

Printer Board-J1P

SERVICE MANUAL

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Canon

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INTRODUCTION

This Service Manual provides facts and figures needed to service the Printer Board - J1P package in field, and consists of the following chapters:

Chapter 1 *General Description* provides an outline of the product, introduces its features, specifications, and shows how it may be operated.

Chapter 2 *Operation Overview* describes the construction of the Printer Board - J1P package, its system overview, electrical circuit overview, and how data dealt with by the host copier.

Chapter 3 *Mechanical System* shows how the Printer Board - J1P package may be disassembled / assembled with points to note during the work.

Chapter 4 *User software* provides an outline of printer driver.

Chapter 5 *Troubleshooting* discusses how to isolate the board and describe the software tool.

Chapter 6 *Parts catalog* provides parts lists.

Appendix provides general circuit diagram and a special tool.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

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HP, PCL, PCL5e and PCL6 are trademark of Hewlett - Packard Company.
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I. FEATURES

1. Accommodates the PCL5e and PCL6 PDL as standard.

The Printer Board-J1P package is designed to accommodate the PCL5e and PCL6 PDL (Page Description Language), developed by Hewlett-Packard Company, as standard. The Printer Board-J1P package is capable of decoding instructions written in these languages for printing on a digital black-and-white copier.

2. High-speed print processing by a high-performance CPU.

The high-speed CPU (Intel i960: 32-bit RISC type microprocessor.) with an access clock frequency of 33 MHz processes printing information at a very high rate.

3. Multiple memory sizes.

An 4 MB memory comes standard with the Printer Board-J1P package for use as a buffer for print data from external devices. Adding a SIMM to the memory will expand the capacity to as high as 20 MB, thereby decreasing memory overflow and enabling smooth processing otherwise occurring when complex data from external devices is processed.

4. Disable the Energy saving mode.

Energy saver mode does not operate when the Printer Board-J1P is installed.

II. OUTLINE OF THE PRODUCT

The Printer Board-J1P package serves as an interface between a copying machine and computer via IEEE1284 compliant parallel interface that supports bi-directional communication. Decoding data from the computer for generation of video signals for printing on paper.

The package is capable of decoding PCL6 and PCL5e developed by Hewlett - Packard Company.

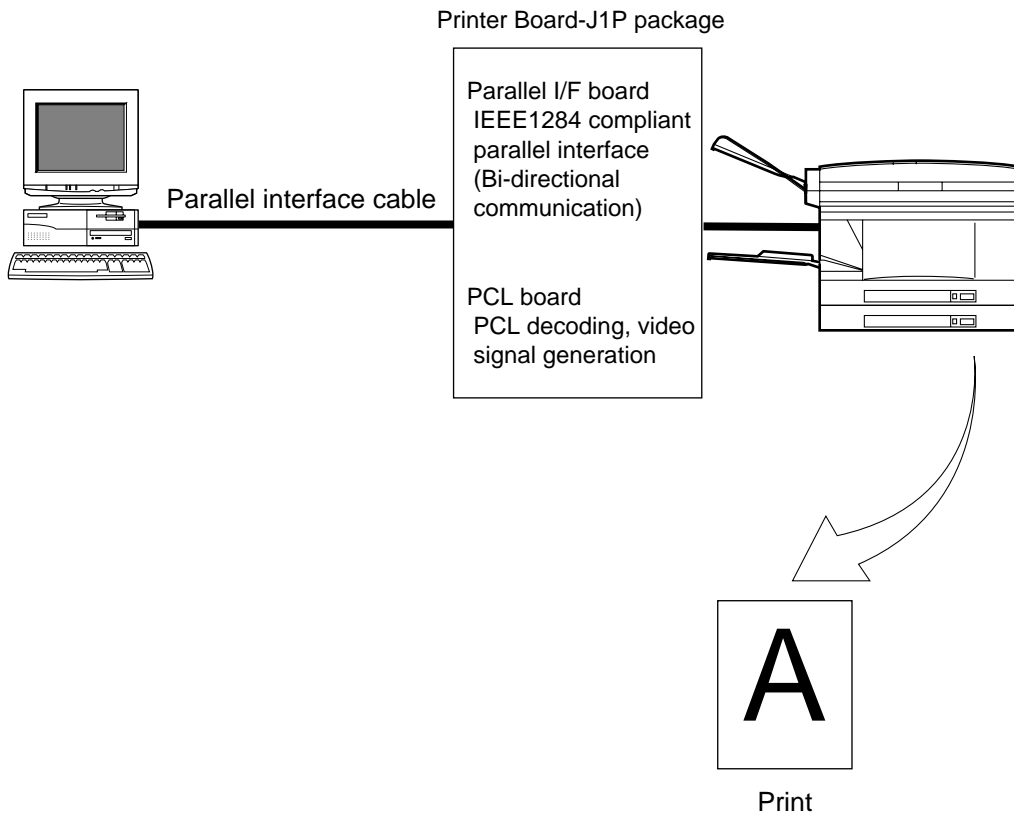


Figure 1-201

III. SPECIFICATIONS

A. PCL Board

Item		Description
CPU	Primary	Intel i960(NG80960JF-33) Microprocessor
	Secondary	Peerless QP1700 Banding Co-processor ASIC at 33MHz (IC2)
ROM		Mask 8MB (IC10, IC11) Content PCL, PCL fonts
RAM	Standard	DRAM 4MB on board
	Optional	SIMM 16MB + standard 4MB (20MB Max.)
Interface		IEEE1284 40pin Page21 style to Parallel I/F board FAX BUS & Video I/F to Image Processor PCB
Operation mode		PCL6, PCL5e emulation (PeerlessPrint6)
Resolution		600dpi / 300dpi
Paper size		A3, A4, A4-R, A5, A5-R, B4, B5, B5-R, 11 x 17, Legal, Letter, Letter-R
Font		45 scalable typefaces in 14 families 35 Intellifont format, 10 TrueType format 8 Bitmapped typefaces in Line Printer Typeface Family
Non-image width		Less than 1/6 inches (on all sides)
Operation temperature /humidity		Same as main body

B. Parallel I/F Board

Item	Description
Interface	IEEE1284 40pin Page21 style to PCL board Amphenol centronics 36pin (Amphenol 57-40360 or equivalent)

C. Supporting OS and PDL

Operating system	Page description language
Windows 3.1x	PCL5e
Windows 95	PCL5e/PCL6
Windows 98	PCL5e/PCL6
Windows NT4.0	PCL5e/PCL6

IV. OPERATION

Once the Printer Board-J1P is installed the PRINT/SCAN (SYSTEM) button on operation panel will become enabled.

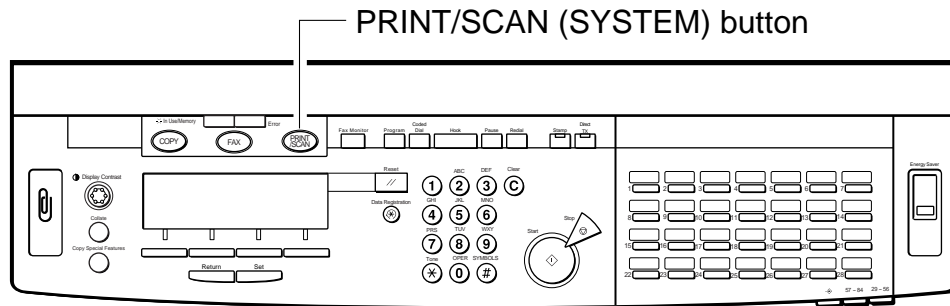


Figure 1-401

When the PRINT/SCAN (SYSTEM) button is pressed, the following screen is displayed on LCD display panel with ON LINE mode displayed.

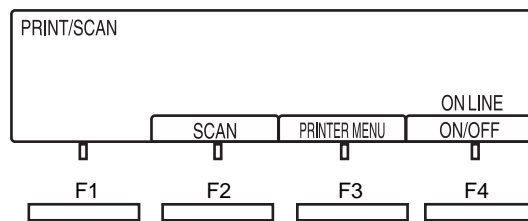


Figure 1-402

ON LINE Use the ON/OFF button (F4) to switch the printer off line and on line. You have to switch the printer off line before you can open the PRINTER MENU to perform a test print and other procedures.

A. Printer Menu

The following pages describe the Printer settings which can be accessed via the print menu.

To enter the printer menu, press ON/OFF button (F4) to take the printer off line, then press PRINTER MENU button (F3).

PRINTER MENU

- 01 CONTINUE
- 02 FORM FEED
- 03 RESET ———— 01 JOB CLEAR
 - 02 PRINTER RESET
 - 03 PCL BOARD RESET
- 04 TEST ———— 01 TEST PRINT
 - 02 FONTS LIST

- CONTINUE** Some errors that interrupt printing can be skipped. For example, if the paper size specified by the application software program is not loaded in the paper cassette an error message will ask you have to load the correct paper size in the cassette. To skip this error, all you have to do is select the CONTINUE item in the PRINTER MENU.
- FORM FEED** This procedure prints any data remaining in the receive buffer on the PCL board. This may occur if the application software program does not send a form feed (FF) or if the printer is taken off line during a print job.
- RESET**
- JOB CLEAR** This procedure is to cancel a print job. After you cancel a print job, the unprinted portion of the print job is deleted.
- PRINTER RESET** This procedure is to cancel the current printer settings and restore the defaults.
- PCL BOARD RESET** This procedure performs a hard reset for the PCL board. Perform a hard reset if the PCL board hangs up.
- TEST**
- TEST PRINT** This procedure is to perform a Test print. The Test print performs three important tasks that confirm the printer is operating correctly. See figure 1-403 sample test print.
1. Listing all menu settings in the upper left corner of the Test Print. If no settings have been changed on the printer, you will see the factory default settings.
 2. Printing a variety of patterns, shading, and black fill at the top of the page so you can judge the quality of printing.
 3. Listing other important information like RAM size, total page count for the printer, version and revision numbers.
- FONTS LIST** This procedure prints a list of the internal fonts. See figure 1-404 sample fonts list.
1. Only information about printer resident fonts and permanently downloaded soft fonts is printed in this list.
 2. Information about soft fonts downloaded temporarily only for a print job are not printed in this list.
 3. When permanent fonts are downloaded to the printer, only details about the downloaded soft fonts are provided in the list.

