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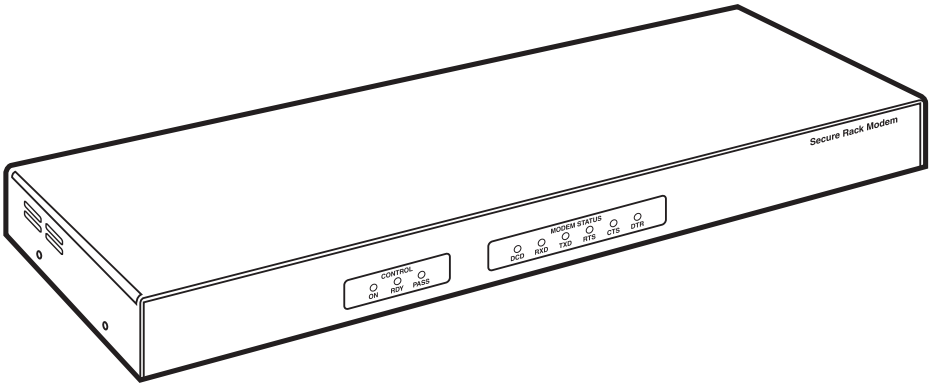
BLACK BOX®
NETWORK SERVICES

NOVEMBER 2000
MD960A
MD960A-D48

Secure Rack Modem



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FEDERAL COMMUNICATIONS COMMISSION
AND
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RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

FCC REQUIREMENTS FOR

TELEPHONE-LINE EQUIPMENT

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network with standardized jacks. This equipment should not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until the repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. If you have problems with your telephone equipment after installing this device, disconnect this device from the line to see if it is causing the problem. If it is, contact your supplier or an authorized agent.

4. The telephone company may make changes in its technical operations and procedures. If any such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.

5. If the telephone company requests information on what equipment is connected to their lines, inform them of:

   a. The telephone number that this unit is connected to.

   b. The ringer equivalence number.

   c. The USOC jack required: RJ-11C.

   d. The FCC registration number.

   Items (b) and (d) can be found on the unit's FCC label. The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5). If too many devices are attached, they may not ring properly.

6. In the event of an equipment malfunction, all repairs should be performed by your supplier or an authorized agent. It is the responsibility of users requiring service to report the need for service to the supplier or to an authorized agent.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

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1. Specifications

General

Compatibility—ITU-T V.22 bis (2400 bps) to ITU-T V.34+ (33.6 kbps); Bell: 212/V.22, 103/V.21

Command Set—Connexant Choppiest; Industry-standard AT commands

Supports—V.42/MNP® 2–4 Error Control; V.42bis/MNP 5 Data Compression

User Password Directory—Passwords allowed: 100 maximum; Password field: 16 characters, case-sensitive; Dialback field: 32 digits

Operating Temperature—32 to 113°F (0 to 45°C)

Humidity—10 to 90%, noncondensing

Power—AC model: 115/230 VAC, 50/60 Hz, 10 watts; DC model: Dual -48 VDC inputs, 0.1 amp

Size—1.75"H x 19"W x 6"D (4.5 x 48.3 x 15.2 cm)

Shipping Weight—5 lb. (2.3 kg)

Modem Port

Interface—RS-232C

Connector—DB25 female

Data Rate—300 to 38,400 baud

Buffer—32 K

Flow Control—None, RTS/CTS, X-ON/X-OFF, Both

Rings to Answer—1 to 32

No Activity Timeout—1 to 30 minutes

Console Port

Interface—RS-232C

Connector—DB9 male

Site ID—32 characters maximum

System Password—16 characters, case-sensitive

2. Introduction

2.1 General

Use the Secure Rack Modem for applications that require secure, dial-up access to console ports on rack-mounted equipment. It can recognize up to 100 passwords, track activity for each password, and create a log of successful and/or unsuccessful access attempts.

2.1.1 Password-Protected Access

Up to 100 passwords can be stored in the modem's non-volatile memory. You can assign each password a user name and a dial back number (it instructs the unit to call the user at a predefined number before allowing access to the secure device). A separate system password restricts access to the modem's command mode. This allows the system administrator to contact the unit via modem in order to change parameters or check access activity.

2.1.2 Access Activity Logs

The modem provides two convenient ways to track access activity: the Audit log and the Password directory. The Audit log lists the 100 most recent connection attempts, including the time, date, password entered, port used, call duration, and reason for disconnect. The Password directory displays user names, passwords and dial back numbers, and counts the use of each individual password. Only the System Administrator can view the Audit log and Password directory; callers who log on with a User Password are not allowed to view these screens.

2.1.3 Three Different Operating Modes

The modem provides three distinct operating modes: the User mode, the Command mode, and the Unsecured mode.

- User mode: Provides password-protected access to the secure device connected to the Secure Rack Modem's serial modem port.
- Command mode: Provides password-protected access to the modem's Command Menus, which are used to define passwords and select configuration parameters.
- Unsecured mode: When this mode is activated, the Secure Rack Modem will function like a normal, unsecured modem; callers are allowed to access the secure device without entering a password.

2.2 Description

2.2.1 Front Panel

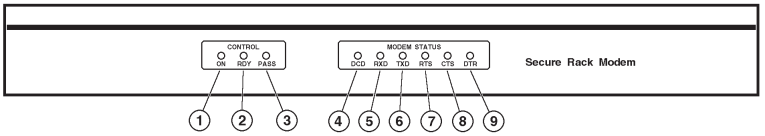

Figure 2-1. Front panel.

1. ON: Lights when power is applied to the modem.
2. RDY: Flashes to indicate that the modem is ready to receive calls or enter the command mode.
3. PASS: Lights when a caller has entered a valid password and has been allowed to access the connected device.
4. DCD (Data Carrier Detect): Lights when the DCD signal is high.
5. RXD (Receive Data): Lights when the RXD signal is high.
6. TXD (Transmit Data): Lights when the TXD signal is high.
7. RTS (Request to Send): Lights when the RTS signal is high.
8. CTS (Clear to Send): Lights when the CTS signal is high.
9. DTR (Data Terminal Ready): Lights when the DTR signal is high.

NOTE

The DTR signal must be high for the modem to communicate. If the DTR signal is low, the modem will prompt callers to enter a password, but will disconnect when a valid password is entered.

2.2.2 BACK PANEL

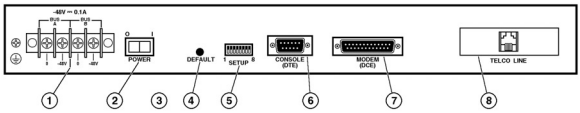

Figure 2-2. Back panel (DC version shown).

1. Power input: (DC unit shown) The DC version includes a dual-bus terminal block for -48-VDC operation and a ground screw. The AC version includes an IEC-32 inlet for connection to a three-wire (grounded) power cord (supplied with the modem).

2. Power switch.

3. Voltage selector switch: (AC units only) For selecting 115-VAC or 230-VAC operation.

4. Default button: Resets unit to default parameters and erases the password directory. To reset to defaults, power off the unit, then press and hold the Default button while pressing the Power switch to ON. Wait several seconds, then release the Default button.

NOTE

The default procedure will clear all menu-selected parameters and erase the Password directory.

5. Setup switches: These eight DIP switches select the default modem baud rate, flow control, parity, rings to answer, compression, speaker (on/off), and security mode. For more information on the setup switches, refer to **Section 4.2**.

6. Console port: For connection to your PC, terminal, or other device. Allows access to command mode. DB9, RS-232, DTE configuration.

NOTE

You can also access command mode via modem as explained in Section 5.1.2.

Appendix A.1 describes the console port interface.

7. Modem port: For connection to the secure device. The modem will protect dialup access to this device by requiring a password or calling the user back at a predefined number. **Appendix A.2** describes the Modem port interface.

8. Telco line: An RJ-11 jack, for connection to your telecommunications line.

2.3 Features

- Password-protected command mode.
- Recognizes up to 100 user-defined passwords.
- Tracks access attempts and password activity.
- Requires only one 19-inch rack unit.
- Filtered and surge-protected power supply.
- Two models available: AC and -48 VDC.

3. Getting Started

This chapter provides a brief introduction to the procedures you'll use to communicate with the modem and access the configuration menus. For detailed instructions about installation and configuration, refer to **Chapters 4** through **6**.

3.1 Applying Power to the Unit

Connect an appropriate power source to the modem. The modem is available in both AC- and DC-powered versions.

- AC model (MD960A): Set the voltage selector switch (located on the modem's back panel) to the appropriate voltage. Connect the supplied power cable to the receptacle on the modem's back panel, then connect the plug to a suitable AC outlet.
- DC model (MD960A-D48): Remove the protective plastic cover from the DC terminal block, switch off the DC power source, then attach the wires from the -48 VDC power source to the screw terminals. Connect your ground line to the grounding screw, then replace the protective cover and switch the DC power source back on.

CAUTION

Only operate the modem with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, please contact your local power company.

After connecting the modem to the power source, put the power switch in the ON position. The ON indicator will light, and after a brief pause, the RDY indicator will begin to flash.

3.2 Connecting a PC to the Console Port

For this overview, we'll connect a PC to the modem's console port. This will allow you to access the command mode and display the menus that are used to select configuration parameters, check connection activity, and define and display user passwords.

NOTE

Although this overview demonstrates the procedure for communicating with the unit via the Console Port, you can also access the Command Mode via modem as described in Section 5.1.2.

To connect your PC to the modem's console port:

1. Attach a standard null-modem cable to a COM port on your PC. Make certain to connect to the COM port that is used by your communications program (for example, ProComm).

2. Connect the other end of the cable to the console port, located on the modem's back panel. For a description of the console port interface, refer to **Appendix A**.

3.3 Communicating with the Secure Rack Modem

To communicate with the modem for the first time, you must set your communications program (for example, ProComm) to match the default console port parameters. After you access command mode, you can then use the General Parameters menu to select other console port parameters as described in **Chapter 5**, and then reset your communications program accordingly.

Start your communications program and set it to match the following default console port parameters:

- 9600 bps.
- 8 data bits, 1 stop bit.
- No parity.

After setting the communications program to match the default console port parameters, press **[Enter]** to activate the modem's command mode. After a brief pause, the modem should display the Help screen shown in Figure 3-1, followed by the "SRM>" command prompt. When you access the modem via the console port, a password prompt will not be displayed.

```
Secure Rack Modem       Version 1.11      Site: (undefined)

COMMANDS
/H    Display Help Screen           /C View Audit Log
/G    View/Set General Parameters   /U Utilities
/M    View/Set Modem Parameters     /X Exit/Disconnect
/E    Edit Password Directory
/D    View Password Directory

Modem Type:       V2.200-V34_AGF_DP1
Reset String:     ATZ
Init String:      AT&C1&D2E0Q1V1M1S0=1&Q%C3
Hang-Up String:   (undefined)

MODEM PORT SETTINGS
Baud Rate:        9600        Result Codes:     Verbose
Flow Control:     RTS/CTS     Speaker:          On
Local Echo:       Off         Error Control:    On
Rings to Answer:  1           Compression:      On
Quiet Mode:       On
```

Figure 3-1. The Secure Rack Modem Help Screen.

If the command prompt and Help screen are not displayed, check to make certain that you've selected the correct communications parameters, cable connectors are firmly seated, and that the cable has been connected to the COM port that is used by your communications program.

When the "SRM>" command prompt is displayed, you can invoke the commands listed in the Help menu to display the various configuration menus and status screens. For this overview, we recommend only that you review the information on each menu in order to familiarize yourself with the modem; you don't need to actually enter parameters at the configuration menus now.

1. View/Set General Parameters: From the command prompt, type `/G` and press **[Enter]**. The General Parameters menu will be displayed. This menu is used to set console port communication parameters, define the system password, and select other general parameters as described in **Section 5.2**. Press **[Esc]** to return to the main menu.

