

# Contents

---

	<i>Page</i>
<b>Preface</b>	<b>xv</b>
Manual organization	xv
Related publications	xvi
Ordering Cray Research publications	xvii
Conventions	xviii
Software problem reporting	xix
Reader comments	xx
<b>The Basics [1]</b>	<b>1</b>
Execution overview	2
Initializing OLNET	2
OLNET under MVS TSO	3
OLNET under UNICOS and UNIX	3
OLNET under VM	4
Accessing the Main menu	4
Entering OLNET commands	5
<b>FEI Test (FEI-1 and FOL-3) [2]</b>	<b>7</b>
Getting started with the FEI-1 test under MVS or VM	7
FEI-1 test menus	8
FEI-1 test commands	9
FEI-1 loopback mode	17
FEI-1 loopback mode from an IBM system	17
FEI-1 (data-streaming or standard) loopback mode from a Cray Research system with an IOS-E	20
Cray Research fiber-optics link (FOL-3) to an IBM system	24

---

	<i>Page</i>
FEI-1 end-to-end mode . . . . .	28
Cray cable loopback mode . . . . .	31
Figures . . . . .	33
<b>NSC Test [3]</b> . . . . .	<b>41</b>
Getting started with the NSC test under MVS or VM . . . . .	44
Getting started with the NSC test under UNICOS or UNIX . . . . .	44
Execution example . . . . .	47
NSC network message format . . . . .	54
NSC test menus . . . . .	56
NSC test commands . . . . .	57
NSC test modes . . . . .	66
Synchronous active-and-passive mode or asynchronous active-and-passive mode . . . . .	66
Local adapter loopback mode . . . . .	70
Remote adapter loopback mode . . . . .	71
Statistics menu . . . . .	73
Local adapter statistics mode . . . . .	74
Local statistics and clear mode . . . . .	75
Remote adapter statistics mode . . . . .	76
Dump extension registers mode . . . . .	77
HYPERchannel mapping mode . . . . .	79
Display driver statistics mode . . . . .	81
Xmapping routine mode . . . . .	82
Xmap (TS) basic loopback command . . . . .	85
Xmap (TS) comprehensive loopback command . . . . .	85
Additional Xmap commands . . . . .	86
NSC DX low-level command mode . . . . .	87
Read single adapter profile mode and map adapter profiles mode . . . . .	94

---

	<i>Page</i>
<b>VME Test (FEI-3) [4]</b>	<b>97</b>
Getting started with the VME test under UNICOS . . . . .	99
Getting started with the VME test for the OWS or MWS . . . . .	103
Execution example . . . . .	103
VME testing using the fy driver . . . . .	112
Pseudo-device drivers . . . . .	112
Suggested scenarios for testing FEI-3 connections . . . . .	115
VME network message format . . . . .	115
VME test menus . . . . .	116
VME test commands . . . . .	117
VME test modes . . . . .	122
Synchronous active-and-passive mode or asynchronous active-and-passive mode . . . . .	123
VME cable loopback mode . . . . .	125
Device channel . . . . .	126
IOS-E LOSP/VME multiplexer channels . . . . .	126
Execution procedure . . . . .	127
Disable cable interrupts mode (cy driver only) . . . . .	130
I/O master clear mode . . . . .	131
Master clear mode . . . . .	131
Dump VME registers mode . . . . .	132
WIN echo mode . . . . .	134
IOS software echo mode . . . . .	134
Control cable test mode . . . . .	134
fymc maintenance character special test mode . . . . .	135
Display driver statistics mode . . . . .	135
<b>HIPPI Test [5]</b>	<b>137</b>
Getting started with the HIPPI test under UNICOS . . . . .	138
Execution examples . . . . .	141