B. Print Sample

TEST PRINT

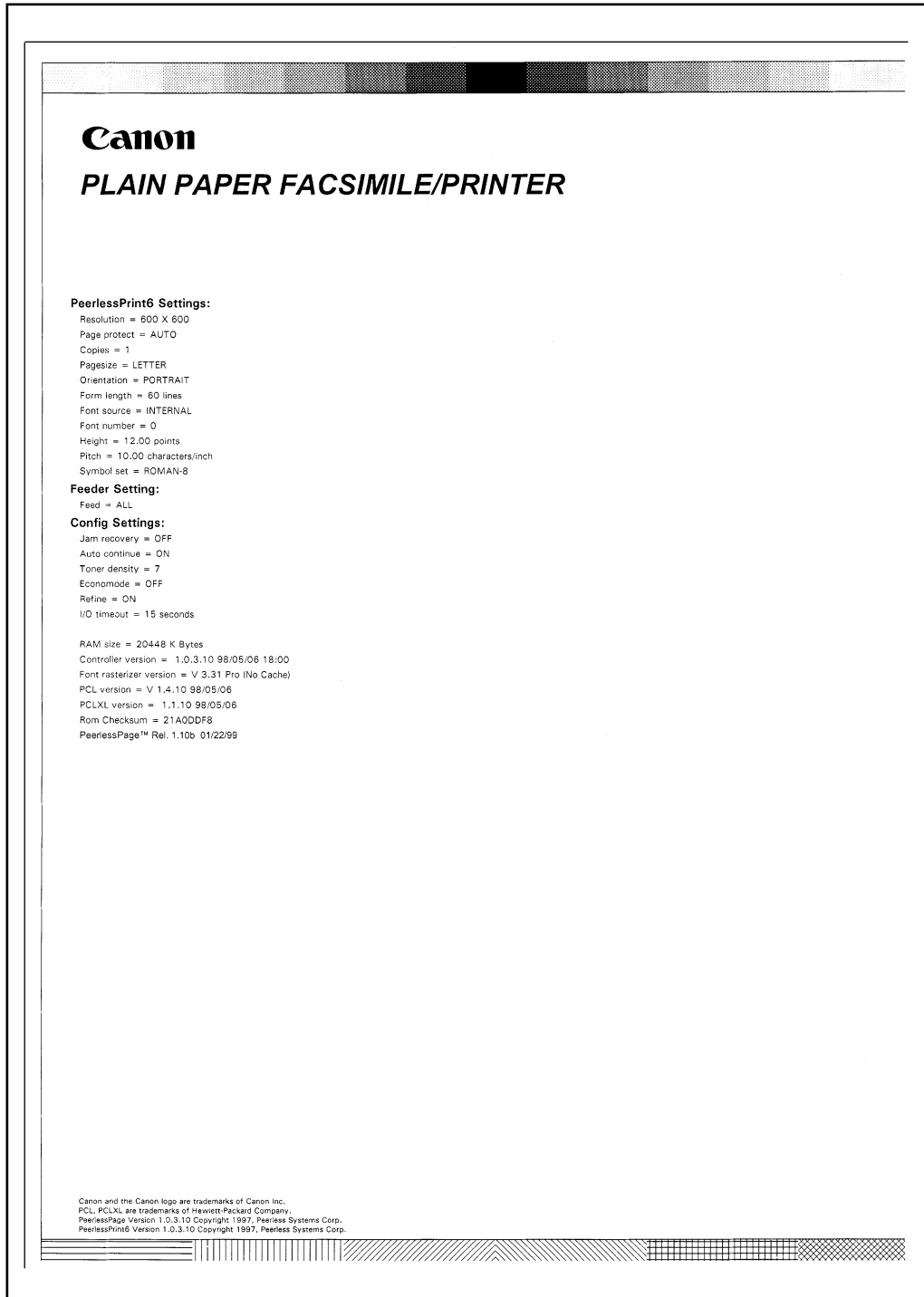


Figure 1-403

1. PeerlessPrint6 Settings:

These settings for print jobs can be adjusted in the printer driver.

Please refer to Printer Driver online Help for further information regarding the printer driver.

2. Feeder Setting:

These settings identify the paper supply sources. These settings can be adjusted with the Paper tab in the printer driver.

3. Config Settings:

The first two lines tell you the settings that cannot be changed for this printer. The other lines give you information about the device's printer hardware. The items in lines 4-6 are unaffected by printer resets. The "RAM size" item tells you how much memory is available on the PCL board. Standard memory for the PCL board is 4 MB. If you see more than 4 MB for the RAM size value, then you know an additional memory SIMM has been installed on the PCL board.

Jam Recovery and Auto Continue settings cannot be changed and only the default settings are available. Other configuration settings can be adjusted in the printer driver. Please refer to Printer Driver online Help for further information regarding the printer driver.

FONTS LIST

Font List										
Font #	Font ID	Symbol Set	Fix /PS	Pitch (cpi)	Point Size	Style	Stroke Weight	Name or Typeface	Default Orient	Print Sample & Escape Sequence
"PERMANENT" SOFT FONTS										
INTERNAL FONTS										
1000	ROMAN-8	F	Scale			Upright	Medium	Courier	Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s0b4099T
1001	ROMAN-8	F	Scale			Upright	Medium	Courier	Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s0b4099T
1002	ROMAN-8	F	Scale			Upright	Bold	Courier	Bd Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s3b4099T
1003	ROMAN-8	F	Scale			Upright	Bold	Courier	Bd Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s3b4099T
1004	ROMAN-8	F	Scale			Italic	Medium	Courier	It Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h1s0b4099T
1005	ROMAN-8	F	Scale			Italic	Medium	Courier	It Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h1s0b4099T
1006	ROMAN-8	F	Scale			Italic	Bold	Courier	BdIt Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h1s3b4099T
1007	ROMAN-8	F	Scale			Italic	Bold	Courier	BdIt Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h1s3b4099T
1008	ROMAN-8	P	Scale			Upright	Medium	CG Times	Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v0s0b4101T
1009	ROMAN-8	P	Scale			Upright	Bold	CG Times	Bd Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v0s3b4101T
1010	ROMAN-8	P	Scale			Italic	Medium	CG Times	It Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v1s0b4101T
1011	ROMAN-8	P	Scale			Italic	Bold	CG Times	BdIt Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v1s3b4101T
1012	ROMAN-8	F	Scale			Upright	Medium	LetterGothic	Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s0b4102T
1013	ROMAN-8	F	Scale			Upright	Bold	LetterGothic	Bd Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h0s3b4102T
1014	ROMAN-8	F	Scale			Italic	Medium	LetterGothic	It Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s0p_h1s0b4102T
1015	ROMAN-8	P	Scale			Upright	Medium	CG Omega	Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v0s0b4113T
1016	ROMAN-8	P	Scale			Upright	Bold	CG Omega	Bd Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v0s3b4113T
1017	ROMAN-8	P	Scale			Italic	Medium	CG Omega	It Port	ABCDEFghijjÃÂ°ÇÑ;¿£\$ê#\$\$@ [] ^ ` { } ~ 123 <esc>{8U<esc>{s1p_v1s0b4113T

Figure 1-404

- | | |
|----------------------|---|
| 1. Font # | The letter prefix of the number tells you the font source
I: Resident (internal) font S: Permanent soft (downloaded) font |
| 2. FONT ID | The user allocated numbers for soft fonts downloaded to the printer. |
| 3. Symbol Set | The name of the Symbol set. |
| 4. Fix/PS | Whether the font is a fixed, non-proportional font (F) or a proportional font (P). |
| 5. Pitch (cpi) | The pitch and point size. For a scaleable font, Scale is displayed. |
| 6. Point size | The measured vertical distance in points (72 points=1 in.) from the top of the capital letters to the descenders of the letter y. |
| 7. Style | Upright (straight) characters or italic (slanted) characters. |
| 8. Stroke Weight | The stroke weight of the characters in the font. |
| 9. Name or Typeface | The commercial name of the typeface. |
| 10. Default Orient | The orientation of the print. Port means Portrait. Land means Landscape. Default orientation for all fonts is Portrait (Port). |
| 11. Print sample and | Escape Sequence |
| | Sample font print and the PCL commands used to select this font. |

CHAPTER 2

OPERATION OVERVIEW

This chapter given a overview description of basic unit operations.

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II.	ELECTRICAL CIRCUIT OVERVIEW	2-2	B.	Flow of Image Signals	2-5

I. SYSTEM OVERVIEW

Host-computer generated data transmitted via the Parallel interface cable are passed by the Parallel I/F board. The data are then output to the PCL board via the bi-directional parallel interface (IEEE 1284) in response to a Main body (copying machine) generated transfer command.

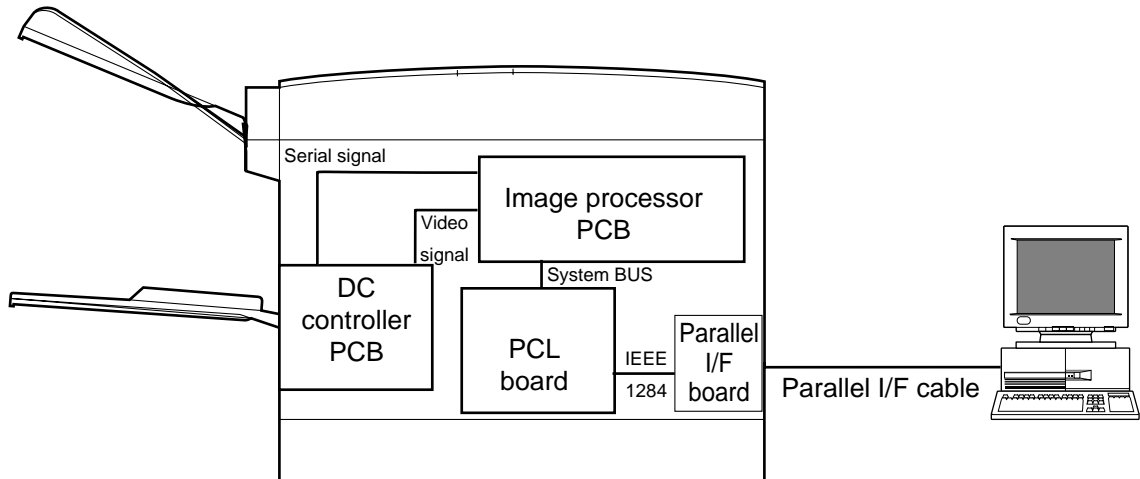


Figure 2-101

II. ELECTRICAL CIRCUIT OVERVIEW

A. Hardware Construction

The figures that follow show the hardware construction of the PCL board and the Parallel I/F board.

