

WY-99GT
User's
Guide

WYSE
| | |

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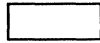
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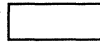
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Overview

Introduction

In addition to advanced display, communications, and keyboard features, this terminal supports a variety of personalities for ANSI X3.64 (DEC VT220/100), ASCII (WT-99GT, WY-50/50+, HZ1500, and the TeleVideo family), PC Terminal, and graphics (including Tektronix and PC Graphics modes).

Chapters 1 through 4 present the basic information you'll need to install and operate the terminal in its native mode. The appendixes include a complete list of commands supported by the terminal in all modes.

Conventions

The term *native mode* refers to the terminal's normal operating mode. The term *personality* refers to operating modes characteristic of one or more other terminals.

Key functions are described in the text as follows:

- The symbol for the key on the WY-99GT VT220-style keyboard is shown first, followed by key symbols in parentheses for the other keyboards if they are different. For example,

| | | | | |
|-------|-------|-------|-------|--------|
| Setup | Shift | Setup | Shift | Select |
|-------|-------|-------|-------|--------|

identifies

| |
|-------|
| Setup |
|-------|

 on the WY-99GT VT220-style keyboard,

| |
|-------|
| Shift |
|-------|

| |
|-------|
| Setup |
|-------|

 on the ASCII keyboard and

| |
|-------|
| Shift |
|-------|

| |
|--------|
| Select |
|--------|

 on the Enhanced PC-style keyboard.
- When a key symbol in the text refers to one of two names on a key on the keyboard, the action of other keys may be implied. For example,

| |
|-------|
| Print |
|-------|

 assumes the simultaneous pressing of

| |
|-------|
| Shift |
|-------|

 on the ASCII keyboard, where

| |
|------|
| Send |
|------|

 would mean the same key by itself (unshifted).
- The italic *kpd* identifies keys on the numeric keypad.

1

Installing the Terminal

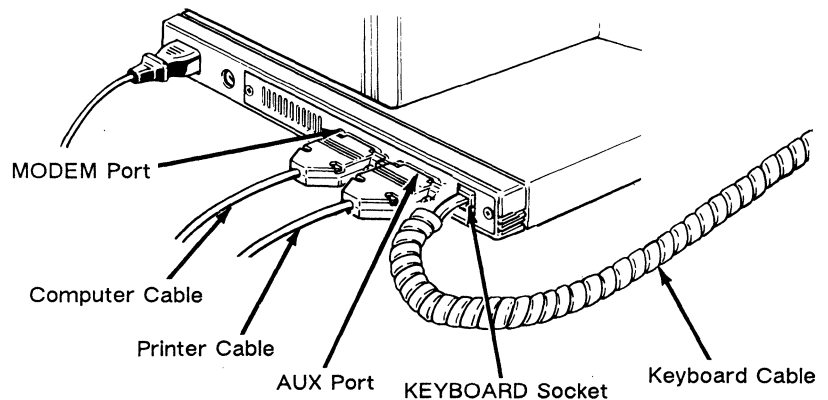
Getting Ready

You'll need a shielded serial interface cable (fitted with a female 25-pin connector on the terminal end) to connect the terminal to your computer or modem. If you plan to connect a serial printer directly to the terminal, you'll need a second serial cable with a male connector. (See Appendix A for connector pin assignments.)

Place the terminal on a flat, hard surface, allowing three inches on all sides for ventilation.

Connecting the Terminal

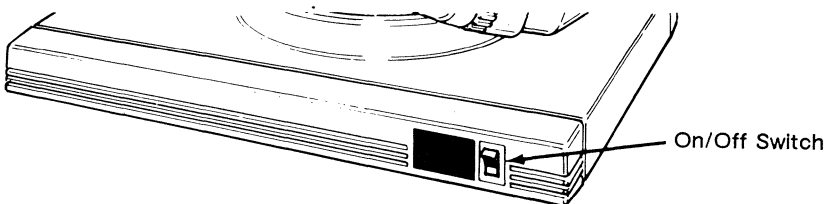
- 1 Press the bottom half of the power switch on the right side of the terminal base to be sure that the terminal is turned off.
- 2 Plug the keyboard cable into the socket labeled **KEYBOARD** on the left rear of the terminal.



- 3 Connect the computer cable to the MODEM port and the printer cable to the AUX port.
 - 4 Plug the power cord into the terminal's power connector and into a three-pronged grounded power outlet. (If you use an adapter, be sure to ground the outlet.)
- Note** Make sure your building's voltage (120 in the U.S.) matches the voltage shown on the back of the terminal.

Turning On the Terminal

Press the top half of the power switch to turn on the terminal. You'll hear an immediate beep if the terminal has received power.



- Note** If the bell sounds and an A, B, C, D, E, F, G, K, W, X, Y, 6, or 7 appears at the bottom of the screen, press **Setup** (**Select**) to exit the self-test. If the error codes 0, 1, 9, p, or P appear, call your service representative—the terminal needs to be serviced by a qualified technician.

Adjusting the Terminal

Adjust the screen's brightness with the dial in the right front corner. If you want the keyboard slanted up slightly, turn it over and unfold the hinged foot.

2

Configuring the Terminal

This chapter tells how to configure the terminal's operating parameters and redefine the programmable keys in setup mode.

Entering and Leaving Setup Mode

To enter setup mode, press **Setup** (**Shift** **Setup**, **Shift** **Select**), or, on the VT220-style keyboard when the terminal is in PC terminal or PC graphics personalities, press **Select**). Data on the screen disappears, and the *top setup level* screen appears; the data is restored when the terminal returns to normal operating mode.

- **Caution** Don't enter setup mode while data is being transmitted. The terminal can't receive data from the computer in setup mode.

Top Setup Level

| | | | | |
|------|------------|----------|-------------|-------------|
| EXIT | SAVE MODES | SAVE ALL | DEFAULT ALL | RESTORE ALL |
|------|------------|----------|-------------|-------------|

| | |
|----------------------------------|--------------------------------|
| TO EXIT SETUP USE ARROWS AND F10 | TO CHANGE PARAMETERS USE F1-F9 |
|----------------------------------|--------------------------------|

| | | | | | | | | | |
|------------|--------------|--------------|------------|-------------|-------------|------------|--------------|--------------|-------------|
| F1 DISP | F2 GENERL | F3 KEYBRD | F4 COMM | F5 MISC1 | F6 MISC2 | F7 TABS | F8 F/KEYS | F9 A/BACK | F10 EXIT |
|------------|--------------|--------------|------------|-------------|-------------|------------|--------------|--------------|-------------|

The top level serves as a directory to the other setup levels and to the alternatives for leaving setup mode.

- The fields at the bottom of the screen name the various setup levels where you can change the terminal's operating parameters.

- The fields at the top of the screen show the options for saving or not saving changes in nonvolatile memory when you return the terminal to the normal operating mode.
- The second line identifies the keys that you press to select the fields and activate their functions.

Press the cursor keys to highlight one of the fields at the top of the screen and press **F10**. Table 2-1 explains the function of each field.

Table 2-1 Top Level Functions

| Field | Function |
|--------------|--|
| EXIT | Returns terminal to normal operating mode without saving parameter changes for power up. |
| SAVE MODES | Saves operating parameter changes only and returns terminal to normal operating mode. |
| SAVE ALL | Saves all changes (operating parameters, tabs, key definitions, and answerback message); returns terminal to normal operating mode. |
| DEFAULT ALL | Restores all settings (operating parameters, tabs, key definitions, and answerback message) to default values and highlights EXIT field. Default values are <i>not</i> saved unless you select the SAVE ALL option to exit setup mode. |
| RESTORE ALL | Restores all settings and definitions to values last saved in nonvolatile memory and highlights the EXIT field. |

Changing the Operating Parameters

To select one of the setup levels named on the bottom line, press the indicated function key.

- The screen for that level appears with the name highlighted.
- The fields in the middle of the screen indicate the current settings for parameters you can change in that level.
- The top line identifies the keys you press to highlight the parameter fields and change the settings. Pressing **F10** always returns you to the top level.

The following tables list the parameters for each level and explain their settings. Default settings are listed first unless otherwise noted.

- Note** Explanations of setup parameters apply to the terminal's native mode. If you select a parameter setting that's invalid for the current personality, the terminal defaults to a valid setting upon leaving setup mode.

Table 2-2 F1 DISP: Display Setup Parameters

| Parameter | Explanation |
|--|---|
| AUTOSCROLL ON OFF | When the cursor moves past the last line of the page, The data scrolls up one line It returns to the top of the same page |
| ATTRIBUTE CHAR LINE PAGE | Display attributes are Assigned to each character as it is entered Active to the end of the line Active to the end of the page |
| BACKGROUND DARK LIGHT | The screen displays Light characters on a dark background Dark characters on a light background |
| CELL SIZE* 10 X 10 10 X 13 | The character cell size is Ten scan lines high Thirteen scan lines high |
| COLUMNS 80 132 | The screen displays 80 columns 132 columns |
| CURSOR BLINK BLOCK STEADY BLOCK BLINK LINE STEADY LINE | The cursor display is a Blinking rectangle Steady rectangle Blinking underline Steady underline |
| DISPLAY CURSOR ON OFF | The cursor is Visible Invisible |
| END OF LINE WRAP ON OFF | When additional characters are entered at the end of a line, The cursor wraps to the start of the next line Characters at the cursor position are replaced |
| LINES 24 25 48 50 | The screen displays 24 data lines, top status line, and label line 25 data lines and top status line 48 data lines, top status line, and label line 50 data lines and top status line |

* If you change the cell size parameter and the FONT LOAD setup parameter is ON, the screen will be blank for a few seconds when you leave setup while the font is loading.

Table 2-2 Continued

| Parameter | Explanation |
|--------------|--|
| SCROLL SPEED | The display scrolls |
| JUMP | At the rate data is received |
| SMOOTH-8 | Eight lines per second |
| SMOOTH-4 | Four lines per second |
| SMOOTH-2 | Two lines per second |
| SMOOTH-1 | One line per second |
| SCRN SAVER | If the terminal receives no data for approximately 15 minutes, |
| ON | The screen blanks until you press a key (no data is lost) |
| OFF | Screen data displays continuously |
| STATUS LINE | The screen displays |
| STANDARD | A status line with time and cursor line and column indicators |
| EDITING | A status line with editing status messages |
| OFF | No status line |

Table 2-3 F2 GENERAL:
General Setup Parameters

| Parameter | Explanation |
|-------------------|---|
| ANSWERBACK | The answerback message is |
| CONCEAL | |
| OFF | Displayed in setup mode |
| ON ¹ | Concealed |
| ANSWERBACK | The answerback message is |
| MODE ² | |
| OFF | Not sent |
| ON | Sent to the computer |
| COMM MODE | The terminal's communication mode is |
| FULL DUPLEX | Full duplex |
| BLOCK | Block |
| HALF DUPLEX | Half duplex |
| HALF BLOCK | Half-duplex block |
| ENHANCE | In some nonnative terminal personalities, an enhanced set of codes is |
| ON | Recognized by the terminal |
| OFF | Not recognized by the terminal |

1. If you conceal the message, you can't redisplay it—the message stays concealed until you redefine it. The parameter defaults to off when you redefine the message.
2. In ANSI modes, the answerback message is always set in response to ENQ (CTRL-E) or if CTRL BREAK is pressed. In ANSI mode this field determines if answerback message is sent at power-on.

Table 2-3 Continued

| Parameter | Explanation |
|-----------------------------|---|
| FONT LOAD | When changing personalities or the character cell size, the terminal |
| ON | Loads the appropriate character set |
| OFF | Doesn't change the current character set |
| RESTORE TABS | When the terminal is turned on, tab stops are |
| OFF | Cleared |
| ON | Initialized from nonvolatile memory |
| MONITOR | The terminal |
| OFF | Executes escape sequences and control codes |
| ON | Displays symbols for escape sequences and control codes without acting on them ³ |
| PERSONALITY ^{4, 5} | The terminal can run programs written for the following terminals: |
| WY-99GT | Native mode |
| WY50+ | WY-50, WY-50+, WY-100 |
| TVI 910+ | TeleVideo 910 and 910+ |
| TVI 912/920 | TeleVideo 912 and 920 |
| TVI 925 | TeleVideo 925 |
| TVI 950 | TeleVideo 950 |
| PC TERM | PC terminal |
| ADDS A2 | ADDS Viewpoint A2 |
| HZ 1500 | Hazeltine 1500 |
| ADM-31 | Lear Siegler ADM 31, ADM 3A, ADM 5 |
| VT52 | Digital Equipment VT52 |
| VT100 | Digital Equipment VT100 |
| VT220-7 | Digital Equipment VT220, 7-bit mode |
| VT220-8 | Digital Equipment VT220, 8-bit mode |
| TEK 4010/4014 | Tektronix 4010/4014 |
| PC GRAPHICS | PC graphics |
| RCVD CR | When the terminal receives an ASCII CR, the cursor moves to the beginning of the |
| CR | Current line |
| CRLF | Next line |
| SEND ACK ⁶ | After executing certain commands, the terminal sends |
| ON | An ASCII ACK character to the computer |
| OFF | No acknowledgment |

3. See WyseWorks ASCII Table for symbols displayed.

4. When you select a new terminal personality, the terminal displays the appropriate character set unless the FONT LOAD parameter is set to off.

5. Caution The terminal may clear the entire display memory when you change its personality.

6. ACK is sent for font load, font clear, and MODEM or AUX port changes. SEND ACK must be ON to send an answerback in ASCII modes.

Table 2-3 Continued

| Parameter | Explanation |
|------------------------------------|--|
| TEST OFF ON | The terminal is ready for Normal operation A manufacturing self-test (don't select this value) |
| WIDTH CHANGE CLEAR OFF ON | When executing a command to change the number of columns, the terminal Doesn't clear the screen Clears the screen |

Table 2-4 F3 KEYBRD:
Keyboard Setup Parameters

| Parameter | Explanation |
|---|---|
| BREAK 250MS 170MS 500MS OFF | The terminal sends a break signal on the data port for 250 milliseconds 170 milliseconds 500 milliseconds No break |
| CORNER KEY* FUNCT HOLD | Pressing the corner key Together with an alphanumeric key sends an ASCII SOH, the other key's code, and an ASCII CR Freezes the current data on the screen until the key is pressed again |
| ENTER CR CRLF TAB | ENTER sends the ASCII character for Carriage return (CR) Carriage return (CR) and linefeed (LF) Horizontal tab (HT) |
| FKEY XMT LIMIT NONE 60CPS 150CPS | The terminal sends function key definitions As fast as the baud rate allows At a maximum rate of 60 characters per second At a maximum rate of 150 characters per second |
| KEY REPEAT ON OFF | When held down for more than half a second, the keys Repeat Don't repeat |
| KEYCLICK ON OFF | Each time a key is pressed or repeated, A muted beep sounds No beep sounds |

* FUNCT, HOLD, or SCROLL LOCK, depending on your keyboard.

Table 2-4 Continued

| Parameter | Explanation |
|---------------------------------------|--|
| KEYLOCK CAPS REV SHIFT | When CAPS LOCK is engaged, Alphabetic keys generate only uppercase characters The action of SHIFT is reversed—shifted alphabetic keys generate lowercase characters, unshifted keys generate uppercase characters All keys generate shifted characters only |
| LANGUAGE | Choose the setting that matches your keyboard language. |
| MARGIN BELL OFF ON | The terminal's margin bell Doesn't ring Rings when the cursor reaches the column where margin bell is set (default is column 72 in 80-column mode, column 124 in 132-column mode) |
| PRINTER RECEIVE OFF ON MOUSE | Data received on the printer port Is ignored Is sent to the host Is processed as data from a pointing device |
| RETURN CR CRLF TAB | RETURN sends the ASCII character for Carriage return (CR) Carriage return (CR) and linefeed (LF) Horizontal tab (HT) |
| XMT LIMIT NONE 60CPS 150CPS | The terminal sends data through the data port As fast as the baud rate allows At a maximum rate of 60 characters per second At a maximum rate of 150 characters per second |

Table 2-5 F4 COMM:
Communication Setup
Parameters

| Parameter | Explanation |
|--|--|
| AUX BAUD RATE 50 2400 110 4800 134.5 7200 200 9600 ¹ 300 19200 600 38400 1200 | The AUX port transmit and receive baud rate is |
| 1. Default. | |

Table 2-5 Continued

| Parameter | Explanation |
|-------------------------|--|
| AUX DATA/STOP BITS | Through the AUX port, the terminal sends and receives |
| 8/1 | 8-bit data with one stop bit |
| 7/2 | 7-bit data with two stop bits |
| 8/2 | 8-bit data with two stop bits |
| 7/1 | 7-bit data with one stop bit |
| AUX PARITY ² | The terminal sends data to the AUX port with |
| NONE | No parity bit |
| ODD | Odd parity |
| MARK | A high (mark) parity bit |
| EVEN | Even parity |
| SPACE | A low (space) parity bit |
| AUX DRCV HNDSHAKE | The terminal controls the receipt of data from a device connected to the AUX port by |
| DTR | DTR handshaking (raising and lowering the DTR line voltage) |
| BOTH | Both X-on/X-off and DTR handshaking |
| NONE | No handshaking protocol |
| XON/XOFF | X-on/X-off handshaking |
| AUX XMT HNDSHAKE | When sending data to a device connected to the AUX port, the terminal |
| NONE | Ignores all incoming software handshaking signals |
| XON/XOFF | Responds to X-on/X-off handshaking |
| DSR | DSR handshaking |
| BOTH | Both X-on/X-off and DSR handshaking |
| DATA/PRINTER MODEM/AUX | The terminal communicates with the computer through |
| AUX/MODEM | The MODEM port (AUX port is printer port) The AUX port (MODEM port is printer port) |
| MDM DATA/STOP BITS | Through the MODEM port, the terminal sends and receives |
| 8/1 | 8-bit data with one stop bit |
| 7/2 | 7-bit data with two stop bits |
| 8/2 | 8-bit data with two stop bits |
| 7/1 | 7-bit data with one stop bit |
| MDM PARITY ³ | The terminal sends data to the MODEM port with |
| NONE | No parity bit |
| ODD | Odd parity |
| MARK | A high (mark) parity bit |
| EVEN | Even parity |
| SPACE | Space parity |

2. The terminal ignores any incoming parity bits.

3. The terminal ignores any incoming parity bits in ASCII modes.

Table 2-5 Continued

| Parameter | Explanation |
|-------------------|--|
| MDM RCV BAUD RATE | The MODEM port receive rate is |
| 50 | 2400 |
| 110 | 4800 |
| 134.5 | 7200 |
| 200 | 9600 ¹ |
| 300 | 19200 |
| 600 | 38400 |
| 1200 | |
| MDM RCV HNDSHAKE | The terminal controls receipt of data from a device connected to the MODEM port by |
| NONE | No handshaking protocol |
| XON/XOFF | X-on/X-off handshaking |
| DTR | DTR handshaking (raising and lowering the DTR line voltage) |
| BOTH | Both X-on/X-off and DTR handshaking signals |
| MDM XMT BAUD RATE | The MODEM port transmit rate is |
| 50 | 2400 |
| 110 | 4800 |
| 134.5 | 7200 |
| 200 | 9600 ¹ |
| 300 | 19200 |
| 600 | 38400 |
| 1200 | |
| MDM XMT HNDSHAKE | When sending data to a device connected to the MODEM port, the terminal |
| NONE | Ignores all incoming software handshaking signals |
| XON/XOFF | Responds to X-on/X-off handshaking |
| DSR | DSR handshaking |
| BOTH | Both X-on/X-off and DSR handshaking |

Table 2-6A F5 MISC1:
Misc Setup Parameters
(ASCII Personalities)*

| Parameter | Explanation |
|---------------|--|
| AUTO PAGE OFF | When the cursor reaches the top or bottom of the page, it wraps on the page or the data scrolls, depending on the AUTOSCRL parameter setting |
| ON | A new page of memory moves onto the screen |

* Parameters displayed when the terminal is in ASCII personalities. See Table 2-6B if you are in ANSI or TEK personalities.

Table 2-6A Continued

| Parameter | Explanation |
|----------------|---|
| LINE/BLOCK END | When the terminal sends a block of data to the computer, the |
| US/CR | Line terminator is an ASCII US character, block terminator is an ASCII CR character |
| CRLF/ETX | Line terminators are ASCII CR and LF characters, the block terminator is an ASCII ETX character |
| PAGE EDIT | The terminal's editing functions affect the |
| OFF | Cursor line |
| ON | Entire page |

Table 2-6B F5 MISC1:
Misc Setup Parameters
(ANSI Personalities)*

| Parameter | Explanation |
|--------------|---|
| CURSOR KEYS | The cursor keys send |
| NORMAL | Their standard sequences |
| APPLICATION | Application-specific sequences, see Appendix B |
| DEL | DEL sends |
| DEL/CAN | The delete code; shifted, it sends the cancel code |
| BS/DEL | The backspace code; shifted, it sends the delete code |
| FEATURE LOCK | When feature lock is |
| OFF | The host can change all features |
| ON | Key auto-repeat, scroll speed, screen background, tab stops, and keyboard lock are locked and cannot be changed by escape sequences from the host |
| F-KEY LOCK | When F-key lock is |
| OFF | The host can change function-key definitions |
| ON | Function key definitions are locked and cannot be changed by the host |
| KEYPAD | When KEYPAD is |
| NUMERIC | The numeric keypad keys send standard codes |
| APPLICATION | The numeric keypad keys send application codes, see Appendix B |
| WARNING BELL | When WARNING BELL is |
| ON | The terminal sounds a bell when it receives a BELL code |
| OFF | The terminal ignores the BELL code |

* Parameters activated only when the terminal is in ANSI or TEK graphics personalities. See Table 2-6A if you are in ASCII personalities.

