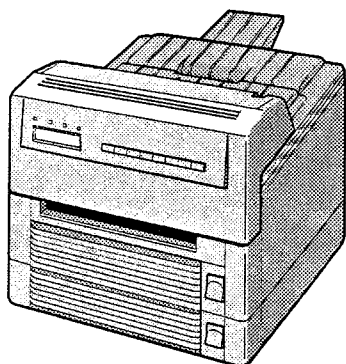


# SHARP SERVICE MANUAL

CODE: 00ZJX9680SMS1



## LASER PRINTER

## MODEL JX-9680

### CAUTION

This laser printer is a class 1 laser product that complies with 21CFR 1040.10 and 1040.11 of the CDRH standard and IEC825. This means that this machine does not produce a hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eye's retina, there is danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

- 1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not an individual part.
- 2) Do not look into the machine with the main switch turned on after removing the developer unit, toner cartridge, and drum cartridge.
- 3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
- 4) The upper frame and the middle frame contains the safety interlock switch.

Do not defeat the safety interlock by inserting wedges or other items into the switch slot.

**CLASS 1  
LASER PRODUCT**

**LASER KLASSE 1**

LASER WAVE - LENGTH : 780 ± 10nm  
Pulse times : 45 ± 2µs/7mm  
Out put power : 0.35mW ± 0.05mW

### CAUTION

INVISIBLE LASER RADIATION,  
WHEN OPEN AND INTERLOCKS DEFEATED.  
AVOID EXPOSURE TO BEAM.

### VORSICHT

UNSICHTBARE LASERSTRAHLUNG,  
WENN ABDECKUNG GEÖFFNET UND  
SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT.  
NICHT DEM STRAHL AUSSETZEN.

### VARO !

AVATTAESSA JA SUOJALUKITUS  
OHITETTAESSA OLET ALTTIINA  
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE ÄLÄ  
KATSO SÄTEESEEN.

### ADVARSEL

USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR  
SIKKERHEDSBRYDERE ER UDE AF  
FUNKTION. UNDGÅ UDSÆTTELSE FOR  
STRÅLNING.

### VARNING !

OSYNLIG LASERSTRÅLNING NÅR DENNA DEL  
ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD.  
BETRAKTA EJ STRÅLEN. - STRÅLEN ÄR  
FARLIG.

**SHARP CORPORATION**

This document has been published to be used  
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The contents are subject to change without notice.



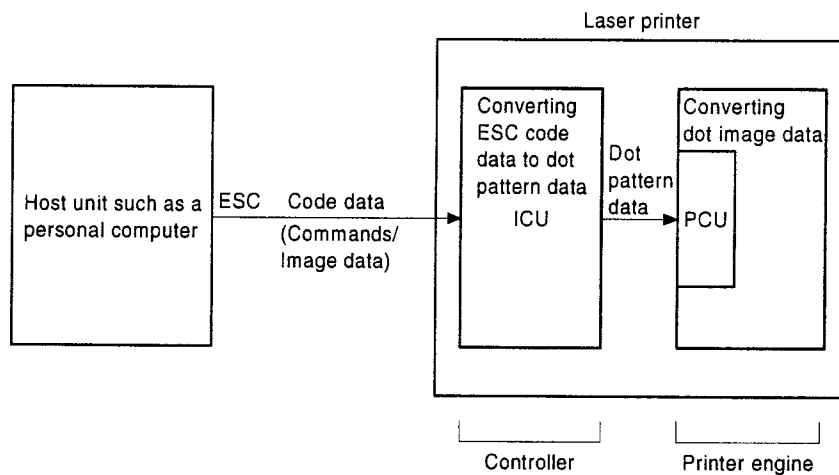
## To begin with

The laser printer is used in connection with the host as a personal computer from which the print data is supplied.

The laser printer consists of two major blocks of the controller and the print engine.

The controller consists of the ICU (Interface Control Unit) which is employed to interpret the source print data to create dot pattern information based on the font.

The print engine is the block employed to print the data of the dot pattern information. The print engine includes the laser print mechanism, drum mechanism, and paper feed mechanism which are controlled by PCU (Process Control Unit). Dot pattern information is sent to the laser print block that is controlled by the PCU where the data is converted into laser beams.



This Service Manual describes the printer engine, the PCU (Process Control Unit) which controls the printer engine, and the ICU (Interface Control Unit) which analyzes data from the host to form dot patterns in this sequence.

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# [1] BASIC SPECIFICATIONS

## 1. Features and sales points

### [General]

The target of the JX-9680 is HP LaserJet 4Plus. Refer to the table below for comparison between the JX-9660 and the JX-9680.

Item	JX9660	JX9680
Printer language	PCL5, PostScript Level 1, FX80, ProPrinter	PCL5e, PostScript Level 2, LQ850, ProPrinter X24
Speed	8ppm	12ppm
Resolution	PCL	300dpi
	PostScript	600dpi
Network specifications	LocalTalk only	YES
Emulation switching	Key only	YES
Auto emulation	3Mbyte	2Mbyte
Memory control	Fixed	Auto charge

### [Resolution]

Printing in 600dpi, which has been possible only in the PostScript language in the conventional model, is now possible with the PCL language. In addition, the 9pin head dot emulation has been changed to the 24pin head dot emulation. As a result, finer graphic expressions can be made in the dot emulation.

### [Network specifications]

In the conventional models, changing emulations has been performed with key setting. While the JX-9680 allows to change emulations with the command, allowing to change setting by sending the command from the host which is apart from the printer to the printer. It is provided with the I/O connector for the AppleTalk (LocalTalk)/Serial port, and with the network I/O port for Ethernet and TokenRing. (However, these two I/O ports cannot be used simultaneously.) (The LAN board is required, which is supplied by the third party.)

### [Changing emulations]

In the conventional models, emulations are changed with the key or the AUTO emulation must be set. The AUTO emulation, however, does not work with the standard memory capacity of 2MB, and requires min. 3MB. While the JX-9680 allows to change emulations by using the command to set the emulation automatically. If the emulation setting command cannot be added to the data, the JX-9680 allows to set the AUTO emulation mode with the standard memory capacity of 2MB.

By increasing the data capacity for judging emulation change with the data in the AUTO emulation mode, the more precise emulation change than the JX-9660 is possible.

### [Memory using method]

In the conventional models, memory is assigned with the fixed capacity by the memory capacity installed when the power is supplied. While the JX-9680 controls the memory as free memory after securing the minimum necessary memory capacity, assigning the free memory to the process requiring the memory, thus allowing more effective memory control for the user.

### [Option board outline]

As the upgraded options of the JX-9680, the JX-96PS2 and the JX-96AP2 are available.

The JX-96PS2 is equipped with two 8Mbit mask ROMs, which allows to use with the PostScript.

The JX-96AP2 is equipped with one serial communication LSI (85230), the RS232 driver, and the AP driver. This board allows serial communication with the RS232 and the AppleTalk.

### [Target users]

The network I/F is optionally available. The target is the network users of 4 to 8 persons. This model is suitable for Windows users, Mackintosh users, UNIX users, and a wide range of computer environments.

Monthly duty --- Recommendable 3,000 pages/month, max. 10,000 pages/month

### [Sales points]

High speed throughput: Excellent throughput is realized by the Am20240 (20MHz) and the 12PPM engine.

High quality print: Supports 600dpi/high-performance print language PCL-5e/PS-2. Provided with the Super Multi Gray in 106 gradations.

Ease of use: The WPS-like driver and the remote front panel software facilitates the use even for the beginners.

Network: The network I/F card has been developed. Supports Novel NetWare and other major networks. The 3-slot RAM upgradable to max. 50MB. The convenient status holding function. The network support of one-rank-higher grade.

Low running cost: Supports 15,000 page Jumbo supply cartridge, realizes lowest class running cost in the industry.

## 2. Printing system

Type: Desktop

### Paper supply method

#### (Cassettes Feed)

Size	Dimensions	Weight
A4	210 x 297 mm	60 g/m <sup>2</sup> (16 lb) to 80 g/m <sup>2</sup> (21 lb)
Letter	8 1/2" x 11" (215.9 x 279.4 mm)	Same as above
Legal	8 1/2" x 14" (215.9 x 355.6 mm)	Same as above

#### (Manual Feed)

Size	Dimensions	Weight
A4	210 x 297 mm	60 g/m <sup>2</sup> (16 lb) to 128 g/m <sup>2</sup> (34 lb)
Letter	8 1/2" x 11" (215.9 x 279.4 mm)	Same as above
Legal*	8 1/2" x 14" (215.9 x 355.6 mm)	60 g/m <sup>2</sup> (16 lb) to 105 g/m <sup>2</sup> (28 lb)

\* A4 is the maximum size for manual feed paper which is thicker than 105 g/m<sup>2</sup> (28 lb).

Max. paper size (Max. width 216 mm (8 1/2") Max. length 356 mm (14"))

Min. paper size (Min. width 98 mm (3 7/8") Min. length 190 mm (7 1/2"))

**Envelopes** (Manual Feed, Cassette Option also available)

Size	Dimensions	Weight
International DL	110 x 220 mm	60 g/m <sup>2</sup> (16 lb) to 90 g/m <sup>2</sup> (24 lb)
International C5	162 x 229 mm	Same as above
Monarch	3 7/8" x 7 1/2" (98.43 x 190.5 mm)	Same as above
Commercial 10 (Business)	4 1/8" x 9 1/2" (104.78 x 241.3 mm)	Same as above

An optional envelope cassette is available for the continuous feeding of up to 20 envelopes.

Do not use envelopes with metal tabs, snaps, windows, strings or other attachments which are likely to cause problems inside the printer.

**(Transparency Film and Labels** (Manual Feed Only))

Use only A4 (210 x 297 mm) and Letter size (8 1/2" x 11") overhead projection transparency film and sheets of labels in your laser printer.

SHARP recommends Folex X-500 as a suitable OHP transparency film to use with the JX-9680.

**Optical System**

The laser light, set at ON/OFF in compliance with electric signal, forms and images on the photo-conductor drum.

Record method:	<ul style="list-style-type: none"> <li>Electro-photographic printing method with semiconductor laser diode (used organic photoconductor coated drum)</li> </ul>
Charging method:	<ul style="list-style-type: none"> <li>Saw-tooth charging method</li> </ul>
Developing method:	<ul style="list-style-type: none"> <li>Dual components magnetic brush process</li> </ul>
Drum cleaning method:	<ul style="list-style-type: none"> <li>Blade cleaning method</li> </ul>
Fixing method:	<ul style="list-style-type: none"> <li>Heat roller method               <ul style="list-style-type: none"> <li>Upper side; Teflon coating roller</li> <li>Lower side; Silicon rubber roller</li> </ul>               Separation guide is mounted on the upper roller. To clean the upper roller, the silicon oiled cleaning pad is used.             </li> </ul>

**Paper Output block**

Face-down tray: 250 sheets (80 g/m<sup>2</sup>)

**Jam Cleaning**

If paper is jammed, open the front cabinet and/or paper cassette, and remove the jammed paper.

**3. Print performance****Print Speed**

In the case of cassette supply.

Upper cassette: Max. 12 pages/min. (A4/Letter size)

Lower cassette: Max. 12 pages/min. (A4/Letter size)

\* In these cases, the papers of A4 or Letter size are applied the simple text containing 4,000 characters per page is provided and use prefeed function.

**First Print Time**

Less than 15 s (upper cassette/in stand-by mode)

	In stand-by mode	in power save mode
Upper cassette	≤ 15 s	≤ 50 s
Lower cassette	≤ 16 s	≤ 51 s

\* This is the time taken from start printing and paper output are completed. In this case, the measurement is made with A4 or Letter papers and the processing time of controller is not included.

Record resolution:	<ul style="list-style-type: none"> <li>600 DPI, 300DPI selectable</li> </ul>
Gray Scale:	<ul style="list-style-type: none"> <li>High Quality Super Multi Gray (Postscript Level2 only) (127 levels/106lpi 600DPI mode)</li> </ul>

**Warm-up Time**

Less than 60 s

\* This is the time take until the printer is set at print possible condition under the standard condition after the power switch ON.

**4. Hardware****CPU**

Am 29240, 20 MHz

**Memory**

ROM:	<ul style="list-style-type: none"> <li>4.0 MB (on ICU board)</li> <li>2.0 MB (on optional PostScript board)</li> </ul>
RAM:	<ul style="list-style-type: none"> <li>Standard 2.0 MB</li> <li>Max. 50.0 MB (with 72pin, 70ns SIMM RAM)</li> </ul>

**[Recommended SIMM RAM]**

1MB:	MSC2327B-70YS8 (OKI)
4MB:	HB56A132BY-7B (HITACHI), THM321000ASG-70 (TOSHIBA), MC-421000A32-70 (NEC)
16MB:	HB56A432B-7 (HITACHI), THM324000ASG-70 (TOSHIBA), MSC23423-70BS8 (OKI)

**Slot for Options**

Front ROM:	1 set (True Type)
Expansion memory:	3 slots on ICU board (SIMM RAM)
PostScript Level2 board:	1 slot on ICU board
Optional Interface board:	1 slot on ICU board for AppleTalk/RS-232C (JX-96AP2: Option) 1 slot on ICU board for Network card (3rd party)

**Operation panel**

Control key:	8 keys
LED lamp:	4 lamps
LCD display:	16 characters Selectable 5 languages (English, German, French, Italic, Spanish)

**Paper cassette**

A4 or Letter (standard 2 cassettes)
A4 (option)
Letter (option)
Legal (option)
Envelope (option)

## 5. Software

### Emulation

PCL 5e Compatible  
 PostScript Level2 Compatible (JX-96PS2: option)  
 Epson LQ-850 Compatible  
 IBM Proprinter X-24 Compatible  
 HEX Dump

### Auto Emulation Switching

With PJI  
 With using PJI commands, printer can switch all emulations

Without PJI  
 Printer can change emulations only between PCL 5e and PostScript Level2

\* not applied to the other three emulations; LQ-850/X-24/HEX

### SoftBand Technology

Realize 600 dpi printing with 2MB memory  
 \* in the case of complex graphics, additional memory is necessary

### Super MultiGray Technology

- Available in optional PostScript Level2 mode
- Realize high quality gradation graphics
- 127 levels/106lpi at 600DPI mode
- Selectable function by PJI command

## 6. Interface

### Auto Interface Switching

- Automatic switching function among IEEE 1284 Parallel, optional RS-232C and AppleTalk interfaces (JX-96AP-2), and optional Network card
- Controller judges and selects capable interface, which signal comes faster than other

### Interface

IEEE 1284 Parallel (Nibble/compatible/ECP mode)  
 AppleTalk/RS-232C (JX-96AP2: option)  
 Network Card (option: 3rd party)

\* Printer can connect one of AppleTalk/RS-232C (option), or 3rd parties Network Card

## 7. Power

- Power source:
- AC 120, 220/230/240 V 50/60 Hz  
 Rated local AC mains voltage  $\pm 10\%$

### Power Consumption

	120 V mode		220/230/240 V model	
	Maximum	Average	Maximum	Average
Printing	650 W	T.B.D.	500 W	T.B.D.
Stand-by mode	650 W	T.B.D.	500 W	T.B.D.
Power save mode	650 W	T.B.D.	500 W	T.B.D.

\* This measurement is done under the standard condition.

### EPA Power Save Mode

If no data is supplied to controller during the specific interval in stand-by mode, the mode will be changed to power save mode.

\* When the printer receive a data or key panel is touched in power save mode, the mode will be changed to stand-by mode.

- Polygon motor; off
- Heat roller; temperature down
- Cooling fan; turn on and off intermittently

This mode is selectable in five conditions by key operation.

- ES MODE = ON
- Interval = 90 s
- Interval = 180 s
- Interval = 255 s
- Power save mode = off

## 8. Supplies

### Photo-conductor cartridge (JX-96DR)

Life: • MAX 30,000 pages

In the case of more than 4% coverage the life becomes less than 30,000 pages.

### Toner/developer kit (JX-96DC1/ND1)

Contents: • Toner/developer cartridge  
 • Roller cleaner  
 • Drum protect cover

Life: • 15,000 pages (A4, Letter – coverage 4% or less)

\* The measurement above are conducted, using the standard paper, under the standard condition.

### Paper

#### (Paper Size)

Standard and Applicable papers (cassette feeding):

- AB system: • A4 (210 x 297 mm)  
 Inch system: • Letter (8-1/2" x 11")  
 • Legal (8-1/2" x 14")

Special papers (manual feeding):

- OHP sheet (transparency film) • A4 (210 x 297 mm)  
 • Letter (8-1/2" x 11")  
 Max. paper size: • Max. width 216 mm (8-1/2")  
 • Max. length 356 mm (14")  
 Min. paper size: • Min. width 98 mm (3-7/8")  
 • Min. length 190 mm (7-1/2")

**(Standard and Applicable Paper)**

Item	Standard paper	Applicable paper
Weight	60 ~ 80 g/m <sup>2</sup>	60 ~ 80 g/m <sup>2</sup> (cassette supply) 60 ~ 128 g/m <sup>2</sup> (manual supply)
Smoothness	face; ≥ 20 s back; ≥ 20 s (BEKK method)	face; ≥ 20 s back; ≥ 18 s (BEKK method)
Porosity	≥ 7 s (BEKK method)	same as left
Opacity	≥ 77%	same as left
Surface resistivity	5 x 10 <sup>10</sup> ~ 1 x 10 <sup>10</sup> (20 ± 1°C, 65 ± 2%RH)	≥ 5.0 x 10 <sup>8</sup>
Stiffness	vertical; ≥ 17 cm horizontal; ≥ 13 cm (CLERK method)	same as left
Moisture content	4.5% ~ 7.0%	same as left
Thickness	75 μ ~ 110 μm	same as left
Dimension	standard ± 1 mm	same as left

**(Recommended Papers)**

**Standard papers**

- USA:
  - Necossa
- Germany:
  - Igepa
- OHP sheet**
  - Folex BG60 (Letter)
- (transparency film)
  - Folex BG60 (A4)
- Label paper**
  - AVERY 5351, 5360

**9. Accessories**

- Photo-conductor cartridge: • one piece
- Toner/developer cartridge: • one piece
- Heart roller cleaner: • one piece
- Paper cassette: • two pieces (A4 or Letter)
- Manual feed guide: • one piece
- Extension tray: • one piece
- Power cord: • one piece
- Operation manual: • one set
- Driver disk: • one piece  
(PCL5e driver for Windows 3.1)

**10. Options**

- Paper cassette:
  - Letter cassette (JX-96BC); 250 sheets
  - Legal cassette (JX-96CC); 250 sheets
  - A4 cassette (JX-96A4); 250 sheets
  - Envelope cassette (JX-96EC); 20 pieces
- Postscript board:
  - PostScript Level2 (JX-96PS2)  
include 35 outline fonts
- Expansion memory:
  - SIMM RAM (72pin, 70nsec: 3rd party)  
[Recommended SIMM RAM: see 5.2]
- Interface board:
  - AppleTalk/RS-232C I/F board (JX-96AP2)
  - Network card

**11. Fonts**

**Internal Font**

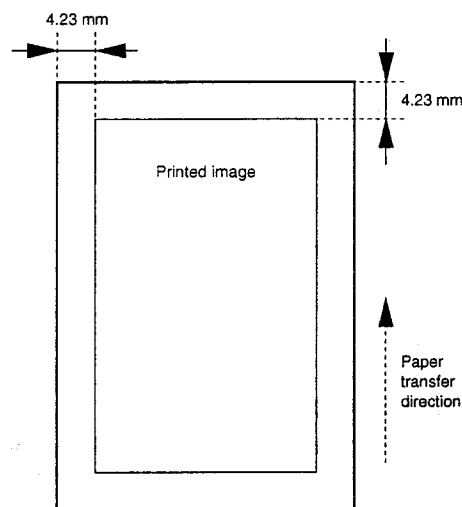
- PCL 5e mode
  - Outline fonts: 45 typefaces (10 TrueType, 35 Intellifont compatible)
  - Bitmap font: 1 typeface (Line Printer)
- PostScript Level2 mode (included in optional PostScript board: JX-96PS2)
  - Outline fonts: 35 typefaces (35 Type 1)

**Symbol Set**

PCL5e mode: Compatible with LaserJet 4P

**12. Printing area**

**Effective Print Area**



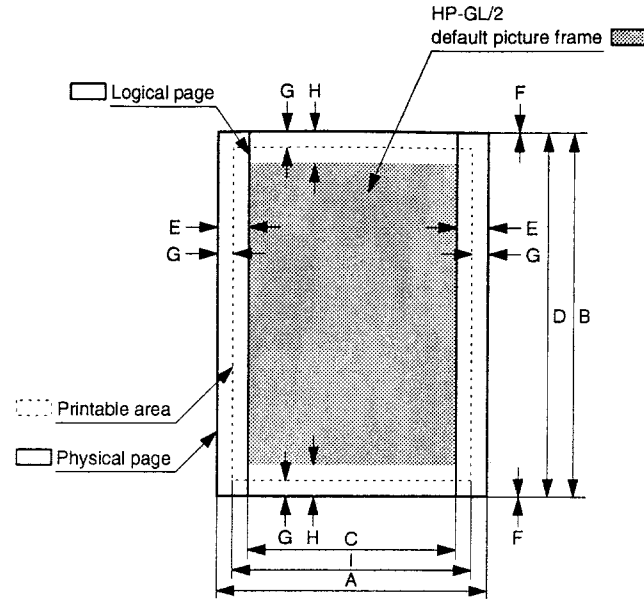
Paper	dot	size
Letter	4900 x 6400	8.17" x 10.67"
Legal	4900 x 8200	8.17" x 13.67"
A4	4760 x 6814	201.5 x 288.5mm

(dot is equivalent to 600 dpi)

\* In case of A4 80 characters mode right side edge on printed paper is out of specification, because in special case some data is missed on paper.



Portrait



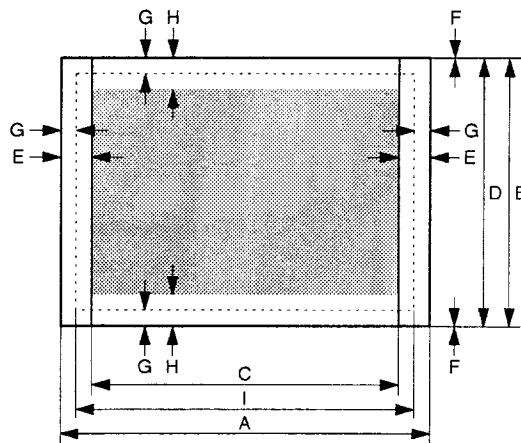
A, B – Physical dimension  
C, D – Logical dimension

PAPER SIZE		SIZE	PRINT AREA									
			AREA									
			A	B	C	D	E	F	G	H	I	
Letter	8-1/2" × 11" (215.9 mm × 279.4 mm)	8.0" × 10.6"	5100	6600	4800	6600	150	0	100	300	4900	
Legal	8-1/2" × 13" (215.9 mm × 279.4 mm)	8.0" × 13.6"	5100	8400	4800	8400	150	0	100	300	4900	
A4 (77)	297 mm × 210 mm	200 mm × 287 mm	4960	7014	4676	7014	142	0	100	300	4760	
COM-10			2474	5700	2174	5700	150	0	100	300	2274	
Monarch			2324	4500	2024	4500	150	0	100	300	2124	
C5			3826	5408	3542	5408	142	0	100	300	3626	
DL			2598	5196	2314	5196	142	0	100	300	2398	

\* applied for left side value/\*dot size = 600DPI

\* In case of A4 80 characters mode right side edge on printed paper is out of specification, because in special case some data is missed on paper.

Landscape



A, B – Physical dimension  
C, D – Logical dimension

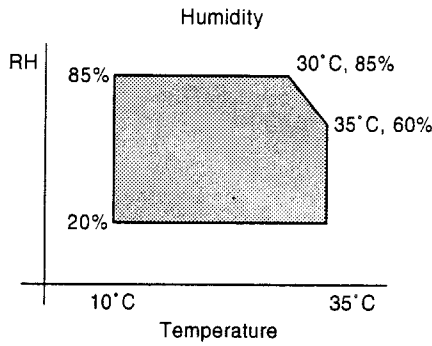
PAPER SIZE		SIZE	PRINT AREA									
			AREA									
			A	B	C	D	E	F	G	H	I	
Letter	8-1/2" × 11" (215.9 mm × 279.4 mm)	10.6" × 8.0"	6600	5100	6360	5100	120	0	100	300	6400	
Legal	8-1/2" × 13" (215.9 mm × 279.4 mm)	13.6" × 8.0"	8400	5100	8160	5100	120	0	100	300	8200	
A4	297 mm × 210 mm		7014	4960	6778	4960	118	0	100	300	6814	
COM-10			5700	2474	5460	2474	120	0	100	300	5500	
Monarch			4500	2324	4260	2324	120	0	100	300	4300	
C5			5408	3826	5172	3826	118	0	100	300	5208	
DL			5196	2598	4960	2598	118	0	100	300	4996	

\* applied for left side value/\*dot size = 600DPI

### 13. Environment conditions

**Environmental condition:** Temperature and humidity condition  
 To keep good machine condition and guarantee print quality, environmental condition is determined as follows and they are applied for both machine and supply.

**Operating condition:** Condition where the machine normally operates, which include supplies.  
 Max. alteration: 10°C/hour, 10% RH/hour  
 - No dewing shall remain.



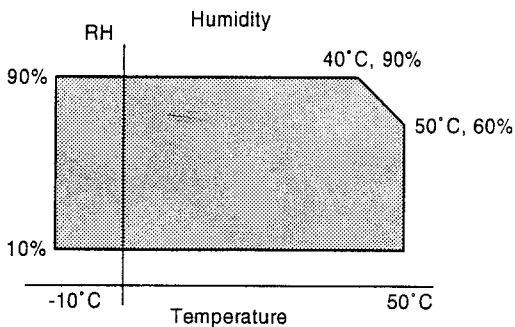
**Standard condition:** Condition where density, backgrounds are measured  
 20°C - 25°C, 65 ±5% RH

**Air pressure:** Normal air pressure to 595 hpa  
 \* under operating and non-operating condition  
 \* 595 hpa is equivalent to 2,000 m altitude

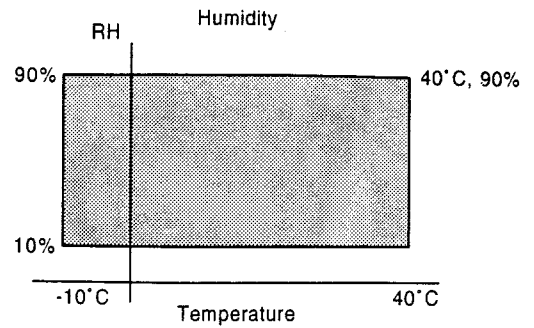
**Non operating condition:** Condition where supplies are set in the machine and the machine is left in the room with power off.  
 5°C - 40°C, 10% RH - 90% RH  
 - No dewing shall be remain.

**Storage condition (packed in the packing material)**  
 Max. alteration: 15°C/hour, 15% RH/hour  
 - No dewing shall remain.

(Machine)

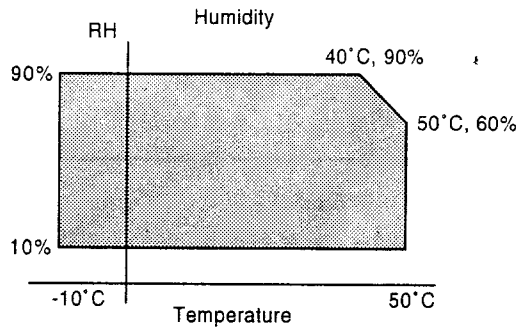


(Supply)

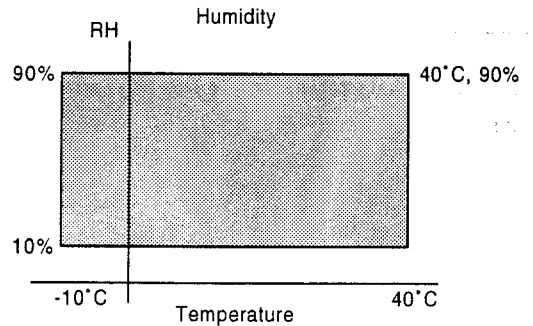


**Transport condition (pack in the packing material)**  
 Max. alteration: 20°/hour, 15% RH/hour  
 - No dewing shall remain.

(Machine)



(Supply)



**Storage guarantee period**

Photoconductor cartridge: 36 months from the manufacturing month  
 Toner/Developer: 24 months from the manufacturing month

The storage period is specified packed and sealed condition.

## 14. Others

### Acoustic Noise

Printing: less than 52 dBA (excluding impact noise)

Stand-by mode: less than 44 dBA

Power save mode: less than 44 dBA

\* measurement according to ISO7779  
(below 70 dBA measured according to DIN45635)

### Ozone Concentration

Less than 0.1 ppm (UL 114, UL 478)

\* measurement according to UL 1950 D3 – 1.7.2

Less than 0.04 mg/m<sup>3</sup> (0.02 ppm)

\* measurement according to RAL-UZ 62, 3-2-2 Annex 2  
(apply Blue Angel standard: copying machine)

### Safety

- 120 V model:
- UL (1950 D3)
  - CSA (C22.2 No. 950 + D3)
- 220/230/240 V model:
- TÜV GS-mark (EN60950 EN60 825)
  - SEMKO (EN60950)
  - NEMKO (EN60950 EN55 022)
  - EI (EN60950 EN60 825)
  - BSI (BS7002/EN60 950)

### Machine Life

5 years or Min. 180,000 pages  
(whichever comes earlier)

### Outside dimensions

330 (W) x 365 (D) x 325 (H) mm  
(13.0" x 14.4" x 12.8")

### Weight

14.5 kg (32.0 lb.)

## [2] UNPACKING AND SETTING

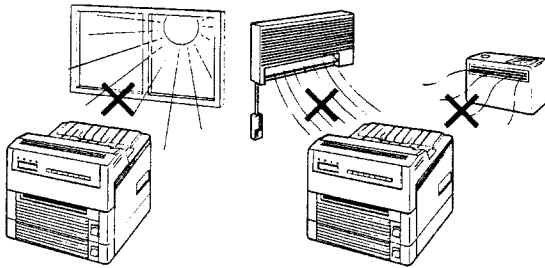
### 1. Environment conditions

Improper setting may damage the printer. Please note the following during initial setting and whenever the printer has been moved:

Be sure to use the rated voltage from a properly grounded wall outlet only.

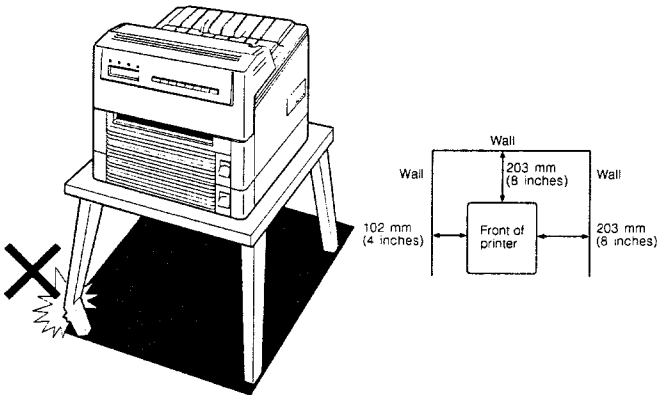
Do not set the printer in areas that are:

- damp or humid,
- exposed to direct sunlight,
- extremely dusty or smoky,
- poorly ventilated,
- subject to extreme temperature or humidity changes, for example, near an air conditioner or heater.

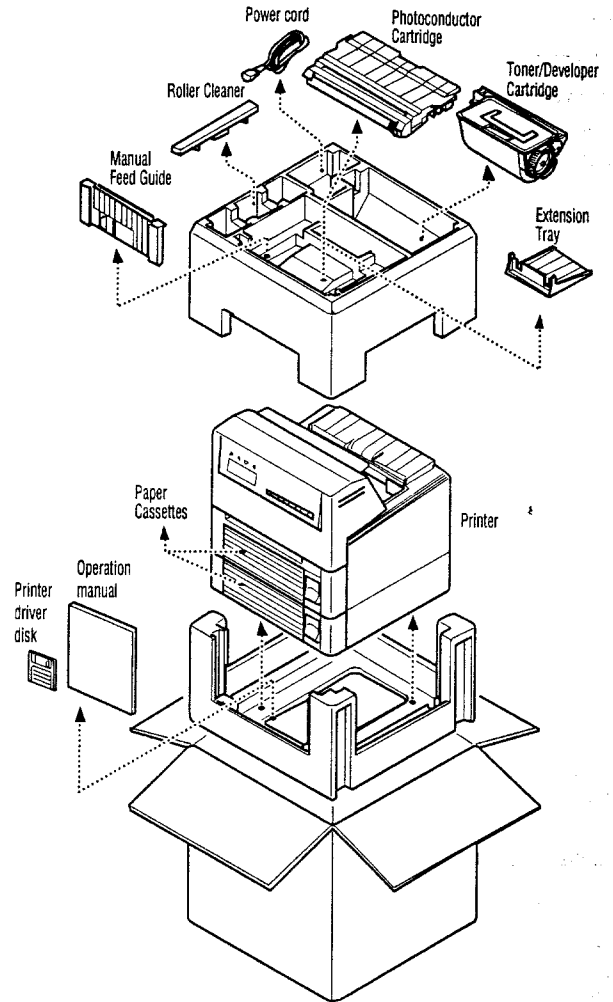


Place the printer on a firm, level table or desk, with enough space to insert the paper cassette and to manually feed the paper.

To ensure proper operation and ventilation, leave at least as much space on each side as shown below.



### 2. Unpacking



Accessories: Photo-conductor cartridge:	one piece
Toner/developer cartridge:	one piece
Heat roller cleaner:	one piece
Paper cassette:	two pieces (A4 or Letter size)
Extension tray:	one piece
Manual feed guide:	one piece
Printer driver disk (PCL5E driver for windows 3.1)	one piece

**NOTE:**

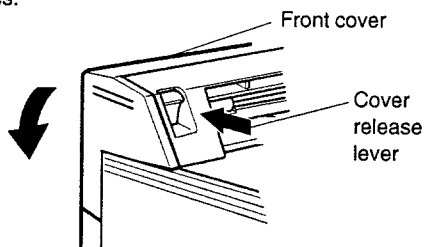
- Save the carton and packing materials. They should be used to repack and protect the printer if it must be shipped for servicing.

### 3. Setting

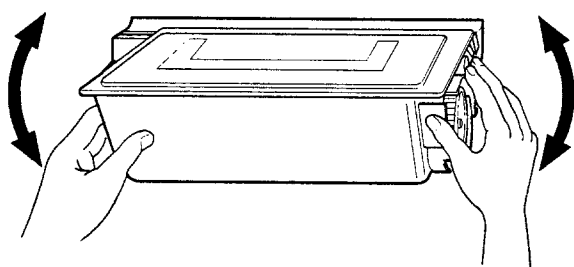
#### (1) Setting supplies

##### Setting the Toner/Developer Cartridge

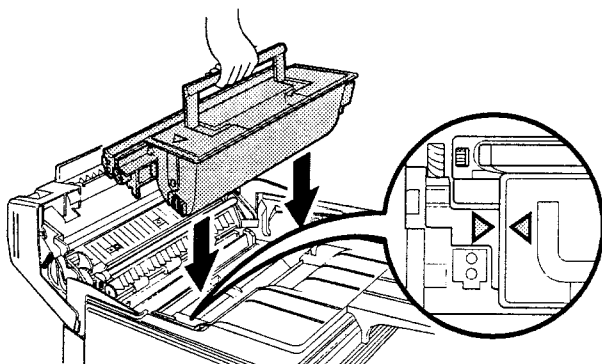
- ① Be sure that the printer is turned off.
- ② Open the front cover.
  - Push the cover release lever and open the front cover by holding both sides.



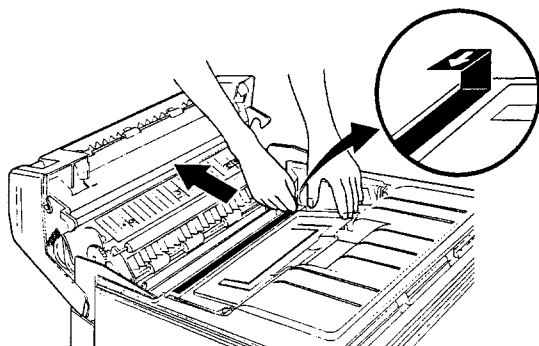
- ③ Remove the toner/developer cartridge from the aluminium bag.
- ④ Shake the toner/developer cartridge vigorously four or five times.



5. Use the handle to hold the toner/developer cartridge horizontally with the roller to the front side and position it gently. Push down the handle.

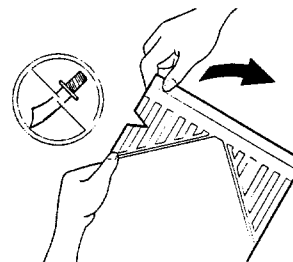


- ⑥ Pull the tab to remove the seal while pressing the toner/developer cartridge.



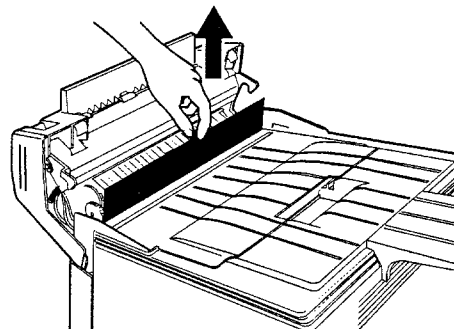
##### Setting the Photoconductor Cartridge

- ① Remove the photoconductor cartridge from the aluminium bag. Do not use a knife to cut the bag.

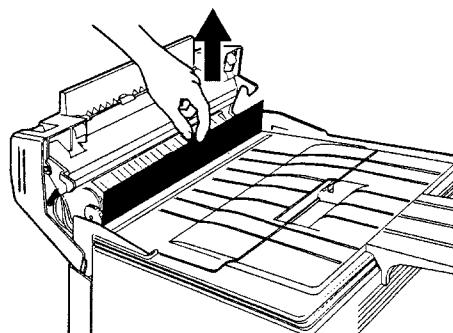


##### NOTE:

- When placing the photoconductor cartridge on a desk temporarily before setting, be sure to place it on a level desk. Otherwise, this may be damaged.
  - The new photoconductor cartridge is sealed with a black protective sheet. To prevent damage to the cartridge surface, do not remove the protective sheet until you have positioned the cartridge into place.
- ② Insert the new photoconductor cartridge vertically with the drum down along the frame guides, pressing downward firmly (①). Then, continue to apply downward pressure and place the photoconductor cartridge in a horizontal position until it clicks (②).



- ③ Remove the protective sheet. Be sure not to leave any torn pieces in the printer.

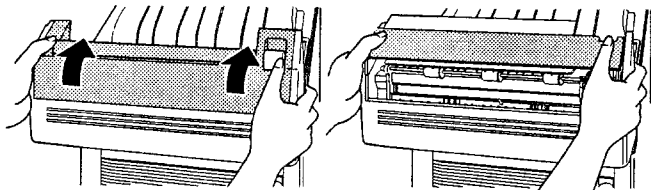


### Setting the Roller Cleaner

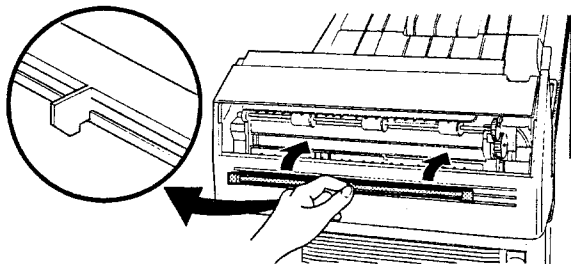
① Open the top cover while keeping the front cover open.

**NOTE:**

Press both sides until the top cover clicks.



② Remove the roller cleaner from the plastic bag and set it on the fusing unit.



- 3. Close the top cover until it clicks.
- 4. Close the front cover until it clicks.

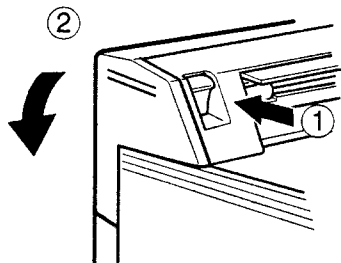
## 4. Cleaning

### (1) Cleaning the Main Charger

① Turn off the power.

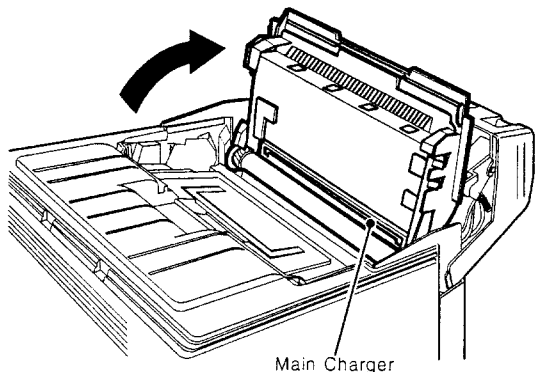
② Open the front cover.

- Push the cover release lever (①) and open the cover by holding both sides (②).

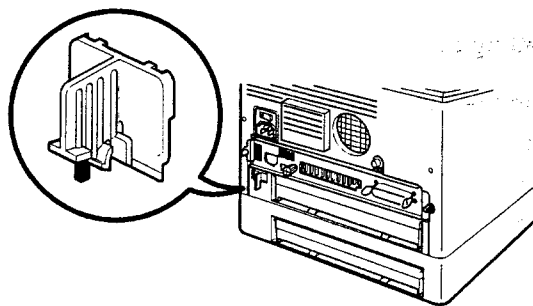


③ Position the photoconductor cartridge vertically.

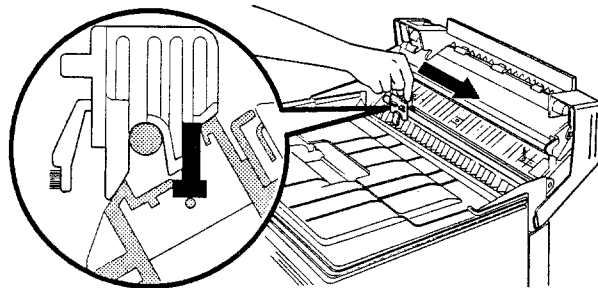
- Insert your hand into the opening between the face down tray and the photoconductor cartridge. Push the lever at the back of the photoconductor cartridge with your fingers and then rotate the cartridge until the cartridge is positioned vertically. The main charger exists near the drum.



④ Remove the charger cleaner from the rear cover.



⑤ Insert the charger cleaner into the main charger and clean the metal plate by sliding the cleaner as shown below.



**NOTE:**

- Do not pull out the cleaner halfway on the metal plate. Be sure to end at either the left or the right end on the plate.

⑥ Replace the charger cleaner on the rear cover.

⑦ Close the photoconductor cartridge until it clicks.

⑧ Close the front cover.

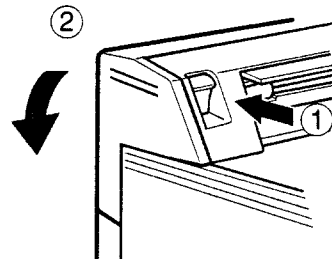
⑨ Turn on the power.

### (2) To clean the transfer charger:

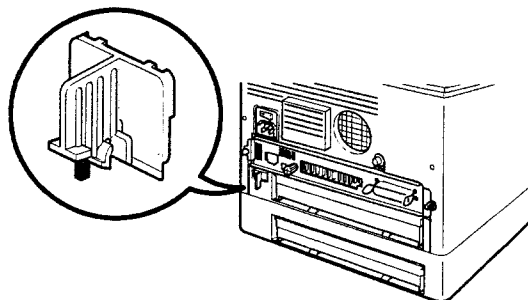
1. Turn off the power.

2. Open the front cover.

- Push the cover release lever (①) and open the cover by holding both sides (②).



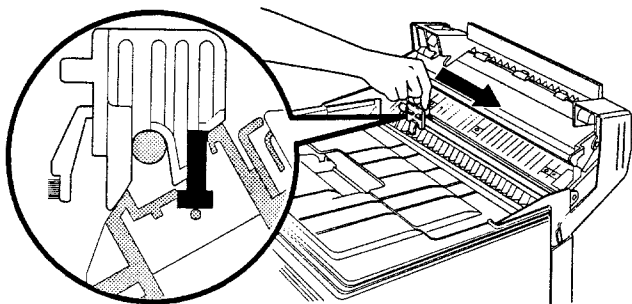
3. Remove the charger cleaner from the rear cover.



- Insert the charger cleaner into the transfer charger at the left end, as shown below, and clean the wire by sliding the cleaner to the right.

**NOTE:**

- Do not pull out the cleaner halfway along the wire. Be sure to go all the way to right end of the wire.
- Be sure to slide the cleaner in the direction shown below. Sliding in the opposite direction may damage the wire.



- Replace the charger cleaner on the rear cover.
- Close the front cover.
- Turn on the power.

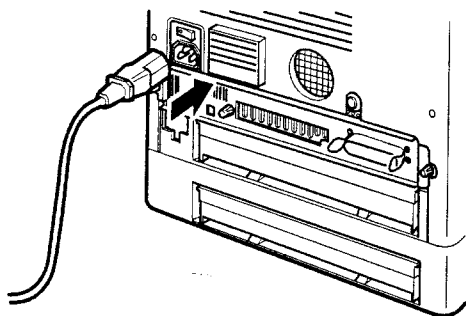
## 5. Setting options

Refer to the [4] OPTIONS.

## 6. Connecting power cord and interface cable

### (1) Power Cord

- Be sure the power is turned off.
- Plug the power cord into the power cord connector at the back of the printer.



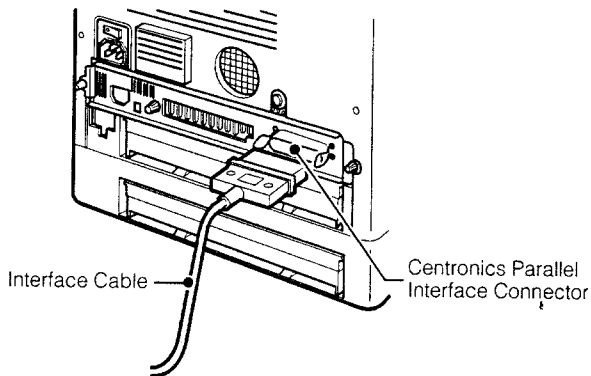
### (2) Interface Cable

This Laser Printer is equipped with a Centronics parallel interface.

**NOTE:**

A shielded, grounded cable and connector are required to comply with either FCC Class B or VDE 0871 and 0875 requirements.

- Be sure the power is turned off.
- Remove the protective cover from the connector.
- Plug the cable into the connector.

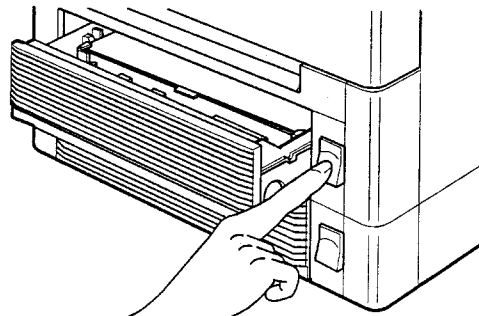


- Fasten the bail clips for the parallel connector.

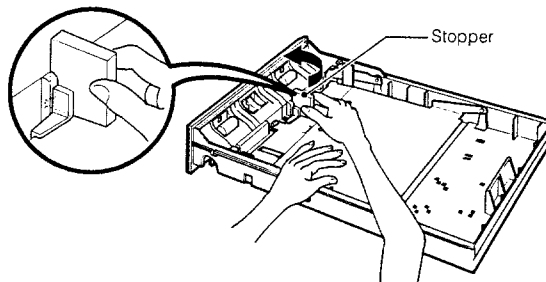
## 7. Loading paper

**When using the paper cassette for the first time:**

- Press the cassette eject button to take out the paper cassette.



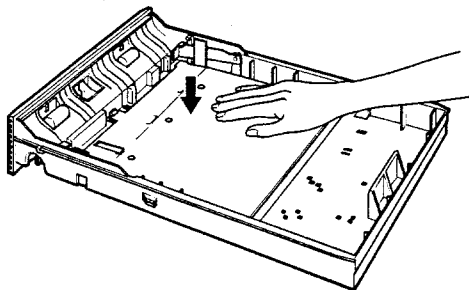
- Remove the stopper by pressing it with your thumb and rotating it as shown below while holding the pressure plate securely with your other hand.



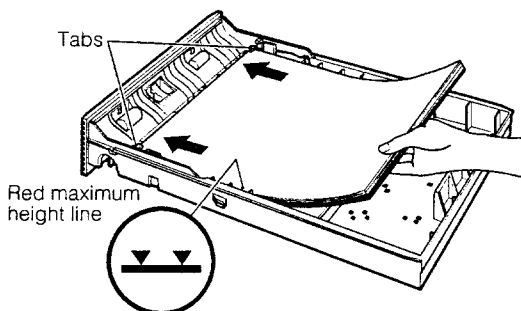
**NOTE:**

Save the stopper since this should be used to protect the cassette if it must be transported.

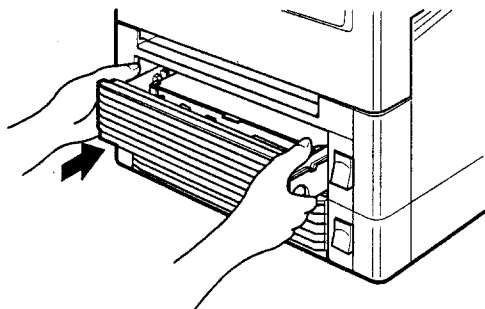
- ① Push the pressure plate down until it locks in position.



- ② Place the paper in the cassette with the corners under the metal corner tabs. Remove some paper if the paper is tight under the metal corner tabs. Shake the paper cassette gently to straighten the paper.
- Note that the side facing up is the printing side.
  - Do not load paper above the red maximum height line, or paper may misfeed.



- ③ Slide the paper cassette into the printer until it locks into place.



**NOTE:**

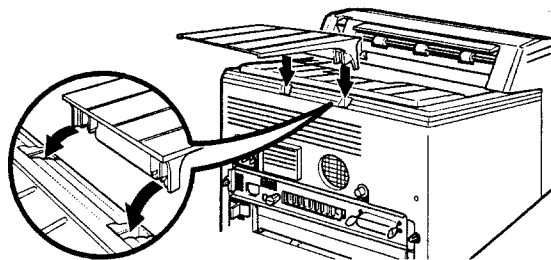
- When using the lower cassette, be sure to set the upper cassette because paper in the lower cassette passes through the upper cassette.
- Do not apply oil to the roller of the cassette.

## 8. Setting tray

### (1) Setting extension tray

**NOTE:**

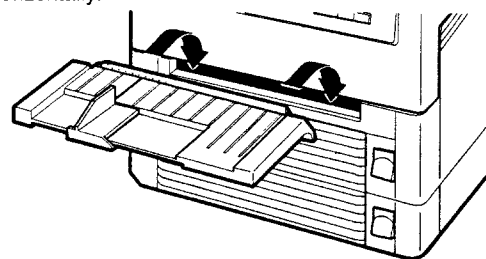
- Please use the extension tray for large size copies or at any time to ensure tidy stacking of out put sheets. Attach as shown in the diagram.



- Do not apply oil to the roller of the cassette.

### (2) Setting the manual feed guide

Insert the Manual Feed Guide into the Manual Feed Slot from an angle, put the claws in place, and then position the Manual Feed Guide horizontally.



## 9. Selecting a language

Messages are set in the factory to appear on the display panel in English. You can change them to French, German, Italian or Spanish. The language setting will also affect printouts of the printer setting list and PCL5e font list.

- ① Press the power switch to turn on the printer. **SELF TEST** will appear on the display panel, **ON LINE** will glow, and then **PCL5E A4/A4** will appear on the display panel.
- ② Press **[LINE]** to take the printer off-line. **ON LINE** will go off and **PRINTING MENU** will appear on the display panel.
- ③ Press **[MENU]** four times or until **MISC MENU** appears on the display panel.
- ④ Press **[ITEM]** twice. **MESSAGE=ENGLISH \*** will appear on the display panel.
- ⑤ Press **▽** or **△** to cycle through the choices, English, French, German, Italian, Spanish, which appear on the display panel.
- ⑥ Press **[ENTER]** to make your selection. An asterisk \* should appear on the right of the display panel next to your choice.
- ⑦ Press **[LINE]** once. **PCL5E A4/A4** will appear on the display panel to confirm the setting has been saved and **ON LINE** will glow.
- ⑧ After resetting the language, it is best to check the results by performing tests from the test menu before printing from the computer.

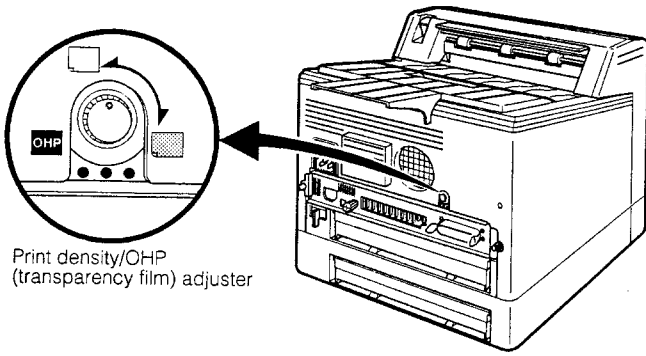


## 10. Performing test print

Refer to the [10] PRINT OUT.

## 11. Print density adjustment

Use the print density/OHP (transparency film) adjuster at the rear side. To increase density, rotate this clockwise. When printing on transparency film, rotate the adjuster counterclockwise fully. Note that increase of density reduces toner life.



Print density/OHP (transparency film) adjuster

## 12. Setting printer driver

### Setting the Printer Software for Windows

- ① Start Windows on your system.
- ② Insert the supplied SHARP JX-9680 Printer Driver disk into your 3.5" disk drive (typically drive A).
- ③ Double-click on the File Manager icon.
- ④ In the open File Manager window, click on the drive icon for the drive containing the disk.
- ⑤ Double-click on the file labeled `setup.exe` to begin the setting process.
- ⑥ Answer the questions and follow the instructions which appear in the JX-9680 printer software setting window.
- ⑦ At the end of the setting procedure, remove the SHARP JX-9680 Printer Driver disk and keep it in a safe place, in case you need to reset the printer driver software.

### Setting the Printer Software for DOS

- ① Insert the supplied SHARP JX-9680 Printer Driver disk into your 3.5" disk drive.
- ② At the DOS prompt type the drive letter for the drive containing the disk (typically drive A), followed by colon, and strike the Enter key.
- ③ An example of setting command follows, in which the setting directory is on drive C and is called SHARPRCP; type:  
`RCPINST C:\SHARPRCP` and strike the Enter key.  
 If you want to set to a different drive and/or directory, substitute the appropriate drive letter and/or directory name.  
 The JX-9680 DOS remote control panel software will be set in the named directory.
- ④ At the end of the setting procedure, after the disk drive lamp goes out, remove the SHARP JX-9680 Printer Driver disk and keep it in a safe place, in case you need to reset the DOS remote control panel software.

## 13. Shipping instructions

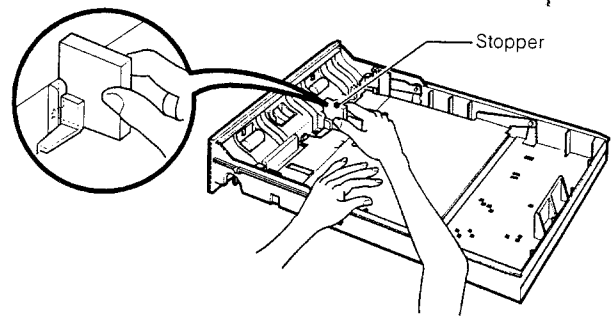
Follow the procedure below whenever transporting or shipping the printer.

- ① Open the front cover.
  - Push the cover release lever (①) and open the cover by holding both sides (②).
- ② Remove the photoconductor cartridge and the toner/developer cartridge.

### NOTE:

Any time the photoconductor cartridge is removed from the printer, it must be placed in a bag which does not allow the photoconductor cartridge to be exposed to light. This is required to prevent the photoconductor from being overexposed to ambient light.

- ③ Remove the paper from the paper cassette and secure the pressure plate with the stopper so that the node of the stopper is inserted into the hole of the cassette front side and the claw of the stopper engages with the pressure plate. Replace the paper cassette.



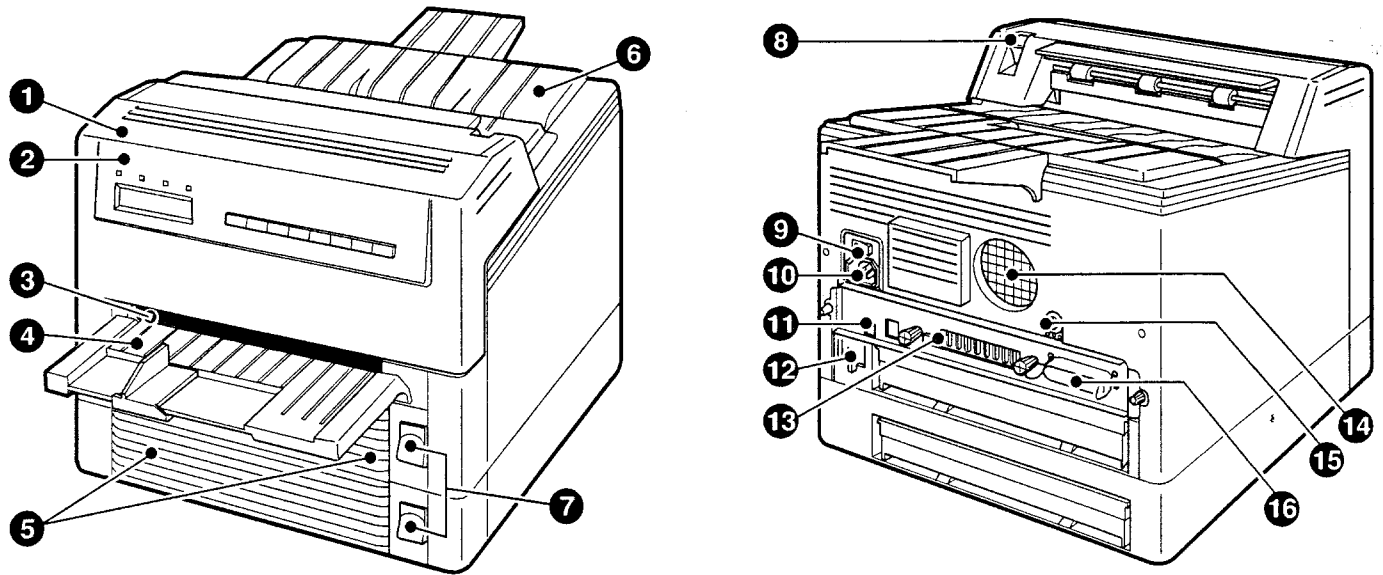
- ④ Close the front cover.
- ⑤ Pack the printer, reversing the order of the UNPACKING instructions.

### NOTE:

- When returning the printer for servicing, include:
  - A) A written explanation of the problem encountered.
  - B) Any print samples which may help in diagnosing the problem.
- Do not include toner/developer cartridge or photoconductor cartridge unless specifically requested by SHARP.

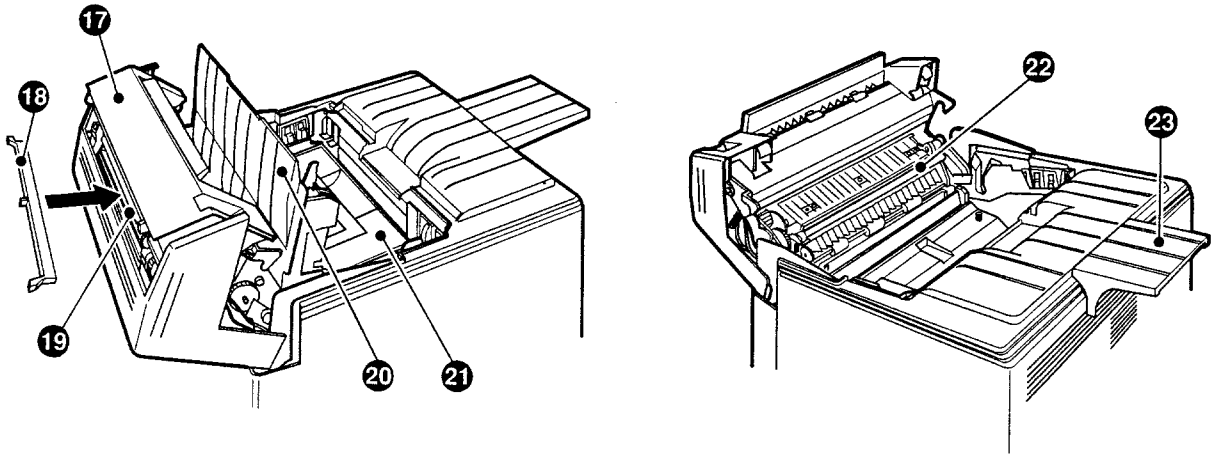
### [3] OUTLOOK AND INTERNAL STRUCTURE

#### 1. Outlook



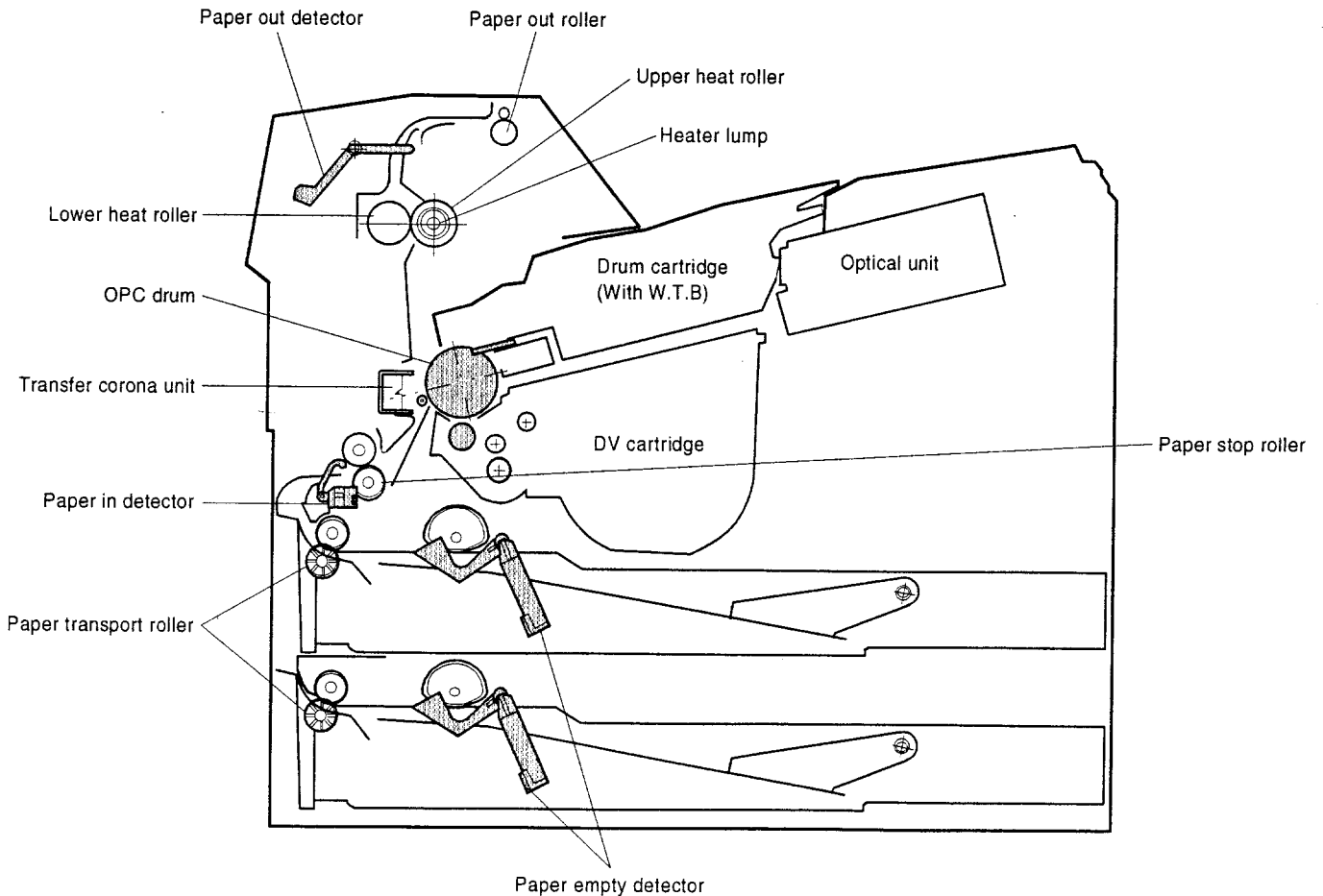
NO.	PART NAME	DESCRIPTION
①	Front Cover	Tilts down for access to printer interior.
②	Operation Panel	Contains the control keys, indicator lights and display.
③	Manual Feed Slot	Mount the manual feed guide here to put items through by hand.
④	Manual Feed Guide	Mount at the manual feed slot for non-standard printing.
⑤	Upper and Lower Paper Cassettes	Each holds 250 sheets of standard paper.
⑥	Face Down Tray	Pages come out here face down after printing.
⑦	Cassette Eject Buttons	Press to release the paper cassettes.
⑧	Cover Release Lever	Push to release and open the front cover.
⑨	Power Switch	Turns the printer on and off.
⑩	Power Cord Connector	Socket to accept the mains power cord.
⑪	Controller Board	Secured by screws. Slide out to install more memory or options such as PostScript.
⑫	Charger Cleaner	Combination cleaning tool for cleaning the chargers during routine maintenance.
⑬	Slot for Optional I/F	Available for AppleTalk/Serial interface.
⑭	Cooling Fan Outlet	Do not block the flow of air from this vent.
⑮	Print Density Adjuster	Rotate the dial clockwise to increase print density.
⑯	Parallel Interface Connector	Wide socket located on the controller board for the computer connector.

## 2. Open view

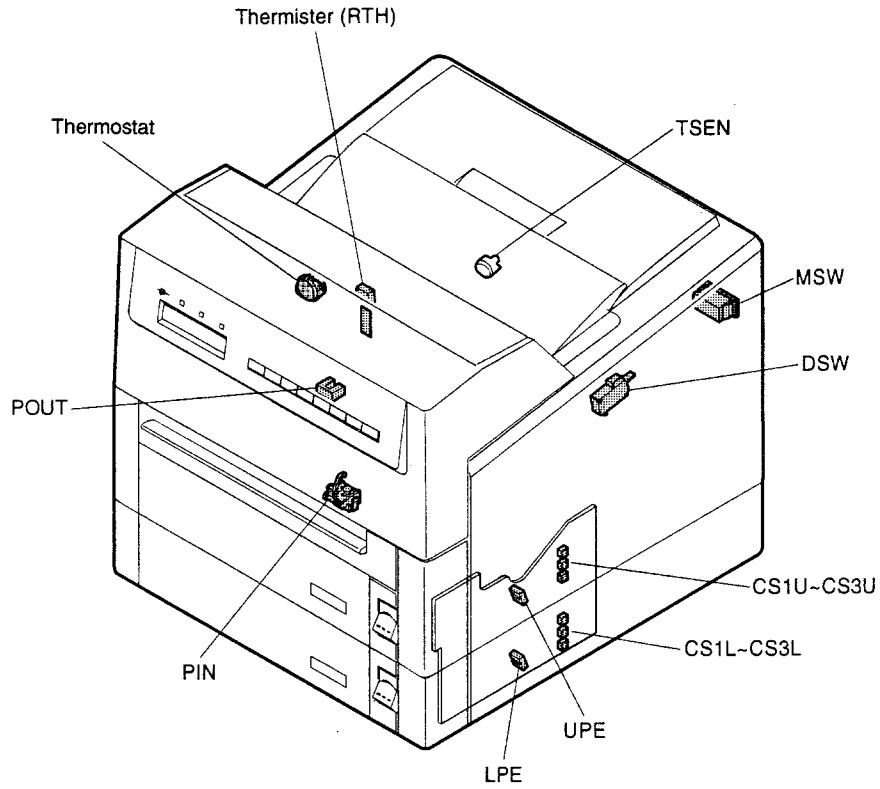


NO.	PART NAME	DESCRIPTION
17	Top Cover	Tilts down to allow access to the fusing unit section.
18	Roller Cleaner	Edged with a felt pad to catch stray toner. Handle using the green tab. Install before using the printer for the first time.
19	Fusing Unit	Sticks toner particles to the paper using heat. The fusing unit is hot, so be careful if you are trying to clear a paper jam.
20	Photoconductor Cartridge	Consists of the main charger and a drum, coated with organic photoconducting resin, that picks up toner particles and carries them to the paper.
21	Toner/Developer Cartridge	Contains fine toner particles and developer that helps carry toner to the photoconductor drum.
22	Transfer Charger	Draws the toner image off the photoconductor drum onto paper.
23	Extension Tray	Attach to support printed output. It can be used for the neat stacking of most sizes of paper.

## 3. Internal major parts

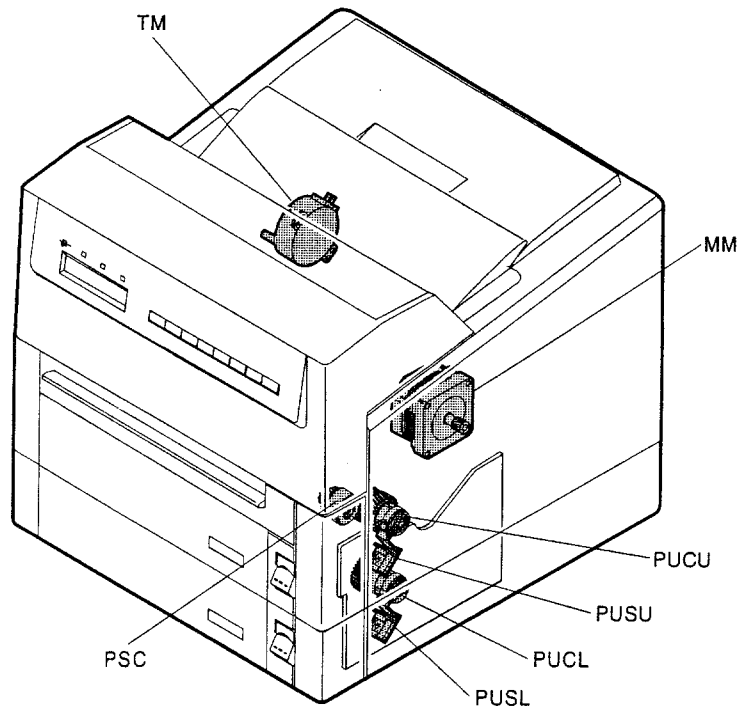


### 4. Switch, Sensor, Detector



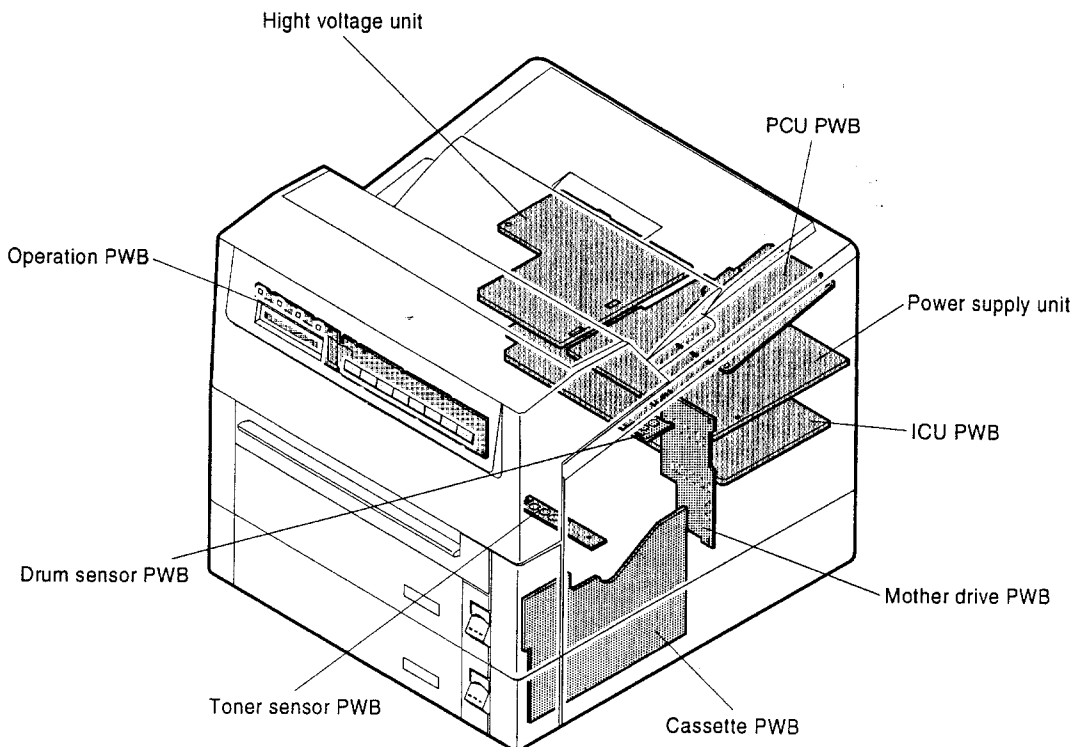
Name	Function	Type
PIN	Paper in detector	Reed switch
POUT	Paper out detector	Photo sensor
UPE	Upper cassette empty detector	Reed switch
LPE	Lower cassette empty detector	Reed switch
CS1U ~ CS3U	Upper cassette size detector	Push switch
CS1L ~ CS3L	Lower cassette size detector	Push switch
MSW	MAIN SWITCH (Power SW)	—
DSW	Front cover open detector (24V, 5V line safety switch)	Micro switch
TSEN	Toner control sensor	Magnetic sensor
RTH	Heat roller surface tempture sensor thermistor	Thermistor
THERMOSTAT		Thermostat

### 5. Motor, solenoid, clutch



Name	Function	Type
MM	Main motor	Stepping motor
TM	Toner motor	AC motor
PSC	Paper stop (resist) clutch	Electrical magnetic clutch
PUSL	Lower pick up roller solenoid	Solenoid
PUSU	Upper pick up roller solenoid	Solenoid
PUCL	Lower pick up clutch	Spring clutch
PUCU	Upper pick up clutch	Spring clutch

### 6. Circuit board



## [4] OPTIONS

- Paper cassette:
  - Letter cassette (JX-96BC); 250 sheets
  - Legal cassette (JX-96CC); 250 sheets
  - A4 cassette (JX-96A4); 250 sheets
  - Envelope cassette (JX-96EC); 20 pieces
- Postscript board:
  - PostScript Level2 (JX-96PS2)
  - include 35 outline fonts
- Expansion memory:
  - SIMM RAM (72 pin, 70 nsec: 3rd party)
- Interface board:
  - AppleTalk/RS-232C I/F board (JX-96AP2)

### 1. Specifications and features

#### (1) Postscript unit (JX-96PS2)

Emulation	Postscript Level II (35 Type 1 compatible, Multi Gray I & II)	
Board Size	63.5 mm x 66 mm	
ROM Size	8 Mbit x 2	
Accessories	1) Operation Manual (including "Install Guide")	
	2) Postscript Level II Printer Driver (for Windows 3.1)	3.5 inch FD x 1
	3) Postscript Level II Printer Driver (for Macintosh)	3.5 inch FD x 1
	4) License Sheet	

This upgrade with Phoenix Technology's PostScript offers you six advantages:

- ① PostScript level II compatibility at 600 dpi. You can work with this sophisticated page description language at fine resolution.
- ② Greater compatibility with professional typesetting companies, where PostScript has become a standard. PostScript files can be printed at any resolution.
- ③ You also get MultiGray technology, which enhances the gray scale gradations you can get at 600 dpi. Gray scale graphics look superb.
- ④ Dedicated PostScript printer drivers for Windows and Macintosh that allow optimal PostScript performance.
- ⑤ Autosensing of, and switching between PostScript and PCL5e data as it comes into the printer. When the board is installed, new branch menu items automatically appear in the operation panel menus.
- ⑥ Do not overlook the extra 35 attractive outline fonts that come with the board.

#### (2) AppleTalk/RS232C I/F unit (JX-96AP2)

Interface	AppleTalk/RS-232C
Board Size	90 mm x 66.4 mm
Accessories	1) Operation Manual (including "Install Guide")

This board allows you to connect the printer with a Macintosh computer. The printer will automatically switch between input sources if you have a PC and a Macintosh connected at the same time. The serial interface, RS-232C is an industry-standard connector that allows data communication at up to 57,600 baud. It is useful if you need to connect to a computer with cables up to about sixteen meters long. Parallel cables have to be much shorter. If you want to connect two computers to the printer, or if your computer is in an environment which is unsuitable for the printer, this option may help you.

#### Basic specifications

- SCC: Z85230-16 (16MHz)
- AP driver/receiver: DS8925, 5V single, conforming to RS422
- RS driver/receiver: DS14C238, 5V single, conforming to RS232E
- AP connector: 8 pin non-DIN
- RS connector: 25 pin E-SUB, 17LE-13250-28
- I/O connector: 40 pin, 179200-1 (AMP)
- Transfer clock original oscillation: 3.6862MHz

#### General

The AP/RS board uses the Z85230 (16MHz) made by Zilog (?????) as its SCC. Channel A is assigned to RS232, and channel B to AP. The transfer clock is common in channel A and channel B. Each baud rate is set with the original oscillation 3.6854MHz. For the original oscillation, the internal oscillating circuit is used and an oscillator is connected.

The Z85230 is of the CMOS process similarly to the Am85C30, and is compatible with Am85C30. The differences from the Am85C30 are the increased capacity of FIFO which provides higher performances and the fixed D0 bit (fixed to 0) of RR15. The Z85230 of 16MHz is used to decrease wait of CPU in the main board, increasing the operating speed.

#### Baud rate

- **RS232E**  
Supports 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, and 57600. These are selected by setting of the internal baud rate generator, using the x16 clock mode.
- **Appletalk**  
Fixed to 230.4kbps, x1 clock mode.

#### AP/RS board ON signal

The main board recognizes the installation of the AP/RS board, and the EXON\_ signal is driven to LOW. Then the main board connects this signal to PI0 to read and recognize it. If the board is not connected, this signal is open. In this case, pull-up in the main board side is required.

#### I/F specifications

- **RS232E**  
The RS232E conforms to the RS232E, and supports transfer speed up to 115200bps. Control is made with the five signals: transmission data (TxD\_), reception data (RxD\_), input signal (DSR), and output signals (RTS, DTR). The connector is 25 pin D-SUB. The driver/receiver is the DS14C238 made by National Semiconductor which includes 4 circuits. It conforms to TIA/EIA-232E and CCITT V.28, and operates on single 5V by the internal DC-DC converter. Transfer speed up to 120kbps is guaranteed.
- **Appletalk (LocalTalk)**  
The Appletalk (LocalTalk) uses 8 pin min DIN for the connector, and controls with four signals of TxD-, TxD+, RxD-, and RxD+. The driver/receiver used DS8925 made by National Semiconductor which includes 2 drivers and 3 receivers. It conforms to TIA/EIA422, 423, and provides electrical characteristics equivalent to 26LS30 and 26LS32. It operates on single 5V.

### (3) SIMM Memory

SoftBand technology allows you to print at 600 dpi with only 2 MB of RAM. This is more than enough for speedy and superb output for most documents. If you print more complex documents or graphics or have installed the PostScript option, and get frequent out of memory problems with auto-switching activated, it is time to think about putting in some more memory.

This model is upgradeable to a total of 50 MB using the 3 slots on the controller board. The printer accepts industry standard 72-pin 70-ns SIMMs at three sizes; 1, 4 and 16 MB. Because of memory addressing factors, 1 MB SIMMs will be ignored if you plug in a 16 MB one. The following SIMMs or their equivalents should work with the JX-9680:

- 1MB ..... MSC2327B-70YS8 (OKI)
- 4MB ..... HB56A132BY-7B (HITACHI),  
THM321000ASG-70 (TOSHIBA), MC-421000A32-70 (NEC)
- 16MB ..... HB56A432B-7 (HITACHI), THM324000SG-70 (TOSHIBA),  
MSC23423-70BS8 (OKI)

### (4) Paper and Envelope Cassettes

If you often find yourself feeding envelopes or different sized paper into the printer by hand, we may have a cassette to help you.

If you have extra cassettes, changing the size or type of paper to be printed is very convenient, all you have to do is swap the cassette already in the printer with the one containing the stock you want to print.

#### 250 Sheet A4 Cassette

Part Number: JX-96A4

#### 250 Sheet Legal Cassette

Part Number: JX-96CC

#### 250 Sheet Letter Cassette

Part Number: JX-96BC

#### 20 Envelope Cassette

Part Number: JX-96EC

International DL

International C5

Commercial 10

Monarch

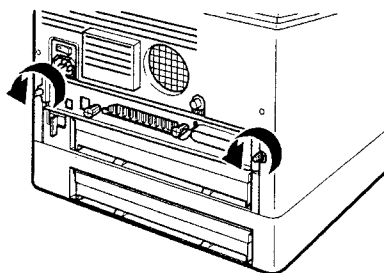
The envelope cassette is the only reliable way to feed envelopes automatically.

## 2. Setting

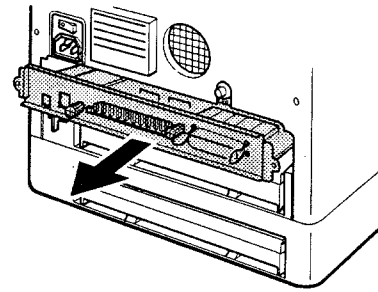
The electronic parts described on the preceding pages all go onto the controller board. The procedure for installing them is the same, but they fit in different places. Before installation, you must remove the controller board.

### (1) Removing the Controller Board

- ① Turn off the power switch. Disconnect everything, including the power supply and computer cables, from the back of the printer.
- ② Unscrew the outside pair of screws holding the controller board in place.



- ③ Carefully slide out the controller board. You can get a grip on the inner thumbscrews.

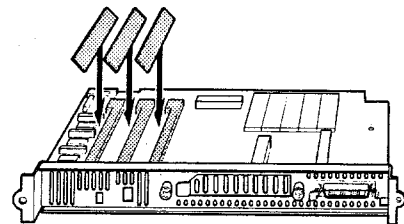


- ④ Put the board down in a safe and level place. Static electricity may also be a problem so do not, for example, put the board down on a carpeted floor.

NOTE: Static electricity may be a hazard, especially in dry conditions, or in rooms with synthetic carpets. Handle the controller board carefully. If possible, wear an anti-static wristband or take other precautions, such as touching the anti-static wrapper that the upgrade part you are installing came packaged in, to avoid static electricity damage to the chips.

### (2) Setting SIMMs

- ① Remove the controller board.
- ② SIMMs go into 3 slots on the left of the controller board. SIMMs should be handled by holding their left and right edges. Avoid touching the chips or the metallic edge connectors. The edge connectors fit into the angled SIMM slots. Holding the SIMM at an angle, line up the edge connectors with the slot. Push the SIMM in gently but firmly. It should pop into place with two retaining lugs fitting into holes on either side of the SIMM and the spring clips gripping it in position.

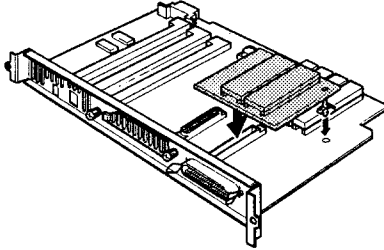


### (3) Installing printer driver (PostScript leved II printer driver)

For best results on Macintosh systems, install and use the SHARP JX-9680PS printer software provided with the optional PostScript upgrade board. Windows PostScript driver software is also provided with this board; when installed, you will be able to choose SHARP JX-9680 PostScript as your printer in Windows. Access to the PostScript printer settings will also become available through the remote control panel, where a new PS2 item will be selectable.

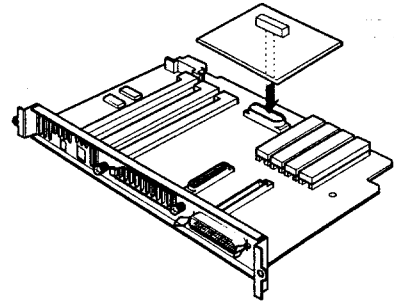
#### (4) Setting the PostScript Board

- ① Remove the controller board.
- ② The PostScript upgrade board fits on the right hand side of the controller board. There is a plug on the bottom of the PostScript board that fits into a socket on the controller board. There is also a plastic post fitted on the bottom of the PostScript board near the edge opposite the connector. The plastic post fits into a hole at the side of the controller board. Line up the PostScript board plug with the controller board socket and the plastic post with its locating hole. Push the board home.



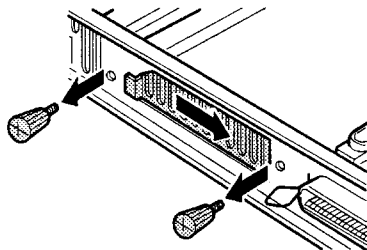
#### (6) Setting LAN board

- ① Remove the controller board
- ② A plug at the bottom of the LAN board fits into a socket on the controller board and push the plug into the socket.

