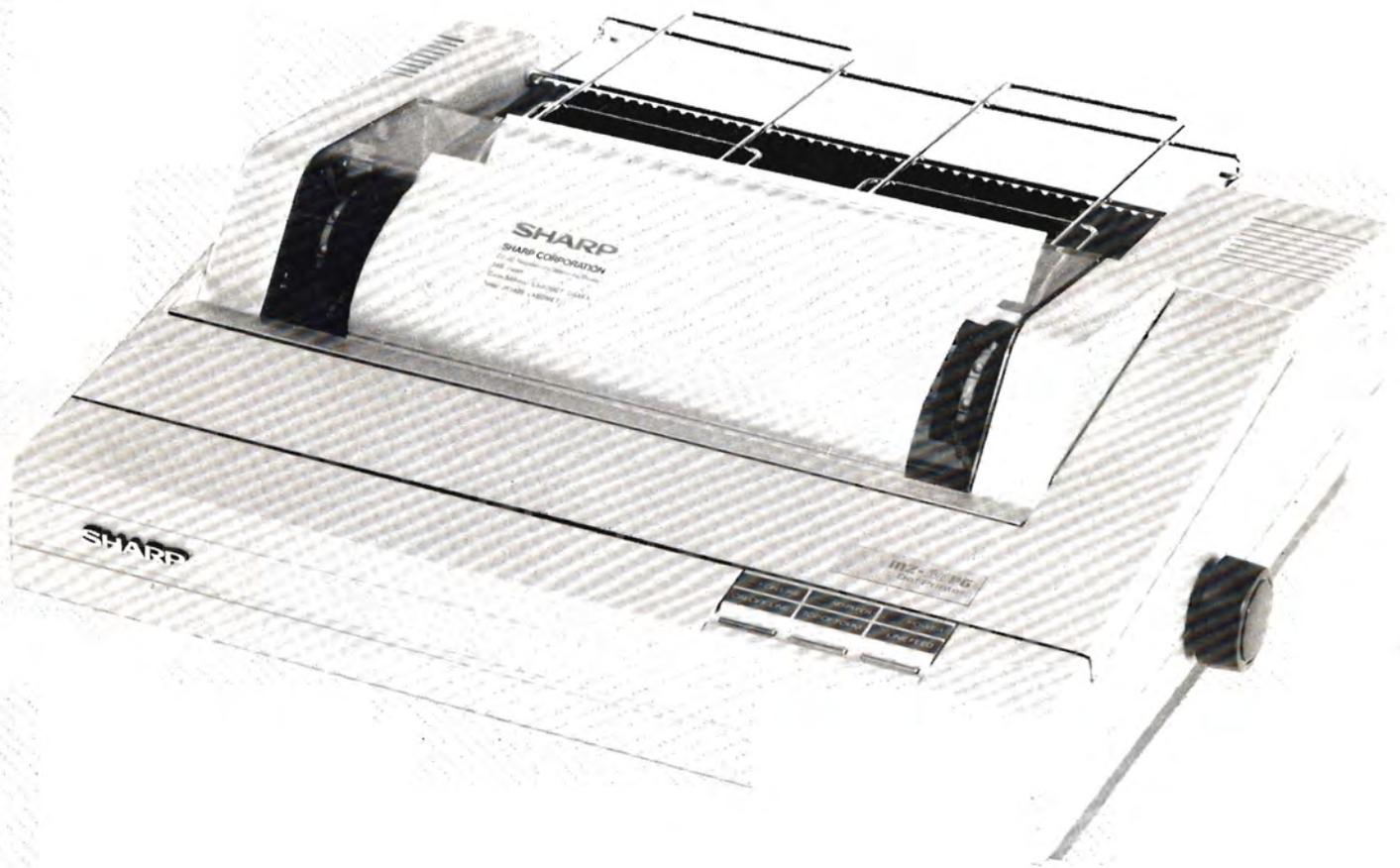


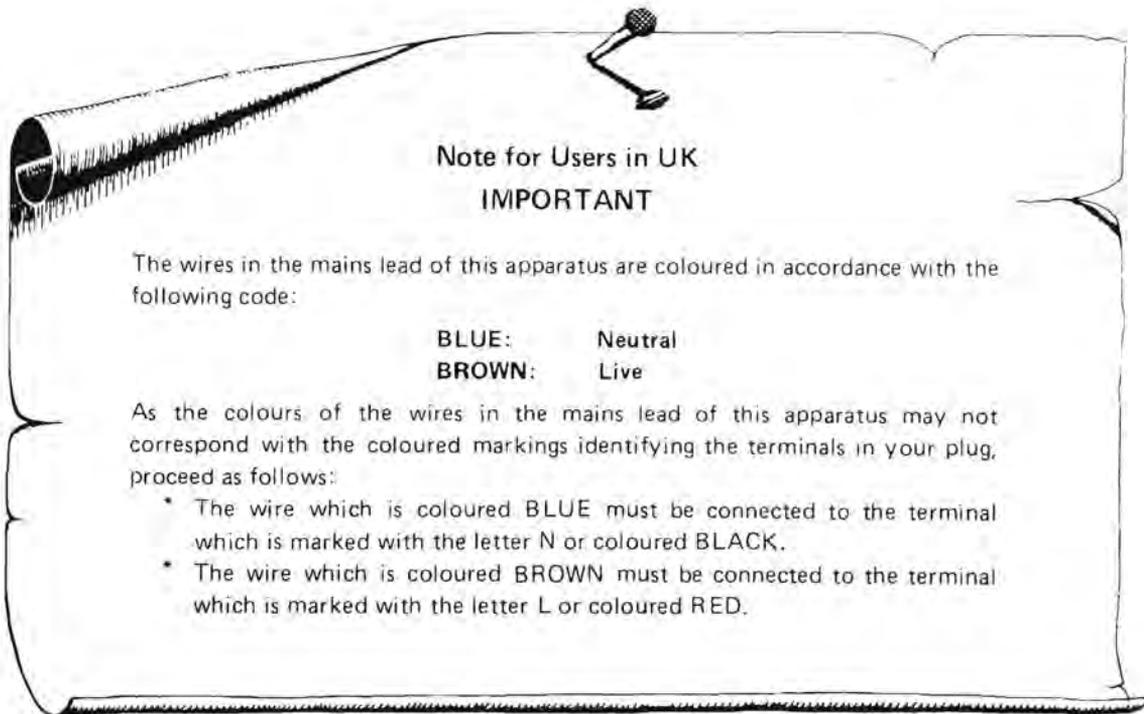
SHARP

DOT PRINTER

MZ-80P6

INSTRUCTION MANUAL





Note for Users in UK
IMPORTANT

The wires in the mains lead of this apparatus are coloured in accordance with the following code:

BLUE:	Neutral
BROWN:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- * The wire which is coloured **BLUE** must be connected to the terminal which is marked with the letter **N** or coloured **BLACK**.
- * The wire which is coloured **BROWN** must be connected to the terminal which is marked with the letter **L** or coloured **RED**.

INTRODUCTION

Thank you very much for purchasing the Sharp Dot Printer MZ-80P6. This unit is designed as a terminal dot matrix impact printer. It has many features and can be used in a wide variety of fields. Read this Instruction Manual before using the MZ-80P6 so that you can use it correctly.

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Features

- **Printing paper** 4 to 10 inch width fanfold paper and 8.3 to 8.5 inch width sheet paper
- **Character printing** Four character sizes are possible.
- **Bit image printing** Printing is possible with dot units.
- **Paging** Number of lines printed on 1 page can be determined.
- **Tabulation** Both vertical and horizontal tabulation control is possible.
- **Feed** Switch for line by line paper feed and paper feed in page units.
Control is also possible through software.
- **Copies** Simultaneous copies, up to 3 pages including the original, are possible.
- **Alarm bell** Alarm bell sounds to warn the user of mechanical trouble, lack of printing paper, etc.
- **Bi-directional printing** Along with bi-directional printing, there is very effective printing thanks to the use of logical seeking. (Except for bit image printing or for non line space mode)
- **Printing ribbon** It can be easily put in and taken out without getting ones hands dirty because a special cartridge ribbon is used.

Cautions during Use

1. Installation

- Do not install the unit in the following places.
 - Where there is lots of moisture.
 - Where it is hit by direct sunlight.
 - Where there is lots of dust.
 - Where the temperature is very high or low.
 - Where there is lots of vibration.
- Install the unit as level as possible.
- Do not install the unit near machines that generate lots of noise. Also, use a power source different from that used by such machines.
- Use the power source voltage shown on the rating plate on the back of the unit.

2. Cautions during Operation

- Do not touch the printing head with your hand during operation because it becomes very hot.
- Immediately pull out the power cord if water or liquid or metal objects such as a wire or pin gets inside the unit by mistake. Then completely remove these foreign objects.
- Always be sure the braided wire, etc. are completely connected when operating this machine. (Refer to page 4 or 5.)

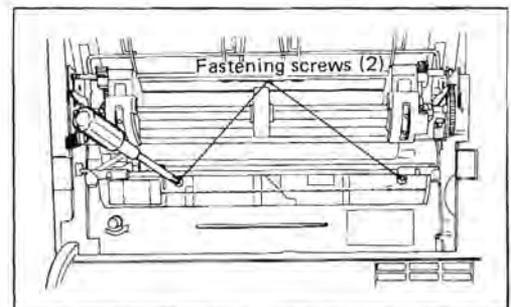
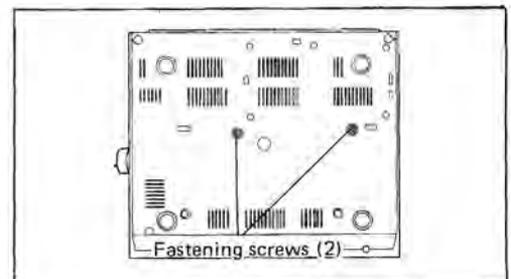
3. Screws to Fasten Printing Mechanism

The printing mechanism is fastened to the chassis with four screws to prevent it from being damaged by vibration during transit. Remove these screws before using the unit. When transporting it again, refasten the mechanism with these screws. Keep the screws that you remove for that purpose.

STEP 1. Remove the two fastening screws that are on the bottom of the printer cabinet.

STEP 2. Remove the screws holding the mechanism. When the printing head is all the way to the left, there is one screw in the chassis between the belt to the right side of it and another fastening screw in the right end of the horizontal direction.

STEP 3. Put the printer cover back. Keep the fastening screws that you removed.