Table 2-6B Continued

| Parameter | Explanation |
|----------------|--|
| XFER TERM | The terminal transmits screen or line blocks of data to the host that end at the |
| EOS | End of the screen or line |
| CURSOR | Cursor position |
| MARGIN CONTROL | (Tektronix 4010/4014 mode only) The alpha portion of the graphics terminal |
| 0 | Doesn't generate a page full signal |
| 1 | Sends a page full signal at the end of margin 1 |
| 2 | Sends a page full signal at the end of margin 2 |
| DEL = LOW Y | (Tektronix 4010/4014 mode only) The DEL character |
| ON | Can be used for low-order Y addressing |
| OFF | Cannot be used for low-order Y addressing; use ESC ? instead |
| GIN TERMINATOR | (Tektronix 4010/4014 mode only) Upon receipt of a graphics input sequence |
| CR | A CR character is sent |
| CR/EOT | A CR/EOT character is sent |
| NONE | No terminator is sent |

Table 2-7A F6 MISC2:
Misc Setup Parameters
(ASCII Personalities)*

| Parameter | Explanation |
|----------------|---------------------------------------|
| WPRT INTENSITY | Write-protected characters appear |
| DIM | Dim |
| NORMAL | Normal |
| INVISIBLE | Invisible |
| WPRT REVERSE | Write-protected characters appear as |
| OFF | Light characters on a dark background |
| ON | Dark characters on a light background |
| WPRT UNDERLINE | Write-protected characters are |
| OFF | Not underlined |
| ON | Underlined |

* Parameters displayed when the terminal is in a non-ANSI personality. See Table 2-7B if you are in ANSI or TEK personalities.

**Table 2-7B F6 MISC2:
Misc Setup Parameters
(ANSI Personalities)***

| Parameter | Explanation |
|---|---|
| DISCONNECT 2 SEC | When the parameter PORT = EIA MODEM is selected The terminal disconnects if the carrier is lost for two seconds |
| 60 MSEC | |
| LOCAL OFF | All data received from the host Is accepted; keyboard data can be processed locally, sent to the host, or both depending on other terminal modes Is ignored, keyboard data is processed locally |
| ON | |
| PORT EIA DATA EIA MODEM RS-422 | The terminal transmits and receives via RS-232-C data pins RS-232-C modem signals RS-422 signal levels |
| PRINT ASCII | During printing Escape sequences are not sent and non-ASCII characters are replaced with underscores Escape sequences and control codes are sent, allowing ASCII and DEC line drawing graphics characters, character attributes, and double size lines to be printed Escape sequences and control codes are sent, allowing the printing of ASCII, line drawing, multinational, double size lines, soft-font characters, and character attributes |
| DRAW/ASCII | |
| ALL | |
| PRINT AREA SCREEN SCROLL RGN | Print operations extend to the Entire screen Defined scrolling region |
| PRINT MODE NORMAL | Data is sent to the printer In response to PRINT keystrokes or PRINT escape codes from the host After processing a linefeed, formfeed, or vertical tab; following an autowrap operation From the host, without being displayed |
| AUTO | |
| CTRL | |
| PRINT TERM NONE FF | Following print operations No termination code is sent to the printer The formfeed code (OCH) is sent to the printer |
| SEND ALL ERASABLE | In block transmissions Erasable and non-erasable data is sent to the host Only erasable data is sent to the host |

* Parameters displayed when the terminal is in ANSI or TEK personalities. See Table 2-7A if you are in an ASCII personality.

Table 2-7B Continued

| Parameter | Explanation |
|-----------------------------------|---|
| SEND AREA SCREEN SCROLL RGN | In a SEND SCREEN operation, The entire screen is sent to the host Only data in the scrolling region is sent to the host |
| SEND TERM NONE FF | Following a SEND SCREEN operation, No character is sent The formfeed code (OCH) is sent |

F7 TABS: Defining Tab Stops

When the RESTORE TABS parameter (Table 2-3) is set to *off*, no tab stops are set when you turn on the terminal. When the RESTORE TABS parameter is set to *on*, the terminal activates the tab stops last saved in nonvolatile memory.

You can clear and set tab stops from the tabs setup level (F7) and save the changes in nonvolatile memory by choosing the SAVE ALL option when you exit setup mode.



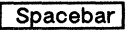


Tabs Setup Level

On the tabs setup level screen, the terminal's current tab stops are indicated by uppercase T's displayed along a line of periods that mark each column position.

- A tab stop in columns 2 through 78 is shown as a T in the upper line of periods.
- A tab stop in columns 79 through 132 is shown as a T in the lower line of periods.

You can easily determine where tabs are set by moving the cursor across the line and reading the column number displayed in the second instruction line at the top of the screen.

Clear and set tabs anywhere on the line, as follows:

- To move the cursor across the line, press  or .
- To either clear or set (toggle) an individual tab stop at the cursor position, press .
- To clear all tabs, press .
- To set tabs every eighth column, press .

 **Note** A tab stop cannot be set in column 1.

F8 F/KEYS: Redefining the Keys

You can redefine the function keys and editing keys, both shifted and unshifted, to send a unique character string of up to 64 characters. You can also redefine a key's *direction*, which determines where the terminal sends the key definition.

To redefine a key, press **F8** to display the keys setup level. Refer to the functions indicated at the top of the screen and follow these steps:

- 1 Select the key to be redefined by pressing that key together with **Ctrl**. This highlights the key's direction and definition fields.
- 2 Press **▲** or **▼** to highlight the unshifted or shifted key definition field.
- 3 Enter the key definition (up to 64 characters) at the cursor position. Correct errors by pressing **◀** to delete characters or **Home** to clear the definition.
- 4 If you want to change the key's direction, press **Enter** until your choice appears: *remote*, *local*, or *normal*.
 - Remote
Data is sent to the computer only, regardless of the terminal's communication mode. (Default)
 - Local
Data is sent to the terminal only, regardless of the terminal's communication mode.
 - Normal
Data is sent to the computer and/or the terminal, depending on the terminal's communication mode.

F9 A/BACK: Defining an Answerback Message

In the answerback setup level (F9) you can program a message of up to 20 characters to identify the terminal to the computer. Enter the message at the cursor position. Correct errors by pressing **Backspace** to delete characters or **Home** to clear the message.

The answerback message shares approximately 350 bytes of nonvolatile memory with key redefinitions and function key labels. To save the message in nonvolatile memory, exit setup mode with the SAVE ALL option.

In ASCII modes, the answerback message is sent when

- o The terminal receives an ASCII ENQ code (CTRL E),
- o The ANSWERBACK mode parameter (Table 2-2) is set to ON,
- o And the SEND ACK parameter (Table 2-3) is set to ON

In ANSI modes, the answerback message is sent when

- o The terminal receives an ASCII ENQ code (CTRL E)
- o Or Ctrl, Shift, and Break are pressed

In ANSI modes, if the ANSWERBACK MODE parameter is ON, then auto-answerback is enabled. The terminal sends the answerback message when

- o It is powered on,
- o Or for a disconnect/reconnect

If the ANSWERBACK CONCEAL parameter (Table 2-2) is set to *on*, the word *CONCEALED* displays in place of the message. The message can't be displayed again until you redefine it.

Memory Space

To save key definitions in nonvolatile memory, choose the SAVE ALL option to exit setup mode. Key definitions share a total of approximately 350 bytes of nonvolatile memory space with the answerback message and function key labels. If you enter more than 64 characters for any one key or reach the 350-character overall limit, you'll hear a warning beep and won't be able to enter more characters.

- Note** If you connect another keyboard to the terminal after you've saved key definitions in nonvolatile memory, clear the definitions to their default values.

3

Operating the Terminal

Keyboard Functions

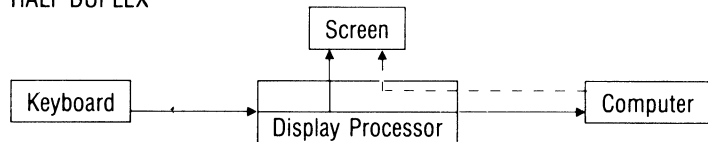
The three U.S. keyboards supported by the terminal are illustrated in Appendix B, which lists the codes sent by the keys in each of the terminal's ASCII personalities. Table D-1 in Appendix D lists the key sequences that control the terminal locally.

Key functions for the terminal's calculator and other desktop accessories are described in Chapter 4, "WyseWorks."

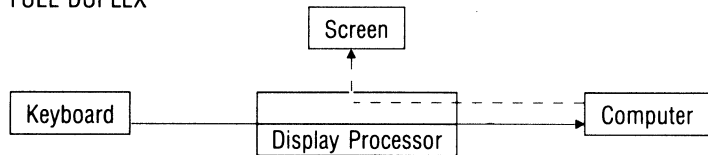
Communication Modes

Four modes of communication are possible between the terminal and an attached computer (in ASCII personalities): full duplex, half duplex, block, and half-duplex block. The terminal handles data in these communication modes as illustrated here.

HALF DUPLEX



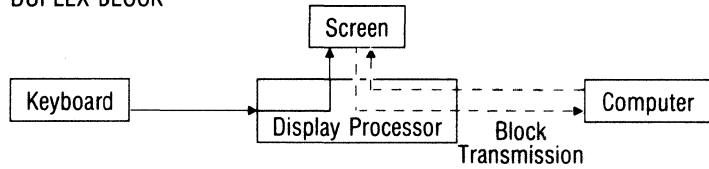
FULL DUPLEX



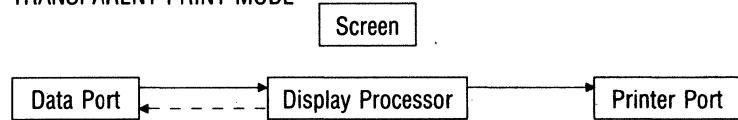
Legend:

—————> From Keyboard <----- To/From Computer

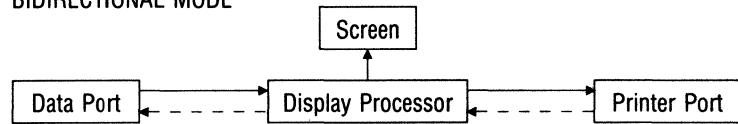
BLOCK/HALF
DUPLEX BLOCK



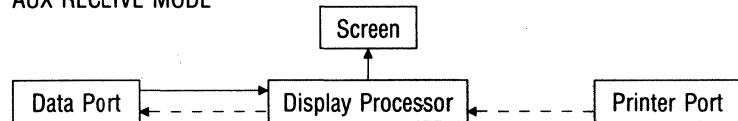
TRANSPARENT PRINT MODE



BIDIRECTIONAL MODE



AUX RECEIVE MODE



Legend:

—————> From Data Port <----- From Display Processor/Printer Port

Printing

The terminal is set up to communicate with a printer through the AUX port. If you choose to connect the printer to the MODEM port instead, reverse the functions of the ports by changing the DATA/PRINTER parameter in setup mode. (Appendix A gives the connector pin assignments for both ports. Appendix D contains corresponding keys for the ASCII and Enhanced PC-style keyboards.)

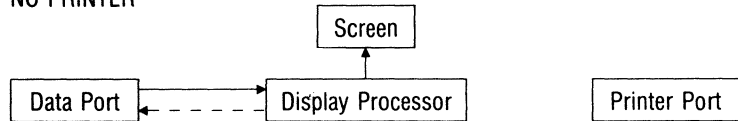
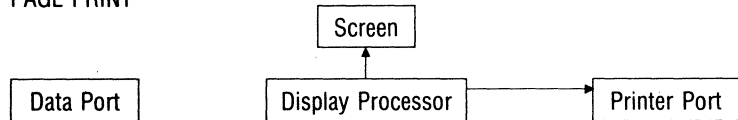
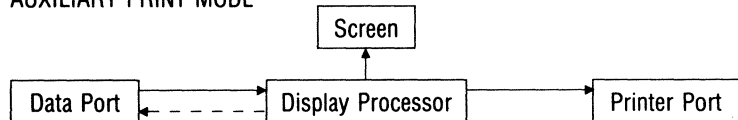
To print data coming from the computer,

- o Make sure the printer port is configured for transmit handshaking that matches the requirements of your printer.
- o Press **Ctrl** and **Print Scrn** to turn on auxiliary print mode.

To print a screenful of data when you have a serial printer connected directly to the terminal,

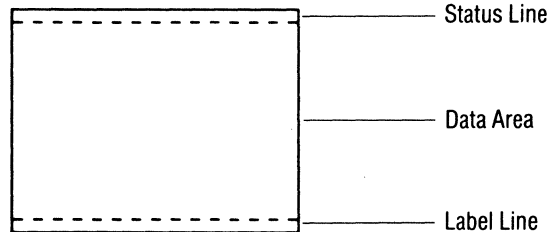
- o Press **Ctrl**, **Shift**, and **.kpd**.

The following illustration shows how the terminal handles data through the printer port.

NO PRINTER**PAGE PRINT****AUXILIARY PRINT MODE**

Screen Areas

The screen has three display areas: the *status line*, the *data area*, and the *label line*.



Unless you turn off the status line display in setup mode or with an escape sequence, the top line of the screen displays terminal or computer status messages.

The bottom line of the screen can display function key labels or a single longer message, or it can be an extra data line on the 25 line screen.

The data area of the screen is the portion of a page of display memory that can be viewed at any one time. The default data area is 24 data lines.

4 WyseWorks

Introducing WyseWorks

WyseWorks is a set of four desktop accessories:

- A calculator with a visual paper tape feature that displays and prints the results of your calculations
- An alarm clock with two alarm settings and reminder messages
- A perpetual calendar that displays three months at a glance
- An ASCII table displaying numerical equivalents and monitor mode symbols for 128 ASCII characters

You have access to these accessories at any time except when the terminal is in setup mode. They are displayed on the top eight lines of the screen, which temporarily changes to 80 columns. (Overlaid data and the previous screen width are restored when you exit WyseWorks.)

Basic WyseWorks Controls

Press **Ctrl Lock** (**Ctrl Caps Lock**) to display the WyseWorks welcome screen, where the fields at the bottom of the screen display the name of each accessory. Follow these steps:

- 1 To select an accessory, press the indicated function key. The accessory will appear in the box at the top of the screen.
- 2 After you've selected an accessory, follow the instructions on the screen, referring to the explanations in this chapter.
- 3 When you're ready to leave an accessory,
 - Press **Ctrl Lock** (**Ctrl Caps Lock**) to leave WyseWorks, or
 - Press **F10** to return to the welcome screen to select another accessory

Calculator

The calculator works very much like a desktop calculator, with the keyboard acting as the numeric keypad and the screen displaying the results of your calculations. A visual tape feature allows you to display five entries at a time and send them to a printer connected directly to the terminal.

Calculator Display

In the box at the top of the screen the display shows

- A keypad that highlights the numbers and functions as you enter them on the keyboard
- Five memory locations, with a pointer (<m) indicating the active memory where you can store and recall your current calculation.

The two fields at the bottom of the screen indicate the function keys that turn the paper tape feature's display and print functions on or off. The current status (on or off) is shown in each field.

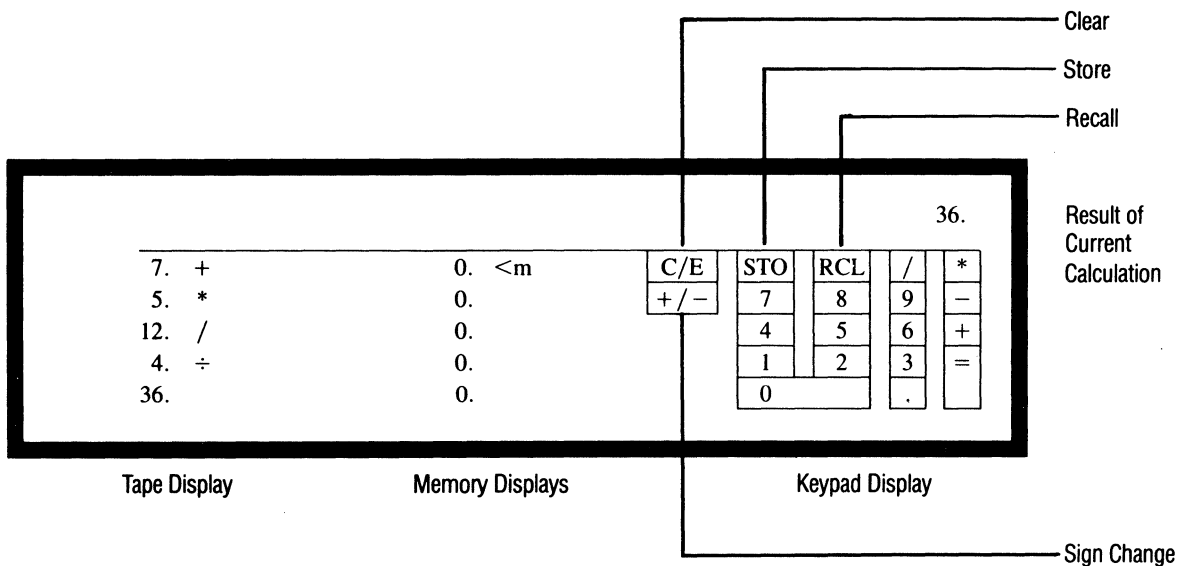
- When the tape is *on*, each keyboard entry appears at the left of the calculator display (see illustration), scrolling up like a paper tape. When more than five entries are made, the top entry scrolls off.
- When the printer is also *on*, each successive bottom line of the tape is sent to the port configured as the printer port.

The following illustration shows the calculator's display of the calculation

$$[(7 + 5) \times 12] \div 4 =$$

when the tape display is on.

- Note** The keypad display shown in the illustration corresponds to keys on the ASCII keyboard. The actual display reflects the keys that perform calculator functions on the keyboard installed on the terminal.



Calculator Operations

The calculator has an absolute numerical range of $\pm 9,999,999.9999$.

Visual Tape Feature

Both the tape display and printer are *off* when you turn on the terminal and first enter WyseWorks. To turn on the tape display, press **[F1]**. To activate the printer, press **[F2]**. Observe the following precautions:

- Turn on the tape *before* starting your calculation—turning it on clears existing entries.
- Don't turn the printer on unless the tape display is also on and a printer is connected directly to the terminal.

Until you turn off the terminal, the status of the tape display and printer will remain as you last set them.

Keyboard Controls

Table 4-1 summarizes the calculator operations that you can perform from the keyboard. The corresponding keypad display on the screen is highlighted as you make each entry on the numeric keypad on the keyboard.

Table 4-1 Calculator Controls

| Control | Description |
|----------------|---|
| C/E | Clear Pressed twice, clear all Shifted, clear the selected memory Shifted, pressed twice, clear all memories |
| STO | Stores number in the selected memory |
| ▲ ▼ | Move memory pointer (<m) |
| RCL | Recalls number from storage to the display |
| +/- | Change sign |
| * | Multiply |
| / | Divide |
| - | Subtract |
| + | Add |
| = | Produce result |
| / = | Reciprocal |
| * = | Square |

Error Messages

If your calculation exceeds 14 digits of if a number has been divided by zero, an error message appears on the top line of the screen (the status line):

****Number too large****

****Division by zero****

If this happens, clear the calculation and recalculate.

Alarm Clock

In the alarm clock accessory you can set two alarm times and enter two 20-character reminder messages. At the set time, the alarm sounds for 30 seconds, and any reminder message is simultaneously displayed on the status line.

- Note** The alarm sounds only during normal terminal operation, not while the terminal is in WyseWorks or setup mode.

Alarm Clock Display

The alarm clock display shows

- The current time according to the terminal's clock (default 8:00 a.m.)
- Two alarm setting lines—Alarm 1 and Alarm 2—each with a time field (default 12:00 a.m.), a 20-character message field, and an on/off indicator field

Setting the Alarm

Position the cursor in the appropriate fields:

- 1 Press the cursor keys or **Tab** or **Backspace** to go from field to field. Pressing **Return** (**Enter**) moves the cursor to the start of a line.
 - 2 To reset the terminal's clock, enter the current time (12-hour format, including a.m or p.m.) in the time field.
 - 3 Enter the desired alarm time in the Alarm 1 or Alarm 2 time field and the desired message in the message field.
 - 4 In the on/off indicator field, press any key to toggle the alarm bell to *on/off*.
- Note** After the alarm sounds, the indicator defaults to *off*, but the time setting and message remain until you redefine them or turn off the terminal.

Turning Off the Alarm

To turn off the alarm, press **Setup** (**Select**).





Before you can resume normal operation or reenter WyseWorks, you must press **Setup** (**Select**) again to clear the message displayed on the status line.

Calendar





The calendar displays three months at a time, defaulting to the factory setting when the terminal is turned on. (If more than five lines are required to include all the days, the leftover days of the month won't appear.)

Calendar Controls

To display other months in the year, press

-  () for earlier months
-  () for later months

To display the same months in another year, press



-  () for earlier years
-  () for later years


ASCII Table

The two-page ASCII table displays the hexadecimal codes for the U.S. ASCII table (64 codes per page), showing the monitor mode symbols for the current terminal personality.

