

V.3400 Manual

For Sales or Service Contact:

Data Connect Enterprise
301-924-7400

[http://www.data-connect.com/
sales@data-connect.com](http://www.data-connect.com/sales@data-connect.com)

Appendix A Specifications

Size

Width 7.0 inches (17.78 cm)
Depth 10.5 inches (26.67 cm)
Height 2.25 inches (5.72 cm)
Weight 2 lbs. 13 oz. (1.28 kg)
Front Panel 32 ASCII character LCD

Environmental Conditions

Temperature:

Operation +32° F to +122° F
(0° C to +50° C)

Storage -40° F to +158° F
(-40° C to +70° C)

Humidity: 0 to 95% relative humidity: noncondensing

Power Requirements

The modem can be ordered for operation with one of three power input options.

Voltage: 115 Vac $\pm 10\%$; 50-60 Hz,
230 Vac $\pm 10\%$; 50-60 Hz, or
12 to 60 Vdc

Power consumption: 14 watts

Telephone Line

Balanced 600 ohm type 3002 or equivalent 16 dB nominal loss,
frequency translation up to ± 10 Hz

Digital Interface

Conforms to EIA-232D and CCITT V.24

Modem Data Rates

300, 1200, 2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, and 28800 bps.

Fax Rates

14400, 12000, 9600, 7200, 4800, 2400, 1200, and 300 bps

Modulations

V.34, V.32, V.22, V.21, V.27 bis, V.29, Bell 103, V.17, V.33, V.22 bis, V.32 bis

Fax Modulation

Modulation	Speed
V.21 channel 2	300 bps
V.27 ter	2400 bps
V.27 ter	4800 bps
V.29	7200 bps
V.17	7200 bps
V.17	7200 bps with short train
V.29	9600 bps
V.17	9600 bps
V.17	9600 bps with short train
V.17	12000 bps
V.17	12000 bps with short train
V.17	14400 bps
V.17	14400 bps with short train

Internal Transmitt Clock Frequency

Selected bit rate \pm 0.01%

External Transmitt Clock Frequency

Selected bit rate \pm 0.01%

Transmitt Output Level

0 to -30 dBm, selectable; PSTN operation is programmable or permissive.

Operation

4-wire, full-duplex, leased (private) line;
2-wire, full-duplex, leased (private) line or PSTN

Carrier Detect Level

Dynamic to -43 dBm

Telco Connection

8-pin modular jack, dial and private lines

Testing

511 PN pattern (per V.52) V.54 remote loopback control

Line Equalization

Automatic adaptive

RTS/CTS Delay

From 0 ± 2 ms to 90 ± 2 ms, user selectable in 10 ms increments
(The default is 0 ms.)

Link Layer Protocols

V.42/V.42 bis error correction and compression protocol
MNP Levels 2-5 error correction and compression protocol

Appendix B Phone Jack Descriptions

LINE PIN FUNCTIONS

The 8-pin LINE jack connects to the PSTN dial-up lines. Pin Functions are:

Pin	Function
1, 2	Not used
3 MI	Switch hook on exclusion key telephone not used in some systems
4 R	Rings side of telephone line
5 T	Tip side of telephone line
6 MIC	Switch hook on exclusion key telephone
7 PR	Data jack program position
8 PC	To data jack program resistor

AUX PIN FUNCTIONS

The 8-pin AUX jack allows a standard telephone or a leased line to be connected to the modem. The pin functions for this jack are:

Pin	Function
1, 2	Transmit pair - 4-wire leased line or Tx and Rx for 2-wire leased line
4, 5	Ring and tip (respectively) of telephone line for a telephone
7, 8	Receive pair - 4-wire leased line

Appendix C Strap Options

STRAP OPTION SELECTION

Modem configuration is controlled by front panel pushbuttons and the LCD, AT or V.25 bis commands, and hardware option straps located on the pc board. Normally straps do not have to be changed. If a change is required, remove the modem cover to access the option straps. The strap diagrams on the following pages indicate the factory settings.

Removing the Cover

Warning

Disconnect ac power before removing the cover. Although dangerous voltage levels are not exposed, disconnecting power ensures an electrical shock hazard is not present.

Place the unit on its side on a flat surface. To disengage the lock prong from the lock clip insert a medium size flat screwdriver blade in one of the latch slots. DO NOT PUSH the screwdriver but lightly pry the handle away from the unit as illustrated in Figure C-1. Assist removal by pushing the cover from the chassis with your fingers on the unit rear edges. Repeat this procedure with the remaining three latch slots.

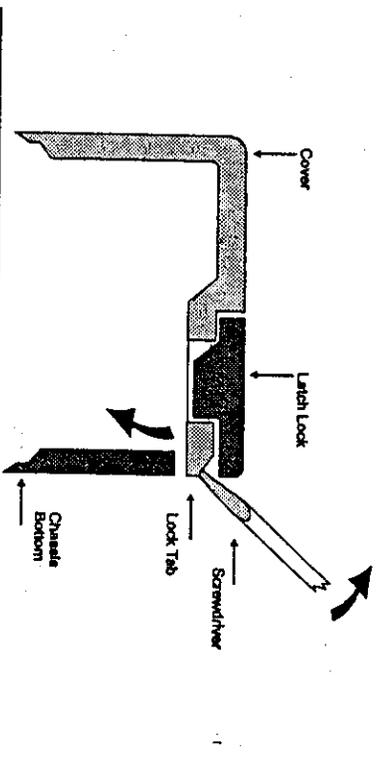


Figure C-1 Cover Removal

Figure C-2 shows strap locations and Figure C-3 shows typical strap configurations.

To replace the cover align the lock clips, rear guide grooves, and front lock tabs. Press the cover in place until the lock clips engage the lock prongs.

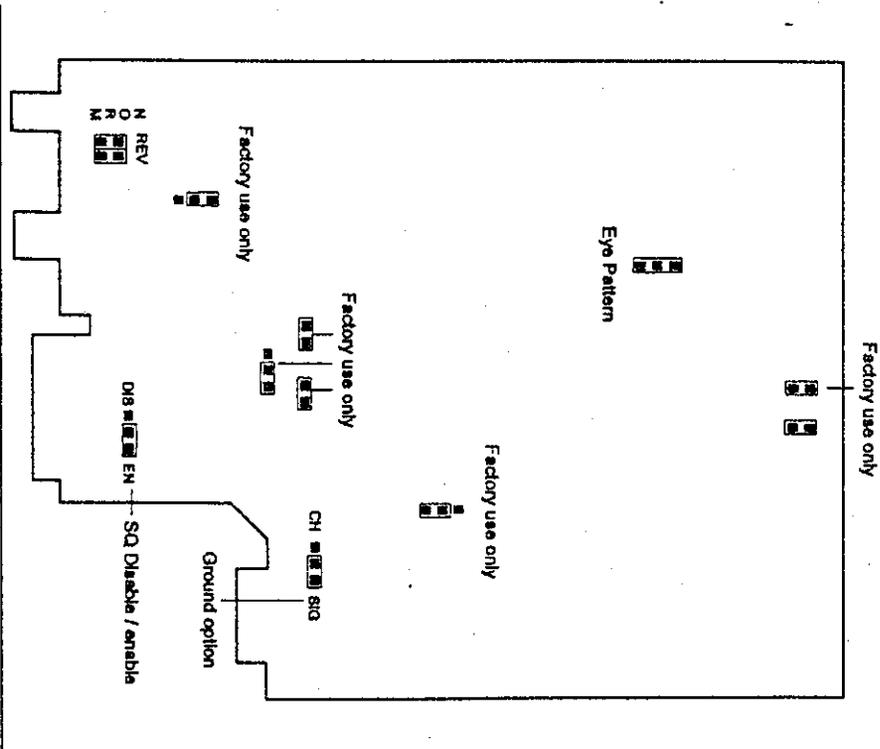


Figure C-2 Strap Locations

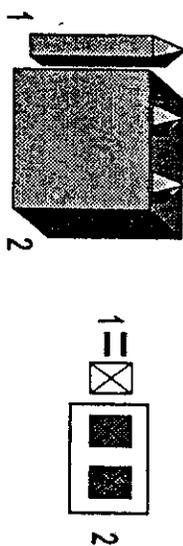
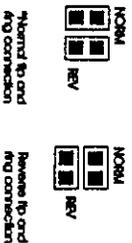


Figure C-3 Typical Strap Configuration

HARDWARE STRAPS

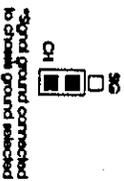
Tip and Ring Polarity

Some telephones are tip and ring polarity sensitive. If a dial tone is detected after dialing, reverse these two straps.



Ground Option Strap

Signal ground is normally connected to chassis ground. If interference exists, isolate signal ground from chassis ground.



* factory setting

QM Disable Option

When enabled, the Quality Monitor (QM) output is connected to the EIA-232 (pin 11) interface. Disabling it disconnects the QM output. Refer to Chapter 4 and Table 2-1 for more QM information.



*QM output (disabled) not connected to EIA-232 Interface

QM Normal/Inverted

This strap selects normal or inverted QM output.



*QM output is normal (QM strap going high indicates poor signal quality)

*factory setting

Appendix D Fault Isolation Procedure

FAULT ISOLATION PROCEDURE

This diagnostic test procedure and the indicator lights built into the modem allow a rapid check of the terminals, modems, and telephone line interface. This procedure can be used to verify normal system operation and to isolate faulty equipment in case of failure.

Ensure the units are turned on and remote loops are enabled at both sites before starting the fault isolation procedure.

Note

In some cases the observer must distinguish between rapid LED blinking and steady on in tests.

Telephone Interface

1. Connect the modem to the dial-in line via the LINE jack on the back panel.

2. If the dial line is installed with a standard permissive data jack, connect a standard telephone to the AUX jack on the back panel of the modem and use the standard telephone procedure.

If the dial line is installed with an exclusion key telephone wired for data set controls the line, connect an exclusion key telephone to the RJ36X jack and use the exclusion key phone procedure.

Standard Phone

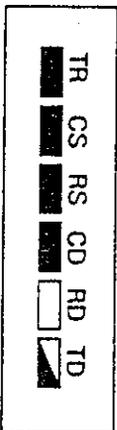
1. Configure the modem to V.34 28800 IDLE mode by pressing the TALK/ DATA button, and then lift the receiver. No dial tone is heard. Press the TALK/DATA button to display V.34 IDLE and wait for dial tone.

