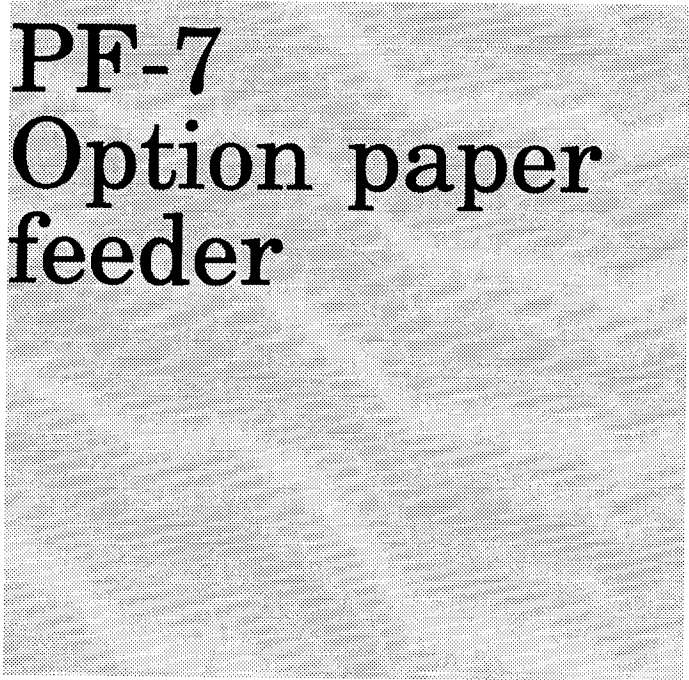


S E R V I C E M A N U A L



June 1994



PF-7
**Option paper
feeder**

A rectangular box with a halftone dot pattern background. Inside the box, the text "PF-7" is on the first line, and "Option paper feeder" is on the second and third lines, all in a bold, serif font.

Export edition/revision 1.00

PF-7 Service manual
©1994 by Kyocera Corporation,
2-14-9 Tamagawadai, Setagaya
Ward, Tokyo 158 Japan
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Revision 1.00 May, 1994

Notice

The information in this manual is subject to change without notification. Additional pages may be inserted in future editions. The user is asked to excuse any technical inaccuracies or typographical errors in the present edition.

No responsibility is assumed if accidents occur while the user is following the instructions in this manual. No responsibility is assumed for defects in the printer's firmware.

The contents of this manual are protected by copyright. No part of this manual may be reproduced or copied by any means without the permission of the copyright holder. The printer's firmware (contents of its read-only memory) is similarly protected by copyright.

FCC notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is en-

couraged to try to correct the interference by one or more of the following measures.

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the manufacturer for compliance could void the user's authority to operate the equipment.

Important notice to service persons

Before attempting service on this product, including disassembling, re-assembling, troubleshooting, and adjustment, read this manual carefully. During performing service, use extreme care to avoid possible electric shock hazard, burn, and human injuries. Make sure the product is not provided with any safety facilities other than those primarily intended for enduser safety.

Ppreface

This manual contains information pertaining to service and maintenance of the Kyocera product. The information in this manual contains the following chapters:

Chapter 1: General information

Chapter 2: Maintenance

Chapter 3: Paper specifications

Chapter 4: Parts catalog

Chapter 5: Hardware notes

Appendix: Schematic diagrams

Legend

Throughout the chapters, **Warning** denotes the precaution which, if ignored, could result in personal injury, and/or irrevocable damage to the printer. **Note** denotes precautions which, if ignored, could result in damage to the printer.

Radio interference requirement in European countries

The option paper feeder PF-7 is intended for use with the following printer models which are originally type tested and accepted as a Class B computing device in accordance with the EN55022 rules. When installed with the option units, the printer's category will be changed as follows:

FS-1550 Class A

FS-3500 Class A

The devices in the Class A category may cause interference to radio or television reception particularly in a residential installation.

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1 | GENERAL INFORMATION

GENERAL INFORMATION

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1.1. General

Chapter 1 provides how to setup the feeder with the printer, the product features, and the basic considerations and precautions that should be observed while following the procedures in disassembly and service of the product. Following the precautions will be very important to ensure safety in servicing.

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Choosing a Location

The feeder will work best if it is installed in a location that is:

- ❖ Level and well-supported: Place the base on a sturdy table or desk.
- ❖ Not exposed to sunlight or other bright light (not next to an uncurtained window).
- ❖ Well ventilated, not too hot or cold, and not too damp or dry: Temperature should be 10 to 32.5° C, ideally about 20° C (50 to 90° F, ideally about 68° F). Humidity should be 20 to 80%, ideally 65%.

Installing the Base and the Printer

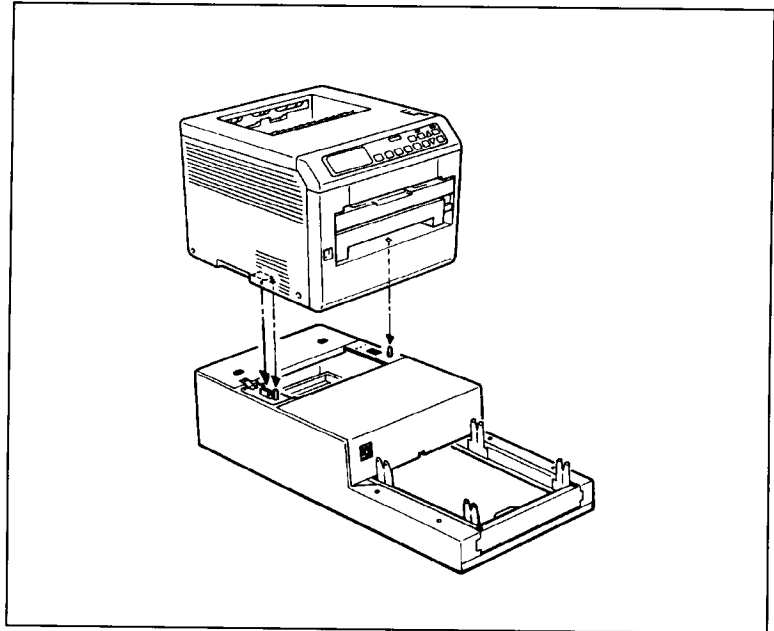
The printer is mounted on the upper deck of the base.

1. Place the base onto a firm, sturdy table or desk.

Note: The table or desk must be larger than the base.

2. Align the positioning pins on the top of the base with the holes in the base of the printer, then slowly and carefully lower the printer onto the base. Make sure that the connector on the base fits squarely into the corresponding connector in the base of the printer. See Figure 1.2. below.

Figure 1.2. Installing the printer to base



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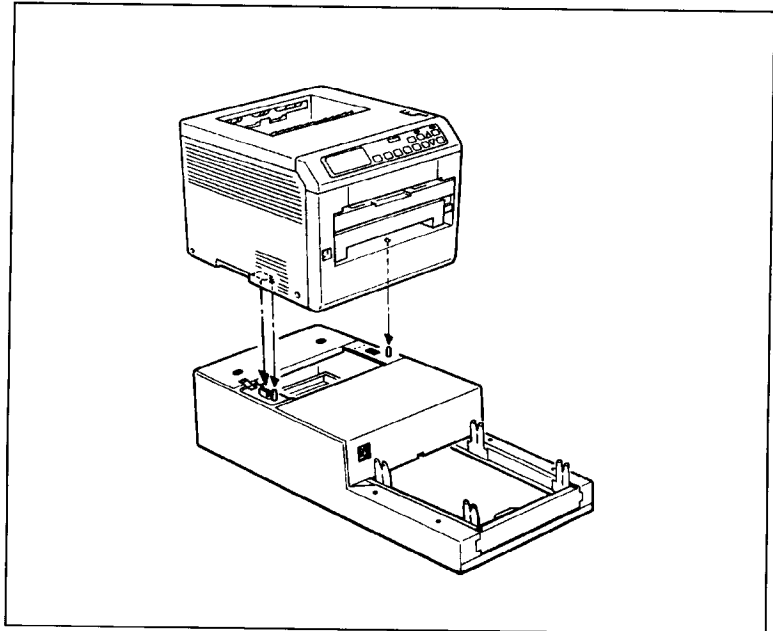
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Figure 1.2. Installing the printer to base

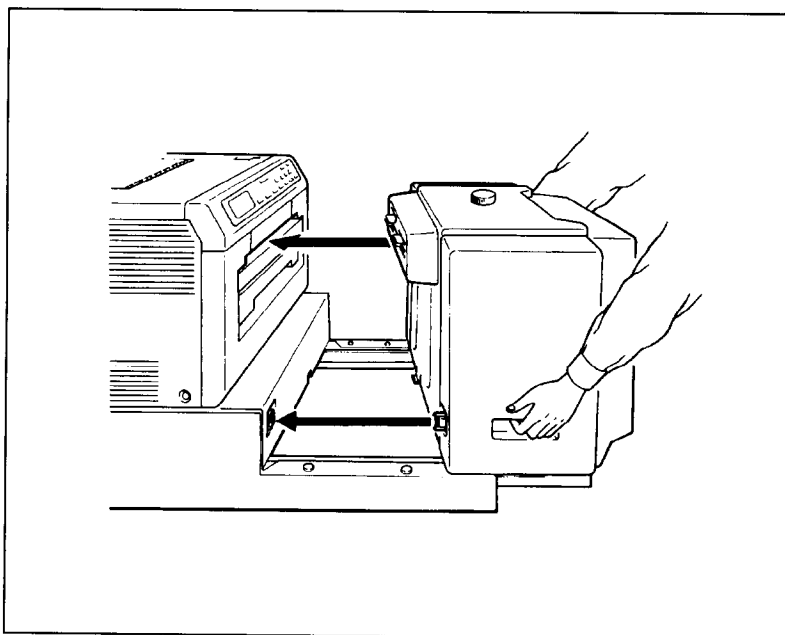


4. Slide the rail with the feeder mounted back toward the printer until the connector on the front side of the feeder is fully connected to the connector on the base, holding the feeder by the both hands.

Caution: When mounting the feeder to the printer, be careful to avoid pinching your fingers between the two.

Note: Do not use the adjuster knob on the top of the feeder or the feeder plastic cover as a handle for sliding the feeder.

Figure 1.4. Connecting the feeder to the printer



Make sure that the output slot of the feeder is properly aligned with the manual feed slot on the front side of the printer.

This completes setting up the feeder with the printer. Before using the feeder, plug the printer to power and load paper in the paper feeder (explained in the following pages).

1.2.3. Operating the Optional Paper Feeder

This chapter describes how to load paper in the feeder and to select the feeder as the paper source.

Caution: When the tray is rising or descending, please observe the following precautions.

- ❖ Keep your fingers out of the slot on the inner side of the feeder.
- ❖ While the tray is descending, keep your hands out from under the tray.
- ❖ Do not push down on the tray or pull it upward.

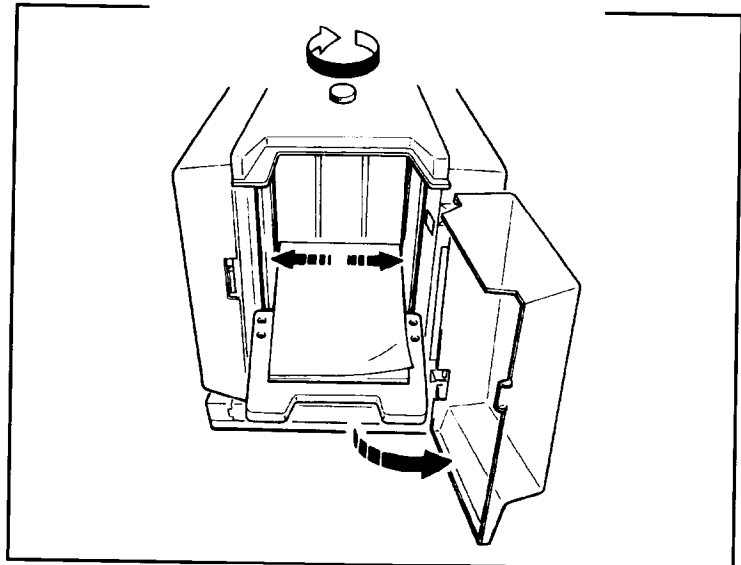
Loading Paper

Once the feeder has been installed in accordance with the instructions provided previously, you can prepare to load paper. Before loading paper, you must adjust the side plates inside the feeder to the actual width of the paper to be loaded.

