V.3225 and V.3225L Manual

Compliments of

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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 unit can be ordered for operation with one of three power input options.		
	Voltage:	115 Vac ±10%; 50-60 Hz, 230 Vac ±10%; 50–60 Hz, or 12 to 60 Vdc	
	Power consumption: 9 watts		
	Fuse: 1/4 Amp Slow-Blow (115 Vac model)		
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

9600 trellis coded,
9600 and 4800 uncoded as stated in CCITT recommendation V.32,
2400 and 1200 compatible with CCITT recommendation V.22 bis,
300 as stated in Bell specification 103

Modulation

9600, 4800, 2400 QAM with suppressed carrier (V.32, V.22 bis compliant)
1200 PSK
300 FSK

Transmit Carrier Frequencies

V.32 bis 1800 Hz

	Originate	Answer
1200 and 2400	1200 Hz ±.01%	2400 Hz ±.01%
300 bps		
Mark:	1270 Hz ±.5%	2225 Hz ±.5%
Space:	1070 Hz ±.5%	2025 Hz ±.5%

Internal Transmit Clock Frequency

Selected bit rate ± 0.01%

External Transmit Clock Frequency

Selected bit rate ± 0.01%

Transmit Output Level

0 to –15 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.)

Appendix B
Phone Jack Descriptions

DIAL LINE PIN FUNCTIONS

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

Pins 1, 2 - Not used

Pin 3 MI - Switch hook on exclusion key telephone
Not used in some systems

Pin 4 R - Rings side of telephone line

Pin 5 T - Tip side of telephone line

Pin 6 MIC Switch hook on exclusion key telephone

Pin 7 PR - Data jack program position

Pin 8 PC - To data jack program resistor

TELSET/LEASED LINE PIN FUNCTIONS

The 8-pin TELSET / LEASED LINE jack allows a standard telephone set or a leased line to be connected to the modem. The pin functions for this jack are:

Pins 1, 2 - Transmit pair - 4-wire leased line or Tx and Rx for 2-wire leased line

Pins 4, 5 - Ring and tip (respectively) of telephone line for TELSET

Pins 7, 8 Receive pair - 4-wire leased line

Appendix C
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

☐ Connect the modem to the dial-up line via the DIAL jack on the back panel.

- If the dial line is installed with a standard permissive data jack, connect a standard telephone to the TELSET/LEASED LINE 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

☐ Configure the modem to V.32 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.32 TALK and wait for dial tone.

☐ Dial out; the phone should operate normally.

EXCLUSION KEY TELEPHONE

☐ Configure the modem to V.32 IDLE mode, lift the receiver of the exclusion key telephone and place the telephone in talk mode. Wait for the dial tone. Placing the telephone in data mode silences the tone.

☐ With the telephone in talk mode, dial out. The telephone should operate normally.

If the telephone interface procedures are successful, the telephone interface is operating properly.

FALLBACK RATES

Since there is no standard fallback procedure from V.32 rates to V.22 rates, problems may arise when a V.32 optioned for 9600 originates a call to a V.224 modem. If this is a problem, change the originate modem speed to 2400 bps from the front panel or with the AT command AT%B3.

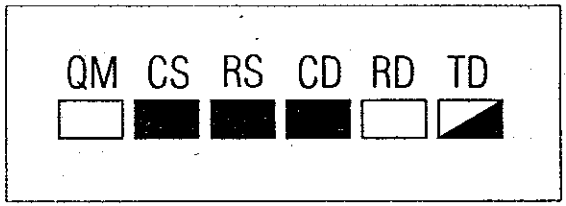
MODEM AND TELEPHONE LINE CHECK

Step 1

☐ 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.

☐ 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.

- When random errors are present, the TEST PATTERN ERRORS display counts receive errors.
- If the circuitry is working properly, the front panel indicators show the following:



☐ Configure the modem for LOCAL ANALOG LOOP to switch the transmitter back to its normal data input.