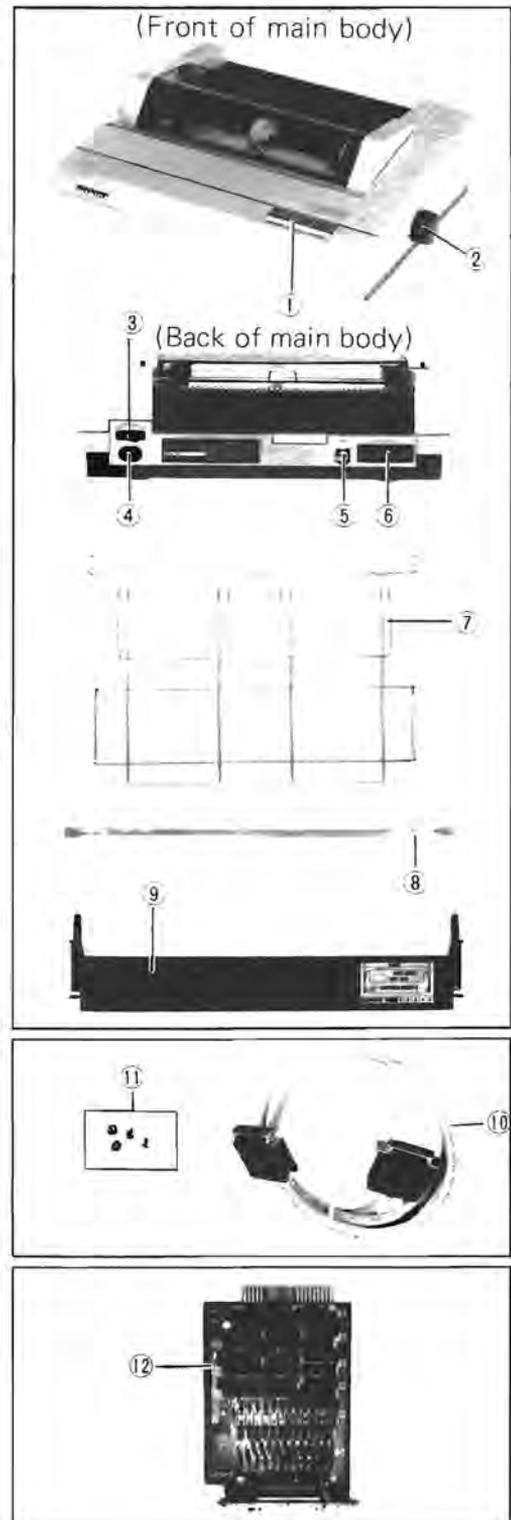


Remove the fastening screws

Dot Printer MZ-80P6

To connect MZ-80P6 to MZ-80B, MZ-80A or MZ-80K (hereinafter called the computer), the printer proper, signal cable (option), and interface card (option) are required.

- ① **Control panel**
Holds on-line switch, paper feed switches and indicators.
- ② **Manual feed knob**
- ③ **Power switch**
- ④ **Appliance inlet**
Connect the power cord connector of an accessory here.
- ⑤ **FG (Frame ground) terminal**
Terminal for connecting braided wire.
- ⑥ **Signal terminal (I/O PORT 1)**
Connect the signal cable connector here.
- ⑦ **Assistant guide**
Attach to the main body for smooth feed of printing paper.
- ⑧ **Braided wire**
Connect to the FG terminals of the computer and MZ-80P6.
- ⑨ **Special cartridge ribbon**
- ⑩ **Signal cable (option)**
Connect the printer I/O card and the MZ-80P6 with this cable.
The signal cable to be used differs depending on the computer to be connected.
MZ-8BP5C: for MZ-80B or MZ-80A
MZ-8KP5C: for MZ-80K
- ⑪ **Screws**
Use these screws to fasten the connectors of the signal cable.
- ⑫ **I/O card (option)**
Interface card for connecting the computer and printer.
The I/O card to be used differs depending on the computer to be connected.
MZ-8BP5I: for MZ-80B or MZ-80A
MZ-8KP4I: for MZ-80K



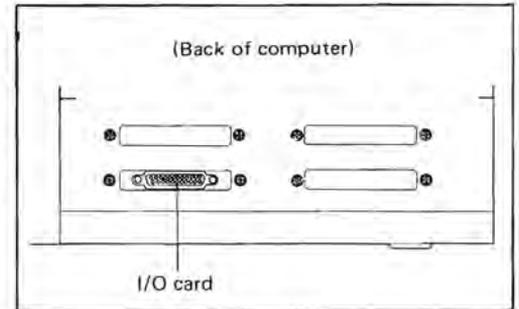
Connecting MZ-80P6 to the Computer

1. When connecting to MZ-80B or MZ-80A.

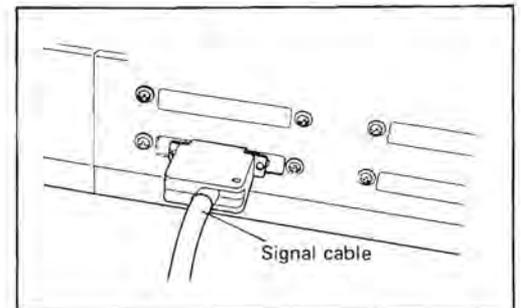
STEP 1. Assemble the I/O card to the extension unit. Return all the screws removed for assembling as before. The right picture shows the assembled I/O card.

With MZ-80B, use No. 3 slit of six slits and, with MZ-80A, use No. 2 slit of four slits for assembling the I/O card.

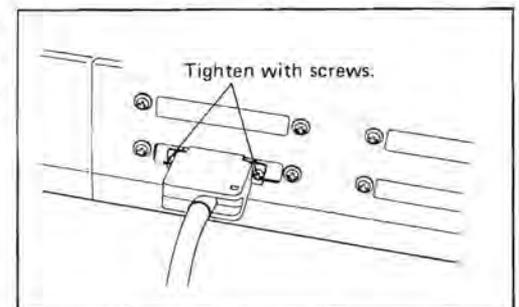
Extension Unit: MZ-80EU for MZ-80B
MZ-80AEU for MZ-80A



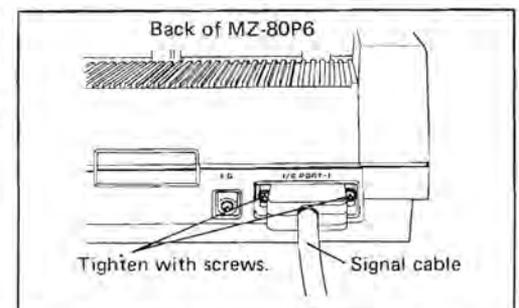
STEP 2. Connect the signal cable to the signal terminal for the I/O card. You can use either the right or left cable connector, but pay attention to the direction when connecting. They are non-reversible connectors.



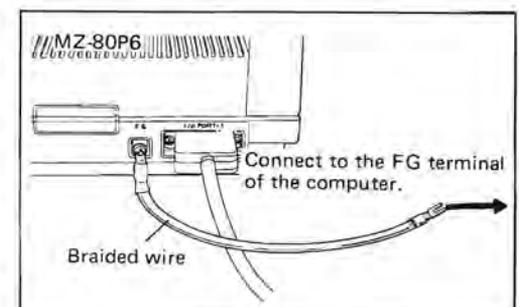
STEP 3. Pass the supplied screws through the holes in the right and left of this connector, and fasten the connector by tightening these screws. Be sure to tighten these screws. (Tighten screws in 2 places)



STEP 4. Connect the other end of the signal cable to the signal terminal (I/O PORT 1) in the back of printer MZ-80P6. As in STEP 3, use the supplied screws, and fasten both sides of this connector by tightening the screws. (Tighten screws in 2 places.)



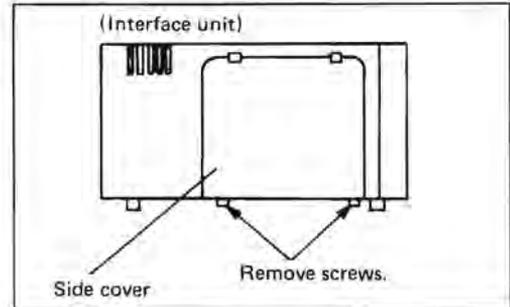
STEP 5. Finally, connect the FG terminals of the computer and MZ-80P6 with the supplied braided wire (Fig. on the right). The lug terminal on one side of the braided wire is "U" shaped, and the other end is round shaped. Connect the "U" shaped lug terminal to the FG terminal of the computer, and the round shaped lug terminal to the FG terminal of the MZ-80P6. When connecting to the FG terminal of the MZ-80P6, tighten the lug terminal of the braided wire with the screw of FG. This connection of the braided wire must be done.



2. When connecting to MZ-80K

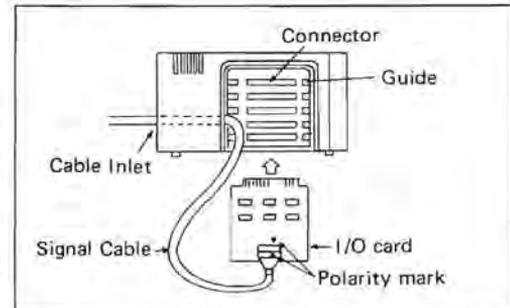
STEP 1. Connect the MZ-80K and interface unit MZ-80I/O. Refer to the explanation of the interface unit for the connecting method.

STEP 2. As shown in the figure on the right, remove the two screws and the side cover of the interface unit.



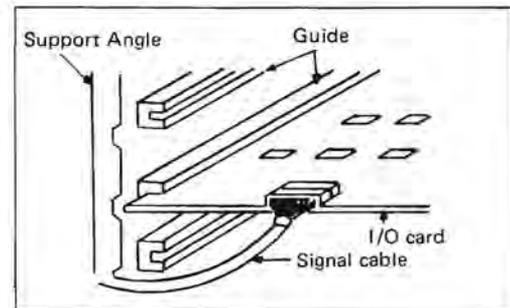
STEP 3. Pass the signal cable through the cable inlet in the back of the interface unit.

STEP 4. Connect the I/O card connector and signal cable. Use the smaller end of the signal cable. When making the connection, match the polarity mark (▼) of the I/O card and polarity mark (▲) of the connector of the cable. (Refer to the figure on the right.)

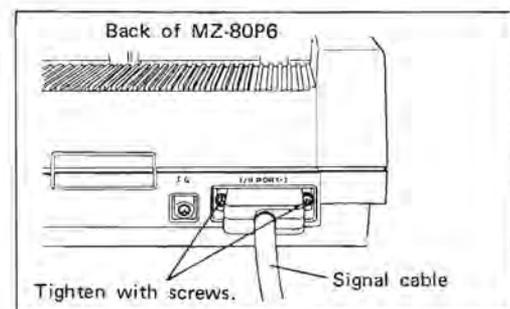


STEP 5. Insert this I/O card in an appropriate place in one of the five slits.

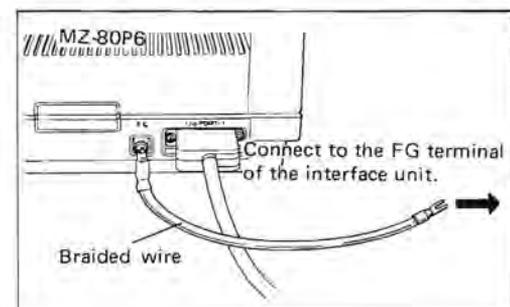
STEP 6. Replace the side cover removed in STEP 2 and tighten the two screws.



STEP 7. In the same way as in STEP 4 on page 4, connect the other end of the signal cable connector to the printer signal terminal and fasten with screws.



STEP 8. In the same way as in STEP 5 on page 4, connect one end (round lug terminal) to the FG terminal of the printer and the other end ("U" shaped lug terminal) to the FG terminal of the interface unit.

