

Symbols

" , " as dial modifier 4-56
" < " as dial modifier> 4-56
"K" as dial modifier 4-56
"K" or "k" as dial modifier 4-57
"P" as dial modifier 4-53
"P" or "p" as dial modifier 4-57
"T" as dial modifier 4-53
"T" or "t" as dial modifier 4-57
"W" or "w" as dial modifier 4-57
*AUXILIARY main menu 4-33
*COMPRESSION main menu (SDC) 4-66
*DUALVIEW main menu 4-63
*MODIFY main menu 4-7
*RESTORAL main menu 4-40
*STATUS main menu 5-2
*TEST main menu 8-3

Numerics

141 (Circuit 141) parameter 4-26
326X
 interoperation 1-9
326X SDC
 restoral interoperation (SDC) 4-69
3500
 and 3512 under network management 4-30
3512
 connection to telephone line 2-6
 environmental limits 10-2
 features 1-3
 operating mode 1-3
 rates and services 10-3
 size, weight, heat output 10-2
3520
 installation requirements 2-4
 interoperability 6-15
3520 interoperability and port-to-channel
 mapping 6-17
64 kbps Clear Channel (64k CC) service 1-3
64CC alarm B-2
64k CC
 and accidental loopbacks 4-8
 and non-interruptive network management 6-
 13
 configuring bitstealing 4-19
 configuring multiplexing 4-19
 latching loopbacks (LLBs) 4-15
 loopback test 8-13
 Opmode parameter 4-8

64k CC Latching Loopback alarm 5-6
64k CC LTCH LB message B-2
64k LDM tail circuit 6-46
64LL alarm 5-6
6500 Series devices 7-9
68HC000 microprocessor 1-3

A

A/B Only parameter 4-51
A/B restoral 4-40
 feature 1-7
A/B restoral (See External restoral)
A/B switch and SDC 7-11
ABN STATION x message B-2
ACROSS key 3-5
ACTIVATE RESTORAL category 4-42
Adaptor cables for DTEs 2-9
Address, Motorola Codex Customer
 Administration 2-3
ALARM STATUS category 5-5
Alarms
 Abnormal Station 4-46
 DDS 4-46
 history 5-5
 No Sealing Current 4-46
 Out of Frame 4-46
 Out of Service 4-46
 that initiate restoral 4-46
Alphanumeric entry 3-5
ALT message-suffix B-1
Analog restoral 4-52
Ans (Answer) Timeout parameter 4-56
Answer end of leased-line link 4-69
Answer end of leased-line link (SDC) 4-69
Answer parameter 4-48
Answering a call
 (SDC) 4-69
 waiting 4-56
Application example
 56 kbps LDM tail circuit 6-44
 64 kbps Clear Channel (64k CC) 6-13
 consolidating multipoint circuits 6-23
 consolidating point-to-point circuits 6-23
 DDS-II SC point-to-point (muxed) 6-12
 DDS-II SC, point-to-point 6-11
 leased 56k integral digital restoral 6-35
 mixed TDM - channel sharing 6-20
 MP-Mux, mixed TDM - channel sharing 6-25
 multipoint channel sharing, DDS-I service 6-19
 Multipoint DDS-II SC, Main Channel mode 6-

multipoint TDM and channel sharing 6-19
 muxed mode and derived secondary channel 6-9
 non-interruptive network management 6-22
 Normal mode over multipoint circuits 6-7
 point-to-point and multipoint circuits,
 Bitstealing 6-8
 point-to-point DDS-I with NMS 6-5
 point-to-point digital tail circuit, restoral 6-42
 point-to-point digital, SLR 6-31
 point-to-point external analog restoral 6-38
 point-to-point muxed, external restoral 6-39
 point-to-point SW 56 integral-restoral 6-34
 Point-to-point TDM and channel sharing
 point-to-point, external restoral, network
 management 6-40
 point-to-point, external restoral, network man-
 agement, rate adaptation 6-41
 port-to-channel mapping 6-15
 rate adaptation and MP-Mux 6-24
 restoral pool 6-31
 SDC Digital point-to-point link 7-9
 SDC digital point-to-point link 7-10
 SDC point-to-point link with T1 access 7-11
 SDC point-to-point restoral link 7-12
 TDM with tail circuit 6-27
 TDM, 56-kbps DDS-I 6-18

Application examples
 overview 6-3

Applications, legacy
 and SDC 7-10
 compression 7-8

AS alarm 5-5, B-2
 ASD alarm B-2
 Asynchronous timing (figure) 6-50
 Asynchronous-to-synchronous conversion
 feature 1-7
 Async-to-sync conversion, V.22 algorithm 4-21
 AT&T specifications 2-3
 AUTO ANSWER category 4-48
 Auto Call Unit (ACU)
 setting for external restoral 6-37
 AUTO STR DISC message B-2
 Automatic call answering 4-48
 Automatic rate negotiation (SLR) 6-30
 Automatic restoral initiation 4-46
 Automatic retrains 4-55
 Automatic stream disconnect 4-26
 Automatic Stream Disconnect (see ASD)
 Automatic stream disconnect delay 4-26
 Automatic stream disconnect restore 4-26

B

Backlight parameter 4-35
 Bandwidth allocation 7-5
 Bandwidth expansion 4-66
 feature (See SDC) 1-4
 Bandwidth expansion (SDC)
 in restoral 4-66
 Baudot code 4-21
 Bellcore specifications 2-3
 BER FAIL message 8-16
 BER PASS message 8-16
 BER SETUP FAIL message 8-16
 BER test
 device 8-5
 line 8-5
 line and device 8-15
 BER TEST RUNNING message 8-16, B-3
 Bipolar Code Errors During Test field (TRT) 9-15
 Bipolar code Errors, Age field (MLS) 9-8
 Bipolar Violations 5-9
 Bitstealing
 effective port rates (table) 4-19
 example, SDC 6-7
 multipoint 4-20
 specifying derived secondary channel 4-19
 BPV 5-9
 Buffering data 7-6
 Buffering data (SDC) 7-7
 Buffering data for flow control 4-68
 Busy signal 4-52

