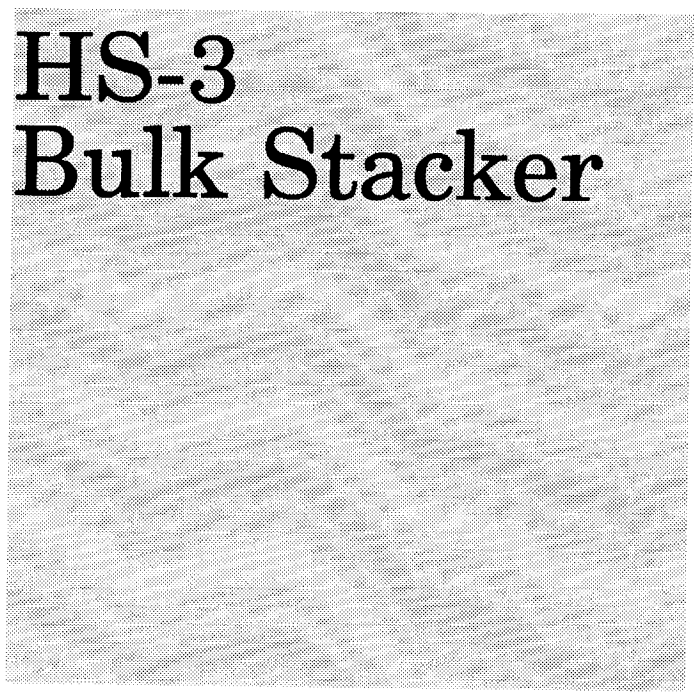
SERVICE MANUAL

July 1994



Export edition/revision 1.00

HS-3 Service Manual

Revision 1.00 July, 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 service person is following the instructions in this manual.

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.

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 encouraged 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 person

Before attempting service on the equipment, 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 printer is not provided with any safety facilities other than those primarily intended for the safety of users.

Preface

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: Parts Catalog

Chapter 4: Hardware Notes

Appendix: Schematic Diagram

Legend

Throughout the manual, WARNING denotes precautions which, if ignored, could result in personal injury, and/or irrevocable damage to the equipment. Note denotes precautions which, if ignored, could result in damage to the equipment.

Radio interference requirement in European countries

The option paper stacker HS-3 is intended for use with the following printer models which are type tested and categorized 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-1500/1550: Class A
FS-3500: Class A

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

CONTENTS

1 GENERAL INFORMATION

This page left blank intentionally

1.1. General

Chapter 1 describes the features of and provides how to set up the bulk stacker. The basic considerations and precautions that should be observed while following the procedures in service are also included in this chapter. Follow these to ensure safety in servicing.

1.2. Product feature

The HS-3 is a bulk paper stacker for use with the Kyocera FS-1500/A, FS-1550/A, or FS-3500/A page printer. The paper stacker provides face-up delivery of up to 2,000 printed pages at one time.

1.3. Stacker setup

The paper stacker must be installed to the printer together with a PF-7 paper feeder or two PF-5 paper feeders. Before installing the paper stacker, please read these instructions carefully. The printer illustrations used in this manual are of the FS-3500/A.

1.3.1. Packing List

Make sure that the paper stacker package contains each of the following items in the indicated quantities.

- ❖ HS-3 optional paper stacker, 1
- ❖ Mounting fillers, 2 (used when installing with a PF-7 paper feeder)
- ❖ Paper receiving sub tray, 1
- ❖ Instruction manual, 1

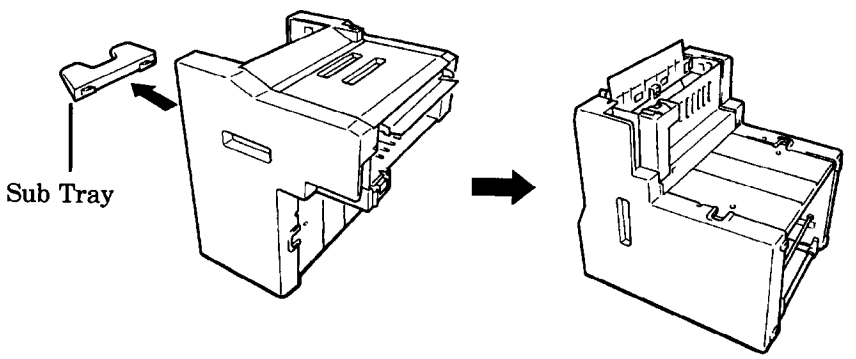
1.3.2. Installing the Paper Stacker with a PF-7 Paper Feeder

When the printer is installed with a PF-7 option paper feeder, the printer is mounted onto the mounting base provided by the feeder kit. (For details on the paper feeder installation, refer to the instructions provided with the PF-7 option paper feeder.) Then, the HS-3 paper stacker mounts on the rear of the printer.

Cautions: Always turn off the printer's power before installing or removing the paper stacker.

When setting the paper stacker before installing it or after removing it from the printer, remove the sub tray and lay the paper stacker on its side as shown below.

Figure 1.2. Putting stacker on the side

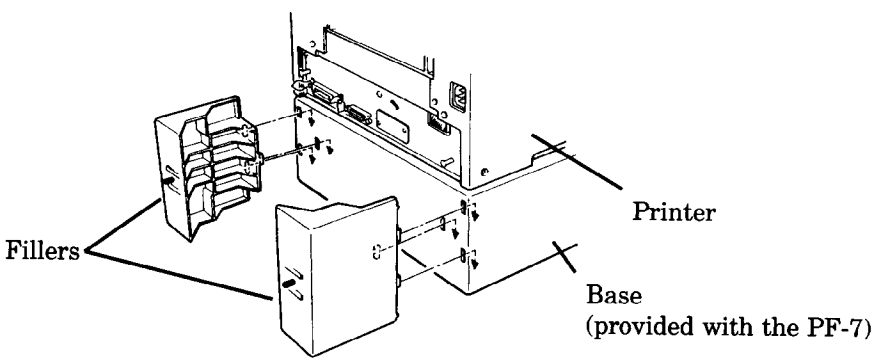


Note: When using the legal cassette in the printer, remove the cassette until the paper stacker is installed.

1. If installed, remove the printer's face-up tray from the printer.
2. Mount each of the mounting fillers onto the back of the feeder's mounting base as shown below.

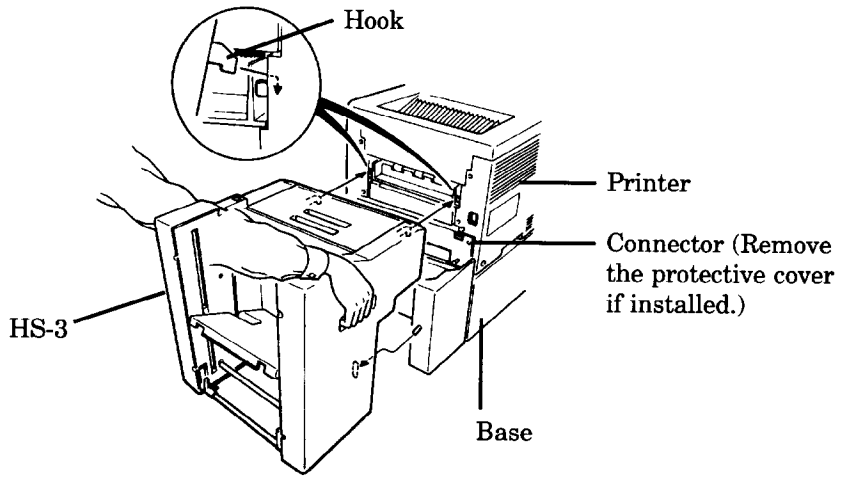
   Align and hook the three hooks on the filler with the holes on the base.

Figure 1.1. Mounting fillers



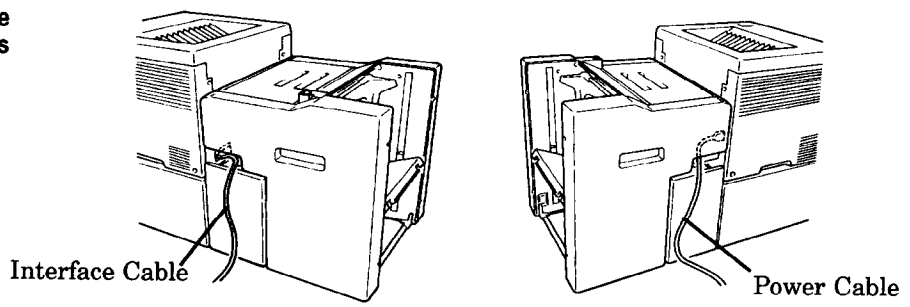
3. Mount the paper stacker on the rear of the printer as shown. Make sure to remove the cap from the printer's connector.

