Qume
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Manual

QVT-102
QVT-102A
Operator Manual

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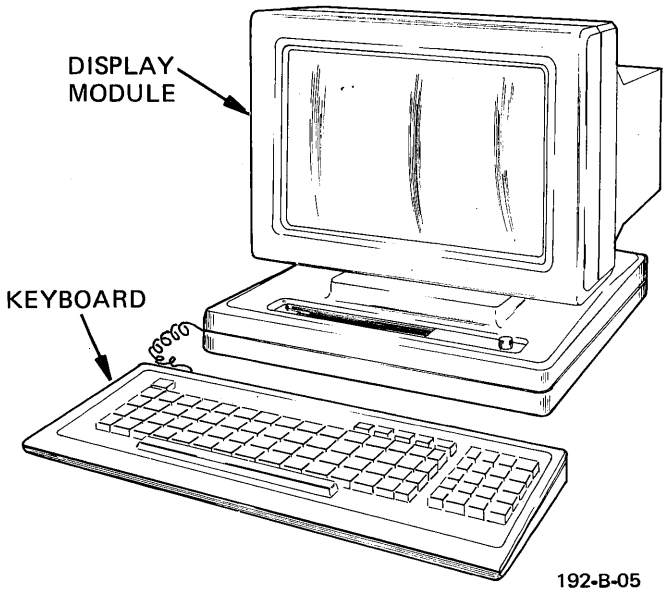

The QVT-102/QVT-102A Video Display Terminal

PREFACE

The purpose of this manual is to describe the proper use, capabilities, and features of the QVT-102TM/QVT-102ATM video display terminal. Even though its application may vary, users of either the Qume Video Terminal, Model 102, or the Model 102A are encouraged to read this manual to acquire a general understanding, and thereby facilitate using the terminal to its fullest potential. The keyboard and display module, the two major components that comprise the terminal, are illustrated above.

Following the PREFACE, is a section entitled PRODUCT DESCRIPTION, which outlines the specifications of the terminal. Next, in the section entitled INSTALLATION, detailed instructions for unpacking and installing the terminal are presented. The next section, OPERATION, is perhaps the most important section, because it describes the power On procedure, set-up, and general operator functions. The PROGRAMMER INFORMATION Section is more technically oriented and explains the terminal's command set. Following, the OPERATOR CARE Section offers helpful tips for maintaining the terminal in good working order. A GLOSSARY and APPENDIX provide an array of reference information, and an INDEX concludes the manual with a topical listing of keywords with page reference.

QVT-102/QVT-102A
DIFFERENCE DATA SUMMARY

Feature/Function	QVT-102	QVT-102A
Programmable Function Keys	None	8
AUX (Auxiliary) Port	Unidirectional	Bidirectional
To Enter Set-up Mode	Depress Setup Key	Depress Ctrl/Shift/ Setup Keys
To Send a Break	Depress Break Key	Depress Shift/Break Keys
To Locally Re-enable the Keyboard after it has been Disabled	Depress Shift/Break or Setup-Setup Keys	Depress Shift/Break or Ctrl/Shift/Setup-Setup Keys
Status Line Display	May be Disabled by Command Code Only	May be Disabled by Command Code or Status Line Selection
To Display "H" Test Pattern	Depress Setup-Zero Keys	Depress Ctrl/Shift/ Setup-Zero Keys

All of the above topics are noted in the manual.

RECORD THE SERIAL NUMBER AND MODEL NUMBER OF YOUR KEYBOARD AND DISPLAY MODULE

The serial number and model number for both the keyboard and display module is located on the bottom outside cover of each component.

Keyboard		Display Module	
Model Number		Model Number	
Serial Number		Serial Number	

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SECTION 1.

PRODUCT DESCRIPTION

INTRODUCTION

This section tabulates the specifications of the QVT-102/QVT-102A video display terminal. Specifications for both models are the same except as where noted.

Screen/Video Display

Screen Module	• 12-inch diagonal screen that features tilt and swivel for individual operator comfort. • Standard non-glare green screen.
Display Format	• 24-lines by 80-character columns. • 25th Status/Set-up line.
Character Formation	• 7 × 9 matrix in a 9 × 12 cell.
Video Attributes	• Blink, Blank, Underline, Normal/Reverse Video, and Half Intensity.
Cursor Type	• Blink/Steady, Block/Underline, or Invisible.
Fields	• Protected and Unprotected Fields.

Keyboard

Keyboard	• Detached, low-profile keyboard with 3-position adjustable feet for enhanced individual operator comfort. • Alphanumeric typewriter character set. • Programmable function keys (QVT-102A only). • Numeric key pad. • 5 cursor positioning keys. • Defeatable audible key click and character auto repeat. • 3-key rollover. • Keyboard lock enable/disable.
Character Set	• 96 ASCII character set. • 32 control characters. • 15 graphics (line drawing symbols).

Features

Emulations	• In addition to its own QVT-102/QVT-102A command set, three emulations are available: Hazeltine 1500, Lear Siegler ADM-3A/5, and Televideo 910.
Editing	• Cursor position/movement keys: Up, Down, Left, Right, Home. • Character/Line Insert and Delete. • Delete to End of Line/Screen. • Tabbing: Tab, Back Tab, Field Tab.
Rear Panel (Screen Module Pedestal) Features	• Power On/Off switch. • Line fuse: Standard 2 amp-250 Vac. • AUX-Auxiliary (printer) interface connector. • EIA-Host computer (RS-232-C) interface connector.
Screen Intensity	• Adjustable screen intensity from potentiometer on right front corner of the display module pedestal.
Keyboard Connection	• Keyboard quick connect/disconnect from telephone style connector on left-side corner of display module pedestal.
Screen-Saver	• Automatic video disable after 15 minutes of inactivity with no loss of data. Depressing any key will return the video display. This feature can be disabled.
Set-up Mode	• Menu style (25th status line) set-up feature with memory storage capability.

Communications

Interface	• Compatible with the EIA RS-232-C interface standard. • Bidirectional printer (AUX) port (QVT-102A only).
Protocol	• X-ON/X-OFF with DTR, X-ON/X-OFF only, or DTR only.
Modes	• Full or Half Duplex. • Character/Line/Block data transmission.

Communications (cont)

Baud Rate	• 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19200.
Parity	• Odd, Even, Mark, Space, or No Parity.
Data Word Size	• 7- or 8-data bits.

Power Requirements

Power Requirements	• 95 to 125 Vac, 0.30 A. • 200 to 264 Vac, 0.15 A. • 50/60 Hz, 35 W.

Physical

Dimensions	• Screen Module: 14 inches high, 13 inches wide, 12 inches deep. • Keyboard: 1.5 inches high, 18 inches wide, 8 inches deep.
Weight	• Screen Module: 19 pounds. • Keyboard: 3 pounds.
Operating Temperature	• 0 to 40 degrees Centigrade (32 to 104 degrees Fahrenheit).
Relative Humidity	• 10 to 90% (non-condensing).

Options

Options	• Foreign character sets. • Non-glare amber screen. • 14-inch diagonal screen (green or amber). • 20-mA current loop communications interface (active or passive).

INSTALLATION

INTRODUCTION

This section describes receiving/inspection and installation of the QVT-102/QVT-102A video display terminal.

RECEIVING/INSPECTION

Each terminal is packaged in an individual carton for protection during shipment.

Before opening the carton, inspect it for any signs of damage. If damage is observed, have the delivery agent note the damage on the shipping document. Note: Some shippers may wish to be present when the carton is opened, if external damage is apparent.

Unpack and inspect the terminal as follows: Refer to Figure 2-1.

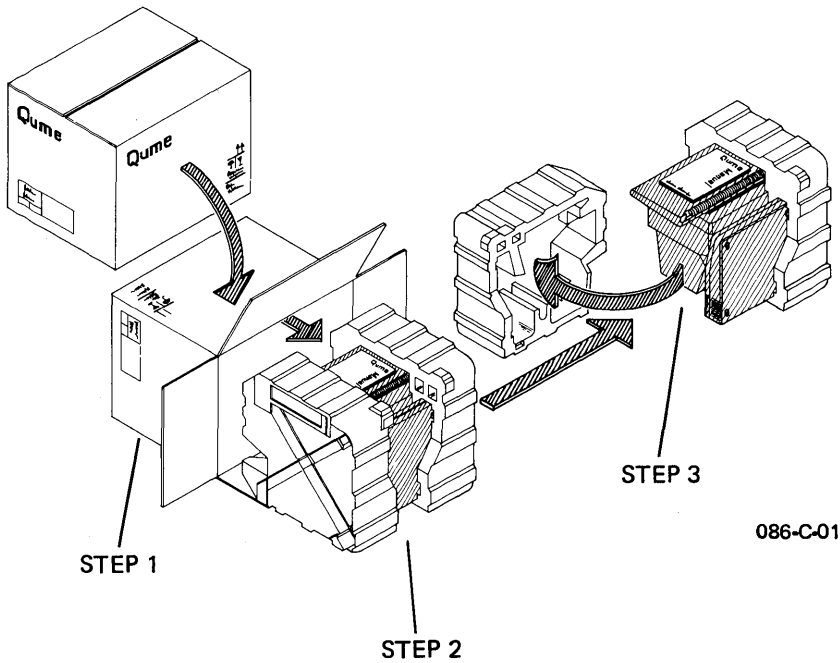

Figure 2-1. Unpacking the Terminal

1. Open the carton and place it on its side on a table top or flat surface.

2. Slide the terminal from the carton.

3. Remove the Styrofoam packing buns, being careful that neither the keyboard or display module are jostled and fall.

4. Remove the plastic bags that wrap each component. Retain all packaging materials for possible reshipment.

5. Inspect both the display module and the keyboard for scratches, loose parts, and damage from rough handling. Note any evidence of such damage on the invoice, and file a claim with the carrier immediately if the condition of either component so warrants.

6. If damage that might impair the proper operation of the terminal is detected, contact your service representative for advice and instructions.

7. If the terminal will not be used for some time, it is advisable to replace the plastic shipping bags for dust protection.

8. When repacking the terminal for shipment or for long storage periods, use only the original packaging materials.

INSTALLATION

Select a suitable site in which to install your terminal. A good site offers a clean, well-lighted environment, with a stable platform to support the terminal at a comfortable height. Install the terminal as follows:

1. Verify that the power switch on the rear panel of the display module pedestal is in the OFF position. The rear panel of the display module pedestal is illustrated in Figure 2-2.

2. Connect the communications cable between the host computer and the connector labeled "EIA" on the rear panel of the display module pedestal. If necessary, refer to Appendix A for a pinout description of this connector, and to Appendix B for information concerning optional interface jumper placement.

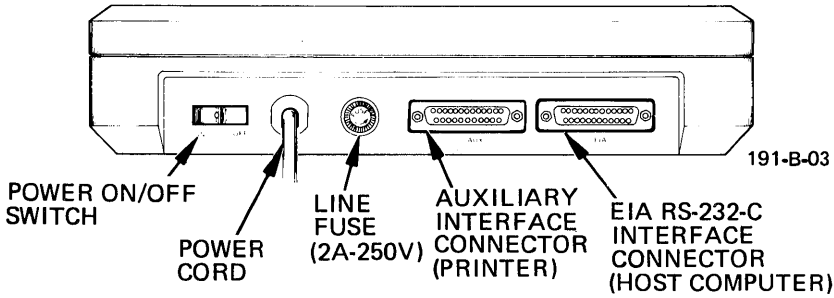

Figure 2-2. The Rear Panel of the Display Module Pedestal

3. If a printer is to be used, connect the printer to the connector labeled "AUX" on the rear panel of the display module pedestal. If necessary, refer to Appendix A for a pinout description of this connector.

