

MODEL 3500 DATA STATION



USER'S MANUAL

PERKIN-ELMER

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PERKIN-ELMER

Terminals Division

MODEL 3500 Data Station User's Manual

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ERRATA

The Mode Switch discussion on Page 2-3 will be amended at the next printing to include the following information.

MODE SELECTION SWITCH POSITIONS

The position of the Mode Selection Switch determines the frequency and operation states.

<u>60 HZ</u>	<u>50 HZ</u>	<u>Operation</u>
0	8	Standard Operation
1	9	Auto Load
2	A	Skip Time and Date Entries
3	B	Auto Load, but skip Time and Date
4	C	Unassigned
5	D	Unassigned
6	E	Unassigned
7	F	Automatic Debug Mode

Auto Load

Upon power up and after time and date entries, the Model 3500 Data Station searches the Diskette in Drive 0 for the file:

G.CS
G.TK or
G. BA

PETOS automatically loads that task and begins its execution. If a Diskette error is encountered, then the Auto Load task must be initiated from the console line.

Skip Time and Date Entries

Time and date entries ordinarily required at power-up are by-passed.

Debug

Upon power-up, the hardware registers are initialized. The Debug Manager is initialized in lieu of the operating system.

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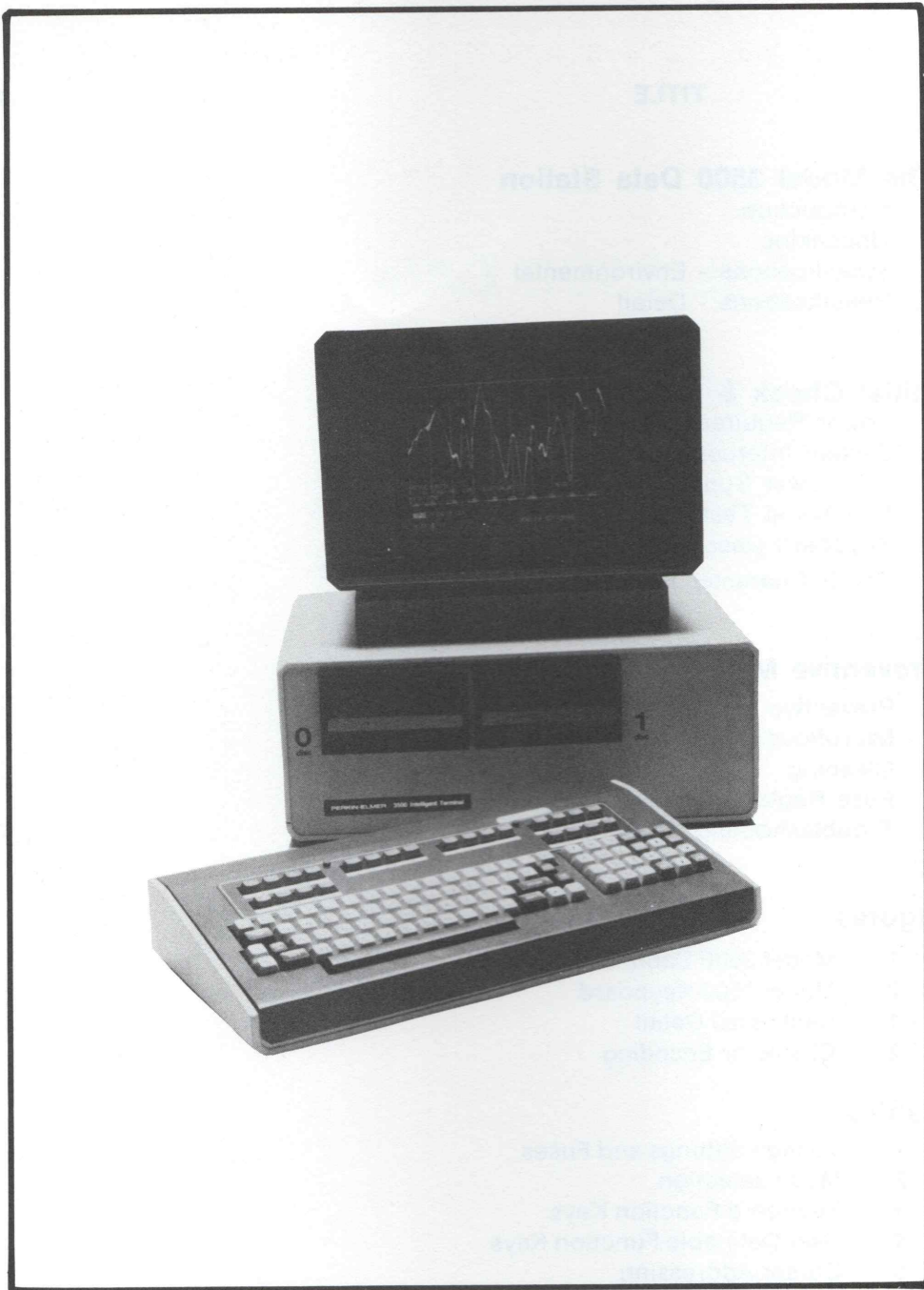
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The new Data Station, the Model 3500 from The Perkin-Elmer Corporation's Terminals Division, is an intelligent terminal specifically designed for incorporation into OEM work stations. The Data Station combines modularity and human engineering qualities, sophisticated program development aids and unbeatable I/O performance, unique provisions for OEM-added hardware and the best OEM terms and conditions available for any intelligent terminal.