C

Cabling
 2-port 3512 2-8
 3-port 3512 SDC 2-8
 8-port 3512 2-8
 for network management 2-11
 for restoral 2-7
 Port 1 (table) A-1
 procedure 2-5
 Call Cntrl (Control) parameter 4-55
 Call collision, avoiding 4-43
 Call Progress parameter 4-52
 Categories
 ACTIVATE RESTORAL 4-42
 ALARM STATUS 5-5
 AUTO ANSWER 4-48
 COMPRESS CONFIG 4-66
 COMPRESS STATUS 5-11
 CONFIG DUALVIEW 4-63
 CQMS 5-8
 DIAL LINE MONITOR 4-61

DIAL PARAMETERS 4-43
DIGITAL CONFIG 4-55
FRONT PANEL 4-35
INIT PARAMETERS 4-46
LINE SELECT 5-5
LINE STATISTICS 5-9
MODEM CONFIG 4-52
MODIFY DSU 4-8
MODIFY NETWORK 4-27
MODIFY PORT 4-17
NETWORK MESSAGE 5-13
PHONE NUMBER 4-57
PORT STATUS 5-10
PROTECTION 4-34
RESTORAL CONFIG 4-49
RESTORAL METHOD 4-42
RESTORAL STATUS 5-12
RMT FRONT PANEL 4-37
SET REMOTE ADDR 4-38
SRCH REMOTE ADDR 4-39
CCITT V.42 bis data compression algorithm 1-4
Change password 4-34
Change Password parameter 4-35
Channel bandwidth and rate negotiation 4-50
Channel rate configuration, automatic 6-24
Channel rates available in restoral 4-51
Channel sharing
 and DTE Config parameter 4-20
 and SDC 7-2
 and time-division multiplexing 6-14
 applications (table) 6-17
 DDS-I service (example)
 feature 1-5
 interoperability with 3520s 6-15
 priority assignment 6-20
 with DDS-II SC service 6-19
Characters, selecting 3-5
CHn Rate parameter (MODIFY DSU category) 4-13
CHn Rate parameter (RESTORAL CONFIG category) 4-51
Circuit 140 4-22, 4-23, 4-25
Circuit 141 4-26
Circuit Assurance
 monitor remote devices 6-6
Circuit configuration and network management 6-3
Circuit consolidation (example) 6-23
Circuit Quality Monitoring System (See CQMS)
CISPR cable requirements A-1
Ckt Assure (Circuit Assurance) parameter 4-18
Clear Alarms message 5-5
Clear To Send (CTS) signal for flow control 4-68
Clear To Send field (MLS) 9-10
clears 5-5
CLF alarm 5-6, B-2
Clock stopping
 throughput control (SDC) 4-68
Clock stopping (SDC) 7-6
Clock stopping, transmit (SDC) 4-68
Clocking (see Timing)
Cmprs (Compression) Mode parameter 4-69
CMPRS LINK FAIL message B-2
CNCT CMD RCVD message 9-16
Comma as dial modifier 4-56
Command Retried field (MLS) 9-12
Compatibility
 with other DSU/CSUs 1-9
COMPRESS CONFIG category 4-66
COMPRESS STATUS category 5-11
Compression 4-66
 feature (See SDC) 1-4
 flow control 4-68
 in restoral 4-67
 legacy applications 7-8
 NRZ and NRZI formats for Port 3 4-69
 transmit and receive clock 4-68
Compression and data underruns 4-68
Compression Link Fail alarm 5-6
Compression Mode parameter 4-69
Compression, enabling and disabling 4-66
Cond (Conditional) Answer parameter 4-48
Config (Configure) Port parameter 4-21
CONFIG DUALVIEW category 4-63
Configuration
 automatically saving 4-6
 default 4-32
Configuration worksheets C-1
Configuring from network manager 7-9
Connecting 3512 to network manager 2-11
Control device (NetView) 4-64, 9-3
Control keys 3-5
Control signaling 4-22, 4-23
CQMS
 Bipolar Violations 5-9
 Error Free 5-9
 Error Probability 5-9
 feature 1-8
 Jitter 5-8
 Line Availability 5-9
 Signal Level 5-8
 signal level, link down detection 4-16
CQMS category 5-8
Crossover cable for synchronizing timing 4-21
CSU loopback test 8-12
CTS and compression 4-68
CTS signal 4-24
CTS signal and flow control (SDC) 4-68
Current Transmit Speed field (TRT) 9-15

Customer Administration
 address and phone number 2-3
Customer-provided equipment 2-3

D

Data
 encoding 10-3
 formats, 3512 10-3
 passing downstream 4-28
Data buffering 7-6
Data buffering (SDC) 7-7
Data compression 4-66
Data Rate parameter (MODIFY DSU category) 4-9
Data Terminal Ready field (MLS) 9-10
Data underruns 7-7
Data underruns (compression mode) 4-68
DCD handshaking signals 4-22
DCD IBS signal in response to RTS 4-22
DCD signal, configuring 4-22
DCE-DCE crossover cable 4-21
DDS Alarms parameter 4-46
DDS To Dial parameter 4-43
DDS-I
 and network management 6-4
DDS-I application
 Normal mode, multi-tier 6-6
DDS-I applications
 channel sharing 6-18
DDS-I type services 1-3
 Opemode parameter 4-8
DDS-II SC
 port and line rates (table) 6-11
 properties 6-11
DDS-II SC type services 1-3
 Opemode parameter 4-8
DDS-Initiated Loopback, Age field (MLS) 9-8
Default configuration 4-32
Defaults 7-9
Delay
 in multi-tier applications 6-6
Delay (SDC) 7-7
Derived secondary channel 4-19
 MPM-BitS 4-20
 MPS-BitS 4-20
Derived Secondary Channel mode
 and DDS-I 6-4
 muxed 6-9
Device Bit Error Rate (DBER) test 8-15
Dial From # parameter 4-58
DIAL IN PROG message B-3
Dial line monitor
 interval 4-61
Dial Line Monitor (DLM)
 feature 1-7
 DIAL LINE MONITOR category 4-61
 Dial Line Monitor Fail alarm 5-6
 Dial modifiers 4-52, 4-53, 4-57
 wait for dial tone 4-53
 Dial parameter 4-53
 DIAL PARAMETERS category 4-43
 Dial To DDS parameter 4-44
 Dial Wait parameter 4-53
 Dialing in a PBX environment 4-53
 Dialing phone numbers 4-56
 Dialing phone numbers, order 4-60
 DIGITAL CONFIG category 4-55
 Digital Data Service
 DDS-I 6-3
 DDS-II SC 6-3
 DIP switch settings 2-13
 DISCNCT CMD RCVD message 9-16
 Disconnect signaling, PSTN 4-54
 Disconnecting after waiting 4-56
Display
 backlight 4-35
 lamp 4-36
Display (front panel) 3-4
Display symbols 5-4
Display, front panel 4-35
DL MONITOR FAIL message B-2
DLM (See Dial Line Monitor)
DLMF alarm 5-6, B-2
Domain, Modem and Line Status command
 (Figure) 9-7
DOWN key 3-5
DSR handshaking signals 4-23
DSR IBS signal in response to RTS 4-23
DSU (LLB) latching loopback test 8-13
DSU (RT) non-latching loopback test 8-12
DSU Check (Loop 3) test 8-10
DSU/CSU Address field (MLS) 9-12
DSU/CSU Address field (TRT) 9-15
DSU/CSU Failure field (MLS) 9-8
DSU/CSU in Idle State field (MLS) 9-12
DTE
 adaptor cables 2-9
 and underruns 4-68
 cable connection 2-5
 connections to 3512 and 3512 SDC 2-8
 timing 4-21
DTE (Data Terminal Equipment) parameter 4-49
DTE Configuration parameter 4-18
DTE handshaking signals 4-22
DTE Interface Connection field (MLS) 9-12
DTE Interface Error, Age field (MLS) 9-10
DTE parameter
 and restoral 4-29

