brother®

Multi-Function Machine

# SERVICE MANUAL

MODEL: MFC6800/DCP1000
MFC9180/MFC9160

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Specifications are subject to change without notice.

# PREFACE

This publication is a Service Manual covering the specifications, construction, theory of operation, and maintenance of the Brother multi-function machine. It includes information required for field troubleshooting and repair--disassembly, reassembly, and lubrication--so that service personnel will be able to understand machine function, to rapidly repair the machine and order any necessary spare parts.

To perform appropriate maintenance so that the machine is always in best condition for the customer, the service personnel must adequately understand and apply this manual.

This manual is made up of six chapters and appendices.

**CHAPTER 1 GENERAL DESCRIPTION**
**CHAPTER 2 INSTALLATION**
**CHAPTER 3 THEORY OF OPERATION**
**CHAPTER 4 DISASSEMBLY/REASSEMBLY AND LUBRICATION**
**CHAPTER 5 MAINTENANCE MODE**
**CHAPTER 6 ERROR INDICATION AND TROUBLESHOOTING**

**Appendix 1. EEPROM Customizing Codes**
**Appendix 2. Firmware Switches (WSW)**
**Appendix 3. Circuit Diagrams**

This manual describes the models and their versions to be destined for major countries. The specifications and functions are subject to change depending upon each destination.

# SAFETY INFORMATION

## Laser Safety (110-120V Model only)

This printer is certified as a Class 1 laser product under the US Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within the protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

## CDRH Regulations (110-120V Model only)

The Center for Device and Radiological Health (CDRH) of the US Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The label shown below indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

The label for Chinese products

MANUFACTURED: JUNE 2001 C
BROTHER CORP. (ASIA) LTD.
BROTHER BUJI NAN LING FACTORY
Gold Garden Industry, Nan Ling Village, Buji,
Rong Gang, Shenzhen, China.
This product complies with FDA radiation
performance standards, 21 CFR Subchapter J.

# CHAPTER 1

# GENERAL DESCRIPTION

# CHAPTER 1 GENERAL DESCRIPTION

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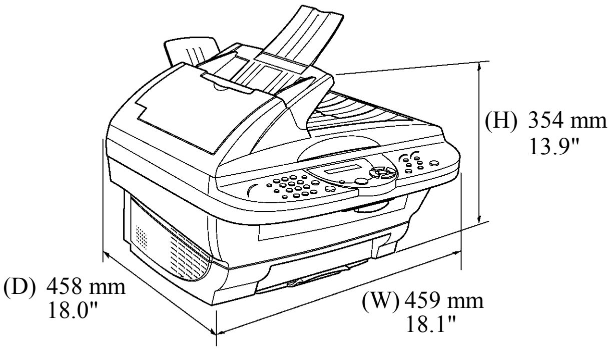
# 1.1 OUTLINE

## 1.1.1 External Appearance and Weight

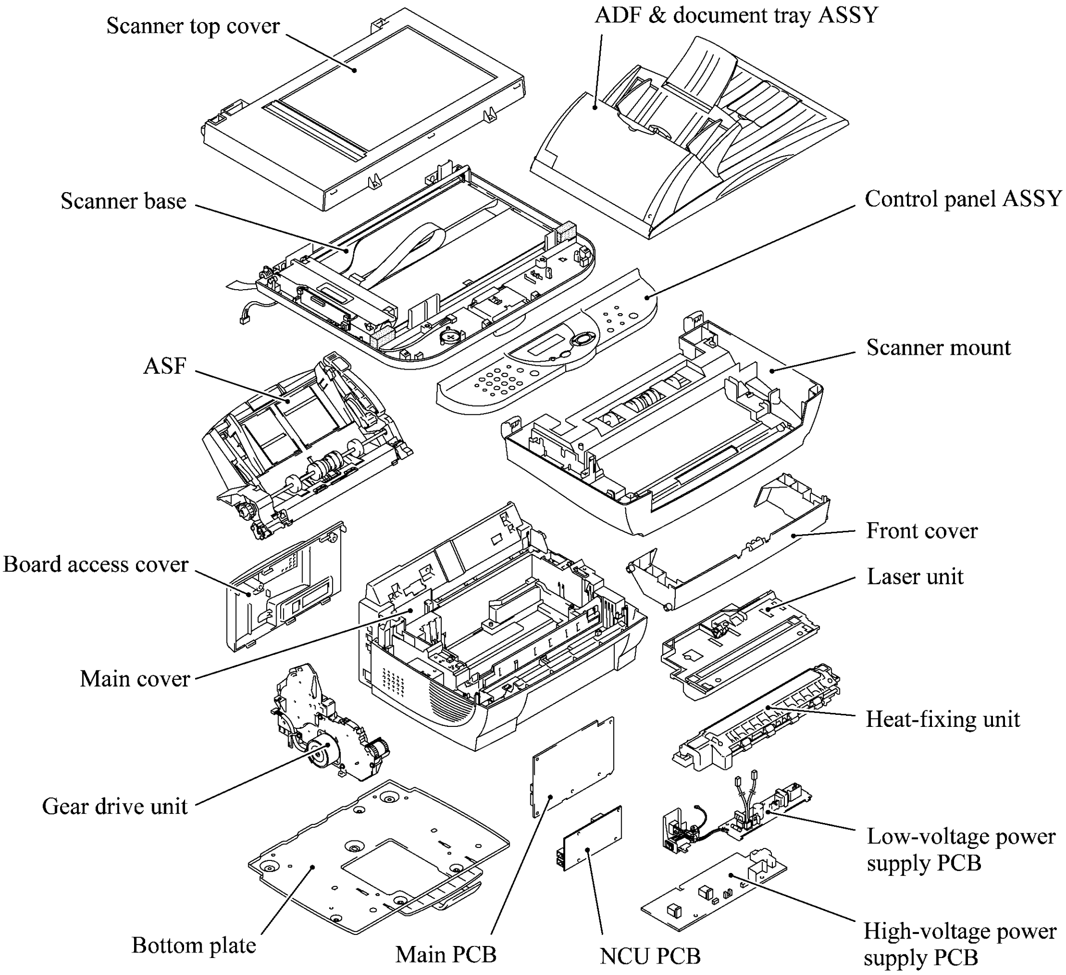
The figure below shows the machine appearance and approximate dimensions.


(H) 354 mm
13.9"
(D) 458 mm
18.0"
(W) 459 mm
18.1"

| Weight: | Machine proper | Approx. 11 kg |
|---|---|---|
| | Machine (incl. drum unit & toner cartridge) | Approx. 12 kg |
| | In package | Approx. 16 kg |

## 1.1.2 Components

The machine consists of the following major components:


Scanner top cover
ADF & document tray ASSY
Scanner base
Control panel ASSY
ASF
Scanner mount
Front cover
Board access cover
Laser unit
Main cover
Heat-fixing unit
Gear drive unit
Low-voltage power supply PCB
Bottom plate
Main PCB
NCU PCB
High-voltage power supply PCB

# 1.2 SPECIFICATIONS

(1/2)

| | YL4-FB(MFC) | YL4-DCP |
|---|---|---|
| Model Name | MFC 6800 | DCP 1000 |
| ***GENERAL*** | | |
| Print Engine | Laser (YL4) | Laser (YL4) |
| Modem Speed (bps) | 14,400 (Fax) | - |
| Transmission Speed (sec.) | 6 (Brother#1,MMR) | - |
| ITU-T Group | G3 | - |
| Coding Method | MH/MR/MMR | - |
| Input/Output Width | 5.8"-8.5"/3.5"-8.5" | 5.8"-8.5"/3.5"-8.5" |
| Input/Output Length | 5"-14"/5"-14" | 5"-14"/5"-14" |
| ADF (pages) | Up to 30 | Up to 30 |
| LCD Size | 16 characters x 2 lines | 16 characters x 2 lines |
| LCD Backlight | No | No |
| Backup Clock | Yes (1 hour) | Yes (1 hour) |
| Memory Capacity (physical) | 8 Mbytes (RAM) | 8 Mbytes (RAM) |
| Optional Memory | No | No |
| Dimensions w/ Carton (WxDxH) | 596 x 566 x 452 mm | 596 x 566 x 452 mm |
| Dimensions w/o Carton (WxDxH) | 459 x 458 x 354 mm | 459 x 458 x 354 mm |
| Weight w/ Carton | 16 kg | 16 kg |
| Weight w/o Carton | 11 kg | 11 kg |
| Color | Gray 1495 | Gray 1495 |
| Operating Environment Temperature | 10 - 32.5 degrees Centigrade | 10 - 32.5 degrees Centigrade |
| Humidity | 20 - 80% | 20 - 80% |
| Power Source | 120 VAC 50/60Hz | 120 VAC 50/60Hz |
| Power Consumption (Sleep/Standby/Peak) | 15W/ 75W/ 940W or less | 15W/ 75W/ 940W or less |
| On/Off Switch | Yes | Yes |
| Warm Up Time | Approx. 13 sec. | Approx. 13 sec. |
| | | |
| ***TELEPHONE*** | | |
| Handset | No | - |
| One-Touch Dial | No | - |
| Speed Dial | 100 | - |
| Speaker Phone | No | - |
| Chain Dialing | Yes | - |
| Caller ID | Yes | - |
| Call Waiting Caller ID | No | - |
| Distinctive Ringing | Yes | - |
| Call Manage | No | - |
| Hold/Mute Key | No | - |
| Power Failure Dialing | No | - |
| Speaker (Volume) | Yes (3 steps + OFF) | - |
| Ring (Volume) | Yes (3 steps + OFF) | - |
| Handset Volume | - | - |
| PBX Feature | No | - |
| Transfer Method | No | - |
| | | |
| ***FAX*** | | |
| Internet FAX | N/A | - |
| Easy Receive/Fax Detect | Yes | - |
| Fax/Tel Switch | - | - |
| Enhanced Remote Activate | Yes | - |
| Scan Speed (sec./page, A4:Standard) | Approx. 3 | - |
| Memory Transmission (Brother#1 Chart) | 500 pages (MMR/Standard Resolution) | - |
| Memory Transmission (ITU-T Chart) | 400 pages (MMR/Standard Resolution) | - |
| Broadcasting | Yes (150 locations) | - |
| Manual Broadcasting | Yes | - |
| Out-of-Paper Reception (Brother #1 Chart) | 500 pages (MMR/Standard Resolution) | - |
| Out-of-Paper Reception (ITU-T Chart) | 400 pages (MMR/Standard Resolution) | - |
| Auto Reduction | Yes | - |
| ECM (Error Correction Mode) | Yes | - |
| Group Dial | Yes (up to 6) | - |
| Memory Security | No | - |
| Memory Backup | No | No |
| Color FAX (Document Send/Receive) | No | - |
| Color FAX (Memory Send/Receive) | No | - |
| | | |
| ***LIST/REPORT*** | | |
| Activity Report/Journal Report | Yes (up to 200) | - |
| Transmission Verification Report | Yes | - |
| | | |
| ***INTERFACE*** | | |
| External TAD Interface | Yes | No |
| Host Interface (Serial) | No | No |
| Host Interface (IEEE1284) | Yes | Yes |
| Host Interface (USB) | Yes | Yes |
| LAN Interface | No | No |
| Acceptable Media Card Slot | N/A | N/A |
| Analog Video Port | N/A | N/A |
| | | |

| | YL4-FB(MFC) | YL4-DCP |
|---|---|---|
| Model Name | MFC 6800 | DCP 1000 |
| ***PRINTER*** | | |
| Color/Mono | Mono | Mono |
| Engine Type | Laser (YL4) | Laser (YL4) |
| Resolution (dpi) | 600 x 600 | 600 x 600 |
| Speed (ppm) | up to 10 | up to 10 |
| Paper Capacity (sheets) | 200 | 200 |
| Additional Paper Capacity (sheets) | No | No |
| Output Paper Capacity (sheets) | 50 | 50 |
| Standard Print Language | Windows GDI | Windows GDI |
| Emulation | No | No |
| Resident Fonts | No | No |
| Fonts Disk Based | Yes | Yes |
| Paper Handling Size | LTR, LGL, A4, B5, A5, EXE | LTR, LGL, A4, B5, A5, EXE |
| Manual Feed Slot | N/A | N/A |
| Other Paper Type | OHP, Envelopes, Organizer | OHP, Envelopes, Organizer |
| Sheet Weight (Paper Tray) | 64-158 g/m$^2$ (16 - 42 lb) | 64-158 g/m$^2$ (16 - 42 lb) |
| (Manual Slot) | N/A | N/A |
| Printer Driver | Win95/98/98SE/Me/2000Professional/ NT4.0WS MacOS 8.5.1-9.1 | Win95/98/98SE/Me/2000Professional/ NT4.0WS MacOS 8.5.1-9.1 |
| | | |
| ***COPY*** | | |
| Color/Mono | Mono | Mono |
| Speed (cpm) | Up to 10 | Up to 10 |
| Multi Copy (Stack) | Yes | Yes |
| Multi Copy (Sort) | Yes (ADF only) | Yes (ADF only) |
| Reduction/Enlargement (%) | 25 -- 400 in 1% increments | 25 -- 400 in 1% increments |
| Resolution (dpi) | 300 x 300 | 300 x 300 |
| First Copy Out Time (From Ready Mode/ADF) | Approx. 13 sec. | Approx. 13 sec. |
| (From Ready Mode/FB) | Approx. 12 sec. | Approx. 12 sec. |
| | | |
| ***SCANNER*** | | |
| Color/Mono | Color | Color |
| Resolution(Optical : dpi) | 600x300 (Max. 600x2,400) | 600x300 (Max. 600x2,400) |
| Resolution(Int. : dpi) | 9,600x9,600 | 9,600x9,600 |
| Gray Scale | 256 | 256 |
| Color Depth | 24 bit (8 bits x 3) | 24 bit (8 bits x 3) |
| TWAIN Compliant&Operating System | Win95/98/98SE/Me, WinNT4.0WS/ 2000Professional, MacOS 8.6-9.1 | Win95/98/98SE/Me, WinNT4.0WS/ 2000Professional, MacOS 8.6-9.1 |
| PCI Scanner (Parallel/Serial) | Parallel/USB | Parallel/USB |
| | | |
| ***BUNDLED SOFTWARE*** | | |
| ***For Windows*** | | |
| Support OS version | Win95/98/98SE/Me, WinNT4.0WS/2000Professional | Win95/98/98SE/Me, WinNT4.0WS/2000Professional |
| Printer Driver | Yes | Yes |
| TWAIN | Yes | Yes |
| Viewer | Yes | Yes |
| Pop Up Menu | Yes | Yes |
| OCR | Yes | Yes |
| PC Fax | Yes(TX:FAX Share only) | N/A |
| Remote Setup | Yes | No |
| PC Diagnostics | Yes | No |
| Others | Auto E-mail Printing(Win 95/98(SE)/Me only) | Auto E-mail Printing(Win 95/98(SE)/Me only) |
| | | |
| ***For iMac/G3/G4*** | | |
| Support OS version Printer Driver | MacOS 8.5.1-9.1 | MacOS 8.5.1-9.1 |
| TWAIN | MacOS 8.6-9.1 | MacOS 8.6-9.1 |
| Printer Driver | Yes | Yes |
| TWAIN | Yes | Yes |
| Viewer | Yes | Yes |
| Pop Up Menu | No | No |
| OCR | Yes | Yes |
| PC Fax | Yes | No |
| Remote Setup | No | No |
| PC Diagnostics | No | No |
| Others | - | - |
| | | |
| ***ACCESSORY*** | | |
| Life / Yield<br>Toner : TN-250 | Starter: 2,200 pages @5% coverage<br>Regular:2,200 pages @5% coverage | Stater: 2,200 pages @5% coverage<br>Regular:2,200 pages @5% coverage |
| Drum : DR-250 | 20,000 pages @5% cvrg: 20 pages/job<br>8,000 pages @5% cvrg: 1 page/job | 20,000 pages @5% cvrg: 20 pages/job<br>8,000 pages @5% cvrg: 1 page/job |

| | **YL4-FB(w/ Modem)** | **YL4-FB(w/o Modem)** |
|---|---|---|
| Model Name | **MFC-9180** | **MFC-9160** |
| ***GENERAL*** | | |
| Print Engine | Laser (YL4) | Laser (YL4) |
| Modem Speed(bps) | 14,400 (Fax) | - |
| Transmission Speed(sec.) | Approx. 6 (brother #1chart,MMR) | - |
| ITU-T Group | G3 | - |
| Coding Method | MH/MR/MMR | - |
| Input/Output Width | 5.8"-8.5"/3.5"-8.5" | 5.8"-8.5"/3.5"-8.5" |
| Input/Output Length | 5"-14"/5"-14" | 5"-14"/5"-14" |
| ADF(pages) | Up to 30 (75 g/m$^2$) | Up to 30 (75 g/m$^2$) |
| LCD size | 16 characters x 2 lines | 16 characters x 2 lines |
| LCD Backlight | Yes | Yes |
| Backup Clock | Yes (9 hours) | Yes (1 hour) |
| Memory Capacity (physical) | 8 Mbytes (RAM) | 8 Mbytes (RAM) |
| Optional Memory | N/A | N/A |
| Dimensions w/ Carton (WxDxH) | 596 x 566 x 452 mm | 596 x 566 x 452 mm |
| Dimensions w/o Carton (WxDxH) | 459 x 458 x 354 mm | 459 x 458 x 354 mm |
| Weight w/ Carton | 16 kg | 16 kg |
| Weight w/o Carton | 11 kg | 11 kg |
| Color | Gray 1495 | Gray 1495 |
| Operating Environment Temperature | 10 - 32.5 degrees Centigrade | 10 - 32.5 degrees Centigrade |
| Humidity | 20 - 80 % | 20 - 80 % |
| Power Source | 220-240 VAC 50/60Hz | 220-240 VAC 50/60Hz |
| Power Consumption (Sleep/Standby/Peak) | 15W/ 75W/ 940W or less | 15W/ 75W/ 940W or less |
| On/Off Switch | Yes | Yes |
| Warm Up Time | Approx. 12 sec. | Approx. 12 sec. |
| | | |
| ***TELEPHONE*** | | ***N/A*** |
| Handset | No | - |
| One-Touch Dial | No | - |
| Speed Dial | 100 | - |
| Speaker Phone | No | - |
| Chain Dialing | Yes | - |
| Caller ID | N/A | - |
| Call Waiting Caller ID | N/A | - |
| Distinctive Ringing | Yes (UK.DEN only) | - |
| Call Manage | No | - |
| Hold/Mute key | N/A | - |
| Power Failure Dialing | N/A | - |
| Speaker Volume | Yes (3 steps + OFF) | - |
| Ring Volume | Yes (3 steps + OFF) | - |
| Handset Volume | N/A | - |
| PBX Feature | Yes | - |
| Transfer Method | Flash | - |
| | | |
| ***FAX*** | | ***N/A*** |
| Internet FAX | N/A | - |
| Easy Receive/Fax Detect | Yes | - |
| Fax/Tel Switch | Yes | - |
| Enhanced Remote Activate | Yes | - |
| Quick Scan(Memory transmission) | Yes as default. Approx.2.8 sec/page (A4 standard) | - |
| Memory Transmission (ITU-T #1 Chart) | 400 pages (MMR/Standard Resolution) | - |
| Memory Transmission (Brother#1 Chart) | 500 pages (MMR/Standard Resolution) | - |
| Broadcasting | Yes ( 150 locations) | - |
| Manual Broadcasting | Yes (50 locations ) | - |
| Out-of-Paper Reception (ITU-T #1 Chart) | 400 pages (MMR/Standard Resolution) | - |
| Out-of-Paper Reception (Brother#1 Chart) | 500 pages (MMR/Standard Resolution) | - |
| Auto Reduction | Yes | - |
| ECM(Error Correction Mode) | Yes | - |
| Group Dial | Yes (up to 6) | - |
| Memory Security | Yes | - |
| Memory Backup | Yes ( Max. 4 days ) | - |
| Color FAX (Document Send/Receive) | No / No | - |
| Color FAX (Memory Send/Receive) | No / No | - |
| | | |
| ***LIST/REPORT*** | | |
| Activity Report/Journal Report | Yes (up to 200) | - |
| Transmission Verification Report | Yes | - |
| | | |
| ***INTERFACE*** | | |
| External TAD Interface | Yes | No |
| Host Interface (Serial) | No | No |
| Host Interface (IEEE1284) | Yes | Yes |
| Host Interface (USB) | Yes | Yes |
| LAN Interface | No | No |
| Acceptable Media Card Slot | N/A | N/A |
| Analog Video Port | N/A | N/A |
| | | |

(2/2)

| | YL4-FB(w/ Modem) | YL4-FB(w/o Modem) |
|---|---|---|
| Model Name | **MFC-9180** | **MFC-9160** |
| ***PRINTER*** | | |
| Color/Mono | Mono | Mono |
| Engine Type | Laser (YL4) | Laser (YL4) |
| Resolution (dpi) | 600 x 600 | 600 x 600 |
| Speed (ppm) | up to 10 | up to 10 |
| Paper Capacity (sheets) | 200 (75 g/m$^2$) | 200 (75 g/m$^2$) |
| Additional Paper Capacity (sheets) | No | No |
| Output Paper Capacity (sheets) | 50 | 50 |
| Standard Print Language | Windows GDI | Windows GDI |
| Emulation | Yes (PCL5e) | Yes (PCL5e) |
| Resident Fonts | Yes ( Bitmap font: LetterGothic16.66, OCR-A, OCR-B, Scalable font: 49 fonts ) | Yes ( Bitmap font: LetterGothic16.66, OCR-A, OCR-B, Scalable font: 49 fonts ) |
| Fonts Disk Based | Yes | Yes |
| Paper Handling Size | LTR, LGL, A4, A5, EXE, A6, ISO B5, ISO B6 | LTR, LGL, A4, A5, EXE, A6, ISO B5, ISO B6 |
| Manual Feed Slot | N/A | N/A |
| Other Paper Type | OHP, Envelopes, Organizer | OHP, Envelopes, Organizer |
| Sheet Weight (Paper Tray) | 64-158 g/m$^2$ (16 - 42 lb) | 64-158 g/m$^2$ (16 - 42 lb) |
| (Manual Slot) | N/A | N/A |
| Printer Driver | Win95/98(SE)/Me/NT4.0WS/2000 professional | Win95/98(SE)/Me/NT4.0WS/2000 professional |
| | | |
| ***COPY*** | | |
| Color/Mono | Mono | Mono |
| Speed (cpm) | Up to 10 | Up to 10 |
| Multi Copy (Stack) | Yes | Yes |
| Multi Copy (Sort) | Yes (on ADF only ) | Yes (on ADF only ) |
| Reduction/Enlargement (%) | 25 to 400 in 1% increments | 25 to 400 in 1% increments |
| Resolution (dpi) | 300 x 300 (print) | 300 x 300 (print) |
| First Copy Out Time (From Ready Mode/ADF) | Approx. 13 sec. | Approx. 13 sec. |
| (From Ready Mode/FB) | Approx. 12 sec. | Approx. 12 sec. |
| | | |
| | | |
| ***SCANNER*** | | |
| Color/Mono | Color/Mono | Color/Mono |
| Resolution (Optical: dpi) | 600 x 2,400 | 600 x 2,400 |
| Resolution (Int.: dpi) | 9,600 x 9,600 | 9,600 x 9,600 |
| Gray Scale | 256 | 256 |
| Color Depth | 24 bits (8 bits x 3) | 24 bits (8 bits x 3) |
| TWAIN Compliant&Operating System | Win95/98(SE)/Me/NT4.0WS/2000Professional<br>MacOS 8.6-9.1 | Win95/98(SE)/Me/NT4.0WS/2000Professional<br>MacOS 8.6-9.1 |
| PCI Scanner (Parallel/Serial) | Parallel/USB | Parallel/USB |
| | | |
| ***BUNDLED SOFTWARE(For Windows)*** | | |
| ***For Windows*** | | |
| Support OS version | Win95/98/98SE/Me, WinNT4.0WS/2000Profrssional | Win95/98/98SE/Me, WinNT4.0WS/2000Profrssional |
| Printer Driver | Yes | Yes |
| TWAIN | Yes | Yes |
| Viewer | Yes | Yes |
| Pop Up Menu | Yes | Yes |
| OCR | Yes | Yes |
| PC Fax | Yes | No |
| Remote Setup | Yes | No |
| PC Diagnostics | Yes | Yes |
| Others | No | No |
| | | |
| ***For iMac/G3/G4*** | | |
| Support OS version Print | MacOS8.5.1-9.1 | MacOS8.5.1-9.1 |
| Others | MacOS8.6-9.1 | MacOS8.6-9.1 |
| Printer Driver | Yes | Yes |
| TWAIN | Yes | Yes |
| Viewer | No | No |
| Pop Up Menu | No | No |
| OCR | No | No |
| PC Fax | Yes | No |
| Remote Setup | No | No |
| PC Diagnostics | No | No |
| Others | No | No |
| | | |
| ***ACCESSORY*** | | |
| Life / Yield | Starter: N/A | Starter: N/A |
| Toner:TN-8000 | Regular:2,200 pages @5% coverage | Regular:2,200 pages @5% coverage |
| Drum:DR-8000 | 20,000 pages @5% cvrg: Continuous printing<br>8,000 pages @5% cvrg: 1 page/job | 20,000 pages @5% cvrg: Continuous printing<br>8,000 pages @5% cvrg: 1 page/job |

# CHAPTER 2

# INSTALLATION

# CHAPTER 2 INSTALLATION

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2.2 SETTING ID CODES TO FACSIMILE MACHINES ......................................................... 2-3

# 2.1 INSTALLING THE UPDATE DATA TO THE FACSIMILE MACHINE

If the program version is updated or the main PCB is replaced, then install the update program onto the flash ROM of the main PCB.

The program installation requires a PC/AT-compatible computer (which is capable of running MS-DOS or its compatible OS).

## Connecting the facsimile machine to your computer

(1) Make sure that your computer is turned off.

(2) Make sure that the machine's power cord is unplugged from a wall socket. (If the machine has a power ON/OFF switch, make sure that the switch is turned off.)

(3) Connect the parallel interface cable to the parallel port on the back of the machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your computer and secure it with the two screws.

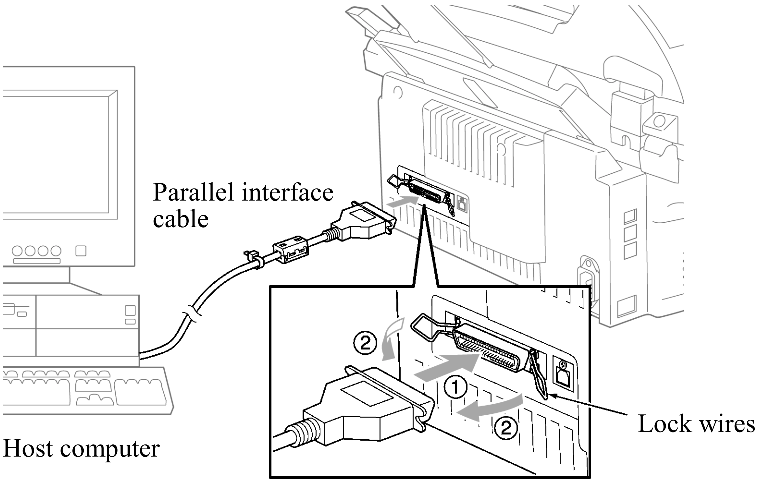
(5) While pressing the **5** key on the machine's control panel, plug the machine's power cord into a wall socket (or turn on the power ON/OFF switch if the machine has the switch).

(6) Check to see that the following pattern displays on the LCD. If it does not display, go back to step (2) above.

⬚■⬚■⬚ ········ ■ ← 1st row: Blank-and-black patterns

← 2nd row: Blank

(7) Turn on your computer.



## Installing the update data onto the flash ROM of the facsimile machine

**NOTE:** The following is an installation procedure example on a PC that is running Windows 95/98.

(1) Copy the update data and transfer utility onto the desired directory of the hard disk.
e.g., C:\UPDATE

(2) Click the Start button, point to Programs, and then click MS-DOS Prompt to open an MS-DOS window.

(3) Type the drive letter where the update data and transfer utility are located. In the above example, type C:\ from the command line and press the **ENTER** key.

Then type CD UPDATE and press the **ENTER** key.

(4) Check that your computer is connected with the facsimile machine correctly.

(5) To start the transfer utility transmitting the update data to the flash ROM of the facsimile machine, type the following:

```
ICEN filename /b
```

Then press the **ENTER** key.

During downloading, the machine beeps *intermittently*.

Upon completion of the downloading, the machine beeps *continuously*.

**NOTE:** If the facsimile machine cannot return to the standby state after completion of downloading, turn the power off and on.

# 2.2 SETTING ID CODES TO FACSIMILE MACHINES

## ■ Function

Brother facsimile machines are assigned unique ID codes (character strings) at the factory. If you replace the main PCB of the machine, the machine will lose its assigned ID code so that it will not be identified by the connected PC*.

You need to assign a unique ID code (character string) to the machine according to the procedure given here. For models covered by this manual, set serial numbers given to individual machines as ID codes.

(*ID codes are essential when more than one machine is connected to a single PC via USB.)

## ■ Connecting each of facsimile machines to your PC

(1) Make sure that your PC is turned off.

(2) Make sure that the machine's power cord is unplugged from a wall socket or other power source.

(3) Connect the interface cable to the parallel interface port on the back of the facsimile machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your PC and secure it with the two screws.

(5) Plug the machine's power cord into a wall socket or other power source.

(6) Turn on your PC.

## ■ Operating Procedure

(1) On your PC, run the ID setting utility. Follow the instructions shown on the PC's screen and enter the 9-digit serial number (e.g., L2J012345) printed on the nameplate labeled to the back of the facsimile machine as an ID code. Then press the Enter key.

The ID setting utility will transmit the ID code data from your PC to the facsimile machine and then it will terminate.

The facsimile machine will automatically return to the standby mode.

(2) To check whether the entered character string (ID code) is correct, make the machine enter the maintenance mode (refer to CHAPTER 5, Section 5.1) and then press the **1** key twice (Subsection 5.3.5).

The facsimile machine will print out a Configuration List. At the right top of the list, "SER.#: BROXXXXXXXXX" is printed.

(3) Check that the character string entered in step (2) is printed in "XXXXXXXXX."

If it is OK, press the **9** key twice to exit from the maintenance mode.

If something other than that is printed in XXXXXXXXX, check the connection between the PC and facsimile machine and go back to step (1).

# CHAPTER 3

# THEORY OF OPERATION

# CHAPTER 3 THEORY OF OPERATION

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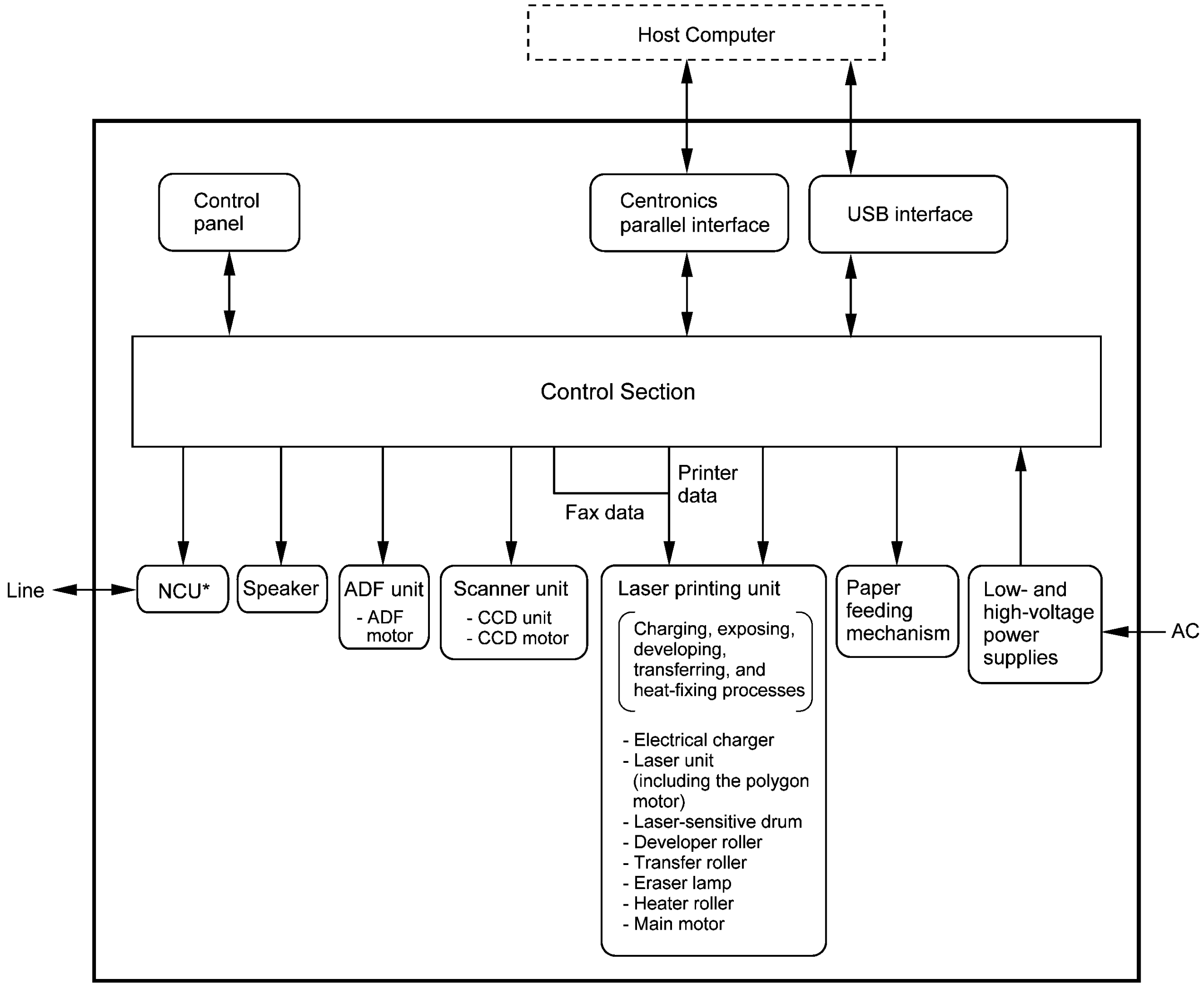
- 3.3.1 Configuration ........ 3-12

# 3.1 OVERVIEW

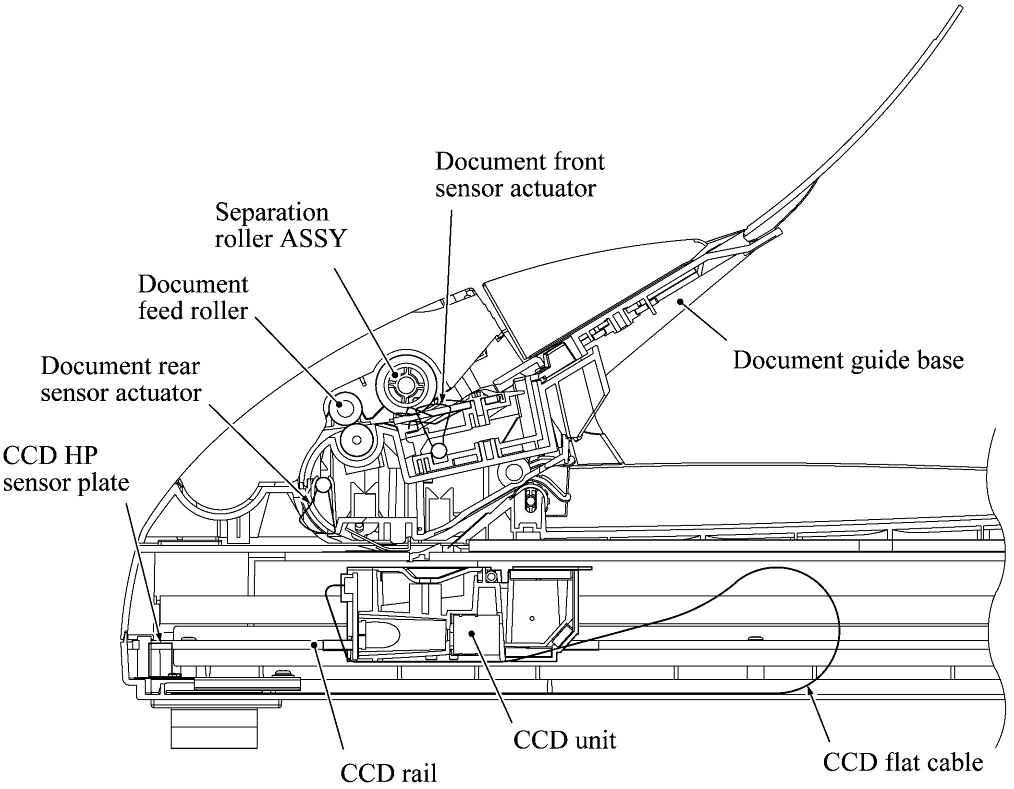

Host Computer
Control panel
Centronics parallel interface
USB interface
Control Section
Printer data
Fax data
Line
NCU*
Speaker
ADF unit
- ADF motor
Scanner unit
- CCD unit
- CCD motor
Laser printing unit
Charging, exposing, developing, transferring, and heat-fixing processes
- Electrical charger
- Laser unit (including the polygon motor)
- Laser-sensitive drum
- Developer roller
- Transfer roller
- Eraser lamp
- Heater roller
- Main motor
Paper feeding mechanism
Low- and high-voltage power supplies
AC

* Provided on models supporting facsimile function.

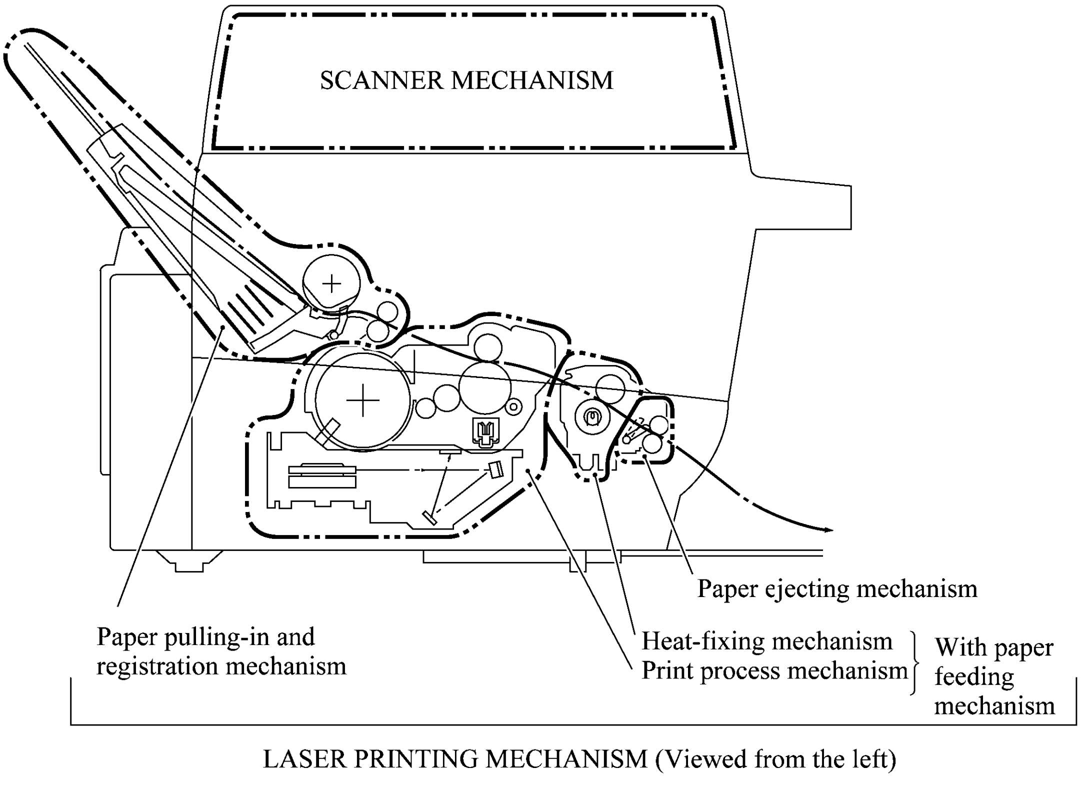
# 3.2 MECHANISMS

The facsimile machine is classified into the following mechanisms:

- SCANNER MECHANISM
  - ADF mechanism
  - Document scanning mechanism
- LASER PRINTING MECHANISM
  - Paper pulling-in and registration mechanism
  - Print process mechanism (consisting of charging, exposing, developing, transferring, and erasing processes) with paper feeding mechanism
  - Heat-fixing mechanism with paper feeding mechanism
  - Paper ejecting mechanism
- SENSORS AND ACTUATORS


Document front sensor actuator
Separation roller ASSY
Document feed roller
Document rear sensor actuator
CCD HP sensor plate
Document guide base
CCD unit
CCD rail
CCD flat cable

SCANNER MECHANISM (Viewed from the front)


SCANNER MECHANISM
Paper ejecting mechanism
Paper pulling-in and registration mechanism
Heat-fixing mechanism
Print process mechanism
With paper feeding mechanism

LASER PRINTING MECHANISM (Viewed from the left)

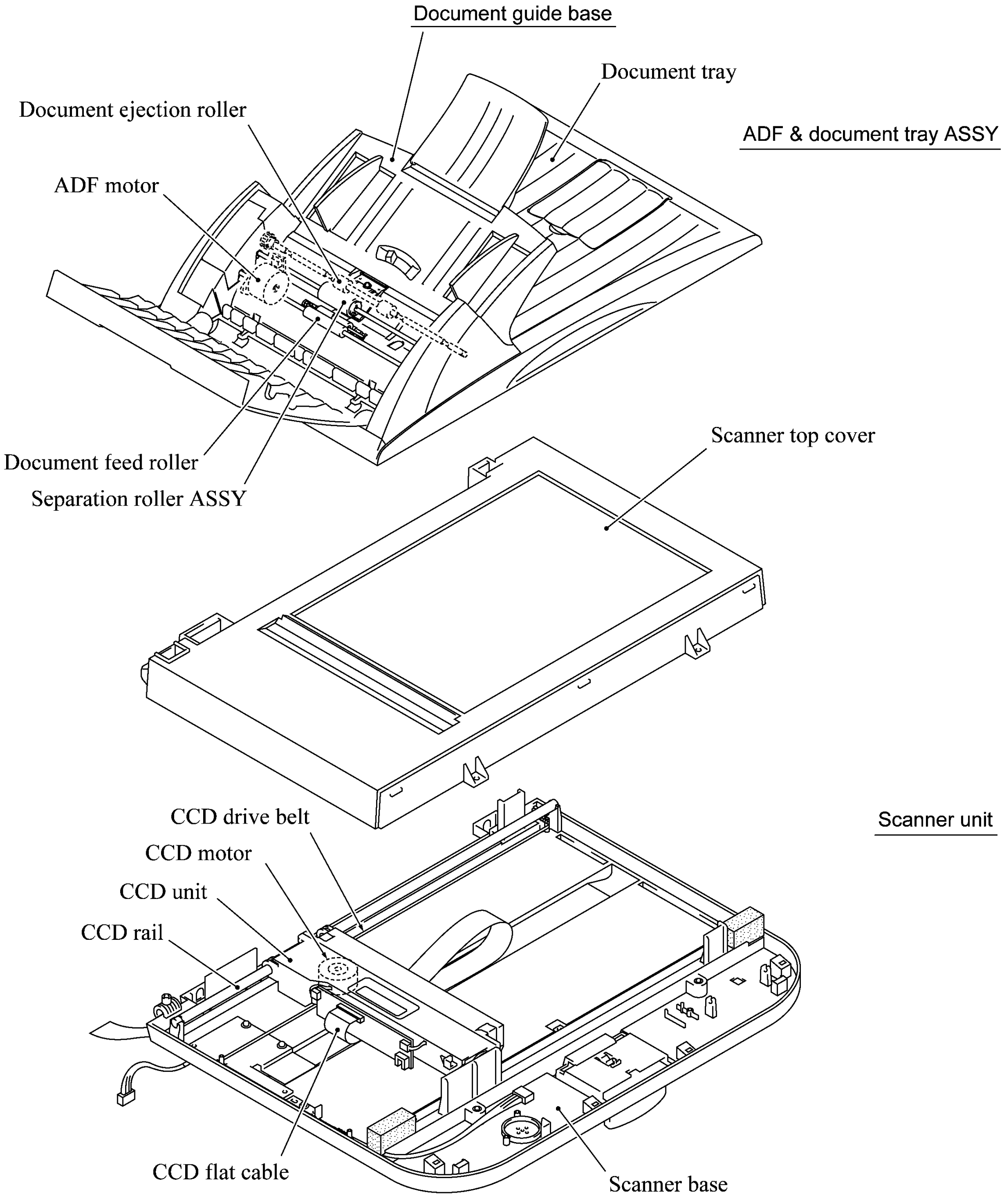
### 3.2.1 Scanner Mechanism

This mechanism consists of the document guide base, ADF & document tray ASSY and scanner unit.

The ADF (automatic document feeder) unit contains a separation roller ASSY, document feed roller ASSY, document ejection roller, ADF motor, and document front and rear sensors.

The scanner unit consists of a scanner top cover, CCD unit, CCD drive mechanism, CCD HP sensor, and scanner base.

For details about the sensors, refer to Subsection 3.2.3.


Document guide base
Document tray
Document ejection roller
ADF & document tray ASSY
ADF motor
Document feed roller
Separation roller ASSY
Scanner top cover
CCD drive belt
Scanner unit
CCD motor
CCD unit
CCD rail
CCD flat cable
Scanner base

This scanner mechanism supports a dual scanning system.

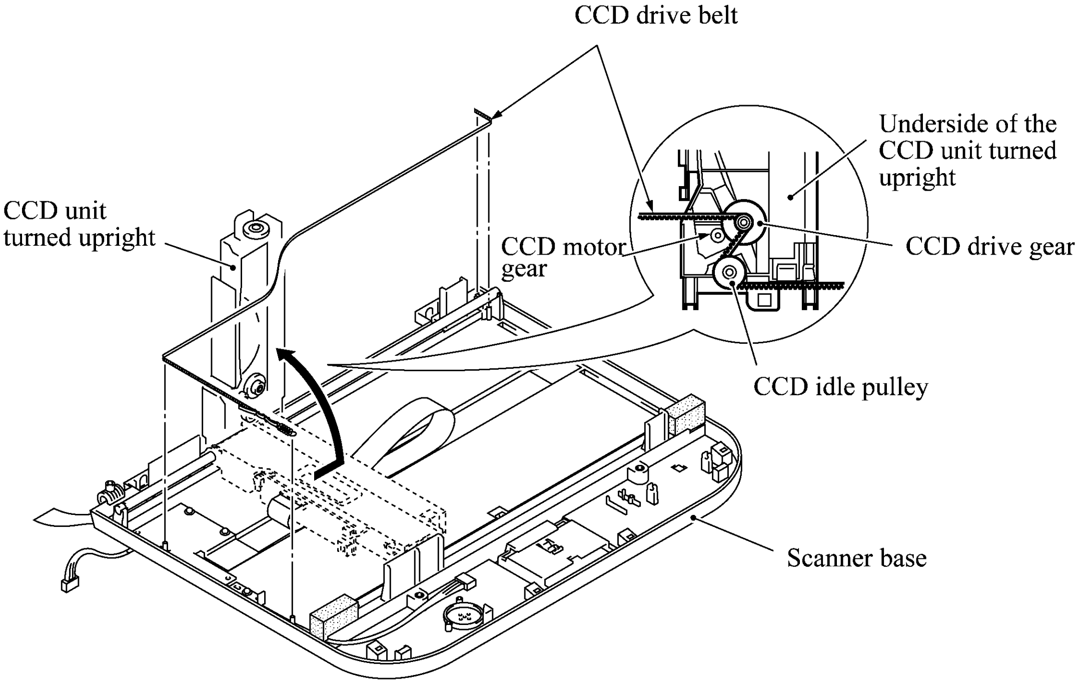
(1) If you set documents on the document guide base with their faces up and start the scanning operation, then the ADF motor rotates to pull in those documents into the ADF unit, starting from the top sheet to the bottom, page by page. Each document curves downwards and turns to the right with the document feed roller so as to advance above the CCD unit, and then it is fed out to the document tray with the document ejection roller ASSY.

This way, documents move above the CCD unit being kept in a stationary position.

(2) If you open the ADF & document tray ASSY, put a sheet of document (or put a bound book opened) on the glass of the scanner top cover, close the ADF & document tray ASSY, and start the scanning operation, then the CCD drive mechanism will be driven.

The CCD motor built in the CCD unit rotates. As illustrated below, the CCD drive gear and idle pulley carry the CCD drive belt on the underside of the CCD unit, so clockwise and counterclockwise rotations of the CCD motor move the CCD unit to the right and left, respectively.

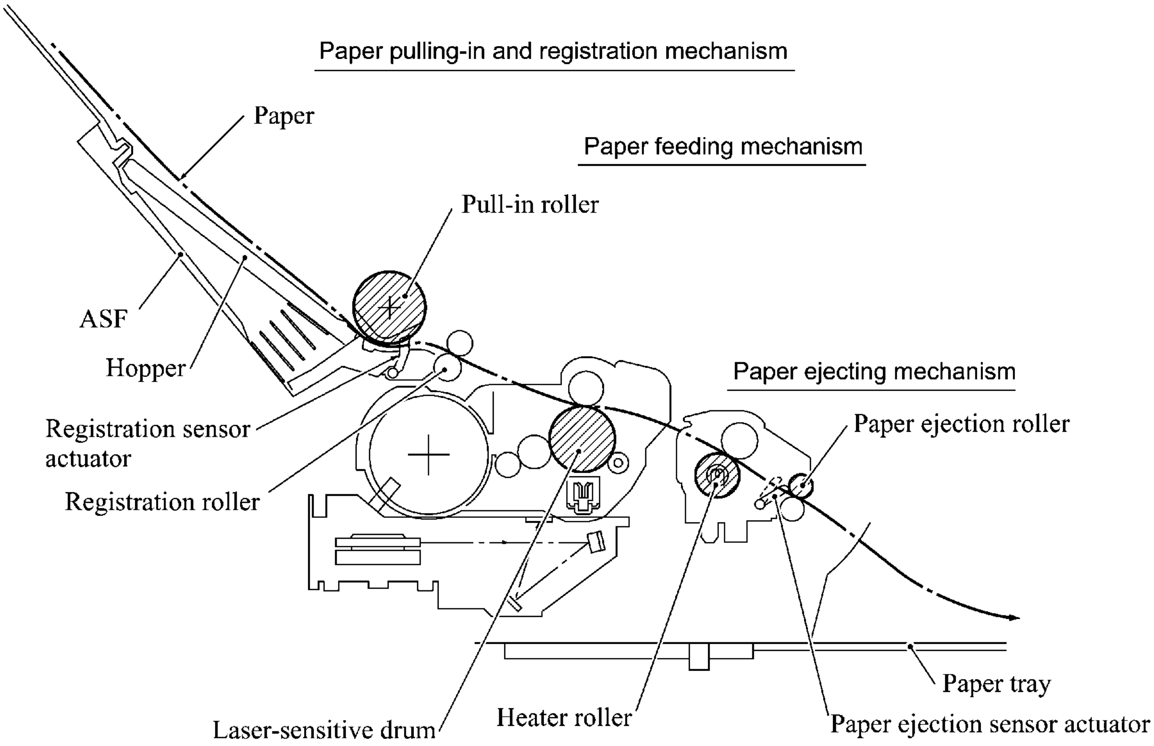
In this scanning system, the CCD unit moves horizontally beneath a document being kept in stationary position.

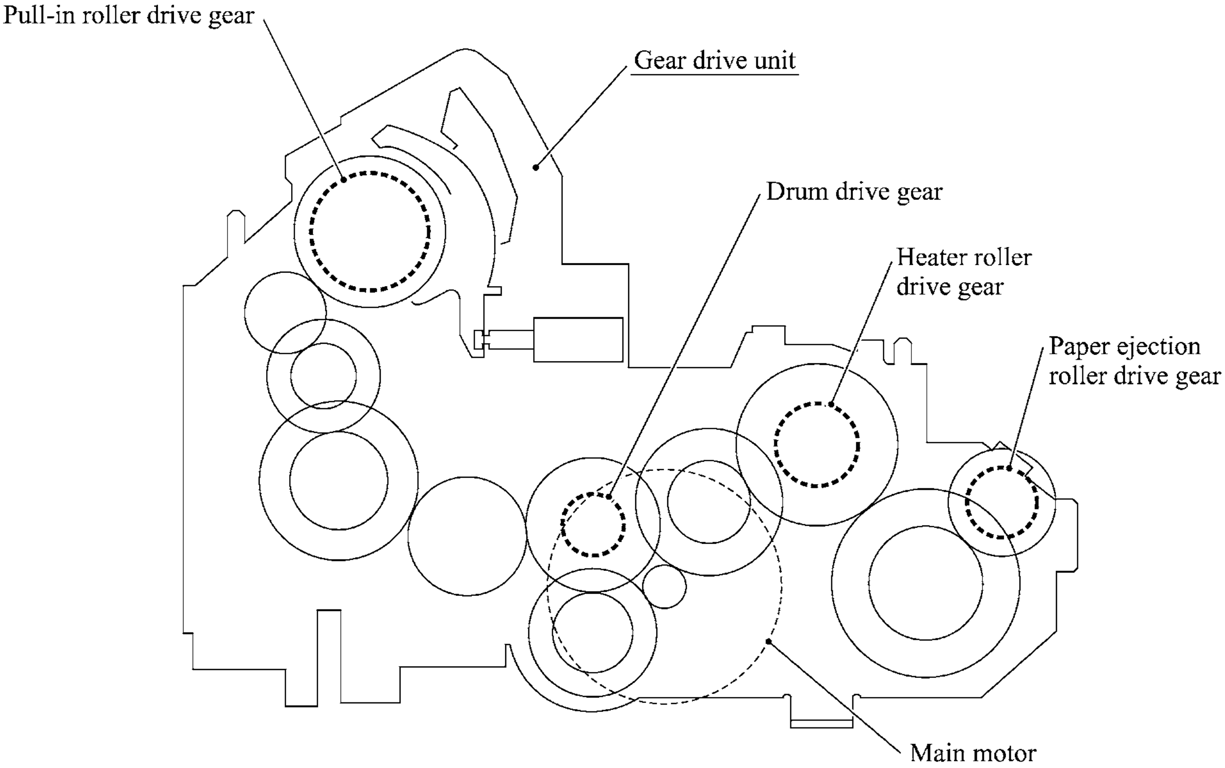


The CCD unit contains a charge coupled device (CCD) image sensor. The cold-cathode fluorescent lamp illuminates a document and the reflected light of the scanned image data is transmitted via the mirrors into the lens which reduces the scanned data so as to form the image on the CCD.

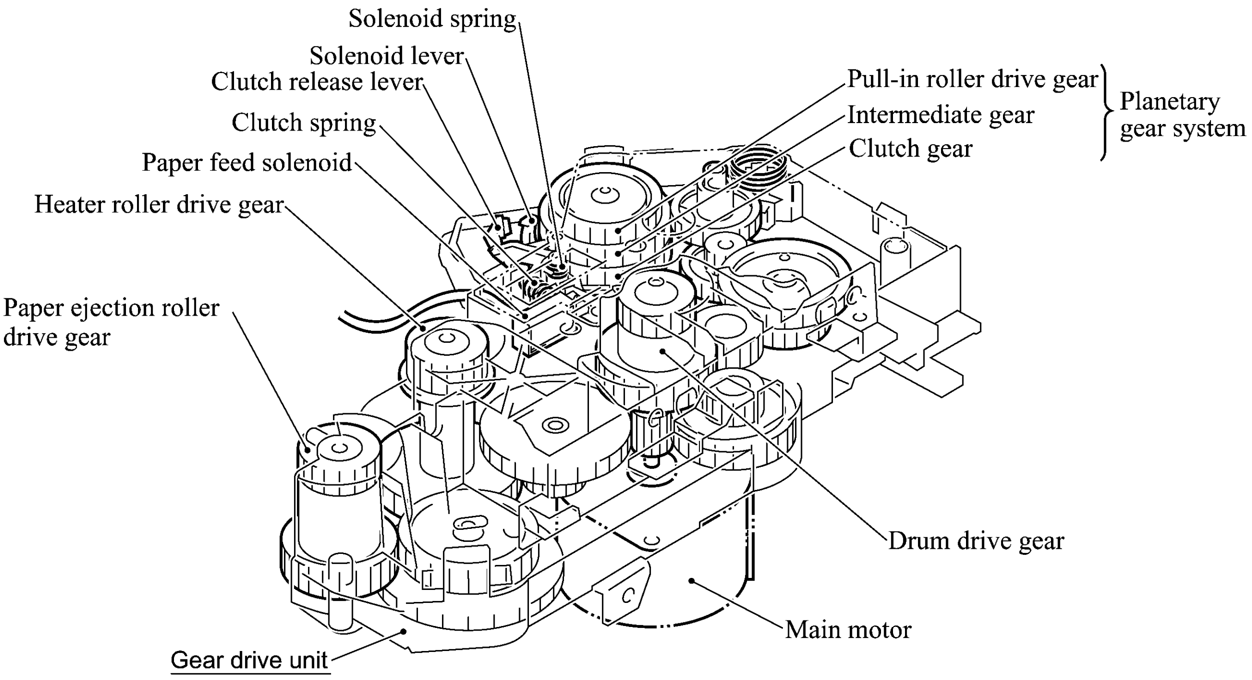
### 3.2.2 Laser Printing Mechanism

### 3.2.2.1 Paper pulling-in, registration, feeding, and ejecting mechanism


Paper pulling-in and registration mechanism
Paper
Paper feeding mechanism
Pull-in roller
ASF
Hopper
Paper ejecting mechanism
Paper ejection roller
Registration sensor actuator
Registration roller
Paper tray
Laser-sensitive drum
Heater roller
Paper ejection sensor actuator


Pull-in roller drive gear
Gear drive unit
Drum drive gear
Heater roller drive gear
Paper ejection roller drive gear
Main motor

### Paper pulling-in and registration mechanism


Solenoid spring
Solenoid lever
Clutch release lever
Clutch spring
Paper feed solenoid
Heater roller drive gear
Paper ejection roller drive gear
Pull-in roller drive gear
Intermediate gear
Clutch gear
Planetary gear system
Drum drive gear
Main motor
Gear drive unit

The paper pulling-in and registration mechanism consists of the pull-in roller gear (incorporated in the auto sheet feeder ASF), planetary gear system, paper feed solenoid, solenoid lever, clutch release lever, and registration sensor. (For the details about the sensor, refer to Subsection 3.2.3.)

If the main motor rotates clockwise, the rotation is transmitted to the intermediate gear of the planetary gear system. As the intermediate gear rotates, the pull-in roller drive gear also rotates since the clutch gear is locked by the solenoid lever and the clutch release lever. Accordingly, the pull-in roller in the ASF rotates to pull in paper into the machine, a sheet at a time.

If the paper feed solenoid is retracted and the clutch release lever is operated according to the cam profile of the pull-in roller drive gear so as to release the clutch gear, the clutch gear rotates and the pull-in roller drive gear does not rotate. This way, the clutch gear switches the transmission of the motor rotation to the pull-in roller drive gear on and off.

The solenoid on/off timing and the clutch release lever timing allow this mechanism to pull in a sheet and register it against the registration roller.

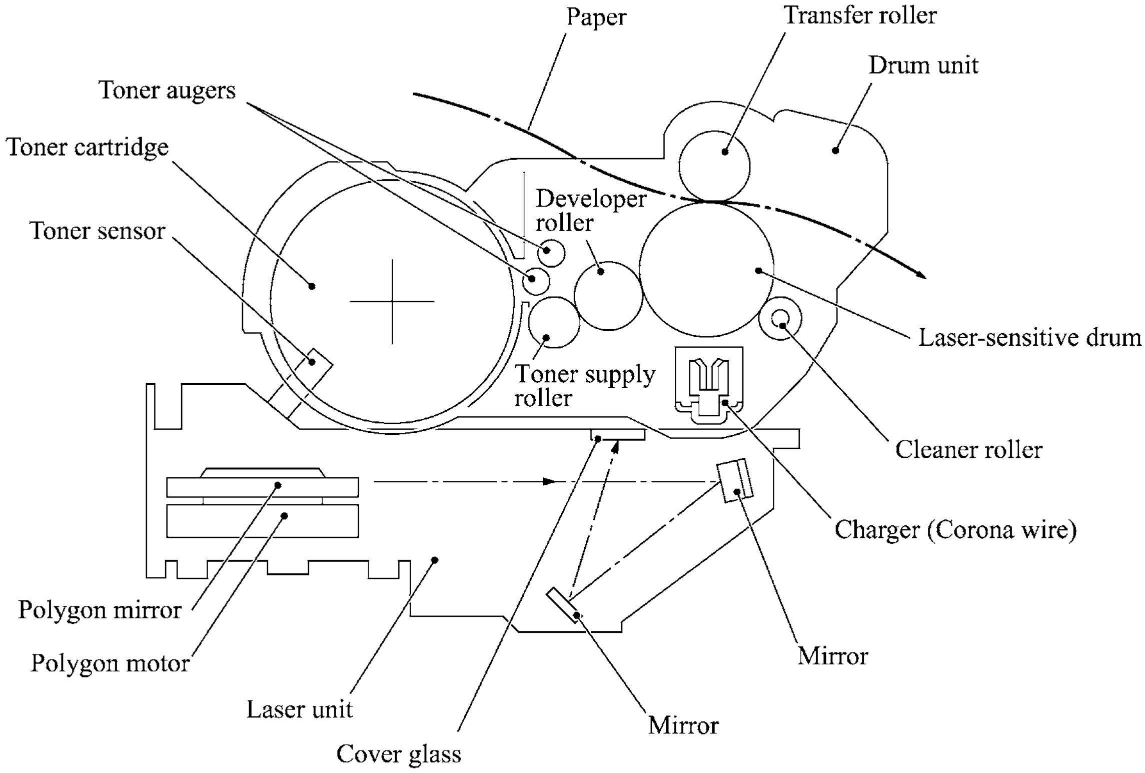
### Paper feeding and ejecting mechanism

If the main motor rotates clockwise, the rotation is transmitted via the gear train to the drum drive gear, heater roller drive gear, and paper ejection roller drive gear.

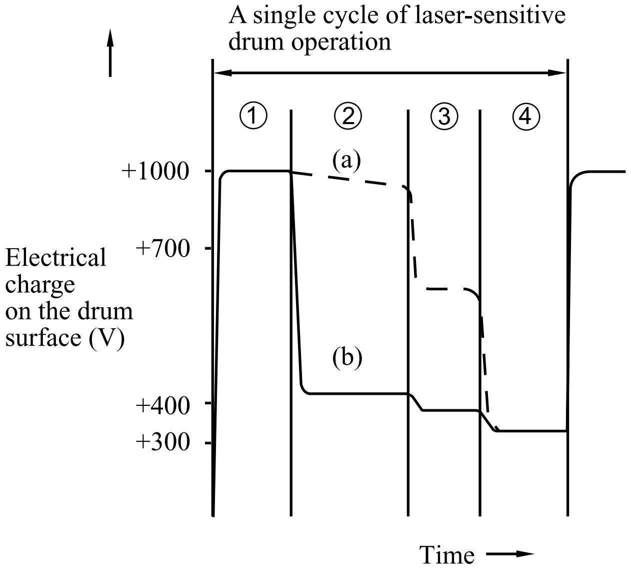
After the paper passes through the heat-fixing process, it will be ejected onto the paper tray.

If the leading edge of the paper pushes up the actuator of the paper ejection sensor, the photosensor becomes opened, signaling the start of paper ejection. If the trailing edge has passed through the sensor actuator, the sensor becomes closed, signaling the completion of paper ejection. Then, the main motor stops rotation.

### 3.2.2.2 Print process mechanism


Paper
Transfer roller
Drum unit
Toner augers
Toner cartridge
Toner sensor
Developer roller
Laser-sensitive drum
Toner supply roller
Cleaner roller
Charger (Corona wire)
Polygon mirror
Polygon motor
Laser unit
Cover glass
Mirror
Mirror

The print process unit works with laser beam, electrical charges, and toner. The graph below shows the transition of electrical charge on the surface of the laser-sensitive drum through the five processes: charging, exposing, developing, transferring, and erasing processes.



① Charges the drum surface positively.

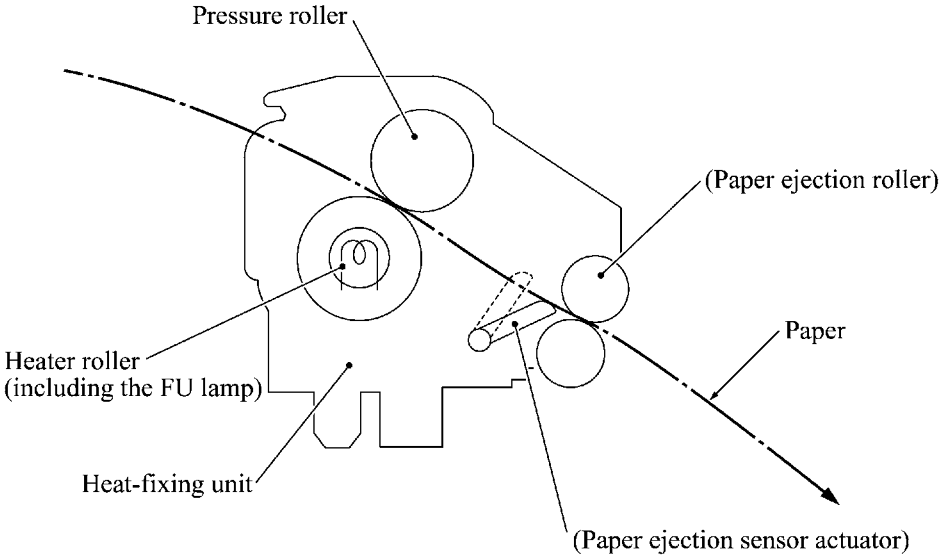
② Exposes the drum surface to a laser beam to form a latent image and develops the latent image with toner.

   (a) Unexposed area (Non-image area)
   (b) Exposed area (Image area)

③ Transfers the toner-formed image from the drum to paper.

④ Erases the residual potential.

### 3.2.2.3 Heat-fixing mechanism


Pressure roller
(Paper ejection roller)
Paper
Heater roller
(including the FU lamp)
Heat-fixing unit
(Paper ejection sensor actuator)

As the paper passes between the heater roller and the pressure roller in the heat-fixing unit, the heater roller fuses the toner on the paper.

