FX-850/1050

TECHNICAL MANUAL

EPSON

NOTICE

“ The contents of this manual are subject to change without notice.

“ All efforts have been made to ensure the accuracy of the contents of this manual. However, should any errors be detected, SEIKO EPSON would greatly appreciate being informed of them.

“ The above notwithstanding SEIKOEPSON can assume no responsibility for any errors in this manual or the consequences thereof.

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of the FX-850 and FX- 1050.
The instructions and procedures included herein are intended for the experienced repair technician, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

Chapter 1 - Provides a general product overview, lists specifications, and illustrates the main components of the printer.

Chapter 2 - Describes the theory of printer operation.

Chapter 3 - Discusses the options

Chapter 4 - Includes a step-by-step guide for product disassembly, assembly, and adjustment.

Chapter 5 - Provides Epson-approved techniques for troubleshooting.

Chapter 6 - Describes preventive maintenance techniques and lists lubricants and adhesives required to service the equipment.

- The contents of this manual are subject to change without notice.

REVISION TABLE

REVISION	DATE ISSUED	CHANGE DOCUMENT
A	February 15, 1988	1st issue

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) personal injury, and 2) damage to equipment:

DANGER **Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by a DANGER headings.**

WARNING **Signals a precaution which, if ignored, could result in damage to equipment.**

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. **ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND THE HOST COMPUTER BEFORE PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURE.**
2. **NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.**
3. **WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.**

WARNING

1. **REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.**
2. **MAKE CERTAIN THAT THE SOURCE VOLTAGE IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY-AC RATING DIFFERENT FROM THE AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.**
3. **ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.**
4. **IN ORDER TO PROTECT SENSITIVE μP CHIPS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.**
5. **REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS RECOMMENDED BY THE MANUFACTURER; INTRODUCTION OF SECOND-SOURCE ICS OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.**

TABLE OF CONTENTS

CHAPTER 1
GENERAL DESCRIPTION

LIST OF FIGURES

LIST FO TABLES

1.1 FEATURES

The FX-850 and FX-1 050 are serial dot matrix 9-pin terminal printers that print at a maximum of 264 CPS. Either model FX-850 with 80 columns or FX-1 050 with 136 columns can be selected according to your requirements. The main features are as follows:

- Max. printing speed: 264 CPS (Draft and Elite)
  220 CPS (Draft and Pica)
- Advanced paper handling functions: Auto tear-off
  Auto loading
  Auto back-out
  Micro adjustment
- SelecType function (Any print mode can be selected directly from the front panel). Once a mode is selected, it is stored in the non-volatile memory, and is selected when the printer power is turned on.
- Two NLQ fonts (Roman and Saris-serif) are standard.
- Printer driver EPSON ESC/P-83 is standard. (This driver is compatible with the high class models such as FX-800, -1000, -86e, and -286e.)
- Double-height function
- Pitch control is possible in the NLQ mode. (Pica, elite, proportional modes)
- Since the IBM emulation mode is standard, these printers are IBM-compatible. The IBM characters are also standard.
- 8K-byte input data buffer (Buffering can be disabled.)
- Push tractor unit
- Printing is possible on envelopes and labels in addition to fan-fold paper, cut sheets, and roll paper.
- User-defined characters are supported in both the Draft and NLQ (Saris-serif) modes. Once a character is registered, it is stored in the non-volatile memory and need not be re-registered. The user-defined character set can only be selected (as a default character set) using the DIP switches.
- Compatible with EPSON optional interface board series #81 XX.

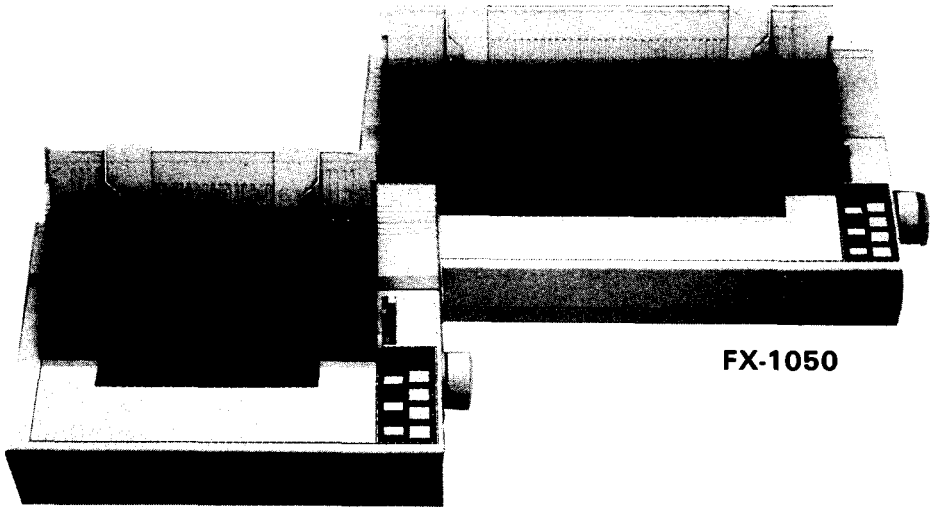


Figure 1-1. Exterior Views of the FX-850/1050

Table 1-1. Optional Units

No.	Name	FX-850	FX-1 050
#83 10	Roll Paper Holder	o	
#731 1	Pull Tractor Unit	o	
#731 2	Pull Tractor Unit		o
#7339	Cut Sheet Feeder (single-bin)	o	
#7340	Cut Sheet Feeder (single-bin)		o
#8750	Ribbon Cartridge	o	
#8755 (M)	Ribbon Cartridge		o
#8758	Ribbon Pack	o	
#81 XX	Optional Interface Board	o	

Table 1-2. Optional Interface Boards

No.	Name
#8 143	New serial interface
#8145	RS-232C current loop interface type II
#8 148	Intelligent serial interface
#8 149	Intelligent serial interface type II
#8 149M	Intelligent serial interface type III
#816 1	IEEE-488 interface
#8 165	Intelligent IEEE-488 interface
#8172	32 K-byte buffer parallel interface
#81 72M	128K-byte buffer parallel interface

1.2 SPECIFICATIONS

The FX-850/1 050 communicates with a wide variety of host computers. This section describes the specifications for the printer.