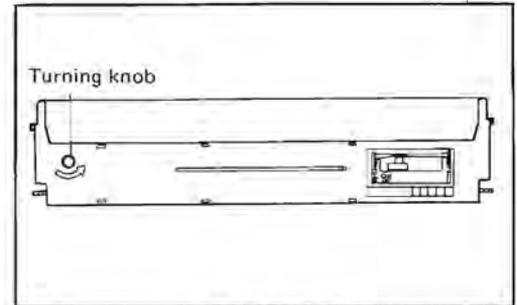


Cartridge Ribbon Setting

The cartridge ribbon for the MZ-80P6 is a long-lasting, endless type and easy to set and remove. Follow the procedure explained below when setting the cartridge ribbon.

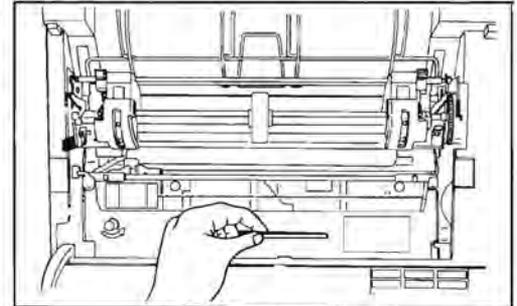
STEP 1. Stand up the printer cover and check that the scale touches (Leans against the back) the platen.

STEP 2. Turn the cartridge ribbon turning knob in the direction of the arrow and check that the ribbon isn't loose or twisted.



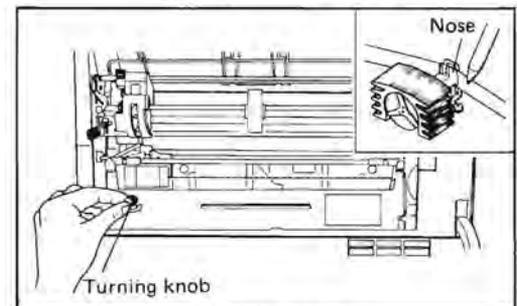
Ink ribbon tension

STEP 3. Take the cartridge ribbon by the handle and set it in by suspending the ribbon in the head nose guide and pushing the cartridge ribbon to the printer mechanism. At this time, check that the cartridge ribbon is in the support grooves on the right and left of the mechanism.



Cartridge ribbon setting

STEP 4. While pushing the ribbon down with a pencil or similar instrument, turn the cartridge ribbon turning knob in the direction of the arrow and set the ink ribbon correctly between the head nose and ribbon mask.

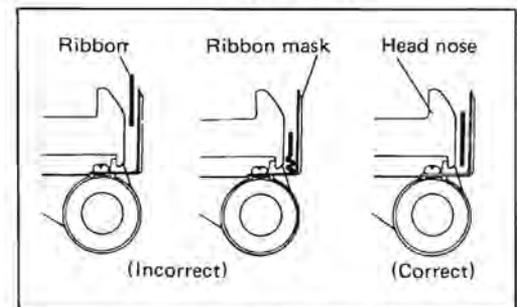


Ink ribbon setting

STEP 5. Finally, check that the ink ribbon isn't twisted or loose and take up the ribbon tension.

(Note 1) Be careful that the ink ribbon is put in correctly. If it isn't, there is danger that the ribbon may come out, there may be mis-printing or that the head needle may be damaged.

(Note 2) This cartridge ribbon can be replaced only with an ink ribbon. However, replacement of the ink ribbon of the same cartridge ribbon can be done only 4 times. After that, use a new cartridge ribbon.

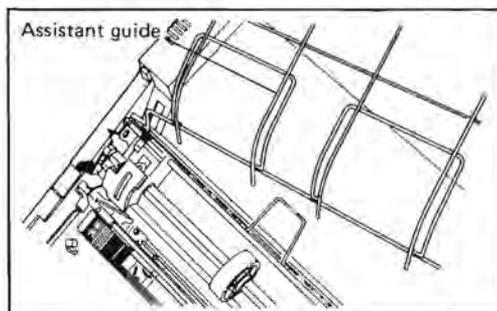


Correct way of inserting ribbon.

Fanfold Paper Loading

This unit can use fanfold paper from 4 inches to 10 inches wide. The printing paper is set according to the following procedure.

STEP 1. Attach the supplied assistant guide for smooth printing paper flow. For this purpose, insert the tips of this assistant guide in the right and left holes on the back of the paper feed mechanism.

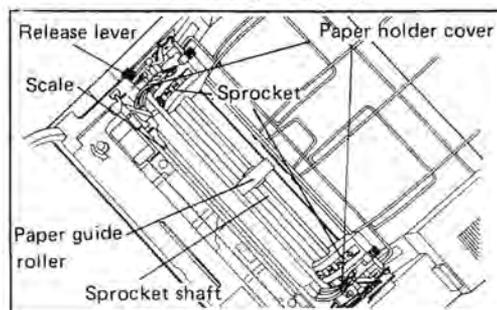


Assistant guide setting

STEP 2. Incline the scale toward yourself and remove it from the platen.

STEP 3. Pull the release lever toward you.

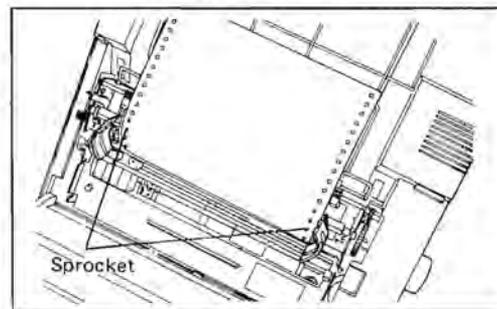
STEP 4. Check that the paper guide roller is in the center of the sprocket shaft and open the right and left covers holding the paper.



Printing paper setting (1)

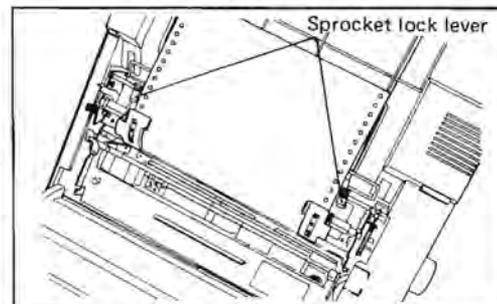
STEP 5. Insert the fanfold paper between the assistant guide roller and the frame, and put it in between the paper guide on the back of the printer mechanism. **(Note)** Make adjustment for paper thickness by shifting the adjusting lever toward you (toward to '+') as paper thickness increases.

STEP 6. When the printing paper comes out toward you, insert the sprocket pin in the printing paper transport hole. At this time check that the printing paper is parallel to the sprocket pin.



Printing paper setting (2)

STEP 7. Return the paper holder cover and scale to their original positions, loosen and raise the sprocket lock levers on both sides toward yourself and adjust the right/left tension and position of the printing paper. Then return the sprocket lock levers to their original positions and lock them. Make sure the release lever is released (as in STEP 3).



Printing paper setting (3)

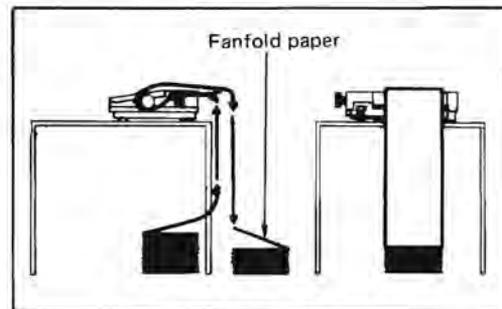
(Note) The scale graduation indicates printing position from the 1st digit to the 80th digit on a line. (For normal printing)

STEP 8. Replace the printer cover and setting of the printing paper is finished.

Printing Paper Adjustment

1. Printing paper placement

Place the top of the printing paper so it is located lower than the surface of the MZ-80P6's assistant guide. Also place the printing paper so it is parallel to the MZ-80P6 and parallel to the printing section. If this isn't done, proper paper feed is not possible and the paper may jam.

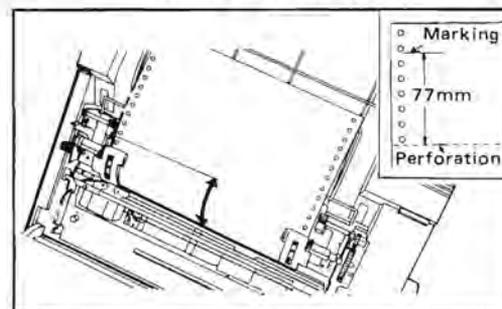


Printing paper setting

2. Page top

Make a mark 77mm above perforations of the fanfold paper and align this mark and the alignment mark (straight line projection part) of the sprocket frame. Then printing will start from the first line (topmost line) of the paper being used.

Under these conditions, this position will become the initial printing line of each page when the power is turned on. (When the fanfold paper used agrees with the set page mode on the printer)



Page top

3. Adjustment for different types of printing paper

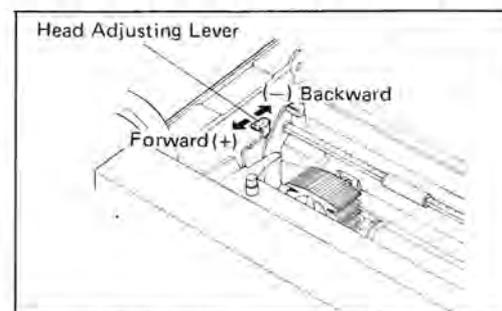
With the MZ-80P6, the space between the print head nose and the platen can be adjusted. Adjust it in the following cases.

- Adjust it according to the thickness of the printing paper being used such as for copy paper, etc.
- Adjust printing pressure when changing the shading (light/dark) of the printed characters, etc.

Method of adjustment

Adjust the distance with the adjusting lever on the left side of the printer mechanism.

- The space between the printer head nose and the platen widens when the lever is pulled toward yourself.
- The space narrows when the lever is pushed backwards.



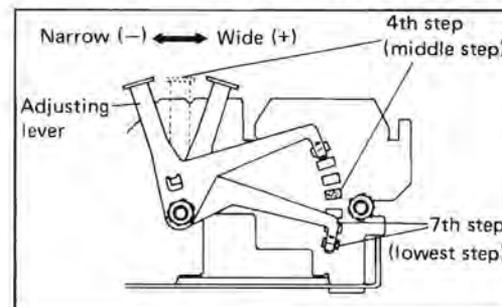
Adjustment of distance between head nose and platen

Recommended position for adjusting lever

The adjusting lever has 7 positions. However, for ordinary printing, set it at the following positions.

- 1 sheet of printing paper used: Step 4 (middle step)
- Copy paper (2–3 sheets): Step 7 (lowest step)

(Note) If printing becomes light when using the printer for a long time, set the adjusting lever one step back (–) and use it that way.