- If the transmit data input is in a mark hold condition, both the TD and RD indicators should remain off.
- 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 except for CS which should turn on.
- If the indicators are correct, the modem is probably operating correctly.
- 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

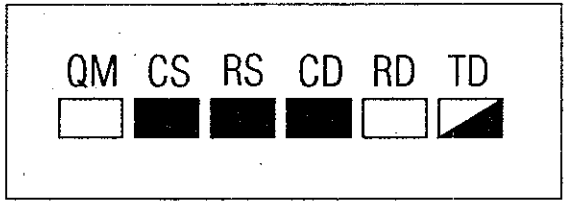
determines each modem's ability to receive a transmitted signal from the other site, properly equalize and decode the signal and then loop this regenerated signal into the transmitter for transmission back to the other modem. This test applies to both leased line and dial line applications.

☐ 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 digital bilateral loop is enabled at the remote, the remote DTE is looped back to itself.

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.

The TEST PATTERN ERRORS display will count received errors.

At the local modem, the indicators should be:



Note: The QM indicator may flash on while no errors are detected. The QM indicator responds to the average noise and distortion in the demodulator and is an indication of receive signal quality.

☐ 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.

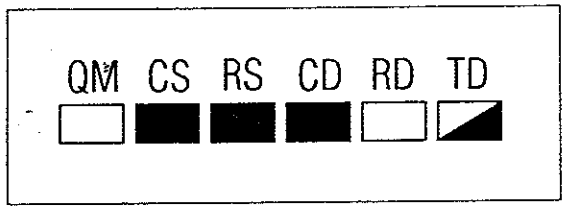
Step 3

This step determines the performance of the telephone line. This test is valid for 4-wire operation only.

☐ Configure the modem for REMOTE ANALOG LOOP WITH TEST PATTERN. This signals the remote to connect its receive pair to its transmit pair through a gain amplifier stage. The test pattern transmitted locally is now looped back to the local modem.

An alternative to the above procedure is to request the operator at the remote modem to place his modem in LOCAL ANALOG LOOP and enable his bilateral analog option. This places the remote modem in local analog loop test. It also connects the transmit phone line to the receive phone line through a gain amplifier stage. At the local modem, configure for TEST PATTERN. The test pattern transmitted by the local modem is looped back through an amplifier stage at the remote modem.

At the local modem, the front panel indicators under ideal conditions should be:



The TEST PATTERN ERRORS display counts received errors.

In this test you are connecting two telephone line links in series, doubling the distortion effects. A telephone link indicated as marginal by this test may be satisfactory as used in normal operation.

- ☐ After determining the quality of the telephone lines, exit the test.
- ☐ If fault remains unidentified, call Technical Services.

AT COMMAND RECOVERY FOR "L" MODELS

For the "L" model of the modem, holding the TALK/DATA button down for 5 seconds reenables AT commands. The TALK LED flashes 3 times to indicate that the command set has been loaded.

Appendix D
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.

Command	Page	S-Reg	Description
AT	5-3		Attention code - command prefix
A/	5-5		Repeat last command
+ + +	5-29	S2, S12	Escape sequence (pause, + + +, pause)
A	5-21		Answer
D	5-16		Dial
T	5-17	S14	Tone dial *
P		S14	Pulse dial
,		S8	Long pause (2 sec or S8 value)
W		S7	Wait for 2nd dial tone (S7 value)
!	5-18		Flash switchboard
R			Switch to answer mode after dialing
@			Wait for 5 seconds of silence
;	5-19		Return to command mode after dialing
S			Dial number stored at location 1
Sn			Dial number stored at location n

