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INTRODUCTION

The Infoton I-100 display terminal is a ruggedly designed high
reliability terminal which employs a powerful Z80 microprocessor to
achieve a new standard of functionality in low priced terminals.

The terminal includes a solid state keyboard with numeric pad and
optional function keys, two industry standard asynchronous serial
interfaces, a 12 inch high resolution, low glare display monitor,
and rugged steel packaging.

The I-100 provides a number of formatting and annunciation features
including dual intensity, line editing, and absolute cursor addressing.
Optionally, added features such as block mode with protected and
unprotected fields and user programmable function keys greatly
enhance the functional capability of the terminal. Additionally,
Infoton can provide emulators with a high degree of compatibility
with the terminals that are emulated. The terminal is also capable
of operation as a simple teletypewriter replacement.

1.0   START-UP PROCEDURES

At the start of operation the following procedures are recommended, and should be followed prior to putting the terminal on-line.

o   Turn the power switch to the ON position, and set the local key for local operation. A 30 second warm-up period is required, afterwhich the blinking cursor will appear on the screen.

o   Set rear panel switches for the desired mode of operation (see Section 4.2). Set BLOCK and CAPS ONLY keys on the keyboard for desired operation.

o   Adjust intensity control as required. The control knob is located on the rear panel (see figure 4.4).

o   Type a message to see that it is correctly written on the screen. Exercise functional keys (i.e., RETURN, LINE FEED, TAB, ECT) to ensure proper operation.

o   Depress the LOCAL Key on the keyboard for on-line operation.

NOTE: TAKE UNIT OFF-LINE BEFORE CHANGING ANY REAR PANEL SWITCHES.

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2.0 SPECIFICATIONS/CHARACTERISTICS

The following paragraphs summarize the basic features of the I-100 display terminal.

2.1.1 Keyboard

The I-100 display terminal uses a keyboard which is permanently attached to the terminal. · The keyboard uses solid state capacitively coupled keys for high reliability and long life.

The keyboard consists of a 62 main keyboard and a 14 key, function shifted, numeric pad. Optionally, 8 special function keys may be added to generate user programmable special function codes. The keyboard is illustrated in figure 4.1.

Depressing a key on the keyboard will cause a code to be sent out on the communication interface if the terminal is on-line. Holding a key down which is a validly repeatable key will cause the key code to be repetitively sent out at the speed of the interface of 15 characters per second, whichever is slower.

2.1.2 Video Monitor

The video display used in the I-100 is a high quality, high resolution, 12 inch display using P4 white phosphor and a non-interlaced rater scanning method which provides

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clear and accurate character reproduction with low glare.
Characters are produced using a 9 x 7 dot matrix for upper
case characters and a 9 x 9 dot matrix for lower case.

Optional scratch resistant filters are available to simulate
green or yellow-brown phosphor.

The display has a screen capacity of 1920 characters, organized
as 24 lines of 80 characters each. An additional 25th line
is used for the display of terminal status information.
Status display is under operator control from the keyboard.

The I-100 has four display modes as standard:

- normal video, light characters on a dark background at
  normal intensity.

- normal video reduced intensity, light characters on a
  dark background at reduced intensity.

- reverse video normal intensity, dark characters on a
  light background at normal intensity.

- reverse video reduced intensity, dark characters on a
  light background at reduced intensity.

Whether normal or reverse video is selected for display of
characters, the dual intensity modes are selectable on a
character by character basis and do not require a displayable
character position to affect the change.

2.1.3   Communications Interface

The I-100 provides two separate industry standard interfaces
to allow simple connection to a variety of equipment. The
terminal has a standard 20 milliampere passive current loop
interface with current supplied by the host equipment. This
interface allows simple direct connection to most equipment.

The terminal also has a second serial interface complying
with EIA RS232-C and CIITT V.24 specifications. This inter-
face provides all required control and sequencing signals
for connection to local equipment or to remote equipment
through a modem.

The two interface are switch selectable from the
rear panel.

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2.1.3   Communications Interface   (continued)

The I-100 also allows the selection of eight data rates and four parity options through switch settings on the rear panel. Possible data rates include: 110, 200, 300, 1200, 2400, 4800, 9600 and 19200 bits per second. Parity choices include mark, space, odd and even parity.

The terminal may be configured to run in full duplex mode or half duplex mode. In half duplex mode, the user has the ability to select one of three line turn-around codes.

In addition to the primary communications interface which is a standard 25 pin EIA connector, the I-100 provides a transmit only auxiliary interface to allow attachment of local hard copy units.

2.2   Physical Characteristics

The I-100 is packaged in a steel enclosure which is both rugged and gives the terminal increased EMI and RFI shielding. Physical characteristics of the terminal are as follows:

SIZE		WEIGHT
Height	14 - 1/8"	45 lbs.
Width	17 - 1/2"	
Depth	22 - 1/2"	

TEMPERATURE		HUMIDITY
Operating: 5	-40 C	5 - 80% non-condensing
Storage: -30	-65 C	

2.3   Engineering Highlights

The I-100 provides the following advances in terminal technology:

- Z80 microprocessor controlled
- 4K bytes of dynamic RAM memory
- Extensive use of large scale integration for video control
- Direct microprocessor control of keyboard scanning for versatility, lower cost and higher reliability
- Steel packaging for ruggedness, noise immunity, increased EMI and RFI shielding and heat dissipation
- Vertically mounted, single PC board design for integral mounting with TV chassis and improved cooling
- Convection cooled, no-fan design for improved reliability and silent operation.

3.0 FEATURES

The I-100 has a number of features which assist in editing text, formatting the display, controlling cursor movement, and performing certain special functions. This section gives a brief summary of these features. A more detailed description of features may be found in Sections 3 and 4.