2. Dial out; the phone should operate normally.

MODEM AND TELEPHONE LINE CHECK

Step 1

- a. Configure the modem for LOCAL ANALOG LOOP WITH TEST PATTERN. This terminates the local modem telephone lines into 600 ohms and connects the local modem transmit output amplifier back to its own receiver through the AGC. Transmit input data from the terminal is inhibited and is substituted with a V.52 test pattern.
- b. This test checks operation of the local modem modulator and demodulator circuitry and should be attempted at both local and remote sites if operators are available.
- c. When random errors are present, the TEST PATTERN ERRORS display counts receive errors.
- d. If the circuitry is working properly, the front panel indicators show the following:

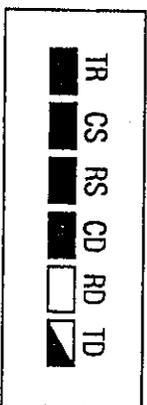


- e. Configure the modem for LOCAL ANALOG LOOP to switch the transmitter back to its normal data input.
- f. If the transmit data input is in a mark hold condition, both the TD and RD indicators should remain off.
- g. If the transmit data input is in a space hold condition, both the TD and RD indicators should come on. All other indicators should remain the same.
- h. If the indicators are correct, the modem is probably operating correctly.
- i. If the preceding tests were not successful, call Technical Services.

Step 2

This step determines the performance of the local and remote modems and the telephone circuits. It also determines each modem's ability to receive a transmitted signal from the other site, properly equalize and decode the signal and then loop this regenerated signal into the transmitter for transmission back to the other modem. This test applies to both leased line and dial line operation.

- a. Configure the local modem for REMOTE DIGITAL LOOP WITH TEST PATTERN. This signals the remote modem to go into digital loop. The remote modem receives and then retransmits the data back to the local mode. If the digital bilateral loop is enabled at the remote, the remote DTE is looped back to itself.
- b. An alternative to the above procedure is to request the operator at the remote modem to configure his modem for LOCAL DIGITAL LOOP. Configure the local modem for TEST PATTERN. The remote modem receives and retransmits the data back to the local modem.
- c. The TEST PATTERN ERRORS display will count received errors.
- d. At the local modem, the indicators should be:



- e. To further test the modem and communications link, reverse the system loopback. First exit the existing loopback test. Reverse the roles of the local and remote modems and repeat step two.

Note

If the bilateral digital loop is enabled at the local modem, the DTE interface is looped to itself and permits the DTE to check the interface circuitry as well as itself.

Appendix E Command Index and Defaults

GENERAL

This reference guide provides asynchronous command characters and their meanings. Pages listed provide initial information on the commands.
S-registers are listed as a cross reference.

Table E-1. AT Commands

Command	Page	S-Reg	Description
AT	5-3		Attention code - command prefix
A/	5-5		Repeat last command
+++	5-21	S2, S12	Escape sequence (pause, + + +, pause)
A	5-17		Answer
D	5-13, 9-4		Dial
T	5-14	S14	Tone dial *
P		S14	Pulse dial
.		S8	Long pause (2 sec or S8 value)
W	5-15	S7	Wait for 2nd dial tone (S7 value)
!			Flash switchboard
R			Switch to answer mode after dialing
:			Return to command mode after dialing
@	5-16		Wait for 5 seconds of silence
Sn			Dial stored command line
B	5-21	S14	Local character echo off
E1			Local character echo on *
F	5-22		Not supported - returns ERROR
F1			Disables online character echo

* factory default

Note

The * in the command is part of the command; the * in the description indicates the default.

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
H	5-22		Hang up †
H1			Forces modem off hook †
H2		S14	Set H command to V.32 * †
H3			Set H command to fast †
I	5-23		Request product code
I1			Request EPTOM CRC value
I3			Request product version
I4			Request capability code
I5			Disconnect reason
L or L1			Speaker volume low
L2			Speaker volume medium *
L3			Speaker volume high
M		S22	Speaker off
M1			Speaker off when carrier is present
M2			Speaker always on
M3			Speaker off when dialing and carrier is present
O	5-24		Restore data mode (after escape) †
O1			Retrain and restores data mode (after escape) †
Q	5-7	S14	Response displays on *
Q1			Response displays off
Q2			Response displays on in originate mode only
Sn?n	10-3		Read value in register n (decimal)
Sn?n			Read value in register n (hexadecimal)
Sn=v			Set v (value) in register n (decimal)
Sn=v			Set v (value) in register n (hexadecimal)
Sn=#=v	10-4		Set single bit value in register n, # = bit position 0-7, v = bit value 1 or 0
V	5-6	S14	Response codes
V1			Response messages *

*factory default
† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
W	5-7		Negotiation display disabled *
W1			Negotiation display enabled
W2			Displays DCE link rate
X		S22	CONNECT (code 1), for all speeds, no dial tone or busy signal detection
X1			Appropriate connect codes for rate, no dial tone detection
X2			Wait for dial tone (appropriate connect codes)
X3			Detect busy signal (appropriate connect codes)
X4			Wait for dial tone, detect busy signal (appropriate connect codes) *
Y	5-24	S21	Long space disconnect disabled
Y1			Long space disconnect enabled *
Z	5-41		Reset to user option set #1 †
Z1			Reset to user option set #2 †
&C	5-18	S21	DCD always on *
&C1			DCD on while carrier is present
&C2			DCD off 5 seconds after disconnect
&C3			DCD follows remote RTS
&D	5-19	S21	DTR ignored *
&D1			DTR recalls command mode
&D2			DTR disconnects
&D3			DTR disconnects and resets modem to stored configuration
&F or &F1	5-40		Restore factory configuration 1 * †
&F2			Restore factory configuration 2 †
&F3			Restore factory configuration 3 †
&F4			Restore factory configuration 4 †
&F5			Restore factory configuration 5 †
&F6			Restore factory configuration 6 †

*factory default
† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
&P7	5-40		Restore factory configuration 7 †
&P8			Restore factory configuration 8 †
&P9			Restore factory configuration 9 †
&G	5-24	S23	No guard tone *
&G1			550 Hz tone
&G2			1800 Hz tone
&L	5-36	S27	Dial line * †
&L1		S32	Leased line 2-wire †
&L2			Leased line 4-wire †
&M	5-25	S27	Asynchronous dial / asynchronous data *
&M1			Asynchronous dial / synchronous data
&M2			Dial's stored number when DTR off / on transition is detected / synchronous data
&M3			Manual dial / synchronous data
&M4		S30	V.25 bis autodialer with BISYNC protocol / synchronous data
&M5			V.25 bis autodialer with SDLC protocol / synchronous data
&M6 †			V.25 bis async dial / sync data
&P	5-26	S22	39/61 pulse make / break ratio *
&P1			33/67 pulse make / break ratio
&R	5-20	S21	CTS normal operating state
&R1			CTS forced on *
&R2		S72	CTS follows DCD
&R9			CTS equals RTS
&S	5-18	S21	DSR always on *
&S1			DSR on when ready to accept data
&S2			DSR off for 5 seconds after disconnect
&S3			DSR follows off hook (OH)
&T	5-44, 7-2		Terminate current test †
&T1	7-3		Initiate analog loopback †

* factory default

† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
&T3	7-5		Initiate digital loopback †
&T4	7-6	S23	Grant remote commanded digital loopback * †
&T5		S23	Denies remote commanded digital loopback †
&T6	7-7		Initiate remote digital loopback †
&T7			Initiate self test remote digital loopback †
&T8	7-4		Initiate self test analog loopback †
&V	5-41		View configuration profiles *
&V1			Display received signal status
&V2			Display active profile
&W	5-39		Store current configuration to user option set #1 *
&W1			Store current configuration to user option set #2
&X	5-26	S27	Internal clock *
&X1			External clock
&X2			Receive clock
&Y	5-40		Powerup with user option set #1 *
&Y1			Powerup with user option set #2
&Y2			Display powerup option set
&Zn	5-41		Store dial string
%A	6-5	S64	Disable auto-reliable fallback
%An			Set auto-reliable fallback character to n (n = ASCII 1-127) †
%B	5-28	S69	Use DTE speed
%B1			300 bps max
%B2			1200 bps max
%B3			2400 bps max
%B4			4800 bps max
%B5			9600 bps unencoded max
%B6			9600 bps max
%B7			7200 bps max

* factory default

† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
%B8	5-28		12000 bps max
%B9			14400 bps max
%B10			Reserved
%B11			16800 bps max
%B12			19200 bps max
%B13			21600 bps max
%B14			24000 bps max
%B15			26400 bps max
%B16			28800 bps max *
%C	6-11	S56	Compression disabled
%C1			Compression enabled on transmit and receive data *
%C2			Compression enabled on transmit data only
%C3			Compression enabled on receive data only
%D	6-4	S62	Disable disconnect buffer delay *
%Dn			Set disconnect buffer delay in seconds n (n = 1-255)
%E	5-29	S60	Disable auto retrain
%E1			Enable auto retrain *
%L		S81	Disabled
%L1			Disabled *
%L2			1200 bps min
%L3			2400 bps min
%L4			4800 bps min
%L5			9600 bps unencoded min
%L6			9600 bps min
%L7			7200 bps min
%L8			12000 bps min
%L9			14400 bps min
%L10			Reserved
%L11			16800 bps min
%L12			19200 bps min

* factory default

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
%L13	5-29		21600 bps min
%L14			24000 bps min
%L15			26400 bps min
%L16			28800 bps min
%P=	5-43		Sets remote configuration security code to value entered after equal sign (0-99999999)
%P=D			Disabled
%P7			Displays remote configuration security code of local modem
%P=(blank)			Clears the security code *
%R	5-30	S53	Disable automatic rate adaption *
%R1			Enable automatic rate adaption low BER
%R2			Enable automatic rate adaption medium BER
%R3			Enable automatic rate adaption using high BER
%T	7-8		Transmit test pattern †
%T=	5-44		Followed by a remote configuration security code, establishes remote configuration †
%V	5-31		Display product revision level
%Z	5-32		Permissive (RJ11) * †
%Z1			Programmable (RJ45) †
VA	6-10	S63	Maximum block size of 64 characters
VA1			Maximum block size of 128 characters
VA2			Maximum block size of 192 characters
VA3			Maximum block size of 256 characters *
VB	6-11	S79	Transmit a break signal *
Vbn			Sets break length in 20 ms increments, n=1-255, default is 35 (700 ms)
VC		S60	Disable auto-reliable buffer *