Figure 1.3. Mounting the stacker



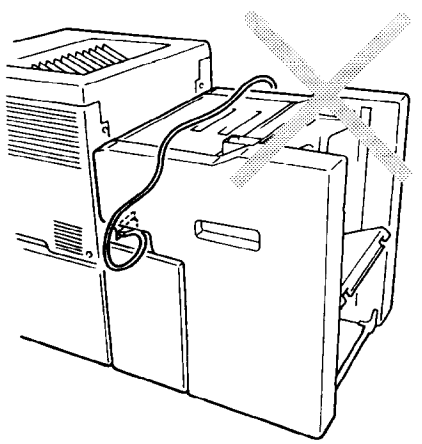
4. When installing the paper stacker, arrange the printer's power and interface cables to fit through the slots at the side of the paper stacker as shown below.

Figure 1.4. Cable arrangements



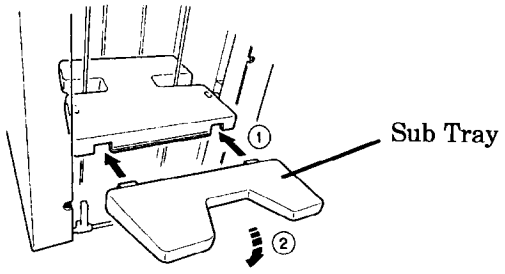
Note: Do not let cables hang on the paper stacker.

Figure 1.5. Avoid cabling like this



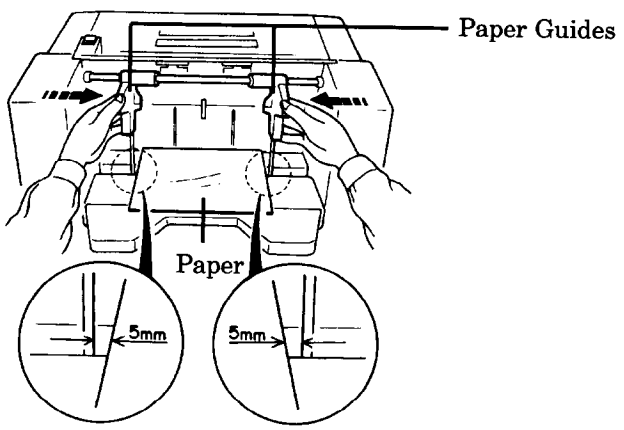
5. Mount the sub tray to the main tray as shown below.

Figure 1.6. Mounting the sub tray



6. Adjust the left and right paper guides according to the paper size of the paper on the tray. Note that the paper guides are best adjusted when there is an approximately 5-mm gap on each side of the paper delivered to the adjuster.

Figure 1.7. Adjusting the paper guides

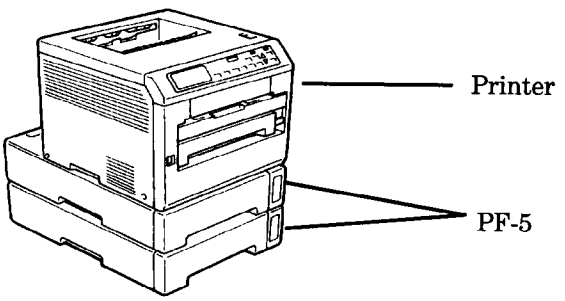


This completes setting up the paper stacker. Before using the stacker, make sure that the top cover is closed. Then, plug the printer to power.

1.3.3. Installing the Paper Stacker with Two PF-5 Paper Feeders

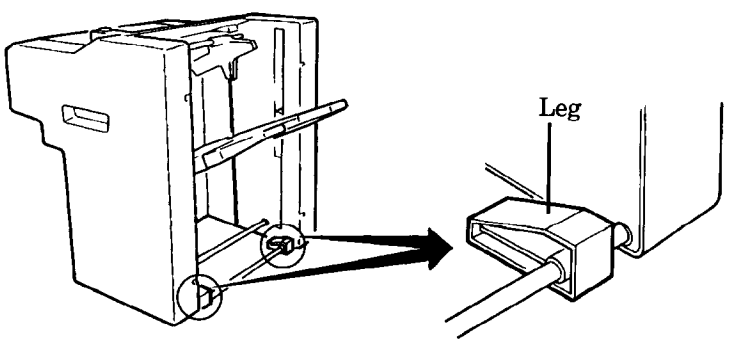
Before installing the paper stacker to the printer with two PF-5 paper feeders, first install the PF-5 paper feeders to the printer as shown below. For the full details on the installation of the PF-5 paper feeders, refer to the paper feeder's Instructions book.

Figure 1.8. Printer and two PF-5's



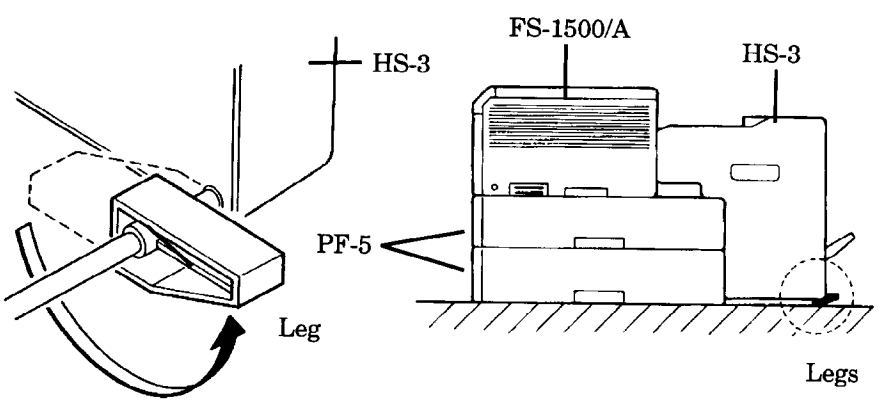
When using the paper stacker together with two PF-5's, the two legs at the bottom left and right sides of the stacker must be adjusted.

Figure 1.9. Adjusting legs



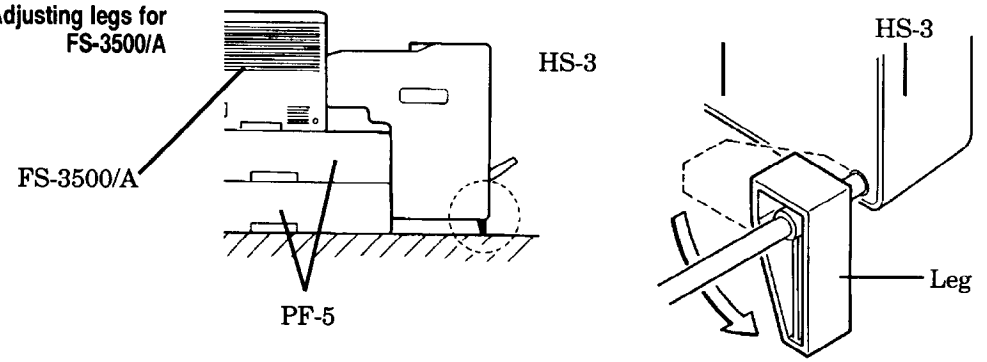
1. If the printer is a FS-1500/A, pivot down the two legs of the stacker as shown below.

Figure 1.10. Pivoting down legs



If the printer is a FS-3500/A, adjust the two legs of the stacker as shown below.

Figure 1.11. Adjusting legs for FS-3500/A



2. Follow steps 3 through 6 of section *Installing the Paper Stacker with a PF-7 Paper Feeder* to complete the installation.

