

# **PAPER HANDLING CONTROLLER PH-72**

## **SERVICE MANUAL PARTS CATALOG**

**REVISION 0**

**Canon**

**JAN. 1999**

**RY8-1397-000**

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***Printed in Japan  
Imprimé au Japon***

Use of this manual should be strictly supervised to avoid disclosure of confidential information.
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## **PREFACE**

This Service Manual contains basic information required for after-sales service of Paper Handling Controller PH-72. This information is vital to the service technician in maintaining the high quality and performance of the controller.

This manual consists of the following chapters:

- Chapter 1: Product information  
Features, specifications and basic operation
- Chapter 2: The Mechanical System  
Installation procedure and malfunction troubleshooting
- Chapter 3: Parts Catalog  
Paper handling controller PCB assembly
- Appendix: Paper handling controller circuit diagram

Information in this manual is subject to change as the product is improved or redesigned. All relevant information in such cases will be supplied in Service Information Bulletins.

A thorough understanding of this controller, based on information in this Manual and Service Information Bulletins is required for maintaining its performance and for locating and repairing malfunctions.

**DTP system**

This manual was produced on an Apple PowerMacintosh 9500/200 personal computer and output by an Apple LaserWriter 16/600 PS laser beam printer; final pages were printed on AGFA Selectset avantra 25.

All graphics were produced with Macromedia FreeHand (E), and all documents and page layouts were created with QuarkXPress (E).

The video images were captured with SONY digital video camcorder and Radius Photo DV capture board, and modified with Adobe Photoshop™ (J).

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# **CHAPTER 1**

## **PRODUCT INFORMATION**

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## **I. FEATURES**

### **1. Option I/O device connection**

By installing the Paper Handling Controller in the printer, connections with optional input devices (high capacity decks with multiple decks of up to 10 decks with a maximum capacity of 6300 pages) and optional output devices (sorters and staple stackers with a maximum of 63 bins) are made possible.

### **2. Wide range of options capability**

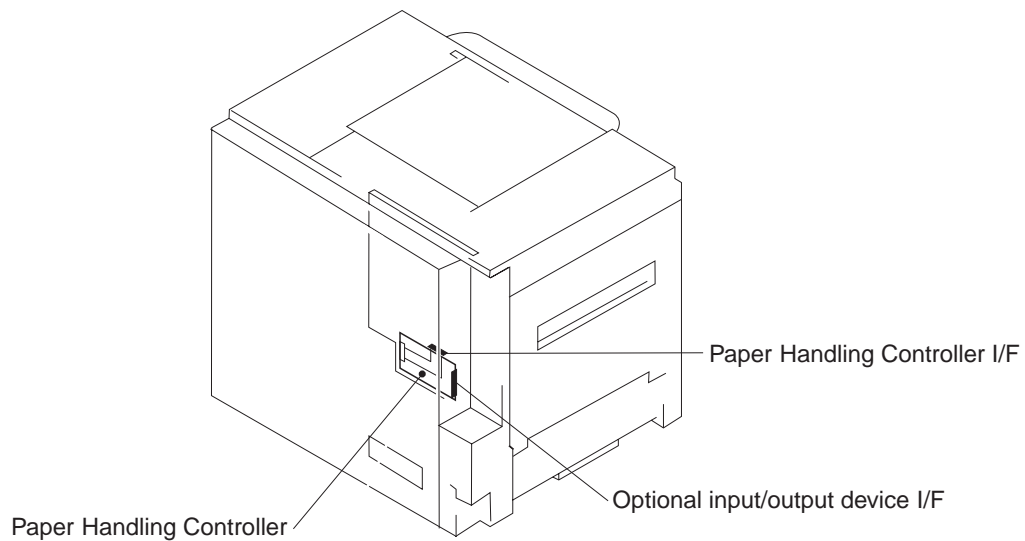
By installing the Paper Handling Controller in the printer, a maximum of 5 optional I/O devices can be connected.