* factory default

† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
VC1	6-11		Buffer data for 4 seconds or 200 characters
VG	6-8	S54	Disable modem port flow control *
VG1			Enable modem port XON/XOFF flow control
V	6-4	S72	Disable slaved DTE/DCE speed * (constant speed DTE on)
V1			Enable slaved DTE/DCE speed (constant speed DTE: off)
Vn	6-8	S59	Selects action when encountering a break
VK			Break option 0
VK1			Break option 1
VK2			Break option 2
VK3			Break option 3
VK4			Break option 4
VK5			Break option 5 *
VM	6-4	S70	V.42 fast detect data sequence disabled
VM1			V.42 fast detect data sequence enabled *
VN	6-5	S70	Normal mode
VN1			Direct mode
VN2			MNP only
VN3			MNP or normal
VN4			LAPM only
VN5			LAPM with normal fallback
VN6			LAPM with MNP fallback
VN7			LAPM with MNP and normal fallback *
VQ	6-6	S54	Disable DTE flow control
VQ1			Enable DTE XON/XOFF flow control *
VQ2			Enable CTS flow control to the DTE
VQ3			Enables bilateral CTS/RTS flow control
VQ4			Disable DCE flow control
VQ5			Enable DCE XON/XOFF flow control *
VQ6			Enable CTS flow control to the DTE

* factory default

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
VO7	6-6		Enable CTS flow control to the DTE
VR	5-19	S60	Ring indicate, blinks for ring and remains on for duration of call
VR1			Ring indicate, blinks for ring and turns off when call is answered *
VT	6-19	S58	Disable inactivity timer *
Vtn			Set inactivity timer to n (n = 1-255 minutes)
IV	5-7	S60	Disable protocol result codes *
IV1			Enable protocol result codes
IX	6-7	S54	No XON/XOFF characters to remove DCE *
IX1			Pass XON/XOFF characters to remove DCE
*AUn	5-16		Dial number stored at location n upon transition of DTR in command mode (n = 1-9)
*AS	5-27		Disable V.34 asymmetric bit rate
*AS1			Enable V.34 asymmetric bit rate
*CNk,n	5-41		Store phone number n in location x (x = 1-9)
*DA	5-32		Switches modem to talk mode * †
*DA1			Switches modem to data mode †
*DB	5-37		Manual dial backup operation *
*DB1			Automatic dial backup operation
*DG	7-9	S34	Disables bilateral digital loop *
*DG1			Enables bilateral digital loop
*PB	5-21	S29	Ignore pin 23 *
*EB1			Pin 23 transition causes DTE speed fallback
*FT	5-32	S29	Disable fast train *
*FT1			Enable fast train
*IC	5-32		Disregard incoming call
*LA	7-9	S34	Ignore pin 18 *
*LA1			DTE commanded LAL enabled
*LB	5-37		Return to leased line from dial backup †
*LC	5-33	S32	Line current disconnect disabled

* factory default

† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
*LC1	5-33		Short (8 ms) line current disconnect
LC2			Long (90 ms) line current disconnect
*LD	5-37		Manual dial backup *
*MM	5-27		Automode (modulation)
*MM1		V.21	Bell 103J
*MM2			Reserved
*MM3			Reserved
*MM4			Bell 212A
*MM5			V.22 bis
*MM6			V.27 bis 4-wire leased only
*MM7			Reserved
*MM8			V.29 4-wire leased only
*MM9			Reserved
*MM10			V.33 4-wire leased only
*MM11			V.32 bis
*MM12		V.34	
*ND	5-41		Displays the nine stored numbers
*NT	5-33	S29	AT command set disabled
*NT1			AT command set enabled *
*OR	5-37	S14	Originate *
*OR1			Forced answer
*RC	5-9	S57	15 - 4800 bps, 18 - 9600 bps *
*RC1			11 - 4800 bps, 12 - 9600 bps
*RD	7-9	S34	Ignore pin 21 *
*RD1			DTE commanded RDL enabled
*RO	5-42	S29	Retain options at disconnect *
*RO1			Restore options at disconnect
*RR	5-31		Rate negotiate to 2400 †
*RR1			Rate negotiate to 4800 †
*RR2			Rate negotiate to 7200 †
*RR3			Rate negotiate to 9600 †

* factory default

† cannot be executed from remote configuration mode

Table E-1. AT Commands (Continued)

Command	Page	S-Reg	Description
*RR4	5-31		Rate negotiate to 12000 †
*RR5			Rate negotiate to 14400 †
*RR6			Rate negotiate to 16800 †
*RR7			Rate negotiate to 19200 †
*RR8			Rate negotiate to 21600 †
*RR9			Rate negotiate to 24000 †
*RR10			Rate negotiate to 26400 †
*RR11			Rate negotiate to 28800 †
*TDn	5-33		Sets dial transmit level -10 to -30 dBm
*TH	5-26		Low rate selection threshold (10 ⁻⁶ BER)
*TH1			Medium rate selection threshold (10 ⁻⁴ BER)
*TH2			High rate selection threshold (10 ⁻² BER) *
*TLn	5-37	S52	Sets leased line transmit level to n where n is a number between 0 and 30 corresponding to 0 to -30 db †
*H	5-31		Online quick reference
*V			Display product serial number

* factory default

† cannot be executed from remote configuration mode

Table E-2. Low Security Commands

Command	Page	S-Reg	Description
*S=x	8-3		Sets an empty password location to x
*C=x,y			Changes either password where x represents the old password and y is the new one
*C=x,-			Deletes password x from memory
*SDR			Reset security
*D=x			Disables security where x is either password
*SD7	8-4		Displays the current status of security
*SE=x			Enables security where x is either password
*SE7			Displays the current security status

Table E-3. High Security Commands

Command	Page	S-Reg	Description
\$Cn=m	8-8		Set user callback number. n = user number and m = the callback number
\$D	8-7		Disable security *
\$E?	8-10		Display current security status (enabled/disabled)
\$E!pw	8-6		Enable security (pw = supersuser password) †
\$E=ppw\$pw	8-10		Reinitialize security *
\$IBn	8-11		Display user information for a block of up to ten valid users (n = first user number)
\$In			Display user information (n = user number)
\$In=m	8-8		Set security level for the user specified by n (m = security level)
\$M	8-9		Display illegal attempts information
\$M*			Reset illegal attempts registers and restore all suspended users to normal status
\$Mn			Reset illegal attempts registers and restore suspended user n to normal status
\$Pn=ppw\$pw	8-7		Set user password: n = user number and new password (n = 0 for supersuser pw = password)
\$Rn	8-10		Remove a user (n = user number)
\$S?			Display current user status (supersuser / user)
\$W0	8-9		Disable user changes (password and callback number) †
\$W1			Enable user changes (password and callback number) †
\$W2	8-10		Enable remote supersuser †
\$W?	8-9		Display user changes remote supersuser option status
\$S	8-11		Local logoff
\$n=ppw			Local logon (n = user number and pw = password)
\$S=ppw			Request to enter supersuser status (pw = password)

* Only local supersuser can execute command
 † Only allowed in idle mode and local DTE

Table E-4. Fax Commands

Fax Command	Page	Description
+FCLASS=0	9-6	Service Class 0 (data modem) * †
+FCLASS=1		Service Class 1 (fax modem) †
+FCLASS?		Display current Service Class setting †
+FCLASS=?		Display available Service Class settings †
+FAA	9-10	Enables fax auto answer function

* default
 † Cannot executed from remote configuration

Extended (Class 1) Commands Valid only in fax mode:

Table E-5. Commands Valid only in Fax Mode

Command	Page	Description
+FTS=(Time)	9-6	Stop transmission and pause (10 ms intervals, 0-255) *
+FRS=(Time)	9-7	Waits for silence (10 ms intervals, 0-255) *
+FTM=(MOD)	9-8	Transmit data with (MOD) carrier *
+FRM=(MOD)		Receive data with (MOD) carrier *
+FTH=(MOD)		Transmit HDLC data with (MOD) carrier *
+FRH=(MOD)	9-9	Receive HDLC data with (MOD) carrier *
where the (MOD) parameter can be one of the following values:0.		
Value	Modulation	Speed
3	V.21 channel 2	300 bps
24	V.27 ter	2400 bps
38	V.27 ter	4800 bps
72	V.29	7200 bps
73	V.17	7200 bps
74	V.17	7200 bps with short train
96	V.29	9600 bps
97	V.17	9600 bps
98	V.17	9600 bps with short train
121	V.17	12000 bps
122	V.17	12000 bps with short train
145	V.17	14400 bps
146	V.17	14400 bps with short train

* cannot be executed from remote configuration

Table E-5. Commands Valid only in Fax Mode (Continued)

Command	Page	Description
+FTX=?	9-9	Check range for values supported where x may be M, S, or H. If x is M or H, the modem returns 3, 24, 48, 72, 73, 96, 97, 98, 121, 122, 145, 146. If x is S, the modem returns 0-255.
+FCERROR		Carrier different from specified in +FRM or +FRH

STATUS REGISTERS

Table E-6. Status Registers

S-Reg	RO/ RW	Page	Function	Default
S0	RW	10-5	Ring to answer	1
S1	RO		Ring count	
S2	RW		Escape sequence character	43 (+)
S3	RW		End-of-line character	13 (CR)
S4	RW	10-6	Line feed character	10 (LF)
S5	RW		Backspace character	8 (BS)
S6	RW		Pause before blind dialing	2 (2 sec)
S7	RW		Pause for carrier	30 (30 sec)
S8	RW		Pause for comma	2 (2 sec)
S9	RW		Carrier validation	6 (0.6 sec)
S10	RW	10-7	Loss carrier delay time	14 (1.4 sec)
S11	RO		DTMF tone duration	
S12	RW		Escape sequence pause	50 (1 sec)
S14	RW	10-8	Bit mapped	
S16	RO	10-9	System tests	
S18	RW		Test timer	0
S21	RW	10-10	Bit mapped	
S22	RW	10-11	Bit mapped	
S23	RW		Bit mapped	
S25	RW	10-12	DTR recognition time	5 (0.5 sec)
S26	RW		RTS/CTS delay	0
S27	RW		Bit mapped	

RO=Read only RW=Read or write

Table E-6. Status Registers (Continued)

