HEWLETT-PACKARD

HP 82162A

Thermal Printer

OWNER'S MANUAL

HEWLETT PACKARD

HP 82162A
Thermal Printer

Owner's Manual

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Contents

Introduction

The HP 82162A Thermal Printer provides printing, graphics, and bar-code printing capabilities for your calculator or computer system. The printer is a peripheral device that can accumulate up to 101 characters internally and print output on a 24-character line. You connect the printer to your system using the Hewlett-Packard Interface Loop (HP-IL).

Typically, you control the printer by using your calculator or computer and its HP-IL capabilities or HP-IL extensions. For this reason, the owner's manual for your calculator, computer, or HP-IL extension should be your primary reference for operating peripherals such as the printer.

Your HP 82162A Thermal Printer is packaged with the following accessories:

- One HP-IL cable.
- Two rolls of thermal paper.
- A rechargeable battery pack (installed in the printer).
- A recharger.

Optional accessories and specifications for the HP 82162A Thermal Printer are listed in appendix B.

Installation

The following paragraphs describe how to set up the HP 82162A Thermal Printer so that you can begin using it with your system.

Power

Power for the HP 82162A Thermal Printer is provided by a rechargeable battery pack. The battery pack is located in the compartment in the bottom of the unit.

CAUTIONS

Be sure the printer is turned off before removing the battery pack.

Be sure the printer is turned off before connecting or disconnecting the recharger.

Be sure the battery pack is installed whenever the recharger is connected.

If these cautions are not followed, the printer's circuitry could be damaged.

To recharge the battery pack using ac power, first switch the printer to OFF. Then insert the ac plug of the recharger into the proper power source. Connect the recharger connector into the POWER receptacle at the rear of the printer. The printer can be operated normally while the battery pack recharges.
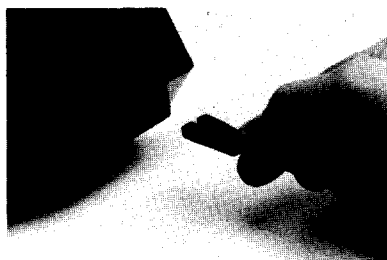
To remove or replace the battery pack, first switch the printer to OFF and disconnect it from the interface loop. Then release the battery door by sliding its two latches inward and drop the door and pack into your hand. Install the battery pack by aligning its contacts with the two spring connectors, then replace the door and secure its two latches.
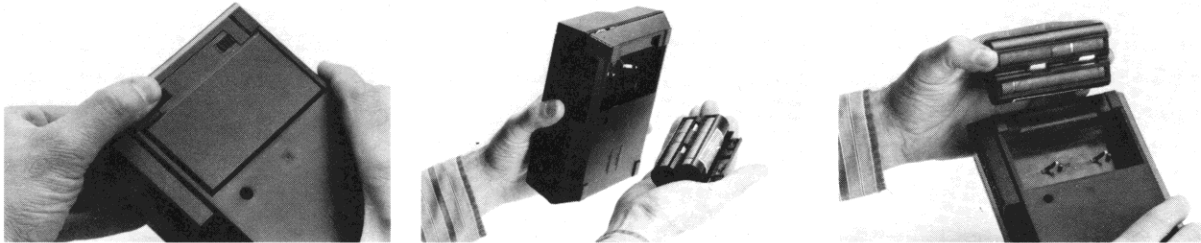
Interface Connections

The Hewlett-Packard Interface Loop can consist of several peripheral devices and a controller (calculator or computer). The devices may be connected in any order—but all of the interface cables must form a continuous loop. All connections are designed to ensure proper orientation.

To connect the HP 82162A Thermal Printer to the loop, first turn off the controller. Then merely disconnect the loop in one place and connect the printer into the loop at that place. (In some situations, the printer might be the only peripheral in the loop.)

Note: Be sure the controller is turned off before connecting interface cables. If this is not done, the system's operation may be disrupted.
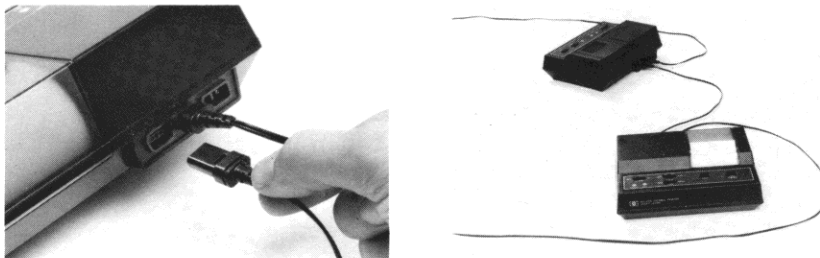
All devices must be turned on for the interface to operate properly.

