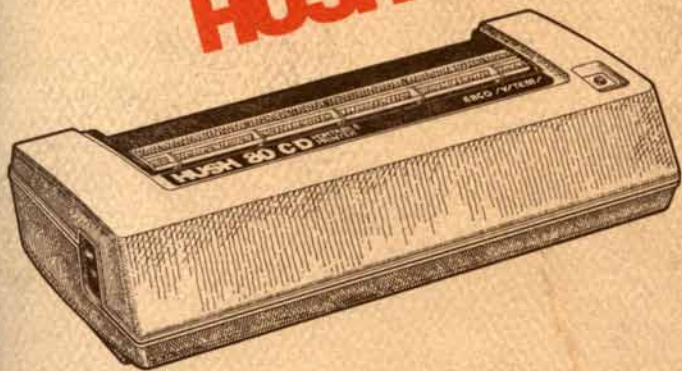


USER'S MANUAL HUSH™ 80 PRINTER

MODEL
HUSH™ 80 P



HUSH 80 P
Parallel Interface
Portable Printer
User's Manual

Ergo Systems, Inc.
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INTRODUCTION

The Ergo Systems HUSH 80 P Parallel Interface Portable Printer uses a standard Centronics-type parallel interface to communicate with a wide variety of computers. In addition, it interconnects like the Epson MX-100 printer, so that software that can be configured for the Epson MX-100 should also work with the HUSH 80 P.

Your new parallel printer is lightweight and takes up very little space, yet it has many features. It prints in four modes:

- 80 characters per line (standard) bidirectional, 80 characters per second
- 40 double-wide characters per line (expanded)
- 160 half-wide characters per line (condensed)
- graphics

The graphic mode is fully dot-addressable with 4800 dots per square inch. Line spacing can be easily programmed to 4½, 6, or 9 lines per inch.

The HUSH 80 P can print uppercase and lowercase letters, numbers, and seven different international character sets. It will even print custom graphics that you design. Inverse printing (white characters on black) can also be selected.

The convenience of your printer is enhanced by its portability and quiet thermal printing. The HUSH 80 P uses low-cost thermal roll paper that stores completely within the printer case. The dot matrix printhead works quietly by heating the paper to form each character as it moves. There are no ribbons to replace.

This manual contains all the information you will need to set up, test, and operate your printer. For information related to programming your computer to use a printer, refer to your computer manual.

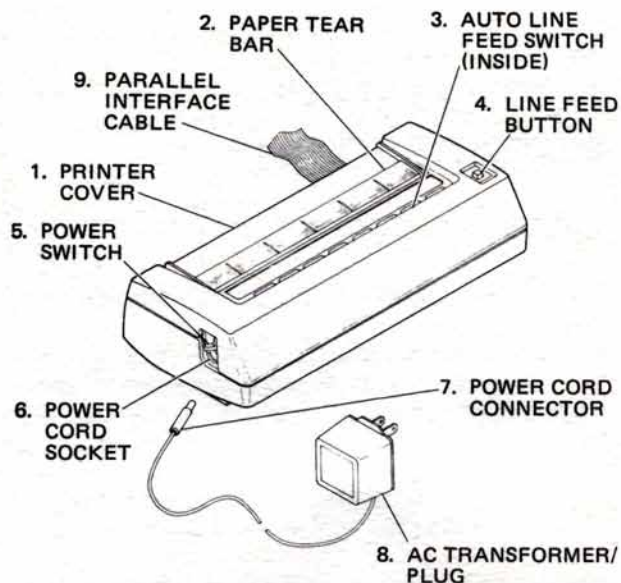
The external controls and components of the HUSH 80 P are shown in Figure 1-1. A detailed description of printer specifications is provided in Appendix A.

Paper

Your HUSH 80 P uses low-cost thermal roll paper that is 8½ inches wide. Each roll is approximately 90 feet in length. One roll is supplied and installed in the printer. Replacement paper is available from your dealer or Ergo Systems, Inc.

CAUTION

The paper is heat-sensitive. If placed in direct sunlight or stored at temperatures over 122°F (50°C), the paper may discolor.



1. **PRINTER COVER** closes over the paper compartment. Push at the center rear and lift cover to insert or remove the paper roll.
2. **PAPER TEAR BAR** provides a sharp edge for tearing off the paper. Pull the paper towards the front of the printer and tear it off against this bar.
3. **AUTO LINE FEED SWITCH** in ON position adds a line feed to every carriage return received from the computer. Has no effect in OFF position. Normally set OFF.
4. **LINE FEED BUTTON** lights when the power is on. Push once to advance the paper one line. Hold down to advance the paper continuously. To activate the Self Test mode, hold this button down while switching on the power.
5. **POWER SWITCH** controls power. Push the top of this switch to turn the power on. Push the bottom of this switch to turn the power off.
6. **POWER CORD SOCKET** connects to the **POWER CORD CONNECTOR**.
7. **POWER CORD CONNECTOR** plugs into the **POWER CORD SOCKET**.
8. **AC TRANSFORMER/PLUG** plugs into a 115 VAC outlet. The transformer converts 115 VAC to 9.2 VAC.
9. **PARALLEL INTERFACE CABLE** plugs into the bottom of the printer and the parallel cable for your computer.