S-Reg	RO/ RW	Page	Function	Default
S28	RW	10-13	Lookback timer	15 min
S29	RW		Bit mapped	
S30	RW	10-14	V.25 mode selection	
S32	RW		Bit mapped	
S34	RW	10-15	Bit mapped	
S35	RW		Default dial number	
S39	RW		Bit mapped	
S44	RW	10-16	DTE XON character	
S45	RW		DTE XOFF character	
S49	RW		DCE XON character	
S50	RW		DCE XOFF character	
S52	RW		Lease transmit level	0
S53	RW	10-17	Bit mapped	
S54	RW		Bit mapped	0
S56	RW	10-18	V.42 compression	
S57	RW		Bit mapped	0
S58	RW		Inactivity timer	0
S59	RW	10-19	MNP break control	5
S60	RW		Bit mapped	
S61	RO	10-20	DTE character size, parity	6
S62	RW		Disconnect buffer delay	0
S63	RW		Maximum protocol block size	255
S64	RW	10-21	Auto-reliable character	0
S67	RO		Link speed status	
S69	RW	10-22	Maximum DCE speed	
S70	RW		Protocol operating mode	1
S71	RO	10-23	Protocol operating mode status	
S72	RW	10-24	Bit mapped	
S73	RW		Password timeout security	
S74	RW		Callback delay	
S75	RW	10-25	Callback retry	

RO=Read only RW=Read or write

Table E-6. Status Registers (Continued)

S-Reg	RO/ RW	Page	Function	Default
S76	RW	10-25	Callback retry delay	
S77	RW		Lockout threshold	
S78	RW		Autocallback timer	30
S79	RW		Break length	35
S80	RO	10-26	Serial port speed	6
S81	RW	10-27	Minimum DCE rate	1
S82	RW		Bit mapped	
S88	RW	10-28	Modulation type	
S91	RW		Current modulation	
S95	RW	10-29	V.34 settings	
S96	RW		V.34 settings	

RO=Read only, RW=Read or write

V.25 bis DIALER COMMANDS

Table E-7. V.25 bis Dialer Commands

Synchronous Command	Page	Description
CIC	11-8	Connect incoming call command
CRN <i>mn..n</i>	11-5	Dial command (<i>mn..n</i> = number to be dialed)
0 - 9		DTMF and pulse digit
* #		DTMF digit
.		Wait for dial tone
W		Wait for second type of dial tone
>		Pause for 1 second
=		Pause for 3 seconds
<		Pause for programmed delay time
P		Pulse dial
T		Tone dial
&		Flash (go on hook) for 1/2 second
.		Parameter separator

Table E-7. V.25 bis Dialer Commands (Continued)

Synchronous Command	Page	Description
Space, dash, parenthesis, period		Clarity characters
CRR <i>n</i>	11-8	Redial the last number a maximum of <i>n</i> times
CRS <i>a</i>	11-6	Dial stored number command (<i>a</i> = address)
DIC	11-7	Disregard incoming call command
PRK	11-13	Save current option settings
PRL <i>a,b</i>	11-9	Link number at address <i>a</i> with number at address <i>b</i>
PRN <i>a; mn..n</i>	11-6	Program number command (<i>mn..n</i> = number to be dialed, <i>a</i> = address)
PRO	11-11	Program options command (<i>xxx</i> = register address, <i>yy</i> = option count)
xxx;yy;0;0...		
PRP <i>n</i>	11-13	Restores current option settings to the factory defaults in default bank <i>n</i> (1-9)
RLL	11-10	Request list of linked numbers command
RLN	11-7	Request list of stored numbers command
RLO xxx;yy	11-14	Request list of stored options command (<i>xxx</i> = register address, <i>yy</i> = option count)
RLV	11-11	Request list of version information command

Table E-8. Response Messages

Response Message	Meaning
CFIAB	Call failure - answer back tone but no connection
CFIDT	Call failure - no dial tone
CFIET	Call failure - reorder or busy
CFILD	Call failure - link list complete
CFINS	Call failure - number not stored
CFINT	Call failure - no answer back tone, no ringback
CFIRT	Call failure - timeout occurred
CNX @ 28800 bps	Intermediate call progress - connection made at 28800

Table E-8. Response Messages (Continued)

Response Message	Meaning
CNX @ 26400 bps	Intermediate call progress - connection made at 26400
CNX @ 24000 bps	Intermediate call progress - connection made at 24000
CNX @ 21600 bps	Intermediate call progress - connection made at 21600
CNX @ 19200 bps	Intermediate call progress - connection made at 19200
CNX @ 16800 bps	Intermediate call progress - connection made at 16800
CNX @ 14400 bps	Intermediate call progress - connection made at 14400
CNX @ 12000 bps	Intermediate call progress - connection made at 12000
CNX @ 9600 bps	Intermediate call progress - connection made at 9600
CNX @ 7200 bps	Intermediate call progress - connection made at 7200
CNX @ 4800 bps	Intermediate call progress - connection made at 4800
CNX @ 2400 bps	Intermediate call progress - connection made at 2400
CNX @ 1200 bps	Intermediate call progress - connection made at 1200
INC	Incoming ring detected
INVCU	Invalid command - command unknown
INVMS	Invalid command - message syntax error
INVP	Invalid command - parameter syntax error
INVPV	Invalid command - parameter value error
VAL	Valid command received

FACTORY OPTION SETS

**FACTORY OPTION SET #1
(Asynchronous Dial-up with V.42bis Protocol) (AT&F or AT&F1)**

- **MODEM OPTIONS**
 - DCE rate - 28800
 - Modulation automode
 - V.34 rate threshold high
 - V.34 asymmetric rate enabled
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 30 seconds
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol enabled
 - MNP protocol enabled
 - Protocol fallback enabled
 - Data compression normal
 - Constant DTE speed
 - DTE flow control XON/XOFF
 - DCE flow control XON/XOFF
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 5
 - V.42 fast detect enabled
- **DTE OPTIONS**
 - Async data
 - DTE rate - 9600
 - 8 bit, No parity
 - Async controlled dialer
 - AT command set enabled
 - Ignores DTR
 - DSR forced high
 - DCD forced high
 - CTS forced high
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On until carrier detect

FACTORY OPTION SET # 2
(Asynchronous Dial-up without V.42bis Protocol) (AT&F2)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - Modulation autumode
 - V.34 rate threshold low *
 - V.34 asymmetric rate enabled
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Dial line
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 30 seconds
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Normal buffer mode *
 - Constant PTE speed
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled *
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect disabled *
- **DTE OPTIONS**
 - Async data
 - DTE rate - 9600
 - 8 bit, No parity
 - Async controlled dialer
 - AT command set enabled
 - Ignore DTR
 - DSR forced high
 - DCD forced high
 - CTS follows RTS *
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On unit carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET #3
(Synchronous Dial-up) (AT&F3)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - Modulation autumode
 - V.34 rate threshold low *
 - V.34 asymmetric rate disabled *
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Dial line
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 30 seconds
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Direct buffer mode *
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect disabled *
- **DTE OPTIONS**
 - Sync data *
 - Dial method manual *
 - AT command set disabled *
 - DTR disconnects *
 - DSR normal *
 - DCD normal *
 - CTS follows RTS *
 - RTS/CTS delay 0 ms *
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On unit carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET #4
(Synchronous 4-wire Leased Line) (AT&F4)

• MODEM OPTIONS

- DCE rate - 28800
- V.34 modulation *
- V.34 rate threshold low *
- V.34 asymmetric rate enabled
- Normal originate
- Fast train disabled
- Auto retrain enabled
- Sq auto rate disabled
- Transmit clock internal
- Leased line *
- 4-wire *
- Transmit level - 0 dBm *
- Dial backup manual *
- Lookback timer - 15 min *
- Jack type RJ11 (permissive)
- Line current disconnect long
- Long space disconnect enabled
- V.22 guard tone disabled

• TEST OPTIONS

- Bilateral analog loop enabled *
- Bilateral digital loop enabled *
- DTE local test disabled
- DTE remote test disabled
- Remote commanded test enabled
- Test timeout off

• DIAL LINE OPTIONS

- Tone dial
- Auto dial #1
- Wait for dial tone
- Wait delay 2 seconds
- Pause delay 2 seconds
- Call timeout 60 seconds *
- Answer on 1 ring
- 801 V.32 timeout long
- Autocallback disabled

• DTE OPTIONS

- Sync data *
- AT command set disabled *
- Ignore DTR
- DSR normal *
- DCD normal *
- CTS follows RTS *
- RTS/CTS delay 0 ms *
- DTE fallback disabled
- Options retained at disconnect

• SPEAKER OPTIONS

- Volume medium
- On until carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET #5
(Asynchronous 4-wire Leased Line with V.42bis Protocol) (AT&F5)

• MODEM OPTIONS

- DCE rate - 28800
- V.34 modulation *
- V.34 rate threshold high
- V.34 asymmetric rate enabled
- Normal originate
- Fast train disabled
- Auto retrain enabled
- Sq auto rate disabled
- Transmit clock internal
- Leased line, 4-wire *
- Transmit level - 0 dBm *
- Dial backup manual *
- Lookback timer - 15 min *
- Jack type RJ11 (permissive)
- Line current disconnect long
- Long space disconnect enabled
- V.22 guard tone disabled

• TEST OPTIONS

- Bilateral analog loop disabled
- Bilateral digital loop disabled
- DTE local test disabled
- DTE remote test disabled
- Remote commanded test enabled
- Test timeout off

• DIAL LINE OPTIONS

- Tone dial
- Auto dial #1
- Wait for dial tone
- Wait delay 2 seconds
- Pause delay 2 seconds
- Call timeout 30 seconds
- Answer on 1 ring
- 801 V.32 timeout long
- Autocallback disabled

• DTE OPTIONS

- Async data
- DTE rate - 9600
- 8 bit, No parity
- AT command set enabled
- Ignore DTR
- DSR forced high
- DCD forced high
- CTS forced high
- DTE fallback disabled
- Options retained at disconnect