1. PCL Board

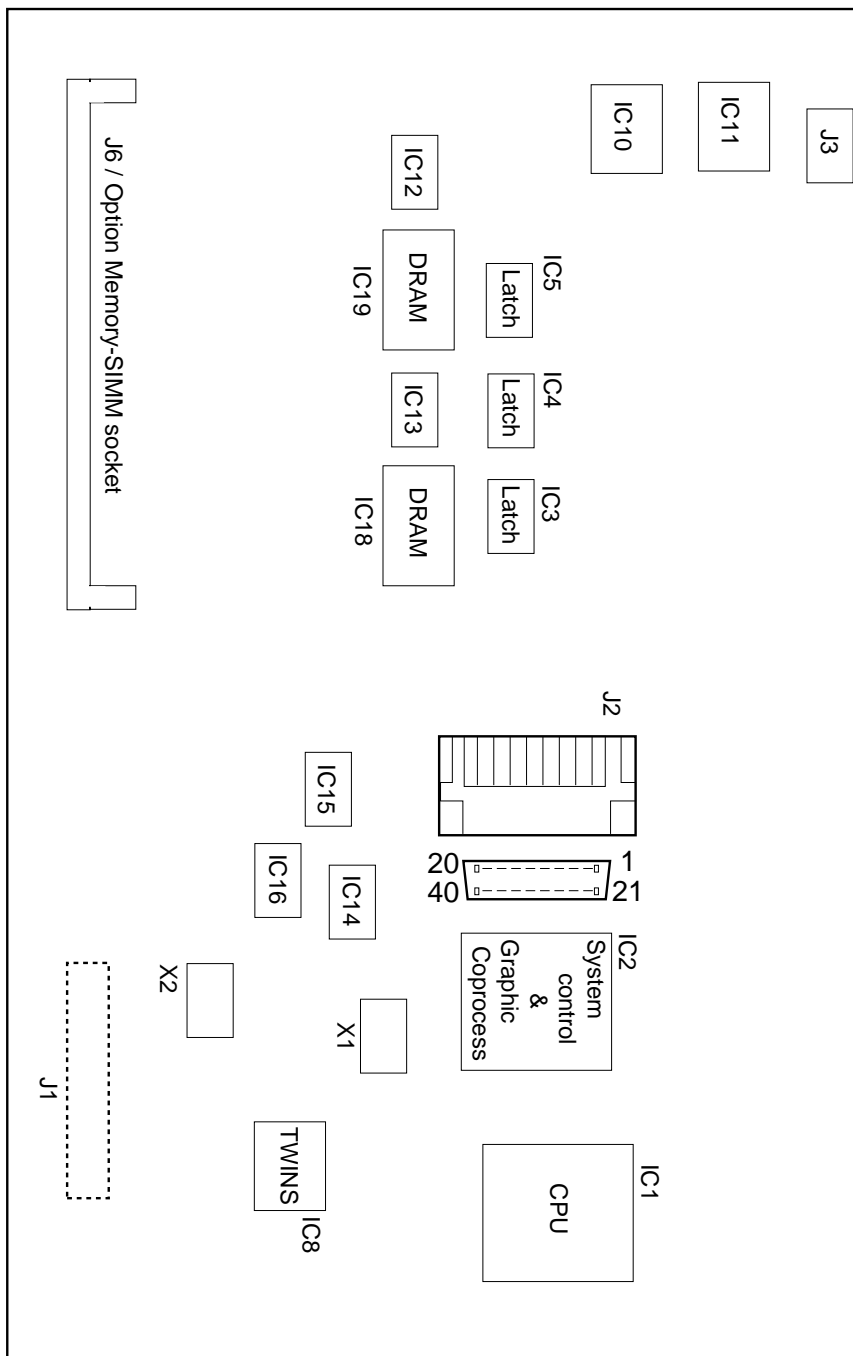


Figure 2-201

- 1) CPU (IC1)
 - Intel NG80960JF processor operating at 33 MHz
 - 32-bit data bus
 - 32-bit address bus

- 2) System control and graphic co-processor (IC2)
 - Graphics accelerator
 - Compression co-processor
 - Interleaved EPROM control
 - DRAM control
 - Printer video and communication interface
 - Interrupt control
 - IEEE 1284 Bi-directional parallel port

- 3) Interface exchange controller TWINS (IC8)
 - IEEE 1284 peripheral Bi-directional parallel port
 - IEEE 1284 host Bi-directional parallel port
 - Video controller interface
 - PCL serial communication interface

2. Parallel I/F Board

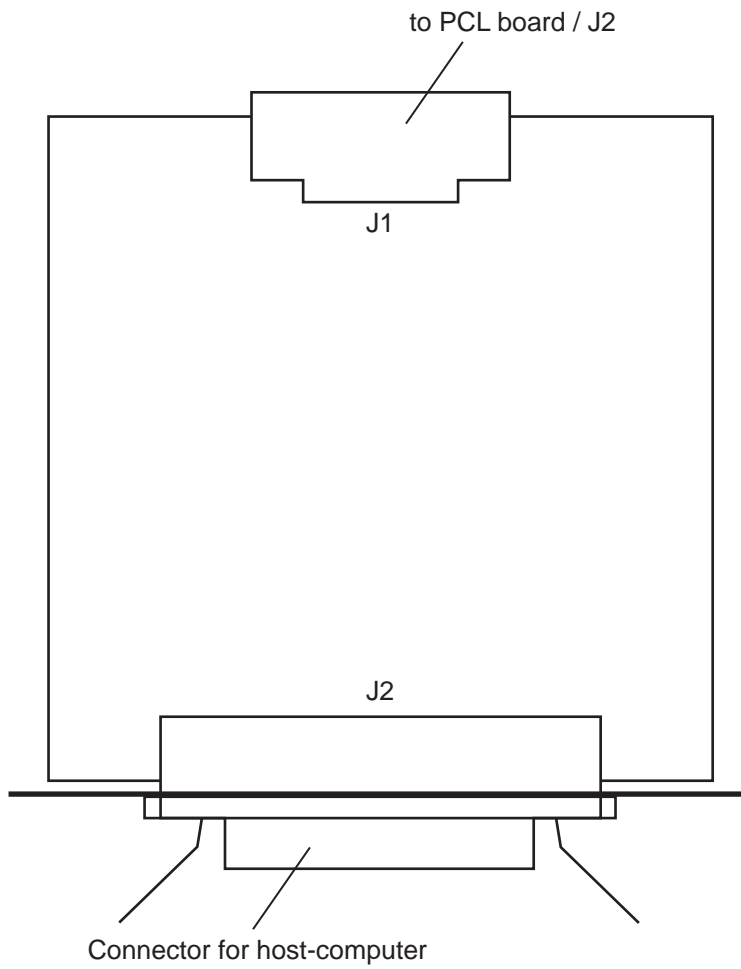


Figure 2-202

B. Flow of Image Signals

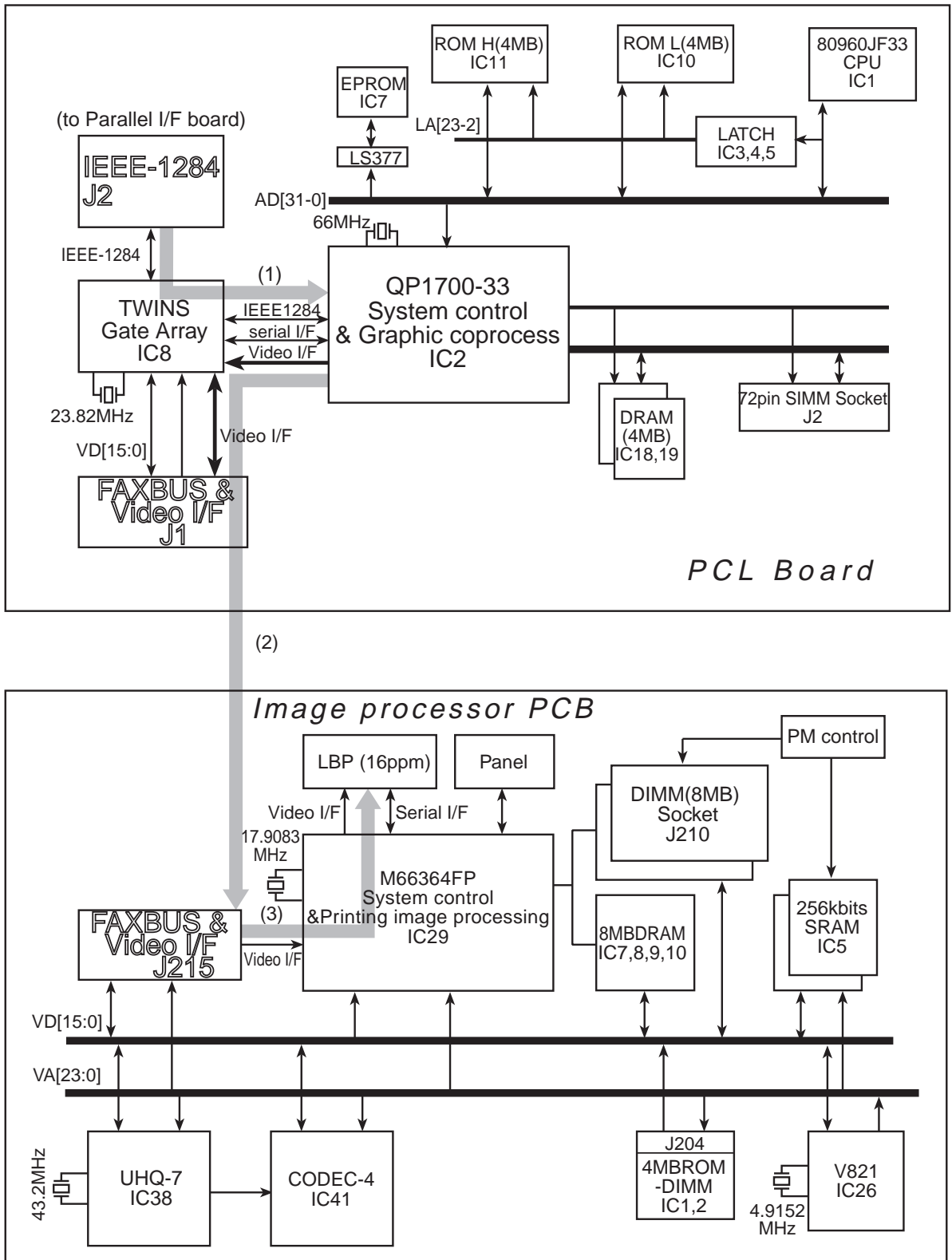


Figure 2-203

- (1) Data sent from the Parallel I/F board via the IEEE 1284 interface pass through the gate array (IC8) on the PCL board and are converted to video signals by the System Control & Graphic Co-process IC (IC2).
- (2) The data are then sent to the image processor PCB.
- (3) Output by the LBP.

