

ML10968  
Rev.-

# PR-40A THERMAL PRINTER OPERATING MANUAL

JULY 1988

Copyright Telecommunications Techniques Corporation 1988

TELECOMMUNICATIONS TECHNIQUES CORPORATION  
444 North Frederick Avenue  
Gaithersburg, MD 20877 U.S.A.  
(301) 258-5011 Telex: 908736

# IMPORTANT

Please return the enclosed card so TTC may ensure that product updates, application notes, and new product information reaches the users of our equipment.

1

## **SECTION 1 GENERAL INFORMATION**

### **1.1 INTRODUCTION**

This operating manual contains information required to install and operate Telecommunications Techniques Corporation's PR-40A Thermal Printer. Specifically included in this manual are a description of the printer, installation instructions, operating procedures, specifications, and service and warranty information.

### **1.2 INSTRUMENT OVERVIEW**

The PR-40A is an alphanumeric and graphics printer utilizing thermal dot matrix printing. The PR-40A features 40- and 80-column printing in a self contained housing including complete control and interface electronics. It can be powered by a built-in nickel cadmium battery or through an AC adaptor. Compact and portable, the PR-40A measures 2.2" H x 9.3" W x 6.3" D and weighs only 2.1 pounds.

## SECTION 2 SETTING UP THE PR-40A PRINTER

### 2.1 INTRODUCTION

This section includes information on unpacking and inspecting the PR-40 Printer and making the proper power connections. It also contains a description of the printer's controls, procedures for loading the printer with paper, and instructions for setting the DIP switches.

### 2.2 UNPACKING

The shipping container housing the PR-40A should be inspected for damage when it is received. If the shipping container or shipping material has been damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked for proper operation. Set-up instructions are given later in this section, and a checklist for resolving routine operational difficulties is included in Section 4. If the contents of the shipment are incomplete, or if the PR-40A fails to operate properly, notify TTC. If the shipping container is damaged, notify the carrier as well as TTC, and keep the shipping container and materials for the carrier's inspection.

### 2.3 EQUIPMENT INCLUDED

The following is a list of parts that should be present when the PR-40A is unpacked.

- (1) PR-40A Thermal Printer
- (2) AC Adaptor
- (3) Thermal Printer Paper (1 roll) (TTC Part Number 10967)
- (4) Carrying Case (TTC Part Number 40831)
- (5) Connection Cable (TTC Part Number 30511)
- (6) PR-40A Operating Manual (ML10968)

### 2.4 POWER REQUIREMENTS

The PR-40A may be powered either by the AC adaptor (included) or the built-in nickel cadmium battery.

### 2.4.1 AC Adaptor Operation

When operated with the AC adaptor, the PR-40A requires an uninterrupted source of 120 VAC power. The DC plug on the AC adaptor inserts into a power jack on the printer's rear panel.

**CAUTION:** Do not use an AC adaptor other than the one supplied with the PR-40A. Using a different, and possibly incorrect, adaptor may damage the PR-40A or cause it to malfunction.

### 2.4.2 Battery Operation

The PR-40A's built-in nickel cadmium battery allows the printing of approximately 1500 character lines before recharging is needed. Since the battery may not be fully charged when the PR-40A is shipped, it should be recharged when received. The battery can be recharged by plugging in the AC adaptor for approximately 10 hours. The battery should not be recharged for more than 48 hours at a time, since doing so may adversely affect printer performance or damage the printer. The battery should always be recharged before storing the printer.

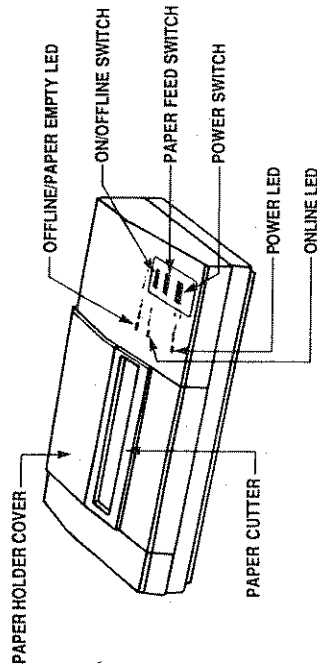
If the PR-40A loses battery power while printing, it will automatically go off-line. Any data being transmitted at the time of power loss will be retained in the buffer memory, and the green ON LINE indicator will flash to signal the presence of such data. The data in the buffer memory can be printed by plugging in the AC adaptor and placing the PR-40A back on line. Data should not be left in the buffer memory for any length of time after battery power is lost.