Note: The legal-size paper is not usable with the paper feeder. For details on paper size, see *Paper Specifications* later in this manual.

1. Turn printer power on. The paper feeder is turned on simultaneously.
2. Gently open the feeder's tray cover. The paper tray will lower.
3. Make sure that the paper tray is lowered and stopped. Then, while watching the side plates inside the feeder, rotate the paper adjuster knob on top of the feeder clockwise. Stop rotating the knob when the side plates have been set to their widest settings (outmost positions). See figure below.
4. Place several sheets of the paper you are going to use with the feeder on the center of the paper tray.

Figure 1.5. Adjusting the paper width



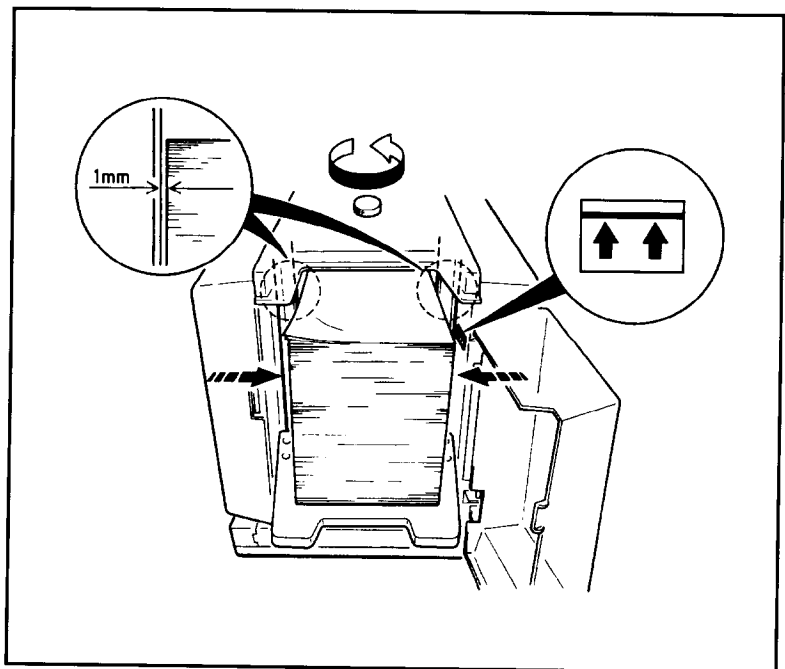
5. Adjust the side plates by rotating the adjuster knob on top of the feeder counterclockwise so that the left and right side edges of the paper are flush with the left and right side plates.

Then, rotate the adjuster knob half a turn clockwise. This allows an approximately 1 mm gap between each side of the paper stack and the side plate, which is needed to ensure the proper paper feeding. See figure below.

Note: Make sure that the paper edges are evenly aligned on the center of the tray and the front edge of the stack fully abuts on the feeder's inside panel.

6. Load up to 2,000 sheets of paper (four standard reams of packages of 75 g/m² or 20 lb. paper) onto the tray. Fan and flex each ream as you load it. Load the paper with the side on which printing is done facing upward in the feeder.

Figure 1.6. Adjusting the side plates

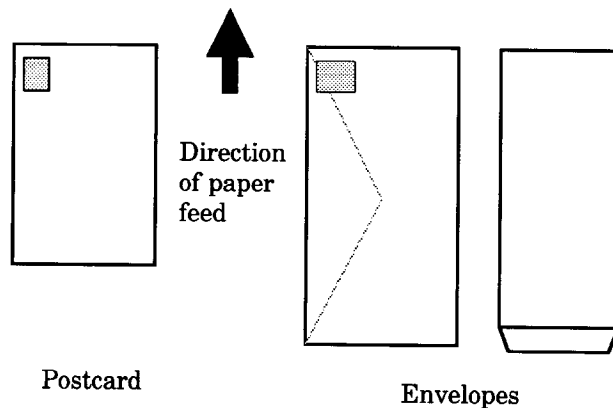


Note: Don't put in more paper than the limit indicated on the inside of the feeder. See figure below.

7. Close the cover. The tray will rise and a sheet will feed partially into the printer. The printer indicates Ready and the feeder is ready for operation.

Loading Envelopes and Postcards

If you are loading postcards in the paper feeder, load them so that they are fed with the top edge first. For envelopes, make sure that they are fed with the right or bottom edge first.



Loading Paper in the Printer's Cassette

To gain access to the printer's paper cassette for loading paper, etc., slide the paper feeder fully backward from the printer. If you are using a Legal-size cassette in the printer, you will need to remove the paper feeder from the mounting base (rail).

Selecting Paper Feed from the Optional Paper Feeder

You can select paper feed from the optional paper feeder using the **FEED SELECT** key on the printer's control panel. You can also select it by including PRESCRIBE's CASS command in a file that you send to the printer from the computer. Note that the optional paper feeder replaces the printer's manual feed tray.

1.2.4. Selection from the Printer's Control Panel

1. First, verify that the printer's message display shows either Ready or Add paper.
2. Next, press the **FEED SELECT** key to change the source of paper feed. The source indication toggles between the following sequences:

Cassette
Manual feed

To select the paper feeder as the paper source, select Manual feed.

Notes: When printing on special forms such as envelopes, labels, or thick paper, use the printer's STACK SELECT key to select paper output to the face up tray.

If paper is not loaded into the feeder, or the feeder is detached from the printer (on the rail which, when pulled, detaches the feeder from the printer), the printer shows Add paper. Add paper as explained on the previous pages.

3. Make sure that the printer is ready and on-line, then begin printing.

During printing using the paper feeder, the printer's message display momentarily shows Add paper between pages. This is normal.

Note: When used with the paper feeder, the printer may print in the position which does not fully corresponds to the one the application software requests.

Selection Using PRESCRIBE's CASS Command

Feed selection can be done using the CASS command of the PRESCRIBE command language. To switch paper feed to the option paper feeder, place the CASS command in a file or program as follows.

```
!R! CASS 0; EXIT;
```

When the printer receives the CASS command, it automatically does a form feed operation. Therefore, the CASS command should be sent either at the beginning of the file, or at the beginning of an intermediate page.

The PRESCRIBE FRPO R4 command changes the printer's default (power-on) paper cassette setting. To change the power-on paper source to the optional paper feeder, use the following command sequence.

```
!R! FRPO R4, 0; EXIT;
```

1.3. Precautions concerning service and maintenance

Only a qualified technician should perform service on the equipment, who is familiar with fundamental safety countermeasures as dictated for all electronics technicians. Observe the following precautions during service and maintenance of the paper feeder. These are to prevent the possible personal injuries to the technician and the damage to the equipment.

1.3.1. Precautions

Always observe the following precautions when maintaining or inspecting the paper feeder.

- ❖ When performing any maintenance or inspection procedure, first unplug the power cord. Make sure that the printer power is turned off before replacing circuit boards or electrical components in the paper feeder.
- ❖ To prevent electrostatic discharge damage to electrical circuits, be sure to wear an antistatic band when handling the circuit boards.
- ❖ Be particularly careful when reconnecting the power after having repaired or replaced a component that has the potential for causing an electric shock.
- ❖ If the paper feeder is to be transported or stored for a lengthy period of time, the unit should be packed in its original packaging.
- ❖ If packed in their original packaging, these units can be stacked five high for up to six months. They should not be stacked sideways or upside down, however.
- ❖ Store the paper feeder in a cool, dark, dry area. Avoid storage in dusty areas.
- ❖ Ship units out on a first in, first out basis.

1.3.2. Replacement parts

Be sure to use only Kyocera-recommended supplies and components. Kyocera assume no liability in the event of damage resulting from the use of unauthorized components.

1.3.3. Notes concerning paper storage

use of paper with a high moisture content in the paper feeder can adversely affect printing quality through the occurrence of paper jams, wrinkling, and other difficulties. Observe the following paper handling precautions.

- ❖ Store paper in a dry place. Do not place paper directly on a damp floor.
- ❖ Do not stand paper on end for storage. Stack paper horizontally on a flat surface.
- ❖ After loading paper in the paper cassette, store any leftover paper in the original wrapping or a plastic bag.

1.4. Specifications

1.4.1. Mechanical specifications

Item		Specification
Applicable printers		Kyocera FS-1550/A and FS-3500/A
Print speed with feed from PF-7		FS-1550/A: 7.5 pages/minute (in copy mode) FS-3500/A: 12.5 pages/minute (in copy mode)
Paper size		Width: 76 to 216 mm (3 to 8.5") × Height: 148 to 305 mm (5.8 to 12")
Paper capacity		2,000 sheets maximum, 75 g/m ² (0.1mm)
Environmental requirements		Temperature: 10 to 32.5° C Humidity: 20 to 80% RH Ideal conditions are 20° C/65% RH, altitude under 2000 m.
Noise		Max. 54 dB(A) during paper feeding Max. 60 dB(A) during moving tray
Dimensions	Paper feeder	352 mm (13.9") H × 345 mm (13.6") W × 376 mm (14.8") D
	Base	PB-1 (for FS-1550/A): 209 (8.2") H × 345 (13.6") W × 641 mm (25.2") D PB-2 (for FS-3500/A): 169 (6.7") H × 345 (13.6") W × 641 mm (25.2") D
Weight	Paper feeder	7.5 kg (16.6 lbs.)
	Base	PB-1 (for FS-1550/A): 6 kg (13.2 lbs.) PB-2 (for FS-3500/A): 5.8 kg (12.8 lbs.)
Power supply		+24V/+5V supplied from printer through mount base

1.5. Paper specifications

1.5.1. General Guidelines

The paper feeder is designed for use with various special types of print media such as adhesive-backed label, thick paper, envelopes, and post cards, it may not be used to print on paper not satisfying the requirements below.

Note: The manufacturer assumes no liability for problems that occur when paper not satisfying these requirements is used with the paper feeder.

Selection of the right paper is important. The wrong paper can result in jams, mis-feeds, curl, poor print quality, and paper waste, and in extreme cases can damage the paper feeder and/or the printer. The guidelines given below will increase the productivity of your office by ensuring efficient, trouble-free printing and reducing wear and tear on the paper feeder and the printer.

1.5.2. Paper Specifications

The following table summarizes the basic paper specifications.

Item	Specification
Weight	60 to 200 g/m ² (16 to 53 lbs/ream)
Thickness	0.086 to 0.29 mm (3.4 to 11.5 mils)
Squareness of corners	90± 0.2°
Curl	Inream flat within 4 mm
Packaging	Moisture-proof ream wrapping required
Moisture content	4 to 6%
Direction of grain	Long grain
Pulp content	80% or more

1.5.3. Selecting the Right Paper

Printer printing is a process involving light beam, electrostatic discharge, toner, and heat. In addition, as the paper passes through the printer it undergoes consid-

erable sliding, bending, and twisting motions. A high-quality printing paper matching the requirements withstands all these stresses, enabling the paper feeder and the printer to turn out clean, crisp printed copy consistently.

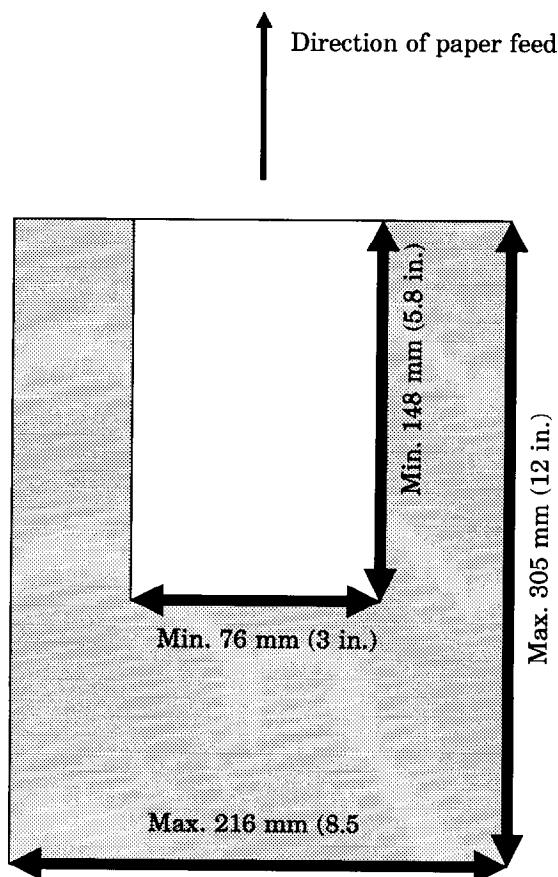
Remember that all paper is *not* the same. Some of the factors to consider when selecting paper for use with the paper feeder are as follows:

Condition of the paper: Avoid using paper that is bent at the edges, curled, dirty, torn, or contaminated with lint, clay, or paper shreds.

