HONEYWELL

VIP7201 DISPLAY TERMINALS USER'S REFERENCE MANUAL

HARDWARE

VIP7201 DISPLAY TERMINALS
USER'S REFERENCE MANUAL

SUBJECT

Reference Information for the VIP7201 Display Terminal

SPECIAL INSTRUCTIONS

This manual has been revised to the -200 level. It supersedes all previous issues.

The following notice is provided in accordance with the United States Federal Communications Commission's (FCC) regulations.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions 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 operated 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.

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Honeywell

Failure to properly follow procedures outlined in this guide may void product warranty. See your Honeywell agreement for warranty statement.

USER COMMENTS FORMS are included at the back of this manual. These forms are to be used to record any corrections, changes, or additions that will make this manual more useful.

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CP92-01

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Section 1
GENERAL DESCRIPTION

The Visual Information Projection (VIP) 7201 keyboard display terminal (see Figure 1-1) is a self-contained, tabletop device designed to operate with many host processor systems. The terminal operates interactively with the host by the operator sending data via the keyboard and receiving data via the display unit. The terminal includes two modules: the keyboard and the display unit which includes the logic and communications interface.

1.1 KEYBOARD

The keyboard consists of 92 keys for the generation of all 128 ASCII character codes, which include uppercase and lowercase alphabetic characters, punctuation, special symbols, numerals 0 to 9 and control codes. The keyboard includes a numeric keypad and seven program function keys. The arrangement of the alphanumeric keys is consistent with the common office typewriter and meets ANSI Standard 4.14.

The low profile keyboard is a separate unit that also has a tilt adjustment. It is connected to the terminal by a coiled cable, which allows it to be positioned up to 3 feet from the terminal.

Section 3 provides a detailed description of keyboard operation.

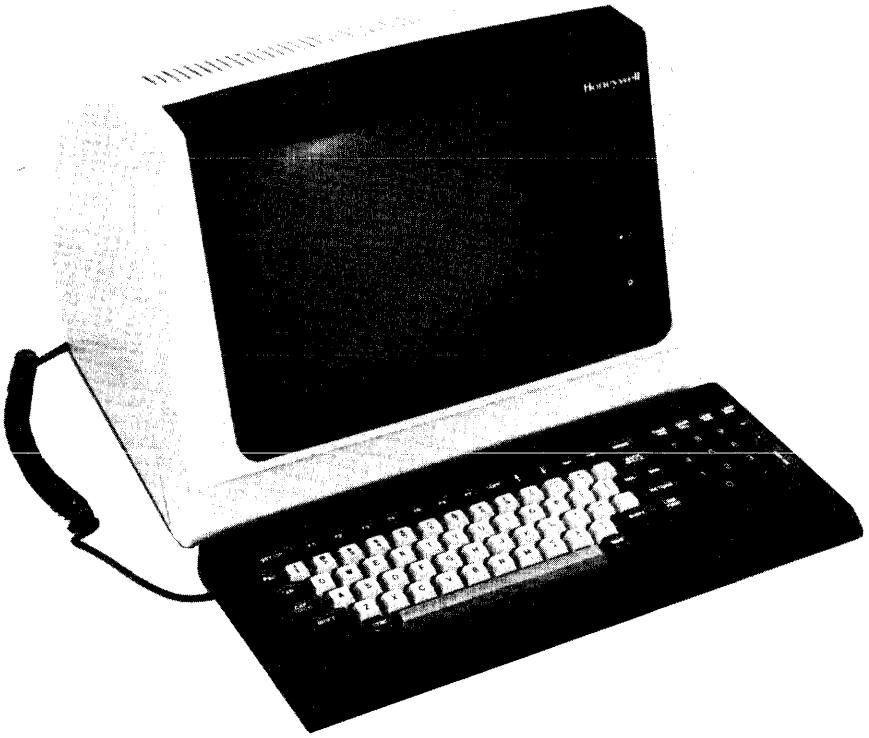


Figure 1-1. VIP7201 Keyboard Display Terminal

1.2 DISPLAY UNIT WITH COMMUNICATIONS INTERFACE

1.2.1 Display Unit

The display screen is a 12-inch diagonal, high-resolution cathode ray tube that can display up to 1920 characters of text in a 24- by 80-column format. Characters are produced using a 7 by 11 dot matrix presented within a 9 by 12 field. The 24th line also serves as the Configuration Line for configuring the terminal and subsequently displaying the terminal's configuration. The use of P31 phosphor allows the generation of distinct green characters on a dark background. The display is refreshed at a 60-hertz rate. Section 5 describes the unit's capability to display visual attributes.

1.2.2 Communications Interface

Both an EIA RS-232C interface and an RS-422A direct connect interface are provided with the VIP7201 terminal. The interfaces are asynchronous, two or four wire, and full-duplex, capable of two-way alternate or two-way simultaneous data transfer at baud rates between 300 and 19,200.

In addition, there is an auxiliary port providing a limited EIA RS-232C or RS-422A interface to allow attachment of local peripherals.

Section 2
INSTALLATION AND MAINTENANCE

2.1 UNPACKING THE TERMINAL

Upon receipt of the VIP7201 terminal, inspect the shipping carton for any apparent damage. If any damage is evident, DO NOT open the carton; instead, contact the carrier immediately. If the carton is undamaged, unpack the equipment as soon as possible after delivery.

2.1.1 Unpacking Procedure

Referring to Figures 2-1 through 2-4, carefully remove the VIP7201 keyboard and display unit from the shipping carton as follows:

1. Carefully cut the carton open at the reinforced shipping tape.

2. Open the carton and remove the polyfoam cover (see Figure 2-1).

3. Lift the keyboard with its attached cord (enclosed in a poly bag) from the carton (see Figure 2-1).

4. Untape the poly bag and carefully remove the keyboard and its cord from the poly bag (see Figure 2-2).

5. Remove the rubber band and the wrap from the cord plug.

6. Set the keyboard and its attached cord aside.

7. The display unit (also enclosed in a poly bag) has a polyfoam pad on each side of the unit. Grasp the polyfoam pads at their base (see Figure 2-3). While pressing the pads against the terminal's sides, carefully lift the pads and terminal from the carton.

8. Untape the poly bag and carefully remove the display unit from the poly bag (see Figure 2-4).

NOTE

SAVE ALL SHIPPING MATERIALS so that they may be reused if reshipment is necessary.

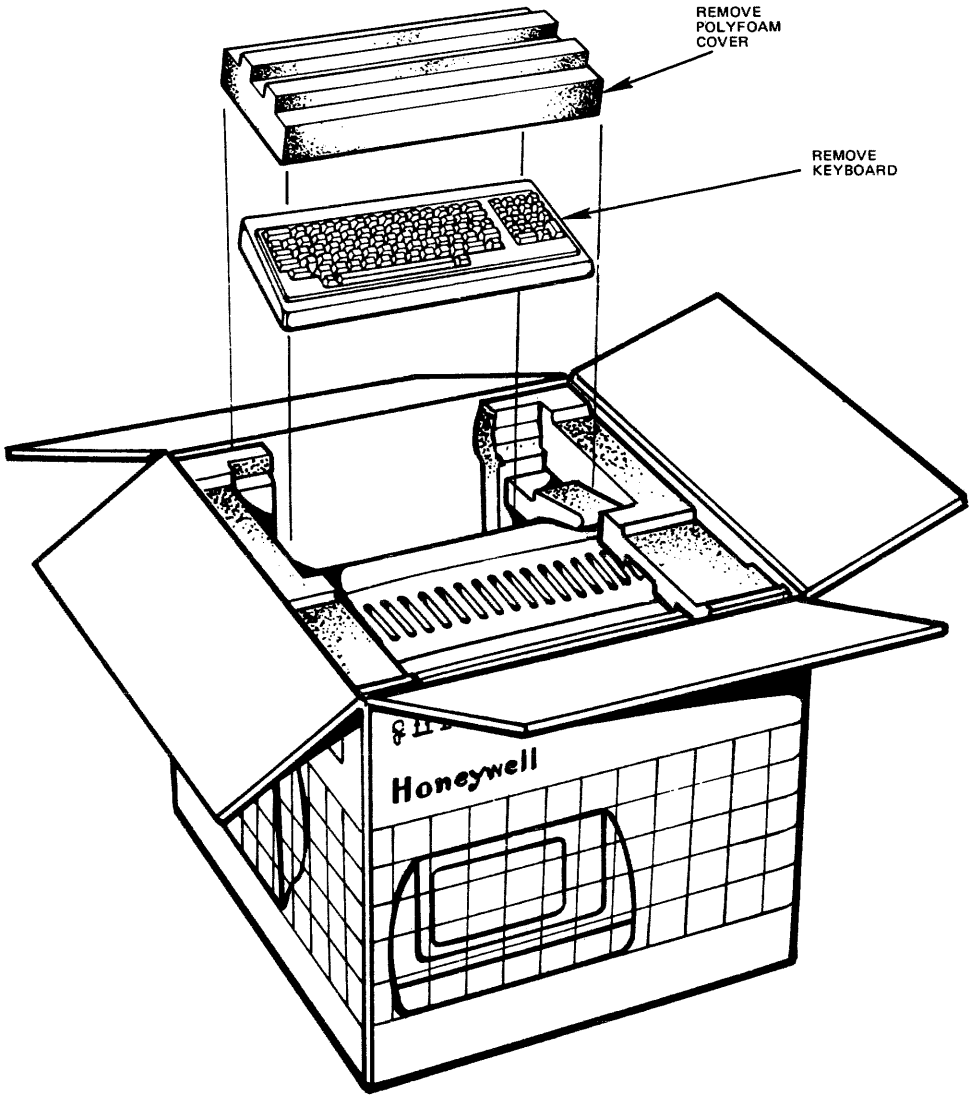


Figure 2-1. Unpacking the Terminal

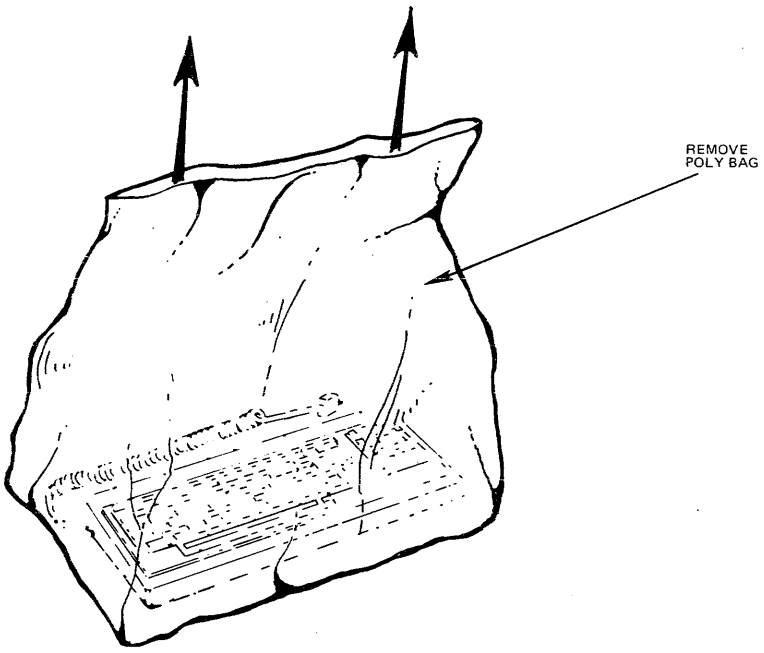


Figure 2-2. Removing Keyboard from Poly Bag

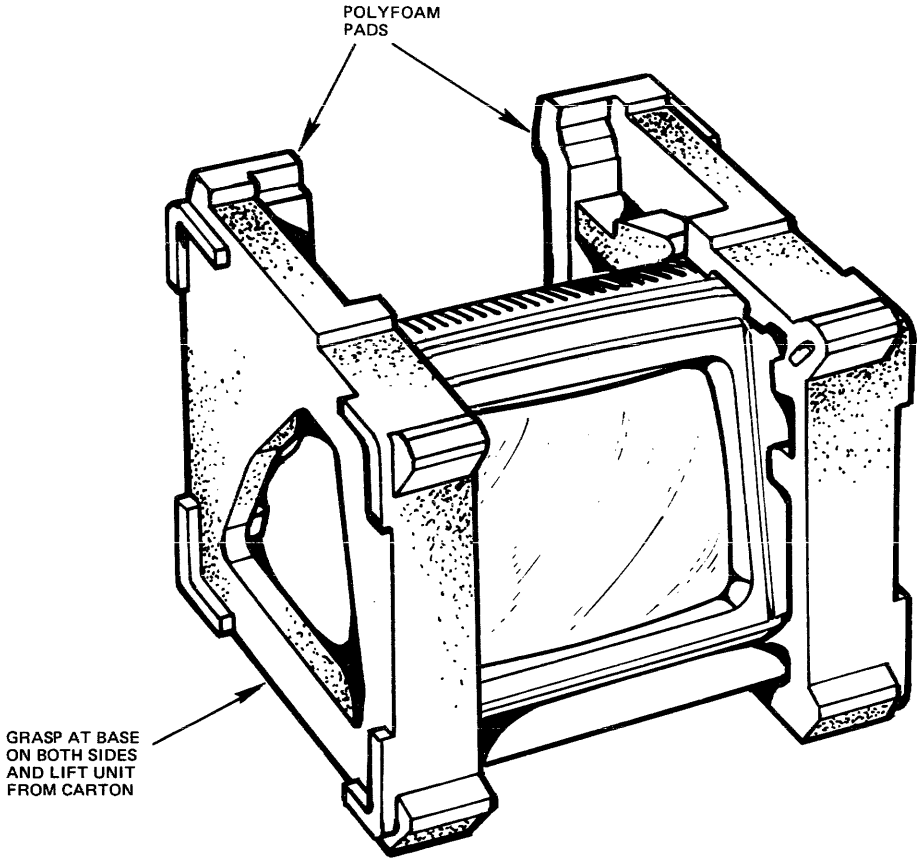


Figure 2-3. Display Unit Removed from Carton

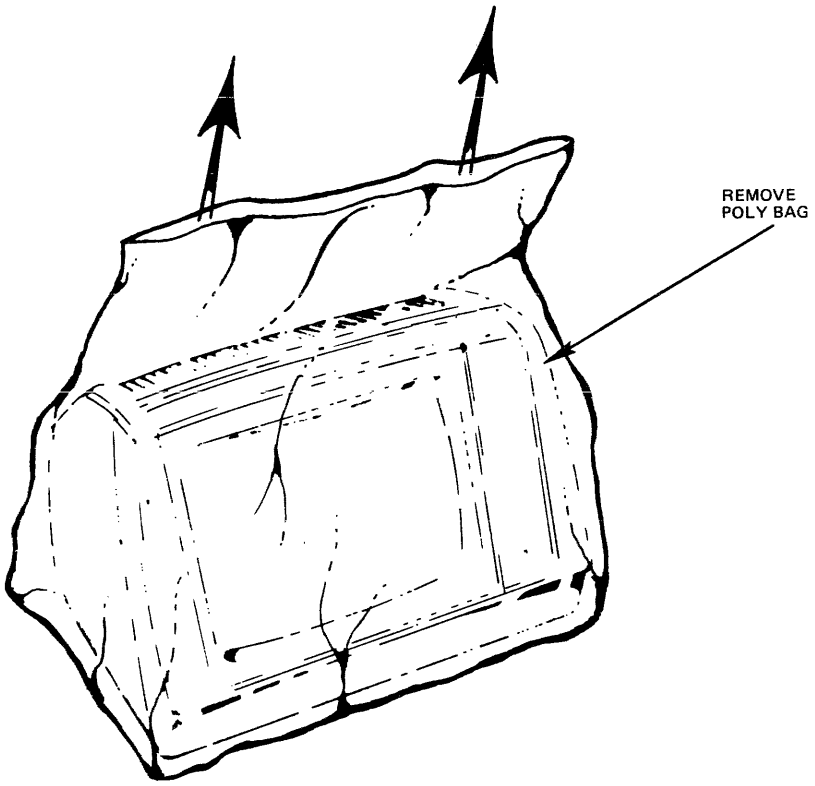


Figure 2-4. Removing Display Unit from Poly Bag

2.1.2 Inspection

Compare the contents of your carton with the Bill of Lading. Inspect the display unit, the keyboard, and the cord for broken or damaged parts. Notify Honeywell if equipment is incorrect, missing, or damaged (see the HELP AND INFORMATION DATA, page 2-13). Make sure shipping carton is saved so that it may be reused if reshipment is necessary.

2.2 SETUP AND CONNECTION

2.2.1 Location

CAUTION

DO NOT locate the terminal on a soft pad such as carpeting. This inhibits the air flow under the unit, which is necessary to keep the terminal operating properly.

To prevent distortion of the screen presentation, do not locate the terminal close to equipment that generates magnetic fields (e.g., motors, transformers).

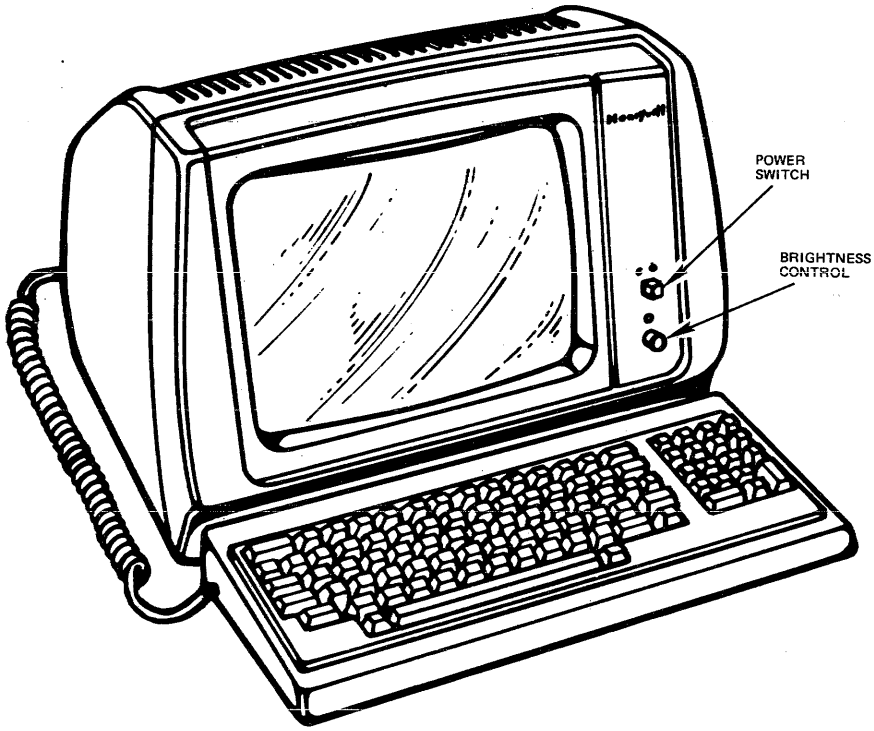
Locate the terminal at the designated area of operation on a table approximately 29 inches high. Make sure that the location is away from heavy traffic and that the cables are out of the way of foot traffic. DO NOT locate the terminal in areas of excessive sunlight or where there is glare from lights, as both conditions inhibit screen viewing.

2.2.2 Installation

The power switch (see Figure 2-5) is pressed to engage it in the ON (in) position; pressing it again releases it to the OFF (out) position.

CAUTION

MAKE SURE the power switch is in the OFF (out) position before beginning this installation procedure.



NOTE

To tilt the keyboard pull out, and turn to lock, the two pegs underneath the keyboard.

Figure 2-5. Display Unit Front Panel

To install the VIP7201 display terminal, proceed as follows:

CAUTION

AVOID DAMAGE from condensation created by the change in temperature. If the display unit was stored in a substantially cold area, allow the unit to warm to room temperature for at least 1 hour before turning the power ON.

1. Plug the keyboard cable into the socket labeled KB on the back of the display unit (see Figure 2-6).

2. Plug the power cable into the wall outlet, connecting to a 115-Vac, 15-amp circuit.

3. Connect the data cable into the 25-pin connector labeled MAIN (see Figure 2-6).

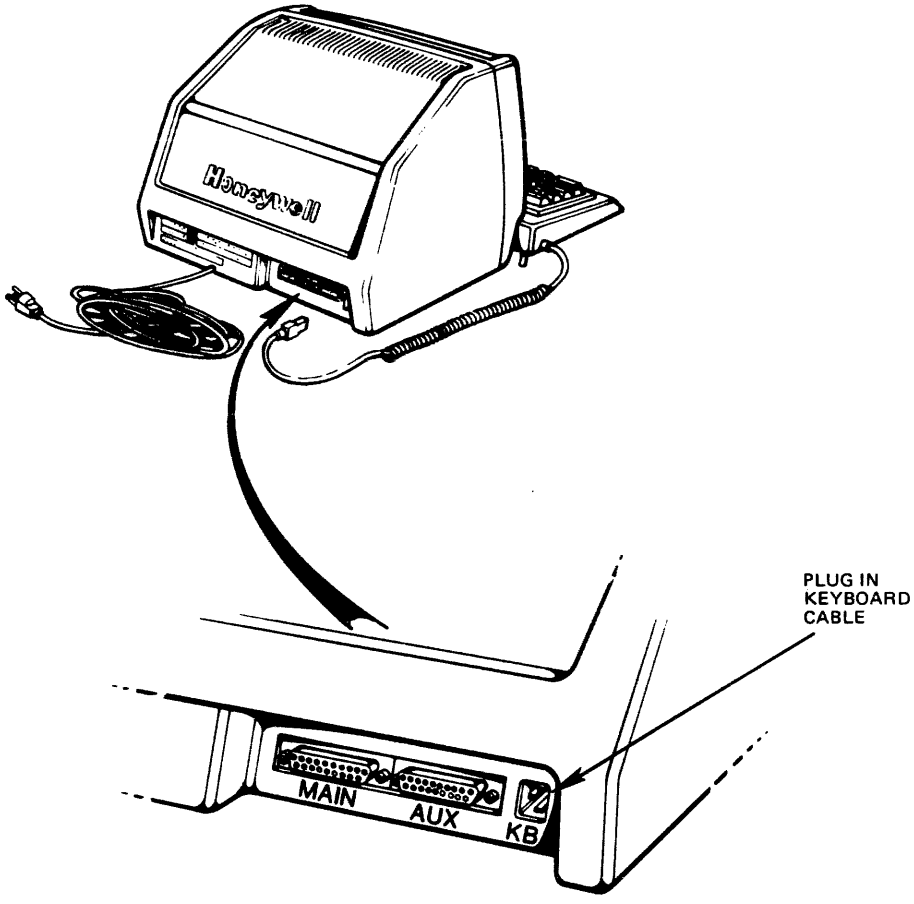


Figure 2-6. Display Unit Communications Interface

CAUTION

WAIT 10 SECONDS between the OFF and ON operation if it is necessary to recycle power using the ON/OFF switch. This ensures the reset of the terminal's electronics.

4. Press the power switch to engage it in the ON (in) position:

   a. The terminal will automatically run a self-test and inform the operator of any terminal malfunctions by displaying a message on the terminal screen. If such a message is displayed, contact Honeywell (see the Help and Information Data at the end of this section).

   b. Listen for an alarm to sound within 6 or 7 seconds. If no alarm sounds within 15 seconds, check the wall outlet and the ON/OFF switch to ensure that power is available.

   c. Watch for the cursor to appear on the upper left corner of the screen within 60 seconds. If the cursor does not appear within this time frame, adjust the BRIGHTNESS control located on the front panel of the display unit (see Figure 2-5).