Figure 1-1 External Controls and Components

INSTALLATION AND OPERATION

2-1 Printer Connection and Set Up

Verify that your HUSH 80 P Printer contains an installed roll of thermal paper, and that an AC power cord with transformer and a five-foot parallel interface cable is included.

To use your printer with a computer, the computer must have a parallel printer interface port.

Insert one end of the interface cable into the connector on the bottom of your printer so that the red stripe on the cable connects to pin 1 (left side), as shown in Figure 2-1. Firmly press the connector in place. The cable should exit toward the rear of the printer. Plug the other end of the cable into the parallel cable used with your computer. (For details on the parallel interface, see Appendix B.)

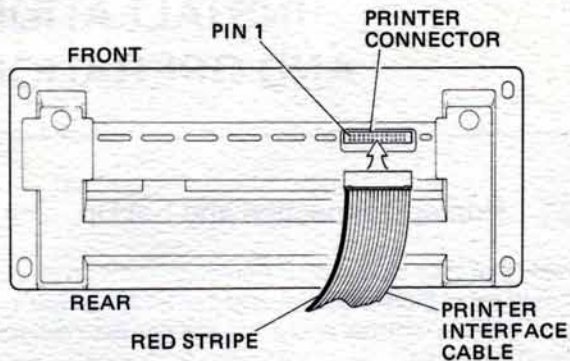


Figure 2-1 Printer Bottom Panel

Plug the transformer into a working 115 VAC outlet. The small end of the power cord plugs into the small, round socket on the left side of the printer (see Figure 1-1).

The printer is switched on by pressing the top of the power switch on the left side, above the power cord. The line feed button lights when power is on. When the printer is first switched on, the printhead will return to the left side, then move across the page and back. This action ensures that printing will always start at the left paper margin.

2-2 Paper Loading

Your new printer already includes one installed roll of paper. This section explains how to install a new roll when needed. Carefully follow the steps listed below, referring to the accompanying illustrations.

1. If the new paper roll has adhesive or tape on the end, trim this off. Then trim the end of the paper using scissors, or tear it off against a straight edge, as shown in Figure 2-2.

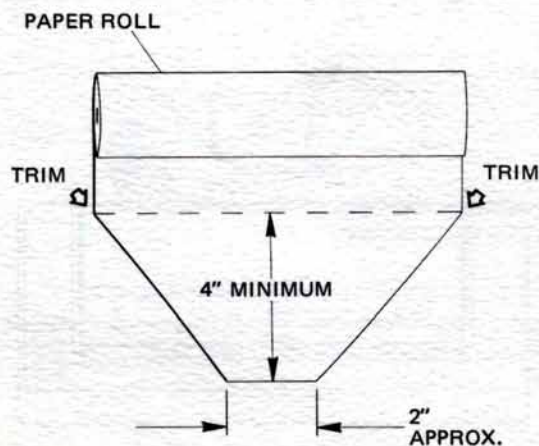


Figure 2-2 Trim Paper Roll

2. Open the hinged printer cover by pressing firmly on the depression on the back of the cover and lifting. Place the paper roll behind the printer with the end of the paper extending from the bottom of the roll, as shown in Figure 2-3.

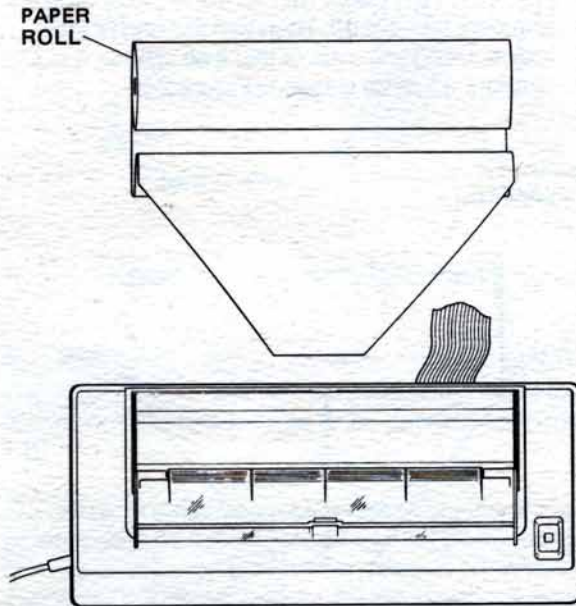


Figure 2-3 Position Paper for Loading

3. Guide the end of the paper into the paper compartment, up the front edge of the compartment, and up between the paper support bar and the upper printhead guide bar, as shown in Figure 2-4. The end of the paper should emerge below the printer cover, into the paper compartment.

