Intermec
Technologies Corporation

TE 2000 ™ 5250 Terminal Emulation

PROGRAMMER'S GUIDE

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Before You Begin

About This Manual

This manual contains information necessary to configure, operate, and troubleshoot TE 2000™ terminal emulation applications 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.

Organization of This Manual

The following summarizes the information in each section.

Section 1 — Getting started with 5250 terminal emulation

Section 2 — Using 5250 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 — Using host data stream commands and orders

Section 7 — Using extended commands

The appendixes contain the following:

Appendix A — Bar codes for 5250 terminal emulation commands

Appendix B — More commonly known bar code symbologies

Appendix C — Decimal-to-hexadecimal and binary-to-EBCDIC conversion tables

Appendix D — Terminal Font Set table for 6400, 5020, 5055, 59XX, 17XX, and 11XX Terminals

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 that indicates any INTERMEC terminal that supports terminal emulation.

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 code labels 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 VT/ANSI Terminal Emulation Programmer's Guide* (P/N: 977-055-005)
- *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). Please 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.

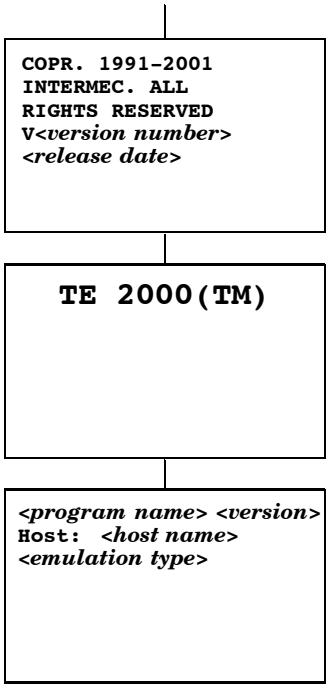
3. Verify that your terminal is communicating correctly with the access point and DCS 300 or the host.

   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:

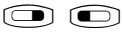
- Become familiar with 5250 TE if you have not previously used it
- Perform a quick configuration
- Configure your TE 2000 application
- Customize your TE 2000 application

Becoming Familiar With 5250 Terminal Emulation

If you have not previously used 5250 TE, see Section 2, "Using Terminal Emulation Applications," to understand 5250 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 5250 commands.

Performing a Quick Configuration

1. Change the data stream to 5250. The default data stream is "Native" for the 11XX, 17XX, 5020, 5055 (WTP), 59XX, and 64XX (WTP) Terminals. The default data stream for 24XX and IP terminals is "3270." *The default may be changed to "VT220" for all terminals.*
   a. Access the terminal emulation configuration menus by pressing the keys in the following chart.

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

   b. From the Main Menu, choose **1) Set-up Parms**.

▶ **NOTE:** *To select a menu option, press the number of the option. To return to a previous menu, press Enter.*

   c. At the **Enter Password** prompt, enter **cr52401**.
   On 17XX (37-key) Terminals, the password is: ***F12 F11 5 2 4 0 1***
   d. From the Set-up Parms menu, choose **3) Protocol Opts**.
   e. From the Protocol Opts menu, choose **2) Data Stream**.
   f. From the Data Stream menu, choose **3) 5250**.
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 Commands 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, a terminal number is also required to be set.*

4. Login to a TE session.
5. 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.
- Preinitialize the 5250 TE program

Unsupported Commands and Functions for Trakker Antares Terminals

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

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

Erase Field
Erased all characters in the field where the cursor was positioned.

Erase Last Word
Erased all characters from the cursor back to the start of a word or a space on the screen.

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

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

Reshow
Resent a screen image from the locally maintained host buffer to refresh the terminal screen.

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

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

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.

TE 2000 does not support the following 5250 commands:

Alternate cursor
Allows selection of either the bar-type or block-type cursor.

Display cursor location
Displays the cursor location.

Display Mode
Allows the operator to adjust the display to his or her preference. To adjust the terminal's display, refer to the terminal's user manual.

Test Request
Accesses diagnostic routines.

Also note that Trakker Antares terminals with UDP Plus or TCP allow only one session per terminal. Dual sessions are not supported.

Program Names

This manual covers TE 2000 version 6.30 or greater. 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 TE/UDP Plus/802.11 TE/IP/2.4 GHz OpenAir TE/IP/802.11	FWP240H0	
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 TE/UDP Plus/802.11 TE/IP/2.4 GHz OpenAir TE/IP/802.11	FWP502H0	
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	

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 5250 TE annunciators.

X **Input inhibited**
The keyboard has accepted enough information for the defined input field. The "key-ahead" feature stores keystrokes after the "input inhibited" annunciator appears. These are saved for the next field.

Insert mode
The keyboard inserts characters instead of overwriting them.

M **Message waiting**
The host has a message waiting for the operator.

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

Auto-Advancing through Fields

You can set up your Trakker Antares® terminal to auto-advance through the fields on a 5250 TE screen. When you scan data into a field on a 5250 TE screen, a Field Exit command clears the rest of the field, advances to the next field, and triggers an auto-enter field to send an ENTER to the application and submit the data. You can just scan data and never touch the keyboard.

To set this up, you need to disable Auto Tab Scan in the TE configuration menus, and set the Postamble command to the 5250 Field Exit code. There are three ways to configure the Postamble command:

- Use the TRAKKER Antares 2400 Menu System.
- Download Postamble command from the DCS 300 to one or more terminals.
- Download the Postamble command from a host using either the TCP/IP direct connect protocol or UDP Plus protocol.

The first two configuration methods are listed in this section. The third method involves creating an application and then downloading the application to the terminals. For help creating the application, refer to your terminal's user manual.

The 5250 Field Exit code is a character in the extended ASCII character set. The terminal supports the full and extended ASCII character sets. For a list of the full and extended ASCII characters, refer to your terminal's user manual.

▶ **NOTE:** *You can also configure the postamble by scanning the Postamble command. However, you cannot scan in extended ASCII characters like the 5250 Field Exit code.*

To disable Auto Tab Scan:

1. Configure the Auto Tab Scan setting to Disable. For help, see Section 4, "Using the Terminal Emulation Configuration Menus."

   With the Auto Tab Scan feature disabled, the terminal functions as if the field has a mandatory field exit turned on (an AS/400 activated feature known as Check FE). As a result, legacy AS/400 applications do not have to be modified to turn this field on properly for bar code support. *The default is **Auto Tab Scan** disabled.*
2. Save your new TE configuration.

To add Field Exit to the postamble via TRAKKER Antares 2400 Menu System:

1. Access the TRAKKER Antares 2400 Menu System. For help, refer to your terminal's user manual.
2. From the **Main Menu**, choose **Configuration Menu**.
3. From the **Configuration Menu**, choose **Terminal Menu**.
4. From the **Terminal Menu**, choose **Preamble/Postamble**.
5. Move the cursor to the postamble field.
6. Type `\x9A` for the literal Field Exit code.
7. Press ; or choose **OK** to save your changes and exit the screen.
8. Exit the TRAKKER Antares 2400 Menu System and save your new configuration to flash memory. For help, refer to your terminal's user manual.

To download Field Exit as a postamble from the DCS 300:
Configure the postamble to the Field Exit's literal value using the download server on the DCS 300. Use the download server on the DCS 300 to configure one or more terminals in the network.

1. In the download server on the DCS 300, select the terminal or group to receive the Postamble (AE) configuration command. For help on configuring a group of terminals, refer to the *DCS 300 System Manual*.

   You can continue running the 5250 TE application on the terminal while configuring a terminal from the DCS 300.
2. Choose the option to enter a command.
3. Type the string `$+AE` and then enter the ASCII code 154 by holding down the Alt key while typing `154` on the numeric keypad. You should see an Ü to represent the literal Field Exit code in the edit box, which now shows this command and value: `$+AEÜ`
4. Download the commands to change the runtime configuration of the terminals selected. The changes are saved in RAM, but not in flash memory.
5. To save the configuration change in flash memory, download this command: `.+1`

   You can also use the TRAKKER Antares 2400 Menu System to save the configuration in flash memory. Refer to the terminal's user manual.

You can set the postamble or preamble to any character from the extended ASCII character set using these instructions. Type the literal ASCII value in Step 3 instead of the Field Exit code. To set the preamble, use the syntax $+AD instead of $+AE. For more information about screen modes, see Section 4, "Using the Terminal Emulation Configuration Menus."

Special Function Keys

Special function keys are:

- Attention Identification (AID) keys
- Cursor movement keys
- Field Exit key
- Signal keys
- Special control keys
- Special host keys

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

The following pages describe the special functions keys. For complete descriptions, refer to the appropriate IBM 5250 reference manual.

AID-Generating Keys

AID-generating keys generate AID codes that go in the display data stream to the host system. They alert the host system that the DCS 300 or controller requires some action.

The terminal emulates all of the AID-generating keys on a 5291 Display Station. The following lists the keys.

Clear
The system environment determines the results of this key. If the terminal is in session, [CLEAR] issues the AID code hex BD, which requests the host system issue a Clear Unit command to the terminal to clear the display. If not in session, [CLEAR] clears the entire display regeneration buffer.

Enter/Rec Adv
Enters information.

F1–F24
User-defined command functions. Refer to your application's user manual for detail on the functions.

Help (nonerror state)
Issues a hex F3 AID byte to the host system.

Print
Tells the controller that the operator wants to print the contents of the present display. Issues hex F6 to the host system.

Record Backspace (Home)
When pressed with the cursor in the home position, a record backspace is requested. The AID code hex F8 and cursor address are sent to the host system.

Roll Up and **Roll Down**
Roll display up or down one page. **Roll Up** issues AID code hex F5. **Roll Down** issues AID code hex F4. For more information on the **Roll** keys, see next page.

Roll Keys

Roll Up and **Roll Down** are AID keys the terminal sends to the host to request and display additional screens. The host transmits a new screen in response to this command. The new screens allow you to view data either above or below what appears on the current screen.

5250 Terminals support the **Roll** command (hex 23) received from a host application. Using this command, a host application can roll an area of the screen up or down. The direction of the roll and number of lines to roll are specified in the command.

Do not confuse the **Roll Up** and **Roll Down** AID keys with the **Roll** command. The **Roll** keys cause the host to send down additional screens when you are at a **Roll** screen. A **Roll** screen typically has text in the lower right-hand corner of the screen indicating that there are additional screens to view.

Note the following:

- A **Roll** command received from a host application moves the screen, but not the window/viewport. The screen scrolls through the window/viewport when you roll up or down, but the window/viewport remains stationary.
- Paging keys (window/viewport page up, window/viewport page down, window/viewport page right, window/viewport page left) move the viewport within one screen. They do not move the screen itself.

For help with the **Roll** command, see Section 6, "Display Data Stream."

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.

Field Exit Key

Field Exit exits an input field and moves the cursor to the beginning of the next input field. If you press this key while the cursor is between characters, then all characters to the right of the cursor are erased.

▶ NOTE: *On Trakker Antares terminals, you can set the Postamble or Preamble command to use characters from the extended ASCII character set such as the Field Exit code for 5250 TE. For help, see "Auto-Advancing through Fields" earlier in this section.*

Signal Keys

Signal keys cause a Signal command to go from the controller to the host system. The following describes the signal keys.

Attn
The operator presses this key to alert the host system the function request (such as [ENTER]) is not honored. **Attn** is valid when the keyboard is locked or unlocked. It does not change the keyboard state or the cursor location.

Help (from error state)
The operator uses this key to request that the host system send data about the error to the display.

Special Control Keys

Use special control keys to change operator-generated information in the display. The keys do not work when the keyboard is locked.

Del
Deletes the character in the position where the cursor was located. All remaining characters in the field shift to the left to fill the column.

Erase Input
Clears all fields to nulls, and cursor moves to the first input position on screen. This command does not erase protected fields. If you press this key when the screen shows only protected fields, the cursor returns to the home position.

Error Reset
Restores the original data on the error line of the display and resets the state.

Hex
Enters hexadecimal codes from the keyboard to generate any EBCDIC characters needed for input or display.

Home
Moves the cursor to the position specified by the insert cursor (IC) address.

Insert
Sets or turns off the insert mode for the input field the operator has the cursor in. The operator must reset the insert state before exiting it, by either pressing [RESET] or [INSERT] again.

Shift Lock
Puts the keyboard into shift lock mode.

Special Host Key

The special 5250 host key is System Request.

Sys Req
Data on the error line is saved, the error line is cleared, a column separator and underscore field attribute are supplied to column 1 of the error line, and the cursor is located under column 2 to begin polling keystrokes.

5250 Additional Functions

The following lists additional operations you can perform on your terminal.

¢ (cent sign)
Enters a cent sign.

↵ (New Line)
Moves the cursor to the first unprotected character position of the first line in the screen. If the entire screen is a protected field, the cursor returns to the home position.

¬ (Not symbol)
Enters a Not symbol.

Back Tab
Moves the cursor back to the most recent first field position. If the cursor is in the middle of a field, it moves it to the first position of the same field. If the cursor is at the first position of a field, it moves it to the first position of the preceding input field.

Dup (duplicate enabled fields only)
Controller repeats hex "1C" from the cursor position to the end of the field. This shows in the display as an overstruck asterisk.

Field–
For numeric fields, makes the input a negative number.

Field+
Advances cursor to the next input field. For numeric fields, makes the input a positive number.

Field Mark
This is valid within any unprotected entry input field in which the **Dup** or **Field Mark** key is allowed (FFW bit 3 set to on). The **Field Mark** character (X'1E') is displayed as an overscore on IBM 5251 Display Stations and as a space on all other supported workstations. If an operator presses the **Field Mark** key in an entry field that does not allow the **Dup** or **Field Mark** key, operator error 0019 is posted. The **Field Mark** code point is allowed in an outbound data stream.

Forward Tab
Moves the cursor to the first position in the next input field.

To enter an operation:

Press the keys listed in the section for the terminal. Or, scan the bar code in *Appendix A*.

System Messages

The terminal's display reserves a line for status information. The status line can display system (nonlocal) information such as a message waiting from the host computer, help messages in response to the [Help] key, or the system request state of the terminal.

System codes can also appear on the status line. System messages and codes are described in Section 6, "Display Data Stream."

Section 3

Using the Terminal's Keyboard

Your terminal has a special keyboard that contains most of the keys available on your 5250 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.

You can access TE commands and functions printed above the keys by pressing key combinations.

2415 Terminal

Your 2415 Terminal has either a 55-key or a 37-key keyboard. For help with using the keyboards, refer to the *TRAKKER Antares 241X Hand-Held Terminal User's Manual* (P/N 069538).

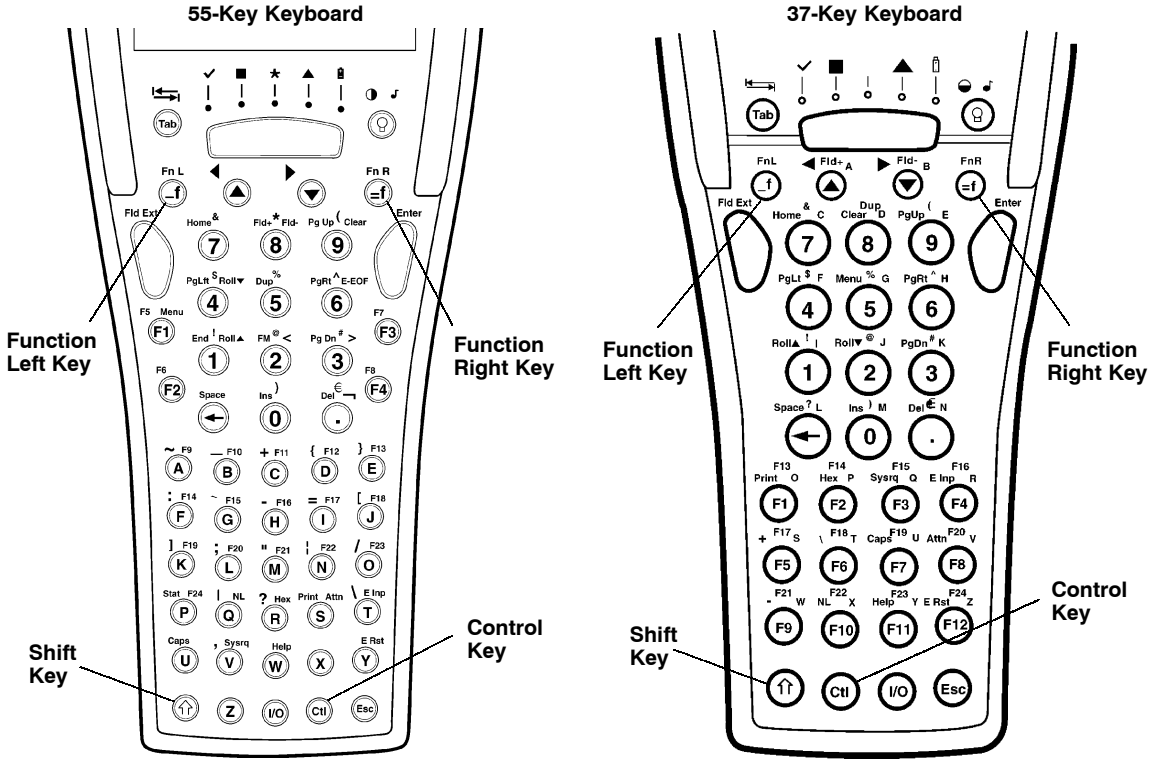


Figure 3-1
2415 Terminal Keyboards

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 Tab Keys

To Enter	Press the Keys
Back Tab	f Tab
Forward Tab	Tab

2415 AID-Generating Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**37-Key Keyboard**
Clear	f 9	f 8
Enter/Rec Adv		
F1	F1	F1
F2	F2	F2
F3	F3	F3
F4	F4	F4
F5	f F1	F5
F6	f F2	F6
F7	f F3	F7
F8	f F4	F8
F9	f A	F9
F10	f B	F10
F11	f C	F11
F12	f D	F12
F13	f E	⇧ F1
F14	f F	⇧ F2
F15	f G	⇧ F3
F16	f H	⇧ F4

To Enter	55-Key Keyboard	37-Key Keyboard
F17	f I	⇧ F5
F18	f J	⇧ F6
F19	f K	⇧ F7
F20	f L	⇧ F8
F21	f M	⇧ F9
F22	f N	⇧ F10
F23	f O	⇧ F11
F24	f P	⇧ F12
Help *(nonerror state)*	f W	f F11
Print	f S	f F1
Record Backspace *(Home)*	f 7	f 7
Roll Down	f 4	f 2
Roll Up	f 1	f 1

2415 Field Exit Key

To Enter	Press the Key
Field Exit	

2415 Signal Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**37-Key Keyboard**
Attn	f S	f F8
Help (from error state)	f W	f F11

2415 Special Control Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**37-Key Keyboard**
Del	f .	f .
Erase Input	f T	f F4
Error Reset	f Y	f F12
Hex	f R	f F2
Home	f 7	f 7
Insert	f 0	f 0
Shift Lock	f U	f F7

2415 Special Host Key

	Press the Keys	
To Enter	**55-Key Keyboard**	**37-Key Keyboard**
Sys Req	f V	f F3

2415 5250 Additional Functions

To Enter	Press the Keys	
	55-Key Keyboard	**37-Key Keyboard**
¢ (cent sign)	Not supported.	Not supported.
↵ (New Line)	f Q	f F10
¬ (Not symbol)	f .	Not supported.
Dup *(duplicate enabled fields only)*	f 5	⇧ 8
Field–	f 8	⇧ ▼
Field+	f 8	⇧ ▲
Field Mark	f 2	Not supported.

2415 Auto-Login Restart

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

Auto-Login Restart

%ALRS

2425 Terminal

Figure 3-2 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).

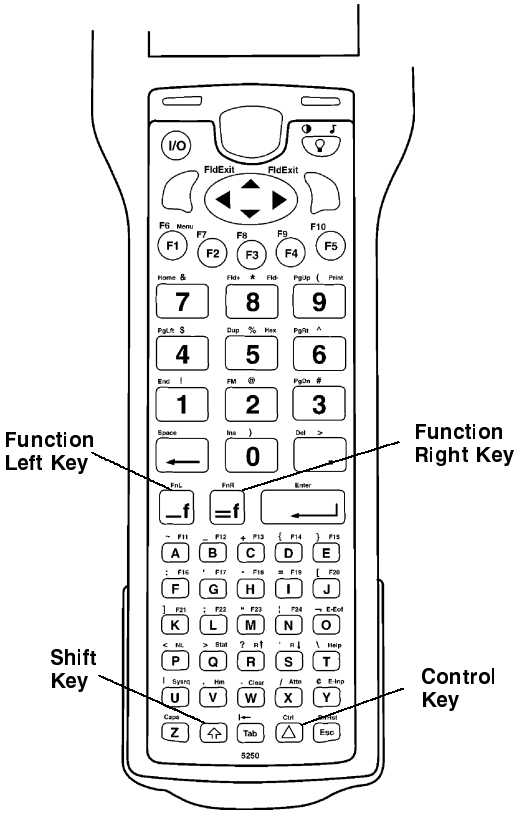


Figure 3-2
2425 Terminal Keyboard

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 Tab Keys

To Enter	Press the Keys
Back Tab	f Tab
Forward Tab	Tab

2425 AID-Generating Keys

To Enter	Press the Keys
Clear	=f W
Enter/Rec Adv	↵
F1	F1
F2	F2
F3	F3
F4	F4
F5	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
F21	=f K
F22	=f L
F23	=f M
F24	=f N
Help *(nonerror state)*	=f T
Print	=f 9
Record Backspace *(Home)*	=f V
Roll Down	=f S
Roll Up	=f R

2425 Field Exit Key

To Enter	Press the Key
Field Exit	◁ *or* ▷

2425 Signal Keys

To Enter	Press the Keys
Attn	f X
Help *(from error state)*	f T

2425 Special Control Keys

To Enter	Press the Keys
Del	f .
Erase Input	f Y
Error Reset	f Esc
Hex	f 5
Home	f V
Insert	f 0
Shift Lock	f Z

2425 Special Host Key

To Enter	Press the Keys
Sys Req	f U

2425 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	f Y
↵ (New Line)	f P
¬ (Not symbol)	f O
Dup *(duplicate enabled fields only)*	f 5
Field–	f 8
Field+	f 8
Field Mark	f 2

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

2435A Terminal

Your 2435A Terminal has either a 57-key or a 39-key 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**

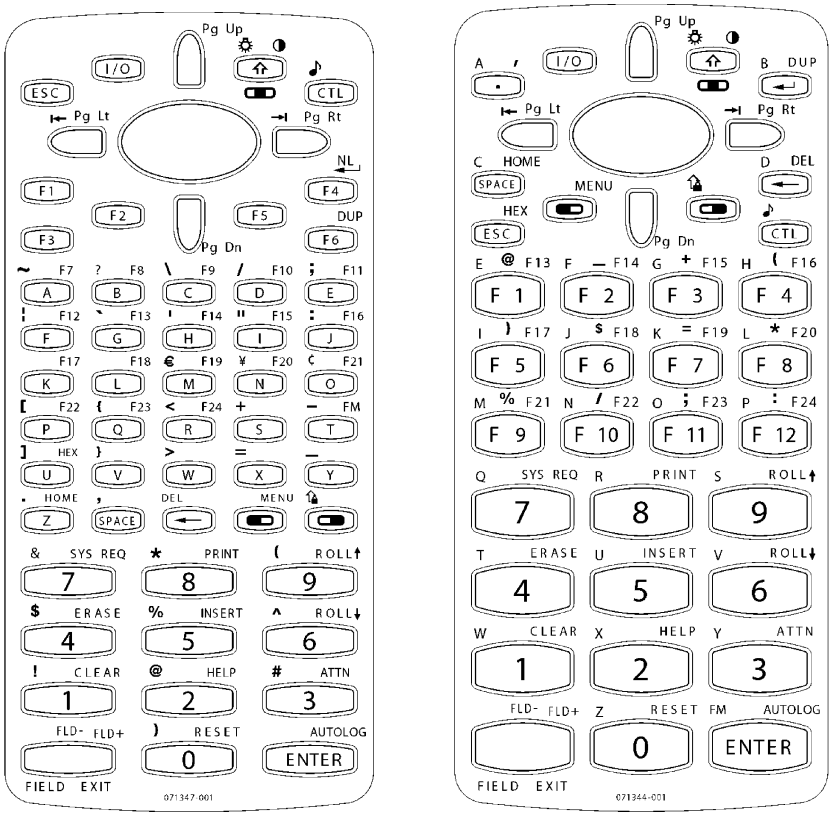


Figure 3-3
2435A Terminal Keyboards

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 Tab Keys

To Enter	Press the Keys
Back Tab	
Forward Tab	

2435A AID-Generating Keys

	Press the Keys	
To Enter	57-Key Keyboard	39-Key Function Numeric Keyboard
Clear	1	1
Enter	ENTER	ENTER
F1	F1	F1
F2	F2	F2
F3	F3	F3
F4	F4	F4
F5	F5	F5
F6	F6	F6
F7	A	F7
F8	B	F8
F9	C	F9
F10	D	F10
F11	E	F11
F12	F	F12
F13	G	F1
F14	H	F2
F15	I	F3
F16	J	F4
F17	K	F5
F18	L	F6
F19	M	F7
F20	N	F8
F21	O	F9
F22	P	F10
F23	Q	F11
F24	R	F12
Help *(non-error state)*	2	2
Print	8	8
Record Backspace *(Home)*	Z	SPACE
Roll Down	6	6
Roll Up	9	9

2435A Field Exit Key

To Enter	Press the Key
Field Exit	FIELD EXIT

2435A Signal Keys

To Enter	Press the Keys
Attn	3
Help *(from error state)*	2

2435A Special Control Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**39-Key Function Numeric Keyboard**
Del	←	←
Erase Input	4	4
Error Reset	0	0
Hex	U	Esc
Home	Z	SPACE
Insert	5	5
Shift Lock		

2435A 5250 Additional Functions

	Press the Keys	
To Enter	**57-Key Keyboard**	**39-Key Function Numeric Keyboard**
¢ (cent sign)	O	Not supported
↵ (New Line)	F4	↵
¬ (Not symbol)	Not supported	Not supported
Dup *(duplicate enabled fields only)*	F6	↵
Field–	FIELD EXIT	FIELD EXIT
Field+	FIELD EXIT	FIELD EXIT
Field Mark	T	Not supported

2435A Auto-Login Restart

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

Auto-Login Restart

%ALRS

2435A 5250 Additional Functions

To access the TE configuration menus, press with either keyboard.

2455 Terminal

Figure 3-4 shows the keyboard for the 2455 Terminal. For help with using the keyboard, refer to the *TRAKKER Antares 2455 Vehicle-Mount Terminal User's Manual* (P/N 067358).

▶ **NOTE:** *You must use the 2455 keyboard (P/N 067028) with the TE applications.*

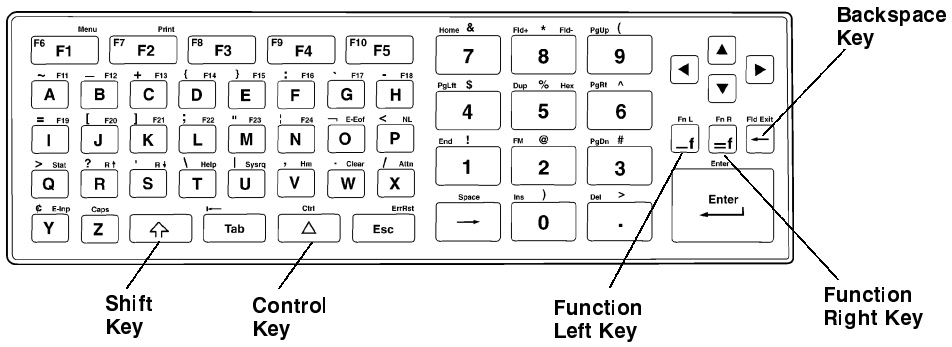


Figure 3-4
2455 Terminal Keyboard

2455 Cursor Keys

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

2455 Paging Keys

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

2455 Tab Keys

To Enter	Press the Keys
Back Tab	f Tab
Forward Tab	Tab

2455 AID-Generating Keys

To Enter	Press the Keys
Clear	f W
Enter/Rec Adv	↵
F1	F1
F2	F2
F3	F3
F4	F4
F5	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
F21	f K
F22	f L
F23	f M
F24	f N
Help *(nonerror state)*	f T
Print	f F2
Record Backspace *(Home)*	f V
Roll Down	f S
Roll Up	f R

2455 Field Exit Key

To Enter	Press the Key
Field Exit	←

2455 Signal Keys

To Enter	Press the Keys
Attn	f X
Help *(from error state)*	f T

2455 Special Control Keys

To Enter	Press the Keys
Del	f .
Erase Input	f Y
Error Reset	f Esc
Hex	f 5
Home	f V
Insert	f 0
Shift Lock	f Z

2455 Special Host Key

To Enter	Press the Keys
Sys Req	f U

2455 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	f Y
↵ (New Line)	f P
¬ (Not symbol)	f O
Dup *(duplicate enabled fields only)*	f 5
Field–	f 8
Field+	f 8
Field Mark	f 2

2455 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

248X Terminal

Figure 3-5 shows the keyboard for the 248X Terminal. For help with using the keyboard, refer to the *TRAKKER Antares 248X Stationary Terminal User's Manual* (P/N 066960).