CHAPTER 3

MECHANICAL SYSTEM

This chapter describes mechanical features and operation as well as disassembly and assembly procedures.

The following precautions must be observed during disassembly and assembly work.

1. Note : For the sake of safety, disconnect the power plug before performing any disassembly and assembly work.
2. Unless otherwise specified, assembly work is performed in the reverse order of the disassembly operations.
3. Be sure to use the right type (diameter and length) of screws in the right places.
4. An inner-clip washer is used with the securing screws in the ground wire and Varistors to ensure electric conductivity. Make sure to use these washers during assembly work.
5. In principal, the copier must not be operated when parts have been removed.
6. Screws that have been paint locked must not be removed during disassembly.

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I. PREPARATORY WORK/PRECAUTION

A. Turning Off Main Power Switch

Turn off the main power switch on the unit and disconnect the power plug before starting assembly and disassembly work.

Note:

When installing the Printer Board-J1P package check to make sure the ROM version of the copying machine (on Image Processor PCB). If the ROM version is older than "EC-05-01," replace the ROM with the most recent version.

II. DISASSEMBLY/ ASSEMBLY

A. Installing the PCL Board

1. Installation

- 1) Remove the four securing screws, and detach the rear cover of the unit.
- 2) Fit the PCL board to connector (J215) on the image processor PCB.
- 3) Secure the PCL board in place with four screws.

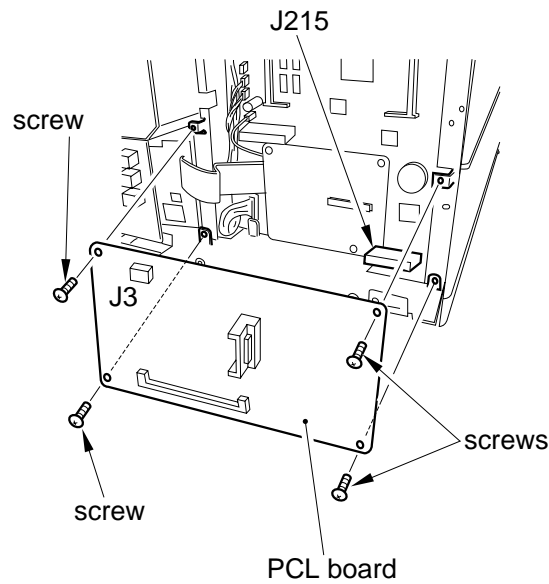


Figure 3-201

- 4) Fit the power cable to connector (J108) on the power supply unit, and connector (J3) on the PCL board.
- 5) Extended option memory SIMM on PCL board, refer to C. Installing option memory.

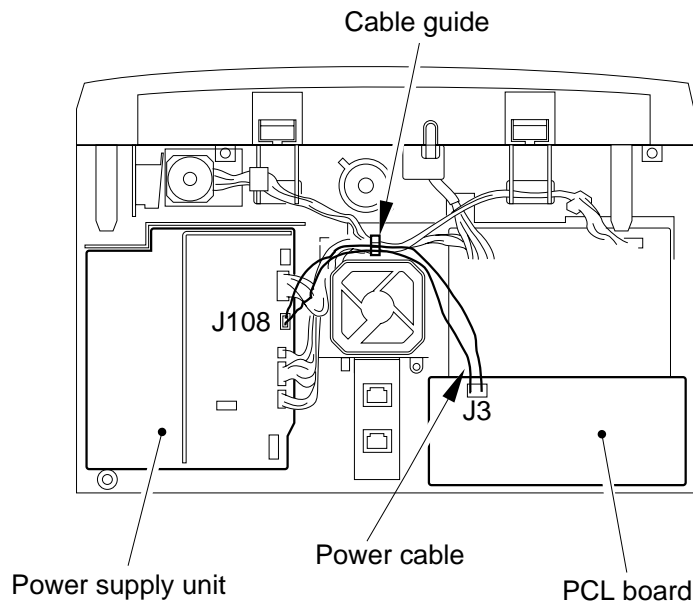


Figure 3-202

B. Installing the Parallel I/F Board

1. Installation

- 1) Remove the two screws, and detach the left cover. (The left cover must be slightly pulled away from the machine using handles; shift it to the right slightly, then removed it.)
- 2) Working from the inside of the left cover, use a pair of sharp nippers to cut the fasteners hold the rectangular knockout. (This provides an opening for the Parallel I/F board.)

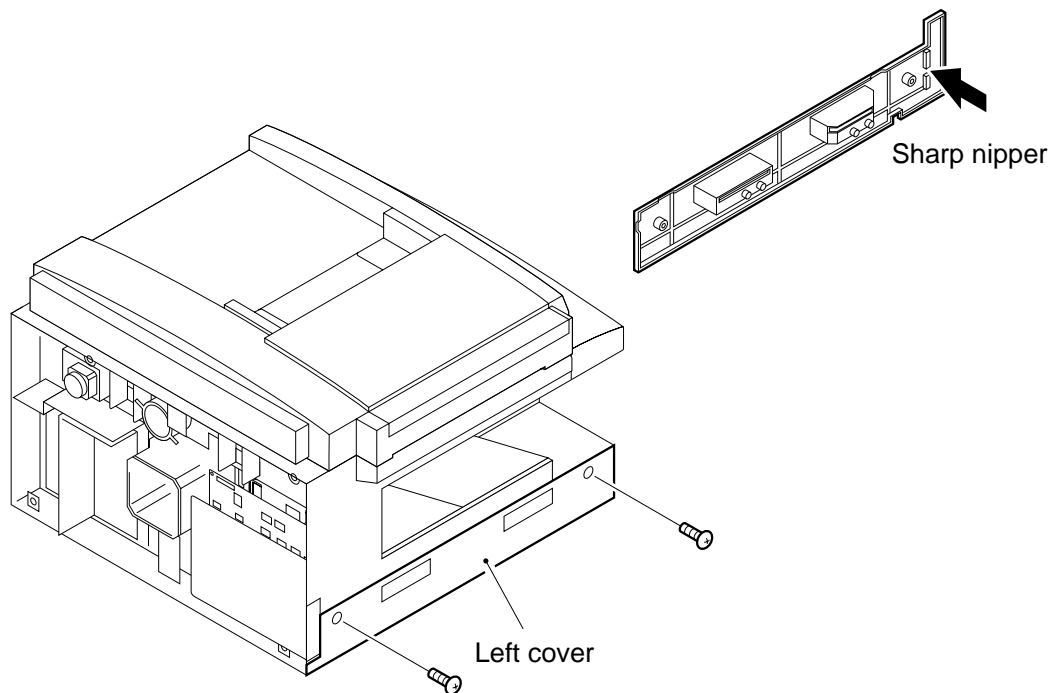


Figure 3-203

- 3) Fit the two screws for the left cover.
- 4) Slide the Parallel I/F board into the slot. Make sure it connects to the connector (J2) on the PCL board. Secure the Parallel I/F board in place with two screws.

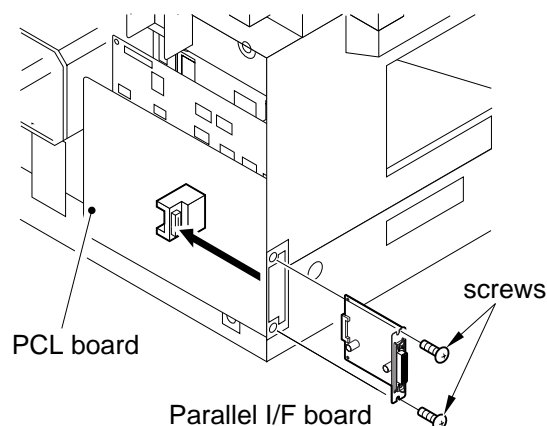


Figure 3-204

- 5) Mount the rear cover using the screws removed previously.
- 6) Turn on the power, and start service mode; then, shift bit 0 of SW29 (#1 SSSW) to '1'.

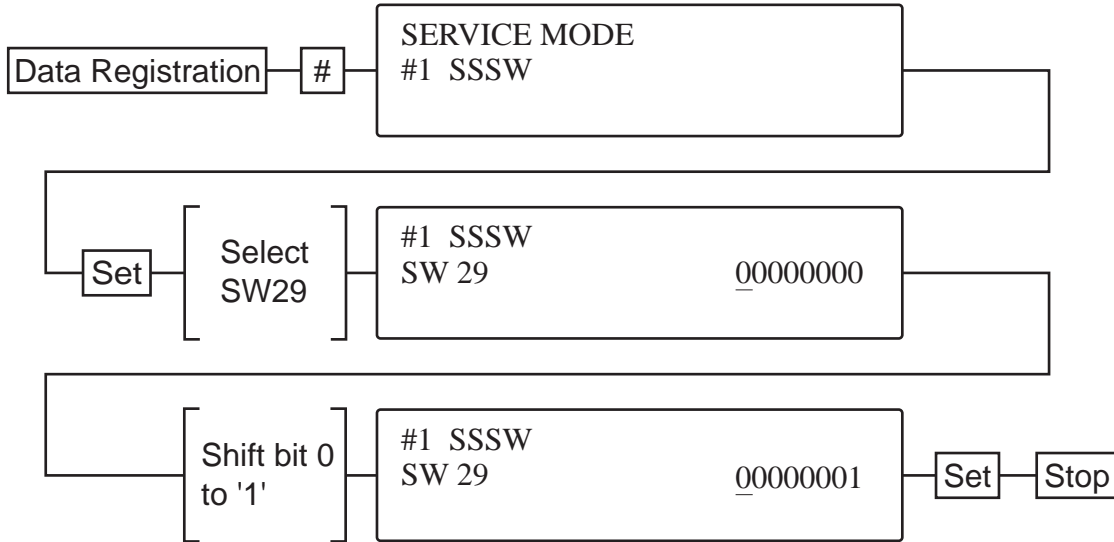


Figure 3-205

- 7) Turn off the power switch, and connect the printer cable (IEEE 1284-compliant parallel interface cable) to the parallel I/F board.
- 8) Turn on the power switch once again, and check to make sure that the message "PRINTER OFF LINE" has not appeared. (The machine must be turned off and then on before it recognizes the new setting. Be sure to turn it off and then on.)

C. Installing the Option Memory

1. Installation

Follow steps 3) of Chapter 3, A. Installing the PCL board"; then, install the option SIMM as shown below.

