Qume
A Subsidiary of ITT

QVT 202™ 201™

Technical Reference

FCC WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed, maintained, and used in accordance with instructions contained in Qume manuals, may cause interference with radio communications. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of the equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

WARNING

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PREFACE

Scope

This manual documents the features, specifications and command sets of the QVT 202 and QVT 201 Alphanumerics Display Terminals. These terminals are designed for use in the Digital VT200 environment. The QVT 202 emulates the VT220; the QVT 201 is compatible with the VT220. This Technical Reference Manual is intended for individuals with knowledge of basic computer programming.

Organization

The QVT 202/QVT 201 Technical Reference Manual is organized into the following sections.

Section 1   Terminal Characteristics and Specifications provides information about the teminals and keyboard layout.

Section 2   Command Set Utilization describes the syntax and the codes necessary to transmit and receive data for the QVT 202 and QVT 201 terminals.

Appendix   The Appendix contains both 7-bit and 8-bit ASCII code tables and the Special Graphics symbols used for the VT220 emulation mode. Status lines and Setup modes are also explained in this section.

Associated Pulbications

The following documents complement the QVT 202/QVT 201 Technical Reference Manual.

QVT 201 Setup Guide   Reorder Number 35093-10
QVT 202 Setup Guide   Reorder Number 35083-10
QVT 202/QVT 201 Maintenance Manual   Reorder Number 35083-30
QVT 202/QVT 201 Quick Reference   Reorder Number 35083-40

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SECTION 1

TERMINAL CHARACTERISTICS AND SPECIFICATIONS

Information documented in this section will be the same for both the QVT 202 and QVT 201 alphanumeric terminals unless otherwise stated.

CHARACTERISTICS

The QVT 202/QVT 201 alphanumerics terminals have the following ergononic characteristics:

The display units for QVT 202/QVT 201 are ball mounted on a pedestal for easy tilt and swivel adjustment. See Figure 1-1.
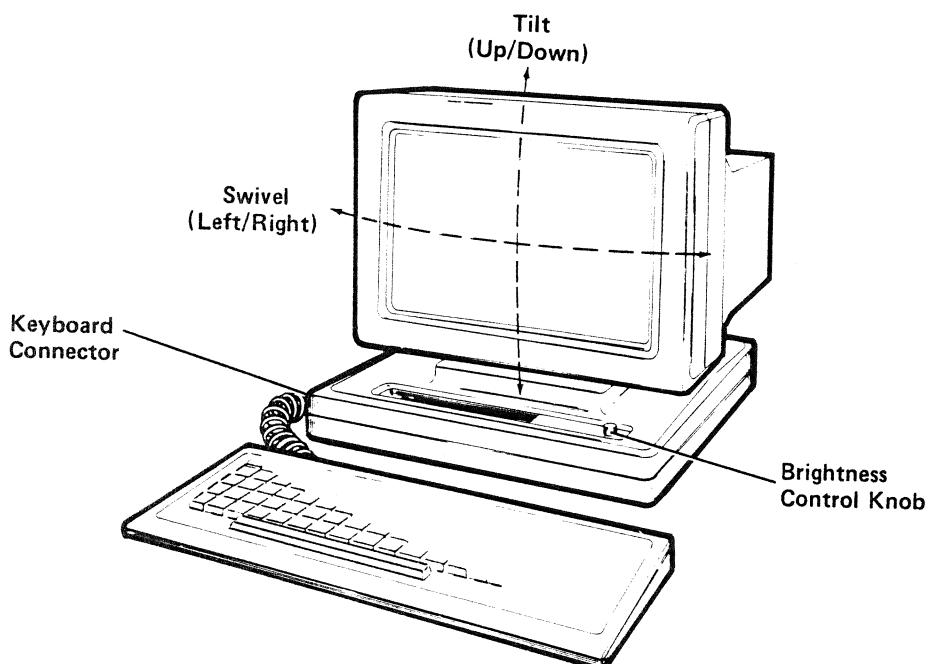
Figure 1-1. Ergonomic Features

The 14" non-glare screen is available in either green or amber phosphor with the brightness control knob located on the right front of the display unit. See Figure 1-1.

All connectors are located on the rear of the display unit, except the keyboard cable connector which is located on the left front side of the display unit (See Figures 1-1 and 1-2).
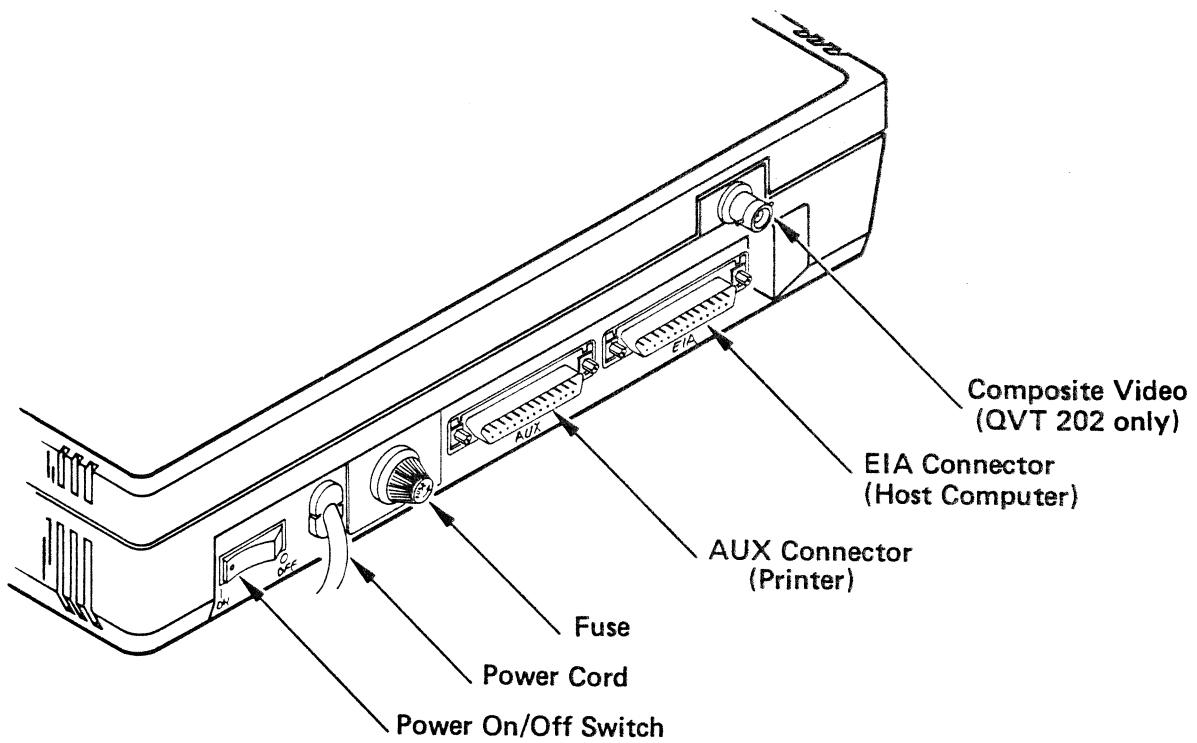
Figure 1-2. The Rear Panel of the Display Unit

The keyboard can be adjusted to three elevations by rotating the two recessed feet outward or inward. See Figure 1-3.

Elevation 1 (5°)   Elevation 2 (10°)   Elevation 3 (15°)
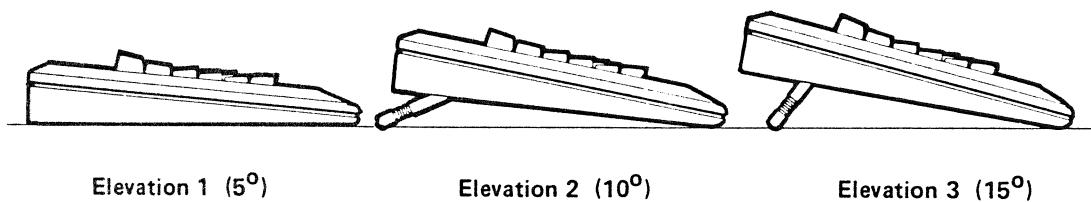
Figure 1-3. Adjusting Keyboard Elevation

SPECIFICATIONS

Display

Dimensions	14-3/4 inches high x 13-1/2 inches wide x 12 inches deep
Weight	20 pounds
Visible tube size	10 inches x 7 1/2 inches
Actual viewing area	75 square inches
Memory	Standard one page 80 column/one page 132 column
Screen saver	Screen shuts off after 5, 10 or 90 (user selectable QVT 201 only) minutes of inactivity without data loss
Display Format	24 lines x 80/132 character 25th status/setup line Composite video (QVT 202)
Scrolling	Jump or smooth (selectable rate)
Character Formation	7 x 9 matrix in a 10 x 10 cell for 80 columns; 7 x 9 matrix in a 9 x 10 cell for 132 columns
Display character Sets	96 ASCII characters, US, UK, Spanish, French and German, 96 DEC Supplemental symbols, (QVT 202) 32 special graphics symbols 32 control symbols
Character Attributes	Normal video, blink, blank, reverse video, underline and bold

Keyboard

Dimensions	1.5 inches H x 18 inches W x 8 inches D
Weight	3 pounds
General	HI RESPONSE Capacitive keyboard: It is detachable, has adjustable tilt, and a low profile, (home row 30mm from work surface)
Main Keyboard	57-key arrangement with 18 auxiliary keys, 10 editing keys and 20 function keys
Editing Keys	10 Special application keys used in the VT200 mode
Auxiliary Keys	14-key numeric pad used to enter data in calculator fashion
Function Keys	The F6-F20 keys are software dependent and their interpretation is dependent on the application program in use. The other five keys (F1 - F5) have individual functions.

Communications

Interface	Standard: EIA RS232-C and RS423 (QVT 202) DTE Optional: RS422 and 20 mA current loop
Protocol	X-ON/X-OFF, DTR and no handshaking
Modes	Full duplex (host, modem QVT 202), half duplex
Parity	Odd, even, mark, space, none
Baud Rates	Host Port: 17 selections from 50 to 38.4K Auxiliary Port: 17 selections from 50 to 38.4K

CHARACTERISTICS AND SPECIFICATIONS

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Power

Requirements	95-125 VAC, 50/60 Hz
Supply	Switching type (low power consumption)
Options	Amber Screen display 20mA Current loop RS422 200-264 VAC, 50/60Hz

THE KEYBOARDS

The QVT 202 Keyboard

The OVT202 keyboard, illustrated below, may be divided into the following functional groups:

- -Main Keyboard Keys
- -Editing Keys
- -Auxiliary Keys
- -Function Keys
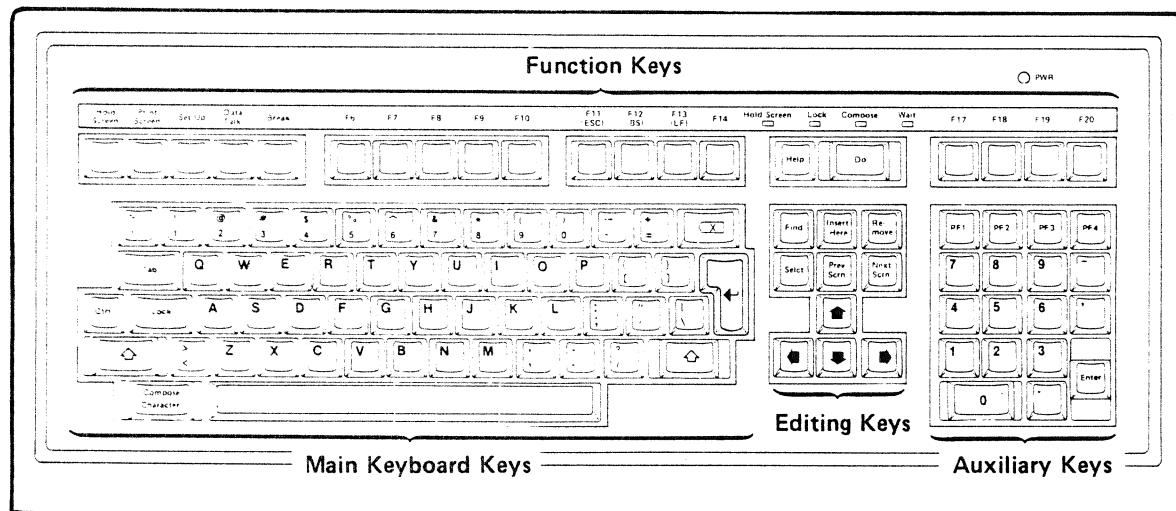
Figure 1-4. The QVT 202 Keyboard

Main Keyboard Keys

Most of the main keyboard keys function like those of any standard typewriter. However, some of the main keyboard keys are unique to the terminal, and these are described as follows:

Tab	Depressing the Tab key transmits the HT (Horizontal Tab) character to the host, and moves the cursor to the next tab stop.
Ctrl	Control. A special key that is always used with another key to invoke a control code.
Compose Character	The Compose Character key is a special key that allows the creation of characters with diacritical marks. Diacritical marks are frequently used in the French, German, and Spanish languages and consist of grave accent, acute accent, circumflex accent, tilde, diaeresis (umlaut) and ring (degree).
	Keyboard alphabetic characters that can be used are: a e i o u c l n p s x y A E I O U C L N P S X Y.
	Diacritical characters that can be used are: " + ' (/) ∧ - ~ ! * < . ? 1 2 3 4.
	You can compose a character from the keyboard or from the host. The following is an example of how to compose a special character.
	1. Press the Compose Character key and the Compose Indicator light on the top row will turn ON.
	2. Press the alphabetic character to be accented. Next, press the diacritical character. The screen will remain blank until the diacritical character is pressed. The Compose Indicator light will go OFF and the composed character will appear on the screen. (See Appendix C for Available Compose Sequences).
< X|	Delete. Depressing the Delete key causes the DEL character to be generated. Depressing the Delete key with the Shift key causes the CAN (Cancel) character to be generated.
Return	Depending on the General Setup Menu selection, depressing the Return key causes either a carriage return, or a carriage return with line feed to be generated.