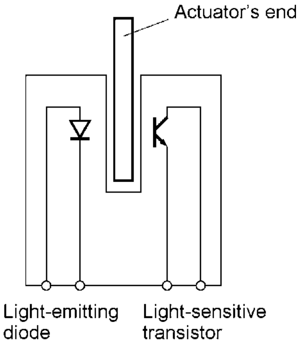
### 3.2.3 Sensors and Actuators

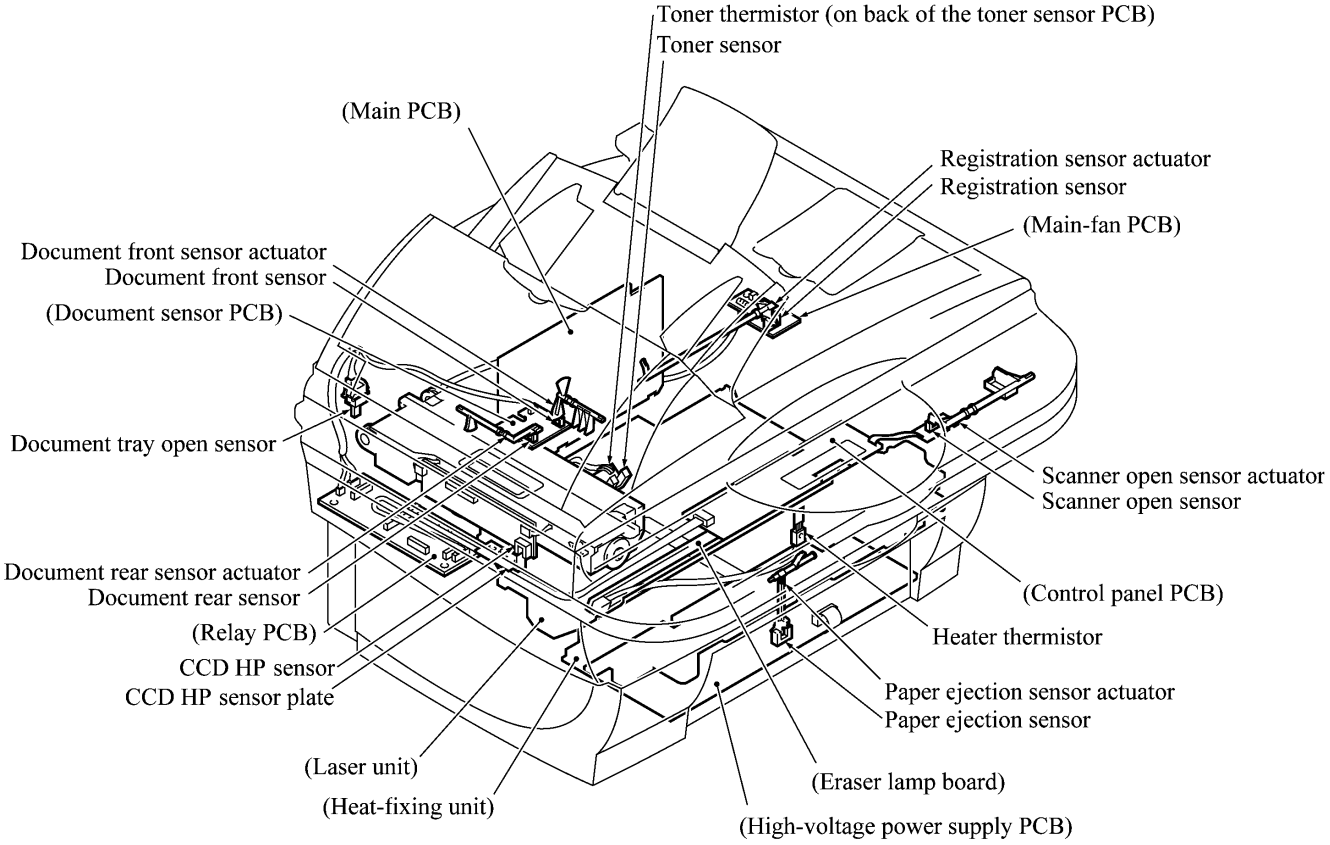
This machine has ten sensors: seven photosensors, two thermistors and a mechanical switch as described below.

| Sensor name | Type | Located on |
|---|---|---|
| Document front sensor | Photosensor | Document sensor PCB in the ADF |
| Document rear sensor | Photosensor | |
| Document tray open sensor | Mechanical switch | Document tray |
| Scanner open sensor | Photosensor | Control panel PCB |
| Registration sensor | Photosensor | Main-fan PCB |
| Paper ejection sensor | Photosensor | High-voltage power supply PCB |
| CCD HP sensor | Photosensor | CCD PCB on the CCD unit |
| Toner sensor | Photosensor | Toner sensor PCB |
| Toner thermistor | Thermistor | |
| Heater thermistor | Thermistor | Heat-fixing unit |

- Document front sensor which detects the presence of documents.
- Document rear sensor which detects the leading and trailing edges of pages to tell the control circuitry when the leading edge of a new page has reached the starting position and when the scan for that page is over.
- Document tray open sensor which detects whether the document tray is closed.
- Scanner open sensor which detects whether the scanner unit is closed.
- Registration sensor which detects the leading and trailing edges of paper, which allows the controller to determine the registration timing and check paper jam.
- Paper ejection sensor which detects whether the recording paper goes out of the machine.
- CCD HP sensor which detects whether the CCD unit is placed in the home position.
- Toner sensor which detects whether there is toner or a toner cartridge is loaded.
- Toner thermistor which allows the controller to monitor the ambient temperature of the toner cartridge.
- Heater thermistor which allows the controller to monitor the temperature of the heater roller of the fixing unit.

These photosensors are a photointerrupter consisting of a light-emitting diode and a light-sensitive transistor. Each of them has an actuator separately arranged as shown on the next page.



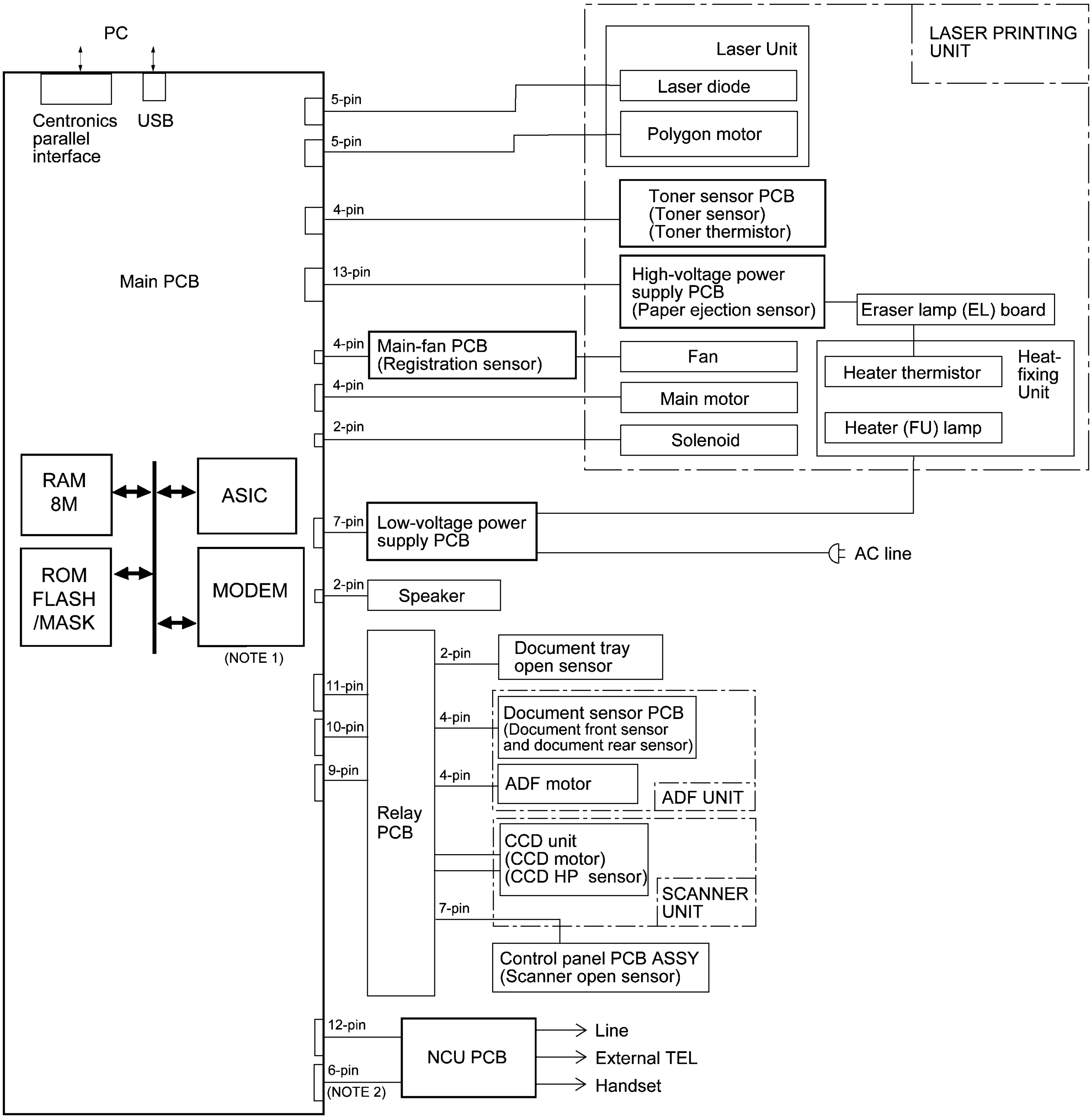

Toner thermistor (on back of the toner sensor PCB)
Toner sensor
(Main PCB)
Registration sensor actuator
Registration sensor
(Main-fan PCB)
Document front sensor actuator
Document front sensor
(Document sensor PCB)
Document tray open sensor
Scanner open sensor actuator
Scanner open sensor
Document rear sensor actuator
Document rear sensor
(Control panel PCB)
(Relay PCB)
Heater thermistor
CCD HP sensor
CCD HP sensor plate
Paper ejection sensor actuator
Paper ejection sensor
(Laser unit)
(Eraser lamp board)
(Heat-fixing unit)
(High-voltage power supply PCB)

**Location of Sensors and Actuators**

# 3.3 CONTROL ELECTRONICS

### 3.3.1 Configuration

The hardware configuration of the facsimile machine is shown below.


PC
Centronics parallel interface
USB
Main PCB
RAM 8M
ASIC
ROM FLASH /MASK
MODEM
(NOTE 1)
5-pin
5-pin
4-pin
13-pin
4-pin
4-pin
2-pin
7-pin
2-pin
11-pin
10-pin
9-pin
12-pin
6-pin
(NOTE 2)
LASER PRINTING UNIT
Laser Unit
Laser diode
Polygon motor
Toner sensor PCB (Toner sensor) (Toner thermistor)
High-voltage power supply PCB (Paper ejection sensor)
Eraser lamp (EL) board
Main-fan PCB (Registration sensor)
Fan
Main motor
Solenoid
Heater thermistor
Heater (FU) lamp
Heat-fixing Unit
Low-voltage power supply PCB
AC line
Speaker
Relay PCB
2-pin
Document tray open sensor
4-pin
Document sensor PCB (Document front sensor and document rear sensor)
4-pin
ADF motor
ADF UNIT
CCD unit (CCD motor) (CCD HP sensor)
SCANNER UNIT
7-pin
Control panel PCB ASSY (Scanner open sensor)
NCU PCB
Line
External TEL
Handset

**Configuration of Facsimile Machine**

(NOTE 1) Provided on models equipped with facsimile function.
(NOTE 2) Provided on the European, Pacific, and Asian versions.

# CHAPTER 4

# DISASSEMBLY/REASSEMBLY AND LUBRICATION

# CHAPTER 4 DISASSEMBLY/REASSEMBLY AND LUBRICATION

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# 4.1 DISASSEMBLY/REASSEMBLY

## ■ Safety Precautions

To prevent the creation of secondary problems by mishandling, observe the following precautions during maintenance work.

(1) Unplug the power cord from the power outlet before replacing parts or units. When having access to the power supply, be sure to unplug the power cord from the power outlet.

(2) When servicing the optical system of the laser printing unit, be careful not to place screwdrivers or other reflective objects in the path of the laser beam. Be sure to take off any personal accessories such as wrist watches and rings before working on the printer. A reflected beam, though invisible, can permanently damage your eyes.

(3) If the machine has been printing, allow the heat-fixing unit sufficient time to cool down before starting maintenance jobs. It is HOT!

(4) Be careful not to lose screws, washers, or other parts removed for parts replacement.

(5) Do not remove gears from the document feed roller ASSY or ejection roller ASSY if at all possible. Once removed, they will become unusable and new gears will have to be put back in.

(6) When using soldering irons and other heat-generating tools, take care not to damage the resin parts such as wires, PCBs, and covers.

(7) Before handling the PCBs, touch a metal portion of the machine to discharge static electricity; otherwise, the electronic parts may be damaged due to the electricity charged in your body.

(8) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.

(9) Be sure to reinsert self-tapping screws correctly, if removed.

(10) Tighten screws to the torque values listed on the next page.

(11) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, always slide the connector lock to unlock it.

(12) Before reassembly, apply the specified lubricant to the specified points. (Refer to Subsection 4.2 in this chapter.)

(13) After repairs, check not only the repaired portion but also that the connectors and other related portions function properly before operation checks.

## Tightening Torque List

| Location | Screw type | Q'ty | Tightening torque N•m | (kgf•cm) |
|---|---|---|---|---|
| ADF thickness adjuster | Taptite, pan B M3x6 | 1 | 0.39 ±0.10 | (4 ±1) |
| Upper ADF chute | Taptite, cup B M3x10 | 2 | 0.69 ±0.10 | (7 ±1) |
| Lower ADF chute | Taptite, cup B M3x10 | 2 | 0.69 ±0.10 | (7 ±1) |
| Grounding wire | Taptite, cup B M3x10 | 1 | 0.69 ±0.10 | (7 ±1) |
| ADF drive unit | Taptite, cup B M3x8 | 2 | 0.69 ±0.10 | (7 ±1) |
| ADF motor | Screw, pan (s/p washer) M3x6 | 1 | 0.69 ±0.10 | (7 ±1) |
| Grounding wire on the scanner mount | Taptite, cup B M3x10 | 1 | 0.39 ±0.10 | (4 ±1) |
| Document tray | Taptite, bind B M4x12 | 2 | 0.98 ±0.20 | (10 ±2) |
| Hinge base R | Taptite, cup B M3x10 | 3 | 0.69 ±0.10 | (7 ±1) |
| Hinge L | Taptite, cup B M3x10 | 3 | 0.69 ±0.10 | (7 ±1) |
| Control panel ASSY | Taptite, cup B M3x12 | 6 | 0.39 ±0.10 | (4 ±1) |
| Scanner open sensor PCB | Taptite, cup B M3x8 | 1 | 0.39 ±0.10 | (4 ±1) |
| Reinforcement plate | Taptite, cup B M3x6 | 7 | 0.39 ±0.10 | (4 ±1) |
| Control panel PCB | Taptite, cup B M3x6 | 2 | 0.39 ±0.10 | (4 ±1) |
| Scanner top cover | Taptite, cup B M4x12 | 4 | 0.98 ±0.20 | (10 ±2) |
| Guide plate | Taptite, cup B M3x8 | 3 | 0.69 ±0.10 | (7 ±1) |
| CCD HP sensor plate | Taptite, cup B M3x8 | 1 | 0.69 ±0.10 | (7 ±1) |
| Flat cable clamp | Taptite, cup B M3x8 | 2 | 0.69 ±0.10 | (7 ±1) |
| Front cover guides | Taptite, cup B M3x10 | 2 | 0.69 ±0.10 | (7 ±1) |
| Relay PCB | Taptite, cup B M3x10 | 2 | 0.39 ±0.10 | (4 ±1) |
| Scanner mount | Taptite, bind B M4x12 | 2 | 0.98 ±0.20 | (10 ±2) |
| Board access cover | Taptite, bind B M4x12 | 2 | 0.78 ±0.10 | (8 ±1) |
| Release lever | Taptite, bind B M4x10 | 1 | 0.98 ±0.20 | (10 ±2) |
| Grounding leaf spring R | Taptite, bind B M2.6x8 | 1 | 0.39 ±0.10 | (4 ±1) |
| Grounding leaf spring L | Taptite, bind B M2.6x8 | 2 | 0.39 ±0.10 | (4 ±1) |
| Heat-fixing unit | Taptite, cup B M4x16 | 2 | 0.98 ±0.20 | (10 ±2) |
| Fixing unit upper cover | Taptite, bind B M3x12 | 2 | 0.69 ±0.20 | (7 ±2) |
| Lock plate | Taptite, pan B M3x10 | 1 | 0.69 ±0.20 | (7 ±2) |
| Fuse plate R | Screw, pan (washer) M2.6x6DA | 1 | 0.39 ±0.10 | (4 ±1) |
| Laser unit | Taptite, bind B M4x12 | 3 | 0.98 ±0.20 | (10 ±2) |
| Main shield | Taptite, cup S M3x6 | 2 | 0.69 ±0.20 | (7 ±2) |
| Parallel interface connector | Taptite, pan S M3x12 | 2 | 0.69 ±0.20 | (7 ±2) |
| Main PCB | Taptite, cup S M3x6 | 2 | 0. 69 ±0.20 | (7 ±2) |
| Bottom plate | Taptite, bind B M4x12 | 5 | 0.98 ±0.20 | (10 ±2) |
|  | Taptite, cup S M3x6 | 4 | 0. 69 ±0.20 | (7 ±2) |

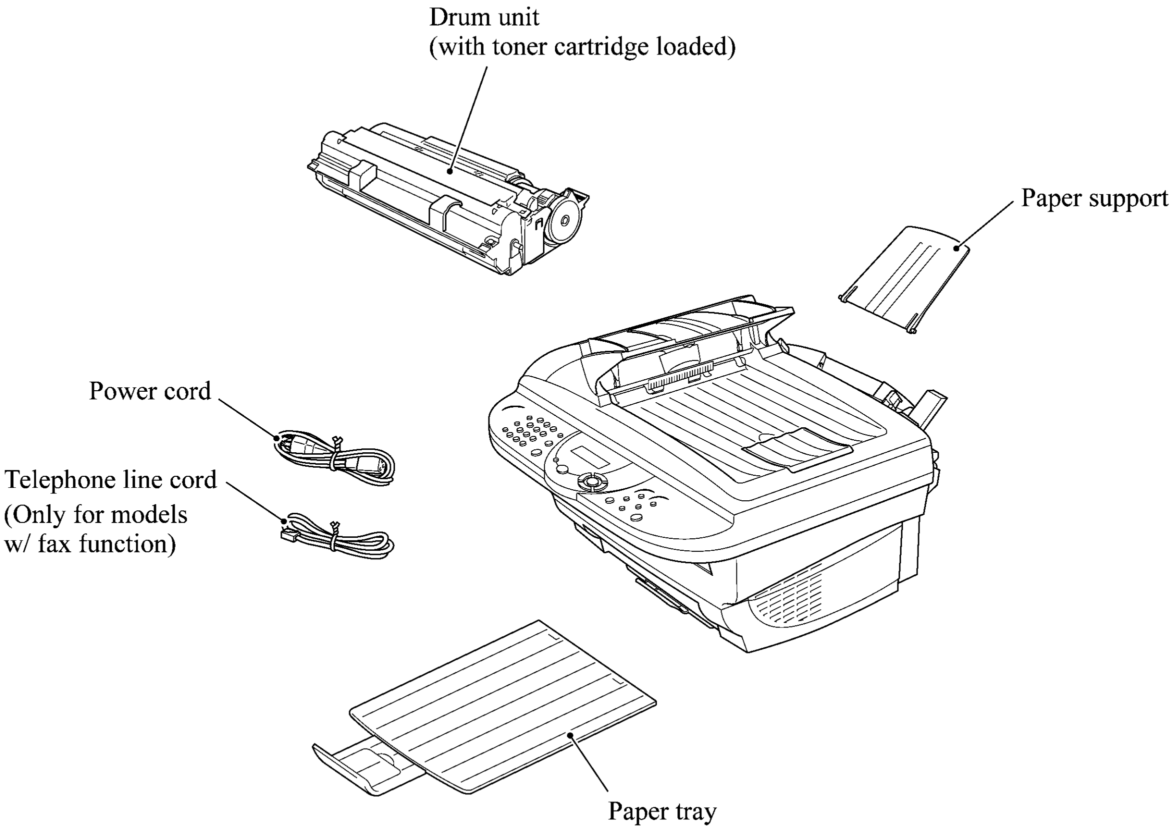
| | | | | |
|---|---|---|---|---|
| Low-voltage power supply PCB (Low-voltage insulator sheet) | Taptite, cup S M3x6 | 2 | 0. 69 ±0.20 | (7 ±2) |
| Grounding wire | Screw, pan (washer) M4x8DB | 1 | 0.39 ±0.20 | (4 ±2) |
| Power inlet support | Taptite, cup S M3x6 | 1 | 0. 69 ±0.20 | (7 ±2) |
| High-voltage power supply PCB | Taptite, bind B M4x12 | 1 | 0.98 ±0.20 | (10 ±2) |
| Duct | Taptite, bind B M4x12 | 2 | 0.98 ±0.20 | (10 ±2) |
| Fan support | Taptite, cup B M3x8 | 1 | 0. 49 ±0.20 | (5 ±2) |
| Power supply shield | Taptite, cup S M3x6 | 2 | 0. 69 ±0.20 | (7 ±2) |
| Gear drive unit | Taptite, bind B M4x14 | 4 | 0. 98 ±0.20 | (10 ±2) |
| Main motor | Taptite, cup S M3x6 | 2 | 0. 69 ±0.20 | (7 ±2) |
| Gear support plate | Taptite, cup S M3x16 | 2 | 0. 69 ±0.20 | (7 ±2) |
| PCB support | Taptite, bind B M4x12 | 2 | 0. 98 ±0.20 | (10 ±2) |
| NCU shield | Taptite, cup S M3x6 | 2 | 0. 69 ±0.20 | (7 ±2) |
| NCU PCB | Taptite, cup S M3x6 | 1 | 0. 69 ±0.20 | (7 ±2) |
| Scanner grounding plate | Taptite, cup B M3x8 | 1 | 0. 49 ±0.20 | (5 ±2) |

## ■ Preparation

Prior to proceeding to the disassembly procedure,

(1) Unplug
  - the modular jack of the telephone line (only for models equipped with the fax function),
  - the power cord,
  - the modular jack of the curled cord (and remove the handset),
  - the PC interface cable (parallel cable or USB cable) if connected (Not shown below), and
  - the modular jack of an external telephone set if connected (Not shown below).

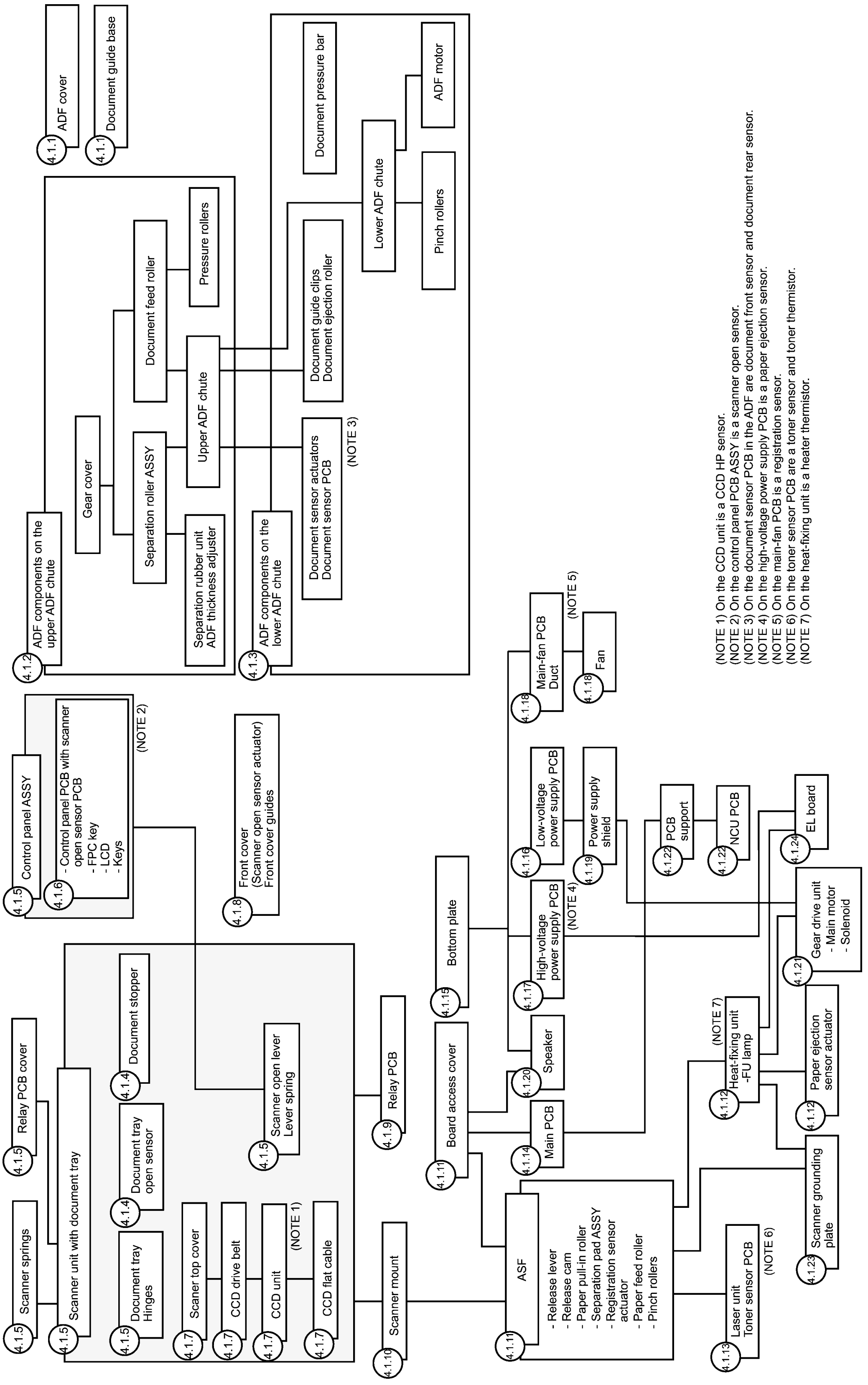
(2) Remove
  - the paper support,
  - the paper tray, and
  - the drum unit (with the toner cartridge loaded)


Drum unit
(with toner cartridge loaded)
Paper support
Power cord
Telephone line cord
(Only for models
w/ fax function)
Paper tray

## ■ How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object components. To remove the gear drive unit, for example, first find it on the flow and learn its number ((4.1.21) in this case). You need to remove parts numbered (4.1.5), (4.1.10), (4.1.11), (4.1.12), (4.1.15), (4.1.16), and (4.1.19) so as to access the gear drive unit.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

## ■ Disassembly Order Flow

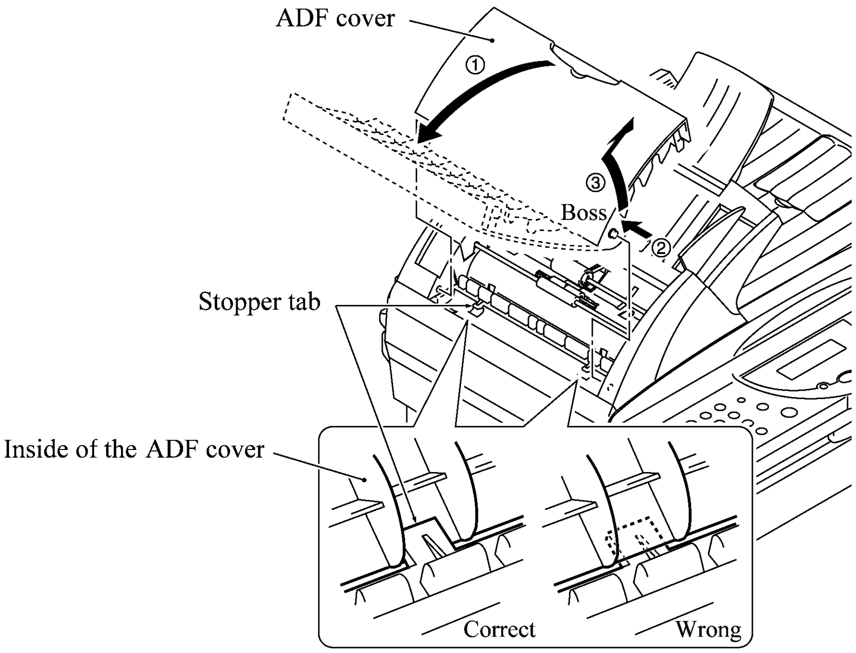


4.1.1 ADF cover
4.1.1 Document guide base
4.1.2 ADF components on the upper ADF chute
Gear cover
Separation roller ASSY
Separation rubber unit
ADF thickness adjuster
Upper ADF chute
Document feed roller
Pressure rollers
Document guide clips
Document ejection roller
Document sensor actuators
Document sensor PCB
(NOTE 3)
4.1.3 ADF components on the lower ADF chute
Lower ADF chute
Pinch rollers
ADF motor
Document pressure bar
4.1.5 Control panel ASSY
4.1.6 - Control panel PCB with scanner open sensor PCB
- FPC key
- LCD
- Keys
(NOTE 2)
4.1.8 Front cover
(Scanner open sensor actuator)
Front cover guides
4.1.5 Scanner springs
4.1.5 Relay PCB cover
4.1.5 Scanner unit with document tray
4.1.5 Document tray Hinges
4.1.4 Document tray open sensor
4.1.4 Document stopper
4.1.5 Scanner open lever Lever spring
4.1.7 Scaner top cover
4.1.7 CCD drive belt
4.1.7 CCD unit
(NOTE 1)
4.1.7 CCD flat cable
4.1.9 Relay PCB
4.1.10 Scanner mount
4.1.11 Board access cover
4.1.15 Bottom plate
4.1.11 ASF
- Release lever
- Release cam
- Paper pull-in roller
- Separation pad ASSY
- Registration sensor actuator
- Paper feed roller
- Pinch rollers
4.1.14 Main PCB
4.1.20 Speaker
4.1.17 High-voltage power supply PCB
(NOTE 4)
4.1.16 Low-voltage power supply PCB
4.1.18 Main-fan PCB Duct
(NOTE 5)
4.1.18 Fan
4.1.19 Power supply shield
4.1.22 PCB support
4.1.22 NCU PCB
4.1.24 EL board
4.1.21 Gear drive unit
- Main motor
- Solenoid
4.1.12 Heat-fixing unit
-FU lamp
(NOTE 7)
4.1.12 Paper ejection sensor actuator
4.1.23 Scanner grounding plate
4.1.13 Laser unit
Toner sensor PCB
(NOTE 6)

(NOTE 1) On the CCD unit is a CCD HP sensor.
(NOTE 2) On the control panel PCB ASSY is a scanner open sensor.
(NOTE 3) On the document sensor PCB in the ADF are document front sensor and document rear sensor.
(NOTE 4) On the high-voltage power supply PCB is a paper ejection sensor.
(NOTE 5) On the main-fan PCB is a registration sensor.
(NOTE 6) On the toner sensor PCB are a toner sensor and toner thermistor.
(NOTE 7) On the heat-fixing unit is a heater thermistor.

### 4.1.1 ADF Cover and Document Guide Base

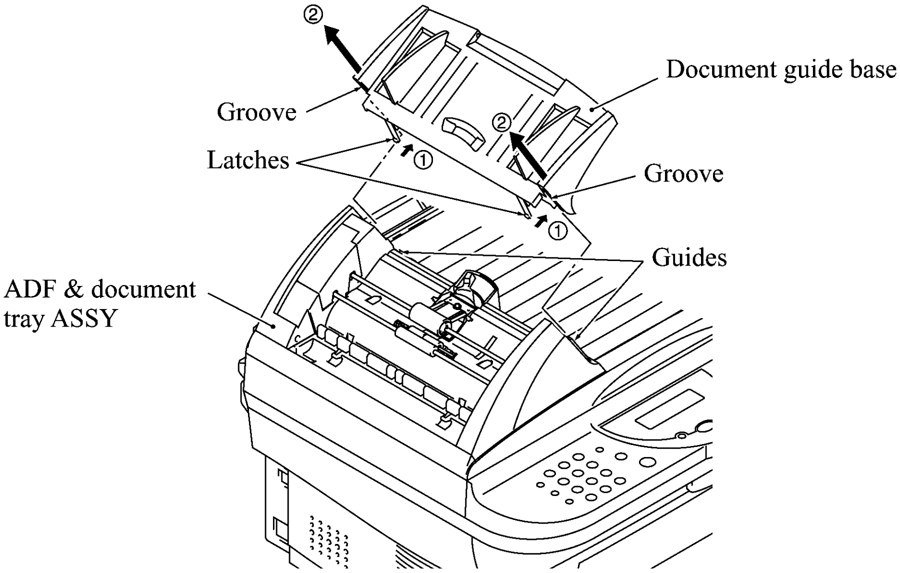
(1) Open the ADF cover, press its front end to release the boss, and take it off (in the direction of arrows ①, ②, and ③).


ADF cover
①
③
Boss
②
Stopper tab
Inside of the ADF cover
Correct
Wrong

Setting the ADF cover back into place

(2) Release the two latches of the document guide base and slide it up *straight along the guides*.

**NOTE:** Do not turn it to the left. Doing so will break the groove sections of the document guide base.


②
Document guide base
Groove
②
Latches
①
Groove
①
Guides
ADF & document
tray ASSY

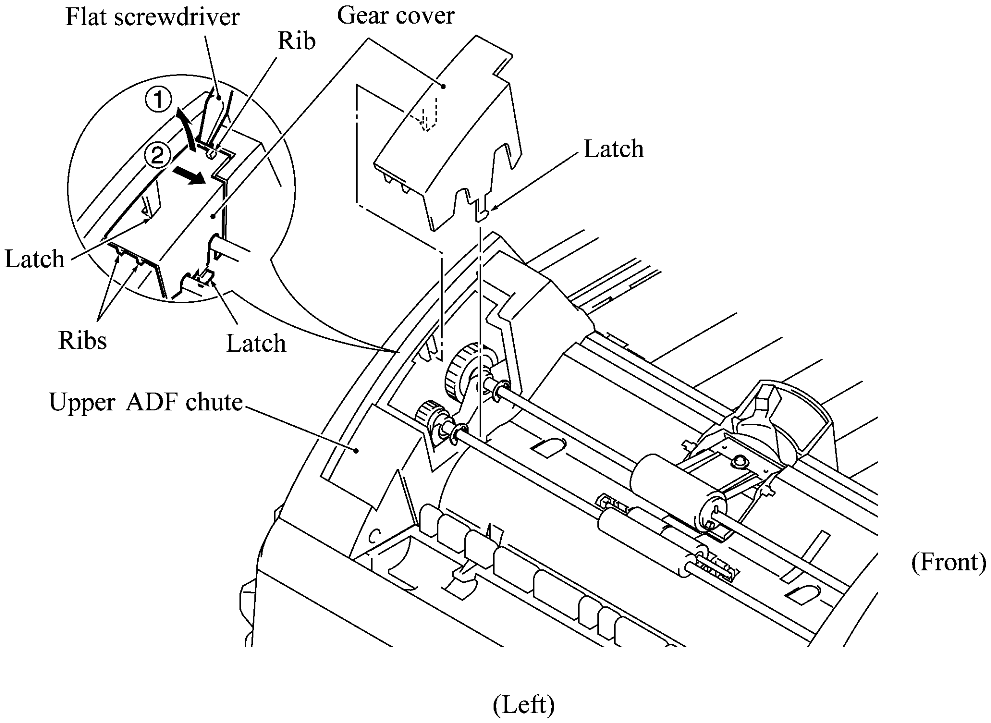
## ■ Reassembling Notes

- When setting the ADF cover back into place, fit its bottom edge under the stopper tabs as illustrated above.

### 4.1.2 ADF Components on the Upper ADF Chute

**Gear cover**

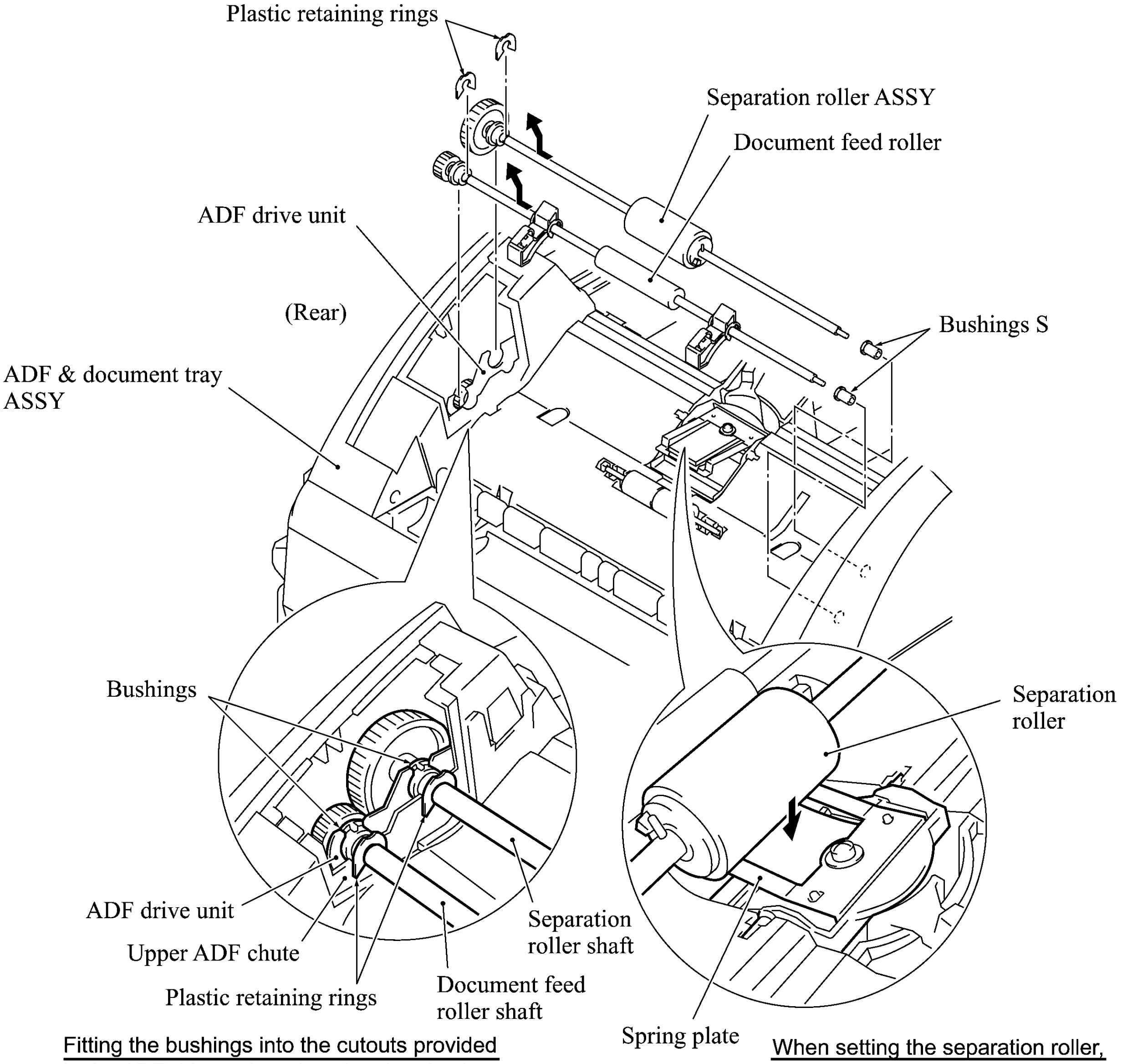
(1) As illustrated below, insert the tip of a flat screwdriver into the slot and lift up the right edge of the gear cover (arrow ①) and move the gear cover to the front (arrow ②).


Flat screwdriver
Gear cover
Rib
①
②
Latch
Latch
Ribs
Latch
Upper ADF chute
(Front)
(Left)

**Separation roller ASSY and document feed roller**

(2) From the rear end of each of the separation roller ASSY and document feed roller, remove the plastic retaining ring. Lift up the rear ends of them and take them out together with bushings S.

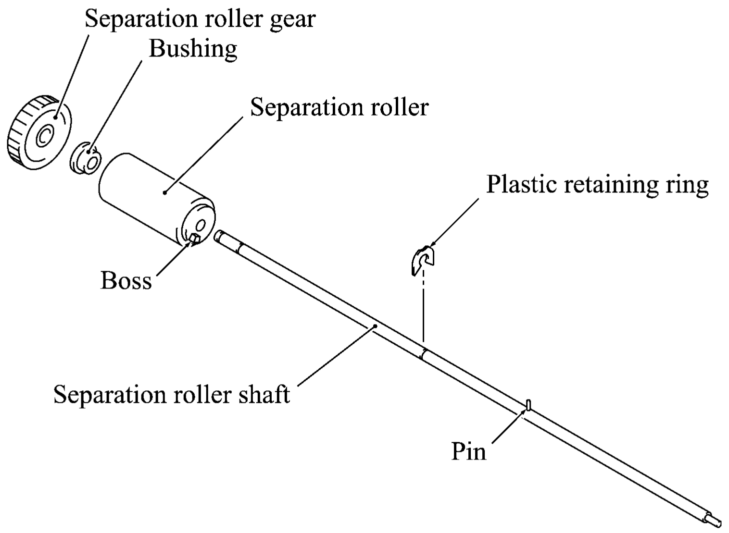
**NOTE:** Take care not to drop bushings S.


Plastic retaining rings
Separation roller ASSY
Document feed roller
ADF drive unit
(Rear)
ADF & document tray ASSY
Bushings S
Bushings
Separation roller
ADF drive unit
Upper ADF chute
Plastic retaining rings
Separation roller shaft
Document feed roller shaft
Spring plate

Fitting the bushings into the cutouts provided in the ADF drive unit and setting the plastic retaining rings inside the upper ADF chute

When setting the separation roller, take care not to apply force to the spring plate *at an angle*

**Reassembling Note:** If you have disassembled the separation roller ASSY, set the separation roller on its shaft with the boss facing towards the pin and then snap the plastic retaining ring into place, as illustrated below.



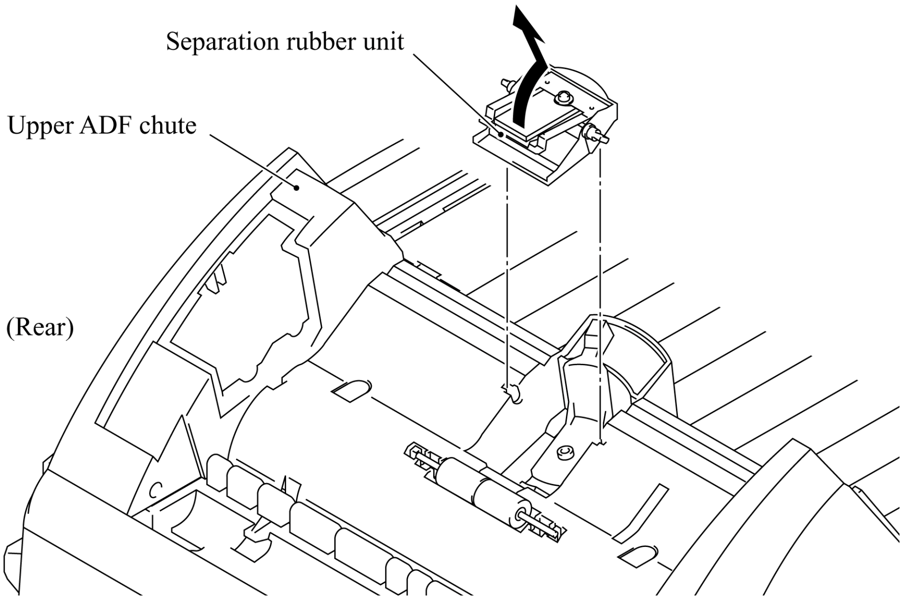
Separation roller gear
Bushing
Separation roller
Plastic retaining ring
Boss
Separation roller shaft
Pin

**Reassembling Note:** When setting the separation roller ASSY, take care not to apply force to the spring plate at an angle, as illustrated on the previous page.

**Reassembling Note:** After setting the rear end of the separation roller ASSY or document feed roller to the ADF drive unit, fit its bushing into the cutout provided in the ADF drive unit and then set the plastic retaining ring inside the upper ADF chute, as illustrated on the previous page.

## Separation rubber unit, ADF thickness adjuster, and pressure rollers

(3) Turn the separation rubber unit as shown below and lift it up.

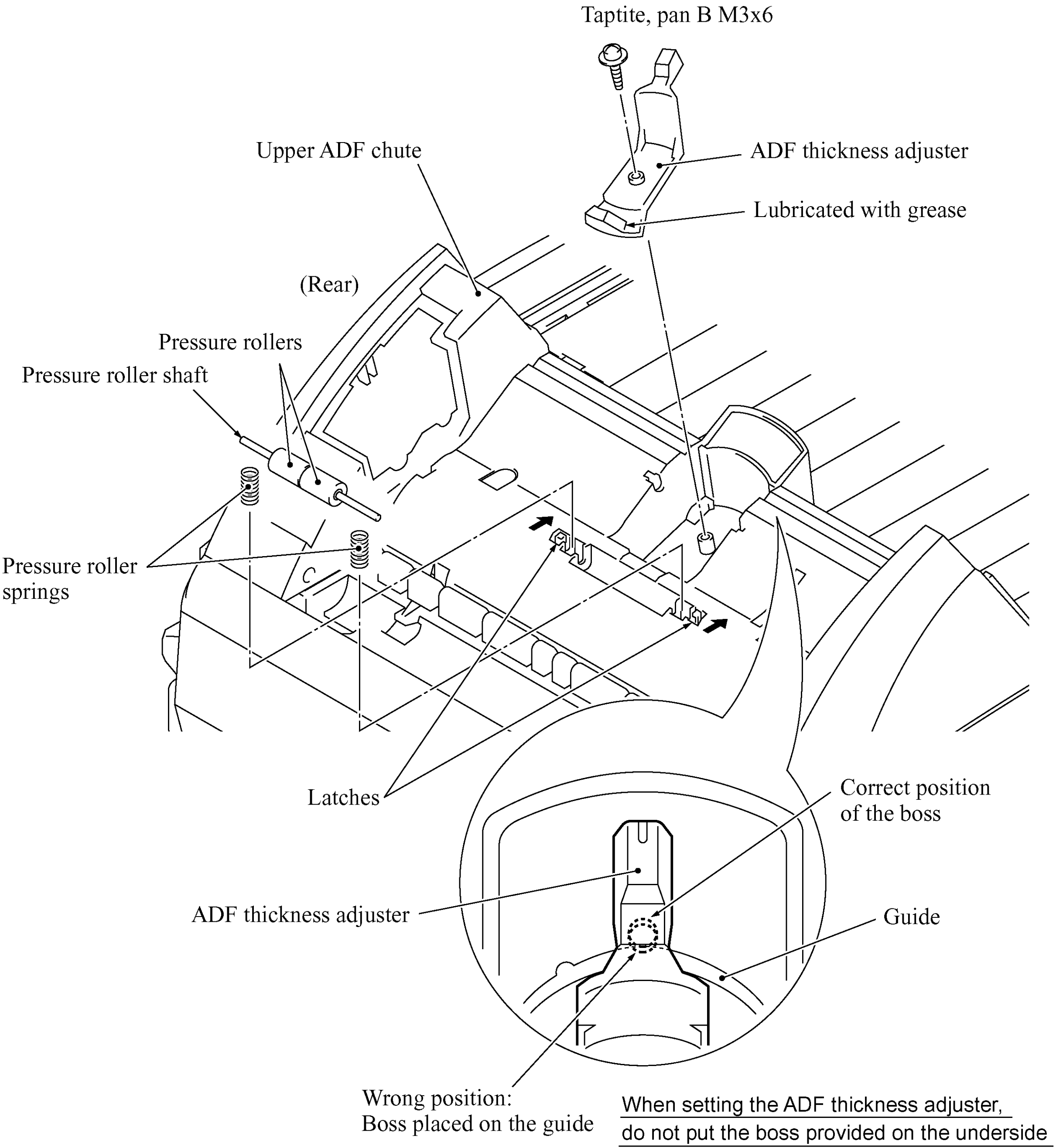


Separation rubber unit
Upper ADF chute
(Rear)

(4) Remove the screw and take the ADF thickness adjuster out of the upper ADF chute.

**NOTE:** The ADF thickness adjuster is lubricated with grease, so take care not to smear surrounding parts with the grease when handing the ADF thickness adjuster.

(5) At either end of the pressure roller shaft, press the latch to the right and take out the pressure rollers and their shaft. Then remove their springs.


Taptite, pan B M3x6
Upper ADF chute
ADF thickness adjuster
Lubricated with grease
(Rear)
Pressure rollers
Pressure roller shaft
Pressure roller springs
Latches
Correct position of the boss
ADF thickness adjuster
Guide
Wrong position: Boss placed on the guide

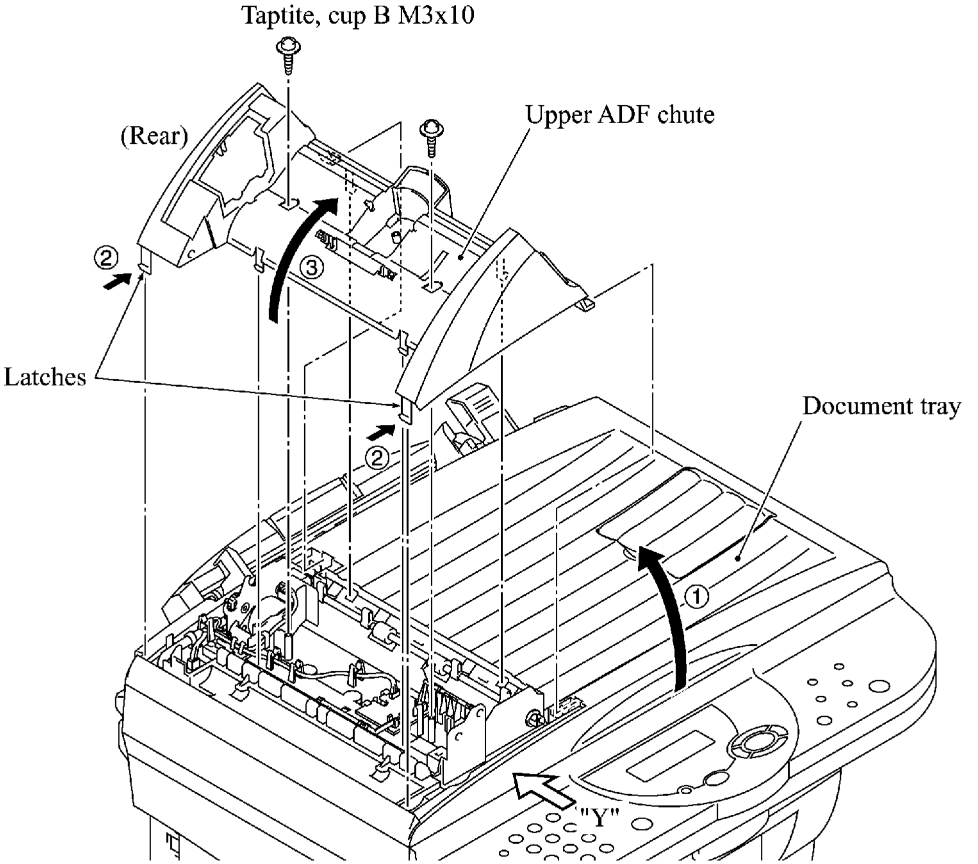
When setting the ADF thickness adjuster, do not put the boss provided on the underside of the adjuster on the guide.

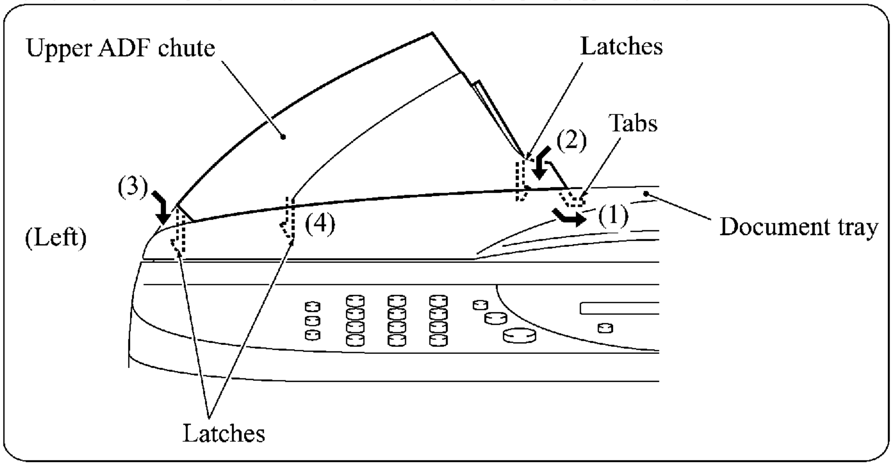
## Upper ADF chute

(6) Remove the two screws from the upper ADF chute.

(7) Open the document tray (①).

(8) From the underside of the document tray, release the two leftmost latches (②) and then pull up the left end of the upper ADF chute (③).


Taptite, cup B M3x10
(Rear)
Upper ADF chute
②
③
Latches
Document tray
②
①
"Y"


Upper ADF chute
Latches
Tabs
(2)
(3)
(1)
Document tray
(Left)
(4)
Latches

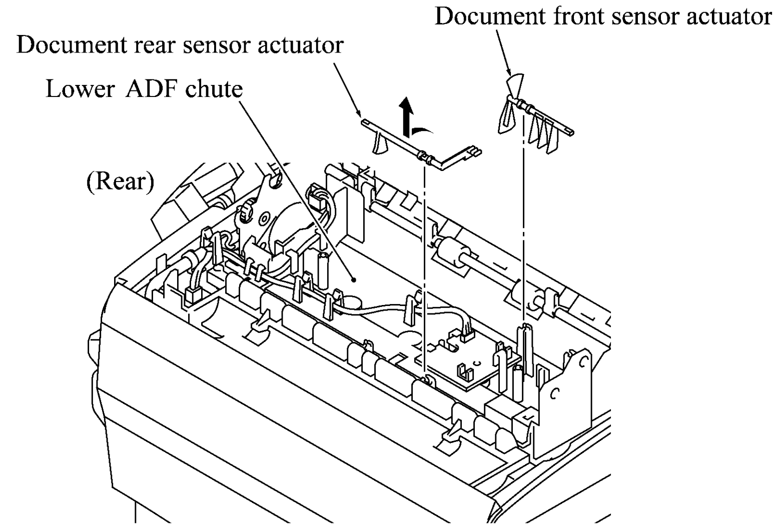
Latching the upper ADF chute (Viewed from "Y")

**Reassembling Note:** When latching the upper ADF chute, first fit tabs (1) of the right end into the openings provided in the document tray, then press latches (2), (3), and (4) into place in this order as shown above.

### 4.1.3 ADF Components on the Lower ADF Chute

**Document front and rear sensor actuators**

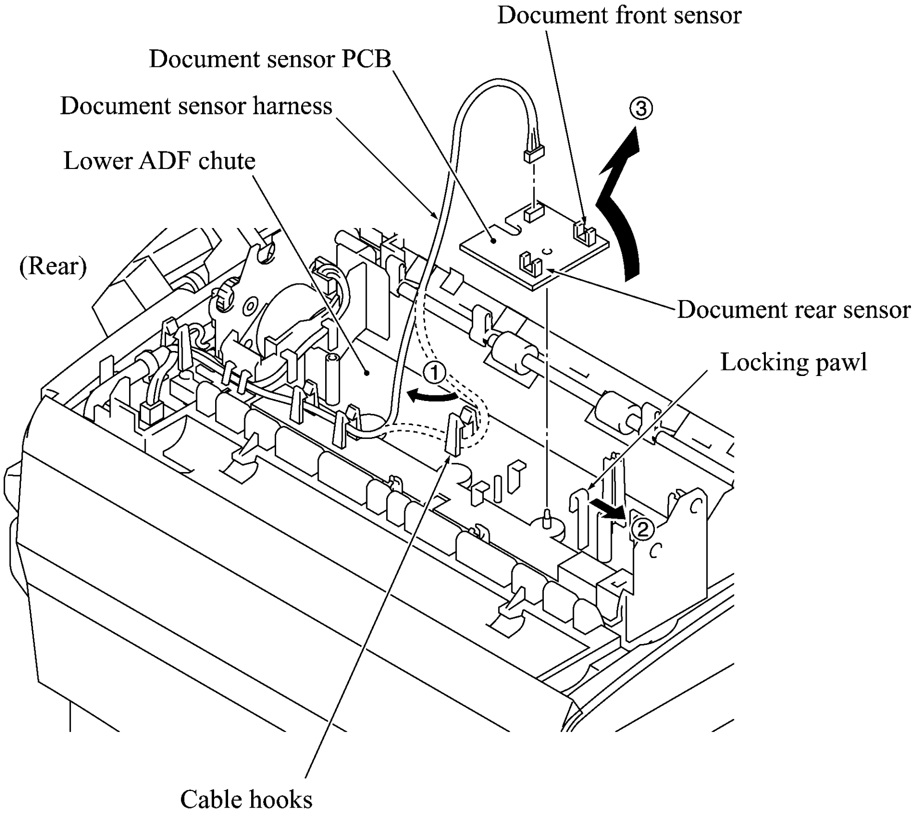
(1) Lift up the document front sensor actuator. Fully turn the document rear sensor actuator counterclockwise, then lift it up.


Document front sensor actuator
Document rear sensor actuator
Lower ADF chute
(Rear)

**Document sensor PCB**

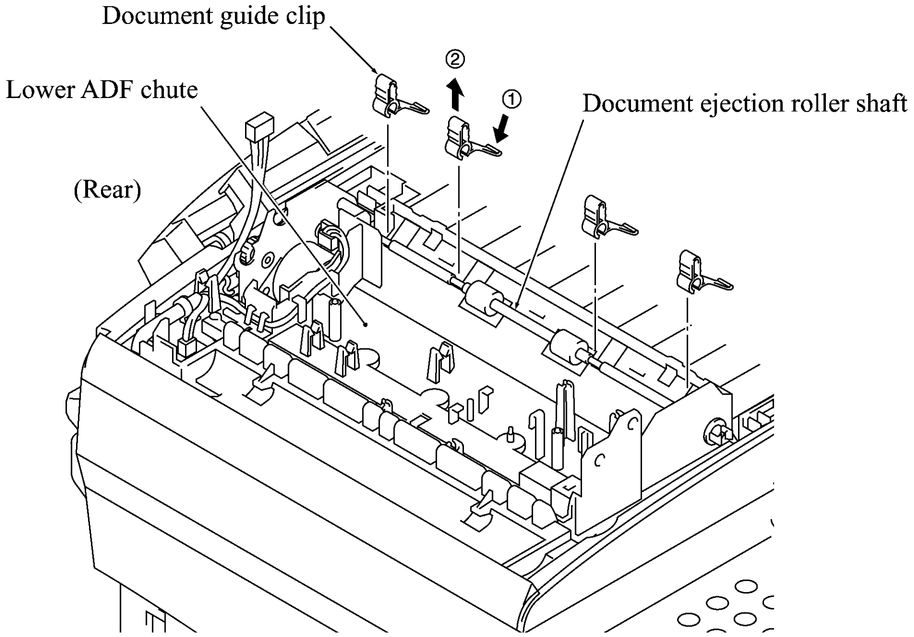
(2) Take the document sensor harness out of the cable hooks, then disconnect it from the document sensor PCB.

(3) Press the locking pawl to the front and take out the document sensor PCB.


Document front sensor
Document sensor PCB
Document sensor harness
③
Lower ADF chute
(Rear)
Document rear sensor
Locking pawl
①
②
Cable hooks

**Document guide clips**

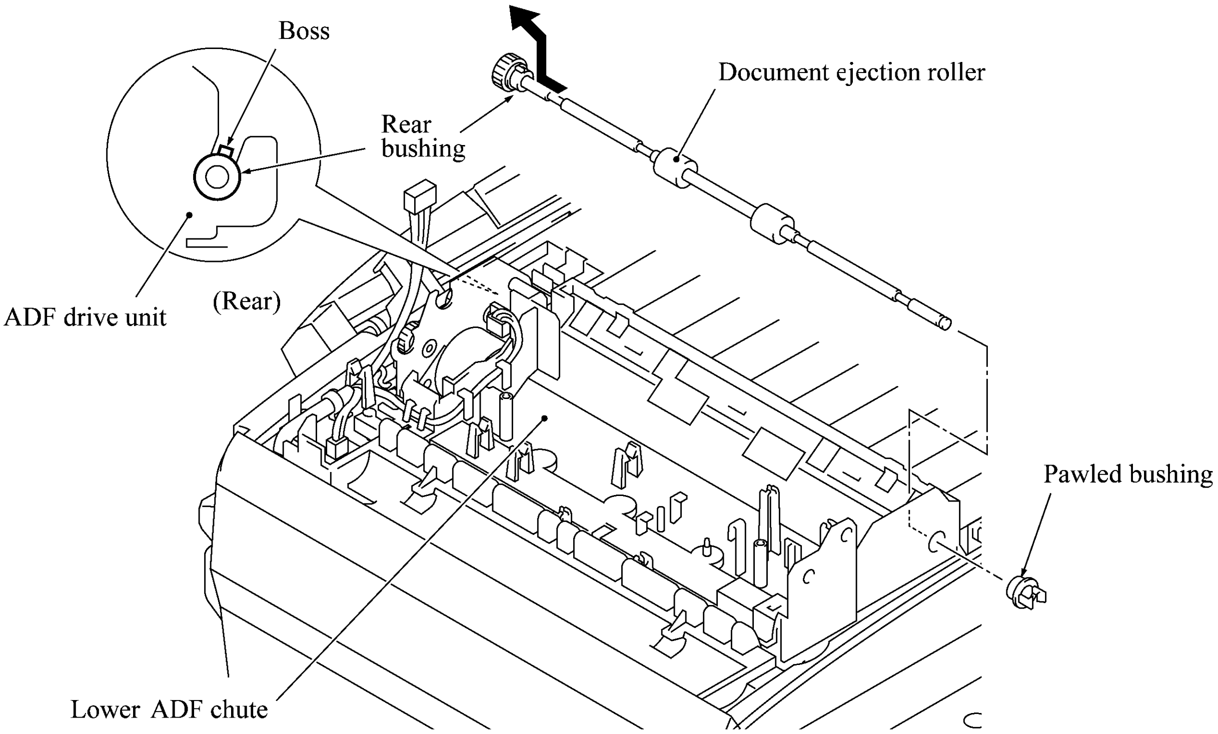
(4) Press the tab of each document guide clip. Each clip will snap out of the document ejection roller shaft.


Document guide clip
②
①
Lower ADF chute
Document ejection roller shaft
(Rear)

**Document ejection roller**

(5) Remove the pawled bushing from the front end of the document ejection roller shaft by pulling its pawls outwards.

(6) Slide the rear bushing to the rear and then lift up the document ejection roller.

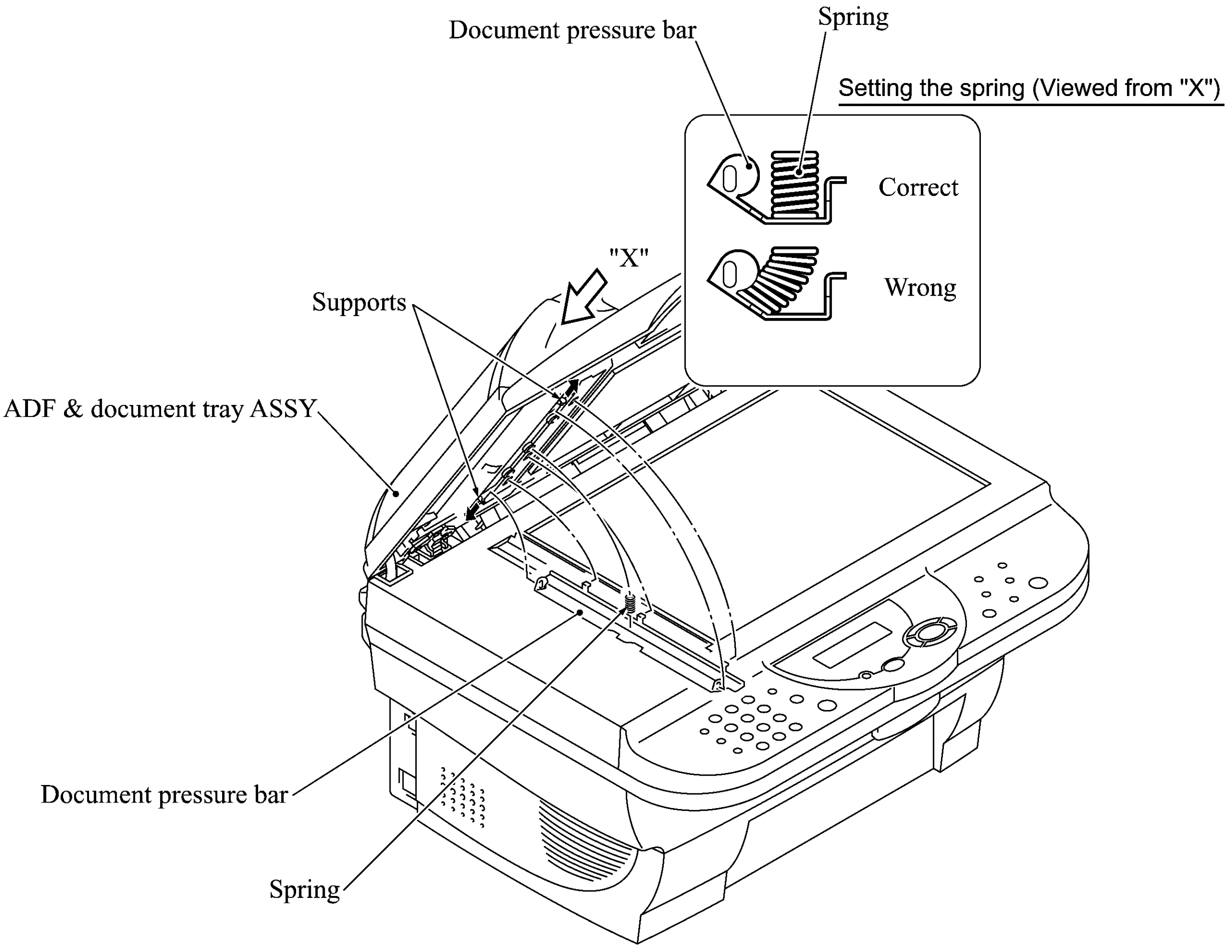

Boss
Document ejection roller
Rear bushing
ADF drive unit
(Rear)
Pawled bushing
Lower ADF chute

**Reassembling Note:** When fitting the rear bushing of the document ejection roller into the cutout of the ADF drive unit, orient the boss as illustrated on the previous page.

## Document pressure bar

(7) Open the ADF & document tray ASSY.

(8) Pull either of the front and rear supports of the document pressure bar outwards and remove the document pressure bar. The spring also comes off.


Document pressure bar
Spring
Setting the spring (Viewed from "X")
Correct
Wrong
"X"
Supports
ADF & document tray ASSY
Document pressure bar
Spring

**Reassembling Note:** After setting the document pressure bar, check in the direction of arrow "X" that the spring is into place as illustrated above.

**Lower ADF chute, pinch rollers, and ADF motor**

(9) Take the document sensor harness out of cable hooks provided on the lower ADF chute.