Use of paper in these conditions can lead to illegible printing, misfeeding, and paper jams, and can shorten the life of the paper feeder and the printer. In particular, avoid using paper with a surface coating or other surface treatment. The paper should have as smooth and even a surface as possible.

Paper size: The minimum size of paper loadable in the paper feeder is 76 × 148 mm (3 × 5.8 inches). The maximum size is 216 × 305 mm (8.5 × 12 inches). The paper feeder can feed paper of any sizes between these sizes (shaded area in the figure below), including the standard sizes of A4, B5, A5, letter-size, etc. The legal size paper is not usable with the paper feeder.

Figure 1.7. Paper sizes



Since the printer does not recognize the size of the paper currently loaded in the option paper feeder, it assumes that all paper fed from the paper feeder have the legal size (8-1/2 by 14 inches). You can use the SPSZ (Set Paper SiZe) command of the PRESCRIBE command language to tell the printer the size of the paper or envelope. Refer to the printer's PRESCRIBE II COMMAND REFERENCE manual.

Smoothness: The paper should have a smooth, uncoated surface. Paper with a rough or sandy surface can cause voids in the printed output. Paper that is too smooth, however, can cause multiple feeding and fogging problems. (Fogging is a gray background effect.)

Basis weight: Basis weight is the weight of a standard quantity of paper. In the traditional system the standard quantity is a ream consisting of 500 sheets measuring 17 × 22 inches each. In the metric system the standard quantity is 1 square meter.

Paper that is too light or too heavy can cause misfeeding, jams, and premature wear of the paper feeder and the printer. Uneven paper weight can cause multiple feeds, print defects, poor toner fusing, blurring, and other print quality problems. The proper weight is 60 to 200 g/m² (16 to 53 lbs/ream).

Moisture content: Moisture content is defined as the percent ratio of moisture to the dry mass of the paper. Moisture can affect the paper's appearance, feedability, curl, electrostatic properties, and toner fusing characteristics.

The moisture content of the paper varies with the relative humidity in the room. When the relative humidity is high and the paper absorbs moisture, the paper edges expand, becoming wavy in appearance. When the relative humidity is low and paper loses moisture, the edges shrink and tighten, and print contrast may suffer.

Wavy or tight edges can cause misfeeding and alignment anomalies. The moisture content of the paper should be 4% to 6%.

To ensure the proper moisture content it is important to store the paper in a controlled environment. Some tips on moisture control are:

- ❖ Store paper in a cool, dry location.
- ❖ Keep the paper in its wrapping as long as possible. Rewrap paper that is not in use.
- ❖ Store paper in its original carton. Place a pallet etc. under the carton to separate it from the floor.
- ❖ After removing paper from storage, let it stand in the same room as the printer for 48 hours before use.

- ❖ A void leaving paper where it is exposed to heat, sunlight, or damp.

Paper Storage

When the paper feeder is not to be used for a long time of period, the paper must be removed from the feeder and wrapped in moisture-proof paper for storage.

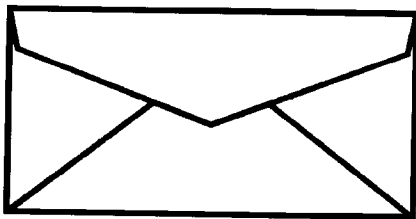
Envelopes and Postcards

When selecting envelopes and postcards, use the guidelines given below.

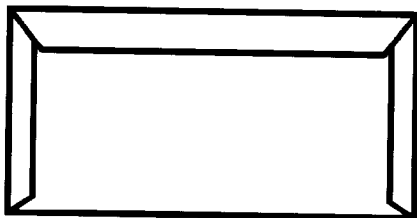
Envelopes : An envelope is a more complex objects than a single sheet of paper. For this reason, it may not be possible to obtain consistent printing quality over the entire envelope surface. Use the following guidelines to select the proper envelopes.

- ❖ Envelopes should have the basis weight of 70 to 100g/m² (0.16 to 0.22 lbs/ream) and up to 4 plies of the paper that is used to construct the paper including all flaps and overlaps.
- ❖ Envelopes should have sharply-creased folds and accurately joined corner edges.
- ❖ Envelopes should have a smooth, uncoated surface. Envelopes that are too smooth, however, can give an adverse effect to the drum and fuser units inside the printer.
- ❖ Envelopes should have a straight grain orientation.
- ❖ Envelopes should have a pulp content of at least 80%, and should have a moisture content of 4 to 6%.

Figure below shows some typical envelope types.

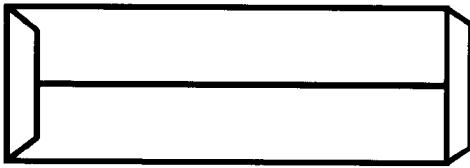


This is the type of envelope best recommended for use with the option paper feeder.

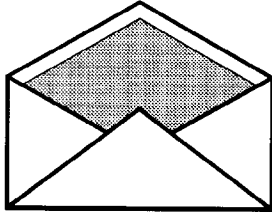


Although this type of envelope generally feeds normally, they are somewhat prone to jamming than above.

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This type of envelope performs reliably, provided that envelopes are loaded so that the bottom (sealed end) feeds into the printer first.



Avoid using this type of envelope made of double-ply paper.

Before printing on envelopes of any type, test printing performance. Avoid using any of the following kinds of envelopes even if the envelope meets the requirements above.

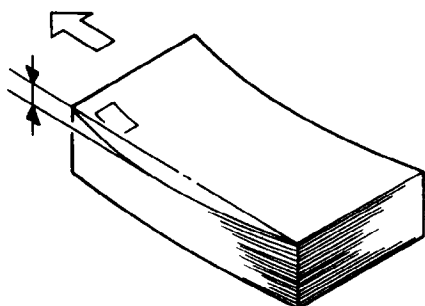
- ❖ Envelopes that have exposed adhesive surface, or having a peel-off sealing string for adhesive surface. (Peeled-off sealing string inside the printer can cause a serious problem.)
- ❖ Envelopes with metal fasteners or tie strings.
- ❖ Envelopes with transparent windows, holes, perforations, or cutouts.
- ❖ Envelopes made using paper, pigment, adhesive, or other material that will degenerate or release hazardous gases when subjected to the heat that is generated in the printer.
- ❖ Envelopes that is bent, dirty, or redundant of paper dust.

Curly Envelopes

An envelope tends to curl excessively or become uneven in its thickness since it is constructed by paper which is folded, creased, and seamed in many parts, making the stack of envelopes on the feeder tray unlevel. To avoid feeding problems, the unlevelness of the stack of envelopes on the paper tray must be less than those specified in the following figures.

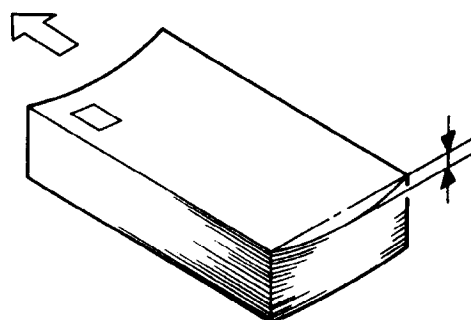
GENERAL INFORMATION

Vertical curl must be less than 10 mm.

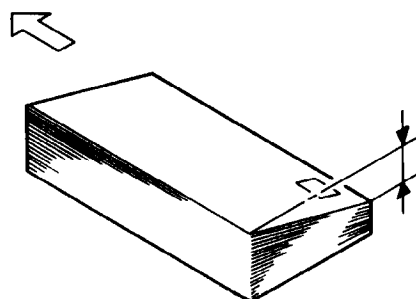
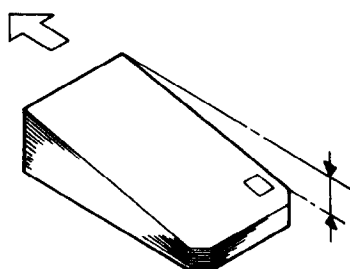


Thickness in bottom or top must be less than 10 mm.

Horizontal curl must be less than 5 mm.



Thickness in right or left part must be less than 5 mm.



Reduce the envelopes, if necessary to keep the unlevelness of the stack of envelope within the specified limit.

Post cards

The paper used in postcards should have a basis weight of 135 to 190 g/m² (0.3 to 0.42 lbs/ream) and uncoated. The paper should also satisfy the same conditions as white bond paper, listed on *page 16*.

Storage of Envelopes and Postcards

Store envelopes and postcards, making sure of the following hints.

- ❖ Avoid leaving paper where it is exposed to sunlight.
- ❖ Store envelopes in a clean, dust-free environment.
- ❖ Temperature in the storage area should be maintained in the range from 50 to 95° F (10 to 35° C), and relative humidity should be kept between 20 and 80 %.

C O N T E N T S

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- 2.1.1. Tools required, 2—3
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- 2.1.3. Removing the tray door, 2—5
- 2.1.4. Removing the side covers, 2—6
- 2.1.5. Removing the paper outlet and top cover, 2—7
- 2.1.6. Removing the mounting rail from the base, 2—8

2 | P A R T R E M O V A L

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2.1. Disassembly procedures

This section provides procedures for removing parts in the paper feeder. Use the reverse manner of removal when replacing (new) parts.

Before beginning disassembly, be sure to read the notes below.

Warning: Power source: Before removing the feeder from the printer, and whenever attempting service to the paper feeder, be sure to turn off printer power and unplug the power cord from the AC power source.

Note: Screws Do not overtighten screws. Use care not to damage screw holes especially for self-tapping screws.

Caution: Static discharge: The paper feeder includes static discharge sensitive parts such as circuit boards. When removing or replacing circuit boards, wear a body-grounded wrist strap.

2.1.1. Tools required

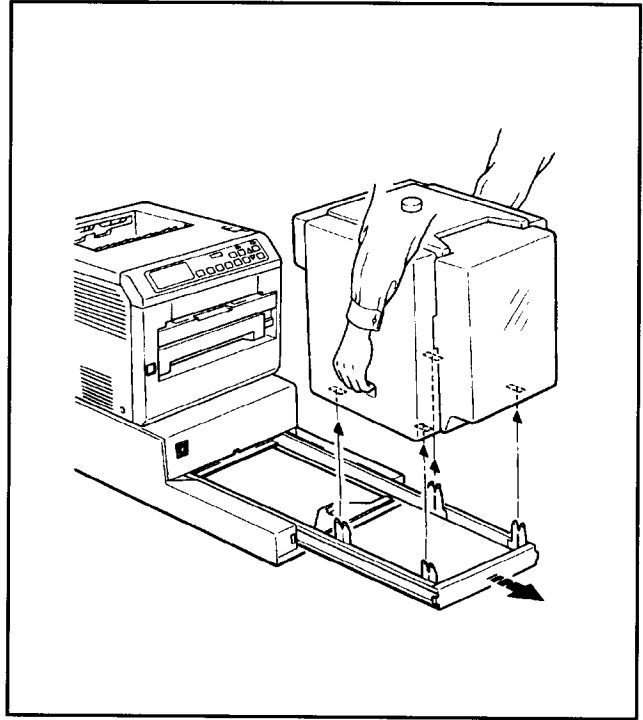
- ❖ Magnetized #2 Philips screwdriver
- ❖ Small flat-blade screwdriver
- ❖ Needle nose pliers

2.1.2. Removing the paper feeder from the printer

Warning Before removing the paper feeder, turn printer power off.