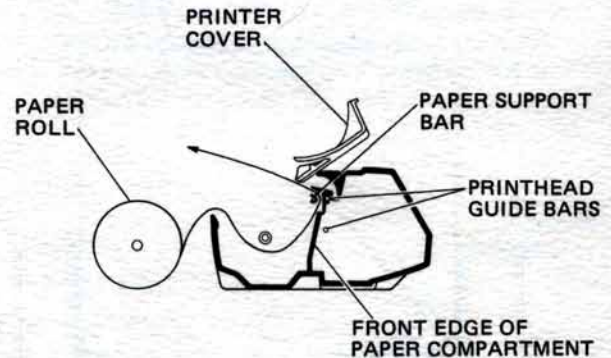


Figure 2-4 Insert Paper between Paper Support Bar and Upper Printhead Guide Bar

4. Pull lightly on the end of the paper until the uncut edges stop against the pinch rollers. With the printer cover open, verify that the sides of the paper are straight and evenly centered between the sides of the paper compartment, as shown in Figure 2-5.

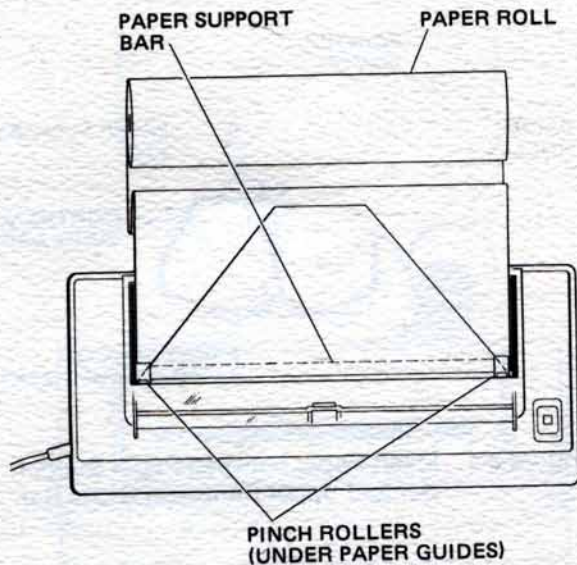


Figure 2-5 Center Paper in Paper Compartment

5. Verify that the printer is plugged in. Switch on the power by pressing the top of the power switch. The line feed button will light when the power is on. Pull lightly on the end of the paper while pressing the line feed button. Advance the paper so that approximately 10 inches extend from out of the paper compartment. Switch off the power by pressing the bottom of the power switch.

6. Take the paper roll from behind the printer and roll up any excess paper, moving the roll into the paper compartment. Insert the roll as shown in Figure 2-6. The roll should turn freely.

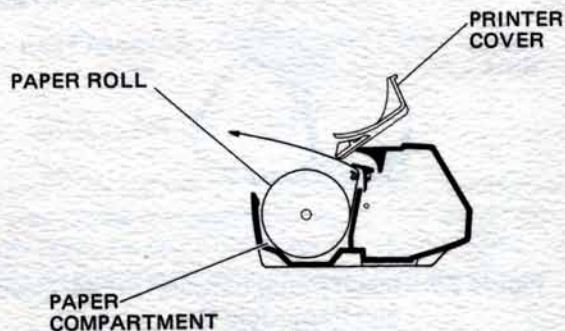


Figure 2-6 Install Paper Roll in Paper Compartment

7. Guide the paper back towards the front of the printer. Feed the end of the paper into the slot between the paper tear bar and the printer cover, as shown in Figure 2-7. Pull the excess paper completely out of the paper compartment and close the printer cover. The paper should exit from under the paper tear bar towards the rear of the printer, as shown in Figure 2-8. Tear off the excess paper.

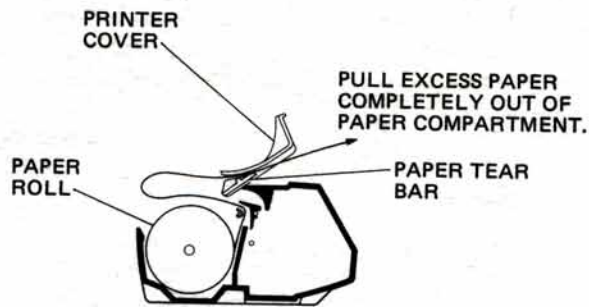


Figure 2-7 Insert Paper between Printer Cover and Paper Tear Bar

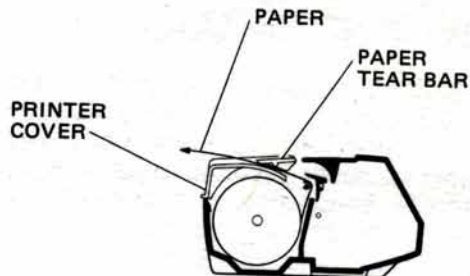


Figure 2-8 Close Printer Cover

2-3 Character Self Test

The character self test can be used to quickly verify that your printer is operating correctly. This test continuously prints the entire character set. The complete HUSH 80 P character set is included in Appendix C.