1.2.1 Hardware Specifications

Printing Method	Serial, impact dot matrix
Pin Configuration	See Figure 1-2 (diameter: 0.29 mm).

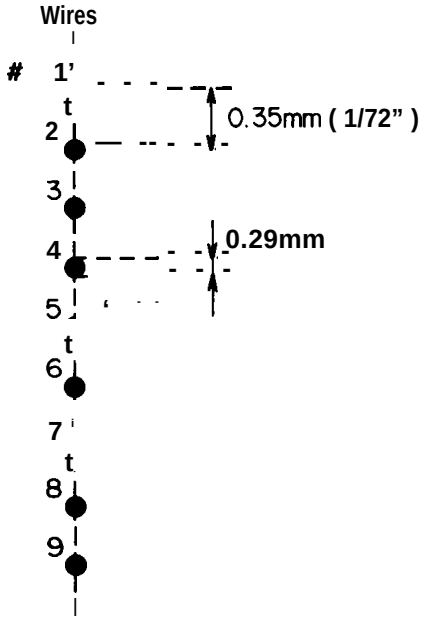


Figure 1-2. Printhead Pin Configuration

Feeding Method	Friction feed Tractor feed (push: standard, pull: optional)

NOTES: 1. When using friction feed:
- Use the paper tension unit.
- Do not use fanfold paper.
- Do not perform reverse feed beyond than 1/6 inches after the paper end has been detected.
- Do not use multi-part, single-sheet forms.

2. When using tractor feed:
- Release the friction feed mechanism.
- Multiple copies for printing must be finished by pasting them together at the line or dots.
- Copy paper must be a carbonless multi-part paper.

a) When using push tractor feed:
- Use the paper tension unit.

- Do not perform reverse feeding for more than 1/6 inches.
- Because accuracy of paper feed cannot be assured, do not perform reverse feeding after the paper end has been detected.

b) When using pull tractor feed:

- Remove the paper tension unit and mount the pull tractor unit.
- Use the paper path when a single sheet is inserted.

c) When using push-pull tractor feed:

- Remove the paper tension unit and mount the pull tractor unit.
- Do not loosen the paper between the platen and the pull sprocket.
- -Precisely the horizontal position of the pull sprocket and push tractor.
- Do not perform reverse feeding after the paper end has been detected.

Paper Loading Directions

Fanfold paper	Inserted from the rear side
Cut sheet paper	Inserted from the up side

Line Spacing 1/6" or programmable (min. 1/2 16")

Line Feed Speed See Table 1-3.

Table 1-3. Line Feed Speeds

Type of Paper	Continuous Feed	Intermittent Feed	Feed Speed
Cut Sheet	48 ins/line	71 ins/line	3.5 "/see
Fanfold	53 ins/line	76 ins/line	3.1 "/see

Paper Specifications

Cut sheet paper Refer to Table 1-4.

Table 1-4. Cut Sheet Paper Specified Conditions

	FX-850	FX-1 050
Width [mm]	182-257 (7.2 - 10.1")	182-366 (7.2 - 14.4")
Length [mm]	182 - 364 (7.2 - 14.3")	
Thickness [mm]	0.065 - 0.10 (0.0025 - 0.004")	
Weight [Kg]	45 - 70 (14 - 22 lb)	
Quality	Plain paper	
Copies	Not available	

NOTE: The form overriding mechanism enables printing as close as 13.5 mm from the bottom edge of the paper. However, paper feed accuracy is not guaranteed within about 22 mm from the bottom.

Fanfold — Refer to Table 1-5.

Table 1-5. Fanfold Paper Specified Conditions

	FX-850	FX-1 050
Width [mm]	101 - 254 (4.0 - 10.0")	101 - 406 (4.0 - 16.0")
Copies [sheet]	4 (1 original + 3) at normal temperature 3 (1 original + 2) at all temperature range	
Quality	Plain paper	
Total Thickness [mm]	0.065 - 0.32 (0.0025 -0.01 2")	
Weight [Kg]	Fanfold 45-70 (14 -22 lb) Multi-part forms 34 - 50 X N (N ≦ 4)	

Roll paper — Refer to Table 1-6.

Table 1-6. Roll Paper Specifications

	FX-850 only
Width [mm]	216 ± 3
Length [mm]	Roll diameter not more than 127 mm (5")
Thickness [mm]	0.07 -0.09 (0.0028 - 0.0035")
Weight [Kg]	45 - 55
Quality	Plain paper
Copies	Not available

Envelope — Refer to Table 1-7.

Table 1-7. Envelope Specifications

	FX-850/1 050
Size [mm]	166 X 92, 240 X 104
Weight [Kg]	3 9 - 78 (12 -24 lb)
Quality	Plain, Bond, Air mail

Operating conditions:

Printing must be executed at normal room temperature.

Envelopes must be oriented with the long direction parallel to the carriage.