To remove the paper feeder from the printer, slide it away from the printer's front panel on the rail. Then slowly and carefully raise the printer from the paper feeder. This also disengages the connectors on the feeder and the one in the base of the printer.

Figure 2.1. Removing the feeder from the printer

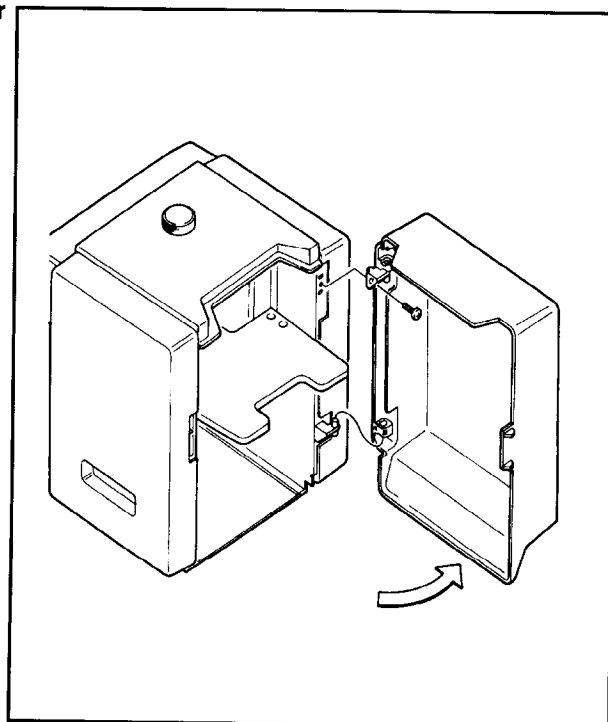


2.1.3. Removing the tray door

Note The feeder door tends to self-open when the feeder is put sideways or upside-down for service. Tape the door to the feeder to avoid this situation or remove the door in prior to making service following the manner described below.

The feeder door is secured to the feeder by catches at the top and bottom. Remove two screws on each catch to remove the door.

Figure 2.2. Removing the tray door

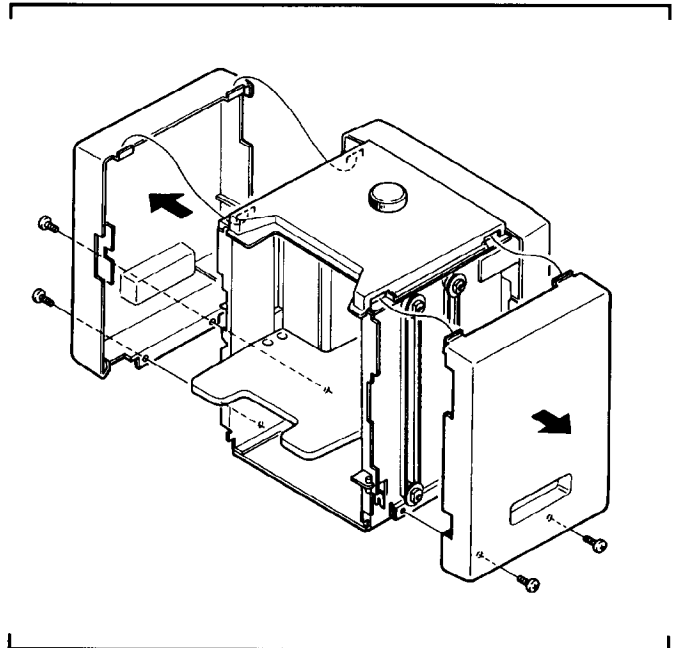


2.1.4. Removing the side covers

Note To gain access to any of the internal parts, the side covers must be removed first.

To remove the side cover, remove two screws at the bottom side of the side cover. Remove the other side cover using the same manner.

Figure 2.3. Removing the side covers



2.1.5. Removing the paper outlet and top cover

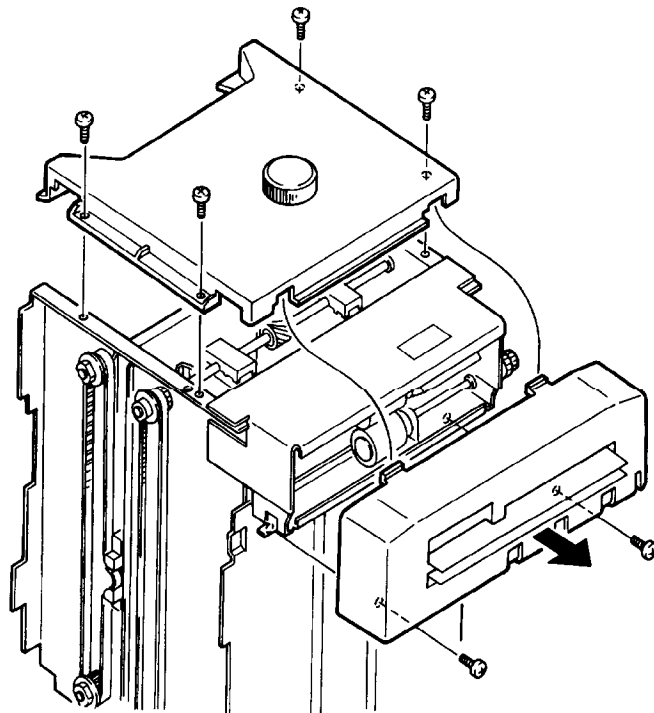
To remove the paper outlet or the top cover, follow the procedure below. We recommend that the paper outlet is also removed when removing the top cover.

To remove the paper outlet, remove two screws as follows.

To remove the top cover, remove four screws as follows.

Note The paper width adjuster knob may not be removed before removing the top cover.

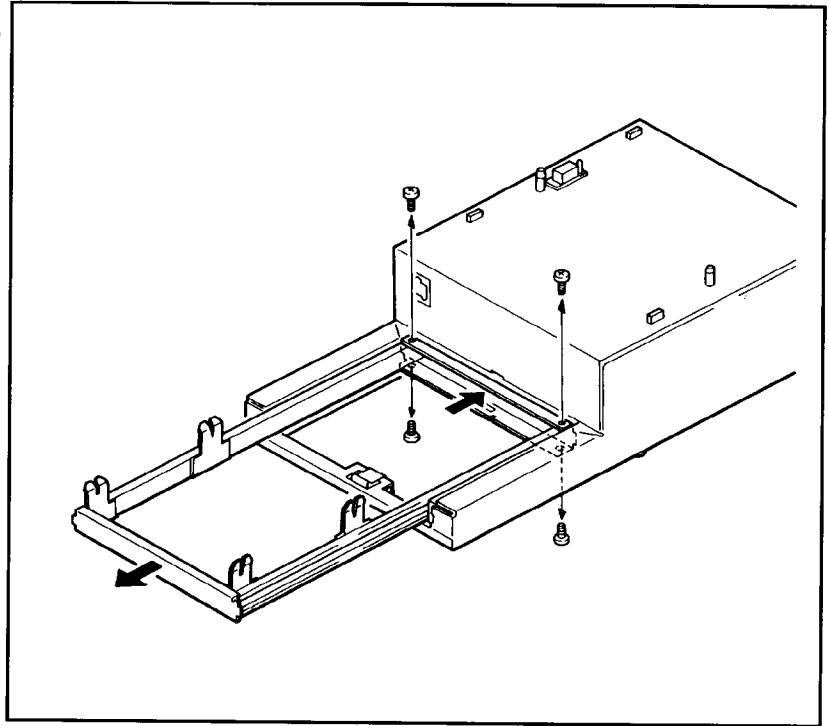
Figure 2.4. Removing the paper outlet/top cover



2.1.6. Removing the mounting rail from the base

To remove the rail from the base, remove four screws that secure the stopper at the inner end. Then pull the rail outward as shown below.

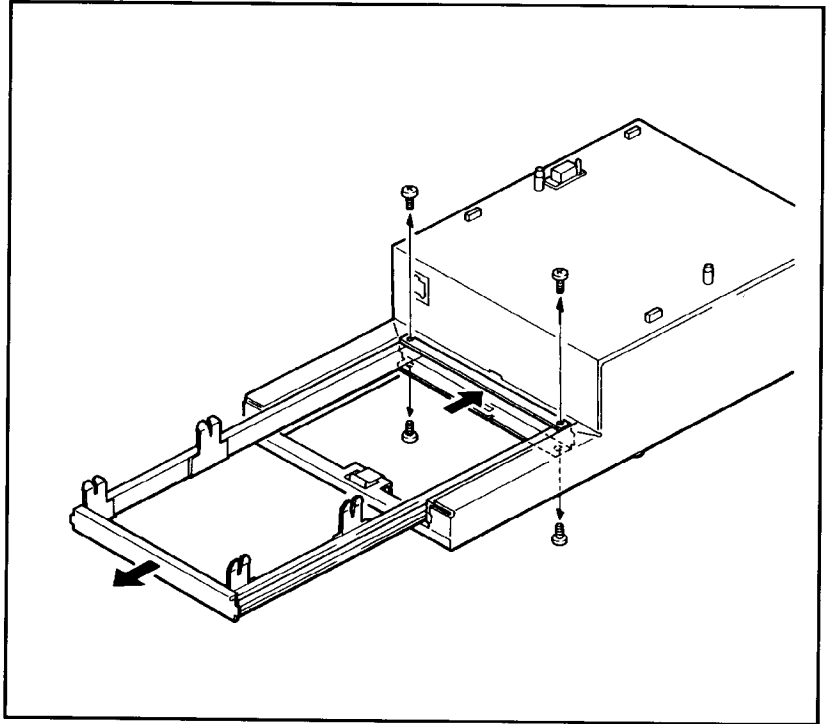
Figure 2.5. Removing the rail from the base



2.1.6. Removing the mounting rail from the base

To remove the rail from the base, remove four screws that secure the stopper at the inner end. Then pull the rail outward as shown below.

Figure 2.5. Removing the rail from the base



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3 | P A R T S C A T A L O G

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3.1. Introduction

This chapter shows exploded views of the paper feeder and the mounting base. These are followed by parts lists that list the reference designator for each part, the associated part number for the item, the quantity, and a description of the part.

3.1.1. Ordering

Parts printed in bold letters in the lists are the recommended parts, stocked, and may be ordered from the nearest Kyocera Regional Service facilities.