	<i>Page</i>
Test Mode menu execution example . . . . .	145
Command Program menu execution example . . . . .	148
HIPPI test menus . . . . .	154
HIPPI test commands . . . . .	154
HIPPI Test Initial menu commands . . . . .	155
HIPPI Test Mode menu commands . . . . .	155
HIPPI Command Program (Program Mode) menu commands . . . . .	158
HIPPI Channel Control menu commands . . . . .	160
HIPPI Command Program (Edit Mode) menu commands . . . . .	161
Help commands . . . . .	162
Display full status (DFS) command output . . . . .	164
HIPPI test mode configurations . . . . .	166
Cable loopback mode . . . . .	167
Ultra adapter loopback mode . . . . .	171
Software loopback mode, NSC PS8 or PS32 . . . . .	173
NSC PS8 . . . . .	174
NSC PS32 . . . . .	174
End-to-end mode . . . . .	176
<b>FDDI Test [6]</b> . . . . .	<b>181</b>
Understanding FDDI . . . . .	181
Getting started with the FDDI test under UNICOS . . . . .	183
Execution example . . . . .	183
FDDI test menus . . . . .	193
FDDI statistical information . . . . .	195
GETULA - Get IEEE universal LAN address . . . . .	195
GET - Get current driver settings . . . . .	195
CDSTATS - Clear device statistics . . . . .	198
CLSTATS - Clear logical path statistics . . . . .	198
STATS - Display driver and logical path statistics . . . . .	198

---

	<i>Page</i>
DSTRUCT- Display device's <code>fd_dev</code> structure . . . . .	199
LSTRUCT - Display logical path's <code>fd_lp</code> structure . . . . .	202
GETVARS - Display <code>fd_vars</code> structure . . . . .	203
MACNBRs - Display MAC neighbor addresses structure . . . . .	204
GET_DAD - Display result of duplicate address test . . . . .	204
GET_HPC - Display <code>fdio_hpc_info</code> structure . . . . .	205
ETHERS - Display contents of <code>/etc/ethers</code> file . . . . .	205
STYLE - Change style of output for display screens . . . . .	206
FDDI test commands . . . . .	206
FDDI test modes . . . . .	216
Synchronous or asynchronous active-and-passive mode . . . . .	216
IOS software echo mode . . . . .	218
Loopback mode . . . . .	219
Warning situations . . . . .	221
Reading unexpected IMPLEMENTOR frames . . . . .	221
Reading unexpected echo data . . . . .	222
<b>MPP Test [7]</b> . . . . .	<b>225</b>
Understanding MPP . . . . .	225
Getting started with the MPP test under UNICOS . . . . .	226
Execution example . . . . .	226
MPP test menus . . . . .	230
MPP test commands . . . . .	232
MPP test modes . . . . .	234
Read IOG statistics . . . . .	235
Read YPE statistics . . . . .	236
Read from MPP or write to MPP . . . . .	237
IOG echo . . . . .	239
Loopback (software) . . . . .	240

	<i>Page</i>
<b>FDR-4 Test [8]</b>	<b>243</b>
Understanding FDR-4	244
Getting started with the FDR-4 test under UNICOS	245
Execution example	245
FDR-4 test menus	252
FDR-4 test commands	254
FDR-4 test modes	263
<b>Appendix A Alternative Methods of Execution</b>	<b>267</b>
MVS command-mode execution	267
UNICOS and UNIX shell script and command-line execution	268
Shell script execution	269
Command-line execution	270
VM EXEC procedure execution	271
VM EXEC procedure (output sent to virtual reader)	271
VM EXEC procedure (interactive execution)	272
<b>Appendix B Supported Configurations</b>	<b>275</b>
<b>Appendix C Theory of Operation</b>	<b>277</b>
Synchronous active-and-passive mode	277
Loopback mode	279
Asynchronous mode	280
<b>Appendix D OLNET Build Procedures</b>	<b>285</b>
Online diagnostic directories	285
Building OLNET on front-end systems	285
C source code	285
Fortran source code	286
VM system	286

---

	<i>Page</i>
MVS system	288
<b>Appendix E OLNET Program Mode Edit Example</b>	<b>291</b>
<b>Index</b>	<b>299</b>

