V.3229/V.3229L
Manual

Compliments of
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Chapter 1
Introduction

GENERAL

The UDS V.3229 and the V.3229L are versatile high speed asynchronous or synchronous modems that allow data transfer between two host computers via the telephone communication system.

The modems can operate full-duplex on both dial-up and leased lines. The modems are compatible with all required standards and recommendations, and feature a wide variety of automatic, remote, and backup capabilities.

Major characteristics include:

- 14.4 kbps data rate
- V.42 bis and MNP 5 error control protocols with data compression
- a V.25 bis autodialer
- secure operation
- trellis coding for superior signal-to-noise perform-ance.

Data Rates

The V.3229 operates at data rates of

- 7.2, 12.0, and 14.4 kbps trellis-coded per CCITT V.32 bis
- 9.6 kbps trellis-coded and 4.8 and 9.6 kbps un-coded per CCITT V.32 bis
- 2400 and 1200 bps per CCITT V.22 bis
- 300 bps per Bell specification 103

DESCRIPTION
Functional

The V.3229 processes serial asynchronous data from a DTE at all standard rates from 300 bps to 57.6 kbps, and serial synchronous data at rates from 1.2 to 14.4

kbps. Transmission can be over the dial-up telephone network or 2- or 4-wire, point-to-point, dedicated leased lines. The maximum telephone line speed is 14.4 kbps.

Built-in test features can determine system performance and isolate faults in the data link.

Operation and configuration are controlled by either the front panel LCD, the AT command set or V.25 command set. Changes can be made easily.

AutoConfiguration

AutoConfigure allows any of eleven option sets to be quickly enabled or selected as the powerup configuration. There are two ways to enable option sets: the LCD and the AT command set. Refer to Chapter 3 and 5 respectively.

Appendix D lists the nine factory option sets. For maximum versatility two additional options sets designed by the user can also be stored for instant recall or as the powerup configuration.

Remote configuration allows option changes to be made to a remote unit.

Standard and L Models

The modem is available in two models: standard and the L model. The standard model has a 32 character (liquid crystal display) LCD front panel with three pushbuttons for option selection (Figure 1-1).

The L model has a TALK LED and TALK/DATA button. The LED is on in talk mode and off in data mode; the pushbutton selects between the two modes (Figure 1-2).

Both models have six light emitting diodes (LEDS) to show communication status between the modem and data terminating equipment (DTE).
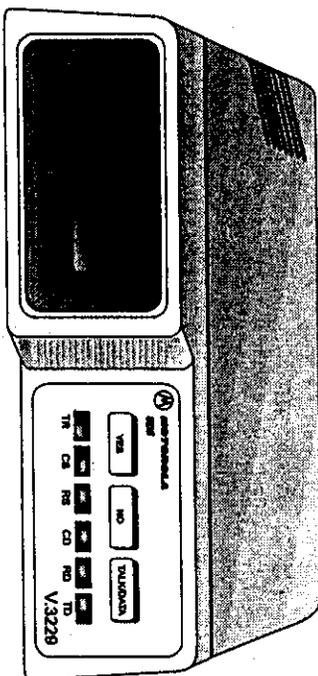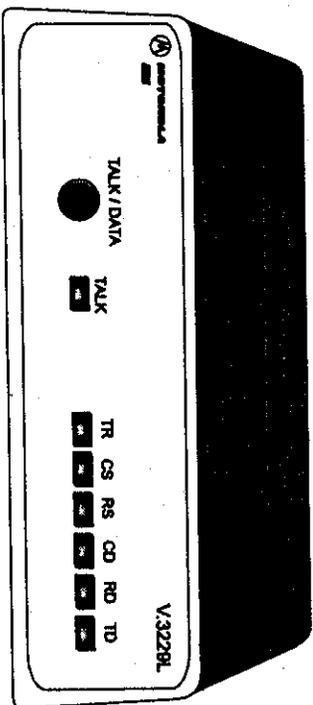
Figure 1-1
Typical Front Panel

Figure 1-2
Typical Front Panel for "L" Model

Standalone and Shelf Units

The standard and L models are available in both standalone or shelf mount configurations. The pc (printed circuit) boards are identical for either so that the standalone board can be field changed for use in the shelf or vice versa. Hardware straps on the pc board offer additional customer options.