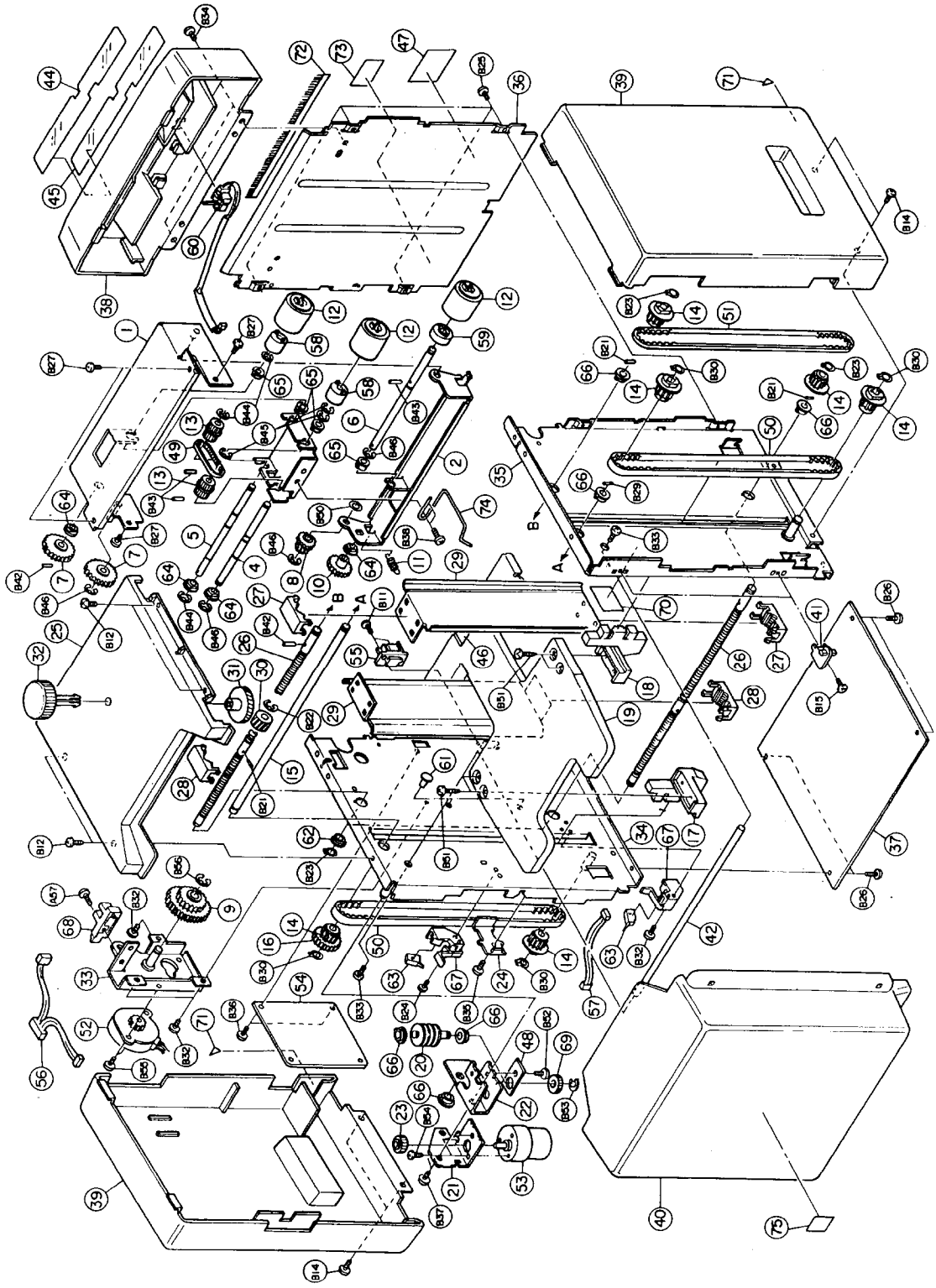
Note Parts that are printed in normal letters are not field replaceable parts.

Contact the local Kyocera Regional Office for detail on part availability. To order a part, please specify:

- ❖ Part description
- ❖ Part code
- ❖ Quantity required
- ❖ Reference number in the exploded view

3.2. Exploded views

3.2.1. Exploded view: PF-7



PARTS CATALOG

Ref. No.	Part code	Description	Q'ty	Remarks
01-001	5MMX866SL006	FRAME FEED UP	1	
01-002	5MMB884SL004	FRAME FEED LOW	1	
01-003	5MMB663SL004	BKT PICK	1	
01-004	5MMT766SN003	SHAFT FEED PICK	1	
01-005	5MMT766SN001	SHAFT FEED UP	1	
01-006	5MMT766SN002	SHAFT FEED LOW	1	
01-007	5MVG148DN012	GEAR Z36	2	
01-008	5MVG028DN002	GEAR Z15-Z19	1	
01-009	5MVG069DN001	GEAR Z33-Z51	1	
01-010	5MVG133DN002	GEAR Z26	1	
01-011	5MMW354LD002	SPRING FEED	2	
01-012	5AAMPF7A**03	ROLLER ASSY	3	
01-013	5MVG337DN002	PULLEY P20-P21	2	
01-014	5MVG318DN001	PULLEY XL14	6	
01-015	5MMT866SN015	SHAFT ELEV	1	
01-016	5MVG138DN018	GEAR WHEEL H30	1	
01-017	5MVX665DN001	GUIDE ELEVATOR R	1	
01-018	5MVX665DN002	GUIDE ELEVATOR L	1	
01-019	5MMB882SN001	TABLE PAPER	1	
01-020	5MVG117DN001	GEAR WORM	1	
01-021	5MML654SL002	BKT DC MOTOR	1	
01-022	5MMU654SL001	BKT WORM	1	
01-023	5MVG127DN031	GEAR MOTOR	1	
01-024	5MVL332SB002	ACTUATER ELEVATOR	1	
01-025	5MVB882SW002	COVER TOP	1	
01-026	5MMT866SN017	SCREW GUIDE	2	
01-027	5MVX422DN002	NUT GUIDE R	2	
01-028	5MVX422DN003	NUT GUIDE L	2	
01-029	5MMU864SL001	GUIDE PAPER	2	
01-030	5MVG127DN030	GEAR H15-R	1	
01-031	5MVG134DN001	GEAR H30-R	1	
01-032	5MVN653SW001	KNOB SIZE	1	
01-033	5MMX765SL011	BKT MOTOR	1	
01-034	5MMX885SL001	FRAME R	1	
01-035	5MMX884SL001	FRAME L	1	
01-036	5MMU882SN001	STAY FRONT	1	
01-037	5MMS887SL002	PLATE BOTTOM	1	
01-038	5MVB876SW007	COVER FEED	1	
01-039	5MVB886SW008	COVER SIDE	2	
01-040	5MVB887SS001	COVER TRAY	1	
01-041	5MVX332DN002	PIVOT TRAY	2	
01-042	5MMT866SN016	SHAFT STAY F	1	
01-043	5MVVL865WN01	LABEL ADJUST	1	
01-044	5MVS442KC001	SHEET GUIDE UP	2	
01-045	5MVS442KC002	SHEET GUIDE LOW	2	
01-046	5MVS336RF004	PAD CASSETTE	1	
01-047	5MVVSPF7A**1	LABEL SERIAL	1	
01-048	5MMS336SL008	PLATE WORM	1	
01-049	5MVX190DB001	BELT MXL60-3.2	1	
01-050	5MVX190DB002	BELT XL250-9.6	2	
01-051	5MVX190DB003	BELT XL230-6.4	1	
01-052	5EZNT2400301*01	MOTOR STEPPING	1	
01-053	5AAYPF7A**07	DC MOTOR ASSY	1	
01-054	5AAPRLGC2002AH	P. W BOARD ASSY	1	
01-055	5AACCNNA8GEA	CONN. CORD ASSY S00839	1	

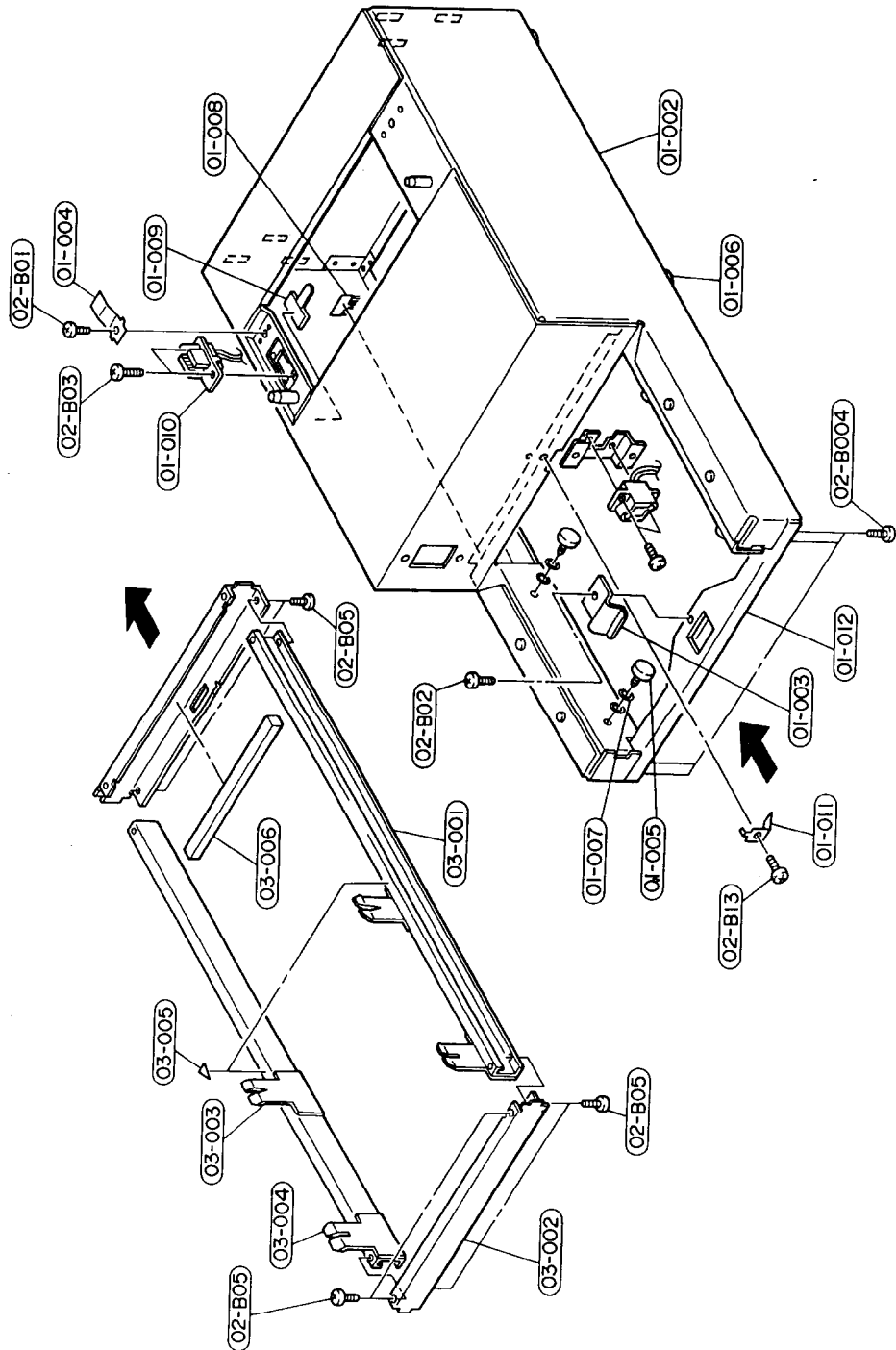
PARTS CATALOG

Ref. No.	Part code	Description	Q'ty	Remarks
01-056	5AACNNA9GEA	CONN. CORD ASSY S00840	1	
01-057	5AACNNB1GEA	CONN. CORD ASSY S00842	1	
01-058	5AAZPF7A**02	BEARING FEED	2	
01-059	5AAZPF7A**03	TORQUE LIMITER	1	
01-060	5ENXOS573533*01	PT. SENSOR	1	
01-061	5MVX211NN019	LOCKING CARD SPACER	3	
01-062	5MMM176CJ003	METAL BUSH KD	3	
01-063	5ESM010235***01	MICRO SWITCH	3	
01-064	5MMM121CX001	BUSH DRUM	4	
01-065	5MVM176DN009	BEARING	4	
01-066	5MVM122DB003	BUSH POM	6	
01-067	5MVX532DN001	BKT SENSOR BOTTLE	2	
01-068	5ENXGP1A05HR*	PHOTO SENSOR	1	
01-069	5MVG137DB024	GEAR CLUTCH Z22	1	
01-070	5MVVL431WN13	PAPER LIMIT LABEL	2	
01-071	5MVVL111WN02	LEVER LABEL	4	
01-072	5MVS824XF002	DIS CHARGER FEED	1	
01-073	5MVVL665WN01	LABEL HAND CAUTION	1	
01-074	5MMW802LD002	ACTUATOR TRAY	1	
01-075	5MVVL221AC02	SEAL TRAY	1	
Screws				
01-B11	5MBTPB3008TN	BIND T.T. SCREW (+)	2	
01-B12	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B14	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B15	5MBTPB3008TN	BIND T.T. SCREW (+)	2	
01-B21	5MBP2012WPLD	PARALLEL PIN	3	
01-B22	5MBCE5060XSW	E STOP RING	1	
01-B23	5MBCC8080XXP	C STOP RING	4	
01-B24	5MBRP3045QNB	PAN HEAD RIVET	1	
01-B25	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B26	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B27	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B29	5MBP2012WPLD	PARALLEL PIN	2	
01-B30	5MBCC8080XXP	C STOP RING	4	
01-B32	5MBTPB3006TZ	BIND T.T. SCREW (+)	3	
01-B33	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
01-B34	5MBSP43006NZ	TP SCREW (+)	2	
01-B35	5MBTPB3008WN	BIND T.T. SCREW (+)	1	
01-B36	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
01-B37	5MBSP43008NZ	TP SCREW (+)	2	
01-B38	5MBTP43008TZ	TP T.T. SCREW (+)	2	
01-B42	5MBP2012WPLD	PARALLEL PIN	2	
01-B43	5MBP2012WWLD	SPRING PIN	3	
01-B44	5MBCE5060XSW	E STOP RING	3	
01-B45	5MBCE5060XSW	E STOP RING	3	
01-B46	5MBCE5060XSW	E STOP RING	3	
01-B47	5MBCE5060XSW	E STOP RING	1	
01-B50	5MBWK62955NN	POLY SLIDER	1	
01-B51	5MBTPB3012WZ	BIND T.T. SCREW (+)	4	
01-B52	5MBTPB3006TZ	BIND T.T. SCREW (+)	1	
01-B53	5MBCE7080XSW	E STOP RING	1	
01-B54	5MBSP3006NZ	PAN HEAD SCREW (+)	3	
01-B55	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	