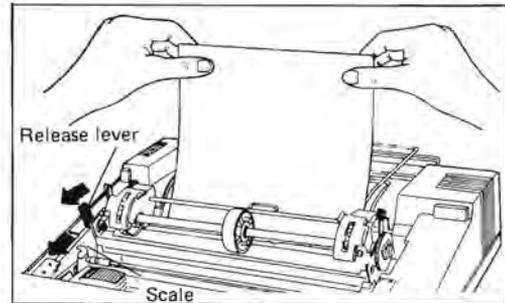


Adjusting lever adjusting positions

Sheet Paper Loading

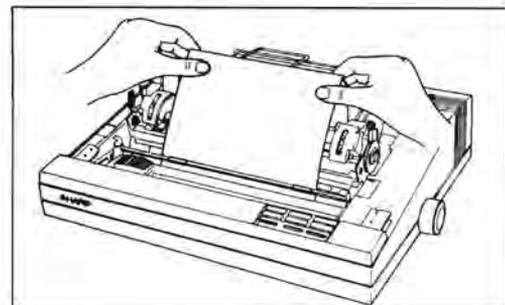
This dot printer can print sheet paper (letter paper) with widths of 8.3 to 8.5 inches (210 to 216mm). Load the sheet paper in the following steps.

STEP 1. Raise the printer cover. Pull the release lever toward you and turn down the scale. Position the paper guide roller in the middle of the sprocket shaft.



STEP 2. Insert the sheet paper (letter paper) into the paper guide at the rear part of the printer mechanism.

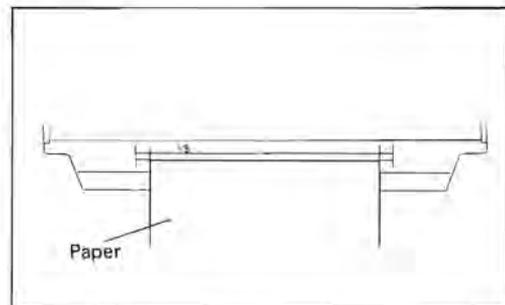
STEP 3. Return the release lever and advance the paper by turning the manual feed knob.



STEP 4. Set the paper free by the release lever and to square up and position the paper.

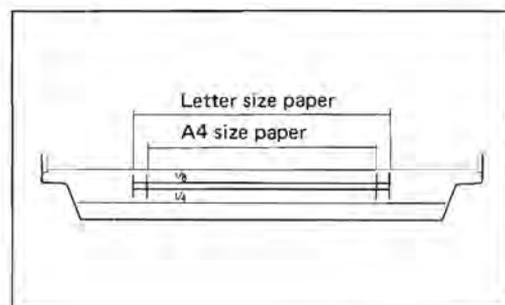
A long sheet of paper can be squared up by aligning the one side edge of the paper.

STEP 4'. A short sheet of paper can be squared up by paralleling the leading edge of the paper to the paper position adjustment marking on the platen cover of the tractor unit. (Refer to the illustration on the right.)



STEP 5. Position the paper according to the paper position markings as shown in the right illustration.

If the leading edge of the paper is aligned with the 1/4 position marking line (a lower line), printing is started from 28.6mm below the leading edge. If aligned with the 1/8 position marking line (an upper line), printing starts from 30.2mm below the top.



STEP 6. Return the release lever, scale, and printer cover as before.

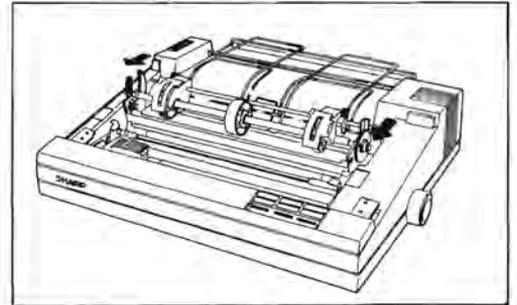
(Note)

- Move the sprocket units to the both ends and lock them in the position.
- The maximum length of sheet paper capable of printing by this printer is 12 inches (305mm). With the longer sheet paper, printing may be deviated.
- Generally, printing is not possible in 7.5mm from the bottom.
- Carbon paper for copying can not be used in principle.

Removal and Installation of Tractor Unit

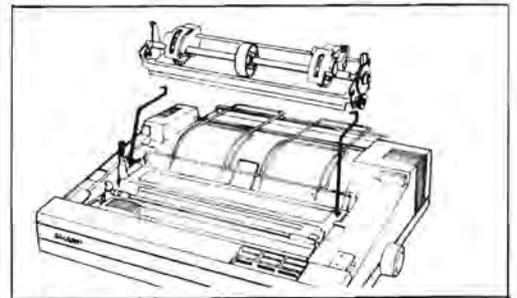
The tractor unit of the printer can be easily removed and installed. When using sheet paper as printing paper, the printer can be used without this tractor unit. To remove the tractor unit for printing sheet paper, observe the following steps.

- STEP 1.** While pulling the lock levers on the both ends of the tractor unit, push away the tractor unit.
- STEP 2.** Then lift the tractor unit upwards.



To install the tractor unit:

- STEP 1.** Engage the notches of the tractor frame with the shaft.
- STEP 2.** Press the tractor unit in place.



Printing Head Change

Printing head life is approximately 50 million characters (when printing 14-dot characters). When there is printing head wear due to long use and damage to the printing head pin, replace with a new printing head in the following way.

STEP 1. If the printer is being used, turn off the power and wait until the head cools off. Never touch the head.

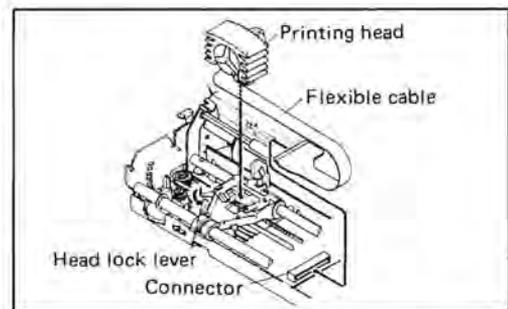
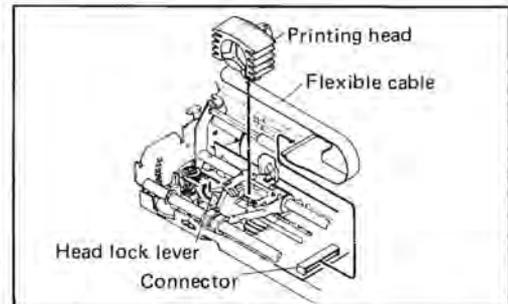
STEP 2. Stand up the printer cover and remove the cartridge ribbon.

STEP 3. While pushing the connector on the terminal board, pull out the flexible cable connected to the head horizontally.

STEP 4. Turn the head lock lever to the right and pull the printing head upwards.

STEP 5. Attach a new head, return the head lock lever to its position and lock the head.

STEP 6. Firmly insert the flexible cable into the connector on the terminal board.

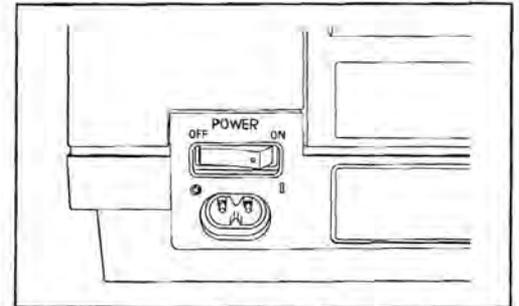


Operation

1. Switch

The POWER switch is on the back of the MZ-80P6 and the ON/OFF LINE, LINE FEED and TOP OF FORM switches are on the front control panel.

POWER: It turns power ON/OFF. Power is turned on when the switch is pushed to ON or to the side marked "I".

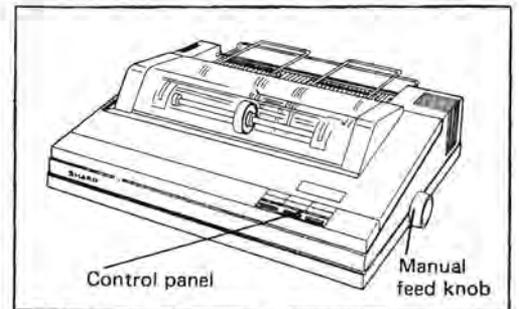


Power switch

ON/OFF LINE: A control for selecting the on-line or off-line of the printer. Must set the printer to the on-line mode (LED is on) when printing. In the on-line mode, the LINE FEED and TOP OF FORM switches are invalid.

LINE FEED: Printing paper is fed through while this switch is depressed with the off-line mode. If it is lightly pushed consecutively, line by line paper feed is possible.

(Note) Paper feed pitch for single line feed is performed by the pitch setting (explained later) through software. When not set, it is 1/6 inch pitch.



Control panel and manual feed knob



Control panel

TOP OF FORM: When this switch is pushed with the off-line mode, printing paper is fed to the top line of the next page. Top line of the page means the printing line when the power is turned on.

(Note) The number of lines printed on one page can be changed with software. When the power is turned on, it is 66 lines per page. However, when the number of lines is changed midway, the position of the top line of the page changes.

2. Indicators

There are three indicators (LED), ON LINE, NO PAPER and POWER, on the control panel of the MZ-80P6.

POWER: Lights up when the power is turned on. This indicator blinks when something irregular happens to the printer mechanism. It is to warn the user.

NO PAPER: Lights up when there is no paper.

ON LINE: Lights up when the printer is in the on-line mode, implying that the printer is ready for printing. As this light also serves to indicate the readiness of the printer, the light may flash according to the condition of data transfer.

3. Alarm bell

There is an alarm bell built into the MZ-80P6 and it sounds under the following circumstances.

- Something irregular happens to the printer mechanism.
- When there is no printing paper.
- When the printer receives the BEL code, and if you yourself make an error in software when it is set in the (ESC + 05H) mode (explained later).

4. Manual feed knob

There is a manual feed knob on the right side of the MZ-80P6. Use it to feed or align printing paper position (top) etc. when the power is OFF. Be careful because the printing paper will become loose when the knob is turned toward you.

5. Abnormalities in the printing mechanism

When there are some abnormalities in the operation of the printing head of the printer, the power lamp blinks and the alarm bell sounds. The printer controls itself to prevent any printer trouble. When this happens, the only thing to do is turn off the power. Before turning on the power once again, check that there is no external cause such as paper jamming, etc. If the extraordinary condition does not disappear after turning off the power, see your dealer.

6. Self Check Test

There is a self check for the MZ-80P6. Because of this feature the following tests are possible.

- Check of printing head and printing quality.
- Check of paper feed and ink ribbon feed.

[Method] Set the printing paper correctly and, while pressing the LINE FEED switch, turn on the power. If all is right, the printer will continuously print correctly the characters it has. This check is automatically ended when one page is printed. To stop the check halfway, switch off the power supply.

Printer Control Code

The MZ-80P6 is a terminal printer capable of software control by the host machine and performs a variety of functions through reception of the following control codes. Control codes and functions differ with the printer for the MZ-80B and the printer for the MZ-80K or MZ-80A.

