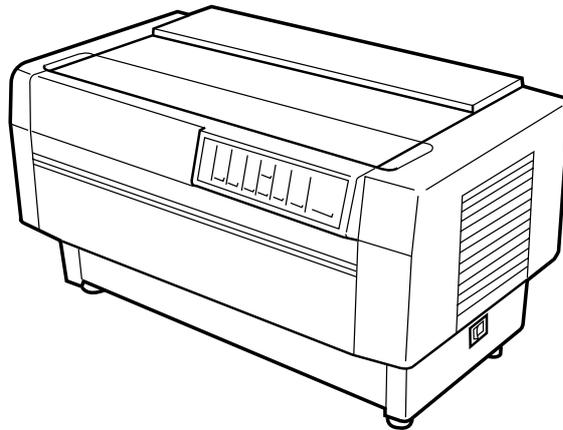


EPSON

IMPACT SERIAL DOT MATRIX PRINTER
DFX-8500

SERVICE MANUAL



SEIKO EPSON CORPORATION

4009310

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PRECAUTIONS

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

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

CAUTION 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.

WARNING

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
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.

CAUTION

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY 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 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 MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of DFX-8500.

The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to die precautions on the preceding page. The Chapters are organized as follows:

CHAPTER 1. GENERAL DESCRIPTION

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

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of printer operation.

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Includes a step-by-step guide for product disassembly and assembly.

CHAPTER 4. ADJUSTMENT

Includes a step-by-step guide for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides EPSON-approved techniques for troubleshooting.

CHAPTER 6. MAINTENANCE

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

APPENDIX

Describes connector pin assignments, circuit diagrams, circuit board component layout and exploded diagram.

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

REVISION SHEET

Revision	Issued Data	Contents
Rev. A	May 18, 1998/	First issue
Rev. B	June 25, 1998	Second issue due to minor correction on the manual contents.

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CHAPTER 1

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1.1 FEATURES

The DFX-8500 is a 18-pin, serial, dot matrix printer with a maximum speed of 1120 characters per second (cps). It is designed for business use and provides high-speed, high-volume printing and continuous-sheet handling. The main features of the printer are:

- ❑ Maximum printing speeds:
 - 1120 cps (high-speed draft mode)
 - 840 cps (draft mode)
 - 210 cps (NLQ mode) at 10 cpi
- ❑ Advanced paper handling:
 - 10 inches per second (ips) paper feeding
 - Paper jam detection
 - Paper width detection
 - Front and rear two-way push tractors
 - Optional pull tractor
 - Automatic paper back-out and loading from another paper path and paper park
 - Automatic platen gap adjustment for paper thickness
 - Automatic tear off
 - Paper memory function
 - Automatic paper path changing
 - Auto cut mode enables the optional perforation cutter to cut the paper at the perforation.
- ❑ Bi-directional parallel interface (IEEE-1284 nibble) and RS-232C serial interface standard
- ❑ EPSON ESC/P (upper compatible with DFX-8000) and IBM/LEXMARK 2381Plus emulation
- ❑ 35 character tables in the NLSP (National Language Support) version and 11 character tables in the standard version
- ❑ 2 NLQ and 1 draft bit-map type faces and 8 barcode fonts are supported.
- ❑ Optional paper cutter and perforation cutter
- ❑ Upgraded data handling
 - 128 KB input buffer
 - Automatic interface selection
 - Type-B optional I/F cards

The figure below shows the DFX-8500.

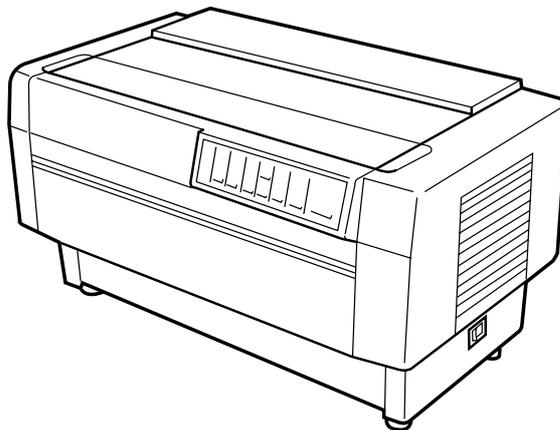


Figure 1-1. DFX-8500 Exterior View

DFX-8500

The following table shows options.

Table 1-1. Option

Code	Name
#8766	Ribbon cartridge
#8767	Ribbon pack
#8309	Pull tractor unit
C81500X	Paper cutter
C81507X	Perforation cutter
C82305*	Serial interface card (inch screw)
C82306*	Serial interface card (mm screw)
C82307*	32-KB intelligent serial I/F card (inch screw)
C82308*	32-KB intelligent serial I/F card (mm screw)
C82310*	32-KB intelligent parallel I/F card (inch screw)
C82311*	32-KB intelligent parallel I/F card (mm screw)
C82312*	Local Talk I/F card
C82313*	32KB IEEE-488 I/F card
C82314*	Coax I/F card
C82315*	Twinax I/F card
C82357*	Ethernet I/F card
C82345*	IEEE-1284 parallel I/F card
C82362	Ethernet I/F card
C82364	Ethernet I/F card

1.2 SPECIFICATIONS

This section describes the specifications for DFX-8500.

1.2.1 Printing Specification

- Print method : Impact dot matrix
- Number of pins : 18-pin (Refer to Figure 1-2.)
- Print pin arrangement : 9 x 2
- Print pin diameter : 0.0114 inches (0.29 mm)
- Color : Black
- Print direction : Bi-directional with logic seeking
- Print speed and printable columns: Refer to Table 1-2.

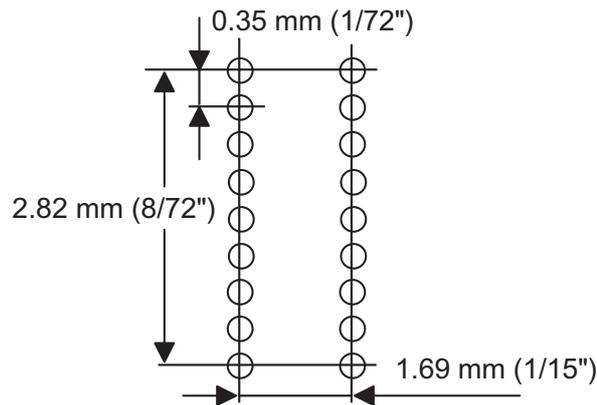


Figure 1-2. Printhead Pin Configuration

Table 1-2. Print Speed and Printable Columns

Print Mode	Character Pitch	Printable Columns	Print Speed (cps)	
			Normal	High Duty
High speed draft	10 cpi	136	1120	1066
Draft	10 cpi	136	840	800
	12 cpi	163	1008	960
	15 cpi	204	630	630
Draft condensed	17 cpi	233	720	685
	20 cpi	272	840	800
Draft emphasized	10 cpi	136	420	400
NLQ	10 cpi	136	210	200
	12 cpi	163	252	240
	15 cpi	204	200	200
NLQ condensed	17 cpi	233	171	171
	20 cpi	272	200	200

Notes 1: The line including graphic B0h - FFh or download characters or bit image data will be printed by "High duty" mode.