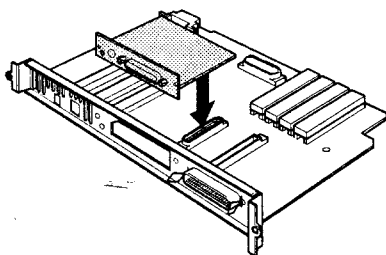


#### (5) Installing the AppleTalk/RS-232C Serial Interface Board

- ① Remove the controller board.
- ② Unscrew the slot cover on the back plate of the controller board and slide it out to the right. Keep the slot cover in case the interface board is removed for any reason.



- ③ A plug at the bottom of the interface board fits into a socket on the controller board, to the right of the slot opening. Push the plug into the socket. The screw holes on the right and left of the back plate and interface board face plate should line up. Fix the interface board in place with the thumbscrews.





## [5] EMULATION

There are 6 kinds of emulation: HP PCL5e, PostScript Level2, IBM Proprinter X24, Epson LQ850. Auto and HEX dump.

Section of emulation is made with the key or expanded PJJ command proposed by SHARP.

When changing the emulation, only the necessary sections of the memory and the ports are initialized.

### **PCL5e (Including PJJ)**

Emulation is performed according to the specifications of PCL5e employed in HP LJ4MP.

PJJ is employed with command expansion or command which proposes invalidity in SHARP.

### **PostScript Level2**

Emulation is performed according to the specifications of PostScript Level2 employed in HP LJ4MP.

### **IBM Proprinter X24**

PJJ is employed with command expansion or command which proposes invalidity by SHARP.

The internal fonts are used for character decoration fonts based on DP (A Data Processing Font), Courier, and Prestige.

### **Epson LQ850**

PJJ is employed with command expansion or command which proposes invalidity by SHARP.

The internal fonts are used for character decoration fonts based on DRAFT, ROMAN, SANS, and SERIF.

### **HEX DUMP**

When HEX DUMP is selected with the key or PJJ, all data received from the host are printed in HEX DUMP format.

### **AUTO**

PJJ is employed with command expansion or command which proposes invalidity by SHARP.

The AUTO mode analyzes the received data and selects either of PCL5e and PostScript Level2 based on the result of analysis, and keeps the selected emulation for analysis and printing until job end is recognized. It operates similarly to HP LJ4MP.

When job end is recognized, the AUTO mode is selected automatically again to perform the next job analysis.

For setting, refer to [9] SETTING.

## [6] FONTS

### PCL 5e Internal Font (Compatible with HP LaserJet 4 35 Intellifonts)

– HP equivalency –	– JX-9680 Internal Fonts –
<b>IntelliFonts Compatible</b>	
Courier	(Courier Roman SWC)
Courier Bold	(Courier Bold SWC)
Courier Italic	(Courier Italic SWC)
Courier Bold Italic	(Courier Bold Italic SWC)
Letter Gothic	(Letter Gothic Roman SWC)
Letter Gothic Bold	(Letter Gothic Bold SWC)
Letter Gothic Italic	(Letter Gothic Italic SWC)
CG Times®	(Dutch 801 SWC)
CG Times Bold	(Dutch 801 Bold SWC)
CG Times Italic	(Dutch 801 Italic SWC)
CG Times Bold Italic	(Dutch 801 Bold Italic SWC)
CG Omega®	(Zapf Humanist 601 Demi SWC)
CG Omega Bold	(Zapf Humanist 601 Bold SWC)
CG Omega Italic	(Zapf Humanist 601 Demi Italic SWC)
CG Omega Bold Italic	(Zapf Humanist 601 Bold Italic SWC)
Coronet™	(Ribbon 131 SWC)
Clarendon Condensed	(Clarendon Condensed SWC)
Univers®	(Swiss 742 SWC)
Univers Bold	(Swiss 742 Bold SWC)
Univers Italic	(Swiss 742 Italic SWC)
Univers Bold Italic	(Swiss 742 Bold Italic SWC)
Univers Condensed	(Swiss 742 Condensed SWC)
Univers Bold Condensed	(Swiss 742 Bold Condensed SWC)
Univers Condensed Italic	(Swiss 742 Condensed Italic SWC)
Univers Bold Condensed Italic	(Swiss 742 Bold Condensed Italic SWC)
Antique Olive™	(Incised 901 SWC)
Antique Olive Bold	(Incised 901 Bold SWC)
Antique Olive Italic	(Incised 901 Italic SWC)
Garamond Antiqua	(Original Garamond SWC)
Garamond Halbfett	(Original Garamond Italic SWC)
Garamond Kursiv	(Original Garamond Bold SWC)
Garamond Kursiv Halbfett	(Original Garamond Italic Bold SWC)
Marigold	(Audrey Two SWC)
Albertus™ Medium	(Flaereserif 821 SWC)
Albertus Extra Bold	(Flaereserif 821 Extra Bold SWC)

### Microsoft Windows 3.1 True Type Compatible (Compatible with Windows 3.1 10 True Type fonts)

Arial™	(Swiss 721 SWM)
Arial Bold	(Swiss 721 Bold SWM)
Arial Italic	(Swiss 721 Oblique SWM)
Arial Bold Italic	(Swiss 721 Bold Oblique SWM)
Times New Roman®	(Dutch 801 Roman SWM)
Times New Roman Bold	(Dutch 801 Bold SWM)
Times New Roman Italic	(Dutch 801 Italic SWM)
Times New Roman Bold Italic	(Dutch 801 Bold Italic SWM)
Symbol	(Symbol Set SWA)
WingDings	(Wingbats SWA)

### Bitmap - 1 font (Compatible with HP LaserJet 4 Line Printer Bitmap Font)

Line printer:

16.7 pitch portrait + landscape

### Postscript Level2 Internal Font (option) Outline - 35 typefaces (Adobe PostScript compatible)

	– Adobe equivalency –
Dutch 801 Normal	(Times Roman)
Dutch 801 Bold	(Times Bold)
Dutch 801 Italic	(Times Italic)
Dutch 801 Bold Italic	(Times Bold Italic)
Courier Normal	(Courier)
Courier Bold	(Courier Bold)
Courier Italic	(Courier Oblique)
Courier Bold Italic	(Courier Bold Oblique)
Swiss 721 Normal	(Helvetica)
Swiss 721 Bold	(Helvetica Bold)
Swiss 721 Oblique	(Helvetica Oblique)
Swiss 721 Bold Oblique	(Helvetica Bold Oblique)
Swiss 721 Narrow Normal	(Helvetica Narrow)
Swiss 721 Narrow Bold	(Helvetica Narrow Bold)
Swiss 721 Narrow Oblique	(Helvetica Narrow Oblique)
Swiss 721 Narrow Bold Oblique	(Helvetica Narrow Bold Oblique)
Zapf Calligraphic 801 Normal	(Palatino)
Zapf Calligraphic 801 Bold	(Palatino Bold)
Zapf Calligraphic 801 Italic	(Palatino Italic)
Zapf Calligraphic 801 Bold Italic	(Palatino Bold Italic)
ITC Avant Garde Gothic Book	(ITC Avant Garde Book)
ITC Avant Garde Gothic Book Oblique	(ITC Avant Garde Book Oblique)
ITC Avant Garde Gothic Demi	(ITC Avant Garde Demi)
ITC Avant Garde Gothic Demi Oblique	(ITC Avant Garde Demi Oblique)
ITC Bookman Light	(ITC Bookman Light)
ITC Bookman Light Italic	(ITC Bookman Light Italic)
ITC Bookman Demi	(ITC Bookman Demi)
ITC Bookman Demi Italic	(ITC Bookman Demi Italic)
Century Schoolbook Normal	(New Century Schoolbook Roman)
Century Schoolbook Bold	(New Century Schoolbook Bold)
Century Schoolbook Italic	(New Century Schoolbook Italic)
Century Schoolbook Bold Italic	(New Century Schoolbook Bold Italic)
ITC Zapf Chancery Medium Italic	(ITC Zapf Chancery Medium Italic)
ITC Zapf Dingbats	(ITC Zapf Dingbats)
Symbol	(Symbol)

**PCL 5e Symbol Set  
(Compatible with LaserJet 4P)**

ID	Display	Name	Bitmap Font	Outline Font
8U	ROMAN-8	Roman 8	OK	OK
0N	ECMA-94	ISO 100 Latin	OK	OK
10U	IBM-US	PC-8	OK	OK
11U	IBM-D/N	PC-8 Denmark/Norway	OK	OK
12U	PC-850	PC-850	OK	OK
1U	LEGAL	Legal	OK	OK
2U	ISO-2	ISO IRV	OK	OK
1E	ISO-4	ISO United Kingdom	OK	OK
OU	ISO-6	ANSI ASCII (US ASCII)	OK	OK
3S	ISO-10	ISO Swedish	OK	OK
OS	ISO-11	ISO Swedish: names	OK	OK
0K	ISO-14	JIS ASCII	OK	OK
0I	ISO-15	ISO Italian	OK	OK
4S	ISO-16	ISO Portuguese	OK	OK
2S	ISO-17	ISO Spanish	OK	OK
1G	ISO-21	ISO GERMAN	OK	OK
OF	ISO-25	ISO French	OK	OK
2K	ISO-57	ISO Chinese	OK	OK
0D	ISO-60	ISO Norwegian v1	OK	OK
1D	ISO-61	ISO Norwegian v2	OK	OK
1F	ISO-69	ISO French	OK	OK
5S	ISO-84	ISO Portuguese: IBM	OK	OK
6S	ISO-85	ISO Spanish: IBM	OK	OK
0G	GERMAN	HP German	OK	OK
1S	SPANISH	HP Spanish	OK	OK
6M	VN MATH	Ventura Math	—	OK
13J	VIN INTL	Ventura International	—	OK
14J	VN US	Ventura US	—	OK
5M	PS MATH	PS Math	—	OK
10J	PS TEXT	PS Text	—	OK
8M	MATH-8	Math-8	—	OK
15U	PI FONT	Pi Font	—	OK
6J	MS PUBL	Microsoft Publishing	—	OK
9J	WINDOWS	Windows	—	OK
7J	DESK TOP	Desk Top	—	OK
9L	—*	Ventura ITC Zapf Dingbats	—	OK
10L	—*	PS ITC Zapf Dingbats	—	OK
11L	—*	ITC Zapf Dingbats Series 100	—	OK
12L	—*	ITC Zapf Dingbats Series 200	—	OK
13L	—*	ITC Zapf Dingbats Series 300	—	OK

\* not available from key operation

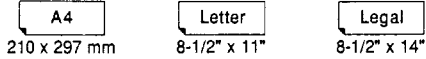
# [7] SUPPLIES

## 1. Paper

### (1) Paper size and weight

**Standard Papers (Used only automatic feeding from the paper cassette)**

Sizes



Weights



Recommended papers

USA: Necossa  
Germany: Igepa

### Maximum and minimum size of paper

Sizes	Max. paper size:	Max. width	216 mm (8-1/2")
		Max. length	356 mm (14")
	Min. paper size:	Min. width	98 mm (3-7/8")
		Min. length	190 mm (7-1/2")

Weights

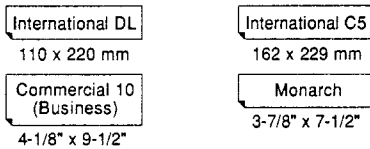


- 210 x 297 mm (A4) is the maximum size for paper weighing more than 105 g/m<sup>2</sup> (28 lbs.). – Manual feeding

### (2) Special papers

#### Envelopes

Sizes



Weights



- An optional envelope cassette is available for continuous feeding of up to 20 envelopes.
- Do not use envelopes with metal tabs, snaps, windows, strings, or other attachments, which may damage the printer.

#### OHP sheet (Transparency film)



Sizes



Recommended OHP sheet (Transparency film)

Letter size: Folex BG60  
A4 size: Folex BG60

#### Label paper

Recommended label paper  
AVERY 5351, 5360

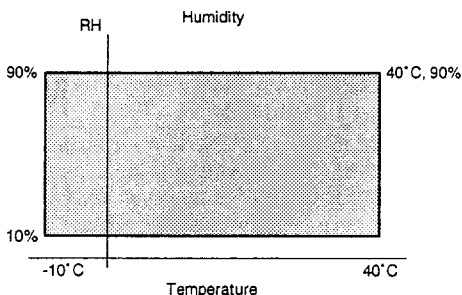
### (3) Standard and Applicable Papers

Item	Standard paper	Applicable paper
Weight	60 ~ 80 g/m <sup>2</sup>	60 ~ 80 g/m <sup>2</sup> (cassette supply) 60 ~ 128 g/m <sup>2</sup> (manual supply)
Smoothness	face; ≥ 20 s back; ≥ 20 s (BEKK method)	face; ≥ 20 s back; ≥ 18 s (BEKK method)
Porosity	≥ 7 s (BEKK method)	same as left
Opacity	≥ 77%	same as left
Surface resistivity	5 x 10 <sup>10</sup> ~ 1 x 10 <sup>10</sup> (20 ± 1°C, 65 ± 2%RH)	≥ 5.0 x 10 <sup>8</sup>
Stiffness	vertical; ≥ 17 cm horizontal; ≥ 13 cm (CLARK method)	same as left
Moisture content	4.5% ~ 7.0%	same as left
Thickness	75 μ ~ 110 μm	same as left
Dimension	standard ± 1 mm	same as left

## 2. Photo-conductor cartridge, developer/toner cartridge

Name	Product name	Pcs/pack	Life	Note
Photo-conductor cartridge (OPC drum/ Drum cleaner/Main corona unit/ Waste toner bottle)	JX-96DRD	5	30,000 pages (A4 or LT 4% black image area)	
Toner/developer cartridge with roller cleaner	JX-96DCD	5	15,000 pages (A4 or LT 4% black image area) 30,000 pages (MAX)	

### (1) Storage condition

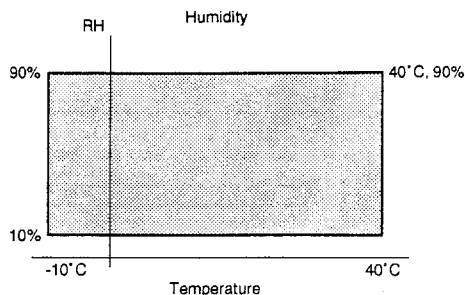


#### Storage Guarantee Period

Photo-conductor cartridge:  
36 month from the manufacturing month  
Toner/developer cartridge:  
24 months from the manufacturing month

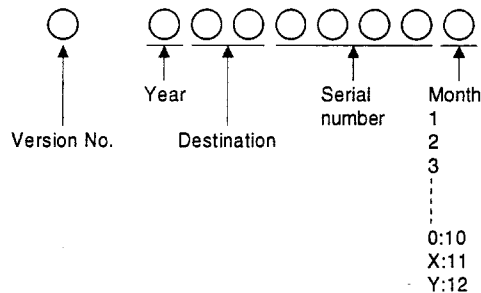
\* the storage period is specified under packed and sealed condition

### (2) Transport condition

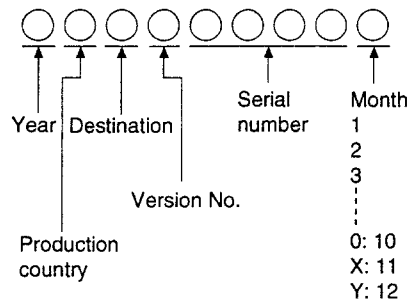


### (3) Lot number identification

Photo-conductor cartridge



Toner/developer cartridge

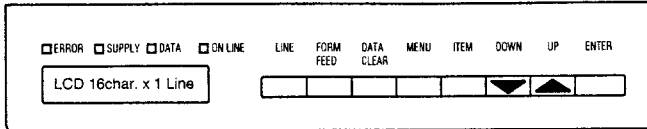


## [8] OPERATOR PANEL DESCRIPTION

The operation panel is used to set the Laser Printer off-line for direct operations, such as setting the menu items and executing self-tests. Note the following when using the operation panel:

- Set the printer off-line before using the keys.
- Some keys have several functions, which are selected by the duration of time the key is pressed. Be sure to check the functions on the display.

### 1. Panel view



### 2. Display functions

#### LED functions

There are four LEDs; OnLine, Data, Error, and Supply. Their functions are as shown in the table below.

	ON	Blink	OFF
OnLine	Shows data reception, transmission, analysis, and printing are allowed.	Shows that data are under analysis. (Processing)	Shows that data reception and analysis are inhibited.
Data	Shows that data are received but the display list exists in the memory.	Shows that the display list exists in the memory but all the received data have been analyzed.	Shows that there is no data reception and no display list in the memory.
Error	Shows that an error occurs.		Shows the normal state.
Supply	Shows that an error occurs in Toner Low, Toner End, DrumNear End, or Drum End.	None	Shows the normal state.

#### LCD display function

The 16-character liquid crystal display indicates the following:

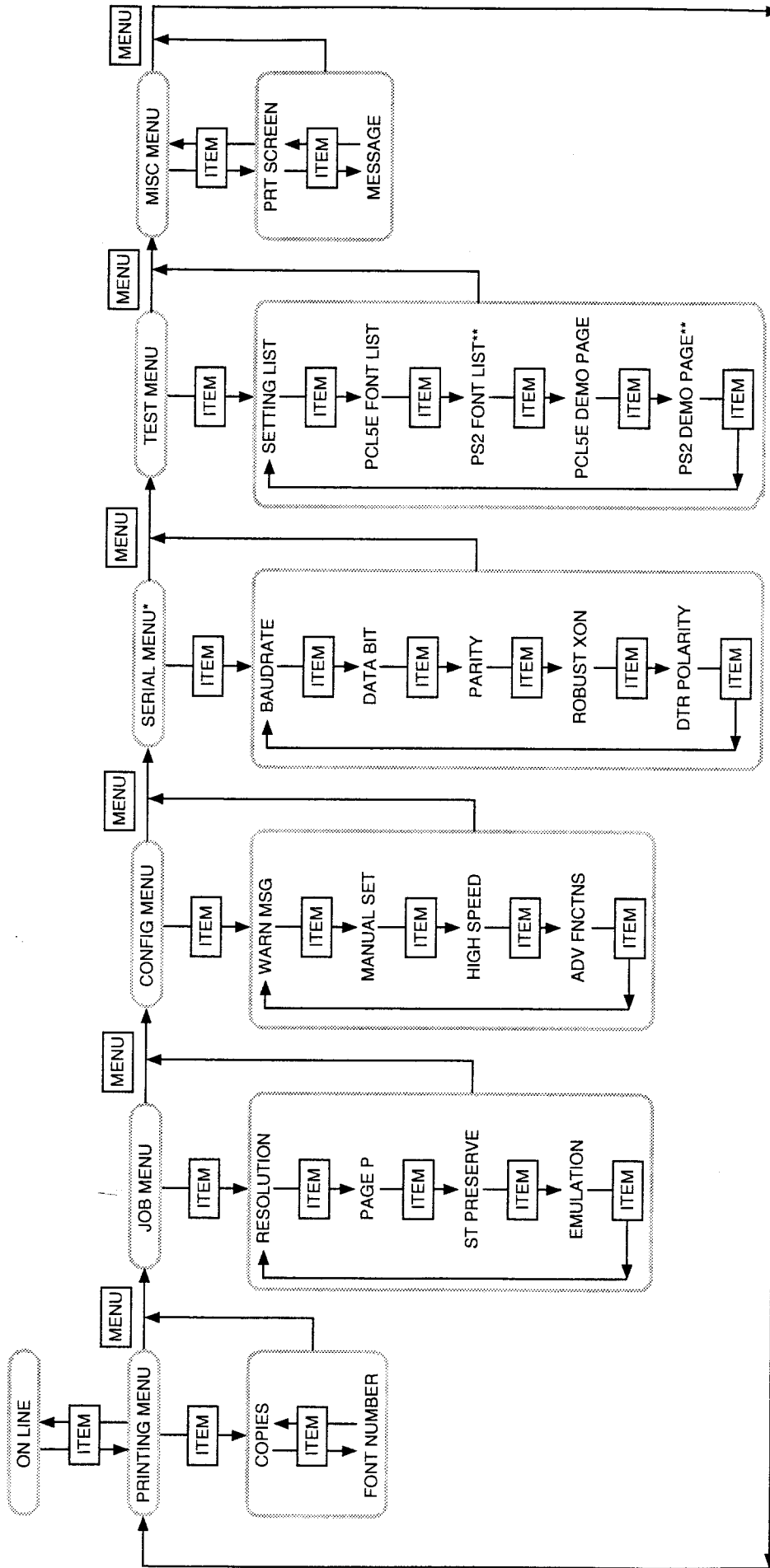
- Status messages
- Menu settings
- Error conditions
- Service messages

### 3. Key functions

There are eight keys; Line, FormFeed, Data Clear, Menu, Item, Up, Down, and Enter. Their functions are as shown in the table below.

Line	Used to set I/F to Off line or On line.
From Feed	Used to feed data which remain without data reception.
Data Clear	Used to erase data in interruption of printing.
Menu	Used to select MENU.
Item	Used to select MENU items.
Up Δ	Used to change the set value of MENU items. At CPLOCK=ON, when the key is pressed, "MENU LOCKED" is displayed on LCD for 1 sec and the previously displayed content (before pressing the key) is displayed. (The currently set value is displayed.)
Down ▽	Used to change MENU item set values. At CPLOCK=ON, when the key is pressed, "MENU LOCKED" is displayed on LCD for 1 sec and the previously displayed content (before pressing the key) is displayed. (The currently set value is displayed.)
Enter	Used to register the set value changed with Up/Down keys to the EPROM.
Menu +	Printer reset.
Up Δ +	Valid only when the I/F is in off line and no print data is under analysis. Similarly to Power ON, the operation is started from SELF TEST. (Reset start)
Down ▽ +	

# JX-9680 Control Menu



\* SERIAL MENU only appears when the optional AppleTalk/RS-232E serial interface board has been installed.

\*\* In TEST MENU, PS2 items only appear when the optional PostScript board has been installed.

# [9] SETTING

## 1. Power save mode

This printer has the power save mode as a default setting to reduce power consumption by reducing the temperature of the fusing unit. If no data is supplied from the computer or no key operation is performed for a certain amount of time, the printer changes to the power save state. However when the printer is in the power save state, it takes longer to start printing the first page because it takes some time to raise the temperature of the fusing unit.

It is possible to adjust the length of time that elapses before returning to the power save state. The power save mode can also be turned off. Follow the procedures listed below.

### Power save mode specifications

- ① Holding the UP **ENTER** key pressed when turning on the power enters the power save mode setting diag.
- ② During the power save mode setting diag, the mode can be set with the UP **ENTER** key and the DOWN (▽) key.
- ③ By turning off the power during displaying the power save mode setting diag selection, the power save mode is set as follows:

DISPLAY	TIMER TO ENTER THE MODE	POLYGON MOTOR	CONTROL TEMP	FAN MOTOR	REMARKS
POWER SAVE 90	90 sec	OFF	100°C	5-minute OFF/1 minute ON	Default value
POWER SAVE 180	180 sec	OFF	100°C	"	
POWER SAVE 255	255 sec	OFF	100°C	"	
POWER SAVE OFF	90 sec	OFF	162°C	ON	

- ④ The power save mode set contents are not changed by turning off/on the power in a mode other than the power save mode setting diag.
- ⑤ The default when shipping is "POWER SAVE 90."
- ⑥ When the SLPOFF command from the controller is received, the polygon motor and the fan will not stop. With the SLPON command, the mode returns to the power save mode.

### Procedures and operations of the power save mode setting diag

Procedures	Operations	Remark
Power on	Normal display	
After completion of warm-up, leave it for 90 sec.	Polygon motor off, the fan motor repeats 5-min. off/one min. on. 100°C of control temperature	Enters the power save mode in 90 sec after completion of warm-up
Power off		
<b>ENTER</b> + Power on	Power save 90 display	Enters the power save mode setting diag. The mode to be set is changed.
△	Power save 180 display	
<b>ENTER</b>	Power save 255 display	The mode to be set is restored. The mode to be set is changed reversely.
<b>ENTER</b>	Power save off display	
▽	Power save 90 display	
▽	Power save off display	
▽	Power save 255 display	
▽	Power save 180 display	
Power off		
Power on	Normal display	
After completion of warm-up, leave it for 180 sec.	Polygon motor off, the fan motor repeats 5-min. off/one min. on. 100°C of control temperature.	The operation of power save 180 in the display mode when the power is turned off in the power save mode setting diag.
Power off		
Power on	Normal display	
After completion of warm-up, leave it for 180 sec.	Polygon motor off, the fan motor repeats 5-min. off/one min. on. 100°C of control temperature.	The mode is stored even when the power is turned off/on.



## 2. Initializing for setting data

### EEPROM initializing

Since the EEPROM in the PCU and the EEPROM in the ICU store different counter values and different set values, they must be initialized individually.

The EEPROM in the PCU stores data for control of counters and other machines and supply parts.

While the EEPROM in the ICU stores data related to the printer operating conditions.

### (PCU EEPROM initializing)

The PCU EEPROM is initialized by the PCU diagnostics.

- ① While pressing the DOWN key and the ITEM key, turn on the power. (The machine goes into the PCU diagnostic mode.)
- ② Press the DOWN key to select "NVRAM INITIAL" mode.
- ③ While manually turning on the paper detector (PIN) in the manual paper feed section, press the DATA CLEAR key. When the PCU EEPROM initializing is completed, a beep sounds. The items are initialized as follows:

DEV 00000  
 DRM 00000  
 DEVTM 00000  
 DRMTM 00000  
 LIFE 000  
 TNL 024

- ④ Turn off the power.

(Note) By initializing the PCU EEPROM, the toner density level (TNL) is set to "024." Under this state, printing cannot be performed. ("TONER LOW LEVEL" is displayed.) After initializing the PCU EEPROM, use the PCU diagnostics to set the toner density level (TNL) to "070" ~ "080."

*TNL Adjusted set to "090"*

### (ICU EEPROM initializing)

The ICU EEPROM is initialized by the operation panel key similarly to the PCU diagnostics. The key operation differs depending on the destination.

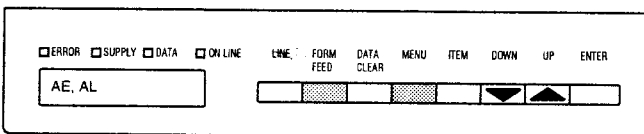
*do after installing new Rem*  
*"Country Init"*

- ① While pressing the key specified according to the destination, turn on the power. When the ICU EEPROM initializing is completed, three beeps sound and the destination code is displayed.

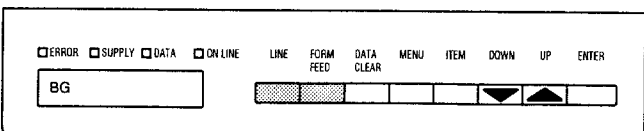
- ② Turn off the power.

The default value of initializing is as follows:

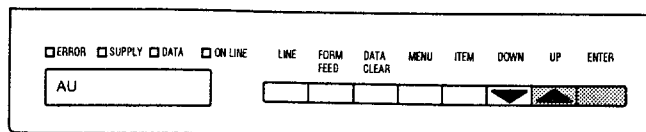
### Canada and 100V series except USA (AE, AL)



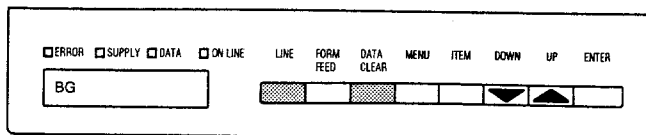
### Europe (BG)



### USA (AU)



### U.K., Australia and 200V series except Europe (BA, BE, BK)



\*1 --- When the PS board is not installed, PCL5E is set.

Set item	Destination setting *			
	AE, AL	AU	BG	BA, BE, BK
TOTALCOUNTER	0	0	0	0
RESOLUTION	600	600	600	600
PAGEPROTECT	AUTO	AUTO	AUTO	AUTO
STATE	OFF	OFF	OFF	OFF
ECONOMODE	OFF	OFF	OFF	OFF
EMULATION	AUTO *1	AUTO *1	AUTO *1	AUTO *1
MANUALSET	ON	ON	ON	ON
LANG	ENGLISH	ENGLISH	ENGLISH	ENGLISH
TIMEOUT	15	15	15	15
COPIES	1	1	1	1
PAPER	LETTER	LETTER	A4	A4
ORIENTATION	PORTRAIT	PORTRAIT	PORTRAIT	PORTRAIT
FORMLINES	60	60	64	64
AUTOLF	OFF	OFF	OFF	OFF
For PCL				
SYMSET	ROMAN8	ROMAN8	ROMAN8	ROMAN8
PRINTSCREEN	OFF	OFF	OFF	OFF
FONT	Courier	Courier	Courier	Courier
FONTSOURCE	I	I	I	I
FONTNUMBER	0	0	0	0
PITCH	10.00	10.00	10.00	10.00
PTSIZE	12.00	12.00	12.00	12.00
For PostScript				
PRTPSERRS	OFF	OFF	OFF	OFF
JOB TIMEOUT	0	0	0	0
MFTIMEOUT	60	60	60	60
WAITTIMEOUT	30	30	30	30
MULTIGRAY	LEVEL2	LEVEL2	LEVEL2	LEVEL2
For LQ850				
PITCH	10.00	10.00	10.00	10.00
CHARACTERTABLE	ITALICS	ITALICS	ITALICS	ITALICS
INTERNATIONAL	USA	USA	USA	USA
GRAPHICS	OFF	OFF	OFF	OFF
DUMPMODE	OFF	OFF	OFF	OFF
For X24				
PITCH	10.00	10.00	10.00	10.00
CHARACTERSET	1	1	2	1
ZERO	0	0	0	0
AUTOOCR	OFF	OFF	OFF	OFF
AGM	OFF	OFF	OFF	OFF

: Differs depending on the destination.

(Note) **TOTAL COUNTER**

There are two kinds of total counters; the PCU life (total) counter and the ICU total counter, which are different from each other.

**(PCU life (total) counter)**

It is stored in the PCU EEPROM and can be displayed with the PCU diagnostics and the content can be changed. The purpose of this counter is to know the using status of the machine. The unit of display is 1,000 sheets.

Various counters stored in the PCU EEPROM are for control of supply parts.

**(ICU total counter)**

It is stored in the ICU, and is displayed on the host screen as status through the printer driver.

The major purpose of this counter is to use in rental business. The unit of display, therefore, is 1 sheet, different from the PCU total counter.

The total page count value displayed with the ICU diagnostics setting list shows the total counter value stored in the ICU EEPROM.

The counter is reset to "0" by initializing with the ICU diagnostics (software diagnostics).

### 3. Default setting

By initializing the PCU EEPROM and the ICU EEPROM, all the values are set to the default values. When shipping from the factory, all the values are set to the default values.

### 4. Parameter setting

The parameters you can change are listed alphabetically in the printer setting table which follows. These parameters can be changed through the remote control panel software, through the printer operation panel, or by both means.

In the left column of the printer setting table, the abbreviations below the parameter name show where the parameters can be changed. Capital letters denote the setting control panel in the software, and lower case letters denote the printer operation panel branch menu, in which the setting can be adjusted. If only a single abbreviation is found, the printer cannot be set using the missing method. In the remote control panel software there are nine setting control panels. Using the printer keys, you have access to a possible six branch menus, including the test menu which is not listed below, depending on the options installed on the printer.

Setting Category	Setting by Remote Control Panel	Setting by Printer Operation Panel
Printing Menu	PRT	prt
Job Menu	JOB	job
Configuration Menu	CON	con
Serial Menu*	SER	ser
Miscellaneous Menu	MIS	mis
PCL5e	PCL	
PS2**	PS2	
LQ850	LQ	
X24	X24	
Password	PSW	

\* Serial items only appear when the optional AppleTalk/RS-232C serial interface board has been installed.

\*\* PS2 items only appear when the optional PostScript board has been installed.

In the centre column of the printer setting table, the range of possible settings is listed. On the printer display panel, the current setting is indicated by an asterisk on the right edge of the panel. The factory default values are indicated by an asterisk next to the appropriate value.

\* Default setting

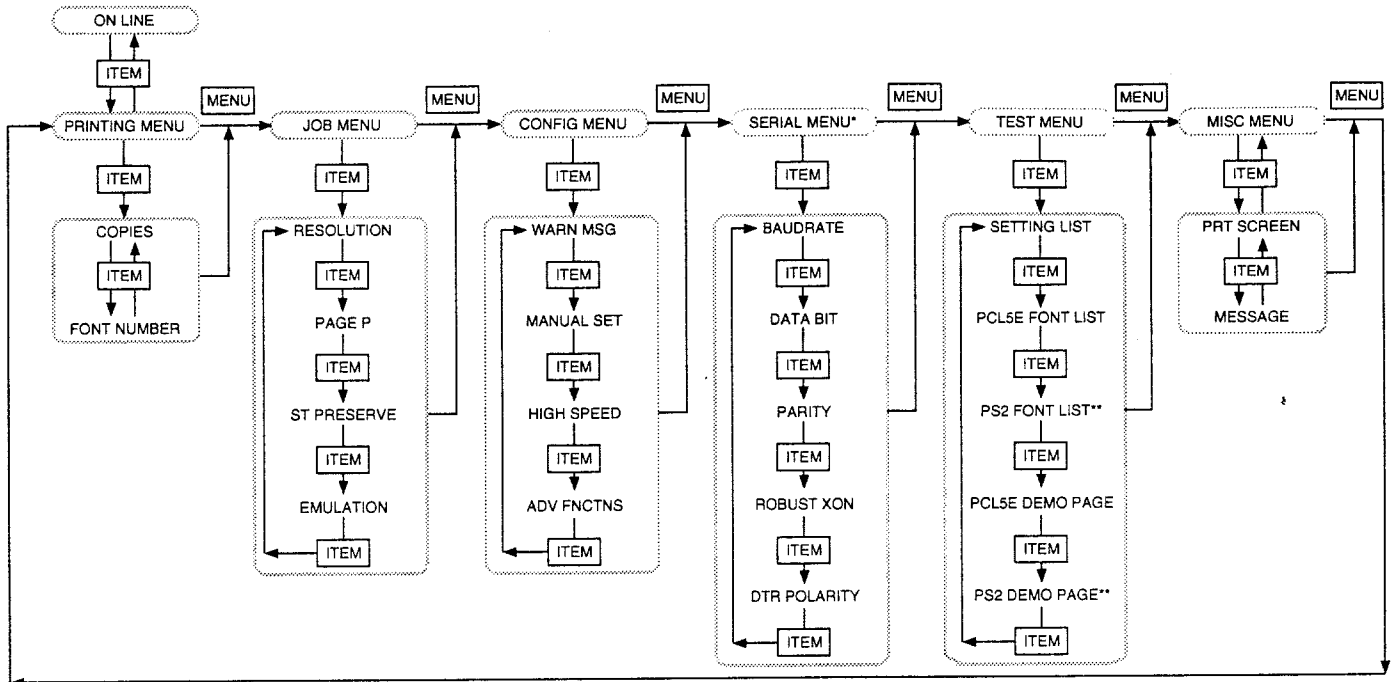
Parameter/Menu Location	Range	Description
<b>Advanced Functions</b> CON/con	On*, Off	Advanced functions must be set to on to take advantage of the bi-directional parallel port's ability to allow the printer to send status messages to the computer.
<b>AGM</b> X24	Off*, On	When set to on, the Alternate Graphics Mode will support ESC 3n, ESC Jn, ESC An and ESCmnz. When set to off, IBM ASCII Mode handles these commands.
<b>Auto CR</b> X24	Off*, On	When set to on, a carriage return is automatically added after VT, ESC J or a line feed is received.
<b>Auto LF</b> LQ X24	Off*, On	When set to on, a line feed is automatically added after a carriage return is received.
<b>Baud Rate</b> SER/ser	300, 600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600	This setting determines the rate at which the information is transferred between the computer and the printer. Older computers and serial cables require slower settings. Please refer to your computer manual.
<b>Character Set</b> X24	1*, 2	Sets the two available character sets.
<b>Character Table</b> LQ	Italics*, Graphics	Epson printers have two character sets, one for printing italics and the other for printing graphics characters.
<b>Copies</b> PRT/prt	1* - 999	Sets how many copies to print.
<b>Data Bit</b> SER/ser	8*, 7	A communication parameter. Printer and host values must match.
<b>DTR Polarity</b> SER/ser	High*, Low	The configuration of Data Terminal Ready polarity determines whether the signal at pin 20 of the serial interface connector is high or low when the printer is ready.
<b>Emulation</b> JOB/job	PCL5e*, PS2, X24, LQ850, Auto	Sets the base printer emulation. Auto only works between PCL and PostScript.
<b>Font Name</b> PCL		Sets the default printer font.
<b>Font Number</b> prt	0* - (variable)	The code number of the printer's base font. Number varies according to how many fonts are installed on the printer.
<b>Form Lines</b> PRT PCL	5 - 128 (64*)	Form line setting determines the vertical spacing for the number of lines to be printed per page.
<b>Graphics</b> LQ	USA*, Multilingual, Portugal, Canada-French, Norway	High ASCII, characters over 80 hex, will print according to these settings when the Character Table is set to graphics. Some keyboard characters print differently according to the country setting.

Parameter/Menu Location	Range	Description
<b>High Speed</b> CON/con	On*, Off	Set this to off for slower or older computers. Setting it to on improves data transfer speed.
<b>International</b> LQ	USA*, France, Germany, UK, Denmark I, Sweden, Italy, Spain I, Japan, Norway, Denmark II, Spain II, Latin America, Korea, Legal	Hex characters 23, 24, 40, 5B, 5C, 5D, 5E, 60, 7B, 7C, 7D, 7E (ASCII 35, 36, 64, 91, 92, 93, 94, 96, 123, 124, 125, 126) are printed differently according to the country setting.
<b>JOB Time Out</b> PS2	0* ~	Sets how long the printer will wait for an individual job to print. Units are seconds.
<b>Manual Set</b> CON/con	On*, Off	When this is set to on, the command will be effective if the computer application requests manual feeding. If set to off, paper will feed automatically from the cassette even if the application requests manual feed.
<b>Manual Time Out</b> PS2	0 ~ (60*)	Sets how long the printer will wait for a page to be inserted in the manual feed slot. Units are seconds.
<b>Message</b> MIS/mis	English*, French, German, Italian, Spanish	Sets the language for the messages that the printer displays.
<b>MultiGray</b> PS2	Level 2*, Level 1, Off	When this is set to off, the minimum number of gray scales is available. Level 1 doubles the number provided at the off setting, and level 2 doubles the level 1 setting. Available only with PostScript.
<b>Orientation</b> PRT	Portrait*, Landscape	Sets the page orientation for normal or sideways printing.
<b>Page Protection</b> JOB/job	Auto*, On	If you need to finish printing a job that is causing a <b>DATA LOSS ERROR</b> , set page protection to on. If you leave the setting on permanently, the printer will work more slowly. Sometimes the printer can spend a long time processing data that is too complex to print. You may need more memory to make effective use of this switch.
<b>Parity</b> SER/ser	None*, Even, Odd	A communication parameter. Printer and host values must match.
<b>Pitch Size</b> PCL	0.44 ~ 99.99 (10*)	Sets the number of characters per inch for fixed-space typefaces.
<b>Point Size</b> PCL	4.00 ~ 999.75 (12*)	Sets the size of the base proportional fonts.
<b>Print PS Errors</b> PS2	On*, Off	Prints a PostScript error page when there are problems with a print job.

Parameter/Menu Location	Range	Description
<b>Password</b> PSW		Enter a five letter password to prevent other users from being able to change settings. Enter the password a second time to confirm the original entry.
<b>Print Screen</b> MIS/mis PCL	Off*, 850, 852	A4 paper is usually 77 characters wide. If this parameter is set to 850 or 852, A4 width will be able to accommodate 80 characters per line, and the default symbol set value will correspond to PC-850 or PC-852. This function is useful, e.g., when printing the 80 characters per line width of computer displays.
<b>Resolution</b> JOB/job	600*, 300	Sets the print resolution dpi.
<b>Robust XON</b> SER/ser	On*, Off	XON/XOFF is a datastream handshaking protocol. When set to on, the printer sends signals at 1 second intervals to tell the host it is ready to receive data.
<b>State Preservation</b> JOB/job	Off*, On	When set to on, the data in the user storage area will not be deleted when switching between PCL5e and PS2 emulations. When set to off, the user area is cleared at emulation change. Setting this on may cause memory problems.
<b>Symbol Set</b> PCL	Roman-8*	Set the symbol set for the default printer font.
<b>Time Out</b> CON	5 ~ 300 (15*)	Time out settings may require adjustment when there are several users sharing the same printer through different ports. If, for example, a print job contains a page without the correct end of page code, the job will stall. This setting lets you adjust how long the printer will wait to receive the data it needs to complete a job before terminating it prematurely. Units are seconds.
<b>Wait Time Out</b> PS2	0 ~ (30*)	If, for example, a print job contains a page without the correct end of page code, the job will stall. This setting lets you adjust how long the printer will wait to receive the data it needs to complete a job before terminating it prematurely. Units are seconds.
<b>Warning Message</b> CON/con	On*, Off	The warning message concerned with running out of memory can be set to on and off. Data Loss Error and Data Memory Full messages will not be shown in the display panel when this is set to off.
<b>Zero</b> X24	0*, 0	Sets the emulation to print either a normal zero or a zero with a slash.

Item and parameter which can be set by the printer operation panel

Printer Key Menu Setting Diagram



\* SERIAL MENU only appears when the optional Apple-Talk/RS-232E serial interface board has been installed.

\*\* In TEST MENU, PS2 items only appear when the optional PostScript board has been installed.

Display Panel	Range	Key Press (x)	Setting Effect
<b>Copies</b>			
PCL5E A4/A4 PRINTING MENU COPIES= 1-999 COPIES= New COPIES= New*		LINE ITEM ▽ or Δ × n ENTER LINE	Take printer off-line Change number of copies Set multi-print number Go back on-line
<b>Fonts</b>			
PCL5E A4/A4 PRINTING MENU FONT NUMBER= Variable FONT NUMBER= New FONT NUMBER= New*		LINE ITEM × 2 ▽ or Δ × n ENTER LINE	Take printer off-line Cycle through font codes Select default font Go back on-line
<b>Resolution</b>			
PCL5E A4/A4 PRINTING MENU JOB MENU RESOLUTION= 600/300 RESOLUTION= New RESOLUTION= New*		LINE MENU ITEM ▽ or Δ ENTER LINE	Take printer off-line Toggle printer resolution Set resolution Go back on-line
<b>Page Protection</b>			
PCL5E A4/A4 PRINTING MENU JOB MENU PAGE P= Auto/On PAGE P= New PAGE P= New*		LINE MENU ITEM × 2 ▽ or Δ ENTER LINE	Take printer off-line Toggle page protection Set to on or auto Go back on-line
<b>State Preservation</b>			
PCL5E A4/A4 PRINTING MENU JOB MENU ST PRESERVE= Off/On ST PRESERVE= New ST PRESERVE= New*		LINE MENU ITEM × 3 ▽ or Δ ENTER LINE	Take printer off-line Toggle status preservation Set status preservation Go back on-line
<b>Emulation</b>			
PCL5E A4/A4 PRINTING MENU JOB MENU EMULATION= PCL5E, X24, LQ850, HEX EMULATION= New EMULATION= New*		LINE MENU ITEM × 4 ▽ or Δ × n ENTER LINE	Take printer off-line Cycle through emulation choices Select emulation Go back on-line
<b>Warning Messages</b>			
PCL5E A4/A4 PRINTING MENU CONFIG MENU WARN MSG= On/Off WARN MSG= New WARN MSG= New*		LINE MENU × 2 ITEM ▽ or Δ ENTER LINE	Take printer off-line Toggle warning message Set to on or off Go back on-line
<b>Manual Feed</b>			
PCL5E A4/A4 PRINTING MENU CONFIG MENU MANUAL SET= On/Off MANUAL SET= New MANUAL SET= New*		LINE MENU × 2 ITEM × 2 ▽ or Δ ENTER LINE	Take printer off-line Toggle manual feed Set to on or off Go back on-line

Display Panel	Range	Key Press (x)	Setting Effect
<b>High Speed</b>			
PCL5E A4/A4 PRINTING MENU CONFIG MENU HIGH SPEED= On/Off HIGH SPEED= New HIGH SPEED= New*		LINE MENU × 2 ITEM × 3 ▽ or △ ENTER LINE	Take printer off-line  Toggle high speed Set to on or off Go back on-line
<b>Advanced Functions</b>			
PCL5E A4/A4 PRINTING MENU CONFIG MENU ADV FNCTNS= On/Off ADV FNCTNS= New ADV FNCTNS= New*		LINE MENU × 2 ITEM × 4 ▽ or △ ENTER LINE	Take printer off-line  Toggle advanced function Set to on or off Go back on-line
<b>Print Setting List</b>			
PCL5E A4/A4 PRINTING MENU TEST MENU SETTING LIST SETTING LIST		LINE MENU × 3 ITEM ENTER LINE	Take printer off-line  Print setting list Go back on-line
<b>Print PCL5e Font List</b>			
PCL5E A4/A4 PRINTING MENU TEST MENU PCL5E FONT LIST PCL5E FONT LIST		LINE MENU × 3 ITEM × 2 ENTER LINE	Take printer off-line  Print PCL5e font list Go back on-line
<b>Print PCL5e Demo Page</b>			
PCL5E A4/A4 PRINTING MENU TEST MENU PCL5E DEMO PAGE PCL5E DEMO PAGE		LINE MENU × 3 ITEM × 3 ENTER LINE	Take printer off-line  Print PCL5e demo page Go back on-line
<b>Set Print Screen Print Width and Character Set</b>			
PCL5E A4/A4 PRINTING MENU MISC MENU PRT SCREEN= Off, 850, 852 PRT SCREEN= New PRT SCREEN= New*		LINE MENU × 4 ITEM ▽ or △ ENTER LINE	Take printer off-line  Cycle screen dump setting Set print screen width and character set Go back on-line
<b>Set Display Panel Message Language</b>			
PCL5E A4/A4 PRINTING MENU MISC MENU MESSAGE= English, French, German, Italian, Spanish MESSAGE= New MESSAGE= New*		LINE MENU × 4 ITEM × 2 ▽ or △ ENTER LINE	Take printer off-line  Cycle through language choices Set display panel language choice Go back on-line

## [10] PRINT OUT THE LISTS

The following data stored in the printer can be printed out.

### 1. Test print

Item	Number of pages	Content/Purpose
LJ4 DEMO PAGE	1	JX-9680 features print. Mainly used to the demonstration of product introduction with illustration for easy grasping of the product image.
PS2 DEMO PAGE *1	1	Features print of LJ4 DEMO PAGE with JX9680 PS boars installation in addition to PS introduction. Mainly used to the demonstration of product introduction with illustration for easy grasping of the product image.

### 2. Setting list print out

Item	Number of pages	Contents/Purpose
SETTING LIST	1	List of option installation, ROM version, supply state, key menu, and remote control setting contents. When initializing the printer or when an error occurs, refer to this information.

### 3. Font list print out

Item	Number of pages	Contents/Purpose
LJ4 FONT LIST	Internal font only: 2 pages Option ROM installed, or down-loaded: 3 pages or more	List of available fonts when EMULATION = LJ4, LQ850, X24. This list includes fonts #, font ID (Download fonts only), font name, sample print, and Esc command for all of the internal fonts, registered fonts, and optional ROM fonts. Refer to the Esc command and font # for selection of a desired font.
PS2 FONT LIST *1	1	List of resident fonts at EMULATION = PS2. Refer to the font name and sample print of the internal font.

\*1: Only when optional JX96PS2 is installed.

### Print out procedure

There are two methods of print out: printing by the control panel key operation, and printing by PJL command in the host.

#### [Printing by the control panel key operation]

The TEST MENU of key menu includes each diagnostic print item

1. Press LINE key to set to OFF LINE. (LCD display: PRINTING MENU)
2. Press and hold the MENU key until the LCD display turns to the TEST MENU.
3. Press and hold the ITEM key until the desired print item is displayed on the LCD.
4. Press the Enter key to print.

#### [In the case of TEST PRINT (diagonal print)]

Above 3: When the LCD displays "PS2 DEMO PAGE," press  $\Delta$  key +  $\nabla$  key to set to "TEST PRINT" display.

Above 4: Press the ENTER key to print.  
Printing is continued until the ENTER key is pressed again.

#### [Printing by using the status monitor on the host side]

1. Select the "DEMO PAGE PRINT" menu on the status monitor to perform printing.  
(The same contents are printed as above.)

# [11] ADJUSTMENTS

## 1. Top margin and left margin adjustments

Top margin and left margin should be adjusted in the following cases:

1. When the margin differs from the reference value.
2. When EE-PROM is replaced.
3. When ICU is replaced.
4. When the optical unit (LSU) is replaced.

### Reference value

(Top margin)

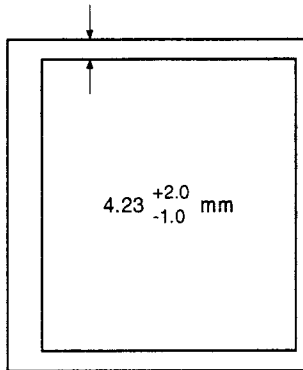


Fig. 11-1

(Left margin)

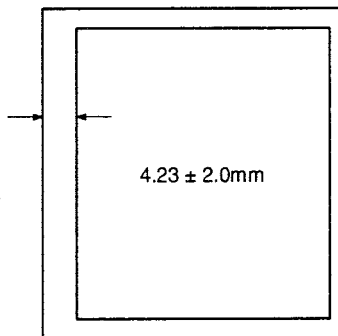


Fig. 11-2

### Adjustment procedures

Margin setting is performed by control panel key operation on the printer side and by status monitor menu on the host side.

1 unit of margin	1/600 inch
Default value	0
Setting range	-128 ~ +127

### [Setting by control panel key operation on the printer side]

- ① Press and hold the **LINE** + **MENU** keys, and turn on the power.
- ② "TOP MARGIN=XX" is displayed. XX is -128 to 128. Press **▼** and **▲** keys to set the value (-128 to 128).
- ③ Press the **MENU** key.
- ④ "LEFT MARGIN=XX" is displayed. XX is -128 to 128. Press **▼** and **▲** keys to set the value (-128 to 128).
- ⑤ Press the **ENTER** key.
  - If the **MENU** key is pressed instead of the **ENTER** key, the process return to ②.
  - If the **FORM FEED** key is pressed instead of the **ENTER** key, the system is set to ONLINE state.
- ⑥ The diagonal print out is discharged. Check the setting.
  - To change the set value, press the **MENU** key to go to ②.
- ⑦ Press the **FORM FEED** key or turn off the power to terminate setting.

Variation: Variation in margin set value is 1/600 dots (0.167mm) for 1 count.

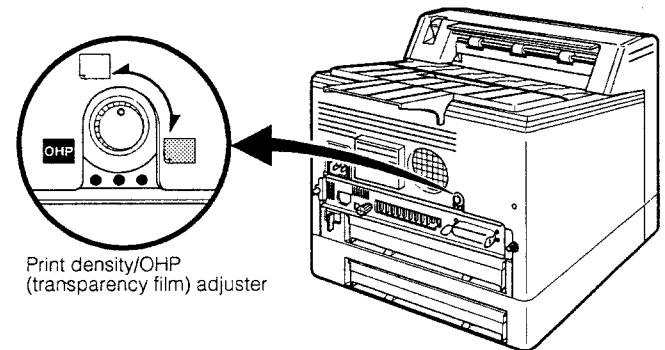
### [Setting by status monitor menu on the host side]

Status monitor

Select the top margin/left margin setting menu on the status monitor on the computer side, and enter the set values to adjust.

## 2. Print density adjustment

Use the print density/OHP (transparency film) adjuster at the rear side. To increase density, rotate this clockwise. When printing on transparency film, rotate the adjuster counterclockwise fully. Note that increase of density reduces toner life.





# [12] DIAGNOSTICS (FUNCTION TEST AND TESTPRINT)

The base engine conditions can be checked with the PCU diagnostics.

## 1. How to operate diagnostics

### Entering the DIAGNOSTIC mode

Keep the  $\nabla$  and **ITEM** keys depressed, turn on the power switch.

### Executing DIAGNOSTIC function

Select the menu with the  $\nabla$ , **ITEM**  $\Delta$  and **ENTER** keys, and execute diagnostic function with **DATA CLEAR** keys. To return to the menu during execution of diag function, press the **FORM FEED** key.

### DIAGNOSTIC display

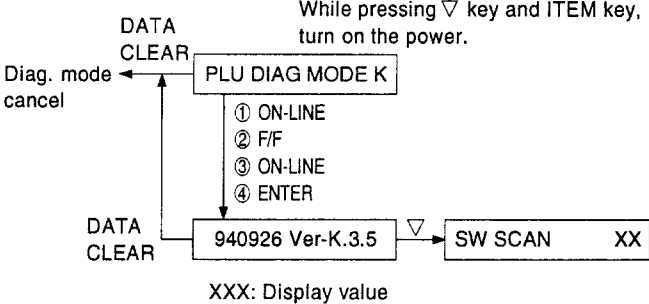
When the machine enters into DIAG mode:

- ① All LED's are lighted for 0.5 sec.
- ② "PCU DIAG MODE X" is displayed. (X: PCU ROM version)

When diagnostic is being executed:

DATA LED is blinks.

## 2. List of the functions

Purpose	Operation																								
ROM version display	<p><b>PCU DIAG MODE #</b></p> <p>"#" shows the ROM version. This menu displays the ROM version only and performs no other operation. Press the DATA CLEAR key to terminate the diagnostics. Press the <math>\nabla</math> key to go to the next menu.</p>  <p>While pressing <math>\nabla</math> key and ITEM key, turn on the power.</p> <p>ROM detailed version display By pressing ① ON-LINE, ② F/F, ③ ON-LINE, and ④ ENTER keys in this sequence in the first menu of the PCU diagnostics, the detailed information of the ROM version is displayed. Only the display differs from that of "PCU DIAG MODE #" and the operations hereinafter are the same.</p>																								
Sensor/detector operation test	<p><b>SW SCAN XX</b></p> <p>Displays the internal switch state with the LED. "XX" is 01 - 06. (Changed with the ENTER key and the <math>\Delta</math> key.) The content is as shown in the table below. Press the DATA CLEAR key to execute the operation. During the operation, "XX" figure of LCD blinks. During the operation, the ENTER key and the <math>\Delta</math> key are disabled. Press the F/F key to cancel. Press the <math>\nabla</math> key to go to the next menu.</p> <p>LED turns on/off according to each switch state.</p> <table border="1"> <thead> <tr> <th>XX</th> <th>LED ERROR</th> <th>MANUAL</th> <th>DATA</th> <th>ON LINE</th> <th></th> </tr> </thead> <tbody> <tr> <td>01</td> <td>DOOR OPEN</td> <td>PIN</td> <td>POUT</td> <td>—</td> <td></td> </tr> <tr> <td>02</td> <td>UPE</td> <td>CS1U</td> <td>CS2U</td> <td>CS3U</td> <td>UPPER CASSET</td> </tr> <tr> <td>03</td> <td>LPE</td> <td>CU1L</td> <td>CS2L</td> <td>CS3L</td> <td>LOWER CASSET</td> </tr> </tbody> </table>	XX	LED ERROR	MANUAL	DATA	ON LINE		01	DOOR OPEN	PIN	POUT	—		02	UPE	CS1U	CS2U	CS3U	UPPER CASSET	03	LPE	CU1L	CS2L	CS3L	LOWER CASSET
XX	LED ERROR	MANUAL	DATA	ON LINE																					
01	DOOR OPEN	PIN	POUT	—																					
02	UPE	CS1U	CS2U	CS3U	UPPER CASSET																				
03	LPE	CU1L	CS2L	CS3L	LOWER CASSET																				

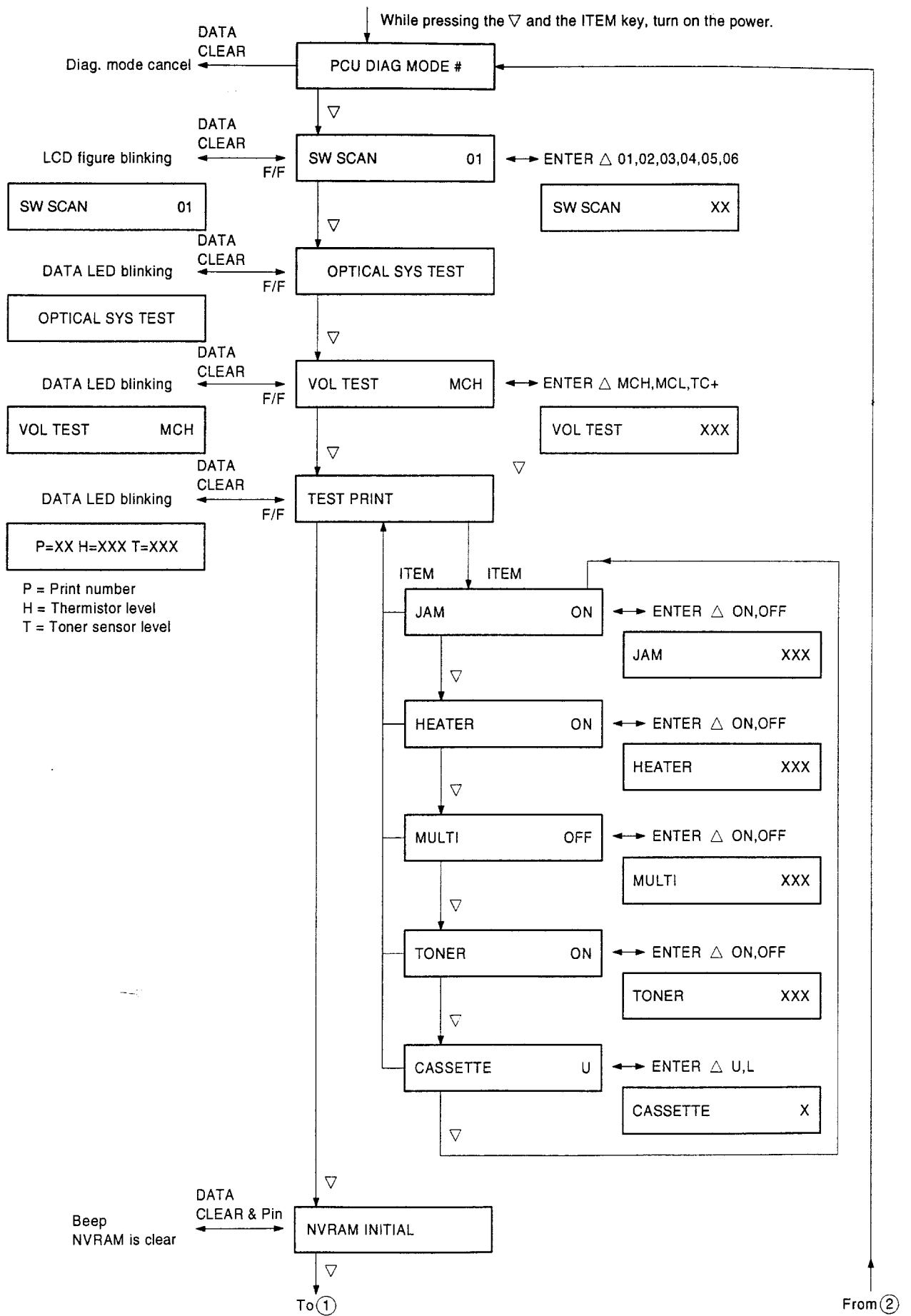
Purpose		Operation																				
		<p>LED turns on by pressing the switches in sequence.</p> <table border="1"> <thead> <tr> <th>XX</th> <th></th> <th>LED</th> </tr> </thead> <tbody> <tr> <td>04</td> <td>PEU → CS1U → CS2U → CS3U</td> <td>MANUAL</td> </tr> <tr> <td>05</td> <td>PEL → CS1L → CS2L → CS3L</td> <td>ERROR</td> </tr> <tr> <td>06</td> <td>PEU → CS1U → CS2U → CS3U → PEL → CS1L → CS2L → CS3L</td> <td>ERROR &amp; MANUAL</td> </tr> </tbody> </table> <p>In "06," when the upper cassette is completed, the ERROR lights up. When the operation is completed</p>	XX		LED	04	PEU → CS1U → CS2U → CS3U	MANUAL	05	PEL → CS1L → CS2L → CS3L	ERROR	06	PEU → CS1U → CS2U → CS3U → PEL → CS1L → CS2L → CS3L	ERROR & MANUAL								
XX		LED																				
04	PEU → CS1U → CS2U → CS3U	MANUAL																				
05	PEL → CS1L → CS2L → CS3L	ERROR																				
06	PEU → CS1U → CS2U → CS3U → PEL → CS1L → CS2L → CS3L	ERROR & MANUAL																				
Optical unit (laser scanning unit) operation test		<p><b>OPTICAL SYS TEST</b></p> <p>Used to perform the laser test. Press the DATA CLEAR key to execute the test. During execution, the DATA LED blinks. The ON-LINE LED is lighted for 60 msec every time when SYNC_ is detected. Press the F/F key to cancel. Press the ∇ key to go to the next menu.</p>																				
High voltage unit (charger unit) operation test		<p><b>VOL TEST XXX</b></p> <p>Used to perform the high voltage system test. "XXX" is MCH, MCL, or TC+. They are displayed in sequence by pressing the ENTER and the Δ keys. Press the DATA CLEAR key to execute the test. During execution, the DATA LED blinks. The content of execution is as shown in the table below. During execution, the ENTER and the Δ key are disabled. After turning on for 30 sec, it is cancelled automatically. Pressing the F/F key also cancels the operation. Press the ∇ key to go to the next menu.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>MC</th> <th>GB</th> <th>BS</th> <th>TC</th> </tr> </thead> <tbody> <tr> <td>MCH</td> <td>ON</td> <td>HIGH</td> <td>ON</td> <td>-</td> </tr> <tr> <td>MCL</td> <td>ON</td> <td>LOW</td> <td>ON</td> <td>-</td> </tr> <tr> <td>TC+</td> <td>ON</td> <td>HIGH</td> <td>ON</td> <td>+</td> </tr> </tbody> </table>	XXX	MC	GB	BS	TC	MCH	ON	HIGH	ON	-	MCL	ON	LOW	ON	-	TC+	ON	HIGH	ON	+
XXX	MC	GB	BS	TC																		
MCH	ON	HIGH	ON	-																		
MCL	ON	LOW	ON	-																		
TC+	ON	HIGH	ON	+																		
Print test	Menu selection and operating procedure	<p><b>TEST PRINT</b></p> <p>Used to perform the print test. Press the DATA CLEAR key to execute the test. During execution, the DATA LED blinks. During execution, the number of print and the analog values of toner concentration level and the Fusing temperature are displayed in decimal. Press the F/F key to cancel. Pressing the F/F key during printing cancels the operation after printing. (It takes some time to stop there-fore.) Press the ITEM key to go to the setting menu of the print test. Press the ∇ key to go to the next menu.</p>																				
	Paper jam detection setting	<p><b>JAM XXX</b></p> <p>Press the TEST PRINT to feed paper and to select JAM check. Press the ENTER key and the Δ key to change the value of "XXX." Press the ∇ key to go to the next menu. Press the ITEM key to return to the test print menu.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>Paper jam detection is performed during printing.</td> </tr> <tr> <td>OFF</td> <td>Paper jam detection is not performed during printing.</td> </tr> </tbody> </table>	XXX	Operation	ON	Paper jam detection is performed during printing.	OFF	Paper jam detection is not performed during printing.														
XXX	Operation																					
ON	Paper jam detection is performed during printing.																					
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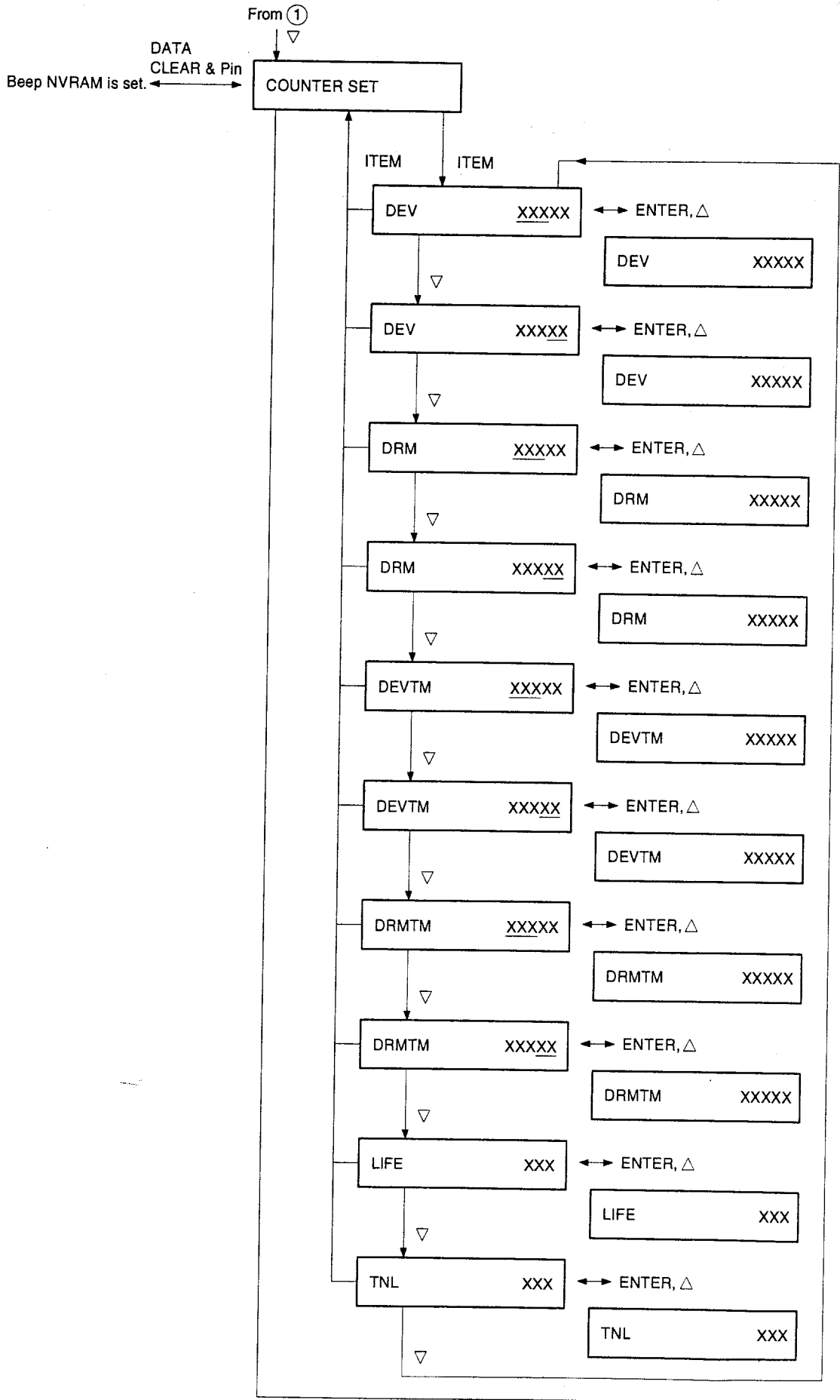
Purpose	Operation												
	<p><b>Fusing temperature control setting</b></p> <p><b>HEATER XXX</b></p> <p>Used to select temperature control ON/OFF.            Press the ENTER key and the Δ key to change the value of "XXX."            Press the ▽ key to go to the next menu.            Press the ITEM key to go to the next menu of the test print.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>Temperature control is performed.</td> </tr> <tr> <td>OFF</td> <td>Temperature control is not performed.</td> </tr> </tbody> </table>	XXX	Meaning	ON	Temperature control is performed.	OFF	Temperature control is not performed.						
XXX	Meaning												
ON	Temperature control is performed.												
OFF	Temperature control is not performed.												
	<p><b>Multi print/single print setting</b></p> <p><b>MULTI XXX</b></p> <p>Press the ENTER key and the Δ key to change the value of "XXX."            Press the ▽ key to go to the next menu.            Press the ITEM key to go to the next menu of the test print.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>Printing is continued until the RESET key is pressed.</td> </tr> <tr> <td>OFF</td> <td>Only one sheet is printed.</td> </tr> </tbody> </table>	XXX	Meaning	ON	Printing is continued until the RESET key is pressed.	OFF	Only one sheet is printed.						
XXX	Meaning												
ON	Printing is continued until the RESET key is pressed.												
OFF	Only one sheet is printed.												
	<p><b>Toner empty detection setting</b></p> <p><b>TONER XXX</b></p> <p>Used to select toner empty detection ON/OFF.            Press the ENTER key and the Δ key to change the value of "XXX."            Press the ▽ key to go to the next menu.            Press the ITEM key to go to the next menu of the test print.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>Toner empty detection is performed.</td> </tr> <tr> <td>OFF</td> <td>Toner empty detection is not performed.</td> </tr> </tbody> </table>	XXX	Meaning	ON	Toner empty detection is performed.	OFF	Toner empty detection is not performed.						
XXX	Meaning												
ON	Toner empty detection is performed.												
OFF	Toner empty detection is not performed.												
	<p><b>Paper feed cassette setting</b></p> <p><b>CASSET XXX</b></p> <p>Used to select the tray cassette which is fed in the test print.            Press the ENTER key and the Δ key to change the value of "XXX" and select UPPER or LOWER.            Press the ▽ key to return to the JAM menu.            Press the ITEM key to go to the next menu of the test print.</p> <table border="1"> <thead> <tr> <th>XXX</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>U</td> <td>Paper is fed from the upper tray.</td> </tr> <tr> <td>L</td> <td>Paper is fed from the lower tray.</td> </tr> </tbody> </table>	XXX	Meaning	U	Paper is fed from the upper tray.	L	Paper is fed from the lower tray.						
XXX	Meaning												
U	Paper is fed from the upper tray.												
L	Paper is fed from the lower tray.												
<p>NVRAM initializing</p>	<p><b>Counters set values display and setting</b></p> <p><b>NVRAM INITIAL</b></p> <p>Used to initialize the NVRAM.            The NVRAM counter values and flags are all cleared.            While pressing the PIN switch, press the DATA CLEAR key to execute. After completion of the operation, a beep sounds.            Press the ▽ key to go to the next menu.</p> <p>After initializing the NVRAM, the values of the counters are as follows:</p> <table> <tbody> <tr> <td>DEV</td> <td>00000</td> </tr> <tr> <td>DRM</td> <td>00000</td> </tr> <tr> <td>DEVTM</td> <td>00000</td> </tr> <tr> <td>DRMTM</td> <td>00000</td> </tr> <tr> <td>LIFE</td> <td>000</td> </tr> <tr> <td>TNL</td> <td>024</td> </tr> </tbody> </table>	DEV	00000	DRM	00000	DEVTM	00000	DRMTM	00000	LIFE	000	TNL	024
DEV	00000												
DRM	00000												
DEVTM	00000												
DRMTM	00000												
LIFE	000												
TNL	024												
<p>Display and setting for counters</p>	<p><b>Menu selection and operating procedure</b></p> <p><b>COUNTER SET</b></p> <p>Used to set each counter value.            While pressing the PIN switch, press the DATA CLEAR key to execute. After completion of the operation, a beep sounds.            Press the ITEM key to go to the counter set menu.            Press the ▽ key to go to the version display menu.</p>												

Purpose	Operation
<p>Developer counter value display and setting</p>	<p><b>DEV XXXXX</b></p> <p>Used to set the upper three digits of the print count for the developer cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p> <p><b>DEV XXXXX</b></p> <p>Used to set the lower two digits of the print count for the developer cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p>
<p>Photoconductor drum counter value display and setting</p>	<p><b>DRM XXXXX</b></p> <p>Used to set the upper three digits of the print count for the drum cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p> <p><b>DRM XXXXX</b></p> <p>Used to set the lower two digits of the print count for the drum cartridge.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p>
<p>Toner motor rotation counter value display and setting for developer unit</p>	<p><b>DEVTM XXXXX</b></p> <p>Used to set the upper three digits of the toner motor rotation count for the developer cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p> <p><b>DEVTM XXXXX</b></p> <p>Used to set the lower two digits of the toner motor rotation count for the developer cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p>
<p>Toner motor rotation counter value display and setting for photoconductor drum unit</p>	<p><b>DRMTM XXXXX</b></p> <p>Used to set the upper three digits of the toner motor rotation count for the drum cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p> <p><b>DRMTM XXXXX</b></p> <p>Used to set the lower two digits of the toner motor rotation count for the drum cartridge.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p>
<p>Photoconductor drum unit life counter value display and setting</p>	<p><b>LIFE XXX</b></p> <p>Used to set the life counter.            When the drum cartridge is replaced, the value rounded from the drum cartridge print number in the unit of 1024 is entered.            Press the ENTER key to count up.            Press the Δ key to count down.            Press the ▽ key to go to the next menu.</p>

Purpose	Operation
	<p>Toner density level display and setting</p> <p>TNL      XXX</p> <p>Used to set the toner level. Press the ENTER key to count up. Press the Δ key to count down. Press the ▽ key to go to the next menu.</p>
<p>Power save mode setting</p>	<p>Power save mode setting diagnostics</p> <p>While pressing the ENTER key, turn on the power to go to the POWER SAVE MODE setting diagnostics.</p> <p>In the diagnostics mode, press the ENTER key or the Δ key to set the time for entering the POWER SAVE mode. There are five selectable time modes; ES (6PPM=15min, 8PPM=30min), 90, 180, 255, and OFF (unit: sec). Once the machine goes into this menu, it cannot go out unless the power is turned off.</p> <p>The default setting is "POWER SAVE ES."</p> <p>While pressing the ENTER key, turn on the power.</p> <pre> graph TD     A[POWER SAVE ES] -- Δ --&gt; B[POWER SAVE 90]     B -- Δ --&gt; C[POWER SAVE 180]     C -- Δ --&gt; D[POWER SAVE 255]     D -- Δ --&gt; E[POWER SAVE OFF]     </pre> <p>Enters the energy star mode. After 90 sec, the polygon motor is turned off. After ES execution time, the heater control is turned off.</p> <p>After 90 sec, the polygon motor is turned off. Temperature control of 100°C is performed.</p> <p>After 180 sec, the polygon motor is turned off. Temperature control of 100°C is performed.</p> <p>After 255 sec, the polygon motor is turned off. Temperature control of 100°C is performed.</p> <p>After 90 sec, the polygon motor is turned off. Temperature control of 160°C is performed. (Ready state)</p>

### 3. Diag. mode transition





## [13] OPERATION TEST

### 1. Operation test for interface

The following kinds of interface boards are available. The print test is performed by connecting the printer with the installed I/F.

- Parallel I/F (Centronics I/F)
- RS232C I/F
- AppleTalk I/F

#### Parallel I/F (Centronics I/F) and RS232C I/F operation test

- ① Connect the host computer and the printer with the I/F cable.
- ② Select the I/F to be tested on the host computer side or the printer side.
- ③ Start the application software wordprocessor, etc.) to form a print document.
- ④ Perform printing.
- ⑤ Check if there occurs an error during printing or if there is any abnormality in the print.

#### AppleTalk I/F operation test

- ① Connect the host computer and the printer with the I/F cable.
- ② Start the application software wordprocessor, etc.) to form a print document.
- ③ Perform printing.
- ④ Check if there occurs an error during printing or if there is any abnormality in the print.

## 2. Test print

### Printing procedure

Printing is performed by the control panel key operation on the printer side or by the status monitor menu on the host computer side.

#### [Printing by the control panel key operation on the printer side]

The diag. print items are in the TEST MENU of the Key Menu.

- ① Set to the OFF LINE with the LINE key. (LCD display: PRINTING MENU)
- ② Press and hold the MENU key until the LCD displays the TEST MENU.
- ③ Press and hold the ITEM key until the desired item to print is displayed.
- ④ Press the ENTER key to print out.

#### [Printing by using the printer driver on the host side]

Follow the instruction on the status monitor menu to print out.

The print content is the same as above.

## [14] COMMAND

This model basically employs the PJI commands which are employed in the HP Laser Jet 4MP and its parameters and set values. Because of the following reasons, however, they are slightly different from each other, that is, there are some additions, changes, and deletions.

(Reason for additions, changes, and deletions)

- The engine configuration is different.
- The firm ware is different.
- X24, LQ850 emulation feature is provided.  
(With X24,LQ850 emulation feature, the DIP switch functions which these models have are used with the PJI commands. Therefore, these commands are added.)



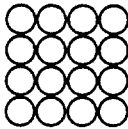
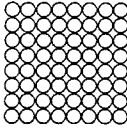
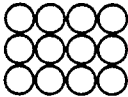
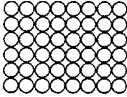
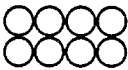







# [15] OPERATIONS AND FUNCTIONS

## 1. Software

### (1) Resolution control

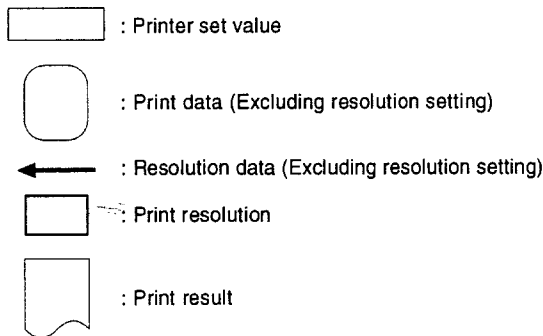
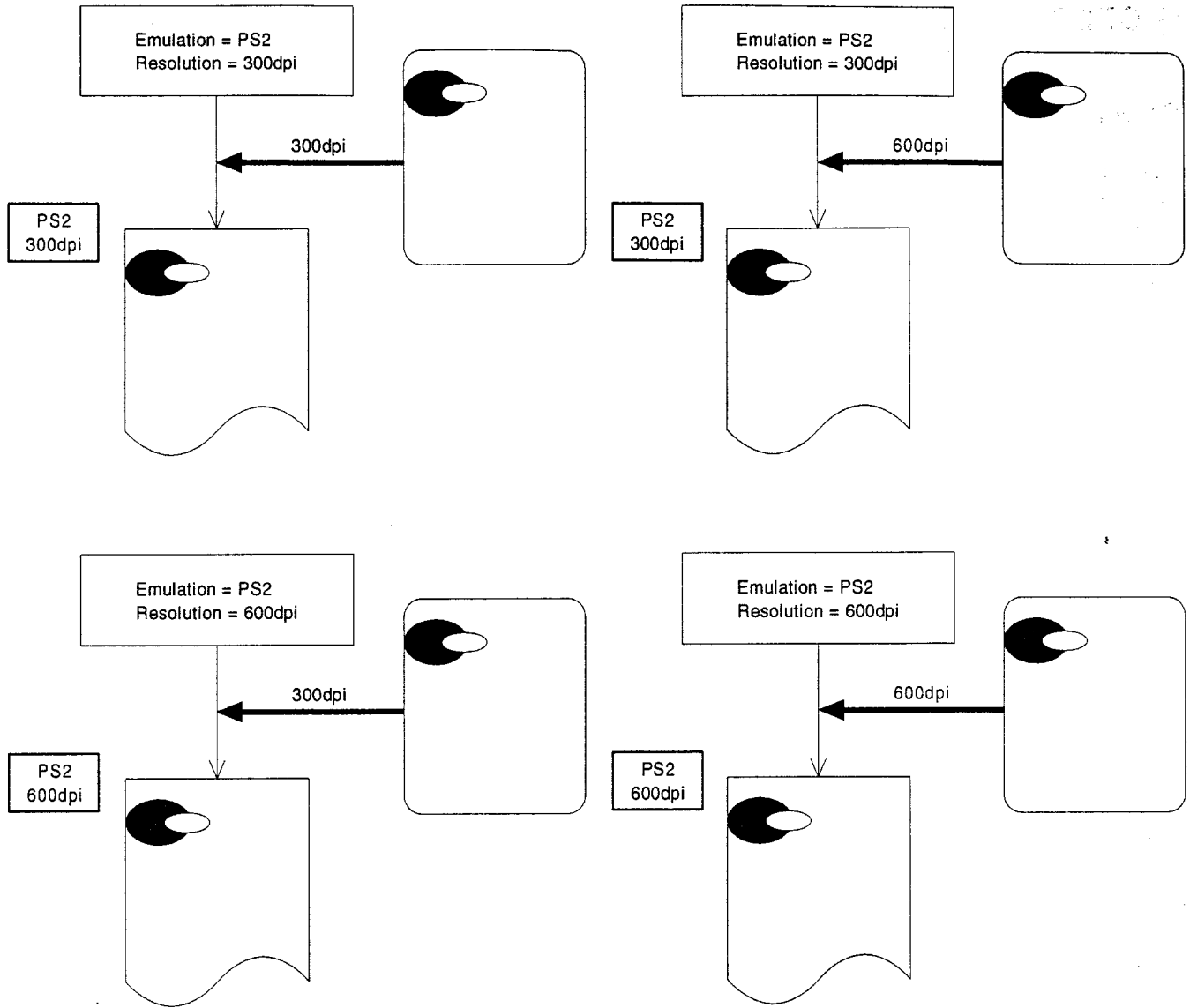
PCL5e, PostScript Level 2, IBM Proprinter X24, Epson LQ850, and auto emulation can print at 300 dpi or 600 dpi.

In PCL5e emulation, the dot composition is as shown below.

(Reception) command	Printer setting	
	300DPI	600DPI
ESC *t75R		
ESC *t100R		
ESC *t150R		
ESC *t200R		
ESC *t300R		
ESC *t600R		

When the resolution is set to 300 dpi, even if 200 dpi or 600 dpi is specified with commands, printing is made in 300 dpi.

During PostScript emulation, if print data of different resolution from what is set with the key or the command, printing is made by transforming the resolution into the set resolution. That is, when 600 dpi data is received with the current set resolution of 300 dpi, the received 600 dpi data is transformed into 300 dpi to print. If the currently set resolution is 600 dpi, then 300 dpi data is transformed into 600 dpi to print.

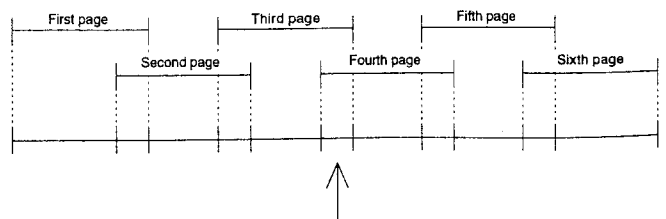


**(2) Paper jam recover**

When there occurs a paper jam after picking up paper and before discharging it, or when the engine stops in the middle of printing, the controller stops the printing process. The page where the printing process is stopped is incomplete. To make complete printing of that page, the jam recover is made when the printing is allowed again. In continuous printing, the next page is picked up before discharging the preceding paper. That means two pages are under printing. If a paper jam occurs under this state, jam recover for two pages must be performed. The sequence of jam recover depends on the sequence of pages before printing is stopped. Print data must be held for jam recover until the page is completely is printed.

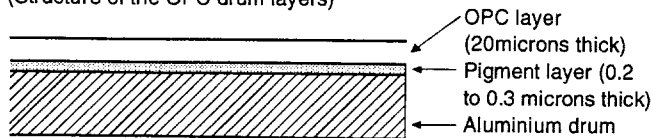
**(Example of jam recover of two pages)**

The following time chart shows printing timing of six pages. If pick up of the fourth page fails to cause a paper jam (a jam occurs at the arrow point), printing of the third page is resumed.