The shelf mount unit has edge connectors that insert into the shelf backplane. The shelf backplane performs the same functions as the standalone rear panel.

The standalone rear panel has an EIA-232 DTE connector, an 8-pin (TELSET / LEASED LINE) jack, and an 8-pin (DIAL) jack, the power switch, fuse and power cord (Figure 1-3). Some versions have a 110/220V selection switch.
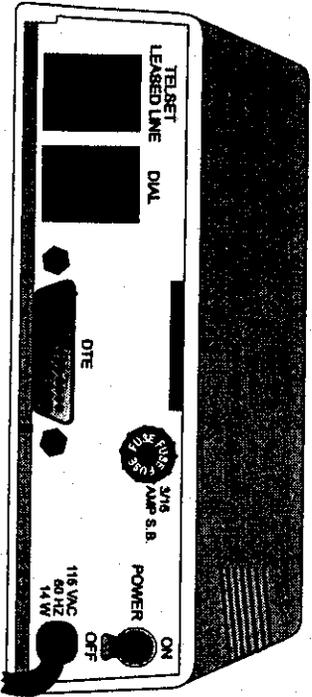

Figure 1-3
Rear Panel (115 Vac Model)

HOW TO USE THIS MANUAL

Most of the manual applies to both the standard and the L model. Users of the L model can ignore Chapter 3 and other explanations of LCD and pushbutton operation throughout the manual. However, these discussions include valid operating information and can be consulted as desired.

Option Selection

There are six ways to change or select options:

• LCD - Using the front panel LCD and pushbuttons is simple, straightforward, and requires the least amount of technical background. Refer to Chapter 3.

• Software program - A variety of software programs is available, or advanced computer users can write their own software programs to interact with the modem. This manual does not discussed software programs.

• AT Commands - The AT compatible command set can be used to select modem options. Refer to Chapter 5.

• Status Registers - A series of special ATS commands allows the user to change the decimal or hexadecimal value of a memory byte to change one or more options in that byte. Refer to Chapter 6.

• Single Bit Commands - A second series of special ATS commands allows the user to change single bits within a byte to change an option. Refer to Chapter 6.

• V.25 bis Commands - An extended set of V.25 commands allows selection of modem options during synchronous operation. Refer to Chapter 7.

Quick Startup

A quick startup procedure at the beginning of Chapter 4 provides information for quickly getting online.

Specifications

Appendix A contains modem specifications.

SECURITY

Three separate security schemes prevent unauthorized access to local and remote modems and DTEs:

- An AT command password prevents remote configuration of the modem.

- An AT command password prevents remote access to the DTE while operating in dial-up mode.

- An autocallback option requires the remote modem to callback the originating modem using the remote unit's autodial capability.

Chapter 2
Installation

GENERAL

This chapter provides information for the mechanical and electrical installation of the modem.

SITE SELECTION

Install the modem within 6 feet of a standard 115 or 230 Vac grounded wall outlet as required for the specific model and no further than 50 feet from the terminal equipment.

The installation area should be clean and free from extremes of temperature, humidity, appreciable shock, and vibration. See equipment specifications in Appendix A for details. Allow clearance for operation and maintenance and at least 4 inches at the rear for cables and air flow.

Receipt Inspection

After unpacking the equipment, check the contents against the packing list. Inspect the equipment for any damage that may have occurred in shipment. If any damage or equipment shortage is noted, refer to the warranty literature. Keep the shipping container and material.

Tools Required

Normal installation requires a screwdriver to secure the data terminal equipment (DTE) cable to the modem and to attach the telephone cable to the 42A terminal block for leased line operation.

Strap Inspection

Several hardware straps on the printed circuit board may require changing prior to installation. Refer to Strap Option Selection at the front of Chapter 3 for information.

ELECTRICAL INSTALLATION

The rear panel (Figure 2-1) houses connectors for the DTE cable and telephone lines.

Figure 2-1
Rear Panel Connections

AC Power Connection

Power is supplied through a 6-foot line cord with a grounded 3-wire plug. If common ground is available through the third prong of the plug, a separate ground wire is not required. If the modem has a 110/220V switch, select the appropriate voltage. If 220 Volt operation is selected, install the supplied 1/8 Amp fuse before connecting power to the modem.

