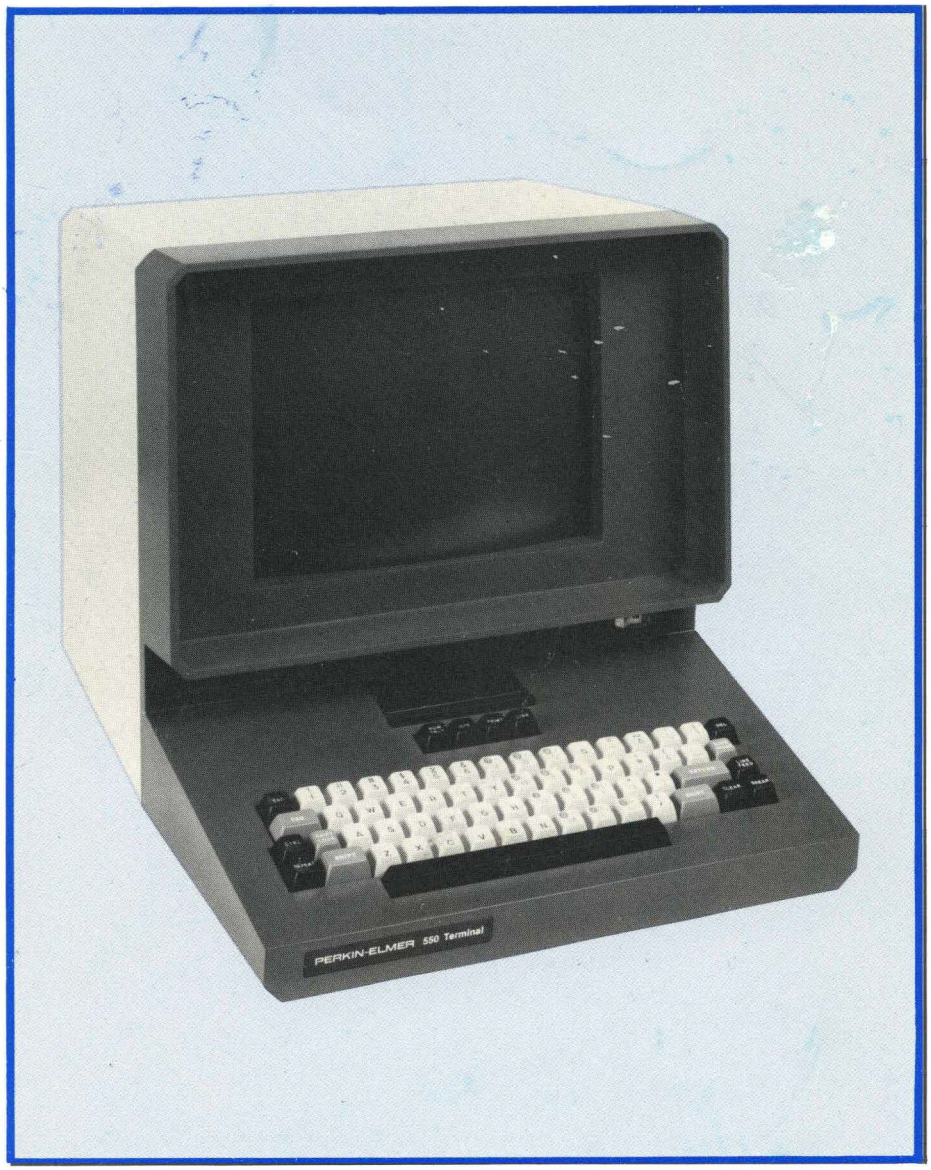
MODEL-550

USER'S MANUAL



PERKIN-ELMER

Terminals Division
Randolph Park West
Route 10 and Emery Avenue
Randolph, New Jersey 07801

MODEL 550
USER'S MANUAL

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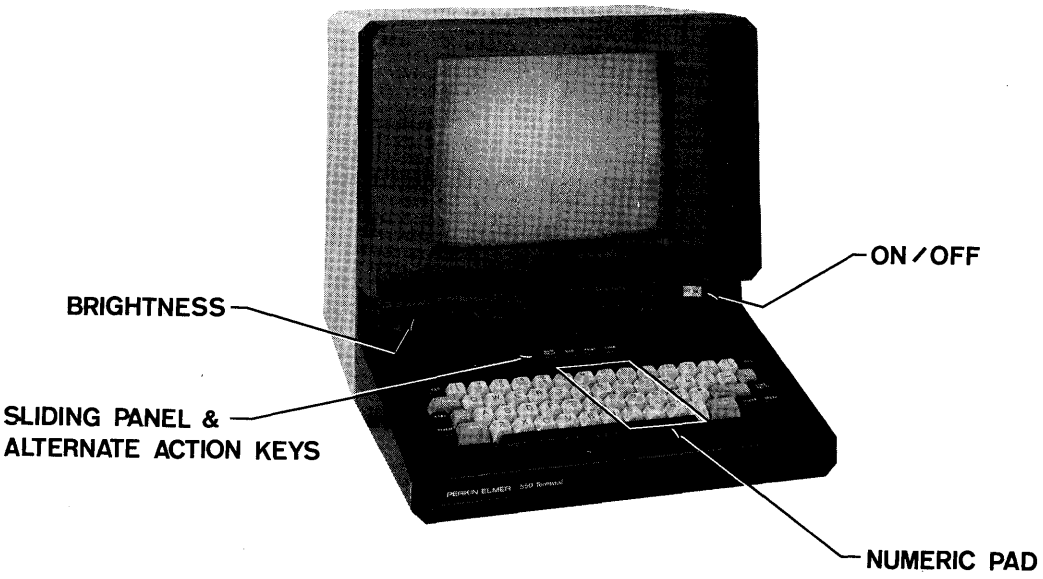
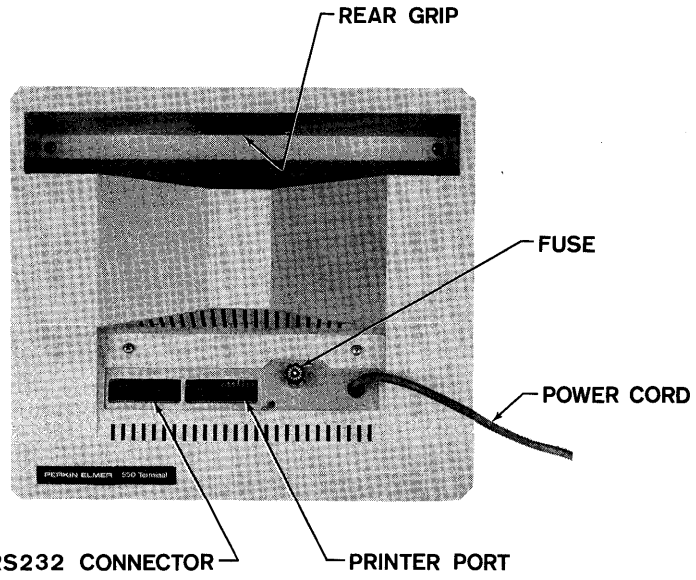