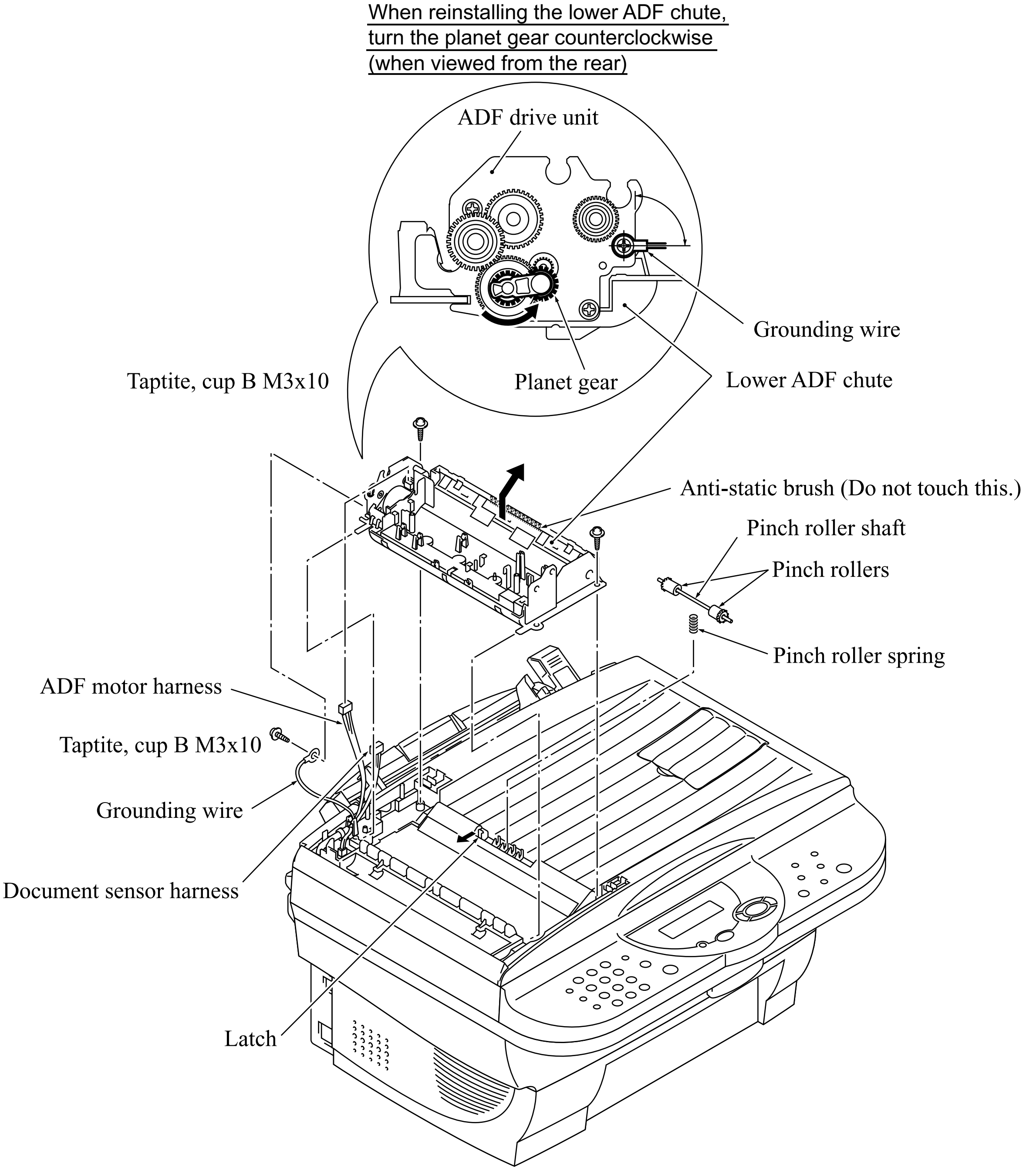
(10) Disconnect the ADF motor harness from the motor, then take its harness out of the cable guides and hooks.

(11) Release the grounding wire from the ADF drive unit by removing the screw.

(12) Remove the two screws from the lower ADF chute.

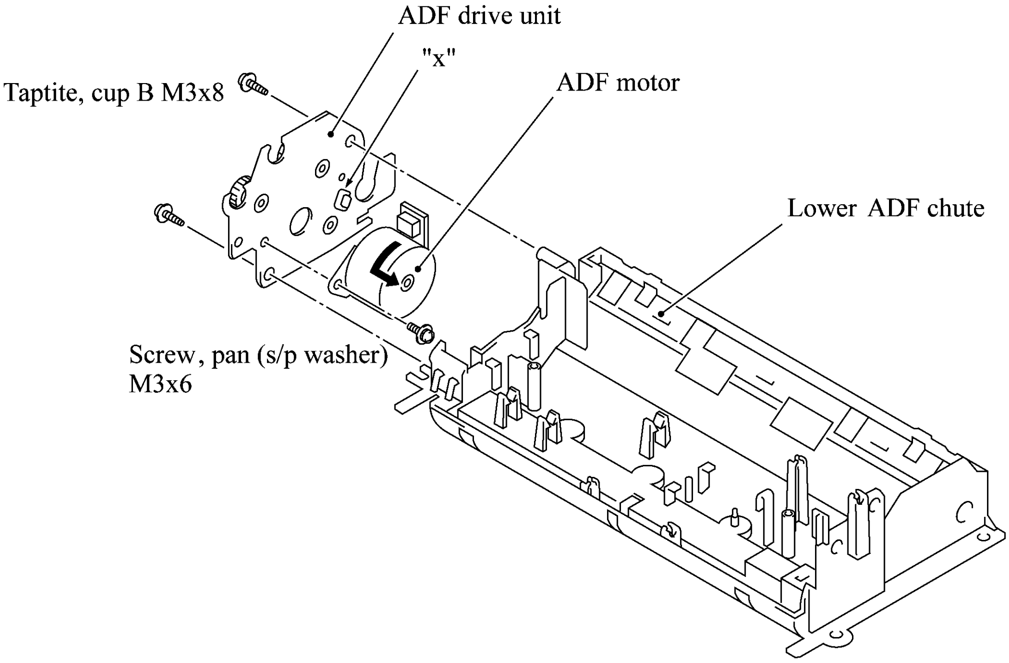
(13) Lift up the lower ADF chute in the direction of the arrow shown below, taking care not to touch the anti-static brush.

(14) Press the latch to the left and remove the pinch rollers and its shaft.


When reinstalling the lower ADF chute, turn the planet gear counterclockwise (when viewed from the rear)
ADF drive unit
Grounding wire
Taptite, cup B M3x10
Planet gear
Lower ADF chute
Anti-static brush (Do not touch this.)
Pinch roller shaft
Pinch rollers
Pinch roller spring
ADF motor harness
Taptite, cup B M3x10
Grounding wire
Document sensor harness
Latch

(15) Remove the two screws from the ADF drive unit and release the ADF motor.

**NOTE:** When using a screwdriver, take care not to scratch or damage gears on the ADF drive unit.



**Reassembling Note:** When setting the ADF motor, hook the non-screw side of the flange on section "x" (shown above) and secure it with the screw.

**Reassembling Note:** Before reinstalling the lower ADF chute to the document tray, be sure to turn the planet gear on the ADF drive unit counterclockwise when viewed from the rear, as illustrated on the previous page.

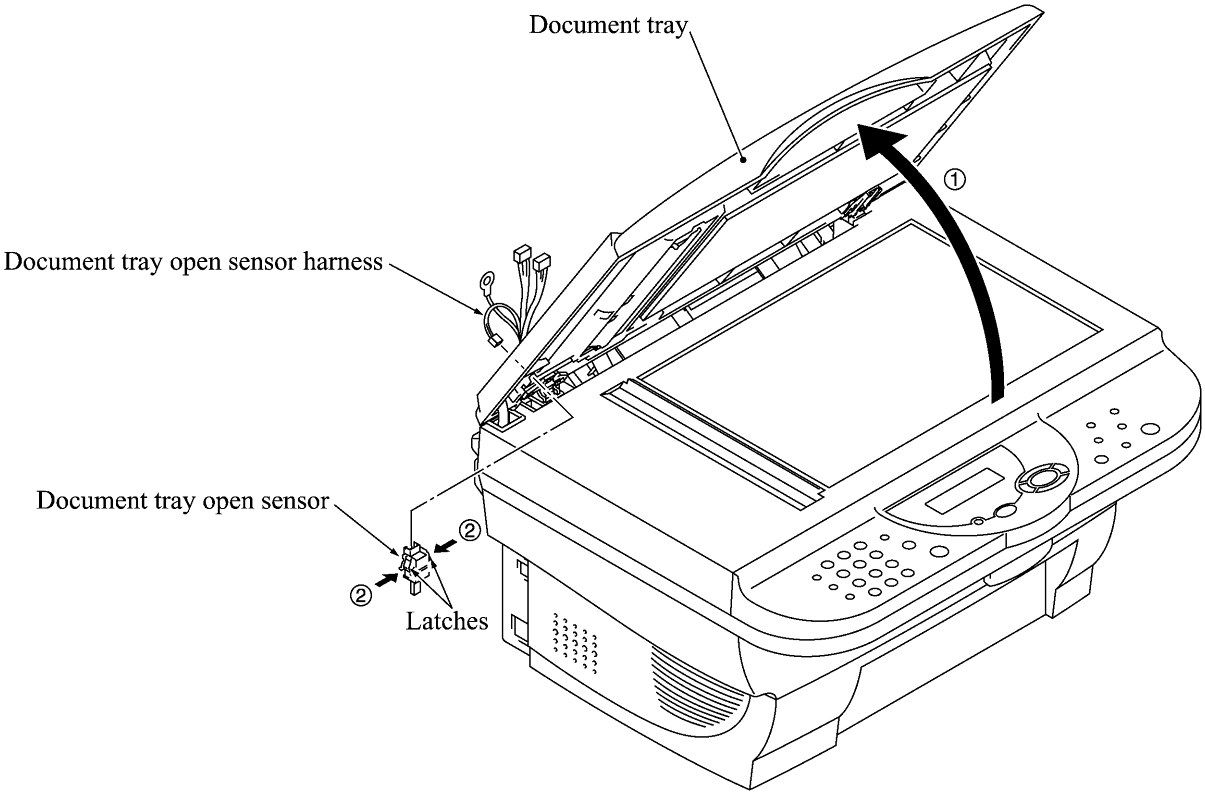
**Reassembling Note:** For routing the ADF motor harness, document sensor harness, and grounding wire, refer to Subsection 4.1.25, "Harness routing A." Secure the grounding wire at the angle shown on the previous page and let it hold down the ADF motor harness and document sensor harness as shown in "Harness routing A."

### 4.1.4 Document Tray Open Sensor and Document Stopper

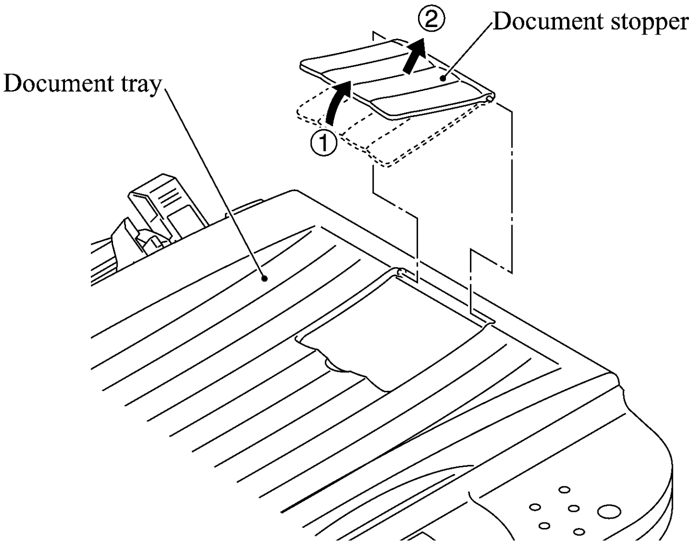
(1) Disconnect the document tray open sensor harness from the sensor.

(2) Open the document tray.

(3) Press the right and left latches of the document tray open sensor with the tip of a flat screwdriver as shown below and push it down.


Document tray
①
Document tray open sensor harness
Document tray open sensor
②
②
Latches

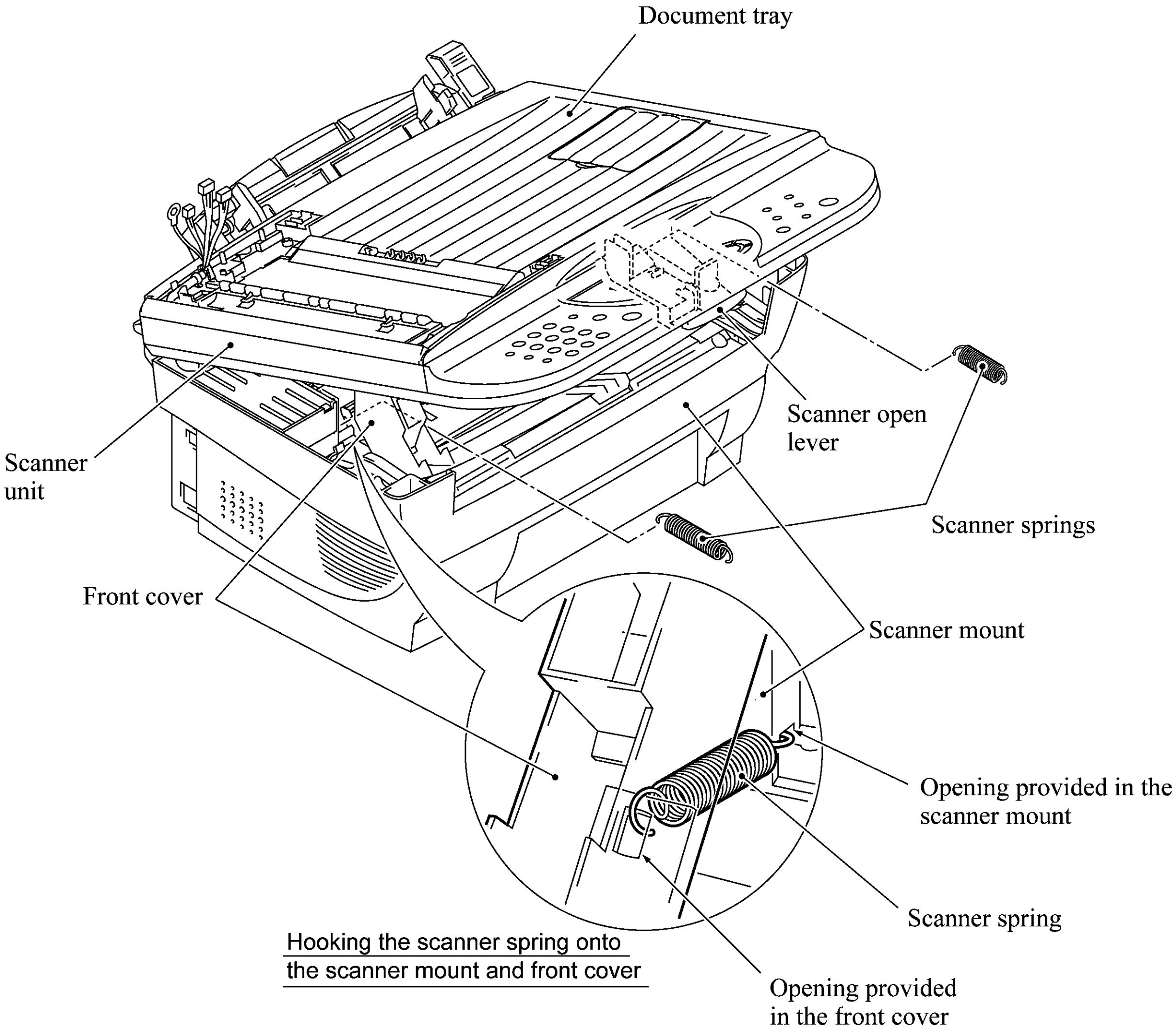
(4) Slightly open the document stopper and remove it while warping it.


②
Document stopper
Document tray
①

### 4.1.5 Scanner Unit and Control Panel ASSY (Together with Document Tray)

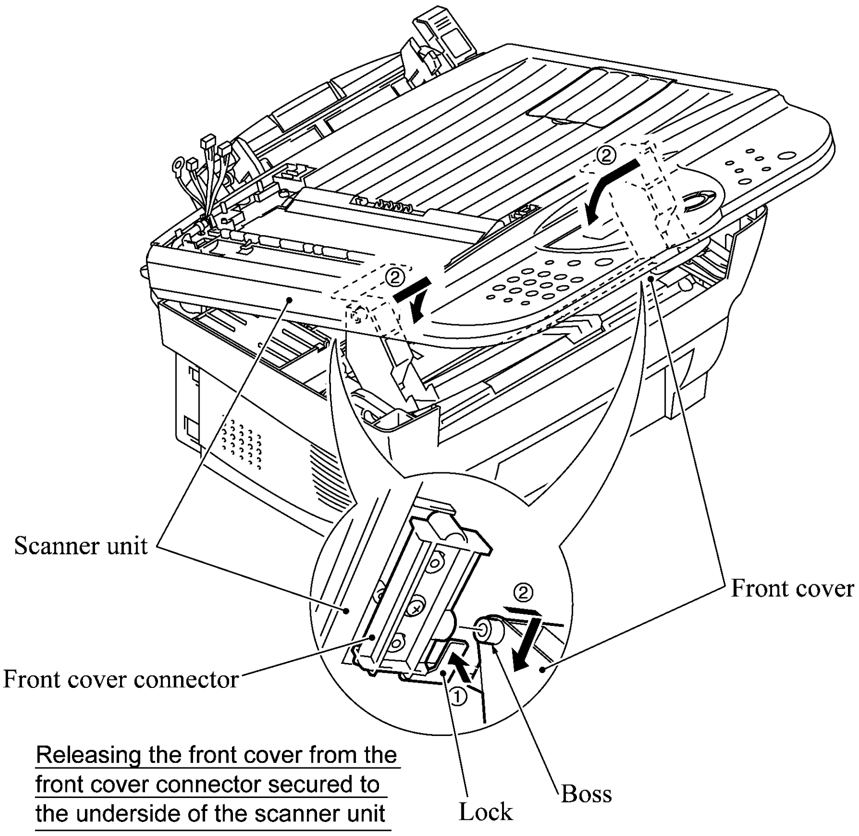
(1) Pull the scanner open lever and open the scanner unit.

(2) Unhook the two scanner springs. (The right-hand scanner spring is shorter than the left-hand one.)

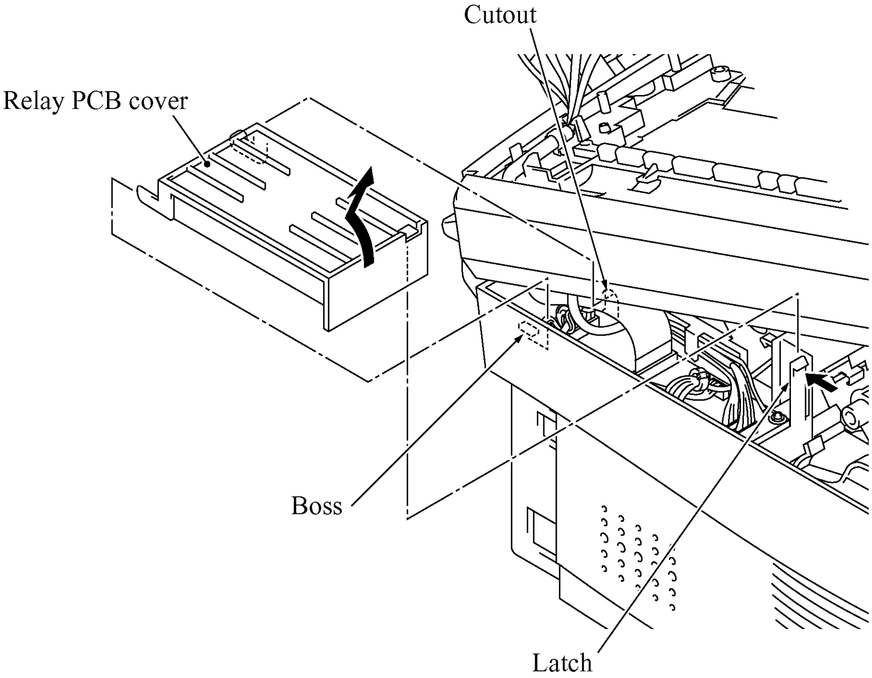

Document tray
Scanner unit
Scanner open lever
Scanner springs
Front cover
Scanner mount
Opening provided in the scanner mount
Scanner spring
Opening provided in the front cover

Hooking the scanner spring onto the scanner mount and front cover

(3) At each of the right and left rear edges of the front cover, push up the lock of the front cover connector (in the direction of arrow ①) and press the rear edge of the front cover inwards (arrow ②) to release its boss from the front cover connector.


②
②
Scanner unit
②
Front cover
Front cover connector
①
Releasing the front cover from the front cover connector secured to the underside of the scanner unit
Lock
Boss

(4) While keeping the scanner unit open, unlatch the relay PCB cover and take it out.

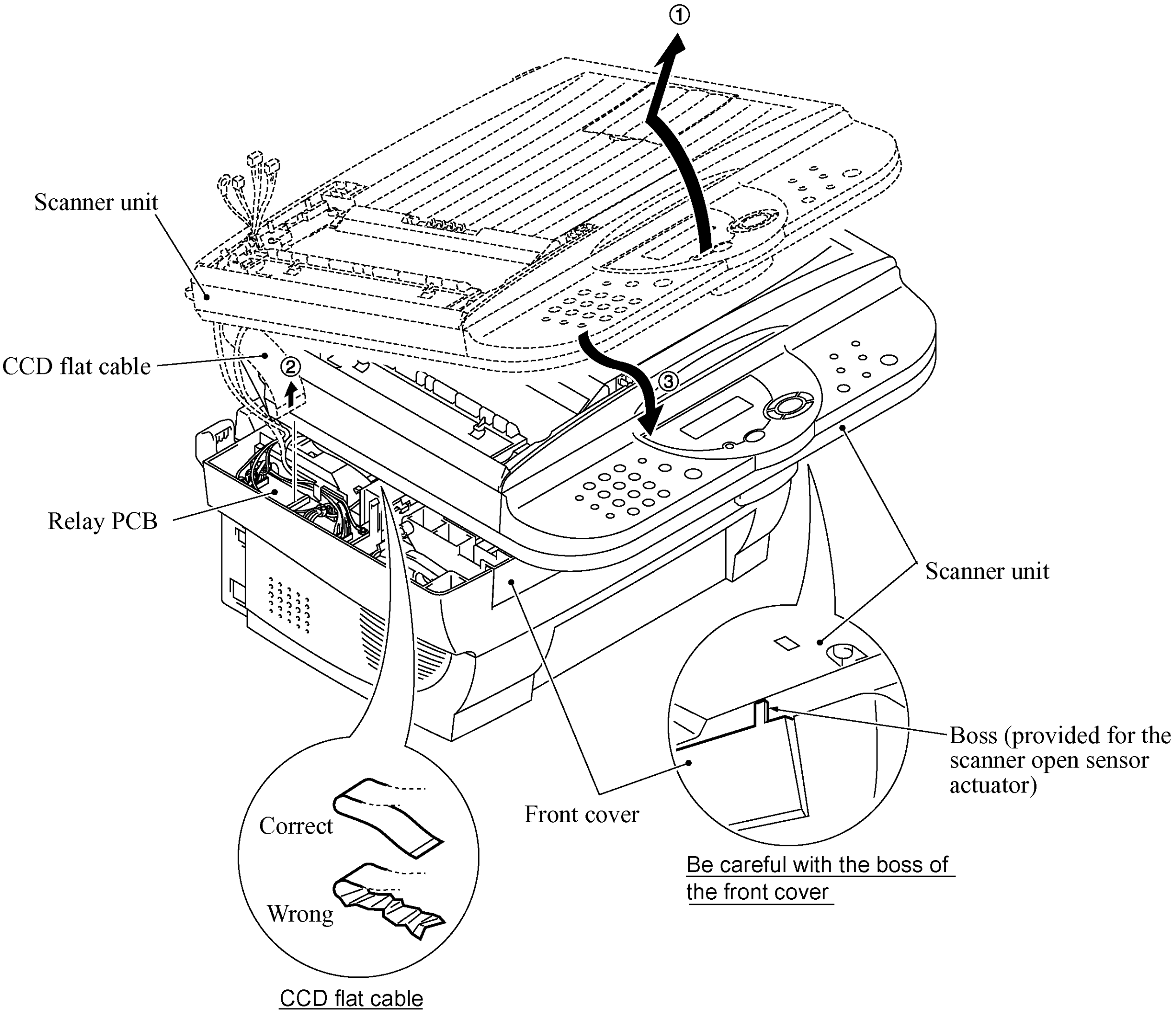

Cutout
Relay PCB cover
Boss
Latch

(5) While keeping the scanner unit open (in the direction of arrow ①), disconnect the CCD flat cable (arrow ②) from the relay PCB.

**NOTE:** Handle the CCD flat cable with care.

(6) Open the scanner unit further and lift up its rear edge to disengage it from the scanner mount. Then shift the scanner unit to the front right as shown below (arrow ③) so that the relay PCB can be fully seen.

**CAUTION:** When putting the scanner unit on the scanner mount, take special care not to bend, wrinkle, or scratch the CCD flat cable or not to break the boss of the front cover (that is provided for the scanner open sensor actuator) by the bottom of the scanner unit.

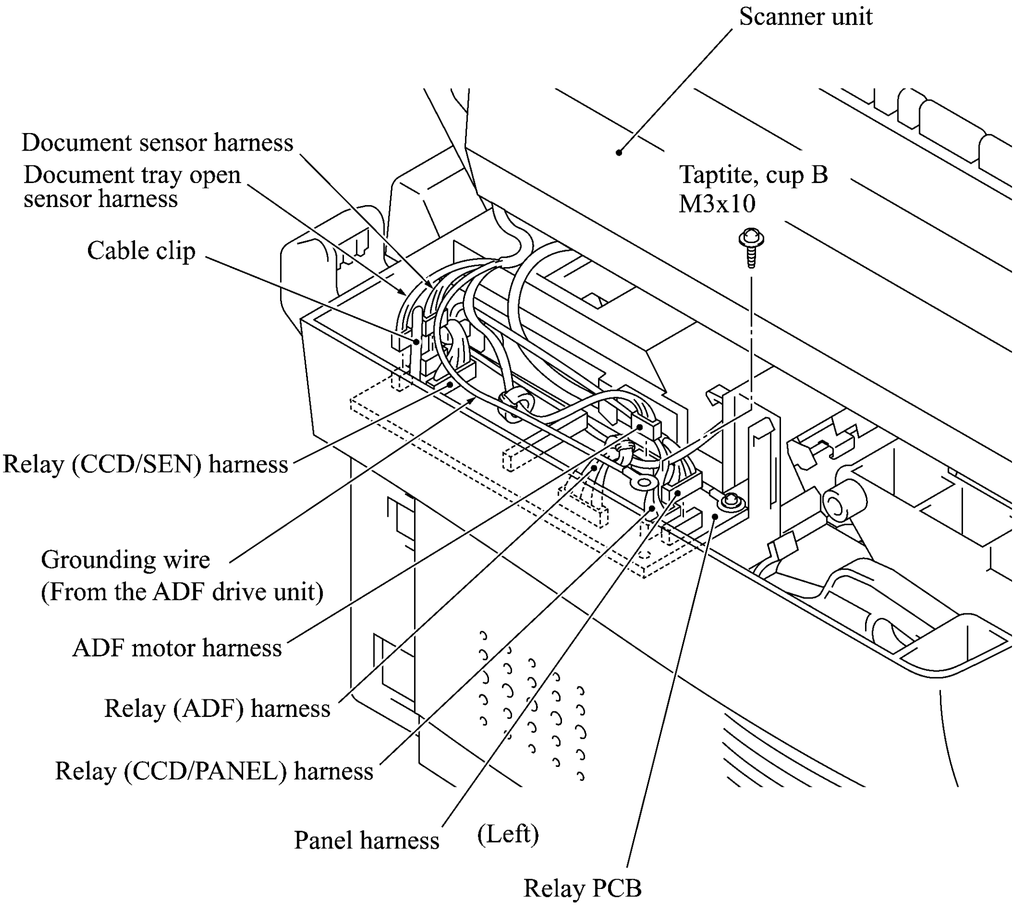

①
Scanner unit
CCD flat cable
②
③
Relay PCB
Scanner unit
Boss (provided for the scanner open sensor actuator)
Front cover
Correct
Wrong
Be careful with the boss of the front cover
CCD flat cable

(7) Disconnect the following harnesses from the relay PCB:

- Document tray open sensor harness
- Document sensor harness
- ADF motor harness
- Panel harness

(8) Release the grounding wire (coming from the ADF drive unit) by removing the screw.

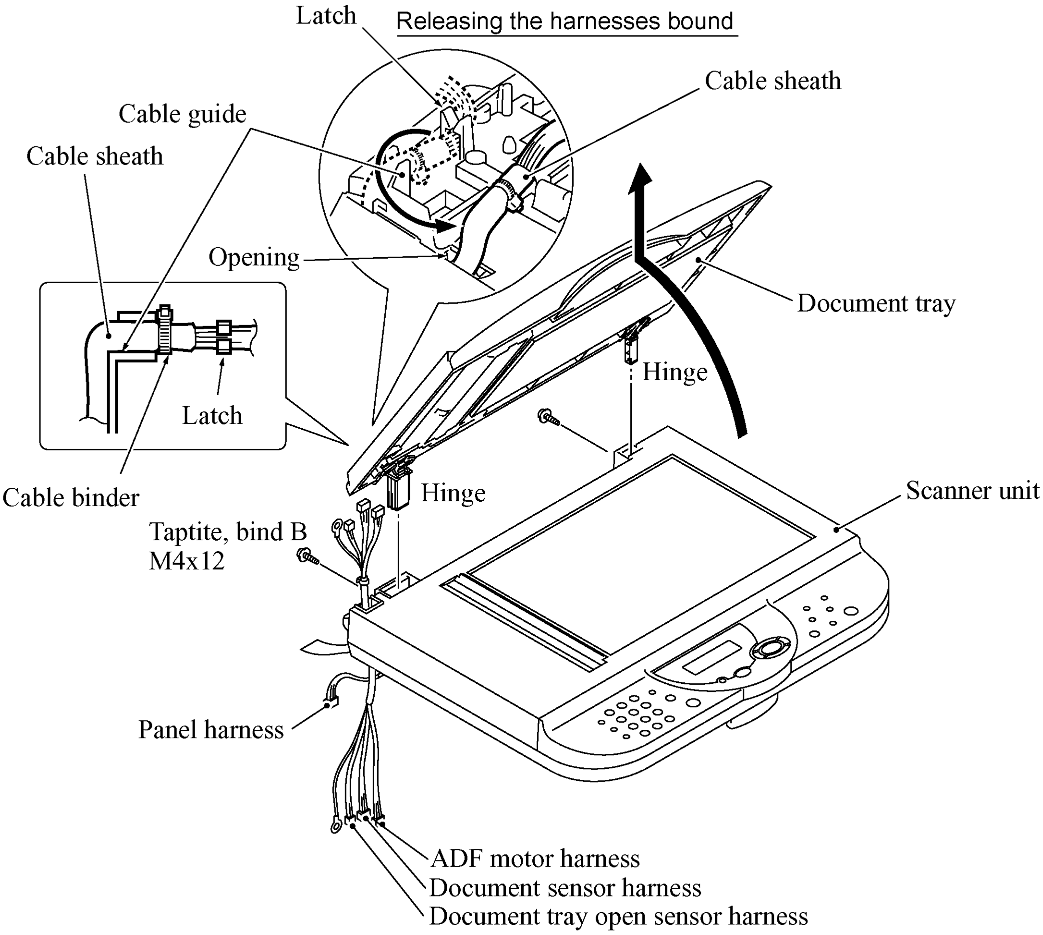
(9) Lift up the scanner unit together with the document tray and control panel ASSY.


Scanner unit
Document sensor harness
Document tray open sensor harness
Taptite, cup B M3x10
Cable clip
Relay (CCD/SEN) harness
Grounding wire (From the ADF drive unit)
ADF motor harness
Relay (ADF) harness
Relay (CCD/PANEL) harness
Panel harness
(Left)
Relay PCB

(10) Remove the two screws from the bottom rear of the hinges.

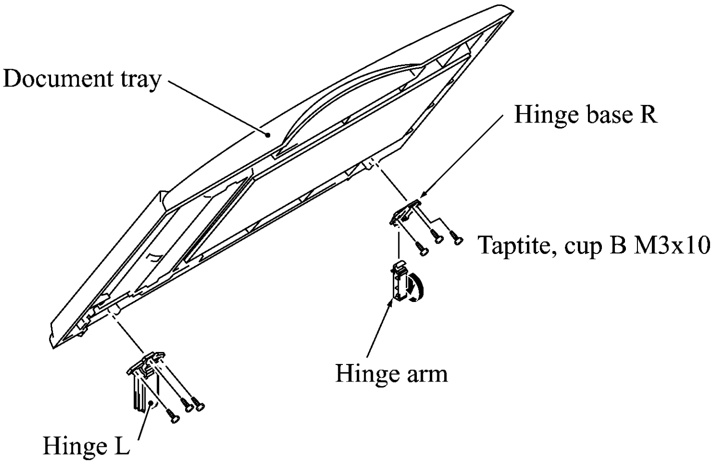
(11) Be sure to open the document tray, then release the harnesses (bound and covered with the cable sheath) from the latch and move them to the front in the opening.

(12) Lift up the document tray.


Latch
Releasing the harnesses bound
Cable sheath
Cable guide
Cable sheath
Opening
Document tray
Hinge
Latch
Cable binder
Hinge
Scanner unit
Taptite, bind B
M4x12
Panel harness
ADF motor harness
Document sensor harness
Document tray open sensor harness

(13) From the hinge base R, remove the hinge arm as shown below. Remove the three screws and release the hinge base R.

(14) From the hinge L that should be kept opened, remove the three screws.


Document tray
Hinge base R
Taptite, cup B M3x10
Hinge arm
Hinge L

(15) Remove the six screws from the underside of the scanner base.

(16) Release the two latches of the control panel ASSY from the scanner base.

(17) Slightly lift up the control panel ASSY and disconnect the panel harness from the control panel PCB.

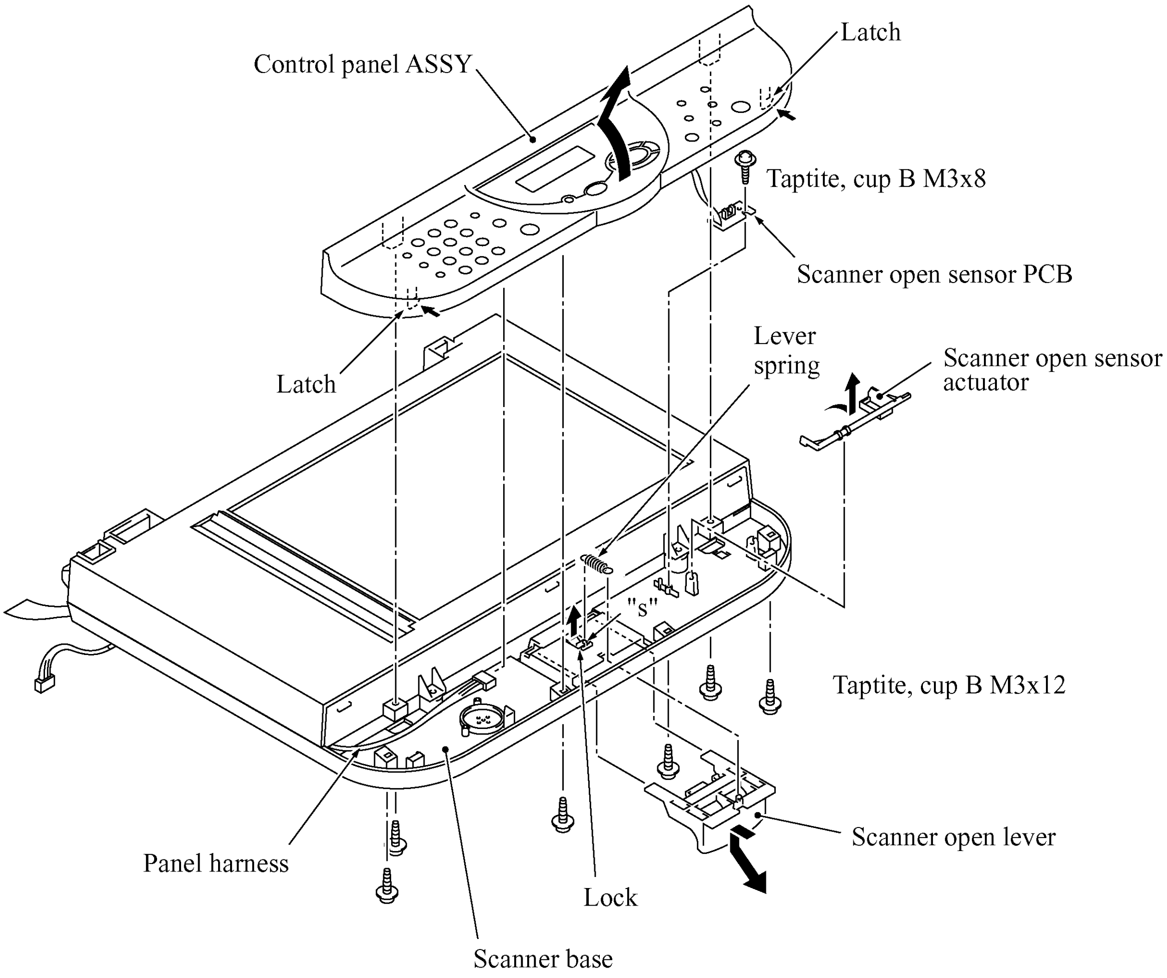
(18) Turn the scanner open sensor actuator as shown below and remove it.

(19) Remove the screw from the scanner open sensor PCB. Then the control panel ASSY is separated from the scanner unit.

(For the disassembly procedure of the control panel ASSY and scanner unit, refer to Subsections 4.1.6 and 4.1.7, respectively.)

(20) Remove the lever spring.

(21) Insert the tip of a flat screwdriver into slit "s," push up the lock, and remove the scanner open lever in the direction of the arrow.


Latch
Control panel ASSY
Taptite, cup B M3x8
Scanner open sensor PCB
Lever spring
Scanner open sensor actuator
Latch
"s"
Taptite, cup B M3x12
Scanner open lever
Panel harness
Lock
Scanner base

## ■ Reassembling Notes

- When setting the document tray on the scanner unit, pass the bound harnesses (ADF motor harness, document sensor harness, document tray open sensor harness, and grounding wire) through the front section of the opening provided in the left rear corner of the document tray, with its bound section facing up (see the illustration given on page 4-22).

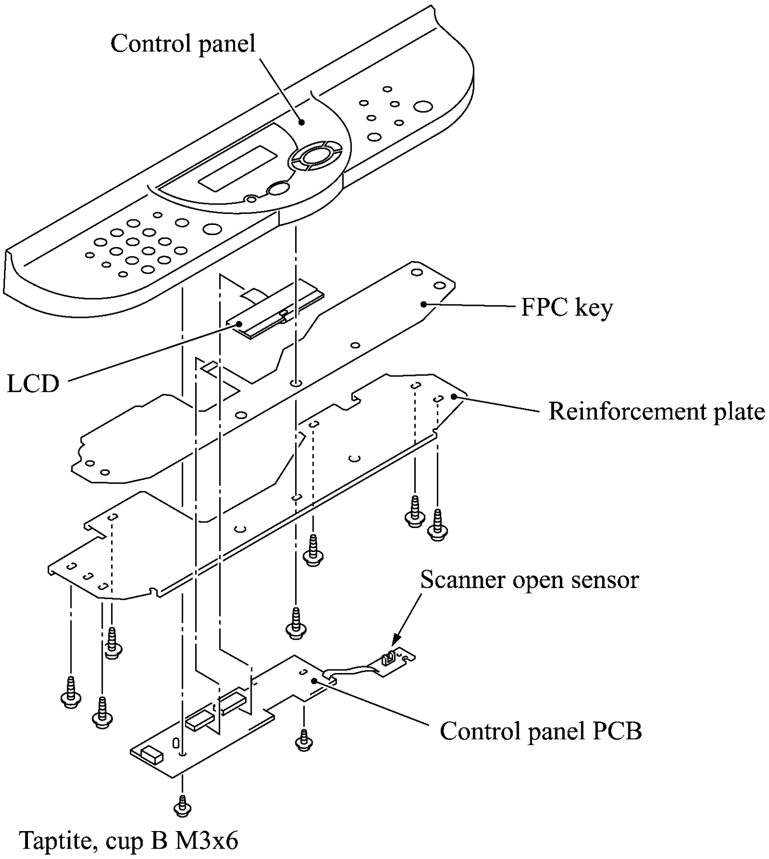
  Move those bound harnesses to the rear section of the opening. Route the bound section through the cable guide so that the cable binder comes into contact with the cable guide as illustrated on page 4-22. Refer to Subsection 4.1.25 "Harness routing A."
- When putting the scanner unit on the scanner mount, take special care not to bend, wrinkle, or scratch the CCD flat cable or not to break the boss of the front cover by the bottom of the scanner unit. (See the illustration given on page 4-20.)
- Route the document sensor harness, document tray open sensor harness, ADF motor harness, panel harness, and grounding wire on the scanner mount as shown on page 4-21. Wind the document sensor harness and document tray open sensor harness around the cable clip on the relay PCB, and then bend the cable clip as shown in Subsection 4.1.25, "Harness routing B."

### 4.1.6 Disassembly of the Control Panel ASSY

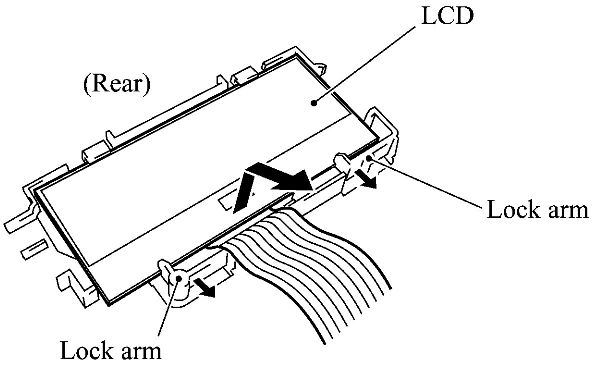
(1) Remove the two screws from the control panel PCB.

(2) Slightly lift up the control panel PCB, then unlock the FPC key connector and disconnect the FPC key. Next, unlock the LCD cable connector and disconnect the LCD flat cable.

(3) Remove the seven screws and take off the reinforcement plate and FPC key.


Control panel
FPC key
LCD
Reinforcement plate
Scanner open sensor
Control panel PCB
Taptite, cup B M3x6

(4) As shown below, pull the lock arms outwards to release the LCD and pull the LCD flat cable gently.


LCD
(Rear)
Lock arm
Lock arm

### ■ Reassembling Notes

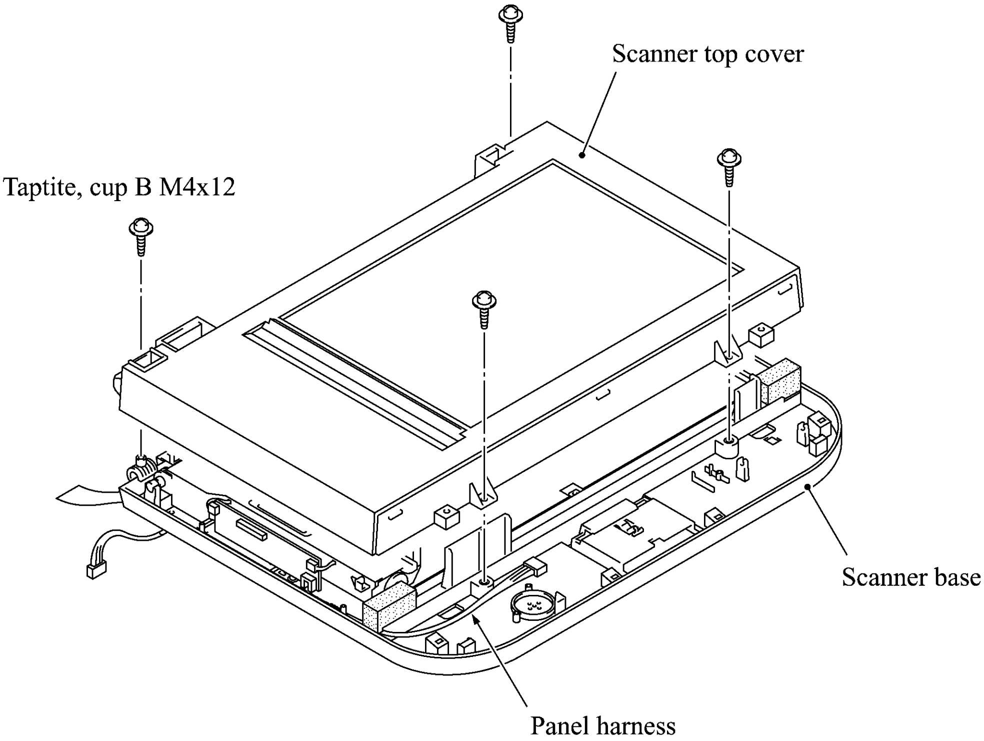
- Before reinstalling the LCD to the control panel, wipe fingerprints or dust off the LCD surface and control panel window with a soft cloth.
- A new LCD is covered with a protection sheet. Before installing it, remove the protection sheet.

### 4.1.7 Disassembly of the Scanner Unit

The disassembly job of the scanner unit should be done in a clean room to prevent dust or dirt from getting into the scanner unit.

(1) Remove the four screws from the scanner top cover.

(2) Separate the scanner top cover from the scanner base.

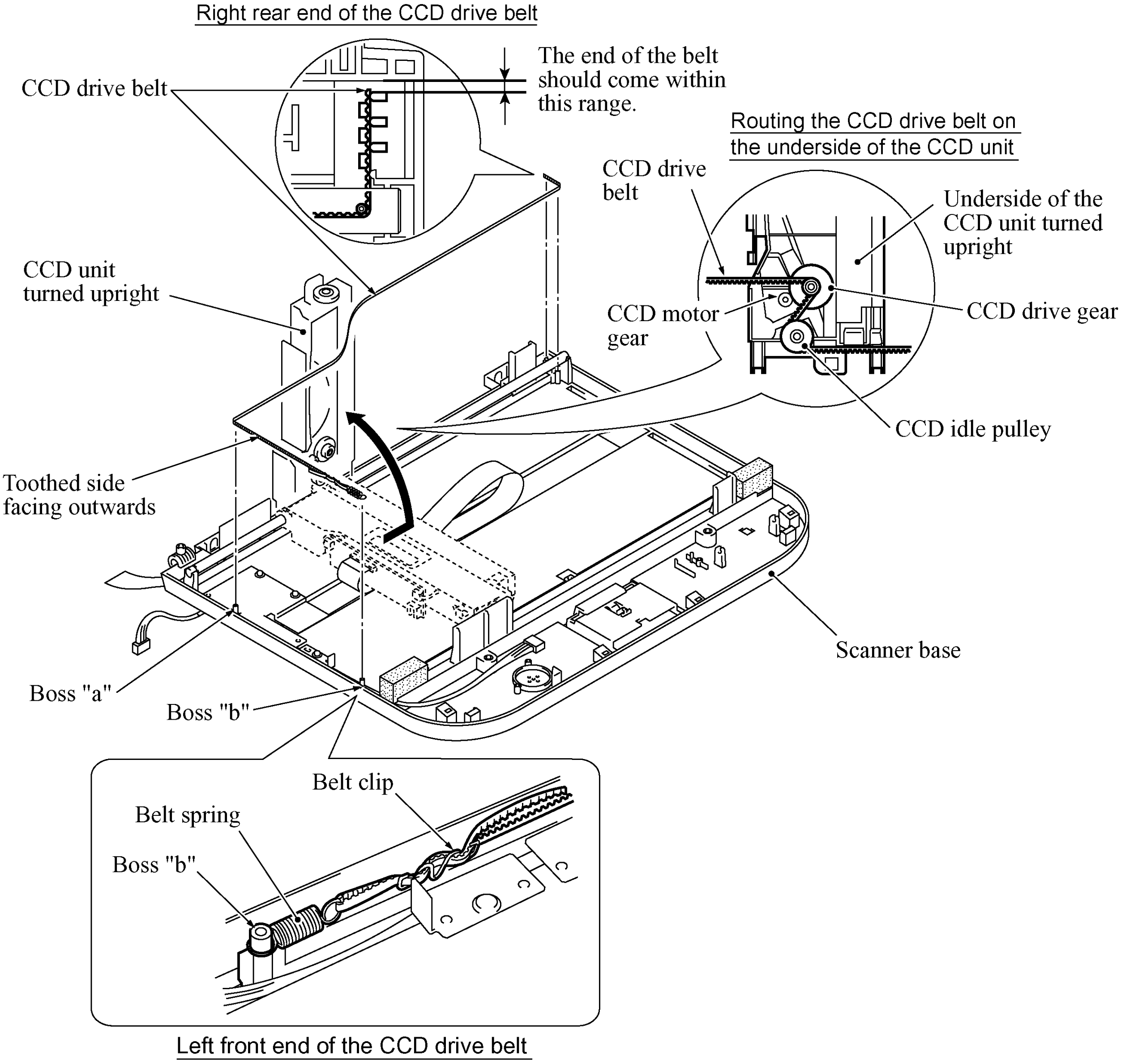

Scanner top cover
Taptite, cup B M4x12
Scanner base
Panel harness

(3) Release the CCD drive belt from boss "a."

(4) At the left front end of the CCD drive belt, unhook the belt spring from boss "b."

**NOTE:** Do not remove the belt spring or belt clip from the CCD drive belt.

(5) As illustrated below, move the CCD unit to the right, lift up its front end and turn the CCD unit upright. The CCD drive belt will slip off the CCD idle pulley and gear on the underside of the CCD unit.

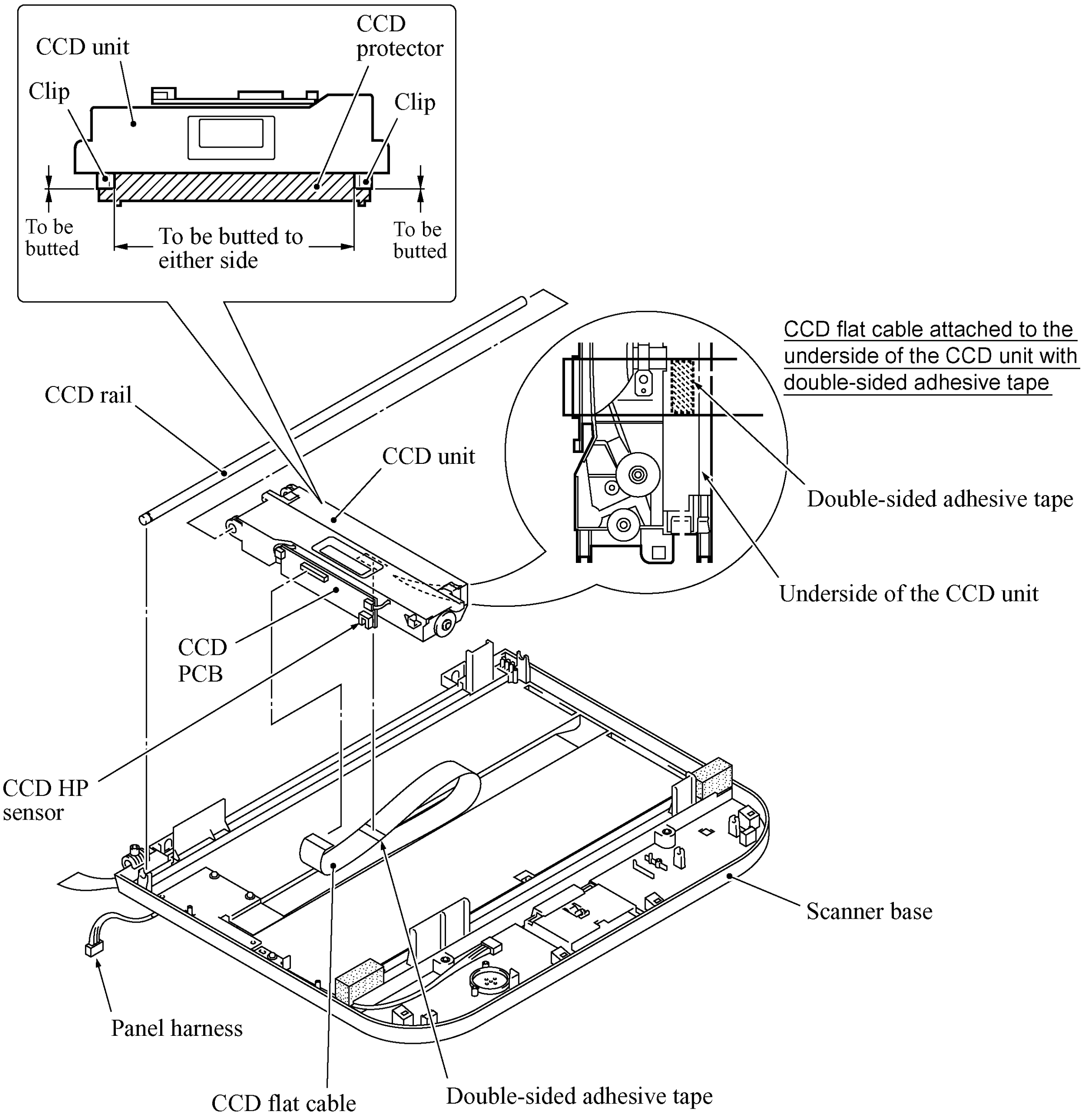

Right rear end of the CCD drive belt
CCD drive belt
The end of the belt should come within this range.
Routing the CCD drive belt on the underside of the CCD unit
CCD drive belt
Underside of the CCD unit turned upright
CCD unit turned upright
CCD motor gear
CCD drive gear
CCD idle pulley
Toothed side facing outwards
Scanner base
Boss "a"
Boss "b"
Belt clip
Belt spring
Boss "b"
Left front end of the CCD drive belt

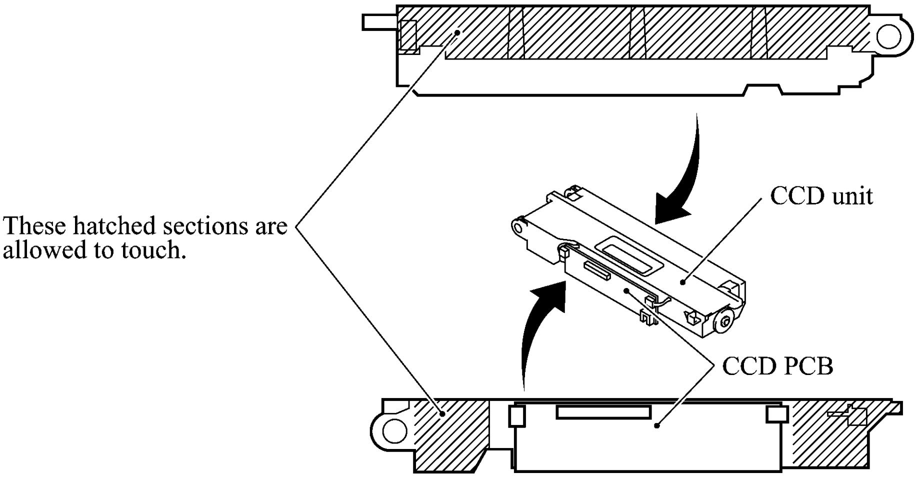
(6) Disconnect the CCD flat cable from the CCD PCB, then release the cable that is attached to the underside of the CCD unit with double-sided adhesive tape.

**NOTE:** Only when the CCD unit or CCD flat cable is defective and requires replacement, release the flat cable. Once released, the flat cable should be attached using new double-sided adhesive tape.

(7) Lift up the CCD rail together with the CCD unit from the scanner base, then pull out the CCD rail.

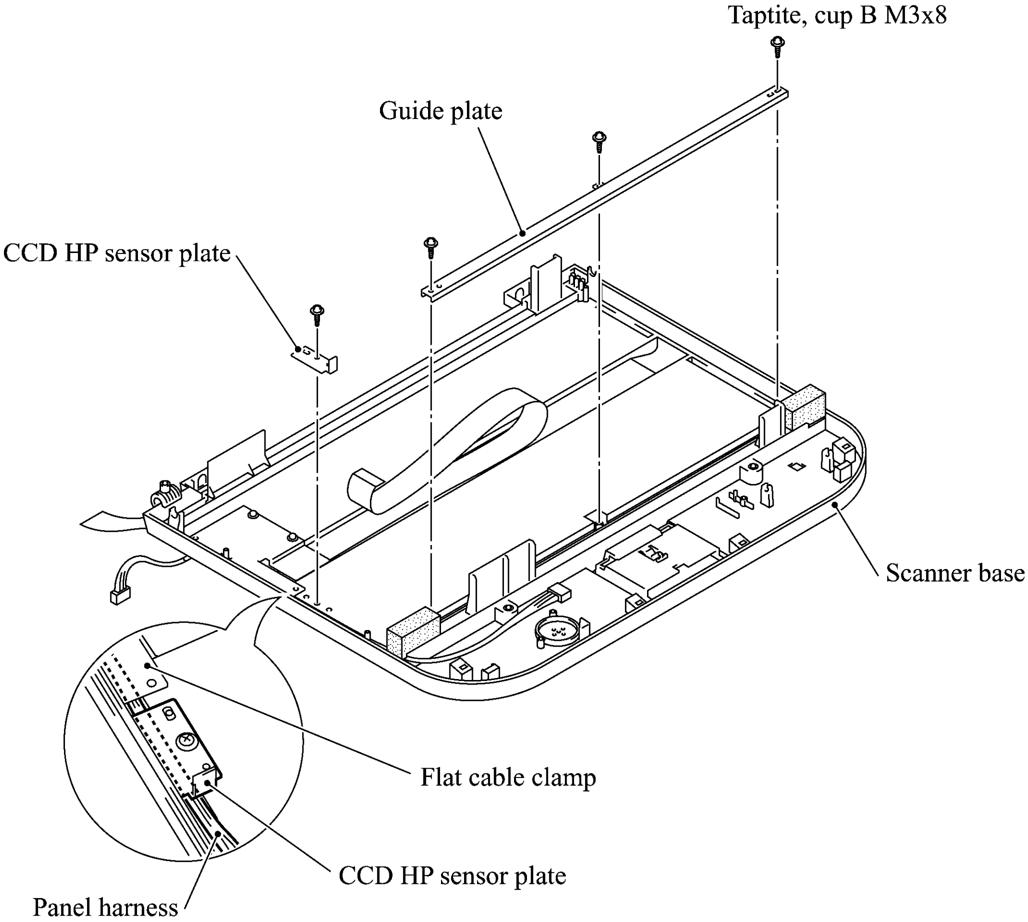
**NOTE:** When handling the CCD unit, do not touch the CCD PCB or glasses but hold the hatched sections as shown on the next page.


CCD unit
CCD protector
Clip
Clip
To be butted
To be butted to either side
To be butted
CCD flat cable attached to the underside of the CCD unit with double-sided adhesive tape
CCD rail
CCD unit
Double-sided adhesive tape
Underside of the CCD unit
CCD PCB
CCD HP sensor
Scanner base
Panel harness
CCD flat cable
Double-sided adhesive tape


These hatched sections are allowed to touch.
CCD unit
CCD PCB

(8) Remove the three screws and lift up the guide plate.

(9) Remove the screw from the CCD HP sensor plate.


Taptite, cup B M3x8
Guide plate
CCD HP sensor plate
Scanner base
Flat cable clamp
CCD HP sensor plate
Panel harness

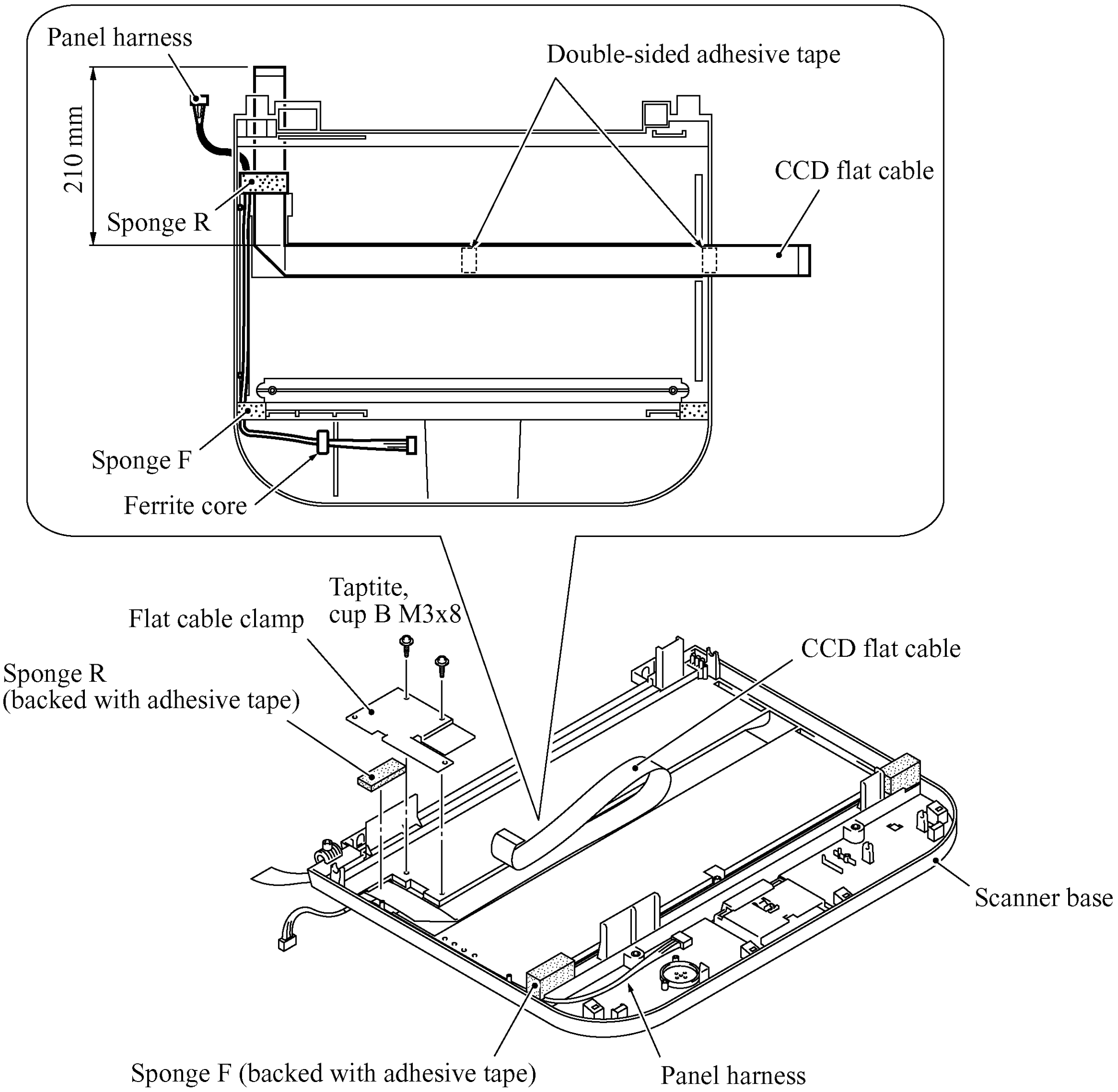
(10) Remove the two screws and take off the flat cable clamp.

(11) To take out the panel harness, remove sponges F and R that are backed with adhesive tape.

**NOTE:** Once removed, those sponges will become unusable and new parts will have to be put back in.

(12) To take out the CCD flat cable, remove sponge R.

CCD flat cable and panel harness secured to the scanner base


Panel harness
Double-sided adhesive tape
210 mm
CCD flat cable
Sponge R
Sponge F
Ferrite core
Taptite,
cup B M3x8
Flat cable clamp
Sponge R
(backed with adhesive tape)
CCD flat cable
Scanner base
Sponge F (backed with adhesive tape)
Panel harness

## ■ Reassembling Notes

- When replacing the CCD unit with a new one, you need to attach a CCD protector to it as specified on page 4-28. A new CCD protector is covered with a protection sheet, so remove the protection sheet before attaching.
- When using a new CCD flat cable, fold it and secure it to the scanner base with double-sided adhesive tape and sponge R (backed with adhesive tape) as illustrated above.

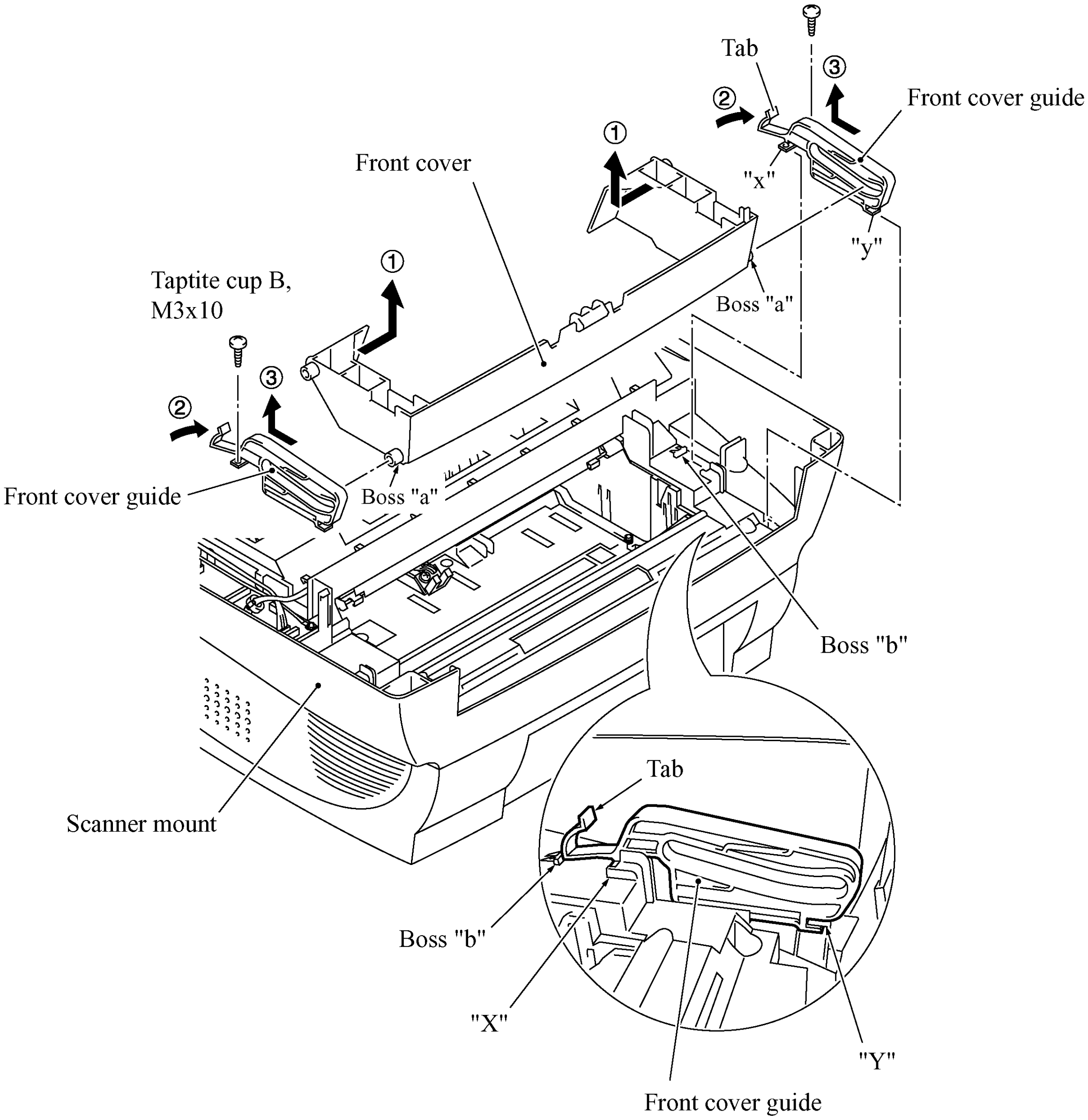
  Then attach it to the underside of the CCD unit with double-sided adhesive tape.
- When reassembling the components inside the scanner unit, use screws (Taptite, cup B M3x8). Never use longer ones (e.g., M3x10). Using longer ones will bore a hole in the scanner base.
- When installing the CCD drive belt to the scanner base, set its rear end within the range specified on page 4-27.