2. View/Set Modem Parameters: Type `/M` and press **[Enter]** to display the Modem Parameters menu. You'll use this menu to select communication parameters for the SRM's internal modem as described in **Section 5.3**. Press **[Esc]** to return to the main menu.

3. Utilities Menu: Type `/U` and press **[Enter]** to display the Utilities menu. You'll use this menu to access the modem's command features, such as the Pass-Through mode, the Download Parameters function, and others. Press **[Esc]** to return to the main menu.

4. Other Menus: At this point, commands such as "View Password Directory" and "View Audit Log" will not display much information. This is because the Password directory has not been defined yet, and the Audit log has not had the opportunity to record connection activity. If you wish to display these menus, key in the appropriate command and then press **[Enter]**. To exit a menu, press **[Esc]** to return to the main menu.

5. Exit/Disconnect: When you have finished exploring the various modem command menus, return to the "SRM>" command prompt, and then type `/X` and press **[Enter]** to exit from command mode.

This completes the introductory overview of the Secure Rack Modem. To demonstrate the modem's security functions, you must completely install the unit, and define the Password directory as explained later in this manual. Refer to **Chapters 4** through **6** for complete installation and configuration instructions.

4. Hardware Installation

4.1 Connecting Power to the Secure Rack Modem

The Secure Rack Modem is available in both AC- and DC-powered versions. When connecting power to the modem, follow the instructions in this section.

CAUTION

Only operate the modem with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, please contact your local power company.

4.1.1 AC-Powered Model (MD960A)

Set the voltage selector switch (located on the modem's back panel) to the appropriate voltage. Plug the supplied power cable into the receptacle on the modem's back panel, and then connect the power cable to a grounded (earthed), 115-VAC outlet.

4.1.2 DC-Powered Model (MD960A-D48)

When connecting the modem to your DC power source, first remove the protective plastic cover from the DC terminal block. Switch off your DC power source, and then attach the wires from the 48-VDC power source to the screw terminals, and connect your ground line to the labeled ground screw. Then replace the protective cover, and switch the DC power source back on.

NOTE

The DC terminal block features a dual bus configuration so you can connect it to a back-up power supply.

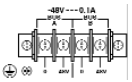

Figure 4-1. Terminal block assembly and grounding screw (DC units only).

4.2 Setup Switches

The setup switches, located on the back panel, select the default settings for Modem Port baud rate, flow control, parity, rings to answer, and enable or disable ARQ/Compression, the modem speaker, and the modem's Security Mode.

NOTE

You can also select operating values for all of these parameters via the modem's configuration menus. However, if you reset the modem to default parameters, these settings will return to the default values selected by the Setup switches.

4.2.1 Default Modem Baud Rate (SW1, SW2)

Setup switches #1 and #2 select the default baud rate for the Secure Rack Modem's internal modem and the serial modem port. You can also select the modem's baud rate via the Modem Parameters menu (/M). If you reset the unit to default parameters, the modem baud rate will return to the default setting selected by setup switches #1 and #2.

NOTE

Automatic baud rate sensing is disabled, so the modem can function with devices that do not send an AT command string.

Table 4-1. Modem baud rate switch settings

Default Modem Baud Rate	SW1	SW2
9600 bps*	DOWN	DOWN
38.4 kbps	DOWN	UP
19.2 kbps	UP	DOWN
2400 bps	UP	UP

*Default setting.

4.2.2 Default Flow Control Format (SW3)

Setup switch #3 selects the default flow control (handshaking) format for the serial modem port. The flow control format for the serial modem port can also be selected via the Modem Parameters menu. You set the flow control format for the internal modem itself using AT commands as described in **Chapter 9**. If you reset the unit to default parameters, the flow control format will return to the default setting selected by setup switch #3.

Table 4-2. Flow control switch settings

Default Flow Control Format	SW3
RTS/CTS (Hardware)* X-ON/X-OFF (Software)	DOWN UP

*Default setting.

4.2.3 Default Bits and Parity (SW4)

Setup switch #4 selects the default bits and parity setting for both the internal modem and the serial modem port. You can also select the bits and parity via the Modem Parameters menu (/M).

NOTE

If you reset the modem to default parameters, bits and parity will return to the default setting selected by setup switch #4.

Table 4-3. Default bits and parity switch settings

Default Bits and Parity	SW4
8 bits, no parity, 1 stop bit* 7 bits, even parity, 1 stop bit	DOWN UP

*Default setting.

4.2.4 Default Rings to Answer (SW5)

Setup switch #5 selects the default "Rings to Answer" setting. The Rings to Answer setting can also be defined via the Modem Parameters menu (/M). If the modem is reset to default parameters, the Rings to Answer feature will return to the default setting selected by setup switch #5.

Table 4-4. Default rings to answer switch settings

Default Rings to Answer	SW5
One*	DOWN
Eight	UP

*Default setting.

4.2.5 Default ARQ/Compression Status (SW6)

Setup switch #6 selects the default enabled/disabled status for the ARQ/Compression feature. The ARQ mode and compression feature can also be enabled or disabled via the Modem Parameters menu (/M).

NOTE

If the modem is reset to default parameters, these features will return to the default settings selected by setup switch #6.

Table 4-5. Default ARQ/Compression status switch settings

Default ARQ/Compression Status	SW6
Enable*	DOWN
Disable	UP

*Default setting.

4.2.6 Default Modem Speaker Status (SW7)

Setup switch #7 selects the default enabled/disabled status for the modem speaker. You can also use the Modem Parameters menu (/M) to enable or disable the speaker. If you reset the modem to default parameters, this feature will return to the setting selected by setup switch #7.

Table 4-6. Default modem speaker status switch settings

Default Modem Speaker Status	SW7
ON*	DOWN
OFF	UP

*Default setting.

4.2.7 Default Security Mode Status (SW8)

Setup switch #8 selects the default enabled/disabled status for the security mode. You can also disable the security mode via the General Parameters menu (/G). Note that if the unit is reset to default parameters, the security mode feature will return to the default status selected by setup switch #8.

NOTE

If the modem security mode is disabled (off), all password and security features will be suppressed, and you will not be able to access the modem command mode via the modem (although console port access to command mode is still allowed). When the security mode is disabled, the modem will function like a normal, non-secure modem.

Table 4-7. Default security mode status switch settings

Security Mode	SW8
ON*	DOWN
OFF	UP

*Default setting.

4.3 Initialize the Unit to Default Settings

If you change setup switch settings, new parameters will not take effect until the modem is initialized.

CAUTION

After initialization, menu-selected parameters will return to the settings specified by the setup switches. Also, the password directory will be erased.

NOTE

To reset the modem to default parameters without clearing the password directory, use the "Default Parameters" option in the Utilities menu as described in Section 7.5.4.

1. Set the modem's Power switch to the OFF position.
2. Press and hold the Default button (located on the back panel). Place the modem's Power switch in the ON position.
3. Wait for one second (or until the front-panel LEDs flash), and then release the Default button.

4.4 Cable Connection

Connect cables and telco lines as described in the sections that follow. Please refer to **Appendix A** for a description of port interfaces.

4.4.1 Modem Port

The serial modem port connects to your secure device. Use a straight-wired modem cable to connect the secure device to the Secure Rack Modem's serial modem port. For a description of the modem port interface, see **Appendix A**.

4.4.2 Console Port

The modem's command mode allows the system administrator to define passwords, select configuration parameters, and review the connection activity log. There are two different ways to access the command mode: via modem or via a local PC connected to the modem's console port.

If you plan to control and configure your modem via the console port, use an appropriate cable to connect the console port to the COM port on your PC or terminal. **Appendix A** describes the console port interface. If you'll control and

configure your installation via modem, you won't need to connect a PC to the console port.

4.4.3 Telco Line

Use a standard RJ-11 phone cable to connect your phone line outlet to the telco line port on the modem's back panel. If the modem's telco line port includes two RJ-11 connectors, connect your phone line to the connector labeled "wall" or "line."

5. Setup and Configuration

This section describes how to select modem configuration parameters. The default modem parameters are intended to fit the requirements of most applications. Please review the default settings to determine if you must change any parameters. In many cases, the factory defaults will work just fine.

5.1 Command Mode Access

The Command mode allows you to select parameters, define passwords, and review the connection activity log. There are two ways to access the Command mode: via the console port and via modem.

NOTE

While the Command mode is active, inbound callers will receive a busy signal.

5.1.1 Access via the Console Port

When a local PC or terminal is connected to the modem's console port, system administrators can access the Command mode as follows:

NOTE

When the the modem is accessed via the console port, the password prompt is not displayed. The password prompt is always displayed when the unit is accessed via modem.

- PC: Start your communications program (for example, ProComm) and then press **[Enter]**. The modem's Help Screen (see Figure 5-1) will be displayed.
- Terminal: Press **[Enter]**. The Help screen will be displayed.

If the modem does not respond, check the following:

- Console Port Communication Parameters: The modem's console port and your communications program or terminal must be set to use the same communication parameters. The default console port parameters are 9600 bps, no parity, 8 data bits, one stop bit.
- Correct Port: Make certain that your communications program or terminal is set to use the COM port that is connected to the modem's console port.

```
Secure Rack Modem       Version 1.11      Site: (undefined)

COMMANDS
/H    Display Help Screen           /C View Audit Log
/G    View/Set General Parameters   /U Utilities
/M    View/Set Modem Parameters     /X Exit/Disconnect
/E    Edit Password Directory
/D    View Password Directory

Modem Type:       V2.200-V34_AGF_DP1
Reset String:     ATZ
Init String:      AT&C1&D2E0Q1V1M1S0=1&Q%C3
Hang-Up String:   (undefined)

MODEM PORT SETTINGS
Baud Rate:        9600        Result Codes:     Verbose
Flow Control:     RTS/CTS     Speaker:          On
Local Echo:       Off         Error Control:    On
Rings to Answer:  1           Compression:      On
Quiet Mode:       On
```

Figure 5-1. The Modem's Help screen.

5.1.2 Access via Modem

To access the Secure Rack Modem's Command mode via modem, dial the number for the phone line connected to the modem. When the password prompt is displayed, key in your system password (Default = SUPER) and press **[Enter]**. The modem will display the Help screen as shown in Figure 5-1.

NOTE

The password is case-sensitive.

If the system dial back number has been defined (see **Sections 5.2** and **7.2.3**), the modem will dial the defined number before allowing access to the Command mode. In this case, when the valid system password is entered, the modem will disconnect, and call the system dial back number before allowing access to Command mode.

If the "Password on Dial Back" feature (see **Sections 5.2** and **7.2.4**) is enabled, the modem will redisplay the password prompt to the answering party. If the answering party enters the system password, the modem will allow access to the Command mode.

If the modem does not respond, check the following:

- Modem Communication Parameters: The Secure Rack Modem's internal modem and your remote communications program must be set to use the same communication parameters. You can select the default modem communication parameters using setup switches #1 through #8 (factory setting is 9600 bps, no parity, 8 data bits, one stop bit).

5.2 The General Parameters Menu

Use the menu shown in Figure 5-2 to set the real-time clock, and select the system password, site ID, and other general parameters. To access the General Parameters menu, activate the modem's Command mode as described in **Section 5.1**, then type `/G` and press **[Enter]**.

```
GENERAL PARAMETERS

1. System Password:                 SUPER
2. System Dial Back #:              (undefined)
3. Site ID:                         (undefined)
4. Real Time Clock:                 Tue 06/13/2000 11:25:26
5. Console Port Communication:      9600, N, 8, 1
6. Command Echo:                    On
7. No Activity Timeout:             5 Min
8. Password Attempts:               3
9. Password on Dial Back:           Off
10. Security Mode:                  On
11. Audit Log Options:              All
12. Dial Back Attempts:             1
13. Dial Back Delay:                30 Sec

Enter Selection,
Press <Esc> to Abort…
```

Figure 5-2. The General Parameters menu.