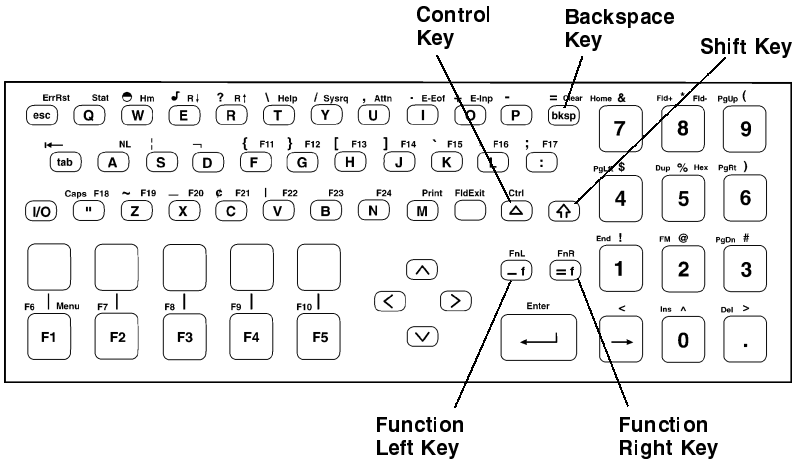


Figure 3-5
248X Terminal Keyboard

248X Cursor Keys

To Enter	Press the Keys
Window/viewport up	f ^
Window/viewport down	f v
Window/viewport right	f >
Window/viewport left	f <

248X Paging Keys

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

248X Tab Keys

To Enter	Press the Keys
Back Tab	f tab
Forward Tab	tab

248X AID-Generating Keys

To Enter	Press the Keys
Clear	f bksp
Enter/Rec Adv	↵
F1	F1
F2	F2
F3	F3
F4	F4
F5	F5
F6	f F1
F7	f F2
F8	f F3
F9	f F4
F10	f F5
F11	f F
F12	f G
F13	f H
F14	f J
F15	f K
F16	f L
F17	f :
F18	f "
F19	f Z
F20	f X
F21	f C
F22	f V
F23	f B
F24	f N
Help *(nonerror state)*	f T
Print	f M
Record Backspace *(Home)*	f W
Roll Down	f E
Roll Up	f R

248X Field Exit Key

To Enter	Press the Key
Field Exit	Fld Ext

248X Signal Keys

To Enter	Press the Keys
Attn	f U
Help *(from error state)*	f T

248X Special Control Keys

To Enter	Press the Keys
Del	f .
Erase Input	f O
Error Reset	f Esc
Hex	f 5
Home	f W
Insert	f 0
Shift Lock	f "

248X Special Host Key

To Enter	Press the Keys
Sys Req	f Y

248X 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	f C
↵ (New Line)	f A
¬ (Not symbol)	f D
Dup *(duplicate enabled fields only)*	f 5
Field–	f 8
Field+	f 8
Field Mark	f 2

248X 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

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).

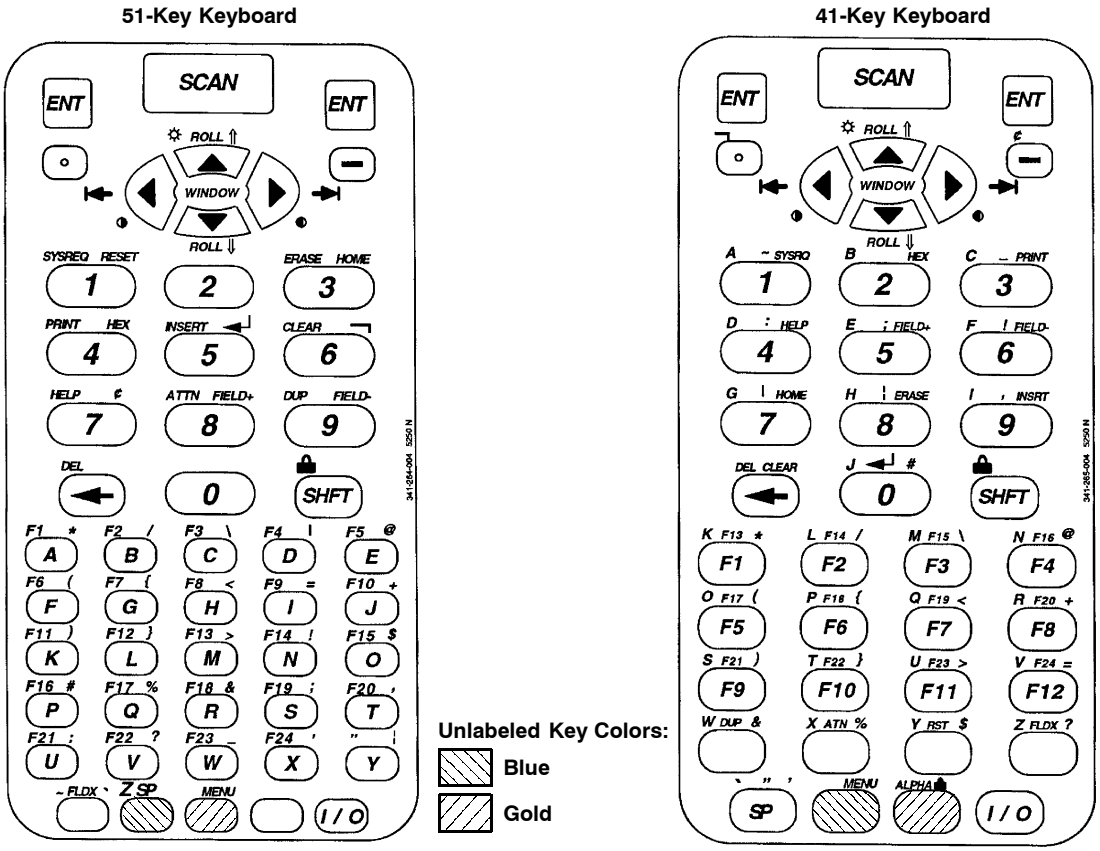


Figure 3-6
6400 Computer Keyboards

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.

[SHFT]
Press the green [SHFT] key plus a letter to type the letter in uppercase.

[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. These are the keys' functions when unshifted (in the primary plane):

- Gray key with "FLDX" printed above it is the **Field Exit** key.
- Gray key with "SP" printed above it is the **Space** key.

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

- Gray key with "DUP" printed above it is the **Duplicate** key.
- Gray key with "ATN" printed above it is the **Attention** key.
- Gray key with "RST" printed above it is the **Error Reset** key.
- Gray key with "FLDX" printed above it is the **Field Exit** key.

Using the 41-Key Keyboard

The 41-key keyboard has standard numeric keys, an [ENTER] key, user-defined function keys in its primary plane and alphabetic keys in its secondary plane.

Because a 6400 Computer with a 41-key keyboard does not have alphabetic keys, do the following to enter passwords and cold-start the computer:

- To enter the password for the Set-Up Parms TE configuration menu, press [SHFT] [BLUE] [3] or [SHFT] [F12] [3] to enter a "C", [SHFT] [BLUE] [F8] or [SHFT] [F11] [3] to enter an "R," then press "52401." *Note that these are not case-sensitive.*
- To initiate the COLD START? menu option, press [BLUE] [F11] [RST] to answer "yes."

You can use one of two methods to type letters on the 41-key keyboard: standard blue shift mode or alpha lock mode. When engaged, alpha lock 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.

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] 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 Tab Keys

To Enter	Press the Keys
Back Tab	
Forward Tab	

6400 AID-Generating Keys

	Press the Keys	
To Enter	**51-Key**	**41-Key** *(Standard Mode)*
F1	[BLUE] [A]	[F1]
F2	[BLUE] [B]	[F2]
F3	[BLUE] [C]	[F3]
F4	[BLUE] [D]	[F4]
F5	[BLUE] [E]	[F5]
F6	[BLUE] [F]	[F6]
F7	[BLUE] [G]	[F7]
F8	[BLUE] [H]	[F8]
F9	[BLUE] [I]	[F9]
F10	[BLUE] [J]	[F10]
F11	[BLUE] [K]	[F11]
F12	[BLUE] [L]	[F12]
F13	[BLUE] [M]	[SHFT] [F1]
F14	[BLUE] [N]	[SHFT] [F2]
F15	[BLUE] [O]	[SHFT] [F3]
F16	[BLUE] [P]	[SHFT] [F4]
F17	[BLUE] [Q]	[SHFT] [F5]
F18	[BLUE] [R]	[SHFT] [F6]
F19	[BLUE] [S]	[SHFT] [F7]
F20	[BLUE] [T]	[SHFT] [F8]
F21	[BLUE] [U]	[SHFT] [F9]
F22	[BLUE] [V]	[SHFT] [F10]
F23	[BLUE] [W]	[SHFT] [F11]
F24	[BLUE] [X]	[SHFT] [F12]
Enter/Rec Adv	[ENTER]	[ENTER]
Help *(nonerror state)*	[BLUE] [7]	[GOLD] [4]
Print	[BLUE] [4]	[GOLD] [3]
Clear	[BLUE] [6]	[GOLD] [←]
Record Backspace *(Home)*	[GOLD] [3]	[GOLD] [7]
Roll Down	[GOLD] [▼]	[GOLD] [▼]
Roll Up	[GOLD] [▲]	[GOLD] [▲]

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 [F24]) move to the [SHFT] [BLUE] plane.

6400 Field Exit

To Enter	**Press the Key**
Field Exit	[FLDX]

6400 Signal Keys

	Press the Keys	
To Enter	**51-Key Keyboard**	**41-Key Keyboard**
Attn	[BLUE] [8]	[ATN]
Help *(from error state)*	[BLUE] [7]	[GOLD] [4]

6400 Special Control Keys

	Press the Keys	
To Enter	**51-Key Keyboard**	**41-Key Keyboard**
Del	[BLUE] [←]	[BLUE] [←]
Erase Input	[BLUE] [3]	[GOLD] [8]
Error Reset	[GOLD] [1]	[RST]
Hex	[GOLD] [4]	[GOLD] [2]
Home	[GOLD] [3]	[GOLD] [7]
Insert	[BLUE] [5]	[GOLD] [9]
Shift Lock	[BLUE] [SHFT]	[BLUE] [SHFT]

6400 Special Host Key

	Press the Key	
To Enter	**51-Key Keyboard**	**41-Key Keyboard**
Sys Req	[BLUE] [1]	[GOLD] [1]

6400 5250 Additional Functions

	Press the Keys	
To Enter	**51-Key Keyboard**	**41-Key Keyboard**
↵ (New Line)	[GOLD] [5]	[SHFT] [0]
Dup *(duplicate enabled fields only)*	[BLUE] [9]	[DUP]
Field–	[GOLD] [9]	[GOLD] [6]
Field+	[GOLD] [8]	[GOLD] [5]
Field Mark	No key available. Scan bar code in *Appendix A*.	

6400 Auto-Login Restart

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

Auto-Login Restart

%ALRS

5020 Data Collection PC

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

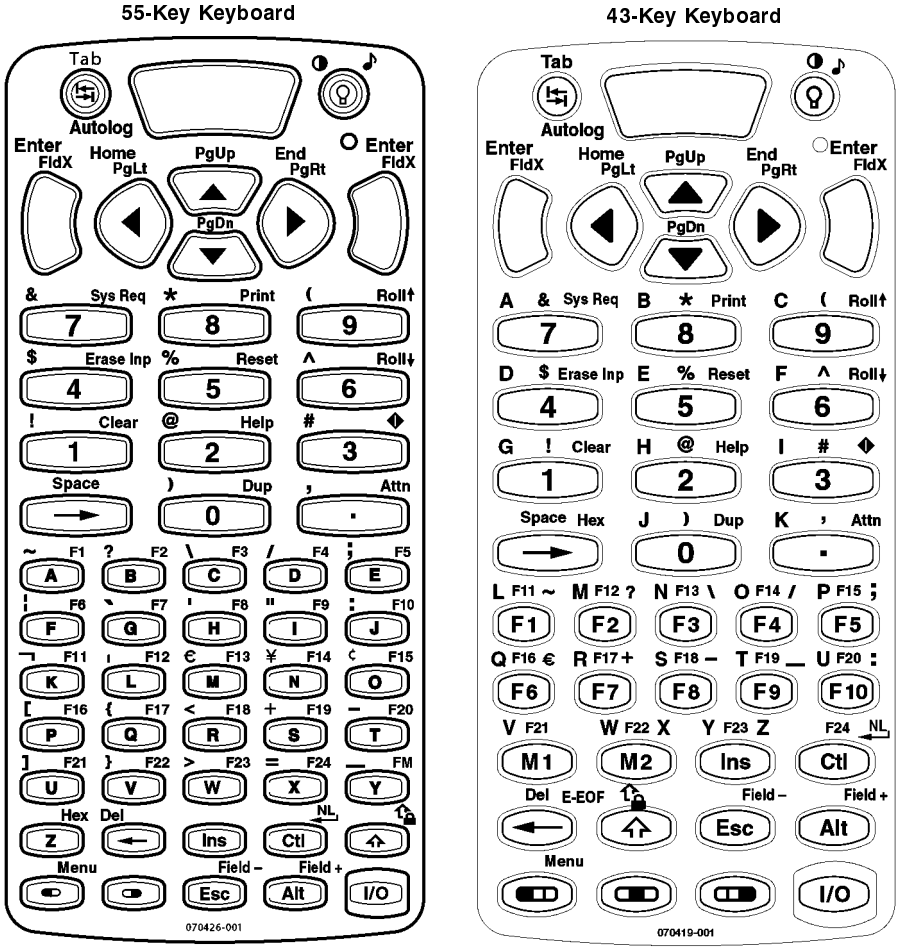


Figure 3-7
5020 Data Collection PC Keyboards

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 Tab Keys

To Enter	**Press the Keys**
Back Tab	⇧ ⇥
Forward Tab	⇥

5020 Signal Keys

To Enter	**Press the Keys**
Attn	⊂⊃ .
Help *(from error state)*	⊂⊃ 2

5020 Special Control Keys

	Press the Keys	
To Enter	**55-Key Keyboard**	**43-Key Keyboard**
Del		
Erase Input	4	4
Error Reset	5	5
Hex	Z	
Home	◀	◀
Insert	Ins	Ins
Shift Lock	▲	▲

5020 Special Host Key

To Enter	Press the Keys
Sys Req	7

5020 5250 Additional Functions

	Press the Keys	
To Enter	**55-Key Keyboard**	**43-Key Keyboard**
↵ (New Line (return)	Ctl	Ctl
Dup *(duplicate enabled fields only)*	0	0
Field–	Esc	Esc
Field+	Alt	Alt
Field Mark	Y	Not supported

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**
F1	[A]	F1
F2	[B]	F2
F3	[C]	F3
F4	[D]	F4
F5 (Break)	[E]	F5
F6	[F]	F6
F7	[G]	F7
F8	[H]	F8
F9	[I]	F9
F10	[J]	F10
F11	[K]	F1
F12	[L]	F2
F13	[M]	F3
F14	[N]	F4
F15	[Q]	F5
F16	[P]	F6
F17	[Q]	F7
F18	[R]	F8
F19	[S]	F9
F20	[T]	F10
F21	[U]	M1
F22	[V]	M2
F23	[W]	Ins
F24	[X]	Ctl

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 [A] ⇧ with the 43-key keyboard or [B] ⇧ with the 55-key keyboard. 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 ⇧ [A] and an alphabetic character key. For example, press ⇧ [A] 6 to type a lowercase letter "f."

*To disable **Caps Lock**:*
Press ⇧ until a tone is emitted, or press [A] ⇧ with the 43-key keyboard or [B] ⇧ with the 55-key keyboard.

5020 Auto-Login Restart

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

Auto-Login Restart

%ALRS

5055 Data Collection PC

Figure 3-8 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).

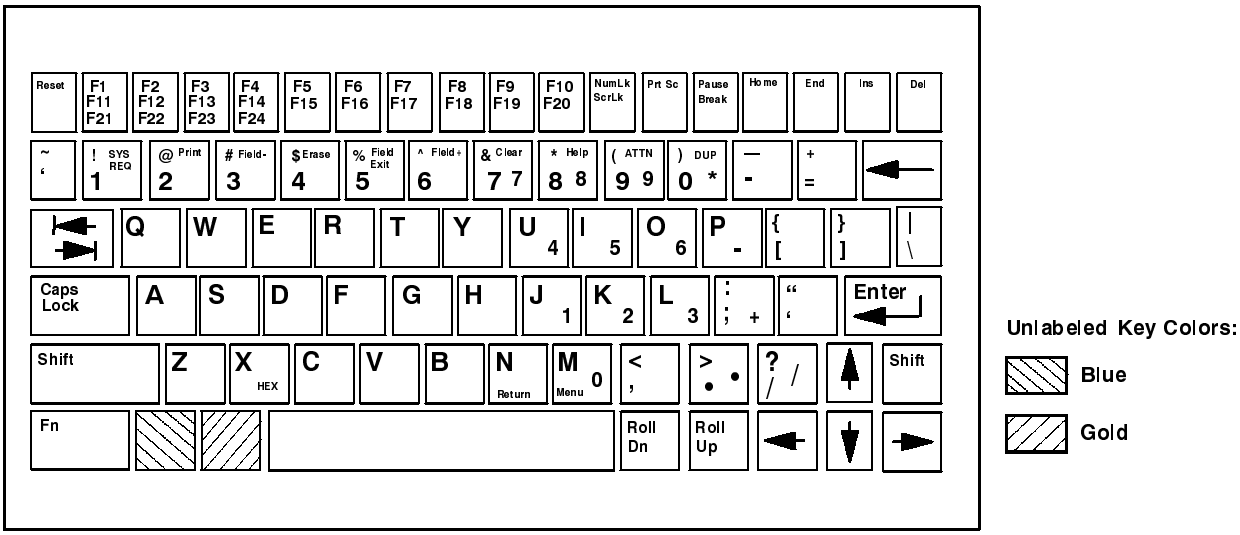


Figure 3-8
5055 Data Collection PC Keyboard

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.

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

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

[NumLk]
The green (number lock) key puts the keyboard into [NumLk] mode. Press [NumLk] plus a keyboard key to type green numbers or characters.

▶ **NOTE:** *These are on the keyboard but are not supported: Fn, Setup, Pause, Break, End, and ScrLk.*

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

5055 Tab Keys

To	Press the Keys
Back Tab	⇤
Forward Tab	⇥

5055 AID-Generating Keys

To	Press the Keys
Clear	[GOLD] [7]
Enter/Rec Adv	[Enter]
F1	[F1]
F2	[F2]
F3	[F3]
F4	[F4]
F5	[F5]
F6	[F6]
F7	[F7]
F8	[F8]
F9	[F9]
F10	[F10]
F11	[BLUE] [F1]
F12	[BLUE] [F2]
F13	[BLUE] [F3]
F14	[BLUE] [F4]
F15	[BLUE] [F5]
F16	[BLUE] [F6]
F17	[BLUE] [F7]
F18	[BLUE] [F8]
F19	[BLUE] [F9]

To	Press the Keys
F20	[BLUE] [F10]
F21	[GOLD] [F1]
F22	[GOLD] [F2]
F23	[GOLD] [F3]
F24	[GOLD] [F4]
Help *(nonerror state)*	[GOLD] [8]
Print	[GOLD] [2]
Record Backspace *(Home)*	[Home]
Roll Down	[Roll Dn]
Roll Up	[Roll Up]

5055 Field Exit Key

To Enter	Press the Keys
Field Exit	[GOLD] [5]

5055 Signal Keys

To Enter	Press the Keys
Attn	[GOLD] [9]
Help *(from error state)*	[GOLD] [8]

5055 Special Control Keys

To Enter	Press the Keys
Del	[Del]
Erase Input	[GOLD] [4]
Error Reset	[Reset]
Hex	[GOLD] [Z]
Home	[Home]
Insert	[Ins]
Shift Lock	[Caps Lock]

5055 Special Host Key

To Enter	Press the Keys
Sys Req	[GOLD] [1]

5055 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	Not supported.
↵ (New Line (return)	[GOLD] [N]
¬ (Not symbol)	Not supported.
Dup *(duplicate enabled fields only)*	[GOLD] [0]
Field–	[GOLD] [3]
Field+	[GOLD] [6]
Field Mark	No key available. Scan bar code in *Appendix A*.

5055 Auto-Login Restart

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

Auto-Login Restart

%ALRS

59XX Terminal

Figure 3-9 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).

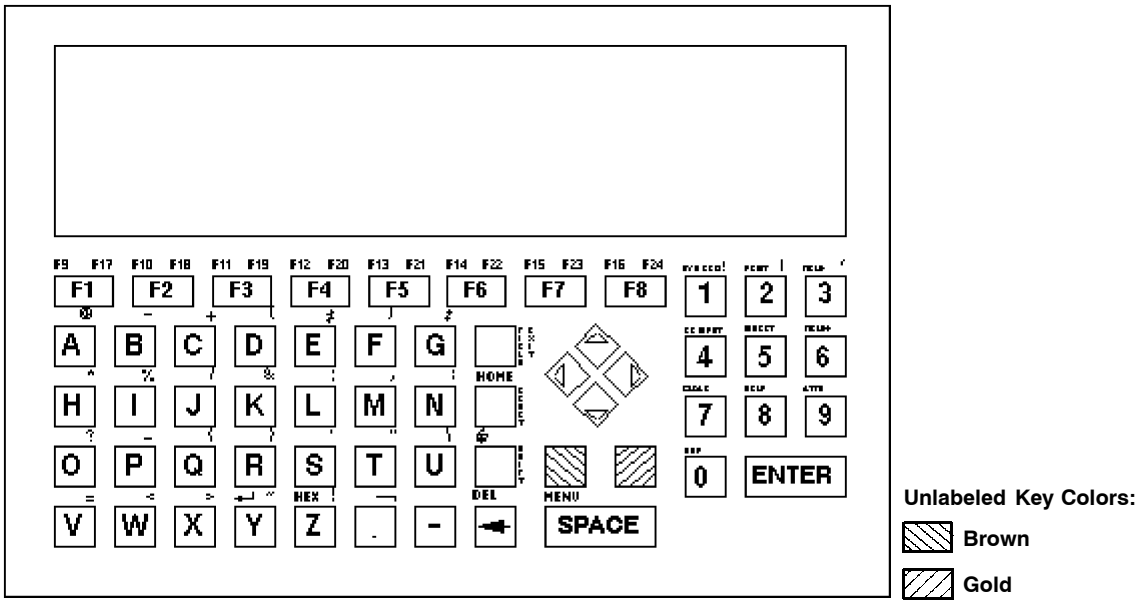


Figure 3-9
59XX Terminal Keyboard

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:

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

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

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

The [FIELD EXIT], [RESET], and [SHIFT] keys have their operations printed to the right of them. The operations printed to the right are the *unshifted* values. The operations printed above [RESET] and [SHIFT] are the *shifted* values. [FIELD EXIT] does not have a shifted value.

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 Tab Keys

To Enter	Press the Keys
Back Tab	[◀]
Forward Tab	[▶]

59XX AID-Generating Keys

To Enter	Press the Keys
Clear	[BROWN] [7]
Enter/Rec Adv	[ENTER]
F1–F8	[F1]–[F8]
F9–F16	[BROWN] [F1] – [BROWN] [F8]
F17–F24	[GOLD] [F1] – [GOLD] [F8]
Help *(nonerror state)*	[BROWN] [8]
Print	[BROWN] [2]
Record Backspace *(Home)*	[BROWN] [RESET]
Roll Down	[▼]
Roll Up	[▲]

59XX Field Exit Key

To Enter	Press the Keys
Field Exit	[FIELD EXIT]

59XX Signal Keys

To Enter	Press the Keys
Attn	[BROWN] [9]
Help *(from error state)*	[BROWN] [8]

59XX Special Control Keys

To Enter	Press the Keys
Del	[BROWN] [←]
Erase Input	[BROWN] [4]
Error Reset	[RESET]
Hex	[BROWN] [Z]
Home	[BROWN] [INSERT]
Insert	[BROWN] [5]
Shift Lock	[BROWN] [SHIFT]

59XX Special Host Key

To Enter	Press the Keys
Sys Req	[BROWN] [1]

59XX 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	[GOLD] [–]
↵ (New Line)	[BROWN] [Y]
¬ (Not symbol)	[GOLD] [.]
Alternate character size	[YELLOW] [SPACE]
Dup *(duplicate enabled fields only)*	[BROWN] [0]
Field–	[BROWN] [3]
Field+	[BROWN] [6]
Field Mark	No key available. Scan bar code in *Appendix A*.

59XX Auto-Login Restart

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

Auto-Login Restart

%ALRS

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* (P/N 961-047-068).

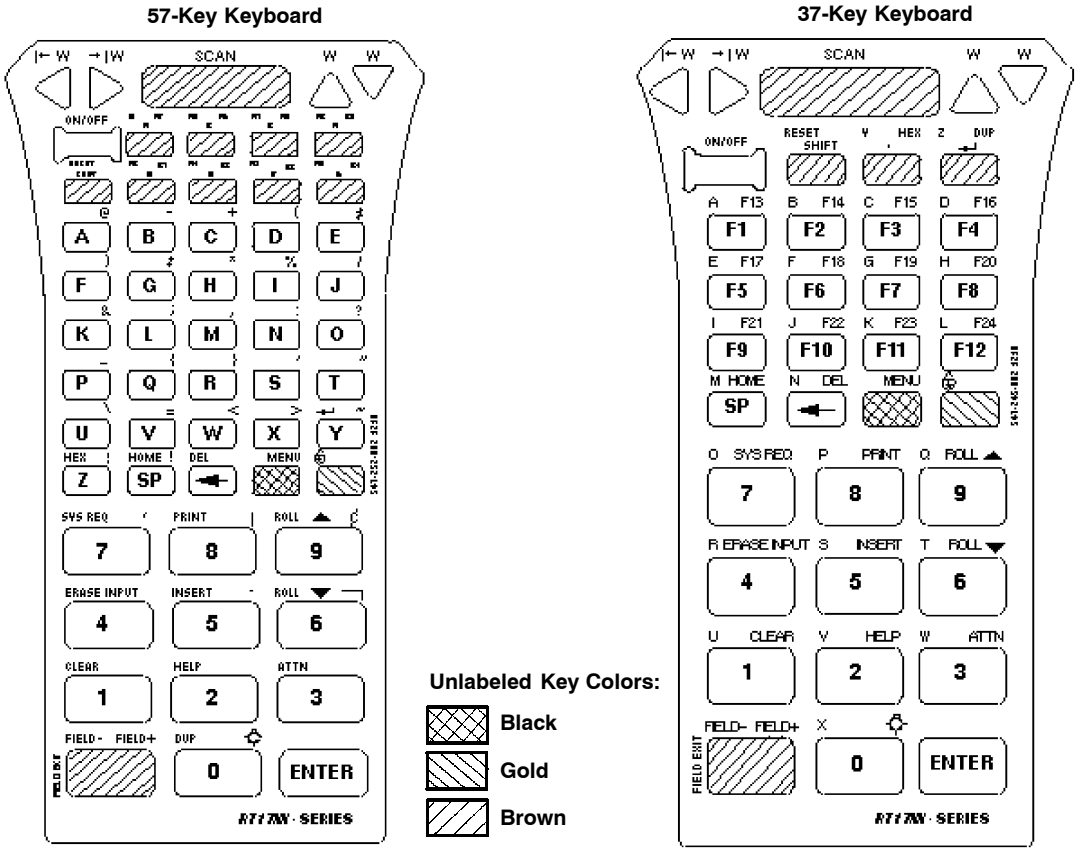


Figure 3-10
17XX Terminal Keyboards

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:

[SHIFT]
Press the [SHIFT] key plus a letter to type the letter in uppercase. The [SHIFT] key is located near the top of the keyboard.

[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.

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

The [FIELD EXIT] key has its operation printed to the left of it. The operation to the left is its *unshifted* value. The operations printed above [FIELD EXIT] are *shifted* values.

37-Key Keyboard

The 37-key keyboard has standard numeric keys, an [ENTER] key, and user-defined function keys in its primary plane. It has alphabetic keys in its secondary plane, and the special character " . " (period).

Because a radio terminal with a 37-key keyboard does not have alphabetic keys, follow these procedures when using its TE configuration menus and downloading software to it:

- 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 radio terminal to go into download mode. This is similar to holding down the [I] key on the standard 57-key keyboard.

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 Tab Keys

To Enter	Press the Key
Back Tab	[◀]
Forward Tab	[▶]

17XX AID-Generating Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
Clear	[BLACK] [1]	[GOLD] [1]
Enter/Rec Adv	[ENTER]	[ENTER]
F1–F8	[F1] – [F8]	[F1] – [F8]
F9–F12	[BLACK] [F1] – [BLACK] [F4]	[F9] – [F12]
F13	[BLACK] [F5]	[GOLD] [F1]
F14	[BLACK] [F6]	[GOLD] [F2]
F15	[BLACK] [F7]	[GOLD] [F3]
F16	[BLACK] [F8]	[GOLD] [F4]
F17	[GOLD] [F1]	[GOLD] [F5]
F18	[GOLD] [F2]	[GOLD] [F6]
F19	[GOLD] [F3]	[GOLD] [F7]
F20	[GOLD] [F4]	[GOLD] [F8]
F21	[GOLD] [F5]	[GOLD] [F9]
F22	[GOLD] [F6]	[GOLD] [F10]
F23	[GOLD] [F7]	[GOLD] [F11]
F24	[GOLD] [F8]	[GOLD] [F12]
Help *(nonerror state)*	[BLACK] [2]	[GOLD] [2]
Print	[BLACK] [8]	[GOLD] [8]
Record Backspace *(Home)*	[BLACK] [SP]	[GOLD] [SP]
Roll Down	[BLACK] [6]	[GOLD] [6]
Roll Up	[BLACK] [9]	[GOLD] [9]

17XX Field Exit Key

To Enter	**Press the Key**
Field Exit	[FIELD EXIT]

17XX Signal Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
Attn	[BLACK] [3]	[GOLD] [3]
Help (from error state)	[BLACK] [2]	[GOLD] [2]

17XX Special Control Keys

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
Del	[BLACK] [←]	[GOLD] [←]
Erase Input	[BLACK] [4]	[GOLD] [4]
Error Reset	[BLACK] [SHIFT]	[BLACK] [SHIFT]
Hex	[BLACK] [Z]	[GOLD] [.]
Home	[BLACK] [SP]	[GOLD] [SP]
Insert	[BLACK] [5]	[GOLD] [5]
Shift Lock	[BLACK] [GOLD]	[BLACK] [GOLD]

17XX Special Host Key

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
Sys Req	[BLACK] [7]	[GOLD] [7]

17XX 5250 Additional Functions

	Press the Keys	
To Enter	**57-Key Keyboard**	**37-Key Keyboard**
¢ (cent sign)	[GOLD] [9]	Not supported.
↵ (New Line)	[BLACK] [Y]	[↵]
¬ (Not symbol)	[GOLD] [6]	Not supported.
Dup *(duplicate enabled fields only)*	[BLACK] [0]	[GOLD] [↵]
Field–	[BLACK] [BROWN]	[BLACK] [BROWN]
Field+	[GOLD] [BROWN]	[GOLD] [BROWN]
Field Mark	No key available. Scan bar code in *Appendix A*.	