### 4.1.8 Front Cover

(1) Press the rear ends of the front cover inwards (in the direction of arrow ①) to release bosses "a" from the front cover guides.

(2) Remove the screw from each of the front cover guides.

(3) While pulling the tab of each front cover guide up and to the front (in the direction of arrow ②) to release the guide from boss "b," remove the guide in the direction of arrow ③.

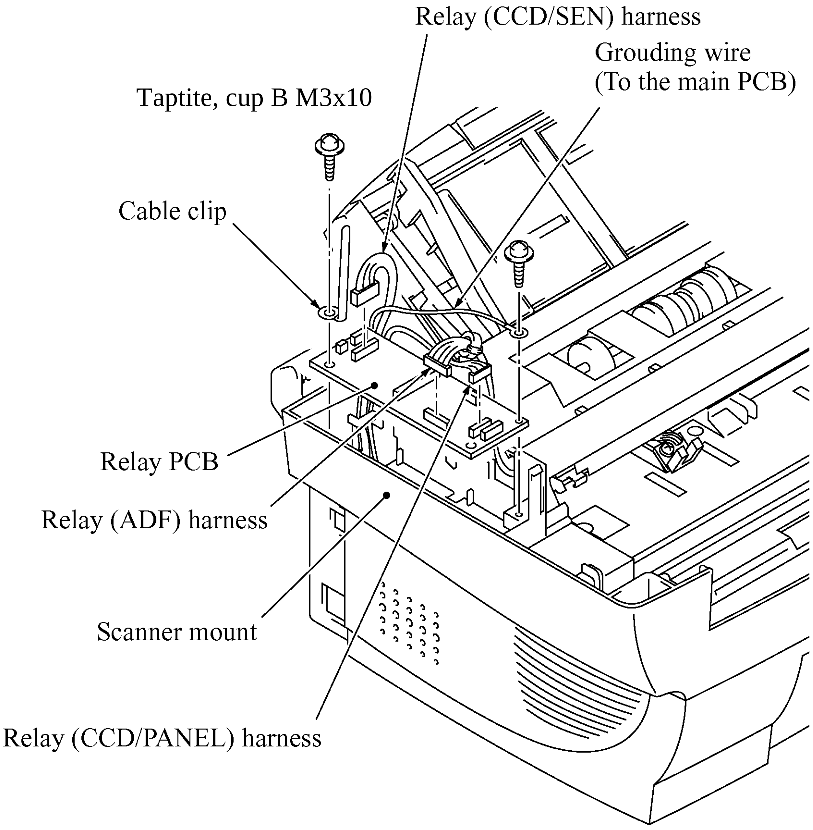

Tab
③
②
Front cover guide
①
Front cover
"x"
"y"
①
Boss "a"
Taptite cup B,
M3x10
③
②
Front cover guide
Boss "a"
Boss "b"
Scanner mount
Tab
Boss "b"
"X"
"Y"
Front cover guide

## ■ Reassembling Notes

- When setting the front cover guides back into place, fit sections "y" and "x" into "Y" and "X" of the scanner mount, respectively, while pushing the guides down and to the front.

### 4.1.9 Relay PCB

1. Disconnect the three relay harnesses from the relay PCB.
2. Remove the two screws. The cable clip will come off and the grounding wire will be released.
3. Lift up the relay PCB.

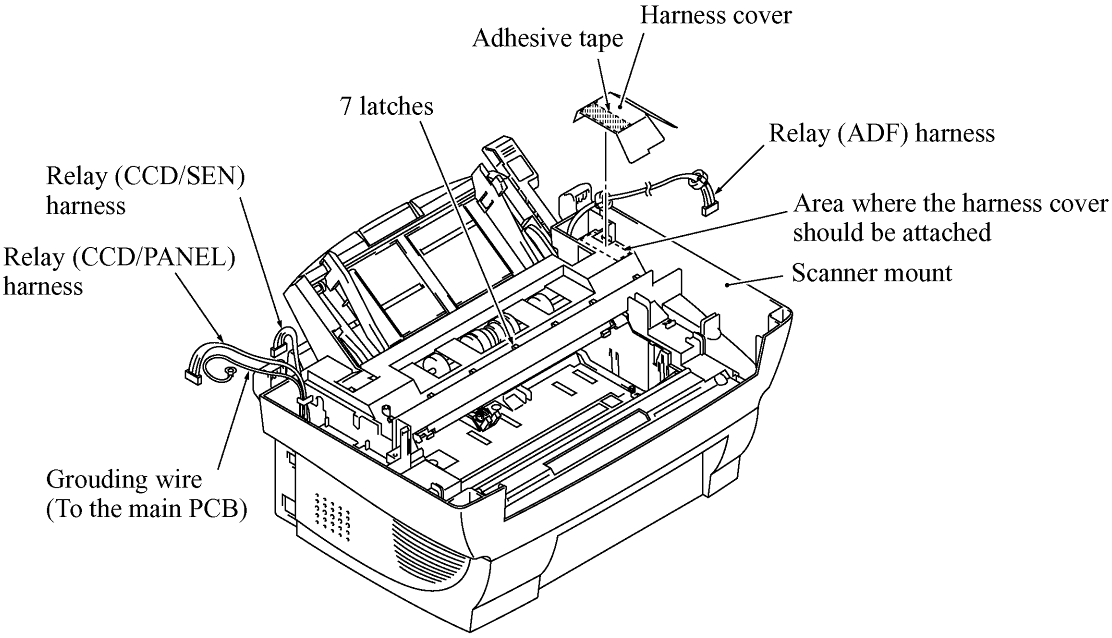

Relay (CCD/SEN) harness
Grouding wire
(To the main PCB)
Taptite, cup B M3x10
Cable clip
Relay PCB
Relay (ADF) harness
Scanner mount
Relay (CCD/PANEL) harness

### 4.1.10 Scanner Mount

(1) Remove the harness cover.

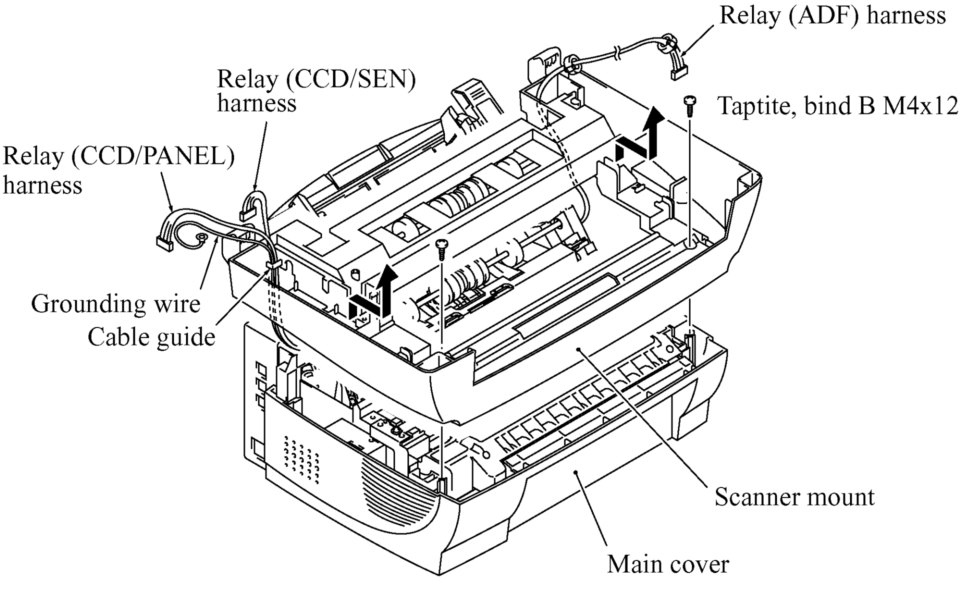
**NOTE:** Once removed, the harness cover will become unusable and a new part will have to be put back in.

(2) Remove the relay (ADF) harness from seven latches and then bring it to the right.


Harness cover
Adhesive tape
7 latches
Relay (ADF) harness
Relay (CCD/SEN) harness
Area where the harness cover should be attached
Relay (CCD/PANEL) harness
Scanner mount
Grouding wire (To the main PCB)

(3) Remove the two screws from the scanner mount

(4) Remove the scanner mount in the direction of the arrows.


Relay (ADF) harness
Relay (CCD/SEN) harness
Taptite, bind B M4x12
Relay (CCD/PANEL) harness
Grounding wire
Cable guide
Scanner mount
Main cover

## ■ Reassembling Notes

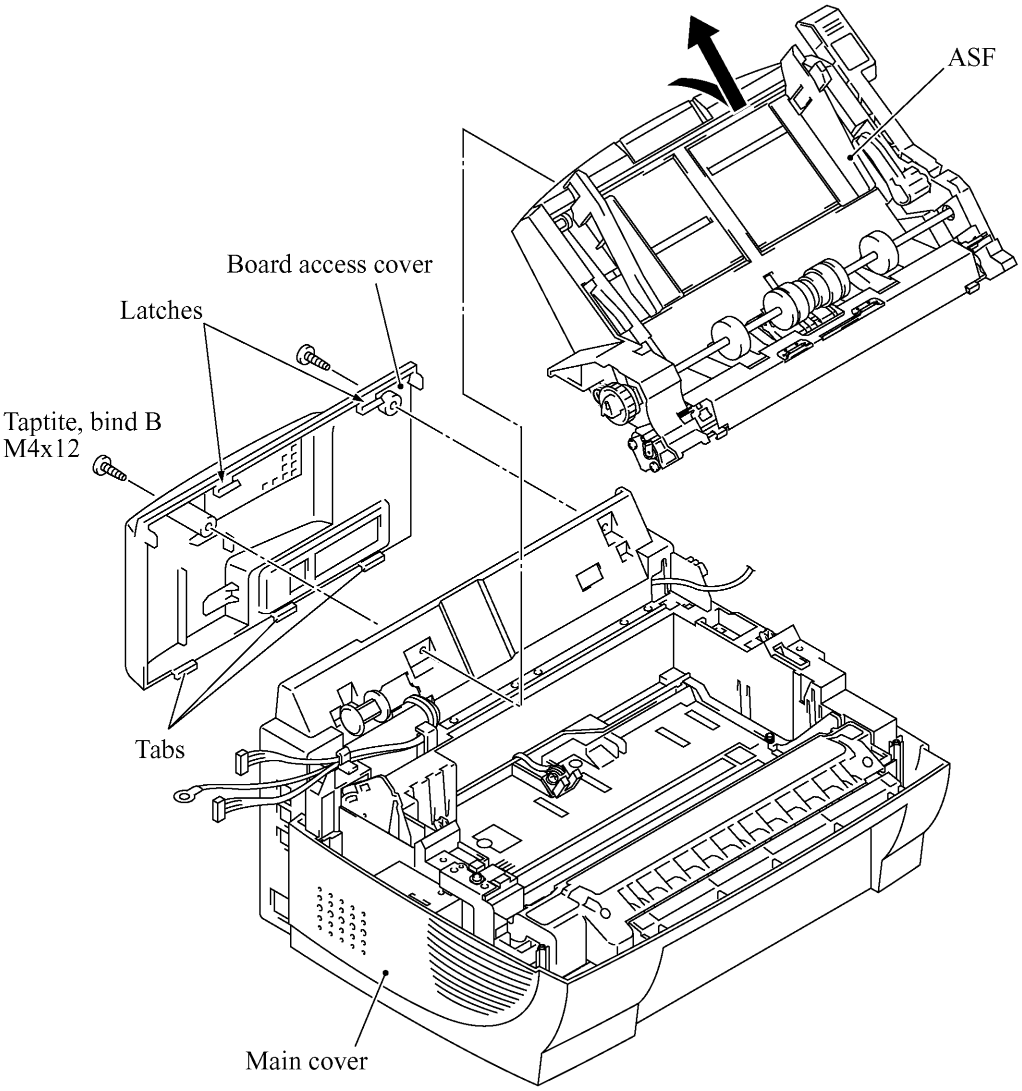
- Route the relay (ADF) harness through seven latches on the scanner mount. Refer to Subsection 4.1.25, "Harness routing C."

### 4.1.11 Board Access Cover and Auto Sheet Feeder (ASF)

(1) Remove the two screws from the board access cover. (Those screws secure also the ASF to the main cover.)

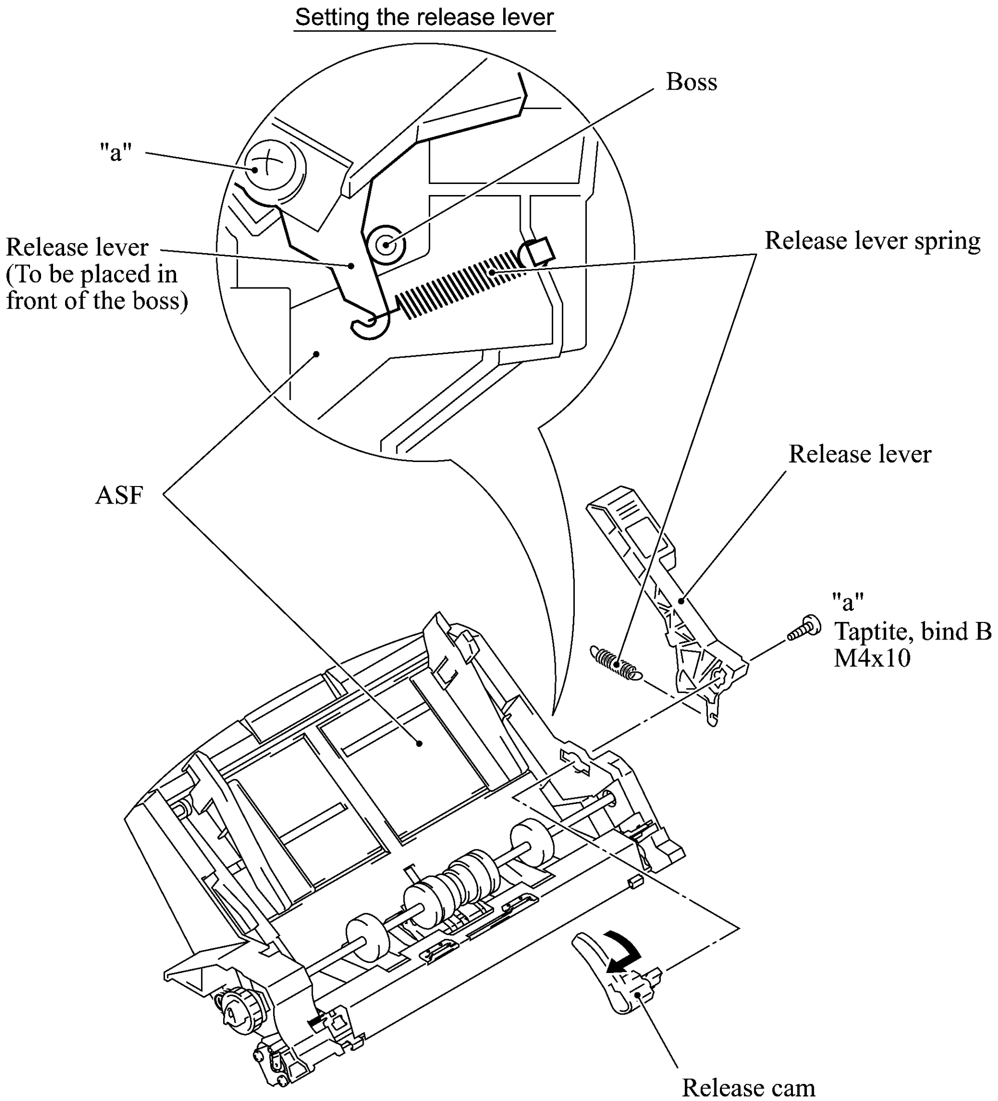
(2) Push down the top of the board access cover to release the two latches from the main cover, then pull it to the rear.

(3) Pull the ASF to the front and then lift it up.


ASF
Board access cover
Latches
Taptite, bind B
M4x12
Tabs
Main cover

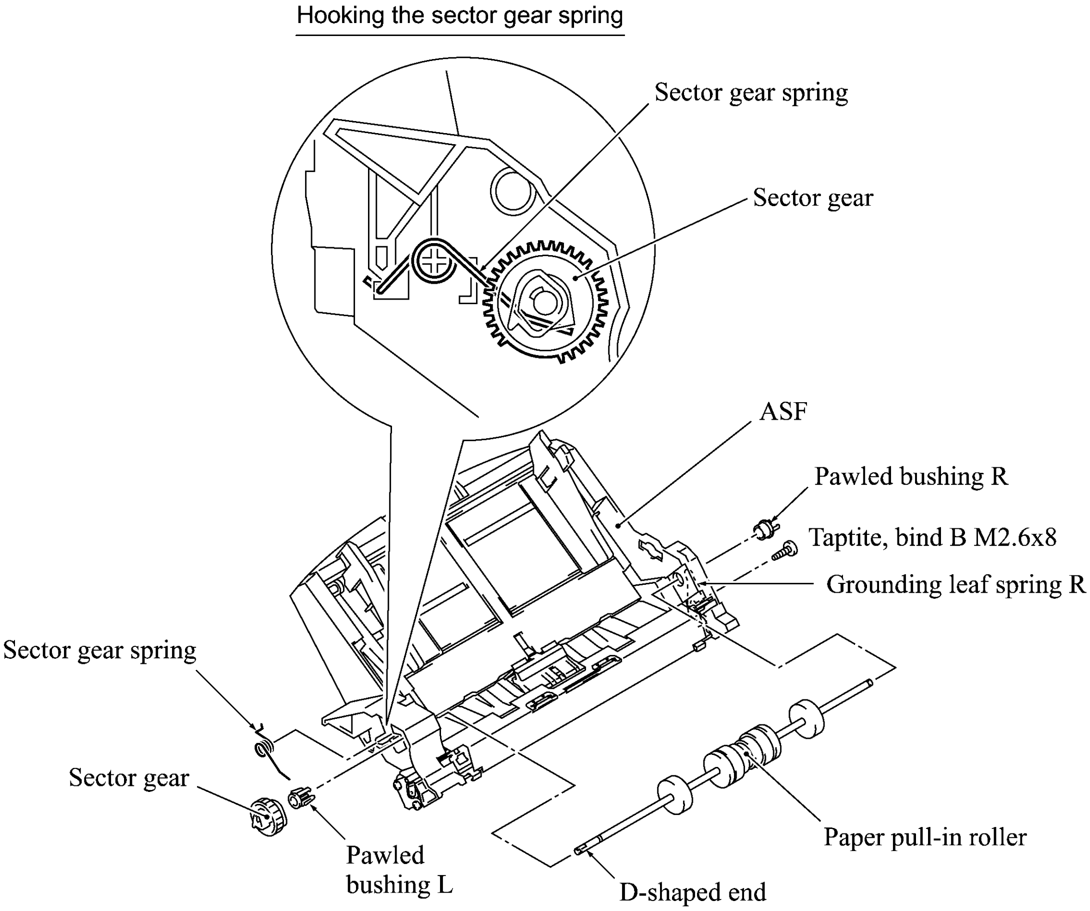
## [Disassembling the ASF]

1) Unhook the release lever spring.
2) Remove screw "a" and pull out the release lever.
3) Turn the release cam to the front and pull it out to the left.

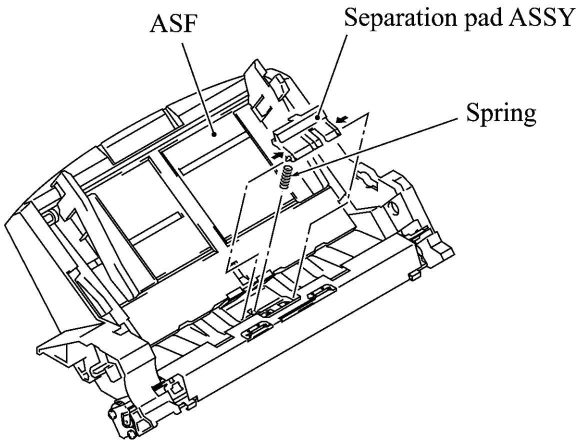

Setting the release lever
Boss
"a"
Release lever
(To be placed in
front of the boss)
Release lever spring
ASF
Release lever
"a"
Taptite, bind B
M4x10
Release cam

4) At the right end of the ASF, remove the screw from the grounding leaf spring R. (It is not necessary to remove the leaf spring.) Next pull out the pawled bushing R.

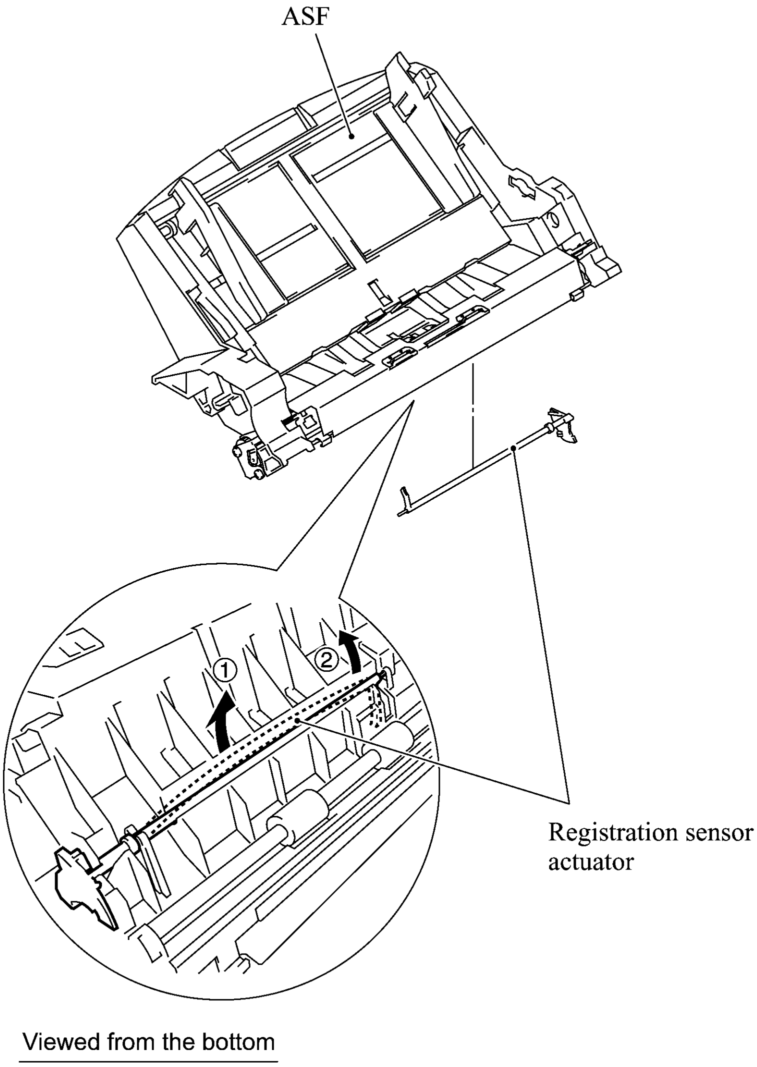
   At the left end of the ASF, remove the sector gear and its spring. Unlatch the pawled bushing L to the left and then remove it from the paper pull-in roller shaft. Remove the paper pull-in roller.


Hooking the sector gear spring
Sector gear spring
Sector gear
ASF
Pawled bushing R
Taptite, bind B M2.6x8
Grounding leaf spring R
Sector gear spring
Sector gear
Pawled bushing L
Paper pull-in roller
D-shaped end

5) Push the right and left ends of the separation pad ASSY inwards and take it out. The spring also comes off.


ASF
Separation pad ASSY
Spring

6) Turn the ASF upside down, then remove the registration sensor actuator.


ASF
①
②
Registration sensor actuator
Viewed from the bottom

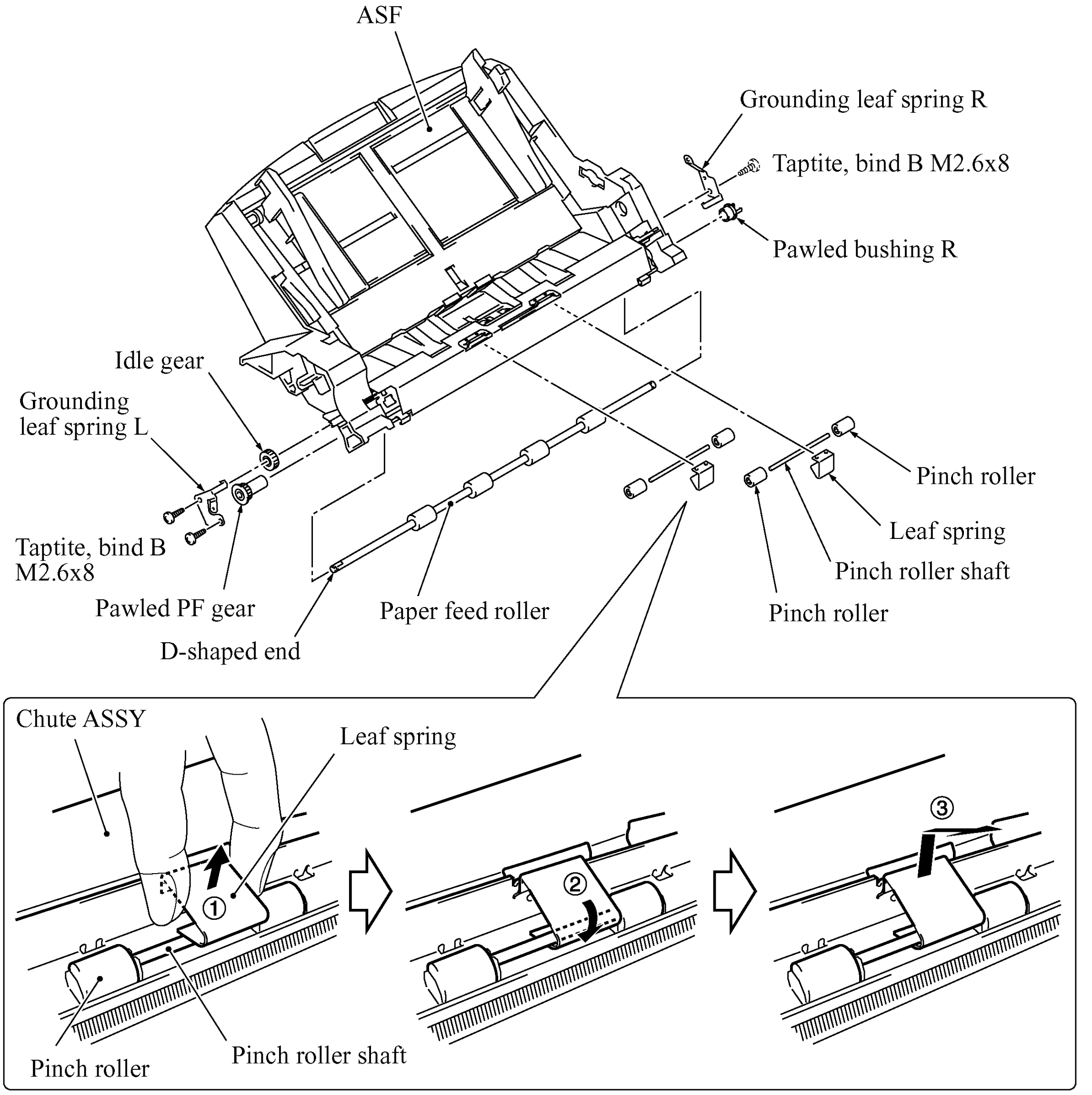
7) There are two sets of pinch roller units. At each set, remove the leaf spring (in the order of ① to ③ shown below), pinch rollers, and pinch roller shaft.

8) At the right end of the paper feed roller, remove the screw and take off the grounding leaf spring R if you have not removed it in step 4) above.

   Remove the pawled pushing R.

9) At the left end of the paper feed roller, remove two screws and take off the grounding leaf spring L, pawled PF gear, and idle gear.

   Then remove the paper feed roller.

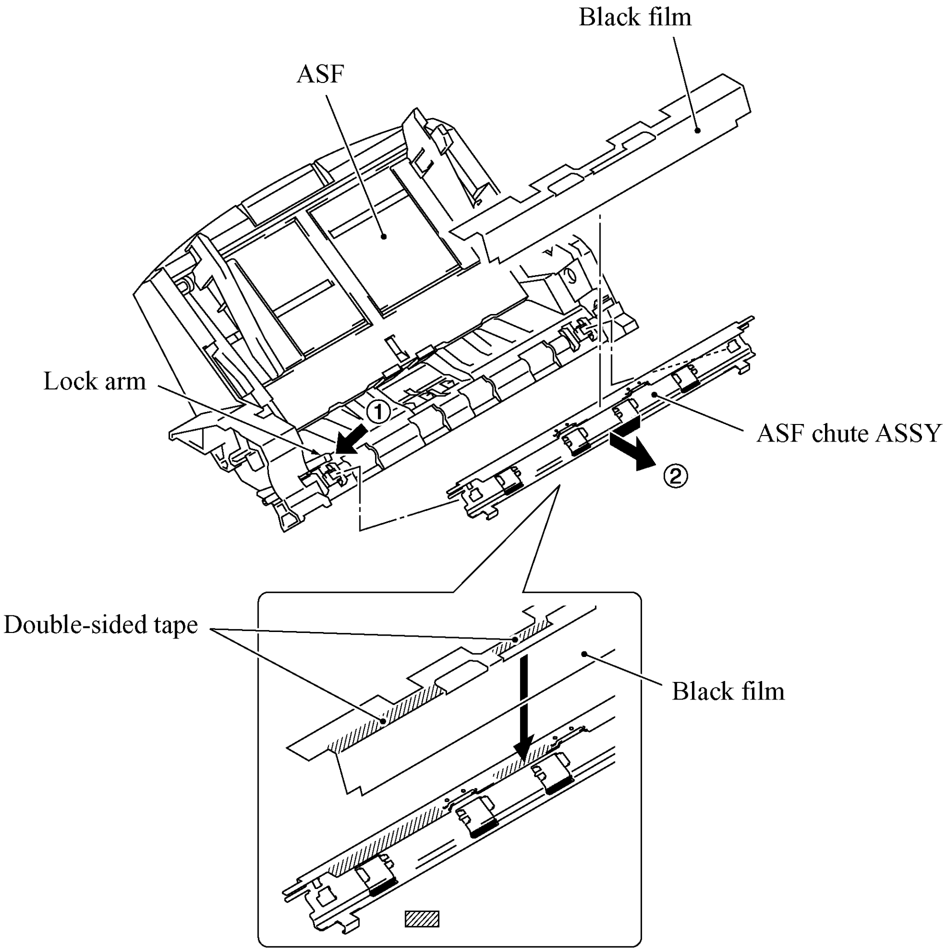

ASF
Grounding leaf spring R
Taptite, bind B M2.6x8
Pawled bushing R
Idle gear
Grounding leaf spring L
Pinch roller
Leaf spring
Pinch roller shaft
Taptite, bind B M2.6x8
Pinch roller
Pawled PF gear
Paper feed roller
D-shaped end
Chute ASSY
Leaf spring
①
②
③
Pinch roller
Pinch roller shaft

Removing the leaf spring from the pinch roller shaft

10) Press the lock arm provided at the left inside of the ASF to the rear with a screwdriver, slide the ASF chute ASSY to the left, and take it out to the front.

**NOTE:** To replace only the black film attached to the chute, do not remove the chute ASSY from the ASF.

**NOTE:** A new chute and black film will be provided separately. When replacing the ASF chute ASSY, first set the chute into the ASF and then attach the black film to the chute. If you first attach the black film to the chute and then set the ASF chute ASSY, then the black film may be bent or wrinkled.



## ■ Reassembling Notes

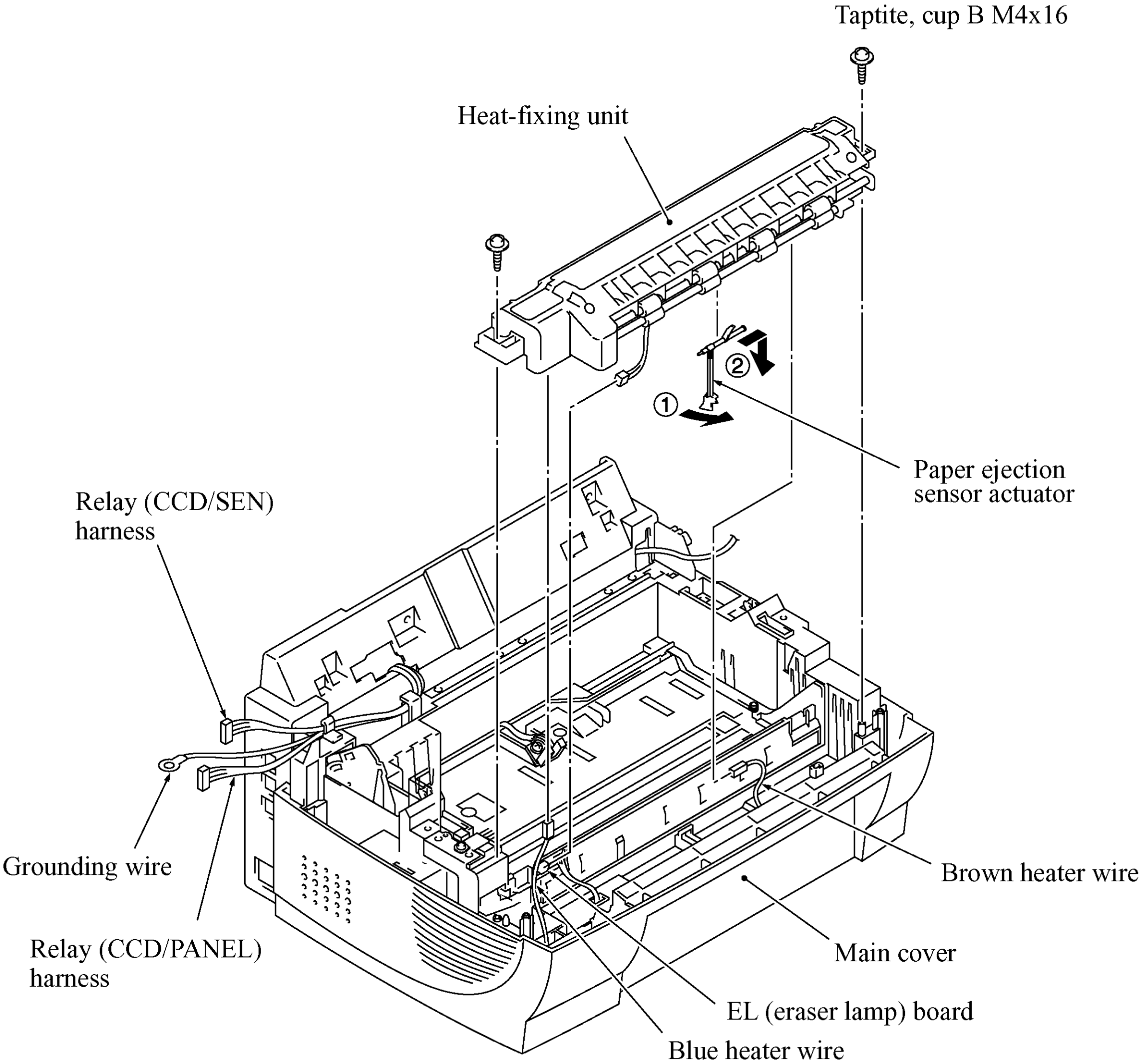
- Set the paper feed roller into the ASF with the D-shaped end facing leftwards.
- Set the paper pull-in roller into the ASF with the D-shaped end facing leftwards.
- When setting the release lever back into place, turn the release cam to the rear and then set the release lever so that the bottom end of the release lever comes in the front of the boss provided on the ASF, as illustrated on page 4-35.

### 4.1.12 Heat-fixing Unit, FU Lamp, and Paper Ejection Sensor Actuator

(1) Remove the two screws from the heat-fixing unit.

(2) Lift up the heat-fixing unit and disconnect the blue and brown heater wires (of the heater harness) from the heat-fixing unit. Then disconnect the heater thermistor harness from the EL (eraser lamp) board.

(3) Remove the paper ejection sensor actuator from the bottom of the heat-fixing unit.


Taptite, cup B M4x16
Heat-fixing unit
②
①
Paper ejection sensor actuator
Relay (CCD/SEN) harness
Grounding wire
Relay (CCD/PANEL) harness
Brown heater wire
Main cover
EL (eraser lamp) board
Blue heater wire

(4) To take out the FU lamp from the heat-fixing unit, remove two screws "a."

(5) Fully open the upper cover and remove it.

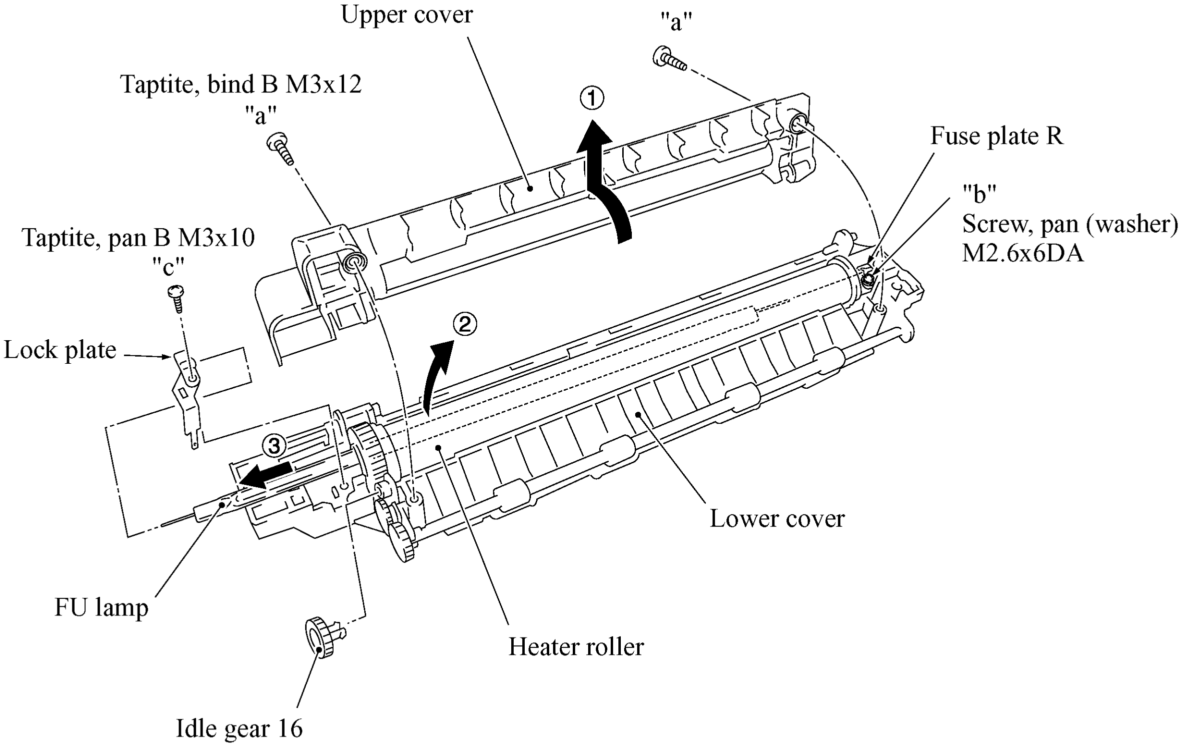
(6) Unlatch the idle gear 16 and remove it.

(7) Loosen screw "b."

(8) Remove screw "c" and take out the lock plate.

(9) Slightly lift up the left end of the heater roller and hold the left end of the FU lamp. While pinching the fuse plate R with your right hand, pull out the FU lamp from the heater roller.

**CAUTION:** Do not touch the FU lamp. If you have touched it, clean it thoroughly with alcohol.


Upper cover
"a"
Taptite, bind B M3x12
"a"
①
Fuse plate R
"b"
Screw, pan (washer)
M2.6x6DA
Taptite, pan B M3x10
"c"
②
Lock plate
③
Lower cover
FU lamp
Heater roller
Idle gear 16

## ■ Reassembling Notes

- When setting the FU lamp into the heat-fixing unit, be sure to insert the right edge of the wire into the folded fuse plate R.
- A new heat-fixing unit will be provided with the heater thermistor harness being taped to the unit. When installing the unit, remove the tape.
- Route the blue and brown heater wires on the main cover as illustrated in Subsection 4.1.25, "Harness routing F."

### 4.1.13 Laser Unit and Toner Sensor PCB

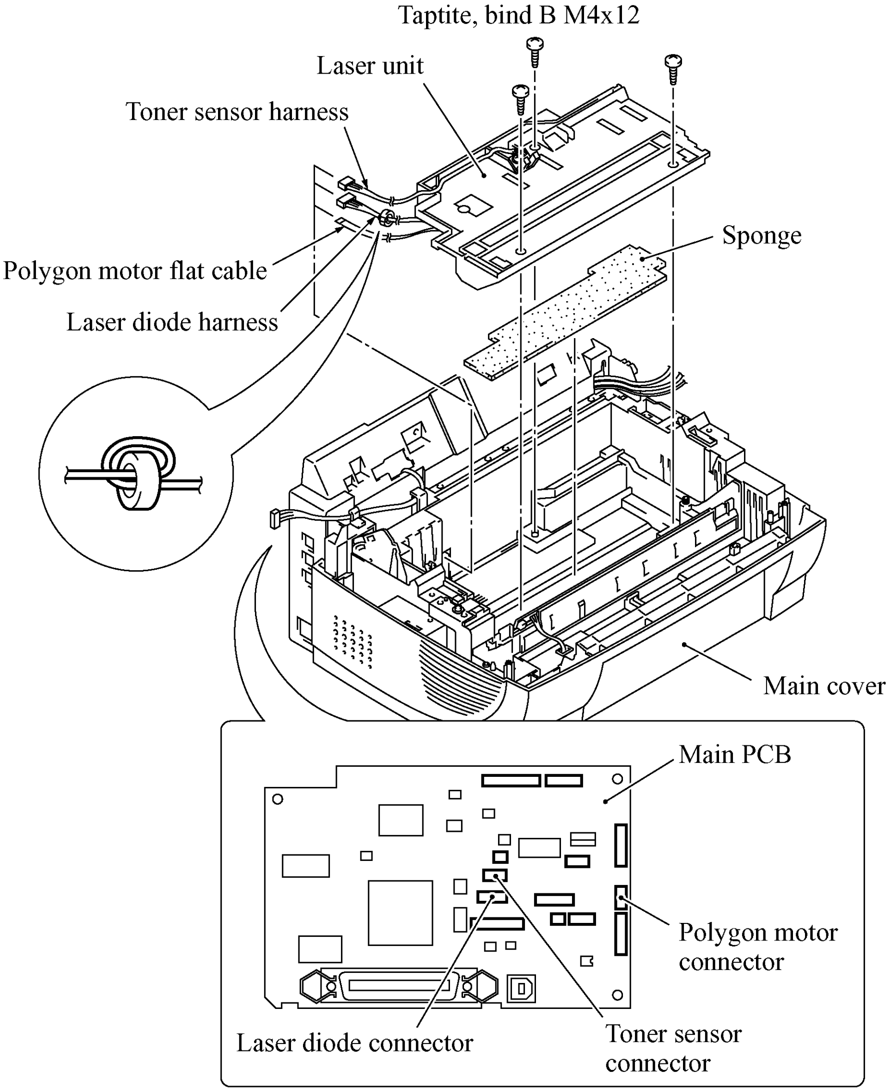
(1) Disconnect the polygon motor flat cable, toner sensor harness, and laser diode harness from the main PCB.

(2) Remove the three screws from the laser unit.

(3) Lift up the laser unit.

**NOTE:** When handling the laser unit, take care not to touch the inside of the unit, glass, or mirror.

**NOTE:** On the small PCB at the right side of the laser unit is a 2-pin connector which is for the adjustment in the factory. Do not disturb it.


Taptite, bind B M4x12
Laser unit
Toner sensor harness
Sponge
Polygon motor flat cable
Laser diode harness
Main cover
Main PCB
Polygon motor connector
Laser diode connector
Toner sensor connector

■ **Reassembling Notes**

- When replacing the laser unit with a new one, be sure to attach a ferrite core to the laser diode harness of the new laser unit. Wind the harness around the ferrite core by two turns as shown above, just like the laser diode harness of the old laser unit.
- On the underside of the laser unit, route the laser diode harness, polygon motor flat cable, and toner sensor harness as illustrated in Subsection 4.1.25, "Harness routing G."
- Before putting the laser unit back into place, check for any toner particles, paper dust or dirt, and clean them out.
- Make sure that the sponge is placed below the laser unit.

### 4.1.14 Main PCB

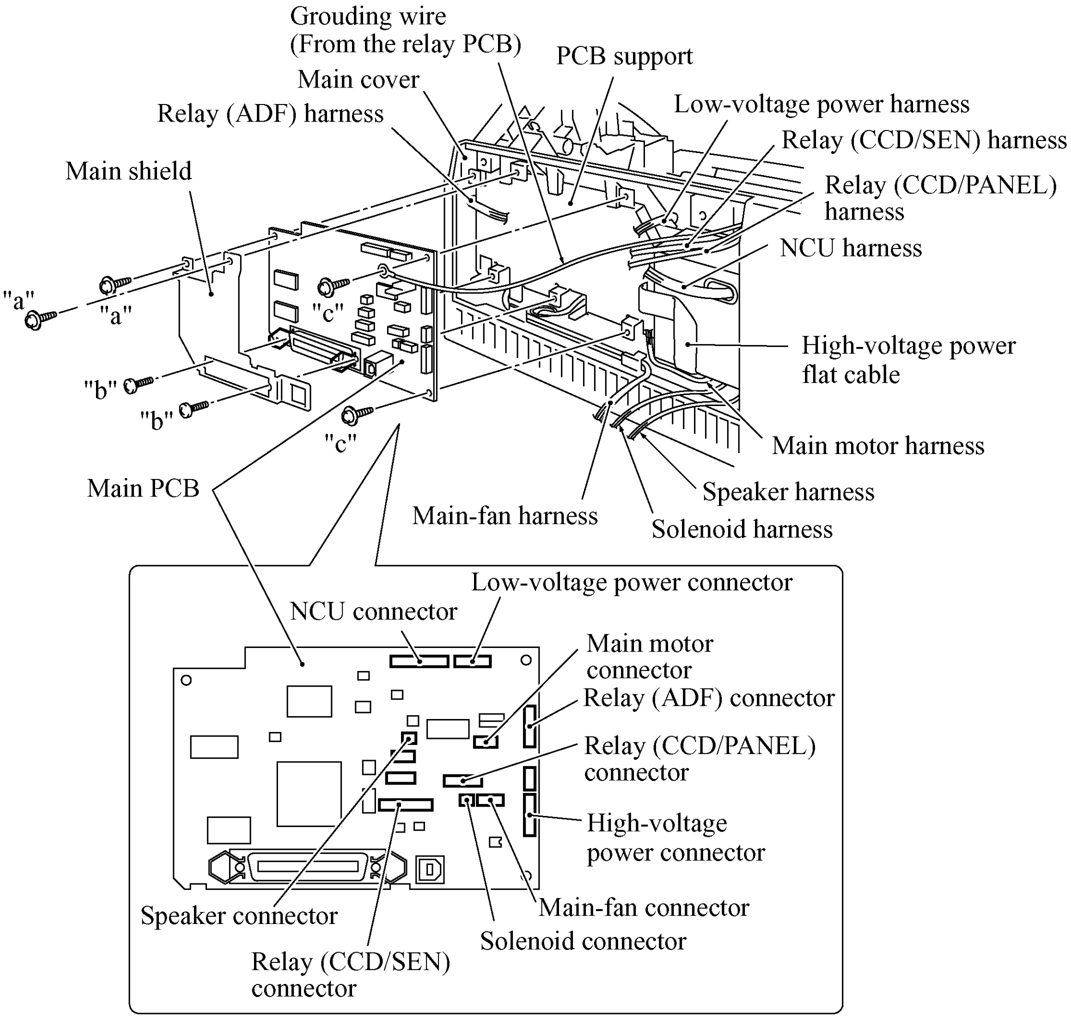
(1) Disconnect the following harnesses and flat cable from the main PCB:

- NCU harness
- Low-voltage power harness
- Main motor harness
- Relay (ADF) harness
- Relay (CCD/PANEL) harness
- High-voltage power flat cable
- Main-fan harness
- Solenoid harness
- Relay (CCD/SEN) harness
- Speaker harness

(2) Remove two screws "a" from the main shield.

(3) Remove two screws "b" from the parallel interface connector.

(4) Remove two screws "c" from the main PCB and then take it off from the PCB support. The grounding wire will be released.


Grouding wire
(From the relay PCB)
PCB support
Main cover
Low-voltage power harness
Relay (ADF) harness
Relay (CCD/SEN) harness
Main shield
Relay (CCD/PANEL) harness
NCU harness
"a"
"a"
"c"
High-voltage power flat cable
"b"
"b"
"c"
Main motor harness
Main PCB
Speaker harness
Main-fan harness
Solenoid harness
Low-voltage power connector
NCU connector
Main motor connector
Relay (ADF) connector
Relay (CCD/PANEL) connector
High-voltage power connector
Speaker connector
Main-fan connector
Solenoid connector
Relay (CCD/SEN) connector

"a" and "c": Taptite, cup S M3x6
"b": Taptite, pan S M3x12

## ■ Reassembling Notes

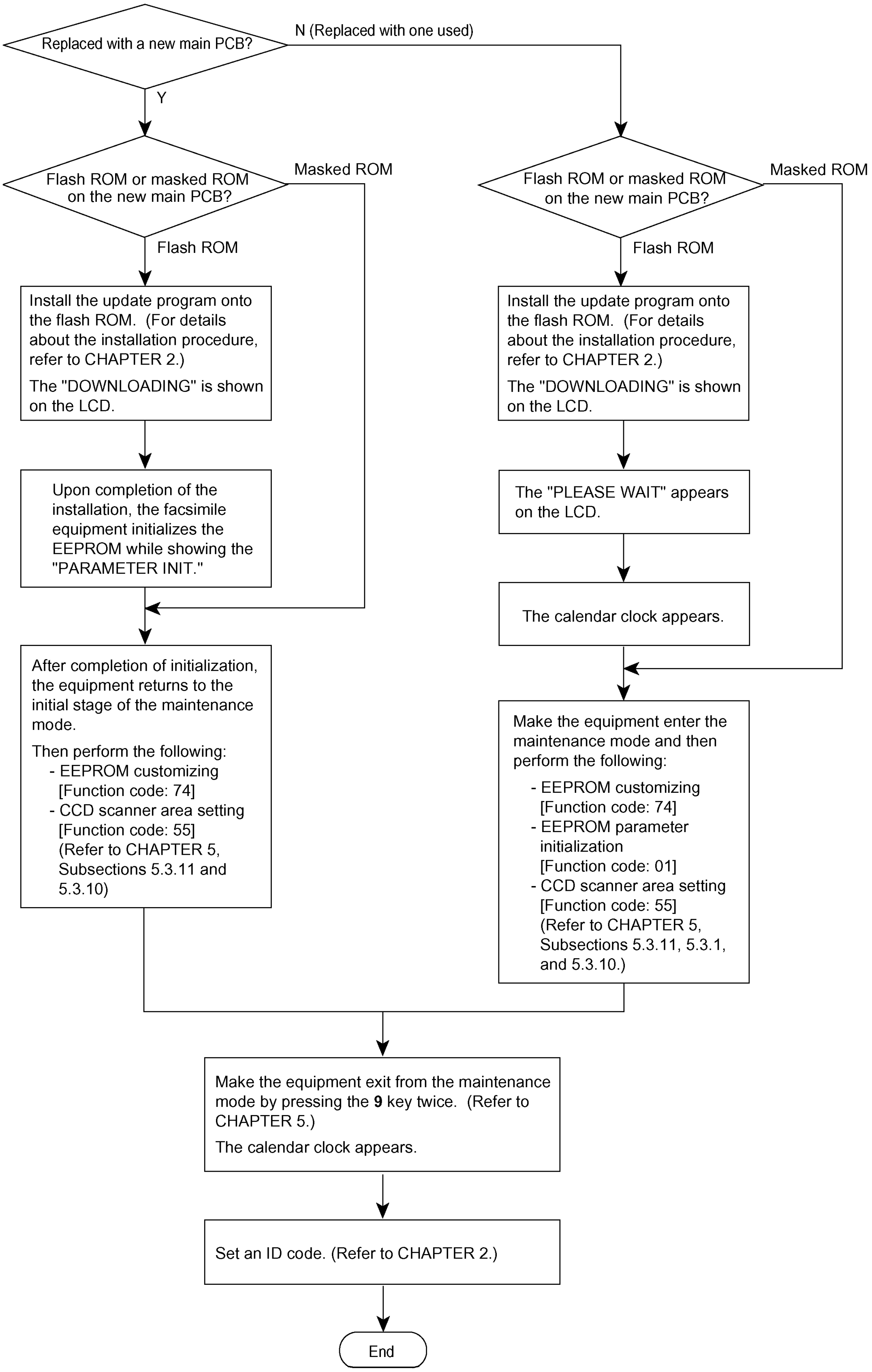
- Be sure to route the harnesses and flat cable as illustrated in Subsection 4.1.25, "Harness routing D."

  Make sure that the main motor harness is routed closest to the main PCB and that the relay (CCD/SEN) harness is routed after other harnesses are connected.

  Make sure that harnesses having ferrite cores are taped. In particular, the main motor harness should be taped above and below the ferrite core.

- If you replace the main PCB, be sure to follow the flowchart given on the next page.

## Setting up the main PCB after replacement


Replaced with a new main PCB?
N (Replaced with one used)
Y
Flash ROM or masked ROM on the new main PCB?
Masked ROM
Flash ROM
Flash ROM or masked ROM on the new main PCB?
Masked ROM
Flash ROM
End

Install the update program onto the flash ROM. (For details about the installation procedure, refer to CHAPTER 2.)

The "DOWNLOADING" is shown on the LCD.

Upon completion of the installation, the facsimile equipment initializes the EEPROM while showing the "PARAMETER INIT."

After completion of initialization, the equipment returns to the initial stage of the maintenance mode.

Then perform the following:

- EEPROM customizing [Function code: 74]
- CCD scanner area setting [Function code: 55] (Refer to CHAPTER 5, Subsections 5.3.11 and 5.3.10)

Install the update program onto the flash ROM. (For details about the installation procedure, refer to CHAPTER 2.)

The "DOWNLOADING" is shown on the LCD.

The "PLEASE WAIT" appears on the LCD.

The calendar clock appears.

Make the equipment enter the maintenance mode and then perform the following:

- EEPROM customizing [Function code: 74]
- EEPROM parameter initialization [Function code: 01]
- CCD scanner area setting [Function code: 55] (Refer to CHAPTER 5, Subsections 5.3.11, 5.3.1, and 5.3.10.)

Make the equipment exit from the maintenance mode by pressing the **9** key twice. (Refer to CHAPTER 5.)

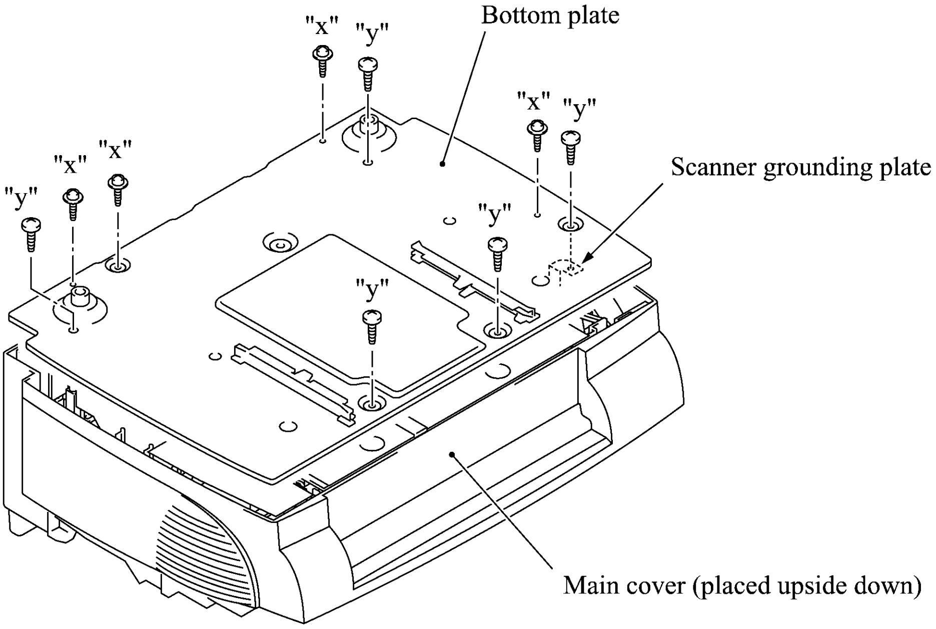
The calendar clock appears.

Set an ID code. (Refer to CHAPTER 2.)

### 4.1.15 Bottom Plate

(1) Turn the machine upside down.

(2) Remove the nine screws (four "x" and five "y") from the bottom plate, then lift it up.


"x"
"y"
Bottom plate
"x"
"y"
"x"
"x"
"y"
Scanner grounding plate
"y"
"y"
Main cover (placed upside down)

"x": Taptite, cup S M3x6
"y": Taptite, bind B M4x12

### 4.1.16 Low-voltage Power Supply PCB

(1) Remove screw "a" and take off the low-voltage insulator sheet.

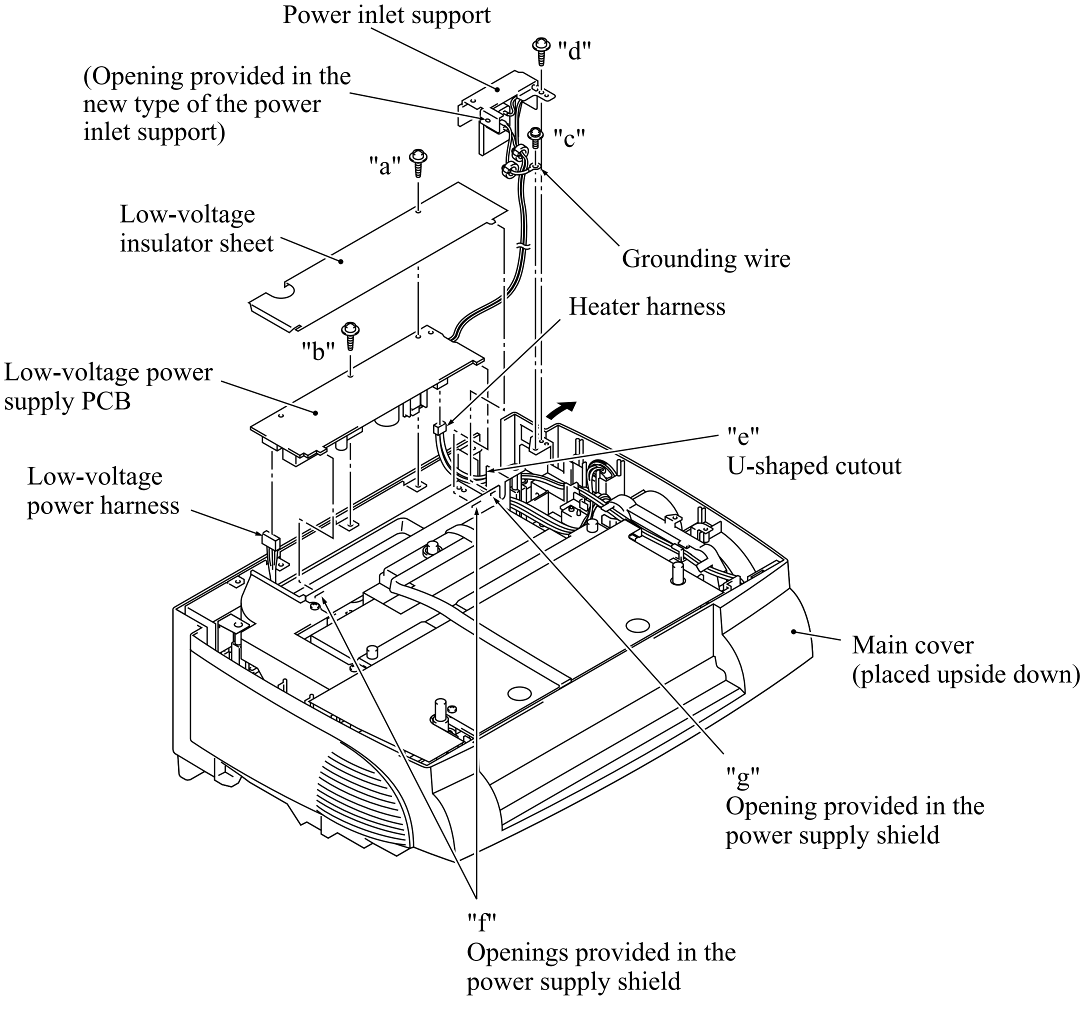
(2) Remove screws "c" and "d" to release the grounding wire and power inlet support, respectively.

(3) While pulling the right rear of the main cover (placed upside down) outwards to release the ON/OFF switch, lift up the power inlet support.

For the new type of the power inlet support having an opening: You need to cut off the binder that fastens the blue and brown lead wires of the AC power cord to the power inlet support.

(4) Remove screw "b."

(5) Slightly lift up the low-voltage power supply PCB and disconnect the low-voltage power harness and heater harness (of the blue and brown wires).


Power inlet support
"d"
(Opening provided in the new type of the power inlet support)
"c"
"a"
Low-voltage insulator sheet
Grounding wire
Heater harness
"b"
Low-voltage power supply PCB
"e"
U-shaped cutout
Low-voltage power harness
Main cover (placed upside down)
"g"
Opening provided in the power supply shield
"f"
Openings provided in the power supply shield

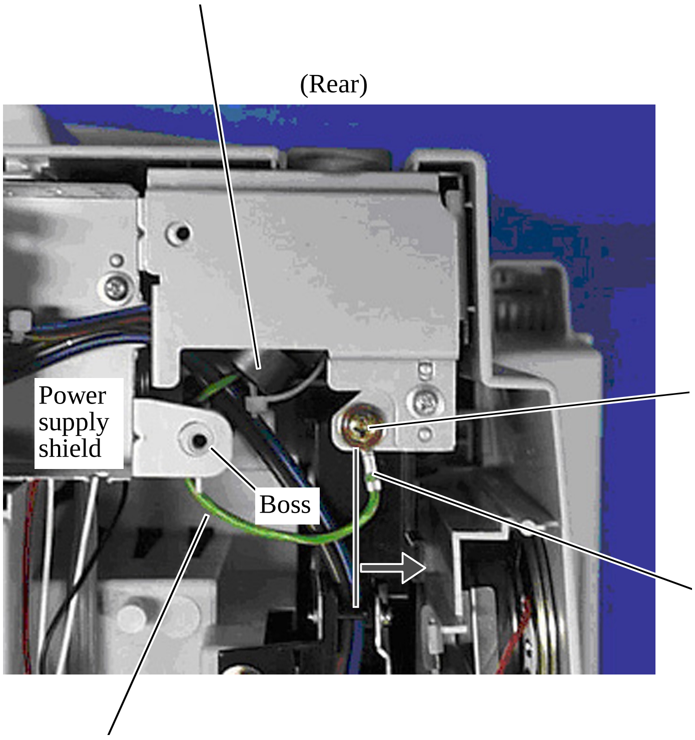
"a," "b," and "d": Taptite, cup S M3x6
"c": Screw, pan (washer) M4x8DB

## ■ Reassembling Notes

- Be sure to route the heater harness through U-shaped cutout "e" provided in the power supply shield. Then, route the AC power cable through the same cutout "e" on the heater harness. (Refer to Subsection 4.1.25, "Harness routing H."
- Fit the front tabs of the low-voltage power supply PCB into openings "f."
- Fit the front tab of the insulator sheet into opening "g."
- To prevent the blue and brown lead wires of the AC power cord from getting damaged by the edge of the power inlet support or the end of screw "c," be sure to observe the following routing instructions:

For the power inlet support having no opening

1) Route the grounding wire between the boss and the power supply shield as shown below.
2) Push down the ferrite cores of the AC lead wires and grounding wire.
3) Secure the grounding terminal to the power inlet support with screw "c" at an angle shown below.



Push down these ferrite cores.

(Rear)

Screw "c"

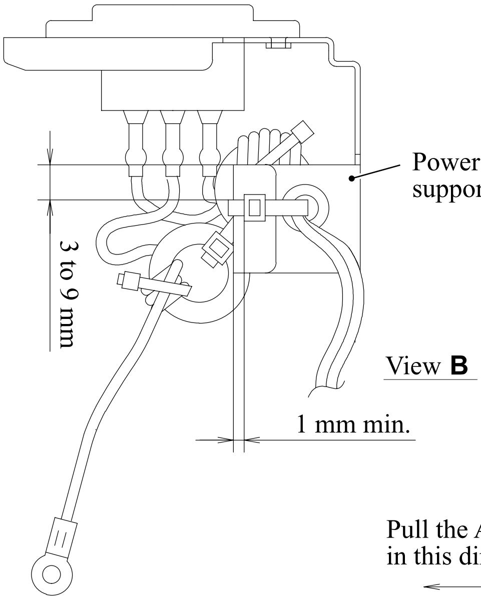
Secure the grounding terminal at this angle.

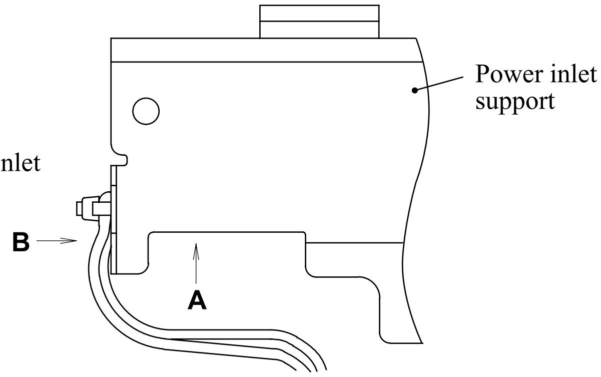
Route the grounding wire between the boss and the power supply shield.

