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Hazeltine 1000

Video Display
Terminal



**Operating
Manual**

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Operating Manual

Hazeltine 1000

Video Display Terminal

The Hazeltine 1000 Video Display Terminal is a product of advanced engineering technology which offers quiet, reliable, and economical operation.

Speed, silence, and flexibility, coupled with the operator-oriented features of the Hazeltine 1000 can serve to improve the efficiency of both software and programmer in data input/output operations.

This manual will familiarize you with the Hazeltine 1000, its operation and features. Should you need additional technical assistance, please contact your Hazeltine Representative.

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INSTALLATION

A. SET-UP AND CONNECTIONS

Following unpacking, place unit to allow free air circulation around base and top. Connect cables securely, insuring that they are free of kinks or tight bends, as follows:

1. Data Set or Acoustical Coupler

The standard connector extending from the rear of the display unit should be plugged into the appropriate data set or coupler connector. Check terminal model number to insure that baud rates of terminal and modem are compatible. See Appendix III for description of Model Numbering System and baud rate identification.

2. Power Cord

The power cord should be plugged into a grounded power outlet. Do not use adapters which would prevent the display unit from being properly grounded.

3. Cleaning

Dirt and smudges can be removed from the cabinet and keys with only recommended solvents or cleaners such as Isopropyl Alcohol or mild detergent solution. The faceplate which may be removed for cleaning by lifting straight up, should be cleaned only with a soft, damp cloth or tissue to avoid scratching.

B. TURN-ON AND WARM-UP

A display unit brought in from a significantly colder environment should be allowed to sit out of the box for at least one hour prior to turn-on.

1. Turn-On

Set the power ON/OFF rocker switch (figure 1) on the right front side of the unit to ON by depressing to the right. When power is on, the POWER ON indicator on the faceplate will be lighted. Whenever power is turned off, allow a minimum of 3 seconds before power is turned back on.

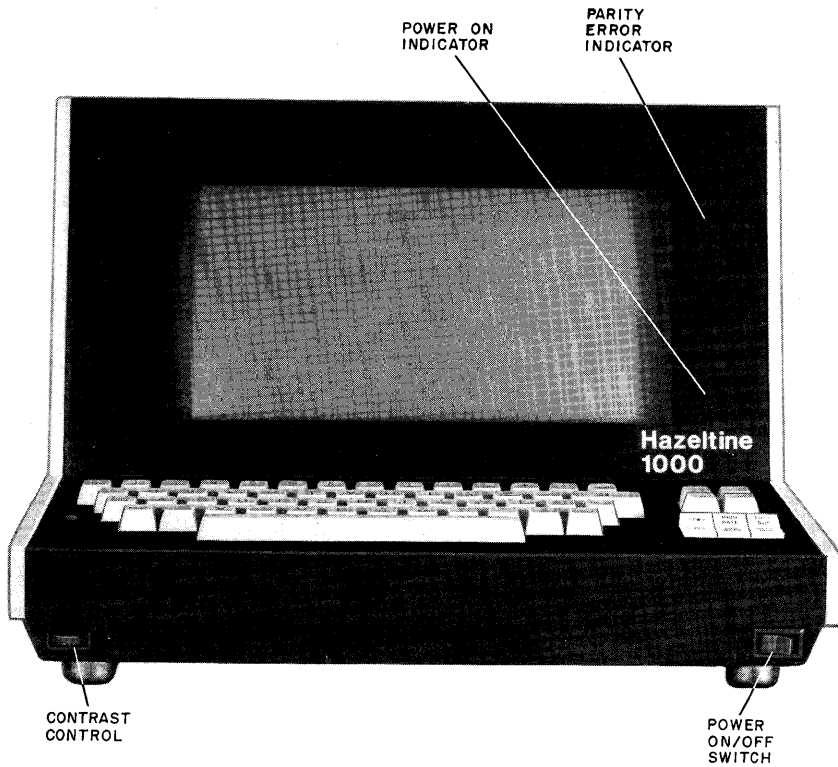


Figure 1. Hazeltine 1000 - Front View

2. Warm-Up

Allow 30 seconds for display warm-up. At the end of this period, the screen will be clear and the cursor will be at the HOME position (the upper left hand corner of the screen).