To perform the character self test, start with the printer off. Switch on the power and immediately depress and hold the line feed button before the printhead resets to the left margin. Release the line feed button once printing starts. The character self test will continue until the printer is switched off.

2-4 Demonstration Self Test

In the demonstration self test mode, your printer will automatically print a message and its entire character set once.

To perform the demonstration self test, start with the printer off. Depress and hold down the line feed button while switching on the power. Release the line feed button after the power is on. The demonstration self test will continue until it finishes automatically.

2-5 Precautions

To avoid any inadvertent damage to your HUSH 80 P Printer, handle it with care. Please observe the following general precautions:

- Never restrain or interfere with the printhead while it is in motion or at rest.
- Do not switch on power or attempt to print without paper loaded.
- Do not attempt to use a different power cord/transformer, even if it looks similar to the unit supplied.
- Do not continuously expose the thermal paper to direct sunlight or extreme temperatures. This could cause it to darken over a period of time.

CONTROLLING BASIC FEATURES

You may already have software that can use the print features of your HUSH 80 P Printer. Any software that can be configured for the Epson MX-100 will also work for the HUSH 80 P Printer. Epson compatibility is described in more detail in Appendix D. To use the basic HUSH 80 P print features on your own, this chapter and Chapter 4 provide explanations of the print features and their corresponding codes.

3-1 Introduction to Printer Codes

The printing features of your HUSH 80 P Printer are controlled by codes. These codes are special data that are sent by the computer to instruct the printer how to print. The codes themselves are not actually printed.

Two different types of printer codes are used to control the HUSH 80 P Printer: "control" codes, and "escape" codes. In this manual, control codes are written as **CTRL** followed by one or more characters. Escape codes are written as **ESC** followed by one or more characters.

Computers use several methods to send these codes to your printer. One common method is to type each code character on the keyboard. Control codes are entered by holding down the control key (usually labelled **CNTL**, **CTL**, or **CTRL**) while entering the code characters. Escape codes are entered by first pressing the escape key (usually labelled **ESC**) and then entering the code characters without holding down the escape key.

Another method of specifying printer codes required by some software packages is to specify each code character by its ASCII (American Standard Code for Information Interchange) number. For example, **ESC R 2** is represented in ASCII as 27 82 50 (decimal). See Appendix E for a table containing the ASCII numbers representing each printer code.

When writing BASIC programs, you can use the `CHR$()` function to specify ASCII printer codes. For detailed information on using the `CHR$()` function, refer to a BASIC programming manual.

3-2 Character Modes

Your HUSH 80 P can print characters in three different sizes: standard, condensed, and expanded. It can also print in inverse mode; that is, white characters on black.

Standard printing looks like this.

Use condensed mode to fit many characters on each line.

This is expanded.

~~Inverse printing is a special effect.~~

Character modes and their corresponding printer codes are described in Table 3-1.

Table 3-1 Character Modes

Character Mode	Char./line	Printer Code	
		Turn On	Turn Off
Standard	80	default	
Condensed	160	CTRL O	CTRL R
Expanded	40	CTRL N or ESC W 1	Line feed/ CTRL T or ESC W 0
Inverse		ESC I 1	ESC I 0

Standard Mode

In the standard character mode, the HUSH 80 P prints 80 characters per line. When the printer is switched on, it automatically starts in this mode. To reset the printer to standard character mode when another mode is active, use the printer code that turns off the other active mode.

Condensed Mode

In the condensed character mode, the HUSH 80 P prints 160 characters per line. Each character uses one half of a print column. Printer code **CTRL O** activates condensed mode. This mode remains in effect until it is turned off by **CTRL R**.

Whenever condensed mode is activated, it is effective from the beginning of the line, even if the code is sent in the middle of a line. However, there is a way to start a line with normal characters and change to condensed in the same line. At the beginning of the line, first activate condensed mode and then enlarged mode. Combined, these modes produce normal characters. Then, to change to condensed characters, turn off the enlarged mode. Anytime condensed mode is active, printing occurs at half normal speed.

Expanded Mode

In the expanded character mode, the HUSH 80 P prints 40 doublewide characters per line. Each character uses two print columns.

There are two ways to activate the expanded mode. To print only a word or part of a line in this mode, use printer code **CTRL N**. When activated in this way, expanded mode is automatically turned off at the end of the line by the line feed code. It can also be turned off before the line end by **CTRL T**. Expanded mode can also be activated by printer code **ESC W 1**. When activated in this way, expanded mode can only be turned off by **ESC W 0**.

Inverse Mode

In the inverse print mode, the HUSH 80 P prints white characters on black. This mode is activated by printer code **ESC I 1**. Inverse mode continues until it is turned off by **ESC I 0**. Inverse mode can be used with any of the three character sizes or while in graphic mode.