Editing Keys

Editing Keys	These keys are special application keys for use in VT200 Mode only. The interpretation of the editing keys is dependent upon the application program in use.
Arrow Keys	The arrow keys control the movement of the cursor, by moving the cursor in the direction indicated by the arrow on the key top.

Auxiliary Keys

Number Keys	The number keys are used to enter numeric data in calculator fashion.
Enter	According to General Setup Menu selection, depressing the Enter key causes either a carriage return or a carriage return with line feed to be generated. The Enter key is also used to activate selections in the Setup menus.
PF1 - PF4	The PF keys are software dependent; their interpretation is dependent upon the application program in use.

Function Keys

Hold Screen*	Depressing the Hold Screen key causes screen updating to cease; any new characters received after the Hold Screen feature has been enabled will not be displayed. The Hold Screen Indicator light is ON when this feature is enabled.
Print Screen*	Depressing the Print Screen key causes data on the screen to be ouput to the printer. Depressing the Control and Print Screen keys resets the Auto Print Mode.
Set-Up*	This key is used to enter and exit Setup Mode.
Data/Talk*	The Data/Talk key is operational only when a modem is being used.
Break	The Break key may be used in three ways: . To send a break signal (when the Break key is used alone, and the break feature has been enabled in Setup Mode). . To cause a disconnect (by depressing Shift and Break). . To send the answerback message (by depressing Control and Break).

*These keys for local use only; they do not generate codes.

Function Keys (Cont)

F6 - F20*	These keys are software dependent; their interpretation is dependent upon the application program in use. However, when the terminal is in VT100 or VT52 Mode, depressing F11 generates the the ESC character, F12 generates the BS character, and F13 Generates the LF character. In VT200 Mode these keys are user-definable in the shifted condition; however, they are not savable.

*See page 2-4 for the transmitted codes.

Indicator Lights

Hold Screen	This indicator is ON when the Hold Screen feature is activated by depressing the Hold Screen key. When this feature is deactivated by depressing the Hold Screen key a second time, the indicator is OFF.
Lock	This indicator is ON when the Caps Lock feature is activated by depressing the Lock key. When this feature is deactivated by depressing the Lock key a second time, the indicator is OFF.
Compose	This indicator is ON when the Compose feature is activated by depressing the Compose Character key. Following a compose sequence, this indicator automatically extinguishes.
Wait	This indicator is ON when the keyboard is locked to prevent data entry from the keyboard. This condition can be reversed by selecting the Clear Communication feature from the System Setup Menu.

The QVT 201 Keyboard

The QVT 201 keyboard, illustrated below, may be divided into the following functional groups:

            Main Keyboard Keys

            Function Keys
              • Terminal Control
              • User Definable

            Auxiliary Keys
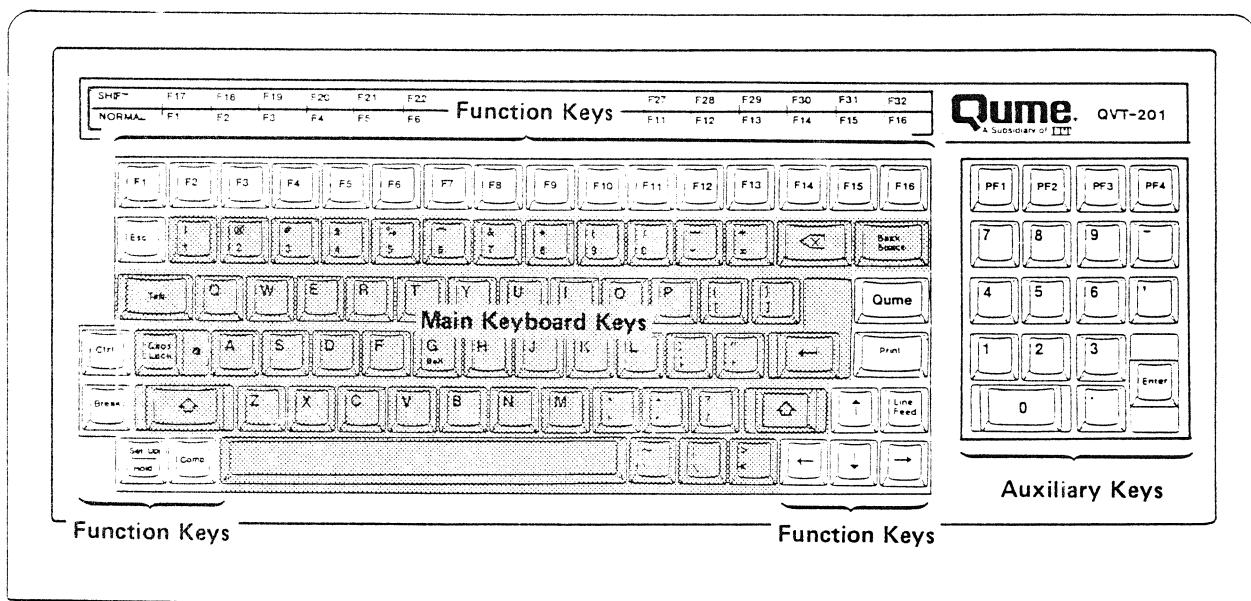
Figure 1-5. The QVT 201 Keyboard

CHARACTERISTICS AND SPECIFICATIONS

Main Keyboard Keys

The Main Keyboard keys are the dark color keys in the large key cluster. Most of these keys function like those of any standard typewriter. However, some of the Main Keyboard keys are unique to the terminal and these are described as follows:

Tab	Depressing the Tab key transmits the HT (Horizontal Tab) character to the host and moves the cursor to the next tab stop.
Caps Lock	Capitals Lock. This key causes the alpha keys to generate uppercase characters. When this feature is active the Caps Lock indicator light displays on the key top and the Lock indicator on the 25th line displays in bold video.
< X|	Delete. Depressing the Delete key causes the DEL character to be generated. Depressing the Delete key with the Shift key causes the CAN (Cancel) character to be sent to the host.
Back Space	Depressing the Back Space key moves the cursor one character position to the left.
Return	Depending on the General Setup Menu selection, depressing the Return key causes either a carriage return or a carriage return with line feed to be performed.

Function Keys

The function keys (terminal control and user definable) are the light color keys in the large key cluster.

Terminal Control	
Esc	Escape. A special key that is used to introduce an escape sequence.
Ctrl	Control. A special key that is always used with another key to invoke a control code.
Break	The Break key may be used in three ways: • To send a break signal (when the Break key is used alone and the break feature has been enabled in Setup Mode). • To cause a disconnect (by depressing Shift and Break). • To send the answerback message (by depressing Control and Break).

Function Keys (Cont)

Set Up/Hold	Set Up/Hold Screen. This key may be used singly to enable and disable the hold screen feature or in combination with the Shift key to enter and exit Setup Mode. When the hold screen feature is enabled, all screen updating ceases until the feature is disabled. During this time, the Hold Indicator or the 25th line displays in bold video.
Comp	Compose Character. This key is a special key that allows the creation of characters with diacritical marks. When this feature is activated, the Compose Indicator (Comp) on the 25th line displays in bold video.
Print Screen	Depressing the Print Screen key causes data on the screen to be output to the printer.
Qume	This key is a special user-definable function key.
Line Feed	Depressing the Line Feed key transmits the LF (Line Feed) character to the host and moves the cursor downward within the same column.
Arrow Keys	The arrow keys control the movement of the cursor by moving the cursor in the direction indicated by the arrow on the key top.
User Definable	
F1 - F16	Top Row Function Keys. These keys are software dependent; their interpretation is dependent upon the application program in use. They may be used singly or in combination with the Shift key to generate a total of 32 possible code sequences. They are user-definable from the keyboard or from the host by a QUMEUDK or DECUDK sequence. Key contents are savable.
	Use the Function Key Identifier Strip on the top edge of the keyboard to note the shifted and unshifted contents of keys F1 through F16.

Auxiliary Keys

The Auxiliary keys are those keys in the small key cluster.

Number Keys	The number keys are used to enter numeric data when in numeric mode or to generate codes when in applications mode. (Refer to page 2-3).
Enter	Depressing the Enter key causes either a carriage return or a carriage return with line feed to be generated. The Enter key is also used to activate selections in the Setup Menus.
PF1 - PF4	The PF keys are software dependent and their interpretation is dependent upon the application program in use.

25th LINE STATUS INDICATORS (QVT 201 only)

ROW: # Col: #	Indicates the active position of the cursor in Row and Column coordinates.
Replace / Insert Mode	Indicates whether Replace or Insert Mode is active.
Printer	Indicates the status of the AUX or Printer Port.
Hold	This indicator displays in bold video when the Hold Screen feature is activated by depressing the Hold key. When this feature is deactivated by depressing the Hold key a second time, the indicator returns to normal display intensity.
Caps Lock	This indicator displays in bold video when the Caps Lock feature is activated by depressing the Caps Lock key. When this feature is deactivated by depressing the Caps Lock key a second time, the indicator returns to normal display intensity.
Comp	This indicator displays in bold video when the Compose Character feature is activated by depressing the Comp key. Following a compose sequence, this indicator automatically returns to normal display intensity.
Wait	This indicator displays in bold video when the keyboard is locked to prevent data entry from the keyboard. This condition can be reversed by selecting the Clear Communication feature from the System Setup Menu.

SECTION 2

COMMAND SET

This section describes the commands recognized by the QVT 202/QVT 201 terminals and the syntax conventions to be observed for operating in 7-bit ASCII environments (C0 controls) or 8-bit environments (C1 controls).

Syntax Conventions

Escape Sequences   An escape sequence is a series of ASCII encoded characters introduced by the C0 character ESC (or Escape). Escape sequences use only 7-bit characters, but can be used in either 7- or 8-bit environments.

Control Sequences   A control sequence is a series of ASCII encoded characters introduced by the CSI (or Control Sequence Introducer), which may be expressed by the 7-bit code equivalent ESC [.

Device Control Strings   A device control string is a delimited string of characters used for control purposes. The format for a device control string is as follows:

> DCS string data ST

Where: DCS = Opening Device Control String Delimiter

string = Command Data

ST = Closing Delimiter or String Terminator

Notes: The 8-bit control character DCS may be expressed as ESC P for application in 7-bit environments.

The 8-bit control character ST may be expressed as ESC / for application in 7-bit environments.

Note: An example of a delimited string that defines the unshifted contents of the F6 key in VT200 mode is as follows:

> ESC P 1;1|17/54455354 ESC /

You have now programmed key number 17 with the word
TEST

TRANSMITTED CODES

Main Keyboard Keys

KEYSTROKE	CODE	7-Bit Hex	8-Bit Hex
< X| (Delete)	DEL character.	7F	FF
Tab	HT character.	09	89
Return	CR character only, or CR character with LF character (depending on Line Feed/New Line selection).		
Space Bar	SP character.	20	A0
Shift Lock Ctrl Compose Character	These keys do not generate any code.		
Back Space	BS Character (F12)*	08	
Line Feed	LF Character (F13)*	0A	
ESC	ESC Character (F11)*	1B	

*Functions only in VT100 or VT52 mode on the QVT 202.