### 2.5 INSTRUMENT DESCRIPTION

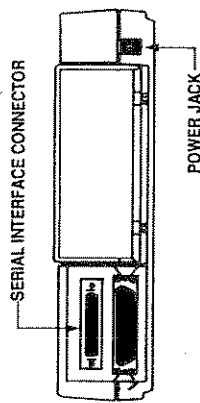
Figures 2-1 thru 2-3 identify the controls, parts, and accessories of the PR-40A Printer. The PR-40A's controls are located on the top panel of the printer. The POWER switch applies power to and removes power from the printer; the switch slides up or down to the appropriate position. The POWER indicator is illuminated when power is applied. Pressing the ON LINE switch will set the printer on-line, and the adjacent green indicator will be illuminated. Pressing the switch again will take the printer off-line, and the red OFF LINE/PAPER END indicator will be illuminated. This indicator will flash when the paper is near the end of the roll or has run out. The FEED switch, when pressed, causes the paper to feed continuously; this switch is operational only when the OFF LINE indicator is illuminated or is flashing.

### 2.6 LOADING PAPER

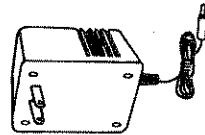
The thermal paper supplied with the PR-40A Printer should be stored away from heat, moisture, and light. To prevent discoloration, the paper should not come



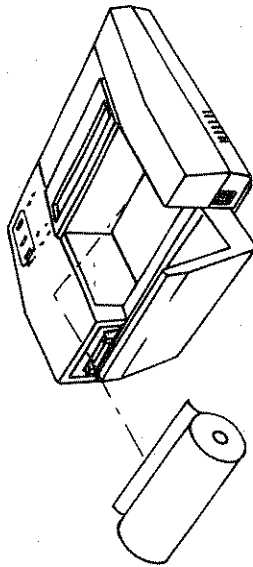
**Figure 2-1**  
PR-40A Top Panel



**Figure 2-2**  
PR-40A Rear Panel



**Figure 2-3**  
AC Adaptor



**Figure 2-4**  
Loading Printer Paper

in contact with vinylchloride film or organic solvents, and only water solvent, starch, or composite glues should be used with the paper. The following procedure contains instructions for loading the PR-40A with paper. The printer should never be allowed to print without paper.

**NOTE:** Use only the printer paper (Part Number 10967) supplied with the PR-40A. Use of incorrect paper may cause poor printing or printer malfunction.

- (1) Open the paper cover on the top panel by pressing slightly to unlatch the cover and lifting it toward the back of the printer to expose the paper roll.
- (2) Cut the paper to be threaded into the printer into a squared V-shape. A jagged paper edge may make loading difficult.
- (3) As shown in Figure 2-4, insert the end of the paper in the direction of the arrow, and press and hold the FEED switch until the paper flows smoothly out the front of the printer mechanism. The paper should never be pulled backwards out of the printer.

**NOTE:** Since only the outside of the paper roll is coated with a heat-sensitive agent for printing, the coated (outside) side of the paper should be facing down when the paper edge is first inserted into the printer.

**NOTE:** Always use the FEED switch to feed out the paper. If the paper is pulled out by hand, it must be fed one line with the FEED switch before printing begins.

- (4) Use the paper cutter to neatly tear off the printer paper by pulling the paper slightly forward from left to right.
- (5) Close the paper cover and latch it shut by pressing down slightly.

## 2.7 PRINTER SELF-TEST

The PR-40A Printer has a self-test function to ensure print quality. The self-test is enabled by setting the POWER switch to the ON position while simultaneously pressing and holding the FEED switch. During the self-test, the PR-40A prints one set each of all characters, followed by a zigzag pattern for 10 lines. The printing self-test then ends automatically.

## 2.8 CABLE CONNECTION

A cable (Part Number 30511) is provided for connecting the PR-40A to the test set. Pin assignments and descriptions for the serial interface are given in Section 3 (Specifications).

Before connecting the printer to the test set, ensure that neither instrument has power applied. Connect the AC adaptor to the printer and to the power source; then connect the cable from the printer to the test set. It is recommended that power be applied to the test set before the printer is turned on.

## 2.9 DIP SWITCH SETTINGS

The PR-40A Printer features two sets of DIP switches on its bottom panel that enable the user to select required functions.

**NOTE:** Power to the PR-40A must be turned off and then turned on again to activate any changes in DIP switch settings.

A set of eight printer control DIP switches determine the input data format, the number of columns desired, and the character set; settings for these switches are shown in Table 2-1. A second set of six DIP switches determine the serial RS-232 port configuration. They include character length, parity, and baud rate; settings for these switches are shown in Table 2-2. An asterisk (\*) indicates the factory-set

Table 2-1  
Printer Control DIP Switches

Switch #	Function	ON	OFF
SW1	Input data format	Parallel	Serial*
SW2	Auto Line Feed	Enabled*	Disabled
SW3	No. of columns/line	40*	80
SW4	Character selection	Regular	Special*
SW5	Zero form selection	0	Ø
SW6	International Characters	—	USA*
SW7		USA*	—
SW8		USA*	—

position of each of the DIP switches. These are the settings for the most common applications using TIC products; however, the RS-232 settings should be double-checked with each piece of equipment used.