CAUTION

AVOID DAMAGE to the terminal display screen when the terminal is to remain ON but unchanged for extended periods of time. Reduce the screen brightness by using the BRIGHTNESS control.

   d. Press the SET UP key and configure the terminal for off-line operation (refer to Keyboard Test, steps 1 and 2 (below), and to Section 6.

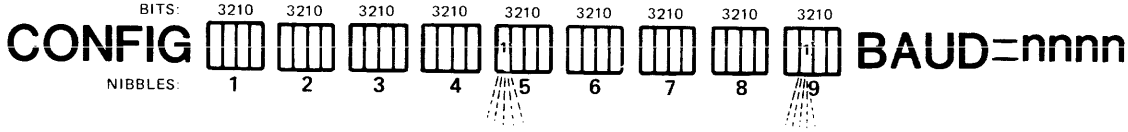
The terminal should now be operational. If not, turn off the power, wait 10 seconds, turn on the power, and repeat steps 4b and 4c. If the terminal is still not operational, contact Honeywell (see the Help and Information Data at the end of this section).

2.3 KEYBOARD TEST

Once the terminal is operational, the keyboard test procedure should be run to determine if the VIP7201 keyboard is functioning properly. Before performing the keyboard test, MAKE SURE keyboard cable is plugged in properly, then proceed as follows:

1. Press the SET UP key. The Configuration Line should appear on line 24 of the terminal display screen. If it does not and the keyboard is plugged in properly, refer to subsection 6.1 for additional reference to the keyboard test.

2. On the Configuration Line, set nibble 5 bit 3 to 1 (Local) and nibble 9 bit 2 to 1 (Control Code Display ON). Refer to subsection 7.3, steps 1 through 4, for the procedure used to set the bits of the Configuration Line.



3. Press the SET UP key a second time to store the Configuration Line.

4. SHIFT Test. Press the A key. A lowercase a is displayed on the terminal screen. Simultaneously press and hold the left SHIFT key down and press the A key. An uppercase A is displayed on the terminal screen. Repeat for the right SHIFT key.

5. CAP LOCK Test. Press the CAP LOCK key (the key automatically locks in the down position). Then, press the A key. An uppercase A is displayed on the terminal screen. Press the CAP LOCK key again (this unlocks the key). Press the A key again. A lowercase a is displayed on the terminal screen.

6. CTRL Test. Press and hold the CTRL key. Press the A key. $^{S}_{H}$ is displayed on the terminal screen.

7. Repeat Test. Press and hold the A key. Lowercase a's (aaaaaaa) are displayed on the terminal screen.

8. Keyboard and Numeric Pad Test. Press each light gray key on the keyboard. The corresponding letter, symbol, or number is displayed on the terminal screen. Press each black key on the numeric keypad. The corresponding number or symbol is displayed on the terminal screen.

9. TAB Key Test. Press the left TAB $\left(\begin{smallmatrix}\leftarrow\\ \rightarrow|\end{smallmatrix}\right)$ key. $^{H}_{T}$ is displayed on the terminal screen. Repeat for the right TAB $\left(\begin{smallmatrix}\text{CLEAR}\\ \rightarrow|\end{smallmatrix}\right)$ key.

10. Function and Special Keys Test. Press the dark gray keys as listed and see the appropriate symbol displayed.

Key	Display
F1	0
F2	2
F3	6
F4	8
F5	:
F6	<
F7	>
↑	A
↓	B
←	D
→	C
HOME	H
INSERT	I
DELETE	P
EOP EOL	K
CLEAR ⇥	H_T
ESC	E_C
BACK SPACE	B_S
RETURN	C_R
LINE FEED	L_F

11. Blank Keys (Two Blank Keys) Test. Press and hold down any alphabetic key. Note the normal key click rate. Press and hold down the blank key next to the BREAK key, and hear a normal key click. Press the other blank key (next to the F7 key). The cursor disappears for some time and reappears with a short audible alarm.

12. Press the SET UP key.

13. Reset the Configuration Line. Set nibble 5 bit 3 to 0 (Online) and nibble 9 bit 2 to 0 (Control Code Display OFF).

14. Press the SET UP key. The Configuration Line disappears and the terminal screen display returns to the display prior to step 13.

15. BREAK Key Test. Recall the normal key click rate. Press the SHIFT and BREAK keys simultaneously. A key click rate of approximately five key clicks per second (a rate slower than normal) should be heard.

If the keyboard malfunctions, contact Honeywell (see the Help and Information Data at the end of this section).

2.4 MAINTENANCE

The VIP7201 is essentially maintenance free; however, it must be cleaned periodically. To clean the display unit and keyboard, simply wipe them with a damp cloth. MAKE SURE they are completely dry after cleaning.

MAKE SURE that nothing is placed over the openings on top of the display unit. Any blocking of these openings will inhibit air flow. Also, objects and liquids placed on top of the display unit could fall through the openings.

2.5 PROBLEM ANALYSIS

If the VIP7201 terminal is not functioning properly, it should be tested thoroughly using the procedures outlined in Figure 2-7 and described in the following paragraphs. This testing not only provides information as to the possible causes of the malfunction, but can isolate trouble that the terminal operator can correct. Also, if it becomes necessary to contact Honeywell (see the Help and Information Data at the end of this section), the information that the operator has obtained from terminal testing will prove useful to Honeywell and save you time in correcting any terminal operation problems.

Before beginning testing procedures, the operator should check the terminal's power supply and power cable to make sure the terminal is properly connected. In addition, the keyboard and data cables should be checked to make sure no cabling is loose or damaged.

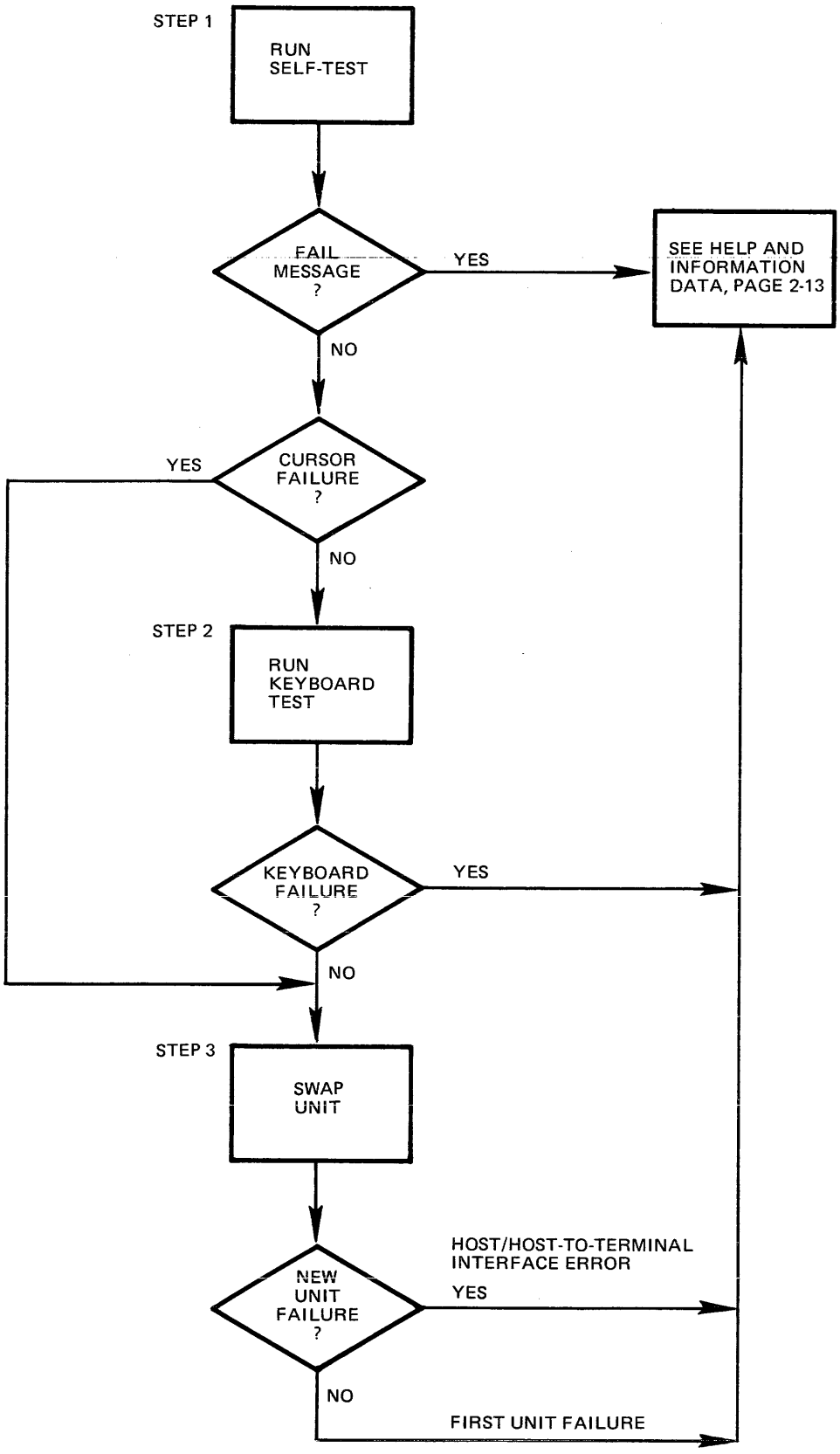


Figure 2-7. Problem Analysis Flow Chart

The operator should then check the bit settings of the Configuration Line to determine if the terminal configuration is correct for the terminal's operation.

If the terminal is still not functioning at this time, the operator should complete the following procedure.

1. Run the self-test by issuing the Reset Initial State (RIS) command. To issue the RIS command, hold down the CTRL key and press the (CLEAR →) key.

   a. If a message informing the operator that the terminal is not working is displayed on the screen, the operator should record the message on a piece of paper and see the Help and Information Data at the end of this section.

   b. If no message appears on the screen, the operator should check that the cursor is displayed. If the cursor does not appear and the BRIGHTNESS control is turned all the way up, the operator should proceed to step 3. If the cursor does appear, the operator should proceed to step 2.

2. Refer to subsection 2.3 for the keyboard test.

   a. Complete steps 1 through 3 of the test.

   b. Perform the specific test that relates to the terminal's problem (e.g., use the SHIFT test if the terminal exhibits problems with the SHIFT key). Make sure to repeat the tests for all keys, when necessary.

   c. If the terminal fails the keyboard test, see the Help and Information Data at the end of this section; otherwise, proceed to step 3.

3. If another VIP7201 terminal is available, swap the unit. Note whether the new unit works properly.

   a. If the new unit works properly, a problem exists with the first unit.

   b. If the new VIP7201 terminal does not work properly, a problem exists with the host or host-to-terminal interface.

   c. See the Help and Information Data at the end of this section.

NOTE

If a unit requires return for repair, the detachable communication cables (main or auxiliary ports) should not be returned with the unit.

HELP AND INFORMATION DATA

NOTE

USA Only.

Once you have identified a faulty unit or are in need of assistance, determine the steps you need to follow according to your service agreement with Honeywell. Identify your contract type before calling.

STANDARD MAINTENANCE CONTRACT (NOT CAMP CONTRACT)

After you have found that a unit is faulty, call the HELP telephone number that applies to your area. The National Response Center (NRC) will arrange for a Honeywell Customer Service Engineer to contact you to provide assistance. If necessary, the Engineer will be dispatched to service your unit.

CUSTOMER ASSISTED MAINTENANCE PROGRAM CONTRACT

When you have identified the faulty unit, use the Repair Authorization Form to return the unit to Honeywell for repair or replacement. Package the unit in the same materials in which it was shipped. If you require additional assistance or information, you may call the HELP telephone number and arrangments will be made for the proper Honeywell organization to contact you.

NON-MAINTAINED CUSTOMER

Even though you have no maintenance agreement with Honeywell, you can still call the HELP telephone number and the NRC will arrange for the proper Honeywell organization to contact you to answer your questions on service alternatives.

National Response Center
HELP telephone numbers:

Outside Georgia:	800-241-1634
Georgia:	800-282-4350
Atlanta Only:	404-982-3066

When you call, please state that this is a CAMP product and provide the serial number of the CAMP customer replaceable unit.

To order supplies or additional units, refer to the National Distribution Center Catalogue and call the number that applies to your area.

National Distribution Center:

Outside Massachusetts:	800-343-6665
Within Massachusetts:	617-392-5246

Section 3
KEYBOARD DESCRIPTION

This section describes the function of all the keys on the VIP7201 terminal keyboard, which is shown in Figure 3-1. The operator uses the keyboard to transmit ASCII codes to the host, and to the display unit if in Non-Echo mode.

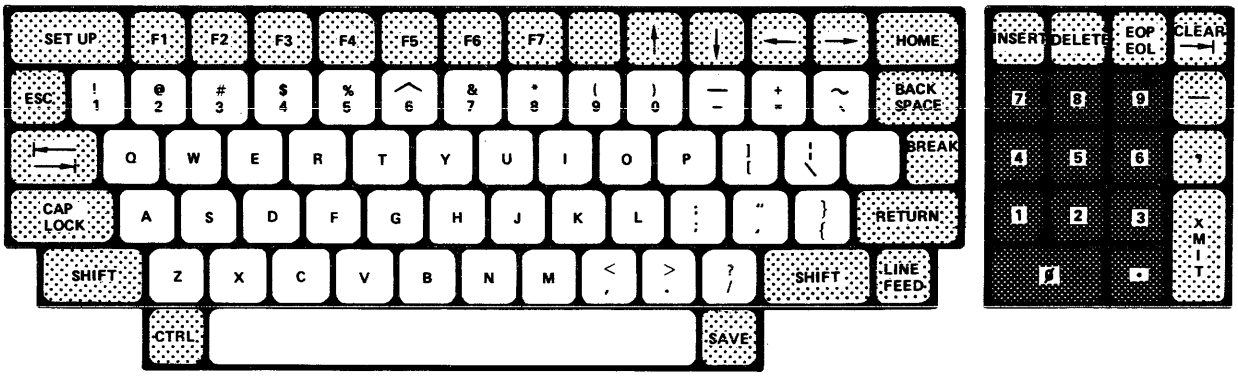


Figure 3-1. VIP7201 Keyboard

3.1 ESCAPE (ESC) KEY

The ESC key generates the lead-in code for multiple character sequences.

3.2 ALPHABETIC KEYS

The alphabetic keys correspond to the 26 letters of the alphabet (A to Z). Pressing any alphabetic key generates the ASCII code that corresponds to the lowercase letter. To generate the code that corresponds to the uppercase letter, the key along with either the SHIFT or CAP LOCK key is pressed.

3.3 PUNCTUATION AND NUMERIC KEYS

A variety of punctuation keys (period, comma, etc.), numeric keys (0 to 9), and special symbols (backslash, brackets, etc) are included on the keyboard. Each of these keys can generate either of two ASCII codes, depending on the postion of the SHIFT key. When the key is pressed alone, it generates the code of the character graphically depicted on the lower portion of the key; when the key is pressed simultaneously with the SHIFT key, the code of the character depicted on the upper portion of the key is generated.

3.4 SPECIAL KEYS

Three keys (SHIFT, CAP LOCK, and CTRL) do not generate a code, but rather modify the code of other keys when pressed in conjunction with them.

The SHIFT key pressed with an alphabetic key generates the code for the uppercase alphabetic character. The SHIFT key pressed with the punctuation and numeric keys generates the code for the character depicted graphically on the top portion of the key.

The CAP LOCK key locks when pressed down and unlocks when pressed again. The CAP LOCK key in the locked or down position modifies alphabetic key code generation; only the code that corresponds to the uppercase alphabetic character is generated regardless of the position of the SHIFT key. In the up or unlocked position, the CAP LOCK key does not affect any key.

NOTE

> The CAP LOCK key can only be used with the alphabetic keys; it does not affect any of the other keys.

The CTRL key generates control codes, in conjunction with the alphabetic group and the punctuation group. If the control key is pressed while an alphabetic or punctuation key is typed, the generated code will consist of the 7-bit ASCII code, with the two high-order bits forced to Zero.

3.5 NUMERIC KEYPAD

The numeric keypad consists of 14 keys (0 to 9 _ . , XMIT). The keys, except for the XMIT key, are repetitions of keys in the center keyboard. Their location, however, facilitates numeric data entry, especially useful in data processing.

3.6 FUNCTION KEYS

The function keys and the ASCII codes that these keys transmit are:

Function Key	ASCII Code Transmitted Alone	ASCII Code Transmitted with SHIFT key
RETURN	0D	0D
LINE FEED	0A	0A
BACK SPACE	08	08
TAB ⇤ ⇥	09	1B 5B 5A
CLEAR ⇥	09	1B 60
SPACE BAR	20	20
ESC	1B	1B

NOTE

A functional desciption of these keys follows in Section 4.

3.7 CURSOR KEYS

3.7.1 Cursor Control

As data is received either from the keyboard or the host, the data is displayed at the position of the cursor, and the cursor moves one position to the right for each character received. Similarly, when data is to be modified, the cursor is used to designate the characters to be acted upon. Eighty columns in each of the 24 lines is available for data entry. The cursor can be easily moved to any location within this data space.

There are four cursor control keys: up (↑), down (↓), forward (→), and back (←).

The cursor up (↑) key moves the cursor up one line in its current column. If the cursor is on line 1 (the top line of the screen), the cursor wraps from line 1 to line 24.

The cursor down (↓) key moves the cursor down one line in its current column. If the cursor is postioned at line 24 (the last line of the screen), the cursor wraps from line 24 to line 1.

The cursor forward (→) key moves the cursor forward (to the right) one position. If the cursor is positioned at column 81 (the last column of a line), the cursor wraps to the first column of the next line. If the cursor is positioned at column 81, line 24, the cursor wraps to the Home position (column 1, line 1).

The cursor back (←) key moves the cursor back (to the left) one column. If the cursor is positioned at column 1 of a line, it wraps to column 81 (the last column) of the the previous line. If the cursor is at the Home position (column 1, line 1), the cursor moves to column 81 of line 24.

3.7.2 Cursor Position and Column 81

While data cannot be entered in the 81st column, the cursor can occupy this position. When positioned at column 81, the cursor appears in column 80 and takes on the opposite attribute of its configuration (i.e., the blinking cursor will cease to blink and the non-blinking cursor will start to blink).

If the terminal receives a displayable character when the cursor is positioned at column 80, the character will be displayed in column 80. The cursor will move to column 81, but will appear in column 80, taking on the opposite attribute of its configuration.

If a displayable character is received when the cursor is positioned at column 81, the character will appear in the first column of the next line, and the cursor will appear in column 2.

If the cursor is positioned at column 81 and the terminal receives a Carriage Return (CR) and Line Feed (LF) code sequence, these codes will be acted upon. The cursor will move to column 1 of the next line. The next displayable character received will appear at the cursor position. This feature eliminates an extra blank line below an 80-character data line followed by a CR and an LF.

If the cursor is at the end of the last line (line 24), operation depends on the Roll or Non-Roll mode configuration setting.

3.8 CURSOR MOVEMENT KEYS

The following keys cause cursor movement:

HOME	Moves the cursor to column 1, line 1 (the Home position).
BACK SPACE	Moves the cursor one column to the left of the current line. If the cursor is positioned at column 1, it will not back out of the first column position.
LINE FEED	Moves the cursor one line down in the current column. When Roll mode is enabled (nibble 9 bit 1 is set to 1) and the cursor is positioned at line 24 (the last line), a roll occurs (i.e., the top line of the display is lost and a new blank line appears at the bottom of the screen). If Roll mode is disabled (nibble 9 bit 1 is set to 0) and the cursor is positioned at line 24, the cursor does not move and the alarm sounds.
RETURN	Moves the cursor to column 1 of the current line. If the RETURN key is pressed and Auto-LF is set, the cursor moves to column 1 of the next line.
TAB ⇤ ⇥ or CLEAR ⇥	Moves the cursor to the next tab in the current row, wrapping to the next line when appropriate. Tab stops are located in columns 1, 9, 17, 25, 33, 41, 49, 57, 65, and 73. If the cursor is positioned at line 24 (the last line) on or past the last tab set, and Roll mode is enabled (nibble 9 bit 1 is set to 1), the screen will roll up one line and the cursor will move to the first tab setting on the next line. If Roll mode is not enabled (nibble 9 bit 1 is set to 0), the cursor moves to and stays in column 80 of line 24.
SHIFT and TAB ⇤ ⇥	Moves the cursor backward (to the left) to the previous tab setting. If the cursor is positioned at column 1 of a line, the cursor backs to the last tab setting of the previous line. However, if the cursor is in the Home position (column 1, line 1), the cursor does not move (i.e., back out of the Home position).

3.9 EDITING KEYS

Editing keys are used by the operator to add to and modify data displayed on the screen before transmission.

Pressing the editing keys generates a code that changes or adds data. For this reason, all editing should be done in the Text mode, where data can be changed before it is transmitted. Attempts to edit data in Character mode, where data is transmitted immediately after the keystroke, result in the transmission of codes that change data already received by the host. This can cause discrepancies between data displayed at the terminal and data already received by the host.

Descriptions of the functions of the three editing keys (INSERT, DELETE, and EOP EOL) when pressed alone and simultaneouly with the SHIFT or CTRL keys follow:

INSERT	Enables the Insert mode, which allows characters to be inserted at the cursor position. Each insertion causes the cursor and all the data on the line from the cursor to the end of the line to be shifted to the right one position. Characters shifted off the end of the line will be lost. If the cursor is positioned at column 81 (the last position of a line), no action is taken and an alarm sounds.
CTRL and INSERT	Resets the Insert mode.
SHIFT and INSERT	Moves the data on the line that contains the cursor and all lines below it down one line. The bottom line of the screen is lost and a new blank line is inserted at the cursor position. The cursor is moved to the beginning of the new blank line.
DELETE	Deletes the character designated by the cursor. The rest of the characters to the right of the cursor shift one position to the left and a space is added to the end of the line. The cursor itself does not move.

DELETE and SHIFT	Deletes the data on the line that contains the cursor. All the lines roll up one line and the cursor moves to column 1 of its line. A new blank line is added to the bottom of the screen.
EOP EOL	Erases data characters and attributes from the cursor's position to the end of the line.
SHIFT and EOP EOL	Erases data characters and attributes from the cursor's position to the end of the page.

3.10 BREAK KEY

Pressing the BREAK key alone causes no code transmission and no action at the terminal. Pressing the SHIFT and the BREAK keys forces the Transmitted Data signal (pin 2) on the main port EIA RS-232C communications (data set) interface and the RS-422A transmit line to a space condition for approximately 200 milliseconds. This function is useful for communications signaling between the operator and the host.

3.11 BLANK KEY TO LEFT OF BREAK KEY

Pressing the Blank key to the left of the BREAK key generates the ASCII delete code, 7F hexadecimal.

3.12 CONFIGURATION LINE CONTROL

The SET UP key causes the Configuration Line to appear at the bottom (line 24) of the screen, and the whole screen to roll up one line.

Once the Configuration Line is displayed, the operator can change it by using the cursor up (↑), cursor forward (→), and cursor back (←) keys, as explained in Section 7.

The operator can then choose to either temporarily reconfigure the terminal by storing the new Configuration Line or permanently reconfigure the system by saving the Configuration Line.

To temporarily store the Configuration Line, the operator presses the SET UP key. The Configuration Line disappears, the terminal screen returns to its original display (i.e., the display before the SET UP key was first pressed), and the terminal operates under the new configuration until the Configuration Line is changed again or the terminal is turned OFF. When the terminal is turned ON, the Configuration Line returns to its previous configuration.