• SPEAKER OPTIONS

- Volume medium
- On until carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET # 6
(Asynchronous 4-wire Leased Line without V.42 Bis Protocol) (AT&F6)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - V.34 modulation *
 - V.34 rate threshold low *
 - V.34 asymmetric rate enabled
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Leased line, 4-wire *
 - Transmit level - 0 dBm*
 - Dial backup manual *
 - Lookback timer - 15 min *
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 30 seconds
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback: disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Normal buffer mode
 - Constant DTE speed
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect enabled
- **DTE OPTIONS**
 - Async data
 - DTE rate - 9600
 - 8 bit, No parity
 - AT command set enabled
 - Ignore DTR
 - DSR forced high
 - DCD forced high
 - CTS forced high
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On until carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET # 7
(Synchronous 2-wire Leased Line Normal Originate) (AT&F7)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - V.34 modulation *
 - V.34 rate threshold low *
 - V.34 asymmetric rate disabled *
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Leased line, 2-wire *
 - Transmit level - 0 dBm*
 - Dial backup manual *
 - Lookback timer - 15 min *
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 60 seconds *
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Direct buffer mode *
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect disabled *
- **DTE OPTIONS**
 - Sync data *
 - AT command set disabled *
 - Ignore DTR
 - DSR normal *
 - DCD normal *
 - CTS follows RTS *
 - RTS/CTS delay 0 ms *
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On until carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET # 8
(Synchronous 2-wire Leased Line Forced Answer) (AT&F8)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - V.34 modulation *
 - V.34 rate threshold low *
 - V.34 asymmetric rate disabled *
 - Forced answer *
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Leased line, 2-wire *
 - Transmit level - 0 dBm *
 - Dial backup manual *
 - Lookback timer - 15 min *
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop enabled *
 - Bilateral digital loop enabled *
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 60 seconds *
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Direct mode *
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect disabled *
- **DTE OPTIONS**
 - Sync data *
 - AT command set disabled *
 - Ignore DTR
 - DSR normal *
 - DCD normal *
 - CTS follows RTS *
 - RTS/CST delay 0 ms *
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On until carrier detect

* Indicates variation from factory option set #1

FACTORY OPTION SET #9
(Synchronous V.25bis Dialer) (AT&F9)

- **MODEM OPTIONS**
 - DCE rate - 28800
 - Modulation autumode
 - V.34 rate threshold low *
 - V.34 asymmetric rate disabled *
 - Normal originate
 - Fast train disabled
 - Auto retrain enabled
 - Sq auto rate disabled
 - Transmit clock internal
 - Dial line
 - Jack type RJ11 (permissive)
 - Line current disconnect long
 - Long space disconnect enabled
 - V.22 guard tone disabled
- **TEST OPTIONS**
 - Bilateral analog loop disabled
 - Bilateral digital loop disabled
 - DTE local test disabled
 - DTE remote test disabled
 - Remote commanded test enabled
 - Test timeout off
- **DIAL LINE OPTIONS**
 - Tone dial
 - Auto dial #1
 - Wait for dial tone
 - Wait delay 2 seconds
 - Pause delay 2 seconds
 - Call timeout 30 seconds
 - Answer on 1 ring
 - 801 V.32 timeout long
 - Autocallback disabled
- **PROTOCOL OPTIONS**
 - LAPM protocol disabled *
 - MNP protocol disabled *
 - Direct mode *
 - DTE flow control disabled *
 - DCE flow control disabled *
 - XON/XOFF pass through disabled
 - Inactivity timer off
 - Break control 0 *
 - V.42 fast detect disabled *
- **DTE OPTIONS**
 - Sync data *
 - V.25 SDLC dialer *
 - Character type ASCII
 - SDLC data format NRZ *
 - DTR disconnect *
 - DSR normal *
 - DCD normal *
 - CTS follows RTS *
 - RTS/CTS delay 0 ms *
 - RTS/CTS delay 0 ms *
 - DTE fallback disabled
 - Options retained at disconnect
- **SPEAKER OPTIONS**
 - Volume medium
 - On until carrier detect

* Indicates variation from factory option set #1

Appendix F ASCII and EBCDIC Characters

GENERAL

Hexadecimal equivalents of binary and decimal numbers are illustrated in the following chart:

Binary	Decimal	Hexadecimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	10	A
1011	11	B
1100	12	C
1101	13	D
1110	14	E
1111	15	F

Hexadecimal Examples:

0101	1011	=5B hex
1001	1101	=9D hex
1110	0010	=E2 hex

The following chart lists the ASCII decimal, hexadecimal, equivalent character values, and EBCDIC characters. The table only goes as high as available keyboard symbols. Control keys are shown in the right column of the first table.

ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC	Control Key
(NUL)	0	00	NU (null)	@
(SOH)	1	01	SH (start of header)	A
(STX)	2	02	SX (start of text)	B
(ETX)	3	03	EX (end of text)	C
(EOT)	4	04	PF	D
(ENO)	5	05	HT (horizontal tab)	E
(ACK)	6	06	LC (lower case)	F
(BEL)	7	07	delete	G
(BS)	8	08	--	H
(HT)	9	09	--	I
(LF)	10	0A	(SMM)	J
(VT)	11	0B	VF (vertical tab)	K
(FF)	12	0C	FF (form feed)	L
(CR)	13	0D	CR (carriage return)	M
(SO)	14	0E	SO (shift out)	N
(SI)	15	0F	SI (shift in)	O
(DLE)	16	10	DL (data link escape)	P
(DC1)	17	11	D1 (device control 1)	Q
(DC2)	18	12	D2 (device control 2)	R
(DC3)	19	13	D3 (device control 3)	S
(DC4)	20	14	RE (restore)	T
(NAK)	21	15	NL (new line)	U
(SYN)	22	16	BS (back space)	V
(ETB)	23	17	IL (flight)	W
(CAN)	24	18	CN (cancel)	X
(EM)	25	29	EM (end of message)	Y
(SUB)	26	1A	CC	Z
(ESC)	27	1B	CI (CU1)	[

ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC	Control Key
(FS)	28	1C	FS (form separator)	\
(GS)	29	1D	GS (group separator)	
(RS)	30	1E	RS (record separator)	^
(US)	31	1F	US (unit separator)	DEL
(SP)	32	20	DS	--
	33	21	SS (SOS)	--
	34	22	--	--
#	35	23	--	--

ASCII Symbol	Decimal	Hex	EBCDIC
\$	36	24	CP (bypass)
%	37	25	LF (line feed)
&	38	26	EB (end of block)
'	39	27	EC (escape)
(40	28	--
)	41	29	--
*	42	2A	SM
+	43	2B	C2 (CU2)
,	44	2C	--
-	45	2D	EQ (enquiry)
.	46	2E	AK (acknowledgment)
/	47	2F	BL (bell)
0	48	30	--
1	49	31	--
2	50	32	SY (sync)
3	51	33	--
4	52	34	PN

ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC
5	53	35	--
6	54	36	UC (uppercase)
7	55	37	ET (end of transmission)
8	56	38	--
9	57	39	--
:	58	3A	--
;	59	3B	C3 (CU3)
<	60	3C	D4 (device control 4)
=	61	3D	NK (no acknowledgment)
>	62	3E	--
?	63	3F	SB (substitute)
@	64	40	space
A	65	41	--
B	66	42	--
C	67	43	--
D	68	44	--
E	69	45	--
F	70	46	--
G	71	47	--
H	72	48	--
I	73	49	¢ (cent)
J	74	4A	. (period)
K	75	4B	< (less than)
L	76	4C	((open parenthesis)
M	77	4D	+ (plus)
N	78	4E	--
O	79	4F	& (ampersand)
P	80	50	--

ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC
Q	81	51	--
R	82	52	--
S	83	53	--
T	84	54	(leading pad)
U	85	55	--
V	86	56	--
W	87	57	--
X	88	58	--
Y	89	59	! (exclamation)
Z	90	5A	\$ (dollar sign)
[91	5B	* (asterisk)
\	92	5C) (close parenthesis)
]	93	5D	:(semicolon)
^	94	5E	^ (caret or ~)
_	95	5F	--
`	96	60	/ (ACK1)
a	97	61	--
b	98	62	--
c	99	63	--
d	100	64	--
e	101	65	--
f	102	66	--
g	103	67	--
h	104	68	--
i	105	69	--
j	106	6A	
k	107	6B	,
l	108	6C	%

ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC
m	109	6D	-
n	110	6E	>
o	111	6F	?
p	112	70	ACK0
q	113	71	-
r	114	72	-
s	115	73	-
t	116	74	-
u	117	75	-
v	118	76	-
w	119	77	-
x	120	78	-
y	121	79	' (single quote)
z	122	7A	: (colon)
{	123	7B	# (pound)
	124	7C	@ (at)
)	125	7D	' (apostrophe)
-	126	7E	= (equal)
DEL	127	7F	" (double quote)
-	128	80	-
-	129	81	a
-	130	82	b
-	131	83	c
-	132	84	d
-	133	85	e
-	134	86	f
-	135	87	g
-	136	88	h

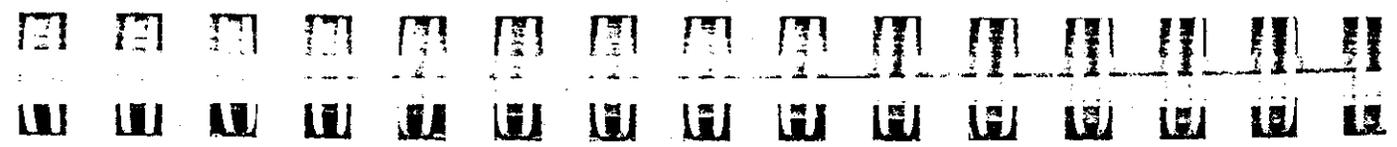
ASCII and EBCDIC Characters

ASCII Symbol	Decimal	Hex	EBCDIC
-	137	89	i
-	138	8A	-
-	139	8B	-
-	140	8C	S (less than or equal)
-	141	8D	(
-	142	8E	+
-	143	8F	-
-	144	90	-
-	145	91	j

Decimal	Hex	EBCDIC
146		
147	93	l
148	94	m
149	95	n
150	96	o
151	97	p
152	98	q
153	99	r
154	9A	-
155	9B	-
156	9C	x
157	9D)
158	9E	±
159	9F	-
160	A0	-
161	A1	-

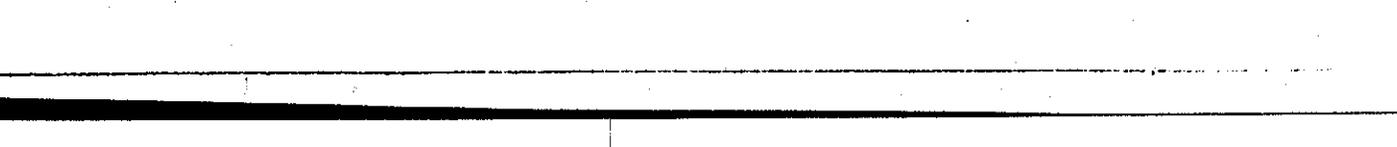
ASCII and EBCDIC Characters

Decimal	Hex	EBCDIC
162	A2	s
163	A3	t
164	A4	u
165	A5	v
166	A6	w
167	A7	x
168	A8	y
169	A9	z
170	AA	--
171	AB	l
172	AC	f
173	AD	l
174	AE	z
175	AF	.
176	B0	S0 (SM10)
177	B1	S1 (SM1)
178	B2	S2 (SM2)
179	B3	S3 (SM3)
180	B4	S4 (SM4)
181	B5	S5 (SM5)
182	B6	S6 (SM6)
183	B7	S7 (SM7)
184	B8	
185	B9	S9 (SM9)
186	BA	--
187	BB	l
188	BC	l
189	BD	l (close bracket)
190	BE	≠ (not equal)