17XX Auto-Login Restart

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

Auto-Login Restart

%ALRS

11XX Terminal

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

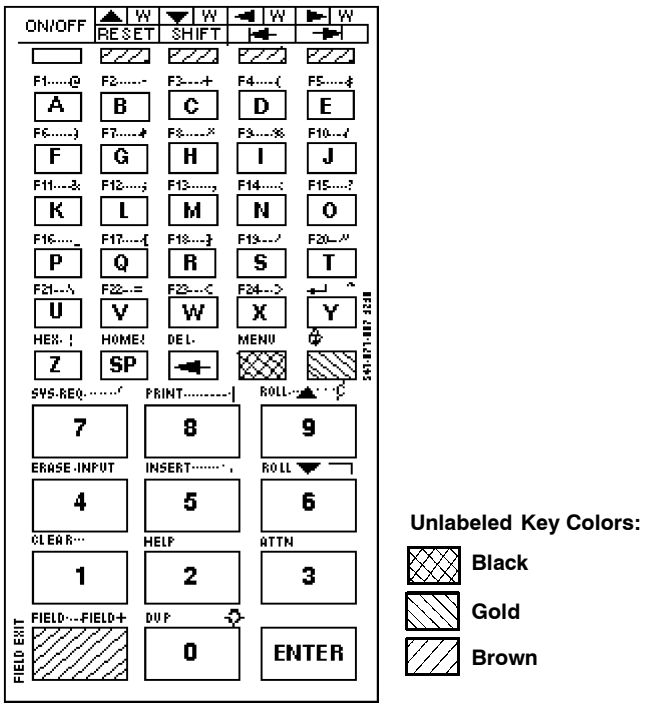


Figure 3-11
11XX Terminal Keyboard

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:

[SHIFT]
Press the brown [SHIFT] key plus a letter to type the letter in uppercase. The [SHIFT] key is located near the top of the keyboard.

[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.

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

The [FIELD EXIT] key has its operation printed to the left of it. The operation printed to the left is its *unshifted* value. Operations printed above [FIELD EXIT] are *shifted* values.

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 Tab Keys

To Enter	Press the Key
Back Tab	
Forward Tab	

11XX AID-Generating Keys

To Enter	Press the Keys
Clear	[BLACK] [1]
Enter/Rec Adv	[ENTER]
F1	[BLACK] [A]
F2	[BLACK] [B]
F3	[BLACK] [C]
F4	[BLACK] [D]
F5	[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]
F21	[BLACK] [U]
F22	[BLACK] [V]
F23	[BLACK] [W]
F24	[BLACK] [X]
Help *(nonerror state)*	[BLACK] [2]
Print	[BLACK] [8]
Record Backspace *(Home)*	[BLACK] [SP]
Roll Down	[BLACK] [6]
Roll Up	[BLACK] [9]

11XX Field Exit Key

To Enter	Press the Key
Field Exit	[FIELD EXIT]

11XX Signal Keys

To Enter	Press the Keys
Attn	[BLACK] [3]
Help *(from error state)*	[BLACK] [2]

11XX Special Control Keys

To Enter	Press the Keys
Del	[BLACK] [←]
Erase Input	[BLACK] [4]
Error Reset	[RESET]
Hex	[BLACK] [Z]
Home	[BLACK] [SP]
Insert	[BLACK] [5]
Shift Lock	[BLACK] [GOLD]

11XX Special Host Key

To Enter	Press the Keys
Sys Req	[BLACK] [7]

11XX 5250 Additional Functions

To Enter	Press the Keys
¢ (cent sign)	[GOLD] [9]
↵ (New Line)	[BLACK] [Y]
¬ (Not symbol)	[GOLD] [6]
Dup *(duplicate-enabled fields only)*	[BLACK] [0]
Field–	[BLACK] [BROWN]
Field +	[GOLD] [BROWN]
Field Mark	No key available. Scan bar code in *Appendix A*.

11XX Auto-Login Restart

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

Auto-Login Restart

%ALRS

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
- 59XX Terminal — **[ENTER]** key
- 5020 Data Collection PC — ⎔ or ⎔ keys
- 5055 Data Collection PC — **<Enter>** via external keyboard
- 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.

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

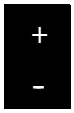
SCAN **Laser scanner in use** *(17XX, 11XX)*
Observe caution labels on laser scanners.

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:

- Trakker Antares (2415, 2425, 2435A, 2455, 248X) page 4-56
- 6400 Computer page 4-56
- 5055 Data Collection PC page 4-57

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]

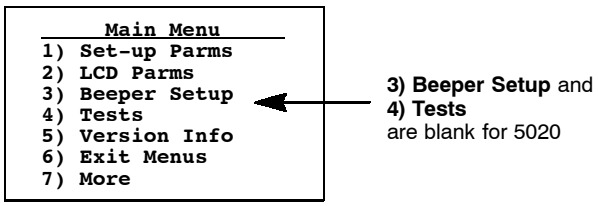
NOTE: *You can also access the **Main Menu** by scanning the following bar code label.*

TE configuration menus

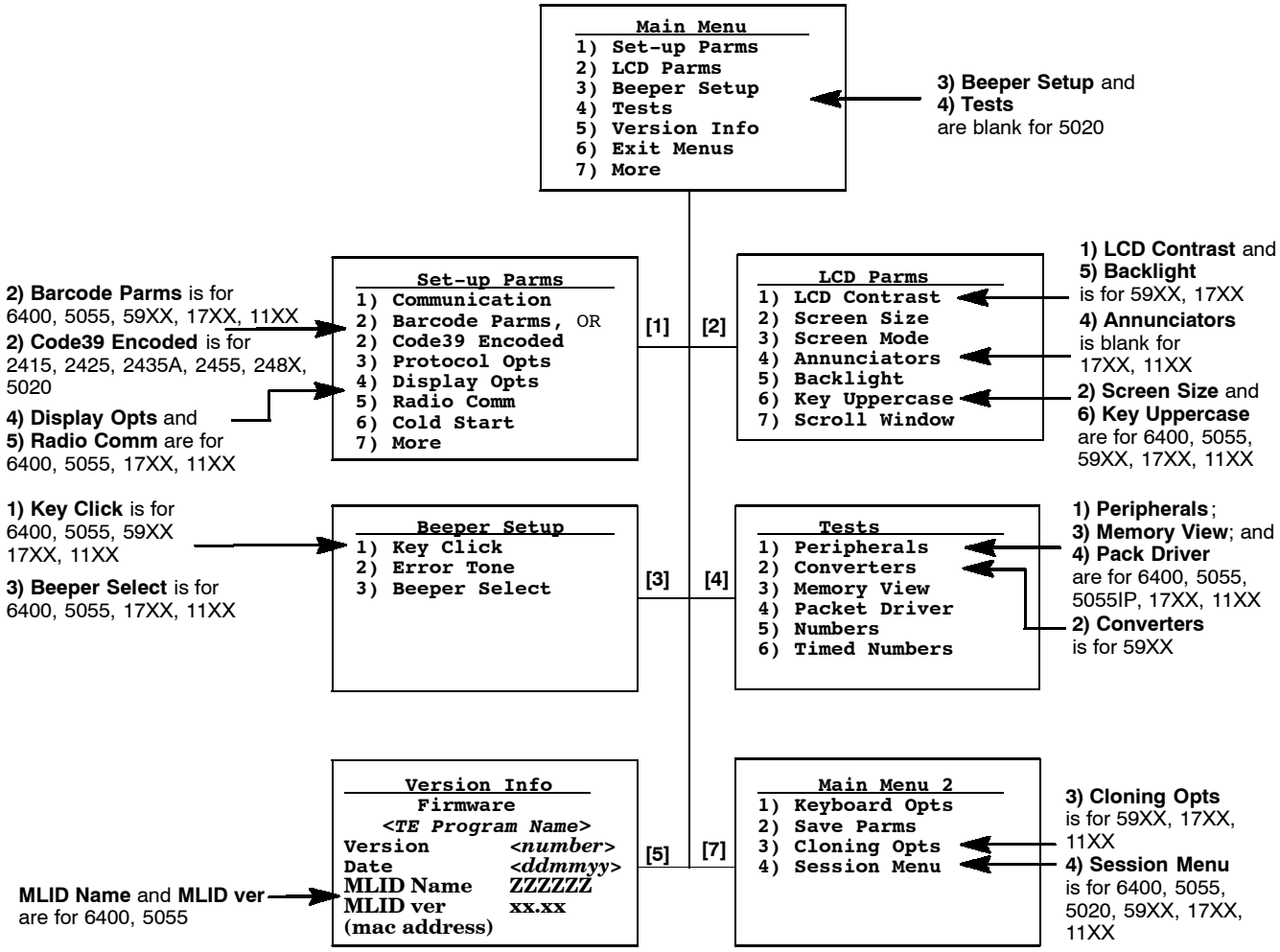
%TECFG

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.

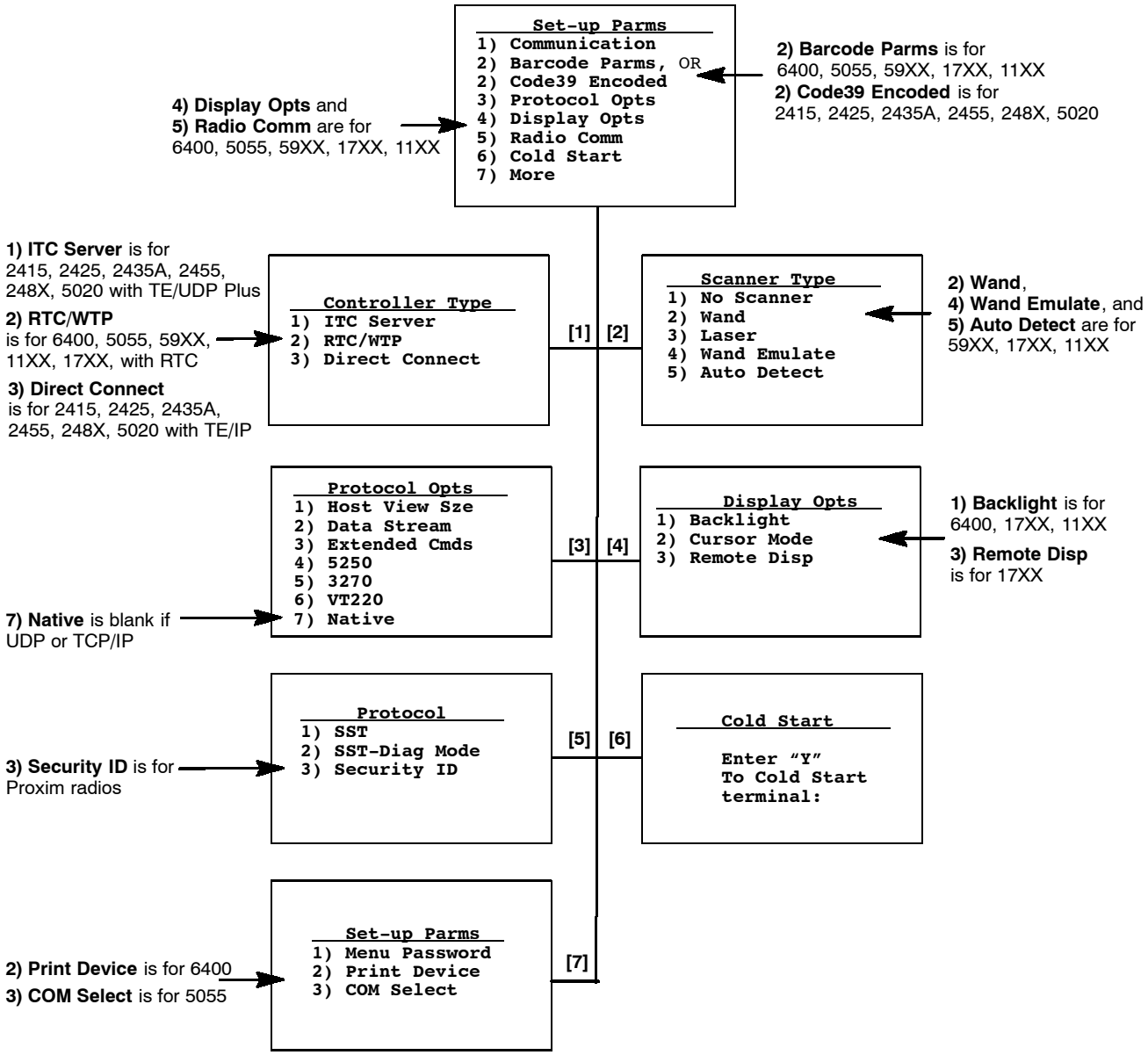


1) Set-Up Parms

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:

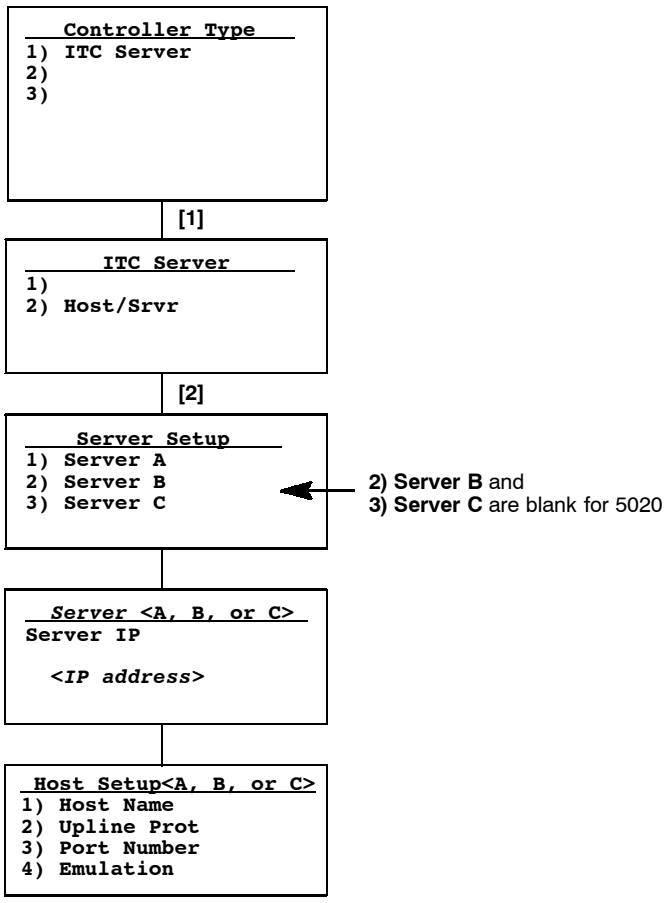
2415, 2425, 2435A, 2455, 248X, and 5020 Terminals with UDP Plus
1) ITC Server via the next paragraph.

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.

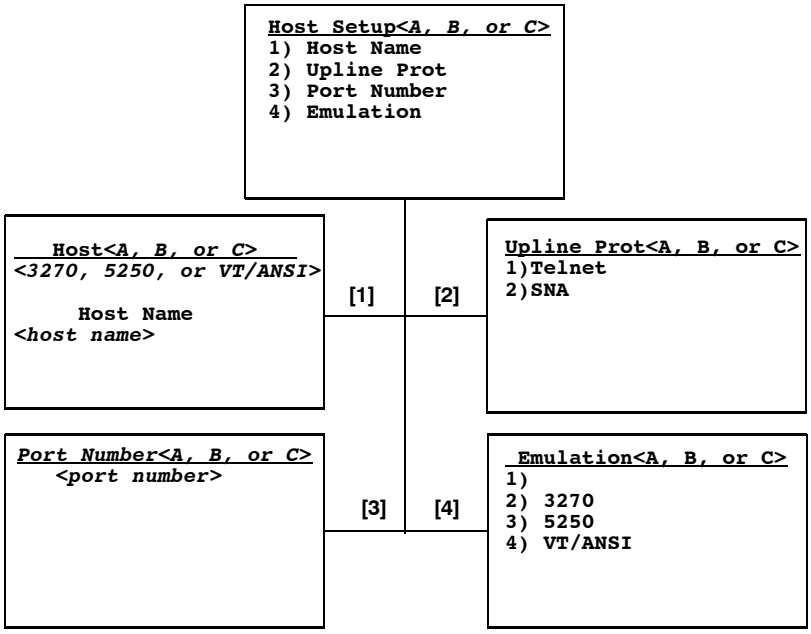
***1) ITC Server** (2415, 2425, 2435A, 2455, 248X, 5020 with TE/UDP Plus)*
ITC (Intermec Technologies Corporation) Server options are as follows. To set the options, select **1) ITC Server**, **2) Host/Srvr**, then the **Server Setup** option (Server A, B, or C).



***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.

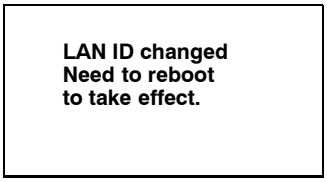
The **1) Radio Setup** and **2) Host/Cntl** menus are shown on the following pages. Depending on which option you are exercising you will either advance to the WTP Stack settings or the TCP/IP Stack settings.

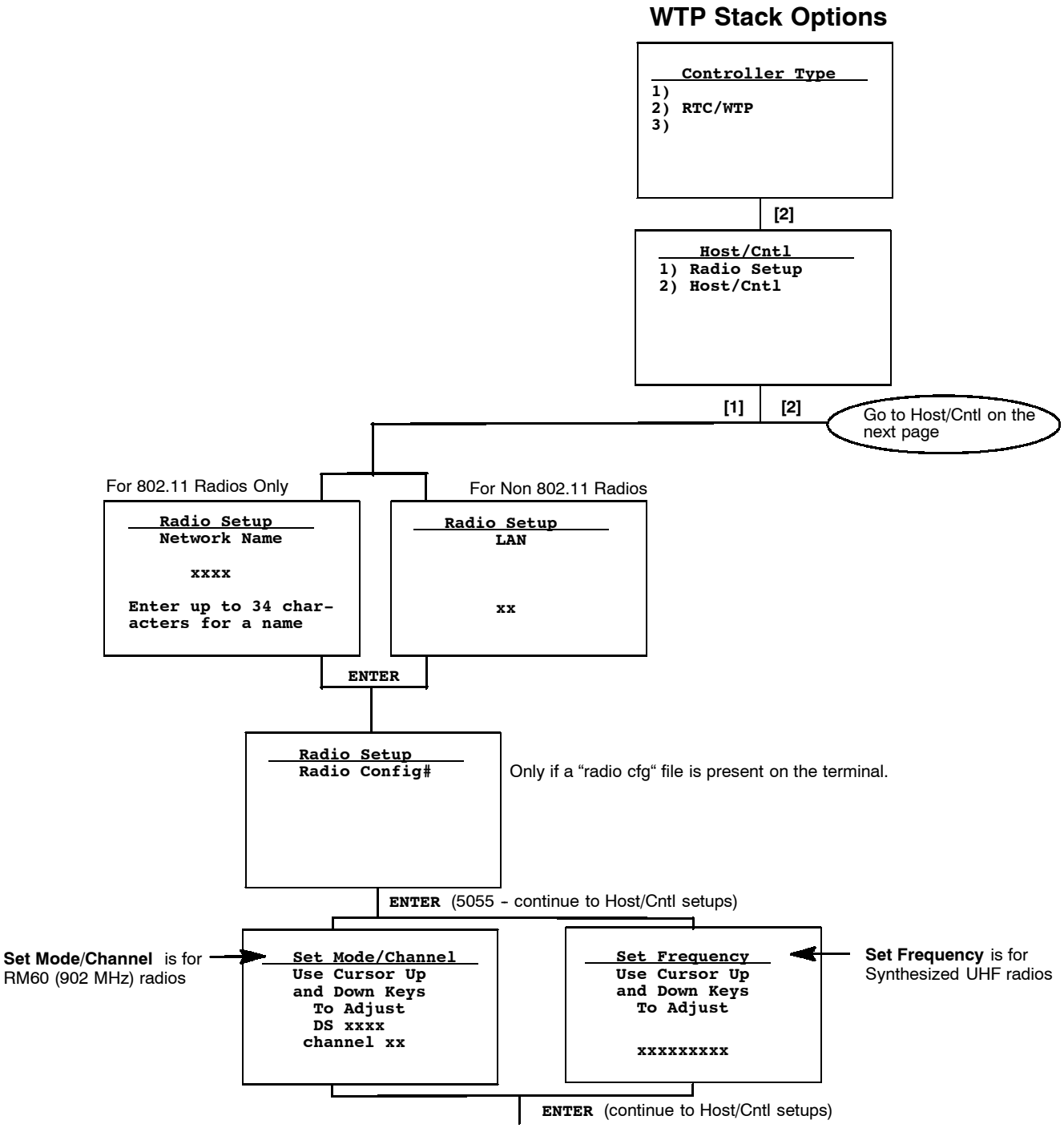
WTP Settings

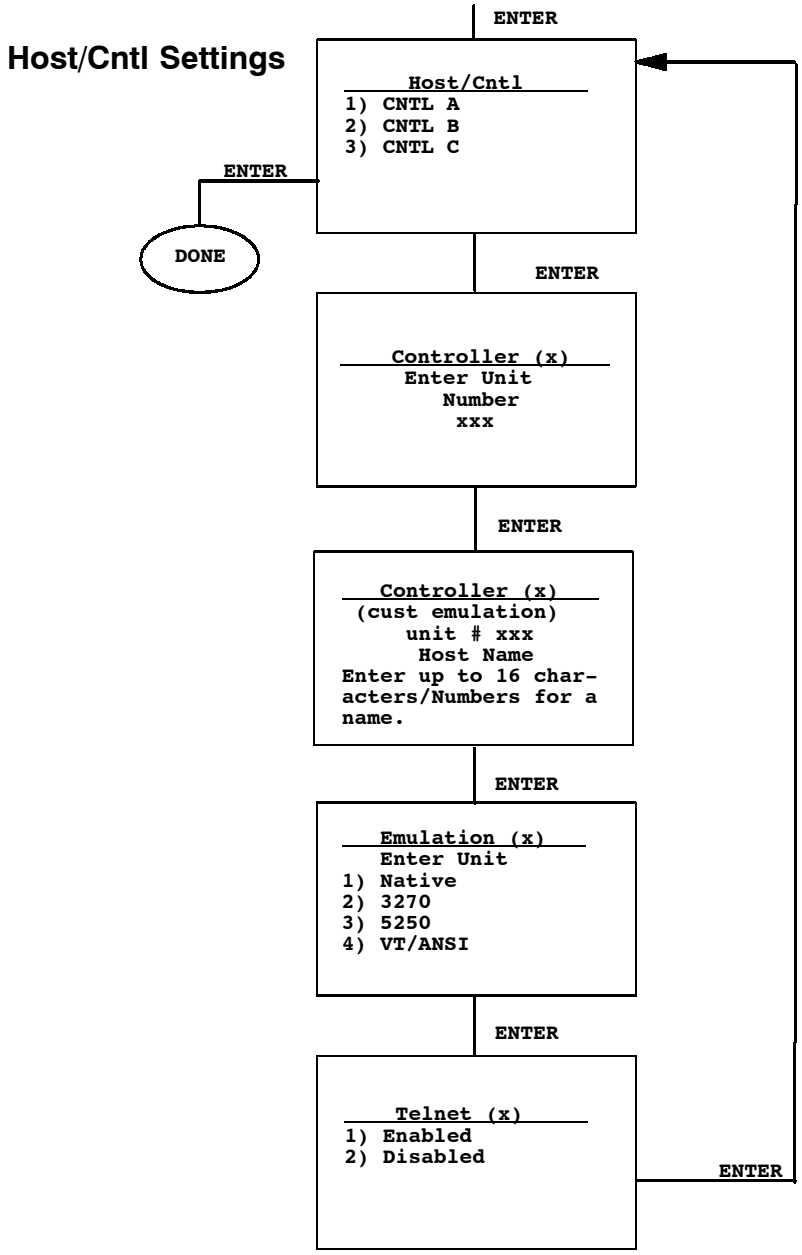
Use the numeric keys on the terminal keyboard or 5055 external keyboard to modify its ID. Enter a number between 0–126, then press [Enter] to go to the **2) Host/Cntl** menus.

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
Controller Type
1)
2) RTC/WTP
3)
[2]
Host/Cntl
1) Radio Setup
2) Host/Cntl
[1]
[2]
Go to Host/Cntl on the next page
For 802.11 Radios Only
For Non 802.11 Radios
Radio Setup
Network Name
xxxx
Enter up to 34 characters for a name
Radio Setup
LAN
xx
ENTER
Radio Setup
Radio Config#
Only if a "radio cfg" file is present on the terminal.
ENTER (5055 - continue to Host/Cntl setups)
Set Mode/Channel is for RM60 (902 MHz) radios
Set Mode/Channel
Use Cursor Up
and Down Keys
To Adjust
DS xxxx
channel xx
Set Frequency
Use Cursor Up
and Down Keys
To Adjust
xxxxxxxxx
Set Frequency is for Synthesized UHF radios
ENTER (continue to Host/Cntl setups)



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.

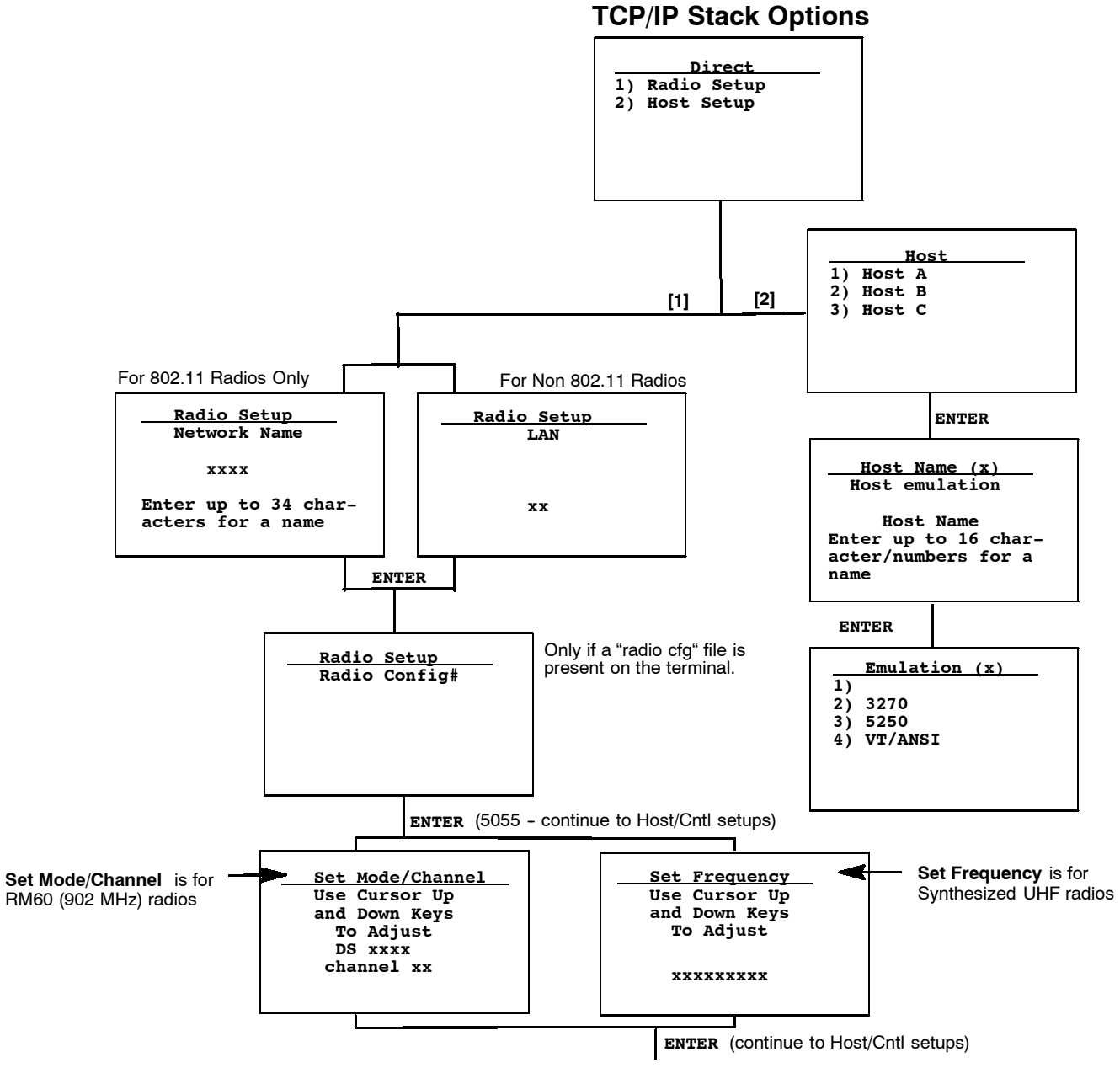
If using a 902 MHz radio module, use the up and down arrows to pick the Direct Sequence (DS) and Channel configuration. If using a Synthesized UHF radio, select the possible frequencies for your radio module from the list.

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:

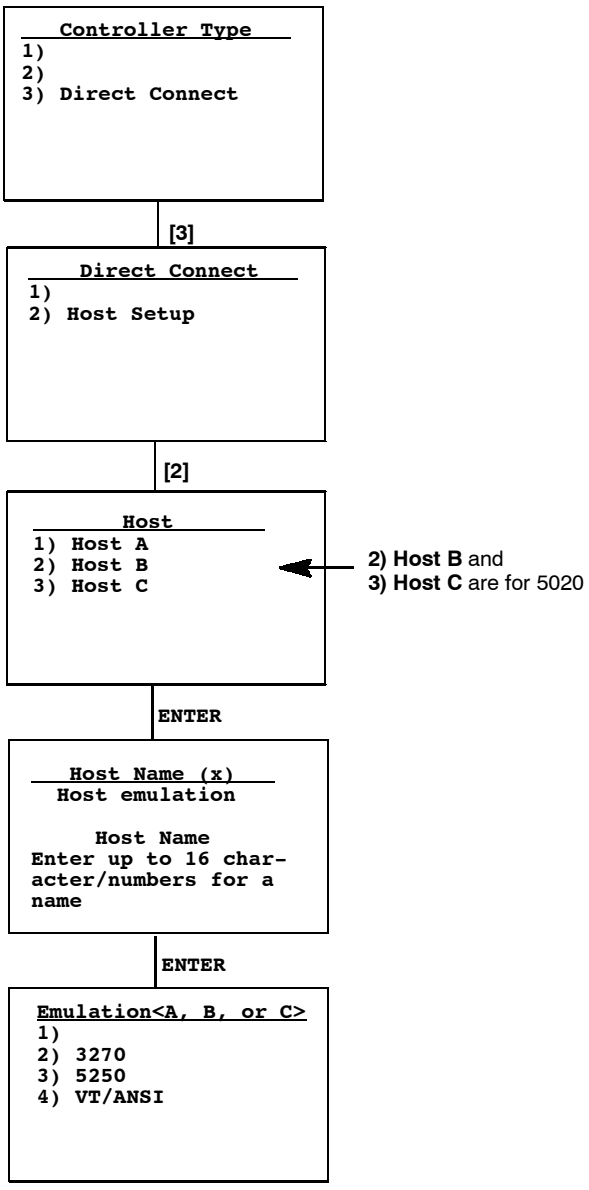
- Tell the 6400 Computer or 5055 PC the host type of each host computer: (3270, 5250, or VT/ANSI).
- Tell the 6400 Computer or 5055 PC the name of each host.