To change the setting for any item in this menu, key in the number for the desired item, press **[Enter]**, then follow the instructions in the submenu. The General Parameters menu includes the following items:

1. System Password: This password protects modem access to the Command mode. When a caller connects to the modem, it sends a password prompt. If the system password is entered, the caller will then be granted access to the Secure Rack Modem's Command mode.

NOTE

The System Password is case-sensitive. (It can be up to 16 characters, and the default is SUPER).

2. System Dial Back #: When defined, the modem will dial this number before allowing modem access to the Command mode. When a caller contacts the modem, it sends a password prompt. If the caller enters the valid system password, the modem will disconnect and then call the system dial back number. When the system dial back number answers, the Modem Command mode will start (up to 32 characters; default is "undefined").

NOTE

While a dial back operation is in progress, the modem is not able to accept incoming calls, and will not recognize commands entered via the console port.

3. Site ID: Defines a text string which can be used to identify the location where the modem is installed. The site ID message will be displayed at the top of the modem's Help screen (up to 32 characters; default is "undefined").

4. Real Time Clock: Sets the Secure Rack Modem's internal real time clock and calendar. The modem uses the real-time clock to record times and dates when logging connection activity. Enter the correct time using 24-hour (military) format.

5. Console Port Communication: Defines the baud rate, parity bits, data bits, and stop bits for the console port (default is 9600 bps, no parity, 8 data bits, 1 stop bit).

NOTE

If you change the console port parameters, new settings will take effect immediately, and may affect your ability to communicate with the modem. Make certain to note newly selected parameters, and set your communications program to match.

6. Command Echo: Enables/disables the command echo. When enabled, characters sent to the modem will be echoed back and shown on the display monitor (default is ON).

7. No Activity Timeout: Selects the timeout value for both the console port and the internal modem. If no data or command activity is detected during this period, the modem will disconnect or exit from Command mode (default is 5 min.).

8. Password Attempts: The number of password attempts that will be accepted when a user attempts to access the Secure Rack Modem via modem. If this number is exceeded, the Secure Rack Modem will disconnect and terminate the modem connection (default is 3).

NOTE

If the number of password attempts is set to zero, the user password requirement is disabled. In this case, if the unit is contacted via modem, the password prompt will still be displayed, but callers will be allowed to access the secure device by pressing [Enter] in response to the prompt. The modem will continue to log access attempts, and the system password will continue to protect access to the Command mode.

9. Password on Dial Back: This item adds an additional layer of security to the dial back feature: when a dial back is performed, the modem will prompt the answering party to enter a password before allowing access. When this feature is enabled, it will be applied to both user password dial backs and system password dial backs. Note that the answering party must enter the same password that was entered to initiate the dial back (default is OFF).

10. Security Mode: This item can be used to disable the modem's security features. When the security mode is off, the modem will function like a normal, unprotected modem. Callers will be granted access to the secure device without entering a password (default is determined by setup switch 8; factory setting is ON).

NOTES

When the security mode is disabled, the modem will not prompt callers to enter a password before allowing access to the secure device.

If the security mode is disabled (off), you will not be able to access the Secure Rack Modem Command mode unless you place setup switch 8 in the down position, and you reinitialize the unit as described in Section 4.3.

11. Audit Log Options: This item determines which type of calls will be recorded in the modem's Audit log. The modem can log all connection attempts, only successful attempts, or only unsuccessful attempts. This log will list the user name, password entered, duration of the call, and exit status. **Section 7.4** describes the Audit log screen (default is "all").

12. Dial Back Attempts: This item determines how many times the modem will attempt to contact the dial back number if the initial call is not successful (default is "1").

13. Dial Back Delay: Determines how much time will elapse between each dial back attempt (default is 30 seconds).

When you have finished selecting parameters from the General Parameters menu, press **[Esc]** to return to the main Help screen. Menu-selected parameters will be stored in the modem's non-volatile memory.

5.3 The Modem Parameters Menu

The Modem Parameters menu is used to select communication parameters for both the Secure Rack Modem's internal modem and the serial modem port. To display the Modem Parameters menu, access the Command mode as described in **Section 5.1**, then type `/M` and press **[Enter]**.

```
MODEM PARAMETERS

1. Baud Rate:                 9600
2. Bits/Parity:               8-None
3. Stop Bits:                 1
4. Flow Control:              RTS/CTS
5. Local Echo:                Off
6. Rings to Answer:           1
7. Quiet Mode:                On
8. Result Codes:              Verbose
9. Speaker:                   On
10. Error Control:            On
11. Compression:              On
12. Reset String:             ATZ
13. Custom Init String:       (undefined)
14. Hang-Up String            (undefined)

Enter Selection,
Press <Esc> to abort…
```

Figure 5-3. The Modem Parameters menu.

To change the setting for any item in this menu, key in the number for the desired item, press **[Enter]**, and follow the instructions in the submenu. The Modem Parameters menu includes the following items:

1. Baud Rate: The operating baud rate for the Secure Rack Modem's modem and serial modem port. If you reinitialize the unit, the baud rate will return to the default value selected by setup switches #1 and #2 (select the default by setup switches #1 and #2; factory setting is 9600).

NOTE

Automatic baud rate sensing is disabled. This allows the modem to function with devices that do not send an AT command string.

2. Bits/Parity: The operating data bits and parity bits for the Secure Rack Modem's internal modem and serial modem port. If you initialize the unit to default settings, the bits and parity will return to the default setting currently selected by setup switch #4 (determine the default by setup switch #4; factory setting is 8-None).

3. Stop Bits: The setting for the internal modem (default is 1).

4. Flow control: This item selects the operating flow control format for the Secure Rack Modem's internal modem. To set the flow control format for the serial modem port, invoke the appropriate AT command as described in **Chapter 9**, or modify the modem initialization string as described under item 13.

NOTE

If the Secure Rack Modem is initialized to defaults, the modem will return to the default flow control format selected by setup switch 3. (Default is determined by setup switch 3; factory setting is RTS/CTS.)

5. Local Echo: Enables/disables the local echo for the Secure Rack Modem's internal modem (default is OFF).

6. Rings to Answer: Determines how many rings will elapse before the Secure Rack Modem's internal modem answers an incoming call.

NOTE

If the modem is reinitialized, the modem will return to the setting selected by setup switch 5. (Default determined by setup switch 5; factory setting is 1.)

7. Quiet Mode: Enables/disables the quiet mode. When enabled, the Secure Rack Modem's internal modem will not send confirmation messages in response to AT commands (default is ON).

8. Result Codes: Determines whether the Secure Rack Modem will respond to AT commands with terse (numeric/abbreviated) or verbose (English text) messages. For a listing of possible AT result codes, please refer to **Chapter 11**.

NOTE

If the quiet mode (see item 7) is enabled, the Secure Rack Modem will not send responses to AT commands, regardless of which result code setting is selected (default is "verbose").

9. Speaker: Enables/disables the modem speaker (default is ON).

10. Error Control: Enables/disables the error control function (default is ON).

11. Compression: Enables/disables the data compression function (default is ON).

12. Reset String: If necessary, this item can be used to redefine the modem reset string. (Up to 16 characters: default is ATZ.)

13. Custom Initialization String: This item is used to "customize" the Secure Rack Modem's modem initialization string. During configuration, the unit will build an initialization string based on items selected from the modem parameters menu. This string will consist of three components: (1) the default string header (AT&C1&D2), (2) the responses to items 1 through 11 in the Modem Parameters menu, and (3) any special AT commands entered via item 13. For a listing of available AT commands, please refer to **Chapter 9**. (Up to 16 characters: default is "undefined".)

14. Hang-Up String: This item is used to define tasks that are performed after the Secure Rack Modem hangs up at the end of a communication session. Typically, the hang-up string would be used to clear memory, or reset the modem to a set of user-defined parameters. To define the hang-up string, simply key in the appropriate AT commands for the desired operation(s). For a listing of available AT commands, please refer to **Chapter 9**. (Up to 16 characters: default is "undefined".)

When you have finished selecting modem configuration parameters, press **[Esc]** to return to the main Help screen. User-selected parameters will be saved in the modem's non-volatile memory.

5.4 Save Parameters

After you've completely configured the unit, save configuration parameters to an ASCII file as described in **Chapter 8**. This allows quick recovery if the unit is reset to default parameters, or if configuration is accidentally deleted or altered.

6. The Password Directory

When the modem is properly configured, each inbound caller will be prompted to enter a password before accessing the secure device. The password directory is a listing of all valid user passwords, user names, and their associated dial back numbers.

The modem will accept up to 100 user passwords and one system password. User passwords allow access to the secure device connected to the Secure Rack Modem's serial modem port, and the system password allows access to the command mode. As discussed in **Section 5.2**, the system password is defined via the General Parameters menu. The procedure for defining user passwords is described in this chapter.

To add passwords to the directory or edit existing user passwords, make certain the command mode is active, then type `/E` and press **[Enter]**. The Secure Rack Modem will display the Edit Password Directory menu shown in Figure 6-1. This menu offers three options; Add Name/Password, Edit/Delete from List, and Edit/Delete from Search.

After defining the password directory, you may wish to review its contents. Section 6.4 describes the procedure for displaying the password directory and explains the directory screen.

NOTES

User passwords do not allow access to the modem's Command mode.

In order for the modem to protect access to the secure device, the security mode must be enabled (see Section 5.2) and at least one user password must be defined.

```
EDIT PASSWORD DIRECTORY

1. Add Name/Password
2. Edit/Delete from List
3. Edit/Delete from Search

Enter Selection,
Press <Esc> to abort…
```

Figure 6-1. The Edit Password Directory menu.

6.1 Add Name/Password

To add new user passwords and names to the password directory, go to the Edit Password Directory menu (/**E**), type 1 (**Add Name/Password**) and press **[Enter]**. The modem will display a submenu that contains the following items:

1. Name: This item assigns a name to each user password. The modem will not prompt callers to enter the user name in order to log in. This name is used only for internal accounting purposes and to associate each password with a specific client or employee. (Up to 16 characters.)

NOTE

The modem will not accept duplicate user names or passwords. The unit will display an error message if you attempt to define a name or password that is already in use.

2. Password: This item assigns a password for each user. When a caller attempts to log on to the modem, he must enter a valid user password (case-sensitive, up to 16 characters) in order to access the secure device.

3. Dial back number: This item can assign a dial back number to each user password. If the dial back number is not defined, a caller who accesses the Secure Rack Modem with this user password will be granted immediate access to the secure device. If the dial back number is defined, when a caller enters this user password, the Secure Rack Modem will disconnect, call the assigned dial back number, and then allow the answering party to access to the secure device (up to 32 characters.)

NOTES

The modem can be configured to perform a dial back for some user passwords, while providing immediate access to other user passwords.

While a dial back operation is in progress, the modem is not able to accept incoming calls, and will not recognize commands entered via the console port.

If the initial call is not successful, the modem will repeat the dial back procedure as specified by item 12 (dial back attempts) and item 13 (dial back delay) in the General Parameters menu (see Section 5.2).

4. Save entry: This item stores the password, name, and dial back number in the password directory. If you are satisfied with the data entered at prompts 1 through 3, type 4 and press **[Enter]** to save this information in non-volatile memory.

After each password is saved, the Secure Rack Modem will redisplay the Add Name/Password menu. To continue to add names and passwords, repeat steps one through four in this section. If you have finished adding passwords, press **[Esc]** to return to the Edit Password Directory menu.

6.2 Edit/Delete from List

Options 2 and 3 in the Edit Password Directory menu are used to edit and/or delete passwords from the password directory. The difference between these two options is the manner in which the desired password is selected. When option 2 is used, the desired password is selected from a list of all passwords. When option 3 is used, the password is selected by searching for a specific password or user name.