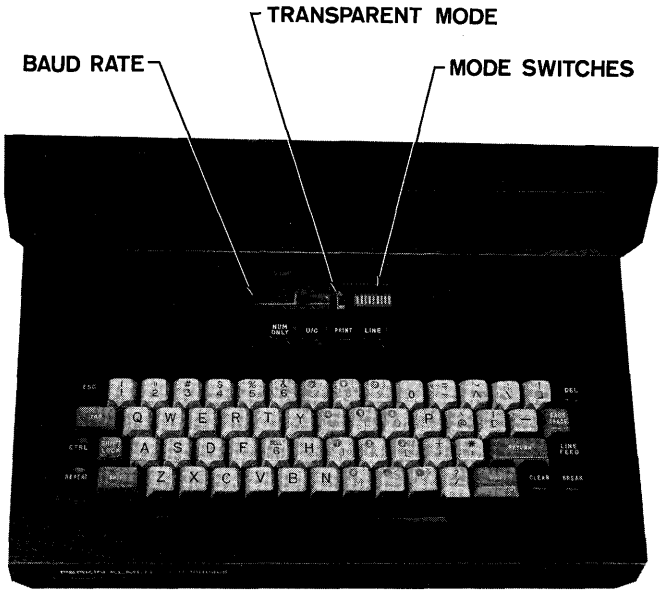


Figure 1-1 Model 550 CRT

Section 1
INTRODUCTION

1.1 GENERAL DESCRIPTION

The PERKIN-ELMER Model 550 terminal is a low-cost, interactive teletypewriter replacement, one of a family of PERKIN-ELMER CRT computer terminals. See Figure 1-1.

The hardware for the Model 550 is assembled from basic building blocks designed around a proprietary LSI CRT controller chip.

1.2 GENERAL SPECIFICATIONS

The basic unit operates on 115V, 60Hz for the domestic market with 100V/115V/230V, 50/60Hz available for the international market. Communications are performed in a serial, asynchronous mode using the EIA RS232C/CCITT V.24 interface or an optional 20ma current loop. Data transmission rate, parity selection, stop bit, and half and full duplex transmission modes are switch selectable. Factory installed options are described under appropriate headings.

1.3 ENVIRONMENTAL SPECIFICATIONS

The terminal operates through an ambient temperature range of 0°C to 40°C with a maximum relative humidity of 80% (non-condensing). When not in operation, it will withstand temperatures ranging from −40°C to +65°C with a maximum relative humidity of 95% (non-condensing).

1.4 PHYSICAL SPECIFICATIONS

The Model 550 measures 14 inches high, 15 inches wide, and 19 inches deep*. It weighs 30 pounds and has an off-white exterior with charcoal grey front. The standard keyboard contains highlighted control keys which facilitate high-speed operations.

Screen Format

Screen size	12 inches diagonal.
Screen capacity	1920 characters.
Number of lines	24.
Characters per line	80.
Phosphor	P4 (white).
Displayable characters	128 upper/lower case characters, numbers, punctuation, and control characters.
Character formation	5x9 characters in a 7x10 field.
Number of scans	10 per character.
Refresh rate	50/60Hz (non-interlaced).

*35.5 x 38.1 x 48.3 cm; 13.6 Kg

Keyboard

Character code	ASCII.
Keyboard layout	ASCII, bit pairing.
Repeat key rate	12 cps.
Shadowed Numeric Pad	0-9, decimal point, comma, in standard calculator format.
Clear key	To avoid accidental loss of data "Control" must be depressed at the same time as "Clear."

Switch Format

Eleven baud rates	110, 200, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, and 9600 baud
Stop bits	One or two.
Transmission	Full or half duplex.
Parity	Space, mark, even or odd.
Refresh rate	50/60Hz.
Video	White-on-black and black-on-white (inverse video).
Modem control	The DTR lead to the modem is disabled when the terminal is in local mode.
Current loop power	Switch selectable. +12V and -12V are supplied by the Model 550 when the current loop option is used. (see Table 3-2).
Transparent Mode	Switchable for display of control characters on the screen.

Factory Options

Keyboard	International keyboards are available in French, Swedish, Danish/ Norwegian, German, British, and Spanish character sets.
Universal power supply	100V/115V/230V, 50/60 Hz, switch selectable
Current loop cable	Switch selectable 20ma current loop for passive, active, or hybrid connections.
Peripheral Interface	Auxiliary output ("wye" type connection) direct connection to the communications port, when enabled by the PRINT key.
Antiglare Screen	Reduces reflection and glare.

Section 2
INITIAL CHECKOUT AND FUNCTIONAL TEST

2.1 UNPACKING AND VISUAL INSPECTION

All Model 550 terminals are thoroughly inspected at the factory for loose or missing hardware, scratches and dents. After taking the terminal out of its box, inspect for any damage incurred during shipment. Refer to the shipping papers to verify the presence of options.

If the shipping carton shows external damage and the unit does not perform properly, file a claim with the shipping firm immediately and notify the PERKIN-ELMER Customer Service Department. PERKIN-ELMER Technical Support Representatives and Customer Engineers are available to provide consultation and assistance on request. A list of PERKIN-ELMER Sales and Service offices is given at the end of this manual.

Retain packing material and container for any future repacking and shipment. Improper repacking will void the warranty.

2.2 ENVIRONMENTAL REQUIREMENTS

See the detailed environmental requirements in Section 1.3.