DTE Power Loss Detected field (MLS) 9-10
DTE restoral-rate clocking 4-67
DTE signaling 4-23, 4-24, 4-25, 4-26
DTEs that do not supply RTS 4-22
DTMF 4-53
DTR (Data Terminal Ready) parameter 4-45
DTR and external restoral 4-48
DTR handshaking signals 4-23
DTR IBS signal in response to RTS 4-23
DTR signal and dial restoral 4-43
DualVIEW
 and 9300 or 9800 NMS 9-2
 and NetView 9-2
 configuring 9-4
 feature 1-9
 management from NetView 9-4
 NetView monitoring and testing 9-6
 network topologies 9-3
 operation 9-2
 point-to-point and multipoint circuits 4-64
DUPLICATE ADDR message B-3

E

Echo Can (Cancel) parameter 4-55
EIA Signal Status parameter 5-11
EIA Signals parameter 5-10
EIA timing designations (table) 6-46
EIA232 electrical interface 2-13, 4-25, 10-3
Electrical connection 2-12
Electrical interface 2-13
 display 5-10
 EIA232 4-25, 10-3
 specifying 4-25
 V.35 10-3
 V.35 and SDC 7-2
Encoding compression data 4-69
ENTER key 3-5
Enter Phone # parameter 4-59
Entering a password 4-34
Err Prob (Error Probability) 5-9
Error correction in restoral (SDC) 4-66
Error detection and compressionHigh-Level Data
 Link Control (See HDLC)
Error detection and correction 4-67
Error Free 5-9
Escape-RFP mode 3-7, 3-9
Execute parameter (SET REMOTE ADDRESS
 category) 4-38
Execute parameter (SRCH REMOTE ADDR
 category) 4-39
External (A/B) restoral 4-40, 6-32
 feature 1-7
External restoral 4-51

F

Factory parameter 4-32
Fail Message parameter 5-13
Failure Alarm, Age field (MLS) 9-8
FCC

 cable requirements A-1
 filing complaints 2-4
 regulations 2-3, A-4
 requirements 2-12

Features

 standard 1-2

Ferrite cylinder 2-6

File transfer and window size 7-5

Flow (Flow Control) parameter 4-68

Flow Control

 setting for external restoral 6-37

Flow control

 and timing (SDC) 7-3

 methods 4-68

Flow Control parameter (SDC) 7-6

Frame size 7-5

Framed data and compression 4-66

Framing and underruns 4-68

From DDS parameter 4-43

Front panel

 control keys 3-5

 customizing display 4-36

 default display 5-4

 display 3-4

 lights 3-3

 locked 4-35

 overview 3-2

FRONT PANEL category 4-35

Front-end processor 6-14, 9-2

G

Green LED 3-3

H

Handshaking 4-23

Handshaking signals

 and Circuit 140 4-22, 4-23

Hang up 4-52

Hardware Monitor (NPDA) 9-4

HDLC

 and compression 4-66

 compression and framing 4-66, 4-67

 counting frame throughput 5-11

 environments 1-4

 framed data and SDC 7-4

 frames 7-9

frames, SDC Port 3 7-3
Hold Dial Line parameter (DIGITAL CONFIG category) 4-56
Hold Dial Line parameter (MODEM CONFIG category) 4-54
Host polling 6-7

I

Identification numbers 3-2
Idle signaling option for restoral 4-15
Idles parameter 4-46
ILL CH AGGREGATE message B-3
ILLEGAL P-TO-CH message B-3
ILLEGAL RestRate message B-3
ILLEGAL TIMING message B-3
In=xxx message 8-16
Inband signaling 4-22, 4-23, 6-26
 preventing problems 4-20
 SDC 7-3
Incompressible data 7-6
Init Message parameter 5-13
INIT PARAMETERS category 4-46
Initiate/Terminate RFP parameter 4-37
Initiating/terminating dial restoral 6-36
Installation 2-5
 checkout, automatic self-test 2-13
 standalone unit 2-2
Integral analog restoral 4-52, 6-30
 SLR 4-40
Integral digital restoral 4-40, 6-34
Integral restoral
 analog, feature 1-6
 and network control 4-29
 digital, feature 1-6
 features 1-6
 rates 4-50
 selecting 4-42
Interexchange carriers 1-2
Internal timing (figure) 6-47
Interoperability
 326X 1-9
 326X SDC, restoral (SDC) 4-69
 3520s and port-to-channel mapping 6-17
 3520s,3260s 6-32
 channel sharing and 3520s 6-15
 feeder 7-10
 Motorola 6500 Series concentrators 7-9
 router 7-10
 V.FAST modems and SDC 7-12
 with 3520 DSU/CSU 4-11
 with network managers 1-8
Interruptive network-management 7-8
Interval parameter 4-61