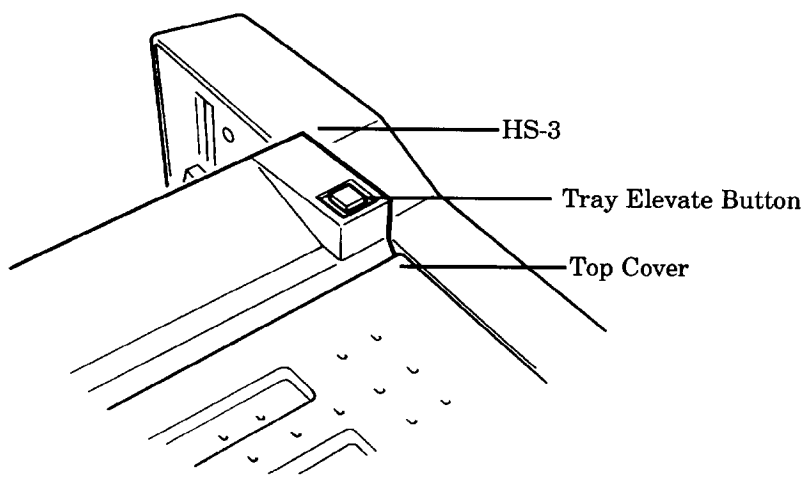
1.4. Operating the Paper Stacker

You can select paper stack into the paper stacker using the STACK SELECT key on the printer's control panel.

1. Turn printer power on by pressing the printer's POWER switch. If there is no paper in the stacker, the stacker's tray rises to the home (uppermost) position.

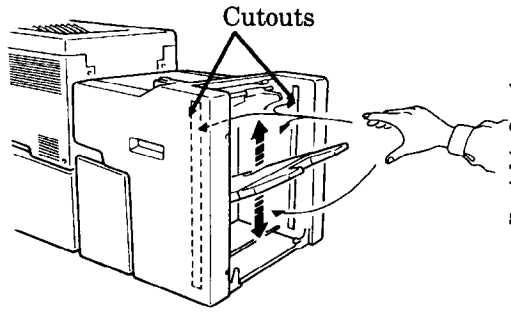
   If you remove paper from the paper stacker which may have been delivered as a previous job of printing, you can manually set the paper tray to the home position by pressing the **tray elevate** button at the top of the paper stacker. See figure below.

Figure 1.12. Tray elevate button



Warning: When the paper tray is rising or descending, do not put your hand above or below the tray. Keep your fingers out of the left and right cutouts inside the paper stacker.

Figure 1.13. Warning



2. Verify that the printer's message display shows `Ready`.

3. To select the stacker for face-up delivery of printed pages, press the STACK SELECT key on the printer's control panel so that the printer's message display shows `Face-up tray`.

4. Make sure that the printer is on-line, then begin printing.

   During printing, the paper tray in the stacker automatically lowers as it receives printed pages.

Note: The printer does not stop printing when the stacker tray becomes full. If printing is continued, paper will fall out of the tray or jam inside the stacker. Therefore, when the tray becomes full, set the printer off line and remove the paper as described below, then set the printer back on line to resume printing.

5. When printing is finished, remove all paper from the paper stacker and press the **tray elevate** button at the top of the stacker to reset the tray to its home position.

1.4.1. Selecting the Paper Stacker using PRESCRIBE Commands

In a file or program, you can select the paper stacker as the paper destination by placing the PRESCRIBE STAK command: `!R! STAK 2; EXIT;`

The following command sequence using the PRESCRIBE FRPO command permanently changes the printer's power-on paper stack setting to the option stacker: `!R! FRPO R0, 2; EXIT;`

1.5. 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 sorter. These are to prevent the possible personal injuries to the technician and the damage to the equipment.

1.5.1. Precautions

Always observe the following precautions when maintaining or inspecting the paper handler/stacker.

- 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 handler/stacker.
- 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 handler/stacker 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 handler/stacker in a cool, dark, dry area. Avoid storage in dusty areas.
- ❖ Ship units out on a first in, first out basis.

1.5.2. 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.

1.6. Specifications

Item	Specification
Applicable printers	Kyocera FS-1500/A, FS-1550/A, and FS-3500/A
Paper capacity	2,000 sheets maximum, 75 g/m^2 (0.1 mm)
Paper size	Width: 76 to 216 mm (3 to 8.5") × Height: 148 to 305 mm (5.8 to 12")
Environmental requirements	Temperature: 10 to 32.5° C Humidity: 20 to 80% RH Ideal conditions are 20° C/65% RH, altitude under 2,000m.
Dimensions	373 mm (14.7") H × 345 mm (13.6") W × 332 mm (13.1") D
Weight	6kg (13.2 lb..)
Power supply	Supplied from printer

CONTENTS

2 MAINTENANCE

2.1. Introduction

This chapter explains the following subjects:

Section 2.2 explains with illustrations the disassembly procedures required to replace parts.

2.2. Disassembly

This section provides procedures for disassembling the paper stacker. The exploded diagram in chapter 5 will also help locating a part.

Before beginning any disassembly procedure, be sure to read the notes below:

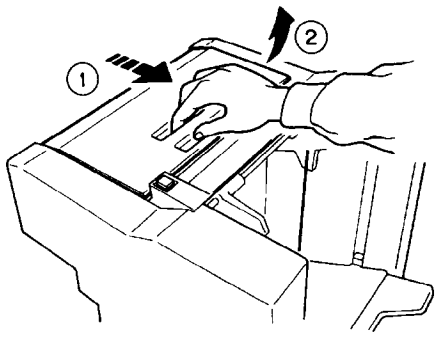
- Before removing the paper stacker from the printer, be sure to turn off the printer power and disconnect the connecting cables that may be running underneath the paper handler/stacker.

- Be sure to use the correct screws when installing a component. Using incorrect screws can result in the threads of the screws being stripped, which may lead in turn to other problems. Frequent insertion and removal of self-tapping screws can cause damage to screw holes. Do not tighten screws excessively.

- When removing or installing circuit boards, wear a gounrded wrist strap to protect against damage due to discharge of static electricity.

Before proceeding, make sure printer power is switched off. Remove the face-up stack tray from the paper handler/stacker. Remove the paper stacker from the printer's rear panel.

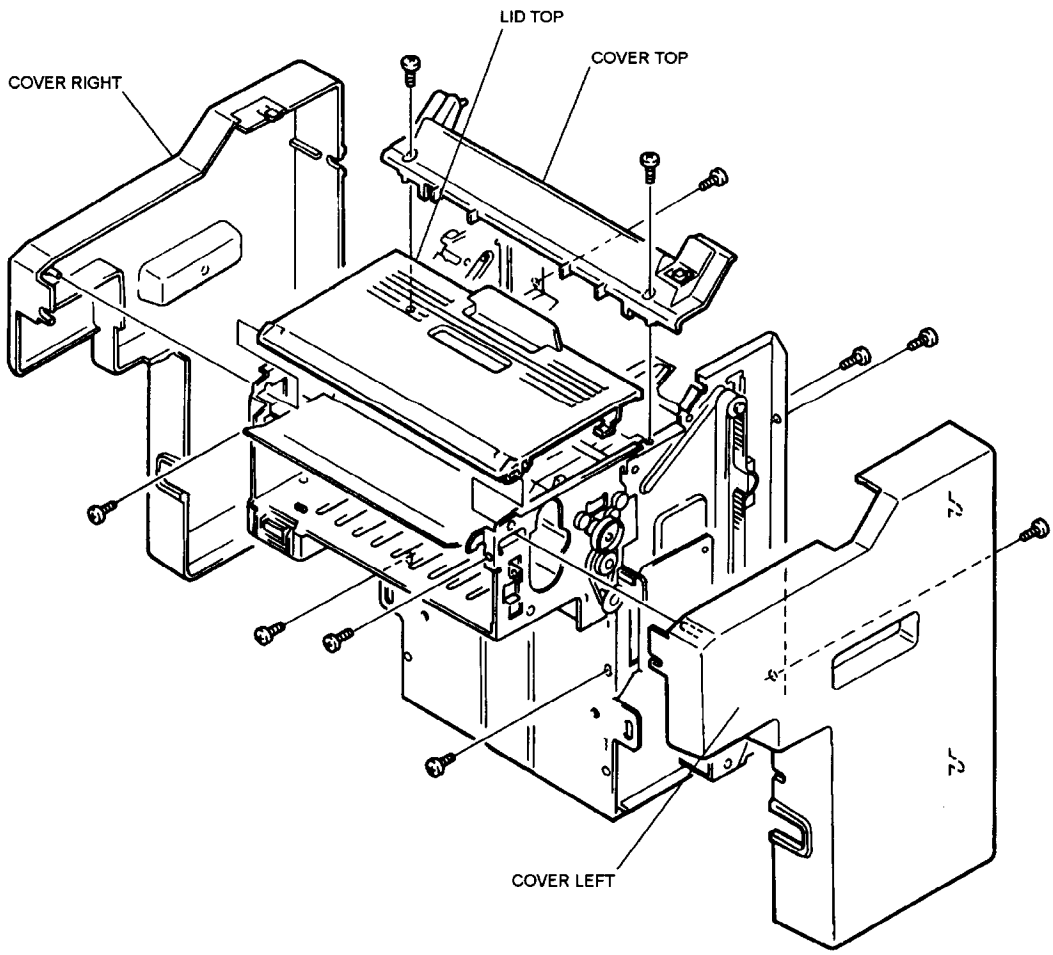
2.2.1. Removing the covers



Before removing the covers, open the top lid as shown to the right.

