Intermec
Technologies Corporation

TE 2000 ™ VT/ANSI Terminal Emulation

PROGRAMMER'S GUIDE

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Before You Begin

This manual contains information necessary to configure and operate TE 2000™ terminal emulation applications (version 6.30 or greater) for INTERMEC® terminals. This manual is intended for these audiences:

- All users who need to know how to use terminal emulation.
- Information systems personnel, operations personnel, analysts, and programmers who need to know how to configure, test, and use the terminal emulation application to operate in a network. You should have a good knowledge of your company's network and data collection software. You should be familiar with data communications and network protocols.

Manual Organization

The following summarizes the information in each section.

Section 1 — Getting started with VT/ANSI terminal emulation

Section 2 — Using VT/ANSI terminal emulation applications

Section 3 — Using your terminal's keyboard

Section 4 — Using the terminal emulation configuration menus

Section 5 — Customizing your configuration

Section 6 — Programming with VT/ANSI received and transmitted codes

Section 7 — Using extended commands

The appendixes contain the following:

Appendix A — Bar codes for VT/ANSI terminal emulation commands

Appendix B — More commonly known bar code symbologies

Appendix C — Full ASCII table

Terminology

248X
Indicates the 2480, 2481, 2485, and 2486 Terminals.

Host
Refers to a computer that communicates with the terminal.

TE
Stands for Terminal Emulation.

Terminal
Generic term for INTERMEC terminals that support terminal emulation.

VT/ANSI
Indicates VT100/220/320/340 and ANSI.

Conventions for Input From a Keyboard

To help you quickly locate and interpret information, this manual uses the conventions in the following chart.

`Monospace text`
Shows the command as you should enter it.

Italic text
Indicates a variable that you must replace with a real value, such as a number, filename, or command.

Shows the key you must press on the terminal's keyboard. For example, "press " directs you to press the Enter key.

Shows a series of keys you must press and release in the order shown. For example, "Press to open the TE configuration menus on the 2425."

Bar Code Conventions

You can scan the bar codes listed in this manual to enter data or perform a command. The bar codes are in the Code 39 symbology. Each bar code includes the name and human-readable interpretation. For example:

The asterisks (*) at the beginning and end of the human-readable interpretation are the start and stop codes for a Code 39 bar code label. If you are using a bar code printing utility, it may automatically supply the asterisks as the start and stop codes, so that you only need to type the actual text of the command. You can also create and print configuration labels and reader command labels in Code 93, which has its own start and stop codes.

Related Manuals

Visit our Web site at *http://www.intermec.com* to download many of our current manuals in PDF format. Contact your local Intermec representative to order printed versions of these manuals.

- *1100 Series Data Terminal User's Guide* (P/N: 961-047-069)
- *2100 Universal Access Point User's Manual* (P/N: 067150)
- *5020 Data Collection PC User's Manual* (P/N: 068975-002)
- *5055 Data Collection PC User's Guide* (P/N: 961-054-017)
- *5900 Series User's Guide* (P/N: 961-047-121)
- *The Bar Code Book* (P/N: 051241)
- *DCS 300 System Manual* (P/N: 067296)
- *DCS 300 Terminal Reference Manual* (P/N: 067717)
- *EZBuilder Getting Started Guide* (P/N: 066450)
- *EZBuilder Tutorial* (P/N: 066449)
- *PEN*KEY Model 6400 User's Guide* (P/N: 961-047-098)
- *RT1700 Radio Terminal User's Guide* (P/N: 961-047-068)
- *TE 2000 3270 Terminal Emulation Programmer's Guide* (P/N: 977-055-003)
- *TE 2000 5250 Terminal Emulation Programmer's Guide* (P/N: 977-055-004)
- *TRAKKER Antares 241X Hand-Held Terminal User's Manual* (P/N: 069538)
- *TRAKKER Antares 2420 and 2425 Hand-Held Terminal User's Manual* (P/N: 064024)
- *TRAKKER Antares 242X Serial Interface Module Instruction Sheet* (P/N: 067690)
- *TRAKKER Antares 243X Hand-Held Terminal User's Manual* (P/N: 071791-001)
- *TRAKKER Antares 2455 Vehicle Mount Terminal User's Manual* (P/N: 067358)
- *TRAKKER Antares 248X Stationary Terminal User's Manual* (P/N: 066960)
- *TRAKKER Antares 248X COM4 Adapter Cable Installation Instruction Sheet* (P/N: 068251)
- *TRAKKER Antares Application Development Tools System Manual* (P/N: 064433)
- *TRAKKER Antares Optical Link Adapter Quick Reference Guide* (P/N: 065826)
- *TRAKKER Antares TD2400 Communications Dock Quick Reference Guide* (P/N: 065555)
- *TRAKKER Antares TD2410 Communications Dock Quick Reference Guide* (P/N: 069552)

Customer Support

Customer Support Center

The Intermec Customer Support Center (technical support) telephone number is 800-755-5505 (U.S.A. or Canada) or 425-356-1799. The facsimile number is 425-356-1688. Email is *support@intermec.com*.

If you email or fax a problem or question include the following information in your message: your name, your company name and address, phone number and email to respond to, and problem description or question (the more specific, the better). Indicate if the equipment was purchased through a value-added reseller.

Bulletin Board Service

The Customer Support Bulletin Board (BBS), maintained by Intermec Technologies Corporation, provides software and documentation:

- **Phone number:** 319-369-3515 (14.4 kbps modem)
  319-369-3516 (28.8 kbps modem)
- **Protocol:** Full duplex, ANSI or ANSI-BBS; 300 to 28,800 bps; v.32bis; 8 bits, no parity, 1 stop bit. *For high-speed modems, disable XON/XOFF and enable RTS/CTS.*

This is the same location available via the web site. If your web access uses high-speed phone lines, the web interface provides a faster response.

Section 1
Getting Started

Understanding Network Protocol Options

TE 2000™ applications for the Enterprise Wireless LAN™ system use one of the following network protocol options:

- UDP Plus — the terminal communicates with the host computer through the INTERMEC® Data Collection Server (DCS) 300 and an access point.
- TCP/IP — the terminal communicates through an INTERMEC access point, which is directly connected to the host computer on an Ethernet or a token ring network.
- WTP — the terminal communicates with the host computer through the DCS 300, INTERMEC access point, or other INTERMEC gateway.

For network configuration options, refer to your terminal's user manual.

Setting Up the Terminal and the Network

Before you can start using the TE 2000 application on your terminal, you need to do the following:

1. Set up your terminal.

   Set-up includes charging and installing the battery pack and turning on the terminal for the first time. For instructions, refer to your terminal's user manual.

NOTE: *Battery packs do not apply to all terminals. Vehicle mount and stationary terminals are powered via an external source.*

2. Configure your terminal and the network.

   To use RF communications on the terminal, you need to:

   a. Configure the DCS 300 (UDP Plus or WTP), other INTERMEC gateway (WTP), or host (TCP/IP).

   b. Configure the access point. *This does not apply to the 2480/2481 Terminal, which contains an Ethernet NIC instead of a radio.*

   c. Configure the network parameters on the terminal.

   For instructions, refer to your terminal's user manual.

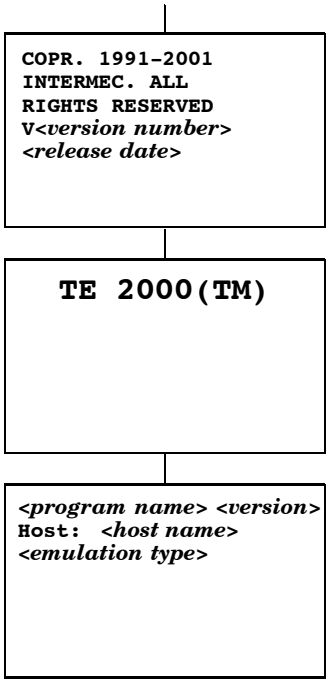
3. Verify that your terminal is communicating correctly with the access point and DCS 300 or the host.

   To verify that your terminal is communicating correctly, refer to the terminal's user manual for instructions.

Starting the TE 2000 Application

You are ready to start your application once the terminal has been set up, the terminal and the network have been configured, and communications have been established with the gateway and access point or host.

To start your application:
Turn on the terminal. Wait a few seconds while the initialization screens (below) clear and the application starts.



▶ **NOTE:** *If your application does not start after a few seconds, you may not have configured the terminal correctly. For help, refer to your terminal's user manual.*

You can now do one of the following:

- Become familiar with VT/ANSI TE if you have not previously used it
- Perform a quick configuration
- Configure your TE 2000 application
- Customize your TE 2000 application

Becoming Familiar With VT/ANSI Terminal Emulation

If you have not previously used VT/ANSI TE, see Section 2, "Using Terminal Emulation Applications," to understand VT/ANSI commands. See Section 3, "Using the Terminal's Keyboard," to become familiar with your terminal's keyboard and the keys you need to press to perform VT/ANSI commands.

Performing a Quick Configuration

1. Change the data stream to VT/ANSI. The default data stream is "Native" for the 11XX, 17XX, 5055 (WTP), 59XX, and 64XX (WTP) Terminals. The default data stream for 24XX and IP terminals is "3270." *The default may be changed to "VT" for all terminals.*
   a. Access the terminal emulation configuration menus by pressing the keys in the following chart, then choose **1) Set-up Parms** from the Main Menu.

2415:	=f F1 *(55-key keyboard)* =f 5 *(37-key keyboard)*
2425:	=f F1
2435A:	
2455 and 248X:	=f F1
6400:	[GOLD] [BLUE]
5020:	
5055:	[BLUE] [M] *or* [ALT] [M]
59XX:	[BROWN] [SPACE]
17XX and 11XX:	[GOLD] [BLACK]

▶ **NOTE:** *Press a number to select a menu option, then press [Enter] to return to a previous menu.*

   b. At the **Enter Password** prompt, enter **cr52401**.
   On 17XX (37-key) Terminals, the password is: ***F12 F11 5 2 4 0 1***
   c. From the **Set-up Parms** menu, choose **3) Protocol Opts**.
   d. From the **Protocol Opts** menu, choose **2) Data Stream**.
   e. From the **Data Stream** menu, choose **4) VT/ANSI**.
2. Extended commands transmit or receive data over the terminal's RS-232 port, send information to an RS-232 device, or collect data. Enable the **Extended Cmds** option if your host computer is configured to send extended commands to the terminal. It is disabled by default.
   a. From the **Protocol Opts** menu, choose **3) Extended Cmds**.
   b. From the **Extended Cmds** menu, choose **1) Enabled**.
3. Save your changes.
   a. From the **Main Menu**, choose **7) More**.
   b. From **Main Menu 2**, choose **2) Save Parms**.
   c. At the **Enter Password** prompt, type **cr52401**, then press enter.
   On 17XX (37-key) Terminals, the password is: ***F12 F11 5 2 4 0 1***
   d. From the **Main Menu**, choose **6) Exit Menus**.

▶ **NOTE:** *For WTP devices, also set a terminal number.*

4. Login to a TE session, then start using the terminal to collect and transmit data.

Configuring the TE 2000 Application

You can use the terminal's TE configuration menus to configure site-specific operational parameters, including UDP Plus, WTP, or TCP/IP communications, terminal emulation options, and the **Main Menu** password. For information about configuring the terminal, see Section 4, "Using the Terminal Emulation Menus."

Using Advanced Features

You can customize the standard TE 2000 program to do the following. For more information, see Section 5, "Customizing Your Configuration."

- Use the auto-login feature to send the same login information each time you login to the host.
- Display double-byte characters.
- Create a custom parameter set-up file.
- Change the text of TE configuration menus or system messages.
- Remap the terminal's keys.
- Preinitialize the VT/ANSI TE program.

Unsupported Commands and Functions for Trakker Antares Terminals

TE 2000 Terminal Emulation for the 2415, 2425, 2435A, 2455, and 248X Terminals does not support the following commands and functions. These commands and functions were supported in previous versions.

End (viewport)
Moved window or viewport to the end of the last line displayed on the TE screen.

Fast Cursor Right or Left
Moved the cursor two positions to the right or left rather than one.

Home (viewport)
Moved the window or viewport to the top left corner of the TE screen.

Reshow
Resent screen image from local host buffer to refresh terminal screen.

Status
Toggled terminal's screen between status line and normal field input displays.

Status line messages
Reported the operating status of the terminal and host system.

Dual sessions
Not supported in Trakker Antares UDP Plus or TCP terminals.

If you scan the bar code for an unsupported command, the bar code data is read into the terminal. If you press the key sequence for the command, the sequence is ignored.

Program Names

The following chart lists TE options and program names.

► **NOTE:** *TE 2000 does not support SST (Spread Spectrum Transmission) or regular UHF. "S-UHF" is synthesized UHF.*

Model	Option	Program Name	
2415, 2425, 2435A, 2455, 248X	TE/UDP Plus/2.4 GHz OpenAir	FWP240H0	
	TE/UDP Plus/802.11		
	TE/IP/2.4 GHz OpenAir		
	TE/IP/802.11		
6400		*51-key keyboard*	*41-key keyboard*
	TE/WTP/2.4 GHz OpenAir	FWP640H0	FWP640H4
	TE/WTP/802.11	FWP640H0	FWP640H4
	TE/WTP/900 MHz Falcon	FWP640H0	FWP640H4
	TE/IP/2.4 GHz OpenAir	FWP64TH0	FWP64TH4
	TE/IP/802.11	FWP64TH0	FWP64TH4
5020	TE/UDP Plus/2.4 GHz OpenAir	FWP502H0	
	TE/UDP Plus/802.11		
	TE/IP/2.4 GHz OpenAir		
	TE/IP/802.11		
5055	TE/WTP/2.4 GHz OpenAir	FWP650H0	
	TE/WTP/802.11	FWP650H0	
	TE/IP/2.4 GHz OpenAir	FWP65TH0	
	TE/IP/802.11	FWP65TH0	
59XX	TE/WTP	FWP592H0	
	TE/WTP	FWP594H0	
	TE/WTP/2.4 GHz OpenAir	FWP598H0	
	TE/WTP/900 MHz Falcon	FWP596H0	
	TE/WTP/S-UHF	FWP591H1	
17XX		*57-key keyboard*	*37-key keyboard*
	TE/WTP	FWP170H0	FWP170H3
	TE/WTP	FWP174H0	FWP174H3
	TE/WTP/2.4 GHz OpenAir	FWP178H0	FWP178H3
	TE/WTP/900 MHz Falcon	FWP176H0	FWP176H3
	TE/WTP/S-UHF	FWP171H0	FWP171H3
11XX	TE/WTP	FWP110H0	
	TE/WTP	FWP114H0	
	TE/WTP/2.4 GHz OpenAir	FWP118H0	
	TE/WTP/900 MHz Falcon	FWP116H0	
	TE/WTP/S-UHF	FWP111H0	

VT/ANSI Standard Terminal Keyboard

To compare your terminal's keyboard with the VT/ANSI keyboard, see Figure 1-1, which is an illustration of the VT/ANSI terminal's standard North American keyboard. As you read how your terminal's keyboard emulates VT/ANSI operation, you may want to frequently refer to Figure 1-1 for your terminal.

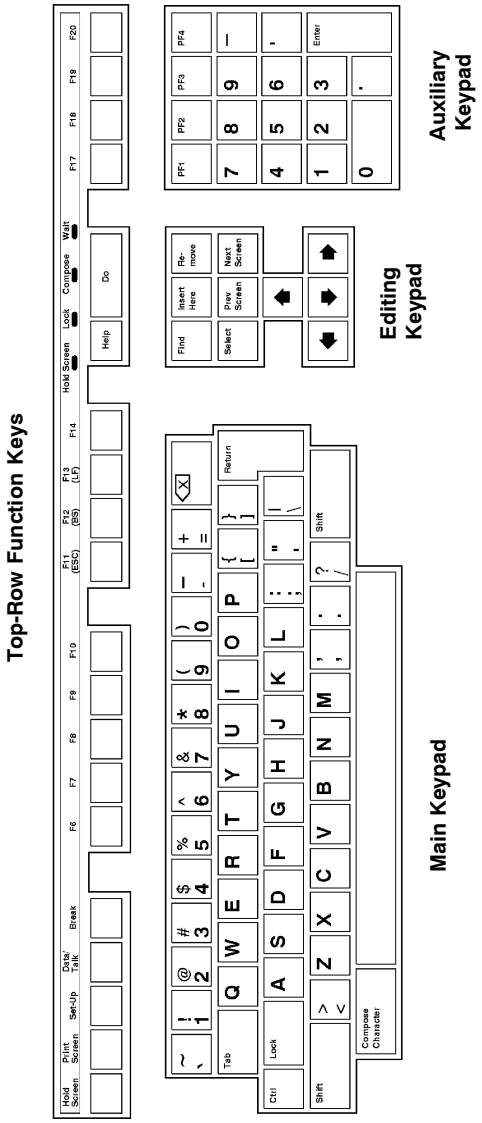


Figure 1-1
VT/ANSI Terminal Standard Keyboard *(North American)*

Section 2

Using Terminal Emulation Applications

Annunciators

The terminal's display reserves a location for annunciators (icons) that help you monitor RF and network communications, or alert you of a condition that requires action. Following are VT/ANSI TE annunciators.

X
Keyboard action mode (KAM) has been set. The terminal ignores all keystrokes that send characters to the host. This state stays on until KAM is reset.

K
The terminal is in Keypad mode.

C
Terminal is in Character mode. The terminal sends each character as it is pressed.

B
The terminal is in Line Edit (block) mode. When you press a terminating key, the terminal sends a block of characters to the host.

e
The terminal is in Local Edit mode, which is a feature of the VT330/VT340 Terminal.

For information about annunciators that indicate battery condition and general operational status, refer to the terminal's user manual.

Main Keypad

The VT/ANSI Terminal's main keypad consists of standard keys and function keys. Standard keys generate letters, numbers, and symbols. Function keys generate special function codes. The following describes the keys.

Compose character
The terminal does not support this function, which starts a compose sequence that creates characters that cannot be typed directly from the keyboard.

Ctrl
The Ctrl key is used with another key to send a control code.

Delete
Operation depends on how the DEL to BS option is set in the TE configuration menus. The key either sends a delete (DEL, 7F hexadecimal) or a backspace (BS, 08 hexadecimal).

Lock
The Lock key alone does not send a code. It is used with shift-lock, which either sets or clears shift-lock.

Return
Sends either a CR character (0D hexadecimal) or a CR character (0D hexadecimal) and an LF character (0A hexadecimal), depending on the set or reset state of line feed or new line mode (LNM).

Shift
The Shift key alone does not send a code. It is used with other standard keys to send uppercase characters.

Space bar
Sends an SP character (20 hexadecimal).

Tab
Sends an HT character (09 hexadecimal).

To enter a function key:
Press the keys listed in the section for the terminal. Or, scan the following bar codes (also in *Appendix A*).

Backspace

%BKSP

Delete (Del)

%DEL

Editing Keypad

The terminal's editing keypad has editing keys and cursor (arrow) keys.

Editing Keys

▶ **NOTE:** *Editing keys apply only to VT220/320/340.*

Editing keys have functions assigned to them by the application software in use. Refer to your application's software manual for information about editing key functions. Editing keys are Find, Insert, Next Screen, Previous Screen, Remove, and Select.

To enter an editing key:
Press the keys listed in the section for the terminal. Or, scan the following bar codes (also in *Appendix A*).

Find
(VT220/320 only)

%FIND

Insert
(VT220/320 only)

%INS

Next Screen
(VT220/320 only)

%NEXT

Previous Screen
(VT220/320 only)

%PREV

Remove
(VT220/320 only)

%REM

Select
(VT220/320 only)

%SEL

Cursor Keys

You can manually move the terminal's window/viewport by using the cursor keys and paging keys. For more information about the window/viewport, refer to the terminal's user manual.

Auxiliary Keys

The VT/ANSI terminal's auxiliary keypad consists of numeric keys (which enter numeric data) and programmable function (PF) keys. The following chart describes VT/ANSI terminal auxiliary keypad operations.

0—9
Enters numeric data.

– (hyphen)
Enters a hyphen character.

, (comma)
Enters a comma character.

. (period)
Enters a period character.

Enter
Sends CR, CRLF, or SS# M, depending on the mode settings.

PF1 – PF4
PF keys have operations assigned to them by the application software in use. Refer to your application's software manual for the programmed uses of these keys.

To enter an auxiliary key:
Press the keys while the terminal is in Keypad mode. Or, scan the bar code in *Appendix A*.

Top-Row Function Keys

VT220/320/340 terminals support function keys F1 through F20. Keys F1 through F5 are used for hold screen, print screen, set-up, data/talk, and break. The terminal supports only the break function. For VT220/320/340, F1 through F4 are PF1 through PF4.

F5 (Break)
Sends a break function to the host.

F6–F20
User-defined keys (UDKs) that have operations assigned to them by the application software in use. Refer to your application's software manual for their uses.

▶ **NOTE:** *VT100 Terminals only support top-row function keys F11 (Escape), F12 (Backspace), and F13 (Line feed).*

To enter a top-row function key:
Press the keys listed in the section for the terminal. Or, scan the bar code in *Appendix A*.

Transmission Mode

Use the transmission mode (labeled "Mode" on the overlay) to toggle between Line Edit (block) mode and Character mode. These modes are described in Section 6, "Programming."

When Lock mode is disabled, you can press the Mode key to toggle between Line Edit (block) mode and Character mode. When Lock mode is enabled, you cannot toggle between the modes. By default, Lock mode is disabled. You can configure Lock mode through the TE configuration menus. See Section 4 for information about the menus.

Local Edit Mode

If your application software program supports local editing, you can use the terminal in Local Edit Mode, a feature of the VT330/ VT340 terminal. Local Edit Mode is described in Section 6.

VT/ANSI Printing

You can print data from a VT/ANSI host. If you are using a 2415, 2425, 2435A, 2455, or 248X Terminal, you can use different methods to connect it to your printer depending on the type of terminal and printer you have. To connect your terminal to a printer, refer to the terminal's user manual for instructions.

Using the Print Modes

The following chart defines the print modes you can use with the VT/ANSI TE application.

Auto print
Prints each line after the cursor leaves that line using a carriage return or when auto-advancing through fields. This mode can be turned on and off from a VT/ANSI host.

Printer controller
Prints all data from a VT/ANSI host. Turn this mode on or off from the host as all host screens are printed without allowing the user to respond. You cannot log on or off while in this mode.

Print cursor line
Prints the line that the cursor is on. This mode can only be turned on from a VT/ANSI host and turns off after the line prints.

Print form feed
After a screen is printed, the printer advances the printed screen out of the printer. This mode can be turned on and off from a VT/ANSI host.

To send commands from the host, refer to the programmer's guide for your VT/ANSI host for help.

Configuring Printing and Scanning Options

The following instructions explain how to set printing and scanning options. The method depends on the type of terminal you are using.

2415, 2425, 2435A, 2455, or 248X Terminal:

1. Connect your terminal to a printer.
2. Open the TRAKKER Antares 2400 Menu System.
3. Configure the terminal's serial port to match the parameters set for the serial port on the printer. Flow Control must be set to XON/XOFF on both the terminal and the printer. For help configuring the parameters, refer to your terminal's user manual.

If the terminal will receive data from a scanner, and if you enable the **RS232 Stream** option for the terminal, set the scanner options as follows:

- For the Configurable protocol, set the scanner preamble/postamble to STX/ETX (0x02/0x03).
- For the Binary protocol, set the scanner preamble to STX (0x02) with no postamble.

In both cases, Full ASCII should be enabled. The baud rate must match the terminal's printer settings. The data bits, stop bits, and parity must match the terminal's serial port settings.

1. Open the TRAKKER Antares 2400 Menu System firmware.
2. From the Main Menu, choose **Configuration Menu → Communications Menu → Serial Port**, then configure the serial port parameters. See the terminal's user manual for help.

To set the **RS232 Stream** option, do the following.

1. Open the TE configuration menus. For the correct key sequence, see Section 1, "Getting Started."
2. From the **Main Menu**, choose **1) Set-up Parms**.
3. At the **Enter Password** prompt, enter **cr52401**.
4. Choose **3) Protocol Opts**.
5. Choose **6) VT/ANSI**.
6. Choose **7) More**.
7. Choose **7) More**.
8. Enable or disable the **RS232 Stream** option.

For 6400, 5020, 5055, 59XX, 17XX, or 11XX Terminals, select **4) RS232 Setup** in step 7, then set the baud rate, parity, stop bits, data bits, or flow in step 8.

Section 3

Using the Terminal's Keyboard

Your terminal has a special keyboard that contains most of the keys available on your VT/ANSI terminal keyboard. Use the keyboard to enter data in the TE screens.

The keys on the keyboard have their main character or operation marked directly on the key itself. To access that character or operation, just press the key.

2415 Terminal

Your 2415 Terminal has a 55-key, 37-key numeric, or 37-key function numeric keyboard. Figure 3-1 shows the 55-key keyboard.

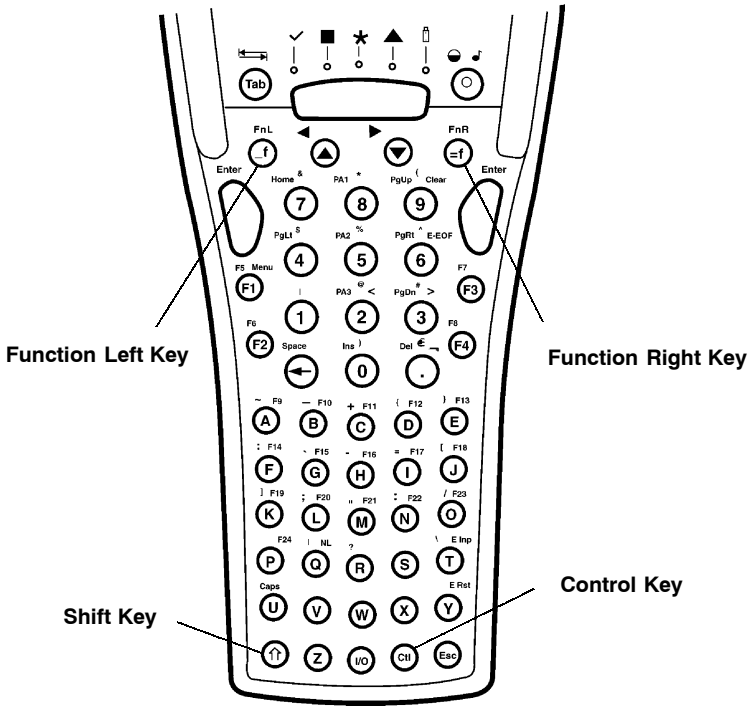


Figure 3-1
2415 Terminal 55-Key Keyboard

Figure 3-2 shows the 37-key numeric keyboard with alphabetic keys in the primary plane. Also shown is the 37-key function numeric keyboard, which has function keys in the primary plane. *Note that the 37-key numeric configuration, while not orderable, is still supported.*

For help with using the keyboards, refer to the *TRAKKER Antares 241X Hand-Held Terminal User's Manual* (P/N 069538).

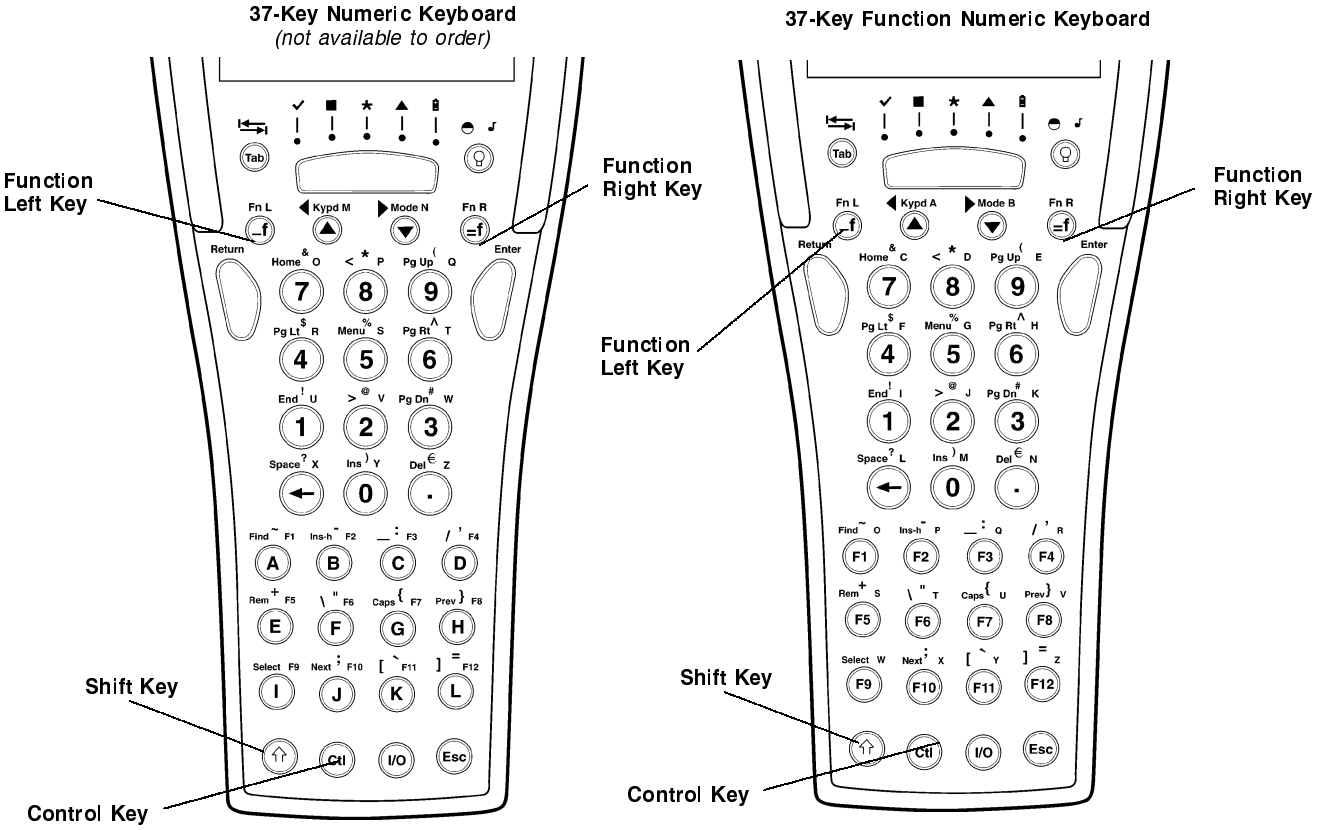


Figure 3-2
2415 Terminal 37-Key Keyboards

2415 Cursor Keys

To Enter	Press the Keys
Window/viewport up	▲
Window/viewport down	▼
Window/viewport right	f ▼
Window/viewport left	f ▲

2415 Paging Keys

To Enter	Press the Keys
Page up	f 9
Page down	f 3
Page right	f 6
Page left	f 4

2415 Standard Keys

To Enter	Press the Keys
Numbers	0 – 9
Symbols	f *or* ⇧, plus corresponding key.

2415 Function Keys

	Press the Keys		
To Enter	**55-Key Keyboard**	**37-Key Numeric Keyboard**	**37-Key Function Numeric Keyboard**
Back Tab	f Tab	f Tab	f Tab
Backspace	←	←	←
Caps Lock	f U	f G	f F7
Ctrl	Ctl	Ctl	Ctl
Delete	f .	f .	f .
Forward Tab	Tab	Tab	Tab
Return	↵	↵	↵
Shift	⇧	⇧	⇧
Space bar	f ←	f ←	f ←

2415 Editing Keys

	Press the Keys		
To Enter	**55-Key Keyboard**	**37-Key Numeric Keyboard**	**37-Key Function Numeric Keyboard**
Find	f M	f A	f F1
Insert here	f N	f B	f F2
Next screen	f Y	f J	f F10
Prev screen	f X	f H	f F8
Remove	f O	f E	f F5
Select	f W	f I	f F9

2415 Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

To Enter	Press the Keys: 55-Key Keyboard	37-Key Numeric Keyboard	37-Key Function Numeric Keyboard
F5 (Break)	f F1	f E	F5
F6	f F2	f F	F6
F7	f F3	f G	F7
F8	f F4	f H	F8
F9	f A	f I	F9
F10	f B	f J	F10
F11	f C	f K	F11
F12	f D	f L	F12
F13	f E	Not supported.	Not supported.
F14	f F	Not supported.	Not supported.
F15	f G	Not supported.	Not supported.
F16	f H	Not supported.	Not supported.
F17	f I	Not supported.	Not supported.
F18	f J	Not supported.	Not supported.
F19	f K	Not supported.	Not supported.
F20	f L	Not supported.	Not supported.

2415 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press ⇧ ▼.

2415 Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

2415 Control Keys

To Enter	Press the Keys: 55-Key Keyboard	37-Key Numeric Keyboard	37-Key Function Numeric Keyboard
FS (file separator)	Ctl F1	Not supported.	Ctl F1
GS (group separator)	Ctl F2	Not supported.	Ctl F2
RS (record separator)	Ctl F3	Not supported.	Ctl F3
US (unit separator)	Ctl F4	Not supported.	Ctl F4
NUL (null)	Ctl 0	Not supported.	Ctl 0

2415 VT/ANSI Additional Functions

To	Press the Keys: 55-Key Keyboard	Press the Keys: 37-Key Keyboard
Access TE configuration menus	(f) (F1)	(f) (5)
Toggle between Application mode and Numeric Keypad mode	No keys available. Use the TE configuration menus or set from the host. For more information, see Section 4.	

2425 Terminal

Figure 3-3 shows the keyboard for the 2425 Terminal. For help with using the keyboard, refer to the *TRAKKER Antares 2420 and 2425 Hand-Held Terminal User's Manual* (P/N 064024).

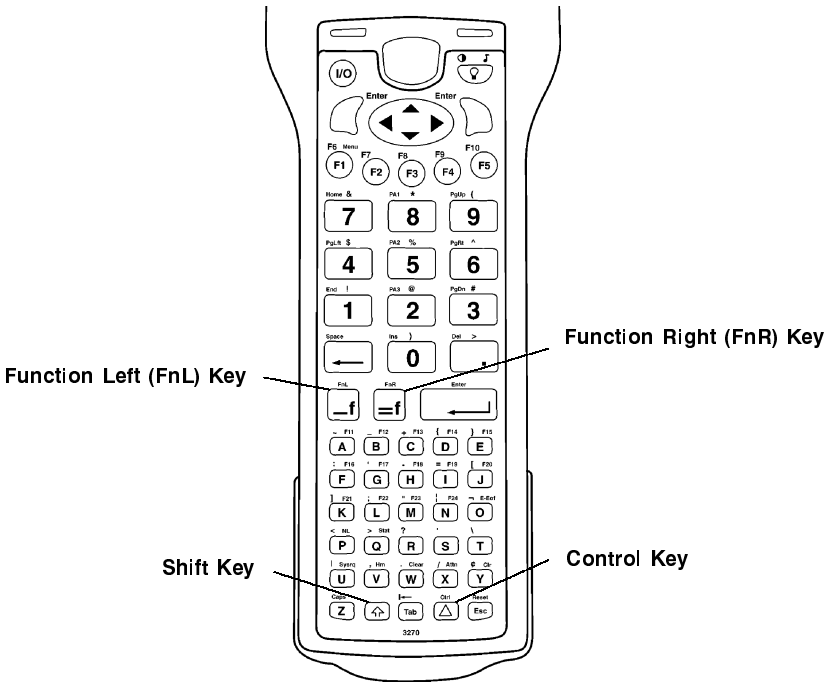


Figure 3-3
2425 Terminal Keyboard

2425 Cursor Keys

To Enter	Press the Keys
Window/viewport up	(f) ▲
Window/viewport down	(f) ▼
Window/viewport right	(f) ▶
Window/viewport left	(f) ◀

2425 Paging Keys

To Enter	Press the Keys
Page up	f 9
Page down	f 3
Page right	f 6
Page left	f 4

2425 Standard Keys

To Enter	Press the Keys
a-z	A - Z
A-Z	⇧ A - ⇧ Z
Numbers	0 - 9
Symbols	f *or* ⇧, plus corresponding key.

2425 Function Keys

To Enter	Press the Keys
Back Tab	f Tab
Backspace	←
Caps Lock	f Z
Ctrl	△
Delete	f .
Forward Tab	Tab
Return	↵ *or* ↵
Shift	⇧
Space bar	f ←

2425 Editing Keys

To Enter	Press the Keys
Find	f K
Insert here	f L *or* f 0
Next screen	f R
Prev screen	f Q
Remove	f M
Select	f P

2425 Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

To Enter	Press the Keys
F5 (Break)	F5
F6	f F1
F7	f F2
F8	f F3
F9	f F4
F10	f F5
F11	f A
F12	f B
F13	f C
F14	f D
F15	f E
F16	f F
F17	f G
F18	f H
F19	f I
F20	f J

2425 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press f F3.

2425 Auto-Login Restart

To enter Auto-Login Restart, press f F5 or scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

2425 Control Keys

To Enter	Press the Keys
FS (file separator)	△ F1
GS (group separator)	△ F2
RS (record separator)	△ F3
US (unit separator)	△ F4
NUL (null)	△ F5

2425 VT/ANSI Additional Functions

To	Press the Keys
Access TE configuration menus	f F1
Toggle between Application mode and Numeric Keypad mode	No keys available. Use the TE configuration menus or set from the host. For more information, see Section 4.

2435A Terminal

Your 2435A Terminal has a 57-key or a 39-key function numeric keyboard. For help with using the keyboards, refer to the *TRAKKER Antares 243X Hand-Held Terminal User's Manual* (P/N: 071791-001).

57-Key Keyboard **39-Key Keyboard**

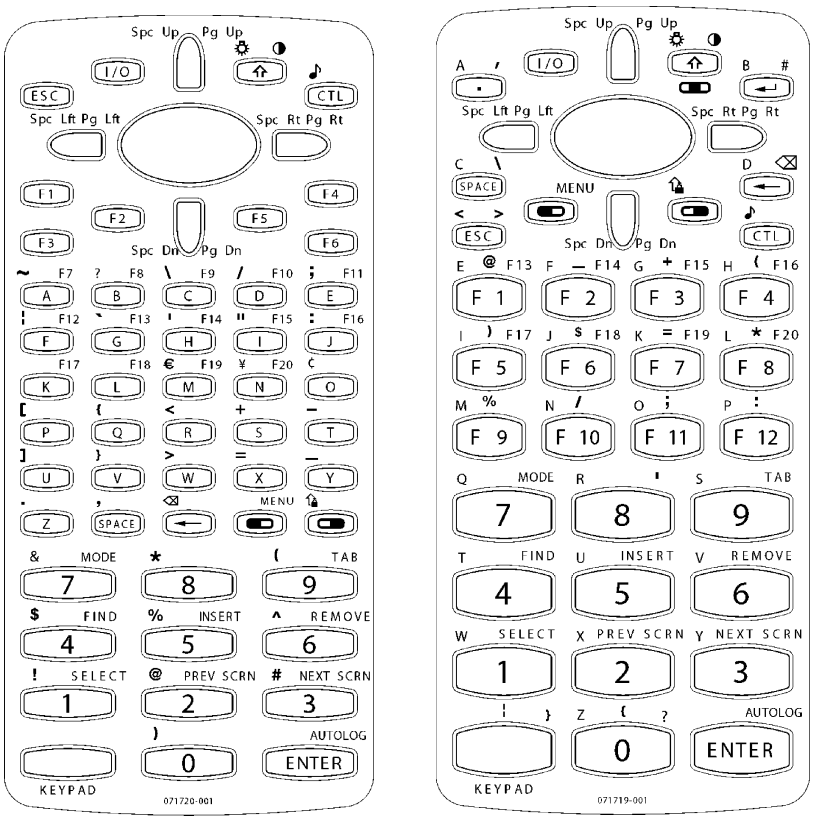


Figure 3-4
2435A Terminal Keyboards

2435A Cursor Keys

To Enter	Press the Keys
Window/viewport up	
Window/viewport down	
Window/viewport right	
Window/viewport left	

2435A Paging Keys

To Enter	Press the Keys
Page up	
Page down	
Page right	
Page left	

2435A Standard Keys

To Enter	Press the Keys
Numbers	0 – 9
Symbols	⇧, plus corresponding key.

2435A Function Keys

	Press the Keys	
To Enter	57-Key Keyboard	39-Key Function Numeric Keyboard
Backspace	←	←
Caps Lock	⇧ ⇧	⇧ ⇧
Ctrl	Ctl	Ctl
Delete	⇧ ←	⇧ ←
Forward Tab	⇧ 9	⇧ 9
Return	ENTER	ENTER
Shift	⇧	⇧
Space bar	SPACE	SPACE

2435A Editing Keys

	Press the Keys	
To Enter	57-Key Keyboard	39-Key Function Numeric Keyboard
Find	⇧ 4	⇧ 4
Insert here	⇧ 5	⇧ 5
Next screen	⇧ 3	⇧ 3
Prev screen	⇧ 2	⇧ 2
Remove	⇧ 6	⇧ 6
Select	⇧ 1	⇧ 1

2435A Top-Row Function Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**39-Key Function Numeric Keyboard**
F7	Blue A	F7
F8	Blue B	F8
F9	Blue C	F9
F10	Blue D	F10
F11	Blue E	F11
F12	Blue F	F12
F13	Blue G	Blue F1
F14	Blue H	Blue F2
F15	Blue I	Blue F3
F16	Blue J	Blue F4
F17	Blue K	Blue F5
F18	Blue L	Blue F6
F19	Blue M	Blue F7
F20	Blue N	Blue F8

2435A Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press Blue 7.

2435A Auto-Login Restart

To enter Auto-Login Restart, press Blue ENTER or scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

2435A Control Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**39-Key Function Numeric Keyboard**
FS (file separator)	Ctl F1	Ctl (
GS (group separator)	Ctl F2	Ctl)
RS (record separator)	Ctl F3	Ctl -
US (unit separator)	Ctl F4	Ctl .
NUL (null)	Ctl 0	Ctl ENTER

6400 Computer

Your 6400 Computer has either a 51-key or a 41-key keyboard. For help with using the keyboard, refer to the *PEN*KEY Model 6400 User's Guide* (P/N 961-047-093).

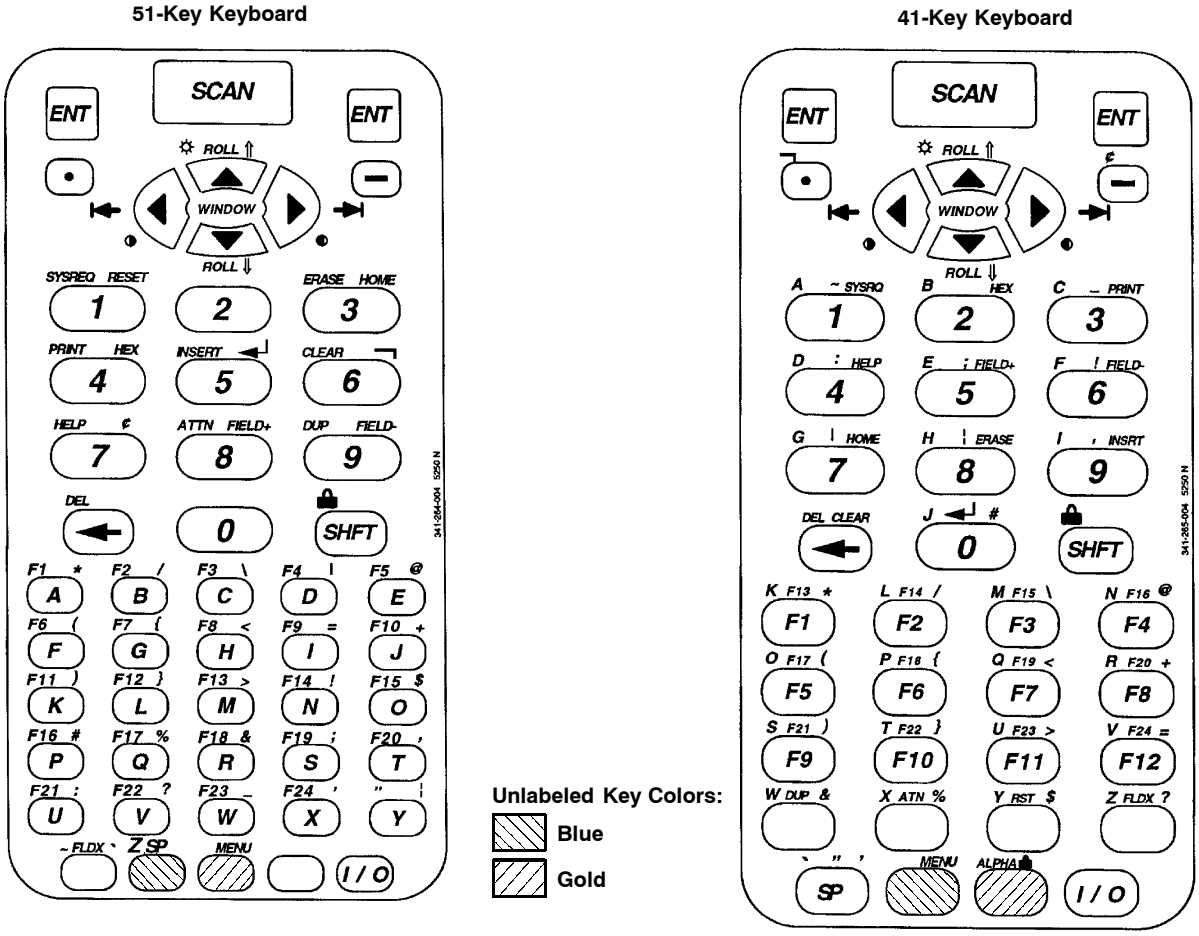


Figure 3-7
6400 Computer Keyboards

The special characters and functions printed above the keys are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[GREEN]
The green [SHFT] put the keyboard into green shift mode.

[GOLD]
The gold key puts the keyboard into gold shift mode. Press [GOLD] plus a keyboard key to type a character or do an operation printed in gold on the overlay.

[BLUE]
The blue key puts the keyboard into blue shift mode. Press [BLUE] plus a keyboard key to do an operation printed in blue on the overlay.

The 51-key keyboard has two gray, unlabeled keys in the bottom row of the keyboard. Following are the keys' functions when they are unshifted (in the primary plane):

- Gray key with "CTRL" above is the Control key ([CTRL]) which, combined with other keys, does control functions.
- Gray key with "SP" above is the Space key ([SP)], which types one space.

The 41-key keyboard has four gray, unlabeled keys near the bottom row of the keyboard. Following are the key's functions when they are in the primary plane:

- Gray key with "CTRL" above is the control key ([CTRL]) which, in combination with other keys, does control functions.
- Gray key with "%" above is a percent key ([%]), which types a percent sign.
- Gray key with "$" above is a dollar key ([$]), which types a dollar sign.
- Gray key with ":" above is a colon key ([:]), which types a colon.

Using the 41-Key Keyboard

The 41-key keyboard has standard numeric and **[ENT]** keys, plus application-defined function keys. The keys are color-coded according to function to make recognition and key entry easier.

Because a PEN*KEY computer with a 41-key keyboard does not have alphabetic keys in its primary plane, follow these procedures to enter passwords and cold-start the computer:

- To enter the password for the SET-UP PARMS firmware menu, press [BLUE] [3] or [F12] [3] to enter a "C," [BLUE] [F8] or [F11] [3] to enter an "R," then press "52401." *Note that these are not case-sensitive.*
- To initiate the COLD START? firmware menu option, press [BLUE] [$] to answer "yes."

You can use one of two methods to type letters on the 41-key keyboard: standard mode or alpha lock mode. When engaged, alpha lock mode switches the alphabetic keys with the function keys. That is, it moves lowercase alphabetic keys from their standard [BLUE] plane to the primary plane. It moves uppercase alphabetic keys from their standard [SHFT] [BLUE] plane to the [SHFT] plane. Alpha lock provides a faster way to type a series of letters because it reduces the number of key presses.

▶ **NOTE:** *Alpha lock mode moves only lowercase alphabetic keys to the primary plane.*

To engage alpha lock mode press [BLUE] [GOLD]. Then, to type a series of letters, press the correct key combination. The keyboard stays in alpha lock mode until you press [BLUE] [GOLD] again to unlock it.

6400 Cursor Keys

To Enter	Press the Keys
Window/viewport up	[GOLD] [▲]
Window/viewport down	[GOLD] [▼]
Window/viewport right	[GOLD] [▶]
Window/viewport left	[GOLD] [◀]

6400 Paging Keys

To Enter	Press the Keys
Page up	[BLUE] [▲]
Page down	[BLUE] [▼]
Page right	[BLUE] [▶]
Page left	[BLUE] [◀]

6400 Standard Keys

To Enter	Press the Keys
Numbers	[0]–[9]
Symbols	[GOLD] *or* [BLUE], plus the corresponding key.

6400 Function Keys

To Enter	Press the Key(s)
Ctrl	[CTRL]
Delete	[BLUE] [←]
Delete or Backspace	[←]
Forward Tab	[GOLD] [3]
Lock	[BLUE] [SHFT]
Return	[ENT]
Shift	[SHFT]
Space bar	[SP]

6400 Editing Keys

To Enter	Press the Keys
Find	[GOLD] [4]
Insert here	[GOLD] [5]
Next screen	[GOLD] [9]
Prev screen	[GOLD] [8]
Remove	[GOLD] [6]
Select	[GOLD] [7]

6400 Auxiliary Keys

	Press the Keys	
To Enter	**51-Key Keyboard**	**41-Key Keyboard**
0–9	[GOLD] [0] [1] – [GOLD] [0] [9]	[GOLD] [0] [1] –[GOLD] [0] [9]
– (hyphen)	[GOLD] [0] [–]	[GOLD] [0] [–]
, (comma)	[GOLD] [0]+[GOLD] [T]	[GOLD] [0]+[GOLD] [$]
. (period)	[GOLD] [0] [.]	[GOLD] [0] [.]
Enter	[GOLD] [0] [ENT]	[GOLD] [0] [ENT]
PF1	[BLUE] [A]	[F1]
PF2	[BLUE] [B]	[F2]
PF3	[BLUE] [C]	[F3]
PF4	[BLUE] [D]	[F4]

6400 Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

To Enter	**Press (51-Key Keyboard)**
F5 (Break)	[BLUE] [E]
F6	[BLUE] [F]
F7	[BLUE] [G]
F8	[BLUE] [H]
F9	[BLUE] [I]
F10	[BLUE] [J]
F11	[BLUE] [K]
F12	[BLUE] [L]
F13	[BLUE] [M]
F14	[BLUE] [N]
F15	[BLUE] [O]
F16	[BLUE] [P]
F17	[BLUE] [Q]
F18	[BLUE] [R]
F19	[BLUE] [S]
F20	[BLUE] [T]

When alpha lock mode is engaged on the 41-key keyboard, it switches the function keys with the alphabetic keys. That is, function keys normally in the primary plane ([F1] through [F12]) move to the [BLUE] plane. Function keys normally in the [SHFT] plane ([F13] through [F20]) move to the [SHFT] [BLUE] plane.

The following chart describes how to do function operations when the 41-key keyboard is in standard mode or alpha lock mode.

▶ **NOTE:** *The **F5** (Break) function does not work with DCS controllers.*

	Press the Keys	
To Enter	**Standard Mode**	**Alpha Lock Mode**
F5 (Break)	[F5]	[BLUE] [F5]
F6	[F6]	[BLUE] [F6]
F7	[F7]	[BLUE] [F7]
F8	[F8]	[BLUE] [F8]
F9	[F9]	[BLUE] [F9]
F10	[F10]	[BLUE] [F10]
F11	[F11]	[BLUE] [F11]
F12	[F12]	[BLUE] [F12]
F13	[SHFT] [F1]	[SHFT] [BLUE] [F1]
F14	[SHFT] [F2]	[SHFT] [BLUE] [F2]
F15	[SHFT] [F3]	[SHFT] [BLUE] [F3]
F16	[SHFT] [F4]	[SHFT] [BLUE] [F4]
F17	[SHFT] [F5]	[SHFT] [BLUE] [F5]
F18	[SHFT] [F6]	[SHFT] [BLUE] [F6]
F19	[SHFT] [F7]	[SHFT] [BLUE] [F7]
F20	[SHFT] [F8]	[SHFT] [BLUE] [F8]

6400 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [GOLD] [1] on the 51- and 41-key keyboards.

6400 Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

6400 Control Keys

Following are key combinations for the 51-key keyboard.

To Enter	**Press (51-Key Keyboard)**
DEL (delete)	[CTRL] [8]
ESC (escape)	[CTRL] [3]
FS (file separator)	[CTRL] [4]
GS (group separator)	[CTRL] [5]
RS (record separator)	[CTRL] [6]
US (unit separator)	[CTRL] [7]

To use the control keys on the 41-key keyboard, press the key combinations in the following chart.

To Do	Standard Mode	Alpha Lock Mode
CTRL A	[CTRL] [BLUE] [1]	[BLUE] [CTRL] [1]
CTRL B	[CTRL] [BLUE] [2]	[BLUE] [CTRL] [2]
CTRL C	[CTRL] [BLUE] [3]	[BLUE] [CTRL] [3]
CTRL D	[CTRL] [BLUE] [4]	[BLUE] [CTRL] [4]
CTRL E	[CTRL] [BLUE] [5]	[BLUE] [CTRL] [5]
CTRL F	[CTRL] [BLUE] [6]	[BLUE] [CTRL] [6]
CTRL G	[CTRL] [BLUE] [7]	[BLUE] [CTRL] [7]
CTRL H	[CTRL] [BLUE] [8]	[BLUE] [CTRL] [8]
CTRL I	[CTRL] [BLUE] [9]	[BLUE] [CTRL] [9]
CTRL J	[CTRL] [BLUE] [0]	[BLUE] [CTRL] [0]
CTRL K	[CTRL] [BLUE] [F1]	[BLUE] [CTRL] [F1]
CTRL L	[CTRL] [BLUE] [F2]	[BLUE] [CTRL] [F2]
CTRL M	[CTRL] [BLUE] [F3]	[BLUE] [CTRL] [F3]
CTRL N	[CTRL] [BLUE] [F4]	[BLUE] [CTRL] [F4]
CTRL O	[CTRL] [BLUE] [F5]	[BLUE] [CTRL] [F5]
CTRL P	[CTRL] [BLUE] [F6]	[BLUE] [CTRL] [F6]
CTRL Q	[CTRL] [BLUE] [F7]	[BLUE] [CTRL] [F7]
CTRL R	[CTRL] [BLUE] [F8]	[BLUE] [CTRL] [F8]
CTRL S	[CTRL] [BLUE] [F9]	[BLUE] [CTRL] [F9]
CTRL T	[CTRL] [BLUE] [F10]	[BLUE] [CTRL] [F10]
CTRL U	[CTRL] [BLUE] [F11]	[BLUE] [CTRL] [F11]
CTRL V	[CTRL] [BLUE] [F12]	[BLUE] [CTRL] [F12]
CTRL W	[CTRL] [BLUE] [CTRL]	[BLUE] [CTRL] [CTRL]
CTRL X	[CTRL] [BLUE] [%]	[BLUE] [CTRL] [%]
CTRL Y	[CTRL] [BLUE] [$]	[BLUE] [CTRL] [$]
CTRL Z	[CTRL] [BLUE] [:]	[BLUE] [CTRL] [:]

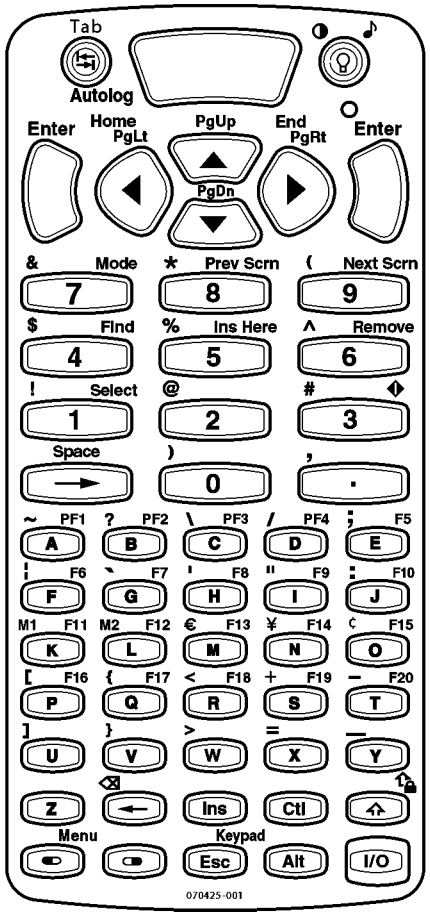
6400 VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	[GOLD] [BLUE]
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

5020 Data Collection PC

Your 5020 Data Collection PC has either a 55-key or a 43-key keyboard. For help with using the keyboard, refer to the *5020 Data Collection PC User's Manual* (P/N 068975-002).