INVALID ADDRESS message B-3
INVALID PASSWORD message B-3
IPX Burst Mode NLM and SDC 7-5

J

Jack connection 4-54
Jack, telephone 2-6
Jitter 5-8

L

Lamp Test parameter 4-36
LAN-to-LAN connection, and SDC 7-10
LAPM and SDC 7-8
Latchng loopback, accidental initiation 8-13
Layer, protocol
 measuring at link 7-4
 throughput 7-4
LD alarm 5-6, B-2
LD Detect (Link Down Detection) parameter 4-16
LDM (see Limited distance modem)
Leased-line link
 ends 4-69
LED (see Light-emitting diode)
Letters, selecting 3-5
Light-emitting diode (LED) 3-3
Lightning damage, prevention 1-2
Limited distance modem 6-43
 and tail circuits 6-44
 tail circuit 6-46
Limited-distance circuits and NetView 4-65
Line Availability 5-9
Line Bit Error Rate (LBER) test 8-15
Line Quality field (TRT) 9-15
Line Quality, Worst field (MLS) 9-8
LINE SELECT category 5-5
LINE STATISTICS category 5-9
Link Access Procedure for Modems and SDC 7-8
Link Down alarm 5-6
Link Down parameter 4-46
LINK DOWN x message B-2
Link Phone # parameter 4-60
Link Problem Determination Aid (LPDA)
 and DualVIEW 9-2
 feature 1-9
Link Problem Determination Aid (LPDA) and
 NetView 4-63
LL (Leased Line) Restoral parameter 4-15
LL alarm 5-6, B-2
LL loopback test 8-12
LLB (Latchng Loopback) code 4-15
LLB (Latchng Loopback) in 64k CC mode 4-8
LLB latching loopback test 8-13

Local Loopback (Loop 4) test 8-11
 Local Loopback alarm 5-6
 Loop 1 test 8-7
 Loop 2 test 8-9
 Loop 3 test 8-10
 Loop 4 test 8-11
 Loopback 4-15
 and Circuit Assurance 4-18
 and RFP session 4-37
 local analog 4-26
 preventing accidental triggering 4-17
 resolution in 64k CC mode 8-13
 resolving in 64k CC mode 4-8, 4-10
 Loopback test
 running 8-7
 LPDA (see Link Problem Determination Aid) 4-63
 LPDA Microcode Card Level field (MLS) 9-12
 LPDA support, changing 9-18
 LPDA-2 and DualVIEW 9-2
 LPDA-2 command flow (figure) 9-2
 LTCH DSU parameter 4-15

M

Main menus
 ***AUXILIARY** 4-33
 ***COMPRESSION (SDC)** 4-66
 ***DUALVIEW** 4-63
 ***MODIFY** 4-7
 ***RESTORAL** 4-40
 ***STATUS** 5-2
 ***TEST** 8-3
 Manual Test, Age field (MLS) 9-12
 Mark signaling option for restoral 4-15
 Master Down alarm 5-6
 MASTER DOWN x message B-2
 MDMCNTL command 9-4
 MDMCNTL syntax 9-15
 MDN alarm 5-6
 Menu symbols 3-4
 Menu tree 3-5
 Menu tree structure 3-4
 Menu tree structure (figure) 4-5
 Messages
 RFP (table) B-4
 status (table) B-5
 Messages (table) B-3
 Method parameter (RESTORAL METHOD category) 4-42
 Microprocessor 1-3
 Mini-Nest 6-32
 back panel conversion kit 2-14
 feature 1-9
 installation 2-2

MJU (See Multipoint junction unit)
 MLS
 Solicited and Unsolicited 9-12
 MLS CMD RCVD message 9-6
 MLS command 9-4, 9-6
 solicited and unsolicited 9-5
 MLS display (figures) 9-7
 Model number 3-2
 MODEM ALR ACTIVE message B-3
 Modem and Line Status (MLS) diagnostic command 9-4
 MODEM CONFIG category 4-52
 Modem Control (MDMCNTL) command 9-4
 syntax 9-15
 MODIFY DSU category 4-8
 MODIFY NETWORK category 4-27
 MODIFY PORT category 4-17
 MODIFY SLV ADDR (Modify Slave Address) parameter 4-31
 Modulus Nest 6-32
 MORE THAN 1 MSU message B-3
 Motorola 9800 and DualVIEW 4-63
 Motorola Codex Customer Administration address and phone number 2-3
 MP-Mux
 automatic channel rate configuration 6-17
 MP-Mux master device
 training slaves 4-16
 Msg (Message) parameter 4-36
 Msg (Message) Select parameter 4-36
 MSU (see Channel sharing)
 MSU NOT CONTIG message B-3
 Multiplexing
 and channel rates 4-51
 Multiplexing feature 1-5
 Multipoint
 bitstealing 4-20
 device identification 4-28
 Multipoint circuit (example)
 Normal mode 6-7
 Multipoint circuits
 DualVIEW 4-64
 master automatically configuring slave channel rates 6-17
 port-to-channel mapping 4-10
 specifying network control 4-28
 Multipoint circuits and automatic stream disconnect 4-26
 Multipoint circuits and streaming terminals 4-26
 Multipoint circuits, bitstealing (example) 6-8
 Multipoint junction unit (MJU) 6-21
 Multipoint multiplexing (MP-Mux)
 and loopback tests 8-8, 8-11
 and multipoint TDM 6-21

and SDC 7-2
 and time-division multiplexing 6-14
 configuring slave device 4-20
 feature 1-5
 specifying master device 4-19
 specifying slave devices 4-20
 training sequence 6-17
 with mixed TDM and channel sharing 6-25
M
 Multipoint TDM and MP-Mux 6-21
 Multi-tier application 4-30
 Multi-tier applications
 DDS-I Normal mode 6-6
 Multi-tier configurations 6-11
 Multi-tier environments
 incompatibility with loopbacks 8-9
 Mux Loss parameter 4-47
 Muxed mode
 port and line rates (table) 6-10
 SDC 6-9
 Muxed mode and derived secondary channel
 (example) 6-9
 Muxed mode and loopback tests 8-10

