

SERIES 60

**BASIC
UNIVERSAL
TERMINAL**

SPECIFICATION

ADI

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1.0 OPERATIONAL CHARACTERISTICS

1.1 Basic Description

The Basic Universal Terminal is a microprocessor-controlled, raster-scan CRT controller. Advanced design techniques have been coupled with modern LSI components to yield an extremely flexible and reliable product, ideally suited to diversified applications. Customer needs are easily met through the use of designed-in hardware and software options. Logic components are mounted on two plug-in printed circuit boards. These boards, plus a power supply regulator board, comprise a basic three-card set which is packaged in a rugged rectangular metal case. A printed-circuit backplane within the case interconnects the boards through a logic bus structure, while also providing expansion capability for additional, optional plug-in logic boards.

1.2 Functional Operation

The terminal operates in the same manner as a KSR Teletype terminal. As the operator strikes each key, its ASCII character code is sent to the modem or host computer as a start/stop synchronized serial character at the specified BAUD rate.

If the terminal is set for full-duplex, the host device echoes back the character (or an error or textual message) to the terminal's memory, whereupon it is displayed on the screen. Alternately, received control codes are executed by the terminal. This is the more common mode of operation. If the host device is not programmed for echo-back, the terminal may be set for half-duplex, whereupon the character is acted upon by the terminal as well as being transmitted.

In either case, incoming data are stored and the cursor positioned under control of the microprocessor. Characters enter at the cursor position. The cursor automatically advances after each character entry. Each entry overwrites the character previously displayed at that position; no other data on the screen are affected. Advance of the cursor past the end of a line automatically advances it to the beginning of the next line.

The ASCII table for displayable characters and control characters for I/O communication is shown in figure 1.1.

1.3 Commands

Control codes and their equivalent ASCII assignments are discussed in section 4.0.

All cursor commands and the screen erase command apply to the basic configuration. Mode, accent, edit, block send and support commands apply only if the appropriate options have been installed.

USA STANDARD CODE FOR INFORMATION INTERCHANGE (USACII)

Bits					0	0	0	0	1	1	1	1
b6					0	0	0	0	1	1	1	1
b5					0	0	1	1	0	0	1	1
b4					0	1	0	1	0	1	0	1
b3	b2	b1	b0	Column Row	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10(A)	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11(B)	VT	ESC	+	;	K	[	k	{
1	1	0	0	12(C)	FF	FS	,	<	L	\	l	|
1	1	0	1	13(D)	CR	GS	-	=	M	]	m	}
1	1	1	0	14(E)	SO	RS	.	>	N	^	n	~
1	1	1	1	15(F)	SI	US	/	?	O	_	o	≡

NUL	Null	LF	Line Feed	SYN	Synchronous Idle
SOH	Start of Heading	VT	Vertical Tabulation	ETB	End of Transmission Block
STX	Start of Text	FF	Form Feed	CAN	Cancel
ETX	End of Text	CR	Carriage Return	EM	End of Medium
EOT	End of Transmission	SO	Shift Out	SUB	Substitute
ENQ	Enquiry	SI	Shift In	ESC	Escape
ACK	Acknowledge	DLE	Data Link Escape	FS	File Separator
BEL	Bell [audible or attention signal]	DC1	Device Control 1	GS	Group Separator
BS	Backspace	DC2	Device Control 2	RS	Record Separator
HT	Horizontal Tabulation [punched card skip]	DC3	Device Control 3	US	Unit Separator
		DC4	Device Control 4 [Stop]	≡	Delete
		NAK	Negative Acknowledge		

FIGURE 1.1

2.0 GENERAL SPECIFICATIONS

2.1 Size

Rectangular metal case with rubber feet. Nominal dimensions 5 3/4 inches wide, 6 inches tall, 15 inches deep.

2.2 Weight

9 pounds nominal.

2.3 Power

105 - 125 VAC, 60 Hertz, 100 watts maximum. See section 3.0 for options. Circuit-breaker provided on connector panel.

2.4 Temperature

2.4.1 Operating Ambient

+10°C to +40°C

2.4.2 Storage Ambient

-40°C to +65°C

2.5 Humidity

0 to 95% non-condensing, operating or storage.

2.6 Color

Clear anodized endplates with black silk-screened nomenclature. Light Blue perforated cover.

2.7 Power Cord

6 foot nominal, terminated with standard NEMA 5-15P 3-prong plug. Opposite end permanently attached to controller.

2.8 Cooling

Natural convection, bottom to top. Unobstructed path must be provided. See section 3.0 for Fan Option used in restricted environments.

2.9 Connectors

2.9.1 Keyboard

TRW/Cinch-Jones DB-25S or equivalent. See section 6.8.

2.9.2 Data I/O

TRW/Cinch-Jones DB-25S or equivalent. See section 6.6.

2.9.3 Video Out

Series BNC, type UG-625B/U. See section 6.7.

2.10 Operating Controls

2.10.1 Power Switch

Push-on, push-off incorporated into circuit breaker. Located on connector panel.

2.10.2 Logic Switches

Four two-position slide switches located on connector panel. Functions controlled are Local/Remote, Half/Full duplex, Roll/Page and Low/High Baud. See section 5.0.

3.0 OPTIONS

3.1 Screen Format

While the 24-Line, 80-character format is the most popular, the terminal has been designed to produce the following additional formats (Line count x character count): 8x32, 16x32, 16x40, 16x80, 20x50, 24x40, 25x80, 40x80.

3.2 Character Font

The customer may select a 5x7 dot character in an 8x10 dot field or a 7x9 dot character in a 10x12 dot field. Upper case or upper/lower case characters are available in a variety of fonts. In addition, custom fonts may be special-ordered.

3.3 Data I/O Format

Read-only (RO) or Keyboard Send/Receive (KSR) versions of the terminal are supported by parallel TTL, serial RS232, and serial 20 or 60 milliampere current loop options.

3.4 Memory Size

A basic terminal contains sufficient display memory for up to 2048 display characters. Options are available to expand this memory up to 8192 display characters.

3.5 Data I/O Ports

Normal communications to an associated modem or host computer take place through the primary port (connector). Options provide for alternate communication ports, including one for a line printer.

3.6 Communications Options

The basic terminal functions are outlined in section 1.0. Options exist for other modes, including Block Send and Addressable Multidrop. Block Send permits the sending from the terminal of a block of screen data in a controlled manner. Leading, imbedded and trailing control codes provide demarcation of data segments.

Addressable Multidrop permits a number of terminals to be connected to a single I/O line. Data to or from a particular terminal is controlled through the use of assigned addresses and a communications protocol.

3.7 Cursor Style

The underline cursor, preferred by a large segment of users, is available either blinking or non-blinking. Additionally, the block, or "Blob" style cursor, blinking or non-blinking, is available.

3.8 Cursor Movement

As supplied in the basic terminal, carriage return (CR) and line-feed (LF) codes cause separate cursor actions and are independent. Optionally, auto-LF on CR or auto-CR on LF may be installed. Additionally, hold at end-of-line (HEOL) which simulates Teletype operation, is available.

3.9 Power

The terminal may be supplied wired for 100, 115 or 230 VAC, 50 or 60 Hertz power mains.

3.10 Text Manipulation

Editing capability may be added which functions with a single visible page or with multiple-page memory. Selective erase, character insert/delete and line insert/delete commands are supplied.

3.11 Text Control

Four-level character accent (standard, dim character, blink and reverse video) is available for use with upper-case only terminals. Two level accent (standard, and one of dim, blink or reverse) may be provided for upper/lower case terminals. In addition, the protected data feature is available to ease the tasks of securing data and form-filling.

3.12 Control Code Set

One of the most powerful of the terminal's options is the ability to emulate other CRT terminal's control-code sets. This feature allows the ADI terminal to be used with a host computer, whose software was written for another terminal, without the need for software conversion. To users for which this is not a concern, the standard ADI control set is supplied as outlined in section 4.0.

3.13 BAUD Rates

Sixteen different BAUD rates may be selected for serial communications, ranging from 50 to 19,200 BAUD. Refer to section 4.0 for a detailed listing.

3.14 Baud Select

Upon power-up, the terminal enables communications at whatever baud rates were selected by the customer at order entry for both data and printer ports. These rates may be redefined from the keyboard by executing a particular keystroke sequence (see section 4.0) after the power-up initialization has taken place. Optionally, the High/Low BAUD switch may be enabled either as the sole control or in conjunction with the keyboard for the data port. Split BAUD options allow differing transmit and receive BAUD rates.

3.15 Support

Several miscellaneous options allow RTS/CTS control of serial communications, current sources for 20 or 60-milliampere current loops, an audible bell, a fan option for cooling in restricted environments, and separate sync video for specialized monitors.

3.16 Comments

Refer to the configurator sheet, document L_.E900A0100, for a full detailed listing of all options and how to specify a terminal.

4.0 COMMANDS

4.1 BASIC OPERATION

4.1.1 Set KSR State (ESC/M/K):

Causes the terminal to enter KSR state. Terminal on-line to host device unless overridden by Local/Remote switch. Mutually exclusive with Text state. Edit commands inactive. At power-on, state is KSR.

4.1.2 Set Text State (ESC/M/T):

Causes the terminal to enter text state. Terminal declared off-line to host device. The output data line is held at Mark for keyboard entered characters and control codes. Incoming data is ignored, with an ASCII NAK response made to the host device for each attempted data entry. Access to character positions dependent on user selection of Unprotect or Protect modes which are fully operational. Page function active; Roll function inoperative. Mutually exclusive with KSR state. Edit commands active. Exited by Set KSR State or Execute Block Send commands.

4.1.3 Set Unprotect Mode (ESC/M/U):

Causes the terminal to enter unprotect mode. All character positions accessible regardless of accent status. Tab/Skip inoperative. Accent tag bits may be set or cleared. Page and/or roll functions active. Mutually exclusive with protect mode. At power-on, mode is unprotect.

4.1.4 Set Protect Mode (ESC/M/P):

Causes the terminal to enter protect mode. Only unaccented character positions are accessible to operator and/or associated host computer. Tab/Skip active. Accent tag bit register held clear. Page function active; Roll function inoperative. Cursor cannot be positioned in any accented character position. Mutually exclusive with unprotect mode. NOTE: To insure complete security of protected data, the host device should expect operation in this mode to require additional time beyond that used in unprotected operation. If RTS/CTS control is not desired, wait times should be provided in host computer driver software.

4.2 CURSOR COMMANDS

4.2.1 Cursor Right (FS):

Page Function: Moves the cursor one character position to the right. If in the last character position of a line, the cursor moves to the first character position of the next line. If in the last character position of the screen, the cursor moves to the first character position of the top line.

Roll Function: Same as Page function.

Protect Mode: Same as Page function; except, cursor moves as indicated to the first available unaccented character position.

4.2.2 Cursor Left (BS):

Page Function: Moves the cursor one character position to the left. If in the first character position of a line, the cursor moves to the last character position of the preceding line. If in the first character position of the screen, the cursor moves to the last character position of the bottom line.

Roll Function: Same as Page function.

Protect Mode: Same as page function; except, cursor moves as indicated to the first available unaccented character position.

4.2.3 Cursor Up (US):

Page Function: Moves the cursor one line above its present position. If in the top line, the cursor moves to the same character position in the bottom line.

Roll Function: Same as page function.

Protect Mode: Same as page function; except, if the character position in the new line is accented, cursor moves right in the new line, following Cursor Right instruction, to the first available unaccented character position.

4.2.4 Cursor Down (RS):

Page Function: Moves the cursor one line below its present position. If in the bottom line, the cursor moves to the same character position in the top line.

Roll Function: Same as page function.

Protect Mode: Same as page function; except, if the character position in the new line is accented, cursor moves right in the new line, following Cursor Right instruction, to the first available unaccented character position.

4.2.5 Cursor Home (VT):

Page Function: Moves the cursor to the first character position of the top line.

Roll Function: Same as page function.

Protect Mode: Same as page function; except, if the home character position is accented, cursor moves right, following Cursor Right instruction, to the first available unaccented character position.

4.2.6 Line Feed (LF):

Page Function: Moves the cursor one line below its present position. If in the bottom line, the cursor moves to the same character position in the top line.

Roll Function: Same as page function; except, if in the bottom line, cursor will remain stationary. All data will move up one line, with the top line of data being lost and the bottom data line, containing the cursor, being filled with space codes.

(cont)

4.2.6 Protect Mode: Same as page function; except if the character position in the new line is accented, cursor moves right in the new line, following Cursor Right instruction, to the first available unaccented character position.

4.2.7 Carriage Return (CR):

Page Function: Moves the cursor to the first character position of the same line.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function; except, if the first character position is accented, cursor moves right, following Cursor Right instruction, to the first available unaccented character position.

