown
SSSS_OS_fgets
SSSS_OS_fopen
SSSS_OS_fork
SSSS_OS_fstat
SSSS_OS_getenv
SSSS_OS_gethostbyaddr
SSSS_OS_gethostbyname
SSSS_OS_getpeername
SSSS_OS_getpgid
SSSS_OS_getpwuid
SSSS_OS_getsid
SSSS_OS_initgroups
SSSS_OS_kill
SSSS_OS_link
SSSS_OS_mkdir
SSSS_OS_nice
SSSS_OS_open
SSSS_OS_pipe
SSSS_OS_read
SSSS_OS_read_full
SSSS_OS_rename
SSSS_OS_rmdir
SSSS_OS_schedctl
SSSS_OS_setgid
SSSS_OS_setpgid
SSSS_OS_setreuid
SSSS_OS_setsid
SSSS_OS_setuid
SSSS_OS_stat
SSSS_OS_tcsetattr
SSSS_OS_uname
SSSS_OS_unlink
SSSS_OS_waitpid
SSSS_OS_write
SSSS_OS_write_full
SSSS_PTY_Fork
SSSS_PTY_Log_Messages
SSSS_PTY_Master_Open
SSSS_PTY_Slave_Open

SSSS_Parse_Resource
SSSS_Process_Build_Spec_Struct
SSSS_Process_Check_Spec_Data
SSSS_Process_Exec_Keyed_Process
SSSS_Process_FilSpec_With_Safe_Data
SSSS_Process_Free_Spec_Struct
SSSS_Process_Is_Ptr_Ok
SSSS_Process_Is_Ptr_Ok_Size
SSSS_Process_Is_Value_Within_Limits
SSSS_Process_Param_Get
SSSS_Process_Result_Message
SSSS_Process_Result_Message_Table
SSSS_Process_Start_Keyed_Process
SSSS_Process_Start_List
SSSS_Process_Start_Spec_Process
SSSS_Process_Struct_Ptr_Check_Spec_Da
ta
SSSS_Quarantine_Create_Area
SSSS_Quarantine_Destroy_Area
SSSS_Quarantine_Dir_Contents
SSSS_Quarantine_Dir_Create
SSSS_Quarantine_Dir_Destroy
SSSS_Quarantine_Dir_Set_Current
SSSS_Quarantine_File_Chmod
SSSS_Quarantine_File_Copy_From
SSSS_Quarantine_File_Copy_To
SSSS_Quarantine_File_Destroy
SSSS_Quarantine_File_Move_From
SSSS_Quarantine_File_Move_To
SSSS_Quarantine_File_Open
SSSS_Quarantine_File_Rename
SSSS_Quarantine_File_Share
SSSS_Quarantine_File_Stat
SSSS_Quarantine_File_Temp_Name
SSSS_Quarantine_Result_Message
SSSS_Quarantine_Set_Area
SSSS_Realloc
SSSS_SPD_Add_Recv_Entry
SSSS_SPD_Add_Recv_Token_Table
SSSS_SPD_Add_Send_Entry
SSSS_SPD_Add_Send_Token_Table
SSSS_SPD_Create
SSSS_SPD_Destroy
SSSS_SPD_Dispatch_Line
SSSS_SPD_Dispatch_Vector
SSSS_SPD_Protocol_Driver
SSSS_SPD_Send
SSSS_SPD_Send_Var
SSSS_SPD_Write
SSSS_SPD_X11_Done
SSSS_SPD_X11_Protocol_Driver
SSSS_SecLog_Event
SSSS_SecLog_Open
SSSS_Start_XAUTOLOCK
SSSS_Str_Argv_Free
SSSS_Str_Argv_Join
SSSS_Str_Argv_Split
SSSS_Str_Argv_Split_With_Escapes
SSSS_Str_Basename
SSSS_Str_Dirname
SSSS_Str_Duplicate
SSSS_Str_Error_Code
SSSS_Str_Error_Code_Set
SSSS_Str_Error_Message
SSSS_Str_Error_Signal
SSSS_Str_Error_Text
SSSS_Str_Pattern_Match
SSSS_Str_Printable_Char
SSSS_Str_Printable_String
SSSS_Str_Safe
SSSS_Str_Translate_Escapes
SSSS_Stream_Create
SSSS_Stream_Fork
SSSS_Stream_Fork_Stderr
SSSS_Stream_Read
SSSS_Stream_Write
SSSS_Trace_Function
SSSS_Trace_Stack
SSSS_Transfer_Command_Tokens
SSSS_Transfer_Response_Tokens
SSSS_VP_Is_Executable
SSSS_VP_Is_Reserved_Name
SSSS_Xsession_Bug
SSUP_Add_Big_Group
SSUP_Add_Group
SSUP_Add_Passwd
SSUP_Add_Shadow
SSUP_Audit_Close
SSUP_Audit_Create
SSUP_Audit_Log
SSUP_Audit_Open_Read
SSUP_Audit_Open_Write
SSUP_Audit_Remove
SSUP_Capability_Str
SSUP_Caps_Add
SSUP_Caps_Allocate
SSUP_Caps_Are_Equal
SSUP_Caps_Clear
SSUP_Caps_Clear_All
SSUP_Caps_Deallocate
SSUP_Caps_Is_Set
SSUP_Caps_Name
SSUP_Caps_Name_List
SSUP_Caps_Name_List_Free
SSUP_Caps_Remove
SSUP_Caps_Set
SSUP_Caps_Set_All
SSUP_Caps_Value

SSUP_Caps_sprintf
SSUP_Caps_sscanf
SSUP_Check_Host
SSUP_Check_Privileges
SSUP_Check_Privlg
SSUP_Check_Privlg_GUI
SSUP_Create_Local_Mission
SSUP_Distribute_Profile
SSUP_EHS_Profile_Get_External_EHS_List
SSUP_EHS_Profile_Get_External_EHS_List_Free
SSUP_EHS_Profile_List_Delete
SSUP_EHS_Profile_List_Difference
SSUP_EHS_Profile_List_Difference_Free
SSUP_EHS_Profile_List_Get
SSUP_EHS_Profile_List_Get_Free
SSUP_EHS_Profile_List_Save
SSUP_Get_Host_List
SSUP_Get_Mission_Id
SSUP_Get_SMAC_Mission
SSUP_Group_Copy_Entries
SSUP_List_Merge
SSUP_Lladd
SSUP_Lldel
SSUP_Local_Install
SSUP_Local_Mission_Profile_Edit
SSUP_Local_Mission_Profile_Mine
SSUP_Local_Mission_Profile_Open
SSUP_Local_Mission_Profile_Open_Mine
SSUP_Local_Mission_Profile_Save
SSUP_Login_Identifier
SSUP_MH_Acknowledge_Text
SSUP_MH_Destination_Text
SSUP_MH_Last_GMT
SSUP_MH_Last_MET
SSUP_MH_Last_Message
SSUP_MH_Last_Return
SSUP_MH_Log_Message
SSUP_MH_Severity_Text
SSUP_MH_Table
SSUP_Misc_Basename
SSUP_Misc_Copy_Dir
SSUP_Misc_Get_Local_MOPs
SSUP_Misc_Get_MOPs
SSUP_Misc_Is_Directory
SSUP_Misc_Mission_ID_To_Lower
SSUP_Misc_Mission_ID_To_Upper
SSUP_Misc_Remove_Directory
SSUP_Misc_SMCM_Connect
SSUP_Misc_SMCM_Disconnect
SSUP_Misc_Share_File
SSUP_Misc_Share_File_With_User
SSUP_Misc_Truncate
SSUP_Mission_Area_Lock_Long_Term
SSUP_Mission_Area_Lock_Remove
SSUP_Mission_Area_Lock_Short_Term
SSUP_Mission_ID_Profile_Allocate
SSUP_Mission_ID_Profile_Close
SSUP_Mission_ID_Profile_Deallocate
SSUP_Mission_ID_Profile_Edit
SSUP_Mission_ID_Profile_Exists
SSUP_Mission_ID_Profile_GID
SSUP_Mission_ID_Profile_GID_Set
SSUP_Mission_ID_Profile_Lifetime
SSUP_Mission_ID_Profile_Lifetime_Set
SSUP_Mission_ID_Profile_Max_Idle_Time
SSUP_Mission_ID_Profile_Max_Idle_Time_Set
SSUP_Mission_ID_Profile_Mission_ID
SSUP_Mission_ID_Profile_Mission_ID_Path
SSUP_Mission_ID_Profile_Mission_Name
SSUP_Mission_ID_Profile_Mission_Name_Set
SSUP_Mission_ID_Profile_Mission_Open
SSUP_Mission_ID_Profile_Mission_Update
SSUP_Mission_ID_Profile_Open
SSUP_Mission_ID_Profile_Open_Flag
SSUP_Mission_ID_Profile_PDB_Delete
SSUP_Mission_ID_Profile_PDB_Get
SSUP_Mission_ID_Profile_PDB_Next
SSUP_Mission_ID_Profile_PDB_Open_Read
SSUP_Mission_ID_Profile_PDB_Open_Write
SSUP_Mission_ID_Profile_PDB_Remove
SSUP_Mission_ID_Profile_PDB_Reset
SSUP_Mission_ID_Profile_PDB_Set
SSUP_Mission_ID_Profile_PW
SSUP_Mission_ID_Profile_PW_Lifetime
SSUP_Mission_ID_Profile_PW_Lifetime_Set
SSUP_Mission_ID_Profile_PW_Set
SSUP_Mission_ID_Profile_PW_Time
SSUP_Mission_ID_Profile_PW_Time_Set
SSUP_Mission_ID_Profile_Path
SSUP_Mission_ID_Profile_Project
SSUP_Mission_ID_Profile_Project_Set
SSUP_Mission_ID_Profile_Remove
SSUP_Mission_ID_Profile_Save
SSUP_Mission_ID_Profile_Temp
SSUP_Mission_ID_Profile_UID
SSUP_Mission_ID_Profile_UID_Set
SSUP_Mission_ID_Profile_Update
SSUP_Mission_Profile_Alias
SSUP_Mission_Profile_Alias_Set
SSUP_Mission_Profile_Allocate

```
SSUP_Mission_Profile_Assign_IDs
SSUP_Mission_Profile_Change_Time
SSUP_Mission_Profile_Close
SSUP_Mission_Profile_Copy
SSUP_Mission_Profile_Deallocate
SSUP_Mission_Profile_Desc
SSUP_Mission_Profile_Desc_Set
SSUP_Mission_Profile_Edit
SSUP_Mission_Profile_Exists
SSUP_Mission_Profile_Get_ID_Pointer
SSUP_Mission_Profile_Get_Name_From_Mi
ssion_ID
SSUP_Mission_Profile_ID
SSUP_Mission_Profile_ID_Assign
SSUP_Mission_Profile_ID_Profile_Not_E
xist
SSUP_Mission_Profile_MOP_Assign
SSUP_Mission_Profile_MOP_Assign_Inter
nal
SSUP_Mission_Profile_Mission_Path
SSUP_Mission_Profile_Name
SSUP_Mission_Profile_Open
SSUP_Mission_Profile_Open_Write
SSUP_Mission_Profile_PDB_Delete
SSUP_Mission_Profile_PDB_Get
SSUP_Mission_Profile_PDB_Next
SSUP_Mission_Profile_PDB_Open_Read
SSUP_Mission_Profile_PDB_Open_Write
SSUP_Mission_Profile_PDB_Remove
SSUP_Mission_Profile_PDB_Reset
SSUP_Mission_Profile_PDB_Set
SSUP_Mission_Profile_Path
SSUP_Mission_Profile_Project
SSUP_Mission_Profile_Project_Set
SSUP_Mission_Profile_Remove
SSUP_Mission_Profile_Remove_Mission_I
D_Profile
SSUP_Mission_Profile_Save
SSUP_Mission_Profile_Save_Mission_ID_
Profile
SSUP_Mission_Profile_Set
SSUP_Mission_Profile_Set_ID_Profile_N
ot_Exist
SSUP_Mission_Profile_Set_Name
SSUP_Mission_Profile_Temp
SSUP_Mission_Profile_Temp_Set
SSUP_Mission_Profile_Update
SSUP_Mission_Profile_User_Name_Prefix
SSUP_Mission_Profile_Version
SSUP_Mission_Unix_ID_Close
SSUP_Mission_Unix_ID_Exists
SSUP_Mission_Unix_ID_Next
SSUP_Mission_Unix_ID_Open
SSUP_Mission_Unix_ID_Open_Create
SSUP_Mission_Unix_ID_Open_Flag
SSUP_Mission_Unix_ID_PDB_Get
SSUP_Mission_Unix_ID_PDB_Next
SSUP_Mission_Unix_ID_PDB_Open
SSUP_Mission_Unix_ID_PDB_Open_Create
SSUP_Mission_Unix_ID_PDB_Reset
SSUP_Mission_Unix_ID_PDB_Set
SSUP_Mission_Unix_ID_Path
SSUP_Node_List_Convert
SSUP_Node_List_Free
SSUP_NonEHS_Delete_Profile
SSUP_NonEHS_Open_Profile
SSUP_NonEHS_Profile_Allocate
SSUP_NonEHS_Profile_Attribute
SSUP_NonEHS_Profile_Attribute_Clear
SSUP_NonEHS_Profile_Attribute_Name
SSUP_NonEHS_Profile_Attribute_Set
SSUP_NonEHS_Profile_Clear
SSUP_NonEHS_Profile_Deallocate
SSUP_NonEHS_Profile_Get_Host_Address
SSUP_NonEHS_Profile_Host_Name
SSUP_NonEHS_Profile_Host_Name_Set
SSUP_NonEHS_Profile_List_Delete
SSUP_NonEHS_Profile_List_Get
SSUP_NonEHS_Profile_List_Get_Free
SSUP_NonEHS_Profile_List_Save
SSUP_NonEHS_Profile_Status
SSUP_NonEHS_Profile_Status_Set
SSUP_NonEHS_Profile_Str
SSUP_NonEHS_Save_Profile
SSUP_PDB_Get_Joined
SSUP_PDB_Joined_Delete_Entry
SSUP_PDB_Joined_Get_Entry
SSUP_PDB_Joined_Insert_Entry
SSUP_PDB_Joined_List_Free
SSUP_PDB_Set_Joined
SSUP_Passwd_Copy_Entries
SSUP_Passwd_Entry_Free
SSUP_Passwd_Entry_Generate
SSUP_Server_Mode_Convert
SSUP_Shadow_Copy_Entry
SSUP_Shadow_Entry_Free
SSUP_Shadow_Entry_Generate
SSUP_Status_Message
SSUP_Status_Str
SSUP_User_Profile_Alias
SSUP_User_Profile_Alias_Set
SSUP_User_Profile_Allocate
SSUP_User_Profile_Caps
SSUP_User_Profile_Caps_Set
SSUP_User_Profile_Change_Time
SSUP_User_Profile_Clear_All_Passwords
SSUP_User_Profile_Contact
SSUP_User_Profile_Contact_Set
```

SSUP_User_Profile_Copy
SSUP_User_Profile_DMC_Flag
SSUP_User_Profile_DMC_Flag_Set
SSUP_User_Profile_DMC_Resync
SSUP_User_Profile_DMC_User_Mod
SSUP_User_Profile_Deallocate
SSUP_User_Profile_Desc
SSUP_User_Profile_Desc_Set
SSUP_User_Profile_GID
SSUP_User_Profile_Home_Path
SSUP_User_Profile_ID
SSUP_User_Profile_ID_Set
SSUP_User_Profile_Lifetime
SSUP_User_Profile_Lifetime_Set
SSUP_User_Profile_List
SSUP_User_Profile_List_Free
SSUP_User_Profile_Max_Idle_Time
SSUP_User_Profile_Max_Idle_Time_Set
SSUP_User_Profile_Name
SSUP_User_Profile_New
SSUP_User_Profile_Open
SSUP_User_Profile_PW
SSUP_User_Profile_PW_Lifetime
SSUP_User_Profile_PW_Lifetime_Set
SSUP_User_Profile_PW_Set
SSUP_User_Profile_PW_Time
SSUP_User_Profile_PW_Time_Set
SSUP_User_Profile_Remove
SSUP_User_Profile_Save
SSUP_User_Profile_Shell_Path
SS_Limit
SS_Message_Index
SS_Message_Lookup
SS_PS_End_function
SS_PS_Filler_function
SS_PS_Start_function
SS_PS_Unsigned16_function
SS_PS_Unsigned32_function
SS_PS_Unsigned8_function
Save_Data_Mode
Save_MOP
Save_OCDB_Flag_Text
Save_Save_Data_Mode
Save_Save_MOP
Send_DP_Message
Set_All_MSID_Init_Status
Set_Local_Table_Errors
Set_Process_Name
Set_Sample_Status_Bits
Set_TDM_Overall_Status_Bits
StrCopies
TDB_Connect
TDB_Connect_User
TDB_Disconnect
TDB_Get_Counter_Data
TDB_Get_EM_MSID_List
TDB_Get_GPC_Format_Data
TDB_Get_GPC_Format_List
TDB_Get_GSE_MSID_List
TDB_Get_GSE_Packet_Data
TDB_Get_GSE_Packet_List
TDB_Get_Group_Content_List
TDB_Get_Group_ID_Data
TDB_Get_Group_ID_List
TDB_Get_Grp_Prjct_EM_List
TDB_Get_LES_MSID_List
TDB_Get_LTG_Group_ID_List
TDB_Get_LTG_MSID_List
TDB_Get_MSID_Cal_Switch
TDB_Get_MSID_Data
TDB_Get_MSID_Decom_Data
TDB_Get_MSID_ES_Switch
TDB_Get_MSID_Expected_State
TDB_Get_MSID_Group_List
TDB_Get_MSID_LRVT
TDB_Get_MSID_Limit_Switch
TDB_Get_MSID_Limits
TDB_Get_MSID_List
TDB_Get_MSID_Point_Pairs
TDB_Get_MSID_Poly_Cals
TDB_Get_MSID_State_Codes
TDB_Get_MSID_Stream_List
TDB_Get_Multi_Discrete_List
TDB_Get_OI_Format_Data
TDB_Get_OI_Format_List
TDB_Get_PDI_Format_Data
TDB_Get_PDI_Format_List
TDB_Get_Packet_Authorization
TDB_Get_Packet_Min_Update_Cycle
TDB_Get_Single_Discrete_List
TDB_Get_Stream_Block_Data
TDB_Get_Stream_Format_List
TDB_Get_Stream_ID_List
TDB_Get_Stream_MSID_List
TDB_Get_Stream_Max_Length
TDB_Get_Stream_Packet_Data
TDB_Get_Stream_Subset_Data
TDB_Get_Stream_TDM_Data
TDB_Get_Time_MSID_List
TDB_Prepare_Table_Prefix
TDB_Put_LTG_Group_ID_List
TDB_Put_LTG_MSID_List
TDB_Validate_MSID_List
TDM_Checksum_Text
TDM_Counter_Direction_Text
TDM_Enable_State_Text
TDM_Header
TDM_PDI_Mode_Text

TDM_Polarity_Text
TDM_Signal_Format_Code_Text
TNS_Activate_Group
TNS_Apply_DBD_Change_File
TNS_Apply_Internal_Pseudo
TNS_Apply_LT_Change_File
TNS_Attach_To_Sh_Mem
TNS_CL_Close
TNS_CL_Open_Opt
TNS_CL_Receive
TNS_CL_Send
TNS_CL_Unblock
TNS_CO_Client_Connect
TNS_CO_Client_Open
TNS_CO_Close
TNS_CO_Receive
TNS_CO_Send
TNS_CO_Server_Accept
TNS_CO_Server_Open
TNS_CO_Set
TNS_Check_Common_Timestamp
TNS_Check_Datamode_Timestamp
TNS_Cleanup_Decom
TNS_Cleanup_Decom_From_Packet
TNS_Cleanup_External_Pseudos
TNS_Cleanup_Internal_Pseudos
TNS_Cleanup_Packet
TNS_Cleanup_Time
TNS_Common_Init
TNS_Construct_Major_Frame
TNS_Core_Init
TNS_Deactivate_Group
TNS_Decom_From_Packet
TNS_Delete_Local_Table
TNS_Dump_Local_Table
TNS_Free_LT_Structs
TNS_GSE_Baud_Rate_Values
TNS_GetBackupnode
TNS_GetPrimeAddress
TNS_GetPrimenode
TNS_Get_All_Groups
TNS_Get_All_MSIDs
TNS_Get_All_MSIDs_For_EM
TNS_Get_All_Subsets
TNS_Get_File_List
TNS_Get_Group_Data
TNS_Get_Group_Info
TNS_Get_Group_Sources
TNS_Get_Groups_for_MSID
TNS_Get_Key_File_Path
TNS_Get_Local_Public_Dir
TNS_Get_Local_Table_Data
TNS_Get_Local_User_Dir
TNS_Get_MSID_Data
TNS_Get_MSID_Sources
TNS_Get_Newest_Value
TNS_Get_Next_Value
TNS_Get_Original_MSID_Data
TNS_Get_Project_Public_Dir
TNS_Get_Project_User_Dir
TNS_Get_Subset_Data
TNS_Get_Subset_Sources
TNS_Get_TDB_Revision
TNS_Get_User_Key_File_Path
TNS_Get_Whole_Packet
TNS_Gethostbyaddr
TNS_Gethostbyname
TNS_Getlocaladdress
TNS_Getlocalmode
TNS_Getnetbyname
TNS_Getnodebyname
TNS_Getpacketinfo
TNS_Getservbyname
TNS_Getservbyport
TNS_Getservnamebyport
TNS_Getservportbyname
TNS_Initialize_Decom
TNS_Initialize_Decom_From_Packet
TNS_Initialize_External_Pseudos
TNS_Initialize_Internal_Pseudos
TNS_Initialize_Packet
TNS_Initialize_Time
TNS_Is_Group_Activation_Manual
TNS_Is_Group_Active
TNS_Is_MSIDs_Group_Active
TNS_Lock_Decom
TNS_MET_InUse_Text
TNS_Make_Change_File
TNS_Make_Local_Table
TNS_Maximum_Port_Values
TNS_Minimum_Port_Values
TNS_Multicast_Group_Open
TNS_Multicast_Source_Open
TNS_Network_Accept
TNS_Network_Bind
TNS_Network_Close
TNS_Network_Connect
TNS_Network_Dup
TNS_Network_Get_Socket_Port
TNS_Network_Listen
TNS_Network_Look
TNS_Network_Open
TNS_Network_Receive
TNS_Network_Receive_Unit_Data
TNS_Network_Select
TNS_Network_Send
TNS_Network_Send_Unit_Data
TNS_Open_Change_File

TNS_Packet_Receive_Open
TNS_Packet_Source_Open
TNS_Parameter_Select_Mode_Text
TNS_Parity_Text
TNS_Put_Key_File_Path
TNS_Put_Local_Public_Dir
TNS_Put_Local_Public_Dir_Top
TNS_Put_Local_User_Dir
TNS_Put_Local_User_Dir_Top
TNS_Put_Project_Public_Dir
TNS_Put_Project_User_Dir
TNS_Put_TDB_Revision
TNS_Put_User_Key_File_Path
TNS_Read_Applied_Changes
TNS_Read_Change_File
TNS_ReconfigStatus
TNS_Remove_DBD_Change_File
TNS_Remove_Internal_Pseudo
TNS_Remove_Internal_Pseudos
TNS_Remove_LT_Change_File
TNS_Save_Change_File
TNS_Send_External_Pseudos
TNS_Server_Mode_Text
TNS_Set_Database_Revision
TNS_Set_LES_Processing
TNS_Start_Group
TNS_Stop_Group
TNS_TDS_InUse_Text
TNS_Time_Text
TNS_Unicast_Client_Open
TNS_Unicast_Server_Open
TNS_Unlock_Decom
TNS_Update_Comp_Constant
TNS_Update_External_Pseudo
TNS_Update_Internal_Pseudos
TNS_Update_LTRC
TNS_Update_Local_Table_Data
TNS_View_LT_Changes
TNS_Write_External_Pseudos
Time_MSID
Trace
Trim_Trailing_Blanks
UDE_Connect
UDE_Database_Get_Names
UDE_Database_Retrieve
UDE_Database_Store
UDE_Disconnect
UITL_Connect
UITL_Create_Key
UITL_Destroy_Key
UITL_Disconnect
UITL_Generate_Key
UITL_Get_Archived_LRVT_Size
UITL_Get_Archived_LVT_Offset
UITL_Get_Archived_LVT_Size
UITL_Get_Baselined_LRVT_Size
UITL_Get_Baselined_LVT_Offset
UITL_Get_Baselined_LVT_Size
UITL_Get_LTRC_Archived_Counter
UITL_Get_LTRC_Archived_LES_Flag
UITL_Get_LTRC_Archived_Version
UITL_Get_LTRC_Baselined_Counter
UITL_Get_LTRC_Baselined_LES_Flag
UITL_Get_LTRC_Baselined_Version
UITL_Get_Number_Archived_LVT_Entries
UITL_Get_Number_Baselined_LVT_Entries
UITL_Get_Read_Access
UITL_Get_Write_Access
UITL_Make_Path
UITL_Put_LTRC_Archived_Counter
UITL_Put_LTRC_Archived_LES_Flag
UITL_Put_LTRC_Baselined_Counter
UITL_Put_LTRC_Baselined_LES_Flag
UITL_Release_Read_Access
UITL_Release_Write_Access
UTL_Backslashes_Out
UTL_Local_Check
UTL_Pat_Debug
UTL_Quotes_To_Backslash
UTL_Service_To_Host
UTL_Strcmp_Nocase
UTL_Strpblnks
UTL_Substrcpy
UTL_Substrsrch
UTL_Time
UTL_Timeline
Unswap_Bytes
Unswap_Words
Update_SCM_Status
Validate_Time
WCP_Attach_Shared_Memory
WCP_Create_Response_IPC
WCP_Detach_Shared_Memory
WCP_Int_Write_Request
WCP_Log_In
WCP_Log_Out
WCP_Read_Response
WCP_Start_Update_Command
WCP_Stop_File
WCP_Stop_Group
WCP_Uplink_Command
WCP_Uplink_File
WCP_Uplink_Group
WCP_Validate_Form
WCP_Validate_Group
Warning
Watch
access_message_table

access_port_result
action
alt_add_filename_to_hash_table
alt_add_group_to_hash_table
alt_add_msid_to_hash_table
alt_c_type_len
alt_close_hash_table
alt_close_local_table
alt_convert_to_protocol
alt_create_file_header
alt_create_hash_table
alt_create_local_table
alt_data_type
alt_delete_file
alt_find_pseudo_sync
alt_free_decom_ptrs
alt_free_es_ptrs
alt_free_limit_ptrs
alt_free_lt_cal_structs
alt_free_lt_decom_structs
alt_free_lt_les_structs
alt_free_ltg_group_list
alt_free_ltg_msid_list
alt_free_pc_ptrs
alt_free_pp_ptrs
alt_free_sc_ptrs
alt_get_cal_data
alt_get_decom_data
alt_get_filename_hash_data
alt_get_first_hash_key
alt_get_format_id_msid
alt_get_group_hash_data
alt_get_les_data
alt_get_msid_data
alt_get_msid_hash_data
alt_get_next_hash_key
alt_get_private_write_lock
alt_get_project_EM_list
alt_get_public_write_lock
alt_get_read_lock
alt_get_subset_hash_data
alt_init_hash_table
alt_load_data_types_and_lengths
alt_load_expected_states
alt_load_format
alt_load_limits
alt_load_ltg_group_id_list
alt_load_ltg_msid_list
alt_load_point_pairs
alt_load_poly_cals
alt_load_source_info
alt_load_state_codes
alt_open_hash_table
alt_open_local_table
alt_open_local_table_for_update
alt_proj_em
alt_read_group_from_file
alt_read_msid_from_file
alt_read_sync_from_file
alt_release_private_write_lock
alt_release_public_write_lock
alt_release_read_lock
alt_remove_filename_from_hash
alt_remove_group_from_hash_table
alt_remove_internal_pseudo_msid
alt_remove_msid_from_hash_table
alt_remove_pseudo_from_file
alt_store_group_in_local_table
alt_store_internal_pseudo_msid
alt_store_msid_in_local_table
alt_tdb_to_c_type
alt_trim_spaces
alt_update_group_in_hash_table
alt_update_msid_in_hash_table
alt_write_group_to_file
alt_write_msid_to_file
alt_write_pseudo_to_file
args
bad_code_flag
buf
check_internal_pseudo
check_parameters
check_table_semaphore
copy_parameters
crctbl
create_iplvt_key
create_iplvt_semaphore
create_iplvt_shared_memory
data_mode
database
destination
fifo_fd
fifo_write_status
findpaper
findspace
form_fp
form_path
get_destination
get_ehs_type
get_output_type
get_paper_orientation
get_paper_size
get_paper_source
get_size
get_time_struct
get_timestamp
height
hex

```
high_raw_count
hrc_ind
infile
is_data_type_valid
jump_buffer
jump_value
last_DB
local_param_copy
locate_msid_in_TDB_list
low_raw_count
lrc_ind
mh_fifo_name
mh_msg_message_text
missing_message_code
newspec
ns_open_flag_set
num_copies
old_action
oraca
outfile
output_type
pagelabel
pageno
pages
paper_orientation
paper_size
paper_source
parameter_mismatch_handler
platform_name
ps_program
ps_verbose
psdo_log_message
psdo_log_status
psresize
pstops
read_setup
remove_iplvt_key
save_mask
scanpages
search_mcs
search_packet
search_table
seekable
seekpage
sqlca
table_access_status
table_ptr
table_sem_id
tdb_2_changed
tdb_2_columns1
tdb_2_columns10
tdb_2_columns11
tdb_2_columns13
tdb_2_columns2
tdb_2_columns3
tdb_2_columns4
tdb_2_columns5
tdb_2_columns6
tdb_2_columns7
tdb_2_columns8
tdb_2_columns9
tdb_2_msid
tdb_2_place_holders1
tdb_2_place_holders10
tdb_2_place_holders11
tdb_2_place_holders13
tdb_2_place_holders2
tdb_2_place_holders3
tdb_2_place_holders4
tdb_2_place_holders5
tdb_2_place_holders6
tdb_2_place_holders7
tdb_2_place_holders8
tdb_2_place_holders9
tdb_2_ptr0
tdb_2_ptr1
tdb_2_ptr10
tdb_2_ptr11
tdb_2_ptr12
tdb_2_ptr13
tdb_2_ptr15
tdb_2_ptr16
tdb_2_ptr17
tdb_2_ptr2
tdb_2_ptr3
tdb_2_ptr4
tdb_2_ptr5
tdb_2_ptr5a
tdb_2_ptr5b
tdb_2_ptr5c
tdb_2_ptr6
tdb_2_ptr7
tdb_2_ptr8
tdb_2_ptr8a
tdb_2_ptr8b
tdb_2_ptr9
tdb_2_ptr9a
tdb_2_ptr9b
tdb_2_sqlcode
tdb_2_sqlstmt
tdb_2_status
tdb_2_stream_number
tdb_2_table_prefix
tdb_2_table_type
tdb_2_user_id
tdb_2_workstation_id
tdb_calib_type
tdb_calib_type_ind
```

tdb_calibration_default_set_number
tdb_calibration_switch_msid
tdb_calibration_type
tdb_cdsn_ind
tdb_cm_ind
tdb_conv_type
tdb_conv_type_ind
tdb_counter_msid
tdb_csm_ind
tdb_d_ind
tdb_data_type
tdb_description
tdb_ehs_header_flag
tdb_em_error_description
tdb_em_error_description_ind
tdb_engineering_unit
tdb_esdsn_ind
tdb_essm_ind
tdb_eu_ind
tdb_expected_state_default_set_number
tdb_expected_state_switch_msid
tdb_grp_change_file
tdb_grp_changed
tdb_grp_control_code
tdb_grp_control_high
tdb_grp_control_high_ind
tdb_grp_control_low
tdb_grp_control_low_ind
tdb_grp_control_msid
tdb_grp_delay_time
tdb_grp_group_id
tdb_grp_owner_id
tdb_grp_project_em
tdb_grp_ptr0
tdb_grp_ptr1
tdb_grp_ptr2
tdb_grp_sqlcode
tdb_grp_sqlstmt
tdb_grp_start_time
tdb_grp_status
tdb_grp_stop_time
tdb_grp_table_prefix
tdb_grp_time_type
tdb_high_raw_count
tdb_hrc_ind
tdb_ldsn_ind
tdb_limit_default_set_number
tdb_limit_lrvt_location
tdb_limit_lrvt_location_ind
tdb_limit_switch_msid
tdb_low_raw_count
tdb_lrc_ind
tdb_lsm_ind
tdb_max_engineering_units
tdb_max_sample_rate
tdb_min_engineering_units
tdb_mission
tdb_msid
tdb_owner_id
tdb_par_comp
tdb_project
tdb_proprietary_flag
tdb_ptr1
tdb_ptr10
tdb_ptr11
tdb_ptr12
tdb_ptr13
tdb_ptr15
tdb_ptr16
tdb_ptr17
tdb_ptr2
tdb_ptr3
tdb_ptr4
tdb_ptr5
tdb_ptr5a
tdb_ptr5b
tdb_ptr5c
tdb_ptr6
tdb_ptr7
tdb_ptr8
tdb_ptr8a
tdb_ptr8b
tdb_ptr9
tdb_ptr9a
tdb_ptr9b
tdb_range_msid
tdb_revision
tdb_rm_ind
tdb_sample_per_group
tdb_sample_rate
tdb_spg_ind
tdb_sqlstmt
tdb_table_prefix
tdb_technical_name
tdb_total_length
temp_control_high
temp_control_low
temp_msg_string
time_error_flag
timebuffer
timestamp_failure
timestamp_message
tmpbuf
two_to
uid
use_default_message_parameters
userid
v_tdb_max_engineering_units

v_tdb_min_engineering_units
w_debugmsg
w_indent_debug
w_open_debug
wcp_fifo_path
wcp_msg_code
wcp_resp_fifo
wcp_rqst_fifo_name
wcp_rqst_fifo_semid
wcp_session_id
wcp_user_id
width
word
write_setup
write_to_a_file
write_validation_to_file
writeheader
writepagebody
writepageheader
writepagesetup
writepartcopies
writepartprolog
writeprolog
writesetup
writestring
writetrailer

LIBM

c_abs_
cis
cis_
exp__E
gamma_err_val
hypot_err_val
log__L
set_arg_val
set_err_val
set_res_val
swapINX
swapRM
z_abs_

LIBX11

XAddExtension
XAddHost
XAddHosts
XAddToExtensionList
XDisableAccessControl
XEHeadOfExtensionList
XESetBeforeFlush
XESetCloseDisplay
XESetCopyGC
XESetCreateFont
XESetCreateGC
XESetError
XESetErrorString
XESetEventToWire
XESetFlushGC
XESetFreeFont
XESetFreeGC
XESetPrintErrorValues
XESetWireToError
XESetWireToEvent
XEnableAccessControl
XFindOnExtensionList
XFreeExtensionList
XInitExtension
XListExtensions
XQueryExtension
XRemoveHost
XRemoveHosts
XSetAccessControl
XSetAuthorization
XWriteBitmapFile
XauDisposeAuth
XauFileName
XauGetBestAuthByAddr
XauReadAuth
XcmsCIELabColorSpace
XcmsCIELuvColorSpace
XcmsCIEXYZColorSpace
XcmsCIEuvYColorSpace
XcmsCIExyYColorSpace
XcmsLinearRGBFunctionSet
XcmsRGBColorSpace
XcmsRGBiColorSpace
XimCompEnableTable
XimCompFreeTables
XimCompGetTables
XimCompInitTables
XimCompIsComposeKey
XimCompProcessSym
XimCompReadTables
XimCompResetStatus
XimCompSetTables
XimCompUseTables
XimKSToShortKS
XimParseStringFile
XimShortKSToKS
XkbAllocClientMap
XkbAllocCompatMap
XkbAllocNames
XkbAllocServerMap
XkbBell
XkbChangeMap