To permanently retain the new terminal configuration, the operator presses the SAVE key. The Configuration Line disappears, the terminal screen returns to its original display, and the terminal operates under the new configuration. This new configuration is kept even if the terminal is turned OFF. The previous configuration no longer exists.

3.13 PROGRAM FUNCTION KEYS

There are seven program function keys (F1 to F7). These keys immediately transmit a two-character sequence in all modes; the first character is ESC (1B hexadecimal), followed by these codes:

	Unshifted		Shifted	
Key	Hex	ASCII	Hex	ASCII
F1	30	0	31	1
F2	32	2	35	5
F3	36	6	37	7
F4	38	8	39	9
F5	3A	:	3B	;
F6	3C		3D	=
F7	3E		3F	?

NOTE

If the terminal receives these code sequences from the host, the sequences are ignored. No action is taken and the cursor does not move.

3.14 SCREEN COPY KEY (BLANK KEY TO RIGHT OF F7 KEY)

Pressing the blank key located adjacent to the key labeled F7 causes a local action of transferring the content of the screen out the auxiliary port. Normal operation requires the auxiliary port to be configured (nibble 4 bit 3 set to 0) as disabled to prevent unwanted transmissions from a connected device. Pressing the screen copy key overrides the disable setup configured for the auxiliary port and does not cause the transmit of any code from the terminal to a connected host on the primary communciations port. The data on the screen to be transmitted out the auxiliary port is defined to begin at the screen Home position, include all spaces, and end at the cursor position minus one. The keyboard is locked during this transmission and the cursor disappears until the transmission is completed. The terminal ignores any input from the connected host during this transmission. The transmission rate for the auxiliary port screen copy is selected to be compatible with the connected device and is set by configuring nibble 8 bits 2, 1, and 0

(refer to Section 7). The terminal firmware supports two formatted outputs for screen copy: an ASPI protocol selected when nibble 9 bit 3 is set to 0 and normally operated at 9600 bps (refer to Section 8) or a TTY-like character stream output selected when nibble 9 bit 3 is set to 1 and normally operated at 300 bps (i.e., CR, LF, and 9 delete codes (7F Hex) follow each line).

3.15 CLEAR KEY

Pressing the SHIFT and CLEAR keys simultaneously causes the following actions:

- Moves the cursor to the Home position
- Erases all displayed data
- Sets normal (high) intensity
- Resets Insert mode, if set
- Resets Graphic mode, if set
- Resets Forms mode

Pressing the CLEAR and CTRL keys simultaneously resets the terminal to its initial state by aborting all operations, clearing the screen of all data and attributes, and restoring the Configuration Line to the configuration ROM settings. Specifically, pressing the CLEAR and CTRL keys causes the following actions:

- Moves the cursor to the Home position
- Resets the Insert and Graphic modes
- Resets the Keyboard Lock command
- Resets incomplete command sequences and errors
- Initializes the self-test
- Turns off the auxiliary port.
- Resets Forms mode

These are the same logical sequences that are performed at power up.

3.16 KEYBOARD COMMANDS

Many remote commands can be entered from the keyboard using the appropriate sequences (refer to Section 4).

Section 4
VIP7201 COMMANDS AND KEYS

4.1 GENERAL DESCRIPTION

This section is a dictionary of all the operational commands and keys used by the VIP7201 terminal. Special keys that generate no codes by themselves but which alter codes generated by other keys are also included.

4.2 COMMAND FORMAT

The information is organized in a categorical format, listing the name of the command, its ASCII code, and the hexadecimal equivalent for the code. These entries are followed by the keys that are used to generate the command and a concise description of the command's function(s).

4.3 CONVENTIONS

The following conventions are used to represent key activation:

ESC	then	N	means these keys are pressed sequentially.
CTRL	and	N	means these keys are pressed simultaneously.

For clarity, all alphabetic keys will be identified as either uppercase or lowercase as follows:

(lowercase) = CAP LOCK key is up and SHIFT key is not pressed.

(uppercase) = Either CAP LOCK key is down or SHIFT key is pressed.

Pressing the alphabetic key alone generates the lowercase character, while pressing the alphabetic key simultaneously with the SHIFT or CAP LOCK key generates the uppercase character.

Punctuation, numeric keys, and several symbol keys depict two characters. To generate the character depicted on the upper portion of the key, the key is pressed simultaneously with the SHIFT key. To generate the character depicted on the lower portion of the key, the key is pressed alone.

Most commands can be generated by entering the proper escape sequence. Some commands can be generated by dedicated keys that automatically generate this sequence.

For listings of all VIP7201 terminal commands, both by mnemonic and ASCII code sequence, refer to Appendix A. Also included in Appendix A is a table listing ASCII codes and their definitions.

APC - AUXILIARY PORT CONNECT (WITHOUT DISPLAY)

ASCII Code: ESC a Hexadecimal: 1B 61

Keyboard Generation: [ESC] then [A] (lowercase)

Function: Simultaneously connects the auxiliary port to the primary communications port and disconnects the display interface in all modes (nibble 4 bit 3 is set to 1). The auxiliary port permits direct connection of an RS-232C or RS-422A type device. The port provides a secondary input/output of data. The keyboard is not locked.

NOTE

On power up, the auxiliary port depends on nibble 4 bit 3 (refer to subsection 6.3).

APD - AUXILIARY PORT DISCONNECT

ASCII Code: ESC b Hexadecimal: 1B 62

Keyboard Generation: [ESC] then [B] (lowercase)

Function: Simultaneously disconnects the auxiliary port from the primary communications port and connects the display interface (nibble 4 bit 3 is set to 0). The APD command does go out the auxiliary port.

APP - AUXILIARY PORT PARALLEL (WITH DISPLAY)

ASCII Code: ESC d Hexadecimal: 1B 64

Keyboard Generation: [ESC] then [D] (lowercase)

Function: Logically connects the primary communications port with the auxiliary port and display interface, which results in input from the host going to both the display interface and the auxiliary port. In Normal mode, input from the auxiliary port goes to the host and if in Non-Echo mode, to the display interface.

In Character/Echo mode, keyboard data is not transmitted directly to the auxiliary port. Keyboard data is transmitted to the host. All data from the host goes to the display interface and out the auxiliary port. In turn, inputs from the auxiliary port are transmitted directly to the host and, if echoed by the host, transmitted to both the display interface and the auxiliary port.

In Character/Non-Echo mode, keyboard data and auxiliary port data are transmitted to the host via the main port and to the display interface. Data from the host is transmitted to the auxiliary port and the display.

In Text mode, keyboard data is transmitted only to the display interface. When the displayed data is transmitted to the main port, it is also transmitted to the auxiliary port.

BEL - BELL

ASCII Code: BEL Hexadecimal: 07

Keyboard Generation: [CTRL] and [G] (uppercase and lowercase)

Function: Sounds the alarm for approximately 0.8 second.

BRK - BREAK

ASCII Code: None Hexadecimal: None

Keyboard Generation: [SHIFT] and [BREAK]

Function: Forces the Transmitted Data signal (pin 2) on the main port EIA RS-232C communications (data set) interface and the RS-422A transmit line to a space condition for approximately 200 milliseconds. This command is used by the operator in conjunction with the a host system for communications signaling. BREAK remains active even if the Keyboard Lock (KBL) command was issued.

BS - BACK SPACE

ASCII Code: BS Hexadecimal: 08

Keyboard Generation: [BACK SPACE] or [CTRL] and [H] (uppercase or lowercase)

Function: Moves the cursor back (to the left) one position on the line. If the cursor is positioned at column 1 of a line, it will not back out of that line.

CAP LOCK - CAP LOCK (This is a key, not a command.)

ASCII Code: None Hexadecimal: None

Keyboard Generation: [CAP LOCK]

This is an alternate action key. Pressing the key once enables it, locking the key in the down position. Pressing the key a second time disables it, returning it to the up position.

Function: Causes the 26 alphabetic keys (A through Z) to generate their uppercase codes (ASCII hexadecimal 41 through 5A) without pressing and holding down the SHIFT key.

NOTE

Because the CAP LOCK key modifies alphabetic codes, escape sequences entered from the keyboard that use alphabetic codes are affected. Escape sequences generated by single keys (e.g., HOME) are not affected.

CBT - CURSOR BACK TAB

ASCII Code: ESC [Z Hexadecimal: 1B 5B 5A

Keyboard Generation: [SHIFT] and [⇤ ⇥]

Function: Moves the cursor back (to the left) to the previous tabular setting. If the cursor is positioned at column 1 of a line, the cursor backs to the last tab position of the previous line. The cursor, however, will not back out of the Home position (line 1, column 1).

CLR - CLEAR

ASCII Code: ESC Hexadecimal: 1B 60

Keyboard Generation: [SHIFT] and [CLEAR →|]

Function: Causes the following actions:

- Moves the cursor to the Home position
- Erases all displayed data
- Clears incomplete command sequences
- Sets normal (high) intensity
- Resets Insert mode, if set
- Resets Graphic mode, if set, to Normal mode
- Unlocks keyboard, if locked.
- Resets Forms mode

CM - CHARACTER MODE

ASCII Code: ESC k Hexadecimal: 1B 6B

Keybaord Generation: [ESC] then [K] (lowercase)

Function: Sets the terminal to Character mode (nibble 5 bit 0 is set to 1). In this mode, the terminal transmits each character or command sequence as it is entered at the keyboard.

CPB - CURSOR POSITION BINARY

ASCII Code: ESC f P_C P_L Hexadecimal: 1B 66 P_C P_L

Keyboard Generation: [ESC] then [F] (lowercase)

then ___ then ___
P_C P_L

Function: Moves the cursor to the position specified by the column P_C and the line P_L parameters, which are given in the following table. The parameter ranges are limited to columns 01 through 81 and lines 01 to 24 (i.e., the command is invalid when out of range).

Cursor Position Binary P_C/P_L Values

COL/ LINE	ASCII CHAR	HEX	COL/ LINE	ASCII CHAR	HEX	COL/ LINE	ASCII CHAR	HEX
1	SP	20	28	;	3B	55	V	56
2	!	21	29	<	3C	56	W	57
3	"	22	30	=	3D	57	X	58
4	#	23	31	>	3E	58	Y	59
5	$	24	32	?	3F	59	Z	5A
6	%	25	33	@	40	60	[	5B
7	&	26	34	A	41	61	\	5C
8	'	27	35	B	42	62	]	5D
9	(	28	36	C	43	63	^	5E
10	)	29	37	D	44	64	_	5F
11	*	2A	38	E	45	65	`	60
12	+	2B	39	F	46	66	a	61
13	,	2C	40	G	47	67	b	62
14	-	2D	41	H	48	68	c	63
15	.	2E	42	I	49	69	d	64
16	/	2F	43	J	4A	70	e	65
17	0	30	44	K	4B	71	f	66
18	1	31	45	L	4C	72	g	67
19	2	32	46	M	4D	73	h	68
20	3	33	47	N	4E	74	i	69
21	4	34	48	O	4F	75	j	6A
22	5	35	49	P	50	76	k	6B
23	6	36	50	Q	51	77	l	6C
24	7	37	51	R	52	78	m	6D
25	8	38	52	S	53	79	n	6E
26	9	39	53	T	54	80	o	6F
27	:	3A	54	U	55	81	p	70

CR - CARRIAGE RETURN

ASCII Code: CR Hexadecimal: 0D

Keyboard Generation: RETURN

Function: Moves the cursor to position 1 of its current line.

When operating from the keyboard with Auto-LF set, the CR command results in a Carriage Return followed by a Line Feed. This moves the cursor to position 1 of the next line.

If the cursor is positioned on line 24 (the last line) when this command occurs, the resulting action depends on whether the terminal is in Roll or Non-Roll mode. If in Roll mode, all data rolls up one line, the data that was on line 1 is lost, and the cursor moves to position 1 of the new (and blank) line 24. If in Non-Roll mode, the cursor moves to position 1 of its line and the alarm sounds.

The terminal will not append an LF code to a CR code received from the host when Auto-LF is set.

CRB - CURSOR REQUEST BINARY

ASCII Code: ESC n Hexadecimal: 1B 6E

Keyboard Generation: Not normally generated from the keyboard.

Function: Automatically transmits a CPB (Cursor Position Binary) code, which reflects the cursor's current position in the binary column and the line coordinates tabulated under the CPB command.

For example, if the cursor is located at column 28, line 20, and the CBR command is received, the response would be:

Command	Response
1B 6E	1B 66 3B 33
ESC n	ESC f ; 3

CTL - CONTROL (This is a key, not a command.)

ASCII Code: None Hexadecimal: None

Keyboard Generation: [CTRL]

Press this key simultaneously with the key for which the code is to be altered.

Function: Modifies the code of certain keys, thus changing their functions. Refer to Appendix B for a matrix that summarizes the key codes with and without CTRL.

CUB - CURSOR BACKWARD

ASCII Code: ESC D Hexadecimal: 1B 44

Keyboard Generation: [←]

Function: Moves the cursor back (to the left) one column at a time (at the rate of 15 cps) as long as the cursor key is held down continuously. The cursor wraps around line for line until the Home position (column 1, line 1) is reached. When backed out of the Home position, the cursor goes to line 24, column 81, and continues backward.

When in column 81, the cursor appears in column 80, but takes on the attribute opposite to its configuration (i.e., a blinking cursor will cease to blink and a non-blinking cursor will start to blink).

CUD - CURSOR DOWN

ASCII Code: ESC B Hexadecimal: 1B 42

Keyboard Generation: [↓]

Function: Moves the cursor down one line at a time (at the rate of 15 cps) as long as the key is held down, wrapping around in the same column from screen line 24 to screen line 1.

CUF - CURSOR FORWARD

ASCII Code: ESC C Hexadecimal: 1B 43

Keyboard Generation: [→]

Function: Moves the cursor forward (to the right) one column at a time (at the rate of 15 cps) as long as the key is held down, wrapping around line for line to line 24, column 81. When moved forward out of screen line 24, column 81, the cursor goes to the Home position (line 1, column 1) and continues forward. When advanced to column 81, the cursor appears in column 80, but takes on the attribute opposite to its configuration (i.e., a blinking cursor will cease to blink and a non-blinking cursor will start to blink).

CUH - CURSOR HOME

ASCII Code: ESC H Hexadecimal: 1B 48

Keyboard Generation: [HOME]

Function: Moves the cursor to line 1, column 1.

CUU - CURSOR UP

ASCII Code: ESC A [↑] Hexadecimal: 1B 41

Keyboard Generation:

Function: Moves the cursor up one line at a time (at the rate of 15 cps) as long as the key is held down, wrapping around in the same column from screen line 1 to screen line 24.

DCH - DELETE CHARACTER

ASCII Code: ESC [P Hexadecimal: 1B 5B 50

Keyboard Generation: DELETE

Function: Deletes the data character designated by the cursor. All data with its attributes to the right of the deletion shifts to the left one position, leaving a space at the end of the line. The deletion does not cause a wrap from line to line.

DEL - ASCII DELETE

ASCII Code: DEL Hexadecimal: 7F

Keyboard Generation: Blank key to the left of the BREAK key

Function: Time fill; the terminal takes no action when it receives this code.

DEOT - DISCONNECT

ASCII Code: DLE EOT Hexadecimal: 10 04

Keyboard Generation: CTRL and P then CTRL and D

Function: When the terminal is connected by an EIA RS-232C interface, causes the terminal to drop the Data Terminal Ready (DTR) interface signal (pin 20) for approximately 30 seconds, disconnecting the terminal from its line. On a switched line, this command causes a physical disconnect. The keyboard is locked during the 30-second period, and the terminal cannot receive any data from the host.

DL - DELETE LINE

ASCII Code: ESC [M Hexademimal: 1B 5B 4D

Keyboard Generation: SHIFT and DELETE

Function: Deletes all data and attributes on the line designated by the cursor, and the cursor moves to position 1 of the line. All succeeding lines and attributes move up one line, leaving the last line of screen data blank.

ENQ - ENQUIRY

ASCII Code: ENQ Hexadecimal: 05

Keyboard Generation: Not normally generated on the keyboard.

Function: When received from the host, requests an immediate identification and status message from the terminal. The terminal responds immediately with the 10-byte ASCII message, which consists of a four-character identifier (i.e., the four numeric characters 7201), five additional bytes (as shown in Table 4-1), and ends with EOT.

NOTES

1. The error status bits are reset after the ENQ response is transmitted. The test result bit is not reset.

2. If the ENQ is received while the terminal is transmitting, the reponse occurs after the transmission. ENQ must not be included as part of an escape sequence.

Response Message:

37 32 30 31	— — — — —	04
7 2 0 1		EOT
Identification Bytes 1 through 4	Status Bytes 5 through 9 (see Table 4-1)	Byte 10 (end of message)

NOTE

If any status byte in the configuration is hexadecimal 40, it is transmitted as a hexadecimal 20.

Table 4-1. VIP7201 Status Byte Bit Functions

Status Byte Number	Bit Numbers						
	6	5	4	3	2	1	0
5	Always = 1	Always = 0		Test Result 1 = Fail 0 = Pass	Communications Error 1 = Error 0 = No Error		
6	Always = 1	Always = 0					
7	Always = 1	Always = 0	Roll Mode 1 = On 0 = Off		Echo Mode 1 = Off 0 = On		
8	Always = 1	Always = 0		Keyboard Lock/Unlock 1 = Lock 0 = Unlock			
9	Always = 1	Always = 0	Graphic Mode 1 = On 0 = Off	Insert Mode 1 = On 0 = Off			

EOL - ERASE TO END OF LINE

ASCII Code: ESC K Hexadecimal: 1B 4B

Keyboard Generation: [EOP EOL]

Function: Erases data characters and attributes from the cursor's position to the end of the line.

EOP - ERASE TO END OF PAGE

ASCII Code: ESC J Hexadecimal: 1B 4A

Keyboard Generation: [SHIFT] and [EOP EOL]

Function: Erases data characters and attributes from the cursor's position to the end of the display screen.

EP - ECHO

ASCII Code: ESC m Hexadecimal: 1B 6D

Keyboard Generation: [ESC] then [M] (lowercase)

Function: Sets the terminal to Echo mode (nibble 4 bit 1 is set to 1). In this mode, data and commands keyed in at the terminal are transmitted to the host without being displayed or acted upon by the terminal, unless they are sent back (echoed) from the host for display.

ESC - ESCAPE

ASCII Code: ESC Hexadecimal: 1B

Keyboard Generation: [ESC]

Function: Indicates the beginning of a multicharacter sequence. The terminal does not respond until the entire sequence has been interpreted.

FM

FM- FORM MODE

ASCII Code: ESC [h Hexadecimal: 1B 5B 68

Keyboard Generation: Not normally generated from the keyboard.

Function: This command sets the terminal to Form mode. In this mode, visual attributes also mean protected and unprotected fields. Entry into protected fields is inhibited, and the first position of each unprotected field is an automatic tab stop. Data can only be entered in unprotected fields.

When the cursor is in a protected field, the next character entered causes an automatic tab to the first position of the next unprotected field and the character is displayed. When there are no unprotected fields after the cursor, the attempted entry of data or a tab will not move the cursor and the alarm sounds.

NOTE

1. Refer to subsection 5.1 for details of operation.
2. Refer to TXD for a description of the transmit boundaries.
3. Refer to Appendix F for a sample form and operation of Forms mode.

Fx/FSx - FUNCTION CODES (14)

ASCII Code: See Table 4-2. Hexadecimal: See Table 4-2.

Keyboard Generation: See Table 4-2.

Function: Immediately transmits an Escape (ESC) sequence to be interpreted by the host computer. The terminal does not respond to these codes. When combined with the SHIFT key, the commands become FSx.

Table 4-2. Function Key Codes

Keyboard Key Cap	Command Code Hexadecimal	ASCII Character Sequence
F1	1B 30	ESC 0
SHIFT and F1	1B 31	ESC 1
F2	1B 32	ESC 2
SHIFT and F2	1B 35	ESC 5
F3	1B 36	ESC 6
SHIFT and F3	1B 37	ESC 7
F4	1B 38	ESC 8
SHIFT and F4	1B 39	ESC 9
F5	1B 3A	ESC :
SHIFT and F5	1B 3B	ESC ;
F6	1B 3C	ESC <
SHIFT and F6	1B 3D	ESC =
F7	1B 3E	ESC >
SHIFT and F7	1B 3F	ESC ?

HT - HORIZONTAL TAB

ASCII Code: HT Hexadecimal: 09

Keyboard Generation: [←→|] or [CLEAR →|]

Function: Moves the cursor forward (to the right) to the next tabular setting, wrapping around to the next line, if appropriate. If Roll mode is enabled and the HT command is received with the cursor on or past the last tab on line 24, the screen will roll up one line. If in Non-Roll mode, the cursor moves to and stops at column 80.

IL - INSERT LINE

ASCII Code: ESC [L Hexadecimal: 1B 5B 4C

Keyboard Generation: [SHIFT] and [INSERT]

Function: Inserts a single blank line at the line designated by the cursor. The cursor moves to the beginning of the new blank line. All lines from and including the line on which the cursor was positioned move down one line. The previous 24th line will be lost.

IM - INSERT MODE

ASCII Code: ESC [I Hexadecimal: 1B 5B 49

Keyboard Generation: [INSERT]

Function: Sets the terminal to Insert mode, permitting character insertion at the cursor's position. Each insertion causes the cursor and all data from that point to the end of the line to shift right one position. Characters that are shifted off the end of the line do not wrap around to the next line.

When the cursor reaches column 81, no characters can be inserted and the alarm sounds.

An Insert Mode Reset (IMR), Clear (CLR), or Reset Initial State (RIS) command terminates Insert mode.

IMR - INSERT MODE RESET

ASCII Code: ESC [J Hexadecimal: 1B 5B 4A

Keyboard Generation: CTRL and INSERT

Function: Terminates Insert mode; otherwise, the command is ignored.

KBL - KEYBOARD LOCK

ASCII Code: ESC [X Hexadecimal: 1B 5B 58

Keyboard Generation: Not normally generated on the keyboard.

Function: Disables all keyboard functions except the BREAK and function keys. If the key click is enabled (nibble 6 bit 3 is set to 1) when the keyboard is locked, a key click will be heard if the SHIFT and BREAK keys are pressed simultaneously, or if any one of the functions keys is pressed. The cursor video is turned off (no cursor is displayed) to indicate to the operator that the keyboard is locked. The keyboard can be enabled by the host system sending a Keyboard Unlock (KBU), Clear (CLR), or Reset Initial State (RIS) command.

The keyboard will be unlocked after a Transmit Data (TXD) command from the host.

The operator can enable the keyboard by pressing the SET UP key twice, if the lock was caused by a KBL command.

KBU - KEYBOARD UNLOCK

ASCII Code: ESC [W Hexadecimal: 1B 5B 57

Keyboard Generation: Not normally generated on the keyboard.

Function: Unlocks the keyboard after the keyboard has been locked by the Keyboard Lock (KBL) command. The cursor will reappear. The Clear (CLR) and Reset Initial State (RIS) commands also unlock the terminal.

LF - LINE FEED

ASCII Code: LF Hexadecimal: 0A

Keyboard Generation: [LINE FEED]

Function: Moves the cursor down one line. If the cursor is on the last line of data space and in Roll mode, the data rolls up one line, the data that was on line 1 is lost, and a new blank line containing the cursor appears at the bottom of the screen. If in Non-Roll mode, the cursor does not move and the alarm sounds.