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

** factory default*

Command	Page	S-Reg	Description
E	5-29	S14	Local character echo off
E1			Local character echo on *
H	5-30		Hang up
H2		S14	V.32 cleardown enabled
H3			V.32 cleardown disabled *
I	5-30		Request product code
I1			Request EPROM CRC value
I3			Request product version
L or L1	5-30	S22	Speaker volume low
L2			Speaker volume medium *
L3			Speaker volume high
M	5-31	S22	Speaker off
M1			Speaker off when carrier is present
M2			Speaker always on
M3			Speaker off when dialing and carrier is present
O	5-31		Restore data mode (after escape)
Q	5-12	S14	Response displays on *
Q1			Response displays off
Q2			Response displays on in originate mode only
Sn?	6-4		Read value in register n (decimal)
Sn?^			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.bit #=1 or 0			Set single bit value in register
V	5-11	S14	Response codes
V1			Response messages *
X	5-12	S22	CONNECT (code 1), for all speeds, no dial tone or busy signal detection
X1			Appropriate connect codes for rate, no dial tone detection

**factory default*

Command	Page	S-Reg	Description
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	5-31	S21	Long space disconnect off
Y1			Long space disconnect on *
Z	5-41		Reset to stored configuration
&C	5-22	S21	DCD always on *
&C1			DCD on while carrier is present
&C2			DCD off 5 seconds after disconnect
&C3			DCD follows remote RTS
&D	5-23	S21	DTR ignored *
&D1			DTR recalls command mode
&D2			DTR disconnects
&D3			DTR disconnects and resets modem to stored configuration
&F or &F1	5-41		Restore factory configuration 1 *
&F2			Restore factory configuration 2
&F3			Restore factory configuration 3
&F4			Restore factory configuration 4
&G	5-32	S23	No guard tone *
&G1			550 Hz guard tone
&G2			1800 Hz guard tone
&L	5-32	S27,	Dial line *
&L1		S32	Leased line 2-wire
&L2			Leased line 4-wire
&M	5-32	S27	Asynchronous dial / asynchronous data *
&M1			Asynchronous dial / synchronous data
&M2			Dials stored number when DTR off / on transition is detected / synchronous data
&M3			Manual dial / synchronous data

**factory default*

Command	Page	S-Reg	Description
&M4		S30	V.25 bis autodialer with BISYNC protocol / synchronous data
&M5			V.25 bis autodialer with SDLC protocol / synchronous data
&P	5-33	S22	39/61 pulse make / break ratio *
&P1			33/67 pulse make / break ratio
&R	5-24	S21	CTS normal operating state
&R1		S21	CTS forced on *
&R2		S72	CTS follows DCD
&R9		S72	CTS equals RTS
&S	5-23	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	5-26		Terminate any test or exit remote configuration mode
&T1			Initiate analog loopback
&T2			Initiate remote analog loopback
&T3			Initiate digital loopback
&T4		S23	Allow acceptance of remote commanded digital loopback *
&T5		S23	Denies acceptance of remote commanded digital loopback
&T6			Initiate remote digital loopback
&T7			Initiate self test remote digital loopback
&T8			Initiate self test analog loopback
&T9			Initiate self test remote analog loopback
&V	5-41		View configuration profiles
&V1			Display received signal status
&W	5-39		Store current configuration
&X	5-34	S27	Internal clock *
&X1			External clock
&X2			Receive clock

*factory default

Command	Page	S-Reg	Description
&Zn	5-42		Store dial string n = string to be stored
%A	5-49	S64	Disable auto-reliable fallback character
%An			Set auto-reliable fallback character to n (n=ASCII 1-127)
%B	5-34	S69	Use DTE speed
%B1			300 bps max
%B2			1200 bps max
%B3			2400 bps max
%B4			4800 bps max
%B5			9600 bps max
%B6			9600 bps trellis coded max
%C	5-49	S60	Data compression disabled
%C1			Data compression enabled*
%D	5-35	S62	Disable disconnect buffer delay *
%Dn			Set disconnect buffer delay in seconds n (n=1-255)
%E	5-35	S60	Disable auto retrain
%E1			Enable auto retrain *
%P=	5-44		Sets security code to value entered after equal sign (0-99999999)
%P=D			Disabled
%P?			Displays security code of local modem
%T	5-44		Transmit test pattern
%T=			Followed by a security code, establishes remote configuration
%V	5-35		Display product revision level
$V			Display product serial number
%Z	5-36		Permissive*
%Z1			Programmable