3.1 Editing Features

The I-100 will decode and respond to command codes which allow the user to:

- insert a line of text
- delete a line of text
- erase foreground text from the current position of the cursor to the end of a line
- erase foreground text from the current position of the cursor to the end of the display
- provide for non-destructive space advance between receipt of a carriage return and a line feed
- insert character (block mode option required)
- delete character (block mode option required)
- erase field (block mode option required)

3.2 Formatting Aids

The I-100 provides the following functions to aid in formatting and annunciation of the displayed area.

- setting columnar tab stops
- clearing columnar tab stops
- tabbing (forward and back)
- display of data in normal intensity or reduced intensity
- display of data in reverse video
- graphic mode which allows the display of graphic characters

3.3 Cursor Control

The I-100 provides a full compliment of commands and switch options to control and modify the cursor movement. The following list summarizes the cursor control.

- cursor home command
- cursor commands for movement upward, downward, left and right
- absolute cursor addressing
- switch selectable options to automatically advance the cursor at the end of a line (ANL feature) and advance to the next line automatically when a carriage return is keyed by the user (CRNL feature).
- cursor address read

3.4 Special Features

In addition to the above stated features, the I-100 also
provides the following special features.

- an audible alarm activated under program control
- commands to lock and unlock the keyboard
- commands to enable and disable local copy
- commands to enable and disable local print
- optional special function keys

3.5 Display Modes

In PAGE entry mode, the cursor home position is the top left
corner of the display. Data is entered a line at a time from
the top of the display to the bottom line. Entry of data
beyond the bottom line causes the cursor to wrap around to the
top line of the display.

In roll mode, the cursor home position is the top
left corner of the display. Data is entered a line at a time
from the top of the display to the bottom line. Entry of data
beyond the bottom line causes the display to scroll upward
as additional lines of data are entered.

3.6 Optional Features

The I-100 has optional features which extend its functionality
considerably.

The terminal may have a block mode option installed which allows
the use of protected and unprotected fields and block transmission
of unprotected data. This option also includes the insert and
delete character capabilities.

The terminal may also have 8 user programmable function keys
which will send a string of user defined data when depressed.

For applications requiring remote display of data, the I-100
will have a standard RS-170A compatible composite video output
jack installed on the rear panel.

4.0 TERMINAL CONTROLS

This section contains information concerning the meaning and use of the various controls and options available on the I-100.

4.1 Keyboard Controls

From the keyboard, the user can control a variety of terminal operations including the display and setting of terminal status, tab control, cursor control, initiate multicode sequences, and control the local copy or print functions.

Figure 4.1 shows the I-100 keyboard with four different sections or sets of keys. The main section contains 57 alphanumeric and control keys; to the right, the numeric and function key pad contains 14 keys; above the numeric keypad is a row of 5 mode and cursor control keys; and in the upper left hand corner, a row of 8 special function keys is optionally available.

4.1.1 Main Keyboard Controls

There are eight keys on the main keyboard which either send control codes directly or modify the code sent by depressing the other alphanumeric keys.

Depressing the ESC key located to the left of the main keyboard, causes the terminal to send the escape code (1B 16) providing the terminal is on-line. This code is used in the I-100 to initiate multicode control sequences. For example, ESC M will delete a line. See Section 5 for a detailed description of these sequences.

The CTRL (control) key located to the left of the main keyboard, does not produce a code by itself. This key is used in conjunction with other keys on the keyboard to generate control codes. If the CTRL key is depressed in conjunction with any key that transmits a code command as described in Section 5 is transmitted to the host computer. For example, Control L clears the screen.

The SHIFT key causes the terminal to send only upper case alphabetic characters or the characters whose symbols appear in the upper portion of the key being depressed. For operator convenience, two SHIFT keys are on the keyboard. Each of these keys has the same effect on the data.

Depressing the FUNCTION key modifies the use of the numeric pad. See Section 4.1.2.

4.1.1 Main Keyboard Controls (continued)

The RETURN key causes the terminal to send a carriage return control code (OD 16) and return the cursor to the first position of the present line. See section 4.2 switch S 2-2 for cursor operation.

Depressing the LINE FEED control key will cause the terminal to send a line feed control code (OA 16) and move the cursor down one line from its current position. See section 5.3 for LINE FEED operation.

The TAB/BACK TAB control key has a dual function. Depressed by itself, it causes the terminal to send a horizontal tab control code (09 16). If the TAB key is depressed along with the SHIFT key, the terminal BACK TABS. See section 5.2 for TAB/BACK TAB operation.

4.1.2 Numeric Pad Function Controls

Depressing the FUNCTION key on the main keyboard and one key on the numeric pad modifies the code sent by the terminal from a numeric 1 thru 9, comma or period (1-9,.) to the function control code for the function shown on the upper part of the key. These function codes are summarized in Figure 4.2 and described in detail in Section 5.

There are two exceptions to the above description of function codes. The CPY function key will send a control code which is determined by the current state of the respective feature. Successive depressions of this key will alternately enable and disable the function and send a corresponding control code.

The PRT function key causes no code to be sent by the terminal. Instead, the key causes the entire contents of the display to be sent to the auxiliary interface for local printing.

The ENTER key will cause the terminal to send a CARRIAGE RETURN CODE in (character mode); or the contents of the foregound fields on the display (See description of BLOCK mode key, Section 4.1.3). The BLOCK mode message will be terminated by either an EOT (04 16) or a CR (OD 16) depending on the setting of switch S3-7.

The - key on the numeric pad causes the same action as its counterpart on the main keyboard.

4.1.3 Mode and Cursor Control

The mode and cursor control key unit located in the upper right section of the keyboard is composed of a five key unit (Figure 4.1). The basic five key unit contains the

4.1.3 Mode and Cursor Control (continued)

following functions:
CAPS ONLY/CURSOR LEFT, BREAK/CURSOR RIGHT, BLOCK/HOME,
STATUS/CURSOR DOWN and LOCAL/CURSOR UP.