XkbChangeSymsForKey
XkbChangeTypeOfKey
XkbComputeEffectiveMap
XkbDeviceBell
XkbEnlargeKeyActions
XkbEnlargeKeySyms
XkbForceBell
XkbForceDeviceBell
XkbFreeCompatMap
XkbFreeNames
XkbGetAutoRepeatRate
XkbGetCompatMap
XkbGetControls
XkbGetIndicatorMap
XkbGetIndicatorState
XkbGetKeyActions
XkbGetKeyBehaviors
XkbGetKeyExplicitComponents
XkbGetKeySyms
XkbGetKeyTypes
XkbGetMap
XkbGetNames
XkbGetState
XkbGetUpdatedMap
XkbGetVirtualMods
XkbIgnoreExtension
XkbInitCanonicalKeyTypes
XkbKeysymToModifiers
XkbLatchModifiers
XkbLibraryVersion
XkbLockModifiers
XkbLookupKeyBinding
XkbNoteCoreMapChanges
XkbNoteMapChanges
XkbQueryExtension
XkbRefreshMap
XkbSelectEventDetails
XkbSelectEvents
XkbSetAutoRepeatRate
XkbSetCompatMap
XkbSetControls
XkbSetDebuggingFlags
XkbSetIgnoreLockMods
XkbSetIndicatorMap
XkbSetMap
XkbSetNames
XkbSetServerInternalMods
XkbToControl
XkbTranslateKey
XkbTranslateKeySym
XkbUseExtension
XkbVirtualModsToReal
XrmPutFileDatabase

LIBXM

DrawArrowFace
DrawCascadeShadows
DrawCheckMarkIndicator
DrawCheckMenuIndicator
DrawDitch
DrawIndicatorLamp
DrawRadioIndicator
DrawRadioMenuIndicator
GetWidgetNavigPtrs
InitializeScrollBars
ParentShaderInvertedFrame
RenderShadowsDefault
SGImode
SGImodeInit
SG_DropTransferContinue
SG_DropTransferSuspend
SetMwmStuff
SgGetLocatePixel
SgTextFieldSetErrorSelection
SgTextSetErrorSelection
SgcreateDialogFuncPtr
SggetChildFuncPtr
SgvendorShellClassRec
TwoShaderShadows
XmAddToPostFromList
XmCvtFromHorizontalPixels
XmCvtFromVerticalPixels
XmCvtTextToXmString
XmCvtToHorizontalPixels
XmCvtToVerticalPixels
XmCvtXmStringToText
XmDropSiteGetActiveVisuals
XmImGetXIM
XmImMbLookupString
XmImRegister
XmImSetFocusValues
XmImSetValues
XmImUnregister
XmImUnsetFocus
XmImVaSetFocusValues
XmImVaSetValues
XmQmotif
XmRegisterConverters
backgroundShade
darkScheme
dump_external
dump_fontlist
dump_fontlist_cache
dump_internal
freeHashTable
min_slider_length

relocatePoints
relocateSegments
sgIsWindowManager
vendorShellResolveConflicts
xmArrowButtonClassRec
xmArrowButtonGadgetClass
xmArrowButtonGadgetClassRec
xmArrowButtonWidgetClass
xmBulletinBoardClassRec
xmBulletinBoardWidgetClass
xmCascadeButtonClassRec
xmCascadeButtonGCacheObjClassRec
xmCascadeButtonGadgetClass
xmCascadeButtonGadgetClassRec
xmCascadeButtonWidgetClass
xmCommandClassRec
xmCommandWidgetClass
xmDesktopClass
xmDesktopClassRec
xmDesktopObjectClass
xmDialogShellClassRec
xmDialogShellExtClassRec
xmDialogShellExtObjectClass
xmDialogShellWidgetClass
xmDisplayClass
xmDisplayClassRec
xmDisplayObjectClass
xmDragContextClass
xmDragContextClassRec
xmDragIconClassRec
xmDragIconObjectClass
xmDragOverShellClassRec
xmDragOverShellWidgetClass
xmDrawingAreaClassRec
xmDrawingAreaWidgetClass
xmDrawnButtonClassRec
xmDrawnButtonWidgetClass
xmDropSiteManagerClassRec
xmDropSiteManagerObjectClass
xmDropTransferClassRec
xmDropTransferObjectClass
xmExtClassRec
xmExtObjectClass
xmFileSelectionBoxClassRec
xmFileSelectionBoxWidgetClass
xmFormClassRec
xmFormWidgetClass
xmFrameClassRec
xmFrameWidgetClass
xmGadgetClass
xmGadgetClassRec
xmLabelClassRec
xmLabelGCacheObjClassRec
xmLabelGadgetClass
xmLabelGadgetClassRec
xmLabelWidgetClass
xmListClassRec
xmListWidgetClass
xmMainWindowClassRec
xmMainWindowWidgetClass
xmManagerClassRec
xmManagerWidgetClass
xmMenuShellClassRec
xmMenuShellWidgetClass
xmMessageBoxClassRec
xmMessageBoxWidgetClass
xmPanedWindowClassRec
xmPanedWindowWidgetClass
xmPrimitiveClassRec
xmPrimitiveWidgetClass
xmProtocolClassRec
xmProtocolObjectClass
xmPushButtonClassRec
xmPushButtonGCacheObjClassRec
xmPushButtonGadgetClass
xmPushButtonGadgetClassRec
xmPushButtonWidgetClass
xmRowColumnClassRec
xmRowColumnWidgetClass
xmSashClassRec
xmSashWidgetClass
xmScaleClassRec
xmScaleWidgetClass
xmScreenClass
xmScreenClassRec
xmScreenObjectClass
xmScrollBarClassRec
xmScrollBarWidgetClass
xmScrolledWindowClassRec
xmScrolledWindowWidgetClass
xmSelectionBoxClassRec
xmSelectionBoxWidgetClass
xmSeparatorClassRec
xmSeparatorGCacheObjClassRec
xmSeparatorGadgetClass
xmSeparatorGadgetClassRec
xmSeparatorWidgetClass
xmShellExtClassRec
xmShellExtObjectClass
xmTearOffButtonClassRec
xmTearOffButtonWidgetClass
xmTextClassRec
xmTextFieldClassRec
xmTextFieldWidgetClass
xmTextWidgetClass
xmToggleButtonClassRec
xmToggleButtonGCacheObjClassRec
xmToggleButtonGadgetClass

xmToggleButtonGadgetClassRec
xmToggleButtonWidgetClass
xmUseVersion
xmVendorShellExtClassRec
xmVendorShellExtObjectClass
xmWorldClass
xmWorldClassRec
xmWorldObjectClass

LIBXT

IceAcceptConnection
IceAddConnectionWatch
IceAllocScratch
IceAppLockConn
IceAppUnlockConn
IceAuthFileName
IceCheckShutdownNegotiation
IceCloseConnection
IceComposeNetworkIdList
IceConnectionNumber
IceConnectionStatus
IceConnectionString
IceFlush
IceFreeAuthFileEntry
IceFreeListenObjs
IceGenerateMagicCookie
IceGetAuthFileEntry
IceGetConnectionContext
IceGetInBufSize
IceGetListenConnectionNumber
IceGetListenConnectionString
IceGetOutBufSize
IceInitThreads
IceLastReceivedSequenceNumber
IceLastSentSequenceNumber
IceListenForConnections
IceLockAuthFile
IceOpenConnection
IcePing
IceProcessMessages
IceProtocolRevision
IceProtocolSetup
IceProtocolShutdown
IceProtocolVersion
IceReadAuthFileEntry
IceRegisterForProtocolReply
IceRegisterForProtocolSetup
IceRelease
IceRemoveConnectionWatch
IceSetErrorHandler
IceSetHostBasedAuthProc
IceSetIOErrorHandler
IceSetPaAuthData
IceSetShutdownNegotiation
IceSwapping
IceUnlockAuthFile
IceVendor
IceWriteAuthFileEntry
LowerCase
SgiGetSchemeDatabase
SgiLoadNamedScheme
SgiLoadScheme
SgiResetScheme
SgiUseSchemes
SmFreeProperty
SmFreeReasons
SmcClientID
SmcCloseConnection
SmcDeleteProperties
SmcGetIceConnection
SmcGetProperties
SmcInteractDone
SmcInteractRequest
SmcModifyCallbacks
SmcOpenConnection
SmcProtocolRevision
SmcProtocolVersion
SmcRelease
SmcRequestSaveYourself
SmcRequestSaveYourselfPhase2
SmcSaveYourselfDone
SmcSetErrorHandler
SmcSetProperties
SmcVendor
SmsCleanUp
SmsClientHostName
SmsClientID
SmsDie
SmsGenerateClientID
SmsGetIceConnection
SmsInitialize
SmsInteract
SmsProtocolRevision
SmsProtocolVersion
SmsRegisterClientReply
SmsReturnProperties
SmsSaveComplete
SmsSaveYourself
SmsSaveYourselfPhase2
SmsSetErrorHandler
SmsShutdownCancelled
XtCXtToolkitError
XtCvtColorToPixel
XtCvtIntToBool
XtCvtIntToBoolean

XtCvtIntToColor
XtCvtIntToFloat
XtCvtIntToFont
XtCvtIntToPixel
XtCvtIntToPixmap
XtCvtIntToShort
XtCvtIntToUnsignedChar
XtCvtStringToAcceleratorTable
XtCvtStringToAtom
XtCvtStringToBool
XtCvtStringToBoolean
XtCvtStringToCommandArgArray
XtCvtStringToCursor
XtCvtStringToDimension
XtCvtStringToDirectoryString
XtCvtStringToDisplay
XtCvtStringToFile
XtCvtStringToFloat
XtCvtStringToFont
XtCvtStringToFontSet
XtCvtStringToFontStruct
XtCvtStringToGravity
XtCvtStringToInitialState
XtCvtStringToInt
XtCvtStringToPixel
XtCvtStringToRestartStyle
XtCvtStringToShort
XtCvtStringToTranslationTable
XtCvtStringToUnsignedChar
XtCvtStringToVisual
applicationShellClassRec
applicationShellWidgetClass
colorConvertArgs
compositeClassRec
compositeWidgetClass
constraintClassRec
constraintWidgetClass
coreWidgetClass
hookObjClassRec
hookObjectClass
objectClass
objectClassRec
overrideShellClassRec
overrideShellWidgetClass
rectObjClass
rectObjClassRec
screenConvertArg
sessionShellClassRec
sessionShellWidgetClass
shellClassRec
shellWidgetClass
topLevelShellClassRec
topLevelShellWidgetClass
transientShellClassRec
transientShellWidgetClass
vendorShellClassRec
vendorShellWidgetClass
widgetClass
widgetClassRec
wmShellClassRec
wmShellWidgetClass

Appendix L:
Computation Pre-Compiler Functions

The following is a list of the functions of the pre-compiler:

- Association of MSID with source variables
- Telemetry extraction functions
- External pseudo transmit functions
- Internal pseudo write functions
- Computation constant update functions
- Access to necessary EHS include files
- EHS standard data file read / write functions
- Signal handlers required for computation control

Note: The signal handlers SIGUSR1 and SIGUSR2 are reserved for the computation developer to use.

The pre-compiler also declares global variables that may be used by the computation developer within the **@PROCESSING** section. Local variables for use by the computation developer include:

CPS_Loop_Done	A flag that indicates when the main processing section is complete. This flag is normally set to a value of **0**. The flag can be set to **1** if the developer chooses to exit the main loop.
CPS_EML_Conversion	Indicates how input MSIDs will be processed by the Telemetry Extraction libraries. This variable is normally set to EML_CONVERT but can be changed by the developer to one of the following: ■ **EML_CALIBRATE** ■ **EML_CONVERT** ■ **EML_UNPROCESSED**

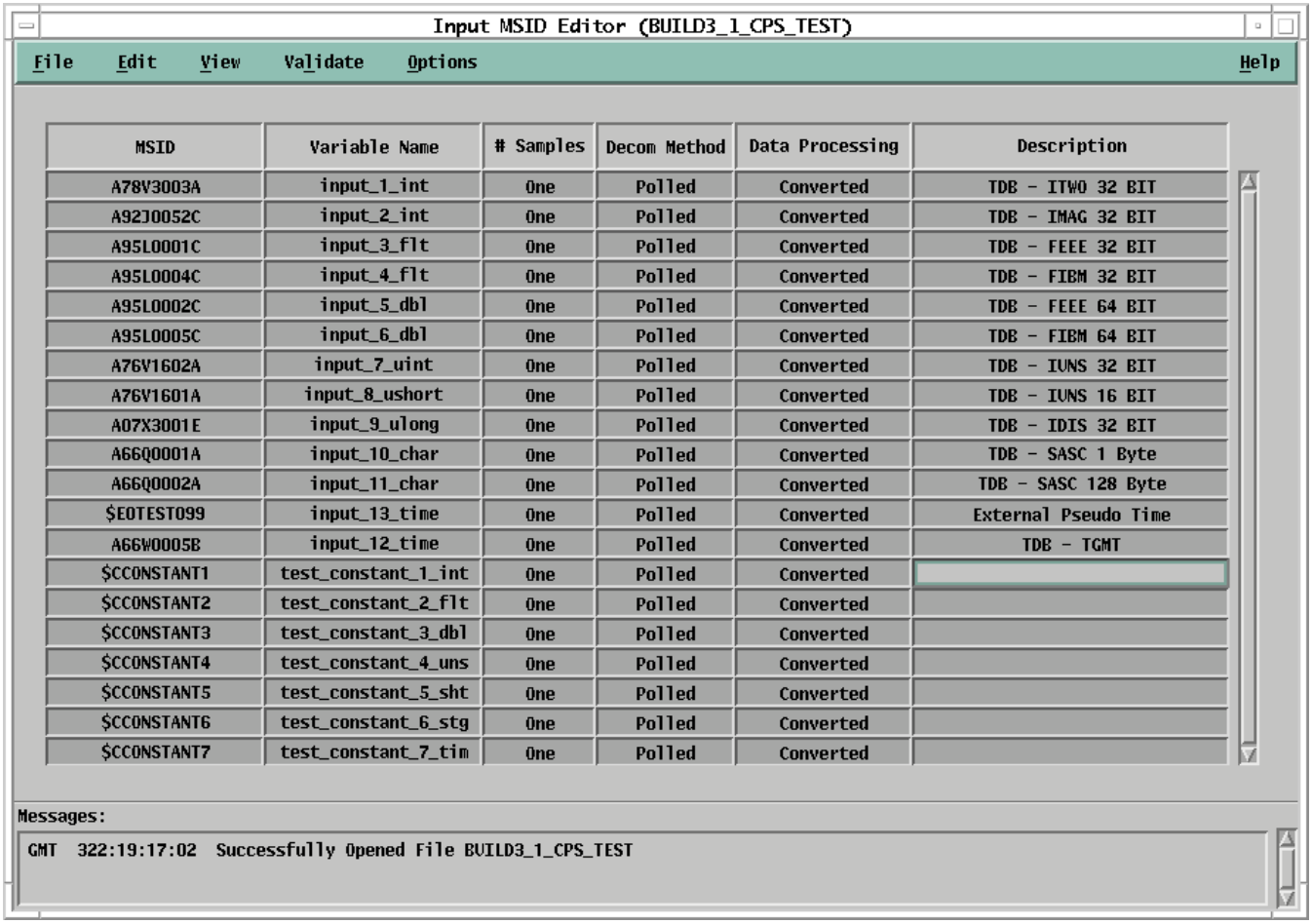
852

Appendix M:
User Computation Example

This appendix illustrates a computation in its source file form for comparison and explanation. Also listed is an Input MSID file example which is used in conjunction with the source code example.

M.1 Input MSID Example

The Input MSID Editor will allow the user to specify most of the information needed for each MSID (see Figure M-1, Input MSIDs for Example Computation).



MSID	Variable Name	# Samples	Decom Method	Data Processing	Description
A78V3003A	input_1_int	One	Polled	Converted	TDB - ITWO 32 BIT
A92J0052C	input_2_int	One	Polled	Converted	TDB - IMAG 32 BIT
A95L0001C	input_3_flt	One	Polled	Converted	TDB - FEEE 32 BIT
A95L0004C	input_4_flt	One	Polled	Converted	TDB - FIBM 32 BIT
A95L0002C	input_5_dbl	One	Polled	Converted	TDB - FEEE 64 BIT
A95L0005C	input_6_dbl	One	Polled	Converted	TDB - FIBM 64 BIT
A76V1602A	input_7_uint	One	Polled	Converted	TDB - IUNS 32 BIT
A76V1601A	input_8_ushort	One	Polled	Converted	TDB - IUNS 16 BIT
A07X3001E	input_9_ulong	One	Polled	Converted	TDB - IDIS 32 BIT
A66Q0001A	input_10_char	One	Polled	Converted	TDB - SASC 1 Byte
A66Q0002A	input_11_char	One	Polled	Converted	TDB - SASC 128 Byte
$EOTEST099	input_13_time	One	Polled	Converted	External Pseudo Time
A66W0005B	input_12_time	One	Polled	Converted	TDB - TGMT
$CCONSTANT1	test_constant_1_int	One	Polled	Converted	
$CCONSTANT2	test_constant_2_flt	One	Polled	Converted	
$CCONSTANT3	test_constant_3_dbl	One	Polled	Converted	
$CCONSTANT4	test_constant_4_uns	One	Polled	Converted	
$CCONSTANT5	test_constant_5_sht	One	Polled	Converted	
$CCONSTANT6	test_constant_6_stg	One	Polled	Converted	
$CCONSTANT7	test_constant_7_tim	One	Polled	Converted	

Figure M-1, Input MSIDs for Example Computation.

M.2 Output MSID File Example

The Output MSID Editor will allow the user to specify most of the information needed for each MSID (see Figure M-2, Output MSIDs for Example Computation).

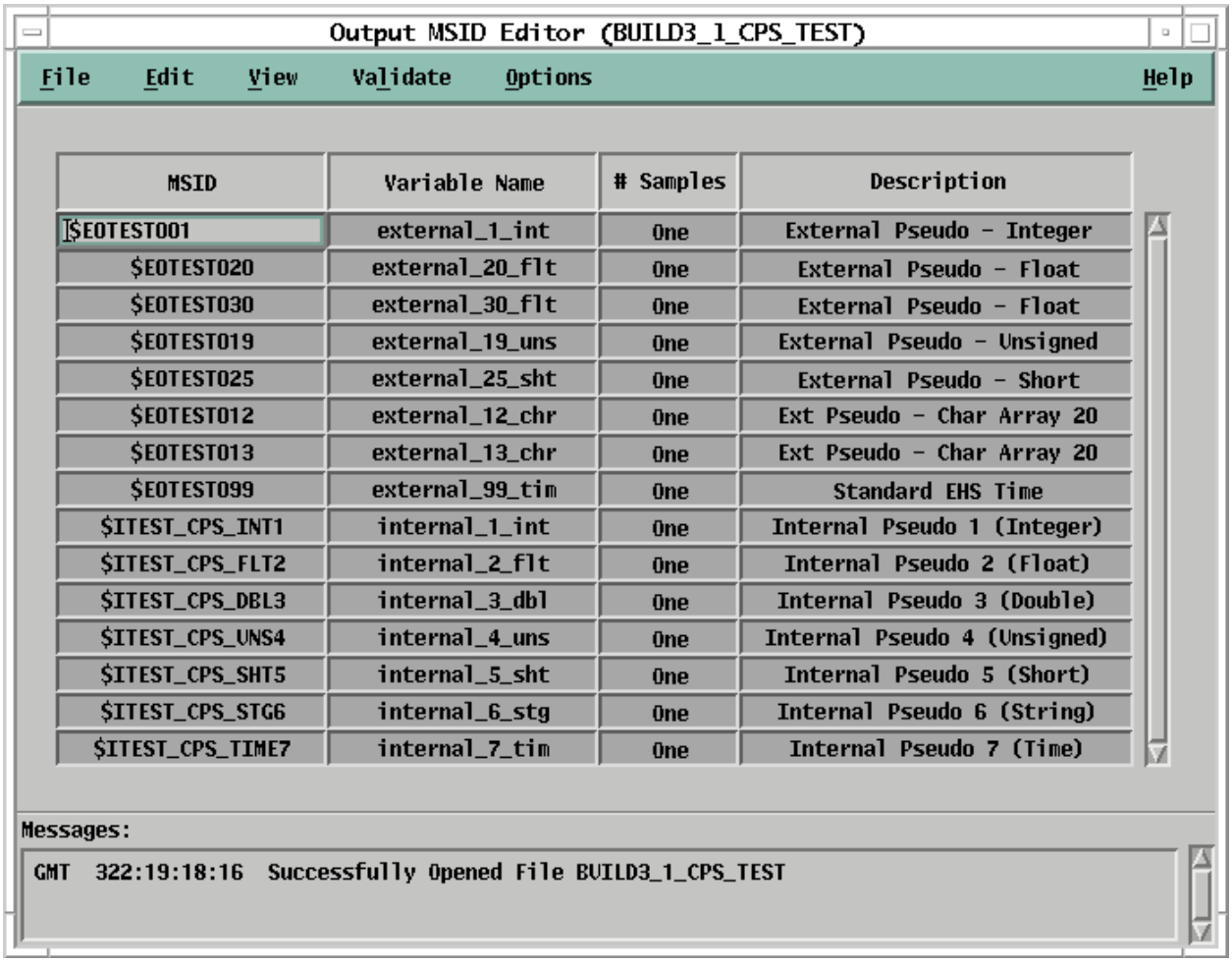


Figure M-2, Output MSIDs for Example Computation.

The '$E' in the MSID Name would signify an external pseudo value while the '$I' in the MSID Name would signify an internal pseudo value.

The external pseudo MSID Name will be found in the Telemetry Database while the internal MSID Name is merely identified in a computation application by a computation designer and will not be found in the database.

M.3 Main Source File Example

All information entered by the user during an edit session is in **bold**. Information not in bold was part of the template when the new file was created.

```
@MAIN_SOURCE_C
/*********************************************************************
 * Main Source: BUILD3.1_CPS_TEST.cms
 *
 *  Description:
 *               This source file is used to test most of the major
 *               EHS functionality associated with computations. This
 *               includes getting decom data from TNS, outputting
 *               External and Internal Pseudos, receive comp constant
 *               updates, check loop cycle and done globals, most
 *               data types tested, etc.
 *
 *  Note: In order to build the computation for the different projects
 *        use the following input and output files:
 *
 *        AXAF INC2 Flight: Use ACCEP_TEST_CPS_AXAF.cmi input file
 *                          and ACCEP_TEST_CPS_AXAF.cmo output file.
 *
 *        SL   TST1 Flight: Use ACCEP_TEST_CPS.cms input file
 *                          and ACCEP_TEST_CPS.cmi output file.
 *
 ********************
 *  Revision History:
 *         09/18/1997  Build 3.1 Update: Test Build 3.1 Capabilities
 *         12/10/1996  Initial Creation  J.R. Jones  (000_GOLD_TEST.cms)
 *********************************************************************/
#include<math.h>
#include<comps/cg/cpstime.h>

@INIT

void increment_loop_count(int *loop_count);

#define MAX_LOOP_COUNT 50

   /* int CPS_Loop_Cycle_Time = 1000;    Example of 1  Sec Loop Count */
   /* int CPS_Loop_Cycle_Time = 10000;   Example of 10 Sec Loop Count */
   int Loop_Count          = 0;

   /* Input MSIDs */
   int             input_1_int;
   long            input_2_int;
   float           input_3_flt;
   float           input_4_flt;
   double          input_5_dbl;
   double          input_6_dbl;
   unsigned  int   input_7_uint;
```

```
unsigned  short input_8_ushort;
unsigned  short input_9_ulong;
char            input_10_char;
char            input_11_char[20];
CPSTIME         input_12_time;

/* Decom Sample Status Variables */
int     decom_1_stat, decom_2_stat,  decom_3_stat,  decom_4_stat  = 0;
int     decom_5_stat, decom_6_stat,  decom_7_stat,  decom_8_stat  = 0;
int     decom_9_stat, decom_10_stat, decom_11_stat, decom_12_stat = 0;

int      test_constant_1_int =  0x1111;    /* Input Constant - Integer  */
float    test_constant_2_flt =  0.0222;    /* Input Constant - Float    */
double   test_constant_3_dbl = -0.0333;    /* Input Constant - Double   */
unsigned test_constant_4_uns =  0x08880000;/* Input Constant - Unsigned */
short    test_constant_5_sht =  0x0055;    /* Input Constant - Short    */
char     test_constant_6_stg[80];          /* Input Constant - String   */
CPSTIME  test_constant_7_tim;              /* Input Constant - Time     */


/****************/
/* Output MSIDs */
/****************/
int      external_1_int;
float    external_20_flt;
float    external_30_flt;    /* Change to Double when TDB supports it */
unsigned external_19_uns;
short    external_25_sht;
char     external_12_chr[20];
char     external_13_chr[20];
CPSTIME  external_99_tim;

int      internal_1_int;           /* Output Internal Pseudo - Integer  */
float    internal_2_flt;           /* Output Internal Pseudo - Float    */
double   internal_3_dbl;           /* Output Internal Pseudo - Double   */
unsigned internal_4_uns;           /* Output Internal Pseudo - Unsigned */
short    internal_5_sht;           /* Output Internal Pseudo - Short    */
char     internal_6_stg[80];       /* Output Internal Pseudo - String   */
CPSTIME  internal_7_tim;           /* Output Internal Pseudo - Time     */

/*************************************/
/* EHS Function Call status variables */
/*************************************/
int getstat_1,  putstat_ext1,  putstat_int1  = 0;
int getstat_2,  putstat_ext2,  putstat_int2  = 0;
int getstat_3,  putstat_ext3,  putstat_int3  = 0;
int getstat_4,  putstat_ext4,  putstat_int4  = 0;
int getstat_5,  putstat_ext5,  putstat_int5  = 0;
int getstat_6,  putstat_ext6,  putstat_int6  = 0;
int getstat_7,  putstat_ext7,  putstat_int7  = 0;
int getstat_8,  putstat_ext8,  putstat_int8  = 0;
int getstat_9,  putstat_ext9,  putstat_int9  = 0;
int getstat_10, putstat_ext10, putstat_int10 = 0;
int getstat_11, putstat_ext11, putstat_int11 = 0;
```

```
   int getstat_12, putstat_ext12, putstat_int12 = 0;


   int   test_1_int = 0x00001111;
   int   test_2_int = 0x77770000;
   float test_3_flt = 123.4567;
   float test_4_flt = -123.4567;

   FILE *print_file = NULL;

   struct ron_data
   {
     int y_int;
     float x_float;
   } object_1;

@BEGIN

  /* execv()  - to test unauthorized function call */

  CPS_Loop_Cycle_Time = 5000;

  /* Open Text File for output */
  print_file = fopen("/tmp/build3_1_cps_test.txt", "w");

  fprintf(print_file, "-------------------------------------------------\n");
  fprintf(print_file, "Test Computation (pid:%d ) Started               \n",
     getpid() );
  fprintf(print_file, "      ***** ***** ***** Loop Count: %d   PID: %d \n\n",
                        Loop_Count,
                        getpid());

  printf("Test Computation (pid:%d ) Started               \n", getpid() );
  printf("      ***** ***** ***** Loop Count: %d   PID: %d \n\n",
         Loop_Count,
         getpid());

  /* Set Constant Time 001:12:59:59 */
  test_constant_7_tim.tm_time.tm_year = 97;
  test_constant_7_tim.tm_time.tm_yday = 1;
  test_constant_7_tim.tm_time.tm_hour = 12;
  test_constant_7_tim.tm_time.tm_min  = 59;
  test_constant_7_tim.tm_time.tm_sec  = 59;
  test_constant_7_tim.tm_milli        = 0;
  test_constant_7_tim.new_data        = 0;
  test_constant_7_tim.hold            = 0;
  test_constant_7_tim.sign            = 0;

  /* Set Internal Time 000:00:00:00 */
  internal_7_tim.tm_time.tm_year = 0;
  internal_7_tim.tm_time.tm_yday = 0;
  internal_7_tim.tm_time.tm_hour = 0;
  internal_7_tim.tm_time.tm_min  = 0;
  internal_7_tim.tm_time.tm_sec  = 0;
```

```
  internal_7_tim.tm_milli = 0;
  internal_7_tim.new_data = 0;
  internal_7_tim.hold     = 0;
  internal_7_tim.sign     = 0;

  /* Set Constant String */
  strcpy(test_constant_6_stg, "Comp Constant (7)");

  /* Define Output Pseudo Status Dependencies - New for Build 3.1 */
  CPS_Define_Output_Dependencies(external_99_tim,  input_12_time);

@BEGIN_LOOP

  /* Instructions to execute each cycle before data reception */
  getstat_1 = 0;
  getstat_2 = 0;
  getstat_3 = 0;
  getstat_4 = 0;
  getstat_5 = 0;
  getstat_6 = 0;

@INPUT

  fprintf(print_file, "\n\n\n");
  fprintf(print_file, "Get Input Data Values...\n");
  printf("Get Input Data Values...\n");

  getstat_1  = CPS_Get_Next_Value(input_1_int);
  getstat_2  = CPS_Get_Next_Value(input_2_int);
  getstat_3  = CPS_Get_Next_Value(input_3_flt);
  getstat_4  = CPS_Get_Next_Value(input_4_flt);
  getstat_5  = CPS_Get_Next_Value(input_5_dbl);
  getstat_6  = CPS_Get_Next_Value(input_6_dbl);
  getstat_7  = CPS_Get_Next_Value(input_7_uint);
  getstat_8  = CPS_Get_Next_Value(input_8_ushort);
  getstat_9  = CPS_Get_Next_Value(input_9_ulong);
  getstat_10 = CPS_Get_Next_Value(input_10_char);
  getstat_11 = CPS_Get_Next_Value(input_11_char);
  getstat_12 = CPS_Get_Next_Value(input_12_time);

@PROCESSING

/* If Status from CPS_Get indicates decom errors then get
   detailed status. */
  if (getstat_1  != 0)
    decom_1_stat  = CPS_Get_Status(input_1_int);
  if (getstat_2  != 0)
    decom_2_stat  = CPS_Get_Status(input_2_int);
  if (getstat_3  != 0)
    decom_3_stat  = CPS_Get_Status(input_3_flt);
  if (getstat_4  != 0)
    decom_4_stat  = CPS_Get_Status(input_4_flt);
  if (getstat_5  != 0)
    decom_5_stat  = CPS_Get_Status(input_5_dbl);
```

```
if (getstat_6  != 0)
  decom_6_stat  = CPS_Get_Status(input_6_dbl);
if (getstat_7  != 0)
  decom_7_stat  = CPS_Get_Status(input_7_uint);
if (getstat_8  != 0)
  decom_8_stat  = CPS_Get_Status(input_8_ushort);
if (getstat_9  != 0)
  decom_9_stat  = CPS_Get_Status(input_9_ulong);
if (getstat_10 != 0)
  decom_10_stat = CPS_Get_Status(input_10_char);
if (getstat_11 != 0)
  decom_11_stat = CPS_Get_Status(input_11_char);
if (getstat_12 != 0)
  decom_12_stat = CPS_Get_Status(input_12_time);


/* Show Input Values */
 fprintf(print_file, "Variable        GetStat   Status    Value    \n");
 fprintf(print_file, "--------        --------  --------  -------- \n");
 fprintf(print_file, "input_1_int     %8.8x  %8.8x  %8.8x    \n",
   getstat_1, decom_1_stat, input_1_int);
 fprintf(print_file, "input_2_int     %8.8x  %8.8x  %8.8x    \n",
   getstat_2, decom_2_stat, input_2_int);
 fprintf(print_file, "input_3_flt     %8.8x  %8.8x  %f     %16.8x       \n",
   getstat_3, decom_3_stat, input_3_flt, input_3_flt);
 fprintf(print_file, "input_4_flt     %8.8x  %8.8x  %f     %16.16x      \n",
   getstat_4, decom_4_stat, input_4_flt, input_4_flt);
 fprintf(print_file, "input_5_dbl     %8.8x  %8.8x  %f       \n",
   getstat_5, decom_5_stat, input_5_dbl);
 fprintf(print_file, "input_6_dbl     %8.8x  %8.8x  %f       \n",
   getstat_6, decom_6_stat, input_6_dbl);
 fprintf(print_file, "input_7_uint    %8.8x  %8.8x  %u       \n",
   getstat_6, decom_7_stat, input_7_uint);
 fprintf(print_file, "input_8_ushort  %8.8x  %8.8x  %u       \n",
   getstat_6, decom_8_stat, input_8_ushort);
 fprintf(print_file, "input_9_ulong   %8.8x  %8.8x  %u       \n",
   getstat_6, decom_9_stat, input_9_ulong);
 fprintf(print_file, "input_10_char   %8.8x  %8.8x  %c       \n",
   getstat_6, decom_10_stat, input_10_char);
 fprintf(print_file, "input_11_char   %8.8x  %8.8x  %s       \n",
   getstat_6, decom_11_stat, &input_11_char);
 fprintf(print_file, "input_12_time   %8.8x  %8.8x
   %02.2d:%03.3d:%02.2d:%02.2d:%02.2d\n",
            getstat_6,
            decom_12_stat,
            input_12_time.tm_time.tm_year,
            input_12_time.tm_time.tm_yday,
            input_12_time.tm_time.tm_hour,
            input_12_time.tm_time.tm_min,
            input_12_time.tm_time.tm_sec);
 fprintf(print_file, "\n");
 fprintf(print_file, "Process Data Input to Output...\n");

 printf("Process Data Input to Output...\n");
```

```
/* Show Constant Values */
fprintf(print_file, "\n");
fprintf(print_file, "         Show Constant Values           \n");
fprintf(print_file, "----------------------------------------\n");
fprintf(print_file, " Integer (1) : 0x%08.8x                 \n",
  test_constant_1_int);
fprintf(print_file, " Float   (2) : %f                       \n",
  test_constant_2_flt);
fprintf(print_file, " Double  (3) : %f                       \n",
  test_constant_3_dbl);
fprintf(print_file, " Unsigned(4) : 0x%08.8x                 \n",
  test_constant_4_uns);
fprintf(print_file, " Short   (5) : 0x%04.4x                 \n",
  test_constant_5_sht);
fprintf(print_file, " String  (6) : %s                       \n",
  test_constant_6_stg);
fprintf(print_file, " Time    (7) : %02.2d:%03.3d:%02.2d:%02.2d:%02.2d \n",
           test_constant_7_tim.tm_time.tm_year,
           test_constant_7_tim.tm_time.tm_yday,
           test_constant_7_tim.tm_time.tm_hour,
           test_constant_7_tim.tm_time.tm_min,
           test_constant_7_tim.tm_time.tm_sec);

/* Show Time Pseudo Values prior to being updated */
fprintf(print_file, "External Time(99)   :
   %02.2d:%03.3d:%02.2d:%02.2d:%02.2d \n",
           external_99_tim.tm_time.tm_year,
           external_99_tim.tm_time.tm_yday,
           external_99_tim.tm_time.tm_hour,
           external_99_tim.tm_time.tm_min,
           external_99_tim.tm_time.tm_sec);

fprintf(print_file, "Internal Time(7)    :
    %02.2d:%03.3d:%02.2d:%02.2d:%02.2d \n",
           internal_7_tim.tm_time.tm_year,
           internal_7_tim.tm_time.tm_yday,
           internal_7_tim.tm_time.tm_hour,
           internal_7_tim.tm_time.tm_min,
           internal_7_tim.tm_time.tm_sec);

/**** Set Internal Values ****/
internal_1_int  = 0x11110000   +  test_constant_1_int;
internal_2_flt  = 2.2          +  test_constant_2_flt;
internal_3_dbl  = -3.3         +  test_constant_3_dbl;
internal_4_uns  = 0x80004444   +  test_constant_4_uns;
internal_5_sht  = 0x5500       +  test_constant_5_sht;
strcpy(internal_6_stg, test_constant_6_stg);

internal_7_tim.tm_time.tm_year = test_constant_7_tim.tm_time.tm_year;
internal_7_tim.tm_time.tm_yday = test_constant_7_tim.tm_time.tm_yday;
internal_7_tim.tm_time.tm_hour = test_constant_7_tim.tm_time.tm_hour;
internal_7_tim.tm_time.tm_min  = test_constant_7_tim.tm_time.tm_min;
internal_7_tim.tm_time.tm_sec  = test_constant_7_tim.tm_time.tm_sec;
```

```
   internal_7_tim.tm_milli        = test_constant_7_tim.tm_milli;
   internal_7_tim.new_data        = test_constant_7_tim.new_data;
   internal_7_tim.hold            = test_constant_7_tim.hold;
   internal_7_tim.sign            = test_constant_7_tim.sign;


   /* Set External Values */
   external_1_int   = 0x11110000     +  test_constant_1_int;
   external_20_flt  = 20.202020;
   external_30_flt  = 30.303030;
   external_19_uns  = 0x80001919;
   external_25_sht  = 0x2525;
   strcpy(external_12_chr, "Test Computation");
   strcpy(external_13_chr, "1997 NTI SW Dev. - EHS Build 3.1");
   memcpy(&external_99_tim, &input_12_time, sizeof(CPSTIME));


   /* Output External Pseudo Values */
   putstat_ext1 = CPS_Put_Pseudo_Value(external_1_int,   1);
   putstat_ext2 = CPS_Put_Pseudo_Value(external_20_flt,  1);
   putstat_ext3 = CPS_Put_Pseudo_Value(external_30_flt,  1);
   putstat_ext4 = CPS_Put_Pseudo_Value(external_19_uns,  1);
   putstat_ext5 = CPS_Put_Pseudo_Value(external_25_sht,  1);
   putstat_ext6 = CPS_Put_Pseudo_Value(external_12_chr,  1);
   putstat_ext7 = CPS_Put_Pseudo_Value(external_13_chr,  1);
   putstat_ext8 = CPS_Put_Pseudo_Value(external_99_tim,  1);

   /* Output Internal Pseudo Values */
   putstat_int1 = CPS_Put_Pseudo_Value(internal_1_int,  1);
   putstat_int2 = CPS_Put_Pseudo_Value(internal_2_flt,  1);
   putstat_int3 = CPS_Put_Pseudo_Value(internal_3_dbl,  1);
   putstat_int4 = CPS_Put_Pseudo_Value(internal_4_uns,  1);
   putstat_int5 = CPS_Put_Pseudo_Value(internal_5_sht,  1);
   putstat_int6 = CPS_Put_Pseudo_Value(internal_6_stg,  1);
   putstat_int7 = CPS_Put_Pseudo_Value(internal_7_tim,  1);


@OUTPUT

   fprintf(print_file, "\n");
   fprintf(print_file, "Put Output Data Values...\n");
   fprintf(print_file, "\n");
   fprintf(print_file, "Variable        PutStat   Value    \n");
   fprintf(print_file, "--------        --------  -------- \n");

/* External Pseudos */
   fprintf(print_file, "external_1_int  %8.8x  %8.8x    \n",
      putstat_ext1, external_1_int);
   fprintf(print_file, "external_20_flt %8.8x  %f       \n",
      putstat_ext2, external_20_flt);
   fprintf(print_file, "external_30_flt %8.8x  %f       \n",
      putstat_ext3, external_30_flt);
   fprintf(print_file, "external_19_uns %8.8x  %8.8x    \n",
      putstat_ext4, external_19_uns);
```

```
   fprintf(print_file, "external_25_sht %8.8x  %4.4x    \n",
      putstat_ext5, external_25_sht);
   fprintf(print_file, "external_12_chr %8.8x  %s       \n",
      putstat_ext6, external_12_chr);
   fprintf(print_file, "external_13_chr %8.8x  %s       \n",
      putstat_ext7, external_13_chr);
   fprintf(print_file, "external_99_tim %8.8x
      %02.2d:%03.3d:%02.2d:%02.2d:%02.2d \n",
                              putstat_ext8,
                              external_99_tim.tm_time.tm_year,
                              external_99_tim.tm_time.tm_yday,
                              external_99_tim.tm_time.tm_hour,
                              external_99_tim.tm_time.tm_min,
                              external_99_tim.tm_time.tm_sec);
/* Internal Pseudos */
   fprintf(print_file, "\n");
   fprintf(print_file, "internal_1_int  %8.8x  %8.8x    \n",
      putstat_int1, internal_1_int);
   fprintf(print_file, "internal_2_flt  %8.8x  %f       \n",
      putstat_int2, internal_2_flt);
   fprintf(print_file, "internal_3_dbl  %8.8x  %f       \n",
      putstat_int3, internal_3_dbl);
   fprintf(print_file, "internal_4_uns  %8.8x  %8.8x    \n",
      putstat_int4, internal_4_uns);
   fprintf(print_file, "internal_5_sht  %8.8x  %4.4x    \n",
      putstat_int5, internal_5_sht);
   fprintf(print_file, "internal_6_stg  %8.8x  %s       \n",
      putstat_int6, internal_6_stg);
   fprintf(print_file, "internal_7_tim  %8.8x
      %02.2d:%03.3d:%02.2d:%02.2d:%02.2d \n",
                              putstat_int7,
                              internal_7_tim.tm_time.tm_year,
                              internal_7_tim.tm_time.tm_yday,
                              internal_7_tim.tm_time.tm_hour,
                              internal_7_tim.tm_time.tm_min,
                              internal_7_tim.tm_time.tm_sec);



  /************************************************/
  /** Run Computation Main Loop n Times then Exit **/
  /************************************************/
  if (Loop_Count < MAX_LOOP_COUNT)
            increment_loop_count(&Loop_Count);


  fprintf(print_file, "      ***** ***** ***** Loop Count: %d   PID: %d \n\n",
         Loop_Count,
         getpid()    );


  printf("      ***** ***** ***** Loop Count: %d   PID: %d \n\n",
         Loop_Count,
         getpid()    );
```

```
  fflush(stdout);

@END_LOOP

  printf("------------------                                \n");
  printf("End Loop Count: %d                                \n", Loop_Count);
  printf("Test Computation (pid:%d ) Completed              \n", getpid() );
  printf("-------------------------------------------------\n");

@END

  /* */

@FUNCTIONS

void increment_loop_count(int *loop_count)
  {
   (*loop_count)++;

@DEPENDENCIES
```