4. Connect the power cord from the display module to a grounded AC outlet.

5. Connect the coiled keyboard cable to the connector on the left front corner of the display module pedestal (refer to figure 2-3).

6. Adjust the height of the keyboard to a comfortable elevation.

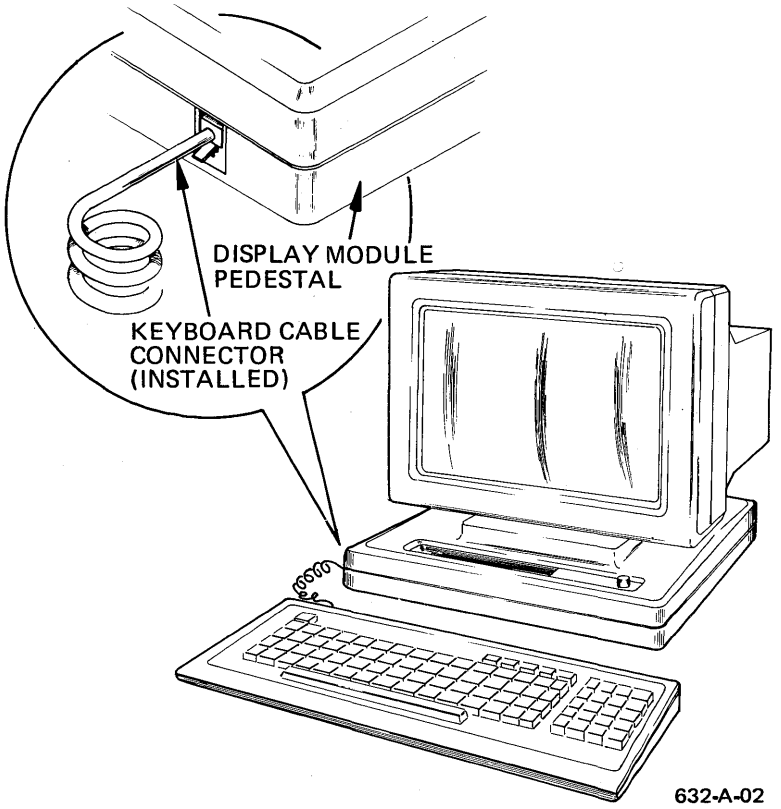

Figure 2-3. Keyboard Cable Connection to the Display Module

OPERATION

INTRODUCTION

This section describes how to operate the QVT-102/QVT-102A video terminal and discusses the following topics: Powering On the terminal; what you should see; adjusting screen intensity; using the keyboard; and general operator functions, such as editing, printing, and sending the screen display.

POWERING ON THE TERMINAL

To power On the terminal perform the following steps:

1. Verify that the terminal is properly installed. Check to see that:

   - The Power Switch on the rear panel of the display module is in the OFF position;
   - The power cord is plugged into a grounded AC outlet;
   - The host computer cable is connected to the EIA Connector;
   - If a printer is to be used, it is connected to the AUX Connector, and that;
   - The keyboard cable is connected to its connector on the left front corner of the display module.

2. Move the Power Switch to the ON position and observe that the following things occur:

   - The margin bell or beeper should sound after about two seconds;
   - In about ten seconds the cursor should appear at its Home position (the QVT-102 will also display the status line on the 25th line of the screen until it is disabled by command code). Note: It may be necessary to adjust the screen intensity by rotating the knob on the right corner of the display module to make the display visible. Refer to Figure 3-1;
   - If an error code is displayed on the screen, refer to Appendix C for further details and contact your service representative;
   - If the terminal appears not to be operating, verify that the power source is satisfactory, and that the fuse installed on the rear panel is a good fuse.

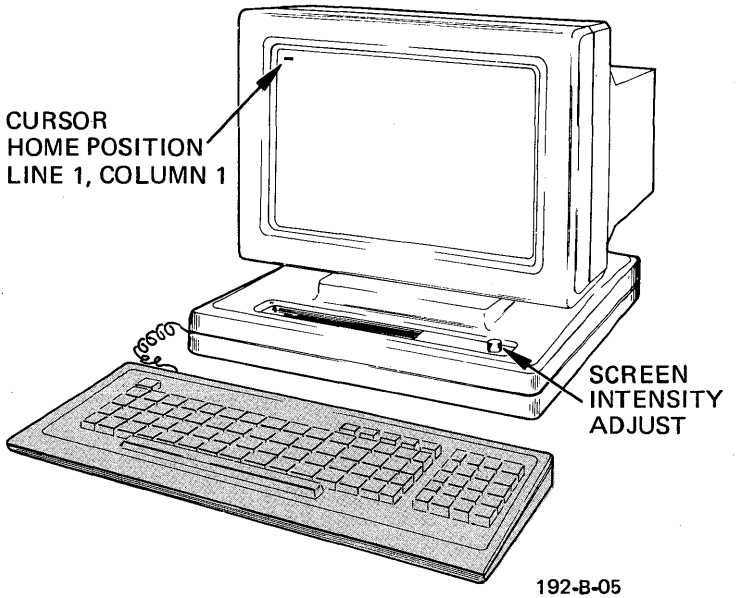

Figure 3-1. The Screen Display After Powering On the Terminal

USING THE TERMINAL

Using a video display terminal is in many ways similar to using a typewriter, except that a video terminal has much greater capability. The ease by which data can be edited on the display screen, before it is printed or sent to the host computer, is no doubt the most beneficial feature. After using the terminal for a short time you will readily agree.

From the operator's viewpoint, the keyboard is the most integral component because from it data is generated for entry into the host computer system. A good understanding of the keyboard is necessary to fully utilize and appreciate all of the terminal's capabilities.

Please continue to read the following sections to familiarize yourself with the features of your terminal.

THE KEYBOARD

The keys of the keyboard can be divided into three functional groups known as the Typewriter Character Keys, Special Function Keys, and the Numeric Key Pad. Each of these functional groups is described below.

TYPEWRITER CHARACTER KEYS

The Typewriter Character Keys (refer to Figure 3-2 on Foldout 3-1) function like those of an ordinary office typewriter. When these keys are depressed, they generate the codes necessary to make the characters display on the screen. Upper-case characters may be produced using the Shift key, or by enabling the Caps Lock key.

An Auto Repeat feature allows a key to be automatically repeated at a rate of approximately 30 characters per second whenever a key is held down for longer than a couple of seconds. The Auto Repeat feature affects all keys except the following:

Return
Esc (Escape)
Setup
No Scroll
Home/Clear
Break
Tab
All keys on the Numeric Key Pad.

SPECIAL FUNCTION KEYS

The Special Function Keys (refer to Figure 3-3 on Foldout 3-1) are used to modify the operation of the terminal. They allow the operator to selectively configure the terminal according to application, alter the programming, move the cursor around the screen, edit the display, and enable the print and send functions. Each of the special function keys is described below. For more detailed information, refer to the PROGRAMMER INFORMATION Section.

Setup

As a safeguard, the Setup key must always be used in combination with the Ctrl (Control) and Shift keys (QVT-102A only; the Setup key is used singularly on QVT-102). This key allows the operator to enter and exit the status line at the bottom of the screen. Refer to The Status Line and Set-up paragraph for a complete description of the status line and the use of the Setup key.

Esc (Escape)

The Escape key is used to momentarily leave (escape) an application program in order to use a special feature or function. The

Escape key is used in combination with the typewriter character keys to specify a command sequence. The Escape key should be pressed and released before the second key is issued. Refer to the PROGRAMMER INFORMATION Section for a complete description of all QVT-102 / QVT-102A escape sequences.

Ctrl (Control)

The Control key is similar in function to the Escape key in that it is used to enable a special feature or function. However, the Control key must be used simultaneously with a typewriter character key to issue a command (similar in action to the Shift key). Commands which require that the keys be depressed simultaneously are indicated by a hyphen separating the key names. Refer to the PROGRAMMER INFORMATION Section for a complete description of all QVT-102 / QVT-102A control code sequences.

Caps Lock

The Caps Lock key enables the shift function so that all alpha keys display as upper-case characters. However, the Caps Lock key is different from a typewriter shift lock key, because it does not enable the characters in the shift position on the number keys - these characters still require that the Shift key be engaged. The Caps Lock key is an On/Off function key.

No Scroll

The No Scroll key is an On/Off function key which when depressed once, signals the host computer to stop scrolling of the screen display. Depressing the No Scroll key a second time enables scrolling of the screen again.

Print

The Print key can be used in three ways. To print all data on the screen, simply depress the Print key. Secondly, to print all data from the Home position (top left-hand corner of the screen, i.e., line 1, column 1) to the present cursor position, use the Print key in conjunction with the Shift key. This is known as a Shift-Print function. Or thirdly, use the Print key in conjunction with the Control key, a Control-Print function, to print all data from the present cursor position to the end of the screen. (For data to print as it is positioned on the display screen, whenever the Print key is used, all null codes are converted to space codes).

Cursor Position Keys: Arrow Up, Down, Left, Right, Home

The cursor position keys are used to move the cursor about the screen. The arrow keys are repeat keys and move the cursor in the direction the arrow is pointing on the key cap. The Home key returns the cursor to the Home position, or location line 1, column 1 on the display screen. Depressing the Home key with the Shift key (or Clear) clears the screen of data and returns the cursor to the Home position.

Break

Depressing the Break key transmits a 200- to 250-millisecond space pulse to the computer. As a safeguard, the Break key must be used in combination with the Shift key (QVT-102A only; the Break key is used singularly on QVT-102).

Del (Delete)

Depressing the Delete key issues an ASCII delete (DEL) character to the host computer.

Line Feed, Shift/Line Feed

Depressing the Line Feed key issues an ASCII line feed (LF) command to the host computer and causes the cursor to be moved down one line in the same column on the screen. Using the Line Feed key in combination with the Shift key causes the cursor to be moved upward in the same column. Visually on the display screen, the cursor moves as it does when using the Up and Down Cursor Position keys.

Program Function Keys: PF1, PF2, PF3, PF4

Each of the Program Function keys transmits to the host computer a special code. A Program Function key may be used by itself, or in conjunction with either the Shift or Control key to generate a total of twelve default codes. For user programming instructions (QVT-102A feature only), refer to the PROGRAMMER INFORMATION Section.

NUMERIC KEY PAD

The Numeric Key Pad (refer to Figure 3-4 on Foldout 3-1) allows numbers to be entered in calculator fashion. Each number key in the Numeric Key Pad generates the same characters as the number keys in the Typewriter Character Set; however, the Numeric Key Pad keys do not auto repeat. Depressing the Enter key causes a carriage return and is also used to enable data transmission from the terminal to the host computer (QVT-102/QVT-102A only).