- a. If the POWER-ON indicator does not light when the power switch is turned on, check to see if the cooling fan inside the display unit is in operation. This can be done by listening for the fan motor or feeling air movement near the grill at the rear of the display.

If the fan is not operating, turn the power switch off and check the 2A fuse at the rear of the display. If the fuse is burned out, contact your Hazeltine Representative for a replacement.

If the fan is operating, a fuse internal to the unit's power supply may be defective. Turn the power switch off and contact your Hazeltine Representative.

- b. If the cursor does not appear after the display CRT has warmed for a reasonable period of time (no more than 3 minutes), depress the RESET and then the CLEAR keys. This will bring the cursor to the "home" position in the upper left corner of the display. If the cursor does not appear and if the entire screen is blank, it is possible that the CONTRAST at the left front of the terminal control is not adjusted properly. To make the adjustment, set the CONTRAST control completely to the left. If the cursor still does not appear, turn the power switch off and contact your Hazeltine Representative.
- c. If the Hazeltine 1000 is used infrequently throughout the day, it is recommended that power be left on rather than continuously turning the unit off and on.

INDICATORS AND CONTROLS

I. KEYBOARD

A. KEYS

The keys described in this section are illustrated in figure 2.

1. CLEAR Key

The CLEAR key clears the screen and places the cursor at the home position. It also causes the transmission of the FF (ASCII) Control code from the terminal.

2. Control (CTRL) Key

The control key is used in conjunction with other character keys to generate non-printing characters for a number of reasons including security, function codes, etc. When CTRL is used it should be depressed and held while the other required character key is depressed. CTRL sends special codes by altering the code pattern of the other key used with it.

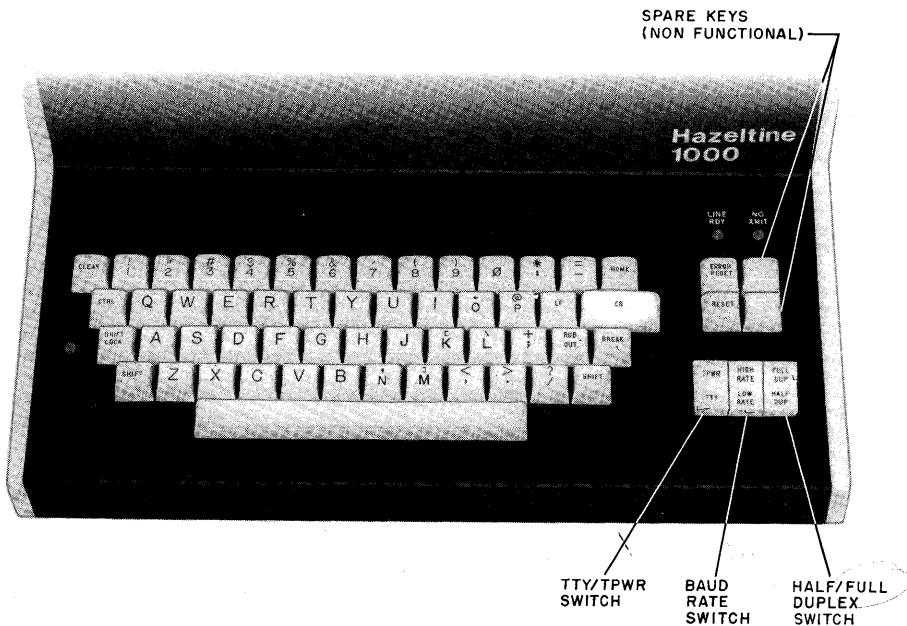


Figure 2. Keyboard (Standard)

3. Line Feed (LF) Key

The LF key causes the line feed character to be transmitted and causes the cursor to move down one line. If the cursor is on the last line, a one line ROLL-UP will occur. The display content is not altered by LF except for the line loss if ROLL-UP occurs.

4. Carriage Return (CR) Key

The CR key moves the cursor to the beginning of the same line without altering the display content and causes the CR code to be transmitted.

5. RUBOUT Key

The RUBOUT key causes a character of all "one" bits to be sent out. Usually rubouts are used as "filler" characters when program execution delays are required.