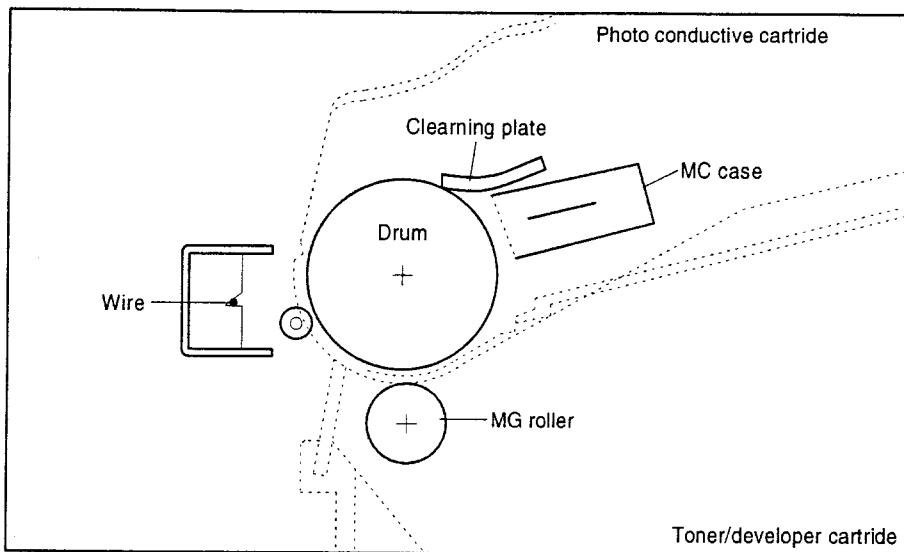


## 2. Printing process

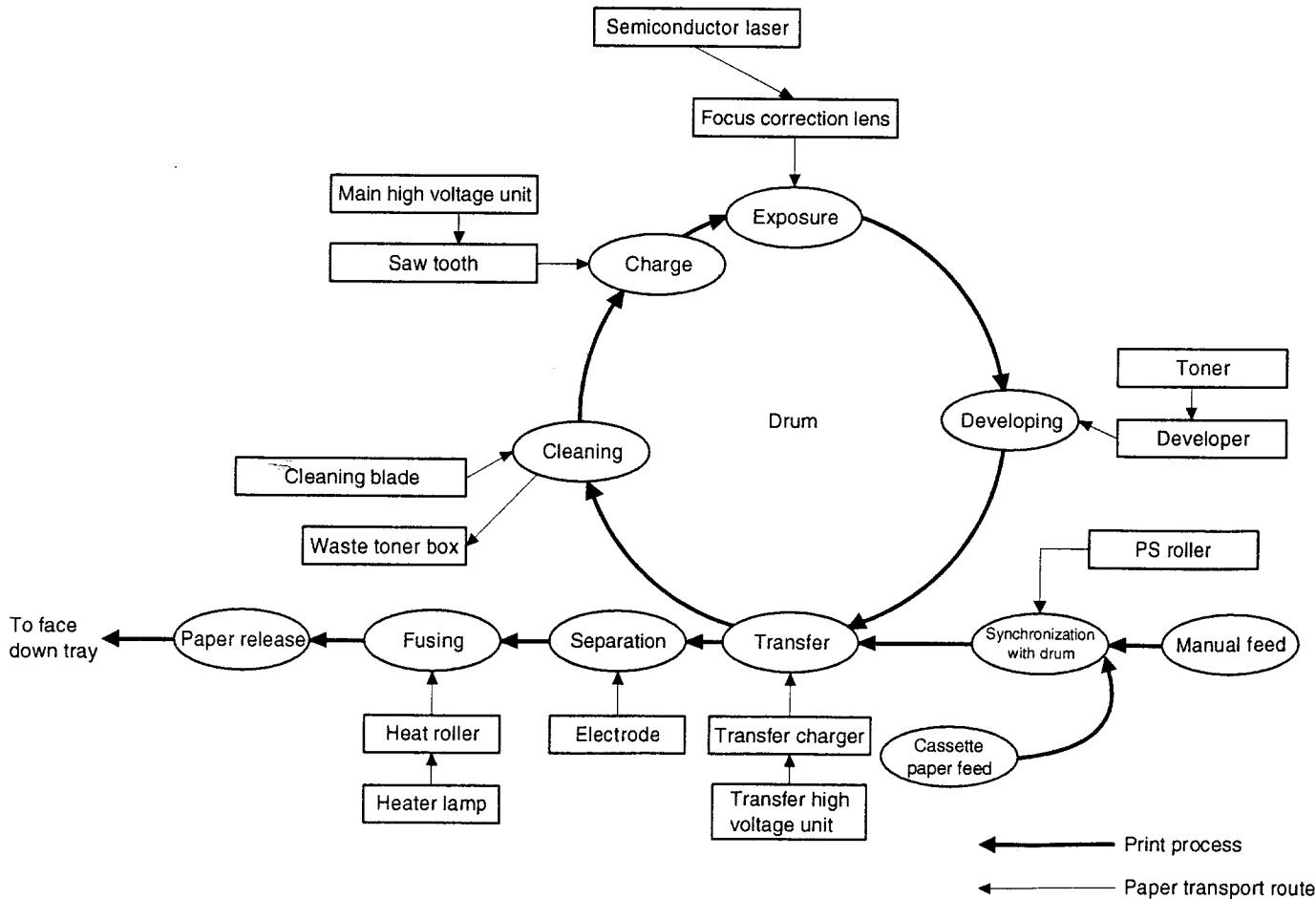
An OPC drum is used for the photoconductor.  
(Structure of the OPC drum layers)



### (1) Functional diagram



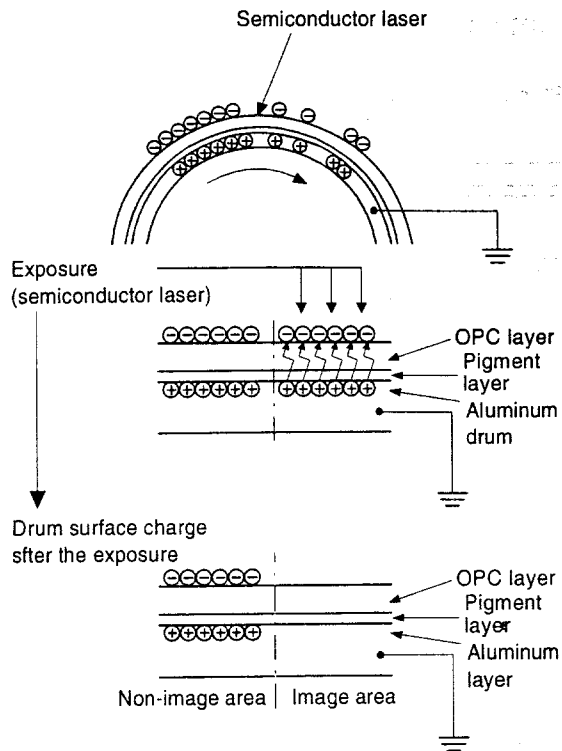
(Basic operation cycle)



**(2) Outline of print process**

This printer is a non-impact printer that uses the semiconductor laser and electrostatic print process and uses an OPC (Organic Photo Conductor) for its photoconductive material. First, corona from the main corona unit charges the drum surface and a latent image is formed on the drum surface using a laser beam. This latent image forms a visible image on the drum surface with toner. The toner image is then transferred onto the print paper by the transfer corona and fixed on the print paper using the fuser roller, and pressure.

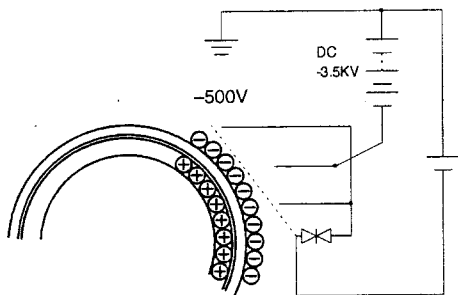
- Step-1: Charge  
Step-1: Charge Latent image is formed on the drum.  
Step-2: Exposure
- Step-2: Exposure
- Step-3: Developing  
Latent image formed on the drum is then changed into visible image with toner.
- Step-4: Transfer  
The visible image (toner image) on the drum is transferred onto the print paper.
- Step-5: Cleaning  
Residual toner on the drum surface is collected by the cleaning blade.
- Step-6: Optical discharge  
Residual charge on the drum surface is removed, by semiconductor laser beam.



**(3) Actual print process**

**Step-1: DC charge**

A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger. Positive charges are generated in the aluminum layer.



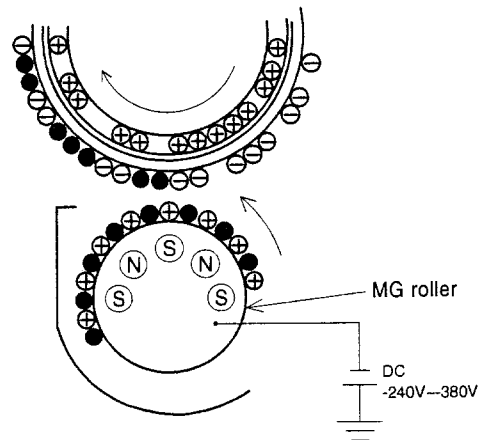
**Step-2: Exposure (laser beam, lens)**

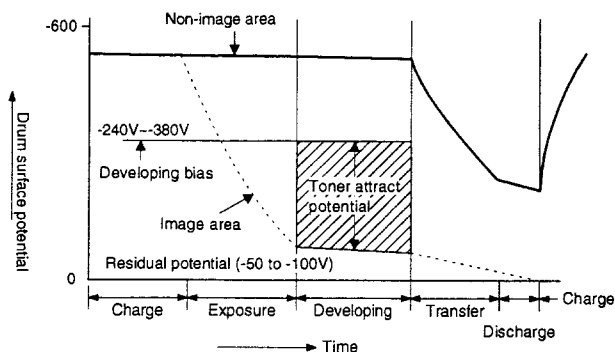
A Laser beam is generated from the semiconductor laser with the print pattern signal. It is exposed onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal). The beam neutralizes the negative charge. The electrostatic latent image is formed on the drum surface.

**Step-3: Developing (DC bias)**

A bias potential is applied to the MG roller in the two component magnetic brush developing method, and the toner is charged negative through friction with the carrier. Non-image area of the drum surface charged with negative potential repel the toner, whereas the bright exposed portions where there are no negative charges exist are developed by the toner. As a result, a visible image appears on the drum surface.

- ⊕ : Carrier (Magnetized particle)
- : Toner (Charge negative by friction)
- (N) (S) : Permanent magnet (provided in three locations)

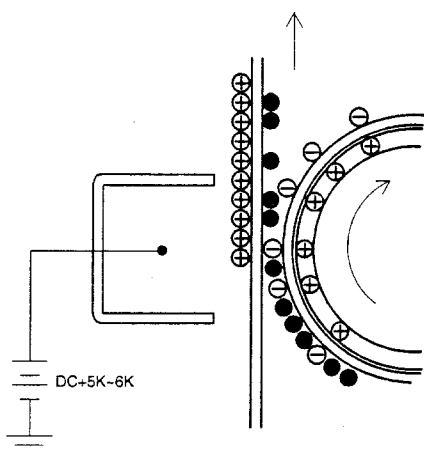




Toner is attracted over the shadowed area because of the developing bias.

**Step-4: Transfer**

The visible image on the drum surface is transferred onto the print paper by applying a positive charge from the transfer corona to the back of the print paper.

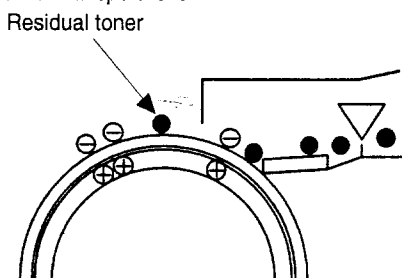


**Step-5: Separation**

Since the separation electrode is grounded, the print paper charged positively by transfer is discharged to be separated.

**Step-6: Cleaning**

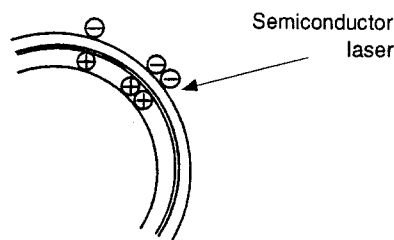
Toner remaining on the drum is collected by the cleaner blade and transported to the waste toner collecting section in the cleaning unit, by the waste toner transport roller.



**Step-7: Optical discharge (Semiconductor laser)**

Before the drum rotation is stopped, semiconductor laser is radiated onto the drum to reduce the electrical resistance in the OPC layer and eliminate residual charge, providing a uniform state to the drum surface.

When the electrical resistance is reduced, positive charges on the aluminum layer are moved and neutralized with negative charges on the OPC layer.



**Charge by the Scorotron charger**

**Function**

The Scorotron charger functions to maintain the surface potential of the drum even at all times which can be used to control the surface potential regardless of the charge characteristics of the photoconductor.

**Basic function**

A screen grid is provided between the saw tooth and the photoconductor, a stable voltage is added to the grid to apply the corona current to the photoconductor and the grid.

As the photoconductor is charged by the corona from the main corona unit, the surface potential increases. This increases the current flowing through the screen grid. When the photoconductor potential nears the grid potential, the entire current turns to flow to the grid so that the photoconductor potential can be maintained at a stable level.

**Process controlling**

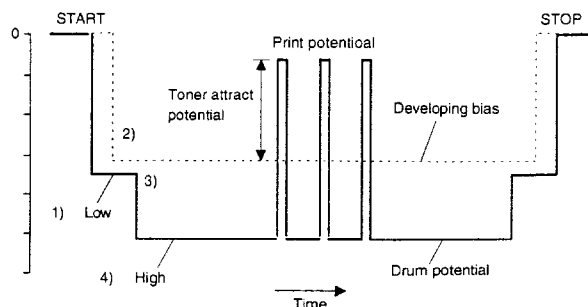
**Function**

Print pattern signal is converted into a visible image by the semiconductor laser using negative to positive (reversible) developing method. Therefore, if the developing bias is added before the drum is charged, toner is attracted onto the drum. If the developing bias is not added when the drum is charged, the carrier is attracted to the drum because of the strong electrostatic force of the drum.

To avoid this, the process is controlled by adjusting the drum potential and the grid potential of the Scorotron charger.

**Basic function**

Voltage added to the screen grid can be selected, high and low. To make it easily understood, the figure below shows voltage transition at the developer unit.



**Start**

- 1) Because the grid potential is at a low level, the drum potential is at about  $-250V$ . (Carrier may not be attracted though the carrier is pulled towards the drum by the electrostatic force of  $-250V$ .)
- 2) Developing bias ( $-300V$ ) is applied when the photoconductor potential is switched from LOW to HIGH.
- 3) Though developing bias ( $-300V$ ) is applied, since the photoconductor potential rises to HIGH, toner is not attached.

**Stop**

The reverse sequence takes place.

Retaining developing bias at an abnormal occurrence

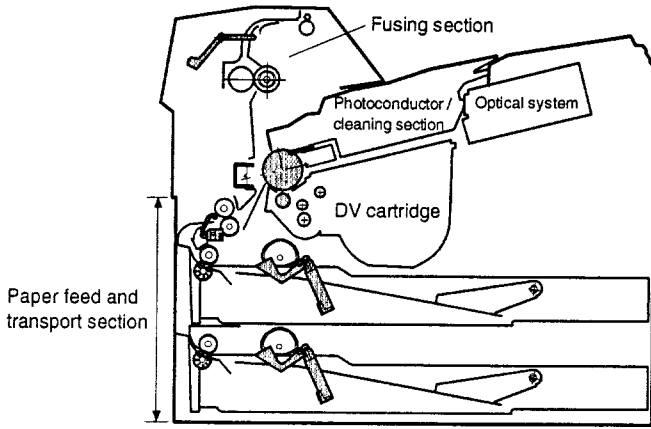
**Function**

The developing bias will be lost if the power supply was shut off during printing due to a power supply failure. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates the function to retain the developing bias for a certain period against a possible power supply failure.

**Basic function**

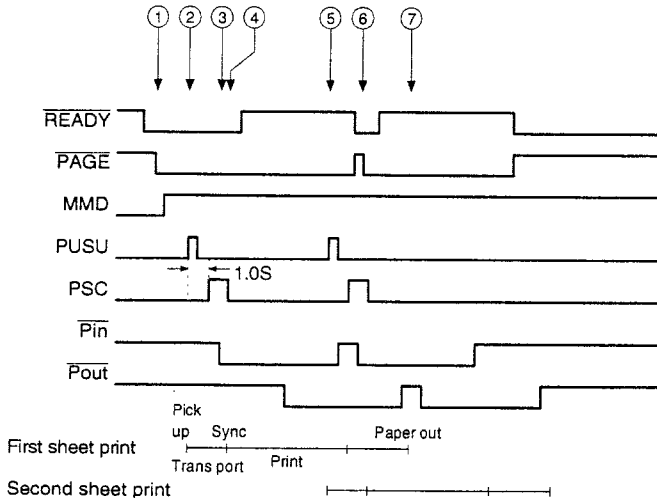
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop, if the machine should stop before completing the normal print cycle. In this way, the developing bias can be added before resuming the operation after an abnormal interruption. No carrier will therefore make a deposit on the drum surface.

### 3. Paper feed and transport section



#### Paper feed system

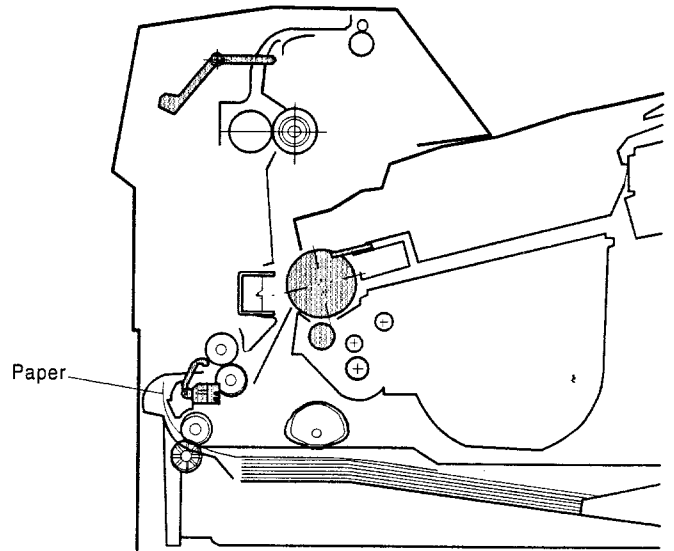
- 250-sheet cassette x 2 (Front loading)
- manual feed paper (Single feed)



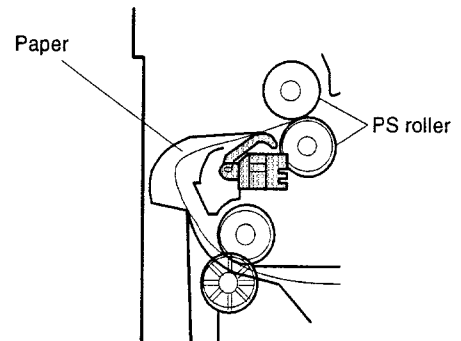
#### Operational description

Timing of paper feed, transport, and paper discharge is shown below:

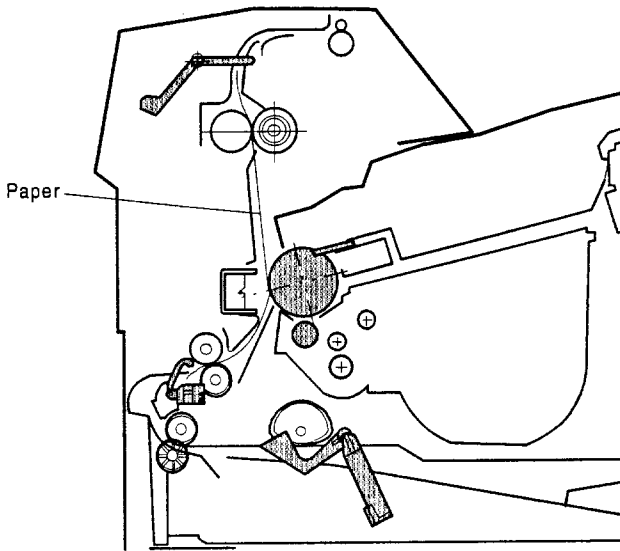
1. When the machine receives a print request signal (PAGE) in the print ready mode, the main motor rotates to start the drive system.
2. When the main motor reaches a constant speed, the pick-up solenoid (PUSU, PUSL) turns on to pick up a paper in the cassette. The paper is transported to the PS roller by the transport roller.



3. After 1 sec of turning on of PUSU, PSC turns on (the PS roller stops) and the paper stops to make synchronization between the image lead edge and the paper lead edge.



4. PSC turns off (PS roller rotates) and the paper is transported through the transfer section to the fusing section.



- 5.6. PUSU turns on to pick up the second paper. If the first paper keeps turning on the PIN SW even after 1 sec of turning on of PUSU, PSC is not turned on. (If the first paper remains, PSC is turns on after 0.3 sec of turning off of the PIN SW.)
7. After transfer and fusing, the first paper is passed through POUT SW and discharged by the paper-out roller.

#### 4. Optical section

All the parts in the optical system (the laser diode, etc.) are assembled in unit.

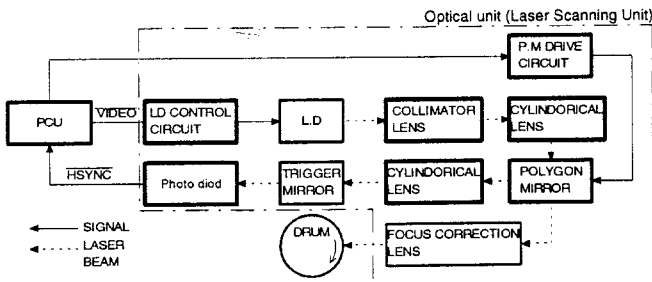
Note 1: Since the optical unit is replaced in unit, never disassemble it.

Note 2: Since the optical unit base is open, be careful to keep it away from dust and not to scratch the lens.

#### General

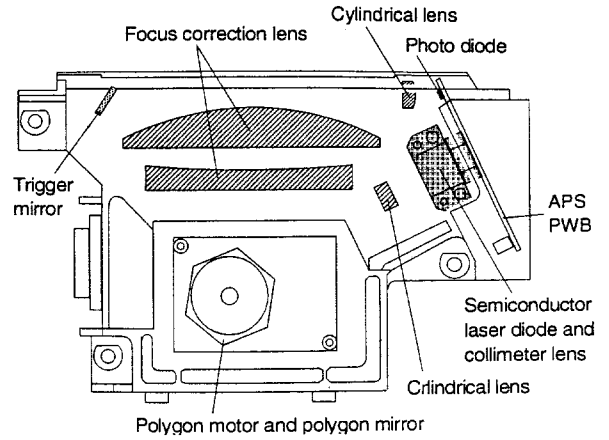
A laser beam issued from the semiconductor laser diode in synchronization with the video signal is focused collaterally by means of the collimator. It is exposed to the polygonal mirror that keeps rotating at a given speed, and the laser beam scans in the main scan direction as the mirror rotates. The main scan laser beam enters the focus correction lens where it is collected and focused to reflect the beam on the drum. The point where write starts is the point where the laser beam coming out of the focus correction lens is reflected by the trigger mirror exposes the photodiode.

#### Block diagram



Light source	Semiconductor laser diode (780nm wavelength) Laser output control PWB (APC circuit)
Deflector	Polygonal mirror, scan motor, control circuit board
Optics collimator	Focus correction lens, Collimator lens
Beam point detector	Pin diode Detect circuit board, Trigger mirror

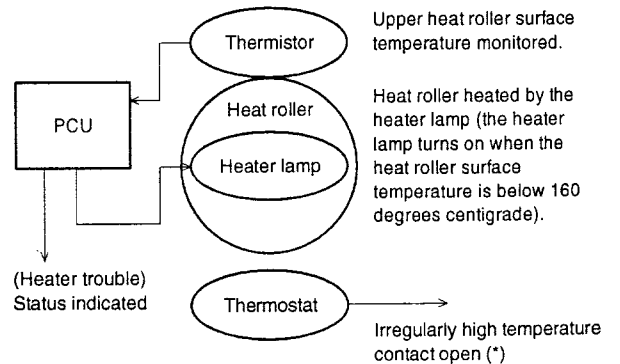
#### Major components



#### 5. Fusing section

After transfer, the toner image on the paper is fused on the paper by the heat and pressure of the heat roller.

- Upper heat roller: A teflon roller is used.
- Lower heat roller: A silicone rubber roller is used.
- Roller cleaner: Used for cleaning the heat roller.
- Separation pawl: Three pawls coated with teflon separate the paper from the heat roller.
- Thermistor: Used to detect the temperature of the upper heat roller.
- Thermostat: The contact opens when the fusing block temperature rises abnormally. (Hardware safety device)
- Heater lamp: The heater lamp employs nickel-chrome wire (570W).



#### Temperature control

Heater temperature control and heater trouble status

- Ready condition 190°C
- Print condition 200°C
- Sleep mode: 100°C
- Irregularly high temperature (C4) 240°C
- Irregularly low temperature (C5) 85°C
- Open thermistor (C6)



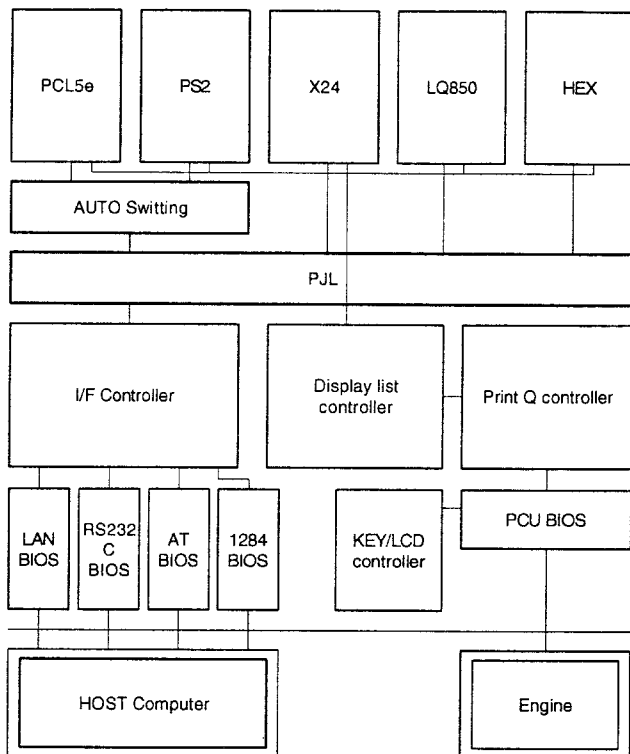
## 6. Electrical section

### (1) Firmware

#### Controller block diagram

The firmware is divided into the following 6 sections:

- Emulation analysis section
- I/F controller
- Display list controller
- Print Q controller
- KEY/LCD controller
- Each BIOS section



#### Emulation decoding section

The JX-9680 is provided with the four emulation features of PCL5e, PS2, X24, and LQ850, as well as the HEX functions.

The differences from the JX-9660 are shown in the table below:

Emulation	JX-9660 (PS)	JX-9680 (PS)	Changes in the machine
HP system	PCL5	PCL5e	Supports 600 dpi. Supports P.J.L.
PostScript system	PS Level1	PS Level2	Addition of operators related to graphics. Addition of color commands: No relation to the JX-9680. Change in using method of memory.
EPSON system	FX80	LQ850	Change from 9 pin head to 24 pin head. (Graphics are changed to 360 dpi.) Supports the vertical magnification ratio.
IBM system	ProPrinter	X24	Change from 9 pin head to 24 pin head. (Graphics are changed to 360 dpi.) Supports the vertical magnification ratio.

The EPSON/IBM system which has been supported in the former model is changed in the JX-9680. Printing in 600 dpi resolution is also available.

The target of the emulation of PCL5e/PC Level 2 is HP LaserJet 5MP. In this model, the P.J.L. (Printer Job Language) is supported to allow monitoring of the printer on the host side.

#### (Auto switching function)

The auto switching function, which has been supported from the JX-9660, is further strengthened.

Switching is performed when the code (ESC E/%%/%%!, etc.) unique to the PCL/PostScript is found not during the JOB but within 2000 characters. When the JOB END is found, the mode returns to Auto Switching once.

Note: Emulation is switched surely by using the P.J.L.

Switching to DOT (X24/LQ850) is possible only by the KEY or the P.J.L.

#### I/F controller

In the JX-9680, different from the JX-9660, the user cannot select the I/F. That is, all reception data from all I/F are automatically selected and printed. (The same operation as I/F=AUTO in the JX-9660.)

There are several kinds of I/F: parallel, RS232, AppleTalk, and LAN. Switching is performed when the input buffer is empty and the JOB is completed, similarly to the JX-9660.

#### Display list controller

The JX-9680 has the display list (intermediate data) in order to allow printing without all print area (frame buffer) in SoftBand (banding system).

This formation and deletion are controlled.

The JX-9680 is designed to perform pre-rendering, suppressing occurrence of data loss error.

The pre-rendering an algorithm for rendering (making bit map) the display list in advance when there are certain number of display lists in one band and there is enough free area.

#### Print Q controller

This controller performs paper handling of the JX-9680. It mainly controls paper size and paper presence in each tray, determines which tray to feed, receives that paper is discharged, transmits to the display list controller, and controls timing of deleting the display list. Therefore, jam recovery is controlled by this controller.

#### KEY/LCD controller

This controller controls the KEY/LCD.

It detects which key was depressed, and controls the LCD display. (It also supports five languages.)

#### Each BIOS section

There are five kinds of BIOS: PCU BIOS, 1284 BIOS (Parallel BIOS), RS232 BIOS, AppleTalk BIOS, and LAN BIOS.

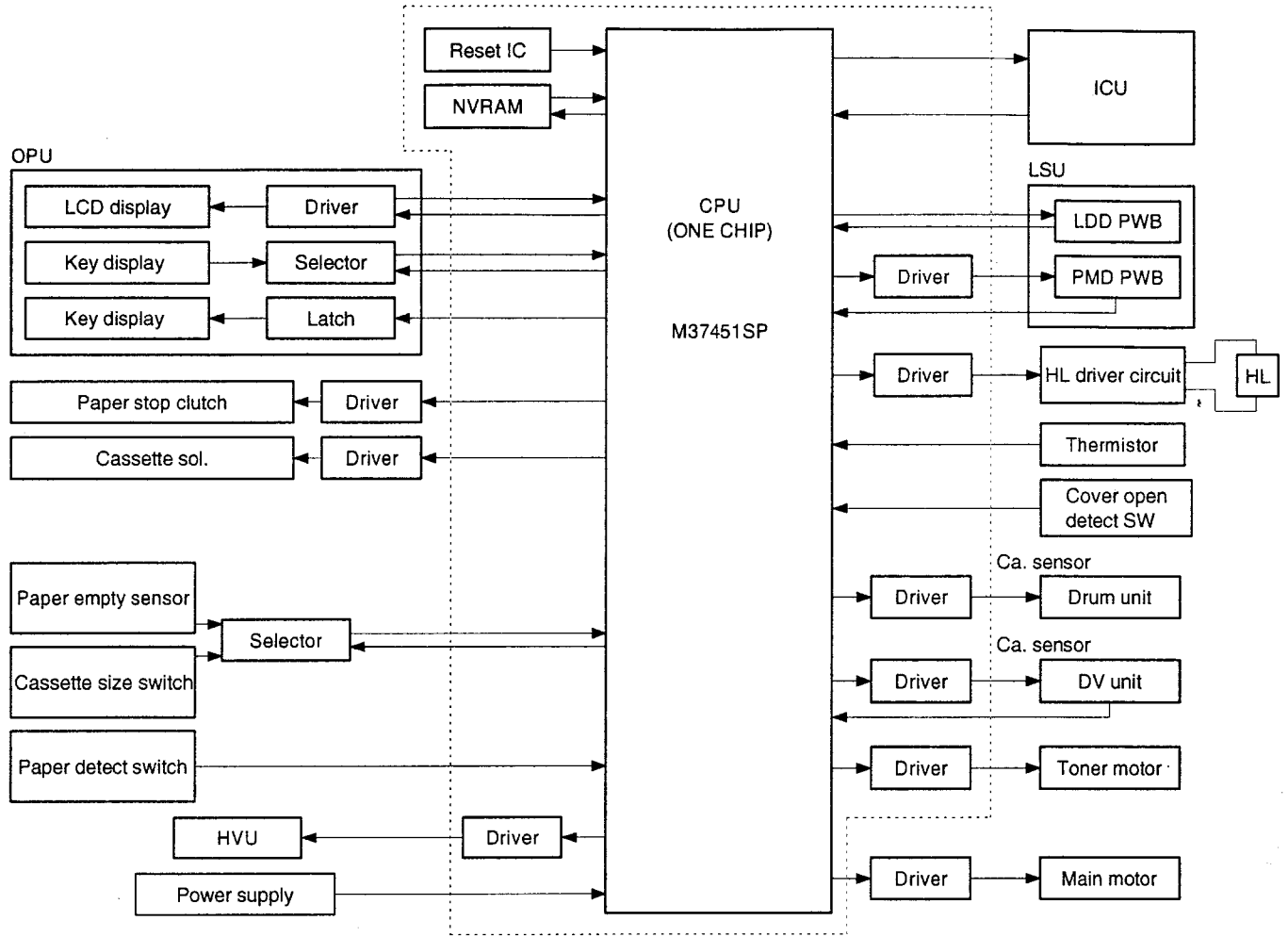
They are programmed according to each hardware configuration.

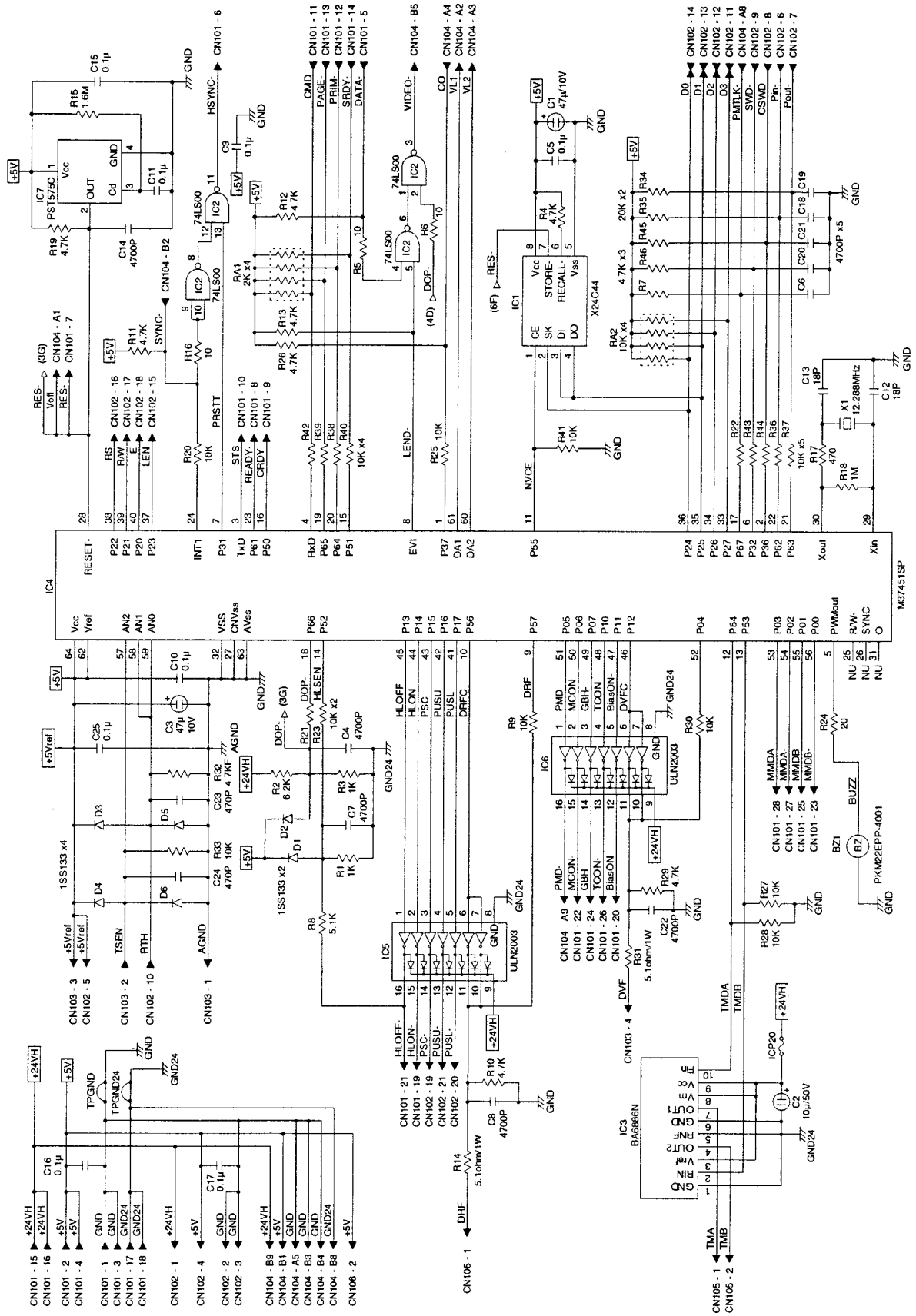
Since the LAN BIOS is provided under the license contract with Xionics, permission is required for exhibiting the specifications.

**(2) Process control unit (PCU)**

The PCU performs the control of the printer engine and interfaces with ICU and OPU.

**Block diagram**





IC4 M37451SP

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64									
DA2	DA1	P37	EVI	P52	P56	P17	P16	P15	P14	P13	P12	P11	P10	P07	P06	P05	P57	P04	P54	P53	P03	P02	P01	P00	PWMout	RW-	RW-	SYNC	Xin	Xout	P63	P62	P61	P60	P59	P58	P57	P56	P55	P54	P53	P52	P51	P50	P49	P48	P47	P46	P45	P44	P43	P42	P41	P40	P39	P38	P37	P36	P35	P34	P33	P32	P31	P30	P29	P28	P27	P26	P25	P24	RESET-	IC4

## Signal descriptions

## Signal list (Printer section)

Signal name	Function
Xin	CPU Clock input
Xout	CPU Clock output
$\overline{\text{RES}}$	CPU reset signal
NVCE	NVRAM chip enable signal
D3~0	LCD control data bus, key signal address, LED data bus, NARAM signal
CSWD	Cassette size, paper out detect signal
BUZZ	Buzzer signal
PRSTT	Print start signal
$\overline{\text{SYNC}}$	Horizontal synchronous signal
$\overline{\text{LEND}}$	Line end signal
$\overline{\text{DATA}}$	Print data signal (from ICU)
$\overline{\text{VIDEO}}$	Print data signal (to LSU)
$\overline{\text{HSYNC}}$	Horizontal synchronous signal (to ICU)
STS	Status output signal (to ICU)
CMD	Command input signal (from ICU)
$\overline{\text{SRDY}}$	Status ready signal (from ICU)
$\overline{\text{CRDY}}$	Command ready signal (to ICU)
$\overline{\text{PAGE}}$	Print action start signal (from ICU)
$\overline{\text{PRIM}}$	PCU initialize request signal (from ICU)
$\overline{\text{READY}}$	Print ready signal (to ICU)
LEN	LED control enable signal
RS	LCD control resistor selection signal
R/W	LCD control data read/ write signal, H:read
E	LCD control data synchronous signal
$\overline{\text{SWD}}$	Key input signal from OPU
TSEN	Toner sensor input signal (analog)
RTH	Thermistor input signal (analog)
$\overline{\text{DOP}}$	Cover open detect signal
$\overline{\text{Pout}}$	Paper exit sensor signal
$\overline{\text{Pin}}$	Pin sensor signal
$\overline{\text{PMD}}$	Polygon motor drive signal, L:Polygon motor ON
$\overline{\text{PMTLK}}$	Polygon motor lock signal
CO	Laser power control signal
VL2	Laser power control signal (analog)
VL1	Laser power control signal (analog)
Voff	Laser power off signal
$\overline{\text{PUSL}}$	Lower paper feed solenoid control signal, L:PUSL ON
$\overline{\text{PUSU}}$	Upper paper feed solenoid control signal, L:PUSU ON
$\overline{\text{PSC}}$	Paper stopper clutch control signal, L:PSC ON
DRFC	Drum unit cartridge sensor cut signal, H:sensor cut
DRF	Drum unit cartridge sensor detect signal, H;New Drum
DVFC	DV unit cartridge sensor cut signal , H:sensor cut
DVF	DV unit cartridge sensor detect signal , H:New DV
HLSEN	Heater lamp control abnormal detect signal
$\overline{\text{HLON}}$	Heater lamp control signal, L:Heater lamp ON
$\overline{\text{HLOFF}}$	Heater lamp control signal, L:Heater lamp OFF

Signal name	Function
BiasON	Bias control signal, H: Bias ON
$\overline{TCON}$	Transfer corona control signal, L: Transfer corona ON
GBH	Grid bias control signal, H: Grid bias HIGH
$\overline{MCON}$	Main corona control signal, L: Main corona ON
TMDA	Toner motor drive signal
TMDB	Toner motor drive signal
TMA	Toner motor output
TMB	Toner motor output
MMDA	Main motor drive signal
$\overline{MMDA}$	Main motor drive signal
MMDB	Main motor drive signal
$\overline{MMDB}$	Main motor drive signal
COMA	Main motor output (common)
COMB	Main motor output (common)
MMA	Main motor output
$\overline{MMA}$	Main motor output
MMB	Main motor output
$\overline{MMB}$	Main motor output

## CPU section

The M37451MS used in the PCU is an 8-bit single-chip microcomputer which includes 16-byte ROM and 384-byte RAM, three 16-bit timers, one serial I/O, three channels of 8-bit AD convertor, two channels of 8-bit DA convertor, forty eight I/O ports.

This CPU is used in the single chip mode.

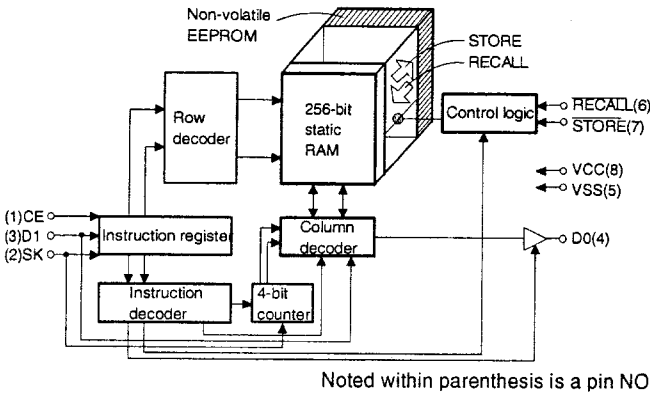
## CPU Terminal arrangement

Pin No.	In/Out	Signal name	Function
1	I	CO	Laser power control signal
2	I	CSWD	Cassette size, paper out detect signal
3	O	STS	Status output signal to ICU
4	I	CMD	Command input signal from ICU
5	O	BUZZ	Buzzer signal
6	I	SWD	Key input signal from OPU
7	O	PRSTT	Print start signal
8	O	LEND	Line end signal
9	I	DRF	Drum unit cartridge sensor detect signal, H: New Drum
10	O	DRFC	Drum unit cartridge sensor cut signal, H: sensor cut
11	O	NVCE	NVRAM chip enable signal
12	O	TMDA	Toner motor drive signal
13	O	TMDB	Toner motor drive signal
14	I	HLESEN	Heater lamp control abnormal detect signal
15	I	SRDY	Status ready signal from ICU
16	O	CRDY	Command ready signal to ICU
17	I	PMTLK	Polygon motor lock signal
18	I	DOP	Cover open detect signal
19	I	PAGE	Print action start signal from ICU
20	I	PRIM	PCU initialize request signal from ICU
21	I	Pout	Paper exit sensor signal
22	I	Pin	Pin sensor signal
23	O	READY	Print ready signal to ICU
24	I	SYNC	Horizontal synchronous signal
25 - 26	—	—	NC
27	—	CNVss	GND
28	—	RES	CPU reset signal
29	I	Xin	Clock input
30	O	Xout	Clock output
31	—	—	NC
32	—	Vss	GND
33 - 36	I/O	D3 - 0	LCD control data bus, key signal address, NVRAM signal
37	O	LEN	LED control enable signal
38	O	RS	LCD control resistor selection signal
39	O	R/W	LCD control data read/write signal, H: read
40	O	E	LCD control data synchronous signal
41	O	PUSL	Lower paper feed solenoid control signal, H: PUSL ON
42	O	PUSU	Upper paper feed solenoid control signal, H: PUSU ON
43	O	PSC	Paper stopper clutch control signal, H: PSC ON
44	O	HLOH	Heater lamp control signal, H: Heater lamp ON
45	O	HLOFF	Heater lamp control signal, H: Heater lamp OFF
46	O	DVFC	DV unit cartridge sensor cut signal, H: sensor cut
47	O	-BiasON	Bias control signal, L: Bias ON
48	O	TCON	Transfer corona control signal, H: Transfer corona ON
49	O	GBH	Grid bias control signal, L: Grid bias HIGH
50	O	MCON	Main corona control signal, H: Main corona ON
51	O	PMD	Polygon motor drive signal, H: Polygon motor ON
52	I	DVF	DV unit cartridge sensor detect signal, H: New DV
53	O	MMDA	Main motor drive signal
54	O	MMDA	Main motor drive signal
55	O	MMDB	Main motor drive signal
56	O	MMDB	Main motor drive signal
57	I	TSEN	Toner sensor input signal (analog)
58 - 59	I	RTH	Thermistor input signal (analog)
60	O	VL2	Laser power control signal (analog)
61	O	VL1	Laser power control signal (analog)
62	—	Vref	+5V
63	—	AVss	GND
64	—	Vcc	+5V

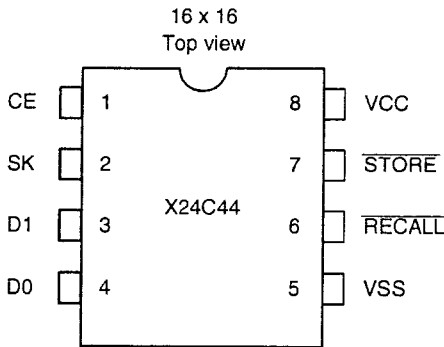
**NVRAM section**

The X24C44 is a CMOS RAM which includes CMOS static RAM and its relevant EEPROM. Its capacity is 16 words x 16 bits. Data is passed through one data bus.

When the STROBE pin is LOW, all RAM data is passed to the EEPROM. When the recall signal is inputted, the EEPROM data is returned to the RAM. The RAM data can be read or written independently of this transmission.



Noted within parenthesis is a pin NO.



CE	Chip enable
SK	Serial clock
D <sub>i</sub>	Serial data, in
D <sub>o</sub>	Serial data, out
RECALL	Recall
STORE	Store
V <sub>cc</sub>	+5V
V <sub>ss</sub>	GND

**(Pin functions)**

**Chip Enable (CE)**

The Chip Enable input should be made HIGH when performing read or write. When CE is LOW, the instruction register is reset and X24C44 goes into the low power standby mode.

**Serial Clock (SK)**

The Serial Clock is used for every input/output of the data.

**Data In (DI)**

The Data In is used for serial data input.

**Data Out (DO)**

The Data Out is used for serial data output.

This pin is kept at HIGH except when data are outputted according to a read command.

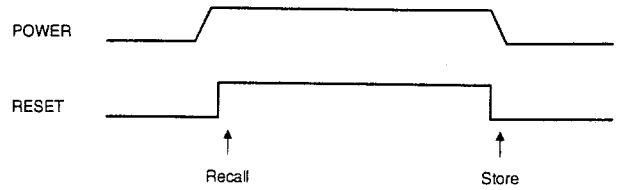
**STORE**

When STORE pin is made LOW, data transmission from RAM to EEPROM is started

**RECALL**

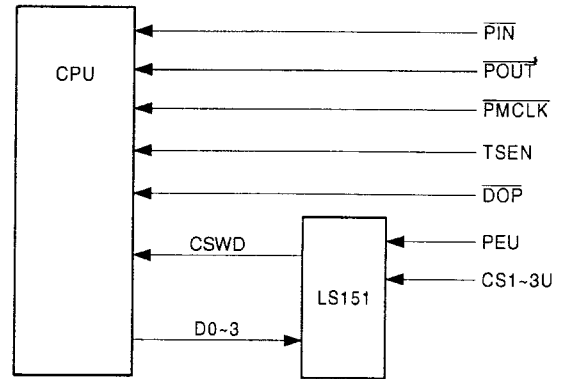
When RECALL pin is made LOW, data transmission from EEPROM to RAM is started.

(NVRAM sequence)



**Sensor, detector, Status signals**

(Engine status input circuit)



**P<sub>in</sub>:**

Paper-in sensor. Senses paper presence inside the body (in front of the PS roller) at LOW.

**P<sub>out</sub>:**

Paper-out sensor. Senses paper presence inside the body (in the paper exit side from the fuser section) at LOW.

**P<sub>M</sub>TLK:**

Polygon motor lock signal. Senses that the polygon motor has reached a constant speed at LOW.

**TSEN:**

Analog signal from the toner sensor.

**D<sub>OP</sub>:**

When the cover is opened, the voltages (+24V) which are regarded as dangerous for the user, such as the motor, are cut off by the safety switch. The PCU detects it by dividing +24V.

**CSWD:**

Multiplexed signal of PEU-CS1 - 3U.

**PEU:**

Sensor output which shows paper empty in the upper cassette. (Empty at HIGH.)

**CS1 - 3U:**

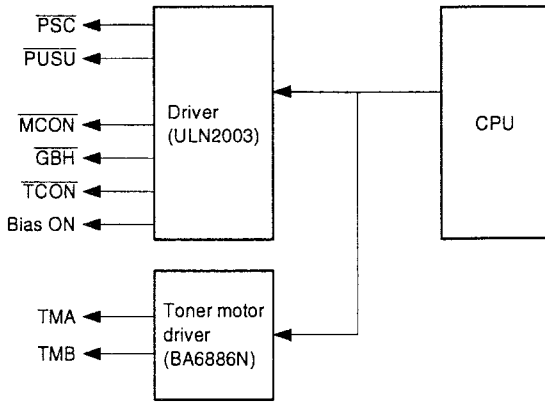
Senses paper size in the upper cassette. (Push the main body switch in the projection at the right side of the cassette.)

CS1U/CS1L	CL2U/CS2L	CS3U/CS3L	Paper size
L	L	L	NO TRAY
L	L	H	LEGAL
L	H	L	LETTER
L	H	H	—
H	L	L	ENVELOPE
H	L	H	A4
H	H	L	—
H	H	H	—

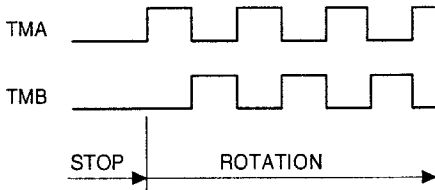
**CS1 - 3L:**

Senses paper size in the lower cassette (Push the main body switch in the projection at the right side of the cassette)

### Engine drive signal



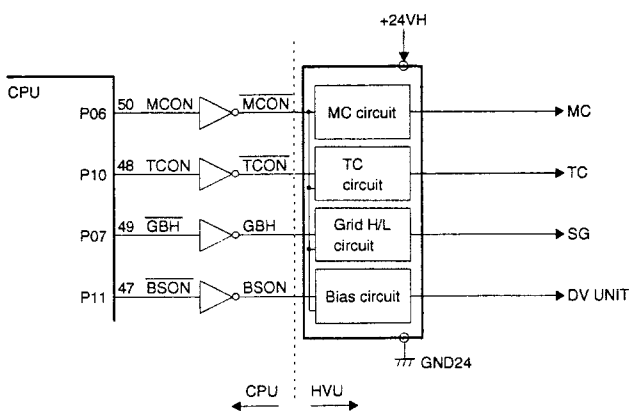
- PSC:** Paper stop clutch ON signal. (ON at LOW.)
- PUSU:** Upper cassette paper pick up solenoid ON signal. (ON at LOW)
- PUSL:** Lower cassette paper pick up solenoid ON signal. (ON at LOW.)
- MCON:** Main corona control signal. (ON at LOW)
- GBH:** Grid bias voltage control signal. (High at HIGH, low at LOW.)
- TCON:** Transfer corona control signal. (ON at LOW.)
- BiasON:** Developer bias control signal. (ON at HIGH.)
- TMA, TMB:** Toner motor (synchronous motor) drive signal



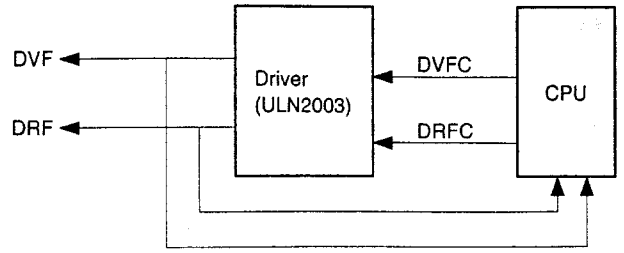
### High voltage unit control

Control signal	MC output	TC output	BS output	GBhigh output	GBlow output
MCON	low active	low active	low active	low active	low active
TCON	X	low active	X	X	X
BSON	X	X	hi active	X	X
GBH	X	X	X	X	low active

X = Arbitrary state

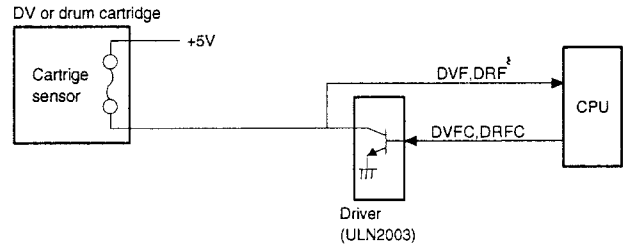


### Developer/Toner, Photoconductor control section



- DVF:** DV cartridge NEW sense signal. (NEW at HIGH.)
- DVFC:** DV cartridge cartridge sensor cut signal. (Cut at HIGH.)
- DRF:** Drum cartridge NEW sense signal. (NEW at HIGH.)
- DRFC:** Drum cartridge sensor cut signal. (Cut at HIGH.)

#### NEW sense in each cartridge

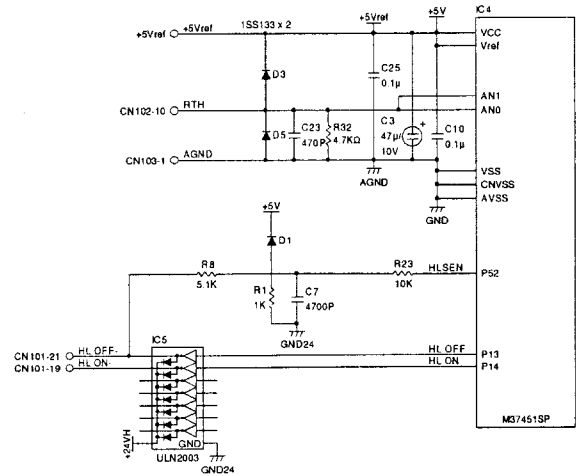


When DVF or DRF is HIGH, the CPU senses NEW of each cartridge and resets the counter. Then DVFC or DRFC is driven to HIGH to cut the cartridge sensor operation. When the cartridge sensor operation is cut off, DVF or DRF signal becomes LOW.

### Fusing section control

#### Heater lamp control

The voltage divided by the thermistor on the fuser roller and R32 (4.7kΩ) of the PCU are inputted to AN0 and AN1 ports to detect the surface temperature of the fuser roller, controlling ON/OFF of the heater lamp with H<sub>L</sub>ON and H<sub>L</sub>OFF signals. Heater temperature control, high temperature error, low temperature error, thermistor open are detected and processed by the CPU. Heater lamp control circuit





**Heater control signal self test**

When the power is ON, heater lamp control signals  $\overline{\text{HLON}}$  and  $\overline{\text{HLOFF}}$  are changed. When  $\overline{\text{HLSEM}}$  is not as shown below, there may be some trouble in the heater lamp control system. In that case, the heater lamp is turned off and the low temperature error (SERVICE C5) is displayed.

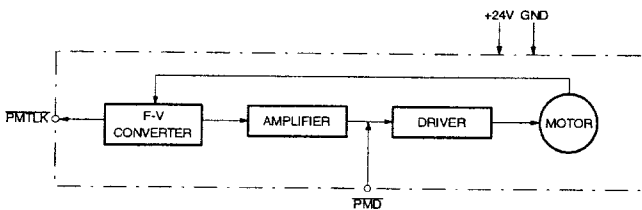
$\overline{\text{HLON}}$	$\overline{\text{HLOFF}}$	$\overline{\text{HLSEN}}$
L	L	L
L	H	L
H	L	L
H	H	H

**Optical (Laser scanning) section control**

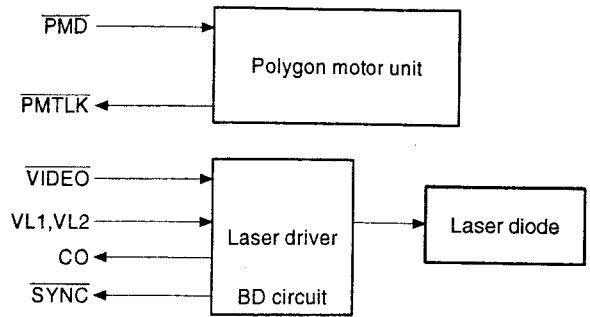
**Polygon motor**

When the motor speed reaches the specified level (11338.583 rpm),  $\overline{\text{PMTLK}}$  signal is supplied and ON/OFF of the motor is controlled by  $\overline{\text{PMD}}$ .

Polygon motor control block diagram



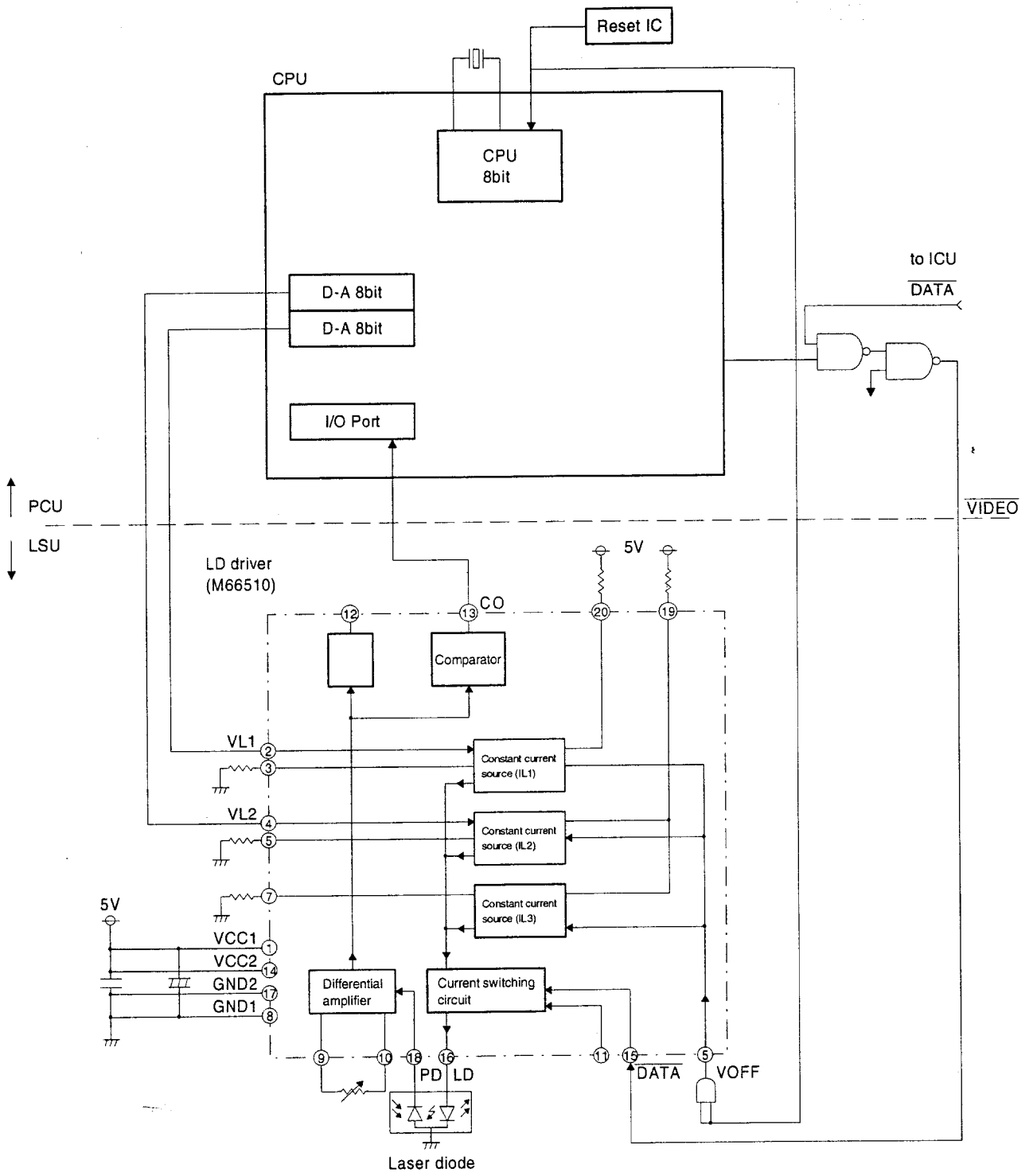
The LSU is composed of the polygon motor unit, the laser driver, and the BD circuit.



- $\overline{\text{VIDEO}}$ : A low on this line causes the laser diode to emit a beam.
- $\overline{\text{SYNC}}$ : A Laser beam is detected at a high to low transition of this signal.
- VL1: LD POWER setting rough adjustment voltage output pin from CPU in PCU.
- VL2: LD POWER setting fine adjustment voltage output pin from CPU in PCU.
- CO: Laser power monitor comparator output for auto power control of the laser power.
- $\overline{\text{VOFF}}$ : Laser current is forcibly turned off when LOW.
- $\overline{\text{PMD}}$  (polygonal motor drive):  
The polygonal motor starts with a low state of this signal and stops with a high state of the signal.
- $\overline{\text{PMTLK}}$  (polygonal motor lock)  
PLL sync complete signal.  
Low: Sync rotation  
High: Async rotation  
It requires 6 seconds, max., before  $\overline{\text{PMTLK}}$  becomes low after  $\overline{\text{PMD}}$  is set low.

**The LDD PWB has the following functions**

- (1) The laser diode drive circuit performs auto power control with a software in the CPU of the process control unit (PCU). The voltage outputted from the D/A converter of the CPU is applied to the two independent voltage pins of rough/fine adjustment to set the drive voltage of the laser diode. The APC feedback laser power is detected by comparing the monitor current of the monitor photo diode included in the laser diode with the reference power in the comparator inside the laser driver, and is outputted to the CPU as logic information.
- (2) Beam emit power of the laser diode is maintained at the given level constant at all times.
- (3)  $\overline{\text{SYNC}}$  is issued.  
The signal  $\overline{\text{SYNC}}$  is issued when laser beam is detected, to determine the write start position.
- (4) Laser diode beam emit is controlled on and off with the  $\overline{\text{VIDEO}}$  signal.
- (5)  $\overline{\text{VOFF}}$  keeps the laser OFF when the power voltage is not stable at rising.



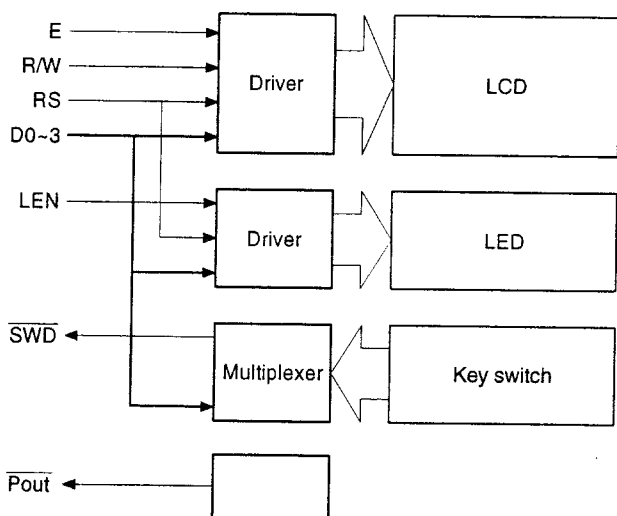
Laser diode drive (including APC) block diagram

### Operation panel control section

The OPU is composed of the LCD display section (16-digit, one line), four LEDs and their driver, eight key switches and their multiplexer, and the paper exit sensor. It is controlled by the 8-bit CPU of PCU.

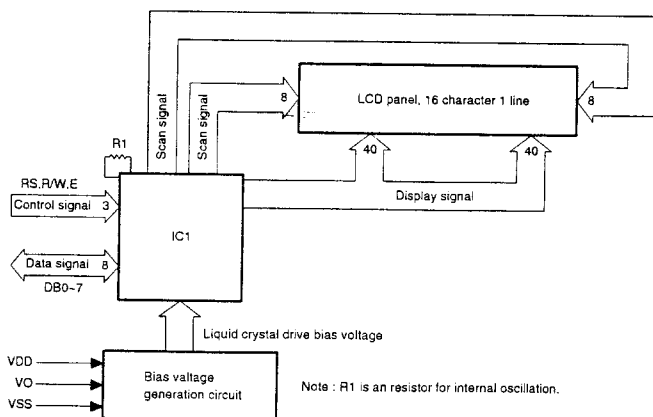
#### Major functions

- LCD display function
- Controls LCD display/blinking in one line of 16 digits by the LCD driver.
- LED display function  
Latches data in LS173 and lights four LEDs.
- Key input multiplex function  
Multiplexes eight key inputs with LS151.
- Paper exit detection  
Detects paper exit with the photo interrupter.



- E LCD control data synchronous signal
- R/W LCD control data read/write signal, H: read
- RS LCD control resistor selection signal
- D3 ~ 0 LCD control data bus, LED data bus, key signal address
- LEN LED data enable signal
- SWD Key input signal
- Pout Paper exit sensor signal

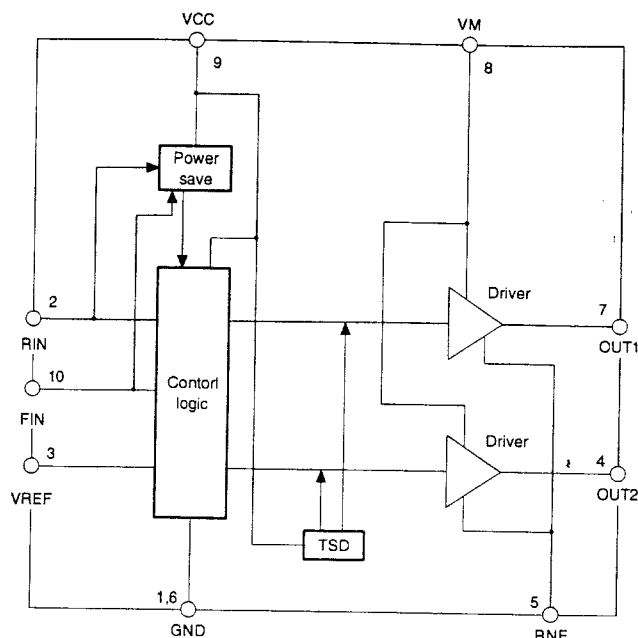
#### LCD control block diagram



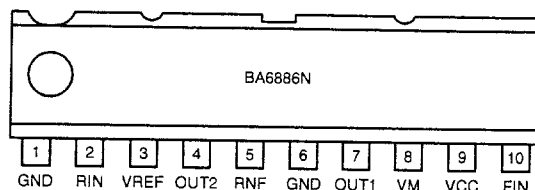
### Toner motor control

The BA6886N is a transistor array composed of H-bridge-connected transistors and the peripheral circuits.

#### [BA6886N block diagram]



(Pin location)



(Pin functions)

Pin No.	Pin Name	Functions
1	GND	GND
2	RIN	Logic input pin
3	VREF	Output HIGH voltage setting pin
4	OUT2	Motor output pin
5	RNF	Output section GND, Output current detecting resistor connection pin.
6	GND	GND
7	OUT1	Motor output pin
8	Vn	Motor section power
9	Vcc	Power pin
10	FIN	Logic input pin

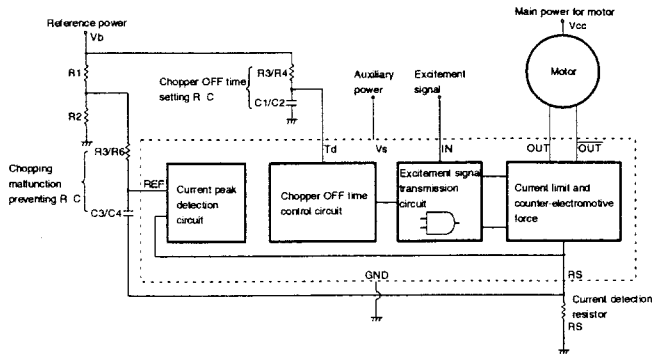
(I/O truth value table)

FIN	RIN	OUT 1	OUT 2	Mode
H	L	H	L	Normal
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OPEN	OPEN	Standby

### Main motor control

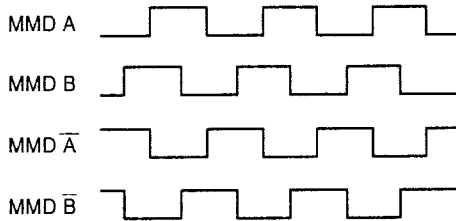
The SLA7024M is a stepping motor driven by the uni-polar constant current.

#### [Block diagram]

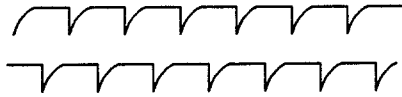


#### [Motor driver SLA7024M control signal]

Input signal

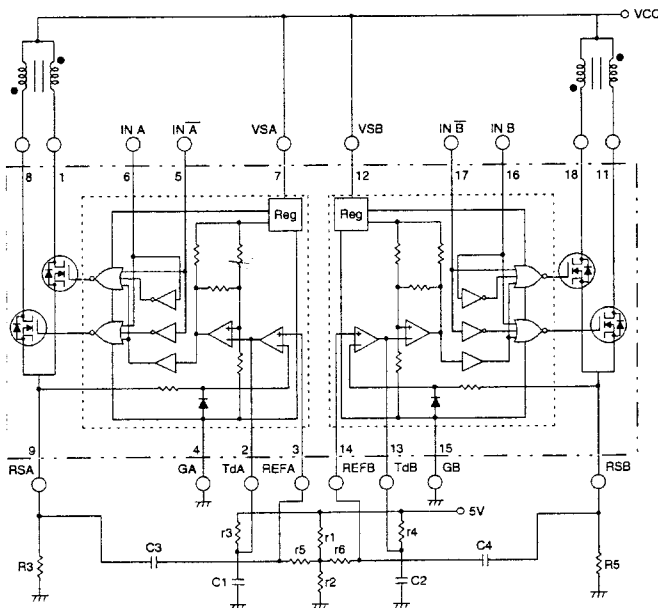


Output current



\* The current waveforms will vary according to the load torque.

#### [Equivalent circuit]



### PCU-ICU interface

#### Serial interface specification

- Baud rate: 9600bps
- Character size: 8bits
- Start bit: 1bit
- Stop bit: 1bit
- Parity bit: None
- System: Full duplex, async

The PCU serial interface uses M37451 single chip CPU internal serial interface circuit and the command is processed by the interrupt routine program after the PCU has received a byte.

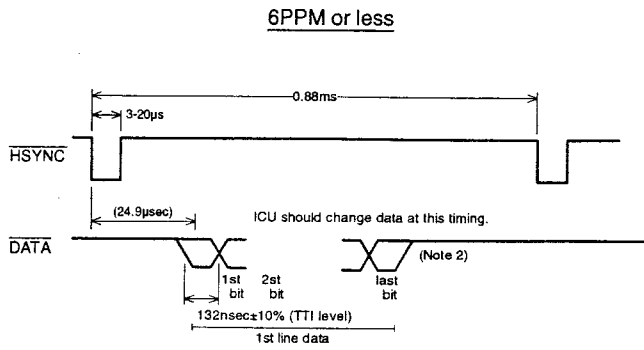
The ICU needs to set the two single byte code transfer interval to 1.5msec. minimum, when sending the control code and status code. At present, the PCU performs send or receive in an interval of 3msec. Figure 12-23 shows the table of commands transferred between ICU and PCU.

#### Function of interface signals

SIGNAL	DIRECTION	FUNCTION
READY	ICU ← PCU (Ready)	L for ready to print. H for warm-up, error detected or printer busy.
PRIM	ICU → PCU (Prime)	Initialize request to PCU. Active L state. When the printer is busy, this request is held until one page printing is completed.
PAGE	ICU → PCU (Page)	Print start request to PCU. It should be L during transmission of one page full of data. When this signal is received and provided that there is no error, PCU will start operation.
HSYNC	ICU ← PCU (Horizontal Sync)	Sync signal for line-by-line printing. This signal indicates start timing of each line.
DATA	ICU → PCU (Data)	Print video data line. L level for black and H level for white. To be kept H after transmission of one line of data.
CMD	ICU → PCU (Command)	Command sending line to PCU. ICU sends various commands to PCU through this line.
STS	ICU ← PCU (Status)	Status sending line from PCU. ICU receives status information from PCU through this line.
SRDY	ICU → PCU (Status Ready)	L for ready to receive STS signal from the PCU. When this signal is H, STS signal is ignored.
CRDY	ICU ← PCU (Command Ready)	L for ready to receive CMD signal from the ICU. When this signal is H, CMD signal is ignored.
RES	ICU ← PCU	Hardware initialize request from PCU. Active L state.

**Video data timing**

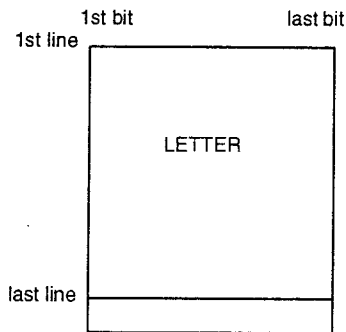
VIDEO DATA TRANSMISSION TIMING CHART



Note: ICU need to have the following control circuit.

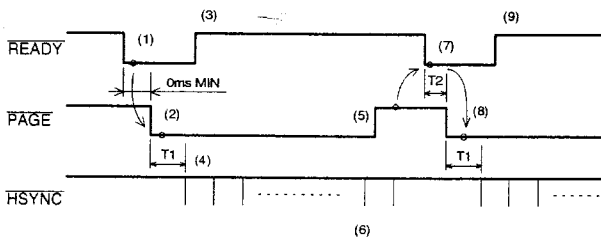
1. Top margin control  
Circuit decided the top margin area from first HSYNC signal per page.
2. Left margin control  
Circuit decided the left margin area from HSYNC signal per line.
3. Jitter control  
Circuit generates HSYNC signal synchronized by the forth clock of the video clock.

DATA to be H level (white) after sending the last bit of line data. The first HSYNC signal is on the top edge of a page. The DATA should be more than 50ns minimum. To obtain the positioning of 600 dpi, one DATA width must be 132ns ± 10% at TTL level.



**Printing operation sequence**

Printing Operation sequence

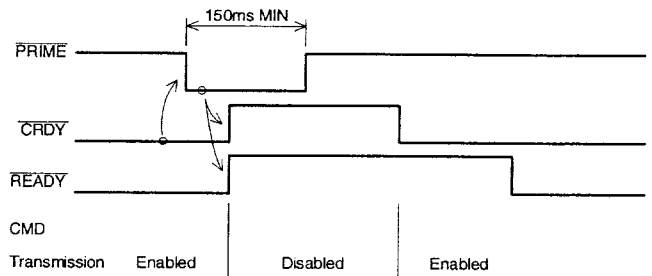


- (1) PCU is ready for printing.
- (2) Start request from ICU to PCU.
- (3) PCU, on receiving  $\overline{\text{PAGE}}$ , send  $\overline{\text{PGACK}}$  command to ICU, makes the mechanism start and turns  $\overline{\text{READY}}$  to H (busy state).
- (4) PCU turns on the polygon motor and, after completing the preparatory process starts to send  $\overline{\text{HSYNC}}$  pulses. (The time of T1 for the first printing is changed depending on the processing condition)
- (5) ICU, after sending one page of data, turn  $\overline{\text{PAGE}}$  to H.  $\overline{\text{PAGE}}$  signal should remain low during the complete page printing time. PCU generates maximum 10  $\overline{\text{HSYNC}}$  pulses past  $\overline{\text{PAGE}}$  goes high. The maximum number of  $\overline{\text{HSYNC}}$  pulses is about 12000 lines if  $\overline{\text{PAGE}}$  has been low. Then PCU waits until  $\overline{\text{PAGE}}$  goes high.
- (6) On completion of last line printing, the printed copy is sent out.
- (7) Same as (1).
- (8) Start request from ICU to PCU.
- (9) Same as (3).

NOTE: (1) The duration of the unstable  $\overline{\text{PAGE}}$  pulse, which occurs when the controller power turns ON/OFF, should be 50 ms at maximum. In case the duration is more than 50 ms, PCU might recognize  $\overline{\text{PAGE}}$  is effective.  
(2) In order to run the printer at it's maximum speed, the printer has to feed the paper by the prefeed command.

**Prime processing sequence**

Prime Processing Sequence



**Sequence:**

- (1) ICU sends  $\overline{\text{PRIM}}$  on conditions that it is not sending CMD and  $\overline{\text{CRDY}}$  is Low. (The width of  $\overline{\text{PRIM}}$  pulse should be 150 ms at minimum)
- (2) PCU, after receiving  $\overline{\text{PRIM}}$ , makes  $\overline{\text{CRDY}}$  and  $\overline{\text{READY}}$  High on condition that it is not sending STS.

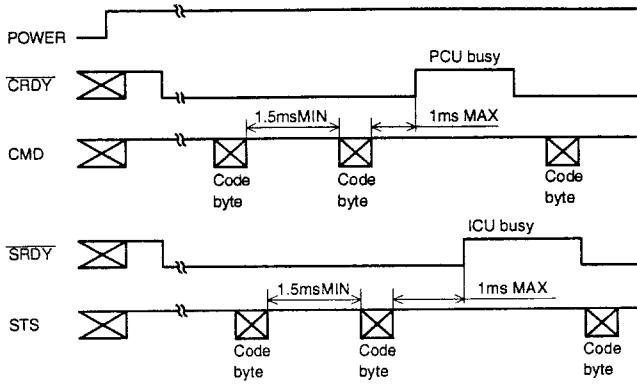
Note: PCU is not required to send back a response (STS) to the last CMD from ICU.

- (3) PCU makes  $\overline{\text{CRDY}}$  Low on completion of the circuit initialization.
- (4) PCU makes  $\overline{\text{READY}}$  Low when it is ready for printing sequence.

**Note:**

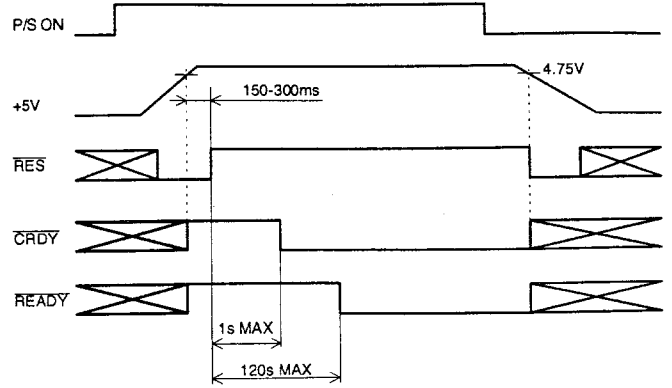
1. PCU can receive  $\overline{\text{PRIM}}$  even when PCU is receiving command status.
2. When PCU has received  $\overline{\text{PRIM}}$  during the printing operation, it performs a circuit initialization after completion of the printing sequence.

**Exchange timing of CMD and STS signals**



**Power on sequence**

**Power-On Sequence and Initialize Request**



NOTE: While the warm-up time is normally 60 seconds, it will be extended to 120 seconds at maximum for Toner density adjustment in the event of a toner near end or a toner empty.

**Warming up operation**

**Preliminary rotation timing (Warming-up)**

Before starting the image forming process, preliminary rotation cycle is performed to initialize the OPC drum state. Process control differs from the previous process completion state (normal completion or abnormal completion).

There are two types of abnormal completion.

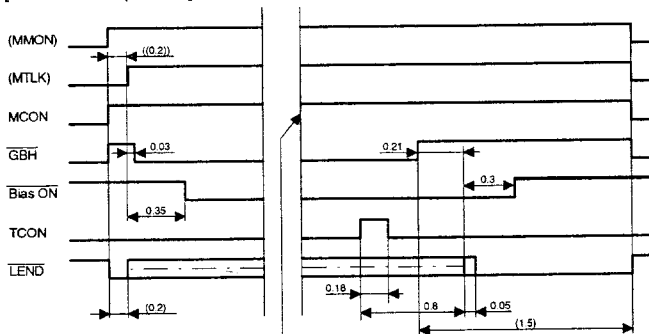
- (1) During the main motor rotation, an error other than toner empty, life over, and paper empty occurs.
- (2) The power is cut off during the main motor rotation.

The preliminary rotation cycle is performed in the following two cases:

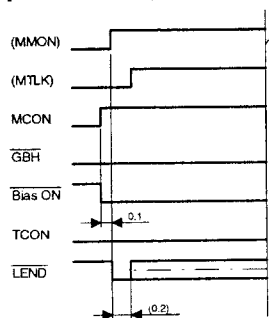
- (1) When the power is supplied. (Except for diag mode)
- (2) When an error state is reset. (A4 error reset command is outputted from ICU.)

Timing chart of normal completion and abnormal completion is shown below:

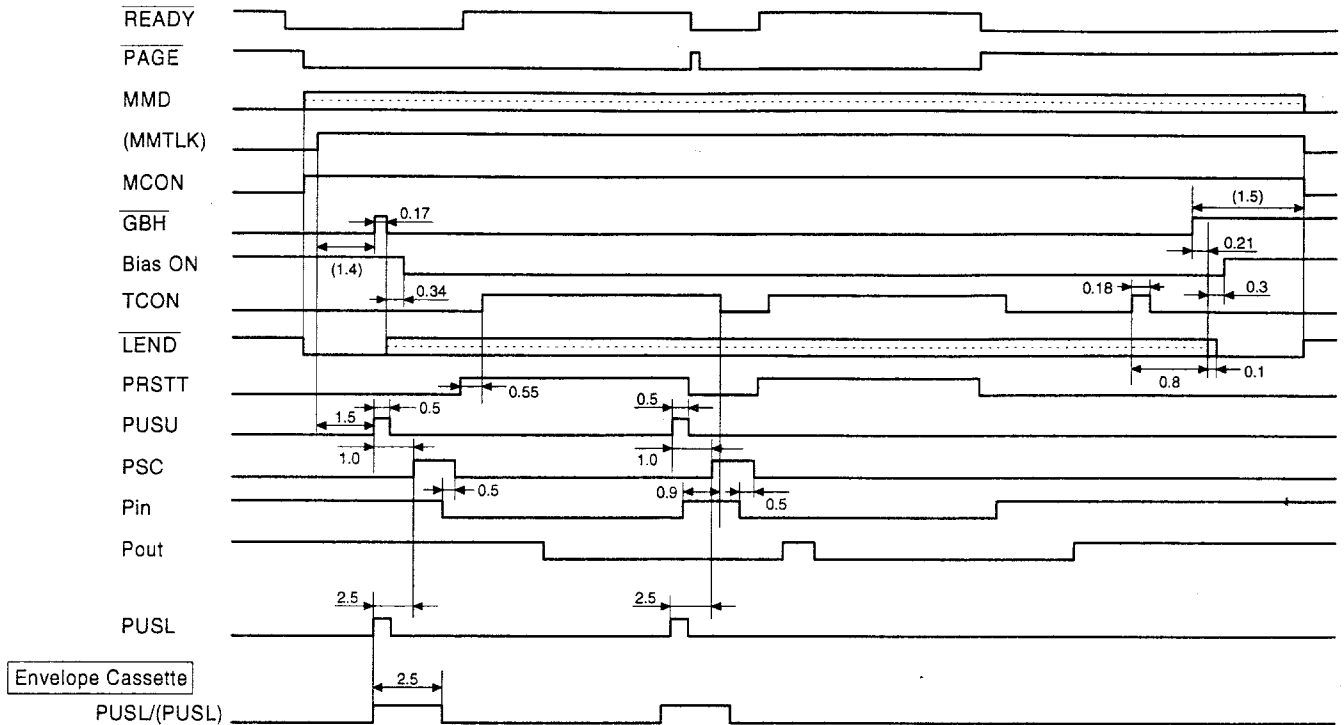
**[Normal completion]**



**[Abnormal completion]**



## Print cycle timing



## Error detection specifications

The error criteria for the printer engine (except for ICU) are as follows:

### (1) Paper jam

1. The paper exit sensor is not turned on within 4.5 sec after turning off PSC (paper stop clutch).
2. The paper exit sensor is not turned on within 4.8 sec after turning off the paper in sensor.
3. The paper sensor is not turned off within 8.8 sec after turning off the paper in sensor.
4. The paper sensor is not turned on within 5.1 sec after turning on PUSU (upper cassette paper pick up solenoid).
5. The paper exit sensor is turned on except during the print cycle.

### (2) Paper out

1. No paper in the cassette.
2. No cassette installed.

### (3) Cover open

1. When the safety switch is off.

### (4) Drum cartridge life over

### (5) DV cartridge life over

### (6) SERVICE P1 (PCU ROM) error

1. ROM check error occurs after turning on the power.

### (7) SERVICE P2 (PCU ROM) error

1. PCU RAM read/write check error occurs after turning on the power.

### (8) SERVICE P3 (NVRAM error)

1. NVRAM check error occurs after turning on the power.

### (9) SERVICE P4 (Serial transmission error)

1. An over run error or framing error occurs when CMD from ICU is received by PCU.

### (10) SERVICE C1 (Optical system error)

1. Abnormality in APC.
2.  $\overline{\text{SYNC}}$  is not detected.

### (11) SERVICE C2 (Main motor error)

1. When the main motor is stopped or out of order for 3 sec or more.  
(The main motor rotation is detected by the toner sensor ripple.)

### (12) SERVICE C3 (Polygon motor error)

1.  $\overline{\text{PMTLK}}$  does not become LOW within 15 sec after turning  $\overline{\text{PMD}}$  to LOW.

### (13) SERVICE C4 (Heater high temperature error)

1. Fuser temperature exceeds 240 degrees C.

### (14) SERVICE C5 (Heater low temperature error)

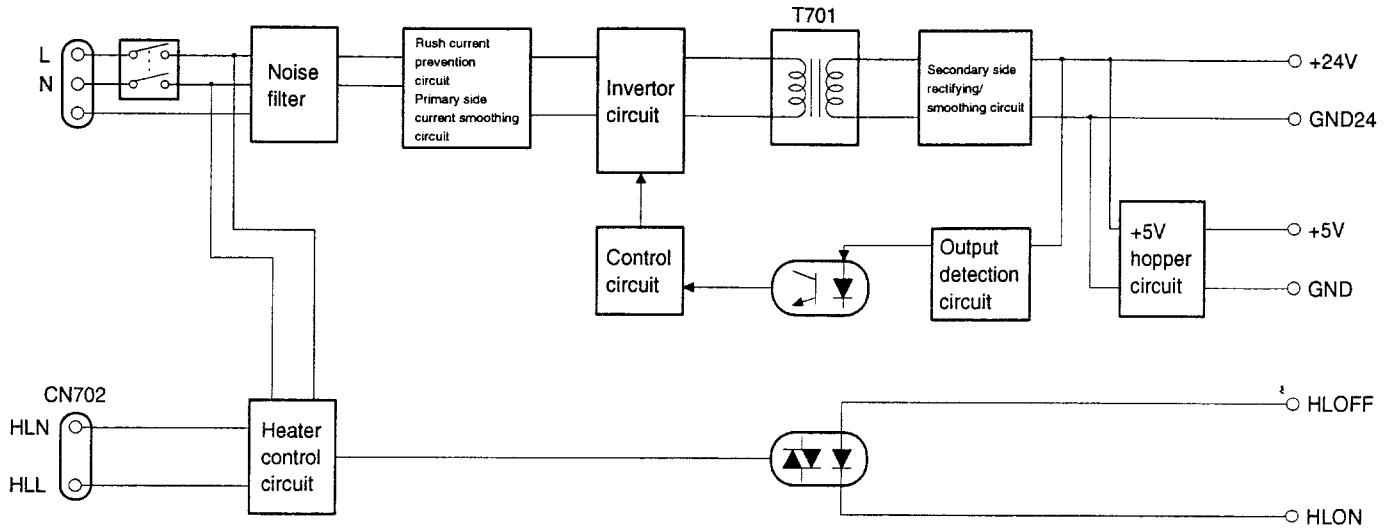
1. Thermistor temperature falls under 85 degrees C or warm-up operation is not completed in 2 minutes.
2. Abnormality in heater control signal ( $\overline{\text{HLON}}$ ,  $\overline{\text{HLOFF}}$ ).