55-Key Keyboard



43-Key Keyboard

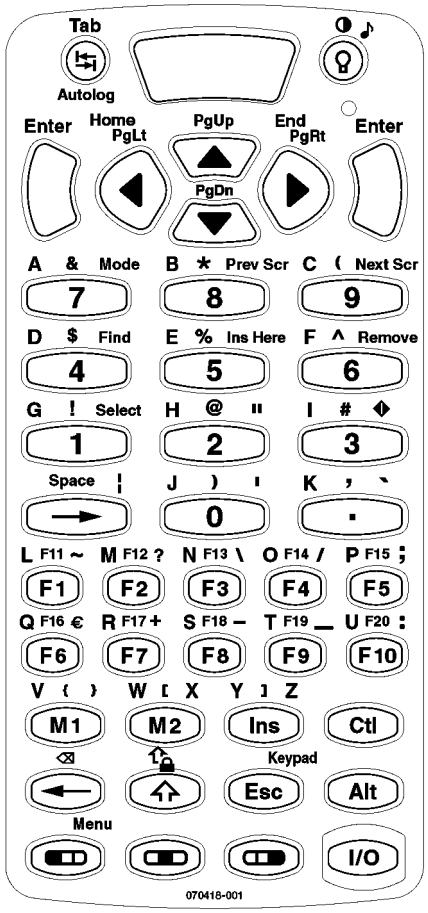


Figure 3-8
5020 Data Collection PC Keyboards

Characters on the 5020 Keypad

Characters, symbols, and functions are printed in four places on or above the keys and are also color-coded to make key combinations.

Position on Keypad	Press the Keys
Printed on key	Press the key
Printed in *orange* on left side above key	, then the key
Printed in *lime* and centered above key	, then the key
Printed in *green* on right side above key	, then the key

5020 Cursor Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**43-Key Keyboard**
Window/viewport up	▲	▲
Window/viewport down	▼	▼
Window/viewport right	▶	▶
Window/viewport left	◀	◀

5020 Paging Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**43-Key Keyboard**
Window/viewport up	▲	▲
Window/viewport down	▼	▼
Window/viewport right	▶	▶
Window/viewport left	◀	◀

5020 Standard Keys

To Enter	Press the Keys
Numbers	0–9
Symbols	, , *or* , plus the corresponding key.

5020 Function Keys

To Enter	Press the Keys
Ctrl	Ctl
Delete	
Delete or Backspace	
Forward Tab	
Return	or
Shift	
Space bar	

5020 Editing Keys

To Enter	Press the Keys
Find	4
Insert here	5
Next screen	9
Prev screen	8
Remove	6
Select	1

5020 Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

	Press the Keys	
To Enter	**55-Key Keyboard**	**43-Key Keyboard**
F5 (Break)	[E]	F5
F6	[F]	F6
F7	[G]	F7
F8	[H]	F8
F9	[I]	F9
F10	[J]	F10
F11	[K]	[E] F1
F12	[L]	[E] F2
F13	[M]	[E] F3
F14	[N]	[E] F4
F15	[Q]	[E] F5
F16	[P]	[E] F6
F17	[Q]	[E] F7
F18	[R]	[E] F8
F19	[S]	[E] F9
F20	[T]	[E] F10
PF	[A]	F1
PF2	[B]	F2
PF3	[C]	F3
PF4	[D]	F4

5020 Caps Lock

To type all alphabetic characters as uppercase letters, either press ⇧ before typing each letter or enable the **Caps Lock** feature.

*To enable **Caps Lock**:*
Press ⇧ until a tone is emitted, or press [E] ⇧. The **Caps Lock** icon will appear in the Notification Tray. **Caps Lock** remains enabled until you disable it.

*To type a lowercase letter while **Caps Lock** is enabled:*
Press ⇧ [E] and an alphabetic character key. For example, press ⇧ [E] 6 to type a lowercase letter "f."

*To disable **Caps Lock**:*
Press ⇧ until a tone is emitted, or press [E] ⇧. The **Caps Lock** icon will disappear from the Notification Tray.

5020 Transmission Mode

To toggle between Line Edit (block) and Character mode, press [E] 7 on the 55-key and 43-key keyboards.

5020 Auto-Login Restart

To enter Auto-Login Restart, press  or scan the following bar code (also in *Appendix A*).

Auto-Login Restart 

%ALRS

5020 Control Keys

Following are the control keys for the 55-key and 43-key keyboards.

To Enter	Press the Key
DEL (delete)	
ESC (escape)	
FS (file separator)	None
GS (group separator)	None
RS (record separator)	None
US (unit separator)	None

5020 VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

5055 Data Collection PC

Figure 3-9 shows the keyboard for the 5055 Data Collection PC. For help with using the keyboard, refer to the *5055 Data Collection PC User's Guide* (P/N 961-054-017).

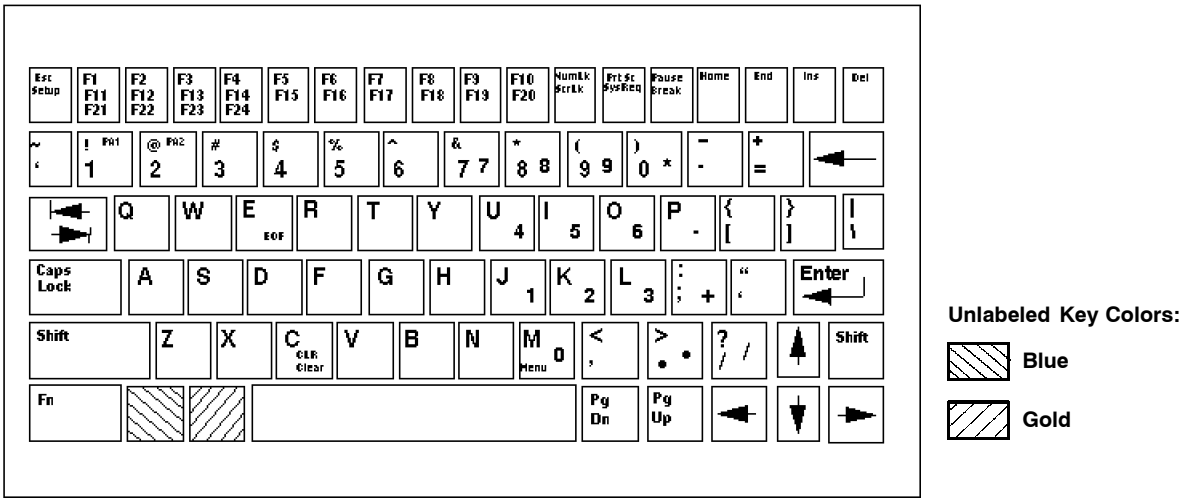


Figure 3-9
5055 Data Collection PC Keyboard

The special characters and functions printed on the overlay are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[Shift]
Press [Shift] plus a letter to type the letter in uppercase.

[BLUE]
The blue (Ctrl) key puts the keyboard into blue shift mode. Press the [BLUE] key plus a keyboard key to do an operation printed in blue, or to send a control character.

[GOLD]
The gold (Alt) key puts the keyboard into gold shift mode. Press the [GOLD] key plus a keyboard key to do an operation printed in gold.

[NumLock]
The green (number lock) key puts the keyboard into [NumLock] mode. Press [NumLock] plus a keyboard key to type a number or character printed in green.

▶ **NOTE:** *These keys are not operational: Fn, Setup, SysReq, Pause, Home, End, Ins, ScrLk, PgDn, and PgUp.*

5055 Cursor Keys

To Enter	Press the Keys
Window/viewport up	[BLUE] ↑
Window/viewport down	[BLUE] ↓
Window/viewport right	[BLUE] →
Window/viewport left	[BLUE] ←

5055 Paging Keys

To Enter	Press the Keys
Page up	[GOLD] ↑
Page down	[GOLD] ↓
Page right	[GOLD] →
Page left	[GOLD] ←

5055 Standard Keys

To Enter	Press the Key(s)
a–z	[A]–[Z]
A–Z	[Shift]+[A] – [Shift]+[Z]
Numbers	[0]–[9]
Symbols	The symbol key, or [Shift] plus the corresponding key.

5055 Function Keys

To Enter	Press the Key(s)
Back Tab	⇤
Ctrl	[BLUE]
Delete	←
Forward Tab	⇥
Lock	[Caps Lock]
Return	[Enter]
Shift	[Shift]
Space bar	[Space bar]

5055 Editing Keys

To Enter	Press the Key(s)
Find	[GOLD]+[4]
Insert here	[GOLD]+[5]
Next screen	[GOLD]+[9]
Prev screen	[GOLD]+[8]
Remove	[GOLD]+[6]
Select	[GOLD]+[7]

5055 Auxiliary Keys

To Enter	Press the Keys
0–9	[GOLD]+[PF2]+[0] – [GOLD]+[PF2]+[9]
– (hyphen)	[GOLD]+[PF2]+[-]
, (comma)	[GOLD]+[PF2]+[M]
. (period)	[GOLD]+[PF2]+[.]
Enter	[GOLD]+[PF2]+[ENTER]
PF1	[PF1]
PF2	[PF2]
PF3	[PF3]
PF4	[PF4]

5055 Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

To Enter	Press the Key(s)
F5 (Break)	[F5]
F6	[F6]
F7	[F7]
F8	[F8]
F9	[F9]
F10	[F10]
F11	[BLUE]+[PF1]
F12	[BLUE]+[PF2]
F13	[BLUE]+[PF3]
F14	[BLUE]+[PF4]
F15	[BLUE]+[F5]
F16	[BLUE]+[F6]
F17	[BLUE]+[F7]
F18	[BLUE]+[F8]
F19	[BLUE]+[F9]
F20	[BLUE]+[F10]

5055 Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press [GOLD]+[PF1].

5055 Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

5055 Control Keys

To Enter	Press the Keys
SOH	[BLUE] [A]
STX	[BLUE] [B]
ETX	[BLUE] [C]
EOT	[BLUE] [D]
ENQ	[BLUE] [E]
ACK	[BLUE] [F]
BEL	[BLUE] [G]
BS	[BLUE] [H]
HT	[BLUE] [I]
LF	[BLUE] [J]
VT	[BLUE] [K]
FF	[BLUE] [L]
CR	[BLUE] [M]
SO	[BLUE] [N]
SI	[BLUE] [O]
DLE	[BLUE] [P]
DC1, X-ON	[BLUE] [Q]
DC2	[BLUE] [R]
DC3, X-OFF	[BLUE] [S]
DC4	[BLUE] [T]
NAK	[BLUE] [U]
SYN	[BLUE] [V]
ETB	[BLUE] [W]
CAN	[BLUE] [X]
EM	[BLUE] [Y]
SUB	[BLUE] [Z]
ESC	[ESC]
FS	[BLUE] [1]
GS	[BLUE] [2]
RS	[BLUE] [3]
US	[BLUE] [4]
DEL	[Del]

5055 VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	[GOLD]+[M]
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

59XX Terminal

Figure 3-10 shows the keyboard for the 59XX Terminal. For help with using the keyboard, refer to the *5900 Series User's Guide* (P/N 961-047-121).

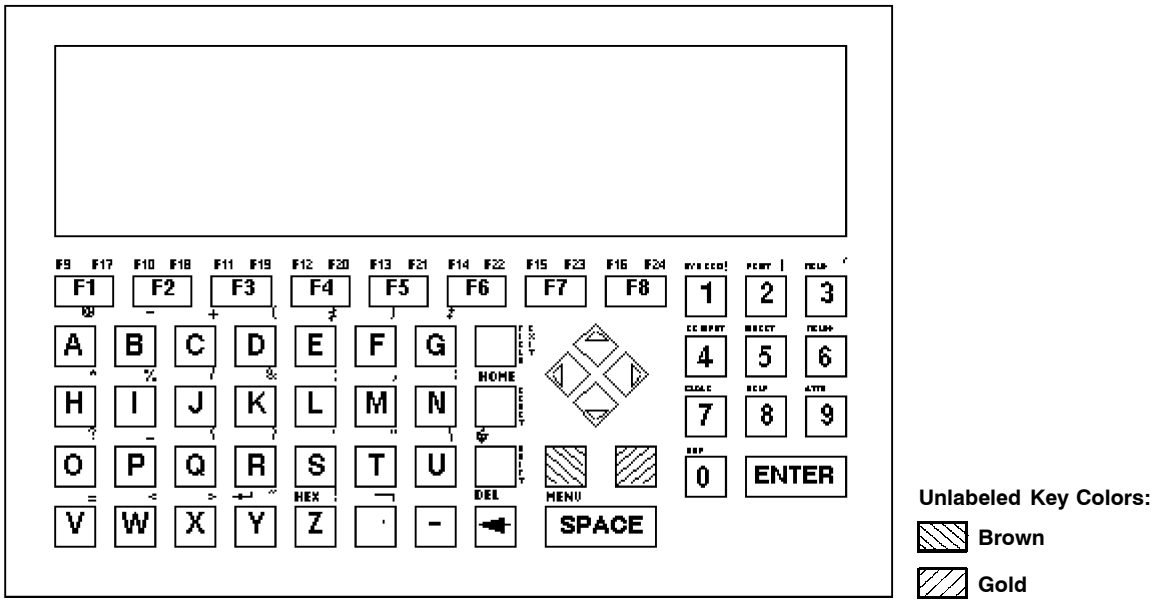


Figure 3-10
59XX Terminal Keyboard

The special characters and functions printed on the overlay are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[BROWN]
The brown key puts the keyboard into brown shift mode. Press [BROWN] plus a keyboard key to type a special character or do an operation printed in brown on the overlay.

[GOLD]
The gold key puts the keyboard into gold shift mode.

59XX Cursor Keys

To Enter	Press the Keys
Window/viewport up	[BROWN] [▲]
Window/viewport down	[BROWN] [▼]
Window/viewport right	[BROWN] [▶]
Window/viewport left	[BROWN] [◀]

59XX Paging Keys

To Enter	Press the Keys
Page up	[GOLD] [▲]
Page down	[GOLD] [▼]
Page right	[GOLD] [▶]
Page left	[GOLD] [◀]

59XX Standard Keys

To Enter	Press the Keys
a–z	[A]–[Z]
A–Z	[SHIFT] [A] – [SHIFT] [Z]
Numbers	[0]–[9]
Symbols	[GOLD] *or* [BROWN], plus the corresponding key.

59XX Function Keys

To Enter	Press the Key(s)
Ctrl	[GOLD]
Delete	[←]
Lock	Not supported.
Return	[ENTER]
Shift	[SHIFT]
Space bar	[SPACE]
Tab	[TAB]

59XX Editing Keys

To Enter	Press the Keys
Find	[BROWN] [4]
Insert here	[BROWN] [5]
Next screen	[BROWN] [3]
Prev screen	[BROWN] [2]
Remove	[BROWN] [6]
Select	[BROWN] [1]

59XX Auxiliary Keys

To Enter	Press the Keys
0–9	[KEYPD] [0] – [KEYPD] [9]
– (hyphen)	[KEYPD] [-]
, (comma)	[KEYPD] [M]
. (period)	[KEYPD] [.]
Enter	[KEYPD] [ENTER]
PF1	[F1]
PF2	[F2]
PF3	[F3]
PF4	[F4]

59XX Top-Row Function Keys

To Enter	Press the Keys
F5 (Break)	[BROWN] [E]
F6	[F6]
F7	[F7]
F8	[F8]
F9	[BROWN] [F1]
F10	[BROWN] [F2]
F11	[BROWN] [F3]
F12	[BROWN] [F4]
F13	[BROWN] [F5]
F14	[BROWN] [F6]
F15	[BROWN] [F7]
F16	[BROWN] [F8]
F17	[GOLD] [F1]
F18	[GOLD] [F2]
F19	[GOLD] [F3]
F20	[GOLD] [F4]

59XX Transmission Mode

To toggle between Line Edit (block) and Character modes, press [GOLD] [F5].

59XX Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

59XX Control Keys

To Enter	Press the Keys
NUL(null)	[CTRL] [2]
DEL (delete)	[CTRL] [8]
ESC (escape)	[CTRL] [3]
FS (file separator)	[CTRL] [4]
GS (group separator)	[CTRL] [5]
RS (record separator)	[CTRL] [6]
US (unit separator)	[CTRL] [7]

59XX VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	[BROWN] [SPACE]
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

17XX Terminal

Your 17XX Terminal has either a 57-key or a 37-key keyboard. For help with using the keyboard, refer to the *RT17XX Radio Data Terminal User's Guide* (Part No. 961-047-068).

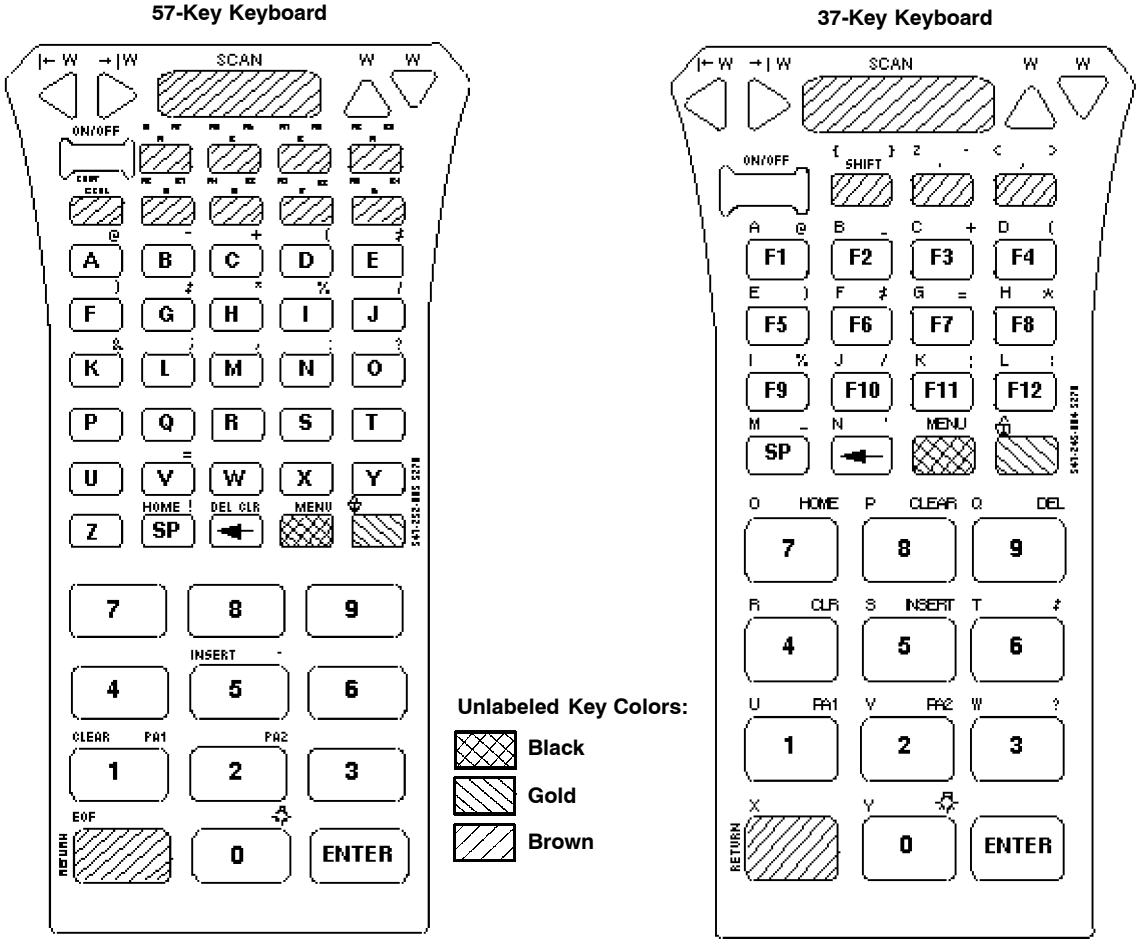


Figure 3-11
17XX Terminal Keyboards

The special characters and functions printed on the overlay are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[BLACK]
The black key puts the keyboard into black shift mode. Press [BLACK] plus a keyboard key to type a special character or do an operation printed in black on the overlay.

[GOLD]
The gold key puts the keyboard into gold shift mode. Press [GOLD] plus a keyboard key to type a special character or do an operation printed in gold on the overlay.

[BROWN]
The brown key puts the keyboard into keypad mode.

▶ **NOTE:** *If you press an unlabeled key (such as the key to the left of the brown [F5] key, or a shift key (black, gold, brown) plus a number or letter (such as [BLACK] [A]), the terminal will beep and flush the type ahead buffer.*

37-Key Keyboard

The 37-key keyboard has standard numeric and **[ENTER]** keys, plus application-defined function keys. It does not have alphabetic keys in its primary plane.

Because a terminal with a 37-key keyboard does not have alphabetic keys in its primary plane, follow these procedures when using its firmware and downloading software:

- To access password-protected menus, press [GOLD], [BLACK], [F12], [F11], then type "52401" for the password; or press [BLACK], [F3], [BLACK], then type "52401" for the password.
- To initiate the COLD START? menu option, press [F10] to answer "yes."
- To download software, hold down the [F1] key as you power up the terminal to go into download mode. This is similar to holding down the [I] key on the standard 57-key keyboard.

The following chart shows how to type letters on the 37-key keyboard.

To Enter	Press the Keys
a–l	[SHIFT] [F1] – [SHIFT] [F12]
m	[SHIFT] [SP]
n	[SHIFT] [←]
o–q	[SHIFT] [7] – [SHIFT] [9]
r–t	[SHIFT] [4] – [SHIFT] [6]
u–w	[SHIFT] [1] – [SHIFT] [3]
x	[SHIFT] [KEYPAD]
y	[SHIFT] [0]
z	[SHIFT] [.]
A–L	[BLACK] [F1] – [BLACK] [F12]
M	[BLACK] [SP]
N	[BLACK] [←]
O–Q	[BLACK] [7] – [BLACK] [9]
R–T	[BLACK] [4] – [BLACK] 6]
U–W	[BLACK] [1] – [BLACK] [3]
X	[BLACK] [KEYPAD]
Y	[BLACK] [0]
Z	[BLACK] [.]

17XX Cursor Keys

To Enter	Press the Keys
Window/viewport up	[GOLD] [▲]
Window/viewport down	[GOLD] [▼]
Window/viewport right	[GOLD] [▶]
Window/viewport left	[GOLD] [◀]

17XX Paging Keys

To Enter	Press the Keys
Page up	[BLACK] [▲]
Page down	[BLACK] [▼]
Page right	[BLACK] [▶]
Page left	[BLACK] [◀]

17XX Standard Keys

To Enter	Press the Keys
Numbers	[0]–[9]
Symbols	[GOLD] *or* [BLACK], plus the corresponding key.

17XX Function Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
Ctrl	[GOLD] [8]	[GOLD] [8]
Delete	[BLACK] [←]	Not supported.
Delete *or* Backspace	[←]	[←]
Lock	[BLACK] [GOLD]	[BLACK] [GOLD]
Return	[ENTER]	[ENTER]
Shift	[GOLD] [7]	[SHIFT]
Space bar	[SP]	[SP]
Tab	[GOLD] [9]	[GOLD] [9]

17XX Editing Keys

To Enter	Press the Keys
Find	[GOLD] [4]
Insert here	[GOLD] [5]
Next screen	[GOLD] [3]
Prev screen	[GOLD] [2]
Remove	[GOLD] [6]
Select	[GOLD] [1]

17XX Auxiliary Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
0–9	[KEYPAD] [0] – [KEYPAD] [9]	[KEYPAD] [0] – [KEYPAD] [9]
– (hyphen)	[KEYPAD] [GOLD] [B]	[KEYPAD] [GOLD] [F2]
, (comma)	[KEYPAD] [GOLD] [M]	[KEYPAD] [,]
. (period)	[KEYPAD] [BLACK] [U]	[KEYPAD] [.]
Enter	[KEYPAD] [ENTER]	[KEYPAD] [ENTER]
PF1	[PF1]	[F1]
PF2	[PF2]	[F2]
PF3	[PF3]	[F3]
PF4	[PF4]	[F4]

17XX Top-Row Function Keys

▶ **NOTE:** *The **F5** (Break) function does not work with DCS controllers.*

	Press the Key(s)	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
F5 (Break)	[F5]	[F5]
F6 – F8	[F6] – [F8]	[F6] – [F8]
F9–F12	[BLACK] [PF1] – [BLACK] [PF4]	[F9] – [F12]
F13–F16	[BLACK] [F5] – [BLACK] [F8]	Not supported.
F17–F20	[GOLD] [PF1] – [GOLD] [PF4]	Not supported.

17XX Transmission Mode

To toggle between Line Edit (block) mode and Character mode, press the following keys.

57-key keyboard: [BLACK] [Y]
37-key keyboard: [GOLD] [7]

17XX Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

17XX Control Keys

To Enter	Press the Keys
DEL (delete)	[GOLD] [8] [8]
ESC (escape)	[GOLD] [8] [3]
FS (file separator)	[GOLD] [8] [4]
GS (group separator)	[GOLD] [8] [5]
RS (record separator)	[GOLD] [8] [6]
US (unit separator)	[GOLD] [8] [7]

Use the control keys on the 37-key keyboard when the keyboard is in SHIFT LOCK mode. To put the keyboard into SHIFT LOCK mode, press [BLACK] [GOLD]. Then press the following key sequences.

To Enter	Press the Keys (37-Key Keyboard)
CTRL A	[GOLD] [8] [F1]
CTRL B	[GOLD] [8] [F2]
CTRL C	[GOLD] [8] [F3]
CTRL D	[GOLD] [8] [F4]
CTRL E	[GOLD] [8] [F5]
CTRL F	[GOLD] [8] [F6]
CTRL G	[GOLD] [8] [F7]
CTRL H	[GOLD] [8] [F8]
CTRL I	[GOLD] [8] [F9]
CTRL J	[GOLD] [8] [F10]
CTRL K	[GOLD] [8] [F11]
CTRL L	[GOLD] [8] [F12]
CTRL m	[GOLD] [8] [SP]
CTRL N	[GOLD] [8] [←]
CTRL o	[GOLD] [8] [7]
CTRL p	[GOLD] [8] [8]
CTRL q	[GOLD] [8] [9]
CTRL r	[GOLD] [8] [4]
CTRL s	[GOLD] [8] [5]
CTRL t	[GOLD] [8] [6]
CTRL u	[GOLD] [8] [1]
CTRL v	[GOLD] [8] [2]
CTRL w	[GOLD] [8] [3]
CTRL X	[GOLD] [8] [KEYPAD]
CTRL Y	[GOLD] [8] [0]
CTRL Z	[GOLD] [8] [.]

17XX VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	[GOLD] [BLACK]
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

11XX Terminal

Figure 3-12 shows the keyboard for the 11XX Terminal. For help in using the keyboard, see the *1100 Series Data Terminal User's Guide* (P/N 961-047-069).

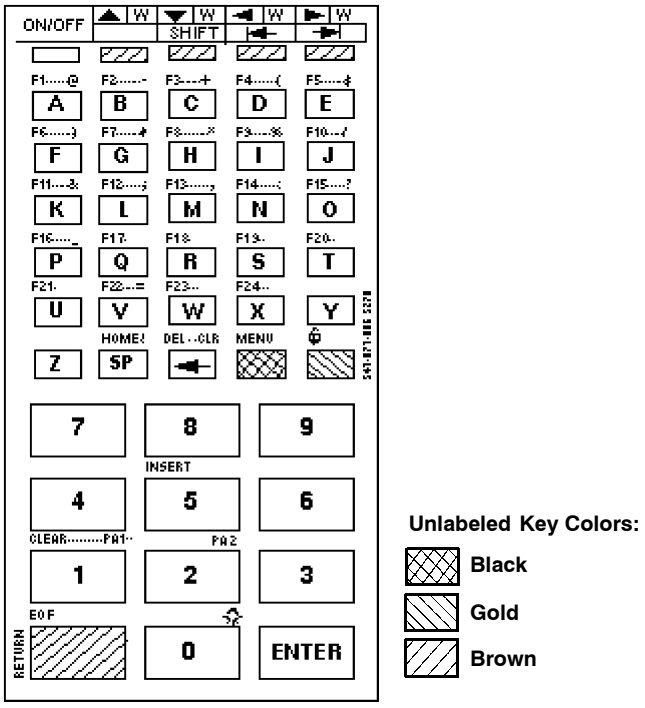


Figure 3-12
11XX Terminal Keyboard

The special characters and functions printed on the overlay are color-coded to correspond with the matching shift keys. The shift keys are as follows.

[BLACK]
The black key puts the keyboard into black shift mode. Press [BLACK] plus a keyboard key to type a special character or do an operation printed in black on the overlay. To lock the keyboard into shift mode, press [BLACK] [GOLD]. To unlock the keyboard, press [BLACK] [GOLD] again.

[GOLD]
The gold key puts the keyboard into gold shift mode. Press [GOLD] plus a keyboard key to type a special character or do an operation printed in gold on the overlay.

[BROWN]
The brown key puts the keyboard into keypad mode.

11XX Cursor Keys

To Enter	Press the Keys
Window/viewport up	[GOLD] [▲]
Window/viewport down	[GOLD] [▼]
Window/viewport right	[GOLD] [▶]
Window/viewport left	[GOLD] [◀]

11XX Paging Keys

To Enter	Press the Keys
Page up	[BLACK] [▲]
Page down	[BLACK] [▼]
Page right	[BLACK] [▶]
Page left	[BLACK] [◀]

11XX Standard Keys

To Enter	Press the Keys
a–z	[A]–[Z]
A–Z	[GOLD] [7] [A] – [GOLD] [7] [Z]
Numbers	[0]–[9]
Symbols	[GOLD] *or* [BLACK], plus the corresponding key.

11XX Function Keys

To Enter	Press the Keys
Backspace	[←]
Ctrl	[GOLD] [8]
Delete	[BLACK] [←]
Lock	[BLACK] [GOLD]
Return	[ENTER]
Shift	[GOLD] [7]
Space bar	[SP]
Tab	[GOLD] [9]

11XX Editing Keys

To Enter	Press the Keys
Find	[GOLD] [4]
Insert here	[GOLD] [5]
Next screen	[GOLD] [3]
Prev screen	[GOLD] [2]
Remove	[GOLD] [6]
Select	[GOLD] [1]

11XX Auxiliary Keys

To Enter	Press the Keys
0–9	[KEYPAD] [0] – [KEYPAD] [9]
– (hyphen)	[KEYPAD] [GOLD] [B]
, (comma)	[KEYPAD] [GOLD] [M]
. (period)	[KEYPAD] [BLACK] [U]
Enter	[KEYPAD] [ENTER]
PF1	[BLACK] [A]
PF2	[BLACK] [B]
PF3	[BLACK] [C]
PF4	[BLACK] [D]

11XX Top-Row Function Keys

▶ **NOTE:** *DCS controllers do not support the **F5** (Break) function.*

To Enter	Press the Keys
F5 (Break)	[BLACK] [E]
F6	[BLACK] [F]
F7	[BLACK] [G]
F8	[BLACK] [H]
F9	[BLACK] [I]
F10	[BLACK] [J]
F11	[BLACK] [K]
F12	[BLACK] [L]
F13	[BLACK] [M]
F14	[BLACK] [N]
F15	[BLACK] [O]
F16	[BLACK] [P]
F17	[BLACK] [Q]
F18	[BLACK] [R]
F19	[BLACK] [S]
F20	[BLACK] [T]

11XX Transmission Mode

To toggle between Line Edit (block) and Character modes, press [BLACK] [Y].

11XX Auto-Login Restart

To enter Auto-Login Restart, scan the following bar code (also in *Appendix A*).

Auto-Login Restart

%ALRS

11XX Control Keys

To Enter	Press the Keys
DEL (delete)	[GOLD] [8] [8]
ESC (escape)	[GOLD] [8] [3]
FS (file separator)	[GOLD] [8] [4]
GS (group separator)	[GOLD] [8] [5]
RS (record separator)	[GOLD] [8] [6]
US (unit separator)	[GOLD] [8] [7]

11XX VT/ANSI Additional Functions

To	Press the Keys or Use
Access TE configuration menus	[GOLD] [BLACK]
Toggle between Application mode and Numeric Keypad mode	DECKPAM/DECPNM *(See "Terminal Modes" in Section 6 for an explanation.)*

Section 4

Using the Terminal Emulation Menus

This section lists ALL TE parameters. If a certain parameter does not apply to your terminal, the parameter will *not* appear in the TE configuration menus.

The CFGLIT.DAT file specifies the text of the TE configuration menus. This section assumes you are using the default settings in CFGLIT.DAT. To customize CFGLIT.DAT, see Section 5, "Customizing Your Configuration."

Function Keys

These paragraphs describe how to navigate through the TE configuration menus.

Enter Key

Press the terminal's [Enter] key to return to a previous TE configuration menu. Press [Enter] several times to return to the **Main Menu** from a submenu. This key also accepts the displayed or keyed input. Below are terminals and their related [Enter] keys:

- 2415, 2425, 2455, 248X — ⏎ or ⏎ keys
- 2435A Terminal — ENTER key
- 6400 Computer — **[ENT]** keys
- 5020 Data Collection PC — ⏎ or ⏎ keys
- 5055 Data Collection PC — **<Enter>** via external keyboard
- 59XX Terminal — **[ENTER]** key
- 17XX, 11XX Terminals — **[ENTER]** keys

Shift Keys

Use shift keys to put the keyboard in the desired shift mode. These shifted key functions are shown on the keyboard overlays in Section 3.

For 6400, 5055
[Yellow] and [Blue] shift keys are required. For the 5055 PC, the [Yellow] shift key substitutes the **<Alt>** key and the [Blue] shift key substitutes the **<Ctrl>** key on the external keyboard.

For 17XX, 11XX
[Gold] and [Black] shift keys are required.

Y ("Yes") Key

Several displays provide a warning that a certain action can cause your terminal to lose data stored in memory. Press the Y ("yes") key to proceed as instructed. Press another key to exit the menu without executing your original choice.

Up and Down Arrows

For 6400, 5055, 11XX, the up and down arrow keys are defined by the host computer.

For 59XX, the up and down arrow keys can be made to function more efficiently, in many cases, by pressing the **FUNC** or **ALT** key, then pressing the desired arrow key.

Use these keys to:

- Adjust the length and frequency of the audible buzzer, key click, and error tone.
- Set the display screen size (the number of rows displayed and characters per row) and contrast.

Number Keys [0] Through [9]

Many menus have numbered options. Press the corresponding numeric key to make a selection.

Once you make a selection and you remain at that menu screen, the option is highlighted, but you can select additional options. To deselect an enabled option, press the number corresponding to that option.

Pressing a number may bring up a submenu. Use the submenu to further modify the choice you made in the parent menu. After the modifications, you may return to the parent menu to make additional selections. (This depends on the menu and function.) Also, you may press a numeric key to exit a menu or cold start the terminal. These situations are covered later in this section.

Various menus require entering a number, but do not necessarily have simple choices such as 1, 2, 3, 4, etc. Instead, you may have to enter a number from a range of numbers, such as 0–32.

These instances are detailed in the text that applies to those menus, or in the menu displays. *Note: There are situations where pressing [**6**] will cause the terminal to exit from a submenu or to reboot.*

Display Annunciators

For 6400, 5055, 59XX, 17XX, 11XX, annunciators show the current status or operation in progress. Some of the more common annunciators are as follows:

▶ **NOTE:** *The following symbols appear larger than actual size on your terminal display. All individual letter annunciators are five pixels in height, except* ***T*** *(temperature) and* ***B*** *(bad battery) which are seven pixels.*

Display Position 0

Radio *(6400, 5055)*
The radio is transmitting data to the base station.

Display Position 1

If the radio icon is displayed in position 0, then position 1 shows the status of the radio transmission (either receiving, sending, communication loss, or message waiting). If there is no radio icon shown in position 0, then this position is blank and position 1 shows the active session number 1 or 2.

Message
A message is received and has not been read.

Specific for 6400, 5055, 59XX Terminals

Sending
Radio is sending data to the base station.

Receiving
Radio is receiving data from the base station. This annunciator appears only when the information is for this particular computer's address.

Communication Loss
No communication with the host computer has occurred for at least 60 seconds. The radio computer may be out of radio range, the base station may not have power, or communications from the host computer to the base station may not be properly set up.

Specific for 17XX, 11XX Terminals

Transmitting data
The terminal is transmitting data to the host computer.

Receiving data
The terminal is receiving data.

Communication Loss
The terminal cannot communicate with the host computer. The terminal may be out of radio range, the base radio may not have power, or communication from the host to the base may not be properly set up.

Display Position 2

x **Input Inhibited**
The keyboard has accepted enough information for the current input field. If the "key ahead" feature is on, the terminal stores the keystrokes made after "input inhibited" appears. The host may also inhibit (lockout) the keyboard upon certain errors or when sending additional information to your computer.

^ **Insert Mode**
Characters are inserted, not overwritten.

C **Character Mode**
The terminal is operating in character mode.

B **Line Edit (Block) Mode**
The terminal is operating in block mode.

K **Keypad Mode**
Keypad is active.

e **Local Edit Mode**
This mode is available only in the VT/ANSI emulation.

Display Position 3

▲ **Alphabet Character Shift Mode** *(59XX, 17XX, 11XX, Green for 6400, 5055)*
The keyboard is in the alphabet character shift mode—any alphabet character keystrokes are entered as uppercase characters.

◄ **Shift Mode** *(Blue for 6400, 5055; Black for 11XX, 17XX; varies for 59XX)*
The keyboard is in a colored shift mode—keystrokes enter the symbol or perform the function shown on the overlay to the upper *left* of the key.

► **Shift Mode** *(Yellow or Gold for 6400, 5055, 11XX, 17XX; varies for 59XX)*
The keyboard is in a colored shift mode—keystrokes enter the symbol or perform the function shown on the overlay to the upper *right* of the key.

Display Position 4

A **Alpha Lock** *(6400)*
This symbol is used only for the 6400 Computer 41-key keyboard model.

c **Battery is charging** *(17XX, 11XX)*
The terminal is connected to a charging source. This does *not* necessarily mean the terminal is charging since this is dependent on battery state, temperature, and other conditions.

Display Position 5

E **Error** *(17XX)*
The terminal is connected to a charging source, but charging is *not* possible.

Display Position 6

B **Bad Battery** *(17XX)*
The battery pack you are currently using is bad..

T **Temperature** *(17XX)*
The terminal is currently out of the battery charging temperature range, which is 5° to 40° C.

Display Positions 1 through 3

SCAN **Laser scanner in use** *(17XX, 11XX)*
Observe caution labels on laser scanners.

Display Positions 4 and 5

CL **Caps Lock** *(5055)*
If **[Caps Lock]** is pressed (activated) on the 5055 external keyboard, the terminal will type all capital letters regardless of how the text is entered.

NL **Num Lock** *(5055)*
If **[Num Lock]** is activated on the 5055 external keyboard, the terminal will enter numbers as pressed via the right-hand pad on the keyboard.

Display Positions 4 through 6

Low battery condition *(17XX, 11XX)*
A Low Battery indication is very important to operation of the terminal, letting you know that your terminal will stop operating shortly. Your terminal should continue to operate 30 minutes to 2 hours depending on how you use it. Data stored in RAM will be saved for approximately 30 days. But you should avoid testing this limit.

Your terminal will retain its RAM data storage for up to five minutes with the battery pack removed. It is always a good idea to replace the battery pack with a fresh recharged pack immediately after removing the discharged pack. Without battery power your terminal will not operate, and your display will be blank.

Display Positions 4 through 8

XX/YY **Current Row/Column Position** *(59XX)*
Shows the current location of the cursor, with "XX" as the row position and "YY" as the column position. For example, if the cursor is at row 5, column 12, the annunciators will show "05/12" in positions 4–8.

Display Positions 5 through 8

Battery Pack Gas Gauge Icons *(6400)*
These battery icons represent the charge level in your main battery pack.

- Four icons (positions 5–8) indicates more than 76% charge level
- Three icons (positions 5, 6, and 7) indicates between 51–75%
- Two icons (positions 5 and 6) indicates between 26–50%
- One icon (position 5) indicates between 21–25%

When the terminal gets below 20%, the icons are replaced by "Ls" and after the charge level is less than 10% your terminal emits a series of beeps.

- Four Ls indicates 16–20% charge level
- Three Ls indicates 11–15%. At the 15% charge level, your terminal beeps once. The sound duration and frequency are at levels you have set for your terminal.
- Two Ls indicates 6–10%. At the 10% and 7% charge levels, your terminal beeps once. The sound duration and frequency are at levels you have set for your terminal.
- One L indicates 0–5%. At this charge level, your terminal beeps three times at its current setting level for both duration and frequency.

▶ **NOTE:** *If you have the beeper turned **off**, you will not hear any of the low battery beep warnings.*

The battery pack icons on your terminal display reflect the same status as the LEDs on the battery pack. However, there may be a one minute delay for updating the icons on the display when the battery pack is replaced.

Configuring TE Parameters

This section contains the TE configuration menus for the following terminals: 2415, 2425, 2435A, 2455, 248X (Trakker Antares), 6400 Computer, 59XX, 17XX, and 11XX Terminals, and 5020 and 5055 Data Collection PCs unless otherwise noted. Additional information is available for each of the following:

NOTE: *Screens are shown with all of the available options.*
*If an option is **not** assigned to a specific terminal, then that option is available for all of the terminals addressed in this publication.*
*If an option **is** specific towards a terminal, this option does not appear on the display, or will be blank, for all other terminals.*

Key Sequence to Open Main Menu

To configure TE parameters on your respective terminal, at the initialization screens or anywhere in a TE session, access the **Main Menu** by pressing the following key sequence:

To configure TE parameters:
At the initialization screens or anywhere in a TE session, access the **Main Menu** by pressing the key sequence.

- 2415 Terminal [=f] [F1] (55-key keyboard)
  [=f] [5] (37-key keyboard)
- 2425 Terminal [=f] [F1]
- 2435A Terminal 
- 2455 and 248X Terminals [=f] [F1]
- 6400 Computer [YELLOW] [BLUE]
- 59XX Terminal [BROWN] [BLACK]
- 5020 Data Collection PC 
- 5055 Data Collection PC [ALT] [M] or [BLUE] [M]
- 17XX, 11XX Terminals [GOLD] [BLACK]

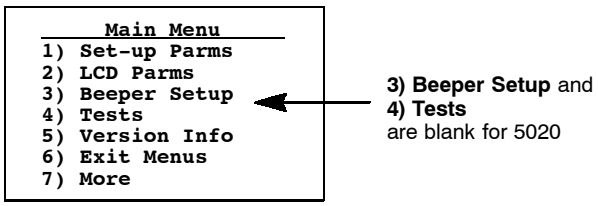
NOTE: *You can also access the **Main Menu** by scanning the following bar code label.*

TE configuration menus

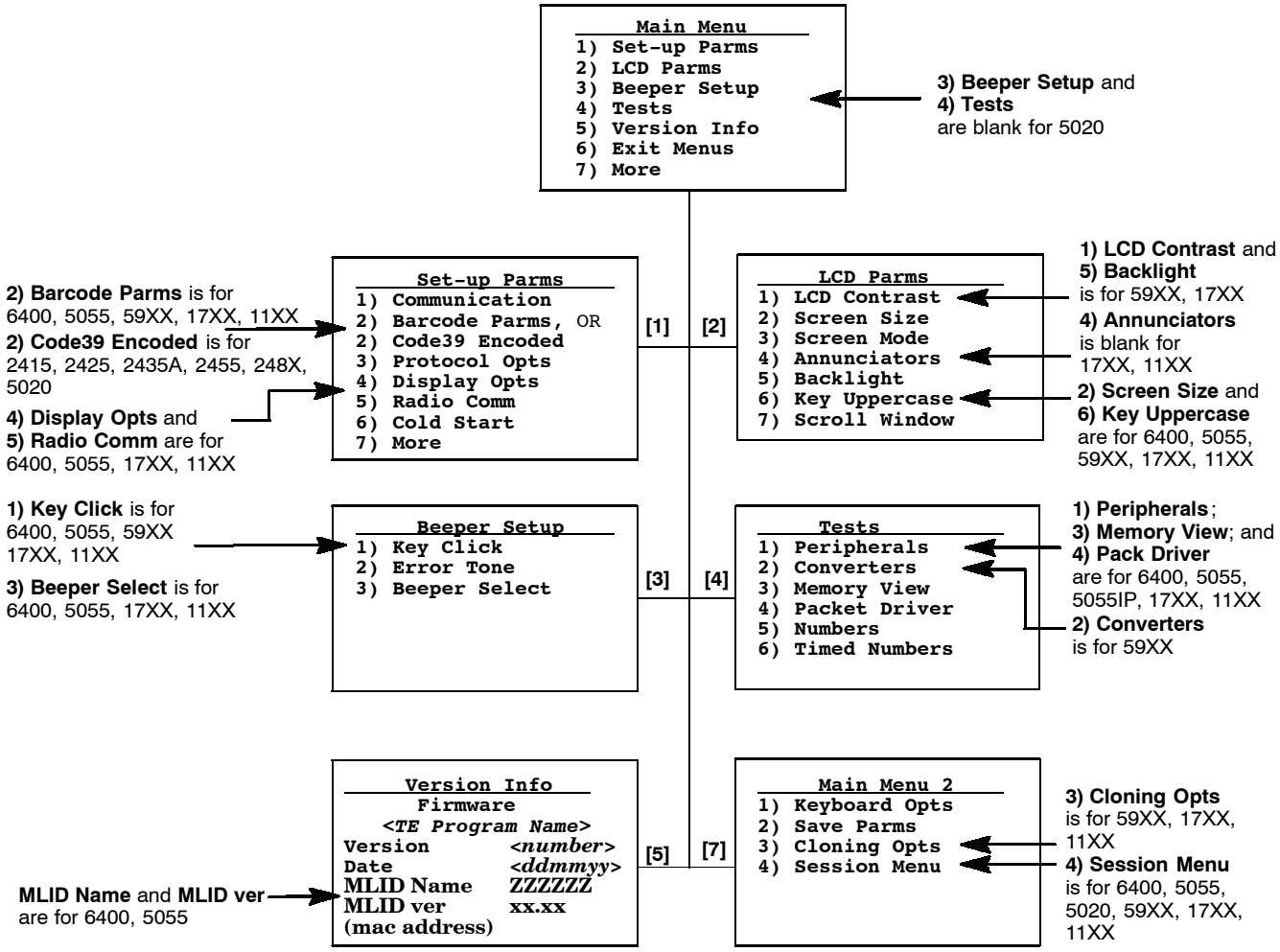
%TECFG

Opening the Main Menu

The **Main Menu** is the first screen displayed when you open the computer menus. All other menus are accessed from the **Main Menu**. At the initialization screens or anywhere in a TE session, access the **Main Menu** by pressing the appropriate key sequences *(defined within each terminal's specific information)*.



After the **Main Menu** appears, enter a number (1 through 7) to make a selection. To return to the **Main Menu** from the terminal menus program, press the [Enter] key several times. You can then select **6) Exit Menus**, to return to the operating system.

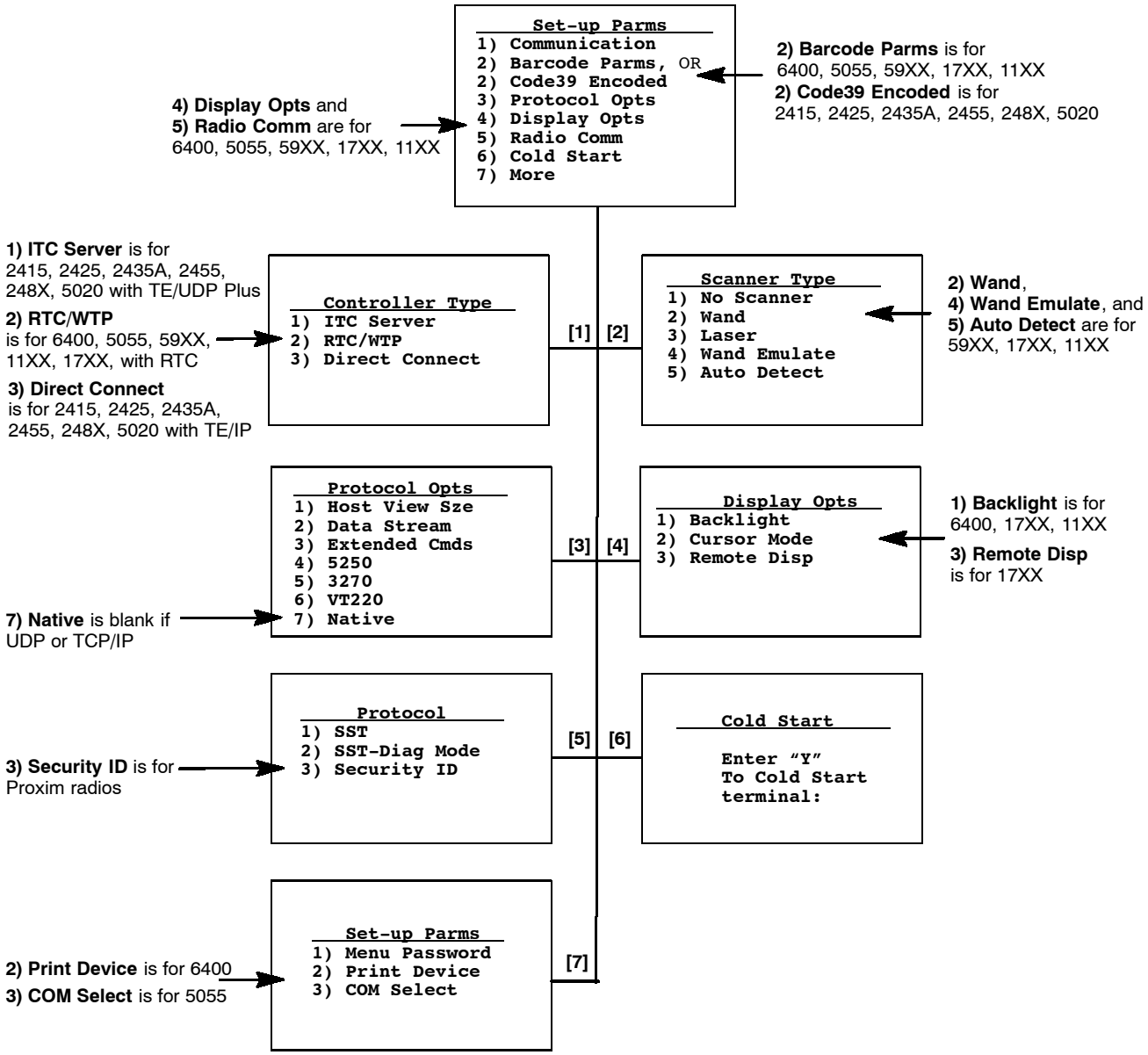


1) Set-Up Parms

1) Set-Up Parms is password-protected to prevent unauthorized users from changing parameters. You can change the password by customizing the parameter's set-up file (CONFIG.DAT). For more information about changing the password, see Section 5.

The parameters set only apply to the current session. If more than one session is available, use the **7) More → 2) Save Parms → 4) Session Menu** to verify or change the current session *before* changing parameter settings.

To open the **1) Set-up Parms** menu, press **[1]**, [Enter], then type **CR52401** at the prompt to access the following menus.



1) Communication

The communication option for the terminals are broken down as follows:

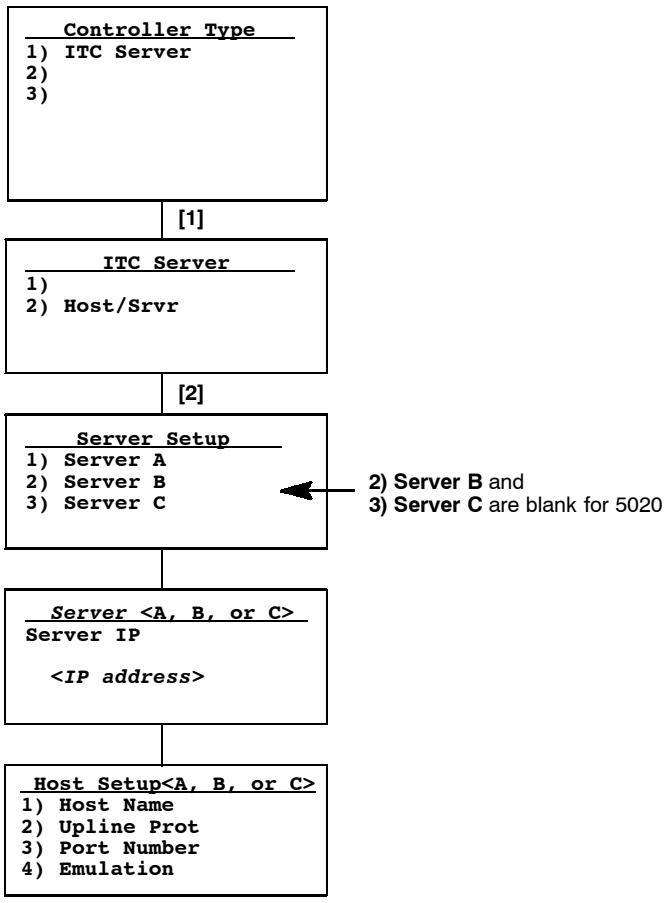
2415, 2425, 2435A, 2455, 248X, and 5020 Terminals with UDP Plus
1) ITC Server via the next paragraph.

6400, 5055, 59XX, 17XX, and 11XX Terminals with RTC
2) RTC/WTP on page 4-11.

6400 and 5055 Terminals with TCP/IP
3) Direct Connect on page 4-13.

2415, 2425, 2435A, 2455, 248X, and 5020 Terminals with TCP/IP
3) Direct Connect on page 4-15.

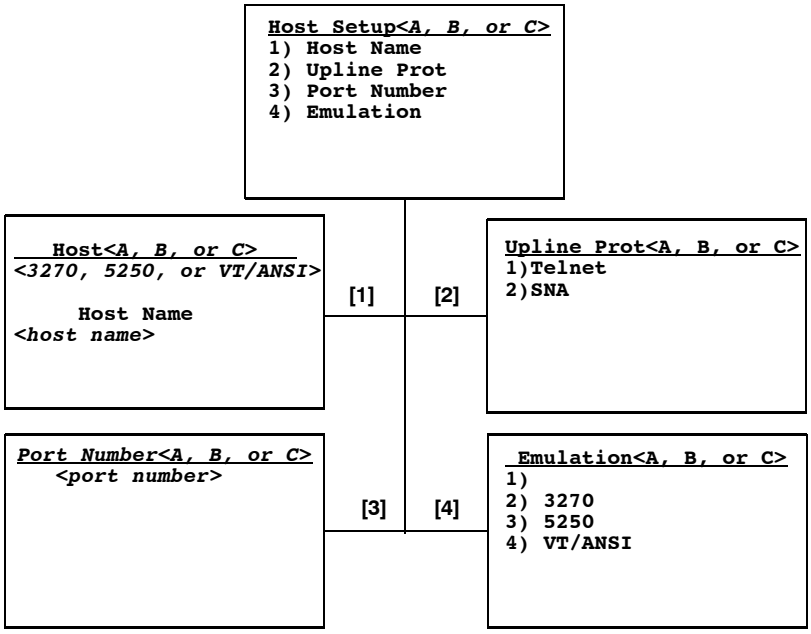
***1) ITC Server** (2415, 2425, 2435A, 2455, 248X, 5020 with TE/UDP Plus)*
ITC (Intermec Technologies Corporation) Server options are as follows. To set the options, select **1) ITC Server**, **2) Host/Srvr**, then the **Server Setup** option (Server A, B, or C).



***Server IP <A, B, or C>** (B and C are blank for 5020)*
The Server <A> IP address is read from either the CONFIG.DAT (if one is saved) or the terminal firmware. When an IP address is entered, it gets written to the terminal's firmware for the next boot.

If you are using the Server <B> or Server <C> option as a fallback DCS 300, enter the server's IP address or DNS name. The boot sequence will continue to try Server <A>, <B>, then <C> in this order by filling the firmware controller slot with the IP values entered for each server.

Host Setup <A, B, or C>
Menu options are as follows:



1) Host Name
The host name can be 16 or fewer characters in length (with no spaces). It is case-sensitive and must match a host name in the list of available hosts defined on the DCS 300, or remain blank. The name can also be the IP address of the host to which you want to connect. Enter the IP address as four decimal numbers separated by periods.

