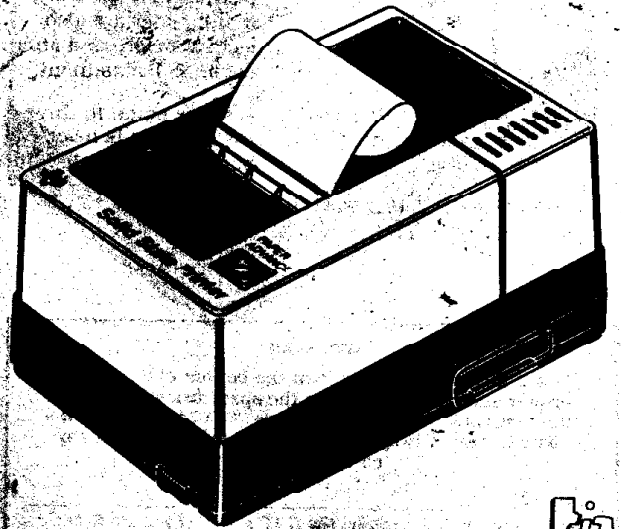


**Texas Instruments
Home Computer
Accessory**

**Solid State
Thermal Printer**
Model PHP1900



TEXAS INSTRUMENTS
INCORPORATED
DALLAS, TEXAS

Printed in U.S.A.

1037190-1

Quick Reference Guide

To take full advantage of the features and benefits of the TI Solid State Thermal Printer, please read this manual completely. The software switch options available for the printer are summarized here for "quick reference."

Software Switch	Result If Switch Is Listed In Program	Result If Switch Is Not Listed In Program
.U	Printer accepts user-defined characters.	Printer uses its resident character set.
.E	Blank paper is not ejected as program runs.	Five lines of blank paper are ejected for each OPEN and CLOSE statement for printer. Five lines of blank paper are also ejected before and after each LIST statement.
.S	No space is inserted between printed lines.	A space equal to three rows of dots is inserted between the printed lines.

Examples: OPEN #1:"TP.U",OUTPUT
OPEN #1:"TP.U.E.S",OUTPUT

IMPORTANT

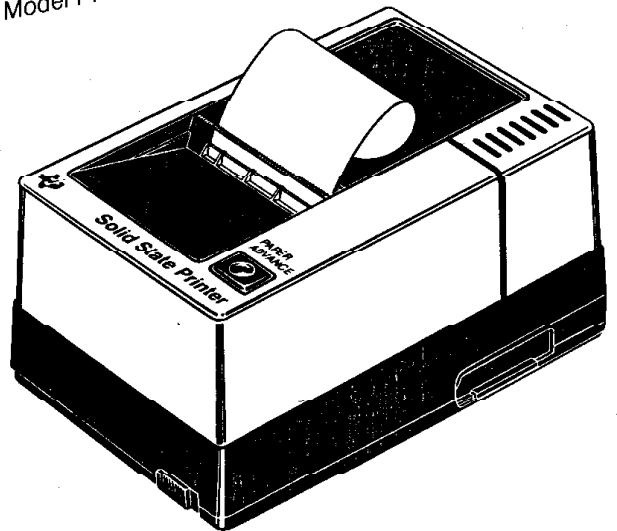
Record the serial number from the bottom of the Thermal Printer and purchase date in the space below. The serial number is identified by the words "SERIAL NO." on the bottom case. Always reference this information in any correspondence.

PHP1900 _____
Model No. Serial No. Purchase Date

Copyright © 1980 Texas Instruments Incorporated

Solid State Thermal Printer

Model PHP1900



Prints a copy of a TI BASIC program or the screen displays from certain Command Modules.

TABLE OF CONTENTS

Introduction	1
Set-Up Instructions	2
Connecting the Printer	2
Installing the Paper	4
Testing the Printer	5
A Common Application	6
The Thermal Printer and Command Modules	6
The Thermal Printer and TI BASIC	6
File Name	7
Software Switch Options	7
TI BASIC Statements and Commands	9
Defining Printable Characters	11
Example Programs for the Thermal Printer	12
Example 1: Printer Character Set	12
Example 2: 99/4 TI BASIC Character Set	14
Example 3: Opening Multiple Files on the Printer	15
I/O Error Codes	17
Caring for the Printer	18
Thermal Paper Information	18
Printhead Cleaning Procedure	18
Service Information	19
In Case of Difficulty	19
Exchange Centers (Local Service Options)	20
If You Have Questions or Need Assistance	21
Warranty	22

INTRODUCTION

The Texas Instruments Solid State Thermal Printer is a quiet and smooth-running electronic printing device. When it's connected to the Home Computer, the Thermal Printer can provide a printed copy of your program and data to aid you in revising long programs or maintaining files of programs and results. In addition, the Thermal Printer can be used with certain *Solid State Software*™ Command Modules to print screen displays.