Loading Paper

To load a roll of paper into the printer, first switch the printer to ON. (If the POWER light doesn't turn on or the BAT light does turn on, recharge the battery pack as described above.) Prepare the new roll by discarding the first two turns (to eliminate glue or tape residue) and cutting or folding a straight leading edge. Temporarily place the roll in the paper cover and push the leading edge into the slot just below the metal contact. Continue pushing straight in until the paper goes no further. Then press and hold the PAPER ADVANCE key until the paper passes the top of the clear tear bar. Finally, place the roll into the paper well and close the cover.
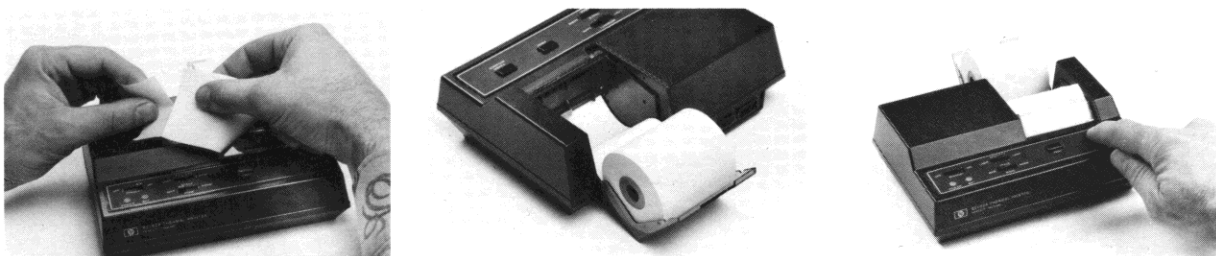
If the paper feeds properly but no printing appears, check that the paper is not installed backwards. The paper should feed from the bottom of the roll.

CAUTION

To prevent damage to your HP 82162A Thermal Printer, use only Hewlett-Packard thermal paper.

Operation

As soon as the HP 82162A Thermal Printer has power, is connected to a controller via the interface loop, has paper installed, and is switched ON, you can begin using its printing capabilities. (If the POWER light doesn't turn on or the BAT light does turn on, recharge the battery pack as described above.) You should refer to the owner's manual for your calculator, computer, or HP-IL extension to find the primary information about controlling the printer.

Appendix A contains information about verifying proper operation of the printer.

The front panel on the printer contains several controls that allow you to set and monitor the printer's operation.

OFF-STANDBY-ON Switch. This switch sets the power mode of the printer. When set to the OFF position, the printer is turned off and cannot be turned on except by manually changing this switch. When set to the ON position, the printer is turned on and cannot be turned off except by manually changing this switch. When set to the STANDBY position, the printer can be turned on and off by the controller using its HP-IL capabilities. When it is on, the printer uses somewhat more power in the STANDBY position than in the ON position. Use the STANDBY position only when you intend to have the controller set the power state.

INTENSITY Switch. This five-position switch controls the intensity or darkness of the printed characters—from LIGHT to DARK.

MODE Switch. The print mode switch selects one of three printer modes: MAN (*manual*), NORM (*normal*), and TRACE. The response of the printer in each of these modes is determined by the controller. Refer to the owner's manual for your calculator, computer, or HP-IL extension to find out if it has selectable printer modes.

POWER Light. This light is on whenever the printer is in its operating power state. The light goes off if the battery power is not sufficient to run the printer.

BAT Light. This light indicates the condition of the rechargeable battery pack. If the light is off, battery power is adequate. If the light is on, battery power is low—only about 10 to 15 minutes of operating power remain. If the power is low and you wish to continue using the printer, turn off the printer and either replace the battery pack or connect the recharger.

CAUTION

Continued operation with the BAT light on may damage the battery pack.

PRINT Key. This key causes the printer to signal the controller when the key is down. The SR (service request) and PR (print) status bits are set when the key is pressed; both bits are cleared when the key is released. Any action taken when you press this key is determined by the controller. (If this key and the PAPER ADVANCE key are held down at turn-on, the printer turns on as an active listener. Refer to Startup Conditions on page 10.)

PAPER ADVANCE key. This key causes the printer to signal the controller when the key is down. The SR (service request) and PA (paper advance) status bits are set when the key is pressed; both bits are cleared when the key is released. The controller determines any special action that is taken. If an Advance Ignore instruction is not received from the controller within about 0.1 second, the paper is advanced one line. (If this key and the PRINT key are held down at turn-on, the printer turns on as an active listener. Refer to Startup Conditions on page 10.)

Technical Description

The preceding pages have covered the basic information about using the HP 82162A Thermal Printer. The next two sections discuss some of the more technical aspects of the printer. For most applications you will not need to use the following information. However, it is included here for those situations that require such detail.

Internal Design

The HP 82162A Thermal Printer has several features that are important for understanding the printer's operation. In particular, it has a number of operating modes that influence how instructions are received and how information is printed.

Print Buffer. The HP 82162A Thermal Printer contains a print buffer that is used for accumulating information to be printed. The print buffer consists of 101 cells, each one containing one byte (eight bits) of information. Typically, each cell stores a character, one pattern representing one column of printed dots, or information about how to print subsequent cells. Whenever the buffer becomes full, one line of output is printed and cleared from the buffer. Accumulating a Carriage Return (CR) character causes the entire buffer to be printed and cleared. A Line Feed (LF) character is ignored (not accumulated).

The printer has two primary modes of operation that define how it receives instructions: Escape mode and Eight-Bit mode. Both of these modes interpret certain HP-IL Data Byte messages as instructions. (Detailed information about operating in these modes is presented in the next section.)