Table 2-2  
RS-232 DIP Switches

Switch #	Function	ON	OFF
SW1	Data bit length	8 (graphics)*	7
SW2	Parity	Disabled*	Enabled
SW3	Parity selection	Odd	Even*
Baud Rate			
		75	150
SW4		ON	ON
SW5		ON	ON
SW6		ON	ON
		300	600
		ON	ON
		OFF	OFF
		ON	ON
		OFF	OFF
		ON	ON
		OFF	OFF
		1200	2400*
		OFF	OFF
		ON	ON
		ON	ON
		OFF	OFF
		ON	ON
		OFF	OFF
		4800	9600
		OFF	OFF
		ON	ON
		OFF	OFF

**NOTE:** For normal ASCII printing, either 7 or 8 data bits may be used. However, to correctly receive graphics printouts, the printer must be set for 8 data bits.

**NOTE:** If the printer is set for 7 data bits, the parity permission should be enabled, otherwise a serial data error will occur.

**NOTE:** When a framing error occurs, a heart character is printed. When a parity error occurs, a spade character is printed. When both types of error occur, they are processed as a parity error.

## SECTION 3 SPECIFICATIONS

### 3.1 INTRODUCTION

This section contains the specifications for the PR-40A Thermal Printer.

### 3.2 PRINTING SPECIFICATIONS

- **Printing Method:** Thermal dot matrix.
- **Printing Speed:** Regular: 37.5 characters/sec.  
Condensed: 50 characters/sec.
- **Character Font:** Regular: 9 x 7 dot matrix, 2.47 x 1.88 mm.  
Condensed: 9 x 7 dot matrix, 2.47 x 0.94 mm.
- **Character Set:** See Table 3-1.
- **Number of Columns:** Regular: 40 columns/line.  
Condensed: 80 columns/line.

### 3.3 PAPER SPECIFICATIONS

- **Paper Type:** Heat sensitive roll paper (TTC Part Number 10967).
- **Paper Size:** 4.37" (112 mm) wide, roll diameter 1.9" (48 mm).

### 3.4 PHYSICAL SPECIFICATIONS

- **Dimensions:** 2.27" high x 9.36" wide x 6.32" deep (58.5 x 240 x 162 mm).
- **Weight:** 2.1 pounds (950 g).
- **Power:** 120 VAC.
- **Operating Temperature:** 32°F to 122°F (0°C to 40°C).
- **Storage Temperature:** 4°F to 140°F (-20°C to 60°C).

Table 3-1  
Character Code Table

	0	1	2	3	4	5	6	7
0	0000	0001	0010	0011	0100	0101	0110	0111
1			SP	∅	@	P	'	p
2		DC2	"	1	A	Q	a	q
3			#	2	B	R	b	r
4		DC4	\$	3	C	S	c	s
5			%	4	D	T	d	t
6			&	5	E	U	e	u
7			'	6	F	V	f	v
8	1000	BS	(	7	G	W	g	w
9	1001	HT	)	8	H	X	h	x
A	1010	LF	*	9	I	Y	i	y
B	1011		+	:	J	Z	j	z
C	1100	FF	ESC	;	K	I	k	{
D	1101	CR	,	<	L	\	l	
E	1110	SO	-	=	M	^	m	~
F	1111	SI	.	>	N	^	n	~
			/	?	O	-	o	DEL

Codes in the blank sections are ignored.  
SP signifies space.

### 3.5 RS-232C SERIAL INTERFACE

- Bit Rate: 75 to 9600 baud, asynchronous.
- Bit Length: 7 or 8 data bits.
- Parity: Odd, even, or no parity.
- Input Signal Polarity: Data Mark: -3 V to -25 V.  
Data Space +3 V to +25 V.  
Control ON: +3 V to +25 V.  
Control OFF: -3 V to -25 V.
- Handshaking: When the signal condition at Pin 20 (DTR) is:  
OFF (Mark) - Data transfer should be disabled.  
ON (Space) - Data transfer should be enabled.
- Signal Description and Pin Assignments: See Table 3-2.

### 3.6 AC ADAPTOR

- Input: 120 V, 60 Hz.
- Output: 6 V, 2000 mA.
- Current Consumption: 1.5 A.
- Dimensions: 3.2" x 2.3" x 1.9" (82 x 60 x 49 mm).
- Weight: 1.1 pound (510 g).

## SECTION 4 MAINTENANCE AND SERVICE

### 4.1 INTRODUCTION

This section contains information on resolving routine operational difficulties and TTC's warranty policy.

