VT 240 Series

Owner's Manual

digital

VT 240 Series

Owner's Manual

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This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/ television technician for additional suggestions. The user may find the booklet *How to Identify and Resolve Radio/TV Interference Problems,* prepared by the Federal Communications Commission, helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

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INTRODUCTION

This manual provides the information you need to operate and maintain your VT240 series video terminal. The manual is organized into six chapters and three appendices as follows.

- Chapter 1, "A Look at the Terminal," introduces you to the VT240 series of terminals. This chapter provides an overview of what the terminals are and what they do, then briefly describes how they work.

- Chapter 2, "Controls, Indicators, and Connectors," describes the terminal controls, indicators, and connectors, and shows their locations.

- Chapter 3, "Operating Procedures," provides information on specific terminal functions and operating procedures.

- Chapter 4, "Terminal Set-Up," describes each set-up screen feature in detail. This chapter shows you how to select set-up features to define the terminal's operating characteristics.

- Chapter 5, "Communication," describes how the VT240 series terminal communicates with a host computer and a peripheral device such as a printer.

- Chapter 6, "Problem Solving," describes the self-test used to find terminal hardware problems. This chapter also contains simple troubleshooting information to correct common operating problems.

- Appendix A, ''Specifications,'' provides all VT240 series terminal specifications.

- Appendix B, ''Options, Documentation, and Supplies,'' describes the options, related documentation, and supplies mentioned in this manual and how to order them.

- Appendix C, ''Keyboards,'' shows the various keyboards available with the VT240 series terminal.

A LOOK AT THE TERMINAL 1

GENERAL
This chapter introduces you to the VT240 series of terminals. This series includes the VT240 and VT241 terminals. The chapter provides an overview of what these terminals are and what they do, then briefly describes how the terminals work.

VT240 COMPONENTS
The three main components of the VT240 series terminals are the monitor, the system box, and the keyboard (Figure 1-1). The VT240 and VT241 terminals use the same system box and keyboard; the only difference between the
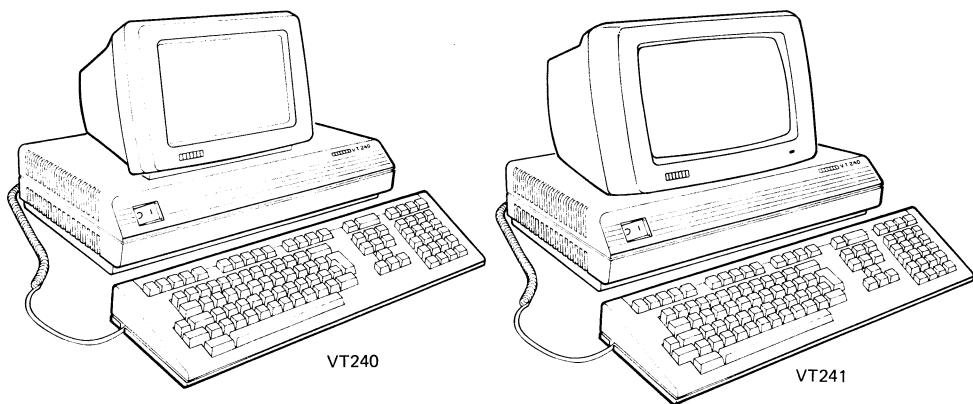
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Figure 1-1   VT240 Series Video Terminals

terminals is the monitor. The VT240 has a monochrome monitor, while the VT241 has a color monitor. This manual uses the VT240 to describe general applications, since both the VT240 and VT241 operate the same way.

Monitor
The monitor consists of a monochrome or color cathode-ray tube (CRT) and a monitor board. A single cable connects the monitor to the system box.

System Box
The system box is the electronic center of the terminal. The main parts of the system box are a power supply, a controller board that contains the central processing unit (CPU), and electrical connectors.

Keyboard
The low-profile keyboard has four groups of keys and four visual indicators. The main keypad operates like a typewriter keyboard. A single coiled cable connects the keyboard to the terminal.

There are 15 basic keyboards available with the VT240. (See Appendix C.) Each keyboard is for a different language.

HOW THE VT240 WORKS
The VT240 is a general-purpose video display terminal that lets you interact with a software application program. You send characters to the application program by typing on the keyboard. Characters sent by the application program appear as text on the monitor screen. You can print the images (text and graphics) you create on the terminal if the terminal is connected to a printer.

The terminal operates by executing standard American National Standards Institute (ANSI) functions in text mode, and ReGIS (Remote Graphics Instruction Set) or Tektronix 4010/4014 in graphics mode. You send characters to the host computer by typing on the keyboard. Characters sent from the computer appear on the monitor screen.

OPERATING STATES
The VT240 has three operating states you can select from the keyboard.

- Set-up
- On-line
- Local

Set-Up
The set-up state lets you select or examine terminal operating features. Chapter 4 describes these set-up features in detail. You also use set-up to select the on-line and local states.

You select set-up from the keyboard by pressing the **Set-Up** key.

On-Line
The on-line state lets the terminal communicate with a host computer. Data entered at the keyboard is sent to the host computer. Data received from the host computer is displayed on the monitor. You can also display data entered from the keyboard on the screen, if you select the local echo feature in set-up (Chapter 4).

You can only select on-line in set-up.

Local
The local state lets you place the host computer on hold. Data entered at the keyboard is sent to the monitor, but not to the host computer. Data received from the host computer is stored; this data is sent to the monitor after you put the terminal back on-line.

You can only select local in set-up.

OPERATING MODES

The VT240 has five major operating modes. You can select these modes in set-up. The default operating mode is VT200 mode, 7-bit controls. A *default* setting is a factory setting the terminal uses until you change that setting.

- VT200 mode, 7-bit controls
- VT200 mode, 8-bit controls
- VT100 mode
- VT52 mode
- 4010/4014 mode

VT200 Mode, 7-Bit Controls

This mode executes standard ANSI functions and lets you use the full range of VT240 capabilities. You should use this mode with application programs that expect 7-bit control characters and either DEC multinational characters or national replacement characters (depending on the character set selected in set-up, Chapter 4).

NOTE: In general, most VT100 application programs will run in VT200 mode, 7-bit controls.

VT200 Mode, 8-Bit Controls

This mode also executes standard ANSI functions and lets you use the full range of VT240 capabilities. You should use this mode with application programs that expect 8-bit control characters and DEC multinational characters.

VT100 Mode

This mode executes standard ANSI functions. You should use this mode with application programs that require strict compatibility with Digital's VT100 terminal.

VT52 Mode

This is a text mode that executes Digital (DEC) private functions (not ANSI). You should use VT52 mode for compatibility with existing application programs designed for Digital's VT52 terminal.

4010/4014 Mode

This is a graphics mode. You should use this mode with application programs designed for Tektronix 4010 and 4014 terminals.

CHARACTER SET MODES

The VT240 has two basic character set modes, multinational and national.

Multinational mode supports the DEC multinational character set (DEC MCS). The DEC MCS is an 8-bit character set that contains most characters used in the major European languages. The ASCII character set is included in the DEC MCS.

National mode supports the national replacement character (NRC) sets. The NRC sets are a group of eleven 7-bit character sets. You can only use one NRC set at a time. The NRC set available depends on the keyboard selected in set-up (Chapter 4). National mode restricts compatibility to a 7-bit environment, so the DEC MCS is not available.

ReGIS GRAPHICS

You can use ReGIS graphics mode in VT100 or VT200 modes, using commands from the keyboard or from the host computer. You can use ReGIS graphics mode with application programs designed for Digital's VT125 terminals.

CRT SAVER FEATURE

If during normal operation the terminal is inactive for 30 minutes (no keyboard activity or input from a host computer), the monitor screen goes blank (but data is not lost). Keyboard activity or input from the host computer activates the monitor again. To reactivate the screen, press the **Ctrl** key.

PROGRAMMING THE VT240

Your VT240 comes with a *VT240 Programmer Pocket Guide.* This guide provides a summary of the control codes used to access the terminal's features. For more detailed information, you can order the *VT240 Programmer Reference Manual* from Digital. (See Appendix B for ordering information.)

NOTE: This manual describes the use of the North American keyboard, unless otherwise specified. When you use the North American keyboard, the terminal defaults to multinational mode. (National mode is disabled.)

CONTROLS, INDICATORS, AND CONNECTORS 2

GENERAL

This chapter provides information about the terminal's controls, indicators, and connectors. The chapter also describes the keyboard, including the three keypads and special function keys.

SYSTEM BOX

The system box controls, indicators, and connectors are shown in Figure 2-1 and described in Table 2-1.

POWER SWITCH

INTEGRAL MODEM OPTION PANEL

VIDEO MONITOR CONNECTOR

POWER CORD CONNECTOR (DO NOT REMOVE LABEL YET)

FUSE

VOLTAGE SELECTION SWITCH

20mA
20 MA HOST PORT CONNECTOR

POWER OK INDICATOR

KB
KEYBOARD CONNECTOR

Comm
EIA HOST PORT CONNECTOR

COMPOSITE VIDEO OUTPUT CONNECTOR

PR
PRINTER PORT CONNECTOR
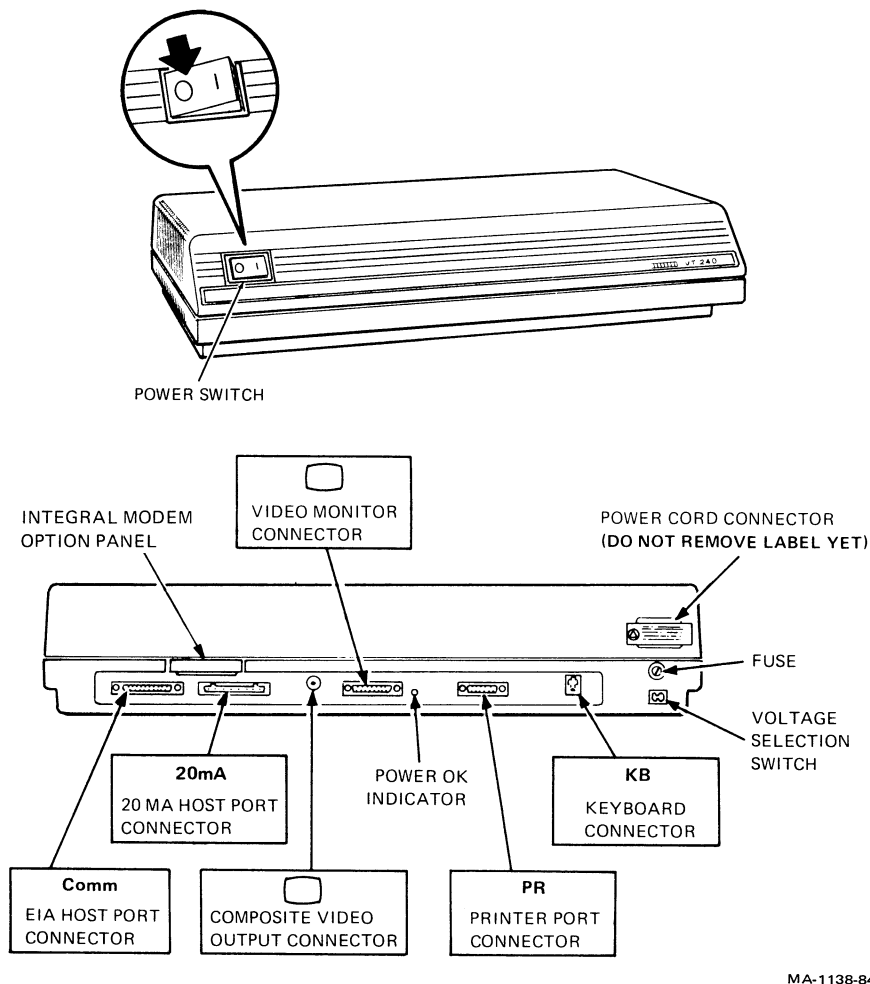
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Figure 2-1   System Box Controls, Indicators, and Connectors

Table 2-1   System Box Controls, Indicators and Connectors

Control/Indicator/Connector	Description
Power switch	Turns the terminal on or off. Pressing **1** turns power on. Pressing **0** turns power off.

Table 2-1   System Box Controls, Indicators and Connectors (Cont)

Control/Indicator/Connector	Description
EIA host port connector	Connects the terminal to a host computer, either directly or via a modem.
20 mA host port connector	Connects the terminal to a nearby host computer via a 20 mA connection.
Composite video output connector	Provides a complete video output signal to an additional slave monitor.
Video monitor connector	Connects the video monitor cable from the system box to the monitor.
Power OK indicator	Turns on to indicate correct power is applied to the terminal.
Printer port connector	Connects a printer or peripheral device to the terminal.
Keyboard connector	Connects the keyboard cable to the system box from the keyboard.

NOTE: You can also connect the keyboard cable from the video monitor to the keyboard.

AC input connector	Connects the power cord to the system box from the wall outlet.
Fuse	Protects the system from electrical damage.
Voltage select switch	This slide switch lets you match the terminal voltage to the wall outlet voltage. See the *VT240 Series Installation Guide* for the correct setting.

CAUTION: An incorrect setting can damage the terminal.

MONOCHROME MONITOR

The monochrome monitor controls, indicators, and connectors are shown in Figure 2-2 and described in Table 2-2.
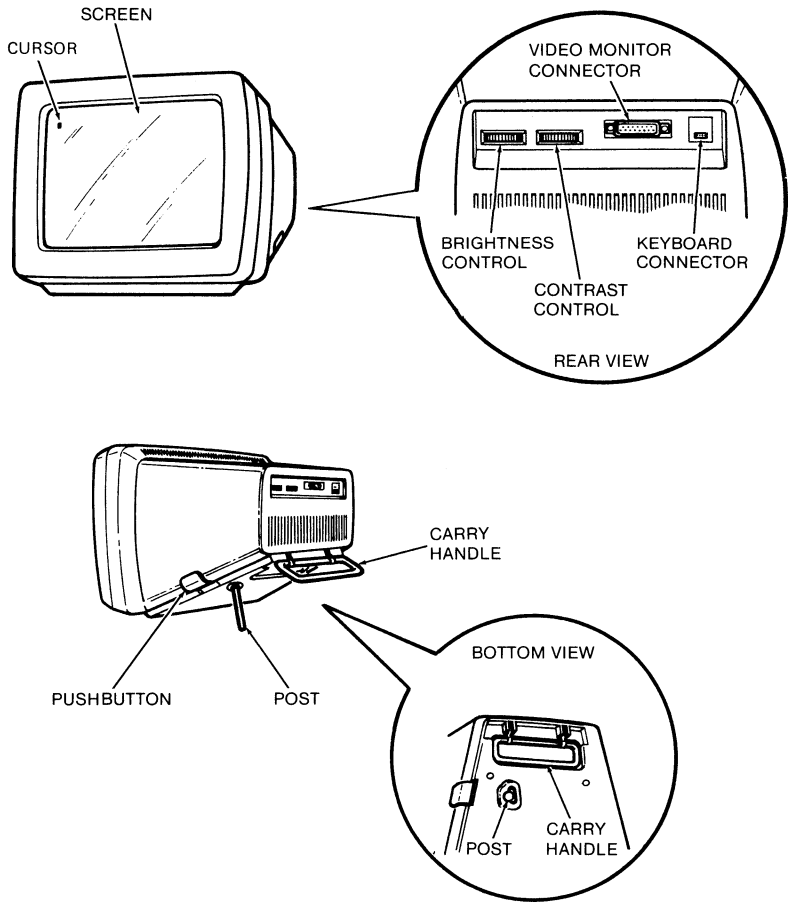
Figure 2-2   Monochrome Monitor Controls, Indicators, and Connectors

Table 2-2   Monochrome Monitor Controls, Indicators, and Connectors

Control	Description
Contrast control	Adjusts the degree of contrast on the monitor screen.
Brightness control	Adjusts the degree of brightness on the monitor screen.
Video monitor connector	Connects the video monitor cable to the monitor from the system box.
Keyboard connector	Connects the keyboard cable to the monitor from the keyboard.

NOTE: You can also connect the keyboard cable from the system box to the keyboard.

Pushbutton	Adjusts the viewing angle of the monitor. Pressing the pushbutton releases a post that drops to provide a 0 to 30 degree tilt range.
Carry handle	Lifts from recess to provide an easy and safe way to carry the video monitor.

COLOR MONITOR

The color monitor controls, indicators, and connectors are shown in Figure 2-3 and described in Table 2-3.
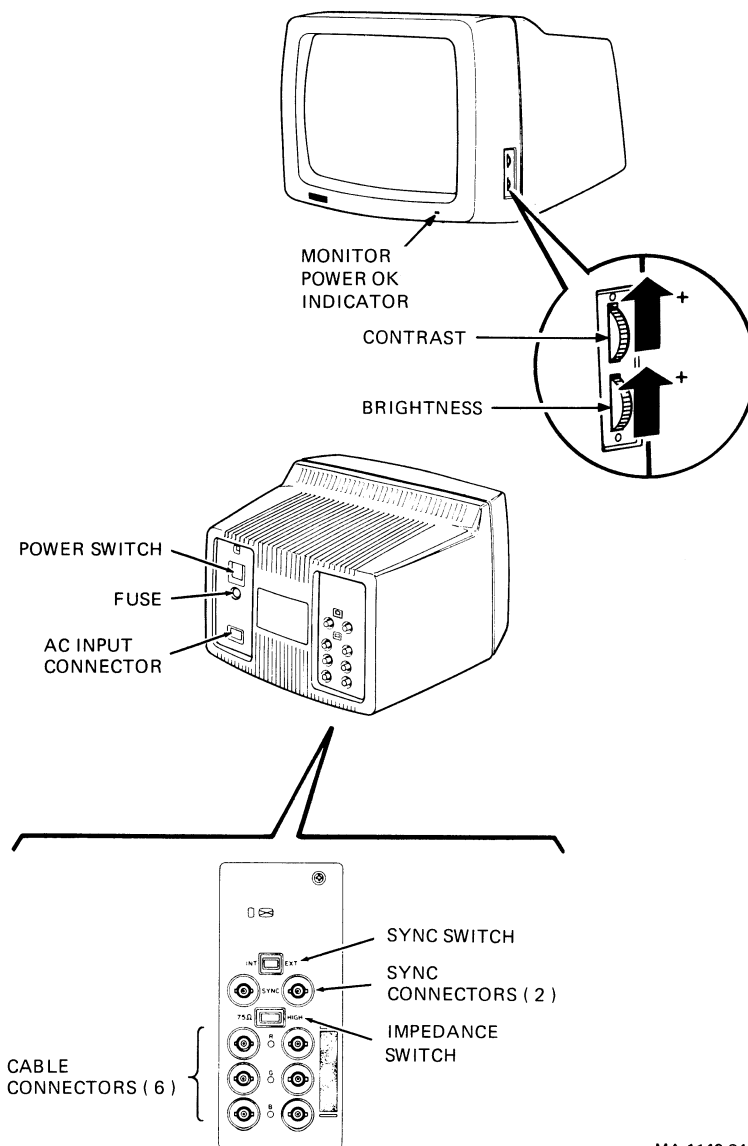
Figure 2-3   Color Monitor Controls, Indicators, and Connectors

Table 2-3   Color Monitor Controls, Indicators, and Connectors

Control	Description
Voltage select switch	This slide switch lets you match the monitor voltage to the wall outlet voltage. See to the *VT240 Series Installation Guide* for the correct setting.

CAUTION: An incorrect setting can damage the monitor.

Control	Description
Power switch	Turns the monitor on or off. Pressing **1** turns power on. Pressing **0** turns power off.
Fuse	Protects the monitor from electrical damage.
AC input connector	Connects the power cord to the monitor from the wall outlet.
Sync switch	Selects internal or external synchronization.
Sync connectors	Connects sync cables.
Impedance switch	Selects 75 ohms or high impedance.
Video cable connectors	Connects the red, green, and blue video cables to the monitor.
Contrast control	Adjusts the degree of contrast on the monitor screen.
Brightness control	Adjusts the degree of brightness on the monitor screen.
Power OK indicator	Turns on to indicate correct power is applied to the monitor.

Cursors

The monitor displays one of two cursors, a text cursor (visible in text mode only) or a graphics cursor (visible in graphics mode only).

The text cursor indicates where the next alphanumeric character will appear. You can select the type of text cursor in set-up: an underline cursor, block cursor, or no cursor display.

The graphics cursor indicates the current screen location that the terminal is referencing. This location is the point on the screen most recently moved to or drawn to. You can turn the graphics cursor on or off in set-up.

KEYBOARD

The keyboard (Figure 2-4) consists of the following parts.