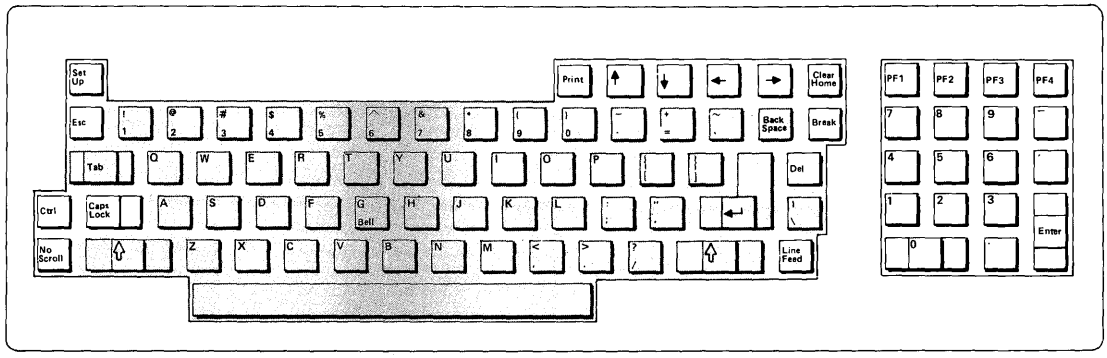

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Figure 3-2. The Typewriter Character Keys

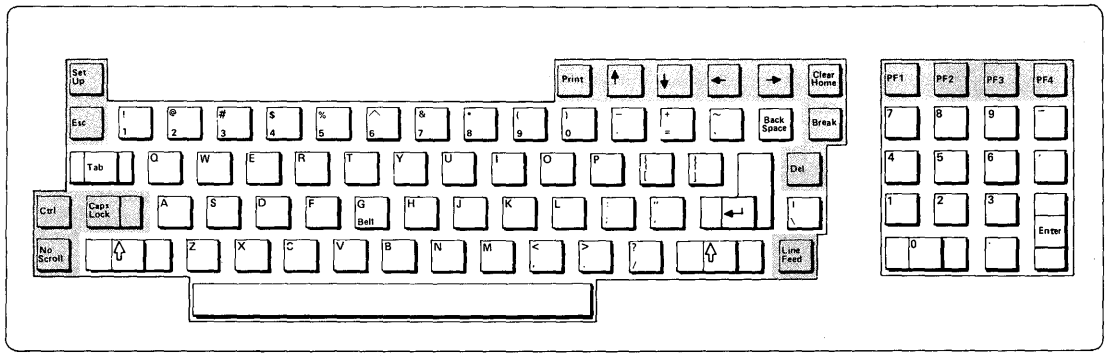

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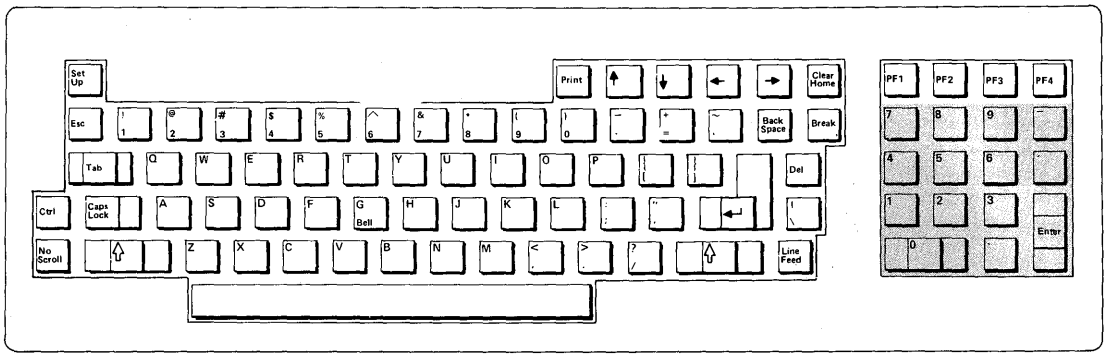
Figure 3-3. The Special Function Keys



077-C-04

Figure 3-4. The Numeric Key Pad

Foldout 3-1

THE STATUS LINE AND SET-UP

The Status Line is the last line (or 25th line) on the display screen. The QVT-102 / QVT-102A has six status lines that can be consecutively displayed to view the set-up configuration of the terminal. Each line contains a series of fields, whose contents may be selectively ordered from the keyboard (some may be selected by command code). Figure 3-5 on Foldout 3-2 illustrates the status lines and the selections available between the Default and Possible values for each field.

Normally, when the Status Line is displayed, it appears in reverse video. However, the Status Line may be blanked, or suppressed, from display on the screen.

CHANGING THE STATUS LINE

Changing a status line is accomplished as a 3-key function by simultaneously depressing the Ctrl/Shift/Setup keys (QVT-102A only; the Setup key is used singularly on QVT-102) to enter the cursor into the Main Status Line. Once the cursor is in the Main Status Line, it can be moved into any field, or advanced into any of the remaining five status lines by depressing the Cursor Position keys. For example, depressing the Down Cursor Arrow key advances the cursor into the next status line, the Up Cursor Arrow key returns the cursor to the previous status line, and the Left and Right Cursor Arrow keys move the cursor left or right from field-to-field within a status line. To change a field from a Default value to a Possible value, move the cursor into that field; then simply depress the Space Bar to toggle (or select) the contents of the field.

If a status line is reconfigured and it is desired that the new selection(s) be "saved," a Shift-S function will write the new values into memory (all except the PROTECT MODE OFF/ON, KEYBOARD ON/LOCK, AUXILIARY PORT OFF/ON, MONITOR MODE OFF/ON, GRAPHICS MODE OFF/ON, and the TRANSPARENT MODE OFF/ON fields which always assume their default values when the power is cycled). Performing a Shift-D function will return all the status lines to their default values; a Shift-R function will recall the previous "saved" status of the six status lines. Whenever a Shift-S, Shift-R, or Shift-D function is performed, the cursor will exit the set-up sequence and return to its last position on the display; otherwise, depress the Setup key a second time.

During a set-up sequence, only the following keys and key combinations are functional: Setup, Cursor Position keys, Space Bar, Shift-S, Shift-R, and Shift-D. The Typewriter Character keys, and the Esc and Ctrl keys are functional only to enter the HERE IS message and to program the Program Function keys (QVT- 102A feature only); the zero key is functional to display an "H" pattern used during video alignment procedures.

It is recommended that after the terminal is configured for operation with the host system, that the Status Line set-up selections be recorded as a reference that identifies the terminal's operating parameters.

STATUS LINE DESCRIPTION

Table 3-1 describes the default and possible values of each field within the six status lines. Note: Some status line selections are available by command code, and in the following table these are identified by an asterisk (*). Refer to the PROGRAMMER INFORMATION Section for the proper command code to use with the emulation selected.

Table 3-1. Status Line Default and Possible Values Description

Default	Possible	Description
Main Status Line		
	CAPS	Capitals. This field is selected by depressing the Caps Lock key, and enables all the alpha characters to display and be transmitted in uppercase. This feature is disabled by depressing the Caps Lock key a second time.
ON LINE	LOCAL	On Line Mode/Local Mode. On Line Mode configures the terminal for communication with the host computer; Local Mode isolates the terminal from the host computer.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
CHAR MODE	LINE MODE BLOCK MODE	Character Mode/Line Mode/Block Mode*. Character Mode (also known as Conversational Mode) enables the terminal to transmit data to the host computer as it is entered on the keyboard. Line Mode enables the terminal to transmit the line in which the cursor is located when the Enter key is depressed. Block Mode enables the terminal to transmit the entire screen display when the Enter key is depressed.
FDX	HDX	Full Duplex/Half Duplex Transmission Mode. This field configures the transmission mode of the terminal. In FDX (Full Duplex) Mode, data entered on the keyboard is transmitted to the host computer only; data must be echoed back to the terminal for screen display. In HDX (Half Duplex) Mode, data entered on the keyboard is transmitted to the host computer and is also internally echoed for screen display.
PROT OFF	ON	Protect Mode Off/On*. Protect Mode is a feature that allows all data displayed in half intensity to be protected from accidental overwriting. This feature can be selectively enabled or disabled.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
KB ON	KB LOCK	Keyboard On/Lock*. This feature can be used to disable the keyboard as a data entry device until a Keyboard Unlock command is received from the host computer, until a set-up sequence is entered, or until the Shift and Break keys are depressed.
AUX OFF	ON	Auxiliary Off/On*. This feature selectively disables or enables the AUX Port or printer interface.
MON OFF	ON	Monitor Mode Off/On*. Monitor Mode is a feature that enables the display of all control codes and escape sequences in addition to the alphanumeric character set. Commands are not executed when Monitor Mode is selected. For proper operation, the Line Wrap feature should also be enabled.
GRAPH OFF	ON	Graphics Off/On*. Graphics Mode is a special applications feature that reconfigures the terminal for 15 line drawing symbols. For a complete tabulation, refer to the PROGRAMMER INFORMATION Section. With the Graphics Mode disabled, the complete alphanumeric character set is available.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
9600	15-Possible	This field allows the operator to select transmission baud rate for both the EIA and AUX Ports. In addition to the default baud rate of 9600, fifteen possible baud rates are available: 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 19200.
Set 1 Status Line		
AUX/KB: AUX	KB	AUX/Keyboard On/Off*. This field is only applicable to the Lear-Sieger ADM-3A/5 emulation, and allows the operator to selectively enable or disable the AUX (printer) Port or the keyboard, by using a Ctrl-N or Ctrl-O command.
REPEAT ON	OFF	Auto Key Repeat On/Off. This field is used to enable or disable the auto repeat key feature. When enabled, if a key is depressed and held down approximately 2 seconds, that character will repeat at a rate of approximately 30 characters per seconds.
CLICK OFF	ON	Key Click Off/On. The Click On/Off feature enables or disables the audible click sound of the keys being depressed.
MARGIN BELL OFF	ON	The Margin Bell On/Off. This field enables or disables the right margin alarm feature. When enabled, a "beep" sound will be emitted when the cursor passes through column 73.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
EIA/CL: EIA	CL	EIA RS-232-C/Current Loop Interface. This field is used to select the type of communications interface used on the EIA or host computer port. EIA is the default selection and identifies an RS-232-C interface. If the terminal is equipped with the current loop option, CL may be selected to enable the 20-ma current loop interface (Default Passive).
E.O.M. NUL	ETX EOT CR	End of Message Terminator*. This field allows the operator to select the type of ASCII code identifier that signifies to the host computer the conclusion of a transmission. Four E.O.M. terminators are available: NUL (Null, Ctrl-@); EOT (End of Transmission, Ctrl-D); ETX (End of Text, Ctrl-C); or CR (Carriage Return, Ctrl-M).
Set 2 Status Line		
LINE WRAP ON	OFF	Line Wrap On/Off. This field is used to select the line wrap feature which moves the cursor from the 80th column of a given line to the first unprotected position of the next line when the active position is shifted one column to the right. If ON is selected, this feature is enabled; if OFF is selected, this feature is disabled. When disabled, the cursor will not move beyond the 80th column position and all data at this position will be subsequently overwritten.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
LINE FEED OFF	ON	Line Feed Off/On. With Line Feed On selected, depressing the Return key will cause a carriage return with a line feed; with Line Feed Off selected, depressing the Return key will cause a carriage return without a line feed.
SCROLL ON	OFF	Scroll On/Off*. This field enables or disables automatic scrolling of the screen display.
DISPLAY PE OFF	ON	Display Parity Error Off/On. This field enables or disables the display a symbol (℔) to indicate that a transmission parity error has occurred.
STD VID	REV VID	Standard Video/Reverse Video. This field allows the operator to select the type of video display. If Standard Video is selected the screen will display as light characters on a dark background; if Reverse Video is selected, the screen display will appear as dark characters on a light background.
X-ON & DTR	X-ON ONLY DTR ONLY	Protocol. This field is used to select the type of protocol used with the host computer. The default selection X-ON & DTR allows both X-ON/X-OFF (Transmit On/Transmit OFF) and DTR (Data Terminal Ready) protocol. Two other selections are available: X-ON ONLY (only X-ON/X-OFF), or DTR ONLY (only Data Terminal Ready).