### (15) SERVICE C6 (Thermistor open)

1.  $\text{RTH} = 0\text{V}$  is detected.

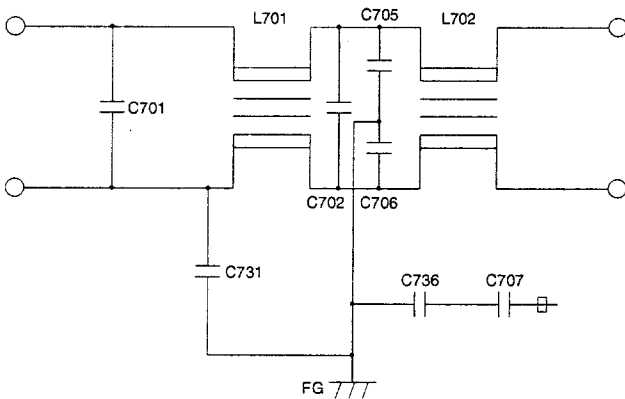
### (3) Power supply unit

In the power unit, the AC input is directly rectified and smoothed, and the voltage is transformed by the transformer in the switching system. Then it is rectified and smoothed again to obtain DC voltages (+24V, +5V). This power unit transforms +24V outputted from the power unit in the switching (chopper) system to provide +5V DC. Fig. 1 shows the block diagram, and circuit descriptions are given in the following.



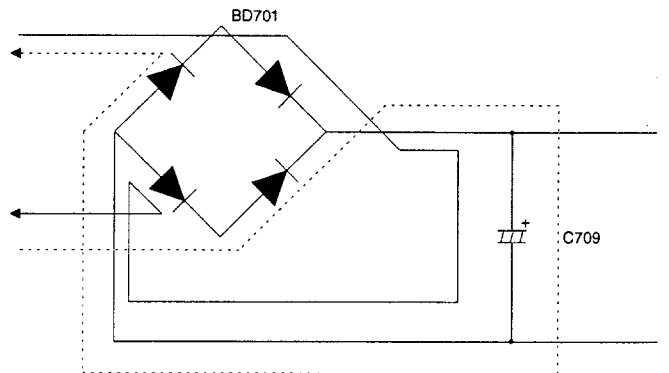
#### Noise filter circuit

This circuit reduces normal mode noise and common mode noise from the AC line. The normal mode noise is the noise overlapped in the AC line or the output line, and is attenuated by L701, L702, C701 and C702. The common mode noise is the noise generated between the AC line and GND, and is passed to GND through C705 and C706.



#### Primary side rectifying/smoothing circuit

This is a full wave rectifying circuit which converts AC voltage of 50/60Hz into a DC voltage. The solid line and the dotted line shows the charging path of C709.



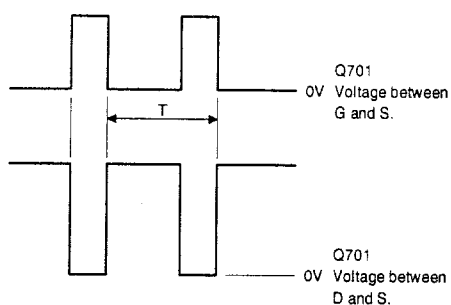
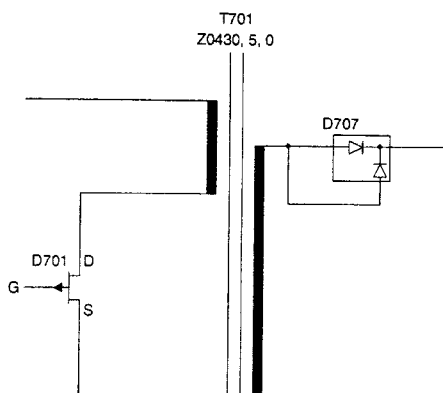
#### Rush current prevention circuit

Since AC input is directly rectified and smoothed, a great rush current may be generated by the charging current flowing through the capacitor and the switch contacts may be damaged. To prevent this, power thermistor TH701 is provided between rectifier BD701 and capacitor C709 to suppress a rush current. T701 has a characteristic which reduces resistance when temperature rises. Its normal resistance value is nearly 0 ohm.



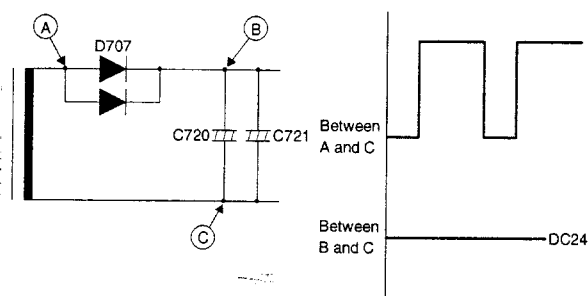
### Inverter circuit

In the flyback converter system, FET connected in series to the converter transformer performs ON/OFF operation. Energy accumulated in the transformer during ON period is discharged to the secondary side during OFF period. The DC voltage from the rectifying/smoothing circuit is converted into a switching pulse by the switching operation of Q701 controlled by the signal from the control circuit. Thus high frequency power is supplied to the secondary side by T701.



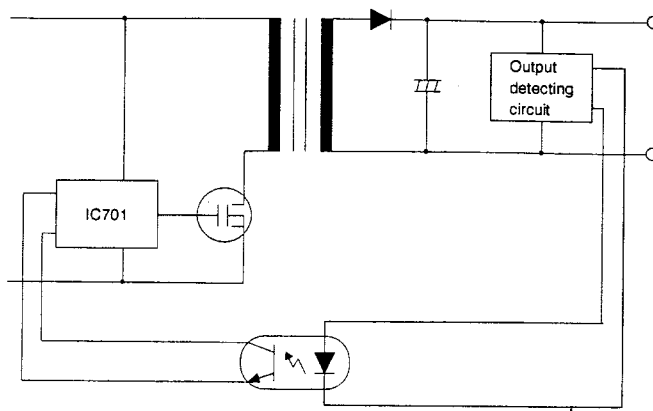
### Secondary side rectifying/smoothing circuit

The voltage of high frequency pulse generated in the inverter circuit is dropped by converter transformer T701, rectified by the high frequency diode, and smoothed by C720 and C721.



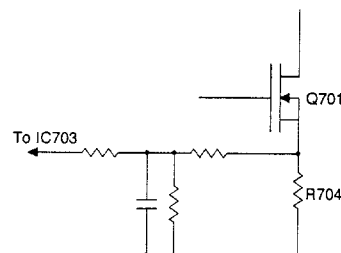
### Control circuit

This circuit operates in the PWM (pulse width modulation) control system by controlling the primary side using a power MOSFET as the switching element. The secondary side output voltage, therefore, is detected by the output detecting circuit, and the detection signal is passed through photocoupler PC701 to control IC (IC703) to stabilize the output voltage.



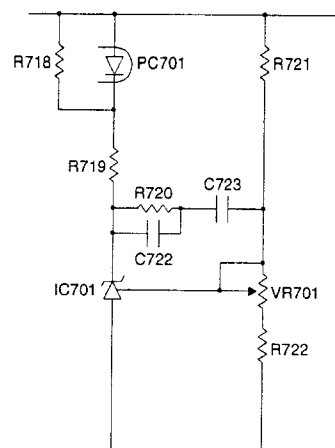
### Overcurrent protection circuit

Resistor R704 is connected to ⊖ line of the primary side. When an overcurrent is generated, it is detected and the signal is sent to the control IC (IC703) to reduce the output in the secondary side.



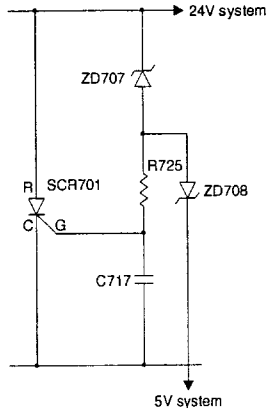
### Output detecting circuit

The 24V system output voltage is detected by R721, VR701, and R722. The detected output voltage is compared with the reference voltage in the IC701. That is, a change in the output voltage is transmitted to the control IC (IC701) in the primary side by changing the cathode current of IC701 and the resultant PC701 light emitting section current. The output voltage is controlled in this manner.



### Overvoltage detecting circuit

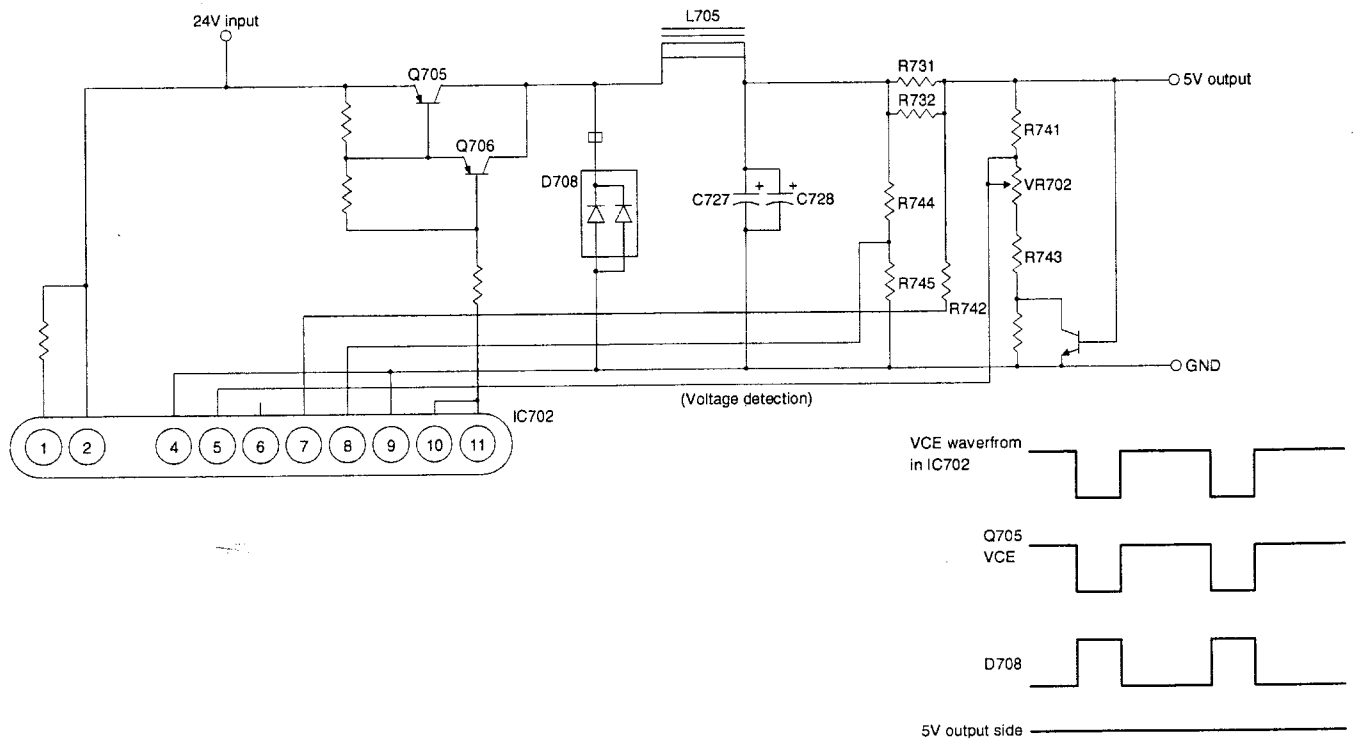
The 24V system detects overvoltage with ZD707, and the 5V system with ZD708. Then SCR701 is turned on to stop the output.



### Chopper circuit (5V output)

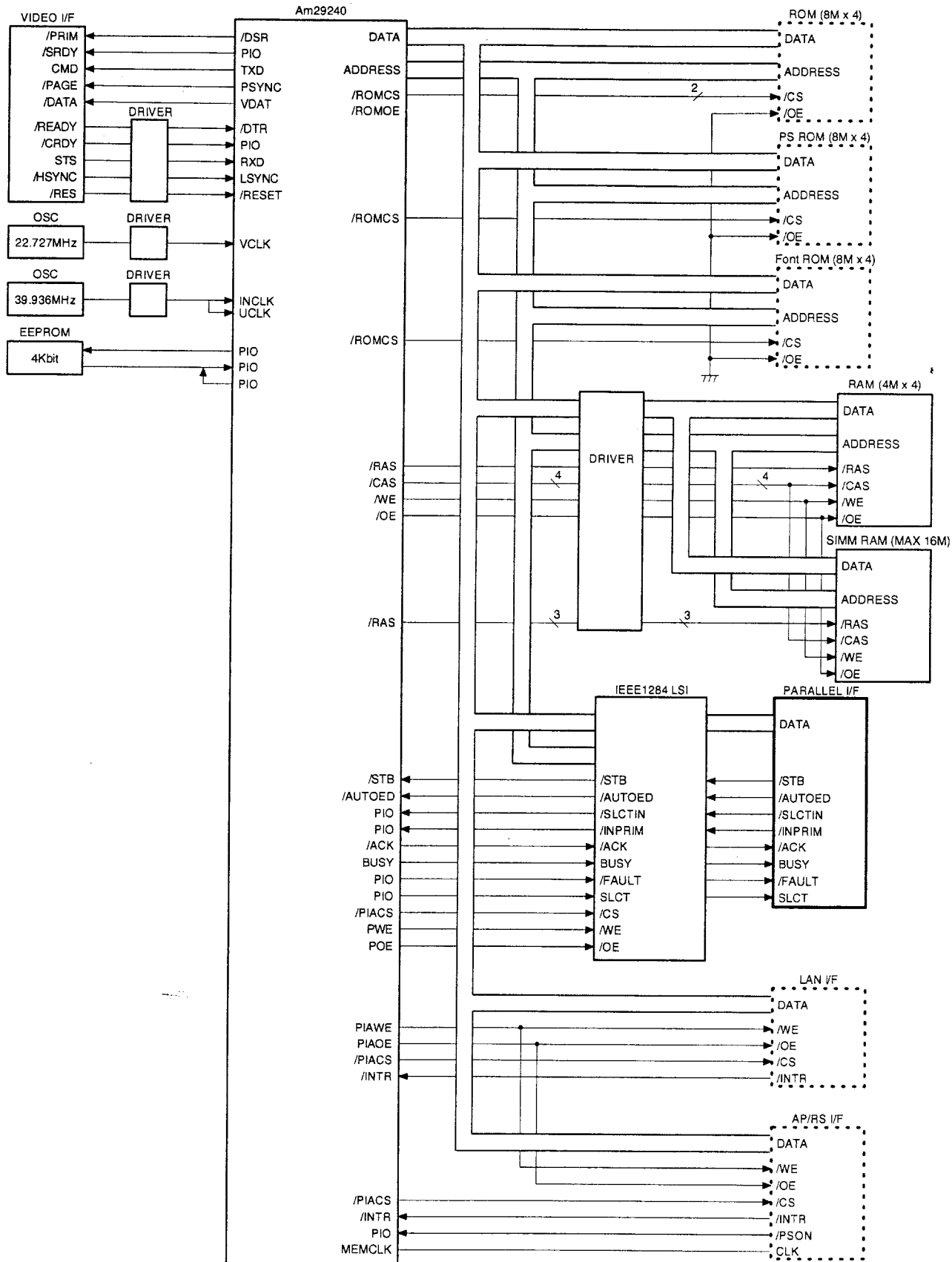
The chopper circuit is shown in Fig. 15-39. The solid line shows the current when Q705 is turned on. The dotted line shows the current generated by counter-electromotive force produced in L705 when the circuit is turned off.

When Q705 is turned on/off in the waveform shown in Fig. 15-39 in the switching frequency determined by IC702, the supplied rectangular waveform voltage is integrated and smoothed by L705, C727, and C728 to convert 24V into 5V. The detection signal from the voltage detecting circuit (R741, VR702, R743) is sent to IC702 to control on/off period of Q704 to stabilize the output.



(4) Interface control unit (ICU)

Block diagram



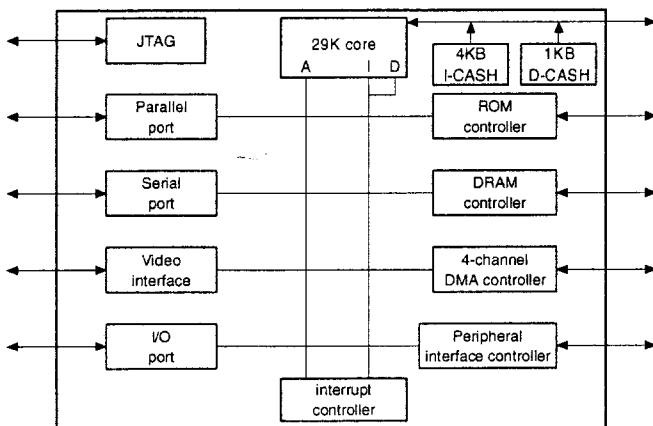
**Basic specifications**

- (1) CPU: Am29240-20 (196pin QFP)
- (2) Program ROM: Base ROM; 4MB mask ROM (8Mbit x 4) PS ROM; 2MB mask ROM (8Mbit x 2) Including the resident data and the outline data.
- (3) Internal RAM: 2MB DRAM (4Mbit x 4)
- (4) Expansion Memory: SIMM RAM (DRAM module) 3-slot Available in 1MB, 4MB, and 16MB. (However, 1MB, 16MB, and SIMM RAM cannot be used simultaneously.) Expandable up to 50MB in total.
- (5) Operating frequency: CPU system clock; 19.968MHz Video clock; 11.3636MHz (12PPM)
- (6) Parameter RAM: 4Kbit EEPROM (512 x 8) serial interface system. Stores the JOB size, paper size, font data, and I/F settings.
- (7) External interface:
  - Video interface
  - Parallel interface
  - LAN (option)
  - AP/RS board (option)
- (8) Parallel I/F: IEEE1284 support (Excluding EPP and the byte mode.)
- (9) Option :
  - PostScript board
  - SIMM RAM slots (3 slots)
  - FONT ROM socket 1MB (4Mbit x 2)
  - LAN board
  - AP/RS board
- (10) Gate array About 3000 gates
  - IEEE1284 control circuit

**General**

**(1) Microprocessor**

The CPU Am29240 has 32bit RISC CPU Am29000 at its core, and is controlled with the 32bit data bus internally and externally. It includes the 4KB instruction cache, the 1KB data cache, realizing high speed operations. It is also equipped with the 4-bank ROM controller, the 4-bank DRAM controller, the 4-channel DMA controller, the peripheral interface adapter which allows connection of up to six external devices, the interrupt controller, 16 I/O ports, the 2-channel serial I/F, the one-channel bi-directional parallel port, the video I/F, and the JTAG for the tester.



The JX-9680 controller fully utilizes this CPU to realize the simple-design, low-price circuit, providing performances which allow operation of PCL5e at 12PPM.

**(2) ROM composition and access**

The program ROM is composed of four 8Mbit (x 16) MASK ROMs with capacity of 4MB. It stores the font data such as the outline data as well as the program data. The ROM is of 120ns, and access is made by dividing the CPU wait to 2 waits.

**(3) RAM composition and access**

The RAM is composed of four 4Mbit (x8) DRAMs with capacity of 2MB. It is controlled by the CPU directly. The CPU wait is fixed to 2 waits at that time. The DRAM is of 70ns.

**(4) Interface**

The bi-directional parallel interface is a standard provision. This parallel interface supports the IEEE1284. As an option, the LAN board can be installed via the built-in LAN interface to provide the LAN interface. The AP/RS board realizes the AP/RS I/F. However, the AP/RS board and the LAN board cannot be installed simultaneously.

**(5) RAM extension**

To upgrade the controller emulation from PCL5e to PostScript, install the PS board. This board is composed of two 8Mbit (x16) mask ROMs. Access and wait in this case are the same as those in the internal ROM.

**(6) ROM extension**

To upgrade this controller's emulation from PCL5e to PostScript, install the PS board, which is composed of two 8Mbit (x 16) MASK ROMs. Access and wait are the same as those of the ROM.

**(7) IEEE1284 LSI**

64pin QFP about 3,000 gates. Supports ECP and the Nibble Mode.

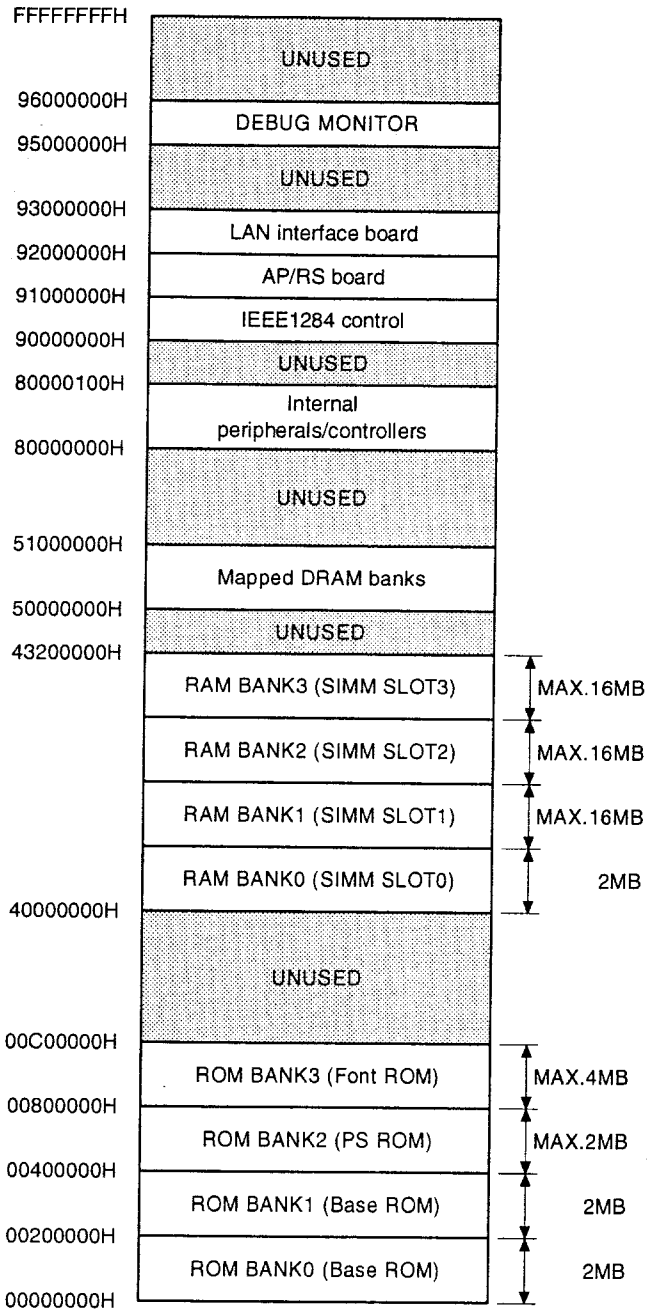
**(8) Operating frequency**

Frequency of up to 20MHz can be connected to the CPU. The original oscillation of the baud rate clock is used to eliminate one oscillator. Each oscillator is connected to the driver to realize stable circuit operations.

**(9) Video control**

All video control is performed by Am29240. the input and the output are connected to the video interface through Schmidt buffer and the dumping resistor respectively. The jitter adjustment is performed with the specifications of 600 dpi 1/2 dot. The top margin and the left margin can be set in the unit of 1 dot.

**Memory map**



CPU (Am29240) signal table

Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name
1	V <sub>cc</sub>	50	V <sub>cc</sub>	99	V <sub>cc</sub>	148	V <sub>cc</sub>
2	MEMCLK	51	Reserved	100	Reserved	149	Reserved
3	MEMDRV	52	Reserved	101	Reserved	150	PIO12
4	INCLK	53	TXDB <sup>3</sup>	102	A23	151	PIO11
5	ID31	54	RXDB <sup>3</sup>	103	A22	152	PIO10
6	ID30	55	$\overline{DTRA}$	104	A21	153	PIO9
7	ID29	56	RXDA	105	A20	154	PIO8
8	ID28	57	UCLK	106	A19	155	PIO7
9	ID27	58	$\overline{DSRA}$	107	A18	156	PIO6
10	ID26	59	TXDA	108	A17	157	PIO5
11	ID25	60	$\overline{ROMCS3}$	109	A16	158	PIO4
12	ID24	61	$\overline{ROMCS2}$	110	GND	159	GND
13	GND	62	$\overline{ROMCS1}$	111	V <sub>cc</sub>	160	V <sub>cc</sub>
14	V <sub>cc</sub>	63	$\overline{ROMCS0}$	112	A15	161	PIO3
15	ID23	64	V <sub>cc</sub>	113	A14	162	PIO2
16	ID22	65	GND	114	A13	163	PIO1
17	ID21	66	$\overline{BURST}$	115	A12	164	PIO0
18	ID20	67	$\overline{RSWE}$	116	A11	165	TDO
19	ID19	68	$\overline{ROMOE}$	117	A10	166	STAT2
20	ID18	69	$\overline{RAS3}$	118	A9	167	STAT1
21	ID17	70	$\overline{RAS2}$	119	A8	168	STAT0
22	ID16	71	$\overline{RAS1}$	120	GND	169	VDAT <sup>2</sup>
23	GND	72	$\overline{RAS0}$	121	V <sub>cc</sub>	170	PSYNC <sup>2</sup>
24	V <sub>cc</sub>	73	$\overline{CAS3}$	122	A7	171	GND
25	ID15	74	$\overline{CAS2}$	123	A6	172	V <sub>cc</sub>
26	ID14	75	V <sub>cc</sub>	124	A5	173	$\overline{GREQ}$
27	ID13	76	GND	125	A4	174	DREQB
28	ID12	77	$\overline{CAS1}$	126	A3	175	DREQA
29	ID11	78	$\overline{CAS0}$	127	A2	176	TDMA
30	ID10	79	$\overline{TR/OE}$	128	A1	177	$\overline{TRAP0}$
31	ID9	80	$\overline{WE}$	129	A0	178	$\overline{TRAP1}$
32	ID8	81	$\overline{GACK}$	130	GND	179	$\overline{INTR0}$
33	GND	82	$\overline{PIACS5}$	131	V <sub>cc</sub>	180	$\overline{INTR1}$
34	V <sub>cc</sub>	83	$\overline{PIACS4}$	132	BOOTW	181	$\overline{INTR2}$
35	ID7	84	$\overline{PIACS3}$	133	WAIT	182	$\overline{INTR3}$
36	ID8	85	$\overline{PIACS2}$	134	PAUTOFD	183	GND
37	ID5	86	V <sub>cc</sub>	135	PSTROBE	184	V <sub>cc</sub>
38	ID4	87	GND	136	$\overline{PWE}$	185	$\overline{WARN}$
39	ID3	88	$\overline{PIACS1}$	137	POE	186	VCLK <sup>2</sup>
40	ID2	89	$\overline{PIACS0}$	138	PACK	187	LSYNC <sup>2</sup>
41	ID1	90	$\overline{PIAWE}$	139	$\overline{PBUSY}$	188	TMS
42	ID0	91	$\overline{PIAOE}$	140	GND	189	$\overline{TRST}$
43	GND	92	R/W	141	V <sub>cc</sub>	190	TCK
44	V <sub>cc</sub>	93	$\overline{DACKB}$	142	PIO15	191	TDI
45	IDP3 <sup>1,3</sup>	94	$\overline{DACKA}$	143	PIO14	192	$\overline{RESET}$
46	IDP2 <sup>1,3</sup>	95	$\overline{DACKD}^3$	144	PIO13	193	CNTL1
47	IDP1 <sup>1,3</sup>	96	$\overline{DACKC}^3$	145	DREQD <sup>3</sup>	194	CNTL0
48	IDP0 <sup>1,3</sup>	97	Reserved	146	DREQC <sup>3</sup>	195	$\overline{TRIST}$
49	GND	98	GND	147	GND	196	GND

Notes: All values are typical and preliminary.

1. Defined as a no-connect on the Am29240 microcontroller.
2. Defined as a no-connect on the Am29243 microcontroller.
3. Defined as a no-connect on the Am29245 microcontroller.

Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.
A0	129	GND	76	INCLK	4	Reserved	149
A1	128	GND	87	INTR0	179	RESET	192
A2	127	GND	98	INTR1	180	ROMCS0	63
A3	126	GND	110	INTR2	181	ROMCS1	62
A4	125	GND	120	INTR3	182	ROMCS2	61
A5	124	GND	130	LSYNC <sup>2</sup>	187	ROMCS3	60
A6	123	GND	140	MEMCLK	2	ROMOE	68
A7	122	GND	147	MEMDRV	3	RSWE	67
A8	119	GND	159	PACK	138	RXDA	56
A9	118	GND	171	PAUTOFD	134	RXDB <sup>3</sup>	54
A10	117	GND	183	PBUSY	139	STAT0	168
A11	116	GND	196	PIACS0	89	STAT1	167
A12	115	GREQ	173	PIACS1	88	STAT2	166
A13	114	ID0	42	PIACS2	85	TCK	190
A14	113	ID1	41	PIACS3	84	TDI	191
A15	112	ID2	40	PIACS4	83	TDMA	176
A16	109	ID3	39	PIACS5	82	TDO	165
A17	108	ID4	38	PIAOE	91	TMS	188
A18	107	ID5	37	PIAWE	90	TR/OE	79
A19	106	ID8	36	PIO0	164	TRAP0	177
A20	105	ID7	35	PIO1	163	TRAP1	178
A21	104	ID8	32	PIO2	162	TRIST	195
A22	103	ID9	31	PIO3	161	TRST	189
A23	102	ID10	30	PIO4	158	TXDA	59
BOOTW	132	ID11	29	PIO5	157	TXDB <sup>3</sup>	53
BURST	66	ID12	28	PIO6	156	UCLK	57
CAS0	78	ID13	27	PIO7	155	V <sub>CC</sub>	1
CAS1	77	ID14	26	PIO8	154	V <sub>CC</sub>	14
CAS2	74	ID15	25	PIO9	153	V <sub>CC</sub>	24
CAS3	73	ID16	22	PIO10	152	V <sub>CC</sub>	34
CNTL0	194	ID17	21	PIO11	151	V <sub>CC</sub>	44
CNTL1	193	ID18	20	PIO12	150	V <sub>CC</sub>	50
DACKA	94	ID19	19	PIO13	144	V <sub>CC</sub>	64
DACKB	93	ID20	18	PIO14	143	V <sub>CC</sub>	75
DACKC <sup>3</sup>	96	ID21	17	PIO15	142	V <sub>CC</sub>	86
DACKD <sup>3</sup>	95	ID22	16	POE	137	V <sub>CC</sub>	99
DREQA	175	ID23	15	PSTROBE	135	V <sub>CC</sub>	111
DREQB	174	ID24	12	PSYNC <sup>2</sup>	170	V <sub>CC</sub>	121
DREQC <sup>3</sup>	146	ID25	11	PWE	136	V <sub>CC</sub>	131
DREQD <sup>3</sup>	145	ID26	10	R/W	92	V <sub>CC</sub>	141
DSRA	58	ID27	9	RAS0	72	V <sub>CC</sub>	148
DTRA	55	ID28	8	RAS1	71	V <sub>CC</sub>	160
GACK	81	ID29	7	RAS2	70	V <sub>CC</sub>	172
GND	13	ID30	6	RAS3	69	V <sub>CC</sub>	184
GND	23	ID31	5	Reserved	51	V <sub>CC</sub>	186
GND	33	IDP0 <sup>1,3</sup>	48	Reserved	52	V <sub>CC</sub>	188
GND	43	IDP1 <sup>1,3</sup>	47	Reserved	97	V <sub>CC</sub>	189
GND	49	IDP2 <sup>1,3</sup>	46	Reserved	100	V <sub>CC</sub>	190
GND	65	IDP3 <sup>1,3</sup>	45	Reserved	101	V <sub>CC</sub>	191
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**Signal description (CPU) (Am29240)**

**A23 – A0**

**Address Bus (output, synchronous)**

The Address Bus supplies the byte address for all accesses, except for DRAM accesses. For DRAM accesses, multiplexed row and column addresses are provided on A14 – A1. A2 – A0 are also used to provide a clock to an optional burst-mode EPROM.

**BOOTW**

**Boot ROM Width (input, asynchronous)**

This input configures the width of ROM Bank 0, so the ROM can be accessed before the ROM configuration has been set by the system initialization software. The BOOTW signal is sampled during and after a processor reset. If BOOTW is High before and after reset (tied High), the boot ROM is 32 bits wide. If BOOTW is Low before and after reset (tied Low), the boot ROM is 16 bits wide. If BOOTW is Low before reset and High after reset (tied to  $\overline{\text{RESET}}$ ), the boot ROM is 8 bits wide. This signal has special hardening against metastable states, allowing it to be driven with a slow-rise-time signal and permitting it to be tied to  $\overline{\text{RESET}}$ .

**BURST**

**Burst-Mode Access (output, synchronous)**

This signal is asserted to perform sequential accesses from a burst-mode device.

**CAS3 – CAS0**

**Column Address Strokes, byte 3 – 0 (output, synchronous)**

A High-to-Low transition on these signals causes the DRAM selected by  $\overline{\text{RAS}}3 - \overline{\text{RAS}}0$  to latch the column address and complete the access. To support byte and half-word writes, column address strokes are provided for individual DRAM bytes.  $\overline{\text{CAS}}3$  is the column address strobe for the DRAMs, in all banks, attached to ID31 – ID24.  $\overline{\text{CAS}}2$  is for the DRAMs attached to ID23 – ID16, and so on. These signals are also used in other special DRAM cycles.

**CNTL1 – CNTL0**

**CPU control (input, asynchronous, internal pull-ups)**

These inputs control the processor mode, as follows:

CNTL1	CNTL0	Condition
0	0	Load Test Instruction
0	1	Step
1	0	Halt
1	1	Normal

**DACKD – DACKA**

**DMA Acknowledge D through A (output, synchronous)**

These signals acknowledge an external transfer on a DMA channel. DMA acknowledgements are not dedicated to a particular DMA channel – each channel specifies which acknowledge line, if any, it is using. Only one channel at a time can use either  $\overline{\text{DACKD}}$ ,  $\overline{\text{DACKC}}$ ,  $\overline{\text{DACKB}}$ , or  $\overline{\text{DACKA}}$ , and the same channel uses the respective  $\overline{\text{DREQD}} - \overline{\text{DREQA}}$  signal for transfer requests. DMA transfers can occur to and from internal peripherals independent of these acknowledgements. The  $\overline{\text{DACKD}}$  and  $\overline{\text{DACKC}}$  signals are supported on the Am29240 and Am29243 microcontrollers only.

**DREQD – DREQA**

**DMA Request D through A**

**(input, asynchronous, pull-up resistors)**

These signals request an external transfer on a DMA channel. DMA requests are not dedicated to a particular DMA channel – each channel specifies which request line, if any, it is using. Only one channel at a time can use either  $\overline{\text{DREQD}}$ ,  $\overline{\text{DREQC}}$ ,  $\overline{\text{DREQB}}$ , or  $\overline{\text{DREQA}}$ , and this channel acknowledges a transfer using the respective  $\overline{\text{DACKD}} - \overline{\text{DACKA}}$  signal. These requests are individually programmable to be either level- or edge-sensitive for either polarity of level or edge. DMA transfers can occur to and from internal peripherals independent of these requests.

The DMA request/acknowledge pairs  $\overline{\text{DREQA}}/\overline{\text{DACKA}}$  and  $\overline{\text{DREQB}}/\overline{\text{DACKB}}$  correspond to the Am29200 microcontroller signals  $\overline{\text{DREQ0}}/\overline{\text{DACK0}}$  and  $\overline{\text{DREQ1}}/\overline{\text{DACK1}}$ , respectively. The pin placement reflects this correspondence, and a processor reset dedicates these request/acknowledge pairs to DMA channels 0 and 1, respectively. This permits backward-compatible upgrade to an Am29200 microcontroller. The  $\overline{\text{DREQD}}$  and  $\overline{\text{DREQC}}$  signals are supported on the Am29240 and Am29243 microcontrollers only.

**DSRA**

**Data Set Ready, Port A (output, synchronous)**

This indicates to the host that the serial port is ready to transmit or receive data on Serial Port A.

**DTRA**

**Data Terminal Ready, Port A (input, asynchronous)**

This indicates to the processor that the host is ready to transmit or receive data on Serial Port A.

**GACK**

**External Memory Grant Acknowledge (output, synchronous)**

this signal indicates to an external device that it has been granted an access to the processor's ROM or DRAM, and that the device should provide an address.

The processor can be placed into a slave configuration that allows tracing of a master processor. In this configuration,  $\overline{\text{GACK}}$  is used to indicate that the processor pipeline was held during the previous processor cycle.

**GREQ**

**External Memory Grant Request**

**(input, synchronous, pull-up resistor)**

This signal is used by an external device to request an access to the processor's ROM or DRAM. To perform this access, the external device supplies an address to the ROM controller or DRAM controller.

To support a hardware-development system,  $\overline{\text{GREQ}}$  should be either tied High or held at a high-impedance state during a processor reset.

**ID31 – ID0**

**Instruction/Data Bus (bidirectional, synchronous)**

The Instruction/Data Bus (ID Bus) transfers instruction to, and data to and from the processor.

**IDP3 – IDP0**

**Instruction/Data Parity (bidirectional, synchronous)**

If parity checking is enabled by the PCE bit of the DRAM Control Register, IDP3 – IDP0 are parity bits for the ID Bus during DRAM accesses. IDP3 is the parity bit for ID31 – ID24, IDP2 is the parity bit for ID23 – ID16, and so on. If parity is enabled, the processor drives IDP3 – IDP0 with valid parity during DRAM writes, and expects IDP3 – IDP0 to be driven with valid parity during DRAM reads. These signals are supported on the Am29243 microcontroller only.



**INCLK****Input Clock (input)**

This is an oscillator Input at twice the system operating frequency. The processor operates either at the system operating frequency or at the INCLK frequency, as controlled by the TBO bit in the Configuration Register. The processor can operate at the INCLK frequency only if MEMCLK is an output.

**INTR3 – INTR0****Interrupt Requests 3-0**

(input, asynchronous, Internal pull-ups)

These inputs generate prioritized interrupt requests. The interrupt caused by INTR0 has the highest priority, and the interrupt caused by INTR3 has the lowest priority. The interrupt requests are masked in prioritized order by the Interrupt Mask field in the Current Processor Status Register and are disabled by the DA and DI bits of the Current Processor Status Register. These signals have special hardening against metastable states, allowing them to be driven with slow-transition-time signals.

**LSYNC****Line Synchronization (Input, asynchronous)**

this signal indicates the start of a raster line. This signal is supported on the Am29240 and Am29245 microcontrollers only.

**MEMCLK****Memory Clock (input/output)**

This is either a clock output or an input from an external clock generator, as determined by the MEMDRV input. It operates at the system operating frequency, which is half of the INCLK frequency. Most processor inputs and outputs are synchronous to MEMCLK. MEMCLK must be driven with CMOS levels. MEMCLK must be an output if the processor operates at the INCLK frequency.

**MEMDRVE****MEMCLK Drive Enable**

(input, internal pull-up resistor)

This input determines whether MEMCLK is an output or an input. If this pin is High, the processor generates a clock on the MEMCLK output. If this pin is Low, the processor accepts a clock generated by the system on the MEMCLK input. This signal is tied High through an internal pull-up resistor so the signal can be left unconnected to configure MEMCOK as an output.

**PACK****Parallel Port Acknowledge (output, synchronous)**

This signal is used by the processor to acknowledge a transfer from the host or to indicate to the host that data has been placed on the port.

**PAUTOFD****Parallel Port Autofeed (input, asynchronous)**

This signal is used by the host to indicate how line feeds should be performed or is used to indicate that the host is busy and cannot accept a data transfer.

**PBUSY****Parallel Port Busy (output, synchronous)**

This indicates to the host that the Parallel Port is busy and cannot accept a data transfer.

**PIACS5 – PIACS0****Peripheral Chip Selects, Regions 5 – 0 (output, synchronous)**

These signals are used to select individual peripheral devices. DMA channels may be programmed to use dedicated chip selects during an external peripheral access.

**PIAOE****Peripheral Output Enable (output, synchronous)**

this signal enables the selected peripheral device to drive the ID bus.

**PIAWE****Peripheral Write Enable (output, synchronous)**

This signal causes data on the ID bus to be written into the selected peripheral.

**PIO15 – PIO0****Programmable Input/Output (input/output, asynchronous)**

These signals are available for direct software control and inspection. IO15 – PIO8 may be individually programmed to cause processor interrupts. These signals have special hardening against metastable states, allowing them to be driven with slow-transition-time signals.

The PIO signals are sampled during a processor reset. After reset, the sampled value is held in the PIO Input Register. This sampled value is supplied the first time this register is read, unless the read is preceded by write to the PIO Input register or by a read or write of any other PIO register. This may be used to indicate system configuration information to the processor during a reset.

**POE****Parallel Port Output Enable (output, synchronous)**

This signal enables an external data buffer containing data from the host to drive the ID Bus.

**PSTROBE****Parallel Port Strobe (input, asynchronous)**

This signal is used by the host to indicate that data is on the Parallel Port or to acknowledge a transfer from the processor.

**PSYNC****Page Synchronization (input/output, asynchronous)**

This signal indicates the beginning of a raster page. This signal is supported on the Am29240 and Am29245 microcontrollers only.

**PWE****Parallel Port Write Enable (output, synchronous)**

This signal writes a buffer with data on the ID Bus. Then, the buffer drives data to the host.

**R/W****Read/Write (output, synchronous)**

During an external ROM, DRAM, DMA, or PIA access, this signal indicates the direction of transfer; High for a read and Low for a write.

**RAS3 – RAS0****Row Address Strobe, Banks 3 – 0 (output, synchronous)**

A High-to-Low transition on one of these signals causes a DRAM in the corresponding bank to latch the row address and begin an access. RAS3 starts an access in DRAM Bank 3, and so on. These signals also are used in other special DRAM cycles.

**RESET****Reset (input, asynchronous)**

This input places the processor in the Reset mode. this signal has special hardening against metastable states, allowing it to be driven with a slow-rise-time signal.

**ROMCS3 – ROMCS0**

**ROM chip Selects, Banks 3 – 0 (output, synchronous)**

A Low level on one of these signals selects the memory devices in the corresponding ROM bank. ROMCS3 selects devices in ROM Bank 3, and so on. The timing and access parameters of each bank are individually programmable.

**ROMOE**

**ROM Output Enable (output, synchronous)**

This signal enables the selected ROM Bank to drive the ID bus. It is used to prevent bus contention when switching between different ROM banks or switching between a ROM bank and another device or DRAM bank.

**RSWE**

**ROM Space Write Enable (output, synchronous)**

This signal is used to write an alterable memory in a ROM bank (such as an SRAM or Flash EPROM).

**RXDA**

**Receive Data, Port A (input, asynchronous)**

This input is used to receive serial data to Serial Port A.

**RXDB**

**Receive Data, Port B (input, asynchronous)**

This input is used to receive data to Serial Port B. This signal is supported on the Am29240 and Am29243 microcontrollers only.

**STAT2 – STAT0**

**CPU Status (output, synchronous)**

These outputs indicate information about the processor or the current access for the purposes of hardware debug. They are encoded as follows:

STAT2	STAT1	STAT0	Condition
0	0	0	Halt or Step Modes
0	0	1	Interrupt/Trap Vector Fetch (vector valid)
0	1	0	Load Test Instruction Mode, Halt/Freeze
0	1	1	Non-sequential instruction fetch (Internal cache hit, or external access and instruction valid)
1	0	0	External data access (data valid)
1	0	1	External sequential instruction access (instruction valid)
1	1	0	Internal peripheral access (data valid)
1	1	1	Idle or data/instruction not valid

The status conditions are prioritized in the order listed, with STAT2 – STAT0 = 000 having highest priority. The STAT2 – STAT0 outputs are changed at the end of every processor cycle to indicate the processor status in the previous cycle. Thus, if the processor operates at twice the system frequency, the STAT2 – STAT0 outputs change on both the rising and falling edge of MEMCLK.

If the processor operates at twice the system frequency, the status indication related to an external access (such as an external instruction access) appears in the first half-cycle of MEMCLK (MEMCLK High) just after the completion of the external access; in the second half-cycle of this MEMCLK cycle (MEMCLK Low), the processor's internal condition is indicated. If the processor operates at the system frequency, the status indication related to an external access appears for the entire MEMCLK cycle following the completion of the access.

The processor can be placed into a slave configuration that allows tracing of a master processor. In this tracing configuration, certain status encodings are changed as follows:

STAT2	STAT1	STAT0	Condition
1	0	0	Load access (internal access and cache hit, or external access and data valid)
1	0	1	Store access (internal access and cache hit, or external access and data valid)
1	1	0	Return from interrupt (first target instruction cache hit or valid on ID bus)
all others			Same as master processor

**TCK**

**Test Clock Input (input, asynchronous, pull-up resistor)**

This input is used to operate the Test Access Port. The state of the Test Access Port must be held if this clock is held either High or Low. This clock is internally synchronized to MEMCLK for certain operations of the Test Access Port controller, so signals internally driven and sampled by the Test Access Port are synchronous to processor internal clocks.

**TDI**

**Test Data Input (Input, synchronous to TCK, pull-up resistor)**

This input supplies data to the test logic from an external source. It is sampled on the rising edge of TCK. If it is not driven, it appears High internally.

**TDMA**

**Terminate DMA (input/output, synchronous)**

This signal is either an input or an output as controlled by the corresponding DMA Control Register. As an input, this signal can be asserted during an external DMA transfer (non-fly-by) to terminate the transfer after the current access. The TDMA input is ignored during fly-by transfers. As an output, this signal is asserted to indicate the final transfer of a sequence.

**TDO**

**Test Data Output (Three-state output, synchronous to TCK)**

This output supplies data from the test logic to an external destination. It changes on the falling edge of TCK. It is in the high-impedance state except when scanning is in progress.

**TMS**

**Test Mode Select (input, synchronous to TCK, pull-up resistor)**

This input is used to control the Test Access Port. If it is not driven, it appears High Internally.

**TR/OE**

**Video DRAM Transfer/output Enable (output, synchronous)**

This signal is used with video DRAMs to transfer data to the video shift register. It is also used as an output enable in normal video DRAM read cycles. This signal is supported on the Am29240 and Am29245 microcontrollers only.

**TRAP1 – TRAP0**

**Trap Requests 1 – 0 (input, asynchronous, internal pull-ups)**

These inputs generate prioritized trap requests. The trap caused by TRAP0 has the highest priority. These trap requests are disabled by the DA bit of the Current Processor Status Register. These signals have special hardening against metastable states, allowing them to be driven with slow-transition-time signals.

**TRIST****Three-State Control (input, asynchronous, pull-up resistor)**

This input is asserted to force all processor outputs into the high-impedance state. This signal is tied High through an internal pull-up resistor.

Note:  $\overline{\text{TRIST}}$  does not control the MEMCLK pin. To three-state MEMCLK, the user must drive MEMDRV Low.

**TRST****Test Reset Input (input, asynchronous, pull-up resistor)**

This input asynchronously resets the Test Access Port. If  $\overline{\text{TRST}}$  is not driven, it appears High internally.  $\overline{\text{TRST}}$  must be tied to  $\overline{\text{RESET}}$ , even if the Test Access Port is not being used.

**TXDA****Transmit Data, Port A (output, asynchronous)**

This output is used to transmit serial data from Serial Port A.

**TXDB****Transmit Data, Port B (output, asynchronous)**

This output is used to transmit data from Serial Port B. This signal is supported on the Am29240 and Am29243 microcontrollers only.

**UCLK****UART Clock (input)**

This is an oscillator input for generating the UART (Serial Port) clock. To generate the UART clock, the oscillator frequency may be divided by any amount up to 65,536. The UART clock operates at 16 times the Serial Port's baud rate. As an option, UCLK may be driven with MEMCLK or INCLK. It can be driven with TTL levels.

**VCLK****Video Clock (input, asynchronous)**

This clock is used to synchronize the transfer of video data. As an option, VCLK may be driven with MEMCLK or INCLK. It can be driven with TTL levels. This signal is supported on the Am29240 and Am29245 microcontrollers only.

**VDAT****Video Data (input/output, synchronous to VCLK)**

This is serial data to or from the video device. This signal is supported on the Am29240 and Am29245 microcontrollers only.

**WAIT****Add Wait States**

(input, synchronous, internal pull-up)

External accesses are normally timed by the processor. However, the  $\overline{\text{WAIT}}$  signal may be asserted during a PIA, ROM, or DMA access to extend the access indefinitely.

**WARN****Warn (input, asynchronous, edge-sensitive, internal pull-up)**

A High-to-Low transition on this input causes a non-maskable  $\overline{\text{WARN}}$  trap to occur. This trap bypasses the normal trap vector fetch sequence, and is useful in situations where the vector fetch may not work (e.g., when data memory is faulty). This signal has special hardening against metastable states, allowing it to be driven with a slow-transition-time signal.

**WE****Write Enable (output, synchronous)**

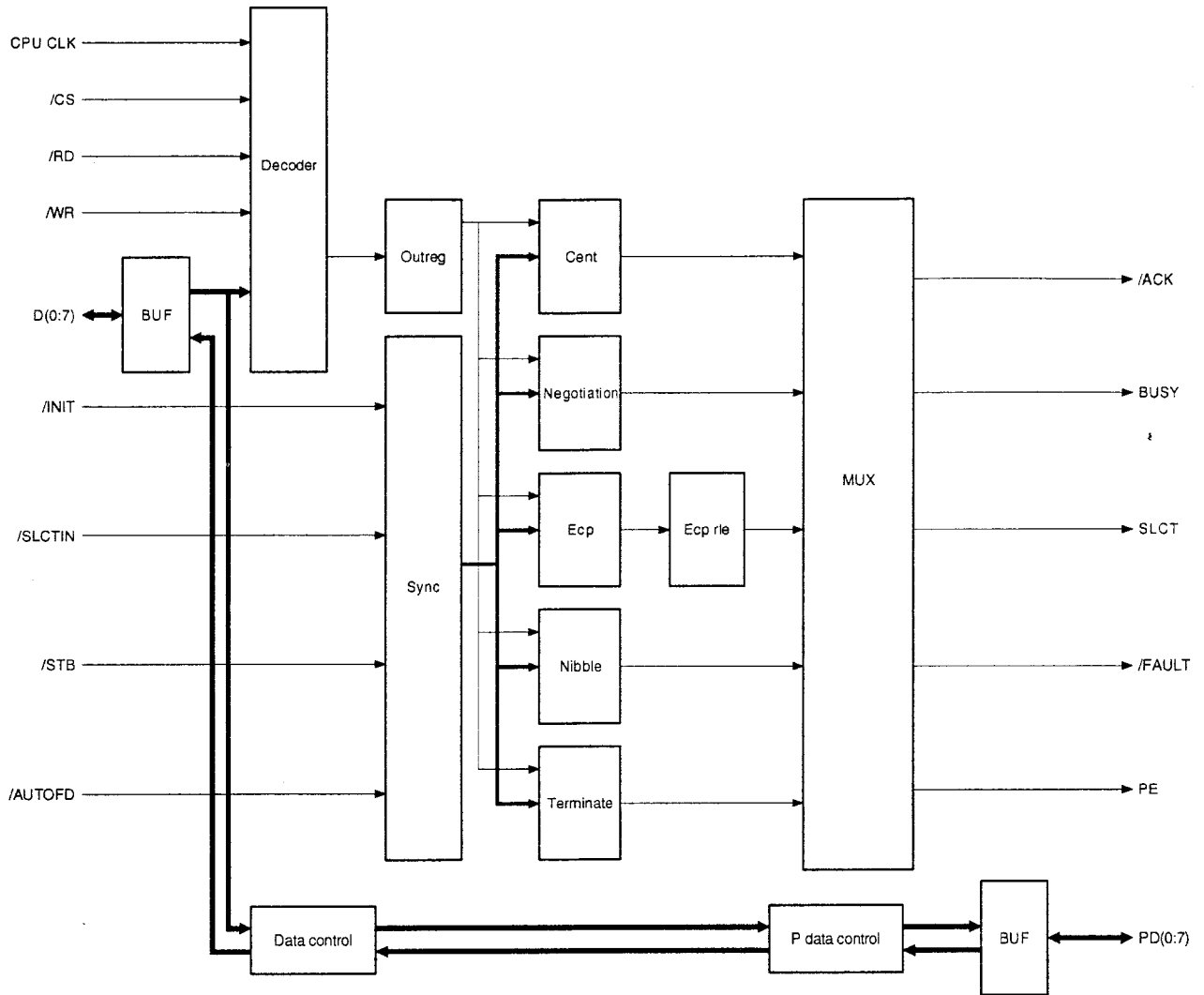
This signal is used to write the selected DRAM bank. "Early write" cycles are used so the DRAM data inputs and outputs can be tied to the common ID bus.

**Interface connection section**

Gate array (IEEE1284 LSI)

This LSI is composed of the 64pin QFP gate array with about 300 gates.

**Block diagram**



This LSI supports the compatible mode (Centronics), the ECP mode, the Nibble mode in the IEEE1284 modes. The mode is transferred in the negotiation state. The LSI informs the CPU of the mode state, and the CPU controls the mode selection for the LSI.

The DMA in the CPU takes in the data.

In the ECP mode, data extension by the run length (RLE) is supported.

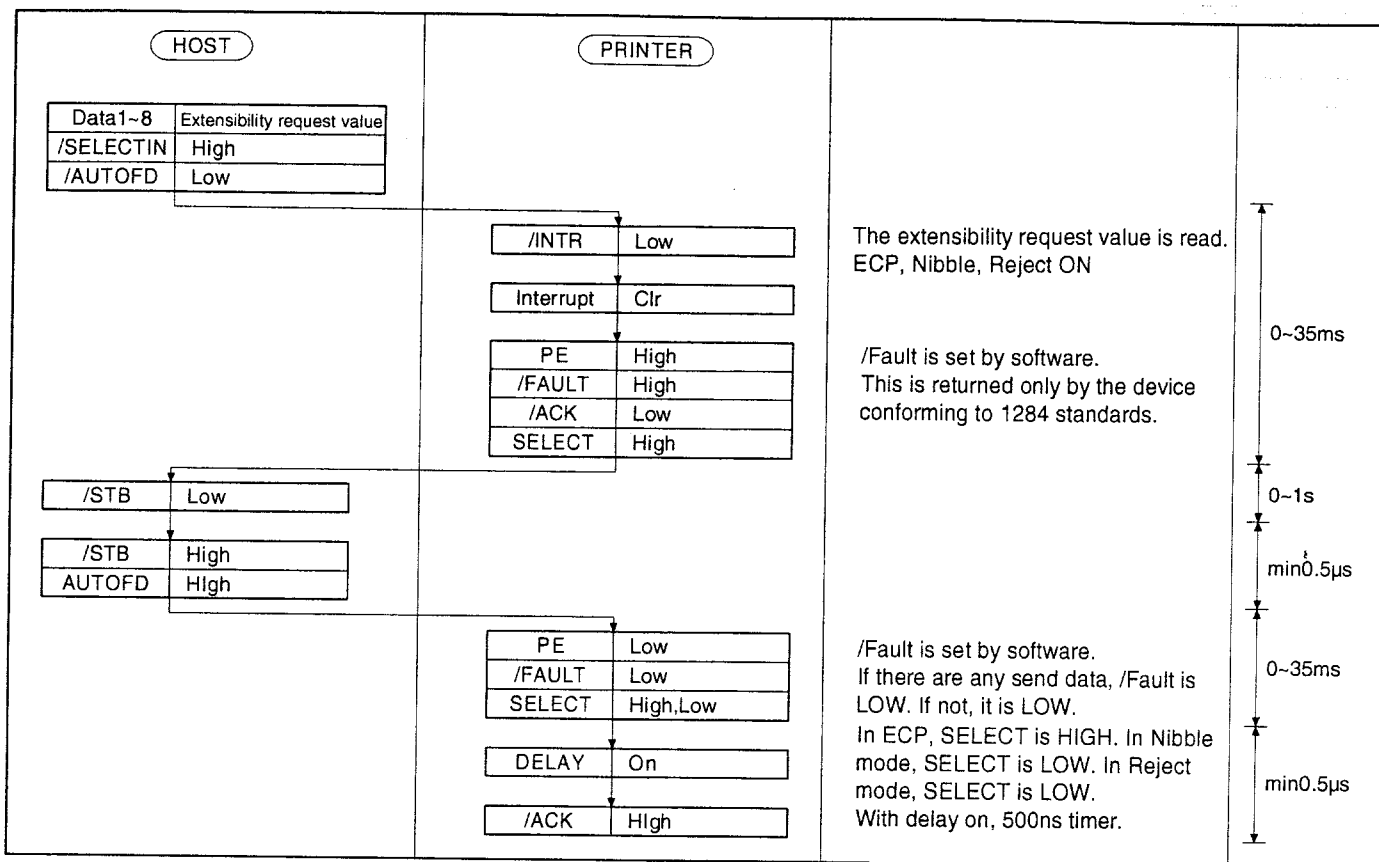
It provides 10mA drive performance of bi-directional parallel data, and prevents each input signal from malfunctioning due to noises by the Schmidt trigger buffer.

**Gate array pin arrangement**

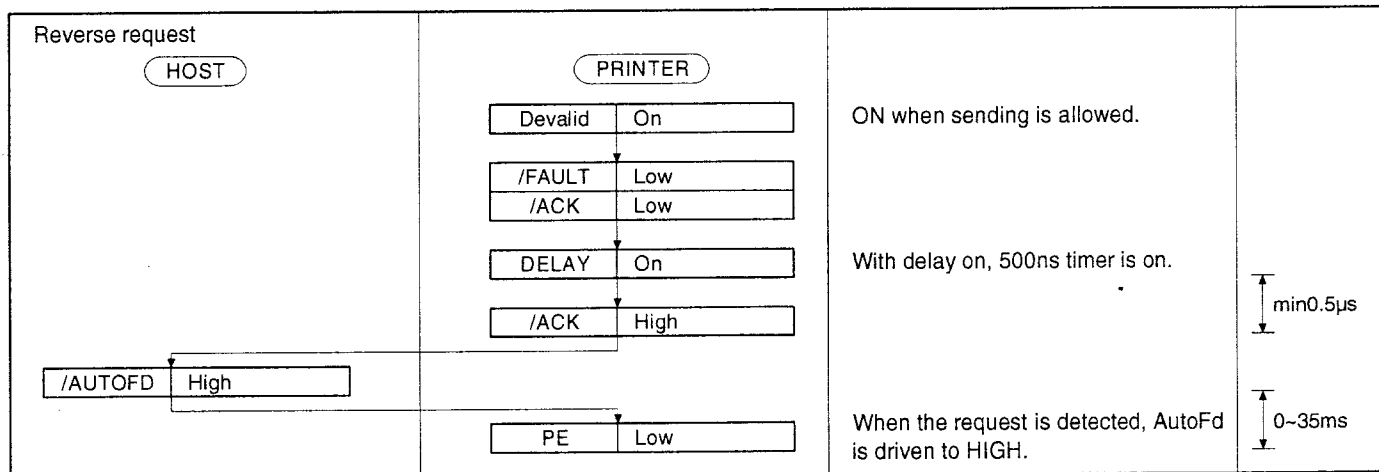
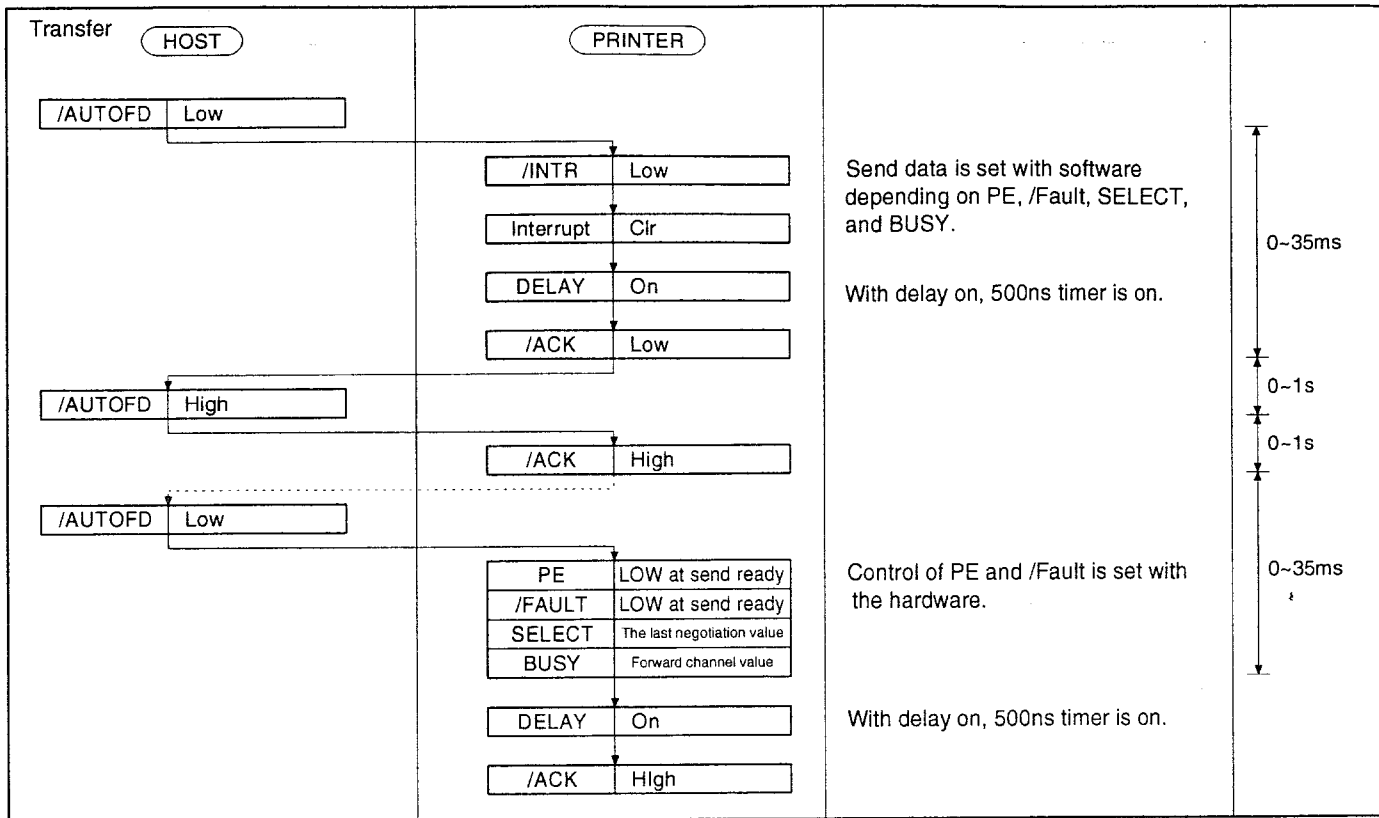
No.	SIGNAL	No.	SIGNAL	No.	SIGNAL
1	M1	23	A3	45	DATA7
2	VCC	24	A4	46	DATA6
3	M0	25	A5	47	DATA5
4	D7	26	GND	48	GND
5	D6	27	VCC	49	DATA4
6	D5	28	NC	50	DATA3
7	D4	29	/DACK	51	DATA2
8	D3	30	/PIAOE	52	DATA1
9	D2	31	/PIAWE	53	GND
10	GND	32	/PIACS	54	/STB
11	D1	33	/SELECT IN	55	/TEST1
12	D0	34	VCC	56	/TEST2
13	MODE	35	/FAULT	57	VCC
14	/DREQ	36	/INIT	58	GND
15	/INTR	37	/AUTOFD	59	M7
16	GND	38	SELECT	60	M6
17	MEMCLK	39	PE	61	M5
18	GND	40	BUSY	62	M4
19	/RES	41	/ACK	63	M3
20	TEST02	42	GND	64	M2
21	A1	43	GND		
22	A2	44	DATA8		

Protocol between the host computer and the printer

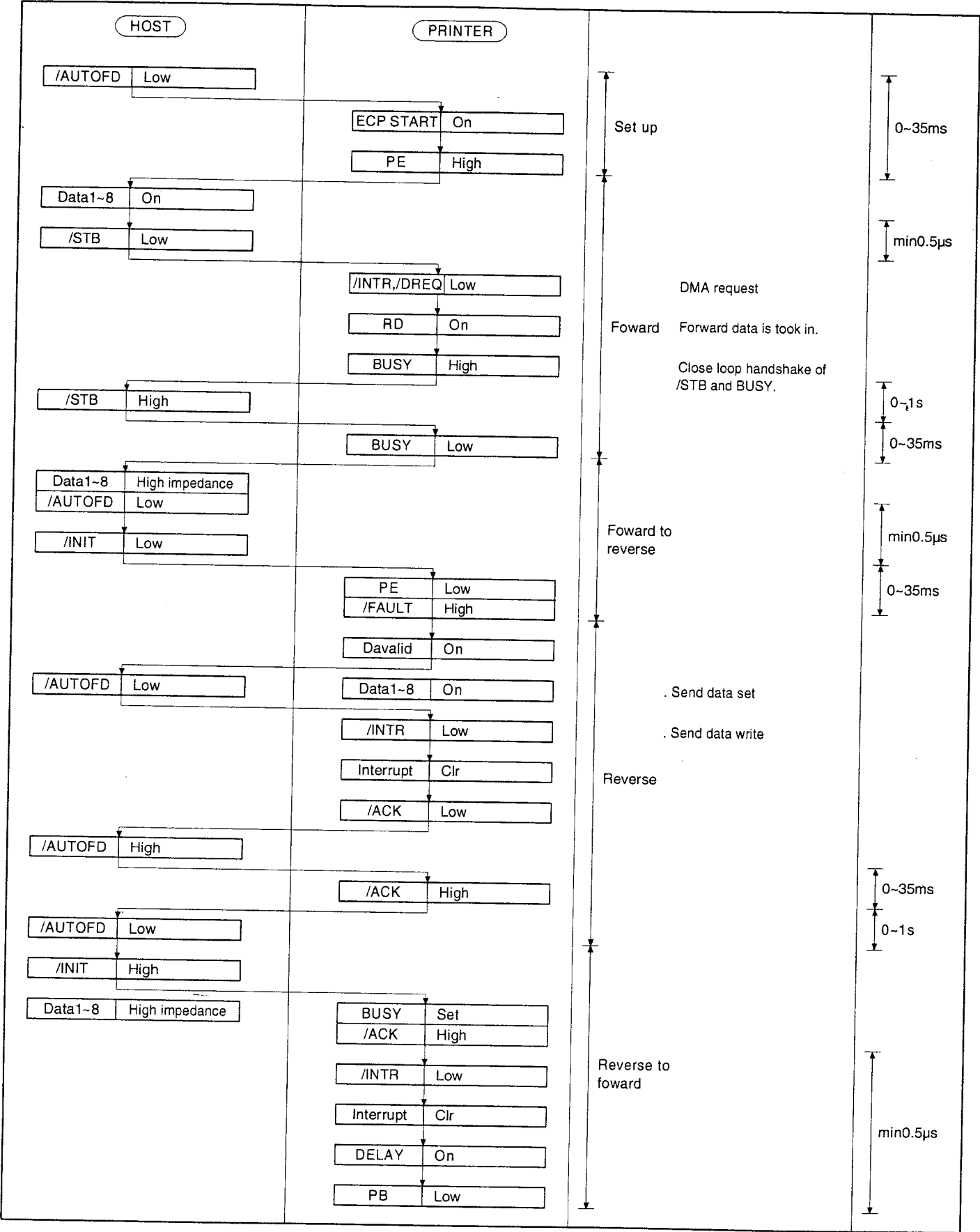
(Negotiation mode)



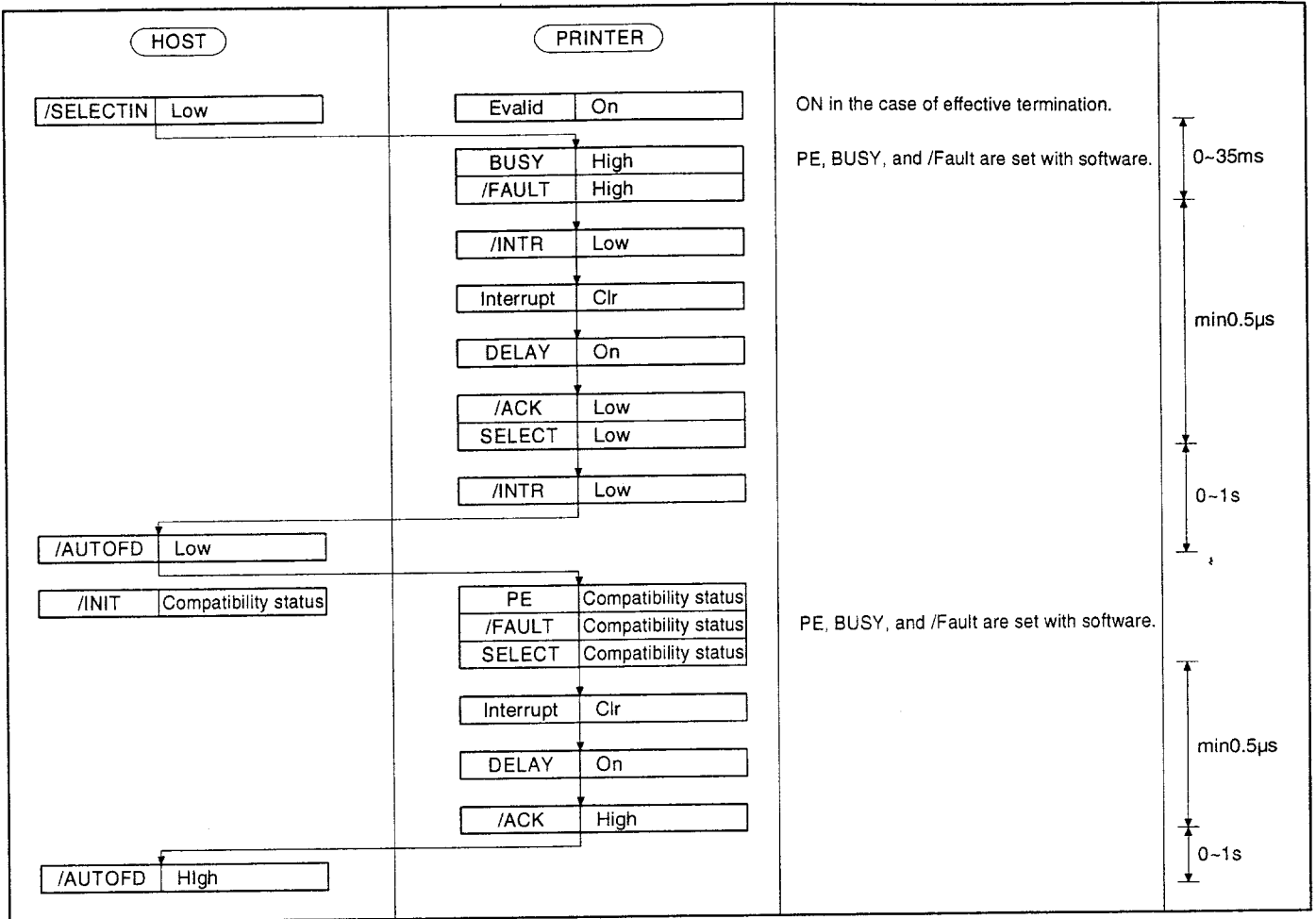
(Nibble mode)



(ECP mode)



(Termination mode)





**Signal table in the each operation mode**

Table shows the pin numbers and their assigned signal names for the 1284-B connector.

A physical description of the 1284-B connector can be found in figure 24.

1284-B Connector Pin Assignments

Pin #	Source	Compatible	Nibble	Byte (Not used)	ECP	EPP (Not used)	
1	H	nStrobe	HostClk	HostClk	HostClk	nWrite	
2	Bi-Di*	Data 1 (Least Significant Bit)					AD1
3	Bi-Di*	Data 2					AD2
4	Bi-Di*	Data 3					AD3
5	Bi-Di*	Data 4					AD4
6	Bi-Di*	Data 5					AD5
7	Bi-Di*	Data 6					AD6
8	Bi-Di*	Data 7					AD7
9	Bi-Di*	Data 8 (Most Significant Bit)					AD8
10	P	nAck	PtrClk	PtrClk	PeriphClk	Intr	
11	P	Busy	PtrBusy	PtrBusy	PeriphClk	nWait	
12	P	PError	AckDataReq	AckDataReq	nAckReverse	User Defined 1	
13	P	Select	Xflag	Xflag	Xflag	User Defined 3	
14	H	nAutoFd	HostBusy	HostBusy	HostAck	nDStrb	
15		Not Defined					
16		Logic Gnd					
17		Chassis Gnd					
18	P	Peripheral Logic High					
19		Signal Ground (nStrobe)					
20		Signal Ground (Data 1)					
21		Signal Ground (Data 2)					
22		Signal Ground (Data 3)					
23		Signal Ground (Data 4)					
24		Signal Ground (Data 5)					
25		Signal Ground (Data 6)					
26		Signal Ground (Data 7)					
27		Signal Ground (Data 8)					
28		Signal Ground (PError, Select, nAck)					
29		Signal Ground (Busy, nFault)					
30		Signal Ground (nAutoFd, nSelectIn, nInit)					
31	H	nInit	nInit	nInit	nReverseRequest	nInit	
32	P	nFault	nDataAvail	nDataAvail	nPeriphRequest	User Defined 2	
33		Not Defined					
34		Not Defined					
35		Not Defined					
36	H	nSelectIn	1284 Active	1284 Active	1284 Active	nAStrb	

\* Data Signals will be driven by some but not all peripheral devices.  
Pins not defined by this spec are used by various manufacturers at their own risk.

The 1284-B connector is a 36 signal ribbon type connector.

**Signal description (Parallel I/F)**

The 1284 mode signals are described below. The name in ( ) shows the name in the capability mode.

**Host Clk/nWrite (nStroke):** Driven by the host.

- Capability Mode: Set to active LOW in order to transfer data to the input latch of peripheral devices. The data are valid when nStroke is LOW.
- Negotiation phase: Set the active LOW in order to transfer the extensibility request value to the input latch of peripheral devices. The data are valid at the falling edge of HostClk.
- Reverse data transfer phase: Set to HIGH during transfer to the Nibble Mode in order not to latch data to the peripheral devices. To confirm data transfer from peripheral devices, it is set to LOW pulse during Byte Mode transfer. The peripheral devices must confirm that new data byte is not transferred to the input latch of the peripheral devices by this pulse.
- ECP Mode: To transfer data or address information from the host to the peripheral devices, it is used in the closed loop handshake with PeriphAck (Busy).
- EPP Mode: Set to LOW in order to show write operation of address or data to peripheral devices.  
Set to HIGH in order to show read operation of address or data from peripheral devices.

**AD1 – AD8 (Data 1 – Data 8):**

Driven by the host in the Compatibility Mode and negotiation phase. (Not used in the Nibble Mode. Bi-directional in the other modes.)

All modes: Data 1 is the lowest bit (Bit 0). Data 8 is the highest bit (Bit 7).

- Compatibility Mode: Forward channel data
- Negotiation phase: Extensibility request value
- Reverse data transfer phase: Nibble Mode: Not used. (The host continues to drive the bus.)  
Byte mode: Reverse channel data
- EPC mode: Address or data transfer from the host to the peripheral device or from the peripheral device to the host.
- EPP mode: Address or data transfer from the host to the peripheral device or from the peripheral device to the host.

**PtrClk/PeriphClk/Intr(nAck):** Driven by the peripheral devices.

- Compatibility Mode: Set to LOW pulse by the peripheral device to confirm transfer of the data byte from the host.
- Negotiation phase: Set to LOW to confirm the 1284 support. Then set to HIGH to show that Xflag (Select) and data available flags can be read.
- Reverse data transfer/phase: Used in either mode of Nibble and Byte to identify (qualify) the data which are under transmission to the host.
- Reverse idle phase: Set to LOW then to HIGH by the peripheral device to generate an interrupt which informs the host of data ready.
- ECP Mode: Used in the closed loop with HostAck (nAutoFd) to transfer data from the peripheral device to the host.

**EPP Mode:** Used by the peripheral devices to interrupt the host. This signal is active LOW, and triggered at the positive edge.

**PtrBusy/PeriphAck/nWait (Busy):** Driven by the peripheral devices.

- Compatibility Mode: Driven to HIGH to show that the peripheral devices are not ready for data reception.
- Negotiation phase: Reflects the current state of the peripheral device forward channel. When the host strobes the interface extensibility request byte to peripheral devices, PtrBury is set to some devices.
- Reverse data transfer phase: Nibble Mode: Data bit 3, then 7, then forward channel busy state.  
Byte Mode: Forward channel busy state
- Reverse idle phase: Forward channel busy state
- ECP Mode: This signal is used by the peripheral devices to control the forward flow. PeriphAck also supplies command information in the reverse direction.
- EPP Mode: This signal is driven to inactive as a positive response from the peripheral device which shows the completion of data or address transfer. This signal is active LOW. It is driven to active to show that the device is ready for transfer of the next address or data.

**AckDataReq/nAckReverse (PError):** Driven by peripheral devices.

- Compatibility Mode: Driven to HIGH by the peripheral device to show an error occurrence in the paper path. The meaning of this signal differs depending on the peripheral device.
- Negotiation phase: Set to HIGH to show the 1284 support. Then it follows nDataAvail (nFault).
- Reverse data transfer phase: Nibble Mode: Data bit 3, then 6.  
Byte Mode: Same as nDataAvail (nFault).
- Reverse idle phase: Set to HIGH until the host requests for data transfer. Then it follows nDataAvail (nFault).
- ECP Mode: Set to LOW by the peripheral device to confirm nReverseRequest. The host depends on nAckReverse to determine when to drive the data signals.
- EPP Mode: This signal is not used in the EPP Mode.

**Xflag (Select):** Driven by the peripheral devices.

- Compatibility Mode: Set to HIGH to show that the peripheral device is in the online state.
- Negotiation phase: "Xflag" means an extension flag. It is used by the peripheral device to respond to the extensibility request byte sent by the host in the negotiation phase. The signal level used to show the positive response to each extension byte.
- Reverse data transfer phase: Nibble Mode: Data bit 1, then 5.  
Byte Mode: Same as the negotiation phase.
- Reverse idle phase: Same as the negotiation phase.
- ECP Mode: Same as the negotiation phase.
- EPP Mode: This signal is not used in the EPP Mode.

**HostBusy/HostAck/nDStrb (nAutoFd):** Driven by the host.

**Compatibility Mode:** The interpretation of this signal differs depending on the peripheral devices. Set to LOW to set a printer to the auto line feed mode. It is also used as the 9th data parity or the command/data control bit.

**Negotiation phase:** To request the 1284 mode, 1284Active (nSelect IN) is set to HIGH and this signal is set to LOW. Then it is set to HIGH after the peripheral device sets PtrClk (nAck) to LOW.

**Reverse data transfer phase:**

**Nibble Mode:** Set to LOW to show that the host is ready to receive data from the peripheral devices. Then it is set to LOW to confirm the nibble reception.

**Byte Mode:** Same as the Nibble Mode to confirm the byte request. Following the reverse channel transfer, the interface is transferred to the idle phase when HostBusy (nAutoFd) is set to LOW and there is no data in the peripheral devices.

**Reverse idle phase:** To enter the reverse data transfer phase again, it is set to HIGH in response to PtrClk (nAck) LOW pulse. When the 1284 Active (nSelect IN) is set to LOW and this signal is set to HIGH, the 1284 idle phase is aborted and the interface returns to the Compatibility Mode.

**ECP Mode:** This signal is driven by the host to control the flow in the reverse direction. Used in the interlock handshake with PeriphClk (nAck). HostAck also provides command information in the forward direction.

**EPP Mode:** This signal is active LOW, and used to show the data cycle.

**Peripheral logic High:** Driven by the peripheral devices.

Set to HIGH to show that all the other signals sourced by the peripheral devices are valid. Set to LOW to show that the peripheral device power is off or that the interface signal of the peripheral device drive is invalid.

The peripheral device maker may use this signal to supply +5V power to the connected device, but it is not vitally necessary.

In all cases, the short current of the peripheral device must be limited to max. 1.0A. The circuit must be provided to assure the effective logic LOW level of this signal when the peripheral device power is turned off.

**nReverse Request (nInIt):** Driven by the host.

**Compatibility Mode:** To reset the interface and forcibly return to the Compatibility Mode idle phase, this signal as well as the 1284 Active is set to LOW.

**Negotiation phase:** Set to HIGH.

**Reverse data transfer phase:** Set to HIGH.

**ECP Mode:** Driven to LOW to set the channel in the reverse direction. During this ECP Mode, the peripheral devices can only drive the bi-directional data signal when nReverse Request is LOW and the 1284 Active is HIGH.

**EPP Mode:** This signal is active LOW. It makes the termination cycle start and returns the interface to Compatibility Mode.

**nDataAvail/nPeriphRequest (nFault):** Driven by the peripheral devices.

**Compatibility Mode:** Set by the peripheral device to show an error occurrence. The meaning of this signal differs depending on the peripheral device.

**Negotiation phase:** Set to HIGH to confirm the conformity to the 1284 standards. Then it is set to LOW in the Nibble Mode or the Byte Mode after setting HostBusy (nAutoFd) to HIGH to show that the host is ready for data reception from the peripheral devices.

**Reverse data transfer phase:**

**Nibble Mode:** Set to LOW to show that the peripheral device has data and is ready to send to the host. Then it is used to send data bit 0 and 4.

**Byte Mode:** Used to show that there are some data.

**Reverse idle phase:** Used to show that there are some data.

**ECP Mode:** In the ECP Mode, this pin is driven to LOW to request for communication with the host. This request serves as a mere "hint" for the host, and the final control on the transfer direction is made by the host. This signal provides the peer-to-peer communication mechanism. This signal is valid only in the forward direction. It is generally used to interrupt the host.

**EPP Mode:** This signal is not used in the EPP Mode.

**1284 Active/nAstrb (nSelect In):** Driven by the host.

**Compatibility Mode:** Set to LOW by the host to select the peripheral device.

**Negotiation phase:** To request the 1284 mode, this signal is set to HIGH and HostBusy is set to LOW.

**Reverse data transfer phase:** Set to HIGH to show that the bus direction is from the peripheral to the host. Set to LOW to set the bus direction from the host to the peripheral.

**Reverse idle phase:** Same as the Reverse data transfer phase.

**ECP Mode:** In the ECP Mode, driven to HIGH by the host. After completion of the ECP Mode operation, it is set to LOW to return the link to the Compatibility Mode.

**EPP Mode:** This signal is used to show the address cycle. Active LOW.

**Host Logic High:** Driven by the host.

Set to HIGH by the host to show that all the other signals sourced by the host are valid. Set to LOW to show that the host power is off or the host drive interface signal is invalid.

The host maker may use this signal to supply +5V power to the connected device, but it is not vitally necessary.

In all cases, the short current of the host must be limited to max. 1.0A. The circuit must be provided to assure the effective logic LOW level of this signal when the peripheral device power is turned off.

**LAN I/F**

**Introduction**

The LAN board will provide an interface that consists of a 16 bit data bus accessing a maximum of 64 KBytes of shared memory and an interrupt control register, 17 addressing bits, interrupt lines, and control lines.

**Signal Description (Between ICU board and LAN I/F board)**

Signal Name	Direction	Description
A0 – A16	OUT	Address lines that are used to access the shared memory space. A0 - least significant bit. word only accesses to shared memory.
D0 – 15	IN/OUT	Bi-directional data lines carrying the data for memory requests. These lines are buffered on the LAN board. D0 - least significant bit. <b>* Loading will not exceed 1 LS TTL load.</b>
RESET-	OUT	Reset line to LAN board. This line is used by the printer to request a hardware reset. <b>Active Low.</b>
NETCS-	OUT	Printer chip select pins. These lines are used by the printer to indicate a valid address for a memory operation. NETCS- will only be active to LAN board accesses. <b>Active Low.</b>
NETOE-	OUT	Printer output enable pin. This line is used by the printer to indicate the printer bus is available. This signal is qualified by NETCS- <b>Active Low.</b>
R/W-	OUT	Printer Read/Write line. This line is used by the printer to indicate a read or write cycle. <b>Write Active Low.</b>
NETRDY-	IN	LAN board Ready line. LAN board will set this line active on a access to the LAN board. It will be used to hold off a printer access to shared memory. <b>Active Low.</b>
NETINT-	IN	Interrupt printer. This line indicates the LAN board wants to interrupt the printer. The LAN board will set this line low if Bit 3 of the ICR register is a "0". (See 5. Interrupt System.) <b>Active Low.</b>
NETON-	OUT	Board plugged in line. A low on this line signifies a LAN board is plugged into the printer. <b>Active Low.</b>
+5V		+5V power lines. These lines provide a continuous
GND		Ground lines. These lines provide a common reference for bus and control signals and provide a return for the +5V power lines.