1. For MZ-80B

Control code	Function
CR [0DH] (Carriage return)	Data in the printer buffer are printed when the CR code is input. <ul style="list-style-type: none">● Printing data (full digits) including spaces are continuously input, and data in the buffer are automatically printed when the subsequent effective data are printing data.● When there are no printing data preceding the CR code or when there are all spaces, the head does not move.● If ESC+0AH (explained later) is previously determined, the paper is fed one line after printing.
LF [0AH] (Line feed)	Data in the buffer are printed and the paper advances one line when the LF code is input. <ul style="list-style-type: none">● When there are no printing data preceding the LF code or when there are all spaces, the paper is fed only one line when the LF code is input.
VT [0BH] (Vertical tabulation)	Data in the buffer are printed and vertical tabulation carried out according to a previously determined program (explained later) when the VT code is input.
FF [0CH] (Form feed)	Data in the buffer are printed and form feed (feed to the initial printing position of the following page) carried out according to a previously determined program (explained later) when the FF code is input.
HT [09H] (Horizontal tabulation)	Horizontal tabulation is carried out according to a previously determined program (explained later) when the HT code is input. <ul style="list-style-type: none">● The HT code is ignored if the positions of the horizontal tabulation were not previously set.
SO [0EH] (Shift out)	Printing, after the SO code is input, is double size. It performs double size printing of the normal printing mode or reduced printing mode (SI code). <ul style="list-style-type: none">● The SO code can be input in any position in a line.● If double size characters and normal size characters are mixed in the same line, the 79th character is the final position when changing double size characters to normal size characters.● That function is cancelled by a new line or the DC4 code (explained later).

Control code	Function
	<p>(Example)</p> <p>1) [SO] + "SHARP" + [CR] + [LF]</p> <p style="text-align: center;">SHARP</p> <p>2) "SHARP" + [SO] + "COMPUTER" + [DC4] + "SYSTEM" + [CR] + [LF]</p> <p style="text-align: center;">SHARPCOMPUTERSYSTEM</p>
<p>SI [0FH] (Shift out)</p>	<p>Printing after input of the SI code is reduced printing mode for normal size.</p> <ul style="list-style-type: none"> ● There are 136 characters/line when the SI code proceeds. ● It becomes the double size character mode when the SO code is input in the SI mode. ● The SI mode is cancelled by input of the DC2 (explained later) code. ● In the SI mode, the SO mode is cancelled by the DC4 code or the next line. <p>(Example)</p> <p>1) [SI] + "SHARP" + [CR] + [LF]</p> <p style="text-align: center;">SHARP</p> <p>2) [SI] + "SHARP" + [SO] + "COMPUTER" + [DC4] + "SYSTEM" + [CR] + [LF]</p> <p style="text-align: center;">SHARPCOMPUTERSYSTEM</p>
<p>DC4 [14H] (Device control 4)</p>	<p>The SO mode (double size character) is cancelled by input of the DC4 code.</p>
<p>DC2 [12H] (Device control 2)</p>	<p>The SI mode (reduced character) is cancelled by input of the DC2 code.</p>
<p>CAN [18H] (Cancel)</p>	<p>All data input before the CAN code on the same line are invalid when the CAN code is input.</p>

Control code	Function
BEL [07H] (Bell)	<p>The alarm bell built into the printer sounds for approximately 3 seconds when the BEL code is input.</p> <ul style="list-style-type: none"> • The alarm bell sounds when there is no printing paper and when there is trouble with the printing mechanism.
ESC (1BH) + 00H (Escape)	<p>Paper feed pitch after input of the (ESC + 00H) code is 1/9 inch.</p> <ul style="list-style-type: none"> • Paper feed pitch becomes 1/6 inch, when the (ESC + 02H) code is input, when reset with the initial reset signal (IRT) or when the power is resupplied. However, immediately after that, correct the paper feed pitch to adjust the page.
ESC + 02H	<p>Paper feed pitch after input of the (ESC + 02H) code is 1/6 inch.</p> <ul style="list-style-type: none"> • 1/6 inch paper feed is automatically set after power is turned on or after resetting.
ESC + 03H	<p>Checks existence of printing paper and responds with status signal (STATUS) when the (ESC + 03H) code is input.</p> <p>STATUS is low level: no printing paper is high level: no trouble</p>
ESC + 04H	<p>Checks mechanical condition of the printer and responds with status signal (STATUS) when (ESC + 04H) code is input.</p> <p>STATUS is low level: mechanical trouble is high level: no trouble</p>
ESC + 05H	<p>The alarm bell sounds for approximately 2 seconds if there is an error in the input command and parameter after the (ESC + 05H) code is input.</p>
ESC + 06H	<p>It cancels the (ESC + 05H) mode.</p> <ul style="list-style-type: none"> • It is set to the (ESC + 06H) mode when the power is turned on.
ESC + 08H	<p>No-paper signal from the printing paper check is ignored when the (ESC + 08H) code is input.</p>
ESC + 09H	<p>It cancels the (ESC + 08H) mode.</p> <ul style="list-style-type: none"> • It is set to the (ESC + 09H) when the power is turned on.
ESC + 0AH	<p>The mode for performing paper feed by input of the CR code is set after input of the (ESC + 0AH) code.</p>
ESC + 0BH	<p>Cancels the (ESC + 0AH) mode.</p> <ul style="list-style-type: none"> • It is set to the (ESC + 0BH) mode when the power is turned on.

Control code	Function
ESC + 10H + n	<p>It depends on (n) which is determined by values 01H – FFH and makes the one line paper feed pitch $n/48H$.</p> <ul style="list-style-type: none"> ● It is valid in this mode only when using the (ESC + 02H) mode. ● Paper feed pitch is 1/6 inch when not set in this mode.
ESC + 11H + $n_1 + n_2 + \dots + n_k + NUL$	<p>Positions (lines) for vertical tabulation are set with n_1, n_2, \dots, n_k. NUL as NULL code (00H) is considered the end mark.</p> <ul style="list-style-type: none"> ● Set positions (k) are within 128. ● Paper feed pitch of one line is determined by (ESC + 10H + n). ● Positions for vertical tabulation should not exceed the length of one page (number of lines). ● Paper feed is by single line when the VT code is input, if no vertical tabulation is set.
ESC + 12H + n	<p>Number of lines printed on each page is determined by n.</p> <ul style="list-style-type: none"> ● n must be within 128. ● Paper feed pitch of one line is determined by (ESC + 10H + n). ● There are 66 lines per one page when this mode is not set.
ESC + 13H + $n_1 + n_2 + \dots + n_k + NUL$	<p>Horizontal tabulation positions (characters) are set for k positions with n_1, n_2, \dots, n_k. NUL is considered end mark with NUL code (00H).</p> <ul style="list-style-type: none"> ● Set positions (k) are within 136. ● In the normal size printing mode, that command is ignored when trying to set the tabulation for more than 80 characters. ● In the reduced size printing mode, that command is ignored when trying to set the tabulation for more than 136 characters. ● It ignores the HT code when the horizontal tabulation positions are not set. ● It ignores the HT code when in the double size printing mode.
ESC + 18H + (DATA SIZE) + $n_1 + n_2 + \dots + n_k$	<p>It prints in order according to each bit pattern of the data n_1, n_2, \dots, n_k of the numbers determined by the (DATA SIZE). It is called bit image printing.</p> <ul style="list-style-type: none"> ● (DATA SIZE) is determined by 2 bytes and must be input in the order of lower 8 bits and upper 8 bits. ● It makes data $n_1 \sim n_k$ 8-bit data. ● It makes data size a maximum of 480 when in the normal size printing mode. ● It makes data size a maximum of 952 when in the reduced size printing mode (SI mode). ● This bit image printing mode is cancelled after one line is printed. ● Vertical and horizontal tabulation are cancelled if they were set before the bit image printing mode is determined.

Control code	Function
ESC + 19H + (LENGTH)	<p>It makes the word length determined by (LENGTH) the maximum number of characters that can be printed on one line.</p> <ul style="list-style-type: none"> ● (LENGTH) is within 80 in the normal size printing mode. ● (LENGTH) is within 136 in the reduced size printing mode (SI mode). ● The above mentioned word length determination is cancelled by changing the printing size mode (SI or DC2). ● It is set for a word length of 80 characters when the power is turned on.

(Note) Codes, data, parameter, etc. sent to the printer are binary values.

For MZ-80K and MZ-80A

Control code	Function
CR [0DH]	<ul style="list-style-type: none"> ● Data in the buffer are printed when the CR code is input. ● When there are no printing data preceding the CR code, there is a one-line line feed.
[0BH]	<ul style="list-style-type: none"> ● Code for setting in the double size character. ● When the printing mode is 80 characters/line before this code is received, it is changed to 40 characters/line with this code. ● When the printing mode is 136 characters/line before this code is received, it is changed to 68 characters/line with this code. ● Changing the line does not cancel the double size character mode.
[0CH]	<ul style="list-style-type: none"> ● Cancels the double size character mode and returns printer to previous printing mode.
[0FH]	<ul style="list-style-type: none"> ● Form feed is carried out when this code is received. In other words, paper is fed to the top of the following page. ● When data are in the buffer, form feed is carried out after printing ends.
[09H]	<ul style="list-style-type: none"> ● Sets printer in the non-line space mode. ● At this time, paper feed pitch is 1/9 inch.
[0AH]	<ul style="list-style-type: none"> ● Sets printer in line space mode. ● At this time, paper feed pitch is 1/6 inch. ● When the power is turned on, the printer is automatically set in the line space mode.

Control code	Function
<p>[09H] + [09H] + (ASCII)_H + (ASCII)_L</p>	<ul style="list-style-type: none"> • Sets printing lines for one page. The printing line with this is the printing line with the line space mode. • Following [09H] + [09H], it sends hexadecimal data with printing lines in 2 byte ASCII code. (Example) When set for 77 line/page $(77)_{10} = 4DH$ $(ASCII)_H = 34H$ (ASCII)_L = 44H • Maximum printing lines are 128. • When the power is turned on, the printer is automatically set for 66 line/page.
<p>[09H] + [09H] + [09H]</p>	<ul style="list-style-type: none"> • With this code, the printing mode can be changed to 80 characters/line or 136 characters/line with the toggle switch. • After the mode change, paper is automatically fed one line. • When printing data exist in the buffer, paper is fed one line after printing and then the mode is changed. • When the power is turned on, the printer is set in the 80 character/line mode.
<p>[0BH] + [0BH] = (ASCII)_{LH} + (ASCII)_{LL} + (ASCII)_{HH} + (ASCII)_{HL} + n₁ + n₂ n_k</p>	<ul style="list-style-type: none"> • Performs bit image printing of the designated data size only. • Data size is given in 4 byte hexadecimal numbers according to the ASCII code. (Example) When data size is 100 $(100)_{10} = 0064H$ $(ASCII)_{HH} = 30H$ (ASCII)_{HL} = 30H (ASCII)_{LH} = 36H (ASCII)_{LL} = 34H • Gives bit image data as n₁, n₂ n_k, and all are 8 bit hexadecimal numbers. • Gives one row of 8 point data vertically as bit data. Bit 1 of the data is printed and the uppermost point corresponds to LSB and the lowermost point to MSB. (Example) <ul style="list-style-type: none"> • ← (LSB) ○ • Bit data A5H ⇒ ○ A5H = (10100101)₂ ○ • ○ • ← (MSB) • In the 80 character/line mode, it makes data size a maximum of 480. • In the 136 character/line mode, it makes data size a maximum of 952.