The Thermal Printer contains a precision stepper motor that moves heat-sensitive (thermal) paper past stationary electronic printheads. The roller moves in tiny steps. Between each step, small semiconductor elements are heated by electronic circuits, producing data on the thermal paper. These dots, after several steps, form numbers, letters, and symbols on the paper.

The TI Thermal Printer:

- Prints about 30 characters per second
- Prints up to 32 characters on a line
- Includes 32 graphic symbols in a predefined set of 128 characters
- Prints user-defined characters, as specified in a TI BASIC program
- Utilizes software switch options to enhance printing of charts, graphs, etc.

SET-UP INSTRUCTIONS

Setting up the TI Thermal Printer is a simple process. First, you need to connect it to the Home Computer and install the paper, and then you need to test its operation. The steps involved in these procedures are included in this section. Please *read this material completely* before proceeding.

Note: No more than three accessories can be connected in series to the accessory connector on the right side of the computer console. If a *Solid State Speech™* Synthesizer is attached to the computer, it must be connected to the console first. Other accessories, including the Thermal Printer, are connected in any order after the speech unit. For proper operation, each of the three must be a different accessory.

CAUTION

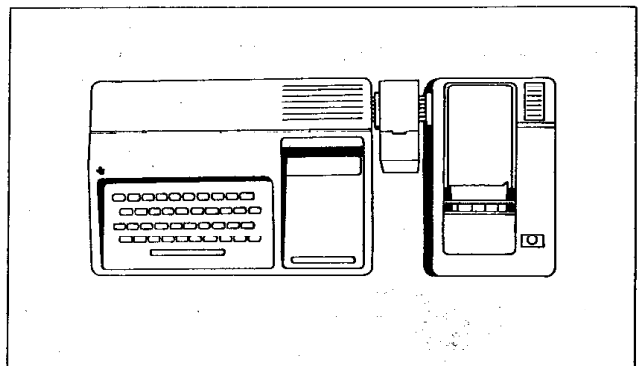
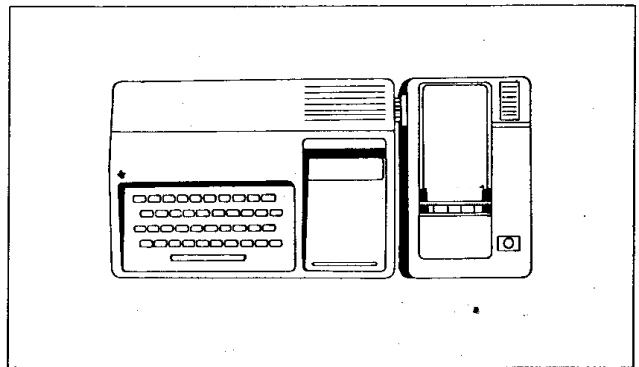
The electronic components of the Thermal Printer can be damaged by static electricity discharges. To avoid damage, do not touch the connector contacts or expose them to static electricity.

First, carefully unpack the contents of the printer box. Make sure that, in addition to this book, you have a TI Thermal Printer, a printhead cleaning card, and a roll of thermal paper. (Save the packing material for storing or transporting the printer.)

Connecting the Printer

1. First, turn off the computer console and all devices attached to the right-hand side of the console.
2. The console connector on the Thermal Printer projects from the left side of the unit. Place the printer so that its connector is to the right of, and parallel to, the computer console (or Speech Synthesizer if it's attached).
3. A small sliding door protects the accessory connector on the right side of your computer (or Speech Synthesizer). Carefully slide this door upward so that the connector is visible.

4. Make sure the console and the Thermal Printer are parallel, with the connectors aligned. Then hold the console firmly with your left hand, and gently push the Thermal Printer connector onto the console (or Speech Synthesizer) connector.