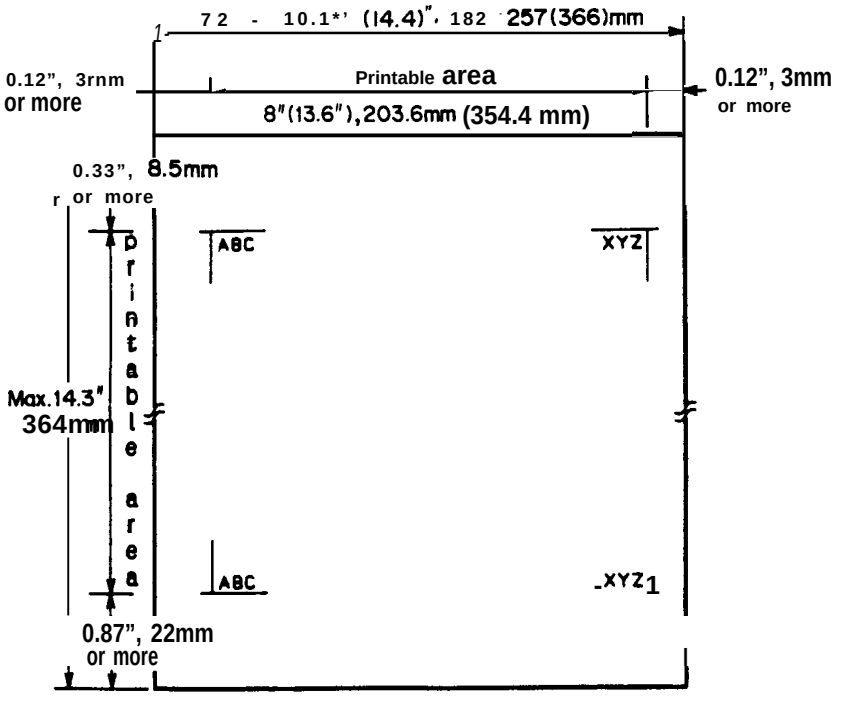
Label **Refer to Table 1-8.**

Table 1-8. Label Specifications

	FX-850/1 050
Size [mm]	63.5 X 2.38 (2.5 X 15/16"), 101.6 X 2.38 (4 X 15/1 6") 101.6 X 36.5 (4 X 1 7/1 6")
Thickness [mm]	less than 0.19 (0.0075")

Printable Area

Cut sheet paper **See Figure 1-3.**

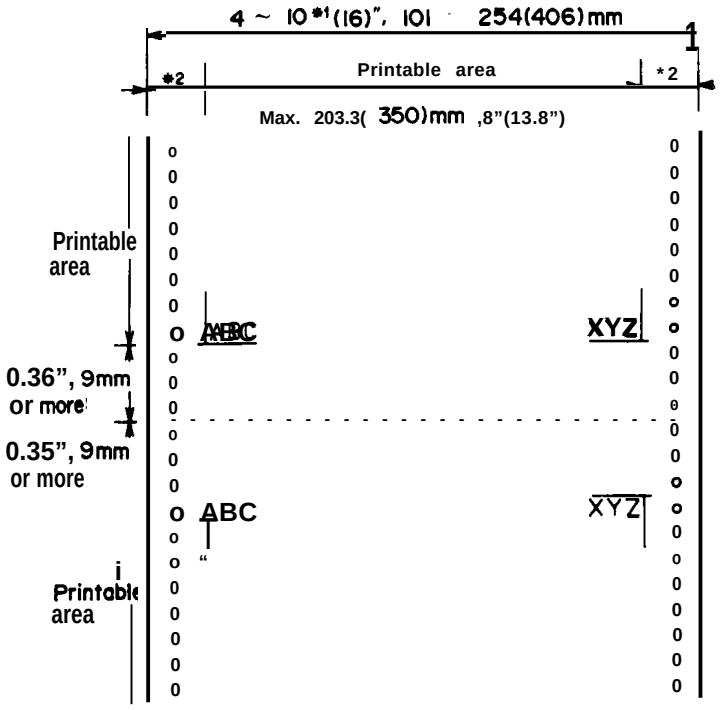


NOTES: 1. Values in the parentheses apply to the FX-105O.

2. Printing is possible for approximately 42 mm after the bottom edge of a page has been detected. Thus, the value 13.5 mm (lowest print position) is given for reference only. Paper feed accuracy cannot be assured in the area approximately 22 mm (0.87") from the bottom edge of the page.

Figure 1-3. Cut Sheet Paper Printable Area

Fanfold paper See Figure 1-4.



NOTE: 1. Values in the parentheses apply to FX-105O.
2. 0.47", 12 mm or more when the 101 to 242 mm (4 to 9.5") width paper is used.
0.98", 25 mm or more when the 254 mm (10") width paper is used.

Figure 1-4. Fanfold Paper Printable Area

Envelopes

Size	**No. 6 (166 X 92 mm), No. 10 (240 X 104 mm)**
Quality	**Bond paper, xerographic copier paper, airmail paper**
Thickness	**0.16- 0.52 mm (0.0063 -0.01 97")**

NOTE: Differences in thickness within printing area must be less than 0.25 mm (0.0098").

Weight 121 -241 lb (45 -91 g/m²)

NOTES: 1. Envelope printing is only available at normal temperature.
2. Keep the longer side of the envelope horizontally at setting.
3. Set the left of No. 6 envelope at the setting mark of the sheet guide.

Label

Size	**2 1/2 X 15/16", 4 X 15/16", 4 X 1 7/16"**
Thickness	**O.19 mm (0.0075) max.**

NOTE: Thickness excluding the base paper must be less than or equal to 0.12 mm (0.0075").

NOTES: 1. Printing of labels is only available at normal temperature.
2. Labels must be fanfold.
3. Labels with pressure-sensitive paper must be jointed by pasting along the dots or lines, and the total thickness must be less than or equal to 0.3 mm (O. 118“) to be printed out under conditions that must be between 5 to 35 “C and 20 to 80% RH.
4. Examples of labels: AVERY CONTINUOUS FORM LABELS
AVERY MINI-LINE LABELS

Lever Adjustment See Figure 1-5 and Table 1-9.