To remove the covers, refer to the diagram below. Note that the left and right side covers can be removed by simply loosening screws several turns.

Figure 2.1. Removing the covers



2.3. Cleaning procedure

After the paper stacker has been used for a certain period of time, tiny paper scraps and dust will begin to accumulate on the rollers. Because these scraps and dust will hamper proper paper feeding, periodic cleaning is necessary using the procedure explained below.

Open the top lid. Clean the feed rollers with a cloth moistened with alcohol.

CONTENTS

3 | PARTS CATALOG

This page intentionally left blank

3.1. Introduction

This chapter shows exploded view of the paper stacker. It is followed by parts list that lists 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

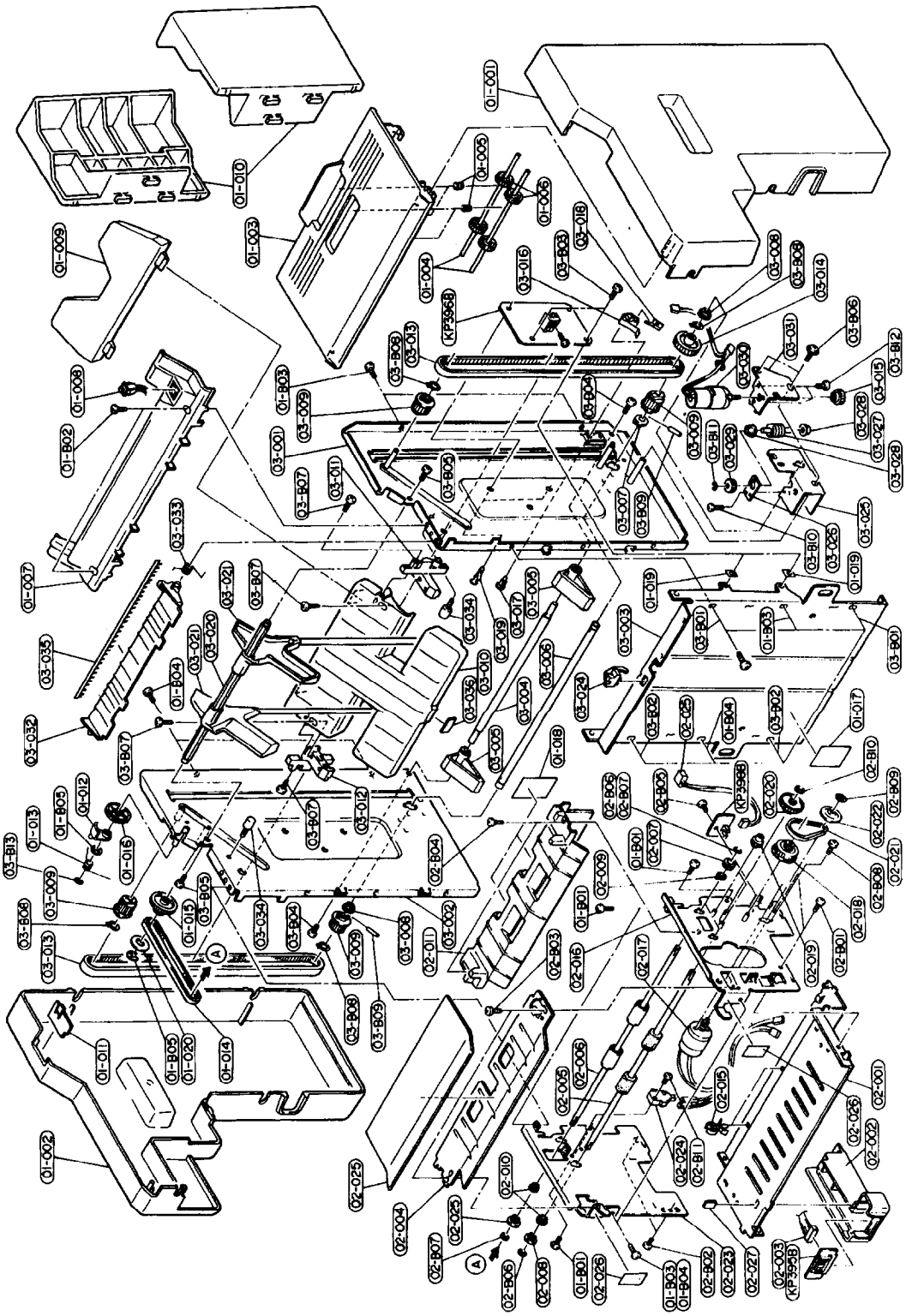
Parts printed in bold letters in the lists are the recommended parts, stocked, and may be ordered from the nearest Kyocera Regional Service facilities.

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 view



3.3. Parts list

Ref. No.	Part code	Description	Q'ty	Remarks
02-001	5MMZ866SL002	FRAME LOW	1	
02-002	5MVB764SW005	BOX PWB	1	
02-003	5AACCNNB3GEA	CONN. CORD S00844	1	
02-004	5MMS866SL017	GUIDE PAPER F	1	
02-005	**5MMT875SN005**	**ROLLER TRANS A**	**1**	
02-006	**5MMT875SN006**	**ROLLER EXIT**	**1**	
02-007	5MVG127DB029	GEAR Z14	2	
02-008	5MVG327DB003	PULLEY P17	1	
02-009	5MMM176CJ005	BUSHING SBK	2	
02-010	5MVM176DB006	BUSHING POM	2	
02-011	5MVL866SW001	GUIDE PAPER R	1	
02-015	5MVX431NN001	SPACING CLIP	2	
02-016	5MMX777SL001	FRAME RIGHT	1	
02-017	**5AAYHS3***02**	**TRNS MOTOR ASSY**	**1**	
02-018	5MVG368DB001	GEAR Z28-P56	1	
02-019	5MVG127DB030	GEAR FEED Z14	2	
02-020	5MVG148DB018	GEAR Z28-P56	1	
02-021	**5MVM150RB007**	**BELT MOTOR Z70**	**1**	
02-023	5MMX777SL002	FRAME LEFT	1	
02-024	**5ESM010234***01**	**MICRO SWITCH**	**1**	
02-025	5AACCNB4GEA	CONN CORD S00845	1	
02-025	5MVG326DB001	PULLEY MXL14	1	
02-025	5MVS 862KN002	SHEET TRANSFER	1	
02-026	5MVS421KN002	SHEET A	2	
02-027	5MVS217SF001	SPACER BOX	1	
Screws				
02-B01	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
02-B02	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
02-B03	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
02-B04	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
02-B05	5MBTPB3006TZ	BIND T.T. SCREW (+)	1	
02-B06	5MBCE4060XSW	E STOP RING	2	
02-B07	5MBCE4060XSW	E STOP RING	2	
02-B08	5MBSPP2603NZ	PAN HEAD SCREW (+)	2	
02-B09	5MBCS5025XSP	CS STOP RING	1	
02-B10	5MBCE4060XSW	E STOP RING	1	
02-B11	5MBTPB3014TZ	BIND T.T. SCREW (+)	1	