The cursor movement commands occur with the unshifted
operation of these keys. The cursor movement functions
are described in Section 5.3.

When used in conjunction with the SHIFT key, these five
keys operate as terminal control functions in the
manner described below.

The LOCAL key controls whether or not the terminal
appears on-line and ready to receive and send data.
When the terminal is powered on, it will be in the on-
line condition. On the EIA interface, the data terminal
can send and receive data. When the LOCAL switch is
depressed, the terminal drops the DTR signal and becomes
off-line. In this condition, data entered at the
keyboard is not sent but is echoed back to the display
automatically.

The STATUS key causes the status of the terminal to be
displayed on the 25th line for several seconds.
Normally, the status line is blank. Figure 4.3 shows
a template of the status line. If a selectable option
is active, it will be displayed on this line.

Depressing the BLOCK key will cause the terminal to
enter or exit from BLOCK mode when the BLOCK mode is
installed. When the terminal is in BLOCK mode, the
data will not be transmitted until the user depresses
the ENTER key. See Section 4.2, Switch 15 EOT/CR
Select for description.

Depressing the CAPS ONLY key causes the terminal to
send only upper case alphabetic characters until the
key is depressed a second time. Normally, the terminal
will send both upper and lower case alphabetic characters.
The current status of this key is shown on the status
line.

Depressing the BREAK key causes the terminal to interrupt
transmission by holding the transmit data line (circuit
BA for EIA interface) in the space or high condition
for 250 milliseconds.

4.2 Rear Panel Controls

Figure 4.4 shows the controls found on the rear panel of the I-100 display terminal. The terminal is provided with 16 miniature switches, two 25 pin EIA connectors, an optional remote video jack, circuit breaker, and power switch. Figure 4.4 shows an enlargement of the 16 miniature switches which are organized as two sets of 8 switches.

The first set of 8 switches, numbered S2-1 through S2-8, is located to the left of the second set, numbered S3-1 through S3-8, when viewed from the back of the terminal. The switches are numbered from left to right. The following paragraphs will discuss the function of each switch.

Switch S2-1 - Auto New Line   (ANL)

When this switch is in the ON position, the cursor will automatically advance to the first column of the next line when a character is entered in column 80 of the present line. In the OFF position, the cursor will remain in the 80th column and any successive characters entered will overlay the last character on the line until a carriage return control code is received by the terminal.

Switch S2-2 - Carriage Return New Line   (CRNL)

When this switch is in the OFF position and the user depresses the return key on the keyboard, the cursor will return to the first position of the present line. In the ON position, the cursor will automatically advance to the first position of the next line when the user depresses the return key. However, only the CR code will be transmitted.

Switch S2-3 - Upper Case Only   (UC)

When this switch is in the ON position all alphabetic data received by the terminal is displayed as upper case characters. In the OFF position, both upper and lower case characters are displayed.

Switches S2-4 and S2-5 - Line Turn-Around

These two switches define the character code selected for line turn-around when operating in half duplex mode. In full duplex mode, the switch settings are ignored. The line turn-around codes are defined in the following table. Direction of data flow is with respect to the terminal.

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4.2 Rear Panel Controls (continued)

Switches S2-4 and S2-5 - Line Turn-Around

SWITCH		TURN-AROUND CODE	
4	5	SEND	RECEIVE
OFF	OFF	CR	CR
OFF	ON	CR	EOT
ON	OFF	CR	ETX
ON	ON	Invalid	Invalid

Switch S2-6 - 50/60 Cycle Power

This switch is set to indicate whether the terminal is to operate with 50 or 60 Hz power line frequency. In the ON position, 50 Hz is selected. In the OFF position, 60 Hz is selected. Note that the terminal must be equipped with the proper transfomer for the line frequency selected.

Switches S2-7 and S2-8 - Interface Selection

These two switches determine whether or not the communications interface operates in RS232-C mode or in 20 milliampere current loop mode. Loop current is supplied by the host equipment. In the OFF position, the EIA RS232-C interface is enabled. In the ON position, the 20 milliampere send and receive data signals are applied to pins 21/25 and pins 18/19 respectively of the 25 pin primary connector.

The second set of 8 switches is located to the right of the first. These switches are numbered S3-1 through S3-8 starting from the left-most switch.

Switches S3-1, S3-2, and S3-3 - Data Rate Selection

SWITCHES			BAUD	# STOP BITS
S3-1	S3-2	S3-3		
OFF	OFF	OFF	110	2
OFF	OFF	ON	200	1
OFF	ON	OFF	300	1
OFF	ON	ON	1200	1
ON	OFF	OFF	2400	1
ON	OFF	ON	4800	1
ON	ON	OFF	9600	1
ON	ON	ON	19200	1

4.2 Rear Panel Controls (continued)

Switches S3-4 and S3-5 - Parity Selection

These switches determine how the parity bit will be set in each character according to the following table:

SWITCH		PARITY
S3-4	S3-5	
OFF	OFF	MARK
OFF	ON	SPACE
ON	OFF	EVEN
ON	ON	ODD

Switch S3-6 - Half/Full Duplex Indicator

This switch determines what type of line control will be used to send and receive data. In the OFF position, the terminal will operate in half duplex mode. In this mode, data may only be sent or received until a turn-around character is detected. At this time, the direction of data flow is reversed. The terminal will automatically echo data sent in this mode. When first powered on, the terminal will remain in the receive mode until a key is depressed on the keyboard.

When switch S3-6 is in the ON position, in this mode the terminal is in full duplex, data may be sent and received at the same time. The terminal will permanently raise the Request to Send (RTS) signal on the EIA interface.

NOTE: When operation in full duplex mode the transmitted data will not be displayed on the screen unless "echoed" back by the host computer or the modem.