Table 1-9. Lever Adjustment

Lever Position	Paper Thickness [mm]
2nd	0.06 - 0.12
3rd	o.13 - 0.17
4th	0.18 ~ 0.25
5th	0.26 ~ 0.32

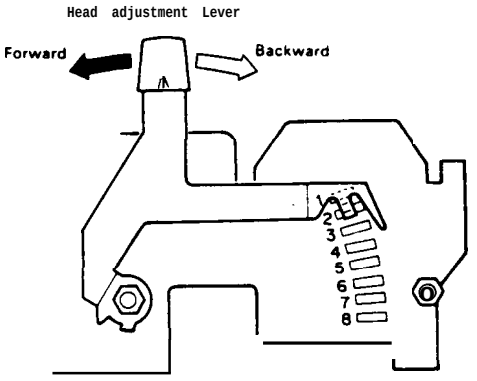


Figure 1-5. Head Adjustment Lever Positioning

NOTES: 1. When printing density becomes lighter, set the head adjustment lever one position lower.
2. When using thicker paper than shown in the above table, set the head adjustment lever to the 6th or higher appropriate position by performing the self-test operation.

Ribbon Cartridge See Table 1-10.

Table 1-10. Ribbon Cartridge Specification

Ribbon Model No.	#8750	#8755 (M)
Printer	FX-850	FX-1 050
Color	Black	
Life [characters]	3 million (14 dots/character)	
Dimension [mm] (W) X (h) X (d)	293 X 34 X 72	468 X 34 X 78

Dimensions See Table 1-11 (Details are shown in Figures A-45 and 46.).
Weight See Table 1-11.

Table 1-11. Dimensions and Weight

	Width [mm]	Height [mm]	Depth [mm]	Weight [Kg]
FX-850	430	150	360	9.5
FX-I 050	605	150	360	12.5

NOTE: Excluding platen knob and paper guide.

Electrical Specifications See Table 1-12.

Table 1-12. Electrical Specifications

	120 V Version	220/240 V Version
Voltage [V AC]	120V ± 10YO	220/240V ± 10%
Frequency range [Hz]	49.5 - 60.5	
Rating current [A]	2	1
Insulation resistance [M ohm] min. (between AC line and chassis)	10	
Dielectric strength [V AC, rms] (1 minute, between AC line and chassis)	1250	1250

Environmental Conditions Refer to Table 1-13.

Table 1-13. Environmental Conditions

	Storage	Operating
Temperature ["C]	–30 - 60	5 -35
Humidity [% RH]	5 - 85	10 - 80
Resistance to shock [G] (within 1 ms)	2	1
Resistance to vibration [G] (55 Hz, max.)	0.50	0.25

Reliability

MCBF 5 million lines (excluding printhead)
(MCBF... Mean Cycles Between Failure)
MTBF FX-850: 4000 POH (duty 25%)
FX-105O: 6000 POH (duty 25%)
Printhead life 100 million characters (14 dots/character)

Safety Approvals

Safety standards	UL4785th (U.S.A. version)
	CSA22.2#220
	VDE0806(TUV) (European version)
Radio Frequency (RFI) Interference	FCC class B (U.S.A. version)
	VDE871 (European version)

1.2.2 Firmware Specifications

Control Code	ESC/P-83
Printing Direction	
Text	Bidirectional printing with logic seeking
Bit-image	Unidirectional printing
Character Code	8 bits
Character Set	96 ASCII and 13 international character sets
	Graphics
Font	NLQ Roman: 10, 12, 15, Proportional
	NLQ Saris-serif: 10, 12, 15, Proportional
	Draft: 10, 12, 15, Proportional
Printing Mode	Printing quality (Draft/NLQ)
	Character pitch (10, 12, 15 CPI or Proportional)
	Condensed
	Double-width
	Double-height
	Emphasized
	Double-strike
	Italic
	Underlined

NOTE: A condensed mode for 15 CPI characters is not available.

Print Speed Refer to Table 1-14.

Table 1-14. Print Speed

Type of Letters	Print Speed [cps]
Draft pica	220 (107)
Draft elite	264 (1 28)
Condensed draft pica	183 (91)
Emphasized draft pica	107
NLQ normal pica	45

NOTE: When any italic character is in the same line, the print speed will be reduced to the value in the parentheses.

Print Columns Refer to Table 1-15.

Table 1-15. Print Columns

Type of Letters	Printable Columns [*cpl*]	
	FX-850	FX-1 050
Normal	80	136
Condensed	137	233
Elite	96	163
Condensed elite	160	272

NOTE: In Condensed mode, printable column is always 137. (Previous FX series is 132.)

Character Size, Pitch Refer to Table 1-16.

Table 1-16. Character Size and Pitch

Type of Letters	Width [mm]	Height [mm]	Character Pitch [mm]
Normal	2.1	3.1	2.54 (1 O cpi)
Emphasized	2.1	3.1	2.54 (1 O cpi)
Condensed	1.05	3.1	1.48 (17 cpi)
Elite	1.7	3.1	2.11 (12 cpi)
Condensed elite	0.85	3.1	1.27 (20 cpi)

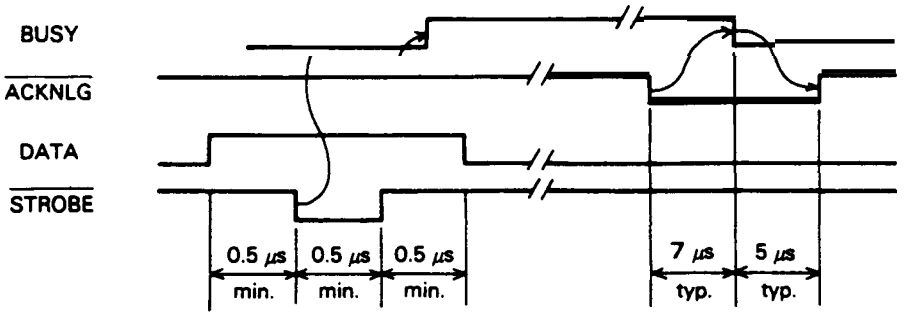
NOTE: Width of Elite character is changed to 1.7 mm from 2.1 mm (not same as normal mode).