If a terminal was linked with a host name on the DCS 300, or a default host was configured on this DCS 300, you do not need to enter a host name on this screen. The terminal displays a list of available hosts if these conditions are met:

- The DCS 300 contains multiple hosts
- The terminal is not linked with a host name on the DCS 300
- The host name is blank

The user can then select the host from the list.

2) Upline Prot(ocol)
When enabled, upline protocol options do the following:

Telnet *(Default)*
Forces the DCS 300 to create a Telnet connection to the host.

SNA
Forces the DCS 300 to create an SNA connection to the host.

3) Port Number
This option overrides the port number set for the upline if you have entered a host name and selected Telnet as your upline protocol. The default port number is 0. The maximum port number is 65535.

4) Emulation
Use this option to tell the terminal each host computer type. Default is 3270.

► NOTE: *You can also set the type through the **2) Data Stream** option on the **3) Protocol Opts** menu.*

2) RTC/WTP *(6400, 5055, 59XX, 17XX, 11XX)*

Use **2) RTC/WTP** to set, view, or change the terminal ID. This number allows the host computer to identify individual terminals in the radio data network. Each terminal must have a unique number in the same network.

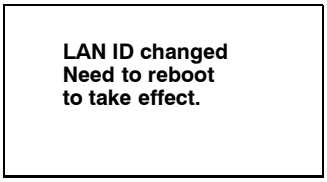
The **1) Radio Setup** and **2) Host/Cntl** menus are shown on the following pages. Depending on which option you are exercising you will either advance to the WTP Stack settings or the TCP/IP Stack settings.

WTP Settings

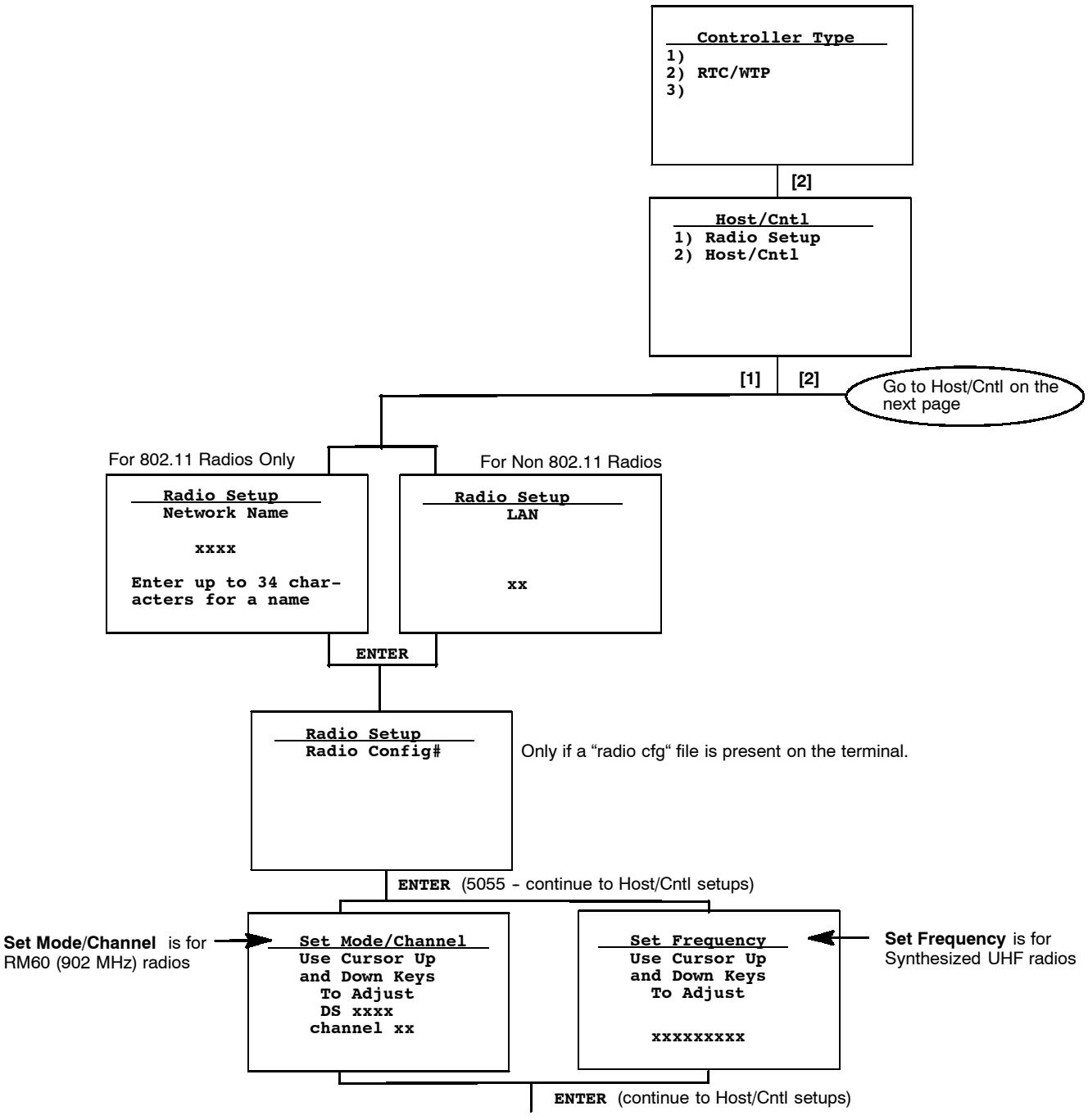
Use the numeric keys on the terminal keyboard or 5055 external keyboard to modify its ID. Enter a number between 0–126, then press [Enter] to go to the **2) Host/Cntl** menus.

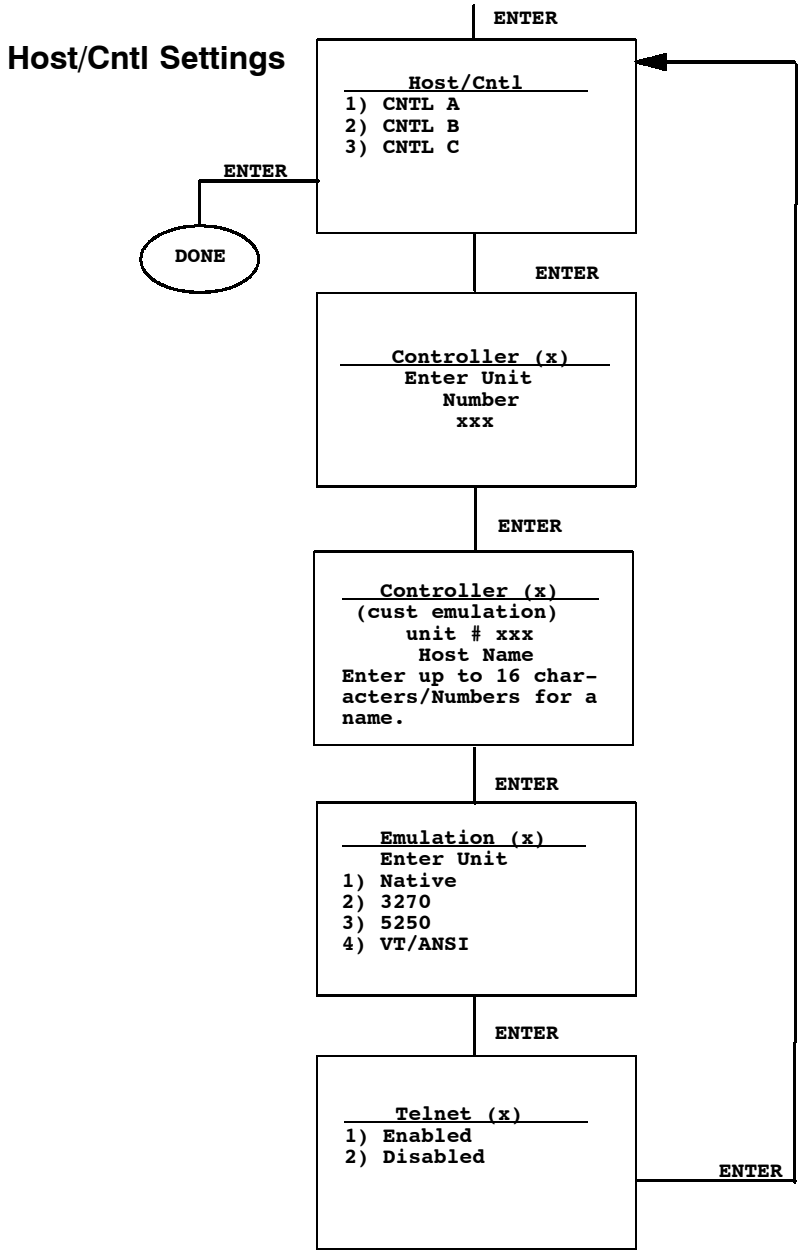
The LAN ID number can be 0-255 depending on the radio being used. With the RM60/70 radio, the number can be 0-255; with the RM80/90 radio, the range is 0-15. Your terminal only communicates with equipment using the same ID number that you assigned to your LAN.

If you enter a LAN ID number different from what is configured in the NET.CFG file you get the following message. If this happens, the system modifies NET.CFG, which is used by WTPPKT.EXE on initializing the terminal.



WTP Stack Options





3) Direct Connect *(6400, 5055)*

The first option if exercising TCP/IP stack is **1) Radio Setup**. Once selected, enter your network name or LAN ID.

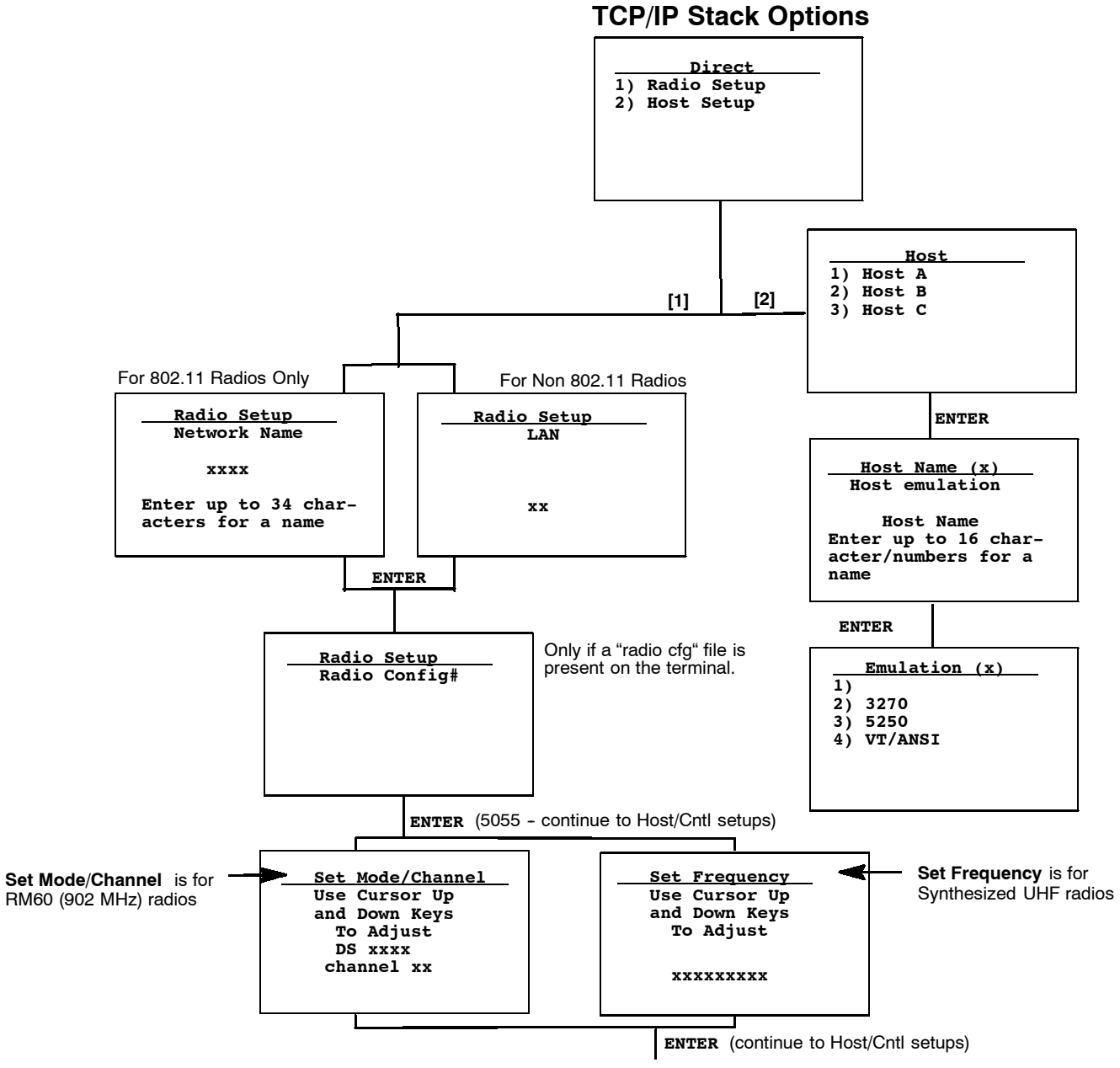
If using a 902 MHz radio module, use the up and down arrows to pick the Direct Sequence (DS) and Channel configuration. If using a Synthesized UHF radio, select the possible frequencies for your radio module from the list.

The **2) Host/Cntl** option changes the host setting to designate up to three host computers for each 6400 Computer or 5055 PC. Each host is assigned a separate priority level (1, 2, or 3). When powered on, the 6400 Computer or 5055 PC seeks host A. If host A is not available, the 6400 Computer or 5055 PC seeks host B; if host B is not available, the unit attempts to log onto host C.

When designating additional hosts for the 6400 Computer or 5055 PC, you must:

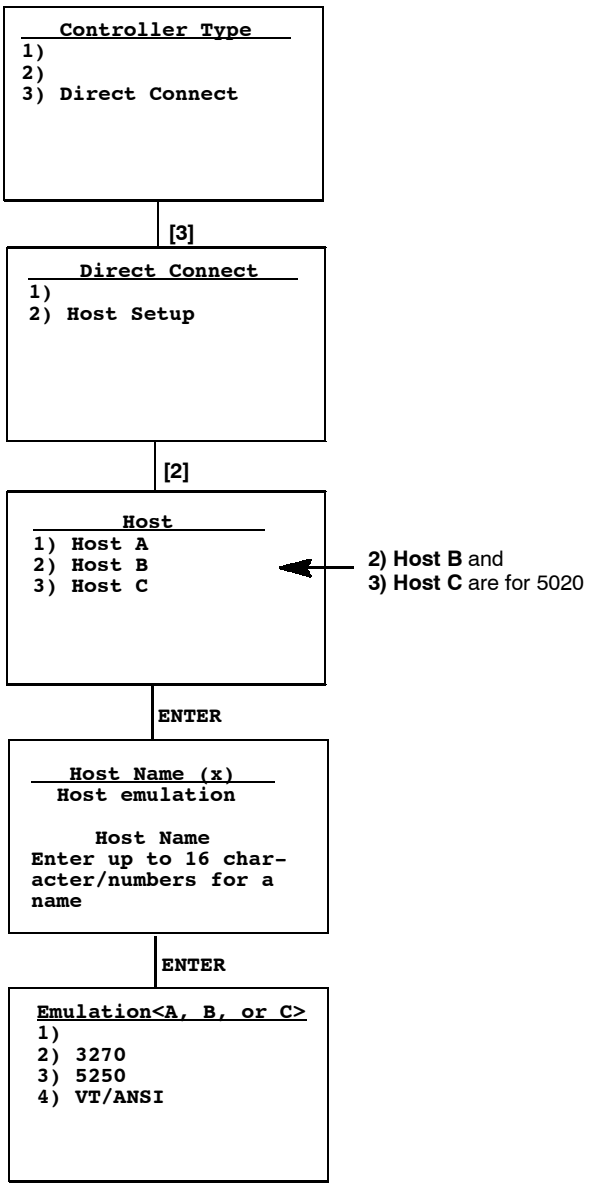
- Tell the 6400 Computer or 5055 PC the host type of each host computer: (3270, 5250, or VT/ANSI).
- Tell the 6400 Computer or 5055 PC the name of each host.

▶ NOTE: *Selections in these menus apply only to the current session. Use **4) Session Menu** to verify or change the current session.*



3) Direct Connect *(2415, 2425, 2435A, 2455, 248X, 5020 with TE/IP)*
To set **3) Direct Connect** options, select **3) Direct Connect**, **2) Host Setup**, then **1) Host A**. Use the **Emulation (A)** option to tell the terminal the type of each host computer. Default is 3270.

▶ **NOTE:** *You can also set the emulation type through the **2) Data Stream** option on the **3) Protocol Opts** menu.*



2) Code39 Encoded (2415, 2425, 2435A, 2455, 248X, 5020)

By default, **2) Code39 Encoded** is disabled. When you enable this option, the key press sequences for Encoded Code 39 are used. For more information, see *Appendix A*, "Bar Code Scanning."

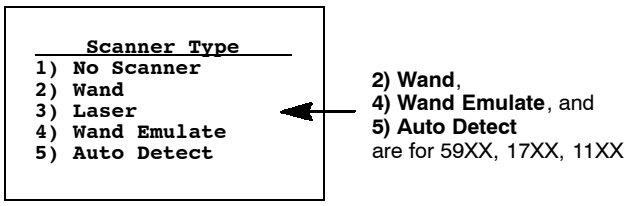
2) Barcode Parms (6400, 5055, 59XX, 17XX, 11XX)

The **2) Bar Code Parms** (parameters) menus designate:

- If you are using a bar code scanner
- Scan options
- The bar code symbologies to use (the terminal can only decode the enabled bar code symbologies)
- Options for each enabled bar code symbology, such as the minimum and maximum bar code lengths

1) Scanner Type

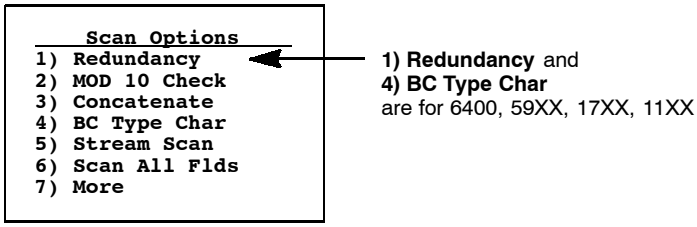
Use the **1) Scanner Type** menu to designate the type of bar code scanner. To make a selection, press the numeric key corresponding to the desired option, then press [Enter] to access the **2) Scan Options** menu.



▶ NOTE: *If **1) No Scanner** is chosen, the remaining scanner and bar code options can be set. Then, if a scanner is used at a later time, only the scanner type needs to be designated. Selected options are highlighted on the display. Press a key corresponding to that option to deselect a selected option.*

2) Scan Options

Use the **2) Scan Options** menu to designate how the terminal handles scanned bar codes. Press [Enter] to advance to additional **2) Scan Options** menus.



1) Redundancy *(6400, 59XX, 17XX, 11XX)*
This option requires two identical scans of a bar code, one right after another, before the terminal accepts the scan as valid.

2) Mod 10 Check
When you select this option, a check digit is added at the end of the bar code after a good read. This is a variation of the modulus 10 formula and is used infrequently.

Mod 10 checks the validity of a bar code number, to ensure the number is within a set of numbers valid for its symbology. "Mod" is the remainder of a division of two numbers. The bar code number is divided by 10, until the number (or modulus) is less than 10. If the modulus subtracted from 10 (remainder) is equal to zero, then the bar code number is valid.

3) Concatenate
Each bar code read is added to the end of the previous bar code read until the 6400 Computer or 5055 PC meets a condition forcing transmission to the host.

When this option is OFF, each bar code read is placed at the beginning of the current input field. After a bar code is placed in a field, any subsequent read replaces the first read.

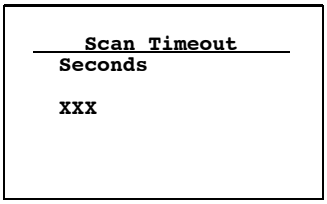
4) BC Type Char *(6400, 59XX, 17XX, 11XX)*
This option adds a character associated with the bar code type at the beginning of the scanned bar code.

5) Stream Scan
If the scanned bar code is too big for the input field, the overflow information appears in the next field and continues until the entire bar code is entered. When this option is OFF, and the scanned bar code is too big for the input field, the overflow information is dropped.

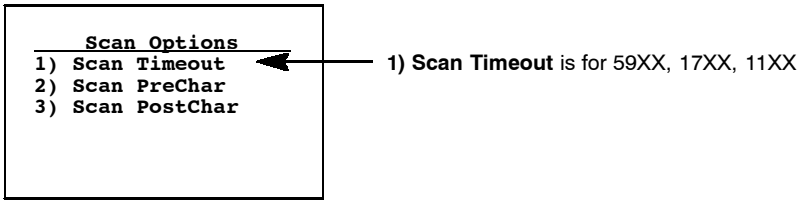
6) Scan All Flds (Fields)
When this option is selected, the scanner is enabled when the cursor is in an input field. When this option is OFF, the host computer must enable the scanner for each input field that requires scanned data.

7) More
This brings you additional scanning options that adjust scanning timeout and characters sent before and after the scanned data.

1) Scan Timeout *(59XX, 17XX, 11XX)*
Use this option to adjust the scanning timeout period from 1 to 200 seconds. When using a proximity-detect scanner, you can shorten the timeout period to speed up scanning while also reducing the duration of errant scans. With a long-range scanner, you may want to increase the timeout period to ensure sufficient aiming time.



2) Scan PreChar and **3) Scan PostChar**
Enter a hexadecimal value from 00–FF for the character to be sent preceding the scanned data or after the scanned data. The value of 20h means that pre- or post-characters are not sent.

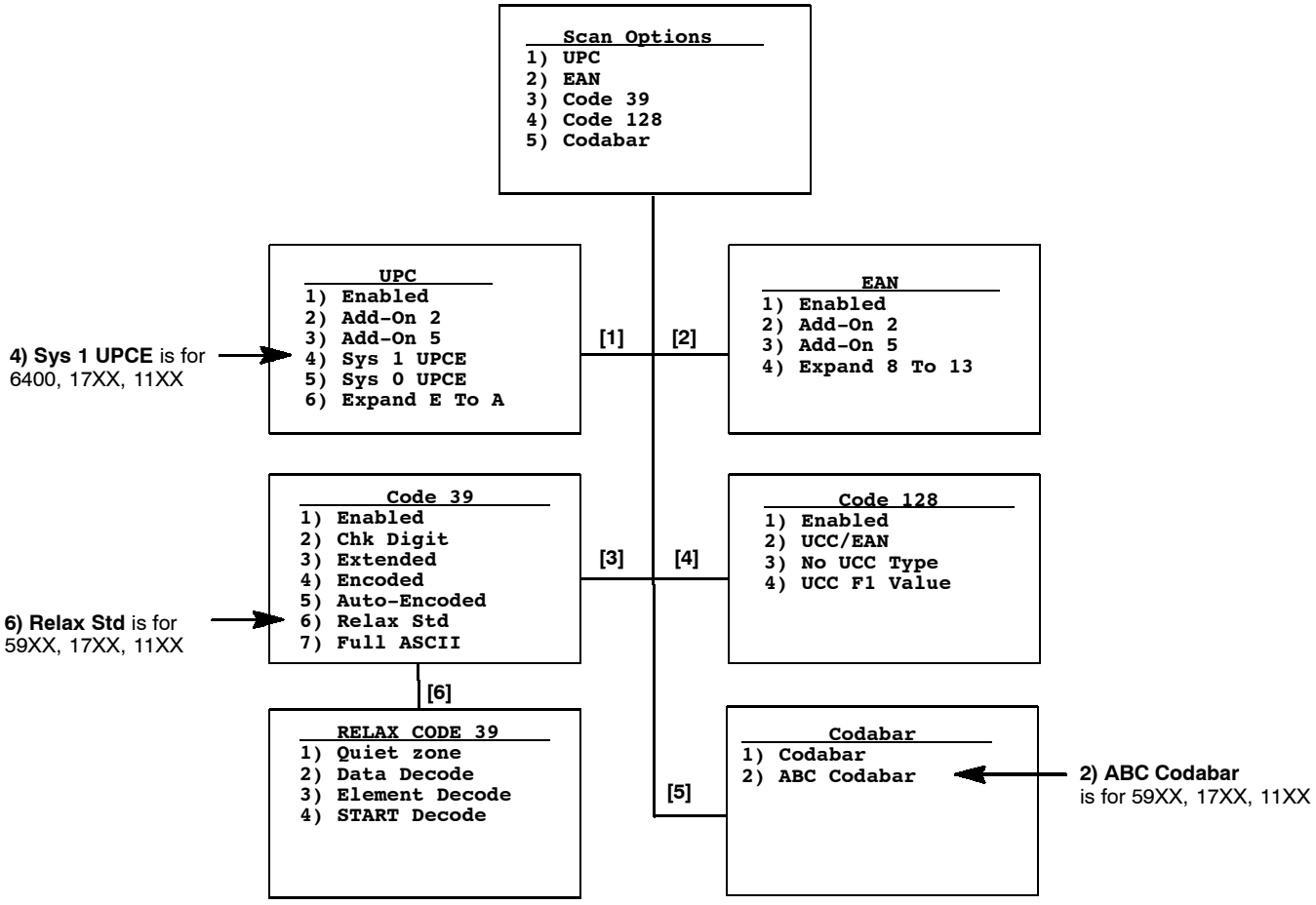


Scan Options to Enable Bar Codes

There are menus of options to enable (or disable) various bar code symbologies. To enable a bar code, press the numeric key corresponding to the number of the bar code symbology (as shown on the menu), then press [Enter].

After enabling a particular bar code, options may have to be selected for the bar code. After selecting the desired options, set the length requirements (such as minimum and maximum length, fixed lengths, leading and trailing character options, etc.).

Once the length requirements are set, the terminal returns to the same **2) Scan Options** menu. Choose another bar code symbology from that menu or press [Enter] to advance to the next **Scan Options** menu.

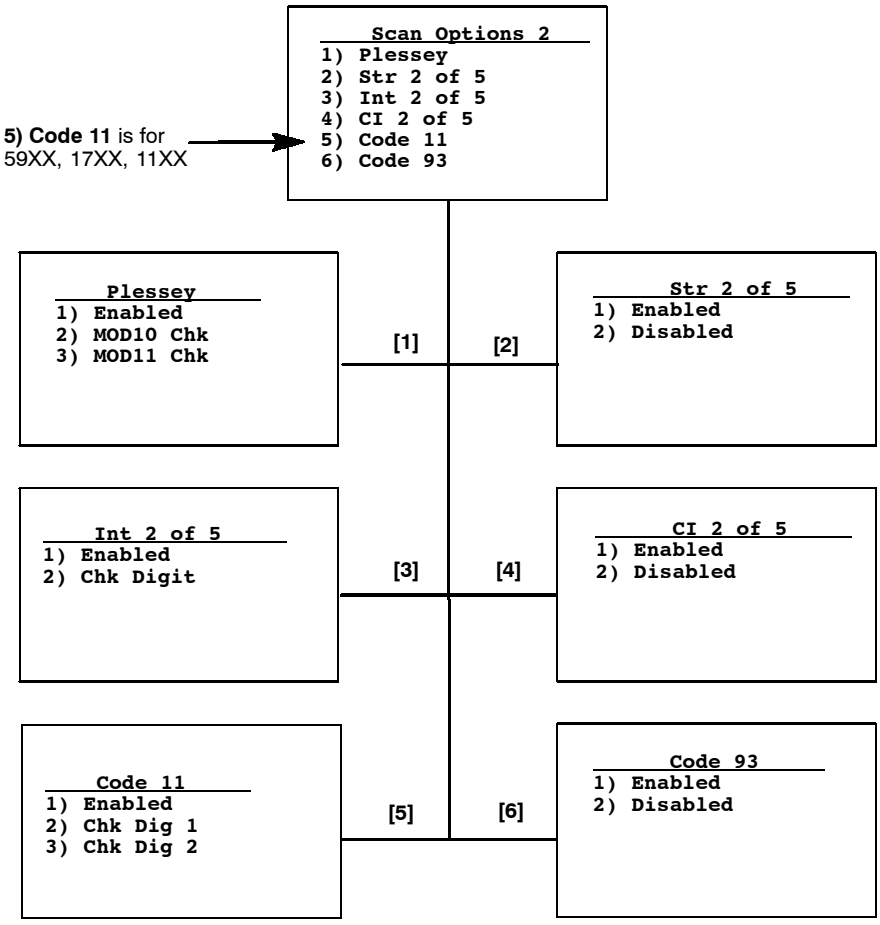


Scan Options of Additional Bar Codes

This menu offers additional bar code selections. After enabling a bar code symbology, various options, including length can be set.

When all options are set, the display returns to the **2) Scan Options** menu. This menu and the bar code symbologies to be enabled are shown below.

When all needed bar code symbologies are enabled, press [Enter] to return to the first **1) Scan Options** menu. Press [Enter] again to back out and return to the **1) Set-up Parms** menu.



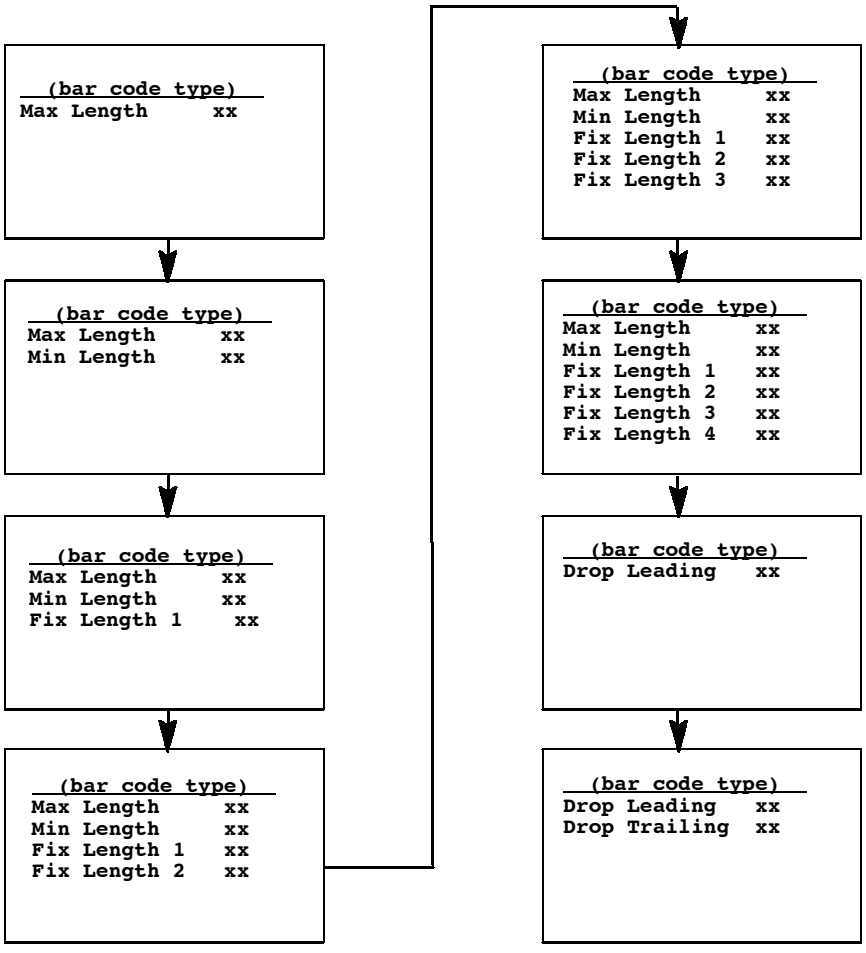
Lengths Options

The **Lengths Options** menus determine the maximum and minimum length for a specific bar code symbology. Setting the length of enabled bar codes helps the terminal determine if a scanned bar code is valid and improves response time. The length options must be set for each enabled bar code.

1. Key in the maximum length (0–99), then press [Enter].
2. Key in the minimum length (0–99), then press [Enter].
3. Fixed-length entries override the maximum and minimum length entries (minimum and maximum are used for chosen codes). If fixed lengths are not needed for the enabled bar code, enter zero (0).

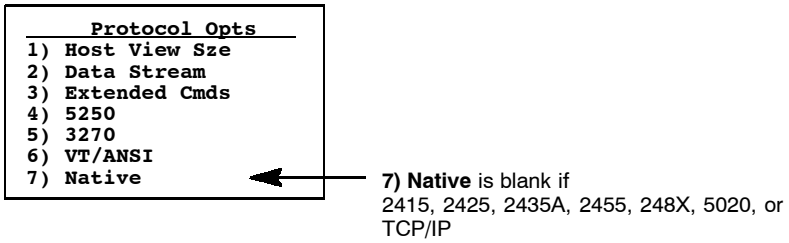
   Enter the fixed length (0–99), then press [Enter]. Up to four prompts to set another fixed length will appear. Enter zero (0) for the unused fixed lengths. *Note that I 2 of 5 only supports fixed lengths 1 and 2. Entries in 3 and 4 are ignored.*
4. Enter the number of characters (0–15) to drop from the front (leading) edge of the scanned bar code, then press [Enter].
5. Enter the number of characters (0–15) to drop from the rear (trailing) edge of the scanned bar code, then press [Enter].

After all of the length options are set for the enabled bar code, the display returns to one of the **1) Scan Options** menus (depending on which menu the bar code was enabled).



3) Protocol Opts

Use the **3) Protocol Opts** menu to designate the type of terminal emulation the host supports. You can also use it to designate additional commands and command sets.



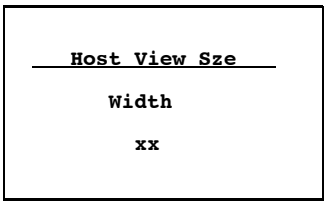
1) Host View Sze

The **1) Host View Sze** option tells the terminal the format of display information sent from the host. The display viewing size equals 1920 (the number of rows times the number of columns). The exception is with 5250 Terminal Emulation which has an additional row for error messages and therefore has 2000 characters.

The default setting for Native Terminal Emulation is 120 columns by 16 rows (equals 1920). The default for VT/ANSI Terminal Emulation is 80 columns by 24 rows (equals 1920). The default for 5250 Terminal Emulation is 80 columns by 24 rows (25 with error messages).

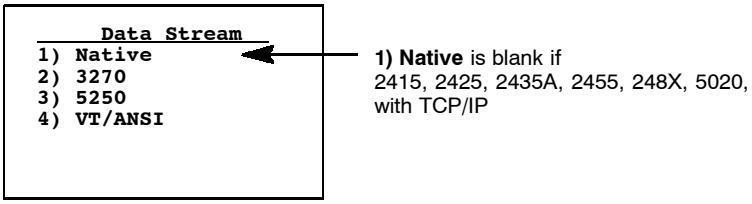
The default for 3270 Terminal Emulation depends on what the original setting was before changing to the 3270 Terminal Emulation. Remember that the total characters must equal 1920 (number of rows by the number of columns) unless using 5250 Terminal Emulation with error messages.

Enter a number between 1–80 to change the width. Press [Enter] to return to the **3) Protocol Opts** menu. "xx" is the width.



2) Data Stream

Enter the number corresponding to the type of host computer to specify the data stream used. Press [Enter] to return to the **3) Protocol Opts** menu.



▶ **NOTE:** *For 2415, 2425, 2435A, 2455, 248X, and 5020, you can also set the emulation type through the **1) ITC Server** or **3) Direct Connect** options.*

For information about 3270 or 5250 TE, refer to the following manuals:

- *TE 2000 3270 Terminal Emulation Programmer's Guide* (P/N 977-055-003)
- *TE 2000 5250 Terminal Emulation Programmer's Guide* (P/N 977-055-004)

3) Extended Cmds (Commands)

Use **3) Extended Cmds** to enable or disable extended commands. By default, extended commands are disabled. For more information about extended commands, see Section 7.

When this option is *enabled*, the host computer can change or use RS-232 communications (such as printers), bar code options, display screen and font size, and error tone features of the unit. Press **[1]** to enable or press **[2]** to disable the extended command list. Press [Enter] to return to the **3) Protocol Opts** menu.

```
   Extended Cmds
1) Enabled
2) Disabled
```

4) 5250 (Options)

The **4) 5250** menu enables the following features *if the 5250 communication protocol is used.* Press the appropriate number to enable an option, then press [Enter] to return to the **3) Protocol Opts** menu.

1) Beep On Error
Causes the buzzer to emit when an error condition occurs; does not lock up the keyboard.

2) Auto Tab Scan
Causes the cursor to automatically tab forward to the next input field when a good scan is obtained.

3) Telnet *(blank for 2415, 2425, 2435A, 2455, 248X, 5020)*
Handles the telnet option negotiations to establish a session with an appropriate telnet server. *Note: this is not changeable if TCP/IP is used.*

4) Scan All Flds *(blank for 6400, 5055, 59XX, 17XX, 11XX)*
The scanner is enabled when the cursor is in an input field. When this option is disabled, the host computer must enable the scanner each time an input field requires scanned data.

5) Stream Scan *(blank for 6400, 5055, 59XX, 17XX, 11XX)*
If the scanned bar code is too big for the input field, the overflow information appears in the next field. This continues until the entire bar code is entered.

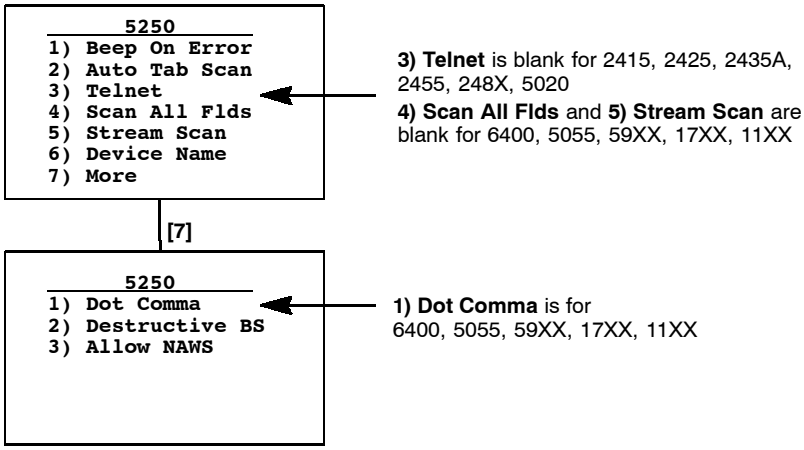
6) Device Name
Enters a physical name for the device. This name is 1–10 characters with allowable values of A–Z, a–z, 0–9, and #, $, –, and @. *Note that the first character of the name cannot start with a number (0–9).* 5250E RFC 1572 Support.

7) More
Select **7) More** to modify the function of the numeric dot key or the backspace key.

1) Dot Comma *(6400, 5055, 59XX, 17XX, 11XX)*
Select **1) Dot Comma** to change the numeric dot key (.) into a comma.

2) Destructive BS (backspace)
Press **[2]** to use the backspace key to remove (delete) any previously-keyed data characters. When disabled, the backspace key goes back one character, but does not delete that character.

3) Allow NAWS (Negotiate About Window Size)
When enabled, the terminal will support Telnet option 31 if prompted. When disabled, this option will return a "won't do" message.



5) 3270 *(Options)*
The **5) 3270** menu enables the following features *if the 3270 communication protocol is used.* Press the appropriate number to enable an option, then press [Enter] to return to the **3) Protocol Opts** menu.

1) Keybrd Unlock
Unlocks the keyboard after the **[PA1]**, **[PA2]**, or **[CLEAR]** keys are pressed. (Normally the keyboard remains locked — until unlocked or the terminal is reset by the host — after any of these keys are pressed.) When using Token Ring on your host, the tab key also unlocks the keyboard.

2) Auto Tab Scan
Causes the cursor to tab forward to the next input field when a good scan is obtained. ***Note:*** *This cannot be enabled at the same time as* ***Auto Entr Scan****.*

3) Auto Entr Scan
Actuates the **<Enter>** function when a good scan is obtained. ***Note:*** *This cannot be enabled at the same time as* ***Auto Tab Scan****.*

4) Emulate 3210 *(blank for 2415, 2425, 2435A, 2455, 248X, 5020)*
The Intermec 3210 emulation option allows the 3270 keyboard to emulate an RT3210 Hand-Held Computer, performing the same functions. For full 3210 compatibility, disable buffering the keyboard, set cursor to lazy mode, and set the LCD Parms to Key Uppercase.

5) Telnet *(blank for 2415, 2425, 2435A, 2455, 248X, 5020)*
Handles telnet option negotiations to establish a session with an appropriate telnet server. *Note: this cannot be changed if using TCP/IP.*

6) Origin Set *(5055)*
When enabled, resets the screen origin when an exclamation mark is found in the data stream.

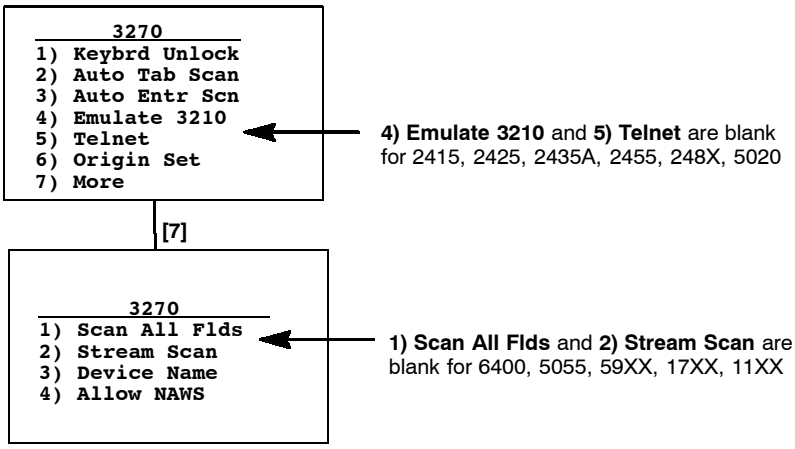
7) More
Select **7) More** for additional features.

1) Scan All Flds *(blank for 6400, 5055, 59XX, 17XX, 11XX)*
The scanner is enabled when the cursor is in an input field. When this option is disabled, the host computer must enable the scanner each time an input field requires scanned data.

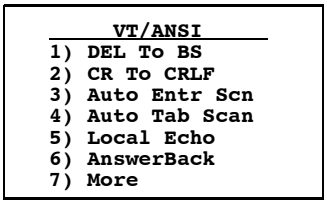
2) Stream Scan *(blank for 6400, 5055, 59XX, 17XX, 11XX)*
If the scanned bar code is too big for the input field, the overflow information appears in the next field. This continues until the entire bar code is entered.

3) Device Name
Enters a physical name for the device. This name is 1–10 characters with allowable values of A–Z, a–z, 0–9, and #, $, –, and @. *Note that the first character of the name cannot start with a number (0–9).* 3270E RFC 2355 Support.

4) Allow NAWS (Negotiate About Window Size)
When enabled, the terminal will support Telnet option 31 if prompted. When disabled, this option will return a "won't do" message.



6) VT/ANSI
The **6) VT/ANSI** menu enables the following features *if the VT/ANSI communication protocol is used.*



1) DEL to BS (Delete to Backspace)
Causes the **[CLEAR]** key to delete the character to the left of the cursor position, and moves the cursor back one space. When this option is not enabled, the **[CLEAR]** key deletes the character at the cursors position. Default is disabled.

2) CR to CRLF (Carriage Return to Carriage Return/Line Feed)
Causes **<Enter>** to perform a carriage return and a line feed. When this option is not enabled, **<Enter>** performs a carriage return only. Default is disabled.

3) Auto Entr Scn (Auto Enter Scan)
Actuates the **<Enter>** function whenever a good scan is obtained. Default is disabled. ***Note:*** *This cannot be enabled at the same time as* ***Auto Tab Scan****.*

4) Auto Tab Scan
Causes the terminal to automatically tab to the next input field when a good scan is obtained. Default is disabled. ***Note:*** *This cannot be enabled at the same time as* ***Auto Entr Scan****.*

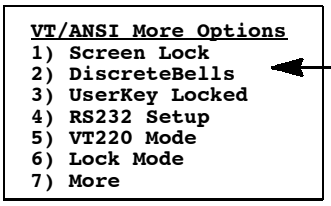
5) Local Echo
Allows characters to be displayed from terminal memory but not from host memory. Default is disabled.

6) AnswerBack
Enables you to enter a character string that is sent to the host in response to an inquiry (hexadecimal 05). The range is 0–30, default is null string.

If you enter any of the following control characters, it is sent out. *Note that control strings count as one character.*

<ACK>	<DC2>	<EOT>	<GS>	<SI>	<US>
<BEL>	<DC3>	<ESC>	<HT>	<SO>	<VT>
<BS>	<DC4>	<ETB>	<LF>	<SOH>	
<CAN>	<DLE>	<ETC>	<NAK>	<STX>	
<CR>	<EM>	<FF>	<NUL>	<SUB>	
<DC1>	<ENQ>	<FS>	<RS>	<SYN>	

7) More
Calls up the following **VT/ANSI More Options** screen.



2) DiscreteBells and
4) RS232 Setup
are for 6400, 5055, 17XX, 11XX

1) Screen Lock
Sets and locks the screen to a specified size. Any characters outside this screen size are ignored by the hand-held unit. Default is disabled.

2) DiscreteBells *(6400, 5055, 17XX, 11XX)*
If enabled, the terminal beeps for each bell character the host sends. If disabled, the unit ignores the bell characters if it is already beeping. Default is disabled.

3) UserKey Locked
If set, the host ignores a host command defining the Function keys. Default is disabled.

4) RS232 Setup *(6400, 5055, 17XX, 11XX)*
When using the media copy command, use this option to set up the communications port, then press [Enter] to return to **3) Protocol Opts**.

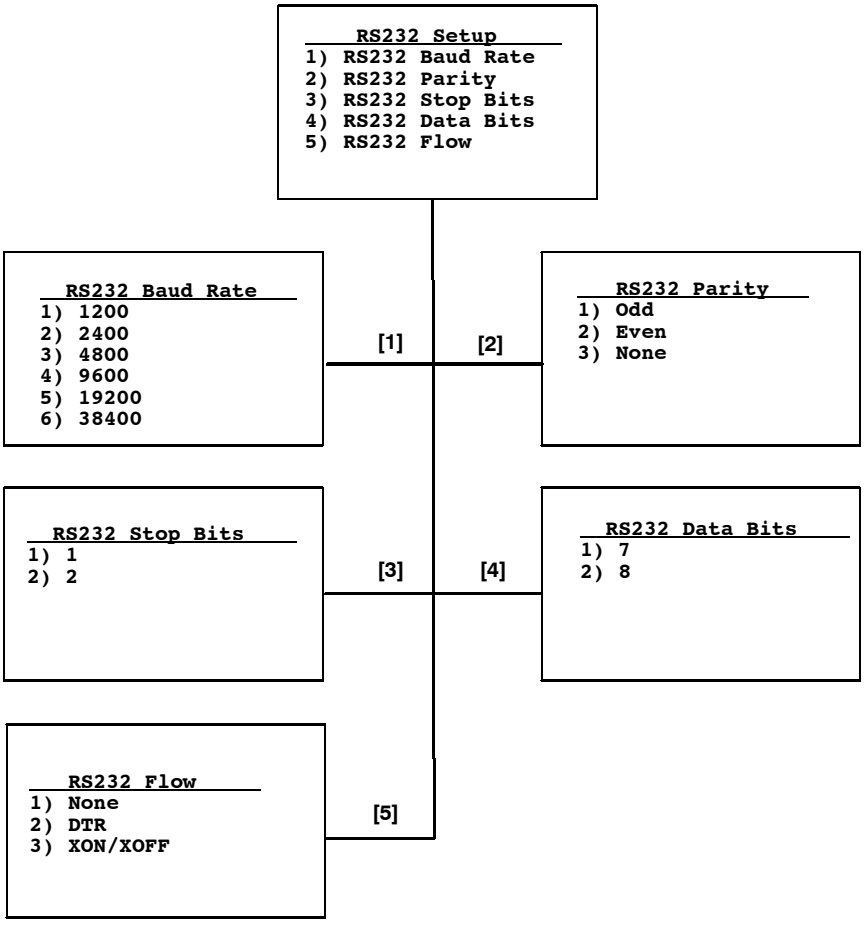
1) RS232 Baud Rate
Select 1200, 2400, 4800, 9600, 19200, or 38400. Default is 9600.

2) RS232 Parity
Select from Odd, Even, or None. Default is None.

3) RS232 Stop Bits
Select either 1- or 2-bits. Default is 1.

4) RS232 Data Bits
Select either 7- or 8-bit. Default is 8.

5) RS232 Flow
Select from None, DTR, or XON/XOFF. Default is None.

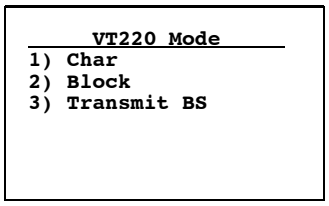


5) VT220 Mode
Selects operating in character or block mode. Select a choice, then press [Enter] to return to the **3) Protocol Opts** menu. Default is **1) Char**.

1) Char
Sets the mode to Character mode. The terminal sends each character as it is pressed.

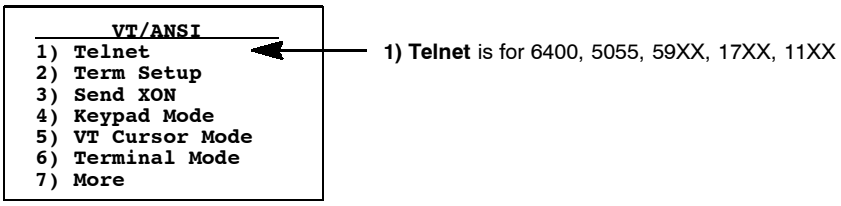
2) Block
Sets the mode to Line Edit (block) mode. The terminal sends a block of characters when a terminating key is pressed.

3) Transmit BS
When enabled, pressing the backspace key sends a backspace to the host for the host to echo back to the terminal. When disabled, the backspace key is handled locally on the terminal by doing a destructive backspace to the printed data characters on the display.



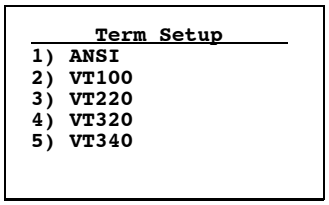
6) Lock Mode
Use the Mode key on the terminal's keyboard or keypad to toggle between Line Edit (block) mode and Character mode. Use the Lock Mode option to disable the Mode key in the VT/ANSI data stream. By default, Lock mode is disabled.

7) More
Selects the telnet option for the VT/ANSI data stream.



1) Telnet *(6400, 5055, 59XX, 17XX, 11XX)*
Handles telnet option negotiations to establish a session with an appropriate telnet server. *Note this cannot be changed if using TCP/IP.*

2) Term Setup
Selects the compliance level of the terminal being emulated. Default is VT340 to support all commands. Make a selection, then press [Enter] to return to the **3) Protocol Opts** menu.

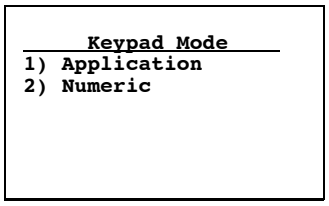


3) Send XON
Default is enabled which indicates that when an RIS is received from the host, the XON character is returned after compliance of this command. Default is enabled.

4) Keypad Mode
Determines what is returned to the host when keys are pressed. Default is **2) Numeric**.

1) Application
Generates application ESC sequences for the key code. For help, refer to your VT manual.

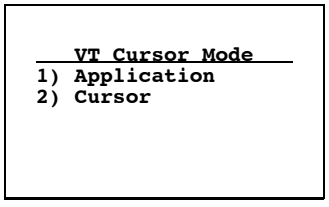
2) Numeric
Generates ANSI cursor control ESC sequences that correspond to what appears on the face of the keys.



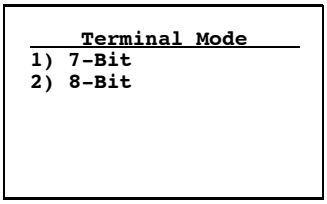
5) VT Cursor Mode
Determines what is returned to the host when cursor keys are hit. Default is **2) Cursor**.

1) Application
Generates application ESC sequences for the key code. For help, refer to your VT manual.

2) Cursor
Generates ANSI cursor control ESC sequences that correspond to what appears on the face of the cursor key.



6) Terminal Mode *(VT220/320 only)*
Sets the terminal mode to 7-bit or 8-bit. This option sets the mode VT-series terminals used to exchange escape sequences, control commands, and status reports with an application. Default is **1) 7-Bit**.



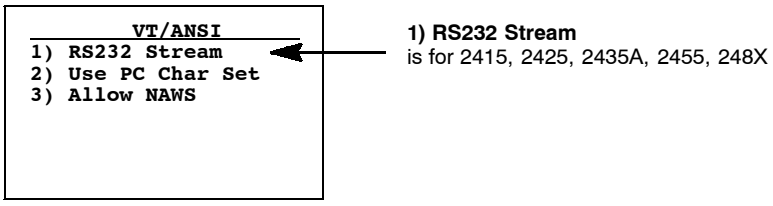
7) More
Below are the RS-232 stream and PC char set options:

▶ **NOTE:** *If you access the TE configuration menus when **1) RS232 Stream** is enabled, all RS-232 data received during this time is lost. Only the data arriving from the COM1 port on the hand-held terminal is received.*

1) RS232 Stream *(2415, 2425, 2435A, 2455, 248X)*
If this option is enabled, the terminal watches the RS-232 port for activity in which the terminal reads in the RS-232 data and sends it to the host. This enables support for fixed-station scanners or scales that send only RS-232 data without having the host send an extended command to enable the RS-232 port. Default for **1) RS232 Stream** is disabled. For information about setting scanner options when this is enabled, see Section 2, "Using Terminal Emulation Applications."

2) Use PC Char Set
Select this option to default the font character to the terminal's character set instead of a DEC terminal character set.

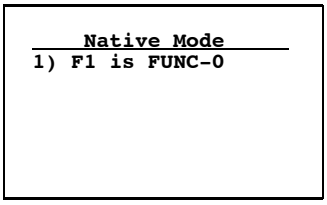
3) Allow NAWS (Negotiate About Window Size)
When enabled, the terminal will support Telnet option 31 if prompted. When disabled, this option will return a "won't do" message.



7) Native *(6400 (WTP), 5055 (WTP), 59XX, 17XX, 11XX)*
This option is enabled by default to preserve backward compatibility.

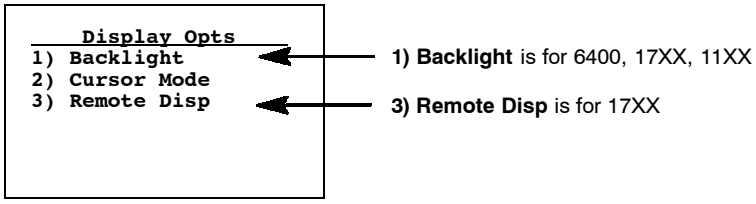
For 6400 (WTP) and 5055 (WTP),
When enabled, pressing **[F1]** is equivalent to pressing [Blue] – [0], while pressing **[F2]** is equivalent to pressing [Blue] – [1], etc. When disabled, **[F1]** is equivalent to [Blue] – [1], **[F2]** is equivalent to [Blue] – [2], etc.

For 59XX, 17XX, 11XX,
When enabled, pressing **[F1]** is equal to [Black] – [0] and **[F2]** is equal to [Black] – [1], etc. When disabled, **[F1]** is equal to [Black] – 1, **[F2]** is equal to [Black] – [2], etc.

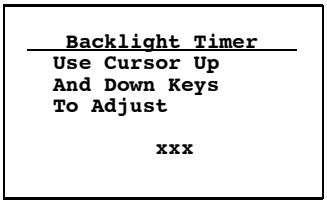


4) Display Opts (6400, 5020, 5055, 59XX, 17XX, 11XX)

4) Display Opts adjusts the backlight timer, the cursor appearance on the display, or the remote display.



1) Backlight *(6400, 17XX, 11XX)*
Use the up and down arrows to select a number from "Off" to "255." This would dictate the number of seconds that the backlight stays on after a key is pressed.