ASCII and EBCDIC Characters

Decimal	Hex	EBCDIC
191	BF	--
192	C0	{ (open brace)
193	C1	A
194	C2	B
195	C3	C
196	C4	D
197	C5	E
198	C6	F
199	C7	G
200	C8	H
201	C9	I
202	CA	--
203	CB	--
204	CC	(unprintable character)
205	CD	--
206	CE	(unprintable character)
207	CF	} (close bracket)
208	D0	J
209	D1	K
210	D2	L
211	D3	M
212	D4	N
213	D5	O
214	D6	P
215	D7	Q
216	D8	R
217	D9	--
218	DA	--
219	DB	--



ASCII and EBCDIC Characters

Decimal	Hex	EBCDIC
220	DC	--
221	DD	--
222	DE	--
223	DF	--
224	E0	\ (back slash)
225	E1	--
226	E2	S
227	E3	T
228	E4	U
229	E5	V
230	E6	W
231	E7	X
232	E8	Y
233	E9	Z
234	EA	--
235	EB	--
236	EC	(unprintable character)
237	ED	--
238	EE	--
239	EF	--
240	F0	0
241	F1	1
242	F2	2
243	F3	3
244	F4	4
245	F5	5
246	F6	6
247	F7	7
248	F8	8

ASCII and EBCDIC Characters

Decimal	Hex	EBCDIC
249	F9	9
250	FA	!
251	FB	--
252	FC	--
253	FD	--
254	FE	--
255	FF	(trailing pad)

Appendix G Acronyms and Abbreviations

A	ABT	Abort Timer OR Answer Back Tone	CC	Carrier Control
	AC	Alternating Current	CCITT	International Consultative Committee for Telegraph and Telephone Communications Control Unit
	ACK	Acknowledgment, positive	CCU	Carrier Detect
	ACR	Abort Call, Retry	CFICB	Call Failure Indication - Local DCE Busy
	ACU	Automatic Call Unit	CFIDT	Call Failure Indication - No Dial Tone
	A/D	Analog-to-Digital	CFINT	Call Failure Indication - No Answer Back Tone
	ADD	Address Field	CFIRT	Call Failure Indication - Ringback Detected
	ADDR	Address	Ch Gnd	Chassis Ground
	AGC	Automatic Gain Control	CIC	Connect Incoming Call
	ASCII	American Standard Code for Information Interchange (7 level)	CMOS	Complementary Metal Oxide Semiconductor
	AT&T	American Telephone and Telegraph	CNX	Connect Complete
B	BC	Bearer Capability	COM	Computer Output Microfilm
	BCD	Binary Coded Decimal	CO	Central Office
	BER	Bit Error Rate	COS	Call Originate Status
	BERT	Bit-Error-Rate-Test (set)	CPE	Customer Premise Equipment
	BIL LB	Bilateral Loopback	CPIH	Characters Per Hour
	Bit	Binary Digit	CPU	Central Processing Unit
	bps	Bits Per Second	CR	Carriage Return
	BSC	Binary Synchronous Communications	CRC	Cyclic Redundancy Check
	BUFF	Elastic Buffer	CRQ	Call Request
C	C	Celsius	CSA	Canadian Standards Association
	CA	Circuit Assurance	CSDC	Circuit Switched Digital Capability
	CBX	Computerized Private Branch Exchange		

Acronyms and Abbreviations

CSU	Channel Service Unit	DDR	Digit Present
CSULL	Channel Service Unit Local Loopback	DRS	Data Rate Select
CTRL	Control Field	DSR	Data Set Ready
CTS, CS	Clear to Send	DSU	Data Service Unit
D		DTE	Data Terminal Equipment
DAA	Data Access Arrangement (AT&T)	DTMF	Dual Tone Multi-Frequency
Dataset	Synonym for Modem (see Modem)	DTN	Dial Tone Detected
dB, db	Decibel	DTR	Data Terminal Ready
DC	Direct Current OR Digital Connection	E	
DCE	Data Circuit Terminating Equipment OR Data Communications Equipment	EBCDIC	Extended Binary Coded Decimal Interchange Code (8 level)
DCD	Data Carrier Detect	EIA-232C, EIA-232D	Interface between DTE and Data Interchange Communication Equipment employing serial binary data
DCPSK	Differentially Coherent Phase-Shift Keying	EN	Enabled
DDD	Direct Distance Dialing	ENQ	Enquiry
DDS	Digital Data Service OR Dataphone Digital Service (AT&T)	EOA	End of Address
DDS/MR	Digital Data Service / Multi Rate	EOM	End of Message
DIC	Disregard Incoming Call	EON	End of Number
Dip	Dual In-line Package	EOT	End of Text OR End of Transmission
DIS, DS	Disable	EPROM	Erasable Programmable Read Only Memory
DLE	Data Link Escape	ER	Error
DLO	Data Line Occupied	ESC	Escape (Key)
DMS	Digital Multiplexer System	ETB	End of Block
DOC	Department of Communications (Canada)	ETC	External Transmitt Clock
DOS	Disk Operating System	FTX	End of Text
		EXT	External

Acronyms and Abbreviations

F		I/O	Input / Output
FA	Feature Activator	IS	International Standard
FB	Fallback	ISDN	Integrated Services Digital Network
FCC	Federal Communications Commission	KBD	Keyboard
FDM	Frequency Division Modulation	kbps	Kilobits Per Second
FDX	Full-Duplex Transmission	L	
FF	Form Feed	LAL	Local Analog Loopback
FGND	Frame Ground	LAPD	Link Access Protocol - D Channel
FL	Flag	LAPM	Link Access Protocol for Modems
FLL	Fixed loss loop	LB	Loopback Options
FM	Frequency Modulation	LB OPTS	
Fox message	Test message (The quick brown fox jumps over the lazy dog) 0123456789	LCD	Liquid Crystal Display OR Line Current Disconnect
FSK	Frequency-Shift Keying	LDL	Local Digital Loopback
FX	Foreign Exchange	LDM	Limited-Distance Modem
H		LED	Light Emitting Diode
HDL/C	High Level Data Link Control	LF	Line Feed
HDX	Half-Duplex Transmission	LINK	Analog Telephone Line Connection
Hz	Hertz (cycles per second)	LL	Local Loopback
I		LO	Line Occupancy
INC	Incoming Call	LRC	Longitudinal Redundancy Check
INV	Invalid	LSD	Long Space Disconnect
INVCU	Invalid Command - Command Unknown	LSI	Large-Scale Integrated (circuit)
INVMS	Invalid Command - Message Syntax Error	LSO	List of Stored Options
INVPS	Invalid Command - Parameter Syntax Error	LSV	List Version
INVPV	Invalid Command - Parameter Value Error	LT	Loop or Link Termination

Acronyms and Abbreviations

M			
MA	Milliamps	PROG, PR	Programmable
MHz	MegaHertz	PROM	Programmable Read Only Memory
Modem	Modulator / Demodulator	PRP	Restored Factory Straps
MR	Modem Ready	PR/RTM	Power / Test Mode / Error
MR/RI	Modem Ready / Ring Indicate	PSK	Phase Shift Keying
ms	Millisecond	PSTN	Public Service Telephone Network
MUX	Multiplexer	PWI	Power Indication
N		Q	
NAK	Negative Acknowledgment	QAM	Quadrature Amplitude Modulation
NET STAT	Network Status	R	
NRZ	Non Return to Zero	R	Reference Designator
NRZi	Non Return to Zero Inverted	RAD	Random Access Method
NS	No Signal	RAL	Remote Analog Loopback
NT	Network Termination	RAM	Random Access Memory
O		RC	Receive Clock
OII	Off Hook	RCD	Receiver-Carrier Detector
OS	Out-of-Service	RCV, RCVR	Receiver
P		RD	Receive Data
PBX	Private Branch Exchange	RD/ER	Receive Data / Error
PC	Personal Computer	RDI	Receive Data Inhibit
pc	Printed circuit (board)	RDL	Remote Digital Loopback
PIW	Power Indication	RI	Ring Indication
PN	Pseudo random	RL	Remote Loopback
PND	Present Next Digit	RLO	Request List of Stored Options
POTS	Plain Old Telephone Service	RLSD	Received Line Signal Detector
PRI	Primary	RLV	Request List of Version
PRO	Program Option	rms	Root-Mean-Square

Acronyms and Abbreviations

RMT LB	Remote Loopback	TEI	Terminal Endpoint Identifier
RNG	Ringback Detection	TELCO	Telephone Company
RO	Receive Only	TELSET	Telephone Set
ROM	Read Only Memory	TM	Test Mode
RT	Remote Terminal	TP	Test Pattern
RTS, RS	Request to Send	TR	Terminal Ready
RX	Receive	TST	Test
S		TTD	Temporary Text Delay
S or ST	Reference Designator	TTL	Transistor-to-Transistor Logic
SCC	Serial (or Satellite) Communications Controller	TX	Transmit
SD	Send Data	U	
SDLC	Synchronous Data Link Control (IBM)	U	Reference Designator
SGND, SG	Signal Ground	UART	Universal Asynchronous Receiver / Transmitter
SH	Switch Hook	USOC	Universal Service Ordering Code
SIM SW CR	Simulated Switched Carrier	V	
SNR	Signal / Noise Ratio	V.	CCITT Code Designation
SPID	Service Profile Identifier	V.24	List of definitions for interchange circuits between data terminal equipment and data circuit-terminating equipment (and provisional amendments, May 1977)
SQD	Signal Quality Detector	Vac	Volts Alternating Current
SQM	Signal Quality Monitor	VAC	Value Added Carrier
SS	Systems Status	VAL	Valid
STX	Start of Text	Vdc	Volts Direct Current
SYN	Synchronization Character	W	
T		WATS	Wide Area Telecommunications Access Method (AT&T)
T	Reference Designator		
TA	Terminal Adapter		
TC	Transmit Clock		
TD	Transmit Data		
TE	Terminal Equipment		