The Model 550 terminal operates reliably in a typical office environment. Uncomfortably high temperature coupled with low humidity may cause high voltage static discharges which can impair performance. This evaluation should be made when selecting an installation site. Place the Model 550 on a typewriter stand, low desk, or any other surface normally provided for office typewriters.

2.3 POWER REQUIREMENTS

Proper power source and grounding are essential to optimum performance. Standard models are equipped for 115V, ±10%. Wire a utility outlet directly to the main power panel for a "clean" power source. Ensure that this line is free of other equipment, such as copying machines, calculators, electric typewriters, etc. These create electrical noise which may be transmitted through power lines and, under certain conditions, cause a malfunction. The ground wire between the terminal power connector and the main power panel ground must be uninterrupted.

2.4 FUNCTIONAL TEST PROCEDURES

To test all functions of the Model 550 prior to operations, proceed as follows:

1. Set the power switch ON, allowing 30 seconds for the CRT to warm up. The power switch is on the right, above the key board.
2. Release the line key so that the terminal is in the local mode. The line key is on the keyboard, above the alphanumeric keys.
3. Adjust the brightness of the display by adjusting the control dial. It is left, above the keyboard.
4. Set the duplex switch to half duplex operation. The duplex switch is mode switch 8, under the sliding panel. Refer to page 4-1 for the location of this and other mode switches.
5. Depress each alphanumeric key in upper and lower case. Verify that the display is accurate.
6. Home the cursor by depressing the ESC and then upper case H keys.
7. Depress ESC and CTRL keys at the same time. The screen should fill with a scrolling display of 95 characters plus the nondisplay character, DEL.
8. To terminate the scrolling display of the self-test, depress DEL and CTRL at the same time.
9. Familiarize yourself with the function keys by reading Section 4, Operations. Using the Keyboard Control and Keyboard Code tables (Tables 4-1 and 4-3), verify that all keys work as stated.

A final test may be performed with the Model 550 on-line in the full duplex mode if the host processor can be programmed to be in the ECHOPLEX mode. Repeat the above test at the desired baud rate to verify that the data line is operational. (Refer to Section 4 Operations, for initial setup of the terminal.)

Section 3
INTERFACING

3.1 DATA COMMUNICATIONS

The terminal transmits ASCII coded data in an asynchronous format. See Table 4-2. Each character is preceded by a start bit and followed by one or two stop bits. The terminal has an EAI RS232C interface and (when ordered), an optional 20ma current loop adapter. Those EIA signals which apply to this class of terminal (asynchronous data communications) are assigned to pins in accordance with EIA Specification RS232C for interfacing data communication equipment. Both the standard EIA circuit name and the circuit name used in Europe (CCITT V.24) are shown in Table 3-1, EIA Data Interface.

Table 3-1. EIA Data Interface

25-Pin Male Connector	EIA RS232C	CCITT	Signal Name
1	AA	101	Chassis Ground
2	BA	103	Transmit Data
3	BB	104	Receive Data
6	CC	107	Data Set Ready
7	AB	102	Logic Ground
8	CF	109	Carrier On
9*	—	—	+12V
10*	—	—	-12V
19	—	—	Printer Busy
20	CD	108.2	Data Terminal Ready

*Used on terminals with current loop option (switch selectable — See Figure 4-1).

The EIA Data Interface

Not all signals at this interface are required for most applications. Signal descriptions are arranged from most used to least used.

Pin 1 — AA Chassis Ground, and Pin 7 — AB Logic Ground, should be carried in a cable to a device such as a modem which is wired according to RS232C. These signals are tied internally.

The "primary channel" data lines, Pin 2 — BA Transmit Data, and Pin 3 — BB Received Data, are the lines on which data go to and from the terminal.

The signals, Pin 6 — CC Data Set Ready, and Pin 8 — CF Carrier On, are not used by the Model 550.

When mode switch 9 is OFF, the line key, on the keyboard, controls Data Terminal Ready. When the terminal is on-line, Data Terminal Ready is high. If the terminal is switched to local (off-line), Data Terminal Ready is switched low. When Switch 9 is ON, Data Terminal Ready is held at a constant high.

If an auxiliary output interface is used, then when the printer generates a busy signal on pin 5 of its auxiliary port, the signal is sent to the host on pin 19 of the EIA Data Interface.

The Current Loop Interface (optional)

The current loop cable converter board forms an integral part of the cable. The board converts the RS232C signals into 20ma current loop levels. The signals generated by the interface are listed in Table 3-2.

Table 3-2. Current Loop Interface

Signal Name	15-Pin Male Connector
Logic ground	15
TDU*	7
Receive (+)	11
Receive (-)	12
Send (+)	9
Send (-)	10
Chassis ground	1

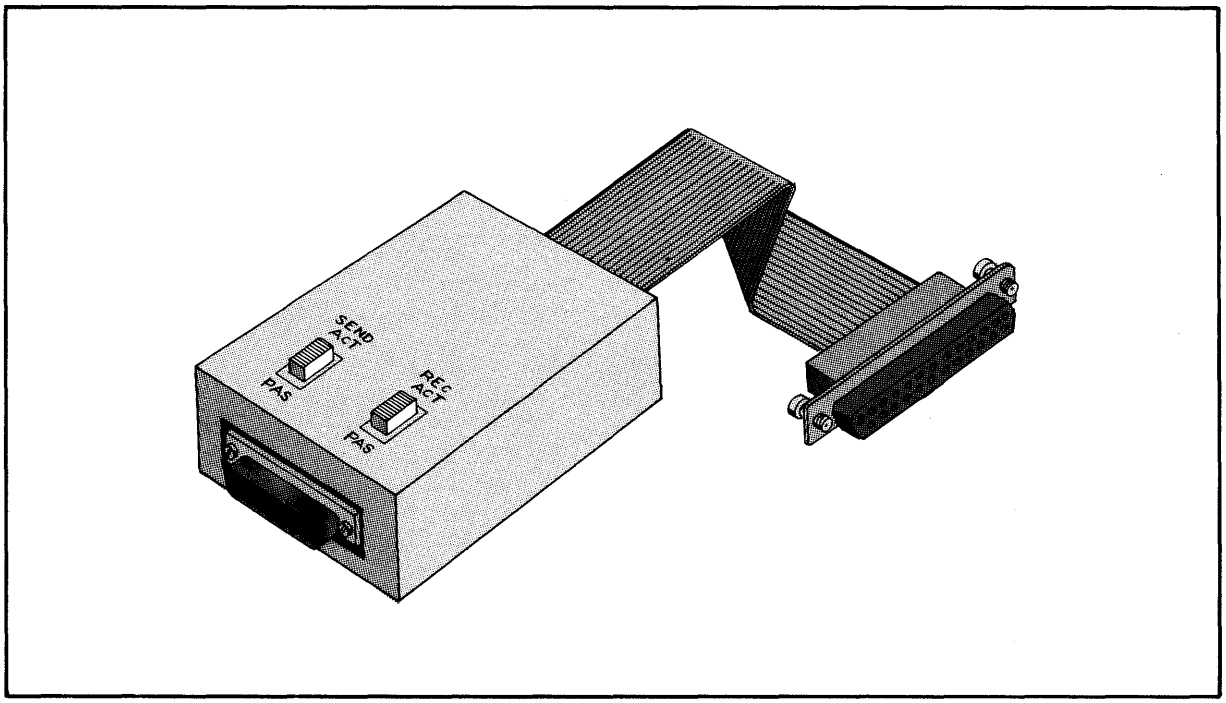
The current loop interface uses optoisolators and can operate at any speed up to 9600 baud, depending on line length and type.