▶ 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."

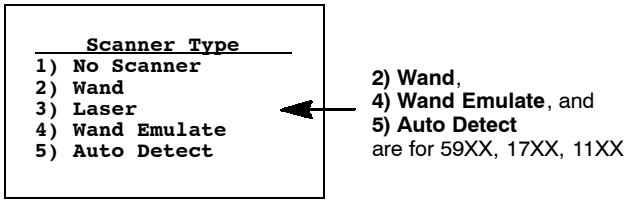
2) Barcode Parms (6400, 5055, 59XX, 17XX, 11XX)

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

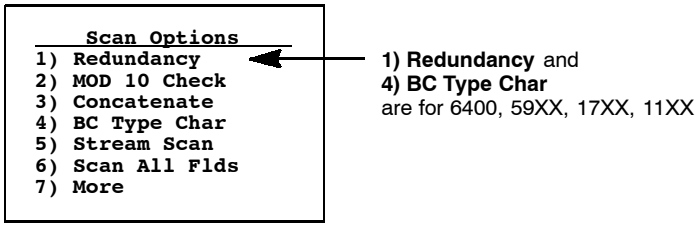
Use the **1) Scanner Type** menu to designate the type of bar code scanner. To make a selection, press the numeric key corresponding to the desired option, then press [Enter] to access the **2) Scan Options** menu.



▶ 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.

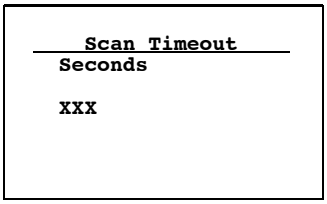
4) BC Type Char *(6400, 59XX, 17XX, 11XX)*
This option adds a character associated with the bar code type at the beginning of the scanned bar code.

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.

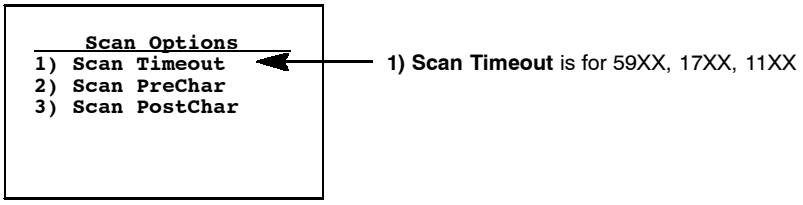
6) Scan All Flds (Fields)
When this option is selected, the scanner is enabled when the cursor is in an input field. When this option is OFF, the host computer must enable the scanner for each input field that requires scanned data.

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.

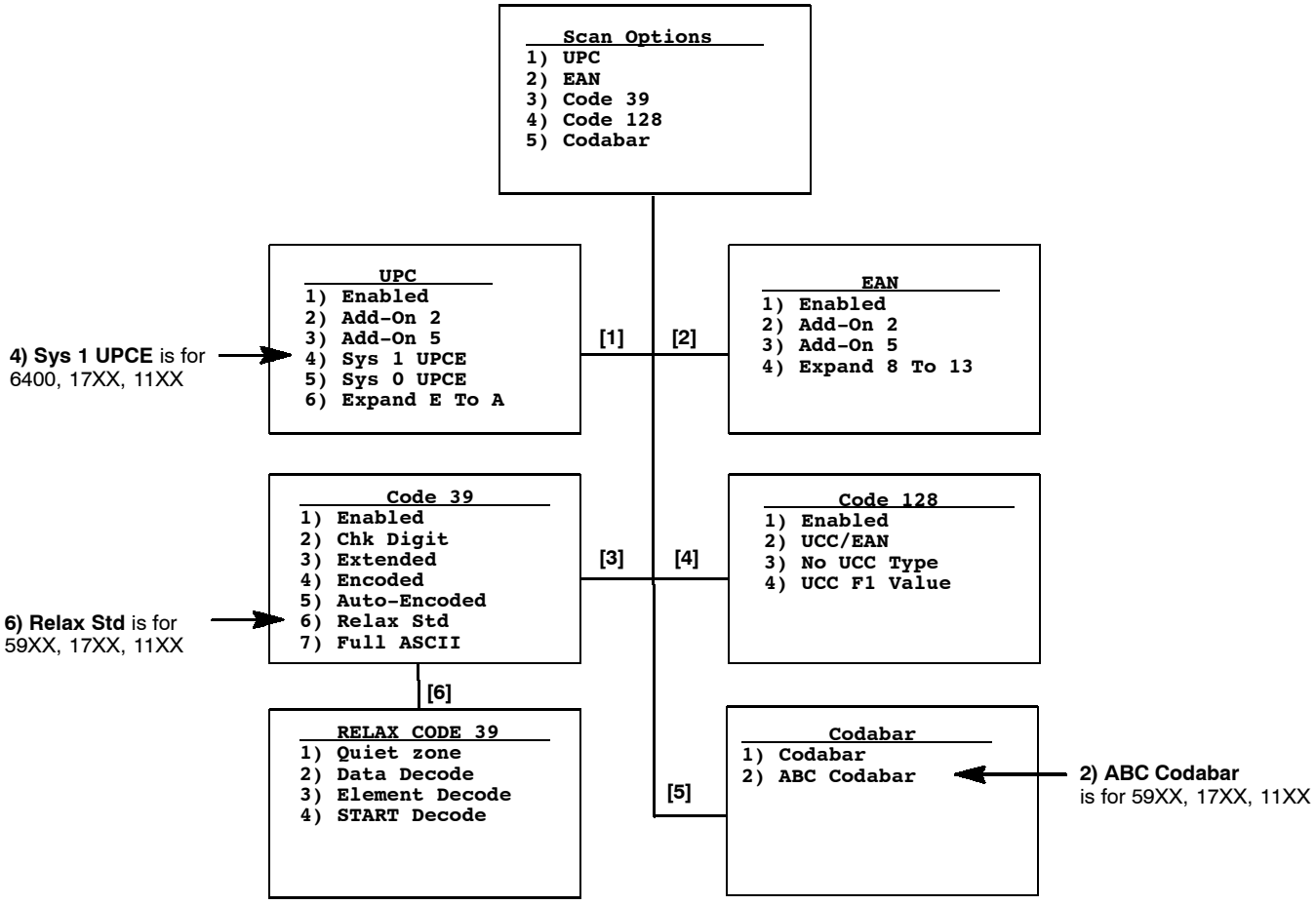


Scan Options to Enable Bar Codes

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.

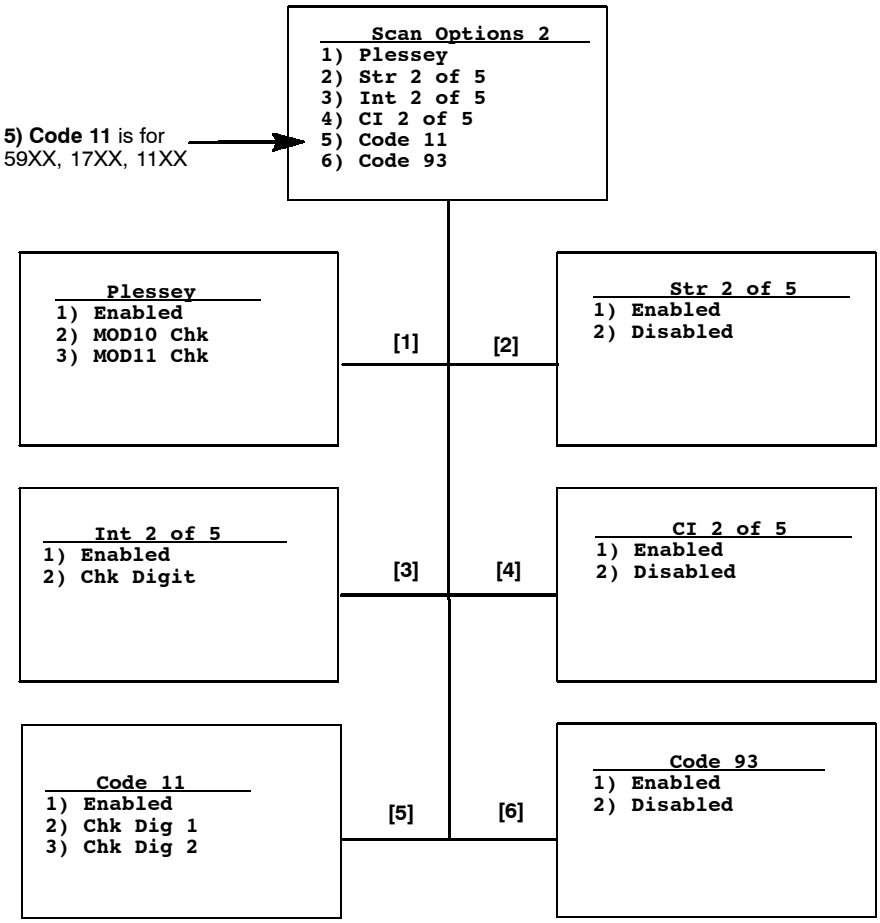


Scan Options of Additional Bar Codes

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.



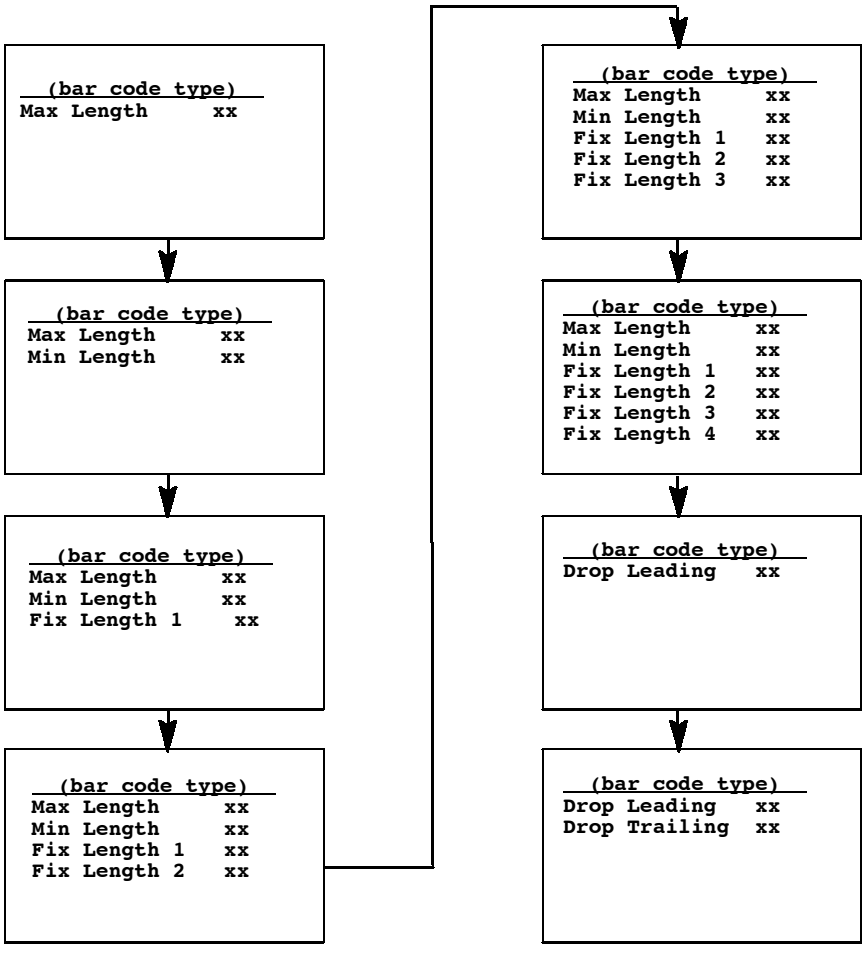
Lengths Options

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).

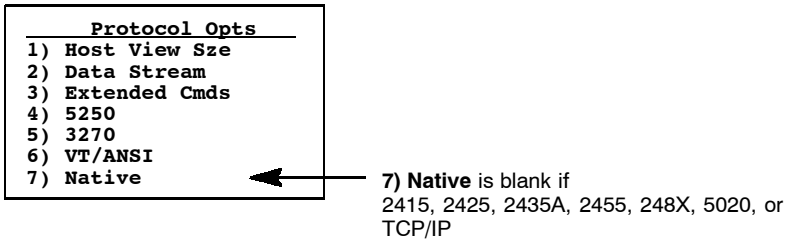
   Enter the fixed length (0–99), then press [Enter]. Up to four prompts to set another fixed length will appear. Enter zero (0) for the unused fixed lengths. *Note that I 2 of 5 only supports fixed lengths 1 and 2. Entries in 3 and 4 are ignored.*
4. Enter the number of characters (0–15) to drop from the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



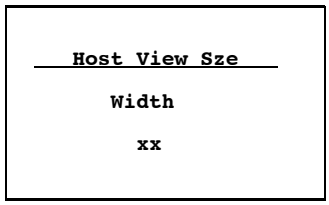
1) Host View Sze

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).

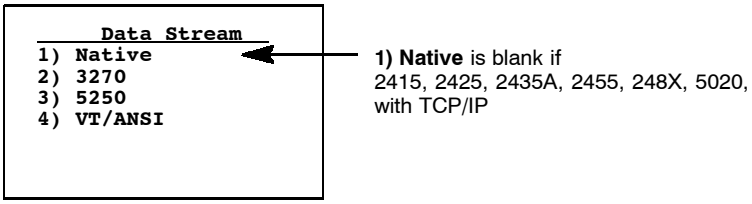
The default for 3270 Terminal Emulation depends on what the original setting was before changing to the 3270 Terminal Emulation. Remember that the total characters must equal 1920 (number of rows by the number of columns) unless using 5250 Terminal Emulation with error messages.

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 VT/ANSI TE, refer to the following manuals:

- *TE 2000 3270 Terminal Emulation Programmer's Guide* (P/N 977-055-003)
- *TE 2000 VT/ANSI Terminal Emulation Programmer's Guide* (P/N 977-055-005)

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.

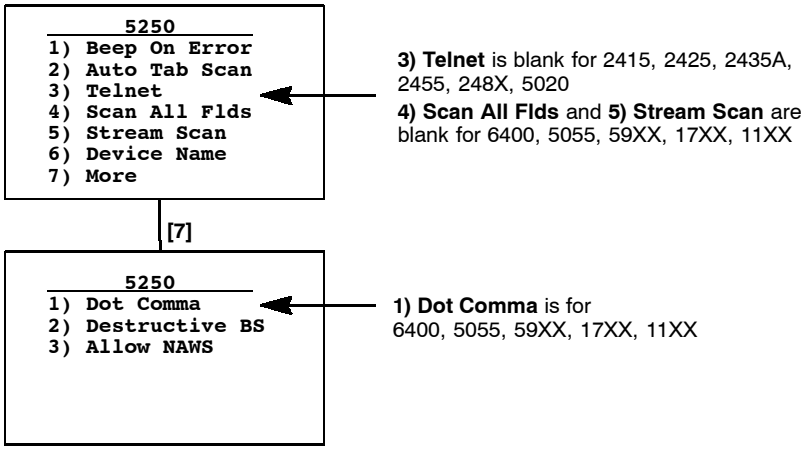
6) Device Name
Enters a physical name for the device. This name is 1–10 characters with allowable values of A–Z, a–z, 0–9, and #, $, –, and @. *Note that the first character of the name cannot start with a number (0–9).* 5250E RFC 1572 Support.

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.

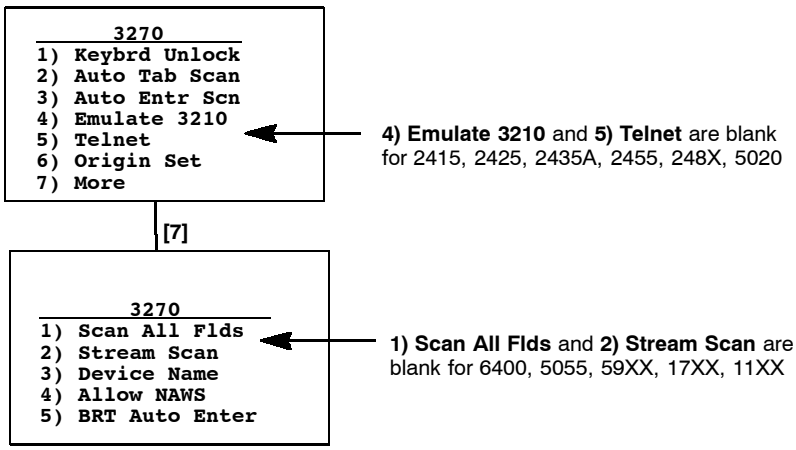
1) Scan All Flds *(blank for 6400, 5055, 59XX, 17XX, 11XX)*
The scanner is enabled when the cursor is in an input field. When this option is disabled, the host computer must enable the scanner each time an input field requires scanned data.

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.

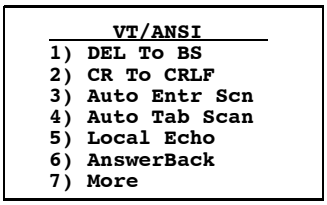
4) Allow NAWS (Negotiate About Window Size)
When enabled, the terminal will support Telnet option 31 if prompted. When disabled, this option will return a "won't do" message.

5) BRT (bright) **Auto Enter**
When enabled, if the last field on a screen has the reverse video attribute set, then when that field is filled, the terminal will automatically send the data for this screen back to the host with an "Enter AID" code. If disabled, the screen will wait for the user to hit the **AID** key prior to sending data back to the host. *Default is disabled.*



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****.*

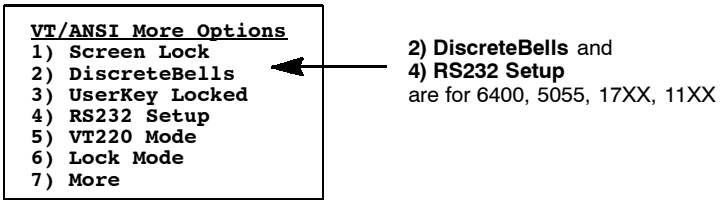
5) Local Echo
Allows characters to be displayed from terminal memory but not from host memory. Default is disabled.

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.



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**.

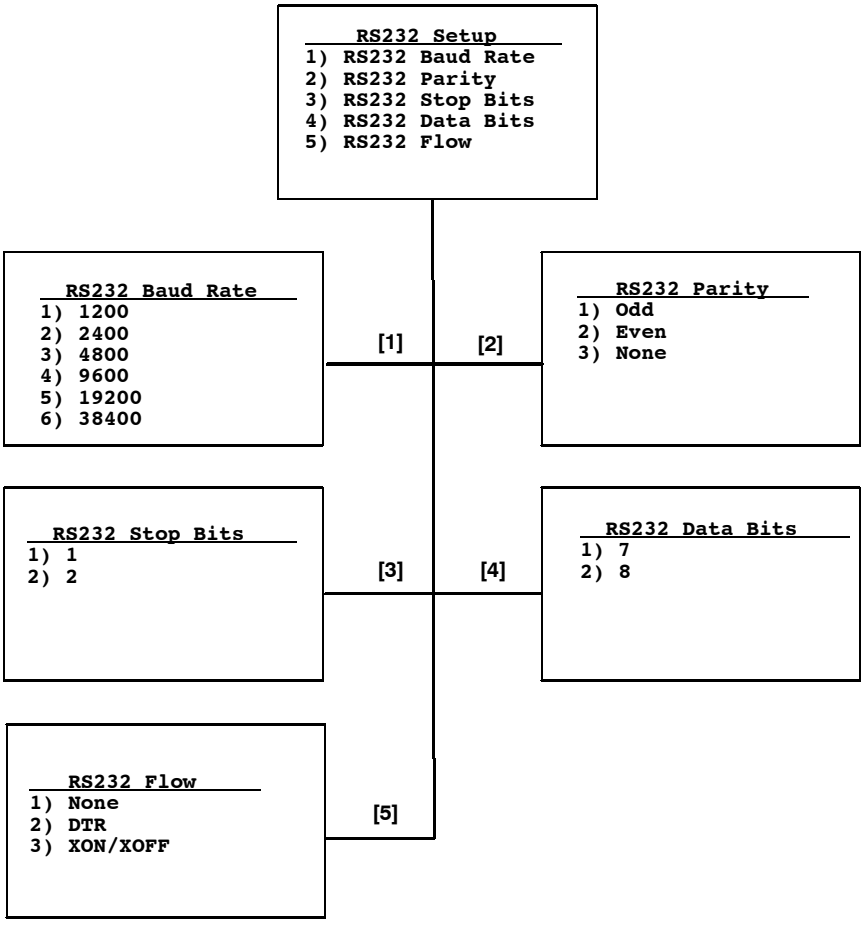
1) RS232 Baud Rate
Select 1200, 2400, 4800, 9600, 19200, or 38400. Default is 9600.

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.

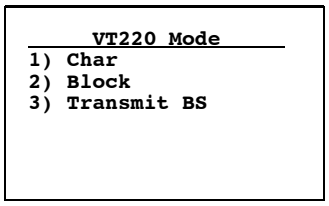


5) VT220 Mode
Selects operating in character or block mode. Select a choice, then press [Enter] to return to the **3) Protocol Opts** menu. Default is **1) Char**.

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

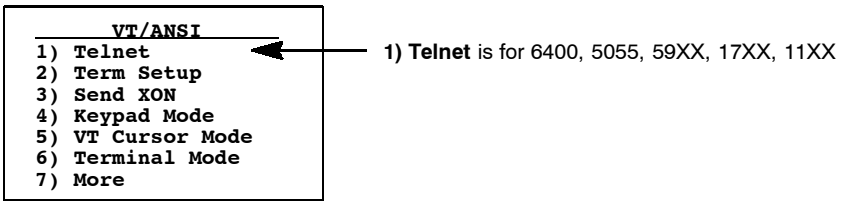
2) Block
Sets the mode to Line Edit (block) mode. The terminal sends a block of characters when a terminating key is pressed.

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.



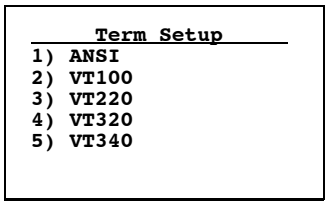
6) Lock Mode
Use the Mode key on the terminal's keyboard or keypad to toggle between Line Edit (block) mode and Character mode. Use the Lock Mode option to disable the Mode key in the VT/ANSI data stream. By default, Lock mode is disabled.

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.

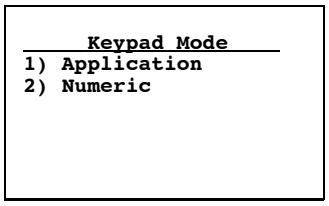


3) Send XON
Default is enabled which indicates that when an RIS is received from the host, the XON character is returned after compliance of this command. Default is enabled.

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.

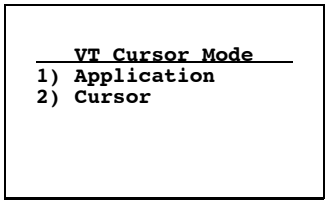
2) Numeric
Generates ANSI cursor control ESC sequences that correspond to what appears on the face of the keys.



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**.

```
Terminal Mode
1) 7-Bit
2) 8-Bit
```

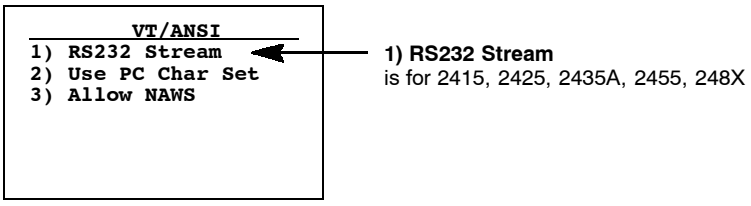
7) More
Below are the RS-232 stream and PC char set options:

▶ **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.

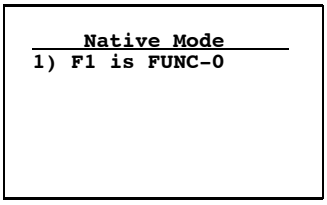
3) Allow NAWS (Negotiate About Window Size)
When enabled, the terminal will support Telnet option 31 if prompted. When disabled, this option will return a "won't do" message.



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

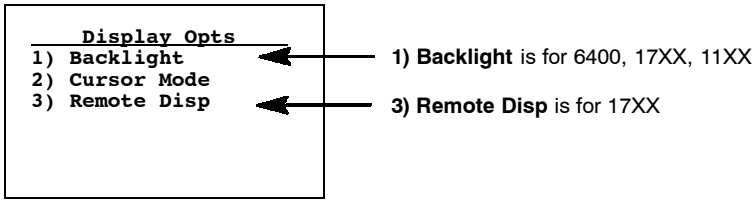
For 6400 (WTP) and 5055 (WTP),
When enabled, pressing **[F1]** is equivalent to pressing [Blue] – [0], while pressing **[F2]** is equivalent to pressing [Blue] – [1], etc. When disabled, **[F1]** is equivalent to [Blue] – [1], **[F2]** is equivalent to [Blue] – [2], etc.

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.

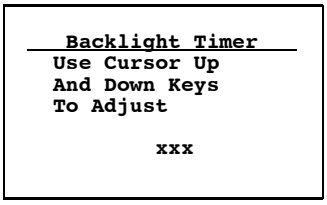


4) Display Opts (6400, 5020, 5055, 59XX, 17XX, 11XX)

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.



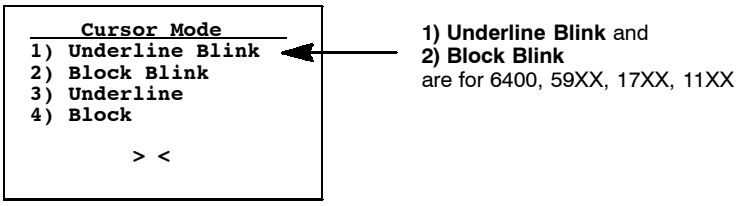
2) Cursor Mode
Selects the cursor style. After making a selection, press [Enter] to return to the **4) Display Opts** menu. The cursor shape is shown between ">" and "<".

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.



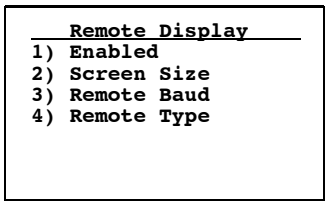
3) Remote Disp *(17XX)*
This menu allows communication to a remote display.

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.

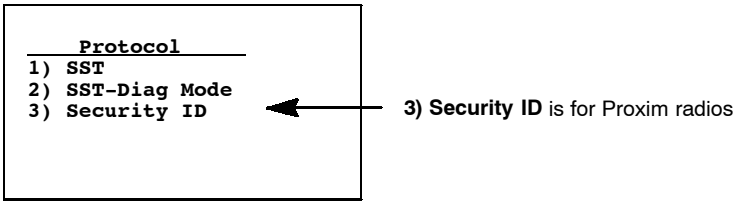


5) Radio Comm

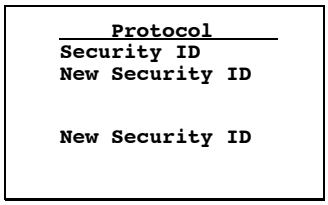
▶ **NOTE:** *Diagnostic modes disable data compression and are reserved for engineering tests.*

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

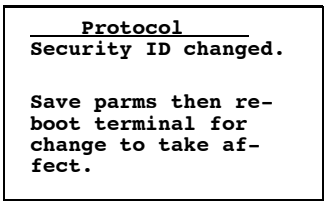
5) Radio Comm enables or disables SST diagnostic mode.



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.



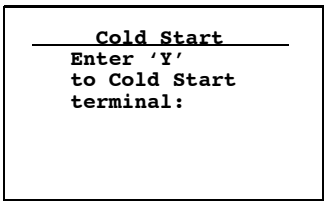
If the new security ID is entered correctly, the following will appear.



6) Cold Start

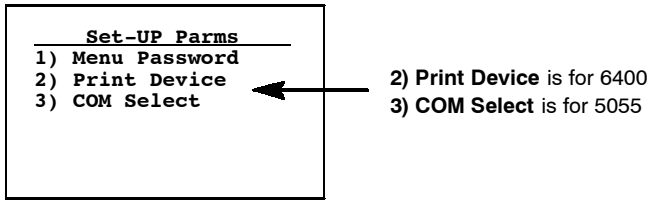
6) Cold Start resets all TE values to the stored configuration in CONFIG.DAT and performs a cold-start on the hand-held terminal. Press **[Y]** to reboot the terminal, or press any other key to return to the **1) Set-up Parms** menu.

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.



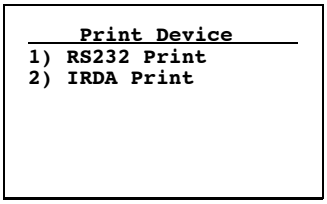
1) Menu Password

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.*

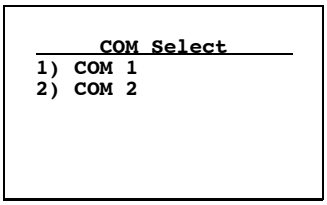
2) Print Device *(6400)*

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)*

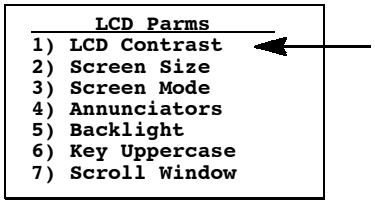
Selects which communications port to use for extended commands, RS-232 communications, or media copy commands.



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.

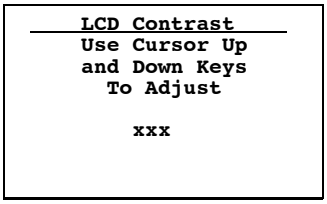


1) LCD Contrast is for 59XX, 17XX
2) Screen Size is for 2435A, 6400, 5020, 5055, 59XX, 17XX, 11XX

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.