N
 Navigating the menu tree 3-5
 NC (Network Control) Address parameter 4-28
 NC (Network Control) Mode parameter 4-28
 NC (Network Control) Override parameter 4-27
 NC (Network Control) Port parameter 4-30
 NC (Network Control) Port Rate parameter 4-27
 NC (Network Control) Restoral parameter 4-29
 NC (Network Control) Type parameter 4-30
 NC Address
 remote 4-38
 setting remote 4-38
 NC Address parameter
 finding and changing remote 3-10
 remote 4-37
 NC ATTACHED message B-3
 NC IN and NC OUT connectors 6-3
 NC IN connector 2-11
 NC LED 3-3
 NC OUT connector 2-11
 NC Override parameter 4-6
 NC Retrans (Network Control Retransmit)
 parameter 4-29
 NCCF
 and NetView 9-5
 NCP (see Network Control Program)
 Nest
 feature 1-9
 NetView
 and DualVIEW 4-63
 circuit type 4-65
 commands 4-64
 control and tributary devices 9-3
 dual management with NMS 6-31, 6-32
 monitoring and testing 9-6
 primary and secondary devices 9-3
 Primary, Tributary, Secondary, Control
 devices 4-64
 NetView address 4-63
 NetView and LPDA 4-63
 Netview Ports parameter 4-65
 Network applications
 planning (SDC) 7-4
 Network Communications Control Facility
 (NCCF) 9-5
 Network control and second-tier devices 4-29
 Network Control Program
 modifying
 Network Function field (MLS) 9-12
 Network Function parameter (see Nwk Fnc)
 Network management
 alternate-line failure 4-61
 and circuit configuration 6-3
 and compression 7-8
 and DDS-I service 6-4
 and dial modifiers 4-53
 and Reserved type devices 4-30
 and RFP 3-11
 and SDC 1-4, 7-3
 and testing 8-6
 cable connection 2-5
 cabling 2-11
 changing configurations 4-6
 configuration 7-9
 connectors 6-3
 data formats 10-5
 dial modifiers 4-57
 feature 1-8
 in restoral, with rate adaptation (example) 6-41
 interruptive 7-8
 messages 5-13
 NC Override parameter and configuration 4-6
 NetView and DualVIEW 4-63
 non-interruptive 4-19, 7-8
 non-interruptive (example) 6-22
 non-interruptive and 64k CC 6-13
 polling 4-29
 secondary channel modes 4-49
 second-tier devices 6-26
 Network Management System (NMS) 6-3
 NETWORK MESSAGE category 5-13
 Network timing (figure) 6-47
 NMS (See Network Management System)
 NMS connection 2-11

NO A/B IF NV P2 message [B-3](#)
 NO CH2 WITH MSU message [B-3](#)
 NO LBER 64k NORM message [B-3](#)
 NO NV P2 IF A/B message [B-3](#)
 NO SEAL CURR x message [B-2](#)
 No Sealing Current alarm [5-6](#)
 Non-interruptive network management [7-8](#)
 Normal mode [4-18](#), [4-49](#)
 and DDS-I [6-4](#)
 Novell IPX environment [7-5](#)
 Novell WANVisible Network Manager [1-8](#)
 NPDA [9-4](#)
 MLS and TRT tests [9-6](#)
 NRZ and NRZI, P3 Format parameter (SDC) [4-69](#)
 NSC alarm [5-6](#), [B-2](#)
 Number Of Blocks Received field (TRT) [9-15](#)
 Number of Blocks...Errors field (TRT) [9-15](#)
 Numbers, selecting [3-5](#)
 NV (NetView) Ports parameter [4-65](#)
 Nwk Fnc (Network Function) parameter [4-64](#)

O

OFCC alarm [5-6](#), [B-2](#)
 Off-hook [4-52](#)
 OOF1 alarm [5-6](#), [B-2](#)
 OOF2 alarm [5-6](#), [B-2](#)
 Operation parameter [4-65](#)
 Opmode parameter (CONFIG DUALVIEW category) [4-64](#)
 Opmode parameter (MODIFY DSU category) [4-8](#)
 Optimizing performance (SDC) [7-4](#)
 OPTION key [3-5](#)
 Orange LED [3-3](#)
 Ordering features (table) [10-6](#)
 Originate end of leased-line link [4-69](#)
 Originate end of leased-line link (SDC) [4-69](#)
 OS alarm [5-7](#), [B-2](#)
 OSY alarm [5-7](#), [B-2](#)
 OUT FR 64k CC message [B-2](#)
 OUT FR DDS1 x message [B-2](#)
 OUT FR DDS2 x message [B-2](#)
 Out of Frame 64k CC alarm [5-6](#)
 Out of Frame Code, Age field (MLS) [9-8](#)
 Out of Frame Line 1 alarm [5-6](#)
 Out of Frame Line 2 alarm [5-6](#)
 OUT OF SERV x message [B-2](#)
 Out of Service alarm [5-7](#)
 Out of Service Code, Age field (MLS) [9-8](#)
 Out of Sync alarm [5-7](#)
 OUT SYN DSU message [B-2](#)
 Out=xxx message [8-16](#)