3-3 Line Spacing

The HUSH 80 P can use three different line spacing standards: normal, close, and wide.

These lines are printed using normal line spacing, which is 6 lines per inch.

These lines are very close together because they are printed using close line spacing (9 lines per inch).

Here is an example of wide line spacing, which is 4-1/2 lines per inch.

Line spacing standards and their corresponding printer codes are described in Table 3-2.

Table 3-2 Line Spacing Standards

Line Spacing	Lines/Inch	Printer Code
Normal (default)	6	ESC 2
Close	9	ESC 1
Wide	4-1/2	ESC 4

Normal Line Spacing

Normal line spacing gives six lines per inch and is equivalent to single spacing on a standard typewriter. When the printer is switched on, it automatically selects normal line spacing. Line spacing is only changed when a different standard is specified.

Close Line Spacing

Close line spacing gives nine lines per inch and leaves no space between printed lines. Use printer code **ESC 1** to select close line spacing. Close line spacing is primarily useful in graphic mode to print contiguous rows of dots.

Wide Line Spacing

Wide line spacing gives 4-1/2 lines per inch and is equivalent to 1-1/2 spacing on a standard typewriter. Wide line spacing is selected by printer code **ESC 4**.

3-4 Tabbing

The HUSH 80 P can tab both horizontally and vertically to fixed tabs. It can also tab horizontally to a specified print column. Dot-column tabbing, primarily for graphics applications, is discussed in Section 4-3. The different types of tabbing and the corresponding printer codes are described in Table 3-3.

Table 3-3 Tabbing

Tab Type	Description	Printer Code
Fixed horizontal	Sets a tab stop every 10 spaces (5 spaces in expanded mode).	CTRL I
Column	Tabs to specified print column.	CTRL P n (n is a 2 digit column number)
Vertical	Generates 3 line feeds.	CTRL K

Fixed Horizontal Tabbing

Fixed horizontal tabbing sets a tab stop every 10 spaces in standard or condensed character modes. In expanded mode, a tab stop is set every 5 spaces. When a tab code is received by the printer, it tabs to the next fixed tab stop and continues printing from that position. To activate fixed horizontal tabbing, use printer code **CTRL I**. Code **CTRL @** clears the fixed horizontal tab stops.

Column Tabbing

The column tab feature is used to tab to a specified print column. Printer code **CTRL P** tells the printer that you want it to tab. This code must be followed by a two-digit number specifying the print column (00-79) where the printhead should print.

Vertical Tabbing

Vertical tabbing generates three line feeds. This has the effect of skipping two blank lines and continuing printing on the third line. Printer code **CTRL K** causes a vertical tab.

3-5 Line Feed and Carriage Return

A line feed causes the paper to advance one line space, but the printhead does not return to the margin. A carriage return causes the printhead to move to the margin where printing is to begin from next, but the paper does not advance. Use printer code **CTRL J** to generate a line feed and printer code **CTRL M** to generate a carriage return.

Most computers automatically send both a line feed and a carriage return to the printer at the end of every line. However, some computers send only a carriage return. If your computer sends only a carriage return, and the paper does not advance properly, set the Line Feed switch (see Fig. 1-1) to the ON position. This automatically adds a line feed to every carriage return received by the printer.

3-6 Unidirectional Printing

The HUSH 80 P normally prints bidirectionally. For applications such as over-printing to give a boldface effect, you may want it to print only from left to right. Unidirectional printing, though slower, results in slightly improved alignment of printed lines. Use printer code **ESC U 1** to activate unidirectional printing and printer code **ESC U 0** to return to bidirectional printing.

3-7 Reset

Use printer code **ESC @** to reset your printer to its default printing specifications: text mode, U.S. character set, standard character mode, normal line spacing, clear tabs, and bidirectional printing. Another method of resetting your printer is to turn it off for a few seconds, then on.

GRAPHICS AND INTERNATIONAL CHARACTERS

The HUSH 80 P Printer can print bit-image graphics and international characters as well as regular text. This chapter explains how to use the graphic features and international character sets.

4-1 Graphic Mode

The HUSH 80 P Printer can print in either text or graphic mode. In text mode, it interprets each data byte it receives as an ASCII number. In graphic mode, however, the eight bits in each data byte directly specify which dots to print.

The printhead can print a column of seven dots in each of the 480 dot columns on one line. Each of the eight bits in a data byte controls one dot position, except the first bit (most significant) which is ignored. Figure 4-1 shows the correspondence between data bits and the dot positions in one column. A dot is only printed in those positions whose corresponding bit is 1, thus the term "bit-image" graphics.