6. HOME Key

The HOME key moves the cursor immediately to the home position (first character position in the top line). In addition, the HOME key causes the transmission of the VT (ASCII) control code from the terminal.

7. SPACE BAR

The SPACE BAR advances the cursor one position to the right without altering the display content, and causes the SP (ASCII) code to be transmitted.

8. BREAK Key

Equivalent to the corresponding button on a conventional Teletypewriter terminal. This button causes a break signal to be transmitted to the computer. If the computer is transmitting to the Hazeltine 1000 the break signal requests the computer to cease transmitting and prepare to receive a transmission from the Hazeltine 1000.

9. RESET Key

Interrupts and resets all internal functions while depressed. The interrupted functions include synchronization and display refresh, and as a result, the display goes completely blank when the RESET key is pressed and then reappears when released.

10. SHIFT LOCK Key

When the TTY/TPWR switch is in the TTY position, this key is non-functional. When in the TPWR position depressing this key causes the SHIFT function to become locked and is indicated by the SHIFT LOCK indicator illuminating. Depressing the SHIFT key releases the SHIFT LOCK condition and extinguishes the indicators.

11. ERROR RESET Key

Is used to reset (extinguish) the PARITY ERROR indicator on the faceplate.

12. Blank Keys

Unmarked keys are provided for options and are inoperative if options are not installed.

B. STANDARD SWITCHES

1. Baud Rate Switch

Has positions marked HIGH and LOW for the selection of either of two baud rates as identified by the model number on the nameplate on the rear of the machine. (See Appendix III for Model Number/baud rate identification.)

2. HALF/FULL DUPLEX Switch

Selects HALF or FULL Duplex operation. In the HALF position, keyboard entries are transmitted and presented on the screen. All received data is displayed on the screen.

In the FULL position, keyboard entries are transmitted but not presented on the screen. Only received data is presented on the screen.

3. TTY/TPWR Switch

Used when the lower case option is specified. Allows selection of either of two types of keyboard operation and display. In the TTY position, the keyboard emulates a teletypewriter keyboard and only produces upper case A/N characters and symbols. The SHIFT LOCK key is inoperative in this mode. In the TPWR position, the keyboard emulates a typewriter keyboard and produces lower case characters unless the SHIFT is depressed in which case upper case characters are produced. The SHIFT LOCK is only operative in this mode

and when depressed causes the SHIFT function to become locked and the light next to the SHIFT LOCK key to illuminate indicating the 'LOCK' condition. Depressing the SHIFT key while in SHIFT LOCK releases the 'LOCK' condition. When lower case option is not specified, this switch is required to be in the TTY position.

C. OPTIONAL SWITCHES

1. ON LINE/OFF LINE Switch

Used when the Export Option is specified in conjunction with the 'READY' indicator. Normal position is OFF LINE. After dialup into a communication system via a modem, this switch is positioned to the ON LINE position which causes the READY indicator to illuminate if modem is ready.

D. INDICATORS

1. SHIFT LOCK Indicator

Used only when the TTY/TYPEWRITER (lower case) option has been specified. Illuminates when in the typewriter mode and in the SHIFT LOCKED condition.

2. READY Indicator

When the H1000 is connected to a modem, this indicator illuminates whenever the Dataset Ready function is on.

3. NO XMIT Indicator

Used in conjunction with medium speed, half duplex modems (202 option). Indicates the status of Request-to-Send and illuminates when no transmission should occur, i. e. - Request-to-Send OFF. When illuminated, modem is not conditioned to transmit and operator should not attempt keyboard entries.

II. FACEPLATE INDICATORS

A. POWER ON

Illuminates when POWER switch is set to ON position and power supply is energized.

B. PARITY ERROR

Illuminates whenever a character is received with incorrect parity as selected by the PARITY SELECT switch (on rear panel). Remains illuminated until manually reset by PARITY RESET key. (The character in error is displayed as a question mark and thus can readily be identified.)

III. REAR PANEL

A. PARITY SELECT SWITCH

The rear panel of the Hazeltine 1000 is shown in figure 3. The PARITY SELECT switch selects ODD, EVEN, or NO parity. Operates for both transmitted and received characters.

B. AUXILIARY EIA OUTPUT (Optional)

Present only when the auxiliary EIA option is specified. Allows system expansion through connection of an auxiliary EIA compatible equipment such as another terminal or an on-line printer.