5. Plug the Thermal Printer cord into a 115-volt outlet.

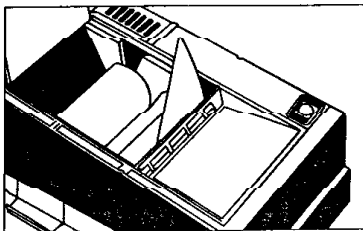
CAUTION

Always turn off the computer and all accessories and disconnect the Thermal Printer before moving the computer console. The connectors between the console and the Thermal Printer are not designed to support the weight of the accessories. To prevent damage, always disconnect all devices before moving any part of your Home Computer system. For long distance moves, repack the accessories in their original packing material.

Installing the Paper

For the best printing results, always clean the printhead before you install a new roll of paper.

1. Turn on the monitor, console, and printer. The master title screen appears.
2. Lift the cover on top of the printer to access the paper compartment.
3. If the paper roll is not empty, pull the paper-release lever to the released position. Then lift the old paper roll out of the compartment.
4. Insert the paper spindle into the new roll. Place the new roll of paper into the compartment so that the paper unrolls from the bottom. The ends of the spindle slide into the slots.
5. Fold the end of the paper to form a 45-degree angle. Hold the paper-release lever in the released position, and insert the point of the folded paper under the rubber roller. When the point of the paper is over the printheads, release the lever. Hold down the paper advance button until the folded portion of the paper feeds through the printer.



6. Guide the paper through the slot as you close the top cover.

For other information on paper replacement and printhead cleaning, see "Caring for the Printer" on page 18.

Testing the Printer

1. Press any key on the console to make the master selection list appear.
2. Select TI BASIC.
3. Enter this program:

```
100 REM-TEST PATTERN
110 OPEN #1:"TP".OUTPUT
120 FOR I=1 TO 32
130 AS=AS&CHR$(0)
140 NEXT I
150 FOR I=1 TO 5
160 PRINT #1:AS
170 NEXT I
180 CLOSE #1
190 END
```

When you run the program, the printer should print five lines of 32 characters as shown here:



Check each character to make sure the dots are printed properly. If not, turn off both units and carefully disconnect the printer. Reconnect the printer and repeat the test above. If you still have difficulty, see "In Case of Difficulty" on page 19.

A COMMON APPLICATION

A common application of your Thermal Printer involves printing a listing of a TI BASIC program. For example, enter this program.

```
10 OPEN #1:"TP",OUTPUT
20 LET K=50
30 LET P=2.2*K
40 PRINT #1:"THE ANSWER IS";P
50 CLOSE #1
60 END
```

Line 10 OPENS the output to the printer. In lines 20 and 30, the computer is instructed to calculate 2.2 times 50. The result is printed by the printer as specified in line 40. Line 50 CLOSES output to the printer.

Now enter this command:

```
LIST "TP"
```

The program in the computer's memory is LISTed by the printer. To print the result of the calculation, type RUN and press ENTER, and the printer prints THE ANSWER IS 110.

THE THERMAL PRINTER AND COMMAND MODULES

The Thermal Printer can be controlled from some Command Modules. Activating the printer when you're using these modules usually requires a single keystroke. Follow the instructions shown on the display or printed in the module's manual.

THE THERMAL PRINTER AND TI BASIC

OPEN, PRINT, CLOSE, and LIST are used in TI BASIC to control and output data to the printer. The OPEN, PRINT, and CLOSE statements in your program produce printed copy when the program is run. The LIST command instructs the computer to print a copy of the program currently in memory. To activate the printer, you must include its file name in the OPEN statement or LIST command. You can also specify certain software switch options to control the type of characters printed, the amount of paper ejected, and the space inserted between lines.

File Name

TI BASIC and certain Command Modules recognize the string expression TP (Thermal Printer) as the file name for the printer. Whenever an OPEN statement or LIST command is performed with the file name TP, all output goes to the TI Thermal Printer.

Examples:

```
OPEN #1:"TP",OUTPUT
LIST "TP"
```

If you reference the printer when it's not attached to the Home Computer, the program stops and the display shows an error message.

Software Switch Options

Computer accessories often require switches to give instructions to the computer. These switches are sometimes a physical part of the product and are set by hand. However, in the Thermal Printer these switches are programmed into an integrated circuit contained in the unit. Since these switches are part of the printer's "software," they are referred to as software switch options.