Notes 2: The line including special high duty download characters or bit image data will be printed by one third speed of "High duty" mode.

Notes 3: When the print head temperature rises to the upper limit, the printer stops printing. And when the print head temperature falls to the normal level, then the printer starts printing again.

Resolution: Refer to Table 1-3.

Table 1-3. Resolution

Print Mode	Horizontal Density	Vertical Density	Adjacent Dot Print
High speed draft	90 dpi	72 dpi	No
Draft	120 dpi	72 dpi	No
Draft condensed	240 dpi	72 dpi	No
Draft emphasized	120 dpi	72 dpi	Yes
NLQ	240 dpi	144 dpi	No
Bit image	60, 72, 80, 90, 120 or 144 dpi	72 dpi	Yes
	120 or 240 dpi	72 dpi	No

Control code: ESC/P and IBM 2381 Plus emulation

Character tables:

■ Standard version (11 character tables):

- | | |
|----------------------|-----------------------------|
| Italic table | PC437 (US, Standard Europe) |
| PC850 (Multilingual) | PC860 (Portuguese) |
| PC861 (Icelandic) | PC863 (Canadian-French) |
| PC865 (Nordic) | Abicomp |
| BRASCII | Roman 8 |
| ISO Latin 1 | |

■ NLSP version (35 character tables):

- | | |
|----------------------------|-----------------------------|
| Italic table | PC437 (US, Standard Europe) |
| PC850 (Multilingual) | PC437 Greek |
| PC852 (East Europe) | PC853 (Turkish) |
| PC855 (Cyrillic) | PC857 (Turkish) |
| PC866 (Russian) | PC869 (Greek) |
| MAZOIWA (Poland) | Code MJK (CSFR) |
| ISO 8859-7 (Latin / Greek) | ISO Latin 1T (Turkish) |
| Bulgaria (Bulgarian) | Estonia (Estonia) |
| PC 774 (LST 1283:1993) | ISO 8859-2 (ISO Latin 2) |
| PC 866 LAT. (Latvian) | PC866 UKR |
| PC 860 | PC 861 |
| PC 865 | PC APTEC |
| PC 708 | PC 720 |
| PC AR864 | PC 863(Canadian French) * |
| Abicomp* | BRASCII* |
| Roman 8* | ISO Latin 1* |
| Hebrew 7* | Hebrew 8* |
| PC862* | |

Note: These tables can not be selected by DIP switch.

■ International character sets : 13 countries

- | | | |
|---------------|-----------|---------|
| USA | France | Germany |
| U.K | Denmark 1 | Sweden |
| Italy | Spain 1 | Japan |
| Norway | Denmark 2 | Spain 2 |
| Latin America | | |

Note : The international and legal characters are these 12 codes; 23h, 24h, 40h, 5Bh, 5Ch, 5Dh, 5Eh, 60h, 7Bh, 7Ch, 7Dh, 7Eh.

Typeface:

■ Bit map font:

- | | |
|------------------|--------------------------------------|
| EPSON Draft | 10 CPI, 12 CPI, 15 CPI |
| EPSON Roman | 10 CPI, 12 CPI, 15 CPI, Proportional |
| EPSON Sans Serif | 10 CPI, 12 CPI, 15 CPI, Proportional |

■ Bar code:

- | | |
|--------------------|---------|
| EAN-13 | EAN-8 |
| Interleaved 2 of 5 | UPC-A |
| UPC-E | Code 39 |
| Code 128 | POSTNET |

- Character tables and type faces: Refer to Table 1-4.

Table 1-4. Character tables and type faces

	Character Table	Bitmap Font
Standard version	Italic Table PC437 (US, Standard Europe) PC850 (Multilingual) PC860 (Portuguese) PC861 (Icelandic) PC863 (Canadian French) PC865 (Nordic) Abicomp BRASCII Roman 8 ISO Latin 1 Italic table	EPSON Draft EPSON Roman EPSON Sans Serif
NLSP version	Italic Table PC437 (US, Standard Europe) PC850 (Multilingual) PC437 Greek PC852 (East Europe) PC853 (Turkish) PC855 (Cyrillic) PC857 (Turkish) PC866 (Russian) PC869 (Greek) MAZOWIA (Poland) Code MJK (CSFR) ISO 8859-7 (Latin / Greek) ISO Latin 1T (Turkish) Bulgaria (Bulgarian) Estonia (Estonia) PC 774(LST 1283:1993) ISO 8859-2 (ISO Latin 2) PC 866 LAT.(Latvian) PC 866 UKR PC 860 PC 861 PC 865 PC APTEC PC 708 PC 720 PC AR864 PC 863* ¹ Abicomp* ¹ BRASCII* ¹ Roman 8* ¹ ISO Latin 1 Hebrew 7* ¹ Hebrew 8* ¹ PC 862* ¹	EPSON Draft EPSON Roman EPSON Sans Serif

***1) These tables can not be selected by DIP switches.**

Note : ESC R command is effective on all the character tables.

- Input data buffer: 0K byte or 128 K bytes (depend on DIP switch settings)

1.2.2 Paper Feeding

- Feeding method: Push tractor feed (front / rear)
Push and pull tractor feed (front / rear)
- Feeder: Front push tractor, rear push tractor, pull tractor (option)
- Paper insertion side alignment :
Left
- Paper path: Tractor (front in, rear in, top out)
- Line spacing: 1 / 6 inches or programmable in increments of 1 / 216 inches.
- Feed speed:
 - 1/ 6-inch feed: 26.5 ms
 - Continuous feed: 0.251 mps (m/s).
9.9 ips (inch/sec)

Note : *The feeding speed will be reduced to 0.152 mps (6.0 ips) when the pull tractor is mounted.*

1.2.3 Electrical Specification

- 120 V version:
 - Rated voltage : 120 V AC
 - Input voltage range : 99 to 132 V AC
 - Rated frequency range : 50 to 60 Hz
 - Input frequency range : 49.5 to 60.5 Hz
 - Rated current : 3.5 A (max.7.5 A)
 - Power consumption : Approx.160 W (ISO/IEC10561 Letter pattern)
Energy Star compliant
 - Insulation resistance : 10 M ohms min. (between AC line and chassis, 500 V DC)
 - Dielectric strength : 1000 AC Vrms. 1 min. or
1200 AC Vrms. 1 sec. (between AC line and chassis)
- 220 - 240 V version:
 - Rated voltage : 220 to 240 V AC
 - Input voltage range : 198 to 264 V AC
 - Rated frequency range : 50 to 60 Hz
 - Input frequency range : 49.5 to 60.5 Hz
 - Rated current : 1.4 A (max.3.5 A)
 - Power consumption : Approx.160 W (ISO/IEC10561 Letter pattern)
Energy Star compliant
 - Insulation resistance : 10 M ohms min. (between AC line and chassis, 500 V DC)
 - Dielectric strength : 1500 AC Vrms. 1 min. (between AC line and chassis)