> Main keypad
> Editing keypad
> Auxiliary keypad
> Top-row function keys
> Four visual indicators
> Two audible indicators
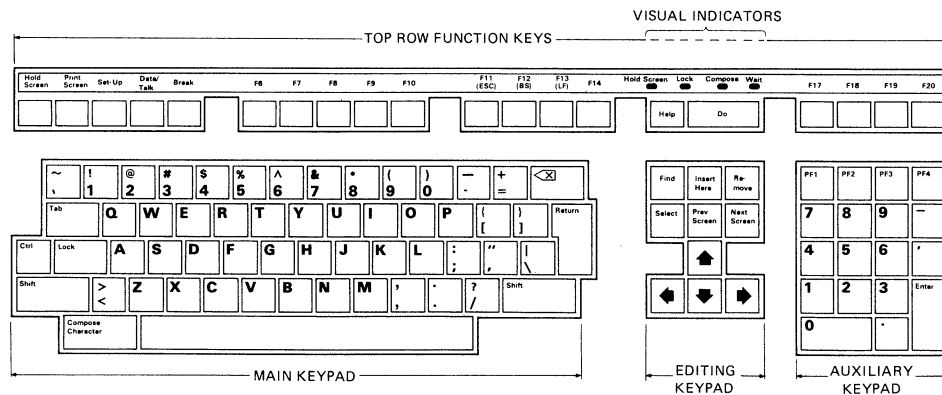
Figure 2-4   Keyboard (North American)
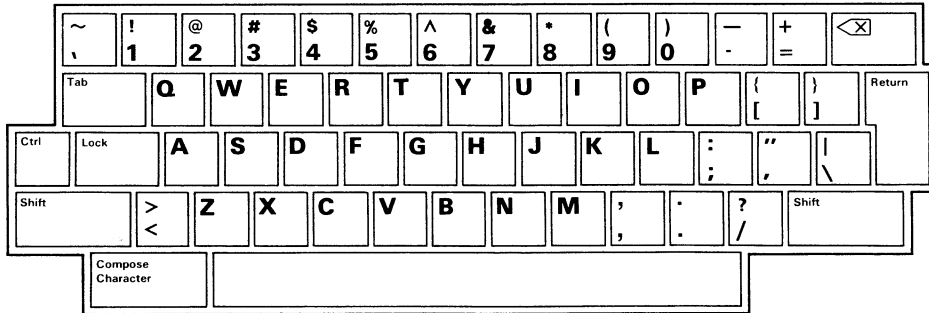
Figure 2-5   Main Keypad

MAIN KEYPAD
This keypad (Figure 2-5) operates like a standard typewriter keyboard.

The main keypad has the following special function keys.
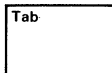
   Tab

Pressing the **Tab** key sends a horizontal tab, which normally moves the cursor to the next tab stop.

   Ctrl

Holding down the **Ctrl** key and pressing another key sends a control code to the system. A control code tells the system to perform a predefined operation.

In this manual, keyboard control functions using **Ctrl** appear as follows.

    Ctrl-(other key)

For example, **Ctrl-Z** means to press and hold **Ctrl** while pressing the **Z** key.
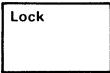
Lock

Pressing the **Lock** key down makes the alphabetic keys send uppercase characters. Pressing **Lock** again makes the alphabetic keys send lowercase characters. **Lock** is similar to the Shift Lock key on a typwriter.
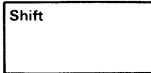
Shift

Holding down the **Shift** key and pressing another key sends uppercase characters, or the top symbol on two-character keys.

In some cases, you use **Shift** with another key to send a predefined control function. In this manual, keyboard control functions using **Shift** appear as follows.

Shift-(other key)

For example, **Shift-Print Screen** means to press and hold **Shift** while pressing the **Print Screen** key.

Return

Pressing the **Return** key sends either a carriage return or a carriage return and line feed (selected in the General Set-Up screen, Chapter 4). In some cases, **Return** moves the cursor to the next line when editing text. In others, **Return** is a signal to the system that a particular operation is complete.
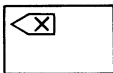
(Delete)

Pressing the ⌫ (delete) key sends a DEL (delete) character. Normally, ⌫ (delete) erases one character to the left of the cursor. Typing **Shift-**⌫ (delete) sends a CAN (cancel) character.
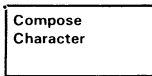
Compose Character

**Compose
Character**

This key lets you create characters that do not exist as standard keys on your keyboard. See the "Composing Characters" section in Chapter 3 to use this key.

EDITING KEYPAD
Normally, you use the editing keypad (Figure 2-6) to control the cursor and edit data that you already entered.

In a typical editing operation, the four arrow keys move the cursor in the direction indicated by the arrow. The six editing keys have functions corresponding to their legends. See your application software manual for specific information.

AUXILIARY KEYPAD
The auxiliary keypad (Figure 2-7) lets you enter numeric data as you would with a standard calculator. Some keys (**PF1**, **PF2**, **PF3**, and **PF4**) may have functions assigned by the application software. See your application software manual for specific information.

The **Enter** key causes a carriage return or a carriage return and line feed, depending on the General Set-Up screen selection. You can also use **Enter** in set-up, to activate a selected feature.
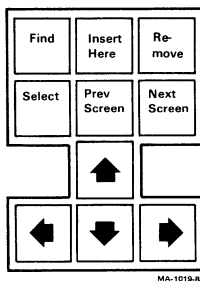
Figure 2-6   Editing Keypad
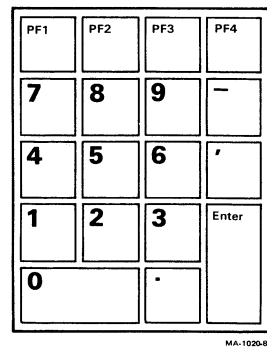
Figure 2-7   Auxiliary Keypad
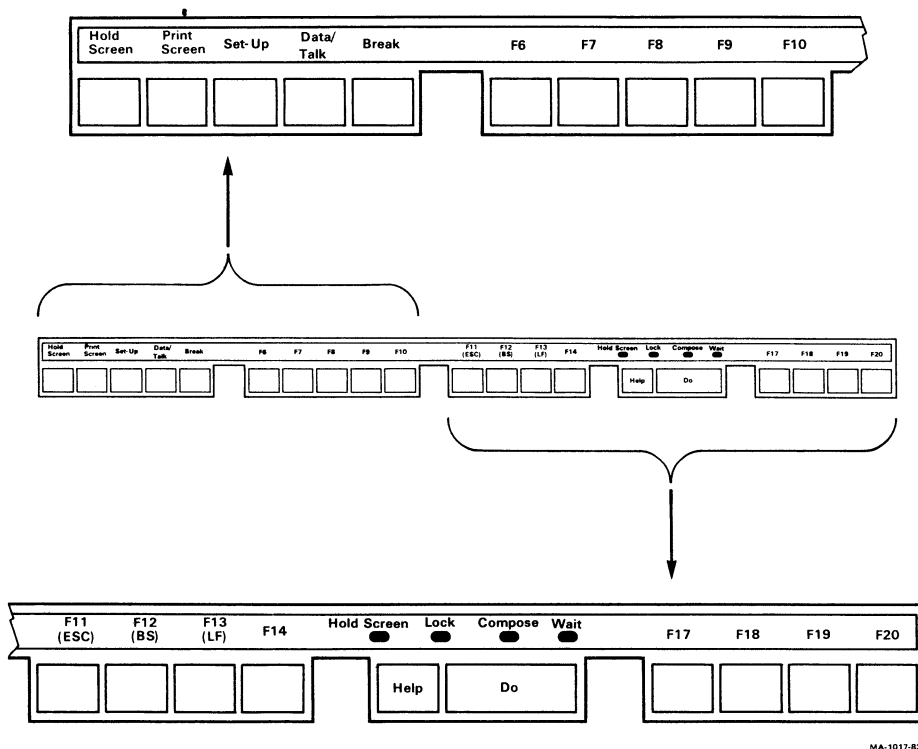
Figure 2-8   Top-Row Function Keys and Visual Indicators

TOP-ROW FUNCTION KEYS

Most of the top-row function keys (Figure 2-8) have functions assigned by the application software. Your application software manual should describe the function of these keys. The following paragraphs describe the predefined top-row keys.

Hold Screen

Pressing the **Hold Screen** key freezes the screen display and stops any new characters from being displayed. The Hold Screen indicator comes on when you press this key. Pressing **Hold Screen** again returns the terminal to normal operation and turns off the Hold Screen indicator.

Print
Screen

Print Screen

Pressing the **Print Screen** key sends the text on the screen to the printer.

Typing **Shift-Print Screen** sends the screen image to the printer.

Typing **Ctrl-Print Screen** sets or resets auto print mode. See the "Auto Print Mode" section in Chapter 3.

Set-Up

Set-Up

Pressing the **Set-Up** key causes the terminal to enter or exit the set-up state. (See Chapter 4.)

Data/
Talk

Data/Talk

The **Data/Talk** key only operates if the optional integral modem is installed. (See Chapter 3.)

Break

Break

The **Break** key works alone or with other keys to perform an operation.

- Pressing **Break** alone sends a break if break is enabled in set-up. (See the "Keyboard Set-Up Screen" section in Chapter 4.)

- Typing **Shift-Break** starts a disconnect. (See the "Connect/Disconnect" section in Chapter 5.)

- Typing **Ctrl-Break** sends the answerback message to the host computer. (See the "Keyboard Set-Up Screen" section in Chapter 4.)

F11
(ESC)

F11
(ESC)

F11 is normally a function key used by application programs. In VT100 and VT52 modes, it sends an ESC (escape) character.

F12
(BS)

F12
(BS)
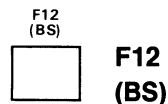
F12 is normally a function key used by application programs. In VT100 and VT52 modes, it sends a BS (backspace) character.

F13
(LF)

F13
(LF)
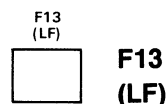
F13 is normally a function key used by application programs. In VT100 and VT52 modes, it sends an LF (line feed) character.

Function Key Summary
The following keys are function keys used by application programs. Each key takes on a meaning defined by the particular application program. The meaning of a key may or may not correspond to the legend on the key. The following list shows typical uses for each key. Actual use depends on the application.

Application-Defined Keys

F6	Do
F7	F17
F8	F18
F9	F19
F10	F20
F11 (ESC)	PF1
F12 (BS)	PF2
F13 (LF)	PF3
F14	PF4
Help	

Cursor Positioning Keys

(←)
(→)
(↑)
(↓)

Editing Keys

Find
Insert Here
Remove
Select
Prev Screen
Next Screen

NOTE: In 4010/4014 mode, pressing the **Next Screen** *key clears the screen.*

VISUAL INDICATORS
The keyboard has four visual indicators showing the current terminal status or operation in progress.

Hold Screen Indicator
The Hold Screen indicator is on when the video monitor screen is frozen. See the ''Hold Screen'' key description.

Lock Indicator
The Lock indicator comes on to indicate that the keyboard will send uppercase characters only. See the ''Lock'' key description.

Compose Indicator
The Compose indicator comes on to indicate you are performing a compose sequence. (See the ''Composing Characters'' section in Chapter 3.)

Wait Indicator
The Wait indicator is on when the keyboard is prevented (locked) from sending information. You can clear this locked condition by invoking the `Clear Comm` feature from the Set-Up Directory screen (Chapter 4). See Chapter 5 for the causes of the keyboard locked condition.

AUDIBLE INDICATORS

The keyboard can generate two sounds you select from the Keyboard Set-Up screen (Chapter 4), a keyclick and a bell. You can use the bell as a margin bell, warning bell, or both.

Keyclick

The keyclick sound occurs each time you press a key, with the following exceptions

- You press **Shift** or **Ctrl**. These keys do not make a keyclick, because they do not send a character. They modify characters sent by other keys.

- The Wait indicator is on; characters from the keyboard are lost.

- The keyclick set-up feature is off.

- You press an inactive key.

Bell

The bell tone sounds in each of the following cases.

- As part of the power-up self-test

- When the terminal receives a bell (BEL) character from the computer

- After a compose character error

- When the cursor approaches the right margin

OPERATING PROCEDURES 3

GENERAL

This chapter helps you to become familiar with some specific terminal functions and operating procedures. However, your main reference source is the documentation for your application software.

PRINTING

The VT240 has a built-in serial printer interface that supports the following optional Digital printers.

    LA34/38
    LA35/LA36
    LA12
    LA100
    LA120
    LA50
    LQP02

The VT240 printing functions operate in one of four modes selected from set-up screens (Chapter 4).

Mode	Set-Up Screen
Normal (default)	Printer Set-Up
Auto print	Printer Set-Up
Printer controller	Printer Set-Up
Local controller	Set-Up Directory and Printer Set-Up

These modes let the terminal perform several print operations selected from the keyboard and/or the computer.

Normal Mode

Normal mode lets you select all local printing functions (such as `Print Full Page`) from the keyboard.

Auto Print Mode

Auto print mode prints the current display line when the cursor moves to the next line. The cursor moves to the next line when the terminal (1) receives a line feed, form feed, or vertical tab, or (2) automatically wraps the line. When selected, `Auto Print Mode` appears on the status line in set-up. You can use all keyboard printing functions (such as `Print Full Page`) in auto print mode.

To select auto print mode, type **Ctrl-Print Screen**. To exit auto print mode, type **Ctrl-Print Screen** again.

Printer Controller Mode

In printer controller mode, the host computer has direct control of the printer. Characters received from the host computer go directly to the printer, and are not displayed on the screen. (See Chapter 5). When selected, `Printer Controller Mode` appears on the status line in set-up. You cannot select this mode from the keyboard (except by entering set-up).

You cannot use local printing functions in printer controller mode. For example, `Print Full Page` does not work.

Local Controller Mode
Local controller mode is a special mode that lets you send information directly from the keyboard to the printer. You may find this feature useful in setting up certain printers for operation, without involving the host computer.

To select local controller mode, you must select two different set-up features.

1. `Local` – selected in the Set-Up Directory screen.

2. `Printer Controller Mode` – selected in the Printer Set-Up screen.

When you select these two set-up features, the terminal is in local controller mode.

INTEGRAL MODEM/AUTO DIALER OPTION
The integral modem/auto dialer option lets you use a telephone for normal voice communication and the terminal for data communication, on the same communications line. This option also lets you use the keyboard to dial telephone numbers to a host computer, instead of using the telephone.

The modem and telephone status appear on the status line in set-up (Chapter 4).

NOTE: The integral modem/auto dialer functions are available only if the option is installed.

The integral modem/auto dialer has three operating modes.

Data mode (default)
Talk mode
Dialer mode

Data Mode
Data mode lets the terminal send and receive data from the host computer. You cannot use the telephone for voice communication in this mode.

To enter data mode, press the **Data/Talk** key.

Talk Mode

Talk mode lets you use the telephone for normal voice communication. Entering talk mode automatically stops data communication with the host computer.

To enter talk mode, type **Ctrl-Data/Talk**.

Dialer Mode

Dialer mode lets you perform the following actions.

1. Use the keyboard to dial a telephone number.

2. Use a single keystroke to redial the last telephone number dialed.

3. Recall and dial telephone numbers you have stored.

To enter dialer mode, type **Shift-Data/Talk**.

USING DIALER MODE FEATURES

The following sections explain how to use dialer mode features, such as dialing and redialing telephone numbers, and dialing stored telephone numbers.

Typing a Telephone Number at the Keyboard

You use the numeric characters 0 through 9 (on the main keypad or numeric keypad) as the conventional telephone number digits. You use the following characters to perform the functions described.

Character	Function
(=)	The equal sign acts as a pause character.
(-, space)	These characters act as separators.

Telephone numbers are limited to 24 characters, including the pause and separator characters. You cannot use alphabetic characters.

You can use the ⌫ (delete) key to correct errors when entering telephone numbers.

Dialing a New Telephone Number

You can dial a new telephone number at any time (without entering set-up) as follows.

1. Type **Shift-Data/Talk** to enter dialer mode. The monitor displays the following message.

   ```
   [Entering Dialer Mode]
   Enter Number:
   ```

2. Enter the telephone number you want to dial and press the **Return** key.

The terminal dials the number while displaying the following message.

```
Dialing (number)
Waiting for connection
```

The terminal remembers this number until you dial another.

Redialing the Last Telephone Number Dialed

You can redial the last telephone number you dialed at any time (without entering set-up) as follows.

1. Type **Shift-Data/Talk** to enter dialer mode. The monitor displays the following message.

   ```
   [Entering Dialer Mode]
   Enter Number:
   ```

2. Press the **Return** key to dial the number. (You do not have to type the number again.)

The terminal dials the last number you dialed, while displaying the following message.

```
Dialing (number)
Waiting For Connection
```

The terminal remembers this number until you dial another.

Call Status

If the telephone number you dial is answered within 30 seconds, the monitor displays the following message.

```
Connection Established
[Exiting Dialer Mode]
```

The terminal enters on-line mode, allowing the monitor to display the host system response messages.

If the telephone number you dial is not answered within 30 seconds, the monitor displays the following message.

```
Connection not Established
[Exiting Dialer Mode]
```

The terminal then stops the call.

Storing Telephone Numbers

You can store up to two telephone numbers in set-up. You can then dial these stored numbers (designated A and B) in dialer mode by pressing the **A** or **B** key followed by **Return**. The terminal automatically dials the telephone numbers.

NOTE: For information on using set-up features, see Chapter 4.

Use the following procedure to store telephone numbers.

1. Press the **Set-Up** key and select `Telephone Set-Up`.

2. Select the `Telephone Number A=` or `Telephone Number B=` field. The set-up status line displays the message `Enter Telephone Number`.

3. Type the telephone number you want to store. The monitor displays the number in the `Telephone number` field.

4. Press the **Enter** key to store the telephone number. The terminal stores the number until you change it.

5. Press **Set-Up** to exit set-up.

Dialing Stored Telephone Numbers

Use the following procedure to dial telephone numbers you stored in set-up.

1. Type **Shift-Data/Talk** to enter dialer mode. The monitor displays the following message

   ```
   [Entering Dialer Mode]
   Enter number:
   ```

2. Press the **A** or **B** key for the telephone number you want dialed. Then press the **Return** key. The monitor displays the following message.

   ```
   Dialing (number)
   Waiting for connection
   ```

NOTE: The monitor screen does not display characters if you chose to conceal the number. (See the "Telephone Set-Up Screen" section in Chapter 4 for information on the `Concealed` *feature.)*

Disconnecting Calls

To disconnect a call at any time, use the following method.

- Type **Shift-Break**. This starts a disconnect. The monitor displays the following message.

   ```
   [Disconnected]
   ```

Monitor Display Messages

Table 3-1 describes the messages the monitor may display when you use dialer mode.

Table 3-1   Dialer Mode Display Messages

Message	Meaning
`[Entering Dialer Mode]` `Enter number:`	Tells you the telephone is effectively off the hook, and the terminal is ready to dial a number. Enter the number you want dialed.
`Dialing (number)` `Waiting For Connection`	Tells you there is a dial tone, and a number is being dialed.

`Dialing`
`No Dial Tone Detected`
 	
`Press Shift-Data/Talk to restart.`
`Press Enter to continue dialing.`
	Tells you no dial tone has been detected. This means your dial tone was not detected by the circuitry, or no dial tone was present.
	
	If your dial tone is present, but not detectable, press **Enter** to continue dialing.

`Connection Established` `[Exiting Dialer Mode]`	Tells you the call has been answered.
`Connection Not Established` `[Exiting Dialer Mode]`	Tells you the call was not answered within 30 seconds and has been aborted.
`[Disconnected]`	Tells you the call has been disconnected.

COMPOSING CHARACTERS

You can use *compose sequences* to create characters that do not exist as standard keys on your keyboard. To use a compose sequence, you press a series of keys. There are two types of compose sequences: three-stroke sequences and two-stroke sequences.

NOTE: The compose sequences you can use depend on the character set mode selected (multinational or national). Table 3-2 lists the valid compose sequences for multinational mode. Table 3-3 lists the valid compose sequences for each keyboard in national mode. In national mode, the compose sequences you can use depend on the keyboard selected.

You can use three-stroke sequences on all VT240 keyboards. First you press the **Compose Character** key, then you press two keys whose characters form a valid compose sequence.

You can use two-stroke sequences on all keyboards except the North American keyboard. Two-stroke sequences are faster than three-stroke sequences, but are limited to sequences starting with the following nonspacing diacritical marks: grave accent, acute accent, circumflex accent, tilde mark, diaeresis mark (umlaut), and ring mark. Two-stroke sequences do not use the **Compose Character** key. Instead, you enter a diacritical mark first. You then enter a standard character that forms a valid compose sequence with the diacritical mark.

Diacritical marks are available on all but the North American keyboard. The diacritical marks vary among the keyboards, depending on relative use. Also, some keyboards have keys that contain both a standard character and a diacritical mark.

As with standard keys, you select the character you want with the **Shift** and **Lock** keys.

If you use a diacritical mark within a three-stroke sequence, the diacritical mark is treated as its equivalent character.

Diacritical Mark	Equivalent Character
Diaresis (umlaut) mark	Double quote "
Acute accent	Apostrophe '
Grave accent	Single quote '
Circumflex accent	Circumflex character ^
Tilde mark	Tilde character ~
Ring mark	Asterisk * or degree °

Tables 3-2 and 3-3 list all valid compose sequences for multinational and national mode, respectively. Depending on the keyboard, you can create the characters listed in column 1 in one or more ways.

- With a standard key (if available on that keyboard)

- With a three-stroke compose sequence (always)

- With a two-stroke compose sequence (if the diacritical mark is available on the keyboard)

Using a Three-Stroke Compose Sequence
Create a three-stroke compose sequence as follows.