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
Set 3 Status Line		
DATA BIT 8	7	Data Word Length. This field is used to configure the length of ASCII encoded characters for either 7 or 8 bits. An eighth bit may be selected for parity.
BIT 8 0	1	Bit 8 - Mark/Space. This field is used to set the eighth bit, or parity bit to logic level 0 or logic level 1 (i.e., space or mark).
PARITY OFF	ON	Parity Check Off/On. This field configures the terminal to check (On) or ignore (Off) the parity bit of incoming data; also, adds parity to transmitted data when ON is selected.
PARITY BIT ODD	EVEN	Parity Bit Odd/Even. This field configures the terminal for odd or even parity.
STOP BIT 1	2	Stop Bit Select. This field is used to select the number of stop bits following a data word: 1 (one) or 2 (two).
EMULATION QVT102	HZ1500 ADM-5A TVI910	Emulation. This field is used to select the emulation command set: QVT102 identifies the terminal's native command set; HZ1500, the Hazeltine 1500; ADM-5A, the Lear Siegler ADM-3A/5; and TVI910, the Televideo 910.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
Set 4 Status Line		
CURSOR UL	BLOCK	Cursor Type. This field allows the operator to select either an Underline or Block type cursor.
CURSOR BLINK	STEADY	Cursor Attribute. This field allows the operator to select the cursor attribute: Blinking or Steady (always On).
HERE IS:		Here Is Message. The Here Is field is a special purpose field that allows an operator or programmer to enter a message that specifically identifies a terminal to the host computer when an ASCII enquiry code (ENQ, Ctrl-E) is received. In the Here Is field, the first and last characters used must be the same, since these characters act as message delimiters (delimiters are not transmitted or displayed). Use a cursor key to exit this field before performing a Save function (Shift-S).
TIME OFF	ON	Screen-Saver Feature. This field is used to enable or disable the automatic screen-saver feature. After approximately 15 minutes of inactivity (no host or operator input) the display is automatically disabled to preserve the screen phosphor, although the screen RAM contents are held intact. When data from the host is received or any key depressed, all screen contents are again displayed without loss of data.

Table 3-1. Status Line Default and Possible Values Description (cont)

Default	Possible	Description
FREQ 60	50	Refresh Rate. This field is used to select the screen refresh rate which should be set to eliminate screen flicker.
Set 5 Status Line		
XPARENT OFF	ON	Transparent Mode Off/On*. Transparent Mode is a feature that configures the terminal to bypass all data received from the host computer to the to the AUX (printer) port. Such data is not displayed, when Transparent Mode is selected.
KB TYPE: US	GM	Keyboard Type: US/German. This field allows a choice of keyboard type (character set): U.S. or German. Note: If the German keyboard type is selected, it is also necessary to install a jumper on the Logic PCB and the appropriate replacement key caps. Consult your service representative for further information.
STATUS OFF	ON	Status Line Blank/Status Line Display*. This field may be used to enable or disable the continuous display of the Status Line.
PF1: A@M	PF2: thru S-PF4:	Program Function Key Codes. This field indicates the code sequence (default or programmed) for each of the Program Function keys. With the cursor in this field, depressing a PF key will cause its contents to be displayed. Refer to the PROGRAMMER INFORMATION Section for further information.

Table 3-2. Data Format Selection

Data can be encoded in any one of the following format combinations. Make the appropriate selection from the Set 3 Status Line to yield the Desired Data Format.

Desired Data Format				Set 3 Status Line Selection				
7 Bit ASCII	Bit 8	Parity	Stop Bits	Data Bit 8/7	Bit 8 0/1	Parity Off/On	Parity Bit Odd/Even	Stop Bit 1/2
7	None	Odd	1	7	*	On	Odd	1
7	None	Odd	2	7	*	On	Odd	2
7	None	Even	1	7	*	On	Even	1
7	None	Even	2	7	*	On	Even	2
7	Mark	None	1	7	1	Off	*	1
7	Mark	None	2	7	1	Off	*	2
7	Mark	Odd	1	8	1	On	Odd	*
7	Mark	Even	1	8	1	On	Even	*
7	Space	None	1	8	0	Off	*	1
7	Space	None	2	8	0	Off	*	2
7	Space	Odd	1	8	0	On	Odd	*
7	Space	Even	1	8	0	On	Even	*

* = Don't Care.

Default		ON LINE	CHAR MODE	FDX	PROT OFF	KB ON	AUX OFF	(MON) OFF	GRAPH OFF	9600
Possible (Main)	CAPS	LOCAL	LINE BLCK	HDX	ON	KB LOCK	ON	ON	ON	19200 50 ↓ 7200

Default	**SET 1**	AUX/KB: AUX	REPEAT ON	CLICK OFF	MARGIN BELL OFF	EIA/CL: EIA	E.O.M.: NUL
Possible		KB	OFF	ON	ON	CL	ETX EOT CR

Default	**SET 2**	LINE WRAP ON	LINE FEED OFF	SCROLL ON	DISPLAY PE OFF	STD VID	X-ON & DTR
Possible		OFF	ON	OFF	ON	REV VID	X-ON ONLY DTR ONLY

Default	**SET 3**	DATA BIT 8	BIT8 0	PARITY OFF	PARITY BIT ODD	STOP BIT 1	EMULATION QVT102
Possible		7	1	ON	EVEN	2	HZ1500 ADM-5A TVI910
		◄---------- Refer to Table 3-2 ----------►					

Default	**SET 4**	CURSOR UL	CURSOR BLINK	HERE IS: •	TIME OFF	FREQ 60
Possible		BLOCK	STEADY		ON	50

Default	**SET 5**	XPARENT OFF	KB TYPE: US	STATUS LINE OFF	PF1:	
Possible		ON	GM	ON	↓	
					S-PF4:	

Figure 3-5. The Six Status Lines

GENERAL OPERATOR FUNCTIONS

ENTERING DATA FROM THE KEYBOARD

After the terminal is configured for use with the host computer system, operator activity begins by "keyboarding" data. As an exercise, first place the terminal in Local Mode, and then proceed through the following steps:

- Type several lines of data while observing how the characters are displayed on the screen. Note how the cursor "wraps around" to the left margin of the next line after each preceding line is completed; it is not necessary to use the Return key as with many typewriters. Line Wrap is a selectable feature available from the Set 2 Status Line.

- Depress and hold down a character key and observe that the character automatically repeats on the screen. Key Repeat is a selectable feature available from the Set 1 Status Line.

- Next, move the cursor about the screen with the cursor arrow keys and see that the cursor always moves in the direction that the arrow on the key is pointing.

- Depress the Home key and observe that the cursor immediately returns to its Home position on the display screen, i.e., Line 1, Column 1.

- To erase the screen or clear it of all data, simultaneously depress the Shift and Home Clear keys. After the screen is cleared, the cursor is returned to the Home position.

EDITING THE SCREEN DISPLAY

Many times it is necessary to edit data on the display screen for the purpose of correcting mistakes, entering a revision, etc. Perhaps the most used editing features are Character Overstrike, Character Insert/Character Delete, and Line Insert/Line Delete. These features are described below and require the use of an Escape sequence (except Character Overstrike). Refer to the PROGRAMMER INFORMATION Section, or to the Command Set Summary in Appendix F for specific applications information about the various editing commands.

Character Overstrike

Character overstrike is a feature that allows the operator to position the cursor under a character, key a new character, and have the new character display in place of the original character.

Character Insert/Character Delete

To insert a character, move the cursor to the position where the new character is desired and enter an ESC Q command. A blank space will appear above the cursor in which the character to be inserted can be entered. When a character is inserted, all data from the cursor to the end of the line is moved one character position to the right (any data in column 80 will be lost). To delete a character, move the cursor under the character to be deleted and enter an ESC W command. The character will be blanked from the display screen and all data that was formerly to its right will move one space to the left to fill the vacated space. A blank space will be inserted at column 80.

Line Insert/Line Delete

To insert a line, move the cursor to the position where the new line is desired. Enter an ESC E command and observe that all data from the present cursor line and below is scrolled downward one line. A blank line will appear above the former cursor line with the cursor located in column one. Within the blank line, new data can now be entered. To delete a line, move the cursor to the line to be deleted and enter an ESC R command. That line will be blanked from the display screen, and the data below will scroll upward to fill the line that was deleted.

PRINTING THE SCREEN DISPLAY

Three print options are available to print the data displayed on the screen. The operator can elect to print the entire screen, to print from the top of the screen to the cursor, or to print from the cursor to the bottom of the screen. These print options are described below. Note: Print command sequences are valid for the QVT-102/QVT-102A command set only.

Printing the Entire Screen

To print the entire screen, simply depress the Print key or issue an ESC P command. For data to print as it is displayed on the screen, whenever the Print key is used all null codes are automatically converted to space codes.

Printing from the Top of the Screen to the Cursor

To print from the top of the screen to the cursor position, simultaneously depress the Shift and Print keys or issue an ESC N command.

Printing from the Cursor to the Bottom of the Screen

To print from the cursor position to the bottom of the screen, simultaneously depress the Control and Print keys or issue an ESC O command.

TRANSMITTING (SENDING) THE SCREEN DISPLAY TO THE HOST COMPUTER

When the terminal is configured to use the QVT-102/QVT-102A command set, data may be transmitted to the host computer by depressing the Enter key or by issuing a specific send command to transmit a select line or page of data (Line or Block Mode). All other emulations transmit data to the host in Character Mode only. Refer to the PROGRAMMER INFORMATION Section for further information.

Send Line

Sending a given line of data to the host system may be accomplished in two ways. First, by using the Enter key, if the terminal is configured to use the QVT-102/QVT-102A command set and is in Line Mode, depressing the Enter key will cause the terminal to send only the unprotected data on a given cursor line. Secondly, by issuing an ESC 4 command, only full intensity data on a given cursor line will be transmitted; issuing an ESC 6 command will cause all data (protected and unprotected) on the a given cursor line to be transmitted to the host.

Send Page

Sending a given page or screen of data to the host system may be accomplished in two ways. First, by using the Enter key, if the terminal is configured to use the QVT-102/QVT-102A command set and is in Block Mode, depressing the Enter Key will cause the terminal to send only unprotected screen data. Secondly, by issuing an ESC 5 command, only full intensity data on a given display page will be transmitted; issuing an ESC 7 command will cause all data (protected and unprotected) on a given display page to be transmitted to the host.

OTHER FUNCTION CODES

Refer to the PROGRAMMER INFORMATION Section for a functional tabulation and description of all commands according to emulation. This information is also presented in abbreviated format in the Command Set Summary, Appendix F.

PROGRAMMER INFORMATION

INTRODUCTION

This section describes the command set of the QVT-102/QVT-102A video terminal and explains in more detail those topics introduced in the preceding section. This section assumes that the reader is already familiar with the proper operation of the terminal.

Refer to the Appendix for the following information as necessary:

- US ASCII Code Set (Appendix D),
- Control Codes (Appendix E),
- Command Set Summary (Appendix F).

MONITOR MODE

Monitor Mode provides the programmer with a means of verifying the use of command codes, by enabling the terminal to display all code sequences (refer to Table 4-1) as they are entered along with alphanumeric characters. It should be noted that command codes are not executed when Monitor Mode is active. Also, for proper operation, enable the line wrap feature.

Monitor Mode is controlled by the following code sequences:

Monitor Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC U Ctrl-1	Ctrl-1	Ctrl-1	ESC U Ctrl-1

Issuing this command configures the terminal to display all host computer and keyboard entries (alphanumeric and control characters). Keyboard entries are sent to the host computer only if the the terminal is On Line.

Monitor Mode Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC X ESC u Ctrl-2	Ctrl-2	Ctrl-2	ESC X ESC u Ctrl-2

Issuing this command disables the Monitor Mode; control characters are not displayed.

Display Select Control Character	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC F N			ESC F N

This command may be used to display a select control character. In the command sequence, "N" specifies the ASCII code for the control character to be displayed.