## II. SPECIFICATIONS

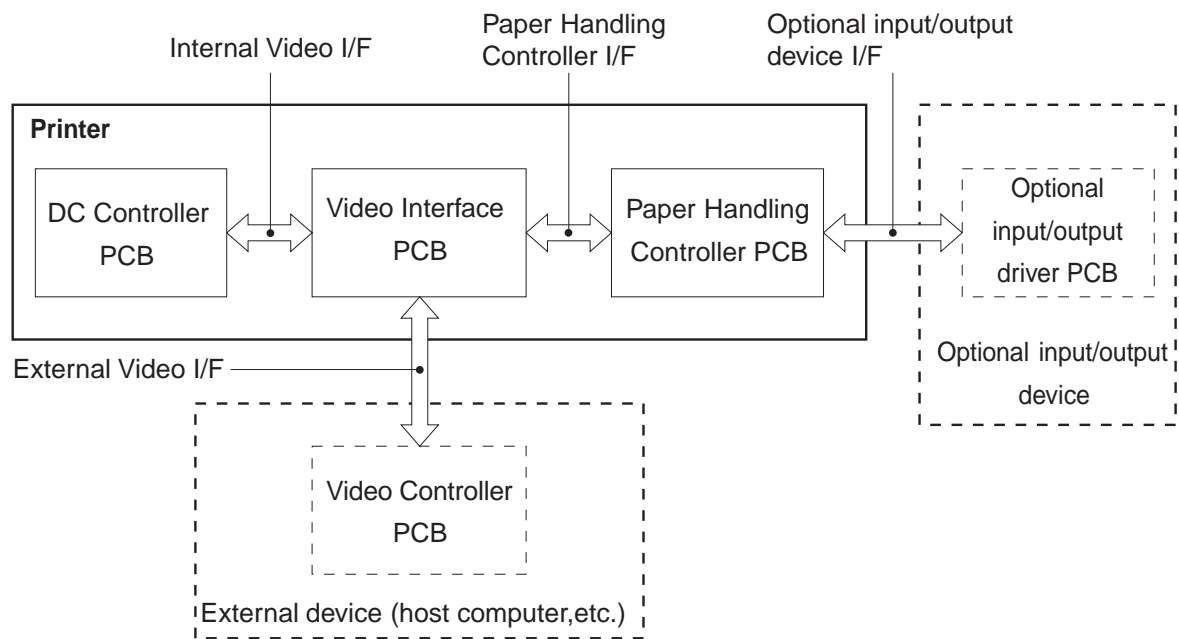
### A. Paper Handling Controller

1) CPU	NEC UPD784020GC-3B9
Memory (RAM)	512 bytes
Frequency	25 MHz
2) EPROM	TEXAS INSTRUMENTS TMS27C512-12JL
	64K bytes
3) SRAM	TOSHIBA TC55257DFL-70L
	32K bytes

### B. Interface Connector Locations



**Figure 1-2-1**

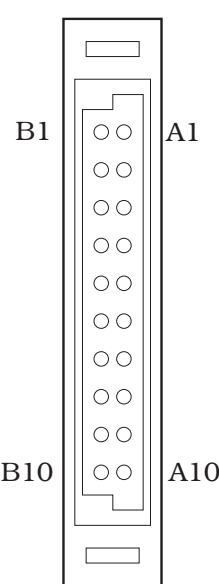
**C. System Block Diagram****Figure 1-2-2**

D. Interface Connector

1. Paper Handling Controller Interface

Table 1-2-1 outlines the connectors and signals which connect the Paper Handling Controller and Video Controller.

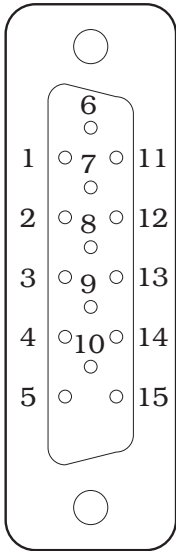
Table 1-2-1

		Pin	Abbreviation	Input/ Output	Signal
		A1	+5V		
		A2	RESET	Input	Reset signal (unused)
		A3	/PRINT	Input	Print signal (unused)
		A4	/SPCHG	Input	Speed change signal (unused)
		A5	/PDLV	Input	Paper delivery signal
		A6	/undetermined 1	Input	For expansion
		A7	N.C.		
		A8	/CKEN	Input	Communication ready signal
		A9	/TX	Input	Send data line
		A10	GND		
		B1	+5V		
		B2	N.C.		
		B3	/VSYNC	Input	Vertical synchronized request signal
		B4	/PFED	Input	Paper feed signal
		B5	RETURN-BACK (GND)		Connection confirmation
		B6	/undetermined 2	Input	For expansion
		B7	/STROBE	Input	Strobe signal
		B8	/RX	Output	Receive data line
		B9	/CLK	Output	Synchronized clock signal
		B10	GND		

2. Optional I/O Device Interface

Table 1-2-2 outlines the connectors and signals which connect the Paper Handling Controller and optional I/O devices.