4.2.8 Cursor Address Set (ESC/A):

Page Function: Moves the cursor to an absolute X-Y location on the visible screen by entering the four-character string: (ESC/A/CPC/CPL). The CPC-code moves the cursor horizontally to the specified character position within the line. The CPL-code moves the cursor vertically to the specified line. The permitted values of CPC and CPL are shown in figures 4.1 and 4.2. Note: Any attempt to move the cursor to an X-Y location which is invalid for the screen format in use will result in no cursor motion.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function; except, if addressed location is accented, cursor will move right, following Cursor Right instruction, to the first available unaccented character position. Note: Cursor addressing is not recommended in this mode unless prior knowledge exists on accent status of absolute location.

4.2.9 Cursor Address Read (ESC/C):

Page Function: Used by a host computer to determine the current X-Y location of the visible cursor. Returns a four-character string: (ESC/@/CPC/CPL). The CPC-code represents the horizontal character position within the current line while the CPL-code represents the vertical line position within the visible screen. The allowable returned values of CPC and CPL are shown in figures 4.1 and 4.2. The cursor does not move.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function.

4.2.10 Forward Tab/Skip (HT):

Page Function: Command Inoperative.

Roll Function: Command Inoperative.

Protect Mode: Causes the cursor to automatically skip right, following Cursor Right instruction, over subsequent character positions. It will come to rest at the first unprotected character position following a field of protected data. If there are no protected fields or if the entire screen is protected, the cursor will come to rest at the first character position of the top line.

4.2.11 Reverse Tab/Skip (EM):

Page Function: Command Inoperative.

Roll Function: Command Inoperative.

Protect Mode: Causes the cursor to automatically skip left, following Cursor Left instruction, over preceding character positions. It will come to rest at the first unprotected character position of an unprotected data field which precedes a field of protected data. If there are no protected fields or if the entire screen is protected, the cursor will come to rest at the first character position of the top line.

4.3 ERASE COMMANDS

4.3.1 Erase Screen (FF):

Page Function: Clears the screen by writing spaces to all visible page memory locations and moves the cursor to the first character position of the top line. Note: Erasing the screen with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function; except, any accented character positions are not affected. If the first character position of the top line is accented, cursor moves right, following Cursor Right instruction, to the first available unaccented character position.

Note: As the accent tag bit register is held clear while in protect mode, the note above does not apply.

4.4 ACCENT COMMANDS

4.4.1 Set Blink Accent Tag Bit (ESC/B):

Page Function: Causes a logic 1 for the Blink Tag Bit to be written into memory appended to the code for each displayable character subsequently entered. Tag bits continue to be written with each character entered until another tag command is received or until protect mode is entered. Resultant displayed characters are accented in accordance with Figure 4.3.

Roll Function: Same as Page Function.

Protect Mode: Command Inoperative.

4.4.2 Set Dim Accent Tag Bit (ESC/D):

Page Function: Causes a logic 1 for the Dim Tag Bit to be written into memory appended to the code for each displayable character subsequently entered. Tag Bits continue to be written with each character entered until another tag command is received or until Protect Mode is entered. Resultant displayed characters are accented in accordance with Figure 4.3.

Roll Function: Same as Page Function.

Protect Mode: Command Inoperative.

4.4.3 Set Reverse Video Tag Bits (ESC/R):

Page Function: Causes a logic 1 for both the Blink and Dim tag bits to be written into memory appended to the code for each character subsequently entered. Tag bits continue to be written with each character entered until another tag command is received or until Protect Mode is entered. Resultant characters are accented in accordance with Figure 4.3.

Roll Function: Same as Page Function.

Protect Mode: Command Inoperative.

4.4.4 Reset Accent Tag Bits (ESC/N):

Page Function: Causes logic 0's for the Blink and Dim Tag Bits to be written into memory appended to the code for each displayable character subsequently entered. At power on, the Tag Bit Register comes up in Reset. Tag Bits are also reset when a Set Protect Mode (ESC/M/P) command is received.

Roll Function: Same as Page Function.

Protect Mode: Command Inoperative.

4.5 EDIT COMMANDS

All edit commands are active only in Text state, during which only the page function is operative. Additionally, activation of Protect mode will disallow edit commands.

4.5.1 Erase to End of Line (ESC/E/E):

Page Function: Clears character positions by writing spaces into memory from the current cursor location to the end of the current line. Cursor remains stationary.

Note: Erasing the line with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Not applicable

Protect Mode: ~~Command Inoperative.~~ *UN Protect DATA ONLY*

4.5.2 Erase to End of Page (ESC/E/P):

Page Function: Clears character positions by writing spaces into memory from the current cursor location to the end of the current visible page. Cursor remains stationary.

Note: Erasing the page with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Not applicable.

Protect Mode: ~~Command inoperative.~~

4.5.3 Erase to Start of Line (ESC/E/B):

Page Function: Clears character positions by writing spaces into memory from the current cursor location to the beginning of the current line. Cursor remains stationary.

Note: Erasing the line with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Not applicable

Protect Mode: ~~Command Inoperative.~~

4.5.4 Erase to Start of Page (ESC/E/H):

Page Function: Clears character position by writing spaces into memory from the current cursor location to the beginning of the current visible page. Cursor remains stationary.

Note: Erasing the page with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Not applicable.

Protect Mode: ~~Command inoperative.~~

4.5.5 Erase Line (ESC/E/L):

Page Function: Clears all character positions in the line displaying the cursor by writing spaces into memory. Cursor returns to the beginning of the erased line.

Note: Erasing the line with accent tag bits set causes all spaces to assume the corresponding accent.

Roll Function: Not applicable

Protect Mode: ~~Command inoperative.~~

4.5.6 Insert Character (ESC/I/C):

Page Function: Moves the character over the cursor (and all following characters to the end of the current line) one character position to the right. The last character on the line is lost. A space is inserted over the cursor. Cursor remains stationary. Note: space carries the accent tags and is displayed accordingly.

Roll Function: Not applicable.

Protect Mode: Command inoperative.

4.5.7 Insert Line (ESC/I/L):

Page Function: Moves the character over the cursor (and all following characters to the end of the visible page) to the right until the cursor - specified character occupies the first character position of the following line. Any characters moved off the end of the page are lost. A space is inserted over the cursor and in all following character positions to the end of the line. Cursor remains stationary. Note: Spaces carry the accent tags and are displayed accordingly.

Roll Function: Not applicable

Protect Mode: Command Inoperative.

4.5.8 Delete Character (ESC/K/C):

Page Function: Deletes the character over the cursor. All characters to the right of the cursor to the end of the current line move one character position to the left. A space is inserted in the last character position of the line. Cursor remains stationary. Note: Space carries the accent tags and is displayed accordingly.

Roll Function: Not applicable.

Protect Mode: Command Inoperative.

4.5.9 Delete Line (ESC/K/L):

Page Function: Deletes the character over the cursor and all following characters to the end of the current line. The character in the first character position of the following line (and all following characters to the end of the visible page) move to the left until the next line first character occupies the character position over the cursor. Spaces are inserted in all vacated character positions at the end of the page. Cursor remains stationary. Note: Spaces carry the accent tags and are displayed accordingly.

Roll Function: Not applicable.

Protect Mode: Command Inoperative

4.6 SUPPORT COMMANDS

4.6.1 Ring Bell (BEL):

Page Function: Causes a 0.5 second audible tone burst to be emitted from within the controller. Used by host computer to notify the operator that an action is required of him or that a task has been completed.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function.

4.6.2 Select Data Port Baud Rate (ESC/P):

Page Function: On power up, the controller serial logic is set to communicate through the data port at a baud rate determined by customer specification at the time of order. The baud rate may be reselected by the operator or host computer by entering the three character string (ESC/P/BAUD) where BAUD is determined from Figure 4.4. Upon reception of the complete three-character string, all data port serial communications will be shifted to the new baud rate. The new baud rate will continue in effect until another select string is received or another power-up cycle is initiated. The entering of an invalid baud code results in no action.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function.

4.6.3 Select Printer Port Baud Rate (ESC/S):

Page Function: On power-up, the controller serial logic is set to communicate through the printer port at a baud rate determined by customer specification at the time of order. The baud rate may be reselected by the operator or host computer by entering the three-character string (ESC/S/BAUD) where BAUD is determined from Figure 4.4. Upon reception of the complete three-character string, all printer port serial communications will be shifted to the new baud rate. The new baud rate will continue in effect until another select string is received or another power-up cycle is initiated. The entering of an invalid baud code results in no action.

Roll Function: Same as Page Function.

Protect Mode: Same as Page Function.

4.6.4 Execute Block Send to Data Port (ESC/T/D):

Page Function: Transmits to the host device through the data port a block of visible page data in a controlled manner. Leading, imbedded and trailing control codes provide demarcation of data segments.

Roll Function: Same as page function; except that if the cursor passes the end of the visible screen, a roll is not executed. Instead, the cursor proceeds to the first character position of the screen and the read continues.

Protect Mode: Same as page function; except that only unaccented characters are transmitted.

Text State: Same as page function; except that a return to KSR state is automatically accomplished following the completion of the command.

4.6.5 Execute Block Send to Printer Port (ESC/T/P):

Page Function: Transmits to an auxiliary device through the printer port a block of visible page data in a controlled manner. Leading, imbedded and trailing control codes provide demarcation of data segments.

Roll Function: Same as page function; except that if the cursor passes the end of the visible screen, a roll is not executed. Instead, the cursor proceeds to the first character position of the screen and the read continues.

Protect Mode: Same as page function; except that only unaccented characters are transmitted.

Text State: Same as page function; except that a return to KSR state is automatically accomplished following the completion of the command.

4.6.6 Cancel Escape Sequence (ESC/ESC):

Page Function: Used by an operator to terminate an Escape (ESC) command sequence in case of keystroke error or change-of-mind. Escape sequence is canceled if ESC occurs as the second stroke of a two-key sequence, second or third stroke of a three-key sequence, or second, third or fourth stroke of a four-key sequence.

Roll Function: Same as Page Function.

Protect Mode: Same a Page Function.

4.7 COMMAND SUMMARY

<u>Command</u>	<u>ASCII</u>	<u>ADI Basic Keyboard</u>
Set Unprotect Mode	ESC/M/U	ESC/M/U
Set Protect Mode	ESC/M/P	ESC/M/P
Set KSR State	ESC/M/K	ESC/M/K
Set Text State	ESC/M/T	ESC/M/T
Cursor Right	FS	CTRL-SH-L
Cursor Left	BS	CTRL-H
Cursor Up	US	CTRL-SH-O
Cursor Down	RS	CTRL-SH-N
Cursor Home	VT	CTRL-K
Line Feed	LF	CTRL-Jor LF
Carriage Return	CR	CTRL-Mor CR
Cursor Addr Set	ESC/A/CPC/CPL	ESC/A/CPC/CPL
Cursor Addr Read	ESC/C	ESC/C
Returned Sequence	ESC/@/CPC/CPL	
Forward Tab/Skip	HT	CTRL-Ior TAB
Reverse Tab/Skip	EM	CTRL-SH-I
Erase Screen	FF	CTRL-L
Set Blink Accent Tag	ESC/B	ESC/B
Set Dim Accent Tag	ESC/D	ESC/D
Set Reverse Video Tags	ESC/R	ESC/R
Reset Accent Tags	ESC/N	ESC/N
Erase to End of Line	ESC/E/E	ESC/E/E
Erase to End of Page	ESC/E/P	ESC/E/P
Erase to Start of Line	ESC/E/B	ESC/E/B
Erase to Start of Page	ESC/E/H	ESC/E/H
Erase Line	ESC/E/L	ESC/E/L
Insert Character	ESC/I/C	ESC/I/C
Insert Line	ESC/I/L	ESC/I/L
Delete Character	ESC/K/C	ESC/K/C
Delete Line	ESC/K/L	ESC/K/L
Ring Bell	BEL	CTRL-G
Select Data Port Baud Rate	ESC/P/BAUD	ESC/P/BAUD
Select Printer Port Baud Rate	ESC/S/BAUD	ESC/S/BAUD

4.7 COMMAND SUMMARY (cont.)

<u>Command</u>	<u>ASCII</u>	<u>ADI Basic Keyboard</u>
Select Page 1	ESC/1	ESC/1
Select Page 2	ESC/2	ESC/2
Select Page 3	ESC/3	ESC/3
Select Page 4	ESC/4	ESC/4
Cancel Escape Sequence	ESC/ESC	ESC/ESC
Execute Block Send to Data Port	ESC/T/D	ESC/T/D
Execute Block Send to Printer Port	ESC/T/P	ESC/T/P

DATA BITS	654	000	001	010	011	100	101	110	111
3210	ROW	COLUMN							
		0	1	2	3	4	5	6	7
0000	0			0	16	32	48	64	80
0001	1			1	17	33	49	65	81
0010	2			2	18	34	50	66	82
0011	3			3	19	35	51	67	83
0100	4			4	20	36	52	68	84
0101	5			5	21	37	53	69	85
0110	6			6	22	38	54	70	86
0111	7			7	23	39	55	71	87
1000	8			8	24	40	56	72	88
1001	9			9	25	41	57	73	89
1010	10			10	26	42	58	74	90
1011	11			11	27	43	59	75	91
1100	12			12	28	44	60	76	92
1101	13			13	29	45	61	77	93
1110	14			14	30	46	62	78	94
1111	15			15	31	47	63	79	95

NOTE: Character position 0 is the leftmost character position and character position 95 is the rightmost character position.