The status line displays the corresponding ASCII character of control code, as well as binary, decimal, and octal equivalents, for the hexadecimal code that's highlighted in the table.

ASCII Table Controls

Press the cursor keys to highlight the codes. Press  () to highlight the code at the start of a line.

Press  to display the alternate page.

A Connector Pin Assignments

**Table A-1 MODEM Port
Connector Pin Assignments
(DTE)**

| Pin | Signal | Mnemonic | Direction |
|-----|-------------------------|----------|-----------|
| 1 | Shield ground | PGND | |
| 2 | Transmit data | TXD | Out |
| 3 | Receive data | RXD | In |
| 4 | Request to send | RTS | Out |
| 5 | Clear to send | CTS | In |
| 6 | Data set ready | DSR | In |
| 7 | Signal ground | SGND | |
| 8 | Data carrier detect | DCD | In |
| 12 | Speed indicator | SPDI | In |
| 15 | Receive data - (RS422) | RX- | |
| 17 | Receive data + (RS422) | RX+ | |
| 19 | Transmit data - (RS422) | TX- | |
| 20 | Data terminal ready | DTR | Out |
| 23 | Speed select | SPDS | Out |
| 25 | Transmit data + (RS422) | TX+ | |

**Table A-2 AUX Port Connector
Pin Assignments (DTE)**

| Pin | Signal | Mnemonic | Direction |
|-----|---------------------|----------|-----------|
| 1 | Shield ground | PGND | |
| 2 | Transmit data | TXD | Out |
| 3 | Receive data | RXD | In |
| 4 | Request to send | RTS | Out |
| 5 | Clear to send | CTS | In |
| 6 | Data set ready | DSR | In |
| 7 | Signal ground | SGND | |
| 20 | Data terminal ready | DTR | Out |

Appendix

B Key Codes

Introduction

This appendix lists the key codes for the terminal's ASCII and ANSI personalities.

ASCII Key Codes

Tables B-1 through B-3 list ASCII codes for each of the three keyboards available for the terminal. Codes are given for editing and special keys only. Alphanumeric keys send the standard ASCII codes (see WyseWorks ASCII Table).

Table B-4 summarizes the hexadecimal values of the scan codes sent by the keys on all keyboards when the terminal is in the PC Term personality: each key sends one scan code when pressed (the *down* code) and another code when released (the *up* code)

- The table gives the codes for the editing and special keys only.
- Scan codes for the alphanumeric and function keys are shown on the VT220- and Enhanced PC-style keyboard illustrations. Only the down codes are shown—the high bit is set when the key is released. (The same codes are sent by the alphanumeric and function keys on the other keyboards when the terminal is in the PC Term personality.)

Table B-5 lists function key default codes for all keyboards and all ASCII personalities except PC Term.

Table B-1 Editing and Special Key Codes—WY-99GT ASCII Keyboard

| | | | | | | | | | | | | | | | | | | | |
|-----------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|---------|------------|----------------------|---------------|---------------------|---------------------|--------------------|-------------|--|
| F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 | F15 | F16 | SetUp | Break | | |
| Esc | 1 1 | @ 2 | # 3 | \$ 4 | % 5 | ^ 6 | & 7 | * 8 | (9 |) 0 | - _ | + = | Back Space | Del | Line INS Char | Line DEL Char | Scr CLR Line | Ins Repl | |
| Tab | Q | W | E | R | T | Y | U | I | O | P | { [| }] | ~ \ | Print Send | 7 | 8 | 9 | - | |
| Ctrl | A | S | D | F | G | H | J | K | L | : | ;" , | Return | Prev PAGE Next | 4 | 5 | 6 | , | | |
| Func | Shift | Z | X | C | V | B | N | M | < , | > . | ? / | Shift | ▲ | Home | 1 | 2 | 3 | Enter | |
| Caps Lock | | | | | | | | | | | | , \ | ◀ | ▼ | ▶ | 0 | * | | |

| Key | Native ¹ Code | Hex. Value | ADDS VP A2 | HZ 1500 |
|--------------------|--|--------------------|--|--|
| BACKSPACE | CTRL H | 08 | CTRL H | CTRL H |
| CLR LINE | ESC T | 1B 54 | ESC K | - CTRL O |
| CLR SCRN | ESC Y | 1B59 | ESC k | - CTRL X |
| ▼ | CTRL J ² | 0A | CTRL J | - CTRL K |
| ◀ | CTRL H | 08 | CTRL U | CTRL H |
| ▶ | CTRL L | 0C | CTRL F | CTRL P |
| ▲ ³ | CTRL K | 0B | CTRL Z | - CTRL L |
| DEL | DEL | 7F | DEL | DEL |
| DEL CHAR | ESC W | 1B 57 | ESC W | |
| DEL LINE | ESC R | 1B 52 | ESC I | |
| ENTER ⁴ | CTRL M or CTRL M CTRL J or CTRL I | 0D 0D, 0A 09 | CTRL M or CTRL M CTRL J or CTRL I | CTRL M or CTRL M CTRL J or CTRL I |
| ESC | CTRL [] | 1B | CTRL [] | CTRL [] |

1. These codes also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.

2. CTRL V if the terminal is in TeleVideo 925 or 950 mode.

3. Shifted key sends ESC j in TeleVideo 925 or 950 mode.

4. Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

Table B-1 Continued

| Key | Native ¹ Code | Hex. Value | ADDS VP A2 | HZ 1500 |
|------------|--|--------------------|-------------------------------|-------------------------------|
| HOME | CTRL ^ | 1E | CTRL A | - CTRL R |
| SHIFT HOME | ESC { | 1B 78 | CTRL A | - CTRL R |
| INS | ESC q | 1B 71 | ESC q | CTRL U |
| INS CHAR | ESC Q | 1B 51 | ESC Q | |
| INS LINE | ESC E | 1B 45 | ESC M | - CTRL Z |
| PAGE NEXT | ESC K | 1B 45 | ESC J | |
| PAGE PREV | ESC J | 1B 4A | ESC J | |
| PRINT | ESC P | 1B 50 | ESC P | CTRL F |
| REPL | ESC r | 1B 72 | ESC r | CTRL D |
| RETURN | CTRL M or CTRL M CTRL J or CTRL I | 0D 0D, 0A 09 | CTRL M or CTRL M CTRL J | CTRL M or CTRL M CTRL J |
| SEND | ESC 7 | 1B 37 | ESC 7 | - 7 |
| TAB | CTRL I | 09 | CTRL I | CTRL I |
| SHIFT TAB | ESC I | 1B 49 | ESC O | |

Table B-2 Editing and Special Key Codes—VT220-Style Keyboard

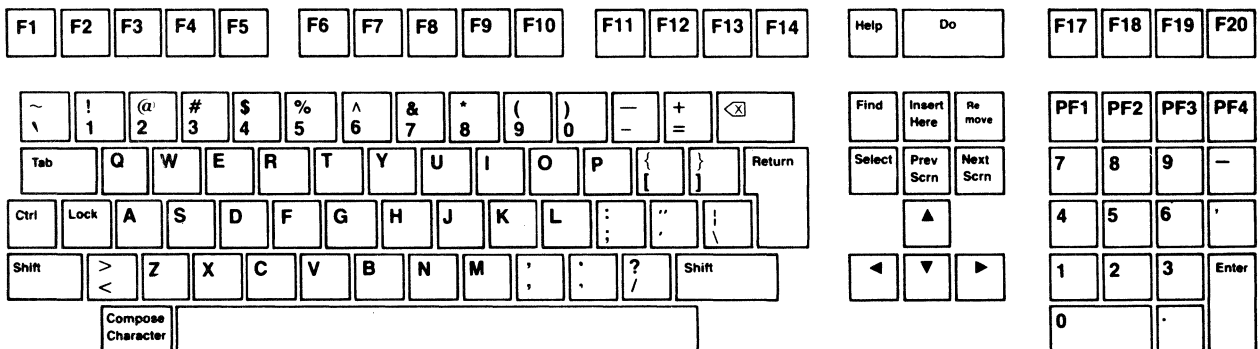


Table B-2 Continued

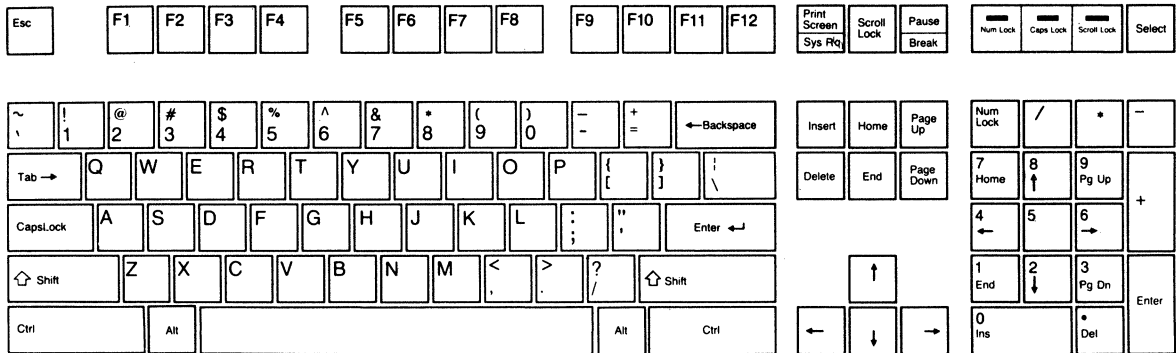
| Key | Native ¹ Code | Hex. Value | ADDS VP A2 | HZ 1500 |
|-----------------------------|--|--------------------|--|--|
| ⊠ | CTRL H | 08 | CTRL H | CTRL H |
| ▼ | CTRL J ² | 0A | CTRL J | - CTRL K |
| ◀ | CTRL H | 08 | CTRL U | CTRL H |
| ▶ | CTRL L | 0C | CTRL F | CTRL P |
| ▲ ³ | CTRL K | 0B | CTRL Z | - CTRL L |
| ENTER ⁴ | CTRL M or CTRL M CTRL J or CTRL I | 0D 0D, 0A 09 | CTRL M or CTRL M CTRL J or CTRL I | CTRL M or CTRL M CTRL J or CTRL I |
| INSERT HERE (PF1) | ESC Q | 1B 51 | ESC Q | |
| SHIFT INSERT (SHIFT PF1) | ESC E | 1B 45 | ESC M | - CTRL Z |
| PF2 | ESC W | 1B 57 | ESC W | |
| SHIFT PF2 | ESC R | 1B 52 | ESC I | |
| PF3 | ESC T | 1B 54 | ESC K | - CTRL O |
| SHIFT PF3 | ESC Y | 1B 59 | ESC k | - CTRL X |
| PF4 | ESC r | 1B 72 | ESC r | CTRL D |
| SHIFT PF4 | ESC q | 1B 71 | ESC q | CTRL U |
| NEXT SCRN | ESC K | 1B 45 | ESC J | |
| PREV SCRN | ESC J | 1B 4A | ESC J | |
| F2 (PRINT SCRN) | ESC P | 1B 50 | ESC P | CTRL F |
| REMOVE | DEL | 7F | DEL | DEL |
| RETURN | CTRL M or CTRL M CTRL J or CTRL I | 0D 0D 0A 09 | CTRL M or CTRL M CTRL J | CTRL M CTRL J |
| SHIFT F4 (SEND) | ESC 7 | 1B 37 | ESC 7 | - 7 |
| TAB | CTRL I | 09 | CTRL I | CTRL I |
| SHIFT TAB | ESC I | 1B 49 | ESC O | |

1. These codes are also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.

2. CTRL V if the terminal is in TeleVideo 925 or 950 mode.

3. Shifted key sends ESC j in TeleVideo 925 or 950 mode.

4. Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

Table B-3 Editing and Special Key Codes—Enhanced PC-Style Keyboard¹

| Key | Native ² Code | Hex. Value | ADDS VP A2 | HZ 1500 |
|--------------------|--|---------------|--|--|
| ←BACKSPACE | CTRL H | 08 | CTRL H | CTRL H |
| ↓ | CTRL J ³ | 0A | CTRL J | - CTRL K |
| ← | CTRL H | 08 | CTRL U | CTRL H |
| → | CTRL L | 0C | CTRL F | CTRL P |
| ↑ ⁴ | CTRL K | 0B | CTRL Z | - CTRL L |
| DELETE | DEL | 7F | DEL | DEL |
| END | ESC T | 1B 54 | ESC K | - CTRL O |
| SHIFT END | ESC Y | 1B 59 | ESC k | - CTRL X |
| ENTER ⁵ | CTRL M or CTRL M CTRL J or CTRL I | 0D, OA | CTRL M or CTRL M CTRL J or CTRL I | CTRL M or CTRL M CTRL J or CTRL I |
| ESC | CTRL [| 1B | CTRL [| CTRL [|

- Codes shown on keyboard layout are alphanumeric and function key scan codes sent in PC Term mode on all keyboards (the high bit is set when the key is released). See Table B-4 for scan codes sent by the editing and special keys in this mode.
- These codes are also recognized in WY-50+, ADM 31, and TeleVideo 910+/920/925/950 modes. Unless otherwise noted, shifted keys send the same code as unshifted.
- CTRL V if the terminal is in TeleVideo 925 or 950 mode.
- Shifted key sends ESC j in TeleVideo 925 or 950 mode.
- Code depends on selection in setup mode. Shifted key sends no code (toggles keyclick).

Table B-3 Continued

| Key | Native ² Code | Hex. Value | ADDS VP A2 | HZ 1500 |
|--------------|-----------------------------|---------------|---------------|----------|
| HOME | CTRL ^ | 1E | CTRL A | - CTRL R |
| INSERT | ESC q | 1B 71 | ESC q | CTRL U |
| SHIFT INSERT | ESC r | 1B 72 | ESC r | CTRL D |
| PAGE DOWN | ESC K | 1B 45 | ESC J | |
| PAGE UP | ESC J | 1B 4A | ESC J | |
| PRT SCREEN | ESC P | 1B 50 | ESC P | CTRL F |
| TAB → | CTRL I | 09 | CTRL I | CTRL I |
| SHIFT TAB → | ESC I | 1B 49 | ESC O | |

Table B-4 Editing and Special Key Codes in PC Term Personality

| Keyboard Style | | | Hexadecimal Scan Codes | |
|------------------|----------------------|-------------------------|------------------------|-------------|
| ASCII | VT220 | Enhanced PC | PC Term Mode DN | UP |
| FUNCT | COMPOSE CHARACTER | LEFT ALT | 38 | B8 |
| | | RIGHT ALT | E0 38 | E0 B8 |
| BACKSPACE | ⊠ | ←BACKSPACE | 0E | 8E |
| CTRL BREAK | CTRL F20 | BREAK | E0 46 | E0 C6 |
| CAPS LOCK | LOCK | CAPS LOCK | 3A | BA |
| CTRL | CTRL | LEFT CTRL RIGHT CTRL | 1D E0 1D | 9D E0 9D |
| RETURN | RETURN | ENTER | 1C | 9C |
| ENTER | ENTER | ENTER kpd | E0 1C | E0 9C |
| ESC | F19 | ESC | 01 | 81 |
| F15 ¹ | PF1 ¹ | NUM LOCK ¹ | 45 | C5 |
| BREAK | F20 | PAUSE | E1 1D 45 E1 9D C5 | (none) |
| REPL | PF4 | * kpd | 37 | B7 |
| SEND | F18 | PRT SCREEN | E0 2A E0 37 | E0 B7 E0 AA |

Table B-4 Continued

| Keyboard Style | | | Hexadecimal Scan Codes | |
|--|--|--|----------------------------|----------------------------|
| ASCII | VT220 | Enhanced PC | PC Term Mode DN | UP |
| F16 | F17 | SCROLL LOCK | 46 | C6 |
| LEFT SHIFT | LEFT/RIGHT SHIFT | LEFT SHIFT | 2A | AA |
| RIGHT SHIFT | | RIGHT SHIFT | 36 | B6 |
| SPACEBAR | SPACEBAR | SPACEBAR | 39 | B9 |
| SEND ² | F18 ² | PRT SCREEN ² | 54 | D4 |
| TAB | TAB | TAB→ | 0F | 8F |
| <i>-kpd</i> | <i>-kpd</i> | <i>-kpd</i> | 4A | CA |
| <i>,kpd</i> | <i>,kpd</i> | <i>+kpd</i> | 4E | CE |
| CLR LINE | PF3 | <i>/kpd</i> | E0 35 | E0 B5 |
| <i>.kpd</i> (DEL) ³ DEL | <i>.kpd</i> (REMOVE) ³ REMOVE | <i>. DELkpd</i> (DELETE) ³ DELETE | 53 E0 53 E0 2A E0 53 | D3 E0 D3 E0 D3 E0 AA |
| <i>0kpd</i> (INS CHAR) ³ INS CHAR | <i>0kpd</i> (INSERT HERE) ³ INSERT HERE | <i>0 INSkpd</i> (INSERT) ³ INSERT | 52 E0 52 E0 2A E0 52 | D2 E0 D2 E0 D2 E0 AA |
| <i>1kpd</i> (DEL CHAR) ³ DEL CHAR | <i>1kpd</i> (PF2) ³ PF2 | <i>1 ENDKpd</i> (END) ³ END | 4F E0 4F E0 2A E0 4F | CF E0 CF E0 CF E0 AA |
| <i>2kpd</i> (▼) ³ ▼ | <i>2kpd</i> (▼) ³ ▼ | <i>2 ↓kpd</i> (↓) ³ ↓ | 50 E0 50 E0 2A E0 50 | D0 E0 D0 E0 D0 E0 AA |
| <i>3kpd</i> (PAGE NEXT) ³ PAGE NEXT | <i>3kpd</i> (NEXT SCRN) ³ NEXT SCRN | <i>3 PG DNkpd</i> (PAGE DOWN) ³ PAGE DOWN | 51 E0 51 E0 2A E0 51 | D1 E0 D1 E0 D1 E0 AA |
| <i>4kpd</i> (◀) ³ ◀ | <i>4kpd</i> (◀) ³ ◀ | <i>4 ←kpd</i> (←) ³ ← | 4B E0 4B E0 2A E0 4B | CB E0 CB E0 CB E0 AA |

1. Toggles NUM LOCK status and NUM indicator on status line. You can press this key simultaneously with the CTRL key to synchronize the terminal with your application program's NUM LOCK status.
2. With the corner key (FUNCT, COMPOSE, or ALT) pressed simultaneously.
3. The key in parentheses sends the indicated code when NUM LOCK is off; the second, longer code is sent when NUM LOCK is on.

Table B-4 Continued

| Keyboard Style | | | Hexadecimal Scan Codes | |
|---|---|---|----------------------------------|----------------------------------|
| ASCII | VT220 | Enhanced PC | PC Term Mode DN | UP |
| <i>5kpd</i> | <i>5kpd</i> | <i>5kpd</i> | 4C | CC |
| <i>6kpd</i> (▶) ³ ▶ | <i>6kpd</i> (▶) ³ ▶ | 6 → <i>kpd</i> (→) ³ → | 4D E0 4D E0 2A E0 4D | CD E0 CD E0 CD E0 AA |
| <i>7kpd</i> (HOME) ³ HOME | <i>7kpd</i> (DO) ³ DO | 7 HOME <i>kpd</i> (HOME) ³ HOME | 47 E0 47 E0 2A E0 47 | C7 E0 C7 E0 C7 E0 AA |
| <i>8kpd</i> (▲) ³ ▲ | <i>8kpd</i> (▲) ³ ▲ | 8 ↑ <i>kpd</i> (↑) ³ ↑ | 48 E0 48 E0 2A E0 48 | C8 E0 C8 E0 C8 E0 AA |
| <i>9kpd</i> (F14) ³ F14 F13 | <i>9kpd</i> (PREV SCRN) ³ PREV SCRN F13 | 9 PG UP <i>kpd</i> (PAGE UP) ³ PAGE UP | 49 E0 49 E0 2A E0 49 59 | C9 E0 C9 E0 C9 E0 AA D9 |

Table B-5 Function Key Default Codes

| Key | Native ¹ | ADDS VP | Key | Native ¹ | ADDS VP |
|-----|---------------------|---------|------------------|---------------------|---------|
| F1 | SOH @ CR | STX 1 | F13 | SOH L CR | STX = |
| F2 | SOH A CR | STX 2 | F14 | SOH M CR | STX > |
| F3 | SOH B CR | STX 3 | F15 ² | SOH N CR | STX ? |
| F4 | SOH C CR | STX 4 | F16 ³ | SOH O CR | STX @ |
| F5 | SOH D CR | STX 5 | F17 | SOH P CR | STX A |
| F6 | SOH E CR | STX 6 | F18 | SOH Q CR | STX B |
| F7 | SOH F CR | STX 7 | F19 | SOH R CR | STX C |
| F8 | SOH G CR | STX 8 | F20 | SOH S CR | STX D |
| F9 | SOH H CR | STX 9 | SHIFT F1 | SOH ' CR | STX ! |
| F10 | SOH I CR | STX : | SHIFT F2 | SOH a CR | STX " |
| F11 | SOH J CR | STX ; | SHIFT F3 | SOH b CR | STX # |
| F12 | SOH K CR | STX < | SHIFT F4 | SOH c CR | STX \$ |

1. Codes also recognized in ADM 31, HZ 1500, and TVI 910+, 920, 925, and 950 modes.

2. HELP key on the VT220-style keyboard.

3. DO key on the VT220-style keyboard.

Table B-5 Continued

| Key | Native ¹ | ADDS VP | Key | Native ¹ | ADDS VP |
|-----------|---------------------|---------|------------------------|---------------------|---------|
| SHIFT F5 | SOH d CR | STX % | SHIFT F13 | SOH l CR | STX - |
| SHIFT F6 | SOH e CR | STX & | SHIFT F14 | SOH m CR | STX . |
| SHIFT F7 | SOH f CR | STX ' | SHIFT F15 ² | SOH n CR | STX / |
| SHIFT F8 | SOH g CR | STX (| SHIFT F16 ³ | SOH o CR | STX 0 |
| SHIFT F9 | SOH h CR | STX) | SHIFT F17 | SOH p CR | STX 1 |
| SHIFT F10 | SOH i CR | STX * | SHIFT F18 | SOH q CR | STX 2 |
| SHIFT F11 | SOH j CR | STX + | SHIFT F19 | SOH r CR | STX 3 |
| SHIFT F12 | SOH k CR | STX , | SHIFT F20 | SOH s CR | STX 4 |

ANSI Key Codes

These tables list codes generated by special keys in the terminal's ANSI modes (VT100 and VT220 7- or 8-bit), or VT52 mode.