Examples of character printing with the MZ-80P6

- 80 characters/line

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```

- 40 characters/line

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```

- 136 characters/line

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```

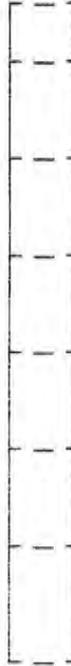
- Non-line space mode

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```



- Bit image printing

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```



- 68 characters/line

```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```

- Line space mode

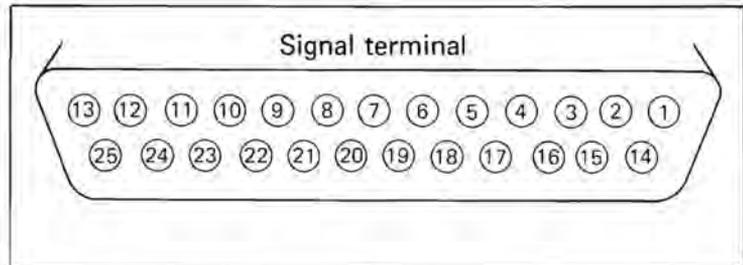
```
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
SHARP Computer System - MZ80 Series
```

Interface

A parallel interface card MZ-8BP5I or MZ-8KP4I (option) is available for MZ-80P6. The following is an explanation of this parallel interface.

1. Signal terminal

Pin arrangement of the input/output signal terminal of the printer is as shown in the Fig. on the right.



2. Signal arrangement and explanation

Pin No.	Signal	Direction	Explanation
1	RDP	Input	<ul style="list-style-type: none"> • This is the strobe signal for data (RD1~RD8) read-in. Data is read in after the signal reaches a high level. • Positive logic
2	RD1	Input	<ul style="list-style-type: none"> • It shows 8-bit parallel data from the 1st bit to 8th bit. RD1, RD8 match LSB, MSB respectively.
3	RD2	Input	
4	RD3	Input	
5	RD4	Input	
6	RD5	Input	
7	RD6	Input	
8	RD7	Input	
9	RD8	Input	
10	IRT	Input	<ul style="list-style-type: none"> • It is the initial reset signal and forcedly returns the printer to READY. (Same conditions when turning power on)
11	$\overline{\text{RDA}}$	Output	<ul style="list-style-type: none"> • It is a signal to indicate whether printing is possible or not (Data can be entered or not). • It is negative logic and data can be entered with the signal at a low level.

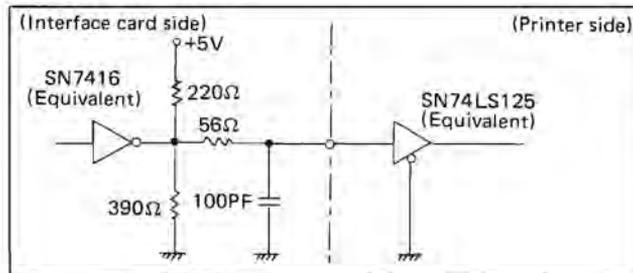
Pin No.	Signal	Direction	Explanation
12	$\overline{\text{STATUS}}$	Output	<ul style="list-style-type: none"> ● It responds with this signal, checking whether there is printing paper or not and checking the condition of the printer mechanism in response to status demands from the host machine. ● *It is negative logic and this signal is at a high level during correct conditions. ● *This signal is at a low level when there is no printing paper or when trouble with the mechanism is caused.
13–25	GND	—	<ul style="list-style-type: none"> ● Logic GND level

(Note) Signals are all at TTL level.

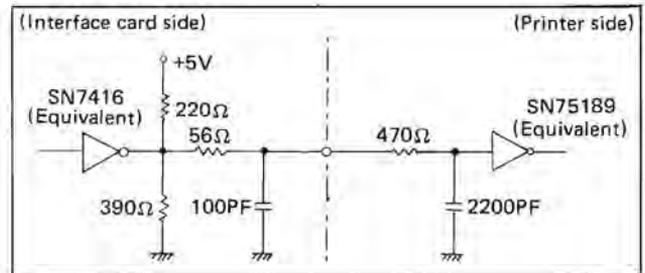
*(Note) These specifications may be different from former ones.

3. Interface circuit

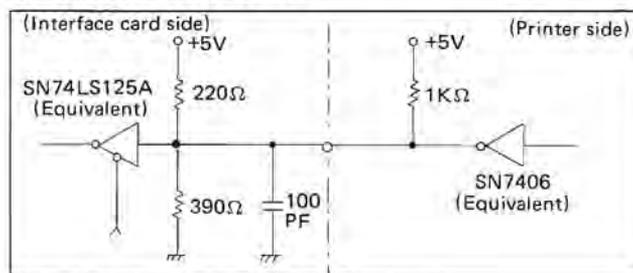
a) RD1–RD8 line



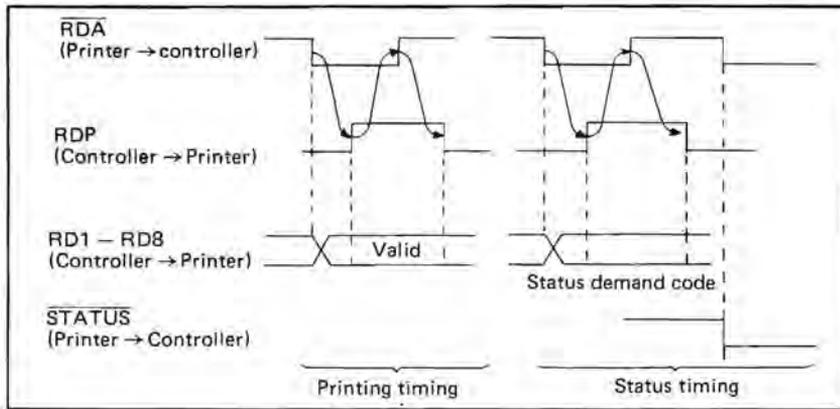
b) IRT, RDP line



c) $\overline{\text{RDA}}$, $\overline{\text{STATUS}}$ line



4. Timing chart



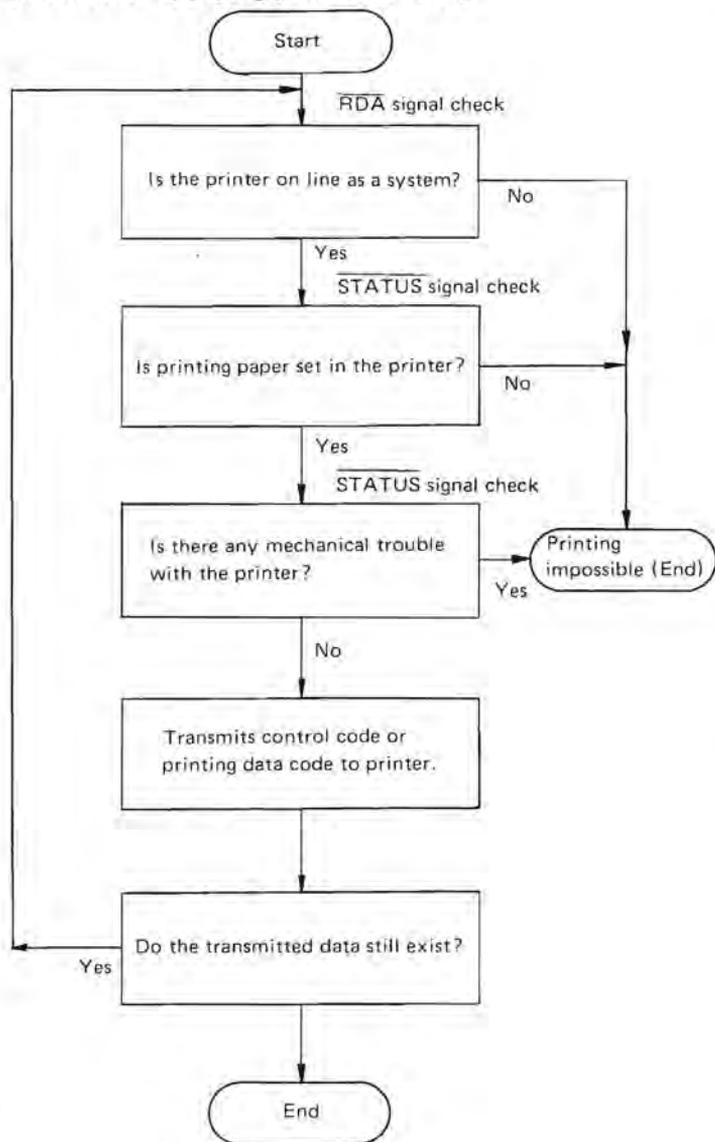
5. Port address

The port address for the MZ-80P6's standard interface is as follows.
Port: FEH, FFH

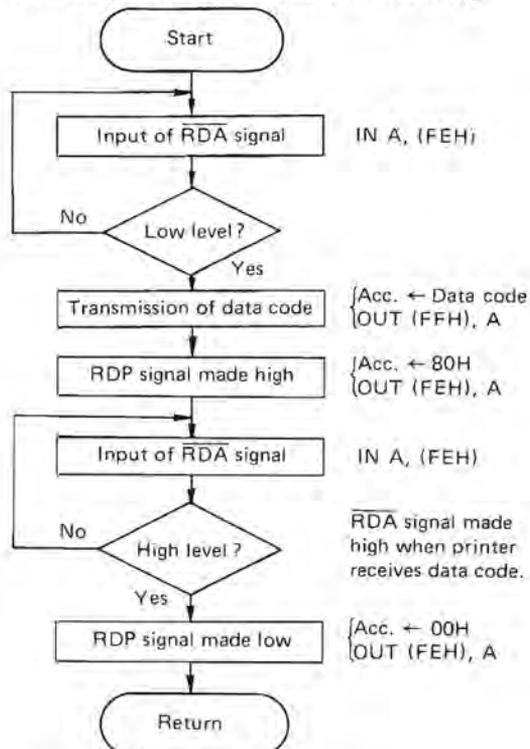
Examples of Control with Machine Language

This shows examples of programs when the MZ-80P6 is controlled by a program written in machine language. Here two programs are mainly taken up; one is the program sending the printing character code or control code to the printer, the other is for checking the status signal. They consist of some subroutine programs. However, these are control examples for printers used with the MZ-80B.

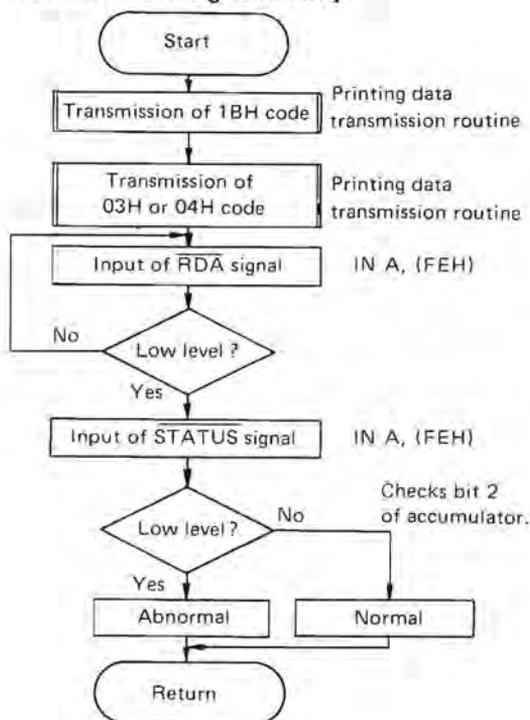
[Method of applying printer control]



[Printing Data Transmission Routine]



[Status Checking Routine]