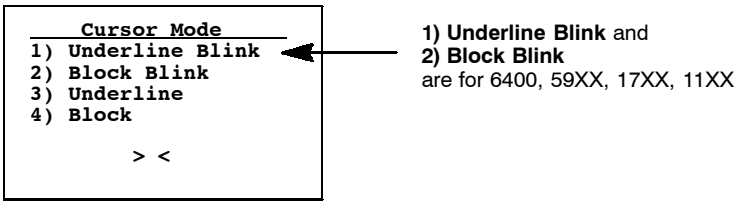
2) Cursor Mode
Selects the cursor style. After making a selection, press [Enter] to return to the **4) Display Opts** menu. The cursor shape is shown between ">" and "<".

1) Underline Blink *(6400, 59XX, 17XX, 11XX)*
Causes the underline character to appear and disappear in its current location.

2) Block Blink *(6400, 59XX, 17XX, 11XX)*
Causes the block (■) character cursor to appear and disappear in its current location.

3) Underline
This option provides a solid underline character to display the cursor's current location.

4) Block
This provides a reverse or highlighted block (■) character displaying the cursor's current location.



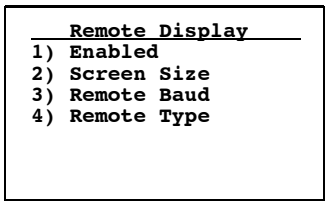
3) Remote Disp *(17XX)*
This menu allows communication to a remote display.

1) Enabled
Press this option to enable the remote display function.

2) Screen Size
Use this option to set the screen size of the remote display.

3) Remote Baud
Select the appropriate baud rate for the remote display: 9600, 19200, or 38400.

4) Remote Type
Use this option to identify the remote terminal: VT100, VT220, or ANSI.

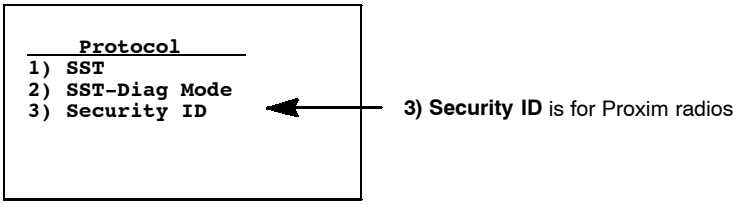


5) Radio Comm

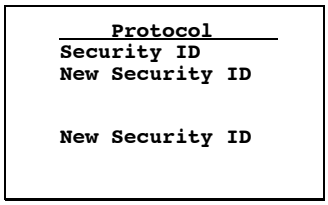
▶ **NOTE:** *Diagnostic modes disable data compression and are reserved for engineering tests.*

Menus for **5) Radio Comm** specify the communication protocol and speed in certain instances. Depending on circumstances, one of the two menus will appear.

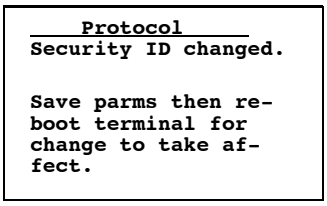
5) Radio Comm enables or disables SST diagnostic mode.



3) Security ID *(Proxim radios)*
This changes the radio security identification. Enter the new security ID (up to 16 characters) twice. If the old security ID is not correct or if the second new security ID was not entered correctly, you will see the message "unchanged" on the bottom line of the display.



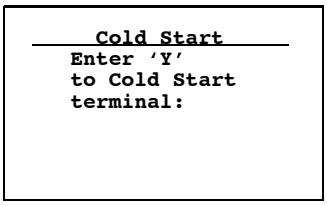
If the new security ID is entered correctly, the following will appear.



6) Cold Start

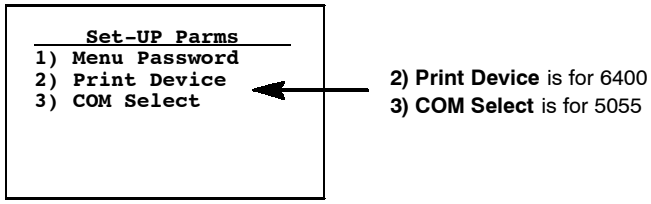
6) Cold Start resets all TE values to the stored configuration in CONFIG.DAT and performs a cold-start on the hand-held terminal. Press **[Y]** to reboot the terminal, or press any other key to return to the **1) Set-up Parms** menu.

Depending on the setting within the firmware menu of the terminal, after rebooting, the terminal opens to the TRAKKER Antares 2400 Menu System.



7) More

7) More enables menu password protection for the TE configuration menus. This provides added protection because once enabled, the password must be entered before any further activity can occur within the terminal emulation menu screens. The default is to have this option disabled.



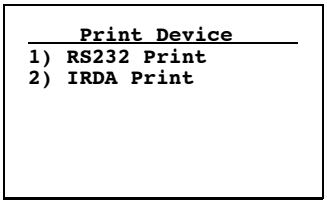
1) Menu Password

To enable the password, press **[1]**, then type "3193693" for the fixed password set by Intermec Technologies Corporation. *The "1)" will change to reverse video to indicate it is enabled.* With this enabled, enter this password when you access the terminal emulation menu screens. Press [Enter] until you reach the **Main Menu**, then press **6) Exit Menus** to return to the main terminal screen.

To disable the password, press **[1]** to display in normal viewing text. You do not need to enter a password to disable this function. *Note that the menu password can be set via a custom configuration. See Section 5 for help on creating a custom configuration file.*

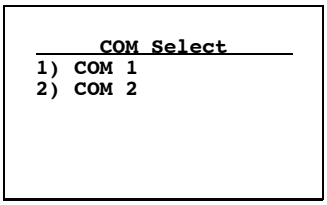
2) Print Device *(6400)*

Establishes extended commands for either the RS-232 or IrDA printer drivers. Press **[1]** for the RS-232 driver or press **[2]** for the IrDA driver.



3) COM Select *(5055)*

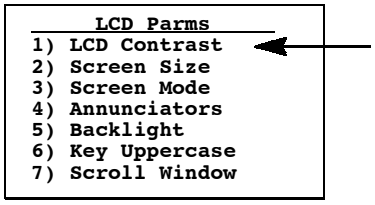
Selects which communications port to use for extended commands, RS-232 communications, or media copy commands.



2) LCD Parms (Parameters)

2) LCD Parms adjusts the following features of the Liquid Crystal Display (LCD):

- The screen size (number of rows displayed, and the number of characters displayed on each row).
- The screen mode (how the cursor positions itself on the display).
- Making all alphabetic character keystrokes uppercase characters.
- Scrolling window parameters.

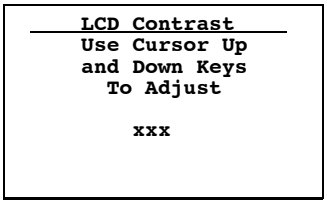


1) LCD Contrast is for 59XX, 17XX
2) Screen Size is for 2435A, 6400, 5020, 5055, 59XX, 17XX, 11XX

4) Annunciators is blank for 17XX
5) Backlight is for 59XX, 17XX
6) Key Uppercase is for 6400, 5055, 59XX, 17XX, 11XX

1) LCD Contrast (59XX, 17XX)

Use this option to adjust the contrast of the display to a more readable level (range: 0–255). The terminal uses this setting as a baseline, automatically re-adjusting contrast as necessary, based on temperature changes. Use the up and down arrow keys to adjust the contrast, then press [Enter] to return to the **LCD Parms** screen.



2) Screen Size (2435A, 6400, 5055, 5020, 59XX, 17XX, 11XX)

2) Screen Size selects the number of lines and characters in each line to be viewed on the display. To change the screen size:

1. Press the arrow keys. Each key press moves the word **On** one position in the direction of the arrow key pressed. The word **On** indicates the current setting.
2. When the word **On** appears in the position corresponding to the desired screen size, press [Enter].

2415, 2425, 2455, 248X Terminal Screen Sizes

Choices for the 2415, 2425, 2455, and 248X Terminals include the following. Only one option can be selected at a time.

- 4 rows, with 10, 12, 17, 22, or 26 characters per row
- 6 rows, with 10, 12, 17, 22, or 26 characters per row
- 8 rows, with 10, 12, 17, 20, 22, or 26 characters per row
- 10 rows, with 12, 17, 22, or 26 characters per row
- 12 rows, with 12, 17, 22, or 26 characters per row
- 16 rows, with 12, 17, 20, 22, 26, or 32 characters per row
- 21 rows, with 12, 17, 22, 26, or 32 characters per row

	Screen Size						
	10	12	17	20	22	26	32
4	Off	Off	Off		Off	Off	
6	Off	Off	Off		Off	Off	
8	Off	Off	Off	Off	Off	Off	
10		Off	Off		Off	Off	
12		Off	Off		Off	Off	
16		Off	Off	On	off	Off	Off
21		off	off		Off	Off	Off

2435A Terminal Screen Sizes

Choices for the 2435A Terminal include the following. Only one option can be selected at a time.

- 4 rows, with 9, 12, 17, 22, or 26 characters per row
- 6 rows, with 9, 12, 17, 22, or 26 characters per row
- 8 rows, with 9, 12, 17, 19, 22, or 26 characters per row
- 10 rows, with 12, 17, 22, or 26 characters per row
- 12 rows, with 12, 17, 22, or 26 characters per row
- 16 rows, with 12, 17, 19, 22, 26, or 31 characters per row
- 21 rows, with 12, 17, 22, 26, or 31 characters per row

	Screen Size						
	9	12	17	19	22	26	31
4	Off	Off	Off		Off	Off	
6	Off	Off	Off		Off	Off	
8	Off	Off	Off	Off	Off	Off	
10		Off	Off		Off	Off	
12		Off	Off		Off	Off	
16		Off	Off	On	off	Off	Off
21		off	off		Off	Off	Off

6400 Computer Screen Sizes

Choices for the 6400 Computer include the following. It is also possible to have selected 5, 8, 10, and 16 for number of rows. This depends on what size of display you have selected. Only one option can be selected at a time.

- 6 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 9 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 12 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 18 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row

Screen Size							
	10	13	16	20	23*	26	32
6	Off	Off	Off	off	Off	Off	Off
9	Off	Off	Off	Off	Off	Off	Off
12	Off	Off	Off	Off	Off	Off	Off
18	Off	Off	Off	On	off	Off	Off

With 1.23 of BIOS 5.36 of Terminal Emulation

59XX Terminal Screen Sizes

Choices for the 59XX Terminal includes the following. Only one option can be selected at a time.

- 8 rows, with 40, 60, or 80 columns per row
- 10 rows, with 40, 60, or 80 columns per row
- 12 rows, with 40, 60, or 80 columns per row
- 16 rows, with 40, 60, or 80 columns per row
- 21 rows, with 80 columns per row
- 25 rows, with 80 columns per row

Screen Size			
	40	60	80
8	Off	Off	Off
10	Off	Off	Off
12	On	Off	Off
16	Off	Off	Off
21			Off
25			Off

5055 PC Screen Sizes

Choices for the 5055 PC include the following. It is also possible to select 5, 8, 10, and 16 for number of rows. This depends on what size of display you have selected. Only one option can be selected at a time.

- 8 rows, with 20 columns per row
- 10 rows, with 20 columns per row
- 12 rows, with 20 or 40 columns per row
- 16 rows, with 20, 40, or 80 columns per row
- 21 rows, with 40 or 80 columns per row
- 25 rows, with 40 or 80 columns per row

Screen Size			
	20	40	80
8	Off		
10	Off		
12	Off	Off	
16	Off	Off	Off
21		Off	Off
25		Off	On

5020 PC Screen Sizes

Choices for the 5020 PC include the following. Only one option can be selected at a time.

- 8 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 10 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 12 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 14 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 16 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row

Screen Size							
	10	13	16	20	23	26	32
8	Off	Off	Off	off	Off	Off	Off
10	Off	Off	Off	Off	Off	Off	Off
12	Off	Off	Off	Off	Off	Off	Off
14	Off	Off	Off	Off	off	Off	Off
16	Off	off	off	On	Off	Off	Off

17XX Terminal Screen Sizes

Choices for the 17XX Terminal include the following. Only one option can be selected at a time.

- 4 lines, with 12, 17, 22, or 26 characters per line
- 6 lines, with 12, 17, 22, or 26 characters per line
- 8 lines, with 12, 17, 22, or 26 characters per line
- 10 lines, with 12, 17, 22, or 26 characters per line
- 12 lines, with 12, 17, 22, or 26 characters per line
- 16 lines, with 12, 17, 22, 26, or 31 characters per line
- 21 lines, with 12, 17, 22, or 26 characters per line

```
                    Screen Size
      12     17     22     26     31
4     Off    Off    Off    off
6     Off    Off    Off    off
8     Off    Off    On     off
10    Off    Off    Off    off
12    Off    Off    Off    off
16    Off    Off    Off    off    off
21    off    off    off    off
```

11XX Terminal Screen Sizes

Choices for the 11XX Terminal include:

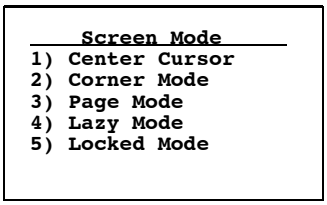
- 4 rows, with 12 or 16 characters per row
- 6 rows, with 12 or 16 characters per row
- 8 rows, with 12 or 16 characters per row
- 9 rows, with 12 or 16 characters per row *(default is 9 rows, 16 characters)*

```
   Select Size
      12     16
4     off    off
6     off    off
8     off    on
9     off    off
```

3) Screen Mode

3) Screen Mode selects the cursor position and movement as you scroll through data in the display buffer. This buffer stores data in a standard CRT format (as sent from the host computer). Since the terminal display is smaller than a CRT, these **3) Screen Mode** options optimize your view of information (data) on the display. Default is **2) Corner Mode**.

Use arrow keys to scroll (or "move") the view port of the screen on the display.



1) Center Cursor
In this mode, the cursor begins near the center of the display and attempts to remain there as you scroll through the data. Upon reaching an outside boundary of the full CRT screen, the display stops advancing while the cursor moves beyond the center of the screen. When the cursor reaches the boundary of the CRT screen, an error tone sounds, such as a "beep." The cursor does not wrap to the next line in the display.

2) Corner Mode
Starts the display at the upper-left corner of the full CRT screen and keeps the cursor in the lower-right corner of the display. As you scroll, the cursor remains there as data advances in the scrolled direction (up, down, right, or left)—until an outside boundary of the full CRT screen is reached. Then the screen stops moving in relation to the display and the cursor moves in the scrolled direction (the cursor no longer remains in the corner of the display). When the cursor reaches the CRT screen boundary it stops moving. The cursor does not wrap to the next line in the display. An error tone sounds if you try to move the cursor beyond the boundary.

This option is recommended when your application uses only the upper-left corner of the full CRT screen.

3) Page Mode
Divides the full CRT screen into predefined "pages," and starts the terminal display on page 1. The cursor first appears in the upper-right corner of the display. As you scroll, only the cursor moves (the data on the screen does not appear to move). When you scroll off the edge of the displayed page, the display snaps to the next (or previous) page. Upon reaching the boundary of the CRT screen, the cursor stops moving and an error tone sounds each time you attempt to move beyond the boundary.

Some "pages" in **3) Page Mode** overlap each other (the same information is shown on both pages). This overlap occurs because the 24-row by 80-column CRT screen cannot be divided equally.

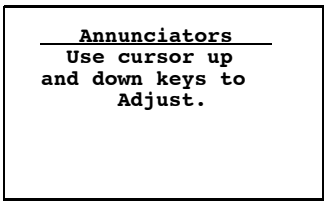
4) Lazy Mode
Starts the cursor in the upper left corner of the terminal display. The cursor moves across the display in the scrolled direction. When the cursor goes beyond the edge of the display, the data begins to move in the opposite direction that the cursor is moving in and the cursor remains at the edge of the display. When you reach an outside boundary of the full CRT display, an error tone sounds each time you try to move beyond the boundary.

5) Locked Mode
When this is selected the screen view is locked to the upper left-hand corner of the display. Any characters selected outside of the display window size are written to the screen but are not visible. The windowing keys do not move the visible window.

▶ **NOTE:** *In 5250 emulation the err_row is mapped to the last row of the screen size selected.*

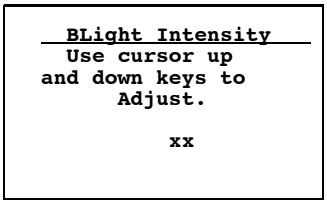
4) Annunciators (Blank for 17XX, 11XX)

4) Annunciators selects and changes the location of the annunciators on the display screen. Press the up or down arrows to position the annunciators around each of the four display corners, once as a line and once as a box (default is the lower right corner, the other choices are any of the other three corners). You can also select "Stealth Mode" which displays the annunciators only when you make a change and then hides it when you press a key.



5) Backlight (59XX, 17XX)

This adjusts the intensity (brightness) of the display backlight. The intensity can be set from 0 (off) to 15 (fully on). Keep in mind that the backlight uses considerable battery power. To conserve battery power, keep the intensity and duration of the backlight as low as possible. Use the up and down arrow keys to adjust the intensity of the backlight. Press the up arrow key to increase the intensity, the down arrow key to decrease. Press [Enter] when finished to return to the **LCD Parms** screen.



6) Key Uppercase (6400, 5055, 59XX, 17XX, 11XX)

When enabled, **6) Key Uppercase** causes the alphabetic keys (A-Z) to display as uppercase characters regardless of the shift or caps lock mode settings.

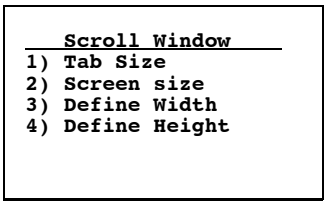
7) Scroll Window

7) Scroll Window defines the cursor movement, just how far it moves with each press of the arrow keys. Default is **1) Tab Size**.

1) Tab Size
Moves the cursor by the amount configured for **3) Define Width** and **4) Define Height**.

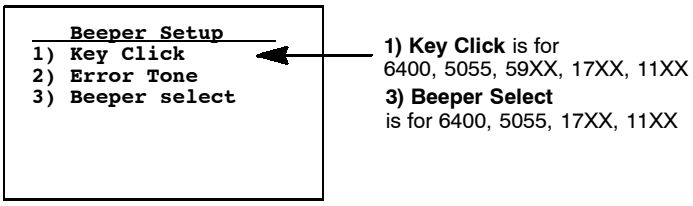
2) Screen Size
Causes the cursor to move by the virtual screen size selected in **2) LCD Parms** under the **Main Menu**.

3) Define Width and **4) Define Height**
These options customize the x-axis and y-axis (up and down) movement of the cursor when **1) Tab Size** is selected. Default is 8.



3) Beeper Setup

The **3) Beeper Setup** menus adjust the beeper tones for key clicks (presses) and error conditions. *For 17XX Terminals*, **3) Beeper Select** directs the audio output to the internal buzzer or to a headset.



1) Key Click (6400, 5055, 59XX, 17XX, 11XX)

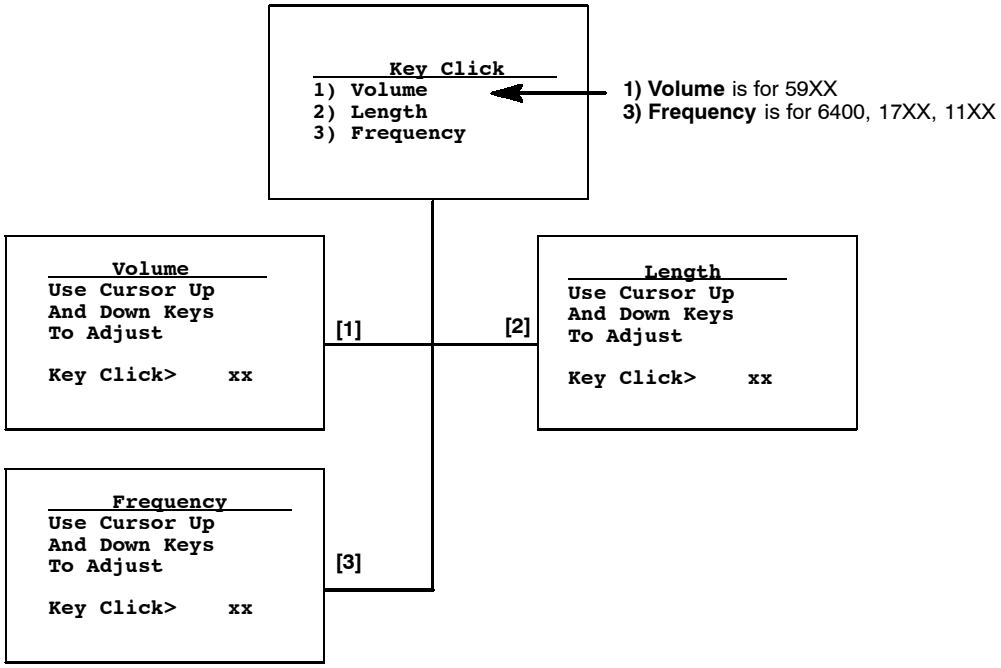
Use **1) Key Click** to adjust the frequency and length (duration) of the sound made when you press a key.

To adjust the key click tone, press the appropriate Key Click option, then press the up or down arrow keys to make the desired adjustment. Each key press is accompanied by a tone at the new frequency or length. Press [Enter] to confirm the selection and return to the previous **1) Key Click** screen.

1) Volume *(59XX)*
Press **[1]** , then the up and down arrow keys to adjust the length in steps from 0 to 32.

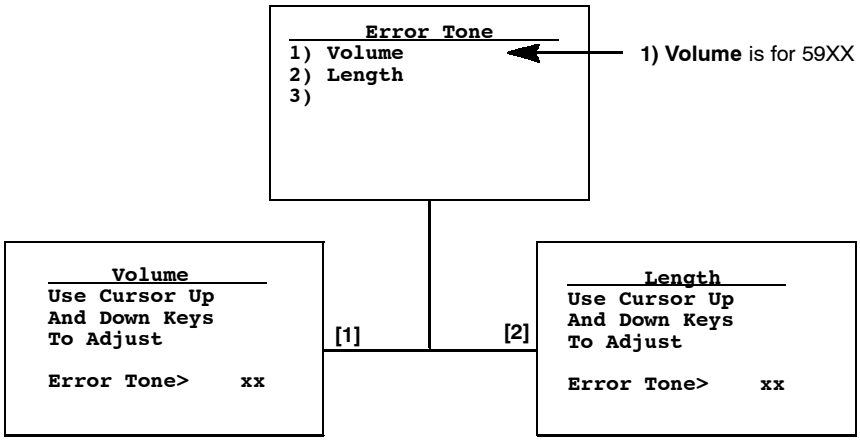
2) Length
Press **[2]** , then the up and down arrow keys to adjust the length in steps from 0 to 10.

3) Frequency *(6400, 17XX, 11XX)*
Press **[3]**, then the up and down arrow keys to adjust the tone frequency in steps from 0 to 32.



2) Error Tone

2) Error Tone adjusts the length and frequency of the tone made when an error occurs (for example, pressing an invalid key). The **2) Error Tone** adjustments, and the procedures for making them are identical to the **1) Key Click** adjustments. Press **2) Length** to set the length. The range is 1 through 10, which equates to a 50 to 500 ms beep for all errors. The default error tone length is 3 (or 150 ms)

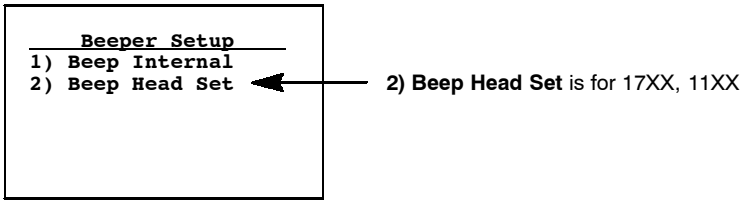


3) Beeper Select *(6400, 5055, 17XX, 11XX)*

For 17XX, 11XX, both buzzers are not allowed to beep simultaneously when using a headset. If both options are enabled, the head set buzzer will beep first before the internal buzzer. If you are using the RS-232 port for communications, enable **1) Beep Internal** and disable **2) Beep Head Set**.

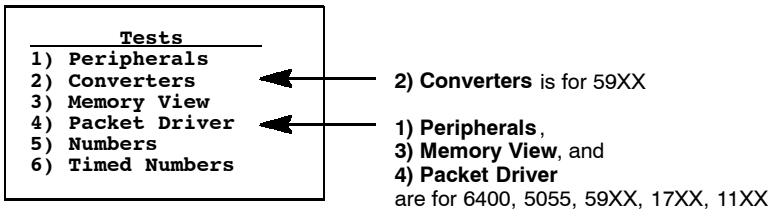
1) Beep Internal
Press **[1]** to direct the audio to the internal beeper. Default is enabled.

2) Beep Head Set *(11XX)*
Press **[2]** to direct sound to the headset.



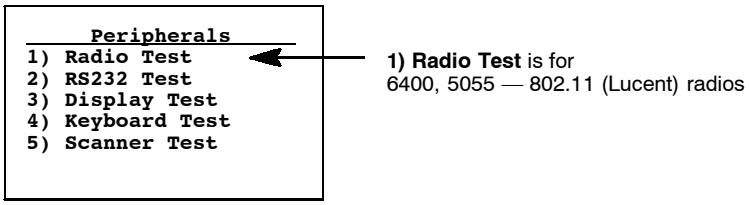
4) Tests

Intermec Systems Engineers use the **4) Tests** menus to verify terminal operation during environmental stress tests, peripherals, the display, RF communications, and memory.



1) Peripherals (6400, 5055, 59XX, 17XX, 11XX)

1) Peripherals tests terminal peripheral devices, such as radio, RS-232, display, keyboard, and scanner. Detailed descriptions of each peripheral test follows.



1) Radio Test (802.11 (Lucent) Radios — 6400, 5055)

Several factors influence the rate at which a frame is transmitted. First, the radio's transmission rate is configured in the **net.cfg** file. The keyword **Transmit_Rate** in **net.cfg** holds a numeric value for the transmission rate.

The transmission rate is also affected by the characteristics of the RF link. If the radio encounters problems sending a higher transmission rate because the RF link is weak, busy, or noisy, the radio may retry the transmission at a lower data rate. Thus, the **TxRate** reported may be lower than the configured transmission rate. Only the transmission rate of the most recent and successful transmission is reported.

Transmit_Rate values and their respective supported transmission rates available in the high speed Lucent radios are as follows:

- **1** Fixed Low (1 Mb/s)
- **2** Fixed Standard (2 Mb/s)
- **3** ARS High (11 Mb/s *default*)
- **4** Fixed Medium (5.5 Mb/s)
- **5** Fixed High (11 Mb/s)
- **4** ARS Standard (2 Mb/s)
- **4** ARS Medium (5.5 Mb/s)

PRI
The primary version of low-level radio firmware.

SEC
The secondary version of the low-level radio firmware.

RFLINK
A general description of the RF connection overall quality between Lucent radios in the terminal and radios in the Access Point. The Lucent radio grades the RF link on a scale from 0–92, representing the RF channel Signal-to-Noise Ratio. The RF link quality descriptions are assigned as: 0–23 "Adequate," 24–47 "Good," or 48–92 "Excellent."

SNR *(Signal-to-Noise Ratio)*
Calculated by dividing the RF signal level by the RF noise level. The result is a number that indicates the overall communications quality of the RF link and is expressed in dBm.

SSID *(Service Set ID)*
A 32-character, alphanumeric string that identifies the service set, or infrastructure, with which the terminal is currently associated. The SSID is a user-configurable parameter and is configured by the keyword **WaveLAN_Network_Name** in the **net.cfg** file. Setting the keyword to ANY allows the station to associate with any service set.

B SSID *(Basic Service Set ID)*
The 6-byte MAC address of the Lucent radio in the Access Point with which the station is associated. The Lucent radio in the terminal may associate with a non-Lucent (but 802.11-compliant) radio in an Access Point. Looking at the first three bytes of the MAC address (OUI) can help identify the Access Point radio's manufacturer.

EXAMPLE: An OUI of "00601D" points to a Lucent radio, while "0020A6" indicates a Proxim radio.

TxRate
The data rate (in Mb/s) of the last message transmitted by the Lucent radio. The default TXRate of 2 Mb/s and will be displayed when the terminal starts up and has not transmitted a frame yet. High speed Lucent radios are capable of data rates of 1 Mb/s, 2 Mb/s, 5.5 Mb/s, and 11 Mb/s. The TxRate 5.5 Mb/s data rate is displayed as 6 Mb/s. This occurs because the Lucent radio reports an integer value for current transmission data rate, so the data rate of 5.5 Mb/s is rounded up to 6 Mb/s.

```
      Radio Test
PRI:     v4.0
SEC:     v4.52
RFLINK: Excellent
SNR:     99dBm
SSID:    xxxxxxx
B SSID: xxxxxxxxxxxx
TxRate:xMb/s std
```

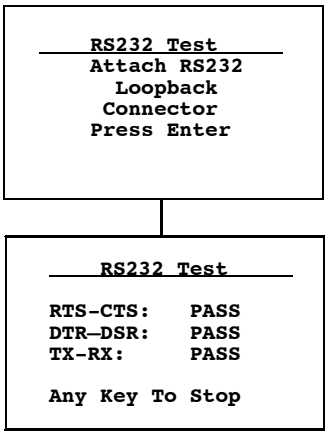
Primary version of Lucent driver
Secondary version of driver
RF link quality
Signal-to-Noise ratio
Network name in use
MAC address of access point
Data rate

2) RS232 Test

Tests the data communication port on the terminal, requiring a special loop-back connector that links the following input and output pins on the data connector:

- TX output to the RX input
- DTR output to the DSR input
- CTS output to the RTS input

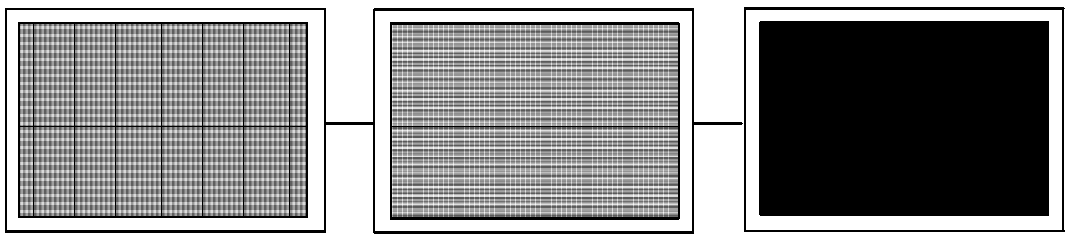
To run the test, select **2) RS232 Test**, attach the loop-back connector to the port connector on the terminal, then press [Enter]. The display changes to the second **RS232 Test** menu shown below. The condition of each line-pair displays as passing or failing the test. If any test fails, return the terminal for service.



3) Display Test

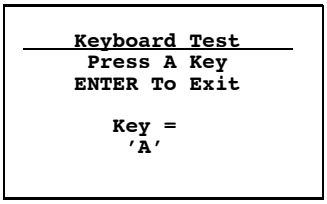
3) Display Test tests the operation of and activates each element in the terminal LCD panel. If a line appears broken, or there are gaps in the display, replace the LCD panel.

1. From the **Display Test** menu, press [Enter] to start the test. The display screen is painted with a series of vertical lines. Visually inspect the lines. All lines should appear clear and complete (no broken segments).
2. Press [Enter] to move to a screen drawn with horizontal lines. Visually inspect the lines using the same criteria.
3. Press [Enter] to move to the final screen. Visually inspect the painted black lines which should be uniformly black for monochrome displays and uniformly white for color displays.
4. Press [Enter] to return to the **1) Peripherals** menu.



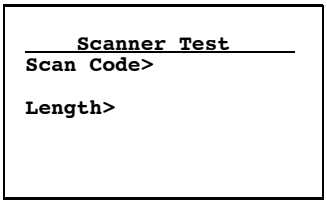
4) Keyboard Test

Tests each key on the terminal keypad or 5055 external keyboard. Press each key, except the [Enter] key, and a character corresponding to the pressed key should appear on the display.



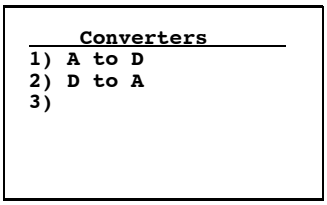
5) Scanner Test

This option tests the operation of an attached bar code scanner. From this menu, scan an enabled bar code. The bar code and the bar code length should appear on the display to pass. Press any key to exit.



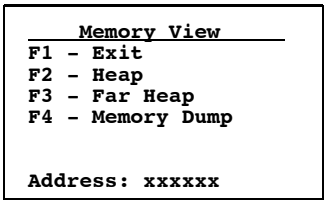
2) Converters (59XX)

Use this option to test the analog-to-digital (A to D) and the digital-to-analog (D to A) converters. The **RSSI Test** (*not available on all radios*) offers a choice of graphics displays of the received radio signals. Press any key to exit.



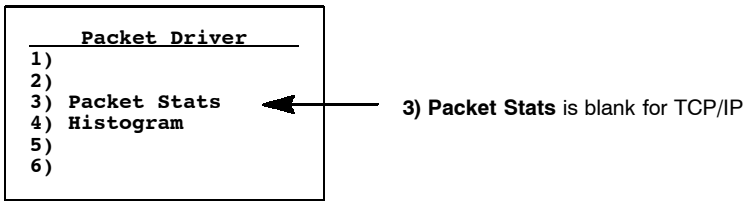
3) Memory View (6400, 5055, 17XX, 11XX)

This menu is reserved for engineering test and evaluation. Press **[F1]** to exit out of this test, **[F2]** to view the heap, **[F3]** to view the far heap, or **[F4]** to do a memory dump.

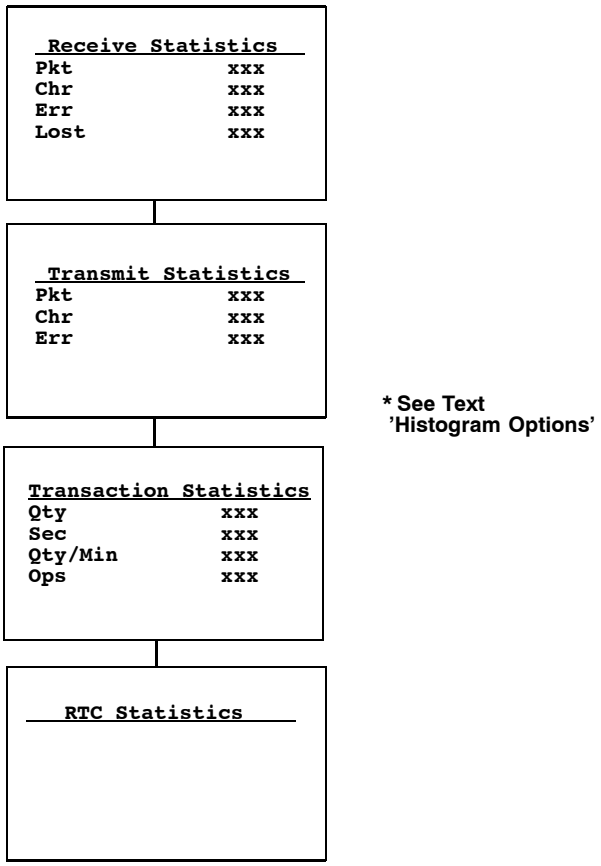


4) Packet Driver (6400, 5055, 59XX, 17XX, 11XX)

4) Packet Driver tests accuracy of data transmissions to and from the terminal.



3) Packet Stats (Statistics) *(6400, 5055, 59XX, 17XX, 11XX, and WTP)*
Shows the number of packets sent and received, number of errors, and number of packets dropped.



4) Histogram
An Intermec engineer may ask you to access this menu if your terminal has problems. From this menu you can provide the Intermec system engineer with vital information about your unit.

The actual menus are not shown in this manual, however some of the general terminology is shown below. Several of the menu options, such as "Clear. . .," are password-protected and are only accessible if the engineer provides you with the correct password. An Intermec system engineer will work with you on these selections. Terminology you might see:

- avg tx time
- avg trans time
- ptt (push-to-talk) count
- addrs on list
- poll no data
- send retries
- rcv retries
- reset count
- interval time
- time bucket #

```
     Histogram
1) Start
2) Stop
3) View
```

5) Numbers

5) Numbers checks the operation of the terminal microprocessor. During the test, the terminal display is filled with hexadecimal numbers that move across the screen horizontally and scroll vertically. Character movement indicates that the processor is still running. To stop the test, press any key.

This test is helpful in detecting lockups during severe operating conditions.

6) Timed Numbers

6) Timed Numbers does the same thing as **5) Numbers** except that it keeps track of the time in seconds that it took to run the test. The test terminates when a key is pressed or when 65,536 numbers are displayed.

5) Version Info (Information)

5) Version Info shows the name, version, and release date of the program you are using, the version of the radio driver, and the MAC address of the 6400, 5055, or 11XX Terminal. See Section 1 for TE program names.

MLID Name and **MLID ver** are for 6400, 5055

```
     Version Info
       Firmware
   <TE Program Name>
Version        <number>
Date           <ddmmyy>
MLID Name      ZZZZZZ
MLID ver       xx.xx
(mac address)
```

6) Exit Menus

▶ **NOTE:** *If direct connect is used, the terminal may reboot upon exiting the TE configuration menu.*

Use **6) Exit Menus** to exit the TE configuration menus. If you changed any parameter settings, the terminal displays the following when you exit the menus.

```
    Save Parms
Enter 'Y'
to save parms
```

If you press **[Y]** ("yes"), you are prompted for a password. "cr52401" is the default password.

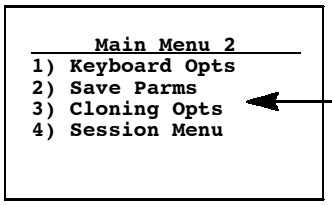
```
    Save Parms

Enter
Password
> .......
```

After you enter the correct password, your settings are saved to Flash, and the terminal may reboot. (Some changes automatically reboot the terminal.) If you press a key other than **[Y]**, you exit the menus and the new settings are *not* saved. In this case, the new settings are lost when you reboot your terminal. When you exit the TE configuration menus, the following information appears:

```
<TE program name> <version>
Session:     <number>
Host:
<data stream>
```

7) More (Main Menu 2)

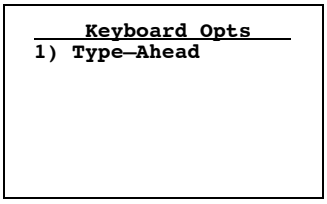
Select **7) More** to open the **Main Menu 2** screen.



3) Cloning Opts is for 59XX, 17XX, 11XX
4) Session Menu is for 6400, 5020, 5055, 17XX, 11XX

1) Keyboard Opts

Use **1) Keyboard Opts → 1) Type-Ahead** to key in information when the terminal cannot immediately send data to the host computer. **1) Type-Ahead** enters information when the terminal cannot immediately send data to the host.



This stores keystrokes after the Input Inhibited annunciator (below) appears on the status line, and then saves them for the next input field. Type-ahead is enabled by default.

X **Input Inhibited annunciator**

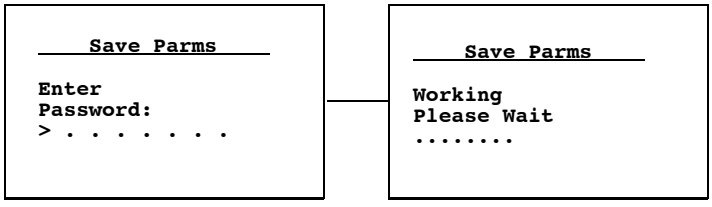
2) Save Parms (Parameters)

Use **2) Save Parms** to retain the changes made to TE configuration settings. When saved, the changes become the default settings for the terminal.

▶ NOTE: *Use this option sparingly. Each it is used, additional memory space is occupied because previously saved changes are not erased. The memory cannot be recovered on 11XX, 17XX, and 59XX Terminals without reflashing.*

Ensure that the parameters are correct before choosing **2) Save Parms**. When selected, you are prompted to enter a seven-character password. The default password is **CR52401**; which can be altered with a custom configuration to be a string of 1 to 10 characters long. After you enter the correct password, your changes are written to Flash.

If an error is made or the incorrect password is entered, the terminal will return to **2) Save Parms** screen without saving your entries.



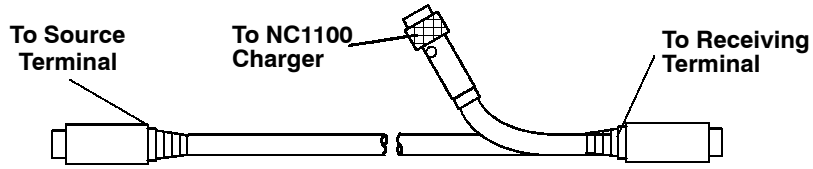
3) Cloning Opts (59XX, 17XX, 11XX)

▶ **NOTE:** ***3) Cloning Opts** is disabled for 59XX Terminals.*

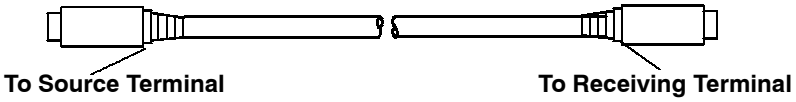
These options transfer the application program or parameter settings from one terminal to another. All three choices are password-protected, with **CR52401** as the default password. To perform this function you need a cloning cable and both terminals set for cloning.

```
     Cloning Opts
1) Clone Prgms
2) Clone Parms
3) Receive Parms
```

1. Connect the two terminals together using the cloning cable. Use cable P/N: 216-911-001, with radio terminals containing 12-volt Flash (Figure 4-1) for connecting with the NC1100 Power Supply and Charger (see Figure 4-2).
2. Plug the NC1100 Power Supply and Charger into an ac outlet. Use cable P/N: 216-909-001, with radio terminals containing 5-volt Flash. You may use the 12-volt Flash cable, but this is optional.
3. Turn on the source terminal from which to copy the application.
4. Press **3) Cloning Opts**, then **1) Clone Prgms**.
5. Key in the password.
6. Hold down the **[I]** key while turning on the terminal receiving the program. The application program will be copied into the receiving terminal.



12-Volt Cable (P/N: 216-911-001)



5-Volt Cable (P/N: 216-909-001)

Figure 4-1
FLASH Cloning Cable Connections

To clone parameters from one terminal to another, first ensure the desired parameters are already set in the terminal you wish to transfer from. Then:

1. Connect the terminals together using the cloning cable. Data Terminals with 12-volt FLASH use P/N: 216-911-001. Data Terminals with 5-volt FLASH use P/N: 216-909-001.
2. With both terminals turned ON, press **3) Cloning Opts** on both terminals.
3. On the source terminal (the one containing the parameters to copy from), press **2) Clone Parms**.
4. On the receiving terminal, press **3) Receive Parms**. If using the cable that requires the NC1100 Power Supply and Charger, make sure it is connected to the NC1100 Power Supply and Charger.

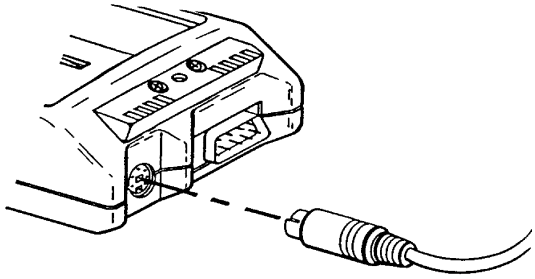


Figure 4-2
Cloning Cable Connection with NC1100 Power Supply

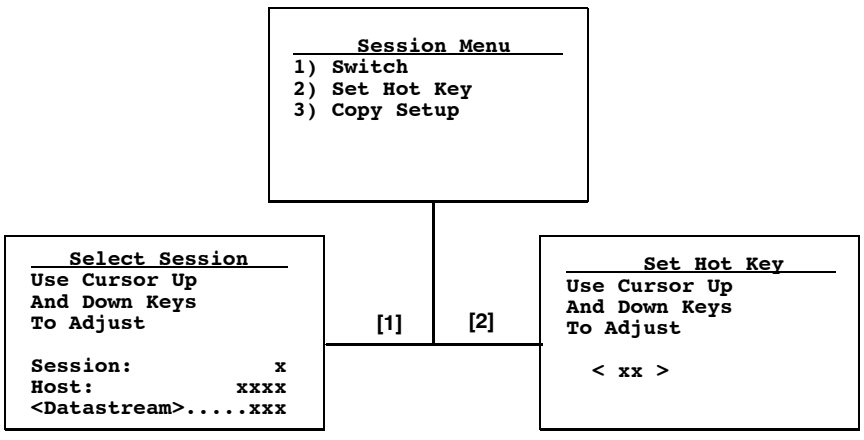
4) Session Menu (6400, 5055, 5020, 59XX, 17XX, 11XX)

4) Session Menu defines different host communication sessions and designates a "hot key" that allows switching quickly between the different sessions.

1) Switch
Use this option to change the current session. The current (or intended) session must be identified (or designated) before setting Parameters.

2) Set Hot Key *(available on units supporting session-switching)*
Displays the current hot key. Use the up and down keys to view the available choices. Press [Enter] to designate a key for the hot key.

3) Copy Setup *(password-protected)*
This copies parameters from the background session to the current session.



Restarting Terminal Emulation

▶ NOTE: *The reset firmware bar code is not supported on the 5020, 59XX, 17XX, or 11XX Terminals. Instead, do the cold-start function to exit the TE application and return to the Windows CE main menu.*

You need to restart your TE application if you are having problems or if you want to reconnect to the host with a new configuration. Restarting your TE application also clears the auto-login information, preventing another user from establishing a TE session using your login information.

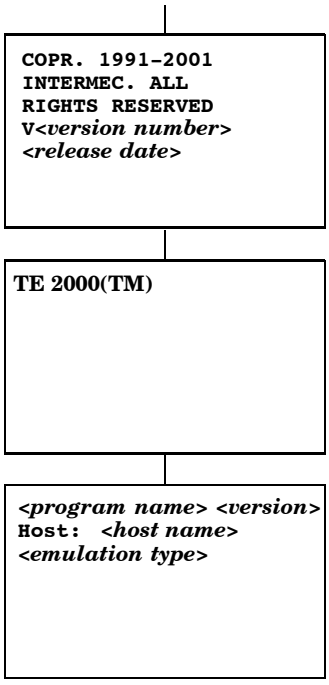
You can restart your TE application by either scanning the following **Reset Firmware** bar code or by using the **6) Cold Start** option in the TE configuration **Main Menu**. Both methods reset all terminal firmware and the application and run the application in a new session.

Reset Firmware

-.

The terminal restarts your TE application using the configuration saved in CONFIG.DAT, or follow this procedure:

1. At the third initialization screen or anywhere in a TE session, access the Main Menu by pressing the appropriate key combination (*see page 1-3*).



▶ NOTE: *If you are not connected to the DCS 300 or host, or have problems accessing the **Main Menu**, reset your terminal to go to the initialization screens.*

2. Select **1) Setup Parms**, then enter the "cr52401" password. *Do not press Enter.*
3. Select **6) Cold Start**, press **[Y]** when prompted to restart, then start using the application or change the TE configuration.

See the terminal's user guide for information on how to recover from a lock-up condition.

Trakker Antares (2415, 2425, 2435A, 2455, 248X)

The following instructions are specific for 2415, 2425, 2435A, 2455, and 248X Terminals.

You can configure several options for VT/ANSI TE on your Trakker Antares® Terminal, including:

- UDP Plus or TCP/IP communications
- VT/ANSI options
- Main Menu password

▶ **NOTE:** *You can also set the password for UDP Plus Terminals from the DCS 300.*

You can access the TE configuration menus when the initialization screens appear or once you establish a TE session. The TE initialization screens appear each time you reboot the terminal or restart your application.

▶ **NOTE:** *Some parameters for 2415, 2425, 2435A, 2455, and 248X Terminals are available through the TRAKKER Antares 2400 Menu System. They are not reproduced in the TE configuration menus. For more information about the menu system, refer to the terminal's user manual.*

6400 Computer

The terminal emulation screens support terminals running Intermec Terminal Emulation or 6400 TCP/IP software. This section describes the menus used to set operating and scanning parameters for the hand-held computer. Additional information can be found in the technical overview for your emulation program.

▶ **NOTE:** *Ensure there is a fully-charged battery pack in the 6400 Computer before setting parameters.*

Opening the Main Menu

The **Main Menu** is the first screen displayed when you open the computer menus. All other menus are accessed from the **Main Menu**. To open the **Main Menu**, press the [Yellow] shift, then the [Blue] shift key. Briefly, these keys generally operate as:

- [Blue] shift, for functions labeled by blue legends above the keys.
- [Green] shift, for functions labeled by green legends above the keys.
- [Yellow] shift, for functions labeled by yellow legends above the keys.
- [Blue], then [Green] shift is CAPS LOCK.
- [Blue], then [Yellow] shift is Alphabetic Lock *(6400 Computer 41-key units).*
- [Yellow], then [Blue] shift is Terminal Emulation menus; your particular emulation software probably treat the keys for contrast control, backlighting and other functions differently.

To Exit Emulation Mode and Return to DOS

Do a cold-restart to exit the current emulation program and return back to the DOS keyboard layout. Press **[Y]**, press [Enter] several times to put you at the DOS C:\ prompt. To exit to the beginning of the current emulation, press and hold the [Blue] and [Yellow] shift keys, and both **[ENT]** keys to do the hard reset.

5055 Data Collection PC

▼**CAUTION:** ***If you are running terminal emulations*** **and ever update the DOS load on the internal SanDisk IDE drive on the 5055 PC, be aware that when updating 50DS1000, avoid copying the CONFIG.SYS and AUTOEXEC.BAT files. The new versions of these two files may interfere with existing applications, such as Terminal Emulations. If affected, Terminal Emulations will automatically run on boot up.**

In all other situations, do **copy the CONFIG.SYS and AUTOEXEC.BAT files.**

This section contains information about the terminal emulations with keyboards supported for the Intermec® 5055 Data Collection PC.

The 5055 PC supports terminal emulations with rugged keyboards. FWP650H0 is DOS-based and is not compatible with Windows DOS prompts.

An external PS/2-compatible keyboard is required for configuring and using terminal emulations.

Terminal emulation font files are needed to generate the various character fonts. See the related terminal emulation programmer's reference guide for additional information.

Programs Used to Create Terminal Emulation Menus

The Terminal Emulation Menu Screens are provided to support terminals running Intermec Terminal Emulation software. This section describes the menus that set operating and scanning parameters for the 5055 PC. Additional information can be found in the programmer's guide or technical overview for your emulation program.

When you power on the 5055 PC, the AUTOEXEC.BAT file executes the following programs, in sequential order, to create the terminal emulation menus. Listed are their descriptions.

LSL
Creates the link layer for the protocol stack.

rl2pcm
Includes the Proxim radio driver for the Proxim RangeLAN2 radio, ***or***
wvlan43
Includes the WaveLAN/IEEE radio driver for the 802.11b HR radio.

6500ikps
Installs multitasking, beeper, and key remapping TSRs.

wtppkt
Includes the WTP Packet driver program if a WTP link accesses the host computer, ***or***
ethdrv and **odipkt**
Includes the Ethernet and ODI Packer driver programs if a TCP/IP link and a controller are used to gain access to the host computer.

65scn7b –c1
Activates the scanner driver.

6500dbcs
Intercepts INT10 and display characters on the display.

fwp650h0
Activates the terminal emulation program.

Press **<Alt>**, then **[M]** on the external keyboard to access the setup menus.

▶ **NOTE:** *On terminal emulation keyboards, use the yellow key in place of the **<Alt>** key. For example, to access the Setup Menus, press **<Yellow>**, then **[M]**.*

Opening the Main Menu

The **Main Menu** is the first screen displayed when you open the computer menus. All other menus are accessed from the **Main Menu**.

To open the **Main Menu**, press the yellow shift, then the blue shift (MENU) key. Briefly, these keys generally operate as:

- [Blue] shift, for functions labeled by blue legends above the keys.
- [Green] shift, for functions labeled by green legends above the keys.
- [Yellow] shift, for functions labeled by yellow legends above the keys.
- [Blue], then [Green] shift is CAPS LOCK.
- [Yellow], then [Blue] shift is Terminal Emulation menus; your particular emulation software probably treat the keys for contrast control, backlighting and other functions differently.

To Exit Emulation Mode and Return to DOS

Do a cold-restart to exit the current emulation program and return back to the DOS keyboard layout. Press **[Y]**, then press [Enter] several times to arrive at the DOS C:\ prompt. To exit to the beginning of the current emulation, press and hold the [Blue] and [Yellow] shift keys, and both **[ENT]** keys to do the hard reset.

Section 5

Customizing Your Configuration

This section describes the procedures you can use to customize the standard VT/ANSI TE program by Intermec Technologies Corporation. You customize the TE program by creating or modifying configuration files, and then downloading them to your terminal to do the following:

- Use the auto-login feature to send the same login information each time you login to the host. *Page 5-1*
- Display double-byte characters. *Page 5-10*
- Create a custom parameter set-up file to download a customized file to all terminals so they have the same setup information. *Page 5-10*
- Change the text of TE configuration menus or system messages. *Page 5-34*
- Preinitialize the VT/ANSI TE program. *Page 5-34*
- Remap the terminal's keys. *Page 5-35*
- Remap characters. *Page 5-40*

Using the Auto-Login Feature

Use the auto-login feature to send the same login information each time you login to the host. When you start the TE application, the terminal checks for an auto-login script file. If a script file exists, the terminal runs the login commands from the auto-login script file before the TE program starts.

To use the auto-login feature, you need to develop an auto-login script file and load the auto-login script file on the terminal. These steps are covered on the following pages along with a list of the necessary control characters and the procedure for disabling the auto-login feature.

Developing Auto-Login Script Files

A typical auto-login script file consists of Input and InputHidden commands followed by a HostName command, followed by a series of WaitFor and Send commands. A very simple script file may not have any input commands if all of the terminals are using the same account.

NOTE: *The auto-login script must be an ASCII text file with AUTOLOG.SCR as the required file name or the file will not be processed.*

Commands

You can use several commands to create auto-login script files. All commands are case-sensitive. For example, **WaitFor** is a command, but **Waitfor** is not a valid command. For examples of script files, see *"Sample Auto-Login Script Files"* on page 5-8.

▶ **NOTE:** *As Microsoft Windows can reserve the word "input," the following **Input** commands are changed to **Inputs** for the 5020 Terminal. All other terminals will continue to use the original **Input** commands.*

Input — Inputs *(5020)*
This is called with two parameters. The first one is a character string enclosed in quotes used as a prompt to the user. The second one is a string variable name indicating where the text string will be stored.

InputHidden
Same as the **Input** or **Inputs** script command except that user input is echoed as a string of asterisks.

HostName
This command is case-sensitive and must be presented as mixed-case letters. **HostName** is followed by a character string enclosed in quotes. The character string can be a host name or an asterisk. The **HostName** command acts as an IF clause. If the host name matches, the following section of the script file is executed up to the next **HostName** command. If an asterisk is used, it matches any host name.

WaitFor
Wait for a list of up to ten strings. The strings must be enclosed in quotes and must be separated by a comma. The strings cannot exceed 20 characters in length.

Send
This command sends a character string enclosed in quotes or a string variable to the host. The character string enclosed in quotes can have an embedded control key in VT/ANSI TE.

Pause "xxxxx"
Delays the terminal for x milliseconds, halts terminal operation from receiving and processing for the duration specified.

PromptSessionStart
This command is a predefined variable. If this variable is defined and set to any value other than 0, the application prompts the user to press [Enter] before starting a Telnet session with the host. Do not put quotes around the variable.

Restart "x"
Restarts the autologin script file. The "x" is a dummy argument.

Keyboard "0"
Disables the keyboard. Key presses are ignored. For additional information, see Note below.

Keyboard "1"
Enables the keyboard. Key presses are processed. The keyboard is enabled by default. For additional information, see Note below.

(pound symbol)
Documents the script file. Text following a # (pound) symbol is considered a comment unless the # symbol is in a quoted string.

▶ **NOTE:** *Input the **Keyboard "0"** or **Keyboard "1"** command into the autologin script file after the **PromptSessionStart** command (if present) and the **HostName** command (if present). Also turn on the keyboard command before another **HostName** command is found in the file.*

Search Strings

Some auto-login search string limitations are as follows. You can use line wrapping to look for unique strings.

- All blank areas on the display are seen as space characters by auto-login in VT emulation.
- The searches are case sensitive.
- The maximum search string length is 20 characters.
- Each WaitFor command searches the entire screen from the top.

If a screen from the host has multiples of the word you are looking for, you can use the preceding spaces to identify a unique string.