CHARACTER POSITION (CPC) CODE

FIGURE 4.1

DATA BITS	654	000	001	010	011	100	101	110	111
3210	ROW	COLUMN							
		0	1	2	3	4	5	6	7
0000	0			0	16	32	48		
0001	1			1	17	33	49		
0010	2			2	18	34	50		
0011	3			3	19	35	51		
0100	4			4	20	36	52		
0101	5			5	21	37	53		
0110	6			6	22	38	54		
0111	7			7	23	39	55		
1000	8			8	24	40	56		
1001	9			9	25	41	57		
1010	10			10	26	42	58		
1011	11			11	27	43	59		
1100	12			12	28	44	60		
1101	13			13	29	45	61		
1110	14			14	30	46	62		
1111	15			15	31	47	63		

NOTE: Line position 0 is the top line and line position 63 is the bottom line.

LINE POSITION (CPL) CODE

FIGURE 4.2

Blink Bit	Dim Bit	Accent
0	0	Normal Intensity
0	1	Dim Intensity
1	0	Blinking
1	1	Reverse Video

FIGURE 4.3

BAUD RATE	ASCII CHARACTER	ASCII CODE (HEX)
50	@	40
75	A	41
110	B	42
134.5	C	43
150	D	44
300	E	45
600	F	46
1200	G	47
1800	H	48
2000	I	49
2400	J	4A
3600	K	4B
4800	L	4C
7200	M	4D
9600	N	4E
19200	O	4F

BAUD RATE (BAUD) CODE

FIGURE 4.4

5.0 LOGIC SWITCHES

5.1 Local/Remote

Local: Keyboard - entered data characters are sent to the display memory. Only keyboard - generated commands are executed by the controller. The output data line is held at Mark; incoming data is ignored.

Remote: Keyboard - entered data characters and commands are processed in accordance with the setting of the Half/Full Duplex switch. Incoming data is sent to the display memory while commands are executed by the controller.

5.2 Half/Full Duplex

Half: Keyboard - entered data characters and commands are sent to display memory or executed within the controller and also sent to the outgoing data line. Data characters and commands on the incoming data line are loaded into display memory or executed in a like fashion.

Full: Keyboard - entered data characters and commands are sent to the outgoing data line. Data characters and commands on the incoming data line are loaded into display memory or executed within the controller.

5.3 Page/Roll

Page Function: Data is entered into display memory at the cursor position. Each entry overwrites the character previously resident at that position. The cursor automatically advances after each character is written. Movement of the cursor past the end of a line causes the cursor to be positioned at the first character position of the next line. Movement of the cursor past the last displayable position of memory results in positioning of the cursor to the first character position of the top line.

Roll Function: As in Page Function; except that movement of the cursor past the last displayable line of memory causes all lines of data in memory to move up one line. Previous data of the top line are lost. The new bottom data line is filled with space codes tagged with the current setting of the accent register. The cursor remains on the bottom line, either stationary (if the roll was caused by a line feed) or at the first character position (if caused by a carriage return or auto-increment).

5.4 Low Baud/High Baud

LBAUD: Causes incoming and outgoing data line communications to take place at the lower of two preselected BAUD rates. Such preselection is made by the customer at the time of order. Reselection of the BAUD rate may be accomplished from the keyboard. Such reselection remains in effect until either another reselection is done or until a power-on cycle is accomplished.

HBAUD: As in LBAUD except that incoming and outgoing data line communications take place at the higher of the two rates.

6.0 INPUT/OUTPUT

6.1 Serial Data Input Format

ASCII - coded serial data, 10 or 11-unit code, Start/Stop synchronized. Parity ignored. Options determine number of data and stop bits.

6.2 Serial Data Output Format

ASCII - coded serial data, 11-unit code, Start/Stop synchronized. Output line held at mark when idle. Options determine number of data and stop bits and sense of parity.

6.3 Serial Data Input Signal Levels

6.3.1 RS232 Compatible

Mark (1): -3V to -25V
Space (0): +3V to +25V

6.3.2 Current Loop

Mark (1): 20 (60) milliamperes $\pm 20\%$
Space (0): 0.5 milliamperes maximum.
Voltage drop at Mark: 1.5V max.

6.4 Serial Data Output Signal Levels

6.4.1 RS232 Compatible

Mark (1): -9 $\pm 2V$ into 3K ohm load.
Space (0): +9 $\pm 2V$ into 3K ohm load.

6.4.2 Current Loop

Mark (1): On-impedance 100 ohms max at 20 milliamperes.
Space (0): Off-impedance 35K ohms min.
Voltage differential at Space: 25 vdc max.

6.5 Serial Data Rates

Standard available rates are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19,200 BAUD.

6.6 Serial Data I/O Connector

6.6.1 General Description

Provides RS-232 compatible or current-loop interface connector. Interfaces with couplers, data sets, and computer I/O channels that are strapped or strappable for RS-232 or 20 milliamperes or 60 milliamperes current-loops. An optional current source is available to power the transmitting current loop.

6.6.2 Connector Type

TRW/Cinch Jones DB25-S or equivalent located on controller connector panel.

6.6.3 Pin and Signal Assignments

Pin 1 (GND): Protective Ground wired to the controller chassis.

Pin 2 (SDO+): RS-232 Serial Data Output. For current loops, this is the positive side of the output loop.

Pin 3 (SDI+): RS-232 Serial Data Input. For current loops, this is the positive side of the input loop.

Pin 4 (RTS): RS-232 Request-to-Send. A space level is provided unless the RTS/CTS support option is installed.

Pin 5 (CTS): RS-232 Clear-to-Send. Ignored by controller unless the RTS/CTS support option is installed.

Pin 7 (COMM): Signal Ground Wired to the controller Power Ground Bus.

Pin 9 (SDO-): Not used for RS-232. For current loops, this is the negative side of the output loop.

Pin 10 (SDI-): Not used for RS-232. For current loops, this is the negative side of the input loop.

Pin 20 (DTR): RS-232 Data Terminal ready. A space level is provided unless the RTS/CTS support option is installed.

6.7 Video Data

6.7.1 Composite Video Format

Sync and video voltage ratios compatible with EIA specification RS170.

6.7.2 Composite Video Signal Level

1.5 ± 0.5V peak-to-peak into 75 ohm unbalanced load.

6.7.3 Connector Type

Series BNC, type UG-625B/U, located on controller connector panel.

6.8 Keyboard Data

6.8.1 Keyboard Data Format

Eight parallel TTL inputs, positive-true. One negative-true TTL service request input. Data and service request remain stable and asserted until one negative-true TTL service acknowledge output is issued by the controller to the keyboard. Rising edge of service acknowledge resets service request and allows data to change.

6.8.2 Keyboard Power

Power to an external keyboard is available as follows:

+5VDC $\pm 5\%$, 500 milliamperes max.
-5VDC $\pm 5\%$, 50 milliamperes max.
+12VDC $\pm 5\%$, 50 milliamperes max.
-12VDC $\pm 5\%$, 50 milliamperes max.

6.8.3 Connector Type

TRW/Cinch Jones DB-25S or equivalent located on controller connector panel.

6.8.4 Pin and Signal Assignments

Pin 1 (KD0+): Data Line 0 (LSB)
Pin 2 (KD1+): Data Line 1
Pin 3 (KD2+): Data Line 2
Pin 4 (KD3+): Data Line 3
Pin 5 (KD4+): Data Line 4
Pin 6 (KD5+): Data Line 5
Pin 7 (KD6+): Data Line 6
Pin 8 (KD7+): Data Line 7 (MSB)
Pin 9 (KST-): Keyboard Service Request
Pin 10 (KRE-): Keyboard Service Acknowledge
Pin 11 (+5V): +5VDC Power
Pin 12 (BRK-): Break Key, contact closure to ground or negative-true TTL level.
Pin 13 (GND): Signal and Power Common.
Pin 23 (+12V): +12VDC Power
Pin 24 (-12V): -12VDC Power
Pin 25 (-5V): -5VDC Power

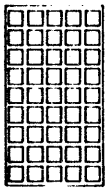
APPENDIX I

CHARACTER FONTS

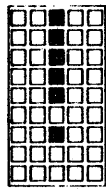
The following sheets illustrate the various standard character sets available for the Basic Universal Terminal. Custom sets may be obtained on special order.

The number associated with each character represents the hex (base 16) code to which the character generator will respond. In most cases it is equivalent to the ASCII input code to the terminal. However, in combinatorial cases such as upper/lower case alphanumeric or Latin/Katakana, such equivalence may not be assumed as the terminal software may realign codes to match a particular input format.

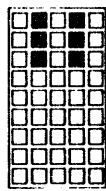
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REV.	ECN NO.	DATE	BASIC UNIVERSAL TERMINAL		SA.E900A0100



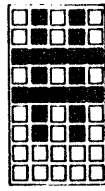
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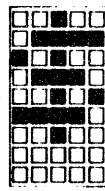
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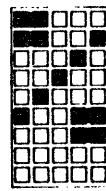
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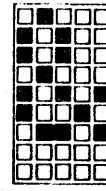
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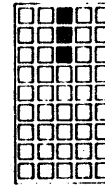
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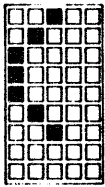
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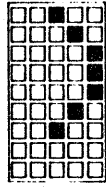
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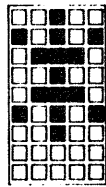
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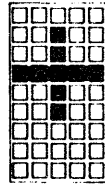
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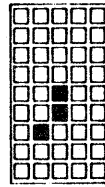
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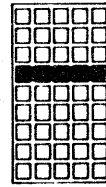
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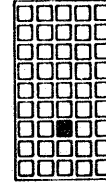
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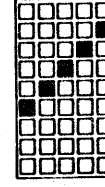
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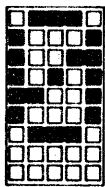
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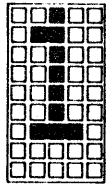
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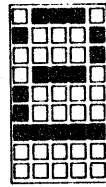
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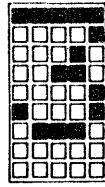
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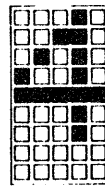
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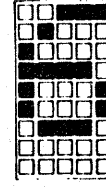
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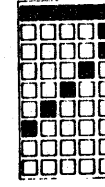
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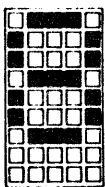
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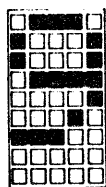
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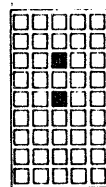
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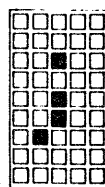
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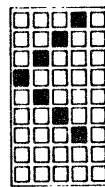
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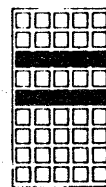
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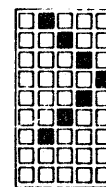
3B



3C



3D



3E



3F

5x7 UPPER CASE BLOCK

OPTION B1

ADI

APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

CHKD. BY

ENGR. APPD.