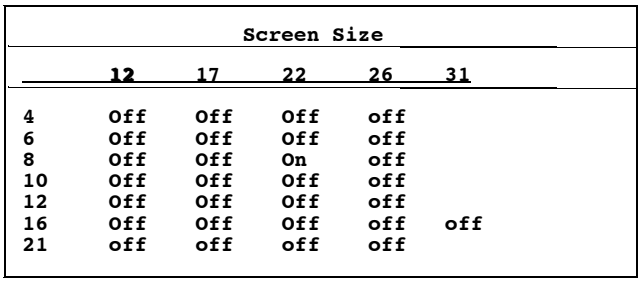
- 8 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 10 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 12 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 14 rows, with 10, 13, 16, 20, 23, 26, or 32 characters per row
- 16 rows, with 10, 13, 16, 20, 23, 26, or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

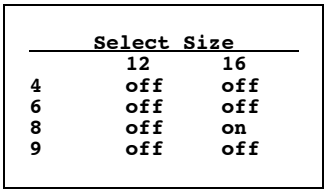


Screen Size					
	12	17	22	26	31
4	Off	Off	Off	off	
6	Off	Off	Off	off	
8	Off	Off	On	off	
10	Off	Off	Off	off	
12	Off	Off	Off	off	
16	Off	Off	Off	off	off
21	off	off	off	off	

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)*

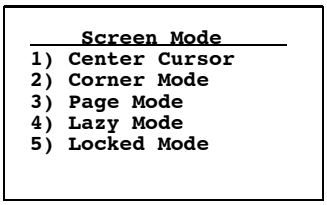


Select Size		
	12	16
4	off	off
6	off	off
8	off	on
9	off	off

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.

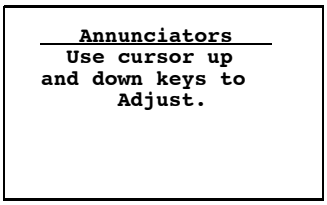
4) Lazy Mode
Starts the cursor in the upper left corner of the terminal display. The cursor moves across the display in the scrolled direction. When the cursor goes beyond the edge of the display, the data begins to move in the opposite direction that the cursor is moving in and the cursor remains at 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.*

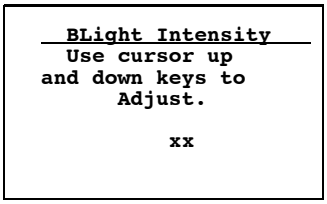
4) Annunciators (Blank for 17XX, 11XX)

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.

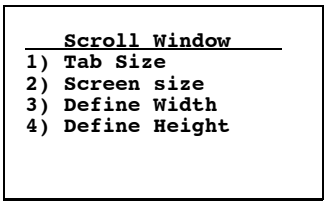
7) Scroll Window

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**.

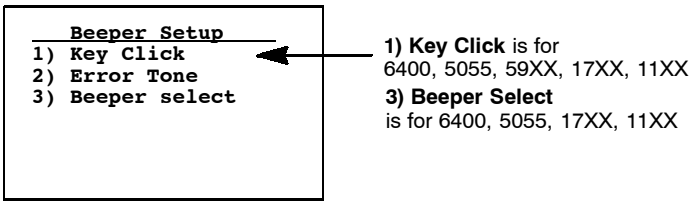
2) Screen Size
Causes the cursor to move by the virtual screen size selected in **2) LCD Parms** under the **Main Menu**.

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)

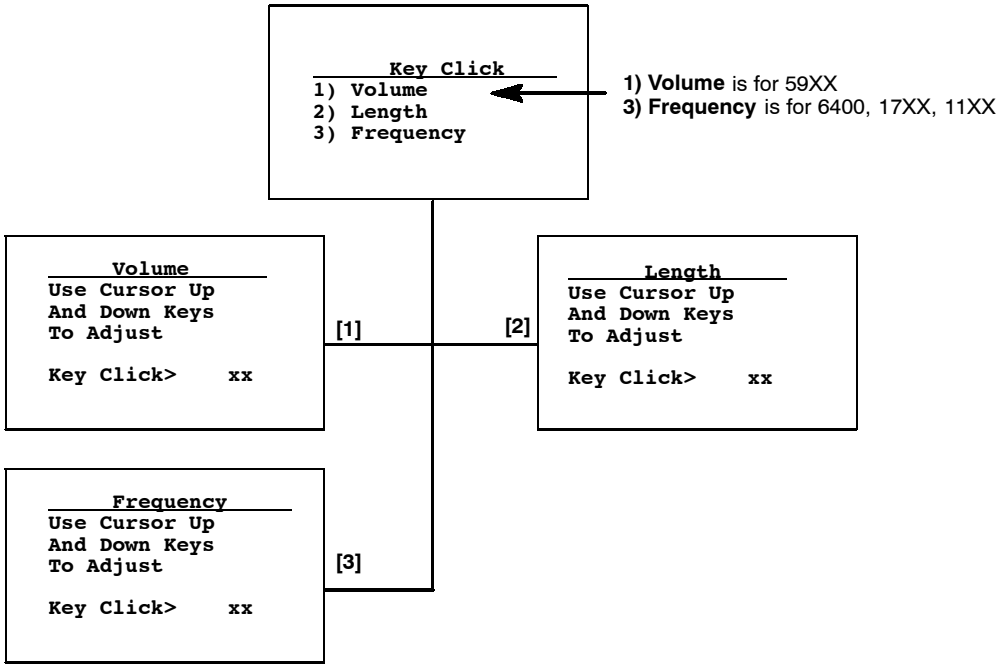
Use **1) Key Click** to adjust the frequency and length (duration) of the sound made when you press a key.

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.

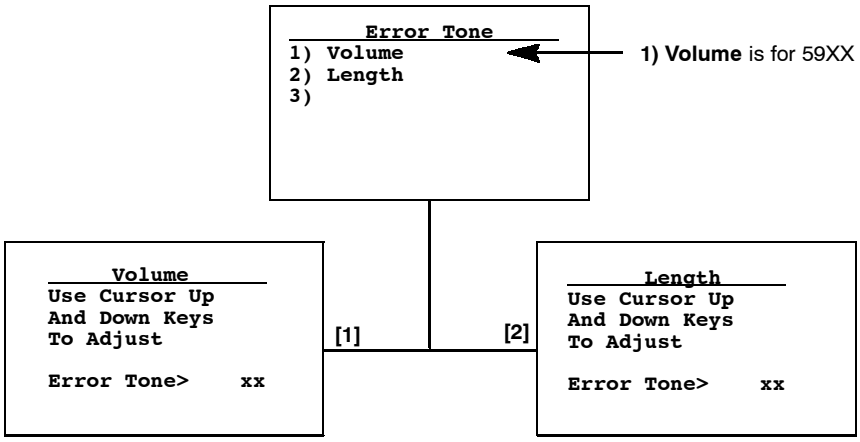
2) Length
Press **[2]** , then the up and down arrow keys to adjust the length in steps from 0 to 10.

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)

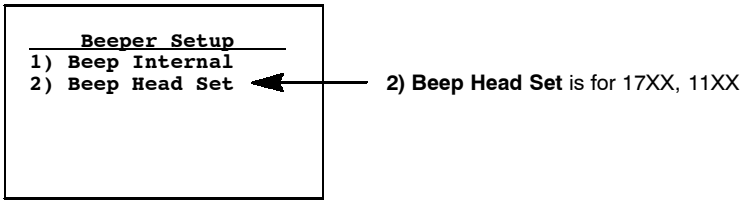


3) Beeper Select *(6400, 5055, 17XX, 11XX)*

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**.

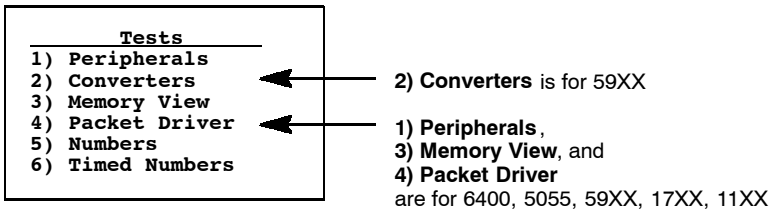
1) Beep Internal
Press **[1]** to direct the audio to the internal beeper. Default is enabled.

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



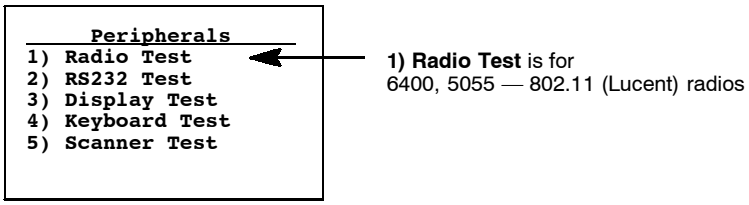
4) Tests

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
```

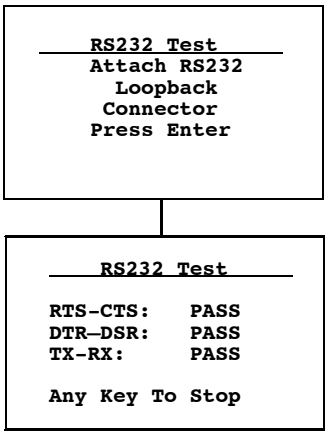
Primary version of Lucent driver
Secondary version of driver
RF link quality
Signal-to-Noise ratio
Network name in use
MAC address of access point
Data rate

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

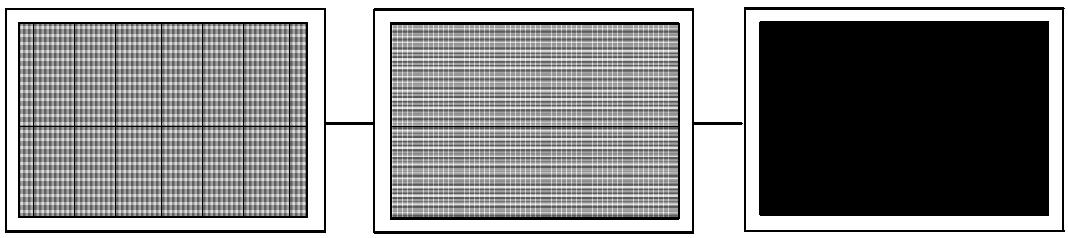
To run the test, select **2) RS232 Test**, attach the loop-back connector to the port connector on the terminal, then press [Enter]. The display changes to the second **RS232 Test** menu shown below. The condition of each line-pair displays as passing or failing the test. If any test fails, return the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



3) Display Test

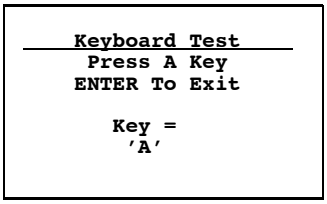
3) Display Test tests the operation of and activates each element in the terminal LCD panel. If a line appears broken, or there are gaps in the display, replace the LCD panel.

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.



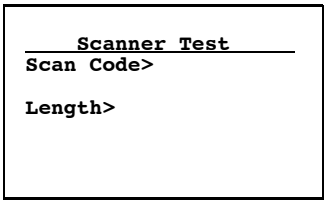
4) Keyboard Test

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.



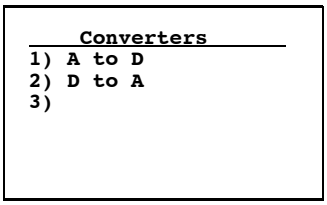
5) Scanner Test

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.



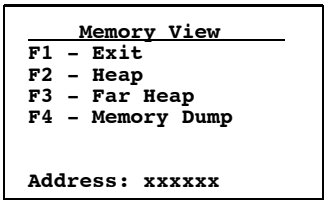
2) Converters (59XX)

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.



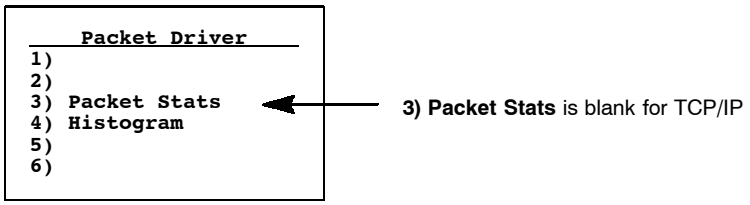
3) Memory View (6400, 5055, 17XX, 11XX)

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.

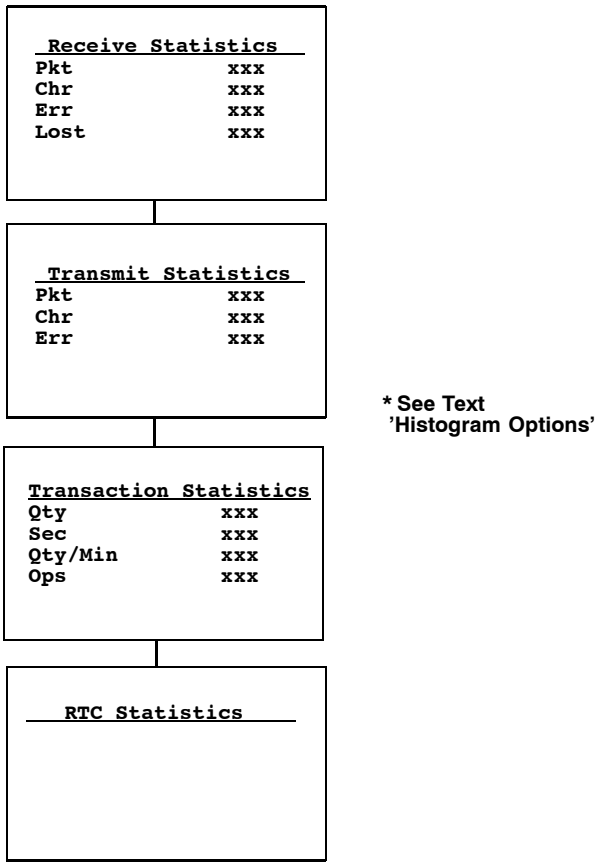


4) Packet Driver (6400, 5055, 59XX, 17XX, 11XX)

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.

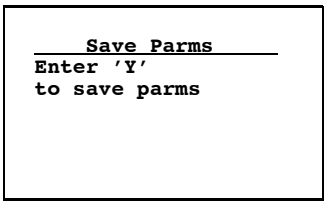
MLID Name and **MLID ver** are for 6400, 5055

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

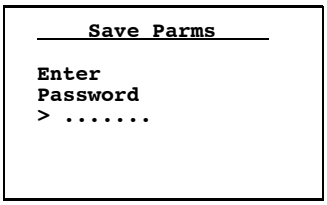
6) Exit Menus

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

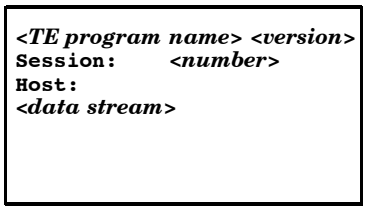
Use **6) Exit Menus** to exit the TE configuration menus. If you changed any parameter settings, the terminal displays the following when you exit the menus.



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

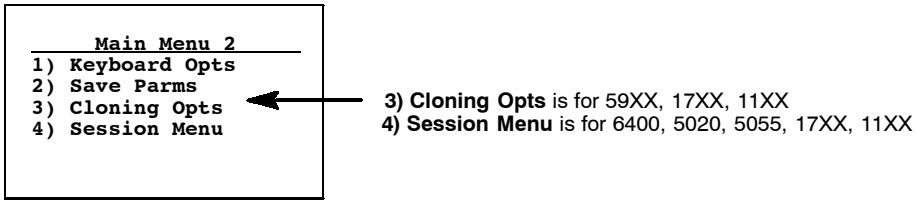


After you enter the correct password, your settings are saved to Flash, and the terminal may reboot. (Some changes automatically reboot the terminal.) If you press a key other than **[Y]**, you exit the menus and the new settings are *not* saved. In this case, the new settings are lost when you reboot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



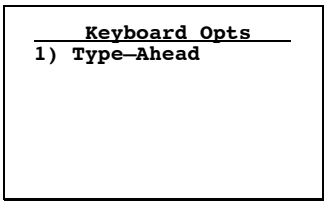
7) More (Main Menu 2)

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



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**

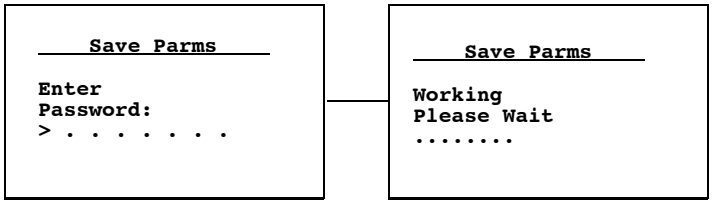
2) Save Parms (Parameters)

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.



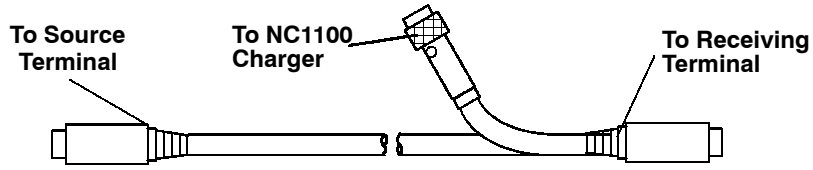
3) Cloning Opts (59XX, 17XX, 11XX)

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

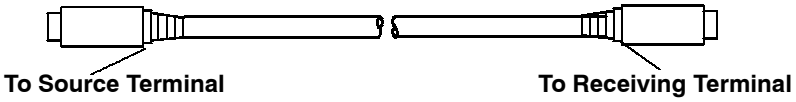
These options transfer the application program or parameter settings from one terminal to another. All three choices are password-protected, with **CR52401** as the default password. To perform this function you need a cloning cable and both terminals set for cloning.

```
     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.

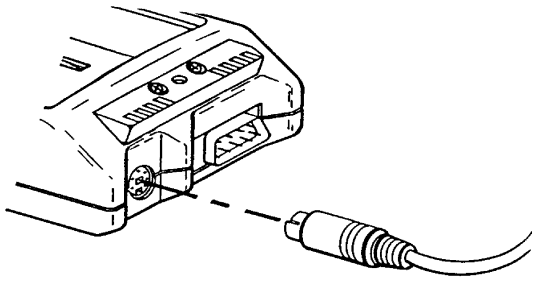


Figure 4-2
Cloning Cable Connection with NC1100 Power Supply

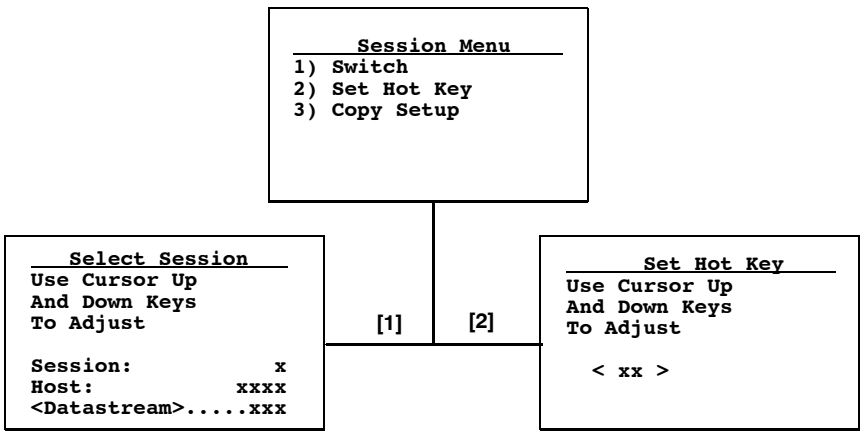
4) Session Menu (6400, 5055, 5020, 59XX, 17XX, 11XX)

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.

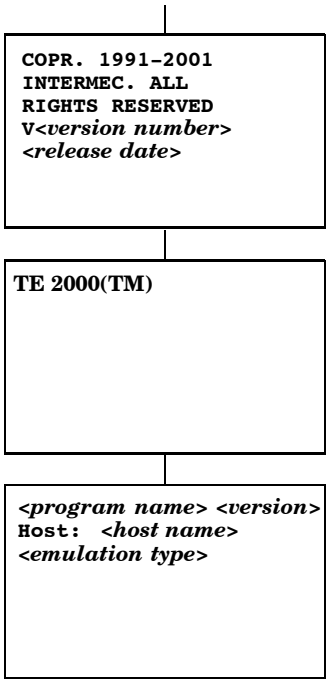
You can restart your TE application by either scanning the following **Reset Firmware** bar code or by using the **6) Cold Start** option in the TE configuration **Main Menu**. Both methods reset all terminal firmware and the application and run the application in a new session.

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 5250 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 5-9*
- Create a custom parameter set-up file to preset any of the configuration parameters you can set from the TE configuration menus. *Page 5-9*
- Change the text of TE configuration menus or system messages. *Page 5-32*
- Preinitialize the 5250 TE program. *Page 5-33*
- Remap characters. *Page 5-38*
- Customize EBCDIC to ASCII translation. *Page 5-39*
- Substitute national characters. *Page 5-42*

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 5-7. The following describes the commands.

▶ **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 embedded IBM mnemonics in 5250 TE.

Pause "xxxxx"
Delays the terminal for x milliseconds.

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. 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.

- The searches are case sensitive.
- The maximum search string length is 20 characters.
- Each **WaitFor** command searches the entire screen from the top.

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 5250 TE.

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

Control Character	Definition	Control Character	Definition
<ATTN>	Attention	<HOME>	Home
<CLEAR>	Clear	<INS>	Insert
<CUR_DN>	Cursor Down	<LTAB>	Left Tab
<CUR_LF>	Cursor Left	<NEWLN>	New Line
<CUR_RT>	Cursor Right	<RESET>	Error Reset
<CUR_UP>	Cursor Up	<ROLL_DOWN>	Roll Down
<DEL>	Delete	<ROLL_UP>	Roll Up
<ENTER>	Enter	<RTAB>	Right Tab
<ERS_EOF>	Erase Input	<SPACE>	Space
<F1> - <F24>	Function keys		

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, but name the file you want to use immediately 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 a download utility to copy your completed AUTOLOG.SCR file to the terminal.

To use the serial port to download the 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
   ```

To use RF communications to download the 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 5-46.

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. 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 must 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:

   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 the **[F7]** key, type a new name for the auto-login script file, then press **[Enter]** or choose **OK**.
5. Exit the TRAKKER Antares 2400 Menu System to return to your current TE session. Restart your 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 the Double-Byte Character Set

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 Terminal. 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 5250 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;

Port Number = 1;

Data Stream = 5250;
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 5-46.

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 '='`	The input config file line does not contain the required "=" (equal sign).	F008
`Missing ';'`	The input config file line 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 5-32.

The Trakker Antares terminals (2415, 2425, 2435A, 2455, 2480, 2481, 2485, and 2486) do not support dual sessions.

▶ **NOTE:** *Only WTP terminals support dual sessions ("Session 2"). For a list of terminals with WTP, see "Program Names" in Section 1.*

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
- **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] *900 MHz*
    Numeric, minimum = 0, maximum = 15 [0] *2.4 GHz OpenAir*

▶ **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
  900 MHz radio:
  DS 225K
  DS 090K
  DS 450K
  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 of IP options, and to the 2415, 242X, 2435A, 245X, 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 the* ***Code 39.Encoded****,* ***Scan All Flds****, and* ***Stream Scan*** *parameters.*

- **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

▶ **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 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]
- **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

5250 Protocol Options

- **Auto Tab Scan**
  [Session 1].Auto Tab Scan
  Session 2.Auto Tab Scan
  Enabled
  [Disabled]
- **Beep On Error**
  [Session 1].Beep On Error
  Session 2.Beep On Error
  Enabled
  [Disabled]
- **Device Name**
  [Session 1].Device Name
  Session 2.Device Name
  String, minimum length = 0, maximum length = 10 [null string]
  Default is NULL for 6400, 5020, 5055, 17XX, 11XX, 59XX Terminals.
- **Destructive BS**
  [Session 1].DestructiveBS
  Session 2.DestructiveBS
  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]
- **Period-Comma**
  [Session 1].Period-Comma
  Session 2.Period-Comma
  Enabled
  [Disabled]
- **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]
- **Bright (BRT) Auto Enter**
  [Session 1].BRT Auto Enter
  Session 2.BRT Auto Enter
  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** *(17XX, 11XX, 59XX)*
  [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, and 248X Terminals. Set the Security ID for the 2415, 2425, 2435A, 2455, or 248X 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, 5020, 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**
  Enable *and* ***set*** *the password to access the* ***Main Menu*** *before changing 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**
  Enable *and* ***set*** *the password to access 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*
  [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 and 17XX only)*
  [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
  Scroll Setting
  Screen Size
  [Tab Size]

Beeper Setup Options

▶ **NOTE:** *Beeper setup options do not apply to the 2415, 242X, 2435A, 245X, and 248X)*

- **Beep Head Set** *(17XX only)*
  [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 only)*
  [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, 5020 5055*
- **Key Click Volume** *(59XX only)*
  [Session 1].KeyClick Volume
  Session 2.KeyClick Volume
  Numeric, minimum = 0, maximum = 255
  [95]

More (Main Menu 2) Options

- **Foreground Session**
  Foreground Sess
  [Session 1]
  Session 2 *(6400, 5020, 5055, 59XX, 17XX, and 11XX only)*
- **Set Hot Key** *(6400, 5020, 5055, 59XX, 17XX, and 11XX only)*
  [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, and 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, and 17XX)*
  [Session 1].Alt Screen Rows
  Session 2.Alt Screen Rows
  Numeric, minimum = 1, maximum = 255
  [8] *17XX*
  [12] *5055*
  [16] *6400 wide display*
- **Contrast Mode**
  [Session 1].Contrast Mode
  Session 2.Contrast Mode
  Compensated
  Absolute
- **Double Byte Character Set (DBCS) Code** *(59XX only)*
  [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 [?.??]
- **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 5-46.

```
makelit cfglit.txt cfglit.dat
```

Preinitializing the 5250 TE Program

You can preinitialize the 5250 TE program. You must name the 5250 initialization file as 5250.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 5-46.

Data is encoded in binary format. To create 5250.INI, you may need a HEX editor or other special program.

INTERMEC 5250 initialization files are composed of the following:

- A prefix of 0 to 255 bytes
- The body of the message, which may be empty or may contain either LU-LU or SS-LU data

Prefix bytes are described as follows:

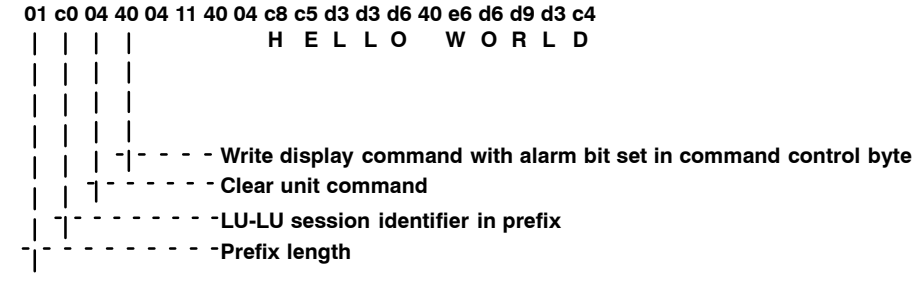
- The first byte of any INTERMEC 5250 data stream prefix contains the length of the prefix. This length may be 0 to indicate that there is no prefix information in the message.
- The second byte of the prefix is a value indicating the session to which the body of the message belongs. It can be either 0xC0 for the LU-LU session (normal 5250 commands), or 0x40 for the SS-LU session (SS messages).

If no prefix is processed, the default session is LU-LU. Once a prefix has been received with a valid session identifier, that session becomes the default until another is received. After the session identifier, the prefix may contain a 5250 signal. The following signals are supported:

0xC9 0x00 0x00 0x00 0x01	Turns on the message waiting indicator
0xC9 0x00 0x00 0x00 0x05	Turns off the message waiting indicator

The body of the message can contain either an SS message, if the current session is SS-LU, or normal 5250 data stream commands if the current session is LU-LU. All data within the message body is encoded as EBCDIC. An SS message contains displayable data that is displayed on the 5250 error row in SS message state.

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 5250 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. You can also remap [CTRL] [B] because it does not perform any function on the terminal.

▶ **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 5-35. 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
[CTRL] [B]	None	0002

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: 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>"
```

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=<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=<1030>="string"   /* Home 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=<103c>="string"/* Backspace key */

remap=<1042>="string"   /* Back Tab key */
remap=<1043>="string"   /* Clear key */
remap=<1044>="string"   /* Del key */
remap=<1045>="string"   /* Enter key */
remap=<1048>= "string"  /* Help key */
remap=<1049>="string"   /* Insert key */
remap=<104c>="string"   /* Window/viewport left key */
remap=<104e>="string"   /* New Line key */

remap=<1050>="string"   /* Print key */
remap=<1052>="string"   /* Reset key */
remap=<1054>="string"   /* Tab 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=<1075>="string"   /* Roll Up key */
remap=<1076>="string"   /* Roll Down key */

remap=<2041>="string"   /* Auto-Login Restart key */
remap=<206c>="string"   /* Menu key */

remap=<3020>="string"   /* Field minus key */
remap=<302b>= "string"  /* Field plus key */

remap=<3045>="string"   /* Field Exit key */
remap=<3046>="string"   /* Erase Input key */
remap=<3048>="string"   /* System request key */
remap=<304c>="string"   /* Page left key */

remap=<3051>="string"   /*Attention key */
remap=<3055>="string"   /* Page up key */
remap=<3056>="string"   /* Page down key */
remap=<3057>="string"   /* Field mark key */
remap=<3058>="string"   /* HEX key */
remap=<305a>="string"   /* Page right key */

remap=<4044>="string"   /*Duplicate 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 5250 TE must be 5250.XLT. For instructions on how to download the file to the terminal, see "*Downloading Files*" on page 5-46.

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 replacement ASCII value.

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 5250 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 5250.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.

Customizing 5250 EBCDIC to ASCII Translation

The 5250 data stream translates all data from the host from 8-bit EBCDIC to 8-bit ASCII for processing in the terminal. Before the data is sent back to the host, it is again translated from ASCII to EBCDIC. The default translation is shown below.

You can customize the operation of the 5250 data stream by changing the default EBCDIC to ASCII translation table. You can replace the default table with one that is combined with the HEX file that you download to the terminal. You can use ASEBTBLD.EXE to create the file. You must name it ASCEBD.TBL.