Two techniques for using the current loop are:

1. The terminal supplies the 20ma current for the loop (active).
2. The user's device supplies the 20ma current for the loop (passive).

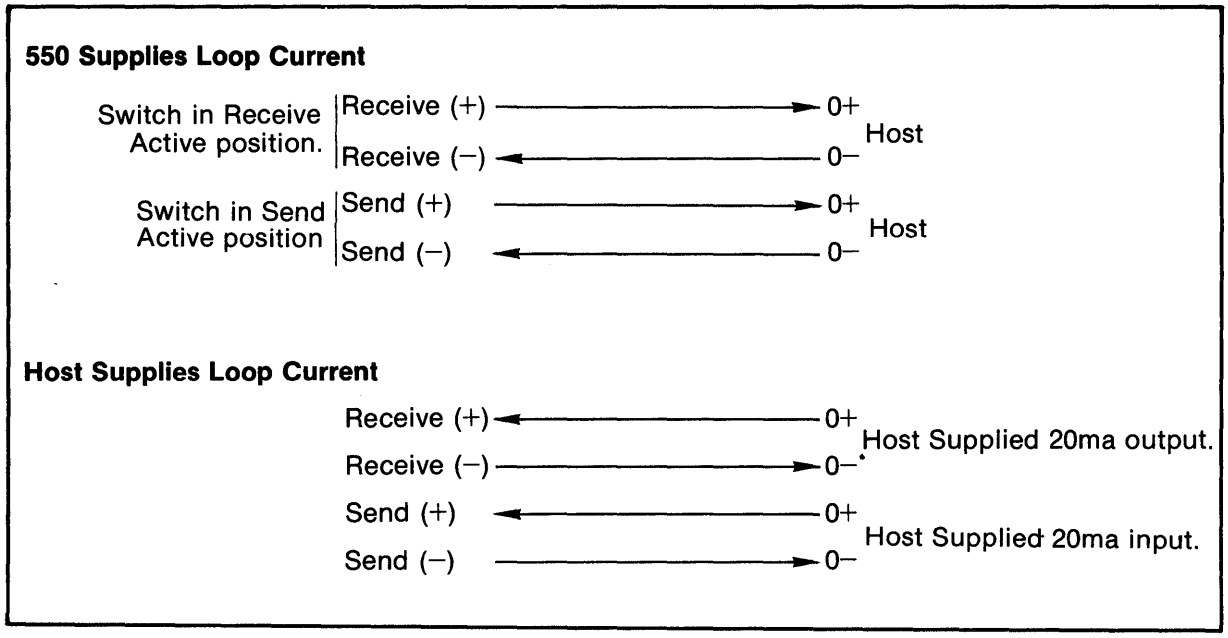
Frequently, a hybrid of the two is used, e.g., the user provides the 20ma to the terminal but expects "contact closure" outputs from the terminal. (Most teletypewriters accept a loop current and provide "contact closure" outputs.) The adapter box on the optional current loop cable permits the setting of switches (Passive/Active) on both the send and receive current loops. See Figure 3-1.

Figure 3-1. 20ma Current Loop Adapter



*Busy signal used by Perkin-Elmer processor systems.

Figure 3-2 Current Loop Connections



3.2 AUXILIARY OUTPUT INTERFACE (Optional)

A local output device, such as a printer, can be connected to the Model 550 via the auxiliary output interface port located on the rear panel of the terminal. The port is unidirectional and is intended to interface serial devices adhering to EIA standards.

Depressing the latching print key connects serial data from the host computer to the auxiliary output interface port via a "wye" connection between the communications port and this port.

Printers which generate busy characters (DC1/DC3; DC2/DC4), are received on pin 2 of the auxiliary interface. They are ORed with the CRT keyboard data.

RS232C Interface

Table 3-3 lists the pin connections and signal names used on the RS232C auxiliary output interface.

Table 3-3. EIA Auxiliary Output Interface

25-Pin Female	Signal Name
1	Chassis ground
2	Printer Transmit Data
3	Printer Receive Data
5	Printer Busy
6	Data Set Ready (+12V)
7	Logic Ground
8	Carrier On (−12V)

Section 4
OPERATIONS

4.1 INITIAL SETUP

Before starting operations, the following procedures should be performed:

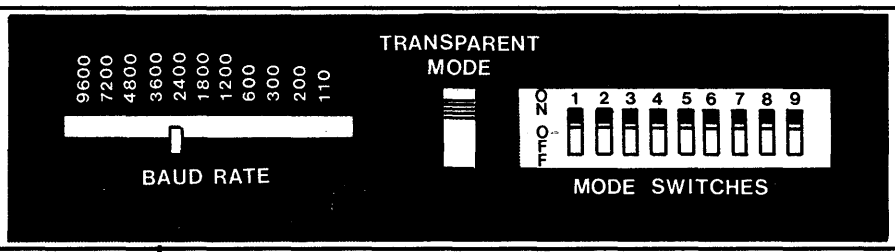
1. Set the power switch to ON. Allow 30 seconds for warm up.
2. Place the terminal in the local mode by releasing the line key (undepressed).
   Adjust the brightness control to the desired comfort level.
3. Set full or half duplex, switch 8,for either full duplex (FDX) or half duplex (HDX) operation as required.
4. Type a message and verify that it is correctly displayed on the CRT screen.