1. Find the character you want to create in column 1 of Table 3-2 or 3-3.

2. Press the **Compose Character** key. (The Compose indicator comes on, indicating the terminal is in compose mode.)

3. Type the two characters in column 2 for the character you want to create.

For example, to create e with acute accent, press **Compose Character**, and then type e and apostrophe; or press **Compose Character**, and then type apostrophe and e.

When you complete a valid sequence, the Compose indicator turns off, and the composite character is sent to the application. If you use an invalid sequence, the sequence is aborted and the bell sounds (if the warning bell is enabled in the Keyboard Set-Up screen, Chapter 4).

NOTE: Function keys abort a compose sequence without sounding the bell.

Using a Two-Stroke Compose Sequence
Create a two-stroke compose sequence as follows.

NOTE: You can use two-stroke compose sequences on all keyboards except the North American keyboard.

1. Find the character you want to create in column 1 of Table 3-2 or 3-3. Verify from column 3 that the character can be created.

2. Press the key with the diacritical mark shown in column 3. (The Compose indicator comes on, indicating the terminal is in compose mode.)

3. Type the second character shown in column 3.

For example, to create e with a grave accent on a Danish keyboard, press the key that has the grave accent and then type e.

When you complete a valid sequence, the Compose indicator turns off, and the composite character is sent to the application. If you use an invalid sequence, the sequence is aborted and the bell sounds (if the warning bell is enabled in the Keyboard Set-Up screen, Chapter 4).

NOTE: Function keys abort a compose sequence without sounding the bell.

Aborting or Restarting a Compose Sequence
If you accidently enter compose mode (by pressing the **Compose Character** key or a diacritical mark key), press the ⟨⌫⟩ (delete) key to immediately abort the compose sequence and exit compose mode. No character is sent to the application.

If you press **Compose Character** during a compose sequence, a new three-stroke sequence starts from that point. The previous sequence is aborted with no effect on the application.

Table 3-2   Valid Compose Sequences: Multinational Mode

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character		(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
"	(quotation mark)	" (sp)	˙˙(sp)
#	(number sign)	++	
'	(apostrophe)	' (sp)	' (sp)
@	(commercial at)	a a or A A	
[	(opening bracket)	((	
\	(backslash)	// or /<	
]	(closing bracket)	))	
^	(circumflex accent)	^ (sp)	^ (sp)
'	(single quote)	' (sp)	' (sp)
{	(opening brace)	(–	
|	(vertical line)	/^	
}	(closing brace)	) –	
~	(tilde)	~ (sp)	~ (sp)
¡	(inverted !)	! !	
¢	(cent sign)	c/ or C/ or c| or C|	
£	(pound sign)	l– or L– or l= or L=	
¥	(yen sign)	y– or Y– or y= or Y=	
§	(section sign)	so or SO or s! or s! or sØ or SØ	
¤	(currency sign)	xo or XO or xØ or XØ	
©	(copyright sign)	co or CO or cØ or CØ	
ª	(feminine ordinal indicator)	a– or A–	

Table 3-2   Valid Compose Sequences: Multinational Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
« (angle quotation mark left)	<<	
° (degree sign)	ø^ or (sp) # or (sp) o	°(sp)
± (plus/minus sign)	±	
² (superscript 2)	2^	
³ (superscript 3)	3^	
µ (micro sign)	/u or /U (order sensitive)	
¶ (paragraph sign)	p! or P!	
· (middle dot)	.^	
¹ (superscript 1)	1^	
º (masculine ordinal indicator)	o- or o-	
» (angle quotation mark right)	>>	
¼ (fraction one-quarter)	1 4 (order sensitive)	
½ (fraction one-half)	1 2 (order sensitive)	
¿ (inverted ?)	??	
À (A grave)	A`	`A
Á (A acute)	A'	'A
Â (A circumflex)	A^	^A
Ã (A tilde)	A~	~A
Ä (A umlaut)	"A or A˙˙	˙˙A
Å (A ring)	A* or A° (degree sign)	°A
Æ (A E ligature)	AE (order sensitive)	

(sp) = space

Table 3-2   Valid Compose Sequences: Multinational Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
ç (C cedilla)	C ,	
è (E grave)	E `	` E
é (E acute)	E '	' E
ê (E circumflex)	E ^	^ E
ë (E umlaut)	E " or E ˙˙	˙˙ E
ì (I grave)	I `	` I
í (I acute)	I '	' I
î (I circumflex)	I ^	^ I
ï (I umlaut)	I " or I ˙˙	˙˙ I
Ñ (N tilde)	N ~	~ N
ò (O grave)	O `	` O
ó (O acute)	O '	' O
ô (O circumflex)	O ^	^ O
õ (O tilde)	O ~	~ O
ö (O umlaut)	O " or O ˙˙	˙˙ O
Œ (O E ligature)	O E (order sensitive)	
ù (U grave)	U `	` U
ú (U acute)	U '	' U
û (U circumflex)	U ^	^ U
ü (U umlaut)	U " or U ˙˙	U ˙˙
ÿ (Y umlaut)	Y " or Y ˙˙	Y ˙˙
ß (German small sharp s)	ss	

Required Characters

Table 3-2   Valid Compose Sequences: Multinational Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
à (a grave)	a`	`a
á (a acute)	a'	'a
â (a circumflex)	a^	^a
ã (a tilde)	a~	~a
ä (a umlaut)	a" or a˙˙	˙˙a
å (a ring)	a* or a° (degree sign)	°a
æ (a e ligature)	a e (order sensitive)	
ç (c cedilla)	c ,(comma)	
è (e grave)	e`	`e
é (e acute)	e'	'e
ê (e circumflex)	e^	^e
ë (e umlaut)	e" or e˙˙	˙˙e
ì (i grave)	i`	`i
í (i acute)	i'	'i
î (i circumflex)	i^	^i
ï (i umlaut)	i" or i˙˙	˙˙i
ñ (n tilde)	n~	~n
ò (o grave)	o`	`o
ó (o acute)	o'	'o
ô (o circumflex)	o^	^o
õ (o tilde)	o~	~o

Table 3-2   Valid Compose Sequences: Multinational Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
ö (o umlaut)	o" or o˙˙	˙˙o
œ (o e ligature)	o e (order sensitive)	
ø (o slash)	o/	
ù (u grave)	u`	`u
ú (u acute)	u'	'u
û (u circumflex)	u^	^u
ü (u umlaut)	u" or u˙˙	˙˙u
ÿ (y umlaut)	y" or y˙˙	˙˙y

Table 3-3   Valid Compose Sequences: National Mode

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
British Keyboard		
£ pound sign	l- or L- or l= or L=	
/ backslash	/<	
Flemish Keyboard		
£ (pound sign)	-L or -l or =L or =l	
§ (section)	!s or !S or os or oS or Os or OS or Øs or ØS or	
ù (u grave)	`u	
è (e grave)	`e	
French Canadian Keyboard		
à (a grave)	`a	`a
â (a circumflex)	^a	^a
ç (c cedilla)	,c	
ê (e circumflex)	^e	^e
è (e grave)	`e	`e
î (i circumflex)	^i	^i
ô (o circumflex)	^o	^o
ù (u grave)	`u	`u
û (u circumflex)	^u	^u

Table 3-3   Valid Compose Sequences: National Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
Danish Keyboard		
# (number sign)	++	
Ä (A umlaut)	¨A	¨A
Å (A ring)	* A	
ø (O slash)	o/	
Ü (U umlaut)	¨U	¨U
ä (a umlaut)	¨a	¨a
å (a ring)	*a	
ø (o slash)	o/	
ü (u umlaut)	¨u	¨u
Finnish Keyboard		
# (number sign)	++	
@ (commercial at)	aa or AA or aA	
Å (A ring)	*A	
Ü (U umlaut)	"U	
é (e acute)	'e	
å (a ring)	*a	
ü (u umlaut)	"u	
German Keyboard		
Ä (A umlaut)	¨A	
Ü (U umlaut)	¨U	
ä (a umlaut)	¨a	
ü (u umlaut)	¨u	

Table 3-3   Valid Compose Sequences: National Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
Dutch Keyboard		
£ (pound sign)	`-L` or `-l` or `=L` or `=l`	
¾ (three quarters)	`3 4` (order sensitive)	
ij (i j sign)	`i j` (order sensitive)	
½ (one half)	`1 2` (order sensitive)	
Florin	`f-` (order sensitive)	
Italian Keyboard		
£ (pound sign)	`-L` or `-l` or `=L` or `=l`	
§ (section)	`!s` or `!S` or `os` or `oS` or `Os` or `OS` or `Øs` or `ØS`	
à (a grave)	`` `a ``	`` `a ``
ç (c cedilla)	`,c`	
é (e acute)	`'e`	

Table 3-3   Valid Compose Sequences: National Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
Swiss (French) Keyboard		
ä (a umlaut)	`··a`	
ç (c cedilla)	`,c`	
ê (e circumflex)	`^e`	`^e`
î (i circumflex)	`^i`	`^i`
ô (o circumflex)	`^o`	`^o`
ö (o umlaut)	`··o`	
û (u circumflex)	`^u`	`^u`
ü (u umlaut)	`··u`	
ù (u grave)	`` `u ``	`` `u ``
Swiss (German) Keyboard		
à (a grave)	`` `a ``	`` `a ``
ç (c cedilla)	`,c`	
ê (e circumflex)	`^e`	`^e`
é (e acute)	`'e`	
è (e grave)	`` `e ``	`` `e ``
î (i circumflex)	`^i`	`^i`
ô (o circumflex)	`^o`	`^o`
û (u circumflex)	`^u`	`^u`
ù (u grave)	`` `u ``	`` `u ``

Table 3-3   Valid Compose Sequences: National Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

(1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
Swedish Keyboard		
# (number sign)	++	
Å (A ring)	*A	
É (E acute)	'E	
Ü (U umlaut)	"U	
å (a ring)	*a	
é (e acute)	'e	
ü (u umlaut)	"u	
Norwegian Keyboard		
# (number sign)	++	
Å (A ring)	*A	
Ä (A umlaut)	˙˙A	˙˙A
Æ (A E diphthong)	A E (order sensitive)	
Ü (U umlaut)	˙˙U	˙˙U
ä (a umlaut)	˙˙a	˙˙a
æ (a e diphthong)	a e (order sensitive)	
å (a ring)	*a	
ü (u umlaut)	˙˙u	˙˙u

Table 3-3   Valid Compose Sequences: National Mode (Cont)

In three-stroke sequences, you can enter required characters in any order unless the table says "order sensitive." You must enter all two-stroke sequences in the order shown.

Required Characters

| (1) Composite Character	(2) Three-Stroke Sequence	(3) Two-Stroke Sequence
French/Belgian Keyboard		
£ (pound sign)	-L or -l or =L or =l	
§ (section)	!s or !S or os or oS or Os or OS or Øs or Øs	
è (e grave)	` e	
ù (u grave)	' u	
Spanish Keyboard		
£ (pound sign)	-L or -l or =L or =l	
§ (section)	!s or !S or os or oS or Os or OS or Øs or Øs	
¡ (inverted !)	! !	
¿ (inverted ?)	? ?	
° (degree sign)	^ o	

TERMINAL SET-UP 4

GENERAL

This chapter describes the VT240 set-up screens, and how to use them. These screens let you examine or change terminal operating features such as transmit/receive speeds, type of cursor, and so on.

The VT240 stores many of its operating features in an NVR (nonvolatile RAM) memory. NVR memory retains theses features even when power is shut off. In addition to storing operator-selected features, the terminal also retains the factory-default settings. You can recall these default settings in set-up.

You can change all available set-up features from the keyboard. Some features can be changed by the host computer as described in the *VT240 Programmer Reference Manual*. (See Appendix B to order other documents.)
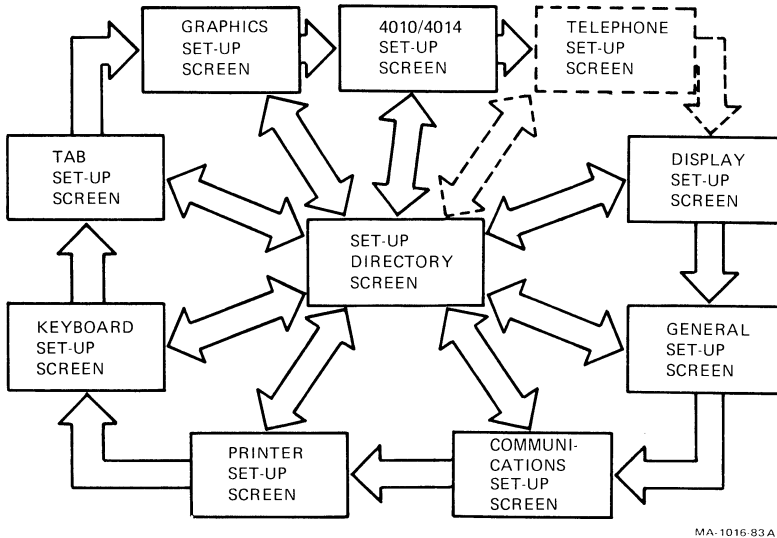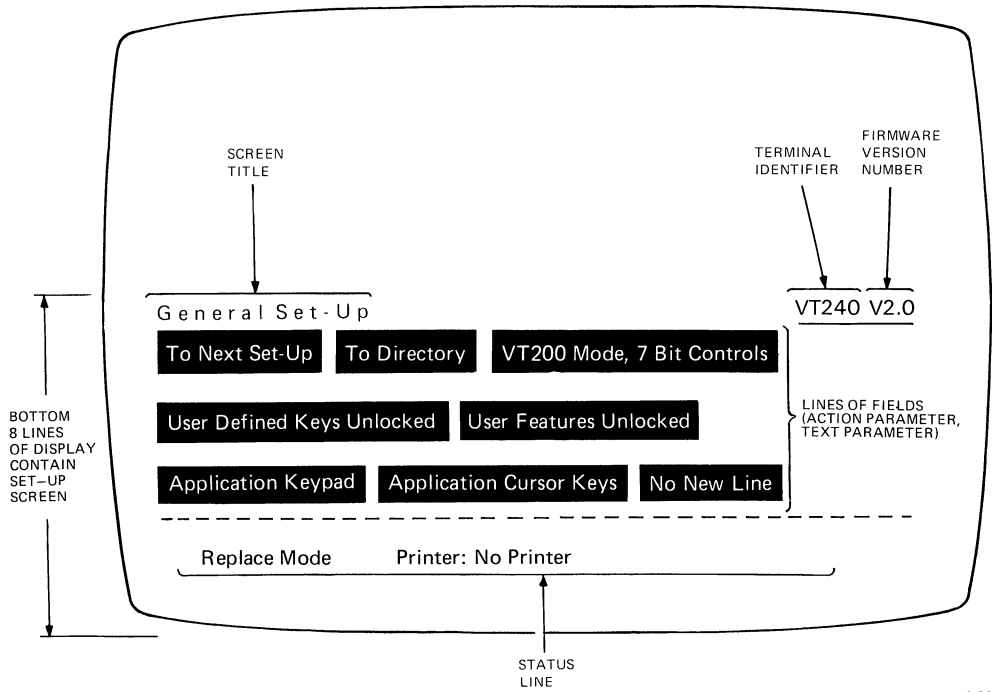
Figure 4-1   Set-Up Screens

USING SET-UP

The set-up state is based on selectable displays called set-up screens. You can select any set-up screen from the Set-Up Directory screen displayed when you enter set-up (Figure 4-1). Each set-up screen displays the features for that set-up function and lets you change or keep those features. You can only display one set-up screen at a time. You can enter the Set-Up Directory screen from any other set-up screen.

SET-UP SCREENS

Each set-up screen occupies the bottom third of the monitor screen. (Current data scrolls up so the set-up screen can appear.) Incoming data is not lost if the host supports XOFF and that feature is enabled. (See the "Communications Set-Up Screen" section in this chapter.) Each screen contains the following information (Figure 4-2).

Screen title
Terminal identifier
Firmware version number
Status line
Fields (action, parameter, text parameter)

Figure 4-2   Sample Set-Up Screen

Screen Title

The screen title identifies the current set-up screen. There are 10 set-up screens (nine standard, one optional).

1.	Set-Up Directory	6.	Keyboard Set-Up
2.	Display Set-Up	7.	Tab Set-Up
3.	General Set-Up	8.	Graphics Set-Up
4.	Communications Set-Up	9.	4010/4014 Set-Up
5.	Printer Set-Up	10.	Telephone Set-Up (optional)

Terminal Identifier

The terminal identifier identifies the type of terminal you are using, in this case a VT240.

Firmware Version Number
The firmware version number identifies the level of firmware the terminal is using.

Status Line
The status line appears at the bottom of each set-up screen. This line shows you the current status of the modem controls (if `EIA Port, Modem Control` or `Integral Modem` are selected), the telephone (if the integral modem option is selected), the printer, and the terminal insert/replace mode. The status line is a reporting line only; you cannot change the status line from the keyboard. Table 4-1 describes the status line messages.

Fields
The fields on each screen are blocks of text describing current operating characteristics. There are three types of fields.

1. *Action Field*
   An action field has only one value. When you select an action field and press the **Enter** key, the terminal performs the action.

   For example, each screen has an action field that reads `To Directory`. When you select this field and press **Enter**, the Set-Up Directory screen replaces the current screen.

2. *Parameter Field*
   A parameter field contains a feature with two or more values. When you select a parameter field and press **Enter**, the next value replaces the current value.

   For example, if you select the keyclick parameter field, it may have a value of `Keyclick`. Pressing **Enter** changes the field to `No Keyclick`.

3. *Text Parameter Field*
   A text parameter fields lets you enter a value from the keyboard. You can select a text parameter field as follows.

   1. Use the arrow keys to move the field cursor to the text parameter field. (See the following "Set-Up Controls and Cursor" section.)

   2. Press **Enter**. The terminal prompts you to enter text on the status line at the bottom of the screen, temporarily overwriting the status line.

Table 4-1   Status Line Messages

Report	Values	Meaning
Insert/ Replace:	Insert	The terminal is in insert mode. During normal text operation, all new display characters move old characters to the right; old characters moved past the right margin are lost.
	Replace	The terminal is in replace mode. During normal text operation, all new display characters replace old characters at the cursor position. Replace is the normal mode of operation.
Printer:	Ready	The printer is ready.
	Not Ready	The printer is not ready.
	None	No printer is available.
	Auto	The terminal is in auto print mode and is ready.
	Controller	The terminal is in printer controller mode and is ready.
Modem:	DSR	The modem is ready to send or receive data.
	NO DSR	The modem is not ready to send or receive data.
Telephone:	Data	The integral modem is in data mode, but no connection has been established.
	Dial	The integral modem is in dialer mode.
	Connect	The integral modem is in data mode with a connection established.
	Talk	The integral modem is in talk mode.

3. Type the text or number you want entered as the new value. The value appears next to the prompt.

4. Press **Enter** to enter the new value.

If you make a mistake, press the ⊲⊠ (delete) key to erase the last character entered. If you want to cancel the entry without changing the original value, press an arrow key to change the field selection. (See the following "Set-Up Controls and Cursor" section.)

Set-Up Controls and Cursor

The VT240 uses a field cursor in set-up. The field cursor appears as a highlighted field (reverse video) that you can move from field to field with the arrow keys.

Table 4-2 describes the keys used to enter and exit set-up, move the field cursor, and change operating characteristics.

Table 4-2   Set-Up Controls and Cursor Functions

Control Key	Function
Set-Up	Pressing the **Set-Up** key one time places the terminal in set-up. Pressing **Set-Up** again returns the terminal to the operating state (on-line or local).
Arrow keys	Pressing the arrow keys moves the field cursor in the direction of the arrow.
Enter	The **Enter** key lets you perform the function displayed at the field cursor position. If the cursor is on an action field, pressing **Enter** immediately performs the action. If the cursor is on a parameter field, pressing **Enter** changes the value of the field. You can use the **Enter** key to see the range of available field values. The value displayed is the current value invoked.

SET-UP EXAMPLE: CHANGING FEATURES

This section provides an example of changing the terminal operating characteristics in set-up.

Suppose the terminal is currently set to display its text in 80 columns, and the keyboard keys click each time you press them.

You decide to change these two operating characteristics so the terminal displays 132 columns, and the keys do not click when pressed.

Use the following procedure to change these two operating characteristics in set-up.

1. Press the **Set-Up** key. The terminal enters set-up and displays the Set-Up Directory screen (Figure 4-3).

2. Note that the field cursor is already on the `Display` field.

3. Press the **Enter** key. The terminal replaces the Set-Up Directory screen with the Display Set-Up screen (Figure 4-4).

4. Use the arrow keys to move the field cursor to the `80 Columns` field.

5. Press **Enter**. The field changes from `80 Columns` to `132 Columns`, indicating that the feature changed.

NOTE: Although many parameter changes are immediate (such as the column feature), some changes do not take effect until you exit set-up.