Section 1

THE MODEL 3500 DATA STATION OPERATING INSTRUCTIONS

1. INTRODUCTION THE MODEL 3500 DATA STATION

Perkin-Elmer's Model 3500 Data Station is a microprocessor based, programmable video display terminal. The Model 3500 offers one or two optional Microfloppy Diskette drives for data storage and information retrieval. Highly flexible, the unit is suitable for a wide variety of applications from microprocessor development to data analysis, word processing, and instrumentation.

The Model 3500 is modular, incorporating three human-engineered units. Each unit can be moved freely, allowing the most efficient use of the Data Station's work area. The electronics module houses the memory and logic boards, the power supply and Diskette drives. The monitor is a separate assembly, and its screen can be tilted for the best and most comfortable operator viewing. The keyboard is also moveable for operator convenience.

2. UNPACKING AND VISUAL INSPECTION

The Model 3500 is shipped in three separate containers, each module being encased in polywrap, inner and outer cartons, and other packing materials. Save these materials in case shipment is ever necessary — improper packing when returning a unit can void product warranties. If new packing material is required, call Perkin-Elmer Customer Service for replacements.

3. SPECIFICATIONS — Environmental

The Model 3500 operates reliably in a normal office environment. It requires an ambient temperature range between 0°C and +35°C, with a maximum relative humidity of 80% (non-condensing).

4. SPECIFICATIONS — Detail

POWER SUPPLY:

Selectable 100/115/230V, 47-63Hz. See detail for procedures for altering any power supply setting in Section 2.

SCREEN:

Characters	Capacity 2,000 characters.
Number of lines	25; 24 screen, 1 console line.
Screen Size	12 inches (diagonal).
Displayable characters	160 (Upper/lower case, numbers, punctuation, ASCII control characters, form drawing.)
Character matrix	9 x 12
Character generation	7 x 9 (7 x 11 for lower case descenders).
Number of scans	12 per character.
Refresh rate	60 Hz (50), non-interlaced.
Diskette drives	0, 1 or 2
Logic board slots	4
Operating System	PETOS (Perkin-Elmer Terminal Operating System).
Character code	ASCII
Keys	40 special function keys. 24 keys are shiftable to 48 different functions.

Keyboard layout ASCII (bit) pairing.
Repeat rate 15 cps (60Hz) or 12.5 cps (50Hz).

MICROFLOPPY DISKETTE

Tracks 40.
Track Density 48 TPI.
Physical Sectors 16.
Bytes per Sector 128.

MICROFLOPPY DISKETTE DRIVE

Rotational Speed 300 RPM.
Track to Track Access Time 30 msec.
Settle Time 20 msec.
Average Latency 100 msec.
Recording Density 2580 BPI.
Head Load Time 60 msec.
Power-up Delay 1 sec.

Communications RS232, asynchronous, full and half duplex.

PHYSICAL SPECIFICATIONS

Monitor 15" W x 12" H x 13 1/8" D, 30 lbs. (13.6 kg)
Electronics Module 19" W x 7 3/4" H x 13 1/4" *D, 35 lbs. (16 kg)
Keyboard 19" W x 3 1/4" H x 9" D, 8 lbs. (3.6 kg)

* Allow approx. 1 3/8" for connector.