**Connector Assignment (Between ICU board and LAN I/F board)**

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	VCC	21	A0	41	NETRDY-
2	VCC	22	D7	42	A6
3	VCC	23	D6	43	NETCS-
4		24	A15	44	A5
5	D15	25	D5	45	NETOE-
6	D14	26	A14	46	
7	D13	27	D4	47	R/W-
8	GND	28	A13	48	GND
9	D12	29	D3	49	A16
10	D11	30	A12	50	NC
11	D10	31	D2	51	NC
12	GND	32	A11	52	GND
13	D9	33	D1	53	NC
14	D8	34	A10	54	NC
15	NETINT-	35	D0	55	NC
16	GND	36	A9	56	GND
17	A3	37	A4	57	NETON-
18	A2	38	A8	58	VCC
19	A1	39	RESET-	59	VCC
20	NC	40	A7	60	VCC

**AC and DC Signal Specifications**

Timing Specification

NETCS-, NETOE-, R/W-, NETRDY-

These signals are used as control lines to read and write data to the LAN board.

R/W- is set high or low to indicate a read (1) or write (0) cycle. NETCS- is set low by the printer to signal a memory access is required and the printer address is now valid.

The LAN board will set NETRDY- within 30nS of receiving NETCS-. Upon receiving a NETCS- the LAN board will begin memory arbitration with the printer. NETRDY- will be deasserted when the LAN board memory arbiter determines the bus is available.

MAXIMUM TIME BEFORE LAN BOARD COMPLETES THE PRINTER ACCESS IS 530nS.

The printer will finish its memory access cycle by deasserting NETCS- and NETOE-

Address and Data signals.

READ: Address and R/W- will be valid before NETCS- is asserted. Data will be valid before NERDY is deasserted.

WRITE: Address and RW- will be valid before CSPn- is asserted. Data will be valid for the duration of the CPSn- signal.

**Common Memory**

A maximum of 64 KBytes will allocated for shared memory access. Common memory will be allocated at LAN board locations 0000 thru FFFF.

# [16] TROUBLESHOOTING AND DISPLAY MESSAGE

## 1. Troubleshooting for display messages

There are a variety of messages which show the troubles and machine states, and they are largely grouped as follows:

### (Messages generated during operation or in standby state)

Message of ICU condition
Message of PCU condition

### (Messages generated immediately after turning on the power)

When the power is turned on, the ICU board and the unit installed to it are checked. In case of any abnormality, an error message is shown on the operation panel of the printer.

The messages are also grouped into those for the operator and those for the serviceman.

### (1) Operator call message

There are following twelve kinds of operator call messages. The errors have the order of priority as shown below:

#### (Message display conditions)

High	SERVICE ERROR
↑	SUPPLY END ERROR
	TONER EMPTY ERROR
	DRUM END ERROR
	COVER OPEN ERROR
	PAPER JAM ERROR
	PAPER EMPTY ERROR
	TONER LOW ERROR
	DRUM NEAR END
	INTERFACE ERROR
↓	DATA LOSS ERROR
Low	DATA MEMORY FULL ERROR

Error Message	Description	Recover
INPUTBUFFER FULL	The host computer ignores the printer's busy state and continues to send data.	Check the protocol signal line between the printer and the host computer or adjust the setting. Press the <b>FORM FEED</b> key.
COVER OPEN	Front cover of printer is not closed properly.	Close the front cover firmly and check that it is properly latched. Press the <b>FORM FEED</b> key.
INTERFACE ERROR	RS-232C interface error (For example, framing error)	Check the RS-232C interface function and execute it again. Press the <b>FORM FEED</b> key.
DATA LOSS ERROR	Too many characters on one line	Delete excess characters and execute again. Press the <b>FORM FEED</b> key.
PAPER OUT *** (*** = UPPER/LOWER)	Paper empty or paper cassette removed.	Add paper or replace the paper cassette. If the paper size matches the previous setting, the printer will return online.
PAPER JAM	Paper is jammed.	Check the cassette, open the front and top covers, and remove the misfed paper. Press the <b>FORM FEED</b> key.
TONER LOW	Near end of toner/developer cartridge life.	Automatically cleared.
REPL. TONER	End of toner/developer cartridge life.	Replace the toner/developer cartridge.
DRUM NEAR END	Near end of photoconductor cartridge life.	Automatically cleared.
REPL. DRUM	End of photoconductor cartridge life.	Replace the photoconductor cartridge.
DATA MEMORY FULL	Printer memory cannot accommodate soft fonts or other data included with the print job.  May be caused by font rotation, i.e. specifying an orientation different from that of the font card.	First press the <b>FORM FEED</b> key. Then, decrease occupied memory space by decreasing number of soft fonts or eliminating font rotation.  When you press the <b>FORM FEED</b> key, the soft font or macro entered prior to going offline is deleted.  If you press and hold the <b>FORM FEED</b> key until "RESET" appears on the display, all temporary soft fonts and macros are deleted.
EEPROM ERROR	Did you turn off power while setting parameters? Check to see again if the setting is correct.	Press the <b>FORM FEED</b> key and then set the parameters again.

**(Message display conditions)**

**\*1. Conditions for "Toner low"**

When one of the following two conditions is satisfied, "Toner low" is displayed.

1. The developer counter (DEV) reaches 29,000.  
The life of the cartridge packed with the LZR855 PLUS body is 4,000.
2. The total rotating time of the toner motor (DEVTM) reaches 19,600 sec. (Toner equivalent to 14,000 copies of 4% print is consumed.) The life of the cartridge packed with the LZR855 PLUS body is 5600 sec.  
The life of the cartridge packed with the LZR855 PLUS body is 5,000.

**\*2. Condition for "REPL toner"**

When one of the following five conditions is satisfied, "REPL toner" is displayed.

1. The developer counter (DEV) reaches 30,000.
2. Toner is refilled continuously for 40 sec in the preliminary rotations of power ON, then further refilled for 90 sec until the first page is printed.
3. Toner is refilled over the specified time continuously or multiply 5 sheets during conduction. Toner is refilled for 30 sec continuously and the first sheet is printed with the TS level at a high level (with the toner density at a low level). Then toner is refilled for 45 sec continuously with the TS level at a high level (with the toner density at a low level) and the second sheet is printed. Similarly toner is refilled for 60 sec and the third sheet is printed. → The fourth sheet is printed after 60 sec of refilling. → The fifth sheet is refilled after 60 sec of refilling. → REPL. TONER

Supplemental figures for describing refilling operation

Fig. 1

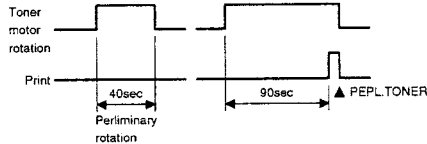


Fig. 2

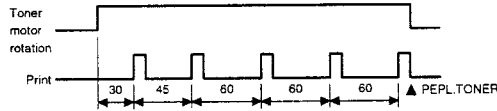
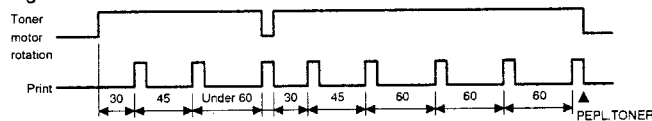


Fig. 3



Reference: Supply life table total of \*1 thru \*4

Life	Print pages		Toner motor rotations (sec)	
	LZR855 PLUS same package items	Option	LZR855 PLUS same package items	Option
Drum near end	4,000	29,000	8,000	58,000
Drum end	5,000	30,000	10,000	60,000
Toner low	4,000	29,000	5,600	19,600
REPL Toner	5,000	30,000	*1	*1

1: Final judgment is not made on the toner motor rotations.

4. DEV NEW fuse is not blown. (After DEV adjustment, if the fuse is not blown, set the DEV counter to 30000 to reach REPL. TONER.)
5. When the developer cartridge is not installed. In other word, the sensor output level is abnormal (lower than 0.5V or higher than 4.0V).  
Note: For "Toner low" and "REPL. TONER", the CPU judges the conditions after 2 sec from turning on of the main motor to recognize each error. (Wait for stabilization of the toner sensor output level.)

**\*3. Conditions "DRUM NEAR END"**

When one of the following two conditions is satisfied, "DRUM NEAR END" is displayed.

1. The drum counter (DRM) reaches 29,000.
2. The total rotating time of the toner motor (DRMTM) reaches 58,000 sec. (Toner equivalent to 29,000 copies of 4% print is consumed.)

In the case of the cartridge packed with the LZR855 PLUS body.

1. The drum counter (DRM) reaches 4,000.
2. The total rotating time of the toner motor (DRMTM) reaches 8,000 sec.

**\*4. Conditions for "REPL DRUM"**

When one of the following two conditions is satisfied, "REPL DRUM" is displayed.

1. The drum counter (DRM) reaches 30,000.
2. The total of rotating time of the toner motor (DRMTM) reaches 60,000 sec. (Toner equivalent to 30,000 copies of 4% print is consumed.)

In the case of the cartridge packed with the LZR855 PLUS body.

1. The drum counter (DRM) reaches 5,000.
2. The total of rotating time of the toner motor (DRMTM) reaches 10,000 sec.

**\*5. In case of data error, set the page protection to A4, letter, or legal.**

## (2) Serviceman call message

If two or more errors occur, the error message of the highest order of priority is displayed. (PCU section).

	LCD display message		Content
High ↑	SERVICE (C6)	Thermistor Open	The thermistor is open.
	SERVICE (C5)	Low Heater Temperature	The heater temperature is too low.
	SERVICE (C4)	High Heater Temperature	The heater temperature is too high.
	SERVICE (C3)	Polygon Motor Defective	The polygon motor is abnormal.
	SERVICE (C2)	Driving Motor Defective	The drive motor is abnormal.
	SERVICE (C1)	Optical System Error	The optical system is abnormal.
↓ Low	SERVICE (P4)	Serial Communication Error	The serial communication is abnormal.
	SERVICE (P3)	Non-volatile RAM Read Error	The NVRAM reading is abnormal.
	SERVICE (P2)	PCU RAM Read/Write Error	The PCU RAM access is abnormal.
	SERVICE (P1)	PCU ROM Checksum Error	The PCU ROM is abnormal.

### <Error type>

- a. P1 to P4: A fault in the PCU (Process control unit)
- b. C1 to C6: Printer mechanism fault.
- c. E5, ERR: A fault in the ICU (Interface control unit)

### <Error check point>

	Cause	Error description	Action
	COVER OPEN	<ol style="list-style-type: none"> <li>1) Check that the transport unit is closed.</li> <li>2) Check that the drum cartridge is installed.</li> <li>3) Check that PCU IC4 18pin is HIGH.</li> </ol>	<ol style="list-style-type: none"> <li>1) Close the transport unit.</li> <li>2) Insert the drum cartridge.</li> <li>3) Replace the CPU.</li> <li>4) Defective contact.</li> </ol>
	PAPER JAM	<ol style="list-style-type: none"> <li>1) Check that paper is discharged from the machine.</li> <li>2) Check that the paper-entry sensor actuator is not hung.</li> <li>3) Check that the paper-exit sensor actuator is not hung.</li> <li>4) Turn on/off the actuator to check that PCU IC4 21pin and 22pin levels change.</li> </ol>	<ol style="list-style-type: none"> <li>1) Discharge paper.</li> <li>2) Replace the paper-entry sensor.</li> <li>3) Replace the paper-exit sensor.</li> <li>4) Defective contact. Replace the CPU.</li> </ol>
	PAPER OUT	<ol style="list-style-type: none"> <li>1) Check that paper is in the cassette.</li> <li>2) Check that the paper empty sensor is not hung.</li> <li>3) Turn on/off the actuator and check that CS-PWB IC1 12pin levels change.</li> </ol>	<ol style="list-style-type: none"> <li>1) Supply paper in the cassette.</li> <li>2) Replace the paper empty sensor.</li> <li>3) Defective contact. Replace IC1.</li> </ol>
SERVICE (P1)	PCU ROM Sumcheck error	Check the CPU if the correct one is used.	Replace the CPU (M37451) with a new one.
SERVICE (P2)	PCU RAM Sumcheck error	Check the CPU if the correct one is used.	Replace the CPU (M37451) with a new one.
SERVICE (P3)	NVRAM read error	Check the CPU, if operating normally. CE received at power on.	Replace the CPU (M37451) with a new one. Replace IC1 (PCU) with a new one.
SERVICE (P4)	Serial communication error	<ol style="list-style-type: none"> <li>1) Check that STS signal is normally supplied from CPU (M37451) 3pin to ICU.</li> <li>2) Check that CMD signal is normally supplied to CPU (M37451) 4pin.</li> </ol>	<ol style="list-style-type: none"> <li>1) Replace the CPU (M37451) with a new one.</li> <li>2) Check ICU and MD-PWB.</li> </ol>
SERVICE (C1)	Optional system error	<ol style="list-style-type: none"> <li>1) Check VIDEO if received correctly.</li> <li>2) Check that SYNC is normally supplied to CPU (M37451) 24pin.</li> </ol>	<ol style="list-style-type: none"> <li>1) Replace the CPU (M37451) with a new one.</li> <li>2) Replace LSU with a new one.</li> </ol>
SERVICE (C2)	Main motor failure	<ol style="list-style-type: none"> <li>1) Check that the main motor rotates.</li> <li>2) Check +24VH if properly supplied.</li> <li>3) Check MMDA, MMD<math>\bar{A}</math>, MMD<math>\bar{B}</math>, MMD<math>\bar{B}</math> if properly received when the motor is on.</li> </ol>	<ol style="list-style-type: none"> <li>1) Replace the developer cartridge.</li> <li>2) Replace the power supply unit with a new one.</li> <li>3) Replace the CPU (M37451) with a new one. Replace the MD-PWB with a new one.</li> </ol>
SERVICE (C3)	Polygonal motor failure	<ol style="list-style-type: none"> <li>1) Check +24VH if properly supplied.</li> <li>2) Check PMD if correctly received when the polygonal motor is on.</li> <li>3) Check PMTLK if issued properly when the polygonal motor is on.</li> </ol>	<ol style="list-style-type: none"> <li>1) Replace the power supply unit with a new one.</li> <li>2) Replace IC6 (PCU) with a new one.</li> <li>3) Replace the optical unit with a new one.</li> </ol>

	Cause	Error description	Action
C4	Irregularly high heater temperature	1) Check the resistance across the thermistor if 100KΩ at room temperature of 25°C. 2) Check HLON if properly issued, not always at a low. 3) Check that a voltage is always applied to the heater.	Replace the thermistor with a new one. Replace IC5 (PCU) with a new one. Replace the power supply with a new one.
C5	Irregularly low heater temperature	1) Check the resistance across the thermistor if 100KΩ at room temperature of 25°C. 2) Check HLON if at a low during wamup. 3) Check that a voltage is applied to the heater.	Replace the thermistor with a new one. Replace IC5 (PCU) with a new one. Replace the power supply with a new one.
C6	Thermistor open	1) Check the resistance across the thermistor if 100KΩ at room temperature of 25°C.	Replace the thermistor with a new one. Replace the CPU (M37451) with a new.
E5	ICU EE-PROM sumcheck error	1) When an abnormal value is read in the EEPROM reading, write the factory adjustment value once, then read again. If the read value is not the same as the written value, perform the process.	Replace the EEPROM with a new one.
ERR XXXX. YYY	Program trouble	When an abnormality occurs in the ICU. When an abnormality occurs in the program. YYY: File name XXXX: Program line number	Replace the ICU unit. Repair the ICU unit. Repair the program.

**(3) Messages which may be displayed immediately after turning on the power**

- ① ROM error  
This error occurs when the main body ROM check sum is not the normal value.  
If the PS board is installed, the PostScript ROM sum check is also performed.
- ② RAM error  
This error occurs when the written value is not the same with the read value in the RAM access check.
- ③ EXT error  
When the LAN Network board or the AppleTalk/Serial board is installed and an abnormality occurs in initial setting, this error occurs. If the LAN Network board or the AppleTalk/Serial board is abnormal, the operation is performed as if they were not installed.

The error treatment is performed after completion of all checks.

According to the error, the LCD displays as follows:

Error	Message
ROM error only	ROM ERROR
RAM error only	RAM ERROR
EXT error only	EXT ERROR
ROM and RAM errors	ROM & RAM ERROR
ROM and EXT errors	ROM & EXT ERROR
RAM and EXT errors	RAM & EXT ERROR
ROM/RAM/EXT errors	ROM & RAM & EXT ERR

To cancel an error, press the LINE key.  
However, the proper operation cannot be guaranteed unless the cause is removed.

Example of transition from power ON to standby

Normal: Power ON → Self test → LJ4 LE/LE  
Abnormal: Power ON → RAM & EXT ERROR → LJ4 LE/LE

↑  
Press the LINE key.

(Example) Differs depending on the error content.



## 2. Troubleshooting for print operation

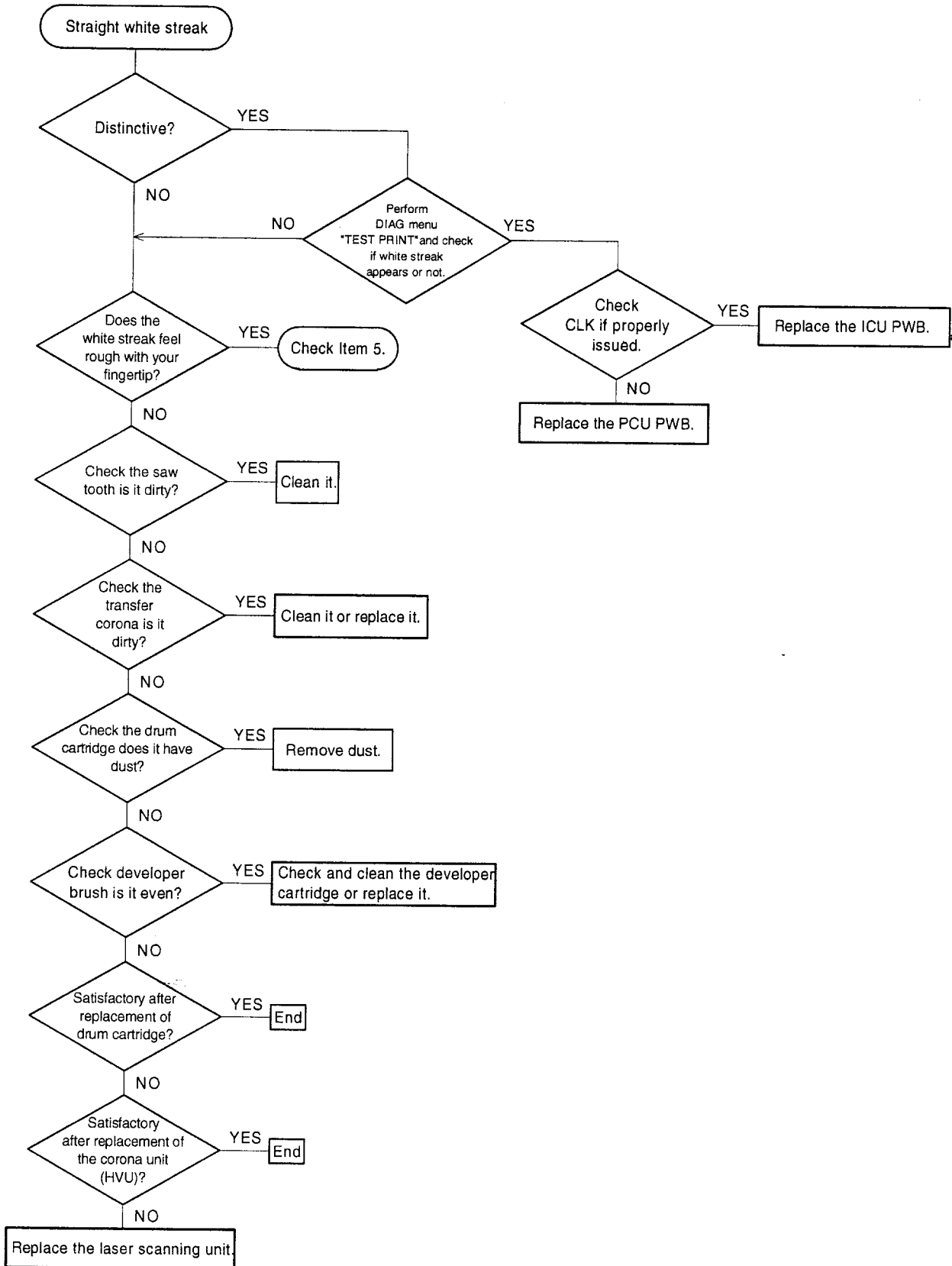
Problem	Probable Cause	Remedy
<b>Print data not received</b>		
Printer turns on, but will not print data from computer	Computer and printer settings mismatch	Confirm that the emulation selected on the printer matches the printer driver on the computer. Print out printer settings off-line and compare with software settings.
	Computer connection problem	Check the printer cable connections and cable. Test your cable by using it with another printer that you know works. Test your printer after connecting it with another cable that you know works.
	Computer not properly set up	Check the MS-DOS manual for mode settings and the computer manual for I/O port settings.
Write Fault Error is displayed on computer screen	Bad cable	Check the printer cable connections and cable. Test your cable by using it with another printer that you know works. Test your printer after connecting it with another cable that you know works.
	Not on-line	Check if the printer is on-line. A printer error other than <b>PAPER OUT</b> may have set the printer off-line. Check the printer display panel.
Time Out Error is displayed on computer screen	Time out error	Increase the time for I/O time-out in the computer software. If the problem occurs when printing from DOS, try adding a Mode command to your computer's AUTOEXEC.BAT file. It can be put on its own on a single line after the PATH statement: If you are using a parallel interface, add: <code>MODE LPT1: , , P</code> If you are using a serial interface, add: <code>MODE COM1: 9600, N, 8, 1, P</code> <code>MODE LPT1=COM1</code>
<b>Printing Errors</b>		
Print job stalled	End of page code not received	If a long time elapses before a page prints and <b>DATA</b> continues flashing, the printer has probably stalled. Press <b>[LINE]</b> and then press <b>[FORMFEED]</b> .
Full pages do not print	Job prematurely terminated	Check that all the data was received from the computer. If there was a fault at the computer such as exiting the application before the data was sent, the computer may not have sent the complete file data. The data file may also have been corrupted before transmission. If you cancel a print job from the computer, partially printed pages may be produced.
	Pages too complex (Data loss error)	Some page data may be too complex for the printer to process the imaging information while the page is printing. In such cases, the printing mechanism gets ahead of the processor and blank spaces result. Try simplifying the file by using fewer characters per line. Turn on page protection and try to print the file again. Install more memory if you want to print complex files.
	Too many fonts or macros transferred to printer (Data memory full error)	The printer has received more data from the computer than can fit in its available memory. Clearing soft fonts and macros will free up printer memory. When printing without additional memory, avoid using too many soft fonts and macros. Lowering the resolution to 300 dpi will also reduce the memory requirements of a print job. If you are getting a lot of memory error messages, install more memory.
	Interface cable faulty	Reseat the connectors at both the printer and the computer ends. Check the cable by using it with another printer.
	Software application sending wrong data	To check if the application is causing the problem, print plain text from DOS with the Copy command or redirection, e.g.: <code>C:\Copy filename.txt LPT1:</code> or <code>C:\dir &gt;prn</code> The DOS print command does not always work.

Problem	Probable Cause	Remedy
<b>Printing Errors</b>		
Printer ejects blank pages	Print data	Check the print data sent from the computer. If there are natural page breaks and forced breaks close to each other in a word processor file, the application may send a blank page to the printer. Check the printing parameters in the application to see if they are set to send extra page eject commands. Some network software inserts blank pages to separate jobs.
	Seal on toner/developer cartridge	Remove the seal from a newly installed toner/developer cartridge.
	Toner/developer cartridge empty	Replace the toner/developer cartridge. If you are printing a long run of pages with more than 30% toner coverage, the printer may not give the usual toner status messages. Normally the printer will give advice messages on the display panel when toner runs out or is low.
	Paper size mismatch	Check that the page size setting in your application matches the paper size(s) available in the printer.
	Multiple sheets fed	Remove the paper from the paper cassette and fan the edges. Straighten it up and then put it back into the cassette. Sometimes the sheets of paper do not easily separate and the paper feed mechanism may pick up two or more sheets.
<b>PostScript Printing Errors</b>		
A page listing PostScript commands is output instead of your print job	Auto-emulation selected	If the printer receives a non-standard PostScript code when set in auto-emulation mode, it might respond by printing a list of PS commands. Set the emulation parameter to PS and try printing the job again.
<b>PostScript Printing Errors</b>		
A PostScript job fails to print	<p>If you are using Windows, make sure that you are using the SHARP PS printer driver supplied with the optional PostScript board. Set <b>Print PS Errors</b> to <b>ON</b> using the remote control panel software. Then try to print the job again. If a PS error page prints, and if it indicates a VM error, the printer needs more memory to print the job. Either simplify the print job or install more memory.</p> <p>If you have already installed extra memory, confirm that the total amount of memory which has been installed in the printer is correctly set in the printer driver. (When you install extra memory, you have to change the memory setting in the printer driver. Change the total at the item <b>Memory Installed</b> to correspond with the changes you have made.) You can print a setting list from the test menu to confirm that memory changes have been recognised by the printer. If the changed memory total is not recognised by the printer, make sure that the SIMMs are properly installed. If the problem persists after a successful memory upgrade, you may need to install even more memory to print the job.</p>	
<b>Print Speed</b>		
Printing takes a long time	Toner supply	When toner is running low, it takes longer to supply toner to the photoconductor drum. Normally the printer will display an advice message that toner is low. If printing persistently takes a long time after this, it is better to replace the toner/developer cartridge before it runs out completely. If you are printing a long run of pages with more than 30% toner coverage, the printer may not give the usual advice message when toner runs low. Jobs that use a lot of toner per page may also print more slowly. Pages requiring a denser covering of toner, typically grayscale graphics or banner text, need to be supplied with more toner. In ordinary text printing, toner covers about 4% of a page, some jobs require many times more than that, so the print mechanism will take a longer time to supply the extra toner.
Long time needed to print first page	Printer standby	Consider changing the power save setting. When Energy Star mode is selected (factory default), it can take up to one minute to warm up from standby. If Energy Star standby is unacceptable, you can customize the setting for quicker response, but the printer will consume more power.
<b>Paper Problems</b>		
Frequent paper jams	Overloaded cassette	Remove some paper from the cassette.
	Unsuitable media	Check the paper specifications. Is the paper too thin (light) or too thick (heavy)?
	Bad media	Check the paper batch for creases, tears, nicks, raggy edges, dirt, damp and so on.
	Paper size mismatch	Check that the page size setting in your application matches the paper size(s) available in the printer.
<b>Print Characters</b>		
Wrong characters print	Characters not present in printer	Check that the typefaces and fonts that you are trying to print are in the printer, installed in your software or on your computer. Software applications often try to match fonts by substituting similar available fonts for ones that are not present.
	Computer and printer settings mismatch	Check your emulation setting options, and parity and data bit communication settings.

### 3. Troubleshooting for print quality

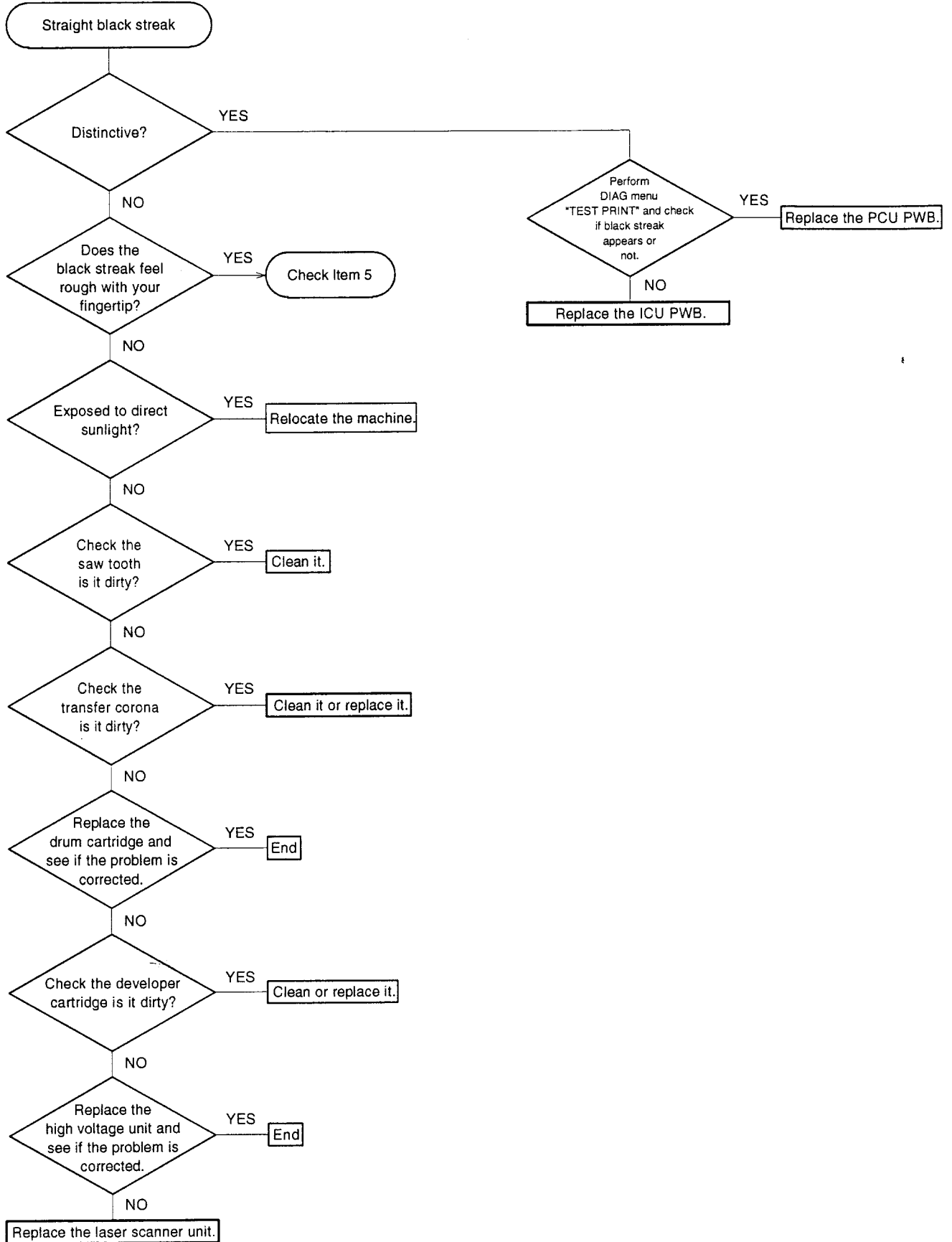
#### White line appearing vertically on print

■ Appearance of white streak or band in the paper feeding direction



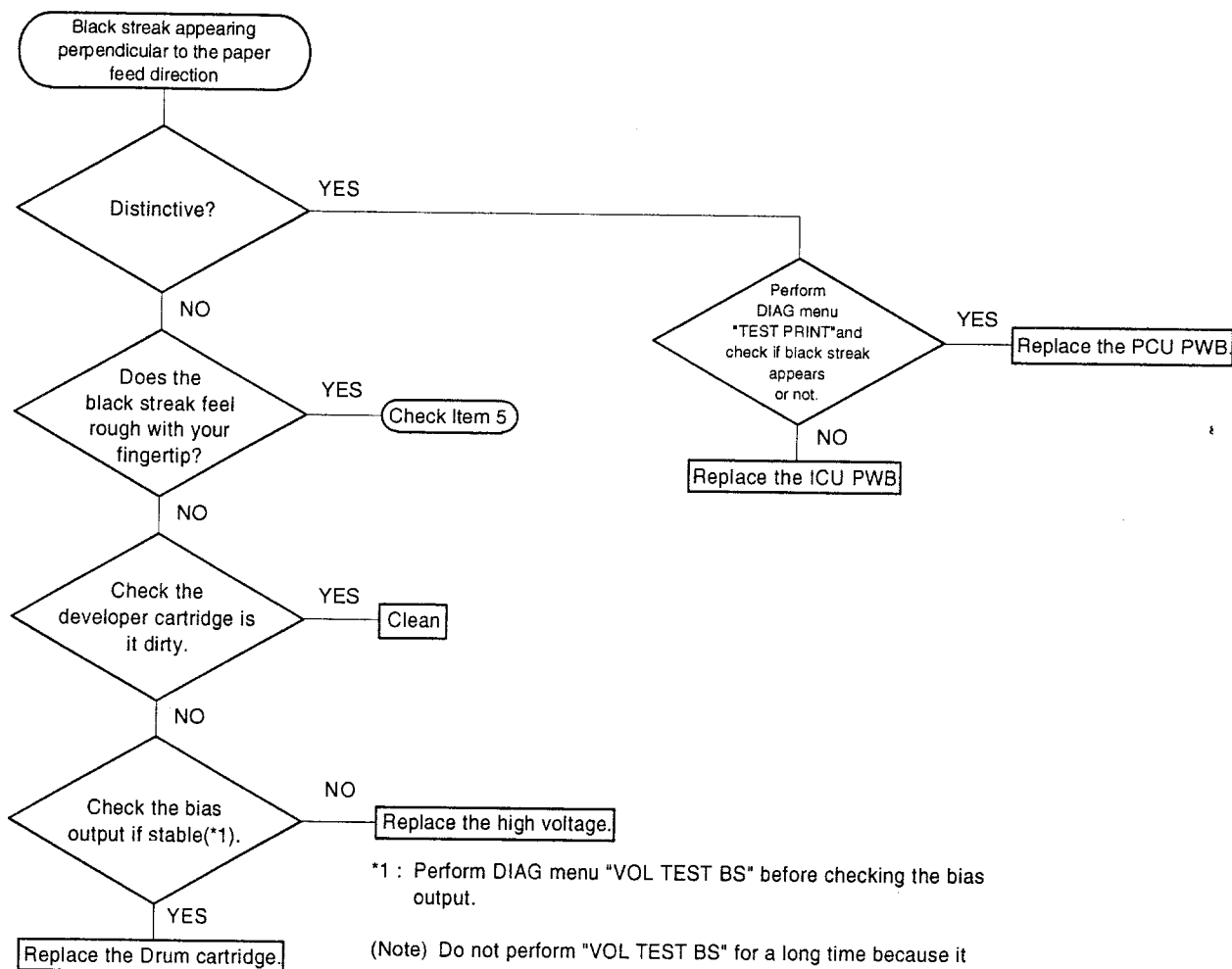
### Black line appearing vertically on print

■ Appearance of black streak or band in the paper feeding direction



### Black line appearing horizontally on print

- Appearance of black streak or band perpendicular to the paper feeding direction

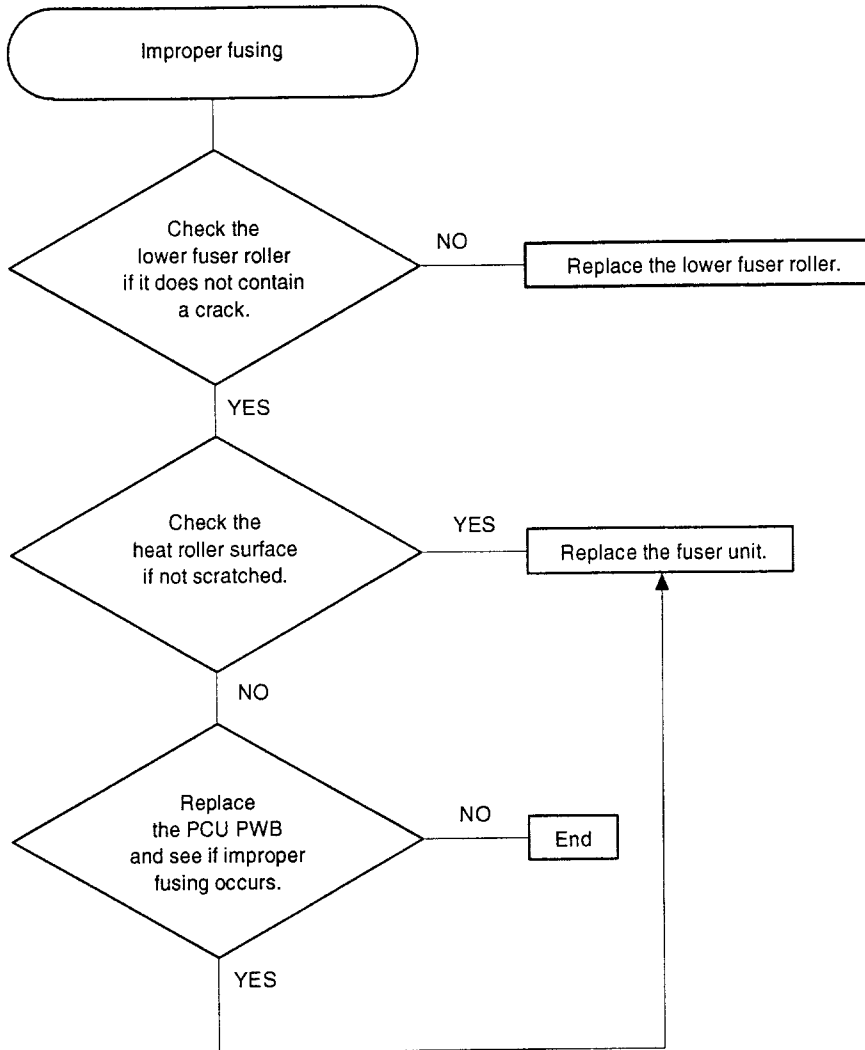


\*1 : Perform DIAG menu "VOL TEST BS" before checking the bias output.

(Note) Do not perform "VOL TEST BS" for a long time because it turns on the main corona.  
Complete the measurement in a few seconds.

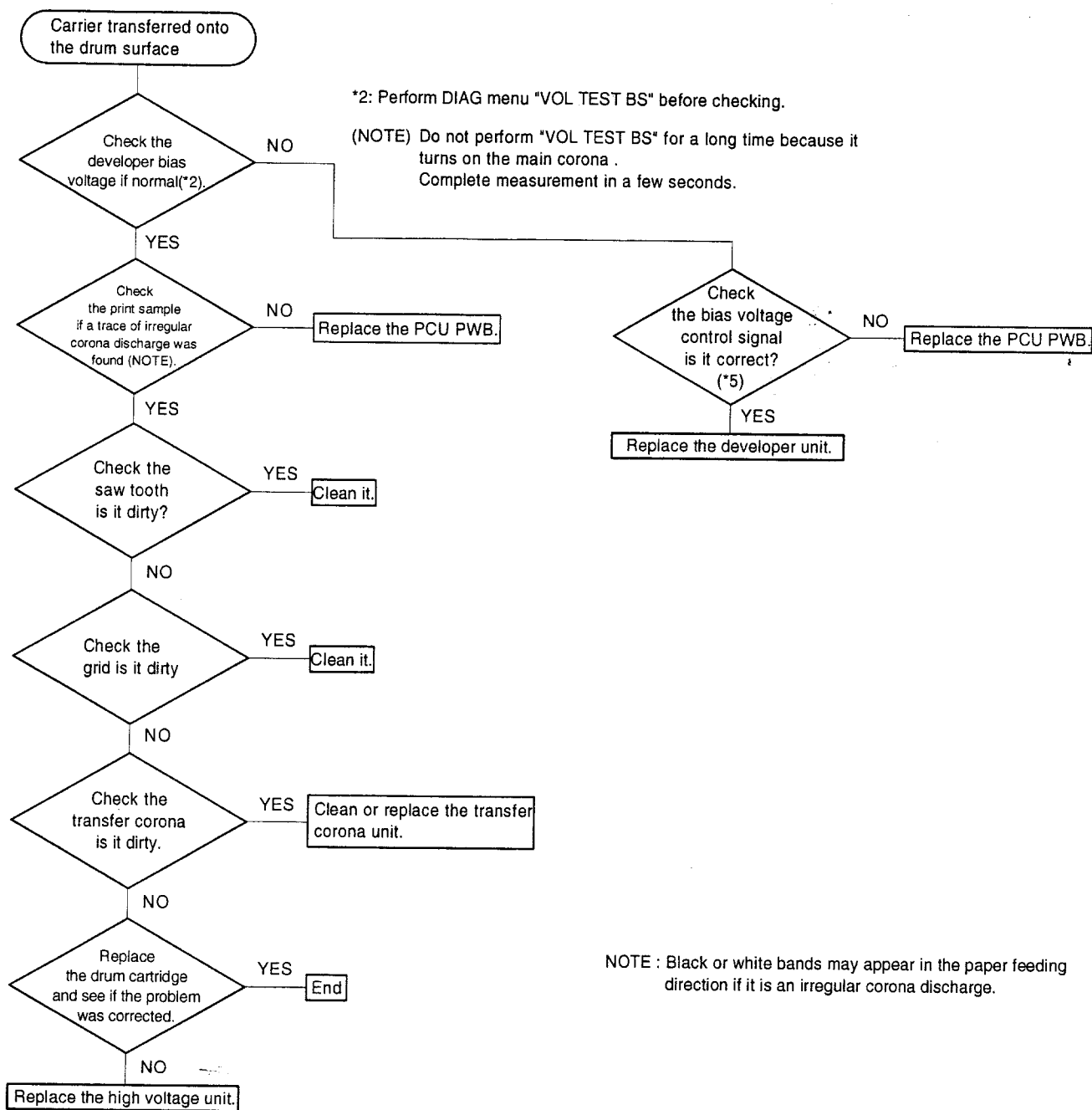
### Poor fusing

- Printed image felt rough and toned image easily wiped away with your fingertip



### Carrier transferred onto the drum surface

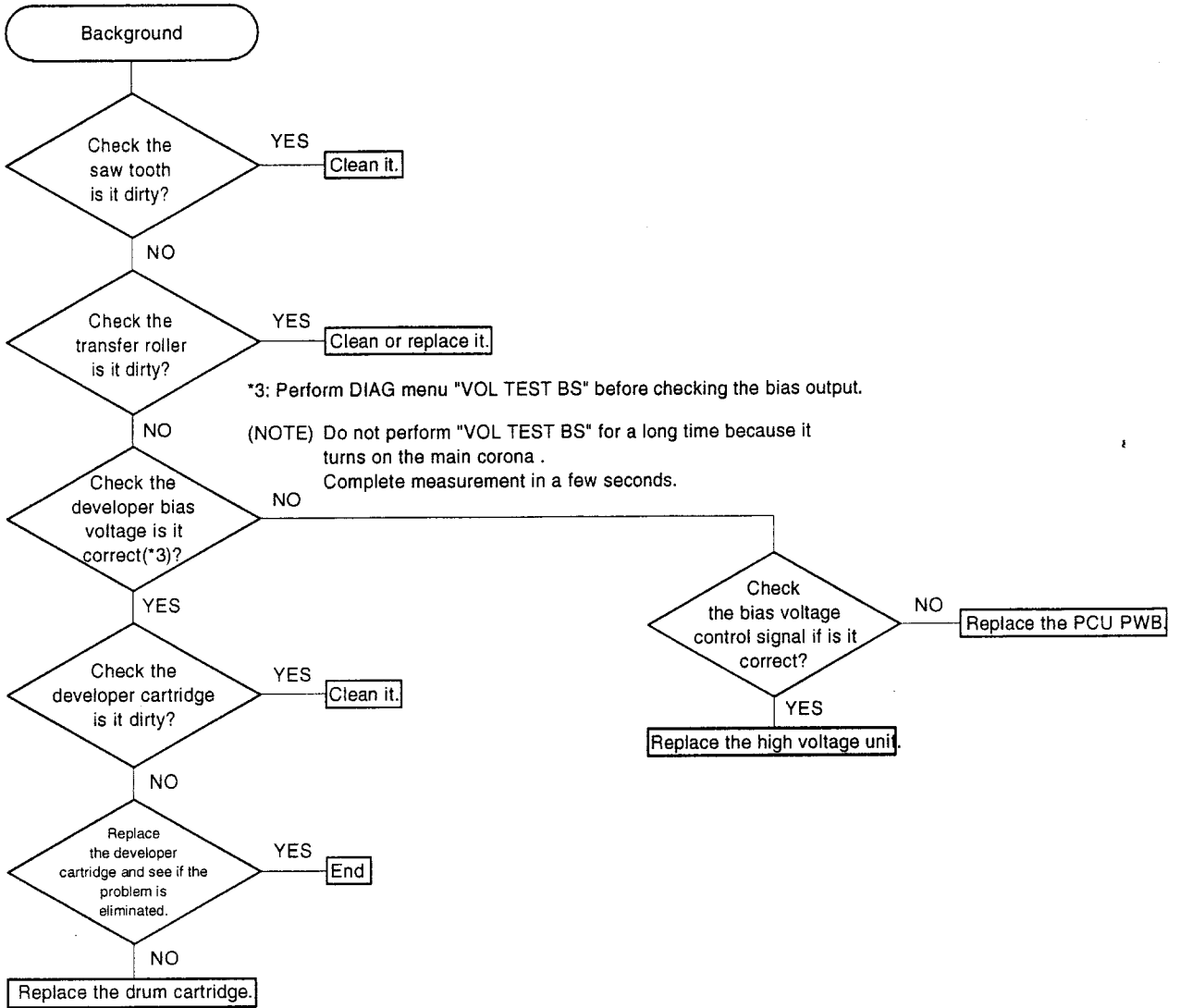
■ Printed image felt rough and toned image easily wiped away with your fingertip



NOTE : Black or white bands may appear in the paper feeding direction if it is an irregular corona discharge.

### Background

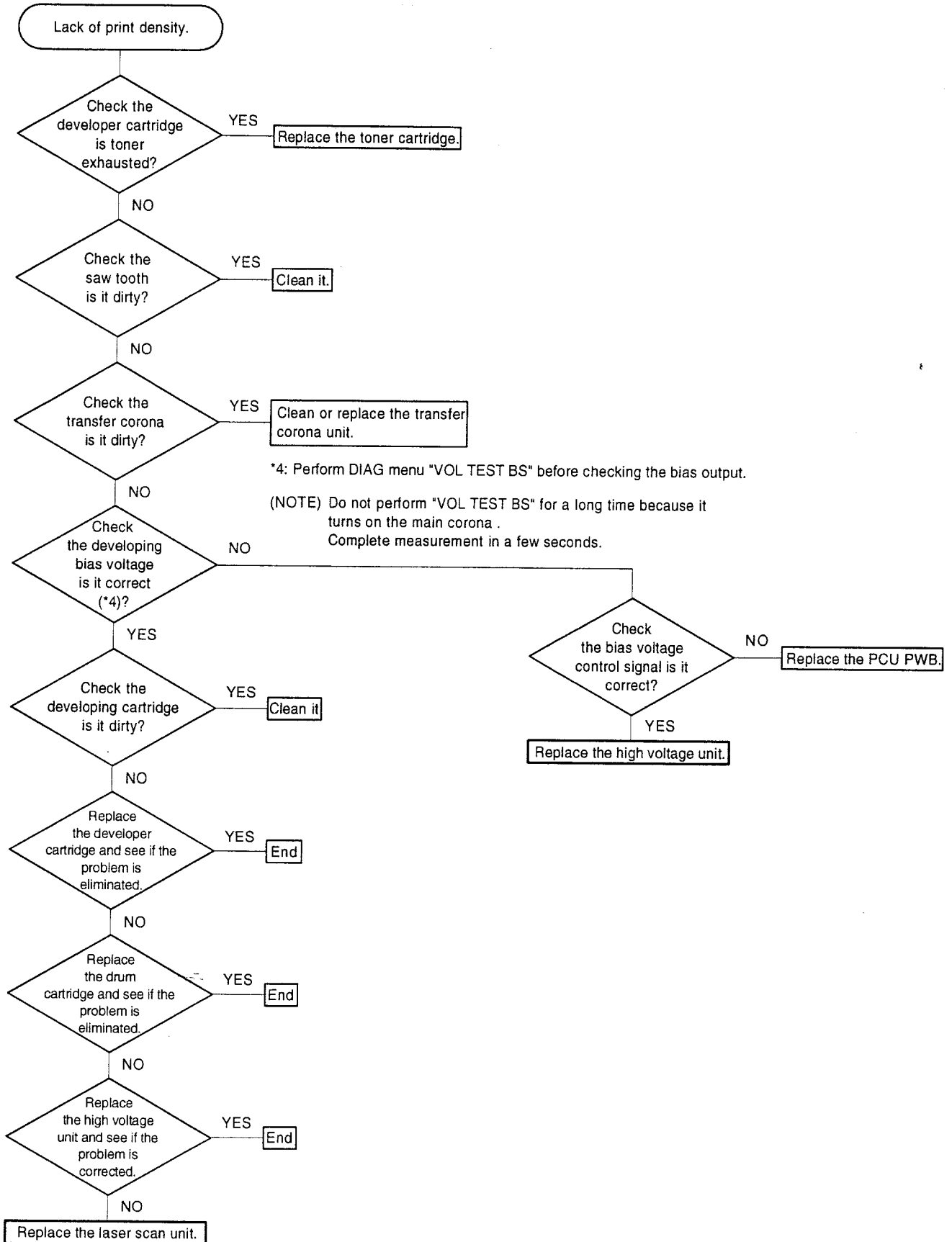
■ Background copied on a part or on the entire area of print





### Lack of print density

■ Extremely light print density



# [17] INTERFACE

The Laser Printer is equipped with the following interfaces:

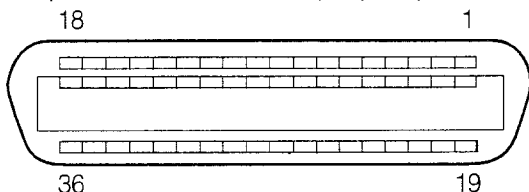
- 1) IEE 1284 Parallel (Standard)
- 2) RS-232C serial (option)
- 3) AppleTalk (option)

This section provides information on the type of connector, pin configuration, pin signals, and signal timing charts.

## 1. IEE 1284 Parallel

### Connector

Female 36-pin DDK 57LE-40360-730B (D29) or equivalent.



### Pin Configuration

The pin numbers and signal names are given in the table below.

1284-B Connector Pin Assignments

PIN #	Source	Mode				
		Compatible	Nibble	Byte (Not used)	ECP	EPP (Not used)
1	H	nStrobe	HostClk	HostClk	HostClk	nWrite
2	Bi-Di*	Data 1 (Least Significant Bit)				AD1
3	Bi-Di*	Data 2				AD2
4	Bi-Di*	Data 3				AD3
5	Bi-Di*	Data 4				AD4
6	Bi-Di*	Data 5				AD5
7	Bi-Di*	Data 6				AD6
8	Bi-Di*	Data 7				AD7
9	Bi-Di*	Data 8 (Most Significant Bit)				AD8
10	P	nAck	PtrClk	PtrClk	PeriphClk	Intr
11	P	Busy	PtrBusy	PtrBusy	PeriphAck	nWait
12	P	PError	AckDataReq	AckDataReq	nAckReverse	User Defined 1
13	P	Select	Xflag	Xflag	Xflag	User Defined 3
14	H	nAutoFd	HostBusy	HostBusy	HostAck	nDStrb
15		Not Defined				
16		Logic Gnd				
17		Chassis Gnd				
18	P	Peripheral Logic High				
19		Signal Ground (nStrobe)				
20		Signal Ground (Data 1)				
21		Signal Ground (Data 2)				
22		Signal Ground (Data 3)				
23		Signal Ground (Data 4)				
24		Signal Ground (Data 5)				
25		Signal Ground (Data 6)				
26		Signal Ground (Data 7)				
27		Signal Ground (Data 8)				
28		Signal Ground (PError, Select, nAck)				
29		Signal Ground (Busy, nFault)				
30		Signal Ground (nAutoFd, nSelectIn, nInit)				
31	H	nInit	nInit	nInit	nReverseRequest	nInit
32	P	nFault	nDataAvail	nDataAvail	nPeriphRequest	User Defined 2
33		Not Defined				
34		Not Defined				
35		Not Defined				
36	H	nSelectIn	1284 Active	1284 Active	1284 Active	nAStrb

\* Data signals will be driven by some but not all peripheral devices.  
Pins not defined by this spec are used by various manufacturers at their own risk.

The 1284-B connector is a 36 signal ribbon type connector.

## MS-DOS/PC-DOS Command

The MS-DOS or PC-DOS command that sets up your computer for communication through its parallel interface is:

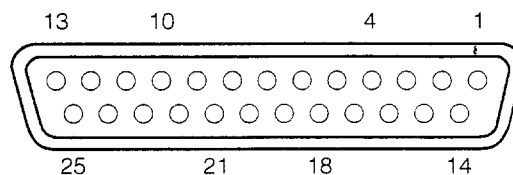
**MODE LPT 1:,,P**

If the LPT port connected to your printer is not LPT1, you need to use the correct LPT port number in the above MODE statements.

## 2. RS-232C Serial

### Connector

Female 25-pin DDK 17LE-13250-28 (D4CK) or equivalent.



### Pin Configuration

The pin numbers and signal names are given in the table below.

PIN	SIGNAL NAME	SOURCE
1	FG (Frame Ground)	...
2	$\overline{\text{TXD}}$ (Transmitted Data)	PRINTER
3	$\overline{\text{RXD}}$ (Received Data)	HOST
4	RTS (Request to Send)	PRINTER
6	DSR (Data Set Ready)	HOST
7	GND (Signal Ground)	...
20	DTR (Data Terminal Ready)	PRINTER

### Signal Descriptions

- Pin 2** ( $\overline{\text{TXD}}$ , printer output):  
Data from the printer to computer.
- Pin 3** ( $\overline{\text{RXD}}$ , printer input):  
Data from the computer to printer.
- Pin 4** (RTS, printer output):  
High signal sent to the computer before the printer transmits.  
This signal is high when the printer power is on.
- Pin 6** (DSR, printer input):  
High signal indicates the computer is ready.  
This signal is not required to receive data.
- Pin 20** (DTR, printer output):  
High signal indicates the printer is ready and low signal indicates the printer is busy.

### Data Format

Start bit 1  
Data bits 8\*  
Stop bit 1  
Parity None\* (EVEN/ODD)

\* The status of these items can be changed.

### MS-DOS/PC-DOS MODE Commands

The first of the MS-DOS and PC-DOS MODE commands listed below sets up your computer's serial interface to match the printer's default serial configuration choices. The second MODE command sets up your computer for communication through its serial interface.

**MODE COM1:9600,N,8,1,P**

**MODE LPT1:=COM1**

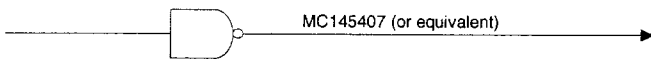
If the COM port connected to your printer is not COM1, you need to use the correct COM port number in the above MODE statements.

### Communication

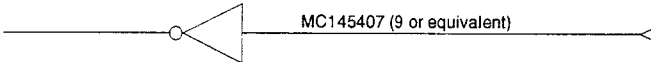
Communication: Start/stop mode ...Asynchronous  
 Baud rate: 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600 bps  
 Transmission: Full duplex  
 Synchronization: Start bit . . . . 1  
 Stop bits . . . 1  
 Data bits . . . 8  
 Internal clock synchronization  
 Error detection: Parity is not used

### Signal levels at RS232C interface

Transmit  
 Signals:  $\overline{\text{TXD}}$ , DTR, RTS



Receive  
 Signals:  $\overline{\text{RXD}}$ , DSR

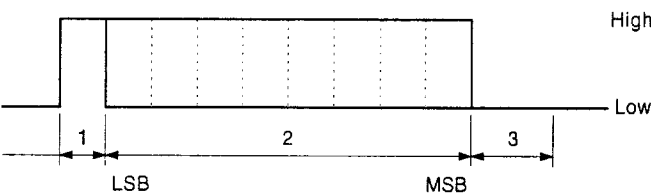


RS232C driven by 5V  
 Driver, Receiver

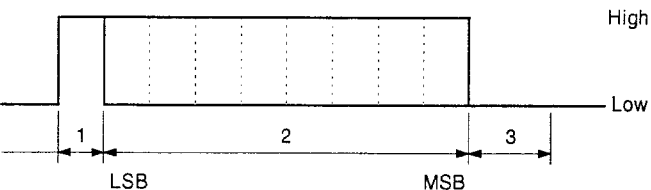
Receive signal level: High ...+3 to +15V  
 Low ... -15 to -3V

Transmit signal level: High ...+3 to +15V  
 Low ...-15 to -5V

Transmit data:  $\overline{\text{TXD}}$



Receive data:  $\overline{\text{RXD}}$

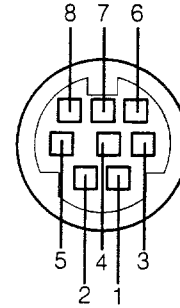


1. Start bit
2. 1-byte data
3. Stop bit(s)

## 3. AppleTalk

### Connector

Female 8-pin TCS7189-01-201 or equivalent.



### Pin Configuration

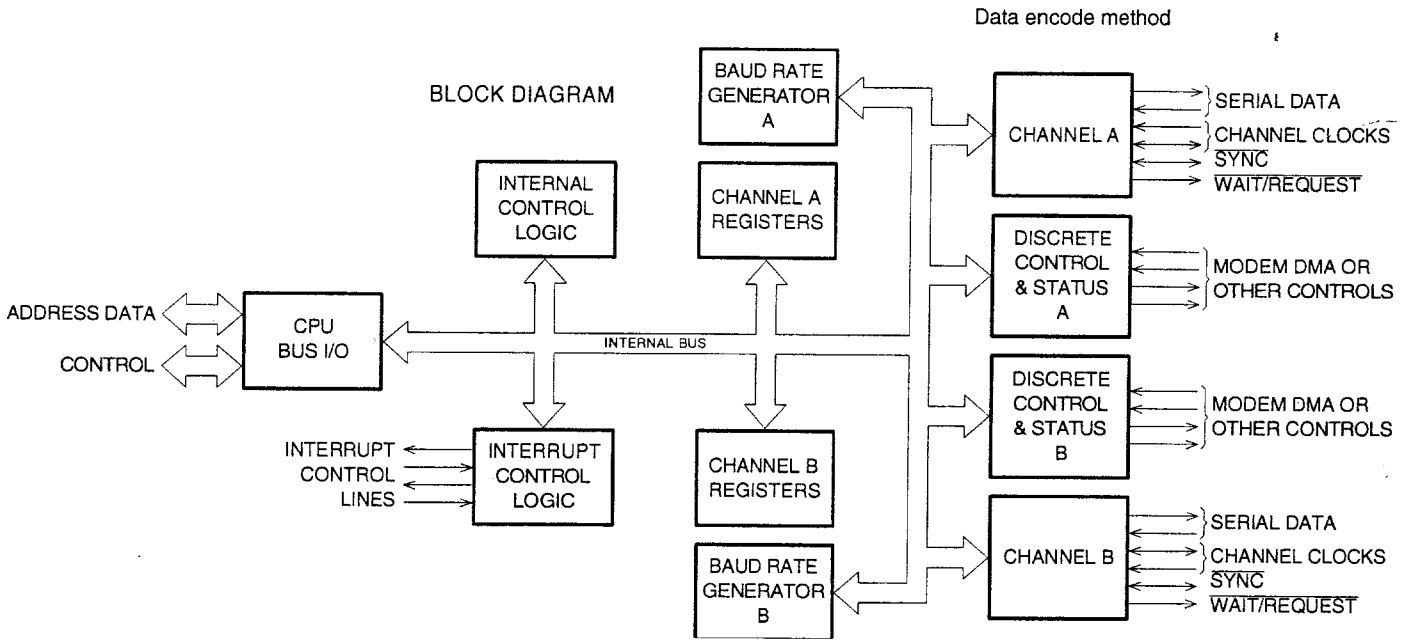
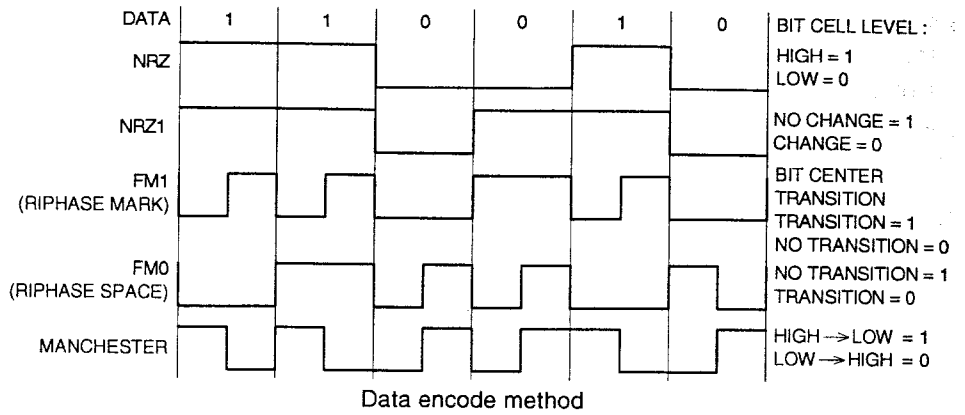
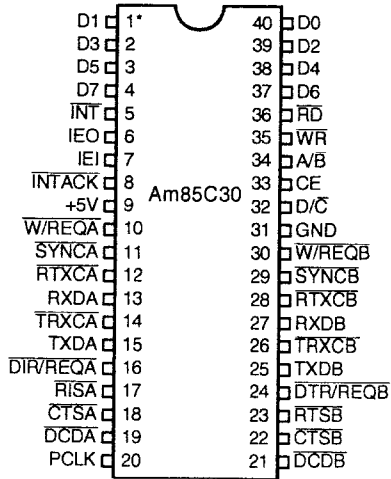
The pin numbers and signal names are given in the table below.

PIN	SIGNAL NAME	SOURCE
3	TXD- (Transmitted Data-)	PRINTER
4	GND (Signal Ground)	...
5	RXD- (Received Data-)	HOST
6	TXD+ (Transmitted Data+)	PRINTER
8	RXD+ (Received Data+)	HOST

### C. Signal Descriptions

- Pin 3** (TXD-, printer output):  
Data from the printer to the computer.
- Pin 5** (RXD-, printer input):  
Data from the computer to the printer.
- Pin 6** (TXD+, printer output):  
Data from the printer to the computer.
- Pin 8** (RXD+, printer input):  
Data from the computer to the printer.

The RS232C circuit is as described in the previous paragraphs.  
 An SCC 85C30 is used for the AppleTalk and runs in the FM mode of the SDLC synchronous protocol.



## [18] MAINTENANCE

- Do not use organic solvents, thinner or volatile cleaning agents to clean the printer. Ammonia-based sprays may also damage the surface of the photoconductor drum. A cloth slightly dampened with alcohol may be used for some cleaning procedures.
- Keep the printer closed when cleaning the area around it.
- Disconnect the printer from the power supply before cleaning.

### 1. Cleaning the Cabinet

Clean the printer cabinet by wiping it with a soft, clean, lint-free cloth. If necessary, dampen the cloth with water. Do not allow liquids of any kind to run into any of the openings on the printer. You may carefully wipe any marks that do not come off easily with a lint-free cloth slightly dampened with cleaning alcohol. Do not scrub at any text printed on the printer cabinet.

### 2. Cleaning the Paper Feed Section

Toner may escape into the printer. When paper jams, it may have toner on it that falls off before it is fused. Toner may also get spilled if you move the printer or remove the toner/developer cartridge. Besides toner, dust from paper can also impair the working of the printer. There are several places along the paper path that may need to be cleaned if printed papers show streaks, blotches or other dirty marks.

#### (1) Cleaning the Manual Feed Section

You should wipe the manual feed slot during routine cleaning. Occasionally, or if the need arises because hand-fed media has unusual markings after printing, you should clean the whole manual feed area. After removing the manual feed guide from the manual feed slot, wipe the slot using a lint-free cloth slightly dampened with cleaning alcohol if necessary. You must be careful when inserting and moving cleaning materials in the manual feed slot. There is a delicate media sensor lever just inside the right hand area of the slot. Lateral pressure can easily damage this lever, so you should be careful when cleaning near it.

#### (2) Cleaning the Autofeed Feed Section

The area where the paper is picked up from the paper cassette is accessible after removing the photoconductor cartridge. You can clean the interior surfaces of the printer and the set of rubber rollers in the interior slot.

Before cleaning the inside of the printer, it is necessary to remove the photoconductor cartridge to gain access. You should also remove the toner/developer cartridge because it is easy to pick up developer from the open charger slot and deposit it on the rollers. Be very careful with the photoconductor cartridge because it is easily damaged by impacts and abrasion. To avoid toner spills, after you remove the toner/developer cartridge, put it down on a clean, level and uncluttered surface, in a place where it is unlikely to be knocked over.

When the photoconductor cartridge is out of the printer, you will see the opening at the front of the interior of the printer and three of the rollers that carry the paper up from the cassette and along the print path. The interior may be wiped with a lint-free cloth. If necessary, you may use a cloth slightly dampened with alcohol to clean the surfaces and the rollers. There are other rollers, too, beyond the readily accessible set of rollers. The presence of easily-damaged paper feed guide sheets made of thin plastic makes it difficult to clean these interior rollers. The cleaning of these inner rollers is best left to qualified service personnel.

When cleaning inside the printer, avoid touching the gears. They are coated with grease and will soil hands and cleaning cloths.

### 3. Cleaning the Charger Unit

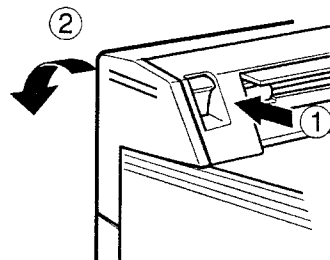
If printouts show streaks and blotches, it is probably because the corona wires are dirty. They are easy to clean with the charger cleaner, which is a special combination tool stored in a slot at the back of the printer.

You have to draw the tool along the parts indicated on the following pages, and its brushes and scrapers will clear away any accumulations of stray toner particles. The main charger is under the photoconductor cartridge and the transfer charger is inside the front cover.

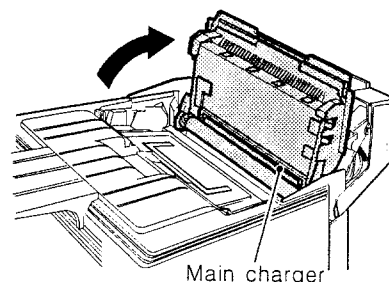
The charger cleaner is simple to use, but it does require a certain technique. Read the instructions carefully before using it. In both instances, draw the charger cleaner all the way along the parts. Do not withdraw it halfway. When cleaning the transfer charger, the direction of movement is also important.

#### (1) Cleaning the Main Charger Unit

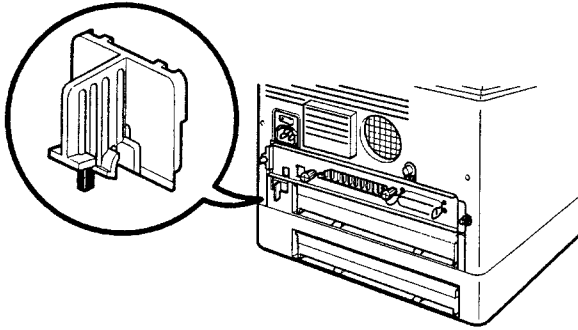
- 1) Disconnect the printer from the electrical supply.
- 2) Open the front cover by ① pushing the cover release lever and ② pulling down from both sides.



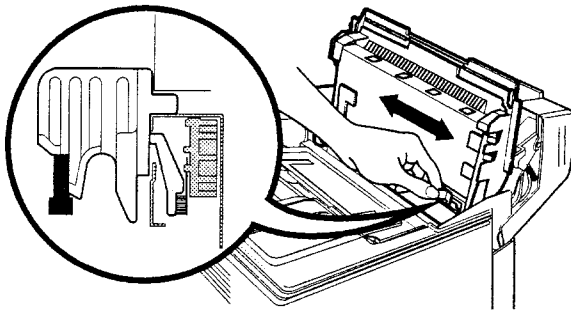
- 3) Raise the photoconductor cartridge to a vertical position by putting your hand into the opening between the face down tray and the photoconductor cartridge, squeezing the catch under the lip of the photoconductor cartridge, and pivoting the cartridge into a vertical position.



- 4) Remove the charger cleaner from its slot under the power socket at the rear of the printer.



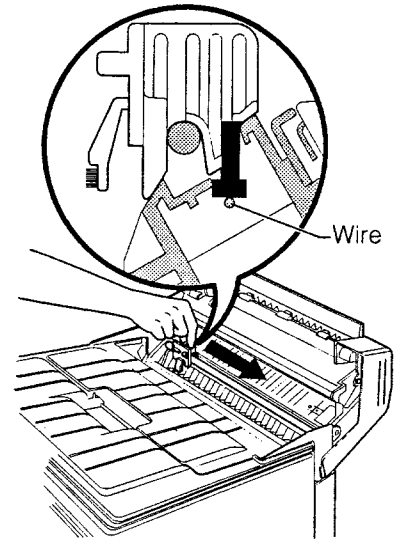
- 5) The main charger is located inside the slot at the base of the raised photoconductor cartridge. A flexible plastic flap is fitted along the inside of the slot. Insert the red brush into one extreme end of the slot. The lug above the brush on the charger cleaner fits into the groove above and parallel to the slot in the photoconductor cartridge. Draw the charger cleaner all the way along the main charger to the other end of the slot, either to the left or the right. Go the complete width, from one side of the cartridge to the other. Do not take the charger cleaner out halfway.



- 6) Put the charger cleaner back into its slot at the rear of the printer.
- 7) Pivot the photoconductor cartridge gently back into place.
- 8) Close the front cover.

## (2) Cleaning the Transfer Charger Unit

- 1) Carry out steps one and two to open the front cover in the same way as for the main charger on the preceding page. Do not move the photoconductor cartridge. Leave it in place.
- 2) The transfer charger is on the open side of the front cover. The black indented edge of the charger cleaner fits over the wire and the other angled scraper surfaces fit against other parts of the printer as shown in the illustration. Look at the printer from the side and use the illustration as a guide when applying the charger cleaner to the transfer charger. The direction of movement is important. Looking at the open printer from the back, draw the charger cleaner from left to right along the wire. Going in the opposite direction may damage the wire. Make one complete sweep, from the left end of the wire to the right end. Do not stop halfway.



- 3) Put the charger cleaner back into its slot at the rear of the printer.
- 4) Close the front cover.

## [19] Disassembly, assembly

### CAUTION FOR SERVICING

NEVER TOUCH THE AC/DC POWER PWB WITH THE AC CORD CONNECTED TO THE POWER OUTLET. IT MAY CAUSE A DANGEROUS ELECTRIC SHOCK.

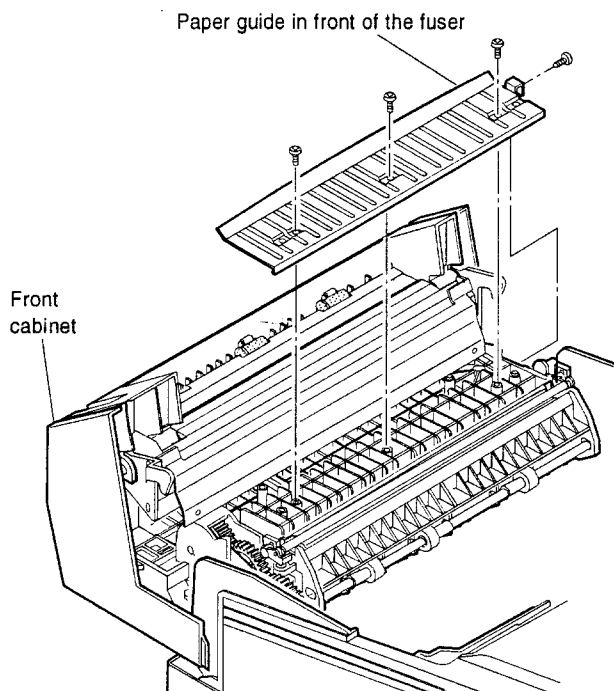
This section describes the disassembly and assembly procedure. The descriptions include the following:

- A description is given for disassembly, re-assembly should be done in the reverse sequence. Where specific caution is required, warnings are given.
- Disassembly and re-assembly items include the units and/or parts which may require replacement during maintenance level. The following description shows these units or parts.
- Describes the screws whose locations may be difficult to find, units or parts which must be removed in a specified order or require a special technique. The following description does not include the units or parts for which the re-assembly procedure is obvious.
- The cable clamp etc. are excluded from the description unless it requires special attention. Location of such items must be checked before its removal from the machine.
- Positions to be lubricated, see figures and descriptions.
- The optical system unit must be replaced as a whole unit without disassembly.
- All the disassembly procedures in this manual require disassembly of the front cabinet and the upper cabinet in advance.

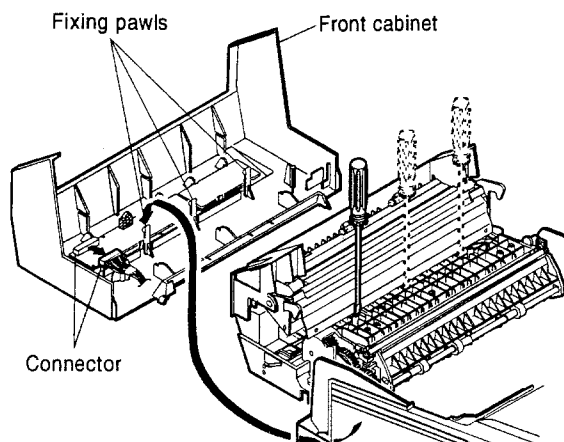
### 1. Cabinet/Operation panel disassembly

#### Front cabinet disassembly

- Remove the drum cartridge and the developer cartridge.
- Remove the paper guide in front of the fuser. (4 screws)

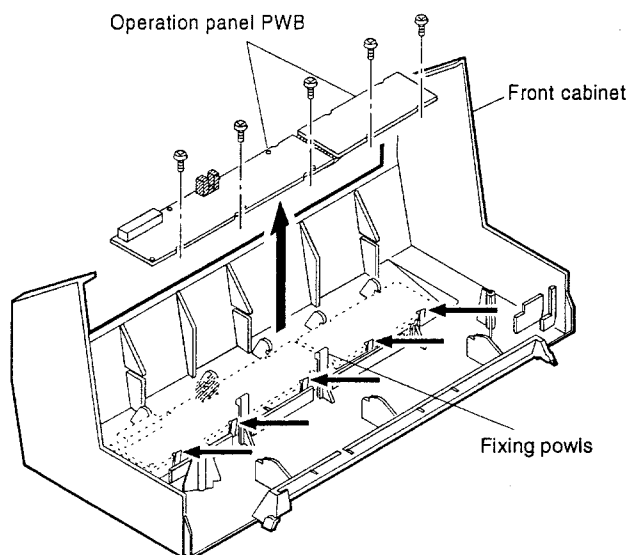


- Disengage three pawls which are fixing the front cabinet.
- Remove the front cabinet and disconnect the connector.



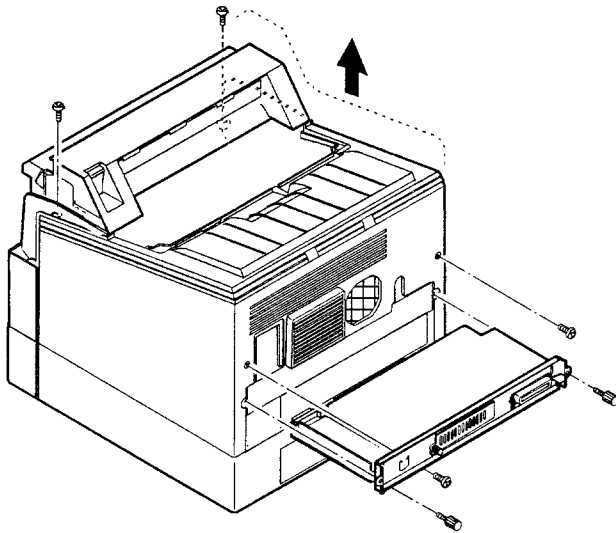
#### Operation panel unit disassembly

- Remove the front cabinet.
- Disengage five pawls which are fixing the panel PWB.



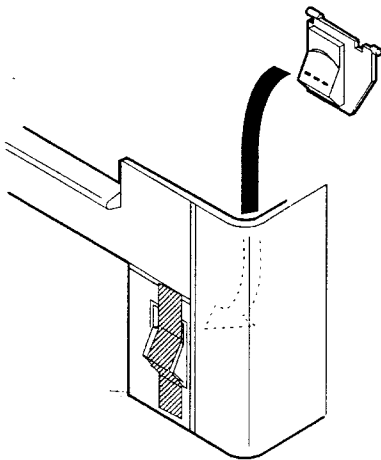
### Upper cabinet disassembly

1. Remove the front cabinet.
2. Remove four screws which are fixing the upper cabinet.
3. Remove the Font card cover.
4. Remove the ICU unit
5. Pull out the upper cabinet upwards.



#### Note for assembly

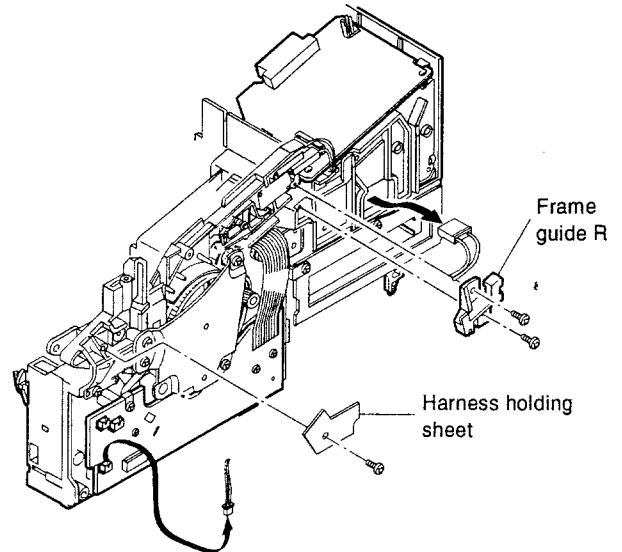
1. When removing the upper cabinet, be careful not to damage the harness. (Arrange the harness so that it does not extrude from the upper frame.)
2. When attaching the upper cabinet, it is advisable to use adhesive tape to attach the cassette button.



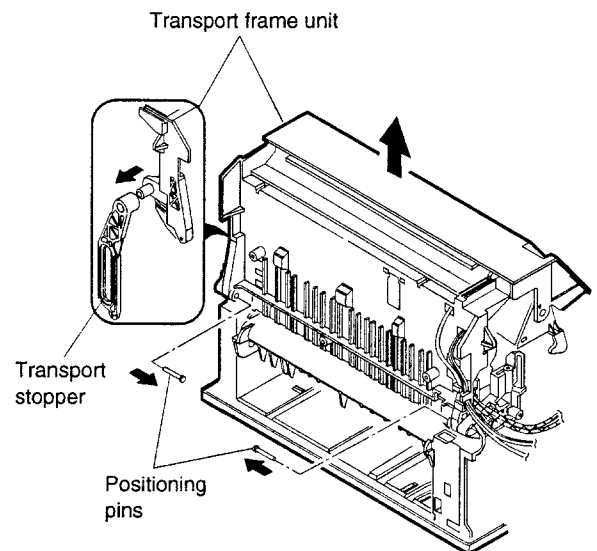
## 2. Paper feed and transport section disassembly

### (1) Paper transport frame unit disassembly

1. Remove the front cabinet and the upper cabinet.
2. Remove the frame guide R. (2 screws)
3. Remove the harness holding sheet. (1 screw)
4. Disconnect the connector of the thermistor.



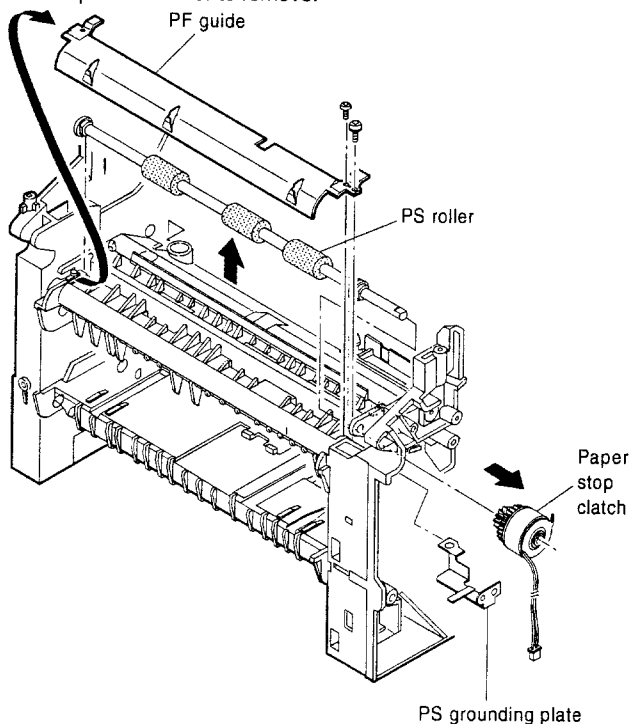
5. Remove two positioning pins.
6. Remove the paper transport unit from the transport stopper and pull it out upwards.





### (2) PS roller disassembly

1. Remove the drive unit. (Refer to 8-1-7)
2. Remove the electromagnetic clutch (PS clutch).
3. Remove two screws which are fixing the PF guide.
4. Remove the PF guide and the PS grounding plate simultaneously.
5. Pull up the PS roller to remove.



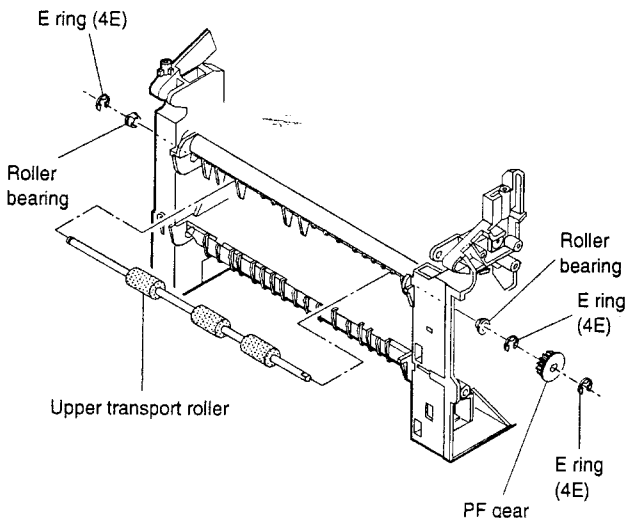
### (3) Upper transport roller and PIN sensor disassembly

1. Remove the drive unit.
2. Remove the right and the left E rings, and remove the PF gear.
3. Remove the right and the left roller bearings.

Note: Note that the bearings are identified by their colors.  
 The right bearing : Black  
 The left bearing: White

4. Remove the roller.

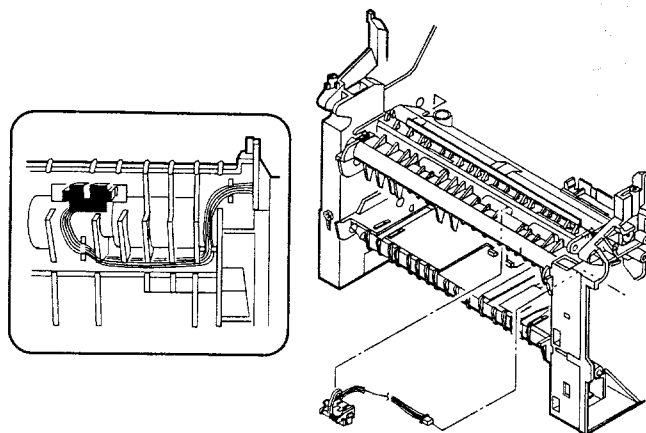
(Reference) The lower transport roller can be removed in the same manner.



Note: Since the right bearing is grounded, check to confirm that the grounding spring and the bearing are in contact when

assembled.

5. Remove the PIN sensor pawl and remove the PIN sensor.  
 When attaching the PIN sensor, process the lead wire properly.



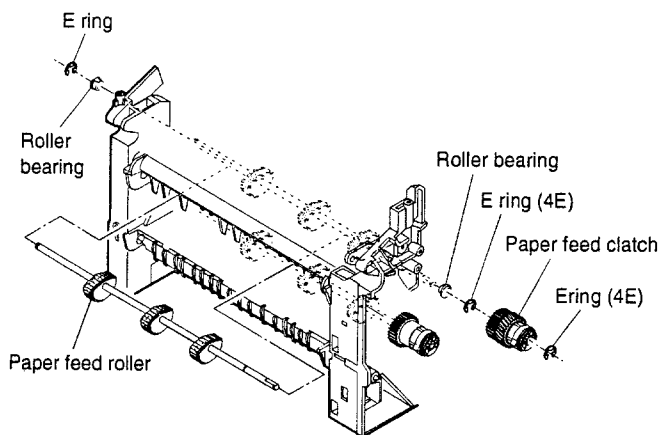
### (4) Paper feed roller (pickup) upper disassembly

1. Remove the drive unit. (Refer to 8-1-7)
2. Remove E-ring (4E) and remove the paper feed clutch (spring clutch).
3. Remove the right and the left E-rings and remove the bearing.