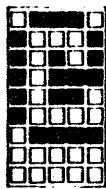
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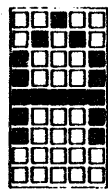
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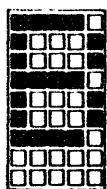
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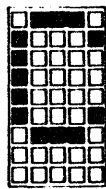
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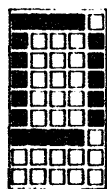
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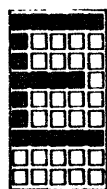
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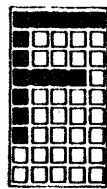
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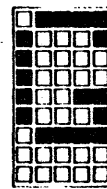
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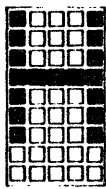
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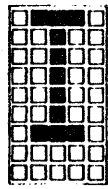
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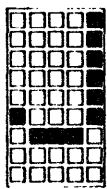
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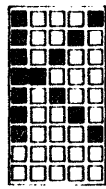
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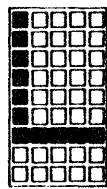
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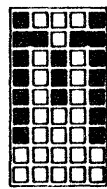
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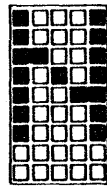
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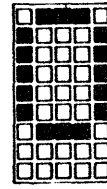
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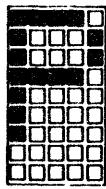
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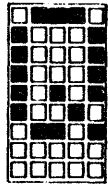
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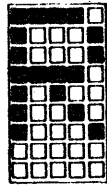
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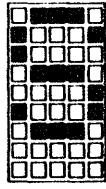
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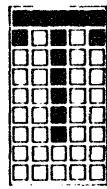
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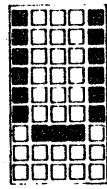
52



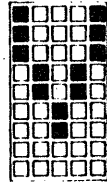
53



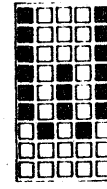
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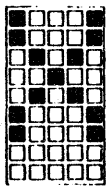
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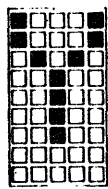
56



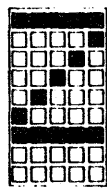
57



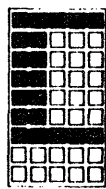
58



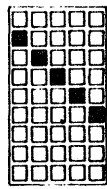
59



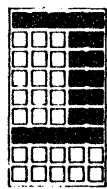
5A



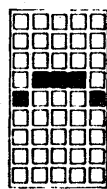
5B



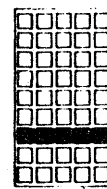
5C



5D



5E

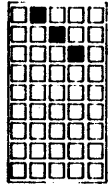


5F

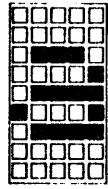
5x7 UPPER CASE BLOCK (con't)

OPTION B1

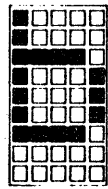
			ADI APPLIED DYNAMICS INTERNATIONAL ANN ARBOR, MICHIGAN		
DRAWN BY GILLIAM		CHKD. BY		ENGR. APPD.	
REV.	ECN NO.	DATE	TITLE BASIC UNIVERSAL TERMINAL		DWG. NO. SA.E900A0100



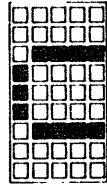
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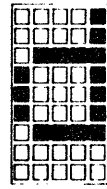
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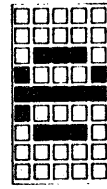
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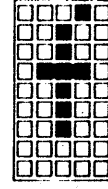
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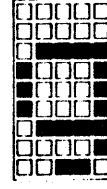
24



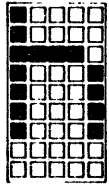
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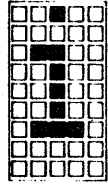
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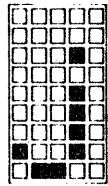
27



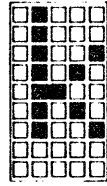
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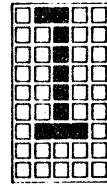
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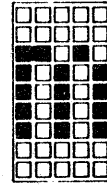
2A



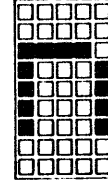
2B



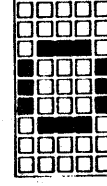
2C



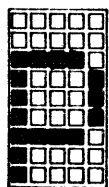
2D



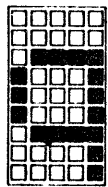
2E



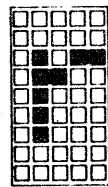
2F



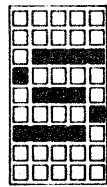
30



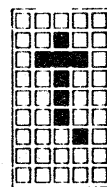
31



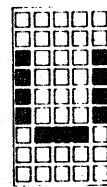
32



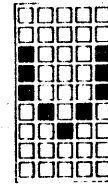
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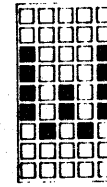
34



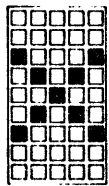
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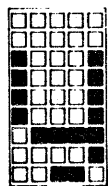
36



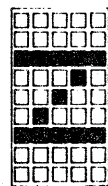
37



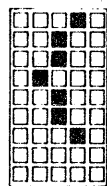
38



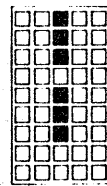
39



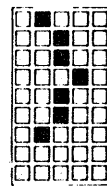
3A



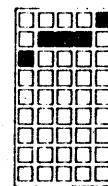
3B



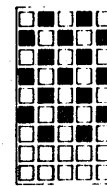
3C



3D



3E

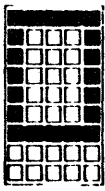


3F

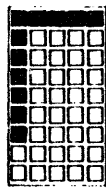
5x7 LOWER CASE SHIFTED BLOCK

OPTION B2

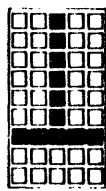
			ADI APPLIED DYNAMICS INTERNATIONAL ANN ARBOR, MICHIGAN		
			DRAWN BY GILLIAM	CHKD. BY	ENGR. APPD.
REV.	ECN NO.	DATE	TITLE BASIC UNIVERSAL TERMINAL		DWG. NO. SA.E900A0100



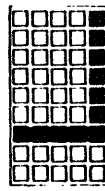
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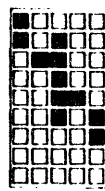
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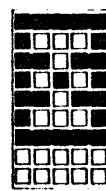
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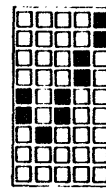
43



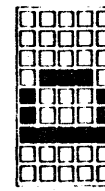
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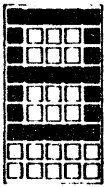
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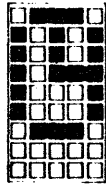
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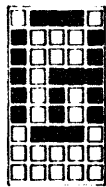
47



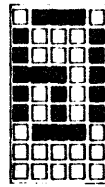
48



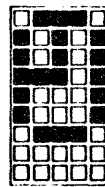
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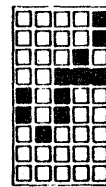
4A



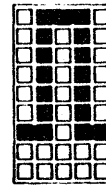
4B



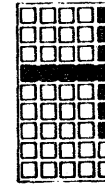
4C



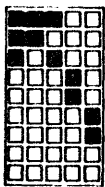
4D



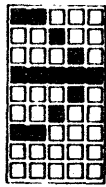
4E



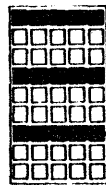
4F



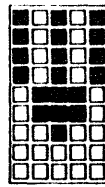
50



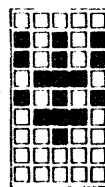
51



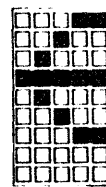
52



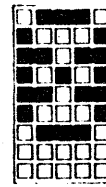
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54



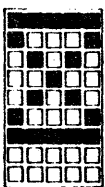
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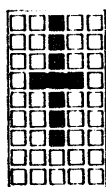
56



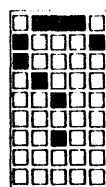
57



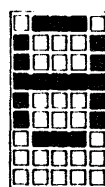
58



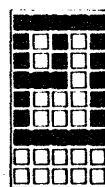
59



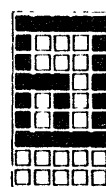
5A



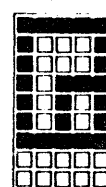
5B



5C



5D



5E



5F

5x7 LOWER CASE SHIFTED BLOCK (con't)

OPTION B2

ADI

APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

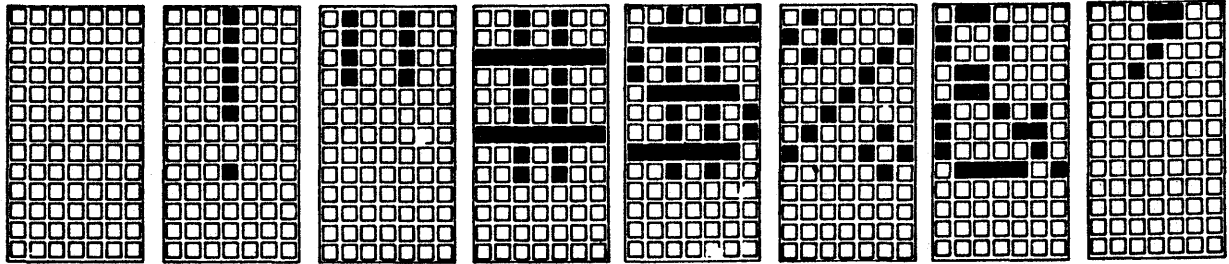
CHKD. BY

ENGR. APPD.

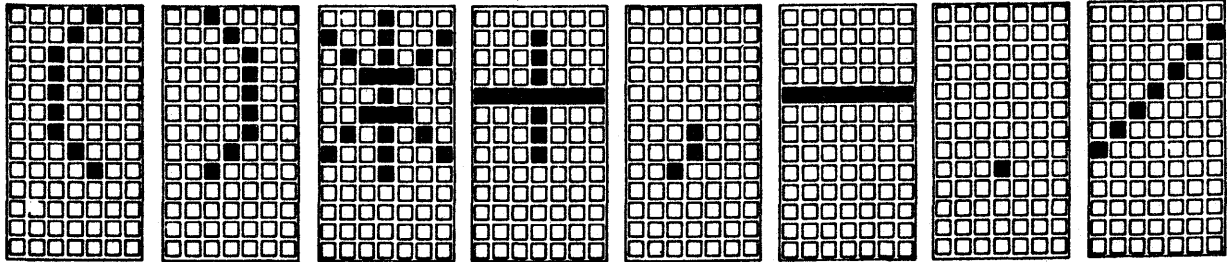
REV. ECN NO. DATE

TITLE
BASIC UNIVERSAL TERMINAL

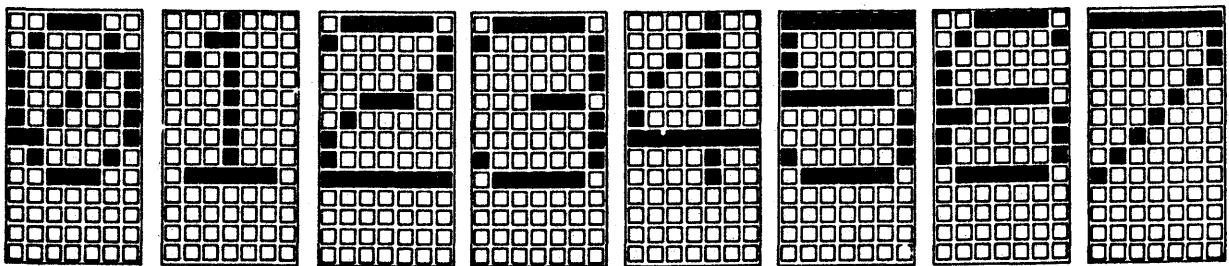
DWG. NO.
SA. E900A0100



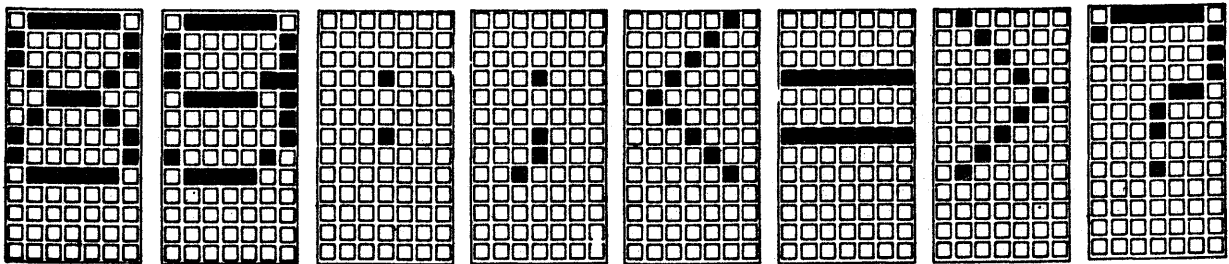
20 21 22 23 24 25 26 27



28 29 2A 2B 2C 2D 2E 2F



30 31 32 33 34 35 36 37



38 39 3A 3B 3C 3D 3E 3F

7x9 UPPER CASE BLOCK

OPTION B4

ADI

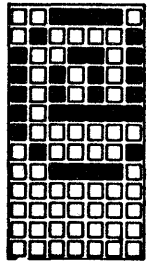
APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM CHKD. BY ENGR. APPD.