6. Use the arrow keys to move the field cursor to the `To Directory` field. (You want to change another feature.)

7. Press **Enter**. The terminal replaces the Display Set-Up screen with the Set-Up Directory screen.

8. Use the arrow keys to move the field cursor to the `Keyboard` field.

9. Press **Enter**. The terminal replaces the Set-Up Directory screen with the Keyboard Set-Up screen (Figure 4-8).

10. Use the arrow keys to move the field cursor to the `Keyclick` field.

11. Press **Enter**. The field changes from `Keyclick` to `No Keyclick`, indicating that the feature changed.

12. Press **Set-Up** to exit set-up and return to the operating mode (on-line or local).

SET-UP SCREEN DESCRIPTIONS

The following sections describe the set-up screens and their features. When you select the various set-up features you want to use, make sure to check off the box beside the parameter value selected for that feature. This gives you a record of the values selected, in case the settings are accidently changed or lost. If repairs to the terminal are necessary, the technician needs this information to reset the set-up feature values.

Table 4-3 summarizes the set-up screens. The table lists the features available on each screen.

Table 4-3   Set-Up Screens Summary

Set-Up Directory	Display Set-Up	General Set-Up
Display Set-Up	To Next Set-Up	To Next Set-Up
General Set-Up	To Directory	To Directory
Communications Set-Up	80/132 Columns	Terminal Mode
Printer Set-Up	Control Representation	VT100 Mode ID
Keyboard Set-Up	Mode	UDK Lock
Tab Set-Up	Auto Wrap	User Features Lock
Graphics Set-Up	Smooth/Jump Scroll	Character Set Mode
Phone Set-Up	Light/Dark Screen	Keypad Mode
On-Line/Local	Display Select	Cursor Key Mode
Clear Display	Text Cursor	New Line
Clear Communications	Cursor Style	
Reset Terminal		
Recall Saved Parameters		
Save Parameters		
Set-Up Language		
Keyboard Language		
Factory Defaults		
Exit Set-Up		

Table 4-3   Set-Up Screens Summary (Cont)

Communications Set-Up	Printer Set-Up	Keyboard Set-Up
To Next Set-Up	To Next Set-Up	To Next Set-Up
To Directory	To Directory	To Directory
Transmit Speed	Transmit/Receive Speed	Typewriter/D.P. Keys
Receive Speed	Printer to Host Mode	Caps/Shift-Lock
XOFF	Print Mode	Auto Repeat
Data-Bits/Parity	XOFF	Keyclick
Stop Bits	Data-Bits/Parity	Margin Bell
Local Echo	Stop Bits	Warning Bell
Host Port Selection	Text Print Extent	Break
Disconnect	Printed Data Type	Auto Answerback
Transmit Rate Limit	Print Terminator	Answerback=
		Conceal Answerback

Tab Set-Up	Graphics Set-Up	4010/4014 Set-Up
To Next Set-Up	To Next Set-Up	To Next Set-Up
To Directory	To Directory	To Directory
Clear All Tabs	To 4010/4014 Set-Up	4010/4014 Character
Set 8 Column Tabs	Graphics Cursor	Mode
Tab Fields and Ruler	Macrograph Report	CR Effect
	Graphics Print	DEL Implies Lo Y
	Graphics Mono/Color Print	LF Effect
	Graphics HLS/RGB Print	GIN Terminator
	Graphics Print Background	

Telephone Set-Up

To Next Set-Up
To Directory
Auto/Manual Answer
Telephone Number A
Conceal A
Telephone Number A
Conceal B

SET-UP DIRECTORY SCREEN
The Set-Up Directory screen (Figure 4-3) appears immediately when you enter set-up. This screen lets you access any other set-up screen. The Set-Up Directory screen also contains fields you can use to select terminal operating features.

Table 4-4 describes all fields on this screen.

Set-Up Directory   VT240 V2.0

Display General Comm Printer Keyboard Tab Graphics Telephone

On Line Clear Display Clear Comm Reset Terminal Recall Save

Set-Up = English North American Keyboard Default Exit

    Replace Mode   Printer: No Printer
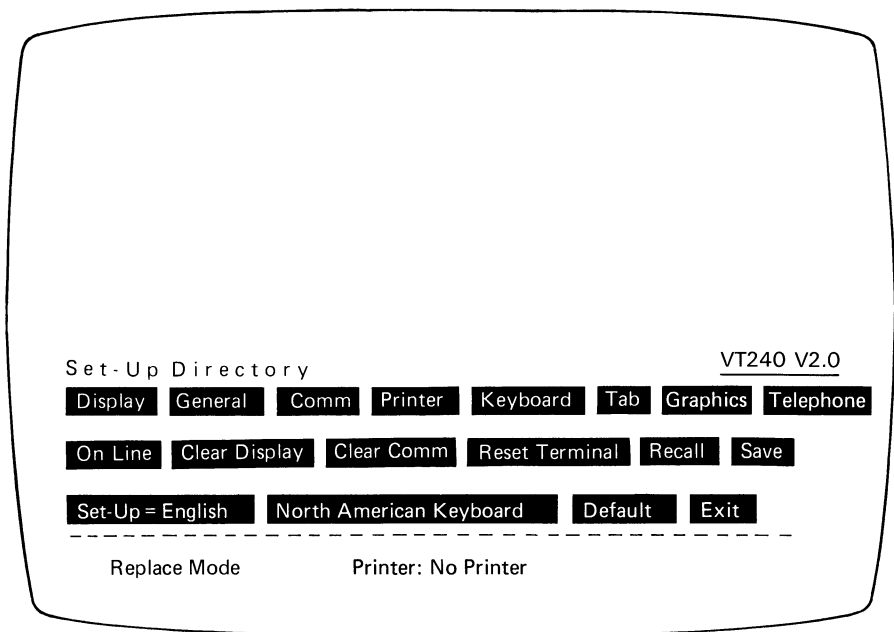
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Figure 4-3   Set-Up Directory Screen

Table 4-4   Set-Up Directory Screen

Field	Function
Display Action field Value: `Display`	Replaces the Set-Up Directory screen with the Display Set-Up screen.
General Action field Value: `General`	Replaces the Set-Up Directory screen with the General Set-Up screen.
Comm Action field Value: `Comm`	Replaces the Set-Up Directory screen with the Communications Set-Up screen.
Printer Action field Value: `Printer`	Replaces the Set-Up Directory screen with the Printer Set-Up screen.
Keyboard Action field Value: `Keyboard`	Replaces the Set-Up Directory screen with the Keyboard Set-Up screen.
Tab Action field Value: `Tab`	Replaces the Set-Up Directory screen with the Tab Set-Up screen.
Graphics Action field Value: `Graphics`	Replaces the Set-Up Directory screen with the Graphics Set-Up screen.

Table 4-4   Set-Up Directory Screen (Cont)

Field	Function
Telephone Action field Value: `Telephone`	Replaces the Set-Up Directory screen with the Telephone Set-Up screen. This field is present only when the integral modem option is installed.
On-Line or **Local** Parameter field Values: ☐ `On-Line` (default) ☐ `Local`	Lets you select the mode of operation. Lets the terminal communicate with the host computer. Effectively puts the host computer on hold. Data entered at the keyboard is sent directly to the monitor screen only.
Clear Display Action field Value: `Clear Display`	Clears the monitor screen when you exit set-up.

Table 4-4   Set-Up Directory Screen (Cont)

Field	Function
Clear Comm	Clears communication lines as follows.
Action field Value: `Clear Comm`	• Aborts any print operation in progress.
NOTE: The printer may not stop printing immediately if it has a large buffer.	
	• Aborts any escape sequence, control sequence or device control string (DCS) processing, including ReGIS.
	• Clears the keyboard buffers.
	• Clears the receive buffer.
	• Clears the transmit buffer.
	• Takes the terminal out of printer controller mode.
	• Sends XON to the host port.
	• Resets XOFF received flags on the printer and host parts.
Reset Terminal Action field	Resets many terminal operating features to a default state. Exits ReGIS.
Value: `Reset Terminal`	Does not affect communication, national and multinational modes, and user-defined keys.

Table 4-4   Set-Up Directory Screen (Cont)

Field	Function
Recall Action field Value: `Recall` *NOTE: Recall causes a disconnect to occur.*	Replaces all existing set-up features with saved values. Clears the monitor screen.
Save Action field Value: `Save`	Saves most set-up features in all set-up screens.
Set-Up=_____ Parameter field Values: ☐ `Set-Up= English` ☐ `Set-Up= Francais` ☐ `Set-Up= Deutsch`	Lets you select the language used to display set-up screens. This field takes effect immediately.
_____Keyboard Parameter field Values: ☐ `North American` ☐ `British` ☐ `Flemish` ☐ `Canadian (French)` ☐ `Danish` ☐ `Finnish` ☐ `German` ☐ `Dutch` ☐ `Italian` ☐ `Swiss (French)` ☐ `Swiss (German)` ☐ `Swedish` ☐ `Norwegian` ☐ `French/Belgian` ☐ `Spanish`	This field lets you select correct terminal operation for the national keyboard you are using.

Table 4-4   Set-Up Directory Screen (Cont)

Field	Function
Default Action field Value: `Default`	Replaces all current set-up features with factory-default settings. Clears the monitor screen, and returns the cursor to the upper-left corner of the screen.

NOTE: Default causes a disconnect to occur.

Exit Action field Value: `Exit`	Exits set-up and returns the terminal to on-line or local.

DISPLAY SET-UP SCREEN

The Display Set-up screen (Figure 4-4) lets you define monitor display characteristics.

Table 4-5 describes all fields on this screen.

Display Set-Up   VT240 V2.0

To Next Set-Up To Directory 80 Columns Interpret Controls

No Auto Wrap Smooth Scroll Light Text, Dark Screen Monochrome Display

Text Cursor Block Cursor Style

- -

Replace Mode   Printer: No Printer

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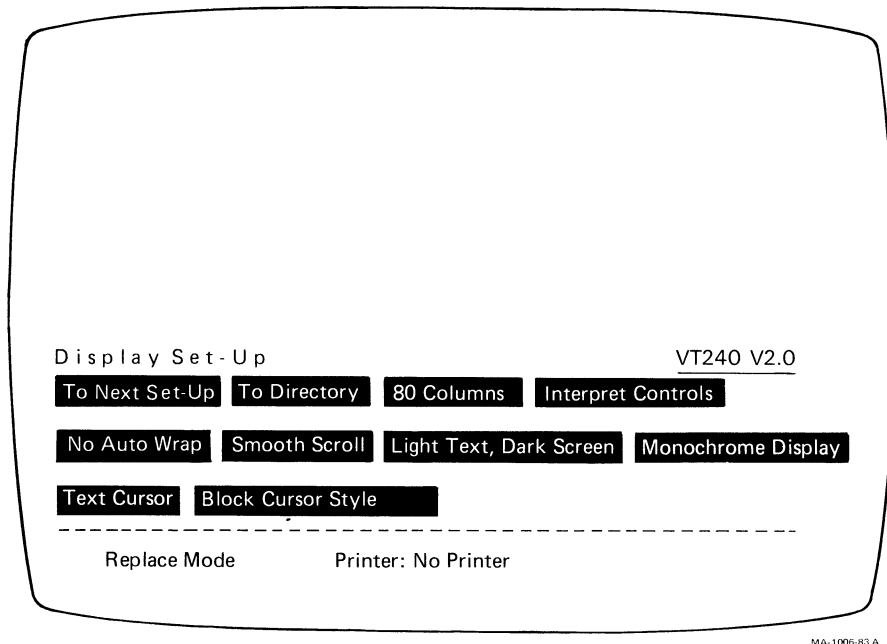
Figure 4-4   Display Set-Up Screen

Table 4-5   Display Set-Up Screen

Field	Function
To Next Set-Up Action field Value: To Next Set-Up	Replaces the Display Set-up screen with the General Set-Up screen.
To Directory Action field Value: To Directory	Replaces the Display Set-Up screen with the Set-Up Directory screen.
_____ **Columns** Parameter field Values: ☐ 80 Columns (default) ☐ 132 Columns	Selects an 80 or 132 column screen for text. A change to this field takes effect immediately and clears the display. Selects 80-column screen. Selects 132-column screen.
_____ **Controls** Parameter field Values: ☐ Interpret Controls (default) ☐ Display Controls ☐ Display ReGIS	Selects how the terminal handles control codes from the host computer. Interprets control codes, but does not display them. Displays control codes as characters, but does not execute them. Displays ReGIS commands as they are executed.

Table 4-5   Display Set-Up Screen (Cont)

Field	Function
Auto Wrap Parameter field Values: □ No Auto Wrap (default)	Selects whether or not display text automatically wraps on the screen. Causes characters received after the right margin to be overwritten into the last character position of the current line.
□ Auto Wrap	Causes a character received after the right margin to automatically appear in the first character position of the next line.
_____ **Scroll** Parameter field Values: □ Smooth Scroll (default)	Selects how fast lines appear on the screen. Limits the speed at which new lines appear on the screen, causing a smooth steady scroll
□ Jump Scroll	Displays new lines as fast as they are received, causing a jump scroll.
□ No Scroll	Disables scrolling.

NOTE: *The* Scroll *field is ignored if the terminal is in 4010 mode.*

Field	Function

_____ **Text,** _____ **Screen**
 	
Parameter field
 	
Values:
□ Light Text,
   Dark Screen
   (default)
	Selects the screen display type.
	
	Selects a normal screen display (light text on a dark background).

□ Dark Text, Light Screen	Selects reverse video screen display (dark text on a light background).

Table 4-5 Display Set-Up Screen (Cont)

Field	Function
_____ **Display** Parameter field	Selects the color map to operate with a monochrome or color monitor (or both).
Values: ☐ Monochrome Display (default)	Select this setting when you use a monochrome monitor.
☐ Color Display	Select this setting when you use a color monitor.
☐ Mono+Color	Select this setting when you use both a monochrome and a color monitor.
Text Cursor Parameter field	Selects whether or not to display the text cursor in text mode.
Values: ☐ Text Cursor (default)	Displays the cursor.
☐ No Text Cursor	Does not display the cursor.
_____ **Cursor Style** Parameter field	Selects the text cursor style displayed.
Values: ☐ Block Cursor (default)	Displays block cursor.
☐ Underline Cursor	Displays underline cursor.

GENERAL SET-UP SCREEN

The General Set-Up screen (Figure 4-5) lets you define a group of commonly used general operating features.

Table 4-6 describes all fields on this screen.

General Set-Up   VT240 V2.0

To Next Set-Up   To Directory   VT200 Mode, 7 Bit Controls   VT240 ID

User Defined Keys Unlocked   User Features Unlocked   Multinational

Numeric Keypad   Normal Cursor Keys   No New Line

Replace Mode   Printer: No Printer

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Figure 4-5   General Set-Up Screen

Table 4-6   General Set-Up Screen

Field	Function
To Next Set-Up Action field Value: `To Next Set-Up`	Replaces the General Set-Up screen with the Communications Set-Up screen.
To Directory Action field Value: `To Directory`	Replaces the General Set-Up screen with the Set-Up Directory screen.
_____ **Mode** _____ Parameter field Values:	Selects the basic text operating mode.

☐ `VT200 Mode, 7-Bit`
   `Controls`
   (default)
	Sets the terminal to operate with a full range of capabilities, using 8-bit graphic characters and 7-bit controls. This is the recommended mode for most applications, including many VT100 applications.

☐ `VT200 Mode, 8-Bit` `Controls`	Sets the terminal to operate with a full range of capabilities in an 8-bit environment with 8-bit controls.
☐ `VT52 Mode`	Sets the terminal for use with application programs designed for a VT52 terminal.
☐ `VT100 Mode`	Sets the terminal for use with application programs requiring strict VT100 compatibility.
☐ `4010/4014 Mode`	Sets the terminal for use with application programs designed for use with Tektronix 4010 and 4014 terminals.

Table 4-6   General Set-Up Screen (Cont)

Field	Function
VT100 Mode Terminal ID Parameter field	Selects the Device Attributes response (terminal ID) in VT100 mode.
NOTE: This field is unique. It only appears on the screen in VT100 mode.	
Values: □ VT240 ID (default)	Causes the terminal to send the device attributes of a VT240 terminal to the host computer.
□ VT100 ID	Causes the terminal to send the device attributes of a VT100 terminal to the host computer.
□ VT101 ID	Causes the terminal to send the device attributes of a VT101 terminal to the host computer.
□ VT102 ID	Causes the terminal to send the device attributes of a VT102 terminal to the host computer.
□ VT125 ID	Causes the terminal to send the device attributes of a VT125 terminal to the host computer.
User Defined Keys _____ Parameter field	Selects whether or not the host can change user-defined key (UDK) definitions.

Values:
□ User Defined
   Keys Unlocked
   (default)
	Allows new UDKs to be loaded.

□ User Defined Keys Locked	Prevents new UDKs from being loaded.

Table 4-6   General Set-Up Screen (Cont)

Field	Function
User Features _____ Parameter field	Selects whether or not the host can change user preference features you have set.

Values:
☐ User Features
  Unlocked
  (default)
	Lets the host change user features.

☐ User Features Locked	Prevents the host from changing features. The following user preference features are affected by this feature. • Auto Repeat • Smooth/Jump Scroll • Light/Dark Screen • Tab Stops • Keyboard Lock

NOTE: Some software applications expect to control these user features. If this applies to your particular software, set the value of the field to User Features Unlocked *to ensure predictable behavior.*

Character Set Mode Parameter field	Selects either the national or multinational character set mode.

NOTE: If you selected the North American keyboard, only multinational mode is available. National mode is disabled.

Values: ☐ Multinational (default)	Enables the terminal to generate 8-bit multinational characters, including 7-bit ASCII characters.
☐ National	Causes the terminal to use one of eleven 7-bit national replacement character sets. The NRC set depends on the keyboard field selected in the Set-Up Directory screen.

Table 4-6   General Set-Up Screen (Cont)

Field	Function
_____ **Keypad** Parameter field	Selects whether the keypad sends ASCII character codes or control codes.
Values: ☐ Numeric Keypad (default)	Causes the auxiliary keypad to send ASCII character codes corresponding to the numeric characters on the keys.
☐ Application Keypad	Causes the auxiliary keypad to send control codes used by an application program.
_____ **Cursor Keys** Parameter field	Selects whether the cursor keys sends ANSI cursor control sequences or application control functions.
Values: ☐ Normal Cursor Keys (default)	Cursor keys send ANSI cursor control sequences (up, down, left and right).
☐ Application Cursor Keys	Cursor keys send application program control functions.
_____ **New Line** Parameter field	Selects whether the **Return** key sends a carriage return only, or a carriage return and a line feed.
Values: ☐ No New Line (default)	The **Return** key sends a carriage return only. Received carriage returns do not cause a new line operation.
☐ New Line	The **Return** key sends a carriage return and a line feed. Received carriage returns cause a new line operation.

NOTE: When the terminal is in numeric keypad mode, this feature affects the **Enter** _key in the same way it does the_ **Return** _key._

COMMUNICATIONS SET-UP SCREEN

The Communications Set-Up screen (Figure 4-6) lets you define the communications environment between the terminal and host.

Table 4-7 describes all fields on this screen.

Figure 4-6   Communications Set-Up Screen

Table 4-7   Communications Set-Up Screen

Field	Function
To Next Set-Up Action field Value: `To Next Set-Up`	Replaces the Communications Set-Up screen with the Printer Set-Up screen.
To Directory Action field Value: `To Directory`	Replaces the Communications Set-Up screen with the Set-Up Directory screen.
Transmit= _____ Parameter field Values: □ `Transmit= 75` □ `Transmit= 110` □ `Transmit= 150` □ `Transmit= 300` □ `Transmit= 600` □ `Transmit= 1200` □ `Transmit= 2400` □ `Transmit= 4800` (default) □ `Transmit= 9600` □ `Transmit=19200`	Selects the rate the terminal uses to send data to the host computer. The terminal transmit speed must match the computer receive speed. However, the terminal can transmit at one speed and receive at another.

Table 4-7   Communications Set-Up Screen (Cont)

Field	Function
Receive= _____ Parameter field Values: ☐ Receive=Transmit (default) ☐ Receive= 75 ☐ Receive= 110 ☐ Receive= 150 ☐ Receive= 300 ☐ Receive= 600 ☐ Receive= 1200 ☐ Receive= 2400 ☐ Receive= 4800 ☐ Receive= 9600 ☐ Receive=19200	Selects the rate the terminal uses to receive data from the host computer. The terminal receive speed must match the computer transmit speed. However, the terminal can receive at one speed and transmit at another.
_____ **XOFF** _____ Parameter field Values: ☐ XOFF at 64 (default) ☐ XOFF at 256 ☐ XOFF at 512 ☐ XOFF at 1024 ☐ No XOFF	Selects the XOFF point or disables the automatic XON/XOFF flow control (See the "Terminal/Host Data Flow Control" section in Chapter 5.) For most applications you should set XOFF at 64 or 256. If you set XOFF greater than 256 and have a buffer overflow problem, set XOFF to the next lower value until the problem stops.

Table 4-7   Communications Set-Up Screen (Cont)

Field	Function
__ **Bits,**__ **Parity**__ Parameter field	Selects the character format used for communication with the host computer. (See the "Character Format" section in Chapter 5.)