*factory default

Command	Page	S-Reg	Description
\A	5-52	S63	Maximum MNP block size of 64 characters
\A1			Maximum MNP block size of 128 characters
\A2			Maximum MNP block size of 192 characters
\A3			Maximum MNP block size of 256 characters *
\B	5-53	S79	Transmit a break signal
\Bn			Sets break length in 20 ms increments, n=1-255, default is 35 (700 ms)
\C	5-53	S60	Disable auto-reliable buffer *
\C1			Buffer data for 4 seconds or 200 characters
\G	5-46	S54	Disable modem port flow control *
\G1			Enable modem port XON/XOFF flow control
\J	5-46	S72	Disable slaved DTE/DCE speed * (constant speed DTE on)
\J1			Enable slaved DTE/DCE speed (constant speed DTE off)
\Kn	5-50	S59	Determines action taken when a break is encountered
\K			MNP Break option 0
\K1			MNP Break option 1
\K2			MNP Break option 2
\K3			MNP Break option 3
\K4			MNP Break option 4
\K5			MNP Break option 5 *
\N	5-45	S70	Normal mode
\N1			Direct mode
\N2			Reliable only
\N3			Auto reliable mode*
\O	5-54	S60	Originate an reliable link

**factory default*

Command	Page	S-Reg	Description
\Q	5-47	S54	Disable DTE flow control
\Q1			Enable DTE XON/XOFF flow control *
\Q2			Enable DTE CTS flow control
\Q3			Enables bilateral CTS/RTS flow control
\R	5-24	S60	RI, blinks for ring and remains on for duration of call
\R1			RI, blinks for ring and turns off when call is answered *
\T	5-52	S58	Disable inactivity timer *
\Tn			Set inactivity timer to n (n=1-255 minutes)
\U	5-54	S60	Accept an MNP link
\V	5-52	S60	Disable protocol result codes *
\V1			Enable protocol result codes
\X	5-48	S54	No XON/XOFF characters to remote DCE *
\X1			Pass XON/XOFF characters to remote DCE
\Y	5-54	S60	Switch to MNP from normal mode
\Z	5-55	S60	Switch to normal from MNP mode
*AN	5-27	S34	Disables bilateral analog loop *
*AN1			Enables bilateral analog loop
*AUn	5-19		Dial number stored at location n upon transition of DTR in command mode (n=1-9) or number used in autodial backup sequence
*CNx,n	5-42		Store phone number n in location x (x=1-9)
*DA	5-36		Switches modem to talk mode
*DA1			Switches modem to data mode

**factory default*

Command	Page	S-Reg	Description
*DB	5-25		Manual dial backup operation *
*DB1			Automatic dial backup operation
*DG	5-27	S34	Disables bilateral digital loop *
*DG1			Enables bilateral digital loop
*FB	5-25	S29	Ignore pin 23 *
*FB1			Pin 23 transition causes DTE speed fallback
*FT	5-37	S29	Disable fast train *
*FT1			Enable fast train
*LA	5-28	S34	Ignore pin 18 *
*LA1			DTE commanded LAL enabled
*LB	5-27		Wait for dial backup call
*LC	5-27	S32	Line current disconnect disabled
*LC1			Short (8 ms) line current disconnect
*LC2			Long (90 ms) line current disconnect *
*LD	5-27		Dial autodial number
*ND	5-42		Displays the nine stored numbers
*NT	5-38	S29	AT command set disabled
*OR	5-38	S14	Originate *
*OR1			Forced answer
*RC	5-14	S57	15 - 4800 bps, 18 - 9600 bps *
*RC1			11 - 4800 bps, 12 - 9600 bps
*RD	5-27	S34	Ignore pin 21 *
*RD1			DTE commanded RDL enabled
*RO	5-43	S29	Retain options at disconnect
*RO1			Restore options at disconnect
*TLn	5-38	S52	Sets leased line Tx level to n where n is a number between 0 and 15 corresponding to 0 to -15 dB