LGR - LINE GRAPHICS RESET

ASCII Code: ESC F Hexadecimal: 1B 46

Keyboard Generation: [ESC] then [F] (uppercase)

Function: Resets Line Graphic mode (nibble 5 bits 2 and 1 are set to 1 and 1, respectively). The Clear (CLR) and Reset Initial State (RIS) commands terminate the Graphic mode and return the terminal to Normal mode as well as the other Clear or RIS functions.

LGS - LINE GRAPHICS SET

ASCII Code: ESC G Hexadecimal: 1B 47

Keyboard Generation: [ESC] then [G] (uppercase)

Function: Sets the terminal to Line Graphic mode (nibble 5 bits 2 and 1 are set to 1 and 0, respectively). Table 4-3 lists the line graphics set available for the terminal. Each symbol can be repeated horizontally by holding its key down.

Graphic symbols use the lowercase alphabetic (except z) and grave accent (hexadecimal 60) codes. These codes are stored in screen memory and transmitted to and from the terminal.

NOTE

Graphics are not framed by the LGS and LGR commands when transmitted to the host.

Table 4-3. VIP7201 Graphic Symbols

Symbol	Description	Hex Code	Key
	Lower Left Corner	60	~
	Vertical Line	61	A
	Upper Left Corner	62	B
	Left Intersection	63	C
	Lower Right Corner	64	D
	Horizontal Line	65	E
	Bottom Intersection	66	F
	Upper Right Corner	67	G
	Right Intersection	68	H
	Top Intersection	69	I
	Center Intersection	6A	J
	Top Left Quadrant (Quadrant 1)	6B	K
	Bottom Left Quadrant (Quadrant 3)	6C	L
	Left Half	6D	M
	Top Right Quadrant (Quadrant 2)	6E	N
	Top Half	6F	O
	Quadrants 2 and 3	70	P
	Quadrants 1, 2, and 3	71	Q
	Bottom Right Quadrant (Quadrant 4)	72	R
	Quadrants 1 and 4	73	S
	Bottom Half	74	T
	Quadrants 1, 3, and 4	75	U
	Right Half	76	V
	Quadrants 1, 2, and 4	77	W
	Quadrants 2, 3, and 4	78	X
	Full (All Quadrants)	79	Y

NEP - NON-ECHO

ASCII Code: ESC l (lowercase) Hexadecimal: 1B 6C

Keyboard Generation: Not normally generated on the keyboard.

Function: Sets Non-Echo mode (nibble 4 bit 1 is set to 0); otherwise, the command is ignored.

NULL

ASCII Code: NUL Hexadecimal: 00

Keyboard Generation: CTRL and SHIFT and @ 2

Function: Time fill; the terminal takes no action in response to this command.

PDS - PRINT DATA SPACE

ASCII Code: ESC [0 p Hexadecimal: 1B 5B 30 70

Keyboard Generation: Blank key adjacent to the F7 key.

Function: This command can be received from the host system or generated from the keyboard. It causes display data space to output to the auxiliary port. The data format on output is dependent upon the terminal setup configuration of nibble 9 bit 3. The keyboard is locked during output of the data to the auxiliary port and the terminal ignores any receive data on the primary communications port during this operation.

Refer to Section 8 for details on this command.

RIS - RESET INITIAL STATE

ASCII Code: ESC c Hexadecimal: 1B 63

Keyboard Generation: CTRL and CLEAR →|

Function: Aborts all operations, clears the screen of all data and attributes, and restores the Configuration Line to the configuration ROM settings. Specifically:

- Moves the cursor to the Home position
- Resets the Insert and Graphic modes
- Resets the Keyboard Lock command
- Resets incomplete command sequences and errors
- Turns off the auxiliary port
- Initializes the self-test.
- Data in the input buffers is cleared.

These operations are the same logical sequences that are performed at power up.

NOTE

The RIS command takes approximately 700 milliseconds to complete. Fill characters (DEL 7F hexadecimal) or a timeout is required after an RIS before data or another command can be transmitted to the terminal. The Data Terminal Ready signal on the RS-232 interface drops for approximately 700 milliseconds.

RMR - ROLL MODE RESET

ASCII Code: ESC q Hexadecimal: 1B 71

Keyboard Generation: [ESC] then [Q] (lowercase)

Function: Sets Non-Roll mode (nibble 9 bit 1 is set to 0); otherwise, the command is ignored.

RMS - ROLL MODE SET

ASCII Code: ESC r Hexadecimal: 1B 72

Keyboard Generation: [ESC] then [R] (lowercase)

Function: Sets the terminal to Roll mode (nibble 9 bit 1 is set to 1).

NOTE

If the cursor is positioned at line 24 and a Line Feed (LF) command is entered or the RETURN key is pressed while in Auto-LF, all data rolls up one line, and the data that was on line 1 is lost.

SHI - SET HIGH INTENSITY

ASCII Code: ESC 3 Hexadecimal: 1B 33

Keyboard Generation: [ESC] then [# 3]

Function: Displays the next received characters in the visual attribute defined by the 0's in nibble 2. Subsequent characters are displayed with this attribute until the Set Low Intensity (SLI) command is received.

SHIFT (2 Keys) (This is a key, not a command.)

ASCII Code: None Hexadecimal: None

Keyboard Generation: [SHIFT]

Function: Modifies key functions. When either of the momentary action SHIFT keys are pressed with the alphabetic keys, the uppercase alphabetic character is generated; with numeric keys, the symbol above the number is generated; with special symbol keys, the upper symbol is generated. The SHIFT key also modifies the meaning of the function and editing keys.

SLI - SET LOW INTENSITY

ASCII Code: ESC 4 Hexadecimal: 1B 34

Keyboard Generation: [ESC] then [$ 4]

Function: Displays the next received characters in the visual attributes defined by the 1's setting in nibble 2. Subsequent characters are also displayed with this attribute until a Set High Intensity (SHI), Clear (CLR), or Reset Initial State (RIS) command is received.

TM - TEXT MODE

ASCII Code: ESC [1 Hexadecimal: 1B 5B 6C

Keyboard Generation: [ESC] then [] [] then [L] (lowercase)

Function: Sets the terminal to Text mode (nibble 5 bit 0 is set to 0). Data can be entered in any position of data space. Visual attributes can be set and are effective. Data, but not the visual attributes, are transmitted by the Transmit Data (TXD) command or the XMIT key.

Graphic symbols are represented by the lowercase alphabetic (except z) and grave accent (hexadecimal 60) codes in the terminal memory and are considered as data when in Text mode.

TRD

Command Name: TRD- TEST RESULTS DISPLAY

ASCII Code: ESC Z Hexadecimal: 1B 5A

Keyboard Generation: [ESC] then [Z] (uppercase Z)

Function: This command is used to determine hardware difficulties and to identify the operating firmware version. This command runs the self-test, clears the data space, and then displays the test results and the firmware version.

TXD - TRANSMIT DATA

ASCII Code: ESC i Hexadecimal: 1B 69

Keyboard Generation: 

Function: When in Character or Text mode and the TXD command is received, the terminal transmits a block of displayed data, starting from the Home position (line 1, column 1) up to, but not including, the cursor's current position. Only data character (including spaces) and line graphic (lowercase alphabetic characters and the grave accent) codes are transmitted. CR and LF codes are not transmitted at the end of a line. The ASCII EOT character is appended to the end of the data as a block delimiter. The block is transmitted at the specified baud rate with no character delays between contiguous characters.

If the cursor is in the Home position, the terminal transmits only an EOT character.

Before the terminal starts to transmit data, the terminal will lock the keyboard; after sending an EOT, it will unlock the terminal. Note that the cursor is off when the keyboard is locked and reappears when it is unlocked.

The transmit key and command, while in the Form mode, transmits only the unprotected data fields separated by the horizontal tab, HT, code (09 hex) in place of protected fields. Transmission starts at the beginning of the first unprotected field up to and including all of the last unprotected field. Trailing spaces in an unprotected field and blank unprotected fields (all spaces) are transmitted. The EOT code (04 hex) is appended to the end of the data stream. Transmission is independent of cursor position.

Example: Data 1,HT,Data2,HT,...,Data n,EOT.

Section 5
FUNCTIONAL DESCRIPTION

The VIP7201 terminal operates in various modes with different display attributes, keyboard features, and communications interfaces. The operator or the host chooses among these features and selects those that meet the requirements of the application. The operator then configures the terminal by setting the Configuration Line to the appropriate bit settings. The host can also control some of the configuration bit settings (refer to Section 4 for a detailed discussion of the host commands that relate to the configuration bit settings).

This section describes all the VIP7201 terminal features, while Section 7 explains the Configuration Line settings used to configure the system to these features.

5.1 OPERATING MODES

The VIP7201 terminal operates in four modes: Normal, Form, Graphic, and Monitor.

5.1.1 Normal Modes

The normal operating modes include the Character, Text, and Form Modes.

Character mode allows operation as a conversational terminal providing for transmit of characters as they are generated by a keystroke, one character at a time. The terminal enters Character mode if specified by Set Up on the Configuration Line or upon receiving the Character Mode (CM) command.

Text mode allows an operator to compose a message on the screen and to edit a message before transmitting. The message can be of variable length up to 24 lines of 80 characters per line. Data to be transmitted is located between the Home position and the cursor position minus one. Space codes are transmitted for locations where data has not been entered. Carriage return and line feed codes are not sent at the end of each line. Transmit is initiated by pressing the XMIT key or after receiving the TXD command from the host. However, pressing a program function key F1 through F7 causes a two-character function code sequence to be transmitted immediately, separate from the message. A message ends with an EOT code.

Form mode provides for protected and unprotected fields of data. An operator cannot enter data within a protected field. Fields of data displayed in the assigned visual attribute (i.e., low intensity, inverse video, underline) become protected fields when the terminal is set to Form mode. Fields not displayed in the assigned visual attribute remain normal unprotected fields. An operator can tab to move from an unprotected field. Transmit is initiated by pressing the XMIT key or the TXD command. Only unprotected fields of data are transmitted to include trailing spaces. Protected fields are replaced in the transmit data stream by an HT code.

5.1.2 Form Mode

The command ESC [h (1B,5B,68 hex) sets the terminal to Form mode. If the terminal was in Character mode, it will cause text mode (nibble 5 bit 0 = 0) to be set. If the AUX Port was enabled, it will be disabled (nibble 4 bit 3 = 0). If roll mode was set, it will be reset (NON-ROLL, nibble 9 bit 1 = 0).

The main differences between Text and Form mode are:

1. In Text mode, the attribute field (bit 8 in screen refresh memory) causes a visual attribute only. In Form mode the visual attribute field has the additional meaning of protected field when the attribute is set.

2. The columnar tab stops set in Character and Text mode are not effective. Instead, the first position of every unprotected field is treated as if a tab stop was set in that position.

3. The cursor home key and host command will position the cursor at the beginning of the first unprotected field in Form mode rather than row 1 and column 1.

4. Although the cursor may be positioned in a protected field, data may not be entered in the protected field while in Form mode. When the cursor is in a protected field, the next displayable character entered will cause an automatic tab to the first position of the next unprotected field, and the character will be displayed there.

5. In Form mode, the TAB (and BACK TAB) keys and commands will move the cursor forward (or reverse) to the first column of the next (or previous) unprotected field. when there are no unprotected fields after (or before) the cursor position, the attempted tab will not move the cursor and the alarm will sound.

6. In Form mode, the visual (protect/unprotect) attribute may not be changed. Only in the Text or Character mode may the attribute be set or cleared.

7. The transmit key and command, while in the Form mode, transmits only the unprotected data fields separated by the horizontal tab, HT, code (09 hex) in place of protected fields. Transmission starts at the beginning of the first unprotected field up to and including all of the last unprotected field. The EOT code (04 hex) is appended to the end of the data stream. Transmission is independent of cursor position.

   Example: Data 1,HT,Data2,HT,...,Data n,EOT.

8. Erase while in Forms mode will erase only the unprotected data. Erase end of page - the erasure is from the cursor position to the end of display. Erase end of line is from the cursor position to the end of only the field the cursor is in, not any other fields.

9. The clear command, when received in Forms mode, as well as clearing all data (protected and unprotected) and clearing all visual (protect) attributes, and the other functions of clear, will reset the Form mode, that is, cause the terminal to be inthe Text mode.

10. Insert and Delete. In form mode, the character insert mode and character delete will operate in an unprotected field only. Protected fields will not be affected or moved. Line insert and delete will not be allowed or honored in form mode.

NOTE

The operator or host system can exit the Form mode by the Set Character Mode command.

5.1.3 Monitor Mode

When the terminal is in Monitor mode, the terminal displays the hexadecimal representation of the ASCII codes, including control codes, on the terminal screen as they are received, rather than acting upon them. This mode is used mainly for program development.

5.1.4 Graphic Mode

When the terminal is in Graphic mode, a line drawing set that allows the generation of simple line drawings and complex forms for limited graphic display is available. The line drawing set comprises graphic symbols that take the place of and use the ASCII codes of the grave accent and the lowercase alphabetic characters, except lowercase z. Refer to Section 4, Table 4-3, for a complete listing of the line graphics set, and also to Appendix C for a discussion of the line graphics set.

5.1.5 Roll Mode

While operating in either the Normal, Graphic, or Monitor mode, the terminal can also be set to Roll mode. If a display ASCII code is received at the last character position (column 81) of the bottom line (line 24) and Roll mode is enabled, the screen data moves up one line, the top line is lost, and the cursor moves to column 1 of the new blank bottom line. If in Non-Roll mode, the data character will be ignored and an alarm will sound. Also, the Line Feed (LF) command will not operate and the alarm will sound when in Non-Roll mode.

5.1.6 Control Code Display

Control codes entered at the keyboard can either be displayed on the screen and cause no action or not be displayed on the screen and cause some action. Control code display is enacted by nibble 9 bit 2, and its use is limited to program development.

5.2 COMMUNICATIONS MODES

In addition to the operational modes, there are communications modes that are used in conjunction with them. For a complete discussion of these modes and for all VIP7201 communications interfaces, refer to Section 6.

5.3 VISUAL ATTRIBUTES

At configuration time, one of or one combination of the following visual attributes can be defined for each location on the screen:

- o Inverse Video
- o Blink
- o Underline
- o High or Low Intensity

Once defined, only that attribute or combination may be assigned or not assigned to each individual displayable character by the host application software. For example, if the combination Inverse Video and Blink is configured, each displayable character will either have no visual attribute associated with it or it will be displayed in inverse video and will be blinking.

5.3.1 Inverse Video by Character

Normally, data is displayed in green characters on a dark background. In inverse video by character, characters will be displayed within a block on a green background.

5.3.2 Inverse Video by Screen

Normally, data is displayed in green on a dark background. In inverse video by screen, the reverse is true -- data is dark and the background is green for the entire screen.

5.3.3 Dual Intensity

Normally data is displayed in high intensity. The option exists, however, to display the data in low intensity.

5.3.4 Blinking or Underlined

Data can be displayed as blinking or steady. Data can be displayed with or without underlines.

5.3.5 Cursor Display

The cursor can be displayed either as steady or blinking. The cursor can be either an underline or an inverse video block.

5.4 KEYBOARD FEATURES

The operator can select or inhibit the following features by setting the Configuration Line.

5.4.1 Margin Bell

When the cursor moves in the forward direction through the 72nd column of any line, a beep will sound to warn that the operator is approaching the end of the line. This warning sound can be turned off by setting nibble 6 bit 2 to 0.

5.4.2 Key Click

The key click is used to simulate typewriter sounds each time a key is pressed. In addition, a click will sound each time a code is sent when the Auto-Repeat feature is in effect. This is especially useful in Echo operation to ensure that a key has been pressed. This key click can be turned off by setting nibble 6 bit 3 to 0.

5.4.3 Auto-Line Feed (LF)

Normally, the RETURN key causes the cursor to move to column 1 of the same line. If Auto-LF is enabled, the cursor moves to column 1 of the next line. No LF is appended on a CR from the host.

If the terminal is in Roll mode and the cursor is on the last line of data space, the data rolls up one line, the data that was on line 1 is lost, and a new blank line containing the cursor appears at the bottom of the screen. If in Non-Roll mode, the cursor does not move and the alarm sounds.

5.4.4 Keyboard Lock

The host can lock and unlock the keyboard. When the keyboard is locked, no keystrokes are honored by the terminal except the BREAK key and the function keys. The cursor video is turned off to indicate to the operator that the keyboard is locked.

The terminal locks the keyboard before it starts to transmit data (when the XMIT key is pressed); after sending an EOT, it will unlock the terminal. The keyboard is also locked during a Transmit Data (TXD) command and when the Copy function is enabled (nibble 9 bit 3 is set to 1).

If the lock was caused by the KBL command, the operator can unlock the terminal by pressing the SET UP key twice.

5.4.5 Auto-Repeat

An Auto-Repeat feature allows a key code to be entered at approximately 15 characters per second.

Section 6
ASYNCHRONOUS COMMUNICATIONS

6.1 COMMUNICATIONS INTERFACES

The VIP7201 interface conforms to the standard EIA RS-232C interface and is also configurable to the EIA RS-422A interface. The interfaces are asynchronous, two-wire or four-wire, and full-duplex and are capable of two-way alternate or two-way simultaneous data transfer at baud rates between 300 and 19,200.

When the terminal is configured for RS-232C on the main port interface, it can differentiate among the following conditions:

1. No physical connection: The communications cable is not connected to the main port. The EIA RS-232C signal Data Set Ready is floating.

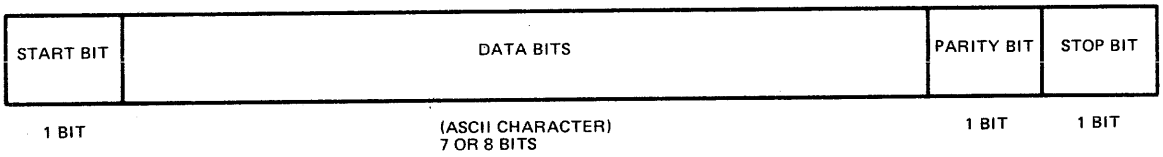
2. A physical connection but no logical connection: The cable is connected but the modem (or the host in direct connect) is not active. The Data Set Ready signal is OFF.

3. A physical and logical connection: The cable is connected and the modem (or the host) is active. The Data Set Ready signal is ON.

In case 2, the terminal will accept only one keystroke before locking the keyboard if the terminal is configured for Online operation. Therefore, to run the keyboard test or any other Offline operation, the SET UP key must be the first key pressed after power-on. This permits access to the Configuration Line so that Offline mode may be set.

6.1.1 Start and Stop Bits

The character transmitted consists of the following:



The terminal communicates with the host using either serial 7-bit or 8-bit ASCII code plus a parity bit . Each transmitted character is preceded by a start bit and followed by one stop bit. Received characters may have any number of stop bits.

6.1.2 Parity

When parity is enabled, the parity bit of each transmitted character is set, and a parity check is done on received data. When a parity error occurs, the character in error is displayed, following the parity error pattern. When parity is disabled, the parity location of each character transmitted is set to 1 if even parity is selected, and set to 0 if odd parity is selected. No parity check is done on received data.

If even parity is selected, even parity is checked for on received data and generated for outgoing data. If odd parity is selected, odd parity is checked for on received data and generated for outgoing data.

6.1.3 Baud Rates

Any one of the following communications speeds can be selected for the main port:

19200
9600
4800
2400
1800
1200
600
300

6.1.4 Data Flow

If the X ON/X OFF feature is enabled (nibble 9 bit 0 is set to 1) and either of the terminal's communications line input buffers (1.0K characters FIFO for Main port or 0.5K characters FIFO for AUX port) approaches the full condition, the terminal transmits a DC3 code (hex 13). As a result, the host and auxiliary device should stop sending data. As the terminal continues to process characters out of the buffer, and thus begins to approach the empty condition, the terminal transmits a DC1 code (hex 11) for the host or auxiliary device to resume data transmission. The terminal recognizes a DC3 and DC1 code from the host and responds similarly if the terminal is transmitting in Text mode. Note that a DC3 locks the keyboard and the terminal. If this feature is disabled (nibble 9 bit 0 is set to 0), the terminal will not generate or recognize DC3 or DC1 codes.

Pressing the SET UP key sends a DC3 if this feature is enabled. Then, pressing the SET UP (or SAVE) key again sends a DC1 (refer to subsection 5.4.4 for unlocking the keyboard).

The time required for the 7201 to process a block of data from the host can vary. The most important factor is if any terminal commands are embedded in the data stream, or the AUX port is enabled with a lower baud rate than the main port. An input buffer is provided to store the input data if the 7201 cannot keep up with the speed of the input data stream. To avoid a buffer overflow, the host application or system software should send an ENQ command after every 255 character block. The VIP7201 responds with a status message and the host can send the next block of data.

If an RIS command is sent to the terminal, it is recommended that a real-time delay of approximately 700 milliseconds be used because if the RIS is followed by data without the delay, that data will be lost since the RIS clears the input buffer.

6.2 COMMUNICATIONS MODES

6.2.1 Echo and Non-Echo Modes

The terminal can be set to either Echo or Non-Echo mode. In Echo mode, codes are sent from the terminal to the host and the host must echo them back before the terminal acts upon them. In Non-Echo mode, codes are generated, acted upon directly, and transmitted by the terminal, without the host echoing back codes to the terminal.

6.2.2 Local and Online Modes

The terminal also operates in either Local or Online mode. In Local mode, communications lines are ignored and keyboard entry is to the the display unit only. Host sequences, consequently, are ignored. In Online mode, codes are sent to the host and received from the host.

6.2.3 Modes of Transmission

The VIP7201 transmits data in two modes: Character and Text.

6.2.3.1 CHARACTER MODE TRANSMISSION

In Character mode, the terminal transmits each character immediately as it is keyed. If the terminal is in Echo mode (nibble 4 bit 1 is set to 1), each character will be echoed back to the display by the host. If the terminal is in Non-Echo mode, data will be displayed on the screen as it is transmitted to the host.

6.2.3.2 TEXT MODE TRANSMISSION

In Text mode, the data entered is stored in the terminal data memory until a Transmit Data (TXD) command is received from the host or the operator presses the XMIT key.

6.3 AUXILIARY PORT

In addition to the main communications port, the VIP7201 terminal has an auxiliary port, which uses both the EIA RS-232C or RS-422A voltage interface. While the RS-422A interface is the same for the main and auxiliary ports, the RS-232C interface is limited in function for the auxiliary port; that is, some control signals are ignored (not generated) and the interface itself can be used only with a direct (local) connection.

6.3.1 Function

The auxiliary port is not a modem expander for the data set interface. The terminal, which controls the auxiliary port, can serve either as a transparent device, with the host sending data to the auxiliary port without displaying the data (the display interface is disconnected) or as a receiver of data from the host (data is displayed on the terminal screen as well as transmitted to the auxiliary port). Section 4 describes the host commands that allow the terminal to operate with or without the terminal display.

The auxiliary port shares some of the same communications features as the main port. These features are parity and data transmission bits, and baud rates.

The auxiliary port can also be turned off by setting nibble 4 bit 3 to 0.

If a device with an RS232 interface is cabled to the auxiliary port and the device is not powered on, the auxiliary port must be disabled (nibble 4 bit 3 = 0) for the terminal to operate correctly.

CAUTION

When the auxiliary port is enabled with the display, host commands for the terminal also go out the auxiliary port. If the device attached to the auxiliary port recognizes these commands, operation is dependent on the connected device.

Example: If the device responds to the ENQ command, both the device and the VIP7201 will try to respond at the same time. Operation is undefined.