Escape Mode. In this operating mode, the printer interprets an "escape sequence" as an instruction. The escape sequence consists of several eight-bit Data Bytes, but only seven bits are used from each byte (the highest-order bit is ignored). Characters are defined by the ASCII (American Standard Code for Information Interchange) character set, which is listed in appendix B.

Eight-Bit Mode. In this operating mode, an instruction consists of a single eight-bit Data Byte. (All eight bits of the Data Byte are used.) Characters are defined by the alternate character set, which is listed in appendix B.

The printer has several other aspects of its operation that can be controlled:

Uppercase/Lowercase Modes. Printer is set to accumulate letters in the print buffer that will be printed in uppercase or lowercase. Other characters (like numbers and symbols) are not affected. (These modes can be selected in the Eight-Bit operating mode only.)

Single Wide/Double Wide Modes. Printer is set to accumulate characters in the print buffer that will be printed single- or double-width.

Character/Column Modes. Printer is set to accumulate either characters or dot-column patterns in the print buffer. (In Escape operating mode, column mode exists only during a Graphics Input instruction.)

Left-/Right-Justify Modes. Printer is set to print lines that are normally left- or right-justified—that is, they are lined up with the left or right margin.

Parse/Nonparse Modes. Printer is set to print lines that break only at blank characters (parse) or that break after the 24th character (nonparse). (Parse mode can be selected in the Escape operating mode only.)

Two special output operations can also be performed: graphics and bar code. These operations require that information be coded according to certain conventions, explained next.

Graphics. This type of operation is used to create special output that does not consist of standard characters. Graphics output can be produced in Escape mode and in Eight-Bit (and Column) mode. To do this, the printer uses one print buffer cell for each column of printed dots. A dot column is specified by a code number from 0 to 127 according to the following scheme: determine each dot that is to be printed in the column, then add the numbers assigned to those dots, as shown in the following examples.

Value	Dots to Print	Entry		Value	Dots to Print	Entry
1	□			1	□	
2	■ ⟶	2		2	■ ⟶	2
4	■ ⟶	4		4	■ ⟶	4
8	□			8	■ ⟶	8
16	□			16	■ ⟶	16
32	■ ⟶	32		32	■ ⟶	32
64	■ ⟶	64		64	■ ⟶	64
		102 ◄─── Code Number				126 ◄─── Code Number

Bar Code. Lines of bar code can be produced in Escape mode and in Eight-Bit mode. A line of bar code consists of two left bars (both narrow), up to 16 groups of eight bars, and two right bars (a wide bar followed by a narrow bar). To print a line of bar code, the printer first clears the print buffer. Then it uses up to 16 code numbers that specify the groups of bars. The left and right bars are automatically printed. A group of eight bars is specified by a code number from 0 to 255 according to the following scheme: locate each wide bar in the group, then add the numbers assigned to those positions, as shown in the following example.

Left Bars   Group of Eight Bars   Right Bars

Bar Values
128 64 32 16 8 4 2 1

32 + 8 + 4 + 1 = 45 ◄───Code Number
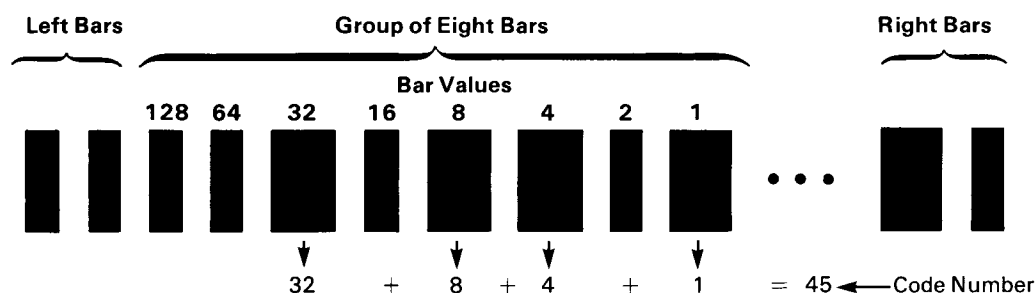
Controlling the Printer

Most controllers perform a specified operation by automatically sending a preprogrammed sequence of HP-IL messages around the interface loop. You would not be using the actual HP-IL messages in this case, but rather you would be using the HP-IL capabilities built into your calculator, computer, or HP-IL extension. However, this section describes how the HP 82162A Thermal Printer responds to the *individual* HP-IL messages.

The printer operates according to information it receives on the interface loop. Specifically, it responds to the standard HP-IL messages (listed below), including special Data Byte messages that are interpreted as instructions.

Startup Conditions. Whenever the printer turns on—including recovery from a low-power condition—it normally positions its carriage to the right, clears the print buffer, sets itself to Escape, Single Wide, Left-Justify, and Nonparse modes, and sets its address to an undefined state. An undefined address prevents the printer from performing any operation until it is assigned a valid address.

The printer may also be set for Active-Listener operation when it is turned on. This is done by holding down the PRINT and PAPER ADVANCE keys and then switching the printer to ON. Active-Listener operation is particularly useful when you do not have a controller setting up talkers and listeners and directing the flow of information in the loop. The printer is set up the same as for normal startup, except that it automatically starts as an active listener with an address of 1.