1.2.4 Environmental Condition

- Temperature : 5 to 35 °C (operating)
-30 to 60 °C (non-operating)
- Humidity : 10 to 80 % RH (operating) *1)
5 to 85 % RH (non-operating) *1)
- Resistance to shock : 1 G, within 1 ms (operating)
2 G, within 2 ms (non-operating) *2)
- Resistance to vibration : 0.25 G, 10 to 55 Hz (operating)
0.50 G, 10 to 55 Hz (non-operating) *2)

***1: Without condensation**

***2: With shipment container**

1.2.5 Reliability

- Total print volume : 26 million lines (except print head)
- MTBF : 10,000 POH (25 % duty)
- Print head life : 400 million characters at 14 dots/character
- Ribbon life : 15 characters at 14 dots /character

1.2.6 Safety Approvals

- 120 V version:
 - Safety standards :
 - UL1950 with D3
 - CSA C22.2 No.950 with D3
 - EMI :
 - FCC part 15 subpart B class B
 - CSA C108.8 class B
- 230 V version:
 - Safety standards :
 - EN60950 (VDE, NEMKO)
 - EMI :
 - EN55022 (CISPR pub.22) class B
 - AS / NZS 3548 class B

1.2.7 CE Marking

- 230 V version:
 - Low Voltage Directive 73/23/EEC : EN60950
 - EMC Directive 89/336/EEC :
 - EN55022 class B
 - EN61000-3-2
 - EN61000-3-3
 - EN50082-1
 - IEC801-2
 - IEC801-3
 - IEC801-4

1.2.8 Acoustic Noise

- Level: 58 dB(A) (ISO 7779 pattern)

1.2.9 Ribbon Cartridge

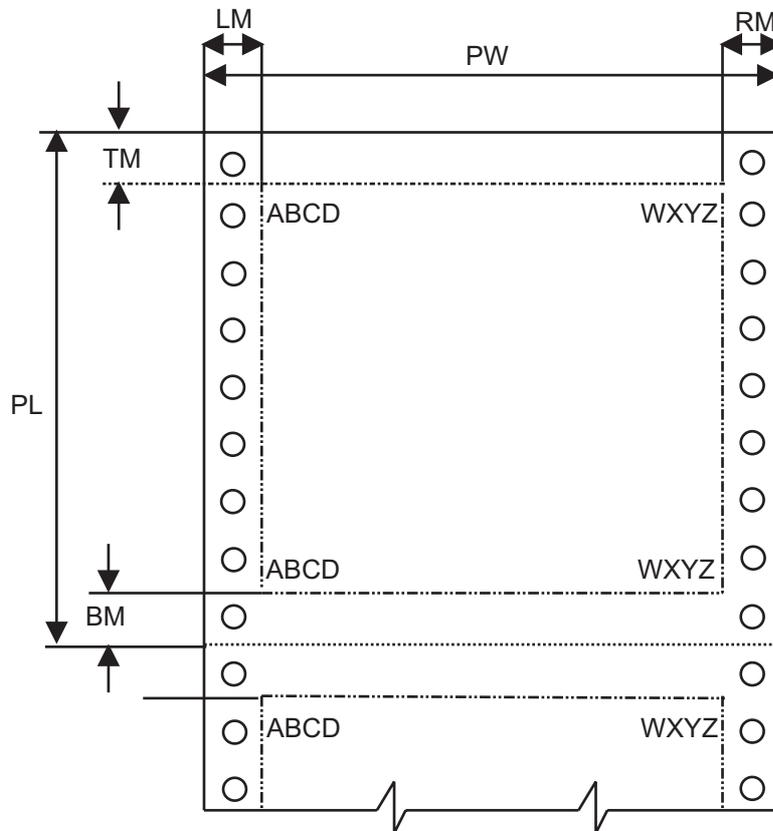
- Type : Fabric
- Color : Black
- Ribbon life : 15 million characters (draft 10 cpi, 14 dots / character)
- Dimensions : 506.0 mm (W) x 123.5 mm (D) x 23.0 mm (H)

1.2.10 Physical Specifications

- Dimensions : 700 mm (W) x 382 mm (D) x 369 mm (H)
- Weight : APPROX. 29 Kg

1.2.11 Printable area

□ Continuous paper : Refer to Figure 1-3.



	Continuous Paper
PW (width)	Refer to Section 1.2.12.
PL (length)	Refer to Section 1.2.12.
LM (left margin)	13 mm to 31mm
RM (right margin)	13 mm or more
TM (top margin)	2.6 mm or more
BM (bottom margin)	4.2 mm or more

Notes 1: In the top 75 mm area, the paper feeding pitch may be irregular.

Notes 2: If the optional pull tractor is used, the top 120 mm area should not be printed.

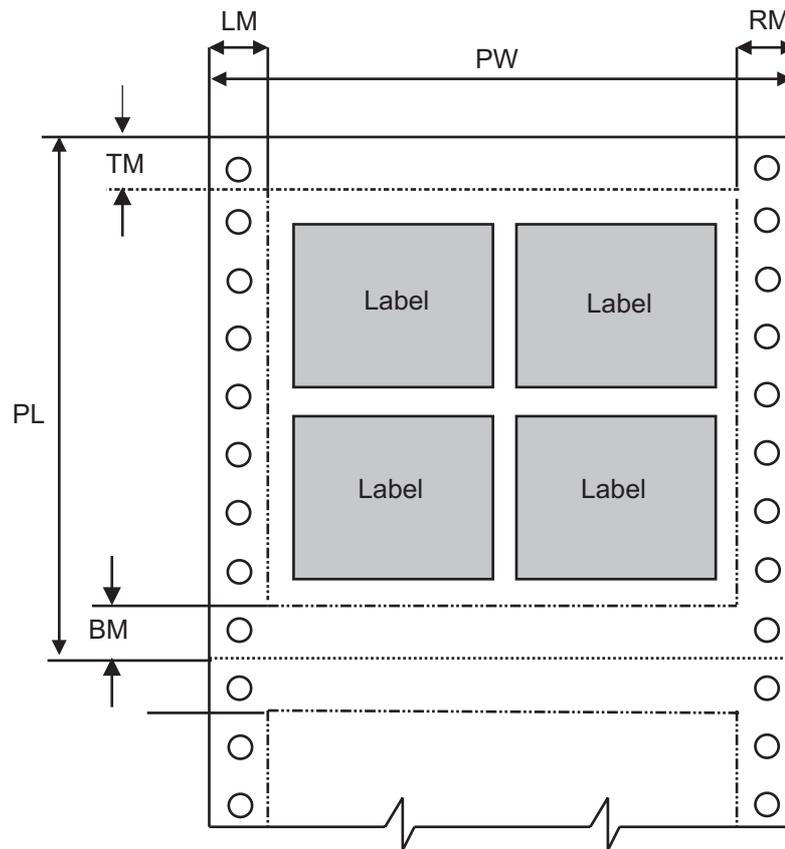
Notes 3: Forms-override printing is available 20 lines after the paper end.

(Paper feeding pitch is not guaranteed.)

The end of the printable area is 9 to 15 mm apart from the bottom edge of the paper.

Figure 1-3. Continuous Paper Printable Area

□ Labels : Refer to Figure 1-4.