6.3.2 Local Copy

Data on the terminal screen can be sent out the auxiliary port by pressing the Blank key to the left of the cursor up key; refer to subsection 3.14. *

6.4 HOST-TO-TERMINAL CONNECTION

The host-to-terminal connection can be either direct connect or remote via a modem interface (see Figure 6-1; also refer to Appendix E for a detailed explanation of the electrical requirements and the interconnecting cables). As the terminal operates two-way alternate on a full-duplex modem (to host connection), the interface signal Request to Send (RTS) is set to remain on whenever the Data Terminal Ready (DTR) signal is on. Consequently, there is no need to take action to go to a Send state prior to transmitting, or to turn the line around after transmission is completed.

6.4.1 Direct Connection

A direct connection can be accomplished using an EIA RS-232C interface, which allows communications over a distance of up to 50 feet. If an RS-422A interface is used for direct connection, communications is allowed over a distance of up to 4000 feet.

6.4.2 Remote Connection

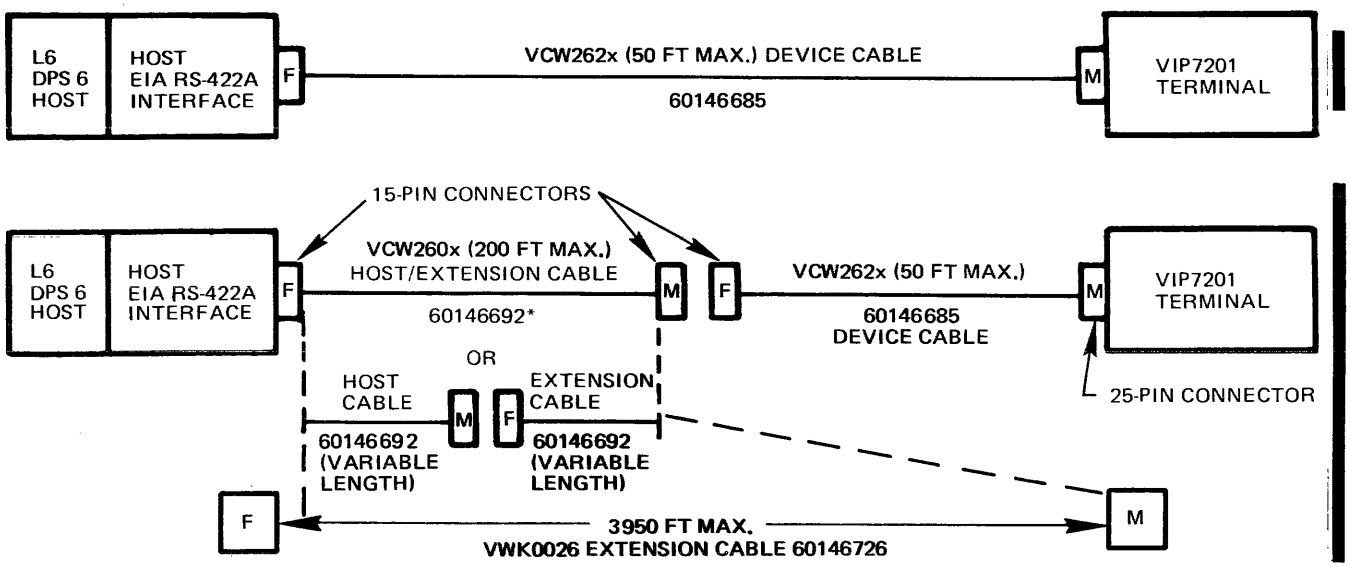
Remote connection via a modem interface enables maximum flexibility in host/terminal communications through the use of full-duplex data sets. Data rates are limited by the throughput of the specific data set.

6.5 COMMUNICATIONS SIGNALING

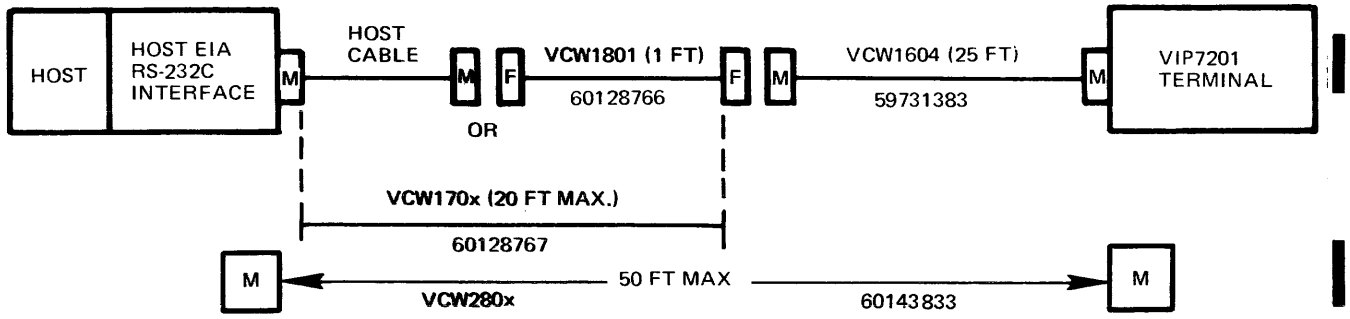
The terminal has two functions that affect the communications signals between the terminal and host: Break (BRK) and Disconnect (DEOT). Refer to Section 4 for a complete discussion of these commands.

6.6 COMPATIBILITY

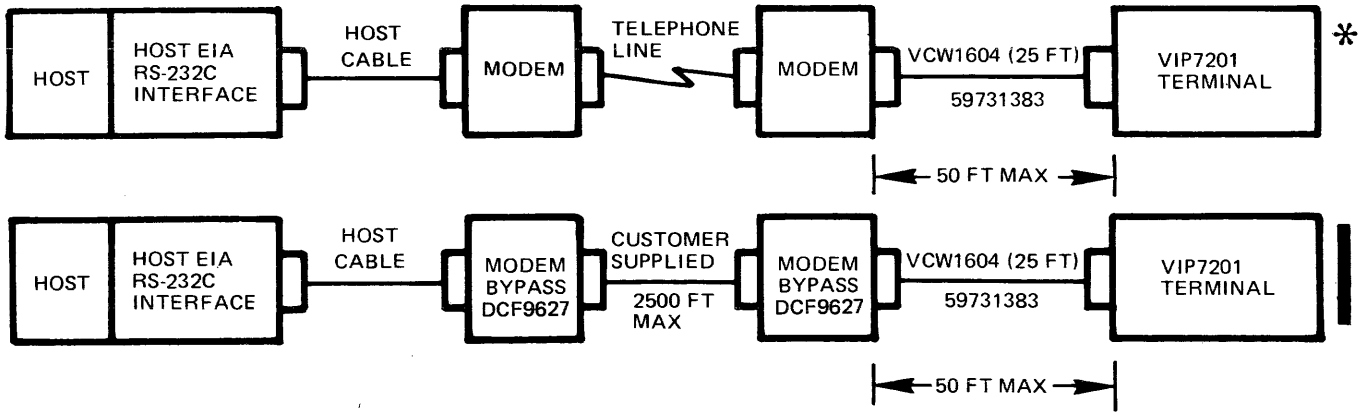
Refer to Appendix D for a description of the VIP7201 terminal's compatibility with other VIP family terminals.



EIA RS-422A DIRECT CONNECT



EIA RS-232C DIRECT CONNECT



EIA RS-232C REMOTE CONNECT

NOTE

COMMUNICATION CABLES ARE NOT INCLUDED WITH VIP7201 AND THEY MUST BE ORDERED.

Figure 6-1. Examples of Host/Terminal Connection

Section 7
TERMINAL CONFIGURATION

Basic terminal operation depends on the terminal configuration. The VIP7201 terminal is configured by setting the Configuration Line, which is a representation of the configuration memory used by the VIP7201 terminal. This Configuration Line replaces the mechanical switches normally found on terminals.

The terminal operator can configure the VIP7201 terminal simply by changing the Configuration Line. The operator, using the SET UP key, can temporarily change the configuration for different short-term applications, or using the SAVE key, can change the configuration for long-term applications or permanent installations.

7.1 CONFIGURATION LINE

The Configuration Line contains 9 nibbles, each consisting of 4 bits (bits 3 to 0, from left to right), and the main port baud rate speed. By setting the bits of each nibble to either a 1 or a 0 and identifying the desired baud rate, which is displayed in numeric form, the operator can select terminal mode, communications modes, keyboard features, and visual attributes (as described in subection 5.3). The format of the Configuration Line is shown in Figure 7-1.

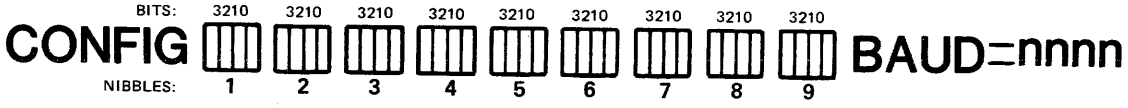


Figure 7-1. Configuration Line Format

7.2. TERMINAL CONFIGURATION

The Configuration Line displays the current configurations of the terminal. To display the Configuration Line, simply press the SET UP key. The Configuration Line will appear on line 24 of the terminal screen. To return to the screen display, press the SET UP key again.

7.3 SETTING TERMINAL CONFIGURATION

The operator can choose to operate the VIP7201 terminal using the standard factory-selected configuration of change the configuration to meet specific applications.

To change the Configuration Line, perform the following procedure:

NOTE

All keys, except the cursor back (←), forward (→), and up (↑), the SET UP key, and the SAVE key, are not active when the Configuration Line is displayed, causing an alarm to sound when they are pressed.

1. Press the SET UP key. The screen data will roll up one line and the Configuration Line will appear at the 24th screen line position.

2. Using the cursor back (←) or cursor forward (→) key, move the cursor to the position of the bit that you want to change or to the display baud rate equal sign.

3. Press the cursor up (↑) key to change the bit from a 0 to a 1 or from a 1 to a 0. To change the baud rate, press the cursor up (↑) key until the desired baud rate is displayed.

4. Repeat steps 2 and 3 until all changes are completed.

5. Determine whether the changes to the Configuration Line are to be temporary or permanent (i.e., whether the new configuration is to be used for only the present application or for long-term applications).

    a. To temporarily store the Configuration Line, press the SET UP key. The new configuration will remain until the terminal is turned off or until the operator changes the Configuration Line again.

    b. To permanently save the Configuration Line, press the SAVE key. The new configuration will remain in effect until the operator changes the Configuration Line, even after the terminal is turned off.

NOTE

The Configuration Line will disappear and any of the data on the screen when the Configuration Line was called will return.

7.4 BASIC OPERATIONAL SETTINGS

A description of each nibble and the meanings of each bit in the nibble follows along with a listing of the terminal operating speeds:

NIBBLE 1 - MAIN PORT

Bit 3
- When set to a 1, the main communications port interface will operate using the RS-422A interface.
- When set to a 0, the main communications port interface will operate using the RS-232C interface.

Bit 2
- When set to a 1, the serial data transmitted and received by the main port will have 8 data bits plus parity.
- When set to a 0, the serial data transmitted and received will have 7 data bits plus parity.

Bit 1
- When set to a 1 and parity is enabled (nibble 1 bit 0 is set to 1), received data will be checked for even parity and even parity will be generated for outgoing data.
- When set to a 0 and parity is enabled (nibble 1 bit 0 is set to 0), received data will be checked for odd parity and odd parity will be generated for outgoing data.

Bit 0
- When set to a 1, parity is enabled. The parity bit of each character transmitted is set and a parity check is done on received data. When a parity error occurs, the wrong data is displayed, following the parity error pattern.
- No parity check is done on received data.
- When "0", Parity Disable - The parity bit of each character transmitted is set to a One if even parity is selected by bit 1 (=1) or the parity bit is set to a Zero if odd parity is selected by bit 1 (=0).

NIBBLE 2 - VISUAL ATTRIBUTE

Nibble 2 defines the visual attribute to be turned on by the remote command ESC 4 (hexadecimal 1B 34) and turned off by the remote command ESC 3 (hexadecimal 1B 33).

Bit 3
- When set to a 1 and ESC 4 is received, inverse video is turned on.
- When set to a 1 and ESC 3 is received, normal video is turned on for subsequent characters.
- When set to a 0, normal video is turned on.

Bit 2
- When set to a 1 and ESC 4 is received, low intensity is turned on for subsequent characters.
- When set to a 1 and ESC 3 is received, the high (normal) intensity is turned on for subsequent characters.
- When set to a 0, the high (normal) intensity is turned on.

Bit 1
- When set to a 1 and ESC 4 is received, the subsequent characters are underlined. The underline goes through lower case desenders.
- When set to a 1 and ESC 3 is received, the subsequent characters are not underlined.
- When set to a 0, no characters are underlined.

Bit 0
- When set to a 1 and ESC 4 is received, subsequent characters will blink.
- When set to a 1 and ESC 3 is received, subsequent characters will not blink.
- When set to a 0, no characters will blink.

NIBBLE 3 - CURSOR PRESENTATION

Bit 3
- When set to a 1, the cursor will blink.
- When set to a 0, the cursor will remain steady.

Bit 2
- When set to a 1, the cursor is an underline.
- When set to a 0, the cursor is an inverse video block.

Bit 1
- Not used.

Bit 0
- Not used.

NIBBLE 4

Bit 3
- When set to a 1, the auxiliary port is enabled.
- When set to a 0, the auxiliary port is disabled.
- This bit can be overrridden by the remote commands:

Auxiliary Port Parallel (APP)	ESC d	Bit = 1
Auxiliary Port Connect (APC)	ESC a	Bit = 1
Auxiliary Port Disconnect (APD)	ESC b	Bit = 0

Bit 2
- Not used.

Bit 1
- When set to a 1, the terminal will operate in Echo mode (i.e., the keystrokes will transmit codes to the host, but the terminal will do nothing until the codes are echoed back from the host).
- When set to a 0, the terminal will operate in Non-Echo mode (i.e., codes will be transmitted and the terminal will react without the host echoing back the character).

Bit 0
- When set to a 1, the complete display is inverted to dark characters on green backgound.
- When set to a 0 (normal), the display is green characters on a dark background.

NIBBLE 5

Bit 3
- When set to a 1, the terminal will operate in Local mode. Reception of messages from the host as well as transmission to the host are inhibited. Keyboard codes are sent directly to the display.
- When set to a 0, the terminal operates in Online mode (i.e., keyboard codes are sent to the communications line and incoming codes are accepted by the terminal).

Bits 2 and 1
- When both bits are set to 0, the terminal operates in Monitor mode (i.e., all ASCII codes from the host, including control codes, will be displayed in Hex on the screen rather than acted upon by the terminal). Multi character codes from the keyboard display only the last character.

- When bit 2 is set to a 0 and bit 1 is set to a 1, or when both are set to 1, the terminal operates in Normal modes, either Character mode or Text mode. In these modes, the terminal can interact with the host computer.

- When bit 2 is set to a 1 and bit 1 is set to a 0, the terminal operates in Graphic mode. A limited line drawing character set is available.

Bit 0

- When set to a 1, the terminal operates in Character mode. As each key is typed, its code or codes are sent to the host immediately.

- When set to a 0, the terminal operates in Text mode. Characters entered from the keyboard are displayed on the terminal but not sent to the host. The command ESC i (hexadecimal 1B 69) codes from the host or the XMIT key will cause a block of data to be transmitted. The block starts at the Home position and transmits each character up to but not including the active cursor position. The ASCII EOT (hexadecimal 04) character is appended to the end of the block of data.

NIBBLE 6

Bit 3

- When set to a 1, a click sound will be heard each time a key is pressed and each time the code is sent when the Auto-Repeat feature is in effect.

- When set to a 0, no sound will be heard.

Bit 2

- When set to a 1, a beep will be heard when the cursor passes column 72 in the forward direction.

- When set to a 0, no sound will be heard.

Bit 1

- Unused.

Bit 0

- When set to a 1, Auto-LF is enabled. An LF (hexadecimal 0A) will be appended to the CR (hexadecimal 0D) code generated by the RETURN key on the keyboard. No LF will be appended on a CR code from the host. When on line 24, the screen will roll up one line if Roll mode is enabled (nibble 9 bit 1 is set to 1).

- When set to a 0 and if Non-Roll mode is enabled (nibble 9 bit 1 is set to 0), the screen will not roll and only a CR (hexadecimal 0D) command will be executed. When set to a 0, no LF will be appended to any CR code.

NIBBLE 7 - AUXILIARY PORT

These bits have the same meaning as nibble 1 but are concerned with the auxiliary port.

Bit 3
- When set to a 1, the auxiliary communications port interface will operate using the RS-422C interface.
- When set to a 0, the auxiliary communications port interface will operate using the RS-232A interface.

Bit 2
- When set to a 1, the serial data transmitted and received by the auxiliary port will have 8 data bits plus parity.
- When set to a 0, the serial data transmitted and received will have 7 data bits plus parity.

Bit 1
- When set to a 1 and parity is enabled (nibble 1 bit 0 is set to 1), received data will be checked for even parity and even parity will be generated for outgoing data.
- When set to a 0 and parity is enabled (nibble 1 bit 0 is set to 0), received data will be checked for odd parity and odd parity will be generated for outgoing data.

Bit 0
- When set to a 1, parity is enabled. The parity bit of each character transmitted is set and a parity check is done on received data. When a parity error occurs, the wrong data is displayed, following the parity error pattern.
- When set to a 0, parity is disabled. The parity bit of each character transmitted is set to a 0 and no parity check is done on received data.

NIBBLE 8 - AUXILIARY PORT

Bit 3
- Not used.

Bits 2, 1, & 0
- The settings of these bits selects the baud rates as follows:

Baud Rate	Bit 2	Bit 1	Bit 0
19200	0	0	0
9600	0	0	1
4800	0	1	0
2400	0	1	1

Baud Rate	Bit 2	Bit 1	Bit 0
1800	1	0	0
1200	1	0	1
600	1	1	0
300	1	1	1

NIBBLE 9

Bit 3
- When set to a 1, the screen dump that is permitted is CR, LF, and 9 Del codes after each line (called TTY).
- When set to a 0, ASPI protocol will be used by the firmware for the screen dump.

Bit 2
- When set to a 1, the control codes received from the keyboard will be displayed and not acted upon by the terminal.
- When set to a 0, the control codes will not be displayed by the terminal, but will cause some terminal action.

Bit 1
- When set to a 1, Roll mode is enabled. Data on the display will roll up one line (with the top line being lost) when more than 80 characters are entered on the bottom line or when the cursor is on the bottom line and an LF command is executed.
- When set to a 0, Non-Roll mode is enabled. If the cursor is on the bottom line, the LF command will not operate and will cause an alarm to sound. Also, if the cursor is in the last column of the last line, data characters will be ignored and the alarm will sound.

Bit 0
- If the X ON/X OFF feature is enabled (nibble 9 bit 0 is set to 1) and either of the terminal's communications line input buffers (1.0K characters FIFO for Main Port or 0.5K characters FIFO for AUX port) approaches the full condition, the terminal will transmit a DC3 code (hex 13). As a result, the host and auxiliary device should stop sending data. As the terminal continues to process characters out of the buffer, and thus begins to approach the empty condition, the terminal transmits a DC1 code (hex 11) for the host or auxiliary device to resume data transmission. The terminal recognizes a DC3 and DC1 code from the host and responds similarly if the terminal is transmitting in Text mode. Note that a DC3 locks the keyboard and the terminal.

If this feature is disabled (nibble 9 bit 0 is set to 0), the terminal will not generate or recognize DC3 or DC1 codes. The terminal recognizes a DC3 and DC1 code from the host and responds similarly if the terminal is transmitting in Text mode. A DC3 code locks the terminal and the keyboard.

- When set to a 0, this feature is disabled and the terminal will not generate or recognize DC3 or DC1 codes.

BAUD RATES

The main communications speeds will be displayed as follows:

19200
9600
4800
2400
1800
1200
600
300

7.5 STANDARD TERMINAL CONFIGURATION

The VIP7201 terminal has a standard configuration (i.e., a configuration set by the factory). The standard Configuration Line displaying this factory setting is shown on Figure 7-2 and is explained in Table 7-1.

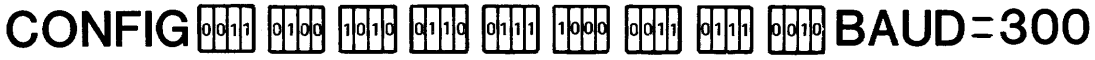


Figure 7-2. Standard Configuration Line

Table 7-1. Standard Configuration Line (Sheet 1 of 2)

Nibble	Bit	Set To	Meaning
			Main Port
1	3	0	RS-232A
	2	0	Data 7 Bits
	1	1	Parity Even
	0	1	Parity Enable
			Visual Attribute
2	3	0	Inverse Off
	2	1	Dual Intensity On
	1	0	Underline Off
	0	0	Blink Off
			Cursor Presentation
3	3	1	Blinking Cursor
	2	0	Block Cursor
	1	1	Not Used
	0	0	Not Used

Table 7-1. Standard Configuration Line (Sheet 2 of 2)

Nibble	Bit	Set To	Meaning
4	3	0	Auxiliary Port Off
	2	1	Not Used
	1	1	Echo On
	0	0	Inverse Off
5	3	0	Online Mode
	2	1	11 Normal
	1	1	11 Normal
	0	1	Character
6	3	1	Key Click On
	2	0	Margin Bell Off
	1	0	Not Used
	0	0	CR/Auto-LF Off
			Auxiliary Port
7	3	0	RS-232C
	2	0	7 Data Bits
	1	1	Parity Even
	0	1	Parity Enable
			Auxiliary Port Speed
8	3	0	Not Used
	2	1	111 300 Baud
	1	1	111 300 Baud
	0	1	111 300 Baud
9	3	0	ASPI/TTY
	2	0	Control Code Display Off
	1	1	Roll Mode On
	0	0	X ON/X OFF OFF

Section 8
LOCAL PRINT FUNCTION

8.1 PRINT DATA SPACE (PDS)

This host command ESC [0 p (1B,5B,30,70 hex) performs the same function as pressing key 9 (refer to Figure B-1 and Table B-1) on the keyboard; i.e., sending screen data out the AUX Port.