EXAMPLE: If the screen sent to the terminal is:

```
Linux rlogin 2.4.6
login
```

The autologin script would be:

```
PromptSessionStart=1
HostName "*"
#wait for host login screen and send login and password
WaitFor " login"
Send "billy<ENTER>"
WaitFor "password"
Send "letmein<ENTER>"
```

In this example, you can search for the three leading spaces from the end of the previous line to make a unique search string.

Control Characters

You can include control characters in your auto-login script file. The control character must be enclosed by < > (angle brackets) in AUTOLOG.SCR. Table 5-1 lists control characters for VT/ANSI TE.

▶ **NOTE:** *Some control characters may be represented by their hexadecimal values. For a description of control characters and hexadecimal equivalents, see the full ASCII chart in Appendix C.*

Table 5-1
Control Characters for Auto-Login Script File

Control Character	Definition	Control Character	Definition
<ACK>	Acknowledgment	<F1> – <F20>	Function keys
<BEL>	Bell	<F21>	Toggles from Character mode/Line Edit (block) mode
<BS>	Backspace	<FF>	Form Feed
<CAN>	Cancel	<FS>	File Separator
<CR>	Carriage Return	<GS>	Group Separator
<CUR_DN>	Cursor Down	<HT>	Horizontal Tab
<CUR_LF>	Cursor Left	<INS>	Insert
<CUR_RT>	Cursor Right	<LF>	Line Feed
<CUR_UP>	Cursor Up	<LTAB>	Left Tab
<DC1>	Device Control 1 (XON)	<NAK>	Negative Acknowledge
<DC2>	Device Control 2	<NUL>	Null, or all zeros
<DC3>	Device Control 3 (XOFF)	<RS>	Record Separator
<DC4>	Device Control	<RTAB>	Right Tab
<DEL>	Delete	<SI>	Shift In
<DLE>	Data Link Escape	<SO>	Shift Out
<EM>	End of Medium	<SOH>	Start of Heading
<ENQ>	Enquiry	<SPACE>	Space
<ENTER>	Enter	<STX>	Start of Text
<EOT>	End of Transmission	<SUB>	Substitute
<ESC>	Escape	<SYN>	Synchronous Idle
<ETB>	End Transmission Block	<US>	Unit Separator
<ETX>	End of Text	<VT>	Vertical Tab

Loading the Auto-Login Script File

Follow these procedures to download an auto-login script file to your terminal. The method depends on the type of terminal you are using.

2415, 2425, 2435A, 2455, or 248X Terminal

You can download more than one script file to a 2415, 2425, 2435A, 2455, or 248X Terminal, but immediately name the file to be used as AUTOLOG.SCR and name any other script files with different names ending with .SCR. To learn more about transferring files, refer to your terminal's user manual.

Use one of the following download utilities to copy your completed AUTOLOG.SCR file to the terminal.

Using Serial Port to Download File

1. Connect the terminal to the development personal computer or host. For help, refer to your terminal's user manual or your accessory documentation.
2. Load the AUTOLOG.SCR file into drive C, where the TE application is stored. For help, refer to your terminal's user manual.
3. Use T24XCOPY.EXE (from the developer's kit) to copy the file directly to drive C: on the terminal;
   or use LOADER.EXE (from the flash upgrade) to copy the file to the terminal in flash mode using the following command:
   ```
   loader AUTOLOG.SCR
   ```

Using RF Communications to Download File

Note that loading the AUTOLOG.SCR file from the DCS 300 is supported.

1. Copy the AUTOLOG.SCR file to the DCS 300.
2. Configure the download server on the DCS 300 to send AUTOLOG.SCR to the terminals in groups of 10 or less.
3. Start the download.

When you reset your terminal, it clears the auto-login information, such as the password and user's name. You can cancel the auto-login process by pressing any key during the auto-login sequence. When a host session is broken, you can restart the auto-login sequence by rebooting your terminal.

5020 Data Collection PC

The *5020 Data Collection PC User's Manual* P/N: 068975-002) has comprehensive information regarding 5020 file management. Below is an excerpt from the manual.

Downloading a File

1. From the host computer or PC, connect to the 5020 Terminal using a web browser and start the Unit Management application. For help, see the *5020 PC User's Manual*.
2. Click **File Manager** to access the main File Manager screen.
3. Click the option button next to the parent directory where the file to be downloaded is located, then click the **Go To** button to access its contents. To download a file to the current directory on the 5020 Terminal, go to the next step.
4. Go to the File Upload form at the bottom of the main File Manager screen on the host computer and click the **Browse** button.
5. From the Choose File box on the host computer, select the file to be downloaded to the 5020 Terminal, then click **Open** to place the path and file name on the File Upload form.
6. On the host computer, click the **Upload File** button to continue, or click **Clear** to clear the form and start again. The screen showing the parent directory is refreshed.

   If successful, the following confirmation message will appear on the host computer, where "Filename" is the file that was downloaded to the 5020 Terminal: **Uploaded file "Filename"**

Copying a File

Use the File Manager from the host computer to make a copy of a file. Repeat steps 1 through 3 of "*Downloading a File*" on the previous page, then do the following:

1. Click the option button next to the file you want to copy, then click the **Copy** button to access the Copy File screen.
2. To save the copied file to the same directory as the original file, enter a unique file name in the **New Name** field, then click **Copy File** to create a copy of the file. The screen showing the parent directory is refreshed.

   If successful, the following confirmation message will appear on the host computer, where "Filename" is the original file and "New Filename" is the copy: **"Filename" copied to "New Filename"**

6400 Computer or 5055 Data Collection PC

Use INTERLNK/INTERSVR communications to connect your terminal to a personal computer. For help, see *"Downloading Files"* on page 5-41.

You must load AUTOLOG.SCR into drive C, where the TE application is stored.

59XX, 17XX, or 11XX Terminal

The download process requires flash and utility files.

1. Using FLSHCONV.EXE from the TOOLS.EXE file from the flash program, append the AUTOLOG.SCR file to the end of the .HEX program. For help, see*"Downloading Files"* on page 5-41. Below are sample command lines for each terminal type:

   11XX Terminal with 256K flash *(example uses 1180, but applies to all radio types)*

   ```
   flshconv –eC000 –a fwp118c0.hex AUTOLOG.scr –oNEW1180.HEX
   ```

   11XX Terminal with 512K flash *(example uses 1180, but applies to all radio types)*

   ```
   flshconv –eFFC0 –a fwp118h0.hex AUTOLOG.scr –oNEW1180.HEX
   ```

   17XX Terminal *(example uses 1780, but applies to all radio types)*

   ```
   flshconv –eFFC0 –a fwp178h0.hex AUTOLOG.scr –oNEW1780.HEX
   ```

   59XX Terminal *(example uses 5980, but applies to all radio types)*

   ```
   flshconv –eE000 –a fwp598h0.hex AUTOLOG.scr –oNEW5980.HEX
   ```

2. Using PROGDUX.EXE from the flash files, load the NEW.HEX file onto the terminal. Below is a sample command line using the 1780 Terminal:

   ```
   PROGDUX –e NEW178H0.HEX
   ```

Disabling the Auto-Login Feature

To disable auto-login, you may rename or delete the AUTOLOG.SCR file. Renaming the file ensures that you can use the same auto-login script file later by changing the name back to AUTOLOG.SCR. If you want to enable a new script file, you can use the instructions in this section to rename a different script file to AUTOLOG.SCR.

Follow these procedures to disable (or delete) the auto-login script file. The method depends on the type of terminal you are using.

2415, 2425, 2435A, 2455, or 248X Terminal

1. Press the appropriate key sequence or scan the following bar code to access the TRAKKER Antares® 2400 Menu System's Main Menu:

   Enter Test and Service Mode

   ..-.

2. Choose System Menu and then choose File Manager.
3. Select drive C. Press ▲ or ▼ to highlight AUTOLOG.SCR.
4. Press [FnL .] to delete the file or press [F7] to rename the file.
5. Exit the TRAKKER Antares 2400 Menu System to return to your current TE session. Restart the TE application to use TE without the auto-login.

You can also rename the auto-login script file from your host. For help, refer to your terminal's user manual.

5020 Data Collection PC

Via your web browser, access the IP address at *http://<IP address>*, double-click the **File Manager** desktop icon, select **File**, then press the **[Del]** key to remove the auto-login feature.

6400 Computer or 5055 Data Collection PC

1. Reboot the terminal to a DOS prompt.

   For the 6400 Computer:
   press and hold the yellow, blue, and both green enter keys until the terminal resets. Watch the screen as the terminal boots and press 0 (zero) when the prompt appears.

   For the 5055 Data Collection PC:
   power-cycle the terminal and select the minimum DOS prompt from the boot menu.

2. Rename or delete the AUTOLOG.SCR file.
3. Reboot the terminal again and allow it to complete the boot into terminal emulation.

59XX, 17XX, or 11XX Terminal

To disable auto-login on a 59XX, 17XX, or 11XX Terminal, reload the terminal with unmodified flash, then perform a cold start to flush the memory. The flash file does not allow selective erasing; files can be added, but not removed without removing all files.

Sample Auto-Login Script Files

▶ **NOTE:** *The Windows CE operating system within the 5020 Data Collection PC uses the **Input** keyword as a reserved word, so this command is changed to **Inputs** for the 5020 PC.*

You can use these sample script files as they are or as the starting point for creating your own auto-login script files.

EXAMPLE 1: **Auto-Login With All Terminals Using the Same Account**

```
HostName "*"                              #Use this to log into any host
WaitFor "login:"                          #Wait for the login prompt
Send "user_name<CR>"                      #Send the user name
WaitFor "Password:"                       #Wait for the password prompt
Send "letmein<CR>"                        #Send the password
```

The **HostName** command matches the host the user accesses.

The **WaitFor** command waits for a string to be displayed by the host. **WaitFor** takes up to 10 strings, 20 characters long. The strings must be enclosed in quotes and separated by a comma.

The first **Send** command sends a fixed user name. The second Send command sends a fixed password.

Angle brackets < and > can enclose uppercase mnemonics or hexadecimal values.

EXAMPLE 2: **Auto-Login With Different User Names and Passwords**

```
Input "Enter user name", username         #Prompt for user name
(5020) Inputs "Enter user name", username #Prompt for user name
InputHidden "Enter password", password    #Prompt for password
HostName "*"
WaitFor "login:"                          #Wait for the login prompt
Send user_name                            #Send the user name
Send "<CR>"                               #Send a carriage return
WaitFor "Password:"                       #Wait for the password prompt
Send password                             #Send the users password
Send "<CR>"                               #Send a carriage return
```

The **Input**, **Inputs** *(5020)*, and **Send** commands use input variables. **Input** and **Inputs** *(5020)* commands require a prompt string followed by a comma and a variable name to store the string in.

The **InputHidden** command will display "*****" in place of any characters the user types. All **Input** and **Inputs** *(5020)* commands must be before the first **HostName** command.

The **Send** command only accepts a single argument, so you need two **Send** commands to send the user name and a carriage return.

EXAMPLE 3: Auto-Login to an Application

```
Input "Enter user name", username          #Prompt for user name
(5020) Inputs "Enter user name", username #Prompt for user name
InputHidden "Enter Password", password     #Prompt for password
HostName "*"
WaitFor "login:"                           #Wait for the login prompt
Send username                              #Send the user name
WaitFor "<CR>"                             #Send a carriage return
WaitFor "Password:"                        #Wait for password prompt
Send password                              #Send the users password
Send "<CR>"                                #Send a carriage return
WaitFor "Main Menu"                        #Wait for the main menu
Send "3"
Send "<CR>"                                #Pick option 3 from the menu
WaitFor "Wip Menu"                         #Wait for work in process menu
Send "1"
Send "<CR>"                                #Pick option 1 from the menu
```

Example 3 modifies the script file in Example 2. The additional modification (which starts with `WaitFor "Main Menu"`) allows you to move automatically to an application after logging in.

EXAMPLE 4: Auto-Login With Variable Processing

```
Input "Enter user name", username          #Prompt for user name
(5020) Inputs "Enter user name", username #Prompt for user name
InputHidden "Enter Password", password     #Prompt for password
HostName "BigHost"                         #Use script portion for BigHost
WaitFor "User:"                            #Wait for the user prompt
Send username                              #Send the user name
Send "<CR>"                                #Send a carriage return
WaitFor "Password:"                        #Wait for the password prompt
Send password                              #Send the users password
Send "<CR>"                                #Send a carriage return
HostName "*"                               #Match any other host name
WaitFor "login:"                           #Wait for the login prompt
Send username                              #Send the user name
WaitFor "<CR>"                             #Send a carriage return
WaitFor "Password:"                        #Wait for password prompt
Send password                              #Send the users password
Send "<CR>"                                #Send a carriage return
WaitFor "Main Menu"                        #Wait for the main  menu
Send "3"
Send "<CR>"                                #Pick option 3 from the menu
WaitFor "Wip Menu"                         #Wait for work in process menu
Send "1"
Send "<CR>"                                #Pick option 1 from the menu
```

A section for the host name BigHost is added to the beginning of the script file. If you log into any host other than BigHost, the script file starts at the **HostName "*"** line. This allows for different processing on each host.

Auto-Login Restart

The Auto-Login Restart command starts the auto-login script file from the correct **HostName** statement in the script file when a host session is broken. For this command to work, the **WaitFor** string must match the last data sent from the host. For example, if the **WaitFor** string is the login prompt "login:" with a space after the colon, the **WaitFor** string must include a space for the auto-login restart to work.

To use the **Auto-Login Restart** command, press the keys listed in Section 3, "Using the Terminal's Keyboard." Or, scan the following bar code.

Auto-Login Restart

%ALRS

Displaying Double-Byte Characters

The 2415 Terminal supports Double-Byte Character Sets. The sets available are Big 5 Chinese, Simplified Chinese, Japanese (Kanji), and Korean (Hangul).

The Double-Byte Character Set is preloaded on the 2415. To order a Double-Byte Character Set, contact your Intermec Sales Representative. If you order a set, follow the instructions in the terminal's user manual to install it.

To configure the terminal for the character set, set the terminal's screen size to 8x16.

Creating a Custom Parameter Set-Up File

You can create a custom VT/ANSI TE set-up file to preset almost any parameter you can set from the TE configuration menus. These parameter settings become the default (cold start) configuration for the terminal.

Syntax

The parameter set up file is an ASCII text file that you create which gets converted to a binary file by the CHECKCFG.EXE utility. New terminals do not come with this utility but it is available by request from the system engineer; or, if you ordered the upgrade version, it is included in the TOOLS.EXE self-extracting file.

You can name the input file as you choose. When you use the CHECKCFG utility later to verify the file, you must change the output file name to CONFIG.DAT. A field may have zero or more qualifiers. The syntax of a line is:

FieldName = Value; *or*

Qualifier.FieldName = Value;

- FieldName is the name of the parameter you want to modify.
- Value is the new value for the field.
- Qualifier and FieldName must be ASCII strings that match one of the configuration parameters.
- Value can be an ASCII string or a numeric value, depending on the type of the parameter FieldName specifies. The parameters along with their types and allowable values are listed under "*Parameters and Qualifiers*" later in this section.

CHECKCFG.EXE ignores the following:

- Blank lines
- Leading white space (spaces and tabs)
- White space on either side of any delimiter (a period, an equal sign, or a semicolon)

In addition, the set-up file converts consecutive white space characters within strings to one space. For example, this line:

```
Screen    Mode      =    Page Mode   ;
```

is the same as:

```
Screen Mode=Page Mode;
```

You can set the Value field of any configuration parameter to "?", which indicates that the TE configuration program should prompt the user for the appropriate value. For example, this parameter causes the terminal to prompt the user to select a screen mode from the list of values:

```
Screen Mode = ?;
```

Following is a sample set-up file.

```
Program Name = CUSTOM;

Screen Mode = Page Mode;

Host A.Port Number = 1;

Data Stream = VT220;
Code 39.Encoded = Enabled;
Extended Cmds = Enabled;
```

Parameter Formats

The complete parameter list with value definitions can be directed to a file using this command: `CHECKCFG –P CFGLIT.DAT > parms.txt`

Each parameter in the set-up file is followed by one of three different formats that indicates the type of parameter and the values it can contain. Formats are as follows:

- **Literal strings.** List of fixed values to choose from.

  Example:
  [Session 1].Screen Mode
  Session 2.Screen Mode
  Center Cursor
  Corner Mode
  Page Mode
  Lazy Mode
  Locked Mode

  Screen Mode may be qualified by Session 1 or 2. It may take the value Center Cursor, Corner Mode, Page Mode, Lazy Mode, or Locked Mode. Session 1 is the default qualifier. These configuration lines are valid:

  ```
  Screen Mode = Lazy Mode;
  Session 1.Screen Mode = Lazy Mode;
  Session 2.Screen Mode = Lazy Mode;
  ```

- **Numeric parameters.** Numeric parameters have minimum and maximum values. Parameters can be either decimal or hexadecimal:
  - Decimal parameters consist of digits 0 through 9.
  - Hexadecimal parameters consist of 0x or 0X, followed by 1 to 4 digits of 0 through 9, a through f, or A through F. These are equivalent: 160, 0xA0, and 0Xa0.

  Example:
  [Session 1].[Host A].Port Number
  Session 2.Host A.Port Number
  [Session 1].Host B.Port Number
  Session 2.Host B.Port Number
  [Session 1].Host C.Port Number
  Session 2.Host C.Port Number
  Numeric, minimum = 0, maximum = 65535

  Port Number is a variable with a minimum value of 0 and a maximum of 65535. These lines are valid:

```
Port Number = 1;
Session 1.Host A.Port Number = 1;
Session 2.Host A.Port Number = 1;
```

- **String parameters.** String parameters are variables with minimum and maximum lengths.

  Example:
  Program Name
  String, minimum length = 8, maximum length = 8

  Program Name is unqualified. It must have eight characters. These configuration lines are valid:

```
Program Name = ABCDEFGH;
Program Name = FWP248H0;
```

Verifying Your Configuration

Use the CHECKCFG utility to verify that you properly configured your set-up file. CHECKCFG reads your configuration and reports any syntax errors. To get the utility, contact your Systems Engineer.

To verify your configuration:

Type: **checkcfg <*input config file*> cfglit.dat config.dat**

- <*input config file*> is the name of your parameter set-up file.
- CFGLIT.DAT contains the strings that appear in the configuration menus, parameter files, and system messages.
- CONFIG.DAT is the name of the output file you will download to the terminal. This file must be named CONFIG.DAT.

You are ready to download CONFIG.DAT to the terminal when CHECKCFG reports no errors. For download instructions, see "*Downloading Files*" on page 5-41.

If CHECKCFG reports an error, use a text editor to open your set-up file and correct it. The following chart lists the system messages CHECKCFG may display.

Default String	Description	ID Number
`Can't open file`	The input config (configuration) file could not be located.	F000
`Bad option name`	The right side of an expression in the input config file is an invalid name.	F001
`Syntax error`	The input config file contains a syntax error.	F002
`Bad string length`	The right side of an expression in the input config file is a string that is too long for the specified parameter.	F003
`Unknown type`	The parameter table in the configuration program contains a bad value. This error is for testing purposes only and should never occur.	F004
`Value out of range`	The right side of an expression in the input config file is a number that is out of range for the specified parameter.	F005
`Bad value`	The right side of an expression in the input config file is a string that is invalid for the specified parameter.	F006
`Expected numeric`	The right side of an expression in the input config file should be a numeric value but contains nonnumeric data.	F007
`Missing '='`	A line in the input config file does not contain the required "=" (equal sign).	F008
`Missing ';'`	A line in the input config file is not terminated by a ";" (semicolon).	F009

Parameters and Qualifiers

▶ **NOTE:** *If parameters are duplicated, an error is not generated. Instead, the terminal will process the entire file and use the last entered value of the duplicated parameter.*

Parameters in the set-up file apply to all model numbers unless otherwise noted here. The following pages list each parameter and its qualifiers. Some qualifiers have default values. If you want to use the default value, you can omit the qualifier from the parameter set-up file. Default qualifiers are listed between square brackets "[ ]" in this section.

The CFGLIT.DAT file specifies the text of set-up menus or system messages. Parameters and qualifier strings in the set-up file assume you are using the default CFGLIT.DAT file. To customize CFGLIT.DAT, see *"Changing Text"* on page 5-34.

The Trakker Antares terminals (2415, 2425, 2435A, 2455, 248X) do not support dual sessions.

Set-Up Parameters Options

- **Channel** *(900 MHz radio)*
  [Session 1].[Host A].Channel
  Session 2.Host A.Channel
  [Session 1].Host B.Channel
  Session 2.Host B.Channel
  [Session 1].Host C.Channel
  Session 2.Host C.Channel
  10
  25
  30
  25
  30
  35
  40

- **Data Stream**
  [Session 1].[Host A].Data Stream
  Session 2.Host A.Data Stream
  [Session 1].Host B.Data Stream
  Session 2.Host B.Data Stream
  [Session 1].Host C.Data Stream
  Session 2.Host C.Data Stream
  [Native] *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [3270]
  5250
  VT220

▶ NOTE: *"VT" will be the new default for the Data Stream in a later version.*

- **Frequency** *(S-UHF radio)*
  [Session 1].[Host A].Frequency
  Session 2.Host A.Frequency
  [Session 1].Host B.Frequency
  Session 2.Host B.Frequency
  [Session 1].Host C.Frequency
  Session 2.Host C.Frequency
  Numeric, minimum=0, maximum=0xFFFFFFFF
- **Host Name** *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [Session 1].[Host A].Host
  Session 2.Host A.Host
  [Session 1].Host B.Host
  Session 2.Host B.Host
  [Session 1].Host C.Host
  [Session 1].Host C.Host
  String, minimum length = 0, maximum length = 16 [null string]
- **Lan ID**
  [Session 1].[Host A].Lan
  Session 2.Host A.Lan
  [Session 1].Host B.Lan
  Session 2.Host B.Lan
  [Session 1].Host C.Lan
  Session 2.Host C.Lan
  Numeric, minimum = 0, maximum = 254 [0] *applies to 900 MHz*

▶ NOTE: *Values greater than 15 on terminals with OpenAir or 802.11 radios have a MOD 16 operation done on the terminals. For example, LAN IDs 0, 16, and 32 all equal 0 (zero).*

- **Mode**
  [Session 1].[Host A].Mode
  Session 2.Host A.Mode
  [Session 1].Host B.Mode
  Session 2.Host B.Mode
  [Session 1].Host C.Mode
  Session 2.Host C.Mode
  For 900 MHz radio:
  DS 225K
  DS 090K
  DS 450K
  For S-UHF radio:
  Freq Agility
  Single Freq

- **Port Number**
  [Session 1].[Host A].Port Number
  Session 2.Host A.Port Number
  [Session 1].Host B.Port Number
  Session 2.Host B.Port Number
  [Session 1].Host C.Port Number
  Session 2.Host C.Port Number
  Numeric, minimum = 0, maximum = 65535 [0]

- **Radio Configuration Number**
  [Session 1].[Host A].Radio Config#
  Session 2.Host A.Radio Config#
  [Session 1].Host B.Radio Config#
  Session 2.Host B.Radio Config#
  [Session 1].Host C.Radio Config#
  Session 2.Host C.Radio Config#
  Numeric, minimum = 0, maximum = 255 [0]

- **Radio Number** (*same as unit number*)
  [Session 1].[Host A].Radio #
  Session 2.Host A.Radio #
  [Session 1].Host B.Radio #
  Session 2.Host B.Radio #
  [Session 1].Host C.Radio #
  Session 2.Host C.Radio #
  Numeric, minimum = 0, maximum = 127 [127]

- **Server IP**
  [Session 1].[Host A].Server IP
  Session 2.Host A.Server IP
  [Session 1].Host B.Server IP
  Session 2.Host B.Server IP
  [Session 1].Host C.Server IP
  Session 2.Host C.Server IP
  Numeric, minimum = 1, maximum = 16

- **SNA**
  [Session 1].SNA
  Session 2.SNA
  Enabled
  [Disabled]

- **Telnet**
  [Session 1].Telnet
  Session 2.Telnet
  [Enabled] *this default applies to the 6400 and 5055 TE over IP options, and to the 2415, 2425, 2435A, 2455, and 248*X
  [Disabled]

- **Terminal Type**
  [Session 1].[Host A].Terminal Type
  Session 2.Host A.Terminal Type
  [Session 1].Host B.Terminal Type
  Session 2.Host B.Terminal Type
  [Session 1].Host C.Terminal Type
  Session 2.Host C.Terminal Type
  Numeric, minimum = 0, maximum = 255

- **Unit Number** *(same as radio number)*
  [Session 1].[Host A].Unit #
  Session 2.Host A.Unit #
  [Session 1].Host B.Unit #
  Session 2.Host B.Unit #
  [Session 1].Host C.Unit #
  Session 2.Host C.Unit #
  Numeric, minimum = 0, maximum = 127 [127]

Bar Code Parameters

NOTE: *Bar code parameters apply to 6400, 5055, 59XX, 17XX, and 11XX Terminals unless otherwise noted. 2415, 2425, 2435A, 2455, 248X, and 5020 Terminals support only the "Code 39.Encoded" parameter.*

- **BC Type Character** *(not supported on the 5055)*
  [Session 1].BC Type Char
  Session 2.BC Type Char
  Enabled
  [Disabled]
- **Concatenate**
  [Session 1].Concatenate
  Session 2].Concatenate
  Enabled
  [Disabled]
- **MOD 10 Check**
  [Session 1].MOD 10 Check
  Session 2.MOD 10 Check
  Enabled
  [Disabled]
- **Redundancy** *(not supported on the 5055)*
  [Session 1].Redundancy
  Session 2.Redundancy
  Enabled
  [Disabled]
- **Scan All Fields**
  [Session 1].Scan All Flds
  Session 2.Scan All Flds
  Enabled
  [Disabled]
- **Scan Postamble Character**
  [Session 1].Scan PostChar
  Session 2.Scan PostChar
  Numeric, minimum = 0, maximum = 255 [0]
- **Scan Preamble Character**
  [Session 1].Scan PreChar
  Session 2.Scan PreChar
  Numeric, minimum = 0, maximum = 255 [0]
- **Scan Timeout** (*not supported on the 6400 and 5055*)
  [Session 1].Scan Timeout
  Session 2.Scan Timeout
  Numeric, minimum = 1, maximum = 200 [30]

- **Scanner Type** *(6400 and 5055 support Laser only)*
  [Session 1].Scanner Type
  Session 2.Scanner Type
  [No Scanner]
  Wand
  Laser
  Wand Emulate
  Auto Detect
- **Stream Scan**
  [Session 1].Stream Scan
  Session 2.Stream Scan
  Enabled
  [Disabled]

Bar Code Symbologies

- **ABC Codabar**
  [Session 1].ABC Codabar
  Session 2.ABC Codabar
  Enabled
  [Disabled]
- **Codabar**
  [Session 1].Codabar
  Session 2.Codabar
  Enabled
  [Disabled]
- **Code 11** *(not supported on the 6400 and 5055)*
  [Session 1].Code 11
  Session 2.Code 11
  Enabled
  [Disabled]
- **Code 93**
  [Session 1].Code 93
  Session 2.Code 93
  Enabled
  [Disabled]
- **Code 39**
  [Session 1].Code 39
  Session 2.Code 39
  Enabled
  [Disabled]
- **Code 128**
  [Session 1].Code 128
  Session 2.Code 128
  Enabled
  [Disabled]
- **Computer Identics 2 of 5**
  [Session 1].CI 2of5
  Session 2.CI 2of5
  Enabled
  [Disabled]

- **EAN**
  [Session 1].EAN
  Session 2.EAN
  Enabled
  [Disabled]
- **Interleaved 2 of 5**
  [Session 1].Int 2of5
  Session 2.Int 2of5
  Enabled
  [Disabled]
- **Plessey** *(6400 does not support Plessey alpha characters)*
  [Session 1].Plessey
  Session 2.Plessey
  Enabled
  [Disabled]
- **Straight 2 of 5**
  [Session 1].Str 2of5
  Session 2.Str 2of5
  Enabled
  [Disabled]
- **UPC**
  [Session 1].UPC
  Session 2.UPC
  Enabled
  [Disabled]

Generic Bar Code Options

- **Drop Leading**
  [Session 1].UPC.Drop Leading
  Session 2.UPC.Drop Leading
  [Session 1].EAN.Drop Leading
  Session 2.EAN.Drop Leading
  [Session 1].Code 128.Drop Leading
  Session 2.Code 128.Drop Leading
  [Session 1].Code 39.Drop Leading
  Session 2.Code 39.Drop Leading
  [Session 1].Codabar.Drop Leading
  Session 2.Codabar.Drop Leading
  [Session 1].ABC Codabar.Drop Leading
  Session 2.ABC Codabar.Drop Leading
  [Session 1].Str 2of5.Drop Leading
  Session 2.Str 2of5.Drop Leading
  [Session 1].Int 2of5.Drop Leading
  Session 2.Int 2of5.Drop Leading
  [Session 1].CI 2of5.Drop Leading
  Session 2.CI 2of5.Drop Leading
  [Session 1].Code 11.Drop Leading
  Session 2.Code 11.Drop Leading
  [Session 1].Code 93.Drop Leading
  Session 2.Code 93.Drop Leading
  [Session 1].Plessey.Drop Leading
  Session 2.Plessey.Drop Leading
  Numeric, minimum = 0 [0], maximum = 15 [0]

▶ **NOTE:** *Generic bar code options must be qualified by one of the bar code symbology strings. For example: "Session 1.UPC.Max Length = 13;"*

- **Drop Trailing**
  [Session 1].UPC.Drop Trailing
  Session 2.UPC.Drop Trailing
  [Session 1].EAN.Drop Trailing
  Session 2.EAN.Drop Trailing
  [Session 1].Code 128.Drop Trailing
  Session 2.Code 128.Drop Trailing
  [Session 1].Code 39.Drop Trailing
  Session 2.Code 39.Drop Trailing
  [Session 1].Codabar.Drop Trailing
  Session 2.Codabar.Drop Trailing
  [Session 1].ABC Codabar.Drop Trailing
  Session 2.ABC Codabar.Drop Trailing
  [Session 1].Str 2of5.Drop Trailing
  Session 2.Str 2of5.Drop Trailing
  [Session 1].Int 2of5.Drop Trailing
  Session 2.Int 2of5.Drop Trailing
  [Session 1].CI 2of5.Drop Trailing
  Session 2.CI 2of5.Drop Trailing
  [Session 1].Code 11.Drop Trailing
  Session 2.Code 11.Drop Trailing
  [Session 1].Code 93.Drop Trailing
  Session 2.Code 93.Drop Trailing
  [Session 1].Plessey.Drop Trailing
  Session 2.Plessey.Drop Trailing
  Numeric, minimum = 0 [0], maximum = 15 [0]
- **Fix Length 1**
  [Session 1].UPC.Fix Length 1
  Session 2.UPC.Fix Length 1
  [Session 1].EAN.Fix Length 1
  Session 2.EAN.Fix Length 1
  [Session 1].Code 128.Fix Length 1
  Session 2.Code 128.Fix Length 1
  [Session 1].Code 39.Fix Length 1
  Session 2.Code 39.Fix Length 1
  [Session 1].Codabar.Fix Length 1
  Session 2.Codabar.Fix Length 1
  [Session 1].ABC Codabar.Fix Length 1
  Session 2.ABC Codabar.Fix Length 1
  [Session 1].Str 2of5.Fix Length 1
  Session 2.Str 2of5.Fix Length 1
  [Session 1].Int 2of5.Fix Length 1
  Session 2.Int 2of5.Fix Length 1
  [Session 1].CI 2of5.Fix Length 1
  Session 2.CI 2of5.Fix Length 1
  [Session 1].Code 11.Fix Length 1
  Session 2.Code 11.Fix Length 1
  [Session 1].Code 93.Fix Length 1
  Session 2.Code 93.Fix Length 1
  [Session 1].Plessey.Fix Length 1
  Session 2.Plessey.Fix Length 1
  Numeric, minimum = 0 [0], maximum = 99 [0]

- **Fixed Length 2**
  [Session 1].UPC.Fix Length 2
  Session 2.UPC.Fix Length 2
  [Session 1].EAN.Fix Length 2
  Session 2.EAN.Fix Length 2
  [Session 1].Code 128.Fix Length 2
  Session 2.Code 128.Fix Length 2
  [Session 1].Code 39.Fix Length 2
  Session 2.Code 39.Fix Length 2
  [Session 1].Codabar.Fix Length 2
  Session 2.Codabar.Fix Length 2
  [Session 1].ABC Codabar.Fix Length 2
  Session 2.ABC Codabar.Fix Length 2
  [Session 1].Str 2of5.Fix Length 2
  Session 2.Str 2of5.Fix Length 2
  [Session 1].Int 2of5.Fix Length 2
  Session 2.Int 2of5.Fix Length 2
  [Session 1].CI 2of5.Fix Length 2
  Session 2.CI 2of5.Fix Length 2
  [Session 1].Code 11.Fix Length 2
  Session 2.Code 11.Fix Length 2
  [Session 1].Code 93.Fix Length 2
  Session 2.Code 93.Fix Length 2
  [Session 1].Plessey.Fix Length 2
  Session 2.Plessey.Fix Length 2
  Numeric, minimum = 0 [0], maximum = 99 [0]
- **Fixed Length 3**
  [Session 1].UPC.Fix Length 3
  Session 2.UPC.Fix Length 3
  [Session 1].EAN.Fix Length 3
  Session 2.EAN.Fix Length 3
  [Session 1].Code 128.Fix Length 3
  Session 2.Code 128.Fix Length 3
  [Session 1].Code 39.Fix Length 3
  Session 2.Code 39.Fix Length 3
  [Session 1].Codabar.Fix Length 3
  Session 2.Codabar.Fix Length 3
  [Session 1].ABC Codabar.Fix Length 3
  Session 2.ABC Codabar.Fix Length 3
  [Session 1].Str 2of5.Fix Length 3
  Session 2.Str 2of5.Fix Length 3
  [Session 1].Int 2of5.Fix Length 3
  Session 2.Int 2of5.Fix Length 3
  [Session 1].CI 2of5.Fix Length 3
  Session 2.CI 2of5.Fix Length 3
  [Session 1].Code 11.Fix Length 3
  Session 2.Code 11.Fix Length 3
  [Session 1].Code 93.Fix Length 3
  Session 2.Code 93.Fix Length 3
  [Session 1].Plessey.Fix Length 3
  Session 2.Plessey.Fix Length 3
  Numeric, minimum = 0 [0], maximum = 99 [0]

- **Fixed Length 4**
  [Session 1].UPC.Fix Length 4
  Session 2.UPC.Fix Length 4
  [Session 1].EAN.Fix Length 4
  Session 2.EAN.Fix Length 4
  [Session 1].Code 128.Fix Length 4
  Session 2.Code 128.Fix Length 4
  [Session 1].Code 39.Fix Length 4
  Session 2.Code 39.Fix Length 4
  [Session 1].Codabar.Fix Length 4
  Session 2.Codabar.Fix Length 4
  [Session 1].ABC Codabar.Fix Length 4
  Session 2.ABC Codabar.Fix Length 4
  [Session 1].Str 2of5.Fix Length 4
  Session 2.Str 2of5.Fix Length 4
  [Session 1].Int 2of5.Fix Length 4
  Session 2.Int 2of5.Fix Length 4
  [Session 1].CI 2of5.Fix Length 4
  Session 2.CI 2of5.Fix Length 4
  [Session 1].Code 11.Fix Length 4
  Session 2.Code 11.Fix Length 4
  [Session 1].Code 93.Fix Length 4
  Session 2.Code 93.Fix Length 4
  [Session 1].Plessey.Fix Length 4
  Session 2.Plessey.Fix Length 4
  Numeric, minimum = 0 [0], maximum = 99 [0]
- **Maximum Length**
  [Session 1].UPC.Max Length
  Session 2.UPC.Max Length
  [Session 1].EAN.Max Length
  Session 2.EAN.Max Length
  [Session 1].Code 128.Max Length
  Session 2.Code 128.Max Length
  [Session 1].Code 39.Max Length
  Session 2.Code 39.Max Length
  [Session 1].Codabar.Max Length
  Session 2.Codabar.Max Length
  [Session 1].ABC Codabar.Max Length
  Session 2.ABC Codabar.Max Length
  [Session 1].Str 2of5.Max Length
  Session 2.Str 2of5.Max Length
  [Session 1].Int 2of5.Max Length
  Session 2.Int 2of5.Max Length
  [Session 1].CI 2of5.Max Length
  Session 2.CI 2of5.Max Length
  [Session 1].Code 11.Max Length
  Session 2.Code 11.Max Length
  [Session 1].Code 93.Max Length
  Session 2.Code 93.Max Length
  [Session 1].Plessey.Max Length
  Session 2.Plessey.Max Length
  Numeric, minimum = 0 [0], maximum = 99 [0]

- **Minimum Length**
  [Session 1].UPC.Min Length
  Session 2.UPC.Min Length
  [Session 1].EAN.Min Length
  Session 2.EAN.Min Length
  [Session 1].Code 128.Min Length
  Session 2.Code 128.Min Length
  [Session 1].Code 39.Min Length
  Session 2.Code 39.Min Length
  [Session 1].Codabar.Min Length
  Session 2.Codabar.Min Length
  [Session 1].ABC Codabar.Min Length
  Session 2.ABC Codabar.Min Length
  [Session 1].Str 2of5.Min Length
  Session 2.Str 2of5.Min Length
  [Session 1].Int 2of5.Min Length
  Session 2.Int 2of5.Min Length
  [Session 1].CI 2of5.Min Length
  Session 2.CI 2of5.Min Length
  [Session 1].Code 11.Min Length
  Session 2.Code 11.Min Length
  [Session 1].Code 93.Min Length
  Session 2.Code 93.Min Length
  [Session 1].Plessey.Min Length
  Session 2.Plessey.Min Length
  Numeric, minimum = 0 [0], maximum = 99 [0]

UPC Options

- **Add-On 2**
  [Session 1].UPC.Add-On 2
  Session 2.UPC.Add-On 2
  Enabled
  [Disabled]
- **Add-On 5**
  [Session 1].UPC.Add-On 5
  Session 2.UPC.Add-On 5
  Enabled
  [Disabled]
- **Expand E to A**
  [Session 1].UPC.Expand E to A
  Session 2.UPC.Expand E to A
  Enabled
  [Disabled]
- **System 0 UPCE**
  [Session 1].UPC.Sys 0 UPCE
  Session 2.UPC.Sys 0 UPCE
  Enabled
  [Disabled]
- **System 1 UPCE** *(not supported on the 6400)*
  [Session 1].UPC.Sys 1 UPCE
  Session 2.UPC.Sys 1 UPCE
  Enabled
  [Disabled]

EAN Options

- **Add-On 2**
  [Session 1].EAN.Add-On 2
  Session 2.EAN.Add-On 2
  Enabled
  [Disabled]
- **Add-On 5**
  [Session 1].EAN.Add-On 5
  Session 2.EAN.Add-On 5
  Enabled
  [Disabled]
- **Expand 8 to 13**
  [Session 1].EAN.Expand 8to13
  Session 2.EAN.Expand 8to13
  Enabled
  [Disabled]

Code 39 Options

- **Auto-Encoded**
  [Session 1].Code 39.Auto-Encoded
  Session 2.Code 39.Auto-Encoded
  Enabled
  [Disabled]
- **Check Digit**
  [Session 1].Code 39.Chk Digit
  Session 2.Code 39.Chk Digit
  Enabled
  [Disabled]
- **Data Decode**
  [Session 1].Code 39.Data decode
  Session 2.Code 39.Data decode
  Enabled
  [Disabled]
- **Element Decode**
  [Session 1].Code 39.Element decod
  Session 2.Code 39.Element decod
  Enabled
  [Disabled]
- **Encoded**
  [Session 1].Code 39.Encoded
  Session 2.Code 39.Encoded
  Enabled
  [Disabled]
- **Extended**
  [Session 1].Code 39.Extended
  Session 2.Code 39.Extended
  Enabled
  [Disabled]
- **Full ASCII**
  [Session 1].Code 39.Full ASCII
  Session 2.Code 39.Full ASCII
  Enabled
  [Disabled]

- **Quiet Zone**
  [Session 1].Code 39.Quiet zone
  Session 2.Code 39.Quiet zone
  Enabled
  [Disabled]
- **START Decode**
  [Session 1].Code 39.START decode
  Session 2.Code 39.START decode
  Enabled
  [Disabled]

Interleaved 2 of 5 Option

- **Interleaved 2 of 5 Chk Digit**
  [Session 1].Int 2of5.Chk Digit
  Session 2.Int 2of5.Chk Digit
  Enabled
  [Disabled]

Code 11 Options

- **Check Digit 1** (*not supported on the 6400*)
  [Session 1].Code 11.Chk Dig 1
  Session 2.Code 11.Chk Dig 1
  Enabled
  [Disabled]
- **Check Digit 2** *(not supported on the 6400)*
  [Session 1].Code 11.Chk Dig 2
  Session 2.Code 11.Chk Dig 2
  Enabled
  [Disabled]

Plessey Options

- **Allow Alpha**
  [Session 1].Plessey.Allow Alpha
  Session 2.Plessey.Allow Alpha
  Enabled
  [Disabled]
- **MOD 10 Check**
  [Session 1].Plessey.MOD10 Chk
  Session 2.Plessey.MOD10 Chk
  Enabled
  [Disabled]
- **MOD 11 Check**
  [Session 1].Plessey.MOD11 Chk
  Session 2.Plessey.MOD11 Chk
  Enabled
  [Disabled]

Code 128 Options

- **UCC/EAN**
  [Session 1].Code 128.UCC/EAN
  Session 2.Code 128.UCC/EAN
  Enabled
  [Disabled]
- **No UCC Type**
  [Session 1].Code 128.NO UCC Type
  Session 2.Code 128.NO UCC Type
  Enabled
  [Disabled]
- **UCC F1 Value**
  [Session 1].UPC.UCC F1 Value
  Session 2.UPC.UCC F1 Value
  [Session 1].EAN.UCC F1 Value
  Session 2.EAN.UCC F1 Value
  [Session 1].Code 128.UCC F1 Value
  Session 2.Code 128.UCC F1 Value
  [Session 1].Code 39.UCC F1 Value
  Session 2.Code 39.UCC F1 Value
  [Session 1].Codabar.UCC F1 Value
  Session 2.Codabar.UCC F1 Value
  [Session 1].ABC Codabar.UCC F1 Value
  Session 2.ABC Codabar.UCC F1 Value
  [Session 1].Str 2of5.UCC F1 Value
  Session 2.Str 2of5.UCC F1 Value
  [Session 1].Int 2of5.UCC F1 Value
  Session 2.Int 2of5.UCC F1 Value
  [Session 1].CI 2of5.UCC F1 Value
  Session 2.CI 2of5.UCC F1 Value
  [Session 1].Code 11.UCC F1 Value
  Session 2.Code 11.UCC F1 Value
  [Session 1].Code 93.UCC F1 Value
  Session 2.Code 93.UCC F1 Value
  [Session 1].Plessey.UCC F1 Value
  Session 2.Plessey.UCC F1 Value
  Numeric, minimum = 0 [0], maximum = 255

VT/ANSI Protocol Options

- **AnswerBack**
  [Session 1].AnswerBack
  Session 2.AnswerBack
  String, minimum length=0, maximum length = 30
  [null string, not defined]
- **Auto Enter Scan**
  [Session 1].Auto Entr Scn
  Session 2.Auto Entr Scn
  Enabled
  [Disabled]
- **Auto Tab Scan**
  [Session 1].Auto Tab Scan
  Session 2.Auto Tab Scan
  Enabled
  [Disabled]

- **CR to CRLF**
  [Session 1].CR to CRLF
  Session 2.CR to CRLF
  Enabled
  [Disabled]
- **DEL to BS**
  [Session 1].DEL to BS
  Session 2.DEL to BS
  Enabled
  [Disabled]
- **Discrete Bells** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].DiscreteBells
  Session 2.DiscreteBells
  Enabled
  [Disabled]
- **Extended Commands**
  [Session 1].Extended Cmds
  Session 2.Extended Cmds
  Enabled
  [Disabled]
- **Host View Columns**
  [Session 1].Host View Cols
  Session 2.Host View Cols
  Numeric, minimum = 1, maximum = 255 [24]
- **Host View Rows**
  [Session 1].Host View Rows
  Session 2.Host View Rows
  Numeric, minimum = 1, maximum = 255 [80]
- **Keypad Mode**
  [Session 1].Keypad Mode
  Session 2.Keypad Mode
  [Numeric]
  Application
- **Local Echo**
  [Session 1].Local Echo
  Session 2.Local Echo
  Enabled
  [Disabled]
- **Lock Mode**
  [Session 1].Lock Mode
  Session 2.Lock Mode
  Enabled
  [Disabled]
- **RS-232 Baud Rate** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].RS232 BaudRate
  Session 2.RS232 BaudRate
  1200
  2400
  4800
  [9600]
  19200
  38400

- **RS-232 Data Bits** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].RS232 DataBits
  Session 2.RS232 DataBits
  7
  [8]
- **RS-232 Flow** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].RS232 Flow
  Session 2.RS232 Flow
  [NONE]
  DTR
  XON/XOFF
- **RS-232 Parity** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].RS232 Parity
  Session 2.RS232 Parity
  [NONE]
  EVEN
  ODD
- **RS-232 Stop Bits** *(not supported on 2415, 2425, 2435A, 2455, 248X, 5020)*
  [Session 1].RS232 StopBits
  Session 2.RS232 StopBits
  [1]
  2
- **RS-232 Stream** *(not supported on 6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [Session 1].RS232 Stream
  Session 2.RS232 Stream
  Enabled
  [Disabled]
- **Screen Lock**
  [Session 1].Screen Lock
  Session 2.Screen Lock
  Enabled
  [Disabled]
- **Send XON**
  [Session 1].Send XON
  Session 2.Send XON
  [Enabled]
  Disabled
- **Terminal Mode**
  [Session 1].Terminal Mode
  Session 2.Terminal Mode
  [7-Bit]
  8-Bit
- **Terminal Setup**
  [Session 1].Term Setup
  Session 2.Term Setup
  ANSI
  VT100
  VT220
  VT320
  [VT340]

- **VT Cursor Mode**
  [Session 1].VT Cursor Mode
  Session 2.VT Cursor Mode
  [Cursor]
  Application
- **VT220 Mode**
  [Session 1].VT220 Mode
  Session 2.VT220 Mode
  [Char]
  Block
- **Transmit BS**
  [Session 1].Transmit BS
  Session 2.Transmit BS
  Enabled
  [Disabled]
- **Use PC Character Set**
  [Session 1].Use PC Char Set
  Session 2.Use PC Char Set
  Enabled
  [Disabled]
- **Allow Negotiate About Window Size (NAWS)**
  [Session 1].Allow NAWS
  Session 2.Allow NAWS
  Enabled
  [Disabled]

Display Options

NOTE: *Display options do not apply to the 2415, 2425, 2435A, 2455, and 248X Terminals, Use the Trakker Antares firmware setup menu to set the display options.*

- **Backlight State**
  [Session 1].Backlight State
  Session 2.Backlight State
  Enabled
  [Disabled]
- **Backlight Timer** *(6400, 17XX, 11XX)*
  [Session 1].Backlight Timer
  Session 2.Backlight Timer
  Numeric, minimum = 0, maximum = 255
- **Contrast Mode** *(59XX, 17XX, 11XX)*
  [Session 1].Contrast Mode
  Session 2.Contrast Mode
  [Compensated]
  Absolute
- **Cursor Mode**
  [Session 1].Cursor Mode
  Session 2.Cursor Mode
  Underln Blink
  Block Blink
  Underline
  [Block]

- **Remote Baud** *(17XX, 11XX)*
  [Session 1].Remote Baud
  Session 2.Remote Baud
  9600
  19200
  [38400]
- **Remote Display** *(17XX, 11XX)*
  [Session 1].Remote Disp
  Session 2.Remote Disp
  Enabled
  [Disabled]
- **Remote Display Remote Columns** (*17XX, 11XX*)
  Session 1.Remote Cols
  Session 2.Remote Cols
  Numeric, minimum = 1, maximum = 255 [80]
- **Remote Display Remote Rows** (*17XX, 11XX*)
  [Session 1].Remote Rows
  Session 2.Remote Rows
  Numeric, minimum = 1, maximum = 255 [24]
- **Remote Display Remote Type** (*17XX, 11XX*)
  [Session 1].Remote Type
  Session 2.Remote Type
  VT100
  VT220
  [ANSI]

Radio Communications Options

NOTE: *Radio Communications options do not apply to the 2415, 2425, 2435A, 2455, 248X, 5020 Terminals. Set the Security ID for these terminals through the TRAKKER Antares 2400 Menu System.*

- **Baud Rate** *(UHF radio)*
  Radio Baud Rate
  4800
  4800/9600
  9600
  The default depends on the type of radio in the terminal.
- **Protocol** *(6400, 5055, 59XX, 17XX, 11XX)*
  Radio Protocol
  The following qualifiers apply to UHF:
  RTC
  Adaptive Poll
  RTC-Diag Mode
  The following qualifiers apply to SST:
  SST
  SST-Diag Mode
  The default depends on the type of radio and is either RTC or SST.
- **Security ID**
  [Session 1].Security ID
  Session 2.Security ID
  String, minimum length=0, maximum length=16 [null string]
  Default is NORANDOWL for 6400, 5055, 17XX, 11XX, 59XX.

More Options

- **Change Menu Password**
  *The password must be **enabled** and **set** for access to the Main Menu before you can change it. To set the password:*
  [Session 1].Change Menu Password
  Session 2.Change Menu Password
  String, minimum length = 1, maximum length = 10 [3193693]
  To enable the password, see "Main Menu password."
- **COM Select** *(5055)*
  [Session 1].Com Select
  Session 2.Com Select
  [COM 1]
  COM 2
- **Main Menu Password**
  *The password must be **enabled** and **set** for access to the Main Menu. To enable or disable the password:*
  [Session 1].Menu Password
  Session 2.Menu Password
  Enabled
  [Disabled]
  To set the password, see "Change menu password".
- **Print Device** *(6400)*
  [Session 1].Print Device
  Session 2.Print Device
  [RS232 Print]
  IRDA Print

LCD Options

- **Annunciator Format**
  [Session 1].Annun Format
  Session 2.Annun Format
  [Vertical] *2455, 248X, 59XX, 5055, 5020*
  [Horizontal] *2415, 2425, 2435A, 6400*
- **Annunciator Position**
  [Session 1].Annun Position
  Session 2.Annun Position
  Upper Right
  Upper Left
  [Lower Right]
  Lower Left
  Stealth
- **Backlight Intensity** *(59XX)*
  [Session 1].BLight Intensity
  Session 2.BLight Intensity
  Numeric, minimum = 0, maximum = 15
- **Define Height (Scroll Window)**
  [Session 1].Define Height
  Session 2.Define Height
  Numeric, minimum = 1, maximum = 24 [8]
- **Define Width (Scroll Window)**
  [Session 1].Define Width
  Session 2.Define Width
  Numeric, minimum = 1, maximum = 80 [8]

- **Key Uppercase** *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [Session 1].Key Uppercase
  Session 2.Key Uppercase
  [Enabled]
  Disabled
- **LCD Contrast** *(59XX, 17XX)*
  [Session 1].LCD Contrast
  Session 2.LCD Contrast
  Numeric, minimum = 0, maximum = 255
- **Screen Mode**
  [Session 1].Screen Mode
  Session 2.Screen Mode
  Center Cursor
  [Corner Mode]
  Page Mode
  Lazy Mode
  Locked Mode
- **Screen Columns**
  [Session 1].Screen Cols
  Session 2.Screen Cols
  Numeric, minimum = 1, maximum = 255
  [16] *11XX*
  [17] *17XX*
  [19] *2435A*
  [20] *2415, 2425, 2455, 248X*
  [40] *59XX*
  [80] *5055*
  [16] *6400 wide display, 5020*
- **Screen Rows** *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [Session 1].Screen Rows
  Session 2.Screen Rows
  Numeric, minimum = 1, maximum = 255
  [8] *11XX*
  [8] *17XX*
  [10] *59XX*
  [16] *2415, 2425, 2435A, 2455, 248X*
  [25] *5055*
  [16] *6400 wide display, 5020*
- **Scroll Window**
  [Session 1].Scroll Window
  Session 2.Scroll Window
  Screen Size
  Scroll Setting
  [Tab Size]

Beeper Setup Options

NOTE: *Beeper setup options do not apply to the 2415, 242X, 2435A, 245X, and 248X Terminals)*

- **Beep Head Set** *(17XX)*
  [Session 1].Beep Head Set
  Session 2.Beep Head Set
  Enabled
  [Disabled]

- **Beep Internal** *(not supported on the 59XX)*
  [Session 1].Beep Internal
  Session 2.Beep Internal
  [Enabled]
  Disabled
- **Beeper (Error Tone) Frequency** *(not supported on the 59XX)*
  [Session 1].Beep Frequency
  Session 2.Beep Frequency
  Numeric, minimum = 0, maximum = 30
  [13] *11XX and 17XX*
  [6] *6400*
- **Beeper (Error Tone) Length**
  [Session 1].Beep Length
  Session 2.Beep Length
  Numeric, minimum= 1 , maximum= 10 [3]
- **Beeper (Error Tone) Volume** *(59XX)*
  [Session 1].Beep Volume
  Session 2.Beep Volume
  Numeric, minimum = 0, maximum = 255
  [95]
- **Key Click Frequency** *(not supported on the 59XX)*
  [Session 1].KeyClick Freq
  Session 2.KeyClick Freq
  Numeric, minimum = 0, maximum = 30
  [13] *17XX and 11XX*
  [6] *6400*
- **Key Click Length**
  [Session 1].KeyClick Length
  Session 2.KeyClick Length
  Numeric, minimum = 1, maximum = 10
  [1] *59XX, 17XX, and 11XX*
  [6] *6400 and 5055*
- **Key Click Volume** *(59XX)*
  [Session 1].KeyClick Volume
  Session 2.KeyClick Volume
  Numeric, minimum = 0, maximum = 255
  [95]

More (Main Menu 2) Option

- **Foreground Session**
  Foreground Sess
  [Session 1]
  Session 2 *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
- **Set Hot Key** *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
  [Session 1].Set Hot Key
  Session 2.Set Hot Key
  F1
  through
  F24
  [Disabled]

- **Type-Ahead**
  [Session 1].Type-Ahead
  Session 2.Type-Ahead
    [Enabled]
    Disabled

Additional Parameters

The following parameters do not have equivalent TE configuration menu options.

- **Alternate Screen Columns** (*6400, 5055, 17XX)*
  [Session 1].Alt Screen Cols
  Session 2.Alt Screen Cols
    Numeric, minimum = 1, maximum = 255
    [17] *17XX*
    [40] *5055*
    [16] *6400*
- **Alternate Screen Rows** (*6400, 5055, 17XX)*
  [Session 1].Alt Screen Rows
  Session 2.Alt Screen Rows
    Numeric, minimum = 1, maximum = 255
    [8] *17XX*
    [12] *5055*
    [16] *6400 wide display*
- **Double Byte Character Set (DBCS) Code** *(59XX)*
  [Session 1].DBCS Code
  Session 2.DBCS Code
    Numeric, minimum = 0, maximum = 16 [0]
- **Key Repeat** *(59XX only)*
  [Session 1].Key Repeat
  Session 2.Key Repeat
    Enabled
    [Disabled]
- **Program Name** *(appears on the initialization and version screens)*
  Program Name
    String, minimum length = 8, maximum length = 8 [FWP???H?]
- **Program Version** *(appears on the initialization and version screens)*
  Program Version
    String, minimum length = 4, maximum length = 4 [?.??]
- **Return Result** *(this is a test feature for VT/ANSI emulation; if disabled, extended commands (for #K only) will not return a result to the host application)*
  Return Result
    [Enabled]
    Disabled
- **Set-Up Parms Menu Password**
  [Session 1].Password
  Session 2.Password
    String, minimum length = 1, maximum length = 10 [CR52401]

Changing Text

Modify CFGLIT.DAT to change the text of TE configuration menus, configuration parameters, or system messages. This file contains the strings that appear in the configuration menus, parameter set-up files, and system messages.

An identification (ID) number identifies each literal string. To create your own literal file, you create a text file that associates these numbers with the actual literal strings. You then use MAKELIT.EXE to convert the text file to a format the configuration program can use.

Each line in the literal text file begins with the literal ID number. After the ID number, you type the quoted string that is used when that ID number is referenced. If you omit an ID number, its string appears as "Bad Literal File" when you run the program in the terminal.