P A R T S C A T A L O G

Ref. No.	Part code	Description	Q'ty	Remarks
01-B56	5MBCE7080XSW	E STOP RING	1	
01-B57	5MBTPB4012TZ	BIND T.T. SCREW (+)	1	

3.2.2. Explodedview: PB-2



PARTS CATALOG

Ref. No.	Part code	Description	Q'ty	Remarks
01-002	5AAMPF7B**01	BASE ASSY B	1	
01-003	5MMP153LD001	STOPPER PF	1	
01-004	5MMX432LD001	SPRING SHAFT FD	1	
01-005	5AAZPF7A**01	ROLLER DL	4	
01-006	5MVS778RB002	FOOT PR	6	
01-007	5MBWK65D0ASZ	FLAT S WASHER	8	
01-008	5MVS224XF001	DIS CHARGER PB	1	
01-010	5AACCNNB2GEA	CONN. CORD ASSY	1	
01-011	5MML322LD001	PLATE EMC	1	
01-012	5MMU852SL016	STAY MAIN	1	
02-B01	5MBTPB3008TN	BIND T.T. SCREW (+)	1	
02-B02	5MBTPB3008TN	BIND T.T. SCREW (+)	1	
02-B03	5MBTPB3008TN	BIND T.T. SCREW (+)	2	
02-B04	5MBTPB3008TN	BIND T.T. SCREW (+)	4	
02-B05	5MBTPB3006TZ	BIND T.T. SCREW	6	
02-B13	5MBTPB3008TN	BIND T.T. SCREW (+)	1	
03-001	5MMU832SL002	RAIL	2	
03-002	5MMU833SL001	STAY RAIL	2	
03-003	5MMS657SL012	GUIDE PF F	2	
03-004	5MMS657SL013	GUIDE PF R	2	
03-005	5MVVL111WN02	LAVER LABEL	2	
03-006	5MVQ843RB001	PAD RAIL	1	
03-009	5MMX321SM001	CORD KEEP	1	

C O N T E N T S

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4.2.1. Overview of feeder operation, 4—5

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4.2.3. IC details and pin assignments, 4—11

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4.1. Introduction

This chapter describes an operational overview of the paper feeder. It ensures correct understanding of the behavior of both the mechanical and electrical mechanism of the paper feeder to assist servicing.

The following basic functions of the paper feeder are discussed in the following pages.

- ❖ Overall functionality of the feeder
- ❖ Signal definitions
- ❖ Tray driving motor driver
- ❖ Paper feeding motor driver

4.2. Overall block

Figure 4.1. is a functional block diagram of the paper feeder. Also see schematic diagram in *Appendix A* of this manual.

Figure 4.1. Block diagram

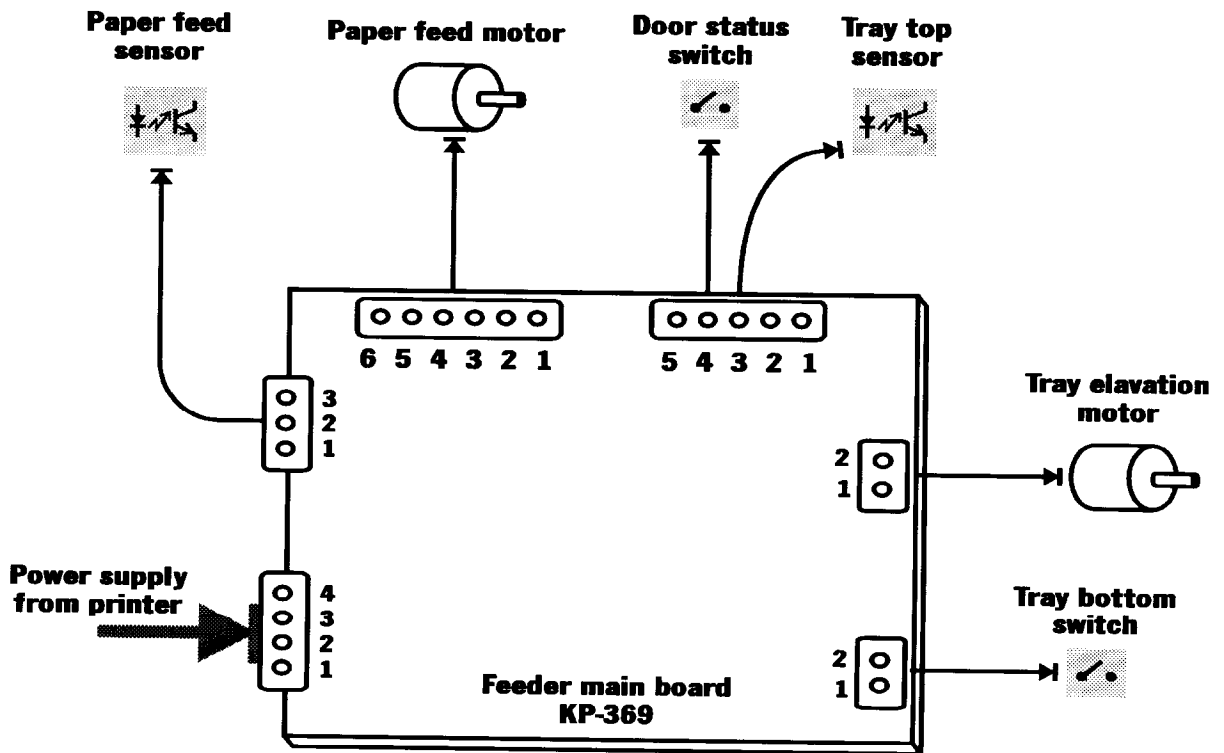
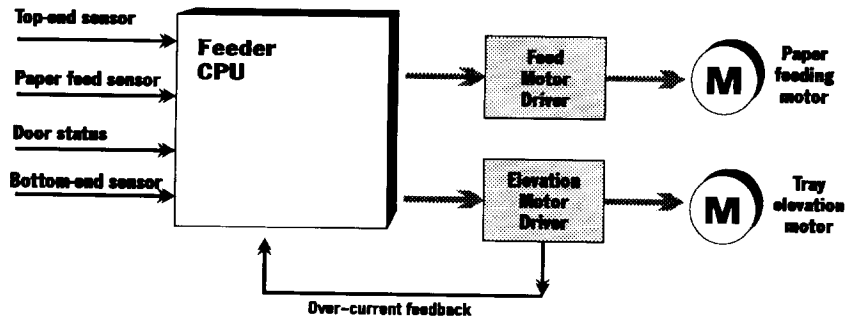


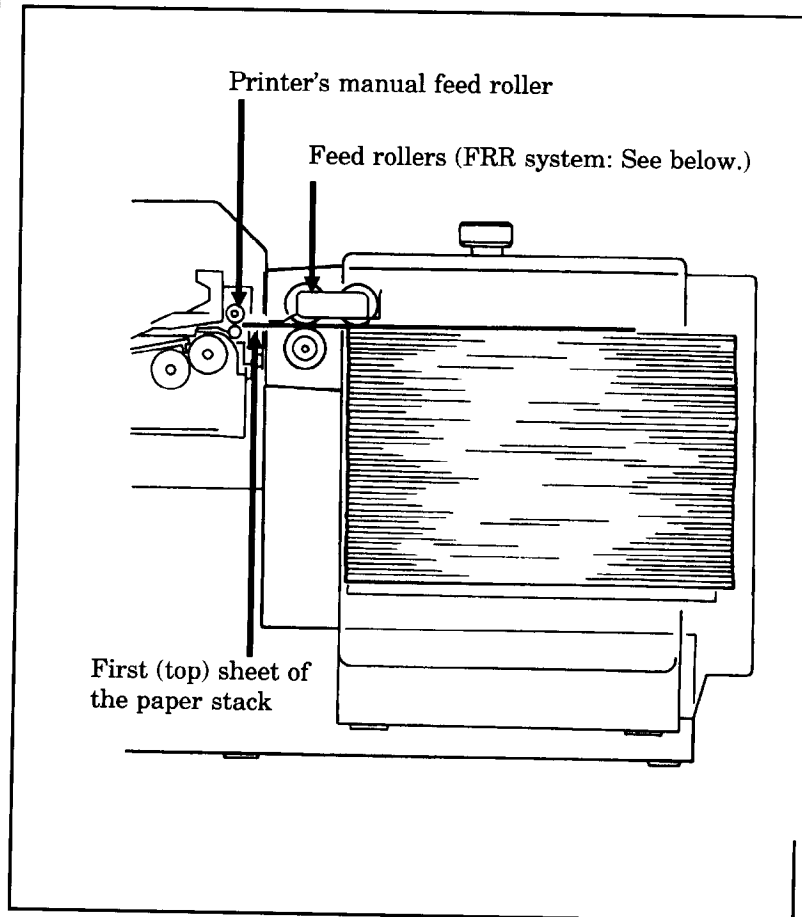
Figure 4.2. Main board functions



4.2.1. Overview of feeder operation

The PF-7 paper feeder feeds paper into the printer manual feed slot. The paper feeder has no connection with the printer's engine system as to synchronization with the printer paper feed. The feeder automatically places the paper at the printer's manual feed roller by activating the paper feed motor each time the succeeding sheet is pulled into the printer. Absence of paper at the feeder outlet is detected by the feed sensor which subsequently requests the feeder electronics to feed a sheet from the tray.

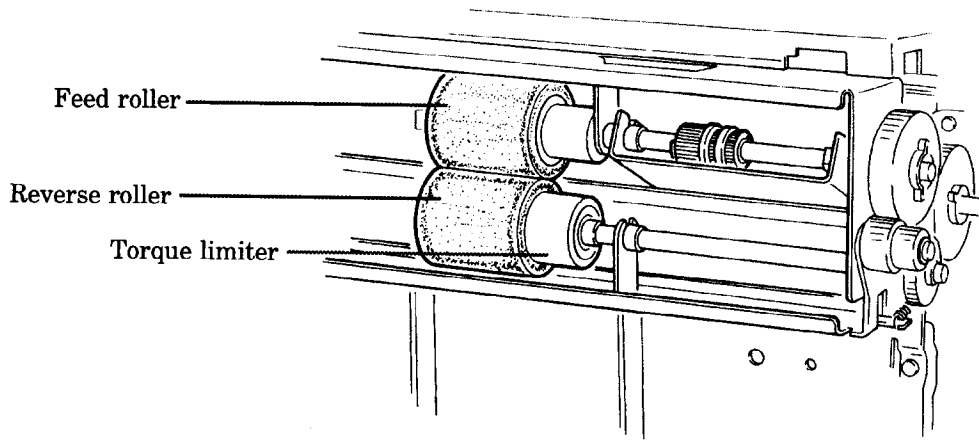
Figure 4.3. Feeder paper feeding



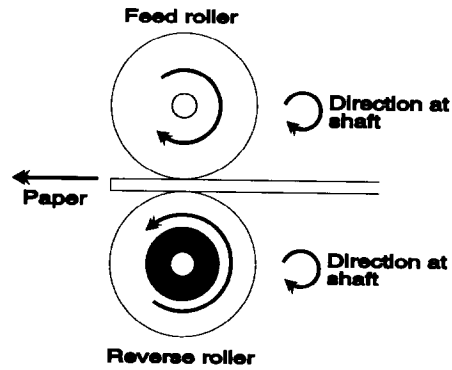
Friction-returded roller (FRR) system

The paper feeder utilizes the friction-returded rollers to ensure a reliable paper feeding free of multiple feeding problem. This system is comprised of the paper feed roller, reverse roller, and the torque limiter as shown in figure below.