Type **asebtbld** to display this information:

```
ASEBTBLD ASCII-EBCDIC Translation Table Creation.
$Revision:  1.0   $
$Date:  03 Apr 1998 13:46:14  $
Copyright 1995, Norand Corporation.

Usage:  ASEBTBLD [<options>] <commands> <fname>
  <options>:
    -r<file>   Input file containing replacement table type,
               0x00-0xff table index, 0x00-0xff value.
    -v         Verbose – display processing steps.
  <fname>      Output file name, extension ignored.
```

ASEBTBLD creates <*fname*>.TBL from the default ASCII and EBCDIC tables using the replacement values specified in -r<*file*>. Typing the following creates the file ASCEBD.TBL, with the replacement values specified in CHANGES.MY.

asebtbld -rchanges.my ascebd

The replacement file is an ASCII text file formatted as follows:

```
-----------------top of replacement file--------------------
/* Any line beginning with '/*' in column 1 is a comment.

/*A=ASCII=>
/*     EBCDIC
/* E=EBCDIC=>   0-based       hex
/*   ASCII      index value   Anything after value is a comment
/*-------       -------       ---------
    A    0x30   0xf0   ASCII   '0' returns EBCDIC '0'
    E    0xf0   0x30   EBCDIC  '0' returns ASCII '0'
    E    0xc9   0x3f   Unknown   EBCDIC 0xc9 returns ASCII '?'
/* Any number of blanks, tabs allowed before, between and
/* after values.

/* blank lines allowed
-----------------bottom of replacement file------------------
```

ASEBTBLD creates the following default tables if no replacement file, or an empty replacement file, is specified.

ASCII to EBCDIC

0x00

0x00	0x01	0x02	0x03	0x37	0x2d	0x2e	0x2f
0x16	0x05	0x25	0x0b	0x0c	0x0d	0x4f	0x0f
0x10	0x11	0x12	0x13	0x3c	0x00	0x32	0x1c
0x18	0x19	0x3f	0x27	0x22	0x00	0x35	0x00

0x20

0x40	0x5a	0x7f	0x7b	0x5b	0x6c	0x50	0x7d
0x4d	0x5d	0x5c	0x4e	0x6b	0x60	0x4b	0x61
0xf0	0xf1	0xf2	0xf3	0xf4	0xf5	0xf6	0xf7
0xf8	0xf9	0x7a	0x5e	0x4c	0x7e	0x6e	0x6f

0x40

0x7c	0xc1	0xc2	0xc3	0xc4	0xc5	0xc6	0xc7
0xc8	0xc9	0xd1	0xd2	0xd3	0xd4	0xd5	0xd6
0xd7	0xd8	0xd9	0xe2	0xe3	0xe4	0xe5	0xe6
0xe7	0xe8	0xe9	0x5b	0xe0	0x5d	0x6a	0x6d

0x60

0x79	0x81	0x82	0x83	0x84	0x85	0x86	0x87
0x88	0x89	0x91	0x92	0x93	0x94	0x95	0x96
0x97	0x98	0x99	0xa2	0xa3	0xa4	0xa5	0xa6
0xa7	0xa8	0xa9	0xc0	0x6a	0xd0	0xa1	0x07

0x80

0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x4a	0x00	0x00	0x00	0x00

0xa0

0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x5f	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0xad	0x9d	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0xbc

0xc0

0xab	0x8c	0x8b	0x8d	0xbf	0x8e	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0xbb	0xac	0x00	0x00	0x00	0x00	0x00

0xe0

0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

EBCDIC to ASCII

0x00

0x00	0x01	0x02	0x03	0x00	0x09	0x00	0x7F
0x00	0x00	0x00	0x0B	0x0C	0x0D	0x0E	0x0F
0x10	0x11	0x12	0x13	0x00	0x00	0x08	0x00
0x18	0x19	0x00	0x00	A_DUP	0x00	0x00	0x00

0x20

0x00	0x00	0x1C	0x00	0x00	0x0A	0x17	0x1B
0x00	0x00	0x00	0x00	0x00	0x05	0x06	0x07
0x00	0x00	0x16	0x00	0x00	0x1E	0x00	0x04
0x00	0x00	0x00	0x00	0x14	0x16	0x00	0x1A

0x40

0x20	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x9b	0x2E	0x3C	0x28	0x2B	0x0e
0x26	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x21	0x24	0x2A	0x29	0x3B	0xaa

0x60

0x2D	0x2F	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x7C	0x2C	0x25	0x5F	0x3E	0x3F
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x60	0x3A	0x23	0x40	0x27	0x3D	0x22

0x80

0x00	0x61	0x62	0x63	0x64	0x65	0x66	0x67
0x68	0x69	0x00	0xc2	0xc1	0xc3	0xc5	0x00
0x00	0x6A	0x6B	0x6C	0x6D	0x6E	0x6F	0x70
0x71	0x72	0x00	0x00	0x00	0xb4	0x00	0x00

0xa0

0x00	0x7E	0x73	0x74	0x75	0x76	0x77	0x78
0x79	0x7A	0x00	0xc0	0xda	0xb3	0x00	0x00
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00
0x00	0x00	0x00	0xd9	0xbf	0x00	0x00	0xc4

0xc0

0x7B	0x41	0x42	0x43	0x44	0x45	0x46	0x47
0x48	0x49	0x00	0x00	0x00	0x00	0x00	0x00
0x7D	0x4A	0x4B	0x4C	0x4D	0x4E	0x4F	0x50
0x51	0x52	0x00	0x00	0x00	0x00	0x00	0x00

0xe0

0x5c	0x00	0x53	0x54	0x55	0x56	0x57	0x58
0x59	0x5A	0x00	0x00	0x00	0x00	0x00	0x00
0x30	0x31	0x32	0x33	0x34	0x35	0x36	0x37
0x38	0x39	0x00	0x00	x00	0x00	0x00	0x00

Substituting National Characters

This topic tells how to create a file that remaps one character in the terminal's Terminal Font Set for another character in the set. Use this information to provide characters on the terminal in the local language.

Intermec Technologies Corporation provides a table for converting from characters used in English (U.S.) to German, Danish, Finnish, Italian, Spanish, French, Belgian, and English (UK). The procedure for converting the characters appears first. Then two slightly longer procedures show how to remap any character to another. One procedure describes the steps with the symbol's EBCDIC value. The other one describes the steps without a value. Finally, examples show the remap files for German characters and a few English symbols.

For all procedures, the terminal's Terminal Font Set table is needed. The table lists characters and their decimal and hexadecimal values. For the font set table for the 2415, 2425, 2435A, 2455, and 248X, refer to the terminal's user manual. For the font set table for the 5020, 5055, 6400, 59XX, 17XX, or 11XX, see *Appendix D*.

Creating the File

Follow these steps to create a table that substitutes characters in the local language for characters normally used in U.S. English. These steps apply *if the EBCDIC value is* 4A, 4F, 5A, 5B, 5F, 6A, 79, 7B, 7C, 7F, A1, C0, D0, *or* E0.

1. Find the character to replace in Table 5-2 on page 5-43 and determine its EBCDIC value.
2. Find the default translation value in Table 5-3 on page 5-43 (2415, 2425, 2435A, 2455, or 248X Terminal) or Table 5-4 on page 5-44 (6400, 5020, 5055, 59XX, 17XX, 11XX, or Terminal).
3. Using the default value from step 2, search the terminal's Terminal Font Set for the character. If the default character is correct, you are done.

   If the default character is incorrect, go to step 4.
4. Search the terminal's Terminal Font Set for the character you want.
5. Create file 5250.XLT. Put the default value of the font character (found in step 2) as the first byte in the file. Put the replacement value (found in step 4) as the second byte in the file.
6. Repeat steps 1 through 5 until all replacement characters are completed.
7. Download 5250.XLT to your terminal and restart the terminal emulation program for the changes to take effect. For downloading information, see "*Downloading Files*" on page 5-46.

Table 5-2
EBCDIC Values

Character Set EBCDIC	4A	4F	5A	5B	5F	6A	79	7B	7C	7F	A1	C0	D0	E0
English (US)	¢	|	!	$	¬	¦	‘	#	@	"	~	{	}	\
Austrian/German	Ä	!	Ü	$	^	ö	‘	#	§	"	β	ä	ü	Ö
Austrian/German (alternate)	ö	|	ü	Ü	¬	β		Ä	Ö	ä				
Danish/Norwegian	#	!	¤	Å	^	ø	‘	Æ	Ø	"	ü	æ	å	\
Danish/Norwegian (alternate)	ø	|	å	Å	¬	¦		Æ	Ø	æ				
Finnish/Swedish	§	!	¤	Å	^	ö	é	Ä	Ö	"	ü	ä	å	É
Finnish/Swedish (alternate)	ö	|	å	Å	¬	¦		Ä	Ö	ä				
French	°	!	§	$	^	ù	‘	£	à	"	··	é	è	ç
Italian	°	!	é	$	^	ò	ù	£	§	"	ì	à	è	ç
Portuguese	[	!	]	$	^	õ	‘	Ã	Õ	"	ç	ã	’	Ç
Spanish	[	|	]	Pts	¬	ñ	‘	Ñ	@	"	··	{	}	\
Spanish (alternate)	¢	|	!	Pts	¬	¦		Ñ	@	ñ				
English (UK)	$	|	!	£	—	¦	‘	#	@	"	–	{	}	\
Belgian	[	!	]	$	^	ù	‘	#	à	"	··	é	è	ç
Brazilian/ Portuguese	É	!	$	Ç	^	ç	ã	Õ	Ã	"	~	õ	é	\
Japanese (English)	£	|	!	¥	¬	¦	‘	#	@	"	–	{	}	$
Spanish Speaking	[	|	]	$	¬	ñ	‘	Ñ	@	"	··	{	}	\
Canadian (French)	à	!	’	$	^	ù	‘	#	@	"	··	é	è	ـ
International	[	!	]	$	^	¦	‘	#	@	"	~	{	}	\

Table 5-3
ASCII Equivalents for EBCDIC Values *(2415, 2425, 2435A, 2455, 248X Terminals)*

	ASCII													
	4A	4F	5A	5B	5F	6A	79	7B	7C	7F	A1	C0	D0	E0
English (US)	BD	7C	21	24	AA	DD	60	23	40	22	7E	7B	7D	5C
German	8E	21	9A	24	5E	94	60	23	F5	22	E1	84	81	99
Danish/Norwegian	23	21	0F	8F	5E	9B	60	92	90	22	81	91	86	5C
Finnish/Swedish	F5	21	0F	8F	5E	94	82	8E	99	22	81	84	86	90
Italian	F8	21	82	24	5E	95	97	9C	F5	22	8D	85	8A	87
Spanish	5B	7C	5D	—	AA	A4	60	A5	40	22	F9	7B	7D	5C
French	F8	21	F5	24	5E	97	60	9C	85	22	F9	82	8A	87
Belgian	5B	21	5D	24	5E	97	60	23	85	22	F9	82	8A	87
English (UK)	24	7C	21	9C	AA	DD	60	23	40	22	16	7B	7D	5C

Table 5-4
***ASCII Equivalents for EBCDIC Values** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

	ASCII													
	4A	**4F**	**5A**	**5B**	**5F**	**6A**	**79**	**7B**	**7C**	**7F**	**A1**	**C0**	**D0**	**E0**
English (US)	9B	0E	21	24	AA	7C	60	23	40	22	7E	7B	7D	5C
German	8E	21	9A	24	5E	94	60	23	15	22	E1	84	81	99
Danish/Norwegian	23	21	0F	8F	5E	ED	60	92	05	22	81	91	86	5C
Finnish/Swedish	15	21	0F	8F	5E	7C	82	8E	99	22	81	84	86	90
Italian	F8	21	82	24	5E	95	97	9C	15	22	8D	85	8A	87
Spanish	5B	OE	5D	—	AA	A4	60	A5	40	22	06	7B	7D	5C
French	F8	21	15	24	5E	97	60	9C	85	22	06	82	8A	87
Belgian	5B	21	50	24	5E	97	60	23	85	22	06	82	8A	87
English (UK)	24	OE	21	9C	AA	7C	60	23	40	22	5F	7B	7D	5C

For characters other than those in Table 5-3 on page 5-43, refer to the appropriate IBM character set. Languages and set numbers are in Table 5-5.

Table 5-5
IBM Character Sets

Number	Language	IBM Set
1	English (U.S.)	037–850
2	German	273–850
3	Danish/Norwegian	277–850
4	Swedish/Finnish	278–850
5	Italian	280–850
6	Spanish	284–850
7	French	297–850
8	Belgian	500–850

Examples

- The first example on the next page remaps three characters. It applies only to 2415, 2425, 2435A, 2455, or 248X Terminals. It does not apply to 6400, 5020, 5055, 59XX, 17XX, or 11XX Terminals because U.S. English values are correct in these terminals.
- The second example applies to 2415, 2425, 2435A, 2455, or 248X Terminals. This example remaps 14 characters appropriate to U.S. English to 14 characters more appropriate to Austrian/German.
- The third example applies to 6400, 5020, 5055, 59XX, 17XX, or 11XX Terminals. This example also remaps 14 characters appropriate to U.S. English to 14 characters more appropriate to Austrian/German.

EXAMPLE 1: **ASCII hexadecimal file 5250.XLT remaps 3 characters**

0x9B 0xBD
0x0E 0x7C
0x7C 0xDD

EBCDIC Hex Value	Original to be Replaced	Replacement for Display
4A	ø	¢
4F	≠	|
7C	|	¦

EXAMPLE 2: **ASCII hexadecimal file 5250.XLT remaps for German** (2415, 2425, 2435A, 2455, 284X Terminals)

0x9B 0x8E
0x0E 0x21
0x21 0x9A
0x24 0x24
0xAA 0x5E
0x7C 0x94
0x60 0x60
0x23 0x23
0x40 0xF5
0x22 0x22
0x7E 0xE1
0x7B 0x84
0x7D 0x81
0x5C 0x99

EBCDIC Hex Value	Original to be Replaced	Replacement for Display
4A	¢	Ä
4F	|	!
5A	!	Ü
5B	$	$
5F	¬	^
6A	¦	ö
79	`	`
7B	#	#
7C	@	§
7F	"	"
A1	~	β
C0	{	ä
D0	}	ü
E0	\	Ö

EXAMPLE 3: **ASCII hexadecimal file 5250.XLT remaps for German** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)

```
0x9B 0x8E
0x0E 0x21
0x21 0x9A
0x24 0x24
0xAA 0x5E
0x7C 0x94
0x60 0x60
0x23 0x23
0x40 0x15
0x22 0x22
0x7E 0xE1
0x7B 0x84
0x7D 0x81
0x5C 0x99
```

EBCDIC Hex Value	Original to be Replaced	Replacement for Display
4A	¢	Ä
4F	|	!
5A	!	Ü
5B	$	$
5F	¬	^
6A	¦	ö
79	`	`
7B	#	#
7C	@	§
7F	"	"
A1	~	β
C0	{	ä
D0	}	ü
E0	\	Ö

Downloading Files

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

You can use one of several methods to download a file to a 2415, 2425, 2435A, 2455, or 248X Terminal, including:

- T24FCOPY.EXE through a serial connection from your Trakker Antares Terminal to your personal computer.

▶ **NOTE:** *You must use the latest version of the T24FCOPY FileCopy utility and do a Ymodem transfer of the data. Do not do an Xmodem transfer.*

- The Download Server feature on the DCS 300 to a Trakker Antares terminal loaded with UDP Plus protocol.
- The Receive File reader command.
- 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, then choose Power Management. Each time you press œ to turn on the Trakker Antares terminal, it boots and restarts your application. For more information, refer to the terminal's user manual.
- 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 5055 Data Collection PC, you must configure INTERLNK on a desktop or laptop PC. INTERLNK, a part of MS-DOS, is a device driver that connects your 6400 Computer or 5055 PC and a 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 PC. INTERLNK and INTERSVR are provided with DOS and shipped with your 6400 or 5055 computer toolkit. For complete installation instructions, refer to the README.TXT file provided with 6400 Computers and 5055 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 the instructions below before proceeding.

NOTE: *Keep the 6400 Computer or 5055 PC on charge while performing any setup, 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 for connecting the host PC's COM 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 have been 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

If you are using a 59XX, a 17XX, or an 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 a 59XX, a 17XX, or an 11XX 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 5250 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 -o1700exes.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 5250eml.key 5250eml.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

To download a .HEX file to a 59XX, a 17XX, or an 11XX Terminal, you need the following:

- 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)*
- 59XX, 17XX, or 11XX Terminal

▶ **NOTE:** *You can also download files via the terminal's dock. For instructions, see the dock's user manual.*

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 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

Display Data Stream

This section describes the following:

- The host 5250 display data stream commands the host application can send to terminals.
- The host 5250 data stream orders the host can send to terminals. Orders govern format and data expectations within the Write to Display command.
- Asynchronous 5250 prefixes.
- System messages and parameter errors that can appear in the terminal's display.

This section is not intended as a specific guide for programming, but a comparison with your existing system. The information helps identify differences between your screen-generating utilities and the features the terminals support.

Screen Design Aid

This section, along with your Screen Design Aid (SDA) documentation, can help you resolve occasional questions concerning discrepancies that may arise regarding attribute selection and the capabilities of the terminals. This section includes information you may not need, because you can use your SDA to do much, if not all, of the programming to handle commands and orders for the network. This information is provided to assure you have the most accurate and detailed information available and to describe variations from the 5250 data stream where they occur.

If you are comfortable using the SDA on your host computer, you can flip through this section to find out which commands and orders the terminals support. You can then read Section 7, which describes the extended commands you can use to do operations beyond the capability of the IBM Display Station.

Applications

If you need to write applications specifically for the terminal, it is recommended that you use the corner mode window onto the IBM Display Station and write programs using the portion of the display available without moving the window. This is the most efficient method for developing custom applications for the terminal.

Data Stream Command Structure

The 5250 command structure enables the terminal to display prompts and accept keyboard or scanner input. A second kind of command, called an order, works with the Write-To-Display command to define display characteristics, buffer sizes, and acceptable data types.

Display data stream commands form two categories: the input commands and the output commands. The *IBM 5250 Information Display System Functions Reference Manual* (IBM part number SA21-9247-6 provides more detailed descriptions than those presented in this programmer's guide).

Input Commands and Hex Codes

Below are the input commands and hex codes. Pages reference additional information about each command.

- Read Immediate *(page 6-3)* 72
- Read Modified Immediate Alternate *(page 6-4)* 83
- Read Input Fields *(page 6-4)* 42
- Read MDT Fields *(page 6-6)* 52
- Read MDT Alternate *(page 6-7)* 82
- Read Screen *(page 6-7)* 62
- Save Screen *(page 6-8)* 02
- Write Structured Field Not supported

Output Commands and Hex Codes

Below are the output commands and hex codes. Pages reference additional information about each command.

- Clear Format Table *(page 6-9)* 50
- Clear Unit *(page 6-10)* 40
- Clear Unit Alternate Not supported
- Restore Screen *(page 6-10)* 12
- Roll *(page 6-11)* 23
- Write Error Code *(page 6-12)* 21
- Write to Display (WTD) *(page 6-13)* 11

Input Commands

Input commands consist of immediate and AID-associated Read commands. Immediate commands are executed when the controller receives the command. AID-associated commands are queued until the operator presses an AID-generating key such as Enter/Rec Adv. Other AID-generating keys are listed in the section for each terminal.

Read Immediate

Function

The **Read Immediate** command is similar to the **Read Screen** command, except the data comes from the format table rather than the display. The command sends back the contents of all the input fields on the display.

Restrictions

This command must be the last command in the chain and the controller must have change of direction (CD). The command is rejected if the terminal is in an error, system request, or SS message state.

▶ **NOTE:** *If the display supports a separate message line, and the message line is selected, the command is rejected only for the system request and SS message states. The command is processed with the display in error state.*

Format

The command takes the following form:

ESC	Read Immediate Command
Hex 04	Hex 72

Results

Information associated with this command returns to the user in the LU-LU nonexpedited flow. What the user receives when they issue this command depends on the condition of the master modified data tag (MDT) bit:

- If the MDT bit is not set, the user receives:
  Cursor Address AID Code
- If the master MDT bit is set, the user receives:
  Cursor Address AID Code Field Data

The field data consists of the contents of all input fields as they appear on the display, unless resequencing has been specified. Any attributes contained in a field are treated as data and returned as such. Field boundary attributes are not considered part of the field. All nulls are converted to blanks. If the specified field is a signed numeric field, the last character is not sent.

If that same field is negative, the zone position of the next-to-the-last character is changed to hex D. In each case, the returned cursor address indicates the current location of the cursor and the AID code is hex 00.

▶ **NOTE:** *Queued Read commands and pending AID codes are not cleared. The format table, display annunciators, insert mode keying history, and display contents are not affected.*

Read Modified Immediate Alternate

Function

The **Read Modified Immediate Alternate** command enables the host to read data from modified input fields without depending on the operator to press an AID request key.

Restrictions

None.

Format

The command takes the following form:

ESC	Read Modified Immediate Alternate Command
Hex 04	Hex 83

Results

This command is processed the same as the **Read Immediate** command, except for these differences in the format of data sent to host:

- Controller only returns data from those fields in the format table that have the MDT bit on.
- Data field is delimited by Set Buffer Address (SBA) orders in the same way as the response data field for the **Read MDT Fields** command.
- Leading and imbedded nulls within each field's data are not converted to blanks.
- Trailing nulls within each field's data are suppressed.

Read Input Fields

Function

The **Read Input Fields** command causes the terminal to wait for the operator to press an active AID-generating key, then sends the contents of all fields defined in the format table to the host.

Restrictions

The operator must press an AID-generating key to execute this command. Also, CD in the Request/Response Header (RH) must be on before the AID byte can be serviced. This command is cleared if:

- The host system issues a session control request (such as Unbind).
- The host system issues a **Clear Unit** command and the controller executes it.
- The host system sends another **Read** command to the same LU and overlays this command.
- The **Read** command is executed.

Format

The command takes the following form:

ESC	Read Input Fields Command	CC Byte 1	CC Byte 2
Hex 04	Hex 42	Hex 00	Hex 13

Results

Information associated with this command returns to the user in the LU-LU nonexpedited flow. Note that the host system cannot receive this information until the operator presses an AID-generating key. What the user receives when they issue this command depends on the condition of the master MDT bit:

- If the master MDT bit is not set, the user receives:
  Cursor Address AID Code
  - Cursor Address: Position of the cursor when the AID-generating key was pressed.
  - AID Code: Code for the AID-generating key the operator used.
- The user receives the cursor address and AID code if any of the following keys are pressed:
  Clear
  Help
  Print
  Record Backspace in home position
- If the master MDT bit is on, the user receives:
  Cursor Address AID Code Field Data
  - Cursor Address: Position of the cursor when the AID-generating key was pressed.
  - AID Code: Code for the AID-generating key the operator used.
  - Field Data: Returned only when one of the following AID-generating keys is used:
    Roll Up
    Roll Down
    Enter/Rec Adv
    An unmasked function key

    When it is returned, the field data consists of the contents of all input fields as they appear on the display unless resequencing was specified.

Any attributes in a field are treated as data and returned as such. Field attributes are not considered part of the field. All nulls are converted to blanks. All pending AID request bytes are cleared. If the specified field is signed numeric, the first character is not sent; if that same field is negative, the zone position of the next-to-the-last character is changed to hex D. Though data is not sent, the CC bytes are processed.

To determine the appropriate codes for the control character (CC) bytes, see the "Write To Display" topic (page 6-13).

Format

The format of the returned data is:

Bytes 1 and 2	Byte 3	Byte 4	Byte 5
Cursor address	AID code	Field data	Field data

Byte 6 and all that follow contain the remaining field data from the format table. The terminal returns complete contents of each field, with nulls converted to blanks.

Read MDT Fields

Function

The **Read MDT Fields** command causes the terminal to wait for the operator to press an active AID-generating key, then sends all fields that have their MDT bit set. The bit could have been set by the operator entering data in the field or by the WTD command.

Restrictions

The operator must press an AID-generating key to execute this command. In addition, the CD in the RH for the requested LU must be on before any information can be sent back to the host system in response to the command. The command is cleared if:

- A session control request (such as Unbind) is issued by the host.
- A **Clear Unit** command is issued.
- The host system sends another **Read** command to the same LU and overlays this command.
- The **Read** command is serviced.

Format

The command take the following form:

ESC	Read MDT Command	CC Byte 1	CC Byte 2
Hex 04	Hex 52	00	13

The format of the returned data is:

Byte 1 and 2	*Byte 3*	*Byte 4*	*Byte 5*	*Byte 6*
Cursor address	AID code	{SBA	Field address	Field data}

NOTE: *The {} brackets around the last three fields indicate these fields may be repeated as a unit.*

The cursor address gives the cursor location on the display. The SBA fields are formatted as **Set Buffer Address** orders. The field address comes from the address portion of the order and gives the address of the modified field (excluding the attribute).

Results

The contents of each field that has an MDT bit on are returned to the host system in the order that the fields appear in the format table, if one of the following AID-generating keys is used:

Roll up/Page down
Roll down/Page up
Enter/Rec Adv
Unmasked function keys

If no MDT bits are on, or if the operator does not use one of the acceptable AID-generating keys (Clear, Help, Print, or Record Backspace), only the cursor and AID code are returned to the host system.

The host system can use field control words (FCWs) to rearrange the sequence in which the fields are returned. If data is returned, the following formatting is done. If the field is not a transparent data field, the following occurs:

- Trailing nulls are stripped. If the field consists of all nulls, only the Set Buffer Address, row, and column are returned.
- Leading and embedded nulls are converted to blanks.

If the field is signed numeric, the last character is not sent. If that same field is negative, the zone position of the next-to-the-last character is changed to hex D.

Hex 10 and hex 11 are control data. Avoid writing hex 10 and hex 11 to the display as data unless they are written in transparent data fields.

Read MDT Alternate

Function

Read MDT Alternate is similar to the **Read MDT Fields** command with these exceptions:

- Leading and embedded nulls within the fields remain nulls. Trailing nulls are stripped.
- For fields that are nulls but have their MDT bit on, the controller returns an SBA order followed by the field's address.

Restrictions

None.

Format

None.

Results

None.

Read Screen *(Immediate)*

Function

The **Read Screen** command sends the contents of the display to the host in the same order information appears on the screen. For example, row 1 goes first.

Restrictions

This command must be the last command in the SNA chain, and CD must be on. The terminal rejects the command when it is in the prehelp error, posthelp error, system request, or SS message state. During transmission the keyboard is locked, but pending AID requests or Read commands are retained.

▶ **NOTE:** *If the display supports a separate message line, and the message line is selected, the command is rejected only for the system request and SS message states. The command is processed with the display in error state.*

Format

The command takes the following form:

ESC	Read Screen Command
Hex 04	Hex 62

Results

The contents of the entire display, including the attributes, is sent to the host system just as it appears in the regeneration buffer (no formatting or conversion is done). Cursor address and AID are not returned. This command does not clear either pending Read commands or AID requests. The keyboard is temporarily locked. The following are unaltered:

- Annunciators
- Cursor location
- Modes
- Keying history
- Display contents
- Format table

Save Screen *(Immediate)*

Function

The **Save Screen** command sends the state of the terminal to the host. Information sent to the host includes:

- Format table
- Display buffer
- Keyboard state
- Cursor location
- Code returned in response to the Help key
- Any outstanding AID requests
- Any outstanding Read commands

Restrictions

This command must be the last command in the SNA chain and CD must be on. The command is rejected if the addressed LU is in either the system request or SS message state.

Format

The command takes the following form:

ESC	Save Screen Command
Hex 04	Hex 02

The format of the returned data is:

Byte 1	Byte 2	Byte 3	Byte 4
Escape	Restore Screen	<terminal state>	<terminal state>

Byte 5 and all remaining bytes contain the Save Screen information.

Results

All data required for restoring the display are sent to the host system. It must not be modified by the host system if the result of the **Restore Screen** command is to have integrity.

Output Commands

Some output commands have associated data and control information (write characters and orders). The **Write** commands are executed immediately.

Clear Format Table

Function

The **Clear Format Table** command clears the format table without erasing data in the display buffer.

Restrictions

The terminal rejects the command when in an error, system request, or SS message state.

▶ **NOTE:** *If the display supports a separate message line, and the message line is selected, the command is rejected only for the system request and SS message states. The command is processed with the display in error state.*

Format

The command takes the following form:

ESC	Clear Format Table Command
Hex 04	Hex 50

Results

The following list describes what happens when this command is executed.

- The keyboard is locked.
  The keyboard clicker is turned off.
  The Input Inhibited annunciator is turned on.
  The insert mode is cleared (as is the annunciator).
- The format table is cleared. The format table header formats as follows:

Format ID	Hex 00
First field transmitted to host system	0 *(Resequencing is disabled)*
Error line	Bottom line of display

- The system insert cursor address is set to row 1, column 1. This clears a previous Insert Cursor order.
- Any pending AID request is cleared.
- All keying history is cleared.
- The master MDT bit is cleared.
- A blinking cursor caused by waiting for a required Field Exit key is reset.

▶ **NOTE:** *Operator-selected reverse image and the Message Waiting annunciator are not affected by this command.*

Clear Unit

Function

This command clears the display and format table.

Restrictions

The terminal rejects the command when it is in the SS message state.

Format

The command takes the following form:

ESC	Clear Unit Command
Hex 04	Hex 40

Results

When the terminal receives the **Clear Unit** command, these occur:

- The keyboard locks.
  The Input Inhibited annunciator is turned on.
  The error state (or system request state) is cleared.
  The shift, alternate, function, and insert modes are cleared.
- The format table is cleared. Because this is not format level 0, a default header is assumed.
- The MDT bit is cleared.
- All function keys are set up to return data.
- The display is cleared by writing nulls to the display buffer.
- A normal attribute is written byte to row 1, column 1 of the display.
- The cursor is placed at row 1, column 2; this makes the insert cursor address.
- Any AID requests and pending **Read Input Fields** or **Read MDT Fields** commands are cleared.

▶ **NOTE:** *Operated-selected reverse image and the Message Waiting annunciator are not affected by this command.*

Restore Screen

Function

The **Restore Screen** command restores all data stored by the last **Save Screen** command.

Restrictions

The terminal rejects this command when it is in a system request or SS message state.

Format

The command takes the following form:

ESC	Restore Screen Command	Data From Last Save Command
Hex 04	Hex 12	<saved data>

Results

The following describes what happens when this command is executed.

These are restored:

- Contents of the display.
- Contents of the format table.
- State of the keyboard, including the insert mode with the annunciators.
- Location of the cursor and the way it was displayed.
- System insert cursor address.
- State of the master MDT bit.
- Error code and any explanatory information provided by the host system in the **Write Error Code** command, if the terminal was in an error state. The error code and any information are returned via the operator's use of the Help key.
- Requirements to send LU-LU Lustat when error line is available.
- Any **Read** command that was pending at the time.
- Any AID requests that were outstanding at the time of the **Save Screen** command.

These conditions from the previous save are not restored:

- Condition of the Shift key and the associated annunciator.
- Status of the Message Waiting annunciator.
- The current status of the hex mode is reset.