Literal ID numbers are available upon request from Intermec. Contact your Intermec representative for more information about ID numbers.

You can create a sample file containing the default literal strings using MAKELIT.EXE to "reverse engineer" the standard CFGLIT.DAT file. To do this, type the following command line to unpack CFGLIT.DAT into a CFGLIT.TXT text file:

```
makelit -r cfglit.dat cfglit.txt
```

The CFGLIT.TXT file this command creates contains all the default strings the configuration program uses. One line in CFGLIT.TXT looks like this:

```
0x2f10 "RS232 PORT\nIN USE\n\nPLEASE WAIT!"
```

"0x2f10" is the literal ID number for the RS-232 port-in-use message that appears when a personal computer sends an RS-232 command to the TE program. The message text follows the ID number in a quoted string. The embedded "\n" sequence within the quoted string indicates a "new line" character and outputs a carriage return/line feed. To change the text of the message that appears, change the quoted string. For example, change the above line to look like this:

```
0x2f10 "Printing\nPlease Wait!"
```

When you have a text file with one line for every ID number, use MAKELIT.EXE to convert the file to an indexed literal file. If your text file is named CFGLIT.TXT, you would type the following command which creates the new literal CFGLIT.DAT file. For instructions on how to download the file, see *"Downloading Files"* on page 5-41.

```
makelit cfglit.txt cfglit.dat
```

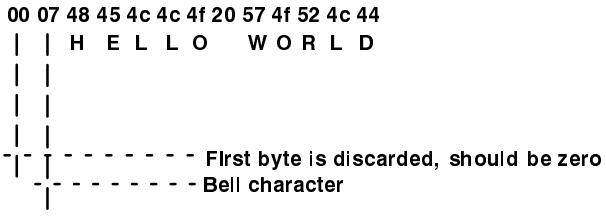
Preinitializing the VT/ANSI TE Program

You can preinitialize the VT/ANSI TE program. You must name the VT/ANSI initialization file as VT220.INI. The file is processed when you reset or warm start the terminal. The file is processed as if the radio had received the data, and must be in the "on-air" format. For instructions on how to download the file, see *"Downloading Files"* on page 5-41.

Data is encoded in binary format. To create VT220.INI, you may need a HEX editor or other special program.

VT220.INI starts with a single byte that the terminal ignores. This byte should always be 0 (zero). The remainder of the file contains standard VT/ANSI terminal escape sequences.

The following example shows how to display "HELLO WORLD" and beep the beeper from within a data stream initialization file. The line of hexadecimal digits represent the binary values that must be stored in the initialization files.



Remapping the Terminal's Keys

You may need to remap the terminal's keys if your users need to press a key in VT/ANSI TE that is not on a standard 101-key keyboard. You can also remap a terminal key to transmit a text string or message to the personal computer.

To remap the terminal keys, you create the REMAP.CFG file and add a Remap command to remap a terminal key. You can remap a single key or a two-key sequence. You can add a Remap command or create a macro in the REMAP.CFG file that remaps a single key or a two-key sequence.

You can remap any terminal key or two-key sequence that does not perform a specific function on the terminal. For example, you can remap the [B] key because it only types the lowercase letter B.

▶ **NOTE:** *On the 2425, 2455, and 248X, you cannot remap the two-key sequence [f] ◢ because it moves the window/viewport up on the Trakker Antares Terminals.*

Each terminal key or two-key sequence generates a 4-digit hexadecimal remap code as listed in the Key Code Table starting on page 5-37. The key code table gives the 4-digit hexadecimal codes for ASCII characters for the terminals. These codes identify the key or keys pressed. For example:

Key	Action	4-Digit Hex Key Code
[B]	Types a lowercase B	0062
[SHIFT] [B]	Types an uppercase B	0042

Remapping a Key or Two-Key Sequence

▶ **NOTE:** *For terminals made before 1997, refer to the "Using FLSHCONV" section for the proper –e parameter value.*

1. Choose the key or two-key sequence to remap and determine the current 4-digit hexadecimal code of the keys and the code you will enter to remap the keys. For help, see the Key Code Table on the next page.
2. Connect the terminal to your personal computer.
3. Using any text editor, enter the keys you want remapped on individual lines in this format:
   `remap=<key>="string"`

   remap is the command you enter in REMAP.CFG.

   key is the 4-digit hexadecimal key or keys you are remapping.

   string is the new function for the key or keys. The string can be a text string, ASCII mnemonic, or another 2-byte hexadecimal code. Enclose the entire string in quotation marks.
4. Save the new file as REMAP.CFG.
5. Download REMAP.CFG to drive C on your terminal.

EXAMPLE 1: Suppose you want to remap "+" on your terminal to send a message and then enter a carriage return. In the REMAP.CFG file, add the following command:

```
remap=<002b>="My battery is low.<CR>"
```

EXAMPLE 2: To remap the function of the function keys to another key, replace *string* with the transmitted code for the function and replace *key* with the 4-digit hexadecimal key that will do the function. In the REMAP.CFG file, add the **`remap=<1031>="<ESC>OR<CR>"`** command. See Section 6, "Programming" to find the transmitted code for a key.

Creating a Macro

1. Using any text editor, add the **`macro=<key>="string"`** Macro command to the end of the REMAP.CFG file, where:

   macro is the command you enter in REMAP.CFG.

   key is the 4-digit hexadecimal key or keys you are remapping.

   string is the new action for the key or keys. The string can be a text string, ASCII mnemonic, or another 2-byte hexadecimal code. Enclose the entire string in quotation marks.
2. At the end of the macro, type **`runmacro=<key>`** where *key* is the 4-digit hexadecimal code that identifies the key or keys that activate the macro.
3. Save the file name as REMAP.CFG for the macros to work.
4. Append the new remap to the original hex file using one of the following commands. Replace ??? with your type of terminal:
   17XX, 11XX Terminals
   ```
   FLSHCONV -a –eFFC0 FWP1???H0.HEX REMAP.CFG –oNEW.HEX
   ```
   59XX Terminals
   ```
   FLSHCONV -a –eE000 FWP59??H0.HEX REMAP.CFG –oNEW.HEX
   ```
5. Download REMAP.CFG to drive C on your terminal.

EXAMPLE: You can assign "+" to activate a macro that remaps [B] to send the message, "Change the battery pack now." In the REMAP.CFG file, add the following command:

```
remap=<002b>="Change the battery pack now.<CR>"
```

Key Code Table

▶ **NOTE:** *Values that are not listed here may work but are not supported.*

```
remap=<0001>="string"   /*CTRL A*/
remap=<0002>="string"   /*CTRL B*/
remap=<0003>="string"   /*CTRL C*/
remap=<0004>="string"   /*CTRL D*/
remap=<0005>="string"   /*CTRL E*/
remap=<0006>="string"   /*CTRL F*/
remap=<0007>="string"   /*CTRL G*/
remap=<0008>="string"   /*CTRL H or Backspace key*/
remap=<0009>="string"   /*CTRL I or Tab key*/
remap=<000A>="string"   /*CTRL J*/
remap=<000B>="string"   /*CTRL K*/
remap=<000C>="string"   /*CTRL L*/
remap=<000D>="string"   /*CTRL M*/
remap=<000E>="string"   /*CTRL N*/
remap=<000F>="string"   /*CTRL O*/
remap=<0011>="string"   /*CTRL P*/
remap=<0012>="string"   /*CTRL Q*/
remap=<0013>="string"   /*CTRL R*/
remap=<0014>="string"   /*CTRL S*/
remap=<0015>="string"   /*CTRL T*/
remap=<0016>="string"   /*CTRL U*/
remap=<0017>="string"   /*CTRL V*/
remap=<0018>="string"   /*CTRL W*/
remap=<0019>="string"   /*CTRL X*/
remap=<001A>="string"   /*CTRL Y*/
remap=<001B>="string"   /*CTRL Z*/

remap=<0020>="string"   /* SPACE key */
remap=<0021>="string"   /* ! key */
remap=<0022>="string"   /* " key */
remap=<0023>="string"   /* # key */
remap=<0024>="string"   /* $ key */
remap=<0025>="string"   /* % key */
remap=<0026>="string"   /* & key */
remap=<0027>="string"   /* ' key */
remap=<0028>="string"   /* ( key */
remap=<0029>="string"   /* ) key */
remap=<002a>="string"   /* * key */
remap=<002b>="string"   /* + key */
remap=<002c>="string"   /* , key */
remap=<002d>="string"   /* - key */
remap=<002e>="string"   /* . key */
remap=<002f>="string"   /* / key */

remap=<0030>="string"   /* 0 key*/
remap=<0031>="string"   /* 1 key*/
remap=<0032>="string"   /* 2 key*/
remap=<0033>="string"   /* 3 key*/
remap=<0034>="string"   /* 4 key*/
remap=<0035>="string"   /* 5 key*/
remap=<0036>="string"   /* 6 key*/
remap=<0037>="string"   /* 7 key*/
```

```
remap=<0038>="string"   /* 8 key*/
remap=<0039>="string"   /* 9 key*/

remap=<003a>="string"   /* : key */
remap=<003b>="string"   /* ; key */
remap=<003c>="string"   /* < key */
remap=<003d>="string"   /* = key */
remap=<003e>="string"   /* > key */
remap=<003f>="string"   /* ? key */
remap=<0040>="string"   /* @ key */

remap=<0041>="string"   /* A key*/
remap=<0042>="string"   /* B key*/
remap=<0043>="string"   /* C key*/
remap=<0044>="string"   /* D key*/
remap=<0045>="string"   /* E key*/
remap=<0046>="string"   /* F key*/
remap=<0047>="string"   /* G key*/
remap=<0048>="string"   /* H key*/
remap=<0049>="string"   /* I key*/
remap=<004a>="string"   /* J key*/
remap=<004b>="string"   /* K key*/
remap=<004c>="string"   /* L key*/
remap=<004d>="string"   /* M key*/
remap=<004e>="string"   /* N key*/
remap=<004f>="string"   /* O key*/
remap=<0050>="string"   /* P key*/
remap=<0051>="string"   /* Q key*/
remap=<0052>="string"   /* R key*/
remap=<0053>="string"   /* S key*/
remap=<0054>="string"   /* T key*/
remap=<0055>="string"   /* U key*/
remap=<0056>="string"   /* V key*/
remap=<0057>="string"   /* W key*/
remap=<0058>="string"   /* X key*/
remap=<0059>="string"   /* Y key*/
remap=<005a>="string"   /* Z key*/

remap=<005b>="string"   /* [ key */
remap=<005c>="string"   /* \ key */
remap=<005d>="string"   /* ] key */
remap=<005e>="string"   /* ^ key */
remap=<005f>="string"   /* _ key */
remap=<0060>="string"   /* ` key */

remap=<0061>="string"   /* a key*/
remap=<0062>="string"   /* b key*/
remap=<0063>="string"   /* c key*/
remap=<0064>="string"   /* d key*/
remap=<0065>="string"   /* e key*/
remap=<0066>="string"   /* f key*/
remap=<0067>="string"   /* g key*/
remap=<0068>="string"   /* h key*/
remap=<0069>="string"   /* i key*/
remap=<006a>="string"   /* j key*/
remap=<006b>="string"   /* k key*/
remap=<006c>="string"   /* l key*/
remap=<006d>="string"   /* m key*/
```

```
remap=<006e>="string"   /* n key*/
remap=<006f>="string"   /* o key*/
remap=<0070>="string"   /* p key*/
remap=<0071>="string"   /* q key*/
remap=<0072>="string"   /* r key*/
remap=<0073>="string"   /* s key*/
remap=<0074>="string"   /* t key*/
remap=<0075>="string"   /* u key*/
remap=<0076>="string"   /* v key*/
remap=<0077>="string"   /* w key*/
remap=<0078>="string"   /* x key*/
remap=<0079>="string"   /* y key*/
remap=<007a>="string"   /* z key*/

remap=<007b>="string"   /* { key */
remap=<007c>="string"   /* | key */
remap=<007d>="string"   /* } key */
remap=<007e>="string"   /* ~ key */
remap=<007f>="string"   /* Del key */

remap=<1031>="string"   /* F1 key */
remap=<1032>="string"   /* F2 key */
remap=<1033>="string"   /* F3 key */
remap=<1034>="string"   /* F4 key */
remap=<1035>="string"   /* F5 key */
remap=<1036>="string"   /* F6 key */
remap=<1037>="string"   /* F7 key */
remap=<1038>="string"   /* F8 key */
remap=<1039>="string"   /* F9 key */

remap=<1042>="string"   /* Back Tab key */
remap=<1044>="string"   /* Del key */
remap=<1045>="string"   /* Enter key */
remap=<1049>="string"   /* Insert key */

remap=<104c>="string"   /* Window/viewport left key */
remap=<1055>="string"   /* Window/viewport up key */
remap=<1056>="string"   /* Window/viewport down key */
remap=<105a>="string"   /* Window/viewport right key */

remap=<1061>="string"   /* F10 key */
remap=<1062>="string"   /* F11 key */
remap=<1063>="string"   /* F12 key */
remap=<1064>="string"   /* F13 key */
remap=<1065>="string"   /* F15 key */
remap=<1066>="string"   /* F16 key */
remap=<1067>="string"   /* F17 key */
remap=<1068>="string"   /* F18 key */
remap=<1069>="string"   /* F19 key */
remap=<106a>="string"   /* F20 key */
remap=<106b>="string"   /* F21 key */
remap=<106c>="string"   /* F22 key */
remap=<106d>="string"   /* F23 key */
remap=<106e>="string"   /* F24 key */

remap=<2041>="string"   /* Auto-Login Restart key */
remap=<206c>="string"   /* Menu key */

remap=<304c>="string"   /* Page left key */
remap=<3055>="string"   /* Page up key */
```

```
remap=<3056>="string"   /* Page down key */
remap=<305a>="string"   /* Page right key */

remap=<6061>="string"   /* Find key */
remap=<6062>="string"   /* Insert here key */
remap=<6063>="string"   /* Remove key */
remap=<6064>="string"   /* Select key */
remap=<6065>="string"   /* Previous screen key */
remap=<6066>="string"   /* Next screen key */

remap=<6067>="string"   /* Keypad key */
remap=<6068>="string"   /* Keypad Enter key */
remap=<6069>="string"   /* Keypad 0 key */
remap=<606a>="string"   /* Keypad 1 key */
remap=<606b>="string"   /* Keypad 2 key*/
remap=<606c>="string"   /* Keypad 3 key*/
remap=<606d>="string"   /* Keypad 4 key*/
remap=<606e>="string"   /* Keypad 5 key*/
remap=<606f>="string"   /* Keypad 6 key*/
remap=<6070>="string"   /* Keypad 7 key*/
remap=<6071>="string"   /* Keypad 8 key*/
remap=<6072>="string"   /* Keypad 9 key*/
remap=<6073>="string"   /* Keypad . key*/
remap=<6077>="string"   /* Keypad - key*/
remap=<6078>="string"   /* Keypad + key*/
```

Remapping Characters

You can use display character translation files to remap characters as they are written to the display. The translation file name for VT/ANSI TE must be VT220.XLT. For instructions on how to download the file to the terminal, see "*Downloading Files*" on page 5-41.

Display character translation files are binary files consisting of ordered pairs of eight bit values. Each pair of values remaps a displayable character to a different displayable character.

- The first byte of a pair is the ASCII value of the character to be replaced.
- The second byte of a pair is the ASCII value that replaces the first.

These translations are only made when a character is written to a display device. If the character is sent to the host (such as keystroke or scan data) or sent to an external device (such as a printer), it is sent as the original, untranslated value.

Suppose you want a terminal running VT/ANSI emulation to replace the uppercase B with the Greek letter beta, and replace the uppercase Z with the Greek letter omega. Create a file named VT220.XLT that is four bytes long (two ordered pairs of two bytes each). The file should contain the 0x42, 0xE1, 0x5A, and 0xEA bytes in this order. These represent the ASCII display character set values for B, beta, Z, and omega, respectively.

Downloading Files

2415, 2425, 2435A, 2455, or 248X Terminal

You can use one of several methods to download a file to a 2415, 2425, 2435A, 2455, or 248X Terminal, including:

- LOADER.EXE file loader utility. *Note that using this utility will automatically restart the TE 2000 application.*
- T24FCOPY.EXE through a serial connection from your Trakker Antares terminal to your personal computer
- The Download Server feature on the DCS 300 to a Trakker Antares terminal loaded with UDP Plus
- A TFTP application on a personal computer or host to a Trakker Antares terminal loaded with TCP/IP

To use these methods, refer to your terminal's user manual for help.

To restart your TE application, do one of the following:

- Scan this bar code label:

  Reset Firmware

  -.

  You can also send the Reset Firmware command over the network. For help, refer to your terminal's user manual.

- Use the TRAKKER Antares 2400 Menu System to configure the Resume Execution command to resume "not allowed." Choose Terminal Menu from the Configuration Menu and then choose Power Management. Each time you press œ to turn on the Trakker Antares terminal, it boots and restarts your application. Refer to the terminal's user manual for information.
- Access the TRAKKER Antares 2400 Menu System and select the TE application through the File Manager option. For help, refer to your terminal's user manual.

The Trakker Antares terminal restarts your TE application using the configuration saved in CONFIG.DAT.

5020 Data Collection PC

From your web browser, use the *ftp://<IP address>* URL to download files.

6400 Computer or 5055 Data Collection PC

Before you can download a file to a 6400 Computer or , configure INTERLNK on a desktop or laptop PC. INTERLNK, part of MS-DOS, is a device driver that connects your 6400 Computer or 5055 Data Collection PC and personal computer through their serial ports. This connection enables you to exchange files. It also enables you to edit the 6400 or 5055 configuration files, such as CONFIG.DAT.

INTERSVR is the INTERLNK server and is a communications option on your 6400 Computer or 5055 Data Collection PC. INTERLNK and INTERSVR are provided with DOS and shipped with your 6400 or 5055 or toolkit. For complete installation instructions, refer to the README.TXT file provided with 6400 Computers and 5055 Data Collection PCs.

Reprogramming Flash Memory

Flash upgrades can be ordered on diskette from Intermec (contact an account representative for the media), or downloaded from the Intermec Bulletin Board System (see *Before You Begin*). Read all of these instructions before proceeding.

▶ **NOTE:** *Keep the terminal on charge while setting up, reprogramming, or reflashing.*

Prerequisites for INTERLNK Flash Update

- A working 6400 Computer or 5055 PC to do this procedure(if the flash is corrupted, perform a serial master mode boot).
- A RAM drive (D:) of at least 960 KB.
- A disk file contains the flash archive, 50BDXXXX.EXE. The last four numbers indicate the flash version (*0129* indicates flash version 1.29).
- A standard host PC for connecting to the 6400 Computer or 5055 PC. INTERLNK.EXE must be loaded by the CONFIG.SYS file. For more detailed information on running INTERLNK, refer to a DOS manual.
- A NULL modem cable to connect the host PC's communications port to the 6400 Computer or 5055 PC with a single dock or communication adapter.

INTERLNK Installation

Use the following instructions if you have a version of flash that includes INTERSVR as a possible Comm option on your 6400 Computer or 5055 PC. If you do not have INTERSVR, you must update the flash using a serial master mode boot.

The following instructions assume that you have placed all files from the self-extracting archive in a directory (on your host personal computer) called C:\PENKEY\FLASH. If you choose to place these files in a different location, adjust the instructions accordingly.

▶ **NOTE:** *Delete the self-extracting file from this directory once the files are extracted.*

Your host personal computer must be running INTERLNK, which is part of MS-DOS. Load INTERLNK as a device driver in your CONFIG.SYS file, using the following statement, at the end of the CONFIG.SYS file (after any other statement that creates a drive letter):

```
DEVICE=C:\DOS\INTERLNK.EXE  /DRIVES:3
```

The previous statement assumes that MS-DOS is located in the host PC C:\DOS directory. The /DRIVES: 3 parameter allows mapping of three drives from the 6400 Computer or 5055 PC.

INTERLNK and INTERSVR

INTERLNK is a device driver that interconnects a 6400 Computer or 5055 PC and a host personal computer through serial ports. INTERSVR is the INTERLNK server, a communication option in the Norand Utilities program. These two resources are provided with ROM DOS 6.22 and are shipped with the 6400 Computer or 5055 PC toolkit. A standard null modem cable connects the personal computer to the 6400 Computer or 5055 PC. A TTY TCOM cable also works. A dock is needed for the 6400 Computer or 5055 PC or a communication adapter that plugs onto the bottom end of the terminal.

INTERLNK causes the 6400 Computer or 5055 PC drives to appear as virtual drives on the host personal computer, with drive letters immediately beyond the highest drive letter currently used on the host personal computer. Typing "INTERLNK" from the host personal computer command line displays the designations of the redirected drives. For details of INTERLNK and INTERSVR topics, refer to the DOS on-line help text.

INTERLNK is installed on a host PC, using the following statement in the CONFIG.SYS file:

```
device=c:\dos\interlnk.exe /drives:4
```

After installation, you can copy the application files to the 6400 Computer or 5055 PC. To terminate INTERSVR, press [ALT] + [F4].

59XX, 17XX, or 11XX Terminal

For a 59XX, 17XX, or 11XX Terminal, use utility program CHECKCFG.EXE to verify the correctness of your configuration.

Using CHECKCFG to Compile and Decompile Custom Configurations

CHECKCFG reads your configuration and literal files, and reports any syntax errors. It also converts your data files to the proper format for the TE program.

The ASCII text of the configuration file converts to a compressed binary format to save space in the terminal. CHECKCFG can reverse the operation by converting a binary file into its ASCII source. CHECKCFG can also list set-up parameters, their types, and their allowable values.

To display the program version number and a short message that lists the different command line formats for the program, type **checkcfg**

Converting Files From ASCII To Binary

To convert an ASCII parameter file into binary format before downloading it to a terminal, use the following command line:

checkcfg <*input config file*>cfglit.dat<*output config file*>

- <*input config file*> is the name of your ASCII text parameter file
- <*output config file*> is the name of the file that you must append to your TE hex file. The output file must be named CONFIG.DAT.

Converting Files From Binary To ASCII

To convert a binary parameter file back into its ASCII equivalent, use the following command line:

checkcfg -r <*config file*> cfglit.dat <*output file*>

- <*config file*> is the name of your binary parameter file
- CFGLIT.DAT is the name of your terminal literal file
- <*output file*> is the name of the file that will contain the converted ASCII output

Listing Parameters and Values

To display a list of all possible set up parameters and their values, use the following command line: **checkcfg -p cfglit.dat**

▶ **NOTE:** *The output from this command is about seven hundred lines long. You may want to redirect it into another file for viewing.*

Using FLSHCONV.EXE to Build Customized HEX Files

FLSHCONV.EXE is a utility program that creates Intel-hex files in the proper format for downloading to an 11XX, 17XX, or 59XX Terminal. FLSHCONV can do the following:

- Locate .EXE programs and append them for download in an Intel-hex file
- Append data and configuration files to an existing Intel-hex file (FLSHCONV *cannot* locate and append .EXE programs to an existing hex file)

To display the program version number and a short message that lists command line formats, type: **`flshconv`**

The following lists FLSHCONV command line options, where <*hexnum*> represents a hexadecimal segment address and <*number*> represents a decimal number.

–f<*hexnum*>
<*hexnum*> is the starting address of Flash memory for the terminal. Default: 8000 (absolute address 0x80000).

–e<*hexnum*>
<*hexnum*> is the ending address of Flash. If you omit this parameter, FLSHCONV does not report an error if your Flash image is too big.

–d<*hexnum*>
<*hexnum*> is the starting address of memory space for .EXE programs. Default: 200 (absolute address 0x2000). You should ordinarily use 60 (absolute address 0x600).

–o<*filename*>
<*filename*> is the Intel-hex output file name.

–v<*number*>
<*number*> indicates "verbosity." Default: 0, meaning no information appears on the standard output device. Intermec recommends a value of 1 to generate a report of where each file is located. You can use higher values, but they may not produce useful information for the end user.

–a
This option tells FLSNCONV to append data files to an existing Intel-hex file. The hex file must be the first file name on the command line.

The following chart lists FLSHCONV command line arguments.

Terminal	-f<*hexnum*>	-e<*hexnum*>	-d<*hexnum*>
11XX, 256K Flash	–f8000	–eC000	–d60
11XX, 512K Flash	–f8000	–eFFC0	–d60
17XX, 512K Flash	–f8000	–eFFC0	–d60
5928–5948, 384K Flash	–f9000	–eE000	–d60

Locating and Appending .EXE Files

As an example, suppose you are building a customized version of the 17XX Flash program FWP170H0.HEX. As a minimum, you must have the following files:

1700BIOS.EXE	17XX BIOS program
KERNEL.EXE	Intermec multitasking services
FWP170H0.EXE	17XX VT/ANSI TE program
NORAND.FNT	Display character font file. This may be the standard font file or a customized user replacement.
CFGLIT.DAT	Terminal literal file. This may be the standard literal file or a customized user replacement.

To bind these files into an Intel-hex file that is ready for download to a 17XX, use the following single command line to build a file called NEW.HEX:

```
flshconv -f8000 -effc0 -d60 1700bios.exe kernel.exe
fwp170h0.exe norand.fnt cfglit.dat -onew.hex
```

Or, you can create a file that contains each file name on a separate line. Assuming that file was named 1700FILE.LST, use the following command line for the same results:

```
flshconv -f8000 -effc0 -d60 @1700file.lst
```

Appending Data Files To Intel-Hex Files

In the above example, you could have bound the .EXE files together by typing the following (single) command line:

```
flshconv -f8000 -effc0 -d60 1700bios.exe kernel.exe
fwp170h0.exe -o1700exe s.hex
```

You can then customize the 1700EXES.HEX file with different font files and literal files by typing the following (single) command line:

```
flshconv -effc0 -a 1700exes.hex norand.fnt
cfglit.dat —onewlang.hex
```

You can provide keyboard translation file pairs to change the default key values. The (single) command line is:

```
flshconv -effc0 -a newlang.hex vt220eml.key vt220eml.xlt
-onewkeys.hex
```

You can specify more than one file pair. For example, you could provide all four file pairs (eight files) to modify the keyboard for each of the four data streams.

Downloading a Hex File

These are needed to download a .HEX file to 59XX, 17XX, 11XX Terminals:

- PROGDUX.EXE *(provided with the terminal's Flash)*
- Personal computer
- INTERMEC® cable P/N: 216-806-001, which is a powered Flash cable that plugs into the personal computer's COM port *(note that power is not required for download)*
- 11XX, 17XX, or 59XX Terminal

To download a .HEX file:

1. Ensure the terminal is powered ON.
2. Ensure PROGDUX.EXE is loaded on the personal computer.
3. Use cable P/N: 216-806-001 to connect the 11XX or 17XX Terminal to the personal computer. Use cable P/N: 216-831-001 to connect the 59XX Terminal to the personal computer. For help, refer to the terminal's user manual. *Note that power is not required for download.*
4. Power the terminal off.
5. To receive the .HEX file, the terminal must be in download mode. To enter this mode, press and hold down the terminal's [I] key as you power up the terminal.

   For the 17XX 37-key keyboard, press and hold down the [F1] key as you power up the terminal.
6. At the DOS prompt, type: **`progdux -?`** to display a list of command line options.
7. Erase the terminal's original Flash and download the new .HEX file by typing: **`progdux -e <newfile>`** where <*newfile*> is the name of the .HEX file.

A successful download will boot the terminal into the TE application. If communications is interrupted, PROGDUX.EXE will send out a negative acknowledgement (NAK) and reset itself to try sending again. No interaction is required except to restore communications.

Section 6

Programming

This section describes programming for the terminals. This section contains the following information:

- The received codes the terminals support. Received codes include C0 and C1 control characters, character sets, and terminal modes *(page 6-9)*.
- The transmitted keyboard codes generated by the terminals' keys and sent to the host computer *(page 6-31)*.
- The capability of the terminals to emulate VT/ANSI terminal top-row function, main keypad, editing, and auxiliary keys *(page 6-32)*.
- VT340 applications supported by the terminals. Applications include working in local editing and interactive modes, and creating text forms *(page 6-28)*.

Character Encoding

The implementation of VT/ANSI terminal emulation supports both 7-bit and 8-bit communications environments. The implementation consists of an 8-bit asynchronous character encoding scheme and a 7-bit code extension technique so that the terminal is compatible with ANSI and ISO standards. All 8-bit codes can be referenced by using two-byte ESCape sequences in accordance with ANSI standard X3.41 -- 1974.

The document commonly referred to when ANSI is mentioned is ANSI X3.64 -- 1979, *Additional Controls for Use With American National Standard for Information Interchange*. The ANSI X3.64 standard controls character imaging devices such as the VT200 terminal. ANSI and ISO determine the current standards for character encoding in the communications industry.

Character Sets

The terminal processes most characters it receives from the host computer based on characters whose codes and functions are defined and standardized by ANSI. The types are 7-bit and 8-bit character codes.

Multinational Character Set

The DEC multinational character set consists of C0, GL, C1, and GR codes.

C0 and GL Codes

The left half of the multinational character set consists of control characters (C0 codes) and graphic characters (GL codes). Control characters are 7-bit compat-

ible, nondisplayable single-byte characters that perform specific functions during communications and text processing. C0 codes range from 00 to 1F hexadecimal, and include 7F hexadecimal (DEL) and can be used in a 7- or 8-bit environment.

Graphic characters are 7-bit compatible, displayable characters that represent various alphanumeric characters, punctuation marks, and symbols that appear in the terminal's display. GL codes range from 21 to 7E hexadecimal. They can be used in a 7-bit or an 8-bit environment. The space character (20 hexadecimal) may be a graphic character or a control character, depending on the context.

Table 6-1 shows the C0 and and GL codes recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no action taken by the terminal. Codes that the terminal ignores are also indicated in the table. Table 6-2 *(next page)* describes the action taken by the terminal when it receives a C0 code.

Table 6-1
C0 and GL Codes

row	column	0		1		2		3		4		5		6		7	
	b8 bits b7 b6 b5 b4 b3 b2 b1	0 0 0 0		0 0 0 1		0 0 1 0		0 0 1 1		0 1 0 0		0 1 0 1		0 1 1 0		0 1 1 1	
0	0 0 0 0	NUL	0 00	DLE	16 10	SP	32 20	0	48 30	@	64 40	P	80 50	‘	96 60	p	112 70
1	0 0 0 1	SOH	1 01	DC1 (XON)	17 11	!	33 21	1	49 31	A	65 41	Q	81 51	a	97 61	q	113 71
2	0 0 1 0	STX	2 02	DC2	18 12	″	34 22	2	50 32	B	66 42	R	82 52	b	98 62	r	114 72
3	0 0 1 1	ETX	3 03	DC3 (XOFF)	19 13	#	35 23	3	51 33	C	67 43	S	83 53	c	99 63	s	115 73
4	0 1 0 0	EOT	4 04	DC4	20 14	$	36 24	4	52 34	D	68 44	T	84 54	d	100 64	t	116 74
5	0 1 0 1	ENQ	5 05	NAK	21 15	%	37 25	5	53 35	E	69 45	U	85 55	e	101 65	u	117 75
6	0 1 1 0	ACK	6 06	SYN	22 16	&	38 26	6	54 36	F	70 46	V	86 56	f	102 66	v	118 76
7	0 1 1 1	BEL	7 07	ETB	23 17	’	39 27	7	55 37	G	71 47	W	87 57	g	103 67	w	119 77
8	1 0 0 0	BS	8 08	CAN	24 18	(	40 28	8	56 38	H	72 48	X	88 58	h	104 68	x	120 78
9	1 0 0 1	HT	9 09	EM	25 19	)	41 29	9	57 39	I	73 49	Y	89 59	i	105 69	y	121 79
A	1 0 1 0	LF	10 0A	SUB	26 1A	*	42 2A	:	58 3A	J	74 4A	Z	90 5A	j	106 6A	z	122 7A
B	1 0 1 1	VT	11 0B	ESC	27 1B	+	43 2B	;	59 3B	K	75 4B	[	91 5B	k	107 6B	{	123 7B
C	1 1 0 0	FF	12 0C	FS	28 1C	,	44 2C	<	60 3C	L	76 4C	\	92 5C	l	108 6C	|	124 7C
D	1 1 0 1	CR	13 0D	GS	29 1D	-	45 2D	=	61 3D	M	77 4D	]	93 5D	m	109 6D	}	125 7D
E	1 1 1 0	SO	14 0E	RS	30 1E	.	46 2E	>	62 3E	N	78 4E	^	94 5E	n	110 6E	~	126 7E
F	1 1 1 1	SI	15 0F	US	31 1F	/	47 2F	?	63 3F	O	79 4F	_	95 5F	o	111 6F	DEL	127 7F

C0 Codes — GL Codes (ASCII Graphics Character Set)

Legend:

ENQ | 5 | 05 — decimal / hexadecimal — **code recognized by the terminal**

NUL | 0 | 00 — decimal / hexadecimal — **code ignored by the terminal**

Table 6-2
C0 Control Characters and Terminal Action

Mnemonic	Hex	Name	Action
NUL	00	Null	Ignored.
SOH	01	Start of heading	Ignored.
STX	02	Start of text	Ignored.
ETX	03	End of text	Ignored.
EOT	04	End of transmission	Ignored.
ENQ	05	Enquiry	Generates Answerback message. Set number of characters in the message (0–30) through the terminal's firmware. If the terminal is operating in ANSI mode, it ignores this character.
ACK	06	Acknowledge	Ignored.
BEL	07	Bell	Generates bell tone if bell is enabled.
BS	08	Backspace	Moves cursor one column to the left. If cursor is in Column 1, takes no action.
HT	09	Horizontal tab	Moves cursor to predetermined tab stop. Moves cursor to right margin if there are no tab stops.
LF	0A	Line feed	Causes a line feed or new line operation, depending on how the LNM received code is set.
VT	0B	Vertical tab	Processes as LF (line feed).
FF	0C	Form feed	Processes as LF (line feed).
CR	0D	Carriage return	Moves cursor to Column 1 of the current row.
SO (LS1)	0E	Shift out (Lock shift G1)	Invokes G1 character set into GL.
SI (LS0)	0F	Shift in (Lock shift G0)	Invokes G0 character set into GL.
DLE	10	Data link escape	Ignored.
DC1 (XON)	11	Device control 1	Clears DC3 if XOFF support is enabled, which causes the terminal to continue sending characters (keyboard unlocks).
DC2	12	Device control 2	Ignored.
DC3 (XOFF)	13	Device control 3	If XOFF support is enabled, causes the terminal to stop sending characters until it receives a DC1 control character.
DC4	14	Device control 4	Ignored.
NAK	15	Negative acknowledgment	Ignored.
SYN	16	Synchronous table	Ignored.
ETB	17	End transmission block	Ignored.
CAN	18	Cancel	Terminates and cancels any sequence in progress.
EM	19	End of medium	Ignored.
SUB	1A	Substitute	Terminates, cancels escape or control sequence, or terminates the device control string and displays reverse question mark.
ESC	1B	Escape	Processes as escape sequence introducer. Terminates any escape, control, or device control sequence in process.
FS	1C	File separator	Ignored.
GS	1D	Group separator	Ignored.
RS	1E	Record separator	If guarded area transfer mode (GATM) is reset, the record separator is processed as a protected field entry.
US	1F	Unit separator	Ignored.
DEL	7F	Delete	Ignored; it cannot be used as a fill character.

C1 and GR Codes

The right half of the DEC multinational character set consists of eight-bit control codes (C1 codes) and supplemental graphic characters (GR codes). C1 codes are nondisplayable codes that perform additional functions beyond those possible with the C0 codes. C1 codes range from 80 to 9F hexadecimal.

The supplemental graphic characters set (GR codes) range from A0 hexadecimal to FF hexadecimal. The set has alphabetic characters with accents and diacritical marks that appear in the major Western European alphabets. It also has other symbols not included in the ASCII graphics set.

Table 6-3 shows the C1 control characters and GR codes recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no terminal action taken. Ignored codes are also indicated in the table. Note that some letters that are normally in uppercase are converted into lowercase. The hexadecimal values for the converted letters are C0, C1, C2, C8, CA, CB, CC, CD, CE, CF, D9, DA, and DB. *(These values may be supported correctly in later versions.)*

Table 6-3
C1 and GR Codes

8		9		10		11		12		13		14		15		column	row
1 0 0 0		1 0 0 1		1 0 1 0		1 0 1 1		1 1 0 0		1 1 0 1		1 1 1 0		1 1 1 1		b8 bits b7 b6 b5 b4 b3 b2 b1	
	128 80	DCS	144 90	NBSP	160 A0	°	176 B0	à	192 C0	Ð	208 D0	à	224 E0	ð	240 F0	0 0 0 0	0
	129 81	PU1	145 91	¡	161 A1	±	177 B1	á	193 C1	Ñ	209 D1	á	225 E1	ñ	241 F1	0 0 0 1	1
	130 82	PU2	146 92	¢	162 A2	²	178 B2	â	194 C2	Ò	210 D2	â	226 E2	ò	242 F2	0 0 1 0	2
	131 83	STS	147 93	£	163 A3	³	179 B3	Ã	195 C3	Ó	211 D3	ã	227 E3	ó	243 F3	0 0 1 1	3
IND	132 84	CCH	148 94	¤	164 A4	‘	180 B4	Ä	196 C4	Ô	212 D4	ä	228 E4	ô	244 F4	0 1 0 0	4
NEL	133 85	MW	149 95	¥	165 A5	µ	181 B5	Å	197 C5	Õ	213 D5	å	229 E5	õ	245 F5	0 1 0 1	5
SSA	134 86	SPA	150 96	¦	166 A6	¶	182 B6	Æ	198 C6	Ö	214 D6	æ	230 E6	ö	246 F6	0 1 1 0	6
ESA	135 87	EPA	151 97	§	167 A7	·	183 B7	Ç	199 C7	X	215 D7	ç	231 E7	÷	247 F7	0 1 1 1	7
HTS	136 88		152 98	¨	168 A8	’	184 B8	è	200 C8	Ø	216 D8	è	232 E8	ø	248 F8	1 0 0 0	8
HTJ	137 89		153 99	©	169 A9	¹	185 B9	É	201 C9	ù	217 D9	é	233 E9	ù	249 F9	1 0 0 1	9
VTS	138 8A		154 9A	ª	170 AA	º	186 BA	ê	202 CA	ú	218 DA	ê	234 EA	ú	250 FA	1 0 1 0	A
PLD	139 8B	CSI	155 9B	«	171 AB	»	187 BB	ë	203 CB	û	219 DB	ë	235 EB	û	251 FB	1 0 1 1	B
PLU	140 8C	ST	156 9C	¬	172 AC	¼	188 BC	ì	204 CC	Ü	220 DC	ì	236 EC	ü	252 FC	1 1 0 0	C
RI	141 8D	OSC	157 9D	—	173 AD	½	189 BD	í	205 CD	Ý	221 DD	í	237 ED	ÿ	253 FD	1 1 0 1	D
SS2	142 8E	PM	158 9E	®	174 AE	¾	190 BE	î	206 CE	Þ	222 DE	î	238 EE	Þ	254 FE	1 1 1 0	E
SS3	143 8F	APC	159 9F	¯	175 AF	¿	191 BF	ï	207 CF	ß	223 DF	ï	239 EF	ÿ	255 FF	1 1 1 1	F

C1 Codes — GR Codes (DEC Supplemental Graphics)

Legend:

IND | 132 / 84 — decimal / hexadecimal — code recognized by the terminal

HTJ | 137 / 89 — decimal / hexadecimal — code ignored by the terminal

code not yet standa ANSI and ignored b terminal

Table 6-4 describes the terminal action when it receives a C1 control code.

Table 6-4
C1 Control Characters and Terminal Action

Mnemonic	Hex	Name	Action
	80–83		Ignored.
IND	84	Index	Moves cursor down one line in same column. If cursor is at bottom margin, display performs a scroll up.
NEL	85	Next line	Moves cursor to first position on next line. If cursor is at bottom margin, display performs a scroll up.
SSA	86	Start of selected area	Selects which current page characters the terminal can send to the host.
ESA	87	End of selected area	Ends the selected area that is sent to the host when forms are created for VT340 terminal emulation.
HTS	88	Horizontal tab set	Sets one horizontal tab stop at column with cursor.
HTJ	89	Horizontal tab w/justify	Ignored.
VTS	8A	Vertical tabulation set	Ignored.
PLD	8B	Partial line down	Ignored.
PLU	8C	Partial line up	Ignored.
RI	8D	Reverse index	Moves cursor up one line in same column. If cursor is at top margin, display performs a scroll down.
SS2	8E	Single shift 2	Temporarily invokes G2 character set into GL for the next graphic character. G2 is designated by a select character set (SCS) sequence.
SS3	8F	Single shift 3	Temporarily invokes G3 character set into GL for the next graphic character. G3 is designated by an SCS sequence.
DCS	90	Device control string	Processes as opening delimiter of a device control string for device control use.
PU1	91	Private use 1	Ignored.
PU2	92	Private use 2	Ignored.
STS	93	Set transmit state	Ignored.
CCH	94	Cancel character	Ignored.
MW	95	Message waiting	Ignored.
SPA	96	Start of protected area	Starts the protected area in page memory that cannot be edited when forms are created from the host.
EPA	97	End of protected area	Ends the protected area in page memory that cannot be edited when forms are created from the host.
	98–9A		Ignored.
CSI	9B	Ctrl sequence introducer	Processes as control sequence introducer.
ST	9C	String terminator	Processes as the closing delimiter of a string opened by DCS and processes code as the end of a line of extended command characters.
OSC	9D	O/S command	Ignored.
PM	9E	Privacy message	Ignored.
APC	9F	App program command	Processes code as the start of a line of extended command characters.

Display Controls Mode

The terminal does not support the VT/ANSI terminal display controls mode, which displays control codes as graphic characters for debugging.

Dynamically Redefinable Character Set

The terminal does not support the dynamically redefinable character set (DRCS), which is a 94-character set created on the VT/ANSI terminal and down-line loaded into the terminal DRCS buffer.

Special Graphics Character Set

The terminal supports most of the DEC special graphics character set. The set contains ASCII C0 codes and most of the GL codes. It also has special symbols and short line segments. You would normally use these characters to create a limited range of drawings while working in text mode.

Table 6-5 shows special graphics characters recognized by the terminal. Ignored codes are parsed (removed) from the data stream with no action taken by the terminal. Ignored and unsupported codes are also indicated in the table.

Table 6-5
Special Graphics Character Set

row	column	0		1		2		3		4		5		6		7	
	b8 bits b7 b6 b5 b4 b3 b2 b1	0 0 0 0		0 0 0 1		0 0 1 0		0 0 1 1		0 1 0 0		0 1 0 1		0 1 1 0		0 1 1 1	
0	0 0 0 0	NUL	00	DLE	10	SP	20	0	30	@	40	P	50		60		70
1	0 0 0 1	SOH	01	DC1 (XON)	11	!	21	1	31	A	41	Q	51		61	- SCAN 5	71
2	0 0 1 0	STX	02	DC2	12	"	22	2	32	B	42	R	52		62		72
3	0 0 1 1	ETX	03	DC3 (XOFF)	13	#	23	3	33	C	43	S	53		63		73
4	0 1 0 0	EOT	04	DC4	14	$	24	4	34	D	44	T	54		64	├	74
5	0 1 0 1	ENQ	05	NAK	15	%	25	5	35	E	45	U	55		65	┤	75
6	0 1 1 0	ACK	06	SYN	16	&	26	6	36	F	46	V	56		66	┴	76
7	0 1 1 1	BEL	07	ETB	17	'	27	7	37	G	47	W	57		67	┬	77
8	1 0 0 0	BS	08	CAN	18	(	28	8	38	H	48	X	58		68	│	78
9	1 0 0 1	HT	09	EM	19	)	29	9	39	I	49	Y	59		69		79
A	1 0 1 0	LF	0A	SUB	1A	*	2A	:	3A	J	4A	Z	5A	⌋	6A		7A
B	1 0 1 1	VT	0B	ESC	1B	+	2B	;	3B	K	4B	[	5B	⌉	6B		7B
C	1 1 0 0	FF	0C	FS	1C	,	2C	<	3C	L	4C	\	5C	⌈	6C		7C
D	1 1 0 1	CR	0D	GS	1D	-	2D	=	3D	M	4D	]	5D	⌊	6D		7D
E	1 1 1 0	SO	0E	RS	1E	.	2E	>	3E	N	4E	^	5E	+	6E		7E
F	1 1 1 1	SI	0F	US	1F	/	2F	?	3F	O	4F		5F		6F		7F

C0 Codes (ASCII Nondisplayable Control Character Set)

GL Codes (DEC Special Graphics Character Set)

Legend:

5F **code not supported and character displayed may change without notice**

National Replacement Character Sets

The terminal supports the 7-bit national replacement character (NRC) sets for European languages. The NRC sets are similar to the 7-bit ASCII set, except for a few characters. You designate the character sets as hard using escape sequence formats as on page 6-8.

Table 6-6 lists characters in each NRC set that are different from the ASCII set. The terminal does not support "¾" (40 hexadecimal) in the Dutch NRC set.

Table 6-6
National Replacement Character Set

Character Set	Hexadecimal											
	23	**40**	**5B**	**5C**	**5D**	**5E**	**5F**	**60**	**7B**	**7C**	**7D**	**7E**
ASCII	#	@	[	\	]	^	_	‘	{	|	}	~
British	£	@	[	\	]	^	_	‘	{	|	}	~
Dutch	£		ÿ	½	|	^	_	‘	¨	ƒ	¼	’
Finnish	#	@	Ä	Ö	Å	Ü	_	é	ä	ö	å	ü
French	£	à	°	ç	§	^	_	‘	é	ù	è	¨
French Canadian	#	à	â	ç	ê	î	_	ô	é	ù	è	û
German	#	§	Ä	Ö	Ü	^	_	‘	ä	ö	ü	ß
Italian	£	§	°	ç	é	^	_	ù	à	ò	è	ì
Norwegian/Danish	#	@	Æ	Ø	Å	^	_	‘	æ	ø	å	~
Portuguese	#	@	Ã	Ç	Õ	^	_	‘	ã	ç	õ	~
Spanish	£	§	¡	Ñ	¿	^	_	‘	‘	°	ñ	ç
Swedish	#	É	Ä	Ö	Å	Ü	_	é	ä	ö	å	ü
Swiss	ù	à	é	ç	ê	î	è	ô	ä	ö	ü	û

Table 6-7
Greek National Replacement Character Set
(6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)

row	column	0		1		2		3		4		5		6		7	
	b8 bits b7 b6 b5 b4 b3 b2 b1	0 0 0		0 0 1		0 1 0		0 1 1		1 0 0		1 0 1		1 1 0		1 1 1	
0	0 0 0 0		00		10		20	•	30	ΐ	40	Π	50	ΰ	60	Π	70
1	0 0 0 1		01		11	‘	21	±	31	A	41	P	51	α	61	ϱ	71
2	0 0 1 0		02		12	’	22	2	32	B	42		52	β	62	ς	72
3	0 0 1 1		03		13	£	23	β	33	Γ	43	Σ	53	Y	63	σ	73
4	0 1 0 0		04		14		24	΄	34	Δ	44	T	54	δ	64	τ	74
5	0 1 0 1		05		15		25	΅	35	E	45	Y	55	ε	65	υ	75
6	0 1 1 0		06		16	¦	26	Ά	36	Z	46	Φ	56	ς	66	φ	76
7	0 1 1 1		07		17	§	27	·	37	H	47	X	57	η	67	χ	77
8	1 0 0 0		08		18	¨	28	Έ	38	Θ	48	Ψ	58	θ	68	Ψ	78
9	1 0 0 1		09		19	©	29	Ή	39	I	49	Ω	59	ι	69	ω	79
A	1 0 1 0		0A		1A		2A	Ί	3A	K	4A	Ϊ	5A	κ	6A	ϊ	7A
B	1 0 1 1		0B		1B	«	2B	»	3B	Λ	4B	Ÿ	5B	λ	6B	ϋ	7B
C	1 1 0 0		0C		1C	¬	2C	Ό	3C	M	4C	ά	5C	μ	6C	ό	7C
D	1 1 0 1		0D		1D	SHY	2D	½	3D	N	4D	έ	5D	ν	6D	ύ	7D
E	1 1 1 0		0E		1E		2E	Ύ	3E	Ξ	4E	ή	5E	ξ	6E	ώ	7E
F	1 1 1 1		0F		1F	—	2F	Ώ	3F	O	4F	ι	5F	ο	6F		7F

Character Set Selection

The terminal supports hard character sets. It does not support designating soft (down-line loadable) character sets.

Designating Hard Character Sets

Designate hard character sets using the escape sequence format in Table 6-8.

Table 6-8
Hard Character Set Escape Sequences

Escape Sequence	Designated As
Supplemental and special graphics sets:	
1B hexadecimal 28 hexadecimal ESC ((Final)	G0
1B hexadecimal 29 hexadecimal ESC) (Final)	G1
1B hexadecimal 2A hexadecimal ESC * (Final)	G2
1B hexadecimal 2B hexadecimal ESC + (Final)	G3
NRC sets:	
1B hexadecimal 2D hexadecimal ESC – (Final)	G1
1B hexadecimal 2E hexadecimal ESC . (Final)	G2
1B hexadecimal 2F hexadecimal ESC / (Final)	G3

The final character in the escape sequence represents the character set you want to designate. For the terminal, the final characters are indicated in Table 6-9.

Table 6-9
Hard Character Set Final Characters

Character Set		Final Character (Hex)
ASCII		B (42)
Special graphics		0 (30)
National replacement	British	A (41)
	Dutch	4 (34)
	Finnish*	5 (35) *or* C (43)
	French	R (52)
	French Canadian*	9 (39) *or* Q (51)
	German	K (4B)
	Italian	Y (59)
	Norwegian/Danish*	‘ (60) *or* E (45)
	Portuguese	% (25)
	Spanish	Z (5A)
	Swedish*	7 (37) *or* H (48)
	Swiss	= (3D)
	Greek**	6 (36) (Private extension)

* *The first code shown is recommended.*

** *Applies only to 6400, 5020, 5055, 59XX, 17XX, and 11XX Terminals.*

Locking Shifts

The terminal applies the locking shift (LS) control functions in Table 6-10. Locking shifts LS1R, LS2, LS2R, LS3, and LS3R are not available in VT100 mode or ANSI mode.

Table 6-10
Locking Shifts

Control Name	Code	Function
LS0 (Locking shift 0)	SI (0F hexadecimal)	Map G0 into GL *(default)*
LS1 (Locking shift 1)	SO (0E hexadecimal)	Map G1 into GL
LS1R* (Locking shift 1, right)	ESC ~ (1B, 7E hexadecimals)	Map G1 into GR
LS2* (Locking shift 2)	ESC n (1B, 6E hexadecimals)	Map G2 into GL
LS2R* (Locking shift 2, right)	ESC } (1B, 7D hexadecimals)	Map G2 into GR
LS3* (Locking shift 3)	ESC o (1B, 6F hexadecimals)	Map G3 into GL
LS3R* (Locking shift 3, right)	ESC | (1B, 7C hexadecimals)	Map G3 into GR

* *Available only in VT320 and VT340 modes.*

Received Codes

Received codes are codes the terminal receives from an application or host computer. The following pages describe received codes, and the action taken by the terminal when it receives the codes from an application or host.

Select C1 Controls

Select C1 controls (code extension announcers) control the representation of C1 control codes returned to the application. The terminal supports select 7-bit and 8-bit C1 control transmission (Table 6-11).

▶ **NOTE:** *The terminal does not support DECSCL sequences.*

Table 6-11
Select C1 Controls

Transmission	Sequence	Action
Select 7-bit C1 Control (S7C1T)	ESC sp F	Converts all C1 codes returned to the application to their equivalent 7-bit code extensions.
Select 8-bit C1 Control (S8C1T) *(Ignored in VT100 and ANSI modes.)*	ESC sp G	Returns C1 codes to the application without converting them to their equivalent 7-bit code extensions.

Terminal Modes

A mode is one of several operating states used by the terminal. Table 6-12 lists selectable terminal modes and the action taken by the terminal in set mode and reset mode.

▶ **NOTE:** *The last character of each reset mode sequence is lowercase L (6C hexadecimal).*

Table 6-12
Selectable Terminal Modes

Mode (Mnemonic)	Set Mode / Reset Mode	Sequence	Action
Keyboard action (KAM)	Locked	CSI 2 h	Locks the keyboard for all following keystrokes.
	Unlocked	CSI 2 l	Unlocks the keyboard.
Insert/ Replace (IRM)	Insert	CSI 4 h	Selects insert mode. New display characters move old display characters to the right. Characters moved past the right margin are lost. Text moved into a protected character field is lost. If erasure mode (ERM) is reset, text moved into a protected character field is lost.
	Replace	CSI 4 l	Selects replace mode. New display characters replace old display characters at cursor position. Old character is erased.
Send/Receive (SRM))	Off	CSI 1 2 h	Disables local echo. When the terminal sends characters to the host, the host must echo them back to the display.
	On	CSI 1 2 l	Enables local echo. When the terminal sends characters, they are automatically sent to the display.
Line feed/ New line (LNM)	New line	CSI 2 0 h	Causes a received LF, FF, or VT code to move the cursor to the first column of the next line. "Return" sends both a CR and an LF code.
	Line feed	CSI 2 0 l	Causes received LF, FF, or VT code to move cursor to the next line in the current column. "Return" sends a CR code only.
Cursor key (DECCKM)	Application	CSI ? 1 h	Causes cursor keys to send application control functions.
	Cursor	CSI ? 1 l	Causes cursor keys to send ANSI cursor control sequences.
ANSI/VT52 (DECANM)	(None)	(None)	Not applicable.
	VT52	CSI ? 2 l	Ignored.
Column (DECCOLM)	132 column	CSI ? 3 h	Ignored.
	80 column	CSI ? 3 l	Selects 80 columns per line.
Scrolling (DECSCLM)	Smooth	CSI ? 4 h	Ignored.
	Jump	CSI ? 4 l	Lets the terminal add lines to the display as fast as possible.
Screen (DECSCNM)	Reverse	CSI ? 5 h	Ignored.
	Normal	CSI ? 5 l	Selects normal (light characters on a dark background).
Origin (DECOM)	Origin	CSI ? 6 h	Ignored.
	Absolute	CSI ? 6 l	Ignored.
Auto wrap (DECAWM)	On	CSI ? 7 h	Graphic display characters received when the cursor is at right margin appear on the next line. The display scrolls up if cursor is at end of the scrolling region.
	Off	CSI ? 7 l	Graphic display characters received when cursor is at right margin replace previously displayed characters.

Table 6-12 (Continued)
Selectable Terminal Modes

Mode (Mnemonic)	Set Mode / Reset Mode	Sequence	Action
Auto repeat (DECARM)	On	CSI ? 8 h	Ignored.
	Off	CSI ? 8 l	Ignored.
Print form feed (DECPFF)	On	CSI ? 18 h	Selects form feed (FF) as print termination character. The terminal sends this character to the printer after each print screen operation.
	Off	CSI ? 18 l	Selects no termination character. The terminal does not send an FF to the printer after each print screen operation.
Print extent (DECPEX)	Full screen	CSI ? 19 h	Selects full screen to print during a print screen operation.
	Scrolling region	CSI ? 19 l	Selects scrolling region to print during a print screen operation.
Text cursor enable (DECTCEM)	Visible	CSI ? 25 h	Makes the cursor visible.
	Not visible	CSI ? 25 l	Makes the cursor not visible.
Keypad (DECKPAM/ DECPNM)	Application	ESC =	Keypad keys send application control functions.
	Numeric	ESC >	Keypad keys send characters that match the numeric, comma, period, and minus sign keys on main keypad. PF1–PF4 send control functions.
Character set (DECNRCM)	National	CSI ? 42 h	Ignored.
	Multinational	CSI ? 42 l	Ignored.
Back arrow key mode (DECBKM)	Backspace	CSI ? 6 7 h	The arrow key moves cursor back one space and deletes the character. It sends a BS character to the host.
	Delete	CSI ? 6 7 l	The arrow key deletes the character at the cursor position. It sends a DEL character to the host.

Cursor Positioning

The cursor indicates the position where the next character appears. The terminal supports all cursor positioning sequences (Table 6-13).