## Figures

Figure 1. Sample Main menu for OLNET	4
Figure 2. FEI-1 menu under MVS	8
Figure 3. FEI-1 menu under VM	9
Figure 4. Cray Research FEI operator's panel for an IBM system	33
Figure 5. Cray Research standard FEI maintenance panel for an IBM system	34
Figure 6. Cray Research data-streaming FEI maintenance panel for an IBM system	35
Figure 7. FEI loopback mode (front-end system)	36
Figure 8. FEI loopback mode for a Cray Research standard FEI (Cray Research system)	37
Figure 9. FEI loopback mode for a Cray Research fiber-optics link (FOL-3)	38
Figure 10. Cray Research FEI cable connector panel for an IBM system	39
Figure 11. FEI loopback mode for an FEI (Cray Research system side)	40
Figure 12. NSC test environment	43
Figure 13. NSC network message format	55
Figure 14. NSC menu under MVS and VM	56
Figure 15. NSC menu under UNICOS and UNIX operating systems	57
Figure 16. Statistics menu	73
Figure 17. Adapter statistics package	74
Figure 18. Dump Extension Registers menu	78
Figure 19. Sample Xmap	84
Figure 20. Selecting the appropriate loopback point	90
Figure 21. VME loopback mode and test environment	98

	<i>Page</i>
Figure 22. FEI-3 board set . . . . .	99
Figure 23. Pseudo-device drivers . . . . .	113
Figure 24. VME network message format . . . . .	116
Figure 25. VME menu . . . . .	117
Figure 26. VME Dump Registers menu . . . . .	133
Figure 27. VME Dump Registers display . . . . .	133
Figure 28. HIPPI test environment . . . . .	138
Figure 29. HIPPI major and minor numbers . . . . .	140
Figure 30. Cray PVP HIPPI cable loopback (Ultra) . . . . .	169
Figure 31. Cray PVP HIPPI cable loopback (NSC PS8) . . . . .	170
Figure 32. Cray PVP IOS-E HIPPI cable loopback, 32- or 64-bit (NSC PS32) . . . . .	171
Figure 33. Ultra HIPPI adapter (loopback switch) . . . . .	173
Figure 34. NSC PS8 switch . . . . .	175
Figure 35. OLNET Main menu . . . . .	184
Figure 36. FDDI Test Initial menu . . . . .	185
Figure 37. Device Path menu . . . . .	185
Figure 38. Updated FDDI Test Initial menu . . . . .	186
Figure 39. FDDI Test Mode menu . . . . .	186
Figure 40. FDDI test modes . . . . .	187
Figure 41. Executing the IOS software echo test . . . . .	187
Figure 42. IOS software echo test completion message . . . . .	188
Figure 43. FDDI test modes . . . . .	188
Figure 44. Executing the loopback test . . . . .	189
Figure 45. Loopback test completion message . . . . .	189
Figure 46. FDDI Test Mode menu . . . . .	190
Figure 47. Updated FDDI Test Mode menu . . . . .	191
Figure 48. Starting execution on the passive system (figure 1) . . . . .	191