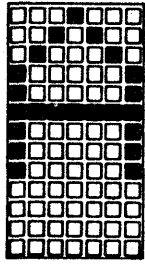
TITLE
BASIC UNIVERSAL TERMINAL

DWG. NO.
SA.E900A0100

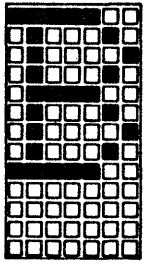
REV. ECN NO. DATE



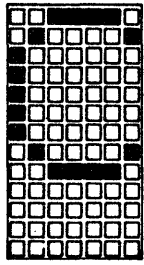
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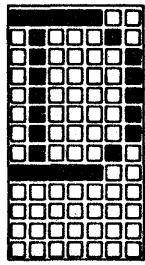
41



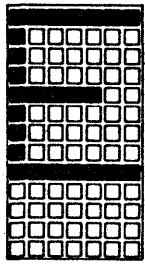
42



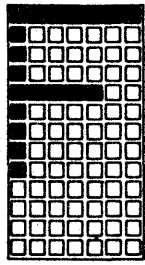
43



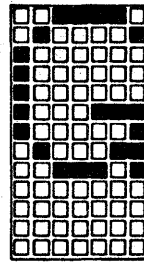
44



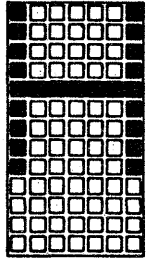
45



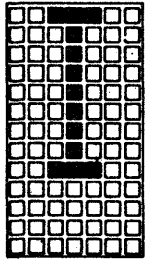
46



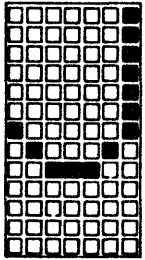
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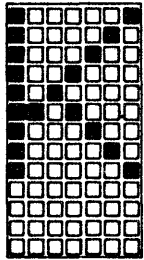
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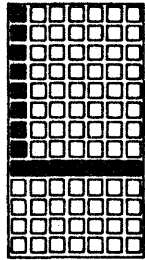
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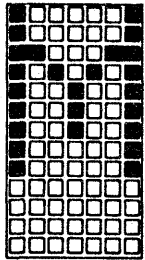
4A



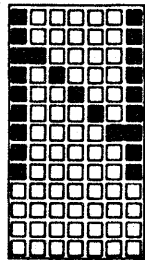
4B



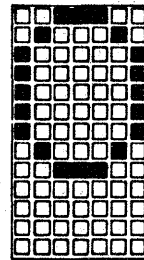
4C



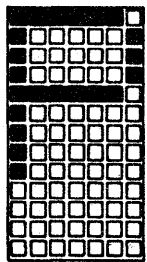
4D



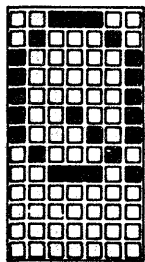
4E



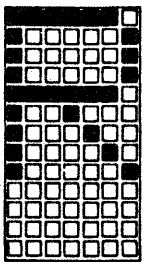
4F



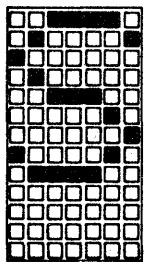
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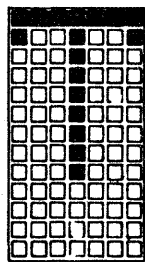
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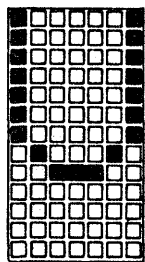
52



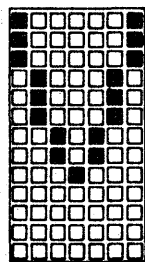
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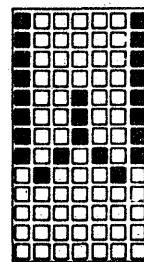
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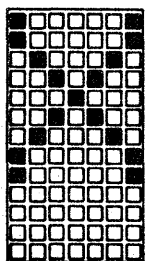
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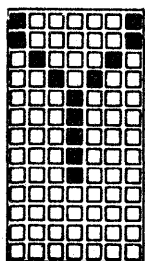
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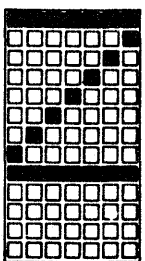
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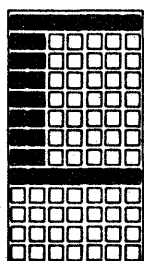
58



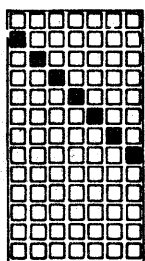
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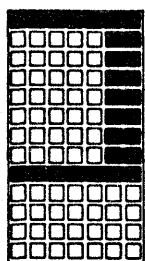
5A



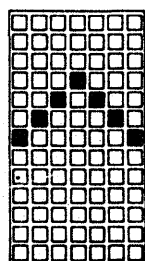
5B



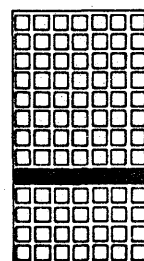
5C



5D



5E



5F

7x9 UPPER CASE BLOCK (con'd)

OPTION B4

ADI

APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

CHKD. BY

ENGR. APPD.

TITLE

BASIC UNIVERSAL TERMINAL

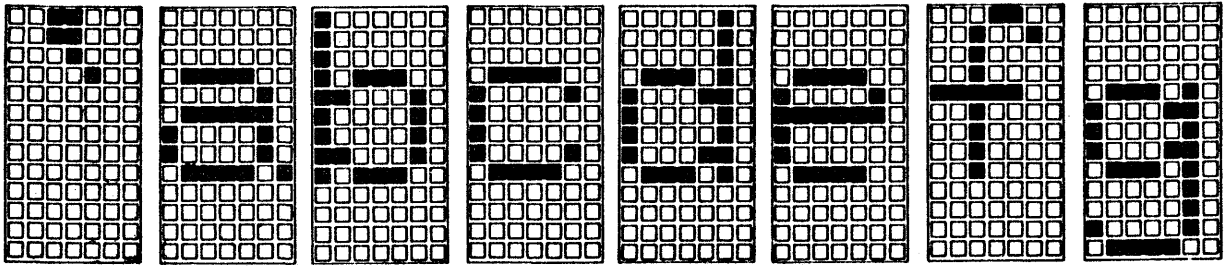
DWG. NO.

SA.E900A0100

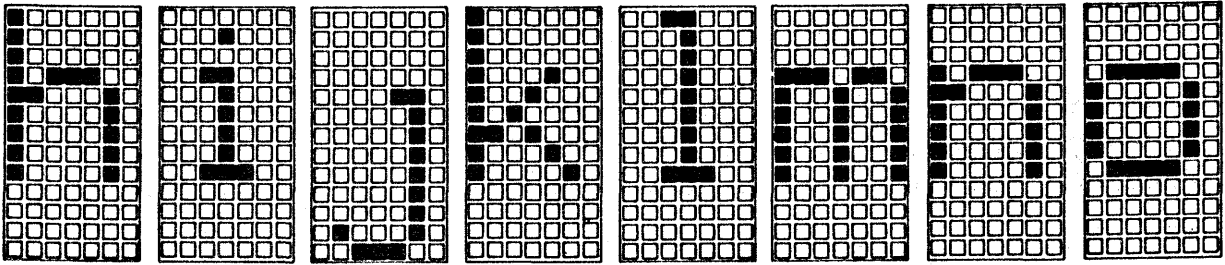
REV.

ECN NO.

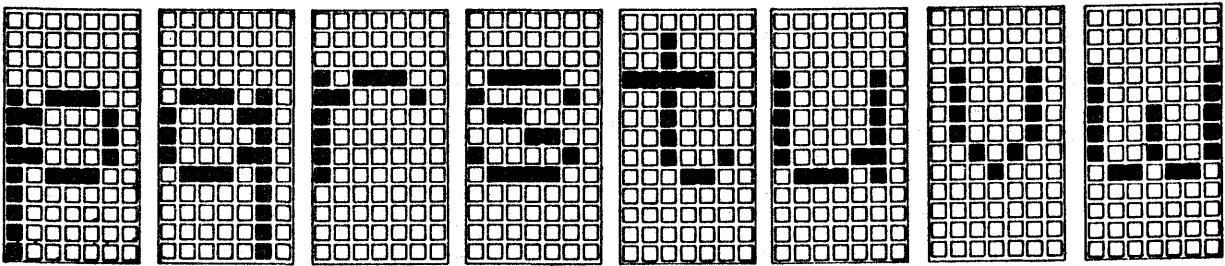
DATE



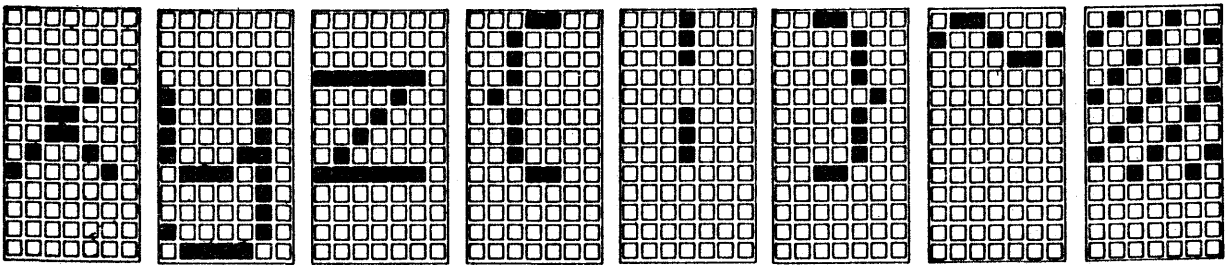
20 21 22 23 24 25 26 27



28 29 2A 2B 2C 2D 2E 2F



30 31 32 33 34 35 36 37



38 39 3A 3B 3C 3D 3E 3F

7x9 LOWER CASE SHIFTED BLOCK

OPTION B5

ADI

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ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

CHKD. BY

ENGR. APPD.

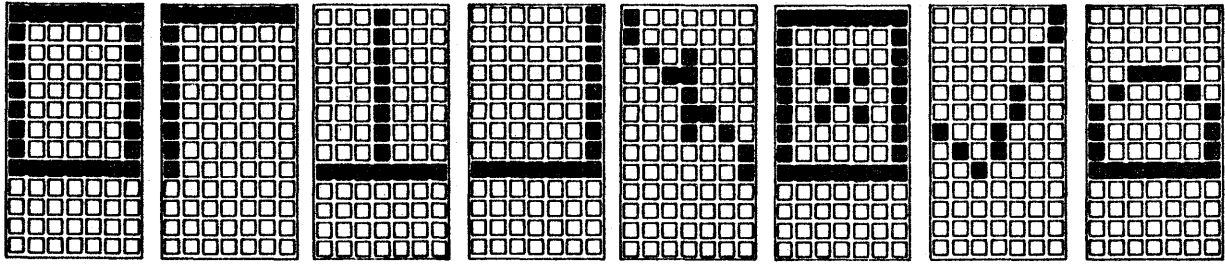
TITLE

DWG. NO.

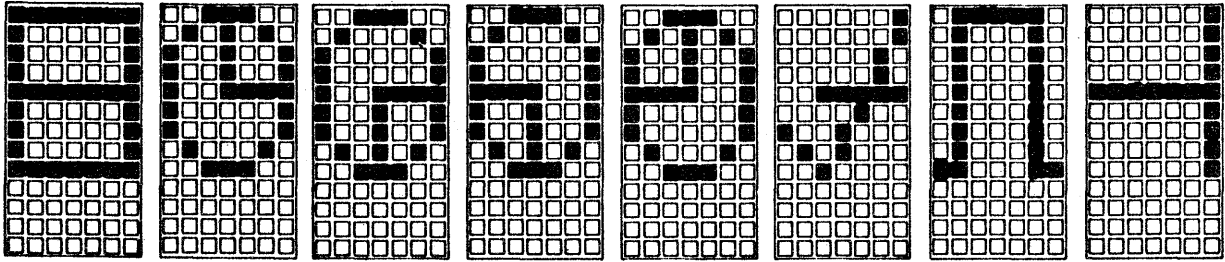
REV. ECN NO. DATE

BASIC UNIVERSAL TERMINAL

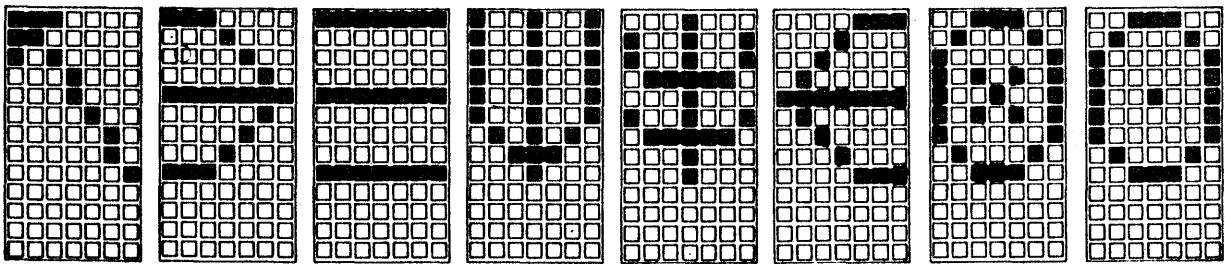
SA. E900A0100



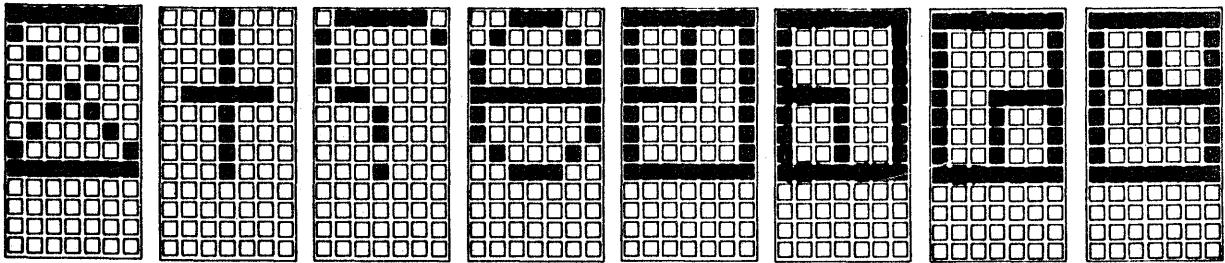
40 41 42 43 44 45 46 47



48 49 4A 4B 4C 4D 4E 4F



50 51 52 53 54 55 56 57



58 59 5A 5B 5C 5D 5E 5F

7x9 LOWER CASE SHIFTED BLOCK (con'd)

OPTION B5

ADI

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ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

CHKD. BY

ENGR. APPD.