▶ **NOTE:** *Pn is a variable, ASCII-coded, numeric parameter.*

Table 6-13
Cursor Positioning

Name (Mnemonic)	Sequence	Action
Cursor up (CUU)	CSI Pn A	Moves cursor up Pn lines in the same column. Cursor stops at top margin.
Cursor down (CUD)	CSI Pn B	Moves cursor down Pn lines in the same column. Cursor stops at bottom margin.
Cursor forward (CUF)	CSI Pn C	Moves cursor right Pn columns. Cursor stops at right margin.
Cursor backward (CUB)	CSI Pn D	Moves cursor left Pn columns. Cursor stops at left margin.
Cursor position (CUP)	CSI Pl ; Pc H	Moves cursor to Line P1, Column Pc.
Horizontal and vertical positions (HVP)	CSI Pl ; Pc f	Moves cursor to Line P1, Column Pc.
Index (IND)	ESC D	Is an 8-bit control character (84 hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. IND moves the cursor down one line in the same column. If cursor is at bottom margin, display scrolls up.
Reverse index (RI)	ESC M	Is an 8-bit control character (8D hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. RI moves the cursor up one line in the same column. If the cursor is at top margin, the display scrolls down.
Next line (NEL)	ESC E	Is an 8-bit control character (85 hexadecimal) that can be expressed as an escape sequence for a 7-bit environment. NEL moves the cursor to the first position on the next line. If the cursor is at bottom margin, the display scrolls up.
Save cursor (DECSC)	ESC 7	Saves the following into memory: cursor position, graphic rendition, character set shift state, state of wrap flag, state of origin mode, state of selective erase.
Restore cursor (DECRC)	ESC 8	Restores the states described for DECSC. If none of these characteristics were saved the cursor moves to home position, origin mode is reset, no character attributes are assigned, and the default character set mapping is established.

Tab Stops

Tab stops are selected based on the vertical column of the display. When the terminal receives a horizontal tab code (HT, 09 hexadecimal), the cursor tabs to the next tab stop. If no tab stops exist, the cursor tabs to the right margin.

The terminal supports both tab stop sequences (Table 6-14). The terminal supports "global" line tab stops only. It does not allow tab set and clear on every character on every line as for a VT/ANSI.

Table 6-14
Tab Stops

Name (Mnemonic)	Sequence	Action
Horizontal tab set (HTS)	ESC H	Sets a tab stop at the current column. HTS is an 8-bit control character (88 hexadecimal) that can also be expressed as an escape sequence when coding for a 7-bit environment.
Tabulation clear (TBC)	CSI g	Clears a horizontal tab stop at cursor position.
	CSI 0 g	Clears a horizontal tab stop at cursor position.
	CSI 3 g	Clears horizontal tab stops.

Character Rendition and Attributes

Character rendition and attributes affect how a character is displayed, without changing the character. Select graphic rendition sequences change character rendition. The select character attribute sequence designates characters as erasable or non-erasable.

Select Graphic Rendition (SGR)

Table 6-15 lists select graphic rendition sequences and the terminal action taken.

Table 6-15
Select Graphic Rendition

Graphic Rendition	Sequence and Ps (Single Parameter)	Action
All attributes off	CSI 0 m	Turns all attributes off.
Display bold	CSI 1 m	Translates bold to reverse video.
Display underscored	CSI 4 m	Displays underscored.
Display blinking	CSI 5 m	Ignored.
Display negative (reverse) image	CSI 7 m	Displays negative (reverse) image.
Display normal intensity	CSI 2 2 m	Displays normal intensity.
Display not underlined	CSI 2 4 m	Displays not underlined.
Display not blinking	CSI 2 5 m	Ignored.
Display positive image	CSI 2 7 m	Displays positive image.

Select Character Attributes (DECSCA)

The terminal ignores select character attributes (Table 6-16).

Table 6-16
Select Character Attributes

Character Attribute	Sequence and Ps	Action
All attributes off	CSI 0 ″ q	Ignored
Designate characters as non-erasable by DECSEL/DECSED	CSI 1 ″ q	Ignored
Designate character as erasable by DECSEL/DECSED	CSI 2 ″ q	Ignored

Line Attributes

Line attributes affect an entire display line. The cursor selects the line affected by the attribute. It stays in the same character position when the attribute changes, unless the attribute would move the cursor past the right margin. In this case, the cursor stops at the right margin. When scrolling, the attribute moves with the line.

Double-height line sequences make the line with the cursor the top or bottom half of a double-height, double-width line. The terminal ignores these sequences (Table 6-17).

Table 6-17
Select Character Attributes

Line Attribute	Half	Sequence	Action
Double-height, double-width	Top	ESC # 3	Ignored
	Bottom	ESC # 4	Ignored

The terminal supports the single-width line (Table 6-18).

Table 6-18
Single-Width Line

Line Attribute	Sequence	Action
Single-width, single-height	ESC # 5	Makes the line with the cursor single-width, single-height. This is the line attribute for all new lines on the display.

Double-width line makes the line with the cursor double-width, single-height. The terminal ignores this sequence (Table 6-19).

Table 6-19
Double-Width Line

Line Attribute	Sequence	Action
Double-width, double-height	ESC # 6	Ignored

Erasure Mode

Erasure mode (ERM) determines whether erasing functions (ECH, erase character; EL, erase in line; and ED, erase in display) can edit protected characters. Table 6-20 lists erasure mode sequences.

▶ **NOTE:** *In edit mode (DECEDM), ERM affects editing functions IL, DL, ICH, and DCH.*

Table 6-20
Erasure Mode

Mode	Sequence	Comments
Set	CSI 6 h	Erasing functions ECH, EL, and ED can affect all protected and unprotected characters.
Reset	CSI 6 l	Erasing functions ECH, EL, and ED can affect only unprotected characters.

Table 6-21 lists the erasing and editing functions that ERM affects. ERM also affects the independent style of character protection.

Table 6-21
Control Functions Affected by Character Protection

Always Affected	Affected if Edit Mode (DECEDM) is Set
Erase character (ECH)	Insert character (ICH)
Erase in line (EL)	Insert line (IL)
Erase in display (ED)	Delete character (DCH) Delete line (DL)

Editing

Editing sequences insert and delete characters and lines of characters at the cursor position. The position does not change when lines are inserted or deleted. The terminal supports all editing sequences (Table 6-22).

▶ **NOTE:** *Pn is a variable, ASCII-coded, numeric parameter.*

Table 6-22
Editing

Name (Mnemonic)	Sequence	Action
Insert line (IL)	CSI Pn L	Inserts Pn lines at the cursor. If fewer than Pn lines remain from the current line to the end of the scrolling region, the number of lines inserted is the lesser number. Lines within the scrolling region at and below the cursor move down. Lines moved past bottom margin are lost. The cursor is reset to the first column. This sequence is ignored when the cursor is outside the scrolling region. In edit mode (DECEDM), if erasure mode (ERM) is reset, lines that move down into a line with a protected character field are lost.
Delete line (DL)	CSI Pn M	Deletes Pn lines, starting at the line with the cursor. If fewer than Pn lines remain from the current line to the end of the scrolling region, the number of lines deleted is the lesser number. As lines are deleted, the lines within the scrolling region and below the cursor move up, and blank lines are added at the bottom of the scrolling region. The cursor is reset to the first column. This sequence is ignored when the cursor is outside the scrolling region. In edit mode (DECEDM), if erasure mode (ERM) is reset, DL cannot delete lines that have protected characters. As lines are deleted, the area moved up is bounded by the bottom of the scrolling region, or by the next line with a protected character field.
Insert characters (ICH) *(Applies only to ANSI, VT220, VT320, and VT340 modes. Is ignored in VT100 mode.)*	CSI Pn @	Inserts Pn blank characters at the cursor position, with the character attributes set to normal. The cursor does not move and remains at the beginning of the inserted blank characters. A parameter of 0 or 1 inserts one blank character. Data on the line is shifted forward as in character insertion. In edit mode (DECEDM), if erasure mode (ERM) is reset, text moved into a protected character field is lost.
Delete character (DCH)	CSI Pn P	Deletes Pn characters, starting with the character at the cursor position. When a character is deleted, all characters to the right of the cursor move to the left. This creates a space character at the right margin for each character deleted. Character attributes move with the characters. Spaces created at the end of the line have all of their character attributes off. In edit mode (DECEDM), if erasure mode (ERM) is reset, DCH cannot delete protected characters.

Erasing

Erasing deletes characters in the terminal's display without affecting other characters. Erased characters are lost. Cursor positioning does not change when characters or lines are erased. Table 6-23 lists erasing sequences and the action taken by the terminal.

Table 6-23
Erasing

Name (Mnemonic)	Sequence	Action
Erase character (ECH) *(Applies only to ANSI, VT220, VT320, and VT340 modes. Is ignored in VT100 mode.)*	CSI Pn X	Erases characters at the cursor position and the next Pn-1 character. A parameter of 0 or 1 erases a single character. Character attributes are set to normal. No reformatting of data on the line occurs. The cursor remains in the same position. If erasure mode (ERM) is reset, ECH cannot erase protected characters.
Erase in line (EL)	CSI K	Erases from the cursor to the end of the line, including the cursor position. Line attribute is not affected. If erasure mode (ERM) is reset, EL cannot erase protected characters.
	CSI 0 K	Same as CSI K.
	CSI l K	Erases from the beginning of the line to the cursor, including the cursor position. Line attribute is not affected.
	CSI 2 K	Erases the complete line.
Erase in display (ED)	CSI J	Erases from cursor to the end of display, including the cursor position. Line attribute is single-height, single-width for all completely erased lines. If erasure mode (ERM) is set, ED cannot erase protected character positions.
Erase in display (ED)	CSI 0 J	Same as CSI J.
	CSI 1 J	Erases from the beginning of the display to the cursor, including the cursor position. Line attribute becomes single-height, single-width for all completely erased lines.
	CSI 2 J	Erases complete display. All lines are erased and changed to single-width. The cursor does not move.
Selective erase in line (DECSEL)	CSI ? K CSI ? 0 K CSI ? 1 K CSI ? 2 K	Ignored by the terminal.
Selective erase in display (DECSED)	CSI ? J CSI ? 0 J CSI ? 1 J CSI ? 2 J	Ignored by the terminal.

Scrolling Margins (Top and Bottom)

The scrolling region is the area of the terminal's display that can receive new characters by scrolling old characters off the display. The area is defined by the top and bottom display margins (Table 6-24). The smallest scrolling region allowed is two lines. The number of the top margin must be at least one less than the number of the bottom margin.

Table 6-24
Scrolling Margins (Top and Bottom)

Name (Mnemonic)	Sequence	Action
Set top and bottom margins (DECSTBM)	CSI Pt ; Pb r	Sets top and bottom scrolling margins. The value of Pt must be less than Pb. Moves the cursor to Column 1, Line 1 of the page.

Printing

Select print operations (Table 6-25) with control sequences. When characters are printed on the screen, printer tab stops are ignored. Print characters are spaced with the SP character. The terminal sends a carriage return and line feed, vertical tab, or form feed after the last printable character on a line (not a space character).

▶ **NOTE:** *The terminal ignores printer port DSR exchanges.*

Table 6-25
Printing

Name (Mnemonic)	Sequence	Action
Auto print mode	CSI ? 5 i	Turns on auto print mode. Display lines print when you move the cursor off the line with a line feed, form feed, vertical tab, or auto wrap. The printed line ends with a carriage return and the character that moved the cursor off the previous line (LF, FF, or VT). Auto wrap lines end with a line feed.
	CSI ? 4 i	Turns off auto print mode.
Printer controller	CSI 5 i	Turns on printer controller mode. The terminal sends received characters to the printer without displaying them on the screen. All characters and character sequences except NUL, XON, XOFF, CSI 5 i, and CSI 4 i are sent to the printer. The terminal does not insert or delete spaces, provide line delimiters, or select the correct printer character set. Keyboard activity is still directed to the host.
	CSI 4 i	Turns off printer controller mode.
Print cursor line	CSI ? l i	Prints the data on the display line with the cursor. Cursor position does not change. Print-cursor-line sequence is complete when the line prints. No CR/LF is attached to the line.
Print screen	CSI i	Prints the screen display (full screen or scrolling region, depending on the print extent DECPEX selection). Printer form feed mode (DECPFF) selects either a form feed (FF) or nothing as the print terminator. Print screen sequence is complete when the screen prints.
	CSI 0 i	Same as CSI i.

User-Defined Keys (DECUDK)

▶ **NOTE:** *The DECUDK command is ignored in VT100 mode.*

The terminal has 20 user-defined keys (UDKs). You can define the codes of 15 of these keys. The keys are F6 through F14, F15 (Help), F16 (Do), and F17 through F20.

Use UDKs to store and recall text and commands that you often use with applications. You should refer to your application's software manual for the commands you can store in user-defined keys.

If you use dual sessions, you can define UDKs for each session. However, you can only save one set of UDK definitions. For each session you can use a total of 256 characters to define UDKs.

Using UDKs

To enter definitions for the 15 UDKs, you program the definitions with DECUDK device control strings. To use a UDK after you have defined it, the terminal must be in caps lock mode. For example, if you defined the F6 key, you can use it by pressing the caps lock key for the terminal and then the key sequence for the F6 key. The following chart shows key combinations for caps lock. *Note that the host system can also define the function keys.*

Terminal	Key Sequence
2415	f U (55-key keyboard) f G (37-key numeric keyboard) f F7 (37-key function numeric keyboard)
2425, 2455	f Z
2435A	
248X	f "
6400	[BLUE] [space] (41-key keyboard); *not supported on the 51-key keyboard*
5020	+ function key
5055	[Caps Lock] on the external keyboard
59XX	Not supported
11XX, 17XX	[BLACK] [GOLD]

UDK Memory Space

There are 256 bytes of memory space available for the 15 UDKs. Space is supplied on a first-come, first-serve basis. When the 256 bytes are full you cannot define any more keys until you clear some of the memory space. Three ways that you can clear space are:

- Redefine one or more UDKs by using a DECUDK control string.
- Clear one or more UDKs by using a DECUDK control string.
- Clear all UDKs with a terminal power-up or hard terminal reset (RIS) operation.

▶ **NOTE:** *All UDK key definitions are lost when terminal power is lost.*

Programming UDKs

Use the following Device Control String (DCS) format to load UDK definitions from the host.

DCS	Pc ; Pl	|	Ky1/St1;...Kyn/Stn	ST
Device control string introducer	Clear and lock parameters	Final character	Key definition string	String terminator

DCS indicates the beginning of a device control string. DCS is an 8-bit C1 character (90 hexadecimal). You can use ESC P (1B and 50 hexadecimals) for a 7-bit environment.

Pc is the clear parameter that selects how to clear key definitions.

Pc	Meaning
0 (default) or none	Clear all keys before loading new values.
1	Clear one key at a time, before loading a new value.

When Pc is 1, the terminal only clears the keys you are loading. By using a Pc value of 1, you can redefine some keys without redefining them all.

▶ **NOTE:** *There are 256 bytes of memory for all UDKs. A key definition can only use the number of bytes available when that key is loaded.*

If Pc is 1, a key load may fail because no memory space is available. The reason for this is, with Pc set to 1, keys are cleared and loaded sequentially. If the new definition for a key is larger than the old one you may exceed the 256-byte limit.

EXAMPLE: Suppose F6 contains 120 bytes, F7 contains 110 bytes, and F8 contains 20 bytes. You try to load F8 with 40 bytes, F6 with 1 byte, and F7 with 1 byte, in that order. This works if all keys are cleared first (Pc is 0), but not if keys are cleared one at a time (Pc is 1). When you try to load F8 with 40 bytes, the load fails because only 26 bytes are free at that time. (256 maximum — 120 in F6 — 110 in F7 = 26.)

Pl is the lock parameter. Pl determines whether the key definitions are locked or unlocked after you load them.

Pl	Meaning
0	Lock the keys. If you want to load new values into the keys, you must unlock the keys through the terminal's firmware menus.
1 (default) or none	Do not lock the keys. The keys are unlocked and can be redefined with another DECUDK string.

▶ **NOTE:** *If Pl is 1 and the keys are already locked, nothing happens. The terminal ignores UDK DSR exchanges.*

The terminal uses a special lock to allow or prevent the programming of UDKs. You can turn on this lock through the terminal's firmware menus or from the host (with a DECUDK device control string). The lock affects all programmable keys. When using the lock follow these guidelines:

- Unlock the keys to define them. The keys must be unlocked before you can define them. You can only unlock the keys through the terminal's firmware menus. If a key is locked and an application tries to redefine the key with a DECUDK sequence, the terminal ignores the sequence.
- Lock the keys to prevent redefinition. You can lock the keys through the terminal's firmware menus or from the host (with a DECUDK sequence). New key definitions are unlocked by default.

The **vertical bar** (|, 7C hexadecimal) is the final character. It identifies this control string as a DECUDK.

Ky1/St1;...**Kyn/Stn** are the key definition strings. You include these strings between the final character (|) and the string terminator (ST). Each string consists of a key selector number (Kyn) and a string parameter (Stn), separated by a slash (/, 2F hexadecimal). A semicolon (3B hexadecimal) separates different strings.

The key selector number (Kyn) indicates which key you are defining. Following is a list of definable keys and their identifying values.

Key	Value	Key	Value
F6	17	F13	25
F7	18	F14	26
F8	19	Help	28
F9	20	Do	29
F10	21	F17	31
F11	23	F18	32
F12	24	F19	33
F13	25	F20	34
F14	26		

String parameters (Stn) are the encoded definition of the keys. String parameters consist of hex pairs in the following ranges:

- 30 through 39 hexadecimal (0 through 9)
- 41 through 46 hexadecimal (A through F)
- 61 through 66 hexadecimal (a through f)

When you combine these hexadecimal values they represent an 8-bit quantity. This method lets you use any of the 256 character codes in the key string. You can enter key definition strings in any order.

The default for Stn is "empty." The key is undefined.

ST is the string terminator. ST (9C hexadecimal) is a C1 8-bit character. You can use ESC \ (1B and 5C hexadecimals) for a 7-bit environment.

Loading UDKs

Following are some guidelines for loading UDKs.

- Clear UDK memory space before loading new definitions. Use a DECUDK string to clear keys without locking them. Then you can use another DECUDK string to redefine the keys and lock them.
- If you redefine a key, the old definition is lost. This may clear some space if the new definition uses fewer bytes than the old one.
- There are two ways to lock UDKs, but only one way to unlock them. To lock UDKs, you can use either the terminal's firmware menus or a DECUDK control string. To unlock UDKs, you must use the terminal's firmware menus.
- The default value for each key definition is empty. When you clear UDKs, they are empty.
- An invalid hex pair in a DECUDK string is ignored.

Examples of Device Control Strings

This sequence clears UDKs:

```
DCS 0 ; 1 | ST
```

This sequence locks UDKs:

```
DCS 1 ; 0 | ST
```

Suppose you want to define the F20 key to be PRINT without clearing or locking any other keys and you are using 8-bit mode. The first part of the sequence would look like this:

```
É1;1|34/
```

where 34 is the code for the F20 key and "É" is the ASCII character for 90 hexadecimal.

After the slash character "/" (2F hexadecimal) you would include the definition. The rest of the sequence after the slash character would be,

```
5052494E54£
```

where the hex encoding for PRINT is:

50 = P
52 = R
49 = I
4E = N
54 = T

The ST ASCII character "£" (9C hexadecimal) marks the end of the control string. The complete string is:

```
É1;1|34/5052494E54£
```

Down-Line Loadable Character Set

The terminal does not support the ability to create and down-line load a character set of up to 94 characters (Table 6-26). This character set is also called a dynamically redefinable character set (DRCS).

Table 6-26
Down-Line Loadable Character Set

Function	Action
Down-line load DRCS characters	Ignored
Clear a down-line loaded character set	Ignored

Reports

The terminal sends reports in response to host computer requests. Reports provide identification (type of terminal). Two categories of reports are available: primary and secondary device attributes, and device status reports.

Device Attributes (DA)

Table 6-27 shows the action taken by the terminal when it receives primary and secondary device attribute exchanges. During a primary exchange, the host asks for the terminal's service class code. The terminal responds with "I am a service class 2 terminal." During a secondary exchange the terminal responds with "I am a VT (identification code of 1) family terminal."

Table 6-27
Device Attributes

Communication	DA Exchange	Sequence	Meaning
Host to VT220 (request)	Primary	CSI > c *or* CSI > 0 c	What type of terminal are you?
	Secondary	CSI c *or* CSI 0 c	What type of terminal are you?
VT220 to host (response)	Primary	CSI > c	I am a VT100 Terminal
		CSI > 1 c	I am a VT220 Terminal.
		CSI > 24 c	I am a VT320 Terminal.
		CSI > 19 c	I am a VT100 Terminal.
	Secondary	CSI ? 61 c	I am a VT100 Terminal.
		CSI ? 62 ; 8 ; 9 c	I am a VT220 Terminal supporting user-defined keys and national replacement character sets.
		CSI ? 63 ; 8 ; 9 c	I am a VT320 Terminal supporting user-defined keys and national replacement character sets.
		CSI ? 63 ; 8 ; 9 ; 13 c	I am a VT340 Terminal supporting user-defined keys, national replacement character sets, and local editing.

Device Status Reports (DSR)

Table 6-28 shows the action taken by the terminal when it receives device status report exchanges, when the host computer asks for the general operating status of the terminal or printer, or both. If the terminal is in printer controller mode, the printer receives the DSR request but cannot answer.

Table 6-28
Device Status Reports

DSR Exchange	Communication	Sequence	Action
VT220	Host to VT220 (Request for status)	CSI 5 n	Ignores this code.
	VT220 to host (DA response)	CSI 0 n *or* CSI 3 n	Ignores these codes.
	Host to VT220 (Request for cursor position)	CSI 6 n	"Please report your cursor position using a CPR (not DSR) control sequence."
	VT220 to host (CPR response)	CSI Pv; Ph R	"My cursor is positioned at _____ (Pv); _____ (Ph)." (Pv=row, Ph=column)
Printer port	Request for printer status	CSI ? 15 n	What is the printer status?
	Response	CSI ? 13 n	No printer.
User-defined keys	Request for UDK status	CSI ? 25 n	Ignored in VT100 mode.
	Response	CSI ? 20 n	UDKs are unlocked.
		CSI ? 21 n	UDKs are locked.
Keyboard language	Request for keyboard language	CSI ? 26 n	What is the keyboard language?
	Response	CSI ? 27; Pn n	North American keyboard dialect.

Identification

The terminal supports the identification sequence (Table 6-29).

Table 6-29
Identification

Name (Mnemonic)	Sequence	Action
Identification (DECID)	ESC Z	Ignored.

Terminal Reset

Terminal reset escape sequences cause either a soft terminal reset or a hard terminal reset.

Soft Terminal Reset (DECSTR)

▶ **NOTE:** *The DECSTR control function is available for all VT/ANSI modes.*

DECSTR changes most of the terminal's current settings to the power-up default settings listed in Table 6-30. The escape sequence is:

CSI ! p

DECSTR affects only those functions listed in Table 6-30.

Table 6-30
Soft Terminal Reset (DECSTR) States

Mode	Mnemonic	State After DECSTR
Text cursor enable	DECTCEM	Cursor enabled.
Insert/replace	IRM	Replace. (“Insert” if local editing mode.)
Origin	DECOM	Absolute (cursor origin at upper-left of screen).
Auto wrap	DECAWM	No auto wrap.
Keyboard action	KAM	Unlocked.
Numeric Keypad	DECNKM	Numeric characters.
Cursor keys	DECCKM	Normal (arrow keys).
Edit	DECEDM	Interactive.
Transmit execution	DECTEM	Immediate.
Erasure	ERM	All characters.
Guarded area transfer	GATM	All characters.
Multiple area transfer	MATM	All selected areas.
Selected area transfer	SATM	All areas.
Scanner lock		Reset.

Table 6-31 lists other control functions.

Table 6-31
Other Control Functions

Mode	Mnemonic	State After DECSTR
Set top and bottom margins	DECSTBM	Top margin = 1. Bottom margin = page length.
All character sets	G0, G1, G2, G3, GL, GR	VT/ANSI default settings.
Select graphic rendition	SGR	Normal rendition.
Start of selected area	SSA	Cleared.
End of selected area	ESA	Cleared.
Start of protected area	SPA	Cleared.
End of protected area	EPA	Cleared.
Save cursor state	DECSC	Home position with VT/ANSI defaults.

All tab stops are reset. User-defined keys are cleared.

Hard Terminal Reset (RIS)

When the RIS is complete, the terminal sends XON to resume communication.

The RIS sequence is:

ESC c

RIS resets values to factory default settings. It is the same as DECSTR, but also does the following:

- Clears the screen.
- Returns cursor to the upper-left corner of the screen.
- Sets SGR function to normal rendition.

Tests and Adjustments

The terminal has adjustment patterns you can invoke from the host computer with escape sequences. Adjustment sequences send uppercase Es to the terminal's display. Only qualified technicians perform adjustment procedures.

Table 6-32 shows the action taken by the terminal when it receives test and adjustment sequences.

Table 6-32
Tests and Adjustments

Name (Mnemonic)	Sequence	Action
Tests (DECTST)	CSI 4 ; Ps ; ..... ; Ps y	Ignored
Adjustments (DECALN)	ESC # 8	Fills display with uppercase Es

VT52 Mode Escape Sequence

The terminal does not support VT52 mode, which allows the VT/ANSI Terminal to operate with DEC software written for VT52 Terminals.

Define Area Qualification

The define area qualification (DAQ) command indicates that the active position is the first character position of a qualified area. The end of a qualified area is indicated by the beginning of the following qualified area. The qualifications of the area are specified according to the parameter(s). Table 6-33 lists qualification sequences.

▶ **NOTE:** *DAQ is ignored unless the terminal is in VT340 mode.*

Table 6-33
Define Area Qualification

Qualification	Sequence and Ps (Single Parameter)	Action
Accept all input	CSI 0 o	Accepts all input
Accept no input (protected) and do not transmit (guarded)	CSI 1 o	Accepts no input
Accept graphics	CSI 2 o	Accepts graphics
Accept numerics	CSI 3 o	Accepts numerics
Accept alphabetics	CSI 4 o	Accepts alphabetics
Right justify in area	CSI 5 o	Right justifies area
Zero fill in area	CSI 6 o	Fills area with zeros.
Horizontal tab stop at start of area	CSI 7 o	Puts horizontal tab stop at start of area
Accepts no input (protected), but select for transmission (unguarded)	CSI 8 o	Accepts no input
Space fill in area	CSI 9 o	Fills area with spaces
Invisible	CSI 1 0 o	Makes passwords invisible

Private Sequences

Private sequences enable or disable autosend (Table 6-34).

Table 6-34
Define Area Qualification

Mode	Sequence*	Action
Set	ESC [= 3 l	Enables autosend. Transmits the screen when the last field is filled. If you are on the last defined field and get data from the bar code reader or RS-232 port, the display will also be automatically sent even if the field not filled.
Reset	ESC [= 3 h	Disables autosend. Only transmits when a terminating key is pressed.

* *The last character of the set mode sequence is lowercase L (6C hexadecimal).*

Proprietary Sequences

Following are INTERMEC® extensions to the data stream.

Line Edit and Character Modes

Two proprietary escape sequences enable the host to put the terminal into Line Edit (block) mode or Character mode (Table 6-35). Note that the terminal enters Character mode when it is cold-started.

Table 6-35
Line Edit and Character Mode Sequences

Mode	Sequence*
Line Edit	CSI = 1 l
Character	CSI = 1 h

* *The last character of the Line Edit sequence is lowercase L (6C hexadecimal).*

Norcompress

The Norcompress function handles the norrc command, where “a” is the number of iterations that “b” occurs in the datastream. The sequence for Norcompress is **CSI a;bz**.

Scanner Lock Mode

Scanner lock mode is similar to the KAM function; however, you do not need to repeatedly send the Locked command (this command is assumed after each scan).

Table 6-36
Scanner Lock Mode

Mode	Sequence*	Action
Set	CSI = 4 h	The host sends this sequence, which puts the terminal into Scanner Lock mode. When the terminal is in this mode, only one scan is allowed; the scanner is then inhibited. After this sequence is sent, the user can scan only once (no additional scans are allowed). To re-enable the scanner, the host must send CSI 2 l to unlock the scanner.
Reset	CSI = 4 l	Resets Scanner Lock mode (default).

* *The last character of the reset sequence is lowercase L (6C hexadecimal).*

The scanner lock state can also be reset by the RIS command (ESC c) or the DECSTR command (CSI ! p).

VT340 Applications

VT340 Terminal applications supported by the terminal include setting the right margin, using control functions, and creating text forms.

Right Margin

The terminal's display contains 2 to 80 columns. To ensure that the cursor will not go beyond Column Pn, use the following sequence to set the number of columns (Pn is a number from 2 to 80):

CSI Pn $ ¦

Control Functions

In editing mode you can use the erasure, deletion, and insertion control functions. The character protection field lets you design text forms that cannot be changed or overwritten. In edit mode, character protection also depends on the setting of erasure mode (ERM):

- If ERM is set all characters can be changed, erased, and moved, regardless of protection.
- If ERM is reset only unprotected characters can be changed, erased, and moved. These control functions will not affect protected areas in page memory:

  Insert line (IL)
  Delete line (DL)
  Insert character (ICH)
  Delete character (DCH)
  Erase in display (ED)
  Erase in line (EL)
  Erase character (ECH)

Text Forms

When using C1 control characters SPA, EPA, SSA, and ESA to create forms on the host, the rows and columns to which the cursor moves must be in sequential order. The following shows some sequences that create a text form, start with the left column.

Sequence	Description	Sequence	Description
ESC [1; 1 H	Home cursor	ESC V	Start protected area
ESC [2 J	Clear screen	ESC [4; 1 H	Move cursor to Row 4, Col 1
ESC [? 10 h	Start local editing mode	"Lot:"	Display literal
ESC V	Start protected area	ESC [1 D	Move cursor back 1 position
ESC [1; 2 H	Move cursor to Row 1, Col 2	ESC W	End protected area
"Manufacturing"	Display literal	ESC [1 C	Move cursor forward 1 position
ESC [1 ; 17 H	Move cursor to Row 1, Col 17	ESC F	Start selected area
"Receiving"	Display literal	ESC [4; 9 H	Move cursor to Row 4, Col 9
ESC [2; 1 H	Move cursor to Row 2, Col 1	ESC G	End selected area
"LIP:"	Display literal	ESC V	Start protected area
ESC W	End protected area	ESC [5; 1 H	Move cursor to Row 5, Col 1
ESC [1 D	Move cursor back 1 position	"Qty:"	Display literal
ESC W	End protected area	ESC [1 D	Move cursor back 1 position
ESC [1 C	Move cursor forward 1 position	ESC W	End protected area
ESC F	Start selected area	ESC [1 C	Move cursor forward 1 position
ESC [2; 15 H	Move cursor to Row 2, Col 15	ESC F	Start selected area
ESC G	End selected area	ESC [5; 13 H	Move cursor to Row 5, Col 13
ESC V	Start protected area	ESC G	End selected area
ESC [3; 1 H	Move cursor to Row 3, Col 1	ESC V	Start protected area
"Item:"	Display literal	ESC [24; 80 H	Move cursor to Row 24, Col 80
ESC [1 D	Move cursor back 1 position	ESC W	End protected area
ESC W	End protected area	ESC [26 $ |	Set the number of Cols to 26
ESC [1 C	Move cursor forward 1 position	ESC [1; 8 r	Set top at 1, bottom at 8 Rows
ESC F	Start selected area	ESC [3 g	Clear tab stops
ESC [3; 16 H	Move cursor to Row 3, Col 16	ESC [2; 5 H	Move cursor to Row 2, Col 5
ESC G	End selected area		

If this information is entered on the form:

111111111	for "LIP:"
2222222222	for "Item:"
3333	for "Lot:"
44444444	for "Qty:"

The data stream will be sent to the host as indicated in the following chart. (If guarded area transfer mode (GATM) is reset, then the record separator is processed as a protected field entry.)

Sequence	Description	Sequence	Description
RS	Protected field Line 1	**3333**	Selected field Line 4
RS	First protected field Line 2	**RS**	Second protected field Line 4
111111111	Selected field Line 2	**RS**	First protected field Line 5
RS	First protected field Line 3	**44444444**	Selected field Line 5
RS	First protected field Line 3	**RS**	Second protected field Line 5
2222222222	Selected field Line 3	**RS**	Protected field Line 6
RS	Second protected field Line 3	**RS**	Protected field Line 7
RS	First protected field Line 4	**RS**	Protected field Line 8

ANSI Mode Sequences

Cursor Positioning

The terminal supports the cursor positioning sequences in Table 6-37.

Table 6-37
Cursor Positioning Sequences

Name (Mnemonic)	Sequence	Action
Cursor backward tab (CVT)	CSI Ps Z	Moves the cursor to previous Ps tab stop(s). If there is no previous tab stop, then the cursor moves to the left margin.
Cursor horizontal absolute (CHA)	CSI Ps G	Moves the cursor to the Ps column on the current line.
Cursor horizontal tab (CHT)	CSI Ps I	Moves the cursor to the next Ps tab stop(s). If there is not next tab stop, then the cursor moves to the right margin.
Cursor next line (CNL)	CSI Ps E	Moves the cursor down Ps lines. If at the bottom margin of the screen, then the cursor is not moved.
Cursor previous line (CPL)	CSI Ps F	Moves the cursor up Ps lines. If at the top margin of the screen, then the cursor is not moved.
Horizontal position absolute (HPA)	CSI Ps	Moves the cursor to Ps column on the current line.
Horizontal position relative (HPR)	CSI Ps a	Moves the cursor Ps columns from the current location. If past the right margin, then the cursor is stopped at the right margin.
Vertical position absolute (VPA)	CSI Ps d	Moves the cursor to Ps row using the current column.
Vertical position relative (VPR)	CSI Ps e	Moves the cursor Ps rows from the current location. If at the bottom margin, then the cursor is stopped at the bottom margin.
Cursor vertical tab (CVT)	CSI Ps Y	Moves the cursor down Ps vertical tab stops. If at the bottom margin, then the cursor is stopped.

Cursor Tabulation Control

Table 6-38 lists cursor tabulation control (CBT) sequences in ANSI mode.

Table 6-38
Cursor Tabulation Control Sequences

Sequence	Action
CSI 0 W	Sets horizontal tab stop at current location.
CSI 1 W	Sets vertical tab stop at current location.
CSI 2 W	Clears horizontal tab stop.
CSI 3 W	Clears vertical tab stop.
CSI 4 W	Clears all horizontal tab stops this line.
CSI 5 W	Clears all horizontal tabs stops in the machine.
CSI 6 W	Clears all vertical tab stops

Scrolling

Table 6-39 lists scrolling sequences in ANSI mode.

Table 6-39
Scrolling Sequences

Name (Mnemonic)	Sequence	Action
Scroll up (SU)	CSI Ps S	Scrolls display up Ps lines.
Scroll down (SD)	CSI Ps T	Scrolls display down Ps lines.

Transmitted Keyboard Codes

Transmitted codes are generated by the terminal's keys and sent to the host computer or software application in use. The following pages describe the capability of the terminals to emulate codes generated by the VT/ANSI terminal keyboard's main keypad, editing keypad, auxiliary keypad, and top-row function keys.

Codes are sent via Line Edit (block) mode or optimized Character mode selected through the keyboard function labeled MODE on the overlay.

Line Edit (Block) Mode

Line Edit (block) mode is a synchronous condition where the terminal temporarily stores or "buffers" keys you press. It sends the cumulative data to the host computer when you press one of the following terminating keys:

[ENTER]

[F6] through [F20], [PF1] through [PF4]

[CTRL]+[A] through [CTRL]+[Z]

Forward Tab

DEL (7F hexadecimal)

Backspace

The following also apply to Line Edit (block) mode:

- When you press [PF1], the following key will also be transmitted directly to the host computer.
- When scanning, the terminal automatically enters Line Edit (block) mode for each individual scan. When it completes scanning, it returns to the mode it was set at before it started scanning.

For codes generated by the cursor control key, see page 6-33. For codes generated by the auxiliary keypad keys, see page 6-34.

Character Mode

Character mode (the default) is a condition where the terminal sends, to the host computer, each key as you press it. You should place the terminal into Character mode during these situations:

- When the terminal should immediately send information to the host computer. This operation is called "type-ahead."
- When the terminal's keyboard sends a character to the display as well as to the host. This operation is called "local echo." If local echo is disabled, the host receives the character from the terminal and then sends the return response.

To alternate between Line Edit (block) mode and Character mode, press the mode key as defined under "Transmission Mode" in Section 3, "Using the Terminal's Keyboard."

Transmitted Keyboard Keys

The following pages describe codes generated by main keypad keys, editing keys, auxiliary keys, and top-row function keys.

Main Keypad

The terminal emulates all of the standard and most of the special function keys on the VT/ANSI main keypad. The standard keys generate letters, numbers, and symbols, either alone or in combination with other keys. The function keys generate special function codes.

Table 6-40 lists the codes generated by the special function keys.

Table 6-40
Special Function Keys and Codes Generated

VT/ANSI Key	Code
Ctrl	Does not send a code when used alone. Is always used in combination with another key to send a control code.
Delete	DEL (7F hexadecimal).
Lock	None.
Return	CR (0D hexadecimal) or CR (0D hexadecimal) LF (0A hexadecimal).
Shift	Does not send a code when used alone; sends uppercase characters when used with other standard keys.
Space bar	SP (20 hexadecimal).
Tab	HT (09 hexadecimal).

Editing Keypad

The terminal has editing keys and cursor control keys. Editing keys have functions assigned to them by the application software in use. Refer to your VT/ANSI application software manual for the uses of the editing keys.

Editing Keys

Table 6-41 lists the codes generated by the editing keys.

▶ **NOTE:** *The editing keys do not send codes in VT100 mode.*

Table 6-41
Editing Keys and Codes Generated

VT/ANSI Key	Code	VT/ANSI Key	Code
Find	CSI 1 ~	Prev screen	CSI 5 ~
Insert here	CSI 2 ~	Remove	CSI 3 ~
Next screen	CSI 6 ~	Select	CSI 4 ~

Cursor Keys

Table 6-42 lists codes generated by the terminals' cursor keys.

Table 6-42
Cursor Keys and Codes Generated

Key	Cursor Key Mode Reset (Normal)	Cursor Key Mode Set (Application)
Down arrow	CSI B	SS3 B
Left arrow	CSI D	SS3 D
Right arrow	CSI C	SS3 C
Up arrow	CSI A	SS3 A

Sending Host Cursor Keys

In keyboard unshifted and shifted modes, the cursor control key sends a host cursor key to the host computer. The cursor control key emulates the arrow keys of a VT/ANSI Terminal in either their normal arrow key mode or Application mode, depending on the state set by the programmer.

To Send	Press Terminal Key(s)
Host cursor down key	[▼]
Host cursor left key	[◀]
Host cursor right key	[▶]
Host cursor up key	[▲]
Host cursor down key	[SFT]+[▼]
Host cursor left key	[SFT]+[◀]
Host cursor right key	[SFT]+[▶]
Host cursor up key	[SFT]+[▲]

Auxiliary Keypad

Auxiliary keypad keys enter numeric data. The application software in use can also assign functions to these keys; refer to your VT/ANSI application software manual for their uses. Table 6-43 shows codes generated by the auxiliary keys in keypad Application mode.

Table 6-43
Auxiliary Keys and Codes Generated

VT/ANSI Key	Keypad Mode	VT/ANSI Key	Keypad Mode
0	SS3 p	9	SS3 y
1	SS3 q	- (hyphen)	SS3 m
2	SS3 r	, (comma)	SS3 l
3	SS3 s	. (period)	SS3 n
4	SS3 t	Enter	SS3 M
5	SS3 u	PF1	SS3 P
6	SS3 v	PF2	SS3 Q
7	SS3 w	PF3	SS3 R
8	SS3 x	PF4	SS3 S

Top-Row Function Keys

Table 6-44 lists function keys and the codes generated.

Table 6-44
Top-Row Function Keys and Codes Generated

Key	VT220/320/340 Mode	VT100 Mode	Key	VT220/320/340 Mode	VT100 Mode
F5 (Break)	No code	No code	F13	CSI 2 5 ~	LF
F6	CSI 1 7 ~	No code	F14	CSI 2 6 ~	No code
F7	CSI 1 8 ~	No code	F15	CSI 2 8 ~	No code
F8	CSI 1 9 ~	No code	F16	CSI 2 9 ~	No code
F9	CSI 2 0 ~	No code	F17	CSI 3 1 ~	No code
F10	CSI 2 1 ~	No code	F18	CSI 3 2 ~	No code
F11	CSI 2 3 ~	Esc	F19	CSI 3 3 ~	No code
F12	CSI 2 4 ~	BS	F20	CSI 3 4 ~	No code

Local Edit Mode

If your application software program supports local editing, the terminal can be programmed to operate in Local Edit mode. Local Edit mode is a feature of the VT340 Terminal. Use the mode to send characters to page memory instead of to the host. The terminal sends a block of edited text to the host after you press a terminating key. Terminating keys in Local Edit mode are:

[ENTER]
[F1] through [F20]

Edit Mode and Interactive Mode

The edit mode control function (DECEDM) selects edit mode or interactive mode. The function determines when the terminal sends data to the host. Table 6-45 describes the modes.

Table 6-45
Local Edit Modes

Mode	Sequence*	Action
Set	CSI ? 1 0 h	Selects edit mode. (Turns on the annunciator in the display.) The terminal stores all typed characters in page memory for local editing. After the data is edited, it can be sent in a block to the host.
Reset	CSI ? 1 0 l	Selects interactive mode. (Turns off the annunciator in the display.) The terminal immediately sends typed characters to the host.

* *The last character in the reset sequence is lowercase L (6C hexadecimal).*

Local Editing Setup

To use the terminal in Local Edit mode, the local editing features must be set up for the application software as described in Table 6-46.

Table 6-46
Local Editing Setup

Feature	Setting	Description
Edit mode	Edit	Edited text is stored in memory until you press a terminating key, which sends the text to the host.
Edit key execution mode		Not supported.
Transmit execution mode	Immediate	The terminal sends data to the host immediately after you press a terminating key.
Local editing application keys	Suffix transmit	When you press [F1] through [F20], the terminal sends that function to the host after sending a block of data.
Line transmit mode	Disabled	The terminal sends a full page of data to the host after you press a terminating key.
Transfer termination mode	Enabled	After you press a terminating key, the terminal sends the scrolling region, which is the area inside the scrolling margins.
VT131 transfer mode		Not supported.
Space compression	Disabled	The terminal sends a space character for each unused character position.
End of line characters		On the terminal, no characters indicate the end of a line in a data block.
End of block characters		On the terminal, no characters indicate the end of a data block.

Selecting Characters to Send

Three control functions allow you to define which characters the terminal can send to the host. Table 6-47 shows how the control functions select which characters the terminal sends.

Table 6-47
Selecting Character Fields for Transmission

Fields Selected	Guarded Area Transfer Mode	Selected Area Transfer Mode	Multiple Area Transfer Mode
All fields	Set	Set	Unavailable
Unprotected fields only	Reset	Set	Unavailable
Selected fields only	Set	Reset	Set
Selected field with cursor only	Set	Reset	Reset
Unprotected and selected fields	Reset	Reset	Set
Selected field with cursor only	Reset	Reset	Reset

Guarded Area Transfer Mode (GATM)

The GATM control function selects whether the terminal sends all characters or only unprotected characters to the host. When GATM is unprotected (reset), the terminal sends a record separator (RS, 1E hexadecimal) to the host in place of a protected field. Table 6-48 lists GATMs.

Table 6-48
Guarded Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 h	Selects all characters. During block transmission, the terminal can send all protected and unprotected characters to the host.
Reset (Unprotected)	CSI 1 l	Selects unprotected characters. During a block transmission, the terminal can send only unprotected characters to the host.

* *The last character of the reset sequence is lowercase L (6C hexadecimal).*

Selected Area Transfer Mode (SATM)

The SATM control function determines whether the terminal can send all characters or only selected characters to the host. Selected characters are characters defined as eligible to send to the host. Table 6-49 lists SATMs.

Table 6-49
Selected Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 7 h	Selects all characters. The terminal can send selected and unselected characters on the current page to the host.
Reset (Unprotected)	CSI 1 7 l	Selects only selected characters. The terminal can only send selected characters on the current page to the host.

* *The last character of the reset sequence is lowercase L (6C hexadecimal).*

Multiple Area Transfer Mode (MATM)

The MATM control function determines what selected character areas the terminal can send to the host. MATM work only when SATM is reset. Table 6-50 describes MATMs.

Table 6-50
Multiple Area Transfer Modes

Mode	Sequence*	Action
Set (All)	CSI 1 5 h	The terminal can send all selected areas on the page to the host.
Reset (Unprotected)	CSI 1 5 l	Selects one area. The terminal can send only the selected area with the cursor. If the cursor is not in a selected field, cursor moves to the next selected field.

* *The last character of the reset sequence is lowercase L (6C hexadecimal).*

Defining Selected Areas

Start selected area (SSA) and end selected area (ESA) control functions select which characters on the current page the terminal can send to the host. SSA and ESA are 8-bit C-1 control characters that can also be coded as 7-bit escape sequences. The following conditions apply to SSA and ESA:

- They work only when SATM is reset.
- If the terminal receives ESA before SSA, it ignores ESA.
- If SSA is not followed by ESA on the same page, the SSA has no effect on that page. Selected areas must always end with ESA.
- Selected areas cannot be changed by the ED, EL, or ECH control functions.

Table 6-51 describes SSA and ESA.

Table 6-51
Start Selected Area and End Selected Area

Name (Mnemonic)	8-Bit	7-Bit Equivalent	Action
Start selected area (SSA)	SSA (86 hex)	ESC F (1B, 46 hex)	Marks the cursor position as the first of a string of character positions the terminal can send to the host.
End selected area (ESA)	ESA (87 hex)	ESC G (1B, 47 hex)	Defines the cursor position as the last of a string of character fields the terminal can send to the host.

Local Edit Mode Keys

Keys with special functions in Local Edit mode are described in Table 6-52.

Table 6-52
Local Edit Mode Keys

Key(s)	Function
Find	Advances cursor to the top margin, Column 1.
Tab	Advances cursor to the next tab stop. If in protected area, it advances to the next selectable field. If tab stop is selected, it advances to the next selectable field.
Insert here	Default mode is "insert." The key toggles between insert and overstrike. If in insert mode, all following characters in the field are shifted right one position. If the field is full the last character is deleted.
Remove	If in protected area, terminal beeps and the cursor advances to the first position of the next selectable field. If no selectable field is found, it advances to the bottom margin (the default is Row 24, Column 80). If in unprotected field, the field is cleared and the cursor is positioned to the beginning of the selectable field.
Prev screen	Ignores this key.
Next screen	Ignores this key.
Select	Ignores this key.
Backspace	Moves cursor one position to the left until it reaches the left margin.
Delete	Deletes the previous selectable character.
A–Z, 0–9, Auxiliary keypad	If one of these keys is pressed while in a protected area, the terminal beeps, advances the cursor to the next selectable field, and enters the characters. If no other selectable field is found, the cursor advances to the bottom margin.
Back Tab	Cursor moves back to the first occurrence of the following: ▶ Previous tab stop. ▶ Beginning of the current unprotected field. ▶ Beginning of the previous unprotected field. ▶ Beginning of scrolling region. (Also called top margin.)
Cursor [▲]	Cursor moves up one line until it reaches the top margin. The terminal beeps when the cursor reaches the top margin.
[▼]	Cursor moves down one line until it reaches the bottom margin. The terminal beeps when the cursor reaches the bottom margin.
[▶]	Cursor moves right one character position until it reaches the right margin. The terminal beeps when the cursor reaches the right margin.
[◀]	Cursor moves left one character position until it reaches the left margin. The terminal beeps when the cursor reaches the left margin.

Scanning in Local Edit Mode

When scanning is enabled, data from the scanner is placed into the field where the cursor is located. If the cursor is not in an input field, the data from the scanner is placed into the next input field. If the data from the scanner fills the first input field, the remaining characters are placed into the next input field.

When the bar code does not fill the input field, the cursor stays where it ended. If autotab scanning is enabled, the cursor is placed at the beginning of the next input field. If not next input field is found, extra data will be lost.

Set Transmit Termination Character (DECTTC)

The terminal supports the set transmit termination character (DECTTC) control function. Use the control function to select a character to indicate the end of a block transmission. You do not need to use an end-of-block character. The terminal sends the end-of-block character to the host at the end of each block transmission.

The control sequence is:

CSI Ps |

Ps is the end-of-block character in the following chart.

Ps	End-of-Block Character	Action
0 (default)	No character (DECTTC disabled)	
1	FF (0C hexadecimal)	Form feed
2	ETX (03 hexadecimal)	End of text
3	EOT (04 hexadecimal)	End of transmission
4	CR (0D hexadecimal)	Carriage return
5	DC3 (13 hexadecimal)	XOFF

Use an extended form of DECTTC to select a string of characters to indicate the end of a block. The extended form uses decimal codes to represent characters. You can use the extended form to send a control function at the end of a block transmission, instead of a single character. You can send a control sequence of up to six characters (Pn1 through Pn6) at the end of a block.

The control sequence is:

CSI ? Pn1 ; … **Pn6** |

Pn1 through Pn6 are decimal codes for characters you can define as end-of-block. For example, the decimal code for ESC is 27 (1B hexadecimal). A code outside the range of 0 to 254 is ignored. Table 6-1 on page 6-2 and Table 6-3 on page 6-4 contain decimal codes for characters.

For example, to send the default code of the PF1 key on the terminal's numeric keypad at the end of a block transmission, use the following procedure.

1. The PF1 key sends this default code:

   ESC O P

2. Translate each character in the sequence to decimal code.

   ASCII characters: **ESC O P**
   Decimal codes: **27 79 80**

3. Insert the decimal codes into the extended DECTTC sequence:

   CSI ? 27 ; 79 ; 80 |

Section 7

Extended Commands

Extended commands govern abilities unique to terminals. You can use extended commands to transmit or receive data over the terminal's RS-232 port, send information to an RS-232 device (such as a printer or bar code printer), or collect data. The following chart lists the commands.

Name	Characters
Transmit and Receive On RS-232 Port	#F
Transmit Only On RS-232 Port	#P
Receive Only On RS-232 Port	#G
Set Parameters *(supported on 6400, 5020, 5055, 59XX, 17XX, 11XX)*	#H
Return Version	#V
Tone	#T
Scan	#S

To use extended commands, you must enable the extended command option through the TE configuration menus. See Section 4 for information about enabling the command on a terminal.

Transmit and Receive On RS-232 Port (#F)

Use the #F extended command to transmit and receive data on the terminal's RS-232 port.

When constructing a Transmit and Receive command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression, where "yy" is the hexadecimal representation of the output byte). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character.

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This assures that all data is present before the extended command is parsed (removed).

There are two ways to send the #F extended command. The conventional method involves writing the command to the screen on line one, writing the data to be printed on the second line, then writing a "#" character on the first line to activate the print. The other method is to use the control characters APC (0x9F) and ST (0x9C) to encapsulate the command. Using the control characters method is faster since they are not written to the display.

Conventional Method

This is an example of Transmit and Receive using the conventional method. *Note that the descriptions for the "This is the Data to be sent" command are listed under the control character sequence method.*

Command	Action
CSI 2J	Clears the screen.
CSI 1;3H	Move the cursor to top row, Column 3.
F4N8100005500A0102~~b~~~~b~~00	Start the print command.
CSI 2;1HThis is the Data to be sent#	Moves cursor to Row 2, Column 1 and sends the data to be printed
CSI 1;2H#	Move the cursor to top row, Column 2 and start the print job.

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

Control character sequences for mnemonics APC (Application Program Command) and ST (String Terminator) can also start and end data. The last data character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character and the string terminator sequence. Below are the descriptions of each group of characters. Note that "~~b~~" indicates a 1-byte space.

^9F#F4N8100005500A0102~~b~~~~b~~00This is the Data to be sent#^9C

Data to send

^9F	APC character 0x9F
#F	Extended command for transmit and receive
4N81	9600 baud, no parity, 8 data bits, 1 stop bit
000	Flow control options *(disabled)*
05	Flow timeout *(5 seconds)*
50	Maximum receive characters
0A	Delimiting character
01	Number of delimiting characters to wait for
02	Start character *(STX)*
~~b~~	Start character return *(do not return start character)*
~~b~~	Parity error flags *(do not flag parity errors)*
00	Receive timeout *(use 5-second default)*
Data to send	
#	Data termination character
^9C	ST character 0x9C

The output stream appears in ASCII character format. For bytes that are not displayable ASCII characters, you may insert the "=yy" characters, where "yy" is the hexadecimal representation of the output byte. Table 7-1 describes the line and columns where characters must appear, and their meanings. Note that "b" indicates a 1-byte space.

Table 7-1
Transmit and Receive Characters

Line 1, Columns 2-24

Column	Description	Character
2	Extended command	#
3	Transmit and Receive on RS-232 Port command	F
4	Speed (bits per second)	1=1200; 2=2400; 3=4800; 4=9600; 5=19200; 6=38400
5	Data parity	N=None; 0 (zero)=None; b=None; E=Even; O=Odd
6	Data bits	7=Seven; 8=Eight
7	Stop bits	1=One; 2=Two
8	*For 6400, 5020, 5055, 59XX, 17XX, 11XX:* CTS flow control	0=Disable; 1=Enable
	For 2415, 2425, 2435A, 2455, 248X: Reserved	b
9	*For 5020, 5055, 59XX, 17XX, 11XX:* DTR flow control	0=Disable; 1=Enable
	For 2415, 2425, 2435A, 2455, 248X, 6400: Reserved	b
10	XON/XOFF flow control	0=Disable; 1=Enable
11–12	Flow control timeout value	XX=Number of seconds
13–14	Maximum characters to receive	dd *or* Xd…dX, where: dd=00–99. Default: 99. d…d=Any number of decimal digits from 0–2000, inclusive. Default: 99.
15–16	Delimiter character	AA=Hexadecimal ASCII code that marks the end of data to be received. Range: 00–7E. Default of 00 or bb implies no start character.
17–18	Number of delimiter characters	XX=Number of characters accepted before sending return code to host. Range: 00–99. Default of 00 or bb implies no start character.
19–20	Start character	AA=Hexadecimal ASCII code. Range: 00–99. Default of 00 or bb implies no start character.
21	Return start character to host	F=Return character; b = Do not return character
22	Flag parity errors	P=Flag; b = Do not flag
23–24	Receive timeout length	XX=Number of seconds the terminal waits for input from the RS-232 port before it sends a timeout error. Uses a 5-second default when field contains spaces.

Flow Control

The Transmit command supports these types of flow control:

- RTS/CTS *(6400, 5020, 5055, 59XX, 17XX, 11XX)*
- DTR/DSR *(59XX only)*
- XON/XOFF

Use CTS and DSR flow control lines to show XON/XOFF conditions from the output device. Also use them to prevent output when the terminal has no output device. The output device DTR should connect to either the DSR or CTS lines. On the 59XX Terminal, DTR is normally low and is raised to indicate that the terminal is prepared for an RS-232 data exchange.

XON/XOFF is the same XON/XOFF flow control most devices support. The timeout value tells the terminal how long to wait for the flow control handshake before returning a one-byte error value.

Return Codes for Transmit and Receive

The Transmit and Receive return code is the status sent to the host computer. The terminal returns data and the extended command's status to the host computer in the **X****CC****DATA<CR>** or **X****CCCC****DATA<CR>** format.

X	The return code listed in the following chart.
CC or **CCCC**	The character count of the data returned. **CC** is 00–99. **CCCC** is 100–2000.
DATA	The RS-232 data received from the RS-232 device attached to the terminal (if any data was received). The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits or stop bits, or flow control timeout.	4, 6, 7, 11–12
2	No delimiter (#) on data stream.	(None)
3	Timeout while using CTS flow control *(6400, 5020, 5055, 59XX, 17XX, 11XX)*.	(None)
4	Timeout while using DTR flow control *(6400, 5020, 5055, 59XX, 17XX, 11XX)*.	(None)
5	Timeout while using XON/XOFF flow control.	(None)
6	Improper return field.	(None)
7	Hexadecimal value is outside the range of 00–0F.	15–16, 19–20
8	Reserved.	(None)
9	Incorrect setting for maximum characters to receive.	13–14
A	Incorrect setting for delimiter character.	15–16
B	Incorrect setting for number of delimiter characters.	17–18
C	Incorrect setting for CTS, DSR, or XON/OFF flow control.	8, 9, 10
D	Incorrect setting for start character.	19–20
E	Incorrect setting for data parity.	5, 22
f/F*	Timeout.	(None)
o/O*	Overrun of UART receive register; an error from the RS-232 device.	(None)
p/P*	Data parity or framing error.	(None)
R	Syntax error from RD5500 Remote Display (not the expected character; no character error was detected). (Applies only to the 17XX Terminal.)	(None)

** An uppercase letter indicates an error from the RS-232 device. A lowercase letter indicates an error from the RD5500 Remote Display (applies only to the 17XX Terminal).*

Transmit Only On RS-232 Port (#P)

The Transmit Only On RS-232 Port extended command lets the terminal send information to a slaved RS-232 device, such as a receipt printer or bar code printer. The command uses the RS-232 communications port to send data to the device. The terminal checks data from the host computer for a transmit sequence, then sends the requested data. The host computer signals the terminal for a transmit command by inserting the characters "#P" into the display at Line 1, Columns 2 and 3. Characteristics of the transmission immediately follow the #P command.