M.4 Subroutine File Example

All information entered by the user during an edit session is in **bold**. Information not in bold was part of the template when the new file was created.

```
@SUBROUTINE_C
/*****************************************************************
 *    Subroutine File:  mission_x
 *    Description:
 *
 *          This file contains a collection of subroutines to be used for
 *          mission x.
 *
 *    Creation Date: 12-1-96
 *    Revision Date:
 *
 *    Author:  J.R. Jones / New Technology Inc.
 *    NASA MSFC Enhanced HOSC System - Computation Generation Subroutine File
 *    System Revision: 3.0
 *****************************************************************/
/*** Place include files here ***/
@FUNCTIONS
/*** Insert Functions here ***/
     int  delta_int (int a, int b)
     {
     /* Find the non-negative delta between two integers */
             if (a > b)
                   a = a-b;
             else
                   a = b-a;
     return a;
     }
*************************************************************************
END OF SUBROUTINE FILE EXAMPLE
*************************************************************************
```

M.5 Include File Example

All information entered by the user during an edit session is in **bold**. Information not in bold was part of the template when the new file was created.

```
@INCLUDE
/*************************************************************************
 *    Header File:  mission_x
 *    Description:
 *
 *   This file contains the common definitions and declarations for mission x.
 *
 *    Creation Date: 12-1-96
 *    Revision Date:
 *
 *    Author:  J.R. Jones - New Technology Inc.
 *    NASA MSFC Enhanced HOSC System - Computation Generation Header File
 *    System Revision: 3.0
 *************************************************************************/
/*** Place include files here ***/
@INIT
/*** Insert Declarations here ***/
#define     Start_Of_Mission        20;   /* Number of Seconds */
#define     End_Of_Mission          600;  /* Number of Seconds */
*************************************************************************
END OF INCLUDE EXAMPLE
*************************************************************************
```

Appendix N:
Available Libraries - Computations

The following libraries are available to computation developers:

LIBC
LIBCOMP
LIBEHS
LIBFTN
LIBM
LIBX11
LIBXM
LIBXT

Help: Any functions contained in these libraries that are not available to computation developers are indicated in "Appendix K: Computation Legal & Illegal Functions."

Appendix O: Computation Data Type Conversion Matrix

The table on the following page provides you with a computation data type conversion matrix.

		FROM	TO CAL		TO COMP										TO SCRIPT			
CODE(1949)	**Native Data Type Description**	**EHS Conv Type**	**FP**	**SC**	**Int**	**short**	**long**	**unit**	**ushrt**	**ulong**	**float**	**double**	**char**	**char(u)**	**long**	**ulong**	**double**	**char**
Strings																		
SASC	ASCII Character String	Null Term ASCII String											ptr					ptr
SASCB	Byte Swapped ASCI CharString	Null Term ASCII String											ptr					ptr
SEBC	EBCDIC Character String	Null Term ASCII String											ptr					ptr
SUND	Undefined Byte String	Null Term ASCII String											ptr					ptr
IUND	Undefined Integer	Null Term ASCII String											ptr					ptr
Integers																		
IMAG	Signed Magnitude Integer	Two's Compl Integer	x	x	x	r	x				x	x			x			
ITWO	Two's Complement Integer	Two's Compl Integer	x	x	x	r	x				x	x			x			
ITWOW	Two's Compl Int Word Swapped	Two's Compl Integer	x	x	x	r	x				x	x			x			
IUNS	Unsigned Integer	Unsigned Integer	x	x	r	r	r	x	r	x	x	x				x		
IDIS	Discrete Integer	Unsigned Integer	x	x	r	r	r	x	r	x	x	x				x		
Floats																		
FEEE	IEEE Floating Point (Single/Double)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)					x	
FIBM	IBM Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FIUS	IUS Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FNTL	Intel Float Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FSPL	Spoacelab Floating Point (S/D (48))	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FVAX	Vax Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
Times																		
TCCP	CCSDS Cal Seg Time Code-Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCCS	CCSDS Calendar Seg Time Code	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCDP	CCSDS Seg Time Code - Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCDS	CCSDS Seg Time Code	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCNT	Count Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCUP	CCSDS Unseg Time Code - Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TDMS	SSFP Data Mgmt System Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TECI	ECIO GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TECS	ECOS Binary GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TGMT	Greenwich Mean Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TGPC	Orbiter GPC GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TIUS	IUS Floating Point Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOOI	Orbiter OI GMT & MET	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TTSM	Time Since Midnight	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1

x - assignment ok
x(s) - single to single recommended
x(d) - double to double recommended
ptr - assignment to char pointer recommended
Note 1: Data Type declared for each element in structure

a - accuracy may be lost
r - out of range may occur
Blank - Not recommended

Appendix P: Computation Services Validation Warning Matrix

The table on the following page provides a Computation Services Validation Warning matrix

		Unprocessed Declaration												Converted Declaration												Calibrated Declaration											
1949	Native Data Type	i	s	l	ui	us	ul	f	d	c	uc	t	Conv Type	i	s	l	ui	us	ul	f	d	c	uc	t	Cal Type	i	s	l	ui	us	ul	f	d	c	uc	t
Strings																																					
SASC	ASCII Character String	0	0	0	0	0	0	0	0	1	0	0	ASCII String	0	0	0	0	0	0	0	0	1	0	0	---	0	0	0	0	0	0	0	0	0	0	0
SASCB	Byte Swap ASCII CharString	0	0	0	0	0	0	0	0	1	0	0	ASCII String	0	0	0	0	0	0	0	0	1	0	0	---	0	0	0	0	0	0	0	0	0	0	0
SEBC	EBCDIC Character String	0	0	0	0	0	0	0	0	1	0	0	ASCII String	0	0	0	0	0	0	0	0	1	0	0	---	0	0	0	0	0	0	0	0	0	0	0
SUND	Undefined Byte String	0	0	0	0	0	0	0	0	1	0	0	---	0	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0	0
Integers																																					
IMAG	Signed Magnitude Integer	0	0	0	0	0	0	0	0	1	0	0	Long,Short	L	S	L	0	0	0	0	0	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
ITWO	Two's Complement Integer	0	0	0	0	0	0	0	0	1	0	0	Long,Short	L	S	L	0	0	0	0	0	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
ITWOW	Two's Compl Int Word Swap	0	0	0	0	0	0	0	0	1	0	0	Long,Short	L	S	L	0	0	0	0	0	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
IUNS	Unsigned Integer	0	0	0	0	0	0	0	0	1	0	0	Ulong,Ushort	0	0	0	L	S	L	0	0	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
IDIS	Discrete Integer	0	0	0	0	0	0	0	0	1	0	0	Ulong,Ushort	0	0	0	L	S	L	0	0	0	0	0	ASCII String	0	0	0	0	0	0	0	0	0	1	0
IUND	Undefined Integer	0	0	0	0	0	0	0	0	1	0	0	---	0	0	0	0	0	0	0	0	0	0	0	---	0	0	0	0	0	0	0	0	0	0	0
Floats																																					
FEEE	IEEE Floating Point (S/D)	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	D	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
FIBM	IBM Floating Point (S/D)	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	1	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
FNTL	Intel Floating Point (S/D)	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	1	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
FSPL	Spacelab Float Point (S/D(48))	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	1	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
FVAX	Vax Floating Point (S/D)	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	1	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
FMIL	Military Floating Point (S/D)	0	0	0	0	0	0	0	0	1	0	0	Float,Double	0	0	0	0	0	0	F	1	0	0	0	Float,Double	0	0	0	0	0	0	0	F	D	0	0
Times																																					
TCCP	CCSDS Cal Seg Time - Pre	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TCCS	CCSDS Calendar Seg Time	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TCDP	CCSDS Seg Time Code - Pre	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TCDS	CCSDS Seg Time Code	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TCUP	CCSDS Unseg Time - Pre	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TCNT	Count Time	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TDMS	SSFP Data Mngmnt Sys Time	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TECI	ECIO GMT	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TECS	ECOS Binary GMT	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TGMT	Greenwi ch Mean Time	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TGPC	Orbiter GPC GMT	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TOOI	Orbiter OI GMT & MET	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TTSM	Time Since Midnight	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TERT	Earth Receive Time	0	0	0	0	0	0	0	0	1	0	0	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0
TEHS	EHS Time Word	0	0	0	0	0	0	0	0	1	0	1	EHS Time	0	0	0	0	0	0	0	0	0	0	1	---	0	0	0	0	0	0	0	0	0	0	0

1 - Valid
0 - Not valid (warning to user)
L- Valid for Long
S- Valid for Short
F- Valid for Float
D- Valid for Double

i - integer
s - short
l - long
ui - unsigned integer
us - unsigned short
ul - unsigned long

f- float
d- double
c- char
uc- unsigned char
t- ehs time

Appendix Q: Example Script

To ensure this script will validate and execute, variables must be declared as the appropriate type and User-Generated Data Elements (UDEs) referenced within the script are available on your workstation. The while loops of this script may need to be changed based on the incoming values of the Measurement Stimulus Identifier (MSID) you are using.

```
BEGIN_SCRIPT Example1

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

;    This is a script that will start displays based on the value of

;    an MSID and stop all displays based on a different value of

;    the MSID

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

DECLARATIONS

            SYSTEM_SECTION

            GLOBAL_SECTION

            LOCAL_SECTION

                integer pkt_stat, samp_status

                unsigned_int msid_val

END_DECLARATIONS

step on

msid_val=0

while (msid_val < 10) .or. (msid_val > 15) do

    sample new A71T3002A conv into msid_val packet_status pkt_stat;;

    sample_status samp_status
```

```
        write “Packet Status = ” ,pkt_stat, “MSID Value = ”,msid_val
        wait 1
endwhile
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
;  Start the desired display
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
start display training01
start display precaution1
start display precaution2
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
;   Pause until all displays start
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
write “Allow enough time for display operation to initialize displays”
wait 45
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
;   Now stop all displays when the second threshold is met
;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
msid_val=0
while (msid_val < 80) .or. (msid_val > 90) do
        sample new A71T3002A conv into msid_val packet_status pkt_stat;;
        sample_status samp_status
        write “Packet Status =  ” ,pkt_stat, “MSID Value = ”,msid_val
        wait 1
```

```
endwhile

stop display all

step

write “All done...”

END_SCRIPT
```

Command Script Example

```
BEGIN_SCRIPT update_command_fields

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

;    This is a script that will update commands fields with decimal, binary,
;    octal and hexadecimal numbers and character strings

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

DECLARATIONS

                SYSTEM_SECTION

                GLOBAL_SECTION

                LOCAL_SECTION

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

;    The next line declares the variables VAR1, VAR2, VAR3 and VAR4 as
;    character string variables.

;+++++++++++++++++++++++++++++++++++++++++++++++++++++++++

                        STRING VAR1, VAR2, VAR3, VAR4

END_DECLARATIONS

; The character strings are not defined.

VAR1=”WX”

VAR2=”a”
```

```
VAR3=”wx
VAR4=”A”
; Update commands TEST010 and TEST015 with character strings
update_command TEST010 fields
        TEST010_FLD01=VAR1,
        TEST010_FLD02=VAR2
endupdate
update_command TEST015 fields
        TEST015_FLD01=VAR3,
        TEST015_FLD02=VAR4
endupdate
; Update command TEST017 with decimal numbers.
update_command TEST017 fields
        TEST017_FLD01=-10.3,
        TEST017_FLD02=14
endupdate
;Update command TEST011 with binary numbers.
update_command TEST011 fields
        TEST011_FLD01=B#11111111111111,
        TEST011_FLD02=B#0
endupdate
; Update command TEST014 with an octal number.
update_command TEST014 fields
```

```
        TEST014_FLD01=O#57060516
endupdate
; Update command AOAMOM04 with hexadecimal numbers.
        L12MTC1=H#BC6,
        U08MTC2=H#FED
endupdate
END_SCRIPT
```

878

Appendix R:
Script Data Type Conversion Matrix

The table on the following page provides you with a script data type conversion matrix.

		FROM	TO CAL		TO COMP										TO SCRIPT			
CODE(1949)	**Native Data Type Description**	**EHS Conv Type**	**FP**	**SC**	**Int**	**short**	**long**	**unit**	**ushrt**	**ulong**	**float**	**double**	**char**	**char(u)**	**long**	**ulong**	**double**	**char**
Strings																		
SASC	ASCII Character String	Null Term ASCII String											ptr					ptr
SASCB	Byte Swapped ASCI CharString	Null Term ASCII String											ptr					ptr
SEBC	EBCDIC Character String	Null Term ASCII String											ptr					ptr
SUND	Undefined Byte String	Null Term ASCII String											ptr					ptr
IUND	Undefined Integer	Null Term ASCII String											ptr					ptr
Integers																		
IMAG	Signed Magnitude Integer	Two's Compl Integer	x	x	x	r	x				x	x			x			
ITWO	Two's Complement Integer	Two's Compl Integer	x	x	x	r	x				x	x			x			
ITWOW	Two's Compl Int Word Swapped	Two's Compl Integer	x	x	x	r	x				x	x			x			
IUNS	Unsigned Integer	Unsigned Integer	x	x	r	r	r	x	r	x	x	x				x		
IDIS	Discrete Integer	Unsigned Integer	x	x	r	r	r	x	r	x	x	x				x		
Floats																		
FEEE	IEEE Floating Point (Single/Double)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)					x	
FIBM	IBM Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FIUS	IUS Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FNTL	Intel Float Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FSPL	Spoacelab Floating Point (S/D (48))	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
FVAX	Vax Floating Point (S/D)	IEEE Floating Point	x	x	a	a	a	r	r	r	x(s)	x(d)	x				x	
Times																		
TCCP	CCSDS Cal Seg Time Code-Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCCS	CCSDS Calendar Seg Time Code	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCDP	CCSDS Seg Time Code - Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCDS	CCSDS Seg Time Code	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCNT	Count Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TCUP	CCSDS Unseg Time Code - Preamble	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TDMS	SSFP Data Mgmt System Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TECI	ECIO GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TECS	ECOS Binary GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TGMT	Greenwich Mean Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TGPC	Orbiter GPC GMT	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TIUS	IUS Floating Point Time	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOOI	Orbiter OI GMT & MET	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1
TTSM	Time Since Midnight	EHS Time Structure			1	1	1	1	1	1	1	1	1	1	1	1	1	1

x - assignment ok
x(s) - single to single recommended
x(d) - double to double recommended
ptr - assignment to char pointer recommended
Note 1: Data Type declared for each element in structure

a - accuracy may be lost
r - out of range may occur
Blank - Not recommended

Appendix S: Status Codes

This appendix contains status codes and their meaning. The status word is defined as follows:

Unused	Data Cond	Source	Quality	Packet	Delta Limit	Reconfv	Decom/Conv/Cal/LES
31	30	29-28	27-24	23-22	21	20	19-0

Table S-1. Status Word Description

Bit	Bit Description	Value	Value Description
31	Unused		
30	Data Condition	0	New Data
		1	Old Data
29-28	Source	0	AOS
		1	LOS
		2	Source Initialized
27-24	Indicates Data Quality		
27	Minor frames error	0	OK
		1	Suspect
26	Minor frame or packet	0	OK
		1	DQ failed
25	No Data in Packet	0	OK
		1	No Data
24	Override Set	0	No Override
		1	Override
23-22	Indicates Packet Status		

Table S-1. Status Word Description

Bit	Bit Description	Value	Value Description
23	Packet length error	0	OK
		1	Error
22	Sequence count error	0	OK
		1	Error
21	Indicates delta limit violation when LES	0	OK
		1	Error
20	Indicates reconfiguration detected (packet routing)	0	OK
		1	Reconfiguration
19-0	Indicates function processing error from Decom/Convert/Calibrate/LES functions		

Table S-2. Packet and Sample Status Codes

Message	Code Number
EML_OK	0x00000000
EML_STATUS_TABLE_ATTACH_ERROR	0x00000001
EML_INIT_SOURCES_ERROR	0x00000002
EML_INIT_PACKETS_ERROR	0x00000003
EML_CDD_REQUEST_ERROR	0x00000004
EML_LOCAL_TABLE_ERROR	0x00000005

Table S-2. Packet and Sample Status Codes

Message	Code Number
EML_MEMORY_ERROR	0x00000006
EML_PACKET_INTERRUPT_ERROR	0x00000007
EML_REQUEST_UPDATES_ERROR	0x00000008
EML_SMAC_TDS_ERROR	0x00000009
EML_DP_RECONFIG_ERROR	0x0000000A
EML_PACKET_NOT_FOUND	0x0000000B
EML_DP_ADDRESS_ERROR	0x0000000C

Table S-2. Packet and Sample Status Codes

Message	Code Number
EML_DP_PID_ERROR	0x0000000D
EML_NPA_FIFO_ERROR	0x0000000E
EML_MAX_PACKET_LENGTH_ERROR	0x0000000F
EML_DECOM_ERROR	0x00000010
EML_INVALID_DATA_TYPE	0x00000011
EML_SW_CONV_ERROR	0x00000012
EML_INVALID_LENGTH	0x00000013
EML_IMPROPER_FUNCTION_TYPE	0x00000014
EML_INVALID_SAMPLE_TYPE	0x00000015
EML_NO_DECOM_SAMPLES	0x00000016
EML_PLVT_ATTACH_ERROR	0x00000017
EML_LVT_ATTACH_ERROR	0x00000018
EML_PIT_ATTACH_ERROR	0x00000019
EML_NEW_LOCAL_TABLE	0x0000001A
EML_SOURCE_UNAVAILABLE	0x0000001B
EML_PDB_ATTACH_ERROR	0x0000001C

Table S-2. Packet and Sample Status Codes

Message	Code Number
EML_CLEANUP_SOURCES_ERROR	0x0000001D
EML_SOURCE_NOT_FOUND	0x0000001E
EML_SCM_STATUS_DETACH	0x0000001F
EML_PIT_DETACH_ERROR	0x00000020
EML_REMOVE_PACKET_ERROR	0x00000021

Table S-3. Calibration Use Error Codes

Message	Code Number
CAL_STATUS_OK	0x00000000
CAL_CANNOT_CALIBRATE	0x00000070
CAL_ERROR	0x00000081
CAL_PP_NOT_FOUND_ERROR	0x00000082
CAL_SET_UNDEFINED_ERROR	0x00000084
CAL_LOCAL_TABLE_ERROR	0x00000088
CAL_LT_POINTER_ERROR	0x00000089
CAL_LT_DECOM_POINTER_ERROR	0x0000008A
CAL_LT_CAL_POINTER_ERROR	0x0000008B

Table S-3. Calibration Use Error Codes

Message	Code Number
CAL_POLY_DEGREE_RANGE_ERROR	0x0000008C
CAL_METHOD_ERROR	0x0000008D
CAL_LT_ACTIVATION_ERROR	0x0000008E
CAL_DIVISION_BY_ZERO_ERROR	0x000000A0
CAL_MSID_POINTER_ERROR	0x00000090
CAL_MSID_DATA_POINTER_ERROR	0x00000091
CAL_DATA_POINTER_ERROR	0x00000092

Table S-4. LES Use Error Codes

Message	Code Number
EML_STATUS_OK	0x00000000
EML_LES_NO_GROUP_STUFF_TILL_BLD2	0x000000E0
EML_LES_LIMIT_TYPE_NONE_SPECIFIED	0x00000100
EML_LES_INVALID_LIMIT_TYPE	0x00000101
EML_LES_LIMIT_SENSE_CAUTION_HI_EXCEEDED	0x00000102

Table S-4. LES Use Error Codes

Message	Code Number
EML_LES_LIMIT_SENSE_WARNING_HI_EXCEEDED	0x00000103
EML_LES_LIMIT_SENSE_CAUTION_LO_EXCEEDED	0x00000104
EML_LES_LIMIT_SENSE_WARNING_LO_EXCEEDED	0x00000105
EML_LES_OUT_OF_STATE	0x00000106
EML_LES_DELTA_EXCEEDED	0X00000107

Table S-5. Data Quality Error Codes

Message	Code Number
EML_DQ_SUSPECT	0x08000000
EML_DQ_FAILED	0x04000000
EML_DQ_NO_DATA	0x02000000
EML_DQ_OVERRIDE	0x01000000

Table S-6. Data Source Error Codes

Message	Code Number
EML_SS_AOS	0x00000000
EML_SS_LOS	0x10000000

Table S-6. Data Source Error Codes

Message	Code Number
EML_SS_INITIALIZED	0x20000000

Table S-7. Data Condition Error Codes

Message	Code Number
EML_SS_AOS	0x00000000
EML_SS_LOS	0x10000000
EML_SS_INITIALIZED	0x20000000

Table S-8. New Data Error Codes

Message	Code Number
EML_DC_NEW_DATA	0x00000000
EML_DC_OLD_DATA	0x40000000

Table S-9. Packet Status Codes

Message	Code Number
EML_PS_LENGTH_ERROR	0x00800000
EML_PS_SEQUENCE_COUNT_ERROR	0x00400000
EML_PS_DATA_LOST	0x00020000

Table S-10. Delta Limit Status Codes

Message	Code Number
EML_LES_OVERALL_STATUS_WORD_ERROR	0x00200000

Table S-11. Reconfig Status Codes

Message	Code Number
EML_RECONFIG_DETECTED	0x00100000

Table S-12. TDM MJF Status Codes

Message	Code Number
EML_MJF_FORMAT_ID_ERROR	0x00080000
EML_MJF_PARENT_FRAME_ERROR	0x00040000

Table S-13. Minor Frame Error Codes

Message	Code Number
EML_SAMPLE_STATUS__PARENT_FRAME_ERROR	0x80000000
EML_SAMPLE_STATUS__DATA_NOT_AVAILABLE_ERROR	0x40000000

Table S-13. Minor Frame Error Codes

Message	Code Number
EML_SAMPLE_STATUS__CHECKSUM_ERROR	0x20000000
EML_SAMPLE_STATUS__FIXED_VALUE_ERROR	0x10000000
EML_SAMPLE_STATUS__FRAME_COUNTER_ERROR	0x08000000
EML_SAMPLE_STATUS__FORMAT_ID_ERROR	0x04000000
EML_SAMPLE_STATUS__BIT_SLIP_ERROR	0x02000000
EML_SAMPLE_STATUS__SYNC_ERROR	0x01000000

Table S-14. Data Condition Error Codes

Message	Code Number
EML_SAMPLE_STATUS_SUSPECT	0x00800000
EML_SAMPLE_STATUS_FAILED	0x00400000
EML_SAMPLE_NO_DATA	0x00200000
EML_SAMPLE_STATU_OVERRIDE	0x00100000

Table S-15. Limit Sensing Status Codes

Message	Code Number
EML_SAMPLE_STATUS_DELTA_LIMIT_ERROR	0x00080000

Table S-16. NASCOM Protocol Status Codes

Message	Code Number
EML_SAMPLE_STATUS_HEADER_ERROR	0x00040000

Appendix T:
Report Previewer

This appendix introduces the Command Delog Report Previewer main window.

- Identifies and explains the **Report Previewer** main window components
- Describes the purpose of each **Report Previewer** menu bar item
- Provides information on how to use dialog boxes that are invoked through the **Report Previewer** menus

T.1 Overview

A report can be generated from within the **Command Delog** form by selecting a report from the **Options** menu. When the report is generated, you will use the Oracle Reports' Previewer to view it. The previewer allows you to view and print a generated report output copy and paste text, as well as export text.

Help: For more information about Oracle Reports' Previewer, see the Oracle Reports Reference Manual, GUI Version. This appendix covers only the **Command Delog** specifics from the Previewer's main window.

Note: If you want an ASCII report, select the **Generate ASCII Report...** option from the Command Delog **Options** menu. The report will be saved to your **doc** directory and subsequently opened in FrameMaker.

T.2 Main Window Components

The **Report Previewer** main window is comprised of four major components (see Figure T-1, Report Previewer main window):

- Application title bar
- Menu bar
- Tool bar
- Work area

Each component of the main window is unique to this application and will be addressed on the following pages.

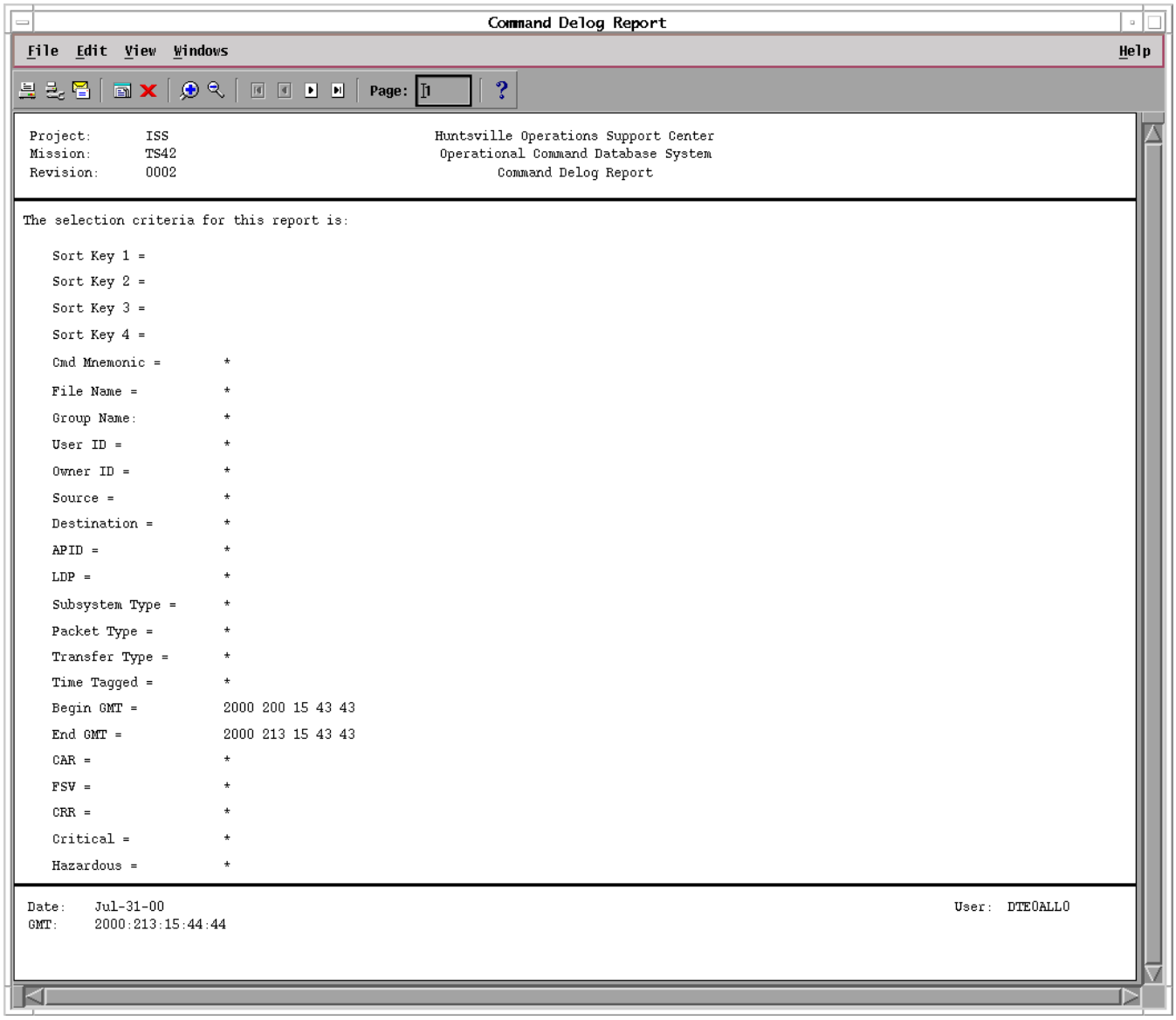


Figure T-1, Report Previewer main window.

T.2.1 Application Title Bar

The application title bar contains the name of the report, **Command Delog**, as well as the type of report.

T.2.2 Menu Bar

The menu bar consists of the **File**, **Edit**, **View**, **Windows**, and **Help** menus. All the menu bar items and their associated menus are discussed below.

Tip: Any of the menu bar pulldown menus that have a broken line at the top of the pulldown menu may be detached from the Menu Bar and placed anywhere on the workstation screen to easily access the options by clicking on the broken line with the middle mouse button (see Figure T-2, Detached pulldown menu).

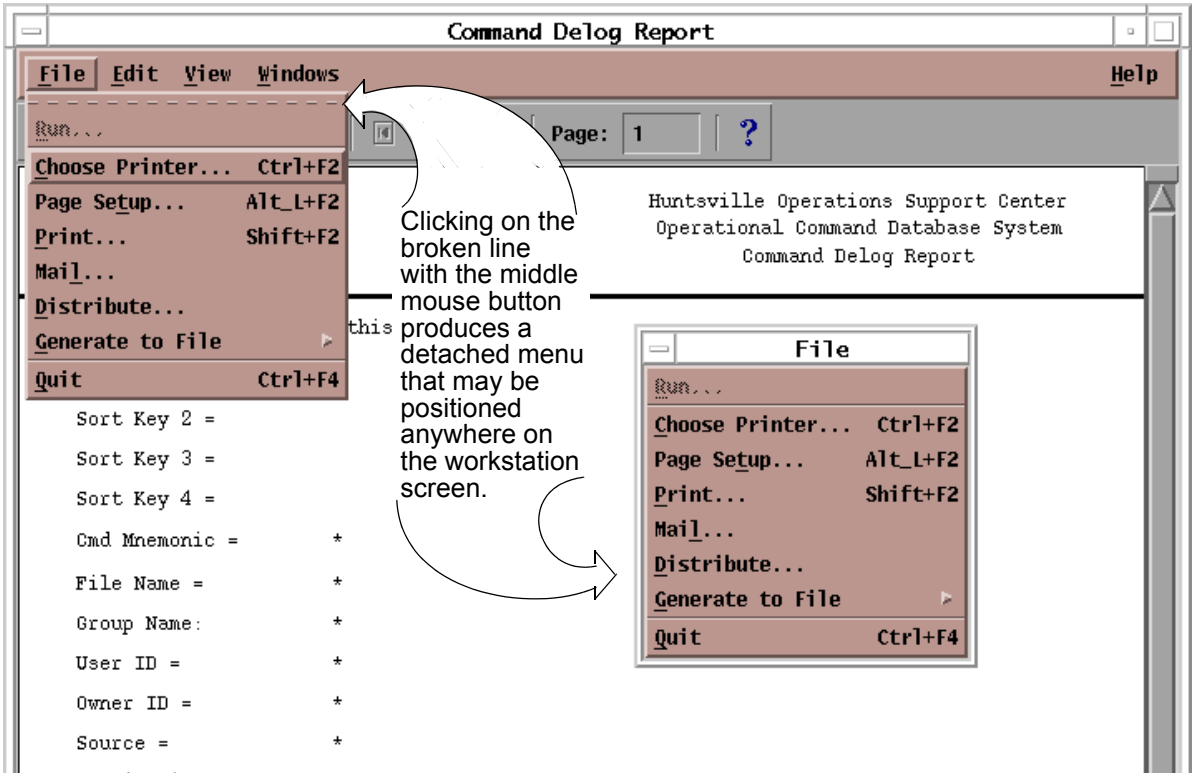


Figure T-2, Detached pulldown menu.

T.2.2.1 File Menu

The **File** menu is the first menu available off the Command Delog Report menu bar (see Figure T-3, , Report Previewer File Menu). The **File** menu allows you to perform page setup, select a printer, save to a file,and quit the application.