- 1) Holding the memory SIMM horizontally by the ends with the notched end pointing left, insert the edge connector of the memory SIMM into the slot at a 45-degree angle.

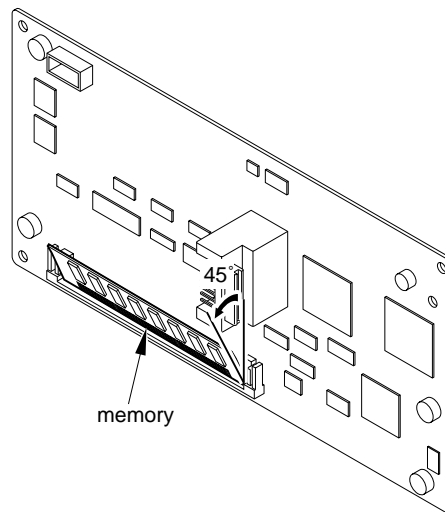


Figure 3-206

- 2) Slowly press down and in on the memory SIMM to the top. The memory SIMM should snap into the slot and come to rest parallel to the PCL board. Make sure the memory slot is straight and securely locked in place.

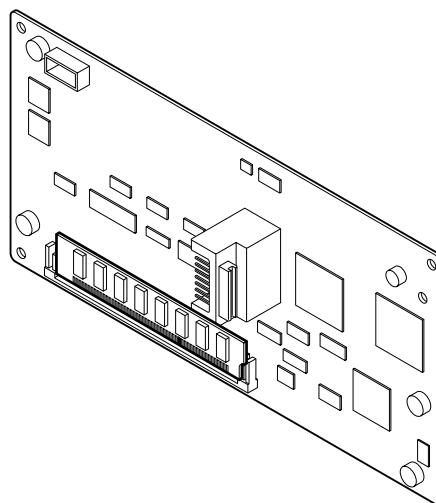


Figure 3-207

CHAPTER 4

USER SOFTWARE

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I. OUTLINE

The Printer Board-J1P includes printer driver CD-ROM containing printer drivers.

For detailed information on how to install, descriptions on functions, and how to use the functions, see the Setup Guide.

II. PRINTER DRIVER

When a printer command is executed using an application program, the printer driver converts the image data received by the operating system from the application program into commands written in a page description language. At the same time, settings selected on the Property screen of the printer are sent to the PCL board after conversion into commands.

A printer driver appropriate to the type of page description language used is needed. In general, different operating systems use different protocols to exchange data with printer drivers, requiring that there be a printer driver for each operating system. The user software CD-ROM that comes with the Printer Board-J1P includes the following printer drivers suited to various types of PCL languages used by individual operating systems,

- Windows 3.1x (For PCL5e, NetWare only)

- Windows 95/98

- Windows NT 4.0

To provide the application program and the printer driver with such information as specific to each printer (e.g. number of internal font, number of paper cassettes). Figure 4-201 shows part of the screen appearing when the Properties item of Windows 95 printer driver has been selected.