┌─────────────────────────────────┐
│ *Caution: To protect the dc to dc converter from* │
│ *damage, ensure the positive and negative leads* │
│ *are properly connected.* │
└─────────────────────────────────┘

DC Power Input Option

If the modem is equipped for dc power input, connect 12 to 60 Vdc power to the terminal block attached to the modem back panel. A chassis ground connection is also supplied on the terminal block.

DTE CONNECTION

The DTE connector is a 25-pin D-series type conforming to EIA-232 specifications. Pin signals are shown in Figure 2-2 and described in Table 2-1.
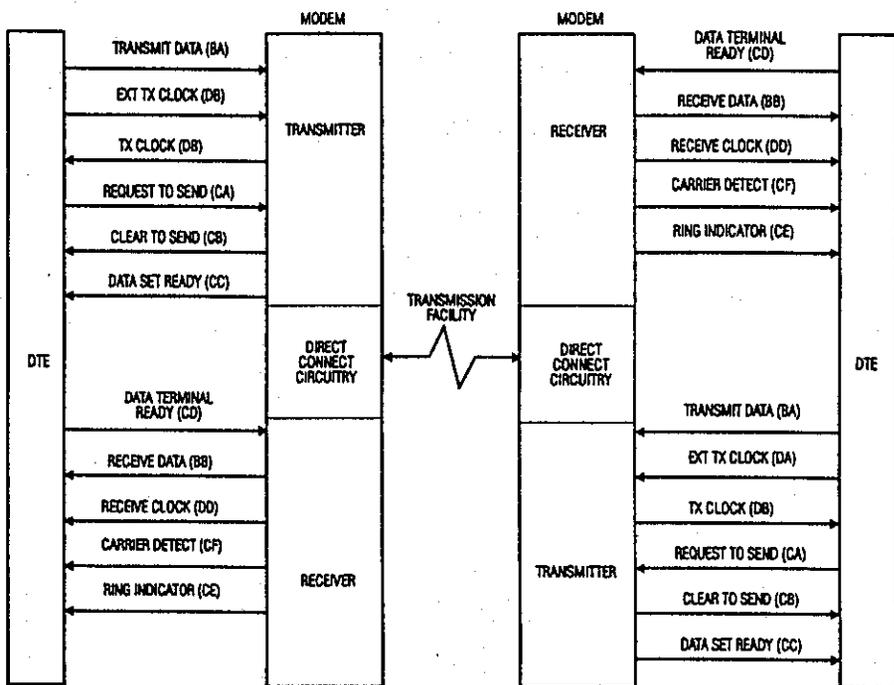
Figure 2-2
Digital Interface Signals

Table 2-1

Digital Interface Signal Descriptions

Pin No.	EIA-232D	CCITT V.24	Signal Name	Description
1		101	Shield	Protective Ground
2	BA	103	Transmitted Data	Serial digital data (to be modulated) from a data terminal or other digital data source: Synchronous data must be accompanied by the modem transmit clock (pin 15) or by an external data rate clock (pin 24). Data transitions should occur on negative-going clock transitions; asynchronous data does not require a transmit clock.
3	BB	104	Received Data	Serial digital data output to the DTE interface: Sync data is accompanied by an internal data rate (receive) clock (pin 17) with negative-going transitions on the data transition. Async data does not require a receive clock.
4	CA	105	Request to Send	A positive level to the modem when data transmission is desired
5	CB	106	Clear to Send	A positive level from the modem in response to request to send and when the modem is ready to transmit*
6	CC	107	Data Set Ready	A positive level from the modem when power is on and ready to operate. In dial-up operation, the modem must be off hook to give a high DSR signal.*
7	AB	102	Signal Ground or Common Return	Common signal and DC power ground
8	CF	109	Received Line Signal Detector	A positive level from the modem indicating the presence of a received signal (carrier detect)*
9			+12 Volts	+12 voltage reference
10			-12 Volts	-12 voltage reference

* Modem options may force these signals on or cause them to be ignored.

Table 2-1 Cont.