**factory default*

Command	Page	S-Reg	Description
$S=x	4-10		Sets an empty password location to x
$C=x,y	4-10		Changes either password where x represents the old password and y is the new one
$C=x,-	4-10		Deletes password x from memory
$E=x	4-10		Enables security where x is either password
$E?	4-10		Displays the current security status
$D=x	4-10		Disables security where x is either password
$DR	4-10		Reset security
$D?	4-10		Displays the current status of security

STATUS REGISTERS

S-Reg	RO/RW	Page	Function	Factory Default Option Set #1
S0	RW	6-6	Ring to answer	(o = auto answer off)
S1	RO	6-6	Ring count	
S2	RW	6-6	Escape sequence character	43 (+)
S3	RW	6-6	End-of-line character	13 (CR)
S4	RW	6-6	Line feed character	10 (LF)
S5	RW	6-6	Backspace character	8 (BS)
S6	RW	6-7	Pause before blind dialing	2 (2 sec)
S7	RW	6-7	Pause for carrier	30 (30 sec)
S8	RW	6-7	Pause for comma	2 (2 sec)
S9	RW	6-7	Carrier validation	6 (0.6 sec)
S10	RW	6-7	Loss-of-carrier disconnect delay	14 (1.4 sec)
S11	RO	6-8	DTMF tone length	80 (80 ms)
S12	RW	6-8	Escape sequence pause	50 (1 sec)
S14	RW	6-9	Bit mapped	
S16	RW	6-10	System tests	0
S18	RW	6-10	Test timer	0
S21	RW	6-11	Bit mapped	
S22	RW	6-12	Bit mapped	
S23	RW	6-12	Bit mapped	
S25	RW	6-13	DTR recognition time	5 (0.5 sec)
S26	RW	6-13	RTS/CTS delay	0
S27	RW	6-13	Bit mapped	
S28	RW	6-13	Lookback timer	15 min
S29	RW	6-14	Bit mapped	
S30	RW	6-14	Bit mapped	
S32	RW	6-15	Bit mapped	
S34	RW	6-15	Bit mapped	
S39	RW	6-16	Bit mapped	
S52	RW	6-16	Bit mapped	
S53	RW	6-16	801 V.32 timeout	0 (long)
S54	RW	6-17	Flow control DTE	0
S57	RW	6-17	Number code application	0

RO=Read only
RW=Read or write

S-Reg	RO/RW	Page	Function	Factory Default Option Set #1
S58	RW	6-18	Disable MNP Inactivity timer, timer value in minutes	0
S59	RW	6-18	MNP break control	5
S60	RW	6-19	Bit mapped	
S61	RO	6-19	Indicates DTE speed, character size, parity	6
S62	RW	6-20	Disconnect buffer delay	0
S63	RW	6-20	Maximum MNP block size	255
S64	RW	6-20	Auto-reliable fallback character	0
S67	RO	6-20	Link speed status	
S69	RW	6-21	DCE speed	
S70	RW	6-21	Operating mode	1
S71	RO	6-22	Operating mode status	
S72	RW	6-22	Bit mapped	
S78	RW	6-23	Autocallback timer	30
S79	RW	6-23	Break length	35
S84	RW	6-23	Bit mapped	

RO=Read only
RW=Read or write

V.25 bis DIALER COMMANDS

Synchronous Command	Page	Description
CIC	7-9	Connect incoming call command
CRN *nn...n*	7-5	Dial command (*nn...n* = 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 Space Clarity characters dash parenthesis period
CRR *n*	7-9	Redial the last number a maximum of *n* times
CRS *a*	7-7	Dial stored number command (*a* = address)
DIC	7-8	Disregard incoming call command
PRK	7-15	Save current option settings
PRL *a;b*	7-10	Link number at address *a* with number at address *b*
PRN *a; nn...n*	7-6	Program number command (*nn...n* = number to be dialed, *a* = address)