Editing Keys (QVT 202 Only)

KEYSTROKE	VT200 MODE	VT100 / VT52 MODES
Find	CSI 1 ~ (tilde)	None
Insert Here	CSI 2 ~	None
Remove	CSI 3 ~	None
Select	CSI 4 ~	None
Previous Screen	CSI 5 ~	None
Next Screen	CSI 6 ~	None

TRANSMITTED CODES (Cont)

Editing Keys - Cursor Control Keys

KEYSTROKE	VT200 / VT100 MODE		VT52 MODE	
	NORMAL	APPLICATION	NORMAL	APPLICATION
Up Arrow	CSI A	SS3 A (*)	ESC A	ESC A
Down Arrow	CSI B	SS3 B	ESC B	ESC B
Right Arrow	CSI C	SS3 C	ESC C	ESC C
Left Arrow	CSI D	SS3 D	ESC D	ESC D

Auxiliary Keypad Keys

KEYSTROKE	VT200 / VT100 MODE		VT52 MODE	
	NUMERIC	APPLICATION	NUMERIC	APPLICATION
0	0	SS3 p	0	ESC ? p
1	1	SS3 q	1	ESC ? q
2	2	SS3 r	2	ESC ? r
3	3	SS3 s	3	ESC ? s
4	4	SS3 t	4	ESC ? t
5	5	SS3 u	5	ESC ? u
6	6	SS3 v	6	ESC ? v
7	7	SS3 w	7	ESC ? w
8	8	SS3 x	8	ESC ? x
9	9	SS3 y	9	ESC ? y
- (minus)	-	SS3 m	-	ESC ? m
, (comma)	,	SS3 l	,	ESC ? l
. (period)	.	SS3 n	.	ESC ? n
Enter	CR or CR LF	SS3 M	CR or CR LF	ESC ? M
PF1	SS3 P	SS3 P	ESC P	ESC P
PF2	SS3 Q	SS3 Q	ESC Q	ESC Q
PF3	SS3 R	SS3 R	ESC R	ESC R
PF4	SS3 S	SS3 S	ESC S	ESC S

*See page 2-9 for an explanation of SS3 (Single Shift)

TRANSMITTED CODES (Cont)

Function Keys (QVT 202 Only)

KEYSTROKE	VT200 MODE	VT100 / VT52 MODES
Hold Screen	None	None
Print Screen	None	None
Set-Up	None	None
Data/Talk	None	None
Break	None	None
F6	CSI 1 7 ~ (tilde)	None
F7	CSI 1 8 ~	None
F8	CSI 1 9 ~	None
F9	CSI 2 Ø ~	None
F10	CSI 2 1 ~	None
F11 (ESC)	CSI 2 3 ~	ESC
F12 (BS)	CSI 2 4 ~	BS
F13 (LF)	CSI 2 5 ~	LF
F14	CSI 2 6 ~	None
Help (F15)	CSI 2 8 ~	None
Do (F16)	CSI 2 9 ~	None
F17	CSI 3 1 ~	None
F18	CSI 3 2 ~	None
F19	CSI 3 3 ~	None
F20	CSI 3 4 ~	None

TRANSMITTED CODES (Cont)

Function Keys (QVT 201 Only)

KEYSTROKE	GENERIC NAME	VT200 MODE	KEY NUMBER *
F1	F17	CSI 3 1	31
F2	F18	CSI 3 2	32
F3	F19	CSI 3 3	33
F4	F20	CSI 3 4	34
F5	F22	CSI 3 6	36
F6	F6	CSI 1 7	17
F7	F7	CSI 1 8	18
F8	F8	CSI 1 9	19
F9	F9	CSI 2 0	20
F10	F10	CSI 2 1	21
F11	F11	CSI 2 3	23
F12	F12	CSI 2 4	24
F13	F13	CSI 2 5	25
F14	F14	CSI 2 6	26
F15	F15	CSI 2 8	28
F16	F16	CSI 2 9	29
Qume	Qume	None	0

* Note: The Key Number is the value (Kyn) that is used to identify Function Keys when they are being user-defined in a QUMEUDK or DECUDK device control string.

COMMAND SET UTILIZATION

TRANSMITTED CODES (Cont)

Control Code Keystrokes for 7-Bit Controls

CONTROL CODE MNEMONIC	CONTROL KEY DEPRESSED with ADDITIONAL KEY(S)	NOTES	
		QVT 202	QVT 201
NUL	Control-2,Control-sp		
SOH	Control-A		
STX	Control-B		
ETX	Control-C		
EOT	Control-D		
ENQ	Control-E		
ACK	Control-F		
BEL	Control-G		
BS	Control-H	F12(BS)*	Back Space
HT	Control-I	Tab	Tab
LF	Control-J	F13(LF)*	Line Feed
VT	Control-K		
FF	Control-L		
CR	Control-M	Return	Return
SO	Control-N		
SI	Control-O		
DLE	Control-P		
DC1	Control-Q		
DC2	Control-R		
DC3	Control-S		
DC4	Control-T		
NAK	Control-U		
SYN	Control-V		
ETB	Control-W		
CAN	Control-X		
EM	Control-Y		
SUB	Control-Z		
ESC	Control-3, Control [	F11(ESC)*	Escape
FS	Control-4, Control \		
GS	Control-5, Control]		
RS	Control-6, (Tilde)		
US	Control-7, Control ?		
DE	Control-8	Delete	Delete

*VT100/VT52 Modes

2-6

RECEIVED CODES

C∅ (ASCII) Control Code Interpretation

MNEMONIC	NAME	INTERPRETATION
NUL	Null	Ignored.
ENQ	Enquiry	Causes the Answerback Message to be transmitted.
BEL	Bell	Sounds the bell tone if Bell is enabled.
BS	Backspace	Causes the cursor to move one character position to the left; ignored when the cursor is at the left margin.
HT	Horizontal Tab	Cause the cursor to move to the next tab stop or to the right margin if no tab stops are set.
LF	Line Feed	Generates a Line Feed (New Line), depending on how New Line is set.
VT	Vertical Tab	Same as Line Feed.
FF	Form Feed	Same as Line Feed.
CR	Carriage Return	Causes the cursor to move to the left margin on the same line or to the left margin one line down if CR=CR + LF is activated in the status.
SO (LS1)	Shift Out (Lock Shift G1)	Invokes the G1 character set as specified by Select Character Set.
SI (LS∅)	Shift In (Lock Shift G∅)	Invokes the G∅ character set as specified by Select Character Set.
DC1	Device Control 1	Same as XON. Resets DC3 (XOFF) to enable the terminal to transmit. Unlocks the keyboard depending the setting of Lock Keyboard and Handshake setting.
DC3	Device Control 3	Same as XOFF. Resets DC1 (XON) to stop data transmission.

RECEIVED CODES (Cont)

CØ (ASCII) Control Code Interpretation (Cont)

MNEMONIC	NAME	INTERPRETATION
CAN	Cancel	Aborts the execution of control, escape, or device control sequences. No error character is displayed.
SUB	Substitute	Aborts the execution of control, escape, or device control sequences. Causes a reverse question mark to display.
ESC	Escape	Escape cancels any control sequence currently in progress.
DEL	Delete	Ignored.

C1 (ASCII) Control Code Interpretation

MNEMONIC	NAME	INTERPRETATION
IND	Index	Causes the cursor to move downward one line in the same column; causes the screen to scroll when the cursor reaches the bottom margin. (Equivalent to the 7-bit code: ESC E)
NEL	Next Line	Causes the cursor to move to the left margin of the following line; causes the screen to scroll when the cursor reaches the bottom margin. (Equivalent to the 7-bit code: ESC E)
HTS	Horizontal Tab Set	Sets a tab stop at the current cursor column. (Equivalent to the 7-bit code: ESC H)

RECEIVED CODES (Cont)

C1 (ASCII) Control Code Interpretation (Cont)

MNEMONIC	NAME	INTERPRETATION
RI	Reverse Index	Causes the cursor to move upward one line in the same column; causes the screen to scroll when the cursor reaches the top margin. (Equivalent to the 7-bit code: ESC M)
SS2	Single Shift G2	Designates the G2 character set (as specified by Select Character Set) as GL. (Equivalent to the 7-bit code: ESC N)
SS3	Single Shift G3	Designates the G3 character set (as specified by Select Character Set) as GL. (Equivalent to the 7-bit code: ESC O)
DCS	Device Control String	Device Control String opening delimiter. (Equivalent to the 7-bit code: ESC P)
CSI	Control Sequence Introducer	Control Sequence Introducer. (Equivalent to the 7-bit code: ESC [ )
ST	String Terminator	The Device Control String closing delimiter. (Equivalent to the 7-bit code: ESC /)

COMMAND SET UTILIZATION

GENERAL

Cursor Positioning

NAME	COMMAND	INTERPRETATION
Cursor Up (CUU)	CSI Pn A	Causes the cursor to move up Pn lines in the same column. Unspecified Pn = 1.
Cursor Down (CUD)	CSI Pn B	Causes the cursor to move down Pn lines in the same column. Unspecified Pn = 1.
Cursor Forward (CUF)	CSI Pn C	Causes the cursor to move right Pn columns. Unspecified Pn = 1.
Cursor Backward (CUB)	CSI Pn D	Causes the cursor to move left Pn columns. Unspecified Pn = 1.
Cursor Position (CUP)	CSI Pl ; Pc H	Causes the cursor to move to line Pl and column Pc.
Horizontal and Vertical Position (HVP)	CSI Pl ; Pc f	Causes the cursor to move to line Pl and column Pc.
Index (IND)	ESC D	Causes the cursor to move downward one line in the same column. When the cursor is at the bottom margin, the screen will scroll.
Reverse Index (RI)	ESC M	Causes the cursor to move upward one line in the same column. When the cursor is at the top margin, the screen will scroll.
Next Line (NEL)	ESC E	Causes the cursor to move to column 1 of the next line. When the cursor is at the bottom margin, this command causes the screen to scroll.
Save Cursor (DECSC)	ESC 7	Saves the following parameters in terminal memory: Cursor position, graphic rendition, character set shift state, line wrap setting, origin mode setting, and selective erase setting.
Restore Cursor (DECRC)	ESC 8	Resets the parameters stored by Save Cursor; otherwise, the cursor moves Home, origin mode is reset, no character attributes are assigned, and the default character set is implememted.

GENERAL (Cont)

Editing

NAME	COMMAND	INTERPRETATION
Insert Line (IL)	CSI Pn L	Causes Pn lines to be inserted from the cursor position. Unspecified Pn = 1.
Delete Line (DL)	CSI Pn M	Causes Pn lines to be deleted from the cursor position. Unspecified Pn = 1.
Insert Characters (ICH)	CSI Pn @	Causes Pn blank characters to be inserted from the cursor position (VT200 Mode only). Character attributes are set to normal. Unspecified Pn = 1.
Delete Characters (DCH)	CSI Pn P	Causes Pn characters to be deleted from the cursor position. Unspecified Pn = 1.

Erasing

NAME	COMMAND	INTERPRETATION
Erase Character (ECH)	CSI Pn X	Causes Pn characters at the cursor position and the Pn - 1 characacter position to be erased (VT200 Mode only). Unspecified Pn = 1.
Erase In Line (EL)	CSI K or CSI Ø K	Causes all characters from the cursor position to the end of the line to be erased.
	CSI 1 K	Causes all characters from the beginning of the line, to and including the character at the cursor position, to be erased.
	CSI 2 K	Causes the complete line to be erased.

GENERAL (Cont)

Erasing (Cont)

NAME	COMMAND	INTERPRETATION
Erase In Display (ED)	CSI J or CSI Ø J	Causes the display to be erased from the cursor to the end of the screen. Line attributes become single high/single wide.
	CSI 1 J	Causes the display to be erased from the beginning of the screen, to and including the cursor position. Line attributes become single high/single wide.
	CSI 2 J	Causes the entire display to be erased.
	CSI 2 J	Causes the entire display to be erased.
Selective Erase In Line (DECSEL)	CSI ? K or CSI ? Ø K	Causes all erasable characters from the cursor to the end of the line to be erased (VT200 Mode only). Does not affect video line or character attributes.
	CSI ? 1 K	Causes all erasable characters (DECSCA) from the beginning of a line, to and including the cursor position, to be erased (VT200 Mode only).
	CSI ? 2 K	Causes all erasable characters (DECSCA) on a given cursor line to be erased (VT200 Mode only).
Selective Erase In Display (DECSED)	CSI ? J or CSI ? Ø J	Causes all erasable characters from the cursor to the end of the screen to be erased (VT200 Mode only).
	CSI ? 1 J	Causes all erasable characters (DECSCA) from the beginning of the screen, to and including the cursor position, to be erased (VT200 Mode only).
	CSI ? 2 J	Causes all erasable characters (DECSCA) in the display to be erased (VT200 Mode only).