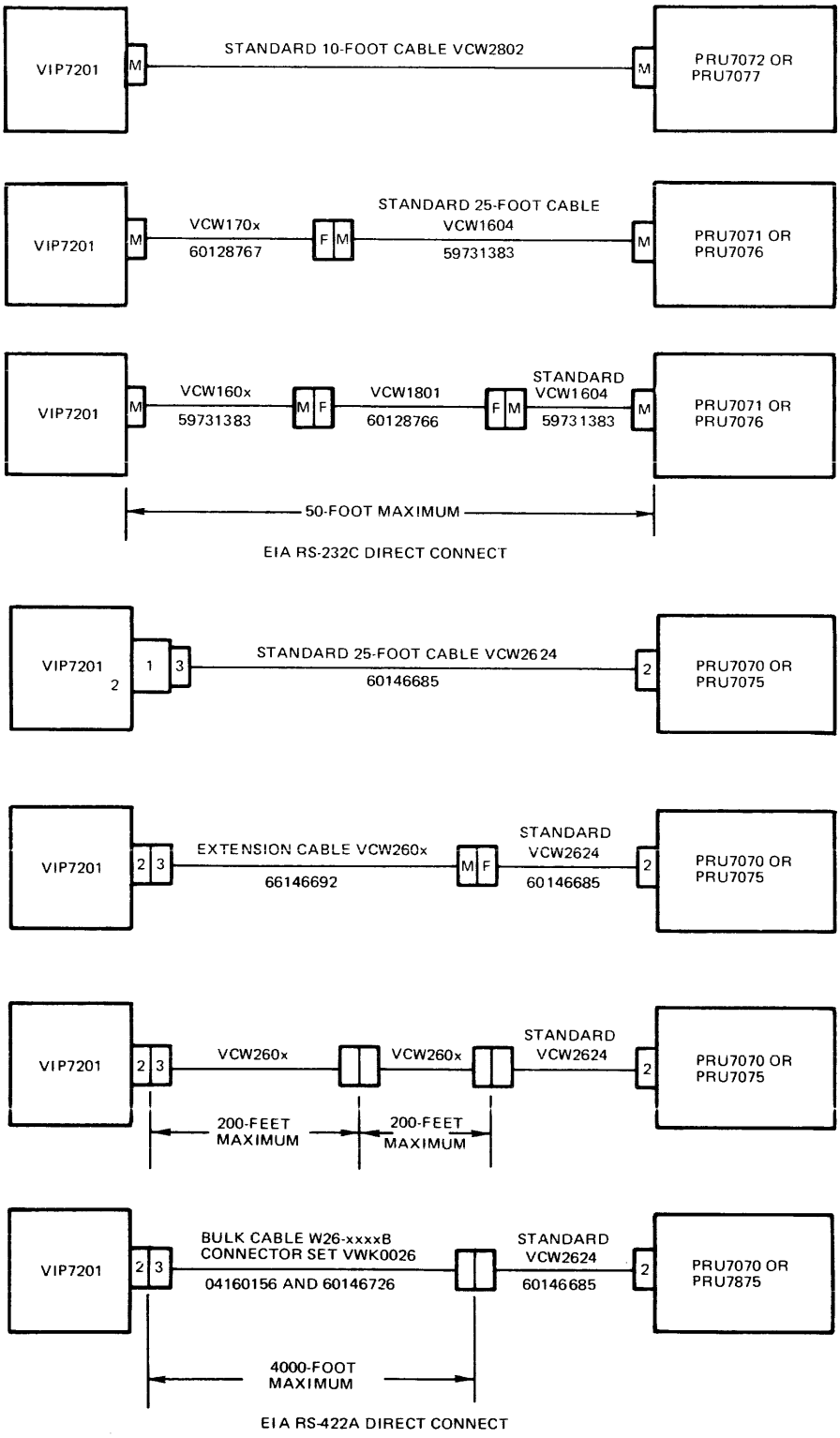
8.2 ASPI PRINTER ON THE AUX PORT

8.2.1 General

The VIP7201 terminal is connected to the PRUXXXX printers with the cable configurations as shown in Figure 8-1.

The VIP7201 firmware controls the printer as data is dumped from the screen, out to the AUX Port. The screen dump is initiated by key 9 on the keyboard and by a command from the host called Print Data Space (PDS) ESC [0 p (1B,5B,30,70 hex). Refer to Section 4 for the description of the PDS command.

The terminal provides the screen dump capability with nibble 9 bit 3 = 1; i.e., CR, LF and 9 DEL (7F hex) codes after each line (called TTY). If nibble 9 bit 3 = 0, the firmware uses ASPI protocol to control the printer. The PDS command and key 9 causes screen data to go out the AUX Port. Nibble 9 bit 3 determine if ASPI protocol or TTY is used by the firmware.



NOTES

1. CBL9813 25-PIN TO 15-PIN ADAPTER.
2. 25-PIN MALE CONNECTOR REQUIRED. CBL 9813 SATISFIES REQUIREMENT.
3. 15-PIN FEMALE CONNECTOR.

Figure 8-1. Terminal-to-Printer Connections

The terminal supports ASPI handshaking protocol (ETX/ACK), ID and status (response to ENQ), error control and reporting (printer to terminal), and blocking. It operates local connect only; i.e., no modems between the terminal and printer. It does not include support for LRC (longitudinal redundancy check). It does not support double width or line graphics printing. There is no keyboard on the printer.

8.2.2 Underline

The terminal supports underline printing in the following way:

1. Bit 8 in the refresh memory defines protect/unprotect, as well as visual attributes.

2. When a field of characters are to be sent to the printer with the attribute set, they are preceded by an ESC, S, - (1B,73,5F hex) code sequence. This causes the characters that follow to be printed with an underline.

3. The attribute selected for screen presentation may be blinking instead of underline, but the underline will be printed.

4. At the end of a field of characters with the attribute set, and before a field of characters with the attribute reset, there will be an ESC, s, r or R (1B,73,72 or 52 hex) code sequence. Thus the characters that follow will not be underlined.

The normal format to the AUX Port (when nibble 9 bit 3 = 0) would be:

STX, 80 ASCII printable codes, CR, LF, ETX

This format is used for screen lines 1 to 23. The 24th line is the same except an FF (0C hex) is between the LF and ETX (...LF, FF, ETX).

There can be more than 80 characters between the STX and CR when the attribute is set, because of the escape sequences to turn on and off the underline printing, but only 80 printable characters. The character count from and including STX to ETX cannot exceed 127.

8.2.3 Graphics

If key 9 is pressed, or a PDS command is received with nibble 9 bit 3 = 0 and the terminal is in the graphics mode, the graphics codes from the display memory is changed to space codes (20 hex) when sent out to the AUX Port. There will be no attempt

to print graphics. By sending space codes instead of graphics the user can draw on the paper in the blank area, any graphics shown on the screen.

If nibble 9 bit 3 = 1 (TTY), the lowercase alpha codes are sent.

8.2.4 Timeout

The ASPI protocol specifies the use of a short and long timeout. The VIP7201 uses 1 second for the short timeout (after a status request), and a 5-second timeout (after a print command), to support error recovery if a response is not received from the printer.

The retry count for error recovery is 7.

8.2.5 Other

The VIP7201 ASPI firmware for screen data to AUX port is not used for other host system AUX port operations. If the AUX Port is enabled (with or without display), the VIP7201 passes characters from the host (main port) to the AUX port, and characters coming in the AUX port are passed to the host via the main port.

Even if the AUX port is off (disabled nibble 4 bit 3 = 0), local print key 9 and the PDS command cause the screen data to go out the AUX Port. When the AUX port is enabled (nibble 4 bit 3=1), the only response from the ASPI printer forwarded to the host system (other than an ENQ response), is the final ACK which indicates that the print is complete.

Appendix A
COMMAND SORTS

This appendix contains alphabetic sorts of every command used in the VIP7201 terminal. Table A-1 lists the commands in mnemonic sequence, while Table A-2 lists them according to ASCII code sequence. The tables contain each command's mnemonic and name along with its ASCII and hexadecimal code.

Table A-1. VIP7201 Commands - Mnemonic Sort

Mnemonic	Command	ASCII	Hexadecimal
APC	Auxiliary Port Connect	ESC a	1B 61
APD	Auxiliary Port Disconnect	ESC b	1B 62
APP	Auxiliary Port Parallel	ESC d	1B 64
BEL	Bell	BEL	07
BS	Back Space	BS	08
CBT	Cursor Back Tab	ESC] Z	1B 5B 5A
CLR	Clear	ESC \`	1B 60
CM	Character Mode	ESC k	1B 6B
CPB	Cursor Position Binary	ESC f P_C P_L	1B 66 P_C P_L
CR	Carriage Return	CR	0D
CRB	Cursor Request Binary	ESC n	1B 6E
CUB	Cursor Backward	ESC D	1B 44
CUD	Cursor Down	ESC B	1B 42
CUF	Cursor Forward	ESC C	1B 43
CUH	Cursor Home	ESC H	1B 48
CUU	Cursor Up	ESC A	1B 41
DCH	Delete Character	ESC [P	1B 5B 50
DEL	Delete	DEL	7F
DEOT	Disconnect	DLE EOT	10 04
DL	Delete Line	ESC [M	1B 5B 4D
ENQ	Enquiry	ENQ	05
EOL	Erase to End of Line	ESC K	1B 4B
EOP	Erase to End of Page	ESC J	1B 4A
EP	Echo	ESC m	1B 6D
ESC	Escape	ESC	1B
FM	Form Mode	ESC [h	1B 5B 68
Fx/FSx	Function Codes		
	F1	ESC 0	1B 30
	SHIFT and F1	ESC 1	1B 31
	F2	ESC 2	1B 32
	SHIFT and F2	ESC 5	1B 35
	F3	ESC 6	1B 36
	SHIFT and F3	ESC 7	1B 37
	F4	ESC 8	1B 38
	SHIFT and F4	ESC 9	1B 39
	F5	ESC :	1B 3A
	SHIFT and F5	ESC ;	1B 3B
	F6	ESC <	1B 3C
	SHIFT and F6	ESC =	1B 3D
	F7	ESC >	1B 3E
	SHIFT and F7	ESC ?	1B 3F
HT	Horizontal Tab	HT	09
IL	Insert Line	ESC [L	1B 5B 4C
IM	Insert Mode	ESC [I	1B 5B 49
IMR	Insert Mode Reset	ESC [J	1B 5B 4A
KBL	Keyboard Lock	ESC [X	1B 5B 58
KBU	Keyboard Unlock	ESC [W	1B 5B 57
LF	Line Feed	LF	0A
LGR	Line Graphics Reset	ESC F	1B 46
LGS	Line Graphics Set	ESC G	1B 47
NEP	Non-Echo	ESC l	1B 6C
NUL	Null	NUL	00
PDS	Print Data Space	ESC [0 p	1B 5B 30 70
RIS	Reset Initial State	ESC c	1B 63
RMR	Roll Mode Reset	ESC q	1B 71
RMS	Roll Mode Set	ESC r	1B 72
SHI	Set High Intensity	ESC 3	1B 33
SLI	Set Low Intensity	ESC 4	1B 34
TRD	Test Result Display	ESC Z	1B 5A
TM	Text Mode	ESC [l	1B 5B 6C
TXD	Transmit Data	ESC i	1B 69

Table A-2. VIP7201 Commands - ASCII Sort

ASCII Code	Hexadecimal	Mnemonic	Command
BEL	07	BEL	Bell
BS	08	BS	Back Space
CR	0D	CR	Carriage Return
DEL	7F	DEL	Delete
DLE EOT	10 04	DEOT	Disconnect
ENQ	05	ENQ	Enquiry
ESC	1B	ESC	Escape
ESC A	1B 41	CUU	Cursor Up
ESC B	1B 42	CUD	Cursor Down
ESC C	1B 43	CUF	Cursor Forward
ESC D	1B 44	CUB	Cursor Backward
ESC F	1B 46	LGR	Line Graphics Reset
ESC G	1B 47	LGS	Line Graphics Set
ESC H	1B 48	CUH	Cursor Home
ESC J	1B 4A	EOP	Erase to End of Page
ESC K	1B 4B	EOL	Erase To End of Line
ESC Z	1B 5A	TRD	Test Result Displayed
ESC a	1B 61	APC	Auxiliary Port Connect
ESC b	1B 62	APD	Auxiliary Port Disconnect
ESC c	1B 63	RIS	Reset Initial State
ESC d	1B 64	APP	Auxiliary Port Parallel
ESC f P_C P_L	1B 66 P_C P_L	CPB	Cursor Position Binary
ESC i	1B 69	TXD	Transmit Data
ESC k	1B 6B	CM	Character Mode
ESC l	1B 6C	NEP	Non-Echo
ESC m	1B 6D	EP	Echo
ESC n	1B 6E	CRB	Cursor Request Binary
ESC q	1B 71	RMR	Roll Mode Reset
ESC r	1B 72	RMS	Roll Mode Set
ESC 0	1B 30		F1
ESC 1	1B 31		SHIFT and 1
ESC 2	1B 32		F2
ESC 3	1B 33	SHI	Set High Intensity
ESC 4	1B 34	SLI	Set Low Intensity
ESC 5	1B 35		SHIFT and F2
ESC 6	1B 36		F3
ESC 7	1B 37		SHIFT and F3
ESC 8	1B 38		F4
ESC 9	1B 39		SHIFT and F4
ESC :	1B 3A		F5
ESC ;	1B 3B		SHIFT and F5
ESC <	1B 3C		F6
ESC =	1B 3D		SHIFT and F6
ESC >	1B 3E		F7
ESC ?	1B 3F		SHIFT and F7
ESC [h	1B 5B 68	FM	Form Mode
ESC [l	1B 5B 6C	TM	Text Mode
ESC [Z	1B 5B 5A	CBT	Cursor Back Tab
ESC [I	1B 5B 49	IM	Insert Mode
ESC [J	1B 5B 4A	IMR	Insert Mode Reset
ESC [M	1B 5B 4D	DL	Delete Line
ESC [L	1B 5B 4C	IL	Insert Line
ESC [P	1B 5B 50	DCH	Delete Character
ESC [W	1B 5B 57	KBU	Keyboard Unlock
ESC [X	1B 5B 58	KBL	Keyboard Lock
ESC [0 P	1B 5B 30 70	PDS	Print Data Space
ESC	1B 60	CLR	Clear
HT	09	HT	Horizontal Tab
LF	0A	LF	Line Feed
NUL	00	NUL	Null

Appendix B
VIP7201 KEYBOARD MAP AND ASCII CONTROL CODES AND CHARACTERS

This appendix contains a map of the VIP7201 terminal keyboard (Figure B-1) and an output code matrix of its keys (Table B-1). The appendix also includes tables (Tables B-2 and B-3) that list the ASCII control codes and character set, the graphic mode character set (Table B-4), and the control code display and parity error symbol (Table B-5).

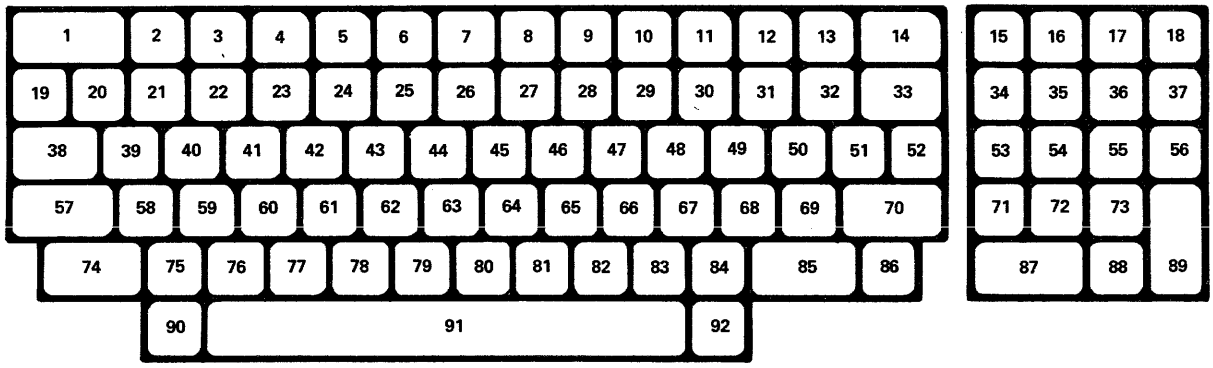


Figure B-1. VIP7201 Keyboard Map

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 1 of 7)

Key Location Number	Legend	Hex Code	With SHIFT Key	With CTRL Key
1	SET UP	Note 1	Note 1	Note 1
2	F1	1B 30	1B 31	Note 8
3	F2	1B 32	1B 35	Note 8
4	F3	1B 36	1B 37	Note 8
5	F4	1B 38	1B 39	Note 8
6	F5	1B 3A	1B 3B	Note 8
7	F6	1B 3C	1B 3D	Note 8
8	F7	1B 3E	1B 3F	Note 8
9	(No Legend)	Note 2	Note 2	Note 2
10	↑ (Up Arrow)	1B 41	1B 41	1B 41
11	↓ (Down Arrow)	1B 42	1B 42	1B 42
12	← (Left Arrow)	1B 44	1B 44	1B 44

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 2 of 7)

Key Location Number	Legend	Hex Code	With SHIFT Key	With CTRL Key
13	→ (Right Arrow)	1B 43	1B 43	1B 43
14	HOME	1B 48	1B 48	1B 48
15	INSERT	1B 5B 49	1B 5B 4C	1B 5B 4A
16	DELETE	1B 5B 50	1B 5B 4D	No-Op
17	EOP EOL	1B 4B	1B 4A	No-Op
18	CLEAR ⇥	09	1B 60	1B 63
19	ESC	1B	1B	unspecified
20	! 1	31	21	31
21	@ 2	32	40	32/00(CTRL&SHIFT)
22	# 3	33	23	33
23	$ 4	34	24	34
24	% 5	35	25	35
25	^ (Circumflex) 6	36	5E	36/1E(CTRL&SHIFT)
26	& 7	37	26	37
27	* 8	38	2A	38
28	(9	39	28	39
29	) 0	30	29	30
30	_ (Underscore) - (Hyphen)	2D	5F	2D/1F (CTRL/SHIFT)

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 3 of 7)

Key Location Number	Legend	Hex Code	With SHIFT Key	With CTRL Key
31	+ = =	3D	2B	3D
32	~ (Tilde) ` (Grave Accent)	60	7E	60
33	BACK SPACE	08	08	08
34	7	37	37	37
35	8	38	38	38
36	9	39	39	39
37	- (Hyphen)	2D	2D	2D
38	⇤ (Back Tab) ⇥ (Forward Tab)	09	1B 5B 5A	09
39	Q	71	51	11 (DC1)
40	W	77	57	17 (ETB)
41	E	65	45	05 (ENQ)
42	R	72	52	12 (DC2)
43	T	74	54	14 (DC4)
44	Y	79	59	19 (EM)
45	U	75	55	15 (NAK)
46	I	69	49	09 (HT)
47	O	6F	4F	0F (SI)
48	P	70	50	10 (DLE)
49	] (Right Bracket) [(Left Bracket)	5B	5D	1D (GS)CTRL&SHIFT 1B (ESC)
50	¦ (Broken Vertical Bar) \ (Reverse Solidus)	5C	7C	1C (FS)

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 4 of 7)

Key Location Number	Legend	Hex Code	With SHIFT Key	With CTRL Key
51	(No Legend)	7F	7F	7F
52	BREAK	No-Op	Note 3	No-Op
53	4	34	34	34
54	5	35	35	35
55	6	36	36	36
56	, (Comma)	2C	2C	2C
57	CAP LOCK	Note 4	Note 4	Note 4
58	A	61	41	01 (SOH)
59	S	73	53	13 (DC3)
60	D	64	44	04 (EOT)
61	F	66	46	06 (ACK)
62	G	67	47	07 (BEL)
63	H	68	48	08 (BS)
64	J	6A	4A	0A (LF)
65	K	6B	4B	0B (VT)
66	L	6C	4C	0C (FF)
67	: (Colon) ; (Semicolon)	3B	3A	3B
68	" (Double Quote) ' (Single Quote)	27	22	27
69	} (Right Brace) { (Left brace)	7B	7D	7B
70	RETURN	0D	0D	0D
71	1	31	31	31

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 5 of 7)

Key Location Number	Legend	Hex Code	With SHIFT Key	With CTRL Key
72	2	32	32	32
73	3	33	33	33
74	SHIFT	Note 5	Note 5	Note 5
75	Z	7A	5A	1A (SUB)
76	X	78	58	18 (CAN)
77	C	63	43	03 (ETX)
78	V	76	56	16 (SYN)
79	B	62	42	02 (STX)
80	N	6E	4E	0E (SO)
81	M	6D	4D	0D (CR)
82	< (Less Than) , (Comma)	2C	3C	2C
83	> (Greater Than) . (Period)	2E	3E	2E
84	? (Question Mark) / (Solidus)	2F	3F	2F
85	SHIFT	Note 5	Note 5	Note 5
86	LINE FEED	0A	0A	0A
87	0	30	30	30
88	. (Period)	2E	2E	2E
89	XMIT	1B 69	No-Op	No-Op
90	CTRL	Note 6	Note 6	N/A
91	(No Legend)	20	20	20
92	SAVE	Note 7	Note 7	Note 7

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 6 of 7)

NOTES

1. This key will not transmit any code to the host. It causes the Configuration Line to appear at the bottom of the screen, and the whole screen to roll up one line. When pressed a second time, the screen will return to the original display.

2. This key will not transmit any code to the host. Depending on the Configuration Line nibble 9 bit 3 setting, the following will occur. If the bit is a 0, ASPI protocol will be used by the firmware for the screen dump (the contents of the screen memory will be transmitted out the AUX port). Refer to subsection 8.2.1. If the bit is a 1, the contents of the screen memory will be transmitted out the auxiliary port. Transmission starts at the Home position and continues up to, but not including, the cursor location. The ASCII CR LF characters (hexadecimal 0D 0A) and nine ACSII deletes (hexadecimal 7F) are transmitted at the end of each line and after the last character (i.e., the character to the left of the cursor is transmitted). The keyboard will be locked during this transmission and the terminal will ignore any input from the host.

3. When the SHIFT and BREAK keys are pressed together, a Break signal is generated (refer to Section 3).

4. The CAP LOCK key locks (in the down position) when pressed once and unlocks (up position) when pressed a second time. When the CAP LOCK is unlocked (up), it has no effect on any of the other keys. When it is locked (down), it forces the alphabetic keys to transmit only uppercase ASCII codes regardless of the position of the SHIFT key. The CAP LOCK key does not affect any keys other than the alphabetic group.

Table B-1. VIP7201 Keyboard Character Code Matrix
(Sheet 7 of 7)

5. If the SHIFT key is held down while an alphabetic key is pressed, the uppercase ASCII code of the character is transmitted. If the SHIFT key is not held down while an alphabetic key is pressed, then the lowercase ASCII code of the character is transmitted. Similarly, for dual legend keys when the SHIFT key is held down, the ASCII code for the upper character on the key top is transmitted, while the ASCII code for the lower character on the key top is transmitted if the SHIFT key is in the up position.

6. The CTRL key is used in conjunction with the alphabetic and punctuation keys to transmit a control code. If the CTRL key is held down while an alphabetic key or punctuation key is pressed, the code that is transmitted consists of the usual 7-bit ASCII code with the two high-order bits forced to Zero.

7. When the Configuration Line has been changed and the new settings are to be saved after power OFF/ON, the SAVE key should be pressed.

8. With CTRL, the CAP LOCK key does not affect the codes that are transmitted. They depend on CTRL and the SHIFT keys only.