NOTE: *This field does not set the format for the printer port.*

Values:
- ☐ `8 Bits, No Parity`
  (default)
- ☐ `8 Bits, Even Parity`
- ☐ `8 Bits, Odd Parity`
- ☐ `7 Bits, No Parity`
- ☐ `7 Bits, Even Parity`
- ☐ `7 Bits, Odd Parity`
- ☐ `7 Bits, Mark Parity`
- ☐ `7 Bits, Space Parity`
- ☐ `7 Bits, Even Parity,`
  `No Check`
- ☐ `7 Bits, Odd Parity,`
  `No Check`
- ☐ `8 Bits, Even Parity`
  `No Check`
- ☐ `8 Bits, Odd Parity`
  `No Check`

Field	Function
__ **Stop Bit** Parameter field	Sets the number of stop bits (1 or 2) used by the host port. (See the "Character Format" section in Chapter 5.)

NOTE: *This field does not set stop bits for the printer port.*

Values:
- ☐ `1 Stop Bit`
  (default)

- ☐ `2 Stop Bits`

Table 4-7   Communications Set-Up Screen (Cont)

Field	Function
＿＿ **Local Echo** Parameter field Values:	Enables or disables the local echo feature.
□ No Local Echo (default)	Sends data from the keyboard to the host computer only. The host may or may not send the data back to the monitor screen.
□ Local Echo	Sends data from the keyboard to the monitor screen as well as the host computer.
＿＿＿ **Port** ＿＿＿ Parameter field Values:	Selects the type of port used for communication with the host computer. (See the "Host and Auxiliary Port Interfaces" section in Chapter 5.)

□ EIA Port,
   Data Leads Only
   (default)
	Select EIA port, data leads only if the terminal connects directly to the host computer via the EIA host port, or indirectly using an external modem.

□ EIA Port, Modem Control	Select EIA port, modem control if the terminal connects to the host via the EIA host port and an external modem requiring modem control is used.
□ 20 mA Port	Select the 20 mA port if the terminal connects to the host computer via the 20 mA port.
□ Integral Modem Port	Select the integral modem port if the terminal is using the VT24X-AA integral modem option to communicate with the host computer.

Table 4-7 Communications Set-Up Screen (Cont)

Field	Function
Disconnect, ____ Delay Parameter field	When modem control is used, the disconnect delay feature determines the time allowed before the terminal disconnects from the communications line when the received line signal detection (RLSD) is lost.

Values:
☐ Disconnect,
  2 s Delay
  (default)
	All countries except the United Kingdom should use the 2 s delay.

☐ Disconnect, 60 ms Delay	The 60 ms delay is for use in the United Kingdom.
_____ Transmit Parameter field	Selects the terminal transmit speed.
Values: ☐ Limited Transmit (default)	Limits the terminal transmit speed to 150 to 180 characters per second, regardless of the baud rate. This places a minimal interrupt burden on the operating system.
☐ Unlimited Transmit	Selects an unlimited terminal transmit speed.

PRINTER SET-UP SCREEN

The Printer Set-Up screen (Figure 4-7) lets you define printer (or auxiliary device) operations with the VT240.

Table 4-8 describes all fields on this screen.

```
Printer Set-Up                                         VT240 V2.0
 To Next Set-Up   To Directory   Speed=4800   No Printer to Host

 Normal Print Mode   XOFF    7 Bits, Space Parity   1 Stop Bit

 Print Full Page     Print National Only        No Terminator
 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

 Replace Mode   Printer: No Printer   Modem: No DSR
```

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Figure 4-7   Printer Set-Up Screen

Table 4-8   Printer Set-Up Screen

Field	Function
To Next Set-Up Action field Value: `To Next Set-Up`	Replaces the Printer Set-Up screen with the Keyboard Set-Up screen.
To Directory Action field Value: `To Directory`	Replaces the Printer Set-Up screen with the Set-Up Directory screen.
Speed= _____ Parameter field Values: ☐ `Speed= 75` ☐ `Speed= 110` ☐ `Speed= 150` ☐ `Speed= 300` ☐ `Speed= 600` ☐ `Speed= 1200` ☐ `Speed= 2400` ☐ `Speed= 4800` (default) ☐ `Speed= 9600` ☐ `Speed=19200`	Selects the rate the terminal uses to send data to, and receive data from, a printer (or auxiliary device).
_____ **Printer to Host** Parameter field Values: ☐ `No Printer to Host` (default)	Selects whether or not input from the printer (or auxiliary device) is sent to the host computer. Sends data from the terminal keyboard only to the host computer. The terminal ignores data received from the printer.
☐ `Printer to Host`	Sends data from the printer (or auxiliary device), as well as the terminal keyboard, to the host computer.

Table 4-8   Printer Set-Up Screen (Cont)

Field	Function
_____ **Mode** Parameter field	Selects the operating mode for the printer.
Values: ☐ Normal Print Mode (default)	Lets you invoke print functions from the keyboard.
☐ Auto Print Mode	Prints the current text line when the terminal receives a line feed, form feed, or vertical tab code from the host.
☐ Controller Mode	Causes the printer port to treat the device connected to it as a terminal, while the VT240 monitors traffic. (The printer and host computer transfer data without displaying the data on the monitor screen.)
XOFF Parameter field	Lets you enable or disable XON/XOFF flow control support for the printer port.
Values: ☐ XOFF (default)	Enables XON/XOFF flow control for the printer port.
☐ NO XOFF	Disables XON/XOFF flow control for the printer port.

Table 4-8   Printer Set-Up Screen (Cont)

Field	Function
____ Bits, ____ Parity Parameter field	Selects the character format used by the printer port. (See the "Character Format" section in Chapter 5.)

NOTE: Select the correct character format to match the printer. For example, if you use a 7-bit compatible printer, then select one of the five 7-bit parameter field options.

Values: ☐ 7 Bits, Space Parity (default) ☐ 7 Bits, No Parity ☐ 7 Bits, Mark Parity ☐ 7 Bits, Even ☐ 7 Bits, Odd ☐ 8 Bits, No Parity ☐ 8 Bits, Even Parity ☐ 8 Bits, Odd Parity	Parity for received characters is always checked if you select even or odd parity.
____ Stop Bits Parameter field	Sets the number of stop bits (1 or 2) to match those used by the printer (or auxiliary device).
Values: ☐ 1 Stop Bit (default)	Selects 1 stop bit.
☐ 2 Stop Bits	Selects 2 stop bits.
Print Parameter field	Selects how much of the screen is printed during a text print operation.
Values: ☐ Print Full Page (default)	Print the full screen.
☐ Print Scroll Region	Print only the scrolling region.

Table 4-8   Printer Set-Up Screen (Cont)

Field	Function
Printed Data Type Parameter field	Selects the type of characters (from the terminal's character sets) to send to the printer.
Values: ☐ Print National Only (default)	Use with a printer that supports ASCII (multinational mode) or the current national set (national mode). (Examples: LA34, LA36, LA120, non-Digital printers.)
☐ Print National and Line Drawing	Use with a printer that supports ASCII, and the line drawing sets (multinational mode), or the current national set and the line drawing set (national mode). (Example: LA100.)
☐ Print Multinational	Use with a printer that supports the multinational and line drawing sets. (Example: LA50.)
Print Terminator Parameter field	Selects whether or not a terminator (form feed) is sent at the end of a print page operation.
Values: ☐ No Terminator (default)	Selects no terminator.
☐ Terminator = FF	Selects the form feed (FF) terminator.

KEYBOARD SET-UP SCREEN

The Keyboard Set-Up screen (Figure 4-8) lets you define keyboard operating features.

Table 4-9 describes all fields on this screen.

```
┌──────────────────────────────────────────────────────┐

  Keyboard Set-Up                              VT240 V2.0
  ┌─────────────┐ ┌────────────┐ ┌───────────────┐ ┌──────────┐
  │To Next Set-Up│ │To Directory│ │Typewriter Keys│ │Caps Lock │
  └─────────────┘ └────────────┘ └───────────────┘ └──────────┘

  ┌───────────┐ ┌────────┐ ┌───────────┐ ┌────────────┐ ┌─────┐
  │Auto Repeat│ │Keyclick│ │Margin Bell│ │Warning Bell│ │Break│
  └───────────┘ └────────┘ └───────────┘ └────────────┘ └─────┘

  ┌──────────────────┐ ┌─────────────────────────────────┐ ┌─────────────┐
  │No Auto Answerback│ │Answerback= VT240 Answerback Message│ │Not Concealed│
  └──────────────────┘ └─────────────────────────────────┘ └─────────────┘

  Replace Mode   Printer: No Printer  Modem: No DSR  Telephone: Talk

└──────────────────────────────────────────────────────┘
```
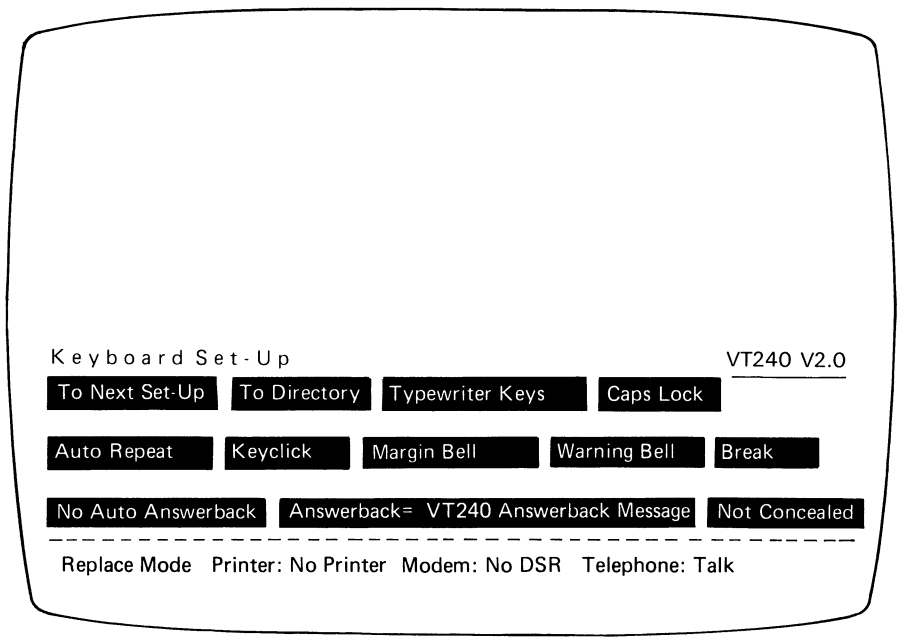
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Figure 4-8   Keyboard Set-Up Screen

Table 4-9   Keyboard Set-Up Screen

Field	Function
To Next Set-Up Action field Value: To Next Set-Up	Replaces the Keyboard Set-Up screen with the Tab Set-Up screen.
To Directory Action field Value: To Directory	Replaces the Keyboard Set-Up screen with the Set-Up Directory screen.
_____ Keys Parameter field Values:	Sets the terminal keyboard map for the type of keyboard you are using.
□ Typewriter Keys (default)	If your keyboard is North American, select Typewriter Keys.

□ Data Processing
   Keys
	For all other keyboards, select either Typewriter Keys or Data Processing Keys.
	
	Typewriter Keys selects the characters on the left half of the keycaps; Data Processing Keys selects the characters on the right half of the keycaps.
	
	Example
	The French Canadian keyboard uses a key that has a C cedilla Ç (on the left side), and brackets [(on the right side).]
	
	Selecting Typewriter Keys makes the key respond as uppercase and lowercase C cedilla Ç.
	
	Selecting Data Processing Keys makes the key respond as [.
	                              ]

Table 4-9   Keyboard Set-Up Screen (Cont)

Field	Function
_____ **Lock** Parameter field	Selects the function of the **Lock** key. Pressing **Lock** key turns on the Lock indicator on the keyboard. To clear the lock function, simply press **Lock** again. (The Lock indicator turns off.)
Values: ☐ Caps Lock (default)	The alphabetic keys send uppercase characters only.
☐ Shift Lock	The alphabetic keys send uppercase characters, and the numeric/symbol keys send the top characters only. Shift Lock can also be cleared by pressing the **Shift** key.
Auto Repeat Parameter field	Selects whether or not keystrokes automatically repeat when you hold down a key.
Values: ☐ Auto Repeat (default)	Pressing a key sends the character repeatedly until the key is released.
☐ No Auto Repeat	Pressing a key sends only one character.
Keyclick Parameter field	Selects whether or not the keyboard makes a clicking sound each time you press a key.
Values: ☐ Keyclick (default)	Selects the keyclick feature.
☐ No Keyclick	Turns off the keyclick feature.

Table 4-9   Keyboard Set-Up Screen (Cont)

Field	Function
Margin Bell Parameter field	Selects whether or not the terminal sounds a bell tone when the text cursor approaches the right margin.
Values: ☐ `Margin Bell` (default)	Selects the margin bell feature.
☐ `No Margin Bell`	Turns off the margin bell feature.
Warning Bell Parameter field	Selects whether or not the terminal generates a bell tone for operating errors, and for **Ctrl-G.**
Values: ☐ `Warning Bell` (default)	Selects the warning bell feature.
☐ `No Warning Bell`	Turns off the warning bell feature.
Break Parameter field	Enables or disables the **Break** key function (See the ''Break'' section in Chapter 3.)
Values: ☐ `Break` (default)	Selects the **Break** key function.
☐ `No Break`	Turns off the **Break** key function.
	Terminal disconnect (**Shift-Break**) is not affected by this feature. (See the ''Connect/Disconnect'' section in Chapter 5.)
Auto Answerback Parameter field	Selects whether or not the answerback message is automatically sent to the host computer after a communication line connection.
Values: ☐ `Auto Answerback` (default)	Selects the answerback message feature.
☐ `No Auto Answerback`	Turns off the answerback message feature.

Table 4-9   Keyboard Set-Up Screen (Cont)

Field	Function
Answerback= Text Parameter field	Lets you enter an answerback message entry.
Value: `text entry`	The terminal sends an answerback message when it receives ENQ or you type **Ctrl-Break**. In the case of ENQ, the message you enter is sent to the host without affecting screen data or requiring further operator action. When you select this field, the set-up status line displays the prompt `Enter Answerback =` (temporarily overwriting the status line). You can enter any keyboard character, up to a 30-character limit. Your message can be concealed using the `Concealed` field in this set-up screen.
Concealed Parameter field Value:	Selects whether or not your answerback message entry is displayed on the screen.
☐ `Not Concealed` (default)	The terminal can display the answerback message as entered.
☐ `Concealed`	Your answerback message is not displayed on the screen, so it will not be revealed. You cannot reset this feature to `Not Concealed`, except by entering a new answerback message.

TAB SET-UP SCREEN
The Tab Set-Up screen (Figure 4-9) lets you set the terminal tab stop settings.

Table 4-10 describes all fields on this screen.

The tab stop fields are one character wide. A ruler appears below the tab stop fields on the screen. Refer to the ruler when setting tabs.

There is one tab stop field for each column on the screen display. The display can be either 80 or 132 columns wide, depending on the number of columns set. (See `Columns` in the Display Set-Up screen.)

There are two possible settings for each tab stop field: the letter T (tab stop setting) or a blank (no tab stop set).

You can move the field cursor to a tab stop field with the arrow keys or the **Tab** key. After you select a field, press the **Enter** key to place a T in a blank field or erase a T from that field.
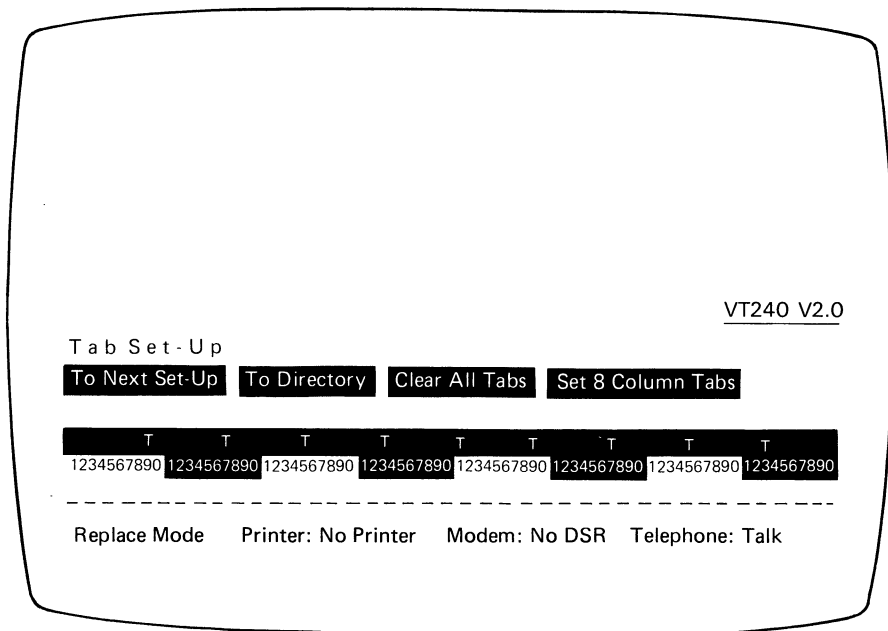
Figure 4-9   Tab Set-Up Screen

Table 4-10   Tab Set-Up Screen

Field	Function
To Next Set-Up Action field Value: To Next Set-Up	Replaces the Tab Set-Up screen with the Graphics Set-Up screen.
To Directory Action field Value: To Directory	Replaces the Tab Set-Up screen with the Set-Up Directory screen.
Clear All Tabs Action field Value: Clear All Tabs	Clears all tabs previously set.
Set 8 Column Tabs Action field Value: Set 8 Column Tabs	Automatically sets tabs every 8 columns, starting with column 9.

GRAPHICS SET-UP SCREEN

The Graphics Set-Up screen (Figure 4-10) lets you define graphics characteristics.

Table 4-11 describes all fields on this screen.

NOTE: To set Tektronix 4010/4014 characteristics, see your application software manuals.


```
Graphics Set-Up                                        VT240 V2.0

  To Next Set-Up        To Directory      To 4010/4014 Set-Up

  Graphics Cursor      Macrograph Report

  Compressed Print      Mono Print     HLS Print  No Print Background
─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─
  Replace Mode     Printer: No Printer
```
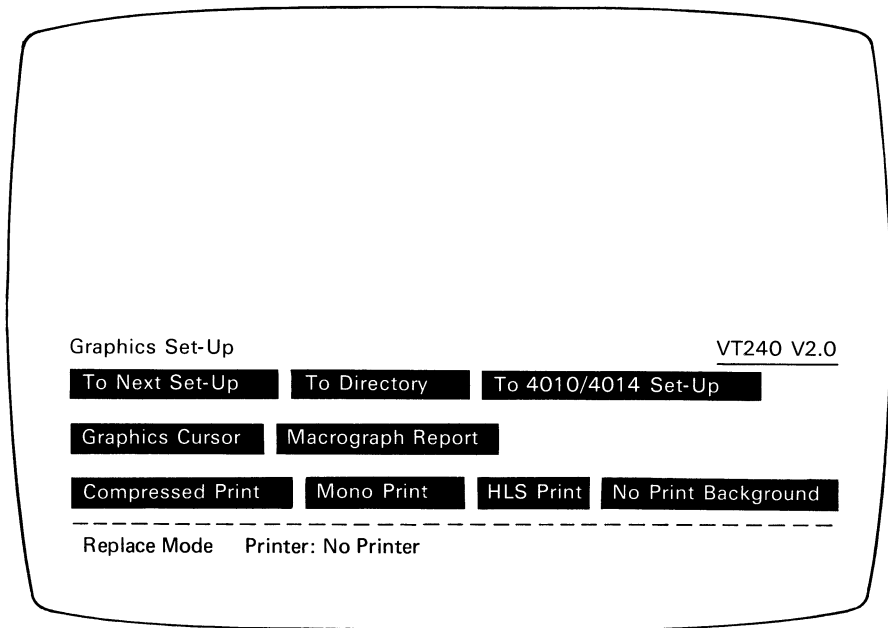
MA-1137-84

Figure 4-10   Graphics Set-Up Screen

Table 4-11   Graphics Set-Up Screen

Field	Function
To Next Set-Up Action field Value: To Next Set-Up	Replaces the Graphics Set-Up screen with the 4010/4014 Set-Up screen.
To Directory Action field Value: To Directory	Replaces the Graphics Set-Up screen with the Set-Up Directory screen.
To 4010/4014 Set-Up Action field Value: To 4010/4014 Set-Up	Replaces the Graphics Set-Up screen with the 4010/4014 Set-Up screen.
Graphics Cursor Parameter field Values: ☐ Graphics Cursor (default) ☐ No Graphics Cursor	Selects whether or not to display the graphics cursor. Displays the cursor. Does not display the cursor.
Macrograph Report Parameter field Values: ☐ Macrograph Report (default) ☐ No Macrograph Report	Selects whether or not the contents of a macrograph report is sent in the response to the ReGIS Report Macrograph command R(M...). (See the *VT240 Programmer Reference Manual*, Appendix B.) Sends the macrograph report. Does not send the macrograph report.