The OPEN statement and LIST command control the software switch options that affect the operation of the printer. When they are used in TI BASIC, these switch options turn printer features on or off. Three software switch options are available:

Software Switch Option	Meaning	If Switch Option Is Not Included in Program
.U	User defined characters ON	Printer uses its resident character set.
.E	Eject paper OFF	Five lines of blank paper are ejected for each OPEN and CLOSE statement. Five lines of blank paper are also ejected before and after each program is LISTed.
.S	Space between lines OFF	A space equal to three rows of dots is inserted between the printed lines.

To use software switch options, you must observe certain procedures:

- Software switch options must follow the file name, TP, in the TI BASIC OPEN statement or LIST command.
- Each software switch option must be preceded by a period (no space between period and switch).
- Software switch options can be listed in any order.

Examples:

```
LIST "TP"  
OPEN #1:"TP.S.E", OUTPUT  
OPEN #2:"TP.U.E.S", OUTPUT
```

.U SWITCH

The printer uses its resident character set *unless* you include the .U software switch option in your TI BASIC OPEN statement or LIST command. The example on page 12 lists this character set.

If the .U switch is specified, the printer uses the TI BASIC character set, as shown in the example on page 14. These characters are represented by a 5x6 dot matrix. The defined character codes range between 32 and 95. You can use the CALL CHAR subprogram to redefine any character within this range and to define additional characters with codes 96-159.

.E SWITCH

Five blank lines of paper are ejected when the OPEN and CLOSE statements are performed and before and after each LIST command *unless* the .E software switch option is listed. These extra lines make it easier to tear off the paper between listings. The .E switch, if listed with TP in a program, "turns off" the printer's paper ejection so that no blank paper comes out as a program is printed.

.S SWITCH

A space equal to three rows of dots is left after each line *unless* the .S software switch option is included in a program. If the .S switch is listed with TP, no space is left between lines. This option is useful when you are printing charts or graphs.

TI BASIC Statements and Commands

This section discusses the TI BASIC statements and commands, OPEN, CLOSE, PRINT, and LIST, which are used with the printer. For a more detailed explanation, see the BASIC Reference Section of the *User's Reference Guide*.

OPEN #file-number:file-name[,file-attributes]

The OPEN statement links the printer to a *file-number* and sets the software switch options that control its function. Any combination of the three switch options can be listed in the OPEN statement.

- *File-number* is a numeric expression that evaluates to an integer between 1 and 255, inclusive.
- *File-name* is a string expression containing the device name, TP, and any combination of the three software switch options.
- *File-attributes* are string expressions, separated by commas, which specify file structure, data format, file processing, and record length. To make things as easy as possible for you, the Thermal Printer assumes certain *file-attributes*. These assumed specifications are called *default* values. You only have to specify those attributes you need to change from the default values. The four *file-attribute* categories, their valid specifications, and the default values for the printer are:

Entry	Default
<i>file-organization</i> : SEQUENTIAL or RELATIVE	SEQUENTIAL
<i>file-type</i> : DISPLAY or INTERNAL	DISPLAY
<i>open-mode</i> : OUTPUT or APPEND	none
<i>record-type</i> : FIXED or VARIABLE	VARIABLE 32

The following OPEN statements are equivalent.

```
10 OPEN #1:"TP",OUTPUT  
10 OPEN #1:"TP",SEQUENTIAL,DISPLAY,OUTPUT,VARIABLE 32
```

Notice that the *open-mode* has no default value and that the INPUT and UPDATE modes cannot be used.

When you list a *record-type*, specify a length not exceeding 32, the maximum length used by the printer, if you want the output printed in columns. INTERNAL file-type prints the 9-byte internal representation of each character, and DISPLAY prints the ASCII character set. *File-attributes* and file processing are explained further in the BASIC Reference Section of the *User's Reference Guide*.

CLOSE #file-number

The CLOSE statement "closes" or discontinues the association between the file specified by the *file-number* and a program. When you close a file, the printer ejects five blank lines of paper unless the .E (eject paper off) software switch option is listed. A file must be closed before any pending outputs are printed.

```
130 CLOSE #1
```

PRINT #file-number[:print-list]

This form of the PRINT statement outputs data to the Thermal Printer. A file must be OPENed and assigned to the Thermal Printer before the PRINT statement can be used to output to the printer.