Ref. No.	Part code	Description	Q'ty	Remarks
03-001	**5MMX876SL020**	**FRAME ELEVATOR R**	**1**	
03-002	5MMX876SL007	FRAME ELEVATOR L	1	
03-003	5MMS886SL007	FRAME STACK	1	
03-004	5MMT865SN002	SHAFT FOOT	1	
03-005	**5MVX643SW002**	**FOOT**	**2**	
03-006	5MMT866SN018	SHAFT ELEVATOR	1	
03-007	5MMM176CJ003	METAL BUSH KD	1	
03-008	5MVM122DB003	BUSH POM	2	
03-009	5MVG318DN001	PULLEY XL14	4	
03-010	5MVB882SW003	TRAY ELEVATOR	1	
03-011	5MVX665DN001	GUIDE ELEVATOR R	1	
03-012	5MVX665DN002	GUIDE ELEVATOR L	1	
03-013	**5MVM190RB016**	**BELT XL280-9.6**	**2**	
03-014	**5MVG138DN018**	**GEAR WHEEL H30**	**1**	
03-015	5MVG127DN031	GEAR MOTOR	1	
03-016	5MVX532DN001	BKT SENSOR BOTTLE	1	
03-017	5MBRP3045QNB	PAN HEAD RIVET	1	
03-018	**5ESM010235***01**	**MICRO SWITCH**	**1**	
03-019	5MVX211NN019	LOCKING CARD SPACER	2	
03-020	5MMT865SN004	SHAFT STAY	1	
03-021	5AAYHS3***14	PAPER SIZE R ASSY	1	
03-022	5AAYHS3***15	PAPER SIZE L ASSY	1	
03-024	**5AAXPS022GEA**	**PT. SENSOR ASSY**	**1**	
03-025	5MMU654SL001	BKT WORM	1	
03-026	5MMS336SL008	PLATE WORM	1	
03-027	**5MVG117DN001**	**GEAR WORM**	**1**	
03-028	5MVM122DB003	BUSH POM	2	
03-029	**5MVG137DB024**	**GEAR CLUTCH Z22**	**1**	
03-030	**5AAYHS3***01**	**ELEV MOTOR ASSY**	**1**	
03-031	5MML654SL002	BKT DC MOTOR	1	
03-032	5MVX832CB006	GUIDE CHANGE	1	
03-033	5MMW162LJ011	SPRING GUIDE	1	
03-034	5MMT263SZ016	PIN STUD	2	
03-035	5MVS824XF001	DISCHARGER HS	1	
03-036	5MVS643KN001	SEAL TRAY	2	
KP395B	5AAPRIFC2004AH	P.W. BOARD ASSY	1	
KP396B	5AAPRDVC2004AH	P.W. BOARD ASSY	1	
KP398B	5AAPRSSC2002AH	P.W. BOARD ASSY	1	
Screws				
03-B01	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
03-B02	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
03-B03	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
03-B04	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
03-B05	5MBTPB3006TZ	BIND T.T. SCREW (+)	2	
03-B06	5MBSP43008NZ	TP SCREW (+)	2	
03-B07	5MBTPB3012WZ	BIND T.T. SCREW (+)	4	
03-B08	5MBCC8080XXP	C STOP RING	4	
03-B09	5MBP2012WPLD	PARALLEL PIN	2	
03-B10	5MBTPB3006TZ	BIND T.T. SCREW (+)	1	
03-B11	5MBCE7080XSW	E STOP RING	1	
03-B12	5MBSPP3006NZ	PAN HEAD SCREW (+)	3	
03-B13	5MBC6025XSP	CS STOP RING	1	

Ref. No.	Part code	Description	Q'ty	Remarks
01-001	5MVB885SW002	COVER RIGHT	1	240V / 120V / 100V
01-002	5MVB885SW003	COVER LEFT	1	240V / 120V / 100V
01-003	5MVX874SW001	LID TOP	1	
01-004	5MMT733SN001	SHAFT EXIT	2	
01-005	5MMW251LD005	SPRING PULLEY	4	
01-006	5MVM174DB002	PULLEY EXIT	4	
01-007	5MVX863SW005	COVER TOP	1	
01-008	**5AAYHS3***03**	**PUSH SWITCH ASSY**	**1**	
01-009	**5MVB872SW029**	**TRAY BACK**	**1**	
01-010	**5MVB876SW008**	**BKT HS**	**1**	
01-011	5MVS432SW001	COVER JOINT	1	
01-012	5MVX332SB016	COVER GEAR	1	
01-013	5MMW162LJ012	SPRING COVER	1	
01-014	5MVM150RB009	BELT MXL109-32	1	
01-015	5MVG048DB007	GEAR FUX Z32-P19	1	
01-016	5MVG138DB020	GEAR FD Z30	1	
01-017	5MVVSH3J**1	LABEL SERIAL J	1	100V
01-017	5MVVSHS3***1	LABEL SERIAL	1	240V
01-018	5MVS631KN001	SHEET STACK	2	
01-019	5MVS111KN002	SEAL PWB	2	
01-020	5MBWN92135NB	POLY WASHER	1	
01-022	5MVM196DB003	PLATE ENCODER	1	
Screws				
01-B01	5MBTPB3006TZ	BIND T.T. SCREW (+)	4	
01-B02	5MBTPB3008TN	BIND T.T. SCREW (+)	2	
01-B03	5MBTPB3008TN	BIND T.T. SCREW (+)	4	
01-B04	5MBTPB3008TN	BIND T.T. SCREW (+)	4	
01-B05	5MBCE5060XSW	E STOP RING	2	

CONTENTS

4 HARDWARE NOTES

This page intentionally left blank

4.1. Introduction

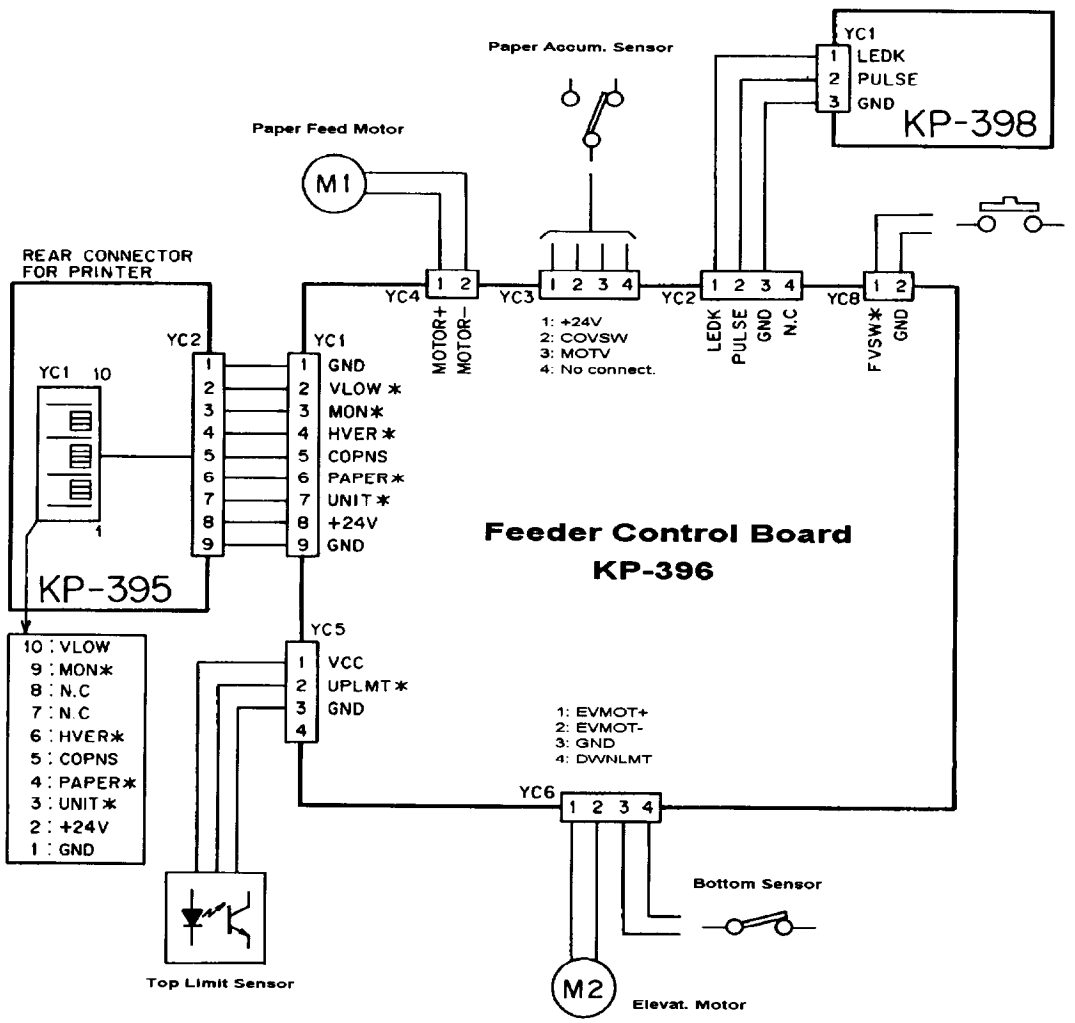
This chapter describes the operation of the electrical circuits in the paper stacker. Referring to the schematic diagram in Appendix while reading through this chapter will help easy understanding of the operation of the circuits.