4.2 DATA LINE SETUP

Switches are under the sliding front panel above the keyboard. (See Figure 4-1)

1. Set the baud rate switch to the transmission rate of the host computer.
2. Set the stop bits to one or two.
3. Set the parity, switches 1 and 2, to the parity state required by the host computer.
4. Set refresh rate, switch 4 (50 or 60 Hz).
5. Set the DTR, switch 9, to the required protocol.
6. Enable the +12V and −12V switches (6 and 7 respectively), if the current loop cable is connected.
7. Set the Passive/Active switches on the current loop adapter cable as required (refer to Table 3-2).
8. Depress the line key on the keyboard.

Figure 4-1. Front Panel Switches



Parity Switch	1	2	Mode Switch	3	4	5	6*	7*	8	9
Odd	OFF	OFF	ON	1-stop	50 Hz	INV. video	+12V	−12V	HDX	DTR high
Even	OFF	ON								
Mark	ON	OFF	OFF	2-stop	60 Hz	STD.	open	open	FDX	LINE switch controlled DTR
Space	ON	ON								

*Used with the current loop option.

4.3 ESTABLISHING COMMUNICATIONS

The next step depends upon the communications link used by the host computer. If the host computer is accessed via private wire or direct cable connections, the Model 550 is ready for operation. If the Model 550 is connected via switched telephone lines, the computer must be dialed to establish the connection.

4.4 OPERATIONS

Operation of the Model 550 is controlled by the computer and/or the keyboard, depending on the transmission mode. Figure 4-2 depicts the various selectable modes of operations.

On-line operations may take place in either full or half duplex mode. In the full duplex mode, data transmitted via the keyboard do not appear on the CRT unless the host computer is programmed to echo the characters (ECHOPLEX).

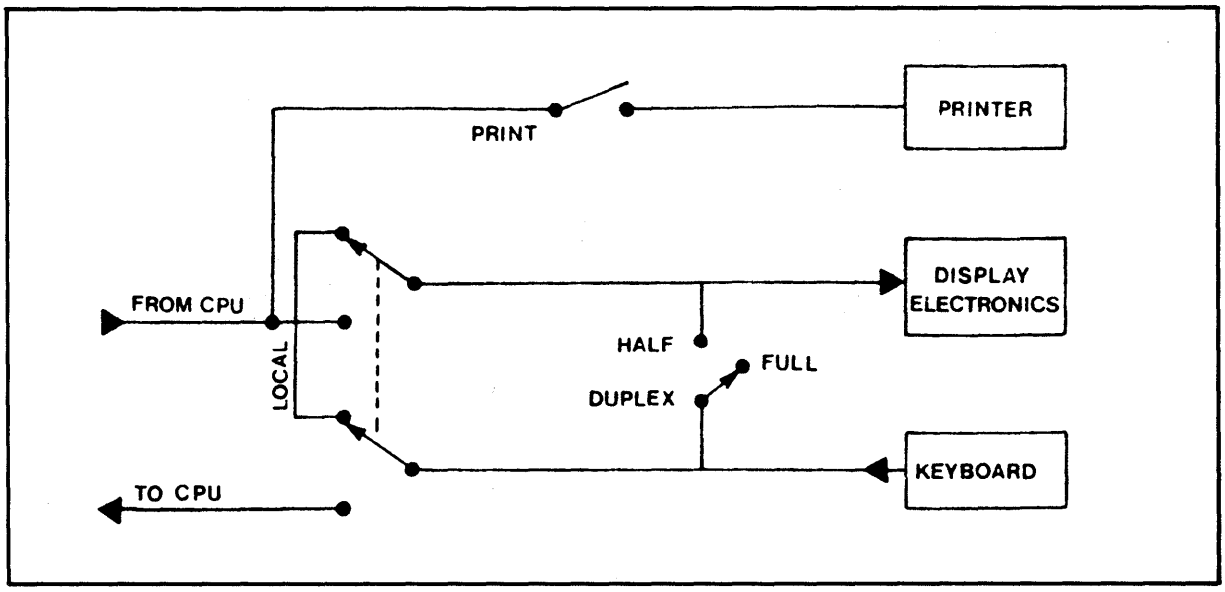
In the half duplex mode, ECHOPLEX is not required since a direct tie to the electronics is completed via the duplex switch. Queries and acknowledgements from both the host computer and the keyboard will be displayed in the conventional manner. However, if the keyboard and computer generate data simultaneously, the display will show intermixed characters.

Note that in local mode, no data are transmitted over the lines. Keyboard input causes the appropriate action to take place directly on the display. In all cases, display memory will store and display all displayable input characters. Non-displayable characters are not stored in the display memory unless preceded by an ESC.

In the transparent mode, all received characters are stored in display memory. Control characters such as CR, LF, etc., are displayed but not executed.

In this mode only, the display provides automatic CR/LF at the end of each line and scrolls at the end of the page.