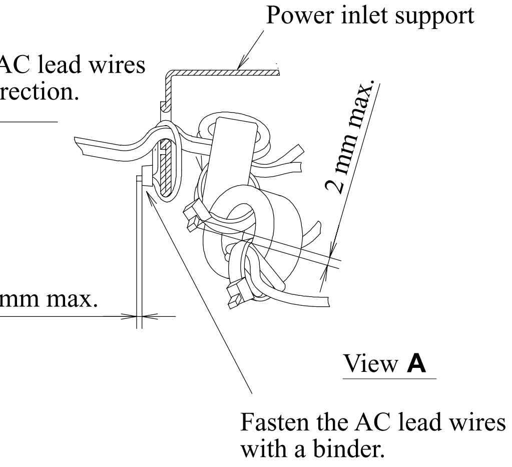
For the new type of the power inlet support having an opening

1) Route the AC lead wires (blue and brown) through the opening provided in the power inlet support and pull them in the direction shown below to bring the ferrite cores closer to the opening.
2) Fasten the AC lead wires to the power inlet support with a binder.

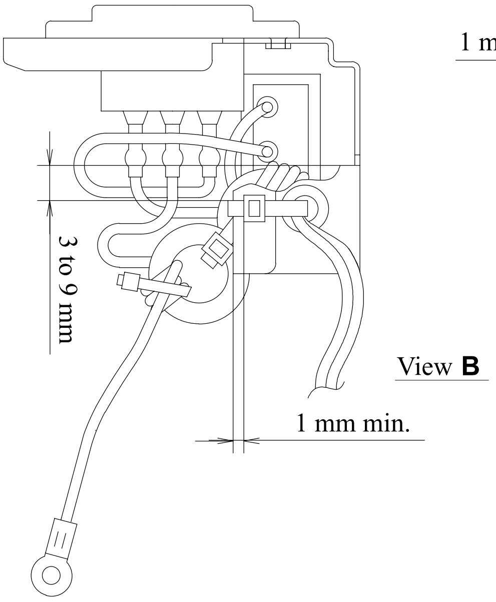
For machines without power switch


Power inlet support
3 to 9 mm
View **B**
1 mm min.


Power inlet support
**B**
**A**


Power inlet support
Pull the AC lead wires in this direction.
2 mm max.
1 mm max.
View **A**
Fasten the AC lead wires with a binder.

For machines with power switch

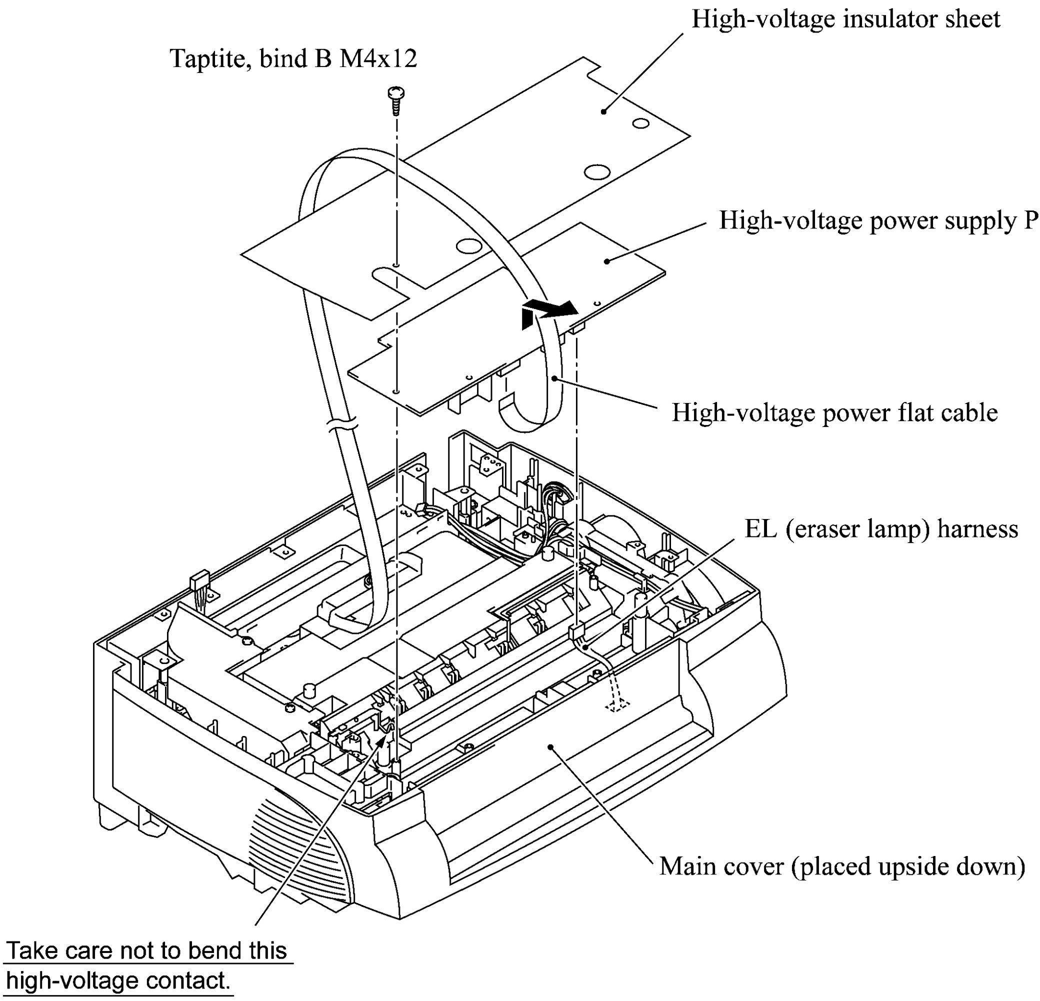

3 to 9 mm
View **B**
1 mm min.

3) Secure the grounding wire to the power inlet support with screw "c."

### 4.1.17 High-voltage Power Supply PCB

(1) Remove the screw and take off the high-voltage insulator sheet.

(2) Slightly lift up the high-voltage power supply PCB and disconnect the high-voltage power flat cable and EL (eraser lamp) harness.


High-voltage insulator sheet
Taptite, bind B M4x12
High-voltage power supply PCB
High-voltage power flat cable
EL (eraser lamp) harness
Main cover (placed upside down)
Take care not to bend this high-voltage contact.

## ■ Reassembling Notes

- Fold the high-voltage power flat cable and route it as illustrated above.
- Before reinstalling the high-voltage power supply PCB, check the high-voltage contacts for any toner particles, paper dust or dirt, and clean them out.

### 4.1.18 Main-Fan PCB, Duct, and Fan

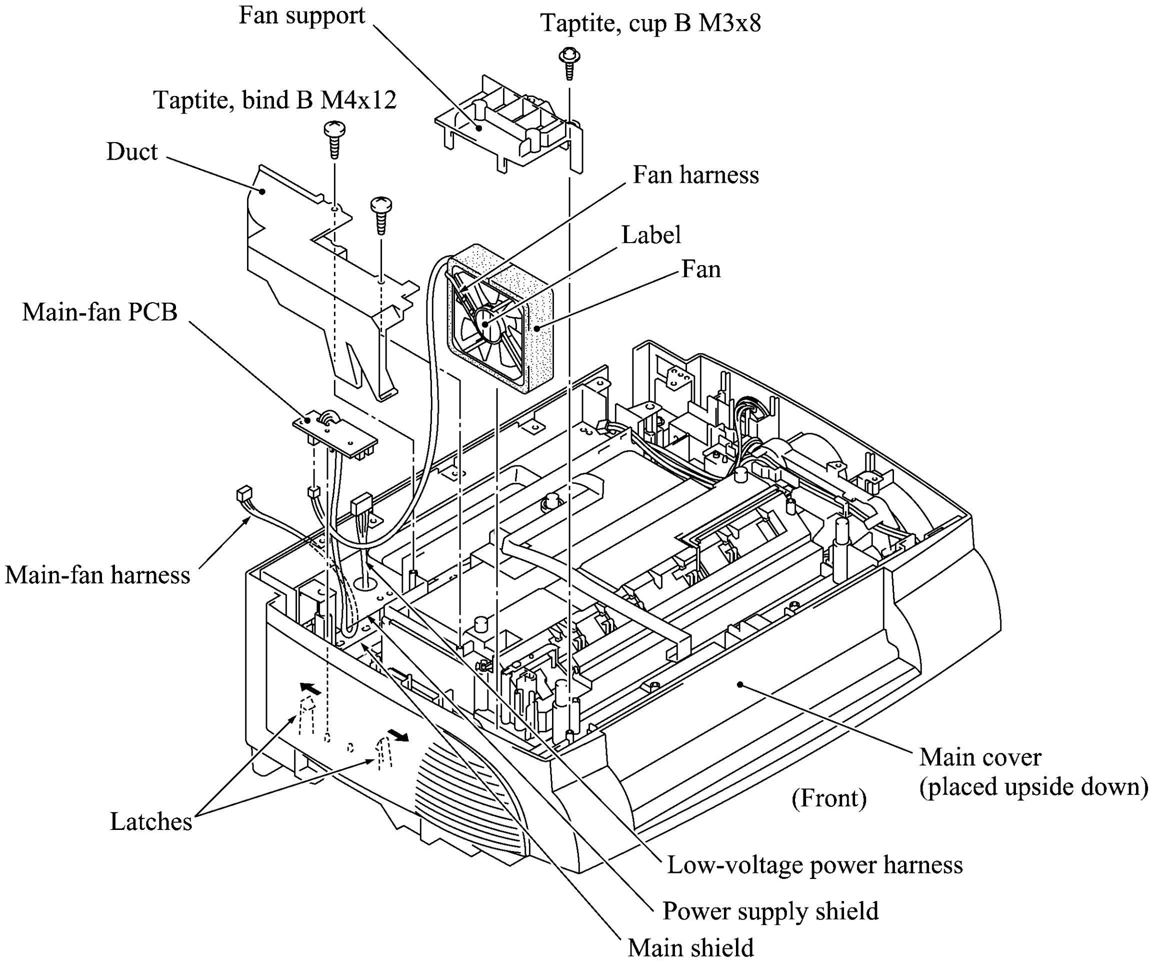
(1) Take off the duct by removing the two screws.

(2) Unlatch the main-fan PCB and lift it up and out of the main cover.

(3) Disconnect the fan harness from the PCB.

(4) Take off the fan support by removing the screw.

(5) Lift up the fan.

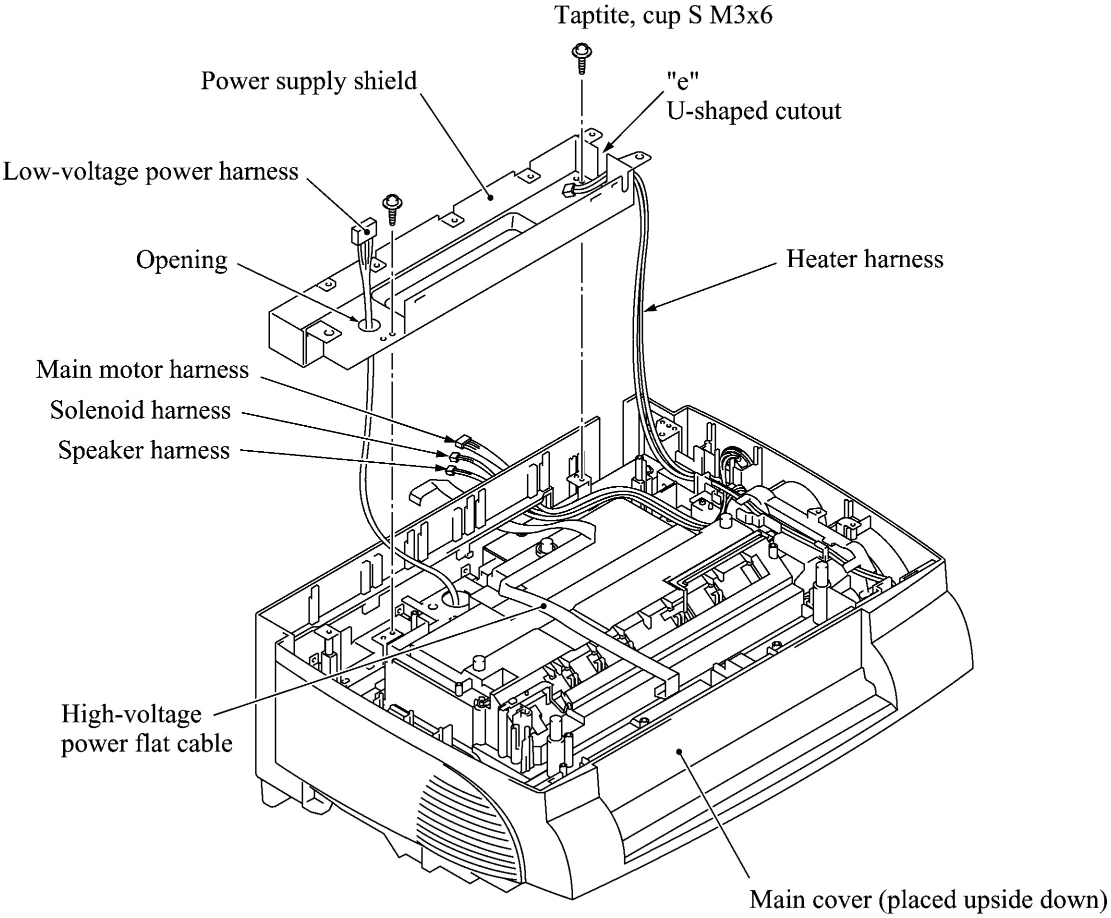

Fan support
Taptite, cup B M3x8
Taptite, bind B M4x12
Duct
Fan harness
Label
Fan
Main-fan PCB
Main-fan harness
Main cover
(placed upside down)
(Front)
Latches
Low-voltage power harness
Power supply shield
Main shield

## ■ Reassembling Notes

- Route the fan harness on the fan as illustrated above.
- Put the fan back into place with the label side facing outwards and with its harness directed as shown above.

### 4.1.19 Power Supply Shield

(1) Remove the two screws and lift up the power supply shield.

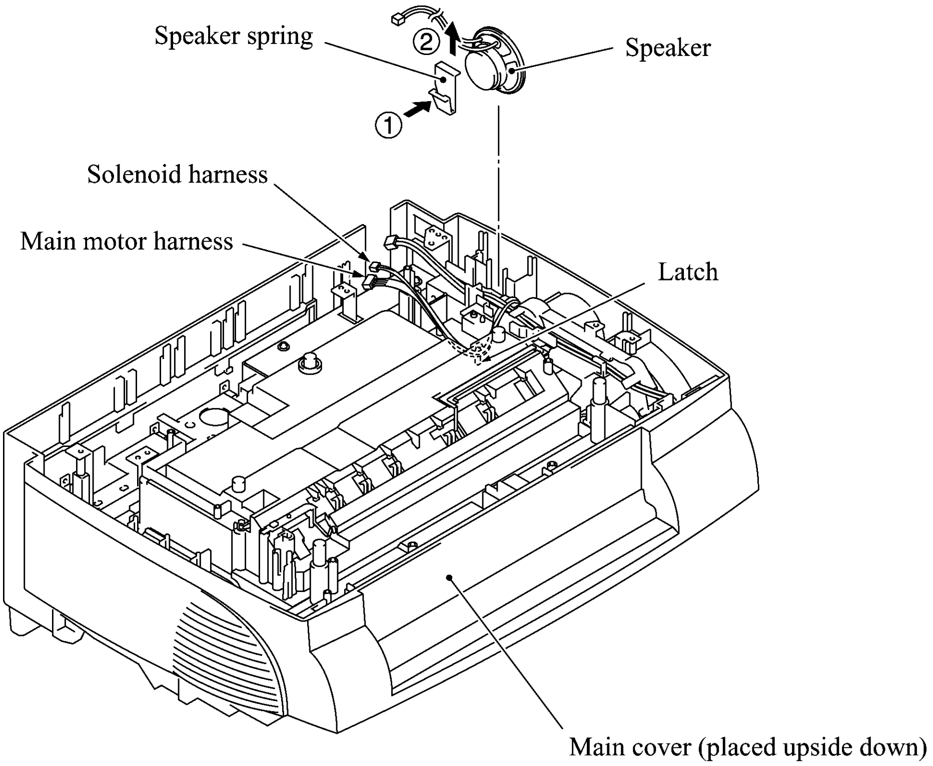

Taptite, cup S M3x6
Power supply shield
"e"
U-shaped cutout
Low-voltage power harness
Opening
Heater harness
Main motor harness
Solenoid harness
Speaker harness
High-voltage
power flat cable
Main cover (placed upside down)

## ■ Reassembling Notes

- When reinstalling the power supply shield, route the low-voltage power harness through the opening and route the heater harness through U-shaped cutout "e" as shown above.

### 4.1.20 Speaker

(1) Pull the speaker spring inwards and pull up the speaker together with the spring.


Speaker spring
②
Speaker
①
Solenoid harness
Main motor harness
Latch
Main cover (placed upside down)

#### ■ Reassembling Notes

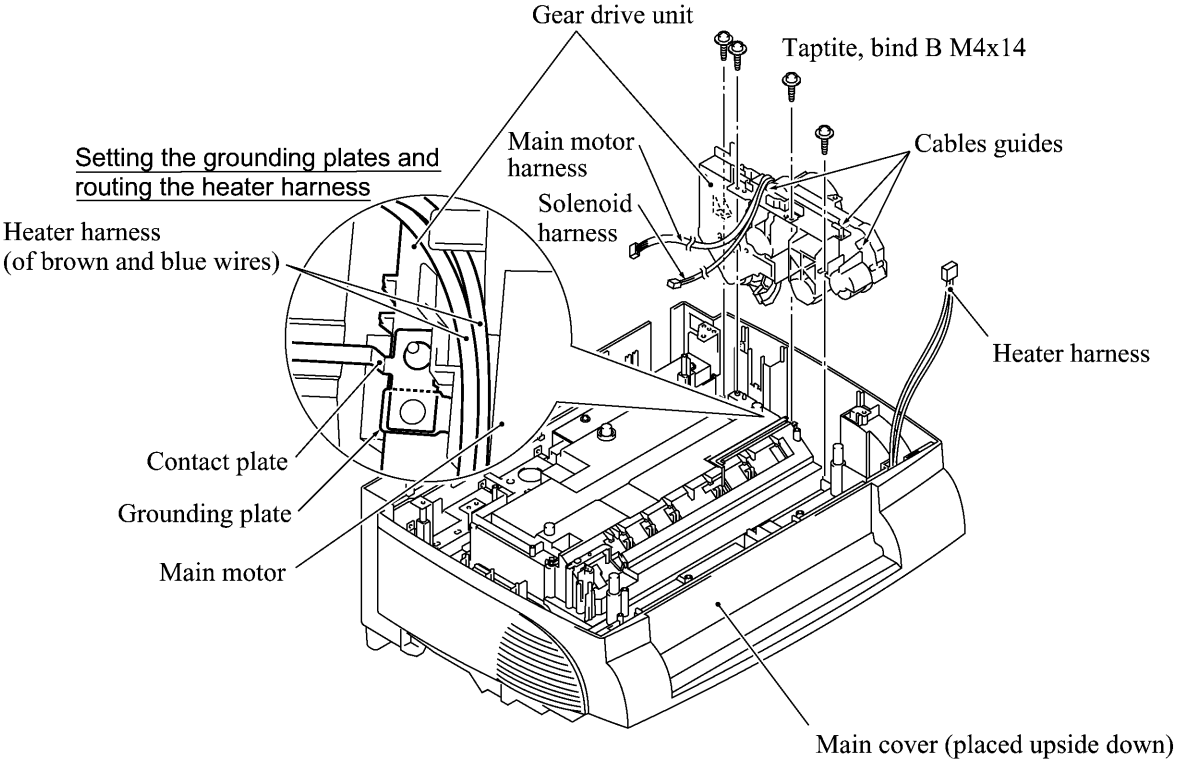
- Put the speaker into place with its harness facing up.
- Route the speaker harness through the latch together with the solenoid harness and main motor harness as shown above.

### 4.1.21 Gear Drive Unit

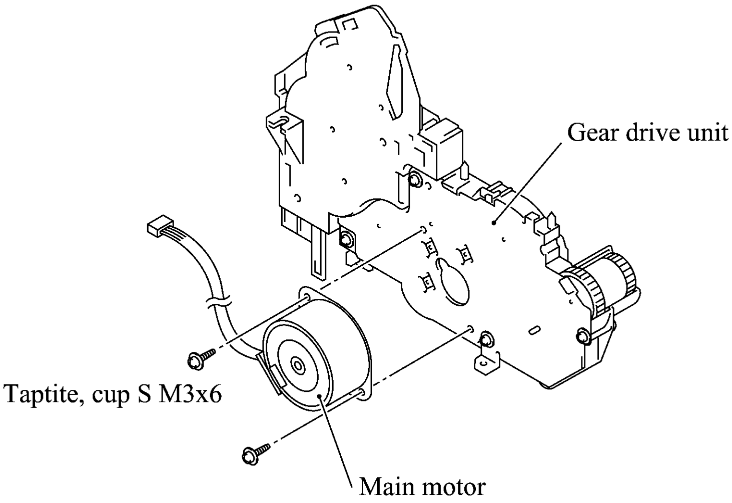
(1) Make sure that the heat-fixing unit is removed.

(2) Take out the heater harness from the cable guides provided on the top of the gear drive unit.

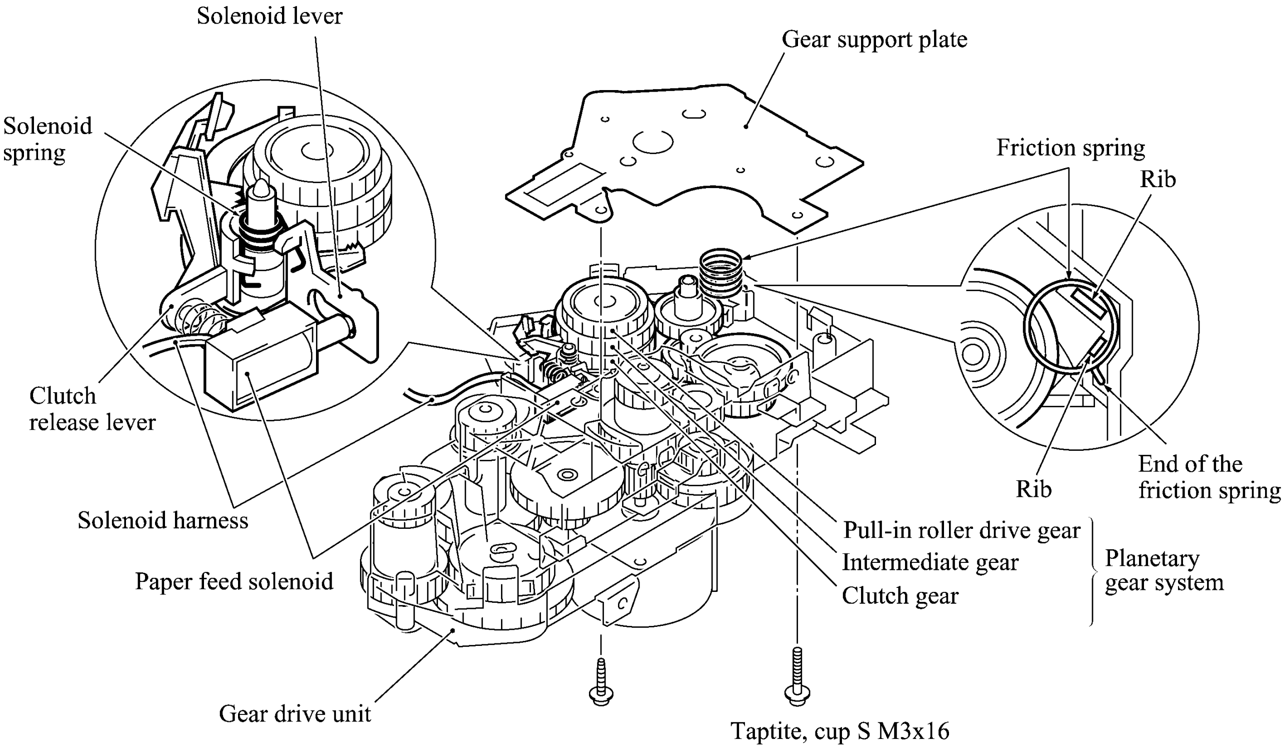
(3) Remove the four screws and lift up the gear drive unit.


Gear drive unit
Taptite, bind B M4x14
Main motor harness
Cables guides
Setting the grounding plates and routing the heater harness
Solenoid harness
Heater harness (of brown and blue wires)
Heater harness
Contact plate
Grounding plate
Main motor
Main cover (placed upside down)

(4) Remove the two screws and take off the main motor.


Gear drive unit
Taptite, cup S M3x6
Main motor

(5) To take off the paper feed solenoid, solenoid lever, or clutch release lever, remove the two screws.

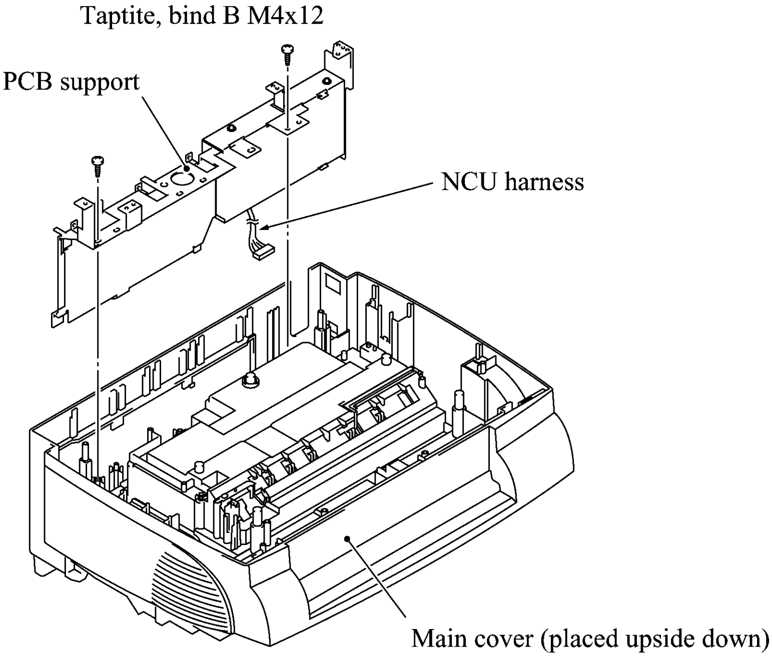

Solenoid lever
Gear support plate
Solenoid spring
Friction spring
Rib
Clutch release lever
Rib
End of the friction spring
Solenoid harness
Pull-in roller drive gear
Intermediate gear
Clutch gear
Planetary gear system
Paper feed solenoid
Gear drive unit
Taptite, cup S M3x16

## ■ Reassembling Notes

- If the friction spring in the gear drive unit slips off, fit the straight end of the spring in the support hole of the gear drive unit as illustrated above.
- When putting the gear drive unit back into the main cover, route the solenoid harness and main motor harness along the outside of the gear drive unit. Be sure to sandwich the grounding plate between the contact plate and gear drive unit. See the illustration given on the previous page.
- After securing the gear drive unit, route the heater harness through the cable guides provided on the top of the gear drive unit.

### 4.1.22 PCB Support and NCU PCB

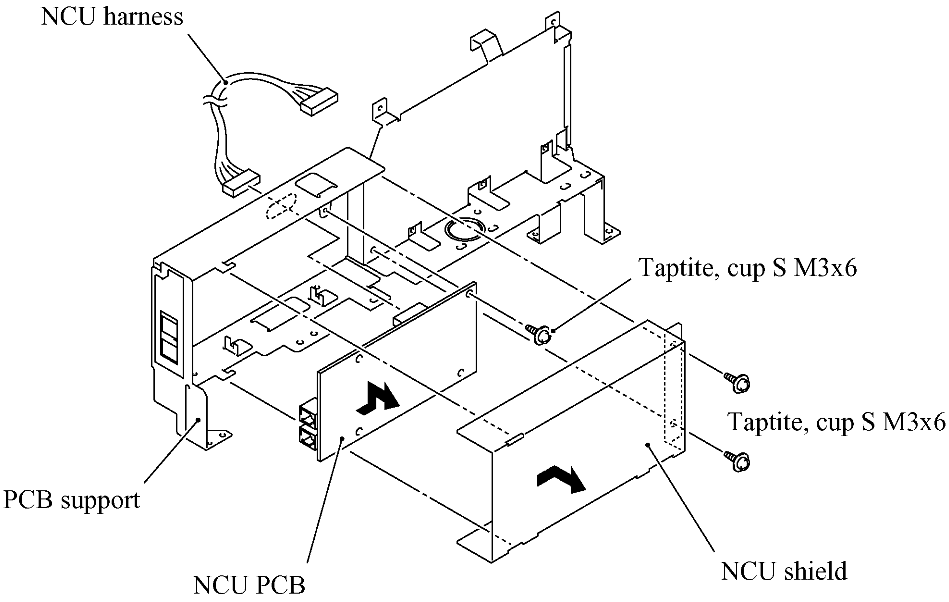
(1) Remove the two screws and lift up the PCB support.


Taptite, bind B M4x12
PCB support
NCU harness
Main cover (placed upside down)

(2) Remove the two screws and take off the NCU shield.

(3) Remove the screw and take off the NCU PCB from the PCB support.

(4) Disconnect the NCU harness.


NCU harness
Taptite, cup S M3x6
Taptite, cup S M3x6
PCB support
NCU PCB
NCU shield

### 4.1.23 Scanner Grounding Plate

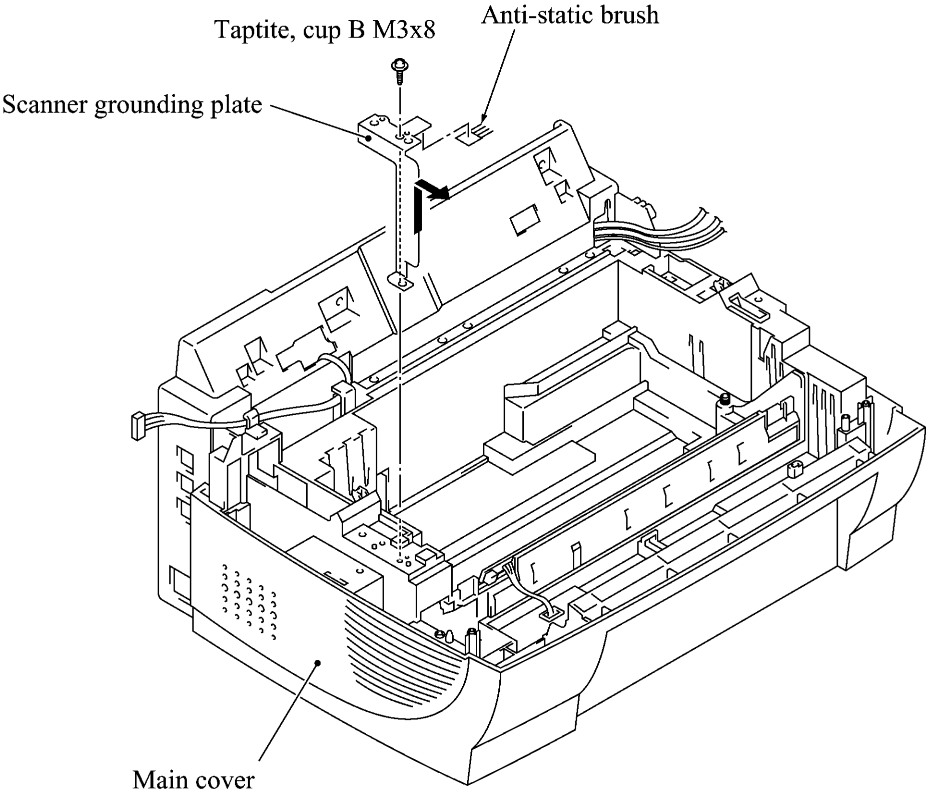
(1) Make sure that the heat-fixing unit is removed.

(2) Remove the screw from the scanner grounding plate. (If the bottom plate has not been removed, remove screw "y" also (see page 4-46) that secures both the scanner grounding plate and bottom plate.)

(3) Slightly lift up the scanner grounding plate.

(4) You may peel off the anti-static brush from the scanner grounding plate.

**NOTE:** Once removed, the anti-static brush will become unusable and a new one will have to be put back in.



### ■ Reassembling Notes

- Before attaching a new anti-static brush onto the scanner grounding plate, wipe the surface of the attaching place with a cloth dampened with alcohol.
- When reinstalling the scanner grounding plate, fit it over the two bosses of the main cover.

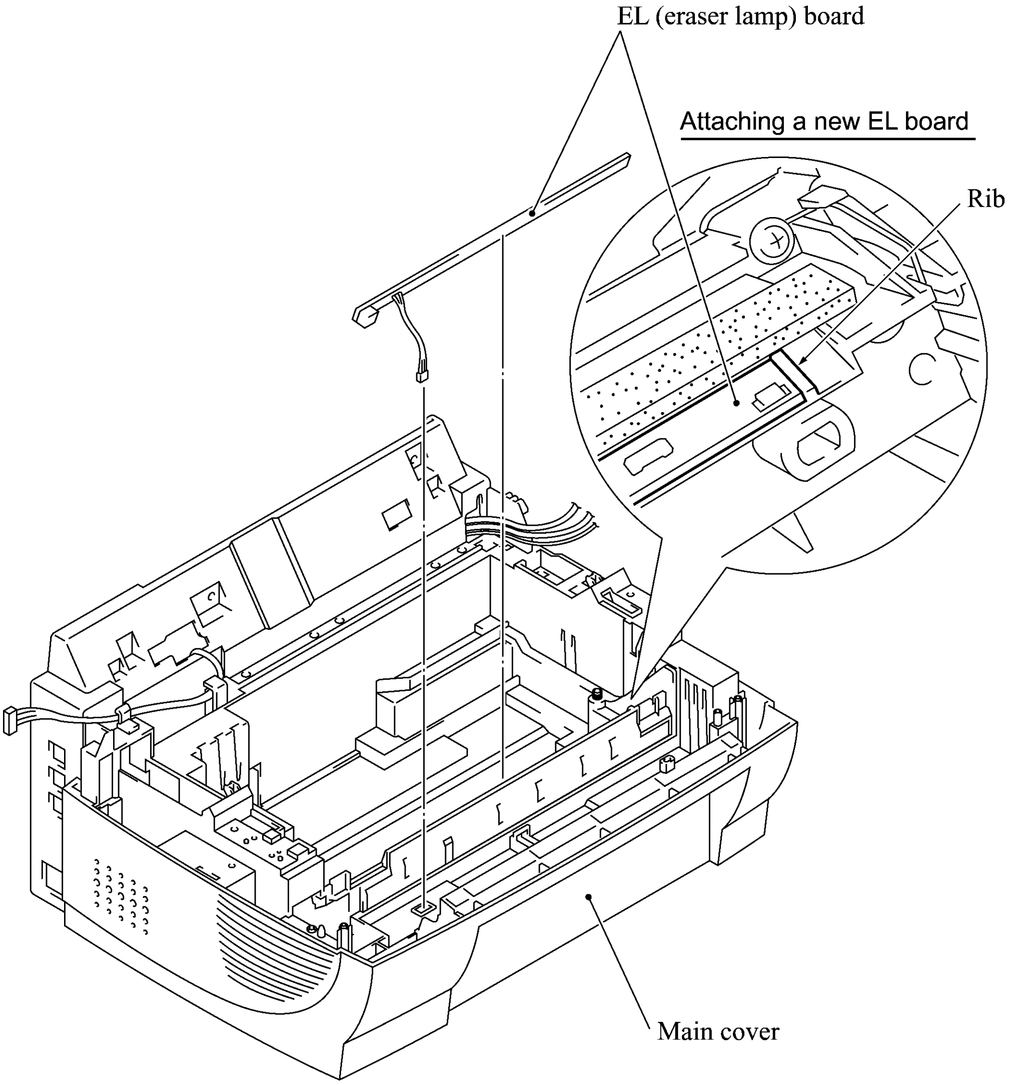
### 4.1.24 EL (Eraser Lamp) Board

Only when you need to replace the EL board (which is attached with double-sided adhesive tape), remove it according to the steps below.

(1) Make sure that the EL harness is disconnected from the high-voltage power supply PCB. (Refer to Subsection 4.1.17.)

(2) Make sure that the heat-fixing unit is removed.

(3) Peel off the EL board from the main cover and clear adhesive tape if remaining.

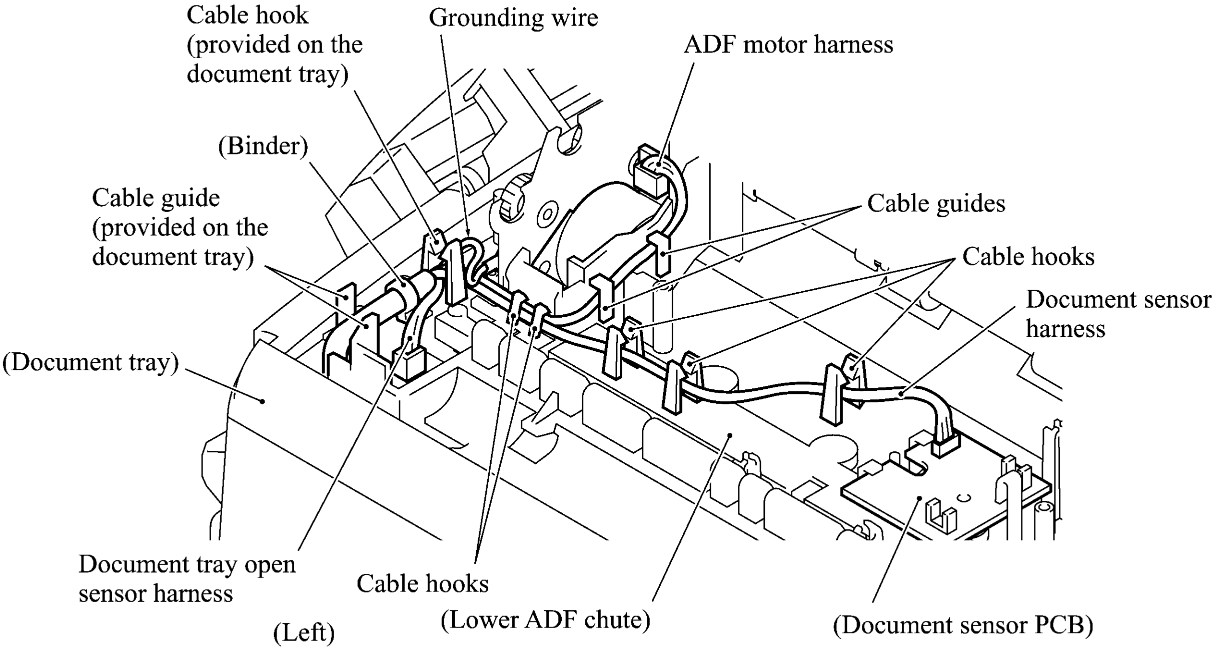

EL (eraser lamp) board
Attaching a new EL board
Rib
Main cover

■ **Reassembling Notes**

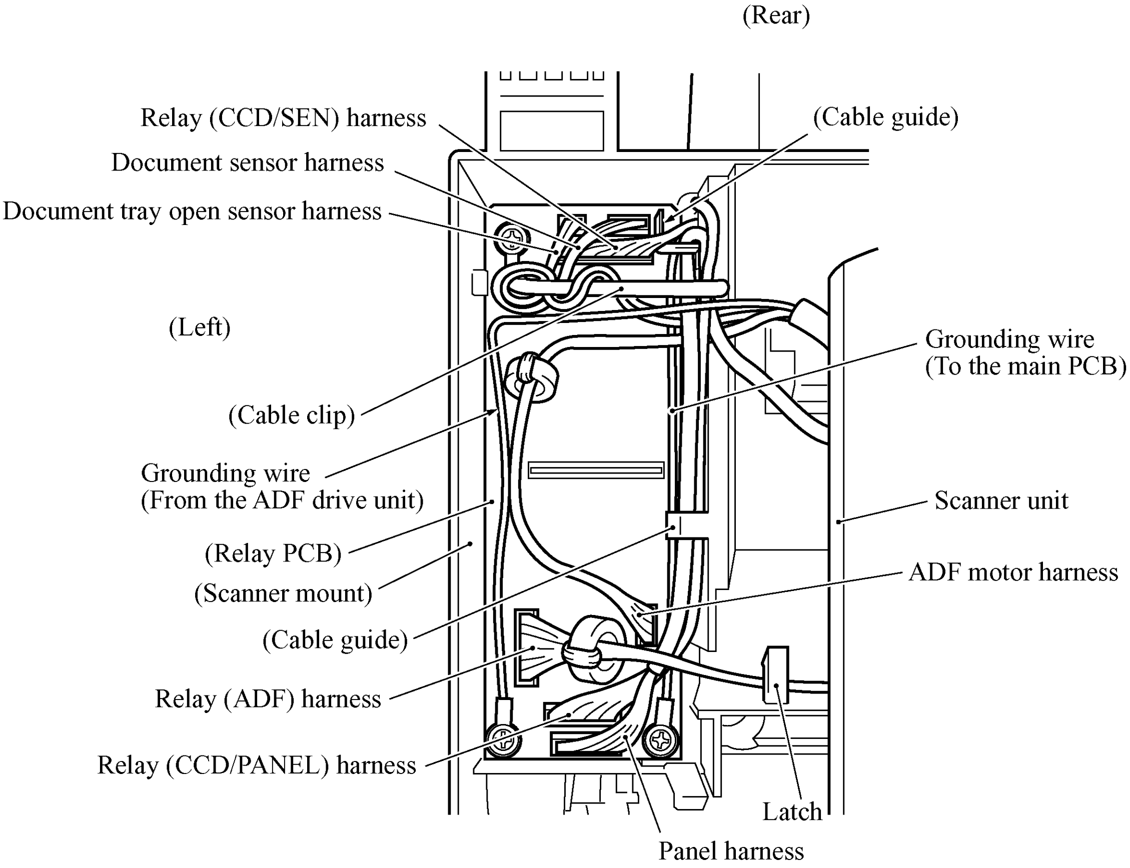
- When attaching a new EL board, bring the right end into contact with the rib provided on the main cover.

### 4.1.25 Harness Routing

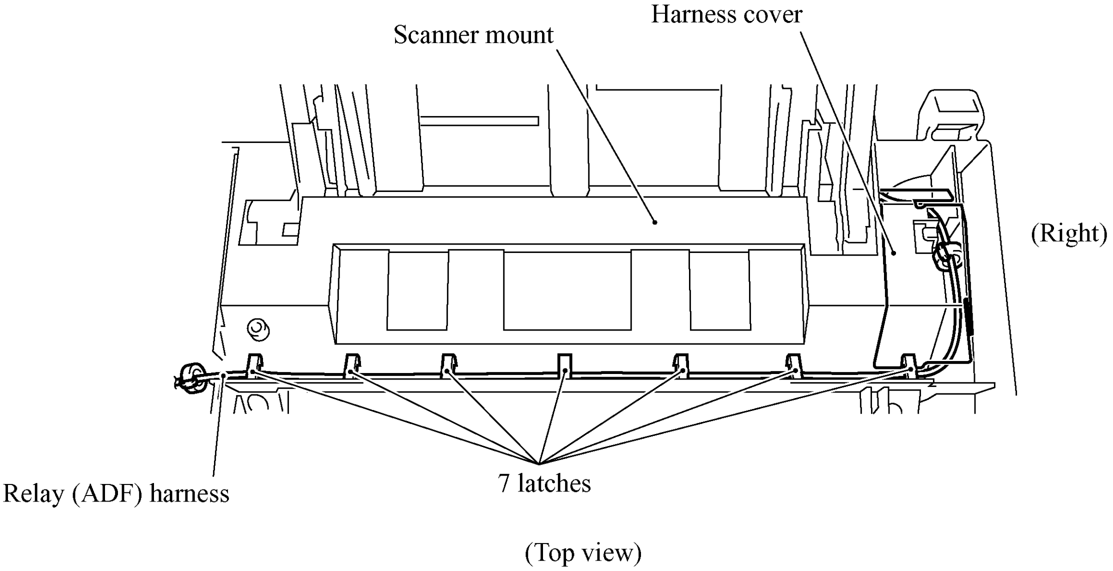
**Harness routing A:** ADF motor harness, document sensor harness, document tray open sensor harness, and grounding wire on the lower ADF chute


Cable hook
(provided on the
document tray)
Grounding wire
ADF motor harness
(Binder)
Cable guide
(provided on the
document tray)
Cable guides
Cable hooks
Document sensor
harness
(Document tray)
Document tray open
sensor harness
Cable hooks
(Lower ADF chute)
(Document sensor PCB)
(Left)

**Harness routing B:** Relay PCB-related harnesses

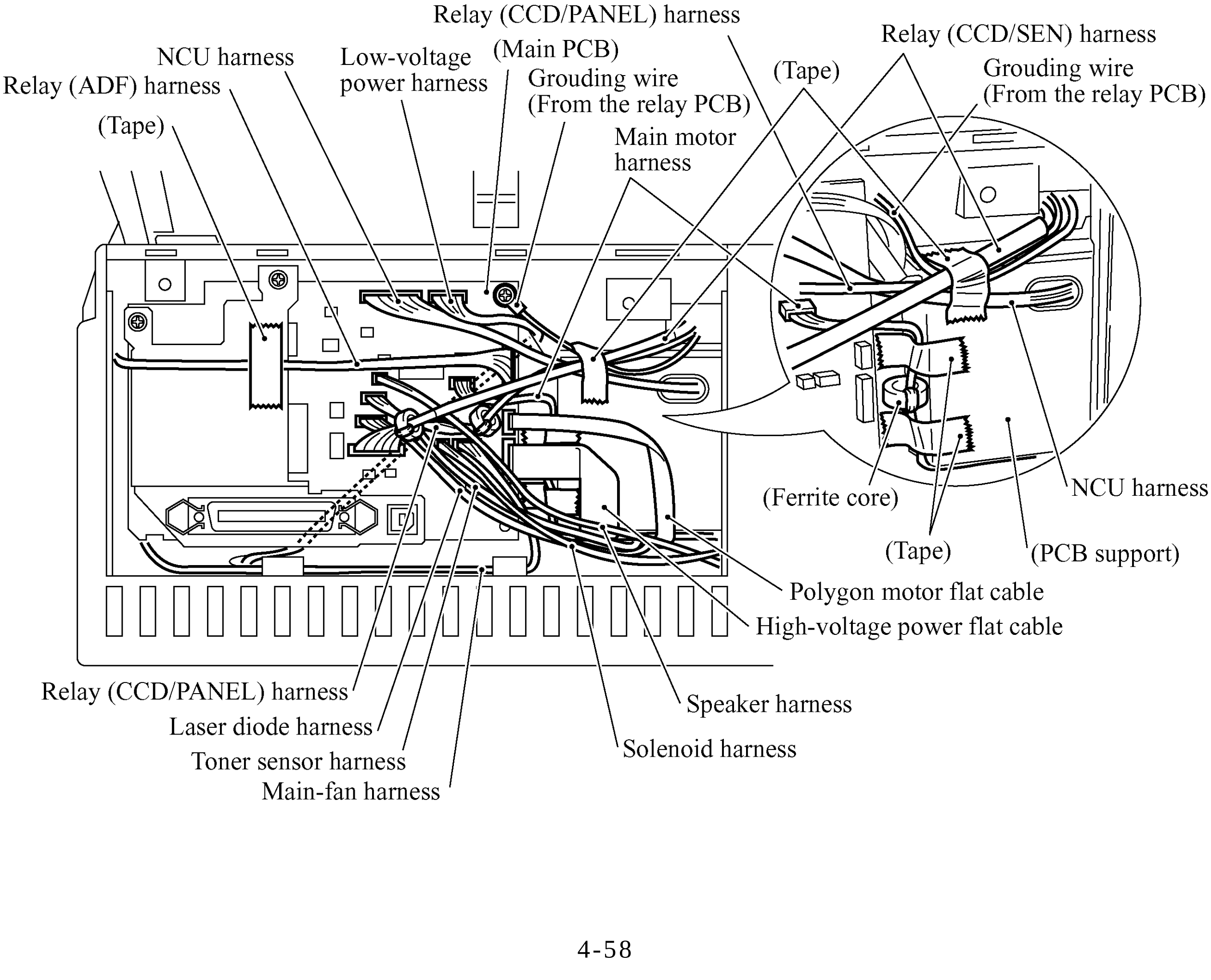

(Rear)
Relay (CCD/SEN) harness
(Cable guide)
Document sensor harness
Document tray open sensor harness
(Left)
Grounding wire
(To the main PCB)
(Cable clip)
Grounding wire
(From the ADF drive unit)
Scanner unit
(Relay PCB)
(Scanner mount)
ADF motor harness
(Cable guide)
Relay (ADF) harness
Relay (CCD/PANEL) harness
Latch
Panel harness

**Harness routing C:** Relay (ADF) harness on the scanner mount



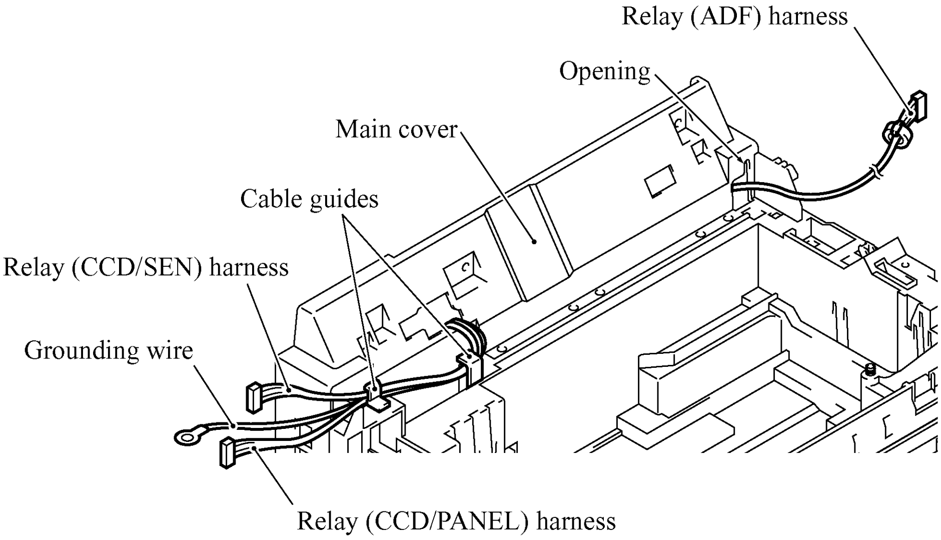
Harness cover
Scanner mount
(Right)
Relay (ADF) harness
7 latches
(Top view)

**Harness routing D:** Main PCB-related harnesses

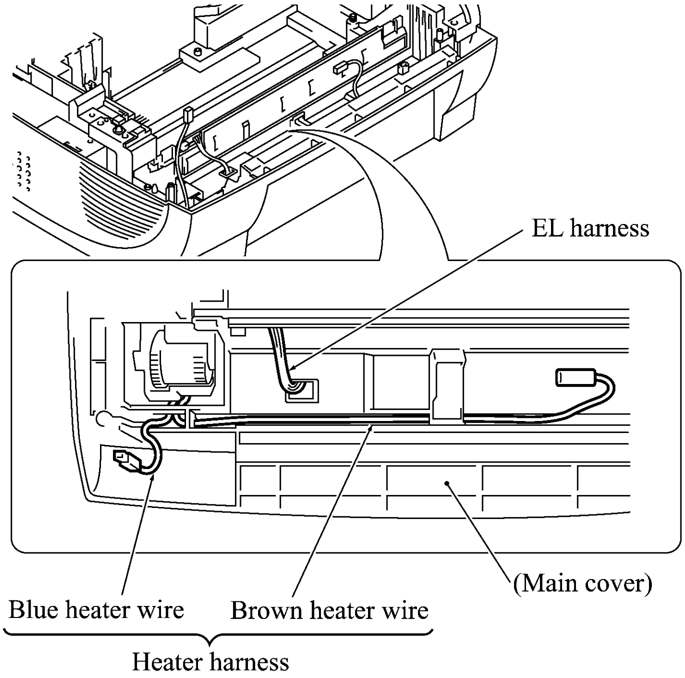


Relay (CCD/PANEL) harness
Relay (CCD/SEN) harness
NCU harness
Low-voltage power harness
(Main PCB)
Grouding wire (From the relay PCB)
(Tape)
Grouding wire (From the relay PCB)
Relay (ADF) harness
(Tape)
Main motor harness
(Ferrite core)
NCU harness
(Tape)
(PCB support)
Polygon motor flat cable
High-voltage power flat cable
Relay (CCD/PANEL) harness
Laser diode harness
Toner sensor harness
Main-fan harness
Speaker harness
Solenoid harness

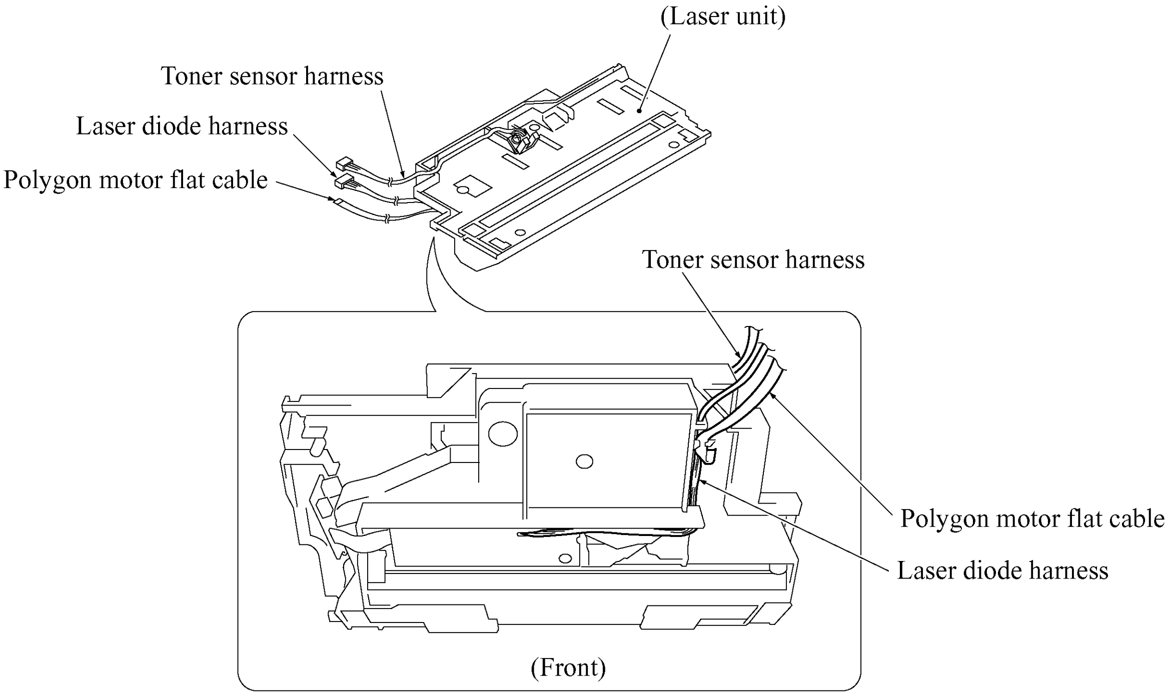
**Harness routing E:** Relay harnesses on the main cover (after the ASF is removed)


Relay (ADF) harness
Opening
Main cover
Cable guides
Relay (CCD/SEN) harness
Grounding wire
Relay (CCD/PANEL) harness

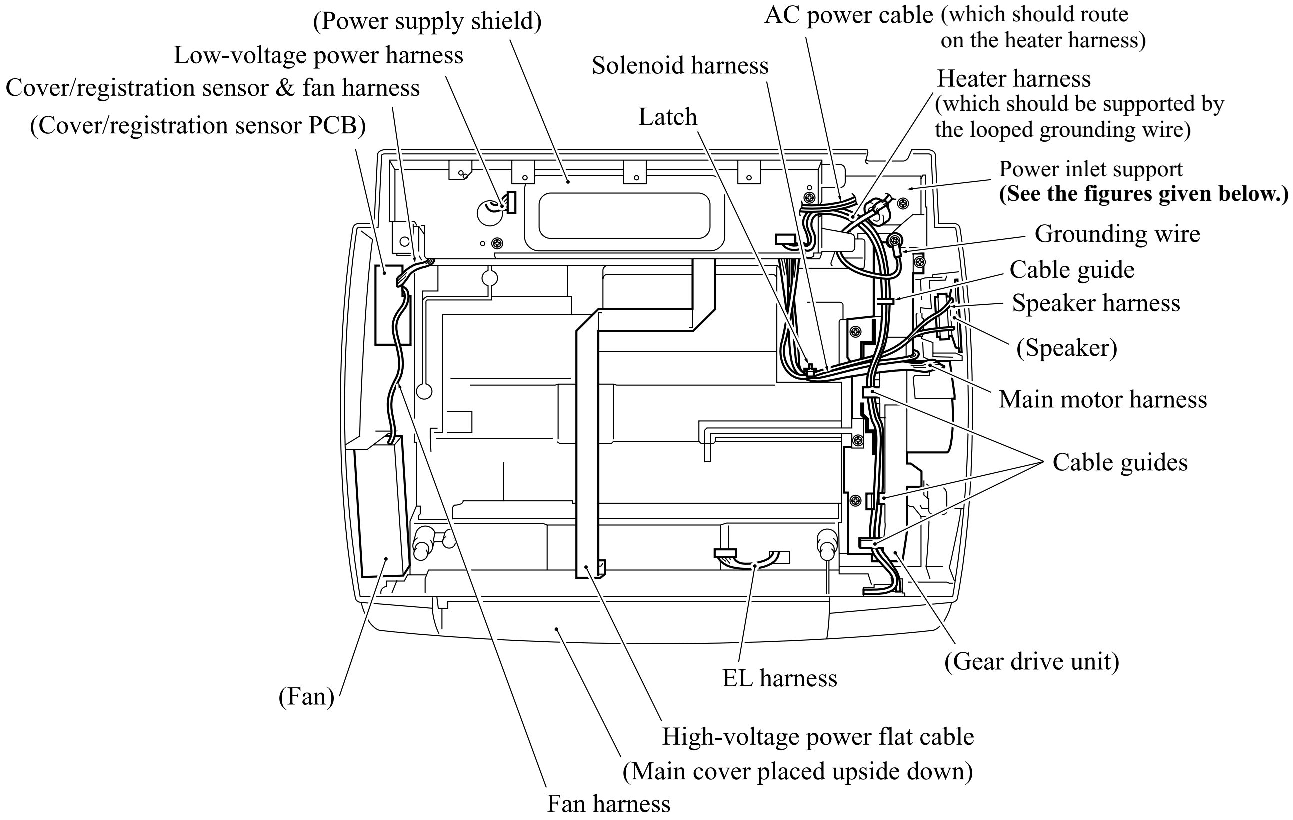
**Harness routing F:** Heater harness on the main cover (after the heat-fixing unit is removed)


EL harness
(Main cover)
Blue heater wire
Brown heater wire
Heater harness

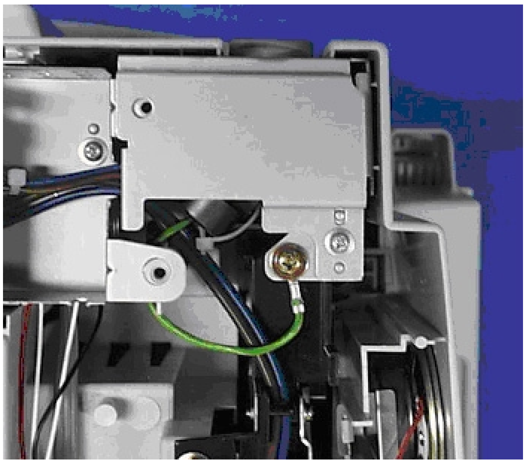
**Harness routing G:** Laser diode harness, polygon motor flat cable, and toner sensor harness on the laser unit


(Laser unit)
Toner sensor harness
Laser diode harness
Polygon motor flat cable
Toner sensor harness
Polygon motor flat cable
Laser diode harness
(Front)

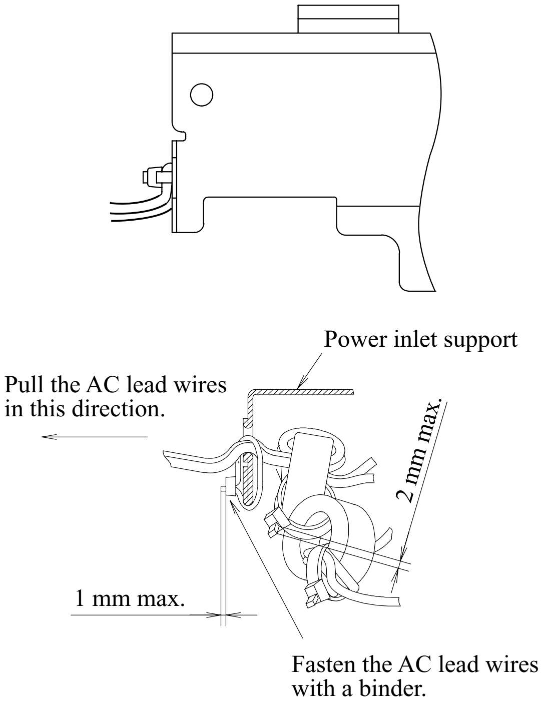
**Harness routing H:** Harnesses viewed from the bottom of the machine


(Power supply shield)
Low-voltage power harness
Cover/registration sensor & fan harness
(Cover/registration sensor PCB)
Solenoid harness
Latch
AC power cable (which should route on the heater harness)
Heater harness (which should be supported by the looped grounding wire)
Power inlet support
(See the figures given below.)
Grounding wire
Cable guide
Speaker harness
(Speaker)
Main motor harness
Cable guides
(Gear drive unit)
EL harness
(Fan)
High-voltage power flat cable
(Main cover placed upside down)
Fan harness

For the power inlet support having no opening



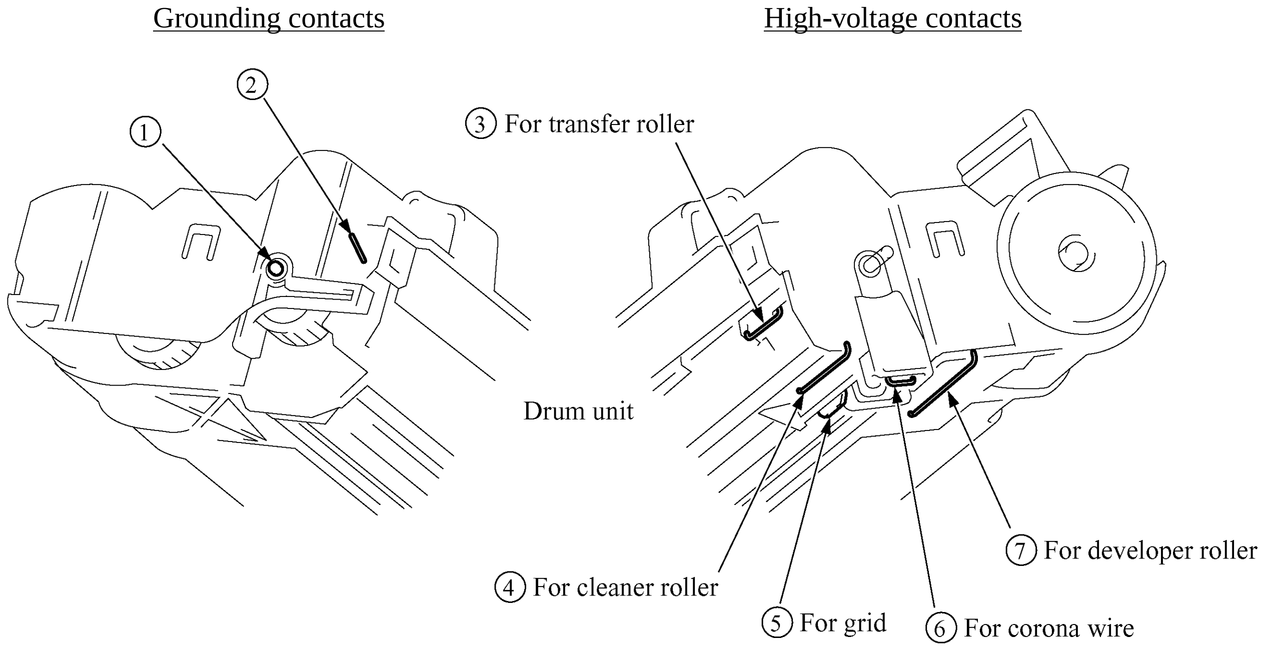
For the power inlet support having an opening


Power inlet support
Pull the AC lead wires in this direction.
2 mm max.
1 mm max.
Fasten the AC lead wires with a binder.

For the harness routing around the power inlet support, see page 4-47-2.

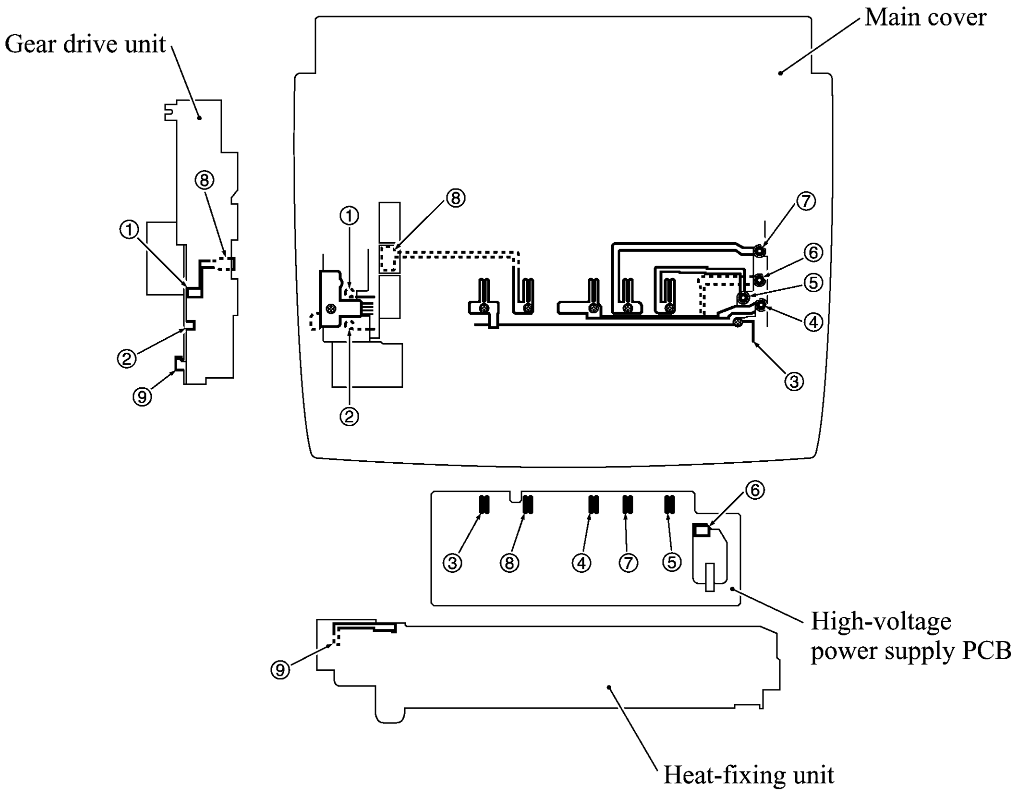
### 4.1.26 Cleaning of High-voltage Contacts and Grounding Contacts

If any toner particles, paper dust or dirt are on the contacts, clean them out. This will ensure that power flows correctly to enable printing.