To use option 2 to edit or delete user passwords:

1. Go to the Edit Password Directory menu (**/E**). Type 2 (**Edit/Delete from List**) and press **[Enter]**.

2. The modem will display the first line of the password directory.

   a) To select a password, press ≥ or ≤ until the desired password appears at the bottom of the list. The password at the bottom of the list is the currently selected password.

   b) To display the next 15 lines of the directory, press **[Enter]**.

```
EDIT/DELETE NAME/PASSWORD:

1. Name:                A. User
2. Password:            secret
3. Dial Back #:         15555551212
4. Save Entry
5. Delete Entry

Type "<" <Enter> previous entry, ">" <Enter> next entry,
<number><Enter> to select item,
<ESC> to abort…
```

Figure 6-2. The Edit/Delete Name/Password menu.

3. When the desired password appears at the bottom of the list, press **E**. The menu shown in Figure 6-2 will be displayed.

NOTE

The password that appears at the bottom of the list is the selected password.

4. Edit password: To edit the selected password, type the number for the field that you wish to change and follow the instructions in the submenu.

   a) For example, to change the dial back number for the selected password, type 3, press **[Enter]**, and then key in the new number as described in the submenu.

   b) When you have finished editing the password, return to the Edit/Delete Name/Password menu; type 4 and press **[Enter]** to save the edited password to the password directory.

   c) To edit another password, type > and press **[Enter]** for the next password, or type < and press **[Enter]** for the previous password.

   d) To exit from the Edit/Delete Name/Password menu, press **[Esc]**. The modem will display the new listing for the edited password. To return to the main Help screen, press **[Esc]**, or type /H and press **[Enter]**.

5. Delete password: To delete the selected password, type 5 and press **[Enter]**.

   a) The modem will ask for confirmation and then delete the selected password from the directory. Note that passwords cannot be "undeleted." After you confirm that the selected password should be deleted, the modem will display the next password in the list.

   b) To continue to delete or edit passwords, use the ≥ and ≤ keys to scroll through the list until the desired password is selected (appears at bottom of list). Then press **E** to edit or delete the next password.

   c) To exit from the Edit/Delete Name/Password menu, press **[Esc]**, or type /H and press **[Enter]** to return to the main Help screen.

6.3 Edit/Delete from Search

When you use option 3 to edit or delete passwords, the password is selected by searching for the specific password or user name. To search for the specific password to be edited or deleted, proceed as follows.

1. From the Edit Password Directory menu (/**E**), type 3 (**Edit/Delete from Search**) and press **[Enter]**.

2. The modem will display a menu which offers the option to search by name or search by password.

   a) To search by name, type 1 and press **[Enter]**. To search by user password, type 2 and press **[Enter]**.

   b) If the desired name or password is found, the SRM-100 will display the Edit/Delete Name/Password menu as shown in Figure 6-2.

3. Edit password: To edit the selected name/password, type the number for the field that you wish to change and follow the instructions in the submenu.

   a) For example, to change the dial back number for the selected password, type 3, press **[Enter]**, and then key in the new number as described in the submenu.

   b) When you have finished editing the password, return to the Edit/Delete Name/Password menu. Type 4 and press **[Enter]** to save the edited password.

   c) To edit another password type > and press **[Enter]** for the next password, or type < and press **[Enter]** for the previous password.

   d) To exit from the Edit/Delete Name/Password menu, press **[Esc]**. The modem will display the listing for the edited password. To return to the main Help screen, press **[Esc]**, or type /H and press **[Enter]**.

4. Delete password: To delete the selected password, type 5 and press **[Enter]**.

   a) The modem will ask for confirmation and then delete the selected password from the directory. Passwords cannot be "undeleted." After you confirm that the selected password should be deleted, the Secure Rack Modem will display the next password in the list.

   b) To continue to delete or edit passwords, use the ≥ and ≤ keys to scroll through the list until the desired password is selected (appears at bottom of list). Then press **E** to edit or delete the next password.

   c) To exit from the Edit/Delete Name/Password menu, press **[Esc]**, or type /H and press **[Enter]** to return to the main Help screen.

6.4 Viewing the Password Directory

After you have added several names and passwords, you may wish to view the Password directory in order to verify that data has been correctly entered. To display a screen which lists all currently defined user names and user passwords, type `/D` and press **[Enter]**. The Secure Rack Modem will display the screen shown in Figure 6-3.

NOTE

This command will not display the system password. To display the system password, you must access the General Parameters menu (/G).

```
Name              Password          Dial Back #                          Activity
A. Lincoln        stovepipehat      194955512234                         12
B. Ross           flag              (undefined)                          11
B. Ruth           homerun           (undefined)                          15
C. Coolidge       silentcal         (undefined)                          14
D. Crocket        coonskincap       15155551111                          0
D. Madison        cake              (undefined)                          5
F. Roosevelt      dime              17145554321                          9
G. Washington     cherrytree        (undefined)                          31
N. Armstrong      moon              (undefined)                          3
P. Revere         horse             (undefined)                          23
T. Jefferson      nickel            12135559876                          15
T. Roosevelt      roughride         12145553741                          8
1234567890123456 1223567890123456  12345678901234567890123456789012     0

Reached End of Directory
Press <Enter> to continue…
```

Figure 6-3. The Password directory (sample data shown).

The Password directory display includes the following items:

1. Name: The user-defined name for this password. Callers will not be prompted to enter their user name, only the password. The “Name” is generally used to identify the user or client associated with each password.

NOTE

In the Password directory, lines are sorted alphabetically by name. Uppercase letters are listed before lower-case letters, and letters are listed before symbols.

2. Password: The user password that is currently defined for this name.

NOTE

The password is case-sensitive.

3. Dial Back Number: The dial back number currently defined for this name.

NOTE

If the Dial Back Number has not been defined, this field will read "undefined."

4. Activity: The number of times that this password has been used since the last time the activity counter was reset. The procedure for resetting the activity counter is discussed in **Section 6.5**.

6.5 Zero Activity Counters

To track password activity, the password directory screen lists the number of access attempts for each user password/name. From time to time, you may wish to re-zero these counters to obtain a more accurate picture of password activity. To zero the activity counters:

1. Access the modem's Command mode as described in **Section 5.1**.

2. When the "SRM>" command prompt appears, type `/U` and press **[Enter]**. The Utilities menu will appear as shown in Figure 7-2 (see **page 44**).

3. From the Utilities menu, type `1`, then press **[Enter]** and follow the instructions in the submenu.

6.6 Save Parameters

After you've defined the password directory, save modem configuration parameters and the password directory to an ASCII file as described in **Chapter 8**. This lets you quickly recover the parameters when the unit is reset to default parameters, or configuration is accidentally deleted or altered.

7. Operation

7.1 Secure Rack Modem Operating Modes

The modem provides three separate operating modes: the User mode, the Command mode, and the Unsecured mode.

7.1.1 User Mode

The User mode is activated when a caller enters a user password at the login prompt. The User mode only allows the caller to access the secure device which is connected to the serial modem port. The User mode does not allow access to configuration menus or the password directory.

7.1.2 Command Mode

The Command mode is activated when a caller enters the system password at the login prompt, or when a local terminal or PC accesses the modem via the console port. The Command mode allows access to all modem configuration menus. It is used to define passwords and select operating parameters as described in **Chapters 5** and **6**.

7.1.3 Unsecured Mode

When the Unsecured mode is active, the modem will function like a normal, unprotected modem. Callers will be allowed to access the secure device without entering a password. The Unsecured mode is activated by placing setup switch 8 in the UP position (see **Section 4.2.7**), or by accessing the General Parameters menu (see **Section 5.2**) and disabling the security mode.

NOTE

When the unsecured mode is active, you will not be able to access the command mode. To return to password-protected operation, you must enable the security mode by placing setup switch 8 in the DOWN position, and then reinitialize the Secure Rack Modem as described in Section 4.3.

7.2 Password Functions

The modem features two different types of passwords: the system password and the user passwords. The system password allows system administrators to invoke configuration commands and review connection activity. The user passwords allow callers to access the secure device that is connected to the modem unit.

7.2.1 The System Password

The system password protects modem access to the Secure Rack Modem's Command mode. The Command mode allows system administrators to invoke commands to select configuration parameters, edit the password directory, and review connection activity.

The modem lets you define one system password via the General Parameters menu (/**G**). The default system password is "SUPER." The system password is case-sensitive.

The system password is not required when you access the Command mode via the console port; this password is only used when the Secure Rack Modem is contacted via modem. When the unit answers an incoming call, the password prompt is displayed. If the caller enters the system password, he will be granted access to the Command mode; if the caller enters a user password, the caller will be allowed to access the secure device.

NOTES

When defining the system password, we strongly recommend that you record the password for future reference.

If you forget or lose your system password, you will not be able to access the Secure Rack Modem's command mode via modem. In this case, you will need to access the Command mode locally, via the console port, and then redefine the system password (default is SUPER).

7.2.2 User Passwords

User passwords allow callers to access the secure device. User passwords do not grant access to the Command mode. The modem allows definition of up to 100 user passwords, which are defined via the Edit Password Directory menu (/**E**) as described in **Chapter 6**. User passwords are case-sensitive.

7.2.3 Dial Back Numbers

Both the system password and the user passwords allow definition of a dial back number. When you've defined a dial back number for a given password, callers who enter that password will not be granted immediate access. Instead, when a valid password is entered, the Secure Rack Modem will disconnect, call the defined dial back number for the password, and then grant access to the answering party.

When a dial back for a system password is performed, the modem will allow access to the command mode. When a dial back for a user password is performed, the modem will allow access to the secure device. The system dial back number is

defined via the General Parameters menu (/**G**), and the user dial back numbers are defined via the Edit Password Directory menu (/**E**).

NOTE

When user dial back numbers are defined, the modem can be configured to perform a dial back for some user passwords, while granting immediate access to other user passwords. If the dial back number is not defined for a given password, then a dial back will not be performed when that password is entered at the login prompt.

NOTES

Callers will receive a busy signal while the dial back operation is in progress.

If the initial call is not successful, the modem will repeat the dial back procedure as specified by item 12 (dial back attempts) and item 13 (dial back delay) in the General Parameters menu (see Section 5.2).

7.2.4 Password on Dial Back

The password on dial back option provides an additional level of security when dial back numbers are used. When a dial back is performed, the modem will prompt the answering party to enter a password before allowing access. When you enable this feature at the System Parameters menu, it will be applied to both system passwords and user passwords.

Each time the modem is accessed via modem, a password prompt is displayed, and the caller will then key in a user password or system password. If the password is recognized as valid, the modem will check to see if a dial back number has been assigned to that password.

If a dial back number has been assigned, the modem will hang up and call the dial back number. If "password on dial back" has been enabled, the answering party will again be prompted to enter a password. If the system password is entered, the answering party will be allowed to access Command mode. If a user password is entered, the answering party will be allowed to access the secure device.

NOTE

The password entered at the dial back prompt must be the same password that was entered at the dial in prompt.

7.3 Suppressing the Confirmation Prompt

The modem will display a confirmation prompt before executing commands such as /**X** (**Exit/Disconnect**), or performing tasks such as clearing the Audit log. The

confirmation prompt provides one last chance to terminate a command before it is executed.

In some cases, you may wish to execute a command or perform a task without being prompted for confirmation. To suppress the confirmation prompt, include the ",Y" argument in the Secure Rack Modem command line.

EXAMPLES:

- Exit/Disconnect: To exit from Command mode without displaying the confirmation prompt, type `/X,Y` and press **[Enter]**.
- Delete Audit Log: The Utilities menu (see Figure 7-2) includes a function (item 2) which allows you to clear all logged connection attempts. If you type `2` and press **[Enter]**, the Secure Rack Modem will display a confirmation prompt before clearing connection attempts. If you type `2,Y` and press **[Enter]**, the Secure Rack Modem will clear the Audit log without displaying the confirmation prompt.

7.4 Viewing the Audit Log

The Audit log lets you track password use and access attempts. Item 11 in the General Parameters menu (**/G**) determines which type of access attempts will be recorded. You can configure the Audit log to record all connection attempts, only successful attempts, or only unsuccessful attempts.