HP-IL Messages. When the printer receives an HP-IL message on the interface loop, the printer responds according to the following list. Except where noted, the printer automatically sends each HP-IL message to the next device in the loop.

HP-IL MESSAGE	PRINTER RESPONSE
COMMAND GROUP	
Interface Clear	Removes talker or listener status.
Device Clear	Carriage positioned to right, print buffer cleared, and modes set to Escape, Single Wide, Left-Justify, and Nonparse.
Selected Device Clear	If listener, device cleared as with Device Clear command.
Go To Local	No response.
Local Lockout	No response.
Remote Enable	No response.
Not Remote Enable	No response.
Parallel Poll Enable 0-15	No response.
Parallel Poll Disable	No response.
Parallel Poll Unconfigure	No response.
Group Execute Trigger	No response.
Loop Power Down	If ON, device not accessible for 0.7 second, address becomes undefined, device set as with Device Clear and Interface Clear (except Enable Asynchronous Requests status not cleared), and power remains on.
	If STANDBY, device goes to low-power state and sets itself to become active if it receives any signal. When activated, address becomes undefined and device set as with Device Clear and Interface Clear.
Enable Asynchronous Requests	Device set to send Identify (service request) message if PRINT key is pressed. This condition cleared by any command except Loop Power Down.
Auto Address Unconfigure	Address set to 1.
Listen Address 0-31	If address matches, device removed from talker status and becomes a listener.
	If address is 31, device removed from listener status.
Unlisten	Device removed from listener status.
Device Dependent Listener 0-31	No response.
Talk Address 0-31	If address matches, device removed from listener status and becomes a talker.
	If address doesn't match, device removed from talker status.
Untalk	Device removed from talker status.
Device Dependent Talker 0-31	No response.
Secondary Address 0-30	No response.
Null	No response.

HP-IL MESSAGE	PRINTER RESPONSE
READY GROUP	
Take Control	No response.
Ready For Command	Executes a pending Loop Power Down command.
Send Data	No response.
Send Status	If talker, sends two bytes of status (refer to the table following this list).*
Send Device ID	No response.
Send Accessory ID	If talker, sends one byte with the value 32.*
Not Ready For Data	If talker, makes previous data byte the last byte sent, then sends End Of Transmission message.
End Of Transmission—OK	If talker, sent at end of data.
End Of Transmission—Error	If talker, sent immediately for bad HP-IL error check.
Auto Address 0-31	If device has earlier auto address, no response.
	If address is 31, no response.
	If message address less than 31 and device doesn't have earlier auto address, sets device address to message address, increments message address by one, and passes revised message.
Auto Extended Primary 0-31	No response.
Auto Extended Secondary 0-31	No response.
Auto Multiple Primary 0-31	No response.
IDENTIFY GROUP	
Identify (no service request)	No response.
Identify (service request)	No response.
DATA GROUP	
Data Byte (no service request) ⎱ Data Byte (service request) ⎰	If talker, performs HP-IL error check and sends next data byte.* If listener, accepts data byte and passes to next device.
End Byte (no service request) ⎱ End Byte (service request) ⎰	If listener, accepts data byte and passes to next device.

* Indicates that the received message is not passed to the next device in the loop.

Status Byte Definitions

	BIT NUMBER	BIT VALUE*	NAME	DEFINITION
FIRST BYTE	7	—	—	Always set to 0.
	6	64	SR	Service request. Set for out-of-paper condition, carriage jam, or PRINT or PAPER ADVANCE key pressed. Cleared when condition removed or by Send Status, Device Clear, Selected Device Clear, or Loop Power Down message.
	5	32	MB	Print mode/jam. Set according to:
	4	16	MA	
	3	8	ER	Error condition. Set for out-of-paper or carriage jam.
	2	4	PA	Paper advance. Set while PAPER ADVANCE key is down.
	1	2	PR	Print. Set while PRINT key is down.
	0	1	LA	Long advance. Set following out-of-paper condition, indicating long carriage movement during advance. Cleared when Carriage Return character received.
SECOND BYTE	7	128	EL	End line. Set if carriage return was last byte received.
	6	64	ID	Idle. Set if printer is not printing.
	5	32	BE	Buffer empty. Set if no information is accumulated in print buffer.
	4	16	EB	Eight bit. Set if printer is in Eight-Bit mode.
	3	8	RJ	Right justify. Set if printer set to right-justify mode.
	2	4	DW	Double wide. Set if printer set to double wide mode.
	1	2	CO	Column mode. Set if printer set to column mode.
	0	1	LC	Lowercase. Set if printer is in Eight-Bit mode and set to lowercase mode.

The MB/MA condition table:

MB	MA	Condition
0	0	Manual print mode
0	1	Trace print mode
1	0	Normal print mode
1	1	Carriage jam (valid only if ER = 1)

* Add the bit values for all bits that are set (equal to "1") to find the decimal value of the status byte.