Section 2

INITIAL CHECK AND FUNCTION TEST

1. POWER REQUIREMENTS

Proper power sources and grounding for the Model 3500 are essential for reliable performance. Wire a utility outlet directly to the main power panel for a constant power source. Ensure the line is free of outlets that serve other equipment, such as copying machines, calculators, typewriters, etc. These create electrical noise on the power lines which may cause terminal malfunction. An uninterrupted, grounded connection must exist between the terminal power connector and the ground of the main power line. *Do not use two-prong adapters or two-wire extension cords.*

2. SYSTEM INTERCONNECTION

Figure 2 - 1, Model 3500 Backpanel, shows the Model 3500 Data Station with its lines and interfacing pin receptacles.

1. For easy interconnection, place the screen unit on top of the base with the keyboard nearby.
2. On the rear of the unit, insure that the main power switch is OFF. Refer to illustration for its exact location on the power supply panel.
3. Connect the monitor signal cable ① into the receptacle marked MONITOR on the rear of the base unit.
4. Connect the monitor power cord ② in the .65 Amp power socket on the power supply panel.
5. Connect the keyboard cable ③ in the receptacle marked KEYBOARD on the back of the base.
6. With a flat screw driver, tighten the connector screws which mount lines ① and ③.

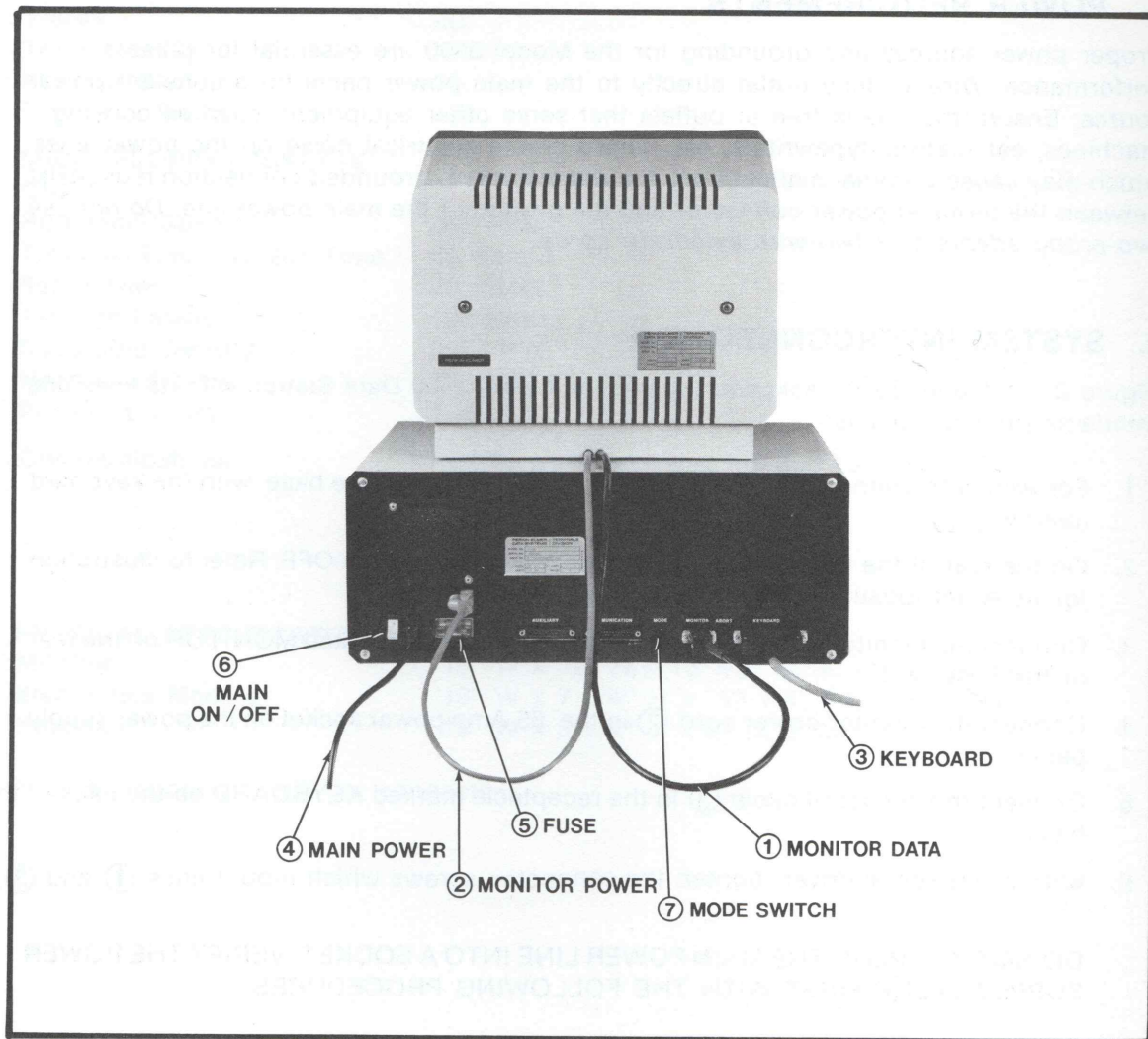
DO NOT YET PLUG THE MAIN POWER LINE INTO A SOCKET. VERIFY THE POWER SUPPLY VALUE FIRST WITH THE FOLLOWING PROCEDURES.