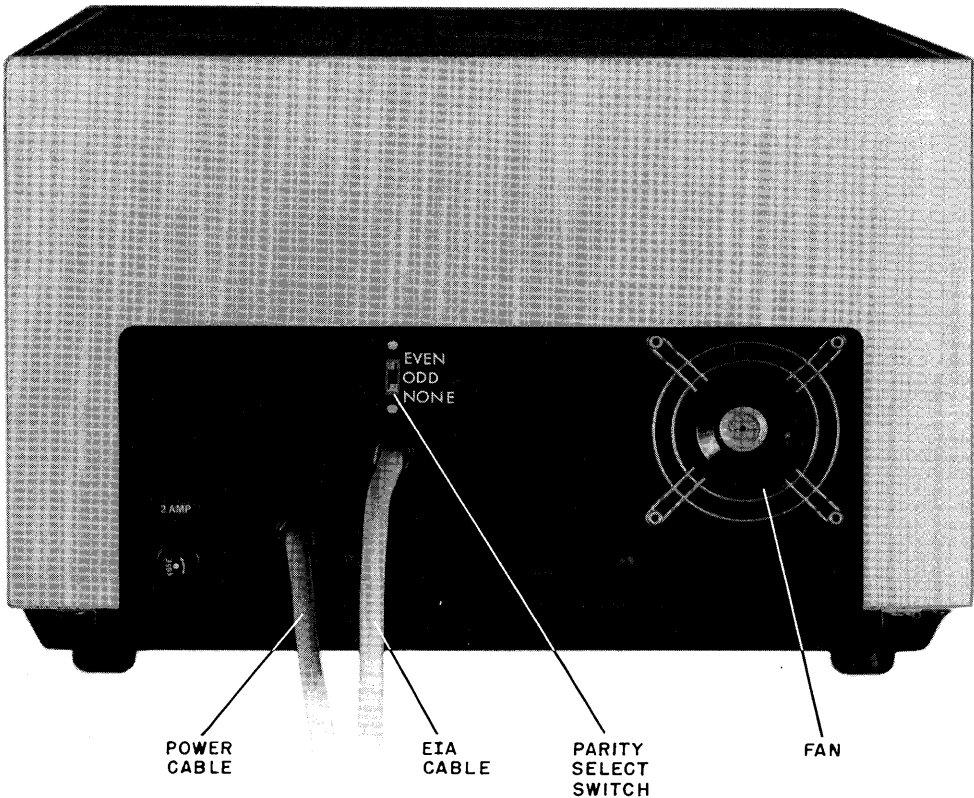


Figure 3. Rear Panel

OPERATION

A. INTRODUCTION

The basic mode of operation for the Hazeltine 1000 Video Display Terminal is character by character (switch setting at HALF or FULL DUPLEX).

When the unit is operating in either HALF or FULL duplex mode, data which is keyed in is sent directly to the computer. Each line must be terminated with a carriage return (CR) and a line feed (LF) and any editing or correction that takes place becomes a function of the computer program under which you are operating. Most time shared software recognizes special characters and have special subroutines for backspacing and, in some cases, line and character replacement.

B. OPERATION IN FULL DUPLEX

In this mode, data entered from the keyboard is sent directly to the remote computer system. Normally, upon reaching the computer, the data is "echoed" back to the Hazeltine 1000 screen. The keyboard entered data is not displayed. Only data received from an external source is displayed.

C. OPERATION IN HALF DUPLEX

In this mode, data entered from the keyboard is sent directly to the computer system and also displayed on the screen via an internal connection. "Echoing", as in full duplex, is not required and if used, would likely cause each character transmitted to be displayed twice.

REMOTE FUNCTIONS

The Hazeltine 1000 terminal has four functions that can be used through a unique combination of ASCII characters which can easily be made a part of your remote computer programs.

The following is a listing of the functions, command codes, and key strokes required:

Function	Key Stroke	ASCII Equivalent
1. Home Cursor	c _K	VT
2. Clear Screen	c _L	FF
3. Carriage Return	c _M	CR
4. Line Feed	c _J	LF

^cDepress the Control (CTRL) Key while striking the character.