Note 1: The bearings are identified with their colors.  
 The right bearing: Black  
 The left bearing: White

4. Remove the paper feed roller.

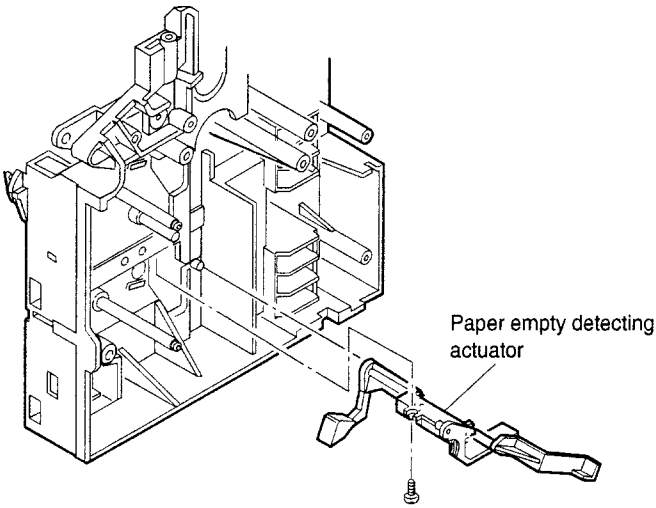
(Reference) The lower paper feed roller can be removed in the same manner.



Note 2: Since the right bearing is grounded, check to confirm that the grounding spring and the bearing are in contact when assembled.

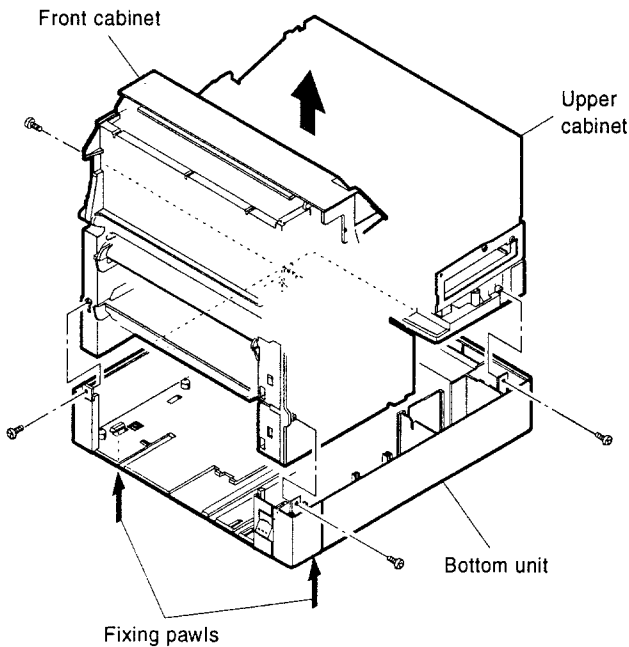
**(5) Paper empty detector disassembly**

1. Remove the drive unit, the lower transport roller and the lower paper feed roller.
2. Remove the screw which is fixing the lower cassette paper empty detecting actuator (PEL).
3. Slide the paper empty detecting actuator to the right (when viewed from the front) to remove.



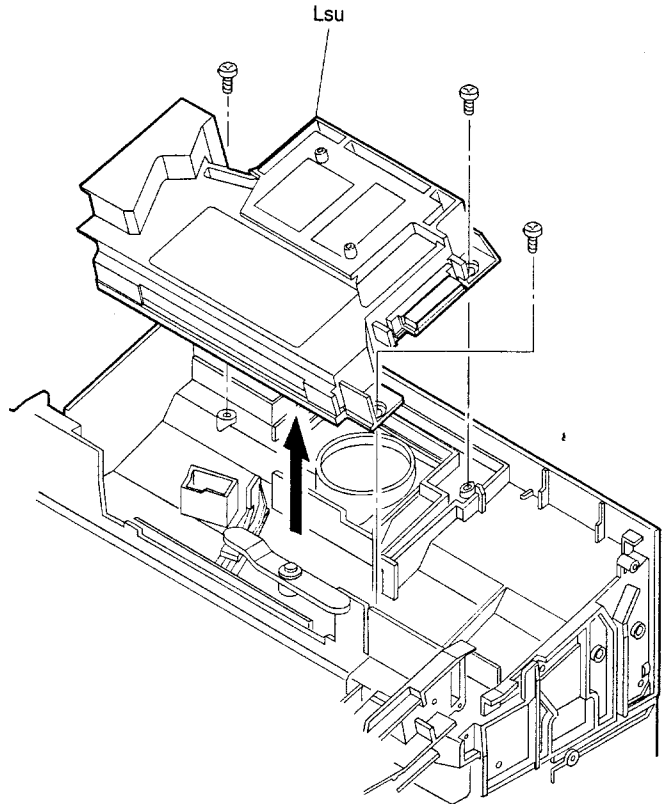
**(6) Lower paper cassette section disassembly**

1. Remove the upper cabinet and the front cabinet.
  2. Remove four screws which are fixing the bottom unit.
  3. Disengage two pawls of the bottom and remove the bottom unit.
- \* Be careful not to break the pawl.



**3. Optical unit disassembly.**

1. Remove the front cabinet and the upper cabinet.
2. Remove the PCU.
3. Remove three screws which are fixing the optical unit.



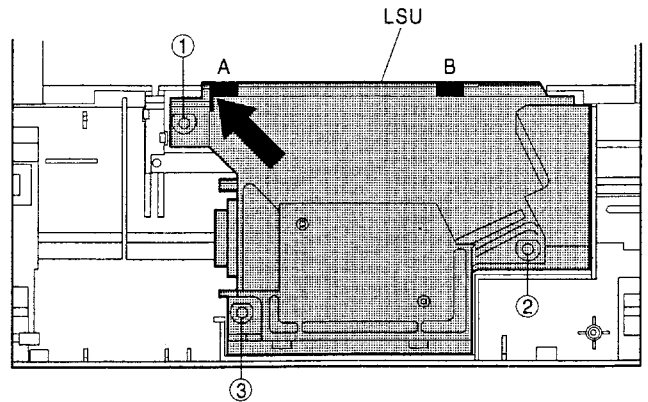
Note 1: The bottom of the optical unit is open. Do not touch the bottom surface. Place it on a flat surface. Be careful not to allow dust to enter the unit.

Note 2: Never disassemble the optical unit.

Note 3: Do not operate the machine with the optical unit disassembled.

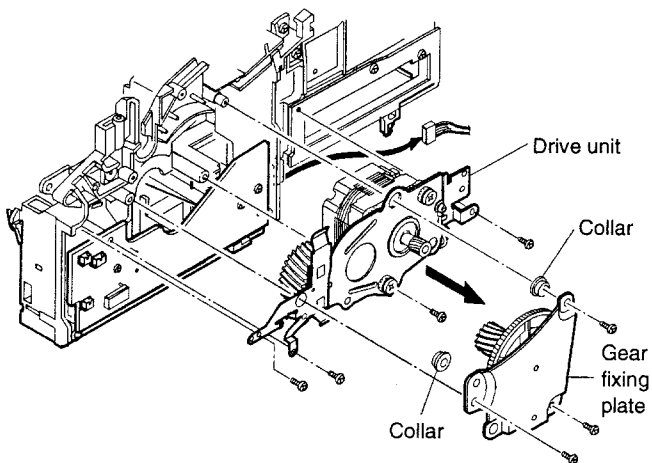
**Reassembly** For reassembly of the optical unit, follow the procedure below:

1. Fit the unit with corner A and press in direction B.
2. Fix the unit with screws. (Tighten screws in the sequence of ①, ②, and ③.)



#### 4. Drive unit disassembly

1. Remove the front cabinet and the upper cabinet.
2. Remove three screws which are fixing the gear fixing plate.
3. Remove the gear fixing plate ass'y.
4. Remove four screws which are fixing the drive unit.
5. Slide the drive unit to the right (when viewed from the front) to remove.

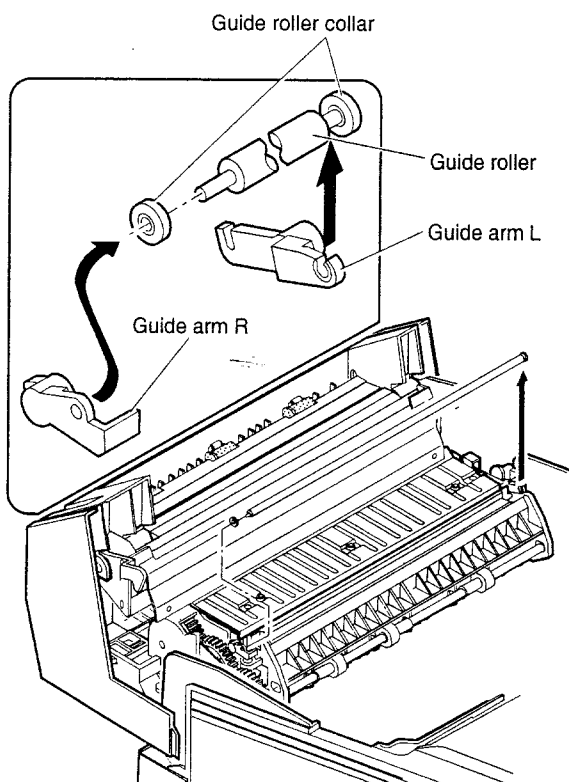


\* The collars are provided to protect the harness. Be careful to observe the correct direction when installing the collars.

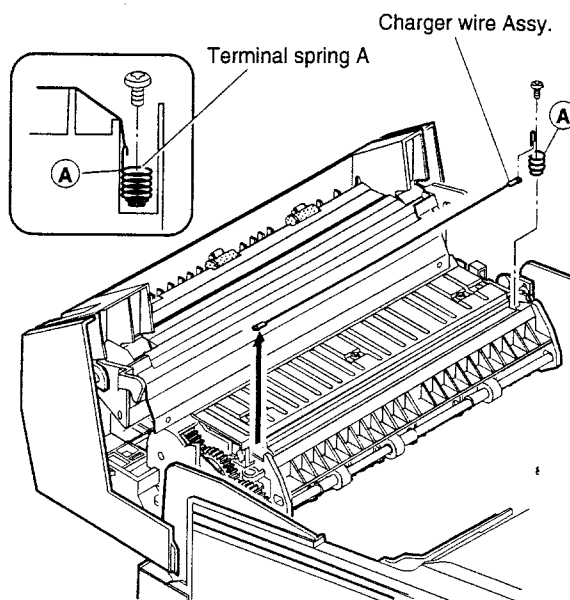
#### 5. Transfer charge wire replacement procedure

(Disassembly)

1. Remove the drum cartridge and the DV cartridge.
2. Open the transport unit and remove the guide roller from the guide arm.



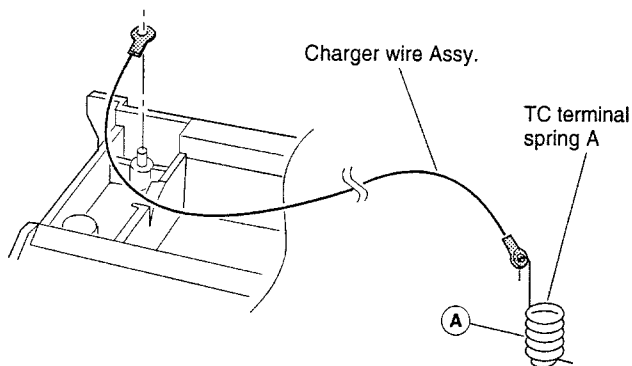
3. Remove the fixing screw of TC terminal spring A, and remove TC terminal spring A together with the wire.
4. Disconnect the other end of the wire terminal from the transport frame.



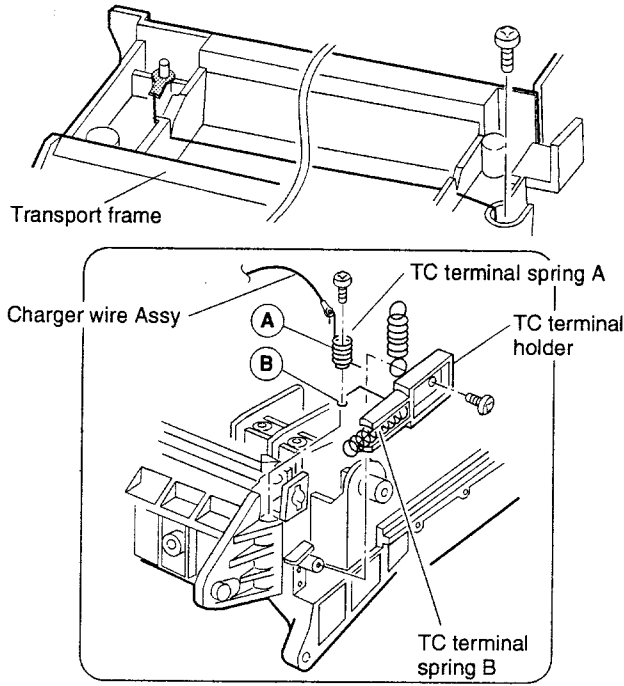
5. Remove TC terminal spring A from the wire.  
(Assembly)

Note: When attaching the wire, hold the both terminals of the wire.

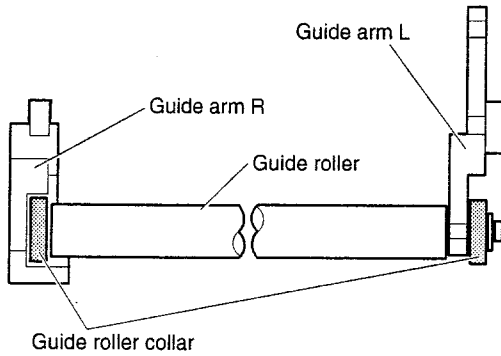
1. Engage one end of the charger wire Assy terminal with the boss of the transport frame.
2. Hang TC terminal spring A on the other end of the charger wire Assy.



- Put the wire along the V-groove in the frame and tighten TC terminal spring A together with TC spring B with M2.6 screw.

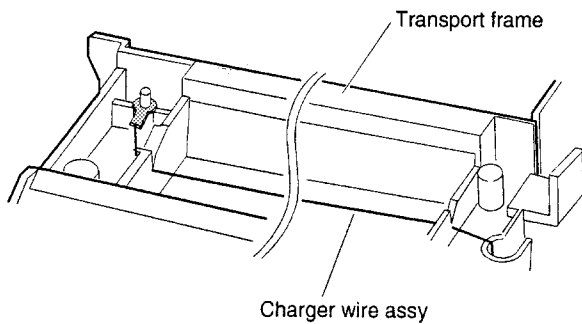


- Attach the guide roller to the guide arm. (Put the left-side collar to the outside of the guide arm L.)



**Note:**

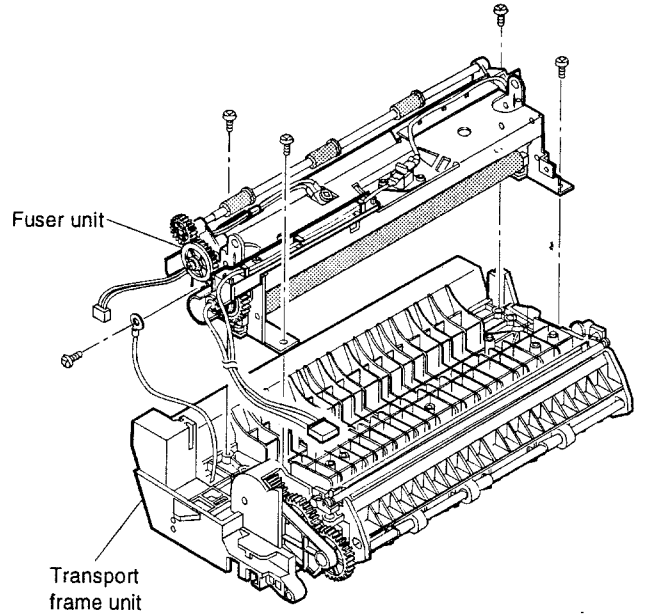
- Do not fold the wire.
- Do not touch the wire (printing area) with bare hand.
- Be sure to place the wire securely in the V-groove in the frame.



## 6. Fusing unit disassembly

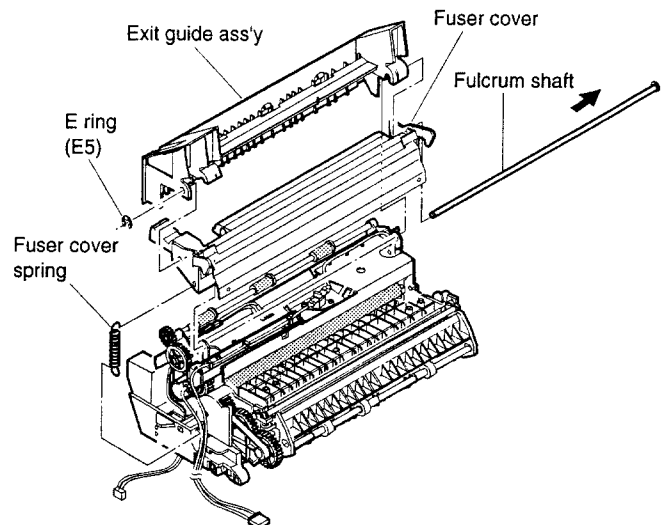
### (1) Fusing unit disassembly

- Remove the front cabinet, the upper cabinet, and the transport frame unit.
- Remove the four screws which are fixing the fuser unit.
- Remove the screw for GND harness.
- Cut the band which fixes the thermistor lead with to the transport frame.
- Remove the harness holding sheet and the guide frame R.

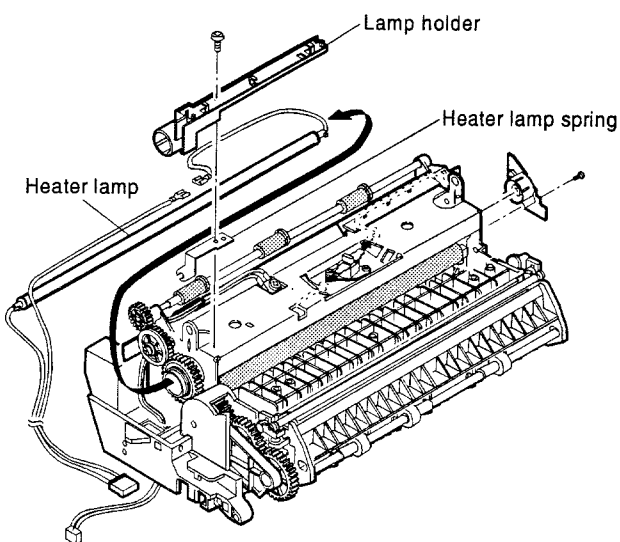


### (2) Heater lamp disassembly

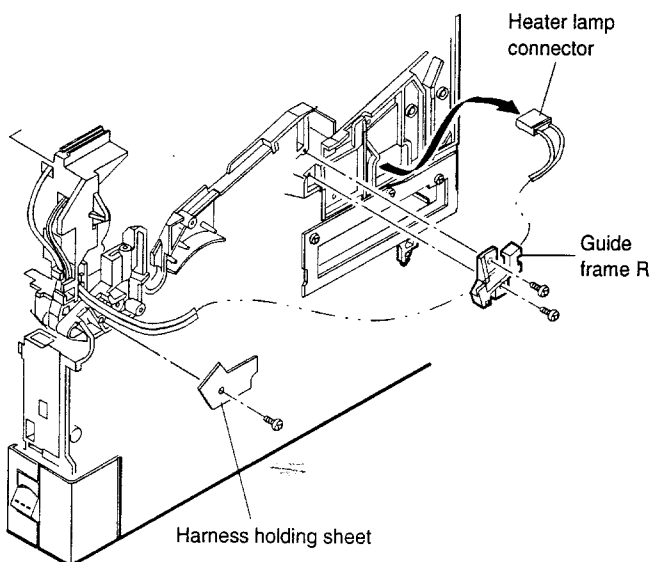
- Remove the front cabinet and the upper cabinet. (Refer to 8-1-1 and 8-1-3)
- Remove the E-ring (E5) which is fixing the paper exit guide ass'y by sliding the fulcrum shaft.
- Remove the paper exit guide ass'y.
- Remove the fuser cover spring and remove the fuser cover.



5. Disconnect the heater fasten terminal from the thermostat.
  6. Remove the heater lamp holder, and heater lamp spring.
  7. Slide the heater lamp to the right when viewed from the front to remove.
- \* When removing the heater lamp, do not pull the lead wire. (The nickel-chrome wire may be extended.) Hold the insulator and the glass to pull.



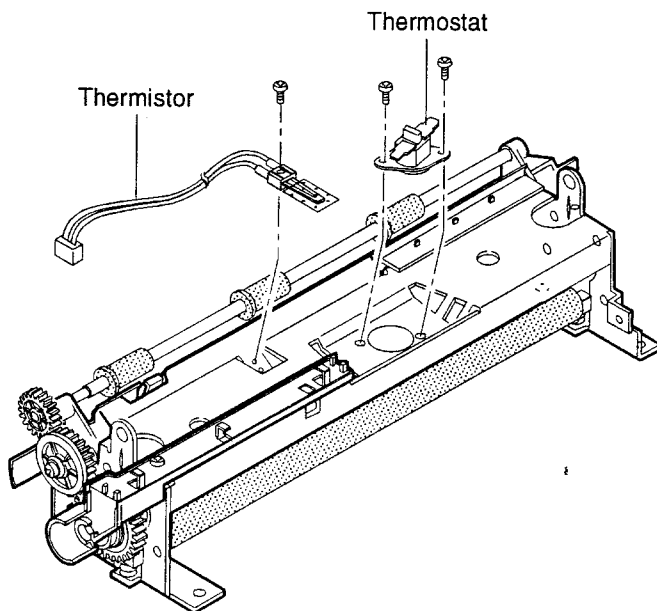
6. Remove the harness holding sheet (one screw) and the guide frame R (two screws).
7. Disconnect the connector from the power unit.



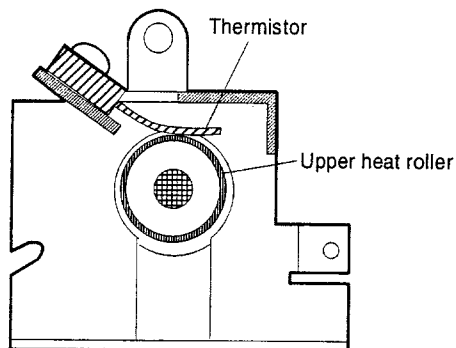
Note: When assembling the lamp, be careful of the harness wiring.

### (3) Thermistor replacement

1. Remove the fuser unit.
2. Remove the screw which is fixing the thermistor and remove the thermistor.

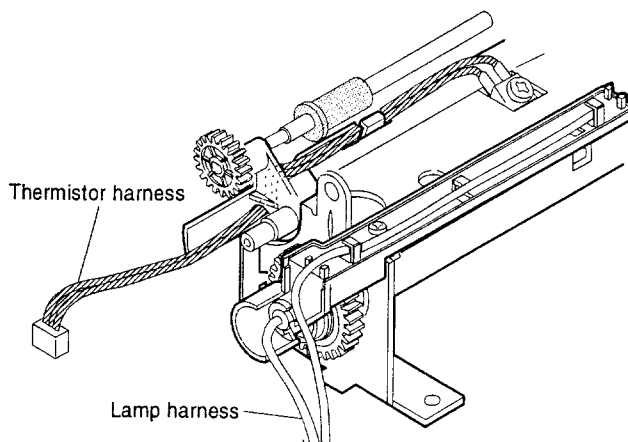


Note 1: For assembly of the thermistor, refer to the figure below and check that the thermistor is in contact with the heat roller.



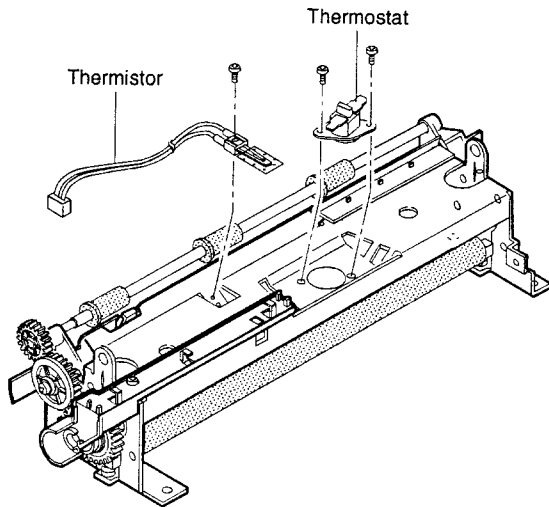
Note 2: Place the thermistor so that the positioning projection is on the lower side.

Note 3: For wiring of the thermistor harness, remove slack in the harness and fix with the binding band. Be careful not to allow the harness to contact the paper exit roller and the gears.



#### (4) Thermostat disassembly

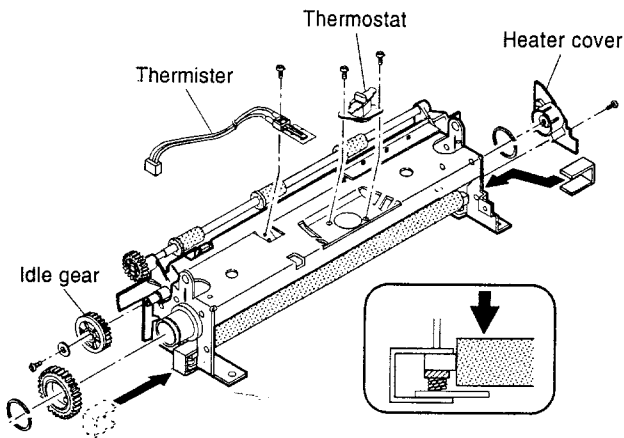
1. Remove the fuser unit.
2. Remove two screws which are fixing the thermostat, and remove the thermostat.



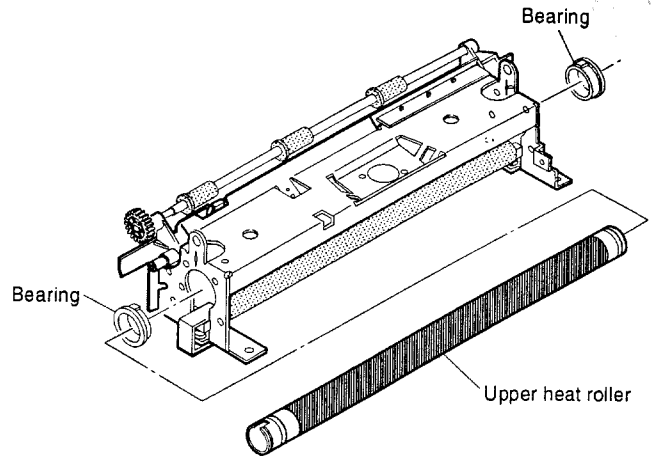
Note: When assembling, check that the clearance between the thermostat and the heat roller is  $0.75 \pm 0.25\text{mm}$ .

#### (5) Heat roller disassembly

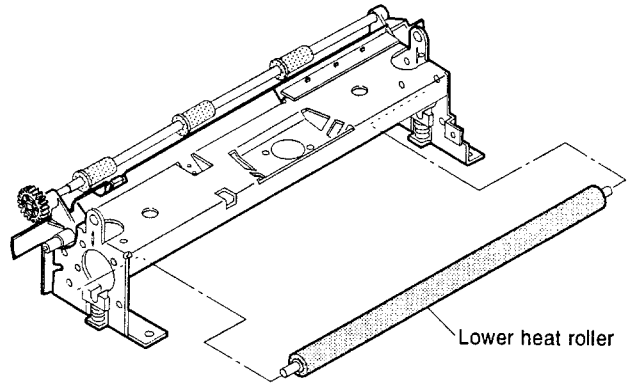
1. Remove the fuser unit.
2. Remove the heater lamp.
3. Remove the idler gear and heat roller gear.
4. Remove the heater cover.
5. Use the heat roller replacement jig to release the pressure. Remove the thermistor and the thermostat.
6. Remove two C-rings (one in the right and one the left).



7. Remove the bearings (one in the right and one in the left).
8. Remove the upper heat roller.

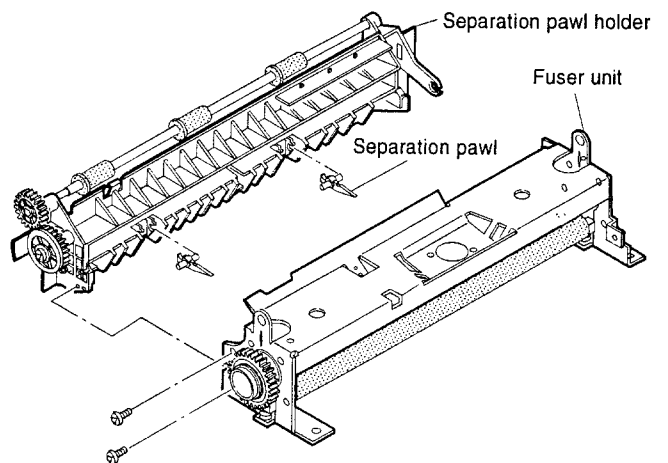


9. Remove the lower heat roller.



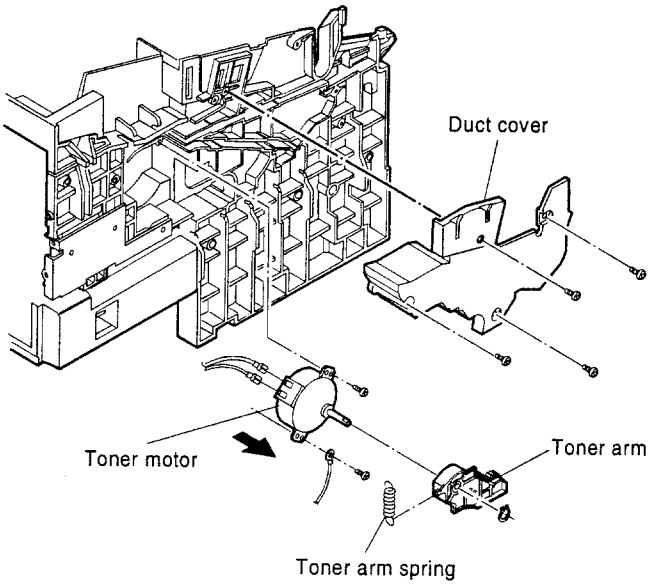
#### (6) Fusing separation pawl disassembly

1. Remove the fuser unit.
2. Remove two screws which are fixing the separation pawl holder.
3. Slide the separation pawl first to the left when viewed from the front, and disengage the right side.
4. Remove the separation pawl.



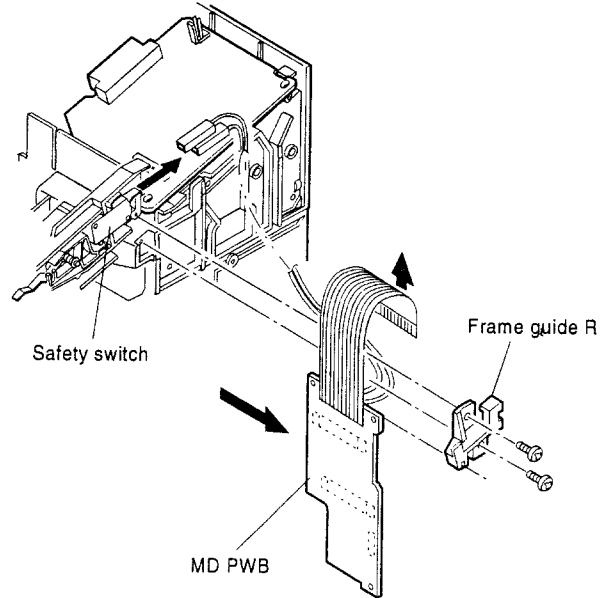
## 7. Toner motor disassembly

1. Remove the drive unit.
2. Remove the duct cover
3. Remove the toner arm spring.
4. Remove two screws which are fixing the toner motor, and remove the toner motor.



## (2) MD (Motor Drive) PWB disassembly

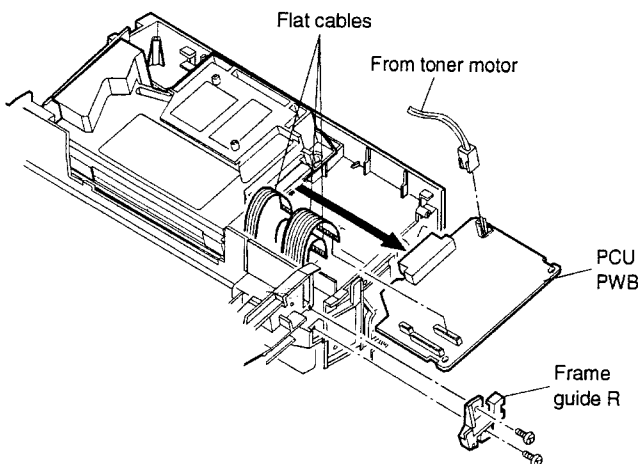
1. Remove the drive unit.
2. Remove the screw which is fixing the PWB chassis, and slide the PWB chassis.
3. Remove two terminals of the safety switch.
4. Pull out the flat cable.
5. Slide the MD PWB to the right (when viewed from the front) to remove.



## 8. PWB disassembly

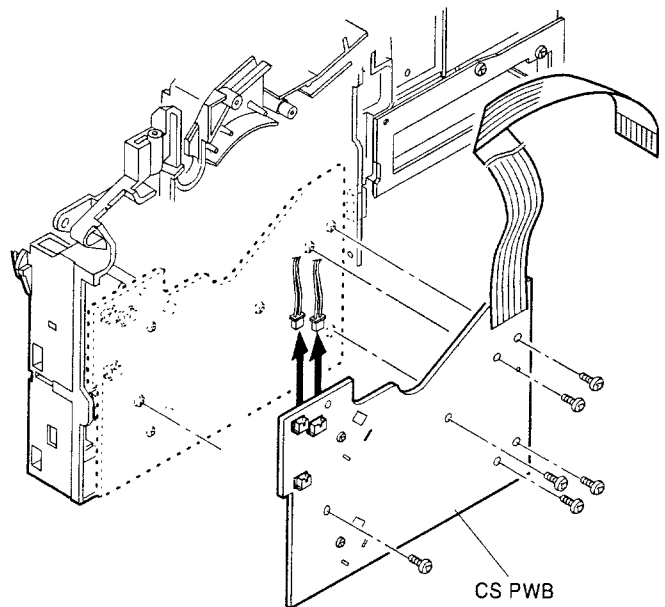
### (1) PCU disassembly

1. Remove the front cabinet and the upper cabinet.
2. Remove the frame guide R. (2 screws)
3. Disconnect three flat cables and two connectors.
4. Slide PCU to the left (when viewed from the front) to remove it.



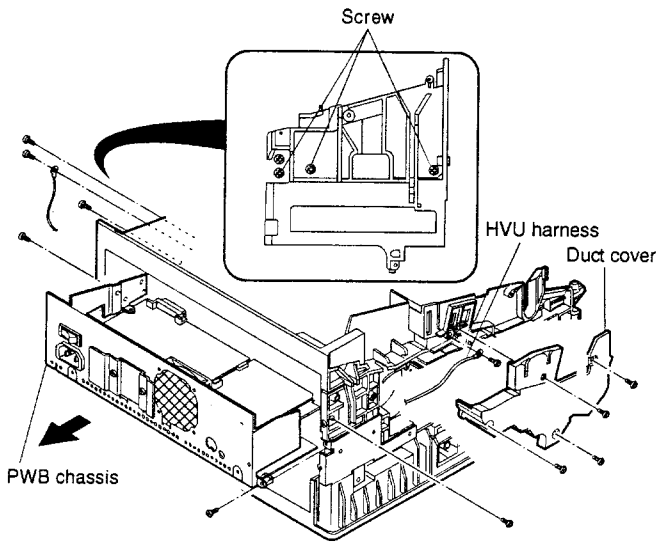
### (3) Cassette PWB (CS PWB) disassembly

1. Remove the front cabinet, the upper cabinet, and the bottom unit.
2. Disconnect three connectors.
3. Remove seven screws which are fixing the PWB and remove it.



#### (4) Power PWB and high voltage PWB disassembly

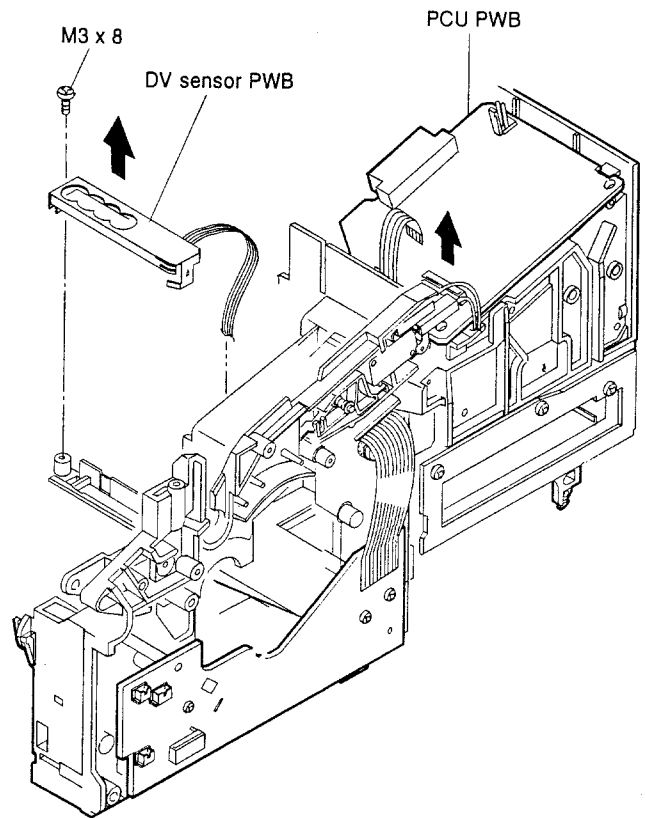
1. Remove the front cabinet and the upper cabinet.
2. Remove the duct cover.
3. Remove the high voltage unit cable (red one).
4. Remove the screws (3 in the right, 1 in the left) which are fixing the bottom plate, and pull out the power chassis.



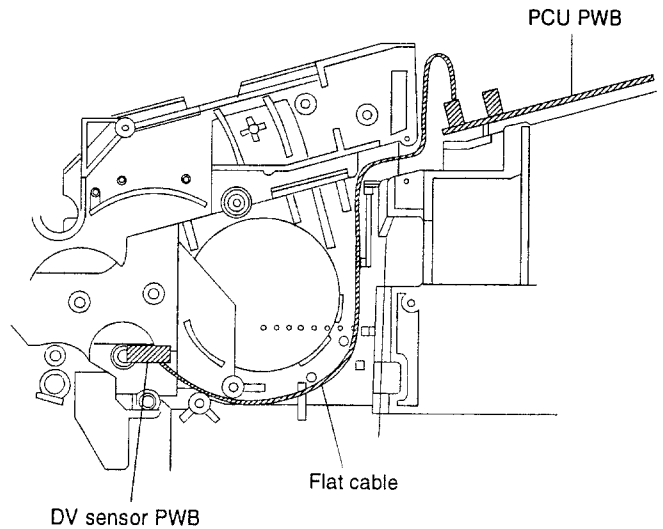
#### 9. Other parts disassembly

##### (1) Developer unit detector disassembly

1. Remove the drive unit. (Refer to 1-7)
2. Disconnect the cable from the PCU PWB connector (CN103).
3. Remove the screw which is fixing the DV sensor PWB and remove the PWB.



Note: When assembling the sensor PWB, be careful of the wiring.





## [20] OTHERS

### 1. Hex dump mode

Hex Dump mode is used by programmers to analyse the print codes when testing programs related to printing. All incoming data is printed in hexadecimal code, which includes all print instructions. In Hex Dump mode, you will probably have to take the printer off-line and press **FORM FEED** to print the last page of data, as the printer will be unable to recognise the end of job code.

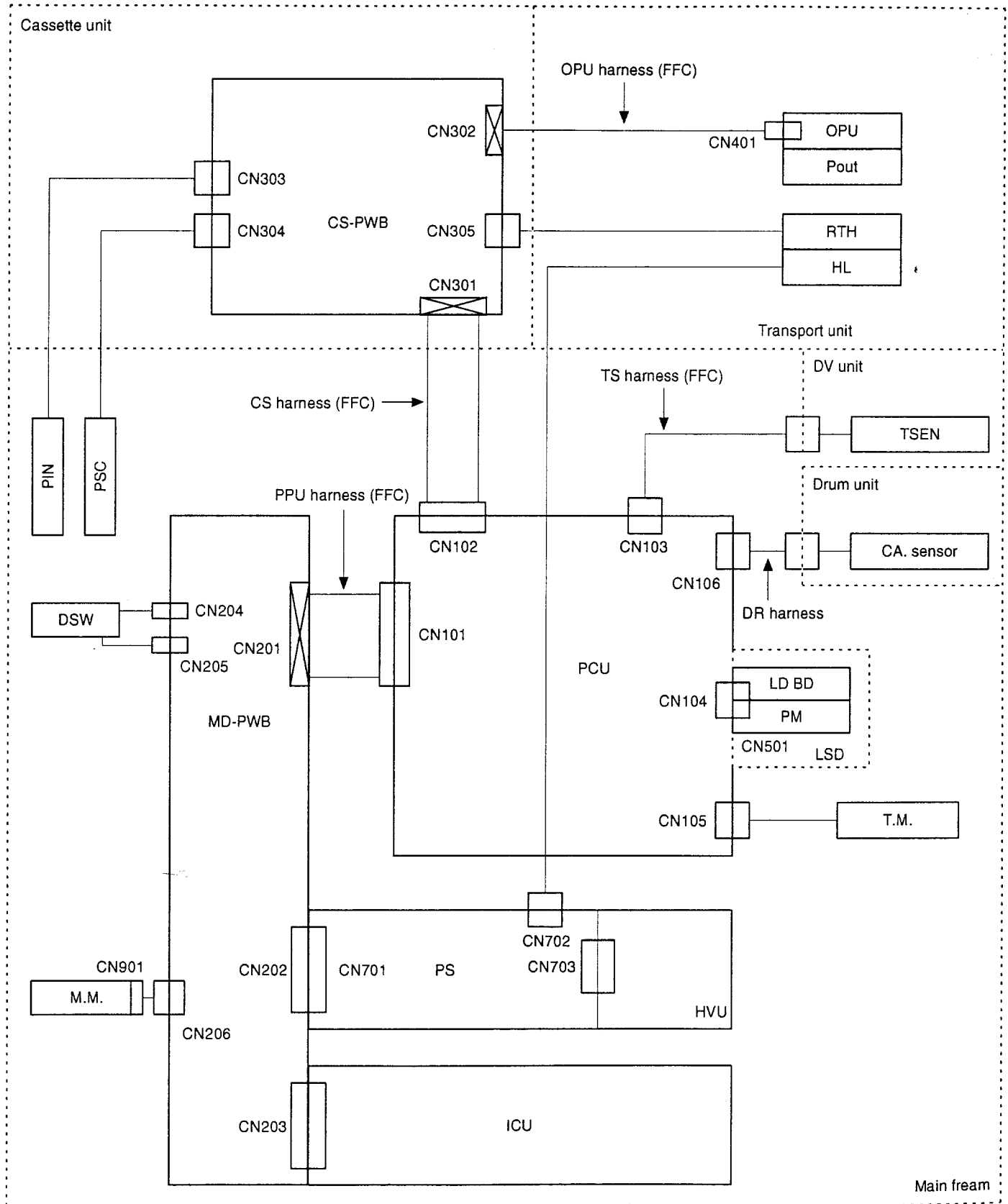
A sample of Hex Dump printout is shown below.

The key press sequence to perform a hex dump is as follows:

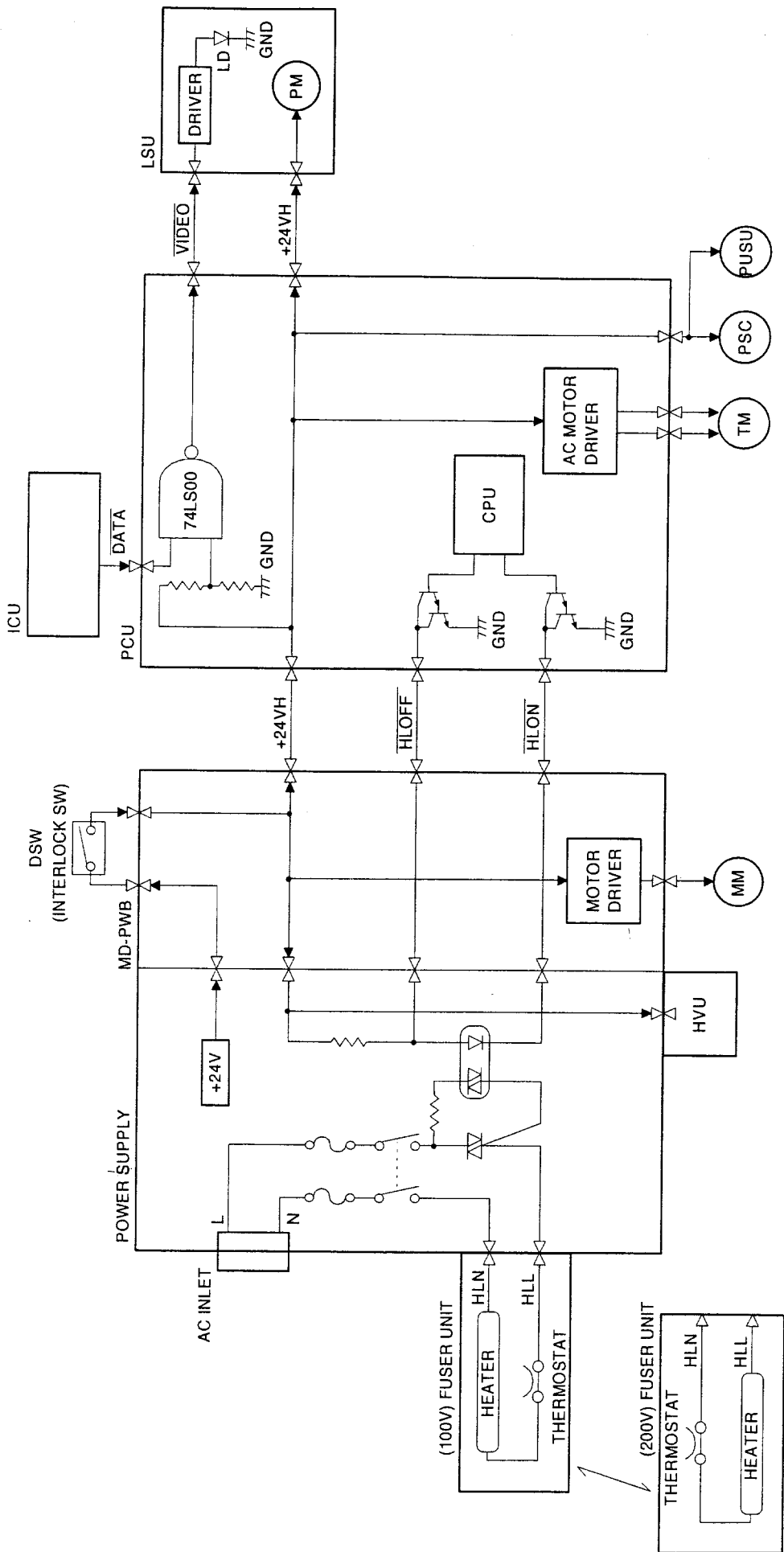
- ① Press **LINE** to take the printer off-line.
- ② Press **MENU** once.
- ③ Press **ITEM** four times.
- ④ Press  $\Delta$  or  $\nabla$  to cycle through the choices until **HEX** appears on the display panel.
- ⑤ Press **ENTER** to set **EMULATION=HEX** (Hex Dump).
- ⑥ Press **LINE** to place the printer back on-line.

# [21] CIRCUIT DIAGRAM

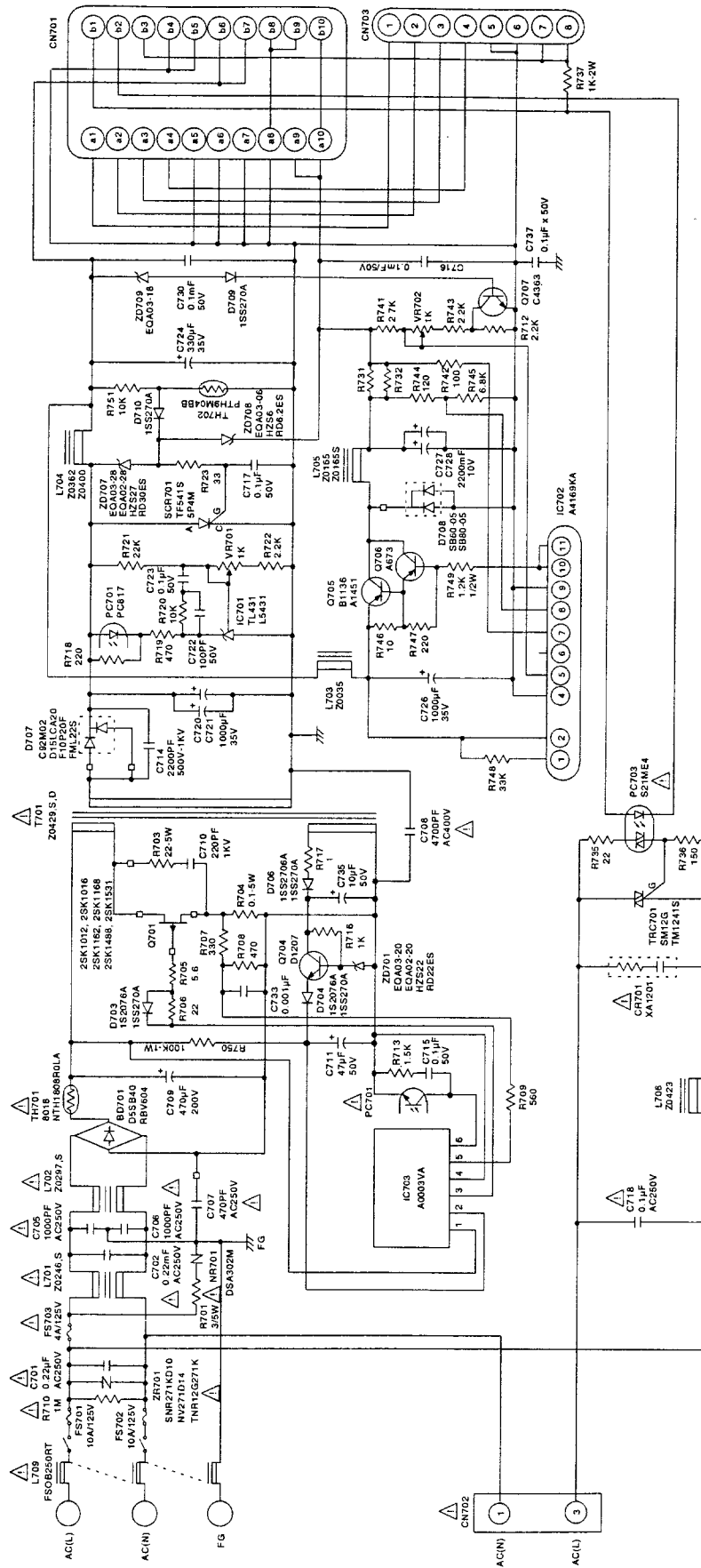
## 1. WIRING DIAGRAM



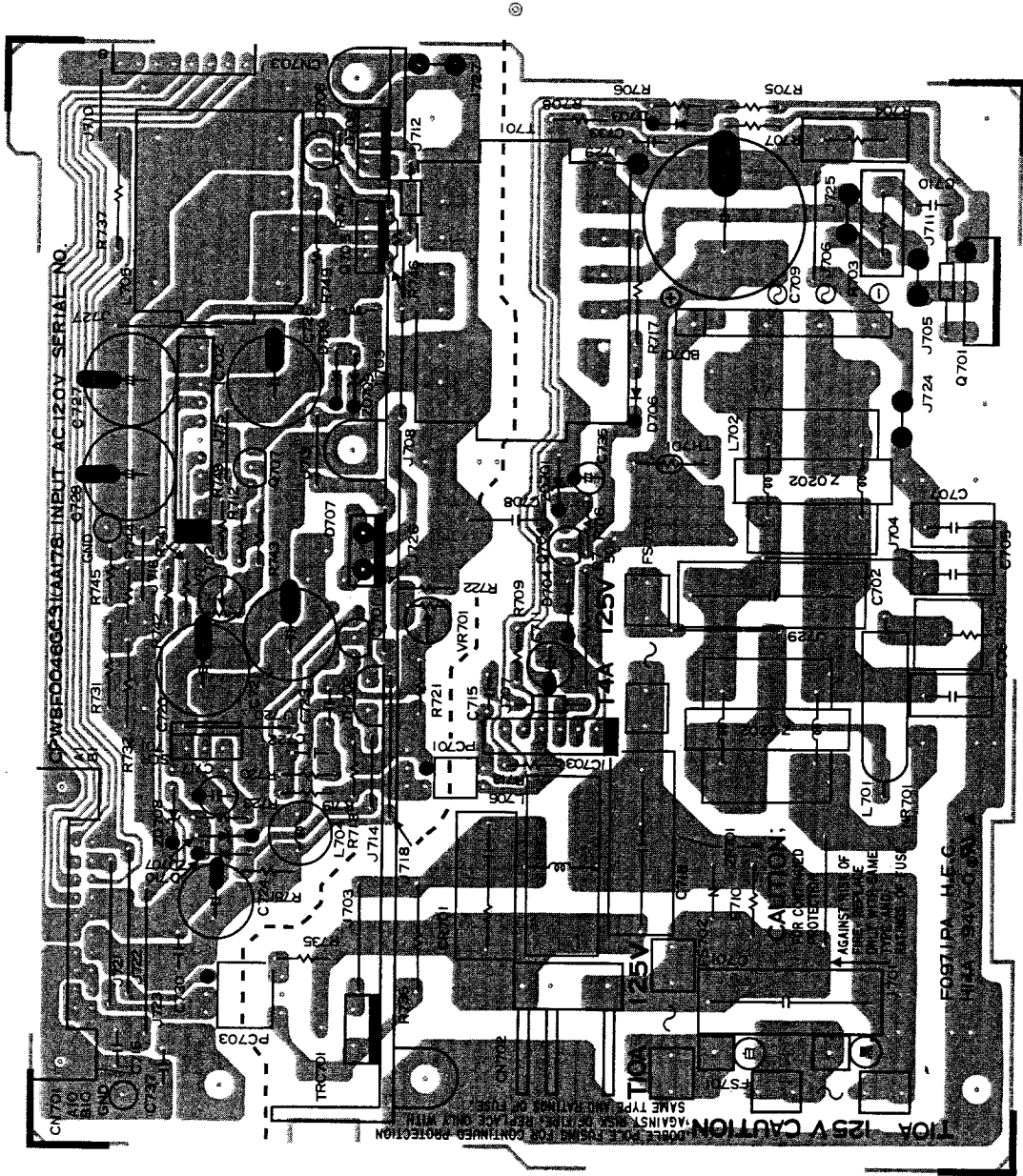
2. INTERLOCK CIRCUIT



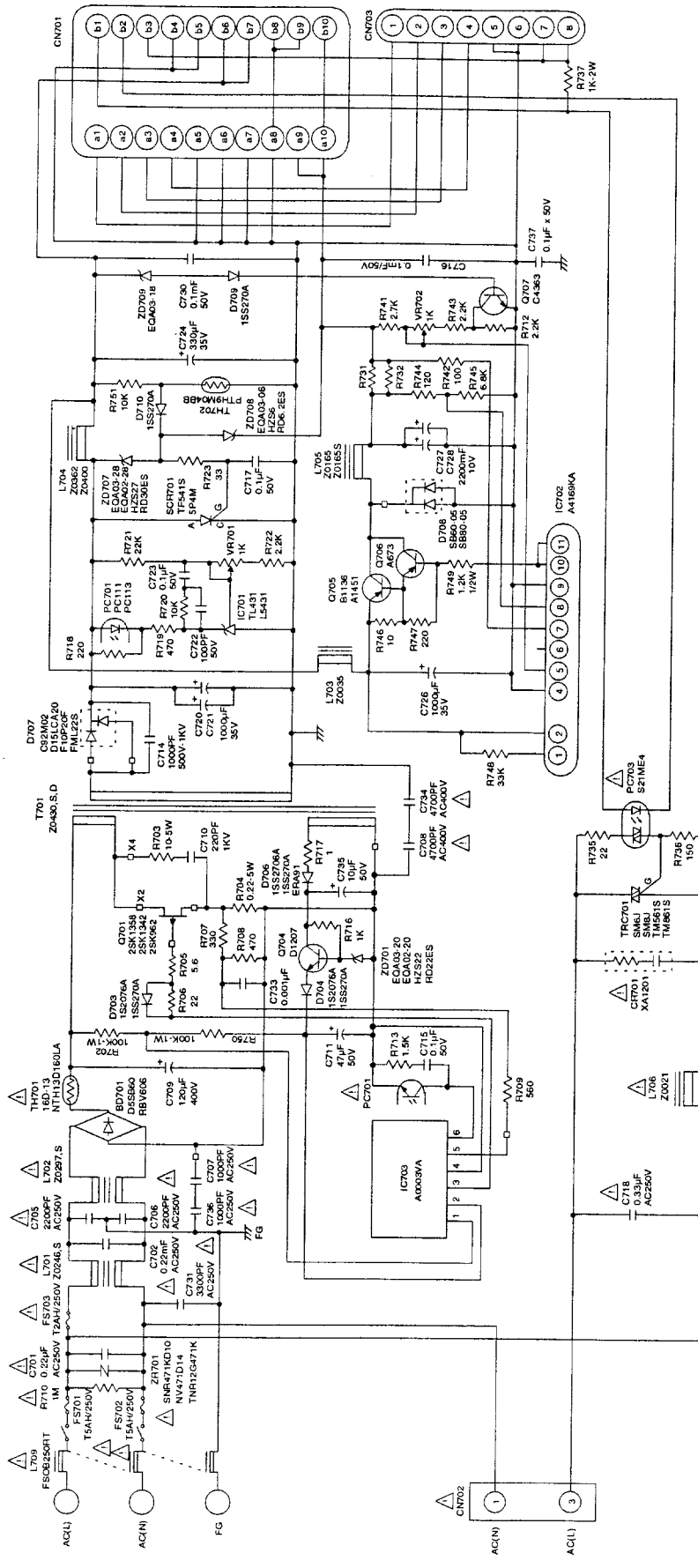
### 3. POWER SUPPLY BOARD CIRCUIT DIAGRAM (100V SERIES)



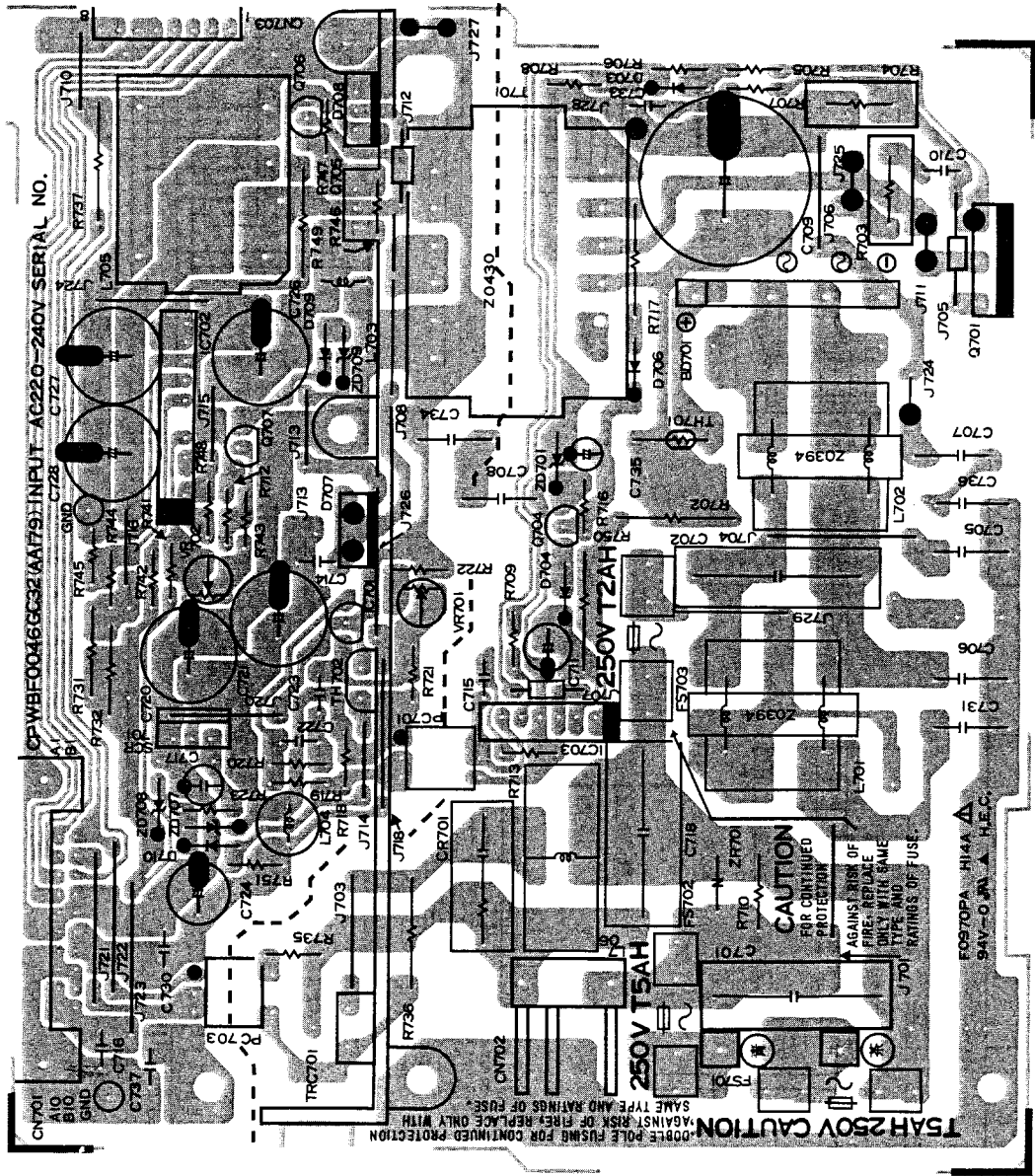
POWER SUPPLY UNIT  
PARTS LAYOUT (100V SERIES)



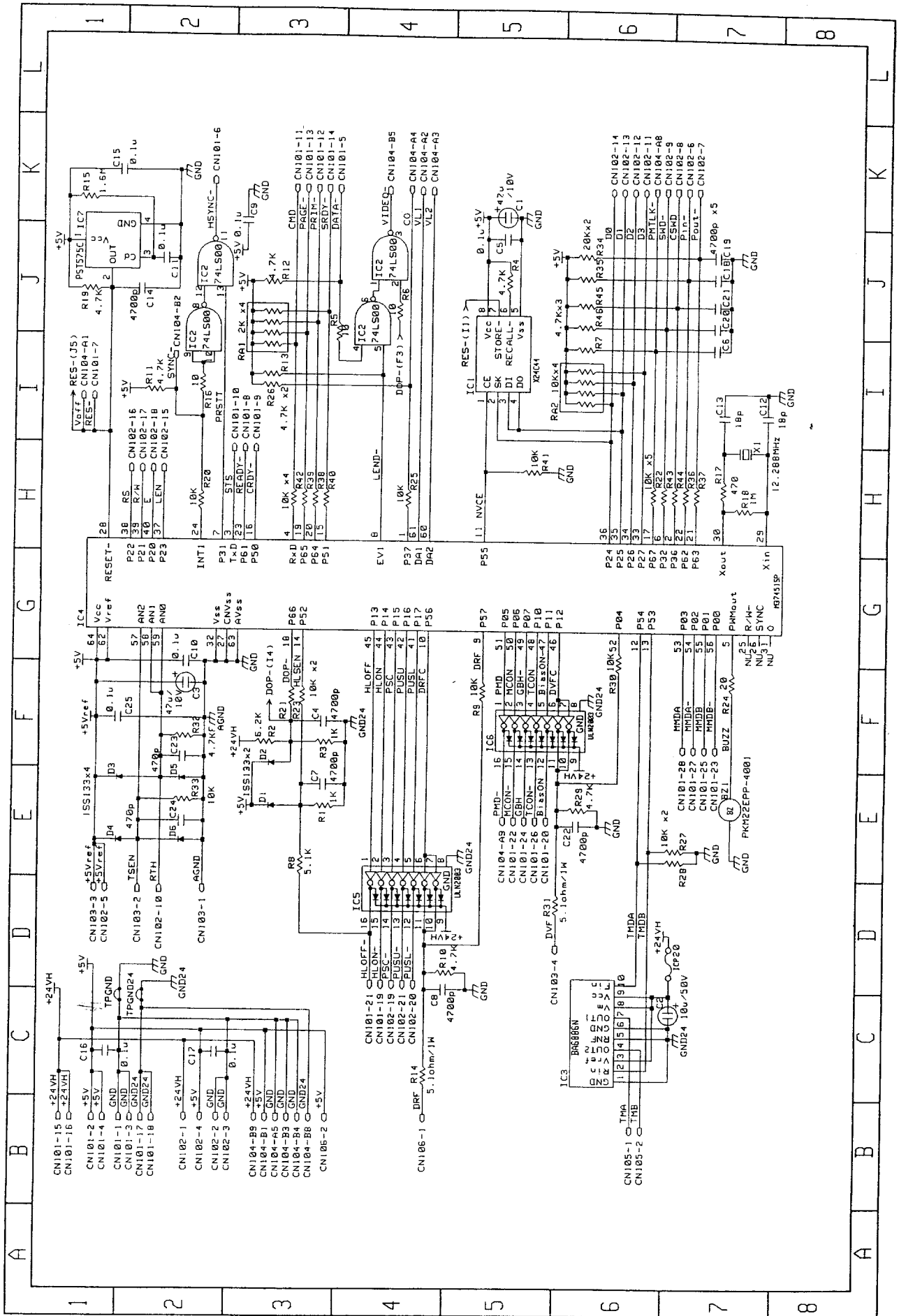
# POWER SUPPLY BOARD CIRCUIT DIAGRAM (200V SERIES)



POWER SUPPLY UNIT  
PARTS LAYOUT (200V SERIES)

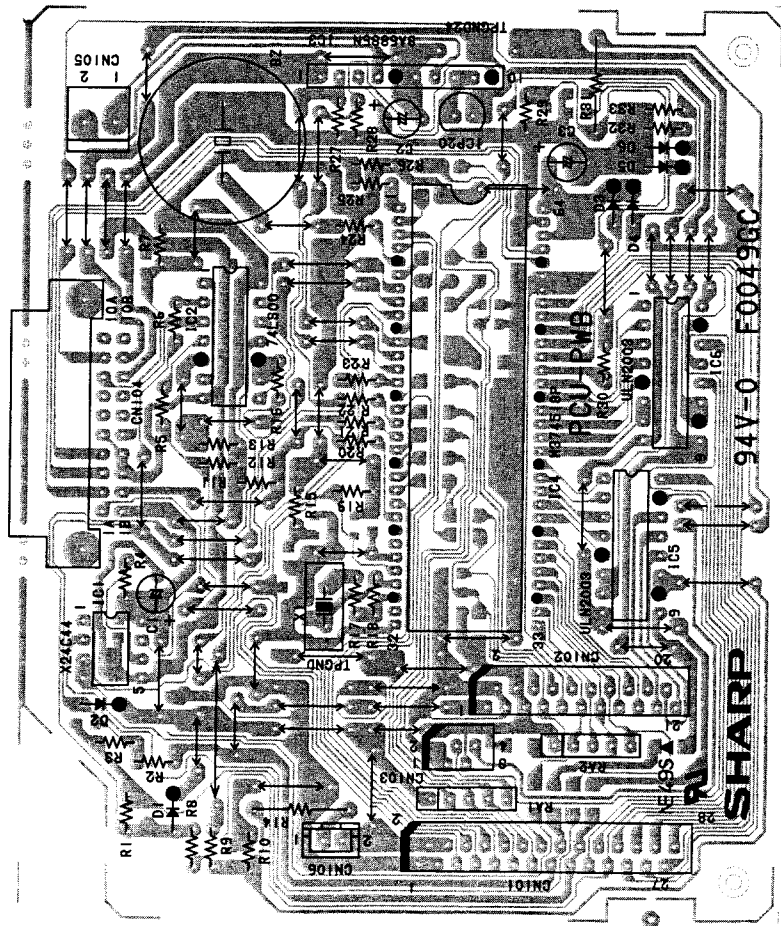
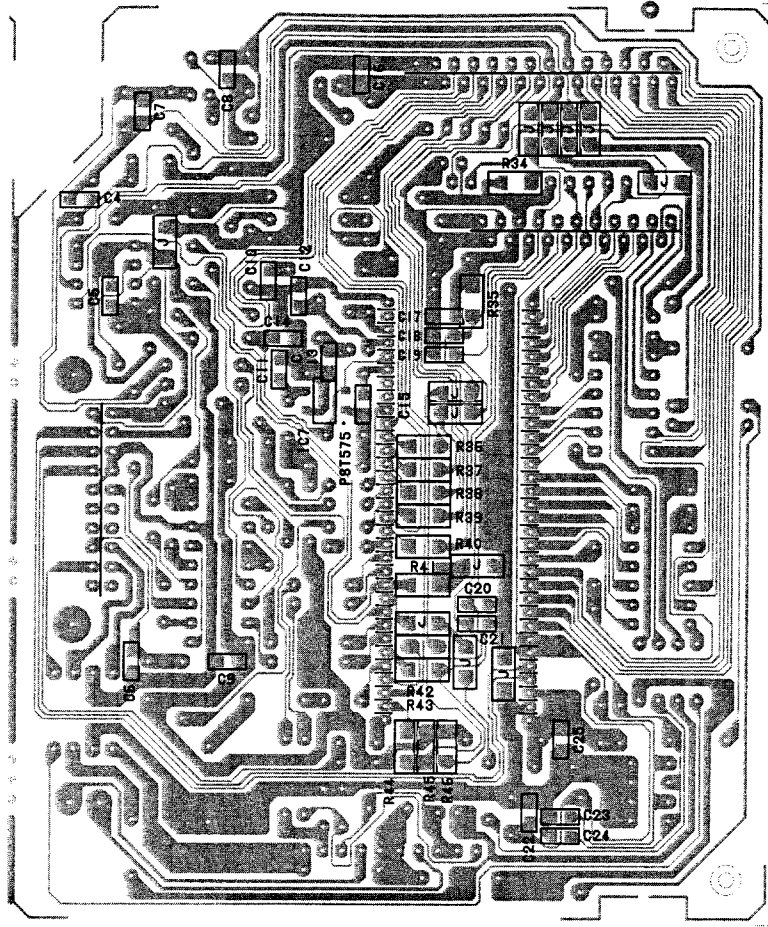


# 4. PCU BOARD CIRCUIT DIAGRAM



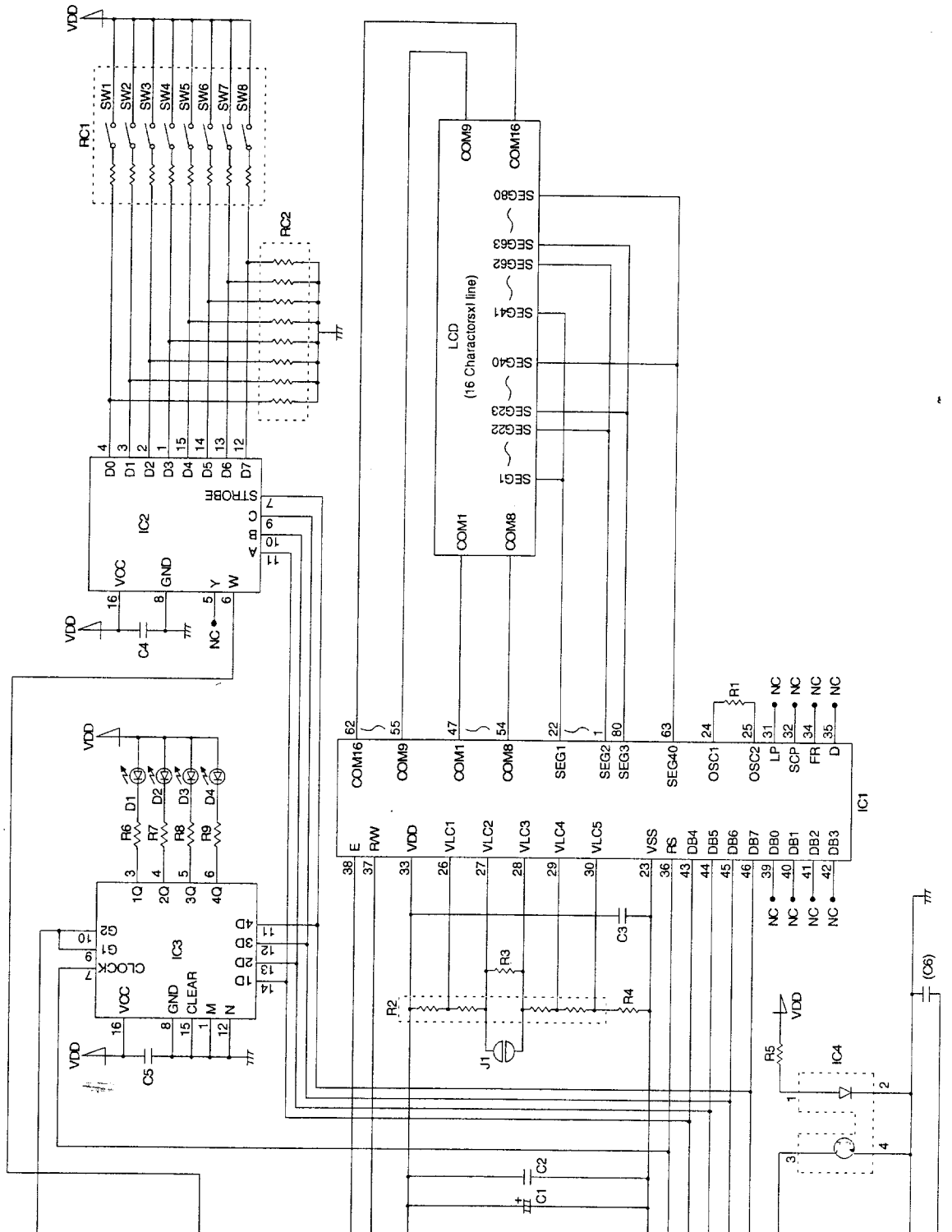


PCU PWB UNIT  
PARTS LAYOUT

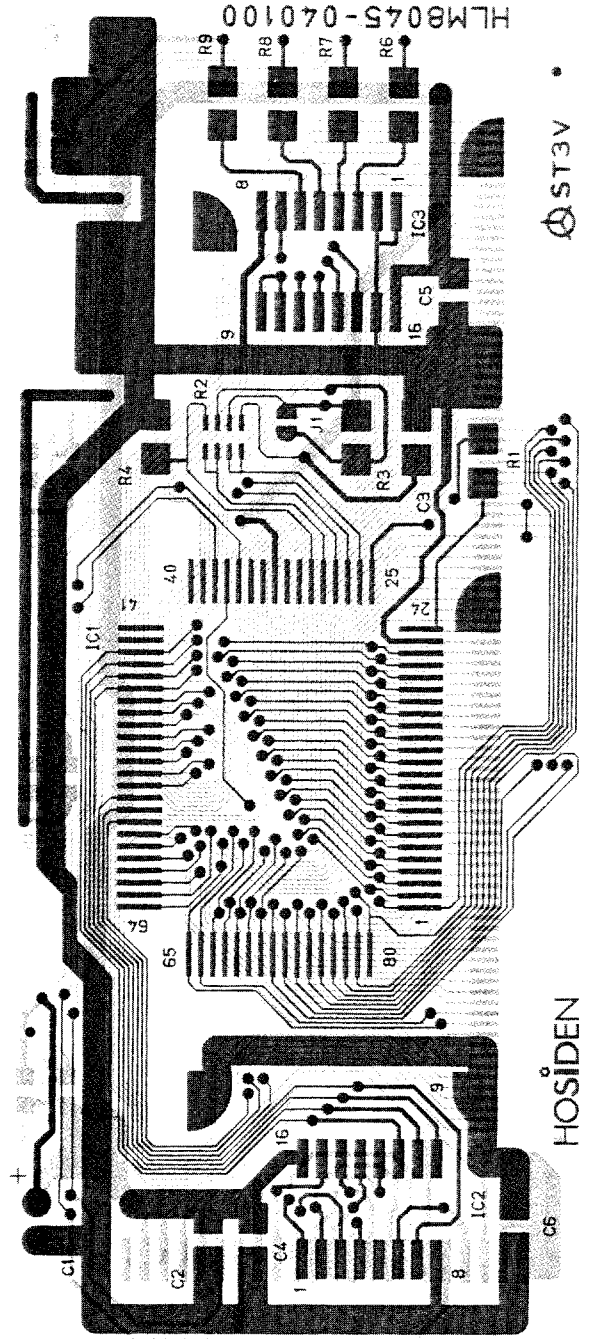


### 5. OPERATION BOARD CIRCUIT DIAGRAM

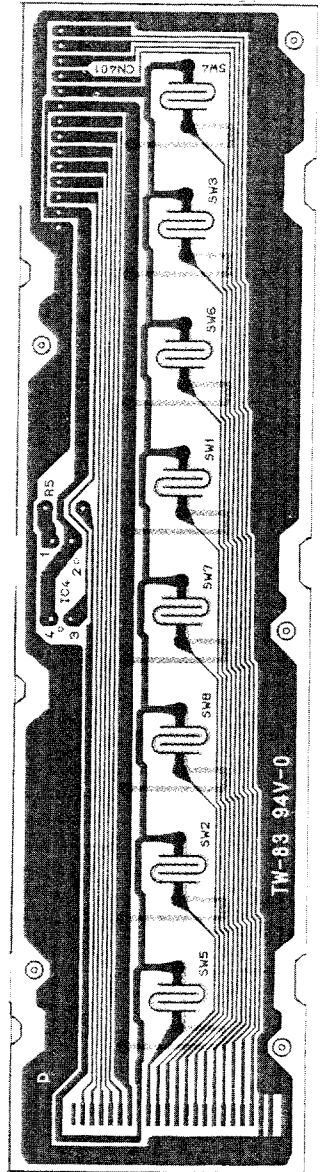
PIN NO.	SYMBOL	LEN
1	LEN	
2	SWD	
3	E	
4	RW	
5	VDD	
6	S.GND	
7	RS	
8	D0	
9	D1	
10	D2	
11	D3	
12	Pout	
13	S.GND	
14	F.GND	



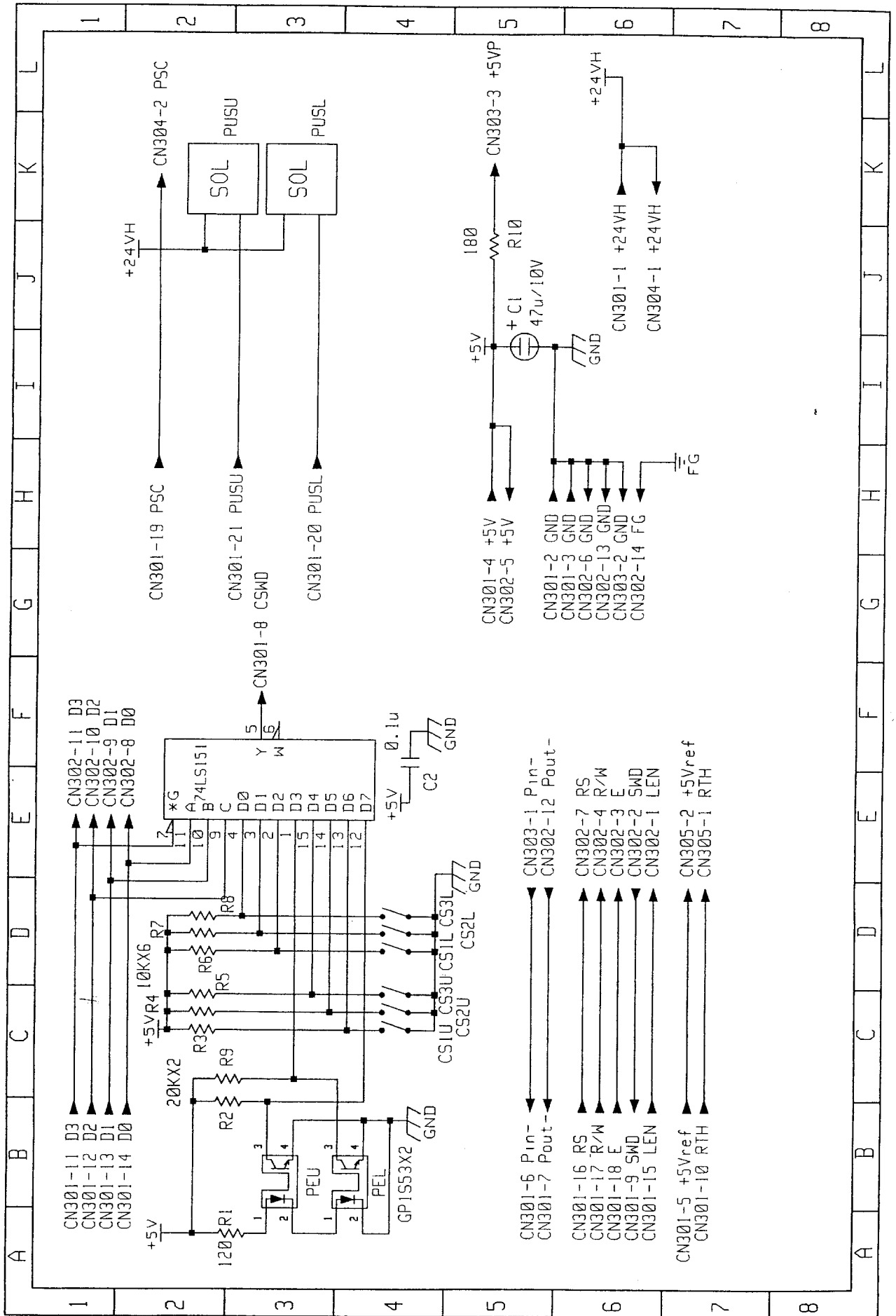
OPERATION PWB UNIT  
PARTS LAYOUT



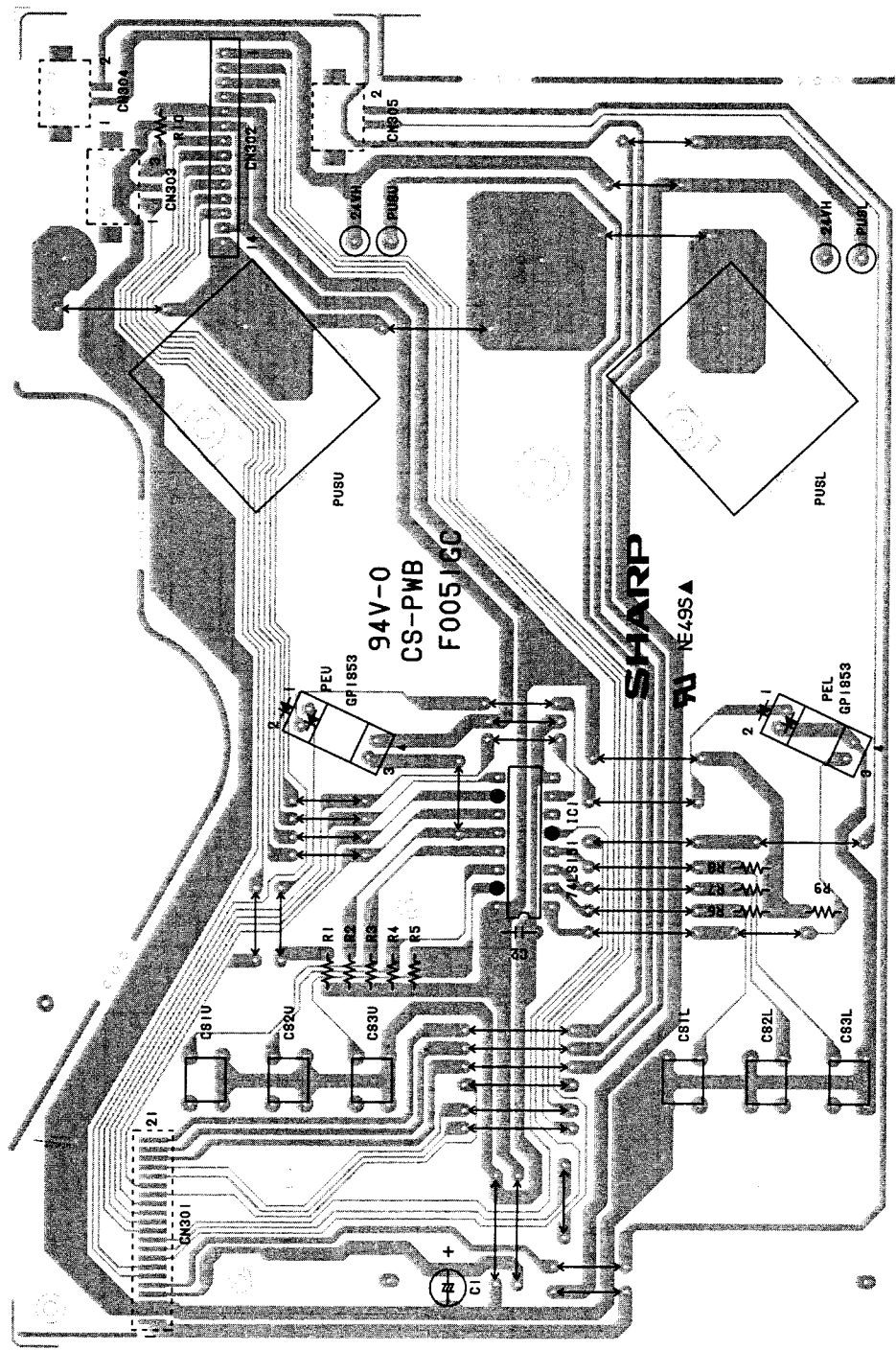
ST3V



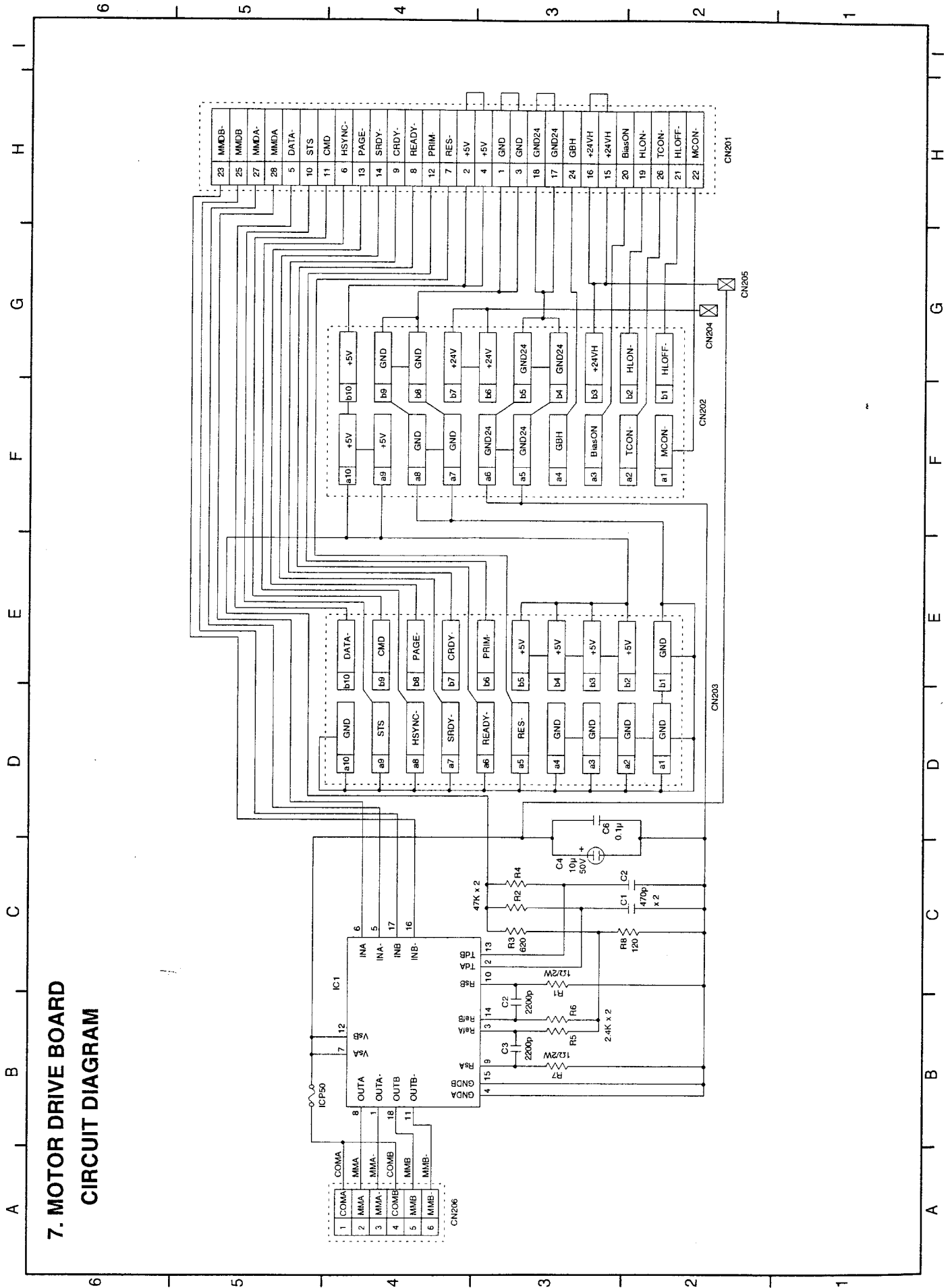
6. CASSETTE SWITCH BOARD  
CIRCUIT DIAGRAM