Power Supply Verification:

The operating voltage of power supply for the Model 3500 Data Station is operator selectable via printed circuit card beneath the fuse in the fuse housing.

The setting visible when the card is in place is the setting which corresponds to the voltage, as in Table 2-1. This should match the value stamped on the UL label of the power supply back panel. To change the voltage setting of the power supply;

1. Unplug the Data Station's main power cord ④ from the external power receptacle grounded wall socket and from the rear of the electronics module.
2. Position the fuse cover to its full left position to expose the fuse and printed circuit card. Move the FUSE PULL lever to the left, removing the fuse.
3. Using a long nose pliers or similar tool, firmly grasp the circuit board and pull out.



**Figure 2 - 1 Model 3500 Data Station
Back Panel and Cable Connection**

4. Orient the circuit board for reinsertion so that the desired voltage rating can be properly read on the top left side of the circuit board. Refer to Table 2-1.
5. Maintaining this orientation, reinsert the circuit board in its slot, making sure it is fully inserted so that the fuse cover will clear it.
6. Refer to Table 2-1 to determine the proper fuse rating to match the voltage being selected. Install the fuse.
7. Close fuse and circuit board cover by sliding it right.

Table 2-1 Voltage Setting & Fuse Rating

Card Readings	Voltage Settings	Fuse Rating
100	100	4Amp
120	115	3Amp
220	215*	---
240	230	1.5Amp

To change the frequency setting of the power supply:

1. Refer to Table 2-2 and determine the correct mode switch position for the local frequency.
2. Using a flat blade screwdriver, turn the mode switch to the proper position.

Table 2-2 Mode Selection

Hz.	Mode Select Switch Position
50	0-7
60	8-F

WARNING
A FUSE OF THE PROPER CURRENT RATING MUST BE INSTALLED
TO MATCH THE VOLTAGE RATING SELECTED.
SEE TABLE 2-1.

When the power supply setting is appropriate for the operating environment, the unit may be plugged in.

1. Plug in the main power line ④ into grounded AC socket.
2. Turn unit on ⑥ Fig. 2-1. A bell will sound. Allow 30 seconds for warm-up.
3. Adjust bell volume by turning volume control located on top right rear of keyboard assembly.
4. Adjust the raster by turning the brightness control on the monitor bezel.

*This voltage setting not used.

3. FUNCTIONAL TEST

A test program for verifying the RAM (random access memory) is contained in the ROM (read only memory). Turn the unit on and perform the test in the following manner.