Table 1-2-2



Pin	Abbreviation	Input/ Output	Signal
1	/TX	Output	Send data line
2	GND		
3	/RX	Input	Receive data line
4	/TERMINATE	Input	Communication ready signal
5	+24V		
6	/CLOCK	Output	Synchronized clock signal
7	GND		
8	GND		
9	GND (KEY)		Mis-insertion prevention
10	+24V		
11	GND		
12	/STROBE	Output	Strobe signal
13	PWRON	Output	Power ON signal
14	GND		
15	+24V		

III. BASIC OPERATION

A. Outline

To install an optional I/O device into the printer, the Paper Handling Controller must first be attached to the printer. The Paper Handling Controller uses an 16 bit micro computer (IC101) that controls serial communication with the Video Controller and serial communication with optional I/O devices. The Paper Handling Controller controls up to 5 optional I/O devices simultaneously according to the various commands and signals sent from the Video Controller and signals sent from the DC Controller.

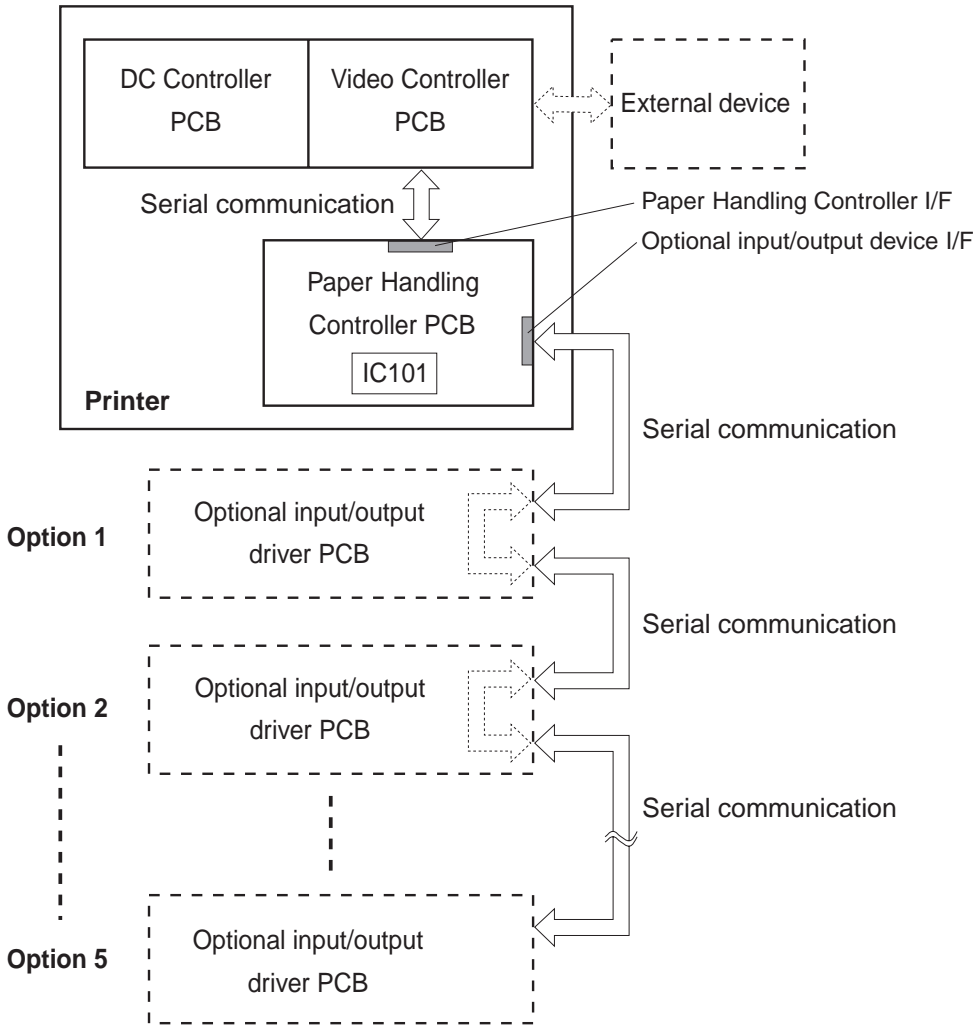


Figure 1-3-1

**B. Operations by Block****1. CPU (IC101)**

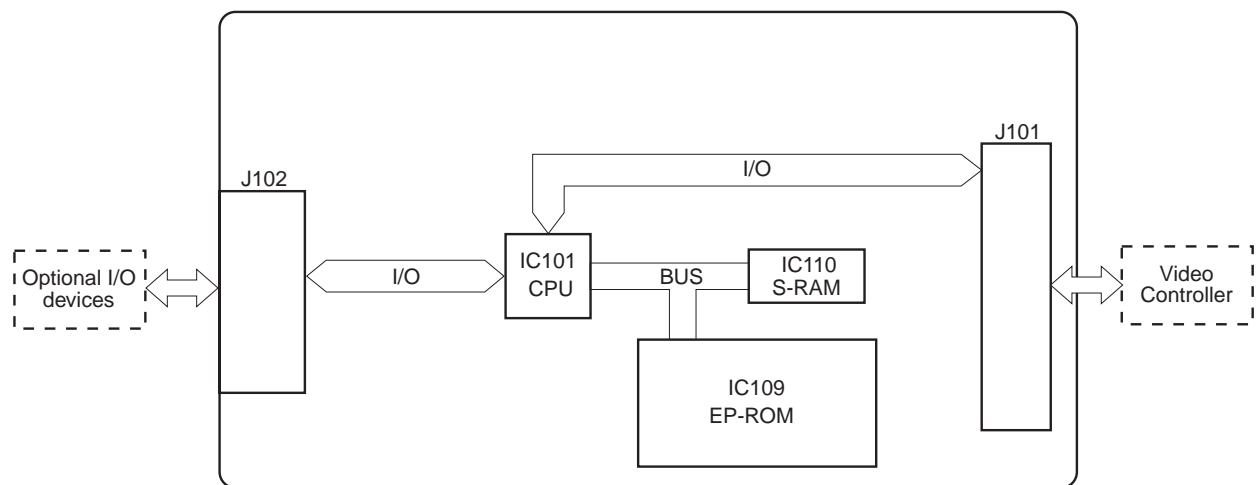
An NEC 1 chip micro computer (UPD784020GC-3B9) is used. The CPU communicates with the Video Controller and optional I/O driver, and controls the optional I/O devices.

**2. EP-ROM (IC109)**

The EP-ROM has a 64K byte memory capacity, and contains the optional I/O device's operation control program.

**3. S-RAM (IC110)**

The S-RAM has a memory capacity of 32K bytes. The S-RAM contains communication data (maximum of 40 pages) between the Video Controller and the optional I/O devices.



**Figure 1-3-2**

C. Operation Outline

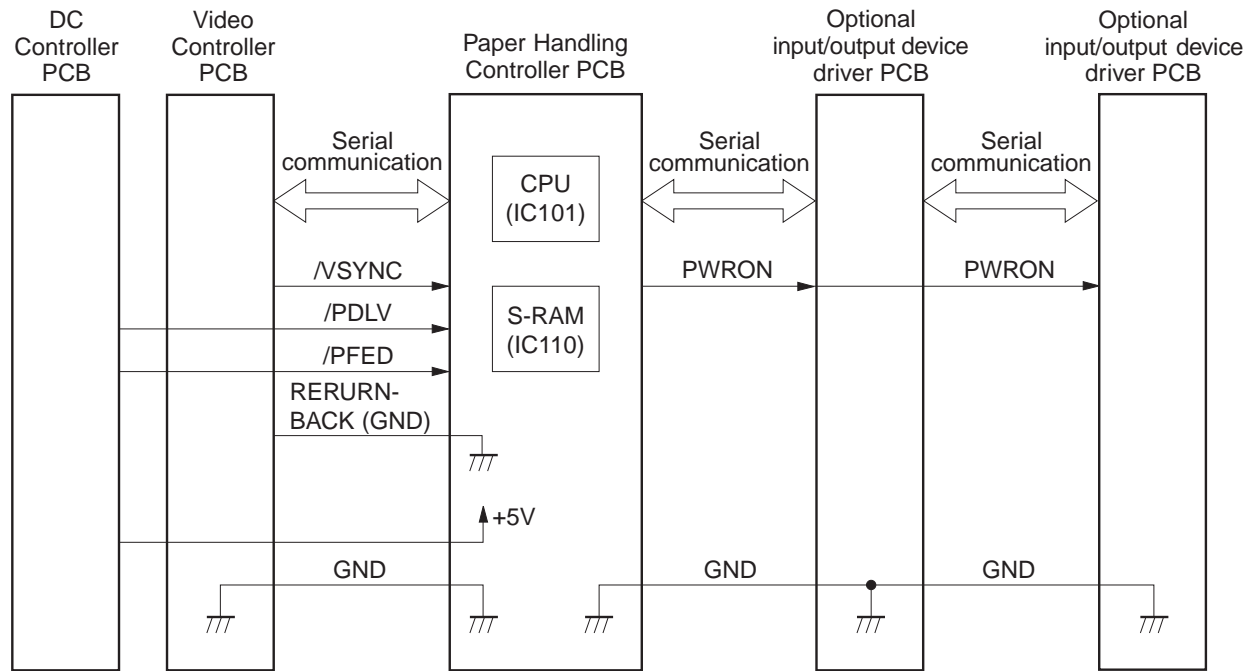


Figure 1-3-3

The Video Controller supplies a +5V power supply to the Paper Handling Controller when the printer power is turned ON, and communication commences after a specified period of time.