Escape Mode. In this mode the printer receives special instructions in the form of escape sequences. An escape sequence is a string of ASCII-coded Data Bytes starting with the code for ^{E}c (Escape)—character code 27. Each character in the string is represented by a single byte representing its ASCII code (refer to appendix B).

A proper escape sequence takes one of the following basic forms:

$$^Ec\, a \qquad \text{or} \qquad ^Ec\, x\, y\, nnn\, Z$$

If x and y are common to a series of sequences, the sequences may be combined into a longer string:

$$^Ec\, x\, y\, nnn_1\, z_1\, nnn_2\, z_2 \ldots nnn_N\, Z_N$$

The characters represented by a, x, y, n, and z are restricted to certain characters, as listed below. Any uppercase z character or any improper character terminates the escape sequence when it is received. Subsequent Data Bytes are interpreted as data, and the corresponding characters are accumulated into the print buffer.

Escape Sequence Restrictions

PROPER CHARACTER CODES				
a	x	y	n	z
48 thru 126	33 thru 47	96 thru 126	32 thru 63	64 thru 94
				96 thru 126
Characters 0 thru 6, 10, 13, 16, 17, 19, 21, 22, 23, and 127 are ignored if they occur in an escape sequence.				

The printer responds to only those escape sequences listed in the table below. The specified operations are performed as the sequences are received by the printer (if the printer is a listener). Any portions of a proper escape sequence are ignored if they are not listed in the table—only the listed instructions are performed.

Escape sequences are recognized as instructions in the Escape operating mode only.

Escape Sequence Instructions

ESCAPE SEQUENCE*	INSTRUCTION	DESCRIPTION
^{E}c & a +nn C	Skip Characters	Accumulates skipped characters into one print buffer cell. (nn is number up to 23 that specifies number of skipped characters.)
^{E}c & a nnn D	Skip Absolute	Accumulates necessary skipped columns and characters into two print buffer cells. (nnn is number up to 168 that specifies column position relative to first character.)
^{E}c & a +n D	Skip Columns	Accumulates skipped columns into one print buffer cell. (n is number up to 7 that specifies number of skipped columns.)
^{E}c & k 0 H	Nonparse Mode	Selects no parsing.
^{E}c & k 1 H	Parse Mode	Selects automatic parsing.
^{E}c & k 0 S	Single Wide Mode	Selects normal-width output.
^{E}c & k 1 S	Double Wide Mode	Selects double-width output.
^{E}c & l 0 J	Left-Justify Mode	Selects printing aligned at left margin.
^{E}c & l 1 J	Right-Justify Mode	Selects printing aligned at right margin.
^{E}c & l 2 J	Format	Accumulates format specifier† into two print buffer cells.
^{E}c * b nnn G $x_1 x_2 ... x_{nnn}$	Graphics Input	Accumulates dot-column data into print buffer. (nnn is number up to 255 that specifies the number of codes; x's are characters having appropriate code numbers—0 through 127.)
^{E}c * z nn B $x_1 x_2 ... x_{nn}$	Bar-Code Input	Clears the print buffer and accumulates bar-code data into the buffer. (nn is number up to 16 that specifies the number of codes; x's are characters having appropriate code numbers—0 through 255.)
^{E}c l	Eight-Bit Mode	Selects operation using all eight bits of Data Bytes (refer to Eight-Bit Mode below) and selects alternate character set. (This mode can be cleared by sending a Data Byte of 252 or 253.)

* An uppercase letter in an escape sequence should be in lowercase if it is *not* the last instruction in a string. Any numerical parameter that is out of range will be interpreted as 0.

† If a format specifier is in the first or last cell to be printed, the printing is centered on the line. If the format specifier occurs between other output to be printed, the output is left- and right-justified on the line as split by the specifier.

Eight-Bit Mode. In this mode the printer receives special instructions as Data Bytes with the most-significant bit set to "1". That is, the decimal value of the Data Byte is 128 through 255. Data Byte values below this range are treated as characters (alternate character set, appendix B) or as column print numbers and are accumulated into the print buffer.

Eight-bit instructions are recognized as instructions in the Eight-Bit operating mode only.

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Eight-Bit Mode Instructions

DATA BYTE VALUE*	INSTRUCTION	DESCRIPTION
0 - 127	Data	Treats as character according to alternate character set or as code number and accumulates into print buffer.
128	Read 1 Bar Code	If in column mode, prepares to read and print 1 byte of bar-code data.
⋮	⋮	⋮
143	Read 16 Bar Codes	If in column mode, prepares to read and print 16 bytes of bar-code data.
160	Skip 0 Characters	Accumulates 0 skipped characters into one print buffer cell.
⋮	⋮	⋮
183	Skip 23 Characters	Accumulates 23 skipped characters into one print buffer cell.
184	Skip 0 Columns	Accumulates 0 skipped columns into one print buffer cell.
⋮	⋮	⋮
191	Skip 7 Columns	Accumulates 7 skipped columns into one print buffer cell.
192	Format	Accumulates format specifier† into two print buffer cells.
208	Single/Character/Upper	Selects single wide, character, and uppercase modes.
209	Single/Character/Lower	Selects single wide, character, and lowercase modes.
210, 211	Single/Column	Selects single wide and column modes.
212	Double/Character/Upper	Selects double wide, character, and uppercase modes.
213	Double/Character/Lower	Selects double wide, character, and lowercase modes.
214, 215	Double/Column	Selects double wide and column modes.
224	Left-Justify	Selects left-justify mode.
232	Right-Justify	Selects right-justify mode.
252, 253	Escape Mode	Selects operation using escape sequences.
254	Advance Active	Allows paper to be advanced using PAPER ADVANCE key.
255	Advance Ignore	Prevents PAPER ADVANCE key from advancing paper. This action cleared when key is released or Advance Active received.