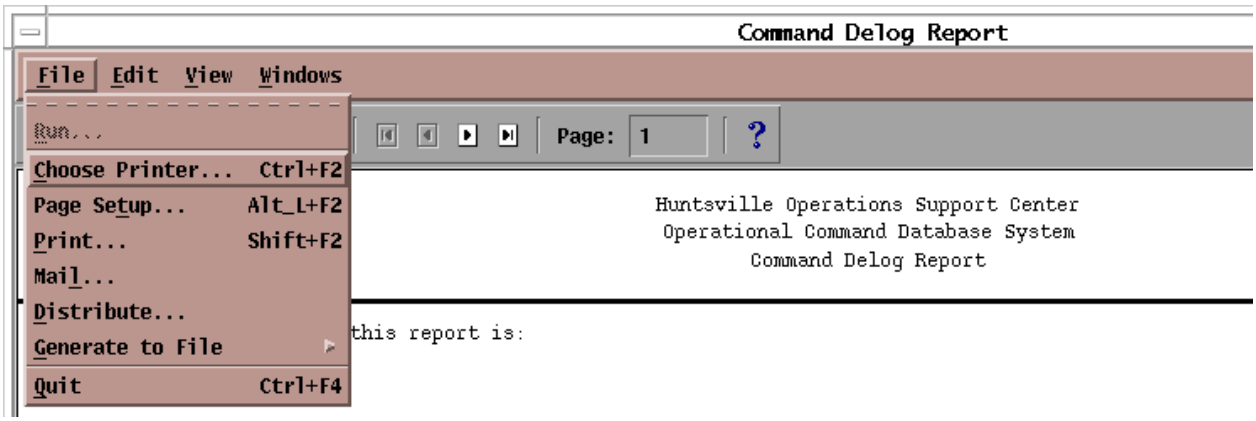


Figure T-3, Report Previewer File Menu.

The **Mail...** and **Distribute...** menu items are not available for use with the Command Delog Report Previewer software. Since Report Previewer software is a Commercial Off the Shelf (COTS) product, the software cannot be altered to prevent the use of these menu items. Thus, selection of these menu items will produce errors if you attempt to use them.

The **Generate to File** menu item allows you to save the current Command Delog Report to a file. Formats in which the report may be saved are: PDF, HTML, HTML Style Sheet, RTF, Postscript, and Text.

Help: For more information about Oracle Reports' Previewer, see the Oracle Reports Reference Manual, GUI Version. This appendix covers only the **Command Delog** specifics from the Previewer's main window.

T.2.2.2 Edit Menu

The **Edit** menu is not available for use with the Command Delog Report Previewer software. Since Report Previewer software is a Commercial Off the Shelf (COTS) product, the software cannot be altered to prevent the use of this menu. Thus, any menu items that appear to be available under this menu will produce errors if you attempt to use them (see Figure T-4, Report Previewer Edit Menu).

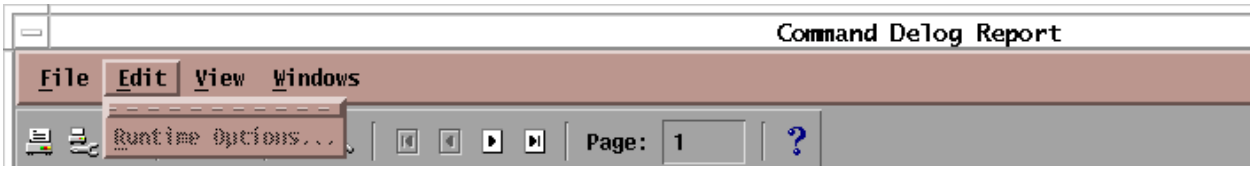


Figure T-4, Report Previewer Edit Menu.

T.2.2.3 View Menu

The View menu contains options which allows you to zoom in/out, select a new previewer window with the same contents as the current one, close the Report Previewer window, and move between pages of the report (see Figure T-5, , Report Previewer View Menu).

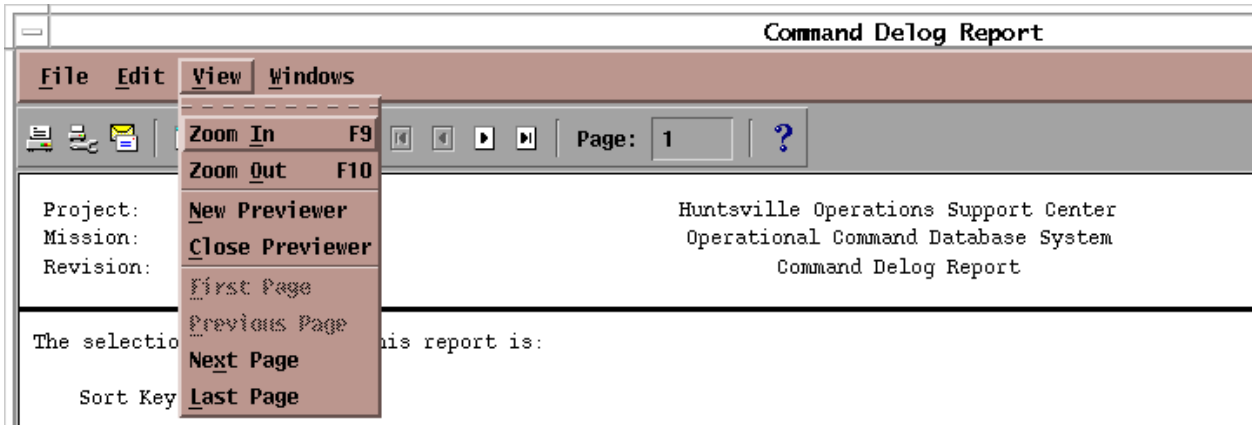


Figure T-5, Report Previewer View Menu.

T.2.2.4 Windows Menu

The **Windows** menu shows the name of the window you are currently viewing (see Figure T-6, , Report Previewer Windows Menu).

Figure T-6, Report Previewer Windows Menu

T.2.2.5 Help Menu

The **Help** menu is the last menu on the **Command Delog** menu bar (see Figure T-7, Report Previewer Help Menu). It provides information about the Oracle Reports software and an on-line help system, which is currently unavailable.

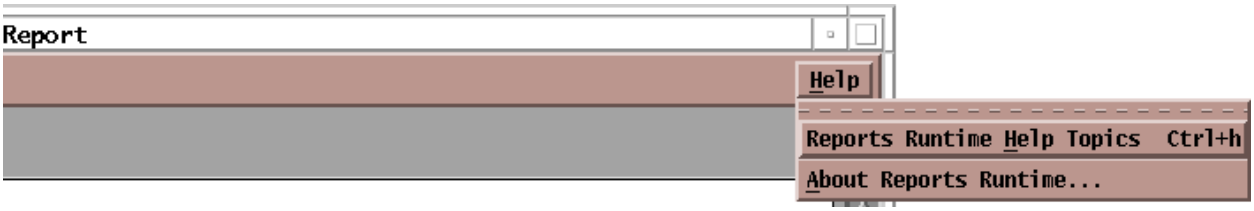


Figure T-7 Report Previewer Help Menu

Help: For more information about Oracle Reports' Previewer, see the Oracle Reports Reference Manual, GUI Version. This appendix covers only the **Command Delog** specifics from the Previewer's main window.

T.2.3 Tool Bar

The Tool Bar provides convenient access to select functions contained in the **File** and **View** menus. These functions are depicted in the tool bar as a series of icons, pushbuttons, and text entry fields (see Figure T-8, Report Previewer Tool Bar).

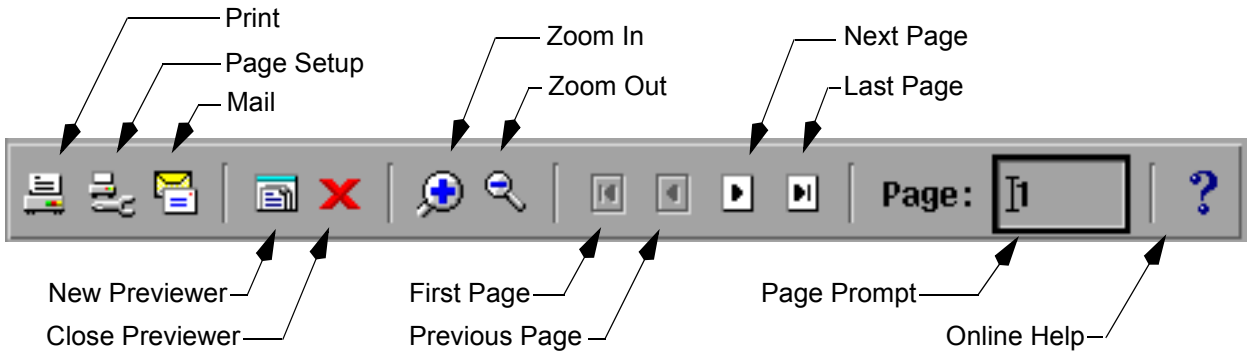


Figure T-8 Report Previewer Tool Bar.

T.2.4 Work Area

The contents of the work area will change based on the type of report that is generated.

The report contains a header sheet that shows the selection criteria that is included on the report (see Figure T-1, Report Previewer main window). The second and subsequent pages will contain those items that match the selection criteria (see Figure T-9, Report Previewer contents).

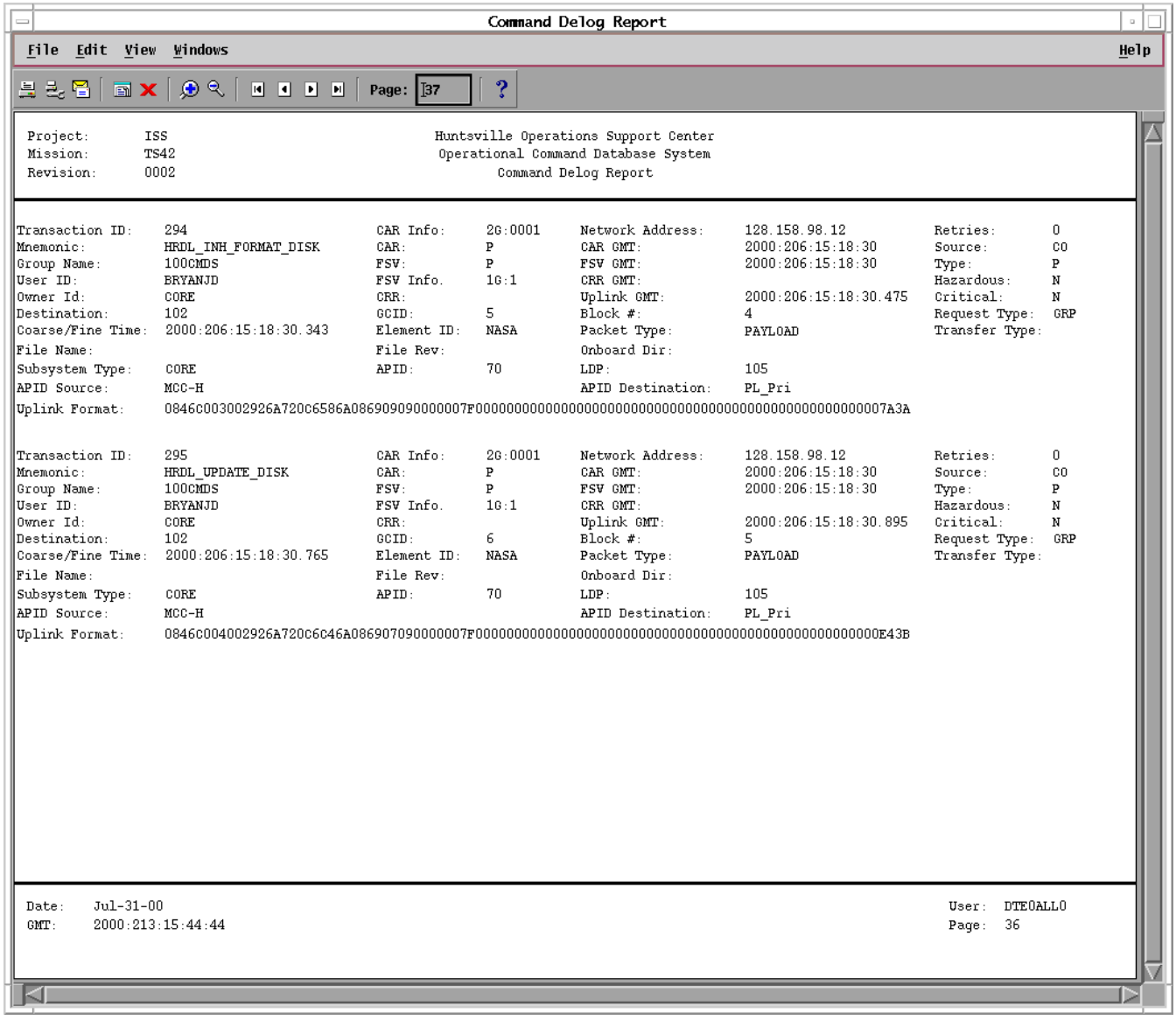


Figure T-9, Report Previewer Contents.

Note: Scroll bars are provided at the bottom of the main window to allow you to see the remaining columns.

Help: For more information about Oracle Reports' Previewer help, see the Oracle Reports Reference Manual, GUI Version.

894

Appendix U:
Command Delog Report Example

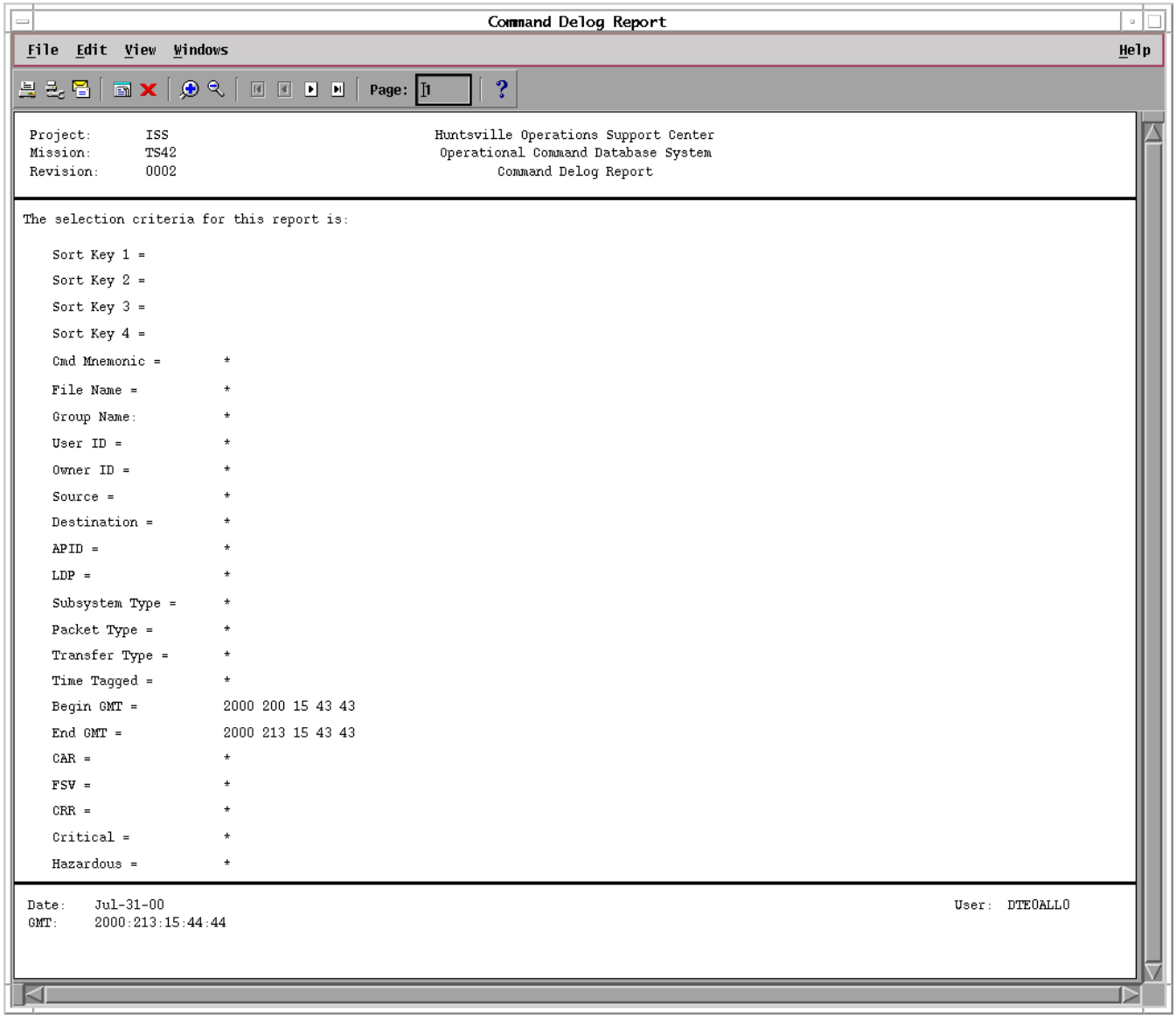


Figure U-1, Command Delog Report Example (Screen 1).

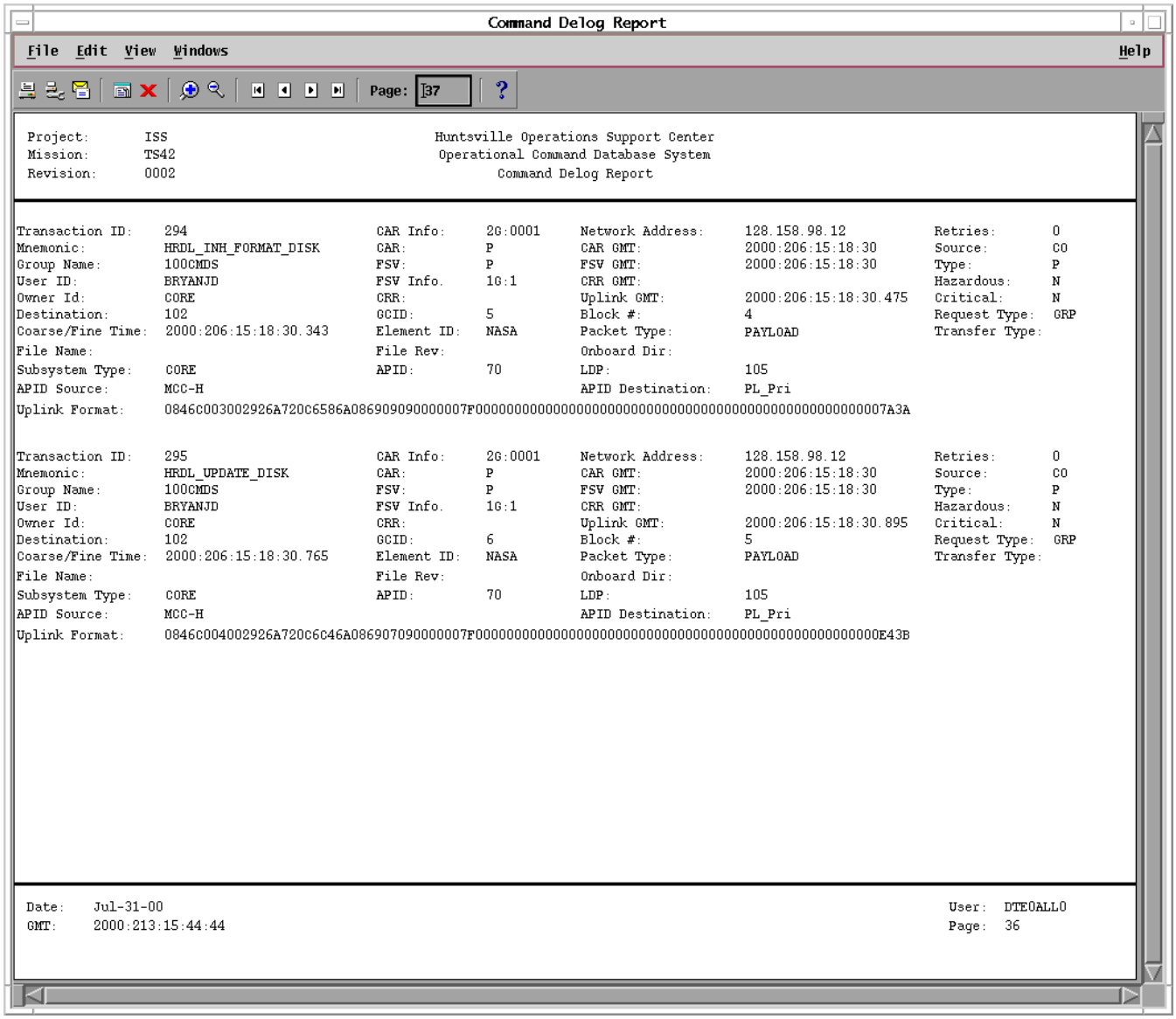


Figure U-2, Command Delog Report Example (Screen 2).

Appendix V: Acknowledgement Codes

The following table defines the CAR1 acknowledgment codes for **TT** (Time-Tagged) and **Real-Time Command Uplink** types:

Ack Code	Description
1	command successfully received
2	illegal source message key
3	invalid priority
4	illegal activity
5	invalid source LDP
6	invalid destination LDP
7	packet sequence count error
8	invalid message length in header
9	invalid message type
10	invalid message subtype
11	message type/user data field mismatch
12	invalid user data format
13	time sent is too old
14	message checksum error
15	HOSC disabled for commanding
16	MCC-H disabled for commanding
17	uplink queue is full
18	CCSDS command checksum error
19	invalid CCSDS packet size for S-Band path
20	invalid CCSDS packet size for early Comm path
21	illegal time id code
22	illegal CCSDS packet type

Ack Code	Description
23	illegal secondary header present flag
24	illegal CCSDS packet length
25	illegal element ID
26	invalid element ID

Example:

P 1G:0001
F 1G:0014

The following table defines the CAR2 acknowledgment codes for **TT** (Time-Tagged) and **Real-Time Command Uplink** types:

Ack Code	Description
1	command successfully uplinked
2	uplink FEP interface error

Example:

P 2G:0001
F 2G:0002

The following table defines the FSV1 acknowledgment codes for **TT** (Time-Tagged) and **Real-Time Command Uplink** types:

Ack Code	Description
1	command successfully received by USOS
2	error received from USOS
3	command not received by USOS
4	MCC-H could not determine command receipt at USOS

Example:

P 1G:1
F 1G:2/065
F 1G:4

Note: If the acknowledgement code is a 2 (indicating an error) a USOS command response code will be appended to it in order to further clarify the onboard error (see second example above). USOS command response codes are presented in the following table:

USOS Code	Description
1	sequence error
2	checksum failure
3	invalid APID
5	time authentication failure
6	time-tag error: execution time too far in future
7	time-tag error: execution time in past
8	time-tag queue full
9	time-tag error: duplicate time
10	invalid station mode
11	command routing queue full
13	application queue full
14	invalid dump address
15	command routing error
51	command inhibited
52	illegal command code
53	command parameter error
54	improper command sequence
61	command function unavailable
62	incompatible operational state
63	commanded device or process busy
64	command ORU unavailable
65	command ORU failed

The following table defines the FSV2 acknowledgment codes for **TT** (Time-Tagged) and **Real-Time Command Uplink** types:

Ack Code	Description
0	command successfully received at payload MDM
1	sequence error
2	checksum failure
3	invalid APID
5	time authentication failure
6	time-tag error: execution time too far in future
7	time-tag error: execution time in past
8	time-tag queue full
9	time-tag error: duplicate time
10	invalid station mode
11	command routing queue full
13	application queue full
14	invalid dump address
15	command routing error
51	command inhibited
52	illegal command code
53	command parameter error
54	improper command sequence
61	command function unavailable
62	incompatible operational state
63	commanded device or process busy
64	command ORU unavailable
65	command ORU failed
102	invalid component
103	invalid in current state

Example:

P 2S:0
F 2S:102

The following table defines the acknowledgment codes for response source **G**, for **File Uplinks**, applicable to both CARs and FSVs:

Ack Code	Description
1	successfully received at MCC-H
2	illegal source message key
3	invalid priority
4	illegal activity
5	invalid source LDP
6	invalid destination LDP
7	packet sequence count error
8	invalid message length in header
9	invalid message type
10	invalid message subtype
11	message type/user data field mismatch
12	invalid user data format
13	time sent is too old
14	message checksum error
15	HOSC disabled for commanding
16	MCC-H disabled for commanding
17	uplink queue full
18	invalid source file name
19	source file does not exist
20	invalid destination file name
21	invalid execute after time
22	invalid execute deadline time
23	illegal file transfer type

Ack Code	Description
24	illegal source file location
25	illegal destination file location
26	illegal missed deadline flag

Example:

CARs:	**P 1G:0001**	FSVs:	**P 1G:1**
	F 1G:0023		**F 1G:2/26**

The following table defines the acknowledgment codes for response source **S**, for **File Uplinks** applicable to both CARs and FSVs:

Ack Code	Description
0	No error
1	MSD not available
2	illegal command
3	illegal Bus/RT pair for setup dump
4	illegal dump address
5	file uplink in progress so extended dump cannot proceed
6	data load not supported for this APID or destination changed during transfer
7	file download already in progress to specified destination
8	ten file downloads already in progress
9	illegal super directory or no write access for requester
10	unexpected start file transfer command
11	unexpected file transfer command
12	unexpected group number in start file transfer command
13	no matching file transfer for a file transfer command
14	wrong group number in file transfer command
15	file larger than 8MB
16	file does not fit in allocated space
17	no file transfer control block available
18	could not submit disk request

Ack Code	Description
19	unexpected file state
20	file transfer timed out because expected command not received in time
21	response from the disk did not return in time
22	MSD read error indicated in a file transfer command
23	could not send file transfer command through command processing
24	CCS state changed

Example:

CARs:	**P 1S:0000**	FSVs:	**P 2S:0**
	F 2S:0023		**F 2S:3**

Appendix W:
Status Character Definitions

Status Character	Definition
a	CDD Process Not Responding
A	DP Process Not Responding
B	Common Configuration Error
c	Decom/Conv/Cal Status-Calibration Error
C	Decom/Conv/Cal Status-Conversion Error
d	Limits Not Defined in the Local Table
D	Decom/Conv/Cal Status-Decom Error
E	LES Status-Out of Expected State
f	Data Quality-DQ Failed (No data returned-old data is used)
F	Data Quality-DQ Failed with/Override (New data is used-bad data)
G	Packet Routing Table Configuration Error
H	LES Status-Warning High
l	LES Status-LES error
L	LES Status-Warning low
M	Invalid Format for Data Type
n	Packet not Defined in the Routing Table
N	Source Status-Loss of Signal (No data returned-old data used)
p	Private Measurement-No Privilege to Access
P	Telemetry Processing Discrepancies
R	Source Status-Source Initialized/Unavailable
S	Data Condition-Old/Stale Data
T	Telemetry Database Discrepancies
U	Unrecognized/Invalid MSID

Status Character	Definition
W	Memory Error
x	Data Quality-Data is Suspect (No data returned-old data is used)
Y	MSID Not Initialized For Decom
Z	Unrecognized Status from TNS_Initialize_Decom
v	LES Status-Caution Low
~	Data Quality-No Data (No data returned-old data used)
$	Invalid Status Received from EML
#	Data Format Field Overflow
^	LES Status-Caution High
?	Data Quality-DQ Suspect w/Override (New data is used-suspect data)
‘’ (space)	Source Status-Acquisition of Signal (Parameter is okay-new data is returned)

Appendix X: Protocol Descriptions

Protocol	Description	Project
PDSS Core	Payload Data System Services. International Space Station data processed as core Consultative Committee for Space Data Systems (CCSDS) Packets	International Space Station
PDSS Payload	Payload Data System Services. International Space Station data processed as payload Consultative Committee for Space Data Systems (CCSDS) Packets	International Space Station
PDSS BPDU	Payload Data System Services. International Space Station data processed as payload Bitstream Protocol Data Unit (BPDU)	International Space Station
PDSS UDSM	Payload Data System Services. International Space Station data processed as User Data Summary Message (UDMS) and PDSS Retrieve Processing Summary Messages (RPSM)	International Space Station
TDM	Time Division Multiplexed	AXAF, Spacelab, and Shuttle
NASCOM	NASA Communication System 4800-bit block	Other NASA Centers
PSEUDO	Data generated by a user-generated computation or script	All
HDRS-DQ	High Data Rate System Data Quality	Spacelab
GSE	Ground Support Equipment Packets produced by the GSE packets application	Spacelab, International Space Station
TIME	Time data from the HOSC Time Distribution System	All

Appendix Y:
Valid Entries for Each Native Data Type

When creating NRT List Requests and NRT Snapshot Requests the output generated for each MSID depends on how the MSID is defined within the Telemetry Database. The native data types supported within the EHS are:

- SASC - ASCII Character String
- SASCB - ASCII Character String
- SEBC - EBCDIC Character String
- SUND - Undefined Byte String
- IDIS - Discrete Integer
- IMAG - Signed Magnitude Integer
- IUND - Undefined Integer
- IUNS - Unsigned Integer
- IUNSB - Unsigned Byte Swapped Integer
- IUNSW - Unsigned Word Swapped Integer
- IUNSX - Unsigned Word and Byte Swapped Integer
- ITWO - Two's Complement Integer
- ITWOB - Two's Compliment Byte Swapped Integer
- ITWOW - Two's Complement Word Swapped
- ITWOX - Two's Compliment Word and Byte Swapped Integer
- FEEE - IEEE Floating Point
- FIBM - IBM Floating Point
- FMIL - Military Floating Point
- FNTL - Intel Floating Point
- FSPL - Spacelab Floating Point
- FVAX - VAX Floating Point
- TDMS - SSP Data Management System Time
- TECI - ECIO GMT
- TECS - ECOS Binary GMT
- TEHS - EHS Time Word
- TERT - Earth Receive Time
- TGMT - GMT
- TGPC - Orbiter GPC GMT
- TIUS - IUS Floating Point Time
- TOOI - Orbiter OI GMT and MET
- TTSM - Time Since Midnight
- TTWO - Count Time

Note: To identify the native data type for individual MSIDs initiate the Telemetry Database application's MSID Detail Form.

Unprocessed Data

If you elect, under the data processing options within the NRT List Request or NRT Snapshot Request applications, to use **Unprocessed** data, the only valid data representations are binary/integer, hexadecimal/integer, or octal/integer. Hexadecimal is the default data representation. Unprocessed data cannot be limit sensed. Within the NRT List Request application the filtering options available for **Unprocessed** data are:

- None
- < A
- > A
- <= A
- >= A
- = A
- <> A
- AND (when included with any of the above relational operators)
- OR (when included with any of the above relational operators)
- Compressed (when included with any of the above relational operators)

Note: If you attempt to implement an unsupported filter option (in this case, Delta for example, is unsupported), you will get a validation error. You cannot submit a request until all validation errors have been corrected.

Converted Data

If you elect, under the data processing options within the NRT List Request or NRT Snapshot Request application, to use **Converted** data, the native data types will be converted as shown in Table F-1. Valid LES sensing and NRT List Request filter options are also shown in this table.

Note: If you execute a relational filter on a Null Terminated ASCII String, the filter will execute using the character's numeric value as found in a standard ASCII table. Essentially that means that it will filter alphabetically except that all capital letters come before lower case letters. For example, "ON" comes before and therefore is less than "on", and "On".

Table Y-1, Converted data representation options for each data type.

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
SASC - ASCII Character String	Null Terminated ASCII String	ASCII	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
SASCB - ASCII Character String	Null Terminated ASCII String	ASCII	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
SEBC - EBCDIC Character String	Null Terminated ASCII String	ASCII	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
SUND - Undefined Byte String	Cannot be converted	Not Applicable	N/A	Not Applicable
IDIS - Discrete Integer	Unsigned Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
IMAG - Signed Magnitude Integer	Two's Complement Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
IUND - Undefined Integer	Cannot be converted	Not Applicable	N/A	Not Applicable
IUNS - Unsigned Integer	Unsigned Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
IUNSB - Unsigned Byte Swapped Integer	Unsigned Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
IUNSW - Unsigned Word Swapped Integer	Unsigned Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
IUNSX - Unsigned Word and Byte Swapped Integer	Unsigned Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWO - Two’s Complement Integer	Two’s Complement Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWOB - Two’s Compliment Byte Swapped Integer	Two’s Compliment Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWOW - Two’s Complement Word Swapped	Two’s Complement Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWOX - Two’s Compliment Word and Byte Swapped Integer	Two’s Compliment Integer	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FEEE - IEEE Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
FIBM - IBM Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FNTL - Intel Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FSPL - Spacelab Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FVAX - VAX Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
TDMS - SSP Data Management System Time	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TECI - ECIO GMT	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
TECS - ECOS Binary GMT	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TEHS - EHS Time Word	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TERT - Earth Receive Time	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TGMT - GMT	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
TGPC - Orbiter GPC GMT	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TIUS - IUS Floating Point Time	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TOOI - Orbiter OI GMT and MET	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)
TTSM - Time Since Midnight	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)

If the Native Data Type is...	The Converted Data Type is...	the valid Data Representations are ...	LES Sensing Allowed?	and the Valid Filters are...
TTWO - Count Time	EHS Time Structure	ddd:hh:mm:ss ddd:hh:mm:ss:ss ddd:hh:mm:ss:ss:sss	No	None < A > A <= A >= A = A <> A AND OR Compressed (all)

Calibrated Data

If you elect, under the data processing options within the NRT List Request or NRT Snapshot Request applications, to use **Calibrated** data, the native data types will be calibrated using a polynomial equation, point pair interpolation, or state code conversion depending on how each parameter is defined in the telemetry database.

Calibrated data is not available for native data types that are of an ASCII or time format (therefore no filters are available for these data types either). The following table identifies for each remaining native data type the calibrated output data type, the valid data representations, whether LES sensing is permitted and the valid NRT List Request filters.

Table Y-2, Converted data representation options for each data type.

If the Native Data Type is...	the Calibrated Data Type is...	the valid Data Representations are ...	LES Sensing Allowed ?	and the Valid Filters are...
IDIS - Discrete Integer	Null Terminated ASCII String	ASCII	Yes	None < A > A <= A >= A = A <> A AND OR Compressed (all)

If the Native Data Type is...	the Calibrated Data Type is...	the valid Data Representations are ...	LES Sensing Allowed ?	and the Valid Filters are...
IMAG - Signed Magnitude Integer	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
IUND - Undefined Integer	Cannot be Calibrated	None	No	None
IUNS - Unsigned Integer	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWO - Two's Complement Integer	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
ITWOW - Two's Complement Word Swapped	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FEEE - IEEE Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters

If the Native Data Type is...	the Calibrated Data Type is...	the valid Data Representations are ...	LES Sensing Allowed ?	and the Valid Filters are...
FIBM - IBM Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FMIL - Military Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FNTL - Intel Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FSPL - Spacelab Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters
FVAX - VAX Floating Point	IEEE Floating Point	Decimal/Integer Decimal/Real Decimal/Scientific Notation	Yes	All Filters

Appendix Z:
Creating NRT Time Plots

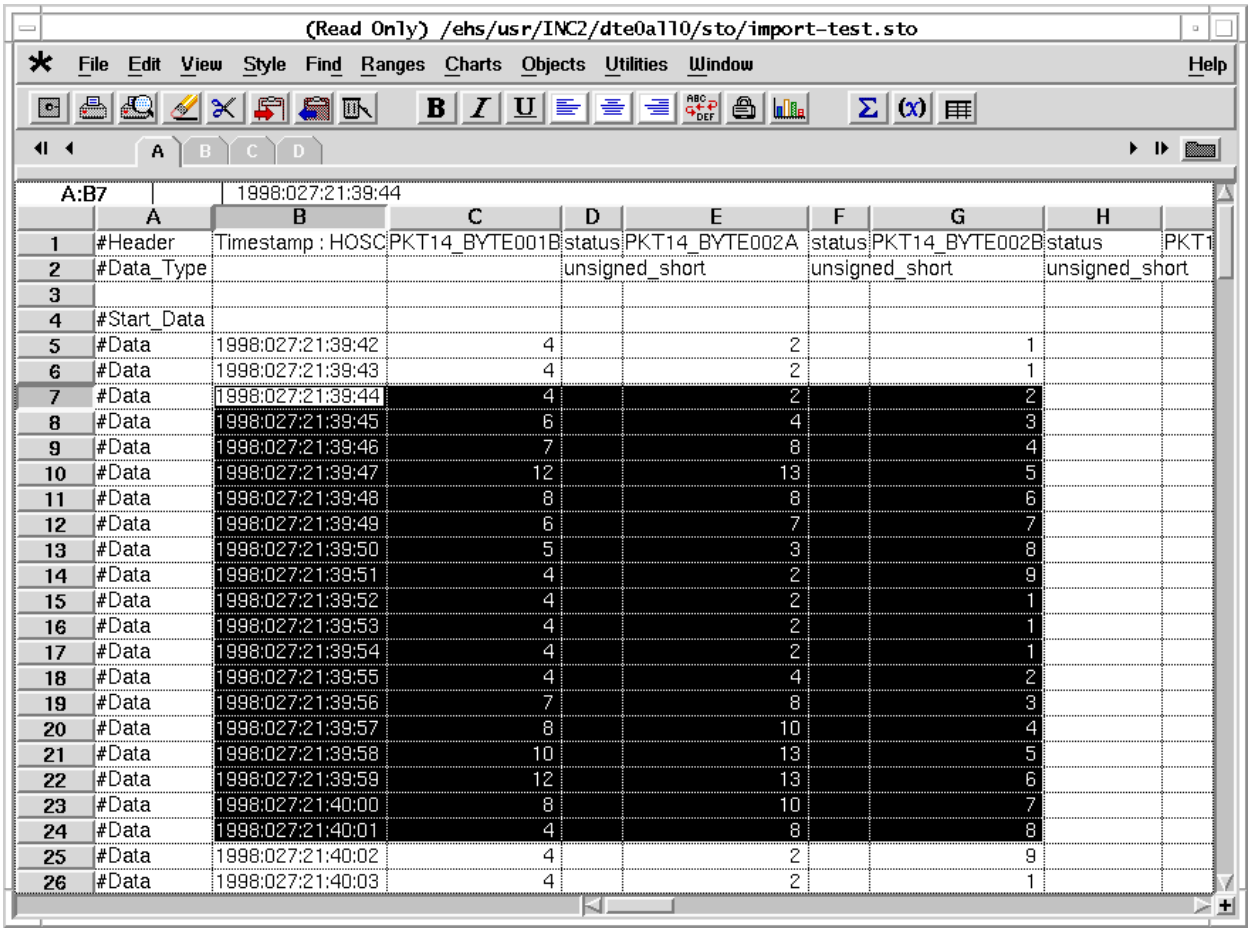
The Applix spreadsheet application is used to view and plot data within the EHS system. The steps addressed here assume that you've already submitted a NRT Data Request and that you received notification in the NRT application's message area that the NRT output file has been received from the telemetry server.