Table 4-11   Graphics Set-Up Screen (Cont)

Field	Function
Graphics Print Parameter field Values:	Selects the size of the graphic image printed on a graphics printer.
☐ Compressed Print (default)	Selects an image approximately 6 × 3 inches.
☐ Expanded Print	Selects an image approximately 12 × 8 inches.
☐ Rotated Print	Selects an image approximately 8 × 12 inches that is rotated 90 degrees.
Graphics Mono/Color Print Parameter field Values:	Selects whether printed graphics are black and white or color.
☐ Mono Print (default)	Selects black and white printing.
☐ Color Print	Selects color printing. Use only with printers designed for color printing.
Graphics HLS/RGB Print Parameter field Values:	Selects the color designation coordinate system used to send a color image.
☐ HLS Print (default)	Selects HLS (hue/lightness/saturation).
☐ RGB Print	Selects RGB (red/green/blue).
Graphics Print Background Parameter field Values:	Selects whether or not to print background colors.
☐ No Print Background (default)	Sends all colors *except* background colors.
☐ Print Background	Sends all colors, *including* background colors.

4010/4014 SET-UP SCREEN
The 4010/4014 Set-Up screen (Figure 4-11) lets you define Tektronix 4010/4014 graphics characteristics.

Table 4-12 describes all fields on this screen.

NOTE: To set Tektronix 4010/4014 characteristics, see your application software manuals.

```
4010/4014 Set-Up                                    VT240 V2.0
    To Next Set-Up    To Directory    Aligned Characters

    CR Effect = CR    DEL Implies Lo Y

    LF Effect = LF    GIN Terminator = None
    _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
     Replace Mode      Printer: No Printer
```

MA-1141-84
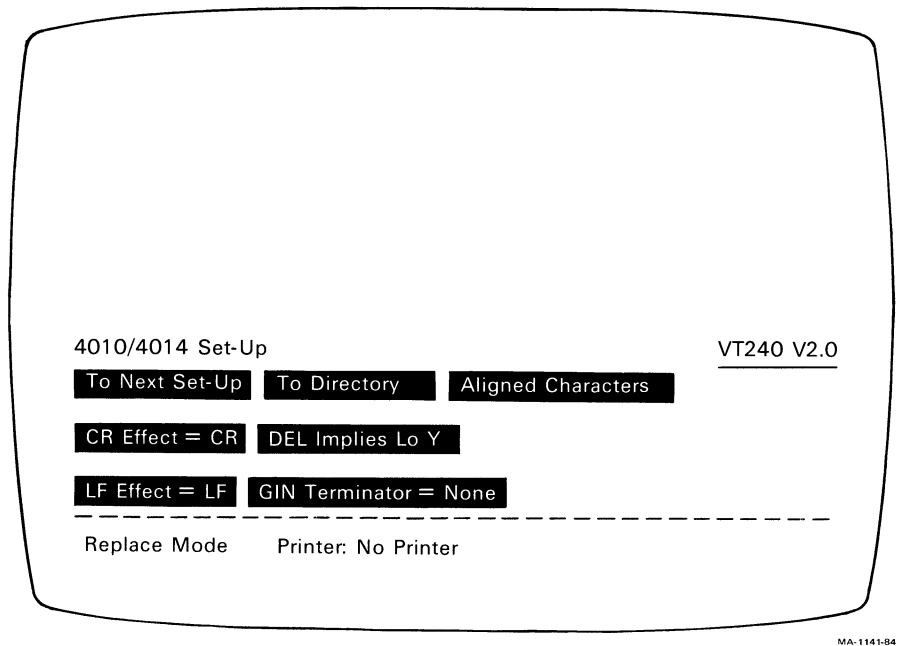
Figure 4-11   4010/4014 Set-Up Screen

Table 4-12   4010/4014 Set-Up Screen

Field	Function
To Next Set-Up Action field Value: `To Next Set-Up`	Replaces the 4010/4014 Set-Up screen with the Display Set-Up screen or the Telephone Set-Up screen (if the integral modem option is installed).
To Directory Action field Value: `To Directory`	Replaces the 4010/4014 Set-Up screen with the Set-Up Directory screen.
4010/4014 Character Mode Parameter field Values:	Selects whether to use enlarged characters or smaller aligned characters. These character sizes are specific to 4010/4014 mode.
☐ `Aligned Characters` (default)	Displays up to 133 characters per line on a screen of up to 64 lines. Aligned characters provide correct alignment for software designed for 4010/4014 graphics.
☐ `Enlarged Characters`	Displays up to 128 characters per line on a screen of up to 48 lines. Enlarged characters are easier to read than the smaller aligned characters.

NOTE: The remaining parameter field values emulate 4010/4014 strap options.

Field	Function
CR Effect Parameter field Values:	Selects whether a received carriage return generates a carriage return only or a carriage return and a line feed.
☐ `CR Effect = CR` (default)	Selects a carriage return (CR) only.
☐ `CR Effect = CR-LF`	Selects a carriage return (CR) and line feed (LF).

Table 4-12   4010/4014 Set-Up Screen (Cont)

Field	Function
DEL Implies Lo Y Parameter field	Selects whether to emulate or disable the 4010/4014 DEL Implies Lo Y strap option.
Values: ☐ DEL Implies Lo Y (default)	Emulates this strap option.
☐ DEL ignored	Disables this strap option.
LF Effect Parameter field	Selects whether a received line feed generates a line feed only or a line feed and a carriage return.
Values: ☐ LF Effect = LF (default)	Selects a line feed (LF) only.
☐ LF Effect = LF-CR	Selects a line feed (LF) and carriage return (CR).
GIN Terminator = Parameter field	Selects the characters that follow graphics input mode (GIN) address transmission.

Values:
☐ GIN Terminator =
   None
   (default)
	Selects no character.

☐ GIN Terminator = CR	Selects a carriage return (CR).
☐ GIN Terminator = ☐ CR-EOT	Selects a carriage return (CR) and end of transmission (EOT).

TELEPHONE SET-UP SCREEN

The Telephone Set-Up screen (Figure 4-12) lets you store and display telephone numbers for automatic dialing.

Table 4-13 describes all fields on this screen.

NOTE: You can only select the Telephone Set-Up screen if the VT24X-AA integral modem option is installed.

Figure 4-12   Telephone Set-Up Screen

Table 4-13 Telephone Set-Up Screen

Field	Function
To Next Set-Up Action field Value: `To Next Set-Up`	Replaces the Telephone Set-Up screen with the Display Set-Up screen.
To Directory Action field Value: `To Directory`	Replaces the Telephone Set-Up screen with the Set-Up Directory screen.
_____ **Answer** Parameter field Values: ☐ `Manual Answer` (default)	Selects automatic telephone answering by the terminal or manual telephone answering by the user. Leaves the integral modem in talk mode after a disconnect and allows the user to answer telephone calls manually. Required for normal telephone operation.
☐ `Auto Answer`	Leaves the integral modem in data mode after a disconnect and allows the terminal to automatically answer incoming calls.
Telephone Number A = Text parameter field Value: ☐ `text entry`	Lets you enter a telephone number and store it as **A**. After you select this field, press the **Enter** key. The screen status line prompts `Enter Telephone Number`. Type the telephone number you want stored. (See the "Typing a Telephone Number at the Keyboard" section in Chapter 3.) After you enter the number, press **Enter** to store the number. You can conceal the phone number by using the `Conceal Telephone Number A` field in this set-up screen.

Table 4-13   Telephone Set-Up Screen (Cont)

Field	Function
Concealed Parameter field	Selects whether or not telephone number A is displayed on the screen.
Values: ☐ `Not Concealed` (default)	The terminal displays the telephone number as it is entered.
☐ `Concealed`	The terminal displays the word `Concealed` in place of the telephone number.

NOTE: If you set this field to `Concealed`, *you cannot reset the field to* `Not Concealed` *except by entering a new telephone number.*

Telephone number B = Text parameter field	Lets you enter a telephone number and store it as **B**.
Value: ☐ `text entry`	You use this field the same way as described for the `Telephone Number A =` field above.
Concealed Parameter field	Selects whether or not telephone number B is displayed on the screen.
Values: ☐ `Not Concealed` (default)	The terminal displays the telephone number as it is entered.
☐ `Concealed`	The terminal displays the word `Concealed`, in place of the telephone number.

NOTE: If you set this field to `Concealed`, *you cannot reset the field to* `Not Concealed` *except by entering a new telephone number.*

COMMUNICATION 5

GENERAL

This chapter describes how the VT240 communicates with a host computer and a printer.

The terminal operates on full-duplex asynchronous lines only, and has 10 possible transmit/receive speeds. You select the transmit/receive speeds in set-up for both the terminal (Communications Set-Up screen) and the printer (Printer Set-Up screen).

The VT240 operates in accordance with the following national and international communications standards.

        EIA Standard RS232C/RS423
        CCITT V.24
        CCITT V.26 (V.10)
        CCITT X.20 (V.21)

You can connect the terminal directly to a local host computer with a cable. You can also connect the terminal indirectly to a remote host computer through public-switched or dedicated telephone lines, using a modem or acoustic coupler.

HOST AND PRINTER PORT INTERFACES

The VT240 has two asynchronous serial ports. One port is for communication with a host computer, and the other is for communication with a printer.

The host port has two connectors.

- A 25-pin subminiature D-type (EIA RS232C/RS423) connector that connects the terminal to a local or remote host computer

- An 8-pin EIA Mate-N-Lok (20 mA) connector that connects the terminal to a local host computer

The printer port has one connector.

- A 9-pin subminiature D-type (EIA RS232C/RS423) connector that connects the terminal to a local printer

Tables 5-1 through 5-3 describe the interface signals for the three connectors.

NOTE: Only the connector pins listed in Tables 5-1 through 5-3 are used.

MODEMS

The VT240 can operate with all modems conforming to the national and international standards listed at the beginning of this chapter. However, the modem at the terminal must be compatible with the modem at the host computer.

The VT240 accepts compatible modems and acoustic couplers such as the AT&T 103, 113, and 212 types, in addition to Digital's DF02 and DF03.

The terminal must be certified for connection to non-AT&T type modems used outside of continental North America. Your local Digital Field Service office has detailed information on terminal certification and use of non-AT&T type modems.

Table 5-1   Comm Port EIA Interface Signals

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
2	Transmit data	TXD	BA/103/D1	*From VT240* Transmits serial characters. Held in mark state when no characters are transmitted. In modem control modes, transmits data only when RTS, CTS, DSR, and DTR are on.
3	Receive data	RXD	BB/104/D2	*To VT240* Receives serial characters. In modem control modes, ignores characters if RLSD is off.
4	Request to send	RTS	CA/105/S2	*From VT240* When on, places the modem in transmit mode.
5	Clear to send	CTS	CB/106/M2	*To VT240* When on, tells the terminal that the modem is ready to transmit.
6	Data set ready	DSR	CC/107/M1	*To VT240* When on, tells the terminal that the modem is in the data mode and is ready to exchange RTS, CTS, and RLSD.

Table 5-1   Comm Port EIA Interface Signals (Cont)

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
7	Signal ground	SGND	AB/102/E2	Serves as common ground reference potential for all connector signals except protective ground.
8	Receive line signal detect (carrier detect)	RLSD	CF/109/M5	*To VT240* When on, tells the terminal that the signal received on the communication line is good enough to ensure correct demodulation of received data. When off, indicates no signal received, or signal unsuitable for demodulation.
12	Speed indicator	SPDI	CI/112/M4	*To VT240* When on, enables modem to control terminal transmit and receive speeds. Sets terminal transmit and receive speeds to 1200 bits per second regardless of set-up selection.
20	Data terminal ready	DTR	CD/108.2/S1.2	*From VT240* When on, tells the modem that the terminal is ready to transmit or receive.

Table 5-1   Comm Port EIA Interface Signals (Cont)

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
23	Speed select	SPDS	CH/111/S4	*From VT240* When on, tells the modem that receive speed selected in set-up is greater than 600 bits per second.

Table 5-2   20 mA Port Interface Signals

Pin	Signal
1	−12 V
2	Transmit −
3	Receive −
5	Transmit +
7	Receive +
8	Ground

Table 5-3   Printer Port EIA Interface Signals

Pin	Signal	Mnemonic	EIA/CCITT/DIN	Description
2	Transmit data	TXD	BA/103/D1	*From VT240* Transmits serial characters. Held in mark state when no characters are transmitted.
3	Receive data	RXD	BB/104/D2	*To VT240* Receives serial characters.
5	Data terminal ready	DTR	CD/108.2/ S1.2	*From VT240* On when the terminal is on.
6	Data set ready	DSR	CC/107/M1	*To VT240* Receives DTR on this line. If DSR is present at power-up, the printer controls print operations. If DSR is not present at power-up, the terminal checks for DSR before each character print operation.
7	Signal ground	SGND	AB/102/E2	Common ground reference for all voltages on interface.
8	Signal ground	GND		Tied to pin 7.

25-PIN EIA HOST PORT

TERMINAL — NULL MODEM CABLE — HOST COMPUTER
BCC22D-10 (10 feet)
-25 (25 feet)
-50 (50 feet)

20mA PORT

TERMINAL — 20 mA CABLE — HOST COMPUTER
BCO5F-15 (15 feet)
-50 (50 feet)

20 mA PORT

TERMINAL — 20 mA EXTENSION — 20 mA CABLE — HOST COMPUTER
BCO5X-15 (15 feet)   BCO5F-15 (15 feet)
-50 (50 feet)   -50 (50 feet)

25-PIN EIA HOST PORT

TERMINAL — MODEM CABLE — MODEM — HOST COMPUTER
BCCO4-10 (10 feet)
-25 (25 feet)
-50 (50 feet)

9-PIN PRINTER PORT

TERMINAL — PRINTER CABLE — PRINTER
BCCO5-10 (10 feet)
-25 (25 feet)
-50 (50 feet)

MA-1014-83

Figure 5-1   Cables

CABLES
Figure 5-1 shows the RS232C cables you can use to connect the terminal to a host computer and printer.

PRINTERS
You can connect the terminal to a local asynchronous serial printer using a null modem cable. Here are some of the Digital printers you can use with the VT240.

LA12   LA50
LA34   LA100
LA35   LA120
LA36   LQP02
LA38
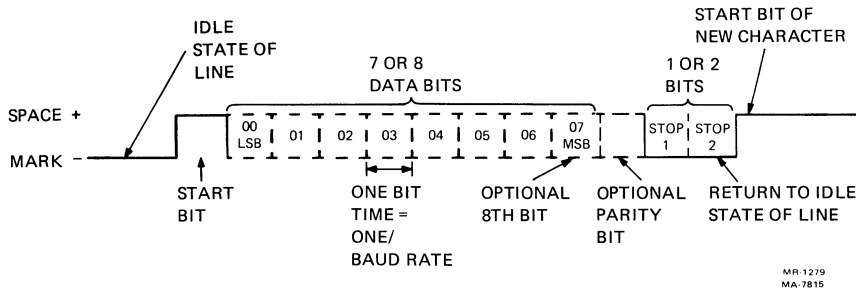
Figure 5-2   Character Format

CHARACTER FORMAT

The terminal sends and receives characters in serial format. You select the character format (Figure 5-2) in set-up.

NOTE: Detailed information on character format is available in ANSI Standard X3.15.

TERMINAL–HOST DATA FLOW CONTROL

The terminal stores incoming characters in a character input buffer and processes the characters on a first-in/first-out basis. The size of the input buffer is 2048 characters. When the input buffer fills to 64, 256, 512, or 1024 characters (selected from the Communications Set-Up screen), the terminal sends an XOFF character (if you enabled XOFF from the Communications Set-Up screen) to stop the host computer from sending more characters. If the computer fails to respond to the XOFF character, the terminal sends a second XOFF character when the input buffer fills to 1920 characters. The terminal sends a third XOFF character when the buffer is full.

When the input buffer contents falls below 16, 80, 160, or 240 characters (corresponding to the XOFF point of 64, 256, 512, or 1024 respectively), the terminal sends an XON character to signal the host computer to start sending characters again.

*NOTE: If you disable XOFF in set-up, the terminal does not send XOFF to the host computer when the input buffer fills. The **Hold Screen** key is also disabled. With XOFF disabled, there is no way to ensure that data will not be lost.*

If you enable XON/XOFF, the terminal recognizes received XON and XOFF characters. When the terminal receives XOFF, it stops sending data (except XON/XOFF characters). If the keyboard data buffer overflows, the keyboard locks and the Wait indicator turns on. The terminal starts transmitting again when it receives XON.

Conditions That Send XON
When you enable the XOFF/XON feature in set-up, the following conditions send XON.

- The number of characters in the input buffer reaches the XON point, and the last flow control character sent was XOFF.

- A clear terminal operation is performed.

- A recall operation is performed.

- The power-up self-test is completed (Chapter 6).

- You press the **Hold Screen** key to release the screen when the input buffer is at or below the XON point.

Conditions That Send XOFF
When you enable the XOFF/XON feature in set-up, the following conditions send XOFF.

- The number of characters in the input buffer reaches the first XOFF point (64, 256, 512, or 1024 characters, selected in set-up) for the first time since the last XON was sent.

- The number of characters in the input buffer reaches the second XOFF point (1920 characters) for the first time since the last XON was sent.

- The terminal receives a character when the input buffer is full (2048 characters).

Buffer Overflow Prevention

If the host computer does not respond to the XOFF from the terminal, the input buffer continues to fill with characters. If the buffer is filled and characters are still coming, the buffer overflows and characters are lost. In place of lost characters, the terminal displays reverse question mark characters (⸮).

You can use the following formulas to determine how fast the host computer must respond to the first XOFF character, to prevent loss of characters due to buffer overflow. Calculate the overflow first, then host response time.

NOTE: These formulas assume that you set the transmit rate limit feature in the Communications Set-Up screen to Unlimited.

    1.   *Overflow*

        OVFL = (MXBF - XOFF) - [3 × (RCDR/XMDR)]

   where:

        OVFL = the number of characters to overflow

        MXBF = the receive buffer size (2048 characters)

        XOFF = the first XOFF point (64, 256, 512 or 1024)

        RCDR = the received data rate (receive speed)

        XMDR = the transmitted data rate (transmit speed)

2. *Host Response Time*

HRST = OVFL × [(DATA + STOP + PRTY + 1)/RCDR]

where:

HRST = the host computer response time (in seconds)

OVFL = the number of characters to overflow

DATA = the number of data bits per character

STOP = the number of stop bits per character

PRTY = the number of parity bits per character

Example
The VT240 sends and receives 8-bit characters with no parity at 4800 bits per second. There is 1 stop bit. XOFF is sent when the buffer has 1024 characters in it.

OVFL = (2048 - 1024) - [3 × (4800/4800)]
      = 1021 characters

HRST = 1021 × [(8 bits + 1 bit + 0 bits + 1)/4800]
     = 2.13 seconds

Therefore, the host computer must stop sending data in 2.13 seconds, or the terminal input buffer will overflow.

Use of Fill Characters
Software that does not support XON/XOFF characters from the terminal can still use all terminal features by using fill characters. In some applications, you can use the terminal without XON/XOFF support or fill characters. However, the bit rate must be limited to 4800; also the software must not send the ESC (escape) code, or use slow scrolling, split screen, or the printer port.

Connect/Disconnect

When a connection is made to the host computer via a modem, the terminal performs the following operations to ensure it is ready to send and receive.

- Unlocks the keyboard (if it was locked).
- Clears any transmit in progress.
- Clears the keyboard buffer and all message buffers.
- Clears the input buffer.
- Clears XOFF sent and XOFF received.

The following conditions cause communications line disconnect.

- Typing **Shift-Break**

- Invoking `Recall` or `Default` values in the Set-Up Directory screen

- Loss of DSR

- Loss of RLSD for a time you defined in set-up

- No RLSD within 30 seconds after DSR

- A self-test command received from the host computer

- Switching among the EIA port, the 20 mA port, and the integral modem port

The usual way to disconnect the terminal from the communications line at the end of communications is to type **Shift-Break**. The host computer's response to the disconnect signal depends on the computer and the software.

PRINTER PORT OPERATION

You can use the printer port as an input, output, or input/output device (selected in set-up).

When you select the printer port as an input device (printer-to-host mode), you can send data from the printer (or auxiliary device) and the keyboard to the host (Figure 5-3). The terminal treats data from the printer port the same as keyboard data. Usually, this data is sent to the host computer.

MA-0647-83
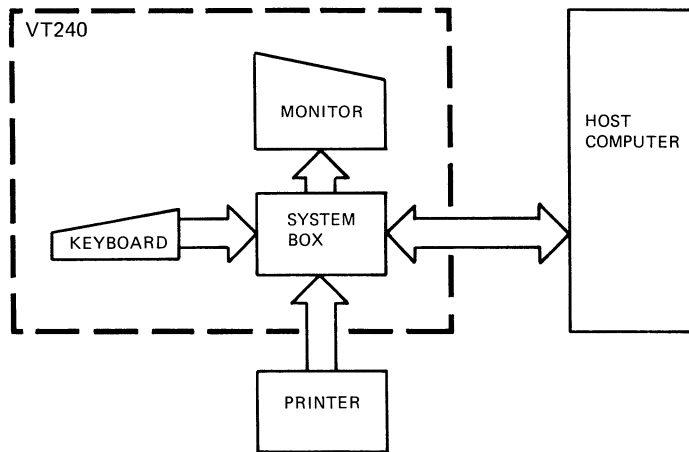
Figure 5-3   Printer Port as Input Device
(Printer-to-Host Mode)

When you select the printer port as an output only device (no printer-to-host), you can start text and graphics print functions from the keyboard as well as from the host computer. However, input from the printer is disabled (Figure 5-4).