* Data Bytes with values not shown are ignored.

† If a format specifier is in the first or last cell to be printed, the printing is centered on the line. If the format specifier occurs between other output to be printed, the output is left- and right-justified on the line as split by the specifier.

Care, Warranty, and Service Information

Care of the Printer

The HP 82162A Thermal Printer is designed to require virtually no maintenance. However, you should observe the following guidelines:

- Use only Hewlett-Packard thermal paper, which is designed to produce clear output and minimize print-head wear.

- Observe the temperature limits listed in appendix B.

Verifying Proper Operation

If at any time you suspect that your printer or interface loop is not operating properly, you can verify its operation by doing the following:

1. Check that all peripheral devices are turned on.

2. Check that the POWER light is on and the BAT light is off. If the rechargeable battery pack has inadequate power, the printer will not operate.

3. Check that the paper is installed properly, not backwards. The paper should feed from the bottom of the roll.

4. Check that the calculator or computer and its interface are working properly. If applicable, check that they are set to operate with a printer. Refer to the owner's manuals for those devices.

5. Turn off the calculator or computer and the printer. Then disconnect the printer from the interface loop.

6. Turn on the printer while it is disconnected from the interface loop. Press the PAPER ADVANCE key.

   - If the paper advances normally, the printer is operating properly and is probably good.

   - If the paper doesn't advance normally or if there is excessive noise or friction, the printer requires service.

If this procedure indicates proper operation, but you still experience difficulty, write or telephone Hewlett-Packard at an address or phone number listed below under Service.

Limited One-Year Warranty

What We Will Do

The HP 82162A Thermal Printer is warranted by Hewlett-Packard against defects in materials and workmanship for one year from the date of original purchase. If you sell your unit or give it as a gift, the warranty is automatically transferred to the new owner and remains in effect for the original one-year period. During the warranty period, we will repair or, at our option, replace at no charge a product that proves to be defective, provided you return the product, shipping prepaid, to a Hewlett-Packard service center.

What Is Not Covered

This warranty does not apply if the product has been damaged by accident or misuse or as the result of service or modification by other than an authorized Hewlett-Packard service center.

No other express warranty is given. The repair or replacement of a product is your exclusive remedy. **ANY OTHER IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS IS LIMITED TO THE ONE-YEAR DURATION OF THIS WRITTEN WARRANTY.** Some states, provinces, or countries do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. **IN NO EVENT SHALL HEWLETT-PACKARD COMPANY BE LIABLE FOR CONSEQUENTIAL DAMAGES.** Some states, provinces, or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, province to province, or country to country.

Warranty for Consumer Transactions in the United Kingdom

This warranty shall not apply to consumer transactions and shall not affect the statutory rights of a consumer. In relation to such transactions, the rights and obligations of Seller and Buyer shall be determined by statute.

Obligation to Make Changes

Products are sold on the basis of specifications applicable at the time of manufacture. Hewlett-Packard shall have no obligation to modify or update products once sold.

Warranty Information

If you have any questions concerning this warranty, please contact an authorized Hewlett-Packard dealer or a Hewlett-Packard sales and service office. Should you be unable to contact them, please contact:

- In the United States:

Hewlett-Packard
1000 N.E. Circle Blvd.
Corvallis, OR 97330
Telephone: (503) 758-1010
Toll-Free Number: (800) 547-3400 (except in
Oregon, Hawaii, and Alaska)

- In Europe:

Hewlett-Packard S.A.
7, rue du Bois-du-lan
P.O. Box
CH-1217 Meyrin 2
Geneva
Switzerland
Telephone: (022) 83 81 11

Note: Do *not* send units to this address for repair.

- In other countries:

Hewlett-Packard Intercontinental
3495 Deer Creek Rd.
Palo Alto, California 94304
U.S.A.
Telephone: (415) 857-1501

Note: Do *not* send units to this address for repair.

Service

Hewlett-Packard maintains service centers in most major countries throughout the world. You may have your unit repaired at a Hewlett-Packard service center any time it needs service, whether the unit is under warranty or not. There is a charge for repairs after the one-year warranty period.

Hewlett-Packard products are normally repaired and reshipped within five (5) working days of receipt at any service center. This is an average time and could possibly vary depending upon the time of year and work load at the service center. The total time you are without your unit will depend largely on the shipping time.

Obtaining Repair Service in the United States

The Hewlett-Packard United States Service Center for battery-powered computational products is located in Corvallis, Oregon:

Hewlett-Packard Company
Corvallis Division Service Department
P.O. Box 999/1000 N.E. Circle Blvd.
Corvallis, Oregon 97330, U.S.A.
Telephone: (503) 757-2000

Obtaining Repair Service in Europe

Service centers are maintained at the following locations. For countries not listed, contact the dealer where you purchased your unit.