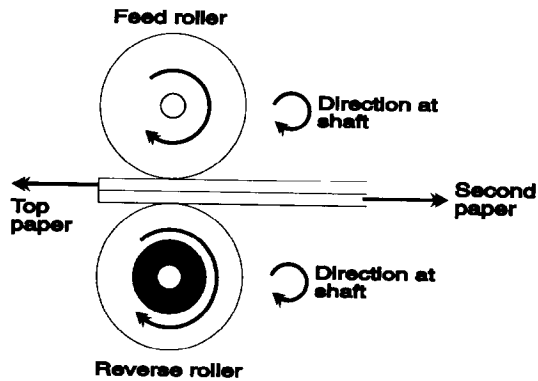
Figure 4.4. FRR system



In this system, both the paper feed and reverse rollers are driven clockwise at the shaft. The reverse roller, however, has the torque limiter (one-way clutch) at one end which in normal paper feeding effectively frees the reverse roller from the shaft to turn in counter-clockwise direction by means of the friction given by the paper feed roller through the paper.



Assuming more than one sheet of paper are accidentally fed and pinched between these rollers, there no longer is friction between the rollers as the friction is subtle among the sheets of paper. The reverse roller can then rotate following the shaft rotation defeating the torque limiter. The feed roller continues feeding the top sheet towards the printer; the reverse roller feeds the second sheet backward, thus avoiding misfeeding problem.

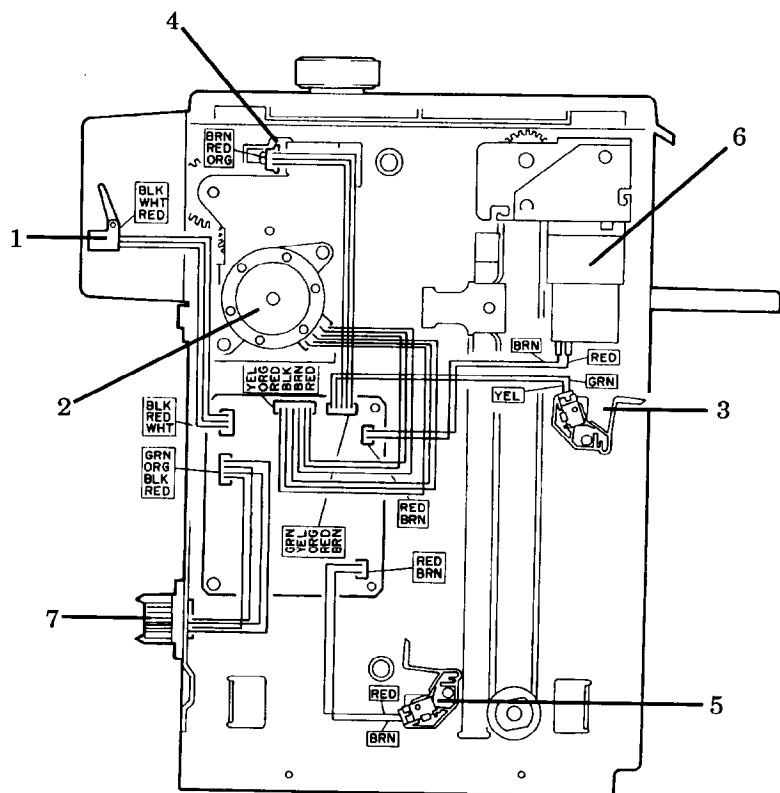


4.2.2. Electrical parts

The feeder's internal electronics, including the one-chip microprocessor μ PD78213¹ as CPU, serves mainly for activating and deactivating the motors to elevate the tray and feed paper (towards the printer manual feed rollers) in cooperation with the sensors.

The function of each major component of the feeder is as follows. (All these components are connected to the main circuit board KP-369.)

Figure 4.5. Electrical parts



Paper feed sensor (1)

This sensor monitors the presence of paper at the feeder output slot. It requests the feeder CPU to forward or stop paper feed into the feeder output slot.

1 Also used with some Kyocera printer models.

If paper is not found at the sensor, the sensor requests the CPU to drive the paper feed motor; as the paper feed motor drives the top sheet of the stack forward and the leading edge of the paper hits and passes the sensor and the leading edge of the paper reaches the printer's registration rollers, the sensor then requests the CPU to stop revolving the motor.

Paper feed motor (⊗)

This is a stepping motor which is activated when requested by the paper feed sensor to feed paper toward the feeder output slot. Feed motor driver U4, SLA7024M, is a constant-current chopper type driver IC which includes power MOSFETs for simplified driver configuration of the stepping motor. See section 4.4. for details on this IC. The driver output current for the motor is adjusted and limited by components R7, R8, R12, and C5 which determine the output current, I_o , in the following formula:

$$I_o \approx \frac{R8}{R7+R8} \cdot \frac{5}{R12}$$

The chopping frequency, represented by the period of time during the absence of current flow, T_{off} , for the stepping motor is determined as follows:

$$T_{off} \approx 0.51 \cdot R5 \cdot C2 = 0.51 \cdot R6 \cdot C3$$

Feeder door status sensor (⊗)

This sensor reports feeder CPU as to whether the feeder door is closed or open. If the door is open, the sensor sends COVOP signal by which the CPU begins activating the tray elevation motor so that the paper tray descends until the tray bottom sensor is energized or the door is closed again.

Tray top position sensor (⊕)

This sensor, when the top of the paper stack in the paper tray has reached the top most position, ready for feeding paper through the feeder output slot, sends feeder CPU the TRYUP signal to stop the tray elevation motor.

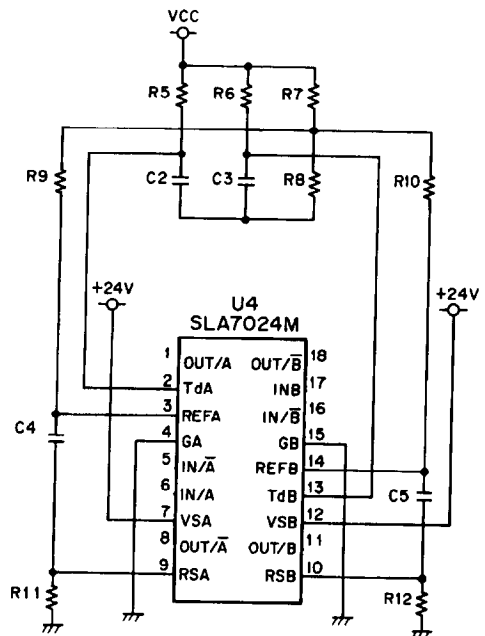


Figure 4.6. Feed motor driver (U4)

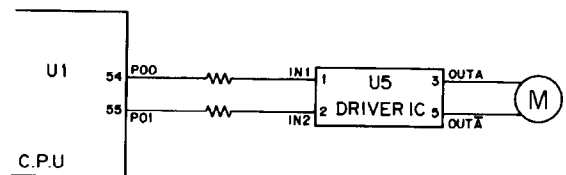
Tray bottom position sensor (5)

This sensor, when *stepped on* by the paper tray as the paper tray descends, sends feeder CPU the TRYLW signal to stop the tray elevation motor.

Tray elevation motor (6)

This is a DC-servo motor to raise or descends the paper tray. It revolves in either forward or reverse direction in the control of motor driver U5, TA8428K, a full-bridge type DC motor driver, in accordance with the feeder door status sensor (switch). The logic for motor revolution is tabled as follows.

	Input		Output	
	IN1	IN2	OUT A	OUT \bar{A}
Raise	L	H	L	H
Descend	H	L	H	L
Still	L	L	High imped.	

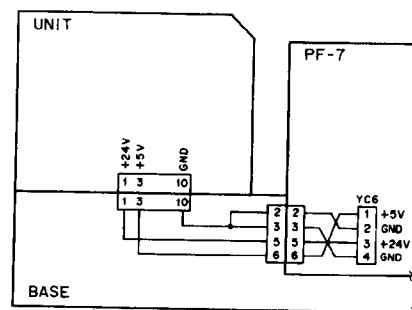


H level is approximately 5V for inputs and 20---22V for outputs.

Power supply connector (7)

A 10-pin connector is used to connect the feeder to the printer power supply. The connector supplies +5V and +24V DC power only: No signal connection is made between feeder CPU and the printer engine system. The connector is the same type one as used for some Kyocera printer models and option equipment.

Figure 4.7. Power supply connection



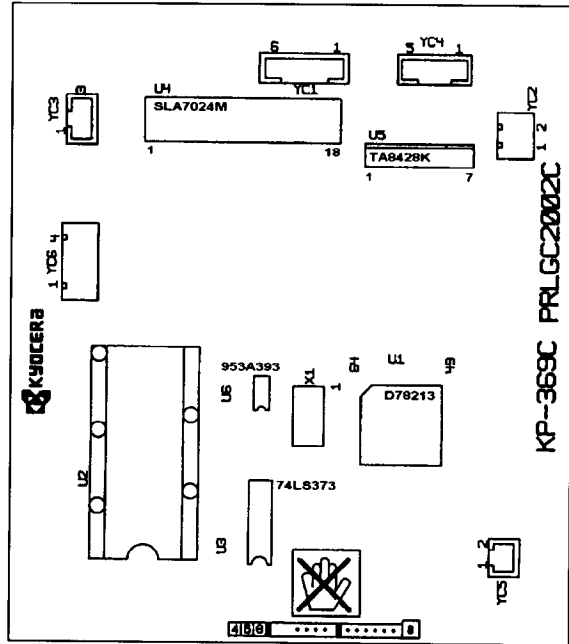
Feeder main board (Ⓢ)

All electrical component are mounted on board KP-369. The feeder CPU μ PD78213C is responsible for most functions of the paper feeder electronics. It entertains sensor output signals such as from tray elevation top/bottom sensors, paper feeding sensor, door status sensor; and delivers motor driving outputs for paper feeding and tray elevation motors. Figure below shows the inputs/outputs for the CPU.

4.2.3. IC details and pin assignments

This section describes information on the major ICs used with the paper feeder. Figure below shows ICs used with the paper feeder (KP-369 board).

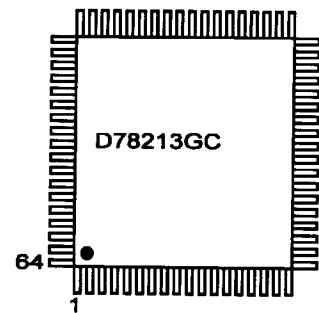
Figure 4.8. ICs on board



Main controller, μ PD78213GC (U1)

The 78213 is a one-chip microprocessor, including ROMs and RAMs for controlling paper feeding using motors. This IC looks like the figure below and has the following pin assignment.

Figure 4.9. 78213



For pin assignment, see next page.