In general the computer performs a PRINT statement to the printer the same way it does to the display screen. However, when a PRINT statement ends with a comma or semicolon, the data is not printed until the computer encounters a PRINT statement without an ending comma or semicolon, until the file is closed, or until the record exceeds the length specified in the OPEN statement.

For information on the *print-list* clause, see the BASIC Reference Section of the *User's Reference Guide*.

```
100 OPEN #1:"TP.E.U".OUTPUT
110 PRINT #1
```

LIST file-name[:line-list]

When the LIST command is entered, the computer prints the entire program or the lines specified in the *line-list*.

Examples:

Print the entire program:

```
LIST "TP"
```

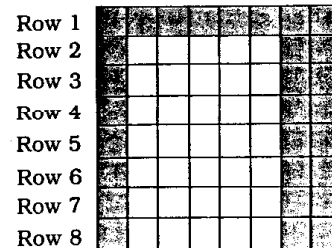
Print program lines 100-200:

```
LIST "TP":100-200
```

Defining Printable Characters

With the Thermal Printer and the .U (user-defined characters) software switch option on, you can define the characters to be printed, by writing a TI BASIC program which includes the CALL CHAR subprogram to define any of the ASCII character codes 32 through 159. (For detailed information on defining characters, see the appropriate sections of *Beginner's BASIC* and the *User's Reference Guide*.)

Characters printed by the printer are composed of a 5x7 dot matrix, while the characters displayed on the Home Computer screen are composed of an 8x8 dot matrix. The following diagram shows which dots in the 8x8 matrix are printed by the printer. In defining characters for the printer, keep in mind that any dots in the shaded region will not be printed.



EXAMPLE PROGRAMS FOR THE THERMAL PRINTER

Before you use the Thermal Printer with your own programs, try the following sample applications. These programs can be used to:

- Obtain a printed copy of the printer's resident character set
- Print the TI BASIC character set
- Experiment with opening multiple files

Example 1: Printer Character Set

This program prints the Thermal Printer's resident character set. The output is divided into four columns. The decimal code and corresponding character are printed for the entire character set. Each character is printed in a 5x7 dot matrix, and the codes range from 0 through 127, inclusive. These characters cannot be redefined.

```
100 REM - PRINTER CHARACTER SET
110 OPEN #1:"TP", OUTPUT
120 FOR I=0 TO 31
130 PRINT #1:; CHR$(I); " ";
140 PRINT #1:;32;CHR$(I+32);" ";
150 PRINT #1:;64;CHR$(I+64);" ";
160 PRINT #1:;96;CHR$(I+96)
170 NEXT I
180 CLOSE #1
190 END
```

Line 110 OPENS output to the printer using its resident character set. The FOR-NEXT loop in lines 120 and 170 instructs the printer to print 31 lines of characters. These characters are to be printed in four columns as specified in lines 130-160. Column one is characters 0-31 (line 130), two is characters 32-63 (line 140), three is characters 64-95 (line 150), and four is characters 96-127 (line 160). For proper results, leave two spaces between the quotation marks in lines 130, 140, and 150. Line 180 CLOSES the output to the printer.

Printed output for Example 1:

0	■	32		64	@	96	`
1	▀	33	!	65	A	97	a
2	▁	34	"	66	B	98	b
3	▂	35	#	67	C	99	c
4	▃	36	\$	68	D	100	d
5	▄	37	%	69	E	101	e
6	▅	38	&	70	F	102	f
7	▆	39	'	71	G	103	g
8	▇	40	(	72	H	104	h
9	█	41	)	73	I	105	i
10	▉	42	*	74	J	106	j
11	▊	43	+	75	K	107	k
12	▋	44	,	76	L	108	l
13	▌	45	-	77	M	109	m
14	▍	46	.	78	N	110	n
15	▎	47	/	79	O	111	o
16	▏	48	0	80	P	112	p
17	▐	49	1	81	Q	113	q
18	░	50	2	82	R	114	r
19	▒	51	3	83	S	115	s
20	▓	52	4	84	T	116	t
21	▔	53	5	85	U	117	u
22	▕	54	6	86	V	118	v
23	▖	55	7	87	W	119	w
24	▗	56	8	88	X	120	x
25	▘	57	9	89	Y	121	y
26	▙	58	:	90	Z	122	z
27	▚	59	;	91	[	123	[
28	▛	60	<	92	\	124	\
29	▜	61	=	93	]	125]
30	▝	62	>	94	^	126	^
31	▞	63	?	95	_	127	_

Example 2: 99/4 TI BASIC Character Set

This program prints the TI BASIC character set shown on the Home Computer's display screen. This character set is divided into four columns. The decimal code and its corresponding character are printed for the entire set. *Note:* You must list the .U (user defined characters) software switch option in the OPEN statement to print this character set.