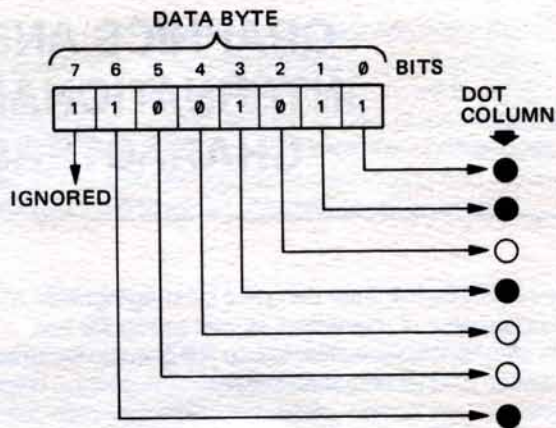


Figure 4-1 Correspondence Between Data Bits and Dot Positions

Graphic mode is activated by printer code **ESC K**. This code must be followed by two numbers which specify the number of bit-image data bytes to be printed (1-480). After printing the specified amount of bit-image data, the printer automatically returns to text mode. The format is as follows:

ESC K + n1 + n2

The two numbers $n1$ and $n2$ represent a 16-bit binary number where $n1$ is the most significant byte and $n2$ is the least significant byte. Note that $n1$ and $n2$ can only be sent to the printer in decimal or hexadecimal format. These numbers cannot be sent by including them in a BASIC PRINT statement, enclosed in quotes.

The decimal number $n1$ is determined as follows. If the number of data bytes is less than 256, then $n1$ equals 0. If the number of data bytes is equal to or greater than 256, then $n1$ equals 1.

The decimal number $n2$ is determined as follows. If the number of data bytes is less than 256, then $n2$ equals the number of data bytes. If the number of data bytes is equal to or greater than 256, then $n2$ equals the number of data bytes minus 256. For example, if the number of data bytes is 392, $n2$ equals $392 - 256$, or 135.

Using both numbers to specify the amount of bit-image data, if the number of data bytes equals 289, then graphic mode is specified as follows:

ESC K + 1 + 33

All graphic data are automatically printed unidirectionally.

4-2 Designing Graphics

The HUSH 80 P graphic mode allows you the flexibility to design custom graphic characters. The following steps explain how to design a graphic.

1. Use a $7 \times n$ grid of small squares to design your graphic. (n represents any number, 1 through 480.) Number the rows of boxes as shown in the example in Figure 4-2.
2. Design your graphic in dot form by filling in the appropriate squares.
3. Each dot in a column has a value equal to its row number. Add together the values of the leftmost column of dots. In the example, the first column has dots in rows 32, 16, and 8. The total equals 56.
4. The totals are the decimal data that should be sent to the printer in sequence from left to right to produce the pictured graphic.

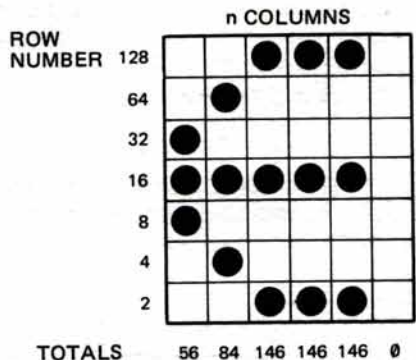


Figure 4-2 Designing a Graphic

4-3 Setting Dot-addressable Tabs

Each of the 80 print columns is composed of 6 dot columns. The dot-addressable tab feature is used to select at which of the 480 dot columns the printhead should begin to print. This feature can be used in graphic mode or with text.

Printer code **ESC *** tells the printer that you want it to set a dot-addressable tab. This code must be followed by two numbers which specify the dot column (0-479) where the printhead should print. The format is as follows:

$$\text{ESC} * + n1 + n2$$

The two numbers $n1$ and $n2$ represent a 16-bit binary number where $n1$ is the most significant byte and $n2$ is the least significant byte. Note that $n1$ and $n2$ can only be sent to the printer in decimal or hexadecimal format. These numbers cannot be sent by including them in a BASIC PRINT statement, enclosed in quotes.

The decimal number $n1$ is determined as follows. If the tab column number is less than 256, then $n1$ equals 0. If the tab column number is equal to or greater than 256, then $n1$ equals 1.

The decimal number $n2$ is determined as follows. If the tab column number is less than 256, then $n2$ equals the tab column number. If the tab column number is equal to or greater than 256, then $n2$ equals the tab column number minus 256. For example, if the tab column number is 400, $n2$ equals $400 - 256$, or 144.

Using both numbers to specify the desired tab position, if the tab column number is 318, then the tab code is specified as follows:

$$\text{ESC} * + 1 + 62$$

4-4 International Character Sets

Your HUSH 80 P Printer can print seven different international character sets in addition to the standard U.S. character set. Appendix C includes a detailed list of the characters and ASCII codes for each of the languages represented. The international character sets and their corresponding printer codes are shown in Table 4-1.

To activate a new character set, use the corresponding printer code from Table 4-1. A selected character set will remain in effect until it is changed.