GENERAL (Cont)

Printing

NAME	COMMAND	INTERPRETATION
Auto Print Mode	CSI ? 5 i	Enables Auto Print Mode, and causes display lines to be printed (on the printer connected to AUX port) whenever the cursor is moved to another line, as occurs with a LF, FF, VT, or auto linewrap. A print line is terminated with a CR and the cursor movement code that initially moved the cursor.
	CSI ? 4 i	Disables Auto Print Mode.
Printer Controller Mode	CSI 5 i	Enables Printer Controller Mode, so that the terminal directs all received characters from the host, to the AUX port without displaying them (except NUL, XON, XOFF, CSI 5 i, and CSI 4 i). In this mode the terminal does not insert or delete spaces, add delimiters, or select printer character set. All keyboarded characters are directed to the host. Printer Controller Mode has a higher priority than Auto Print Mode.
	CSI 4 i	Disables Printer Controller Mode.
Print Cursor Line	CSI ? 1 i	Causes the current cursor line to be printed. Cursor position remains unchanged.
Print Screen	CSI i or CSI Ø i	Causes the screen display to be printed; i.e., full screen or scrolling region depending on the setting of Print Extent (DECEXT). The print operation terminator may be either a FF or no terminator specified, according to Print Form Feed Mode (DECPFF) selection.

GENERAL (Cont)

Set Top and Bottom Margins (DECSTBM)

COMMAND	INTERPRETATION
CSI Pt; Pb r	Specifies the top and bottom margins of the scrolling region. Where: Pt Specifies the first line of the scrolling region. Pb Specifies the bottom line of the scrolling region. Note: If Pt and Pb are not specified, their values default to the top and bottom of the display. The scrolling region originates from Line 1.

Tab Stops

NAME	COMMAND	INTERPRETATION
Horizontal Tab Set (HTS)	ESC H	Causes a tab stop to be set at the current cursor column.
Clear Tab Stop (TBC)	CSI g or CSI Ø g	Causes the tab stop at the current cursor position to be cleared.
	CSI 3 g	Causes all tab stops to be cleared.

CHARACTER SET SPECIFICATIONS

Character sets may be specified for application in VT100 mode or VT200 mode (refer to Appendix B).

The character sets are:

1. ASCII 7-Bit
2. Multinational
3. UK (Same as ASCII 7-bit character set except the US # sign is replaced with the British £ sign, row 3/column 2 of the 7-bit Multinational Code Chart).
4. Special Graphics
5. Down-line loadable

The character sets can be designated as G0, G1, G2 or G3 and mapped as either the Graphics Left (GL) character set or Graphics Right (GR) character set. Characters can be invoked for application by using either lock shifts or single shifts commands. (See Figure 2-1 for character set designation).

DIGITAL 8 - BIT CODE CHART
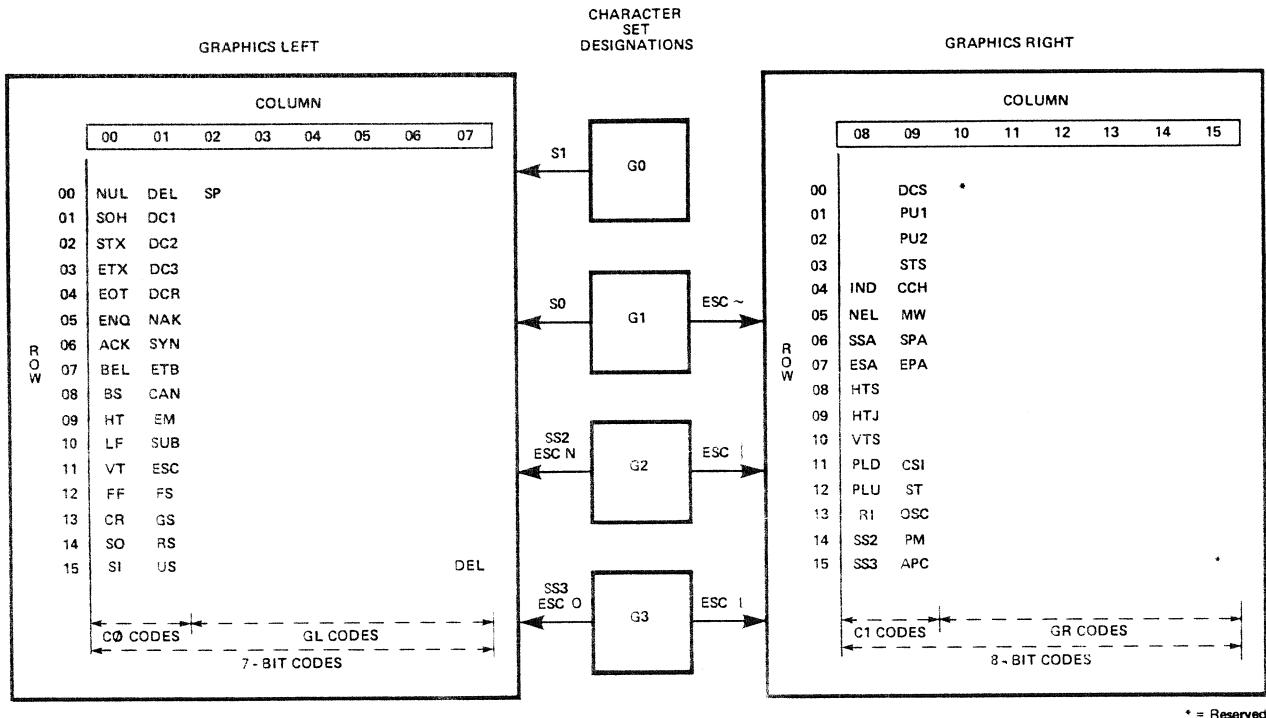
Figure 2-1. Character Set Specifications

CHARACTER SET SPECIFICATIONS (Cont)

Character Set Selection (SCS and DSCS)

- Assigning "Hard" Character Sets

CHARACTER SET	COMMAND	ASSIGNMENT
ASCII	ESC (B	GØ (Default)
	ESC) B	G1
	ESC * B	G2 (VT200 Mode only)
	ESC + B	G3 (VT200 Mode only)
DEC Supplemental	ESC (<	GØ
(VT200 Mode only)	ESC) <	G1
	ESC * <	G2
	ESC + <	G3
UK (VT100 Mode only)	ESC (A	GØ
	ESC) A	G1
DEC Special Graphics	ESC (Ø	GØ
	ESC) Ø	G1
	ESC * Ø	G2 (VT200 Mode only)
	ESC + Ø	G3 (VT200 Mode only)

(QVT 202 Only)

- Assigning "Soft" or Down-Loadable Character Sets (DSCS)

COMMAND	ASSIGNMENT
ESC (DSCS	GØ
ESC) DSCS	G1
ESC * DSCS	G2
ESC + DSCS	G3

Note: Where DSCS is Ø, 1, or 2 intermediate characters in the range SP to /
(slash), followed by a final character in the range Ø to ~ (tilde).

CHARACTER SET SPECIFICATIONS (Cont)

- Using Lock Shifts to Invoke Character Sets

FUNCTION	CODE	APPLICATION
Lock Shift GØ (LS0)	SI	Invokes GØ into GL (Default)
Lock Shift G1 (LS1)	SO	Invokes G1 into GL
Lock Shift G1 Right (LS1R)	ESC ~	Invokes G1 into GR (VT200 Mode only)
Lock Shift G2 (LS2)	ESC n	Invokes G2 into GL (VT200 Mode only)
Lock Shift G2 Right (LS2R)	ESC }	Invokes G2 into GR (Default - VT200 Mode only)
Lock Shift G3 (LS3)	ESC o	Invokes G3 into GL (VT200 Mode only)
Lock Shift G3 Right (LS3R)	ESC |	Invokes G3 into GR (VT200 Mode only)

- Using Single Shifts to Invoke Character Sets

FUNCTION	CODE	APPLICATION
Single Shift G2 (SS2)	SS2 or ESC N	Moves G2 into GL for application when the next graphic character is received.
Single Shift G3 (SS3)	SS3 or ESC O	Moves G3 into GL for application when the next graphic character is received.

CHARACTER SET SPECIFICATIONS (Cont)

Down-Loading Characters (DRCS) (VT200 Mode)

The DRCS character set may be down-loaded using the following DECDLD device control string:

DCS Pfn; Pcn; Pe; Pcms; Pw; Pt { Dscs Sxbp1; Sxbp2;...; Sxbpn ST

Where the following parameter specifications are in effect:

PARAMETER	NAME	SPECIFICATION
Pfn	Font Number	0 or 1
Pcn	Beginning Character Number	Specifies the first DRCS character to be loaded in the font buffer. This character is loaded in column 2/row 1 character position of the Special Graphics Code Chart. (See Appendix B).
Pe	Erase Control	0 to erase all characters in this DRCS set. 1 to erase only the characters that are in reload. 2 to erase all characters in all DRCS sets (to erase all font buffer numbers).
Pcms	Character Matrix Size	0 7 X 10 (Default). 1 Not Used 2 5 X 10 3 6 X 10 4 7 X 10
Pw	Width Attribute	0 80 columns (Default) 1 80 columns 2 132 columns
Pt	Text/Full-Cell	0 Text (Default) 1 Text 2 Full-Cell (Not Used)

DSCS specifies the name of a soft font character set used in the SCS (Select Character Set) escape sequence.

Sxbp1; Sxbp2;...; Sxbpn specify 1 X 6 pixel matrixes used for defining DRCS characters. Each 1 X 6 pixel matrix has the following format:

S...S/...S

Where: S...S specifies the upper pixel pattern of the DRCS character,
          / (or slash) acts as a pointer between the upper and lower pixel patterns, and
          S...S specifies the lower pixel pattern of the DRCS character.

CHARACTER SET SPECIFICATIONS (Cont)

Down-Loading Characters (DRCS) (Cont)

To clear a down-loaded character set, issue the following DECDLD control sequence:

DCS 1; 1; 2 Sp @ ST

Or

1. Execute a power-up self-test
2. Execute a Set-Up Recall or Set-Up Default
3. Use any RIS or ESC c sequence

How to Design a Character Set (QVT 202 only)

You can create and down-line load a character set while in the VT200 mode.

Characters are designed in two parts, the upper character matrix and the lower character matrix.

First, decide how your character or characters will look. Characters are made from individual pixels that are specified ON or OFF, with binary one (1) as the "ON" pixels and binary zero (0) as the "OFF" pixels. Normally, the background is designated "OFF" and the foreground is designated "ON".

In a 10 x 10 character cell the upper character matrix is a 6 x 7 pixel pattern, and the lower character matrix is a 4 x 7 pixel pattern. For example, to design the letter Q (refer to Figures 2-2 and 2-3), column 1 of upper character matrix starting with the most significant bit at the bottom of the colummn and the least significant bit at the top, translates to binary 111100 or octal 74. Column 2 translates to binary 000010 or octal 02, and so on, until all columns in both the upper and lower character matrixes are complete. Each binary column must be converted to an octal value, then offset by the addition of octal 77, and finally the total octal value, converted to a character from the ASCII chart. Refer to the ASCII chart in Appendix B.