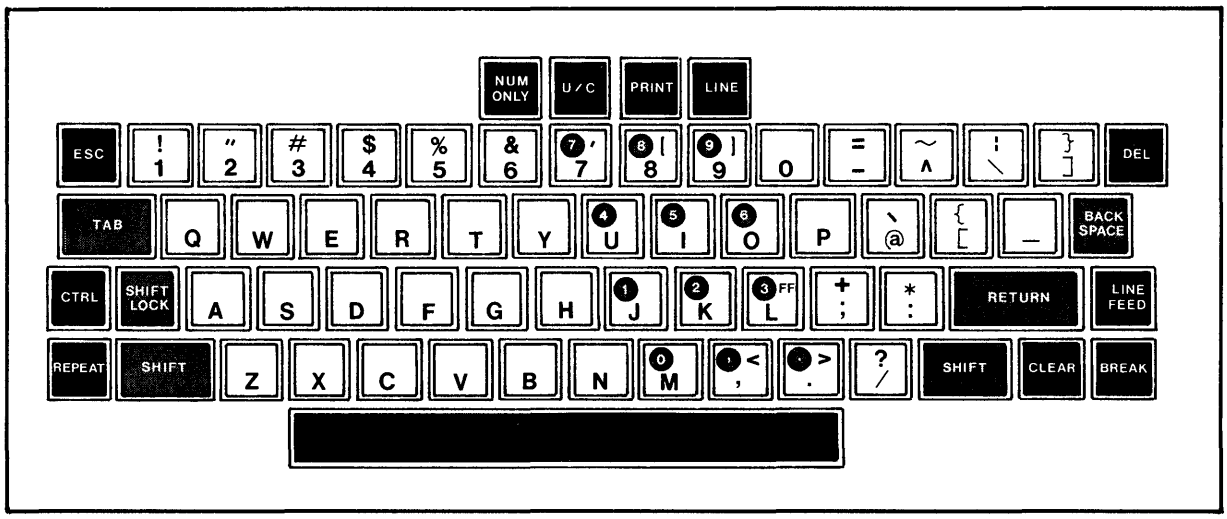
Figure 4-2. Transmission Modes



4.5 KEYBOARD FUNCTIONS

The terminal keyboard (Figure 4-3) is separated into two basic groups of keys, alphanumeric keys used to enter data, and function keys used in peripheral control, to erase screen, etc. All the alphanumeric keys generate ASCII code which, depending on the transmission mode, is immediately transmitted and/or stored in terminal memory. The repeat key feature of the Model 550 causes a repetition rate of 12 cps after any key is held down in conjunction with it.

Figure 4-3. Model 550 Keyboard



The following keyboard description (Table 4-1), lists each key and its control function. An asterisk (*) designates alternate action switches, double asterisks (**) designate momentary action switches, and an "at" sign (@) designates ASCII character generation.

Table 4-1. Keyboard Controls

Item	Control Key	Function
1	LINE	*When set, places terminal on-line. When released (off-line), and full/half duplex switch is in half duplex, terminal displays only data entered via the keyboard. No data are received or transmitted via the communications lines.
2	U/C	*Lower case alpha characters are converted to upper case, plus the following: to @, { to [, | to \ , } to] and ~ to ^ Conversion takes place only to characters entered from the keyboard.
3	PRINT	*Enables the auxiliary port; on-line data are routed via a "wye" connection from the communications port to the auxiliary output port.
4	NUM ONLY	*When set, enables the calculator formatted keyboard section for quick numeric entries.
5	REPEAT	**Used in conjunction with other keys to provide an instant and continuous repetition of the depressed key. Repeat rate is 12 cps.
6	CLEAR	**When depressed simultaneously with CTRL, display memory is cleared and cursor goes to Home.
7	ESC	@**(EC) Escape Key used in conjunction with other keys to enable specific functions.
8	TAB	@**(HT) Horizontal tab used to move the cursor to the next tab position. If the cursor is at the end of the line, it will move to the first position of the next line.
9	BACK SPACE	@**(BS) Moves the cursor to the left one position. The cursor will not move if a backspace is attempted at Home. If the cursor is in position one of any line (except line one), it will "wrap back" to position 80 of the previous line when backspace is attempted.
10	DEL	@**Generates an ASCII delete character which is stored only if preceded by ESC.
11	LINE FEED	@**(LF) Used to move the cursor down one line. On the 24th line the *display* is moved up one line, causing line one to scroll off the display.
12	RETURN	@**(CR) Returns the cursor to the first position of the current line.
13	CTRL	**Control key used in conjunction with other keys to enable specific functions.
14	SHIFT LOCK	*Used to maintain the shift key in the depressed state.
15	SHIFT	**Permits the entry of all the upper case characters depicted on the keyboard.
16	BREAK	**Presents the communications line with a space (break) for as long as the key is depressed. It has no effect when the terminal is in local mode.
17	Space Bar and Character Keys	@**Writes a character at the current position and moves the cursor one position to the right. The cursor will stop at position 80. Any additional entries will overwrite at position 80.

* Alternate
** Momentary
@ ASCII

4.6 ASCII CONTROL FUNCTIONS

The American Standard Code for Information Interchange (ASCII) provides a set of 32 transmittable characters which are keyboard generated using a simultaneously depressed CTRL key and a character key (see Tables 4-1 and 4-2). The codes are functionally grouped as follows:

Communication control characters — Functional characters which control or facilitate transmission of information over communications networks.

Format effector codes — Functional characters which control the layout or position of information in printing or display devices.

Information separator codes — A group of four characters which are used in a graded order that serves to separate and qualify information.

Table 4-2. ASCII Coding Chart

					COMMUNICATION CODES		PRINTABLE CHARACTERS					
b_7					0	0	0	0	1	1	1	1
b_6					0	0	1	1	0	0	1	1
b_5					0	1	0	1	0	1	0	1
Bits	b_4 ↓	b_3 ↓	b_2 ↓	b_1 ↓	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	LF	SUB	*	:	J	Z	j	z
	1	0	1	1	11	VT	ESC	+	;	K	[	k	{
	1	1	0	0	12	FF	FS	,	<	L	\	l	|
	1	1	0	1	13	CR	GS	–	=	M	]	m	}
	1	1	1	0	14	SO	RS	.	>	N	^	n	~
	1	1	1	1	15	SI	US	/	?	O	_	o	DEL

Table 4-3. Keyboard Codes

CTRL & KEY CODE	FUNCTION
@ *NUL (Null)	All-zeros character which can be used to accomplish time and media fill.
A *SOH (Start of Heading)	Communications control character used at the beginning of sequence of characters constituting machine-sensible address or routing information.
B *STX (Start of Text)	Communications control character which precedes the transmission of characters started by STX.

*Ignored when received by the Model 550.