Switch S3-7 - EOT/CR Select

When the terminal is operating in BLOCK mode, this switch determines the format to be used when transmitting to the central computer.

If switch S3-7 is set to the OFF position "CR", no start of message character (STX) will be transmitted; a CR (OD 16) will be transmitted at end of message only, and no separator will be transmitted between fields unless explicitly set by a separator escape sequence.

If switch S3-7 is set to the ON position "EOT", the start of message character is indicated by an STX (02 16), with each foreground field on the display delimited by a TAB control character (09 16), and the end of message is indicated by an EOT (04 16).

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4.2 Rear Panel Controls (continued)

Switch S3-8 - Display Mode Select

When this switch is off, the display is set to PAGE mode. In
this mode, the cursor home position is in the upper left corner
of the screen. Successive lines of data are entered and dis-
played below the previous lines until the bottom of the display
is reached. The display then wraps around and enters the data
at the top of the page.

When the switch is in the ON position, the display is in ROLL
mode. In this mode, the cursor home position is in the upper
left corner of the display. Successive lines of data are
entered and displayed below the previous lines until the bottom
line of the display is reached. Entry of additional lines of
data beyond the bottom line causes the display to scroll upward
with the top line lost.
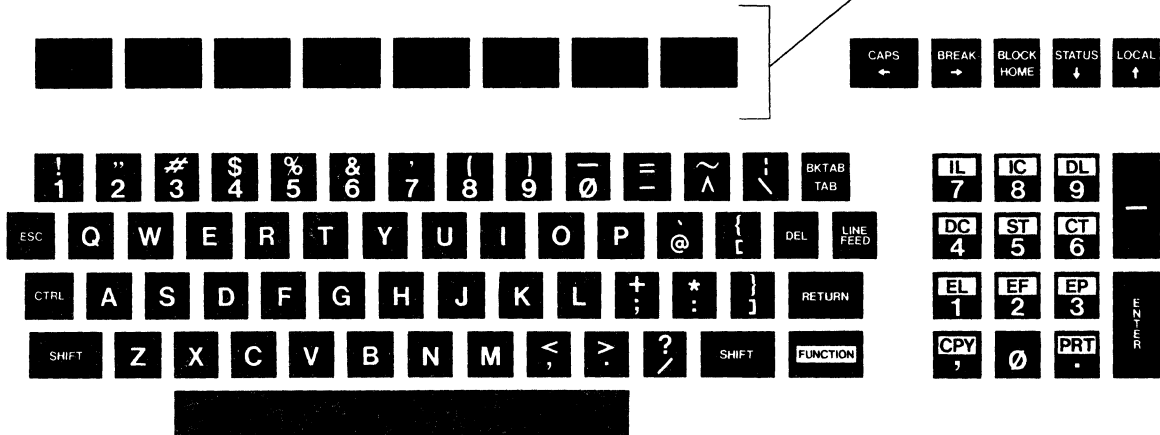
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STANDARD
model 100 (U.S. version)

FIGURE 4.1

IL / 7	- Insert line	
DC / 4	- Delete Character	
EL / 1	- Clear to end of line foreground	
CPY / ,	- Succeeding data received at the printer port	
IC / 8	- Insert character	
ST / 5	- Set columnar tab stop	
EF / 2	-- Erase field	
DL / 9	- Delete line	
CT / 6	- Clear columnar tab stop	
EP / 3	- Clear to end of page	
PRT / .	- The display is printed to a local hard copy	

FIGURE 4.2

STATUS LINE INDICATORS

LINE	Terminal is on-line
LOCAL	Terminal is off-line
CAPS	Shift lock/caps only
COPY	Received data sent to printer
DSR	Data set ready
CD	Carrier detect
CTS	Clear to second send
BLOCK	Block mode
PAGE	Page mode
ROLL	Roll mode
NOVID	Received data is not displayed on the CRT.
PRINT	Terminal is busy printing
KEYLK	Keyboard is disabled

LINE CAPS COPY DSR

Figure 4.3

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S2-1
S2-2
S2-3
S2-4
S2-5
S2-6
S2-7
S2-8