- Table B-6 lists the codes generated by the cursor keys.
- Table B-7 lists the keys used to generate the PF codes for each keyboard.
- Table B-8 lists the codes generated by the numeric keypad keys.
- Table B-9 lists the codes generated by the editing keys for the VT220-, ASCII-, and Enhanced PC-style keyboards.
- Table B-10 lists the default codes for the function keys.

Table B-6 Cursor Key Codes

| Key | Mode | VT220 7-Bit | VT220 8-Bit | VT100 | VT52 |
|-----|-----------------------|--------------------|----------------|--------------------|------------|
| ▲ | Normal Application | ESC [A ESC O A | CSI A SS3 A | ESC [A ESC O A | ESC A * |
| ▼ | Normal Application | ESC [B ESC O B | CSI B SS3 B | ESC [B ESC O B | ESC B * |
| ▶ | Normal Application | ESC [C ESC O C | CSI C SS3 C | ESC [C ESC O C | ESC C * |
| ◀ | Normal Application | ESC [D ESC O D | CSI D SS3 D | ESC [D ESC O D | ESC D * |

* Application mode is not available in VT52 mode.

Table B-7 Simulated
PF-Key Codes

| Function Codes* | | | Keyboard Style | |
|-----------------|-------|-------|----------------|-------------|
| VT100 | VT52 | VT220 | ASCII | Enhanced PC |
| ESC O P | ESC P | PF1 | INS CHAR/LINE | F1 |
| ESC O Q | ESC Q | PF2 | DEL CHAR/LINE | F2 |
| ESC O R | ESC R | PF3 | CLR LINE/SCRN | F3 |
| ESC O S | ESC S | PF4 | REPL/INS | F4 |

* The codes output are the same if the key is shifted or unshifted.

Table B-8 Numeric
Keypad Codes¹

| Key | VT220 | VT220 | VT100 | VT52 |
|--------------------|---------|-------|---------|---------|
| | 7-Bit | 8-Bit | | |
| PF1 | ESC O P | SS3 P | ESC O P | ESC P |
| PF2 | ESC O Q | SS3 Q | ESC O Q | ESC Q |
| PF3 | ESC O R | SS3 R | ESC O R | ESC R |
| PF4 | ESC O S | SS3 S | ESC O S | ESC S |
| - | ESC O m | SS3 m | ESC O m | ESC ? m |
| *2 | ESC O l | SS3 l | ESC O l | ESC ? l |
| , ³ | ESC O l | SS3 l | ESC O l | ESC ? l |
| . | ESC O n | SS3 n | ESC O n | ESC ? n |
| 0 | ESC O p | SS3 p | ESC O p | ESC ? p |
| 1 | ESC O q | SS3 q | ESC O q | ESC ? q |
| 2 | ESC O r | SS3 r | ESC O r | ESC ? r |
| 3 | ESC O s | SS3 s | ESC O s | ESC ? s |
| 4 | ESC O t | SS3 t | ESC O t | ESC ? t |
| 5 | ESC O u | SS3 u | ESC O u | ESC ? u |
| 6 | ESC O v | SS3 v | ESC O v | ESC ? v |
| 7 | ESC O w | SS3 w | ESC O w | ESC ? w |
| 8 | ESC O x | SS3 x | ESC O x | ESC ? x |
| 9 | ESC O y | SS3 y | ESC O y | ESC ? y |
| ENTER ⁴ | ESC O M | SS3 M | ESC O M | ESC ? M |

1. Codes apply when the keypad is set to application mode; in numeric mode, these keys generate the appropriate code for the character on the keycap.

2. Enhanced PC-style keyboard only.

3. ASCII and VT220 keyboards only.

4. In numeric mode, ENTER sends a carriage return code (CR or CRLF).

Table B-9 Editing and Special Key Codes¹

| Key | VT220 7-Bit | VT220 8-Bit | VT100 | VT52 |
|-----------------------------|-------------------------|----------------|---------|-------|
| VT220-Style Keyboard | | | | |
| BLOCK (F4) | Local ² | Same | Same | Same |
| BREAK (F5) | Local ³ | Same | Same | Same |
| SHIFT BREAK (F5) | Local ⁴ | Same | Same | Same |
| CTRL BREAK (F5) | Local ⁵ | Same | Same | Same |
| ▲ | ESC [A | CSI A | ESC [A | ESC A |
| ▼ | ESC [B | CSI B | ESC [B | ESC B |
| ▶ | ESC [C | CSI C | ESC [C | ESC C |
| ◀ | ESC [D | CSI D | ESC [D | ESC D |
| ⊠ | DEL or BS ⁶ | Same | Same | Same |
| SHIFT ⊠ | CAN or DEL ⁶ | Same | Same | Same |
| ENTER | CTRL M ⁷ | Same | Same | Same |
| FIND | ESC [1 ~ | CSI 1 ~ | None | None |
| HOLD SCREEN (F1) | Local ⁸ | Same | Same | Same |
| INSERT HERE | ESC [2 ~ ⁹ | CSI 2 ~ | None | None |
| NEXT SCR N | ESC [6 ~ ¹⁰ | CSI 6 ~ | None | None |
| PREV SCR N | ESC [5 ~ ¹¹ | CSI 5 ~ | None | None |
| PRINT SCREEN (F2) | Local ¹² | Same | Same | Same |
| REMOVE | ESC [3 ~ ¹³ | CSI 3 ~ | None | None |
| RESET (SHIFT F3) | Local ¹⁴ | Same | Same | Same |
| RETURN | CTRL M ¹⁵ | Same | Same | Same |

1. Codes for cursor and numeric keypad keys apply only in numeric mode.
2. Toggles the terminal in and out of block mode.
3. Sends break to DATA port. Length depends on BREAK parameter selection in setup mode.
4. Sends two-second disconnect break to DATA port.
5. Sends the answerback message.
6. Action or code depends on DEL KEY parameter selection in setup mode.
7. Sends CTRL M, or CTRL M CTRL J, or CTRL I depending on ENTER field selection in setup.
8. Toggles data communications on and off.
9. If block mode is on, toggles the terminal in and out of insert mode.
10. If block mode is on, clears from the cursor position to the end of the screen.
11. If block mode is on, homes the cursor and clears the screen. Pressed with CTRL, the cursor is homed and the screen cleared regardless of block mode.
12. Sends the contents of the screen to the PRINTER port. Pressed with CTRL or SHIFT, toggles copy print mode on and off.
13. If block mode is on, deletes the character at the cursor and moves the characters to the right one position left.
14. Performs a terminal soft (modes) reset. Pressed with CTRL and SHIFT, performs a hard (power-on) reset.
15. Sends CTRL M, or CTRL M CTRL J, or CTRL I depending on RETURN field selection in setup.

Table B-9 Continued

| Key | VT220 7-Bit | VT220 8-Bit | VT100 | VT52 |
|-----------------------|-------------------------|----------------|---------|--------|
| SELECT | ESC [4 ~ | CSI 4 ~ | None | None |
| SEND (SHIFT F4) | Local ¹⁶ | Same | Same | Same |
| SETUP (F3) | Local ¹⁷ | Same | Same | Same |
| TAB | CTRL I | Same | Same | Same |
| SHIFT TAB | ESC [Z | CSI Z | ESC [z | CTRL I |
| ASCII Keyboard | | | | |
| BACKSPACE | CTRL H ³ | Same | Same | Same |
| BREAK (F5) | Local ³ | Same | Same | Same |
| SHIFT BREAK | Local ⁴ | Same | Same | Same |
| CTRL BREAK | Local ⁵ | Same | Same | Same |
| CTRL SHIFT BREAK | Local ² | | | |
| CLR LINE/SCRN | ESC O R | SS3 R | ESC O R | ESC R |
| ▲ | ESC [A | CSI A | ESC [A | ESC A |
| ▼ | ESC [B | CSI B | ESC [B | ESC B |
| ▶ | ESC [C | CSI C | ESC [C | ESC C |
| ◀ | ESC [D | CSI D | ESC [D | ESC D |
| DEL | DEL or BS ⁶ | Same | Same | Same |
| SHIFT DEL | CAN or DEL ⁶ | Same | Same | Same |
| DEL CHAR/LINE | ESC O Q | SS3 Q | ESC O Q | ESC Q |
| ENTER | CTRL M ⁷ | Same | Same | Same |
| ESC | CTRL [| Same | Same | Same |
| FUNCT | Local ⁸ | Same | Same | Same |
| HOME | ESC [H | CSI H | ESC [H | ESC H |
| CTRL SHIFT HOME | Local ¹⁸ | Same | Same | Same |
| INS/REPL | ESC O S | SS3 S | ESC O S | ESC S |
| INS CHAR/LINE | ESC O P | SS3 P | ESC O P | ESC P |
| PAGE NEXT | ESC [U | CSI U | ESC [U | None |
| PAGE PREV | ESC [V | CSI V | ESC [V | None |
| PRINT | Local ¹² | Same | Same | Same |
| RETURN | CTRL M ¹³ | Same | Same | Same |
| SEND | Local ¹⁵ | Same | Same | Same |

16. Sends the cursor line to the data port.

17. Puts terminal in setup mode. Pressed with CTRL, performs a hard (power-on reset).

18. Homes cursor and clears screen.

Table B-9 Continued

| Key | VT220 7-Bit | VT220 8-Bit | VT100 | VT52 |
|---|-------------------------|----------------|---------|--------|
| SETUP | Local ¹⁴ | Same | Same | Same |
| SHIFT SETUP | Local ¹⁷ | Same | Same | Same |
| TAB | CTRL I | Same | Same | Same |
| SHIFT TAB | ESC [Z | CSI Z | ESC [Z | CTRL I |
| Enhanced PC-Style Keyboard | | | | |
| ←BACKSPACE | CTRL H | Same | Same | Same |
| PAUSE | Local ⁴ | Same | Same | Same |
| SHIFT PAUSE | Local ⁵ | | | |
| CTRL PAUSE | Local ⁹ | Same | Same | Same |
| ▲ | ESC [A | CSI A | ESC [A | ESC A |
| ▼ | ESC [B | CSI B | ESC [B | ESC B |
| ▶ | ESC [C | CSI C | ESC [C | ESC C |
| ◀ | ESC [D | CSI D | ESC [D | ESC D |
| DEL | DEL or BS ⁶ | Same | Same | Same |
| SHIFT DEL | CAN or DEL ⁶ | Same | Same | Same |
| ENTER | CTRL M ⁷ | Same | Same | Same |
| ESC | CTRL [| Same | Same | Same |
| HOME | ESC [H | CSI H | ESC [H | ESC H |
| CTRL SHIFT HOME | Local ¹⁰ | Same | Same | Same |
| SCROLL LOCK | Local ⁸ | Same | Same | Same |
| SELECT | Local ¹⁹ | Same | Same | Same |
| SHIFT SELECT | Local ¹⁷ | | | |
| TAB → | CTRL I | Same | Same | Same |
| SHIFT TAB → | ESC [Z | CSI Z | ESC [Z | CTRL I |
| 19. Pressed with CTRL, performs a soft (modes) reset. | | | | |

Table B-10 Function Key
Default Codes¹

| Key | Keyboard Style | | |
|-------------------------|--------------------|--------------------------|------------------|
| | VT220 ² | ASCII | Enhanced PC |
| F1 (HOLD SCREEN) | Local | ESC [? 5 i ³ | PF1 ⁴ |
| SHIFT F1 | Local | ESC [5 i ⁵ | PF1 |
| F2 (PRINT SCREEN) | Local | ESC [? 3 i | PF2 |
| SHIFT F2 | Local | ESC [? 1 i | PF2 |
| F3 (SETUP/RESET) | Local | ESC [2 i | PF3 |
| SHIFT F3 | Local | ESC [0 i | PF3 |
| F4 (BLOCK/SEND) | Local | ESC [@ | PF4 |
| SHIFT F4 | Local | ESC [L | PF4 |
| F5 (BREAK) | Local | ESC [M | Same |
| SHIFT F5 | Local | ESC [K | Same |
| F6 | ESC [17 - | Same | Same |
| SHIFT F6 | None | ESC [31 - | Same |
| F7 | ESC [18 - | Same | Same |
| SHIFT F7 | None | ESC [32 - | Same |
| F8 | ESC [19 - | Same | Same |
| SHIFT F8 | None | ESC [33 - | Same |
| F9 | ESC [20 - | Same | Same |
| SHIFT F9 | None | ESC [34 - | Same |
| F10 | ESC [21 - | Same | Same |
| SHIFT F10 | None | ESC [35 - | Same |
| F11 (ESC) ⁶ | ESC [23 - | Same | Same |
| SHIFT F11 | None | ESC [1 - | Same |
| F12 (BS) ⁷ | ESC [24 - | Same | Same |
| SHIFT F12 | None | ESC [2 - | Same |
| F13 (LF) ⁸ | ESC [25 - | Same | |
| SHIFT F13 | None | ESC [3 - | |
| F14 (HOME) ⁹ | ESC [26 - | Same | |
| SHIFT F14 | None | ESC [4 - | |

1. These default codes apply only before the function keys are redefined or after any redefinition has been cleared.
2. On the VT220-style keyboard, F1 through F5 have local functions—see Table B-10.
3. With auxiliary print mode off. Sends ESC [? 4 i if auxiliary print mode is on.
4. On the Enhanced PC-style keyboard, function keys F1 through F4, shifted and unshifted, send PF key codes (see Table B-8).
5. With transparent print mode off. Sends ESC [4 i if transparent print mode is on.
6. In VT52 and VT100 modes, the default is ESC (CTRL I).
7. In VT52 and VT100 modes, the default is BS (CTRL H).
8. In VT52 and VT100 modes, the default is LF (CTRL J).
9. In VT52 mode, the default is ESC H. In VT100 mode, the default is ESC [H.

Table B-10 Continued

| Key | Keyboard Style | | Enhanced PC |
|------------|--------------------|-----------|-------------|
| | VT220 ² | ASCII | |
| F15 (HELP) | ESC [28 ~ | Same | |
| SHIFT F15 | None | ESC [5 ~ | |
| F16 (DO) | ESC [29 ~ | Same | |
| SHIFT F16 | None | ESC [6 ~ | |
| F17 | ESC [31 ~ | | |
| SHIFT F17 | None | | |
| F18 | ESC [32 ~ | | |
| SHIFT F18 | None | | |
| F19 | ESC [33 ~ | | |
| SHIFT F19 | None | | |
| F20 | ESC [34 ~ | | |
| SHIFT F20 | None | | |

Appendix

C**Graphics Modes Command Guide**

Appendix C describes commands for Tektronix 4010/4014 mode, Hercules, CGA, and Alpha graphics modes.

Tektronix 4010/4014 Mode

Table C-1 summarizes the control codes and escape sequences recognized by the terminal in 4010/4014 mode.

**Table C-1 4010/4014
Command Summary**

| Sequence | CTRL Code | Description |
|-----------------|------------------|--|
| BEL | G | Sounds bell, clear bypass |
| BS | H | Moves cursor left |
| HT | I | Moves cursor right |
| LF | J | Linefeed, clears bypass |
| VT | K | Moves cursor up |
| CR | M | Carriage return, resets to alpha mode, clears bypass, cancels crosshair cursor |
| FS | \ | Sets point plot mode |
| GS |] | Sets graph mode, directs beam without draw (dark vector) |
| RS | - | Sets incremental plot mode |
| US | - | Resets to alpha mode, clears bypass |
| ESC ENQ | Ē | Sends terminal status, sets bypass, sends beam or cursor address, resets to alpha mode |
| ESC BEL | G | Same as BEL |
| ESC LF | J | Carriage return, resets to alpha mode, clears bypass, cancels crosshair cursor |
| ESC FF | L | Sets alpha mode, erases screen, homes cursor, clears bypass |
| ESC CR | M | Ignores CR in alpha mode |
| ESC CAN | X | Sets bypass condition |
| ESC SUB | Z | Sets GIN mode (displays crosshair cursor, sets bypass) |
| ESC GS |] | Same as GS |
| ESC RS | - | Same as RS |
| ESC US | - | Same as US |
| ESC 8 | - | Selects 74 characters per line |

Table C-1 Continued

| Sequence | CTRL Code | Description |
|--------------|-----------|---------------------------------|
| ESC 9 | | Selects 81 characters per line |
| ESC : | | Selects 121 characters per line |
| ESC ; | | Selects 133 characters per line |
| ESC [? 38 l | | Selects VT200 7-bit mode |
| ESC ' 1 | | Selects solid line |
| ESC a | | Selects dotted line |
| ESC b | | Selects dot-dashed line |
| ESC c | | Selects short dashed line |
| ESC d | | Selects long dashed line |
| ESC e | | Selects solid line |
| ESC f | | Selects solid line |
| ESC g | | Selects solid line |
| ESC h | | Selects solid line |
| ESC i | | Selects dotted line |
| ESC j | | Selects dot-dashed line |
| ESC k | | Selects short dashed line |
| ESC l | | Selects long dashed line |
| ESC m | | Selects solid line |
| ESC n | | Selects solid line |
| ESC o | | Selects solid line |

Hercules and CGA Modes

In both of these modes, display bytes 0-92 and 98-FF are written directly to the screen. Display bytes 93-97 are command bytes. To display the byte corresponding to the command range 93-97H, that byte must be followed by a null. Table C-2 summarizes the command format recognized by both modes.

Table C-2 Hercules and CGA
Command Format Summary

| Command Byte Format | Function |
|------------------------|---|
| 93 + MSB + LSB | Sets the video RAM address for the current page. Note that the MSB is always set high. |
| 94 + 7-bit signed byte | Indicates the number of location to move the current video address offset. |
| 95 + 1 byte | Creates a horizontal line. The byte is in the 2 through 255 range, indicating the number of consecutive words in the line. |
| 95 + 01 + MSB + LSB | Alternate format to create a horizontal line where 01 is a long function and MSB + LSB indicates the number of words in the line. |
| 96 | Replaces leading NUL in character mode control sequences when in block (Hercules) mode. |

Table C-2 Continued

| Command Byte Format | Function |
|------------------------|---|
| 97 + 1 byte | Creates a vertical line. The byte is in the 2 through 255 range, indicating the number of consecutive words in the line. |
| 97 + 01 + MSB + LSB | Alternate format to create a vertical line where 01 is a long function and MSB + LSB indicates the number of words in the line. |

Alpha Mode

Within PC Graphics, there is a text mode. In this mode, bytes 1 to FF, when received by the terminal, are treated as standard ASCII text. Byte 00H (Null) is the leading byte for a set of control commands in this mode. Table C-3 summarizes those commands.