AUSTRIA
HEWLETT-PACKARD GmbH
Kleinrechner-Service
Wagramerstr.-Lieblgasse
A-1220 VIENNA
Telephone: (222) 35.16.20

BELGIUM
HEWLETT-PACKARD BELGIUM SA/NV
Boulevard de la Woluwe 100
Woluwelaan
B-1200 BRUSSELS
Telephone: (2) 762 32 00

DENMARK
HEWLETT-PACKARD A/S
Datavej 52
DK-34-60 BIRKEROD (Copenhagen)
Telephone: (02) 81 66 40

EASTERN EUROPE
Refer to the address listed under Austria

FINLAND
HEWLETT-PACKARD OY
Revontulentie 7
02100 ESPOO 10 (Helsinki)
Telephone: (90) 455 02 11

FRANCE
HEWLETT-PACKARD FRANCE
Division Informatique Personnelle
S.A.V. Calculateurs de Poche
F-91947 Les Ulis Cedex
Telephone: (6) 907 78 25

GERMANY
HEWLETT-PACKARD GmbH
Kleinrechner-Service
Vertriebszentrale
Berner Strasse 117
Postfach 560 140
D-6000 FRANKFURT 56
Telephone: (611) 50041

ITALY
HEWLETT-PACKARD ITALIANA S.P.A.
Casella postale 3645 (Milano)
Via G. Di Vittorio, 9
I-20063 CERNUSCO SUL NAVIGLIO (Milan)
Telephone: (2) 90 36 91

NETHERLANDS
HEWLETT-PACKARD NEDERLAND B.V.
Van Heuven Goedhartlaan 121
N-1181 KK AMSTELVEEN (Amsterdam)
P.O. Box 667
Telephone: (020) 472021

NORWAY
HEWLETT-PACKARD NORGE A/S
P.O. Box 34
Oesterndalen 18
N-1345 OESTERAAS (Oslo)
Telephone: (2) 17 11 80

SPAIN
HEWLETT-PACKARD ESPANOLA S.A.
Calle Jerez 3
E-MADRID 16
Telephone: (1) 458 2600

SWEDEN
HEWLETT-PACKARD SVERIGE AB
Enighetsvagen 3
Box 205 02
S 161 BROMMA 20 (Stockholm)
Telephone: (8) 730 05 50

SWITZERLAND
HEWLETT-PACKARD (SCHWEIZ) AG
Kleinrechner-Service
Allmend 2
CH-8967 WIDEN
Telephone: (057) 50111

UNITED KINGDOM
HEWLETT-PACKARD Ltd
King Street Lane
GB-WINNERSH, WOKINGHAM
BERKSHIRE RG11 5AR
Telephone: (734) 784774

International Service Information

Not all Hewlett-Packard service centers offer service for all models of HP products. However, if you bought your product from an authorized Hewlett-Packard dealer, you can be sure that service is available in the country where you bought it.

If you happen to be outside of the country where you bought your unit, you can contact the local Hewlett-Packard service center to see if service is available for it. If service is unavailable, please ship the unit to the address listed above under Obtaining Repair Service in the United States. A list of service centers for other countries can be obtained by writing to that address.

All shipping, reimportation arrangements, and customs costs are your responsibility.

Service Repair Charge

There is a standard repair charge for out-of-warranty repairs. The repair charges include all labor and materials. In the United States, the full charge is subject to the customer's local sales tax. In European countries, the full charge is subject to Value Added Tax (VAT) and similar taxes wherever applicable. All such taxes will appear as separate items on invoiced amounts.

Products damaged by accident or misuse are not covered by the fixed repair charges. In these situations, repair charges will be individually determined based on time and material.

Service Warranty

Any out-of-warranty repairs are warranted against defects in materials and workmanship for a period of 90 days from date of service.

Shipping Instructions

Should your unit require service, return it with the following items:

- A completed Service Card, including a description of the problem and system setup when the problem occurred.

- A sales receipt or other documentary proof of purchase date if the one-year warranty has not expired.

The product, the Service Card, a brief description of the problem and system configuration, and (if required) the proof of purchase date should be packaged in the original shipping case or other adequate protective packaging to prevent in-transit damage. Such damage is not covered by the one-year limited warranty; Hewlett-Packard suggests that you insure the shipment to the service center. The packaged unit should be shipped to the nearest Hewlett-Packard designated collection point or service center. Contact your dealer directly for assistance. (If you are not in the country where you originally purchased the unit, refer to International Service Information above.)

Whether the unit is under warranty or not, it is your responsibility to pay shipping charges for delivery to the Hewlett-Packard service center.

After warranty repairs are completed, the service center returns the unit with postage prepaid. On out-of-warranty repairs in the United States and some other countries, the unit is returned C.O.D. (covering shipping costs and the service charge).

Further Information

Service contracts are not available. Circuitry and designs are proprietary to Hewlett-Packard, and service manuals are not available to customers.