Grounding contacts

High-voltage contacts

①
②
③ For transfer roller
Drum unit
④ For cleaner roller
⑤ For grid
⑥ For corona wire
⑦ For developer roller

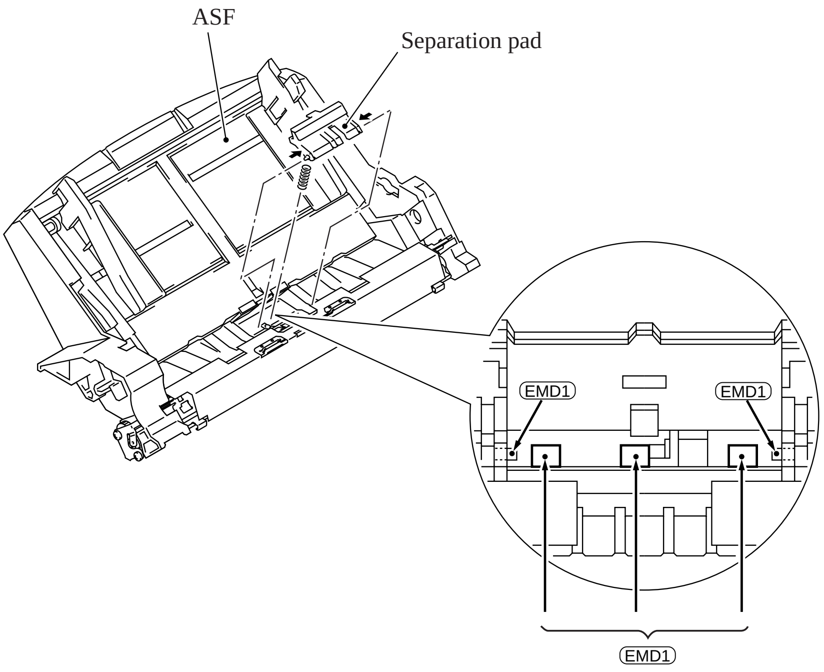

Gear drive unit
Main cover
①
②
③
④
⑤
⑥
⑦
⑧
⑨
High-voltage
power supply PCB
Heat-fixing unit

# 4.2 LUBRICATION

Apply the specified lubricants to the lubrication points as shown below.

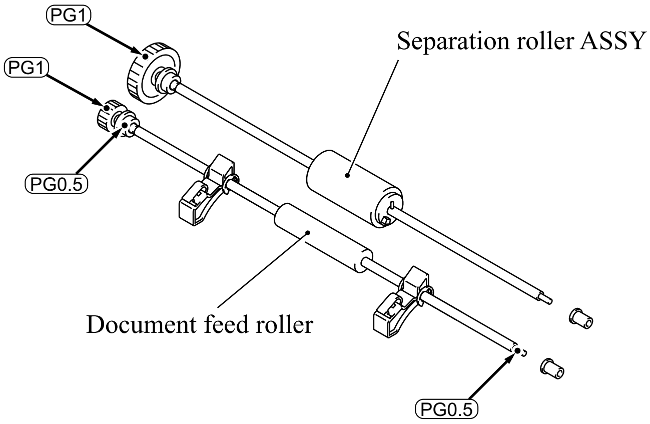
| Lubricant type (Manufacturer) | Lubricant amount | | |
|---|---|---|---|
| | Rice-sized pinch of grease (3 mm dia. ball) | Half rice-sized pinch of grease (2 mm dia. ball) | Thin coat of grease with a brush |
| Molykote EM-D110 (Dow Corning) | EMD1 | — | — |
| Molykote PG662 (Dow Corning) | PG1 | PG0.5 | — |
| Molykote HP-300 (Dow Corning) | — | — | HP |
| Molykote HP-500 (Dow Corning) | — | HP2 | — |
| FLOIL 951-P32 (Kanto Kasei Ltd.) | P1 | — | — |

### [ 1 ]   Separation pad

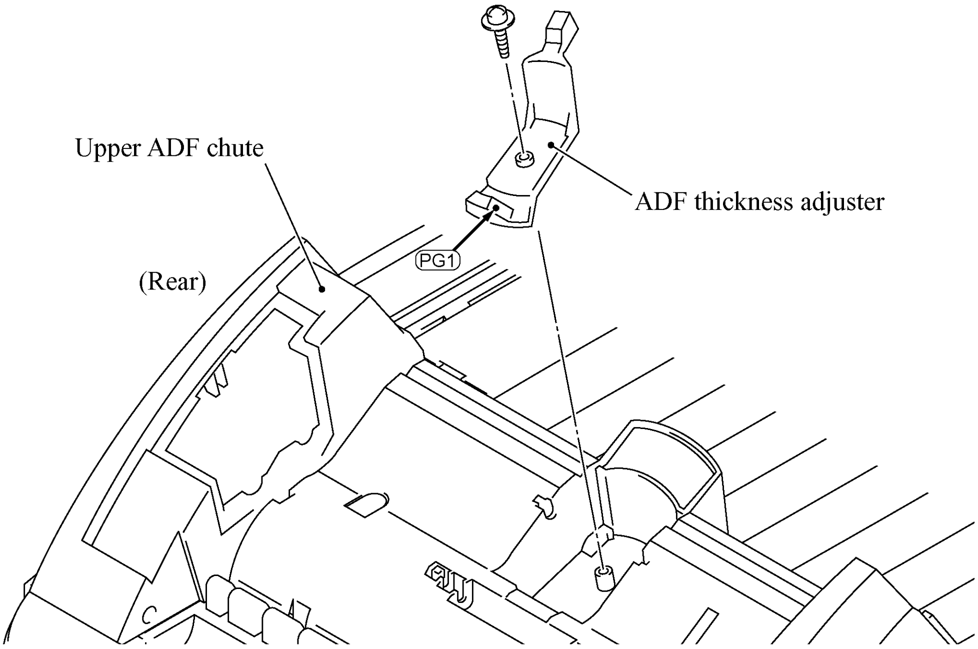


(Apply thin coat of grease to these sections with a brush where the separation pad is to be mounted.)

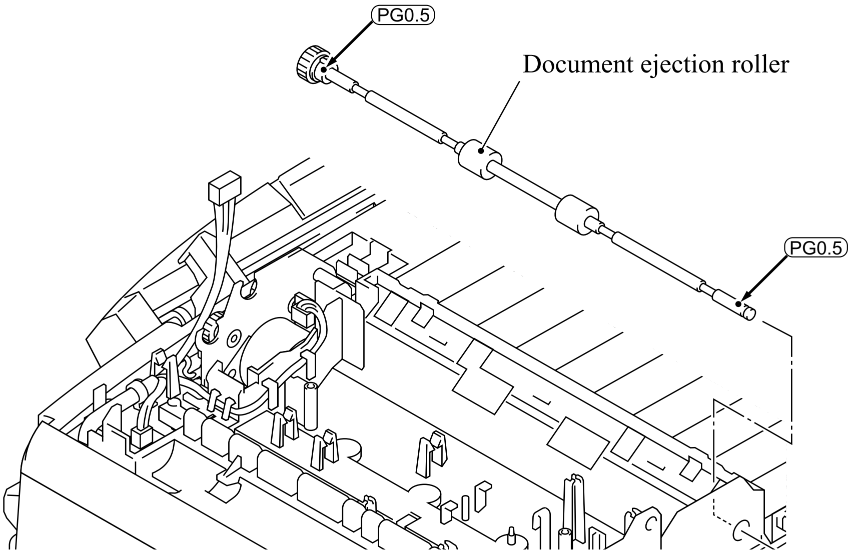
### [ 2 ]    Separation roller ASSY and document feed roller


PG1
PG1
PG0.5
Separation roller ASSY
Document feed roller
PG0.5

### [ 3 ]    ADF thickness adjuster


Upper ADF chute
ADF thickness adjuster
PG1
(Rear)

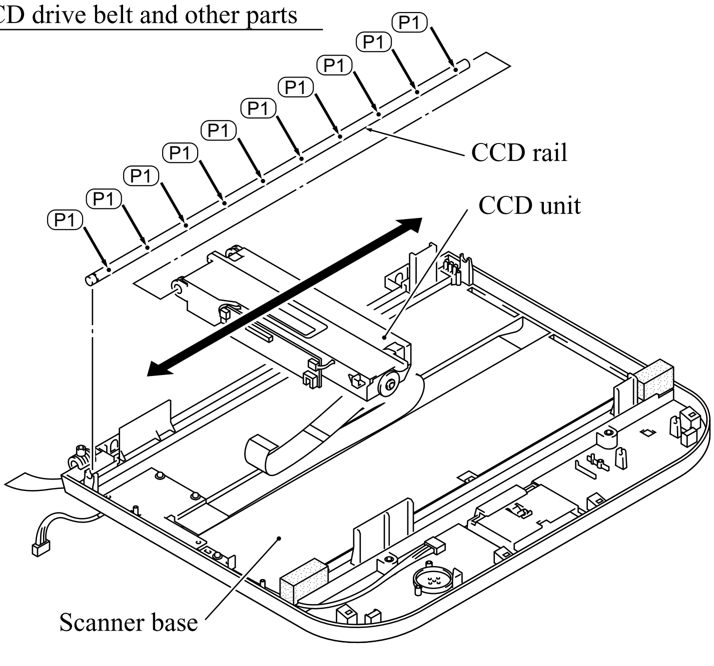
## [ 4 ] Document ejection roller


PG0.5
Document ejection roller
PG0.5

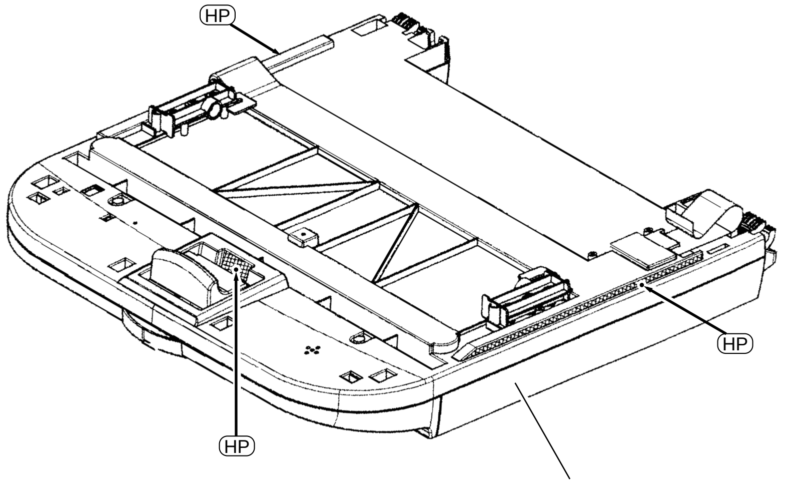
## [ 5 ] CCD rail in the scanner unit

Apply P1 to 10 points on the CCD rail and move the CCD unit to the right and left ends of its travel.

NOTE: Keep the CCD drive belt and other parts free from lubricant.

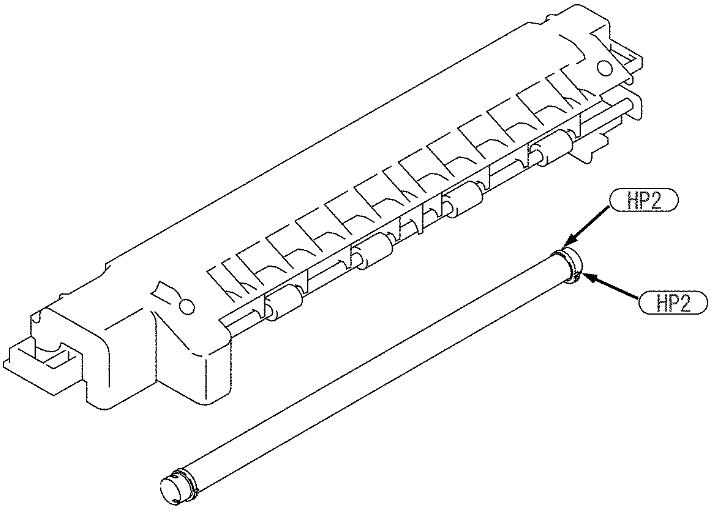

P1
P1
P1
P1
P1
P1
P1
P1
P1
P1
CCD rail
CCD unit
Scanner base

## [ 6 ]  Underside of the scanner unit


Apply thin coat of grease to these three sections (▨) with a brush.

Scanner unit placed upside down

## [ 7 ]  Heat roller in the fixing unit



# 4.3 PERIODICAL REPLACEMENT PARTS

Parts listed below require to be replaced periodically in order to assure the product quality. Even if it seems that those parts are not damaged in appearance, replace them at regular intervals specified below.

The replacement procedure is given in Section 4.1 "DISASSEMBLY/REASSEMBLY."

| Parts Name | Q’ty | Replacement Interval (Number of prints in terms of A4 size) | For the replacement procedure, refer to: |
|---|---|---|---|
| Heat-fixing unit | 1 | 50,000 pages | Subsection 4.1.12 |
| Paper pull-in roller | 1 | 50,000 pages | Subsection 4.1.11<br>(Illustration on page 4-36) |
| Separation pad ASSY | 1 | 50,000 pages | |

NOTE: The above table gives only the reference values.

## 4.4 MTBF/MTTR

The meantime between failures (MTBF) and meantime to repair (MTTR) of this machine are listed below.

MTBF: At least 10,000 hours
MTTR: Average 30 minutes per repair

# CHAPTER 5

# MAINTENANCE MODE

# CHAPTER 5 MAINTENANCE MODE

## CONTENTS

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5.2 LIST OF MAINTENANCE-MODE FUNCTIONS ........ 5-2

5.3 DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS ........ 5-4

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- 5.3.2 Printout of Scanning Compensation Data ........ 5-5
- 5.3.2A Movement of CCD Unit to the Transport Position ........ 5-1
- 5.3.3 ADF Performance Test ........ 5-7
- 5.3.4 Test Pattern 1 ........ 5-8
- 5.3.5 Firmware Switch Setting and Printout ........ 5-9
- 5.3.6 Operational Check of LCD ........ 5-12
- 5.3.7 Operational Check of Control Panel PCB ........ 5-12
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- 5.3.14 Output of Transmission Log to the Telephone Line (Not applicable to machines w/o fax) ........ 5-18
- 5.3.15 Cancellation of the Memory Security Mode (Applicable to the European version w/ fax only) ........ 5-19

# 5.1 ENTRY INTO THE MAINTENANCE MODE

For machines w/ fax

To make the machine enter the maintenance mode, press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

For machines w/o fax

To make the machine enter the maintenance mode, press the **Menu**, **0**, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

The machine beeps for approx. one second and displays " ▮▮ MAINTENANCE ▮▮▮ " on the LCD, indicating that it is placed in the initial stage of the maintenance mode, a mode in which the machine is ready to accept entry from the keys.

To select one of the maintenance-mode functions listed in Section 5.2, enter the corresponding 2-digit function code with the numerical keys on the control panel. (The details of each maintenance-mode function are described in Section 5.3.)

**NOTES:**

- Pressing the **9** key twice in the initial stage of the maintenance mode makes the machine exit from the maintenance mode, restoring it to the standby state.
- Pressing the **Stop** key after entering only one digit restores the machine to the initial stage of the maintenance mode.
- If an invalid function code is entered, the machine resumes the initial stage of the maintenance mode.

# 5.2 LIST OF MAINTENANCE-MODE FUNCTIONS

**Maintenance-mode Functions**

| Function Code | Function | Reference Subsection (Page) |
|---|---|---|
| 01 | EEPROM Parameter Initialization | 5.3.1 (5-4) |
| | | |
| 05 | Printout of Scanning Compensation Data | 5.3.2 (5-5) |
| 06 | Movement of CCD Unit to the Transport Position | 5.3.2A (5-6-1) |
| 08 | ADF* Performance Test | 5.3.3 (5-7) |
| 09 | Test Pattern 1 | 5.3.4 (5-8) |
| 10 | Firmware Switch Setting | 5.3.5 (5-9) |
| 11 | Printout of Firmware Switch Data | 5.3.5 (5-11) |
| 12 | Operational Check of LCD | 5.3.6 (5-12) |
| 13 | Operational Check of Control Panel PCB (Check of Keys and Buttons) | 5.3.7 (5-12) |
| | | |
| 32 | Sensor Operational Check | 5.3.8 (5-14) |
| | | |
| 54 | Fine Adjustment of Scanning Start/End Position | 5.3.9 (5-15) |
| 55 | CCD Scanner Area Setting | 5.3.10 (5-16) |
| | | |
| 74 | EEPROM Customizing | 5.3.11 (5-16) |
| | | |
| 80 | Display of the Machine's Log Information | 5.3.12 (5-17) |
| | | |
| 82 | Machine Error Code Indication | 5.3.13 (5-18) |
| | | |
| 87 | Output of Transmission Log to the Telephone Line | 5.3.14 (5-18) |
| | | |
| 91 | EEPROM Parameter Initialization (except the telephone number storage area) | 5.3.1 (5-4) |
| | | |
| 99 | Exit from the Maintenance Mode | ----- (5-1) |

* ADF: Automatic document feeder

## IMPORTANT

Basically, the maintenance-mode functions listed on the previous page should be accessed by service personnel only. However, you may allow end users to access some of these under the guidance of service personnel (e.g., by telephone).

The user-accessible functions (codes 06, 10, 11, 12, 54, 80, 82, 87 and 91) are shaded in the table given on the previous page. Function code 10 accesses the firmware switches, each of which has eight selectors. You should not allow end users to access all of those selectors, but you may allow them to access user-accessible selectors which are shaded in the firmware switch tables in Appendix 2.

The service personnel should instruct end users to follow the procedure given below.

(1) For MFC6800
Press the **Menu** and **Receive Mode** keys in this order.
**NOTE:** The **Receive Mode** key is inoperable during standby for redialing and timer.

For MFC9180
Press the **Menu** and **Fax Resolution** keys in this order.

For DCP1000 and MFC9160
Press the **Menu** and **Sort** keys in this order.

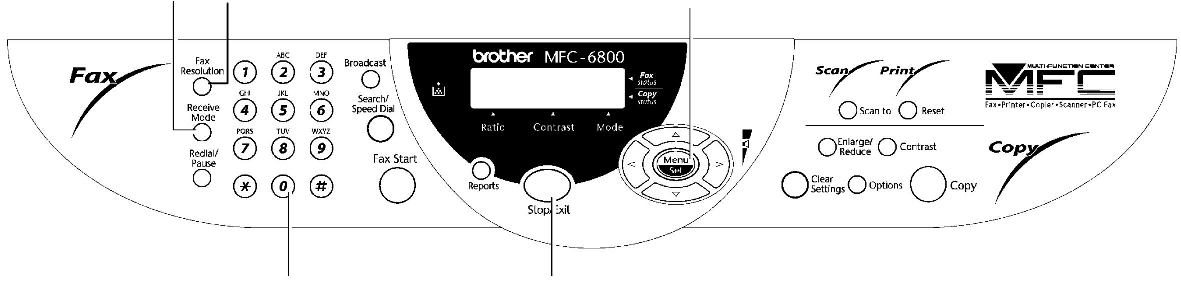
The LCD clears the current display.

(2) Press the **0** key.

(3) Enter the desired function code (06, 10, 11, 12, 54, 80, 82, 87, or 91) with the numerical keys.
For function code 10, access the desired firmware switch according to the operating procedure described in Appendix 2.

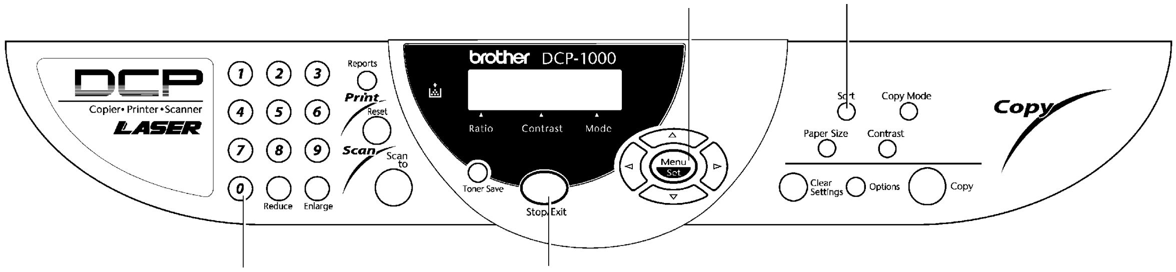
(4) To make the machine return to the standby state, press the **Stop** key.

For machines w/ fax


Fax
Fax Resolution
Receive Mode
Redial/ Pause
Broadcast
Search/ Speed Dial
Fax Start
brother MFC-6800
Fax status
Copy status
Ratio
Contrast
Mode
Reports
Stop/Exit
Menu Set
Scan
Print
Scan to
Reset
MFC
Fax•Printer•Copier•Scanner•PC Fax
Enlarge/ Reduce
Contrast
Copy
Clear Settings
Options
Copy

Receive Mode key
Fax Resolution key
Menu key
0 key
Stop key

For machines w/o fax


DCP
Copier•Printer•Scanner
LASER
Reports
Print
Reset
Scan
Scan to
Reduce
Enlarge
brother DCP-1000
Ratio
Contrast
Mode
Toner Save
Stop/Exit
Menu Set
Sort
Copy Mode
Paper Size
Contrast
Copy
Clear Settings
Options
Copy

Menu key
Sort key
0 key
Stop key

# 5.3 DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS

### 5.3.1 EEPROM Parameter Initialization

#### ■ Function

The machine initializes the parameters, user switches, and firmware switches registered in the EEPROM, to the initial values. Entering the function code 01 initializes all of the EEPROM areas, but entering 91 does not initialize some areas, as listed below.

| Function code<br>Data item | 01 | 91 |
|---|---|---|
| Maintenance-mode functions<br>User switches<br>Firmware switches<br>Remote activation code | All of these will be. initialized | These will be initialized |
| Activity report<br>Station ID data<br>Outside line number<br>Telephone function registration<br>Speed dialing<br>Group dialing | | These will not be initialized |
| Received FAX messages temporarily stored in the flash memory (Not applicable to the American version)<br>EEPROM customizing code (4-digit) | These will not be initialized.<br>(Note that the first digit of the 4-digit customizing code will be initialized to "0." If the code is 1001, for example, it will be initialized to 0001.) | |

**NOTE:** If you replace the main PCB with one used for any other machine, carry out this procedure and then customize the EEPROM (maintenance-mode function code 74 in Subsection 5.3.11).

#### ■ Operating Procedure

(1) Press the **0** and **1** keys (or the **9** and **1** keys according to your need) in this order in the initial stage of the maintenance mode.

The "PARAMETER INIT" will appear on the LCD.

(2) Upon completion of parameter initialization, the machine returns to the initial stage of the maintenance mode.

### 5.3.2 Printout of Scanning Compensation Data

#### ■ Function

The machine prints out the white and black level data for scanning compensation.

#### ■ Operating Procedure

Do not start this function merely after powering on the machine but start it after carrying out a sequence of scanning operation. Unless the machine has carried out any scanning operation, this function cannot print out correct scanning compensation data. This is because at the start of scanning operation, the machine initializes white and black level data and takes in the scanning compensation reference data.

(1) Press the **0** and **5** keys in this order in the initial stage of the maintenance mode.

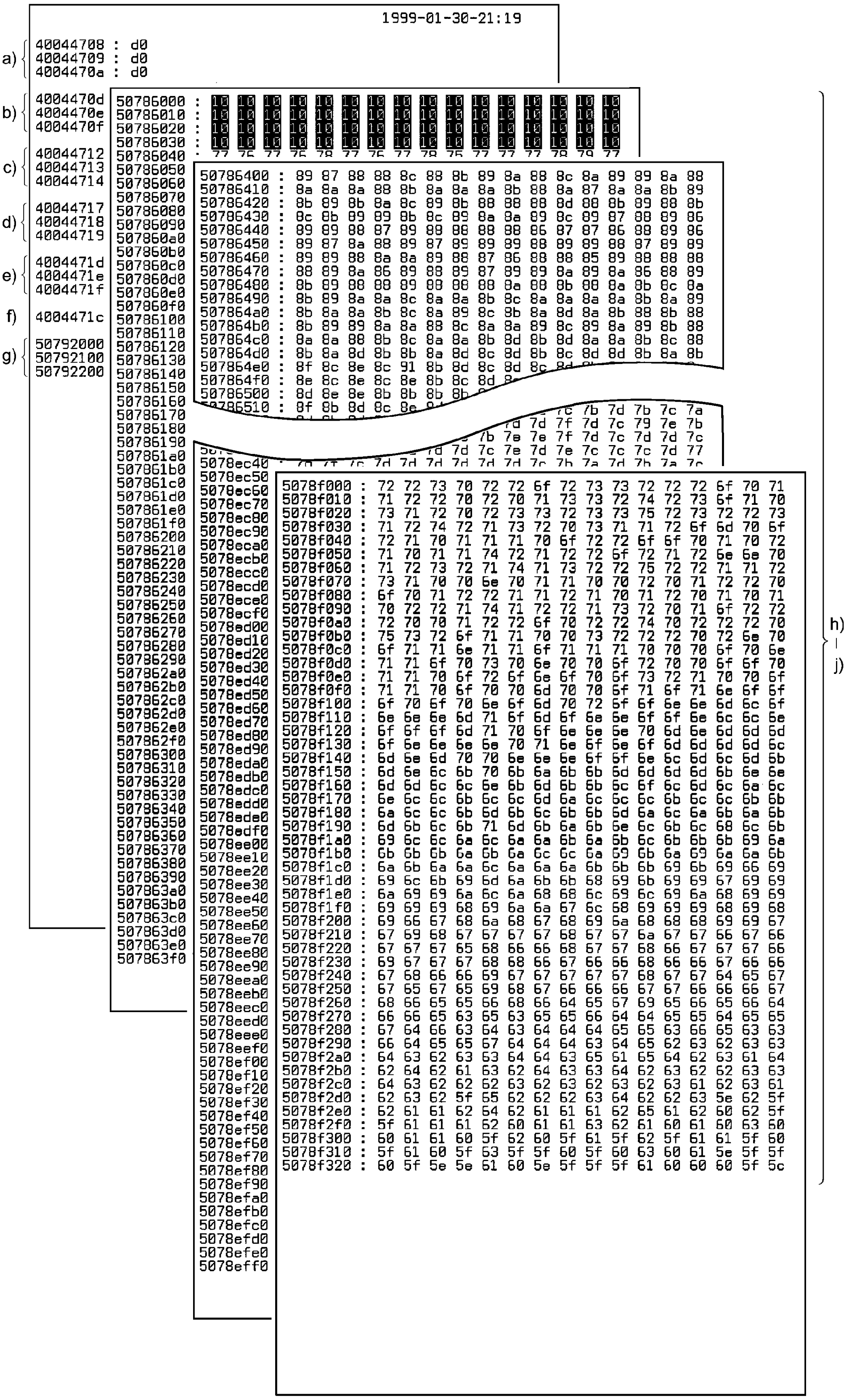
The "WHITE LEVEL 1" will appear on the LCD.

(2) The machine prints out the scanning compensation data list containing the following:

a) A/D converter reference level for high value (3 bytes for green, blue, and red)
b) A/D converter reference level for low value (3 bytes for green, blue, and red)
c) Dark level offset data (3 bytes for green, blue, and red)
d) Gain control data (3 bytes for green, blue, and red)
e) Voltage division data (3 bytes for green, blue, and red)
f) Compensation data for background color (1 byte)
g) 2-value quantization black level data (3 bytes for green, blue, and red)
h) 2-value quantization white level data (4912 bytes for green)
i) 2-value quantization white level data (4912 bytes for blue)
j) 2-value quantization white level data (4912 bytes for red)

(3) Upon completion of recording of the compensation data list, the machine returns to the initial stage of the maintenance mode.

**NOTE:** If any data is abnormal, its code will be printed in inline style, as shown on the next page.



```
                                   1999-01-30-21:19
40044708 : d0
40044709 : d0
4004470a : d0
4004470d
4004470e
4004470f
40044712
40044713
40044714
40044717
40044718
40044719
4004471d
4004471e
4004471f
4004471c
50792000
50792100
50792200
```

```
50786000 : 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
50786010 : 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
50786020 : 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
50786030 : 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
50786040 : 77 76 77 76 78 77 76 77 78 75 77 77 77 78 79 77
50786050
50786060
50786070
50786080
50786090
507860a0
507860b0
507860c0
507860d0
507860e0
507860f0
50786100
50786110
50786120
50786130
50786140
50786150
50786160
50786170
50786180
50786190
507861a0
507861b0
507861c0
507861d0
507861e0
507861f0
50786200
50786210
50786220
50786230
50786240
50786250
50786260
50786270
50786280
50786290
507862a0
507862b0
507862c0
507862d0
507862e0
507862f0
50786300
50786310
50786320
50786330
50786340
50786350
50786360
50786370
50786380
50786390
507863a0
507863b0
507863c0
507863d0
507863e0
507863f0
```

```
50786400 : 89 87 88 88 8c 88 8b 89 8a 88 8c 8a 89 89 8a 88
50786410 : 8a 8a 8a 88 8b 8a 8a 8a 8b 88 8a 87 8a 8a 8b 89
50786420 : 8b 89 8b 8a 8c 89 8b 88 88 88 8d 88 8b 89 88 8b
50786430 : 8c 8b 89 89 8b 8c 89 8a 8a 89 8c 89 87 88 89 86
50786440 : 89 89 88 87 89 88 88 88 88 86 87 87 86 88 89 86
50786450 : 89 87 8a 88 89 87 89 89 89 88 89 89 88 87 89 89
50786460 : 89 89 88 8a 8a 89 88 87 86 88 88 85 89 88 88 88
50786470 : 88 89 8a 86 89 88 89 87 89 89 8a 89 8a 86 88 89
50786480 : 8b 89 88 88 89 88 88 88 8a 88 8b 88 8a 8b 8c 8a
50786490 : 8b 89 8a 8a 8c 8a 8a 8b 8c 8a 8a 8a 8a 8b 8a 89
507864a0 : 8b 8a 8a 8b 8c 8a 89 8c 8b 8a 8d 8a 8b 88 8b 88
507864b0 : 8b 89 89 8a 8a 88 8c 8a 8a 89 8c 89 8a 89 8b 88
507864c0 : 8a 8a 88 8b 8c 8a 8a 8b 8d 8b 8d 8a 8a 8b 8c 88
507864d0 : 8b 8a 8d 8b 8b 8a 8d 8c 8d 8b 8c 8d 8d 8b 8a 8b
507864e0 : 8f 8c 8e 8c 91 8b 8d 8c 8d 8c
507864f0 : 8e 8c 8e 8c 8e 8b 8c 8d
50786500 : 8d 8e 8e 8b 8b 8b 8b
50786510 : 8f 8b 8d 8c 8e
                                     7c 7b 7d 7b 7c 7a
                                  7d 7d 7f 7d 7c 79 7e 7b
                               7b 7e 7e 7f 7d 7c 7d 7d 7c
                         7d 7d 7c 7e 7d 7e 7c 7c 7c 7d 77
5078ec40 : 7d 7f 7c 7d 7d 7d 7d 7d 7d 7c 7b 7a 7d 7b 7a 7c
5078ec50
5078ec60
5078ec70
5078ec80
5078ec90
5078eca0
5078ecb0
5078ecc0
5078ecd0
5078ece0
5078ecf0
5078ed00
5078ed10
5078ed20
5078ed30
5078ed40
5078ed50
5078ed60
5078ed70
5078ed80
5078ed90
5078eda0
5078edb0
5078edc0
5078edd0
5078ede0
5078edf0
5078ee00
5078ee10
5078ee20
5078ee30
5078ee40
5078ee50
5078ee60
5078ee70
5078ee80
5078ee90
5078eea0
5078eeb0
5078eec0
5078eed0
5078eee0
5078eef0
5078ef00
5078ef10
5078ef20
5078ef30
5078ef40
5078ef50
5078ef60
5078ef70
5078ef80
5078ef90
5078efa0
5078efb0
5078efc0
5078efd0
5078efe0
5078eff0
```

```
5078f000 : 72 72 73 70 72 72 6f 72 73 73 72 72 72 6f 70 71
5078f010 : 71 72 72 70 72 70 71 73 73 72 74 72 73 6f 71 70
5078f020 : 73 71 72 70 72 73 73 72 73 73 75 72 73 72 72 73
5078f030 : 71 72 74 72 71 73 72 70 73 71 71 72 6f 6d 70 6f
5078f040 : 72 71 70 71 71 71 70 6f 72 72 6f 6f 70 71 70 72
5078f050 : 71 70 71 71 74 72 71 72 72 6f 72 71 72 6e 6e 70
5078f060 : 71 72 73 72 71 74 71 73 72 72 75 72 72 71 71 72
5078f070 : 73 71 70 70 6e 70 71 71 70 70 72 70 71 72 72 70
5078f080 : 6f 70 71 72 72 71 71 72 71 70 71 72 70 71 70 71
5078f090 : 70 72 72 71 74 71 72 72 71 73 72 70 71 6f 72 72
5078f0a0 : 72 70 70 71 72 72 6f 70 72 72 74 70 72 72 72 70
5078f0b0 : 75 73 72 6f 71 71 70 70 73 72 72 72 70 72 6e 70
5078f0c0 : 6f 71 71 6e 71 71 6f 71 71 71 70 70 70 6f 70 6e
5078f0d0 : 71 71 6f 70 73 70 6e 70 70 6f 72 70 70 6f 6f 70
5078f0e0 : 71 71 70 6f 72 6f 6e 6f 70 6f 73 72 71 70 70 6f
5078f0f0 : 71 71 70 6f 70 70 6d 70 70 6f 71 6f 71 6e 6f 6f
5078f100 : 6f 70 6f 70 6e 6f 6d 70 72 6f 6f 6e 6e 6d 6c 6f
5078f110 : 6e 6e 6e 6d 71 6f 6d 6f 6e 6e 6f 6f 6e 6c 6c 6e
5078f120 : 6f 6f 6f 6d 71 70 6f 6e 6e 6e 70 6d 6e 6d 6d 6d
5078f130 : 6f 6e 6e 6e 6e 70 71 6e 6f 6e 6f 6d 6d 6d 6d 6c
5078f140 : 6d 6e 6d 70 70 6e 6e 6e 6f 6f 6e 6c 6d 6c 6d 6b
5078f150 : 6d 6e 6c 6b 70 6b 6a 6b 6b 6d 6d 6d 6d 6b 6e 6e
5078f160 : 6d 6d 6c 6c 6e 6b 6d 6b 6b 6c 6f 6c 6d 6c 6a 6c
5078f170 : 6e 6c 6c 6b 6c 6c 6d 6a 6c 6c 6c 6b 6c 6c 6b 6b
5078f180 : 6a 6c 6c 6b 6d 6b 6c 6b 6b 6d 6a 6c 6a 6b 6a 6b
5078f190 : 6d 6b 6c 6b 71 6d 6b 6a 6b 6e 6c 6b 6c 68 6c 6b
5078f1a0 : 69 6c 6c 6a 6c 6a 6a 6b 6a 6b 6c 6b 6b 6b 69 6a
5078f1b0 : 6b 6b 6b 6a 6b 6a 6c 6c 6a 69 6b 6a 69 6a 6a 6b
5078f1c0 : 6a 6b 6a 6a 6c 6a 6a 6a 6b 6b 6b 69 6b 69 66 69
5078f1d0 : 69 6c 6b 69 6d 6a 6b 6b 68 69 6b 69 69 67 69 69
5078f1e0 : 6a 69 69 6a 6c 6a 68 68 6c 69 6c 69 6a 68 69 69
5078f1f0 : 69 69 69 68 69 6a 6a 67 6c 68 69 69 69 68 69 68
5078f200 : 69 66 67 68 6a 68 67 68 69 6a 68 68 68 69 69 67
5078f210 : 67 69 68 67 67 67 67 68 67 67 6a 67 67 66 67 66
5078f220 : 67 67 67 65 68 66 66 68 67 67 68 66 67 67 67 66
5078f230 : 69 67 67 67 68 68 66 67 66 66 68 66 66 67 66 66
5078f240 : 67 68 66 66 69 67 67 67 67 67 68 67 67 64 65 67
5078f250 : 67 65 67 65 69 68 67 66 66 66 67 67 66 66 66 67
5078f260 : 68 66 65 65 66 68 66 64 65 67 69 65 66 65 66 64
5078f270 : 66 66 65 63 65 63 65 65 66 64 64 65 65 64 65 65
5078f280 : 67 64 66 63 64 63 64 64 64 65 65 63 66 65 63 63
5078f290 : 66 64 65 65 67 64 64 64 63 64 65 62 63 62 63 63
5078f2a0 : 64 63 62 63 63 64 64 63 65 61 65 64 62 63 61 64
5078f2b0 : 62 64 62 61 63 62 64 63 63 64 62 63 62 62 63 63
5078f2c0 : 64 63 62 62 62 63 62 63 62 63 62 63 61 62 63 61
5078f2d0 : 62 63 62 5f 65 62 62 62 63 64 62 62 63 5e 62 5f
5078f2e0 : 62 61 61 62 64 62 61 61 61 62 65 61 62 60 62 5f
5078f2f0 : 5f 61 61 61 62 60 61 61 63 62 61 60 61 60 63 60
5078f300 : 60 61 61 60 5f 62 60 5f 61 5f 62 5f 61 61 5f 60
5078f310 : 5f 61 60 5f 63 5f 5f 60 5f 60 63 60 61 5e 5f 5f
5078f320 : 60 5f 5e 5e 61 60 5e 5f 5f 5f 61 60 60 60 5f 5c
```

**Scanning Compensation Data List**

### 5.3.2A Movement of CCD Unit to the Transport Position

#### ■ Function

This procedure moves the CCD unit to the transport position of the right end of its travel. After completing repairs and operation checks on the machine, you need to carry out this procedure immediately before packing and transporting the machine.

**NOTE:** If an end user needs to transport his/her machine to the dealer or service station for repair, then you should instruct him/her to carry out this procedure if possible before packing and transporting the machine. (For the user-access to the maintenance mode, refer to page 5-3.)

#### ■ Operating Procedure

(1) Press the **0** and **6** keys in this order in the initial stage of the maintenance mode.

The CCD unit will move to the right end of its travel, during which the "MAINTENANCE 0" will appear on the LCD.

When the CCD unit reaches the transport position, the "SCAN LOCKED" will appear on the LCD.

(2) Press the **Stop** key to make the machine return to the initial stage of the maintenance mode.

### 5.3.3 ADF Performance Test

#### ■ Function

The machine counts the documents fed by the automatic document feeder (ADF) and displays the count on the LCD for checking the ADF performance.

#### ■ Operating Procedure

(1) Set documents. (Allowable up to the ADF capacity.)

The "DOC. READY" will appear on the LCD.

(2) Press the **0** and **8** keys in this order.

While counting the documents, the machine feeds them in and out, displaying the current count on the LCD as shown below.

ADF CHECK P.01

Current count (1st page in this example)

(3) After showing the final count, the machine beeps for one second. To return the machine to the initial stage of the maintenance mode, press the **Stop** key.

### 5.3.4 Test Pattern 1

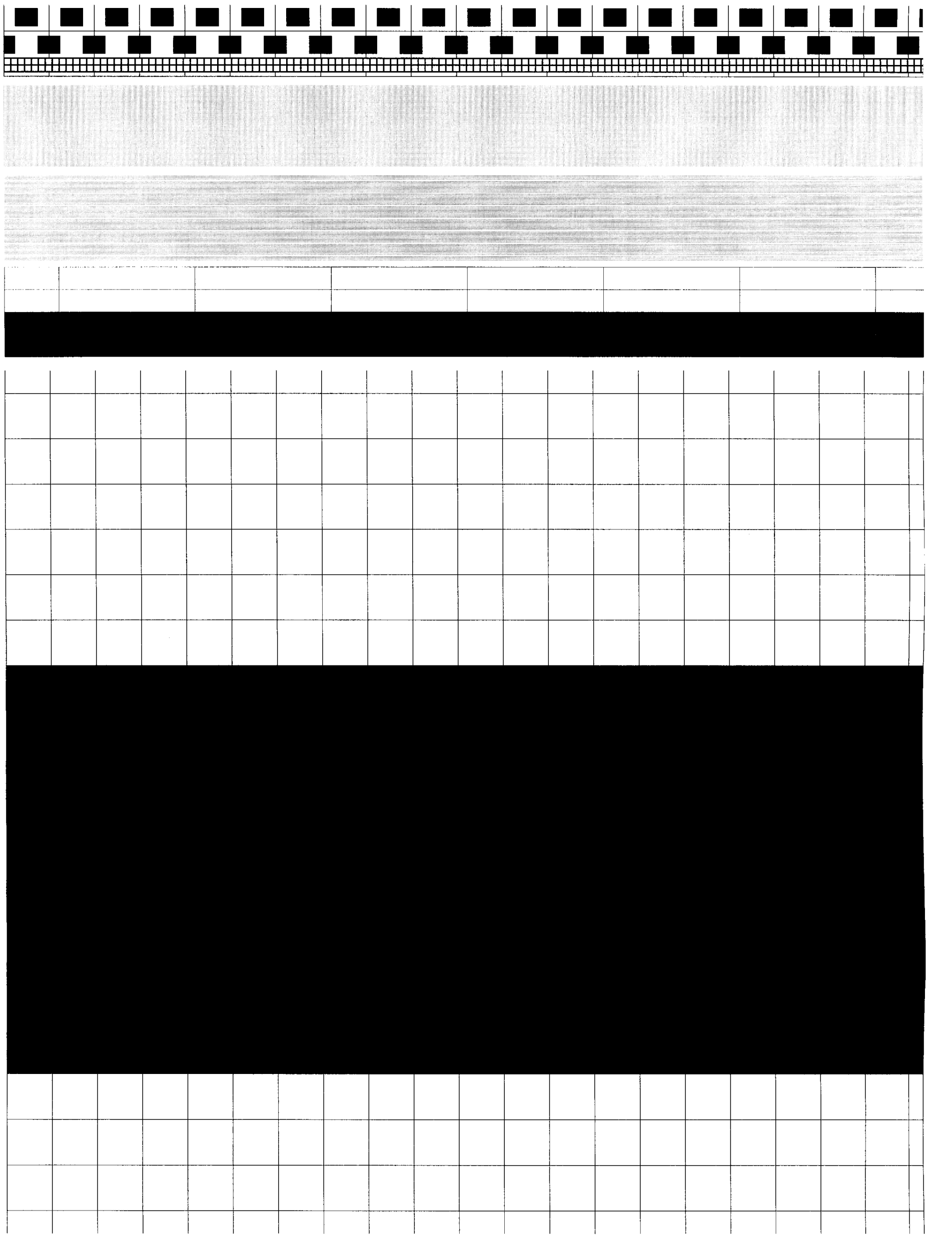
#### ■ Function

This function, much like the copying function, prints out test pattern 1 to allow the service personnel to check for record data missing or print quality.

#### ■ Operating Procedure

Press the **0** and **9** keys in this order in the initial stage of the maintenance mode.

The figure below shows test pattern 1.



**Test Pattern 1**

### 5.3.5 Firmware Switch Setting and Printout

### [ A ] Firmware switch setting

#### ■ Function

The machine incorporates the following firmware switch functions which may be activated with the procedures using the control panel keys and buttons.

The firmware switches have been set at the factory in conformity to the communications standards and codes of each country. Do not disturb them unless necessary. Some firmware switches may not be applicable in some versions. The firmware switch data list indicates "Not used." for those inapplicable switches.

**Firmware Switches (WSW01 through WSW46)**

| WSW No. | Function |
|---|---|
| WSW01 | Dial pulse setting |
| WSW02 | Tone signal setting |
| WSW03 | PABX mode setting |
| WSW04 | TRANSFER facility setting |
| WSW05 | 1st dial tone and busy tone detection |
| WSW06 | **Pause** key setting and 2nd dial tone detection |
| WSW07 | Dial tone setting 1 |
| WSW08 | Dial tone setting 2 |
| WSW09 | Protocol definition 1 |
| WSW10 | Protocol definition 2 |
| WSW11 | Busy tone setting |
| WSW12 | Signal detection condition setting |
| WSW13 | Modem setting |
| WSW14 | AUTO ANS facility setting |
| WSW15 | REDIAL facility setting |
| WSW16 | Function setting 1 |
| WSW17 | Function setting 2 |
| WSW18 | Function setting 3 |
| WSW19 | Transmission speed setting in V. 17 mode |
| WSW20 | Overseas communications mode setting |
| WSW21 | TAD setting 1 |
| WSW22 | ECM setting |
| WSW23 | Communications setting |
| WSW24 | TAD setting 2 |
| WSW25 | TAD setting 3 |
| WSW26 | Function setting 4 |
| WSW27 | Function setting 5 |
| WSW28 | Function setting 6 |
| WSW29 | Function setting 7 |
| WSW30 | Function setting 8 |
| WSW31 | Function setting 9 |
| WSW32 | Function setting 10 |
| WSW33 | Function setting 11 |

**Firmware Switches (WSW01 through WSW46)** ***Continued***

| WSW No. | Function |
|---|---|
| WSW34 | Function setting 12 |
| WSW35 | Function setting 13 |
| WSW36 | Function setting 14 |
| WSW37 | Function setting 15 |
| WSW38 | Function setting 16 in V. 34 mode |
| WSW39 | Transmission speed setting in V. 34 mode |
| WSW40 | Function setting 17 in V. 34 mode |
| WSW41 | CCD fluorescent lamp and modem attenuator in V. 34 mode |
| WSW42 | Function setting 18 |
| WSW43 | Function setting 19 |
| WSW44 | Speeding up scanning-1 |
| WSW45 | Speeding up scanning-2 |
| WSW46 | Monitor of power ON/OFF state |

## ■ Operating Procedure

(1) Press the **1** and **0** keys in this order in the initial stage of the maintenance mode.

The machine displays the "WSW00" on the LCD and becomes ready to accept a firmware switch number.

(2) Enter the desired number from the firmware switch numbers (01 through 46).

The following appears on the LCD:

Selector 1 Selector 8
↓ ↓
WSWXX = 0 0 0 0 0 0 0 0

(3) Use the right and left arrow keys to move the cursor to the selector position to be modified.

(4) Enter the desired number using the **0** and **1** keys.

(5) Press the **Set** key. This operation saves the newly entered selector values onto the EEPROM and readies the machine for accepting a firmware switch number.

(6) Repeat steps (2) through (5) until the modification for the desired firmware switches is completed.

(7) Press the **Set** or **Stop** key to return the machine to the initial stage of the maintenance mode.

**NOTES:**
- To cancel this operation and return the machine to the initial stage of the maintenance mode during the above procedure, press the **Stop** key.
- If there is a pause of more than one minute after a single-digit number is entered for double-digit firmware switch numbers, the machine will automatically return to the initial stage of the maintenance mode.

## ■ Details of Firmware Switches

The details of the firmware switches are described in Appendix 2 in which the user-accessible selectors of the firmware switches are shaded.

## [ B ] Printout of firmware switch data

### ■ Function

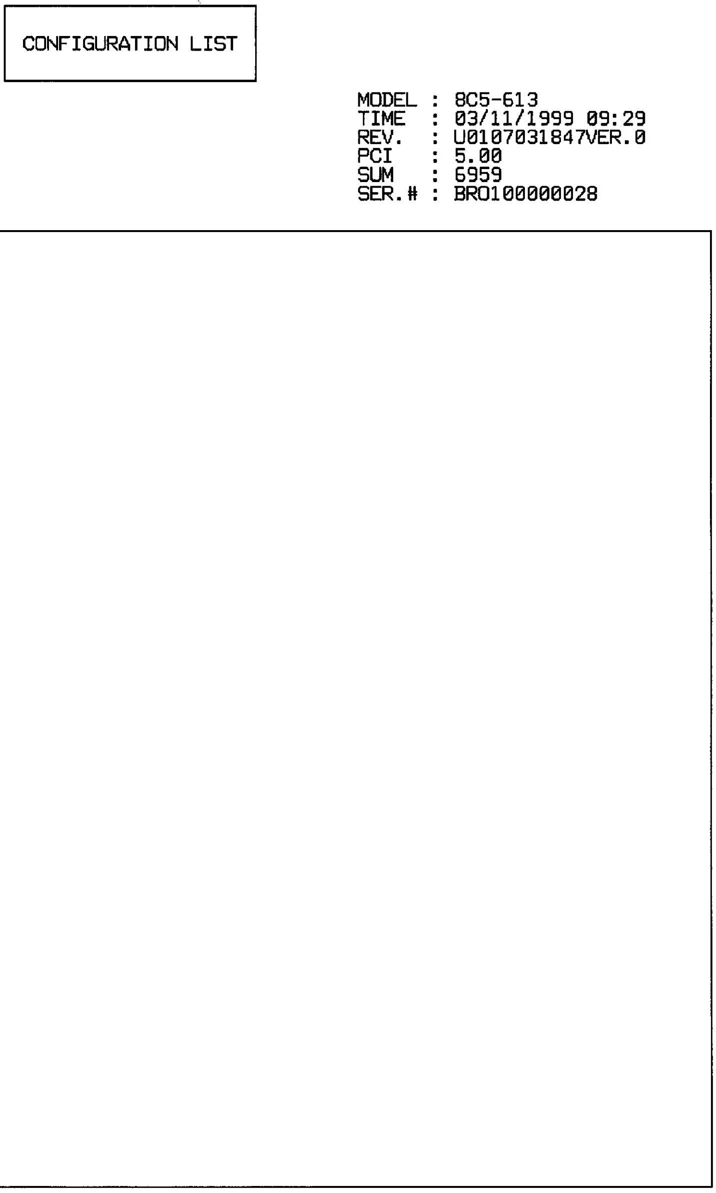
The machine prints out the setting items and contents specified by the firmware switches.

### ■ Operating Procedure

(1) Press the **1** key twice in the initial stage of the maintenance mode.
The "PRINTING" will appear on the LCD.

(2) The machine prints out the configuration list as shown in the figure below.

(3) Upon completion of printing, the machine returns to the initial stage of the maintenance mode.



```
CONFIGURATION LIST

                                              MODEL : 8C5-613
                                              TIME  : 03/11/1999 09:29
                                              REV.  : U0107031847VER.0
                                              PCI   : 5.00
                                              SUM   : 6959
                                              SER.# : BRO100000028

WSW01 = 00000010
WSW02 = 11111010
WSW03 = 10000000
WSW04 = 00010111
WSW05 = 00000110
WSW06 = 00101100
WSW07 = 01001100
WSW08 = 01100100
WSW09 = 00000000
WSW10 = 00010100
WSW11 = 01011000
WSW12 = 10011011
WSW13 = 00011010
WSW14 = 01100111
WSW15 = 00001110
WSW16 = 01100010
WSW17 = 00100011
WSW18 = 10001010
WSW19 = 11100000
WSW20 = 10011111
WSW21 = 00101000
WSW22 = 00100000
WSW23 = 00001110
WSW24 = 01000010
WSW25 = 00011010
WSW26 = 00110010
WSW27 = 00100001
WSW28 = 00000000
WSW29 = 01101001
WSW30 = 10000000
WSW31 = 10100101
WSW32 = 01010000
WSW33 = 10000010
WSW34 = 00010000
WSW35 = 01000000
WSW36 = 00001000
WSW37 = 10000101
WSW38 = 00010100
WSW39 = 11110000
WSW40 = 00000000
WSW41 = 00000111
WSW42 = 11110100
WSW43 = 00000001
WSW44 = 00000010
WSW45 = 00000010
WSW46 = 00000000
WSW47 = 00000000
WSW48 = 00000000
WSW49 = 00000000
WSW50 = 00000000
```

**Configuration List**

### 5.3.6 Operational Check of LCD

■ **Function**

This function allows you to check whether the LCD on the control panel works normally.

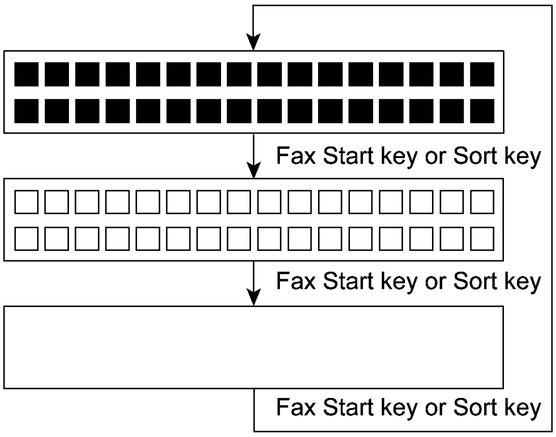
■ **Operating Procedure**

(1) Press the **1** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the screen given at right.

(2) For machines w/ fax: Press the **Fax Start** key. Each time you press the **Fax Start** key, the LCD cycles through the displays shown at right.

For machines w/o fax: Press the **Sort** key. Each time you press the **Sort** key, the LCD cycles through the displays shown at right.


Fax Start key or Sort key
Fax Start key or Sort key
Fax Start key or Sort key

(3) Press the **Stop** key in any process of the above display cycle. The machine beeps for one second and returns to the initial stage of the maintenance mode.

### 5.3.7 Operational Check of Control Panel PCB

■ **Function**

This function allows you to check the control panel PCB for normal operation.

■ **Operating Procedure**

(1) Press the **1** and **3** keys in this order in the initial stage of the maintenance mode.

The "00 " will appear on the LCD.

(2) Press the keys and buttons in the order designated in the illustration shown below.

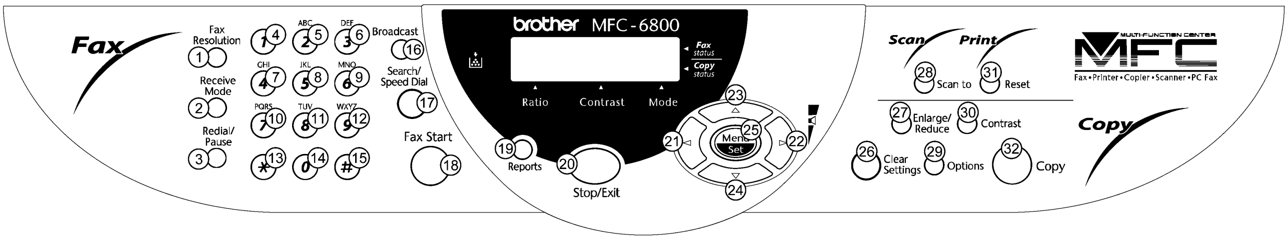
The LCD shows the corresponding number in decimal notation each time a key or button is pressed. Check that the displayed number is correct by referring to the illustration below.

If a key or button is pressed out of order, the machine beeps and displays the "INVALID OPERATE" on the LCD. To return to the status ready to accept key & button entry for operational check, press the **Stop** key.

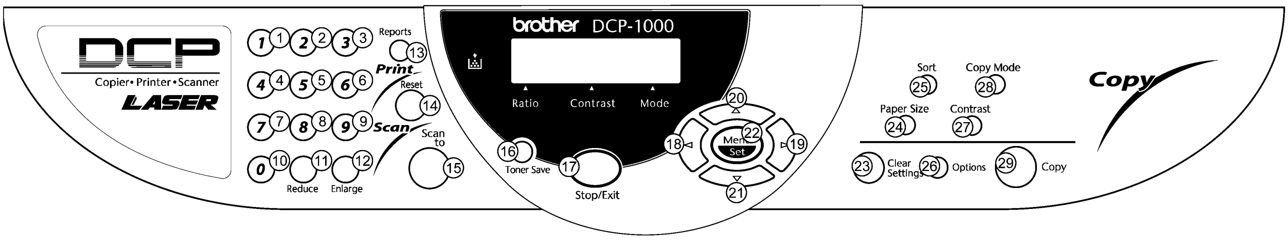
(3) After the last number key or button is pressed, the machine beeps and returns to the initial stage of the maintenance mode.

To terminate this operation, press the **Stop** key. The machine returns to the initial stage of the maintenance mode.

For machines w/ fax


Fax
Fax Resolution
Receive Mode
Redial/Pause
ABC
DEF
GHI
JKL
MNO
PQRS
TUV
WXYZ
Broadcast
Search/Speed Dial
Fax Start
brother MFC-6800
Fax status
Copy status
Ratio
Contrast
Mode
Reports
Stop/Exit
Menu Set
Scan
Print
Scan to
Reset
MULTI-FUNCTION CENTER
MFC
Fax•Printer•Copier•Scanner•PC Fax
Enlarge/Reduce
Contrast
Clear Settings
Options
Copy
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

For machines w/o fax


DCP
Copier• Printer•Scanner
LASER
Reports
Print
Reset
Scan
Scan to
Reduce
Enlarge
brother DCP-1000
Ratio
Contrast
Mode
Toner Save
Stop/Exit
Menu Set
Sort
Copy Mode
Paper Size
Contrast
Clear Settings
Options
Copy
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

**Key & Button Entry Order**

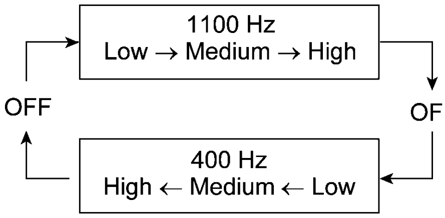
### 5.3.8 Sensor Operational Check

## ■ Function

This function allows you to check whether the eight sensors--document front sensor, document rear sensor, scanner open sensor, registration sensor, paper ejection sensor, toner sensor, CCD HP sensor, and document tray open sensor--operate correctly.

## ■ Operating Procedure

(1) Press the **3** and **2** keys in this order in the initial stage of the maintenance mode. The machine beeps 1100 Hz and 400 Hz tones cyclically through the following volumes for testing the speaker.



**NOTE:** To stop beeping, press the **Menu** key.

If the sensing status are as listed below, the LCD will show the following:

"FRRECVRGPOTNFHFC

Given below is the relationship between the LCD indication, sensor names and sensor status.

| LCD | Sensors | Sensing status |
|---|---|---|
| FR | Document front sensor | No document detected. |
| RE | Document rear sensor | No document detected. |
| CV | Scanner open sensor | Scanner unit closed. |
| RG | Registration sensor | No paper detected. |
| PO | Paper ejection sensor | No paper jam. |
| TN | Toner sensor | Toner detected. |
| FH | CCD HP sensor | CCD unit placed in the home position |
| FC | Document tray open sensor | Document tray closed. |

(2) Change the detecting conditions (e.g., insert paper through the document sensors or the registration sensor, open the scanner unit, jam paper at the paper outlet, remove the toner cartridge, move the CCD unit out of the home position, open the document tray), and then check that the indication on the LCD changes according to the sensor states.

(3) To stop this operation and return the machine to the initial stage of the maintenance mode, press the **Stop** key.

### 5.3.9 Fine Adjustment of Scanning Start/End Position

## ■ Function

This function allows you to adjust the scanning start/end position.

## ■ Operating Procedure

(1) Press the **5** and **4** keys in this order in the initial stage of the maintenance mode.

The "SCAN START ADJ." and "1.ADF 2.FB" appear on the LCD in this order.

(2) Press the **1** or **2** key.

The current scanning position correction value appears.

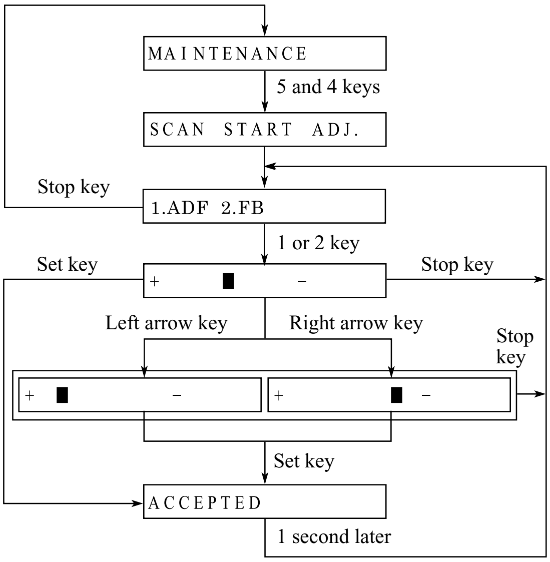
You may adjust the correction value to 11 levels from +5 to -5 (mm).

(3) To increase the correction value, press the left arrow key; to decrease it, press the right arrow key.

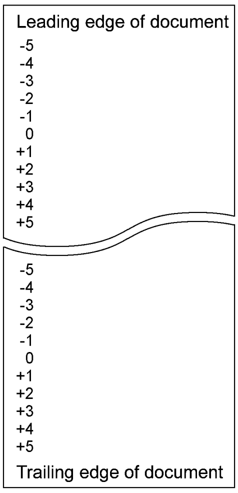
If you press the **Stop** key, the machine returns to the initial stage of the maintenance mode without making change of the correction value.

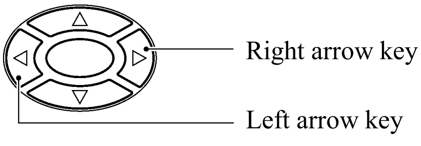
(3) Press the **Set** key.

The "ACCEPTED" appears on the LCD. After one second, the machine returns to the initial stage of the maintenance mode.


MAINTENANCE
5 and 4 keys
SCAN START ADJ.
Stop key
1.ADF 2.FB
1 or 2 key
Set key
Stop key
+ ■ –
Left arrow key
Right arrow key
Stop key
+ ■ –
+ ■ –
Set key
ACCEPTED
1 second later

**NOTE**: The relationship between the scanning start/end positions and their correction values is shown below.


Leading edge of document
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
Trailing edge of document


Right arrow key
Left arrow key

### 5.3.10 CCD Scanner Area Setting

#### ■ Function

The machine sets the CCD scanner area and stores it into the EEPROM.

#### ■ Operating Procedure

(1) Press the **5** key twice in the initial stage of the maintenance mode.

The "SCANNER AREA SET" will appear on the LCD.

The machine checks and sets the area to be scanned.

If no error is noted, the machine returns to the initial stage of the maintenance mode.

If any error is noted, the "SCANNER ERROR" will appear on the LCD. To return the machine to the initial stage of the maintenance mode, press the **Stop** key.

### 5.3.11 EEPROM Customizing

#### ■ Function

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings. The customizing codes list is given in Appendix 1.

**NOTE:** If you replace the main PCB, be sure to carry out this procedure.

#### ■ Operating Procedure

(1) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC6800 USA version) appears.

(2) Enter the desired customizing code (e.g., 0002 in the case of MFC6800 Canadian version).

The newly entered code appears.

***NOTE:*** *If a wrong 4-digit code is entered, the machine will malfunction.*

(3) For machines w/ fax: Press the **Fax Start** key.
For machines w/o fax: Press the **Sort** key.

The machine saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the machine stops the procedure and returns to the initial stage of the maintenance mode.

### 5.3.12 Display of the Machine's Log Information

#### ■ Function

The machine may display the its log information on the LCD.

#### ■ Operating Procedure

(1) Press the **8** and **0** keys in this order in the initial stage of the maintenance mode.

The USB serial number appears on the LCD.

(2) For machines w/ fax: Press the **Fax Start** key.
For machines w/o fax: Press the **Sort** key.

Each time the **Fax Start** or **Sort** key is pressed, one of the following log information items appears on the LCD in the order given below.

1) Jam count, indicating how many times a paper jam has been occurred
2) Page count, indicating how many pages the current drum has been printed
3) Total page count, indicating how many pages the machine has been printed since produced
4) Drum count, indicating how many times the drum has been rotated
5) Drum change count, indicating how many times drum replacement has been made
6) Toner change count, indicating how many times toner replacement has been made
7) Copy page count, indicating how many copies have been made
8) PC print page count, indicating how many pages the machine has been printed as an output device of the connected PC
9) FAX page count, indicating how many received FAX pages have been printed
10) Error code of the most recent machine error
11) Error code of the most recent communications error
12) ADF jam count, indicating how many times a document jam has been occurred
13) ADF page count, indicating how many documents have been fed

(3) To stop this operation and return to the machine to the initial stage of the maintenance mode, press the **Stop** key.

### 5.3.13 Machine Error Code Indication

#### ■ Function

This function displays an error code of the last error on the LCD.

#### ■ Operating Procedure

(1) Press the **8** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the "MACHINE ERROR X X."

(2) To stop this operation and return the machine to the initial stage of the maintenance mode, press the **Stop** key.

### 5.3.14 Output of Transmission Log to the Telephone Line (Not applicable to machines w/o fax)

#### ■ Function

This function outputs the transmission log (that the machine has stored about the latest transmission) to the telephone line. It allows the service personnel to receive the transmission log of the user's machine at a remote location and use it for analyzing problems arising in the user's machine.

#### ■ Operating Procedure

(1) If the user's machine has a transmission-related problem, call the user's machine at a remote location from your machine.

(2) If the line is connected, have the user perform the following:

1) For MFC6800 Press the **Menu**, **Receive Mode**, and **0** keys in this order.
For MFC9180 Press the **Menu**, **Fax Resolution**, and **0** keys in this order.

2) Press the **8** and **7** keys.

The above operation makes the user's machine send CNG to your machine for sending the transmission log.

(3) If you hear the CNG sent from the user's machine, press the **Fax Start** key of your machine.

Your machine will start to receive the transmission log from the user's machine.

### 5.3.15 Cancellation of the Memory Security Mode (Applicable to the European version w/ fax only)

#### ■ Function

This procedure can cancel the memory security mode. Use this procedure if the user forgets his/her password entered when setting the memory security mode so as not to exit from the memory security mode.

**NOTE:** Carrying out this procedure will lose passwords previously entered but retain FAX messages received in the memory security mode.

#### ■ Operating Procedure

(1) When the SECURE MODE is displayed on the LCD, press the **Menu** and # keys *at the same time*. Within two seconds, start to press the **2**, **7**, **9**, **0**, and **0** keys.

The memory security mode will be canceled and the machine returns to the calendar clock screen.

# CHAPTER 6

# ERROR INDICATION AND TROUBLESHOOTING

# CHAPTER 6 ERROR INDICATION AND TROUBLESHOOTING

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# 6.1 ERROR INDICATION

To help the user or the service personnel promptly locate the cause of a problem (if any), the machine incorporates the self-diagnostic functions which display error messages for machine errors and communications errors.

For the communications errors, the machine also prints out the transmission verification report and the communications list.

### 6.1.1 Machine Errors

If a machine error occurs, the machine emits an audible alarm (continuous beeping) for approximately 4 seconds and shows the error message on the LCD. For the error messages, see [ 1 ] below.