APPENDIX I. TECHNICAL SUMMARY

A. DISPLAY

MEMORY	Solid State - Shift Register type with constant refresh.
SCREEN CHARACTER CAPACITY	960 characters, 80 characters per line, 12 lines total
CHARACTER STRUCTURE	5 x 7 dot matrix (5 x 9 matrix used for lower case option)
RASTER	Standard Raster - 264 lines 60 frames/sec. Optional Raster - 317 lines 50 frames/sec.
CHARACTER REPERTOIRE	64 ASCII alpha-numeric charac- ters (95 with lower-case option) 33 ASCII control codes
CHARACTER SIZE	Nominal height - 1/8 inch Nominal width - 3/32 inch
REFRESH RATE	60 fields/second

B. COMMUNICATION INTERFACE

DATA TRANSMISSION RATES	Keyboard switch controlled for selection of HIGH rate or LOW rate from among following available* rates: 110, 150, 200, 300, 600, 900, 1200, 1800, 2400, 4800, 9600 (* 900 and 1800 baud are not available if either 110 or 200 baud are selected and vice versa.)
DATA INTERFACE	EIA RS-232/C compatible with (a) Bell 103A type dataset (b) Bell 202C type dataset (optional) 16x baud rate clock (buffered TTL level) also provided at interface.

Dataset cable 10 feet (3.048 meters) long and fixed to the terminal.

EIA AUXILIARY INTERFACE
(OPTIONAL)

Optional DS-25S connector at rear panel for use with add on EIA compatible equipments such as another terminal or an On-Line Printer.

C. POWER

200 watts, 115 VAC 60 Hz (220 VAC 50 Hz optional) Single phase fused line protection.

Line voltage selection:

Low: 90/180 - 110/220 VAC

Medium: 104/208 - 126/250 VAC

High: 114/224 - 136/272 VAC

Power Supply Protection -
Overvoltage, short circuit, over temperature

D. KEYBOARD

Teletypewriter key format for alpha- numerics plus switch cluster for operational mode selection.

Other indicators are present when the appropriate option has been specified as follows:

<u>Indicator</u>	<u>Option</u>	<u>Function</u>
Shift Lock	Lower Case (typewriter)	Indicates locked SHIFT key
Line Ready	Export Unit	Dataset Ready ON
No Xmit	202C	Request to Send Low

E. CONTROLS AND INDICATORS

INDICATORS - FACEPLATE

(a) POWER ON - Power supply energized.

(b) PARITY ERROR - Received character parity incorrect.

INDICATORS - KEYBOARD

(a) SHIFT LOCK - Located next to SHIFT LOCK key. Indicates locked SHIFT condition.

(b) LINE READY - Located above PARITY RESET key. Indicates presence of DATASET READY function when connected to modem.

(c) NO XMIT - Located above upper spare key. Indicates improper transmit conditions.

CONTROLS - FRONT PANEL

- (a) CONTRAST Control - Thumb-wheel type contrast adjustment.
- (b) POWER ON/OFF Switch - Controls primary power to terminal.

CONTROLS - REAR PANEL

- (a) Parity Select Switch - 3 position switch for the selection of transmitted and received parity. Can select ODD, EVEN, or NONE.
- (b) End of Message Character Select switch (provided only with 202C option) - Allows selection of either of two preselected characters to be used to signify end of message.

F. PARITY

Generation and checking switch selectable for ODD, EVEN, or NONE (parity bit always a "one").

Character received with parity error displayed as a question mark and illuminates PARITY ERROR indicator. Indicator extinguished manually by depressing PARITY RESET key.

G. ENVIRONMENTAL

- 1. Temperature 10° to 40° C
- 2. Humidity 90% Relative Humidity - non-condensing

PHYSICAL CHARACTERISTICS (nominal)

- 1. Dimensions 11.5 in. (29.21 cm)H; 15 in. (38.1 cm)W; 20 in. (50.8 cm)L
- 2. Weight 38 lbs. (17.4 kg)
- 3. Electrical Cable/Connector Interfaces:

- (a) Display to Dataset 10 feet (3.05 meters) cable from Display terminated with DB25-P connector.