Table 4-3. Keyboard Codes (Continued)

CTRL & KEY	CODE	FUNCTION
C	*ETX (End of Text)	Communications control character used to terminate a sequence begun with STX.
D	*EOT (End of Transmission)	Communications control character used to indicate conclusion of message transmission.
E	*ENQ (Enquiry)	Communications control character used as a request for a response from remote station.
F	*ACK (Acknowledge)	Communications control character transmitted by the receiver as an affirmative response to sender.
G	*BEL (Bell)	Character used to cause an audible alarm at a remote terminal.
H	BS (Backspace)	Format effector causing the cursor to move one space backward on same line.
I	HT (Horizontal Tabulation)	Format effector causing the cursor to move to the next-in-series of predetermined positions along the line. Fixed tab stops are in every eighth position.
J	LF (Line Feed)	Format effector causing the cursor to advance to the next line.
K	*VT (Vertical Tabulation)	Format effector causing movement of paper to first predetermined line on next form or page.
L	FF (Form Feed)	Treated by the Model 550 as the equivalent to line feed.
M	CR (Carriage Return)	Format effector which causes cursor to position itself at the first position of the line.
N	*SO (Shift Out)	Code used to indicate that code combinations which follow will be interpreted as outside of the character set of standard ASCII Code until an SI character is reached.
O	*SI (Shift In)	Code used to indicate that code combinations which follow will conform to codes listed on the standard ASCII Code Chart.
P	*DLE (Data Link Escape)	Communications control character which will change the meaning of a limited number of continuously following characters.

*Ignored when received by the Model 550.

Table 4-3 Continued

CTRL & KEY	CODE	FUNCTION
*Q *R *S *T	(=DC1) (=DC2) (=DC3) (=DC4)	Device controls, used for control of auxiliary devices associated with communications systems, especially switching devices on or off.
U	*NAK (Negative Acknowledgement)	Communications control character transmitted by the receiving station as negative response to the sending station.
V	*SYN (Synchronous Idle)	Communications control character used by a synchronous transmission system.
W	*ETB (End of Transmission Block)	Communications control character used to indicate the end of block data.
X	*CAN (Cancel)	Control character used to indicate that the data with which it is sent is in error or is to be disregarded.
Y	*EM (End of Medium)	Control character used to indicate the physical end of medium, or the end of the unwanted portion of information recorded on the medium.
Z	*SUB (Substitute)	Character used for substitution of a character that is determined to be invalid or in error.
[	ESC (Escape)	Control character used to provide code extension. The Escape character itself is a prefix affecting the interpretation of a limited number of suffix characters.
|	*FS (File Separator)	Information separators used within data in an optional fashion. FS is most inclusive. US is least inclusive.
]	*GS (Group Separator)	
^	*RS (Record Separator)	
—	*US (Unit Separator)	
No CTRL Key	DEL (Delete)	Character used primarily for time and media fill.

*Ignored when received by the Model 550.

4.7 ESCAPE CODE SEQUENCES

The Model 550 offers, as standard, use of the ESC key plus a character key or keys to effect an escape code sequence. Escape code sequencing permits the expansion of the ASCII code to include controls for cursor positioning, direct cursor addressing, and display clearing. Unlike the ASCII control functions, these functions are initiated by depressing and releasing the ESC key followed by the character key(s). The terminal offers the following escape code sequences:

Table 4-4. Escape Code Sequences

Code*	Action
ESC A	Cursor up. Moves cursor up by one line. If in line one, cursor will wrap around to line 24.
ESC B	Cursor down. Moves cursor down by one line. If in line 24, will move display up by one line.
ESC C	Cursor right. Moves cursor one position to the right. When cursor is moved beyond position 80 the cursor will wrap around to position 1 of the following line.
ESC D	Cursor left. Moves cursor one position to the left. When cursor is moved beyond position 1 the cursor will wrap around to position 80 of the previous line. The code is ignored if the cursor is at the Home position.
ESC H	Cursor home. Moves cursor to position 1, line 1 (Home).
ESC X character	Direct cursor address — line position. Moves cursor vertically to any line as specified by the character following "X", as shown in Table 4-5. The code is ignored if it exceeds 24 lines.
ESC Y character	Direct cursor address — character position. Moves cursor horizontally to any position on a line. The character following "Y" specifies the character position as specified in Table 4-4.
ESC K	Clear all. Will clear display memory to spaces and home the cursor. ESC K needs 20ms to refresh. Thus, the programmer should insert sufficient nulls as filler data (20 at 9600 baud).
ESC I	Clear line. Will clear the line (reset to spaces), starting with the present position of the cursor through the end of the line. ESC I needs 20ms to refresh. Thus, the programmer should insert sufficient nulls as filler data (20 at 9600 baud).
ESC (followed by a non-ESC character).	ASCII characters other than A, B, C, D, H, X, Y, K, and I are stored in the display memory as data.
ESC ESC	When a second ESC code follows an ESC, the second is displayed but is not used to generate any ESC code sequences with following characters.

*Note that ESC combinations are upper case.

Table 4-5 Cursor Addressing

ASCII CHARACTER	LINE or COLUMN
(SP)	1
!	2
"	3
#	4
$	5
%	6
&	7
'	8
(	9
)	10
*	11
+	12
,	13
-	14
.	15
/	16
0	17
1	18
2	19
3	20
4	21
5	22
6	23
7	24

LINE

ASCII CHARACTER	COLUMN
8	25
9	26
:	27
;	28
<	29
=	30
>	31
?	32
@	33
A	34
B	35
C	36
D	37
E	38
F	39
G	40
H	41
I	42
J	43
K	44
L	45
M	46
N	47
O	48
P	49
Q	50

ASCII CHARACTER	COLUMN
R	51
S	52
T	53
U	54
V	55
W	56
X	57
Y	58
Z	59
[	60
\	61
]	62
^	63
_	64
`	65
a	66
b	67
c	68
d	69
e	70
f	71
g	72
h	73
i	74
j	75
k	76
l	77
m	78
n	79
o	80

Examples:

ESC X + ESC Y > moves the cursor to line 12, position 31.

ESC X 7 ESC YZ moves the cursor to line 24, position 59.

Section 5
MAINTENANCE

The solid state circuitry of the Model 550 and relatively few moving parts, renders the terminal virtually free from operator required maintenance. Preventive maintenance is, therefore, restricted to cleaning.

5.1 CLEANING

Brush accumulated dust from active parts of the terminal as it accumulates. Care should be exercised that foreign objects such as staples, pins, paper clips, etc., do not fall into the keyboard or into the front panel switch area.

Clean the cover case, keyboard, and other exterior surfaces with a liquid cleaner or a mild detergent and lukewarm water. Do not use solutions which erode plastics.

Use any liquid sparingly.

5.2 OPERATOR CHECKLIST

Table 5-1. Lists the various symptoms and possible causes of common errors. These errors are correctable at the operator level, thereby avoiding unnecessary service.