Table B-2. Keyboard Generation of ASCII Control Codes (That Do Not Have a Dedicated Key) (Sheet 1 of 2)

Name	ASCII Code	Hexadecimal Value	Key with CTRL
Acknowledge	ACK	06	F
Bell	BEL	07	G
Cancel	CAN	18	X
Data Link Escape	DLE	10	P
Device Control 1	DC1	11	Q
Device Control 2	DC2	12	R
Device Control 3	DC3	13	S
Device Control 4	DC4	14	T
End of Block	ETB	17	W
End of Medium	EM	19	Y
End of Text	ETX	03	C
End of Transmission	EOT	04	D
Enquiry	ENQ	05	E
File Separator	FS	1C	\
Form Feed	FF	0C	L
Group Separator	GS	1D	] Shifted [
Negative Acknowledge	NAK	15	U
Null	NUL	00	@ Shifted 2
Record Separator	RS	1E	^ Shifted 6
Shift In	SI	0F	O
Shift Out	SO	0E	N

Table B-2. Keyboard Generation of ASCII Control Codes (That Do Not Have a Dedicated Key) (Sheet 2 of 2)

Name	ASCII Code	Hexadecimal Value	Key with CTRL
Start of Heading	SOH	01	A
Start of Text	STX	02	B
Substitute	SUB	1A	Z
Synchronous Idle	SYN	16	V
Unit Separator	US	5F	_ Shifted -
Vertical Tab	VT	0B	K

Table B-3. Standard ASCII Character Chart

b7 b6 b5 → / B1 TS b4 b3 b2 b1 ↓ COLUMN → / ROW ↓	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
	0	1	2	3	4	5	6	7
0 0 0 0 0	NUL	DLE	SP	0	@	P	`	p
0 0 0 1 1	SOH	DC1	!	1	A	Q	a	q
0 0 1 0 2	STX	DC2	"	2	B	R	b	r
0 0 1 1 3	ETX	DC3	#	3	C	S	c	s
0 1 0 0 4	EOT	DC4	$	4	D	T	d	t
0 1 0 1 5	ENQ	NAK	%	5	E	U	e	u
0 1 1 0 6	ACK	SYN	&	6	F	V	f	v
0 1 1 1 7	BEL	ETB	'	7	G	W	g	w
1 0 0 0 8	BS	CAN	(	8	H	X	h	x
1 0 0 1 9	HT	EM	)	9	I	Y	i	y
1 0 1 0 A	LF	SUB	*	:	J	Z	j	z
1 0 1 1 B	VT	ESC	+	;	K	[	k	{
1 1 0 0 C	FF	FS	,	<	L	\	l	|
1 1 0 1 D	CR	GS	-	=	M	]	m	}
1 1 1 0 E	SO	RS	.	>	N	^	n	~
1 1 1 1 F	SI	US	/	?	O	_	o	DEL

Table B-4. Graphic Mode Character Set

B_4	B_3	B_2	B_1	ROW ↓ / COLUMN →	0 (000)	1 (001)	2 (010)	3 (011)	4 (100)	5 (101)	6 (110)	7 (111)
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	A	LF	SUB	*	:	J	Z	j	z
1	0	1	1	B	VT	ESC	+	;	K	[	k	{
1	1	0	0	C	FF	FS	,	<	L	\	l	!
1	1	0	1	D	CR	GS	-	=	M	]	m	}
1	1	1	0	E	SO	RS	.	>	N	^	n	~
1	1	1	1	F	SI	US	/	?	O	_	o	DEL

Table B-5. Control Code Display and Parity Error Symbol

ASCII	HEX	PARITY ERROR SYMBOL	ASCII	HEX	PARITY ERROR SYMBOL
NUL	00	(SPACE)	DLE	10	D_L
SOH	01	S_H	DC1	11	D_1
STX	02	S_X	DC2	12	D_2
ETX	03	E_X	DC3	13	D_3
EOT	04	E_T	DC4	14	D_4
ENQ	05	E_Q	NAK	15	N_K
ACK	06	A_K	SYN	16	S_Y
BEL	07	B_L	ETB	17	E_B
BS	08	B_S	CAN	18	C_N
HT	09	H_T	EM	19	E_M
LF	0A	L_F	SUB	1A	S_B
VT	0B	V_T	ESC	1B	E_C
FF	0C	F_F	FS	1C	F_S
CR	0D	C_R	GS	1D	G_S
SO	0E	S_O	RS	1E	R_S
SI	0F	S_I	US	1F	U_S

PARITY ERROR

DEL 7F 

Appendix C
GRAPHIC MODE

The VIP7201 character matrix field consists of a screen area that is 9 cells wide by 12 cells high with adjacent vertical elements contiguous. In the horizontal direction, there is a one dot time blank between graphic symbols. Figure C-1 shows the cell distribution for all line graphics available on the VIP7201.

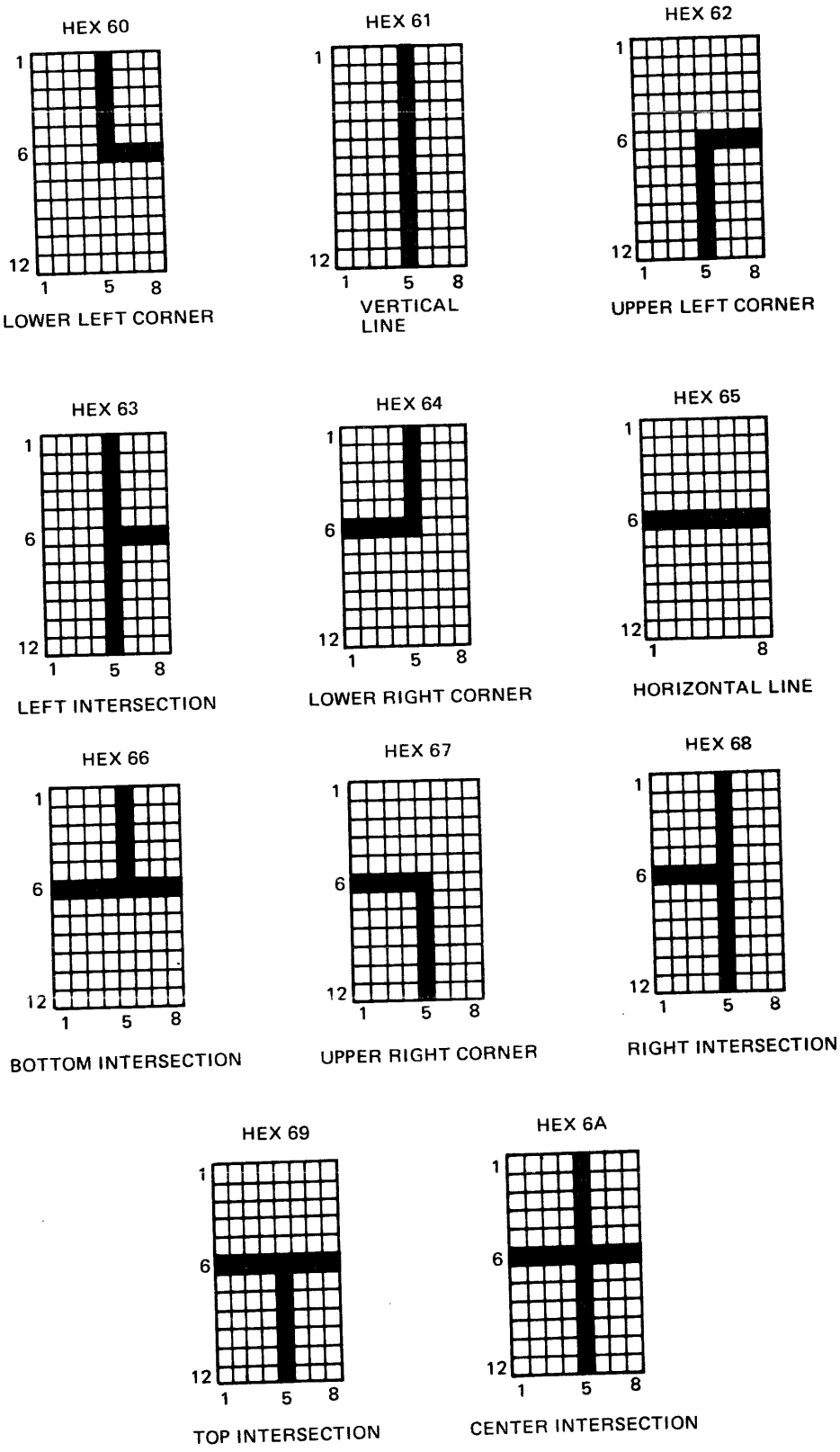


Figure C-1. Line Graphics Set (Sheet 1 of 2)

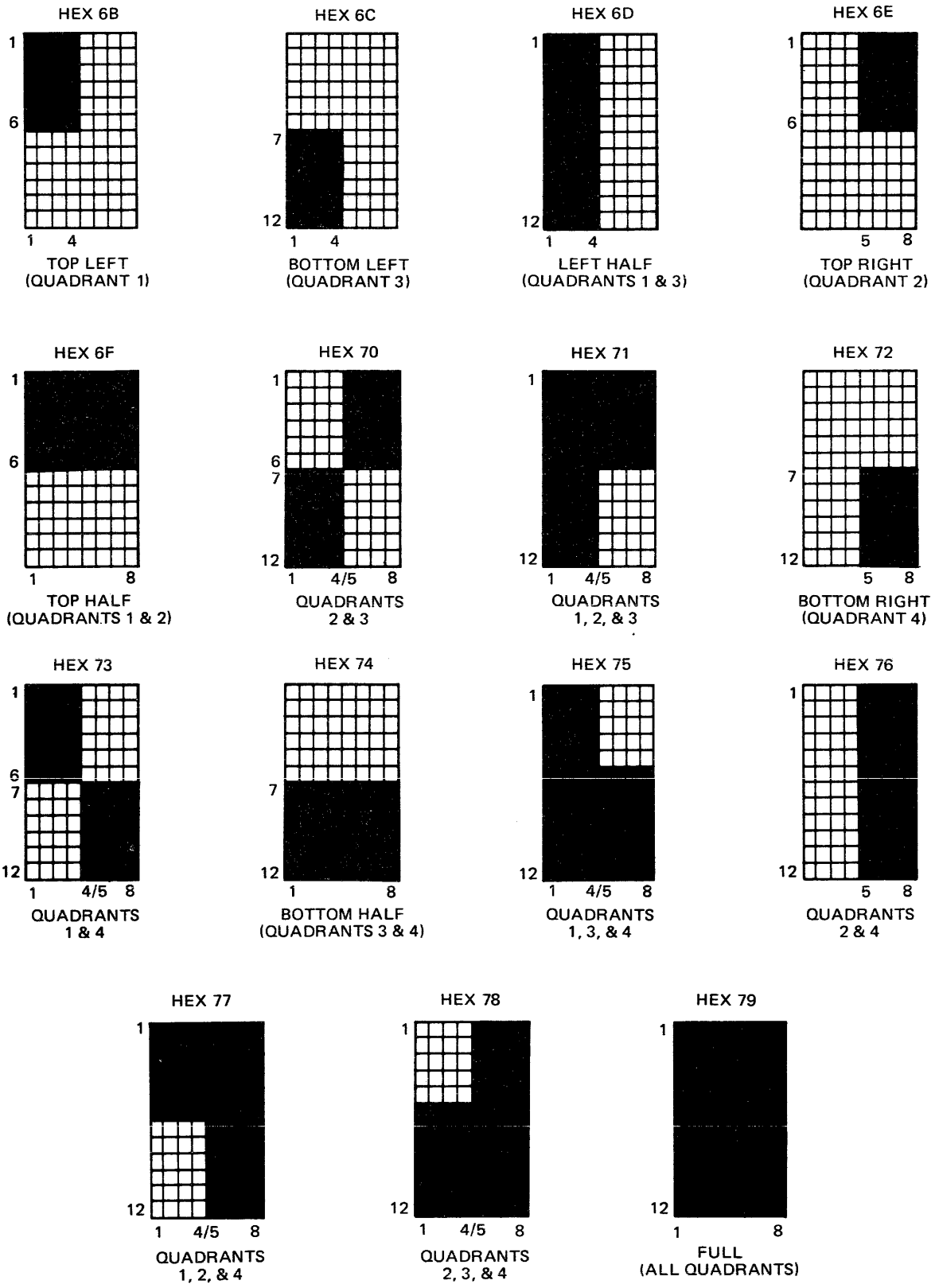


Figure C-1. Line Graphics Set (Sheet 2 of 2)

Appendix D
VIP7201 COMPATIBILITY WITH OTHER VIP FAMILY TERMINALS

D.1 VIP7201 COMPATIBILITY WITH VIP7200/VIP7205

VIP7201 terminals can communicate with a host by using VIP7200 host application software. Table D-1 compares VIP7200 functionality to the VIP7201 enhancements, while Tables D-2 and D-3 list the differences that are invisible or visible to the host.

D.2 VIP7201 CODE RECOGNITION RULES

The VIP7201 recognizes the same codes as the VIP7200 for similar functions, if the following rules are observed:

1. The host does not issue any commands or code sequences other than those recognized and acted upon by the VIP7200.

2. The operator does not generate any commands or code sequences other than those generated by the VIP7200 in its Online mode of operation.

3. The VIP7200 Back Space command (08) wraps around to the previous line when in column 1. The VIP7201 does not backspace out of column 1.

4. The DLE command is ignored in the VIP7200, and the following character is accepted. In the VIP7201, a DLE followed by a character other than EOT results in the DLE and the following character being ignored.

5. Some timing differences may exist. If such a condition arises, it may be necessary to add fill characters (DEL (7F)) to the data stream.

Table D-1. VIP7201 Enhancements to VIP7200/VIP7205 Functionality (Sheet 1 of 2)

VIP7200/VIP7205	VIP7201
Character display: 5 x 7 cell matrix in 7 x 10 field	7 x 11 cell matrix in 9 x 12 field
Low-resolution CRT	Medium-resolution CRT
No CAMP	CAMP
Repeat (RPT) key	Keys repeat automatically
End of Message key to turn line around in half-duplex	Full-duplex only
Media Copy (MC) command: If cursor at (1,1), transmits Space EOT (04) and advances cursor one column	Transmit Data (TXD) command: If cursor at (1,1), transmits EOT (04) and does not advance cursor
Cursor Position Binary (CPB) (called Horizontal Vertical Position (HVP) in VIP7200) acts on parameters as received	Validates both parameters before acting on either
Switch to disable end-of-line alarm; does not affect response to BEL (07) code	Configuration Line to disable end-of-line alarm
If parity error, displays as (?)	If parity error, the wrong data is displayed, following the parity error pattern
If receives Escape (ESC) character with parity error, displays as (?)	Ignores sequence
Data Link Escape (DLE) ignored by VIP7200; following character is accepted	Except for EOT, character following DLE is ignored as is the DLE
Lowercase character display is standard with VIP7205	Lowercase character display is standard
	Executes all VIP7200 commands, plus the following: Auxiliary Port Connect (APC) Auxiliary Port Disconnect (APD)

Table D-1. VIP7201 Enhancements to VIP7200/VIP7205 Functionality (Sheet 2 of 2)

VIP7200/VIP7205	VIP7201
	Auxiliary Port Parallel (APP) Cursor Back Tab (CBT) Character Mode (CM) Delete Character (DCH) Disconnect (DEOT) Delete Line (DL) Enquiry (ENQ) Echo (EP) Horizontal Tab (HT) Insert Line (IL) Insert Mode (IM) Insert Mode Reset (IMR) Keyboard Lock (KBL) Keyboard Unlock (KBU) Line Graphics Reset (LGR) Line Graphics Set (LGS) Non-Echo (NEP) Reset Initialize State (RIS) Roll Mode Reset (RMR) Roll Mode Set (RMS) Text Mode (TM) Transmit Data (TXD)
Does not require Data Set Ready to be present when receiving data from the host	Requires Data Set Ready to be present when receiving data from the host

Table D-2. VIP7201 Differences Invisible to a Host

VIP7200/VIP7205	VIP7201
Clear to Send, Data Set Ready indicators on CRT	No Data Set Ready or Clear to Send indicators
Back Space (08) wraps around to previous line when in column 1	Back Space command does not back cursor out of column 1

Table D-3. VIP7201 Differences That Can Be Visible to a Host

VIP7200/VIP7205	VIP7201
Auxiliary port always on	Auxiliary port control
10 baud rates (75-9600)	8 baud rates (300-19,200)
Line, page transmit (MC)	Page transmit
Transmit terminator could be CR	Terminator is EOT

Appendix E
ELECTRICAL REQUIREMENTS AND INTERCONNECTING CABLES

E.1 AC POWER

Each VIP7201 terminal comes equipped with an ac power cord, with a three-prong plug that plugs into a 115-volt, 60-hertz, three-wire receptacle or connector.

When providing receptacles or connectors, it is the customer's responsibility to ensure that the equipment ground conductor is enclosed with the circuit conductors (phase and neutral wires). Conduit, metallic raceway, or other enclosures cannot be used for equipment ground. A separate ground wire (green or green/yellow) back to the building ground is required. The size of the equipment ground conductor must be at least the same size as the circuit conductors supplying the equipment. All grounding provisions must be in accordance with the National Electric Code (National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210). The service of a licensed electrician will be required to assess and possibly modify your ac power circuits to meet these requirements.

Although the required ac voltage is specified as 115 volts, VIP7201 terminals are designed to operate between +10 and -10 percent of 115 volts. If the line voltage varies outside of these limits, the equipment may not operate properly.

Disturbances such as electrical noise from other equipment in the building and lightning can cause malfunctions in equipment operation. Your electrician can identify noise sources and suggest possible remedies. In extreme cases where large variations in line voltage are coupled with electrical noise, a line conditioner may be required. Such a device effectively isolates the equipment from excessive line voltage variations and electrical noise. Purchase and installation of the line conditioner, if required, is the customer's responsibility.

E.2 CONVENIENCE ELECTRICAL OUTLETS

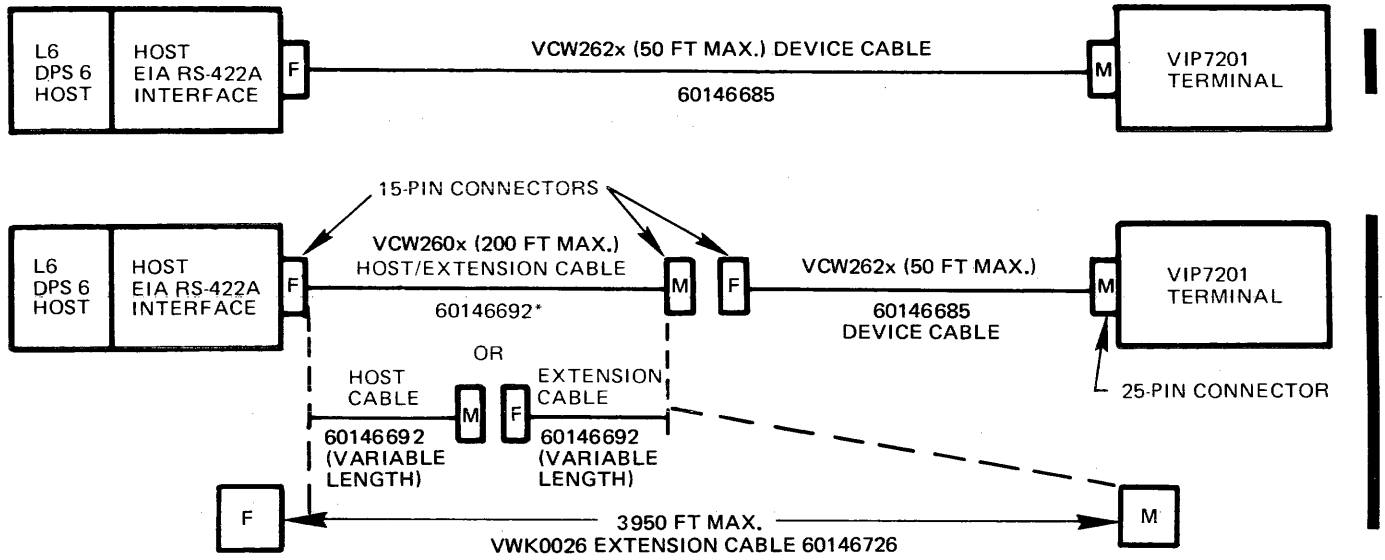
Auxiliary 115-volt, 60-hertz wall outlets should be present in the terminal area for test equipment, vacuum cleaners, floor buffers, etc. The recommended circuit capacity is 15 amperes, with individual outlets rated at 15 amperes. These outlets should not be on the same circuit as the terminal receptacles.

The convenience outlets in the vicinity of the terminal equipment must be of the grounding type. Conduit, metallic raceway, or other enclosures cannot be used for equipment ground. A separate ground wire (green or green/yellow) back to the building ground is required.

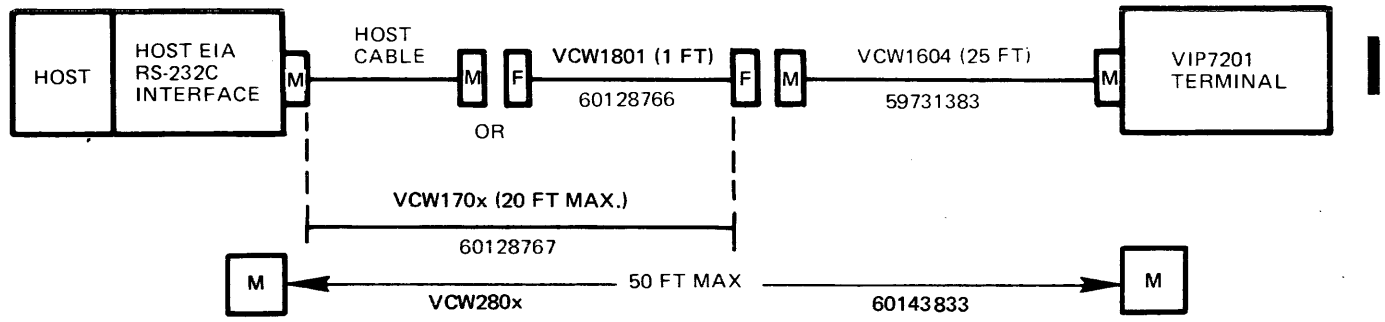
E.3 INTERCONNECTING CABLES

Honeywell supplies certain standard lengths for the various cables that connect the terminal to the data communications equipment. Cable types and available lengths are shown on Figure E-1. If custom length cables are desired, a layout drawing is helpful in determining the required lengths. Connectors must be ordered separately. When calculating cable length, be sure to include the tabletop to floor distance at both ends plus an extra 2 feet at each end to allow for changes in equipment orientation or for equipment movement when servicing. If cables are to be enclosed in a cable trough or raceway, this enclosure should be shown on the layout drawing. Cable lengths can then be determined from the layout of the enclosure. Long cables require that particular attention be paid to the grounding requirements of subsection E.1. Specifically, any currents flowing in the ground system may result in equipment damage or a safety hazard.

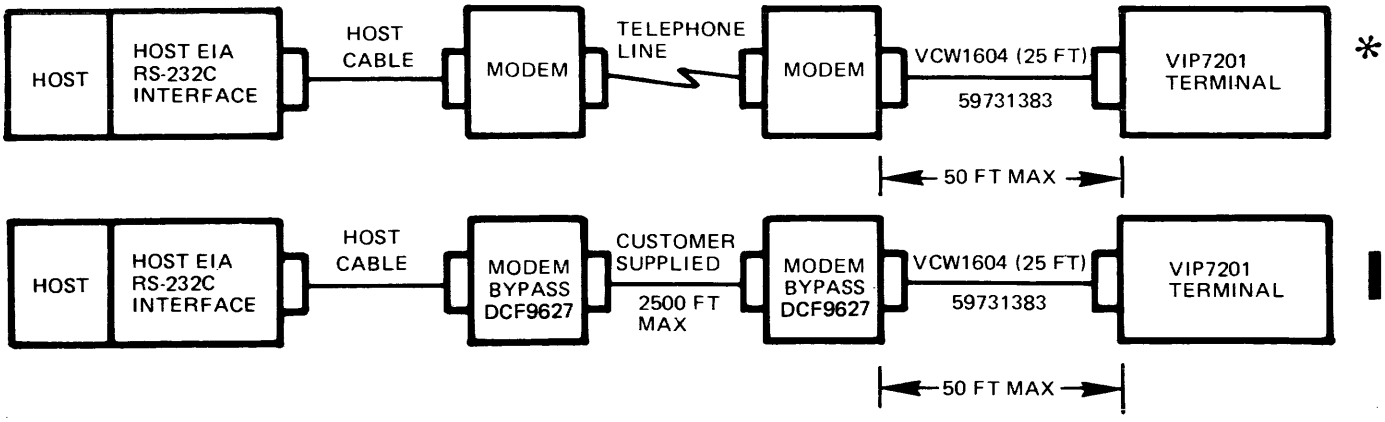
Installation of required cabling and associated equipment prior to the installation of the terminals is the customer's responsibility. For example, cables that go from one area to another with intervening walls or floors, or cables that must be installed in cable troughs or raceway should be in place and tested prior to the arrival of the terminal equipment. Building codes, fire protection codes, and electrical codes determine the requirements for installation of cables through walls and between floors. Such cables should be routed away from equipment that produces electrical noise (e.g., fluorescent lights, diathermy machines, and induction heating devices) and three-phase power lines. Electrical noise pickup can be reduced by running the cables in a conduit.