Table C-3 Alpha Mode
Command Format Summary

| Command Byte Format | Function |
|---|--|
| Null + 0000 <i>aaaa</i> + <i>aaaa aaaa</i> | Sets a new cursor position where Binary <i>a</i> is the offset of the cursor in the text display |
| Null + 20H + <i>ttts ssss</i> + <i>ttte eeee</i> | Sets cursor attribute where Binary <i>s</i> —Starts cursor overlay scan line Binary <i>e</i> —Ends cursor overlay scan line Binary <i>t</i> —Controls cursor attribute: Bit 7—No function Bit 6—Cursor display, on or off Bit 5—Cursor blink, on or off Bits 4 through 0—Start/stop cursor scan |
| Null + 40H | Clears display |
| Null + 41H | Clears from cursor position to end of line |
| Null + 42H | Sounds bell |
| Null + 43H | Scrolls page and inserts blank row at the bottom of the page |

Table C-3 Continued

| Command Byte Format | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|----------------|---|---|---|---|---|---|---|---|-------|---|---|---|---|---|---|---|---|-----------|---|---|---|---|---|---|---|---|----------------|---|---|---|---|---|---|---|---|---------------|---|---|---|---|---|---|---|---|
| Null + 011 <i>p pppp</i> + <i>dddd dddd</i> | Controls port I/O. If <i>p pppp</i> equals 4, then this command writes to the control register of the port where the data portion of the command (<i>dddd dddd</i>) has this format: Bit 7—Page select (only page 0 supported) Bit 6—Not used Bit 5—Enables text blinker Bit 4—Not used Bit 3—Screen enable Bit 2—Not used Bit 1—Enters graphics/clears screen Bit 0—Clear, Hercules format set, CGA format | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Null + 80H + <i>aaaa aaaa</i> | Sets new character attributes where <i>aaaa aaaa</i> designates the following attributes: <table border="0"> <tr> <td>Attribute code</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td>Blank</td> <td>B</td> <td>0</td> <td>0</td> <td>0</td> <td>I</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Underline</td> <td>B</td> <td>0</td> <td>0</td> <td>0</td> <td>I</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Normal display</td> <td>B</td> <td>0</td> <td>0</td> <td>0</td> <td>I</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>Reverse video</td> <td>B</td> <td>1</td> <td>1</td> <td>1</td> <td>I</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> where I = 0—Sets normal text I = 1—Sets bold text B = 1—Sets a blinking character if the text blinker is enabled B = 1—Sets a bold background if the text blinker is not enabled | Attribute code | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Blank | B | 0 | 0 | 0 | I | 0 | 0 | 0 | Underline | B | 0 | 0 | 0 | I | 0 | 0 | 1 | Normal display | B | 0 | 0 | 0 | I | 1 | 1 | 1 | Reverse video | B | 1 | 1 | 1 | I | 0 | 0 | 0 |
| Attribute code | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blank | B | 0 | 0 | 0 | I | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Underline | B | 0 | 0 | 0 | I | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Normal display | B | 0 | 0 | 0 | I | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reverse video | B | 1 | 1 | 1 | I | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Null + 11 <i>tn nnnn</i> + <i>rrrr rrrr</i> + <i>cccc cccc</i> + <i>RRRR RRRR</i> + <i>CCCC CCCC</i> + <i>aaaa aaaa</i> | Scrolls the display where <i>t</i> —Sets the scroll direction (1 = up, 0 = down) <i>n nnnn</i> —Defines the number of lines to scroll up or down <i>rrrr rrrr</i> —Address of the upper left row <i>cccc cccc</i> —Not used <i>RRRR RRRR</i> —Address of the lower right row <i>CCCC CCCC</i> —Not used <i>aaaa aaaa</i> —Attribute of new lines inserted at the top or bottom | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Appendix

D**Local Keyboard Command Guide****Table D-1 Native Mode Local Keyboard Commands**

| Command | Keyboard Style WY-99GT ASCII | VT220 | Enhanced PC |
|--|---------------------------------|------------------------|------------------------|
| Toggle SHIFT LOCK on/off | CAPS LOCK | CAPS LOCK | CAPS LOCK |
| Toggle NUM LOCK on/off | F15 | PF1 | NUM LOCK |
| Hold data on screen ¹ | FUNCT | HOLD SCREEN (F1) | SCROLL LOCK |
| Put terminal in setup mode | SHIFT SETUP | SETUP | SHIFT SELECT |
| Partially reset terminal, including communication; unlock keyboard, turn off all print modes | SETUP | SHIFT SETUP | SELECT |
| Send break | BREAK | BREAK (F5) | BREAK |
| Toggle between block/full-duplex modes | SHIFT BREAK | BLOCK (F4) | SHIFT BREAK |
| Print screen formatted | PRINT | PRINT SCREEN | PRINT SCREEN |
| Select other port as data port | CTRL BREAK | | |
| Turn auxiliary print mode on/off | CTRL PRINT | CTRL PRINT SCRN | SHIFT SYS REQ |
| Turn monitor mode on/off | CTRL SHIFT <i>1kpd</i> | CTRL SHIFT <i>1kpd</i> | CTRL SHIFT <i>1kpd</i> |
| Turn keyclick on/off | SHIFT ENTER | SHIFT ENTER | SHIFT ENTER |
| Turn status line display on/off | CTRL SHIFT ◀ | CTRL SHIFT ◀ | CTRL ← |
| Turn on instant screen saver ² | CTRL CLR SCRN | | |
| Put terminal in WyseWorks | CTRL CAPS LOCK | CTRL CAPS LOCK | CTRL CAPS LOCK |
| Speed scrolling rate | CTRL SHIFT ▲ | CTRL SHIFT ▲ | CTRL SHIFT ↑ |
| Slow scrolling rate | CTRL SHIFT ▼ | CTRL SHIFT ▼ | CTRL SHIFT ↓ |
| Home cursor and clear page | CTRL SHIFT HOME | | CTRL SHIFT HOME |
| Display page 0 | CTRL <i>0kpd</i> | CTRL <i>0kpd</i> | CTRL <i>0kpd</i> |
| Display page 1 | CTRL <i>1kpd</i> | CTRL <i>1kpd</i> | CTRL <i>1kpd</i> |
| Display next page (or activate other window ³) | CTRL NEXT PAGE | NEXT SCRN | CTRL PAGE DOWN |

1. When CORNER KEY setup parameter is set to HOLD and the data port has handshaking enabled

2. SCRN SAVER parameter must be on

3. If screen is split

Table D-1 Continued

| Command | Keyboard Style WY-99GT ASCII | VT220 | Enhanced PC |
|--|---------------------------------|------------------------|------------------------|
| Display previous page (or activate other window ³) | CTRL PREV PAGE | PREV SCRNL | CTRL PAGE UP |
| Toggle split screen/full screen format ⁴ | CTRL SHIFT <i>-kpd</i> | CTRL SHIFT <i>-kpd</i> | CTRL SHIFT <i>-kpd</i> |
| Raise horizontal split and adjust display | CTRL <i>-kpd</i> | CTRL <i>-kpd</i> | |
| Lower horizontal split and adjust display | CTRL <i>,kpd</i> | CTRL <i>,kpd</i> | |
| Roll active window up in page ⁴ | CTRL ▲ | CTRL ▲ | |
| Roll active window down in page ⁴ | CTRL ▼ | CTRL ▼ | |

4. Splits screen at line 12

Appendix

E Installing a Mouse

This appendix contains instructions to connect a Microsoft Mouse to either the MODEM or AUX port on the rear panel of the terminal.

- Note** In Tektronix mode, mouse data positions the cursor on the terminal screen. In all other modes, your application must understand data sent from the mouse if you choose to use one.

Installation

If your application program requires a mouse, you can install one following these instructions:

- 1 Find the PRT RCV field in setup menu F3. Set it for MOUSE.
- 2 Find the DATA/PRINTER field in setup menu F4. Assign the printer function to the MODEM or the AUX port.
- 3 Set the following configuration parameters for the port you have chosen to perform the printer function:
 - Data/Stop Bits 8/1
 - Baud Rate 1200
 - Handshaking None
 - Parity None
- 4 Attach the mouse according to the instruction provided by the manufacturer.

When you leave setup, look for the <PRT (printer receive) symbol above the status line. This symbol tells you that the mouse is installed and ready to generate data.

Appendix

F ASCII Command Guide

Commands Supported in ASCII Personalities

The following tables list all the ASCII commands recognized by the terminal. Table F-1 lists all commands recognized in native mode, the WY-50+, the ADM 31, the ADDS Viewpoint A2, and the Hazeltine 1500 terminals. Table F-2 lists all commands recognized in native mode and the TeleVideo family terminals. Table F-3 lists commands recognized in PC terminal mode.

In Tables F-1 and F-2, columns other than the native mode column show the support for the command in other ASCII personalities according to the following notations:

- Same = Same as native code (code is native to other terminal also)
- Wyse = Wyse enhancement—code not native to other terminal, but always executed
- ENH = Wyse enhancement—code not native to other terminal, but executed in enhanced mode

A blank in any column indicates that the command is not supported. Variables are shown in italics. Their values are given at the end of the tables (page F-18) according to the reference numbers in brackets after the command description, e.g., [21].

Table F-1 Commands Supported in Native and Miscellaneous ASCII Personalities

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---------------------|---------------------------|------------------|---------------|------------|
| Monitor Mode | | | | |
| Monitor mode on | ESC U | Same | | ENH |
| Monitor mode off | ESC u or ESC X | Same | | ENH |

Table F-1 Continued

Command

| Function | Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---|--------------------------------------|---------------|------------|---------|
| Selecting Personalities | | | | |
| Enhance mode off | ESC - SPACE | Same | ENH | Wyse |
| Enhance mode on | ESC - I | Same | | |
| Select WY-50+ mode | ESC - " | Same | ENH | Wyse |
| Select TVI 910+ mode | ESC - # | Same | ENH | Wyse |
| Select TVI 925 mode | ESC - \$ | Same | ENH | Wyse |
| Select ADDS VP A2 mode | ESC - % | Same | ENH | Wyse |
| Select HZ 1500 mode | ESC - & | Same | ENH | Wyse |
| Select TVI 912/920 mode | ESC - ' | Same | ENH | Wyse |
| Select TVI 950 mode | ESC - (| Same | ENH | Wyse |
| Select ADM 31 mode | ESC - + | Same | ENH | Wyse |
| Select Native mode | ESC - 4 | Same | ENH | Wyse |
| Select PC Terminal | ESC - 5 | Same | ENH | Wyse |
| Select PC Graphics | ESC - ? | Same | ENH | Wyse |
| Select VT52 mode | ESC - 6 | Same | ENH | Wyse |
| Select VT100 mode | ESC - ; | Same | ENH | Wyse |
| Select VT220 7-bit mode | ESC - < | Same | ENH | Wyse |
| Select VT220 8-bit mode | ESC - = | Same | ENH | Wyse |
| Select TEK 4010/4014 mode | ESC - > | Same | ENH | Wyse |
| Communicating with the Computer | | | | |
| Enable transmission | CTRL Q | Same | Same | |
| Stop transmission | CTRL S | Same | Same | |
| Send ACK (if ACK mode on) | CTRL E | Same | | |
| ACK mode off | ESC e 6 | Same | | Wyse |
| ACK mode on | ESC e 7 | Same | | Wyse |
| Full-duplex mode on | ESC C ESC D F | Same | | ENH |
| Half-duplex mode on | ESC C ESC D H | Same | | ENH |
| Block mode on | ESC B | Same | | ENH |
| Half-duplex block mode on | ESC D H ESC B | Same | | ENH |
| Select MODEM port for data communications | ESC e 8 | Same | | |
| Select AUX port for data communications | ESC e 9 | Same | | |
| Set MODEM port operating parameters [1,2,3,4] | ESC c 0 <i>baud stop parity word</i> | Same | | ENH |
| Set AUX port operating parameters [1,2,3,4] | ESC c 1 <i>baud stop parity word</i> | Same | | ENH |

Table F-1 Continued

| Function | Command | | | |
|--|---------------------------------|---------------|------------|----------------|
| | Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
| Set MODEM port receive handshaking [5] | ESC c 2 <i>hndshk</i> | Same | | ENH |
| Set-AUX port receive handshaking [5] | ESC c 3 <i>hndshk</i> | Same | | ENH |
| Set MODEM port transmit handshaking [5] | ESC c 4 <i>hndshk</i> | Same | | ENH |
| Set AUX port transmit handshaking | ESC c 5 <i>hndshk</i> | Same | | ENH |
| Set maximum data transmission speed [6] | ESC c 6 <i>max</i> | Same | | Wyse |
| Send terminal ID | ESC SPACE | Same | | |
| Program answerback message [7] | ESC c ; <i>answer</i> CTRL Y | Same | | |
| Send answerback message | ESC c < | Same | | |
| Conceal answerback message | ESC c = | Same | | |
| Answerback mode off | ESC e SPACE | Same | | |
| Answerback mode on | ESC e ! | Same | | |
| Load time of day [8,9] | ESC c 8 <i>hh mm</i> | Same | | Wyse |
| Controlling the Terminal and Keyboard | | | | |
| Local edit mode on | ESC k | Same | | ENH |
| Duplex edit mode on | ESC l | Same | | ENH |
| Restore tabs off | ESC e : | Same | | ENH |
| Restore tabs on | ESC e ; | Same | | ENH |
| Sound bell | CTRL G | Same | Same | Same |
| Unlock keyboard | CTRL N or ESC " | Same | CTRL B | ENH or -ACK |
| Lock keyboard | CTRL O or ESC # | Same | CTRL D | ENH or -NAK |
| Keyclick off | ESC e \$ | Same | | ENH |
| Keyclick on | ESC e % | Same | | ENH |
| CAPS LOCK on | ESC e & | Same | | ENH |
| CAPS LOCK off | ESC e ' | Same | | ENH |
| Margin bell off | ESC e L | Same | | ENH |
| Set margin bell at cursor position | ESC ' J | Same | | ENH |
| Margin bell on | ESC e M | Same | | ENH |
| Key repeat off | ESC e , | Same | | ENH |
| Key repeat on | ESC e - | Same | | ENH |
| Define CAPS LOCK key as CAPS LOCK | ESC e T | Same | | |
| Define CAPS LOCK key as REV | ESC e U | Same | | |

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---|---|------------------|---------------|------------|
| Redefining the Keys | | | | |
| Program function key definition [10,11] | ESC z <i>fkey</i> <i>sequence</i> DEL | Same | ENH | ENH |
| Program key direction and definition [10,11,12,13] | ESC Z <i>dir key</i> <i>sequence</i> DEL | Same | | |
| Read key direction and definition [11,13] | ESC Z - <i>key</i> | Same | | |
| Clear fkey definition [11] | ESC z <i>fkey</i> DEL | Same | ENH | ENH |
| Set maximum function key transmission speed [6] | ESC c 7 <i>max</i> | Same | | |
| Default all programmable keys | ESC c U | Same | | |
| Screen and Cursor Display | | | | |
| Screen display off | ESC ' 8 | Same | ENH | ENH |
| Screen display on | ESC ' 9 | Same | ENH | ENH |
| Screen saver off | ESC e P | Same | | |
| Screen saver on | ESC e Q | Same | | |
| Reverse screen | ESC ^ 1 | Same | ENH | Wyse |
| Restore normal screen | ESC ^ 0 | Same | ENH | Wyse |
| Set scrolling speed and type [14] | ESC ' <i>scroll</i> | Same | ENH | ENH |
| Set cursor display features [15] | ESC ' <i>cursor</i> | Same | ENH | ENH |
| Cursor display off | ESC ' 0 | Same | CTRL W | |
| Cursor display on | ESC ' 1 | Same | CTRL X | |
| Displaying the Message Fields | | | | |
| Editing status line on | ESC ' a | Same | ENH | ENH |
| Standard status line on | ESC ' b | Same | ENH | ENH |
| Status line off | ESC ' c | Same | ENH | ENH |
| Program/display computer message on status line [16] | ESC F <i>message</i> CR | Same | | ENH |
| Program computer message on unshifted label line ¹ [17] | ESC z (<i>text</i> CR | Same | ENH | ENH |
| Program computer message on shifted label line [17] | ESC z) <i>text</i> CR | Same | ENH | ENH |
| Turn off unshifted label line | ESC A 11' | Same | | ENH |
| Turn off shifted label line | ESC z DEL | Same | ENH | ENH |
| Clear unshifted label line | ESC z (CR | Same | ENH | ENH |
| Clear shifted label line | ESC z) CR | Same | ENH | ENH |

1. Automatically displayed in native mode; may be hidden by assigning blank attribute (ESC A 1 1)

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|--|----------------------------------|------------------|---------------|------------|
| Program/display function key label [18,19] | ESC z <i>field label</i> CR | Same | ENH | ENH |
| Clear function key label [19] | ESC z <i>field</i> CR | Same | ENH | ENH |
| Defining the Data Area | | | | |
| Select 80-column display | ESC ' : | Same | | |
| Select 132-column display | ESC ' ; | Same | | |
| Width-change-clear mode off | ESC e . | Same | | Wyse |
| Width-change-clear mode on | ESC e / | Same | | Wyse |
| Display 24 data lines ² | ESC e (| Same | | |
| Display 25 data lines ² | ESC e) | Same | | |
| Display Memory/Split Screen | | | | |
| Page size = 1 x data lines | ESC w G | Same | | |
| Page size = 2 x data lines | ESC w H | Same | | |
| Display previous page | ESC w B or ESC J ³ | Same | | |
| Display next page | ESC w C or ESC K ³ | Same | | |
| Display page 0 | ESC w 0 | Same | | |
| Display page 1 | ESC w 1 | Same | | |
| Split screen horizontally (2 pages only) [20] | ESC x A <i>line</i> | Same | | |
| Split screen horizontally (2 pages only) and clear pages [20] | ESC x 1 <i>line</i> | Same | | |
| Split screen horizontally (multiple pages) [20] | ESC x C <i>line</i> | Same | | |
| Split screen horizontally (multiple pages) and clear pages [20] | ESC x 3 <i>line</i> | Same | | |
| Activate upper window | ESC] | Same | | |
| Activate lower window | ESC } | Same | | |
| Activate other window (or page ³) | ESC J or ESC K | Same | | |
| Lower horizontal split | ESC x P | Same | | |
| Raise horizontal split | ESC x R | Same | | |
| Roll window up in page | ESC w E | Same | | |
| Roll window down in page | ESC w F | Same | | |
| Redefine screen as one window | ESC x @ | Same | | |
| Redefine screen as one window and clear pages | ESC x 0 | Same | | |

2. Screen cleared

3. If screen is not split

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---|---------------------------|-------------------|-------------------|----------------|
| Display Attributes | | | | |
| Assign display attribute to a message field [21,22] | ESC A <i>n attr</i> | Same | | ENH |
| Assign character display attribute [22] | ESC G <i>attr</i> | Same | | ENH |
| Character attribute mode off | ESC e 0 | | | |
| Character attribute mode on | ESC e 1 | | | |
| Page attribute mode on | ESC e 2 | Same | | |
| Line attribute mode on | ESC e 3 | Same | | |
| Assign write-protected character display attribute [23] | ESC ' <i>wpca</i> | Same | ESC 0 | |
| Clear unprotected page to display attribute [22] | | ESC ! <i>attr</i> | ENH | ENH |
| Assign line attribute [24] | ESC G <i>lattr</i> | Same | | |
| Set tag protect attribute | | | CTRL N | |
| Reset tag protect attribute | | | CTRL O | |
| Protecting Data | | | | |
| Write-protect mode off | ESC (| Same | CTRL O | - US |
| Write-protect mode on | ESC) | Same | CTRL N | - EM |
| Clear cursor column to write-protected spaces | ESC V | Same | | ENH |
| Protect mode off | ESC ' | Same | ENH | ENH |
| Protect mode on | ESC & | Same | ENH | ENH |
| Graphics Characters | | | | |
| Line drawing graphics mode on | ESC H CTRL B | Same | | ENH |
| Line drawing graphics mode off | ESC H CTRL C | Same | | ENH |
| Line drawing display graphics character [25] | ESC H <i>key</i> | Same | | ENH |
| Controlling the Cursor | | | | |
| Cursor left (backspace) | CTRL H | Same | Same or CTRL U | Same |
| Cursor right | CTRL | Same | CTRL F | CTRL P |
| Cursor up; no scroll | CTRL K | Same | CTRL Z | - FF |
| Cursor up; scroll (reverse linefeed) | ESC j | Same | ENH | ENH |
| Cursor down; no scroll | | | | ENH or - VT |
| Cursor down; scroll (linefeed) | CTRL J | Same | Same | Same |
| Cursor to start of line | CTRL M | Same | Same | Same |
| Cursor to start of next line | CTRL _ | Same | ENH | ENH |

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|--|------------------------------------|------------------|--------------------|-----------------|
| Home cursor | ESC { or CTRL ^ | Same | ENH or CTRL A | ENH or - DC2 |
| Cursor to specific column | | | CTRL P <i>col</i> | |
| Cursor to specific line | | | CTRL K <i>line</i> | |
| End-of-line wrap off | ESC d . | Same | | |
| End-of-line wrap on | ESC d / | Same | | |
| Received CRLF mode off | ESC e 4 | Same | | |
| Received CRLF mode on | ESC e 5 | Same | | |
| Autopage mode off | ESC d * | Same | | |
| Autopage mode on | ESC d + | Same | | |
| Autoscrolling mode off | ESC N | Same | | ENH |
| Autoscrolling mode on | ESC O | Same | | ENH |
| Line lock mode on (lock line at cursor) | ESC ' H | Same | | |
| Line lock mode off | ESC ' I | Same | | |
| Address cursor in 80-column current page [20] | ESC = <i>line col</i> | Same | ENH or ESC Y | ENH or - DC1 |
| Address cursor in specific 80-column page [26,20] | ESC w @ <i>page line col</i> | Same | ENH | |
| Address cursor in specific 80-column window/page ⁹ [26,20] | ESC - <i>wnd/page line col</i> | Same | ENH | |
| Address cursor in 80/132-column current page [27,28] | ESC a <i>lll R ccc C</i> | Same | ENH | ENH |
| Read cursor line and column address in 80-column current page | ESC ? | Same | ENH | - ENQ |
| Read 80-column page number and cursor address | ESC w ' | Same | | |
| Read 80-column window/page number and cursor address | ESC / | Same | | |
| Read cursor address in 80/132-column page | ESC b | Same | | ENH |
| Editing | | | | |
| Clear all tab stops | ESC 0 | Same | | ESC 3 |
| Set tab stop | ESC 1 | Same | | ENH |
| Clear tab stop | ESC 2 | Same | | ENH |
| Tabulate cursor | ESC i or CTRL I | Same | ENH | |
| Backtab | ESC I | Same | ENH | ENH |
| Insert mode on, replace mode off | ESC q | Same | ENH | ENH |