The microcomputer (CPU) on the Paper Handling Controller sends a POWER ON (PWRON) signal to the optional I/O device, turning the optional I/O device's power ON. Following this, the Paper Handling Controller and optional I/O device commence serial communication.

The Paper Handling Controller sends pick-up and delivery command data for each page printed to the optional I/O device based on data and the VERTICAL SYNCHRONIZED signal (/VSYNC) from the Video Controller along with PAPER FEED (/PFED) and PAPER DELIVERY (/PDLV) signals output from the DC Controller. The optional I/O device then returns its paper feed status back to the Paper Handling Controller.

The S-RAM (IC110) constantly stores the latest 40 pages of communication data allowing the CPU to control the optional I/O paper feed in real time for each page printed. The Video Controller monitors the paper feed status of the optional I/O device in real time by obtaining S-RAM information via the Paper Handling Controller interface.

# **CHAPTER 2**

## **THE MECHANICAL SYSTEM**

This chapter describes the installation and troubleshooting procedures of the paper handling controller. Note the following precautions during installation and removal.

1. **⚠ CAUTION: Before servicing the paper handling controller, disconnect the printer power cord from the electrical outlet.**
2. Installation is the reverse of removal unless otherwise specified.
3. Note the lengths, diameters, and locations of screws as you remove them. When installing the paper handling controller, be sure to use them in their original locations.
4. Discharge electrical static from your body by touching the metal frame of the printer prior to installing the paper handling controller in order to avoid any static charge causing damage.

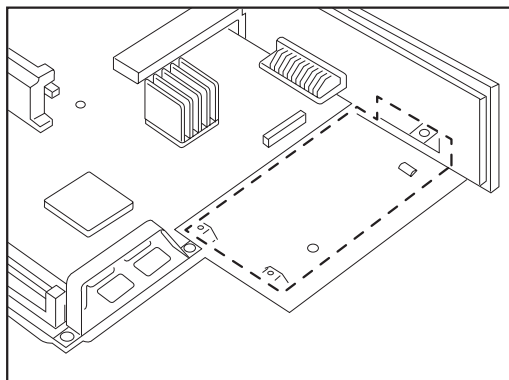
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<b>II. MALFUNCTION</b>	
<b>    TROUBLESHOOTING .....</b>	<b>2-3</b>



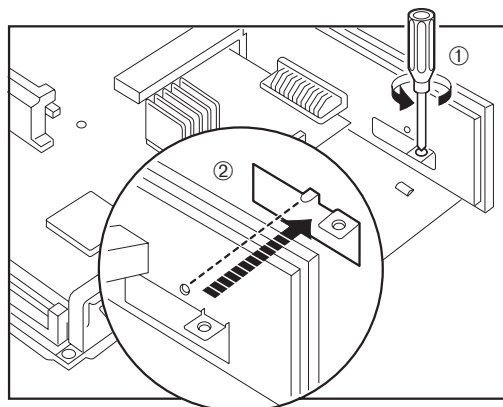
## I. INSTALLATION PROCEDURE

- 1) The Paper Handling Controller is installed in the slot on the right side of your printer's motherboard, when facing the rear of the motherboard, as shown below.



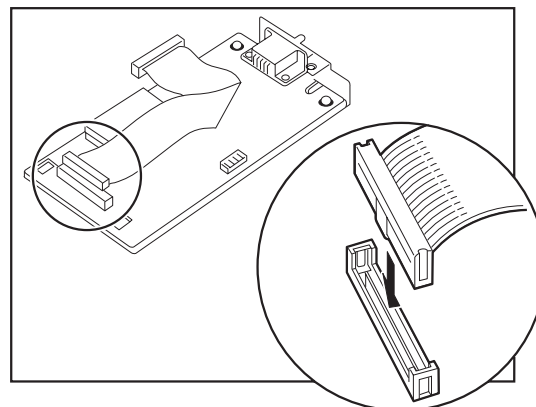
**Figure 2-1-1**

- 2) Place the motherboard on a flat surface and remove the cover with a screwdriver ① ②.