S3-1
S3-2
S3-3
S3-4
S3-5
S3-6
S3-7
S3-8

CONTRAST

CB1

S2   1=ON   S3   1=ON
     0=OFF   0=OFF

EIA/CURRENT LOOP   PRINTER

PWR

COMP/VIDEO

FIGURE 4.4
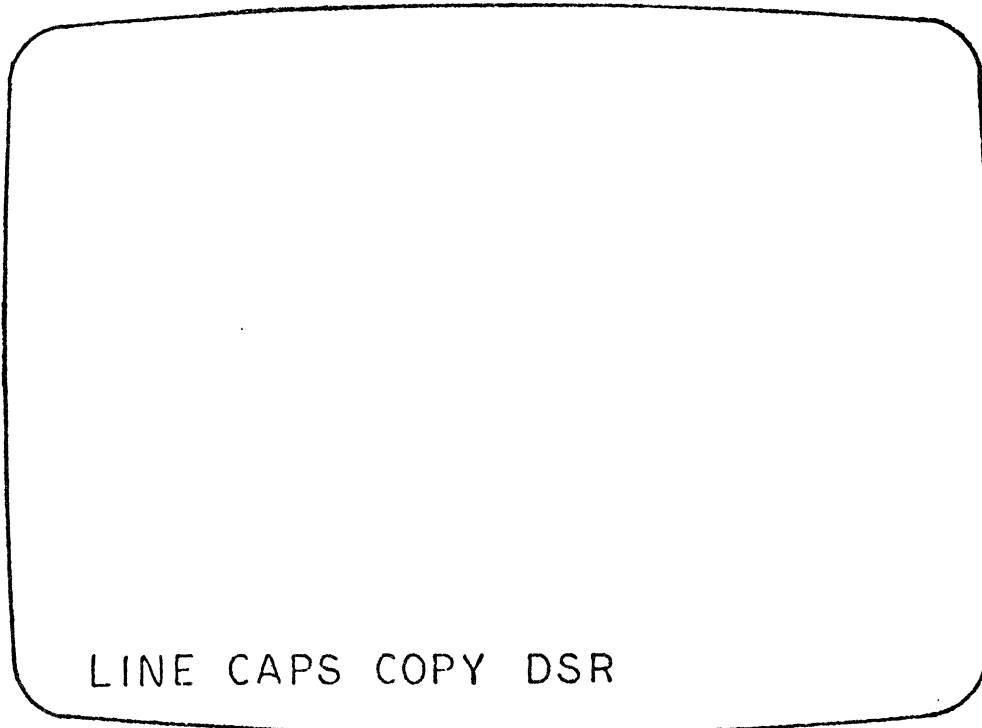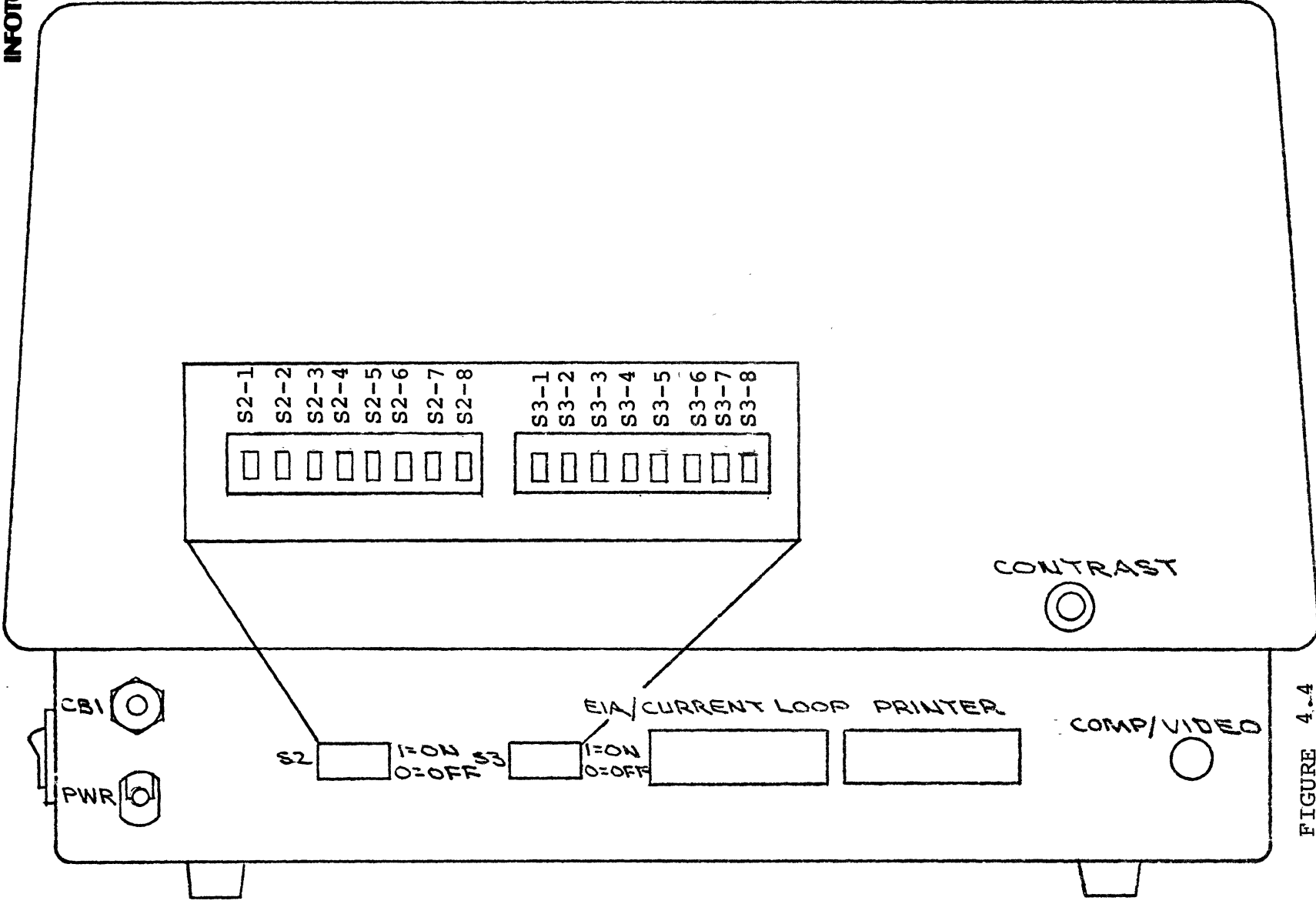
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FIGURE 4.5

MODEL 100 EIA RS-232 SIGNALS AND CONNECTOR PINS

EIA RS-232C Name	CCITT V-24 Name	Description	Printer EIA Pin No.	Modem EIA Pin No.	Comments
BA	103	Data transmitted from terminal	—	2	Logical "1" = OFF = −12V Logical "0" = ON = +12V 300-ohm source impedance.
CA	105	Request to send signal from terminal	—	4	Goes high (+12V) when the terminal is ready to transmit.
CB	106	Clear to send signal to terminal	—	5	Must be high to allow terminal to send is supplied by a modem.
BB	104	Data transmitted to terminal	—	3	Logical "1" = OFF = −5V to −25V Logical "0" = ON = +5V to +25V 6.8K ohm load impedance
CF	109	Carrier present signal to terminal	—	8	Must be high to allow terminal to receive; is supplied by a modem.
CD	108.2	Data terminal ready signal from terminal	—	20	Goes high (+12V) when terminal is on LINE; is low when terminal is in LOCAL mode.
		External clock input at TTL logic level	—	—	For use with RECEIVE RATE selector switch in EXT position.
AB	102	Signal ground	7	7	
CC	107	Data set ready		6	Must be high to allow terminal to operate; is supplied by a modem.
BB	104	Data to printer	3	—	Optional print data
CB	106	Clear to send	5	—	
CC	107	Data set ready	6	—	These signals are connected to the printer's data terminal ready signal.
CF	109	Carrier present	8	—	
CD	108.2	Data terminal ready	20	—	