When constructing a Transmit Only command, the data to be sent should be placed at Line 2, Column 1. The data must be less than 1840 bytes in length (after "=yy" compression). The last character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character.

Conventional Method

This is an example of Transmit Only using the conventional method. *Note that the descriptions for the "Data to send" command are listed under the control character sequence method.*

Command	Action
CSI 2J	Clears the screen.
CSI 1;3HP5E72010008Data to send=0A=0D#	Moves the cursor to top row, Column 3
CSI 1;2H #	Moves the cursor to the beginning.

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This will assure that all data is present before the extended command is parsed (removed).

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

Control character sequences for mnemonics APC (application program command) and ST (string terminator) can also start and end data. The last data character must be a "#" (pound sign). The terminal sends the data to the RS-232 port until it detects a "#" character and the string terminator sequence. Below are the descriptions of each group of characters.

^9P#P5E7201008Data to send=0A=0D#^9C

^9P	PC character 0x9F
#P	Extended command for transmit only
5E72	19200 baud, even parity, 7 data bits, 2 stop bits
010	Enable DTR Flow control
08	Wait up to 8 seconds for DSR to be returned
Data to send	Sending string with CR, LF
#	Extended command terminating character
^9C	ST character 0x9C

The output stream takes the form of ASCII characters. For nondisplayable ASCII characters, you may insert the "=yy" characters, where "yy" is the hexadecimal representation of the output byte.

Table 7-2 describes the line and columns where characters must appear, and their meanings. Note that "b" indicates a 1-byte space.

Table 7-2
Transmit Only Characters

Line 1, Columns 2-12

Column	Description	Character
2	Extended command	#
3	Transmit Only On RS-232 Port command	P
4	Speed (bits per second)	1=1200; 2=2400; 3=4800; 4=9600; 5=19200; 6=38400
5	Data parity	N=None; 0 (zero)=None; b=None; O=Even; E=Odd
6	Data bits	7=Seven; 8=Eight
7	Stop bits	1=One; 2=Two
8	*For 6400, 5020, 5055, 59XX, 17XX, 11XX:* CTS flow control	0=Disable; 1=Enable
	For 2415, 2425, 2435A, 2455, 248X: Reserved	b
8	*For 6400, 5020, 5055, 59XX, 17XX, 11XX:* DTR flow control	0=Disable; 1=Enable
	For 2415, 2425, 2435A, 2455, 248X: Reserved	b
10	XON/XOFF flow control	0=Disable; 1=Enable
11–12	Flow control timeout value	XX=Number of seconds

Flow Control

Transmit Only supports RTS/CTS, DTR/DSR, and XON/XOFF. For descriptions, see page 7-4.

Return Codes for Transmit Only

The Transmit Only return code is the status sent to the host computer. The terminal returns the extended command's status to the host computer in the **X<CR>** format. **X** is the return code listed in the following chart. The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, number of stop bits, or flow control timeout.	4, 6, 7, 11–12
2	No delimiter (#) on data stream.	(None)
3	Timeout while using CTS flow control *(6400, 5055, 59XX, 17XX, 11XX)*.	(None)
4	Timeout while using DTR flow control *(6400, 5055, 59XX, 17XX, 11XX)*.	(None)
5	Timeout while using XON/XOFF flow control.	(None)
6	Improper return field.	(None)
C	Incorrect setting for CTS, DTR, or XON/OFF flow control.	8, 9, 10
E	Incorrect setting for data parity.	5
f	Timeout. No acknowledgment was received from the RD5500 Remote Display *(applies to the 17XX Terminal)*.	(None)
o/O*	Overrun of UART receive register.	(None)
p/P*	Data parity or framing error.	(None)
R	Syntax error from RD5500 Remote Display (not the expected character; no character error was detected). *(Applies to the 17XX Terminal.)*	(None)

** An uppercase letter indicates an error from the RS-232 device. A lowercase letter indicates an error from the RD5500 Remote Display (applies only to the 17XX Terminal).*

Receive Only On RS-232 Port (#G)

► **NOTE:** *There are no flow control settings for extended command #G.*

The Receive Only On RS-232 Port extended command provides a way to use the RS-232 port on the terminal to collect data. A scale is one example of a use for this command. The host computer sends "#G" characters to alert the terminal for activity on the port.

Conventional Method

This is an example of Receive Only using the conventional method. *Note that the descriptions for the middle command are listed under the control character sequence method and that "b" indicates a 1-byte space.*

Command	Action
CSI 2J	Clears the screen.
CSI 1;3HG3E81bbbbbX1000X03010202FP06	Moves the cursor to the top row, Column 3
CSI 1,2H #	Moves the cursor to the beginning.

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background. Note that "b" indicates a 1-byte space.

^9F#G3E81bbbbbX1000X03010202FP06^9C

^9F	APC character 0x9F
#G	Extended command for receive only
3E81	9600 baud, even parity, 8 data bits, 1 stop bit
bbbbb	Reserved
X1000X	Receive 1000 bytes
03	Delimiting character *(ETX)*
01	One delimiting character
02	Start character *(STX)*
02	Number of start characters *(2)*
F	Return start characters
P	Flag parity errors
06	Receive all data within 6 seconds
^9C	ST character 0x9C

Table 7-3 describes the line and columns where characters must appear, and their meanings. Note that "b" indicates a 1-byte space.

Table 7-3
Receive Only Characters

Line 1, Columns 2-24

Column	Description	Character
2	Extended command	#
3	Receive Only On RS-232 Port command	G
4	Speed (bits per second)	1=1200; 2=2400; 3=4800; 4=9600; 5=19200; 6=38400
5	Data parity	N=None; 0 (zero)=None; b=None; O=Odd; E=Even
6	Data bits	7=Seven; 8=Eight
7	Stop bits	1=One; 2=Two
8–12	Reserved	bbbbb
13–14	Maximum characters to receive	dd *or* Xd…dX, where: dd=00–99. Default: 99. d…d=Any number of decimal digits from 0–2000, inclusive. Default: 99.
15–16	Delimiter character	AA=Hexadecimal ASCII code that marks end of valid data to be received. Range: 00–7E. Default: 00.
17–18	Number of delimiter characters	XX=Delimiter characters received before transmitting return code to host. Range: 00–99. Default: 00.
19–20	Start character	AA=Hexadecimal ASCII code for start character. Range: 00–99. Default of 00 or bb implies no start character.
21	Return start character to host	F=Return character; b=Do not return character
22	Flag parity errors	P=Flag; b=Do not flag
23–24	Receive timeout length	XX=Number of seconds the terminal waits for input from the RS-232 port before it sends a timeout error. Uses 5-second default when this field contains spaces.

Return Codes for Receive Only

The Receive Only return code is the status sent to the host computer. The terminal returns data and the extended command's status to the host computer in the **\\X\CC\DATA<CR>** or **\\X\CCCC\DATA<CR>** format.

X The return code listed in the following chart.

CC or **CCCC** The character count of the received data. **CC** is 00–99. **CCCC** is 100–2000.

DATA The RS-232 data received from the RS-232 device attached to the terminal (if any data was received). The terminal simulates the [Enter] key to return the code to the host.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, or number of stop bits.	4, 6, 7
2	No delimiter (#) on data stream.	(None)
6	Improper return field.	(None)
7	Hexadecimal value is outside the range of 00–0F.	15–16, 19–20
8	Reserved.	(None)
9	Incorrect setting for maximum characters to receive.	13–14
A	Incorrect setting for delimiter character.	15–16
B	Incorrect setting for number of delimiter characters.	17–18
D	Incorrect setting for start character.	19–20
E	Incorrect setting for data parity.	5, 22
f/F*	Timeout.	(None)
o/O*	Overrun of UART receive register.	(None)
p/P*	Data parity or framing error.	(None)
R	Syntax error from RD5500 Remote Display (not the expected character; no character error was detected). (Applies only to the 17XX Terminal.)	(None)

** An uppercase letter indicates an error from the RS-232 device. A lowercase letter indicates an error from the RD5500 Remote Display (applies only to the 17XX Terminal).*

Set Parameters (#H)

Use Set Parameters to set TE configuration parameters that you would otherwise set at the terminal. The parameters are part of the configuration menus.

Set most of the parameters once per terminal. You can set them when you install a network or when you add terminals to the network. Unless the terminal fails (perhaps a dead battery) or a user does something destructive (such as a RAM test), you probably will not need to set them again. Note that "b" indicates a 1-byte space.

Conventional Method

When constructing a Set Parameters command, the data to be sent should be placed at Line 2, Column 1. *Note that the descriptions for the middle command are listed under the control character sequence method.*

Command	Action
CSI 2J	Clears the screen.
CSI 1;3H H099bbb3b125502200310001001600 8020	Moves the cursor to the top row, Column 3
CSI 1;2H #	Moves the cursor to the beginning.

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

^9F#H099bbb3b125502200310001001600 8020^9C

^9F	APC character 0x9F
#H	Extended command for setting terminal parameters
099	Set backlight timer to 99 seconds
bbb	*Three 1-byte spaces* Do not change sleep time
3	Set cursor mode to block
b	Do not change screen mode
1	Remote display is attached
255	Set beeper volume to 255
022	Set beeper frequency to 22
003	Set beeper length to 3 seconds
1	Delete key returns 0x9F to host
0	Enter key returns ON 0x0D to host
0	Host will echo characters back to terminal
010	Set screen size to 10 rows
016	Set screen size to 16 columns
008	Alternate screen size is 8 rows
020	Alternate screen size is 20 columns
^9C	ST character 0x9C

Table 7-4 lists columns in which characters must appear. Note that "b" indicates a 1-byte space.

▶ **NOTE:** *Some parameters do not apply to all terminal models. Refer to the terminal's user manual for applicable parameters.*

Table 7-4
***Set Parameters Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Columns 2-36

Column	Description	Character
2	Extended command	#
3	Set Parameters command	H
4–6	Backlight timer	bbb=No change from current setting; 000=On continuously; 001–255=Seconds to remain on
7–9	Sleep timer delay *(for legacy RT3210 Terminals)*	bbb=No change from current setting; 000=Off; 001–255=Seconds of inactivity before sleep
10	Cursor mode	b=No change from current setting *(default is underline)* 1=Underline; 2=Underline blink; 3=Block; 4=Block blink
11	Screen mode *(value must be sent, but it is ignored)*	b=No change from current setting; 1=Center cursor; 2=Corner; 3=Page
12	Remote display *(17XX, 11XX Terminals)*	b=No change from current setting; 0=Not attached; 1=Attached
13–15	Beeper volume	bbb=No change from current setting; 000–255=Range from quiet to loud
16–18	Beeper frequency	bbb=No change from current setting; 000–030=Range from low to high
19–21	Beeper length	bbb=No change from current setting; 000–010=Duration in seconds from short to long (keyboard response time)
22	Delete key mapping	b=No change from current setting; 0=Delete key is delete (7F hex); 1=Delete key is backspace (08 hex)
23	CR expansion mapping	b=No change from current setting; 0=CR; 1=CR/LF
24	Local host echo	b=No change from current setting; 0=Host echo; 1=Local echo
25–27	Primary screen row size	bbb=No change from current setting; 000–255=Number of rows per display screen
28–30	Primary screen column size	bbb=No change from current setting 000–255=Number of columns per display screen
31–33	Alternate screen row size	bbb=No change from current setting 000–255=Number of rows per display screen
34–36	Alternate screen column size	bbb=No change from current setting 000–255=Number of columns per display screen

Return Codes for Set Parameters

Line 24, Column 1 has the return status field. The code returned in this position tells the host the status of the extended command. The Set Parameters return code is the status sent to the host computer.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Backlight timer parameter invalid.	4–6
2	Sleep mode timer parameter invalid.	7–9
3	Normal cursor set parameter invalid.	10
4	Insert cursor set parameter invalid.	11
5	Remote display parameter invalid.	12
6	Shift key unlock parameter invalid.	13
7	Keyboard lock parameter invalid.	14
8	Beeper volume parameter invalid.	15–17
9	Beeper frequency parameter invalid.	18–20
A	Beeper length parameter invalid.	21–23
B	Stream scan parameter invalid.	24
E	Incorrect setting for number of rows.	25–27
F	Incorrect setting for number of columns.	28–30

Return Version (#V)

The Return Version extended command returns the current terminal emulation name and version to the host computer. Table 7-5 lists columns in which characters must appear.

Table 7-5
Return Version Characters

Line 1, Columns 2–3

Column	Description	Character
2	Extended command	#
3	Return Version command	V

The return code is the status sent to the host computer and indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the following format.

0**<Program name> <Version> <CR>**

0
Return code, which indicates "good status, transaction complete."

<Program name>
TE program name.

<Version>
Program version.

For example: **0****FWP240H0 V6.52 <CR>**

Conventional Method

Note that the descriptions for the second command are listed under the control character sequence method.

Command	Action
CSI 2J	Clears the screen.
CSI 1;2H #V#	Moves the cursor to the top row, Column 2

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

^9F#V#^9C

^9F	APC character 0x9F
#V#	Extended command to get program name and version
^9C	ST character 0x9C

Tone (#T)

The Tone extended command causes the terminal to make a tone of a specified volume, frequency, and length ().

Conventional Method

Note that the descriptions for the middle command are listed under the control character sequence method.

Command	Action
CSI 2J	Clears the screen.
CSI 1;3HT25015008	Moves the cursor to the top line, Column 3
CSI 1,2H #	Moves the cursor to the beginning.

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

^9F#T125015008^9C

^9F	APC character 0x9F
#H	Extended command for the tone command
125	Sets beeper volume to 125
015	Sets beeper frequency to 15
008	Set beeper length to 8 seconds
^9C	ST character 0x9C

Table 7-6 describes the line and columns where characters must appear, and their meanings. *Note that a "b" indicates a 1-byte space.*

Table 7-6
Tone Options

Line 1, Columns 2–12

Column	Description	Character
2	Extended command	#
3	Tone command	T
4–6	Volume	bbb=No change from current setting; 000–255=Range from quiet to loud
7–9	Frequency	bbb=No change from current setting; 000–030=Range from low to high
10–12	Length	bbb=No change from current setting; 001–010=Duration in seconds from short to long (keyboard response time)

Return Codes for Tone

The return code is the status sent to the host computer; the code indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the **\\x<CR>** format. **X** is the return code listed in the following chart.

Code	Description	Column
0	Good status, transaction complete.	(None)
8	Incorrect setting for volume.	4–6
9	Incorrect setting for frequency.	7–9
A	Incorrect setting for length.	10–12

Scan (#S)

The Scan extended command allows host systems to have the same capabilities as terminals using the Native data stream to set bar code parameters and scan.

By inserting characters "#S" in the display buffer at Line 1, Columns 2 and 3, the host computer tells the terminal to expect a Bar Code Scanner extended command. Appropriate descriptive characteristics should follow the "#S" characters. The terminal returns a code to indicate if the command was successful. Then it simulates the [Enter] key to return a value to the host computer. *Note that "b" indicates a 1-byte space.*

Conventional Method

Note that the descriptions for the middle command are listed under the control character sequence method.

Command	Action
CSI 2J	Clears the screen.
CSI 1;3H S07F3201221132001208010806bbbbb#	Moves the cursor to the top row, Column 3
CSI 1;2H #	Moves the cursor to the beginning.

Control Character Sequence Method

This is the same example using the control character sequence method. You do not need to clear the screen or move the cursor in the example because the print command executes in the background.

^9F#S08F32012211320012080108060~~bbbb~~#^9C

^9F	APC character 0x9F
#S	Extended command for setting scan parameters
0	Laser with no redundancy
7	Auto enter scan
F	Enable stream scanning, return bar code type and concatenate bar code
32	Set maximum length for all bar codes to 32 characters
01	Set minimum length for all bar codes to 1 character
2	Decode UPC-E system 0 and UPC-A bar codes
2	Enable EAN bar code symbology
1	Enable Encoded 39 bar code symbology
1	Enable Plessey bar code symbology
3	Keep MOD 10 first check digit for Plessey symbology
2	Enable ABC Codabar bar code symbology
0	Disable Code 11 bar code symbology
0	Disable Code 93 bar code symbology
1	Enable Code 128 bar code symbology
2	Enable Straight 2 of 5 bar code symbology
08	Set maximum length to 8 characters
01	Set minimum length to 1 character
08	Set first fixed length to 8 characters
06	Set second fixed length to 6 characters
0	Disable Interleave 2 of 5 bar code symbology
~~bbbb~~#	Keep current value
^9C	ST character 0x9C

Due to possible system fragmentation of a data stream, the "#" in Line 1, Column 2 should be the last character placed on the screen. This will ensure that all data is present before the extended command is parsed (removed).

Table 7-7 lists the command. Other tables list options.

Table 7-7
Scan Bar Code Parameters

Line 1, Columns 2–3

Column	Description	Character
2	Extended command	#
3	Scan command	S

CC Byte 1

Control Character Byte 1 (CC Byte 1) implementation differs among the terminals. Table 7-8 and Table 7-9 show the CC Byte 1 options for scanning. 6400 Computers do not support HP Wand Select. *A "~~b~~" indicates a 1-byte space.*

Table 7-8
***CC Byte 1 Options Supported by Characters** (2415, 2425, 2435A, 2455, 248X Terminals)*

Line 1, Column 4

CC Byte 1	Laser	Disable Scanner	No Change From Current Setting
0	•		
1	•		
2			
3	•		
4			
5	•		
6			
7	•		
8			
9	•		
A			
B	•		
C			
D	•		
E			
F		•	
~~b~~			•

Table 7-9
***CC Byte 1 Options Supported by Characters** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 4

CC Byte 1	HP Wand Select	Redundancy	Laser	No Redundancy
0			•	•
1		•	•	
2		•		
3		•	•	
4	•			•
5	•	•	•	
6	•	•		
7	•	•	•	
8				•
9		•	•	
A		•		
B		•	•	
C	•			•
D	•	•	•	
E	•	•		
F	Disable scanner.			
~~b~~	No change from current setting.			

CC Byte 2

CC Byte 2 implementation differs among the types of terminals. Table 7-10 and Table 7-11 show CC Byte 2 options. *Note that "b" indicates a 1-byte space.*

Table 7-10
***CC Byte 2 Options Supported by Characters** (2415, 2425, 2435A, 2455, 248X Terminals)*

Line 1, Column 5

CC Byte 2	Scan Termination Character
0–3	None
4–7	Auto Enter Scan
8–F	Auto Tab Scan
b	No change from current setting

Table 7-11
***CC Byte 2 Options Supported by Characters** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 5

CC Byte 2	Scan Termination Character	Modulo 10 Check Digit
0	None	
1		•
2		
3		•
4	[Enter] key	
5		•
6		
7		•
8	[Tab] key	
9		•
A		
B		•
C		
D		•
E		
F		•

CC Byte 3

Note that "b" indicates a 1-byte space.

Table 7-12
***CC Byte 3 Options Supported by Characters** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals*

Line 1, Column 6

CC Byte 3	Enable Stream Scanning	Reserved	Return Bar Code Type	Bar Code Concatenated
0				
1				•
2			•	
3			•	•
4		•		
5		•		•
6		•	•	
7		•	•	•
8	•			
9	•			•
A	•		•	
B	•		•	•
C	•	•		
D	•	•		•
E	•	•	•	
F	•	•	•	•
b	No change from current setting			

Bar Code Length

Bar Code Length sets the minimum and maximum character lengths for all types of bar codes scanned (Table 7-13). Setting the minimum and maximum values to their optimum can increase scanning performance. If the terminal scans bar codes that are outside the minimum and maximum value, the terminal ignores the bar code. *Note that a "b" indicates a 1-byte space.*

Table 7-13
***Bar Code Length** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Columns 7-10

Column	Character and Description
7–8	XX=Bar code length. Maximum length: 99. bb=No change from current setting
9–10	XX=Bar code length. Minimum length: 00. bb=No change from current setting

UPC

▶ **NOTE:**

Use the UPC command to select the combinations of characters listed in Table 7-14. 6400 Computers do not support UPC-E Number System 1. *Note that a "b" indicates a 1-byte space.*

Table 7-14
***UPC Bar Code Characters** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	UPC-E # System 1	Expand UPC-E to UPC-A	UPC-E # System 0	Add-ons	UPC-A
0	Disables all.				
1				•	•
2			•		•
3			•	•	•
4		•			•
5		•		•	•
6		•	•		•
7		•	•	•	•
8	•				•
9	•			•	•
10	•		•		•
11	•		•	•	•
12	•	•			•
13	•	•		•	•
14	•	•	•		•
15	•	•	•	•	•
b	No change from current setting				

EAN Algorithms

Use EAN Algorithms to select combinations of EAN options (Table 7-15). *Note that a "b" is a 1-byte space.*

Table 7-15
***EAN Algorithms** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 12

Character	Description
0	EAN disabled
1	EAN with Add-ons enabled
2	EAN enabled
3	EAN and EAN with Add-ons enabled
b	No change from current setting

Code 39

Code 39 (Table 7-16) sets the scanner to read simple Code 39 bar codes that do not include extended or encoded sequences. *Note that a "b" is a 1-byte space.*

Extended Code 39 is a superset of Code 39 and scans all regular Code 39 bar codes. You cannot select both Code 39 and Extended Code 39. Encoded Code 39 combines key presses with normal bar code data.

Appendix A contains Encoded Code 39 sequences.

Table 7-16
***Code 39 Algorithms Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 13

Character	Description
0	Code 39 disabled
1	Encoded Code 39 enabled
2	Extended Code 39 enabled
3	Code 39 enabled
b	No change from current setting

Plessey

If the Plessey bar code scanning algorithm is enabled, set its check digits (Table 7-17) according to your requirements. Refer to the manufacturer's bar code specifications for more information on check digits. 6400 Computers do not support Plessey alpha characters. *Note that a "b" indicates a 1-byte space.*

Table 7-17
***Plessey Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 14

Character	Description
0	Plessey disabled
1	Plessey enabled
b	No change from current setting

The dots in Table 7-18 indicate the Plessey check digits the characters support.

Table 7-18
Plessey Check Digit Characters

Line 1, Column 15

Character	Keep 2nd Digit Check	Do Not Validate 1st Check Digit	Keep 1st Check Digit	Mod 10 1st Check Digit	Mod 11 1st Check Digit
0					•
1				•	
2			•		•
3			•	•	
4		•			•
5		•		•	
6		•	•		•
7		•	•	•	
8			•		•
9			•	•	
A	•		•		•
B	•		•	•	
C		•	•		•
D		•	•	•	
E	•	•	•		•
F	•	•	•	•	
~~b~~	No change from current setting				

Codabar

The Codabar options (Codabar and ABC Codabar) are mutually exclusive coding algorithms and cannot be selected at the same time. *Note that a "~~b~~" indicates a 1-byte space.*

Table 7-19
***Codabar Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 16

Character	Description
0	Codabar disabled
1	Codabar enabled
2	ABC Codabar enabled
~~b~~	No change from current setting

Code 11

Table 7-20 lists Code 11 characters. *Note that a "~~b~~" indicates a 1-byte space.*

Table 7-20
***Code 11 Characters** (59XX, 17XX, 11XX Terminals)*

Line 1, Column 17

Character	Description
0	Code 11 disabled
1	Code 11 enabled
~~b~~	No change from current setting

Code 93

Code 93 and Code 128 options can be enabled. *Note that a "~~b~~" indicates a 1-byte space.*

Table 7-21
***Code 93 Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 18

Character	Description
0	Code 93 disabled
1	Code 93 enabled
~~b~~	No change from current setting

Code 128

Table 7-22 lists Code 128 characters. *Note that a "~~b~~" indicates a 1-byte space.*

Table 7-22
***Code 128 Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Column 19

Character	Description
0	Code 128 disabled
1	Code 128 enabled
~~b~~	No change from current setting

Straight or Computer Identics 2of5

If the Straight or Computer Identics bar code is enabled, select the maximum and minimum lengths and the first and second fixed bar code lengths according to your requirements (Table 7-23). *Note that a "~~b~~" indicates a 1-byte space. Refer to the manufacturer's bar code specifications for more information.*

Table 7-23
***2 of 5 Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Columns 20-28

Column	Character
20	0=Straight and Computer Identics 2 of 5 disabled; 1=Computer Identics 2 of 5 enabled; 2=Straight 2 of 5 enabled; ~~b~~=No change from current setting
21–22	XX=maximum length Straight or Computer Identics 2 of 5; ~~bb~~=No change from current setting
23–24	XX=minimum length Straight or Computer Identics 2 of 5; ~~bb~~=No change from current setting
25–26	XX=1st fixed bar code length for Straight or Computer Identics 2 of 5; ~~bb~~=No change from current setting
27–28	XX=2nd fixed bar code length for Straight or Computer Identics 2 of 5; ~~bb~~=No change from current setting

Interleaved 2 of 5

If Interleaved 2 of 5 is enabled, select the maximum and minimum lengths and the first and second fixed bar code lengths according to requirements (Table 7-24). *Note that a "b" indicates a 1-byte space. Refer to the manufacturer's bar code specifications for more information.*

Table 7-24
***Interleaved 2 of 5 Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

Line 1, Columns 29-37

Column	Character
29	0=Interleaved 2 of 5 disabled; 1=Interleaved 2 of 5 enabled; b=No change from current setting
30–31	XX=maximum length Interleaved 2 of 5; bb=No change from current setting
32–33	XX=minimum length Interleaved 2 of 5; bb=No change from current setting
34–35	XX=1st fixed length for Interleaved 2 of 5 Bar Code; bb=No change from current setting
36–37	XX=2nd fixed length for Interleaved 2 of 5 Bar Code; bb=No change from current setting

Return Codes for Scan Bar Code

The Scan Bar Code Parameters return code is the status sent to the host computer; the code indicates if the extended command was successful. The terminal returns data and the extended command's status to the host computer in the **X<CR>** format where **X** is the return code listed in the following chart. The terminal simulates the [ENTER] key to return a value to the host computer. If a hexadecimal number is entered wrong, the return code defaults to "0."

Code	Description
0	Good status, transaction complete
1	Bad status, transaction incomplete

Appendix A

Bar Code Scanning

This appendix lists bar code labels for VT/ANSI TE commands and functions. It also contains Encoded Code 39 key press sequences.

▶ **NOTE:** *To scan the bar code labels, configure the terminal to use Code 39 in Full ASCII mode.*

- *For the 2415, 2425, 2435A, 2455, or 248X Terminal, configure the mode through the TRAKKER Antares® 2400 Menu System. For help, refer to the terminal's user manual.*

DK, Display Column Spacing

The spacing parameters define the number of pixels to be added between each row or column of characters. Note that font arrays have one or two lines built in for character separation.

`DK<param1><param2><param3>`

where:

param1 represents the font type and is one character
param2 represents column spacing and is two characters
param3 represents row spacing and is two characters

The following examples apply to the 2415, 2425, 2435A, 2455, 248X displays.

9 Columns *(2435A)*
10 Columns *(2415, 2425, 2455, 248X)*

9 columns x 8 rows *(2435A)*
10 columns x 8 rows
(2415, 2425, 2455, 248X)

$+DK20000

12 Columns (2415, 2425, 2435A, 2455, 248X)

12 columns x 4 rows

$+DK90116

12 columns x 6 rows

$+DK90105

12 columns x 8 rows

$+DK90100

12 columns x 10 rows

$+DK80502

12 columns x 12 rows

$+DK80500

12 columns x 16 rows

$+DK70700

17 Columns (2415, 2425, 2435A, 2455, 248X)

17 columns x 4 rows

$+DK80122

17 columns x 6 rows

$+DK80111

17 columns x 8 rows

$+DK80106

17 columns x 10 rows

$+DK80102

17 columns x 12 rows

$+DK80100

17 columns x 16 rows

$+DK70300

17 columns x 21 rows

$+DK60400

19 Columns *(2435A)*
20 Columns *(2415, 2425, 2455, 248X)*

19 columns x 8 rows *(2435A)*
20 columns x 8 rows
(2415, 2425, 2455, 248X)

$+DK10000

19 columns x 16 rows *(2435A)*
20 columns x 16 rows
(2415, 2425, 2455, 248X)

$+DK00000

22 Columns *(2415, 2425, 2435A, 2455, 248X)*

22 columns x 4 rows

$+DK70124

22 columns x 6 rows

$+DK70113

22 columns x 8 rows

$+DK70108

22 columns x 10 rows

$+DK70104

22 columns x 12 rows

$+DK70102

22 columns x 16 rows

$+DK70100

22 columns x 21 rows

$+DK60200

26 Columns *(2415, 2425, 2435A, 2455, 248X)*

26 columns x 4 rows

$+DK70024

26 columns x 6 rows

$+DK70013

26 columns x 8 rows

$+DK70008

26 columns x 10 rows

$+DK70004

26 columns x 12 rows

$+DK70002

26 columns x 16 rows

$+DK70000

26 columns x 21 rows

$+DK60100

31 Columns *(2435A)*
32 Columns *(2415, 2425, 2455, 248X)*

31 columns x 21 rows *(2435A)*
32 columns x 21 rows
(2415, 2425, 2455, 248X)

$+DK60000

Cursor Keys

Window/Viewport up (up one line)

%UP

Window/Viewport down (down one line)

%DN

Window/Viewport right (right one character)

%RT

Window/Viewport left (left one character)

%LF

Paging Keys

Page up

%PGUP

Page down

%PGDN

Page right

%PGRT

Page left

%PGLT

Tab Keys

Back Tab

%BTAB

Forward Tab

%TAB

Special Function Keys

Backspace

%BKSP

Delete (Del)

%DEL

Editing Keys

Find
(VT220/320 only)

%FIND

Insert
(VT220/320 only)

%INS

Next Screen
(VT220/320 only)

%NEXT

Previous Screen
(VT220/320 only)

%PREV

Remove
(VT220/320 only)

%REM

Select
(VT220/320 only)

%SEL

Top-Row Function Keys

▶ **NOTE:** *VT220/320 Terminals only support function keys F1 (PF1) through F20. VT100 Terminals only support function keys F11, F12, and F13.*

F1

%F1

F2

%F2

F3

%F3

F4

%F4

F5

%F5

F6

%F6

F7

%F7

F8

%F8

F9

%F9

F10

%F10

F11

%F11

F12

%F12

F13

%F13

F14

%F14

F15

%F15

F16

%F16

F17

%F17

F18

%F18

F19

%F19

F20

%F20

Transmission Mode

Scan the following bar code label to toggle between Line Edit (block) mode and Character mode:

F21

%F21

VT/ANSI Additional Functions

TE configuration menus

%TECFG

Bar codes are not supported for these functions:

- Toggling between **Application** mode and **Numeric Keypad** mode
- Transmitting the **AnswerBack** field to the host

To enter these functions, see the key sequence in Section 3, "Using the Terminal's Keyboard."

Auto-Login Restart

Auto-Login Restart

%ALRS

Encoded Code 39

Table A-1 lists escape characters and key press sequences for Encoded Code 39. The "(t)" in the table indicates a terminating key. Any bar code data following this key code is ignored. The "t" sequences, therefore, should be located only at the end of the bar code. If you attempt to use an invalid sequence (termed "reserved" in the table) the terminal will beep and the data stream will be flushed.

Table A-1
Key Press Sequences for Encoded Code 39

Sequence	Key	Sequence	Key
$space	Find (t)	+space	09 hexadecimal (t)
$-	Insert here (t)	+–	0A hexadecimal (t)
$.	Remove (t)	+.	0B hexadecimal (t)
$0	Keypad 0 (t)	+0	0C hexadecimal (t)
$1	Keypad 1 (t)	+1	0D hexadecimal (t)
$2	Keypad 2 (t)	+2	0E hexadecimal (t)
$3	Keypad 3 (t)	+3	0F hexadecimal (t)
$4	Keypad 4 (t)	+4	10 hexadecimal (t)
$5	Keypad 5 (t)	+5	11 hexadecimal (t)
$6	Keypad 6 (t)	+6	12 hexadecimal (t)
$7	Keypad 7 (t)	+7	13 hexadecimal (t)
$8	Keypad 8 (t)	+8	14 hexadecimal (t)
$9	Keypad 9 (t)	+9	15 hexadecimal (t)
$A	New Line (t)	+A	a
$B	Delete (t)	+B	b
$C	Forward Tab (t)	+C	c

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

Sequence	Key	Sequence	Key
$D	Forward Tab (t)	+D	d
$E	Reserved	+E	e
$F	Reserved	+F	f
$G	Reserved	+G	g
$H	Backspace (t)	+H	h
$I	Reserved	+I	i
$J	Reserved	+J	j
$L	Reserved	+K	k
$M	Enter (t)	+L	l
$N	Reserved	+M	m
$O	Reserved	+N	n
$P	Reserved	+O	o
$Q	PF1 (t)	+P	p
$R	PF2 (t)	+Q	q
$S	PF3 (t)	+R	r
$T	PF4 (t)	+S	s
$U	F5 (t)	+T	t
$V	F6 (t)	+U	u
$W	F7 (t)	+V	v
$X	F8 (t)	+W	w
$Y	F9 (t)	+X	x
$Z	F10 (t)	+Y	y
%space	Select (t)	+Z	z
%-	Previous screen (t)	/space	16 hexadecimal (t)
%.	Next screen (t)	/–	17 hexadecimal (t)
%0	Enter (t)	/.	18 hexadecimal (t)
%1	00 hexadecimal (t)	/0	19 hexadecimal (t)
%2	01 hexadecimal (t)	/1	1A hexadecimal (t)
%3	02 hexadecimal (t)	/2	1B hexadecimal (t)
%4	03 hexadecimal (t)	/3	1C hexadecimal (t)
%5	04 hexadecimal (t)	/4	1D hexadecimal (t)
%6	05 hexadecimal (t)	/5	1E hexadecimal (t)
%7	06 hexadecimal (t)	/6	1F hexadecimal (t)
%8	07 hexadecimal (t)	/7	Reserved
%9	08 hexadecimal (t)	/8	Reserved
%A	Reserved	/9	Reserved
%B	F11 (t)	/A	! (exclamation mark)
%C	F12 (t)	/B	” (double quote)
%D	Reserved	/C	# (pound)
%E	Reserved	/D	$ (dollar)
%F	; (semicolon)	/E	% (percent)
%G	< (less than)	/F	& (ampersand)
%H	= (equal)	/G	’ (single quote)

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

Sequence	Key	Sequence	Key
%I	> (greater than)	/H	((left parenthesis)
%J	? (question mark)	/I	) (right parenthesis)
%K	[(left brace)	/J	* (asterisk)
%L	\ (backslash)	/K	+ (plus)
%M	] (right brace)	/L	, (comma)
%N	^ (circumflex)	/M	- (hyphen)
%O	_ (underscore)	/N	F14 (t)
%P	{ (left brace)	/O	/ (forward slash)
%Q	| (vertical bar)	/P	F15 (t)
%R	} (right brace)	/Q	F16 (t)
%S	~ (tilde)	/R	F17 (t)
%T	Keyboard delete (t)	/S	F18 (t)
%U	Reserved	/T	F19 (t)
%V	@ (at)	/U	F20 (t)
%W	′ (grave accent)	/V	Reserved
%X	Reserved	/W	Reserved
%Y	Reserved	/X	Reserved
%Z	F13 (t)	/Y	Reserved
		/Z	: (colon)

Terminating Keys

Terminating keys are the nonprintable ASCII sequences and action keys. When the terminal encounters them in a bar code, an action is taken, and the terminal sends the data in the buffer to the host computer. Terminating keys should appear only at the end of the bar code. If they are located in the middle of a bar code, they are executed normally, but the data following them in the bar code is ignored. Terminating keys cause a terminal-to-base station transmission. The terminal ignores data in the bar code buffer following these keys once a transmission takes place.

For example, the terminal interprets the following sequence:

123$V456

as

123F6

The terminal will not send “456” to the host computer, because it follows terminating key F6.

ASCII sequences can be used any time before a terminating key. For example, the terminal interprets

+H+E+L+L+O$M

as

hello<Enter>

Concatenation

When Encoded Code 39 is enabled, all bar codes are concatenated. This allows several separate bar code scans to be strung together into one input field. This feature is especially useful when using separate Encoded Code 39 bar codes to replace operator key presses.

For example, if the bar code "1234" is scanned followed by the scanning of a separate "$C" bar code, the terminal keeps the "1234" in the starting field and tabs to the next unprotected field. If concatenation was not automatically enabled, the "1234" bar code would be cleared out due to the second scan. Then the terminal would tab to the next unprotected field.

Enabling Encoded Code 39 also allows scanning to occur when the cursor is in a protected field. This feature is provided to allow scanning of cursor movement functions (such as Forward Tab and Back Tab) while in a protected location on the screen. Scanning alphanumeric codes in a protected field causes an error tone for each character scanned.

Escape Characters

The four escape characters in Table A-1 yield a VT220 data stream key press equivalent when followed by another character. The escape characters are:

$ (dollar sign)
% (percent)
+ (plus)
/ (forward slash)

For example:

- If a bar code contains the sequence "%U" somewhere within it, the terminal converts this sequence to an [ENTER] key and processes it as soon as encountered in the scanning buffer.
- "+B" is converted to the lower case "b."
- "%B" is converted to an F11 key press.

If you want the Encoded Code 39 option but the bar codes to be scanned already contain the "$," "%," "+," or "/," character, then each place where these characters occur must be expanded to a special "/" sequence:

- Every bar code where the "$" is maintained must be expanded to a "/D" sequence.
- Percent signs (%) must be expanded to "/E".
- Forward slashes (/) must be expanded to the letter "/O".
- Plus signs (+) must be expanded to "/K".

Appendix B

Bar Code Symbologies

This appendix contains a brief explanation of each bar code symbology that the VT/ANSI Terminal Emulation application decodes. It explains some of the general characteristics and uses of these bar code types.

Specific bar code algorithms can be enabled using the setup menus or the host computer. Once the computer correctly decodes a bar code, the computer encodes data with descriptive information about the symbol. Response time is improved by limiting the computer to the bar codes being used.

Table B-1
Bar Code Data String Formats

Data Bar Code Type	Data Format	Data Length
UPC short (UPC-E)	nddddddc	8
EAN short (EAN-8)	fnddddc	8
UPC long (UPC-A)	ndddddddddddc	12
EAN long (EAN-13)	fnddddddddddc	13
UPC short add-on 2	nddddddcaa	10
EAN short add-on 2	fnddddcaa	10
UPC long add-on 2	nddddddddddcaa	14
EAN long add-on 2	fnddddddddddcaa	15
UPC short add-on 5	nddddddcaaaaa	13
EAN short add-on 5	fnddddcaaaaa	13
UPC long add-on 5	nddddddddddcaaaaa	17
EAN long add-on 5	fnddddddddddcaaaaa	18
Interleaved 2 of 5	d.....d	1 to 31
Standard 2 of 5	d.....d	1 to 31
Plessey	d.....dc	2 to 31
Codabar	sd....ds	3 to 31
Code 11	d.....d	1 to 31
Code 39	d.....d	1 to 31
Extended Code 39	d.....d	1 to 31
Code 93	d.....d	1 to 31
Code 128	d.....d	1 to 31

▶ **NOTE:** *These bar code data definitions apply to the Data Format column in Table B-1:*

- *a Add-on code digits*
- *c Check digits*
- *d Bar code digits*
- *f EAN flag 1 characters*
- *n Number system digits*
- *s Start and stop digits*

If MOD 10 or MOD 11 check digits are enabled, the digit falls at the end of a bar code data string. Each check digit enabled extends the bar code data string length by one character.

The VT/ANSI Terminal Emulation application recognizes eleven of the most widely used bar code symbologies. With bar code symbologies, like languages, there are many different types. A bar code symbology provides the required flexibility for a particular inventory tracking system.

A symbology may be for particular industries, such as food and beverage, automotive, railroad, or aircraft. Some of these industries have established their own bar code symbology because other symbologies did not meet their needs.

Without going into great detail on the bar code structure, note that no two products use the same bar code. Each product gets a unique bar code.

Industries that use a particular type of bar code symbology have formed regulating committees or are members of national institutes that issue and keep track of bar codes. This ensures that each organization that contributes to a particular industry conforms to its standard. Without some form of governing body, bar coding would not work.

- UPC (Universal Product Code) with/without add-ons
- EAN (European Article Numbering Code) with/without add-ons
- Codabar
- C11 (Code 11)
- C39 (Code 39)
- C93 (Code 93)
- C128 (Code 128)
- I 2 of 5 (Interleaved 2 of 5 Code)
- S 2 of 5 (Standard 2 of 5)
- Plessey
- MSI (a variant of Plessey)

UPC

The UPC (Universal Product Code) is the symbology used throughout the grocery and retail industries. This bar code symbology contains two pieces of numerical information encoded on the bar code, producer identification, and product identification information.

The UPC symbol is 12 characters long. The first character of the UPC symbol is a number system character, such as "0" for grocery items and "3" for drug- and health-related items.

The UPC symbology is for retail environments such as grocery stores, convenience stores, and general merchandise stores.

Some retail items are so small that a standard UPC bar code cannot fit on the packaging. When this occurs there is a permitted shorter version of the UPC symbology, referred to as UPC-E. UPC-E is six characters long (eight including number system and check digit), approximately half the size of a standard UPC bar code.

EAN

EAN (European Article Numbering) symbology is similar to UPC symbology, except that it contains 13 characters and uses the first two to identify countries.

The EAN symbology is used throughout most of Europe in the retail environment. Although similar to UPC symbology, the two are not interchangeable.

Codabar

Codabar was for retail price-labeling systems. Today it is widely accepted by libraries, medical industries, and photo finishing services.

Codabar is a discrete, self-checking code with each character represented by a stand-alone group of four bars and three intervening spaces.

Four different start or stop characters get defined and designated "a", "b", "c", and "d". These start and stop characters are constructed using one wide bar and two wide spaces. A complete Codabar symbol begins with one of the start or stop characters followed by some number of data characters and ending in one of the start or stop characters.

Any of the start or stop characters may be used on either end of the symbol. It is possible to use the 16 unique start or stop combinations to identify label type or other information.

Since Codabar is variable-length, discrete, and self-checking, it is a versatile symbology. The width of space between characters is not critical and may vary significantly within the same symbol. The character set consists of "0" through "9", "–", "$", ":", "/", ".", and "+".

The specific dimensions for bars and spaces in Codabar optimize performance of certain early printing and reading equipment. Codabar has 18 different dimensions for bar and space widths. So many different dimensions often result in labels printed out of specification and cause Codabar printing equipment to be more expensive.

Code 11

Code 11 satisfies the requirements for a very high density, discrete numeric bar code. The name Code 11 derives from 11 different data characters that can be represented, in addition to a start or stop character.

The character set includes the 10 digits and the dash symbol. Each character is represented by a stand-alone group of three bars and two intervening spaces. Although Code 11 is discrete, it is not self-checking. A single printing defect can transpose one character into another valid character. One or two check digits obtain data security.

The specifications for Code 11 suggest that this code should have a narrow element width of 7.5 mils. This results in an information density of 15 characters per inch.

Code 39

Code 39 (C39) is the most widely used symbology among the industrial bar codes. Most major companies, trade associations, and the federal government find this code to fit their needs. The main feature of this symbology is the ability to encode messages using the full alphanumeric character set, seven special characters, and ASCII characters.

Programming for this symbology can be for any length that the application requires. The application program handles symbology that is at least one character but no more than 32 characters in length.

When programming the computer for Code 39, it is important to set the symbology limit as close as possible (minimum and maximum bar code lengths being scanned). Doing so keeps the computer bar code processing time to a minimum and conserves battery power.

Bar code readers can respond to Uniform Symbology Specification symbols in non-standard ways for particular applications. These methods are not for general applications, because of the extra programming required. Code 39 Full ASCII is one example of non-standard code.

Encoded Code 39 (Concatenation)

If the first data character of a symbol is a space, the reader may be programmed to append the information contained in the remainder of the symbol to a storage buffer. This operation continues for all successive symbols that contain a leading space, with messages being added to the end of previously stored ones. When a message is read which does not contain a leading space, the contents are appended to the buffer, the entire buffer is transmitted, and the buffer is cleared.

Encoded Code 39 (Full ASCII)

If the bar code reader is programmed for the task, the entire ASCII character set (128 characters) could be coded. This is done using two character sequences made up of one of the symbols (“$”,“.”,“%”,“/”) followed by one of the 26 letters.

Code 93

The introduction of Code 93 provided a higher density alphanumeric symbology designed to supplement Code 39. The set of data characters in Code 93 is identical with that offered with Code 39. Each character consists of nine modules arranged into three bars and three spaces.

Code 93 uses 48 of the 56 possible combinations. One of these characters, represented by a square, is reserved for a start or stop character, four are used for control characters, and the remaining 43 data characters coincide with the Code 39 character set. An additional single module termination bar after the stop character concludes the final space.

Code 93 is a variable length, continuous code that is not self-checking. Bar and spaces widths may be one, two, three, or four modules wide. Its structure uses edge-to-similar-edge decoding. This makes the bar code immune to uniform ink spread, which allows liberal bar width tolerances.

Code 93 uses two check characters. Its supporters believes this makes it the highest density alphanumeric bar code. The dual check digit scheme provides for high data integrity. All substitution errors in a single character are detected for any message length.

Code 128

Code 128 (C128) is one of the newest symbologies used by the retail and manufacturing industries. It responds to the need for a compact alphanumeric bar code symbol that could encode complex product identification.

The fundamental requirement called for a symbology capable of being printed by existing data processing printers (primarily dot-matrix printers) that produce daily, work-in-progress, job, and product traceability documents. The ability to print identification messages between 10 and 32 characters long, on existing forms and labels deemed an important requirement.

Code 128 uniquely addresses this need as the most compact, complete, alphanumeric symbology available.

Additionally, the Code 128 design with geometric features, improves scanner read performance, does self-checking, and provides data message management function codes.

Code 128 encodes the complete set of 128 ASCII characters without adding extra symbol elements. Code 128 contains a variable-length symbology and the ability to link one message to another for composite message transmission. Code 128, being a double-density field, provides two numeric values in a single character.

Code 128 follows the general bar code format of start zone, data, check digit, stop code, and quiet zone. An absolute minimum bar or space dimension of nine mils (0.010 inch minimum nominal ± 0.001 inch tolerance) must be maintained.

Characters in Code 128 consist of three bars and three spaces so that the total character set includes three different start characters and a stop character.

UCC/EAN-128 Shipping Container Labeling is a versatile tool that can ease movement of products and information. The Shipping Container Labeling bar code can take any form and usually has meaning only within the company or facility where applied.

Because this *random* data can get mistaken later for an industry standard code format, the UCC and EAN chose a symbology uniquely identified from these other bar codes. This standard is for maximum flexibility, to handle the diversity of distribution in global markets by cost efficiency.

The UCC/EAN-128 Container Labeling specification calls for a FUNC1 to immediately follow the bar code's start character. FUNC1 also follows any variable-length application field. The specification also calls for the computer to send "]C1" for the first FUNC1. The specification requires that the computer send a "<GS>" (hex 1D) for subsequent FUNC1 codes in the bar code.

Because "<GS>" is not compatible with computer emulation data streams, the Uniform Code Council has been asked to change the specification. This change is made to send the same three character sequence "]C1" to identify the embedded FUNC1 codes.

This implementation should provide for clean application coding by identifying the same sequences for the same scanned codes. If the communication of Norand bar code types is enabled, the Shipping Container Label codes precede with a "J". These strings will appear on the computer display. The application may have to allow for strings longer than 48 characters (maximum length indicated in the specification). Actual length variance depends on the number of variable-length data fields. Allowing for 60 characters should be sufficient. Within the Code 128 specification, the computer can link bar codes together. If this is to happen, allow for more characters (computer limit is 100 characters).

The Application Identifier Standard, that is part of the UCC/EAN Shipping Label concept, complements, rather than replaces, other UCC/EAN standards. Most UCC/EAN standards primarily identify products.

Several industries expressed the need to standardize more than product identification. The UCC/EAN Code 128 Application Identifier Standard supplies this tool. The standard adds versatility for inter-enterprise exchanges of perishability dating, lot and batch identification, units of use measure, location codes, and several other information attributes.

For more detailed information on Code 128 UCC/EAN Shipping Label bar code and Application Identifier Standard, refer to the UCC/EAN-128 Application Identifier Standard specification.

I 2 of 5 (Interleaved)

I 2 of 5 (Interleaved 2 of 5 Code) is an all-numeric symbology, widely used for warehouse and heavy industrial applications. Its use has been particularly prevalent in the automobile industry. The I 2 of 5 symbology can be placed on smaller labels than what the standard UPC symbology requires.

I 2 of 5 also provides a little more flexibility on the type of material it can print on. Interleaved 2 of 5 Code has its name because of the way the bar code is configured.

I 2 of 5 bars and spaces both carry information. The bars represent the odd number position digits, while spaces represent the even number position digits. The two characters are interleaved as one. Messages encoded with this symbology have to use an even number of characters since two numeric characters always get interleaved together.

S 2 of 5 (Standard 2 of 5)

The code S 2 of 5 (Standard 2 of 5 Code) is designed primarily for:

- Warehouse inventory handling
- Identification of photo finishing envelopes
- Airline tickets
- Baggage and cargo handling

The code S 2 of 5 is simple and straightforward. All information is contained in the widths of the bars, with the spaces serving only to separate the individual bars.

Bars can either be wide or narrow, and the wide bars are usually three times the widths of the narrow bars. Spaces may be any reasonable width but are typically equal to the narrow bars. Narrow bars are identified as zero bits and wide bars as one bits.

Remember the code structure by associating the bar positions from left to right with weighting factors 1, 2, 4, 7, and parity. Exceptions to this rule are zero, start, and stop. This code is a discrete code, since the white spaces between the characters are not part of the code. Because the white spaces carry no information, their dimensions are not critical.

The S 2 of 5 code is self-checking, meaning a scanner passing through a printing void would detect the proper ratio of wide bars to total bars. When the scanner spots an error, a non-read will occur.

Plessey

Plessey finds its origin in the pulse width modulated (PWM) code developed in England. It is widely used for shelf markings in grocery stores. Pulse width modulated codes represent each bit of information by a bar and space pair. A zero bit consists of a narrow bar followed by a wide space, while a one bit consists of a wide bar followed by a narrow space. It is mainly a numeric symbology (0–9) with six extra characters available for assigning any symbol or letter desired.

Plessey codes are not self-checking and employ a variety of check characters. Plessey employs a polynomial-based Cyclic Redundancy Check (CRC). For start and stop characters, Plessey employs a 1101 and previously used a 0101.

This symbology is very limited about what information can be encoded. It is not considered for new applications.

MSI Code (Variant of Plessey)

In addition to Plessey characteristics, the MSI Code employs a Modulus 10 Check. For start and stop checks, MSI employs a single bit pair of 1 as a start symbol and a single bit pair of 0 as a stop symbol. MSI reverses the 1-2-4-8 BCD pattern for bit pair weighting to 8-6-2-1.

Appendix C
Full ASCII Table

This table lists the ASCII characters and their binary, hexadecimal, and Code 39 equivalents.

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]
00000000	00	00	%U	NUL	00100000	20	32	SP	SP[5]
00000001	01	01	$A	SOH	00100001	21	33	/A	!
00000010	02	02	$B	STX	00100010	22	34	/B	”
00000011	03	03	$C	ETX	00100011	23	35	/C	#
00000100	04	04	$D	EOT	00100100	24	36	/D	$
00000101	05	05	$E	ENQ	00100101	25	37	/3	%
00000110	06	06	$F	ACK	00100110	26	38	/F	&
00000111	07	07	$G	BEL	00100111	27	39	/G	’
00001000	08	08	$H	BS	00101000	28	40	/H	(
00001001	09	09	$I	HT	00101001	29	41	/I	)
90001010	0A	10	$J	LF	00101010	2A	42	/J	*
00001011	0B	11	$K	VT	00101011	2B	43	/K	+
00001100	0C	12	$L	FF	00101100	2C	44	/L	,
00001101	0D	13	$M	CR	00101101	2D	45	/M	-
00001110	0E	14	$N	SO	00101110	2E	46	/N	.
00001111	0F	15	$O	SI	00101111	2F	47	/O	/
00010000	10	16	$P	DLE	00110000	30	48	/P[6]	0
00010001	11	17	$Q	DC1	00110001	31	49	/Q	1
00010010	12	18	$R	DC2	00110010	32	50	/R	2
00010011	13	19	$S	DC3	00110011	33	51	/S	3
00010100	14	20	$T	DC4	00110100	34	52	/T	4
00010101	15	21	$U	NAK	00110101	35	53	/U	5
00010110	16	22	$V	SYN	00110110	36	54	/V	6
00010111	17	23	$W	ETB	00110111	37	55	/W	7
00011000	18	24	$X	CAN	00111000	38	56	/X	8
00011001	19	25	$Y	EM	00111001	39	57	/Y	9
00011010	1A	26	$Z	SUB	00111010	3A	58	/Z	:
00011011	1B	27	%A	ESC	00111011	3B	59	%F	;
00011100	1C	28	%B	FS	00111100	3C	60	%G	<
00011101	1D	29	%C	GS	00111101	3D	61	%H	=
00011110	1E	30	%D	RS	00111110	3E	62	%I	>
00011111	1F	31	%E	US	00111111	3F	63	%J	?

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]
01000000	40	64	%V	@	01100000	60	96	%W	‘
01000001	41	65	A	A	01100001	61	97	+A	a
01000010	42	66	B	B	01100010	62	98	+B	b
01000011	43	67	C	C	01100011	63	99	+C	c
01000100	44	68	D	D	01100100	64	100	+D	d
01000101	45	69	E	E	01100101	65	101	+E	e
01000110	46	70	F	F	01100110	66	102	+F	f
01000111	47	71	G	G	01100111	67	103	+G	g
01001000	48	72	H	H	01101000	68	104	+H	h
01001001	49	73	I	I	01101001	69	105	+I	i
01001010	4A	74	J	J	01101010	6A	106	+J	j
01001011	4B	75	K	K	01101011	6B	107	+K	k
01001100	4C	76	L	L	01101100	6C	108	+L	l
01001101	4D	77	M	M	01101101	6D	109	+M	m
01001110	4E	78	N	N	01101110	6E	110	+N	n
01001111	4F	79	O	O	01101111	6F	111	+O	o
01010000	50	80	P	P	01110000	70	112	+P	p
01010001	51	81	Q	Q	01110001	71	113	+Q	q
01010010	52	82	R	R	01110010	72	114	+R	r
01010011	53	83	S	S	01110011	73	115	+S	s
01010100	54	84	T	T	01110100	74	116	+T	t
01010101	55	85	U	U	01110101	75	117	+U	u
01010110	56	86	V	V	01110110	76	118	+V	v
01010111	57	87	W	W	01110111	77	119	+W	w
01011000	58	88	X	X	01111000	78	120	+X	x
01011001	59	89	Y	Y	01111001	79	121	+Y	y
01011010	5A	90	Z	Z	01111010	7A	122	+Z	z
01011011	5B	91	%K	[	01111011	7B	123	%P	{
01011100	5C	92	%L	\	01111100	7C	124	%Q	|
01011101	5D	93	%M	]	01111101	7D	125	%R	}
01011110	5E	94	%N	^	01111110	7E	126	%S	~
01011111	5F	95	%O	_	01111111	7F	127	%T[7]	n[8]

Notes for the Full ASCII Table:

0 Bit positions are 76543210.
1 Hexadecimal value
2 Decimal value
3 Code 39 character(s)
4 ASCII character
5 SP is the SPACE character.
6 The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9.
7 May be interchanged with %X or %Y or %Z.
8 n is the DELETE character.

General Index

NOTE:

This index covers all topics. Those in italics are figures, those in bold are tables.

SYMBOLS

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Files Index

NOTE:

This index section is provided to assist you in locating descriptions for device drivers, applications, utilities, batch files, or other files within this publication.

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