X	CCITT Recommendation Designation
X	Transmit
XMIT	Transmitter Off
XOFF	Transmitter On
XON	External Transmitt Clock
XTC	

Index

- Numerics
 - 2-wire operation of 5-34
 - 4-wire operation of 5-34
- A
 - Active profile 5-38
 - Analog loopback 10-9
 - Analog loopback, self test 10-9
 - Answer / originate 10-8
 - Answer mode switching to after dialing 5-15
 - Answer/originate command description of 5-37
 - Answering a call 3-3
 - ASCH character table F-1
 - Async / sync mode selection 5-25
 - Async DTR dialer DTR async dialer 10-12
 - Async/sync mode s-register settings 10-12
 - AT command answer 5-17
 - AT command set disable 5-33
 - S-register enable/disable 10-13
 - AT command statement creating a 5-3 repeating a 5-5
 - AT command statements guidelines for creating 5-4
 - AT Commands E-1

- \$\$ 8-11
- \$C=x, - 8-3
- \$C=x, y 8-3
- \$Cn=m 8-8
- \$D 8-7
- \$D=x 8-3
- \$D? 8-4
- \$DR 8-3
- \$E=x 8-4
- \$E? 8-4, 8-10
- \$EH=pw 8-6
- \$F=pw\$pw 8-10
- \$IBn 8-11
- \$In 8-11
- \$Ln=m 8-8
- \$M 8-9
- \$n=pw 8-11
- \$Pn=pw\$pw 8-7
- \$Rn 8-10
- \$S=pw 8-11
- \$S=x 8-3
- \$S? 8-10
- \$V 5-31
- \$W 8-9
- \$W? 8-9
- %A 10-20
- %An 6-5
- %B 5-28, 10-22
- %C 6-11, 10-17
- %D 6-4, 10-20
- %E 5-29, 10-19
- %L 5-29, 10-27
- %P= 5-43
- %R 5-30, 10-16
- %T= 5-44
- %V 5-31
- %Z 5-32
- &D 5-19, 10-10
- &F 5-40
- &G 5-24, 10-11

&L 5-36, 10-12, 10-14
 &M 5-25, 10-12, 10-13
 &P 5-26, 10-11
 &R 5-20, 10-10, 10-24
 &S 5-19, 10-10
 &T 5-44, 10-11
 &V 5-41
 &W 5-39
 &X 5-26, 5-27, 10-12
 &Y 5-40
 &Z 5-41
 *AN 10-14
 *CNxn 5-41
 *DA 5-32
 *DB 5-37, 10-14
 *DG 10-14
 *FB 5-21, 10-13
 *FT 5-32, 10-13
 *IC 5-32
 *LA 10-14
 *LC 5-33, 10-14, 10-15
 *MM 5-27
 *ND 5-41
 *NT 5-33, 10-13
 *OR 5-37, 10-8
 *RC 5-9, 10-18
 *RD 10-14
 *RO 5-42, 10-13
 *RR 5-31
 *TDn 5-33
 *TLn 5-37, 10-16
 +++ 5-21
 - 6-6, 10-17
 A 5-17, 6-10, 10-20
 A/ 5-5
 AT 5-3
 B 6-11, 10-25
 C 6-11, 10-19
 categories of 5-1
 D 5-13
 E 5-21, 10-8
 F 5-22
 G 6-8, 10-17
 groups of 5-5
 H 5-22, 10-8

 I 5-23
 J 6-4, 10-24
 K 10-18
 Kn 6-8
 L 5-23, 10-11
 M 5-23, 6-4, 10-11, 10-23
 N 6-5, 10-23
 numbered 5-5
 O 5-24, 10-19
 P 10-8
 Q 5-7, 10-8
 quick reference guide E-1
 R 5-20, 10-19
 response commands 5-6
 T 6-10, 10-8, 10-18
 V 5-6, 10-8, 10-19
 W 5-7
 X 5-7, 6-7, 10-11, 10-17
 Y 5-24, 10-10
 Z 5-41
 Attention code (AT) 5-3
 Auto reliable data buffer
 s-register settings 10-19
 Auto retrain
 poor signal quality response
 5-29
 s-register settings 10-19
 Autoanswer 10-5
 Autohand 5-3
 Autocallback
 security 8-1
 s-register settings 10-24
 Autocallback timer
 s-register settings 10-25
 Autodial backup number to dial
 DTR number to dial 10-14
 Autodialer Command Strings and
 Parameters 11-1
 Autodialing
 from front panel 3-2
 Auto-reliable
 fallback character 6-5
 Auto-reliable fallback character
 s-register settings 10-20
 Auto-reliable mode 6-1

B
 Backspace character 10-6
 Backspace key 5-5
 BER
 s-register settings 10-16
 Bilateral analog/digital
 s-register settings 10-14
 Bit error rate 10-16
 Block size
 maximum reliable 6-10
 s-register settings controlling
 size 10-20
 Break control 6-8
 s-register settings 10-18
 Break length
 s-register settings 10-25
 Buffer
 disconnect delay 6-4
 set auto-reliable 6-11

C
 Call
 disregard incoming 5-32
 ending a 3-3
 Call progress / connect speed
 messages 5-7
 Call termination
 conditions of 3-3
 Callback delay
 s-register settings 10-24
 Callback retry
 s-register settings 10-24
 Callback retry delay
 s-register settings 10-25
 Carrier detect level A-3
 Carrier detect time 10-6
 Clock
 external transmit frequency A-2
 internal transmit frequency A-2
 s-register settings 10-12
 synchronous transmit source of
 5-26
 Command Index and Defaults E-1

 Command statement
 buffer 5-4
 Commands Valid only in Fax
 Mode E-13
 Communications software 1-3
 Compression
 s-register settings 10-17
 Configuration
 remote 5-43
 resetting stored 5-41
 storing a 5-39
 Configuration commands 5-38
 Configuration profiles 5-38
 viewing of 5-41
 Connect messages
 s-register settings 10-11
 Constant speed interface 6-2
 Cover
 removal of C-1
 CTS
 s-register settings 10-10
 CTS control
 Clear to send (CTS) 10-10
 CTS flow control
 s-register settings 10-17
 CTS follows DCD option
 s-register settings 10-24
 CTS/RTS flow control 10-17

D
 Data compression 6-2
 V42 bis 6-11
 Data link
 flow control 6-8
 Data mode 5-2
 features of 1-1
 Data rates A-2
 Data set ready
 command description 5-19
 Data terminal ready
 command description 5-19
 DCD
 s-register settings 10-10

D
DCD control
 Data carrier detect (DCD)
 control 10-10
DCE
 maximum speed of 5-28
 minimum speed of 5-29
DCE independent speed
 s-register settings 10-22
DCE minimum speed
 s-register settings 10-27
DCE speed
 s-register settings 10-21
Dial
 pulse ratio 5-26
 Dial backup 5-35
 command description of 5-37
 selecting stored number 10-14
 s-register settings 10-14
 Dial commands 5-13
 Dial line
 transmit level 5-33
Dial Modifiers
 P 5-14
 Dial modifiers
 "1" 5-15
 R 5-15
 Sn 5-16
 Dial, tone/pulse
 s-register settings 10-8
Dial/lease line
 command description of 5-36
Dialing
 Placing a call 3-2
 stored number 5-16
 Digit/word selection 5-6
Digital interface
 specifications A-1
Digital interface signals
 table of descriptions 2-3
Digital loopback 10-9
 Direct mode 6-2, 6-9
Disconnect
 buffer delay 6-4
 fast 5-22
 line current 5-33

long space 5-24
 Disconnect buffer delay
 s-register settings 10-20
DSR
 s-register settings 10-10
DSR control
 Data set ready (DSR) control
 10-10
DTE
 connection of 2-2
 serial port adjust 6-4
DTE fallback
 S-register enable/disable 10-13
DTE flow control
 s-register settings 10-17
DTE options
 s-register settings 10-19
DTE speed
 s-register settings 10-26
DTE/DCE constant speed
 s-register settings 10-24
DTMF tone duration 10-7
DT
 recognition state 10-12
 s-register settings 10-10
DT
 control
 Data terminal ready (DTR)
 control 10-10
DT
 dialer
 s-register settings 10-12
DT
 in autoanswer 5-18

E
 Echo 10-8
 local character 5-21
 online character 5-22
 End-of-line character 10-5
 Environmental conditions A-1
EPR
 check command 5-23
 Error control 6-1
 Escape character 10-5
 Escape sequence

Changing from data mode to
 command mode 5-21

F
 Factory option set
 loading a 5-40
 Factory option sets E-19
 set #1 E-19
 set #2 E-20
 set #3 E-21
 set #4 E-22
 set #5 E-23
 set #6 E-24
 set #7 E-25
 set #8 E-26
 set #9 E-27
 factory profile 5-38
 Fallback character
 auto-reliable 6-5
 Fallback rate
 command description 5-21
 Fast train
 description of 5-32
FAULT ISOLATION
 PROCEDURE D-1
 Fax Commands E-13
 Fax commands
 class1 quick reference E-13
 D 11-5, 11-6, 11-7, 11-11,
 11-13
 quick reference E-13
 Fax mode
 features of 1-3
 Fax modulation rates A-2
 Fax Operation 9-1
 Fax operation
 dialing 11-5, 11-6, 11-7, 11-11,
 11-13
 Fax Operations
FAX DEFAULTS 9-2
 Fax rates A-2
 Features 1-1
 Flow control 6-3

data link 6-8
 serial port 6-6
 s-register settings 10-17
 Front panel
 operation of 4-1
 full duplex 5-34
FUSE 12-1

G
 General commands 5-21
 Ground C-3
 Guard tones 10-11
 command description 5-24
 s-register settings 10-11

H
 Hanging up 5-22
 High Security Commands E-12

I
 Inactivity timer 6-10
 s-register settings 10-18
 Installation 2-1
 Invalid Responses Explanations
 11-3

J
 Jack
 AUX pin functions B-1
 Line pin functions B-1
 Jacks
 programmable and permissive
 types 2-7