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---|---------------------------|-------------------|------------------|-----------------|
| Insert mode off, replace mode on | ESC r | Same | ENH | ENH |
| Page edit mode off | ESC e " | Same | | |
| Page edit mode on | ESC e # | Same | | |
| Insert space character | ESC Q | Same | ENH | ENH |
| Insert line of spaces | ESC E | Same | ENH | ENH or - SUB |
| Insert column of nulls | ESC c M | | | |
| Delete cursor character | ESC W | Same | ENH | ENH |
| Delete cursor line | ESC R | Same | ESC 1 | ENH or - DC3 |
| Delete cursor column | ESC c J | | | |
| Clearing Data | | | | |
| Clear page to nulls | ESC * | Same | ENH | ENH |
| Clear page to spaces | ESC + | Same | ENH or CTRL L | ENH or - FS |
| Clear page to write-protected spaces | ESC , | Same | ENH | ENH or - ETB |
| Clear unprotected page to spaces | ESC ; or CTRL Z | Same | ESC ; | ENH or - GS |
| Clear unprotected page to nulls | ESC : | Same | ENH | ENH |
| Clear unprotected page to a specific character [29] | ESC . <i>char</i> | Same | ENH | ENH |
| Clear unprotected page to display attribute [22] | | ESC ! <i>attr</i> | ENH | ENH |
| Clear unprotected page to spaces from cursor | ESC Y | Same | ESC k | ENH or -CAN |
| Clear unprotected page to nulls from cursor | ESC y | Same | ENH | ENH |
| Clear unprotected page foreground to spaces | ESC c P | Same | | |
| Clear unprotected page foreground to nulls | ESC c Q | Same | | |
| Clear unprotected line to spaces from cursor | ESC T | Same | ESC K | ENH or -SI |
| Clear unprotected line to nulls from cursor | ESC t | Same | | ENH |
| Clear unprotected to end of line with spaces | ESC c O | Same | | |
| Clear unprotected to end of line with nulls | ESC c L | Same | | |
| Clear unprotected line foreground to spaces | ESC c R | Same | | |
| Clear unprotected line foreground to nulls | ESC c S | Same | | |
| Clear unprotected column to nulls | ESC c K | | | |
| Clear unprotected column to specific character [29] | ESC c I <i>char</i> | | | |

Table F-1 Continued

| Function | Command Native Mode | WY-50+ ADM 31 | ADDS VP A2 | HZ 1500 |
|---|--|------------------|---------------|------------|
| Sending Data | | | | |
| Begin print/send at top of page | ESC d ' | Same | | |
| Begin print/send at top of screen | ESC d & | Same | | |
| Send cursor character | ESC M | Same | | ENH |
| Send line then cursor | ESC 6 | Same | | ENH |
| Send unprotected line through cursor | ESC 4 | Same | | ENH |
| Send page through cursor | ESC 7 | Same | ENH | ENH |
| Send unprotected page through cursor | ESC 5 | Same | | ENH |
| Mark block beginning | ESC 8 | Same | ENH | ENH |
| Mark block end | ESC 9 | Same | ENH | ENH |
| Send entire block | ESC s | Same | ENH | ENH |
| Send unprotected characters in block | ESC S | Same | ENH | ENH |
| Print Functions | | | | |
| Print formatted page | ESC P | Same | ENH | ENH |
| Print formatted unprotected page | ESC @ | Same | ENH | ENH |
| Print unformatted page | ESC p or ESC L | Same | ESC p | ENH |
| Auxiliary print mode off | CTRL T | Same | Same | ENH |
| Auxiliary print mode on | CTRL R | Same | Same | ENH |
| Transparent print mode off | CTRL T | Same | ESC 4 | ENH |
| Transparent print mode on | ESC d # | Same | ESC 3 | ENH |
| Secondary receive mode off | ESC d SPACE | Same | | ENH |
| Secondary receive mode on | ESC d ! | Same | | ENH |
| Bidirectional mode off | ESC d \$ | Same | | ENH |
| Bidirectional mode on | ESC d % | Same | | ENH |
| Character Sets | | | | |
| Select primary character set | ESC c D | Same | | |
| Select secondary character set | ESC c E | Same | | |
| Define primary character set [32] | ESC c B <i>bank</i> | Same | | |
| Define secondary character set [32] | ESC c C <i>bank</i> | Same | | |
| Automatic font loading off | ESC e N | Same | | |
| Automatic font loading on | ESC e O | Same | | |
| Load font bank with predefined character set [32,33] | ESC c @ <i>bank set</i> | Same | | |
| Clear font bank [32] | ESC c ? <i>bank</i> | Same | | |
| Define and load character [32,34,35] | ESC c A <i>bank pp</i> <i>bb...bb</i> | Same | | |

Table F-2 Commands Supported in TeleVideo Modes

| Function | Command | | | | |
|--|-------------------|----------------|------|------|------|
| | Native Mode | TeleVideo 910+ | 920 | 925 | 950 |
| Monitor Mode | | | | | |
| Monitor mode on | ESC U | Same | Wyse | Same | Same |
| Monitor mode off | ESC u or ESC X | Same | Wyse | Same | Same |
| Selecting Other Personalities | | | | | |
| Enhance mode off | ESC ~ SPACE | ENH | ENH | ENH | ENH |
| Enhance mode on | ESC ~ ! | ENH | ENH | ENH | ENH |
| Select WY-50+ mode | ESC ~ " | Wyse | Wyse | Wyse | Wyse |
| Select TVI 910+ mode | ESC ~ # | Wyse | Wyse | Wyse | Wyse |
| Select TVI 925 mode | ESC ~ \$ | Wyse | Wyse | Wyse | Wyse |
| Select ADDS VP A2 mode | ESC ~ % | Wyse | Wyse | Wyse | Wyse |
| Select HZ 1500 mode | ESC ~ & | Wyse | Wyse | Wyse | Wyse |
| Select TVI 912/920 mode | ESC ~ ' | Wyse | Wyse | Wyse | Wyse |
| Select TVI 950 mode | ESC ~ (| Wyse | Wyse | Wyse | Wyse |
| Select ADM 31 mode | ESC ~ + | Wyse | Wyse | Wyse | Wyse |
| Select Native mode | ESC ~ 4 | Wyse | Wyse | Wyse | Wyse |
| Select PC terminal | ESC ~ 5 | Wyse | Wyse | Wyse | Wyse |
| Select PC graphics | ESC ~ ? | Wyse | Wyse | Wyse | Wyse |
| Select VT52 mode | ESC ~ 6 | Wyse | Wyse | Wyse | Wyse |
| Select VT100 mode | ESC ~ ; | Wyse | Wyse | Wyse | Wyse |
| Select VT220-7 bit mode | ESC ~ < | Wyse | Wyse | Wyse | Wyse |
| Select VT220-8 bit mode | ESC ~ = | Wyse | Wyse | Wyse | Wyse |
| Select TEK 4010/4014 mode | ESC ~ > | Wyse | Wyse | Wyse | Wyse |
| Communicating with the Computer | | | | | |
| Enable transmission | CTRL Q | Same | Same | Same | Same |
| Stop transmission | CTRL S | Same | Same | Same | Same |
| Send ACK (if ACK mode on) | CTRL E | Wyse | Wyse | Wyse | Wyse |
| ACK mode off | ESC e 6 | ENH | ENH | ENH | ENH |
| ACK mode on | ESC e 7 | ENH | ENH | ENH | ENH |
| Full-duplex mode on | ESC C ESC D F | Same | Wyse | Same | Same |
| Half-duplex mode on | ESC C ESC D H | Same | Wyse | Same | Same |
| Block mode on | ESC B | Same | Wyse | Same | Same |

Table F-2 Continued

| Function | Command | | | | |
|--|--------------------------------------|----------------|--------|-----------|-----------|
| | Native Mode | TeleVideo 910+ | 920 | 925 | 950 |
| Half-duplex block mode on | ESC D H ESC B | Same | Same | Same | Same |
| Set MODEM port operating parameters [1,2,3,4] | ESC c 0 <i>baud stop parity word</i> | | | | ESC { |
| Set AUX port operating parameters [1,2,3,4] | ESC c 1 <i>baud stop parity word</i> | | | | ESC } |
| Enable DTR MODEM port handshaking | ESC c 4 <i>hndshk</i> | CTRL N | CTRL N | CTRL N | CTRL N |
| Enable X-on/X-off MODEM port handshaking | ESC c 5 <i>hndshk</i> | CTRL O | CTRL O | CTRL O | CTRL O |
| Send terminal ID | ESC SPACE | ESC M | ESC M | ESC M | |
| Load time of day [8,9] | ESC c 8 <i>hh mm</i> | | | ESC SPACE | ESC SPACE |
| Controlling the Terminal and Keyboard | | | | | |
| Local edit mode on | ESC k | Same | | Same | Same |
| Duplex edit mode on | ESC l | Same | | Same | Same |
| Sound bell | CTRL G | Same | Same | Same | Same |
| Unlock keyboard | CTRL N or ESC " | ESC " | ESC " | ESC " | ESC " |
| Lock keyboard | CTRL O or ESC # | ESC # | ESC # | ESC # | ESC # |
| Keyclick off | ESC e \$ | ESC < | | ESC < | ESC < |
| Keyclick on | ESC e % | ESC > | | ESC > | ESC > |
| CAPS LOCK on | ESC e & | ENH | | ENH | ENH |
| CAPS LOCK off | ESC e ' | ENH | | ENH | ENH |
| Key repeat off | ESC e , | ENH | ENH | ENH | ENH |
| Key repeat on | ESC e - | ENH | ENH | ENH | ENH |
| Redefining the Keys | | | | | |
| Program function key definition [10,11] | ESC z <i>fkey sequence DEL</i> | ENH | ENH | ENH | ENH |
| Program key direction and definition [10,11,12,13] | ESC Z <i>dir key sequence DEL</i> | ESC | ESC | ESC | ESC |
| Screen and Cursor Display | | | | | |
| Screen display off | ESC ' 8 | ESC o | ESC o | ESC o | ESC o |
| Screen display on | ESC ' 9 | ESC n | ESC n | ESC n | ESC n |
| Screen saver off | ESC e P | ENH | ENH | ENH | ENH |

Table F-2 Continued

| Function | Command | | | | |
|--|----------------------------------|--------------------|--------------------|--------------------|--------------------|
| | Native Mode | TeleVideo 910+ | 920 | 925 | 950 |
| Screen saver on | ESC e Q | ENH | ENH | ENH | ENH |
| Reverse screen | ESC ^ 1 | ESC b | ESC b | ESC b | |
| Restore normal screen | ESC ^ 0 | ESC d | ESC d | ESC d | ESC d |
| Smooth scrolling on | | ESC 8 ¹ | ESC 8 ¹ | ESC 8 ¹ | ESC 8 |
| Smooth scrolling off | | ESC 9 ¹ | ESC 9 ¹ | ESC 9 ¹ | ESC 9 |
| Set cursor display features [15] | ESC ' <i>cursor</i> | ESC . | ESC . | ESC . | ESC . |
| Displaying the Message Fields | | | | | |
| Program/display computer message on status line [16] | ESC F <i>message</i> CR | ENH | ENH | ENH | ENH |
| Program computer message on unshifted label line ² [17] | ESC z (<i>text</i> CR | ESC f ¹ | ESC f ¹ | ESC f ¹ | ESC f |
| Turn on unshifted label line | | ESC g ¹ | ESC g ¹ | ESC g | ESC g |
| Turn off unshifted label line | ESC A 11 ² | ESC h ¹ | ESC h ¹ | ESC h | ESC h |
| Turn off shifted label line | ESC z DEL | ENH | ENH | ENH | ENH |
| Clear shifted label line | ESC z) CR | ENH | ENH | ENH | ENH |
| Program/display function key label [18,19] | ESC z <i>field label</i> CR | ENH | ENH | ENH | ENH |
| Clear function key label [19] | ESC z <i>field</i> CR | ENH | ENH | ENH | ENH |
| Display Memory | | | | | |
| Display previous page | ESC w B or ESC J ⁴ | ESC J | ESC J | ESC J | ESC J. |
| Display next page | ESC w C or ESC K ⁴ | ESC K | ESC K | ESC K | ESC K |
| Display Attributes | | | | | |
| Assign display attribute to a message field [21,22] | ESC A <i>n attr</i> | ESC \ ³ | ESC \ ³ | ESC \ ³ | ESC \ ³ |
| Assign character display attribute [22] | ESC G <i>attr</i> | Same | Same | Same | Same |
| Clear unprotected page to display attribute | | Wyse | Wyse | Wyse | ENH |
| Start reverse video | | ESC j | | | |

1. With enhance mode on

2. Automatically displayed in native mode; may be hidden by assigning blank attribute (ESC A 1 1)

3. With enhance mode off

4. If screen is not split

Table F-2 Continued

| Function | Command | | | | |
|---|--------------------|---------------------|---------------------|---------------------|---------------------|
| | Native Mode | TeleVideo 910+ | 920 | 925 | 950 |
| End reverse video | | | ESC k | | |
| Start underline | | | ESC l | | |
| End underline | | | ESC m | | |
| Start blink | | | ESC ^ | | |
| End blink | | | ESC q | | |
| Start blank | | | ESC _ | | |
| End blank | | | ESC q | | |
| Protecting Data | | | | | |
| Write-protect mode off | ESC (| Same | Same | Same | Same |
| Write-protect mode on | ESC) | Same | Same | Same | Same |
| Clear cursor column to write-protected spaces | ESC V | Same | Same | Same | Same |
| Protect mode off | ESC ' | Same | Same | Same | Same |
| Protect mode on | ESC & | Wyse | Same | Same | Same |
| Graphics Characters | | | | | |
| Line drawing graphics mode on | ESC H CTRL B | ESC \$ ¹ | ESC \$ ¹ | ESC \$ ¹ | ESC \$ ¹ |
| Line drawing graphics mode off | ESC H CTRL C | ESC % ¹ | ESC % ¹ | ESC % ¹ | ESC % ¹ |
| Controlling the Cursor | | | | | |
| Cursor left (backspace) | CTRL H | Same | Same | Same | Same |
| Cursor right | CTRL L | Same | Same | Same | Same |
| Cursor up; no scroll | CTRL K | Same | Same | Same | Same |
| Cursor up; scroll (reverse linefeed) | ESC j | Wyse | | Same | Same |
| Cursor down; no scroll | | CTRL V | CTRL V | CTRL V | CTRL V |
| Cursor down; scroll (linefeed) | CTRL J | Same | Same | Same | Same |
| Cursor to start of line | CTRL M | Same | Same | Same | Same |
| Cursor to start of next line | CTRL _ | Same | Same | Same | Same |
| Home cursor | ESC { or CTRL ^ | Wyse Same | Wyse Same | Wyse Same | Wyse Same |
| Cursor to specific column | | ESC] | | | |
| Cursor to specific line | | ESC [| | | |
| End-of-line wrap off | ESC d . | | | | |

Table F-2 Continued

| Function | Command | TeleVideo | | | |
|--|------------------------------|--------------------|--------------------|--------------------|--------------------|
| | Native Mode | 910+ | 920 | 925 | 950 |
| End-of-line wrap on | ESC d / | | | | |
| Received CR mode off | ESC e 4 | ENH | ENH | ENH | ENH |
| Received CR mode on | ESC e 5 | ENH | ENH | ENH | ENH |
| Autopage mode off | ESC d * | ESC w | ESC w | ESC w | ESC w |
| Autopage mode on | ESC d + | ESC v | ESC v | ESC v | ESC v |
| Line lock mode on | ESC ' H | | | | ESC ! 1 |
| Line lock mode off | ESC ' I | | | | ESC ! 2 |
| Address cursor in 80-column current page [20] | ESC = <i>line col</i> | Same | Same | Same | Same |
| Address cursor in specific 80-column page [26,20] | ESC w @ <i>page line col</i> | ESC - ³ | ESC - ³ | ESC - ³ | ESC - ³ |
| Read cursor address in 80-column current page | ESC ? | Same | Same | Same | |
| Read 80-column window/page number and cursor address | ESC / | ENH | ENH | Same | Same |
| Editing | | | | | |
| Clear all tab stops | ESC 0 | ESC 3 | ESC 3 | ESC 3 | ESC 3 |
| Set tab stop | ESC 1 | Same | Same | Same | Same |
| Clear tab stop | ESC 2 | Same | Same | Same | Same |
| Tabulate cursor | ESC i or CTRL I | CTRL I | CTRL I | CTRL I | CTRL I |
| Backtab | ESC I | Same | Same | Same | Same |
| Field tab | | ESC i | ESC i | ESC i | ESC i |
| Insert mode on, replace mode off | ESC q | ENH | | ENH | Same |
| Insert mode off, replace mode on | ESC r | ENH | | ENH | Same |
| Page edit mode off | ESC e " | | | | ESC O |
| Page edit mode on | ESC e # | | | | ESC N |
| Insert space character | ESC Q | Same | Same | Same | Same |
| Insert line of spaces | ESC E | Same | Same | Same | Same |
| Delete cursor character | ESC W | Same | Same | Same | Same |
| Delete cursor line | ESC R | Same | Same | Same | Same |

Table F-2 Continued

| Function | Command | | | | |
|--|--------------------|-------------------|--------------------|-------------------|--------------------|
| | Native Mode | TeleVideo 910+ | 920 | 925 | 950 |
| Clearing Data | | | | | |
| Clear page to nulls | ESC * | Same | Same | Same | Same |
| Clear unprotected page to spaces | ESC ; or CTRL Z | ESC ; or ESC + | ESC ; or ESC + | ESC ; or ESC + | ESC ; or ESC + |
| Clear unprotected page to protected spaces | | ESC , | | ESC , | ESC , |
| Clear unprotected page to nulls | ESC : | Same | Same | Same | Same |
| Clear unprotected page to display attribute [22] | | ESC ! | ESC ! | ESC ! | ESC ! |
| Clear unprotected page to spaces from cursor | ESC Y | Same | Same | Same | Same |
| Clear unprotected page to nulls from cursor | ESC y | Same | Same | Same | Same |
| Clear unprotected line to spaces from cursor | ESC T | Same | Same | Same | Same |
| Clear unprotected line to nulls from cursor | ESC t | Same | Same | Same | Same |
| Sending Data | | | | | |
| Send entire cursor line | ESC 6 | Same | Same | Same | Same |
| Send unprotected line | ESC 4 | Same | Same | Same | Same |
| Send entire page | ESC 7 | Same | Same | Same | Same |
| Send unprotected page | ESC 5 | Same | Same | Same | Same |
| Send entire block | ESC s | Same | Same | Same | Same |
| Send unprotected characters in block | ESC S | Same | Same | Same | Same |
| Print Functions | | | | | |
| Set print terminator | | ESC p | ESC p | ESC p | ESC p |
| Define delimiters | | ESC x | ESC x ¹ | ESC x | ESC x ¹ |
| Print formatted page | ESC P | Wyse | Same | Same | Same |
| Print unformatted page | ESC p | ESC L | ESC L | | ESC L |
| Print page with time | | | | ESC L | |
| Auxiliary print mode off | CTRL T | ESC A | ESC A | ESC A | ESC A |
| Auxiliary print mode on | CTRL R | ESC @ | ESC @ | ESC @ | ESC @ |
| Transparent print mode off | CTRL T | ESC a | ESC a | ESC a | ESC a |
| Transparent print mode on | ESC d # | ESC ' | ESC ' | ESC ' | ESC ' |
| Bidirectional mode off | ESC d \$ | CTRL T | CTRL T | CTRL T | CTRL T |
| Bidirectional mode on | ESC d % | CTRL R | CTRL R | CTRL R | CTRL R |

Table F-3 PC Terminal
Mode Commands

| Function | Command |
|--|------------------------|
| Monitor Mode | |
| Monitor mode on | ESC U |
| Monitor mode off | ESC u or ESC X |
| Selecting Other Personalities | |
| Enhance mode off | ESC v SPACE |
| Enhance mode on | ESC v ! |
| Select WY-50+ mode | ESC v " |
| Select TVI 910+ mode | ESC v # |
| Select TVI 925 mode | ESC v \$ |
| Select ADDS VP A2 mode | ESC v % |
| Select HZ 1500 mode | ESC v & |
| Select TVI 920 mode | ESC v ' |
| Select TVI 950 mode | ESC v (|
| Select ADM 31 mode | ESC v + |
| Select Native mode | ESC v 4 |
| Select PC Terminal | ESC v 5 |
| Select PC Graphics | ESC v ? |
| Select VT52 mode | ESC v 6 |
| Select VT100 mode | ESC v ; |
| Select VT220-7 bit mode | ESC v < |
| Select VT220-8 bit mode | ESC v = |
| Select TEK 4010/4014 mode | ESC v > |
| Communicating with the Computer | |
| Enable transmission | CTRL Q |
| Stop transmission | CTRL S |
| Send ACK (if ACK mode on) | CTRL E |
| Full-duplex mode on | ESC } |
| Half-duplex mode on | ESC { |
| Block mode on | ESC B |
| Block mode off (conversation) | ESC C |
| Enable DTR MODEM port handshaking | CTRL N |
| Enable X-on/X-off MODEM port handshaking | CTRL O |
| Program answerback message [7] | ESC] <i>answer</i> CR |
| Load time of day [8,9] | ESC SPACE <i>hh mm</i> |
| Controlling the Terminal and Keyboard | |
| Local edit mode on | ESC k |
| Duplex edit mode on | ESC l |
| Sound bell | CTRL G |