Table 4-1. Monitor Mode Code Sequence Visualization

Code	ASCII Command	Hex	Screen Visualization
Ctrl-@	Null	00	@
Ctrl-A	SOH	01	A
Ctrl-B	STX	02	B
Ctrl-C	ETX	03	C
Ctrl-D	EOT	04	D
Ctrl-E	ENQ	05	E
Ctrl-F	AK	06	F
Ctrl-G	BEL	07	G
Ctrl-H	BS	08	H
Ctrl-I	HT	09	I
Ctrl-J	LF	0A	J
Ctrl-K	VT	0B	K
Ctrl-L	FF	0C	L
Ctrl-M	CR	0D	M
Ctrl-N	SO	0E	N
Ctrl-O	SI	0F	O
Ctrl-P	DLE	10	P
Ctrl-Q	DC1	11	Q
Ctrl-R	DC2	12	R
Ctrl-S	DC3	13	S
Ctrl-T	DC4	14	T
Ctrl-U	NAK	15	U
Ctrl-V	SYN	16	V
Ctrl-W	ETB	17	W
Ctrl-X	CAN	19	X
Ctrl-Y	EM	19	Y
Ctrl-Z	SUB	1A	Z
Escape/Ctrl-[	ESC	1B	[
Ctrl-\	FS	1C	\
Ctrl-]	GS	1D	]
Ctrl-^	RS	1E	^
Ctrl-_	US	1F	_
Delete	DEL	7F	None

PROGRAM FUNCTION KEYS

PROGRAM FUNCTION KEYS: PF1-PF4 (Default Selection)

Each of the Program Function keys transmits to the host computer an ASCII character bracketed by a Ctrl-A (SOH) code and a Carriage Return (CR) code. A Program Function key may be used by itself, with the Shift key, or with the Ctrl key, to generate a total of 12 codes. Default Program Function key codes are listed in Table 4-2.

Table 4-2. Default Program Function Key Codes

	Key	Code Transmitted
1	PF1	Ctrl-A @ CR
2	PF2	Ctrl-A A CR
3	PF3	Ctrl-A B CR
4	PF4	Ctrl-A C CR
5	Shift-PF1	Ctrl-A D CR
6	Shift-PF2	Ctrl-A E CR
7	Shift-PF3	Ctrl-A F CR
8	Shift-PF4	Ctrl-A G CR
9	Control-PF1	Ctrl-A H CR
10	Control-PF2	Ctrl-A I CR
11	Control-PF3	Ctrl-A J CR
12	Control-PF4	Ctrl-A K CR

PROGRAM FUNCTION KEYS: PF1-PF4 (Programmable Selection)

The first 8 Program Function Key code values listed in Table 4-2 above may be user programmed from the keyboard to include any 8 ASCII characters. Programmable Function keys are a feature of the QVT-102A only.

To program a Function Key from the keyboard proceed as follows:

- Enter Set-up Mode (Ctrl/Shift/Setup) and move the cursor into the last field of the Set 5 Status Line.
- Depress the Function key to be programmed; PF1 through Shift/PF4.

- Enter a start delimiter (any character that is not used in the data string that is to be the contents of that Function key). Note that delimiters do not display.

- Enter the desired data string. A maximum of 8 ASCII characters may be selected.

- Enter the trailing delimiter (the trailing delimiter must be the same character as that used for the start delimiter).

- Repeat the above steps to program the contents of any of the remaining Programmable Function keys.

- To "save" the programmed contents of the Program Function key(s), first exit the cursor from the field, then issue a Shift-S.

CURSOR CONTROL

Cursor control may be simply moving the cursor about the screen (Home, Right, Left, Up, Down, etc.), assigning the cursor to a discrete location (cursor addressing), or enquiring of the terminal the active position of the cursor (read cursor). Each of these cursor control functions is discribed as follows:

CURSOR MOVEMENT

Cursor Home	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-^	~Ctrl-R	Ctrl-^	Ctrl-^

Depressing the Home key or issuing a Cursor Home command causes the cursor to exit its current position and be relocated at the Home position on the display screen.

Cursor Right	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-L	Ctrl-P	Ctrl-L	Ctrl-L

Depressing the Cursor Right Arrow key, the Shift and Backspace keys, or issuing a Cursor Right command relocates the cursor one character position to the right. If the Key Repeat feature is enabled, the cursor will advance until the key is released or transmission of the command stopped. The cursor will line wrap regardless of the Line Wrap selection on the Status Line, and advance through any protected fields encountered.

Cursor Left	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-H	Ctrl-H	Ctrl-H	Ctrl-H

Depressing the Cursor Left Arrow Key, the Backspace key, or issuing a Cursor Left command relocates the cursor one character position to the left. If the Key Repeat feature is enabled, the cursor will advance until the key is released or transmission of the command stopped. The cursor will line wrap regardless of the Line Wrap selection on the Status Line, and advance through any protected fields encountered.

Cursor Up	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-K	~Ctrl-L	Ctrl-K	Ctrl-K

Depressing the Cursor Up Arrow Key, the Shift and Linefeed keys, or issuing a Cursor Up command relocates the cursor upward in the same column. If the Key Repeat feature is enabled, the cursor will advance upward and scroll within a given column, until the key is released or transmission of the command stopped. The cursor will advance through any protected fields encountered.

Cursor Down	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-J	~Ctrl-K Ctrl-J	Ctrl-J	Ctrl-J

Depressing the Cursor Down Arrow Key, the Linefeed key, or issuing a Cursor Down command relocates the cursor one line downward in the same column. If the Key Repeat feature is enabled, the cursor will advance downward and scroll within a given column, until the key is released or the transmission of the command stopped. The cursor will advance through any protected fields encountered.

Carriage Return	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-M	Ctrl-M	Ctrl-M	Ctrl-M

Depressing the Carriage Return key, the Enter key, or issuing a Carriage Return command causes the cursor to be relocated to column 1 of the current cursor line. If Line Feed is enabled, the cursor will advance to column 1 of the next line. With Auto Scroll enabled when line 24 is completed, the display will scroll up one line and the cursor will wrap to column 1 of line 24. If Auto Scroll is disabled, when line 24 is completed the cursor will return to Home and the display will be overwritten.

New Line	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-_			Ctrl-_

Issuing a New Line command advances the cursor to column 1 of the following line. With the Auto Scroll feature enabled, if the cursor is on the 24th line when a New Line command is issued, the screen will scroll upward one line and the cursor will advance to column 1 of the new 24th line. If the Auto Scroll feature is disabled, the cursor will move to the Home position and the display will be overwritten.

CURSOR ADDRESSING/CURSOR READING

Cursor addressing/reading offers the capability of assigning the cursor to specific line and column coordinates on the display screen, or enquiring of the terminal the coordinates of the cursor's location. Refer to the appropriate Cursor Coordinate Codes table.

Address Cursor	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC = Line# Col#	~Ctrl-Q Col#Line#	ESC = Line# Col#	ESC = Line# Col#

Issuing this command assigns the cursor to specific line and column coordinates on the current display page. In the escape sequences, "#" equals the ASCII line and column equivalent values. Refer to the appropriate Cursor Coordinate Codes table for the emulation in use.

Read Cursor Address	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC ?	~Ctrl-E		ESC ?

Issuing this command causes the terminal to output the cursor address coordinates to the host computer in the format: Line, Column, Carriage Return (Column, Line, Carriage Return for HZ-1500 only). Refer to the appropriate Cursor Coordinate Codes table for the emulation in use.

Load Cursor Line	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC [Line #			ESC [Line#

Issuing this command assigns the cursor to a specific line within the current cursor column.

Load Cursor Column	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC] Col#			ESC]Col#

Issuing this command assigns the cursor to a specific column within the current cursor line.

Table 4-3a. Cursor Coordinate Codes (QVT-102/102A, ADM-3A/5, and TVI-910)

Code Sequence: ESC = Line # Col #

Line		Column					
Line #	Character	Col #	Character	Col #	Character	Col #	Character
1	Space	1	Space	28	;	55	V
2	!	2	!	29	<	56	W
3	"	3	"	30	=	57	X
4	#	4	#	31	>	58	Y
5	$	5	$	32	?	59	Z
6	%	6	%	33	@	60	[
7	&	7	&	34	A	61	\
8	'	8	'	35	B	62	]
9	(	9	(	36	C	63	^
10	)	10	)	37	D	64	_
11	*	11	*	38	E	65	`
12	+	12	+	39	F	66	a
13	,	13	,	40	G	67	b
14	-	14	-	41	H	68	c
15	.	15	.	42	I	69	d
16	/	16	/	43	J	70	e
17	0	17	0	44	K	71	f
18	1	18	1	45	L	72	g
19	2	19	2	46	M	73	h
20	3	20	3	47	N	74	i
21	4	21	4	48	O	75	j
22	5	22	5	49	P	76	k
23	6	23	6	50	Q	77	l
24	7	24	7	51	R	78	m
		25	8	52	S	79	n
		26	9	53	T	80	o
		27	:	54	U		

Table 4-3b. Cursor Coordinate Codes (HZ-1500 Only)

Code Sequence: ~Ctrl-Q Col # Line #

Note: It is recommended to avoid the use of codes in column 0 and column 1 of the ASCII Code Chart.

Line #	Col #	Character	Line #	Col #		Character
0	0	NUL	0	32		SP
1	1	SOH	1	33		!
2	2	STX	2	34		"
3	3	ETX	3	35		#
4	4	EOT	4	36		$
5	5	ENQ	5	37		%
6	6	ACK	6	38		&
7	7	BEL	7	39		'
8	8	BS	8	40		(
9	9	HT	9	41		)
10	10	LF	10	42		*
11	11	VT	11	43		+
12	12	FF	12	44		,
13	13	CR	13	45		–
14	14	SO	14	36	Read	.
15	15	SI	15	47	Cursor	/
16	16	DLE	16	48	Address Output	0
17	17	DC1	17	49		1
18	18	DC2	18	50		2
19	19	DC3	19	51		3
20	20	DC4	20	52		4
21	21	NAK	21	53		5
22	22	SYN	22	54		6
23	23	ETB	23	55		7
	24	CAN		56		8
	25	EM		57		9
	26	SUB		58		:
	27	ESC		59		;
	28	FS		60		<
	29	GS		61		=
	30	RS		62		>
	31	US		63		?

Table 4-3b. Cursor Coordinate Codes (cont) (HZ-1500 Only)

Code Sequence: ~Ctrl-Q Col # Line #

Line #	Col #		Character	Line #		Col #		Character
0	64		@	0		0		`
1	65		A	1		1		a
2	66		B	2		2		b
3	67		C	3		3		c
4	68		D	4		4		d
5	69		E	5		5		e
6	70		F	6		6		f
7	71	Read	G	7		7		g
8	72	Cursor	H	8		8		h
9	73	Address	I	9		9		i
10	74	Output	J	10		10		j
11	75		K	11	Read	11	Read	k
12	76		L	12	Cursor	12	Cursor	l
13	77		M	13	Address	13	Address	m
14	78		N	14	Output	14	Output	n
15	79		O	15		15		o
16			P	16		16		p
17			Q	17		17		q
18			R	18		18		r
19			S	19		19		s
20			T	20		20		t
21			U	21		21		u
22			V	22		22		v
23			W	23		23		w
			X			24		x
			Y			25		y
			Z			26		z
			[			27		{
			\			28		|
			]			29		}
			^			30		~*
			_			See Note		DEL

* = Lead-In Code.

Note: Hex 7F = Read cursor address output for column 31.

TAB CONTROL

As a default condition, typewriter tabs are preset at every 8th character position. Default tab stops may be deleted and any custom tab arrangement specified as described below. A tab stop does not occupy a character position in the display.

	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
Column Tab	Ctrl-I			Ctrl-I

Depressing the Tab key or issuing a Tab command, causes the terminal to advance the cursor to the next tab stop. If no tab stops are present, the tabbing feature has no effect. With Protect Mode enabled, the cursor will be moved to the first unprotected character following a protected field.

	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
Back Tab	ESC I			ESC I

Depressing the Shift and Tab keys, or issuing a Back Tab command, causes the terminal to move the cursor back to the previous tab stop on the current line, or to column 1 if the cursor is at the first tab stop on a line. Protect Mode has no affect.