1.3 INTERFACE OVERVIEW

The FX-850/1 050 has 8-bit parallel interface as standard.

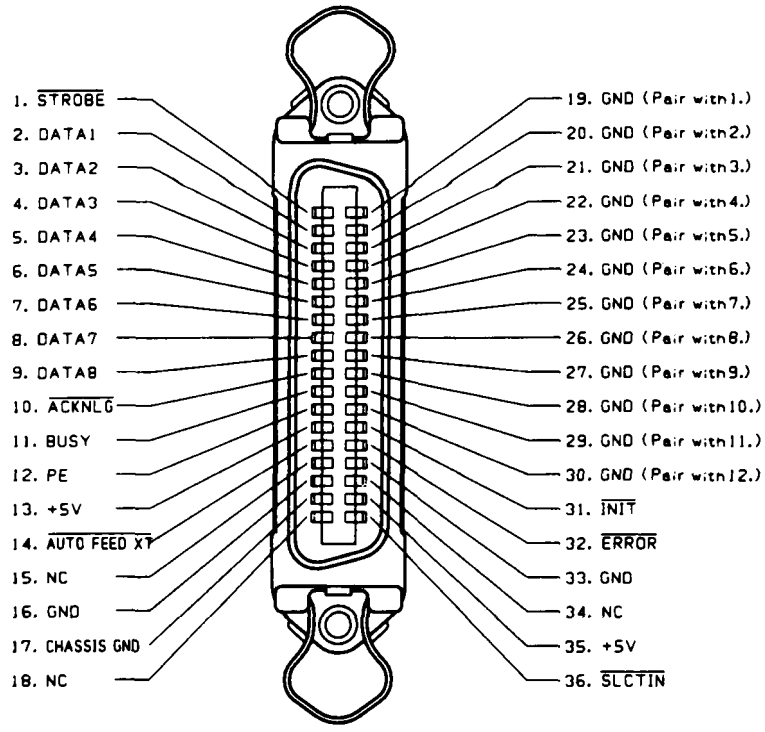
1.3.1 8-bit Parallel Interface Specifications

Data Transmission Mode	8-bit pallarel
Synchronization	By $\overline{\text{STROBE}}$ pulse
Handshaking	By BUSY and $\overline{\text{ACKNLG}}$ (either or both)
Logic Level	TTL compatible
Data Transmission Timing	See Figure 1-6.
Connector	57-30360 (AMPHENOL) or equivalent (See Figure 1-7.)



NOTE: Transmission time (rising and falling time) of every input signal must be less than 0.2 μs.

Figure 1-6. Data Transmission Timing of 8-bit Parallel Interface



⊏igure 1-7. 36-Pin 57-30360 Connector

Table 1-17 shows the connector pin assignments and signal functions of the 8-bit parallel interface.

Table 1-17. Connector Pin Assignments and Signal Function

Pin No.	Signal Name	Return Pin No.	DIR	Functional Description
1	$\overline{\text{STRORE}}$	19	In	Strobe pulse to read the input data. Pulse width must be more than 0.5μs. Input data is latched after falling edge of this signal.
2	DATA 1	20	In	These signals represent information of the 1st to 8th bits of parallel data, respectively. Each signal is at "HIGH" level when data is logical "1" and "LOW" when logical "O".
3	DATA 2	21	In	
4	DATA 3	22	In	
5	DATA 4	23	In	
6	DATA 5	24	In	
7	DATA 6	25	In	
8	DATA 7	26	In	
9	DATA 8	27	In	
10	$\overline{\text{ACKNLG}}$	28	out	This pulse indicates data has been received and the printer is ready to accept more data. Pulse width is approximately 12μs.
11	BUSY	29	out	A "HIGH" signal indicates that the printer cannot receive data. The signal becomes "HIGH" in the following cases: 1. During data entry 2. During printing operation 3. In off-line status 4. During printer error status
12	PE	30	out	A "HIGH" signal indicates that the printer is out of paper.
13				Pulled up to +5V through 3.3 K ohms resistor.
14	$\overline{\text{AUTO FEED XT}}$		In	With this signal at "LOW"' level, the paper is automatically fed one line after printing. (The signal level can be fixed to "LOW"' with DIP SW 2-4.)
15	NC			Not used.
16	0V			Logic GND level.
17	CHASSIS GND			Printer chassis GND. In the printer, the chassis GND and the logic GND are isolated from each other.
18	NC			Not used.
19 - 30	GND			TWISTED-PAIR RETURN signal GND level.
31	INIT		In	When the level of this signal become "LOW", the printer controller is reset to its initial state and the print buffer is cleared. This signal is normally at "HIGH" level, and its pulse width must be more than 50 μs at the receiving terminal.
32	$\overline{\text{ERROR}}$		out	The level of this signal becomes "LOW" when the printer is in - 1. Paper-out status 2. Off-line status 3. Error status

Table 1-17. Connector Pin Assignments and Signal Function (cent'd)

Pin No.	Signal Name	Return Pin No.	DIR	Functional Description
33	GND			Same as with Pin No. 19 to 30.
34	NC			Not used.
35				Pulled up to +5V through 3.3 K ohms resistor.
36	$\overline{\text{SLCT-IN}}$		In	The DC 1/DC3 code is only valid when this signal is "HIGH" level. (Internal fixing can be carried out with Jumper- I.)

NOTES:
1. "DIR" refers to the direction of signal flow as viewed from the printer.
2. "Return" denotes "TWISTED-PAIR RETURN" and is to be connected at signal ground level. As to the wiring for the interface, be sure to use a twisted-pair cable for each signal and never fail to complete connection on the Return side. To prevent noise effectively, these cables should be shielded an connected to the chassis of the host computer and the printer, respectively.
3. All interface conditions are based on TTL level. Both the rise and fall times of each signal must be less than 0.2μs.
4. Data transfer must not be carried out by ignoring the $\overline{\text{ACKNLG}}$ or BUSY signal.
   (Data transfer to this printer can be carried out only after confirming the $\overline{\text{ACKNLG}}$ signal or when the level of the BUSY signal is "LOW".)