To display detailed error information, use the maintenance-mode function code 82 described in CHAPTER 5, Subsection 5.3.13 (that is, make the machine enter the maintenance mode and then press the **8** and **2** keys). Following the MACHINE ERROR, one of the error codes listed in [ 2 ] will appear on the LCD.

### [ 1 ] Error messages on the LCD

| Messages on the LCD | Probable Cause |
|---|---|
| CHANGE DRUM SOON | The service life of the drum unit will expire soon. This message appears for one minute.<br>(You can turn this message indication on or off by the maintenance-mode function code 10, WSW31, selector 8. Refer to Appendix 2.) |
| CHECK ORIGINAL<br>Remove original, and then press STOP KEY.<br>(See NOTE below.)<br>or<br>CHECK DOCUMENT<br>Remove document, then press STOP KEY. | ■ Document jam<br>(1) The document length exceeds the limitation (400 or 90 cm) registered by firmware switch WSW16. (Refer to Appendix 2.)<br>(Both the document front and rear sensors stay ON after the document has been fed by the registered length.)<br>(2) The document rear sensor detects no trailing edge of a document after the document has been fed by 400 cm.<br>(The document rear sensor stays ON even after the document has been fed when the document front and rear sensors were OFF and ON, respectively.) |

NOTE: This message appears in North American models.

| Messages on the LCD | Probable Cause |
|---|---|
| CHECK ORIGINAL<br>Remove original, and then press STOP KEY.<br>(See NOTE below.)<br>or<br>CHECK DOCUMENT<br>Remove document, then press STOP KEY. | ■ Document loading error<br>(1) The document rear sensor detects no leading edge of a document within 10 seconds from the start of document loading operation.<br>(The document rear sensor stays OFF even after the document has been fed when the document front sensor was ON.)<br>(2) The loaded document is too short.<br>(Since the document is shorter than the distance between the document front and rear sensors, the document front sensor is turned OFF before the document rear sensor is turned ON.) |
| CHECK DRUM UNIT<br>Open cover, then reinstall drum unit. | No drum unit is loaded. |
| CHECK PAPER<br>Reload paper by using lever, then press FAX START. | Even after paper pick-up operation, the registration sensor does not detect paper. |
| CHECK PAPER<br>Reload paper by using lever, then press COPY.<br>(These messages apply to models w/o fax.) | |
| CHECK PAPER SIZE<br>Reload correct paper, then press FAX START. | The registration sensor detects that paper shorter than the specified length has been fed.<br>(This message appears only when a received message is printed.) |
| CHECK PAPER SIZE<br>Reload correct paper, then press COPY.<br>(These messages apply to models w/o fax.) | |
| CLEAN UP SCANNER | In the scanning compensation data list printed by the maintenance-mode function code 05, less than fifty percent of the white level data is faulty.<br>(This message may appear only in the maintenance mode.) |

NOTE: This message appears in North American models.

| Messages on the LCD | Probable Cause |
|---|---|
| COOLING DOWN<br>WAIT FOR A WHILE | The controller, which monitors the internal resistance of toner thermistor, has detected that the toner temperature exceeded the specified level. If temperature exceeds the preset level, recording is no longer possible.<br>If the toner temperature drops, the machine will be automatically recovered from the error state. |
| COVER OPEN<br>PLS CLOSE COVER | The scanner open sensor detects that the scanner unit is not closed. |
| DOC. COVER OPEN<br>Remove original and close cover. | The document tray open sensor detects that the document tray is not closed when the ADF is feeding or ejecting a document(s). |
| MACHINE ERROR XX<br>Unplug machine, then call Brother. | "XX" indicates an error code. Refer to [ 2 ] on the following pages. |
| PAPER JAM<br>Open cover, then remove jammed paper. | Paper jam<br>(1) The registration sensor detects no paper within the specified time length after the start of paper pulling-in.<br>(2) The registration sensor has been ON for less than the specified time length (paper of approx. 3.15" long) or for more than the specified time length (paper of approx. 16" long).<br>(3) When the machine is switched on or the scanner unit is opened and then closed, the registration sensor or paper ejection sensor is ON.<br>(4) The paper ejection sensor sticks to ON.<br>(5) The paper ejection sensor does not come ON within the specified time length after the registration sensor has come ON.<br>(6) The paper ejection sensor is kept ON after the specified time length although the registration sensor has come ON. |
| PLS OPEN COVER | To display the relating detailed error code, use maintenance-mode function code 82. (Refer to CHAPTER 5, Subsection 5.3.13.)<br>If this message appears, open and close the scanner unit. The message may disappear if opening/closing the scanner unit removes the error. If the error persists, the "MACHINE ERROR XX" will appear. |

| Messages on the LCD | Probable Cause |
|---|---|
| SCANNER ERROR | In the scanning compensation data list printed by the maintenance-mode function code 05, fifty percent or more of the white level data is faulty.<br>(This message may appear only in the maintenance mode.) |
| TONER EMPTY<br>Open cover, then replace new toner cartridge. | The toner sensor has detected that there is no toner in the cartridge or that no toner cartridge is loaded. If this message appears, recording is no longer possible. |
| TONER LOW | The toner sensor has detected that there is not enough toner. |
| WARMING UP<br>WAIT FOR A WHILE | The in-casing temperature is too low. If the temperature reaches the appropriate level, the machine will be automatically recovered from the error state. |

If only an alarm beep is heard without any message on the LCD when the machine is turned on, the ROM or RAM will be defective.

## [ 2 ] Error codes shown in the "MACHINE ERROR X X " message

| Error Code X X (Hex.) | Error factor |
|---|---|
| ( 71 | Polygon motor does not synchronize with the reference clock. ) |
| ( 72 | Cannot detect Beam Detect signal. ) |
| ( 73 | No toner cartridge loaded. ) |
| ( 74 | Toner empty. ) |
| ( 75 | In-casing temperature error. ) |
| ( 76 | Heater harness disconnected or broken. Or heater thermistor harness disconnected or broken when the power is turned on, the top cover is opened and closed, or the machine exits from the sleep mode. ) |
| ( 77 | Power turned off and on at the occurrence of error 76 or 78. ) |
| ( 78 | Heater thermistor short-circuited. Or heater thermistor harness disconnected or broken when the machine is on standby. ) |
| ( 79 | Toner thermistor harness disconnected or broken. ) |
| ( 80 | Paper size setting error. ) |
| ( 82 | Paper feeding error. ) |
| ( 83 | Paper jam. The registration sensor remains ON.) |
| ( 84 | Paper jam. The paper ejection sensor remains ON. ) |
| ( 88 | Paper jam. Even after the registration sensor has gone OFF, the paper ejection sensor still stays OFF.) |
| ( A1 | Scanner unit opened. ) |
| ( A2 | Document too long to scan. ) |
| ( A3 | Document not detected by the document rear sensor. ) |
| ( A4 | 50% or more faulty of white level data. ) |
| ( A7 | One-line feeding timeout error. ) |
| ( A8 | One-line scanning timeout error. ) |
| ( A9 | Abnormal scanning reference voltage. ) |
| ( AA | Document tray opened. ) |
| ( AC | Less than 50% faulty of white level data. ) |

Error codes in parentheses do not appear in the "MACHINE ERROR X X", since those errors are displayed as messages described in "[ 1 ] Error messages on the LCD." In the maintenance mode (Function code 82), those error codes may be displayed.

| Error Code X X (Hex.) | Error factor |
|---|---|
| ( AE | The CCD HP sensor sticks to OFF, indicating that the CCD unit has not returned to the home position. ) |
| ( AF | The CCD HP sensor sticks to ON, indicating that the CCD unit has stayed in the home position. ) |
| ( B1 | Dark level offset data error. ) |
| ( B2 | Gain control data error. ) |
| ( B3 | Scan area left edge detection error. ) |
| ( B4 | Scan area right edge detection error. ) |
| ( B7 | A/D converter reference voltage error (at High level). ) |
| ( B8 | A/D converter reference voltage error (at Low level). ) |
| ( BA | Magnification error for substantial white level data. ) |
| ( BB | Substantial white level data error in black & white mode. ) |
| ( BC | Substantial white level data error in photo mode. ) |
| ( BD | Black level data error. ) |
| ( BE | Detection error of black mark. ) |
| ( BF | Detection error of ADF scanning position. ) |
| ( D5 | The MODEM fails to complete the command transmission sequence. ) |
| ( E4 | Out of recording paper. ) |
| E6 | Write error in EEPROM. |
| ( E8 | Data scanning error during transmission. ) |
| ( EA | Document removed in phase B.) |
| ( F5 | EOL not found in page memory transmission mode. ) |
| ( F6 | PC interface error. ) |

Error codes in parentheses do not appear in the "MACHINE ERROR X X", since those errors are displayed as messages described in "[ 1 ] Error messages on the LCD." In the maintenance mode (Function code 82), those error codes may be displayed.

### 6.1.2 Communications Errors

If a communications error occurs, the machine

① emits an audible alarm (intermittent beeping) for approximately 4 seconds,

② displays the corresponding error message, and

③ prints out the transmission verification report if the machine is in sending operation.

## ■ Definition of Error Codes on the Communications List

### (1) Calling

| Code 1 | Code 2 | Causes |
|---|---|---|
| 10 | 08 | Wrong number called. |
| 10 | 20 | Retrieval file error. |
| 10 | 21 | Image data entry error. |
| 11 | 01 | No dial tone detected before start of dialing. |
| 11 | 02 | Busy tone detected before dialing. |
| 11 | 03 | 2nd dial tone not detected. |
| 11 | 05 | No loop current detected.* |
| 11 | 06 | Busy tone detected after dialing or called. |
| 11 | 07 | No response from the remote station in sending. |
| 11 | 10 | No tone detected after dialing. |
| | | |
| 17 | 07 | No response from the calling station in receiving. |
| 1A | 01 | Calling impossible due to memory full. |

*Available in German versions only.

### (2) Command reception

| Code 1 | Code 2 | Causes |
|---|---|---|
| 20 | 01 | Unable to detect a flag field. |
| 20 | 02 | Carrier was OFF for 200 ms or longer. |
| 20 | 03 | Abort detected ("1" in succession for 7 bits or more). |
| 20 | 04 | Overrun detected. |
| 20 | 05 | A frame for 3 seconds or more received. |
| 20 | 06 | CRC error in answerback. |
| 20 | 07 | Undefined command received. |
| 20 | 08 | Invalid command received. |
| 20 | 09 | Command ignored once for document setting or for dumping-out at turn-around transmission. |
| 20 | 0A | T5 timeout error |
| 20 | 0B | CRP received. |

| Code 1 | Code 2 | Causes |
|---|---|---|
| 20 | 0C | EOR and NULL received. |
| 20 | 0D | Effective command not received. |
| 20 | 10 | Unable to reserve a command receiver memory. |
| 20 | 11 | Image data file error. |

### (3) Compatibility [checking the NSF and DIS]

| Code 1 | Code 2 | Causes |
|---|---|---|
| 32 | 01 | Remote terminal only with V.29 capability in 2400 or 4800 bps transmission. |
| 32 | 02 | Remote terminal not ready for polling. |
| | | |
| | | |
| 32 | 10 | Remote terminal not equipped with password function or its password switch OFF. |
| 32 | 11 | Remote terminal not equipped with or not ready for confidential mail box function. |
| 32 | 12 | Remote terminal not equipped with or not ready for relay broadcasting function. |
| 32 | 13 | No confidential mail in the remote terminal. |
| 32 | 14 | The available memory space of the remote terminal is less than that required for reception of the confidential or relay broadcasting instruction. |
| | | |
| | | |
| | | |

### (4) Instructions received from the remote terminal [checking the NSC, DTC, NSS, and DCS]

| Code 1 | Code 2 | Causes |
|---|---|---|
| 40 | 02 | Illegal coding system requested. |
| 40 | 03 | Illegal recording width requested. |
| | | |
| 40 | 05 | ECM requested although not allowed. |
| 40 | 06 | Polled while not ready. |
| 40 | 07 | No document to send when polled. |
| | | |
| | | |
| 40 | 10 | Nation code or manufacturer code not coincident. |
| 40 | 11 | Unregistered group code entered for relay broadcasting function, or the specified number of broadcasting subscribers exceeding the limit. |
| 40 | 12 | Retrieval attempted when not ready for retrieval. |
| 40 | 13 | Polled by any other manufacturers' terminal while waiting for secure polling. |
| 40 | 17 | Invalid resolution selected. |
| | | |
| | | |

### (5) Command reception [checking the NSF and DIS after transmission of NSS and DCS]

| Code 1 | Code 2 | Causes |
|---|---|---|
| 50 | 01 | Vertical resolution capability changed after compensation of background color. |
| | | |
| | | |
| | | |

### (6) ID checking

| Code 1 | Code 2 | Causes |
|---|---|---|
| 63 | 01 | Password plus "lower 4 digits of telephone number" not coincident. |
| 63 | 02 | Password not coincident. |
| 63 | 03 | Polling ID not coincident. |
| 63 | 04 | Entered confidential mail box ID uncoincident with the mail box ID. |
| 63 | 05 | Relay broadcasting ID not coincident. |
| 63 | 06 | Entered retrieval ID uncoincident with that of the mail box ID. |
| | | |
| | | |
| | | |

### (7) DCN reception

| Code 1 | Code 2 | Causes |
|---|---|---|
| 74 | | DCN received. |
| | | |
| | | |
| | | |

### (8) TCF transmission/reception

| Code 1 | Code 2 | Causes |
|---|---|---|
| 80 | 01 | Fallback impossible. |
| | | |
| | | |
| | | |
| | | |
| | | |

### (9) Signal isolation

| Code 1 | Code 2 | Causes |
|---|---|---|
| 90 | 01 | Unable to detect video signals and commands within 6 seconds after CFR is transmitted. |
| 90 | 02 | Received PPS containing invalid page count or block count. |
| | | |
| | | |

### (10) Video signal reception

| Code 1 | Code 2 | Causes |
|---|---|---|
| A0 | 03 | Error correction sequence not terminated even at the final transmission speed for fallback. |
| A0 | 11 | Receive buffer empty. (5-second time-out) |
| A0 | 12 | Receive buffer full during operation except receiving into memory. |
| A0 | 13 | Decoding error continued on 500 lines. |
| A0 | 14 | Decoding error continued for 10 seconds. |
| A0 | 15 | Timeout: Five seconds or more for one-line transmission. |
| A0 | 16 | RTC not found and carrier OFF signal detected for 6 seconds. |
| A0 | 17 | RTC found but no command detected for 60 seconds. |
| A0 | 18 | Receive buffer full during receiving into memory. |
| A0 | 19 | Unable to obtain compressed image data to be sent in phase C. |
| A8 | 01 | RTN, PIN, or ERR received at the calling terminal.* |
| A9 | 01 | RTN, PIN, or ERR received at the called terminal.* |

* Available in German versions only

### (11) General communications-related

| Code 1 | Code 2 | Causes |
|---|---|---|
| B0 | 02 | Unable to receive the next-page data. |
| B0 | 03 | Unable to receive polling even during turn-around transmission due to call reservation. |
| B0 | 04 | PC interface error. |
| BF | 01 | Transmission canceled by pressing the **Stop** key (before completion of the G3 FAX negotiation). |
| BF | 02 | Transmission canceled by pressing the **Stop** key (after completion of the G3 FAX negotiation). |
| BF | 03 | Transmission canceled due to a scanning error. |

### (12) Transmission in V. 34 mode

| Code 1 | Code 2 | Causes |
|---|---|---|
| C0 | 01 | No common modulation mode or failed to poll. |
| C0 | 02 | Unable to detect JM. |
| C0 | 03 | Unable to detect CM. |
| C0 | 04 | Unable to detect CJ. |
| | | |
| C0 | 10 | Cannot finish V. 34 negotiation or training. |
| C0 | 11 | Modem error detected during V. 34 negotiation or training. (For modem error details, refer to the table given on the next page.) |
| | | |
| C0 | 20 | Modem error detected during sending of commands. (For modem error details, refer to the table given on the next page.) |
| C0 | 21 | Modem error detected during receiving of commands. (For modem error details, refer to the table given on the next page.) |
| C0 | 22 | Control channel connection time-out. |
| | | |
| C0 | 30 | Modem error detected during sending of video signals. (For modem error details, refer to the table given on the next page.) |
| C0 | 31 | Modem error detected during receiving of video signals. (For modem error details, refer to the table given on the next page.) |
| | | |

**Modem error details (Code 3)**

| Code 3 | Causes |
|---|---|
| 21 | Timeout waiting for INFO0. |
| 22 | Checksum error in INFO0. |
| 23 | Timeout waiting for tone A or B. |
| 24 | Timeout waiting for first phase reverse. |
| 25 | Timeout waiting for probing cut-off tone. |
| 26 | Timeout waiting for second phase reverse. |
| 27 | Timeout waiting for end of probing. |
| 28 | Timeout waiting for third phase reverse. |
| 29 | Timeout waiting for INFO1. |
| 2A | Checksum error in INFO1. |
| 2B | Tone detected preceding INFO0. |
| 2C | Unexpected INFO0 detected. |
| 31 | Timeout waiting for turning off the receive control channel. |
| 91 | Error occurred in the first CC train. |
| 92 | Timeout waiting for PPh. |
| 93 | Tone A/B detected in the CC retrain. |
| 94 | Timeout waiting for ALT. |
| 95 | ACh found. |
| 96 | FED turned off during reception of CC data. |
| 97 | Timeout waiting for turning off the CC. |
| A1 | Retraining forced for problems not fixed in phase 2. |
| B0 | Problem with S-sequence of HDX-resync. |
| B1 | FED turned off in the S-sequence of HDX-resync. |
| B2 | S-sequence finished before prediction in HDX-resync. |
| B3 | Timeout waiting for S-Sbar in HDX-resync. |
| B4 | Timeout waiting for S-Sbar in HDX-resync. |
| B5 | Timeout waiting for S in HDX-resync. |
| B6 | Timeout waiting for synchronization with PP. |
| C0 | Problem with S-sequence in phase 3. |
| C1 | FED turned off in the S-sequence in phase 3. |

| Code 3 | Causes |
|---|---|
| C2 | S-sequence finished before prediction in phase 3. |
| C3 | Timeout waiting for S-Sbar in phase 3. |
| C4 | Timeout waiting for S-Sbar in phase 3. |
| C5 | Timeout waiting for S in phase 3. |
| C7 | Training after TRN failure. |
| D0 | Problem with S-sequence in phase 4. |
| D1 | FED turned off in S-sequence in phase 4. |
| D2 | S-sequence finished before prediction in phase 4. |
| D3 | Timeout waiting for S-Sbar in phase 4. |
| D4 | Timeout waiting for S-Sbar in phase 4. |
| D5 | Timeout waiting for S in phase 4. |
| D6 | Timeout waiting for MP. |
| D8 | Timeout waiting for E. |
| DA | Timed out in re-negotiation of the transmitter rate. |
| DB | Timed out in the transmitter MPh. |
| E2 | Retraining detected in phase 2. |
| E3 | Retraining detected in phase 3. |
| E4 | Retraining detected in phase 4. |
| FE | DTR turned off during retraining. |
| FF | Tx set-abort flag. |
| 71 | Did not write onto the first mapping frame. |

### (13) Maintenance mode

| Code 1 | Code 2 | Causes |
|---|---|---|
| E0 | 01 | Failed to detect 1300 Hz signal in burn-in operation. |
| E0 | 02 | Failed to detect PB signals in burn-in operation. |
| E0 | 03 | Failed to detect commands from the RS-232C in burn-in operation. |

### (14) Machine error

| Code 1 | Code 2 | Causes |
|---|---|---|
| FF | 00 | Burn-in operation canceled by pressing the **Stop** key. |
| FF | FF | Unrecoverable MODEM error. |
| | | |
| | | |

# 6.2 TROUBLESHOOTING

### 6.2.1 Introduction

This section gives the service personnel some of the troubleshooting procedures to be followed if an error or malfunction occurs with the machine. It is impossible to anticipate all of the possible problems which may occur in future and determine the troubleshooting procedures, so this section covers some sample problems. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

### 6.2.2 Precautions

Be sure to observe the following to prevent the secondary troubles from happening:

(1) Always unplug the AC power cord from the outlet when removing the covers and PCBs, adjusting the mechanisms, or conducting continuity testing with a circuit tester.

(2) When disconnecting the connectors, do not pull the lead wires but hold the connector housings.

(3)
- Before handling the PCBs, touch a metal portion of the machine to discharge static electricity charged in your body.
- When repairing the PCBs, handle them with extra care.

After repairing the defective section, be sure to check again if the repaired section works correctly. Also record the troubleshooting procedure so that it would be of use for future trouble occurrence.

### 6.2.3 Checking prior to Troubleshooting

Prior to proceeding to the troubleshooting procedures given in Subsection 6.2.4, make the following initial checks:

Environmental conditions

Check that:

(1) The machine is placed on a flat, firm surface.

(2) The machine is used in a clean environment at or near normal room temperature (10°C to 32.5°C) with normal relative humidity (20 to 80%).

(3) The machine is not subjected to rapid change of the ambient temperature. (Moving the machine from a cold place to warm place will cause condensation inside the machine. If it takes place, leave the machine in the warm place for approx. two hours before turning on the power.) Powering on the machine with dew condensation will result in damaged electronic devices.

(4) The machine is not exposed to direct sunlight or harmful gases.

Power requirements

Check that:

(1) The power supply specified on the rating plate located on the bottom of the machine is used. The supply voltage stays within the rating ±10%.

(2) Each voltage level on AC input lines and DC lines is correct.

(3) All cables and harnesses are firmly connected.

(4) None of the fuses are blown.

Recording paper

Check that:

(1) A recommended type of recording paper is used.

(2) The recording paper is not dampened.

### 6.2.4 Troubleshooting Procedures

### [ 1 ] Control panel related

| Trouble | Check: |
|---|---|
| (1) LCD shows nothing. | • Panel harness between the control panel PCB and relay PCB<br>• Relay (CCD/PANEL) harness between the relay PCB and main PCB<br>• Control panel PCB<br>• Low-voltage power supply PCB<br>• Main PCB<br>• LCD |
| (2) Control panel inoperative. | • Panel harness between the control panel PCB and relay PCB<br>• Relay (CCD/PANEL) harness between the relay PCB and main PCB<br>• Control panel PCB<br>• FPC key<br>• Main PCB |

### [ 2 ] Telephone related

| Trouble | Check: |
|---|---|
| (1) No phone call can be made. | • FPC key<br>• Control panel PCB<br>• NCU PCB<br>• Main PCB |
| (2) Speed dialing or one-touch dialing will not work. | • Ordinary dialing function (other than the speed and one-touch dialing)<br>If it works normally, check the main PCB; if not, refer to item (1) above. |
| (3) Speaker silent during on-hook dialing. | • Ordinary dialing function (other than the on-hook dialing with the hook key)<br>If it works normally, proceed to the following checks; if not, refer to item (1) above. |
| (4) Dial does not switch between tone and pulse. | • Main PCB<br>• NCU PCB |
| (5) Telephone does not ring. | • Speaker<br>• NCU PCB<br>• Main PCB |

### [ 3 ] Communications related

| Trouble | Check: |
|---|---|
| (1) No tone is transmitted. | • Main PCB<br>• NCU PCB |

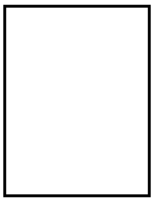
### [ 4 ] Paper/document feeding related

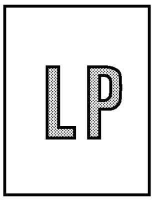
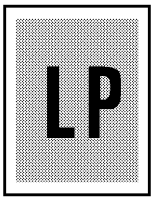
| Trouble | Check: |
|---|---|
| (1) Neither "COPY: PRESS COPY" nor "FAX: NO. & START" message appears although documents are set. | • Sensors by using the maintenance-mode function code 32. (Refer to CHAPTER 5, Subsection 5.3.8.)<br>• Document front sensor actuator and document rear sensor actuator<br>• Main PCB |
| (2) Document not fed. | • ADF and its related sections<br>• ADF motor and its harness<br>• Document feed roller and its related gears<br>• Main PCB |
| (3) Document double feeding | • ADF parts |
| (4) Recording paper not fed. | • ASF<br>• Drum unit<br>• Heat-fixing unit<br>• Drive gear ASSY<br>• Main PCB |
| (5) Recording paper double feeding | • Separation pad on the ASF |

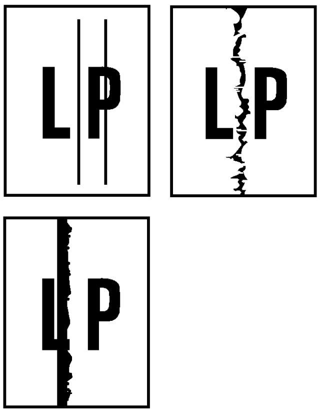
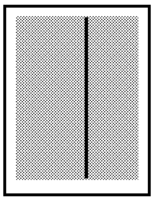
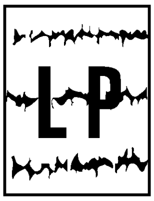
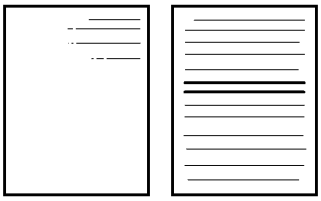
### [ 5 ] Print-image related

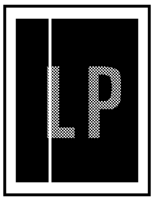
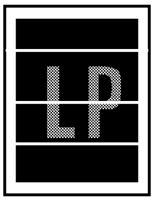
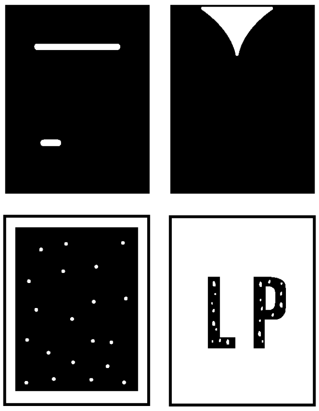
If the received or sent image has any problem, first make a copy with the machine.

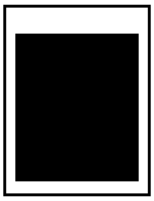
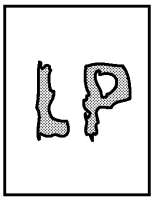
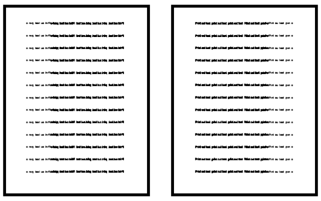
If the copied image is normal, the problem may be due to the remote terminal; if it is abnormal, proceed to the following checks:

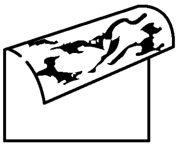
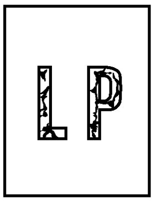
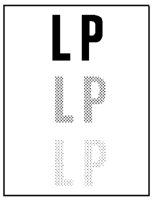
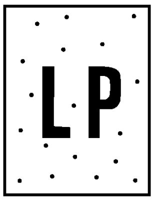
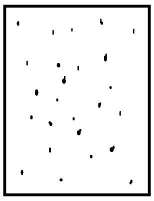
| Trouble | Action to be taken |
|---|---|
| (1) Completely blank<br> | At the scanner<br>Check the following components:<br>- CCD flat cable<br>- Main PCB<br>- CCD unit<br>At the printer side<br>● Clean the high-voltage contacts for the developer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ③ in the illustration given on page 6-28)<br>● Clean the grounding contacts on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ① in the illustration given on page 6-28)<br>● Check that the grounding plate is sandwiched between the contact plate and gear drive unit. (Refer to CHAPTER 4, Subsection 4.1.21, page 4-52.)<br>● Replace the toner cartridge.<br>● Replace the drum unit.<br>● Check the connection of the laser flat cable on the main PCB.<br>● Replace the main PCB.<br>● Replace the laser unit.<br>● Replace the high-voltage power supply PCB. |
| (2) All black<br> | At the scanner<br>Check the following components:<br>- CCD flat cable<br>- CCD unit<br>- Main PCB<br>At the printer side<br>● Clean the high-voltage contacts for the grid and charger on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ⑤ and ⑥ in the illustration given on page 6-28)<br>● Clean the charger (corona wires) itself.<br>● Check the connection of the laser flat cable on the main PCB.<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB.<br>● Replace the main PCB. |

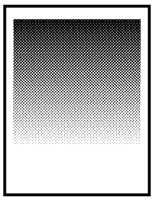
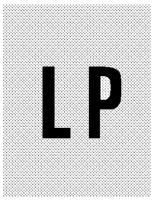
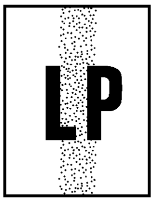
| Trouble | Action to be taken |
|---|---|
| (3) Light<br><br> | At the scanner<br>Check the following components:<br>- CCD unit<br>- Main PCB<br>At the printer side<br>● Replace the toner cartridge with a new one and print 4 to 5 pages. If the problem persists, proceed to the next step.<br>● Remove the toner cartridge and start printing. If printing takes place, clean the toner sensors (LED and light-receiver), check the sensor harnesses, and then replace the toner sensor PCBs.<br>● Clean the high-voltage contacts for the transfer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ③ in the illustration given on page 6-28)<br>● Clean the high-voltage contacts for the developer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ⑦ in the illustration given on page 6-28)<br>● Clean the grounding contacts on the drum unit, gear drive unit, and main cover. (Contacts ① and ② in the illustration given on page 6-28)<br>● Check the connection of the high-voltage power flat cable on the main PCB and high-voltage power supply PCB.<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB.<br>● Replace the main PCB.<br>● Replace the laser unit. |
| (4) Dark<br><br> | At the scanner<br>Check the following components:<br>- CCD unit<br>- Main PCB<br>At the printer side<br>● Slide the wire cleaner to clean the corona wire inside the drum unit.<br>● Clean the high-voltage contacts for the grid and charger on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ⑤ and ⑥ in the illustration given on page 6-28)<br>● Replace the toner cartridge.<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB.<br>● Replace the main PCB. |

| Trouble | Action to be taken |
|---|---|
| (5) Black and blurred vertical stripes or band<br><br> | At the scanner<br>Check the following components:<br>- CCD unit<br>At the printer side<br>- Clean the paper path which may be contaminated with toner.<br>- Slide the wire cleaner to clean the corona wire inside the drum unit.<br>- Make sure that the wire cleaner is returned to its home position.<br>- Replace the toner cartridge.<br>- Replace the drum unit.<br>- Replace the heat-fixing unit. |
| (6) Black vertical streaks on gray background<br> | At the printer side<br>- Clean the laser beam window (glass) on the laser unit.<br>- Replace the laser unit. |
| (7) Black and blurred horizontal stripes<br><br> | At the printer side<br>- Slide the wire cleaner to clean the corona wire inside the drum unit.<br>- If they appear at 94-mm or 17-mm intervals, replace the drum unit.<br>- If they appear at 54-mm intervals, replace the heat-fixing unit.<br>- Replace the high-voltage power supply PCB. |
| (8) Horizontal lines<br> | At the printer side<br>- Check the connection between the right end of the paper feed roller and the grounding wire. (Contact ⑦ in the illustration given on page 6-28.) |

| Trouble | Action to be taken |
|---|---|
| (9) White vertical streaks<br> | At the scanner<br>Check the following components:<br>- CCD unit<br>At the printer side<br>● Clean the laser beam window on the laser unit.<br>● Replace the toner cartridge.<br>● Replace the drum unit. |
| (10) White horizontal stripes<br> | At the printer side<br>● Replace the drum unit. |
| (11) Dropout, white spots, or hollow print<br> | At the printer side<br>● Check the connection of the high-voltage power flat cable on the main PCB and high-voltage power supply PCB.<br>● Replace the toner cartridge.<br>● Gently wipe off the surface of the photo-sensitive drum with a cotton swab.<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB. |

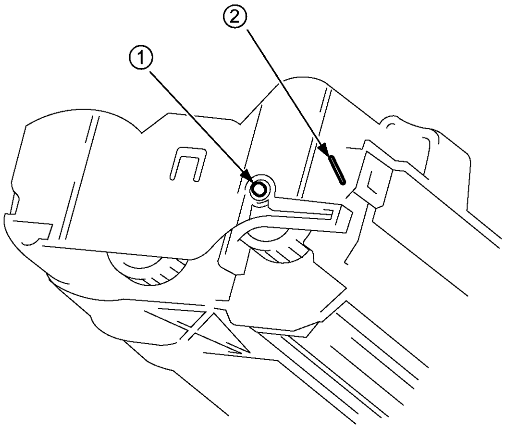
| Trouble | Action to be taken |
|---|---|
| (12) Faulty image registration<br>(Leading edge of image starts too late on paper)<br> | At the printer side<br>● Instruct the user not to load paper exceeding the limit in the ASF.<br>● Instruct the user to use the recommended types of paper.<br>● Replace the ASF.<br>● Check the position of the registration sensor.<br>● Replace the gear drive unit. |
| (13) Image distortion or improper image alignment<br> | In communications<br>Check the following components:<br>- Error code displayed. (Refer to Section 6.1, "ERROR INDICATION" in this chapter.)<br>- NCU PCB<br>- Main PCB<br>At the scanner<br>Check the following components:<br>- Document take-in roller, separation roller, and their related sections<br>- Document feed roller and its related gears<br>- ADF motor and its harness<br>- Main PCB<br>At the printer side<br>● Check that the laser unit is secured with the screws without looseness.<br>● Check the connection of the polygon motor harness.<br>● Check the connection of the laser flat cable on the main PCB.<br>● Replace the laser unit. |
| (14) Blurred at either side<br> | At the printer side<br>● Check that the machine is placed on a flat surface.<br>● Shake the toner cartridge horizontally. If the problem persists, replace it.<br>● Clean the laser beam window (glass) on the laser unit.<br>● Replace the laser unit. |

| Trouble | Action to be taken |
|---|---|
| (15) Dirt back of paper<br> | At the printer side<br>● Clean the pressure roller in the heat-fixing unit. Replace the heat-fixing unit.<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB. |
| (16) Poor fixing<br> | At the printer side<br>● Instruct the user to use paper of the recommended weight (less than 36 lb./m$^2$).<br>● Clean the toner sensors (LED and light-receiver).<br>● Replace the toner cartridge.<br>● Replace the drum unit.<br>● Check the fitting of the heater thermistor. Replace the heat-fixing unit.<br>● Replace the low-voltage power supply PCB. |
| (17) Ghost<br> | At the printer side<br>● Instruct the user to use paper of the recommended weight (less than 36 lb./m$^2$).<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB. |
| (18) Black spots<br> | At the printer side<br>● Gently wipe off the surface of the photo-sensitive drum with a cotton swab.<br>● Replace the drum unit.<br>● Replace the heat-fixing unit.<br>● Replace the high-voltage power supply PCB. |
| (19) Light rain<br> | At the printer side<br>● Replace the drum unit.<br>● Replace the high-voltage power supply PCB. |

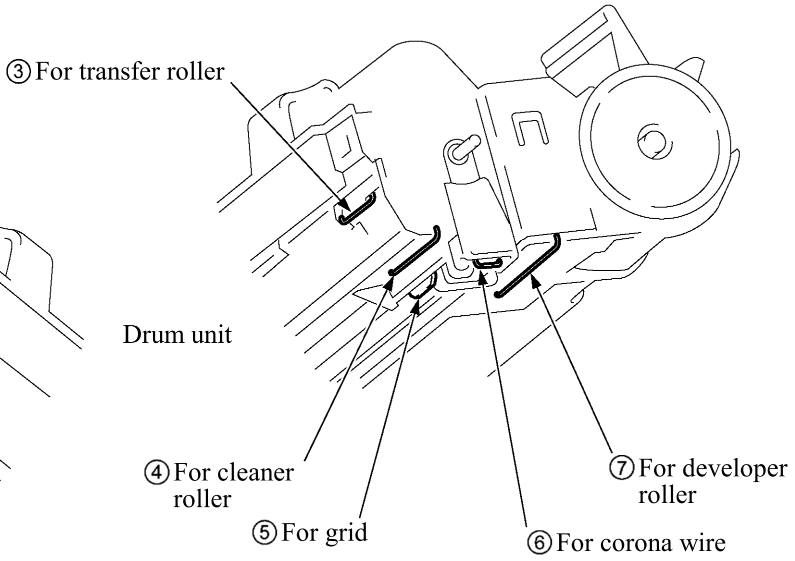
| Trouble | Action to be taken |
|---|---|
| (20) Fading (black to white)<br> | At the printer side<br>• Replace the toner cartridge.<br>• Replace the high-voltage power supply PCB. |
| (21) Gray background<br><br> | At the printer side<br>• Instruct the user to use paper of the recommended weight (less than 36 lb./m$^2$).<br>• Clean the toner sensors (LED and light-receiver).<br>• Check the toner sensor harnesses.<br>• Replace the toner cartridge.<br>• Replace the drum unit.<br>• Replace the high-voltage power supply PCB. |
| (22) Toner specks<br><br> | At the printer side<br>• Instruct the user to use paper of the recommended weight (less than 36 lb./m$^2$).<br>• Replace the toner cartridge.<br>• Replace the drum unit. |

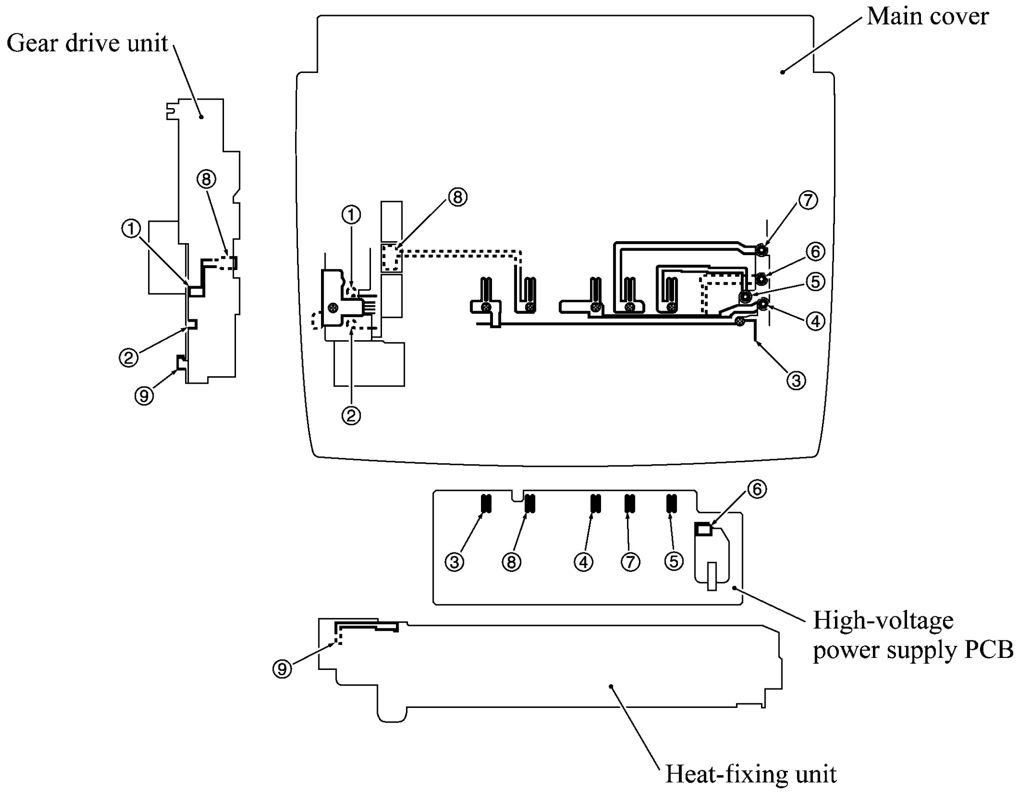
# Location of High-voltage Contacts and Grounding Contacts

## Grounding Contacts



## High-voltage Contacts


③ For transfer roller
Drum unit
④ For cleaner roller
⑤ For grid
⑦ For developer roller
⑥ For corona wire


Gear drive unit
Main cover
⑧
①
②
⑨
①
⑧
⑦
⑥
⑤
④
②
③
⑥
③
⑧
④
⑦
⑤
High-voltage power supply PCB
⑨
Heat-fixing unit

# MFC6800/DCP1000
# MFC9180/MFC9160

# Appendix 1. EEPROM Customizing Codes

# EEPROM CUSTOMIZING CODES

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings.

■ Operating Procedure

(1) For machines w/ fax

To make the machine enter the maintenance mode, press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order.
|← Within 2 seconds →|

For machines w/o fax

To make the machine enter the maintenance mode, press the **Menu**, **0**, **2**, **8**, **6**, and **4** keys in this order.
|← Within 2 seconds →|

The machine beeps for approx. one second and displays " ▮▮ MAINTENANCE ▮▮▮ " on the LCD.

(2) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC6800 U.S.A. version) appears.

(3) Enter the desired customizing code (e.g., 0002 in the case of MFC6800 Canadian version).

The newly entered code appears.

***NOTE:*** *If a wrong 4-digit code is entered, the machine will malfunction.*

(4) For machines w/ fax Press the **Fax Start** key.
For machines w/o fax Press the **Sort** key.

The machine saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the machine stops the procedure and returns to the initial stage of the maintenance mode.

## ■ EEPROM Customizing Codes List

| Versions | Model | |
|---|---|---|
| | DCP1000 | MFC6800 |
| U.S.A. | 0001 | 9001 |
| CANADA | 0002 | 0002 |
| TAIWAN | 0001 | --- |

| Versions | Model | |
|---|---|---|
| | MFC9160 | MFC9180 |
| GERMANY | 0003 | 0003 |
| U.K. | 0004 | 0004 |
| FRANCE | 0005 | 0005 |
| NORWAY | 0007 | 0007 |
| BELGIUM | 0008 | 0008 |
| NETHERLANDS | 0009 | 0009 |
| SWITZERLAND | 0010 | 0010 |
| IRELAND | 0004 | 0004 |
| FINLAND | 0012 | 0012 |
| DENMARK | 0013 | 0013 |
| AUSTRIA | 0003 | 0003 |
| SPAIN | 0015 | 0015 |
| ITALY | 0016 | 0016 |
| SOUTH AFRICA | 0004 | 0004 |
| SWEDEN | 0026 | 0026 |
| AUSTRALIA | 0004 | 0006 |
| NEW ZEALAND | 0004 | 0027 |
| ASIA (SINGAPORE) | 0004 | 0040 |
| EURO GENERIC | 0050 | 0050 |

# MFC6800/DCP1000
# MFC9180/MFC9160

# Appendix 2. Firmware Switches (WSW)

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## WSW01 (Dial pulse setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Dial pulse generation mode | No. 1 2<br>0 0 : N<br>0 1 : N+1<br>1 0 : 10-N<br>1 1 : N |
| 3<br>4 | Break time length in pulse dialing | No. 3 4<br>0 0 : 60 ms<br>0 1 : 67 ms<br>1 0 : 40 ms (for 16 PPS)<br>1 1 : 64 ms (at 106-ms intervals) |
| 5<br>6 | Inter-digit pause | No. 5 6<br>0 0 : 800 ms<br>0 1 : 850 ms<br>1 0 : 950 ms<br>1 1 : 600 ms |
| 7 | Switching between pulse (DP) and tone (PB) dialing, by the function switch | 0: Yes 1: No |
| 8 | Default dialing mode, pulse (DP) or tone (PB) dialing | 0: PB 1: DP |

**NOTE:** In models supporting no pulse (DP) dialing mode (e.g., U.S.A. version), selector 7 takes no effect even if it may be set.

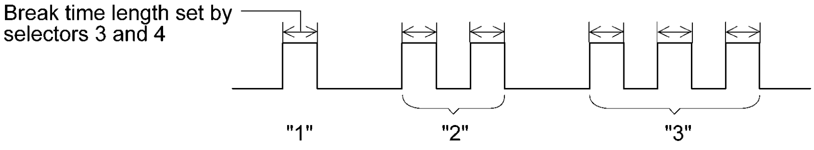
- **Selectors 1 and 2: Dial pulse generation mode**

  These selectors set the number of pulses to be generated in pulse dialing.

  N: Dialing "N" generates "N" pulses. (Dialing "0" generates 10 pulses.)
  N + 1: Dialing "N" generates "N + 1" pulses.
  10 - N: Dialing "N" generates "10 - N" pulses.

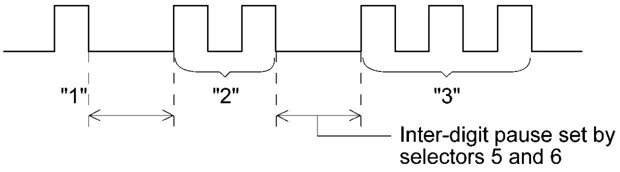
- **Selectors 3 and 4: Break time length in pulse dialing**

  These selectors set the break time length in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selectors 5 and 6: Inter-digit pause**

  These selectors set the inter-digit pause in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selector 7: Switching between pulse (DP) and tone (PB) dialing, by the function switch**

  This selector determines whether or not the dialing mode may be switched between the pulse (DP) and tone (PB) dialing by using the function switch.

- **Selector 8: Default dialing mode, pulse (DP) or tone (PB) dialing**

  This selector sets the default dialing mode (pulse dialing or tone dialing) which may be changed by the function switch. If the user switches it with the function switch when selector 7 is set to "0," the setting specified by this selector will also be switched automatically.

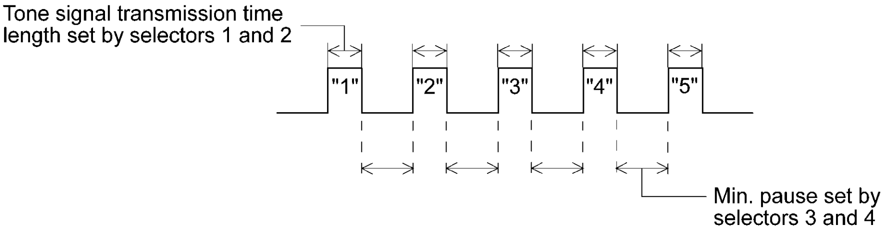
**WSW02 (Tone signal setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Tone signal transmission time length | No. 1 2<br>0 0 : 70 ms<br>0 1 : 80 ms<br>1 0 : 90 ms<br>1 1 : 100 ms |
| 3<br>4 | Min. pause in tone dialing | No. 3 4<br>0 0 : 70 ms<br>0 1 : 80 ms<br>1 0 : 90 ms<br>1 1 : 140 ms |
| 5<br>\|<br>8 | Attenuator for pseudo ring backtone to the line (selectable in the range of 0-15 dB) | 0 : 0 dB 1: 8 dB<br>0 : 0 dB 1: 4 dB<br>0 : 0 dB 1: 2 dB<br>0 : 0 dB 1: 1 dB |

- **Selectors 1 through 4: Tone signal transmission time length and Min. pause in tone dialing**

  These selectors set the tone signal transmission time length and minimum pause in tone dialing.

  (Example: If "1," "2," "3," "4," and "5" are dialed.)


Tone signal transmission time length set by selectors 1 and 2
"1"
"2"
"3"
"4"
"5"
Min. pause set by selectors 3 and 4

- **Selectors 5 through 8: Attenuator for pseudo ring backtone to the line**

  These selectors are used to adjust the sound level of beep generated as a ring backtone in the F/T mode or as a signal during remote control operation or at the start of ICM recording.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

### **WSW03** (PABX* mode setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | CNG detection when sharing a modular wall socket with a telephone | 0: A 1: B |
| 2<br>\|<br>4 | Min. detection time length of PABX* dial tone, required for starting dialing | No. 2 3 4<br>0 0 0 : 50 ms<br>0 0 1 : 210 ms<br>0 1 0 : 500 ms<br>0 1 1 : 800 ms<br>1 0 0 : 900 ms<br>1 0 1 : 1.5 sec.<br>1 1 0 : 2.0 sec.<br>1 1 1 : 2.5 sec. |
| 5 | CNG detection when sharing a modular wall socket with a telephone | 0: A 1: B |
| 6<br>7 | Dial tone detection in PABX* | No. 6 7<br>0 0 : No detection (3.5 sec. WAIT)<br>0 1 : No detection (5 sec. WAIT)<br>1 0 : No detection (7 sec. WAIT)<br>1 1 : Detection (Frequency only) |
| 8 | Not used. | |

* PABX: Private automatic branch exchange

**NOTE:** Selectors 2 through 4, 6 and 7 are not applicable where no PABX is installed.

- **Selectors 1 and 5: CNG detection when sharing a modular wall socket with a telephone**

  These selectors determine whether or not the machine detects a CNG signal when a line is connected to a telephone sharing a modular wall socket with the machine. Upon detection of CNG signals by the number of cycles specified by these selectors, the machine interprets CNG as an effective signal and then starts FAX reception.

| Selector No. 1 | Selector No. 5 | Cycle |
|---|---|---|
| 0 (A) | 0 (A) | 0.5 cycle |
| 0 (A) | 1 (B) | 1.0 cycle |
| 1 (B) | 0 (A) | 1.5 cycles |
| 1 (B) | 1 (B) | 2.0 cycles |

- **Selectors 2 through 4: Min. detection time length of PABX dial tone, required for starting dialing**

  Upon detection of the PABX dial tone for the time length set by these selectors, the machine starts dialing.

  These selectors are effective only when both selectors 6 and 7 are set to "1" (Detection).

- **Selectors 6 and 7: Dial tone detection in PABX**

  These selectors activate or deactivate the dial tone detection function which detects a dial tone when a line is connected to the PABX.

  Setting both of these selectors to "1" activates the dial tone detection function so that the machine starts dialing upon detection of a dial tone when a line is connected.

  Other setting combinations deactivate the dial tone detection function so that the machine starts dialing after the specified WAIT (3.5, 5.0, or 7.0 sec.) without detection of a dial tone when a line is connected.

## WSW04 (TRANSFER facility setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Earth function in transfer facility | 0: Provided 1: Not provided |
| 2<br>\|<br>4 | Not used. | |
| 5<br>6 | Earth time length for earth function | No. 5 6<br>0 0 : 200 ms<br>0 1 : 300 ms<br>1 0 : 500 ms<br>1 1 : 700 ms |
| 7<br>8 | Break time length for flash function | No. 7 8<br>0 0 : 80 ms<br>0 1 : 110 ms<br>1 0 : 250 ms<br>1 1 : 500 ms |

**NOTE:** Selectors 5 through 8 are not applicable in those countries where no transfer facility is supported.

- **Selector 1: Earth function in transfer facility**

  This selector determines whether or not the earth function is added to the transfer setting menu to be accessed by the function switch.

- **Selectors 5 and 6: Earth time length for earth function**

  These selectors set the short-circuiting time length of the telephone line (La or Lb) to ground.

  This setting is effective only when the earth function is selected for the R key by using the function switch.

- **Selectors 7 and 8: Break time length for flash function**

  These selectors set the break time length.

  This setting is effective only when the flash function is selected for the R key by using the function switch.

**WSW05 (1st dial tone and busy tone detection)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | 1st dial tone detection | No. 1 2 3<br>0 0 0 : 3.5 sec. WAIT<br>0 0 1 : 7.0 sec. WAIT<br>0 1 0 : 10.5 sec. WAIT<br>0 1 1 : 14.0 sec. WAIT<br>1 0 0 : 17.5 sec. WAIT<br>1 0 1 : 21.0 sec. WAIT<br>1 1 0 : 24.5 sec. WAIT<br>1 1 1 : Detection (Without WAIT) |
| 4 | Max. pause time allowable for remote ID code detection | 0 : 2 seconds 1: 1 second |
| 5<br><br>6 | Busy tone detection in automatic sending mode | No. 5 6<br>0 0 : No detection<br>0 1 : Detection only after dialing<br>1 0 : No detection<br>1 1 : Detection before and after dialing |
| 7 | Busy tone detection in automatic receiving mode | 0 : Yes 1: No |
| 8 | Not used. | |

**NOTE:** Selectors 5 through 7 are not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 3: 1st dial tone detection**

  These selectors activate or deactivate the 1st dial tone detection function which detects the 1st dial tone issued from the PSTN when a line is connected to the PSTN.

  Setting all of these selectors to "1" activates the dial tone detection function so that the machine starts dialing upon detection of a dial tone when a line is connected. For the detecting conditions of the 1st dial tone, refer to WSW07 and WSW08.

  Other setting combinations deactivate the dial tone detection function so that the machine starts dialing after the specified WAIT (3.5, 7.0, 10.5, 14.0, 17.5, 21.0, or 24.5 seconds) without detection of a dial tone when a line is connected to the PSTN.

- **Selector 4: Max. pause time allowable for remote ID code detection**

  This selector sets the maximum pause time allowable for detecting the second digit of a remote ID code after detection of the first digit in remote reception.

  If selector 4 is set to "0" (2 seconds), for instance, only a remote ID code whose second digit is detected within 2 seconds after detection of the first digit will become effective so as to activate the remote function.

- **Selectors 5 and 6: Busy tone detection in automatic sending mode**

  These selectors determine whether or not the machine automatically disconnects a line upon detection of a busy tone in automatic sending mode.

  Setting selector 6 to "0" ignores a busy tone so that the machine does not disconnect the line.

  Setting selectors 5 and 6 to "0" and "1," respectively, makes the machine detect a busy tone only after dialing and disconnect the line.

  Setting both of selectors 5 and 6 to "1" makes the machine detect a busy tone before and after dialing and then disconnect the line.

- **Selector 7: Busy tone detection in automatic receiving mode**

  This selector determines whether or not the machine automatically disconnects a line upon detection of a busy tone in automatic receiving mode.

### WSW06 (Pause key setting and 2nd dial tone detection)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | **Pause** key setting and 2nd dial tone detection | No. 1 2 3<br>0 0 0 : No pause<br>0 0 1 : 3.5 sec. WAIT<br>0 1 0 : 7 sec. WAIT<br>0 1 1 : 10.5 sec. WAIT<br>1 0 0 : 14 sec. WAIT<br>1 1 0 : 2nd dial tone detection only in pulse dialing (DP) system<br>1 0 1 :<br>1 1 1 : } 2nd dial tone detection both in DP and push-button (PB) dialing system |
| 4<br>\|<br>6 | Detection of 2nd dial tone | No. 4 5 6<br>0 0 0 : 50 ms<br>0 0 1 : 210 ms<br>0 1 0 : 500 ms<br>0 1 1 : 800 ms<br>1 0 0 : 900 ms<br>1 0 1 : 1.5 sec.<br>1 1 0 : 2.0 sec.<br>1 1 1 : 2.5 sec. |
| 7 | No. of 2nd dial tone detection times | 0: Once 1: Twice |
| 8 | 2nd dial tone interrupt detecting time | 0: 30 ms 1: 50 ms |

- **Selectors 1 through 3: Pause key setting and 2nd dial tone detection**

| Selectors | | | |
|---|---|---|---|
| 1 | 2 | 3 | |
| 0 | 0 | 0 | No WAIT is inserted even if the **Pause** key is pressed. |
| 0<br>0<br>0<br>1 | 0<br>1<br>1<br>0 | 1<br>0<br>1<br>0 | If you press the **Pause** key during dialing, the machine will insert WAIT as defined in the above table.<br>If the **Pause** key is pressed repeatedly, the machine inserts the specified WAIT multiplied by the number of depressions. It applies also in hook-up dialing. |
| 1<br>1<br>1 | 0<br>1<br>1 | 1<br>0<br>1 | When these selectors are set to "1, 0, 1":<br>If you press the **Pause** key during dialing, the machine will wait for the 2nd dial tone to be sent via the communications line.<br>When these selectors are set to "1, 1, 0" or "1, 1, 1":<br>If you press the **Pause** key during dialing, the machine will first wait for the 2nd dial tone to be sent via the communications line. After that, the machine will insert a WAIT of 3.5 seconds.<br>If no 2nd dial tone is received within the specified time length (set by WSW08), the machine will disconnect the line if in automatic dialing, or it will start transmitting the dial signal if given after depression of the **Pause** key in hook-up dialing. |

- **Selectors 4 through 6: Detection of 2nd dial tone**

  Upon detection of the 2nd dial tone for the time length specified by these selectors, the machine starts dialing.

  This setting is effective only when the 2nd dial tone detection function is activated by selectors 1 through 3 (Setting 101, 110, or 111).

  This function does not apply in those countries where no dial tone detection function is supported.

- **Selector 7: No. of 2nd dial tone detection times**

  This selector sets the number of dial tone detection times required for starting dialing.

- **Selector 8: 2nd dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 2nd tone dialing.

### **WSW07 (Dial tone setting 1)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Frequency band range | No. 1 2<br>0 0 : Narrows by 10 Hz<br>0 1 : Initial value<br>1 X : Widens by 10 Hz |
| 3 | Line current detection | 0: No 1: Yes |
| 4<br>\|<br>6 | 2nd dial tone detection level (Z = 600 Ω) | No. 4 5 6<br>0 0 0 : -21 dBm<br>0 0 1 : -24 dBm<br>0 1 0 : -27 dBm<br>0 1 1 : -30 dBm<br>1 0 0 : -33 dBm<br>1 0 1 : -36 dBm<br>1 1 0 : -39 dBm<br>1 1 1 : -42 dBm |
| 7 | 1st dial tone interrupt detecting time | 0: 30 ms 1: 50 ms |
| 8 | Not used. | |

**NOTE:** Selectors 1 through 7 are not applicable in those countries where no dial tone or line current detection is supported, e.g., U.S.A.

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for the 1st dial tone and the busy tone (before dialing) to be detected.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selector 3: Line current detection**

  This selector determines whether or not the machine should detect a line current before starting dialing.

- **Selectors 4 through 6: 2nd dial tone detection level**

  These selectors set the detection level of the 2nd dial tone.

- **Selector 7: 1st dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 1st dial tone dialing.

### **WSW08** (Dial tone setting 2)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | 1st dial tone detection time length | No. 1 2 3<br>0 0 0 : 50 ms<br>0 0 1 : 210 ms<br>0 1 0 : 500 ms<br>0 1 1 : 800 ms<br>1 0 0 : 900 ms<br>1 0 1 : 1.5 sec.<br>1 1 0 : 2.0 sec.<br>1 1 1 : 2.5 sec. |
| 4<br>5 | Time-out length for 1st and 2nd dial tone detection | No. 4 5<br>0 0 : 10 sec.<br>0 1 : 20 sec.<br>1 0 : 15 sec.<br>1 1 : 30 sec. |
| 6<br>\|<br>8 | Detection level of 1st dial tone and busy tone before dialing | No. 6 7 8<br>0 0 0 : -21 dBm<br>0 0 1 : -24 dBm<br>0 1 0 : -27 dBm<br>0 1 1 : -30 dBm<br>1 0 0 : -33 dBm<br>1 0 1 : -36 dBm<br>1 1 0 : -39 dBm<br>1 1 1 : -42 dBm |

**NOTE:** The WSW08 is not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: 1st dial tone detection time length**

  Upon detection of the 1st dial tone for the time length set by these selectors, the machine starts dialing.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selectors 4 and 5: Time-out length for 1st and 2nd dial tone detection**

  These selectors set the time-out length for the 1st and 2nd dial tone detection so that the machine waits dial tone input for the specified time length and disconnects itself from the line when no dial tone is inputted.

### WSW09 (Protocol definition 1)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Frame length selection | 0: 256 octets 1: 64 octets |
| 2 | Use of non-standard commands | 0: Allowed 1: Prohibited |
| 3<br>4 | No. of retries | No. 3 4<br>0 0 : 4 times<br>0 1 : 3 times<br>1 0 : 2 times<br>1 1 : 1 time |
| 5 | T5 timer | 0: 300 sec. 1: 60 sec. |
| 6 | T1 timer | 0: 35 sec. 1: 40 sec. |
| 7<br>8 | Elapsed time for time-out control for no response from the called station in automatic sending mode | No. 7 8<br>0 0 : 60 sec. (55 sec. for US and Canada)<br>0 1 : 140 sec.<br>1 0 : 90 sec.<br>1 1 : 35 sec. |

**NOTE:** Selectors 1 through 6 are not applicable in those models which do not support ECM.

- **Selector 1: Frame length selection**

  Usually a single frame consists of 256 octets (1 octet = 8 bits). For communications lines with higher bit error rate, however, set selector 1 to "1" so that the machine can divide a message into 64-octet frames.

  Remarks: The error correction mode (ECM) is a facsimile transmission manner in which the machine divides a message into frames for transmission so that if any data error occurs on the transmission line, the machine retransmits only those frames containing the error data.

- **Selector 2: Use of non-standard commands**

  If this selector is set to "0," the machine may use non-standard commands (the machine’s native-mode commands, e.g., NSF, NSC, and NSS) for communications. If it is set to "1," the machine will use standard commands only.

- **Selectors 3 and 4: No. of retries**

  These selectors set the number of retries in each specified modem transmission speed.

- **Selector 5: T5 timer**

  This selector sets the time length for the T5 timer.

- **Selector 6: T1 timer**

  This selector sets the time length for the T1 timer.

- **Selectors 7 and 8: Elapsed time for time-out control**

  If the machine receives no response (no G3 command) from the called terminal in automatic sending during the time set by these selectors, it disconnects the line.

### WSW10 (Protocol definition 2)

| Selector No. | Function | | Setting and Specifications |
|---|---|---|---|
| 1 | Switching of DPS, following the CML ON/OFF | | 0: No 1: Yes |
| 2 | Time length from transmission of the last dial digit to CML ON | | 0: 100 ms 1: 50 ms |
| 3 | Time length from CML ON to CNG transmission | | 0: 2 sec. 1: 4 sec. |
| 4 | Time length from CML ON to CED transmission (except for facsimile-to-telephone switching) | | 0: 0.5 sec. 1: 2 sec. |
| 5<br>6 | No. of training retries | | No. 5 6<br>0 0 : 1 time<br>0 1 : 2 times<br>1 0 : 3 times<br>1 1 : 4 times |
| 7 | Encoding system (Compression) | MR | 0: Allowed 1: Not allowed |
| 8 | | MMR | 0: Allowed 1: Not allowed |

- **Selector 1: Switching of DPS, following the CML ON/OFF**

  Setting this selector to "1" automatically switches DPS following the CML ON/OFF operation.

- **Selector 2: Time length from transmission of the last dial digit to CML ON**

  This selector sets the time length from when the machine transmits the last dial digit until the CML relay comes on.

- **Selector 3: Time length from CML ON to CNG transmission**

  This selector sets the time length until the machine transmits a CNG after it turns on the CML relay.

- **Selector 4: Time length from CML ON to CED transmission**

  This selector sets the time length until the machine transmits a CED after it turns on the CML relay. This setting does not apply to switching between facsimile and telephone.

- **Selectors 5 and 6: No. of training retries**

  These selectors set the number of training retries to be repeated before automatic fallback.

- **Selectors 7 and 8: Encoding system (Compression)**

  This selector determines whether or not use of the MR/MMR coding system will be allowed.

### **WSW11 (Busy tone setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Frequency band range | No. 1 2<br>0 0 : Narrows by 10 Hz<br>0 1 : Initial value<br>1 x : Widens by 10 Hz |
| 3 | Not used. | |
| 4 | ON/OFF time length ranges (More than one setting allowed) | 1: 400-600/400-600 ms |
| 5 | | 1: 175-440/175-440 ms |
| 6 | | 1: 100-1000/17-660 ms |
| 7 | | 1: 110-410/320-550 ms |
| 8 | | 1: 100-660/100-660 ms |

**NOTE:** WSW11 is not applicable in those countries where no busy tone detection is supported.

**NOTE:** The setting of WSW11 is effective only when selectors 5 and 6 of WSW05 are set to "0, 1" or "1, 1" (Busy tone detection).

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for busy tone to be detected.

- **Selectors 4 through 8: ON/OFF time length ranges**

  These selectors set the ON and OFF time length ranges for busy tone to be detected. If more than one selector is set to "1," the ranges become wider. For example, if selectors 4 and 5 are set to "1," the ON and OFF time length ranges are from 175 to 600 ms.

**WSW12 (Signal detection condition setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Min. OFF time length of calling signal (Ci) | No. 1 2<br>0 0 : 1500 ms<br>0 1 : 500 ms<br>1 0 : 700 ms<br>1 1 : 900 ms |
| 3<br>4 | Max. OFF time length of calling signal (Ci) | No. 3 4<br>0 0 : 6 sec.<br>0 1 : 7 sec.<br>1 0 : 9 sec.<br>1 1 : 11 sec. |
| 5<br>6 | Detecting time setting | No. 5 6<br>0 0 : 800 ms<br>0 1 : 200 ms<br>1 0 : 250 ms<br>1 1 : 150 ms |
| 7 | Delay | 0: Yes 1: No |
| 8 | Not used. | |

- **Selectors 1 through 4: Min. and max. OFF time length of calling signal (Ci)**

  If the machine detects the OFF state of calling signal (Ci) for a time length which is greater than the value set by selectors 1 and 2 and less than the value set by selectors 3 and 4, then it interprets the Ci signal as OFF.

- **Selectors 5 and 6: Detecting time setting**

  These selectors set the time length required to make the machine acknowledge itself to be called. That is, if the machine continuously detects calling signals with the frequency set by selectors 1 through 4 of WSW14 during the time length set by these selectors 5 and 6, then it acknowledges the call.

- **Selector 7: Delay**

  Setting this selector to "0" allows the machine to insert a 900 ms WAIT after acknowledgment of the call until the machine turns on the CML relay to start receiving operation.

**WSW13 (Modem setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Cable equalizer | No. 1 2<br>0 0 : 0 km<br>0 1 : 1.8 km<br>1 0 : 3.6 km<br>1 1 : 5.6 km |
| 3<br>4 | Reception level | No. 3 4<br>0 0 : -43 dBm<br>0 1 : -47 dBm<br>1 0 : -49 dBm<br>1 1 : -51 dBm |
| 5<br>\|<br>8 | Modem attenuator | 0: 0 dB 1: 8 dB<br>0: 0 dB 1: 4 dB<br>0: 0 dB 1: 2 dB<br>0: 0 dB 1: 1 dB |

The modem should be adjusted according to the user's line conditions.

- **Selectors 1 and 2: Cable equalizer**

  These selectors are used to improve the pass-band characteristics of analogue signals on a line. (Attenuation in the high-band frequency is greater than in the low-band frequency.)

  Set these selectors according to the distance from the telephone switchboard to the machine.

- **Selectors 3 and 4: Reception level**

  These selectors set the optimum receive signal level.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies to G3 protocol signals.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

  This setting will be limited if selector 8 of WSW23 is set to "0."

**WSW14 (AUTO ANS facility setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Frequency band selection (Lower limit) | No. 1 2<br>0 0 : 13 Hz<br>0 1 : 15 Hz<br>1 0 : 23 Hz<br>1 1 : 20 Hz |
| 3<br>4 | Frequency band selection (Upper limit) | No. 3 4<br>0 0 : 30 Hz<br>0 1 : 55 Hz<br>1 0 : 70 Hz<br>1 1 : 200 Hz |
| 5<br>\|<br>8 | No. of rings in AUTO ANS mode | No. 5 6 7 8<br>0 0 0 0 : Fixed to once<br>0 0 0 1 : Fixed to 2 times<br>0 0 1 0 : Fixed to 3 times<br>0 0 1 1 : Fixed to 4 times<br>0 1 0 0 : 1 to 2 times<br>0 1 0 1 : 1 to 3 times<br>0 1 1 0 : 1 to 4 times<br>0 1 1 1 : 1 to 5 times<br>1 0 0 0 : 2 to 3 times<br>1 0 0 1 : 2 to 4 times<br>1 0 1 0 : 2 to 5 times<br>1 0 1 1 : 2 to 6 times<br>1 1 0 0 : 1 to 10 times<br>1 1 0 1 : 2 to 10 times<br>1 1 1 0 : 3 to 5 times<br>1 1 1 1 : 4 to 10 times |

- **Selectors 1 through 4: Frequency band selection**

  These selectors are used to select the frequency band of calling signals for activating the AUTO ANS facility.