Digital Interface Signal Descriptions

Pin No.	EIA-232D	CCITT V.24	Signal Name	Description
11			Signal Quality Indicator	This circuit indicates probability of errors in the received data: a positive level indicates poor signal quality while a negative level indicates good signal quality. †
15	DB	114	Transmit Clock (DCE)	A transmit data rate clock output for use by the DTE equipment. Negative clock transitions correspond to data transitions.
17	DD	115	Receive Clock	A receive data rate clock output for use by the DTE equipment. Negative clock transitions correspond to data transitions.
18		141	Local Loopback (Loop 3) Control	A positive level causes the modem to enter the local analog loopback test mode.*
20	CD	108.2	Data Terminal Ready	This circuit is positive when the DTE is ready to originate or answer a call in dial-up operation. DTR must always be active (high) in 2-wire private line operation.* Cycling DTR causes retraining.*
21		140	Remote Digital Loopback	A positive level causes a digital loopback test mode at the remote modem.
22	CE	125	Ring Indicator	In dial line operation this circuit is positive in response to an incoming ring signal.*
23	CH	111	Data Rate Select	Supplies a data rate control input to select primary or fallback data rate: Negative voltage selects primary data rate and positive voltage selects fallback data rate.*
24	DA	113	External Transmit Clock	A serial data rate clock input from the data source. Negative clock transitions correspond to data transitions.
25		142	Test Mode	Indicates the modem is in a test mode

* Modem options may force these signals on or cause them to be ignored.
† This function can be disabled or its logic sense reversed by hardware straps. Refer to Strap Options.

TELEPHONE LINE CONNECTION

The modem operates in one of three line-related modes:

- Permissive (PSTN)
- Programmable (PSTN)
- Private line

Permissive and programmable modes are used on the Public Switched Telephone Network (PSTN). Private line mode is used on 4-wire or 2-wire dedicated leased lines. The user must decide which mode to use and then select the telephone jack arrangement accordingly.

PSTN Connection

Modems are registered with the Federal Communications Commission (FCC) for direct connection to the PSTN (dial-up network). The label on the chassis bottom gives the FCC registration number and other information.

Direct connection to the PSTN provides two modes of operation (Figure 2-3):
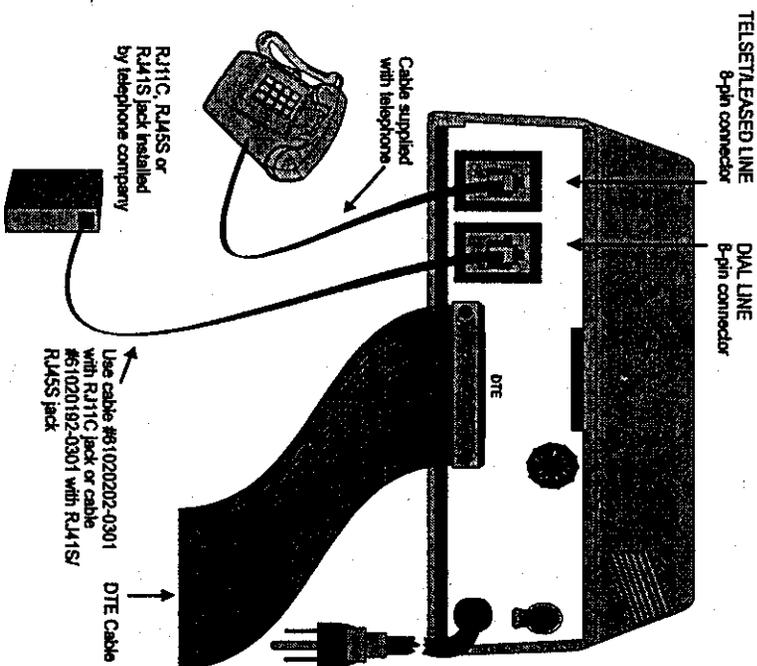
- Permissive (standard)
- Programmable

Permissive

In permissive mode, the modem transmits a maximum signal level of -10 dBm. For standard telephones the jack arrangement is RJ11C. Cable PN 61020202-0301 connects the DIAL jack on the back of the modem to the RJ11C wall jack.