Table 5-1. Troubleshooting

Symptom	Possible Cause
1. No display	• Terminal unplugged • Blown fuse • Power switch OFF • Brightness too low
3. Unintelligible data is displayed in on-line mode, operates in local mode.	• Erroneous baud rate setting
4. Each character keyed is displayed twice.	• FULL/HALF DUPLEX switch set erroneously to HALF.

5.3 FUSE REPLACEMENT

Fuses sometimes blow in much the same manner as light bulbs. If this is the case, then a simple fuse replacement (as outlined below) is appropriate. However, if the replacement fuse also blows, then this may indicate an internal short which *requires service.* To replace a fuse, proceed as follows:

1. Set the power switch OFF and disconnect the power cord.
2. Rotate the fuse cap (rear panel) counterclockwise and remove the fuse.
3. Replace blown fuse with a $^{8}/_{10}$ ampere SLO-BLO for a 115V (60Hz) terminal or a $^{3}/_{8}$ ampere, SLO-BLO for a 230V (50Hz) terminal.

All replacement fuses must be UL listed and rated for 250V minimum.

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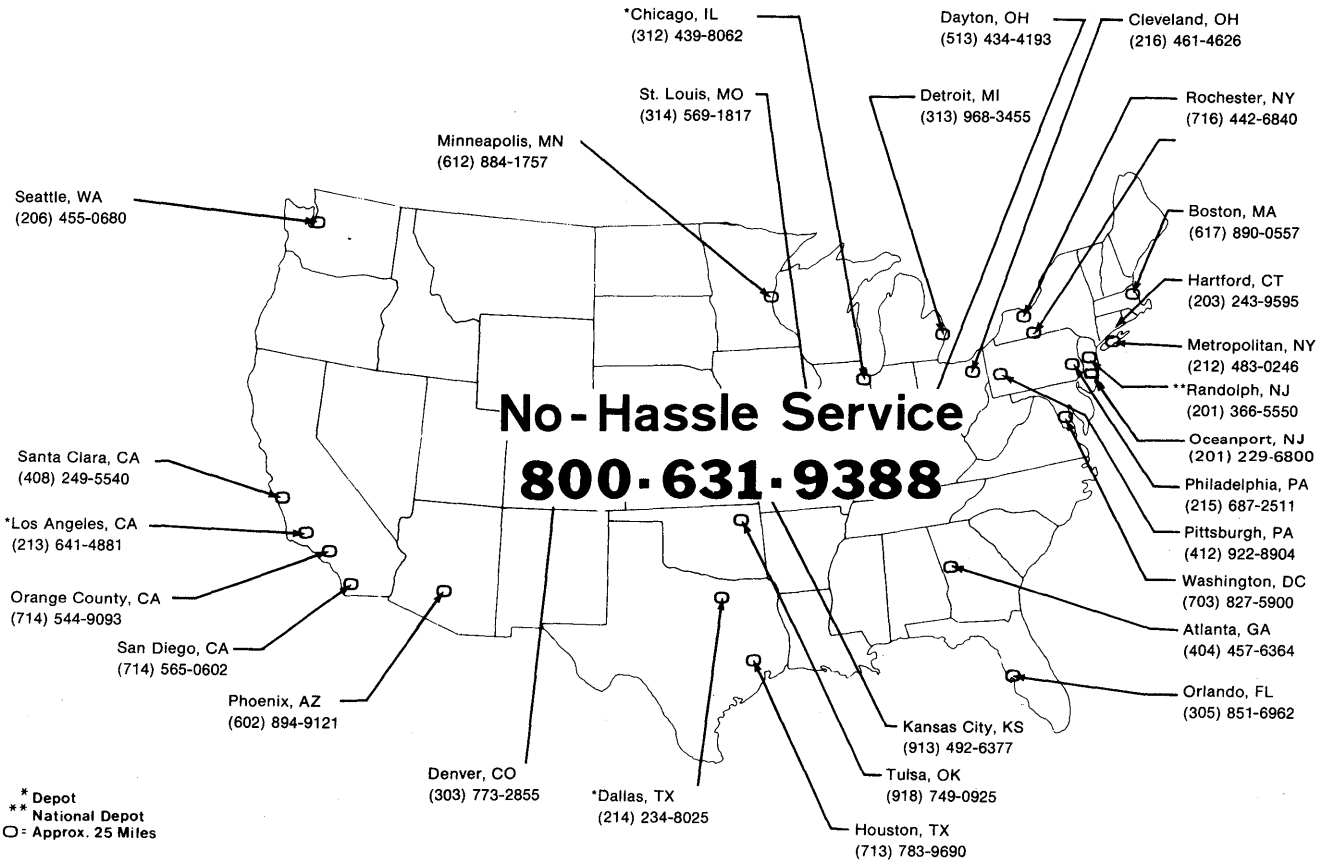
Call your nearest Perkin-Elmer Sales and Service office, or one of our authorized, full-service distributors for more information about the Model 550 CRT as well as the full line of Perkin-Elmer equipment.



INTERNATIONAL

AUSTRALIA
Interdata Computers Pty. Ltd.
3 Byfield St.
North Ryde
New S. Wales 2113
Australia
612-887-1000

CANADA
Interdata of Canada, Ltd.
6486 Viscount Rd.
Mississauga, Ontario
Canada L4V 1H3
416-677-8990

FRANCE
Perkin-Elmer Data Systems
France S.A.
83/85 Avenue
Aristide Briand
94110 Arvueil
664 18 58

WEST GERMANY
Interdata GmbH
8 Munchen 71
Forstenrieder Allee 122
Interdata-Zentrum
West Germany
89 753081

UNITED KINGDOM
Interdata Ltd.
227 Bath Rd.
Slough SL14AX
England
0753 34511

SINGAPORE
Interdata — Perkin-Elmer Data Systems — Far East — P.T.E. Ltd.
30th Floor, U.I.C. Bldg.
Shenton Way, Singapore 1
Republic of Singapore
2200-949

SOUTH AFRICA
Protea PNI (Pty. Ltd.)
746 6th St.
Wynberg 2001
Johannesburg, South Africa
11/786-3647

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Terminals Division
Randolph Park West
Route 10 and Emery Avenue
Randolph, New Jersey 07801