Table 1-18 shows the printer select/deselect (DC 1/DC3) control, including relations among ON-LINE, $\overline{\text{SLCT-IN}}$ input, DC 1/DC3, and interface signals.

Table 1-18. Printer Select/Deselect Control

ON-LINE SW	$\overline{\text{SLCT-IN}}$	DC1/DC3	$\overline{\text{ERROR}}$	BUSY	$\overline{\text{ACKNLG}}$	DATA ENTRY
OFF-LINE	HIGH/LOW	DC 1/DC3	LOW	HIGH	No pulse	Disable
ON-LINE	HIGH	DC 1	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable (Normal Process)
		DC3	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable (Waits DC1. See Note 2)
	L O W	DC 1	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	Enable (Normal Process)
		DC3	HIGH	LOW/HIGH (During data entry)	Pulse output after entry	

NOTES: 1. In the Table 1-18, it is assumed that no $\overline{\text{ERROR}}$ status exists other than that attributable to OFF-LINE mode.

2. Once the printer is deselected by the DC3 code, the printer will not revert the selected state unless the DC 1 code is input again. (In the deselected state, the printer ignores input data until the DC 1 code is received.)

3. The DC 1 and DC3 codes are enabled only when the $\overline{\text{SLCT-IN}}$ signal (Input Connector No.36 for the parallel interface unit) is HIGH and printer power is initialized.

4. If the $\overline{\text{SLCT-IN}}$ signal is LOW when the printer is initialized, DC 1/DC3 printer select/deselect control is invalidated, and these control codes are ignored.

5. If the $\overline{\text{SLCT-IN}}$ signal is HIGH and is not set to LOW by jumper 6 when printer initialized, the printer starts from the selected (DC 1) state.

1.4 DIP SWITCHES AND JUMPER SETTINGS

This section describes the DIP switch selections and jumper setting for the FX-850/1 050 printer.

1.4.1 DIP Switch Settings

The DIP switches are located at the right side of the printer. When the printer hardware is initialized, the following functions are set to the default values shown in the table below.

Table 1-19. DIP Switch 1 Settings

SW	Description	ON	OFF
1-1	Default character set	User-defined	ROM
1-2	Shape of zero	Slashed	Not slashed
1-3	Table select	Graphic	Italic
1-4	Protocol mode	IBM emulation	ES C/P
1-5	Short tear-off mode	off	On
1-6	International character set	See Table 1-20.	
1-7			
1-8			

NOTE: When DIP SW1-4 is on (IBM mode), the function of DIP SW1-3 changes to auto CR ON/OFF.

Default character set

When DIP switch 1-1 is ON, the user-defined character set will be selected as default. User-defined characters are maintained in printer memory even when the power is turned off, so the user-defined character set can be easily selected simply by turning off the power, setting this switch to ON, and then turning the power on again.

Shape of zero

When DIP switch 1-2 is ON, prints a stashed zero (0); when OFF, prints open zeros (0). Useful for clearly distinguishing between uppercase O and zero when printing program lists, etc.

Protocol mode

When DIP switch 1-4 is ON, printer operates in the IBM emulation mode; when off, printer operates in the Epson ESC/P mode.

Functions of DIP switches 1-6, 1-7, and 1-8 are different when using the printer in the IBM emulation mode.

Short Tear-off

When print operation has finished, the short tear-off feature automatically feeds the perforation of the continuous paper to the tear-off edge of the sheet guide cover so that the user can tear off the last sheet. When the user resume printing, the paper is fed backward to the loading position.

Table 1-20. International Character Set

Country	SW 1-6	SW 1-7	SW 1-8	IBM CG Table
USA	ON	ON	ON	CG Table 1
France	ON	ON	OFF	CG Table 2
Germany	ON	OFF	ON	
UK	ON	OFF	OFF	
Denmark	OFF	ON	ON	
Sweden	OFF	ON	OFF	
Italy	OFF	OFF	ON	
Spain	OFF	OFF	OFF	

NOTE: When DIP SW1-4 is on (IBM mode), the functions of DIP SW1-6 through SW1-8 change to IBM character generator selection.

Table 1-21. DIP Switch 2 Settings

SW	Description	ON	OFF
2-1	Page length	12 inch	11 inch
2-2	Cut sheet feeder mode	On	off
2-3	1 -inch skip over perforation	On	off
2-4	Auto line feed	On	off

1.4.2 Jumper Setting

The jumper J 1 is located on the main board and it can fix the $\overline{\text{SLCT-IN}}$ signal to "LOW" level.

Table 1-22. J1 Setting

ON	Fix to "LOW"
OFF	Depend on the external signal.

NOTE: If the jumper J 1 is connected, the $\overline{\text{SLCT-IN}}$ signal is fixed to LOW, and DC 1 /DC3 printer select control is ignored.