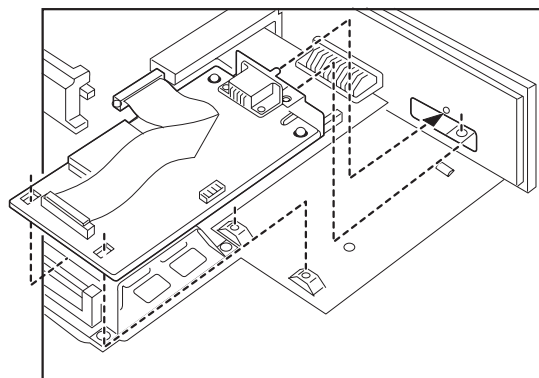
**Figure 2-1-2**

- 3) Press down on the connector and insert the protruding part of the controller board into the slot, as shown below.



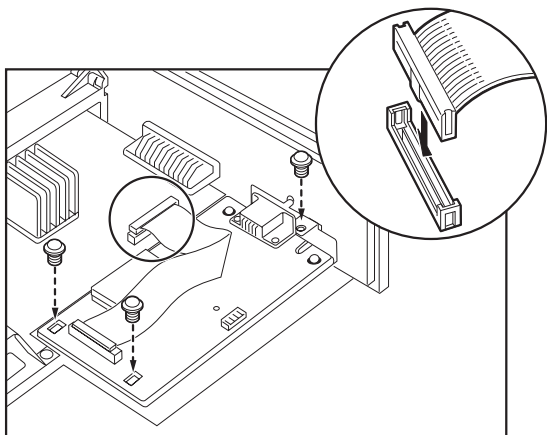
**Figure 2-1-3**

- 4) Attach the cable by pressing the connector into the slot at the rear of the Paper Handling Controller.



**Figure 2-1-4**

- 5) Press down on the connector and tighten the screws to fix the board in place.



**Figure 2-1-5**

## II. MALFUNCTION TROUBLESHOOTING

### A. Initial Check

- 1) Check the rated voltage is present.
- 2) Confirm that the power plug is firmly inserted into the printer, optional I/O device and wall socket.
- 3) Check that the interface connector is firmly connected.

### B. Malfunction Troubleshooting

The malfunction troubleshooting when the paper handling controller PCB is installed in the printer are as follows. Be sure to check that the printer operates normally before installing the paper handling controller PCB.

- 1) Turn OFF the printer and reinstall the paper handling controller PCB. If the problem is still not rectified, conduct the troubleshooting procedures for the various optional I/O devices specified in their respective service manuals.

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**Notes:** 1. Refer to the service manual of the printer for printer troubleshooting.