Each TI BASIC character is printed in a 5x6 dot matrix. The character codes range from 32 through 95. All of these characters and character codes 96 through 159 may be redefined as explained in *Beginner's BASIC* and the *User's Reference Guide*.

```
100 REM-99/4 TI BASIC CHARACTER SET
110 OPEN #1:"TP,U", OUTPUT
120 FOR I=32 TO 47
130 PRINT #1:CHR$(I);" ";
140 PRINT #1:I+16; CHR$(I+16);" ";
150 PRINT #1:I+32; CHR$(I+32);" ";
160 PRINT #1:I+48; CHR$(I+48)
170 NEXT I
180 CLOSE #1
190 END
```

Line 110 OPENS output to the printer, specifying the TI BASIC character set. The FOR-NEXT loop in lines 120 and 170 instructs the printer to print 16 lines beginning with character code 32. Lines 130-160 cause the characters to be printed in four columns: the first column contains characters 32-47 (line 130); the second, characters 48-63 (line 140); the third, characters 64-79 (line 150); and the fourth, characters 80-95 (line 160). Notice that you need to leave two spaces between the quotation marks in lines 130, 140, and 150. Line 180 CLOSEs the output to the printer.

Printed output for Example 2:

32	48 O	64 @	80 P
33 !	49 1	65 A	81 Q
34 "	50 2	66 B	82 R
35 #	51 3	67 C	83 S
36 \$	52 4	68 D	84 T
37 %	53 5	69 E	85 U
38 &	54 6	70 F	86 V
39 /	55 7	71 G	87 W
40 (	56 8	72 H	88 X
41)	57 9	73 I	89 Y
42 *	58 :	74 J	90 Z
43 +	59 ;	75 K	91 [
44 ,	60 <	76 L	92 \
45 -	61 =	77 M	93]
46 .	62 >	78 N	94 ^
47 /	63 ?	79 O	95 _

Example 3. Opening Multiple Files on the Printer

A program can OPEN more than one file associated with the Thermal Printer. In the program below, two files are OPENed. The first file lists no software switch options and uses the Printer's resident character set. The second file lists the .U software switch option which uses the TI BASIC character set and the .E software switch option so that paper is ejected only for the OPEN and CLOSE statements in the first file. The result is that both character sets can be used in the same program. The output from the program lists all the ASCII character codes in the range 65 through 69 and the corresponding characters in both character sets.

```

100 REM- MULTIPLE FILES
110 OPEN #1:"TP", OUTPUT
120 OPEN #2:"TP,U,E", OUTPUT
130 FOR I=65 TO 69
140 PRINT #1:I
150 PRINT #1:CHR$(I)
160 PRINT #2:CHR$(I)
170 PRINT #2
180 NEXT I
190 CLOSE #1
200 CLOSE #2
210 END

```

Lines 110 and 120 OPEN the output to the printer. File #1 uses the printer's resident character set as specified in line 110. Line 120 designates the TI BASIC character set for use with file #2. The output prints characters 65 through 69 from both character sets — lines 130-170. The character number is printed first (line 140), then the character from the printer's set (line 150), then the character from the TI BASIC set (line 160), followed by a space (line 170). The CLOSE statements in lines 190 and 200 end the output from both files.

Printed output for Example 3:

```

      65
      A
      A

      66
      B
      B

      67
      C
      C

      68
      D
      D

      69
      E
      E

```

I/O ERROR CODES

When an error occurs in a program, an error code appears at the bottom of the display screen. This section tells which statements used with the printer can produce errors and what the different error codes mean.