D78213 pin assignment

Pin #	Port #	Signal	Function	Input/Output
1	P64	\overline{RD}	Read timing for option units, L: Active	Output
2-5	P63-60	—	Unused	—
6	—	\overline{RESET}	Reset	—
7	—	X2	—	
8	—	X1	—	
9	—	Vss	—	
10-17	P57-50	A15-8	Address bus, H: active	
18	P47	AD7	Address/data bus A7/D7, H: active	Both
19	P46	AD6	Address/data bus A6/D6, H: active	
20	P45	AD5	Address/data bus A5/D5, H: active	
21	P44	AD4	Address/data bus A4/D4, H: active	
22	P43	AD3	Address/data bus A3/D3, H: active	
23	P42	AD2	Address/data bus A2/D2, H: active	
24	—	Vss	—	
25	P41	AD1	Address/data bus A1/D1, H: active	Both
26	P40	AD0	Address/data bus A0/D0, H: active	
27	—	ASTB	—	—
28-31	P20-23	—	Reserved	Input
32-39	P24-33	—	Unused	—
40	—	—	—	—
41	—	VDD	—	—
42	—	AVSS	—	—
43	—	AVREF	—	—
44	P75	COVOP	Door status, H: open	Input
45	P74	—	Unused, connected to ground	Input
46	P73	TRYUP	Tray elevate signal, H: elevate	Input
47	P72	TRYLW	Tray lowering signal, H: lower	Input
48	P71	FEED	Paper feed signal, H: Feed paper	Input
49	AN0	ISENS	Tray elevate motor encoding sensor	Input
50-53	P34-36	—	Unused	—
54	P00	OUT1	Tray elevat. motor drive signal 1	Output
55	P01	OUT2	Tray elevat. motor drive signal 1	Output
56, 57	P02, 03	—	Unused	—
58	P04	OUTA	Feed motor drive signal, phase A	Output

H A R D W A R E N O T E S

Pin #	Port #	Signal	Function	Input/ Output
59	P05	OUTB	Feed motor drive signal, phase B	Output
60	P06	OUTC	Feed motor drive signal, phase \bar{A}	Output
61	P07	OUTD	Feed motor drive signal, phase B	Output
62-64	P67-65	—	Unused	—

Feed motor driver, SLA7024M (U4)

Figure 4.10. SLA7024M appearance

The SLA7024M, U4, is a constant-current chopper type driver IC which includes power MOSFETs for simplified driver configuration of the stepping motor. The PWM-type chopper circuitry has a good high-frequency response and advanced driver efficiency. Figure below shows a simplified internal circuitry of this IC.

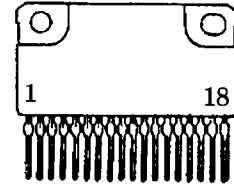
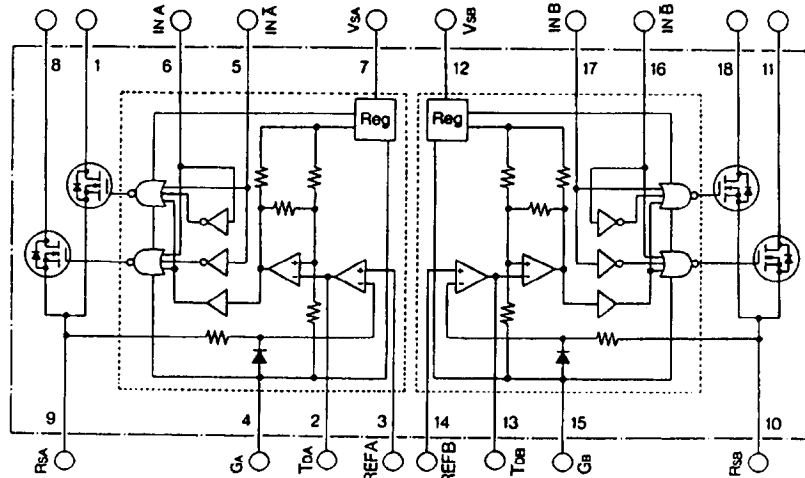


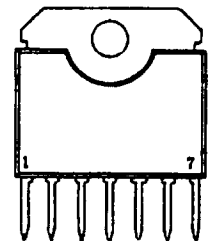
Figure 4.11. SLA7024M internal circuit



Tray motor driver, TA8428K (U5)

Figure 4.12. TA8428K appearance

The TA8428K, U5, is a full-bridge driver IC for controlling the tray elevation motor. This IC provides four modes of motor operation, forward-rotating, reverse-rotating, brake, and stop. The door status switch, when open, requests U5 to rotate the tray elevation motor in forward direction so that the paper tray descends; while it drives the motor in reverse direction when the door status switch is closed. The driver stops the motor either when the tray has reached the top or bottom most position, pressing the appropriate sensor.



C O N T E N T S

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5.1. Clearing paper misfeeding

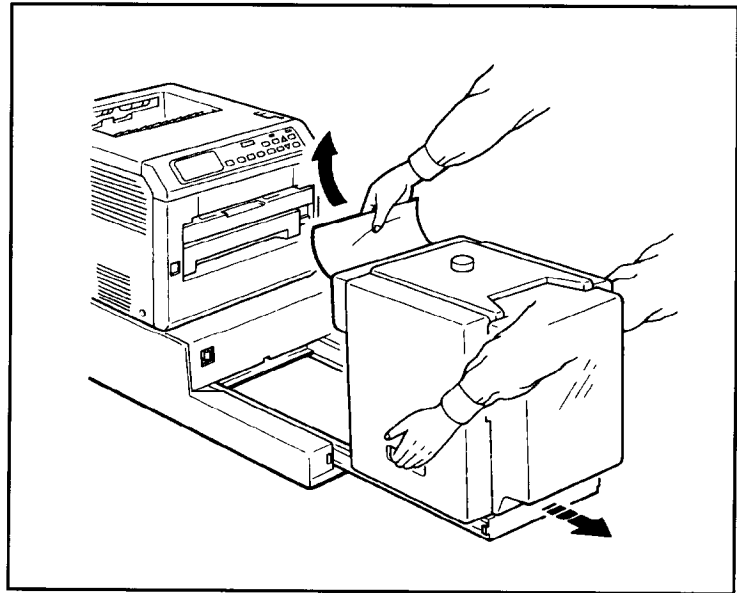
5.1.1. Removing jammed paper

If the printer's message display shows **Paper jam** or **Add paper** (even though the feeder has paper loaded inside), detach the paper feeder from the printer by sliding with the rail away from the printer, holding the paper feeder by both hands as shown below.

If paper is partially fed out from the feeder's output slot, pull the paper out by hand as shown.

Notes When paper is protruding from the feeder's output slot, always remove it by pulling the paper in its normal direction of travel. Never pull paper backwards.

Figure 5.1. Removing jammed paper



If paper is not stuck at the feeder's output slot, open the feeder cover and pull the paper in the feeder.

If no paper is found jammed inside the paper feeder, slide the paper feeder away from the printer, and check if paper is jammed inside the printer.

After connecting the feeder back to the printer, open the printer's upper unit once, then close it again and wait for the message display to show **Ready**.

5.1.2. Other paper handling problems

If paper handling problems are frequently experienced, check for the conditions indicated in the table below.

Symptom	Suggested Cause	Remedy
Paper will not feed properly into printer.	Too much paper in feeder.	Open cover. Remove any quantity in excess of the marked limit.
	Paper too slick or stack together tightly.	Fan and flex paper to separate sheets. Check that paper isn't too shiny or slick causing rollers to slip. Replace with plain paper to check feeder operation. Refer to Paper Specifications section later in this manual for proper paper. Clean rollers of feeder with lint-free cloth.
	Paper is damaged.	Check paper stack for bent corners, edges, etc., and replace paper.
	Side plates inside the feeder are improperly set.	Set the side plates so that a 1-mm gap is left between each side of the paper stack and the side plate.
Feeder does not raise/lower paper tray.	Feeder cover not closed/opened.	Open/close feeder cover.
	Printer not powered on.	Plug printer power cord.
	Feeder not properly mounted on the base (rail).	Mount feeder aligning the arrow marks on the feeder with the arrow marks on the rail.
	Feeder's connector not properly connected to the printer's connector.	Press the feeder toward the printer firmly to ensure good contact of both connectors.

5.2. Working with electrical problems

The following symptoms of feeder operation imply the electrical problems .

- ❖ The paper feeder does not feed paper.
- ❖ The paper tray does not ascend nor descend.

Use the following flow charts to locate the cause for each problem.

5.2.1. The paper feeder does not feed paper

When the paper feeder does not feed paper, it is most likely that the paper feed motor is defective.

Paper feed motor won't rotate.						
Remove all paper in the feeder. Remove paper which may be protruding from the feeder's outlet, if any.						
Tray elevation motor rotates?	<table border="0"> <tr> <td style="text-align: right;">No→</td> <td>YC6 connected properly?</td> <td style="text-align: left;">No→</td> </tr> </table>	No→	YC6 connected properly?	No→		
No→	YC6 connected properly?	No→				
Yes↓						
YC1 connected properly?	<table border="0"> <tr> <td style="text-align: right;">No→</td> <td>Connect YC1 properly.</td> </tr> </table>	No→	Connect YC1 properly.			
No→	Connect YC1 properly.					
Yes↓						
Is resistance between the following terminals approx. 25Ω ?	Replace paper feed motor.					
<table border="0"> <tr> <td style="text-align: right;">Pins 1 and 2</td> <td rowspan="4" style="vertical-align: middle;">No→</td> </tr> <tr> <td>Pins 1 and 3</td> </tr> <tr> <td>Pins 4 and 5</td> </tr> <tr> <td>Pins 4 and 6</td> </tr> </table>	Pins 1 and 2	No→	Pins 1 and 3	Pins 4 and 5	Pins 4 and 6	
Pins 1 and 2	No→					
Pins 1 and 3						
Pins 4 and 5						
Pins 4 and 6						
Yes↓						
YC3 connected properly?	<table border="0"> <tr> <td style="text-align: right;">No→</td> <td>Connect YC3 properly.</td> </tr> </table>	No→	Connect YC3 properly.			
No→	Connect YC3 properly.					
Yes↓						
Is the level at pin 1 of YC3 low?	<table border="0"> <tr> <td style="text-align: right;">No→</td> <td>Replace paper feed sensor.</td> </tr> </table>	No→	Replace paper feed sensor.			
No→	Replace paper feed sensor.					
Yes↓						
Replace the board.						

5.2.2. The paper tray does not ascend

Paper tray won't ascend			
Paper feed motor rotates?	No→	YC6 connected properly?	No→ Connect YC6 properly.
		Yes↓	
		+5V at pin 1 of YC6?	No→ All wires of YC6 conduct?
		Yes↓	Yes↓
Yes↓		Paper tray ascends if power is turned off then on?	No→ Replace YC6 wires.
		Yes↓	
		Check paper stack is put fully inside the feeder.	No→ Harness inside the base (PB1/2) conducts (wired properly)?
			Yes↓
		Check fuse F1 on printer's engine board.	
Paper tray descends?	No→	YC2 connected properly?	No→ Connect YC2 properly.
		Yes↓	Yes↓
		+21 to +23V at pin 2 of YC2 when the tray moves?	Replace board.
Yes↓		Yes↓	
		Replace the tray elevation motor and the harness altogether.	
Is the level at pin 3 of YC4 low?		Is the level at pin 3 (orange-col.) of tray top sensor low?	No→ +5V at pin 1 (brown-col.) and 0V at pin 2 (red-col.) of tray top sensor? No→ Replace harness.
		Yes↓	Yes↓
Yes↓		Replace harness.	Replace tray top sensor.
Is the level at pin 4 of YC4 low?		Tray ascends when shortcircuiting door sensor?	No→ Harness for door sensor disconnected?
		Yes↓	Yes↓
Yes↓		Replace door switch.	Replace harness.
Replace board.			

5.2.3. The paper tray does not descend

Paper tray won't descend			
Paper feed motor rotates?	No→	YC6 connected properly?	No→ Connect YC6 properly.
		Yes↓	
		+5V at pin 1 of YC6?	No→ Replace YC6 wires.
		Yes↓	Yes↓
Yes↓		Paper tray descends if power is turned off then on?	Harness inside the base (PB1/2) conducts (wired properly)?
		Yes↓	No→ Replace the harness.
		Check/remove obstacle that may be preventing the motor revolution.	Yes↓
			Check fuse F1 on printer's engine board.
Paper tray ascends?	No→	YC2 connected properly?	No→ Connect YC2 properly.
		Yes↓	
		+21 to +23V at pin 1 of YC2 when YC4 is removed from board?	No→ Replace board.
Yes↓		Yes↓	
		Replace the tray elevation motor and the harness altogether.	
Is the level at pin 1 of YC5 low?	No→	Does tray descend when YC4 is removed from board and tray bottom sensor is shortcircuited?	Harness to tray bottom sensor disconnected?
		Yes↓	Yes↓
Yes↓		Replace tray bottom sensor.	Replace harness.
Does tray descend when YC4 is disconnected?	No→		
Yes↓			
Replace door sensor.			