1. Go to the **Utilities** menu and select **Spreadsheet**. This invokes the Applix spreadsheet application.

2. Once a blank Applix spreadsheet is shown on your workstation screen, go to the application's **File** menu and click on **Import**. The EHS directory structure will be displayed within the **Import** dialog box.

3. Scroll down through the folders. Find and double click on the **sto** directory. The contents of the directory will be shown. Find the output file that was just received from the telemetry server and single click on it. At the bottom of this dialog box select **ASCII grid** as the import file type and click on **Start**.

4. Once you receive the output file within the displayed spreadsheet you are ready to begin charting (plotting) the data. Select the data you wish to plot beginning with cells in the HOSC time stamp column (B). Hold down the left mouse button and dragging the mouse down and right. Don't worry about selecting data you don't want included in your plot, you can delete this data later in this plot definition process (see Figure Z-1, Selecting data to plot).



	A	B	C	D	E	F	G	H	
1	#Header	Timestamp : HOSC	PKT14_BYTE001B	status	PKT14_BYTE002A	status	PKT14_BYTE002B	status	PKT1
2	#Data_Type			unsigned_short		unsigned_short		unsigned_short	
3									
4	#Start_Data								
5	#Data	1998:027:21:39:42	4		2		1		
6	#Data	1998:027:21:39:43	4		2		1		
7	#Data	1998:027:21:39:44	4		2		2		
8	#Data	1998:027:21:39:45	6		4		3		
9	#Data	1998:027:21:39:46	7		8		4		
10	#Data	1998:027:21:39:47	12		13		5		
11	#Data	1998:027:21:39:48	8		8		6		
12	#Data	1998:027:21:39:49	6		7		7		
13	#Data	1998:027:21:39:50	5		3		8		
14	#Data	1998:027:21:39:51	4		2		9		
15	#Data	1998:027:21:39:52	4		2		1		
16	#Data	1998:027:21:39:53	4		2		1		
17	#Data	1998:027:21:39:54	4		2		1		
18	#Data	1998:027:21:39:55	4		4		2		
19	#Data	1998:027:21:39:56	7		8		3		
20	#Data	1998:027:21:39:57	8		10		4		
21	#Data	1998:027:21:39:58	10		13		5		
22	#Data	1998:027:21:39:59	12		13		6		
23	#Data	1998:027:21:40:00	8		10		7		
24	#Data	1998:027:21:40:01	4		8		8		
25	#Data	1998:027:21:40:02	4		2		9		
26	#Data	1998:027:21:40:03	4		2		1		

Figure Z-1, Selecting data to plot.

5. Once you have the data you want to plot selected, click on the plot tool icon (from the icons located under the menu bar). Move the cursor into the body of your spreadsheet. Your cursor should change shape to indicate that you are initiating a plot. Hold down the left mouse button and draw a box to indicate the size and location of your plot. Once you release your left mouse button, a dialog box entitled **Chart - Step by Step: Step 1 of 5** will be invoked. This dialog box is the first of 5 in step-by-step charting. Verify that the data you highlighted is reflected in the text entry field, then click on **Next >**.

6. On the **Chart - Step by Step: Step 2 of 5** dialog box you must identify the type of plot you'd like to create. Time plots require that you select the XY plot type (see Figure Z-2, Chart - Step by Step: Step 2 of 5 dialog box). The XY plot is the 3rd from the left in the second row. Click on **Next >**.

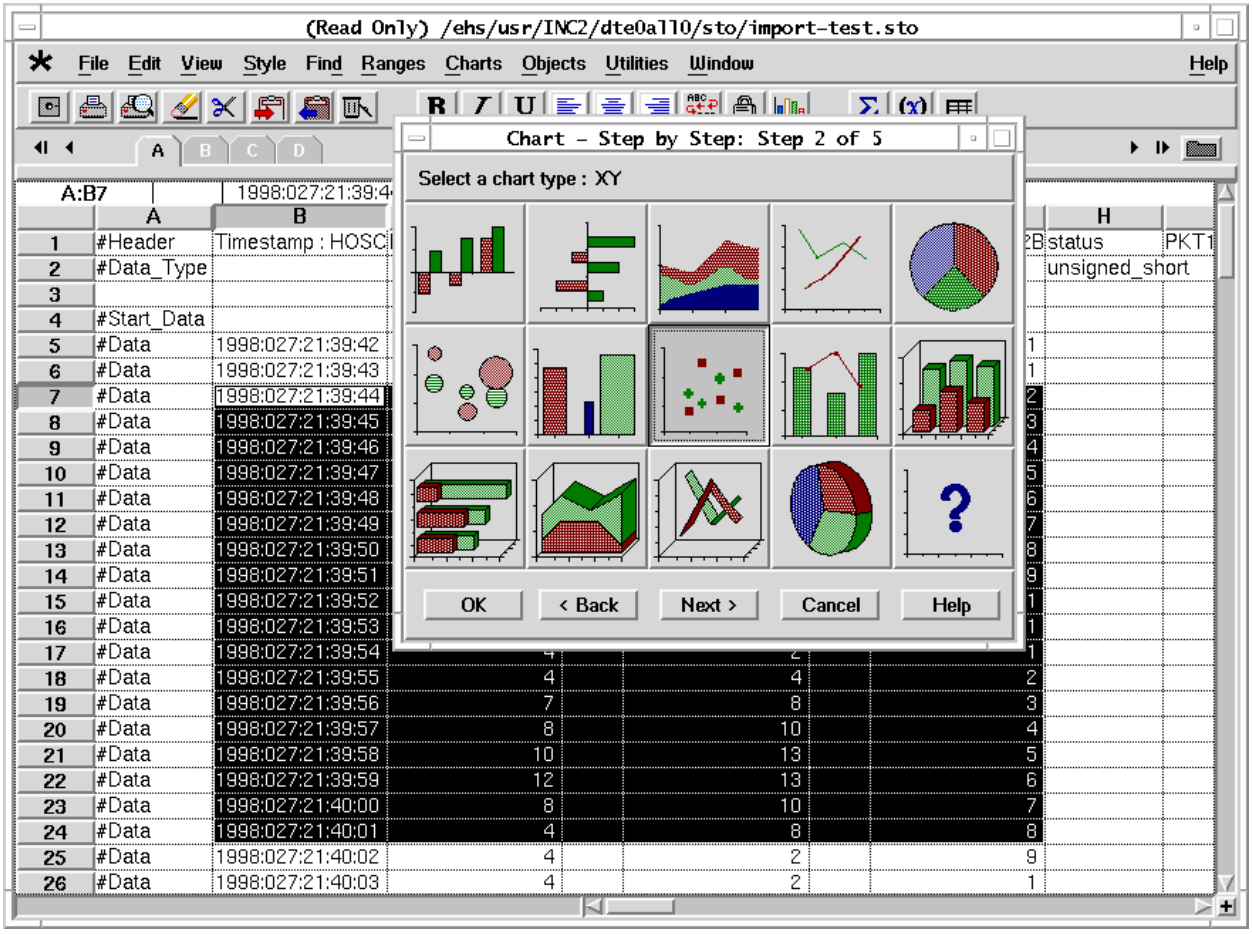


Figure Z-2, Chart - Step by Step: Step 2 of 5 dialog box.

7. On the **Chart - Step by Step: Step 3 of 5** dialog box you select how you'd like the data represented (i.e., with individual data points, with just a line, with a background grid, etc.). If you've elected to plot numerous data points, it is more efficient to select one of the line options rather than an option which includes individual data points. Click on **Next >**.

8. On the **Chart - Step by Step: Step 4 of 5** dialog box, the system will begin plotting a thumbnail representation of your plot as currently defined (see Figure Z-3, Chart - Step by Step: Step 4 of 5 dialog box). If you elected to include the first row in your plot, you'll have to click on the **Column** radio button within the **Data Source Order** frame and then you must select the **Use First Row for Legend Text** toggle button. Click on **Next >**.

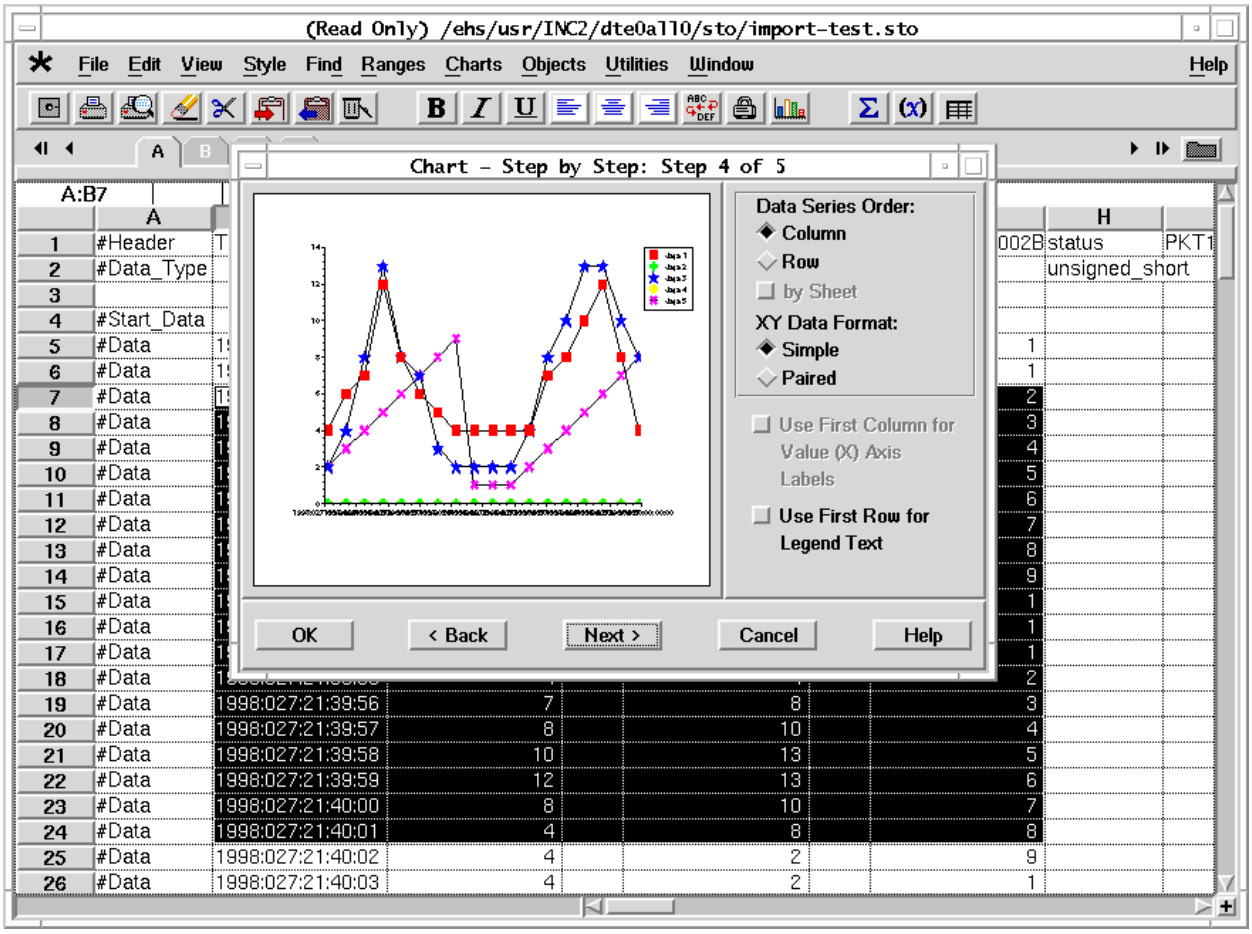


Figure Z-3, Chart - Step by Step: Step 4 of 5 dialog box.

9. The **Chart - Step by Step: Step 5 of 5** dialog box allows you to enter plot and axes titles. A separate drawing package is also available for you to enter this information later. Click on **OK** and the thumbnail chart will be placed in the defined area of your spreadsheet.

10. In the current version of the Applix chart tool times displayed overlap, thus making them illegible. To fix this, go to the **Chart** menu, select the **Format** cascade menu and select **Axes...** to invoke the **Axes of Chart** dialog box (see Figure Z-4, Axes of Chart Tick Marks dialog box). Within the **Tick Count:** frame, reduce the number in the **Major:** and **Minor:** text entry fields and click on **OK**.

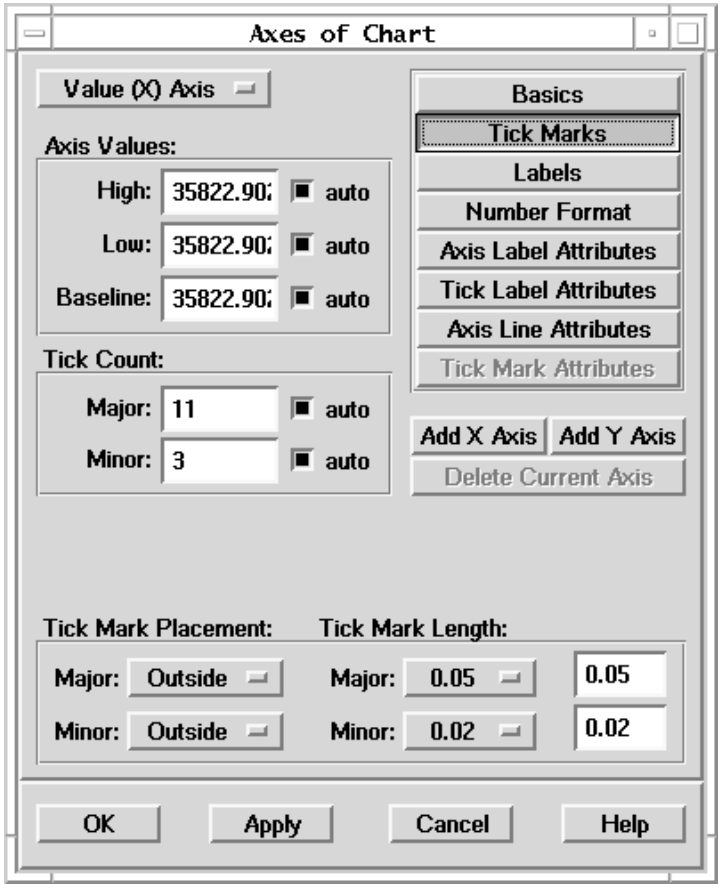


Figure Z-4, Axes of Chart Tick Marks dialog box.

11. To enter MSID labels into the chart legend go to the **Chart** menu, select the **Format** cascade menu and select **Data Groups...** to invoke the **Data Groups** dialog box (see Figure Z-5, Data Groups of Chart dialog box). Within the **Data Groups:** frame there is a scrolling list identifying data 1, data 2, etc. By default, data 1 is initially highlighted. In the **Data Ranges:** frame the text fields show the range of X values that are being plotted against the range of Y values. The Y values correlate to the columns on your spreadsheet. Look at your spreadsheet and identify which columns you want included on your plot. Go to the **Data Groups:** frame and click on **Delete** to eliminate those columns (data groups) you don't want to plot (this will also eliminate their entries from the legend). Note that text won't plot, but are still carried on the legend. Delete columns containing text (this includes all status character columns which are even numbered data groups).

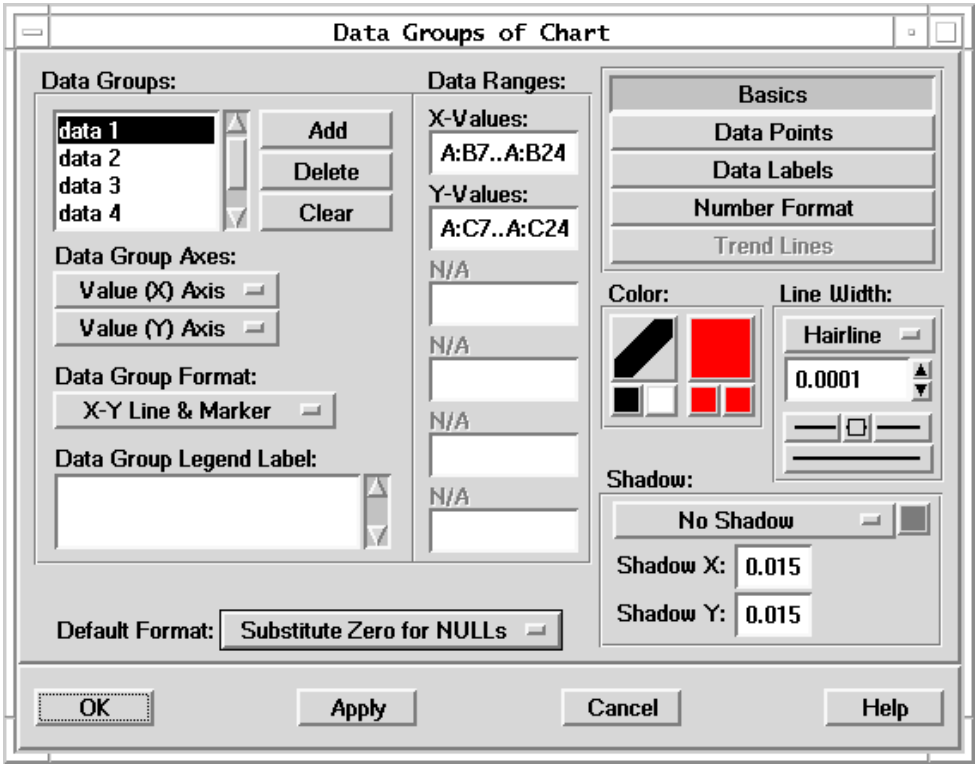


Figure Z-5, Data Groups of Chart dialog box.

12. To enter MSID labels which will appear within your legend, select the first remaining data group and look at the **Y-Values** text field to determine the column being plotted. Enter this column number followed by a **1** in the **Data Group Legend Label:** text field. This will pull the MSID label from row 1 of the output file. Continue this same process until all data groups have been given a legend label. Click **OK**.

13. To enter additional text information and to print a chart, double click on the chart within the spreadsheet. The chart will be invoked within a drawing package and the area it once occupied on the spreadsheet will become shadowed (see Figure Z-6, Plot within the Chart drawing package). Use the tools within this application to add text to your plot.

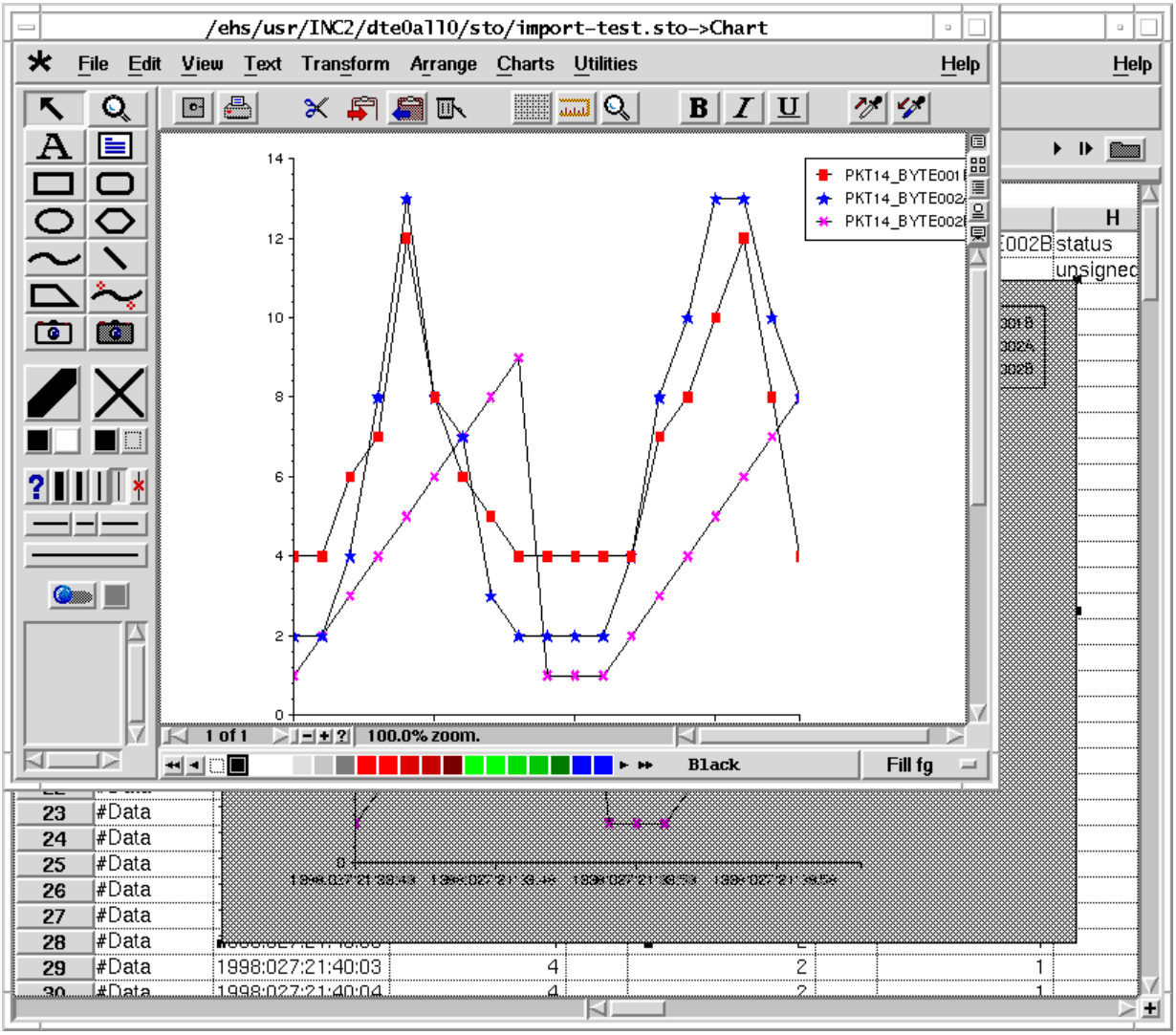


Figure Z-6, Plot within the Chart drawing package.

14. To size your plot so that it fits on a landscaped page, go to the **Utilities** menu, select **Page Setup...** and click on the **Landscape** radio button. You can resize your plot by first selecting the plot (indicated by handles at the corners) and then clicking and dragging one of the corner handles so that the plot fits on the landscape page. To print the plot, select **Print...** from the **File** menu. When you are through making modifications to the plot, you can exit the drawing package by selecting **Exit** from the **File** menu. You will be given the opportunity to save the changes you made to the plot within the drawing package and control will be retuned to the spreadsheet application. The plot will once again become part of the spreadsheet. When you exit the spreadsheet application, you'll be given an opportunity to save or discard your changes to the NRT output file. If your work, the file will be stored as an Applix spreadsheet and will have a **.as** file extension.

Appendix AA:
Filter Test Options

Filter Test Expression	Example Filter Value A	Example Filter Value B	Result
Min/Max/Avg			The minimum, maximum and average values over the entire time slice are provided
Mean/Var/Std Dev			The mean (average), variance, and standard deviation of all values over the requested time slice are provided.
< A	30		Only values less than 30 will be written to the output file
> A	60		Only values greater than 60 will be written to the output file
<= A	90		Only values that are less than or equal to 90 will be written to the output file
>= A	120		Only values that are greater than or equal to 120 will be written to the output file
= A	150		Only those values that are 150 will be written to the output file
<> A	190		Only those values that are not equal to 190 will be written to the output file
Delta A	5		Only values that represent a change of at least 5 from the previously received value will be written to the output file
Compressed Only			Only values that represent a change from the previously received value will be written to the output file
>= A AND <= B	10	20	Only values that are greater than or equal to 10 AND less than or equal to 20 will be written to the output file. For example a value of “5” WOULD NOT be written to the output file.

Filter Test Expression	Example Filter Value A	Example Filter Value B	Result
< A OR > B	10	20	Only values that are less than 10 OR greater than 20 will be written to the output file. For example, a value of "5" WOULD be written to the output file.
Compressed, < A	10		Only values differ from the previously received value and that are less than 10 will be sent to the output file.
Compressed, > A	10		Only values that differ from the previously received value and that are greater than 10 will be sent to the output file.
Compressed, <= A	10		Only values that differ from the previously received value and that are less than or equal to 10 will be sent to the output file.
Compressed, >= A	10		Only values that differ from the previously received value and that are greater than or equal to 10 will be sent to the output file.
Compressed, = A	10		Only values that differ from the previously received value and that equal 10 will be sent to the output file.
Compressed, <> A	10		Only values that differ from the previously received value and that are not equal to 10 will be sent to the output file.
Compressed, Delta A	5		Only values that differ from the previously received value by 5 will be sent to the output file.
Compressed, >= A AND <= B	5	8	Only values that differ from the previously received value and that are greater than or equal to 5 AND less than or equal to 8 will be entered into the output file.
Compressed, < A OR > B	10	20	Only values that differ from the previously received value and that are less than 10 OR greater than 20 will be entered into the output file.

Appendix AB: Telemetry Database NRT Cross-Reference

The following information will assist you in correlating the protocol, APID, and APID extension terminology used within the NRT applications to that used within the Telemetry Database application. Within the NRT applications you have the opportunity to retrieve data from a specific telemetry stream. Telemetry streams are uniquely identified by specifying the protocol, APID and APID extension. Three Telemetry Database forms relate specifically to identifying information about individual streams, the Stream List form, the Packet Detail form and the Packet MSID List form. All of these forms are accessible via the Telemetry Database application's cascade menus (see Figure AB-1, Telemetry Database application cascade menus).

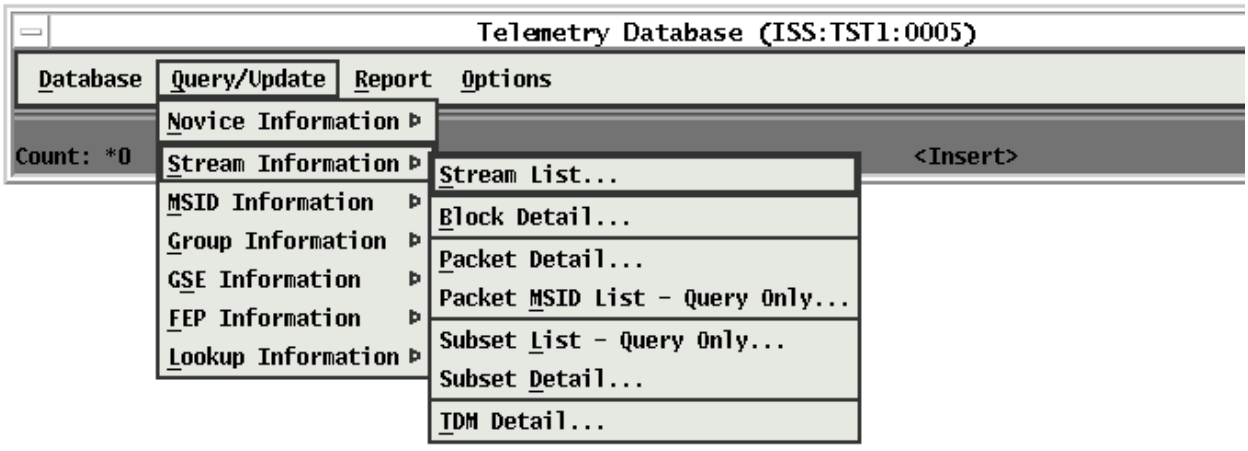


Figure AB-1, Telemetry Database application cascade menus.

AB.1Stream List Form

The Telemetry Database application **Stream List** form can be used to identify all relevant telemetry streams (see Figure AB-2, Telemetry Database Stream List form). On the **Stream List** form, the column labeled **Stream ID** correlates to **APID** as used within the NRT applications. The column labeled **Protocol** displays a single character identifying the applicable stream protocol. Valid characters in this column are shown in Table I-1 and can be accessed by clicking on the **Protocol** LOV. The column labeled **Packet ID Ext** displays a number which correlates to the NRT application's **APID Extension**. The correlation between the numbers shown on the **Stream List** form and the phrases used in the NRT applications is shown in Table AB-1 below.

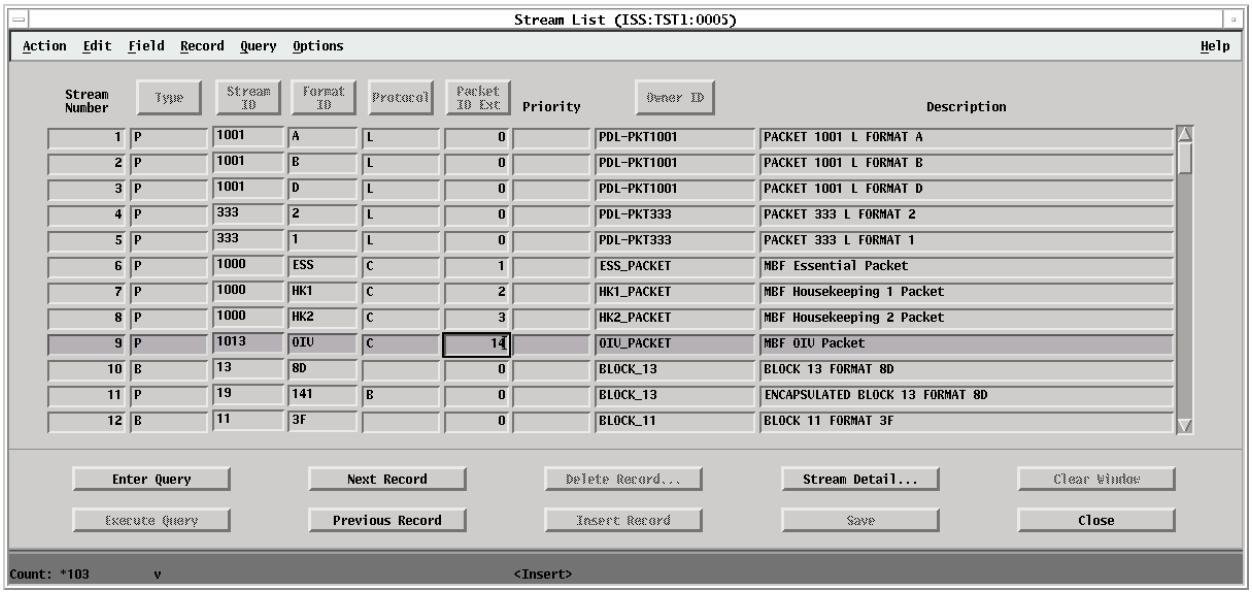


Figure AB-2, Telemetry Database Stream List form.

Table AB-1, Protocol correlations between NRT and the Protocol Column on the Stream List form.

Telemetry Database Protocol Characters	NRT Request Application Protocol Text
C	PDSS Core
L	PDSS Payload
S*	PDSS BPDU
U*	PDSS UDSM
T	TDM
B	NASCOM
P	Pseudo
**	HDRS DQ
G	GSE
D	Time

* - indicates that the protocol has not been defined within the Telemetry Database application for this software release.

** - indicates that the protocol is suspect, is not supported within the Telemetry Database application for this software release, and may not be supported in the future.

The **Stream List** form includes a column identified as **Packet ID Ext**. The following table correlates the numerical entries in this form with the text entries provided in the NRT applications.

TableAB-2, Packet ID Ext and APID extension correlation.

Stream Packet ID Ext	NRT Request Application APID Extensions
1	Essential
2	Housekeeping 1
3	Housekeeping 2
14	CCS to OIU
20	ZOE Normal
21	ZOE Extended

Any other **Stream List** form Packet ID extensions, other than those shown above are disregarded by NRT.

AB.2Packet Detail Form

The Telemetry Database **Packet Detail** form is invoked either through the Telemetry Database's **Stream Information** cascade menu or when users click on Stream Detail... from the **Stream List** form. The **Packet Detail** form includes a **Protocol** frame (see Figure AB-3, Telemetry Database Packet Detail form).

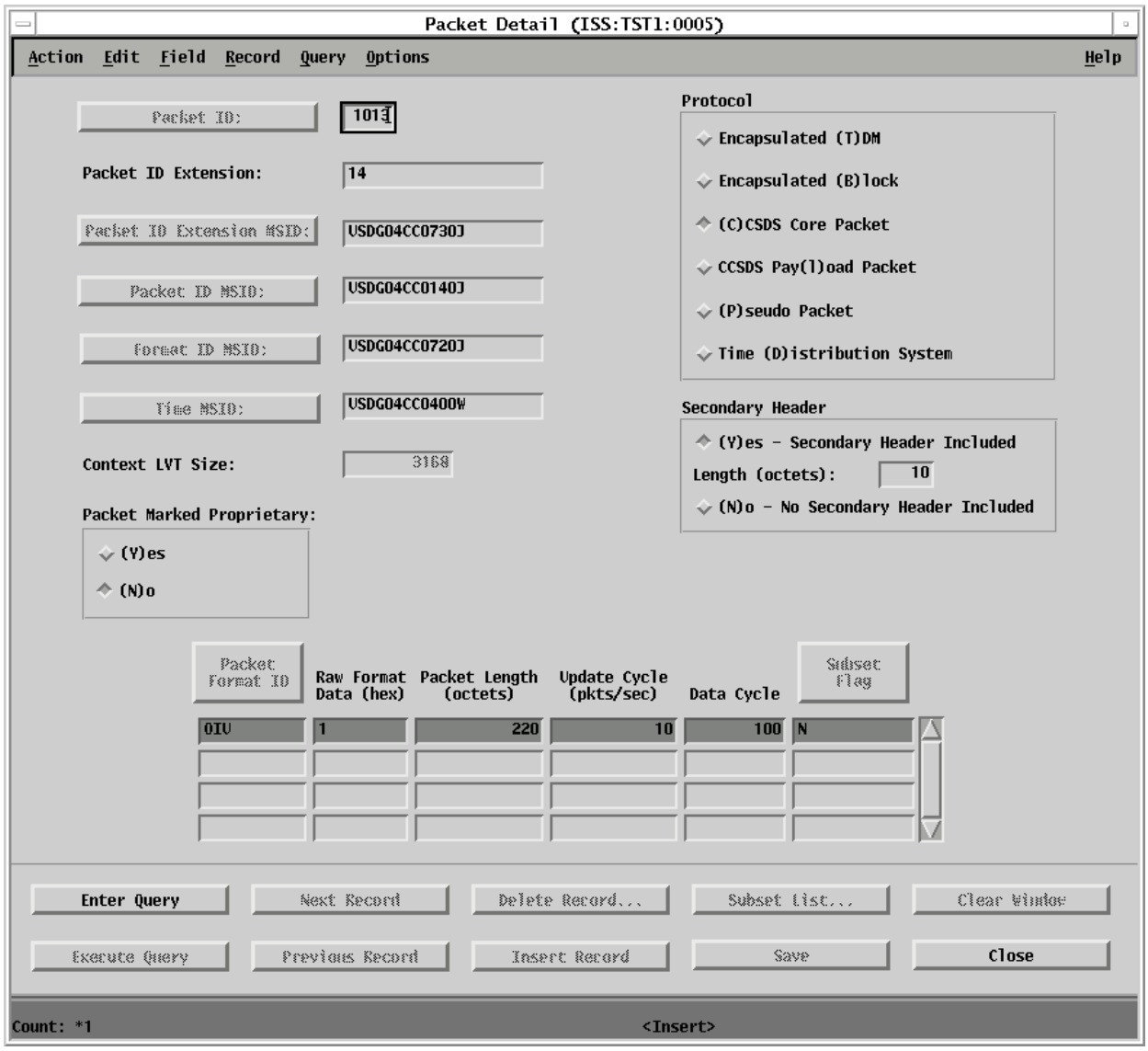


Figure AB-3 Telemetry Database Packet Detail form.