FIGURE 4.5 (continued)

I-100 CURRENT LOOP PIN POLARITY DESIGNATION

PIN#   FUNCTION

21   OUT + ⎫
                                               ⎬ SENDING
25   OUT - ⎭

18   IN +   ⎫
                                               ⎬ RECEIVING
19   IN -   ⎭

NOTE: Rear panel switches must be set and loop current must be supplied by the host equipment.

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5.0 **TERMINAL PROGRAMMING**

This section describes how the I-100 responds to control codes received over the communications interface. Control codes may be generated directly by the computer which is controlling the terminal or they may be echoed back to the terminal from the keyboard. It is important to note that no control code entered from the terminal keyboard can have any effect unless it is echoed back to the terminal. The terminal only interprets received control codes.

The control codes which the I-100 will decode and respond to are divided into five categories or sets; editing controls, format control, cursor control, line control, and control of special functions. The following paragraphs define how the terminal will respond to each control code.

When reading the following descriptions, the following conventions should be noted. Foreground data refers to data displayed at full intensity. Background data refers to data displayed at reduced intensity. Coding conventions are represented as the decimal column/row of the ASCII Code Chart. The column number is the decimal equivalent of the high order three bits of the seven bit ASCII character, the row number is the decimal equivalent of the low order four bits. See Appendix I for the ASCII Code Chart.

5.1 **Editing Control**

The following control code sequences provide the I-100 edit control features.

Erase Screen (FF) [CTRL] with [L]
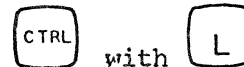
Receipt of this code will cause the entire screen to be erased and the cursor positioned to the proper home position. The cursor home position is the upper left corner of the screen. Coded as 0/12.

Clear To End Of Page (ESC J) [FUNCTION] with [EP]

Receipt of this control code sequence clears all foreground data fields between the present cursor location and the end of the display. The cursor position remains unchanged. Coded as 1/11 4/10.

Clear To End Of Line (ESC K) [FUNCTION] with [EL]

Receipt of this control code sequence clears all foreground data fields between the present cursor location and the end of the current line. The cursor position is unchanged. Coded as 1/11 4/11.

Editing Control   (continued)
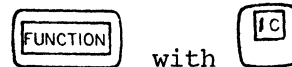
Erase Field   (ESC q)   [FUNCTION]   with   [EF]

The contents of the field in which the cursor is currently
positioned will be erased.   The cursor will be repositioned
to the beginning of the field.   (Block Mode Option required).
Coded as 1/11   7/1.

Insert Character   (ESC @)   [FUNCTION]   with   [IC]

A space will be inserted at the current cursor position.   All
characters from the current cursor position will be shifted
right.   This command will affect all characters from the present
cursor position to the end of the current field.   (Block Mode
Option required).   Coded as 1/11   4/0.

Delete Character   (ESC P)   [FUNCTION]   with   [DC]
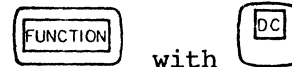
The character at the current cursor position will be deleted.   All
characters to the right of the cursor will be shifted left one
position.   This command affects all characters from the present
cursor position to the end of the current field.   (Block Mode
Option required).   Coded as 1/11   5/0.

Insert Line   (ESC L)   [FUNCTION]   with   [IL]
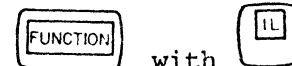
When this control code sequence is received the terminal will insert a
blank line following the line on which the cursor is presently
positioned and position the cursor at the beginning of the blank
line.   Coded as 1/11   4/12.

Delete Line   (ESC M)   [FUNCTION]   with   [DL]

When this control code sequence is received, the line on which
the cursor is currently positioned is deleted and the cursor is
positioned at the beginning of the next line.   Coded as 1/11   4/13.

Set Non-Destructive Space Advance (ESC Z)   [ESC] then   [SHIFT]   with   [Z]

When this control code sequence is received, the terminal is
set to non-destructive space advance mode.   This mode allows the
space bar to be used to move the cursor over data without alter-
ing the data after the return key is depressed.

When this mode is enabled, the line feed character becomes the
normal line terminator.   If every line is terminated by a line
feed, the space bar will operate destructively, ie. a blank will
replace the previous character at the cursor position.   If a line
is terminated by a carriage return, the cursor is returned to the

5.1 Editing Control (continued)

beginning of the current line and the space bar is made non-destructive allowing it to be used to space over data. Coded as 1/11 5/10.

Reset Non-Destructive Space Advance (ESC Y)   [ESC] then [SHIFT] with [Y]

Receipt of this control code sequence disables non-destructive space advance mode. Coded as 1/11 5/9.

5.2 Format Control

The following control code sequences provide for the format and presentation of data.

Horizontal Tab   (HT)   [TAB]

If tab stops have been set, receipt of this control code will cause the cursor to advance to the next tab stop of the next foreground field,whichever comes first. If no tab stops have been set, the code is inoperative. Coded as 0/9.

Set Foreground   (ESC 3)   [ESC] then [3]

Receipt of this code sequence causes succeeding characters to be displayed at full intensity. This is the default display mode when power is first applied to the terminal. Coded as 1/11 3/3.