The following conditions cause parameter errors:

- Invalid data is detected.
- The required amount of data is not received.

▶ **NOTE:** *A **Clear Unit** command is executed if an error is detected.*

Roll

Function

The **Roll** command causes the image presented in the terminal display to roll up or down across the larger image area available on the IBM Display Station.

Restrictions

The command is rejected if the display is in the prehelp error, posthelp error, system request, or SS message state.

▶ **NOTE:** *If the display supports a separate message line, and the message line is selected, the command is rejected only for system request and SS message states. The command is processed with the display in error state.*

Format

The command consists of five bytes in the following form:

			Row Number	
ESC	**Command**	**Direction**	**Top**	**Bottom**
Hex 04	Hex 23	Hex 08	Hex 01	Hex 23

Bits in the direction byte define the direction and number of lines to roll. See the following chart for the bit meanings. Bit 7 is the most significant bit.

Bit	Description
7	0 = Roll up 1 = Roll down
6 through 0	Number of lines to roll

The top row number tells the first line for inclusion in the roll. Bottom row number tells the last row number to include. Top and bottom row numbers together define the number of lines presented on the display for the roll.

Results

The following conditions govern the **Roll** command:

- Lines vacated due to the **Roll** are not cleared to nulls.
- Format table is not changed (could cause bizarre results).

▶ **NOTE:** *If display does not conform to the format table, roll should not be done.*

- Rolled over data is lost.
- The lines rolled out of the area are lost (cannot be rolled back onto screen).
- The state of the keyboard is not affected.
- Pending AID bytes are not affected.
- The following conditions cause parameter errors:
  A top line of zero.
  A top line greater than or equal to the display length.
  A bottom line of zero.
  A bottom line greater than the display length.
  A top line greater than or equal to the bottom line.
  A roll area greater than the bottom line minus the top line.

A scroll distance of zero has no effect on the display.

Write Error Code

Function

The **Write Error Code** command forces the terminal into the prehelp state (the same state the terminal enters when the operator makes a keying error).

Restrictions

A **Write Error Code** clears any outstanding AID requests. The terminal rejects this command if it is in the prehelp, system request, or SS messages state.

Format

The command may take any of the following forms. The **Insert Cursor** (IC) order may also be embedded in the error message.

▶ **NOTE:** *Headings in brackets indicate the individual field can be omitted. However, both fields cannot be omitted. Provide either an **Insert Cursor** order or error message to avoid an error.*

ESC	Write Error Code Command	Insert Cursor Order
Hex 04	Hex 21	Position cursor

ESC	Write Error Code Command	Error Message
Hex 04	Hex 21	<message text>

ESC	Write Error Code Command	Insert Cursor Order	Error Message
Hex 04	Hex 21	Position cursor	<message text>

Results

You can use the **IC order** to place the cursor at the beginning of the field where the error occurred. This helps the operator find the source of the error. The **IC order** does not affect where the error message is written.

The terminal writes only the first 78 bytes of the error message to the error line. If the error line is already used for error presentation, the terminal saves data on the error line and restores it after the operator presses the Reset key.

When the operator presses the Help key (prehelp error state only) in response to the error condition, characters from columns 2, 3, 4, and 5 of the error line are returned to the host system in a packed form and sent as a Signal command.

These characters form an index code that elicits a user-generated description of the error for the operator.

- Prehelp error state is selected for the keyboard.
- Input Inhibited annunciator is on.
- Insert mode and Insert annunciator are cleared.
- Command, dead key diacritic, and hex modes are cleared.
- Cursor is blinking.
- The line in the format table header defined as an error line is saved.
- Cursor moves to the location specified by the **IC order**. If no **IC order** is given, the cursor does not move.
- All characters (except **IC order**) found between the command byte and the end of the chain or next ESC are written on the error line. If the data exceeds 80 characters, an error occurs.
- All outstanding AID bytes are cleared.
- When the operator presses [HELP], the controller places a nonblink high intensity attribute in column 1 of the error line, replacing anything that was previously there.
- The locked state of the keyboard is cleared if the keyboard was locked and the terminal was not in a posthelp error state. This allows the operator to release the keyboard by pressing the Reset key.

The following conditions cause parameter errors:

- Neither an **IC order** nor data follows the command.
- Invalid **IC order**.
- More data than 80 bytes is specified.

Write to Display (WTD)

Function

The WTD command does the following:

- Modifies the format table and display buffer contents.
- Governs MDT flags and Message Waiting annunciator.
- Nulls nonbypass fields.
- Controls keyboard lock and cursor blink.

Restrictions

This command is rejected if the display is in a prehelp error, posthelp error, system request, or SS message state.

If the display supports a separate message line, and the message line is selected, then only system request or SS message state result in a contention state error. If the error line is in use, however, and the WTD attempts to redefine the error line (using Start of Header byte 4), a negative response is generated.

Format

The WTD command takes either of the following forms.

ESC	WTD Command	CC Byte 1	CC Byte 2	Orders or Data
Hex 04	Hex 11	Hex 00	Hex 13	<orders>
Hex 04	Hex 11	Hex 00	Hex 13	<data>

▶ **NOTE:**

CC Byte 1 and CC Byte 2 are the write control characters. CC Byte 1 may do the following:
Clear the master MDT flag and reset the MDT flags.
Null all appropriate nonbypass fields.
CC Byte 2 sets the following:
Cursor blink
Keyboard lock
Alarm
Message Waiting annunciator

Orders are described in detail starting on page 6-15. Any character that is not an order and not associated with an order is considered data, and is written on the screen at the current display address. The address is then incremented by 1 for each character written. These characters should be hex 00, hex 1C, or above hex 1F, so there is no conflict with the codes reserved for orders.

Results

If the WTD command changes the format table, the keyboard remains locked until specifically unlocked by CC Byte 1 or a subsequent WTD command.

See Table 6-1 to determine the appropriate command for your particular combination of needs. To select a command, check the body of the table for the row showing the desired combination of conditions. Then refer to the left-most column to find the corresponding hex code.

Table 6-1
Write to Display Control Byte 1

Hex Code	Reset Pending AID, Lock Keyboard	Clear Master MDT and Reset MDT Flags		Null All Appropriate Nonbypass Fields	
		Nonbypass Fields	All	Field with MDT On	All
00					
20	•				
40	•	•			
60	•		•		
80	•			•	
A0	•	•			•
C0	•	•		•	
E0	•		•		•

Below are the bit positions for CC byte 2. The most significant bit is 7; the least significant bit is 0. Invalid orders or no data, orders, or CC following the command byte cause parameter errors:

Bit	Description
7	Always 00
6	0 = Cursor moves to default or **IC order** position when keyboard unlocks. * 1 = Cursor does not move when keyboard unlocks.
5	0 = No action; 1 = Reset blinking cursor
4	0 = No action; 1 = Set blinking cursor (if reset bit also = 1)
3	0 = No action; 1 = Unlock keyboard, reset pending AID bytes
2	0 = No action; 1 = Sound alarm
1	0 = No action; 1 = Reset Message Waiting annunciator
0	0 = No action; 1 = Set Message Waiting annunciator (even if bit 5 is set to 1)

* *Exception: When a **WTD** is received with the keyboard unlocked and the **WTD** does not modify the keyboard state.*

Orders

The following pages describe the host 5250 data stream orders the host can send to terminals on the network. Orders govern format and data expectations within the **WTD** command (page 6-13).

The host application can include terminal orders in the **WTD** command, alone or intermixed with display data. The terminal executes orders sequentially and does *not* store orders in the display buffer with other data in the data stream.

Five buffer control orders position, define, and format data written into the buffer, erase selected unprotected data in the buffer, and reposition the cursor. The **TD** order writes transparent data to the display.

Below are the orders and hex codes. Pages reference additional information about each order.

- Insert Cursor (IC) *(next page)* 13
- Move Cursor (MC) *(page 6-16)* 14
- Repeat to Address (RA) *(page 6-17)* 02
- Set Buffer Address (SBA) *(page 6-17)* 11
- Start of Field (SF) *(page 6-18)* 1D
- Start of Header (SOH) *(page 6-22)* 01
- Transparent Data (TD) *(page 6-24)* 10

Insert Cursor (IC)

Function

The **IC** order either sets the system insert cursor (IC) address to the location specified by the 2 bytes that follow the order when it is included in the **WTD** command, or moves the cursor to the specified address without affecting the system IC address when it is included in the **Write Error Code** command. Byte 1 gives the row address and byte 2 gives the cursor address.

▶ **NOTE:** *If multiple **IC** orders appear in the Write data stream, the last one encountered is used in subsequent operations.*

Restrictions

A parameter error is posted when:

- There are fewer than 2 bytes following the order.
- The row address equals 0 or is greater than 24.
- The column address equals 0 or is greater than 80.

Format

The order takes the following form:

Insert Cursor Order	Row Address	Column Address
Hex 13	Hex 01	Hex 01

Results

When the order is used in the **WTD** command, the cursor is not immediately moved; the address is saved for later use. The cursor is moved when the entire WTD is completed.

When the order is used in the **Write Error Code** command, the cursor is moved to the address given in the **IC** order and does not affect the system IC address. The cursor exits the field regardless of the type and does not perform any field checks. For example, it does not check for a filled field for a field specified as mandatory fill.

You can use the **IC** order in the **Write Error Code** command to tell the terminal operator where an error has occurred. Maximum row and column addresses are determined by the character size selected through the terminal's TE configuration menus or firmware.

Move Cursor *(MC)*

Function

The **MC** order enables the host to move the cursor to a specified position without modifying the home address, and without regard to the keyboard's state.

Restrictions

None.

Format

The order takes the following form:

MC Order	Row Address	Column Address
Hex 14	1 byte	1 byte

If the WTD data stream contains multiple **IC** or **MC** orders, the last **IC** or **MC** order determines the cursor position. The **IC** order negates any previously coded **MC** orders and the **MC** order negates any previously coded **IC** orders, with the exception that the last **IC** order establishes home position. To set the home position and then move the cursor, code the **IC** order, and then the **MC** order. **WTD** control character values do not affect the **MC** order, including the move cursor flag. See page 6-15 for more information.

Results

None.

Repeat to Address (RA)

Function

The **RA** order stores a specified alphanumeric or null character in all buffer locations starting at the current buffer address and ending on the specified stop address. This stop address and the character to repeat are identified by the three bytes immediately following the **RA** order in the Write data stream. You can use **RA** orders to fill an area of the display.

Restrictions

A parameter error is posted when:

- Fewer than three bytes follow the order.
- A row address equals 0 or is greater than 24.
- The specified ending address is less than the current display address.

▶ **NOTE:** *Although any character can be repeated, avoid using hex 11 (**SBA** orders), because this value is the delimiter between the fields sent in response to the **Read MDT Fields** command.*

Format

None.

Results

The character is repeated from the current display address through the ending display address specified. The current display address is then updated to the value of the last position +1.

Set Buffer Address (SBA)

Function

The **SBA** order specifies a new buffer address from which operations are to start or continue. You can use the **SBA** order to:

- Write data into various areas of the buffer.
- Precede another order in the data stream to specify the starting address for an **RA** order.
- Specify the address at which an attribute byte is stored by a **SF** order.

Restrictions

A parameter error is posted when:

- Fewer than two bytes follow the order.
- The row address is equal to 0 or greater than 24.
- The column size equals 0 or is greater than 80.

Default. When the **SBA** is not specified in the **WTD** command, the data starts at row 1, column 1. This is where the **WTD** command initialized it.

Format

The **SBA** order takes the following form:

SBA Order	Row Address	Column Address
Hex 11	Hex 01	Hex 01

Row addresses begin with 1, as do column addresses. However, the terminal accepts column address hex 00 and translates it to column 1.

Start of Field (SF)

Function

The **SF** order defines input and output fields. If an input field is being defined, it also resets any pending AID byte and locks the keyboard.

▶ **NOTE:** *Although this order can be used for output fields, it is not recommended because it degrades performance. Use the **SBA** order instead.*

Restrictions

None.

Format

SF order takes the following form with minimal information:

SF Order	Attribute	Length
Hex 1D	Hex 01	Hex 0012

You may also include format and control information in the SF order. In these cases it takes one of the following forms:

▶ **NOTE:** *Brackets around "format" and "control" headings indicate these fields are optional.*

SF Order	[Format]	Attribute	Length
Hex 1D	Hex 4000	Hex 01	Hex 0012

SF Order	[Format]	[Control]]	Attribute	Length
Hex 1D	Hex 4000	Hex 8102	Hex 01	Hex 0012

You can only include the control word after you have provided a format word. You can also insert several control words between the format and attribute portions of the SF order, but these control words are not required.

The following paragraph describes the format portion, page 6-21 describes the control portion, and page 6-21 has the attribute portion of the SF order. The 2-byte Field Format Word (FFW) contains the information listed on page 6-21.

Format Portions of SF Order

Within the format portion of the **SF** order, the two most significant bits (15 and 14) must always be hex 01. See below for descriptions of bits 13 through 0.

Bit	Description
14–15	Always 01 (reserved) *Bit 15 is the most significant bit.*
13	0 = Nonbypass field; 1 = Bypass field.
12	0 = Duplication not allowed; 1 = Duplication allowed
11	0 = Field was not modified (**MDT**) bit; 1 = Field was modified
10–8	000 = Alpha shift; 001 = Alpha only; 010 = Numeric shift; 011 = Numeric only; 100 = Katakana shift *(not supported)*; 101 = Digits only; 110 = I/O *(feature input field)*; 111 = Signed numeric
7	0 = Auto enter disabled; 1 = Auto enter when field is exited
6	0 = Field Exit key is not required; 1 = Field Exit key is required
5	0 = Accept lowercase letters; 1 = Translate lowercase to uppercase
4	Reserved
3	0 = No mandatory entry; 1 = Mandatory entry
2–0	000 = No adjustment; 001 = Reserved; 010 = Reserved; 011 = Reserved; 100 = Reserved; 101 = Right adjust, zero fill; 110 = Right adjust, blank fill; 111 = Mandatory fill

FCWs (two bytes each) are optional. The user program can use the **WTD** command to send FCWs to the controller. When FCWs are used, they should follow the FFW of the **SF** order. An FCW encountered during modification of an existing format table entry is ignored. The LU does not accept an FCS of hex FFxx.

Below are the valid FCWs and functions supported by the terminals.

Value (Hex)	Description
80nn	Entry field resequencing. The "nn" specifies the next entry field in the sequence (hex 00 to 80).
8101	Magnetic stripe reader (MSR) entry field.
8103	MSR and selector light pen (SLP) entry field.
84nn	Transparency entry field. The "nn" is any two digits.
B140	Self-check modulus 11 entry field.
B1A0	Self-check module 10 entry field.

The first FCW of any type is used; subsequent FCWs of the same type are ignored. The controller does not check to see if the FCWs are formatted correctly or if the requested function is installed. During subsequent command and keystroke processing, the controller detects and reports these errors to the host if the FCW is required. FCWs types are as follows.

Resequencing
Resequencing enables the controller to send the input fields to the host in any specified order. Resequencing is done by chaining input fields with FCWs that specify the desired order of transmission. The resequencing FCW takes the following format:

Bits	Description
0–1	B 10
2–7	B 000000
8–15	The normal sequence position of the next field to be returned to the host. (The first field on the screen is number 1. Field numbers progress sequentially, left to right and top to bottom.)

Bit 3 of the **SOH** order contains the number of the field to be sent. If the first field identifier in the **SOH** is zero, resequencing does not occur. That is, all resequencing FCWs are ignored. Fields are sent to the host in the order defined in the format table. If resequencing occurs, the last field to be sent to the host must contain this FCW:

Bits	Description
0–1	B 10
2–7	B 000000
8–15	B11111111

▶ **NOTE:** *If FCWs create a closed loop, the controller detects the error and stops the transmission. An FCW for each field is not required. An FCW pointing to the next sequential field is assumed if no resequencing FCW is specified. The last field in the format table must have a resequencing FCW.*

MSR
MSR enables the scanner for an input field.

SLP
SLP is accepted, but ignored.

Transparency
Transparency defines a field that can contain data of any value.

Self-Check

Self-check on the controller provides additional integrity for data entry. All field types can be specified for self-checking. The following requirements must be met when specifying a field for self-checking:

- An FCW must be defined for the field. Hex B1A0 selects Modulus 10 checking, and hex B140 selects Modulus 11.
- Field lengths for checking are restricted to 33 positions. For signed numeric fields, only 32 positions can contain digits and the sign is not checked. If more than 33 characters are given a LUSTAT parameter error results.

Self-check resolves fields and conditions as follows:

- The function converts nonnumeric characters (including nulls and blanks) by using the four low-order bits from their EBCDIC representation when the low-order bits are in the range 0–9. For example, A in EBCDIC is C1, thus A = 1. R in EBCDIC is D9, thus R = 9.

  A "0" replaces all other characters with the four low-order bits in the range of A through F. For example, % is EBCDIC 6C, thus % = 0.

  Null and blank characters also convert to 0. All high-order nulls, zeros, and blanks in a field are converted to 0 and do not affect the value of the check number.
- An all-null field checks correctly. This field can result when the operator unsuccessfully tried to enter digits into a field and checking fails. The controller enables the operator to exit the field from the first position by using the Field Exit key.

Field Type	Description
Alpha only	Accepts only the characters A–Z (uppercase and lowercase) and the , . - and blank space.
Alpha shift	Accepts all data keys. The shift keys are acknowledged.
Auto enter	When the operator uses [FIELD EXIT] key to leave this field or puts the last character in the field, the terminal treats the action as if the operator pressed [ENTER].
Bypass	Operator cannot put entries in this field. Attempts to enter data cause a keying error.
Digits only	Operator can only put the characters 0–9 in this field. The [DUP] key is allowed if enabled.
Duplication	Allows operator to use the [DUP] key. When the operator presses [DUP], the controller fills the field from the cursor to the end of the field with "1C." (Typically the host program uses this to place data from a previous record into the field when it receives the data.) An overstruck asterisk is displayed for the "1C" characters.
Field Exit key required	Operator can only exit the field by pressing a non-data key such as [FIELD EXIT] or other cursor-moving key.
I/O	Only the scanner can put data in this field.
Mandatory entry	The operator must put data in this field before pressing [ENTER] or another AID-generating key.
Mandatory fill	When the operator begins putting data into this field, they must completely fill it before exiting from it.
Modified	Marks this field as modified.

Field Type	Description
Numeric only	Accepts only the characters 0–9 and the symbols + , . – and blank. [FIELD+] exits the field with a positive number; [FIELD–] with a negative number. [FIELD EXIT] exits the field as entered with the sign specified by the host. The controller marks a minus field by changing the high nibble of the last byte to "B" unless a + , . – or blank is in that byte. These characters cause an error to occur.
Numeric shift	Accepts any data characters.
Right-adjust	When the operator exits the field, the controller shifts the contents to the right and fills on the left with zeros or blank spaces, as specified. Bits 13–15 can be 0. This allows the operator to make entries into any part of the field without any subsequent position adjustment. When the controller sends the field to the host, it also sends whatever is in the field (nulls if a **Clear Unit** command was received).
Self-check	Modulus 10 self-check fields perform a MOD 10 Check on the input. Modulus 11 self-check fields perform a MOD 11 Check on the input. The controller performs these checks when the operator exits the field. If the checks fail, an input error is indicated and the Input Inhibited annunciator is turned on. The operator must press the [RESET] key to clear the condition. The network checks data by doing the appropriate modus on the low four bits of the characters in the field. If the low four bits are within the range "A" through "F," zero is used in the modulus calculation.
Signed numeric	Only the characters 0–9 are allowed. The last byte of the field is reserved for the sign character. The operator cannot place data in this location. If the operator presses [FIELD–] to exit the field, the last character is set to "–" and the field is right adjusted. The high nibble of the last digit input is set to "B." If the operator uses [FIELD+] or [FIELD EXIT] to exit the field, the last character is set to blank and the field is right-adjusted. The "–" or "blank" is sent in response to **Read Input Fields** or **Read MDT Fields** commands.

Control Portions of SF Order

Below describes the control portions of the SF order.

Hex Code	Description
80XX	Resequencing, "xx" defines the next field number
80FF	Resequencing terminator
8101	Enable scanner (extended 5250); this is IBM's MSR option
8102	Reserved (extended 5250)
B1A0	Modulus 10 self-check
B140	Modulus 11 self-check

Attribute Portions of SF Order

Below describes the attribute portions of the SF order.

Hex Code	Description
20	Normal (dark characters on light background)
21	Reverse image (light characters on dark background)
24	Underscore
28	Blink (applies only to the 6400, 59XX, and 17XX)
2F	Nondisplay
30	Column separator

Results

The **SF** order does the following:

- The display address is set to the end-of-field address (as specified by the last SF order + 1). This does not happen if this is the first **SF** order or if an **SBA** order precedes it (the **SBA** points at the field starting attribute).
- The screen attribute in the **SF** order is written into the location defined by the display address.
- The start-of-field address is set to the display address +1.
- The end-of-field address is set to the display address + the field length specified by the **SF** order. The ending screen attribute is written to the end-of-field +1. This is a "20."
- The display address is incremented by 1.
- If this is an input field (one in which a field format word has been specified), a format table entry consisting of the field format and the FCWs is generated. In addition, if the **SF** order is rejected, the keyboard is locked and any outstanding AID byte is cleared.
- The format table is modified if the display address +1 is equal to the starting address of an input field that was previously defined. This happens as follows:
  - The field format word of the previously defined field is overlaid with the new one.
  - All FCWs and length parameters that were specified are ignored. Two bytes, however, are still required for the length even though no value check is performed on them.
  - The field ending address is set equal to the field's original ending address.
  - The screen ending address is not rewritten.
  - The defined field is not null filled. If any data characters follow the length field, they are written into the defined field.

Start of Header *(SOH)*

Function

The **SOH** order notifies the terminal that the next byte in the Write data steam contains a header order. The order specifies header information for the format table. When the controller receives this order, it first clears the format table, then inserts the contents of the **SOH** order.

Restrictions

A parameter error is posted when the output data stream ends before the number of bytes needed are sent or when the first byte of the order is not between 1 and 254.

Format

The **SOH** order takes the following form:

Function	Hex Code
Order	01
Length	07
Reserved	00
Reserved	00
Resequence	00
Error row	00
F keys	000000

Results

Because the length of this order varies, the first byte after the order code contains the number of bytes included. Length may range from 0 through 7 bytes.

A length of 7 bytes enables or disables selected function keys designated by the bits in bytes 5 through 7. When bits are enabled, function keys return AID codes with input data. When bits are inhibited, or length is less than 7, function keys return AID codes but without input data.

Table 6-2 shows the data-included switches for the function keys. In the table: 0 = enable, 1 = inhibit, and bit 0 is the most significant bit.

Table 6-2
Function Key Bit Switches

Byte 5		Byte 6		Byte 7	
Bit #	**Function Key**	**Bit #**	**Function Key**	**Bit #**	**Function Key**
0	F24	0	F16	0	F8
1	F23	1	F15	1	F7
2	F22	2	F14	2	F6
3	F21	3	F13	3	F5
4	F20	4	F12	4	F4
5	F19	5	F11	5	F3
6	F18	6	F10	6	F2
7	F17	7	F9	7	F1

You can use *resequencing* to point to a field, other than the first, as the field you want sent to the host in response to a **Read Input Fields** or **Read MDT Fields** command. If not zero, the FCW of the field is checked as each field is sent to see whether resequencing is enabled. If so, the FCW points to the next field to send. If the FCW has resequencing disabled (or no FCW exists for the field), the next defined field is sent and checked for resequencing.

Bits	Description
0000 0000	Disable resequencing
XXXX XXXX	Number of first field to be transmitted to the host, in response to a **Read Input Fields** or **Read MDT Fields** command.

The error row may vary from 0 to 24. Row “00” signifies the default row, which is the last line for most 5250 devices. You can use other values to override the default row.

Transparent Data (TD)

Function

The **TD** order lets you send data with any value to the terminal display.

Restrictions

None.

Format

The order takes the following form:

TD Order	Length (2 Bytes)	Data
Hex 10	Hex 0020	<data>

The 2-byte length field after the order tells how many bytes of data follow.

Asynchronous 5250 Prefixes

Each asynchronous 5250 data stream command is preceded by a variable-length prefix. The first byte of the prefix contains the number of bytes in the prefix, not including the length byte. The length may be zero, which indicates an empty prefix. The second byte of the prefix (if the length is nonzero) must be either hex 40 or C0.

- Hex 40 indicates that the data in the rest of the message is LU-LU (normal 5250 commands).
- C0 indicates that the rest of the message is SS-LU data (an SS message). SS messages cause the terminal to enter the SS message state, where the only allowable keystroke is Reset. The SS message is a one-line message that is displayed on the terminal's status line until the Reset key is pressed.

After hex 40 or C0, the 5250 prefix may contain one 5250 signal. A signal is a sequence of 5 bytes that tells the terminal to perform a special operation. The terminal supports the Signal command formats in the following chart.

Hex Code	Description
C9 00 00 00 01	Signal operator (turns on the Message Waiting annunciator and sounds the audible alarm)
C9 00 00 00 05	Resets the Message Waiting annunciator

A parameter error is posted when less data is in the message than indicated by the length byte. This causes a parameter error of "21." If the terminal encounters data it does not understand, it ignores the rest of the prefix.

System Messages and Parameter Errors

The terminal's display reserves a line for status information. The status line can display system (nonlocal) information such as a message waiting from the host computer, help messages in response to the Help key, or the system request state of the terminal. You can program the location of the status line through the Start of Header order.

System codes can also appear on the status line. (On 17XX and 59XX terminals, the system codes will blink.) The parameter errors displayed when the stated condition occurs are listed on the next page. Unless otherwise noted in the table, the terminal's Reset key restores the status line and returns to the keying mode in effect when the problem occurred.

Code	Description
0005	Attempt to enter data when not in a field.
0006	A key other than a data key or [ENTER] was pressed in the system request state.
0007	A mandatory entry field has not had data put into it.
0008	The field is alpha only, and an invalid key was pressed.
0009	The field is numeric only, and an invalid key was pressed.
0010	The field is signed numeric, and an invalid key was pressed.
0011	Data cannot be entered into the last byte of a signed numeric field.
0012	No room in field for insert. The field is full or on the last byte.
0013	Cannot leave field while in insert mode.
0014	Field is mandatory fill and cannot be exited until filled.
0015	MOD 10 or MOD 11 Check has failed on field.
0016	Field error: Cannot be used in field that is not signed numeric.
0017	Attempt to use [FIELD EXIT] key in unfilled, mandatory fill field.
0018	Only a nondata key can be used to exit this field; for example, [FIELD EXIT].
0019	[DUP] key not allowed in this field.
0020	Cannot use AID-generating key to exit signed numeric or right-adjusted field. Must use [FIELD EXIT].
0021	Cannot exit a mandatory enter field without entering data.
0023	Invalid hex value entered.
0026	The [FIELD–] key was pressed, but the last character of the field was not 0–9.
0099	An invalid key was pressed before the terminal was in session. Only [SYS REQ] is allowed.
C00	An invalid 5250 command was received. This sequence of bytes is sent to the host: 01 10 03 01 01.
PXX	System code where "XX" is the parameter error .

When a 5250 command contains invalid parameters, system code "PXX" appears on the bottom line of the display. (On 17XX and 59XX Terminals, the system code blinks.) The "XX" in the system code indicates the type of parameter error.

The message sent to the host is: 01 10 05 01 XX, where "XX" is the same parameter error that was put in the terminal's display.

The parameter errors are a subset of the 5250 data stream command set. Those errors supported by the terminals are listed in below.

Parameter Error	Description
P21	Premature end of data stream.
P22	A row or column specification is out of range.
P23	The ending address of the Repeat to Address order is less than the start address.
P25	A signed input field had a length of 1. It must be at least 2.
P26	An input field start address was less than a previously-defined input field start address.
P27	An invalid **Restore Screen** command was received.
P28	An attempt was made to define an input field past the end of the display.
P29	Format table overflow (too many input fields were defined).
P2A	An attempt was made to write data past the end of the display.
P2C	Invalid roll up or roll down parameters were received.
P30	An invalid attribute was received as part of a **SF** order.
P87	A MOD 10 or MOD 11 input field was defined with a length greater than 33.

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 the 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 the 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.

Line 2, Column 1 begins the start of transmit data. The host application must set up the screen with a transmit field to locate the RS-232 port I/O data. the field can be anywhere on the screen, beginning at position 80). The host application must supply the receive field (for response from the RS-232 port to the host). The receive field can be anywhere on the screen except for the position allocated for the return status field.

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. For example, insert "=0D" if your printer requires a carriage return, or insert "=0A" for a line feed. *Appendix B* contains other hexadecimal values.

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 *2415, 2425, 2435A, 2455, 248X:* Reserved	0=Disable; 1=Enable b
9	*For 5020, 5055, 59XX, 17XX, 11XX:* DTR flow control *For 6400, 2415, 2425, 2435A, 2455, 248X:* Reserved	0=Disable; 1=Enable b
10	XON/XOFF flow control	0=Disable; 1=Enable
11–12	Flow control timeout value	XX=Number of seconds
13	Return AID key	b=AID key is Enter *(default)*; X=AID key character. Table 7-2 (page 7-3) has return AID key characters
14–15	Maximum characters to receive	bb=Default; dd *or* Xd…dX, where dd=00–99. Default: 99. d…d=Any number of decimal digits from 0–2000, inclusive. Default: 99.
16–17	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.
18–19	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.
20–21	Start character	AA=Hexadecimal ASCII code. Range: 00–99. Default of 00 or bb implies no start character.
22	Return start character to host	F=Return character; b=Do not return character
23	Flag parity errors	P=Flag; b=Do not flag
24–25	Receive timeout length	XX=Number of seconds the terminal waits for input from RS-232 port before it sends a timeout error. Uses 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 DTR of the output device should connect to either the DSR or CTS lines. On the 59XX, 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 AID Key Characters

Table 7-2 lists the extended command AID keys and characters returned to the host. For example, if you want an F1 AID key, use "A" as the character. Note that "b" indicates a 1-byte space.

Table 7-2
Return AID Keys

AID Key	Character	AID Key	Character
Enter	b	F10	J
Help	)	F11	K
Roll down/Page up	*	F12	L
Roll up/Page down	+	F13	M
Print	,	F14	N
Home	.	F15	O
Clear	7	F16	P
F1	A	F17	Q
F2	B	F18	R
F3	C	F19	S
F4	D	F20	T
F5	E	F21	U
F6	F	F22	V
F7	G	F23	W
F8	H	F24	X
F9	I		

Return Codes for Transmit and Receive

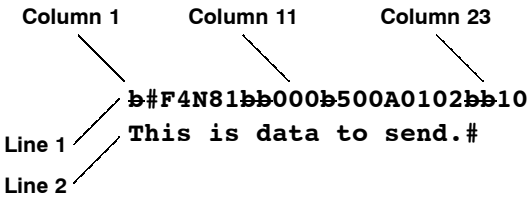
Line 24, Column 1 has the return status field. The code returned in this position tells the host the status of the extended command. The following chart lists the codes.