2. When removing or installing the paper handling controller PCB, be sure to always turn the printer power OFF.
-



# **CHAPTER 3**

## **PARTS CATALOG**

<b>I. PAPER HANDLING CONTROLLER</b>	
PCB ASSEMBLY .....	<b>3-1</b>



I. PAPER HANDLING CONTROLLER PCB ASSEMBLY

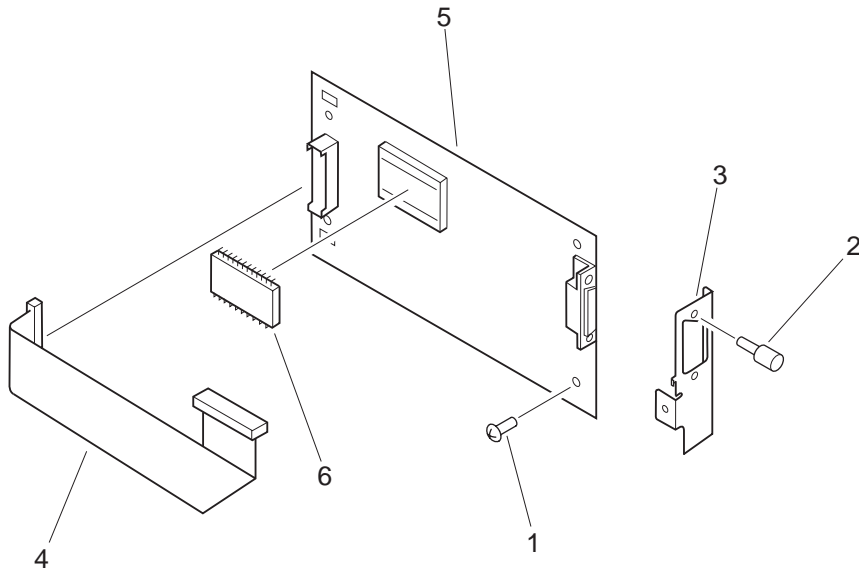


FIGURE & KEY NO.	PART NUMBER	R A N K	Q' T Y	DESCRIPTION	SERIAL NUMBER / REMARKS
I -	NPN		RF	PAPER HANDLING CONTROLLER PCB UNIT	
1	XA9-0836-000		1	SCREW, TP, M3X6	
2	WT2-5391-000		2	SCREW, HEX	
3	RB1-7071-000		1	PLATE, COVER	
4	RG1-3707-000		1	CABLE, FLAT	
5	RG5-4314-000		1	PAPER HANDLING CONTROLLER PCB ASS'Y	
6	RF1-4083-000		1	IC, TMS27C512-12JL, EP-ROM	