Date	Time	Duration	Port	Name	Password Entry	Exit Status
08/11	09:53	00:00:00	M(out)			No Answer
08/11	09:49	00:00:00	M(in)	T. Jefferson	nickel	Dialing Back
08/11	09:42	00:01:05	C			Exit Command
08/11	09:39	00:00:41	M(in)	G. Washington	cherrytree	Connection Lost
08/11	09:37	00:01:35	M(out)			DTR Drop
08/11	09:33	00:00:00	M(in)	A. Lincoln	stovepipehat	Dialing Back
08/11	09:33	00:02:15	C			Exit Command
08/11	09:27	00:03:45	M(in)	P. Revere	horse	No Activity
08/11	09:22	00:00:00	M(in)		secret	Invalid Password
08/11	09:17	00:03:05	M(in)	F. Roosevelt	dime	DTR Drop
08/11	09:07	000:05:18	M(in)	B. Ross	flag	Connection Lost
08/11	09:05	00:01:30	M(out)			Connection Lost
08/11	09:05	00:00:00	M(in)	A. Jackson	twenty	Dialing Back
08/11	08:52	00:03:27	M(in)	G. Washington	cherrytree	No Activity
08/11	08:43	00:05:48	C			No Activity
08/11	08:40	00:00:00	M(in)		guest	Invalid Password
08/11	08:39	00:00:00	M(in)		test	Invalid Password
08/11	08:36	00:02:31	M(in)	C. Coolidge	silentcal	DTR Drop

Press <Enter> Next 20 entries, <ESC> to abort…

Figure 7-1. The Audit log.

NOTE

You can only view the Audit log via the Secure Rack Modem command mode. To display the Audit log, access the Command mode as described in Section 5.1, then type `/C` and press [Enter]. Events are listed in reverse chronological order, with the most recent attempts appearing at the top of the list.

The Audit log will list the 100 most recent connection attempts. After 100 events are recorded, the log will wrap-around, and older events will be deleted as each new event is added. If you wish to clear the Audit log and delete all entries, access Command mode, then type `/U` and press **[Enter]**. The Utilities menu will appear. From the Utilities menu, type `2` (**Delete Audit Log**), press **[Enter]**, and follow the instructions in the submenu.

NOTE

Deleted log entries cannot be recovered.

To view access activity for each individual password, type `/D` and press **[Enter]** to display the Password directory as described in **Section 6.4**.

As shown in Figure 7-1, the Audit log screen includes the date, time, call duration, port used, user name, password entered, and exit status. Note the following:

1. Port Used: Lists the port used for each connection attempt:
   - M(out): An outbound call placed by the modem. This usually indicates that the Secure Rack Modem has performed a dialback in response to a user password entered at login.
   - M(in): An inbound call received by the modem.
   - C (Console Port): The Command mode was accessed via the console port.
   - S (Serial Port): The device connected to the serial modem port has accessed the modem using the pass-through function.
2. Name: The user name for the password entered at login. If an invalid password is entered, this column will be blank.
3. Password Entry: The last password entered during this connection attempt. Although the Secure Rack Modem will allow 1, 3, 5, 9, or an infinite number of password attempts, the Audit log will list the last password entered at the login prompt. Earlier password attempts will not be listed.
4. Exit Status: The reason for disconnection:

- Exit Command: The caller entered the **/X** command to exit from the Secure Rack Modem Command mode.
- Invalid Password: The caller did not enter a valid password within the allowed number of password attempts.
- Dialing Back: The Secure Rack Modem ended the connection in order to perform a dialback operation. For more information on the dialback function, please refer to **Section 7.2.3**.
- No Answer: The Secure Rack Modem has performed a dial back operation, and the dialback number did not answer.
- Connection Lost: The party on the other end of the phone line has either hung-up or unplugged the phone line.
- DTR Drop: The connection was terminated because the Secure Rack Modem dropped the DTR signal, did not receive a DTR signal, or detected a bad line.
- No Activity: The connection has timed out because of a lack of data activity. For more information on the timeout feature, refer to **Section 5.2**.

7.5 The Utilities Menu

The Utilities menu allows access to a series of command functions that are related to general operation and maintenance of the modem. To display the Utilities menu, access the Secure Rack Modem Command mode as described in **Section 5.1**, then type `/U` and press **[Enter]**. The menu shown in Figure 7-2 will appear. The various functions of the Utilities menu are discussed in the sections that follow.

```
UTILITIES

1. Zero All Activity Counters
2. Delete Audit Log
3. Delete Entire Password Directory
4. Default Parameters
5. Send Test Message (ESC to Stop)
6. Upload Parameters
7. Download Parameters
8. Pass-Through (Console-Modem)

Enter Selection
Press <Esc> to Abort…
```

Figure 7-2. The Utilities Menu.

7.5.1 Zero All Activity Counters

This command is used to reset the counters that track connection activity for each password. To zero all activity counters, access the Utilities menu, then type 1, press **[Enter]**, and follow the instructions in the submenu.

To view the password activity counters, access the modem's Command mode as described in **Section 5.1**, type /D and press **[Enter]** to display the Password directory. For more information, refer to **Sections 6.4** and **6.5**.

7.5.2 Delete Audit Log

This command is used to clear all records from the Audit log. To erase all Audit log entries, access the Utilities menu, type 2 and then press **[Enter]**.

NOTE

Once you clear the Audit log, you can't recover the deleted connection activity records.

7.5.3 Delete Entire Password Directory

This function is used to completely clear the entire modem password. To completely clear all entries from the Secure Rack Modem Password directory, first access the Utilities menu as described above. When the Utilities menu appears, type 3, press **[Enter]**, and follow the instructions in the submenu.

NOTE

When this function is performed, the entire modem Password directory will be cleared. You cannot restore the Password directory unless you've previously saved parameters to an ASCII file as described in Chapter 8.

7.5.4 Default Parameters

This option allows the system administrator to reset the unit to default parameters without deleting the Password directory. To clear all menu-selected parameters except the Password directory, and return the modem to its default configuration, first access the Utilities menu as described in **Section 7.5**. When the Utilities menu appears, type 4, press **[Enter]**, and follow the instructions in the submenu.

NOTES

When the modem is reset to default parameters, all menu-selected parameters will be cleared. You cannot recover menu selected parameters unless you've saved them to an ASCII text file as described in Chapter 8.

When the "Default Parameters" function is performed via modem, the

Secure Rack Modem will not immediately reset modem parameters. The unit will reset all other parameters, wait for the caller to disconnect, and then reset modem parameters.

7.5.5 Send Test Message

This option allows the system administrator to send a test message via the console port or telecommunications line. If the Secure Rack Modem Command mode has been accessed via the console port, the test message will be sent out the console port. If the Command mode has been accessed via modem, the test message will be sent via the telecommunications line.

This test message is used to test communication with a remote device that has accessed the Secure Rack Modem Command mode via modem, or to test communication with the local device connected to the console port. To send the test message, proceed as follows:

1. Access the modem's Command mode as described in **Section 5.1**.
2. When the "SRM>" command prompt appears, type `/U` and press **[Enter]**. The Utilities menu will appear as shown in Figure 7-2.
3. From the Utilities menu, type `5`, and press **[Enter]**.
   a) If you have accessed the modem's Command mode via the console port, the test message will then be sent out the console port.
   b) If you have accessed the modem's Command mode via modem, the test message will then be sent out the telecommunications line.
4. To terminate the test message, press the **[Esc]** key.

7.5.6 Upload Parameters

This function is used to restore Secure Rack Modem parameters that have been saved to an ASCII text file using the Utilities menu's "Download Parameters" function. To restore saved modem parameters, please refer to the instructions in **Section 8.2**.

7.5.7 Download Parameters

This function is used to save user-selected modem parameters to an ASCII text file on your PC or control device. To save modem parameters, please refer to the instructions in **Section 8.1**.

7.5.8 Pass-Through Mode (Console-Modem)

The Pass-through mode allows communication between the device connected to the console port and the Secure Rack Modem's internal modem.

When the Pass-through mode is active, the console port can access the modem in order to place outbound calls, or invoke any of the AT commands listed in **Chapter 9**.

NOTE

When the Command mode is accessed via modem, the Pass-through mode can also allow a remote user to access a control device connected to the console port.

To activate the Pass-through mode:

1. Access the Command mode as described in **Section 5.1**.
2. When the "SRM>" command prompt appears, type `/U` and press **[Enter]**. The Utilities menu will appear as shown in Figure 7-2.
3. From the Utilities menu, type `8`, then press **[Enter]** and follow the instructions in the submenu.
4. To exit from Pass-through mode and return to the Command mode, type `/X` and press **[Enter]**.

8. Saving and Restoring Parameters and Password Directory

After the modem has been properly configured and the Password directory has been defined, configuration parameters and the Password directory can be saved as an ASCII text file. Later, if the configuration is accidentally altered, you can upload the file to automatically reconfigure the unit so you won't have to manually assign each parameter and password.

Saved parameters and passwords can also be uploaded to other Secure Rack Modems. This allows rapid setup when several units will be configured with the same parameters and Password directory.

You can run the "Save Parameters" procedure from any communications program (for example, ProComm, Hyperterminal, etc.) that allows downloading of ASCII files.

8.1 Sending Parameters to a File

1. Start your communications program and access the modem's Command mode as described in **Section 5.1**.

2. When the command prompt appears, type `/U` and press **[Enter]**.

   a) The Utilities menu will appear. From the Utilities menu, type 7 and press **[Enter]**. The Secure Rack Modem will prompt you to configure your communications program to receive an ASCII download.

   b) Set your communications program to receive an ASCII format download, and specify a name for a file that will receive the saved parameters (for example, SRM.PAR).

   c) Make certain to disable your communication program's line wrap function. This will prevent command lines from being broken in two during transmission.

3. When the communications program is ready to receive the file, return to the Secure Rack Modem Command mode and press **[Enter]** to proceed with the download. Menu selected parameters and the currently defined Password directory will be saved on your hard drive in the file specified in step 2 above.

4. The modem will send a series of ASCII command lines which specify the currently selected Secure Rack Modem parameters.

8.2 Restoring Saved Parameters

Once menu-selected parameters and the Password directory have been saved, the parameters file can be uploaded to the modem to quickly configure the unit without the need to manually enter each parameter and password. To restore saved parameters, proceed as follows:

NOTE

When the "Upload Parameters" function is performed via modem, the modem will not immediately reset modem parameters. The unit will reset all other parameters, wait for the caller to disconnect, and then reset modem parameters.

1. Start your communications program and access the modem's Command mode via the console port, or via modem using the system password.

2. When the command prompt appears, type `/U` and press **[Enter]**.

   a) The Utilities menu will appear. From the Utilities menu, type `6` and press **[Enter]**. The Secure Rack Modem will display a message which indicates that the unit is ready to receive the parameters file.

   b) Set your communications program to upload an ASCII text file using the file name specified in **Section 8.1**. When the communications program is ready, begin the upload procedure.

3. The saved parameters file will be sent to the modem, and the saved parameters and Password directory will be restored. When the upload is complete, make certain to terminate the communication program's upload mode.

9. Modem Command Set (AT Commands)

In addition to the Secure Rack Modem's menu-driven configuration functions, the internal modem will also accept standard Rockwell format AT commands. This section describes the AT command set and lists the function of each command.

The AT command set is used to select advanced modem configuration parameters, which are not available via the Secure Rack Modem's menuing system. AT commands can be sent directly to the modem, or added to the user-defined initialization string via item 13 (Custom Init. String) in the Secure Rack Modem's Modem Parameters menu (see **Section 5.3**).

9.1 Communicating with the Internal Modem

In order to invoke AT commands, you must communicate directly with the Secure Rack Modem's internal modem. The modem command mode is only available via the console port or the serial modem port; inbound callers cannot communicate directly with the modem. To send AT commands to the Secure Rack Modem's internal modem proceed as follows.