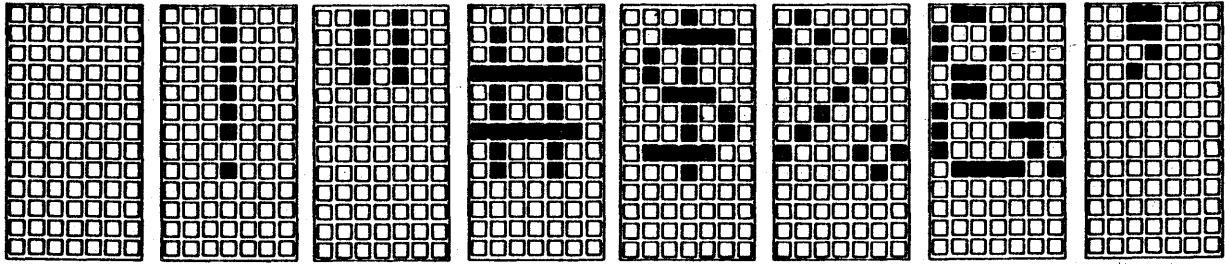
TITLE

BASIC UNIVERSAL TERMINAL

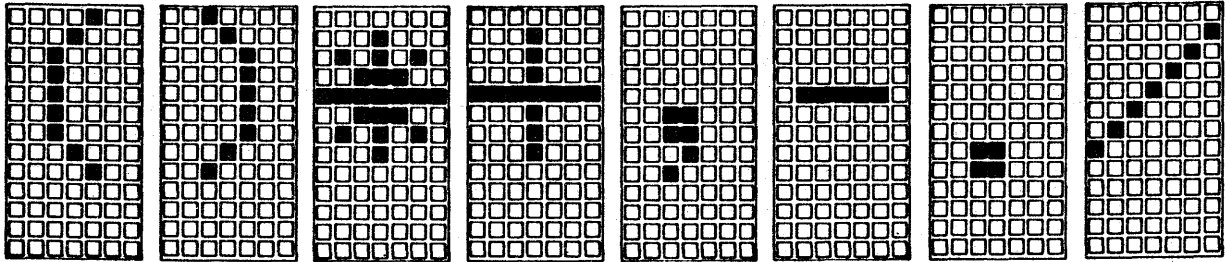
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SA.E900A0100

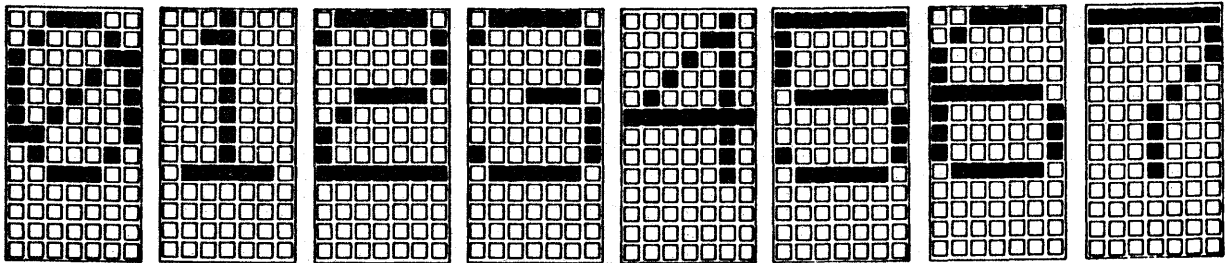
REV.	ECN NO.	DATE
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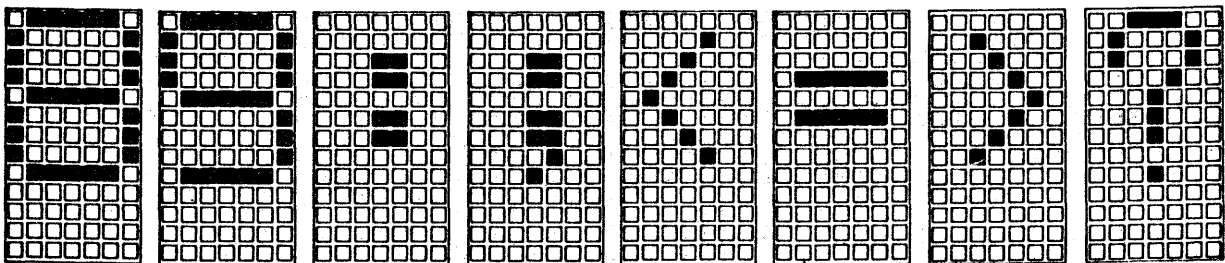
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28 29 2A 2B 2C 2D 2E 2F



30 31 32 33 34 35 36 37

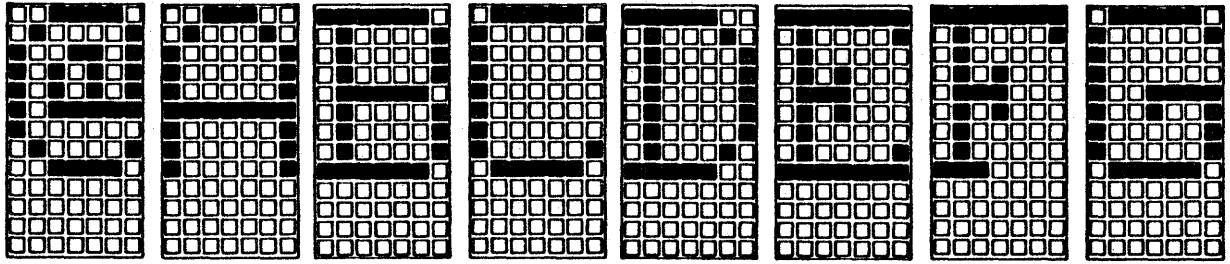


38 39 3A 3B 3C 3D 3E 3F

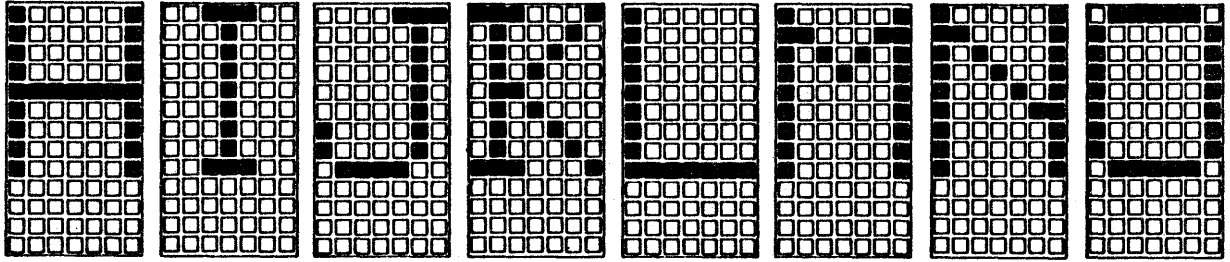
7x9 UPPER CASE SCRIPT

OPTION B7

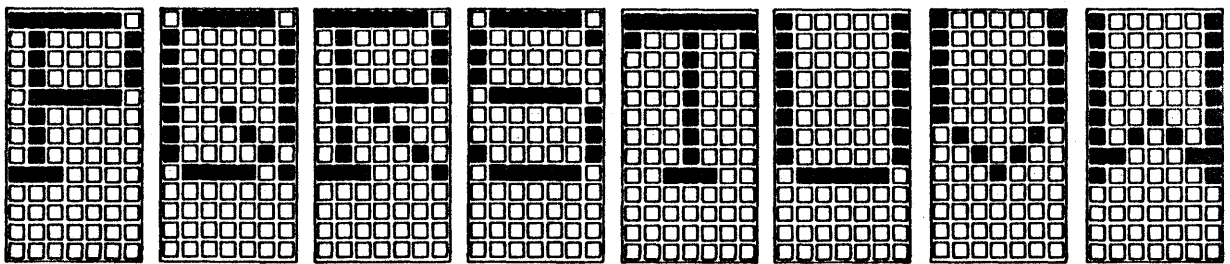
			ADI APPLIED DYNAMICS INTERNATIONAL ANN ARBOR, MICHIGAN		
DRAWN BY GILLIAM		CHKD. BY		ENGR. APPD.	
REV.	ECN NO.	DATE	TITLE BASIC UNIVERSAL TERMINAL		DWG. NO. SA.E900A0100



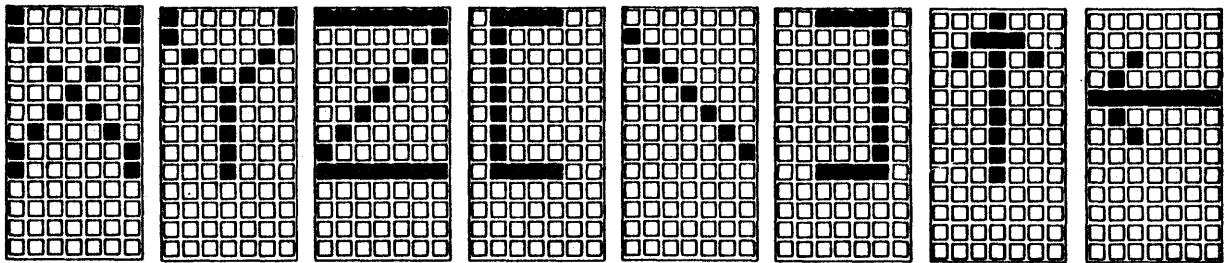
40 41 42 43 44 45 46 47



48 49 4A 4B 4C 4D 4E 4F



50 51 52 53 54 55 56 57



58 59 5A 5B 5C 5D 5E 5F

7x9 UPPER CASE SCRIPT (con'd)

OPTION B7

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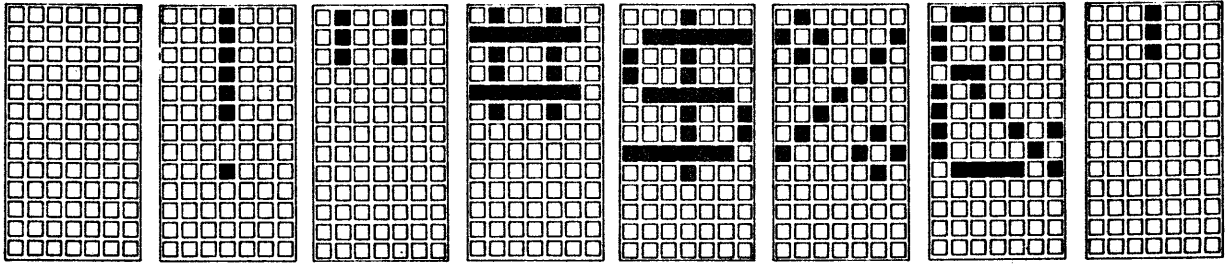
TITLE

BASIC UNIVERSAL TERMINAL

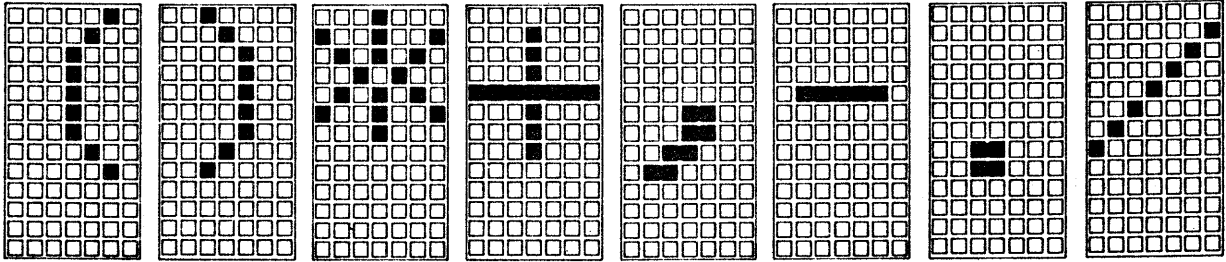
DWG. NO.