Section 4.2. describes the block diagram and terminal configuration, including signals.

4.2. Block diagram and terminal configuration

This section describes how the boards and other major components are wired. Signal names and their definitions are also tabled.

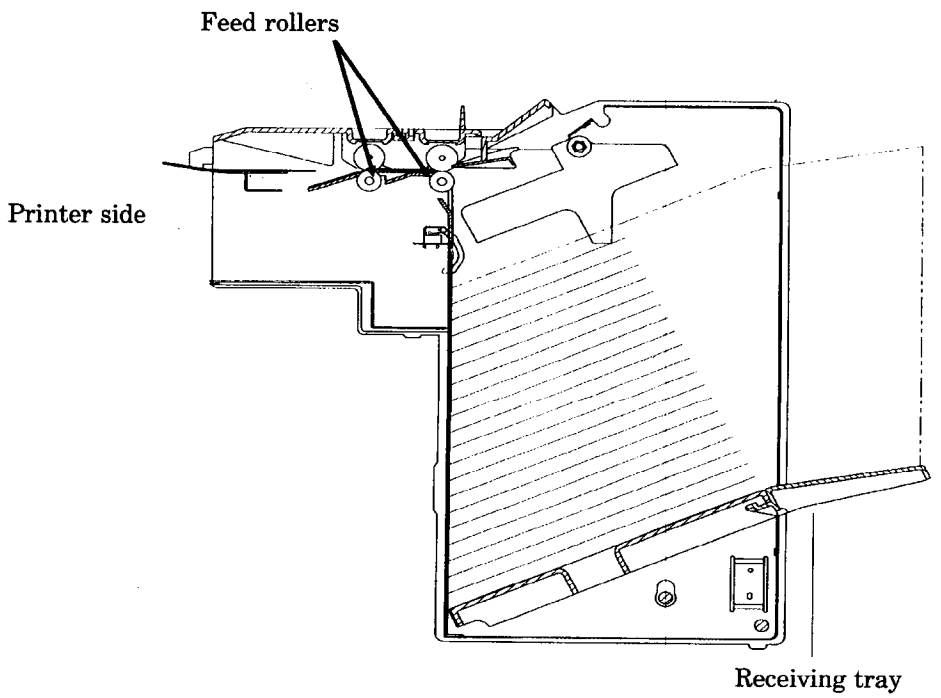
Figure 4.1. Block diagram



4.3. Overview of stacker operation

The stacker receives printed paper as it is deliered from the printer's face-up outlet, pulling the paper toward the receiving tray by means of the feed rollers. The receiving tray, which usually waits for paper at its topmost position in the stacker, descends as it receives paper and the paper has ccummulated for approximately 1 inch thickness as the paper stack pushes in the sensor.

Figure 4.2. Stacker operation



As the pritner finishes data processing and begins rotating its paper feeding rollers, etc., the $\overline{\text{MON}}$ signal turns to be low at pin 3 of the feeder connector (YC1) at the back of the printer. This starts rotating the paper feeder motor (M1) in the

feeder and drives the rollers to transport paper into the paper receiving tray.

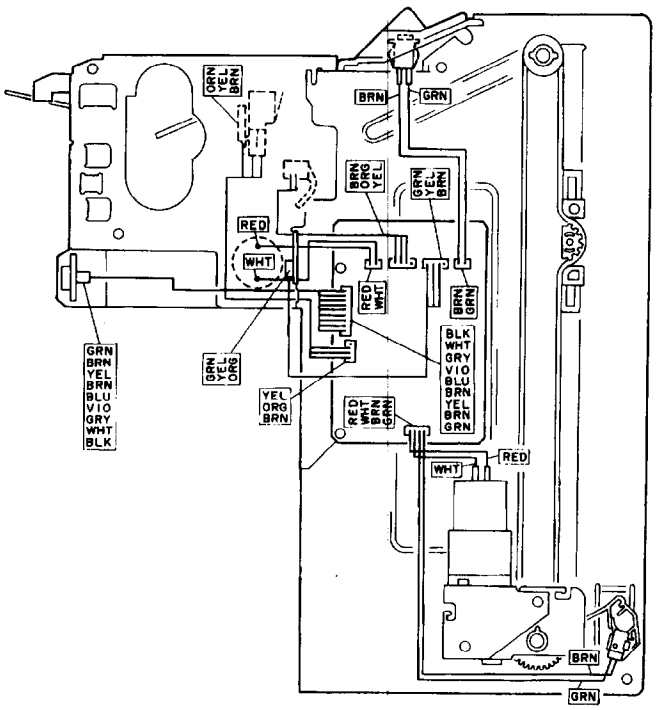
Pin configuration for all connectors in the feeder is tabled below.

Board	Connect.	Pin	Signal	Definition
KP-396, controller board	YC1	1	GND	Ground
		2	$\overline{\text{VLOW}}$	Unused
		3	$\overline{\text{MON}}$	Motor control
		4	$\overline{\text{HVER}}$	Speed control
		5	COPNS	Top cover is open.
		6	$\overline{\text{PAPER}}$	Paper is not present.
		7	$\overline{\text{UNIT}}$	Stacker install. detection
		8	+24V	+24V power
		9	GND	Ground
	YC2	1	+24V	+24V power
		2	PULSE	Encoding signal
		3	GND	Ground
	YC3	1	COVSW	Top cover is open.
		2	+24V	+24V power
		3	MOTV	Unused
	YC4	1	MOTOR+	Feed motor + power
		2	MOTOR-	Feed motor - power
	YC5	1	Vcc	+5V power
		2	$\overline{\text{UPLMT}}$	Elevation top sensor signal
		3	GND	Ground
	YC6	1	EVMOT+	Elevation motor + power
		2	EVMOT-	Elevation motor - power
		3	GND	Ground
		4	DWNLMT	Elevation bottom limit sig.
	YC8	1	$\overline{\text{EVSW}}$	Elevation reset switch
		2	GND	Ground

4.3.1. Electrical parts

The stacker's internal electronics serves maily for activating and deactivating motors to rotate rollers for paper feeding and to elevate and lower the paper receiving tray in cooperation with sensors. Figure below shows the location of major electrical components in the stacker.

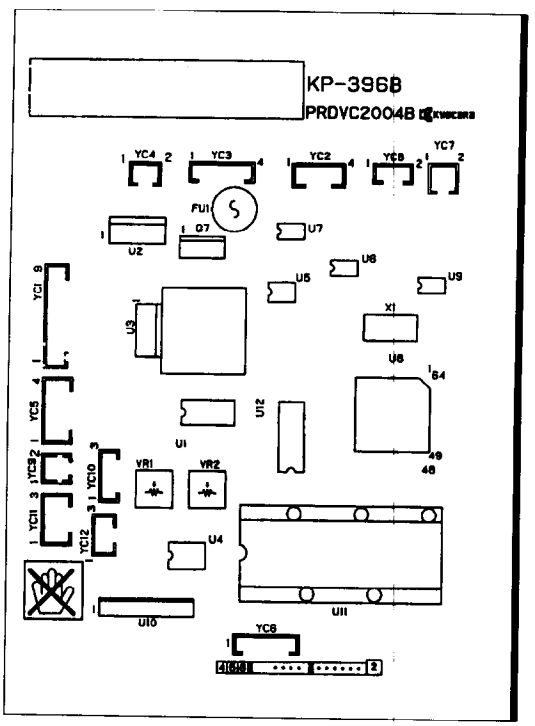
Figure 4.3. Electrical parts



4.3.2. IC details and pin assignments

This section describes information on the major ICs used with the stacker. Figure below shows the location of ICs, connectors, etc.