The correlation between the protocols listed on the **Packet Detail** form and the protocols listed in the NRT applications are shown in Table AB-3.

Table AB-3, Protocol correlations between NRT and the Telemetry Database Packet Detail form.

Packet Detail Form Protocols	NRT Application Protocols
Encapsulated (T)DM	TDM
Encapsulated (B)lock	NASCOM
(C)CSDS Core Packet	PDSS Core
CCSDS Pay(l)oad Packet	PDSS Payload

Packet Detail Form Protocols	NRT Application Protocols
(P)seudo Packet	Pseudo
Time (D)istribution System	Time

The remaining protocols listed in the NRT applications are not included on the **Packet Detail** form.

AB.3Packet MSID List Form

The **Packet MSID List** form provides you with the mechanism needed to determine what MSIDs are included in each stream. This form is invoked through the Telemetry Database's **Stream Information** cascade menu. You must provide the **Packet ID:**, **Protocol:**, and **Packet ID Extension:** in order to execute a query. The **Packet ID:** is the same as the **Stream ID** used on the **Stream List** form and the term APID as used in the NRT applications. The **Protocol:** is a single character and is the same as that described earlier in Table AB-1. The **Packet ID Extension:** is the same as that described earlier in Table AB-2.

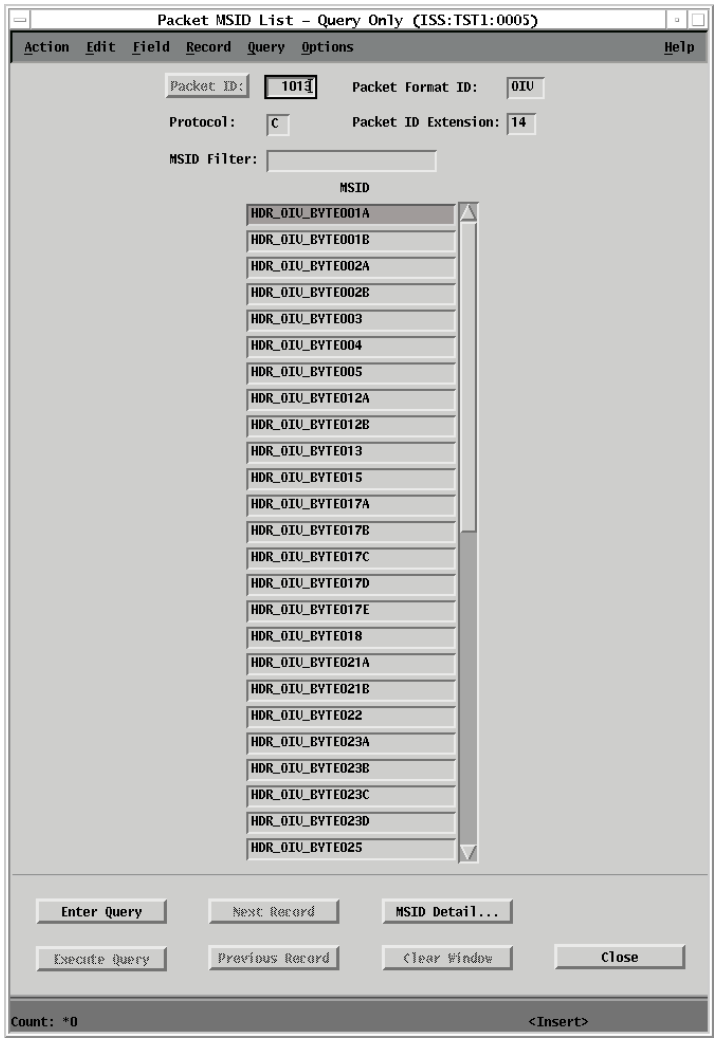


Figure AB-4, Telemetry Database Packet MSID List - Query Only form

Appendix AC: Limit/Expected State Sensing Set Activation Criteria

Case No.	Is LES Sensing Dependent on Group Activation?	Is MSID in a Group?	Is the MSID Set Specified in a Group?	Is a Switch MSID Specified?	Result
1	Yes	Yes	Yes	Yes	Set in Group Definition Used
2	Yes	Yes	Yes	No	Set in Group Definition Used
3	Yes	Yes	No	Yes	Set Specified by the Switch is Used
4	Yes	Yes	No	No	Default is Used
5	No	Yes	Yes	Yes	Set Specified by the Switch is Used
6	No	Yes	Yes	No	Default is Used
7	No	No	N/A	Yes	Set Specified by Switch is Used
8	No	No	N/A	No	Default is Used

Appendix AD:
PIMS Account Privileges

This table lists the privileges available to PIMS users along with its description. You must specify which privileges you will need on an Account Request Form.

PIMS Access	Launchpad access to PIMS functions including: 1. Action Request 2. Documents 3. Operations Change Request 4. Timeliner 5. To Do List 6. User Information 7. Bulletin Board
PIMS Bulletin Board Manager	PIMS internal capability to designate Bulletin Board Manager.
PIMS HOSC Drop Box Planning Access	PIMS internal capability to allow access to the HOSC Drop Box Planning Partition. PODF can place a file in the mcc-h/simulation/procedures directory within the HOSC Drop Box.
PIMS HOSC Drop Box Operational Access	PIMS internal capability to allow access to the HOSC Drop Box General Partition.
PIMS Transfer Command File	PIMS internal capability to allow access to the HOSC Drop Box Command Partition for Command File Transfer.
PIMS OSTP Access	PIMS internal capability to allow access to the HOSC Drop Box for storage for OSTP.
PIMS Security Directory Access	PIMS internal capability to allow access to the HOSC Drop Box Security Directory.
PIMS POIC Lead Approver	PIMS internal capability to designate POIC Lead Approver
PIMS POIC Member	PIMS internal capability to designate POIC (Payload Operations Integration Center) Member
PIMS SOF Reviewer	PIMS internal capabilty to designate Safety of Flight Reviewer.
PIMS US PCC Lead Approver	PIMS internal capabilty to designate U.S. PCC Lead Approver.
PIMS US PCC Member	PIMS internal capabilty to designate U.S. PCC (Partner Control Center) Member.
PIMS RSA PCC Lead Approver	PIMS internal capability to designate RSA PCC Lead Approver.

PIMS NASDA PCC Lead Approver	Pims internal capability to designate NASDA PCC Lead Approver.
PIMS ESA PCC Lead Approver	PIMS internal capability to designate ESA PCC Lead Approver
PIMS Facility Lead Approver	PIMS internal capability to designate Facility Lead Approver.
PIMS Facility Member	PIMS internal capability to designate Facility Team Member.
PIMS Experiment or Commercial Payload Member	PIMS internal capability to designate Experiment or Commercial Payload Member.

Appendix AE:
PIMS HOSC Drop Box Privileges

Keys to Interpreting the Directory Structure

Command Privilege	PIMS controls write access with the SSUP privilege 'PIMS Transfer Command File'
Planning Privilege	PIMS controls write access with the SSUP privilege 'PIMS HOSC Drop Box Planning Access'
OSTP Privilege	PIMS controls write access with the SSUP privilege 'PIMS OSTP Access'
General Privilege	PIMS controls write access with the SSUP privilege 'PIMS HOSC Drop Box Operational Access'
Security Privilege	PIMS controls write access with the SSUP privilege 'PIMS Security Directorory Access'
Directory Names in Italics	OS Read-Only permissions (subject to change)
Directory Names in Bold	OS Read-Write permissions (subject to change)
Directory Names w/Border	Restricted from use by the PIMS automatic dropbox transfer capability

MSFC General Drop Box (public_out):

mcc-h_command
- *mission*
  - *command*
    - **uplink**
- *simulation*
  - *command*
    - **uplink**
- *test*
  - *command*
    - **uplink**

mcc-h
administrative
log
antenna management
predict
mission
general
archive
oca procedures
uplink
downlink
command
downlink
transport_ack
ballistics
planning
dly
stp
ostp
procedures
life_support
power
inventory
orientation
moscow
red
yellow
green
realtime
executed
houston
red
yellow
green
realtime
executed
adco
sud status
robotics
flight_products

planning_products

pre_increment

general

robotics_flight_products

00inc
...
09inc

post_increment

general

archive

planning

simulation

(same as mission)

test

(same as mission)

security

audit_report

incident_report

userid_request

sca

appendix_e

test_report

config_info

change_docs

design_docs

PIMS Rules for Access

From the GUI (Transfer to HOSC Dropbox, Delete from HOSC Dropbox, and Select Auto Transfer Location screens)

- Access will be denied to these capabilities if the user does not have at least one of the "Dropbox" SSUP privileges.

- If a user has access to the dropbox, that user can see and traverse (i.e., read access) the entire public_out directory structure of the HOSC dropbox.
- In order for the user to have write permissions to a directory of the HOSC dropbox, all of the following must be true:

    1. The operating system (OS) allows write access.
    2. The user has the SSUP privilege associated with access to the directory.
    3. The directory is either:
        - Associated with the user's current operational mode, or
        - The directory is not associated with any mode (pre-increment, post-increment, or security)
    4. In the case of the "Select Auto Transfer Location" screen, the directory does not have an auto-transfer restriction (uplink).

From the API (DCM_Transfer_To_HOSC_Dropbox routine)

- The transfer will be allowed, provided all of the following are true:

    1. The operating system (OS) allows write access.
    2. The user has the SSUP privilege associated with access to the directory.
    3. The directory is either:
        - Associated with the user's current operational mode, or
        - The directory is not associated with any mode (pre-increment, post-increment, or security)

Appendix AF: PIMS Folder Types and Icon Representations

The following table defines the folder types available in the Documents application and lists the class(es) of documents that may be stored within each.

Folder Type	Description	Document Class(es)
Anomaly Logs	Contains a history of actions related to problems associated with on-board objects. Provides a running dialog of the problem that occurred. Describes who were the decision makers during the remedy of the problem along with their decisions and why they were made.	Anomaly Log
Automated Procedures	Includes procedures that are automated and their associated TimeLiner Compiler products. An auto procedure is a group of sequences and subsequences in a single coded file that are treated as a unit.	Automated Procedure
Crew Messages	Includes change message template files used for documenting operational changes to crew procedures. These change files are prepared for onboard viewing.	Crew Message
Crew Procedures	Includes all non-automated crew procedures and their associated Change Messages.	Crew Procedure
Downlinked Files	Includes downlinked files and placeholders for files that are registered but not yet downlinked.	General
Miscellaneous	Includes miscellaneous documents that everyone is allowed to access.	General
OCMS	Contains OCMS documents including: TimeLiner Compiler Listings, OCMS Reference File, Directory List File, and Onboard File List.	General
Personal	Includes any type of document that only the originator can view and access.	All classes (Anomaly Log, Automated Procedure, Crew Message, Crew Procedure, General, Shift Report)
Shift Reports	Organized by mission teams with one mission shift report per mission team. Initially the mission shift report will be blank. At the end of the mission, it will contain all team compiled shift report document files. The team lead will gather all individual position shift reports into one team shift report document file prior to the end of a shift.	Shift Report

The following table provides a cross-reference for the various icons used within the PIMS applications and their corresponding descriptions.

Icon	Description
	Used to represent an Adobe Acrobat file.
	Used to represent a closed Anomaly Log document.
	Used to represent an open Anomaly Log document.
	Used to represent an Applix file.
ASCII	Used to represent an ASCII text file.
	Used to represent an audio file.
	Used to represent a closed Automated Procedures document.
	Used to represent an open Automated Procedures document.
BIN	Used to represent a binary file.
	Used to signify file or document characteristics.
	Used to represent a closed Crew Messages document.
	Used to represent an open Crew Messages document.
	Used to represent a closed Crew Procedures document.
	Used to represent an open Crew Procedures document.
	Used to represent a Microsoft Excel file.

Icon	Description
	Used to represent High Priority items.
	Used to represent a closed folder.
	Used to represent an open folder.
	Used to represent a FrameMaker file.
	Used to represent a closed General document.
	Used to represent an open General document.
	Used to represent an HTML file.
	Used to represent an image file.
	Used to demonstrate object movement on buttons.
	Used to represent video files.
	Used to represent a task that is late and not a high priority.
	Used to represent an OCR that has been Approved.
	Used to represent the location of an OCR.
	Used to represent an OCR that has been Disapproved.
	Used to represent a Follow-Up OCR.
	Used to represent an OCR that has been put on hold.

Icon	Description
	Used to represent an OCR that has been Putback.
	Used to represent an OCR that has been Released.
	Used to represent a Standard OCR.
	Used to represent an OCR that has been Submitted.
	Used to represent an OCR that has been Withdrawn.
	Used to represent a closed Payload Planning document.
	Used to represent an open Payload Planning document.
	Used to represent a file of unknown type.
	Used to demonstrate object movement on buttons.
	Used to represent a closed Shift Reports document.
	Used to represent an open Shift Reports document.
	Used to represent a task that is late and high priority.
	Used to represent a Microsoft Word file.
	Used to represent a file of zip format.

Appendix AG:
PIMS Workflow Diagrams

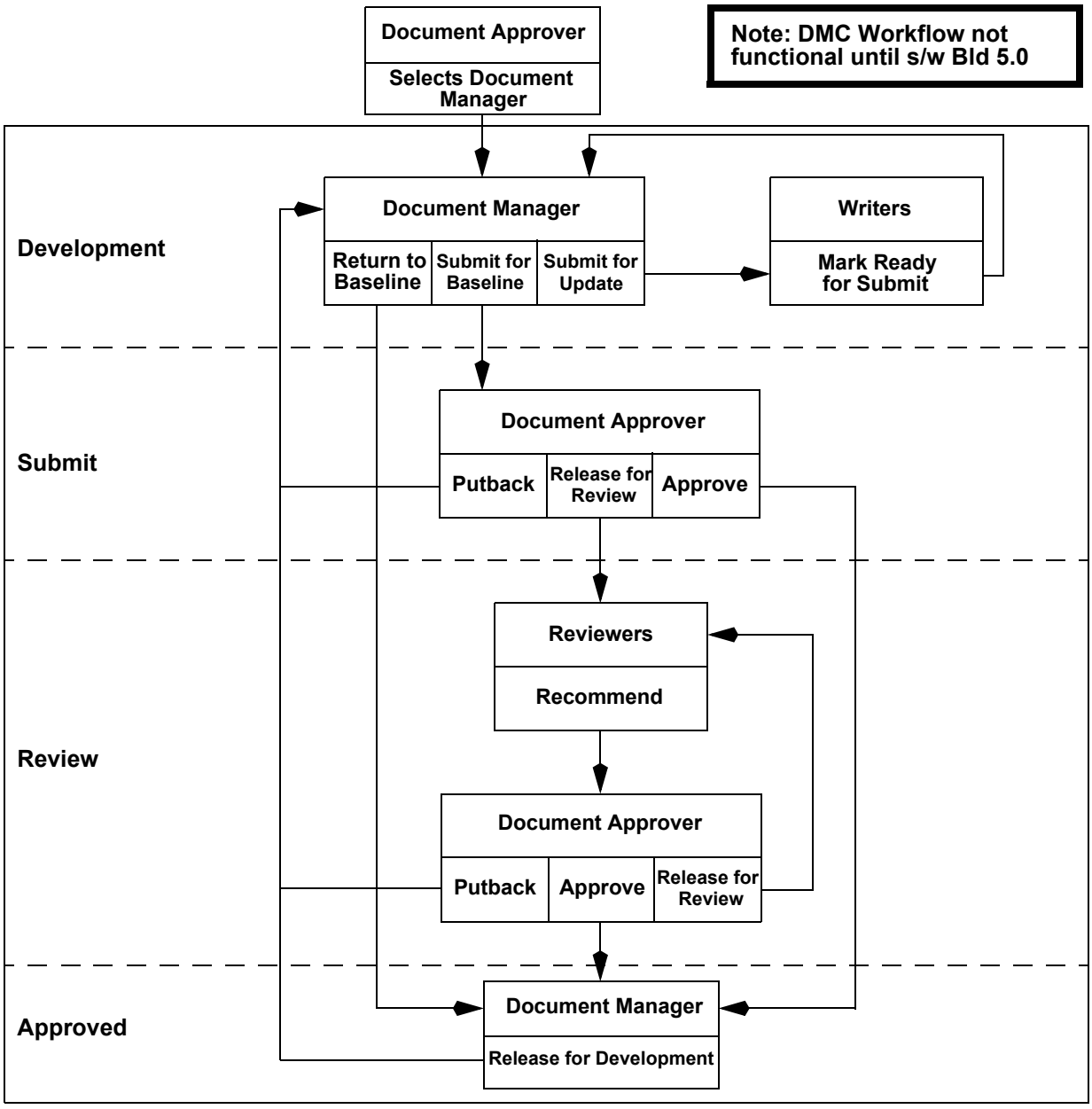


Figure AG-1, Document Management Workflow diagram.

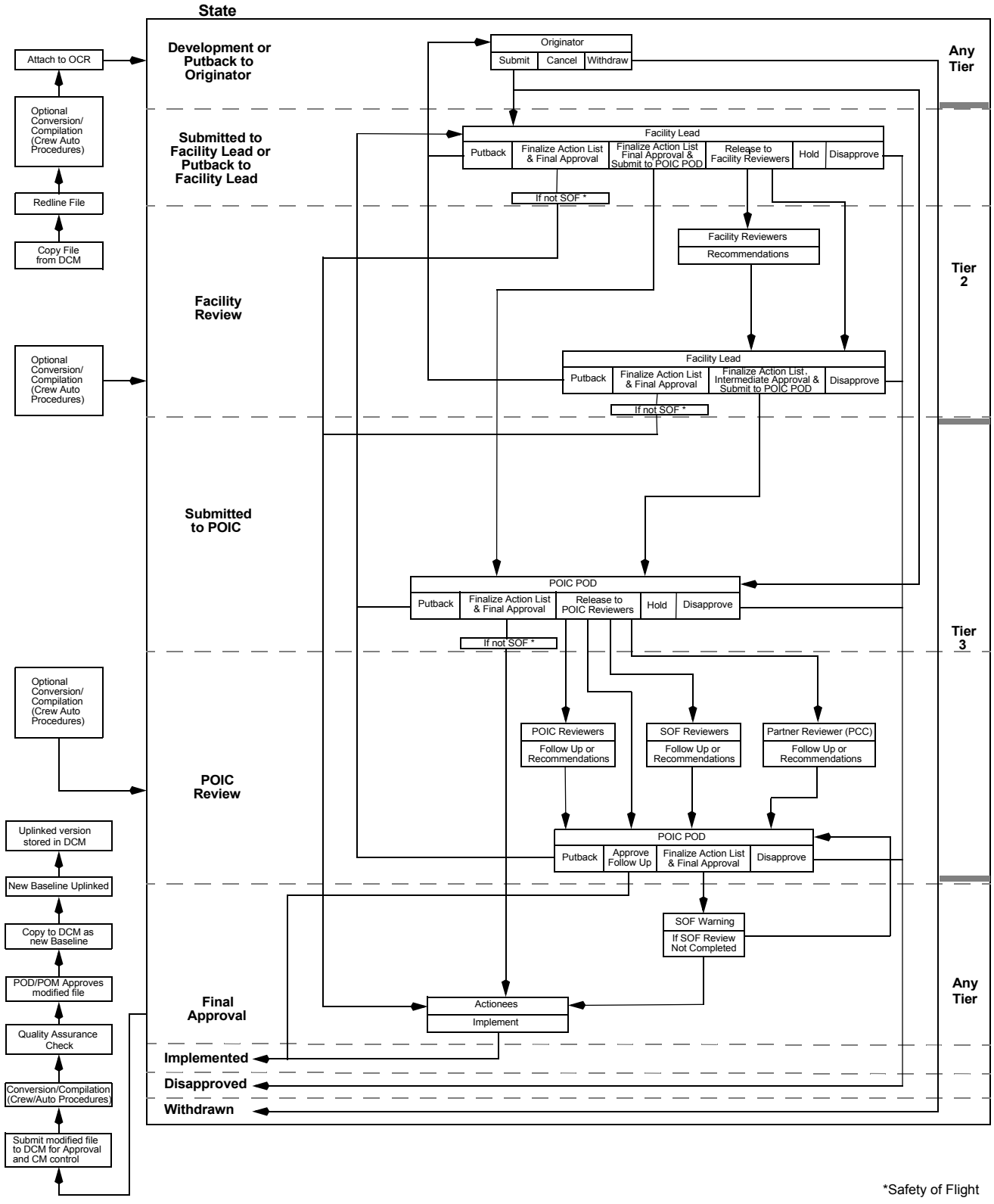


Figure AG-2, OCR Workflow diagram.

Table AG-1, PIMS Messaging Matrix for Message Handler/E-mail

Document Event	Document Role					
Document CM Actions:	**Originator**	**Writer**	**Reviewers**	**Manager**	**Approver**	**FYI List**
Writer: mark ready to submit (to Manager)				X		
Manager: submit for update (to Writer)		X				
Manager: submit for approved (to approver)		X			X	
Manager: return to approved		X	X		X	X
Manager: release for development		X			X	X
Approver: putback (to manager)		X	X	X		
Approver: release for review (to reviewers)		X	X	X		X
Approver: approve/disapprove		X	X	X	X	X
Reviewer: store markup/ comments		X	X	X	X	
Special Cases:						
Approver: change approver				X	X (Note #1)	
Approver: change manager				X (Note #2)		

Notes:
1. New approver is notified
2. Old and new managers are notified

Note: PIMS Messaging Matrix for Message Handler/E-mail is not available until s/w bld 4.2-10.

950

Appendix AH:
Example Reference File

The following is the default reference file and is presented here to illustrate the typical format. Your reference file will follow the same format, but the content will vary depending on the telemetry and command database versions for which the reference file is being created.

```
OCMSReference.rfe                        GMT: 1999 342:22:27:33
Validated TDB: 0003                      CDB: 0002

OCMSRegFlag,$E_OCMS_REG_FLAG     %OCMS Privileged Tool Registration Flag
Type = ITWO
Size = 16 bits
FGMTUpdate,$E_FGMT_UPDATE_FLAG   %FGMT Dynamic Update Flag for on-board List
Type = ITWO
Size = 16 bits
OSTPUpdate,$E_OSTP_UPDATE_FLAG   %OSTPGMT Dynamic Update Flag for new OSTP
Type = ITWO
Size = 16 bits
CPMTUpdate,$E_CPMT_UPDATE_FLAG   %CPMT Dynamic Update Flag for new Comand Flag
Type = ITWO
Size = 16 bits
FGMTPEPMODE,PEPMODE              %Payload Executive Processor Exec Mode
Type = IUNS
Size = 16 byte
FGMTMSDSpace,MSDFREESPACE        %PLMDM MSD Free
Type = IUNS
Size = 31 bytes
------------------------------------------------------------------------------
-
FREEZE_EXEC,TL_FREEZE_ALL,1        %Payload Timeliner Freeze Command
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
RESET_FREEZE,TL_RESET_FREEZE,1     %Payload Timeliner Reset Freeze Command
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
INSTALL_BUNDLE,TL_INSTALL_BUNDLE,5 %Payload Timeliner Install Bundle Command
Mnem = BUNDLE_PATH_NAME_1
Type = SASC
Size = 42 bytes
Mnem = BUNDLE_PATH_NAME_2
Type = SASC
Size = 42 bytes
Mnem = BUNDLE_PATH_NAME_3
Type = SASC
Size = 16 bytes
Mnem = CONTROLLER_ID
```

```
Type = ITWO
Size = 16 bits
Mnem = MONITOR_ID
Type = ITWO
Size = 16 bits
REMOVE_BUNDLE,TL_REMOVE_BUNDLE,2    %Payload Timeliner Remove Bundle Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
HALT_BUNDLE,TL_HALT_BUNDLE,2        %Payload Timeliner Halt Bundle Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
START_SEQUENCE,TL_START_SEQUENCE,4  %Payload Timeliner Start Sequence Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
Size = 22 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
STOP_SEQUENCE,TL_STOP_SEQUENCE,4     %Payload Timeliner Stop Sequence Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
Size = 22 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
RESUME_SEQUENCE,TL_RESUME_SEQUENCE,4 %Payload Timeliner Resume Seq. Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
```

```
Size = 22 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
STEP_SEQUENCE,TL_STEP_SEQUENCE,4    %Payload Timeliner Step Sequence Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
Size = 22 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
HOLD_SEQUENCE,TL_HOLD_AT_STMT,5     %Payload Timeliner Hold at Seq. Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
Size = 22 bytes
Mnem = STATEMENT_NUMBER
Type = IUNS
Size = 16 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
JUMP_SEQUENCE,TL_JUMP_TO_STMT,5     %Payload Timeliner Jump to Seq. Command
Mnem = BUNDLE_NAME
Type = SASC
Size = 32 bytes
Mnem = SEQUENCE_NAME_1
Type = SASC
Size = 10 bytes
Mnem = SEQUENCE_NAME_2
Type = SASC
Size = 22 bytes
Mnem = STATEMENT_NUMBER
Type = IUNS
Size = 16 bytes
Mnem = CONTROLLER_ID
Type = ITWO
Size = 16 bits
FGMTDwnLnkFile,HRDL_DOWNLINK_FILE,4   %Downlink File Ku-band
Mnem = CORE_PAYLOAD
Type = IDIS
Size = 1 bit
Mnem = TRANSFER_APID
```

```
Type = IUNS
Size = 11 bytes
Mnem = MSD_FILENAME_1
Type = SASC
Size = 42 bytes
Mnem = MSD_FILENAME_2
Type = SASC
Size = 54 bytes
Setfilename,HRDL_SET_FILE_NAME,9           %FGMT Set File Name Command
Mnem = CHANNEL_KEY
Type = IDIS
Size = 1 bit
Mnem = SOURCE_DESTINATION
Type = IDIS
Size = 1 bit
Mnem = TARGET_STORAGE_TYPE
Type = IUNS
Size = 2 bytes
Mnem = CORE_PAYLOAD
Type = IDIS
Size = 1 bit
Mnem = TRANSFER_APID
Type = IUNS
Size = 11 bytes
Mnem = SUBADDRESS
Type = IUNS
Size = 16 bytes
Mnem = FILE_NAME_LENGTH
Type = IUNS
Size = 16 bytes
Mnem = MSD_FILENAME_1B
Type = SASC
Size = 34 bytes
Mnem = MSD_FILENAME_2B
Type = SASC
Size = 62 bytes
Deletefile,HRDL_DELETE_FILE,2         %FGMT MSD Delete File Command
Mnem = MSD_FILENAME_1A
Type = SASC
Size = 44 bytes
Mnem = MSD_FILENAME_2A
Type = SASC
Size = 52 bytes
Copyfile,HRDL_COPY_FILE,2             %FGMT MSD Copy File Command
Mnem = COPY_FILE_STRING_1
Type = SASC
Size = 44 bytes
Mnem = COPY_FILE_STRING_2
Type = SASC
Size = 62 bytes
Changeattribute,HRDL_CHANGE_FILE_ATT,6 %FGMT MSD Change File Attrib command
Mnem = FILE_ATT_READ_ONLY
Type = IDIS
Size = 1 bit
```

```
Mnem = FILE_ATT_WRITE_ONLY
Type = IDIS
Size = 1 bit
Mnem = FILE_ATT_READ_WRITE
Type = IDIS
Size = 1 bit
Mnem = FILE_ATT_REMOVABLE
Type = IDIS
Size = 1 bit
Mnem = MSD_FILENAME_1
Type = SASC
Size = 42 bytes
Mnem = MSD_FILENAME_2
Type = SASC
Size = 54 bytes
Createdirectory,HRDL_CREATE_DIR,2      %FGMT MSD Create Directory Command
Mnem = MSD_DIR_NAME_1
Type = SASC
Size = 44 bytes
Mnem = MSD_DIR_NAME_2
Type = SASC
Size = 52 bytes
Deletedirectory,HRDL_DELETE_DIR,2      %FGMT MSD Delete Directory Command
Mnem = MSD_DIR_NAME_1
Type = SASC
Size = 44 bytes
Mnem = MSD_DIR_NAME_2
Type = SASC
Size = 52 bytes
Formatdisk,HRDL_FORMAT_DISK,0          %FGMT Format MSD disk command
Formatenable,HRDL_ENA_FORMAT_DISK,0    %FGMT Format Enable command
Formatdisable,HRDL_INH_FORMAT_DISK,0   %FGMT Format Disable command
Updatediskstat,HRDL_UPDATE_DISK,0      %FGMT Update Disk Statistics command
```

Appendix AI:
EHS Data Modes

The following diagram illustrates the relationship between data paths and their resulting EHS data modes.

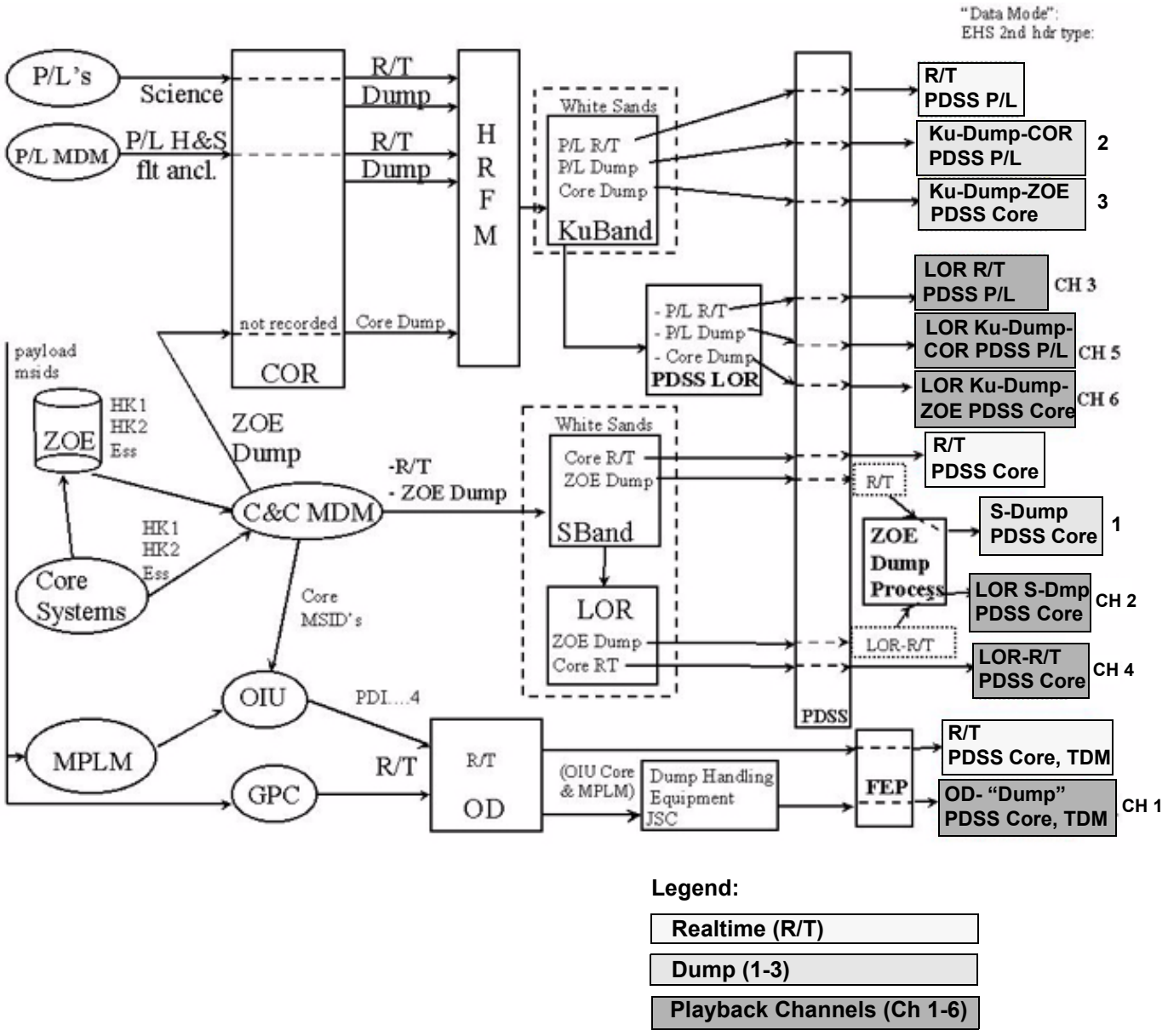


Figure AI-1, Data paths and their resulting EHS data modes.

The following table shows the data mode that is assigned by the three possible processing services within the POIC:

- PDSS
- EHS FEP
- EHS ZOE Dump Proces

The resulting, or final data mode in which TNS expects to receive the packets is shown in the far right column. Playbacks from the NRT and PDSS archives are considered internal to the POIC and are not shown in the table. The Internal Playbacks use Playback Channels 7-11 and are allocated at the time of the playback request.

Table AI-1, Data modes assigned by POIC processing services.

"Type" of Data	Data Mode out of PDSS	Data Mode out of FEP	Data Mode out of ZOE Dump Process	Data Mode Processed by TNS
Ku-Band P/L R/T	R/T **(R/T)**			R/T
S-Band Core R/T	R/T **(R/T)**			R/T
OD OIU Core R/T		R/T **(R/T)**		R/T
OD MPLM TDM R/T		R/T **(R/T)**		R/T
S-Band ZOE Dump R/T	R/T **(R/T)**		S-Dump **(Dump 1)**	Dump 1
Ku-Band P/L Dump)	Ku-Dump-COR **(Dump 2)**			Dump 2
Ku-Band Core Dump	Ku-Dump-ZOE **(Dump 3)**			Dump 3
OD OUI Core out of LOR		OD Dump **(PB CH 1)**		PB CH 1
OD MPLM TDM out of LOR		OD Dump **(PB CH 1)**		PB CH 1
Ku-Band P/L R/T out of LOR	LOR R/T **(PB CH 3)**			PB CH 3
S-Band Core R/T out of LOR Approver: change approver	LOR R/T **(PB CH 4)**			PB CH 4
S-Band ZOE Dump out of LOR	LOR R/T **(PB CH 4)**		LOR-S-Dump **(PB CH 2)**	PB CH 2
Ku-Band P/L Dump out of LOR	LOR Ku-Dump-COR **(PB CH 5)**			PB CH 5
Ku-Band Core Dump out of LOR	LOR-Ku-Dump-ZOE **(PB CH 6)**			PB CH 6

Appendix AJ:
GSE Display Overall Status Codes

The following table lists the encoded status portion of the Overall Status. The mask code shown in the right hand column is refelected on the GSE Display application's main window under the Overall Status column. The mask definition should be used to ‘mask-off’ other portions of the Overall Status when determining the encoded errors.

Table AJ-1, Encoded Status of Overall Status.