1. The screen displays the prompt on line 1:
ENTER TIME HH:MM
Enter the time of day: first hours, colon, then minutes. Key RETURN. The time of day is now displayed on the 25th line, called the console line, on the right side of the screen.
2. The screen now displays the prompt on line 1:
ENTER DATE YR/MO/DA
Enter the date: year, slash, month, slash, day. Key RETURN. The date is stored in the directory of the Diskette, but otherwise does not appear on the screen. The cursor has returned to the console line.
3. Note that the 25th line, the console line, displays the prompt
PETOS
4. Enter the command DBG and key RETURN. The program status is on the 23rd line and the 24th line displays *.
5. Enter T, RETURN. The screen fills with "U's" and then goes blank.
6. The PETOS operating system tests RAM, which lasts approximately 60 seconds. When the test is completed, the prompt character * appears on the 24th line. The RAM test may be made to repeat until interrupted (loop) by entering L instead of T, in Step 5.
If an error is detected, a descriptive error message appears on the console line.
7. Terminate the RAM test by depressing the CTRL and RELOAD keys simultaneously.
8. Continue the Data Station initial check and functional test by proceeding through the keyboard test, given in the next section.

4. KEYBOARD DESCRIPTION AND TEST

The keyboard (See Figure 2-3) features a familiar office style design for alphanumeric, upper and lower cases, and such operating features as RETURN and automatic repeat (hold a key down for one second). Additional operations such as cursor movements are also provided.

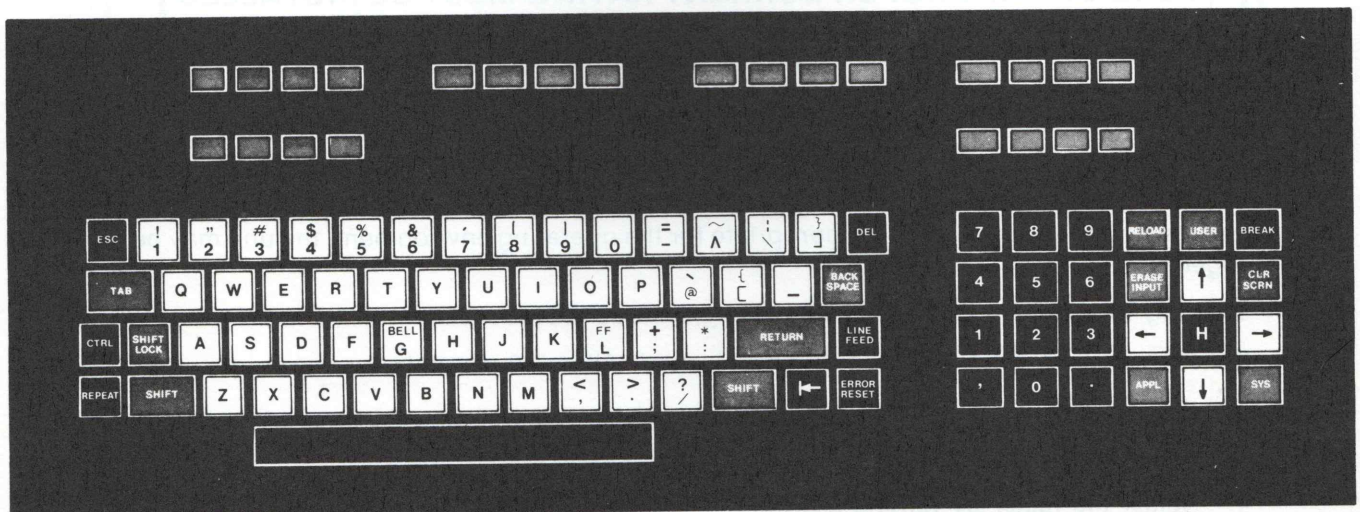


Figure 2 - 2 Model 3500 Keyboard

The keyboard test should consist of using the following tables to depress each key and verify the results of its action.

Table 2 - 3 lists eleven function keys on the main keyboard.

Table 2 - 4 lists 13 user definable function keys.

Table 2 - 5 lists the ESCAPE key combinations for cursor addressing.

Table 2 - 6 gives hexadecimal codes and functions for the 24 (shift up for 48) programmable keys on the upper part of the keyboard.