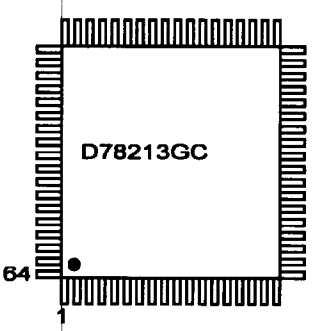
Figure 4.4. Main board



Main controller, mPD78213GC (U8)

The 78213 is a one-chip microprocessor, including ROMs and RAMs for controlling paper feeding and tray elevation using sensors and motors.

Figure 4.5. 78213



The pin assignment is as tabled below.

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	Output
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	P24	$\overline{MON}$	Feed motor drive, L: active	Input
33-35	P25-27	—	Unused	—
36	P30	COPNS	Cover status signal, H: active	Output

Pin #	Port #	Signal	Function	Input/ Output
37	P31	$\overline{\text{PAPER}}$	Paper jam signal, L: active	Output
38, 39	P32, 33	—	—	—
40	—	—	—	—
41	—	VDD	—	—
42	—	AVSS	—	—
43	—	AVREF	—	—
44	P75	—	—	—
45	P74	—	Unused, connected to ground	Input
46-49	P73 -AN0	—	—	—
50	P34	COVSW	Cover open signal, L: active	Input
51	P35	$\overline{\text{UPLMT}}$	Elevator upper limit sensor signal, L: active	Input
52	P36	DWNLMT	Elevator lower limit sensor signal, H: active	Input
53	P37	$\overline{\text{EVSW}}$	Elevator reset signal, L: active	Input
54	P00	EVCNT2	Tray elevat. motor drive signal 2	Output
55	P01	EVCNT1	Tray elevat. motor drive signal 1	Output
56, 57	P02, 03	—	Unused	—
58	P04	—	—	—
59	P05	MOTOR	Feed motor drive signal	Output
60	P06		—	—
61	P07	—	—	—
62-64	P67-65	—	Unused	—

Tray motor driver, TA8428K (U10)

The TA8428K, U10, 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 paper accumulation sensor, each time triggered, requests U10 to rotate the tray elevation motor in forward direction so that the paper tray descends; while it drivers the motor in reverse direction when the tray elevate button on top is closed. The driver stops the motor either when the tray has reached the top or bottom most position, pressing the appropriate sensor.

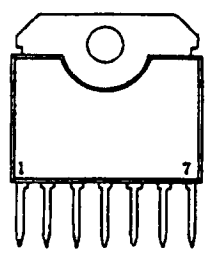


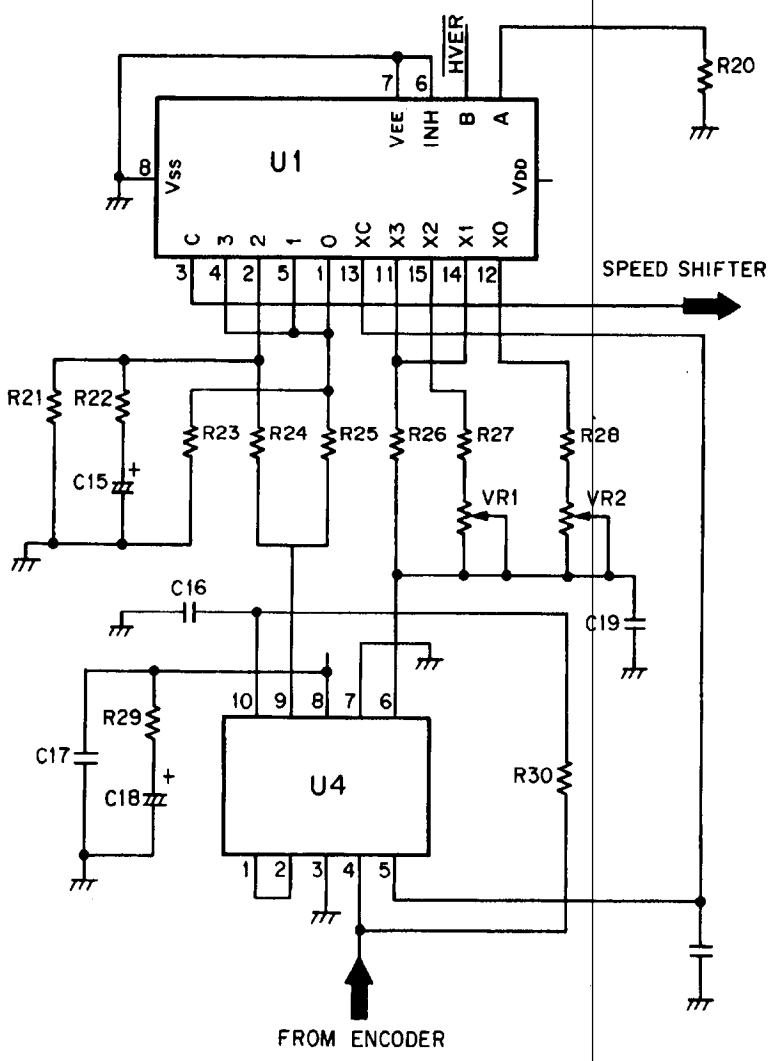
Figure 4.6. TA8428K

Motor speed shifter, 4052 (U1)

The paper stacker is compatible with the printers of different printing speeds. Therefore, it should shift the motor speed in two ways by means of the speed shifter circuit described in this section.

Figure below shows the system comprised of the speed shifter and a gain controller. By changing the gain of the IC, which is accomplished by selecting a proper resistance of R27+VR1 and R28+VR2, to switch the level of HVER signal. The level is low when the stacker receives paper running at 60mm/s for model FS-1500/A, FS-1550/A; and the level is high when paper is running at 115mm/s for model FS -3500/A.

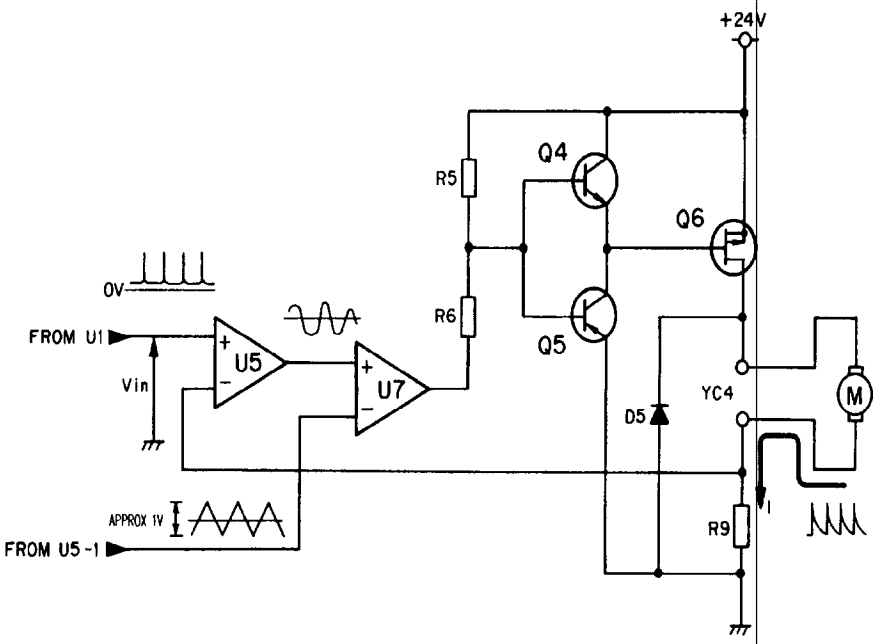
Figure 4.7. Motor speed shifter



Paper feed motor driver, 3404 (U5)/311 (U7)

Figure below shows a simplified schematic diagram of the motor driver.