```

01 0000      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
02 0000      ;          PRINTER MZ-80PS CONTROL SUBROUTINE
03 0000      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
04 0000      ;
05 0000  F    PORT/I: EQU    FEH
06 0000  F    PORT/O: EQU    FFH
07 0000      ;
08 0000      ; JF ABNML: NO POWER, NO PAPER OR MECHANICAL TROUBLE
09 0000      ; THEREFORE, MAKE THE PROGRAM FOR ABOVE CONDITIONS
10 0000      ;
11 0000      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
12 0000      ;          DATA CODE TRANSFER SUBROUTINE
13 0000      ;
14 0000      ; BEFORE CALL "PRINT", SET TRANSFERED PRINT CODE IN ACC
15 0000      ; ALL REGISTOR RESERVED ON NOMAL RETURN
16 0000      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
17 0000      ;
18 0000  F5    PRINT:  PUSH  AF
19 0001  3E00      LD    A,00H
20 0003  CD1600   CALL  RDA/CK      ; RDA SIGNAL IS LOW?
21 0006  F1      POP   AF
22 0007  D3FF      OUT   (PORT/O),A      ; DATA TRASFER
23 0009  3E80      LD    A,80H
24 000B  D3FE      OUT   (PORT/I),A      ; IT MAMES RDP HIGH
25 000D  3E01      LD    A,01H
26 000F  CD1600   CALL  RDA/CK      ; RDA SIGNAL IS HIGH?
27 0012  AF      XOR   A
28 0013  D3FE      OUT   (PORT/I),A      ; IT MAKES RDP LOW
29 0015  C9      RET
30 0016      ;
31 0016      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
32 0016      ;          RDA SIGNAL CHECK SUBROUTINE
33 0016      ;
34 0016      ; ONLY ACC. IS BROKEN ON NOMAL RETURN
35 0016      ; RESARVED EXCEPT ACCUMULATOR (A)
36 0016      ; BEFORE CALL "RDA/CK", SET FOLLOWING CODE IN ACC.
37 0016      ; A=0:CHECKS IF RDA IS LOW LEVEL
38 0016      ; A=1:CHECKS IF RDA IS HIGH LEVEL
39 0016      ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
40 0016      ;
41 0016  C5    RDA/CK: PUSH  BC
42 0017  D5      PUSH  DE
43 0018  57      LD    D,A
44 0019  1E00      LD    E,00H
45 001B  010000   LD    BC,0000H      ; FOR TIME DELAY
46 001E  DBFE      LOOP:  IN   A,(PORT/I)
47 0020  E60D      AND   ODH
48 0022  BA      CP    D      ; CHECKS RDA SIGNAL
49 0023  2003      JR   NZ,+5      ; REPEAT
50 0025  D1      POP   DE

```

```

01 0026 C1          POP     BC
02 0027 C9          RET              ; NOMAL RETURN
03 0028 0B          DEC     BC
04 0029 78          LD      A,B
05 002A B1          OR      C
06 002B 20F1        JR      NZ,LOOP
07 002D 1D          DEC     E
08 002E 20EE        JR      NZ,LOOP
09 0030 D1          POP     DE
10 0031 C1          POP     BC
11 0032 C30000      E          JP      ABNML          ; PRINTER IS NOT ON LINE
12 0035              ;
13 0035              ; *****
14 0035              ; STATUS INPUT SUBROUTINE
15 0035              ;
16 0035              ; A=03H: FOR PAPER CHECK
17 0035              ; A=04H: FOR MECHA. TROUBLE CHECK
18 0035              ; *****
19 0035              ;
20 0035 47          STATUS: LD     B,A
21 0036 3E1B        LD      A,1BH          ; 1BH = ESC CODE
22 0038 CD0000      CALL   PRINT          ; 1BH CODE TRANSFER
23 003B 78          LD      A,B
24 003C CD0000      CALL   PRINT          ; 03H OR 04H TRANSFER
25 003F 3E00        LD      A,00H
26 0041 CD1600      CALL   RDA/CK
27 0044 DBFE        IN      A,(PORT/I)
28 0046 0F          RRCA
29 0047 0F          RRCA          ; CARRY FLAG=BIT 2 OF A
30 0048 C9          RET
31 0049              ;
32 0049              ; *****
33 0049              ; STATUS CHECK SUBROUTINE
34 0049              ; *****
35 0049 3E03        STS/CK: LD     A,03H
36 004B CD3500      CALL   STATUS          ; PAPER CHECK
37 004E D20000      E          JP      NC,ABNML          ; PAPER IS LACK
38 0051 3E04        LD      A,04H
39 0053 CD3500      CALL   STATUS          ; MECHA. TROUBLE CHECK
40 0056 D20000      E          JP      NC,ABNML          ; PRINTER UNDER TROUBLE
41 0059 C9          RET              ; NOMAL RETURN
42 005A              ;
43 005A              ; END

```