	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
Field Tab	Ctrl-I	Ctrl-I		

With the Protect Mode enabled, the cursor moves as defined for Column Tab. Depressing the Tab key or issuing a Field Tab command, causes the cursor to move to the first unprotected character following a protected field. If Protect Mode is not active, a field tab has no affect.

	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
Set Tab	ESC 1			ESC 1

Issuing a Set Tab command causes the terminal to set a column tab at the cursor position. Tab stop locations can be "saved" by entering Set-up Mode and depressing Shift-S.

Clear Tab	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 2			ESC 2

Issuing a Clear Tab command causes the terminal to delete any tab stop from the column in which the cursor is located. Protect Mode has no affect.

Clear All Tabs	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 3			ESC 3

Issuing a Clear All Tabs command causes the terminal to delete all tabs stops from screen memory.

EDITING FUNCTIONS

The following editing functions are available by code sequence.

Character Insert	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC Q			

Issuing a Character Insert command causes the terminal to move all data from the cursor on a given line, one column to the right (any data moved beyond the 80th column is lost). A space character is inserted at the cursor position. Characters can only be inserted into unprotected areas.

Character Delete	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC W			

Issuing a Character Delete command causes the terminal to delete the character at the cursor position. All data that was formerly to the right of the cursor is moved one character position to the left and a space character is entered at column 80. Characters can only be deleted from unprotected areas.

Line Insert	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC E	~Ctrl-Z		

Issuing a Line Insert command causes the terminal to insert a line of space characters on the present cursor line and relocates the cursor to column 1. The former cursor line and any data below it is moved downward one line; any data moved beyond the 24th line is lost. Protect Mode has no affect.

Line Delete	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC R	~Ctrl-S		

Issuing a Line Delete command causes the terminal to delete the present cursor line. All data below the former cursor line is moved upward one line and the cursor is relocated to column 1. The 24th line is filled with space characters. Protect Mode has no affect.

Clear Line to Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC T	~Ctrl-O	ESC T	ESC T

A Clear Line to Spaces command causes the terminal to replace all characters with space characters, from the cursor position to the end of the line. Protect Mode has no affect.

Clear Line to Nulls	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC t			

A Clear Line to Nulls command causes the terminal to replace all characters with nulls, from the cursor position to the end of the line. Protect Mode has no affect.

Clear Screen to Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC Y	~Ctrl-X	ESC Y	ESC Y

A Clear Screen to Spaces command causes the terminal to replace all characters with space characters, from the cursor position to the end of the screen. Protect Mode has no affect.

Clear Screen to Nulls	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC y			

A Clear Screen to Nulls command causes the terminal to replace all characters with nulls, from the cursor position to the end of the screen. Protect Mode has no affect.

Clear Screen to Background Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
		~Ctrl-w		

A Clear Screen to Background Spaces causes the terminal to replace all display data with background spaces (half intensity) from the cursor to the end of the screen.

Clear All to Background Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC ,			

Issuing this command clears all display data to background spaces (half intensity) and homes the cursor.

Clear All Foreground Area to Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC ;	~CtlShftM ~Ctrl-]		

Issuing this command clears all data to space characters and homes the cursor.

Clear All Foreground Area to Nulls	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC:			

Issuing this command clears all data to nulls and homes the cursor.

Clear Screen to Spaces	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-Z ESC +	~Ctrl-\ ~Ctl-Shft-L	Ctrl-Z	Ctrl-Z ESC +

Depressing the Shift and Clear Home keys or issuing a Clear Screen to Spaces command, clears all screen data to space characters and homes the cursor.

Clear Screen to Nulls	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC *			ESC *

Issuing a Clear Screen to Nulls command, clears all screen data to nulls and homes the cursor.

SEND FUNCTION

Data may be transmitted to the host computer by either depressing the Enter key (QVT-102/QVT-102A only) or by issuing a specific send command to transmit a select string of data. Each of these send options is described below. See also "Transmission Modes" later in this section, and "Transmitting (Sending) the Screen Display to the Host Computer" in the section entitled OPERATION.

Send Line (Full Intensity Only)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 4			

Issuing this command causes all full intensity data in a given cursor line to be transmitted to the host computer.

Send Page (Full Intensity Only)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 5			

Issuing this command causes all full intensity data on the display screen to be transmitted to the host computer.

Send Line (All)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 6			

Issuing this command causes all data on a given cursor line to be transmitted to the host computer.

Send Page (All)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC 7			

Issuing this command causes all data on the display screen to be transmitted to the host computer.

Send ID Message	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-E		Ctrl-E	

Issuing this command transmits the HERE IS Message entered on the Status Line to the host computer.

Program Send Delimiter	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC x N			

This command specifies the End of Message character that terminates each data transmission. In the code sequence, "N" equals the ASCII code for the delimiter desired. Possible values may be a NUL, ETX, EOT, or a CR.

PRINT FUNCTION

Data is output from the terminal to the printer via the AUX (Auxiliary) Port. The AUX Port on the QVT-102 is capable of supporting only unidirectional communication; whereas, the QVT- 102A can support bidirectional communications. Both honor X- ON/X-OFF and/or DTR protocol, and comply with the EIA RS-232-C standard. The various print functions and their command sequences are described below.

Print from Top of Screen to Cursor	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC N			

Depressing the Shift and Print keys, or issuing a Print from Top of Screen to Cursor command causes the terminal to transmit all screen data from the Home position to the cursor, to the printer.

Print from Cursor to End of Screen	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC O			

Depressing the Ctrl and Print keys, or issuing a Print from Cursor to End of Screen command causes the terminal to transmit all screen data from the cursor position to the end of the screen, to the printer.

Print Entire Page	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC P			

Depressing the Print key or issuing a Print Entire Page command causes the terminal to transmit all screen data to the printer.

Transparent Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-R			Ctrl-R

Issuing a Transparent Mode Enable command causes the terminal to bypass all data received (including control characters) and output it via the Auxiliary Port. No screen updating can occur while Transparent Print Mode is enabled.

Transparent Mode Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-T			Ctrl-T

Issuing a Transparent Mode Disable command disables the Transparent Print Mode after all data remaining in the Auxiliary Port buffer has been output.

AUX Port Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC @		Ctrl-N	ESC @

Issuing an AUX Port Enable command functionally connects the AUX Port to the EIA Port to enable the terminal to output all data received from either the host or the keyboard, to the peripheral (printer) connected to the AUX Port. The QVT-102A is equipped with a bidirectioinal AUX Port.

AUX Port Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC A		Ctrl-O	ESC A

Issuing an AUX Port Disable command functionally disconnects the EIA and AUX Ports.

VIDEO ATTRIBUTES

A video attribute can be classified as either a screen, field/line, or character attribute depending on the way it affects the display. Each of these classifications is described below.

SCREEN ATTRIBUTES

Screen attributes affect all areas on the display screen. This kind of attribute is not embedded and therefore does not occupy a character position on the screen.

Cursor Visible/ Invisible	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC .			ESC .

The Cursor Visible/Invisible command is an On/Off feature that allows the cursor to be selectively displayed or blanked from screen display.

FIELD/LINE ATTRIBUTES

Field/line attributes affect all or part of a given display line. Such attributes are embedded (i.e., they occupy a character position on the screen) and appear as a space that displays with the same attribute they specify. All characters on a line following a field/line attribute will exhibit the characteristics of that attribute until a new attribute is specified or until the 80th column is reached. Field/line attributes do not carry over to the next line.

Blank	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 1			ESC G 1

Blank is a video attribute that is visualized as a space character(s). Issuing this command causes all character positions from the cursor to the end of a field or line to be suppressed or blanked from screen display.

Blink	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 2			ESC G 2

Blink is a video attribute that causes all character positions displaying data from the cursor position to the end of a field or line to blink synchronously.

Invisible/Blink	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 3			ESC G 3

Invisible/Blink combines the characteristics of the Blank and Blink video attributes. All data entered from the cursor position to the end of a field or line is suppressed or blanked from video display. The blink attribute is not apparent.

Reverse Video	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 4		ESC G	ESC G 4

Reverse Video is a field/line attribute that causes all character positions displaying data from the cursor position to the end of the field or line to be visualized as dark characters on a light background; the opposite of the default power On video display condition.

Invisible/Reverse	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 5			ESC G 5

Invisible/Reverse combines the characteristics of the Blank and Reverse Video attributes. When this combination attribute is selected, it is visualized as a blank, reverse video field or line originating from the cursor position.

Reverse/Blink	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 6			ESC G 6

Reverse/Blink combines the characteristics of the Blink and Reverse Video attributes. When this combination attribute is selected, it is visualized as a reverse video field or line originating from the cursor position. Data entered after this attribute blinks synchronously.

Invisible/Reverse/ Blink	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 7			ESC G 7

Invisible/Reverse/Blink combines the characteristics of the Blank, Reverse Video, and Blink attributes. When this combination attribute is selected it is visualized as a reverse video field or line originating from the cursor position. Data entered after this attribute is blanked from screen display; the blink attribute is not apparent.

Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 8			ESC G 8

Underline is a video attribute that causes all character positions from the cursor to the end of a field or line to display as underlined.

Invisible/Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 9			ESC G 9

Invisible/Underline combines the Blank and Underline video attributes. When this combination attribute is selected, it is visualized as an underlined field or line originating from the cursor position. Data entered after this attribute is blanked from screen display.

Normal Video	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G 0		ESC G	ESC G 0

Normal Video is a field/line attribute that causes all character positions displaying data from the cursor position to the end of the field or line to be visualized as light characters on a dark background; the opposite of the Reverse Video field/line attribute.

Blink/Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G :			ESC G :

Blink/Underline combines the Blink and Underline video attributes. When this combination attribute is selected, it is visualized as an underlined field or line originating from the cursor position. Data entered after this attribute blinks synchronously.

Invisible/Blink/ Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G ;			ESC G ;

Invisible/Blink/Underline combines the Blank, Blink, and Underline video attributes. When this combination attribute is selected, it is visualized as an underlined field or line originating from the cursor position. Data entered after this attribute is blanked from screen display; the underline attribute is not apparent since it defines the bottom edge of the reverse video area.

Invisible/Reverse Blink/Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G ?			ESC G ?

Invisible/Reverse/Blink/Underline combines the Blank, Reverse Video, Blink, and Underline video attributes. When this combination attribute is selected, it is visualized as a reverse video field or line originating from the cursor position. Data entered after this attribute is blanked from screen display; the underline and blink attributes are not apparent.

Invisible/Reverse/ Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G =			ESC G =

Invisible/Reverse/Underline combines the Blank, Reverse Video, and Underline video attributes. When this combination attribute is selected, it is visualized as reverse video field or line originating from the cursor position. Data entered after this attribute is blanked from screen display; the underline attribute is not apparent since it defines the bottom edge of the reverse video area.

Reverse/Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G <			ESC G <

Reverse/Underline combines the Reverse and Underline video attributes. When this combination attribute is selected, it is visualized as a reverse video field or line originating from the cursor position. Data entered after this attribute displays in reverse video; the underline attribute is not apparent since it defines the bottom edge of the reverse video field.

Reverse/Blink/ Underline	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC G >			ESC G >

Reverse/Blink/Underline combines the Reverse Video, Blink, and Underline video attributes. When this combination attribute is selected, it is visualized as a reverse video field or line originating from the cursor position. Data entered after this attribute blinks synchronously; the underline attribute is not apparent since it defines the bottom edge of the reverse video field.

CHARACTER ATTRIBUTES

Character attributes affect characters as they are entered on the screen and like screen attributes, they are not embedded (i.e., they do not occupy a character position on the screen). Character attributes may exist along with any other screen or field/line attributes already specified. Any new character entered while a given character attribute is in effect will display with that attribute regardless of its position on the screen.