CHARACTER SET SPECIFICATIONS (Cont)

How to Design a Character Set (Cont)

7 X 9 Matrix
10 X 10 Character Cell
80 Columns
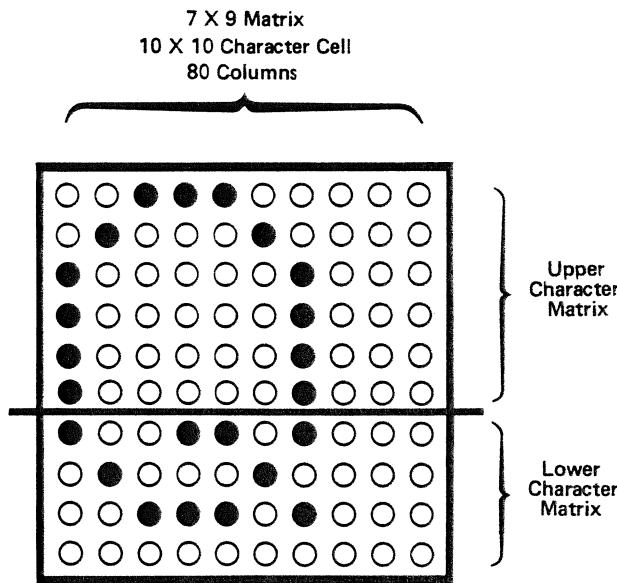
Figure 2-2. "Q" Character Designed Inside Character Cell

Top of Character   Bottom of Character

Column 7 – Same as 1 = |
Column 6 – Same as 2 = A
Column 5 – Same as 3 & 4 = @
Column 4 – Same as 3 = @
Column 3 – 000001 = $1_8 + 77_8 = 100_8$ = @
Column 2 – 000010$_2$ = $2_8 + 77_8 = 101_8$ = A
Column 1 – 111100$_2$ = $74_8 + 77_8 = 173_8$ = |

Column 15 – Same as 12 = D
Column 14 – Same as 10 = A
Column 13 – Same as 12 = D
Column 12 – 0101 = $5_8 + 77_8 = 104_8$ = D
Column 11 – 0100 = $4_8 + 77_8 = 103_8$ = C
Column 10 – 0010 = $2_8 + 77_8 = 101_8$ = A
Column 9 – 0001 = $1_8 + 77_8 = 100_8$ = @
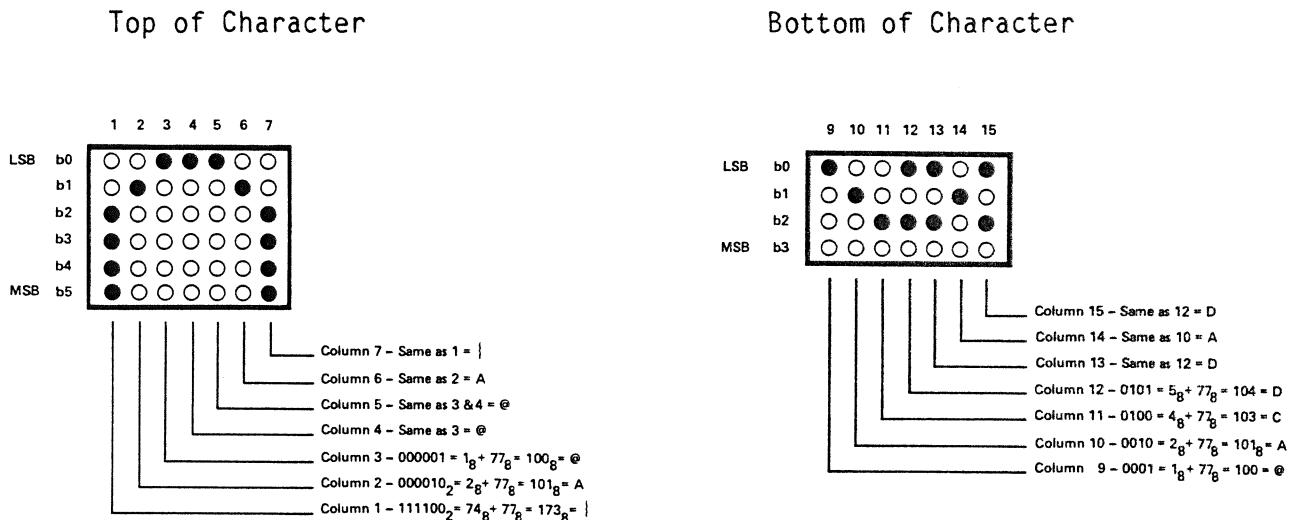
Note: After you convert binary 111100 to octal 74, you must then add 77 to
        get the octal number 173 which is the   symbol on the ASCII chart.

Figure 2-3. Codes for Designing the "Q" Character

CHARACTER SET SPECIFICATIONS (Cont)

How to Design a Character Set (Cont)

You can now down-line load your character or characters, either one at a time or up to 94 characters. You must be in **VT200 Mode**.

For the following example, put the terminal in Local Mode and input the following command sequence.

DCS 1;1;1;0;0;0 { sp @ {A@@@A}/@ACDDAD ST

To see the character on the screen issue the following command:

ESC (sp @

This assigns the soft character set to GØ. Press the key that was programmed, in this case, the shifted 1 or ! was programmed with the Q. All other keys will generate a ? if not programmed in the same string.

        Ctrl [= ESC (7-Bit ASCII Code)
        sp = DSCS
        (DSC defines the character set "name" for the soft font used to
        select character set for use in SCS command).
        { = signals end of parameters
        ST = ESC / (7-Bit ASCII Code)

Select C1 Controls

CONTROL	COMMAND	INTERPRETATION
7-Bit C1 Control (S7C1T)	ESC Sp F	Converts all C1 codes in application to equivalent 7-bit code extensions. Note: Ignored when the terminal is operating in VT100 or VT52 Mode.
8-Bit C1 Control (S8C1T)	ESC Sp G	Utililizes all C1 codes in application without converting them to equivalent 7-bit code extensions.

COMMAND SET UTILIZATION

DISPLAY ATTRIBUTE SELECTION

Select Character Attributes (DECSCA)

Characters may be specified with selective erase or without selective erase.
This feature is functional only in VT200 Mode.

COMMAND	INTERPRETATION	
CSI Ps " q	Where Ps = Ø	No attributes, except graphics rendition attributes (SGR).
	1	Specifies a character without selective erase (DECSEL/DECSED selected).
	2	Specifies a character with selective erase (DECSEL/DECSED deselected).

Select Graphic Rendition (SGR)

COMMAND	INTERPRETATION	
CSI Ps;... Ps m	Where Ps = Ø	All attributes deselected
	1	Display at high intensity
	4	Display with underscore attribute
	5	Display with blink attribute
	7	Display with reverse presentation
	2 2	Display with normal intensity
	2 4	Display without underscore attribute
	2 5	Display without blink attribute
	2 7	Display with normal presentation (Light characters on dark background)

Note: Multiple parameters may be selected and are executed as received.

DISPLAY ATTRIBUTE SELECTION (Cont)

Select Line Attributes

ATTRIBUTE	COMMAND	INTERPRETATION
Double Height Line (DECDHL)	Top Half: ESC # 3 Bottom Half: ESC # 4	When specifying this attribute, to form a full character, the same character must be issued on both top and bottom lines. (If single width/single height lines are specified with this attribute, all characters to the right of center are lost.)
Single Width Line (DECSWL)	ESC # 5	Specifies a single width/single height line.
Double Width Line (DECDWL)	ESC # 6	Specifies a double width/single height line. (If single width/single height lines are specified with this attribute, all characters to the right of center are lost.)

COMMAND SET UTILIZATION

TEST AND ADJUSTMENTS

Adjustments

COMMMAND	INTERPRETATION
ESC # 8	Causes a full screen of Es to display for alignment purposes.

Terminal Reset

NAME	COMMAND	INTERPRETATION
Soft Reset (DECSTR)	CSI ! p	Causes the terminal to assume its power-up default parameters.
Hard Reset (RIS)	ESC c	Causes all set-up parameters to to assume their NVR parameters, or their default parameters if no NVR values have been specified.

Tests (DECTST)

Note: Performing these tests causes a communications line disconnect.

COMMAND	INTERPRETATION
CSI 4 ;...; Ps y	Causes the following test to be performed: Where Ps = 0 Tests 1, 2, 3, and 6 1 Power-up self-test 2 EIA Port loopback test 3 Printer Port loopback test 4 Not Used 5 Not Used 6 EIA Port modem control loopback test 7 20 mA Port loopback test 8 Not Used 9 Repeat other parameter string tests 10 Values 10 and above are not used

COMPATIBILITY LEVEL

COMMMAND	INTERPRETATION
CSI 6 1 " p	Sets the terminal for VT100 Mode (Level 1).
CSI 6 2 " p	Sets the terminal for VT200 Mode, 8-bit controls (Level 2).
CSI 6 2 ; 0 " p	Sets the terminal for VT200 Mode, 8-bit controls (Level 2).
CSI 6 2 ; 1 " p	Sets the terminal for VT200 Mode, 7-bit controls (Level 2).
CSI 6 2 ; 2 " p	Sets the terminal for VT200 Mode, 8-bit controls (Level 2).

REPORTS

- Device Attributes (DA)

COMMUNICATION DIRECTION	COMMAND	INTERPRETATION
Host to Terminal (Primary Request)	CSI c or CSI Ø c	Request to report terminal type and attributes.
Terminal to Host (Primary Request)	CSI ? 62; 1; 2; 6; 7; 8 c	Report terminal type and attributes. Where: 62 Identifies a VT200 type terminal 1 132 column capability 2 Printer port equipped 6 Selective Erase feature 7 DRCS feature 8 UDK feature
Host to Terminal (Secondary Response)	CSI > c or CSI > Ø c	Request to report terminal type, firmware version, and hardware options.
Terminal to Host (Secondary Response)	CSI > 1; Pv; Po c	Report terminal type, firmware, and options installed where: 1 Terminal identification code Pv Firmware version Po Options installed

REPORTS (Cont)

- Device Status Report (DSR)

COMMUNICATION DIRECTION	COMMAND	INTERPRETATION
Host to Terminal	CSI 5 n	Request to operating status in a DSR report sequence.
Terminal to Host	CSI 0 n or CSI 3 n	DA response: No malfunction detected.
Host to Terminal	CSI 6 n	Request to report cursor position in a CPR report sequence.
Terminal to Host	CSI Pv; Ph R	CPR response: Pv identifies cursor vertical position (row); Ph identifies cursor horizontal position (column).

DSR (PRINTER PORT)

COMMUNICATION DIRECTION	COMMAND	INTERPRETATION
Host to Terminal	CSI ? 15 n	Request to report printer status.
Terminal to Host	CSI ? 13 n	Report: No Printer Installed.
	CSI ? 10 n	Report: Printer Is Ready.
	CSI ? 11 n	Report: Printer Is Not Ready.

REPORTS (Cont)

- DSR (USER-DEFINED KEYS - VT200 MODE ONLY)

COMMUNICATION DIRECTION	COMMAND	INTERPRETATION
Host to Terminal	CSI ? 25 n	Request for status of User-Defined Keys (UDK): Locked or Unlocked.
Terminal to Host	CSI ? 20 n	Report: User-Defined Keys Unlocked.
	CSI ? 21 n	Report: User-Defined Keys Locked.

- IDENTIFICATION (DECID)

COMMUNICATION DIRECTION	COMMAND	INTERPRETATION
Terminal to Host	ESC Z	Causes the terminal to issue the DA primary response sequence.

TERMINAL SET AND RESET MODES

MNEMONIC	NAME	SET MODE	RESET MODE
DECANM	ANSI/VT52	N/A CSI ? 2 1	VT52
DECARN	Auto Repeat	ON CSI ? 8 h	OFF CSI ? 8 1
DECAWN	Auto Wrap	ON CSI ? 7 h	OFF CSI ? 7 1
DECCKM	Cursor Key	APPLICATION CSI ? 1 h	CURSOR CSI ? 1 1
DECCOLM	Column	132 COLUMN CSI ? 3 h	80 COLUMN CSI ? 3 1
DECKPAM/DECKPNM	Keypad	APPLICATION ESC =	NUMERIC ESC >
DECPEX	Print Extent	FULL SCREEN CSI ? 19 h	SCROLLING REGION CSI ? 19 1
IRM	Insert/Replace	INSERT CSI 4 h	REPLACE CSI 4 1
KAM	Keyboard Action	LOCKED CSI 2 h	UNLOCKED CSI 2 1
LNM	Line Feed/ New Line	NEW LINE CSI 20 h	LINE FEED CSI 20 1
SRM	Send/Receive	OFF CSI 12 h	ON CSI 12 1
DECPFF	Print Form Feed	ON CSI ? 18 h	OFF CSI ? 18 1
DECSCLM	Scrolling	SMOOTH CSI ? 4 h	JUMP CSI ? 4 1
DECSCNM	Screen	REVERSE CSI ? 5 h	NORMAL CSI ? 5 1
DECTCEM	Text Cursor Enable	ON CSI ? 25 h	OFF CSI ? 25 1

USER-DEFINED KEYS (DECUDK) or (QUMEUDK)

To down load a Function key issue the following command:

QUMEUDK: (QVT 201   DCS Pc; P1; Pks; Pr ~ Ky1/St1; Ky2/St2; ... Kyn/Stn ST
        only)
   or

DECUDK: DCS Pc; P1 | Ky1/St1; Ky2/St2; ... Kyn/Stn ST

Where: DCS =   Device Control String Introducer (7-bit equivalent = ESC P)

      Pc = None Causes all keys to be cleared before loading with new
              values
          0   Same as None
          1   Causes new key values to be loaded over old values for
              those keys specified

      P1 = None Causes all key values to be safeguarded against
              redefinition
          0   Same as None
          1   Causes all key values to be accessible for redefinition

     Pks= None Shifted Function key
         0   Unshifted Function key
         1   Same as None

      Pr = None No routing
         0   Same as None

     Kyn= Key Number

     ~   =   QUMEUDK sequence designator

     | =   DECUDK sequence designator

Function Key	Key Number	Function Key	Key Number
QUME	0	F14	26
F6	17	F15	28
F7	18	F16	29
F8	19	F1 (F17)	31
F9	20	F2 (F18)	32
F10	21	F3 (F19)	33
F11	23	F4 (F20)	34
F12	24	F5 (F22)	36
F13	25		

Stn = Hex encoded key contents

ST = String Terminator = ESC /

USER-DEFINED KEYS (DECUDK) or (QUMEUDK) (Cont)

An example of DECUDK:

The word **TEST** will be programmed in function keys 17, 18, 19 and 20 by using the DECUDK sequence.