Set Background   (ESC 4)   [ESC] then [4]

Receipt of this code sequence causes succeeding characters to be displayed at low intensity. Coded as 1/11 3/4.

Set Columnar Tab Stop   (ESC 1)   [FUNCTION] with [ST]

Receipt of this code sequence causes the current column location of the cursor to be marked as a tab stop. Coded as 1/11 3/11.

Clear Columnar Tab Stop   (ESC 2)   [FUNCTION] with [CT]

If a tab stop has been marked in the current column location, it will be cleared. Coded as 1/11 3/2.

Clear all Columnar Tab Stops (ESC g)   [ESC] then [G]

Receipt of this sequence clears all previously set columnar tabs. Coded as 1/11 6/7.

5.2 Format Control (continued)

Backward Tab   (ESC z)   SHIFT with BKTAB

If tab stops have been set, receipt of this control code will
cause the cursor to be positioned at the start of the previous
tab stop or at the start of the previous foreground field, which-
ever comes first. If no tab stops have been set, the code is
inoperative. Coded as 1/11   7/10.

Set Normal Video   (ESC a)   ESC with a

Receipt of this control code sequence will place the entire
display in normal video mode with characters formed by light
dots on a dark background. Coded as 1/11   6/1.

Set Reverse Video   (ESC b)   ESC then b

Receipt of this control code sequence will place the entire
display in reverse video mode with characters formed by dark
dots on a light background. Coded as 1/11   6/2.

Clear All Columnar Tab Stops   (ESC g)   ESC then G

Receipt of this code sequence will clear all tab stops currently
set. Coded as 1/11   6/7.

5.3 Cursor Control

The following control code sequences provide for the positioning
of the cursor on the display.

Back Space   (BS)   CTRL with H

This control will cause the cursor to move one space to the
left non-destructively. If the ANL switch is set (see Section 3.2)
and the cursor is in the first column of the line, the cursor will
be placed in the 80th column of the previous line. This may cause
the cursor to wrap to the bottom line from the top line if the
display is in PAGE mode. Coded as 0/8.

Line Feed   (LF)   LINE FEED

This control code causes the cursor to move down one line. If the
cursor is on the bottom line and the display is in ROLL mode, the
display will scroll. If the display is in PAGE mode, the cursor
will wrap around to the top line. Coded as 0/10.

5.3 Cursor Control (continued)

Carriage Return   (CR)

Receipt of this control code causes the cursor to move to the beginning of the present line. Coded as 0/13.

Move Cursor Up   (ESC A)

This control code causes the cursor to move up one line. If the top of the display is the current line, the cursor wraps around to the bottom line. Coded as 1/11 4/1.

Move Cursor Down   (ESC B)

This control code causes the cursor to move down one line from its current position. If the current line is the bottom line, the cursor is positioned on the top line. Coded as 1/11 4/2.

Move Cursor Right   (ESC C)

Receipt of this control code sequence causes the cursor to move one character position to the right. If the cursor was located in column 80, the cursor is positioned at column 1 of the next line. Coded as 1/11 4/3.

Move Cursor Left   (ESC D)

This control code causes the cursor to move one character position left. If the current position of the cursor is column 1, the cursor is positioned at column 80 of the previous line. Coded as 1/11 4/4.

Home Cursor (ESC H)

Receipt of this control code sequence positions the cursor to the proper home position for the currently active display mode. For both PAGE and ROLL mode, this is the top left corner of the display. Coded as 1/11 4/8.

Read Cursor Position   (ESC r)
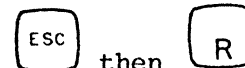
Receipt of this control code sequence causes the I-100 to return the column and the line (x and y) coordinates of the cursor to the central computer, i.e. if the cursor is positioned on column 20 line 2, the terminal will transmit ESC E 4 ". Where the ASCII character "4" represents the X (column) coordinate 20, and ASCII quotation mark character represents the Y (line number) coordinate 2. See Table 5.1 for a quick character representation reference of the coordinate values.

5.3   Cursor Control (continued)

Absolute Cursor Addressing   (ESC f)   ESC then F   *small f*
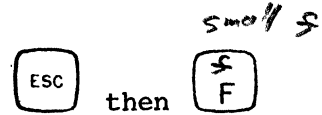
When the I-100 receives this control code sequence,
it interprets the following two characters as the new column
and line address (x and y) coordinates which are used
to position the cursor. Coded as 1/11 6/6.

The first character received is interpreted as the new
column address. Tabel 5.1 show the characters which
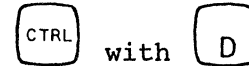correspond to the column addresses for the display.

The second character received is used to determine the
new cursor line address. Only the bottom five bits are
used. Table 5.1 also shows the characters which
correspond to the line number of the display.

5.4   Line Control

End of Text   (EXT)   CTRL with C
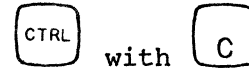
End of Transmission   (EOT)   CTRL with D

The action which the I-100 takes upon receipt of these codes depends
upon the setting of the rear panel switches. (See Section 4.2).
If the terminal is operating in half duplex mode and the switch
settings define one of these codes as a line turn-around control
code, the direction of data flow is changed from its current state.
Coded as 0/3 (EXT) and 0/4 (EOT).

5.5   Special Features Control

The following control codes allow the special features of the I-100
to be used under program control.

Sound Alarm   (BEL)   CTRL with G
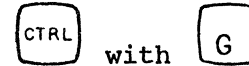
Receipt of this control code activates an audible alarm. Coded
as 0/7.

5.5   Special Features Control (continued)

Set Graphic Mode   (SO)   [CTRL] with [N]

Receipt of this control code enables graphic mode causing the
terminal to interpret successive control codes from columns
one and two of the ASCII code table as graphic characters.
Table 5.2 shows the graphic characters which correspond to each
of the 32 defined control codes.   Coded as 0/14.