### 4.2 MAINTENANCE

If the PR-40A fails to operate properly, check the items listed in Table 4-1 as a guide to resolving the problem. If all of these items have been checked and found to be in correct working order, and the PR-40A still fails to operate properly, contact TTC's Customer Service Department.

### 4.3 SERVICE

#### 4.3.1 Warranty Policy

All equipment manufactured by Telecommunications Techniques Corporation (TTC) is warranted against defects in material and workmanship. This warranty applies only to the original purchaser and is non-transferable unless express written authorization of the warranty transfer is granted by TTC.

The PR-40A Thermal Printer will be repaired or replaced (at our option) at no charge for a period of one (1) year after shipment to the customer. Liability under this warranty extends only to the replacement value of the equipment. The warranty is void under the following conditions.

- (1) Equipment has been altered or repaired without specific authorization from TTC.
- (2) Equipment is installed or operated other than in accordance with instructions contained in TTC literature and operating manuals.

No other warranty is expressed or implied. TTC is not liable for consequential damages.

#### 4.3.2 In-Warranty Service

Equipment in warranty must be returned to the factory with shipping prepaid. The equipment should be packed and shipped in accordance with instructions in Section 4.3.4 of this manual. Before returning any equipment, the customer must obtain a Return Authorization (RA) number by contacting the TTC Repair Department. The RA number should then appear on all paperwork and be clearly marked on the outside of the shipping container.

**Table 3-2**  
Signal Description and Pin Assignments

Pin #	Signal	I/O	Description
1,7	GND	-	Ground
3	Data	I	Serial data input to the printer.
20	Data Terminal Ready (DTR)	O	ON (Space) when printer is ready to accept data; OFF (Mark) when printer is not ready to accept data.

**Table 4-1**  
**Operational Problems and Resolutions**

Problem	Resolution
POWER switch is set to the ON position, but the PR-40A fails to operate.	Check to see that the AC adaptor is securely plugged into an uninterrupted 120 VAC power source and that the DC plug of the adaptor is securely plugged into the power jack on the PR-40A's rear panel.
Printer head moves, but nothing is printed.	Check that the paper is correctly loaded so that the coated side of the paper comes in contact with the printer head (see Section 2.6 for instructions on loading the paper).
Printing is light.	Ensure that the paper is the correct type for the PR-40A Printer.
Printer head stops during printing.	Ensure that the paper is properly feeding through the printer and is not jammed inside the printing mechanism. <b>NOTE:</b> Remove power from the PR-40A before attempting to correct a paper jam.
The first printing is doubled.	The paper may have been pulled out by hand rather than with the FEED switch after the last printing or loading. Feed the paper one line with the FEED switch to correct.
Printer goes off-line by itself.	The nickel cadmium battery may need to be recharged (see Section 2.4.2 for instructions on battery operation).
Characters other than those in the character code table (Table 3-1) are printed.	Check that the number of data bits, parity setting, and parity enable are set correctly (see Section 2.9 for instructions on setting the DIP switches).

After the equipment is repaired by TTC, it will be tested to applicable specifications, burned-in for at least 24 hours, retested, and returned to the customer with shipping prepaid. A brief description of the work performed and the materials used will be provided on the Equipment Repair Report furnished with the returned equipment.

### 4.3.3 Out-of-Warranty Service

The procedure for repairing out-of-warranty equipment is the same as that used for equipment still in warranty. However, there is a minimum charge applied to each request for out-of-warranty service. The minimum charge guarantees the customer an estimate of the repair costs and is used as credit against actual materials and labor costs should the equipment be repaired. Contact the TTC Repair Department for specific information on the minimum out-of-warranty repair charge.

The customer will be billed for parts plus standard labor rates in effect at the time of repair. The customer will also be required to furnish a purchase order number before repair work can be started, and a hard copy of the purchase order must be received by TTC before the repaired equipment may be shipped to the customer. A description of the labor and materials used will be provided in the Equipment Repair Report.

Once an out-of-warranty repair is made, the repaired part or component is warranted for 90 days. This warranty applies only to the part or component that was repaired; other parts or components are not covered under the 90-day repair warranty.

### 4.3.4 Equipment Return Instructions

To all equipment returned for repair, the customer should attach a tag with the following information.

- (1) Owner's name and address.
- (2) A list of the equipment being returned and the applicable serial number(s).
- (3) A detailed description of the problem or service requested.
- (4) The name and telephone number of the person to contact regarding questions about the repair.
- (5) The Return Authorization (RA) number.

If possible, the customer should return the equipment using the original shipping container and material. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit. TTC is not liable for any damage that may occur during shipping. The customer should clearly mark the TTC-issued RA number on the outside of the package and ship it prepaid and insured to TTC.