When you select the printer port as an input/output device (printer controller mode), the device connected to the printer port is treated as a terminal, while the VT240 monitors line traffic (Figure 5-5). All characters from the host are sent directly to the device connected to the printer port, except XON, XOFF, NULL, and control functions from the host that turn printer controller mode on and off. All characters from the printer are sent directly to the host, except XON, XOFF, and NULL.

NOTE: Make sure the host line is compatible with the printer port line.

MA-0647A-83
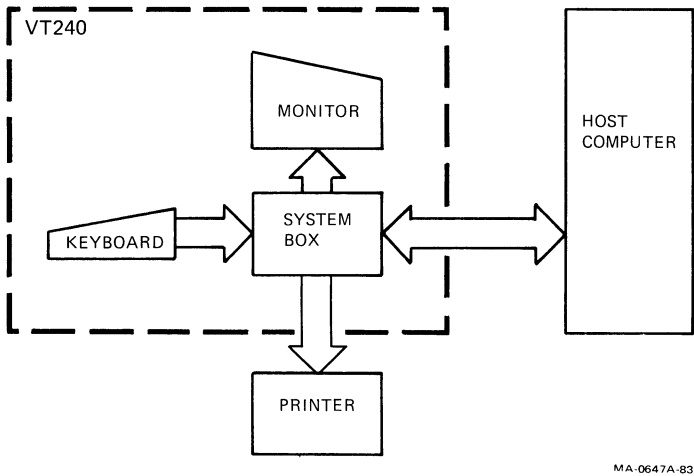
Figure 5-4   Printer Port as Output Device
             (Normal Print Mode)

MA-0647B-83
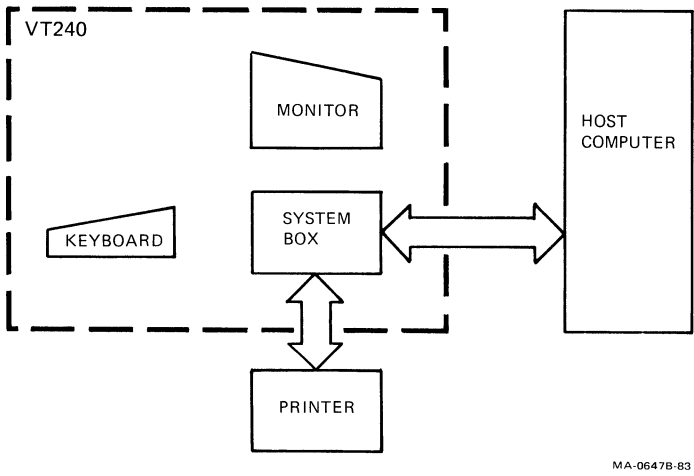
Figure 5-5   Printer Port as Input/Output Device
             (Printer Controller Mode)

TERMINAL–PRINTER DATA FLOW

The XON/XOFF protocol controls data flow between the terminal and the device connected to the printer port. You can enable or disable XON/XOFF support in set-up. When XOFF is enabled, and the device sends XOFF, the terminal stops sending data through the printer port. The terminal starts sending data again when it receives XON or when a clear comm operation is performed.

The terminal has a 256-character input buffer for the printer port, with XOFF points of 128, 184, and 256 characters. The XON point is 16 characters.

When XOFF is enabled, the printer receive buffer fills to the first or second XOFF point. A third XOFF is sent when the buffer reaches the third XOFF point. An XON is sent when the buffer empties to the XON point.

PROBLEM SOLVING 6

GENERAL

This chapter describes what to do if you have a problem with the VT240. The chapter provides a problem checklist, and describes the power-up self-test.

COMMON OPERATING PROBLEMS

Table 6-1 lists common operating problems and their possible solutions. Check this list before calling for service.

Table 6-1   Common Operating Problems

Problem	Possible Solution
The terminal does not power up when the power switch is set to **1** (on).	Make sure the terminal power cord is plugged into the wall outlet. Check for power at the wall outlet by plugging in a lamp to see if it lights.
	Make sure the voltage selection switch is in the correct position. (See the *VT240 Installation Guide* for the correct setting.)
	Check the fuse and replace if necessary. (If the fuse blows again, there is a possible shorting problem. Contact Digital Field Service.)
The printer does not print.	Make sure the printer is plugged in and its power switch is on.
	Make sure the cable connection between the printer and terminal is tight.
	Make sure all communication features on the terminal and printer (such as baud rate and parity) match.
The monitor display does not resume scrolling. The Hold Screen indicator is on.	Press the **Hold Screen** key to resume scrolling.
The terminal seems to be locked and does not respond to data sent from the host.	Clear the terminal by using the `Clear Comm` field in the Set-Up Directory screen (Chapter 4).

Table 6-1   Common Operating Problems (Cont)

Problem	Possible Solution
The screen is blank, and the power OK indicator is on.	The CRT saver feature (Chapter 1) may be on. Press any key to reactivate the screen display. Make sure the brightness and contrast controls are correctly adjusted.
The bell tone does not sound when the terminal is turned on. Keyboard visual indicators are not on.	Make sure the keyboard is connected to the terminal.

POWER-UP SELF-TEST

The power-up self-test runs automatically each time you power up the terminal. During the test cycle, the power-up self-test has full control of the the terminal. The terminal cannot respond to commands other than those used for the test itself. When the test cycle ends, control returns to the terminal.

In the self-test mode, the monitor screen and the keyboard indicators (Hold Screen, Lock, Compose, and Wait) provide information about the terminal operating status. The monitor screen displays a text message, and the keyboard indicators provide a coded message.

PERFORMING THE POWER-UP SELF-TEST

Start the power-up self-test by setting the terminal power switch to **1** (on) (Figure 6-1).

During the self-test the following events should occur.

- All keyboard indicators turn on and off.
- The bell tone sounds.

A successful power-up self-test ends with all keyboard indicators off, the power ok indicator on, and the screen displaying the message shown in Figure 6-1. The message is erased when a character is received from the host computer, or when you press any key.

The terminal displays an error message on the screen (if possible) if the test finds an error. Table 6-2 explains the error messages displayed on the screen.
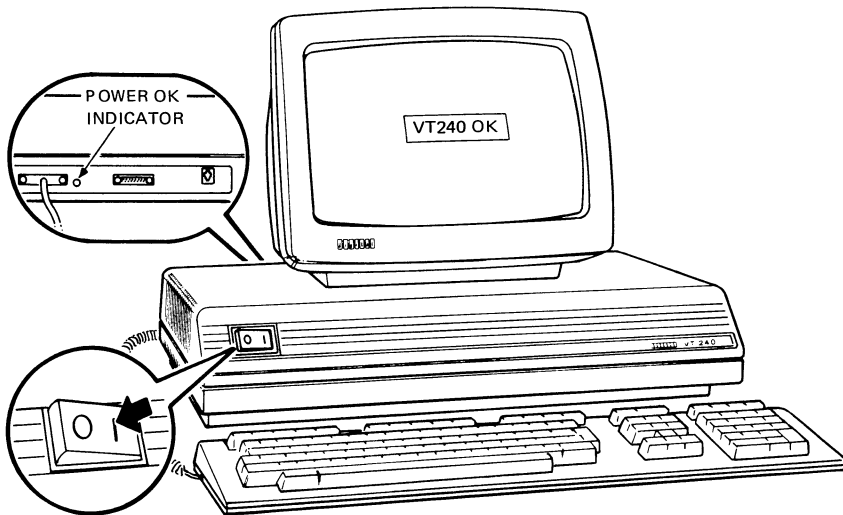
MA-1136-83

Figure 6-1   Power-Up Self-Test Indicators

Table 6-2 Screen Error Messages

Screen Error Message	Problem
`VT240 Display Processor Error - 1`	*Terminal controller board.* This may be a fatal error, meaning the terminal cannot operate.
`VT240 Printer Port Error - 2`	*Printer port.* The terminal can operate, but cannot perform printing functions.
`VT240 EIA Port Data Error - 4`	*Terminal controller board.* The EIA host port cannot operate.
`VT240 Keyboard Error - 6`	*Keyboard.* The terminal can only receive input from the host computer.
`VT240 Keyboard Port Error - 7`	*Terminal controller board.* The keyboard cannot send or receive data from the terminal.
`VT240 Modem Error - 8`	*Modem.* The terminal can operate, but cannot send or receive data via the modem.
`VT240 Monitor Error - 9`	*Monitor or monitor cable.* The terminal cannot display data.
`VT240 NVR Error - 10`	*Terminal controller board.* The nonvolatile memory (set-up storage) is not available.
`VT240 Display Memory Error - 11`	*Terminal controller board.* The monitor may display nothing or scrambled data.
`VT240 Video Error - 12`	*Terminal controller board.* The monitor may display nothing or scrambled data.

DIGITAL SERVICE

If the self-test indicates a problem, call your local Digital Field Service number for assistance. Before calling, make sure to note the exact nature of the problem, when it occurred, and any error messages or codes that appeared.

Information about your warranty, Digital services, terminal supplies, and spare parts is provided on the inside of the back cover of this manual.

SPECIFICATIONS A

GENERAL
This appendix lists the specifications of the VT240 and VT241 video terminals.

Physical

System box

Height	10.2 cm (4 in)
Width	45.7 cm (18 in)
Depth	30.5 cm (12 in)
Weight	7.2 kg (16 lbs)

Keyboard

Height	5.1 cm (2 in)
Width	53.3 cm (21 in)
Depth	17.1 cm (6.75 in)
Weight	2 kg (4.5 lbs)

Monochrome monitor

Height	29.2 cm (11.5 in)
Width	34.9 cm (13.75 in)
Depth	31.1 cm (12.25 in)
Weight	6.4 kg (14 lbs)
Adjustable tilt	+5 to −25 degrees

Color monitor

Height	32.4 cm (12.75 in)
Width	38 cm (15 in)
Depth	42.1 cm (17 in)
Weight	16.6 kg (36.6 lbs)

Environmental

Operating

Temperature	10° to 40°C
	(50° to 104°F)
Relative humidity	10 to 90%
Maximum wet bulb	28°C (82°F)
Minimum dewpoint	2°C (36°F)
Maximum altitude	2.4 km (8000 ft)

Storage

Temperature	−40° to 66°C
	(140° to 151°F)
Relative humidity	0 to 95%
Maximum altitude	9.1 km (30,000 ft)

Electrical

Line voltage	90 to 128 Vac
(switch selectable)	(100 to 120 RMS nominal)
	single-phase, 3-wire
	180 to 268 Vac
	(220 to 240 RMS nominal)
	single-phase, 3-wire
Line frequency	47 to 63 Hz
Power cord	Detachable, 3-conductor, grounded

Display

Format	24 lines $\times$ 80 characters or 24 lines $\times$ 132 characters
Character	7 $\times$ 9 dot matrix in 10 $\times$ 10 cell for 80 columns
	5 $\times$ 9 dot matrix in 6 $\times$ 10 cell for 132 columns
Character size	3.35 mm $\times$ 2.0 mm for 80 columns
	3.35 mm $\times$ 1.3 mm for 132 columns
Active display size	20.2 cm $\times$ 11.5 cm (8 in $\times$ 5 in)
Character sets	ASCII, national replacement (NRC), DEC supplemental, and DEC special graphics, in loadable 80- or 132-column font
	Control characters (using control representation mode) in 80-column font only
Character attributes	Reverse video, underline, bold, blinking (maximum of 100 characters), alternate character ROM
Cursor type	Blinking block cursor or blinking underline cursor

Keyboard

General	105-key detachable unit with a 1.9 m (6 ft) coiled cord with a 4-pin telephone-type modular connector. Word processing and data processing versions available in 15 languages.
Keypad	Sculptured key array. Matte texture finish keys. Home-row key height 30 mm (1.18 in) above desktop.
Key size	1.27 cm (0.5 in) square
Key spacing	1.9 cm (0.75 in) center-to-center (single-width keys)
Numeric keypad	18 keys
Function keys	36 keys, firmware and software driven
Visual indicators	4 LED indicators: Hold, Lock, Wait, and Compose
Audible signals	
Keyclick	Sounds after each keystroke.
Bell	Sounds when BEL character received, when approaching right margin, and when compose errors occur.
Multiple bell	Sounds when error occurs in set-up save or recall operation.

OPTIONS, DOCUMENTATION, AND SUPPLIES B

GENERAL

This appendix describes the options, documentation, and supplies offered by Digital for the VT240. Part numbers and ordering information are included.

AVAILABLE OPTIONS

There are two options available for the VT240. You can order these options from Digital.

Part Number	Description
VT24X-AA	Integral modem/auto dialer – This option is a circuit board installed in the VT240 system box. The option lets you dial through to a host computer from the keyboard, eliminating the need for a telephone as a dialing mechanism.
VR24X-AA	Tilt swivel option for the color monitor

RELATED DOCUMENTATION
In addition to this owner's manual, you can order the following VT240 documents from Digital.

Title and Part Number	Description
VT240 Programmer Reference Manual (EK-VT240-RM)	Describes VT240 character processing, character codes, and control sequences needed to generate terminal control programs. This manual also provides an overview of ReGIS graphics and Tektronix 4010/4014 programming.
VT240 Installation Guide (EK-VT240-IN)	Describes the installation for the VT240. This document comes with the terminal.
VT240 Programmer Pocket Guide (EK-VT240-HR)	Provides a summary of VT240 programming information in a pocket size guide. This document comes with the terminal.
VT240 Pocket Service Guide (EK-VT240-PS)	Describes the procedures used to troubleshoot and repair the VT240 to the field replaceable unit.
VT240 Technical Manual (EK-VT240-TM)	Describes the VT240 to a detailed functional block level. Provides troubleshooting information. Does not include detailed schematics.

Title and Part Number	Description
VT240 Video Terminal IPB (EK-VT240-IP)	Provides a detailed parts breakdown of the VT240 field replaceable units. Does not provide part numbers for printed circuit board components.
VT241 Video Terminal IPB (EK-VT241-IP)	Provides a detailed parts breakdown of the VT241 field replaceable units. Does not provide part numbers for printed circuit board components.
VT240 Field Maintenance Print Set (MP-01807-00)	Provides a complete set of VT240 electrical and mechanical schematic diagrams.
VT241 Field Maintenance Print Set (MP-02002-01)	Provides a complete set of VT241 electrical and mechanical schematic diagrams.

SPECIFICATIONS

ANSI specifications are available from:

> Sales Department
> American National Standards Institute
> 1430 Broadway
> New York, NY 10018

EIA specifications are available from:

> Engineering Department
> Electronic Industries Association
> 2001 Eye Street, NW
> Washington, DC 20006

International standards are available from:

>CCITT
>UN Book Store
>United Nations Building
>New York, NY 10017

ORDERING INFORMATION

You can order options, supplies, and documentation by phone from 8:30 a.m. to 6:00 p.m. (EST) or by mail.

Continental USA and Puerto Rico

Call 800-258-1710 or mail to:

>Digital Equipment Corporation
>P.O. Box CS2008
>Nashua, NH 03061

New Hampshire, Alaska, Hawaii

Call 1-603-884-6660.

Outside the USA and Puerto Rico

Mail to:

>Digital Equipment Corporation
>Attn: Accessories and Supplies Business Manager
>c/o Local Subsidiary or Digital-Approved Distributor

KEYBOARDS C

GENERAL

This appendix provides illustrations of all national keyboards for the VT240 in the following order.

NOTE: Most of the keyboards are available in two versions, standard and word processing. The key positions on both types of keyboards are the same. However, the word processing version has different key legends, appropriate to word processing only.

United States/Canada
United Kingdom
Belgium (Flemish)
Canada (French)
Denmark
Finland
France/Belgium
Germany/Austria
Holland
Italy
Norway
Spain
Sweden
Switzerland (French)
Switzerland (German)
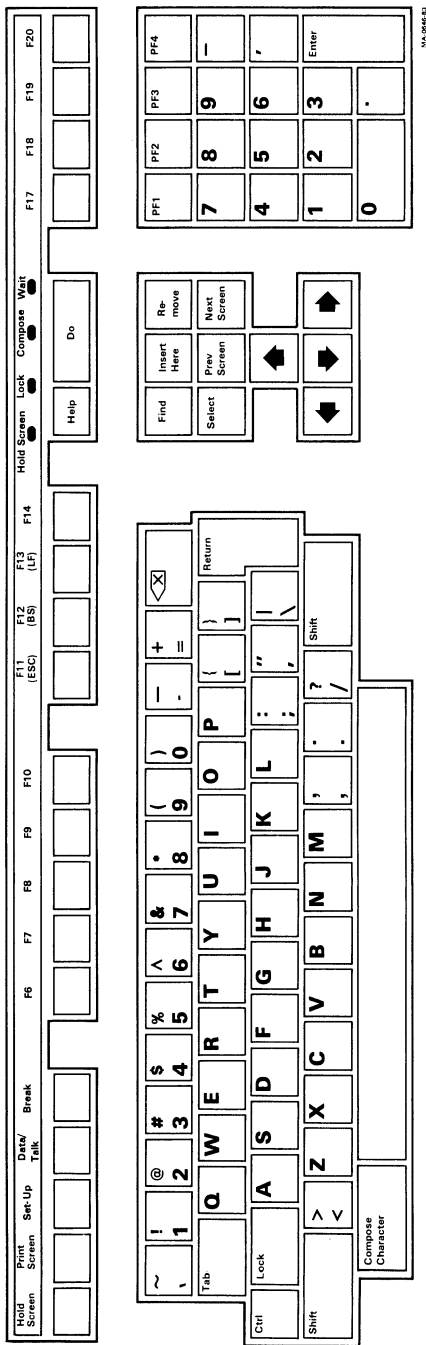
Figure C-1   North American
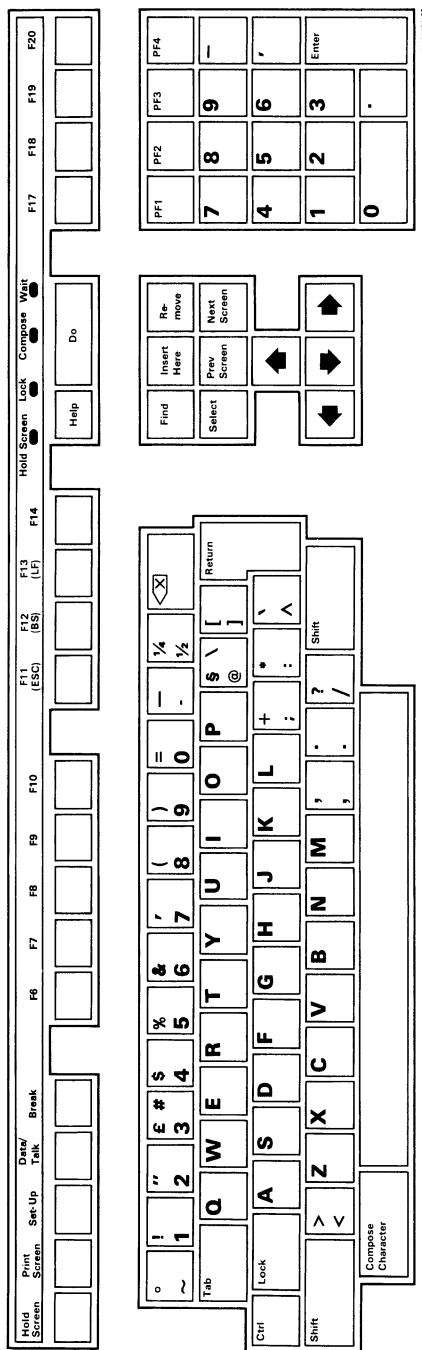
Figure C-2   United Kingdom

Figure C-3   Belgium (Flemish)