	Continuous Paper
PW (width)	Refer to Section 1.2.12.
PL (length)	Refer to Section 1.2.12.
LM (left margin)	13 mm to 31mm
RM (right margin)	13 mm or more
TM (top margin)	2.6 mm or more
BM (bottom margin)	4.2 mm or more

Notes 1: Feeding backward or paper (PATH) selection are prohibited.

Notes 2: If In the top 75 mm area, the paper feeding pitch may be irregular.

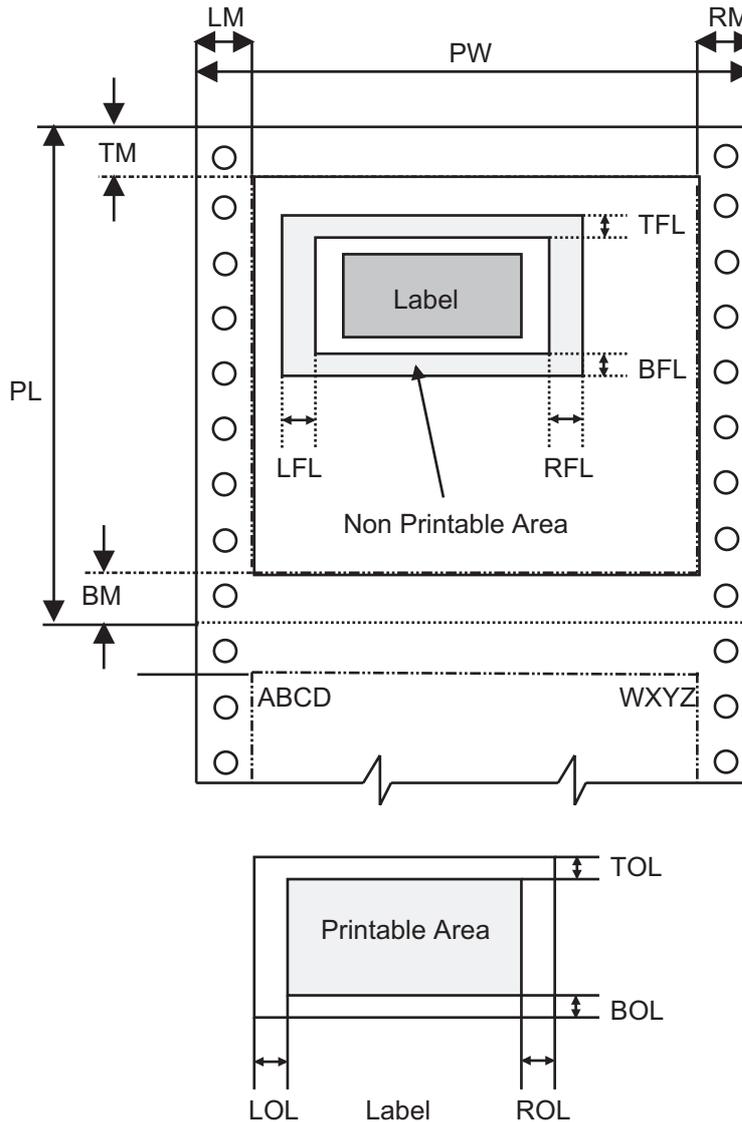
Notes 3: If the optional pull tractor is used, the top 120 mm area should not be printed..

Notes 4: Forms-override printing is available 20 lines after the paper end.
(Paper feeding pitch is not guaranteed.)

The end of the printable area is 9 to 15 mm apart from the bottom edge of the paper.

Figure 1-4. Label Printable Area

□ Continuous forms with labels : Refer to Figure 1-5.

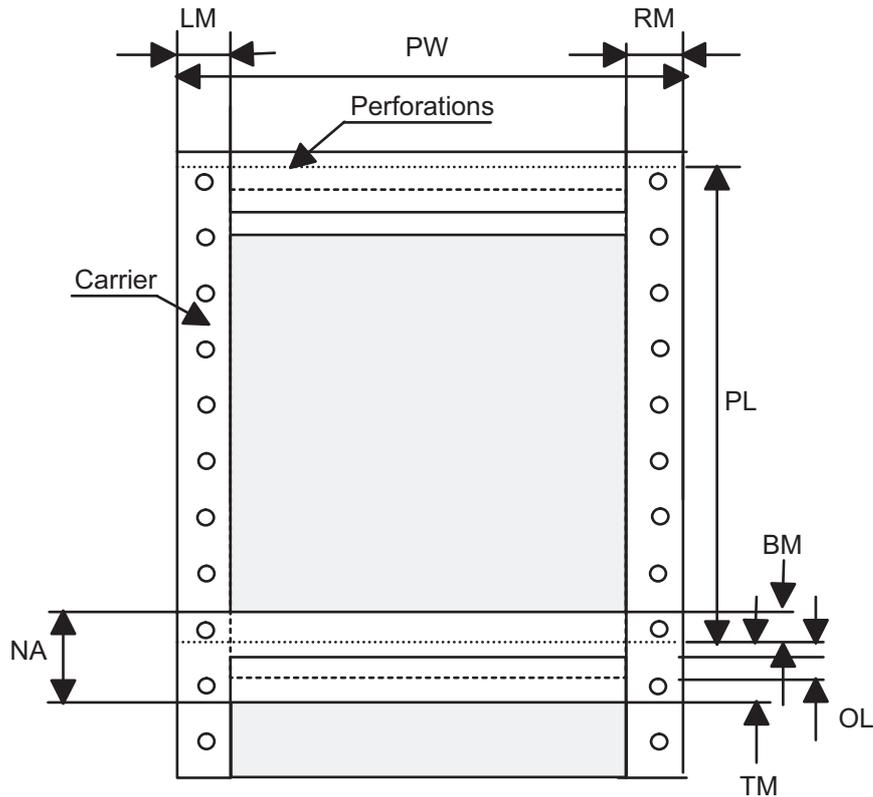


	Continuous Paper
PW (width)	Refer to Section 1.2.12.
PL (length)	Refer to Section 1.2.12.
LM (left margin)	13 mm to 31mm
RM (right margin)	13 mm or more
TM (top margin)	2.6 mm or more
BM (bottom margin)	4.2 mm or more
LFL (left margin from label)	65 mm or more
RFL (right margin from label)	65 mm or more
TFL (top margin from label)	12.5 mm or more
BFL (bottom margin from label)	12.5 mm or more
LOL (left margin on label)	5 mm or more
ROL (right margin on label)	5 mm or more
TOL (top margin on label)	2 mm or more
BOL (bottom margin on label)	2 mm or more

- Notes 1:** Feeding backward or paper (PATH) selection are prohibited.
- Notes 2:** If In the top 75 mm area, the paper feeding pitch may be irregular.
- Notes 3:** If the optional pull tractor is used, the top 120 mm area should not be printed..
- Notes 4:** Forms-override printing is available 20 lines after the paper end.
(Paper feeding pitch is not guaranteed.)
The end of the printable area is 9 to 15 mm apart from the bottom edge of the paper.