1. Via console port: Access the Secure Rack Modem's Command mode as described in **Section 5.1.1**.

   a) When the "SRM>" command prompt appears, type `/U` and press **[Enter]** to display the modem's utilities screen.

   b) When the utilities screen appears, type `8` and press **[Enter]** to activate the Pass-through mode. When the Pass-through mode is active, the device connected to the console port can send AT commands directly to the Secure Rack Modem's internal modem.

   c) To exit the Pass-through mode, type `/X` and press **[Enter]**. The unit will return to the "SRM>" command prompt.

2. Via modem port: The device connected to the Secure Rack Modem's modem port can also issue AT commands. Go to the secure device and start your communications program (for example, ProComm). Make certain that the communications program is configured to use the same COM port that is connected to the modem.

9.2 Modem Status

The Secure Rack Modem's internal modem can generate a status screen, which lists currently selected settings for most of the AT commands, the contents of most of the S-registers, the two stored modem profiles, and four stored phone numbers.

To display the modem status screen, access the internal modem's Command mode as described in **Section 9.1**, then type AT&V and press [Enter]. The internal modem will display the status screen shown in Figure 9-1.

```
ACTIVE PROFILE
B1 E0 L1 M1 N1 Q1 T V1 W0 X4 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0 &Y0
S00:001 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006
S10:014 S11:095 S12:050 S18:000 S25:005 S26:001 S36:007 S37:000 S38:020 S44:020
S46:138 S48:007 S95:000

STORED PROFILE 0
B1 E1 L1 M1 N1 Q0 T V1 W0 X4 T0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &T5 &X0
S00:000 S02:043 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095 S12:050 S18:000
S36:007 S37:000 S40:104 S41:195 S46:138 S95:000

STORED PROFILE 1
B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0
S00:000 S02:043 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095 S12:050 S18:000
S36:007 S37:000 S40:104 S41:195 S46:138 S95:000

TELEPHONE NUMBERS
0=                  1=
2=                  3=
```

Figure 9-1. The Modem Status screen (defaults shown).

9.3 AT Command Set

This section describes the AT command set. Note the following:

- Type commands in either upper or lower case. Do not use a combination of upper- and lower-case characters.
- Use the backspace key to delete errors.
- Some commands have numeric options. If these commands are invoked without a numeric option, the modem will assume option 0 (zero). For example, when the command ATE is invoked, the modem will assume command ATE0 was intended.
- All commands begin with the AT prefix, and are invoked by pressing **[Enter]**. The only exceptions are the A/ command (**Repeat previous command**) and +++ (**Exit to on-line command mode**).

- The maximum command length is 40 characters. This does not include the AT prefix, carriage returns, or spaces.
- **Defaults are marked with an asterisk (*).**

Command	Function/Options
AT	Attention command. Required prefix for all modem commands. Not required for the A/ command or +++ command.
A/	Re-execute last command. Used mainly to redial. Does not require the AT prefix or a carriage return.
A	Manual answer. Goes off hook in answer mode.
B*n*	CCITT or Bell operation. B0 Selects CCITT operation at 300 or 1200 bps. *B1 Selects Bell operation at 300 or 1200 bps.
C*n*	Transmit carrier signal. C0 Not supported. C1 Enable transmit carrier signal.
D*n*	Dial command. Dials the specified phone number. Can also include the following command options: * Dials the "star" digit (tone dialing only). # Dials the "pound" digit (tone dialing only). L Re-dials last number dialed. P Pulse (rotary) dial mode. 10 pulses per second. T Tone dial mode (DTMF). W Wait for dial tone (1 to 255 seconds, default = 50 sec.) , (Comma) Pause. Modem will pause for time period specified by register S8 before dialing (0 to 255 seconds; default is 2 seconds) @ Wait for quiet answer. ! (Exclamation point) Flashes the switch hook. ; (Semicolon) Return to command mode after dialing.

Command	Function/Options	
D*n*	&	Wait for credit card dial tone before continuing with dial string. If the bong is not detected within the time specified by register S7, the modem will abort the dial sequence, go on-hook, and generate an error message.
	^	Toggles calling tone for current dial attempt only.
	S=*n*	Dial stored number (where *n* = 0 to 3).
	( )	(Parentheses) Ignored; may be used to format the dial string.
	-	(Dash) Ignored; may be used to format the dial string.
	<Space>	Ignored; may be used to format the dial string.
E*n*	Set local echo.	
	*E0	Disable echoing of commands to screen.
	E1	Enable echoing of commands to screen.
H*n*	Disconnect (hang-up).	
	H0	Hangs up (goes on-hook).
	H1	Goes off-hook.
I*n*	Modem identification.	
	I0	Display product identification code.
	I1	Display checksum.
	I2	Display ROM checksum as OK or ERROR.
	I3	Display modem firmware revision level.
	I6	Report modem data pump and internal code revision.
L*n*	Modem speaker volume.	
	L0	OFF or low volume.
	*L1	Low volume.
	L2	Medium volume.
	L3	High volume.
M*n*	Modem speaker control.	
	M0	Disable modem speaker.
	*M1	Speaker ON until carrier is detected.
	M2	Speaker always ON.
	M3	Speaker ON after dial, until connection is established.

Command	Function/Options
N*n*	Enable/Disable Automode. N0 Disable automode detection (equivalent to setting the +MS<automode> subparameter to 0). A subsequent handshake will be conducted as specified by register S37, or if S37=0, according to the most recently sensed DTE speed. *N1 Enable automode detection (equivalent to setting +MS<automode> subparameters to 1). A subsequent handshake will be conducted as specified by register S37, or if S37=0, starting at 28,800 bps V.34.

NOTES

The Nn and S37=*x* commands override the +MS command settings. When the N0 or N1 command is issued, the +MS subparameters are updated accordingly. For example, "N1S37=10" updates the +MS command subparameters to reflect "+MS=10,1,300,12000"; while "N0S37=10" updates the +MS command subparameters to "+MS=10,0,300,12000".

We recommend that you use the +MS commands instead of the Nn and S37=*x* commands.

Nn and S37=*x* commands are supported for compatibility with existing communication software.

O*n*	Return to On-Line Mode. O0 Switches modem from Command mode to on-line mode after dropping to Command mode using the escape sequence (+++). O1 Switches from Command mode to on-line mode and initiates an equalizer retrain sequence before returning to on-line mode.
P	Set pulse dial as default. Forces pulse dialing until the next T dial modifier or T command is received.
Q*n*	Enable/disable result codes. Q0 Enable result codes. *Q1 Disable result codes (quiet mode).

Command	Function/Options	
Sr=*n*	Set register r to value *n*. See list of S-registers in **Chapter 10**.	
Sr?	Display current value of register r.	
T	Sets tone dial as default. Forces tone dialing until the next P dial modifier or P command is received.	
Vn	Result code format.	
	*V0	Numeric format.
	V1	Verbal format.
W*n*	Error correction message control.	
	*W0	Upon connection, modem reports DTE speed only.
	W1	Upon connection, modem reports line speed, error correction protocol, and DTE speed.
	W2	Upon connection, modem reports DCE speed.
X*n*	Extended result codes.	
	X0	Disables monitoring of busy tones unless forced by country requirements; sends only OK, CONNECT, RING, NO CARRIER, ERROR, and NO ANSWER result codes.
	X1	Disables monitoring of busy tones unless forced by country requirements; sends only OK, CONNECT, RING, NO CARRIER, ERROR, NO ANSWER, and CONNECT XXXX result codes.
	X2	Disables monitoring of busy tones unless forced by country requirements; sends only OK, CONNECT, RING, NO CARRIER, ERROR, DIAL TONE, NO ANSWER, and CONNECT XXXX result codes.
	X3	Enables monitoring of busy tones; sends only OK, CONNECT, RING, NO CARRIER, ERROR, NO DIAL TONE, NO ANSWER, and CONNECT XXXX result codes.
	*X4	Enables monitoring of busy tones and sends all messages.

Command	Function/Options
Y*n*	Enable/disable long space disconnect. *Y0 Disable long space disconnect. Y1 Enable long space connect.
Z*n*	Soft reset and restore profile. *Z0 Restores stored profile 0. Z1 Restores stored profile 1.
+++	Escape sequence. Switches from on-line mode to Command mode while preserving the connection with the on-line modem.
&C*n*	Controls Data Carrier Detect (DCD) signal. &C0 Forces DCD signal to be ON at all times. *&C1 Normal DCD operation (required by most software).
&D*n*	Control Data Terminal Ready (DTR) signal. Interprets the ON to OFF transition of the DTR signal from the DTE as specified by the &Q*n* setting. &D0 &Q0,5,6: DTR ignored. &Q1,4: Modem hangs up; auto answer not affected. &Q2,3: Modem hangs up; auto answer inhibited &D1 &Q0,1,4-6: Asynchronous escape sequence. &Q2,3: Modem hangs up; auto answer inhibited. *&D2 &Q0-6: Modem hangs up; auto answer inhibited. &D3 &Q0,1,4-6: Modem performs soft reset as if the ATZ command were received. &Q2,3: Modem hangs up; auto answer inhibited.
&F*n*	Load factory defaults. Instructs the modem to load the factory set parameters (non-programmable). &F0 Load factory defaults 0. &F1 Load factory defaults 1.
&G*n*	Select guard tone. *&G0 Disable guard tone. &G1 Disable guard tone. &G2 Select 1800-Hz guard tone.

Command	Function/Options	
&J*n*	Telephone jack control.	
	*&J0	No function. Included for compatibility.
	&J1	No function. Included for compatibility.
&K*n*	DTE/Modem flow control.	
	&K0	Disable flow control.
	*&K3	Enable RTS/CTS.
	&K4	Enable X-ON/X-OFF.
	&K5	Enable transparent X-ON/X-OFF.
	&K6	Enable both RTS/CTS and X-ON/X-OFF.
&P*n*	Select pulse dial make/break ratio.	
	*&P0	USA/Canada ratio (39/61 at 10 pps).
	&P1	UK/Hong Kong ratio (33/67 at 10 pps).
	&P2	Same as &P0, except at 20 pps.
	&P3	Same as &P1, except at 20 pps.
&Q*n*	Asynchronous mode.	
	&Q0	Direct asynchronous mode. All error correction and compression protocols are disabled. This requires that the software's baud rate matches modem baud rate.
	*&Q5	Modem negotiates an error correction link.
	&Q6	Selects asynchronous operation in normal mode. (Speed buffering allows software baud rate to be fixed.)
&R*n*	RTS/CTS option.	
	&R0	In sync mode, CTS tracks the state of the RTS signal; the RTS-to-CTS delay is defined by register S26. In async mode, the CTS signal acts according to V.25bis handshake.
	*&R1	In sync mode, CTS is always ON (RTS transition is ignored). In async mode, CTS will only drop if required by flow control.
&S*n*	Data Set Ready (DSR) signal.	
	*&S0	DSR override; always ON.
	&S1	DSR signal ON after answer tone is detected, and OFF after the carrier is lost.

Command	Function/Options
&T*n*	Test and diagnostics. Modem will perform selected test and diagnostic function.

NOTE

Tests can only be run in asynchronous mode, with error correction disabled.

&T0	Terminate test in progress.
&T1	Execute local Analog Loopback test.
&T3	Execute Local Digital Loopback test.
&T4	Enable modem to accept remote request for Digital Loopback test.
*&T5	Deny remote request for Digital Loopback test.
&T6	Execute remote Digital Loopback test.
&T7	Execute remote Digital Loopback test with self-test.
&T8	Execute remote Analog Loopback test with self-test.

&V	View current configuration. Displays the active profile, stored profiles, and stored phone numbers.
&W*n*	Store user profile. Saves the current configuration in NVRAM.
&W0	Save as user profile 0.
&W1	Save as user profile 1.
&Y*n*	Select default user profile.
*&Y0	Select user profile 0.
&Y1	Select user profile 1.
&Z=*n*	Store phone number to NVRAM (36 digit dial string).
&Z=0	Store phone number at position 0.
&Z=1	Store phone number at position 1.
&Z=2	Store phone number at position 2.
&Z=3	Store phone number at position 3.