Figure C-4   Canada (French)
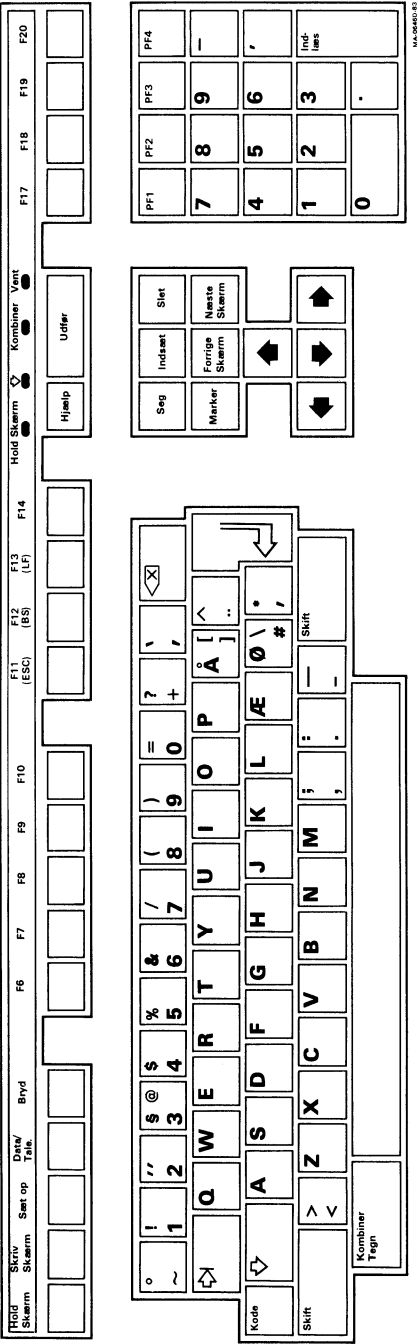
Figure C-5   Denmark
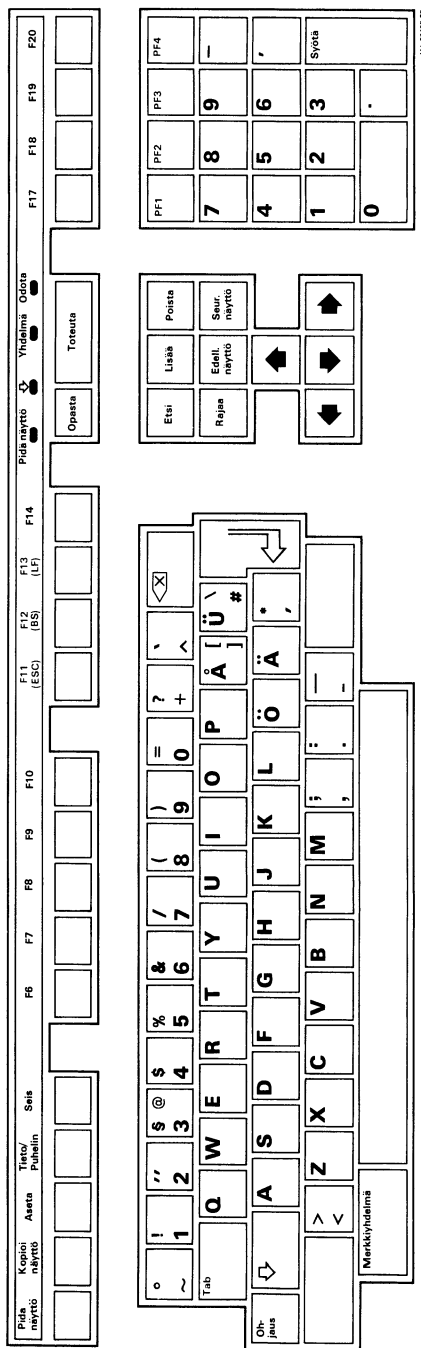
Figure C-6   Finland
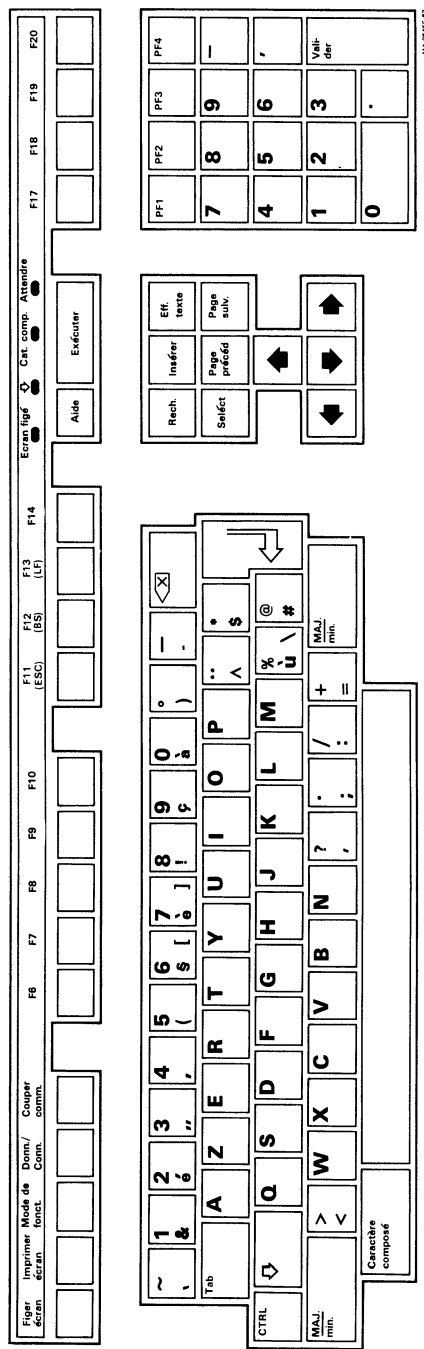
Figure C-7   France/Belgium
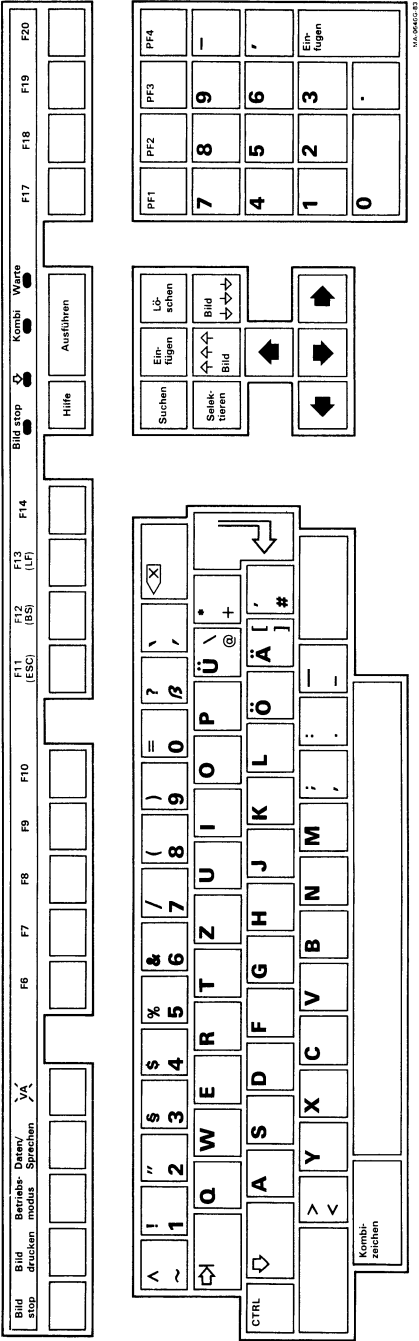
Figure C-8   Germany/Austria
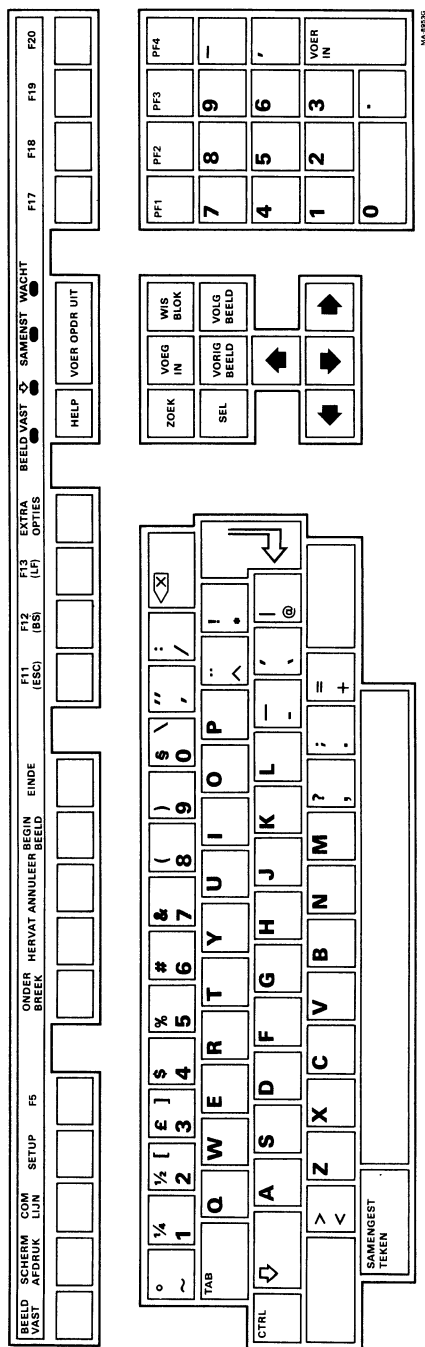
Figure C-9   Holland

Figure C-10   Italy
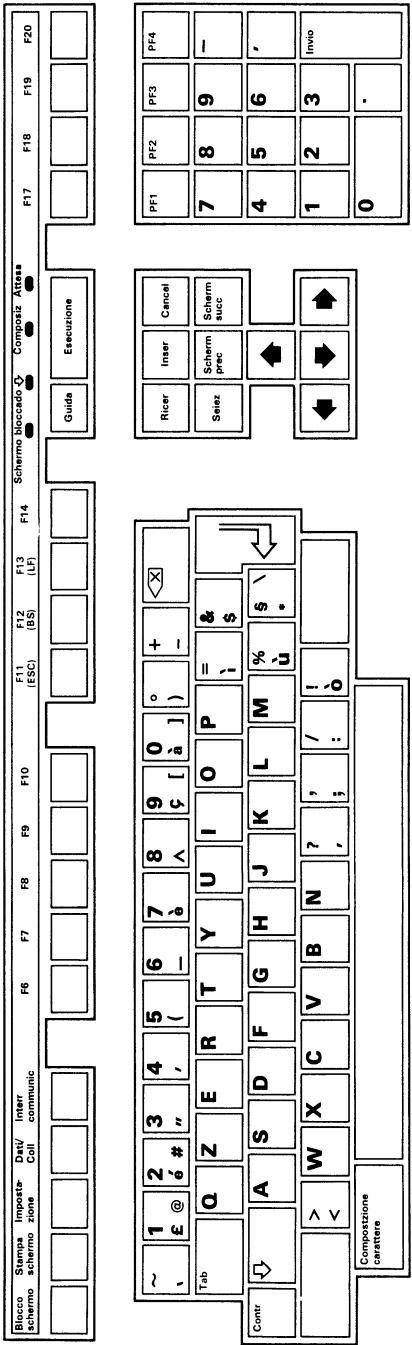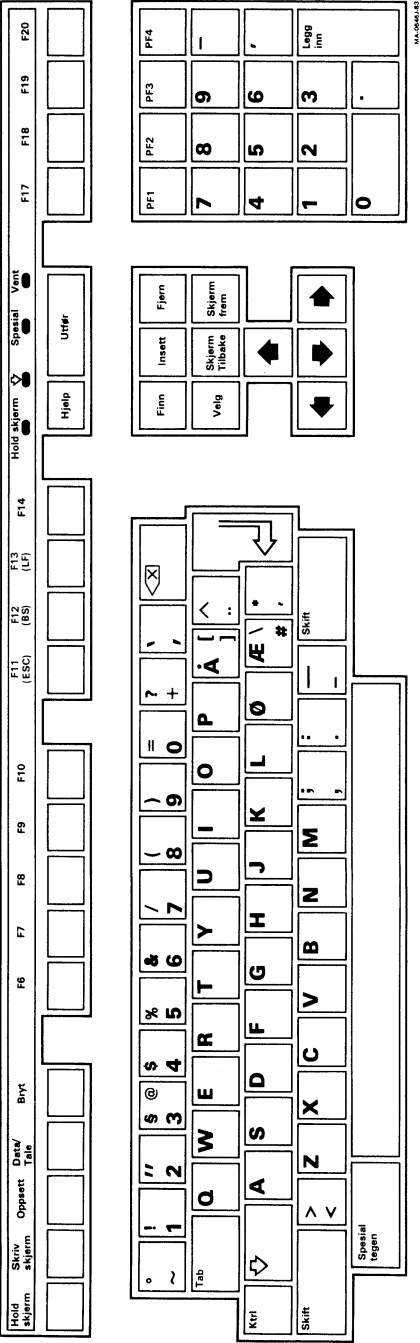
Figure C-11   Norway
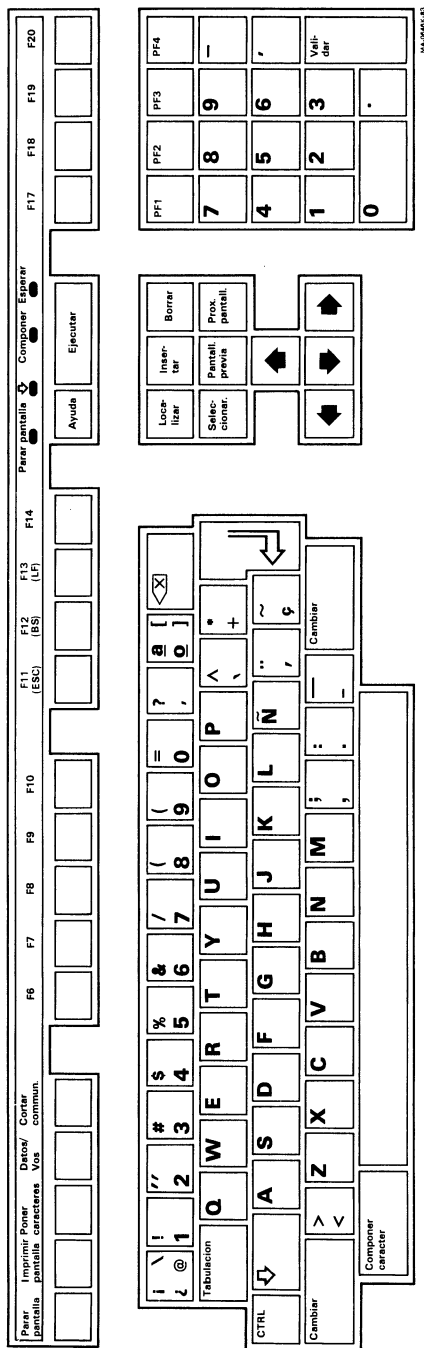
Figure C-12   Spain
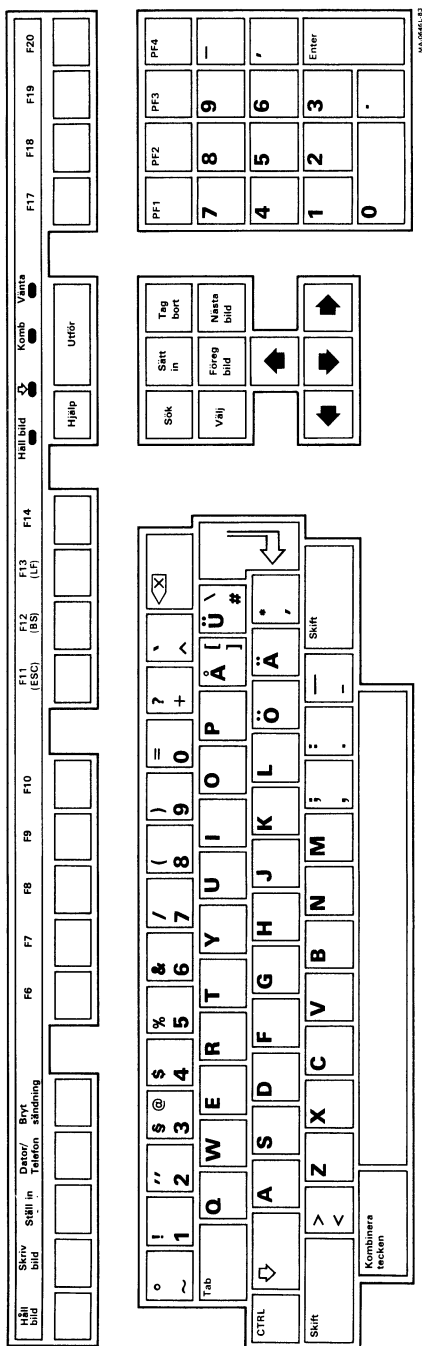
Figure C-13   Sweden
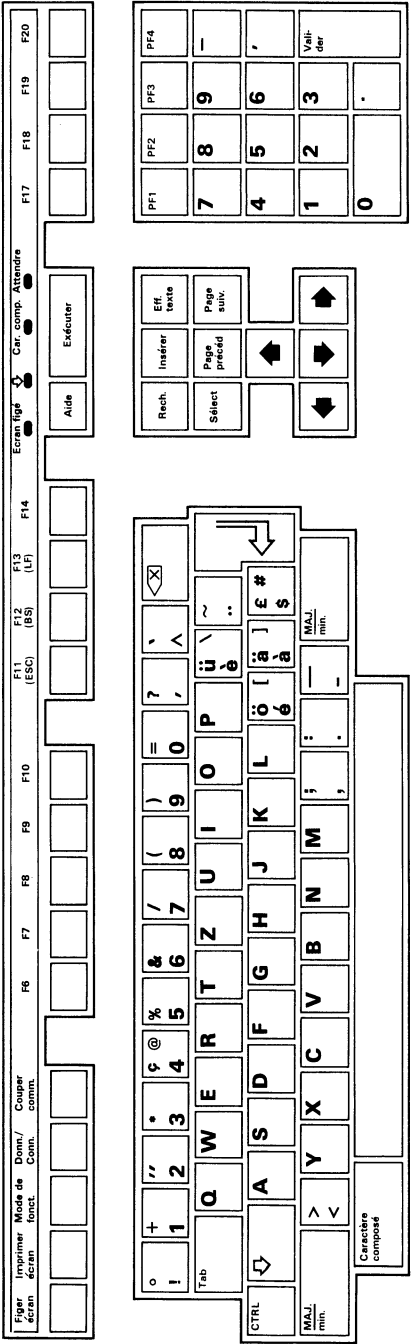
Figure C-14   Switzerland (French)
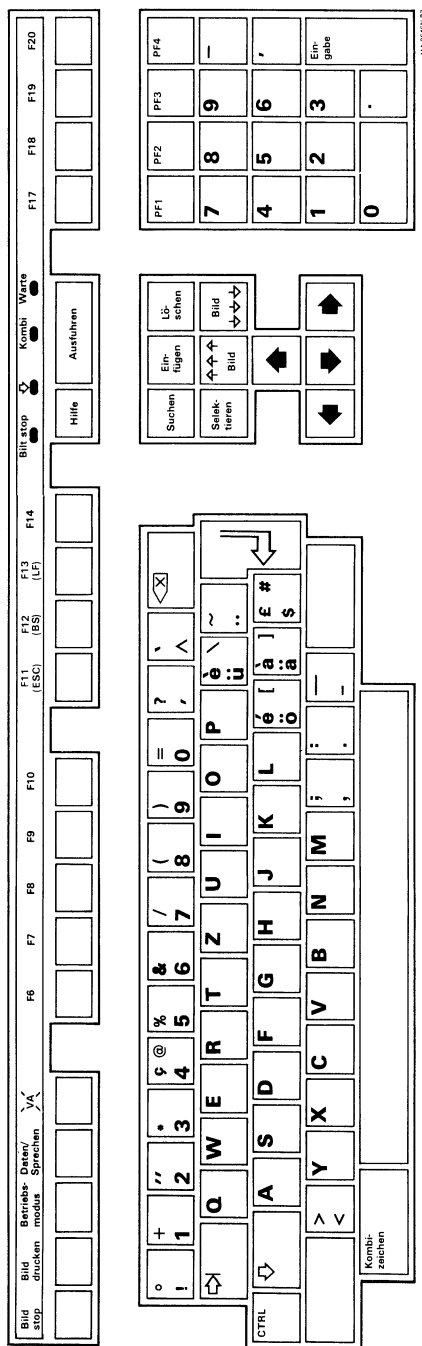
Figure C-15   Switzerland (German)

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INSTALLATION, WARRANTY, AND SERVICE INFORMATION

Installation/Warranty
If you purchased directly from Digital, refer to the sales agreement for installation and warranty terms purchased with your system.

If you purchased, leased, or rented from a vendor other than Digital, contact your vendor for information regarding installation and warranty terms.

Digital Services
Digital provides a wide range of maintenance programs to meet your service needs, from complete Digital support to complete self-maintenance.

On-Site Service
For quality maintenance performed at your site, you can choose from DECservice, Basic Service Agreements, or Time and Materials Service.

Carry-In Service
This is "return-to" maintenance at a considerable savings over on-site service.

DECmailer
If you perform your own maintenance, you should use our fast-turnaround, module-and-subassembly repair service, called DECmailer.

For more information on any of Digital's maintenance services, call the Digital Field Service information number in your area during normal business hours.

U.S.A.	(800)554-3333	Italy	(02)617961
Australia	(02)4125555	Japan	(03)9897161
Austria	(222)6776410	New Zealand	(09)595914
Belgium	(02)2425095	Norway	(2)160290
Canada	(800) 267-5251	Portugal	(1)725402
Denmark	(2)889666	Spain	(1)7331900
Finland	(0)423511	Sweden	(08)7338000
France	(6)0778292	Switzerland	(01)8169111
Holland	(30)640293	United Kingdom	(734)868711
Ireland	(1) 308433	West Germany	(089)95910

Training
Digital offers hardware maintenance courses at 17 worldwide training centers or your own facilities.

Spare Parts
If you perform your own maintenance, Digital Customer Spares provides spares inventory planning, maintenance test equipment and documentation, and emergency spare parts.

Printed in U.S.A.   EK-VT240-UG-003