EIA RS-422A DIRECT CONNECT



EIA RS-232C DIRECT CONNECT



EIA RS-232C REMOTE CONNECT

NOTE

COMMUNICATION CABLES ARE NOT INCLUDED WITH VIP7201 AND THEY MUST BE ORDERED.

Figure E-1. Host/Terminal Connections Diagram

NOTE

Cables that are to be enclosed in conduit may require installation without connectors attached. A Honeywell Customer Service Engineer can install connectors to cables at the time of terminal installation. This service will incur a charge to the customer.

E.4 LIGHTNING PROTECTION

Honeywell does not support interconnection cables that run outside or between buildings whether above or below ground. Furthermore, any such connection is in violation of the National Electric Code unless fitted with protective devices as defined by Article 800 of that code. Other local codes may pose further restrictions. Consequences of an inadequate installation may include both equipment damage and personal safety hazard.

Appendix F
SAMPLE FORM

This appendix contains a sample form and the data stream necessary for sending the form from the host to the VIP7201.

The VIP7201 uses the visual attribute bit being set in display memory for defining a protected field. Since this attribute bit is not normally set, the data on the screen is defaulted to unprotected fields. This means that the user must define the protected information on the screen (including any spaces or unused lines). Refer to the sample form and its generation.

The actual attribute displayed on the screen is dependent on what is set on the Configuration Line. Refer to Section 1 for the setup of the visual attribute (nibble 2). The setting of this line may affect the readability of the form.

Figure F-1 is a typical form that might be used for reporting a customer's charge card account. For the purpose of this illustration, all protected fields are generated in low intensity (nibble 2, bit 2 = 1).

The underscores in the examples are only used to determine the lengths of the unprotected fields and will not be displayed on the screen.

NOTE

The Set High Intensity command must be issued just prior to setting forms mode.

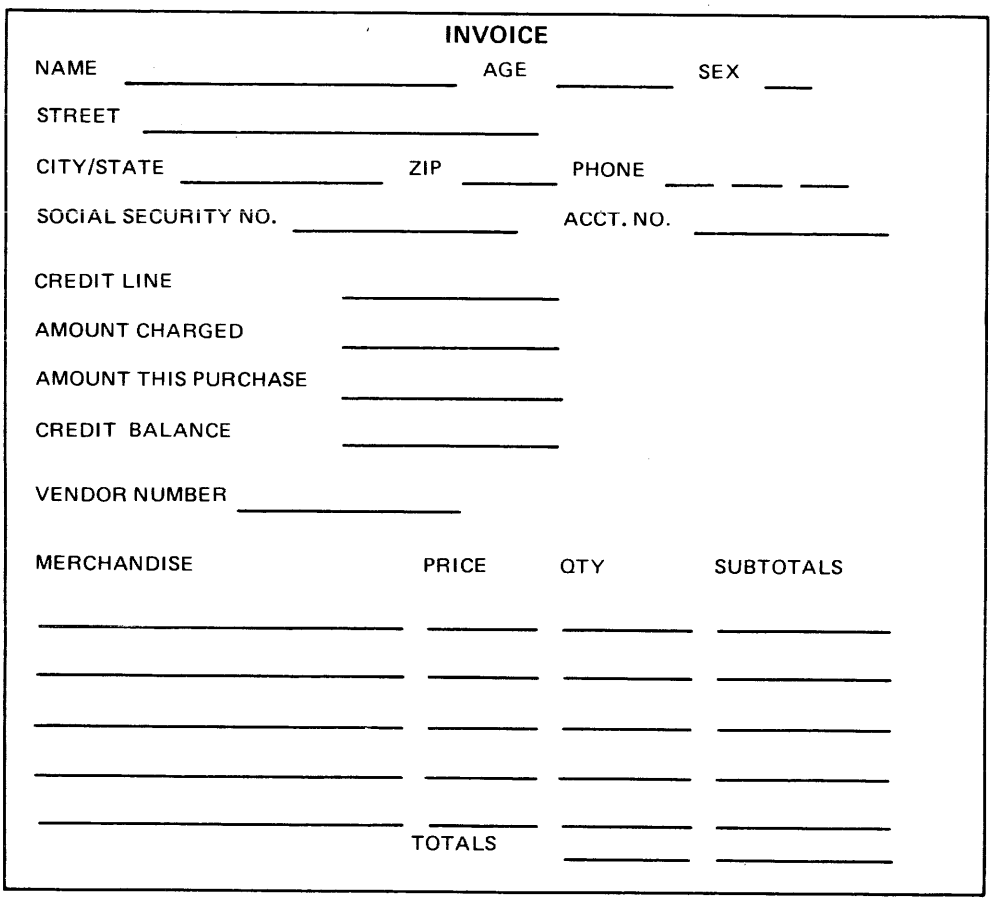


Figure F-1. Form A

Figure F-2 is a form generation work sheet that has been filled out for the sample form. A work sheet should be filled out to aid in the generation of the form. A blank form appears at the end of this appendix and can be copied on any standard office copy machine.

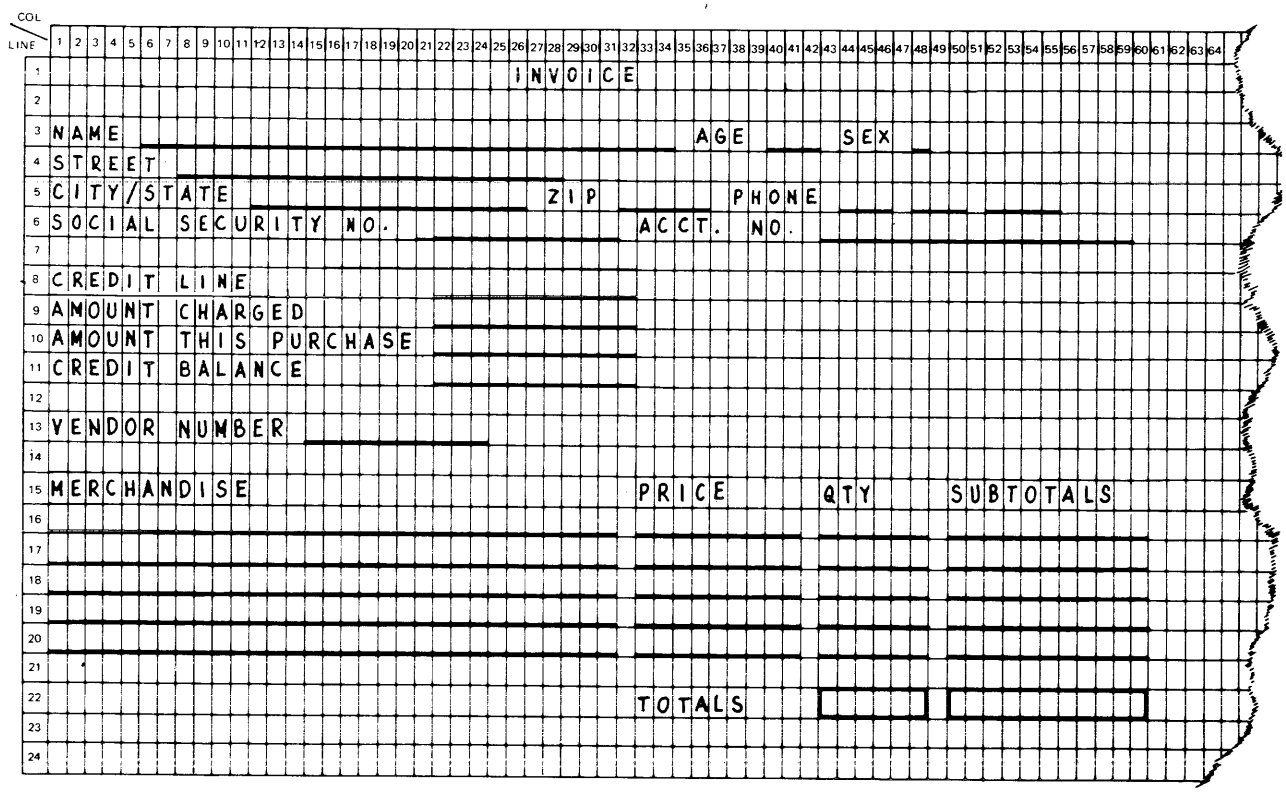


Figure F-2. Form Generation Work Sheet, Form A

The following is the command list for generating a sample form. Refer to Section 4 for detailed descriptions of the commands.

1. CLR — Clear data space, home cursor, reset forms mode, etc.
2. KBL — Keyboard Lock
3. SL1 — Set Low Intensity, set the visual attribute bit in display memory (protected data).
4. 25 Sp — 25 spaces
5. INVOICE
6. 128 Sp — 128 spaces

```
 7.  NAME 1 Sp
 8.  CPB B "          Cursor Position Binary Column 35 Line 3
 9.  Sp AGE Sp
10.  SHI              Set High Intensity
11.  3 Sp             3 spaces
12.  SL1              Set Low Intensity
13.  'Sp' SEX 'Sp'
14.  SHI              Set High Intensity
15.  Sp               1 space
16.  SLI              Set Low Intensity
17.  32 Sp            32 spaces
18.  STREET 'Sp'
19.  CPB < #          Cursor Position Binary Column 29 Line 4
20.  52 Sp            52 spaces
21.  CITY/STATE Sp
22.  CPB : $          Cursor Position Binary Column 27 Line 5
23.  Sp ZIP Sp
24.  CPB D $          Cursor Position Binary Column 37 Line 5
25.  Sp PHONE Sp
26.  CPB N $          Cursor Position Binary Column 47 Line 5
27.  Sp               1 space
28.  CPB R $          Cursor Position Binary Column 51 Line 5
29.  Sp               1 space
30.  CPB W $          Cursor Position Binary Column 56 Line 5
31.  25 Sp            25 spaces
32.  Social Sp Security Sp No. Sp
```

33.	CPB ? %	Cursor Position Binary Column 32 Line 6
34.	Sp ACCT. Sp No. Sp	
35.	CPB [%	Cursor Position Binary Column 60 Line 6
36.	101 Sp	101 spaces
37.	Credit Sp Line	10 spaces
38.	CPB @	Cursor Position Binary Column 33 Line 8
39.	48 Sp	48 spaces
40.	AMOUNT Sp CHARGED	7 spaces
41.	CPB @ (	Cursor Position Binary Column 33 Line 9
42.	48 Sp	48 spaces
43.	AMOUNT Sp THIS Sp PURCHASE Sp	
44.	CPB @)	Cursor Position Binary Column 33 Line 10
45.	48 Sp	48 spaces
46.	CREDIT Sp BALANCE	7 spaces
47.	CPB @ *	Cursor Position Binary Column 33 Line 11
48.	128 Sp	128 spaces
49.	VENDOR Sp NUMBER Sp	
50.	CPB 8 ,	Cursor Position Binary Column 25 Line 13
51.	136 Sp	136 spaces
52.	MERCHANDISE	
53.	21 Sp	21 spaces
54.	PRICE	
55.	5 Sp	5 spaces
56.	QTY	4 spaces
57.	SUBTOTALS	

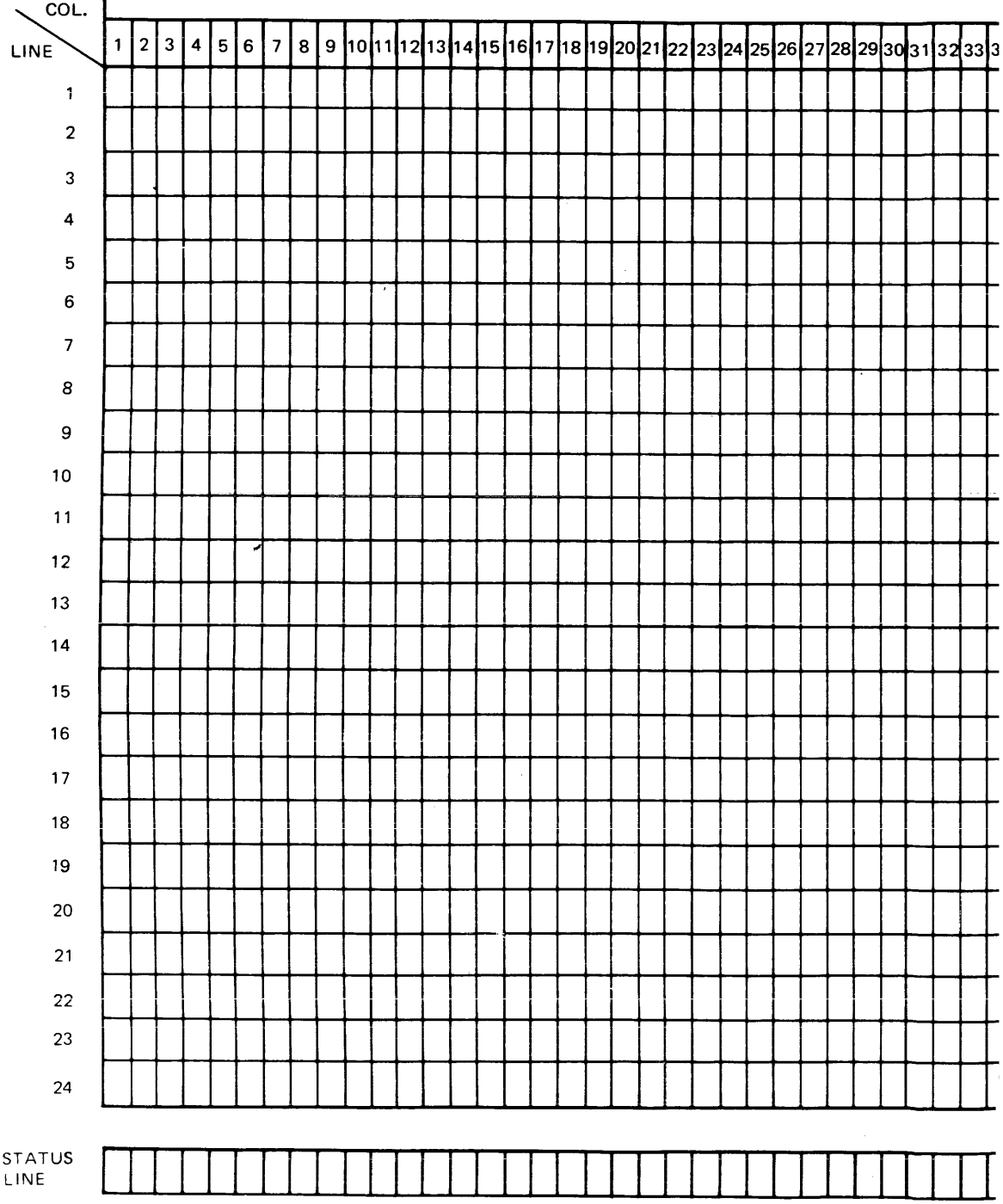
58.	22 Sp	22 spaces
59.	CPB ? /	Cursor Position Binary Column 32 Line 16
60.	Sp	1 space
61.	CPB I /	Cursor Position Binary Column 42 Line 16
62.	Sp	1 space
63.	CPB P /	Cursor Position Binary Column 49 Line 16
64.	Sp	1 space
65.	CPB \ /	Cursor Position Binary Column 61 Line 16
66.	20 Sp	20 spaces
67.	CPB ? 0	Cursor Position Binary Column 32 Line 17
68.	Sp	1 space
69.	CPB I 0	Cursor Position Binary Column 42 Line 17
70.	Sp	1 space
71.	CPB P 0	Cursor Position Binary Column 49 Line 17
72.	Sp	1 space
73.	CPB \ 0	Cursor Position Binary Column 61 Line 17
74.	20 Sp	20 spaces
75.	CPB ? 1	Cursor Position Binary Column 32 Line 18
76.	Sp	1 space
77.	CPB I 1	Cursor Position Binary Column 42 Line 18
78.	Sp	1 space
79.	CPB P 1	Cursor Position Binary Column 49 Line 18
80.	Sp	1 space
81.	CPB \ 1	Cursor Position Binary Column 61 Line 18
82.	20 Sp	20 spaces
83.	CPB ? 2	Cursor Position Binary Column 32 Line 19

84.	Sp	1 space
85.	CPB I 2	Cursor Position Binary Column 42 Line 19
86.	Sp	1 space
87.	CPB P 2	Cursor Position Binary Column 49 Line 19
88.	Sp	1 space
89.	CPB \ 2	Cursor Position Binary Column 61 Line 19
90.	20 Sp	20 space
91.	CPB ? 3	Cursor Position Binary Column 32 Line 20
92.	Sp	1 space
93.	CPB I 3	Cursor Position Binary Column 42 Line 20
94.	Sp	1 space
95.	CPB P 3	Cursor Position Binary Column 49 Line 20
96.	Sp	1 space
97.	CPB \ 3	Cursor Position Binary Column 61 Line 20
98.	132 Sp	132 spaces
99.	TOTALS	4 spaces
100.	CPB P 5	Cursor Position Binary Column 49 Line 22
101.	Sp	1 space
102.	CPB \ 5	Cursor Position Binary Column 61 Line 22
103.	180 Sp	180 spaces. The cursor should be on line 24 in column 81
104.	SHI	Set High Intensity - This command must be issued just prior to setting Forms mode.
105.	FM	Set Forms Mode
106.	CUH	Cursor Home
107.	KBU	Keyboard Unlock

FORM NAME _____

DATE _____

VIP72



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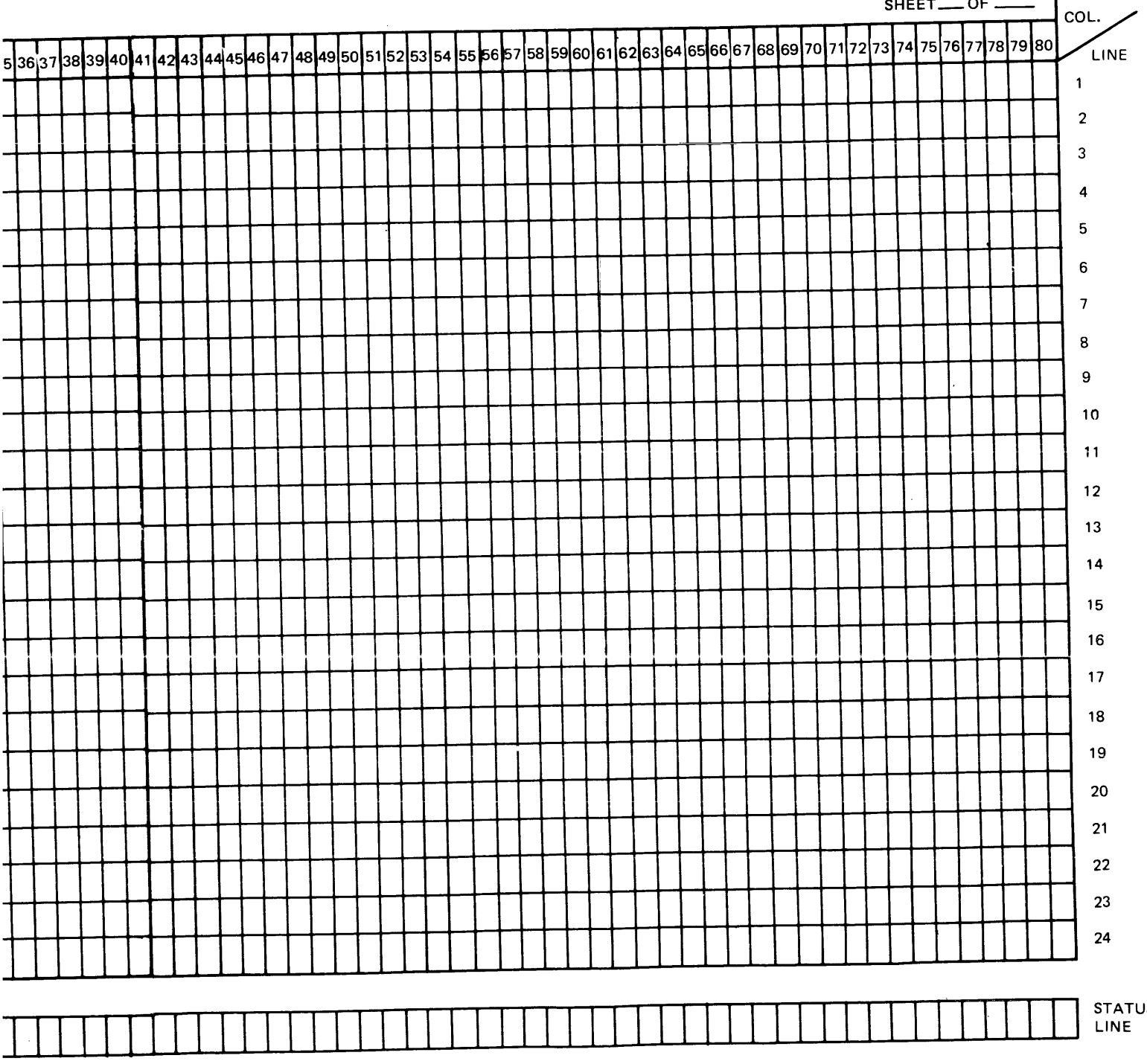
FORMS CREATION WORK SHEET

SHEET ___ OF ___



VIP7201 DISPLAY TERMINALS USER'S REFERENCE MANUAL ADDENDUM A

SUBJECT

Additions and Changes to the Manual

SPECIAL INSTRUCTIONS

This is the first addendum to CP92-01, dated May 1983. Insert the attached pages into the manual according to the collating instructions on the back of this sheet. Change bars in the margin indicate new or changed information; asterisks indicate deletions.

Note:

Insert this cover sheet behind the front cover to indicate the updating of the document with Addendum A.

The following notice is provided in accordance with the United States Federal Communications Commission's (FCC) regulations.

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions 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 operated 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.

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Honeywell

COLLATING INSTRUCTIONS

To update this manual, remove old pages and insert new pages as follows:

Remove	Insert
Title page, Preface	Title page, Preface
iii through viii	iii through vii
1-1, 1-2	1-1, 1-2
2-7 through 2-12	2-7 through 2-12
3-7 through 3-9, blank	3-7 through 3-9, blank
4-7, 4-8	4-7, 4-8
4-15.1, 4-16	4-15.1, 4-16
4-19 through 4-21, blank	4-19 through 4-21, blank
4-21.1, 4-22	4-21.1, 4-22
4-23, blank	4-23 through 4-25, blank
5-1, 5-2	5-1, blank
	5-1.1, 5-2
6-3 through 6-7, blank	6-3 through 6-7, blank
7-7 through 7-10	7-7, 7-8
	7-8.1, blank
	7-9, 7-10
Section 8	Section 8
Appendix A	Appendix A
B-3 through B-8	B-3 through B-8
E-3, E-4	E-3, E-4
Appendix F	Appendix F

Failure to properly follow procedures outlined in this guide may void product warranty. See your Honeywell agreement for warranty statement.

USER COMMENTS FORMS are included at the back of this manual. These forms are to be used to record any corrections, changes, or additions that will make this manual more useful.

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