Synchronous Command	Page	Description
PRO *xxx;yy;*0;0...	7-13	Program options command (*xxx* = register address, *yy* = option count)
PRP *n*	7-16	Restores current option settings to the factory defaults in default bank n (1-9)
RLL	7-11	Request list of linked numbers command
RLN	7-7	Request list of stored numbers command
RLO *xxx;yy*	7-17	Request list of stored options command (*xxx* = register address, *yy* = option count)
RLV	7-12	Request list of version information command

Response Message	Meaning
CFIDT	Call failure - no dial tone
CFIET	Call failure - reorder or busy
CFINS	Call failure - number not stored
CFIRT	Call failure - timeout occurred
INC	Incoming ring detected
INVCU	Invalid command - command unknown
INVMS	Invalid command - message syntax error
INVPS	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 MNP)

- **MODEM OPTIONS**
  DCE rate - 9600
  Normal originate
  Fast train disabled
  Auto retrain enabled
  Transmit clock internal
  Dial line
  Jack type RJ11 (permissive)
  Line current disconnect long enabled
  Long space disconnect enabled
  V.22 guard tone disabled

- **MNP OPTIONS**
  MNP protocol enabled
  Auto fallback enabled
  XON/XOFF pass through disabled
  Data compression enabled
  MNP activity timer off
  MNP break control 5

- **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

- **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

- **SPEAKER OPTIONS**
  Volume medium
  On until carrier detect

FACTORY OPTION SET # 2 (ASYNCHRONOUS DIAL-UP WITHOUT MNP)

- **MODEM OPTIONS**
  DCE rate = DTE rate*
  Normal originate
  Fast train disabled
  Auto retrain enabled
  Transmit clock internal
  Dial line
  Jack type RJ11 (permissive)
  Line current disconnect long enabled
  Long space disconnect enabled
  V.22 guard tone disabled

- **MNP OPTIONS**
  MNP protocol disabled*
  DTE speed = DCE speed*
  Flow control disabled*
  XON/XOFF pass through disabled
  Data compression enabled
  MNP activity timer off
  MNP break control 0*

- **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

- **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

- **SPEAKER OPTIONS**
  Volume medium
  On until carrier detect

** Indicates variation from factory option set #1*

FACTORY OPTION SET #3 (SYNCHRONOUS DIAL-UP WITHOUT MNP)

- **MODEM OPTIONS**
  DCE rate - 9600 trellis
  Normal originate
  Fast train disabled
  Auto retrain enabled
  Transmit clock internal
  Dial line
  Jack type RJ11 (permissive)
  Line current disconnect long enabled
  Long space disconnect disabled*
  V.22 guard tone disabled

- **PROTOCOL OPTIONS**
  MNP protocol disabled*
  DTE speed = DCE speed*
  Flow control disabled*
  XON/XOFF pass through disabled
  Data compression enabled
  MNP activity timer off
  MNP break control 0*

- **DTE OPTIONS**
  Sync data *
  Dial method manual *
  AT command set disabled *
  Responds to DTR*
  DSR normal *
  DCD normal *
  CTS follows RTS *
  RTS/CTS delay 0 ms *
  DTE fallback disabled
  Options retained at disconnect

- **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

- **SPEAKER OPTIONS**
  Volume medium
  On until carrier detect

** Indicates variation from factory option set #1*

FACTORY OPTION SET # 4 (SYNCHRONOUS 4-WIRE LEASED LINE WITHOUT MNP)

- **MODEM OPTIONS**
  DCE rate - 9600 trellis
  Normal originate
  Fast train disabled
  Auto retrain enabled
  Transmit clock internal
  Leased line *
  4-wire *
  Tx level - 0 dBm *
  Dial backup manual *
  Lookback timer - 15 min *
  Jack type RJ11 (permissive)
  Line current disconnect long enabled
  Long space disconnect enabled
  V.22 guard tone disabled

- **MNP OPTIONS**
  MNP protocol disabled*
  DTE speed = DCE speed*
  Flow control disabled*
  XON/XOFF pass through disabled
  Data compression enabled
  MNP activity timer off
  MNP break control 0*

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

- **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

- **SPEAKER OPTIONS**
  Volume medium
  On until carrier detect

** Indicates variation from factory option set #1*