SA. E900A0100

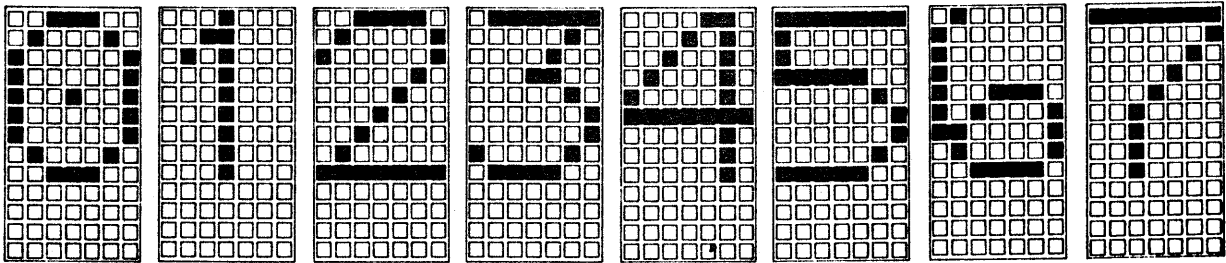
REV.	ECN NO.	DATE
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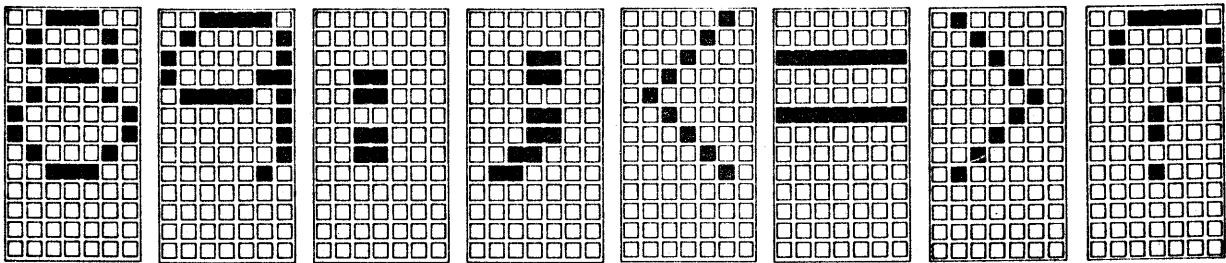
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28 29 2A 2B 2C 2D 2E 2F



30 31 32 33 34 35 36 37

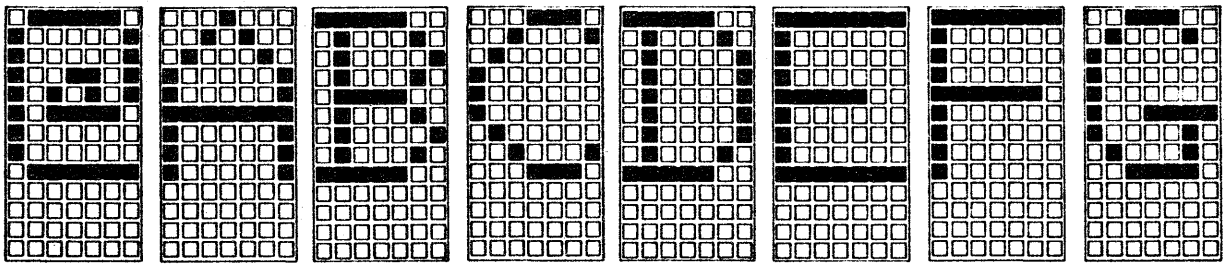


38 39 3A 3B 3C 3D 3E 3F

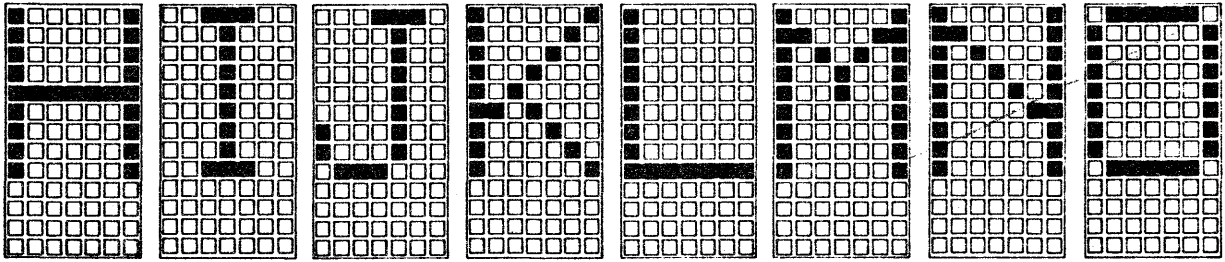
7x9 IBM 3741 SELECTRIC

OPTION B8

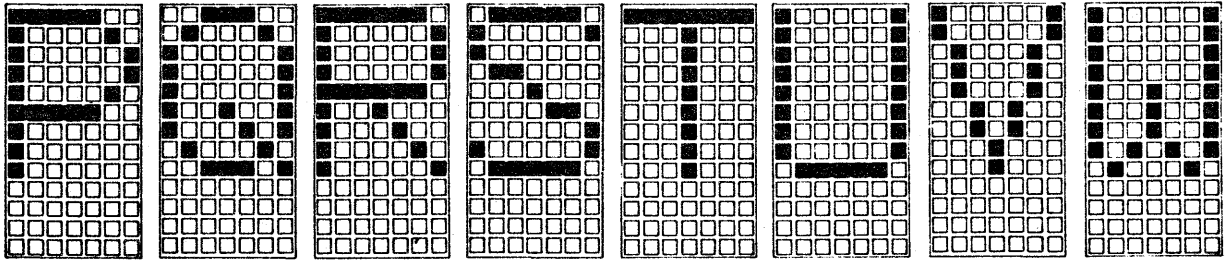
			ADI APPLIED DYNAMICS INTERNATIONAL ANN ARBOR MICHIGAN		
DRAWN BY GILLIAM		CHKD. BY <i>[Signature]</i>		ENGR. APPD <i>[Signature]</i>	
REV.	ECN NO.	DATE	TITLE BASIC UNIVERSAL TERMINAL		DWG. NO. SA. E900A0100



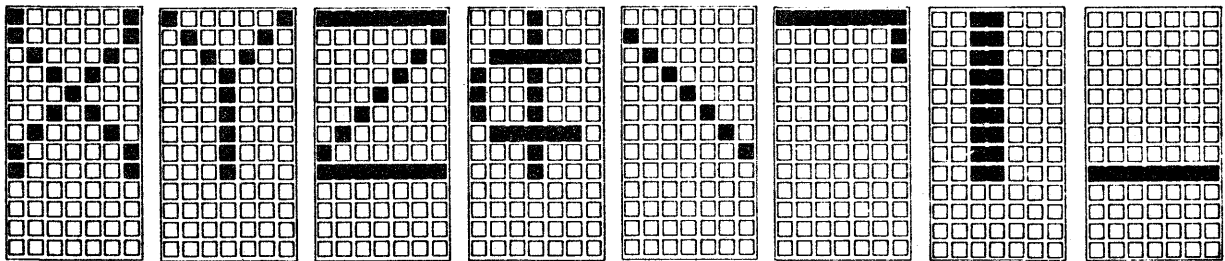
40 41 42 43 44 45 46 47



48 49 4A 4B 4C 4D 4E 4F



50 51 52 53 54 55 56 57



58 59 5A 5B 5C 5D 5E 5F

7x9 IBM 3741 SELECTRIC (con'd)

OPTION B8

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ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

CHKD. BY *[Signature]*

ENGR. APPD *[Signature]*

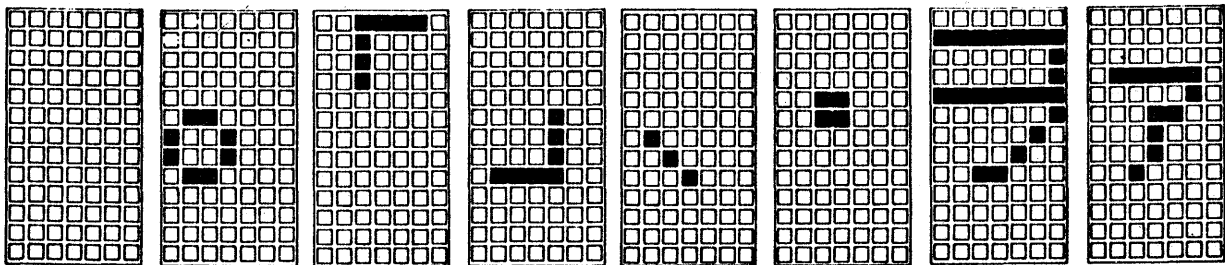
TITLE

DWG. NO.

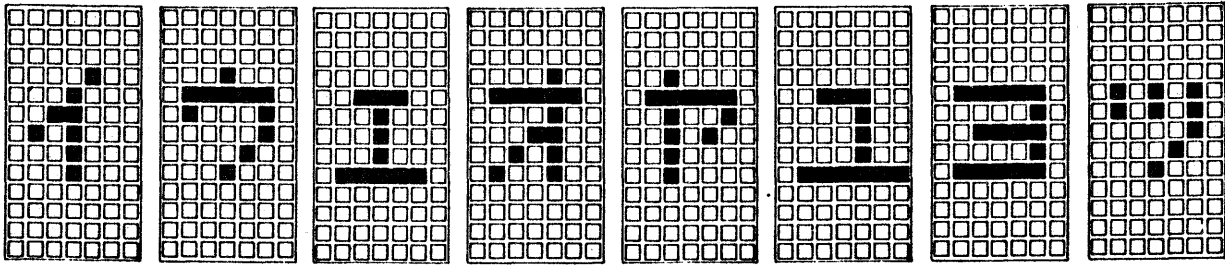
REV. ECN NO. DATE

BASIC UNIVERSAL TERMINAL

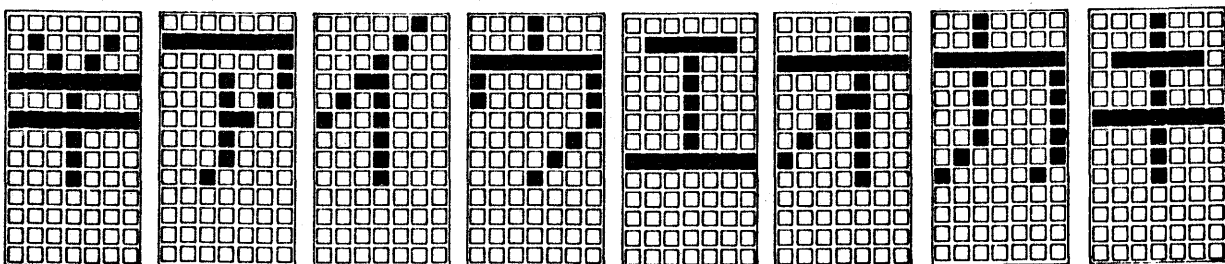
SA.E900A0100



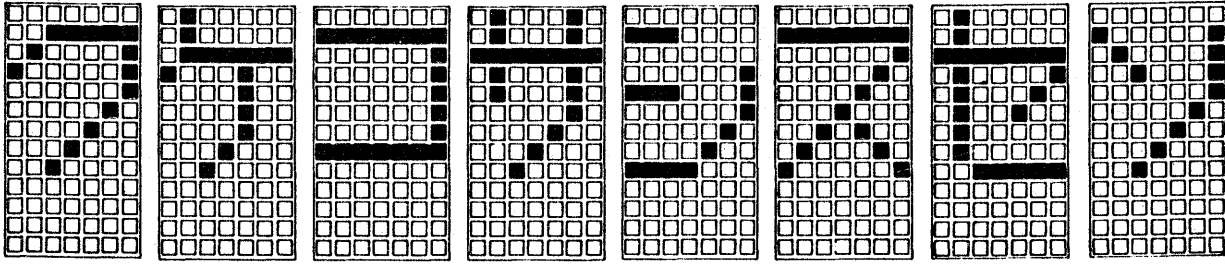
20 21 22 23 24 25 26 27



28 29 2A 2B 2C 2D 2E 2F



30 31 32 33 34 35 36 37



38 39 3A 3B 3C 3D 3E 3F

7x9 KATAKANA

OPTION B9

ADI

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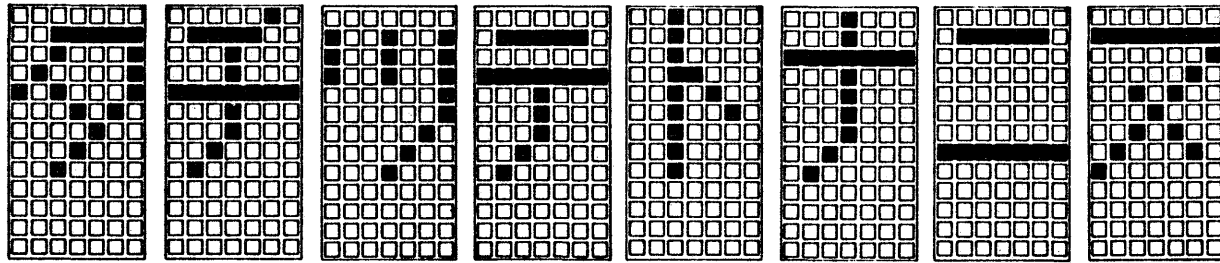
TITLE