- | | |
|---------------------------------|---|
| (b) Auxiliary EIA
(optional) | DB25-S connector on rear panel for operating auxiliary EIA compatible equipments. |
| (c) Display to Power
Source | 7 feet (2.13 meters) cable, 3 wire, fixed to terminal with 3 wire plug. |

H. OPTIONS

The following are available as no-cost options.

Selection of any two baud rates available to be selected by the HI/LO BAUD RATE switch.

The following are available as extra-cost options.

- | | |
|--|--|
| (a) Lower Case
Characters Displayed | Dual utilization of keyboard and display. Switch controlled. TTY position is normal teletypewriter mode and uses upper case characters only. TPWR position converts keyboard to emulate typewriter utilizing upper and lower case in conjunction with SHIFT key. |
| (b) Auxiliary EIA I/O | Provides an additional EIA connector to allow operation of an additional EIA compatible equipment. |
| (c) 202C Communications
Interface | Provides WE 202C dataset compatibility with various line turnaround techniques. |
| (d) Answerback | Provides a programmable character format - up to 16 characters. |
| (e) Export Unit | For operation at 230 VAC 50 Hz. |

APPENDIX II. CHARACTER CODE CHART

<div style="display: flex; justify-content: space-between; align-items: center;"> b7 b6 b5 b4 b3 b2 b1 </div>					
Bits	b4	b3	b2	b1	COLUMN ROW 1
0	0	0	0	0	0
0	0	0	1	1	1
0	0	1	0	2	2
0	0	1	1	3	3
0	1	0	0	4	4
0	1	0	1	5	5
0	1	1	0	6	6
0	1	1	1	7	7
1	0	0	0	8	8
1	0	0	1	9	9
1	0	1	0	10	10
1	0	1	1	11	11
1	1	0	0	12	12
1	1	0	1	13	13
1	1	1	0	14	14
1	1	1	1	15	15
CONTROL + COLUMN					
SHIFT + COLUMN					
CONTROL + SHIFT + COLUMN					

CONTROL	
0 0	0 0
0	1
NUL	DLE
SOH	DC1
STX	DC2
ETX	DC3
EOT	DC4
ENQ	NAK
ACK	SYN
BEL	ETB
BS	CAN
HT	EM
LF	SUB
HOME	ESC
CLEAR	FS
CR	GS
SO	RS
SI	US
4	5
5	4

DISPLAYABLE CHARACTERS					
0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
2	3	4	5	6	7
SP	0	@	P	\	p
!	1	A	Q	a	q
"	2	B	R	b	r
#	3	C	S	c	s
\$	4	D	T	d	t
%	5	E	U	e	u
&	6	F	V	f	v
'	7	G	W	g	w
(8	H	X	h	x
)	9	I	Y	i	y
*	:	J	Z	j	z
+	;	K	[k	{
,	<	L	\	l	!
-	=	M]	m	}
.	>	N	+	n	~
/	?	O	+	o	≡
3	2	5	4	2	3
3	2	5	4	3	2

Key Stroke

c_L
c_K
c_J
c_M

ASCII Symbol

FF
VT
LF
CR

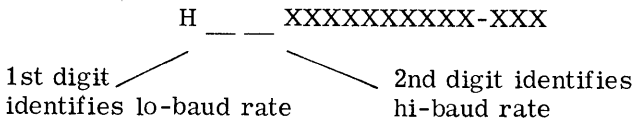
1000-Function

CLEAR SCREEN
HOME CURSOR
LINE FEED
CARRIAGE RETURN

APPENDIX III - BAUD RATE IDENTIFICATION

The baud rates selected by the BAUD RATE switch on the keyboard are installed at time of manufacture and are identified by the Model Number appearing on the Hazeltine nameplate affixed to the rear of the terminal.

The model number is a 16 digit number preceded by the letter H. The first two digits following the H specify the installed baud rates according to the following chart.



Digit Coding for Baud Rates

<u>Digit</u>	<u>Baud Rate</u>
1	110
2	150
3	200
4	300
5	600
6	900
7	1200
8	1800
9	2400
A	4800
B	9600

Example: For lo-rate = 110 and hi-rate = 300
Model No. = H14XXXXXXXXXX-XXX

Hazeltine and the Pursuit of Excellence



Hazeltine

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