Change the System Setup Menu to **On Line**, the General Setup Menu to the **VT200 mode**, and the PF keys Menu to **VT200 Compatible.**

Press the Set-Up key to exit.

From the host send: ESCP1;1|17/54;18/45;19/53;20/54ESC/

Press the Shift Key and the Function key simultaneously to see the programmed information. (Local mode only or at host if you are on line.)

An example of QUMEUDK: (QVT 201 only)

The word **QUME** will be programmed in the function keys F1, F2, F3 and F4.

Change the System Setup Menu to **On Line**, the General Setup Menu to the **QUME mode**, and the PF keys Menu to **QUME Compatible.**

Press the Set-Up key to exit.

From the host send: ESC P1;1;0;0 ~ 31/51;32/55;33/4D;34/45 ESC /

Press the Shift Key and the Function key simultaneously to see the programmed information. (Local mode only or at host if you are on line.)

VT52 COMMANDS

COMMAND	INTERPRETATION
ESC A	Cursor Up
ESC B	Cusor Down
ESC C	Cursor Right
ESC D	Cursor Left
ESC H	Cursor Home
ESC Y Line Col.	Address Cursor
ESC I	Reverse Line Feed
ESC K	Erase to End of Line
ESC J	Erase to End of Screen
ESC F	Enter Graphics Mode
ESC G	Exit Graphics Mode
ESC W	Printer Controller Mode On
ESC X	Printer Controller Mode Off
ESC ∧	Auto Print On
ESC _	Auto Print Off
ESC]	Print Cursor Line
ESC V	Print Screen
ESC Z	Identify
ESC =	Enter Alternate Keypad Mode
ESC >	Exit Alternate Keypad Mode
ESC <	Enter ANSI Mode

SETUP MODE and the SETUP MENUS

Setup mode is used to tailor the operating parameters of the terminal to match the requirements of the system into which it is integrated.

To enter and exit Setup Mode depress the Set-Up key on the QVT 202 or the Shift and Set-Up keys on the QVT 201.

In Setup Mode the QVT 202 amd QVT 201 have eight setup menus. These are:

- System
- General
- Display
- Communication
- Printer
- Keyboard
- Tab
- PF Keys

Also displayed with each setup menu is the following information:

- Terminal Identification: Upper left corner
- Firmware Version: Upper right corner
- Insert/Replace Mode status, Printer status, and Modem status:
     Bottom line of the QVT 202
- Insert/Replace Mode status, Printer status and Keyboard
     Visual Indicator status (Hold Screen, Lock, Compose,
     Wait): Bottom line of the QVT 201

Each setup menu is separated into a series of parameter blocks. Each block contains all the possible values that may be assigned to that particular block.

To specify a parameter assignment, depress the cursor arrow keys to advance through the blocks of the setup menu. Observe that the block where a parameter assignment is to be made displays in Bold Reverse Video. To view the possible values within a parameter block, depress the Enter key until the desired value displays, then move from the block by again depressing a cursor arrow key. Note, there are some parameter blocks, called Action Parameter Blocks, that only display a choice of action that may be selected by depressing the Enter key, or declined by moving into another block. Other parameter blocks, called Text Parameter Blocks, are empty; into these you may enter text, as in the Answerback Block.

APPENDIX

The Setup Menus for QVT 202/QVT 201

System Setup Menu

The System Setup Menu is the first menu displayed after depressing the Set-Up key to enter Setup Mode. This menu allows access to the other setup menus, and may be used to configure the operating characteristics of the terminal. Figure A-1 illustrates the System Setup Menu and Table A-1 offers a description of the parameter blocks within this menu.

QVT   V2.0A
                                                                         VD

| |System| | General | Display | Communication | Printer | Keyboard | Tab | PF Keys |

| To Next Setup | On Line | Default | Recall | Save | Exit | |

| Set-Up English | North American Keyboard | |

| Clear Display | Clear Communication | Reset Terminal | |

| | Replace Mode | Printer: None | Modem: No DSR, Talk |

Figure A-1. The System Setup Menu

Table A-1. System Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-Up	Causes the next setup menu to be displayed when the Enter key is depressed.
On Line	Possible Values: . On Line (Default) . Local On Line configures the terminal for communication with the host computer; Local isolates the terminal from the host computer so that data entered from the keyboard is processed to the display only.
Default	Action Parameter Block. Depressing the Enter key causes all setup parameter selections to be reset to their factory default settings. This action also causes a communications disconnect to occur.
Recall	Action Parameter Block. Depressing the Enter key causes previously saved setup parameter selections to be recalled as the operating parameters of the terminal. This action also causes a communications disconnect to occur.
Save	Action Parameter Block. Depressing the Enter key causes all setup parameter selections to be saved.
Exit	Action Parameter Block. Depressing the Enter key causes the terminal to exit Setup Mode.

Set-up = Language	Possible Values: . English (Default)
	                  . Francais (French)
	                  . Deutsch (German)
	
	This field selects the language that is to display in the setup menus.

Language Keyboard	Possible Values: . North American (Default)* . British* . Italian . Flemish . Swiss (French) . Canadian (French) . Swiss (German) . Danish . Swedish . Finnish . Norwegian . German* . French/Belgian* . Dutch . Spanish* This block selects the character set of the terminal so that it matches the language of the keyboard in use.

*Languages available for QVT 201.

APPENDIX

Table A-1. System Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Clear Display	Action Parameter Block. Depressing the Enter key causes all displayed data to be cleared when Setup Mode is exited.
Clear Communication	Action Parameter Block. Depressing the Enter key clears terminal-host communications and causes the following actions: . Aborts any print operation, and exits Printer Controller Mode . Aborts any escape/control sequence . Clears all buffers (keyboard, receive, transmit) . Transmits XON to the host . Resets received XOFF flags from the host and printer
Reset Terminal	Action Parameter Block. Depressing the Enter key resets the terminal to a default condition that is recognizible by most application programs. Screen features, communications, and the status of user-defined keys are not altered.

General Setup Menu

The General Setup Menu is used to define the general operating features of the terminal. Figure A-2 illustrates the General Setup Menu and Table A-2 offers a description of the parameter blocks within this menu.

QVT   V2.0A
                                                                VD

| System | |General| | Display | Communication | Printer | Keyboard | Tab | PF Keys |

| To Next Setup | VT200 Mode, 7Bit Controls | ID VT100 |

| User Defined Keys Unlocked | User Features Unlocked | Multinational |

| Numeric Keypad | Normal Cursor Keys | New Line | |

| | Replace Mode | Printer: None | Modem: No DSR, Talk |

Figure A-2. The General Setup Menu

APPENDIX

Table A-2. General Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-Up	Causes the next setup menu to be displayed when the Enter key is depressed.
Mode Controls	Possible Values: . VT200 Mode, 7 Bit Controls (Default) . VT200 Mode, 8 Bit Controls . VT52 Mode (ASCII/U.K.) . VT100 Mode (ASCII/U.K.) VT200 Mode, 7 Bit Controls configures the terminal to operate in a 7-bit environment (accepts 8-bit graphics characters). VT200 Mode, 8 Bit Controls configures the terminal for full compatibility in 8-bit environments. VT52 Mode configures the terminal to emulate the VT52 terminal; VT100 configures the terminal to emulate the VT100 terminal.
User Defined Keys	Possible Values: . User Defined Keys Unlocked (Default) . User Defined Keys Locked When Unlocked, the User Defined keys may be loaded; when Locked, the User Defined keys can not be loaded.
User Features	Possible Values: . User Features Unlocked (Default) . User Features Locked When Unlocked, the following user features may be controlled from the host: . Auto Repeat . Tab Stops . Smooth/Jump Scroll . Keyboard Lock . Light/Dark Screen When Locked, the host is prevented from controlling these features.
National/ Multinational	The National mode supports the 7-bit ASCII character set and the Multinational mode supports the 8-bit ASCII character set. (See Appendix B).
Keypad Keys	Possible Values: . Numeric Keypad (Default) . Application Keypad Specifies whether the keypad keys transmit ASCII character codes (Numeric Keypad), or sequences (Application Keypad) when depressed.

Table A-2. General Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Cursor Keys	Possible Values: . Normal Cursor Keys (Default) . Application Cursor Keys Specifies whether the cursor keys transmit ANSI cursor control sequences (Normal Cursor Keys), or application control sequences (Application Cursor Keys) when depressed.
New Line	Possible Values: . No New Line (Default) . New Line Specifies whether the Return key transmits a carriage return (CR code) only, i.e., No New Line, or a carriage return and line feed (CR + LF codes), i.e., New Line.

Display Setup Menu

The Display Setup Menu is used to specify the viewable characteristics of the display. Figure A-3 illustrates the Display Setup Menu and Table A-3 offers a description of the parameter blocks within this menu.

QVT   V2.0A
                                                                        VD

System General |Display| Communication Printer Keyboard Tab PF Keys
To Next Setup	80 Column	Auto Wrap	25th Line On	
Smooth Scroll	Light Text, Dark Screen	
Cursor	Block Cursor Style	Interpret Controls	

	Replace Mode	Printer: None	Modem: No DSR, Talk

Figure A-3. The Display Setup Menu

Table A-3. Display Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Setup	Causes the next setup menu to be displayed when the Enter key is depressed.
Columns	Possible Values: . 80 Columns (Default) . 132 Columns Specifies an 80 or 132 column display width.
Auto Wrap	Possible Values: . No Auto Wrap (Default) . Auto Wrap Specifies whether characters received beyond the right margin wrap to the next line (Auto Wrap) or not (No Auto Wrap).
25th Line	Possible Values: . 25th Line On (Default) . 25th Line Off Specifies whether the 25th line (bottom line) is displayed (25th Line On) or not displayed (25th Line Off).
Scroll	Possible Values: . Smooth Scroll (Default) . Jump Scroll Specifies whether characters smooth scroll or jump scroll when the screen is filled.
Text/Screen	Possible Values: . Light Text, Dark Screen (Default) . Dark Text, Light Screen Specifies a display condition of either Light Text on a Dark Screen (Normal), or Dark Text on a Light Screen (Reverse).
Cursor	Possible Values: . Cursor (Default) . No Cursor Specifies whether the cursor is displayed (Cursor) or not (No Cursor).
Cursor Style	Possible Values: . Block Cursor Style (Default) . Underline Cursor Style Specifies the visual attribute of the cursor; block or underline.

Table A-3. Display Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Controls	Possible Values: . Interpret Controls (Default) . Display Controls Specifies whether control codes are to be executed (Interpret Controls), or displayed and not executed (Display Controls).

Note: The QVT 202 blanks after 15 minutes of non-use; whereas, the QVT 201
has screen saver values of 5 minutes, 10 minutes and 90 minutes.

Communications Setup Menu

The Communications Setup Menu is used to define the communications parameters between the terminal and the host. Figure A-4 illustrates the Communications Setup Menu and Table A-4 offers a description of the parameters blocks within this menu.

QVT   V2.0A
                                                                    VD

System General Display |Communication| Printer Keyboard Tab PF Keys
To Next Setup	No Local Echo	Receive=Transmit	XOFF at 64
Transmit=19200	8 Bits, No Parity	1 Stop Bit	
EIA Port, Modem Control	Disconnect, 2 s Delay	Limited Transmit	

	Replace Mode	Printer: None	Modem: No DSR, Talk

Figure A-4. The Communications Setup Menu

Table A-4. Communications Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-up	Causes the next setup menu to be displayed when the Enter key is depressed.
Echo	Possible Values: . No Local Echo (Default) . . Local Echo Specifies whether data entered from the keyboard is to be transmitted to the host only (No Local Echo), or both transmitted to the host and displayed locally (Local Echo).