Table 4-1 International Character Sets

Char. Set	Printer Code
U.S.	ESC R 0
French	ESC R 1
German	ESC R 2
British	ESC R 3
Danish	ESC R 4
Swedish	ESC R 5
Italian	ESC R 6
Spanish	ESC R 7

MAINTENANCE

5-1 Simple Troubleshooting

If you should ever have a problem, the solutions outlined in Table 5-1 should help you correct it. If the problem persists, return the printer for repair. See the warranty card enclosed with the printer for details on returning it for repair.

Table 5-1 Troubleshooting

PROBLEM	SOLUTION
Printer will not print. Paper advance light is off.	Verify that the power cord is plugged into a working 115 VAC outlet and that the small connector is completely plugged into the printer.
Printer prints in Self Test mode, but does not respond to computer.	Verify that the parallel interface cable is completely plugged into the printer and the parallel interface port of the computer. Also verify that your computer's parallel interface is compatible with the HUSH 80 P parallel interface specifications (see Appendix B).
Paper does not advance properly.	Open the printer cover and verify that the paper roll is correctly seated (see Section 2-2, Step 6). If the paper is jammed, remove the paper roll. Cut off and remove the jammed paper. Reload the paper (see Section 2-2).

Potential for Radio/Television Interference

The HUSH 80 P Printer generates and uses radio frequency energy. If it is not installed in strict accordance with Ergo's instructions, it may cause interference to radio and television reception. Your printer complies with the limits for a class B computing device in accordance with the specifications in Subpart J of Part 15 of the Federal Communications Commission rules. These specifications 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 can try to correct the problem by doing one or more of the following:

- Reorient the receiving antenna.
- Relocate the printer with respect to the receiver.
- Move the printer away from the receiver.
- Plug the printer into a different outlet so that the printer and the receiver are on different branch circuits.
- Use a shielded printer interface cable.

If necessary, 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 No. 004-000-00345-4.

5-2 Service Policy

The Ergo Extra Service Program (ESP) has been developed to provide you with an efficient, cost-effective, and trouble-free method of product repair when your printer is out of warranty. With the ESP plan, Ergo will, at Ergo's option, repair or replace your printer for a fixed fee, regardless of the type of defect. Refer to the warranty card enclosed with the printer for a repair rate schedule.

If your printer needs repair after its warranty expires, return it to your dealer or Ergo Systems, Inc. in accordance with Ergo's post-warranty repair policy as stated on the warranty card.

APPENDIX A

HUSH 80 P PRINTER SPECIFICATIONS

Print method:	Thermal dot matrix
Character matrix:	6 × 7 dot matrix, 80 columns
Character set:	Full alphanumeric and international character set (129 characters and symbols standard)
Print speed:	80 characters per second
Print direction:	Text — bidirectional or unidirectional Graphics — unidirectional
Print characteristics:	Standard — 80 characters per line Expanded — 40 double-wide characters per line Condensed — 160 half-wide characters per line
Graphics:	Dot-addressable with 480 columns, 7 dots per column
Line spacing:	Standard — 6 lines per inch Wide — 4½ lines per inch Close — 9 lines per inch
Print mode:	Programmable — normal or inverse (white characters on black)

Paper feed:	Momentary — per programmed linespace Continuous rate — 1½ inches per second
Media:	Thermal roll paper (8½ inches wide). Store below 122°F (50°C).
Interface:	Centronics-type parallel
Printer cable:	6 inch cable 26 pin to 36 pin connectors
Power requirements:	115 VAC, 50/60 Hz
Power consumption:	12 W while printing; 2 W while idling
Transformer:	9.2 VAC, 3 A integral power cord
External dimensions:	11.625W × 5.5D × 2.8H (inches)
Weight:	Printer — 25 ounces Paper — 11 ounces (full roll)

APPENDIX B PARALLEL INTERFACE SPECIFICATIONS

The Hush 80 P Printer uses a standard parallel interface that is compatible with a variety of personal computers. The pin assignments of the printer connector are shown in Table B-1.

Table B-1 Pin Assignments

Pin	Signal	Pin	Signal
1	– Strobe	2	Ground
3	Data Bit 0	4	– Error
5	Data Bit 1	6	NC
7	Data Bit 2	8	NC
9	Data Bit 3	10	Ground
11	Data Bit 4	12	Ground
13	Data Bit 5	14	Ground
15	Data Bit 6	16	Ground
17	Data Bit 7	18	Ground
19	– Acknowledge	20	Ground
21	Busy	22	Ground
23	Ground	24	Ground
25	Select	26	– Prime

APPENDIX C

ASCII CODES

The HUSH 80 P Printer contains a complete set of 96 ASCII characters. In addition to all of the standard characters shown in Table C-1, the seven international character sets are shown in Table C-2.

Each character in Table C-1 is followed by its ASCII code in both decimal and hexadecimal form.