Programmable

Programmable mode corrects for the signal level loss between the modem and the telephone company central office. This is done by setting the modem transmit output signal level with a resistor selected and installed in the jack by the telephone company. This allows the output signal to reach the central office at the optimum level of -12 dBm. Jack arrangements for this mode are the RJ45S (Programmable) and RJ41S (Universal). The RJ41S has a switch option that must be selected to Programmed (P). Cable PN 61020192-0301 (not supplied with modem) is used to connect the DIAL jack to the RJ41S or RJ45S wall jack.

TELSET/LEASED LINE 8-pin connector

DIAL LINE 8-pin connector

Cable supplied with telephone

RJ11C, RJ45S or RJ41S jack installed by telephone company

Use cable #61020202-0301 with RJ11C jack or cable #61020192-0301 with RJ41S/ RJ45S jack

DTE

DTE Cable

Notes:

1. The TELSET/LEASED LINE jack on the back of the modem is used with a standard tone or pulse dial telephone. A standard tone or pulse dial telephone can be used for originating a call to be switched to data mode after voice communication. A phone is not required at sites where autoanswer or autodial capability is all that is needed.

2. A standard tone or pulse dial telephone can be used for originating a call to be switched to data mode after voice communication. A phone is not required at sites where autoanswer or autodial capability is all that is needed.

Figure 2-3
Dial-up Connection

Leased Line Connection

> *Note: The modem is compatible with exclusion key phone arrangements.*

The modem operates on either 2-wire or 4-wire leased lines. The telephone company will install the leased line and wall jack at your site. The line connects to the modem at the 8-position TELSET/LEASED LINE jack.

The 42A block is the most common termination for leased line use. It requires the use of the 8-pin modular to spade lug cable (PN 61020569-0000). Figure 2-4 illustrates the typical hook-up of the modem for operation over private leased lines with dial backup.

> *Note: Although the 42A block is the most common, some Bell operating companies have discontinued its use for leased lines. Instead, the modular jack JM8 is used. If this is the case in your area, you need a special cable (PN 6102075-0000). Contact your distributor for further information.*
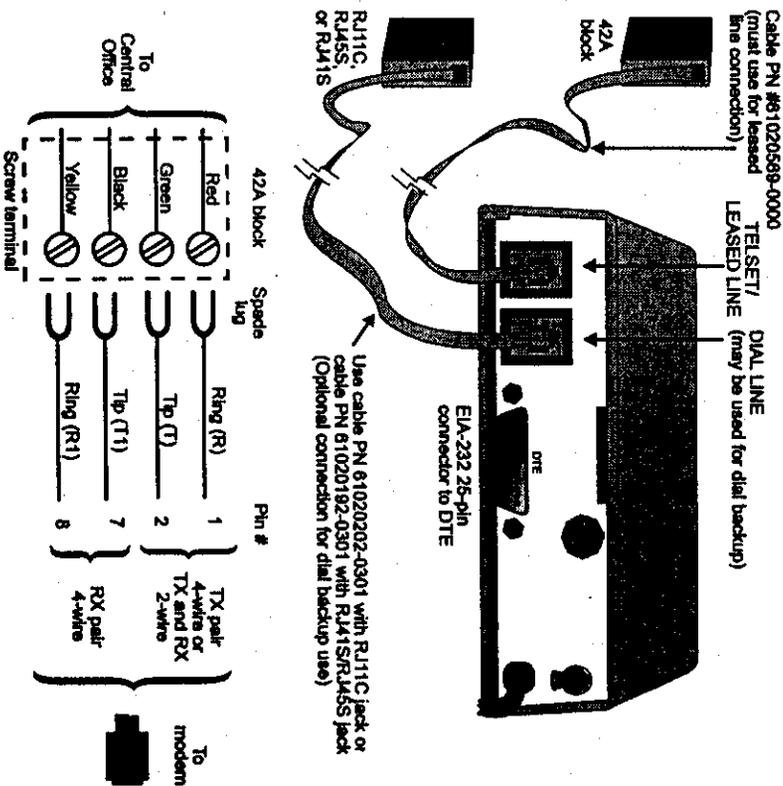
Figure 2-4
Leased Line Connection

Notes:
1. Set the transmit output level to 0 dBm.
2. DTR, which is the signal on pin 20 of the DTE interface, must be active or the option DTR IGNORED must be set for 2-wire leased line operation.
3. The connections shown includes optional dial backup.