Figure 1-5. Continuous Forms with Labels Printable Area

- Overlapping multi-part forms : Refer to Figure 1-6.



	Continuous Paper
PW (width)	Refer to Section 1.2.12.
PL (length)	Refer to Section 1.2.12.
LM (left margin)	19 mm to 31mm
RM (right margin)	19 mm or more
TM (top margin)	21.2 mm or more
BM (bottom margin)	4.2 mm or more
OL (overlapping length)	Less than 13.3 mm
NA (non printable area)	25.4 mm or more

- Notes 1:** Feeding backward or paper (PATH) selection are prohibited.
- Notes 2:** If in the top 75 mm area, the paper feeding pitch may be irregular.
- Notes 3:** If the optional pull tractor is used, the top 120 mm area should not be printed..
- Notes 4:** Forms-override printing is available 20 lines after the paper end.
(Paper feeding pitch is not guaranteed.)
The end of the printable area is 9 to 15 mm apart from the bottom edge of the paper.

Figure 1-6. Overlapping Multi-part Form Printable Area

1.2.12 Paper and Media

1.2.12.1 Continuous paper (Single sheet and multi-part)

Table 1-5. Continuous Paper

		Front Entry		Rear Entry	
		Minimum	Maximum	Minimum	Maximum
Width	(inch)	4.0	16.0	4.0	16.0
	(mm)	101	406	101	406
Length	(inch)	4.0	17.0	4.0	17.0
	(mm)	101	431	101	431
Copies		1 original + 6 copies		1 original + 5 copies	
Total Thickness	(inch)	0.0025	0.021	0.0025	0.018
	(mm)	0.065	0.53	0.065	0.46
Weight (not multi-part)	(g/m ²)	52.6	82.7	52.6	82.7
	(lb)	14	22	14	22
Weight (one sheet of multi-part)	(g/m ²)	41.4	56.4	41.4	56.4
	(lb)	11	15	11	15
Quality		Plain paper, Reclaimed paper, Carbonless multi-part forms			
Multi-part binding		<ul style="list-style-type: none"> • Rough bindings of multi-part paper cause paper jam. • The each sheet of multi-part paper should normally be put together by spot-gluing, paper-stapling, tape stitching. Spot-gluing is recommended for the better printing quality. • Spot-gluing must be applied on both sides of paper (Refer to Figure 1-7.). • The spot-glued parts must be pressed flat. There must be no creases in the paper. • The paper-stapling must be applied from the front of paper and the paper must be flat (Refer to Figure 1-8.). • Paper-stapling must be applied for both feeding directions (Refer to Figure 1-9.). • The paper-stapling should be flat (Refer to Figure 1-10.). • Never use metal staples. • The position of binding must be outside of printable area. • Multi-part paper should be bound firmly to each other and the binding must not be too large. 			
Perforation		Refer to Section 1.2.12.5.			
Notes		Refer to Section 1.2.12.6.			

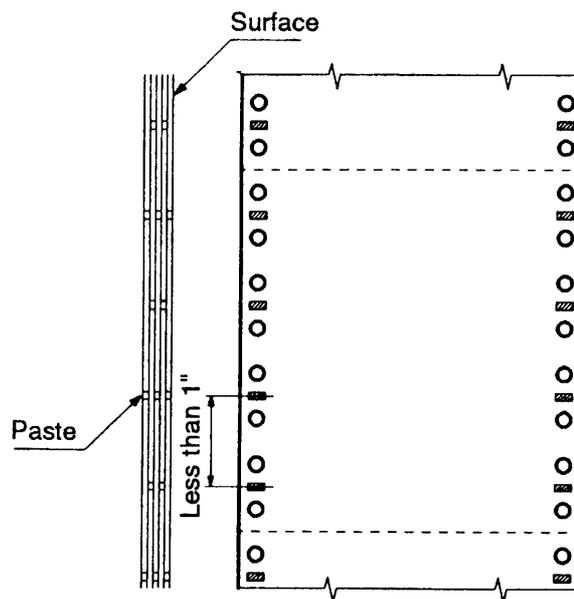


Figure 1-7. Dotted Paste Positions

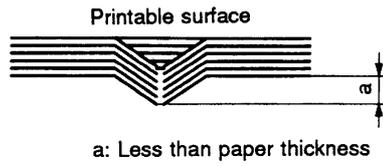


Figure 1-8. Paper-stapling Height

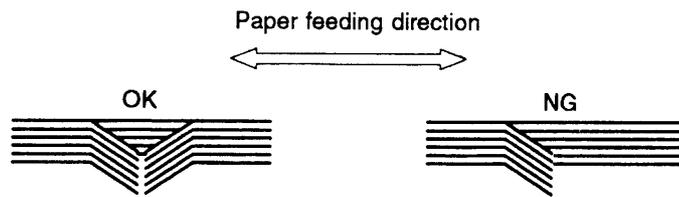


Figure 1-9. Paper-stapling Method 1

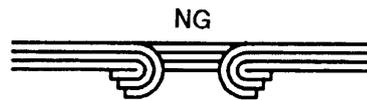
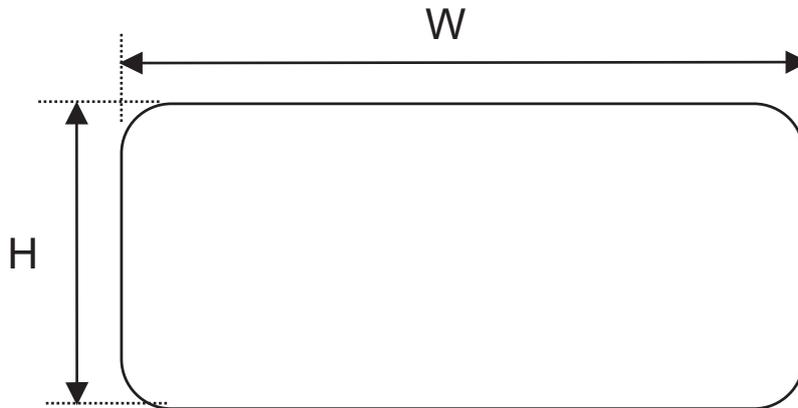


Figure 1-10. Paper -stapling Method 2

1.2.12.2 Labels

Table 1-6. Labels

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Label Size	Refer to Figure 1-11.			
Backing Sheet Width	(inch) 4.0	16.0	-	-
	(mm) 101	406		
Backing Sheet Length	(inch) 3.5	17.0	-	-
	(mm) 89	431		
Label Thickness	(inch) 0.0	0.0047	-	-
	(mm) 0.0	0.12		
Total Thickness	(inch) 0.0025	0.0075	-	-
	(mm) 0.065	0.19		
Quality	AVERY CONTINUOUS FORM LABELS, AVERY MINI-LINE LABELS, or the same quality labels		-	
Perforation	Refer to section 1.2.12.5.			
Notes	<ul style="list-style-type: none"> • The easy-cone-off label should not be used. • Every label must be put on the carrier. • Each corner of those labels must be rounded. • Each label and backing sheet should not have any folds or creases. • Between each label, there should be the same sheet as those labels. • The backing sheet must be continuous paper. • Labels should be inserted from front entrance. <p>Refer to Section 1.2.12.6.</p>			