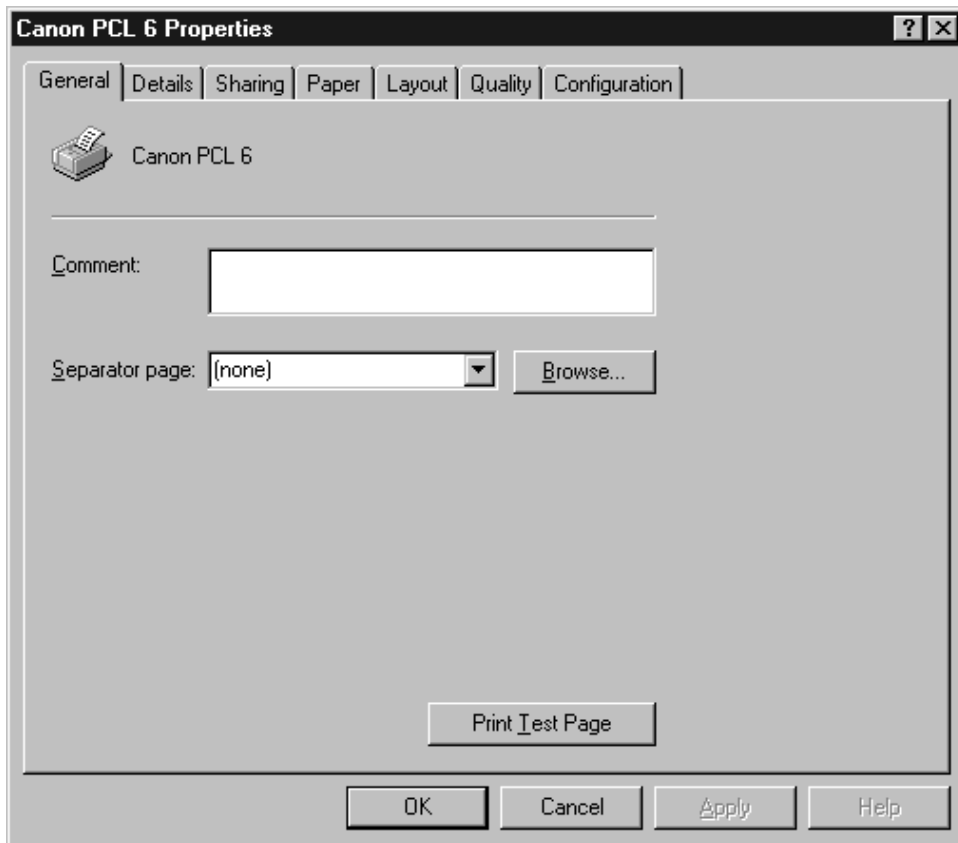


Figure 4-201

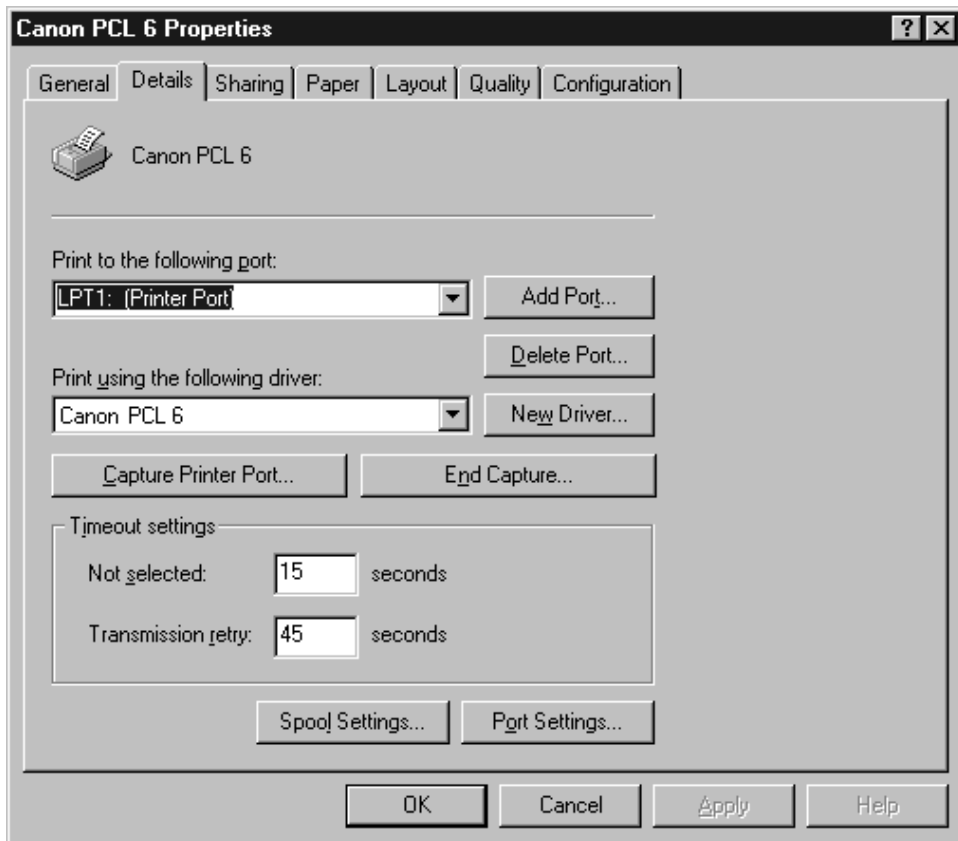


Figure 4-202

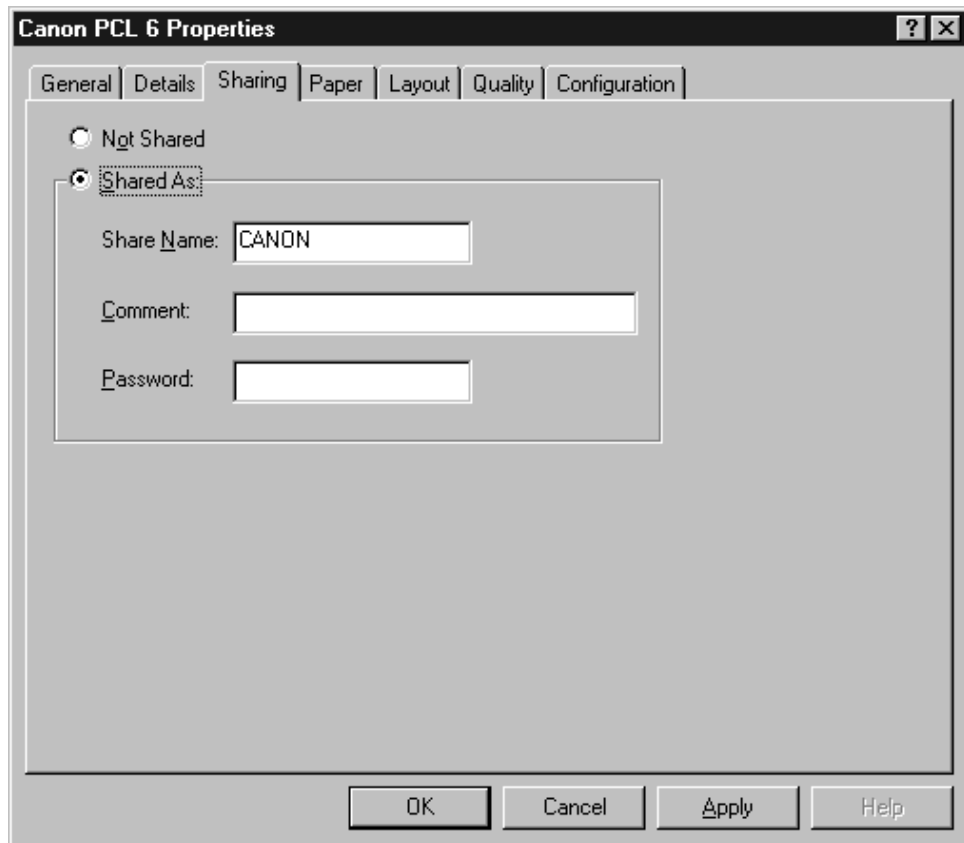


Figure 4-203

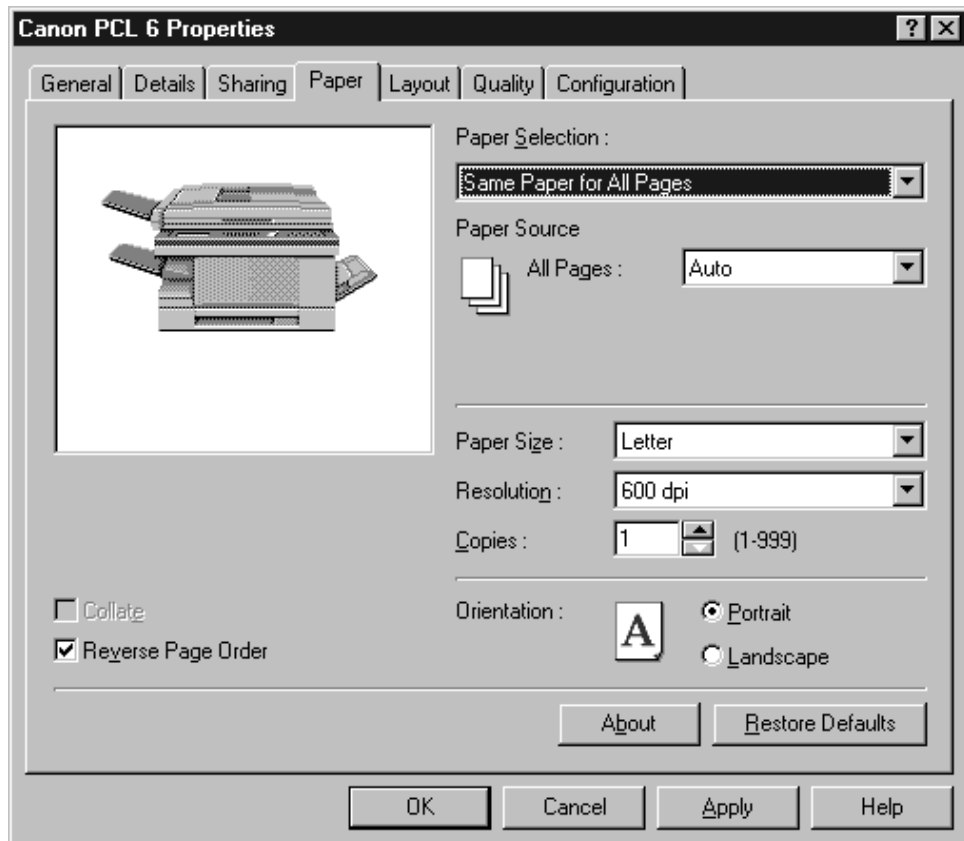


Figure 4-204

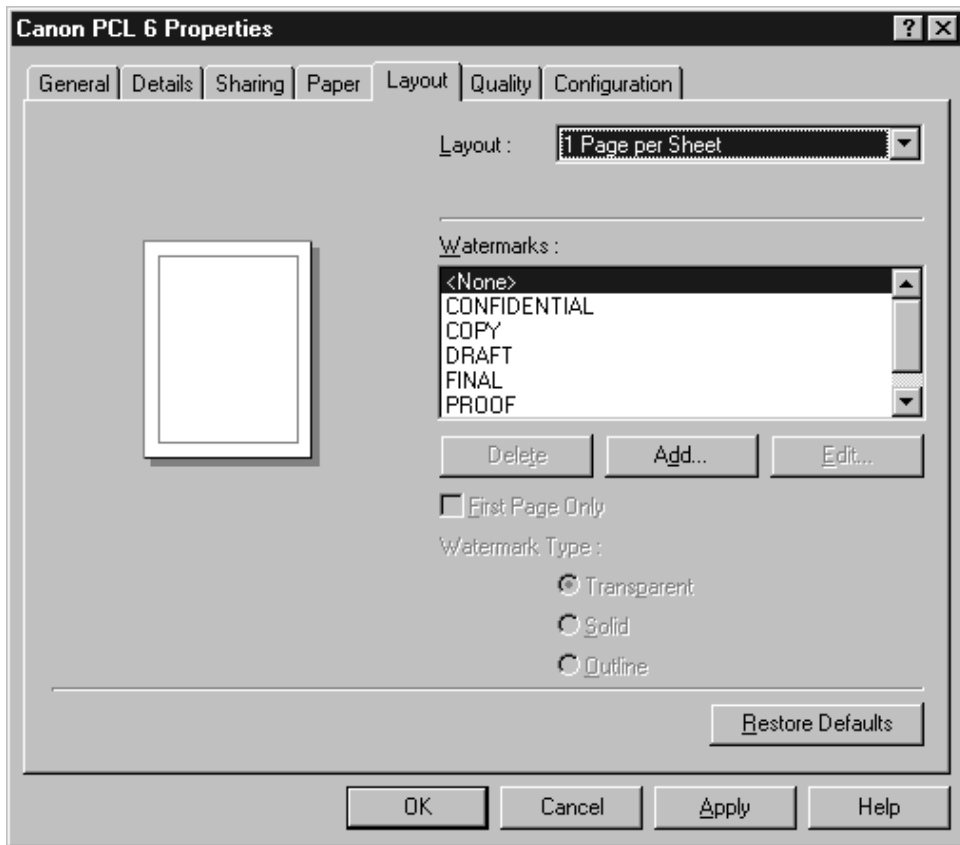


Figure 4-205

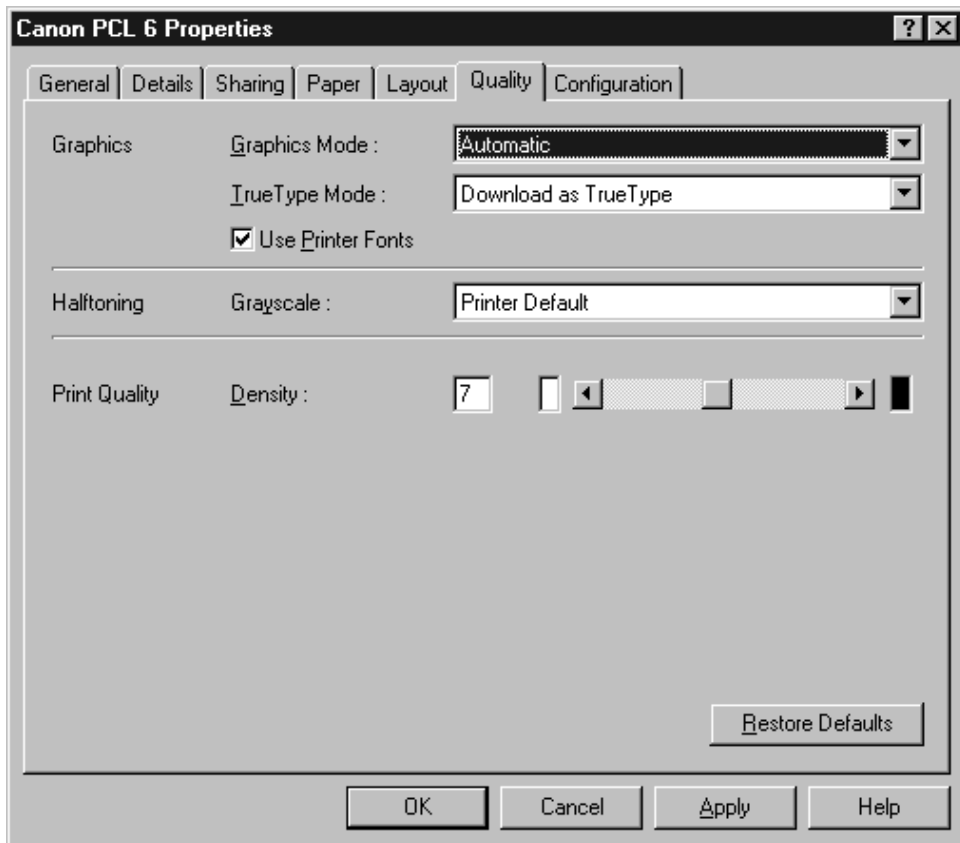


Figure 4-206

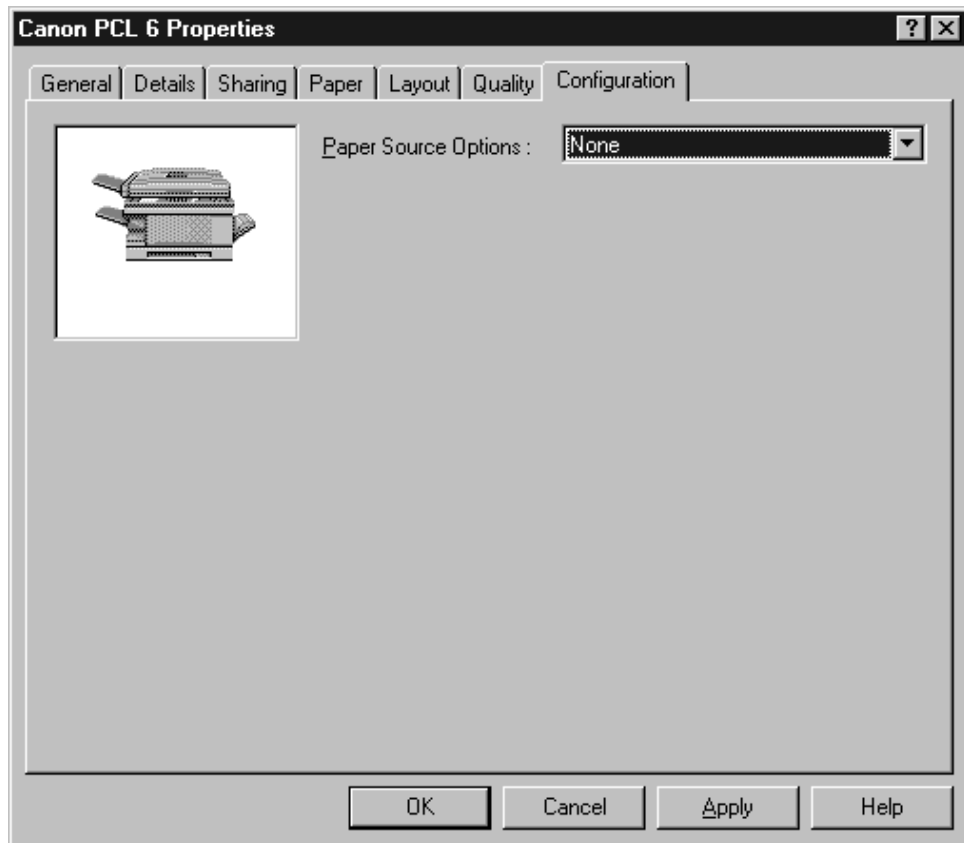


Figure 4-207

CHAPTER 5

TROUBLESHOOTING

I. ERRORS SHOWN ON THE DISPLAY.....5-1	III. STANDARD AND ADJUSTMENT5-3
II. ISOLATING THE BOARD5-2	

I. ERRORS SHOWN ON THE DISPLAY

Refer to the User's guide for information on error messages other than those Shown below.