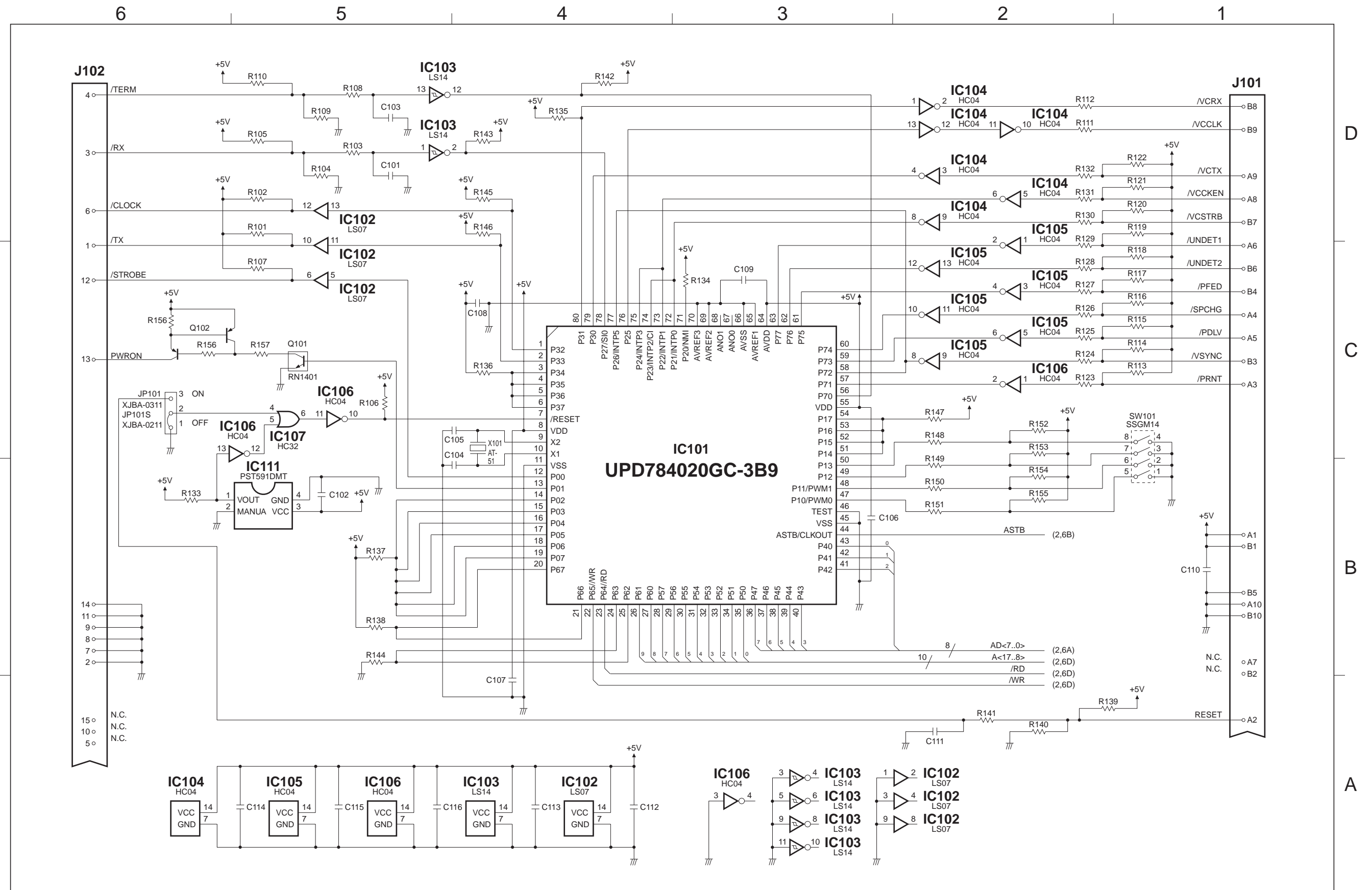


# **APPENDIX**

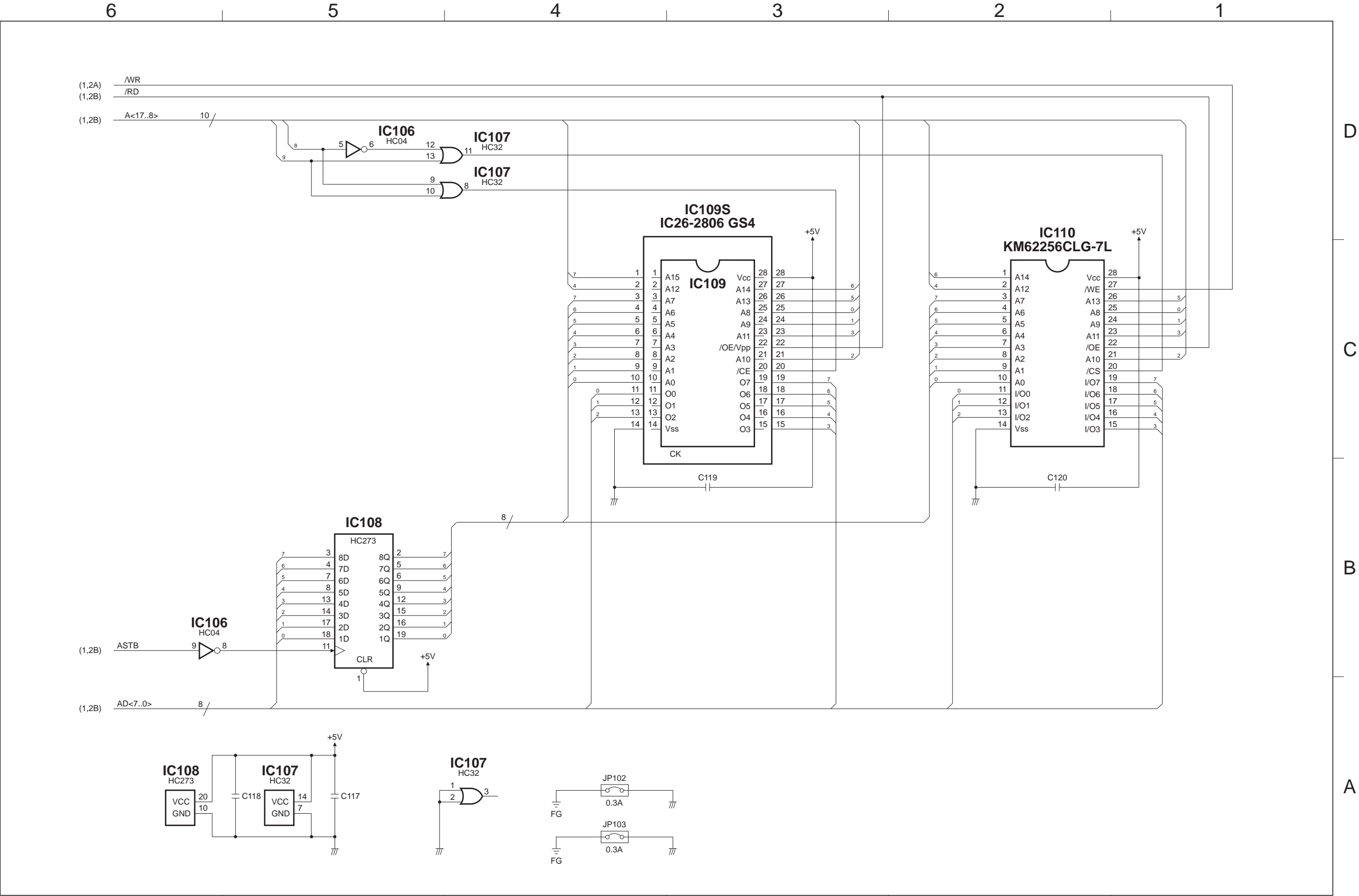
<b>I. PAPER HANDLING CONTROLLER</b>	
<b>CIRCUIT DIAGRAM.....</b>	<b>A-1</b>



# I. PAPER HANDLING CONTROLLER - 1/2



I. PAPER HANDLING CONTROLLER - 2/2



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CANON INC  
Printed in Japan

REVISION 0 ( JAN. 1999 )

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The printing paper contains  
70% waste paper.

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