Table F-3 Continued

| Function | Command |
|--|--------------------------------|
| Unlock keyboard | ESC " |
| Lock keyboard | ESC # |
| Keyclick off | ESC < |
| Keyclick on | ESC > |
| Margin bell off | ESC n |
| Turn margin bell on and set position | ESC o |
| Read status | ESC [|
| Default unit | ESC m |
| Redefining the Keys | |
| Program function key definition [10,11] | ESC z <i>fkey sequence</i> DEL |
| Program key direction & definition [10,11,12,13] | ESC |
| Screen and Cursor Display | |
| Screen display off | ESC O |
| Screen display on | ESC N |
| Set cursor display features [15] | ESC . |
| User line display off | ESC e |
| Display 25 data lines | ESC ^ |
| Displaying the Message Fields | |
| Program computer message on unshifted label line ¹ [17] | ESC f |
| Display Attributes | |
| Assign character display attribute [22] | ESC G <i>attr</i> |
| Protecting Data | |
| Write-protect mode off | ESC (|
| Write-protect mode on | ESC) |
| Protect mode off | ESC ' |
| Protect mode on | ESC & |
| Graphics Characters | |
| Line drawing graphics mode on | ESC \$ |
| Line drawing graphics mode off | ESC % |
| Controlling the Cursor | |
| Cursor left (backspace) | CTRL H |
| Cursor right | CTRL L |
| 1. With enhance mode off | |

Table F-3 Continued

| Function | Command |
|---|---------------------------------|
| Cursor up; no scroll | CTRL K |
| Cursor up; scroll (reverse linefeed) | ESC j |
| Cursor down; no scroll | CTRL V |
| Cursor down; scroll (linefeed) | CTRL J |
| Cursor to start of line | CTRL M |
| Cursor to start of next line | CTRL $\bar{_}$ |
| Home cursor | CTRL $\bar{\^}$ |
| End-of-line wrap off | ESC 0 |
| End-of-line wrap on | ESC ~ |
| Received CR mode off | ESC 9 |
| Received CR mode on | ESC 8 |
| Address cursor in 80-column current page [22] | ESC = <i>line col</i> |
| Address cursor in specific 80-column window/page ² [26,20] | ESC - <i>wnd/ page line col</i> |
| Read cursor address in 80-column current page | ESC ? |
| Read 80-column window/page number and cursor address | ESC / |
| Editing | |
| Clear all tab stops | ESC 3 |
| Set tab stop | ESC 1 |
| Clear tab stop | ESC 2 |
| Tabulate cursor | CTRL I |
| Backtab | ESC I |
| Field tab | ESC i |
| Insert mode on, replace mode off | ESC Z |
| Insert mode off, replace mode on | ESC r |
| Insert space character | ESC Q |
| Insert line of spaces | ESC E |
| Delete cursor character | ESC W |
| Delete cursor line | ESC R |
| Clearing Data | |
| Clear page to nulls | ESC * |
| Clear page to write-protected spaces | ESC , |
| Clear unprotected page to spaces | ESC ; or CTRL Z or ESC + |
| Clear unprotected page to nulls | ESC : |
| 2. If screen is not split | |

Table F-3 Continued

| Function | Command |
|--|---------|
| Clear unprotected page to spaces from cursor | ESC Y |
| Clear unprotected page to nulls from cursor | ESC y |
| Clear unprotected line to spaces from cursor | ESC T |
| Clear unprotected line to nulls from cursor | ESC t |
| Fill page with H's | ESC F |
| Sending Data | |
| Send entire cursor line | ESC 6 |
| Send unprotected line | ESC 4 |
| Send entire page | ESC 7 |
| Send unprotected page | ESC 5 |
| Send entire block | ESC s |
| Send unprotected characters in block | ESC S |
| Report terminal status | ESC [|
| Report attribute under cursor | ESC D |
| Print Functions | |
| Set print terminator | ESC p |
| Define delimiters | ESC x |
| Print formatted page | ESC P |
| Print all unprotected | ESC L |
| Auxiliary print mode off | ESC A |
| Auxiliary print mode on | ESC @ |
| Transparent print mode off | ESC a |
| Transparent print mode on | ESC ' |
| Bidirectional mode off | CTRL T |
| Bidirectional mode on | CTRL R |

Variable Values for Table F-1, F-2, and F-3 Commands

| [1] | <i>baud</i> | MODEM Port | AUX Port | <i>baud</i> | MODEM Port | AUX Port |
|-----|-------------|------------|----------|-------------|------------|----------|
| | 0 | 38400 | 19200 | 9 | 300 | 600 |
| | 1 | 19200 | 9600 | : | | 300 |
| | 2 | 9600 | 7200 | ; | 134.5 | |
| | 3 | 4800 | 4800 | < | 110 | 134.5 |
| | 4 | 2400 | | = | | 110 |
| | 5 | | 2400 | > | 50 | 50 |
| | 7 | 1200 | | ? | 200 | 200 |
| | 8 | 600 | 1200 | @ | 7200 | 38400 |

| | | | | | |
|------------|-------------|------------------|------------|---------------|-------------------|
| [2] | <i>stop</i> | Stop Bits | [3] | <i>parity</i> | Parity Bit |
| | 0 | 1 | | 0 | None |
| | 1 | 2 | | 1 | Odd |
| [4] | <i>word</i> | Data Word | | 2 | Mark |
| | 0 | 7 bits | | 3 | Even |
| | 1 | 8 bits | | 4 | Space |

| | | | | |
|---------------|-----------------------------|-----------------|------------|---------------------------|
| [5] | Handshaking Protocol | [6] | <i>max</i> | Maximum Speed |
| <i>hndshk</i> | Receive | Transmit | 1 | 60 characters per second |
| 0 | None | None | 2 | None |
| 1 | X-on/X-off | X-on/X-off | 3 | 150 characters per second |
| 2 | DTR | DSR | | |
| 3 | Both | Both | | |

[7] *answer* = Up to 20 characters to define answerback message

[8] *hh* = Hour (two-digit decimal number between 00 and 23)

[9] *mm* = Minutes (two-digit decimal number between 00 and 59)

[10] *sequence* = Up to 255 bytes to be loaded in function key

[11] Function Key Values

| Function | <i>fkey</i> | | Function | <i>fkey</i> | |
|----------|-------------|---------|----------|-------------|---------|
| Key | Unshifted | Shifted | Key | Unshifted | Shifted |
| F1 | @ | ' | F9 | H | h |
| F2 | A | a | F10 | I | i |
| F3 | B | b | F11 | J | j |
| F4 | C | c | F12 | K | k |
| F5 | D | d | F13 | L | l |
| F6 | E | e | F14 | M | m |
| F7 | F | f | F15 | N | n |
| F8 | G | g | F16 | O | o |

| | | |
|-------------|------------|------------------|
| [12] | <i>dir</i> | Direction |
| | 0 | Normal |
| | 1 | Remote |
| | 2 | Local |

[13] Editing Key Values

Keyboard Style

WY-99GT

ASCII

VT220

Enhanced PC

key
Value

| | | | |
|-----------------|-----------------|----------------------------|-------|
| ESC | | ESC | SPACE |
| SHIFT ESC | | SHIFT ESC | % |
| TAB | TAB | TAB→ | ! |
| SHIFT TAB | SHIFT TAB | SHIFT TAB→ | & |
| BACKSPACE | ⊠ | ←BACKSPACE | " |
| SHIFT BACKSPACE | SHIFT ⊠ | SHIFT ←BACKSPACE | ' |
| DEL | REMOVE | | # |
| SHIFT DEL | SHIFT REMOVE | | (|
| RETURN | RETURN | ENTER | \$ |
| SHIFT RETURN | SHIFT RETURN | SHIFT ENTER |) |
| HOME | | HOME | * |
| SHIFT HOME | | SHIFT HOME | / |
| ▲ | ▲ | ↑ | + |
| SHIFT ▲ | SHIFT ▲ | SHIFT ↑ | 0 |
| ▼ | ▼ | ↓ | , |
| SHIFT ▼ | SHIFT ▼ | SHIFT ↓ | 1 |
| ◀ | ◀ | ← | - |
| SHIFT ◀ | SHIFT ◀ | SHIFT ← | 2 |
| ▶ | ▶ | → | . |
| SHIFT ▶ | SHIFT ▶ | SHIFT → | 3 |
| ENTER | ENTER | ENTER ^{kpd} | s |
| SHIFT ENTER | SHIFT ENTER | SHIFT ENTER ^{kpd} | 4 |
| REPL | PF4 | INSERT | q |
| INS | SHIFT PF4 | SHIFT INSERT | p |
| NEXT PAGE | NEXT SCRN | PAGE DOWN | r |
| PREV PAGE | SHIFT NEXT SCRN | SHIFT PAGE DOWN | w |
| SEND | | | u |
| PRINT | | | t |
| CLR LINE | PF3 | | } |
| CLR SCRN | SHIFT PF3 | | z |
| DEL CHAR | PF2 | DELETE | 5 |
| DEL LINE | SHIFT PF2 | SHIFT DELETE | 6 |
| INS CHAR | | | 7 |
| INS LINE | | | 8 |
| | F17 | | Q |

[13] Continued

Keyboard Style
WY-99GT
ASCII

VT220
SHIFT F17

F18
SHIFT F18
F19
SHIFT F19
F20
SHIFT F20

| | |
|--------------------|------------------|
| Enhanced PC | <i>key Value</i> |
| | W |
| PRINT SCREEN | R |
| SHIFT PRINT SCREEN | X |
| | S |
| | Y |
| | T |
| | Z |
| | P |
| | V |
| END | \ |
| SHIFT END |] |
| PAGE UP | : |
| SHIFT PAGE UP | ; |

[14]

| | | |
|---------------|-----------------------|--------------------|
| <i>scroll</i> | Scrolling Type | Speed (lps) |
| @ | Jump scroll | |
| < | Smooth scroll | 1 |
| = | Smooth scroll | 2 |
| > | Smooth scroll | 4 |
| ? | Smooth scroll | 8 |

[15]

| | |
|---------------|-----------------------|
| <i>cursor</i> | Cursor Display |
| 0 | Cursor display off |
| 1 | Cursor display on |
| 2 | Steady block cursor |
| 3 | Blinking line cursor |
| 4 | Steady line cursor |
| 5 | Blinking block cursor |

| | | | |
|-------------|-------------------------|-------------------------|--------------------------|
| | Character String | 80-Column Screen | 132-Column Screen |
| [16] | <i>message</i> | 46 characters | 98 characters |
| [17] | <i>text</i> | 78 characters | 130 characters |
| [18] | <i>label</i> | 9 characters | 7 characters |

[19]

| | | | | | | | |
|------------|--------------|------------------|----------------|------------|--------------|------------------|----------------|
| Key | <i>field</i> | Unshifted | Shifted | Key | <i>field</i> | Unshifted | Shifted |
| F1 | | 0 | P | F9 | | 8 | X |
| F2 | | 1 | Q | F10 | | 9 | Y |
| F3 | | 2 | R | F11 | | : | Z |
| F4 | | 3 | S | F12 | | ; | [|
| F5 | | 4 | T | F13 | | < | \ |
| F6 | | 5 | U | F14 | | = |] |
| F7 | | 6 | V | F15 | | > | ^ |
| F8 | | 7 | W | F16 | | ? | SPACE |

[20] ASCII Line and Column Codes (Native Mode¹)

| Line/ Column | line/ col | Line/ Column | line/ col | Line/ Column | line/ col | Line/ Column | line/ col |
|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|
| 1 | space | 25 | 8 | 49 | P | 73 | h |
| 2 | ! | 26 | 9 | 50 | Q | 74 | i |
| 3 | " | 27 | : | 51 | R | 75 | j |
| 4 | # | 28 | ; | 52 | S | 76 | k |
| 5 | \$ | 29 | < | 53 | T | 77 | l |
| 6 | % | 20 | = | 54 | U | 78 | m |
| 7 | & | 31 | > | 55 | V | 79 | n |
| 8 | ' | 32 | ? | 56 | W | 80 | o |
| 9 | (| 33 | @ | 57 | X | 81 | p |
| 10 |) | 34 | A | 58 | Y | 82 | q |
| 11 | * | 35 | B | 59 | Z | 83 | r |
| 12 | + | 36 | C | 60 | [| 84 | s |
| 13 | , | 37 | D | 61 | \ | 85 | t |
| 14 | - | 38 | E | 62 |] | 86 | u |
| 15 | . | 39 | F | 63 | ^ | 87 | v |
| 16 | / | 40 | G | 64 | _ | 88 | w |
| 17 | 0 | 41 | H | 65 | ` | 89 | x |
| 18 | 1 | 42 | I | 66 | a | 90 | y |
| 19 | 2 | 43 | J | 67 | b | 91 | z |
| 20 | 3 | 44 | K | 68 | c | 92 | { |
| 21 | 4 | 45 | L | 69 | d | 93 | |
| 22 | 5 | 46 | M | 70 | e | 94 | } |
| 23 | 6 | 47 | N | 71 | f | 95 | ~ |
| 24 | 7 | 48 | O | 72 | g | 96 | DEL/RUB |

1. Native codes also recognized in WY-50+, ADM 31, TeleVideo 910+/920/925/950, VT52, PC Terminal and Graphics modes, and in ADDS VP A2 mode absolute cursor addressing

ASCII Line Codes (ADDS VP A2, HZ 1500)

| ADDS VP A2 | | ADDS VP A2 | | ADDS VP A2 | | ADDS VP A2 | |
|------------|---------|------------|---------|------------|---------|------------|---------|
| Line | HZ 1500 | Line | HZ 1500 | Line | HZ 1500 | Line | HZ 1500 |
| 1 | CTRL @ | 7 | CTRL F | 13 | CTRL L | 19 | CTRL R |
| 2 | CTRL A | 8 | CTRL G | 14 | CTRL M | 20 | CTRL S |
| 3 | CTRL B | 9 | CTRL H | 15 | CTRL N | 21 | CTRL T |
| 4 | CTRL C | 10 | CTRL I | 16 | CTRL O | 22 | CTRL U |
| 5 | CTRL D | 11 | CTRL J | 17 | CTRL P | 23 | CTRL V |
| 6 | CTRL E | 12 | CTRL K | 18 | CTRL Q | 24 | CTRL W |

ASCII Column Codes (ADDS VP A2, HZ 1500)

| Column | ADDS VP A2 | HZ 1500 | Column | ADDS VP A2 | HZ 1500 | Column | ADDS VP A2 | HZ 1500 |
|--------|---------------|------------|--------|---------------|------------|--------|---------------|------------|
| 1 | CTRL @ | CTRL @ | 28 | ' | ! | 55 | T | < |
| 2 | CTRL A | CTRL A | 29 | (| " | 56 | U | = |
| 3 | CTRL B | CTRL B | 30 |) | # | 57 | V | > |
| 4 | CTRL C | CTRL C | 31 | 0 | \$ | 58 | W | ? |
| 5 | CTRL D | CTRL D | 32 | 1 | % | 59 | X | @ |
| 6 | CTRL E | CTRL E | 33 | 2 | & | 60 | Y | A |
| 7 | CTRL F | CTRL F | 34 | 3 | ' | 61 | / | B |
| 8 | CTRL G | CTRL G | 35 | 4 | (| 62 | a | C |
| 9 | CTRL H | CTRL H | 36 | 5 |) | 63 | b | D |
| 10 | CTRL I | CTRL I | 37 | 6 | * | 64 | c | E |
| 11 | CTRL P | CTRL J | 38 | 7 | + | 65 | d | F |
| 12 | CTRL Q | CTRL K | 39 | 8 | , | 66 | e | G |
| 13 | CTRL R | CTRL L | 40 | 9 | - | 67 | f | H |
| 14 | CTRL S | CTRL M | 41 | @ | . | 68 | g | I |
| 15 | CTRL T | CTRL N | 42 | A | / | 69 | h | J |
| 16 | CTRL U | CTRL O | 43 | B | 0 | 70 | i | K |
| 17 | CTRL V | CTRL P | 44 | C | 1 | 71 | p | L |
| 18 | CTRL W | CTRL Q | 45 | D | 2 | 72 | q | M |
| 19 | CTRL X | CTRL R | 46 | E | 3 | 73 | r | N |
| 20 | CTRL Y | CTRL S | 47 | F | 4 | 74 | s | O |
| 21 | SPACE | CTRL T | 48 | G | 5 | 75 | t | P |
| 22 | ! | CTRL U | 49 | H | 6 | 76 | u | Q |
| 23 | " | CTRL V | 50 | I | 7 | 77 | v | R |
| 24 | # | CTRL W | 51 | P | 8 | 78 | w | S |
| 25 | \$ | CTRL X | 52 | Q | 9 | 79 | x | T |
| 26 | % | CTRL Y | 53 | R | : | 80 | y | U |
| 27 | & | SPACE | 54 | S | ; | | | |

| [21] | n | Screen Area |
|------|---|-------------------------|
| | 0 | Data area* |
| | 1 | Function key label line |
| | 2 | Terminal message field |
| | 3 | Computer message field |

* In native mode, only the reverse attribute can be assigned to the data area

[22] Display Attribute Codes

| <i>attr</i> | Display Attributes |
|-------------|--------------------------------------|
| SPACE | Space character |
| 0 | Normal |
| 1 | Invisible |
| 2 | Blink |
| 3 | Invisible |
| 4 | Reverse |
| 5 | Reverse and invisible |
| 6 | Reverse and blink |
| 7 | Reverse, blink, invisible |
| 8 | Underline |
| 9 | Underline and invisible |
| : | Underline and blink |
| ; | Underline, blink, invisible |
| < | Underline and reverse |
| = | Underline, reverse, invisible |
| > | Underline, reverse, blink |
| ? | Underline, reverse, blink, invisible |

| <i>attr</i> | Display Attributes |
|-------------|---|
| p | Dim |
| q | Dim and invisible |
| r | Dim and blink |
| s | Dim, blink, invisible |
| t | Dim and reverse |
| u | Dim, reverse, invisible |
| v | Dim, reverse, blink |
| w | Dim, reverse, blink, invisible |
| x | Dim and underline |
| y | Dim, underline, invisible |
| z | Dim, underline, blink |
| { | Dim, underline, blink, invisible |
| | Dim, underline, reverse |
| } | Dim, underline, reverse, invisible |
| " | Dim, underline, reverse, blink, |
| DEL | Dim, underline, reverse, blink, invisible |

[23] Write-Protected Display Attribute

| <i>wpca</i> | Display Attribute |
|-------------|-------------------|
| 6 | Reverse* |
| 7 | Dim* |
| A | Normal* |
| B | Blink on |
| C | Invisible on |
| E | Underline on |
| F | Reverse on |
| G | Dim on |

* Clears other write-protected attributes

[24] Line Attribute

| <i>lattr</i> | Line Attribute |
|--------------|--|
| @ | Single-high, single-wide characters |
| A | Single-high, double-wide characters |
| B | Top half of double-high, single-wide characters |
| C | Bottom half of double-high, single-wide characters |
| D | Top half of double-high, double-wide characters |
| E | Bottom half of double-high, double-wide characters |
| G | Normal background |
| H | Bold background |
| I | Invisible background |
| J | Dim background |

[25] Graphics Character Codes

| Graphics Character | key | Graphics Character | key | Graphics Character | key | Graphics Character | key |
|--------------------|-----|--------------------|-----|--------------------|-----|--------------------|-----|
| T | 0 | ┆ | 4 | ┆ | 8 | = | < |
| L | 1 | ┆ | 5 | ┆ | 9 | ┆ | = |
| ┆ | 2 | ┆ | 6 | — | : | | > |
| ┆ | 3 | ■ | 7 | ■ | ; | ■ | ? |

- [26] *wnd/page* **Window or Page**
 0 Page 0 or upper window
 1 Page 1 or lower window
- [27] *lll* = One- to three-decimal value of line relative to home
- [28] *ccc* = One- to three-decimal value of column relative to home
- [29] *char* = Character that replaces unprotected characters
- [30] *width* = Column code from [20] for column number representing absolute number of columns to right of cursor
- [31] *height* = Line code from [20] for line number representing absolute number of lines below cursor
- [32] *bank* **Font Bank***
 0 Font bank 0
 1 Font bank 1
 2 Font bank 2
 3 Font bank 3

* Holds predefined character set

- [33] *set* **Predefined Character Set**
 @ Native/WY-50+
 A PC Multinational
 B Standard ASCII
 C Not used
 D PC standard
 E Not used
 F Not used
 G,H US ANSI
 I ANSI Multinational
 J ANSI Alternate Characters
- [34] *pp* = 2-byte hex value of character position*
- [35] *bb...bb* = 32-byte character string defining bit pattern of character

Appendix

G VT52 Command Guide

Table G-1 VT52 Mode Escape Sequences

| Command | Sequence |
|---|-----------------------|
| Move cursor up one line | ESC A |
| Move cursor down one line | ESC B |
| Move cursor right one column | ESC C |
| Move cursor left one column | ESC D |
| Move cursor to home position | ESC H |
| Move cursor up one line with scroll | ESC I |
| Move cursor to line <i>line</i> , column <i>col</i> | ESC Y <i>line col</i> |
| Select graphics character set | ESC F |
| Select U.S. ASCII character set | ESC G |
| Erase from cursor to end of display | ESC J |
| Erase from cursor to end of line | ESC K |
| Print cursor line | ESC V |
| Print display | ESC] |
| Transparent print mode on | ESC W |
| Transparent print mode off | ESC X |
| Copy print mode on | ESC ^ |
| Copy print mode off | ESC _ |
| Keypad application mode on | ESC = |
| Keypad application mode off | ESC > |
| Enter VT100 mode | ESC < |
| Identify terminal | ESC Z |

Appendix

H ANSI Command Guide

Appendix H contains a complete list of ANSI commands. Note that mnemonics beginning with WY are Wyse proprietary, and mnemonics beginning with DEC are Digital Equipment Corporation proprietary. All others are ANSI standard.