Receive=Baud Rate	Possible Values: . Receive = Transmit (Default)
	
	   . 75 . 2400
	   . 110 . 4800
	   . 150 . 9600
	   . 300 . 19200
	   . 600 . 38400
	   . 1200
	
	Specifies the baud rate at which the terminal receives data from the host computer. The receive baud rate of the terminal must match the transmit baud rate of the host computer; however, the terminal may transmit and receive data at different baud rates.

XOFF	Possible Values: . XOFF at 64 (Default) . . XOFF at 128 . . No XOFF Specifies the fill point of the input buffer at which the XOFF signal is to be sent.

Transmit=Baud Rate	Possible Values: . Transmit = 4800 (Default)
	
	   . 75 . 1200
	   . 110 . 2400
	   . 150 . 9600
	   . 300 . 19200
	   . 600 . 38400
	
	Specifies the baud rate at which the terminal transmits data to the host computer. The transmit baud rate of the terminal must match the receive baud rate of the host computer.

Table A-4. Communications Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Bits/Parity	Possible Values: . 8 Bits, No Parity (Default) . 8 Bits, Even Parity . 8 Bits, Odd Parity . 8 Bits, Even Parity, No Check . 8 Bits, Odd Parity, No Check . 7 Bits, Even Parity, No Check . 7 Bits, Odd Parity, No Check . 7 Bits, No Parity . 7 Bits, Even Parity . 7 Bits, Odd Parity . 7 Bits, Mark Parity . 7 Bits, Space Parity Specifies the data format for communications with the host computer.
Stop Bit	Possible Values: . 1 Stop Bit (Default) . 2 Stop Bits Specifies the number of stop bits (1 or 2) included in the data format for characters transmitted to the host computer.
EIA Port	Possible Values: . EIA Port, Data Leads Only (Default) . EIA Port, Modem Control . 20 mA Port (Option) Configures the terminal-host communications port for no modem control (data leads only), modem control, or 20 mA current loop.
Disconnect Delay	Possible Values: . Disconnect, 2 s Delay (Default) . Disconnect, 60 ms Delay Specifies the disconnect delay time when modem control is used, before the terminal drops the communications line following the loss of the Received Line Signal Detection (RLSD) signal.
Transmit Limit	Possible Values: . Limited Transmit (Default) . Unlimited Transmit Offers the capability to limit the terminal transmit rate to 150-180 characters per second, to reduce interrupt time on the operating system. Limited Transmit has priority over the baud rate setting.

APPENDIX

Printer Setup Menu

The Printer Setup Menu is used to define the parameters that specify printer operation. Figure A-5 illustrates the Printer Setup Menu and Table A-5 offers a description of the parameter blocks within this menu.

QVT   V2.0A
                                                                         VD

System General Display Communication |Printer| Keyboard Tab PF Keys

| To Next Setup | Normal Print Mode | Speed=4800 | |

| 8 Bits, No Parity | 1 Stop Bit | No Terminator | |

| Print Full Page | ASCII/U.K. Only | |

| | Replace Mode | | Printer: None | Modem: No DSR, Talk |

Figure A-5. The Printer Setup Menu

A-14

Table A-5. Printer Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-Up	Causes the next setup menu to be displayed when the Enter key is depressed.
Print Mode	Possible Values: . Normal Print Mode (Default) . Auto Print Mode . Controller Mode Specifies the operating mode of the printer. Normal Print Mode allows printer operations to be controlled from the keyboard. Auto Print Mode causes the terminal to transmit a given cursor line following the receipt of line feed, form feed, or vertical tab code from the host. Controller Mode causes the terminal to pass all data received from the host, directly to the printer without displaying it on the screen.
Speed=Baud Rate	Possible Values: . 4800 (Default) . 75 . 1200 . 110 . 2400 . 150 . 9600 . 300 . 19200 . 600 . 38400 Specifies the baud rate for data transmitted from the terminal to the printer.
Bits/Parity	Possible Values: . 8 Bits, No Parity (Default) . 8 Bits, Even Parity . 8 Bits, Odd Parity . 7 Bits, No Parity . 7 Bits, Mark Parity . 7 Bits, Space Parity . 7 Bits, Even Parity . 7 Bits, Odd parity
Stop Bit	Possible Values: . 1 Stop Bit (Default) . 2 Stop Bits Sets the number of stop bits (1 or 2) included in the data format for characters transmitted to the printer.
Terminator	Possible Values: . No Terminator (Default) . Terminator = FF Specifies the termination code for a print page operation as No Terminator or a FF (Form Feed) code.

Table A-5. Printer Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Print	Possible Values: . Print Full Page (Default) . Print Scroll Region Specifies whether the full screen or the scrolling region is to be printed.

Print Data*	Possible Values: . ASCII/U.K. Only (Default)
	                 . Line Drawing And ASCII/U.K.
	                 . All Characters
	
	Specifies the terminal's character set from which data is to be printed.
	
	• ASCII/U.K. Only supports only the ASCII or U.K. character sets; suggested printers for this application are the Digital LA34, LA36, or LA120, and compatible non-Digital printers.
	
	• Line Drawing And ASCII/U.K. supports the ASCII or U.K. character sets with line drawing capability; suggested printer for this application is the Digital LA50 printer.
	
	• All Characters is for use in applications where multinational character sets with line drawing capability is required; suggested printer for this application is the Digital LA100 printer.

*QVT 202 only.

Keyboard Setup Menu

The Keyboard Setup Menu is used to define the operational features of the keyboard. Figure A-6 illustrates the Keyboard Setup Menu and Table A-6 offers a description of the parameter blocks within this menu.

QVT   V2.0A
                                                                          VD

System General Display Communication   Printer |Keyboard| Tab PF Keys

| To Next Setup | Caps Lock | Break | Typewriter Keys | |

| Auto Repeat | Keyclick | Margin Bell | Warning Bell | |

| No Auto Answerback | Answerback= | | Not Concealed | |

| | Replace Mode | Printer: None | Modem: No DSR, Talk |

Figure A-6. The Keyboard Setup Menu

Table A-6.   Keyboard Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-Up	Causes the next setup menu to be displayed when the Enter key is depressed.
Caps Lock	Possible Values: . Caps Lock (Default) . Shift Lock Specifies the operation of the Lock key. When Caps Lock is selected, the main keyboard keys generate uppercase characters only; when Shift Lock is selected, the main keyboard keys generate uppercase characters, and tne top row characters on the number keys.
Break	Parameter Value: . Break (Default) . No Break Specifies the action of the Break key.
Keys*	Possible Values: . Typewriter Keys (Default) . Data Processing Keys Sets the keyboard matrix to match the keyboard in use. Always specify Typewriter Keys when using a North American keyboard. For other keyboards with multiple key cap legends, select Typewriter Keys to generate the character(s) on the left side of the key cap, and select Date Processing Keys to generate the character(s) on the right side of the key cap.
Key Repeat	Possible Values: . Auto Repeat (Default) . No Auto Repeat Specifies whether or not a character is repeated when a key is held down.
Keyclick	Possible Values: . Keyclick (Default) . No Keyclick Specifies whether or not a key depression generates a "click" sound.
Margin Bell	Possible Values: . Margin Bell (Default) . No Margin Bell Specifies whether or not a "beep" sound is generated as the cursor passes through column 72 and approaches the right margin.

*QVT 202 only.

Table A-6. Keyboard Setup Menu Parameter Blocks Description (Cont)

PARAMETER BLOCK	DESCRIPTION
Warning Bell	Possible Values: . Warning Bell (Default) . No Warning Bell Specifies whether or not a "beep" sound is generated upon the receipt of a Ctrl-G command, or to signal an operating error.
Auto Answerback	Possible Values: . Auto Answerback (Default) . No Auto Answerback Specifies whether or not the answerback message is automatically transmitted to the host computer after the communications link is established.
Answerback=	Text Parameter Block. A 30-character answerback message may be programmed into this block. The answerback message is transmitted upon the receipt of an ENQ code or by keying Ctrl-Break. To program an answerback message, first depress the Enter key. Observe the prompt **Enter Answerback=** on the 25th line; following this prompt, key the desired message. Depress the Enter key a second time to program the message into the Answerback= block.
Concealed	Possible Values: . Not Concealed (Default) . Concealed Specifies whether or not the answerback message is displayed. A programmed answerback message that has been concealed, can not be displayed by changing this block to Not Concealed; rather, a new answerback message must be entered. To program an answerback message, first depress the Enter key. Observe the prompt **Enter Answerback=** on the 25th line; following this prompt, key the desired message. Depress the Enter key a second time to program the message into the Answerback= block.

Tab Setup Menu

The Tab Setup Menu is used to set tabs at any desired column location. Figure A-7 illustrates the Tab Setup Menu. Notice that each column is numbered on a ruler line, and that tab stop locations are represented by a caret. Table A-7 describes the parameter blocks within this menu.

```
QVT                                                                    V2.0A
                                                                         VD



System  General  Display  Communication  Printer  Keyboard  |Tab|  PF Keys

| To Next Set-Up | Clear All Tabs | Set 8 Column Tabs |                      |

12345678901234567890123456789012345678901234567890123456789012345678901234567890
      ^       ^        ^         ^         ^         ^         ^         ^         ^


_____


|               | Replace Mode    | Printer: None      | Modem: No DSR, Talk |
```

Figure A-7. The Tab Setup Menu

Table A-7. Tab Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Setup	Causes the next setup menu to be displayed when the Enter key is depressed.
Clear All Tabs	Action Parameter Block. Depressing the Enter key, clears all tab stops. To set other tab stops: Use the Down Cursor key to enter the ruler line; move the column highlighter with the Left or Right Cursor key; then, depress the Enter key.
Set 8 Column Tabs	Action Parameter Block. Depressing the Enter key sets a tab stop at every eighth column beginning with column 9. To set other tab stops: Use the Down Cursor key to enter the ruler line; move the column highlighter with the Left or Right Cursor key; then, depress the Enter key.

PF Keys Setup Menu

The PF (Program Function) Keys Menu is used to program the contents of the top
row Function keys and the Qume key (QVT 201 only). Figure A-8 illustrates the
PF Keys Setup Menu and Table A-8 offers a description of the parameter blocks
within this menu.

QVT   V2.0A
                                                                     VD

System General Display Communication Printer Keyboard Tab [PF Keys]

| To Next Set-Up | PFK=Qume Programmable | Clear Current PFK | Clear All PFK |

| Program: Qume | | Avail. Space=256 |

| | Replace Mode | Printer: None | On/Off: Hold Lock Comp Wait |

Figure A-8. The PF Keys Setup Menu

Table A-8. PF Keys Setup Menu Parameter Blocks Description

PARAMETER BLOCK	DESCRIPTION
To Next Set-Up	Causes the next setup menu to be displayed when the Enter key is depressed.
Programmable Keys	Possible Values: . Qume Programmable (Default) . VT200 Compatible Specifies whether the Programmable Function Keys are to be used as Qume programmable or VT200 compatible keys. To program the Function Keys from the status line: Go to the PF Keys Setup Menu. Determine which mode is to be programmed. Press the Enter Key to change modes. Place the cursor in the Program: block of the Setup line. Simultaneously press the Shift key and the PF key you want to program, F6 through F20 (shifted combinations only) for the QVT 202 and F1 through F16 plus the QUME Key (shifted or unshifted) for the QVT 201). Press the Enter Key. Following this procedure, the cursor will automatically jump to the next block in the setup line. You can now input any information wanted for that particular key. When you finish, again press the Enter Key. The key is now programmed. To save the programmed information in the keys, go to the System Setup Menu and use the Save function.
Clear Current PFK	Action Parameter Block. Depressing the Enter key clears the contents of the PFK designated in the Program Parameter Block.
Clear All PFK	Action Parameter Block. Depressing the Enter key clears the contents of the keyboard definable PFKs.
Program:	Possible Values: . Qume key, keys F1 through F16, and their shifted combinations (34 total). This block is used to designate the PFK whose contents are to be displayed and/or programmed.