CASSETTE SWITCH PWB UNIT  
PARTS LAYOUT



# 7. MOTOR DRIVE BOARD CIRCUIT DIAGRAM

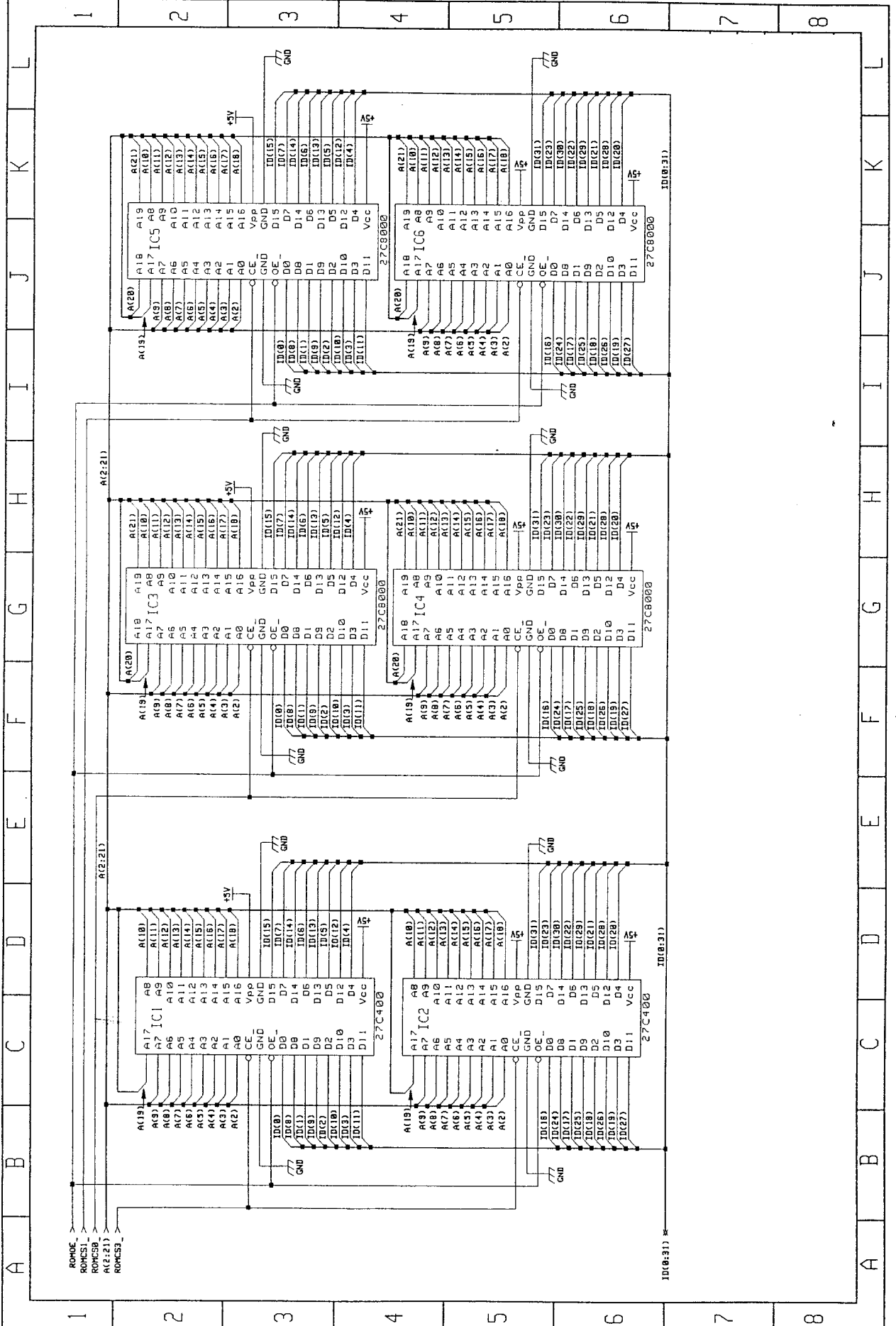






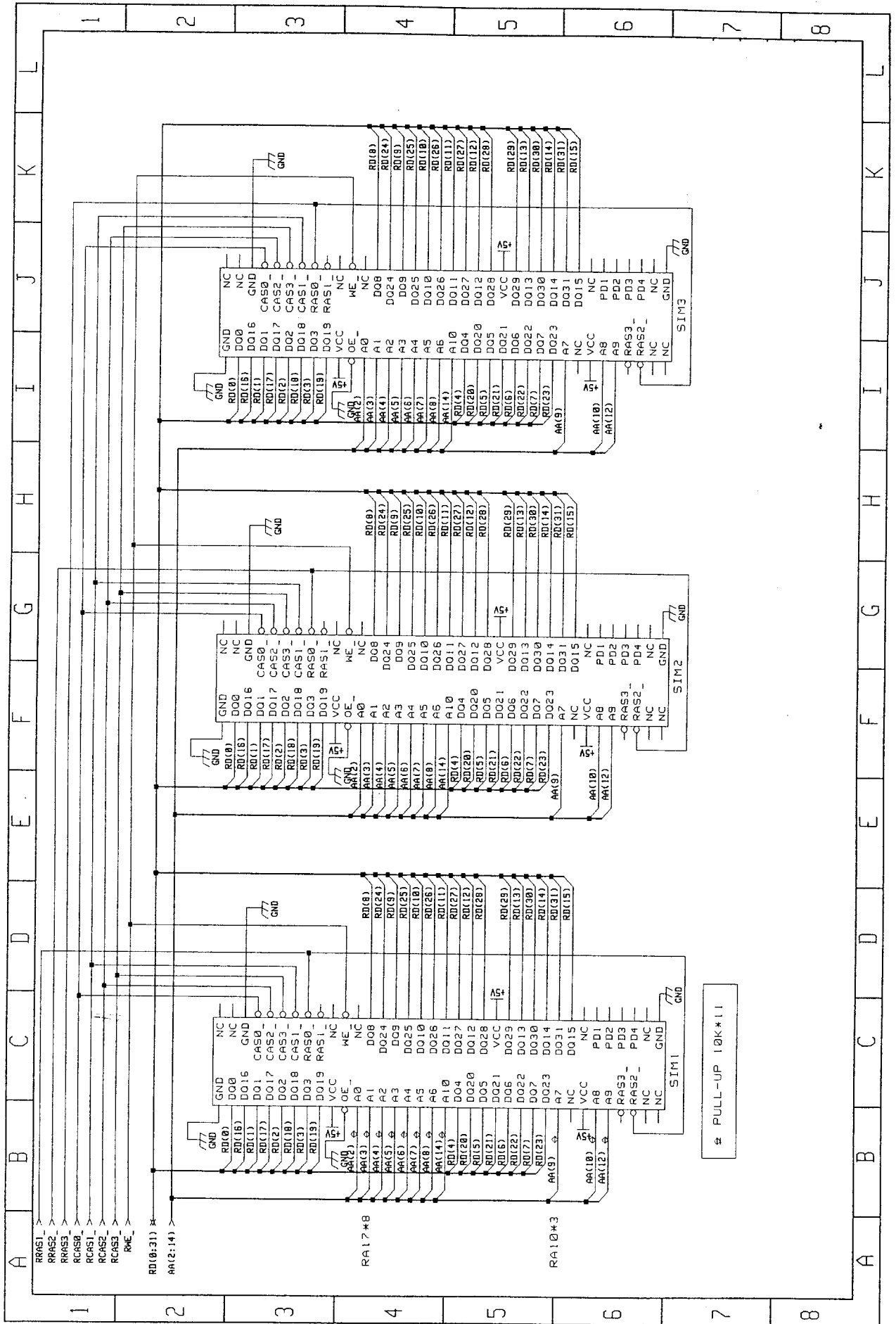


ICU CIRCUIT (ROM ACCESS SECTION)-2

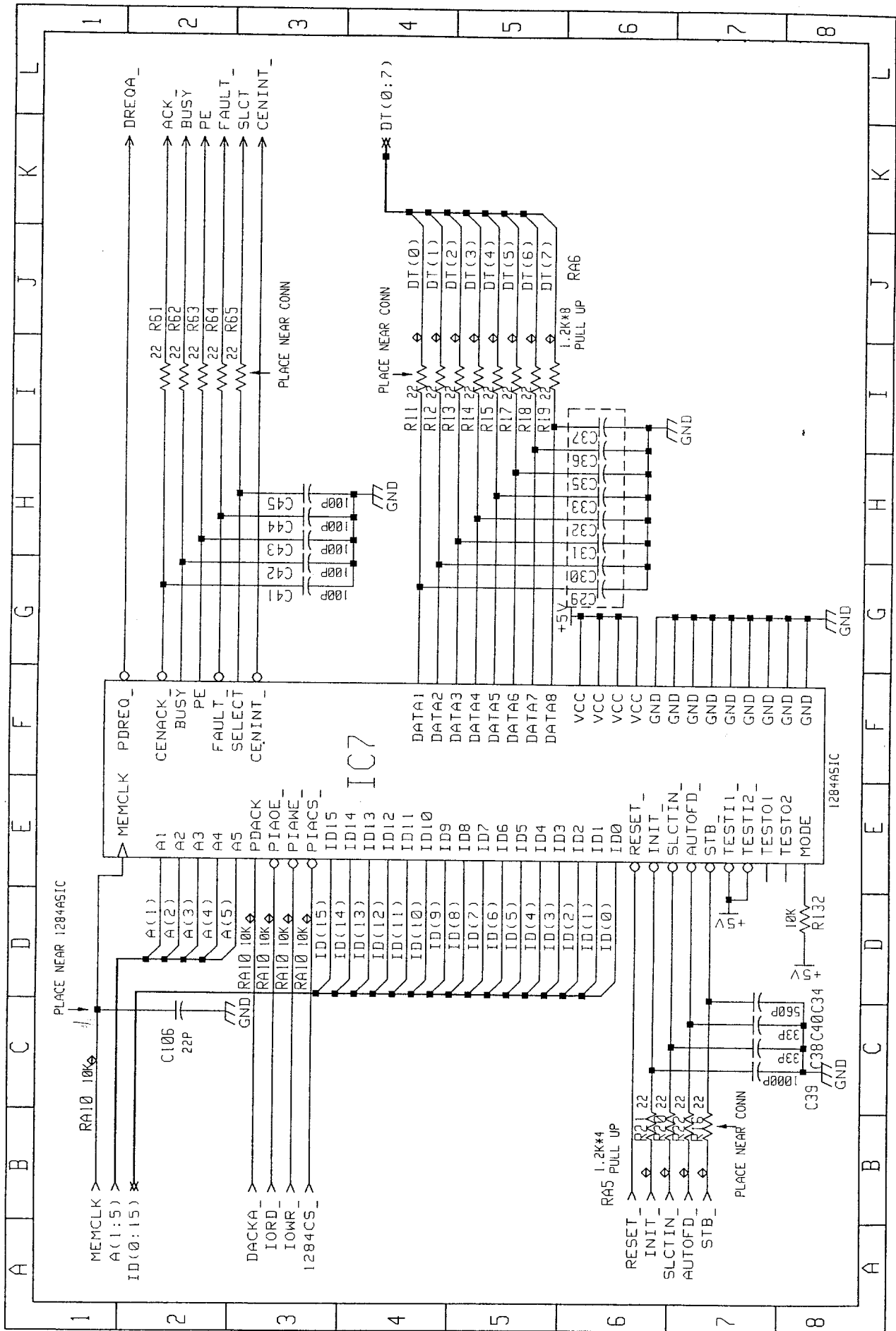




ICU CIRCUIT (SIMMRAM SECTION)-4

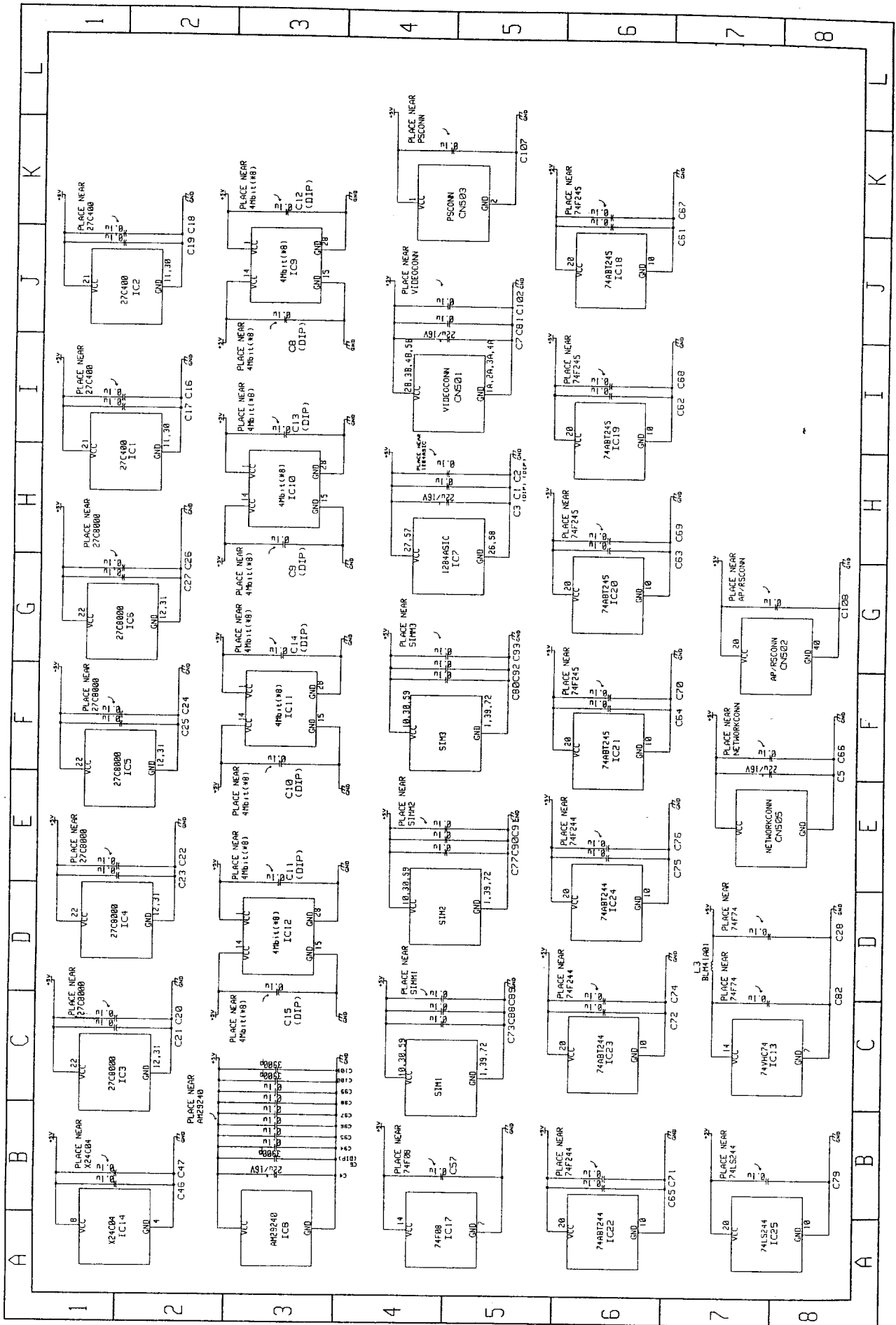


ICU CIRCUIT (PARALLEL I/F CONTROL SECTION)-5



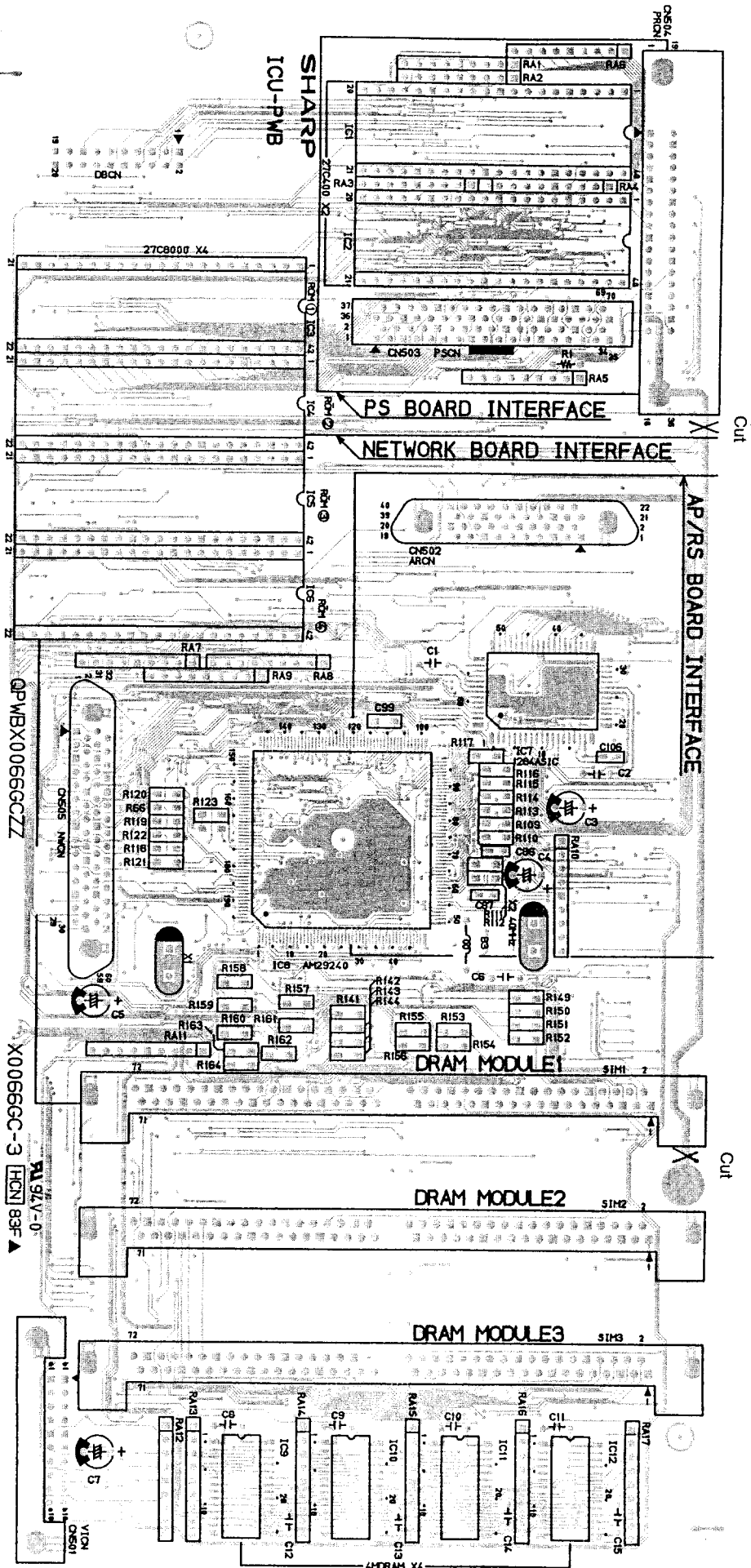


ICU CIRCUIT (CAPACITORS SECTION)-7

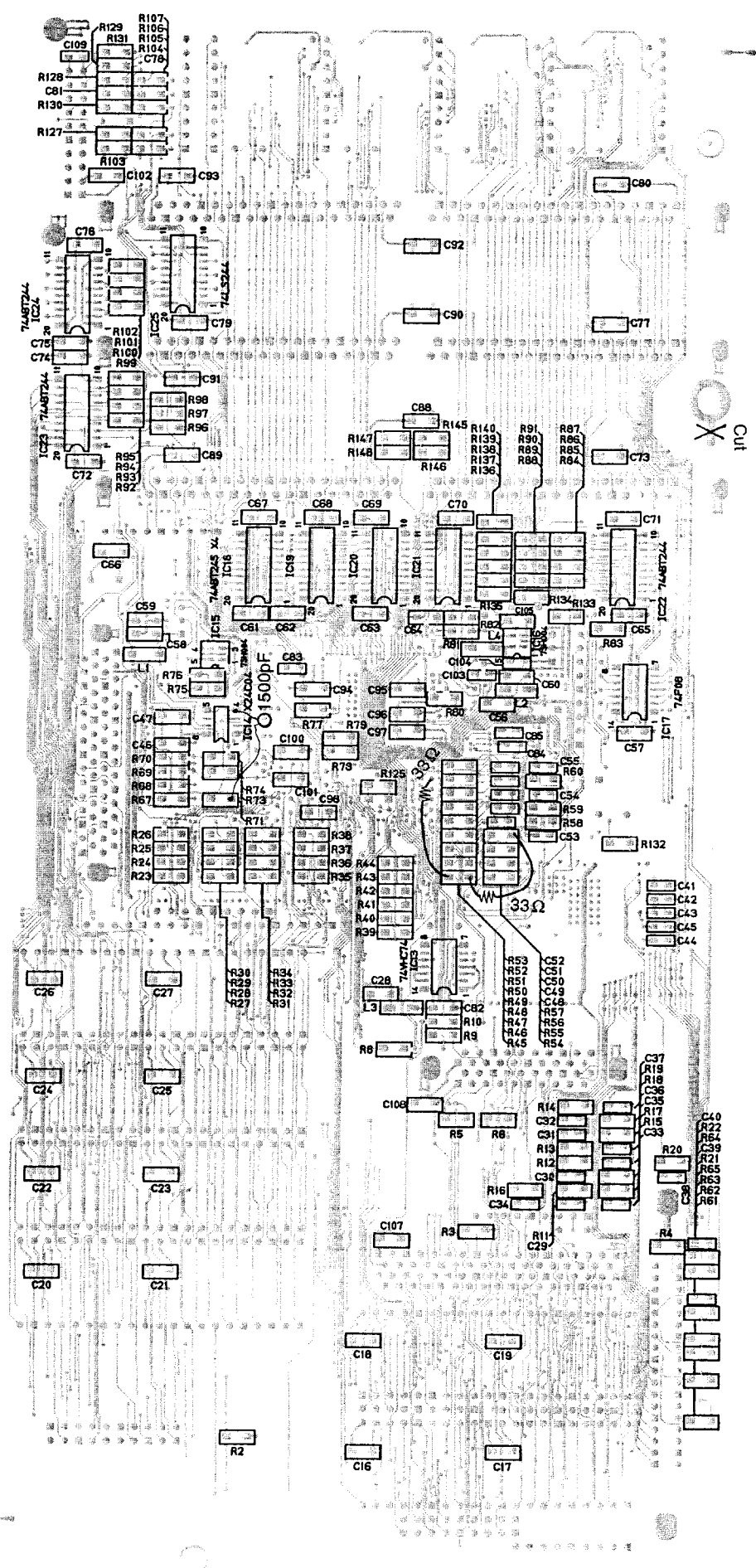


ICU PWB UNIT  
PARTS LAYOUT

(Top view)



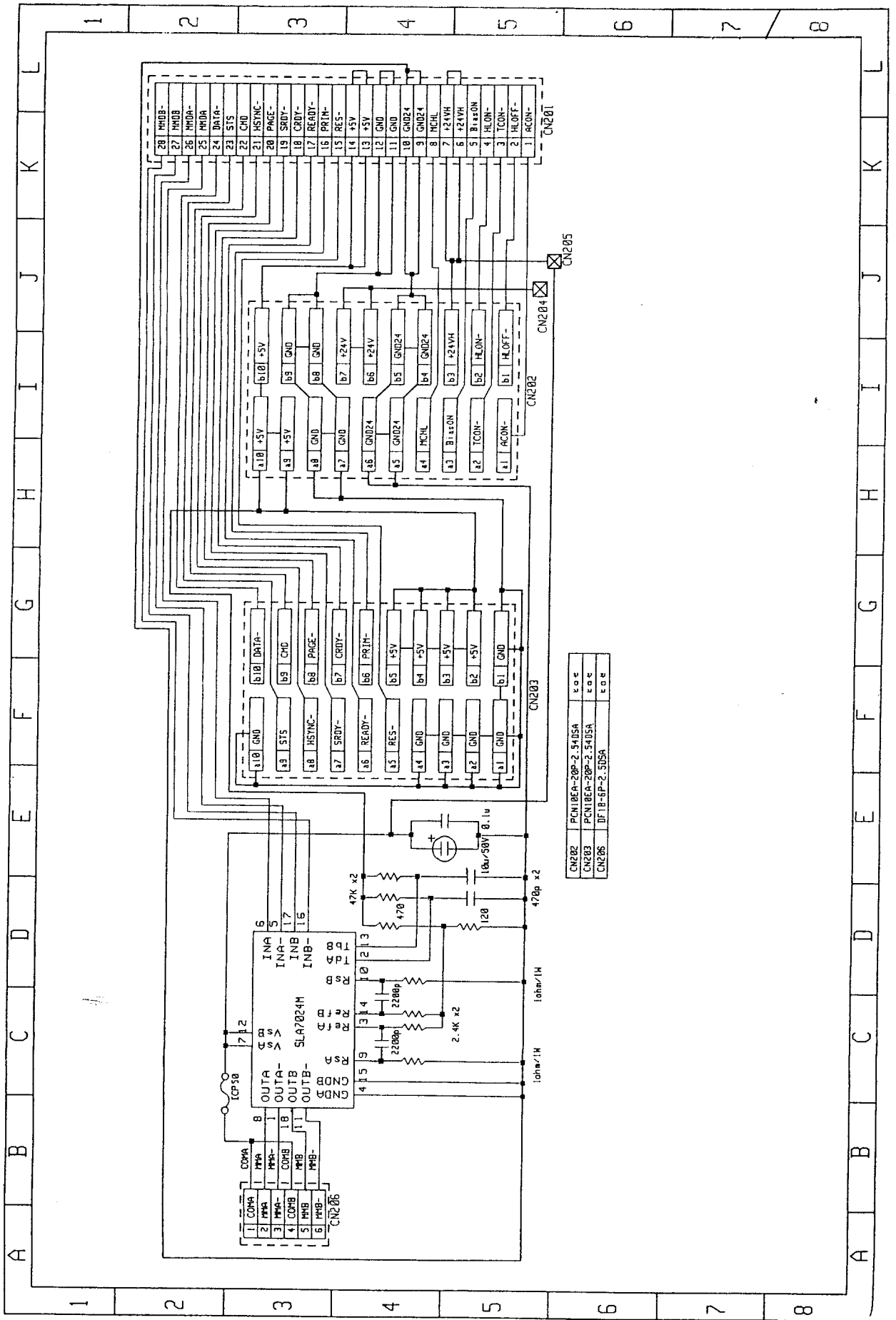
ICU PWB UNIT  
(Rear view)



Note : Three capacitors (100pF) are added.

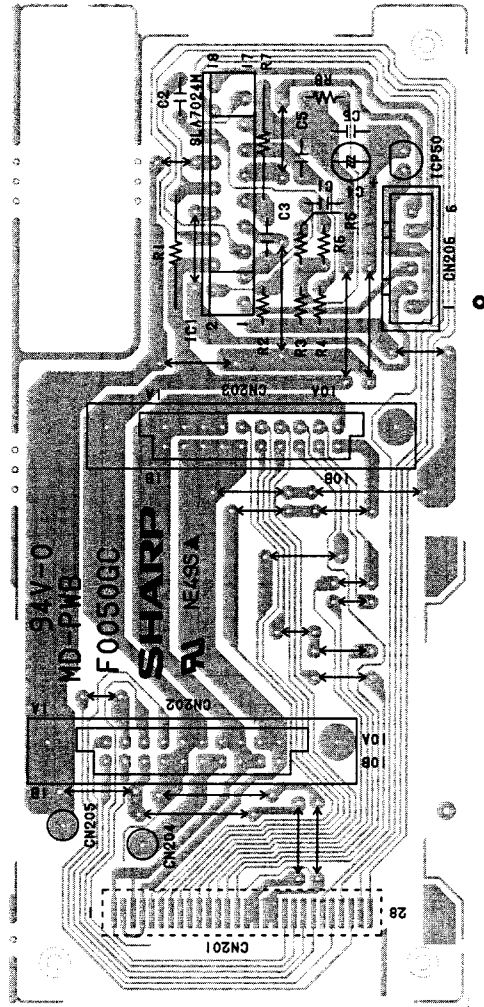


9. MOTHER BOARD  
CIRCUIT DIAGRAM



CN202	PCN10EA-20P-2_54D5A	100
CN203	PCN10EA-20P-2_54D5A	100
CN205	DF18-1P-2_50D5A	100

MOTHER PWB UNIT  
PARTS LAYOUT



# 10. CONNECTOR SIGNAL NAME

## (1) PCU connector pin assignment

CN101

PCU-MD	
PIN	NAME
1	GND
2	+5V
3	GND
4	+5V
5	DATA
6	HSYNC
7	RES
8	READY
9	CRDY
10	STS
11	CMD
12	PRIM
13	PAGE
14	SRDY
15	+24VH
16	+24VH
17	GND24
18	GND24
19	HON
20	BiasON
21	HLOFF
22	MCON
23	MMDB
24	GBH
25	MMDB
26	TCON
27	MMDA
28	MMDA

CN102

PCU-CS	
PIN	NAME
1	+24VH
2	GND
3	GND
4	+5V
5	+5Vref
6	Pin
7	Pout
8	CSWD
9	SWD
10	RTH
11	D3
12	D2
13	D1
14	D0
15	LEN
16	RS
17	RW
18	E
19	PSC
20	PUSL
21	PUSU

CN103

PCU-TS	
PIN	NAME
1	AGND
2	TSEN
3	+5Vref
4	DVF

CN104

PCU-LSU			
PIN	NAME	PIN	NAME
A1	Voff	B1	+5V
A2	VL1	B2	SYNC
A3	VL2	B3	GND
A4	CO	B4	GND
A5	GND	B5	VIDEO
A6	NC	B6	NC
A7	NC	B7	NC
A8	PMTLK	B8	GND24
A9	PMD	B9	+24VH
A10	NC	B10	NC

CN105

PCU-T. MOTOR	
PIN	NAME
1	TMA
2	TMB

CN106

PCU-DR. SENSOR	
PIN	NAME
1	DRF
2	+5V

## (2) MD-PWB connector pin assignment

CN201

MD-PCU	
PIN	NAME
1	GND
2	+5V
3	GND
4	+5V
5	DATA
6	HSYNC
7	RES
8	READY
9	DRDY
10	STS
11	CMD
12	PRIM
13	PAGE
14	SRDY
15	+24VH
16	+24VH
17	GND24
18	GND24
19	HON
20	BiasON
21	HLOFF
22	MCON
23	MMDB
24	GBH
25	MMDB
26	TCON
27	MMDA
28	MMDA

CN204

MD-DSW	
PIN	NAME
1	+24VH

CN205

MD-DSW	
PIN	NAME
1	+24V

CN202

MD-PS			
PIN	NAME	PIN	NAME
1A	MCON	1B	HLOFF
2A	TCON	2B	HON
3A	BiasON	3B	+24VH
4A	GBH	4B	GND24
5A	GND24	5B	GND24
6A	GND24	6B	+24V
7A	GND	7B	+24V
8A	GND	8B	GND
9A	+5V	9B	GND
10A	+5V	10B	+5V

CN203

MD-ICU			
PIN	NAME	PIN	NAME
1A	GND	1B	GND
2A	GND	2B	+5V
3A	GND	3B	+5V
4A	GND	4B	+5V
5A	RES	5B	+5V
6A	READY	6B	PRIM
7A	SRDY	7B	CRDY
8A	HSYNC	8B	PAGE
9A	STS	9B	CMD
10A	GND	10B	DATA

CN206

MD-MM	
PIN	NAME
1	COMA
2	MMA
3	MMA
4	COMB
5	MMB
6	MMB

## (3) CS-PWB connector pin assignment

CN301

CS-PCU	
PIN	NAME
1	+24VH
2	GND
3	GND
4	+5V
5	+5Vref
6	Pin
7	Pout
8	CSWD
9	SWD
10	RTH
11	D3
12	D2
13	D1
14	D0
15	LEN
16	RS
17	RW
18	E
19	PSC
20	PUSL
21	PUSU

CN302

CS-OPU	
PIN	NAME
1	LEN
2	SWD
3	E
4	R/W
5	+5V
6	GND
7	RS
8	D0
9	D1
10	D2
11	D3
12	Pout
13	GND
14	FG

CN303

CS-Pin	
PIN	NAME
1	Pin
2	GND
3	+5VP

CN304

CS-PSC	
PIN	NAME
1	+24VH
2	PSC

CN305

CS-RTH	
PIN	NAME
1	RTH
2	+5Vref

**(4) Operation PWB connector pin assignment**

CN401

OPU-CS	
PIN	NAME
1	LEN
2	SWD
3	E
4	R/W
5	+5V
6	GND
7	RS
8	D0
9	D1
10	D2
11	D3
12	Pout
13	GND
14	NC

**(5) Laser scanner unit connector pin assignment**

CN601

LSU-FCU		
PIN	NAME	NAME
A1	Voff	B1 +5V
A2	VL1	B2 SYNC
A3	VL2	B3 GND
A4	CO	B4 GND
A5	GND	B5 VIDEO
A6	NC	B6 NC
A7	NC	B7 NC
A8	PMTLK	B8 GND24
A9	PMD	B9 +24VH
A10	NC	B10 NC

**(6) Power supply PWB connector pin assignment**

CN701

PS-MD		
PIN	NAME	NAME
1A	MCON	1B HLOFF
2A	TCON	2B HLON
3A	BiasON	3B +24VH
4A	GBH	4B GND24
5A	GND24	5B GND24
6A	GND24	6B +24V
7A	GND	7B +24V
8A	GND	8B GND
9A	+5V	9B GND
10A	+5V	10B +5V

CN702

PS-FUSER	
PIN	NAME
1	HLN
2	NC
3	NC
4	HLL

CN703

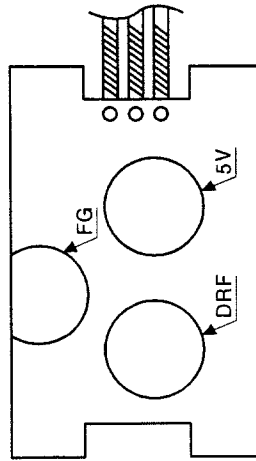
PS-HVU	
PIN	NAME
1	MCON
2	TCON
3	BiasON
4	GBH
5	GND24
6	GND24
7	+24VH
8	+24VH

**(7) Main motor connector pin assignment**

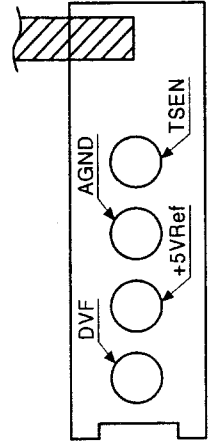
CN901

MM-MD	
PIN	NAME
1	MMA
2	NCD
3	COMA
4	NC
5	MMA
6	NC
7	MMB
8	NC
9	COMB
10	NC
11	MMB

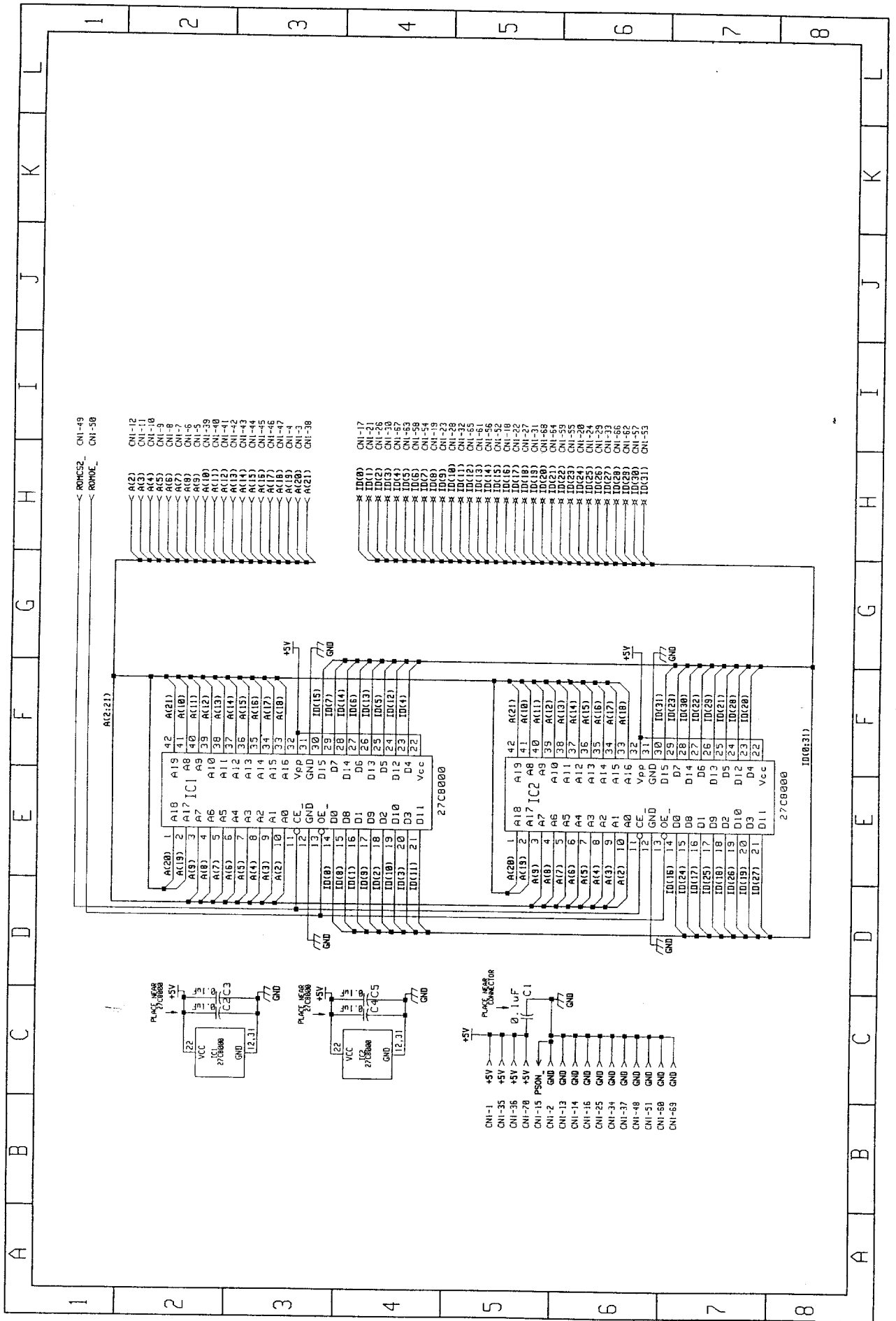
**(8) Drum connect PWB pin assignment**



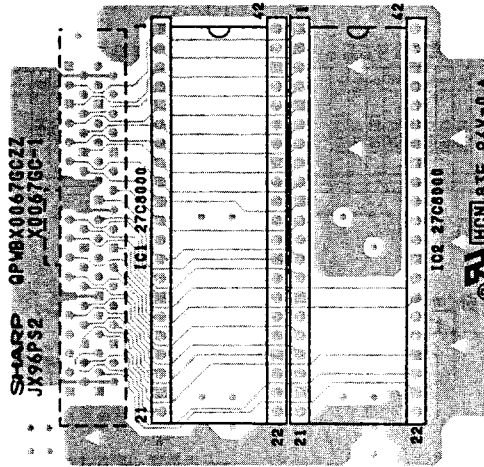
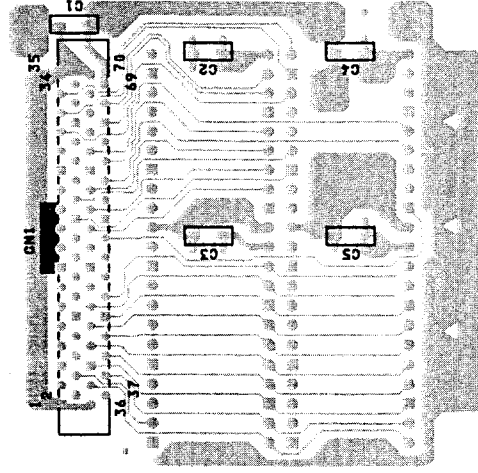
**(9) Toner sensor PWB pin assignment**



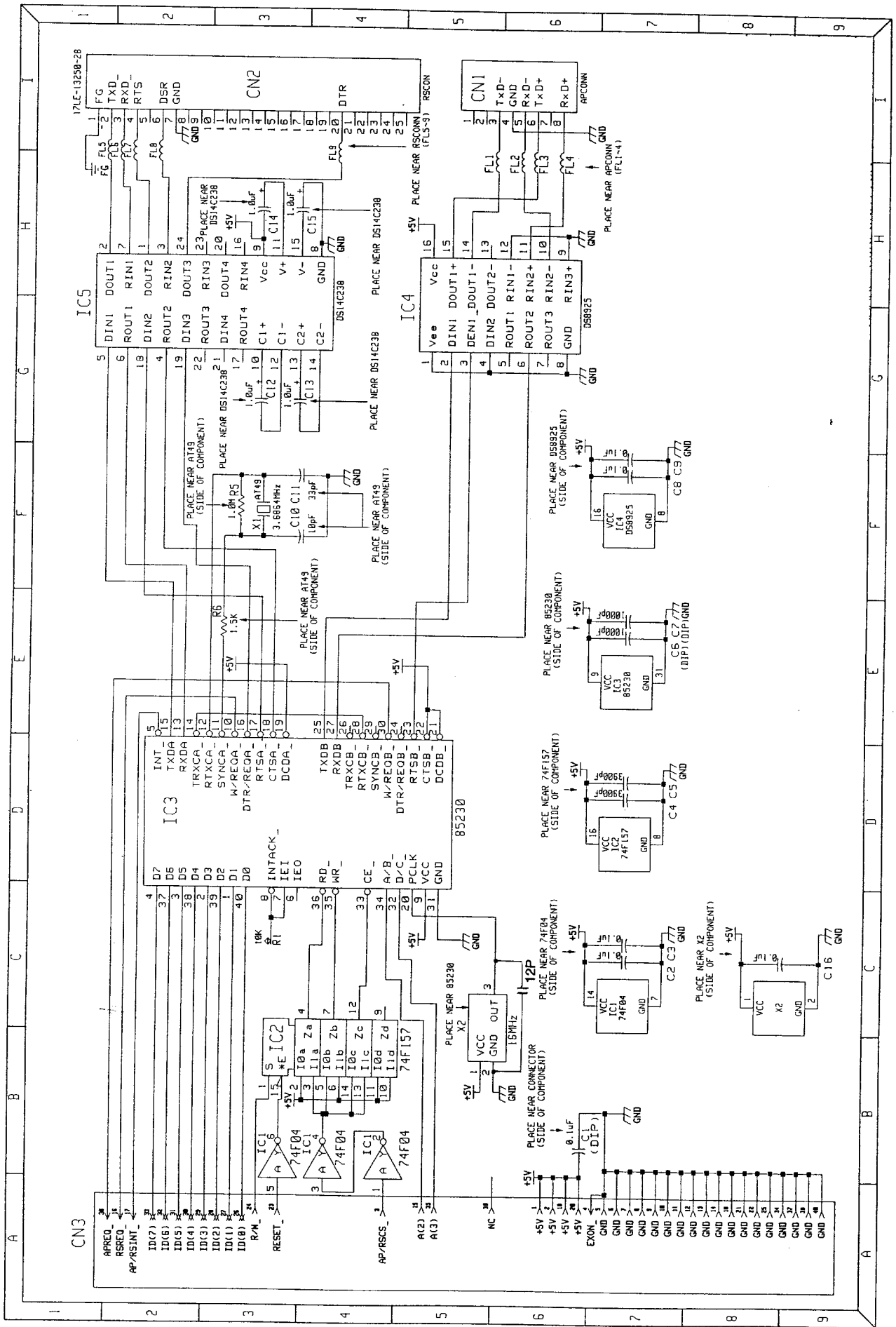
11. P.S CIRCUIT (OPTION)



P.S PWB UNIT  
PARTS LAYOUT



12. APPLE TALK / RS 232C I/F CIRCUIT (OPTION)







# SHARP PARTS GUIDE

MODEL JX-9680

## MODEL JX-9680

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| 4 Transport unit                  | 12 OPU PWB  |
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Because parts marked with "▲" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

## DEFINITION

The definition of each Rank is as follows and also noted in the list

A : Parts necessary to be stocked as High usage parts.

B : Parts necessary to be stocked as Standard usage parts.

C : Low usage parts.

D : Parts necessary for refurbish.

E : Unit parts recommended to be stocked for efficient after sales service.

Please note that the lead time for the said parts may be longer than normal parts.

S : Consumable parts.

Please note that the following parts used in Copier under the same description are classified into A or B Rank depending upon the place used.

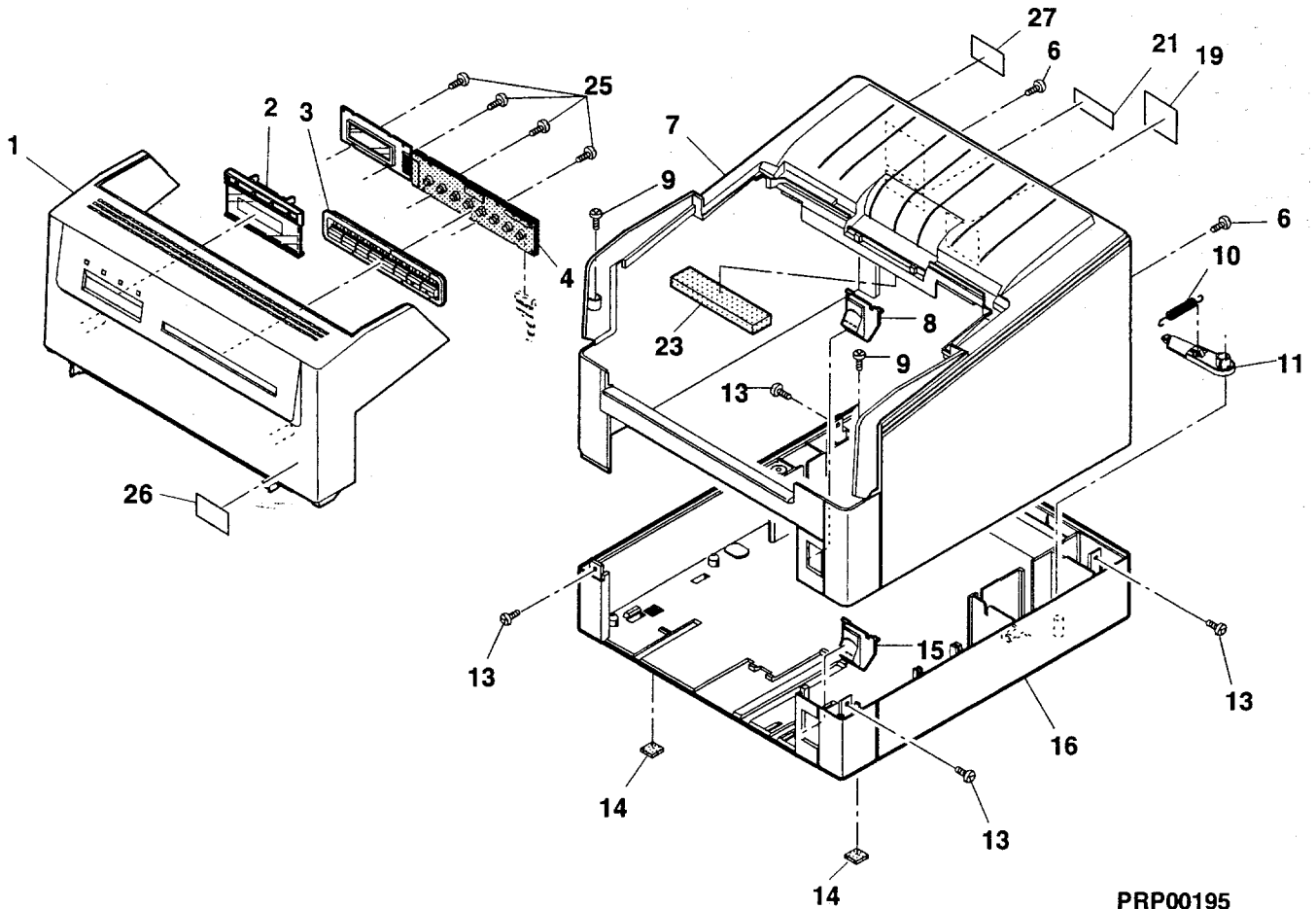
Example : Gear made of Metal, Sprocket, Bearing, Belt made of Rubber, Spring clutch mechanism.

A Rank : The parts which may be with the revolution or loading.

B Rank : Parts similar to A Rank parts, but are not included in Rank A.

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CCAB-0031GC22	AX	N	D	Front cabinet
2	PCOVP0028GCZZ	AG		D	LCD cover
3	HPNLC0018GCZZ	AH	N	D	Key panel
4	CPWBF0045GC51	BG		E	OPU PWB
6	XEBSE30P10000	AA		C	Screw (3×10)
7	CCAB-0030GC02	BC		D	Upper cabinet (This includes No8,23)
8	JBTN-0002GCZ1	AC		C	Eject button
9	XCPSD40P10000	AA		C	Screw (4×10)
10	MSPRT0077GCZZ	AB		C	Cassette push out spring
11	MLEVP0029GCZZ	AD		C	Cassette push out lever
13	XEBSD40P12000	AA		C	Screw (M4×12)
14	GLEGG0002GCZZ	AB		C	Rubber foot
15	JBTN-0002GCZ1	AC		C	Eject button
16	PCASZ0011GCZ1	BA		D	Bottom case
19	TLABH2597FCZZ	AC		D	Caution label (Germany only)
21	TLABT0001QCZZ	AA		C	Hyatte label (USA only)
23	PMLT-0030GCZZ	AB		C	Upper cabinet cushion
25	XEPSD30P08X00	AA		C	Screw (M3×8X)
26	TLABZ0182GCZZ	AD	N	D	Energy star mark (USA, CANADA)
27	TLABH0108GCZZ	AC		D	Class 1 label (Germany only)



PRP00195

## 2 Frame 1

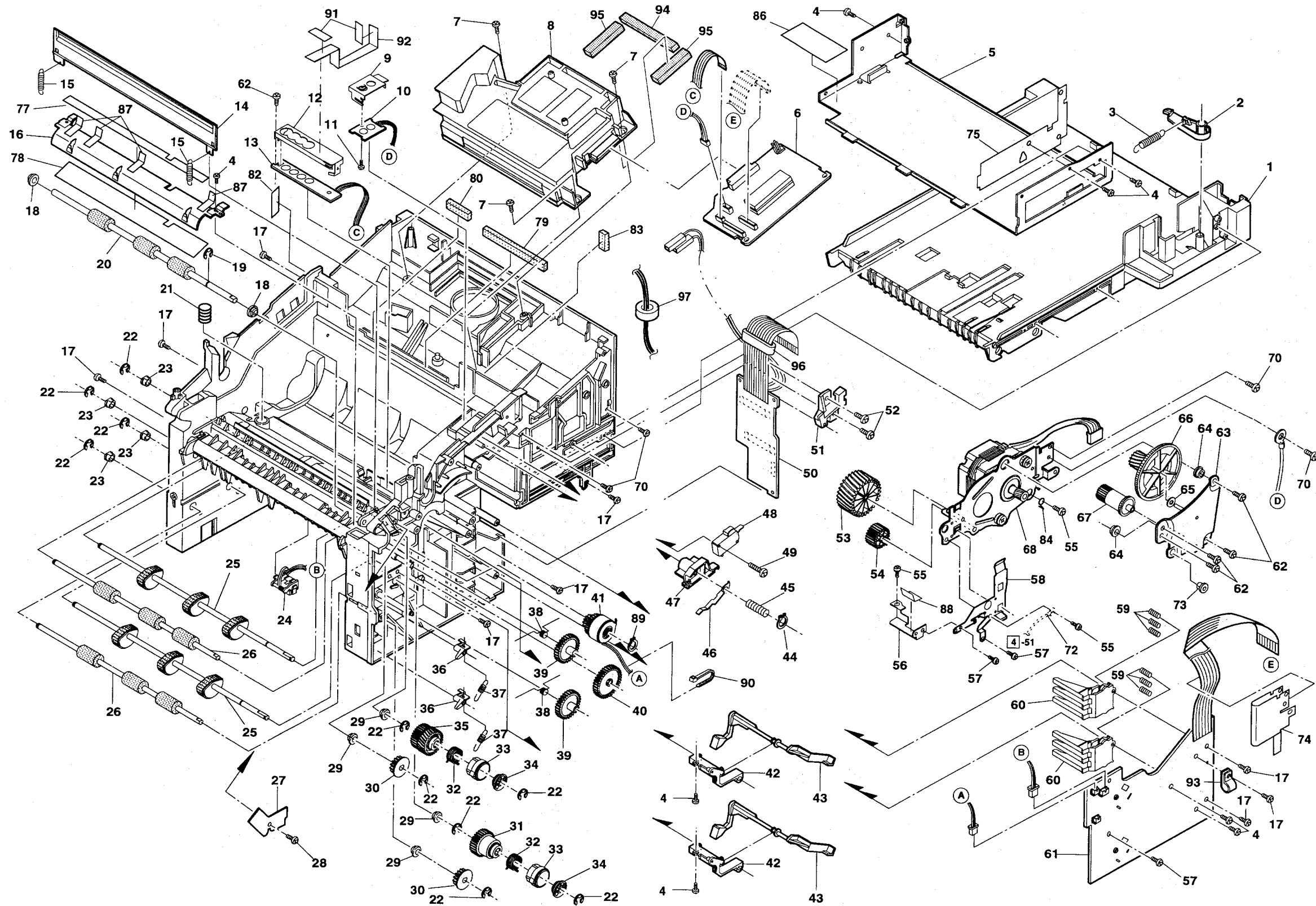
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CFRM-0021GC31	AZ		E	Guide frame unit (This includes No2,3)
2	MLEVP0029GCZZ	AD		C	Cassette push out lever
3	MSPRT0077GCZZ	AB		C	Cassette push out spring
4	XEBSD30P08000	AA		C	Screw (3×8)
5	LPLTM0104GCZZ	AR		C	Bottom plate
6	CPWBF0049GC70	BL	N	E	PCU PWB
7	XEBSD40P12000	AA		C	Screw (M4×12)
8	DUNT-0056GC14	CC		E	Optical unit
9	LPLTM0127GCZ1	AB		C	IN detector shield plate
10	CPWBF0054GC51	AK		E	Drum connect PWB
11	XHBSD30P05000	AA		C	Screw (M3×5)
12	LPLTM0112GCZZ	AD		C	Earth plate for sensor
13	CPWBF0048GC31	AK		E	Toner sensor PWB
14	CGiDM0033GC02	AT		C	PS guide ass'y
15	MSPRT0072GCZZ	AA		C	PS guide spring
16	PGiDH0032GCZZ	AH		C	PF guide
17	XEBSD30P10000	AA		C	Screw (3×10)
18	NBRGC0030GCZZ	AB		C	PS roller bearing
19	XRESP50-06000	AA		C	E type ring (5mm)
20	NRÖLP0046GCZZ	AP		C	PS roller
21	MSPRC0074GCZZ	AA		C	Spring for DV
22	XRESP40-06000	AA		C	4E-Type ring (4mm)
23	NBRGC0343FCZZ	AB		C	FD drive bearing (φ5)
24	RDTCF0013GCZZ	AM		B	P-IN sensor
25	NRÖLR0031GCZZ	AR		C	Pick up roller
26	NRÖLR0032GCZ1	AP		C	PF roller
27	PSHEP0074GCZZ	AB		C	Harness fixing sheet
28	XEBSD30P08000	AA		C	Screw (3×8)
29	NBRGP0013GCZZ	AD		C	Bearing
30	NGERH0036GCZZ	AB		C	PF gear
31	NGERH0037GCZZ	AG		C	27T PU gear lower
32	MSPRC0105GCZZ	AD		C	Clutch spring
33	PPiPP0001GCZ1	AC		C	PU sleeve
34	LBÖSZ1031FCZZ	AC		C	Clutch boss
35	NGERH0039GCZZ	AG		C	27T/27T gear
36	MLEVP0031GCZZ	AC		C	Eject lever
37	MSPRT0069GCZZ	AA		C	Eject spring
38	MSPRC0070GCZZ	AB		C	Earth spring
39	NGERH0040GCZZ	AC		C	31T gear
40	NGERH0038GCZZ	AC		C	39T gear
41	PCLC-0006GCZ1	AX		C	PS electromagnetic clutch
42	LHLDZ0013GCZZ	AD		C	PE lever holder
43	MLEVP0028GCZZ	AF		C	PE lever
44	PRNGP0026FCZZ	AA		C	G ring (GTW-3)
45	MSPRC0071GCZZ	AA		C	Safety switch spring
46	MLEVF0036GCZZ	AC		C	Safety switch actuator
47	MLEVP0032GCZZ	AD		C	Safety switch lever
48	QSW-M0017GCZZ	AG		B	Safety switch
49	XEBSD30P16000	AA		E	Screw (3×16)
50	CPWBF0050GC51	BB		C	MD PWB
51	PGiDM0042GCZZ	AC		C	Frame guide R
52	XEBSE30P10000	AA		C	Screw (3×10)
53	NGERH0046GCZ1	AH		C	36T gear
54	NGERH0047GCZZ	AD		C	30T gear
55	XBPSN40P06K00	AA		C	Screw (4×6K)
56	LPLTM0106GCZZ	AC		C	PSP earth plate
57	XBPSN30P06K00	AB		C	Screw (3×6K)
58	LPLTM0107GCZZ	AE		C	Frame earth plate
59	MSPRC0068GCZZ	AA		C	Size detect spring
60	MLEVP0030GCZZ	AD		C	Size detect lever
61	CPWBF0051GC51	BD		E	Cassette PWB
62	XEPSD30P08X00	AA		C	Screw (M3×8X)
63	CPLTM0118GC03	AH		C	Gear fixing angle
64	PSPAZ0009GCZZ	AA		C	Drive spacer
65	LX-WZ2012SCZZ	AA		C	Washer (C01720C)
66	NGERH0069GCZZ	AH		C	Gear
67	NGERH0045GCZZ	AD		C	54T/24T gear
68	CFRM-0022GC53	BG		E	Drive frame unit
70	XHBSE30P08000	AA		C	Screw (3×8)
72	DHAi-0043GCZZ	AC		C	Fusing earth wire
73	LBÖSZ0051GCZZ	AC		C	Brake boss
74	PSHEP0145GCZZ	AG	N	C	FFC shield sheet
75	PSHEP0081GCZZ	AE		C	ICU shield sheet B
77	PSHEP0083GCZZ	AD		C	PF sheet B
78	PSHEP0082GCZZ	AD		C	PF sheet A
79	PMLT-0028GCZZ	AA		C	Optical cushion C
80	PMLT-0029GCZZ	AA		C	Optical cushion D
82	PSHEP0078GCZZ	AA		C	Slide sheet
83	PMLT-0026GCZZ	AA		C	Optical cushion A
84	MSPRB0107GCZZ	AB		C	MM earth spring

2 Frame 1

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
86	PTPE-0008GCZZ	AC		C	Bottom plate tape
87	PSHEP0101GCZZ	AC		C	Guide sheet
88	PSHEP0102GCZZ	AB		C	Harness sheet
89	PRNGP0019FCZZ	AA		C	G ring (GTW-6)
90	LBNDJ2003SCZZ	AA		C	Band,wire (Large)
91	PSHEP0106GCZZ	AB		C	SNS. earth sheet

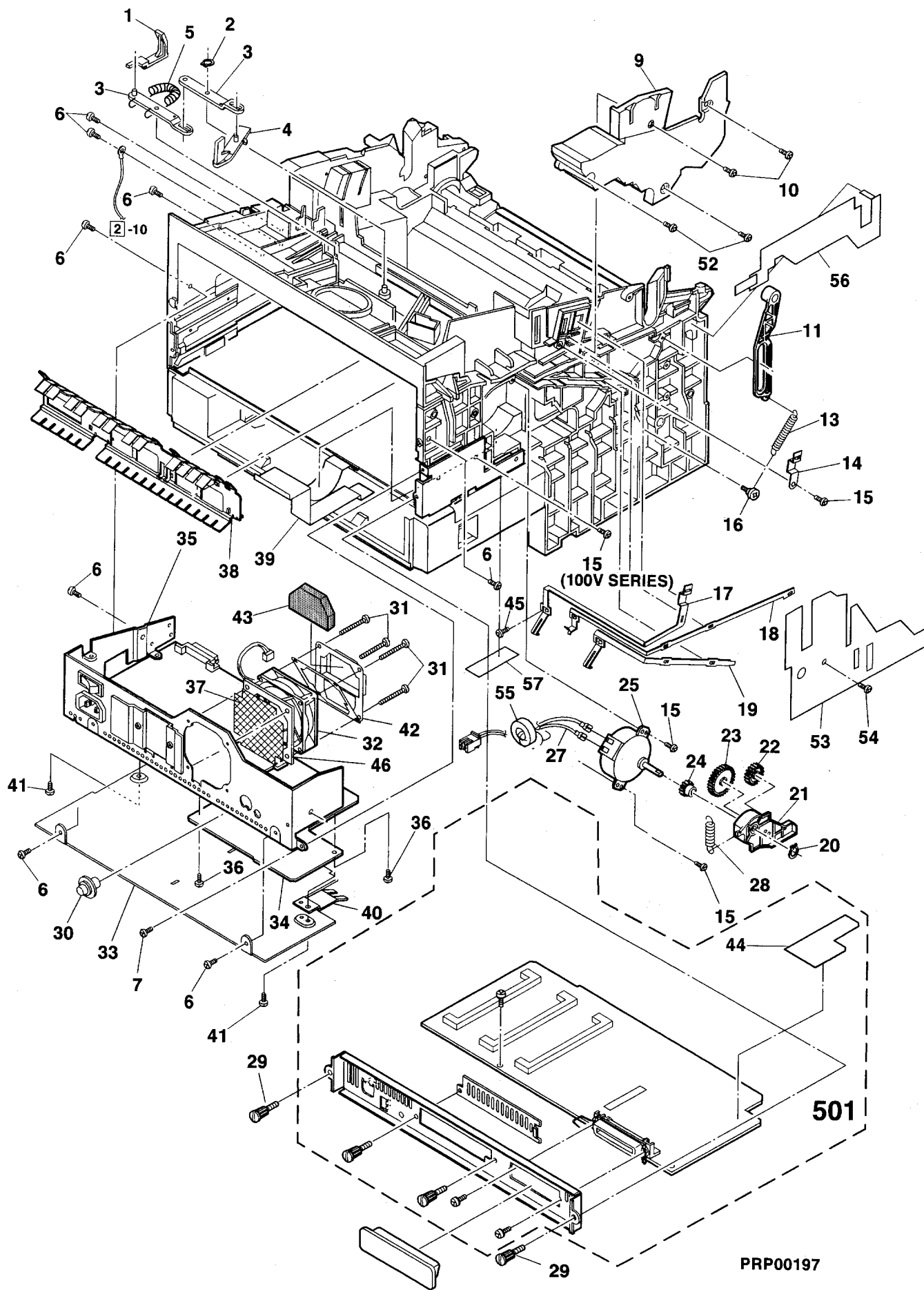
2 Frame 1

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
92	PTPE-0010GCZZ	AD		C	SNS. earth tape
93	LHLDW0006SCZZ	AB		C	Wire holder (NK-3N)
94	PMLT-0039GCZZ	AD	N	C	Optical cushion A
95	PMLT-0040GCZZ	AC	N	C	Optical cushion B
96	RCORF5029SCZZ	AL		C	Core (SSC-452-12H)
97	RCORF1020LCZZ	AF		C	Core (TR21-13-6BH)



PRP00196

3 Frame 2



3 Frame 2

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	MLEVP0034GCZZ	AC		C	Shutter lever B
2	PRNGP0033FCZZ	AA		C	Ring (G4)
3	MLEVP0033GCZZ	AC		C	Shutter lever A (ABS)
4	PSHT-0006GCZ1	AD		C	Optical shutter
5	MSPRT0127GCZZ	AB		C	Shutter spring A
6	XHBSE30P08000	AA		C	Screw (3x8)
7	XBPSN40P06K00	AA		C	Screw (4x6K)
9	PCASZ0015GCZ3	AK		C	Duct case
10	XEBSD30P08000	AA		C	Screw (3x8)
11	LSTPP0006GCZZ	AE		C	Transport stopper
13	MSPRT0130GCZZ	AB		C	Transport stopper spring N
14	QSLP-0024GCZZ	AB		C	High voltage terminal D
15	XEBSD30P08000	AA		C	Screw (3x8)
16	LX-BZ0019GCZZ	AB		C	Screw
17	QSLP-0015GCZZ	AF		C	High voltage terminal C
18	QSLP-0014GCZZ	AG		C	High voltage terminal B
19	QSLP-0013GCZZ	AE		C	High voltage terminal A
20	PRNGP0025FCZZ	AA		C	G type ring (GTW-5)
21	MARMP0008GCZZ	AE		C	Toner arm
22	NGERH0043GCZZ	AC		C	26T gear
23	NGERH0042GCZZ	AC		C	40T gear
24	NGERH0041GCZZ	AB		C	15T gear
25	RMOTN0015GCZZ	AV		B	Toner motor
27	DHAi-0055GCZZ	AE		C	Toner motor harness
28	MSPRT0075GCZ1	AB		C	Toner arm spring
29	LX-BZ2154SCZZ	AB		C	Screw
30	JKNBZ0003GCZZ	AD		C	VR knob
31	XBPSD30P32000	AA		C	Screw (3x32)
32	RMOTN0016GCZZ	AY		B	Fan motor
33	LPLTM0105GCZZ	AM		C	Shield plate
34	CPWBF0047GC38	BP		E	High voltage PWB
35	CPWBF0046GC31	BR		E	DC power supply PWB (110V/120V)
35	CPWBF0046GC34	BU		E	DC power supply PWB (200V series)
35	CPWBF0046GC33	BX		E	DC power supply PWB (127V)
36	XBPSD30P06000	AA		C	Screw (3x6)
37	GNET-0001GCZZ	AK		C	Mesh
38	QEARP0013GCZZ	AL	N	C	AC earth plate
39	PTPE-0006GCZ1	AE		C	TM shield tape
40	LPLTM0139GCZZ	AB		C	Shield plate A
41	XBPSE30P04000	AA		C	Screw (3x4)
42	PCASZ0017GCZ1	AG		C	Filter case
43	PFILZ0006GCZZ	AG		C	Ozone filter
44	PSHEP0105GCZZ	AC		C	ICU sheet
45	XEBSD20P05000	AA		C	Screw (2x5)
46	PSHEG0093GCZZ	AD		C	Fan motor sheet
50	XBPSD30P06000	AA		C	Screw (M3x6)
51	PCAPH1001ACZZ	AE		C	Connector protector cap (36pin)
52	XEBSE30P10000	AA		C	Screw (3x10)
53	LPLTM0155GCZZ	AF		C	TM shield plate (200V series)
54	XEBSD30P08000	AA		C	Screw (3x8)(200V series)
55	RCORF1020LCZZ	AF		C	Core (TR21-13-6BH)
56	PSHEP0130GCZZ	AK	N	C	Duct sheet
57	PTPE-0011GCZZ	AF	N	C	Bottom plate tape
501	CPWBX0066GC51	CS	N	E	ICU PWB

4 Transport unit

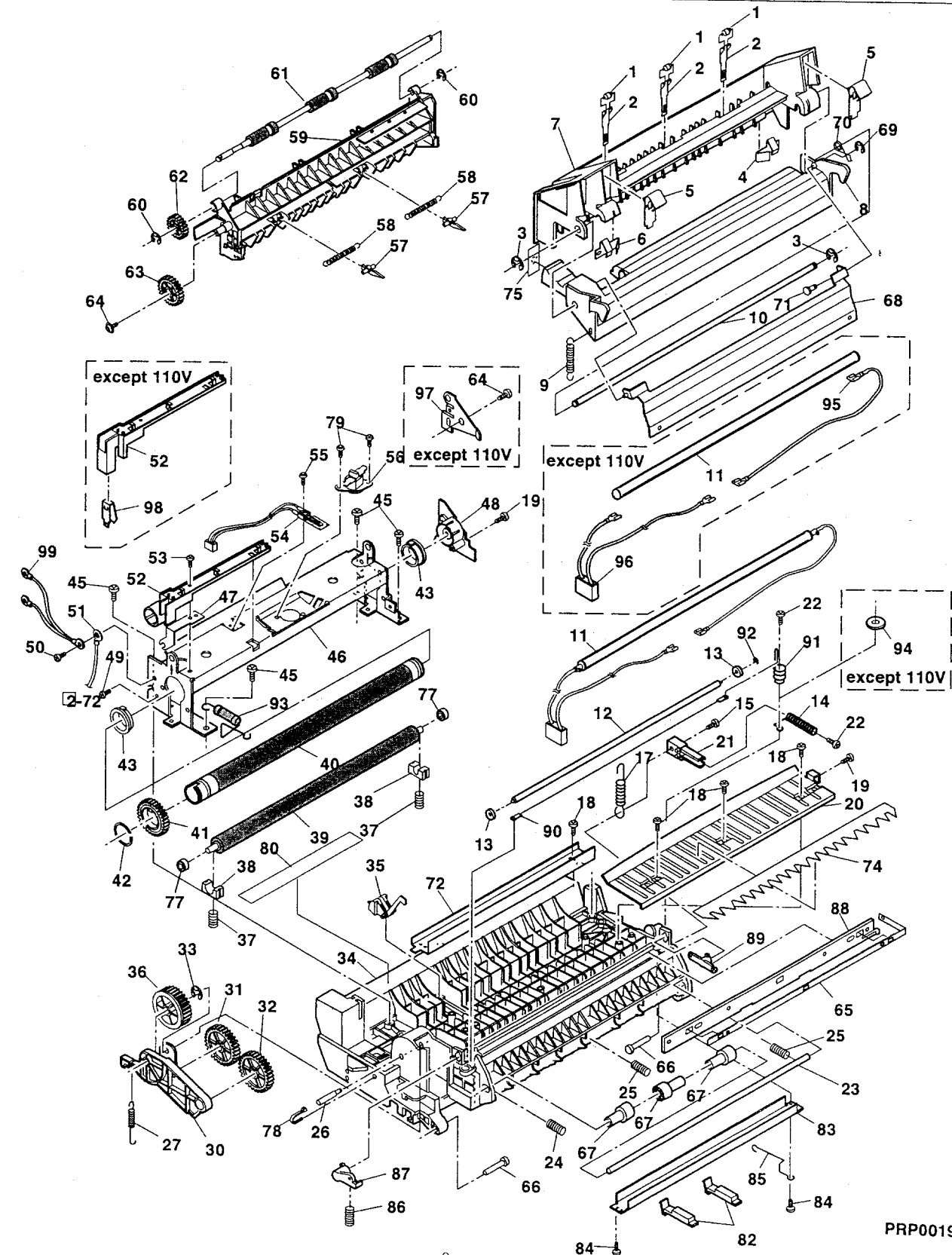
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	NR0LP0037GCZZ	AB		C	Delivery roller
2	MSPRP0083GCZZ	AC		C	Delivery guide spring
3	XRESP50-06000	AA		C	E type ring (5mm)
4	MSPRP0085GCZZ	AD		C	Cleaner pressure spring R
5	MSPRP0087GCZZ	AC		C	DR pressure spring
6	MSPRP0099GCZZ	AD		C	Cleaner pressure spring L
7	PGIDM0035GCZZ	AN		C	Delivery guide (110V)
7	PGIDM0035GCZ1	AV		C	Delivery guide (Except 110V)
8	PCOVP0024GCZ1	AN		C	Fusing cover
9	MSPRT0084GCZZ	AA		C	Fusing cover spring
10	NSFTZ0044GCZZ	AF		C	Fulcrum shaft
11	RLMPU0008GCZZ	AY		B	Heater lamp (120V/127V)
11	RLMPU0009GCZZ	AY		B	Heater lamp (200V series)
11	RLMPU0012GCZZ	AY	N	B	Heater lamp (110V)
12	NR0LR0051GCZZ	AM		C	Guide roller
13	PCLR-0006GCZZ	AB		C	Guide roller collar
14	MSPRT0120GCZ1	AC		C	TC spring BN
15	XEPSD30P08000	AA		C	Screw (3x8)

4 Transport unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
17	MSPRC0118GCZZ	AA		C	Guide roller spring
18	XEBSD30P08000	AA		C	Screw (3X8)
19	XHBSD30P06000	AA		C	Screw (3X6)
20	PGiDH0044GCZZ	AG		C	Fusing front paper guide
21	LHLDZ0023GCZZ	AC		C	TC electrode holder
22	XEPSD26P06000	AA		C	Screw (2.6X6)
23	NSFTZ0039GCZZ	AF		C	PS roller shaft
24	MSPRC0124GCZZ	AB		C	PS earth spring
25	MSPRC0121GCZZ	AA		C	PS roller spring
26	NSFTZ0047GCZZ	AE		C	Gear arm shaft
27	MSPRT0119GCZZ	AA		C	Gear arm spring
30	MARMP0011GCZZ	AE		C	Gear arm
31	NGERH0050GCZZ	AC		C	Transport gear B 31T
32	NGERH0066GCZZ	AC		C	31T gear C
33	XRESP40-06000	AA		C	4E-Type ring (4mm)
34	LFRM-0026GCZ1	AX		C	Transport frame (110V)
35	LFRM-0026GCZ2	AX		C	Transport frame (Except 110V)
36	MLEVP0035GCZZ	AD		C	PO actuator
37	NGERH0049GCZZ	AD		C	Transport gear A 31T
38	MSPRC0086GCZ1	AA		C	Pressure spring (100V series)
39	MSPRC0111GCZZ	AB		C	Pressure spring A (200V series)
40	NBRGC0017GCZZ	AD		C	Pressure roller bearing
41	NRÖLR0036GCZZ	AW		C	Pressure roller (110V)
42	NRÖLR0055GCZZ	AX		C	Pressure roller N (Except 110V)
43	NRÖLM0035GCZZ	AX		C	Heat roller
44	NGERH0051GCZZ	AD		C	Fusing gear 32T
45	LSTPF0007GCZZ	AA		C	HT stopper
46	NBRGC0016GCZZ	AF		C	Heat roller bearing
47	XEBSD40P08000	AA		C	Screw (M4X8)
48	LPLTM0109GCZZ	AM		C	Base plate
49	MSPRP0109GCZZ	AC		C	Heater spring (110V)
50	PCÖVQ0031GCZ1	AH		C	Heater cover (110V)
51	PCÖVQ0036GCZZ	AH		C	Heater cover N (Except 110V)
52	XEBSD30P06000	AA		C	Screw (3X6)
53	XHBSD30P04000	AA		C	Screw (3X4)
54	DHAi-0043GCZZ	AC		C	Fusing earth wire
55	LHLDZ0014GCZZ	AE		C	Lamp holder (110V)
56	LHLDZ0024GCZZ	AE		C	Lamp holder N (Except 110V)
57	RDICT0011GCZZ	AQ		B	Thermistor
58	XBPSD30P10KSO	AA		C	Screw (3X10KS)
59	CTHM-0011FC01	AK		B	Thermostat
60	PTME-0007GCZZ	AE		C	Separator pawl
61	MSPRT0082GCZZ	AA		C	Separator pawl spring
62	LHLDZ0016GCZZ	AP		C	Separator pawl holder
63	XRESP40-06000	AA		C	4E-Type ring (4mm)
64	NRÖLP0038GCZA	AR		C	Delivery roller
65	NGERH0065GCZZ	AC		C	Delivery drive gear
66	NGERH0052GCZZ	AC		C	Idle gear
67	XEPSD30P08X00	AA		C	Screw (M3X8)(Except 110V)
68	QSLP-0025GCZZ	AF		C	Separator electrode
69	LPiNS0008GCZ1	AB		C	Hinge pin
70	NRÖLP0048GCZZ	AC		C	PS roller B
71	CPLTM0135GC01	AM		C	DR pressure plate
72	XRESP20-04000	AA		C	E type ring (2mm)
73	MSPRT0108GCZZ	AA		C	Pressure plate spring
74	NSFTZ0045GCZZ	AC		C	Pressure plate shaft
75	LPLTM0134GCZ1	AG		C	Fusing pressure plate
76	PSHEP0100GCZZ	AF		C	Paper guide sheet
77	TLABZ0127GCZZ	AB		C	Fusing green label
78	NBRGC0029GCZZ	AK		C	Pressure bearing
79	LBNDJ2003SCZZ	AA		C	Band,wire (Large)
80	XBPSD30P04000	AA		C	Screw (M3X4)
81	TLABH0128GCZZ	AC		D	Caution label
82	LANGF0012GCZZ	AB		C	PS reinforcement angle
83	PCASZ0018GCZZ	AE		C	TC case
84	XEPSD30P06000	AA		C	Screw (M3X6)
85	MSPRC0125GCZZ	AC		C	TC case spring
86	MSPRT0117GCZZ	AA		C	Guide roller spring
87	MARMP0009GCZZ	AC		C	Guide arm R
88	PGiDM0043GCZZ	AE		C	Separator guide
89	MARMP0010GCZZ	AB		C	Guide arm L
90	CWiR-0001GC01	AH		C	Charger wire
91	MSPRC0116GCZZ	AB		C	TC spring A
92	XRESP15-04000	AA		C	E type ring (1.5mm)
93	DUNT-0075GCZZ	AN		E	TC resistor
94	XWHBN30-05060	AA		C	Washer
95	DHAi-0062GCZZ	AE		C	Heater harness A (120V/127V)
96	DHAi-0064GCZZ	AE		C	Heater harness A (200V series)
97	DHAi-0063GCZZ	AK		C	Heater harness B (120V/127V)

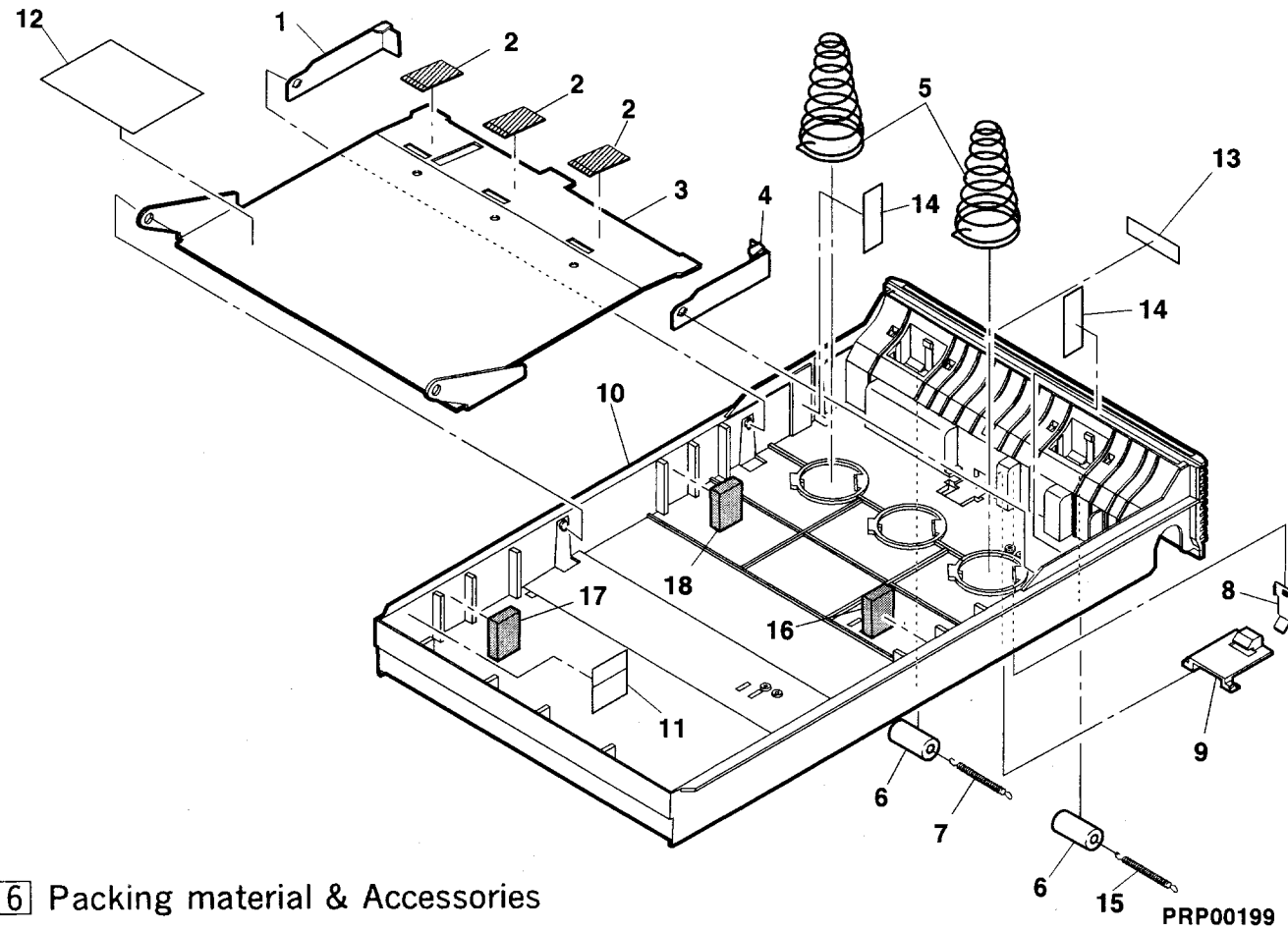
4 Transport unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
96	DHAi-0065GCZZ	AK		C	Heater harness B (200V series)
97	QSLP-0026GCZZ	AC		C	Terminal A (Except 110V)
98	QSLP-0027GCZZ	AC		C	Terminal B (Except 110V)
99	DHAi-0078GCZZ	AK	N	C	Fusing earth wire N
(Unit)					
901	DUNT-0057GC16	BW		E	Transport unit (120V/127V)
	DUNT-0057GC17	BW		E	Transport unit (200V series)
	DUNT-0057GC18	BW	N	E	Transport unit (110V)