Table 2 - 3 Keyboard Function Keys

Key	Function
CTRL	Control Key - Used simultaneously with other keys to enable ASCII control functions. (See Section 2).
SHIFT LOCK	Used to maintain the SHIFT key in a depressed state. A second depression will release the SHIFT LOCK key.
REPEAT	Used simultaneously with other keys to provide an instant and continuous repetition of the depressed character. Repeat rate is 15 cps (60Hz) or 12.5 cps (50Hz).
SHIFT	Permits the entry of upper case characters as depicted on the key caps, just as with a typewriter.
ERROR RESET	Causes the error message on the screen to be cleared.
RELOAD	Depressing in conjunction with the CTRL key, causes the system to effectively re-power up (RELOAD). All current information is lost.
ERASE INPUT	Sets the line to nulls and blanks out all input. If special terminator option* is used, ERASE INPUT is treated as a terminator.
APPL	If no keyboard input is in progress, PETOS changes cycles to the next application task with a keyboard request pending. If input is in progress or if no input is requested, APPL is ignored.
SYS	If no keyboard input is in progress, this key puts the terminal in the system mode; otherwise it is ignored. PETOS is displayed.
CLR SCRN	The screen is cleared to ASCII spaces.
BACK SPACE	Moves the cursor one column to the left. If the special terminator option* is used, BACK SPACE is treated as an ordinary alphanumeric character.

*See PETOS Programmer Manual.

In addition to the standard keyboard, there are special keys which perform specific functions. These keys and functions are described in Table 2-6.

Table 2 - 6 Programmable Function Keys

Key	Hex Code	Function
F1-F32	80-9F	When a function key is depressed, one of two actions can occur: 1. If the function key has been defined using the system command "FUNCTION", the definition is substituted for the function key hex code. 2. An undefined function key generates its designated hex code.
F33-F48	E0-EF	

5. ASCII Character Functions

The American Standard Code of Information Interchange (ASCII) provides a set of 32 transmittable characters which are generated by simultaneously depressing the CTRL key and the character key as indicated in Table 2-7. the codes are functionally grouped as follows:

1. Defined function

CTRL + D

EOT (End of Transmission) When depressed this gives the end of file indicator to the requesting task.

2. Undefined functions

The following CTRL and Key combinations are user defined and generate the physical hexadecimal value presented to the application program.

Table 2 - 7 User Defined Control Codes

CTRL Key	Hex Value	CTRL Key	Hex Value	CTRL Key	Hex Value
@	00	M	0D	Y	19
A	01	N	0E	Z	1A
B	02	O	0F	[	1B
C	03	P	10	\	1C
E	05	Q	11	]	1D
F	06	R	12	^	1E
G	07	S	13	_	1F
H	08	T	14		
I	09	U	15		
J	0A	V	16		
K	0B	W	17		
L	0C	X	18		

The above keys are the only keys affected by the CTRL key, and the same results are obtained shifted or unshifted.

Section 3

MAINTENANCE

1. PREVENTIVE MAINTENANCE

Monitor & Keyboard Assemblies: The solid-state circuitry and minimum number of moving parts render the monitor and keyboard assemblies free from elaborate operator maintenance. Preventive maintenance for these units is, therefore, limited to cleaning.

2. MICROFLOPPY DISKETTE HANDLING PROCEDURES

The Diskette is a mylar coated magnetic oxide data storage device and requires the same careful handling as computer magnetic tapes.

1. Return the Diskette to its storage envelope when not being used.
2. Keep Diskettes away from magnetic fields and ferromagnetic materials. Do not lay them down on the top of the monitor.
3. Replace storage envelopes when they become worn, cracked, or distorted.
4. Do not write on the plastic jacket with a pencil or ball-point pen. Use only a felt tip pen.
5. Do not touch or try to clean the Diskette surface.
6. Do not expose Diskette to heat above 50°C or direct sunlight.

3. CLEANING

Using a soft brush, brush accumulated dust from active areas of the terminal as required. Care should be exercised that foreign objects such as staples, pins, etc., do not fall into the keyboard. Clean the cover case, keyboard and other exterior surfaces with a commercially available liquid cleaner or a mild detergent using a soft lint-free cloth and lukewarm water. Use liquids sparingly.

4. FUSE REPLACEMENT

Fuses sometimes blow out due to age, as do light bulbs. However, if a replacement fuse also blows out, then there may be an internal overload requiring the services of a technician. To replace the fuse in the electronics module, proceed as follows:

1. Set main power ON/OFF switch to the OFF position.
2. Remove external power cable from external power outlet.
3. Remove external power cable from receptacle in power supply module at the rear of the electronics module.
4. Slide plastic fuse and power option circuit board cover to the left as far as it will go.
5. Move FUSE PULL lever to the left to remove fuse.
6. Move FUSE PULL lever to the right and install new fuse of the correct type and rating in fuse brackets.
7. Restore plastic slide cover to its original position, install external power cable and set main power ON/OFF switch to ON.