Width		Height	
Inch	mm	Inch	mm
2.5	63.5	15/16	23.8
4.0	101	15/16	23.8
4.0	101	17/16	27.0

Figure 1-11. Label Size

1.2.12.3 Continuous Forms with Labels

Table 1-7. Continuous Forms with Labels

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Label Size	Refer to Section 1.2.12.2.		-	
Width (inch)	4.0	16.0	-	-
(mm)	101	406		
Length (inch)	4.0	17.0	-	-
(mm)	101	431		
Weight (not multi-part) (g/m ²)	52.6	82.7	-	-
(lb)	14	22		
Weight (one sheet of multi-part) (g/m ²)	41.4	56.4		
(lb)	11	15		
Label Thickness (inch)	0.0	0.0047		
(mm)	0.0	0.12		
Total Thickness (inch)	0.0025	0.021	-	-
(mm)	0.065	0.53		
Quality (Multi-part forms)	Plain paper, reclaimed paper, carbonless multi-part forms			
Quality (Label)	AVERY CONTINUOUS FORM LABELS, AVERY MNI-LINE LABELS, or the same quality labels			
Multi-part binding	<ul style="list-style-type: none"> • Rough bindings of multi-part paper cause paper jam. • The each sheet of multi-part paper should normally be put together by spot-gluing, paper-stapling, tape stitching. Spot-gluing is recommended for the better printing quality. • Spot-gluing must be applied on both sides of paper (Refer to Figure 1-7.). • The spot-glued parts must be pressed flat. There must be no creases in the paper. • The paper-stapling must be applied from the front of paper and the paper must be flat (Refer to Figure 1-8.). • Paper-stapling must be applied for both feeding directions (Refer to Figure 1-9.). • The paper-stapling should be flat (Refer to Figure 1-10.). • Never use metal staples. • The position of binding must be outside of printable area. • Multi-part paper should be bound firmly to each other and the binding must not be too large. 			
Perforation	Refer to Section 1.2.12.5.			
Notes	<ul style="list-style-type: none"> • The easy-cone-off label should not be used. • Every label must be put on the carrier. • Each corner of those labels must be rounded. • Each label and backing sheet should not have any folds or creases. • Between each label, there should be the same sheet as those labels. • The backing sheet must be continuous paper. • Continuous forms with labels should be inserted from front entrance. <p>Refer to Section 1.2.12.6.</p>			

1.2.12.4 Overlapping Multi-part Form

Table 1-8. Overlapping Multi-part Form

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width (inch) (mm)	4.0 101	16.0 406	-	-
Length (inch) (mm)	4.0 101	17.0 431	-	-
Weight (not multi-part) (g/m ²) (lb)	52.6 14	82.7 22	-	-
Weight (one sheet of multi-part) (g/m ²) (lb)	41.4 11	56.4 15	-	-
Copies	1 original + 5 copies + 1 backing sheet		-	
Total Thickness (print area) (inch) (mm)	0.0025 0.065	0.021 0.53	-	-
Total Thickness (overlap area) (inch) (mm)	0.005 0.13	0.028 0.70	-	-
Overlapping Length (inch) (mm)	more than 0 more than 0	0.39 10	-	-
Quality (multi-part forms)	Plain paper, reclaimed paper, carbonless multi-part forms		-	
Multi-part binding	<ul style="list-style-type: none"> • Multi-part paper must be bound at the top side by spot-gluing (Figure 1-12.). • The bindings must not be too hard. And there should not be any spilt glue. • The position of binding must be outside of printable area. • Multi-part paper should be bound firmly to each other and the binding must not be too large. 			
Perforation	Refer to Section 1.2.12.5.			
Notes	<ul style="list-style-type: none"> • Overlapping multi-part form should be inserted from front entrance. Refer to Section 1.2.12.6. 			

1.2.12.5 Perforation

- Weak horizontal and vertical perforations cause paper jams.D
- The length ratio of the cut part and uncut part of perforations must be more than 3 to 1 and less than 5 to 1 (Refer to Figure 1-13.).
- Horizontal perforations must have an uncut part in each end of the paper (Refer to Figure 1-14.).
- At the intersection of horizontal and vertical perforations, the cut part of the perforations must not cross each other (Refer to Figure 1-15.).
- The raised part at the perforation must be less than 1 mm when the bottom layer kept by force (Refer to Figure 1-16.).

1.2.12.6 Notes

- Clean paper (with no folds, creases, tears) should be used (Refer to Figure 1-17.).
- The sprocket hole must be circular. The hole may have teeth (Refer to Figure 1-18.).
- The sprocket hole of each layer must not be shifted (Refer to Figure 1-19.).
- The litter of sprocket holes must be removed from the paper.
- Paper should be fan-folded at horizontal perforations. Never use one that is not fan-folded property (Refer to Figure 1-20.).
- No hole is acceptable in the printable area.
- Paper must be torn off accurately along perforations.