Set Normal Mode   (SI)   [CTRL] with [O]

Receipt of this control codes disables graphic mode causing
the following codes to be displayed as normal ASCII characters.
In this mode, control codes are not displayed.   Coded as 0/15.

Print Locally   (ESC O)   [FUNCTION] with [PRT]

Receipt of this control code sequence causes the entire contents
of the display to be printed to a local hard copy device attached
to the auxiliary interface.   The depression of the FUNCTION and
PRT keys causes the display to be printed locally with no escape
sequence transmitted.   Coded as 1/11 4/15.

Lock Keyboard   (ESC h)   [ESC] then [H]

This control code will lock the terminal keyboard and prevent
the user from entering data.   Coded as 1/11 6/8.

Unlock Keyboard   (ESC 1)   [ESC] then [L]

This control code will unlock the terminal keyboard and permit
normal entry of data.   The function is only operational when the
terminal is on-line.   It is inoperative in local mode.   Coded as
1/11 3/1

Printer on   (DC1)   [FUNCTION] with [CPY]

This code causes the terminal to send the succeeding data received
to the printer port.   In this mode, all data is printed as it is
received.   Coded as 1/3.

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Printer Off (DC3)   [FUNCTION] with [CPY]

This control code resets print copy only so data will now go to
the screen.   Ceded as 1/1.

Video Off (ESC N)   [ESC] then [SHIFT] with [N]

This control code causes all data to be routed to only the printer
port if the printer is on (DC1). No data will go to the screen.
For operation of the CPY key, see section 5.1.2. Coded as
1/11 4/14.

Video On (ESC n)   [ESC] then [N]
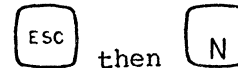
This control code resets video operation so data will be routed to
the screen. Coded as 1/11 6/14.

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TABLE 5.3

ANCII CODE CHART

Bits				COLUMN / ROW	0 (000) CHR()	1 (001) CHR()	2 (010) CHR()	3 (011) CHR()	4 (100) (CHR)	5 (101) CHR	6 (110) CHR	7 (111) CHR
b4	b3	b2	b1									
0	0	0	0	0	0 NUL	16 DLE	32 SP	48 0	64 @	80 P	96 `	112 p
0	0	0	1	1	1 SOH	17 DC1	33 !	49 1	65 A	Q	a	q
0	0	1	0	2	2 STX	18 DC2	34 "	50 2	B	R	b	r
0	0	1	1	3	3 ETX	19 DC3	35 #	51 3	C	S	c	115 s
0	1	0	0	4	4 EOT	20 DC4	36 $	52 4	D	T	100 d	t
0	1	0	1	5	5 ENQ	21 NAK	37 %	53 5	E	85 U	e	u
0	1	1	0	6	6 ACK	22 SYN	38 &	54 6	70 F	V	f	v
0	1	1	1	7	7 BEL	23 ETB	39 '	55 7	G	W	g	w
1	0	0	0	8	8 BS	24 CAN	40 (	56 8	H	X	h	120 x
1	0	0	1	9	9 HT TAB	25 EM	41)	57 9	I	Y	105 i	y
1	0	1	0	10	10 LF	26 SUB	42 *	58 :	J	90 Z	j	z
1	0	1	1	11	11 VT	27 ESC	43 +	59 ;	75 K	[	k	{
1	1	0	0	12	12 FF	28 FS	44 ,	60 <	L	\	l	¦
1	1	0	1	13	13 CR	29 GS	45 -	61 =	M	]	m	125 }
1	1	1	0	14	14 SO	30 RS	46 .	62 >	N	^	110 n	~
1	1	1	1	15	15 SI	31 US	47 /	63 ?	79 O	95 __	111 o	127 DEL

will work in LOCAL MODE?

* Set terminal in lower case
"esc" then "f" (small "f") then X then Y
ASCII card   ASCII card

TABLE 5.1

ABSOLUTE CURSOR POSITIONING

INFOTON

CURSOR X or Y	ASCII CODE	HEX.	CURSOR X or Y	ASCII CODE	HEX.	CURSOR X or Y	ASCII CODE	HEX.
1	SPACE	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	29	53	T	54	80	o	6F
27	:	3A	54	U	55			

NOTE: Transmit X, then Y.

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? CHR(14) ; CHR(64) = —

? CHR(15)

TABLE 5.2

INFOTON

GRAPHIC CONTROL CODES

HEX	ASCII CHARACTER	SYMBOL	GRAPHIC
00	Space, @, \	NULL	—
01	!, A or a	SOH	│
02	", B, b	STX	┼
03	#, C, c	ETX	┴
04	$, D, d	EOT	┬
05	%, E, e	ENQ	└
06	&, F, f	ACK	┌
07	', G, g	BEL	┐
08	(, H, h	BS	┘
09	), I, i	HT	├
0A	*, J, j	LF	┤
0B	+, K, k	VT	═
0C	;, L, l	FF	¥
0D	-, M, m	CR	╪
0E	., N, n	SO	┷
0F	/, O, o	SI	┯
10	Ø, P, p	DLE	└
11	1, Q, q	DC1	┌
12	2, R, r	DC2	┐
13	3, S, s	DC3	┘
14	4, T, t	DC4	├
15	5, U, u	NAK	┤
16	6, V, v	SYN	¢

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TABLE 5.2 (Continued)

INFOTON

HEX	ASCII CHARACTER	SYMBOL	GRAPHIC
17	7, W, w	ETB	£
18	8, X, x	CAN	÷
19	9, Y, y	EM	>
1A	:, Z, z	SUB	<
1B	;, [, {	ESC	→
1C	<, \, |	FS	←
1D	=,], }	GS	↑
1E	>, ↑, ~	RS	↓
1F	?, ←, RO	US	