L
 LAMP 6-1
 LCD menu
 operation of 4-2
 Leased line

s-register settings 10-14
 transmit level 5-37
 Leased line transmit level 10-16
 Leased lines 2-7
 LEDs
 descriptions of 4-1
 Line current
 disconnect 5-33
 Line current disconnect
 s-register settings 10-14
 Line equalization A-3
 Line feed character 10-6
 Line type
 s-register settings 10-12
 Link layer protocols A-3
 Link speed status
 s-register settings 10-21
 Local analog loopback, DTE:
 commanded
 s-register settings 10-14
 Local character echo
 s-register settings 10-8
 Local operation
 and security 8-2
 Lockout threshold
 s-register settings 10-25
 Logon
 Security 8-11
 Long space
 disconnect 5-24
 Long space disconnect 10-10
 s-register settings 10-10
 Lost carrier detect time 10-7
 Low Security Commands 15-11

MNP compression
 s-register settings 10-19
 MNP or normal mode 6-9
 MODEM AND TELEPHONE
 LINE CHECK D-2
 MODEM OPTIONS
 COMMAND 11-11
 Modulation
 command description 5-27
 table of values 9-7
 Modulation rates A-2
 Modulation type
 s-register settings 10-28
 Modulation, current
 s-register control 10-28

N
 Normal mode 6-2, 6-9
 Number code application 5-9

O
 Off hook
 command description 5-22
 Offline command mode 5-2
 Online command mode 5-2
 Operating mode
 selection of 6-5
 Operating mode (MNP, etc.)
 s-register settings 10-22
 Operating mode status
 s-registers settings 10-23
 Operating modes 5-1
 Operation, local with security
 DTE security in local operation
 8-2
 Operation, remote with security
 Remote operation with security
 8-2
 Option selection
 methods of 3-1
 Options
 retaining/restoring 5-42

Options retained / restored 10-13

P
 Parity
 s-register settings 10-19
 Password
 changing a 8-3
 deleting a 8-3
 set command 8-3
 Password timeout
 s-register settings 10-24
 Passwords 8-2, 8-6
 default 8-6
 setting 8-7
 Pause
 before dialing 10-6
 comma, long space 5-14
 escape sequence 10-7
 interval for comma 10-6
 Wait for 2nd dial tone 10-6
 Permissive / programmable mode
 selection of 5-32
 Permissive/programmable
 description of 2-7
 Phone Jack Descriptions B-1
 Phone jack pin descriptions B-1
 Power
 AC connection 2-1
 DC connection 2-1
 modern requirements A-1
 POWERUP
 procedure 3-1
 Powerup
 option set 5-40
 Private line
 operation of 5-34
 Product revision level 5-31
 Product serial number 5-31
 Profile
 active 5-38
 Protocol
 compatible with 1-2
 Protocol commands 6-3

Protocol response messages
 s-register settings 10-19
 Protocols 6-1
 PSTN
 connection 2-5
 Pulse dialing 5-14

Q
 Quality monitor
 strap disabling C-4

R
 Rate renegotiation
 manual control of 5-31
 Reliable mode 6-1
 Remote configuration 5-43
 entering 5-44
 security code 5-43
 security of 5-43
 Remote digital loop request 10-11
 s-register settings 10-11
 Remote digital loopback 10-9
 Remote digital loopback, DTE
 commanded
 s-register settings 10-14
 Remote digital loopback, self test
 10-9
 Remote operation
 and security 8-2
 Request List of Stored Options
 11-14
 Request to send / clear to send
 Command description 5-20
 Response commands 5-6
 Response Messages E-17
 Response messages 10-8, 10-11
 digit/word selection of 5-6
 enable/disable 5-7
 s-register settings 10-8
 Restore Factory Settings 11-13
 Return online 5-24
 RILLED -- ring indicator

s-register settings 10-19
 Ring count 10-5
 Ring indicator
 command description 5-20
 RTS/CTS delay 10-12, A-3

S

Save Current Settings 11-13
 Security 8-1
 autocallback 8-1
 disable high 8-7
 disabling 8-3
 display extended feature status 8-9
 display status of 8-10
 display user status 8-10
 enable high 8-6
 enabling 8-4
 extended features 8-9
 factory reset 8-10
 high level 8-4
 illegal access 8-9
 LCD indication of 8-3
 levels of 8-5
 local logoff command 8-11
 local logon command 8-11
 low level 8-3
 low operation 8-1
 operating without 8-1
 operating without high level 8-4
 passwords 8-6
 passwords, default 8-6
 remote code 5-43
 remote logon procedure 8-11
 removing a user 8-10
 request supervisor status 8-11
 resetting 8-3
 restrictions in operation 8-3
 set levels of 8-8
 setting passwords 8-7
 verify user 8-11
 Security code for remote configuration 5-43

Security commands
 high level quick reference E-12
 low level quick reference E-11

Serial Port
 flow control 6-6
 Serial port
 DTE adjust 6-4
 ring indicator 5-20

Signal options
 displaying received 5-41

Size A-1
 Software 1-3

Speaker
 command control 5-23
 s-register settings 10-11
 volume selection 5-23

Specifications A-1

S-register
 autoanswer 10-5
 hexadecimal/decimal values 10-2

S-register commands
 Sn#=v 10-4
 Sn=v 10-3
 Sn? 10-3
 Sn?n 10-3

S-registers
 changing values of 10-3
 individual bit command 10-4
 quick reference E-14
 read only 10-1
 reading 10-3

S0 10-5
 S1 10-5
 S10 10-7
 S11 10-7
 S12 10-7
 S16 10-9
 S18 10-9
 S2 10-5
 S21 10-10
 S22 10-11
 S23 10-11
 S25 10-12

S26 10-12
 S27 10-12
 S28 10-12
 S29 10-13
 S3 10-5
 S30 10-13
 S32 10-14
 S34 10-14
 S35 10-14
 S4 10-6
 S44 10-15
 S45 10-15
 S49 10-15
 S5 10-6
 S50 10-15
 S52 10-16
 S53 10-16
 S54 10-17
 S56 10-17
 S57 10-18
 S58 10-18
 S59 10-18
 S6 10-6
 S60 10-19
 S61 10-19
 S62 10-20
 S63 10-20
 S64 10-20
 S67 10-21
 S69 10-22
 S7 10-6
 S70 10-22
 S71 10-23
 S72 10-24
 S73 10-24
 S74 10-24
 S75 10-24
 S76 10-25
 S77 10-25
 S78 10-25
 S79 10-25
 S8 10-6
 S80 10-26
 S81 10-27
 S88 10-28

S9 10-6
 S91 10-28

Status registers 10-1
 Standard Phone D-1
 Status Registers E-14
 Stored profile 5-38

Strap
 option selection C-1

Straps
 ground option C-3
 QM disable C-4
 QM normal/inverted C-4
 tip and ring polarity C-3

Superset
 See Security 8-11

Sync clock selection 10-12

Synchronous
 transmit clock source 5-26

T

Talk/data mode
 command description of 5-32

Telephone line
 specifications A-1

Teleco connection A-3

Telephone
 line connection 2-5
 Telephone Interface D-1
 Telephone number
 storing a 5-41

Temperature A-1

Test
 system 10-9
 timeout 10-9

Testing A-3

Timer
 inactivity 6-10, 10-18
 lookback 10-12

Tone / pulse dialing 10-8
 Transmit break/set break length 6-11

Transmit level
 dial line 5-33

Index

- leased line 5-37
- transmit output level A-2
- V
 - V.25 ASCII / EBCDIC
 - s-register settings 10-13
 - V.25 bis
 - response messages E-17
 - V.25 bis auto dialer commands
 - quick reference E-16
 - V.25 bis Autodialer 11-1
 - Connect Incoming Call 11-8
 - Dial Command 11-5
 - Dial Stored Number 11-6
 - Disregard Incoming Call 11-7
 - GUIDELINES 11-2
 - Intermediate Call Progress
 - Response 11-6
 - Link Number by Address 11-9
 - OPTIONS 11-16
 - Program Number Command 11-6
 - Redial Last Number 11-8
 - Request List of Linked Numbers 11-10
 - Request List of Stored Numbers 11-7
 - Request List of Version 11-11
 - V.25 bis autodialer commands
 - quick reference E-17
 - V.25 bis COMMAND AND RESPONSE DEFINITIONS 11-4
 - V.25 bis Dial Parameters 11-4
 - V.25 NRZ/NRZI
 - s-register settings 10-13
 - V.25 protocol selection
 - s-register settings 10-13
 - V.25 VAL
 - s-register settings 10-13
 - V.32 fast train 5-32
 - s-register enable/disable 10-13
 - V.42
 - optional detect phase 6-4
- V.42 bis 6-1
- V.42 compression control
 - s-register settings 10-17
- version level
 - command request 5-23
- Voice calls 5-16
- W
 - Word length -- 7/8 bit
 - s-register settings 10-19
- X
 - XOPF character from DTE
 - s-register settings 10-15
 - XOFF character to DTE
 - s-register settings 10-15
 - XON character from the DTE
 - s-register settings 10-15
 - XON character to DTE
 - s-register settings 10-15
 - XON/XOFF:
 - pass through: flow control 6-7
 - XON/XOFF characters 6-6
 - s-register settings 10-17
 - XON/XOFF control characters 6-7

Service and Support

If you need help or just more information on your Motorola product, these services are available to you:

Motorola ISG BBS:

(508) 261-1058

The Motorola ISG Bulletin Board Service offers answers to the most commonly asked questions about your Motorola ISG products, new product releases, operation and installation tips, and other related topics. Use it today to verify you have correctly installed your Motorola ISG products and to electronically register your product (or register electronically via the software provided with the modem). You can also use the BBS to chat with other Motorola ISG customers. BBS questions sent over the weekend will be answered on the next work day.

Faxback:

(800) 221-4380

A fully-automated FaxBack service offers a variety of information that is faxed directly to you, such as: Product Brochures, Price Lists, Installation instructions and compatibility information. The FaxBack service is available 24 hours a day, 365 days a year.

Hotline: Voice - (800) 365-6394

Fax - (205) 430-8067

If you are experiencing problems or think that you may need to return the modem for repair, please call this number. Technicians are available to assist you with all aspects of your Motorola ISG product. The technicians phone hours are 7am - 7pm CST, Monday through Friday.

Internet WWW Address:

<http://www.mot.com/modems/>
<http://www.mot.com/MIMS/ISG/>

Use our modems address for specific modem information. The MIMS/ISG address gives you access to a wide variety of Motorola ISG product listings, information, contacts, phone numbers, and addresses. You can also e-mail technical support and access frequently asked questions.

Manual Feedback:

motpdp2@email.mot.com

We at Motorola ISG know that users get the most out of our products if they have complete and easy-to-understand documentation to guide them, and we're always looking for ways to improve. If you have any thoughts regarding the documentation that came with your Motorola product, please e-mail us at the above address.