"PCL BOARD FAILURE"

- Cause:
- (1) The PCL board is not connected properly.
 - (2) The Power cable is not connected properly.
 - (3) The PCL board is defective.

- Solution:
- (1) Check the PCL board - Image processor PCB connection
 - (2) Check the PCL board - Power supply Unit connection
 - (3) Replace the PCL board.

"PRINT NVRAM FAILURE"

- Cause:
- (1) The PCL board's RAM data containing the printer settings are damaged.
 - (2) The PCL board's NVRAM, or nearby circuit, is malfunctioning.

- Solution:
- (1) From the PRINTER MENU, select PCL BOARD RESET, and reset the board
 - (2) Replace the PCL board.

II. ISOLATING THE BOARD

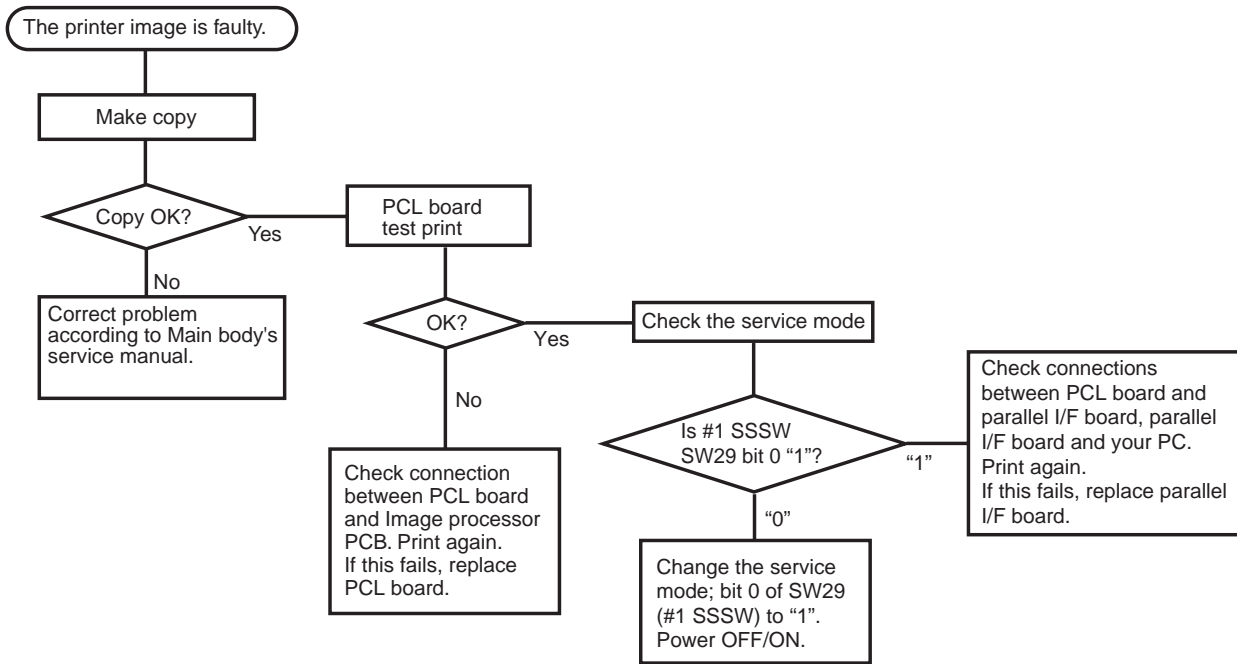


Figure 5-201

III. STANDARD AND ADJUSTMENT

The PCL board and Parallel I/F board have no adjustment item.