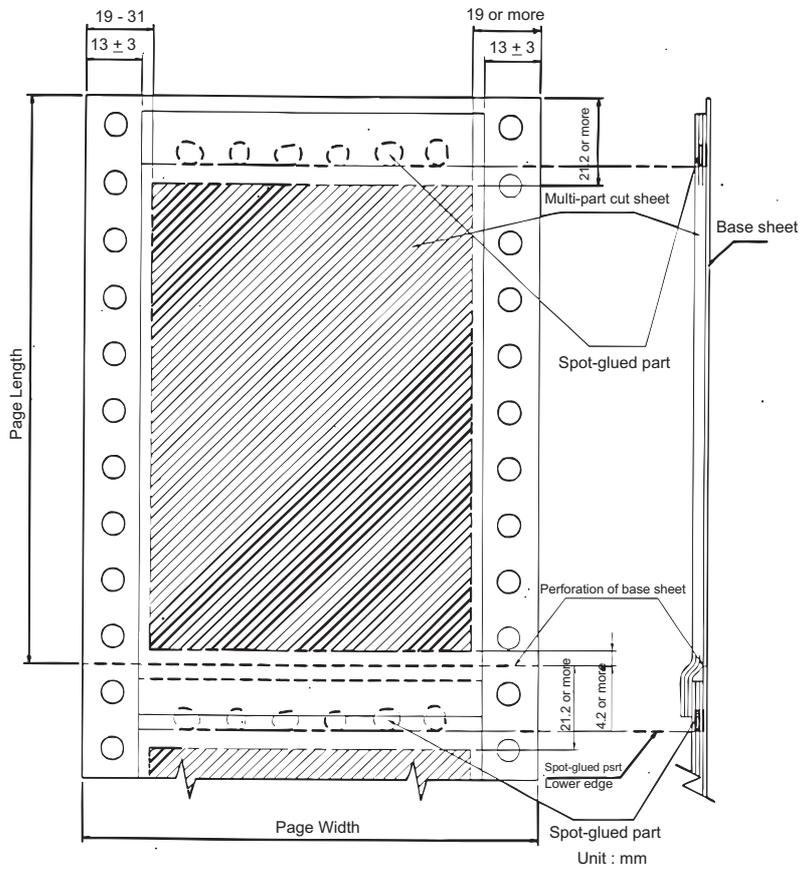


Figure 1-12. Paper Width Overlapping Area

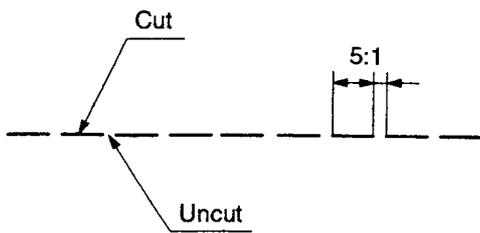


Figure 1-13. Perforations 1

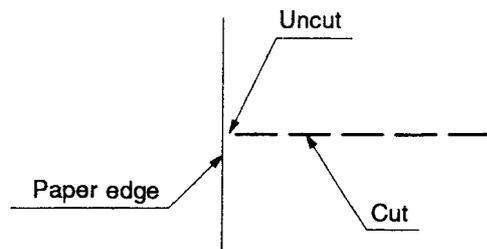


Figure 1-14. Perforations 2

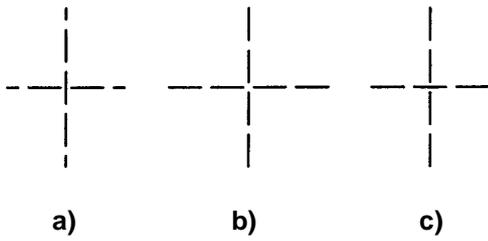


Figure 1-15. Perforations 3

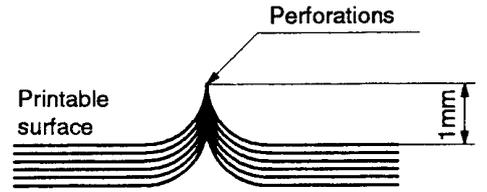


Figure 1-16. Raised Portion at a Perforation

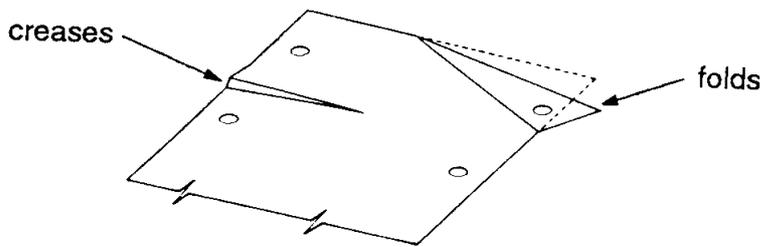
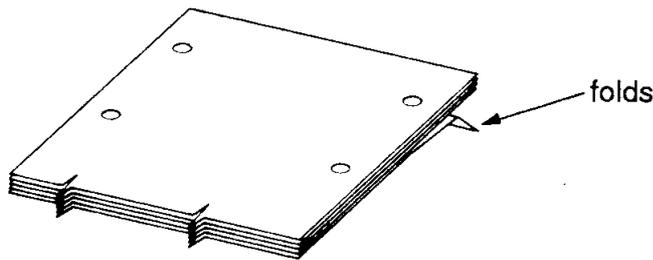
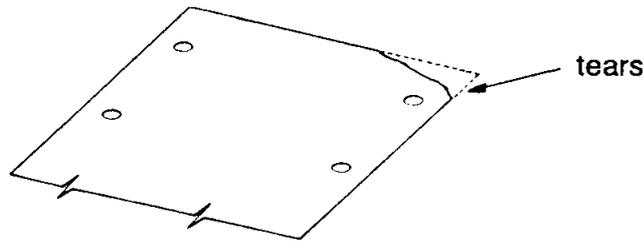


Figure 1-17. Unsuitable Paper



Figure 1-18. Sprocket Hole 1

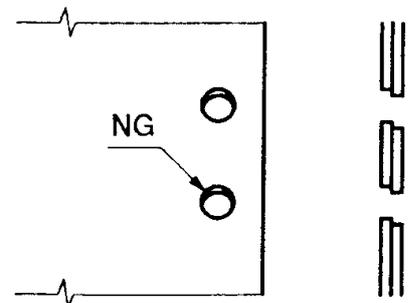


Figure 1-19. Sprocket Hole 2

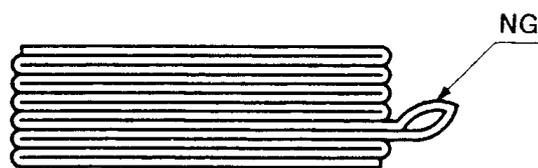


Figure 1-20. Bad Folded Paper

1.3 INTERFACES

The DFX-8500 is equipped with parallel interface, serial interface, and optional Type-B interface card. This section presents the specifications for each interface type.

1.3.1 Parallel Interface (Forward channel)

- Data transmission mode: 8-bit parallel, IEEE-1284 compatibility mode
- Synchronization: /STROBE pulse
- Connector type: 57-30360 (AMPHENOL) 36-pin plug or equivalent
- Handshaking: BUSY and /ACK handshaking

Notes 1: *BUSY signal is set high before setting either /ERROR low or PE high and held high until all these signals return to their inactive state. BUSY signal is at a high level in the following cases.*

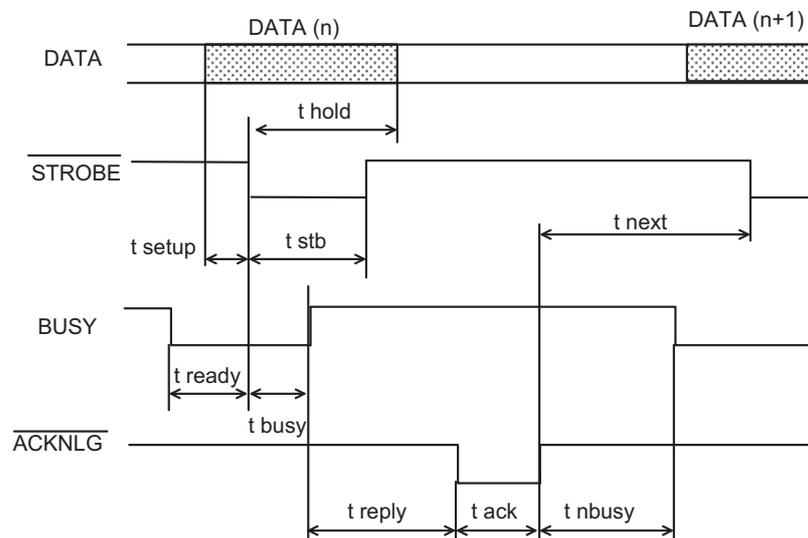
- During data entry (see data transmission timing)
- When input data buffer is full.
- During /INIT signal is at a low level or during hardware initialization
- During printer error (see /ERROR signal)
- During test printing or during setting printing
- During Selectype
- When the parallel interface is not selected.