Should other problems or questions arise regarding repairs, please call your nearest Hewlett-Packard service center.

Potential for Radio/Television Interference

The HP 82162A Thermal Printer generates and uses radio frequency energy and, if not installed and used properly (that is, in strict accordance with the instructions in this manual), may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If the printer does cause interference to radio or television reception, which can be determined by turning the printer off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the printer with respect to the receiver.
- Move the printer away from the receiver.
- Plug the printer's recharger into a different outlet so that the printer and the receiver are on different branch circuits.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio—TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 004-000-00345-4.

Applications Information

A number of our users submit program applications or unique programs to Hewlett-Packard. However, we can consider using only ideas given freely to us. Since it is the policy of Hewlett-Packard not to accept suggestions given in confidence, the following statement must be included with your submittal:

"I am voluntarily submitting this information to Hewlett-Packard Company. The information is not confidential and Hewlett-Packard may do whatever it wishes with the information without obligation to me or anyone else."

Dealer and Product Information

For dealer locations, product information, and prices, please call (800) 547-3400. In Oregon, Alaska, and Hawaii, call (503) 758-1010.

Accessories and Specifications

Accessories

Optional accessories are available for the HP 82162A Thermal Printer:

Blue-Printing Thermal Paper, available in packages of six rolls (model number HP 82045A).

Black-Printing Thermal Paper, available in packages of six rolls (model number HP 82175A).

HP-IL Cables, available (in packages of two) in the following lengths:

½ meter (1½ feet)	HP 82167A
1 meter (3 feet)	HP 82167A Option 001
2 meters (6 feet)	HP 82167A Option 002
3 meters (10 feet)	HP 82167A Option 003
5 meters (16 feet)	HP 82167A Option 005

Reserve Power Pack (model number HP 82037A).

Security Cable (model number HP 82044A).

Specifications

The following specifications apply to the HP 82162A Thermal Printer.

Printing Characteristics

- Line length: 24 standard characters (12 double-wide characters, 168 columns).
- Character sets: ASCII and alternate sets. (Refer to table below.)
- Buffer size: 101 cells (one byte per cell).

Interface

- Type: HP-IL (Hewlett-Packard Interface Loop).
- Startup conditions: normal (inactive) or active-listener, selected at turn-on.
- Default address: undefined (normal startup) or 1 (active-listener startup).

Power Requirements

- Primary source: HP 82033A Battery Pack.
- Recharging time for battery pack: 14 to 16 hours (printer turned on or off).
- Usage:
ON	1.5 watts maximum (not printing).
STANDBY (on)	1.7 watts maximum (not printing).
STANDBY (off)	0 watts.

Temperature Limits

- Operating: 0° to 45° C (32° to 113° F).
- Charging: 15° to 40° C (59° to 104° F).
- Storage: −40° to 55° C (−40° to 131° F).

Character Sets

CHARACTER NUMBER	ASCII SET	ALTERNATE SET	CHARACTER NUMBER	ASCII SET	ALTERNATE SET
0		✦	32	(blank)	(blank)
1		×	33	!	!
2		x̄	34	"	"
3		←	35	#	#
4		α	36	$	$
5		β	37	%	%
6		Γ	38	&	&
7		↓	39	'	'
8		Δ	40	(	(
9		σ	41	)	)
10		(LF)*	42	*	*
11		λ	43	+	+
12		μ	44	,	,
13	(CR)†	(CR)†	45	—	—
14		ϒ	46	.	.
15		∓	47	/	/
16		θ	48	0	0
17		Ω	49	1	1
18		δ	50	2	2
19		Ȧ	51	3	3
20		à	52	4	4
21		Ä	53	5	5
22		ä	54	6	6
23		Ö	55	7	7
24		ö	56	8	8
25		Ü	57	9	9
26		ü	58	:	:
27		Æ	59	;	;
28		œ	60	<	<
29		≠	61	=	=
30		£	62	>	>
31		▓	63	?	?

*Line Feed—ignored.

†Carriage Return—causes buffer to be printed.

Character Sets (Continued)

CHARACTER NUMBER	ASCII SET	ALTERNATE SET	CHARACTER NUMBER	ASCII SET	ALTERNATE SET
64	@	@	96	`	▼
65	A	A	97	a	a
66	B	B	98	b	b
67	C	C	99	c	c
68	D	D	100	d	d
69	E	E	101	e	e
70	F	F	102	f	f
71	G	G	103	g	g
72	H	H	104	h	h
73	I	I	105	i	i
74	J	J	106	j	j
75	K	K	107	k	k
76	L	L	108	l	l
77	M	M	109	m	m
78	N	N	110	n	n
79	O	O	111	o	o
80	P	P	112	p	p
81	Q	Q	113	q	q
82	R	R	114	r	r
83	S	S	115	s	s
84	T	T	116	t	t
85	U	U	117	u	u
86	V	V	118	v	v
87	W	W	119	w	w
88	X	X	120	x	x
89	Y	Y	121	y	y
90	Z	Z	122	z	z
91	[	[	123	{	π
92	\	\	124	|	≰
93	]	]	125	}	→
94	^	↑	126	~	Σ
95	—	—	127		⊢

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