Figure 4.8. Motor driver



The motor is of constant-current driven. U5 continuously compares the motor speed shifter's (U1) output (told previously) with the current flowing through the motor. This comparison is represented by the following formula:

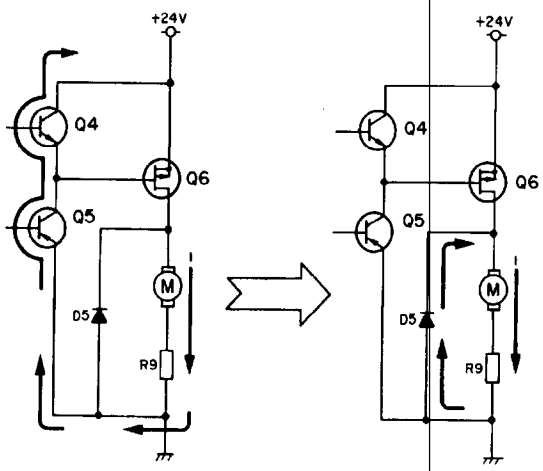
$Vin = R9 \times i$

Resistor R9 is for motor speed detection. The U5's reference output is automatically adjusted so that the above formula is continuously fulfilled. U7 pulse-modulates the U5 output. The complimentary buffers, Q4 and Q5, switch Q6 on and off which in turn controls the motor to revolve.

The motor is constantly switched on and off while U5 makes comparison on the U1 output and the motor current. To smooth the motor revolution, diode D5 is provided to induce the *flywheel effect* which is explained as follows. (Refer to next page.)

Figure 4.9. Flywheel effect The current given by the +24 V source circulates through Q6, etc., and drives the motor.

At the moment Q6 is turned off, the flywheel current, induced by the electromagnetic energy stored in the motor's inductance, flows momentarily through D5 and supplmentarily drives the motor.



CONTENTS

5 TROUBLESHOOTING

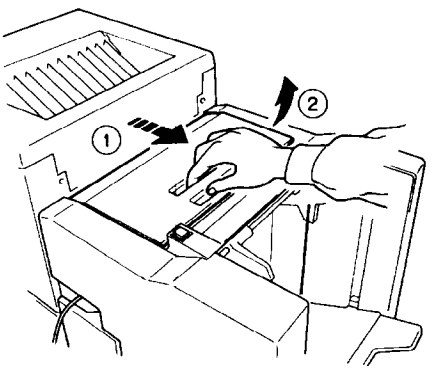
This page intentionally left blank

5.1. Introduction

This chapter explains procedures for identifying and correcting problems (troubleshooting).

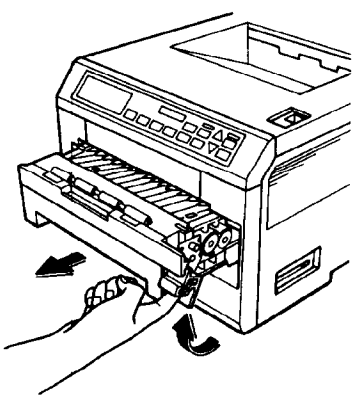
5.1.1. Clearing Paper Jams

If paper jams during printing, the message `Paper jam` appears on the printer's message display. If the paper jams inside the paper stacker, clear the jam as follows.



1. Open the top cover of the paper stacker as shown below. To open the top cover, hold the handle in the top cover and slide toward the tray side, then pivot open.

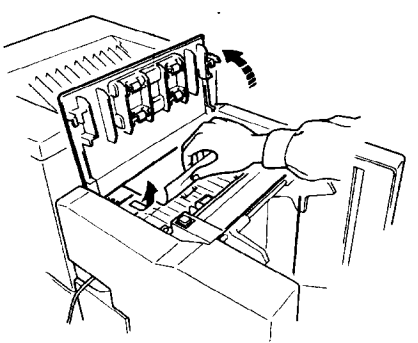
2. Press the paper feed unit release lever up and draw out the paper feed unit half the way out.



3. Clear the jammed paper from the stacker.

   If paper is not found inside the cover, check paper jam inside the printer.

4. After removing the jammed paper, close the stacker top cover properly, using the reverse manner of step 1. Then, close the printer's paper feed unit until it latches in. Wait until the printer's message display indicates `Ready` and the ready indicator stays lit. Press the ON LINE key to resume printing.



Note: If the paper stacker's cover is not closed properly, the message `Paper handler cover Open` appears on the printer's message display. Make sure that the covers are properly closed.

5.1.2. Other paper handling problems

If you frequently experience paper handling problems, please check for the conditions indicated in the table below.

Symptom	Possible Cause	Remedy
Stacker does not rise/lower paper tray.	Stacker's connector not properly mating with printer.	Cables are disturbing the proper connection between the connectors of stacker and printer.
		Stacker's hooks not properly hooked on the printer's rear.
	Sensor in stacker does not sense paper.	Paper with excessive curl is used. Replace paper.
	Too much paper delivered in stacker.	Remove paper from stacker, then press the tray elevate button on the top of stacker.

5.2. Troubleshooting flowcharts

5.2.1. *Paper handler cover open* error

Paper handler cover open

Top cover closed properly? **No→** Close the top cover properly. → «... cover open» goes out?

Yes↓ (from "Top cover closed properly?")

Yes↓ (from "«... cover open» goes out?")

Turn printer power off. Remove and reinstall HS-3 to printer. Turn printer power on.

↓

End

«... cover open» still appears? **No→** **End**

Yes↓

Turn printer power off. Remove HS-3 from printer.

↓

Remove YC3 from KP-396 board. Measure resistance across pins 1 and 2 of the harness.

Yes↓

0Ω when cover is open and ∞ when closed? **No→** **Continued on next page**

Yes↓

Replace KP-396 board.

Paper handler cover open **error—continued**

Paper handler cover open

Continued

↓

Replace rear cover switch.

↓

Remove YC3 on KP-396 board. Measure resistance across pins 1 and 2 of the harness.

↓

0Ω when cover is open and ∞ when closed? **No→** Replace harness.

Yes↓

Reinstall HS-3 on printer and turn printer power on.

↓

«... cover open» still appears? **No→** **End**

Yes↓

Replace KP-396 board.

5.2.2. Feed motor error

Feed motor does not revolve.

Turn printer power off. Remove HS-3 from printer. Reinstall HS-3 to printer and turn printer power on.

↓

Does the motor revolve?

No→ Measure voltage at pin 1 of YC4 on KP-396 board.

Yes↓

End

Å

+24V?

No→ Replace KP-396 board.

Yes↓

Å

Replace motor.

+24V?

No→ Replace printer's engine board.

Yes↓

End

5.2.3. Tray does not ascend

Tray does not ascend when power is on.			Tray does not ascend when the tray ascend button is pressed.		
Paper accummulation sensor depressed?	Yes→	Release the sensor.	Measure voltage at pin 1 of YC8 on KP-396 board while pressing and keeping the tray elevate button down.		
No↓			A		
Measure voltage at pin 1 of YC5 of KP -396 board.		.	0V?	No→	Replace the tray elevata button.
↓			Yes↓		
+5V?	No→	Replace KP-396 board.	Go to Tray does not ascend when power is on in the left column.		
Yes↓					
Measure voltage at pin 2 of YC5 of KP -396 board.					
↓					
+5V?	No→	Replace paper accummulation sensor.			
Yes↓					
Measure voltage across pins 1 (-) and 2 (+) of YC6 on KP-396 board.					
Yes↓					
+24V?	No→	Replace KP-396 board.			
Yes↓					
Replace tray elevation motor.					

5.2.4. Tray does not descend

Tray does not descend.

The paper receiving tray does not descend when the paper accummulation sensor is pressed.

↓

Measure voltage at pin 1 of YC5 of KP -396 board.

↓

+5V? **No→** Replace KP-396 board.

Yes↓

Measure voltage at pin 2 of YC5 of KP -396 board while pressing and holding the sensor.

↓

0V? **No→** Replace paper accummulation sensor.

Yes↓

Measure voltage across pins 1 (+) and 2 (-) of YC6 on KP-396 board while pressing and holding the sensor.* **No→** 0V at pin 4 of YC6 on KP-396 board? **NoÄ** Replace tray bottom sensor.

Yes↓ **Yes↓**

Replace the tray elevation motor. Replace KP-396 board.

* Voltage appears for 500 msec only as the motor revolves only for the same duration.