Full Intensity (Foreground Follows)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC (	~Ctrl-_ ~CtlShftO	ESC (	ESC (

All data entered after this video attribute is selected will display in full video intensity. Full intensity is the normal display intensity at initial power On.

Half Intensity (Background Follows)	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC)	~Ctrl-Y	ESC)	ESC)

All data entered after this video attribute is selected will display in half the normal video intensity. Data displayed in half intensity can be protected by enabling Protect Mode.

PROTECT MODE

Protect Mode is a feature that allows selected areas of the display to be protected from accidental overwriting. The commands that control Protect Mode are discribed below.

Protect Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC &			

Issuing this command causes the terminal to interpret all half intensity fields, including any attributes within these fields, as protected areas within which data can not be ovewritten. Attempting to enter data into a protected area will sound the alarm and the cursor will be moved to the first unprotected character position beyond the protected area; here, subsequent data will display as it is entered.

Protect Mode Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC '			

Issuing this command disables the Protect Mode feature.

TRANSMISSON MODES

Transmission Mode can be selected from either the status line or by command code sequence. See also "Send Function" earlier in this section, and the paragraph "Transmitting (Sending) the Screen Display to the Host Computer" in the section entitled OPERATION.

Block Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC B			

Block Mode configures the terminal for page-by-page data transmission. In Block Mode, only unprotected data will be transmitted to the host computer when the Enter key is depressed (blank areas are transmitted as spaces; no end of line message is transmitted). A Block Mode transmission is a 1,920 character string (maximum) that is terminated by the End of Message code selected on the Status Line. The Program Function keys do not operate in this mode.

Character Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC C			

Character Mode configures the terminal for conversational or character-by-character data transmission. Each character keyed from the keyboard is immediately transmitted to the host.

Line Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC D			

Line Mode configures the terminal for line-by-line data transmission. In Line Mode, only unprotected data on a given cursor line will be transmitted to the host computer when the Enter key is depressed (blank areas are transmitted as spaces). A Line Mode transmission is terminated by the End of Message code selected on the Status Line. The Program Function keys do not operate in the mode.

GRAPHICS MODE

Graphics Mode is a special applications feature that reconfigures the terminal for 15 line drawing symbols (refer to Table 4-4). Graphics Mode is controlled by the following command sequences.

Graphics Mode Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC $			

Issuing this command configures the terminal for Graphics Mode by redefining the A through O alphabetic keys for a special set of line drawing characters. For proper operation the Caps Lock key should be disengaged.

Graphics Mode Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC %			

Issuing this command exits the Graphics Mode; keys A through O function as alphabetic character keys.

Table 4-4. Special Graphics Mode Characters

Key	Graphics Character
a	▒
b	␉
c	␌
d	␍
e	␊
f	°
g	±
h	␤
i	␋
j	┘
k	┐
l	┌
m	└
n	┼
o	⎺

MISCELLANEOUS PROGRAM FUNCTIONS

KEYBOARD LOCK/UNLOCK

Keyboard Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC #	~Ctrl-U	Ctrl-O	ESC #

Issuing this command disables the keyboard except for the Setup, Print, Break, Ctrl, and Shift keys. This feature is also available as a status line selection. Manual override can be accomplished by performing a reset; i.e., depressing the Ctrl/Shift/Setup-Setup keys (QVT-102A only; depress Setup-Setup for QVT-102), or the Shift and Break keys (QVT-102A and QVT-102).

Keyboard Enable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC "	~Ctrl-F	Ctrl-N	ESC "

This command restores the action of the keyboard and can only be issued from the host computer. Locally, the keyboard can be restored by depressing the Ctrl/Shift/Setup-Setup keys (QVT-102A only; depress Setup-Setup for QVT-102), or the Shift and Break keys (QVT-102A and QVT-102).

AUTO SCROLL ENABLE/DISABLE

Auto Scroll Enable/ Disable	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC H			ESC H

The Scroll Enable/Disable feature is an On/Off feature that can be used to control the automatic scrolling of the screen display.

RING BELL

Ring Bell	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl-G

Issuing this command causes the audible alarm to sound.

STATUS LINE DISPLAY/BLANK

Display Status Line	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC }	~Ctrl-P	ESC }	ESC }

Issuing this command causes the terminal to display the status line on the 25th line.

Blank Status Line	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC {	~Ctrl-N	ESC {	ESC {

Issuing this command blanks the display of the status line on the 25th line.

SELF-TEST DISPLAY/BLANK

Self-Test Display	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	ESC V			ESC V

Issuing this command causes the terminal to display its entire complement of control codes, graphics characters, and video attributes as a visual self-test.

Self-Test Blank	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Shft/Break-Shft/Clear			Shft/Break-Shft/Clear

Depressing the Shift and Break keys followed by the Shift and Clear Home keys causes the terminal to clear the current display page to space characters and home the cursor.

"H" VIDEO ALIGNMENT PATTERN DISPLAY/BLANK

"H" Pattern Display	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Ctrl/Shift/Setup 0			

Depressing the Ctrl/Shift/Setup keys followed by the Zero key (QVT-102A only; depress Setup-Zero for QVT-102) causes the terminal to display a 24 line by 80 column "H" video alignment pattern. Centered within this display is a series of numbers that identifies the terminal's firmware revision level.

"H" Pattern Blank	QVT-102/102A	HZ-1500	ADM-3A/5	TVI-910
	Shift/Clear Home			

Depressing the Shift and Clear Home keys causes the terminal to clear the "H" pattern display to space characters and home the cursor.

OPERATOR CARE

Operator care of the QVT-102/QVT-102A is limited to keeping both the display module and keyboard clean and free of dust. Occasionally use a soft brush or vacuum cleaner to remove any accumulated dust.

Use a commercially available cleaning kit for care of the display screen and more stubborn cleaning requirements. Before cleaning the display screen always power OFF the terminal.

In some environments, it may be beneficial to protect the terminal with a dust cover when it is not in use.

GLOSSARY

INTRODUCTION

This glossary of terms is provided as a helpful aid to a better understanding of the terminal and its environment.

ASCII

Acronym for the American Standard Code for Information Interchange. A standardized code for the transmission of data, composed of 128 characters (upper-and lower-case letters, numbers, punctuation marks, symbols, and control characters) represented in 7-bit binary format.

Baud Rate

The rate of data transmission. One baud represents a transmission rate of one binary bit of data per second.

Break

A communications interrupt signal used to immediately halt communications.

Command

A special code, or series of codes, that causes the terminal or host computer to perform a specific electronic or mechanical action. Commands are generated in conjunction with the Control or Escape keys (or the tilde (~) key when the Hazeltine 1500 emulation is selected). Such commands are non-printable, e.g., setting a tab.

Cursor

A highlighted area (underline or block) that is used on the display screen to indicate the next character position.

Data

A general term used to describe that which is transmitted. Data is both ASCII encoded alphanumeric characters and command instructions.

Del (Delete)

An ASCII code used to delete or cancel transmitted data.

EIA RS-232-C

The Electronic Industries Association that sets forth standards for electronic and electrical devices. Your terminal complies with the EIA RS-232-C Standard for communicating devices.

Emulation

The act of imitating a device as if it were that device. Your terminal emulates three other video terminals in addition to its own performance criteria.

Handshaking

A communications method that controls the flow of data transmission. This is necessary when the speed of data handling varies between the devices within the system. Three methods of handshaking are available for use with your terminal: X-ON/X-OFF (Transmit On/Transmit Off) with DTR (Data Terminal Ready), X- ON/X-OFF only, or DTR only.

Home

Home is that position on the display screen identified as Line 1, Column 1.

Host or Host Computer

The computer that controls the system of which the terminal is a part.

Interface (AUX and EIA)

The communications channel through which data flows; both the physical connectors and the signal lines.

Nul (Null)

An ASCII code that is used as a fill character in some communications formats (a nothing character).

Parity

A method of checking for errors in data communications.

Reverse Video

That condition of the video screen in which data is displayed as dark characters on a light background. Reverse video is the opposite of normal or standard video.

Screen

Literally the word "screen" is synonymous with "display screen" and "video display," but in actual usage is often used interchangeably with "page."

Scroll

As all 24 lines of the display screen are filled with data, the screen is said to "scroll" when the first line disappears, and the display moves up one line to vacate the bottom line for new data. If this feature is disabled, as the 24th line is completed, the cursor will move to line 1, column 1 and the display will be overwritten as subsequent data is entered.

Terminal

An electronic communicating device that is generally considered to have the capability to transmit and receive data. Some terminals are used as receive only devices.

Toggle

To select a function, or enable or disable a function, by depressing a key. In this terminal, the fields in the status lines are toggled by the space bar.

Wraparound

An automatic carriage return, line feed operation. The action of the cursor as it reaches the end of a line and then automatically goes to the beginning of the next line.

SECTION A.

APPENDIX

The following appendices are provided for reference.

Appendix

A	EIA/AUX Connector Pinout Descriptions
B	Interface Jumpers Description
C	Errors Code Summary
D	US ASCII Code Chart
E	Control Code Keystrokes
F	Command Set Summary

Appendix A. EIA/AUX Connector Pinout Descriptions

EIA - Main Port Interface Connector Pinout Description

Pin No.	Signal Description	Signal Direction	Designation
1	Protective Ground	————	AA
2	Transmitted Data	From Terminal	BA
3	Received Data	To Terminal	BB
4	Request to Send	From Terminal	CA
5	Clear to Send	To Terminal	CB
6	Data Set Ready	To Terminal	CC
7	Signal Ground	————	AB
8	Data Carrier Detect	To Terminal	CF
12	Current Loop-RXD(+)	————	
13	Current Loop-TXD(−)	————	
20	Data Terminal Ready	From Terminal	CD
24	Current Loop-RXD(−)	————	
25	Current Loop-TXD(+)	————	

AUX-Auxiliary Port Interface Connector Pinout Description

Pin No.	Signal Description	Signal Direction	Designation
1	Protective Ground	————	AA
2	Transmitted Data (QVT-102A Only)	To Terminal	BA
3	Received Data	From Terminal	BB
6	Data Set Ready	To Terminal	CC
7	Signal Ground	————	AB
20	Data Terminal Ready	From Terminal	CD

Appendix B. Interface Jumpers Description

EIA RS-232-C Interface Jumper Placement

Jumper		Description
STANDARD:	W2 Installed	Data Carrier Detect (DCD) - Input signal to the terminal used to monitor the readiness status of an external modem.
	W3 Installed	Data Terminal Ready (DTR) - Output signal from the terminal to the host used to enable communications.
OPTION:	W1 Installed	Data Set Ready (DSR) - Input signal to the terminal that may be used instead of Data Carrier Detect to monitor the readiness status of an external modem.
	W4 Installed	Request to Send (RTS) -Output signal from the terminal to the host that may be used instead of Data Terminal Ready to enable communications.

Current Loop Interface Jumper Placement *

Jumper	Active Mode	Passive Mode
W5	In	Out
W6	Out	In
W7	In	Out
W8	In	Out
W9	Out	In
W10	Out	In
W11	In	Out
W12	In	Out
W13	Out	In
W14	In	Out

*Additional Factory Installed Current Loop Components Required.

Appendix C. Error Codes Summary

When the terminal is powered On, a self-test is automatically performed. If a non-fatal error is detected, an error code will be displayed on the screen. For example, if the letter "D" is displayed, this signifies that an error exists in the video RAM circuit.