1.5 SELF TEST OPERATION

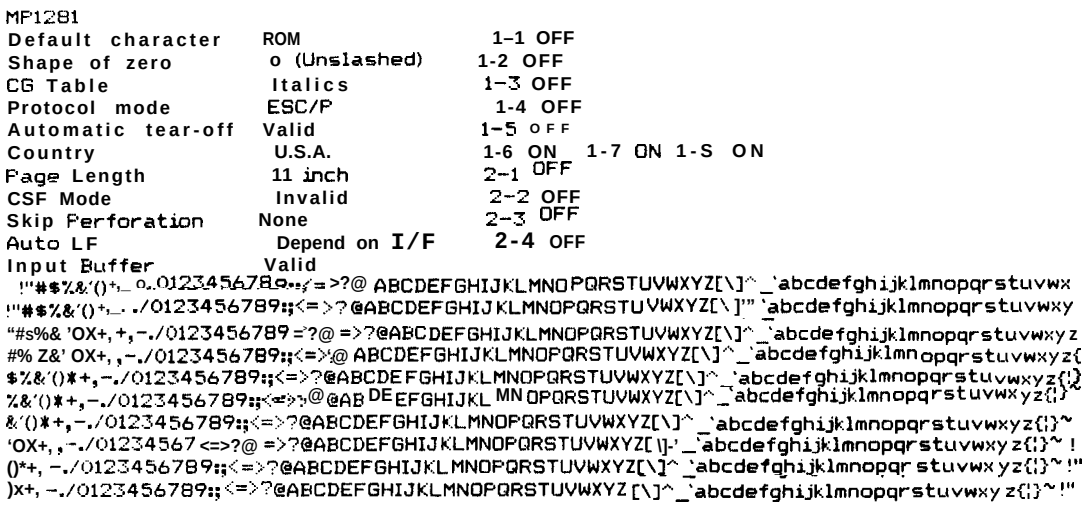
The FX-850/1050 printer has the following self test (self printing) function which checks the following:

- **Control Circuit Functions**
- **Printer Mechanism Functions**
- **Print Quality**
- **DIP Switch Settings**

Table 1-23 lists the self test operating instructions and Figure 1-8 shows the self test printing.

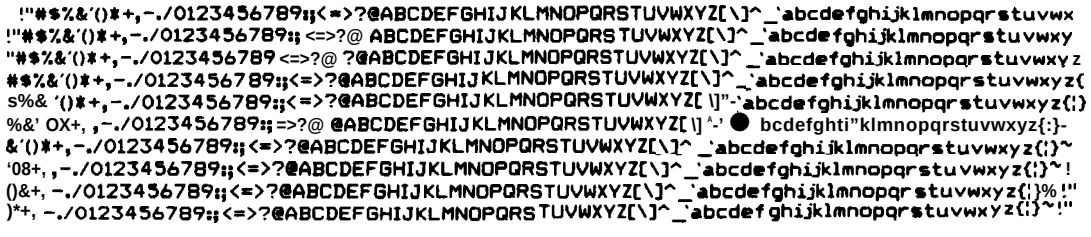
Table 1-23. Self Test Operation

Type-face	Start	stop
Draft	Turn the power ON while pressing the LINE FEED switch.	● Paper out condition. ● Press the ON-LINE switch, and turn the power OFF.
NLQ	Turn the power ON while pressing the FORM FEED switch.	



Draft Mode

NLQ (Roman) Mode



NLQ (Saris-Serif) Mode

Figure 1-8. Self Test Printing

1.6 HEXADECIMAL DUMP FUNCTION

The hexadecimal dump function causes the printer to print the received data in hexadecimal. The printer prints 16 values in hexadecimal, followed by the corresponding ASCII characters, on one line. If there is no corresponding printable character for a value (i.e. a control code), a period (.) is printed. Any remaining data (less than 16 values) can be printed by operating the ON LINE switch. No panel settings can be made in the hexadecimal dump mode. This function makes it easy for technician to identify the source of communications problems between the printer and computer.

Table 1-24 lists the self test operating instructions and Figure 1-9 shows the hexadecimal dump printing.