10. S-Registers

The S-Registers are used to store modem configuration parameters, display modem status, and initiate modem test and diagnostic functions. In order to invoke commands to change or display the contents of the S-Registers, you must first access the modem Command mode as described in Section 9.1. Note the following:

- View status screen: To display the modem status screen (Figure 9-1), which lists the current values assigned to most S-Registers, type `AT&V` and press **[Enter]**.
- View S-Register value: To display the value currently assigned to a specific S-Register, type `ATSr?` and press **[Enter]** (where *r* is the desired S-Register).
- Change S-Register value: To change the value assigned to an S-Register, type `ATSr=n` and press **[Enter]** (where *r* is the desired S-Register, and *n* is the desired value).
- Bit-mapped registers: Some registers control more than one function. If you wish to enable several of these functions, add up the decimal values of the desired functions, and enter the total as the value of the S-Register.

Register	Range	Default	Function
S00	0 - 255	1	Auto answer. Sets the number of rings on which to answer in auto-answer mode. When set to 0, auto answer is disabled.
S01	0 - 255	0	Ring count. Counts and stores the number of rings from an incoming call. This value is cleared if a ring is not detected over an 8-second period. If the value of register S1 equals the value of register S0, the modem will answer the phone.
S02	0 - 127	43	Escape-character code. Stores the ASCII decimal code for the escape-code character. The default character is + (043).

Register	Range	Default	Function
S03	0 - 127	13	Carriage-return character. Stores the ASCII code for the carriage-return character. The default value is 013 (normal carriage return).
S04	0 - 127	10	Line-feed Character. Stores the ASCII decimal code for the line-feed character. The default value is 010 (normal line feed).
S05	0 - 032	8	Backspace character. Stores the ASCII decimal code for the backspace character. The default value is 008 (normal backspace character).
S06	2 - 255	2	Wait for dial tone. Sets the number of seconds the modem will wait between going off-hook and beginning dialing.
S07	0 - 255	50	Wait for carrier. Sets the number of seconds the modem will wait for a carrier signal from a remote modem. If a carrier is not received, the modem will hang up and send the NO CARRIER message. Often used to select a longer duration when the modem is originating an international connection.
S08	0 - 255	2	Pause time for carrier. Sets the duration (in seconds) for the dial command pause option (,).
S09	1 - 225	6	Carrier detect response time. Determines the length of time (in tenths of a second) required for the modem to recognize the receive character from the remote modem and turn on the DCD.

Register	Range	Default	Function
S10	1 - 255	14	Lost carrier to hang-up delay. Sets the length of time (in tenths of a second) the modem will wait after loss of carrier before hanging up. If this value is set lower than the value contained in S09, a loss of carrier will always result in disconnection.
S11	50 - 255	95	Duration/spacing DTMF. Sets the duration and spacing (in milliseconds) between DTMF (touchtone) dialing characters.
S12	0 - 255	50	Escape prompt delay (EDP). Defines the maximum period (in fiftieths of a second), allowed between receipt of the last character in the escape code (+++), from the DTE and sending of the OK result code to DTE. If any characters are detected during this time, the OK will not be sent.
S13	–	—	Not used.
S14	—	—	Bit-mapped options. Bit Option Val Descrip Cmd 0 Used Internally 1 Command Echo 0 Disabled E0 1 Enabled E1 2 Result Codes 0 Enabled Q0 1 Disabled Q1 3 Result Code Type 0 Numeric V0 1 Verbal V1 4 Used Internally 5 Dial Method 0 Tone T 1 Pulse P 6 Used Internally 7 Originate/Answer 0 Answer A 1 Originate D

<table>
<tr><th>Register</th><th>Range</th><th>Default</th><th>Function</th></tr>
<tr><td>S15</td><td>—</td><td>—</td><td>Not used.</td></tr>
<tr><td>S16</td><td>—</td><td>—</td><td>Modem test options.

<table>
<tr><th>Bit</th><th>Option</th><th>Val</th><th>Descrip</th><th>Cmd</th></tr>
<tr><td>0</td><td>Local Analog Loopback</td><td>0
1</td><td>Disabled
Enabled</td><td>
&T1</td></tr>
<tr><td>1</td><td>Not Used</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Local Digital Loopback</td><td>0
1</td><td>Disabled
Enabled</td><td>
&T3</td></tr>
<tr><td>3</td><td>Status Bit</td><td>0
1</td><td>Loopback Off
In progress</td><td></td></tr>
<tr><td>4</td><td>Initiate Remote Digital Loopback</td><td>0
1</td><td>Disabled
Enabled</td><td>
&T6</td></tr>
<tr><td>5</td><td>Remote Digital Loopback with Error Count</td><td>0
1</td><td>Disabled
Enabled</td><td>
&T7</td></tr>
<tr><td>6</td><td>Local Analog Loopback with Self-Test</td><td>0
1</td><td>Disabled
Enabled</td><td>
&T8</td></tr>
<tr><td>7</td><td>Not Used</td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>S17</td><td>—-</td><td>—-</td><td>Not Used.</td></tr>
<tr><td>S18</td><td>0 - 255</td><td>0</td><td>Test Timer. Test timer for &Tn loopback testing. Sets the length of time (in seconds) the modem will wait before automatically timing out and terminating the test. When set to 0, the timer is disabled and the test must be terminated by issuing an <code>&T0</code> or <code>H</code> command.</td></tr>
</table>

Register	Range	Default	Function
S19	—	—	Not Used.
S20	—	—	Not Used.
S21	—	—	Bit-Mapped Options.

Bit	Option	Val	Descrip	Cmd
0	Telephone Jack	0	RJ-11	&J0
		1	RJ-12	&J1
1	Not Used			
2	RTS/CTS	0	CTS/RTS	&R0
		1	CTS always true	&R1
3,4	DTR	0	Ignore DTR	&D0
		1	Modem to Cmd. State on On-to-Off DTR transition	&D1
		2	Modem hangs-up on On-to-Off DTR transition	&D2
		3	Init. state on On-to-Off DTR transition	&D3
5	DCD	0	Always On	&C0
		1	Follows Carrier	&C1
6	Not Used			
7	Long Space Disconnect	0	Disabled	Y0
		1	Enabled	Y1

Register	Range	Default	Function
S22	—	—	Bit-mapped options Bit Option Val Descrip Cmd 0,1 Speaker Volume 0 Low L0 1 Low L1 2 Medium L2 3 High L3 2,3 Speaker Control 0 Speaker Off M0 1 On until carrier detected M1 2 Always On M2 3 On until carrier detected, but Off while dialing M3 4-6 Result Codes 0 See X0 X0 4 See X1 X1 5 See X2 X2 6 See X3 X3 7 See X4 X4 7 Make/Break Ratio 0 39:61 (USA) &P0 1 33:67 (UK) &P1

<table>
<tr><th>Register</th><th>Range</th><th>Default</th><th>Function</th></tr>
<tr><td>S23</td><td>—</td><td>—</td><td>Bit-Mapped Options.
<table>
<tr><th>Bit</th><th>Option</th><th>Val</th><th>Descrip</th><th>Cmd</th></tr>
<tr><td>0</td><td>Obey request from remote modem for remote digital loopback test</td><td>0
1</td><td>Disabled
Enabled</td><td>&T5
&T4</td></tr>
<tr><td>1-3</td><td>Assumed DTE rate</td><td>0
1
2
3
4
5
6</td><td>300 bps
600 bps
1200 bps
2400 bps
4800 bps
9600 bps
19.2 kbps</td><td></td></tr>
<tr><td>4,5</td><td>Parity Option</td><td>0
1
2
3</td><td>Even
Space
Odd
Mark</td><td></td></tr>
<tr><td>6,7</td><td>Guard Tones</td><td>0
1
2</td><td>Disabled
550 Hz
1800 Hz</td><td>&G0
&G1
&G2</td></tr>
</table></td></tr>
<tr><td>S24</td><td>—</td><td>—</td><td>Not used.</td></tr>
<tr><td>S25</td><td>0 - 255</td><td>5</td><td>Async DTR delay. Sets the duration (in hundredths of a second) that DTR must be dropped in order to be interpreted as a DTR loss. Allows the modem to differentiate between a random glitch and a true DTR loss.
In most cases, the default value can be used. The S25 register is useful for setting compatibility with older systems running under older operating software.</td></tr>
</table>

Register	Range	Default	Function
S26	0 - 255	1	Sync RTS/CTS delay. When in synchronous mode, the modem will ignore a change in RTS/CTS status for the time interval (in hundredths of a second) defined in this register.
S27	—	—	Bit-Mapped Options. Bit Option Bits Descrip Cmd 0,1,3 Operation Mode 0 0 0 See &Q0 &M0 or &Q0 0 0 1 See &Q1 &M1 or &Q1 0 1 0 See &Q2 &M2 or &Q2 0 1 1 See &Q3 &M3 or &Q3 1 0 0 See &Q4 &Q4 1 0 1 See &Q5 &Q5 1 1 0 See &Q6 &Q6 2 Line Type 0 Dial Up &L0 1 Leased Line &L1 4,5 Transmit Clock 0 Internal &X0 1 External &X1 2 Slave &X2 6 Service Type 0 CCITT B0 1 Bell 212A B1 7 Not Used.
S28	—-	—-	Not Used.
S29	0 - 255	—-	Flash dial modifier time. Sets the length of time (in hundredths of a second) that the modem will go off-hook when it encounters the flash dial modifier in the dial string.

<table>
<tr><th>Register</th><th>Range</th><th>Default</th><th>Function</th></tr>
<tr><td>S30</td><td>0 - 255</td><td>—</td><td>Disconnect inactivity timer. Sets the length of time (in 10-second intervals) that the modem will stay on-line before disconnecting when no data is sent or received. In error-correction mode, any data transmitted or received will reset the timer. In other modes, any data transmitted will reset the timer. The timer is inoperative in synchronous mode.</td></tr>
<tr><td>S31</td><td>—</td><td>—</td><td>Bit-mapped options.
<table>
<tr><th>Bit</th><th>Option</th><th>Val</th><th>Desc</th><th>Cmd</th></tr>
<tr><td>0</td><td>Not Used</td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>Speed Detection</td><td>0</td><td>Disabled</td><td>N0</td></tr>
<tr><td></td><td></td><td>1</td><td>Enabled</td><td>N1</td></tr>
<tr><td>2,3</td><td>Progress Msgs</td><td>0</td><td>DTE Speed</td><td>W0</td></tr>
<tr><td></td><td></td><td>1</td><td>Full Reporting</td><td>W1</td></tr>
<tr><td></td><td></td><td>2</td><td>DCE Speed</td><td>W2</td></tr>
<tr><td>4-7</td><td>Not Used</td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>S32</td><td>0 - 255</td><td>17</td><td>X-ON character. Stores the ASCII decimal code for the X-ON character.</td></tr>
<tr><td>S33</td><td>0 - 255</td><td>19</td><td>X-OFF character. Stores the ASCII decimal code for the X-OFF character.</td></tr>
</table>

Register	Range	Default	Function
S36	0 - 7	7	V.42 negotiation failure treatment. This register is read when the S48 register equals 128 or if an attempted V.42 connection fails. These fallback options are initiated immediately upon connection if S48 = 128. S36=0 Modem disconnects. S36=1 Modem stays on-line and a direct mode connection is established. S36=2 Reserved. S36=3 Modem stays on-line and a normal mode connection is established. S36=4 An MNP connection is attempted. If this connection fails, the modem then disconnects. S36=5 An MNP connection is attempted. If this connection fails, a direct mode connection is established. S36=6 Reserved. S36=7 An MNP connection is attempted. If this connection fails, a normal mode connection is established.
S37	0 - 21	0	Desired connection rate. S37=0 Attempt auto mode connection. S37=1-3 Attempt to connect at 300 bps. S37=4 Reserved. S37=5 Attempt to connect at 1200 bps. S37=6 Attempt to connect at 2400 bps. S37=7 Attempt to connect at V.23 S37=8 Attempt to connect at 4800 bps. S37=9 Attempt to connect at 9600 bps. S37=10 Attempt to connect at 12 kbps. S37=11 Attempt to connect at 14.4 kbps. S37=12 Attempt to connect at 7200 bps.