Telemetry Encoded Error Mask	0x000000FF
OK	0x00000000
STATUS_TABLE_ATTACH_ERROR	0x00000001
INIT_SOURCES_ERROR	0x00000002
INIT_PACKETS_ERROR	0x00000003
CDD_REQUEST_ERROR	0x00000004
LOCAL_TABLE_ERROR	0x00000005
MEMORY_ERROR	0x00000006
PACKET_INTERRUPT_ERROR	0x00000007
REQUEST_UPDATES_ERROR	0x00000008
SMAC_TDS_ERROR	0x00000009
DP_RECONFIG_ERROR	0x0000000A
PACKET_NOT_FOUND	0x0000000B
DP_ADDRESS_ERROR	0x0000000C
DP_PID_ERROR	0x0000000D
NPA_FIFO_ERROR	0x0000000E
MAX_PACKET_LENGTH_ERROR	0x0000000F
DECOM_ERROR	0x00000010
INVALID_DATA_TYPE	0x00000011
SW_CONV_ERROR	0x00000012
INVALID_LENGTH	0x00000013
IMPROPER_FUNCTION_TYPE	0x00000014
INVALID_SAMPLE_TYPE	0x00000015
NO_DECOM_SAMPLES	0x00000016
PLVT_ATTACH_ERROR	0x00000017
LVT_ATTACH_ERROR	0x00000018
PIT_ATTACH_ERROR	0x00000019
NEW_LOCAL_TABLE	0x0000001A
SOURCE_UNAVAILABLE	0x0000001B

PDB_ATTACH_ERROR	0x0000001C
CLEANUP_SOURCES_ERROR	0x0000001D
SOURCE_NOT_FOUND	0x0000001E
SCM_STATUS_DETACH	0x0000001F
PIT_DETACH_ERROR	0x00000020
REMOVE_PACKET_ERROR	0x00000021
STATUS_TABLE_DETACH_ERROR	0x00000022
PIT_REVISION_COUNTER_ERROR	0x00000023
LOCAL_TABLE_REVISION_COUNTER_ERROR	0x00000024
PIT_ERROR	0x00000025
REMOVE_PACKET_UPDATES_ERROR	0x00000026
SEMID_ERROR	0x00000027
FTOK_ERROR	0x00000028
PARAMETER_DATABASE_ERROR	0x00000029
SHM_KEY_ERROR	0x0000002A
CONVERT_ERROR	0x0000002B
CAL_ERROR	0x0000002C
LES_ERROR	0x0000002D
SWITCH_CAL_ERROR	0x0000002E
SWITCH_CONVERT_ERROR	0x0000002F
SWITCH_DECOM_ERROR	0x00000030
SEM_ACQUIRE_ERROR	0x00000031
PDB_ID_ERROR	0x00000032
SEM_RELEASE_ERROR	0x00000033
TDS_PACKET_QUESTIONABLE	0x00000034
GET_MSID_VALUE_ERROR	0x00000035
DECREMENT_SPC_ERROR	0x00000036
UPDATE_STATUS_TABLE_ERROR	0x00000037
INVALID_FORMAT	0x00000038
TIME_NOT_AVAILABLE	0x00000039
INIT_NEW_SOURCE_ERROR	0x0000003A
CAL_SETS_UNDEFINED	0x0000003B
LIMIT_SETS_UNDEFINED	0x0000003C
PDB_DETACH_ERROR	0x0000003D
NO_LOCAL_TABLE_INFO	0x0000003E
INVALID_FUNCTIONS	0x0000003F
NO_MSID_DATA_MEMORY	0x00000040
INCREMENT_SPC_ERROR	0x00000041
EXPECTED_SAMPLE_SIZE_ERROR	0x00000042
DATA_TYPE_LES_MISMATCH	0x00000043

DATA_TYPE_CAL_TYPE_MISMATCH	0x00000044
MJFB_ATTACH_ERROR	0x00000045
MJFB_DETACH_ERROR	0x00000046
TNS_KEY_FILE_PATH_ERROR	0x00000047
CREATE_PACKET_NOTIFY_KEYFILE_ERROR	0x00000048
CREATE_PACKET_NOTIFY_SEMKEY_ERROR	0x00000049
CREATE_PACKET_NOTIFY_SEMID_ERROR	0x0000004A
KILL_PACKET_NOTIFY_SEMID_ERROR	0x0000004B
PACKET_LIST_ERROR	0x0000004C
INVALID_CONTEXT_TYPE	0x0000004D
CDD_SERVICE_OPEN_ERROR	0x0000004E
CDD_SERVICE_CONNECT_ERROR	0x0000004F
CDD_SERVICE_SEND_ERROR	0x00000050
CREATE_LVT_SEMKEY_ERROR	0x00000051
GET_LVT_SHMID_ERROR	0x00000052
GET_LVT_SEMID_ERROR	0x00000053
LVT_DETACH_ERROR	0x00000054
PLVT_DETACH_ERROR	0x00000055
MSID_NOT_INITIALIZED	0x00000056
SOURCE_INFO_ERROR	0x00000057
UPDATE_LOCAL_TABLE_ERROR	0x00000058
SET_LES_PROC_ERROR	0x00000059
UPDATE_LTRC_ERROR	0x0000005A
UIT_CONNECT_ERROR	0x0000005B
UIT_DISCONNECT_ERROR	0x0000005C
SET_LES_PROC_FLAG_ERROR	0x0000005D
INVALID_MAX_SAMPLES	0x0000005E
ACQUIRE_PDB_READ	0x0000005F
RELEASE_PDB_ERROR	0x00000060
OPEN_PDB_LOCK_FD	0x00000061
UITM_CONNECT_ERROR	0x00000062
GAM_REQUEST_ERROR	0x00000063
DATA_LOST	0x00000064
CDD_SERVICE_RECEIVE_ERROR	0x00000065
CONTEXT_SOURCE_ERROR	0x00000066
RANGE_NO_CAL_INFO	0x00000067
CONTEXT_SAMPLE_SIZE_ERROR	0x00000068
RANGE_CAL_ERROR	0x00000069
RANGE_CONVERT_ERROR	0x0000006A

CONTEXT_DECOM_ERROR	0x0000006B
CONTEXT_FORMAT_ERROR	0x0000006C

The following table lists the Non-Encoded Bit Definition portion of the Overall Status. The mask definitions should be used to 'mask-off' other portions of the Overall Status when determining the bit definitions.

Table AJ-2, Non-Encoded Bit Definition of the Overall Status.

Data Condition Mask	**0x40000000**
DC_NEW_DATA	0x00000000
DC_OLD_DATA	0x40000000
Data Source Mask	**0x30000000**
SS_INITIALIZED	0x20000000
SS_LOS	0x10000000
SS_AOS	0x00000000
Data Quality Mask	**0x0F000000**
DQ_SUSPECT	0x08000000
DQ_FAILED	0x04000000
DQ_NO_DATA	0x02000000
DQ_OVERRIDE	0x01000000
GSE Application Error Mask	**0x00000F00**
GSE_NUMBER_SAMPLES_OVERFLOW	0x00000100
GSE_DATA_TYPE_MISMATCH	0x00000200
Other Bit Definitions:	
PS_LENGTH_ERROR	0x00800000
PS_SEQUENCE_COUNT_ERROR	0x00400000
LES_OVERALL_STATUS_WORD_ERROR	0x00200000
RECONFIG_DETECTED	0x00100000
MJF_FORMAT_ID_ERROR	0x00080000
MJF_PARENT_FRAME_ERROR	0x00040000
PS_DATA_LOST	0x00020000

Appendix AK:
GSE Display Status Characters

The following table identifies the Status Characters that will be shown in the GSE Dispay application's main window under the Sample Status column. In addition, it identifies what the status character means and whether the displayed data is valid given its current status. Only one status character at a time can be associated with a parameter. The Priority of Status Char column in the table below identifies which status character will take precedence (1 takes precedence over 2, etc.).

Table AK-1, Status Characters.

Status Character	Definition	Validity of Data	Priority of Status Character
‘ ‘ (space)	OK, Source Status - Acquisition of Signal	Valid	25
‘G’	Packet Routing Table Configuration Error	Not Valid	24
‘R’	Source Status - Source Initialized/ Unavailable	Stale Data	23
‘N’	Source Status - Loss Of Signal (LOS)	Stale Data	22
‘S’	Data Condition - Old/Stale Data	Stale Data	21
‘~’	Data Quality - No Data	Stale Data	20
‘F’	Data Quality - DQ Failed w/Override	Valid	19
‘?’	Data Quality - DQ Suspect w/Override	Valid	18
‘f’	Data Quality - DQ Failed	Stale Data	17
‘x’	Data Quality - DQ Is Suspect	Valid	16
‘Q’	Format ID Error	Stale Data	15
‘K’	Parent Frame Error	Stale Data	14
‘D’	Decom/Conv/Cal Status - Decom Error	Stale Data	13
‘c’	Decom/Conv/Cal Status – Calibration Error	Stale Data	12
‘C’	Decom/Conv/Cal Status - Conversion Error	Stale Data	11
‘&’	Calibration sets not defined in Local Table	Stale Data	10
‘l’	Limit/Expected State Sensing Error	Stale Data	9
‘d’	Limits sets Not Defined In The Local Table	Valid	8
‘t’	Telemetry Local Table Error	Stale Data	7
‘H’	LES Status - Warning High	Valid	6
‘!’	LES Status - Caution High	Valid	5
‘ ’	LES Status - Caution Low	Valid	4
‘L’	LES Status - Warning Low	Valid	3
‘E’	LES Status - Out Of Expected State	Valid	2
‘$’	Invalid Status Received From EML	Stale Data	1

When sample data are retrieved by POIC, an overall status value is used to reflect any errors the POIC may have encountered obtaining all of the data samples. Each data sample also has an associated status value. By combining the overall status value and the sample value, a status character value can be determined. A status character other than ' ' (OK) indicates that an error occurred obtaining the data sample.

If Overall Status field contains the GSE_NUMBER_SAMPLES_OVERFLOW error, this means that the number of available samples for this MSID is greater than the maximum size specified in the GSE packet definition. In this case, the amount of sample data associated with this MSID will be dictated by the GSE packet definition.

If the GSE_DATA_TYPE_MISMATCH error is found, this means that the data type for this MSID differs from the data type specified in the GSE packet definition. In this case, all fields following the Overall Status will be zero-filled, except for the first Sample Status field, which will contain the status character “T” (Telemetry Database Discrepancies).

If an MSID fails POIC data initialization, GSE will be unable to retrieve sample data associated with this MSID. In these cases, all data fields associated with this MSID will be NULL-filled except for the overall status field and the first status character field. The overall status field will contain the initialization error code, and the status character field will contain on of the values from the following table.

Table AK-2, Status Character Definitions for MSID Initialization Failures.

Status Character	Definition	Validity of Data	Priority of Status Character
‘G’	Packet Routing Table Configuration Error	Not Valid	11
‘I’	UITM Process Connect Error	Not Valid	10
‘B’	Common Configuration Error	Not Valid	9
‘W’	Memory Error	Not Valid	8
‘A’	Distribute Packets (DP) Process Not Responding	Not Valid	7
‘a’	Context Dependent Decom (CDD) Process Not Responding	Not Valid	6
‘T’	Telemetry Database Discrepancies	Not Valid	5
‘&’	Calibration Sets Not Defined In Local Table	Not Valid	4
‘P’	Telemetry Processing Discrepancies and Calibration Sets Not Defined In Local Table	Not Valid	3
‘g’	Group Activation Manager (GAM) Process Not Responding	Not Valid	2
‘Z’	Unrecognized Initialization Decom Status	Not Valid	1

Since each status character is assigned in order of precedence, only a single error condition can exist at one time. For example, if the overall status/sample status combination indicates that an MSIDs source is initialized but unavailable, a status character of ‘R’ (Source Initialized But Unavailable) is assigned to the sample, and any other errors associated with the data sample will not be recognized.

Abbreviations and Acronym List

A

a.k.a.	also known as
A/D	Analog to Digital
A/G	Air-to-Ground
A/M	Automatic/Manual
ACBSP	Assembly Contingency Baseband Signal Processor
ADQ	Average Data Quality
ADR	Achievable Data Rate
ADS	Audio Distribution Subsystem
AIO	Analog Input/Output
AIS	Automated Information Security
AIT	Analysis Integration Team
AM	Amplitude Modulation
ANSI	American National Standards Institute
AOS	Acquisition of Signal
API	Application Programming Interface
APID	Application Process Identifier
APM	Attached Pressurized Module
APP	Approved
APS	Automated Payload Switch
APT	Active Process Table
APV	Automated Procedure Viewer
AR	Action Request Activity Record
ASCII	American Standard Code for Information Interchange
ASCR	Assured Safe Crew Return
ASI	Agencia Spatiale Italiano
AST	Active Server Table
AT	Address Translation
ATM	Asynchronous Transfer Mode
ATT	Attitude

B

B&D	Boot & Diagnostics
BCD	Binary Coded Decimal
BER	Bit-Error Rate
BFS	Backup Flight System

BG	Bit-contiguous Group
BIA	Bus Interface Adapter
BIT	Built-in Test
BPDU	Bitstream Protocol Data Unit
BPSK	Binary Phase-Shift-Key
BRT	BIT Response Table
BSP	Baseband Signal Processor
BST	BIT Summary Table

C

C&C	Command and Control
C&C MDM	Command and Control Multiplexer/Demultiplexer
C&DH	Command and Data Handling
C&T	Communications and Tracking
C&TS	Communications and Tracking System
C&W	Caution and Warning
C	Counter-dependent
C	C Programming Language
CADU	Channel Access Data Unit
CAM	Centrifuge Accomodations Module
CAP	Command Acceptance Pattern
CAR	Command Acceptance Response
CB	Control Bus
CCA	Canadian Space Agency
	Circuit Card Assembly
CCB	Configuration Control Board
CCBD	Configuration Control Board Directive
CCC	Control Center Complex
	Command and Control Centers
CCIR	International Radio Consultative Committee
CCP	Central Command Processor
CCR	Configuration Change Request
CCS	Command and Control Software
	Command and Control System
CCSDS	Consultative Committee for Space Data Systems
CD	Compact Disk
CDB	Command Database
CDD	Command Data Definition
	Context Dependent Decommutation
CDP	Custom Data Packet
CDQ	Current Data Quality
CDT	Configuration Data Table
CEU	Control Electronics Unit
CG	Comp Generation
CGM	Computer Graphics Metafile
CHeCS	Crew Health Care Systems

Chk	Check
CI	Configuration Item
CIC	Crew-Interface Console
CLI	Command Line Interface
CM	Configuration Management
CMATS	Configuration Management Asset Tracking System
CMD	Command
CMIP	Common Management Information Protocol
CMIS	Common Management Information System
CNT	Countdown Time
CO	Comp Operation
COF	Columbus Orbital Facility
COR	Communications Outage Recorder
COTS	Commercial-Off-The-Shelf
CPO	Command and PL MDM Officer
CPS	Consolidated Planning System
	Counts Per Second
CPU	Central Processing Unit
CR	Change Request
CRC	Circular Redundancy Check
	Cyclic Redundancy Check
CRR	Command Reaction Response
CS	Communications System
CSA	Canadian Space Agency
CSC	Computer Software Component
	Command System Component
CSCI	Computer Software Configuration Item
CSM	Command System Management
CSMAC	Communications Status Monitoring and Control
CSO	Computer Security Official
CSOC	Canadian Space Operations Center
CSS	Central Systems Services
	Command System Services
	Coarse Sun Sensor
CSU	Computer Software Unit
CT	Configuration Table
CUI	Common User Interface
CVCDU	Coded Virtual Channel Data Unit
CVDT	Current Value Data Table
CVT	Common Value Table
	Current Value Table

D

dB	Decibels
dBW	Decibels referenced to one Watt
DADS	Data Acquisition and Distribution Services

DAE	Data Acquisition and Extraction
DARL	Database Access Routine Library
DB	Database
DBA	Database Administrator
DBCG	Database Coordination Group
DBCR	Database Change Request
DBD	Database Developer
DBMS	Database Management System
DBS	Database Services
DC	Docking Compartment
DCM	Document Configuration Management
DCN	Document Change Notice
DCR	Database Change Request
DCRG	Distributed Control Room Graphics
DCS	Digital Cross-connect Switch
DD AP	Data Distribution Address Processor
DD NS	Data Distribution Network Server
DDQ	Data Data Quality
DDS	Data Distribution System
DDT	Display Data Table
DEMOS	Distributed Earth Model Orbiter Simulation
DES	Data Encryption Standard
DEV	Development
DG	Display Generation
DIO	Discrete Input/Output
DIST	Distribution
DM	Data Management
DMC	Database Monitor and Control
	Data Management Checklist
	Data Management Controller
DMP	Dump
DoD	Department of Defense
DO	Display Operation
DOCR	Data Operations Control Room
DOSH	Database Operational Support History
DP	Distribute Packet
DPG	Data Packet Generator
DPU	Data Processing Unit
DQ	Data Quality
DQA	Data Quality Assurance
DQM	Data Quality Monitoring
DRAM	Dynamic Random Access Memory
DRF	Data Requirements Form
DS	Digital Signal
DSM	Docking & Stowage Module
DSID	Data Stream Identifier
DSN	Deep Space Network

DV	Telemetry Display Verify

E

EC	Experiment Computer
ECOMM	Early Communications (S-band)
ECR	Engineering Change Request
ECW	Emergency Caution and Warning
ECWA	Emergency, Caution, Warning, and Advisory
EDDS	Enhanced Data Distribution Switch
EDR	External Data Repository
EDS	EMCS Data System
EEPROM	Electrically Erasable Programmable Read Only Memory
EF	External Facility
EGP	Exterior Gateway Protocol
EGSE	Experiment Ground Support Equipment
EHS	Enhanced HOSC System
EIA	Electronics Industries Association
ELF	Extremely Low Frequency
ELM	Experiment Logistics Module
E&M	Electrical and Mechanical
EM	Exception Monitor
EMCS	Enhanced Mission Communications System
EML	Extract MSID Library
EMU	Extravehicular Mobility Unit
EPS	Encapsulated Postscript
ERIS	EHS Remote Interface Server
ES	Expected State Experiment Section
ESA	European Space Agency
ESA/APM	European Space Agency/Attached Pressurized Module
ESA/ATV	European Space Agency/Automated Transfer Vehicle
ESA/ERA	European Space Agency/European Robotic Arm
ESC	Engineering Support Center
EVA	Extravehicular Activity
EViDS	Enhanced Video Distribution System
EVoDS	Enhanced Voice Distribution System
EXPRESS	EXpedite the PRocessing of Experiments to Space Station
EXT FACIL	External Facility

F

FAT	File Allocation Table File Authorization Table
FCB	Functional Cargo Block
FDD	Flight Definition Data
FDDI	Fiber Distributed Data Interface
FDF	Flight Dynamics Facility

FEP	Front-End Processor
FEPSC	Front-End Processor Status and Control
FEW	Front End Workstation
FGMT	File Ground Management Tool
FIFO	First-In-First-Out
FMT	File and Memory Transfer
FOV	Field-of-View
FPTNM	Foot-Pounds to Newton-Meters
FPU	Floating Point Unit
FSS	Fine Sun Sensor
FSV	Flight System Verifier
FTAM	File Transfer Access and Management
FTP	File Transfer Protocol

G

GB	Gigabyte
GCID	Ground Correlation Identification
GCMR	Ground Control Message Request
GG	Ground to Ground
GHz	Gigahertz
GKS	Graphics Kerning Standard
GMT	Greenwich Mean Time
GNC	Guidance, Navigation, and Control
GOS-2	Grade of Service
GOSIP	Government Open Systems Interconnection Profile
GP	General Purpose
GPC	General Purpose Computer
GPS	Global Positioning System
GPU	General Purpose Utilities CSCI
GR	Ground Receipt
GRT	Ground Receipt Time
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
GTC	Ground Testing and Checkout
GTR	Ground Time Reference
GUI	Graphical User Interface
GW	Gateway CSCI

H

H&S	Health and Safety
H/W	Hardware
HAMASE	HOSC Automated Model and Screen Editor
HAPS	HOSC Advance Planning System
HASA	HOSC Administrative Software Account
HASS	HOSC Activity Scheduling System
HCR	HOSC Change Request

HDR P/L	High Data Rate Payload
HI	Honerwell International
HLA	High Level Analog
HLOG	HOSC Automated Logging System
HMCG	HOSC Management Coordination Group
HOSC	Huntsville Operations Support Center
HPGL	Hewlett Packard Graphics Language
HPR	HOSC Problem Report
HRDL	High Rate Data Link
HRDS	High Rate Data System
HRF	Human Research Facility
HRL	High Rate Link
HSM	High Speed Mux
HSMC	Health Status Monitor and Configuration
HSR	HOSC Support Request
HTT	HOSC Training Team
HTTP	Hypertext Transfer Protocol
HTV	HOPE Transfer Vehicle
HUA	HOSC User Assistance
HViDS	HOSC Video Distribution System
HVoDS	HOSC Voice Distribution System
Hz	Hertz (formerly Cycles per Second)

I

I/F	Interface
I/O	Input/Output
IAN	Institutional Area Network
ICD	Interface Control Document
ICMP	Internet Control Message Protocol
ICWG	Interface Control Working Group
ID	Identification Identifier
IDD	Interface Description Document Interface Design Document
IDQ	Instantaneous Data Quality
IEEE	Institute of Electrical and Electronics Engineers
I/F	Interface
IGES	Initial Graphics Exchange Standard
IGSS	International Ground System Specification
IMPS	Interim Mission Planning System
IP	International Partner Internet Protocol
IRIG	Interrange Instrumentation Group
IRIG-B	Interrange Instrumentation Group, Standard B
ISCM	Integrated Support Control and Monitoring
ISDN	Integrated Services Digital Network

ISL	Integrated Signal List
ISO	International Organization for Standardization
ISPR	International Standard Payload Rack
ISS	International Space Station
ISSCB	International Space Station Configuration Board
IST	Integrated Support Team
ITS	Integrated Truss Segment

J

JCP	JEM Control Processor
JDK	Java Development Kit
JEM	Japanese Experiment Module
JSC	Johnson Space Center

K

kbps	kilobits per second
kHz	kilohertz
Kermit	The name of an asynchronous file transfer protocol
KMTS-A	Kennedy/Marshall Transmission System side A
KMTS-B	Kennedy/Marshall Transmission System side B
KSAF	Ku-band Single Access Forward
KSAR	Ku-band Single Access Return
KSC	Kennedy Space Center

L

LAN	Local Area Network
LDP	Logical Data Path
	Logical Destination Processor
LDP_ID	Logical Data Path Identifier
LHC	Local Holding Clock
LES	Limit/Expected State Sensing
LIS	Lead Increment Scientist
LLA	Low Level Analog
LOR	Line Outage Recorder
LORSP	Line Outage Recording, Storage, Playback Service
LOS	Loss of Signal
LOV	List of Values
LPS	Launch Processing System
LRDL	Low Rate Data Link
LRT	Low Rate Telemetry
LSB	Least Significant Bit
LSM	Legal Station Mode
	Life Support Module
	Low Speed Mux
LSW	Least Significant Word

LTE	Local Table Edit
LTG	Local Table Generation
LTO	Local Table Operation

M

M	Multi-syllable
Mbps	Megabits per second
M_{max}	Maximum Allowable Downtime
MAS	Media Archive System
MB	Megabyte Megabit
MBF	Mission Build Facility
MCC	Mission Control Center
MCC-H	Mission Control Center - Houston
MCC-M	Mission Control Center - Moscow
MCCU	Mission Control Center Upgrade
MDB	Mission Database
MDM	Multiplexer/Demultiplexer
MEC	Medical Equipment Computer
MET	Mission Elapsed Time
MF	Maintenance Fixtures
MH	Message Handler
MHz	Megahertz
MIB	Management Information Base
MIC	Media Interface Connector
MIL-STD	Military-Standard
MIPS	Mission Integrated Planning/Replanning System
MLP	Multi-Line Phone
MMC	(APM) Mission Management Computer
MMU	Mass Memory Unit
MOC	Mission Operations Computer
MOP	Mission, Operational Support Mode, and Project
MPLM	Mini Pressurized Logistics Module
MPDU	Multiplexed Protocol Data Unit
MPS	Mission Planning System
MPV	Manual Procedure Viewer
ms	Milliseconds
MS	Matrix Switch
MSB	Most Significant Bit
MSD	Mass Storage Device
MSFC	Marshall Space Flight Center
MSID	Measurement/Stimulus Identifier
MSL	Microgravity Science Laboratory
MSN	Mission Systems
MSO	Marshall Scheduling Office

MSS	Mission Support Services
	Mobile Servicing System
MSW	Most Significant Word
MTBF	Mean Time Between Failure
MTL	Master Timeline
MTTR	Mean Time To Restore
MUPS	Momentum Unloading Propulsion System

N

NI-DDS	NASA Communications System I Data Distribution System
NII-DDS	NASA Communications System II Data Distribution System
N	Normal
NASA	National Aeronautics and Space Administration
NASCOM	NASA Communications
NASDA	National Space Development Agency of Japan
NCC	Network Control Center
NCS	Node 1 Control Software
NDE	Non-operational Development Environment
NDL	NRT Data Log
NDL	Near Real-Time Data Logger
NEMS	NASA Equipment Management System
NG	Bit Non-contiguous Group
NGT	NASA Ground Terminal
NI	NASCOM I
NISN	NASA Integrated Services Network
NIST	National Institute of Standards and Technology
NM	Network Management
NMCC	Network Management Control Center
NMS	Network Management System
NPM	Network Performance Monitoring
NPSS	NASA Packet Switching System
NRT	Near Real-Time
NRZ-L	Non-Return to Zero Level
NRZ-M	Non-Return to Zero Mark
NSOC	NASDA Space Operations Center
NSS	Network System Services
NSTS	National Space Transportation System
NTM	Net to Media
NTP	Network Time Protocol
NTSC	National Television Standards Committee
N/W	Network

O

OBT	Onboard Time
OC	Operations Control
OCC	Operations Control Center

OCDB	Operational Command Database
OCMS	Operations Control Mission Software
OCR	Operations Change Request
OD	Operational Downlink
ODA	Office Document Architecture
ODF	Operations Data File
ODIN	Onboard Data Interfaces and Networks
OI	Operational Instrumentation
OIU	Orbiter Interface Unit
OOS	Onboard Operating Summary
Ops	Operations
ORU	Orbital Replacement Unit
OS	Operating System
OSF	Open Software Foundation
OSI	Open System Interconnection
OSTP	Onboard Short Term Plan
OSTPARM	OSTP Activity Record Manager
OSTPGMT	Onboard Short Term Planning Ground Management Tool
OSTPV	OSTP Viewer
OTE	Operational Test Equipment
OTR	Onboard Time Reference

P

PAP	Payload Activity Plan
PB	Playback
PC	Polynomial Coefficient
	Personal Computer
PCAD	Pointing Control and Aspect Determination
PCAP	Payload Crew Activity Plan
PCDB	Project Command Database
PCDT	PEP Configuration Data Table
PCM	PIMS Configuration Management
	Pulse Code Modulation
PCS	Personal Computer System
PD	Payload Developer
PDAC	Procedures Development and Control
PDF	Portable Document File
PDI	Payload Data Interleaver
PDL	Payload Data Library
PDRF	Playback Data Request Form
PDSS	Payload Data System Services
PEI	Payload Integration & Integration
PEP	Payload Executive Processor
PFS	Primary Flight System
PI	Prime Item
	Principal Investigator

PID	Process Identifier
PIMS	Payload Information Management System
P/L	Payload
PL MDM	Payload Multiplexer/Demultiplexer
PM	Plan Management
	Pressurized Module
PMA	Pressurized Mating Adapter
PMCA	Power Management and Control Application
PMT	PEP Management Tool
PN	Pseudorandom Noise
POCB	Payload Operations Control Board
POCC	Payload Operations Control Center
POD	Payload Operations Director
PODF	Payload Operations Data File
POH	Payload Operations Handbook
POIC	Payload Operations Integration Center
POIF	Payload Operations Integration Function
PP	Point Pair
PPS	Payload Planning System
PREX	Procedure Executor
PRT	Packet Routing Table
PS	Parameter Select
	Pressurized Section
PSCN	Program Support Communications Network
psi	pounds per square inch
PSIVF	Payload Software Integration Verification Facility
PSP	Payload Signal Process
PSRP	Payload Safety Review Panel
P/SS	PDSS System Support
PSS	Project System Services
PTC	Payload Training Complex
PTDB	Project Telemetry Database
PUB	Publication
PUI	Program Unique Identifier

Q

QPSK	Quadrature Phase-Shift-Key

R

R	Range-dependent
RAM	Random Access Memory
RCS	Reaction Control System
RCU	Remote Commanding Unit
RDBMS	Relational Database Management System
RDRP	Raw Data Record Playback
ReGIS	Remote Graphics Instruction Set

REL	Released
RFE	Reference File Editor
RFI	Radio Frequency Interference
RGB	Red, Green, and Blue
RID	Review Item Discrepancy
RP	Retrieval Processor
RPM	Rounds per Minute
RPSM	Retrieval Processing Summary Message
RR	Replanning Request
R-S	Reed-Solomon
RS	Recommended Standard
RSA	Russian Space Agency
RSS	Resident Size
RT	Real-time
	Remote Terminal
RT_{max}	Maximum Repair Time
RTAS	Radians to Arcsecs
RTC	Realtime Clock
	RealTime Command
RTD	Radians to Degrees
RTDS	Real-time Data System
RTI	Remote Telephone Interface
RTN	Return to Normal
RTS	Requirements Tracking System
	Remote Tracking Station
RUM	Remote User Machine
RW	Reaction Wheel

S

S/A	Sub/Address
S/W	Software
S	Super
SA	Sub Address
	Single Access
S&E	Science and Engineering
SC	State Code
	Station Crew
	Subsystem Computer
SCG	Special Computation Generation
SCM	Status and Configuration Manager
SCR	Strip Chart Recorder
SDS	Scripts Database Subsystem
SDT	Shuttle Data Tape
SDV	Systems Development and Verification
SEND	Kermit directive
SER	Scientific, Engineering, and Research Systems

SGI	Silicon Graphics Indy™
	Silicon Graphics Incorporated
SGML	Standard Generalized Markup Language
SL	Spacelab
SM	Service Module
	System Monitor
	Store Manager
SMAC	System Monitor and Control
SMCM	System Monitor and Control Configuration Manager
SMTP	Simple Mail Transfer Protocol
SN	Space Network
SNMP	Simple Network Management Protocol
SOA	Science Operations Area
SOD	Shuttle Operational Downlink
SODF	Systems Operations Data File
SOF	Safety of Flight
SONET	Synchronous Optical Network
SOP	Standard Operating Procedure
SOPG	Science Operation Planning Group
SPD	Serial Parallel Digital
SPL	Scratchpad Line
SQL	Structured Query Language
SRAM	Static Random Access Memory
SRD	Serial Receive Device
SRS	Software Requirements Specification
SS	System Services
SSA	S-band Single Access
SSAF	S-band Single Access Forward
SSAR	S-band Single Access Return
SSCC	Space Station Control Center
SSCS	Space to Space Communications System
SSCT	Send Serial Clock Timing
SSH	Secure Shell
SSGUI	Scripting Services Graphical User Interface
SSL	Secure Socket Layer
SSL3	Secure Socket Layer 3
SSME	Space Shuttle Main Engine
SSOR	Space to Space Orbiter Radio
SSS	Shared System Services
SSSR	Space to Space Station Radio
SSUP	System Services User Profile
STDN	Spaceflight Tracking and Data Network
STP	Short Term Plan
STS	Space Transportation System
SUB	Submitted
SUT	SMAC User Team

SVF	Software Verification Facility

T

T	Typical
TAS	Test and Simulation
TBA	To Be Added
TBC	To Be Confirmed
TBD	To Be Determined
TBR	To Be Resolved
TBS	To Be Supplied
TCO	Timeline Control Officer
TCP/IP	Transmission Control Protocol/Internet Protocol
TDB	Telemetry Database
TDM	Time Division Multiplexer
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TDS	Telemetry Database Subsystem Time Distribution System
TIFF	Tagged Image Formatted File
TIM	Technical Interchange Meeting
TLM	Telemetry
TMO	Timeline Maintenance Officer
TMS	Transport Management System
TNS	Telemetry and Network Services
TNSDP	Telemetry and Network Services Distribute Packet
TPS	Telemetry Processing Services
TRW	TRW Space Park
TSC	TeleScience Center
TTL	Time To Live
TTY	Teletype

U

UAS	User Application Software
UDC	Utilization Development Capability
UDE	User-generated Data Element
UDLT	Universal Data Loop Transceiver
UDN	User Defined Name
UDP	User Diagram Protocol
UDPT	User Defined Profile Table
UDSM	User Data Summary Message
UFT	Unrestricted File Transfer
UGSE	User Ground Support Equipment
UHF	Ultra High Frequency
UI	User Interface
UIL	User Interface Language
ULC	Unpressurized Logistics Carrier

UOA	User Operations Area
UOF	User Operations Facility
UPAR	User Profile Access Routine
UPD	User Performance Data
URL	Universal Resource Locator
USGS	United States Ground Segments
USL	United States Laboratory
USOC	U.S. Operations Center
USOS	United States On-Orbit Segment
UTA	User Telemetry Applications CSCI

V

VAX	Virtual Address Extension
VC	Virtual Channel
VCDU	Virtual Channel Data Unit
VCID	Virtual Channel Identifier
VMS	Virtual Memory System
VT	Video Terminal
VV	Verification and Validation

W

W	Watt
WCP	Workstation Command Processor
WDT	WatchDog Timer
WEX	Workstation Executive
WPL	Word Processing Language
WPSPLUS	Word Processing System PLUS
WSGT	White Sands Ground Terminal
WSC	White Sands Complex
WWW	World Wide Web

X

X Window	X Window System
Xmodem	The name of a file transfer protocol
XPDR	Transponder

Z

ZOE	Zone of Exclusion

Glossary:

Accelerator	A sequence of keys that provides immediate access to application functions. For example, Ctrl + N to invoke the **New** menu item.
Activation Type	Method used within local table application to activate a group. The defined methods are Time and Control.
Active Window	The workstation window that has input focus and in which keyboard entries impact and may appear. See "Input Focus."
Analog	A mechanism in which data is represented by continuously variable physical quantities.
Application Main Window	The primary window of a software application.
Application Process Identifier (APID)	An 11-bit field that is included in Consultative Committee for Space Data Systems (CCSDS) headers. For commands, it identifies the source and destination combination. For Ku-Band telemetry, it identifies the packet destination.
Application Title Bar	The bar at the top of a main window that consists of the window menu button, the title area, and the minimize and maximize buttons.
Apply Pushbutton	A pushbutton that implements any changes made within its dialog box, but leaves the dialog box on the screen so that additional changes can be made. See "OK Pushbutton."
Approve	In PIMS, the action is taken by a reviewer to signify his/her approval that a document, change request, or data request be placed in the baselined state.
Archived Database	A telemetry database that no longer reflects the current real-time telemetry characteristic information. Only one archive database is available online at a time.
Attributes Defaults Bar	The area below the menu bar on the main window where application **Text:**, **Line:**, and **Fill:** default attributes are set.
Avtec™	A manufacturer of telemetry transmit and receive devices used in the Huntsville Operations Support Center (HOSC) Enhanced HOSC System (EHS) as the primary telemetry processing hardware devices.
Baselined	In PIMS, the final state of the review cycle. When a document, change request, or data request has been approved by all reviewers, the approver may place it in the baselined state.

Baselined Database	Database that reflects the current real-time telemetry or command characteristic information for a particular mission activity. Baselined databases have completed validation.
Bitstream Protocol Data Unit (BPDU)	A protocol data unit of the bitstream function having a format of a header followed by a fixed length block of contiguous bitstream data.
Block	NASA Communications (NASCOM) 4800-bit block format utilized for the transfer of data via the GSFC/MSFC Multiplexer/Demultiplexer (MDM) system.
Calibrated	A process of converting processed data. Three types of calibration exist for telemetry samples: polynomial, point pair interpolation, and state code conversion. If calibration is requested, Telemetry and Network Services (TNS) automatically converts the unprocessed sample and then performs calibration on the sample for that Measurement/ Stimulus Identifier (MSID) as defined in the local table.
Cancel Pushbutton	A pushbutton that allows a user to exit a dialog box without implementing any changes.
Cascade Menu	A sub-menu or menu-within-a-menu that appears when you highlight a menu function that has an arrow to the right of its name. Cascade menus are used to group similar functions together beneath the pulldown menu.
Caution	A standard icon used throughout the user guide set to represent destructive actions which could result in loss of data.
Caution Limits	A range defined by a high and low value for an analog MSID in the Telemetry Database (TDB) and Local Table. A color code (yellow) represents values within those ranges in the application.
CCSDS Packet	A source packet comprised of a 6-octet, CCSDS defined primary header followed by an optional secondary header and source data which together may not exceed 65535 octets.
Channel Access Data Unit (CADU)	Protocol data unit used for transmission from the ISS to the PDSS. A CADU consists of a CVCDU that has been prefixed and delimited by a synchronization marker.
Click	The action of pressing and releasing a mouse button. Typically, this is a left mouse button action.
Coded Virtual Channel Data Unit (CVCDU)	A VCDU to which a block of error-correcting Reed Solomon (RS) check symbols has been attached.
Command System Manager	The position in charge of controlling the commanding system utilizing the Command System Managment software.