P

P1 NOT IN MSU message [B-3](#)
 P2 MUST = CH2 message [B-3](#)
 P3 Format parameter [4-69](#)
 P3 parameter [4-66](#)
 P3 Rate parameter [4-67](#)
 Packet window size [7-5](#)
 Packet window size and throughput [7-5](#)
 Parity
 setting port to match DTE [4-21](#)
 Password
 changing [4-35](#)
 Password entry steps [4-34](#)
 Password functions [4-34](#)
 Password parameter [3-5](#), [4-6](#), [4-34](#)
 Password Time-out parameter [4-34](#)
 Pattern parameter [8-14](#)
 Pause Dly (Delay) parameter [4-53](#), [4-56](#)
 Pause while dialing [4-56](#)
 PBX and dialing [4-53](#)
 Permissive jack [4-54](#)
 PHONE NUMBER category [4-57](#)
 Phone number characters [4-52](#), [4-57](#)
 Phone numbers, changing [4-59](#)
 Phone numbers, linking [4-60](#)
 Pins
 on connector cable [2-5](#)
 Pn (Port n) Data parameter [4-21](#)
 Pn 140 (Port n Circuit 140) parameter [4-25](#)
 Pn ASD (Port n Automatic Stream Disconnect) parameter [4-26](#)
 Pn ASD Delay parameter [4-26](#)
 Pn ASD Restore (Port n ASD Restore) parameter [4-26](#)
 Pn CTS (Port n Clear To Send) parameter [4-24](#)
 Pn DCD (Port n Data Carrier Detect) parameter [4-22](#)
 Pn DSR (Port n Data Set Ready) parameter [4-23](#)
 Pn DTR (Port n Data Terminal Ready) parameter [4-23](#)
 Pn Intfce (Port n Interface) parameter [4-25](#)
 Pn RTS (Port n Request to Send) parameter [4-22](#)
 Pn RTS/CTS (Port n Request To Send/Clear To Send) parameter [4-24](#)
 Point-to-point (muxed) DDS-II SC (example) [6-12](#)
 Point-to-point circuits
 DualVIEW [4-64](#)
 Point-to-point circuits, Bitstealing (example) [6-8](#)
 Point-to-point DDS-I applications
 Normal mode [6-4](#)
 Point-to-point DDS-II SC (example) [6-11](#)
 Point-to-point digital SLR (example) [6-31](#)
 Point-to-point SW 56 restoral (example) [6-34](#)

Polling by network manager 4-29
 Polling in multipoint applications 6-7
 Pool, restoral 4-50
 Pool, restoral (example) 6-31
 Port 3 clock rate (SDC) 4-67
 Port 3 clock rate in restoral (SDC) 4-67
 Port 3 Format parameter 4-69
 Port 3 parameter 4-66
 Port 3 Rate parameter 4-67
 Port 3 rates, leased-line 4-67
 Port 3 rates, restoral-line 4-67
 Port 3 throughput (SDC) 5-11
 Port sharing
 see Channel sharing
 PORT STATUS category 5-10
 Port timing, selecting 4-21
 Port-to-channel mapping 4-10
 and time-division multiplexing 6-14
 examples 4-12, 6-15
 guidelines 4-11
 operation 6-15
 Power cord
 plugging in 2-12
 Power cord connection 2-5
 Power failure and configuration (saving) 4-6
 Power requirements 10-5
 Power-off, Age field (MLS) 9-8
 Power-up
 testing alternate line at 4-62
 PR message-suffix B-1
 Primary device (NetView) 4-64, 9-3
 Priority
 and channel sharing 6-20
 Private-wire circuits and NetView 4-65
 Programmable jack 4-54
 Prop (Propagation) Delay parameter 4-16
 PROTECTED message B-3
 PROTECTION category 4-34
 PSTN 4-40, 7-12
 PSTN Cleardown
 setting for external restoral 6-37
 PSTN parameter 4-54
 PSW Time (Password Time-out) parameter 4-34
 P-to-CH (Port-to-Channel) parameter 4-10
 Public switched telephone network (PSTN) 7-12
 Pulse dialing 4-53
 punctuation marks as dial modifiers 4-57

R

Rack-mounting multiple 3512s 1-9
 Radio Frequency Interference (RFI) A-1
 Rate adaptation
 advantages 6-12

and MP-Mux (example) 6-24
 feature 1-7
 in external restoral (example) 6-41
 in LDM tail circuit (example) 6-44
 MPM-Mux 4-19
 MPS-BitS 4-20
 Rate and compression 4-67
 Rate negotiation 4-50
 Rate negotiation, automatic (SLR) 6-30
 Rates available
 bitsteal 10-5
 derived secondary channel 10-5
 multipoint 10-4
 point-to-point 10-4
 SDC 10-5
 Rates available (restoral) 4-50
 Received Line Signal Detector field (MLS) 9-10
 Receiver properties 10-5
 Red LED 3-3
 Redialing after a failed call 4-60
 Redialing to re-establish restoral connection 4-54
 Reinitialization, Age field (MLS) 9-8
 Remote Addr (Address) parameter (RMT FRONT PANEL category) 4-37
 Remote Addr (Address) parameter (SET REMOTE ADDRESS category) 4-38
 Remote configuration
 overview 3-2
 Remote configuration of 3512s 1-4
 Remote configuration with RFP 3-6
 Remote digital loopback signaling 4-25
 Remote Front Panel (RFP)
 feature 1-4
 setting Dial Line Monitor 4-62
 Remote Front Panel (See RFP)
 feature 3-6
 Remote Loop 2 4-25
 Remote Loop 2 test 8-9
 Remote NC Address
 finding 4-39
 Remote serial number 4-38
 Remote Terminal alarm 5-7
 Repair of 3512 2-4
 Request To Send field (MLS) 9-10
 Reserved type device 4-30
 Rest (Restoral) Peer parameter 4-69
 Rest (Restoral) Rate parameter 4-50
 Rest (Restoral) Type parameter 4-45
 REST CH2 MUST=0 message B-3
 REST IN PROGRESS message B-3
 Restoral
 analog 4-52
 and network control 4-29
 and TDM 4-40