Error Code Character Displayed	Fault Detected Item			
	SROM	SRAM	VRAM	KBD
A	*			
B		*		
C	*	*		
D			*	
E	*		*	
F		*	*	
G	*	*	*	
H				*
I	*			*
J		*		*
K	*	*		*
L			*	*
M	*		*	*
N		*	*	*
O	*	*	*	*

Legend: SROM = System ROM (Read Only Memory)
SRAM = System RAM (Random Access Memory)
VRAM = Video RAM
KBD = Keyboard

Appendix D. US ASCII Code Chart

Bits b7 b6 b5					0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
b4	b3	b2	b1	Row / Column	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	A	LF	SUB	*	:	J	Z	j	z
1	0	1	1	B	VT	ESC	+	;	K	[	k	{
1	1	0	0	C	FF	FS	,	<	L	\	l	|
1	1	0	1	D	CR	GS	-	=	M	]	m	}
1	1	1	0	E	SO	RS	.	>	N	^	n	~
1	1	1	1	F	SI	US	/	?	O	_	o	DEL

32 ASCII Control Codes

96 ASCII Character Set

Notes:

- Hexadecimal = ASCII Column + Row. A = 41 Hex
- Example: ASCII Encoded Letter A = Bits: P 7 6 5 4 3 2 1
  * 1 0 0 0 0 0 1
  (* = Parity Bit)
- In the German character set, the Scharfes S occupies the same character position in the ASCII Code Chart as the tilde (~) character. When using the terminal in the HZ-1500 emulation, do not use the Scharfes S in text as it will be interpreted as the Hazeltine lead-in character.

Appendix E. Control Code Keystrokes

The following table lists the keystrokes necessary for generating the 32 possible ASCII control codes. Control codes are issued by depressing the Control key simultaneously with another key as follows:

ASCII			Keystroke	
Control Code	**Hex**	**Description**	**Control Key Depressed with Additional Key(s)**	**Dis-play***
NUL	00	Null	Control-@	@
SOH	01	Start of Header	Control-A	A
STX	02	Start of Text	Control-B	B
ETX	03	End of Text	Control-C	C
EOT	04	End of Transmission	Control-D	D
ENQ	05	Enquiry	Control-E	E
ACK	06	Acknowledge	Control-F	F
BEL	07	Bell	Control-G	G
BS	08	Backspace	Control-H	H
HT	09	Horizontal Tab	Control-I	I
LF	0A	Line Feed	Control-J	J
VT	0B	Vertical Tab	Control-K	K
FF	0C	Form Feed	Control-L	L
CR	0D	Carriage Return	Control-M	M
SO	0E	Shift Out	Control-N	N
SI	0F	Shift In	Control-O	O
DLE	10	Data Line Escape	Control-P	P
DC1	11	Device Control 1	Control-Q	Q
DC2	12	Device Control 2	Control-R	R
DC3	13	Device Control 3	Control-S	S
DC4	14	Device Control 4	Control-T	T
NAK	15	Negative Acknowledge	Control-U	U
SYN	16	Synchronous Idle	Control-V	V
ETB	17	End of Transmission Block	Control-W	W
CAN	18	Cancel	Control-X	X
EM	19	End of Medium	Control-Y	Y
SUB	1A	Substitute	Control-Z	Z

Appendix E. Control Code Keystrokes (cont)

ASCII			Keystroke	
Control Code	**Hex**	**Description**	**Control Key Depressed with Additional Key(s)**	**Display***
ESC	1B	Escape	ESC	[
FS	1C	File Separator	Control-\ or Control-Shift-L	\
GS	1D	Group Separator	Control-] or Control-Shift-M	]
RS	1E	Record Separator	Control-^ or Control-Shift-N	^
US	1F	Unit Separator	Control-_ or Control-Shift-O	_

*If Monitor Mode is enabled, control codes will display as an underlined letter. For example, a CR control code, or carriage return, will display as an underlined capital M (i.e., M).

Appendix F. Command Set Summary

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Cursor				
Home	Ctrl-^ HOME	~Ctrl-R HOME	Ctrl-^ HOME	Ctrl-^ HOME
Right	Ctrl-L RIGHT ARROW SHIFT/BS	Ctrl-P RIGHT ARROW SHIFT/BS	Ctrl-L RIGHT ARROW SHIFT/BS	Ctrl-L RIGHT ARROW SHIFT/BS
Left	Ctrl-H LEFT ARROW BACKSPACE	Ctrl-H LEFT ARROW BACKSPACE	Ctrl-H LEFT ARROW BACKSPACE	Ctrl-H LEFT ARROW BACKSPACE
Up	Ctrl-K UP ARROW SHIFT/LF	~Ctrl-L UP ARROW SHIFT/LF	Ctrl-K UP ARROW SHIFT/LF	Ctrl-K UP ARROW SHIFT/LF
Down	Ctrl-J DOWN ARROW LINEFEED	~Ctrl-K Ctrl-J DOWN ARROW LINEFEED	Ctrl-J DOWN ARROW LINEFEED	Ctrl-J DOWN ARROW LINEFEED
Return	Ctrl-M RETURN ENTER	Ctrl-M RETURN ENTER	Ctrl-M RETURN ENTER	Ctrl-M RETURN ENTER
New Line	Ctrl-_			Ctrl-_

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Tab Control				
Set Tab	ESC 1			ESC 1
Clear Tab	ESC 2			ESC 2
Clear All Tabs	ESC 3			ESC 3
Column Tab	Ctrl-I TAB			Ctrl-I TAB
Field Tab	Ctrl-I |Protect| TAB |Mode Only|	Ctrl-I TAB		
Back Tab	ESC I SHIFT/TAB			ESC I SHIFT/TAB
Editing Functions				
Character Insert	ESC Q			
Character Delete	ESC W			
Line Insert	ESC E	~Ctrl-Z		
Line Delete	ESC R	~Ctrl-S		
Clear from cursor to end of line with spaces	ESC T	~Ctrl-O	ESC T	ESC T

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Editing Functions (cont)				
Clear from cursor to end of line with nulls	ESC t			
Clear from cursor to end of screen with spaces	ESC Y	~Ctrl-X	ESC Y	ESC Y
Clear from cursor to end of screen with nulls	ESC y			
Clear from cursor to end of screen with background spaces		~Ctrl-w		
Clear all to background spaces	ESC ,			
Clear all foreground area to spaces	ESC ;	~Ctrl-SHIFT-M ~Ctrl-]		
Clear all foreground area to nulls	ESC :			

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Editing Functions (cont)				
Clear screen to nulls	ESC *			ESC *
Clear Screen	Ctrl-Z ESC + SHIFT/CLEAR	~Ctrl-\ ~Ctrl-SHIFT-L SHIFT/CLEAR	Ctrl-Z SHIFT/CLEAR	Ctrl-Z ESC + SHIFT/CLEAR
Video Attributes				
Screen Attributes:				
Cursor Visible/Invisible	ESC .			ESC .
Field/Line Attributes:				
Blank	ESC G 1			ESC G 1
Blink	ESC G 2			ESC G 2
Invisible/Blink	ESC G 3			ESC G 3

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Field/Line Attributes (cont)				
Reverse Video	ESC G 4		ESC G	ESC G 4
Invisible/Reverse	ESC G 5		↑	ESC G 5
Reverse/Blink	ESC G 6		Enable/	ESC G 6
Invisible/Reverse/Blink	ESC G 7		Disable	ESC G 7
Underline	ESC G 8		Feature	ESC G 8
Invisible/Underline	ESC G 9		↓	ESC G 9
Normal Video	ESC G 0		ESC G	ESC G 0
Blink/Underline	ESC G :			ESC G :
Invisible/Blink/Underline	ESC G ;			ESC G ;
Invisible/Reverse/Blink/ Underline	ESC G ?			ESC G ?
Invisible/Reverse/ Underline	ESC G =			ESC G =
Reverse/Underline	ESC G <			ESC G <
Reverse/Blink/Underline	ESC G >			ESC G >
Character Attributes:				
Full Intensity (foreground follows)	ESC (	~Ctrl-_ ~Ctrl-SHIFT O	ESC (	ESC (
Half Intensity (background follows)	ESC)	~Ctrl-Y	ESC)	ESC)

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Program Functions				
Keyboard Disable	ESC #	~Ctrl-U	Ctrl-O	ESC #
Keyboard Enable	ESC " (Host*) SHIFT/BREAK	~Ctrl-F (Host*) SHIFT/BREAK	Ctrl-N (Host*) SHIFT/BREAK	ESC " (Host*) SHIFT/BREAK
(QVT-102A Only)	CTRL/SHIFT/ SETUP-SETUP	CTRL/SHIFT SETUP-SETUP	CTRL/SHIFT SETUP-SETUP	CTRL/SHIFT SETUP-SETUP
(QVT-102 Only)	SETUP-SETUP	SETUP-SETUP	SETUP-SETUP	SETUP-SETUP
Address Cursor	ESC = Line # Col #	~Ctrl-Q Col # Line #	ESC = Line # Col #	ESC = Line # Col #
Read Cursor Address	ESC ?	~Ctrl-E		ESC ?
Load Cursor Line	ESC [Line #			ESC [Line #
Load Cursor Column	ESC] Col #			ESC] Col #
Transparent Mode Enable	Ctrl-R			Ctrl-R
Transparent Mode Disable	Ctrl-T			Ctrl-T
AUX Port Enable	ESC @		Ctrl-N	ESC @
AUX Port Disable	ESC A		Ctrl-O	ESC A
Graphics Mode Enable	ESC $			
Graphics Mode Disable	ESC %			
Monitor Mode Enable	ESC U Ctrl-1	Ctrl-1	Ctrl-1	ESC U Ctrl-1

*This command is functional only from the Host.

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Program Functions (cont)				
Monitor Mode Disable	ESC X or ESC u Ctrl-2	Ctrl-2	Ctrl-2	ESC X or ESC u Ctrl-2
Protect Mode Enable	ESC &			
Protect Mode Disable	ESC '			
Auto Scroll Enable/ Disable	ESC H			ESC H
Character Mode Enable	ESC C			
Line Mode Enable	ESC D			
Block Mode Enable	ESC B			
Program Send Delimiter	ESC x N			
Display Select Control Character	ESC F N			ESC F N
Ring Bell	Ctrl-G	Ctrl-G	Ctrl-G	Ctrl-G
Print Functions				
Print from top of screen to cursor	ESC N SHIFT/PRINT	SHIFT/PRINT	SHIFT/PRINT	SHIFT/PRINT
Print from cursor to end of screen	ESC O CTRL/PRINT	CTRL/PRINT	CTRL/PRINT	CTRL/PRINT
Print Entire Screen	ESC P PRINT	PRINT	PRINT	PRINT

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Send Functions				
Send Line (Full Intensity Only)	ESC 4			
Send Line (Unprotected Only)	ENTER (Line Mode Only)			
Send Page (Full Intensity Only)	ESC 5			
Send Page (Unprotected Only)	ENTER (Block Block Only)			
Send Line (All)	ESC 6			
Send Page (All)	ESC 7			
Send ID Message	Ctrl-E		Ctrl-E	

Appendix F. Command Set Summary (cont)

Function	Command/Key			
	QVT-102/QVT-102A	HZ-1500	ADM-3A/5	TVI-910
Miscellaneous				
Self-Test: Enable	ESC V			ESC V
Self-Test: Disable	SHIFT/BREAK-SHIFT/CLEAR			SHIFT/BREAK-SHIFT/CLEAR
Status Line: Display	ESC }	~Ctrl-P	ESC }	ESC }
Status Line: Blank	ESC {	~Ctrl-N	ESC {	ESC {
"H" Pattern: Display	CTRL/SHIFT SETUP-0	CTRL/SHIFT SETUP-0	CTRL/SHIFT SETUP-0	CTRL/SHIFT SETUP-0
(QVT-102A Only)				
(QVT-102 Only)	SETUP-0	SETUP-0	SETUP-0	SETUP-0
"H" Pattern: Blank	SHIFT/CLEAR	SHIFT/CLEAR	SHIFT/CLEAR	SHIFT/CLEAR

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QVT-102/QVT-102A Operator Manual

Reorder Number 35003A: October 1983

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