Table C-1 Standard Character ASCII Codes (1 of 2)

Char.	Dec.	Hex.
Space	32	20
!	33	21
"	34	22
#	35	23
\$	36	24
%	37	25
&	38	26
'	39	27
<	40	28
>	41	29
*	42	2A
+	43	2B
,	44	2C
-	45	2D
.	46	2E
/	47	2F
0	48	30
1	49	31
2	50	32

Char.	Dec.	Hex.
3	51	33
4	52	34
5	53	35
6	54	36
7	55	37
8	56	38
9	57	39
:	58	3A
;	59	3B
<	60	3C
=	61	3D
>	62	3E
?	63	3F
@	64	40
A	65	41
B	66	42
C	67	43
D	68	44
E	69	45

Table C-1 Standard Character ASCII Codes (2 of 2)

Char.	Dec.	Hex.	Char.	Dec.	Hex.
T	70	46	u	99	63
U	71	47	v	100	64
V	72	48	w	101	65
W	73	49	x	102	66
X	74	4A	y	103	67
Y	75	4B	z	104	68
Z	76	4C	[	105	69
[	77	4D	\	106	6A
\	78	4E	]	107	6B
]	79	4F	^	108	6C
^	80	50	_	109	6D
_	81	51	`	110	6E
`	82	52	a	111	6F
a	83	53	b	112	70
b	84	54	c	113	71
c	85	55	d	114	72
d	86	56	e	115	73
e	87	57	f	116	74
f	88	58	g	117	75
g	89	59	h	118	76
h	90	5A	i	119	77
i	91	5B	j	120	78
j	92	5C	k	121	79
k	93	5D	l	122	7A
l	94	5E	m	123	7B
m	95	5F	n	124	7C
n	96	60	o	125	7D
o	97	61	p	126	7E
p	98	62	q	127	7F

Table C-2 International Character Sets

Dec.	U.S.	French	German	British
35	#			£
36	#			
64	@	œ	ö	
91	^	°	°	
92	/	ü	ö	
93	]	ü	ö	
94	>			
96	/			
123	^	œ	œ	
124	--	œ	ö	
125	v	œ	ö	
126	~	:	ö	

Dec.	Danish	Swedish	Italian	Spanish
35				£
36		œ		
64		œ		
91	#	°	.	-
92	œ	ö		~
93	œ	ö	œ	œ
94		ö		
96		œ	œ	
123	œ	œ	œ	:
124	œ	ö	ö	œ
125	œ	œ	œ	
126		ö	ö	

APPENDIX D COMPATIBILITY WITH EPSON MX-100 CONFIGURATION

Your HUSH 80 P Printer is compatible with all Epson MX-100 printer codes. Therefore, you can use the HUSH 80 P with software that can be configured for an Epson MX-100.

Though the HUSH 80 P can recognize every Epson printer code, it uses a filtering feature to screen out those codes that control functions not implemented in the HUSH printer. Table D-1 lists those Epson printer codes that are filtered out by the HUSH 80 P Printer. When one of these codes is received it is simply ignored, and the printer functions as if the code had not been sent.

Table D-1 Unimplemented Epson Printer Codes

Code	Function
ESC 3 n	Set fine line spacing
ESC A n	Set fine line spacing
ESC B n n . . . n NUL	Set variable vertical tabbing
ESC C n n	Set form length
ESC D n n . . . n NUL	Set variable horizontal tabbing
ESC J n	Paper feed
ESC Q n	Set column width
ESC S n	Superscript/subscript on
ESC T	Superscript/subscript off
ESC -n	Underline

Note: n represents a variable value.

APPENDIX E SUMMARY OF PRINT FEATURES

Print Feature	Printer Code ^a	ASCII Code ^a	
		Dec.	Hex.
Stand. char.	default		
Cond. char. on	CTRL O	15	0F
Cond. char. off	CTRL R	18	12
Exp. char. (temp) on	CTRL N	14	0E
Exp. char. (temp) off	CTRL T	20	14
Exp. char. (lock) on	ESC W 1	27-87-49	1B-57-31
Exp. char. (lock) off	ESC W 0	27-87-48	1B-57-30
Inverse on	ESC I 1	27-73-49	1B-49-31
Inverse off	ESC I 0	27-73-48	1B-49-30
Normal line space	ESC 2	27-50	1B-32
Close line space	ESC 1	27-49	1B-31
Wide line space	ESC 4	27-52	1B-34
Horiz. tab (fixed)	CTRL I	9	09
Horiz. column tab	CTRL P n	16-n	10-n
Vert. tab	CTRL K	11	0B
Line feed	CTRL J	10	0A
Carriage return	CTRL M	13	0D
Unidirect. print on	ESC U 1	27-85-49	1B-55-31
Unidirect. print off	ESC U 0	27-85-48	1B-55-30
Reset	ESC @	27-64	1B-40
Graphic mode ^b	ESC K n n	27-75-n-n	1B-4B-n-n
Dot-address. tab ^b	ESC * n n	27-42-n-n	1B-2A-n-n
Internat. char. set	ESC R n	27-82-n	1B-52-n

^an represents a variable value.

^bThese code sequences must be sent to the printer in decimal or hexadecimal format. They cannot be specified literally in a BASIC PRINT statement.

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