OPEN:

- ERROR 00 — Attempting to OPEN the Thermal Printer when it's not attached to the computer.
- ERROR 02 — The software switch option entry is in error. Also, any attempts to OPEN in INPUT mode or UPDATE mode or to specify a logical record length of more than 32 characters cause this error code to be displayed.
- ERROR 03 — Attempting to OPEN a file without specifying OUTPUT or APPEND (*open-mode*).
- ERROR 06 — A hardware error occurred and device cannot be opened.

PRINT:

No errors related to the printer are generated during this statement.

MISC. ERROR CODES:

- ERROR 43, 53, 63, 73, 83, 93 — Attempting to use a command which is not accepted by the Thermal Printer.

CARING FOR THE PRINTER

Thermal Paper Information

When you are printing lengthy programs or data, make sure that sufficient thermal paper remains to complete your output. A continuous stripe appears on the paper when only a few feet remain. If you run out of paper, the printer makes a clicking noise and the rubber roller does not turn when you try to print or advance. Running the printer without paper will not damage the unit unless it occurs for an extended period of time.

Use only PHA1950 thermal printing paper in your TI Thermal Printer. Other thermal papers may damage your printer and void the warranty. If your local dealer is temporarily out of paper, you may order it from:

Texas Instruments Service Facility
P.O. Box 53
Lubbock, Texas 79408

Note: The printing on thermal paper may fade if exposed to light or high temperatures for long periods of time. For best results, always file printed tapes away from light and heat.

For complete instructions on changing the thermal paper in the printer, see "Installing the Paper" on page 4.

Printhead Cleaning Procedure

Occasionally, foreign particles may collect on the printhead and cause partial or dim printing. Each time you change the paper or if the copy becomes streaked, follow these steps to clean the printhead.

1. Remove the paper as explained on page 4.
2. Install the printhead cleaning card in place of the normal thermal paper. (If you do not have your card, cut a 3½-inch by 8-inch strip of standard bond typing paper and use it instead.)

3. Run the following program until most of the card feeds through the printer. To stop the program, press **SHIFT C**.

```
100 REM - TEST PATTERN
110 OPEN #1:"IP", OUTPUT
120 FOR I=1 TO 32
130 AS=AS&CHR$(0)
140 NEXT I
150 PRINT #1:AS
160 GOTO 150
```

4. Remove the card from the printer, and reinstall the thermal paper as described on page 4.

Note: Using metal probes, sharp objects, or lubricants may damage the printhead or rubber roller.

SERVICE INFORMATION

In Case Of Difficulty

If the Thermal Printer does not seem to be operating properly, check the following:

1. *Power* — Make sure that the printer is plugged in and the power switch is on.
2. *Thermal paper* — If printing produces no results, the thermal paper may be installed with the wrong side touching the printheads. Reinstall the paper following the procedure on page 4.
3. *Printhead cleaning* — If the printout has a faded streak down the paper, the printheads may be dirty. Clean the printheads following the procedure on page 18.
4. *Program errors* — If the printer does not print with a TI BASIC program, check your program. The statements used to access the printer could be incorrect. Run the program on page 5 to verify that the printer is operating properly.
5. *Connector separation* — Check the connection between the Thermal Printer and the console (or Speech Synthesizer). If the connectors have begun to separate, turn the computer and the printer off and press the printer and console back together. Turn on the computer and printer, and check the operation of the Thermal Printer using the Test Pattern program on page 5.

If the printer still does not appear to be working properly, first turn all power off. Next, disconnect the Thermal Printer and all other accessories from the console. Then follow these steps:

1. *See if the Home Computer, by itself, is working properly.*
Turn on the Home Computer. Press any key and the master selection list appears. Now select TI BASIC. Type: OPEN #1:"TP" and press ENTER. The error message "I/O ERROR 00," should be displayed, indicating that the device named could not be OPENed. This is the expected result if the Thermal Printer is not connected to the console.
2. *Check to see that the Thermal Printer is working properly.*
Refer to the SET-UP INSTRUCTIONS and reconnect the Thermal Printer. Then test the printer by entering and running the program listed under "Testing the Printer" on page 5.
3. If none of the above procedures corrects the difficulty, consult "If You Have Questions or Need Assistance" or see the "Maintenance and Service Information" section of the *User's Reference Guide*.