---

	<i>Page</i>
Figure 49. Starting execution on the passive system (figure 2) . . . . .	192
Figure 50. Starting execution on the active system . . . . .	192
Figure 51. End-to-end active test completion message . . . . .	192
Figure 52. End-to-end passive test completion message . . . . .	193
Figure 53. FDDI test initial menu . . . . .	193
Figure 54. FDDI test mode menu . . . . .	194
Figure 55. FDDI statistical information menu . . . . .	194
Figure 56. GETULA screen . . . . .	195
Figure 57. Get screen (1 of 3) . . . . .	196
Figure 58. Get screen (2 of 3) . . . . .	196
Figure 59. Get screen (3 of 3) . . . . .	197
Figure 60. CDSTATS screen . . . . .	198
Figure 61. CLSTATS screen . . . . .	198
Figure 62. STATS screen . . . . .	199
Figure 63. DSTRUCT screen (1 of 4) . . . . .	199
Figure 64. DSTRUCT screen (2 of 4) . . . . .	200
Figure 65. DSTRUCT screen (3 of 4) . . . . .	201
Figure 66. DSTRUCT screen (4 of 4) . . . . .	202
Figure 67. LSTRUCT screen (1 of 3) . . . . .	202
Figure 68. LSTRUCT screen (2 of 3) . . . . .	203
Figure 69. LSTRUCT screen (3 of 3) . . . . .	203
Figure 70. GETVARS screen . . . . .	204
Figure 71. MACNBRS screen . . . . .	204
Figure 72. GET_DAD screen . . . . .	205
Figure 73. GET_HPC screen . . . . .	205
Figure 74. ETHERS screen . . . . .	206
Figure 75. STYLE screen . . . . .	206

	<i>Page</i>
Figure 76. Messages/acknowledgment screen	208
Figure 77. FDDI device path select menu	209
Figure 78. Device path name screen	209
Figure 79. Error screen	210
Figure 80. Message length screen	210
Figure 81. Messages/pass screen	211
Figure 82. Pass count screen	211
Figure 83. Pattern type screen	213
Figure 84. Remote address screen	213
Figure 85. Test mode screen	214
Figure 86. Driver trace screen	214
Figure 87. Trace file enabled screen	215
Figure 88. FDDI warning screen	215
Figure 89. Echo test warning screen	216
Figure 90. MPP Test Initial menu	230
Figure 91. MPP IOG Device Path Selection menu	231
Figure 92. MPP Test Mode menu	231
Figure 93. MPP Test menu	232
Figure 94. FDR-4 Test Initial menu	246
Figure 95. Device Path menu	246
Figure 96. Entering the device number	247
Figure 97. FDR-4 Test Initial menu	248
Figure 98. FDR-4 Test Mode menu	249
Figure 99. Test Modes list	250
Figure 100. FDR-4 Test Mode menu	250
Figure 101. Setting the device path	251
Figure 102. Test Mode menu	252

---

	<i>Page</i>
Figure 103. FDR-4 Test Initial menu . . . . .	253
Figure 104. FDR-4 Test Mode menu . . . . .	253
Figure 105. Block length screen . . . . .	254
Figure 106. Bit select screen . . . . .	255
Figure 107. Paths and statuses screen . . . . .	256
Figure 108. Device path name screen . . . . .	256
Figure 109. Fiber select screen . . . . .	257
Figure 110. Injection location screen . . . . .	258
Figure 111. Pass count screen . . . . .	258
Figure 112. Pattern type screen . . . . .	260
Figure 113. SSD address screen . . . . .	261
Figure 114. Driver trace screen . . . . .	262
Figure 115. Trace file enabled screen . . . . .	263
Figure 116. Synchronous active-and-passive mode . . . . .	277
Figure 117. Mechanical loopback . . . . .	280
Figure 118. Software loopback . . . . .	280
Figure 119. Asynchronous active-and-passive mode . . . . .	281

## Tables

Table 1. Message length . . . . .	15
Table 2. Loopback connector selection . . . . .	32
Table 3. Associated data message length . . . . .	58
Table 4. Remote adapter address requirements . . . . .	64
Table 5. Loopback connector selection . . . . .	88
Table 6. Device names for pseudo-drivers . . . . .	114
Table 7. Associated data message length . . . . .	118
Table 8. Remote address requirements . . . . .	121
Table 9. DFS output . . . . .	165

---

	<i>Page</i>
Table 10. Systems and hardware supported by OLNET . . . . .	275
Table 11. C source code . . . . .	286
Table 12. Fortran source code . . . . .	286
Table 13. VM naming conventions . . . . .	287
Table 14. MVS naming conventions . . . . .	288
Table 15. Table 15. MVS files . . . . .	288
Table 16. Files to delete . . . . .	289