```

LOOP: 001E PORT/I 00FE PORT/D 00FF PRINT 0000 RDA/CK 0018
STATUS 0015 STS/CK 0049

```

Character Code Table (ASCII)

The MZ-80P6 has the following printing characters and control codes. The table is a matrix structure with the upper 4 bits corresponding to columns and the lower 4 bits corresponding to lines of the ASCII code. For example, the ASCII code for character "A" is 41H (hexadecimal code). ASCII code 20H is a space code. However, ASCII codes from 00H to 1FH in the table show control codes for the printer. (Refer to the section on control codes mentioned previously.)

Character Code Table (For MZ-80B)

Upper 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 bits	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0 0000	NUL			O	@	P	`	p	||	—		O	@	P	`	p
1 0001	↓		!	I	A	Q	a	q	↓	¥	!	I	A	Q	a	q
2 0010	↑	DC2	"	2	B	R	b	r	↑	£	"	2	B	R	b	r
3 0011	→		#	3	C	S	c	s	→	●	#	3	C	S	c	s
4 0100	←	DC4	\$	4	D	T	d	t	←	○	\$	4	D	T	d	t
5 0101	H		%	5	E	U	e	u	♠	⌋	%	5	E	U	e	u
6 0110	C		&	6	F	V	f	v	♥	⌋	&	6	F	V	f	v
7 0111	BEL		'	7	G	W	g	w	♦	⌋	'	7	G	W	g	w
8 1000		CAN	(	8	H	X	h	x	♣	⌋	(	8	H	X	h	x
9 1001	HT		)	9	I	Y	i	y	†	+	)	9	I	Y	i	y
A 1010	LF		*	:	J	Z	j	z	†	|	*	:	J	Z	j	z
B 1011	VT	ESC	+	;	K	[	k	{	⌋	—	+	;	K	[	k	{
C 1100	FF		,	<	L	\	|	|	⌋	⌋	,	<	L	\	|	|
D 1101	CR		—	=	M	]	m	}	⌋	⌋	—	=	M	]	m	}
E 1110	SO		•	>	N	^	n	~	⌋	⌋	•	>	N	^	n	~
F 1111	SI		/	?	O	_	o	↓	⌋	⌋	/	?	O	_	o	π

Character Code Table (For MZ-80A)

Upper 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 bits	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000			0	@	P	☛	▣	}	—	q	n	|	└	—	▣
1	0001	↓	!	1	A	Q	H	▣	+	#	a	/	▣	H	♠	●
2	0010	↑	"	2	B	R	I	▣	⤵	e	z	ü	▣	H	|	—
3	0011	→	#	3	C	S	♣	▣	⤵	,	w	m	▣	H	—	♥
4	0100	←	\$	4	D	T	♣	▣	⤵	~	s	/	▣	└	—	▣
5	0101	H	%	5	E	U	♣	▣	⤵	⊗	u	/	▣	▣	—	▣
6	0110	C	&	6	F	V	¥	▣	⤵	t	i	/	→	▣	—	⊗
7	0111		'	7	G	W	●	▣	⤵	g	≡	o	▣	▣	—	○
8	1000		(	8	H	X	☺	▣	⤵	h	ö	l	▣	▣	—	♣
9	1001		)	9	I	Y	☹	▣	⤵	/	k	ä	▣	▣	▣	▣
A	1010		*	:	J	Z	♣	▣	⤵	b	f	ö	▣	▣	⤵	♦
B	1011		+	;	K	□	♣	o	^	x	v	ä	H	▣	⤵	£
C	1100		,	<	L	⤵	♣	▣	⤵	d	||	/	○	▣	▣	↓
D	1101		—	=	M	□	♣	/	⤵	r	ü	y	└	└	▣	▣
E	1110		•	>	N	↑	H	/	⤵	p	β	{	└	▣	▣	▣
F	1111		/	?	O	←	≡	↓	⤵	c	j	/	▣	▣	▣	π

Character Code Table (For MZ-80K)

Upper 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 bits	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000			O	@	P	☹	▣		👁	q	n		└	—	▣
1	0001	↓	!	I	A	Q	H	▣	+	▣	a	/	▣	H	♠	●
2	0010	↑	"	2	B	R	I	▣	⤵	e	z	ü	▣	H	—	—
3	0011	→	#	3	C	S	♤	▣	⤵	▣	w	m	▣	H	—	♥
4	0100	←	\$	4	D	T	♣	▣	⤵	▣	s	/	▣	▣	—	▣
5	0101	H	%	5	E	U	♣	▣	⤵	▣	u	/	▣	▣	—	▣
6	0110	C	&	6	F	V	♣	▣	⤵	t	i	/	→	▣	—	✕
7	0111		'	7	G	W	☹	▣	⤵	g	=	o	▣	▣	—	○
8	1000		(	8	H	X	☹	▣	⤵	h	ö	l	▣	▣	—	♣
9	1001		)	9	I	Y	☹	▣	⤵	k	ä		▣	▣	▣	▣
A	1010		*	:	J	Z	♣	▣	⤵	b	f	ö	▣	▣	⤵	♦
B	1011		+	;	K	□	♣	o	☺	x	v	ä	H	▣	⤵	£
C	1100		,	<	L	\	♣	▣	⤵	d	||	/	○	⤵	▣	↓
D	1101		—	=	M	□	♣	▣	⤵	r	ü	y	└	└	▣	▣
E	1110		•	>	N	↑	▣	▣	⤵	p	β	¥	└	▣	▣	▣
F	1111		/	?	O	←	▣	↓	⤵	c	j	/	▣	▣	▣	π

Printer Control with BASIC

With BASIC language, you can easily control the MZ-80P6 and print various formats. Here we will explain a method of printer control based on with BASIC language. Commands differ according to the BASIC used.

1. BASIC for MZ-80B or MZ-80A

Command	Example	Meaning
LIST/P	LIST/P	Outputs to the printer the complete list of the BASIC text.
	LIST/P -100	Outputs to the printer the BASIC text to number 100.
	LIST/P 100-500	Outputs to the printer the BASIC text from number 100 to 500.
	LIST/P 500-	Outputs to the printer the BASIC text after number 500.
PRINT/P	PRINT/P A\$	Outputs to the printer just as it is the contents of string variable A\$.
	PRINT/P CHR\$ (N)	For an N of $32 \leq N \leq 255$, it considers this as an ASCII code, and outputs a matching character to the printer. It prints "A" if N = 65.
	PRINT/P CHR\$ (5) (Form feed)	Feeds paper to top of the form position on the next page. It is called form feed. The function of the control button "TOP OF FORM" of the printer is controlled by software. (Note) It is equivalent to control code FF (0CH) of the printer.
	PRINT/P CHR\$ (6) (Initialization)	Returns the printing mode to its initial condition. Furthermore, the form feed is carried out. It is called initial mode set. Initial mode means 80 digit mode, line space mode.
	PRINT/P CHR\$ (16) (Line space mode)	Sets the printing mode for line spacing. It is called line space mode. (Note) It is equivalent to printer control code (ESC + 02H).
PRINT/P CHR\$ (17) (Non line space mode)	Sets the printing mode, completely closing up printing line space. It is called non line space mode. (Note) It is equivalent to printer control code (ESC + 00H).	

Command	Example	Meaning
COPY/P		COPY/P command is used for output of the pattern (of one screen) displayed on the CRT screen of the MZ-80B (strictly speaking, data in V-RAM area) to the printer. Therefore, the printed pattern is a copy of the CRT screen. There are four styles of copy as explained below. Dot space of the horizontal line is reduced when it is set in the reduced mode.
	COPY/P 1	If the CRT screen shows data in the character V-RAM area, the data of that one screen is output to the printer.
	COPY/P 2	Within the graphic V-RAM area (graphic area 1, graphic area 2) it outputs data of the one screen contained in graphic area 1 to the printer and performs bit image pattern printing. (Refer to the footnote 3.)
	COPY/P 3	It outputs data of the one screen contained in graphic area 2 to the printer and performs bit image pattern printing. (Refer to the footnote 3.)
	COPY/P 4	Determines the logical sum (OR) of each bit of data contained in graphic area 1 and 2 as output data to the printer. Consequently, the pattern is printed as a pattern with the two patterns obtained from COPY/P 2 and COPY/P 3 superimposed. (Refer to the footnote 3.)
PAGE/P	PAGE/P N	Determines the value of N as the maximum number of lines that can be printed on one page. The number of lines here is the number of lines in the space line mode. N is any integer from 1 to 128. The initial condition is 66 lines for one page.

- (Note)
1. With BASIC, all the functions of the MZ-80P6 can not be used. If you want other controls, make the program yourself.
 2. With PRINT/P CHR\$(M), this command is ignored when M is 0–4, 7–15, 22–31.
 3. The commands "COPY/P2", "COPY/P3", and "COPY/P4" are not included in the BASIC of MZ-80A.

2. BASIC for MZ-80K

Command	Example	Meaning
LIST/P	LIST/P	Outputs to the printer the complete list of the BASIC text.
	LIST/P –100	Outputs to the printer the BASIC text to number 100.
	LIST/P 100–500	Outputs to the printer the BASIC text from number 100 to 500.
	LIST/P 500–	Outputs to the printer the BASIC text after number 500.
PRINT/P	PRINT/P A\$	Outputs to the printer just as it is the contents of string variable A\$.
	PRINT/P CHR\$(N)	For an N of $32 \leq N \leq 255$, it considers this as an ASCII code, and outputs a matching character to the printer. It prints "A" if N = 65.
	PRINT/P " f " (Form feed)	Feeds paper to top of the form position on the next page. It is called form feed. The function of the control button "TOP OF FORM" of the printer is controlled by software.
	PRINT/P " c "	Cancels the non-line mode and the double size character mode.
	PRINT/P CHR\$" l " (Non line space mode)	Sets the printing mode, completely closing up printing line space. It is called non line space mode.
	PRINT/P " t " (Double size mode)	Sets the mode to double the present printing size of the characters. It is called double size mode. There is a 40 digit mode or a 68 digit mode.
	PRINT/P" ll XX"	Sets the number designed by XX" as the number of lines that can be printed on one page. Maximum number of lines possible is 128. (Example) When set for 77 lines With $(77)_{10} = 4DH$ PRINT " ll 4D"

Command	Example	Meaning
	PRINT/P" 11 XXαα"	<p>Designates data length with XX and bit image data with αα and carries out bit image printing. (Example) When data length is 5 and bit image data are 41H, 42H, 43H, 44H and 45H.</p> <p>(5)₁₀ → 0005H (LSB)</p> <p>Data length Bit image data →</p> <p>PRINT " 11 0500ABCDE"</p> <p>(Prints dots ("•") on the right.)</p>
	PRINT " 111 "	<p>Changes print mode with the toggle switch to 80 characters/line 136 characters/line. (Example) If it's 136 characters/line, it becomes 80 characters/line, it becomes 136 characters/line. If it's 136 characters/line, it becomes 80 characters/line.</p>

Examples of Printing with BASIC

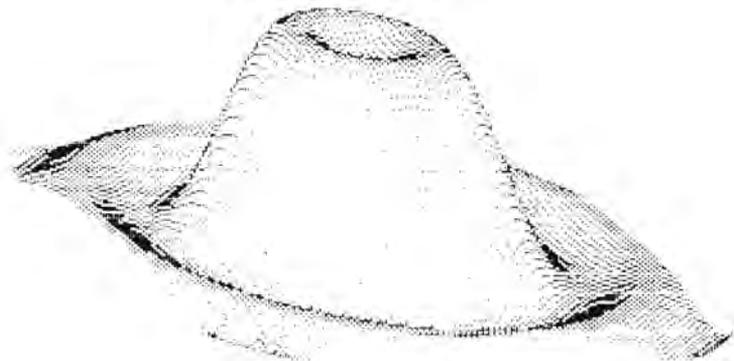
Program 1. Bit Image Pattern with COPY/P Command

[Program List]

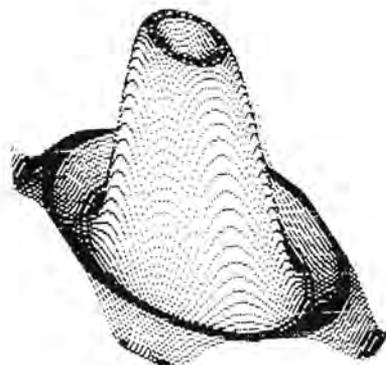
```
100 GRAPH I1:GRAPH C:GRAPH O1
110 PRINT CHR$(6)
120 DIM D(1,255)
130 FOR L=0 TO 255
140 D(0,L)=-1:D(1,L)=-1:NEXT
150 FOR Y=-180 TO 180 STEP4
160 FOR X=-180 TO 180 STEP4
170 R=π/180*SQR(X*X+Y*Y)
180 Z=100*COS(R)-30*COS(3*R)
190 DX=INT((116+X/2+(16-Y/2)/2)
200 DY=INT(((130-Y/2-Z)/2)
210 IF (DX<0)+(DX>255) THEN 250
220 IF D(0,DX)=-1 THEN 300
230 IF DY<=D(0,DX) THEN 370
240 IF DY>=D(1,DX) THEN 390
250 NEXT:NEXT
260 PRINT/P CHR$(18);TAB(6);"3D-PLOT"
270 COPY/P 2
280 PRINT/P CHR$(5);CHR$(20);COPY/P 2
290 END
300 IF DX=0 THEN 360
310 IF D(0,DX-1)=-1 THEN 360
320 IF D(0,DX+1)=-1 THEN 360
330 D(0,DX)=INT((D(0,DX-1)+D(0,DX+1))/2)
340 D(1,DX)=INT((D(1,DX-1)+D(1,DX+1))/2)
350 GOSUB 410:GOTO 250
360 D(0,DX)=DY:D(1,DX)=DY:GOSUB 410:GOTO 250
370 GOSUB 410:D(0,DX)=DY:IF D(1,DX)=-1 THEN D(1,DX)=DY
380 GOTO 250
390 GOSUB 410:D(1,DX)=DY:IF D(0,DX)=-1 THEN D(1,DX)=DY
400 GOTO 250
410 SET DX,DY
420 RETURN
```

[Execution Result]

3D-PLOT



(Normal mode printing)



(Reduced mode printing)

Program 2. Bit Image Pattern with IMAGE/P Command

[Program List]

```
100 A$=CHR$($C0)+CHR$($C0):B$=CHR$($F0)+CHR$($F0)
110 D$=CHR$($FC)+CHR$($FC):E$=CHR$($CF)+CHR$($CF)
120 F$=CHR$($3C)+CHR$($3C):G$=CHR$($FF)+CHR$($FF)
130 H$=CHR$($3F)+CHR$($3F):I$=CHR$($0F)+CHR$($0F)
140 J$=CHR$($33)+CHR$($33):K$=CHR$($03)+CHR$($03)
150 L$=CHR$($C3)+CHR$($C3):M$=CHR$($00)+CHR$($00)
200 I1$=M$+M$+A$+B$+D$+E$+D$+D$+D$+E$+D$+B$+A$+M$+M$+M$+M$
210 I2$=M$+M$+H$+A$+I$+J$+J$+K$+J$+J$+I$+A$+H$+M$+M$+M$+M$
220 I3$=M$+M$+B$+D$+F$+F$+G$+G$+G$+F$+F$+D$+B$+M$+M$+M$+M$
230 I4$=M$+M$+L$+J$+H$+I$+K$+K$+K$+I$+H$+J$+L$+M$+M$+M$+M$
240 PRINT/P CHR$(17)
250 FOR M=0 TO 5:IMAGE/P I1$+I3$+I1$+I3$+I1$+I3$+I1$
260 IMAGE/P I2$+I4$+I2$+I4$+I2$+I4$+I2$
270 PRINT/P:NEXT
280 END
```

[Execution Result]



Specifications

Printing method	Serial impact dot matrix
Feed method	Variable sprocket feed or friction feed selectable manually
Kinds of characters	230 kinds
Character make-up	9(W) x 8(H) dot matrix (normal size character)
Line-to-line space	1/6 inch or determined by program
No. of digits	80 digits, 40 digits, 136 digits, 68 digits or determined by program
Page	66 lines/page (line space mode) or determined by program.
Printing speed	80 cps (characters per second) (ordinary size characters)
Printing direction	Bi-direction for character printing. Uni-direction (left to right) for bit image printing.
Printing paper	Fanfold paper (4 – 10 inch wide), Cut paper sheet (8.3 – 8.5 inch wide)
Copies	Max. of 3 copies (including original)
Printing paper thickness	Within 0.3mm
Ink ribbon	Special cartridge ribbon
Head life	Approx. 50 million characters (14 dot character printing)
Interface	8-bit parallel interface
Power supply	Local supply voltage (Should be power supply voltage indicated on rating plate.)
Power consumption	75W
Working temperature	5 ~ 35°C
Storage temperature	-20 ~ 50°C
External dimensions	Approx. 377(W) x 352(D) x 105(H)mm (including an assistant guide)
Weight	Approx. 7.2 kg

(NOTE) Specifications and appearance are subject to change without prior notice for improvement. In such a case, the explanation here may be a little different from the product.

This apparatus complies with requirements of EEC directive 76/889/EEC.

MEMO

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SHARP CORPORATION

TINSE0035PAZZ
810828-0500-K
Printed in Japan

MZ-80P6
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