Table H-1 Supported ANSI Commands

| Command | Sequence | Mnemonic |
|---|----------|----------|
| Controlling Functional Modes¹ | | |
| Lock keyboard | CSI 2 h | KAM |
| Unlock keyboard | CSI 2 l | KAM |
| Monitor mode on ² | CSI 3 h | CRM |
| Monitor mode off | CSI 3 l | CRM |
| Insert mode on | CSI 4 h | IRM |
| Insert mode off | CSI 4 l | IRM |
| Local echo off | CSI 12 h | SRM |
| Local echo on | CSI 12 l | SRM |
| Control execution off ² | CSI 13 h | FEAM |
| Control execution on ² | CSI 13 l | FEAM |
| Transmit through cursor position | CSI 16 h | TTM |
| Transmit to end of line or end of display | CSI 16 l | TTM |
| New line mode on | CSI 20 h | LNM |
| New line mode off | CSI 20 l | LNM |
| Cursor keys send application-dependent codes | CSI ?1 h | DECCKM |
| Cursor keys send cursor movement codes | CSI ?1 l | DECCKM |
| VT52 mode on | CSI ?2 l | DECANM |
| 132-column display | CSI ?3 h | DECCOLM |
| 80-column display | CSI ?3 l | DECCOLM |

1. More than one mode, but less than 17, may be set with one sequence. Enter multiple numeric parameters separated by semicolons (;). However, you cannot combine sequences containing "?" with those that don't contain "?", nor can you combine sequences ending with "h" with those ending with "l".
2. To toggle monitor mode and control execution off from the keyboard, press CTRL SHIFT 1 (use the 1 on the numeric keypad).

Table H-1 Continued

| Sequence | Mnemonic |
|--|--------------------|
| Smooth scrolling on | CSI ?4 h DECSCLM |
| Jump scrolling on | CSI ?4 l DECSCLM |
| Reverse screen video on | CSI ?5 h DECSCNM |
| Normal screen video on | CSI ?5 l DECSCNM |
| Line 1 is top of scrolling region | CSI ?6 h DECOM |
| Line 1 is top of display area | CSI ?6 l DECOM |
| Autowrap on | CSI ?7 h DECAWM |
| Autowrap off | CSI ?7 l DECAWM |
| Autorepeat on | CSI ?8 h DECARM |
| Autorepeat off | CSI ?8 l DECARM |
| Block mode on | CSI ?10 h DECEM |
| Block mode off | CSI ?10 l DECEM |
| Unshifted function keys operate locally | CSI ?16 h DECEKEM |
| Unshifted function keys operate remotely | CSI ?16 l DECEKEM |
| Send form feed after print screen operation | CSI ?18 h DECPFF |
| No form feed sent after print screen operation | CSI ?18 l DECPFF |
| Print full screen | CSI ?19 h DECPEX |
| Print scrolling region | CSI ?19 l DECPEX |
| Display cursor | CSI ?25 h DECTCEM |
| Cursor off | CSI ?25 l DECTCEM |
| Blank screen | CSI 30 h WYDSCM |
| Display screen | CSI 30 l WYDSCM |
| Display status line | CSI 31 h WYSTLINM |
| Blank status line | CSI 31 l WYSTLINM |
| Screen saver | CSI 32 h WYCRTSAVM |
| Screen saver off | CSI 32 l WYCRTSAVM |
| Cursor steady (nonblinking) | CSI 33 h WYSTCURM |
| Cursor blinking | CSI 33 l WYSTCURM |
| Underline cursor on | CSI 34 h WYULCURM |
| Block cursor on | CSI 34 l WYULCURM |
| Don't clear screen after width change | CSI 35 h WYCLRM |
| Clear screen after width change | CSI 35 l WYCLRM |
| ☒ set to BS/DEL | CSI 36 h WYDELKM |
| ☒ set to DEL/CAN | CSI 36 l WYDELKM |
| Send erasable and nonerasable characters | CSI 37 h WYGATM |
| Send only erasable characters | CSI 37 l WYGATM |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|---|--|----------|
| Send full screen | CSI 38 h | WYTEXM |
| Send scrolling region | CSI 38 l | WYTEXM |
| 10 x 10 character cell | CSI 39 h | WYCELL |
| 10 x 13 character cell | CSI 39 l | WYCELL |
| Turn 25th line on | CSI 40 h | WYEXTDM |
| Turn 25th line off | CSI 40 l | WYEXTDM |
| Controlling Terminal Compatibility Modes | | |
| VT200 8-bit mode on | CSI 62;2 "p | DECSCL |
| VT200 7-bit mode on | CSI 62;1 "p | DECSCL |
| VT100 mode on | CSI 61 "p | DECSCL |
| VT52 mode on | CSI ?2 l | DECANM |
| 8-bit transmission mode on (VT200) | ESC SPACE G | S8C1T |
| 7-bit transmission mode on (VT200) | ESC SPACE F | S7C1T |
| Controlling Character Sets | | |
| Load soft character font | DCS <i>f;n;e;ms;</i> { <i>abc uc/ml/lc;</i> ...ST | DECDLD |
| DCS | 8-bit C1 control character (ESC P for 7-bit formats) | |
| <i>f</i> | Soft font | |
| 0 | Soft font selected | |
| 2 | Soft graphics font selected | |
| <i>n</i> | Initial character position; ASCII character positions are numbered consecutively, beginning with 1 (e.g., to redefine "S" use "4") | |
| <i>e</i> | Erase control specified | |
| 0 or 2 | Erase all characters in set | |
| 1 | Erase only redefined characters | |
| <i>ms</i> | Matrix size | |
| 0 | 7x10 | |
| 1 | 4x10 | |
| 2 | 5x10 | |
| 3 | 6x10 | |
| 4 | 7x10 | |
| 5 | 8x10 | |
| { | A separator | |
| <i>abc</i> | Font code (fcode) | |
| <i>a</i> | U.S. ASCII character from SPACE to / (optional) | |
| <i>b</i> | U.S. ASCII character from SPACE to / (optional) | |
| <i>c</i> | U.S. ASCII character from 0 (zero) to ~ (required) | |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|---|--|---------------------------------|
| <i>uc/mc/lc</i> | Character code | |
| <i>uc</i> | U.S. ASCII characters for upper code of character | |
| <i>/</i> | Required separator | |
| <i>mc</i> | U.S. ASCII characters for middle code of character | |
| <i>lc</i> | U.S. ASCII characters for lower code of character | |
| ST | 8-bit C1 control code (ESC \ in 7-bit format) | |
| Label character set | ESC <i>x fcode</i> | SCS |
| <i>x</i> | Label assigned | |
| (| G0 | |
|) | G1 | |
| * | G2 | |
| + | G3 | |
| <i>fcode</i> | Font code | |
| 0 | Special graphics | |
| 1 | Alternate character | |
| A | U.K. ASCII | |
| B | U.S. ASCII | |
| < | Multinational supplement | |
| other | Defined with load soft character font sequence (must match <i>abc</i> field in soft font load to enable soft font) | |
| Load G0 character set into GL | CTRL O | SO or LS1 |
| Load G1 character set into GL | CTRL N | SI or LS0 |
| Load G1 character set into GR | ESC ~ | LS1R |
| Load G2 character set into GL | ESC n | LS2 |
| Load G2 character set into GR | ESC } | LS2R |
| Load G3 character set into GL | ESC o | LS3 |
| Load G3 character set into GR | ESC | LS3R |
| Shift G2 character set into GL for one character only | ESC N | SS2 |
| Shift G3 character set into GL for one character only | ESC O | SS3 |
| Controlling Character, Field, and Line Attributes | | |
| Define character attributes ³ | CSI <i>attr m</i> | SGR |
| <i>attr</i> | Character attribute | <i>attr</i> Character attribute |
| 0 | Normal | 8 Concealed |
| 1 | Bold | 22 Normal intensity |
| 2 | Dim | 24 Underscore off |
| 4 | Underscored | 25 Steady (blinking off) |
| 5 | Blink | 27 Positive image (reverse off) |
| 7 | Reverse video | |
| 3. Attributes may be combined by separating character attribute parameters with semicolons (;). | | |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|--|---|------------------|
| Define erasable character | CSI 0 "q or CSI 2 "q | DECSCA DECSCA |
| Define nonerasable character | CSI 1 "q | DECSCA |
| Define top half of double-high, double-wide line | ESC # 3 | DECDHL |
| Define bottom half of double-high, double-wide line | ESC # 4 | DECDHL |
| Define single-high, single-wide line | ESC # 5 | DECSWL |
| Define single-high, double-wide line | ESC # 6 | DECDWL |
| Define top half of double-high, single-wide line | ESC # : | WYDHL |
| Define bottom half of double-high, single-wide line | ESC # ; | WYDHL |
| Controlling the Cursor | | |
| Display cursor | CSI ?25 h | DECTCEM |
| Cursor off | CSI ?25 l | DECTCEM |
| Cursor steady (nonblinking) | CSI 33 h | WYSTCURM |
| Cursor blinking | CSI 33 l | WYSTCURM |
| Underline cursor on | CSI 34 h | WYULCURM |
| Block cursor on | CSI 34 l | WYULCURM |
| Cursor keys send application-dependent codes | CSI ?1 h | DECCKM |
| Cursor keys send cursor movement codes | CSI ?1 l | DECCKM |
| Move cursor to <i>n</i> column | CSI <i>n</i> G or CSI <i>n</i> ^ | CHA HPA |
| Move cursor up <i>n</i> lines | CSI <i>n</i> A | CUU |
| Move cursor down <i>n</i> lines | CSI <i>n</i> B or CSI <i>n</i> e | CUD VPR |
| Move cursor right <i>n</i> columns | CSI <i>n</i> C or CSI <i>n</i> a | CUF HPR |
| Move cursor left <i>n</i> columns | CSI <i>n</i> D | CUB |
| Move cursor down <i>n</i> lines to column 1 | CSI <i>n</i> E | CNL |
| Move cursor up <i>n</i> lines to column 1 | CSI <i>n</i> F | CPL |
| Move cursor to line <i>n</i> | CSI <i>n</i> d | VPA |
| Move cursor to line <i>n1</i> , column <i>n2</i> | CSI <i>n1</i> ; <i>n2</i> H or CSI <i>n1</i> ; <i>n2</i> f | CUP HVP |
| Move cursor down one line in in current column, scroll up if at bottom line | IND or ESC D | IND IND |
| Move cursor down one line in current column; execute CR if linefeed mode is on | CTRL J or CTRL K or CTRL L | LF VT FF |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|--|-------------------|---------------|
| Move cursor up one line in current column, scroll down if at top line | RI or ESC M | RI RI |
| Move cursor down one line to column 1 | NEL or ESC E | NEL NEL |
| Save display attributes, cursor position, character sets, wrap flag, and origin mode status | ESC 7 | DECSC WYSC |
| Restore last saved display attributes, cursor position, character set, wrap flag, and origin mode status | ESC 8 or CSI u | DECRC WYRC |
| Backspace cursor | CTRL H | BS |
| Move cursor to next tab stop | CTRL I | HT |
| Move cursor to column 1 of current line | CTRL M | CR |
| Editing Functions | | |
| Erase from cursor to end of display | CSI 0 J | ED |
| Erase from start of display to cursor | CSI 1 J | ED |
| Erase entire display | CSI 2 J | ED |
| Erase from cursor to end of line | CSI 0 K | EL |
| Erase from start of line to cursor | CSI 1 K | EL |
| Erase entire line | CSI 2 K | EL |
| Erase erasable characters from cursor to end of display | CSI ?0 J | DECSED |
| Erase erasable characters from start of display to cursor | CSI ?1 J | DECSED |
| Erase erasable characters in entire display | CSI ?2 J | DECSED |
| Erase erasable characters from cursor to end of line | CSI ?0 K | DECSEL |
| Erase erasable characters from start of line to cursor | CSI ?1 K | DECSEL |
| Erase erasable characters from entire line | CSI ?2 K | DECSEL |
| Erase <i>n</i> characters beginning at cursor | CSI <i>n</i> X | ECH |
| Insert <i>n</i> blank characters beginning at cursor | CSI <i>n</i> @ | ICH |
| Insert <i>n</i> blank lines beginning at cursor line | CSI <i>n</i> L | IL |
| Delete <i>n</i> lines beginning at cursor line | CSI <i>n</i> M | DL |
| Delete <i>n</i> characters beginning at cursor | CSI <i>n</i> P | DCH |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|---|--|------------|
| Controlling Margins | | |
| Set top/bottom margins | CSI <i>t</i> ; <i>b</i> r | DECSTBM |
| <i>t</i> Top line number | | |
| <i>b</i> Bottom line number (optional; if omitted, treated as bottom screen line) | | |
| Controlling Tabs | | |
| Clear tab stop at cursor | CSI 0 g or CSI 2 W | TBC CTC |
| Clear all tab stops | CSI 3 g or CSI 5 W | TBC CTC |
| Set tab stop at cursor | CSI 0 W or ESC H | CTC HTS |
| Set tab stop every 8th column | CSI ?5 W | CTC |
| Move forward <i>n</i> tab stops | CSI <i>n</i> I | CHT |
| Move backward <i>n</i> tab stops | CSI <i>n</i> Z | CBT |
| Move cursor to next tab stop | CTRL I | HT |
| Controlling Scrolling | | |
| Smooth scrolling on | CSI ?4 h | DECSCLM |
| Jump scrolling on | CSI ?4 l | DECSCLM |
| Set 4 lps smooth scrolling speed | CSI 0 z | WYSCRATE |
| Set 1 lps smooth scrolling speed | CSI 1 z | WYSCRATE |
| Set 2 lps smooth scrolling speed | CSI 2 z | WYSCRATE |
| Set 4 lps smooth scrolling speed | CSI 3 z | WYSCRATE |
| Set 8 lps smooth scrolling speed | CSI 4 z | WYSCRATE |
| Controlling Function Keys | | |
| Unshifted function keys operate locally | CSI ?16 h | DECEKEM |
| Unshifted function keys operate remotely | CSI ?16 l | DECEKEM |
| Program function keys ⁴ | DCS <i>c</i> ; <i>kl</i> <i>kc</i> / <i>hc</i> ST | DECUKD |
| <i>c</i> Clear | | |
| 0 Clear all key definitions | | |
| 1 Clear keys only as they are redefined | | |
| <i>kl</i> Key lock | | |
| 0 Lock key definitions | | |
| 1 Don't lock key definitions | | |
| <p>4. Multiple function key definitions can be programmed by entering the <kc>/<hc> parameters for each, separated by semicolons (;).</p> | | |

Table H-1 Continued

| Command | | Sequence | Mnemonic |
|--|--|----------------|------------------------|
| <i>kc</i> | Shifted function key | <i>kc</i> | Unshifted function key |
| 17 | F6 | 37 | F6 |
| 18 | F7 | 38 | F7 |
| 19 | F8 | 39 | F8 |
| 20 | F9 | 40 | F9 |
| 21 | F10 | 41 | F10 |
| 23 | F11 | 43 | F11 |
| 24 | F12 | 44 | F12 |
| 25 | F13 | 45 | F13 |
| 26 | F14 | 46 | F14 |
| 28 | HELP (F15) | 48 | HELP (F15) |
| 29 | DO (F16) | 49 | DO (F16) |
| 31 | F17 | 51 | F17 |
| 32 | F18 | 52 | F18 |
| 33 | F19 | 53 | F19 |
| 34 | F20 | 54 | F20 |
| <i>hc</i> | Hexadecimal representation of character string assigned to the function key. | | |
| Report function key redefinition string | | CSI < <i>n</i> | WYFKEX |
| <i>n</i> | Shifted function key | <i>n</i> | Unshifted function key |
| a | F6 | A | F6 |
| b | F7 | B | F7 |
| c | F8 | C | F8 |
| d | F9 | D | F9 |
| e | F10 | E | F10 |
| f | F11 | F | F11 |
| g | F12 | G | F12 |
| h | F13 | H | F13 |
| i | F14 | I | F14 |
| j | HELP (F15) | J | HELP (F15) |
| k | DO (F16) | K | DO (F16) |
| l | F17 | L | F17 |
| m | F18 | M | F18 |
| n | F19 | N | F19 |
| o | F20 | O | F20 |
| Auxiliary Keypad Modes | | | |
| Auxiliary keypad numeric mode on | | ESC > | DECKPNM |
| Auxiliary keypad application mode on | | ESC = | DECKPAM |
| Transmission/Printer Control | | | |
| Transmit through cursor position | | CSI 16 h | TTM |
| Transmit to end of line or end of display | | CSI 16 l | TTM |
| Send form feed after print screen operation | | CSI ?18 h | DECCPFF |
| No form feed sent after print screen operation | | CSI ?18 l | DECCPFF |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|---|-----------------|----------|
| Print full screen | CSI ?19 h | DECPEX |
| Print scrolling region | CSI ?19 l | DECPEX |
| Send erasable and nonerasable characters | CSI 37 h | WYGATM |
| Send only erasable characters | CSI 37 l | WYGATM |
| Send full screen | CSI 38 h | WYTEXM |
| Send scrolling region | CSI 38 l | WYTEXM |
| 8-bit transmission mode on (VT220) | ESC SPACE G | S8C1T |
| 7-bit transmission mode on (VT220) | ESC SPACE F | S7C1T |
| Print screen | CSI 0 i | MC |
| Send screen | CSI 2 i | MC |
| Transparent print mode off | CSI 4 i | MC |
| Transparent print mode on | CSI 5 i | MC |
| PR port receive mode off | CSI 6 i | MC |
| PR port receive mode on | CSI 7 i | MC |
| Print line | CSI ?1 i | MC |
| Send line | CSI ?3 i | MC |
| Copy print mode off | CSI ?4 i | MC |
| Copy print mode on | CSI ?5 i | MC |
| Transmit form feed after send screen operation | CSI 1 | DECTTC |
| No form feed after send screen operation | CSI 0 | DECTTC |
| Send character at cursor | ESC 5 | WYXCH |
| Send answerback message | CTRL E | ENQ |
| Suspend transmission | CTRL S | DC3 |
| Resume transmission | CTRL Q | DC1 |
| More Terminal Control Commands | | |
| Delay processing about 250 ms | ESC , | WYDELAY |
| Display screen adjustment pattern | ESC # 8 | DECALN |
| Sound bell, if enabled | BEL (CTRL G) | |
| Abort escape sequence; no character displayed ⁵ | CAN (CTRL X) | |
| Abort escape sequence; display reverse question mark ⁵ | SUB (CTRL Z) | |
| Initiate escape sequence | ESC (CTRL [) | |
| 5. In VT52 or VT100 modes, displays checkerboard character. | | |

Table H-1 Continued

| Command | Sequence | Mnemonic |
|--|--|-------------|
| Terminal Resets | | |
| Soft terminal reset | CSI ! p | DECSTR |
| Hard terminal reset | ESC c | RIS |
| Terminal mode reset | ESC ! p | WYSTR |
| Controlling L1-L4 Status Line Labels | | |
| Suppress L1-L4 labels | CSI 0 q | DECLL |
| Display L1 label ⁶ | CSI 1 q | DECLL |
| Display L2 label ⁶ | CSI 2 q | DECLL |
| Display L3 label ⁶ | CSI 3 q | DECLL |
| Display L4 label ⁶ | CSI 4 q | DECLL |
| Terminal Status Reports | | |
| Request product type identification (VT100 mode only) Respond WY-99GT | ESC SPACE 99 CR | WYID |
| Request primary attributes report Respond VT100 mode Respond VT220 mode | CSI 0 c or ESC Z CSI ?1;2c CSI ?62;1;2;6;7;8c | DA DECID |
| Request secondary attributes report Respond with current revision | CSI >0 c CSI >1;20;0c | DA |
| Request terminal status report Respond terminal functioning and ready | CSI 5 n CSI 0 n | DSR |
| Request cursor position report Respond cursor at line <i>l</i> , column <i>c</i> | CSI 6 n CSI <i>l</i> ; <i>c</i> R | DSR |
| Request printer status report Respond printer ready Respond printer not ready Respond printer not connected | CSI ?15 n CSI ?10 n CSI ?11 n CSI ?13 n | DSR |
| Request function key status report Respond key definitions not locked Respond key definitions locked | CSI ?25 n CSI ?20 n CSI ?21 n | DSR |
| 6. These commands may be combined in one string by separating the numeric parameters with semicolons (;). | | |

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WARNING: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It 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 operating in a commercial environment. Operation of this 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.

Only devices certified to comply with the limits for a Class A computing device may be attached to this equipment. Operation with noncertified device(s) is likely to result in interference to radio and TV reception.

This equipment is intended for commercial use only and is not suited for operation in Class B environments.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC rules.

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