Notes 2: */ERROR signal is at a low level when the printer is in one of the following states.*

- Printer hardware error (fatal error)
- Paper out error
- Paper jam error
- Cover open status
- Incomplete paper change
- Paper size error
- Ribbon jam error

Notes 3: *PE signal is at a high level during paper out error.*

- Data transmission timing: Refer to Figure 1-21.



Parameter	Minimum	Maximum	Parameter	Minimum	Maximum
t setup	500 ns	---	t ack	500 ns	10 us
t hold	500 ns	---	t nbusy	0	---
t stb	500 ns	---	t next	0	---
t ready	0	---	tt-out*	---	120 ns
t busy	---	500 ns	tt-in**	---	200 ns
t reply	---	---			

Note: * Rise and fall time of output signals

** Rise and fall time of input signals.

Figure 1-21. Data Transmission Timing

- Signal Level: TTL-level compatible, IEEE-1284 level 1 device
Refer to Table 1-9.

Table 1-9. Signal Level

Parameter	Minimum	Maximum	Condition
VOH*	-	5.5 V	
VOL*	-0.5 V	-	
IOH*	-	0.32 mA	VOH = 2.4 V
IOL*	-	12 mA	VOL = 0.4 V
CO	-	50 pF	
VIH	-	2.0 V	
VIL	0.8 V	-	
IIH	-	0.32 mA	VIH = 2.4 V
IIL	-	12 mA	VIL = 0.8 V
CI	-	50 pF	

Note: * A low logic level on the logical high signal is 2.0 V or less when the printer is powered off. And this signal is equal or exceeding 3.0 V when the printer is powered on. The receiver shall provide an impedance equivalent to 7.5 K ohms to ground.

- Connector pin assignments and signals: Refer to Table 1-10.

Table 1-10. Signal and Connector Pin Assignment (Forward channel)

Pin No.	Signal Name	Return GND pin	In/Out*	Functional Description
1	/STROBE	19	In	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2-9	DATA 0-7	20-27	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	/ACKNLG	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A high signal indicates that the printer cannot receive data.
12	PE	28	Out	A high signal indicates paper-out error.
13	SLCT	28	Out	Always at high level when the printer is powered on.
14	/AFXT	30	In	Not used.
31	/INIT	30	In	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50 us pulse is necessary.
32	/ERROR	29	Out	A low signal indicates printer error condition.
36	/SLIN	30	In	Not used.
18	Logic H	-	Out	Pulled up to +5V via 3.9K ohm resistor.
35	+5V	-	Out	Pulled up to +5V via 3.3K ohm resistor.
17	Chassis GND	-	-	Chassis GND.
16,33,19,30	GND	-	-	Signal GND.
15,34	NC	-	-	Not connected.

Note: * In/Out refers to the direction of signal flow from the printer's point of view.

1.3.2 Parallel Interface (Reverse channel)

- Data transmission mode: IEEE-1284 nibble mode
- Connector type: 57-30360 (AMPHENOL) 36-pin plug or equivalent
- Synchronization: No Info.
- Handshaking: No info.
- Data transmission timing: No info.
- Signal Level: TTL-level compatible, IEEE-1284 level 1 device
- Extensibility request : The printer responds to the extensibility request in the affirmative, when the request is 00h or 04h, which mean:
00h : Request nibble mode of reverse channel transfer
04h : Request device ID in nibble mode of reverse channel transfer
- Device ID :

```
[00h][3Ah]
MPG:EPSON;
CMD:ESCP9,PRPII9,BDC;
MDL:DFX-8500;
CLS:PRINTER;
```

- Connector pin assignments: Refer to Table 1-11.

Table 1-11. Signal and Connector Pin Assignment (Reverse channel)

Pin No.	Signal Name	I/O*	Description
1	/STROBE	IN	HostClk: This signal is a strobe pulse used to read extension request values from the host computer during negotiation.
2-9	DATA 1-8	IN	The signals are data bits of extension request Values during negotiation. This printer supports following values: 0000 0100: Request Device ID (by nibble mode sending) 0000 0000: Request nibble mode
10	/ACKNLG	OUT	PtrClk: Printer data sending clock.
11	BUSY	OUT	PtrBusy: Printer sending data bits 3 and 7 during data transfer to the host computer
12	PE	OUT	AckDataReq: Printer sending data bits 2 and 6 during data transfer to the host computer
13	SLCT	OUT	Xflag: Printer sending data bits 2 and 6 during data transfer to the host computer.
14	/AUTO-FEED	IN	HostBusy: This signal informs the printer of the host computer state. When the signal is HIGH, the host computer cannot accept data.
15	NC	-	Not used.
16	GND	-	Logic ground level
17	CHASSISGND	-	Connected to the printer chassis. The printer chassis GND and the signal GND are connected to each other.
18	NC	-	Not connected.
19-30	GND	-	Ground level for the twisted pair return signal.
31	/INIT	IN	nInIt: High level fixed
32	/ERROR	OUT	nDataAvail: Printer sending data bits 0 and 4 during data transfer to the host computer.
33	GND	-	Same as for ins19to30.
34	NC	-	Not used.
35	+5	-	Pulled up to +5V through 1.0K ohm resistor.
36	/SLCT IN	IN	1284Active: If this signal is set to HIGH, this printer active P1284(reverse mode).

Note: * In/Out refers to the direction of signal flow from the printer's point of view.

- Synchronization : Asynchronous
- Signal level (ELA-232D) :
 - MARK (logical 1) : -3Vto-25V
 - SPACE (logical 0) : +3Vto+25V
- Word length :
 - Start bit : 1 bit
 - Data bit : 8 bit
 - Parity bit : Odd, Even, Non, of Ignore
 - Stop bit : 1 bit or more
- Baud rate : 2400, 4800, 9600 or 19200 bps
- Handshaking : DTR signal or X-ON / X-OFF
 - DTR=MARK, X-OFF : Indicates that the printer cannot receive data.
 - DTR=SPACE, X-ON : Indicates that the printer is ready to receive data.

Note: *The DTR signal is MARK and X-OFF code (DC3, 13h) is transmitted when the rest of the input buffer becomes 256-byte. The DTR signal is SPACE and X-ON code (DC1, 11h) is transmitted when the rest of the input buffer is regained 256-byte.*

- Error handling : When parity error is detected, the received byte is changed to the "*" character code. Overrun error and framing error are ignored.
- Connector : 25 pin sub-miniature D-shell connector (female)
- Connector pin assignment and signals : Refer to Table 1-12.

Table 1-12. Signal and Connector Pin Assignment (EIA-232D)

Pin No.	Signal Name	In / Out*	Functional Description
2	TXD	Out	Transmit data.
20	DTR	Out	Indicates that the printer is ready to receive data or not.
11	REV	Out	Connected directly to the DTR signal.
4	RTS	Out	Request to send. always SPACE level when the printer is powered on. Pulled up to +12 V via 4.7K-ohm resistor.
3	RXD	In	Receive data
7	Signal GND	-	Signal GND
1	Chassis GND	-	Chassis GND
Other	NC	-	Not used. Not connected.

Note: * In/Out refers to the direction of signal flow from the printer's point of view.

1.3.4 Optional Interface

Type-B and Type-B level 2 optional interfaces are available (Refer to Table 1-1.).