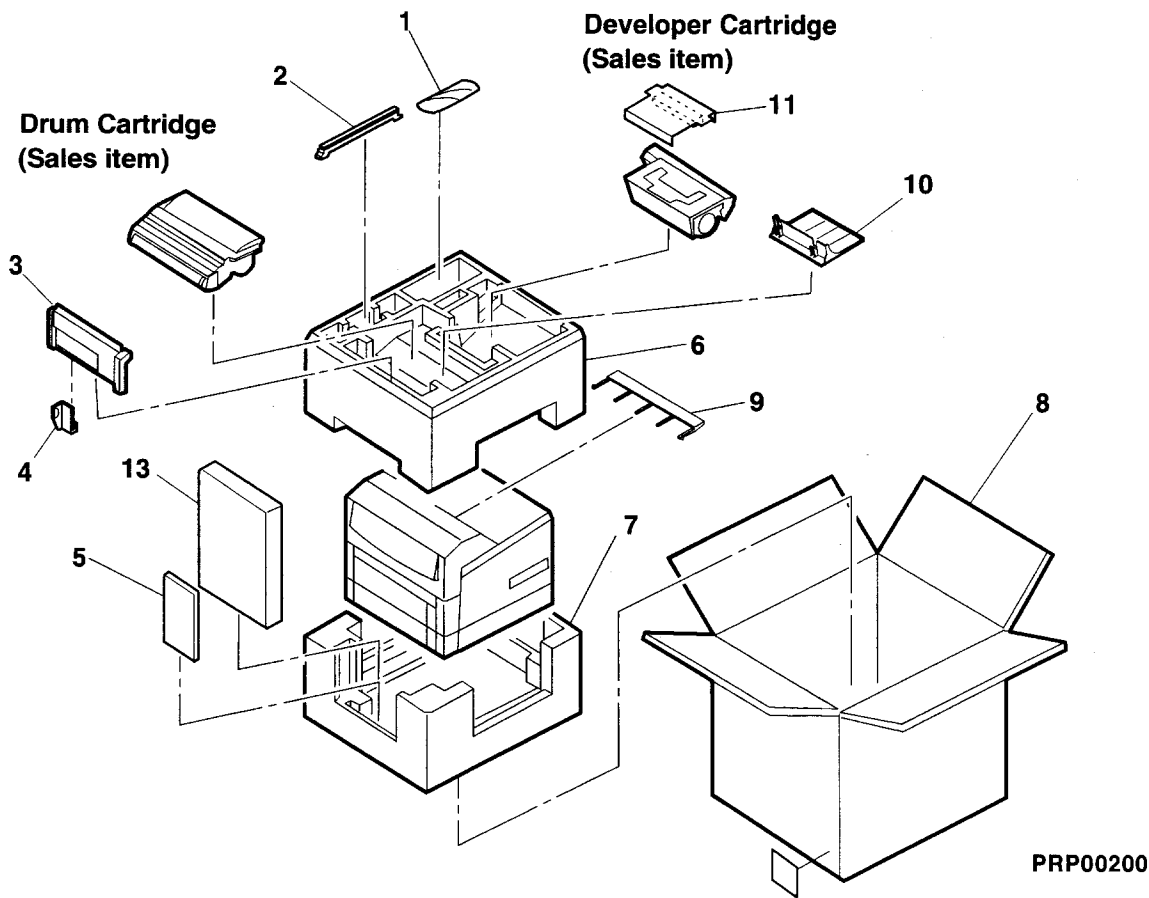




5 Cassette



6 Packing material & Accessories



5 Cassette

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	PTME-0009GCZZ	AD		C	Cassette pawl R
2	PSHEZ1606FCZZ	AB		C	Cassette sheet
3	LPLTM0110GCZ1	AP		C	Rotation plate letter (Inch series)
3	LPLTM0111GCZ1	AP		C	Rotation plate A4 (AB series)
4	PTME-0008GCZZ	AD		C	Cassette pawl L
5	MSPRC0110GCZZ	AC		C	Cassette spring
6	NROLP0039GCZZ	AC		C	PF roller
7	MSPRT0128GCZZ	AB		C	PF roller spring
8	MSPRP0088GCZZ	AB		C	Rotation lock spring
9	LSTPP0008GCZZ	AC		C	Rotation stopper
10	GCASP0007GCL2	AS		D	Cassette case letter (Inch series)
10	GCASP0007GCA2	AV		D	Cassette case A4 (AB series)
11	TLABZ0176GCZZ	AC		D	Label
12	TLABH0096GCZZ	AD		C	Operation instruction label
13	TLABZ0095GCZZ	AC		C	Cassette size label letter (Inch series)
13	TLABZ0098GCZZ	AC		C	Cassette size label A4 (AB series)
14	LPLTM0138GCZZ	AC		C	Cassette side plate
15	MSPRT0129GCZZ	AB		C	PF roller spring
16	PMLT-0035GCZZ	AB		C	Cassette cushion C (Inch series)
17	PMLT-0033GCZZ	AB		C	Cassette cushion A (AB series)
18	PMLT-0034GCZZ	AB		C	Cassette cushion B (AB series)

6 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
△	QACCD6611QCN2	AX		B	AC cord (125V 10A)(USA,CANADA, Costa Rica,Brazil)
△	QACCL7621QCZZ	AX		B	AC cord(Australia plug) (250V 6A)(Australia, New Zealand)
△	QACCV6621QCN1	AU		B	AC cord(φ4.8 2pin)(250V 10A)(Pakistan,Uruguay, Argentina, Paraguay, Indonesia,Kuwait,Oman,Katar,Greece,West Africa)
△	QACCV6621QCN1	AU		B	AC cord(φ4.8 2pin)(250V 10A)(Lebanon,Iran,India,Nigeria,Algeria, Egypt,Iraq,Bangladesh,Turkey,Tunisia,Jordan)
△	QACCV6621QCN1	AU		B	AC cord(φ4.8 2pin) (250V 10A)(Syria,U.A.E,Thailand)
△	QACCB7620QCN1	AX		B	AC cord(BS plug)(250V 6A) (Cyprus,Malaysia,Bahrain,North Yemen,Saudi Arabia)
△	QACCD7613QCN5	AQ		B	AC cord (125V 10A)(Barbados)
△	QACCJ9610QCZZ	AR		B	AC cord(125V 12A)(Dominica,Middle America,Venezuela, Indonesia,Taiwan,Ecuador,Philippines,Colombia)
△	1 QCNW-0132FCZZ	AV		B	Inlet AC cord(φ4 2pin) (Chile,Peru)
△	QCNW-0122FCZZ	AR		B	AC wire (Saudi Arabia)
△	QPLGA0002QCZZ	AN		C	AC plug (125V 15A)(Saudi Arabia)
△	QTANP0096FCZZ	AA		C	AC terminal (V2M3)(Saudi Arabia)
△	PHOG-1023CCZZ	AB		C	AC plug protect (South Africa,Sri Lanka,Hong Kong)
△	QACCB7521QCZZ	AS		B	AC cord (250V 6A)(South Africa,Sri Lanka,Hong Kong)
△	QPLGA4171CCZZ	AN		C	AC plug(3pin) (South Africa,Sri Lanka,Hong Kong)
△	QPLGA0001QCZZ	AN		C	AC plug
△	QACCF7620QCZZ	AX		B	AC cord (250V 6A)(Singapore)
△	QACCB7622QCZZ	BA		B	AC cord (U.Kingdom only)
△	QACCV6621QCZZ	AT		B	AC cord (Germany)
△	2 CHLDZ0015GC02	AM		C	Cleaner holder
△	3 PGIDM0038GCZZ	AH		D	Manual feeding tray
△	4 PGIDM0039GCZZ	AD		D	Paper guide
△	TINSE0120GCZZ	AY	N	D	Operation manual (English)
△	TINSF0122GCZZ	AW	N	D	Operation manual (French)
△	TINSG0121GCZZ	AS	N	D	Operation manual (German)
△	6 SPAKA0221GCZZ	AR		D	Top packing cushion
△	7 SPAKA0222GCZZ	AR		D	Bottom packing cushion
△	8 SPAKC0459GCZZ	AX	N	D	Packing case (USA,CANADA)
△	8 SPAKC0460GCZZ	AX	N	D	Packing case (other countries)
△	8 SPAKC0477GCZZ	AX	N	D	Packing case (Australia)
△	9 PCOVP0033GCZ1	AH		C	Delivery guide cover
△	10 CSOU-0005GC01	AK		C	Received document tray extender
△	11 SPAKA0280GCZZ	AH		D	DV fixer packing cushion
△	13 SPAKA0278GCZZ	AD		D	Cassette fixing cushion (Germany only)
△	101 SSAKA3001CCZZ	AA		D	Vinyl bag for AC cord (140×360mm)
△	102 SSAKA3340QCZZ	AB		D	Vinyl bag for Accessories (320×380mm)
△	103 UBAGF0018FCZZ	AE		D	Drum protect bag (USA only)
△	105 CCLEZ0014GC01	AM		C	Charger cleaner
△	106 LSTPP0009GCZZ	AC		C	Rotation plate lock stopper
△	107 TCADZ2001QCZA	AE		D	Card (Australia only)
△	108 TGANE1001CSZB	AC		D	Warranty card (CANADA only)
△	108 TGANE1001QCZB	AC		D	Warranty card (Australia only)
△	110 TCADZ0014GCZZ	AD		D	Card (USA only)
△	112 SSAKA0005WCZZ	AA		D	Vinyl bag (160×260mm)
△	113 TCADZ0036GCZZ	AC		D	Licence card
△	117 UFLPB0013GCZZ	AQ	N	D	Media (Windows)
△	120 TCADZ0047GCZZ	AD		D	Card for HP (Germany only)
△	126 TCADZ0046GCZZ	AF		D	License card BG (Germany only)
△	127 SSAKA2347QCZZ	AB		D	Vinyl bag (for No.10)



## 7 MD PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VCKYPU1HB471K	AA		C	Capacitor (50WV 470PF) [C1]
2	VCKYPU1HB222K	AA		C	Capacitor (50WV 2200PF) [C2]
3	VCKYPU1HB222K	AA		C	Capacitor (50WV 2200PF) [C3]
4	VCEAEA1HW106M	AA		C	Capacitor (50WV 10 $\mu$ F) [C4]
5	VCKYPU1HB471K	AA		C	Capacitor (50WV 470PF) [C5]
6	VCTYPU1HF104Z	AB		C	Capacitor (50WV 0.10 $\mu$ F) [C6]
7	QCNCM0035GCZZ	AH		C	Connector (20pin) [CN202]
8	QCNCM0035GCZZ	AH		C	Connector (20pin) [CN203]
9	QCNCW0535FCZZ	AB		C	Connector (6pin) [CN206]
10	VHISLA7024M-P	AT		B	IC (SLA7024M) [IC1]
11	VHVICPN50// -1	AE		B	IC protector (ICPN50) [ICP50]
12	VRS-RE3DA1R0J	AB		C	Resistor (2W 1.0 $\Omega$ $\pm$ 5%) [R1]
13	VRD-RC2EY473J	AA		C	Resistor (1/4W 47K $\Omega$ $\pm$ 5%) [R2]
14	VRD-RC2EY621J	AA		C	Resistor (1/4W 620 $\Omega$ $\pm$ 5%) [R3]
15	VRD-RC2EY473J	AA		C	Resistor (1/4W 47K $\Omega$ $\pm$ 5%) [R4]
16	VRD-RC2EY242J	AA		C	Resistor (1/4W 2.4K $\Omega$ $\pm$ 5%) [R5]
17	VRD-RC2EY242J	AA		C	Resistor (1/4W 2.4K $\Omega$ $\pm$ 5%) [R6]
18	VRS-RE3DA1R0J	AB		C	Resistor (2W 1.0 $\Omega$ $\pm$ 5%) [R7]
19	VRD-RC2EY121J	AA		C	Resistor (1/4W 120 $\Omega$ $\pm$ 5%) [R8]
20	DHAi-0046GCZZ	AF		C	MD harness
21	DHAi-0048GCZZ	AE		C	DSW harness
	(Unit)				
901	CPWBF0050GC51	BB		E	MD PWB

## 8 Cassette PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VCEAEA1AW476M	AB		C	Capacitor (10WV 47 $\mu$ F) [C1]
2	RC-K1E104HCZZ	AB		C	Capacitor (25WV 0.1 $\mu$ F) [C2]
3	DHAi-0047GCZZ	AG		C	CS harness [CN301]
4	QCNCM0033GCZZ	AC		C	Connector (3pin) [CN303]
5	QCNCM0034GCZZ	AC		C	Connector (2pin) [CN304]
6	QCNCM0034GCZZ	AC		C	Connector (2pin) [CN305]
7	QSW-P0006GCZZ	AB		B	Push switch [CS1L]
8	QSW-P0006GCZZ	AB		B	Push switch [CS1U]
9	QSW-P0006GCZZ	AB		B	Push switch [CS2L]
10	QSW-P0006GCZZ	AB		B	Push switch [CS2U]
11	QSW-P0006GCZZ	AB		B	Push switch [CS3L]
12	QSW-P0006GCZZ	AB		B	Push switch [CS3U]
13	VHISN74LS151N	AG		B	IC (SN74LS151) [IC1]
14	VHPGP1S53V// -1	AE		B	Photo interruptor (GP1S53V) [PEL]
15	VHPGP1S53V// -1	AE		B	Photo interruptor (GP1S53V) [PEU]
16	RPLU-0001GCZZ	AM		B	Pick up solenoid 1 [PUSL]
17	RPLU-0001GCZZ	AM		B	Pick up solenoid 1 [PUSU]
18	VRD-RC2EY121J	AA		C	Resistor (1/4W 120 $\Omega$ $\pm$ 5%) [R1]
19	VRD-RC2EY203J	AA		C	Resistor (1/4W 20K $\Omega$ $\pm$ 5%) [R2]
20	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R3]
21	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R4]
22	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R5]
23	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R6]
24	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R7]
25	VRD-RC2EY103J	AA		C	Resistor (1/4W 10K $\Omega$ $\pm$ 5%) [R8]
26	VRD-RC2EY203J	AA		C	Resistor (1/4W 20K $\Omega$ $\pm$ 5%) [R9]
27	VRD-RC2EY181J	AA		C	Resistor (1/4W 180 $\Omega$ $\pm$ 5%) [R10]
28	DHAi-0050GCZZ	AL		C	OPU harness
29	XBBSD30P06000	AA		C	Screw (3 $\times$ 6)
	(Unit)				
901	CPWBF0051GC51	BD		E	Cassette PWB

## 9 PCU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	RALMB5006SCZZ	AD		B	Buzzer (EFB-RD22C01) [BZ1]
2	VCEAEA1AW476M	AB		C	Capacitor (10WV 47 $\mu$ F) [C1]
3	VCEAEA1HW106M	AA		C	Capacitor (50WV 10 $\mu$ F) [C2]
4	VCEAEA1AW476M	AB		C	Capacitor (10WV 47 $\mu$ F) [C3]
5	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF) [C4]
6	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10 $\mu$ F) [C5]
7	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF) [C6]
8	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF) [C7]
9	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF) [C8]
10	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10 $\mu$ F) [C9]

9] PCU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	QTY
11	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C1
12	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C1
13	VCCCTV1HH180J	AA		C	Capacitor (50WV 18PF)	[C1
14	VCCCTV1HH180J	AA		C	Capacitor (50WV 18PF)	[C1
15	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C1
16	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C1
17	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C1
18	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C1
19	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C1
20	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C1
21	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C2
22	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C2
23	VCKYTV1HR472K	AA		C	Capacitor (50WV 4700PF)	[C2
24	VCCCTV1HH471J	AA		C	Capacitor (50WV 470PF)	[C2
25	VCCCTV1HH471J	AA		C	Capacitor (50WV 470PF)	[C2
26	VCKYTV1HF104Z	AA		C	Capacitor (50WV 0.10μF)	[C2
27	QCNCW1226AC2H	AE		C	Connector (28pin)	[CN10
28	QCNCW1226AC2A	AE		C	Connector (21pin)	[CN10
29	QCNCW1226AC0D	AC		C	Connector (4pin)	[CN10
30	QCNCM0032GCZZ	AH		C	Connector (20pin)	[CN10
31	QCNCM1005MCZZ	AB		B	Connector (2pin)	[CN10
32	QCNCM2334SC0B	AB		B	Connector (2pin)	[CN10
33	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
34	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
35	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
36	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
37	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
38	VHDDSS133HV-1	AA		C	Diode (DSS133HV)	[D
39	VHIX24C44P/-1	AN		B	IC (X24C44P)	[IC
40	VHISN74LS00-1	AE		B	IC (SN74LS00)	[IC
41	VHIBA6886N/-1	AL		B	IC (BA6886N)	[IC
42	VHIM37451S620	AY	N	B	IC (M37451S620)	[IC
43	VHULN2003AN1	AE		B	IC (ULN2003AN1)	[IC
44	VHULN2003AN1	AE		B	IC (ULN2003AN1)	[IC
45	VHIPST575CMT	AE		B	IC (PST575CMT)	[IC
46	VHVICPN20///-1	AD		B	IC protector (ICP-N20)	[ICP2
47	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R1
48	VRD-RC2EY622J	AA		C	Resistor (1/4W 6.2KΩ ±5%)	[R2
49	VRD-RC2EY102J	AA		C	Resistor (1/4W 1.0KΩ ±5%)	[R3
50	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R4
51	VRD-RC2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R5
52	VRD-RC2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R6
53	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R7
54	VRD-RC2EY512J	AA		C	Resistor (1/4W 5.1KΩ ±5%)	[R8
55	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R9
56	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R10
57	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R11
58	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R12
59	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R13
60	VRS-RE3AA5R1J	AB		C	Resistor (1W 5.1Ω ±5%)	[R14
61	VRD-RC2EY165J	AA		C	Resistor (1/4W 1.6MΩ ±5%)	[R15
62	VRD-RC2EY100J	AA		C	Resistor (1/4W 10Ω ±5%)	[R16
63	VRD-RC2EY471J	AA		C	Resistor (1/4W 470Ω ±5%)	[R17
64	VRD-RC2EY105J	AA		C	Resistor (1/4W 1.0MΩ ±5%)	[R18
65	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R19
66	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R20
67	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R21
68	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R22
69	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R23
70	VRD-RC2EY200J	AA		C	Resistor (1/4W 20Ω ±5%)	[R24
71	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R25
72	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R26
73	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R27
74	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R28
75	VRD-RC2EY472J	AA		C	Resistor (1/4W 4.7KΩ ±5%)	[R29
76	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R30
77	VRS-RE3AA5R1J	AB		C	Resistor (1W 5.1Ω ±5%)	[R31
78	VRNRC2EK4701F	AA		C	Resistor (1/4W 4.70KΩ ±1%)	[R32
79	VRD-RC2EY103J	AA		C	Resistor (1/4W 10KΩ ±5%)	[R33
80	VRS-TP2BD203J	AA		C	Resistor (1/8W 20KΩ ±5%)	[R34
81	VRS-TP2BD203J	AA		C	Resistor (1/8W 20KΩ ±5%)	[R35
82	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R36
83	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R37
84	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R38
85	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R39
86	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R40
87	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R41
88	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R42
89	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R43
90	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R44

9 PCU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
91	VRS-TP2BD472J	AA		C	Resistor (1/8W 4.7KΩ ±5%) [R45]
92	VRS-TP2BD472J	AA		C	Resistor (1/8W 4.7KΩ ±5%) [R46]
93	RMPTC4202QCJB	AA		B	Block resistor (2.0KΩ×4 1/8W ±5%) [RA1]
94	RMPTC4103QCJB	AD		B	Block resistor (10KΩ×4 1/8W ±5%) [RA2]
95	RCRSQ2052HCZZ	AH		B	Crystal (12.288MHz) [X1]
96	VRS-TP2BD000J	AA		C	Resistor (1/8W 0Ω ±5%)
	(Unit)				
901	CPWBF0049GC72	BL	N	E	PCU PWB <i>REV K9.0</i>

10 ICU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	RCORF2024SCZZ	AD		C	Core [B3]
2	RC-K1E104SCZZ	AA		C	Capacitor (25WV 0.1μF +20%,-80%) [C1]
3	RC-K1E104SCZZ	AA		C	Capacitor (25WV 0.1μF +20%,-80%) [C2]
4	VCEAJA1CW226M	AB		C	Capacitor (16WV 22μF) [C3~5]
5	RC-K1E104SCZZ	AA		C	Capacitor (25WV 0.1μF +20%,-80%) [C6]
6	VCEAJA1CW226M	AB		C	Capacitor (16WV 22μF) [C7]
7	RC-K1E104SCZZ	AA		C	Capacitor (25WV 0.1μF +20%,-80%) [C8~15]
8	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C16~28]
9	VCKYTV1HR561K	AA		C	Capacitor (50WV 560PF) [C34]
10	VCCCTV1HH330J	AA		C	Capacitor (50WV 33PF) [C38]
11	VCKYTV1HR102K	AA		C	Capacitor (50WV 1000PF) [C39]
12	VCCCTV1HH330J	AA		C	Capacitor (50WV 33PF) [C40]
13	VCKYTV1HB101K	AA		C	Capacitor (50WV 100PF) [C41~45]
14	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C46]
15	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C47]
16	VCCCTV1HH220J	AA		C	Capacitor (50WV 22PF) [C48~52]
17	VCKYTV1HB101K	AA		C	Capacitor (50WV 100PF) [C53]
18	VCKYTV1HB101K	AA		C	Capacitor (50WV 100PF) [C54]
19	VCKYTV1HB101K	AA		C	Capacitor (50WV 100PF) [C55]
20	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C56~82]
21	VCCCTV1HH330J	AA		C	Capacitor (50WV 33PF) [C83]
22	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C88~93]
23	VCKYTQ1HB392K	AB		C	Capacitor (50WV 3900PF) [C94]
24	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C95~99]
25	VCKYTQ1HB392K	AB		C	Capacitor (50WV 3900PF) [C100]
26	VCKYTQ1HB392K	AB		C	Capacitor (50WV 3900PF) [C101]
27	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C102]
28	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C105]
29	VCCCTV1HH220J	AA		C	Capacitor (50WV 20PF) [C106]
30	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C107]
31	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C108]
32	VCCCTV1HH680J	AA		C	Capacitor (50WV 68PF) [C109]
33	QCNCW0341FCZZ	AG		C	Connector (20pin) [CN501]
34	QCNCM0049GCZZ	AL	N	C	Connector (40pin) [CN502]
35	QCNCW0048GCZZ	AN	N	C	Connector (70pin) [CN503]
36	QCNCW0040GCZZ	AK		C	Connector (68pin) [CN504]
37	QCNCW0047GCZZ	AN	N	C	Connector (60pin) [CN505]
38	VH1LH538817-1	AZ	N	B	IC (LH538817) <i>538815-1 LPE215</i> [IC3]
39	QSOCZ0051FCZZ	AD		C	IC socket (42pin) <i>538815-1 LPE215</i> [IC3~6]
40	VH1LH538818-1	AZ	N	B	IC (LH538818) [IC4]
41	VH1LH538819-1	AZ	N	B	IC (LH538819) [IC5]
42	VH1LH53881A-1	AZ	N	B	IC (LH53881A) [IC6]
43	VH1LZ9AG11///	AX	N	B	IC (LZ9AG11) [IC7]
44	VH1AM29240///	CA	N	B	IC (AM29240) [IC8]
45	VH14M8S0J-70//	BG	N	B	IC (4M8S0J-70) [IC9~12]
46	VH174VHC74//R	AE		B	IC (74VHC74) [IC13]
47	VH1AT24C04//1	AP		B	IC (AT24C04) [IC14]
48	VH17SHU04///	AE	N	B	IC (7SHU04) [IC15]
49	VH17SHU04///	AE	N	B	IC (7SHU04) [IC16]
50	VH174F08SJ//1	AE		B	IC (74F08SJ) [IC17]
51	VH174ABT245F1	AP	N	B	IC (74ABT245F1) [IC18~21]
52	VH174ABT244F1	AP	N	B	IC (74ABT244F1) [IC22~24]
53	VH1SN74LS244N	AS		B	IC (SN74LS244N) [IC25]
54	RCORF1005ACZZ	AB		C	Core (BLM41A01) [L1]
55	RCORF1005ACZZ	AB		C	Core (BLM41A01) [L3]
56	RCORF1005ACZZ	AB		C	Core (BLM41A01) [L4]
57	VRD-RC2EY101J	AA		C	Resistor (1/4W 100Ω ±5%) [R1]
58	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%) [R2]
59	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%) [R3]
60	VRS-TP2BD332J	AA		C	Resistor (1/8W 3.3KΩ ±5%) [R4]
61	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%) [R5]
62	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%) [R6]
63	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%) [R8~22]
64	VRS-TP2BD330J	AA		C	Resistor (1/8W 33Ω ±5%) [R23~44]

10 ICU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
65	VRS-TP2BD330J	AA		C	Resistor (1/8W 33Ω ±5%)	[R46
66	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R47
67	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R48
68	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R49~53
69	VRS-TP2BD330J	AA		C	Resistor (1/8W 33Ω ±5%)	[R54~56
70	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R58~60
71	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R61~65
72	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R67~70
73	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R71
74	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R73
75	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R74
76	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R75
77	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R76
78	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R77
79	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R78~80
80	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R81
81	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R82
82	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R83
83	VRS-TP2BD100J	AA		C	Resistor (1/8W 10Ω ±5%)	[R84
84	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R85~87
85	VRS-TP2BD100J	AA		C	Resistor (1/8W 10Ω ±5%)	[R88~90
86	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R91~102
87	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R103
88	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R104~107
89	VRS-TP2BD330J	AA		C	Resistor (1/8W 33Ω ±5%)	[R109~112
90	VRS-TP2BD100J	AA		C	Resistor (1/8W 10Ω ±5%)	[R113~116
91	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R117
92	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R122
93	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R123
94	VRS-TP2BD220J	AA		C	Resistor (1/8W 22Ω ±5%)	[R125
95	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R127~130
96	VRS-TP2BD101J	AA		C	Resistor (1/8W 100Ω ±5%)	[R131
97	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%)	[R132
98	VRS-TP2BD330J	AA		C	Resistor (1/8W 33Ω ±5%)	[R133~164
99	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA1~4
100	RMPTC8122QCKB	AC		B	Block resistor (1.2KΩ×8 1/8W ±10%)	[RA5
101	RMPTC8122QCKB	AC		B	Block resistor (1.2KΩ×8 1/8W ±10%)	[RA6
102	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA7~11
103	RMPTC8222QCKB	AD		B	Block resistor (2.2KΩ×8 1/8W ±10%)	[RA12
104	RMPTC8103QCKB	AD		B	Block resistor (10KΩ×8 1/8W ±10%)	[RA13~17
105	QSOCZ0003GCZZ	AQ	N	C	SIMM socket	[SIM1~3
106	RCRS-0016GCZZ	AR	N	C	Crystal (22.7272MHz)	[X1
107	RCRS-0015GCZZ	AR	N	C	Crystal (39.936MHz)	[X2
108	HPNLC0011GCZ1	AG		C	Dummy I/F panel	
109	HPNLC0013GCZ1	AK	N	D	I/F panel	
110	LX-BZ0016GCZZ	AB		C	Screw	
111	LX-BZ0494FCZZ	AB		C	Screw	
112	PSHEP0105GCZZ	AC		C	ICU sheet	
113	VCKYPU1HB152K	AA		C	Capacitor (50WV 1500PF)	
114	VRD-HT2EY330J	AA		C	Resistor (1/4W 33Ω ±5%)	
	(Unit)					
901	CPWBX0066GC51	CS	N	E	ICU PWB	

11 DC power supply PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
1	VHDRBV604// -1	AH		B	Diode (RBV-604)(100V series)	[BD701
	VHDRBV606// -1	AH		B	Diode (RBV606)(200V series)	[BD701
2	RC-FZ084DPAZZ	AE		C	Capacitor (0.22MF/125V)	[C701
3	RC-FZ084DPAZZ	AE		C	Capacitor (0.22MF/125V)	[C702
4	RC-QZ0047PAZZ	AC		C	Capacitor (3300PF/400V)(100V series)	[C705
	RC-KZ003DPAZZ	AC		C	Capacitor (2200PF/250V)(200V series)	[C705
5	RC-QZ0047PAZZ	AC		C	Capacitor (3300PF/400V)(100V series)	[C706
6	RC-QZ0044PAZZ	AC		C	Capacitor (470PF/125V)(100V series)	[C707
	RC-QZ0045PAZZ	AB		C	Capacitor ((KC)1000PF/125V)(200V series)	[C707
7	RC-QZ0048PAZZ	AC		C	Capacitor (4700PF/400V)(200V series)	[C708
8	RC-EZ0306PAZZ	AM		C	Capacitor (470MF/200V(MX))(100V series)	[C709
	RC-EZ0305PAZZ	AN		C	Capacitor (120MF/400V(GQ))(200V series)	[C709
9	RC-KZ0064PAZZ	AB		C	Capacitor ((HR)220PF/1KV)	[C710
10	RC-EZ0319PAZZ	AD		C	Capacitor (50WV 47μF)	[C711
11	RC-KZ0032PAZZ	AB		C	Capacitor ((HR)1000PF/500V)	[C714
12	RC-QZS104AFYK	AB		C	Capacitor (104PF/K/50V)	[C715
13	VCKYPA1HF104Z	AB		C	Capacitor (50WV 0.10μF)	[C716
14	VCEAIS1HM105M	AB		C	Capacitor (50WV 1.0μF)(200V series)	[C717
15	RC-FZ083DPAZZ	AD		C	Capacitor (0.1MF/125V)(100V series)	[C718
	RC-FZ085DPAZZ	AF		C	Capacitor (0.33MF/250V)(200V series)	[C718

11 DC power supply PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
16	VCEA1S1VM108M	AE		C	Capacitor (50WV 1000 $\mu$ F)	[C720]
17	VCEA1S1VM108M	AE		C	Capacitor (50WV 1000 $\mu$ F)	[C721]
18	VCCSPA1H6101J	AA		C	Capacitor (50WV 100PF)(SL/101PF/J/50V)	[C722]
19	RC-QZS104AFYK	AB		C	Capacitor (104PF/K/50V)	[C723]
20	VCEA1S1VM337M	AD		C	Capacitor (35WV 330 $\mu$ F)	[C724]
21	VCEA1S1VM108M	AE		C	Capacitor (50WV 1000 $\mu$ F)	[C726]
22	VCEA1S1AM228M	AE		C	Capacitor (10WV 2200 $\mu$ F)	[C727]
23	VCEA1S1AM228M	AE		C	Capacitor (10WV 2200 $\mu$ F)	[C728]
24	VCKYPA1HF104Z	AB		C	Capacitor (50WV 0.10 $\mu$ F)	[C730]
25	RC-KZ004DPAZZ	AD		C	Capacitor (KD 3300PF/250V)(200V series)	[C731]
26	RC-QZA102AFYK	AA		C	Capacitor (102PF/K/50V)	[C733]
27	RC-QZ0048PAZZ	AC		C	Capacitor (4700PF/400V)(200V series)	[C734]
28	RC-EZ0320PAZZ	AC		C	Capacitor (50WV 10 $\mu$ F)	[C735]
29	RC-QZ0045PAZZ	AB		C	Capacitor ((KC)1000PF/125V)(200V series)	[C736]
30	RC-KZ0071PAZZ	AB		C	Capacitor (50WV 0.1 $\mu$ F)(200V series)	[C737]
31	QPLGZ0457PAZZ	AH		C	Connector (20P)	[CN701]
32	QPLGZ0455PAZZ	AD		C	Connector (3P)	[CN702]
33	QPLGZ0456PAZZ	AF		C	Connector (8P)	[CN703]
34	RC-FZ093DPAZZ	AG		C	Capacitor (XA1201)	[CR701]
35	VHD1SS270A/-1	AA		B	Diode (1SS270A)	[D703]
36	VHD1SS270A/-1	AA		B	Diode (1SS270A)	[D704]
37	VHDERA9102/-1	AC		B	Diode (ERA91-02)	[D706]
38	VHDESAC92M02/	AH		B	Diode (ESAC92M02)	[D707]
39	VHDSB80-05J-1	AG		B	Diode (SB80-05J)	[D708]
40	VHD1SS270A/-1	AA		B	Diode (1SS270A)	[D709]
41	VHD1SS270A/-1	AA		B	Diode (1SS270A)	[D710]
42	QFS-F0011PAZZ	AE		A	Fuse (10A/125V)(100V series)	[FS701]
43	QFS-C0028PAZZ	AH		A	Fuse (T5A/250V)(200V series)	[FS701]
43	QFS-F0011PAZZ	AE		A	Fuse (10A/125V)(100V series)	[FS702]
43	QFS-C0028PAZZ	AH		A	Fuse (T5A/250V)(200V series)	[FS702]
44	QFS-F0006PAZZ	AE		A	Fuse (125V/T4A)(100V series)	[FS703]
44	QFS-C0030PAZZ	AF		A	Fuse (T2A/250V)(200V series)	[FS703]
45	RH-iX0783PAZZ	AD		B	IC (L5431)	[IC701]
46	QHICA4169KAZZ	AM		B	HIC (A4169KA)	[IC702]
47	QHICA0003VAZZ	AR		B	HIC	[IC703]
48	RTRNZ0202PAZZ	AK		B	Line filter (20297)(100V series)	[L701]
48	RTRNZ0394PANA	AH		B	Line filter (200V series)	[L701]
49	RTRNZ0202PAZZ	AK		B	Line filter (20297)(100V series)	[L702]
49	RTRNZ0394PANA	AH		B	Line filter (200V series)	[L702]
50	RTRNZ0035PANT	AE		B	Filter-coil	[L703]
51	RTRNZ0400PANT	AD		B	Drum-coil	[L704]
52	RTRNZ0165PANA	AM		B	Choke-coil (Z0165)(100V series)	[L705]
52	RTRNZ0165PAZZ	AK		B	Choke-coil (200V series)	[L705]
53	RTRNZ0423PANN	AL		B	Filter-coil	[L706]
54	RTRNZ0068PAZZ	AE		B	Ring-coil (100V series)	[L708]
55	RCORF2004SCZZ	AM		C	AC core	[L709]
56	RH-PX0104PAZZ	AF		B	Photo coupler (PC817B)(100V series)	[PC701]
56	RH-PX0199PAZZ	AE		B	Photo coupler (PC111)(200V series)	[PC701]
57	VHRS21ME4F/-1	AH		B	Photo triac (S21ME4F)	[PC703]
58	VS2SK1016//--1	AQ		B	Transistor (2SK1016)(100V series)	[Q701]
58	VS2SK1358//--1	AR		B	Transistor (2SK1358)(200V series)	[Q701]
59	VS2SD1207S/-1	AC		B	Transistor (2SD1207S)	[Q704]
60	VS2SA1451Y/-1	AH		B	Transistor (2SA1451Y)	[Q705]
61	VS2SA673AC/-1	AE		B	Transistor (2SA673AC)	[Q706]
62	VS2SC4363//--1	AB		B	Transistor (2SC4363)	[Q707]
63	VRS-FC3AA104J	AA		C	Resistor (1.0W 100K $\Omega$ $\pm$ 5%)	[R702]
64	VRW-GV3HC220K	AD		C	Resistor (5W 22 $\Omega$ $\pm$ 10%)	[R703]
65	RR-FZA3HCR10K	AD		C	Resistor ((FZ)5.0W -0.1K)(100V series)	[R704]
65	RR-FZA3HCR22K	AD		C	Resistor ((FZ)5.0W -0.22K)(200V series)	[R704]
66	RR-XZ0047PAZZ	AB		C	Fuse resistor (1/6W-1J)	[R717]
67	RR-XZ0044PAZZ	AB		C	Fuse resistor (1/6W-22J)	[R735]
68	VRS-FC3AA104J	AA		C	Resistor (1.0W 100K $\Omega$ $\pm$ 5%)	[R750]
69	VHS5P4M//--1	AM		B	Thyristor (5P4M)	[SCR701]
70	RTRNZ0429PANA	AX		B	Power-transformer (100V series)	[T701]
70	RTRNZ0430PANA	AY		B	Power-transformer (200V series)	[T701]
71	VHH18D8R0LA-1	AG		B	Thermistor (100V series)	[TH701]
71	VHH16D13F//--1	AG		B	Thermistor (200V series)	[TH701]
72	RH-HX0030PAZZ	AE		B	Thermistor	[TH702]
73	RH-SX0011PAZZ	AH		B	Triac (100V series)	[TRC701]
73	RH-SX0010PAZZ	AH		B	Triac (200V series)	[TRC701]
74	RVR-M0285PAZZ	AC		B	Variable resistor (1K $\Omega$ )	[VR701]
75	RVR-M0285PAZZ	AC		B	Variable resistor (1K $\Omega$ )	[VR702]
76	VHEQA0320B/-1	AB		B	Zener diode (EQA03-20B)	[ZD701]
77	VHEQA0328B/-1	AB		B	Zener diode (EQA03-28B)	[ZD707]
78	VHEQA0306B/-1	AB		B	Zener diode (EQA03-06B)	[ZD708]
79	VHEQA0318B/-1	AB		B	Zener diode (EQA03-18B)	[ZD709]
80	VHVSN221D10-C	AC		B	Varistor (SNR221KD10)(100V series)	[ZR701]
80	VHVSN471D10-C	AC		B	Varistor (SN471D-10)(200V series)	[ZR701]
81	DTIP-0414PAZZ	AC		C	TIP lead wire	
82	DTIP-0415PAZZ	AD		C	FG lead wire	

11 DC power supply PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
83	DTIP-0416PAZZ	AD		C	TIP lead wire (Brown) (200V series)
84	DTIP-0417PAZZ	AD		C	TIP lead wire (Blue) (200V series)
85	DTIP-0418PAZZ	AD		C	TIP lead wire (Black) (100V series)
86	DTIP-0419PAZZ	AD		C	TIP lead wire (White) (100V series)
87	PZET00059PAZZ	AE		C	SI-rubber (100V series)
	PZET00064PAZZ	AC		C	SI-rubber (200V series)
88	PZET00061PAZZ	AE		C	Sheet (45TT0220)(200V series)
89	PZET00067PAZZ	AC		C	Sheet (200V series)
90	PZET00063PAZZ	AD		C	SI-sheet (200V series)
91	QCNW-0168PAZZ	AD		C	Jumper lead wire (Brown) (200V series)
92	QCNW-0169PAZZ	AD		C	Jumper lead wire (Blue) (200V series)
93	QCNW-0170PAZZ	AC		C	Jumper lead wire (Black) (100V series)
94	QCNW-0171PAZZ	AC		C	Jumper lead wire (White) (100V series)
95	QFSHA0009PAZZ	AB		C	Fuse holder
96	QSOCA0011PAZZ	AG		B	Inlet
97	QSW-C0032PAZZ	AM		B	Seesaw switch
98	RATTT0002PAZZ	AH		B	Arestor (100V series)
99	RCILF7872PAZZ	AB		C	Core
100	RCORF0042PAZZ	AA		C	Core
101	RCORF0043PAZZ	AA		C	Core (200V series)
102	RCORF0069PAZZ	AG		C	Core
103	RCORF0071PAZZ	AB		C	Core
104	RCORF0072PAZZ	AB		C	Core
105	RR-WZ0026PAZZ	AE		C	Resistor (5W-3K(PGBS))(100V series)
	(Unit)				
901	CPWBF0046GC31	BR		E	DC power supply PWB (110V/120V)
	CPWBF0046GC34	BU		E	DC power supply PWB (200V series)
	CPWBF0046GC33	BX		E	DC power supply PWB (127V)

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12 OPU PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VCEAPSI1EC106M	AC		C	Capacitor (25WV 10μF)
2	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
3	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
4	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
5	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
6	VRS-TP2BD000J	AA		C	Resistor (1/8W 0Ω ±5%)
7	VCCCTQ1HH101J	AA		C	Capacitor (50WV 100pF)
8	QCNCM0044GCZZ	AH		C	Connector (14pin)
9	VHPLT1H51A/-1	AC		B	Photo transistor (LT1H51A)
10	VHPLT1K51A/-1	AC		B	Photo transistor (LT1K51A)
11	VHPLT1H51A/-1	AC		B	Photo transistor (LT1H51A)
12	VHPLT1D51A/-1	AC		B	Photo transistor (LT1D51A)
13	VH1HD44780/-1	AS		B	IC (HD44780)
14	VH1SN74LS151N	AG		B	IC (SN74LS151N)
15	VH1SN74LS173N	AL		B	IC (SN74LS173N)
16	VHPGP1S53V/-1	AE		B	Photo transistor (GP1S53V)
17	VRS-TP2BD913J	AA		C	Resistor (1/8W 91KΩ ±5%)
18	RMPTQ4332QCJJ	AB		B	Block resistor (3.3KΩ×4)
19	VRS-TP2BD122J	AA		C	Resistor (1/8W 1.2KΩ ±5%)
20	VRD-RC2EY181J	AA		C	Resistor (1/4W 180Ω ±5%)
21	VRS-TP2BD301J	AA		C	Resistor (1/8W 300Ω ±5%)
22	VRS-TP2BD201J	AA		C	Resistor (1/8W 200Ω ±5%)
23	VRS-TP2BD301J	AA		C	Resistor (1/8W 300Ω ±5%)
24	VRS-TP2BD561J	AA		C	Resistor (1/8W 560Ω ±5%)
25	DHAI-0060GCZZ	AE		C	Interface harness
26	LPLTM0147GCZZ	AC		C	Bezel plate
27	PGUMS0003GCZZ	AH		C	SW rubber
28	PGUMS0004GCZZ	AC		C	Rubber connector
29	PGUMS0005GCZZ	AB		C	Rubber spacer
30	VVLLF7768G/-1	AT		B	LCD (LF7768G)
	(Unit)				
901	CPWBF0045GC51	BG		E	OPU PWB

13 JX-96AP2(Apple talk/RS232C board)···Option

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	RC-K1E104SCZZ	AA		C	Capacitor (25WV 0.1μF +20%, -80%)
2	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
3	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF)
4	VCKYTQ1HB392K	AB		C	Capacitor (50WV 3900PF)

13 JX-96AP2(Apple talk/RS232C board)···Option

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
5	VCKYTQ1HB392K	AB		C	Capacitor (50WV 3900PF) [C5]
6	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF) [C6]
7	VCKYPU1HB102K	AA		C	Capacitor (50WV 1000PF) [C7]
8	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C8]
9	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C9]
10	VCCCTV1HH100J	AA		C	Capacitor (50WV 10PF) [C10]
11	VCCCTV1HH330J	AA		C	Capacitor (50WV 33PF) [C11]
12	VCEAJA1HW105M	AB		C	Capacitor (50WV 1.0μF) [C12~15]
13	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C16]
14	QCNCW0052GCZZ	AM	N	C	Connector (8pin) [CN1]
15	QCNCW0343FCZZ	AK	N	C	Connector (25pin) [CN2]
16	QCNCW0051GCZZ	AQ	N	C	Connector (40pin) [CN3]
17	RCiLZ1003AC01	AA		C	Coil (BL02RN1-R62) [FL1~9]
18	VHi74F04SJ/-1	AE		B	IC (74F04SJ) [IC1]
19	VHi74F157ASJ1	AL	N	B	IC (74F157ASJ) [IC2]
20	VHiZ85230///	BG	N	B	IC (Z85230) [IC3]
21	VHiDS8925M///	AR	N	B	IC (DS8925M) [IC4]
22	VHiDS14C238///	AT	N	B	IC (DS14C238) [IC5]
23	VRS-TP2BD103J	AA		C	Resistor (1/8W 10KΩ ±5%) [R1]
24	VRS-TP2BD105J	AA		C	Resistor (1/8W 1.0MΩ ±5%) [R5]
25	VRS-TP2BD152J	AA		C	Resistor (1/8W 1.5KΩ ±5%) [R6]
26	RCRSP0008GCZZ	AH		B	Crystal oscillator (AT49) [X1]
27	RCRSZ0019GCZZ	AS	N	B	Crystal (16MHz) [X2]
28	HPNLC0017GCZZ	AE	N	D	RS/AP board
29	PCAPH1003ACZZ	AC		C	Connector protect cap (25pin)
30	QEARP0006GCZZ	AC		C	Earth plate
31	VCCCPU1HH120J	AA		C	Capacitor (50WV 12PF)
101	TiNSH0128GCZZ	AN	N	D	Install guide
102	SPAKA0467GCZZ	AE	N	D	Packing protect sheet
103	SPAKC0473GCZZ	AK	N	D	Packing case (USA)
	SPAKC0462GCZZ	AK	N	D	Packing case (Europe)
	SPAKC0461GCZZ	AK	N	D	Packing case (other countries)
104	TLABR0189GCZZ	AK	N	D	Bar-code label UPC (USA)
	TLABR0190GCZZ	AL	N	D	Bar-code label BUTS (USA)
	TLABR0191GCZZ	AK	N	D	Bar-code label EAN (other countries)
105	TCADZ0013GCZZ	AD	N	D	FCC caution card (USA only)
106	UBAGF0007GCZZ	AD		D	Vinyl bag

14 JX-96PS2(PS board)···Option

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VCKYTQ1HF104Z	AA		C	Capacitor (50WV 0.1μF) [C1~5]
2	QCNCM0050GCZZ	AQ	N	C	Connector (70pin) [CN1]
3	QSOCZ0051FCZZ	AD		C	IC socket (42pin) [IC1,2]
4	VHiLH53881B-1	AZ	N	B	IC (LH53881B) [IC1]
5	VHiLH53881C-1	AZ	N	B	IC (LH53881C) [IC2]
101	PSPAZ0021GCZZ	AC	N	C	PWB spacer
102	SPAKA0467GCZZ	AE	N	D	Protect sheet
103	SPAKC0474GCZZ	AM	N	D	Packing case (USA)
	SPAKC0464GCZZ	AM	N	D	Packing case (Europe)
	SPAKC0463GCZZ	AM	N	D	Packing case (other countries)
104	SSAKA0005WCZZ	AA		D	Vinyl bag (160×260mm)
105	TCADZ0036GCZZ	AC		D	Licence card
106	TiNSH0127GCZZ	AQ	N	D	Operation manual
107	TiNSH0128GCZZ	AN	N	D	Install guide
108	TLABR0192GCZZ	AK	N	D	Bar-code label UPC (USA)
	TLABR0193GCZZ	AL	N	D	Bar-code label BUTS (USA)
	TLABR0194GCZZ	AK	N	D	Bar-code label EAN (other countries)
109	UBAGF0007GCZZ	AD		D	Vinyl bag (150W×205Lmm)
110	UFLPB0014GCZZ	AQ	N	C	Media(Window)
111	UFLPB0015GCZZ	AQ	N	C	Media(MAC)



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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
[ C ]				
CCAB-0030GC02	1- 7	BC		D
CCAB-0031GC22	1- 1	AX	N	D
CCLEZ0014GC01	6- 105	AM		C
CFRM-0021GC31	2- 1	AZ		E
CFRM-0022GC53	2- 68	BG		E
CGIDM0033GC02	2- 14	AT		C
CHLDZ0015GC02	6- 2	AM		C
CPLTM0118GC03	2- 63	AH		C
CPLTM0135GC01	4- 68	AM		C
CPWBF0045GC51	1- 4	BG		E
/"	12- 901	BG		E
CPWBF0046GC31	3- 35	BR		E
/"	11- 901	BR		E
CPWBF0046GC33	3- 35	BX		E
/"	11- 901	BX		E
CPWBF0046GC34	3- 35	BU		E
/"	11- 901	BU		E
CPWBF0047GC38	3- 34	BP		E
CPWBF0048GC31	2- 13	AK		E
CPWBF0049GC70	2- 6	BL	N	E
/"	9- 901	BL	N	E
CPWBF0050GC51	2- 50	BB		E
/"	7- 901	BB		E
CPWBF0051GC51	2- 61	BD		E
/"	8- 901	BD		E
CPWBF0054GC51	2- 10	AK		E
CPWBX0066GC51	3- 501	CS	N	E
/"	10- 901	CS	N	E
CSOU-0005GC01	6- 10	AK		C
CTHM-0011FC01	4- 56	AK		B
CWIR-0001GC01	4- 90	AH		C
[ D ]				
DHAI-0043GCZZ	2- 72	AC		C
/"	4- 51	AC		C
DHAI-0046GCZZ	7- 20	AF		C
DHAI-0047GCZZ	8- 3	AG		C
DHAI-0048GCZZ	7- 21	AE		C
DHAI-0050GCZZ	8- 28	AL		C
DHAI-0055GCZZ	3- 27	AE		C
DHAI-0060GCZZ	12- 25	AE		C
DHAI-0062GCZZ	4- 95	AE		C
DHAI-0063GCZZ	4- 96	AK		C
DHAI-0064GCZZ	4- 95	AE		C
DHAI-0065GCZZ	4- 96	AK		C
DHAI-0078GCZZ	4- 99	AK	N	C
DTIP-0414PAZZ	11- 81	AC		C
DTIP-0415PAZZ	11- 82	AD		C
DTIP-0416PAZZ	11- 83	AD		C
DTIP-0417PAZZ	11- 84	AD		C
DTIP-0418PAZZ	11- 85	AD		C
DTIP-0419PAZZ	11- 86	AD		C
DUNT-0056GC14	2- 8	CC		E
DUNT-0057GC16	4- 901	BW		E
DUNT-0057GC17	4- 901	BW		E
DUNT-0057GC18	4- 901	BW	N	E
DUNT-0075GCZZ	4- 93	AN		E
[ G ]				
GCASP0007GCA2	5- 10	AV		D
GCASP0007GCL2	5- 10	AS		D
GLEGG0002GCZZ	1- 14	AB		C
GNET-0001GCZZ	3- 37	AK		C
[ H ]				
HPNLC0011GCZ1	10- 108	AG		C
HPNLC0013GCZ1	10- 109	AK	N	D
HPNLC0017GCZZ	13- 28	AE	N	D
HPNLC0018GCZZ	1- 3	AH	N	D
[ J ]				
JBTN-0002GCZ1	1- 8	AC		C
/"	1- 15	AC		C
JKNBZ0003GCZZ	3- 30	AD		C
[ L ]				
LANGF0012GCZZ	4- 82	AB		C
LBNDJ2003SCZZ	2- 90	AA		C
/"	4- 78	AA		C
LBOSZ0051GCZZ	2- 73	AC		C
LBOSZ1031FCZZ	2- 34	AC		C
LFRM-0026GCZ1	4- 34	AX		C
LFRM-0026GCZ2	4- 34	AX		C
LHLDW0006SCZZ	2- 93	AB		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
[ M ]				
LHLDZ0013GCZZ	2- 42	AD		C
LHLDZ0014GCZZ	4- 52	AE		C
LHLDZ0016GCZZ	4- 59	AP		C
LHLDZ0023GCZZ	4- 21	AC		C
LHLDZ0024GCZZ	4- 52	AE		C
LPiNS0008GCZ1	4- 66	AB		C
LPLTM0104GCZZ	2- 5	AR		C
LPLTM0105GCZZ	3- 33	AM		C
LPLTM0106GCZZ	2- 56	AC		C
LPLTM0107GCZZ	2- 58	AE		C
LPLTM0109GCZZ	4- 46	AM		C
LPLTM0110GCZ1	5- 3	AP		C
LPLTM0111GCZ1	5- 3	AP		C
LPLTM0112GCZZ	2- 12	AD		C
LPLTM0127GCZ1	2- 9	AB		C
LPLTM0134GCZ1	4- 72	AG		C
LPLTM0138GCZZ	5- 14	AC		C
LPLTM0139GCZZ	3- 40	AB		C
LPLTM0147GCZZ	12- 26	AC		C
LPLTM0155GCZZ	3- 53	AF		C
LSTPF0007GCZZ	4- 42	AA		C
LSTPP0006GCZZ	3- 11	AE		C
LSTPP0008GCZZ	5- 9	AC		C
LSTPP0009GCZZ	6- 106	AC		C
LX-BZ0016GCZZ	10- 110	AB		C
LX-BZ0019GCZZ	3- 16	AB		C
LX-BZ0494FCZZ	10- 111	AB		C
LX-BZ2154SCZZ	3- 29	AB		C
LX-WZ2012SCZZ	2- 65	AA		C
[ M ]				
MARMP0008GCZZ	3- 21	AE		C
MARMP0009GCZZ	4- 87	AC		C
MARMP0010GCZZ	4- 89	AB		C
MARMP0011GCZZ	4- 30	AE		C
MLEVF0036GCZZ	2- 46	AC		C
MLEVP0028GCZZ	2- 43	AF		C
MLEVP0029GCZZ	1- 11	AD		C
/"	2- 2	AD		C
MLEVP0030GCZZ	2- 60	AD		C
MLEVP0031GCZZ	2- 36	AC		C
MLEVP0032GCZZ	2- 47	AD		C
MLEVP0033GCZZ	3- 3	AC		C
MLEVP0034GCZZ	3- 1	AC		C
MLEVP0035GCZZ	4- 35	AD		C
MSPRB0107GCZZ	2- 84	AB		C
MSPRC0068GCZZ	2- 59	AA		C
MSPRC0070GCZZ	2- 38	AB		C
MSPRC0071GCZZ	2- 45	AA		C
MSPRC0074GCZZ	2- 21	AA		C
MSPRC0086GCZ1	4- 37	AA		C
MSPRC0105GCZZ	2- 32	AD		C
MSPRC0110GCZZ	5- 5	AC		C
MSPRC0111GCZZ	4- 37	AB		C
MSPRC0116GCZZ	4- 91	AB		C
MSPRC0118GCZZ	4- 17	AA		C
MSPRC0121GCZZ	4- 25	AA		C
MSPRC0124GCZZ	4- 24	AB		C
MSPRC0125GCZZ	4- 85	AC		C
MSPRP0083GCZZ	4- 2	AC		C
MSPRP0085GCZZ	4- 4	AD		C
MSPRP0087GCZZ	4- 5	AC		C
MSPRP0088GCZZ	5- 8	AB		C
MSPRP0099GCZZ	4- 6	AD		C
MSPRP0109GCZZ	4- 47	AC		C
MSPRT0069GCZZ	2- 37	AA		C
MSPRT0072GCZZ	2- 15	AA		C
MSPRT0075GCZ1	3- 28	AB		C
MSPRT0077GCZZ	1- 10	AB		C
/"	2- 3	AB		C
MSPRT0082GCZZ	4- 58	AA		C
MSPRT0084GCZZ	4- 9	AA		C
MSPRT0108GCZZ	4- 70	AA		C
MSPRT0117GCZZ	4- 86	AA		C
MSPRT0119GCZZ	4- 27	AA		C
MSPRT0120GCZ1	4- 14	AC		C
MSPRT0127GCZZ	3- 5	AB		C
MSPRT0128GCZZ	5- 7	AB		C
MSPRT0129GCZZ	5- 15	AB		C
MSPRT0130GCZZ	3- 13	AB		C



PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[ N ]					
NBRGC0016GCZZ	4- 43	AF		C	
NBRGC0017GCZZ	4- 38	AD		C	
NBRGC0029GCZZ	4- 77	AK		C	
NBRGC0030GCZZ	2- 18	AB		C	
NBRGC0343FCZZ	2- 23	AB		C	
NBRGP0013GCZZ	2- 29	AD		C	
NGERH0036GCZZ	2- 30	AB		C	
NGERH0037GCZZ	2- 31	AG		C	
NGERH0038GCZZ	2- 40	AC		C	
NGERH0039GCZZ	2- 35	AG		C	
NGERH0040GCZZ	2- 39	AC		C	
NGERH0041GCZZ	3- 24	AB		C	
NGERH0042GCZZ	3- 23	AC		C	
NGERH0043GCZZ	3- 22	AC		C	
NGERH0045GCZZ	2- 67	AD		C	
NGERH0046GCZ1	2- 53	AH		C	
NGERH0047GCZZ	2- 54	AD		C	
NGERH0049GCZZ	4- 36	AD		C	
NGERH0050GCZZ	4- 31	AC		C	
NGERH0051GCZZ	4- 41	AD		C	
NGERH0052GCZZ	4- 63	AC		C	
NGERH0065GCZZ	4- 62	AC		C	
NGERH0066GCZZ	4- 32	AC		C	
NGERH0069GCZZ	2- 66	AH		C	
NRÖLM0035GCZZ	4- 40	AX		C	
NRÖLP0037GCZZ	4- 1	AB		C	
NRÖLP0038GCZA	4- 61	AR		C	
NRÖLP0039GCZZ	5- 6	AC		C	
NRÖLP0046GCZ2	2- 20	AP		C	
NRÖLP0048GCZZ	4- 67	AC		C	
NRÖLR0031GCZZ	2- 25	AR		C	
NRÖLR0032GCZ1	2- 26	AP		C	
NRÖLR0036GCZZ	4- 39	AW		C	
NRÖLR0051GCZZ	4- 12	AM		C	
NRÖLR0055GCZZ	4- 39	AX		C	
NSFTZ0039GCZZ	4- 23	AF		C	
NSFTZ0044GCZZ	4- 10	AF		C	
NSFTZ0045GCZZ	4- 71	AC		C	
NSFTZ0047GCZZ	4- 26	AE		C	
[ P ]					
PCAPH1001ACZZ	3- 51	AE		C	
PCAPH1003ACZZ	13- 29	AC		C	
PCASZ0011GCZ1	1- 16	BA		D	
PCASZ0015GCZ3	3- 9	AK		C	
PCASZ0017GCZ1	3- 42	AG		C	
PCASZ0018GCZZ	4- 83	AE		C	
PCLC-0006GCZ1	2- 41	AX		C	
PCLR-0006GCZZ	4- 13	AB		C	
PCÖVP0024GCZ1	4- 8	AN		C	
PCÖVP0028GCZZ	1- 2	AG		D	
PCÖVP0033GCZ1	6- 9	AH		C	
PCÖVQ0031GCZ1	4- 48	AH		C	
PCÖVQ0036GCZZ	4- 48	AH		C	
PFiLZ0006GCZZ	3- 43	AG		C	
PGiDH0032GCZZ	2- 16	AH		C	
PGiDH0044GCZZ	4- 20	AG		C	
PGiDM0035GCZZ	4- 7	AN		C	
PGiDM0035GCZ1	4- 7	AV		C	
PGiDM0038GCZZ	6- 3	AH		D	
PGiDM0039GCZZ	6- 4	AD		D	
PGiDM0042GCZZ	2- 51	AC		C	
PGiDM0043GCZZ	4- 88	AE		C	
PGUMS0003GCZZ	12- 27	AH		C	
PGUMS0004GCZZ	12- 28	AC		C	
PGUMS0005GCZZ	12- 29	AB		C	
PHÖG-1023CCZZ	6- 1	AB		C	
PMLT-0026GCZZ	2- 83	AA		C	
PMLT-0028GCZZ	2- 79	AA		C	
PMLT-0029GCZZ	2- 80	AA		C	
PMLT-0030GCZZ	1- 23	AB		C	
PMLT-0033GCZZ	5- 17	AB		C	
PMLT-0034GCZZ	5- 18	AB		C	
PMLT-0035GCZZ	5- 16	AB		C	
PMLT-0039GCZZ	2- 94	AD	N	C	
PMLT-0040GCZZ	2- 95	AC	N	C	
PPIPP0001GCZ1	2- 33	AC		C	
PRNGP0019FCZZ	2- 89	AA		C	
PRNGP0025FCZZ	3- 20	AA		C	
PRNGP0026FCZZ	2- 44	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
PRNGP0033FCZZ	3- 2	AA		C	
PSHEG0093GCZZ	3- 46	AD		C	
PSHEP0074GCZZ	2- 27	AB		C	
PSHEP0078GCZZ	2- 82	AA		C	
PSHEP0081GCZZ	2- 75	AE		C	
PSHEP0082GCZZ	2- 78	AD		C	
PSHEP0083GCZZ	2- 77	AD		C	
PSHEP0100GCZZ	4- 74	AF		C	
PSHEP0101GCZZ	2- 87	AC		C	
PSHEP0102GCZZ	2- 88	AB		C	
PSHEP0105GCZZ	3- 44	AC		C	
"	10- 112	AC		C	
PSHEP0106GCZZ	2- 91	AB		C	
PSHEP0130GCZZ	3- 56	AK	N	C	
PSHEP0145GCZZ	2- 74	AG	N	C	
PSHEZ1606FCZZ	5- 2	AB		C	
PSHT-0006GCZ1	3- 4	AD		C	
PSPAZ0009GCZZ	2- 64	AA		C	
PSPAZ0021GCZZ	14- 101	AC	N	C	
PTME-0007GCZZ	4- 57	AE		C	
PTME-0008GCZZ	5- 4	AD		C	
PTME-0009GCZZ	5- 1	AD		C	
PTPE-0006GCZ1	3- 39	AE		C	
PTPE-0008GCZZ	2- 86	AC		C	
PTPE-0010GCZZ	2- 92	AD		C	
PTPE-0011GCZZ	3- 57	AF	N	C	
PZETÖ0059PAZZ	11- 87	AE		C	
PZETÖ0061PAZZ	11- 88	AE		C	
PZETÖ0063PAZZ	11- 90	AD		C	
PZETÖ0064PAZZ	11- 87	AC		C	
PZETÖ0067PAZZ	11- 89	AC		C	
[ Q ]					
QACCB7521QCZZ	6- 1	AS		B	
QACCB7620QCN1	6- 1	AX		B	
QACCB7622QCZZ	6- 1	BA		B	
QACCD6611QCN2	6- 1	AX		B	
QACCD7613QCN5	6- 1	AQ		B	
QACCF7620QCZZ	6- 1	AX		B	
QACCV9610QCZZ	6- 1	AR		B	
QACCL7621QCZZ	6- 1	AX		B	
QACCV6621QCN1	6- 1	AU		B	
"	6- 1	AU		B	
"	6- 1	AU		B	
QACCV6621QCZZ	6- 1	AT		B	
QCNCM0032GCZZ	9- 30	AH		C	
QCNCM0033GCZZ	8- 4	AC		C	
QCNCM0034GCZZ	8- 5	AC		C	
"	8- 6	AC		C	
QCNCM0035GCZZ	7- 7	AH		C	
"	7- 8	AH		C	
QCNCM0044GCZZ	12- 8	AH		C	
QCNCM0049GCZZ	10- 34	AL	N	C	
QCNCM0050GCZZ	14- 2	AQ	N	C	
QCNCM1005MCZZ	9- 31	AB		B	
QCNCM2334SC0B	9- 32	AB		B	
QCNCW0040GCZZ	10- 36	AK		C	
QCNCW0047GCZZ	10- 37	AN	N	C	
QCNCW0048GCZZ	10- 35	AN	N	C	
QCNCW0051GCZZ	13- 16	AQ	N	C	
QCNCW0052GCZZ	13- 14	AM	N	C	
QCNCW0341FCZZ	10- 33	AG		C	
QCNCW0343FCZZ	13- 15	AK	N	C	
QCNCW0535FCZZ	7- 9	AB		C	
QCNCW1226AC0D	9- 29	AC		C	
QCNCW1226AC2A	9- 28	AE		C	
QCNCW1226AC2H	9- 27	AE		C	
QCNCW-0122FCZZ	6- 1	AR		B	
QCNCW-0132FCZZ	6- 1	AV		B	
QCNCW-0168PAZZ	11- 91	AD		C	
QCNCW-0169PAZZ	11- 92	AD		C	
QCNCW-0170PAZZ	11- 93	AC		C	
QCNCW-0171PAZZ	11- 94	AC		C	
QEARP0006GCZZ	13- 30	AC		C	
QEARP0013GCZZ	3- 38	AL	N	C	
QFS-C0028PAZZ	11- 42	AH		A	
"	11- 43	AH		A	
QFS-C0030PAZZ	11- 44	AF		A	
QFS-F0006PAZZ	11- 44	AE		A	
QFS-F0011PAZZ	11- 42	AE		A	
"	11- 43	AE		A	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
QFSHA0009PAZZ	11- 95	AB		C
QHICA0003VAZZ	11- 47	AR		B
QHICA4169KAZZ	11- 46	AM		B
QPLGA0001QCZZ	6- 1	AN		C
QPLGA0002QCZZ	6- 1	AN		C
QPLGA4171CCZZ	6- 1	AN		C
QPLGZ0455PAZZ	11- 32	AD		C
QPLGZ0456PAZZ	11- 33	AF		C
QPLGZ0457PAZZ	11- 31	AH		C
QSLP-0013GCZZ	3- 19	AE		C
QSLP-0014GCZZ	3- 18	AG		C
QSLP-0015GCZZ	3- 17	AF		C
QSLP-0024GCZZ	3- 14	AB		C
QSLP-0025GCZZ	4- 65	AF		C
QSLP-0026GCZZ	4- 97	AC		C
QSLP-0027GCZZ	4- 98	AC		C
QS0CA0011PAZZ	11- 96	AG		B
QS0CZ0003GCZZ	10- 105	AQ	N	C
QS0CZ0051FCZZ	10- 39	AD		C
"	14- 3	AD		C
QSW-C0032PAZZ	11- 97	AM		B
QSW-M0017GCZZ	2- 48	AG		B
QSW-P0006GCZZ	8- 7	AB		B
"	8- 8	AB		B
"	8- 9	AB		B
"	8- 10	AB		B
"	8- 11	AB		B
"	8- 12	AB		B
QTANP0096FCZZ	6- 1	AA		C
[ R ]				
RALMB5006SCZZ	9- 1	AD		B
RATTT0002PAZZ	11- 98	AH		B
RC-EZ0305PAZZ	11- 8	AN		C
RC-EZ0306PAZZ	11- 8	AM		C
RC-EZ0319PAZZ	11- 10	AD		C
RC-EZ0320PAZZ	11- 28	AC		C
RC-FZ083DPAZZ	11- 15	AD		C
RC-FZ084DPAZZ	11- 2	AE		C
"	11- 3	AE		C
RC-FZ085DPAZZ	11- 15	AF		C
RC-FZ093DPAZZ	11- 34	AG		C
RC-KZ003DPAZZ	11- 4	AC		C
RC-KZ0032PAZZ	11- 11	AB		C
RC-KZ004DPAZZ	11- 25	AD		C
RC-KZ0064PAZZ	11- 9	AB		C
RC-KZ0071PAZZ	11- 30	AB		C
RC-K1E104HCZZ	8- 2	AB		C
RC-K1E104SCZZ	10- 2	AA		C
"	10- 3	AA		C
"	10- 5	AA		C
"	10- 7	AA		C
"	13- 1	AA		C
RC-QZA102AFYK	11- 26	AA		C
RC-QZS104AFYK	11- 12	AB		C
"	11- 19	AB		C
RC-QZ0044PAZZ	11- 6	AC		C
RC-QZ0045PAZZ	11- 6	AB		C
"	11- 29	AB		C
RC-QZ0047PAZZ	11- 4	AC		C
"	11- 5	AC		C
RC-QZ0048PAZZ	11- 7	AC		C
"	11- 27	AC		C
RCILF7872PAZZ	11- 99	AB		C
RCILZ1003AC01	13- 17	AA		C
RCORF0042PAZZ	11- 100	AA		C
RCORF0043PAZZ	11- 101	AA		C
RCORF0069PAZZ	11- 102	AG		C
RCORF0071PAZZ	11- 103	AB		C
RCORF0072PAZZ	11- 104	AB		C
RCORF1005ACZZ	10- 54	AB		C
"	10- 55	AB		C
"	10- 56	AB		C
RCORF1020LCZZ	2- 97	AF		C
"	3- 55	AF		C
RCORF2004SCZZ	11- 55	AM		C
RCORF2024SCZZ	10- 1	AD		C
RCORF5029SCZZ	2- 96	AL		C
RCRS-0015GCZZ	10- 107	AR	N	C
RCRS-0016GCZZ	10- 106	AR	N	C
RCRSP0008GCZZ	13- 26	AH		B

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
RCRSQ2052HCZZ	9- 95	AH		B
RCRSZ0019GCZZ	13- 27	AS	N	B
RDTCF0013GCZZ	2- 24	AM		B
RDTCT0011GCZZ	4- 54	AQ		B
RH-HX0030PAZZ	11- 72	AE		B
RH-IX0783PAZZ	11- 45	AD		B
RH-PX0104PAZZ	11- 56	AF		B
RH-PX0199PAZZ	11- 56	AE		B
RH-SX0010PAZZ	11- 73	AH		B
RH-SX0011PAZZ	11- 73	AH		B
RLMPU0008GCZZ	4- 11	AY		B
RLMPU0009GCZZ	4- 11	AY		B
RLMPU0012GCZZ	4- 11	AY	N	B
RM0TN0015GCZZ	3- 25	AV		B
RM0TN0016GCZZ	3- 32	AY		B
RMPTC4103QCJB	9- 94	AD		B
RMPTC4202QCJB	9- 93	AA		B
RMPTC8103QCKB	10- 99	AD		B
"	10- 102	AD		B
"	10- 104	AD		B
RMPTC8122QCKB	10- 100	AC		B
"	10- 101	AC		B
RMPTC8222QCKB	10- 103	AD		B
RMPTQ4332QCJJ	12- 18	AB		B
RPLU-0001GCZZ	8- 16	AM		B
"	8- 17	AM		B
RR-FZA3HCR10K	11- 65	AD		C
RR-FZA3HCR22K	11- 65	AD		C
RR-WZ0026PAZZ	11- 105	AE		C
RR-XZ0044PAZZ	11- 67	AB		C
RR-XZ0047PAZZ	11- 66	AB		C
RTRNZ0035PANT	11- 50	AE		B
RTRNZ0068PAZZ	11- 54	AE		B
RTRNZ0165PANA	11- 52	AM		B
RTRNZ0165PAZZ	11- 52	AK		B
RTRNZ0202PAZZ	11- 48	AK		B
"	11- 49	AK		B
RTRNZ0394PANA	11- 48	AH		B
"	11- 49	AH		B
RTRNZ0400PANT	11- 51	AD		B
RTRNZ0423PANN	11- 53	AL		B
RTRNZ0429PANA	11- 70	AX		B
RTRNZ0430PANA	11- 70	AY		B
RVR-M0285PAZZ	11- 74	AC		B
"	11- 75	AC		B
[ S ]				
SPAKA0221GCZZ	6- 6	AR		D
SPAKA0222GCZZ	6- 7	AR		D
SPAKA0278GCZZ	6- 13	AD		D
SPAKA0280GCZZ	6- 11	AH		D
SPAKA0467GCZZ	13- 102	AE	N	D
"	14- 102	AE	N	D
SPAKC0459GCZZ	6- 8	AX	N	D
SPAKC0460GCZZ	6- 8	AX	N	D
SPAKC0461GCZZ	13- 103	AK	N	D
SPAKC0462GCZZ	13- 103	AK	N	D
SPAKC0463GCZZ	14- 103	AM	N	D
SPAKC0464GCZZ	14- 103	AM	N	D
SPAKC0473GCZZ	13- 103	AK	N	D
SPAKC0474GCZZ	14- 103	AM	N	D
SPAKC0477GCZZ	6- 8	AX	N	D
SSAKA0005WCZZ	6- 112	AA		D
"	14- 104	AA		D
SSAKA2347QCZZ	6- 127	AB		D
SSAKA3001CCZZ	6- 101	AA		D
SSAKA3340QCZZ	6- 102	AB		D
[ T ]				
TCADE0014GCZZ	6- 110	AD		D
TCADZ0013GCZZ	13- 105	AD	N	D
TCADZ0036GCZZ	6- 113	AC		D
"	14- 105	AC		D
TCADZ0046GCZZ	6- 126	AF		D
TCADZ0047GCZZ	6- 120	AD		D
TCADZ001QCZA	6- 107	AE		D
TGANE1001CSZB	6- 108	AC		D
TGANE1001QCZB	6- 108	AC		D
TINSE0120GCZZ	6- 5	AY	N	D
TINSF0122GCZZ	6- 5	AW	N	D
TINSG0121GCZZ	6- 5	AS	N	D
TINSH0127GCZZ	14- 106	AQ	N	D

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
TINSH0128GCZZ	13- 101	AN	N	D
//	14- 107	AN	N	D
TLABH0096GCZZ	5- 12	AD		C
TLABH0108GCZZ	1- 27	AC		D
TLABH0128GCZZ	4- 80	AC		D
TLABH2597FCZZ	1- 19	AC		D
TLABR0189GCZZ	13- 104	AK	N	D
TLABR0190GCZZ	13- 104	AL	N	D
TLABR0191GCZZ	13- 104	AK	N	D
TLABR0192GCZZ	14- 108	AK	N	D
TLABR0193GCZZ	14- 108	AL	N	D
TLABR0194GCZZ	14- 108	AK	N	D
TLABT0001QCZZ	1- 21	AA		C
TLABZ0095GCZZ	5- 13	AC		C
TLABZ0098GCZZ	5- 13	AC		C
TLABZ0127GCZZ	4- 75	AB		C
TLABZ0176GCZZ	5- 11	AC		D
TLABZ0182GCZZ	1- 26	AD	N	D
[U]				
UBAGF0007GCZZ	13- 106	AD		D
//	14- 109	AD		D
UBAGF0018FCZZ	6- 103	AE		D
UFLPB0013GCZZ	6- 117	AQ	N	D
UFLPB0014GCZZ	14- 110	AQ	N	C
UFLPB0015GCZZ	14- 111	AQ	N	C
[V]				
VCCCPU1HH120J	13- 31	AA		C
VCCCTQ1HH101J	12- 7	AA		C
VCCCTV1HH100J	13- 10	AA		C
VCCCTV1HH180J	9- 13	AA		C
//	9- 14	AA		C
VCCCTV1HH220J	10- 16	AA		C
//	10- 29	AA		C
VCCCTV1HH330J	10- 10	AA		C
//	10- 12	AA		C
//	10- 21	AA		C
//	13- 11	AA		C
VCCCTV1HH471J	9- 24	AA		C
//	9- 25	AA		C
VCCCTV1HH680J	10- 32	AA		C
VCCSPA1H6101J	11- 18	AA		C
VCEAEA1AW476M	8- 1	AB		C
//	9- 2	AB		C
//	9- 4	AB		C
VCEAEA1HW106M	7- 4	AA		C
//	9- 3	AA		C
VCEAJA1CW226M	10- 4	AB		C
//	10- 6	AB		C
VCEAJA1HW105M	13- 12	AB		C
VCEAPS1EC106M	12- 1	AC		C
VCEAIS1AM228M	11- 22	AE		C
//	11- 23	AE		C
VCEAIS1HM105M	11- 14	AB		C
VCEAIS1VM108M	11- 16	AE		C
//	11- 17	AE		C
//	11- 21	AE		C
VCEAIS1VM337M	11- 20	AD		C
VCKYPA1HF104Z	11- 13	AB		C
//	11- 24	AB		C
VCKYPU1HB102K	13- 6	AA		C
//	13- 7	AA		C
VCKYPU1HB152K	10- 113	AA		C
VCKYPU1HB222K	7- 2	AA		C
//	7- 3	AA		C
VCKYPU1HB471K	7- 1	AA		C
//	7- 5	AA		C
VCKYTQ1HB392K	10- 23	AB		C
//	10- 25	AB		C
//	10- 26	AB		C
//	13- 4	AB		C
//	13- 5	AB		C
VCKYTQ1HF104Z	10- 8	AA		C
//	10- 14	AA		C
//	10- 15	AA		C
//	10- 20	AA		C
//	10- 22	AA		C
//	10- 24	AA		C
//	10- 27	AA		C
//	10- 28	AA		C
//	10- 30	AA		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
VCKYTQ1HF104Z	10- 31	AA		C
//	12- 2	AA		C
//	12- 3	AA		C
//	12- 4	AA		C
//	12- 5	AA		C
//	13- 2	AA		C
//	13- 3	AA		C
//	13- 8	AA		C
//	13- 9	AA		C
//	13- 13	AA		C
//	14- 1	AA		C
VCKYTV1HB101K	10- 13	AA		C
//	10- 17	AA		C
//	10- 18	AA		C
//	10- 19	AA		C
VCKYTV1HF104Z	9- 6	AA		C
//	9- 10	AA		C
//	9- 11	AA		C
//	9- 12	AA		C
//	9- 16	AA		C
//	9- 17	AA		C
//	9- 18	AA		C
//	9- 26	AA		C
VCKYTV1HR102K	10- 11	AA		C
VCKYTV1HR472K	9- 5	AA		C
//	9- 7	AA		C
//	9- 8	AA		C
//	9- 9	AA		C
//	9- 15	AA		C
//	9- 19	AA		C
//	9- 20	AA		C
//	9- 21	AA		C
//	9- 22	AA		C
//	9- 23	AA		C
VCKYTV1HR561K	10- 9	AA		C
VCTYPU1HF104Z	7- 6	AB		C
VHDDSS133HV-1	9- 33	AA		C
//	9- 34	AA		C
//	9- 35	AA		C
//	9- 36	AA		C
//	9- 37	AA		C
//	9- 38	AA		C
VHDERA9102/-1	11- 37	AC		B
VHDESAC92M02//	11- 38	AH		B
VHDBRV604///-1	11- 1	AH		B
VHDBRV606///-1	11- 1	AH		B
VHDSB80-05J-1	11- 39	AG		B
VHD1SS270A/-1	11- 35	AA		B
//	11- 36	AA		B
//	11- 40	AA		B
//	11- 41	AA		B
VHEQA0306B/-1	11- 78	AB		B
VHEQA0318B/-1	11- 79	AB		B
VHEQA0320B/-1	11- 76	AB		B
VHEQA0328B/-1	11- 77	AB		B
VHH16D13F///-1	11- 71	AG		B
VHH18D8R0LA-1	11- 71	AG		B
VHiAM29240///	10- 44	CA	N	B
VHiAT24C04///1	10- 47	AP		B
VHiBA6886N/-1	9- 41	AL		B
VHiDS14C238///	13- 22	AT	N	B
VHiDS8925M///	13- 21	AR	N	B
VHiHD44780/-1	12- 13	AS		B
VHiLH53881A-1	10- 42	AZ	N	B
VHiLH53881B-1	14- 4	AZ	N	B
VHiLH53881C-1	14- 5	AZ	N	B
VHiLH538817-1	10- 38	AZ	N	B
VHiLH538818-1	10- 40	AZ	N	B
VHiLH538819-1	10- 41	AZ	N	B
VHiLZ9AG11///	10- 43	AX	N	B
VHiM37451S620	9- 42	AY	N	B
VHiPST575CMT//	9- 45	AE		B
VHiSLA7024M-P	7- 10	AT		B
VHiSN74LS00-1	9- 40	AE		B
VHiSN74LS151N	8- 13	AG		B
//	12- 14	AG		B
VHiSN74LS173N	12- 15	AL		B
VHiSN74LS244N	10- 53	AS		B
VHiULN2003AN1	9- 43	AE		B
//	9- 44	AE		B

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
VHiX24C44P/-1	9- 39	AN		B
VHiZ85230////	13- 20	BG	N	B
VHi4M8S0J-70//	10- 45	BG	N	B
VHi7SHU04////	10- 48	AE	N	B
"	10- 49	AE	N	B
VHi74ABT244F1	10- 52	AP	N	B
VHi74ABT245F1	10- 51	AP	N	B
VHi74F04SJ/-1	13- 18	AE		B
VHi74F08SJ/-1	10- 50	AE		B
VHi74F157ASJ1	13- 19	AL	N	B
VHi74VHC74//R	10- 46	AE		B
VHPGP1S53V/-1	8- 14	AE		B
"	8- 15	AE		B
"	12- 16	AE		B
VHPLT1D51A/-1	12- 12	AC		B
VHPLT1H51A/-1	12- 9	AC		B
"	12- 11	AC		B
VHPLT1K51A/-1	12- 10	AC		B
VHRS21ME4F/-1	11- 57	AH		B
VHS5P4M////-1	11- 69	AM		B
VHViCPN20///-1	9- 46	AD		B
VHViCPN50///-1	7- 11	AE		B
VHVSN221D10-C	11- 80	AC		B
VHVSN471D10-C	11- 80	AC		B
VRD-HT2EY330J	10- 114	AA		C
VRD-RC2EY100J	9- 51	AA		C
"	9- 52	AA		C
"	9- 62	AA		C
VRD-RC2EY101J	10- 57	AA		C
VRD-RC2EY102J	9- 47	AA		C
"	9- 49	AA		C
VRD-RC2EY103J	8- 20	AA		C
"	8- 21	AA		C
"	8- 22	AA		C
"	8- 23	AA		C
"	8- 24	AA		C
"	8- 25	AA		C
"	9- 55	AA		C
"	9- 66	AA		C
"	9- 67	AA		C
"	9- 68	AA		C
"	9- 69	AA		C
"	9- 71	AA		C
"	9- 73	AA		C
"	9- 74	AA		C
"	9- 76	AA		C
"	9- 79	AA		C
VRD-RC2EY105J	9- 64	AA		C
VRD-RC2EY121J	7- 19	AA		C
"	8- 18	AA		C
VRD-RC2EY165J	9- 61	AA		C
VRD-RC2EY181J	8- 27	AA		C
"	12- 20	AA		C
VRD-RC2EY200J	9- 70	AA		C
VRD-RC2EY203J	8- 19	AA		C
"	8- 26	AA		C
VRD-RC2EY242J	7- 16	AA		C
"	7- 17	AA		C
VRD-RC2EY471J	9- 63	AA		C
VRD-RC2EY472J	9- 50	AA		C
"	9- 53	AA		C
"	9- 56	AA		C
"	9- 57	AA		C
"	9- 58	AA		C
"	9- 59	AA		C
"	9- 65	AA		C
"	9- 72	AA		C
"	9- 75	AA		C
VRD-RC2EY473J	7- 13	AA		C
"	7- 15	AA		C
VRD-RC2EY512J	9- 54	AA		C
VRD-RC2EY621J	7- 14	AA		C
VRD-RC2EY622J	9- 48	AA		C
VRNRC2EK4701F	9- 78	AA		C
VRS-FC3AA104J	11- 63	AA		C
"	11- 68	AA		C
VRS-RE3AA5R1J	9- 60	AB		C
"	9- 77	AB		C
VRS-RE3DA1R0J	7- 12	AB		C
"	7- 18	AB		C

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK
VRS-TP2BD000J	9- 96	AA		C
"	12- 6	AA		C
VRS-TP2BD100J	10- 83	AA		C
"	10- 85	AA		C
"	10- 90	AA		C
VRS-TP2BD101J	10- 68	AA		C
"	10- 70	AA		C
"	10- 73	AA		C
"	10- 78	AA		C
"	10- 87	AA		C
"	10- 95	AA		C
"	10- 96	AA		C
VRS-TP2BD103J	9- 82	AA		C
"	9- 83	AA		C
"	9- 84	AA		C
"	9- 85	AA		C
"	9- 86	AA		C
"	9- 87	AA		C
"	9- 88	AA		C
"	9- 89	AA		C
"	9- 90	AA		C
"	10- 58	AA		C
"	10- 59	AA		C
"	10- 62	AA		C
"	10- 72	AA		C
"	10- 76	AA		C
"	10- 79	AA		C
"	10- 81	AA		C
"	10- 97	AA		C
"	13- 23	AA		C
VRS-TP2BD105J	13- 24	AA		C
VRS-TP2BD122J	12- 19	AA		C
VRS-TP2BD152J	13- 25	AA		C
VRS-TP2BD201J	12- 22	AA		C
VRS-TP2BD203J	9- 80	AA		C
"	9- 81	AA		C
VRS-TP2BD220J	10- 61	AA		C
"	10- 63	AA		C
"	10- 66	AA		C
"	10- 67	AA		C
"	10- 71	AA		C
"	10- 74	AA		C
"	10- 75	AA		C
"	10- 77	AA		C
"	10- 80	AA		C
"	10- 82	AA		C
"	10- 84	AA		C
"	10- 86	AA		C
"	10- 88	AA		C
"	10- 91	AA		C
"	10- 92	AA		C
"	10- 93	AA		C
"	10- 94	AA		C
VRS-TP2BD301J	12- 21	AA		C
"	12- 23	AA		C
VRS-TP2BD330J	10- 64	AA		C
"	10- 65	AA		C
"	10- 69	AA		C
"	10- 89	AA		C
"	10- 98	AA		C
VRS-TP2BD332J	10- 60	AA		C
VRS-TP2BD472J	9- 91	AA		C
"	9- 92	AA		C
VRS-TP2BD561J	12- 24	AA		C
VRS-TP2BD913J	12- 17	AA		C
VRW-GV3HC220K	11- 64	AD		C
VS2SA1451Y/-1	11- 60	AH		B
VS2SA673AC/-1	11- 61	AE		B
VS2SC4363///-1	11- 62	AB		B
VS2SD1207S///-1	11- 59	AC		B
VS2SK1016///-1	11- 58	AQ		B
VS2SK1358///-1	11- 58	AR		B
VVLLF7768G///-1	12- 30	AT		B
{ X }				
XBBSD30P06000	8- 29	AA		C
XBPSD30P04000	4- 79	AA		C
XBPSD30P06000	3- 36	AA		C
XBPSD30P10KS0	4- 55	AA		C
XBPSD30P32000	3- 31	AA		C
XBPSE30P04000	3- 41	AA		C







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