Register	Range	Default	Function
S38	0 - 255	20	Delay before forced hang up. This register specifies the delay (in seconds) between the modem's receipt of the H command to disconnect (or on-to-off transition of DTR if the modem is set to follow the signal), and the disconnect operation. Applicable to error correction connection only. This register can be used to ensure that data in the modem buffer is sent before the modem disconnects.
S39	—	—	Bit-mapped register.
S40	—	—	Bit-mapped register.
S41	—	—	Bit-mapped register.
S46	136 or 138	138	Protocol selection. This register controls V.42bis compression. S46=136 Disable V.42bis compression. S46=138 Enable V.42bis compression.
S48	0, 7, or 128	7	V.42 negotiation action. The V.42 negotiation process determines the capabilities of the remote modem. Note that this process is bypassed when the capabilities of the remote modem are known and negotiation is unnecessary. S48=0 Disables negotiation. Bypasses the detection and negotiation phases, and proceeds with V.42 (LAPM). S48=7 Enables negotiation. S48=128 Disables negotiation. Bypasses the detection and negotiation phases, and proceeds with the fallback action specified by register S36. Can be used to force MNP.

Register	Range	Default	Function
S82	—	—	S82 is included for compatibility purposes only. Changing this register will have no effect.
S86	0, 4, 5, 8, 12, 13, or 14	—	Connection failure cause code. When the modem issues a NO CARRIER result code, a value is written to this S register to help determine the reason for the failed connection. S86 records the first event that contributes to a NO CARRIER message. S86=0 Normal Disconnect, no error occurred. S86=4 Loss of carrier. S86=5 V.42 negotiation failed to detect an error-correcting modem at the other end. S86=9 The modems could not find a common protocol. S86=12 Normal disconnect initiated by the remote modem. S86=13 Remote modem does not respond after 10 re-transmissions of the same message. S86=14 Protocol violation.

Register	Range	Default	Function
S95	—-	000	Extended result codes. The bits in this register can be set to override some of the W*n* command options. A bit set to 1 in this register will enable the corresponding result code regardless of the **W*n*** setting. Bit 0 = Dec Value 1: CONNECT CODE indicates DCE speed instead of DTE speed. Bit 1 = Dec Value 2: Append /ARQ (Automatic Repeat Request) to verbose CONNECT XXXX result code if protocol is other than none. Bit 2 = Dec Value 4: Enable CARRIER XXX result code. Bit 3 = Dec Value 8: Enable PROTOCOL XXXX result code. Bit 5 = Dec Value 32: Enable COMPRESSION result code.

NOTE

To enable more than one function, add up the decimal values of the desired functions. For example, to enable CARRIER, PROTOCOL, and COMPRESSION, you would add 4 + 8 + 32 for a total of 44. Therefore, the command to enable these functions would be ATS95=44.

11. Modem Result Codes

When AT commands are invoked, the modem will respond with either terse (numeric) or verbose (text) result codes. The result code format is set using the Modem Parameters menu (/**M**), or the **ATV*n*** command. Result codes can also be completely suppressed by enabling the Quiet Mode via the Modem Parameters menu or the **ATQ*n*** command.

Verbose Response	Terse Response	Description
OK	0	Modem successfully executed a command.
CONNECT	1	Connection made at 300 bps.
RING	2	Modem detected an incoming call.
NO CARRIER	3	Modem lost or could not detect a remote carrier signal within the register S7 time.
ERROR	4	Modem found an error in the command line.
CONNECT 1200	5	Connection made at 1200 bps.
NO DIALTONE	6	Modem did not detect a dial tone within 5 seconds after going off-hook.
BUSY	7	Modem detected a busy signal.
NO ANSWER	8	Five seconds of silence was not detected when using the @ command in the **ATD** command.
CONNECT 0600	9	Connection made at 600 bps.

Verbose Response	Terse Response	Description
CONNECT 2400	10	Connection made at 2400 bps.
CONNECT 4800	11	Connection made at 4800 bps.
CONNECT 9600	12	Connection made at 9600 bps.
CONNECT 7200	13	Connection made at 7200 bps.
CONNECT 12000	14	Connection made at 12,000 bps.
CONNECT 14400	15	Connection made at 14,400 bps.
CONNECT 16800	59	Connection made at 16,800 bps.
CONNECT 19200	16	Connection made at 19,200 bps. (If modem is set to respond with connect message that indicates carrier rate, otherwise indicates software rate.)
CONNECT 21600	61	Connection made at 21,600 bps.
CONNECT 24000	62	Connection made at 24,000 bps.
CONNECT 26400	63	Connection made at 26,400 bps.
CONNECT 28800	64	Connection made at 28,800 bps.
CONNECT 38400	17	Connection made at 38,400 bps. (Indicates software rate.)
CONNECT 57600	18	Connection made at 57,600 bps. (Indicates software rate.)
CONNECT 115200	19	Connection made at 115,200 bps. (Indicates software rate.)

Verbose Response	Terse Response	Description
FAX	33	Fax detected. (Fax/data answer mode.)
DATA	35	Modem detected. (Fax/data answer mode.)
CARRIER 300	40	Carrier rate of 300 bps.
CARRIER 1200	46	Carrier rate of 1200 bps.
CARRIER 2400	47	Carrier rate of 2400 bps.
CARRIER 4800	48	Carrier rate of 4800 bps.
CARRIER 7200	49	Carrier rate of 7200 bps.
CARRIER 9600	50	Carrier rate of 9600 bps.
CARRIER 12000	51	Carrier rate of 12,000 bps.
CARRIER 14400	52	Carrier rate of 14,400 bps.
CARRIER 16800	53	Carrier rate of 16,800 bps.
CARRIER 19200	54	Carrier rate of 19,200 bps.
CARRIER 21600	55	Carrier rate of 21,600 bps.
CARRIER 24000	56	Carrier rate of 24,000 bps.
CARRIER 26400	57	Carrier rate of 26,400 bps.
CARRIER 28800	58	Carrier rate of 28,800 bps.

Verbose Response	Terse Response	Description
COMPRESSION: CLASS 5	66	The modem has connected in MNP class 5, and COMPRESSION message reporting has been enabled.
COMPRESSION: V.42BIS	67	The modem has connected in V.42bis, and COMPRESSION message reporting has been enabled.
COMPRESSION: NONE	69	The modem has connected without data compression, and COMPRESSION message reporting has been enabled.
PROTOCOL: NONE	76	The modem has connected without any form of error correction. (No MNP4 or V.42.)
PROTOCOL: LAPM	77	The modem has connected in the V.42 LAPM mode of error correction.
PROTOCOL: ALT	80	The modem has connected in the MNP 4 mode of error correction.

NOTES

The CARRIER result code must be enabled using S95 bit 2 or the ATW1 command.

The COMPRESSION result code must be enabled using S95 bit 5.

The PROTOCOL result code must be enabled using S95 bit 3 or the ATW1 command.

Appendix A. Interface Descriptions

A.1 Console Port

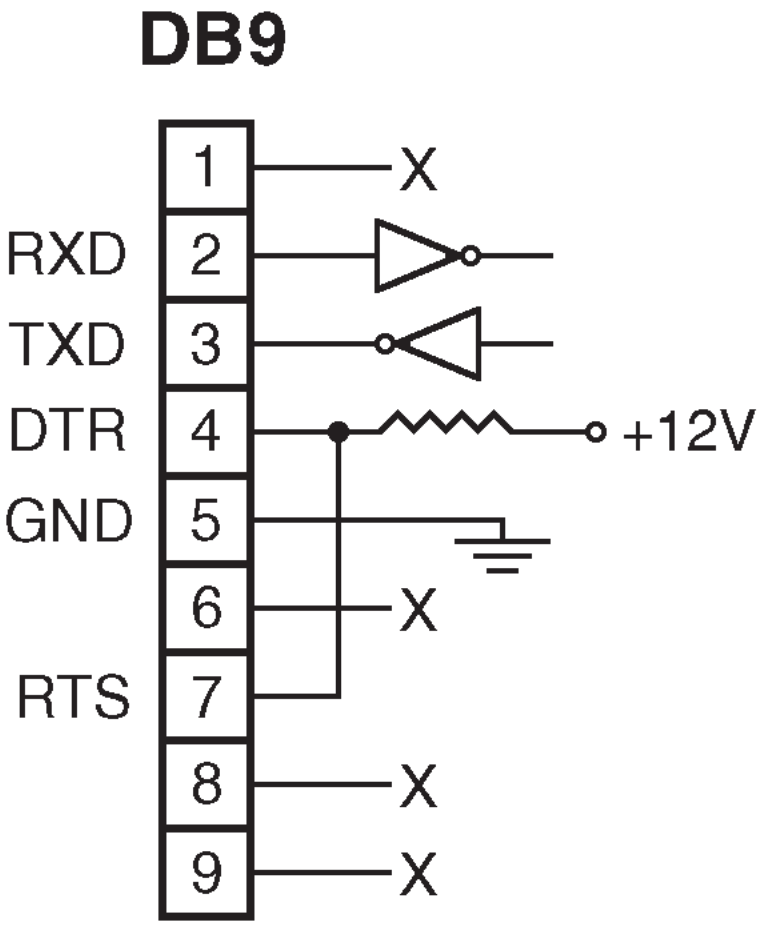

Figure A-1. Console port interface (DTE).

A.2 Modem Port

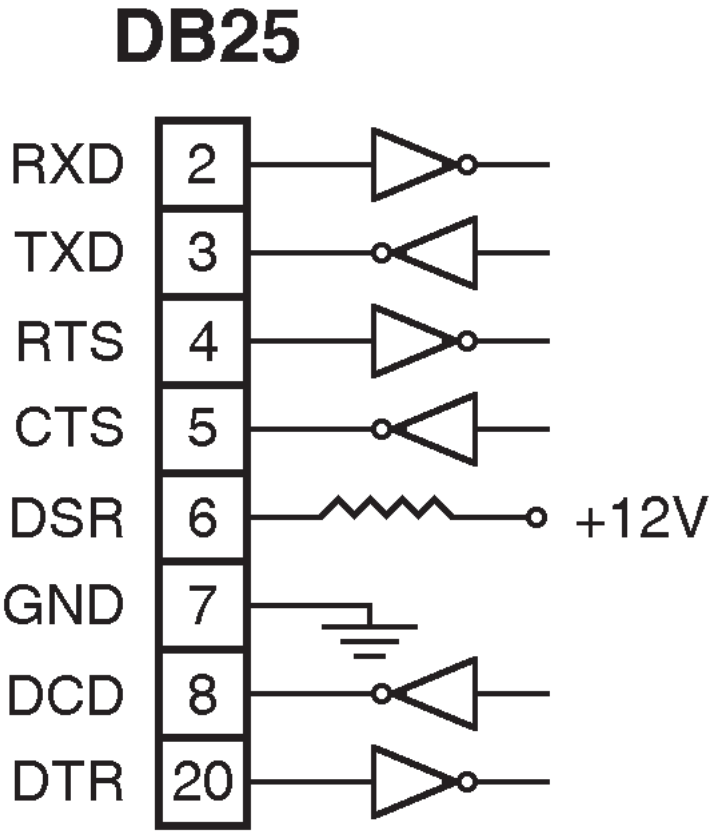

Figure A-2. Modem port interface (DCE).

Appendix B. Troubleshooting

B.1 Calling Black Box

If you determine that your Secure Rack Modem is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

B.2 Shipping and Packaging

If you need to transport or ship your Secure Rack Modem:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Secure Rack Modem for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Material Authorization (RMA) number.