Table A-8. PF Keys Setup Menu Parameter Blocks Description (Cont)

| PARAMETER BLOCK	DESCRIPTION
|_____|	Text Parameter Block. This block displays the contents of the PFK designated in the previous **Program:** block. Editing within this block is accomplished by using the Cursor Arrow Keys; text scrolls left and right so that it remains viewable at the cursor position. Also, the < X| key may be used to backspace delete; the Shift and Right Cursor Arrow keys, to insert new text at the cursor position; and the Shift and Left Cursor Arrow keys, to delete text at the cursor position.
Avail. Space=256	The total memory allocation for the PFKs is 256 bytes. This block displays the remaining memory available for PFK programming.

7-Bit ASCII Code Chart

Bits 7 6 5 / 4 3 2 1	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
0 0 0 0 0	NUL 0　　0	DLE 10　　20	SP 20　　40	0 30　　60	@ 40　100	P 50　120	` 60　140	p 70　160
1 0 0 0 1	SOH 1　　1	DC1 11　　21	! 21　　41	1 31　　61	A 41　101	Q 51　121	a 61　141	q 71　161
2 0 0 1 0	STX 2　　2	DC2 12　　22	" 22　　42	2 32　　62	B 42　102	R 52　122	b 62　142	r 72　162
3 0 0 1 1	ETX 3　　3	DC3 13　　23	# 23　　43	3 33　　63	C 43　103	S 53　123	c 63　143	s 73　163
4 0 1 0 0	EOT 4　　4	DC4 14　　24	$ 24　　44	4 34　　64	D 44　104	T 54　124	d 64　144	t 74　164
5 0 1 0 1	ENQ 5　　5	NAK 15　　25	% 25　　45	5 35　　65	E 45　105	U 55　125	e 65　145	u 75　165
6 0 1 1 0	ACK 6　　6	SYN 16　　26	& 26　　46	6 36　　66	F 46　106	V 56　126	f 66　146	v 76　166
7 0 1 1 1	BEL 7　　7	ETB 17　　27	' 27　　47	7 37　　67	G 47　107	W 57　127	g 67　147	w 77　167
8 1 0 0 0	BS 8　　10	CAN 18　　30	(28　　50	8 38　　70	H 48　110	X 58　130	h 68　150	x 78　170
9 1 0 0 1	HT 9　　11	EM 19　　31	) 29　　51	9 39　　71	I 49　111	Y 59　131	i 69　151	y 79　171
10 1 0 1 0	LF A　　12	SUB 1A　　32	* 2A　　52	: 3A　　72	J 4A　112	Z 5A　132	j 6A　152	z 7A　172
11 1 0 1 1	VT B　　13	ESC 1B　　33	+ 2B　　53	; 3B　　73	K 4B　113	[5B　133	k 6B　153	{ 7B　173
12 1 1 0 0	FF C　　14	FS 1C　　34	, 2C　　54	< 3C　　74	L 4C　114	\ 5C　134	l 6C　154	| 7C　174
13 1 1 0 1	CR D　　15	GS 1D　　35	- 2D　　55	= 3D　　75	M 4D　115	] 5D　135	m 6D　155	} 7D　175
14 1 1 1 0	SO E　　16	RS 1E　　36	. 2E　　56	> 3E　　76	N 4E　116	^ 5E　136	n 6E　156	~ 7E　176
15 1 1 1 1	SI F　　17	US 1F　　37	/ 2F　　57	? 3F　　77	O 4F　117	_ 5F　137	o 6F　157	DEL 7F　177

Digital 8-Bit Code Chart

C O L U M N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
00	NUL	DEL	SP							DCS	*					
01	SOH	DC1								PU1						
02	STX	DC2								PU2						
03	ETX	DC3								STS						
04	EOT	DCR							IND	CCH						
05	ENQ	NAK							NEL	MW						
R 06	ACK	SYN							SSA	SPA						
O 07	BEL	ETB							ESA	EPA						
W 08	BS	CAN							HTS							
09	HT	EM							HTJ							
10	LF	SUB							VTS							
11	VT	ESC							PLD	CSI						
12	FF	FS							PLU	ST						
13	CR	GS							RI	OSC						
14	SO	RS							SS2	PM						
15	SI	US						DEL	SS3	APC						*

```
|<--------->|<-------------------------------->|<--------->|<-------------------------------->|
    C0 CODES            GL CODES                  C1 CODES            GR CODES
|<-------------------------------------------->|
          7-BIT ASCII CODES
```
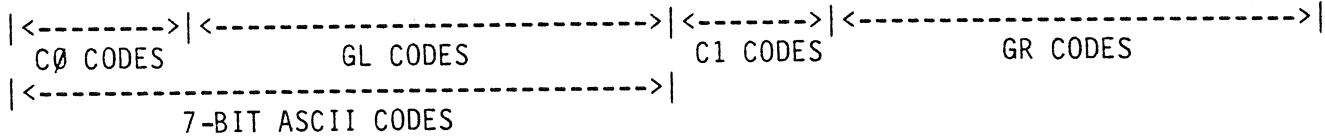
* = Reserved.

Special Graphics Code Chart

b4	b3	b2	b1	Row / Col	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	♦	SCAN 3
0	0	0	1	1	SOH	DC1	!	1	A	Q	⁞	SCAN 5
0	0	1	0	2	STX	DC2	"	2	B	R	H_T	SCAN 7
0	0	1	1	3	ETX	DC3	£/#	3	C	S	E_F	SCAN 9
0	1	0	0	4	EOT	DC4	$	4	D	T	C_R	⊢
0	1	0	1	5	ENQ	NAK	%	5	E	U	L_F	⊣
0	1	1	0	6	ACK	SYN	&	6	F	V	°	⊥
0	1	1	1	7	BEL	ETB	'	7	G	W	±	⊤
1	0	0	0	8	BS	CAN	(	8	H	X	N_L		
1	0	0	1	9	HT	EM	)	9	I	Y	V_T	≤
1	0	1	0	A	LF	SUB	*	:	J	Z	⌐	≥
1	0	1	1	B	VT	ESC	+	;	K	[	¬	⋇
1	1	0	0	C	FF	FS	,	<	L	\	⌐	≠
1	1	0	1	D	CR	GS	-	=	M	]	∟	£
1	1	1	0	E	SO	RS	.	>	N	∧	†	.
1	1	1	1	F	SI	US	/	?	O	(BLANK)	SCAN 1	DEL

Note: The Hexadecimal Value = The ASCII Column Number + The ASCII Row Number

Multinational Code Chart
(Page 1 Of 2)

b4	b3	b2	b1	Column / Row	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

Multinational Code Chart (Cont)
(Page 2 of 2)

b4	b3	b2	b1	Row	8	9	10	11	12	13	14	15
0	0	0	0	0		DCS	▨	°	À		à	
0	0	0	1	1		PU1	¡	±	Á	Ñ	á	ñ
0	0	1	0	2		PU2	¢	2	Â	Ò	â	ò
0	0	1	1	3		STS	£	3	Ã	Ó	ã	ó
0	1	0	0	4	IND	CCH			Ä	Ô	ä	ô
0	1	0	1	5	NEL	MW	¥	µ	Å	Õ	å	õ
0	1	1	0	6	SSA	SPA		¶	Æ	Ö	æ	ö
0	1	1	1	7	ESA	EPA	§	.	Ç	Œ	ç	œ
1	0	0	0	8	HTS		¤		È	Ø	è	ø
1	0	0	1	9	HTJ		©	1	É	Ù	é	ù
1	0	1	0	A	VTS		ª	º	Ê	Ú	ê	ú
1	0	1	1	B	PLD	CSI	«	»	Ë	Û	ë	û
1	1	0	0	C	PLU	ST		¼	Ì	Ü	ì	ü
1	1	0	1	D	RI	OSC		½	Í	Ÿ	í	ÿ
1	1	1	0	E	SS2	PM			Î		î	
1	1	1	1	F	SS3	APC		¿	Ï	ß	ï	▨

Table C-1. Available Compose Sequences

Final Character		Compose Sequence	
		3-Keystroke Method	2-Keystroke Method†
à or À	(a/A grave)	Compose, a` or A`	`a or `A
á or Á	(a/A acute)	Compose, a´ or A´	´a or ´A
â or Â	(a/A circumflex)	Compose, a^ or A^	^a or ^A
ã or Ã	(a/A tilde)	Compose, a~ or A~	~a or ~A
ä or Ä	(a/A umlaut)	Compose, a¨ or A"	¨a or A
å or Å	(a/A ring)	Compose, a*,aº,A* or Aº	ºa or A
a̷ or AE	(a e/A E ligature)	Compose, a e or A E	
ç or Ç	(c/C cedilla)	Compose, c , or C ,	
è or È	(e/E grave)	Compose, e` or E`	`e or `E
é or É	(e/E acute)	Compose, e´ or E´	´e or ´E
ê or Ê	(e/E circumflex)	Compose, e^or E^	^e or^E
ë or Ë	(e/E umlaut)	Compose, e¨ or E"	¨e or "E
ì or Ì	(i/I grave)	Compose, i` or I`	`i or `I
í or Í	(i/I acute)	Compose, i´ or I´	´i or ´I
î or Î	(i/I circumflex)	Compose, i^ or I^	^i or ^I
ï or Ï	(i/I umlaut)	Compose, i¨ or I"	¨i or "I
ñ or Ñ	(n/N tilde)	Compose, n~ or N~	~n or ~N
ò or Ò	(o/O grave)	Compose, o` or O`	`o or `O
ó or Ó	(o/O acute)	Compose, o´ or O´	´o or ´O
ô or Ô	(o/O circumflex)	Compose, o^ or O^	^o or ^O
õ or Õ	(o/O tilde)	Compose, o~ or O~	~o or ~O
ö or Ö	(o/O umlaut)	Compose, o¨ or O"	¨o or "O
oe or OE	(o e/O E ligature)	Compose, o e or O E	
ø	(o slash)	Compose, o/	
ù or Ù	(u/U grave)	Compose, u` or U`	`u or `U
ú or Ú	(u/U acute)	Compose, u´ or U´	´u or ´U
û or Û	(u/U circumflex)	Compose, u^ or U^	^u or ^U
ü or Ü	(u/U umlaut)	Compose, u¨ or U"	¨u or "U

Table C-1. Available Compose Sequences (Cont)

Final Character		Compose Sequence	
		3-Keystroke Method	2-Keystroke Method†
Ü	(U umlaut)	Compose, U" or U¨	¨U
ÿ or Ÿ	(y or Y umlaut)	Compose, y" or Y¨	"y or¨Y
¹	(superscript 1)	Compose, 1 ^	
²	(superscript 2)	Compose, 2 ^	
³	(superscript 3)	Compose, 3 ^	
¼	(fraction one-quarter)	Compose, 1 4	
½	(fraction one-half)	Compose, 1 2	
'	(apostrophe)	Compose, ' sp	' sp
<<	(angle quotation mark left)	Compose, <<	
>>	(angle quotation mark right)	Compose, >>	
\	(backslash)	Compose, // or / <	
¢	(cent sign)	Compose, c/, C/, c|, or C|	
^	(circumflex)	Compose, ^ sp	^sp
}	(closing brace)	Compose,) -	
]	(closing bracket)	Compose,))	
@	(commercial at)	Compose, a a or A A	
©	(copyright sign)	Compose, co, CO, cØ, or CØ	
¤	(currency sign)	Compose, xo, XO, xØ, or XØ	
°	(degree sign)	Compose, Ø , sp*, sp o	o sp
ª	(feminine ordinal indicator)	Compose, a_ or A_	
¡	(inverted !)	Compose, !!	
¿	(inverted ?)	Compose, ??	

Table C-1. Available Compose Sequences (Cont)

Final Character		Compose Sequence	
		3-Keystroke Method	2-Keystroke Method†
o̲	(masculine ordinal indicator)	Compose, o_ or O_	
µ	(micro sign)	Compose, /u or /U	
.	(middle dot)	Compose, . ^	
#	(number sign)	Compose, ++	
{	(opening brace)	Compose, (-	
[	(opening bracket)	Compose, ((	
¶	(paragraph sign)	Compose, p! or P!	
±	(plus/minus sign)	Compose, ±	
£	(pound sign)	Compose, 1-,L-, 1=, or L=	
"	(quotation mark)	Compose, " sp	. . sp
§	(section sign)	Compose, so, SO, S!, s!, or sØ, SØ	
'	(single quote)	Compose, ' sp	' sp
~	(tilde)	Compose, ~ sp	~ sp
|	(vertical line)	Compose, /	
¥	(yen sign)	Compose, y-, Y-, y= or Y=	
ß	(German small sharp s)	Compose, ss	

†Note: These sequences are order sensitive and must be keyed in as shown.

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