BASIC UNIVERSAL TERMINAL

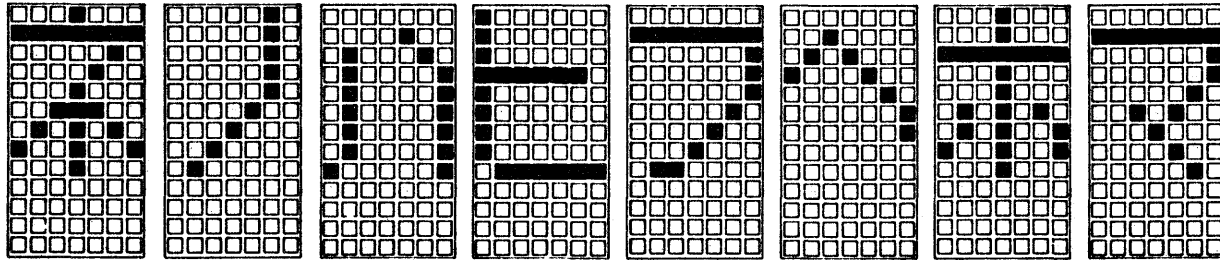
DWG. NO.

SA.E900A0100

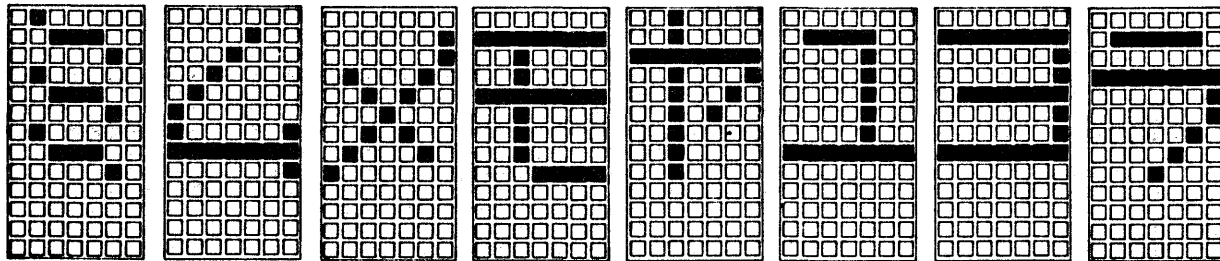
REV. ECN NO. DATE



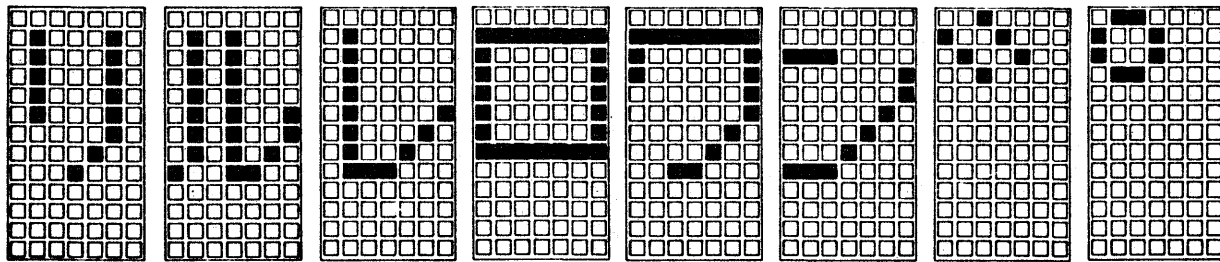
40 41 42 43 44 45 46 47



48 49 4A 4B 4C 4D 4E 4F



50 51 52 53 54 55 56 57



58 59 5A 5B 5C 5D 5E 5F

7x9 KATAKANA (con'd)

OPTION B9

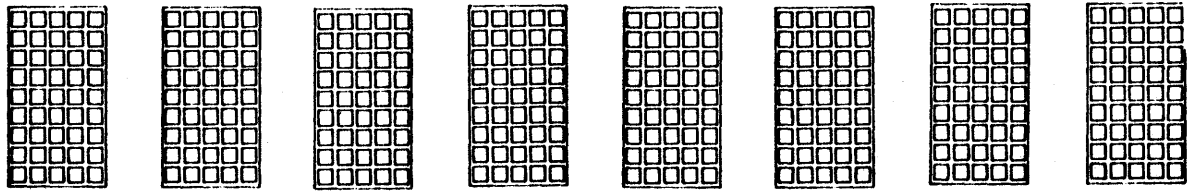
ADI

APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

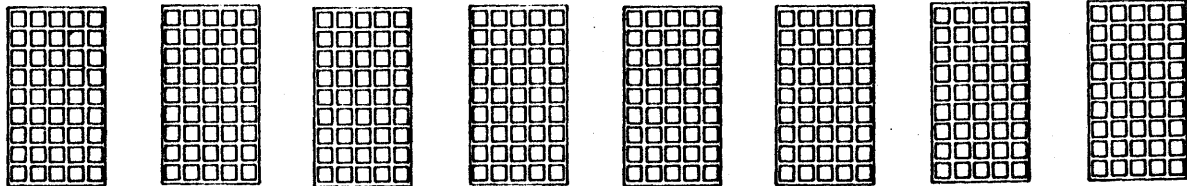
DRAWN BY GILLIAM CHKD. BY ENGR. APPD.

TITLE DWG. NO.
BASIC UNIVERSAL TERMINAL SA.E900A0100

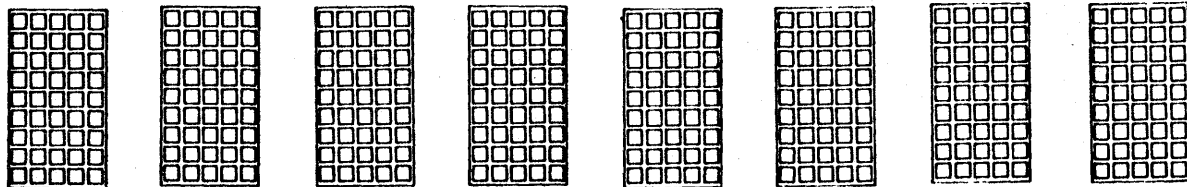
REV. ECN NO. DATE



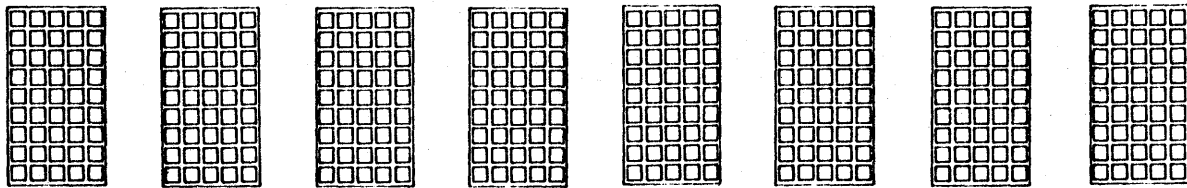
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5x7 WORKSHEET

ADI

APPLIED DYNAMICS INTERNATIONAL
ANN ARBOR, MICHIGAN

DRAWN BY GILLIAM

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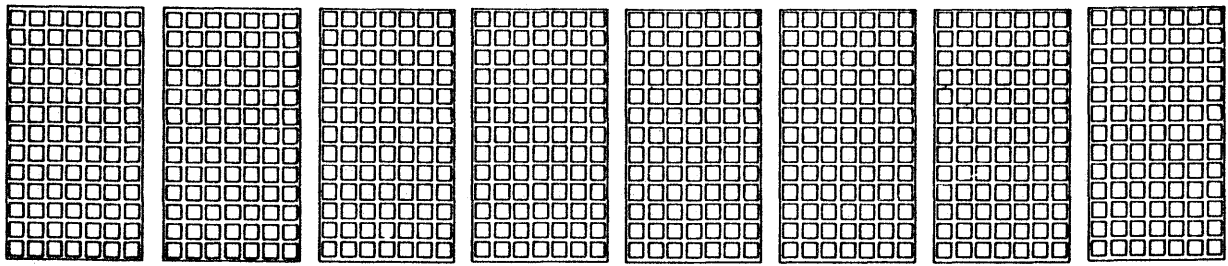
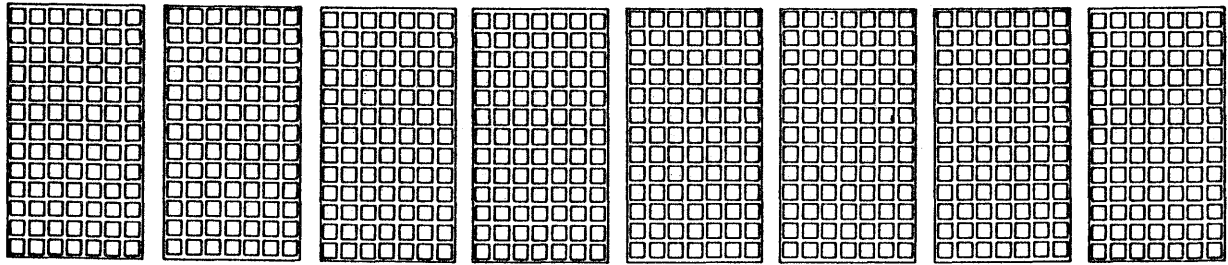
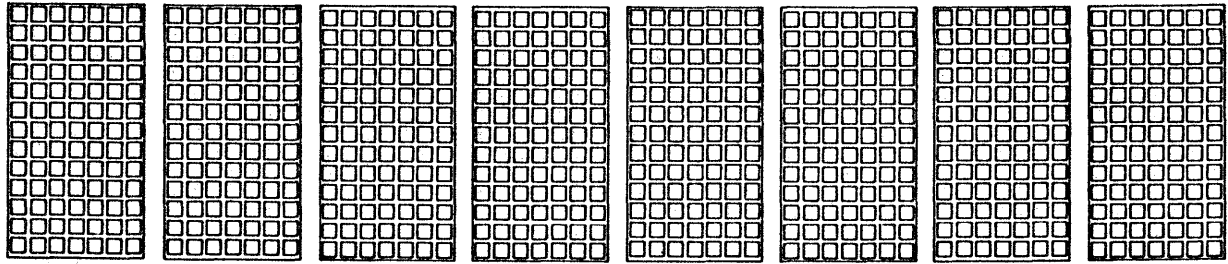
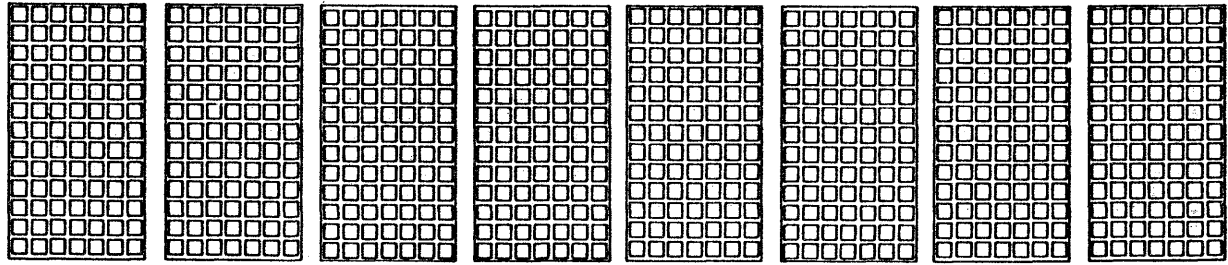
TITLE

DWG. NO.

REV. ECN NO. DATE

BASIC UNIVERSAL TERMINAL

SA. E900A0100



7x9 WORKSHEET

ADI

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REV.

ECN NO.

DATE

TITLE

BASIC UNIVERSAL TERMINAL

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