If the Thermal Printer is in warranty, it will be repaired or replaced under the terms of the Limited Warranty. (See below for information about our optional Exchange Center Service.) Out-of-warranty units in need of service will be repaired or replaced with reconditioned units (at TI's option), and service rates in effect at the time of return will be charged. Because our Service Facility serves the entire United States, it is not feasible to hold units while providing service estimates. For advance information concerning our service charges, please call our toll-free number listed on page 21.

Exchange Centers (Local Service Options)

If your Thermal Printer requires service, instead of returning the unit to a service facility for repair or replacement, you may elect to exchange the unit for a factory-reconditioned Thermal Printer of the same model (or equivalent model specified by TI) by going in person to one of the exchange centers which have been established across the United States. **A handling fee will be charged by the exchange center for in-warranty exchanges of the Thermal Printer unit.** Out-of-warranty exchanges will be charged at the rates in effect at the time of

the exchange. Please refer to the enclosed Exchange Service listing, or call the Consumer Relations Department for exchange-fee information and the location of the nearest exchange center.

If You Have Questions or Need Assistance

If you have questions concerning Thermal Printer repair, or peripheral, accessory, or software purchase, please call our Consumer Relations Department at 800-858-4565 (toll free within the contiguous United States except Texas) or 800-692-4279 within Texas. The operators at these numbers cannot provide programming assistance.

For technical questions such as programming, specific printer applications, etc., you can call 806-741-2663. Please note that this is not a toll-free number, and we cannot accept collect calls.

As an alternative, you can write to:

Consumer Relations Department
Texas Instruments Incorporated
P.O. Box 53
Lubbock, Texas 79408

Because of the number of suggestions which come to Texas Instruments from many sources containing both new and old ideas, Texas Instruments will consider such suggestions only if they are freely given to Texas Instruments. It is the policy of Texas Instruments to refuse to receive any suggestions in confidence. Therefore, if you wish to share your suggestions with Texas Instruments, or if you wish us to review any BASIC language program which you have developed, please include the following statement in your letter:

"All of the information forwarded herewith is presented to Texas Instruments on a nonconfidential, nonobligatory basis; no relationship, confidential or otherwise, expressed or implied, is established with Texas Instruments by this presentation. Texas Instruments may use, copyright, distribute, publish, reproduce, or dispose of the information in any way without compensation to me."

**THREE-MONTH LIMITED WARRANTY
FOR THERMAL PRINTER**

THIS TEXAS INSTRUMENTS SOLID STATE THERMAL PRINTER WARRANTY EXTENDS ONLY TO THE ORIGINAL CONSUMER PURCHASER OF THE THERMAL PRINTER.

WARRANTY DURATION

This Texas Instruments Thermal Printer is warranted for a period of three (3) months from the date of the original purchase by the consumer.

WARRANTY COVERAGE

This Texas Instruments Thermal Printer is warranted against defective materials and construction. **THIS WARRANTY IS VOID IF THE THERMAL PRINTER HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLIGENCE, IMPROPER SERVICE OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR CONSTRUCTION.**

WARRANTY DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER.

Some states do not allow the exclusion or limitation of implied warranties or consequential damages, so the above limitations or exclusions may not apply to you.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

WARRANTY PERFORMANCE

During the above three-month warranty period, your Thermal Printer will be repaired or replaced with a new or reconditioned unit of the same or equivalent model (at TI's option) when the unit is returned either in person or by prepaid shipment to a Texas Instruments Service Facility listed below.

The repaired or replacement unit will be warranted for three months from date of repair or replacement. Other than the cost of postage or shipping the unit to Texas Instruments, no charge will be made for the repair or replacement of in-warranty units.

Texas Instruments strongly recommends that you insure the unit for value, prior to shipment.

TEXAS INSTRUMENTS CONSUMER SERVICE FACILITIES

U.S. Residents

Texas Instruments Service Facility
2303 North University
Lubbock, Texas 79415

Canadian Residents

Geophysical Services Incorporated
41 Shelley Road
Richmond Hill, Ontario, Canada L4C5G4

Consumers in California and Oregon may contact the following Texas Instruments offices for additional assistance or information.

Texas Instruments Consumer Service
831 South Douglas Street
El Segundo, California 90245
(213) 973-1803

Texas Instruments Consumer Service
10700 Southwest Beaverton Highway
Park Plaza West
Beaverton, Oregon 97005
(503) 643-6758