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	Error in AID code.	(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, DTR, 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).*

Example of Transmit and Receive

The following example and chart show what would be sent to a terminal to cause data to be transmitted and received. Note that "b" indicates a 1-byte space.



Column	Character	Description
1	b	This column typically contains a space.
2	#	Extended command.
3	F	Transmit and Receive command.
4	4	9600 baud.
5	N	No parity.
6	8	Eight data bits.
7	1	One stop bit.
8	0	No CTS flow control.
9	0	No DTR flow control.
10	0	No XON/OFF flow control.
11–12	00	No flow control timeout value.
13	b	AID key is Enter.
14–15	50	Receive a maximum of 50 characters.
16–17	0A	Delimiter character is 0A hexadecimal (line feed).
18–19	01	Data will be sent to host after one delimiter character has been received.
20–21	02	Start character is 02 hexadecimal (STX).
22	b	Start character will not be returned.
23	b	Do not flag parity errors.
24–25	10	Receive timeout length is 10 seconds.

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). "#" must be the last character. The terminal sends the data to the RS-232 port until it detects a "#" character.

Line 2, Column 1 begins the start of transmit data. The host application must set up the screen with a transmit field to locate the RS-232 port I/O data. The field can be anywhere on the screen, beginning at position 80.

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. For example, insert "=0D" if your printer requires a carriage return, or insert "=0A" for a line feed. *Appendix D* contains other hexadecimal values.

Table 7-3 describes the line and columns where characters must appear, and their meanings. Note that the line and column information refers to a 24-line by 80-column display station. Note that "b" indicates a 1-byte space.

Table 7-3
Transmit Only Characters

Line 1, Columns 2-12

Column	Character	Description
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 5020, 5055, 59XX, 17XX, 11XX:* CTS flow control	0=Disable; 1=Enable
	For 6400, 2415, 2425, 2435A, 2455, 248X: Reserved	b
8	*For 5020, 5055, 59XX, 17XX, 11XX:* DTR flow control	0=Disable; 1=Enable
	For 6400, 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
13	Return AID key	b=AID key is Enter *(default)*; X=AID key character. See Table 7-2 (page 7-3) for return AID key characters.

Flow Control

Transmit Only supports RTS/CTS, DTR/DSR, and XON/XOFF. For descriptions, see page 7-3.

Return Codes for Transmit Only

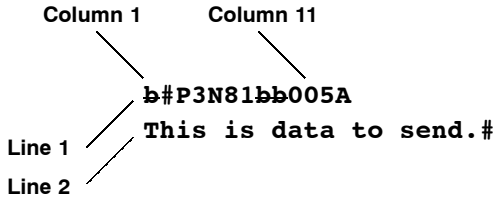
The terminal puts the return code response in an input field in the display buffer at Line 24, Column 1. It simulates [ENTER] to return the value to the host. Use the Start Field order to return a code for this operation.

Code	Description of return codes	Column
0	Good status, transaction complete.	(None)
1	Not enough memory. Or, incorrect setting for speed, number of data bits, number of stopbits, 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)
8	Error in AID code.	(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 only 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 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.)*

Example of Transmit Only

The following example and chart show what would be sent to a 6400, 5020, 5055, 59XX, 17XX, or 11XX Terminal to transmit data. Note that "b" indicates a 1-byte space.



Column	Character	Description of Line 1
1	b	This column typically contains a space.
2	#	Extended command.
3	P	Transmit Only command.
4	3	4800 baud.
5	N	No data parity.
6	8	Eight data bits.
7	1	One stop bit.
8	0	No CTS flow control.
9	0	No DTR flow control.
10	0	No XON/XOFF flow control.
11–12	05	Flow control timeout is 5 seconds.
13	A	AID key is [F1].

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.

Line 2, Column 1 is the start of the area on the screen where an input field may be placed for receive data. The host application must supply the input field for the data received on the RS-232 port. The host can place the input field anywhere on the screen except the position for the return status field.

Table 7-4 describes the line and columns where characters must appear, and their meanings. Note that "~~b~~" indicates a 1-byte space.

Table 7-4
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	Return AID key	~~b~~=AID key is Enter *(default)*; X=AID key character Table 7-2 (page 7-3) has return AID key characters
14–15	Maximum characters to receive	~~b~~=Default dd *or* Xd…dX, where dd=00–99. Default: 99. d…d=Any number of decimal digits from 0–2000, inclusive. Default: 99.
16–17	Delimiter character	AA=Hexadecimal ASCII code marking the end of valid data to be received. Range 00–7E. Default: 00
18–19	Number of delimiter characters	XX=Delimiter characters received before transmitting return code to host. Range 00–99. Default: 00
20–21	Start character	AA=Hexadecimal ASCII code for start character. Range 00–99. 00 or ~~bb~~ default implies no start character
22	Return start character to host	F=Return character; ~~b~~=Do not return character
23	Flag parity errors	P=Flag; ~~b~~=Do not flag
24–25	Receive timeout length	XX=Number of seconds the terminal waits for input from RS-232 port before it sends a timeout error. Uses a 5-second default when field contains spaces.

Return Codes for Receive Only

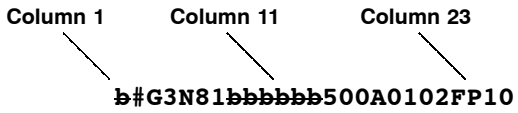
Line 24, Column 1 is the return status byte. The host application defines the 1-byte return status field location. Following are return status codes.

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	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	Error in AID code.	(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).*

Example of Receive Only

The following example and chart show what would be sent to the terminal to cause data to be received. Note that "~~b~~" indicates a 1-byte space.



Column	Character	Description
1	~~b~~	This column typically contains a space.
2	#	Extended command.
3	G	Receive Only command.
4	3	4800 baud.
5	N	No data parity.
6	8	Eight data bits.
7	1	One stop bit.
8–12	~~bbbbb~~	Reserved.
13	~~b~~	AID key is Enter.
14–15	50	Receive a maximum of 50 characters.
16–17	0A	Delimiter character is 0A hexadecimal (line feed).
18–19	01	Data will be sent to host after one delimiter character was received.
20–21	02	Start character is 02 hexadecimal (STX).
22	F	Start character will be returned to host.
23	P	Parity errors will be flagged
24–25	10	Receive timeout length is 10 seconds.

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. Some parameters do not apply to all terminal models. Refer to the terminal's user manual for applicable parameters.

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.

Table 7-5 lists columns in which characters must appear. Note that "b" indicates a 1-byte space.

Table 7-5
***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 stay on
7–9	Sleep timer delay *(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	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	Stream Scan	b=No change from current setting; 0=Disable; 1=Enable
14	Scan All Fields	b=No change from current setting; 0=Disable; 1=Enable
15	Operator error mode	b=No change from current setting 0=Disable beep on keyboard error. Operator must press [RESET] after an error. 1=Enable beep on keyboard error. Emits the error tone, then resets the terminal so the operator can correct the error.
16–18	Beeper volume	bbb=No change from current setting *(Default = 255)* 000–255=Range of volume from quiet to loud.
19–21	Beeper frequency	bbb=No change from current setting 000–030=Frequency range from low to high.
22–24	Beeper length	bbb=No change from current setting; 000–255=Duration in seconds
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

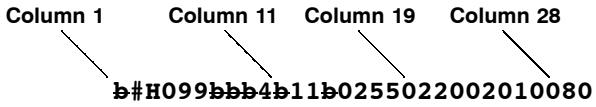
Return Codes for Set Parameters

The Set Parameters return code is the status sent to the host computer. The following chart lists return codes.

Code	Description	Column
0	Good status, transaction complete.	(None)
1	Reserved.	(None)
2	Backlight timer parameter invalid.	4–6
3	Sleep mode timer parameter invalid.	7–9
4	Cursor set parameter invalid.	10
5	Screen mode parameter invalid.	11
6	Reserved.	(None)
7	Remote display parameter invalid.	12
8	Beeper volume parameter invalid.	16–18
9	Beeper frequency parameter invalid.	19–21
A	Beeper length parameter invalid.	22–24
B	Stream scan parameter invalid.	13
C	Scan all fields parameter invalid.	14
D	Error mode parameter invalid.	15
E	Incorrect setting for number of rows.	25–27
F	Incorrect setting for number of columns.	28–30

Example of Set Parameters

The following example and chart show data for Set Parameters. Note that "␣" indicates a 1-byte space.



Column	Character	Description
1	␣	This column typically contains a space
2	#	Extended command
3	H	Set Parameters command
4–6	099	Backlight stays on for 99 seconds
7–9	␣␣␣	No change from current setting *(legacy RT3210 Terminals)*
10	4	Cursor is in block blink mode
11	␣	No change from current setting
12	1	Remote display is in use *(17XX, 11XX)*
13	1	Stream scanning is enabled
14	␣	No change from current setting
15	0	Beep is disabled on keyboard error
16–18	255	Beeper volume is set at 255
19–21	022	Beeper frequency setting is set at 22
22–24	002	Beeper length is 2 seconds
25–27	010	Number of rows in primary screen size is 10
28–30	080	Number of columns in primary screen size is 10

Return Version (#V)

The Return Version extended command returns the current TE program name and version to the host computer. Table 7-6 lists columns in which characters must appear.

Table 7-6
Return Version Characters

Line 1, Columns 2-3

Column	Description	Character
2	Extended command	#
3	Return Version command	V

The terminal returns data and the extended command's status to the host computer in the following format:

`tttK//rrccfl <program name><version>#s`

ttt is the terminal number.

rr is the row.

cc is the column.

fl is the AID key return value.

s is the status.

Tone (#T)

The Tone extended command has the terminal make a tone of a specified volume, frequency, and length (Table 7-7). Note that "~~b~~" indicates a 1-byte space.

Table 7-7
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)

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 that indicates if the command was successful. Then it simulates [Enter] to return a value to the host computer.

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 7-8
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 types of terminals. Dots show the Control Character (CC) Byte options. *Note that "~~b~~" indicates a 1-byte space.*

Table 7-9
***CC Byte 1 Options for Scanning** (2415, 2425, 2435A, 2455, 248X, 5020 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		•	
(Space)			•

6400 Computers do not support HP Wand Select. *Note that a "b" indicates a 1-byte space.*

Table 7-10
***CC Byte 1 Options** (6400, 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.			

Table 7-11
***CC Byte 2 Options Supported by Characters** (6400, 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		•

Table 7-12
***CC Byte 3 Options Supported by Characters** (6400, 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 "~~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

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 "b" indicates a 1-byte space.*

Table 7-14
***UPC Bar Code Characters** (6400, 5055, 59XX, 17XX, 11XX Terminals)*

	Options				
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 "b" indicates 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 "b" indicates a 1-byte space.*

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

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.

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 "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. *Note that "b" indicates a 1-byte space.*

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 "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

Note that "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 "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

Note that "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 1st and 2nd fixed bar code lengths according to your requirements. *Note that "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
23–24	XX=Minimum length Straight or Computer Identics 2 of 5; bb=No change from current setting
25–26	XX=First fixed bar code length for Straight or Computer Identics 2 of 5; bb=No change from current setting
27–28	XX=Second 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 1st and 2nd fixed bar code lengths according to your requirements. *Note that "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

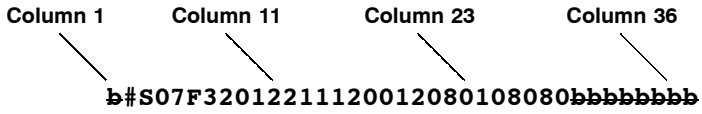
Return Codes for Scan Bar Code

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

Example of Scan Bar Code Parameters

The following example and chart show data for Scan Bar Code Parameters. *Note that "b" indicates a 1-byte space.*



Column	Character	Description
1	b	This column typically contains a space
2	#	Extended command
3	S	Scan Bar Code Parameter command
4	0	No Control Byte 1 options are returned
5	7	[ENTER] key terminates all scans, 12-volt laser is enabled, Mod 10 Check Digit
6	F	Barcode type is returned and concatenated
7–8	32	Maximum length is 32 characters
9–10	01	Minimum length is 1 character
11	2	Decode UPC System 0
12	2	EAN is enabled
13	1	Encoded code 39 is enabled
14	1	Plessey is enabled
15	1	Mod 10 first digit is checked
16	2	ABC Codabar is enabled
17	0	Code 11 is disabled
18	0	Code 93 is disabled
19	1	Code 128 is enabled
20	2	Straight 2 of 5 is enabled
21–22	08	Straight 2 of 5 maximum length is 8
23–24	01	Straight 2 of 5 minimum length is 1
25–26	08	Straight 2 of 5 1st fixed length is 8
27–28	08	Straight 2 of 5 2nd fixed length is 8
29	0	Interleaved 2 of 5 is disabled
30–31	bb	No change from current setting
32–33	bb	No change from current setting
34–35	bb	No change from current setting
36–37	bb	No change from current setting

Appendix A

Bar Code Scanning

This appendix lists bar code labels for 5250 TE commands and functions. It also contains Encoded Code 39 key press sequences.

▶ **NOTE:** *To scan the bar code labels, you must configure the terminal to use Code 39 in Full ASCII mode (the default mode of operation).*

- *For 2415, 2425, 2435A, 2455, 248X Terminals, 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

AID-Generating Keys

Clear

%CLR

Enter/Rec Adv

%CR

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

F21

%F21

F22

%F22

F23

%F23

F24

%F24

Help (nonerror state)

%HELP

Print

%PRINT

Record Backspace (Home)

%Hm

Roll Down

%RODN

Roll Up

%ROUP

Field Exit Key

Field Exit

%FLDX

Signal Keys

Attn

%ATTN

Help (from error state)

%HELP

Special Control Keys

Delete (Del)

%DEL

Erase Input

%EINP

Error Reset

%ERR

Hex

%HEX

Home

%Hm

Insert

%INS

Special Host Key

Sys Req

%SYSR

5250 Additional Functions

¬ (Not symbol)

%NOT

¢ (cent sign)

%CENT

Dup (duplicate enabled fields only)

%DUP

Field–

%FLD–

Field+

%FLD+

Field Mark

%FM

New Line

%NL

TE configuration menus

%TECFG

Auto-Login Restart

Auto-Login Restart

%ALRS

Encoded Code 39

Table A-1 lists escape characters and key press sequences for Encoded Code 39. "(t)" indicates a terminating key. Bar code data following this key code is ignored. Therefore, locate "t" sequences at the end of the bar code. If you attempt to use a "reserved" sequence, the terminal will beep and flush the data stream.

Table A-1
Key Press Sequences for Encoded Code 39

Sequence	Key	Sequence	Key
$A	New Line	+A	a
$B	Del	+B	b
$C	Forward Tab	+C	c
$D	Forward Tab	+D	d
$E	Back Tab	+E	e
$F	Roll ↑ (Roll up/Page down)	+F	f
$G	Roll ↓ (Roll down/Page up)	+G	g
$H	Backspace	+H	h
$I	Field+	+I	i
$J	Field–	+J	j
$K	Insert	+K	k
$L	Home	+L	l
$M	Enter /Rec Adv (t)	+M	m
$N	Field Exit	+N	n
$O	Erase Input	+O	o
$P	Attn	+P	p
$Q	F1 (t)	+Q	q
$R	F2 (t)	+R	r
$S	F3 (t)	+S	s
$T	F4 (t)	+T	t
$U	F5 (t)	+U	u
$V	F6 (t)	+V	v
$W	F7 (t)	+W	w
$X	F8 (t)	+X	x
$Y	F9 (t)	+Y	y
$Z	F10 (t)	+Z	z
%A	Clear	/A	! (exclamation mark)
%B	F11 (t)	/B	" (double quote)
%C	F12 (t)	/C	# (pound)
%D	Error Reset	/D	$ (dollar)
%E	Help	/E	% (percent)
%F	; (semicolon)	/F	& (ampersand)
%G	< (less than)	/G	' (single quote)
%H	= (equal)	/H	((left parenthesis)
%I	> (greater than)	/I	) (right parenthesis)
%J	? (question mark)	/J	* (asterisk)
%K	¬ (not symbol)	/K	+ (plus)
%L	\ (backslash)	/L	, (comma)

Table A-1 (Continued)
Key Press Sequences for Encoded Code 39

Sequence	Key	Sequence	Key
%M	¢ (cent)	/M	– (minus)
%N	| (piping symbol)	/N	F14 (t)
%O	_ (underscore)	/O	/ (forward slash)
%P	{ (left brace)	/P	F15 (t)
%Q	| (vertical bar)	/Q	F16 (t)
%R	} (right brace)	/R	F17 (t)
%S	~ (tilde)	/S	F18 (t)
%T	Del	/T	F19 (t)
%U	Dup	/U	F20 (t)
%V	@ (at)	/V	F21 (t)
%W	‘ (grave accent)	/W	F22 (t)
%X	Sys Req	/X	F23 (t)
%Y	Print	/Y	F24 (t)
%Z	F13 (t)	/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 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 **123$V456** sequence 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 scans 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 5250 data stream key press equivalent when followed by another character. The escape characters are:

$ (dollar)
% (percent)
+ (plus)
/ (forward slash)

For example:

- If a bar code contains the sequence "%M" 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 "/C" 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 5250 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)	ndddddc	8
EAN short (EAN-8)	fndddddc	8
UPC long (UPC-A)	nddddddddddc	12
EAN long (EAN-13)	fnddddddddddc	13
UPC short add-on 2	ndddddcaa	10
EAN short add-on 2	fndddddcaa	10
UPC long add-on 2	nddddddddddcaa	14
EAN long add-on 2	fnddddddddddcaa	15
UPC short add-on 5	ndddddcaaaaa	13
EAN short add-on 5	fndddddcaaaaa	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 5250 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

Conversion Tables

Decimal to Hexadecimal

Following are decimal and hexadecimal values for nondisplayable ASCII and displayable graphic characters.

Decimal	Hex	Char.	Decimal	Hex	Char.	Decimal	Hex	Char.
0	00	NUL	38	26	&	76	4C	L
1	01	SOH	39	27	’	77	4D	M
2	02	STX	40	28	(	78	4E	N
3	03	ETX	41	29	)	79	4F	O
4	04	EOT	42	2A	*	80	50	P
5	05	ENQ	43	2B	+	81	51	Q
6	06	ACK	44	2C	,	82	52	R
7	07	BEL	45	2D	-	83	53	S
8	08	BS	46	2E	.	84	54	T
9	09	HT	47	2F	/	85	55	U
10	0A	LF	48	30	0	86	56	V
11	0B	VT	49	311	1	87	57	W
12	0C	FF	50	32	2	88	58	X
13	0D	CR	51	33	3	89	59	Y
14	0E	SO	52	34	4	90	5A	Z
15	0F	SI	53	35	5	91	5B	[
16	10	DLE	54	36	6	92	5C	\
17	11	DC1	55	37	7	93	5D	]
18	12	DC2	56	38	8	94	5E	^
19	13	DC3	57	39	9	95	5F	_
20	14	DC4	58	3A	:	96	60	‘
21	15	NAK	59	3B	;	97	61	a
22	16	SYN	60	3C	<	98	62	b
23	17	ETB	61	3D	=	99	63	c
24	18	CAN	62	3E	>	100	64	d
25	19	EM	63	3F	?	101	65	e
26	1A	SUB	64	40	@	102	66	f
27	1B	ESC	65	41	A	103	67	g
28	1C	FS	66	42	B	104	68	h
29	1D	GS	67	43	C	105	69	i

Decimal	Hex	Char.	Decimal	Hex	Char.	Decimal	Hex	Char.
30	1E	RS	68	44	D	106	6A	j
31	1F	US	69	45	E	107	6B	k
32	20	DP	70	46	F	108	6C	l
33	21	!	71	47	G	109	6D	m
34	22	”	72	48	H	110	6E	n
35	23	#	73	49	I	111	6F	o
36	24	$	74	4A	J	112	70	p
37	25	%	75	4B	K	113	71	q
114	72	r	173	AD		232	E8	è
115	74	s	174	AE		233	E9	é
116	74	t	175	AF		234	EA	ê
117	75	u	176	B0	°	235	EB	ë
118	76	v	177	B1	±	236	EC	ì
119	77	w	178	B2	²	237	ED	í
120	78	x	179	B3	³	238	EE	î
121	79	y	180	B4		239	EF	ï
122	7A	z	181	B5	µ	240	F0	
123	7B	{	182	B6	¶	241	F1	ñ
124	7C	|	183	B7	·	242	F2	ò
125	7D	}	184	B8		243	F3	ó
126	7E	~	185	B9	¹	244	F4	ô
127	7F	DEL	186	BA	º	245	F5	õ
128	80		187	BB	»	246	F6	ö
129	81		188	BC	¼	247	F7	Œ
130	82		189	BD	½	248	F8	ø
131	83		190	BE		249	F9	ù
132	84	IND	191	BF	¿	250	FA	ú
133	85	NEL	192	C0	À	251	FB	û
134	86	SSA	193	C1	Á	252	FC	ü
135	87	ESA	194	C2	Â	253	FD	ÿ
136	88	HTS	195	C3	Ã	254	FE	
137	89	HTJ	196	C4	Ä	255	FF	
138	8A	VTS	197	C5	Å			
139	8B	PLD	198	C6	Æ			
140	8C	PLU	199	C7	Ç			
141	8D	RI	200	C8	È			
142	8E	SS2	201	C9	É			
143	8F	SS3	202	CA	Ê			
144	90	DCS	203	CB	Ë			
145	91	PU1	204	CC	Ì			
146	92	PU2	205	CD	Í			
147	93	STS	206	CE	Î			
148	94	CCH	207	CF	Ï			
149	95	MW	208	D0				

Decimal	Hex	Char.	Decimal	Hex	Char.	Decimal	Hex	Char.
150	96	SPA	209	D1	Ñ			
151	97	EPA	210	D2	Ò			
152	98		211	D3	Ó			
153	99		212	D4	Ô			
154	9A		213	D5	Õ			
155	9B	CSI	214	D6	Ö			
156	9C	ST	215	D7	Œ			
157	9D	OSC	216	D8	Ø			
158	9E	PM	217	D9	ù			
159	9F	APC	218	DA	ú			
160	A0		219	DB	û			
161	A1	¡	220	DC	Ü			
162	A2	¢	221	DD	ÿ			
163	A3	£	222	DE				
164	A4		223	DF	ß			
165	A5	¥	224	E0	à			
166	A6	¦	225	E1	á			
167	A7	§	226	E2	â			
168	A8	¤	227	E3	ã			
169	A9	©	228	E4	ä			
170	AA	ª	229	E5	å			
171	AB	«	230	E6	æ			
172	AC		231	E7	ç			

Binary to EBCDIC

Following are binary to EBCDIC conversion values.

Bits 0-5	EBCDIC Code	Display Graphic	Bits 0-5	EBCDIC Code	Display Graphic
00 0000	40	<space>	10 0000	60	—
00 0001	C1	A	10 0001	61	/
00 0010	C2	B	10 0010	E2	S
00 0011	C3	C	10 0011	E3	T
00 0100	C4	D	10 0100	E4	U
00 0101	C5	E	10 0101	E5	V
00 0110	C6	F	10 0110	E6	W
00 0111	C7	G	10 0111	E7	X
00 1000	C8	H	10 1000	E8	Y
00 1001	C9	I	10 1001	E9	Z
00 1010	4A	¢	10 1010	6A	EBCDIC
00 1011	4B	.	10 1011	6B	,
00 1100	4C	<	10 1100	6C	%
00 1101	4D	(	10 1101	6D	-
00 1110	4E	+	10 1110	6E	>
00 1111	4F	|	10 1111	6F	?
01 0000	50	&	11 0000	F0	0
01 0001	D1	J	11 0001	F1	1
01 0010	D2	K	11 0010	F2	2
01 0011	D3	L	11 0011	F3	3
01 0100	D4	M	11 0100	F4	4
01 0101	D5	N	11 0101	F5	5
01 0110	D6	O	11 0110	F6	6
01 0111	D7	P	11 0111	F7	7
01 1000	D8	Q	11 1000	F8	8
01 1001	D9	R	11 1001	F9	9
01 1010	5A	!	11 1010	7A	:
01 1011	5B	$	11 1011	7B	#
01 1100	5C	*	11 1100	7C	@
01 1101	5D	)	11 1101	7D	’
01 1110	5E	;	11 1110	7E	=
01 1111	5F	¬	11 1111	7F	”

Appendix D

Terminal Font Set Table

NOTE: *The Terminal Font Set table in this appendix applies to 6400, 5020, 5055, 59XX, 17XX, and 11XX Terminals. For the Terminal Font Set table for 2415, 2425, 2435A, 2455, or 248X Terminals, refer to the terminal's user manual.*

6400, 5020, 5055, 59XX, 17XX, and 11XX Terminals use a font set that supports English and Western European languages, such as French, German, Italian, Portuguese, and Spanish. You can develop applications to display any character in the terminal font set. Depending on the type of keyboard, you can also enter many of the characters. For help, see Section 3, "Using the Terminal's Keyboard."

Table D-1 lists the characters you can display on the terminal. It also lists the decimal and hexadecimal index values.

Table D-1
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
Space	0	00
Ã	1	01
ã	2	02
Õ	3	03
õ	4	04
∅	5	05
¨	6	06
—	7	07
↳	8	08
⇶	9	09
⏍	10	0A
☰	11	0B
Ψ	12	0C
Δ	13	0D
|	14	0E
¤	15	0F
▶	16	10
◀	17	11
⇵ ("communications loss" annunciator)	18	12
⛌ (5250 dup character)	19	13
X ("input inhibited" annunciator)	20	14

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
§	21	15
(“message waiting” annunciator)	22	16
(“radio” annunciator)	23	17
Unused	24	18
Unused	25	19
(“transmit” annunciator)	26	1A
(“receive” annunciator)	27	1B
(“battery” annunciator)	28	1C
Space	29	1D
▲	30	1E
Ý	31	1F
Space	32	20
!	33	21
‖	34	22
#	35	23
$	36	24
%	37	25
&	38	26
’	39	27
(	40	28
)	41	29
*	42	2A
+	43	2B
, (comma)	44	2C
- (dash)	45	2D
. (period)	46	2E
/	47	2F
0	48	30
1	49	31
2	50	32
3	51	33
4	52	34
5	53	35
6	54	36
7	55	37
8	56	38
9	57	39
:	58	3A
;	59	3B

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
<	60	3C
=	61	3D
>	62	3E
?	63	3F
@	64	40
A	65	41
B	66	42
C	67	43
D	68	44
E	69	45
F	70	46
G	71	47
H	72	48
I	73	49
J	74	4A
K	75	4B
L	76	4C
M	77	4D
N	78	4E
O	79	4F
P	80	50
Q	81	51
R	82	52
S	83	53
T	84	54
U	85	55
V	86	56
W	87	57
X	88	58
Y	89	59
Z	90	5A
[	91	5B
\	92	5C
]	93	5D
^	94	5E
_	95	5F
‘	96	60
a	97	61
b	98	62
c	99	63
d	100	64

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
e	101	65
f	102	66
g	103	67
h	104	68
i	105	69
j	106	6A
k	107	6B
l	108	6C
m	109	6D
n	110	6E
o	111	6F
p	112	70
q	113	71
r	114	72
s	115	73
t	116	74
u	117	75
v	118	76
w	119	77
x	120	78
y	121	79
z	122	7A
{	123	7B
¦	124	7C
}	125	7D
~	126	7E
⌂	127	7F
Ç	128	80
ü	129	81
é	130	82
â	131	83
ä	132	84
à	133	85
å	134	86
ç	135	87
ê	136	88
ë	137	89
è	138	8A
ï	139	8B
î	140	8C

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
ì	141	8D
Ä	142	8E
Å	143	8F
É	144	90
æ	145	91
Æ	146	92
ô	147	93
ö	148	94
ò	149	95
û	150	96
ù	151	97
ÿ	152	98
Ö	153	99
Ü	154	9A
¢	155	9B
£	156	9C
¥	157	9D
₨	158	9E
ƒ	159	9F
á	160	A0
í	161	A1
ó	162	A2
ú	163	A3
ñ	164	A4
Ñ	165	A5
ª	166	A6
º	167	A7
¿	168	A8
⌐ (not symbol)	169	A9
¬	170	AA
½	171	AB
¼	172	AC
¡	173	AD
«	174	AE
»	175	AF
⁘	176	B0
▒	177	B1
▓	178	B2
|	179	B3

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
┤	180	B4
╡	181	B5
╢	182	B6
╖	183	B7
╕	184	B8
╣	185	B9
║	186	BA
╗	187	BB
╝	188	BC
┘	189	BD
╜	190	BE
┐	191	BF
└	192	C0
┴	193	C1
┬	194	C2
├	195	C3
─	196	C4
┼	197	C5
╞	198	C6
╟	199	C7
╚	200	C8
╩	210	C9
╦	202	CA
╠	203	CB
═	204	CC
╬	205	CD
╧	206	CE
╨	207	CF
╤	208	D0
╥	209	D1
╙	210	D2
╘	211	D3
╒	212	D4
╓	213	D5
╫	214	D6
╪	215	D7
┘	216	D8
┌	217	D9

Table D-1 (Continued)
***Terminal Font Set** (6400, 5020, 5055, 59XX, 17XX, 11XX Terminals)*

Character	Decimal	Hexadecimal
⌐	218	DA
■	219	DB
▬	220	DC
▌	221	DD
▐	222	DE
▬	223	DF
∝	224	E0
β	225	E1
╔	226	E2
Π	227	E3
∑	228	E4
σ	229	E5
µ	230	E6
γ	231	E7
σ	232	E8
θ	233	E9
Ω	234	EA
δ	235	EB
∞	236	EC
ø	237	ED
∈	238	EE
∩	239	EF
≡	240	F0
±	241	F1
≥	242	F2
≤	243	F3
⌠	244	F4
⌡	245	F5
÷	246	F6
≈	247	F7
°	248	F8
○	249	F9
▪	250	FA
√	251	FB
n	252	FC
2	253	FD
■	254	FE
Space	255	FF

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NOTE:

This index covers all topics. Those in italics are figures, those in bold are tables.

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