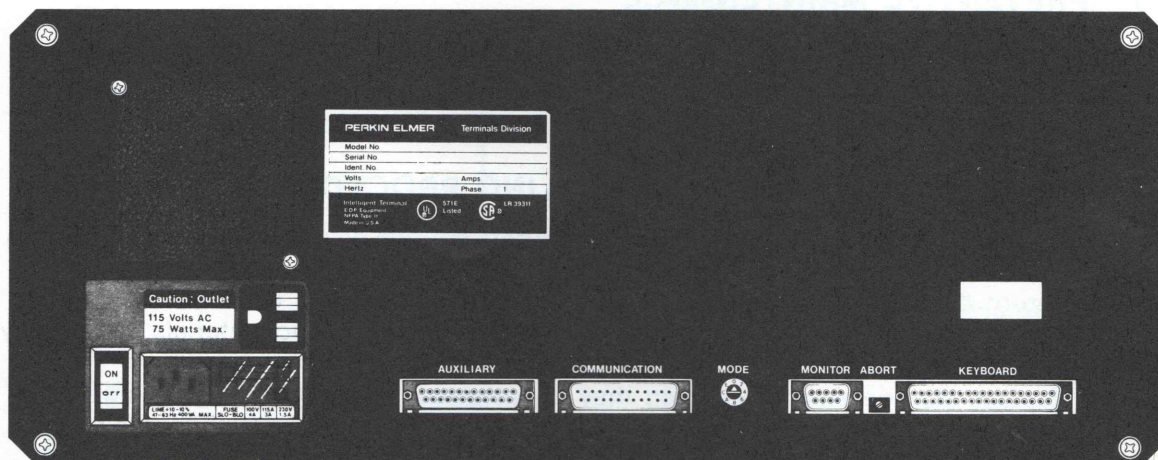


Figure 3 - 1 Backpanel Detail

BITS																			
b8	b7	b6	b5	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
b4	b3	b2	b1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	NUL	DLE	SP	0	(a)	P	\	p	F1	F17					F33	
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q	F2	F18	APPL	↑		F34	
0	0	1	0	2	STX	DC2	"	2	B	R	b	r	F3	F19	SYS	↓		F35	
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s	F4	F20		→		F36	
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t	F5	F21		←		F37	
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u	F6	F22				F38	
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v	F7	F23				F39	
0	1	1	1	7	BEL	ETB	'	7	G	W	w	w	F8	F24	←			F40	
1	0	0	0	8	BS	CAN	(	8	H	X	h	x	F9	F25	ERROR RESET	HOME		F41	
1	0	0	1	9	HT	EM	)	9	I	Y	i	y	F10	F26		ERASE INPUT		F42	
1	0	1	0	A	LF	SUB	*	:	J	Z	j	z	F11	F27	USER	CLR SCRN		F43	
1	0	1	1	B	VT	ESC	+	;	K	[	k	{	F12	F28	BREAK			F44	
1	1	0	0	C	FF	FS	,	<	L	\	l	!	F13	F29				F45	
1	1	0	1	D	CR	GS	-	=	M	]	m	}	F14	F30				F46	
1	1	1	0	E	SO	RS	.	>	N	^	n	~	F15	F31				F47	
1	1	1	1	F	SI	US	/	?	O	_	o	DEL	F16	F32				F48	

Figure 3-2 Character Encoding

5. TROUBLESHOOTING CHART

1. No Display or Power On condition.	Blown fuse. System power cable unplugged. Power switch OFF.	Replace fuse. Plug into power outlet. Set power switch to ON.
2. Microfloppy Disk Drive. Indicator light stays on.	Software problem. Logic failure. Drive Unit failure. Bad or unformatted Diskette	Refer to Maintenance Manual. Obtain proper Diskette.
3. Audible alarm does not shut off.	Major Failure.	Refer to Maintenance Manual.
4. Keyboard does not respond.	Keyboard cable connector unplugged or loose in receptacle.	Reinsert keyboard connector in receptacle.
5. No Display on Monitor	Monitor cable connector unplugged or loose in receptacle. Brightness too low.	Reinsert Monitor connectors in receptacles. Adjust brightness control.

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