Table 1-24. Hexadecimal Dump Operation

Function	Operation	stop
Hexadecimal dump mode	Turn the power ON while pressing both the LINE FEED and FORM FEED switches	● Press the ON LINE switch to set the printer off line. Next, turn off the printer.

```
Data Dump  Mode
0000  1B 40 00 1B 55 00 1B .33 1E 00 OD 0A 12 1B 70 00   .@..U..3......p.
0001  1B 7e 01 1B 57  00 1B 4D 20 20 20 43 48  41  50  54   .x..W..M   CHAPT
0002  45  52 20 31 0D 0A 0D 0A 20 20 20 28 31 2E 0D 0A   ER 1 . . . . ( 1 . . .
0003  0 D 0A 20 2,) 20 31 2E 31 20 20 4& 65 61 74 75 72   . .    1.1  Featur
0004  6S 73 0D 0A 20 20 20 54 68 65 20 46 58 2D 38  .35   es. .    The FX-85
0005  30 20 61 6E 64 20 46 58 2D 31 30 35 30 ·20 61 72   0 •nd FX-1050 ar
0006  &,5  20 73 65 72 69 61 6C 20 64 6F 74 20 6D 61 74   e serial dot mat
0007  72 69 78 20 39 2D 70 69 6E 20 74 65 72 6D 69 6E   rix 9-pin termin
0008  61 6C 20 70 72 69 6E 74 65 72 73 20 74 68 61 74   •l printers that
0009  0D 0A 20 20 20 70 72 69 6E 74 20 61 74 20 61 20   . .    print at •
000A  6D 61 78 69 6D 75 6D 20 6F 66 20 32 36 34 20 4.3   maximum of 264 C
000B  50 53 2E 20 20 45 69 74 68 65 72 20 6D 6F 64 65   Ps . Either mode
000C  6C 20 46 58 2D 3S 35 30 20 77 69 74 68 20 3S 30   1 FX-850 with 80
000D  20 63 6F6C 75 6D 6E 73 20 6F 72 20 46 58 2D 0D    columns or FX-.
0 W E  0A 20 20 20 31 30 35 30 20 77 69 74 68 20 31 33      1050 with 13
000F  36 20 63 6F 6C 75 6D 6E 73 20 63 61 6E 20 62 65   6 columns can be
0010  20 73 65 6C 65 63 74 65 64 20 61 63 63 6F 72 64    selected accord
0011  69 6E 67 20 74 6F 20 79 6F 75 72 20 72 65 71 75   ing to your requ
0012  69 72 65 6D 6S 6E 74 73 2E 20 20 s4 68 65 0D 0A   irements. Thin. .
0013  20 20 20 6D 61 69 6E 20 66 65 61 74 73 72 65 73      main features
0014  20 61 72 65 20 61 73 20 66 6F 6C 6C 6F 77 73 3A    •ra as fol lows :
0015  0D 0A 0D 0A 20 20 20 2A 20 4D 61 78 2E 20 70 72   .... * Max . pr
0016  69 6E 74 69 6E 67 20 73 70 65 65 64 3A 20 20 32   inting speed : 2
0017  36 34 20 43 50 53 20 28 44 72 61 66 74 20 61 6E   64 CPS ( Draft •n
0018  64 20 45 6C 69 74 65 29 0D 0A 20 20 20 20 20 20   d Elite) . .
0019  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
001A  20 20 20 20 20 32 32 30 20 43 50 53 20 28 44 72        220 CPS ( Dr
001B  61 66 74 20 61 6E 64 20 50 6? 63 61 29 0D 0A 0D   •ft and Pica) . . .
001C  0A 20 20 2,> 2A 20 41 64 76 61 &E 63 65 64 20 70      * Advanced p
001D  61 70 65 72 20 68 61 6E 64 6C 69 6E 67 20 66 75   •per handl ing fu
001E  6E 63 74 69 6F 6E 7S 3& 20 20 41 75 74 6F 20 74   nctions: auto t
001F  65 61 72 2D 6F 66 66 0D 0A 20 20 20 20 20 20 20   ear-off . .
0020  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0021  20 20 20 20 20  20  20  20 20 20 20 20 213 20 20 20
0022  20 20 41 75 74 6F 20 6C 6F 61 64 69 6E 67 0D 0A     Auto loading. .
0023  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0024  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0025  20 20 20 20 20 20 20 20 20 41 75 74 6F 20 62 61          Auto ba
0026  63 6B 2D 6F 75 74 0D 0A 20 20 20 20 20 20 20 20   ck-out . .
0027  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0028  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0029  20 4D 69 63 72 6F 20 61 64 6A 75 73 74 60 65 6E    Micro adjustmen
002A  74 0D 0A 0D 0A 20 20 20 2A 20 53 65 6C 65 63 54   t.... * SelecT
002B  79 70 65 20 66 75 6E 63 74 69 6F 6E 20 28 41 6E   ype function (An
002C  7? 20 70 72 69 6E 74 20 6D 6F 64 65 20 63 61 6E   y print mode can
002D  20 62 65 20 73 65 6C 6.5 6.3 74 65 64 20 64 69 72    be selected dir
002E  65 63 74 6C 79 20 66 72 6F 6D 20 74 68 65 20 66   ● ctly from the f
002F  72 6F 6E 74 0D 0A 20 20 20 20 20 70 61 6E 65 6C   rent. .     panel
0030  29 2E 20 20 4F 6E 6.3 65 20 61 20 6D 6F 64 65 20   ). Once • mode
0031  69 73 20 73 65 6C 65 63 74 69 64 2C 20 &9 74 20   is selected, it
0032  69 73 20 73 74 6F 72 6S 64 20 69 6E 20 74 68 65   is stored in the
0033  20 6E 6F 6E 2D 76 6F 6C 61 74 69 6C 65 20 6D 65    non-volatile me
0034  6D 6F 72 79 2C 0D 0A 20 20 20 20 61 6E 64 20   mory, . .    •nd
0035  69 73 20 73 65 6C 65 63 74 65 64 20 77 68 65 6E   is selected when
0036  20 74 68 65 20 70 72 69 6E 74 65 72 20 70 6F 77    the printer pow
0037  65 72 20 69 73 20' 74 75 72 6E 6S 64 20 6F 6E 2E   er is turned on.
0038  0D 0A 0D 0A 20 20 20 2A 20 S4 77 6F 20 4E 4C 51   .... * Two NLQ
0039  20 66 6F 6E 74 73 20 28 52 6F 6D 61 6E 20 61 6E    fonts (Roman•n
003A  64 20 53 61 6E 73 2D 73 65 72 69 66 29 20 61 72   d Sans-seri f ) •r
003 El  6520 73 74 61 6E 64 61 72 64 2E 0D 0A 0D 0A 20   e standard. . . . .
```

Figure 1-9. Hexadecimal Dump Printing

1.7 PRINTER INITIALIZATION

There are two initialization methods: hardware initialization and software initialization.

1.7.1 Hardware Initialization

This type of initialization occurs when printer power is turned on or when the printer receives the INIT signal from the host computer via the 8-bit parallel interface.
When printer is initialized in this way, it performs the following actions:

- Initializes printer mechanism.
- Sets the on-line mode.
- Sets the page length to 11 or 12 inches according to the DIP switch.
- Clears the input data buffer and print buffer.
- Read DIP switch and jumper settings.
- Sets the print mode according to the DIP switch and the non-volatile memory set by control panel.
- Sets printer selections to their default values

1.7.2 Software Initialization

This type of initialization occurs when the printer receives command (ESC @) via software.
When the printer is initialized in this way, it performs the following actions:

- Clears the print buffer.
- Sets printer selections to their default values.

NOTE: The printer's default values are as follows:

Page Position	Preset paper position becomes top of form position
Left and Right Margin	Released
Line Spacing	1/6 inches
Vertical Tab Position	Cleared
Horizontal Tab Position	Every 8 characters (relative)
VFU Channel	Channel O
Family Number of Type Style	Roman (Family Number O)
Downloaded Characters	Deselected: Software initialize Cleared: Hardware initialize
Justification	Left justification
Character Per Inch	10
Bit Image Mode Assignment	ESC K = ESC * O, ESC L = ESC * 1, ESC = ESC * 2, ESC Z = ESC * 3
Printing Effects	Cleared