CHAPTER 6

PARTS CATALOG

PARTS CATALOG6-1

FIGURE VA ASSEMBLY LOCATION DIAGRAM

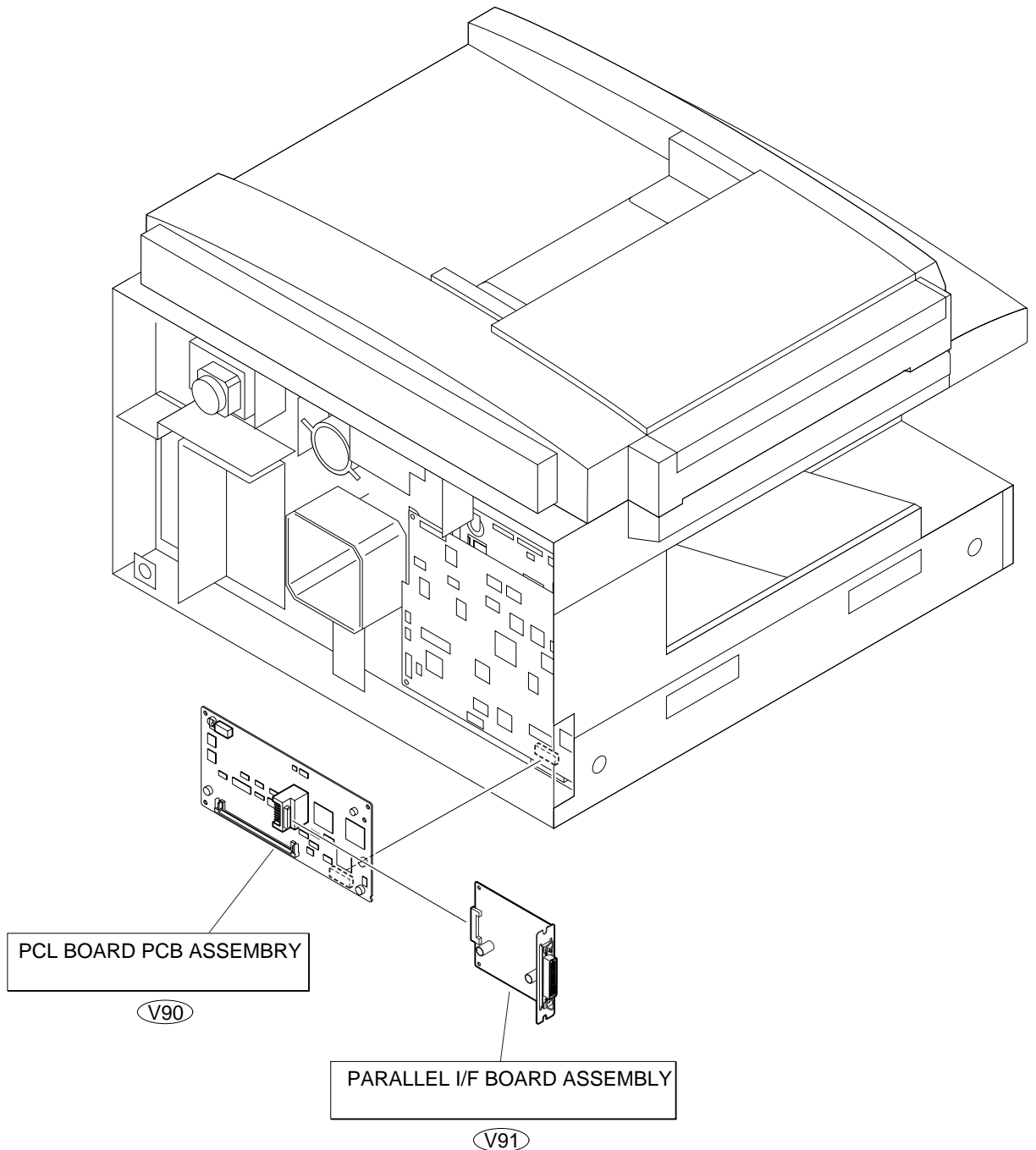


FIGURE V11 PCL BOARD ASSEMBLY

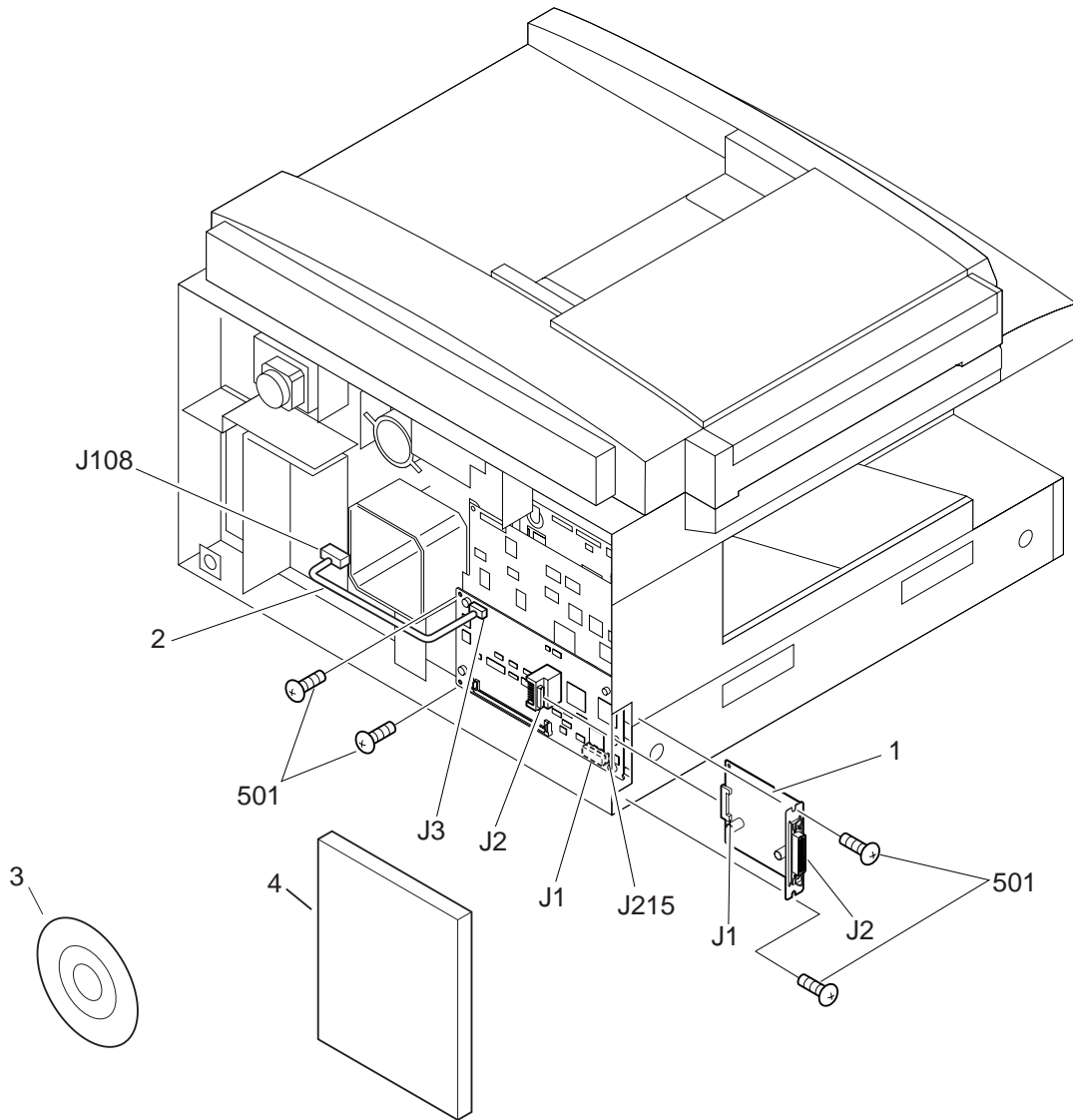


FIGURE & KEY NO.	PART NUMBER	RANK	QTY	DESCRIPTION	SERIAL NUMBER / REMARKS
V11 -	NPN		RF	PCL BOARD ASSEMBLY	
1	FG3-0999-000		1	PARALLEL I/F BOARD ASSEMBLY	
2	FH2-6682-000		1	DC CABLE	
3	FG2-9778-000		1	PRINT DRIVER CD-ROM	230V
4	HT1-2156-000		1	SETUP GUIDE ENGLISH	230V
	HT1-0015-000		1	SETUP GUIDE ITALIAN	230V
	HT1-3095-000		1	SETUP GUIDE FRENCH	230V
	HT1-5072-000		1	SETUP GUIDE GERMAN	230V
501	XB1-2300-607		6	SCREW,MACH.,TRUSS HEAD, M3X6	

FIGURE V90 PCL BOARD PCB ASSEMBLY

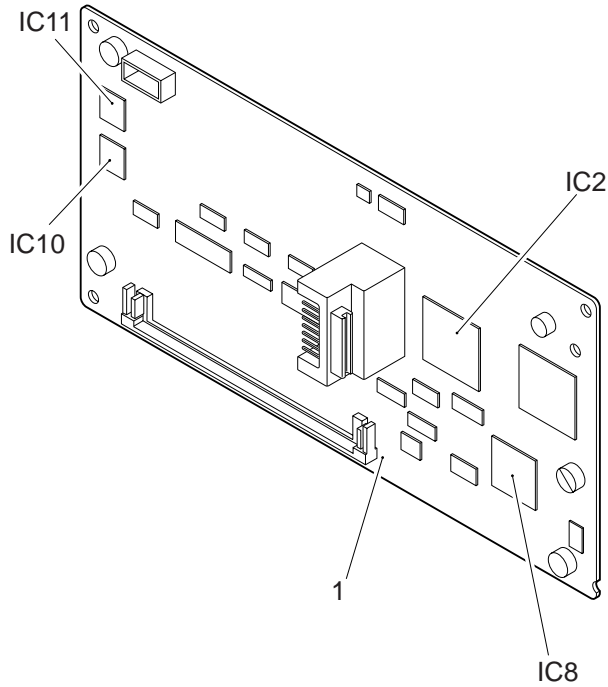


FIGURE & KEY NO.	PART NUMBER	RANK	QTY	DESCRIPTION	SERIAL NUMBER / REMARKS
V90 - 1	FG2-9774-000		1	PCL BOARD PCB ASSEMBLY	
IC2	RH4-5328-000		1	IC, SC414322FT, MPU	
IC8	HH4-2688-000		1	IC, UPD65802GJ-117-3EN	
IC10	FH4-3780-000		1	IC, KM23C16005DG-KF64469	
IC11	FH4-3781-000		1	IC, KM23C16005DG-KF64479	

FIGURE V91 PARALLEL I/F BOARD ASSEMBLY

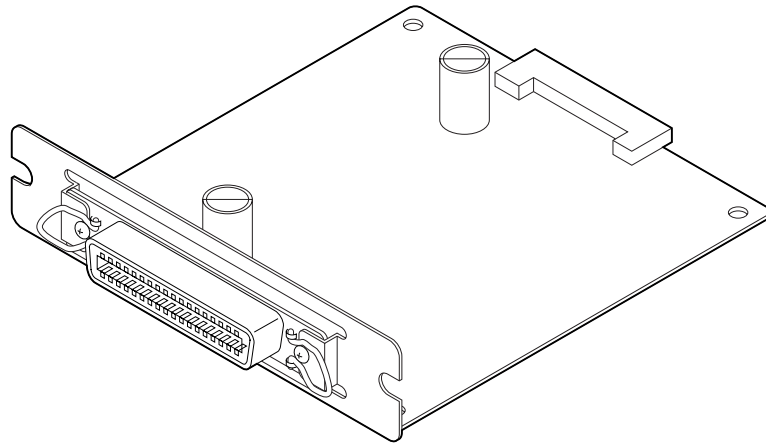
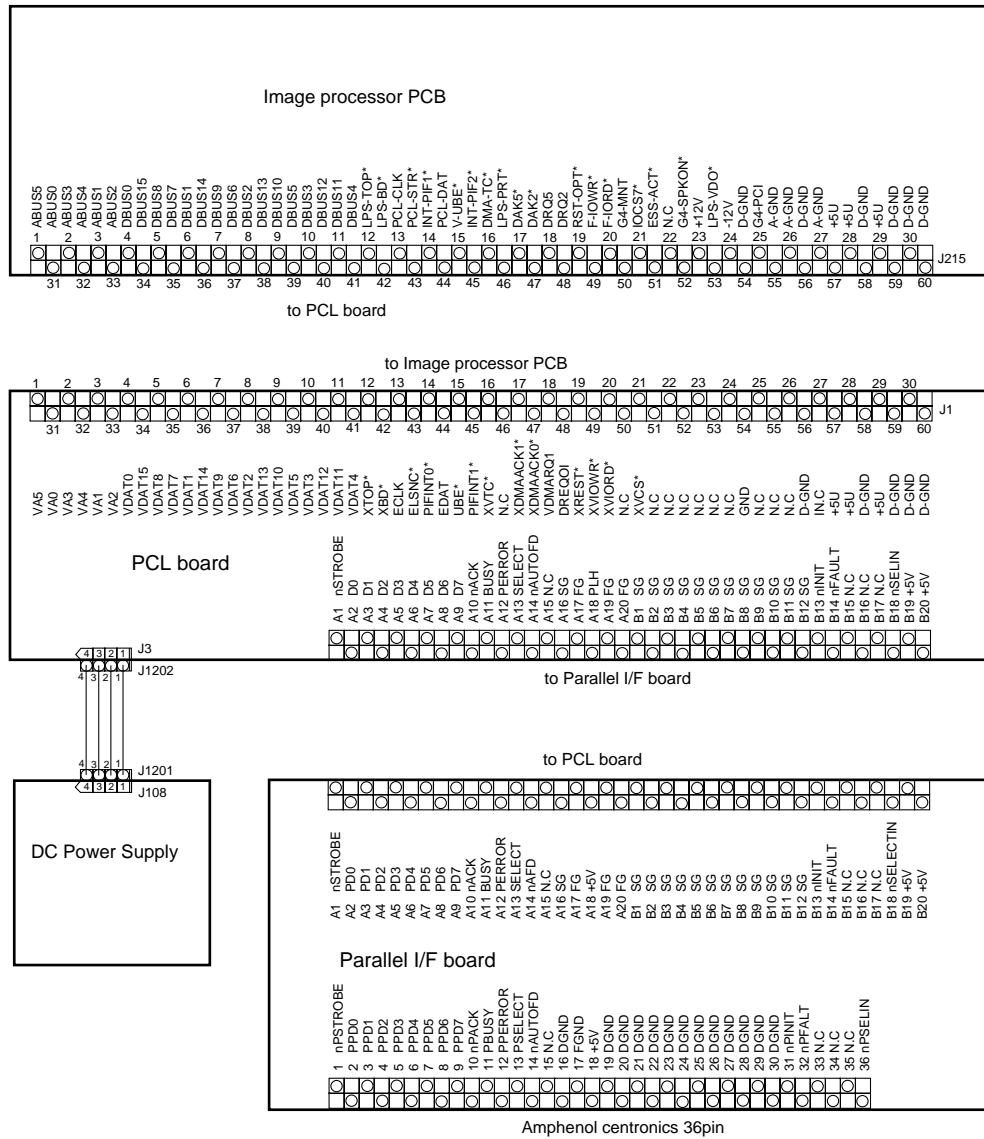


FIGURE & KEY NO.	PART NUMBER	RANK	QTY	DESCRIPTION	SERIAL NUMBER / REMARKS
V91 - 1	FG3-0999-000		1	PARALLEL I/F BOARD ASSEMBLY	

APPENDIX

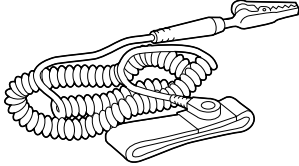
A. GENERAL CIRCUIT DIAGRAM	A-1	B. LIST OF SPECIAL TOOL	A-2
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A. GENERAL CIRCUIT DIAGRAM



B. LIST OF SPECIAL TOOL

You will need the following tool in addition to special tools set.

No.	Special tool	Tool No.	Shape	Rank*	Remarks
1	Wrist strap	CK-0534-000		A	

*See Note.

Note:

- A: Each service person is expected to carry one.
- B: Each group of five service persons is expected to carry one.
- C: Each workshop is expected to carry one.

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