Commercial-Off-The-Shelf (COTS) Software	Software applications that have been purchased from a commercial software vendor as opposed to those that were developed internally.
Computation	A FORTRAN or C program used to manipulate telemetry parameters. These programs are created by the Computation Generation application and are executed in Computation Operation.
Configuration Management (CM) Tools	Institutional applications that allow users to access and perform tasks, such as tracking requirements and equipment, scheduling resources, and logging into automated problem report systems.
Control Indicator	Used to indicate that the group will be activated for limit/ expected state (LES) sensing with either the control MSID or a control MSID plus delay time.
Control Panel	The area of a window where application pushbuttons and other graphical components are located.
Converted	The process of translating raw telemetry data into an American National Standards Institute (ANSI) standard data representation so that the sample can be properly interpreted by the machine which processes the data.
Counter-dependent	A parameter whose occurrence in telemetry is dependent on an incrementing or decrementing counter in the data.
Critical Command	A command whose initiation and execution could possibly cause damage to a payload or spacecraft and impair the mission.
Cyclic Redundancy Check	Method for checking the accuracy of a digital transmission over a communications link. The sending computer performs a calculation on the data and appends the resulting value; the receiving computer performs the same calculation and compares its result to the received value.
Database Administrator	An individual who is primarily responsible for managing the RDBMS engine and administering database accounts. He/she also has the privilege to edit restricted database fields in any database, but is normally not recommended to edit data values that drive the telemetry and command processing for the EHS system.
Database Coordination Group	A working group which includes representatives from the appropriate project operations personnel, project source DB developers, MOL DB developers and the HOSC validation team. Review and approve/dissaprove DBCRs, resolve conflicts and evaluate any DB related issues.

Database Developer	An individual that has the privilege to edit restricted fields (e.g., decom, etc.) for both operational and non-operational databases that drive telemetry and command processing for the EHS system.
Dataset	A saved set of a command's modifiable fields used to update a command prior to being transmitted.
Data Stream Identifier (DSID)	A field within a Secondary EHS Protocol Header for PDSS Payload Data used as a unique identifier for the data stream. This bit denotes if the type of data contained therein is CCSDS packet data (0) or BPDU (1).
Delivered Database	A database that has been delivered but not validated. A database must be delivered before it can become pre-released. A delivered database has not been validated for operational testing. See Baselined Database.
Delta Limit	Maximum acceptable difference between consecutive samples of a parameter.
Desktop	The computer monitor backdrop area on which all windows are opened. May also be referred to as workspace.
Development	In PIMS, the first state of the review cycle in which a document, change request or data request is still being written or is being updated.
Direction Keys	A group of computer keyboard arrow keys which allow users to move up, down, left, and right within an application or menus.
Disapprove	In PIMS, the action taken by a reviewer to signify disapproval and recommendation against moving a document, change request or data request into the baselined state.
Discrete Values	Telemetry values that have states (e.g., on or off).
Double-click	The action of pressing and releasing a mouse button twice in rapid succession.
Drag	To press and hold down a mouse button while moving the mouse on the desktop (and the pointer on the screen). Typically, dragging is used while moving and resizing windows.
Drawing Tools Palette	A group of tool buttons that is used to create graphic objects in order to display telemetry data, initiate commands, and start scripts and computations. The palette is located on its own floating dialog box or the application window.

Dump	During periods when communications with the spacecraft are unavailable, data is recorded onboard and played back during the next period when communications resume. This data, as it is being recorded onboard, is encoded with an onboard embedded time and is referred to as dump data. When a near real-time (NRT) request is written specifying that dump data is desired, the onboard embedded time is used to fulfill the request.
Dynamic Objects	Graphical objects that represent updating telemetry data.
Ellipse	A geometric shape which can be created on a display (i.e., a plane of a cone, an oval shape, etc.).
Expected State	Text state code which indicates the nominal value of a parameter.
Expert Mouse Actions	Clicks or double-clicks of mouse buttons which are non-standard and which activate special functions.
Filter	The filter function is used within a dialog box to refine and define subsets of files you want to work with using a string search and wildcard. Characters can be used to implement the filter function.
Fonts	A style of printed text characters.
Graphical User Interface (GUI)	A way of interacting with computers using graphics-oriented software and hardware.
Grayed out	A menu selection item that has been made insensitive, which is visually shown by making the menu text gray rather than black. Items that are grayed out are not currently available.
Greenwich Mean Time (GMT)	The solar time for the meridian passing through Greenwich, England. It is used as a basis for calculating time throughout most of the world. Displayed within the HOSC, it follows the format ddd:hh:mm:ss.
Grid	A pattern of horizontal and vertical lines forming squares of uniform size on a display, used as a reference for locating points.
Group Parameter Composition	Parameter composition where the bits of a parameter are contiguous and a multiple occurrence of that parameter exists as a group of samples.
Groups	MSIDs which have been grouped together, primarily for use with the Exception Monitor (EM) application.
Hazardous Command	A command whose initiation and execution could pose a threat to human life or the entire mission.
Help	A standard icon used throughout the user guide set to indicate that a cross-reference is provided to assist in solving problems or to answer questions.

Huntsville Operations Support Center (HOSC)	A facility located at the Marshall Space Flight Center (MSFC) that provides scientists and engineers the tools necessary for monitoring, commanding, and controlling various elements of space vehicle, payload, and science experiments. Support consists of real-time operations planning and analysis, inter- and intra-center ground operations coordination, facility and data system resource planning and scheduling, data systems monitor and control operations, and data flow coordination.
I-beam Insertion Bar	A graphical image used to represent the insertion point of text in a text entry area which provides a visual cue that text entry is anticipated by the system.
Icon	A graphical representation of an object on the desktop. Objects can be minimized (iconified) to clear a cluttered workspace, and restored (opened), as needed.
Input Focus	A window or window element that is activated and available for subsequent actions. Input focus is usually indicated by highlighting or changing the color of the activated element.
Input Slider	An input object that allows users to change values of pseudo parameters and computational constants assigned to objects. Pseudos can be used in other applications (i.e., scripts, computations, etc.).
Insensitive	An object or area of an application window that does not have input focus.
Integrated Support Team (IST)	Institutional groups at the HOSC responsible for configuring, monitoring, and resolving problems with computer systems and application software.
Launchpad	A floating menu bar that is used to initiate all HOSC software applications.
Legend	A table that labels parameters plotted on a chart or grid.
Limit Delta	Maximum acceptable difference between consecutive samples of a parameter.
Limit/Expected State Sensing (LES)	A configurable option in Display Operation that allows the user to select whether he wants to see limit violation status or not. The incoming data is compared against the Local Table limits.
Limits	Defined ranges for a measurement which are used to indicate off-nominal conditions: Caution High, Caution Low, Warning High, and Warning Low.
Line Plot	A plot that uses lines to represent the relationships among telemetry values.
Local Table	A subset of the TDB stored on a workstation or server used for telemetry processing.

Maximize Button	A control button that is located to the right of the application title bar. When pressed, this button enlarges the application window to its largest state.
Menu Bar	The area at the top of a window that contains the titles of pulldown menus.
Merge	The combining of data from different sources for a specific time slice. During merge, the best (cleanest) data from each source will be used to create a contiguous segment of data for the specified time slice.
Message Area	The part of the application window where system messages/ responses are shown.
Message Dialog Box	An area that provides information, gives the current status of data, asks questions, issues warnings, or draws attention to errors.
Mini-Application	A secondary main window activated from within a main window application.
Minimize button	A control button located to the right of the application title bar. When pressed, it iconifies the window.
Mission, Operational Support Mode, and Project (MOP)	The configuration which delineates one EHS activity from another. MOP information is available in the common configuration file on every node.
Mnemonic	An underlined character on a menu item, that allows users to initiate the item by typing letters on a keyboard. A user-friendly name used to reference a command residing in the command database.
Mode Independent	Mode Independent is used to describe any process that is not dependent on a data mode.
Modifiable Commands	Commands containing at least one data field which can be updated during operational activities prior to their uplink transmission.
Mouse	A pointing device that is used along with a keyboard in point-and-click user interfaces. The mouse used with HOSC workstations contains three mouse buttons. The left mouse button is used to activate and select items on windows. The middle mouse button is used for move functions. The right mouse button is used to access popup menus.
MSID Text Field	An output object for viewing telemetry containing a label for the telemetry parameter, as well as the current value of the parameter displayed in a specified format (i.e., decimal, hex, octal, binary, American Standard Code for Information Interchange (ASCII), etc.).

Multiple Drawing Mode	A mode that allows users to draw multiple objects of the same type.
Native Data Type	Defined in the database and indicates how the MSID data will be interpreted in the HOSC.
Nominal	A color code indicating expected conditions within defined limits of parameters.
Non-Shareable	The flag that has been set to prevent other users from retrieving your User-generated Data Element (UDE) from the UDE Database and using it on their local workstations.
Normal	A telemetered parameter that occurs once per packet.
Note	A standard icon used throughout the user guide set to direct your attention to specific items of concern.
OK Pushbutton	A pushbutton that implements any changes specified within a dialog box. The dialog box is dismissed after this pushbutton has been selected.
Option Menu Button	A pushbutton which, when clicked, displays a menu of related options. The selected option is shown as the pushbutton label.
Output Slider	An object that displays telemetry parameters.
Packet	A data unit comprised of octets that a source application generates.
Parameter Composition	The description of how the bits of a parameter can be arranged in a packet for a sample(s) of that parameter.
Pixmap Object	A picture that can be drawn using the pixmap editor or scanned and assigned using the pixmap editor.
Playback	A datamode that can originate either internally or from some other facility. Project servers in the HOSC receive Playback telemetry streams from the HOSC Data Distribution System (DDS) and perform the same processing as would be performed on real-time telemetry streams.
Pointer	Sometimes called the mouse cursor, the indicator that shows the location of the mouse on the desktop. The pointer's shape depends on its mode. (e.g., on a window frame, the pointer is an arrowhead; while you are waiting for an action to complete, the pointer becomes clock).
Point Pair Calibration	A measurement which is calibrated using a series of linear segments. The linear segments are defined by a pair of points for each segment. Each point consists of a raw count value and a corresponding engineering unit value.
Pointer Shapes	A graphical shape that a pointer assumes in the drawing mode (e.g., cross-hairs, I-beams, hour-glasses, etc.).

Polynomial Coefficient Calibration	A measurement that is calibrated using the following polynomial calibration equation: where: eu - engineering units cnts - counts eu = COEF0 + (cnts1 x COEF1) + (cnts2 x COEF2) + (cnts3 x COEF3) + (cnts4 x COEF4) + (cnts5 x COEF5) + (cnts6 x COEF6) + (cnts7 x COEF7) + (cnts8 x COEF8) + (cnts9 x COEF9).
Popup Menu	A menu that is invoked when the right mouse button is clicked. Functions available are the most common and vary from application to application.
Predefined Commands	Commands completely defined prior to an operational activity. Predefined commands contain no modifiable data fields.
Pre-released Database	A database that has been validated for operational testing. It is used to validate UDEs (displays, comps, etc.) prior to the baseline release of the database.
Project Telemetry Database	A database that is contained within the Telemetry Database and includes the telemetry definitions needed to drive HOSC telemetry processing for a specific project/mission. The source of the real-time telemetry processing tables found in the Telemetry Local Table identified by a project/mission/ revision prefix. Also included are tables to contain user copy data, an error log, and an Initial Load Table.
Protocol	**1:** A term that provides the formulas for passing messages, specifies the details of message formats, and describes how to handle error conditions. More importantly, it allows us to discuss communication standards independent of any particular vendor's network hardware. A communication protocol allows one to specify or understand data communication without depending on detailed knowledge of a particular vendor's network hardware. **2**: A term referring to the type of source data used in the construction of an EHS packet. EHS Packet Protocols include: "C" - CCSDS packet, "P" - pseudotelemetry packet, "T" - encapsulated TDM packet, "B" - encapsulated block packet, and "D" - TDS packets.
Pseudo MSID/Parameter	A parameter identification (ID) that has been assigned to contain the output from a computation.
Pseudo Packet	A telemetry packet consisting of external pseudo MSIDs. External pseudo MSIDs are generated (either by EHS computations or scripts), packetized and multicast on the project LAN.

Pulldown Menu	A list or menu of possible options that is hidden under a general phrase and invoked by clicking the left mouse button.
Pushbutton	A control that causes an immediate action. To press a pushbutton on the screen, point to it and click the left mouse button.
Radiobuttons	A group of buttons that allows users to make only one selection at a time. Radiobuttons are small diamond-shaped buttons.
Range-dependent	A parameter whose occurrence in telemetry is dependent on the value of a range parameter.
Real-time Data	Data which is telemetered to the HOSC and distributed for immediate use. Real-time telemetry data, received into the HOSC system and written to the NRT log, is indexed by its time stamps and other identifying information. When an NRT request is submitted that covers a particular time slice, this indexing information is used to meet that request.
Recall Text	Area within an application that allows users to input up to 256 characters.
Release	In PIMS, an action taken by the manager of a document or request that releases it from the baselined state back into the development state for modifications.
Resize Borders	The area that surrounds the framed area of an application, and is used to change the height or width of the window.
Resize Handles	Up to eight handles surrounding an object that allows users to resize objects, displays, or windows.
Review	In PIMS, the second state of the review cycle in which the document, change request or data request has been written and submitted for review and approval.
Sample Composition	Describes how the samples of a parameter are arranged in a major frame.
Scatter Plot	A plot that uses unconnected dots to represent the relationships among telemetry values.
Scratchpad Line (SPL) Directives	Keywords that provide users with the capability to start and stop displays, computations, and scripts. A user may also uplink and modify commands and update pseudo MSIDs through the use of SPL directives.
Script	A file containing a sequence of directives that can be invoked in a single step.
Scroll Bar	A control that allows the contents of a window area to be displayed without resizing a window or list.
Select Button	The mouse button used for most operations. By default the select button is the left mouse button.

Set Pushbutton	A pushbutton that allows a user to implement changes based on selections made within a dialog box. Reacts like the OK pushbutton and closes the dialog box.
Setup Message Area	The dialog box that allows users to change the number of lines displayed within the message area of the application main window.
Shareable	The flag that has been set to allow other users to retrieve your UDE from the UDE Database and use it on their local workstation.
Shotgun	Parameter composition when the bits of a parameter are scattered in multiple non-contiguous words of a major frame.
Slider Box	A graphical component of the scroll bar, which is dragged to provide a different view of the same file, list, or text area.
State Code Calibration	A measurement that is converted to a text state code.
Static Object	A graphical object that is not receiving telemetry data.
Status Bar	A feature that allows the viewing of application critical configurations within the main window.
Submit	In PIMS, an action taken by the manager of a document, change request, or data request in which the document or request is placed in a state of review and approval and released from development.
Subset	A collection of measurements from the total measurement set that is bounded as an integer number of octets but does not constitute the packet itself. A mini-packet.
Super	A parameter that occurs more that once per packet.
Superseded Database	A current database designation prior to its being replaced by a new version. If a baselined database already exists for a project and mission, before a new baselined database can be released, the current baselined database is designated as superseded.
Switch MSID	A parameter whose value determines which limit or calibration set will be used for the specified MSID.
TDM	Time Division Multiplexed - a technique for transmitting multiple parameters within a single serial bit stream by interleaving them, one after the other.
Time Indicator	That which indicates that a group will be activated based on a defined start time and deactivated based on a defined stop time.
Time Plot	A plot against time containing up to four Y-Axis parameters.
Time Reference	A time format that is represented in either GMT or Mission Elapsed Time (MET).

Time Tag	A time reference marking an event. For example, a parameter goes out-of-limits at 230:16:00:00. The time tag for the out-of-limit event is 230:16:00:00.
Tip	A standard icon used within the HOSC user guide set to indicate that suggestions or hints are provided.
Togglebuttons	Small buttons that can be switched “on” or “off.” To switch a togglebutton, point to it and click the select button. Black indicates that the desired attribute is in effect or “on.”
Tolerance	Number of times the MSID exceeds the limit value before an EM warning message is issued.
Typical	Parameter composition when the bits of a parameter are contiguous.
Unprocessed	Raw telemetry data.
User-generated Data Element (UDE)	A user-generated file. For example, a display, script, computation, pixmap, etc., is a UDE.
User Data Summary Message (UDSM)	A PDSS Data Quality packet. Information contained in the packet includes: the start/stop time of the UDSM report period, the number of unplanned LOS occurrences, the number of BPDUs or packets per DSID received, the number of VCDU sequence counter errors, and the number of packet sequence counter errors per DSID.
Virtual Channel (VC)	A CCSDS construct whereby a physical communications channel is shared among different users, each of whom uses part of the available bandwidth for a virtual channel of CCSDS CADUs incorporating predetermined CCSDS identifiers for each user.
Virtual Channel Identifier (VCID)	A binary identifier located within the VCDU header, which when concatenated with the spacecraft identifier, uniquely identifies a particular spacecraft virtual channel.
Virtual Channel Data Unit (VCDU)	A CCSDS data set of specific structure and fixed length, which includes CCSDS specified headers and into which user data is packaged for transmission over the space-to-ground link.
Warning Limits	A color code (red) representing limit violations of a parameter.

Wildcard	Placeholders for other characters in a string. Three wildcards are permitted in most HOSC applications. The "*" represents any combination of characters and the "?" represents any single character. A blank can be used to replace a single "*" to indicate "all". Database applications use Oracle as their basis; therefore, "%" is used like the "*" and an underscore character "_" is used like the "?". Blank operates the same way in database applications as in other HOSC applications and represents "all."
Window Menu	The menu that appears when you press the window menu button, which is located to the left of the application title bar on a window frame. Every window has a system menu that enables you to control the position of the window.
Workspace	The area on a terminal where the windows of a user's environment appear. The workspace is sometimes referred to as a desktop or root window.
XY Plot	A plot that contains one X-Axis and up to four Y- Axes parameters.

Index

A
About this user guide 1
Actual GMT 36
APGMT
  Application essentials 714
    Freeze executor 714
    Halt bundle 719
    Install bundle 716
    Monitor bundle 720
    Remove bundle 718
    Reset freeze 715
    View listing 720
  Menu bar 711
  Monitor bundle 721
    Application essentials 724
      Halt bundle 724
      Remove bundle 725
      Resume sequence 728
      Start sequence 726
      Stop sequence 727
      Trace sequence 729
      View sequence 730
    Menu bar 722
    Work area 723
  Overview 709
  Status bar 712
  View sequence 731
    Application essentials 735
      Hold 739
      Jump 740
      Resume 737
      Start 736
      Step 738
      Stop 737
    Menu bar 732
    Status bar 733
    Work area 734
  Work area 713
Automated procedures ground management tool 707
B
Build computation
  Application essentials
    Build computation 127
    Build options 127
    Clean object files 131
    Show compilation information 131
    Show computation characteristics 129
Bulk validate 766
  Application essentials 768

Check for UDEs 769
Validate 768
View UDE report 770
View validation report 769
Menu bar 767
Work area 767
C
CAR (Command Acceptance Response) 245
CCSDS packet data generator
Application essentials 381
Add packet 382
Define packet format 384
Delete packet 383
Modify CCSDS header 393
Modify primary header 387
Modify secondary header 389
Pause 395
Reinitialize MSID data file 398
Resume 396
Set database version 399
Set LOS packet transmission 387
Start 395
Stop 395
View start packet status 398
View stream 396
Menu bar 379
Overview 378
Work area 380
Command delog
Application essentials 255
Define report sort criteria 255
Menu bar 252
Overview 251
Work area 252
Command group generation
Application essentials 163
Find command inventory mnemonic 165
Validate 163
Menu bar 158
Overview 157
Work area 159
Command operation
Application essentials 196
Command summary
Export report 212
Filter 196
Find 213
Show technical name 214
Sort 198
Update 199
Uplink 200
Inventory selection radio buttons 189
Menu bar 186
Overview 186
Status bar 187
Work area 190
Command Inventory 190
File inventory 194
Group inventory 193
Header inventory 191
Inventory popup menus 195
Command plan management tool 620
Command track
Application essentials 247
View time-tag queues 248
Menu bar 243
Overview 242
Status bar 244
Work area 244
Command update form generation
Application essentials 170
Add predefined fields 181
Bulk generate command forms 177
Bulk generate header forms 179
Generate command form 171
Generate header form 174
Redraw 182
Regenerate 175
Set object attributes 182
Set field attributes 183
Set text attributes 182
Menu bar 167
Overview 166
Tool and attribute bar 168
Work area 168
Complete task dialog box
Action list tab 510
CM log tab 504
Resource impacts tab 497
Reviewers tab 503, 508
Supporting attachements tab 500

Computation generation
Application essentials 106
Build Computation mini-application 124
Work area 125
Build computation mini-application
Application essentials 127
Input MSID editor mini-application 112
Work area 113
Output MSID editor mini-application 115
Application essentials 116
Work area 115
Source editor mini-application 107
Work area 107
Menu bar 105
Overview 105
Work area 106
Computation operation
Application essentials 135
Pause 137
Resume 138
Start 135
Stop 138
Menu bar 134
Output area 135
Overview 133
Work area 134
CPMT
Application essentials 632
Edit menu 634
Add user 636
Add window 637
Assign activities 635
Clear all edits 639
Commit edits 640
Delete user 637
Delete window 638
Edit users 635
Extract activity plan 640
Merge activity plan 641
Modify window 638
Undo edit 639
Filter preferences 633
Options menu 641
Activate all users 641
Activate user 641
Activate window 642
Deactivate all users 641
Deactivate user 642
Deactivate window 642
Start/stop execution 642
Asynchronous arrival of new TDRS data 643
Asynchronous commanding status from an external source 643
Control panel 627
Graph area 625
Day/time scale 625
TDRS information bar 626
User information area 626
Keyboard procedures 631
Down arrow 632
Left arrow 632
Right arrow 632
Space bar 632
Up arrow 632
Legend/window status area 623
Menu bar 622
Mouse procedures 628
Command window graphical editing 629
Command window selection 628
EHS user ID selection 628
Graphically adding a command window 630
Time scale slider 630
Overview 617
Status bar 623
D
Database application window 2
Database change request
Menu bar 460
Database menu 461
Exit 462
Select database 461
Help menu 478
Query/update menu 462
Database schedule 472
DBCR form 462
List DBCRs 462

View change data 472
Report menu 473
Select standard report 473
Overview 459
Database schedule report 477
DBCR attribute report 473
DBCR change data report 474
Dialog box 3
Display generation
Application essentials 81
Check for UDEs 91
Create pulldown menu 85
Define display settings 88
Define operation startup list 86
Fit display to objects 88
Generate MSID text objects 92
Set object attributes 82
Access 82
Common set object attibutes
Select MSID dialog box 84
Common set object attributes 83
Set operation defaults 87
Validate 90
Attribute default bar
Fill default attributes 80
Attribute defaults bar 79
Line default attributes 79
Text default attributes 79
Drawing tools palette 75
Input objects 78
Output objects 77
Primitive objects 76
Menu bar 74
Overview 73
Work area 80
Display operation
Application essentials 97
Disable and enable object LES sensing 100
Enable all LES sensing 102
Set data mode and database version 98
Show recall text 99
Menu bar 95
Overview 95
Status bar 96
Work area 97
E
EHS databases 401
End-user command applications 155
Command group generation 156
Command operation application 156
Command update form generation 156
Downlink request application 157
Update command mini-application 157
Exception monitor
Application essentials 350
Create 350
Disable 356
Disable acknowledge messages 357
Edit EM attributes 354
Enable 355
Refresh 357
Set data mode and database version 357
Start EM 353
Stop EM 354
Menu bar 341
Message area 348
Overview 339
View selection radio buttons 342
Work area 343
Groups table 347
MSIDs table 343
F
Fault summary application 304
Application essentials 308
Pause cyclic 310
Resume cyclic 311
Set data mode and database version 309
Set message filters 308
Menu bar 305
Overview 304
Status bar 306
Work area 306
Fault summary software 303
FGMT
Application essentials 652
Change attributes 656
Compare directories 660
Copy 656
Create directory 658
Delete 655
Delete directory 658

Downlink 654
Execute schedule 662
Find 653
Generate MSD schedule 662
Load 654
Refresh 660
Update disk status 661
Update ground model 659
View schedule 661
Execute schedule mini-application 689
Application essentials 695
Execute 695
Execute now 696
Halt 696
Select all 696
Menu bar 690
Status bar 690
Work area 692
Generate schedule mini-application 674
Application essentials 677
Add entry 685
Configure 687
Delete 683
Delete entry 686
Generate 678
Merge 682
Modify entry 684
Open 681
Validate schedule 686
Menu bar 675
Status bar 676
Work area 676
Menu bar 649
Overview 646
Status bar 650
View schedule mini-application 662
Application essentials 667
Filter 669
Late files report 669
MSD utilization report 671
Open 667
TDRS utilization report 672
Menu bar 663
Status bar 663
Work area 665
Work area 651
File ground management tool 645
File manager
Application essentials 53
Copy 54
Delete 54
Rename 54
String search 55
Control panel 53
Menu bar 52
Overview 51
Work area 53
File transfer 748
Application essentials 752
Change file properties 758
Create directory 757
Deselect all 756
Deselect all (remote) 756
Down directory 758
Filter 756
Filter (remote) 756
Remove directory 757
Remove file 758
Retrieve 754
Retrieve as 754
Select all 756
Select all (remote) 756
Send 753
Setup file list options 755
Up directory 758
Menu bar 749
Status bar 750
Work area 750
File transferLApplication essentials
Send as 754
G
GCID (Ground Control ID) 245
Getting started 2
GSE display
Application essentials 326
Set packet retrieval parameters 327
Show GSE packet definition 328
View stream 330
CCSDS primary protocol header 336
GSE secondary CCSDS protocol header 337

GSE secondary protocol header 335
Hex data 338
Primary EHS protocol header 332
Stream offset 338
Menu bar 324
Overview 323
Status bar 324
Work area 325
GSE packets 314
Application essentials 316
Change LES Sensing... 321
Select Merge Data 319
Start 317
Menu bar 315
Work area 315
GSE packets software
Overview 313
H
HOSC packet data generator
Menu bar 376
Overview 375
Work area 377
L
Launchpad 17
Database menu 27
Command database 28
Database change request 28
Database monitor and control 28
Telemetry database 27
UDE database 28
File menu 19
File manager 20
Logoff 21
Print screen 21
Print Status 21
Print window 21
Retrieve UDE 20
Setup print 20
Store UDE 20
Generation menu 21
Command update form generation 22
Computation generation 22
Display generation 22
Script generation 22
OCMS menu 31
File ground management tool 31
OSTP ground management tool 31
Reference file editor 32
Operation menu 23
Command delog 25
Command operation 24
Command system management 24
Command track 24
Command user enable 25
Computation operation 23
Display operation 23
Downlink management 25
Downlink request 25
EHS data generation 27
Exception monitor 26
GSE packets 26
Local table operation 27
NRT data request 26
Scratchpad line 24
Script operation 23
PIMS menu 29
Documents 30
Operation change requests 30
To do list 29
PPS menu 30
Payload planning system 30
Utilities menu 32
Actual GMT 36
Bulk validate 36
Change password 36
DOSH table 35
File transfer 35
Framemaker 32
G2 express rack tool 34
Greenwich mean time (GMT) 36
Login to EHS 35
Login to nonEHS 35
Mission elapsed time (MET) 36
Pixmap editor 33
Playback status 35
Process manager 35
Screen lock 36
Spreadsheet 33
Workstation monitor 35
Workstation preferences 36
xv 33
Local table 405

Local table operation
Application essentials 447
Activate group 450
Apply change file 447
Remove change file 448
Set LES processing 450
View group information 449
View MSID information 448
Database selection radio buttons 447
Menu bar 446
Overview 445
Work area 447
M
Main application window 2
Menu bar items 8
File menu 8
Help menu 10
Index 12
On keys 11
On version 14
On window 10
Table of contents 13
View menu 8
Message dialog box 3
Message handler
Application essentials 42
Configure columns 43
Generate report 45
Work area 46
Set column width 44
Setup message filter 47
Work area 48
Setup message scrolling 50
Control panel 42
Menu bar 39
Overview 37
Work area 39
Mini-application window 3
MSID data generation
Application essentials 363
Reset MSID 363
Update MSID 363
Menu bar 361
Overview 359
Work area 361
N
Non-shareable 457
NRT data capture request 258
Menu bar 290
Overview 289
Work area 291
NRT data capture request output files 262
NRT list request 258
Application essentials 270
Select MSID 272
Set data processing 273
Calibrated 273
Converted 274
Unprocessed 274
Set data representation 274
Set filter test 278
Set limit/ES sensing 277
Set sample thinning 276
Show NRT directory 278
Show NRT output 282
Validate 271
Menu bar 264
Overview 262
Work area 264
NRT list request output files 259
NRT playback request 258
Application essentials 298
Set APID extension 299
Set protocol 298
Set source data mode 300
Menu bar 294
Overview 293
Work area 294
NRT request output files 258
NRT snapshot request 258
Menu bar 286
Overview 285
Work area 286
NRT snapshot request output files 261
O
Onboard short-term planning ground management tool 697
OSTPGMT
Overview 698
Output MSID editor
Application essentials

Edit internal pseudo calibration 118
Edit internal pseudo limits 121
Select external pseudo MSID 117
P
PIMS documents
Application essentials 541
Compare files 549
Copy 546
Delete file from HOSC drop box 551
Edit document properties 554
Move 547
New 542
Document 542
Folder 545
Retrieve copy 547
Transfer file to HOSC drop box 550
View document properties 553
Menu bar 539
Overview 538
Work area 540
PIMS OCR
Application essentials 563
Actionee status 586
Copy 578
Delete 583
Facility review status 583
Modify action descriptions 587
Modify group lists 588
New OCR 564
CM log tab 576
Common elements 565
OCR tab 566
Resource impacts tab 568
Reviewers tab 575
Supporting attachments tab 571
POIC review status 584
View 579
View printable OCR 580
Menu bar 559
Overview 556
Work area 560
PIMS overview 479
PIMS timeliner
Application essentials 601
Compile 602
Save as 605
Set compiler options 606
Validate 609
View document properties 612
Menu bar 595
Overview 589
Work area 596
PIMS to do list
Application essentials 486
Complete task 486
Complete task dialog box - CM configuration 493
Complete task dialog box - OCR configuration 493
Actionee 531
Common elements 495
Facility lead release for review 507
Facility member review 512
Facility review 517
Originator 506
POIC POD 519
POIC POD Approver 527
SOF reviewer 524
Complete task dialog box - Stateless document configuration 487
Complete task dialog box - stateless document configuration
Common elements 488
Document files tab 490
Document information tab 491
Modify group lists 533
Create group list 535
Delete group list 537
Edit group list 536
Menu bar 483
Overview 481
Work area 483
Playback status 762
Work area 763
Print operations
Print screen overview 69
Print Status
Menu bar 70
Print status
Application esentials
Show print jobs 71
Application essentials 71

Remove print job 71
Control panel 71
Work area 70
Print status overview 69
Print window overview 69
Setup print overview 67
R
Reference file editor 699
Retrieve UDE
Application essentials 64
Retrieve 64
Control panel 64
Menu bar 63
Overview 62
Work area 63
RFE
Application essentials 702
Find 703
Find next 704
Replace 704
Validate 705
Menu bar 701
Overview 699
Status bar 702
Work area 702
S
Scratchpad line
Application essentials 231
Buffer 232
Buffer clear all 232
Buffer clear last 233
Buffer command 232
Buffer send 232
Start 233
Start comp 233
Start display 233
Start script 234
Stop 234
Stop chain 234
Stop comp 235
Stop comp all 235
Stop display 235
Stop display all 236
Stop group 234
Stop script 236
Stop script all 236
Update 237
Update command form 237
Update constant 237
Update header form 237
Update pseudo 238
Uplink 238
Uplink chain 238
Uplink command 238
Uplink group 239
Uplink timetagged command 239
Menu bar 230
Overview 229
Work area 230
Script generation
Application essentials 141
Check for UDEs 145
Find 142
Find next 143
Replace 143
Validate 144
Menu bar 141
Overview 139
Work area 141
Script operation
Application essentials 150
Auto scroll 154
Clear standard output log 151
Echo 153
Goto 151
Hold at 151
Manual scroll 154
Pause until 152
Position 152
Resume at 152
Start 153
Step 154
Step off 154
Menu bar 148
Overview 147
Work area 149
Serial data generator
Application essentials 367
Add stream 367
Define stream format 368
Delete stream 368
Pause 372

Reinitialize MSID data file 372
Resume 371
Set database version 375
Set stream transmission 370
Start 371
Stop 371
View start stream status 373
View stream 372
Menu bar 365
Overview 364
Work area 366
Shareable 456
Store UDE
Application essentials 60
Store 61
Control panel 60
Menu bar 59
Overview 58
Work area 60
System initialization 15
T
Telemetry database
Common form functions 425
Menu bar 404
Database menu 404
Directory 406
Exit 406
Select database 404
Help menu 420
Options menu 410
Build partial database 411
Convert database 417
Database server process request monitor 420
Derive context dependent LVT 419
Derive limitsense LRVT 419
Encapsulate TDM 419
Generate external data products 418
Incorporate DBCR 411
Manage local table 418
MBF loader 416
Reinitialize user copy 411
Validate database 419
Query/update menu 406
FEP information 408
Group information 408
GSE information 408
Lookup information 409
MSID information 407
Novice information 407
Stream information 407
Report menu 410
Select project specific report 410
Select standard report 410
Overview 403
Telemetry database forms 428
Block detail form 430
Calibration detail form 433
Calibration list form 434
Configuration controlled GSE form 436
Conversion matrix form 441
Counter detail form 433
Data type form 441
Decommutation detail form 432
Decommutation list form 432
Engineering unit form 440
Error log form 441
GPC format form 438
Group detail form 435
Group list (local table) form 445
Group list form 435
GSE packet assignment form 437
Initial load data form 442
Limit sensing detail forms 434
Limit sensing list forms 435
MBF MSID list form 443
MBF state code form 443
MSID detail form 429
MSID list (local table) form 444
MSID list form 429
Non-configuration controlled GSE form 436
OI format form 438
OI PDI allocation form 438
Owner authorization list form 440
Owner list form 440
Packet destination information form 437
Packet detail form 430
Packet MSID list form 429
PDI list form 439
SDT OD build list form 442
Stream list form 430

Subset detail form 431
Subset list form 431
TDM detail form 431
Telemetry database local table
Menu bar 421
Options menu 423
Incorporate change file into local table 424
Incorporate local table into user copy 424
Reinitialize local table 425
Save change file as 424
Query/update menu 422
Group information 423
MSID information 422
Report menu 423
Select standard report 423
Overview 420
U
UDE database
Menu bar 451
Database menu 452
Exit 452
Select database 452
Help menu 459
Options menu 457
Copy UDEs 457
Query/update menu 452
Edit personal UDE attributes 452
View all users UDE attributes 454
Report menu 456
UDE attribute report 456
Overview 450
Update command mini-application
Application essentials 220
Show binary form 221
Show character form 221
Show decimal form 222
Show hexadecimal form 222
Show octal form 223
Show user defined form 220
Update 224
Conversion area 220
Menu bar 217
Overview 215
Status bar 218
Work area 219
Uplink Time (GMT) 244
User copy 406
Utilities menu 743
Actual GMT 771
Bulk validate 766
Change password 772
COTS 743
FrameMaker 744
Pixmap editor 745
Spreadsheet 744
xv 745
DOSH table 761
File transfer 748
G2 express rack tool 746
Greenwich mean time (GMT) 771
Login to EHS 746
Login to non EHS 747
Mission elapsed time (MET) 771
Playback status 762
Screenlock 771
Workstation monitor 759
Workstation preferences 772
V
Validating groups 163
W
Wildcard characters 14
Working with windows 2
Application dialog boxes 6
Application main windows 3
Database applications 4
Message dialog boxes 7
Mini-applications 6

1008

Reader Comments

We welcome your comments and suggestions to help improve the HOSC User Guides. Please take the time to let us know how you feel about the book: User Guide Number: HOSC-EHS-_____

- The information was easy to understand and complete.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
❑	❑	❑	❑	❑

If not, why? _____

- The information was easy to find.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
❑	❑	❑	❑	❑

If not, why? _____

- This book was useful to me.

Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
❑	❑	❑	❑	❑

Why? _____

- Do you have any additional comments about this User Guide?

_____
_____
_____
_____

Name:_____
Title:_____
Company:_____
Phone: (___)_____ E-mail Address:_____

PLACE
STAMP
HERE

HOSC Training Team
2901 Wall Triana Highway
Madison, Alabama 35824