answering a call 4-48
 automatic initiation 4-46
 bandwidth expansion 4-66
 cable connection 2-5
 cabling 2-7
 call 4-52
 call answering 4-48
 channel rate options 4-51
 data compression 4-67
 data rate and compression 4-67
 digital switched-56 kbps 4-55
 digital, configuration 4-55
 DTR signal 4-43
 error messages (table) B-3
 external (A/B) 1-7, 4-40, 6-36
 external (SDC) 7-11
 external cabling example 2-7
 external, example 6-32
 external, tips and considerations 6-36
 features 1-6
 from network manager with MDMCTL 9-5
 holding SW 56 line 4-56
 initiating and terminating 4-42
 integral 4-40
 integral analog 6-30
 integral analog feature 1-6
 integral digital 6-34
 integral SLR 4-40
 integral, setting 4-42
 interoperation with 326X SDC 4-69
 phone numbers 4-59
 pool 6-30, 6-35
 pool (example) 6-31
 re-initiating within time limit 4-54
 rules of operation 6-28
 SDC 7-12
 SDC (HDLC framed data) 4-66
 SDC and interoperation with 326X SDC 4-69
 specifying analog or digital 4-45
 SW56 device 6-36
 tests supported 8-6
 timing recommendations 6-28
 using RFP 3-11
 RESTORAL CONFIG category 4-49
 RESTORAL METHOD category 4-42
 Restoral pool
 rates 4-50
 Restoral Port 3 parameter 4-67
 Restoral Port 3 Rate parameter 4-67
 RESTORAL STATUS category 5-12
 RestP3 parameter 4-67
 RestP3 Rate parameter 4-67
 Retrain parameter 4-55
 Retrain parameter (OTHER category) 8-17
 Retransmitting secondary-channel data to downstream devices 4-29
 RFI limits, 3512 10-2
 RFI requirements and ferrite cylinder 2-6
 RFP
 and Link Problem Determination Aid (LPDA) 3-11
 and loopbacks 4-37
 and network management 3-11
 and restoral operation 3-11
 and tests 3-12
 feature 1-4, 3-6
 limits on remote access 3-13
 RFP categories and parameters (figure) 3-7
 RFP messages (table) B-4
 RFP session
 beginning, ending 3-8, 4-37
 interrupting and resuming 3-9
 RFP-escape mode 4-38, 4-39
 RLSD Lost field (TRT) 9-15
 RLSD Lost, Age field (MLS) 9-8
 RMT FRONT PANEL category 4-37
 Routers, linking with compression 7-9
 RS232 electrical interface 4-25
 RT alarm 5-7, B-2
 RT non-latching loopback test 8-12
 RT or LTCH DSU parameter 4-15
 RTS and external restoral 4-48
 RTS signal 4-22
 RTS signal in response to CTS 4-24
 RTS signal, configuring 4-22
 RTS/CTS handshaking sequence 4-22
 Rx Link Util parameter 5-12
 RxTP parameter 5-11
 RxTP parameter and SDC 7-4

S

Scrmlbr (Scrambler) parameter 4-10
 Scrolling through the menu tree 3-5
 SDC
 64k CC loopback test 8-13
 and channel sharing 7-2
 and delay 7-7
 and fractional T1 7-9
 and LAPM 7-8
 and legacy applications 7-8, 7-10
 and network management 7-3
 and TDM 7-8
 applications planning 7-4
 enabling and disabling 4-66
 example 7-9
 external restoral 7-11, 7-12
 feature 1-4

flow control 7-3
 HDLC frames 7-3
 inband signaling 7-3
 interoperation 4-69
 IPX Burst Mode NLM 7-5
 LAN-to-LAN 7-10
 muxed mode 6-9
 point-to-point applications 7-2
 point-to-point restoral link (example) 7-12
 tests 7-3
 throughput 7-4
 timing 7-3
 SDC (Synchronous data compression) 4-66
 SDN alarm 5-7, B-2
 Secondary channel
 in restoral 4-29
 Secondary channel and DTE parameter 4-49
 Secondary channel and RFP 3-7
 Secondary device (NetView) 4-64, 9-3
 Security and passwords 4-6
 Selecting remote device by serial number 4-38
 Self-test, automatic 2-13
 Ser # (Serial Number) parameter (SET REMOTE ADDRESS category) 4-38
 Ser # (Serial Number) parameter (SRCH REMOTE ADDR category) 4-39
 Ser # parameter (NETWORK MESSAGE category) 5-13
 Serial number 3-2
 Serial Number field (MLS) 9-12
 Service provider regulations 2-3
 Service type, display 5-4
 SET REMOTE ADDR category 4-38
 Setting factory defaults 7-9
 Setting the time 4-36
 Sig Qual (Signal Quality) parameter 5-12
 Signal Level 5-8
 Signals
 remote digital loopback 4-25
 remote loop 2 4-25
 Single Line Restoral (SLR) feature 1-6
 Single-channel operation (SDC) 7-2
 Slave addresses
 specifying 4-31
 Slave channel rates in multipoint applications 6-17
 Slave device configuration 4-20
 Slave Down alarm 5-7
 SLAVE DOWN message B-2
 SLAVE y Dn message B-2
 Slips 6-26, 6-49
 SLR automatic rate-negotiation 4-50
 SNA (See Systems Network Architecture)
 Software revision-level display 5-13
 Solicited MLS command 9-5

Speed Conversion
 setting for external restoral 6-37
 Speed field (MLS) 9-12
 Speed in Use - NetView field (TRT) 9-15
 SRCH REMOTE ADDR category 4-39
 ST LED 3-3
 State parameter 5-12
 Station Addr (Address) parameter 4-63
 Statistical multiplexer 6-8
 Status
 display 3-3
 line, from NPDA 9-6
 messages (table) B-5
 Stop bits 6-50
 Streaming Detected field (MLS) 9-10
 Streaming terminal 4-26
 Surge suppressor for lightning protection 1-2
 SW 56
 and restoral 4-40
 feature 1-6
 holding connection 4-56
 pause delay dial modifiers 4-56
 restoral (example) 6-34
 restoral cabling 2-7
 SW 56 integral digital restoral (example) 6-35
 SW 56 restoral 4-55
 Switched digital restoral 2-7
 Switched-56 restoral 4-55
 SWREV parameter 5-13
 Symbols in menu tree 3-4
 Synchronizing timing with crossover cable 4-21
 Synchronous data compression (SDC) 4-66
 feature 1-4
 Synchronous/external timing
 Timing
 synchronous/external (figure) 6-49
 Synchronous/internal timing 6-48
 Synchronous/station timing (figure) 6-50
 Sys Status parameter 4-17
 System Status
 monitor remote devices 6-6
 Systems Network Architecture 7-10

T

T/R LED 3-3
 T1
 access with SDC 7-11
 and SDC 7-9
 and tail circuit 6-44
 Tail circuit
 and TDM 6-26
 and time-division multiplexing 6-14
 application example 6-44

configuring 6-44
 timing synchronization 6-49
TDM
 (see Time-division multiplexing)
 and restoral 4-40
 and SDC 7-8
 see Time-division multiplexing
Telco Jack parameter 4-54
TELCO LL message B-2
Telco Loops parameter 4-47
TELCO RT message B-2
 Telephone cable connections 2-6
 Telephone company equipment 2-3
 Telephone number, Motorola Codex Customer Administration 2-3
 Telephone service provider requirements A-4
Term Message parameter 5-13
Terminate Timer parameter 4-44
Test
 and RFP 3-12
 features 1-8
 LCD (front-panel) lamp 4-36
 of alternate line 4-61
Test Control field (MLS) 9-10
TEST IN PROGRESS message B-3
 Testing and troubleshooting (see Troubleshooting)
Tests
 BER, running 8-5
 bit error rate (BER) 4-3
 CSU (LL) Loopback test 8-12
 Device Bit Error Rate (DBER) 8-15
 device bit error rate (DBER) 4-4
 DSU (LLB) latching loopback (SDC) 8-13
 DSU (RT) loopback 8-12
 during RFP session 4-37
 keypress sequence (table) 8-6
 Line 4-3
 Line Bit Error Rate (LBER) 8-15
 Local Loopback (Loop 4) 8-11
 loopback 8-7
 loopbacks and MP-Mux 8-8
 Loopbacks, running 8-5
 Pattern 4-3
 Remote Loop 2 8-9
 SDC 7-3
 Tests supported in restoral 8-6
Throughput 7-4
 adjusting with rate adaptation 6-9
 measurement, SDC 7-4
 Port 3 (SDC) 5-11
Tiered application 4-30
Tiers 6-11
Time parameter 4-36
Time-division multiplexing (TDM) 4-19
 and channel sharing 6-19
 and restoral 4-40
 and tail circuit 6-26
 applications (table) 6-17
 feature 1-5
 overview 6-14
 with tail circuit (example) 6-27
Timing
 and SDC 7-3
 asynchronous (figure) 6-50
 data, parity, start, and stop bits 4-21
 DCE-DCE synchronization 4-21
 device and port 6-46
 DTE 4-21
 in restoral (SDC) 4-67
 internal (figure) 6-47
 network (figure) 6-47
 port, selecting 4-21
 restoral, recommendations 6-28
 SDC 4-67
 selecting source 4-14
 synchronous/internal 6-48
 synchronous/station (figure) 6-50
 types available 10-3
 Timing out when waiting for answer 4-56
Timing parameter (MODIFY DSU category) 4-14
Timing parameter (RESTORAL CONFIG category) 4-49
 To DDS parameter 4-44
 Tone dialing 4-53
TpDlyMin (Throughput Delay Minimization) parameter 4-68
TpDlyMin parameter
 SDC 7-7
 Traffic management 4-68
 Training multipoint slaves 4-13
 Training sequence
 in MP-Mux mode 6-17
 Transmit and Receive Test (TRT) (figure)
 Transmit and Receive Test (TRT) command 9-4
 Transmit level and jack type 4-54
 Tree structure (menus) 3-4
 Tree structure, menu (figure) 4-5
 Tributary device (NetView) 4-64, 9-3
 Trm Tmr (Terminate Timer) parameter 4-44
Troubleshooting
 64k CC and unintended loopbacks 8-13
 accidental loopbacks in 64k CC mode 4-8
 action guide (table) 8-2
 alarms 5-5
 automatic retrains 4-55
 automatic self-test 2-13

call collisions [4-43](#)
data interruptions (example) [6-5](#)
delay and SDC [7-5](#)
DualVIEW [9-4](#)
Echo Cancel in call setup [4-55](#)
electrical interface [2-8](#)
electrical interference [2-13](#)
flashing lights on front panel [3-3](#)
from an NMS [8-6](#)
Hold Dial Line [4-56](#)
Idles activating System Status [4-17](#)
inband signaling [4-20](#)
keypress sequence for tests (table) [8-6](#)
line problems [5-8](#)
line quality [4-3, 9-13](#)
loopback patterns [8-14](#)
multi-tier configurations [4-28](#)
network manager time-out [4-28](#)
no data transmission [4-17](#)
NPDA [9-4](#)
Originate and Answer ends of compression
link [4-69](#)
overview [8-2](#)
port interference [8-17](#)
port timing source, selecting [4-21](#)
power cycle for self-test [8-4](#)
power supply [2-5](#)
preventing loopbacks [4-10](#)
quick checks [8-4](#)
remote devices, with RFP [3-8](#)
restoral holding or inactive [5-12](#)
RFI [2-6](#)
RFP and automatic restoral [3-11](#)
RFP FAIL NO RESP message [3-8](#)
running BER test [8-15](#)
running loopback tests [4-3, 8-7](#)
running tests [4-3](#)
SDCs [8-4](#)
secondary-channel performance [6-13](#)
sequence [8-3](#)
service-provider equipment [2-4](#)
slips [6-26](#)
ST LED steady red [8-4](#)
Time setting and power failure [4-6](#)
training failure [6-24](#)
training on high-delay lines [4-16](#)
using CQMS [5-8](#)
TRT (see Transmit and Receive Test)
TRT command [9-4](#)
Tx Level parameter [5-12](#)
Tx Link Util parameter [5-11](#)
TxTP parameter [5-11](#)
TxTP parameter and SDC [7-4](#)
Type of Line field (MLS) [9-12](#)

Type parameter (CONFIG DUALVIEW
category) [4-65](#)
Type parameter (PATTERN TESTS category) [8-14](#)
Type-Model field (TRT) [9-15](#)
Type-Model, Test Mode field (MLS) [9-12](#)

U

Underruns [7-7](#)
Underruns (compression mode) [4-68](#)
UNK alarm [5-7, B-2](#)
UNKNOWN SLAV message [B-2](#)
Unknown Slave alarm [5-7](#)
Unsolicited MLS command [9-5](#)

V

V.22 algorithm for data conversion [4-21](#)
V.32 and V.32 bis modulation mode compliance [1-
6](#)
V.32 mode and disconnect signaling [4-54](#)
V.35 algorithm
 compression [4-66](#)
 when to use [4-25](#)
V.35 electrical interface [2-13, 4-25, 10-3](#)
 and port rates [2-8](#)
 and SDC [7-2](#)
V.FAST modem interoperation (SDC) [7-12](#)
Ventilation [2-4](#)
View Phone # parameter [4-58](#)

W

WANVisible Network Manager [1-8](#)
Window size and throughput [7-5](#)
Worksheets, configuration [C-1](#)