  In the French versions, if the user sets the PBX to OFF from the control panel, the setting made by selectors 1 and 2 will take no effect and the frequency's lower limit will be fixed to 32 Hz. (Even if the setting made by these selectors does not apply, it will be printed on the configuration list.)

- **Selectors 5 through 8: No. of rings in AUTO ANS mode**

  These selectors set the number of rings to initiate the AUTO ANS facility.

### **WSW15 (REDIAL facility setting)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Selection of redial interval | No. 1 2<br>0 0 : 5 minutes<br>0 1 : 1 minute<br>1 0 : 2 minutes<br>1 1 : 3 minutes |
| 3<br>\|<br>6 | No. of redialings | No. 3 4 5 6<br>0 0 0 0 : 16 times<br>0 0 0 1 : 1 times<br>0 0 1 0 : 2 times<br>0 0 1 1 : 3 times<br>\| \|<br>1 1 1 1 : 15 times |
| 7 | Redialing for no response sent from the called terminal | 0: Redialing 1: No redialing |
| 8 | Not used. | |

**NOTE:** Selector 7 is not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 6: Selection of redial interval and No. of redialings**

  The machine redials by the number of times set by selectors 3 through 6 at intervals set by selectors 1 and 2.

  This setting is effective only when selector 7 is set to "0."

- **Selectors 7: Redialing for no response sent from the called terminal**

  This selector determines whether or not the machine redials if no G3 command response comes from the called station after dialing within the time length set by selectors 7 and 8 of WSW09.

### **WSW16** (Function setting 1)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Not used. | |
| 2 | CCITT superfine recommendation | 0: OFF 1: ON |
| 3<br>\|<br>6 | Not used. | |
| 7 | Max. document length limitation | 0: 400 cm 1: 90 cm |
| 8 | **Stop** key pressed during reception | 0: Not functional 1: Functional |

- **Selector 2: CCITT superfine recommendation**

  If this selector is set to "1," the machine communicates in CCITT recommended superfine mode (15.4 lines/mm). If it is set to "0," it communicates in native superfine mode.

- **Selector 7: Max. document length limitation**

  This selector is used to select the maximum length of a document to be sent.

- **Selector 8: Stop key pressed during reception**

  If this selector is set to "1," pressing the **Stop** key can stop the current receiving operation. The received data will be lost.

### WSW17 (Function setting 2)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Off-hook alarm | No. 1 2<br>0 0 : No alarm<br>0 1 : Always valid<br>1 X : Valid except when 'call reservation' is selected. |
| 3<br>4 | Not used. | |
| 5 | Calendar clock type | 0: U.S.A. type 1: European type |
| 6 | Not used. | |
| 7 | Non-ring reception | 0: OFF 1: ON |
| 8 | Not used. | |

- **Selectors 1 and 2: Off-hook alarm**

  These selectors activate or deactivate the alarm function which sounds an alarm when the communication is completed with the handset being off the hook.

- **Selector 5: Calendar clock type**

  If this selector is set to "0" (USA), the MM/DD/YY hh:mm format applies; if it is set to "1" (Europe), the DD/MM/YY hh:mm format applies: DD is the day, MM is the month, YY is the last two digits of the year, hh is the hour, and mm is the minute.

- **Selector 7: Non-ring reception**

  Setting this selector to "1" makes the machine receive calls without ringer sound if the ring delay is set to 0.

## **WSW18** (Function setting 3)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Not used. | |
| 2<br>3 | Detection enabled time for CNG and no tone | No. 2 3<br>0 0 : 40 sec.<br>0 1 : 0 sec. (No detection)<br>1 0 : 5 sec.<br>1 1 : 80 sec. |
| 4<br>5 | Not used. | |
| 6 | Registration of station ID | 0: Permitted 1: Prohibited |
| 7<br>8 | Tone sound monitoring | No. 7 8<br>0 X : No monitoring<br>1 0 : Up to phase B at the calling station only<br>1 1 : All transmission phases both at the calling and called stations |

- **Selectors 2 and 3: Detection enabled time for CNG and no tone**

  After the line is connected via the external telephone or by picking up the handset of the machine, the machine can detect a CNG signal or no tone for the time length specified by these selectors. The setting specified by these selectors becomes effective only when selector 8 of WSW20 is set to "1."

- **Selectors 7 and 8: Tone sound monitoring**

  These selectors set monitoring specifications of the tone sound inputted from the line.

### WSW19 (Transmission speed setting in V. 17 mode)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | First transmission speed choice for fallback | No. 1 2 3<br>No. 4 5 6<br>0 0 0 : 2,400 bps<br>0 0 1 : 4,800 bps<br>0 1 0 : 7,200 bps<br>0 1 1 : 9,600 bps<br>1 0 0 : 12,000 bps<br>1 0 1 : }<br>1 1 0 : } 14,400 bps<br>1 1 1 : } |
| 4<br>\|<br>6 | Last transmission speed choice for fallback | |
| 7 | V. 34 mode | 0: Permitted 1: Prohibited |
| 8 | V. 17 mode | 0: Permitted 1: Prohibited |

**NOTE:** For the transmission speed setting in V.34 mode, refer to WSW39.

- **Selectors 1 through 6: First and last choices of transmission speed for fallback**

  These selectors are used to set the modem speed range. With the first transmission speed choice specified by selectors 1 through 3, the machine attempts to establish the transmission link via the modem. If the establishment fails, the machine automatically steps down to the next highest speed and attempts to establish the transmission link again. The machine repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 4 through 6.

  If the modem always falls back to a low transmission speed (e.g., 4,800 bps), set the first transmission speed choice to the lower one (e.g., modify it from 12,000 bps to 7,200 bps) in order to deactivate the high-speed modem function and reduce the training time for shorter transmission time.

  Generally, to save the transmission time, set the last transmission speed choice to a higher one.

- **Selector 7: V. 34 mode**

  This selector determines whether or not the machine communicates with the remote station in the V. 34 mode when that station supports the V. 34 mode.

### WSW20 (Overseas communications mode setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | EP* tone prefix | 0: OFF 1: ON |
| 2 | Overseas communications mode (Reception) | 0: 2100 Hz 1: 1100 Hz |
| 3 | Overseas communications mode (Transmission) | 0: OFF 1: Ignores DIS once. |
| 4<br>5 | Min. time length from reception of CFR to start of transmission of video signals | No. 4 5<br>0 0 : 100 ms<br>0 1 : 200 ms<br>1 0 : 300 ms<br>1 1 : 400 ms |
| 6<br>7 | Chattering noise elimination at detection of CNG | No. 6 7<br>0 0 : Yes (When CNG goes either ON or OFF)<br>0 1 : Yes (Only when CNG goes OFF)<br>1 0 : No<br>1 1 : No |
| 8 | CNG detection on/off | 0: OFF 1: ON |

* EP: Echo protection

- **Selector 1: EP tone prefix**

  Setting this selector to "1" makes the machine transmit a 1700 Hz echo protection (EP) tone immediately preceding training in V.29 modulation system to prevent omission of training signals.

  Prefixing an EP tone is effective when the machine fails to transmit at the V.29 modem speed and always has to fall back to 4800 bps transmission.

- **Selectors 2 and 3: Overseas communications mode**

  These selectors should be used if the machine malfunctions in overseas communications. According to the communications error state, select the signal specifications.

  Setting selector 2 to "1" allows the machine to use 1100 Hz CED signal instead of 2100 Hz in receiving operation. This prevents malfunctions resulting from echoes, since the 1100 Hz signal does not disable the echo suppressor (ES) while the 2100 Hz signal does.

  Setting selector 3 to "1" allows the machine to ignore a DIS signal sent from the called station once in sending operation. This operation suppresses echoes since the first DIS signal immediately follows a 2100 Hz CED (which disables the ES) so that it is likely to be affected by echoes in the disabled ES state. However, such a disabled ES state will be removed soon so that the second and the following DIS signals are not susceptible to data distortion due to echoes. Note that some models when called may cause error by receiving a self-outputted DIS.

- **Selectors 8: CNG detection on/off**

  If this selector is set to "1," the machine detects a CNG signal according to the condition preset by selectors 2 and 3 of WSW18 after a line is connected. If it is set to "0," the machine detects a CNG signal as long as the line is connected.

### **WSW21** (TAD setting 1)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>7 | Not used. | |
| 8 | Erasure of message stored in the memory after the message transfer | 0: Yes 1: No |

- **Selector 8: Erasure of message**

  Setting this selector to "0" will erase the message recorded in the memory after the document retrieval feature transfers the message.

### **WSW22** (ECM setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | ECM* in sending | 0: ON 1: OFF |
| 2 | ECM* in receiving | 0: ON 1: OFF |
| 3 | Call Waiting Caller ID | 0: ON 1: OFF |
| 4 | Not used. | |
| 5<br>\|<br>8 | Acceptable TCF bit error rate (%)<br>(Only at 4800 bps) | 0: 0% 1: 8%<br>0: 0% 1: 4%<br>0: 0% 1: 2%<br>0: 0% 1: 1% |

* ECM: Error correction mode

**NOTE:** Selector 3 is applicable to the American version only, but not applicable to those models equipped with high-speed modem.

**NOTE:** Selectors 5 through 8 are applicable to the Asian version only.

- **Selector 3: Call Waiting Caller ID**

  Setting this selector to "0" allows the user to decide whether or not to interrupt the current call when a new call comes in. If Call Waiting Caller ID service is available in the area and the user subscribes to it, he/she can see information about his/her incoming call.

- **Selectors 5 through 8: Acceptable TCF bit error rate (%)**

  Setting two or more selectors to "1" produces addition of percent assigned to each selector. If you set selectors 7 and 8 to "1," the acceptable TCF bit error rate will be 3%.

### WSW23 (Communications setting)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Starting point of training check (TCF) | 0: From the head of a series of zeros<br>1: From any arbitrary point |
| 2<br>3 | Allowable training error rate | No. 2 3<br>0 0 : 0%<br>0 1 : 0.5%<br>1 0 : 1%<br>1 1 : 2% |
| 4<br>5 | Decoding error rate for transmission of RTN | No. 4 5<br>0 0 : 16%<br>0 1 : 14%<br>1 0 : 10%<br>1 1 : 8% |
| 6<br>7 | Not used. | |
| 8 | Limitation of attenuation level | 0: Yes 1: No |

**NOTE:** Selector 8 is not applicable to the French versions.

- **Selector 1: Starting point of training check (TCF)**

  At the training phase of receiving operation, the called station detects for 1.0 second a training check (TCF) command, a series of zeros which is sent from the calling station for 1.5 seconds to verify training and give the first indication of the acceptability of the line.

  This selector sets the starting point from which the called station should start counting those zeros. If this selector is set to "0," the called station starts counting zeros 100 ms after the head of a series of zeros is detected.

  If it is set to "1," the called station starts counting zeros upon detection of 10-ms successive zeros 50 ms after the head of a series of zeros is detected. In this case, if the detection of 10-ms successive zeros is too late, the data counting period will become less than 1.0 second, making the called station judge the line condition unacceptable.

- **Selectors 2 and 3: Allowable training error rate**

  The called station checks a series of zeros gathered in training (as described in Selector 1) according to the allowable training error rate set by these selectors. If the called station judges the line condition to be accepted, it responds with CFR; if not, it responds with FTT.

- **Selectors 4 and 5: Decoding error rate for transmission of RTN**

  The machine checks the actual decoding errors and then transmits an RTN according to the decoding error rate (Number of lines containing an error per page ÷ Total number of lines per page) set by these selectors.

- **Selector 8: Limitation of attenuation level**

  Setting this selector to "0" limits the transmitting level of the modem to 10 dB.

  This setting has priority over the settings selected by WSW02 (selectors 5 through 8) and WSW13 (selectors 5 through 8).

### **WSW24** (TAD setting 2)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Not used. | |
| 3<br>4 | Time length from CML ON to start of pseudo ring backtone transmission | No. 3 4<br>0 0 : 4 sec.<br>0 1 : 3 sec.<br>1 0 : 2 sec.<br>1 1 : 1 sec. |
| 5<br>\|<br>8 | Attenuator for playback of ICM/ OGM to the line<br>(Selectable from the range of 0-15 dB) | 0: 0 dB 1: 8 dB<br>0: 0 dB 1: 4 dB<br>0: 0 dB 1: 2 dB<br>0: 0 dB 1: 1 dB |

- **Selectors 3 and 4: Time length from CML ON to start of pseudo ring backtone transmission**

  These selectors set the length of time from CML-ON up to the start of pseudo ring backtone transmission.

  In those versions which have an OGM facility, the settings made by these selectors also apply to the length of time from CML-ON up to the start of OGM transmission.

- **Selectors 5 through 8: Attenuator for playback of ICM/OGM to the line**

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

  This setting will not be limited by selector 8 of WSW23.

### WSW25 (TAD setting 3)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Delay time for starting detection of voice signal | No. 1 2<br>0 0 : 0 sec.<br>0 1 : 8 sec.<br>1 0 : 16 sec.<br>1 1 : 24 sec. |
| 3<br>4 | Detection level for no voice signal | No. 3 4<br>0 0 : -43 dB (A)<br>0 1 : -46 dB (B)<br>1 0 : -49 dB (C)<br>1 1 : -51 dB (D) |
| 5<br>\|<br>7 | Pause between paging number and PIN | No. 5 6 7<br>0 0 0 : 2 sec.<br>0 0 1 : 4 sec.<br>0 1 0 : 6 sec.<br>0 1 1 : 8 sec.<br>1 0 0 : 10 sec.<br>1 0 1 : 12 sec.<br>1 1 0 : 14 sec.<br>1 1 1 : 16 sec. |
| 8 | Not used. | |

**NOTE:** Selectors 1 through 4 are not applicable to the U.S.A. versions.

**NOTE:** Selectors 5 through 7 are applicable to those models equipped with a built-in TAD.

- **Selectors 1 and 2: Delay time for starting detection of voice signal**

  These selectors take effect only in TAD mode (when the external TAD is connected to the machine). The machine delays starting detection of the voice signal by the time length specified by these selectors.

  The total length of the delay time specified by these selectors and the maximum waiting time specified by WSW21 (selectors 1 through 5) should not exceed 40 seconds.

- **Selectors 3 and 4: Detection level for no voice signal**

  These selectors set the detection level for no voice signal in the TAD mode (when the external TAD is connected to the machine).

- **Selectors 5 through 7: Pause between paging number and PIN**

  These selectors set the pause time between a telephone number being paged and PIN (private identification number) for the paging feature.

### WSW26 (Function setting 4)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Not used. | |
| 3 | Dialing during document reading into the temporary memory in in-memory message transmission | 0: Disabled 1: Enabled |
| 4<br>5 | No. of CNG cycles to be detected<br>(when the line is connected via the external telephone except in the external TAD mode or via the built-in telephone of the machine) | No. 4 5<br>0 0 : 0.5 (A)<br>0 1 : 1 (B)<br>1 0 : 1.5 (C)<br>1 1 : 2 (D) |
| 6<br>\|<br>8 | Not used. | |

- **Selector 3: Dialing during document reading into the temporary memory in in-memory message transmission**

  If this selector is set to "0," the machine waits for document reading into the memory to complete and then starts dialing. This enables the machine to list the total number of pages in the header of the facsimile message.

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The machine interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors in any of the following cases:

  - when the line is connected via the external telephone except in the external TAD mode.
  - when the line is connected via the built-in telephone of the machine.

### **WSW27 (Function setting 5)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Definition of programmable key | 0: TEL key 1: TEL/POLLING key |
| 2 | Ringer OFF setting | 0: Yes 1: No |
| 3 | Not used. | |
| 4 | Detection of distinctive ringing pattern | 0: Yes 1: No |
| 5<br>\|<br>7 | Not used. | |
| 8 | Toner save mode | 0: Yes 1: No |

**NOTE:** Selector 1 takes effect only in models/versions having a TEL key.

**NOTE:** Selector 4 is applicable only to the U.S.A. version.

- **Selector 1: Definition of programmable key**

  This selector defines a programmable key as a TEL key or TEL/POLLING key.

  Setting this selector to "1" allows the programmable key to function as either a TEL or POLLING key if pressed when the handset is off or on the hook, respectively.

- **Selector 2: Ringer OFF setting**

  This selector determines whether or not the ringer can be set to OFF.

- **Selector 4: Detection of distinctive ringing pattern**

  If this selector is set to "1," the machine detects only the number of rings; if it is set to "0," the machine detects the number of rings and the ringing time length to compare the detected ringing pattern with the registered distinctive one.

### **WSW28** (Function setting 6)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | Transmission level of DTMF high-band frequency signal | No. 1 2 3<br>0 0 0 : 0 dB<br>0 0 1 : +1 dB<br>0 1 0 : +2 dB<br>0 1 1 : +3 dB<br>1 0 0 : 0 dB<br>1 0 1 : -1 dB<br>1 1 0 : -2 dB<br>1 1 1 : -3 dB |
| 4<br>\|<br>6 | Transmission level of DTMF low-band frequency signal | No. 4 5 6<br>0 0 0 : 0 dB<br>0 0 1 : +1 dB<br>0 1 0 : +2 dB<br>0 1 1 : +3 dB<br>1 0 0 : 0 dB<br>1 0 1 : -1 dB<br>1 1 0 : -2 dB<br>1 1 1 : -3 dB |
| 7<br>8 | Not used. | |

- **Selectors 1 through 6: Transmission level of DTMF high-/low-band frequency signal**

  These selectors are intended for the manufacturer who tests the machine for the Standard. Never access them.

### **WSW29** (Function setting 7)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>6 | Not used. | |
| 7 | Impedance switching control in pulse dialing | 0: OFF 1: ON |
| 8 | Beep when the memory area for the activity report becomes full | 0: No 1: Yes |

**NOTE:** Selectors 7 and 8 are applicable to the European version only.

- **Selector 8: Beep when the memory area for the activity report becomes full**

  If this selector is set to "1," the machine will beep when the memory area for the activity report becomes full (as well as displaying a message on the LCD, prompting the output of the activity report).

### **WSW30** (Function setting 8)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | Not used. | |
| 4 | Duty cycle control of pulsed current for the heat-fixing unit | 0: OFF 1: ON |
| 5<br>\|<br>8 | Not used. | |

**NOTE:** Selector 4 is applicable to the European version only.

- **Selector 4: Duty cycle control of pulsed current for the heat-fixing unit**

  Setting this selector to "1" activates the duty cycle control that suppresses the rush current. The duty cycle is 10-ms ON and 20-ms OFF.

  However, the duty cycle control may emit switching noise to the AC line. Depending upon the codes and regulations in the country, this selector should be set to "0."

### **WSW31 (Function setting 9)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Not used. | |
| 2 | Default reduction rate for failure of automatic reduction during recording | 0: 100% 1: Reduction rate specified according to the current paper size |
| 3<br>4 | Not used. | |
| 5 | Minimum short-OFF duration in distinctive ringing | 0: 130 ms 1: 90 ms |
| 6<br>7 | Not used. | |
| 8 | "CHANGE DRUM SOON" message | 0: Yes 1: No |

- **Selector 2: Default reduction rate for failure of automatic reduction during recording**

  This selector sets the default reduction rate to be applied if the automatic reduction function fails to record one-page data sent from the calling station in a single page of the current recording paper.

  If it is set to "0," the machine records one-page data at full size (100%) without reduction; if it is set to "1," the machine records it at the size specified according to the current paper size.

- **Selector 5: Minimum short-OFF duration in distinctive ringing**

  The ringer pattern consists of short and long rings, e.g., short-short-long rings. This selector sets the minimum OFF duration following a short ring in order to avoid missing ringer tones in distinctive ringing.

  If this selector is set to "1," when the short-OFF duration is a minimum of 90 ms long, then the machine will interpret the short-OFF as OFF.

- **Selector 8: "CHANGE DRUM SOON" message**

  This selector determines whether or not the "CHANGE DRUM SOON" message should appear on the LCD when the service life of the laser-sensitive drum in the laser unit will expire soon.

### **WSW32** (Function setting 10)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>4 | Not used. | |
| 5<br>6 | Default resolution | No. 5 6<br>0 0 : Standard<br>0 1 : Fine<br>1 0 : Super fine<br>1 1 : Photo |
| 7<br>8 | Default contrast | No. 7 8<br>0 X : Automatic<br>1 0 : Super light<br>1 1 : Super dark |

- **Selectors 5 and 6: Default resolution**

  These selectors set the default resolution which applies when the machine is powered up or completes a transaction.

- **Selectors 7 and 8: Default contrast**

  These selectors set the default contrast which applies when the machine is powered up or completes a transaction.

### **WSW33** (Function setting 11)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>5 | Not used. | |
| 6 | Report output of polled transmission requests | 0: Yes 1: No |
| 7<br>8 | Not used. | |

**NOTE:** Selector 6 is not applicable to American versions.

### WSW34 (Function setting 12)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | Not used. | |
| 4<br>5 | No. of CNG cycles to be detected<br>(when the line is connected via the machine in the F/T mode or via the external telephone in the external TAD mode) | No. 4 5<br>0 0 : 0.5 (A)<br>0 1 : 1 (B)<br>1 0 : 1.5 (C)<br>1 1 : 2 (D) |
| 6<br>7 | Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation | No. 6 7<br>0 0 : 3<br>0 1 : 2<br>1 0 : 1<br>1 1 : OFF |
| 8 | CNG detection when the external telephone is connected with a line in TAD mode | 0: Only when the machine detects itself being called<br>1: Always |

**NOTE:** Selectors 4 and 5 are not applicable to the American version.

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The machine interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the machine in the F/T mode or via the external telephone in the external TAD mode.

- **Selectors 6 and 7: Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation**

  If the machine receives this specified number of DTMF tone signals during external TAD operation, then it will not detect CNG afterwards.

  If these selectors are set to "1, 1," the CNG detection will not be inhibited.

- **Selector 8: CNG detection when the external telephone is connected with a line in TAD mode**

  If this selector is set to "0," the machine will detect a CNG signal only when it detects itself being called. If the external telephone is connected with a line before the machine detects itself being called, the machine will no longer detect a CNG signal.

  If this selector is set to "1," the machine will detect a CNG signal every time the external telephone is connected with a line, even without detecting itself being called.

### WSW35 (Function setting 13)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>8 | Not used. | |

### **WSW36** **(Function setting 14)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | ECP* mode | 0: ON 1: OFF |
| 2 | Recovery from inactive PC interface | 0: Disabled 1: Enabled |
| 3 | PC power-off recognition time | 0: Normal 1: Long |
| 4 | Not used. | |
| 5 | Escape from phase C | 0: Yes 1: No |
| 6<br>\|<br>8 | Lower limit of frequency to be ignored after detection of calling signals (Ci) | No. 6 7 8<br>0 0 0 : 0 (Not ignored)<br>0 0 1 : 4 (448 Hz)<br>0 1 0 : 8 (244 Hz)<br>0 1 1 : 12 (162 Hz)<br>1 0 0 : 16 (122 Hz)<br>1 0 1 : 20 (97 Hz)<br>1 1 0 : 24 (81 Hz)<br>1 1 1 : 28 (69 Hz) |

*ECP (Enhanced Capabilities Port)

- **Selector 1: ECP mode**

  The ECP mode enhances the normal bidirectional communications between the machine and the connected PC for higher transmission speed.

- **Selector 2: Recovery from inactive PC interface**

  If the machine recognizes via the STROBE signal line that the connected PC is powered off, then it will turn the PC interface output Low to protect the PC from hazards that could be caused by weak electric current accidentally flown from the machine.

  This selector determines whether the machine should recover from the inactive PC interface to normal interfacing state upon receipt of data from the PC.

- **Selector 3: PC power-off recognition time**

  This selector sets the time length from when the machine detects the PC powered off until it recognizes the detected state as power-off.

  If selector 2 is set to "0," it is recommended that selector 3 be set to "1": otherwise, the machine may mistakenly detect PC powered off.

- **Selector 5: Escape from phase C**

  This selector determines whether or not the machine will escape from phase C when it detects an RTC (Return to Control) in non-ECM mode or an RCP (Return to Control Partial page) in ECM mode.

- **Selectors 6 through 8: Lower limit of frequency to be ignored after detection of calling signals (Ci)**

  At the start of reception, if the machine detects the frequency of calling signals (Ci) specified by selectors 1 through 4 of WSW14, it will start the ringer sounding. When doing so, the machine may fail to detect the calling signals normally due to noises superimposed at the time of reception. To prevent it, use selectors 6 through 8 of WSW36.

  If the machine detects higher frequencies than the lower limit specified by these selectors, then it will regard them as noise and interpret that detecting state as being normal, allowing the ringer to keep sounding (until the machine starts automatic reception of FAX data if in the FAX mode or enters the TAD mode if set in the TEL mode, according to the preset number of ringers).

### WSW37 (Function setting 15)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Printout of the stored image data of an unsent document onto the error report | 0: No 1: Yes |
| 2 | Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission | 0: No 1: Yes |
| 3<br>\|<br>8 | Not used. | |

- **Selector 1: Printout of the stored image data of an unsent document onto an error report**

  This selector determines whether or not the 1st-page image data of a document will be printed out onto the error report if the document image data stored in the temporary memory cannot be transmitted normally.

- **Selector 2: Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission**

  If in-memory message transmission fails repeatedly when selector 1 is set to "1," the temporary memory will be occupied with image data. Setting selector 2 to "1" will automatically erase the stored 1st-page image data of an unsent document at the time of the subsequent in-memory message transmission only when recording paper or toner runs out.

**WSW38 (Function setting 16 in V. 34 mode)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Setting of the equalizer | No. 1 2<br>0 X : Automatic<br>1 0 : Fixed to 4 points<br>1 1 : Fixed to 16 points |
| 3 | Sending level of guard tone at phase 2 | 0: Normal - 7 db 1: Normal |
| 4 | Stepping down the transmission speed at fallback each | 0: 2400 bps 1: 4800 bps |
| 5<br>6 | Automatic control of modem's EQM gain for proper transmission speed choice | No. 5 6<br>0 0 : For higher transmission speed than the current setting<br>0 1 : No change from the current setting<br>1 0 : For lower transmission speed than the current setting<br>1 1 : For further lower transmission than the setting made by 1, 0 |
| 7 | Redialing when a communications error occurs | 0: ON 1: OFF |
| 8 | Not used. | |

**NOTE:** WSW38 takes effect only in V. 34 mode.

- **Selectors 1 and 2: Setting of the equalizer**

  These selectors set the equalizer's training level to be applied if the machine fails to send training due to weak line connection. If these selectors are set to "0, X," the modem will automatically set the appropriate training level.

- **Selector 3: Sending level of guard tone at phase 2**

  This selector sets the sending level of guard tone for 1800 Hz to be sent at Phase 2 in the V. 34 mode.

- **Selector 4: Stepping down the transmission speed at fallback each**

  This selector determines how much the modem steps down the transmission speed at fallback when called by the remote station. If this selector is set to "1," the modem may step down the transmission speed from 33600 bps to 28800 bps by one-time fallback.

- **Selectors 5 and 6: Automatic control of modem's EQM gain for proper transmission speed choice**

  These selectors determine how the modem controls the EQM (Eye Quality Monitor) gain for proper choice of the transmission speed, which applies if the modem selects higher transmission speed than the possible speed so that it always repeats falling back.

### WSW39 (Transmission speed setting in V. 34 mode)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>4 | First transmission speed choice for fallback | No. 1 2 3 4<br>No. 5 6 7 8<br>0 0 0 0 : 2400 bps<br>0 0 0 1 : 4800 bps<br>0 0 1 0 : 7200 bps<br>0 0 1 1 : 9600 bps<br>0 1 0 0 : 12000 bps<br>0 1 0 1 : 14400 bps<br>0 1 1 0 : 16800 bps<br>0 1 1 1 : 19200 bps<br>1 0 0 0 : 21600 bps<br>1 0 0 1 : 24000 bps<br>1 0 1 0 : 26400 bps<br>1 0 1 1 : 28800 bps<br>1 1 0 0 : 31200 bps<br>1 1 0 1 : 33600 bps<br>1 1 1 0 : 33600 bps<br>1 1 1 1 : 33600 bps |
| 5<br>\|<br>8 | Last transmission speed choice for fallback | |

**NOTE:** WSW39 takes effect only in V. 34 mode. For the transmission speed setting in other modes, refer to WSW19.

- **Selectors 1 through 8: First and last choices of transmission speed for fallback**

  These selectors are used to set the modem speed range. With the first transmission speed choice specified by selectors 1 through 4, the machine attempts to establish the transmission link via the modem. If the establishment fails, the machine automatically steps down to the next highest speed and attempts to establish the transmission link again. The machine repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 5 through 8.

  If the modem always falls back to a low transmission speed (e.g., 24,000 bps), set the first transmission speed choice to the lower one (e.g., modify it from 31,200 bps to 26,400 bps) in order to deactivate the high-speed modem function and reduce the training time for shorter transmission time.

  WSW39 will be limited by selectors 3 through 8 of WSW40.

### WSW40 (Function setting 17 in V. 34 mode)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Not used. | |
| 3<br>\|<br>8 | Masking of symbol rate(s) | Not masking Masking<br>No. 3 0 1 3429 symbols/sec<br>No. 4 0 1 3200 symbols/sec<br>No. 5 0 1 3000 symbols/sec<br>No. 6 0 1 2800 symbols/sec<br>No. 7 - - Not used.<br>No. 8 0 1 2400 symbols/sec |

**NOTE:** WSW40 takes effect only in V. 34 mode.

- **Selectors 3 and 8: Masking of symbol rate(s)**

These selectors allow you to limit the transmission speed range in V. 34 mode by masking the desired symbol rate(s). Transmission speeds assigned to the symbol rates are listed below. The setting made by these selectors will limit the setting made by selectors 1 through 4 of WSW39.

If selector 3 is set to "1" to mask the 3429 symbols/second when the first transmission speed choice is 33600 bps (specified by selectors 1 through 4 of WSW39), for example, then the allowable maximum transmission speed will be limited to 31200 bps. If selector 8 is set to "1" to mask the 2400 symbols/second when the first transmission speed choice is 33600 bps, then the allowable maximum transmission speed remains 33600 bps.

If selector 8 is set to "1" to mask the 2400 symbols/second when the first transmission speed choice is 21600 bps (specified by selectors 1 through 4 of WSW39), then the allowable maximum transmission speed remains 21600 bps but the minimum transmission speed will be limited to 4800 bps.

| Symbol rate | Transmission speed (bps) | Symbol rate | Transmission speed (bps) | Symbol rate | Transmission speed (bps) |
|---|---|---|---|---|---|
| 2400 | 2400 | 3000 | 4800 | 3429 | 4800 |
| | 4800 | | 7200 | | 7200 |
| | 7200 | | 9600 | | 9600 |
| | 9600 | | 12000 | | 12000 |
| | 12000 | | 14400 | | 14400 |
| | 14400 | | 16800 | | 16800 |
| | 16800 | | 19200 | | 19200 |
| | 19200 | | 21600 | | 21600 |
| | 21600 | | 24000 | | 24000 |
| 2800 | 4800 | | 26400 | | 28800 |
| | 7200 | | 28800 | | 31200 |
| | 9600 | 3200 | 4800 | | 33600 |
| | 12000 | | 7200 | | |
| | 14400 | | 9600 | | |
| | 16800 | | 12000 | | |
| | 19200 | | 14400 | | |
| | 21600 | | 16800 | | |
| | 24000 | | 19200 | | |
| | 26400 | | 21600 | | |
| | | | 24000 | | |
| | | | 26400 | | |
| | | | 28800 | | |
| | | | 31200 | | |

### WSW41 (CCD fluorescent lamp and modem attenuator in V. 34 mode)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | ON-duration of the fluorescent lamp built in the CCD unit | No. 1 2 3<br>0 0 0 : 16 hours<br>0 0 1 : 24 hours<br>0 1 0 : 12 hours<br>0 1 1 : 8 hours<br>1 0 0 : 4 hours<br>1 0 1 : 2 hours<br>1 1 0 : 10 minutes<br>1 1 1 : 0 minute |
| 4 | Not used. | |
| 5<br>\|<br>8 | Modem attenuator | No. 5 6 7 8<br>0 0 0 0 : -10 dBm<br>0 0 0 1 : -11 dBm<br>0 0 1 0 : -12 dBm<br>0 0 1 1 : -13 dBm<br>0 1 0 0 : -14 dBm<br>\| \|<br>1 1 1 1 : -25 dBm |

**NOTE:** Selectors 5 through 8 take effect only in V. 34 mode.

**NOTE:** Selectors 1 through 3 are applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 through 3: ON-duration of the fluorescent lamp built in the CCD unit**

  If the scanning operation is started when the fluorescent lamp is off, then the lamp will come on and stay on for the time length specified by these selectors.

  If these selectors are set to "1, 1, 1," the fluorescent lamp will go off after the scanning sequence.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies to super G3 protocol signals.

### **WSW42** (Function setting 18)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Incoming mail server POP*[1] | 0: OFF 1: ON |
| 2 | Incoming mail server SMTP*[2] | 0: OFF 1: ON |
| 3 | Internet-FAX forward function | 0: OFF 1: ON |
| 4 | JBIG*[3] coding system | 0: Disabled 1: Enabled |
| 5<br>\|<br>8 | Not used. | |

*[1] POP: Post Office Protocol
*[2] SMTP: Simple Mail Transfer Protocol
*[3] JBIG: Joint Bi-level Image Group

**NOTE:** Selectors 1 through 3 are applicable to those models equipped with LAN interface.

- **Selector 3: Internet-FAX forward function**

  If this selector is set to "ON," the machine may forward a FAX message received through Internet to other remote G3 facsimile machine.

### **WSW43** (Function setting 19)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1 | Not used. | |
| 2<br>3 | Wait time for PCFax reception (Class 2) and FPTS command transmission | No. 2 3<br>0 0 : 50 ms<br>0 1 : 100 ms<br>1 0 : 150 ms<br>1 1 : 0 ms |
| 4<br>5 | Detection time of 2100 Hz CED or ANSam | No. 4 5<br>0 0 : 200 ms<br>0 1 : 300 ms<br>1 0 : 400 ms<br>1 1 : 500 ms |
| 6<br>\|<br>8 | Not used. | |

**WSW44 (Speeding up scanning-1)**

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>5 | Not used. | |
| 6<br>\|<br>8 | Effective time length of the white level compensation data obtained beforehand | No. 6 7 8<br>0 0 0 : Obtained compensation data ineffective<br>0 0 1 : 1 min.<br>0 1 0 : 3 min.<br>0 1 1 : 5 min.<br>1 0 0 : 10 min.<br>1 0 1 : 15 min.<br>1 1 0 : 20 min.<br>1 1 1 : 30 min. |

**NOTE:** WSW44 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 6 through 8: Effective time length of the white level compensation data obtained beforehand**

If you set documents in the ADF and the document front sensor detects them or if you open the document tray ASSY and the document tray open sensor detects the open state, then the controller will make correction of the reference voltage to be applied to white level compensation for document scanning before the Copy button is pressed.

These selectors determine how long compensation data obtained beforehand will keep effective.

### WSW45 (Speeding up scanning-2)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>\|<br>3 | Delay time from when documents are set until the ADF starts drawing them in | No. 1 2 3<br>0 0 0 : No automatic drawing-in<br>0 0 1 : 1 sec.<br>0 1 0 : 2 sec.<br>0 1 1 : 3 sec.<br>1 0 0 : 4 sec.<br>1 0 1 : 5 sec.<br>1 1 0 : 6 sec.<br>1 1 1 : 7 sec. |
| 4<br>\|<br>6 | Periodical correction intervals of the reference voltage to be applied to white level compensation for document scanning, during standby | No. 4 5 6<br>0 0 0 : No correction of reference voltage during standby<br>0 0 1 : 10 sec.<br>0 1 0 : 30 sec.<br>0 1 1 : 1 min.<br>1 0 0 : 3 min.<br>1 0 1 : 5 min.<br>1 1 0 : 10 min.<br>1 1 1 : 30 min. |
| 7<br>8 | Not used. | |

**NOTE:** WSW45 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 through 3: Delay time from when documents are set until the ADF starts drawing them in**

  These selectors determine how long the ADF will delay automatic drawing-in of documents (to the scanning standby position) after you set them in the ADF, as well as determining whether or not the ADF automatically draws in documents.

- **Selectors 4 through 6: Periodical correction intervals of the reference voltage applied to white level compensation for document scanning, during standby**

  These selectors set the correction intervals (in seconds) of the reference voltage to be applied to white level compensation for document scanning during standby, as well as determining whether or not the controller makes the reference voltage correction during standby. (Conventionally, the correction has been made immediately before the start of actual scanning)

  This function takes effect in copying. Making the correction during standby may shorten the preparation time for copying.

  **NOTE:** Do not access these selectors.

### WSW46 (Monitor of power ON/OFF state)

| Selector No. | Function | Setting and Specifications |
|---|---|---|
| 1<br>2 | Monitoring the PC ON/OFF state | No. 1 2<br>0 0 : Disabled<br>0 1 : Monitor SELECT IN<br>1 0 : Monitor STROBE<br>1 1 : Monitor both SELECT IN and STROBE |
| 3 | Parallel port output pins kept at high level | 0: Enabled 1: Disabled |
| 4<br>\|<br>8 | Not used. | |

**NOTE:** Selector 3 is applicable only to models equipped with a parallel interface.

- **Selectors 1 and 2: Monitoring the PC ON/OFF state**

  For the related functions, refer to WSW36, selectors 2 and 3.

- **Selector 3: Parallel port output pins kept at high level**

  Setting this selector to "0" will keep all parallel output pins of the machine at high level. Use this setting if Resource Manager (bundled with MFC models) installed to WindowsNT running on the connected PC fails to monitor the power ON/OFF state of the machine.

# MFC6800/DCP1000
# MFC9180/MFC9160

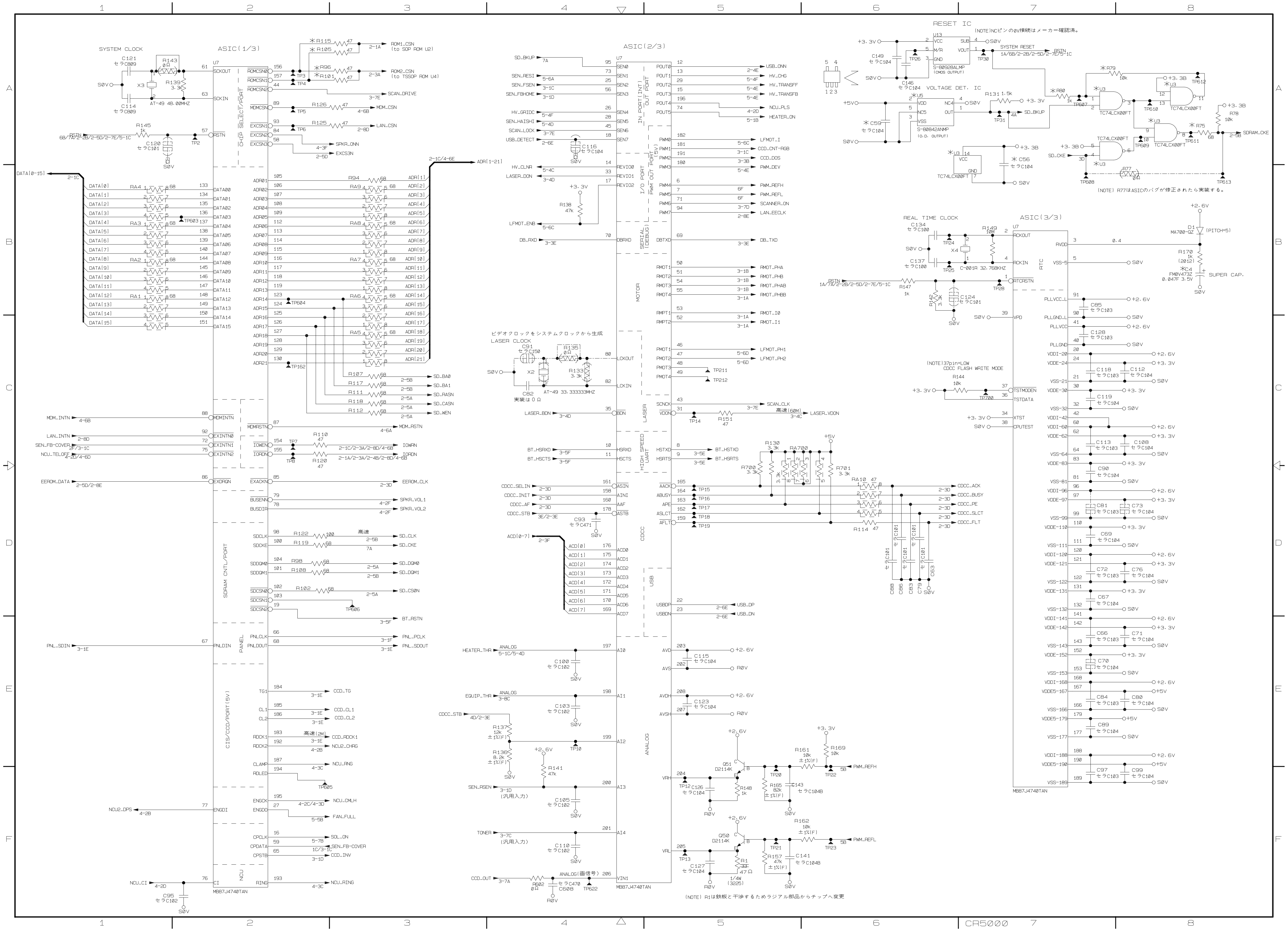
# Appendix 3.  Circuit Diagrams

A. Main PCB
B. Network Control Unit (NCU) PCB
C. Control Panel PCB
D. Power Supply PCBs
E. Relay PCB

Terms in circuit diagrams

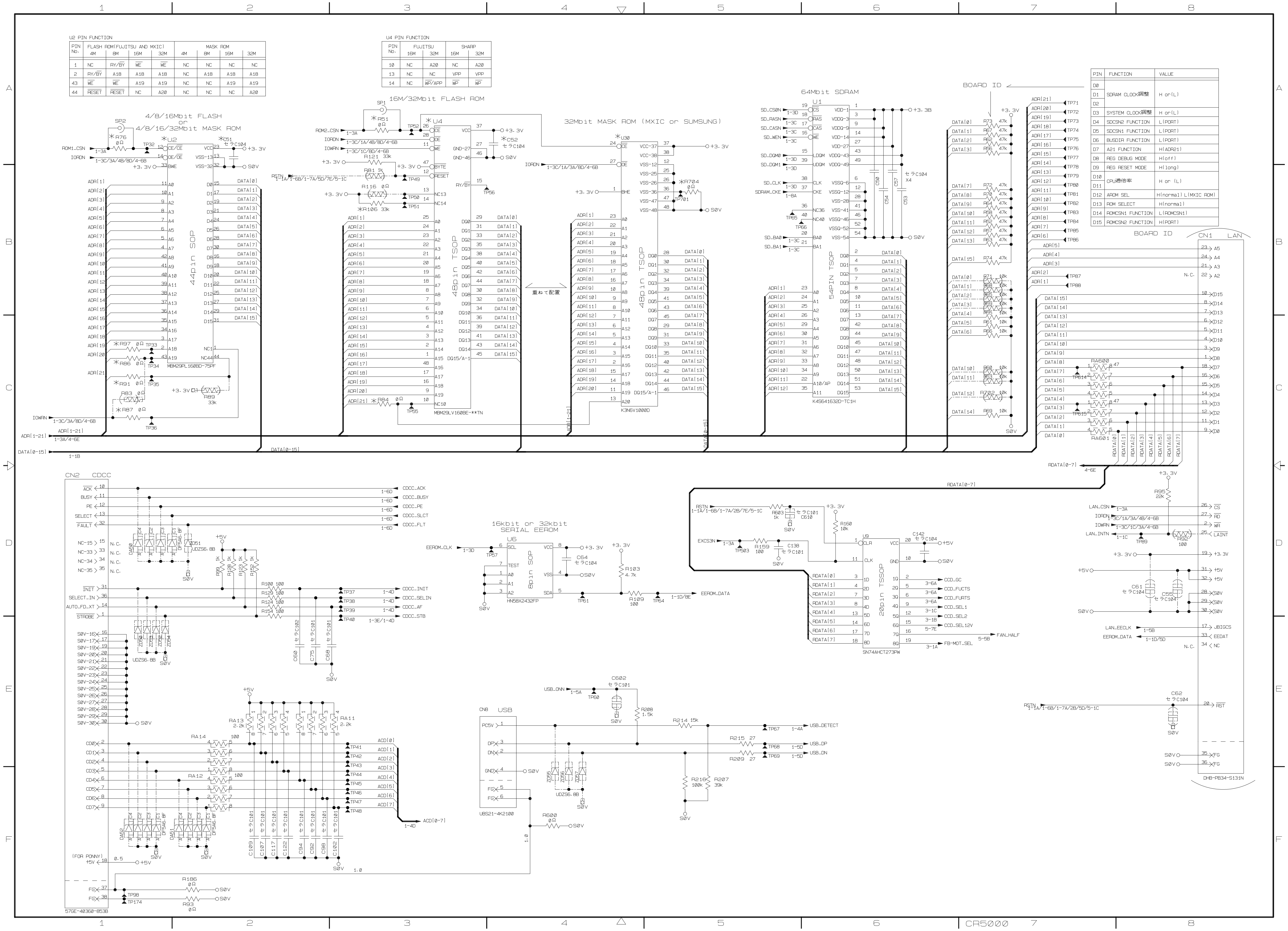
セラＣ: Ceramic capacitor
デンC: Chemical capacitor

## A. Main PCB (1/5)



SYSTEM CLOCK
ASIC(1/3)
ASIC(2/3)
ASIC(3/3)
RESET IC
VOLTAGE DET. IC
REAL TIME CLOCK
[NOTE]NCピンの0V接続はメーカー確認済。
[NOTE] R77はASICのバグが修正されたら実装する。
[NOTE]37pin=LOW CDCC FLASH WRITE MODE
ビデオクロックをシステムクロックから生成
LASER CLOCK
[NOTE] R1は鉄板と干渉するためラジアル部品からチップへ変更
CHIP SELECT/PORT
SDRAM CNTL/PORT
CIS/CCD/PORT(5V)
PANEL
NCU
IN PORT(INT) OUT PORT
I/O PORT PWM OUT PORT
SERIAL (DEBUG)
MOTOR
LASER
HIGH SPEED UART
CDCC
USB
ANALOG
RTC
MB87J4740TAN
X3 AT-49 48.00MHZ
X2 AT-49 33.333333MHZ
X4 C-001R 32.768KHZ
S-80928ALMP
S-80842ANMP
TC74LCX00FT
SUPER CAP.
DATA[0-15]
ADR[1-21]
ACD[0-7]
ROM1_CSN (to SOP ROM U2)
ROM2_CSN (to TSSOP ROM U4)
SDRAM_CKE
CR5000

## A. Main PCB (2/5)


1
2
3
4
5
6
7
8
A
B
C
D
E
F
4/8/16Mbit FLASH
or
4/8/16/32Mbit MASK ROM
SP2
*R76
0Ω
TP32
*U2
*C51
セラC104
+3.3V
ROM1_CSN
IORDN
CE/CE
OE/OE
BWE
VCC
VSS-13
VSS-32
44pin SOP
MBM29PL160BD-75PF
*R97
*R86
*R91
R83
R87
R89
33k
TP33
TP34
TP35
TP36
IOWRN
ADR[1-21]
DATA[0-15]
16M/32Mbit FLASH ROM
SP1
*R51
TP52
*U4
ROM2_CSN
R121
33k
R81
1k
RSTN
R116
*R106
TP49
TP50
TP51
TP55
TP56
BYTE
RESET
RY/BY
48pin TSOP
MBM29LV160BE-**TN
*R84
*C52
セラC104
重ねて配置
32Mbit MASK ROM (MXIC or SUMSUNG)
*U30
*R704
TP701
BHE
K3N6V1000D
64Mbit SDRAM
U1
SD_CS0N
SD_RASN
SD_CASN
SD_WEN
SD_DQM0
SD_DQM1
SD_CLK
SDRAM_CKE
TP65
TP66
SD_BA0
SD_BA1
54PIN TSOP
K4S641632D-TC1H
C50
C54
C57
C53
セラC104
X4
+3.3V
S0V
BOARD ID
R73
R76
R62
R56
R72
R68
R64
R58
R52
R67
R63
R74
R71
R70
R65
R60
R59
R61
R66
R69
R702
47k
10k
TP71
TP72
TP73
TP74
TP75
TP76
TP77
TP78
TP79
TP80
TP81
TP82
TP83
TP84
TP85
TP86
TP87
TP88
TP614
TP615
RA600
RA601
47
CN1
LAN
RDATA[0-7]
N.C.
CN2
CDCC
ACK
BUSY
PE
SELECT
FAULT
INIT
SELECT_IN
AUTO_FD_XT
STROBE
CDCC_ACK
CDCC_BUSY
CDCC_PE
CDCC_SLCT
CDCC_FLT
CDCC_INIT
CDCC_SELIN
CDCC_AF
CDCC_STB
DA50
DA51
DA52
ZD51
UDZS6.8B
R99
R98
R97
R102
R100
R129
R124
R154
TP37
TP38
TP39
TP40
C60
C75
C68
+5V
RA13
RA14
RA12
RA11
2.2k
100
TP41
TP42
TP43
TP44
TP45
TP46
TP47
TP48
ACD[0-7]
C109
C107
C117
C122
C94
C92
C98
C102
セラC101
(FOR PONNY)
R186
R93
TP98
TP174
57GE-40360-8538
16kbit or 32kbit
SERIAL EEROM
U6
EEROM_CLK
TP57
SCL
TEST
SDA
8pin SOP
HN58X2432FP
C64
セラC104
R103
4.7k
R109
100
TP61
TP64
EEROM_DATA
CN8
USB
PC5V
DP
DNX
GND
FG
UBS21-4K2100
USB_ONN
TP60
C602
セラC101
R208
1.5k
R214
15k
R215
27
R209
27
R218
100k
R207
39k
ZD55
ZD56
ZD57
UDZS6.8B
R600
TP67
TP68
TP69
USB_DETECT
USB_DP
USB_DN
RSTN
R603
1k
C610
R150
10k
EXCS3N
TP503
R159
100
C138
U9
CLR
CLK
C142
セラC104
20pin TSSOP
SN74AHCT273PW
CCD_GC
CCD_FUCTS
CCD_FURTS
CCD_SEL1
CCD_SEL2
CCD_SEL12V
FAN_HALF
FB-MOT_SEL
LAN_CSN
LAN_INTN
R95
22k
R92
100
TP89
C61
C55
セラC104
LAN_EECLK
EEROM_DATA
C62
セラC104
DHB-PB34-S131N
CR5000

U2 PIN FUNCTION

| PIN No. | FLASH ROM(FUJITSU AND MXIC) | | | | MASK ROM | | | |
|---|---|---|---|---|---|---|---|---|
| | 4M | 8M | 16M | 32M | 4M | 8M | 16M | 32M |
| 1 | NC | RY/BY | WE | WE | NC | NC | NC | NC |
| 2 | RY/BY | A18 | A18 | A18 | NC | A18 | A18 | A18 |
| 43 | WE | WE | A19 | A19 | NC | NC | A19 | A19 |
| 44 | RESET | RESET | NC | A20 | NC | NC | NC | A20 |

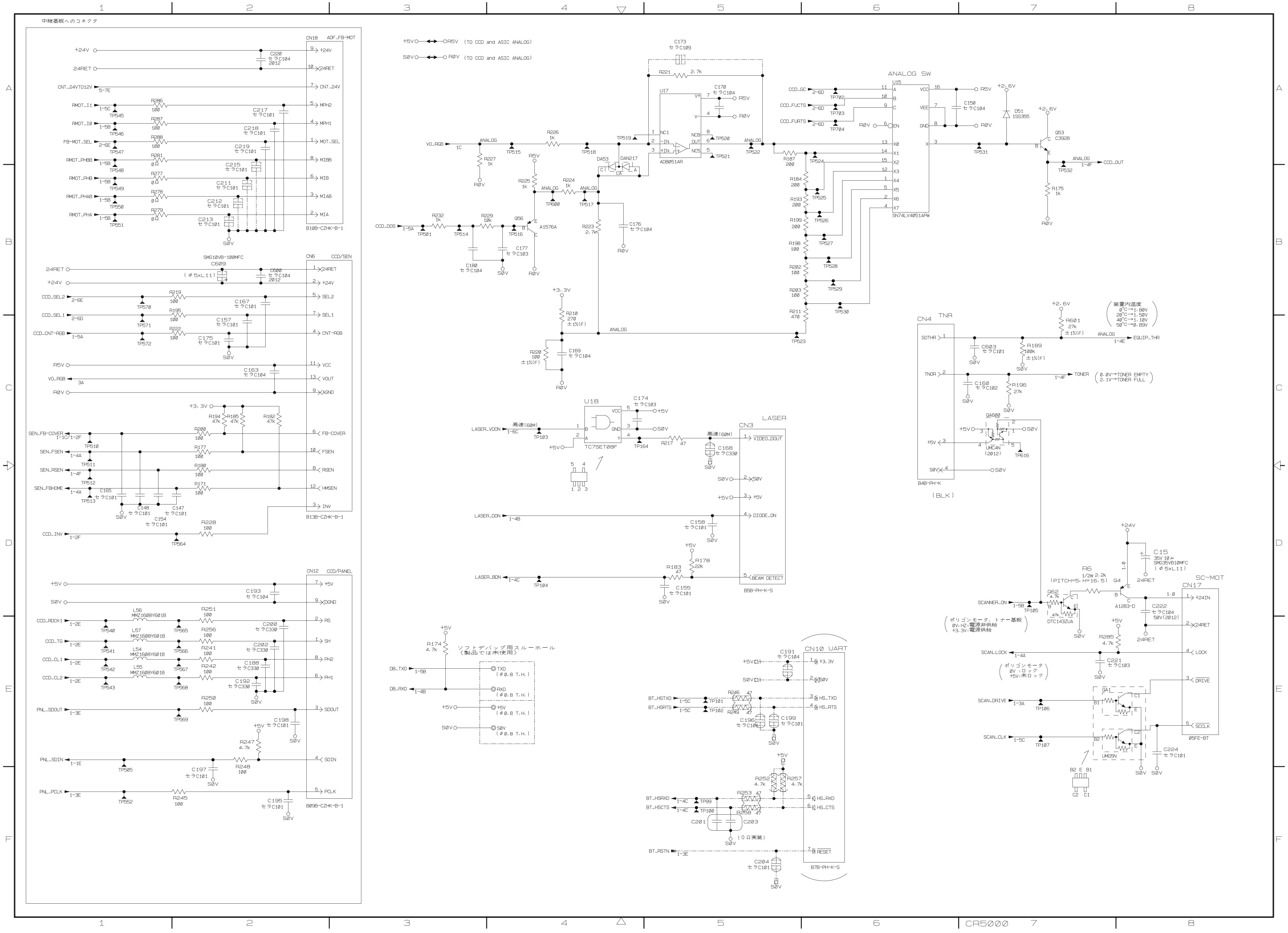
U4 PIN FUNCTION

| PIN No. | FUJITSU | | SHARP | |
|---|---|---|---|---|
| | 16M | 32M | 16M | 32M |
| 10 | NC | A20 | NC | A20 |
| 13 | NC | NC | VPP | VPP |
| 14 | NC | WP/APP | WP | WP |

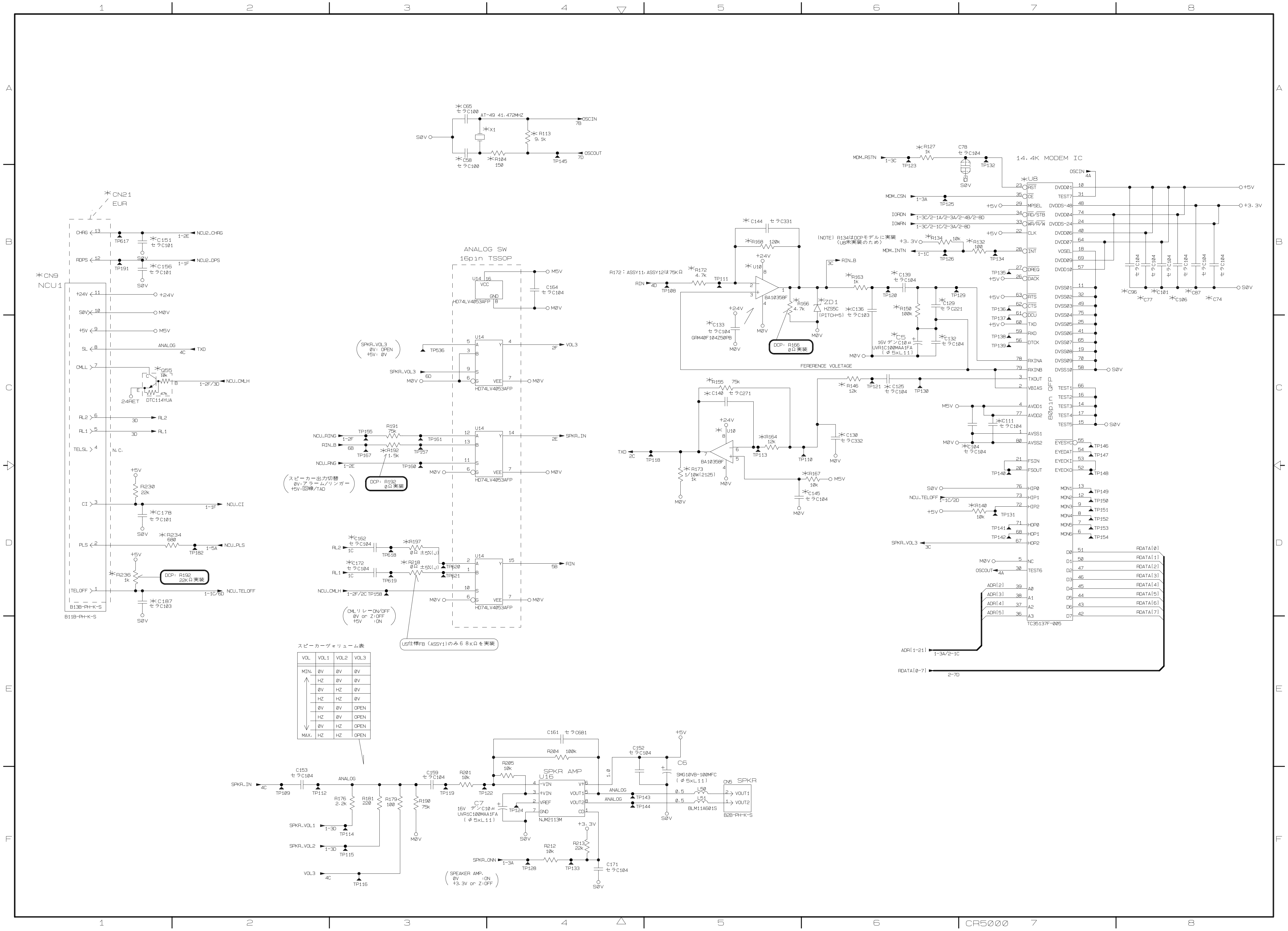
| PIN | FUNCTION | VALUE |
|---|---|---|
| D0 | SDRAM CLOCK調整 | H or(L) |
| D1 | | |
| D2 | | |
| D3 | SYSTEM CLOCK調整 | H or(L) |
| D4 | SDCSN2 FUNCTION | L(PORT) |
| D5 | SDCSN1 FUNCTION | L(PORT) |
| D6 | BUSDIR FUNCTION | L(PORT) |
| D7 | A21 FUNCTION | H(ADR21) |
| D8 | REG DEBUG MODE | H(off) |
| D9 | REG RESET MODE | H(long) |
| D10 | CPU逓倍率 | H or (L) |
| D11 | | |
| D12 | AROM SEL | H(normal) L(MXIC ROM) |
| D13 | ROM SELECT | H(normal) |
| D14 | ROMCSN1 FUNCTION | L(ROMCSN1) |
| D15 | ROMCSN2 FUNCTION | H(PORT) |

BOARD ID

## A. Main PCB (3/5)


中継基板へのコネクタ
CN18 ADF_FB-MOT
+24V
24RET
CNT_24VTO12V
RMOT_I1
RMOT_I0
FB-MOT_SEL
RMOT_PHBB
RMOT_PHB
RMOT_PHAB
RMOT_PHA
B10B-CZHK-B-1
CN6 CCD/SEN
SMG10VB-100MFC
C609
CCD_SEL2
CCD_SEL1
CCD_CNT-RGB
R5V
VO_RGB
R0V
SEN_FB-COVER
SEN_FSEN
SEN_RSEN
SEN_FBHOME
CCD_INV
B13B-CZHK-B-1
CN12 CCD/PANEL
+5V
S0V
CCD_RDCK1
CCD_TG
CCD_CL1
CCD_CL2
PNL_SDOUT
PNL_SDIN
PNL_PCLK
B09B-CZHK-B-1
+5V ○—○ R5V (TO CCD and ASIC ANALOG)
S0V ○—○ R0V (TO CCD and ASIC ANALOG)
C173
U17
AD8051AR
DA53
DAN217
Q56
A1576A
CCD_DOS
ANALOG SW
U15
SN74LV4051APW
CCD_GC
CCD_FUCTS
CCD_FURTS
D51
1SS355
Q53
C3928
CCD_OUT
CN4 TNR
SOTHR
TNOR
B4B-PH-K
(BLK)
装置内温度
0℃→1.80V
20℃→1.50V
40℃→1.10V
50℃→0.89V
EQUIP_THR
TONER
0.0V→TONER EMPTY
2.1V→TONER FULL
QA600
UMC4N
U18
TC7SET08F
LASER_VDON
高速(60M)
CN3 LASER
VIDEO_DOUT
LASER_DON
DIODE_ON
LASER_BDN
BEAM DETECT
B5B-PH-K-S
R174
ソフトデバッグ用スルーホール
(製品では未使用)
DB_TXD
DB_RXD
TXD
RXD
(φ0.8 T.H.)
CN10 UART
BT_HSTXD
BT_HSRTS
BT_HSRXD
BT_HSCTS
BT_RSTN
(0Ω実装)
B7B-PH-K-S
C15
35V10μ
SMG35VB10MFC
(φ5xL11)
R6
1/2W 2.2k
(PITCH=5, H=16.5)
Q4
A1203-D
SC-MOT
CN17
SCANNER_ON
DTC143ZUA
ポリゴンモータ、トナー基板
0V:HZ:電源非供給
+3.3V:電源供給
SCAN_LOCK
ポリゴンモータ
0V:ロック
+5V:未ロック
SCAN_DRIVE
SCAN_CLK
UMG5N
05FE-BT
CR5000
A B C D E F
1 2 3 4 5 6 7 8

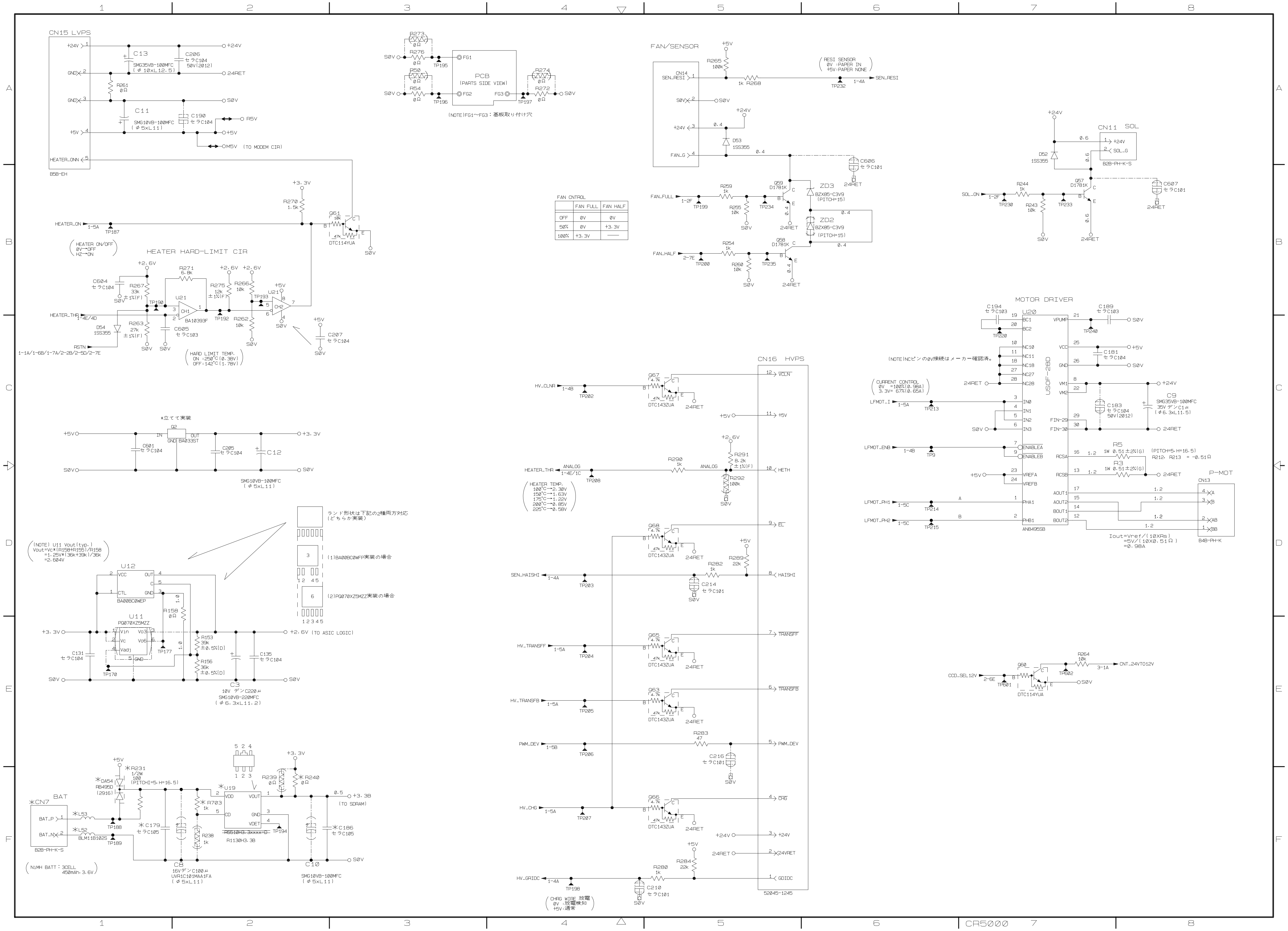
# A. Main PCB (4/5)


1
2
3
4
5
6
7
8
A
B
C
D
E
F
*CN21
EUR
CHRG
RDPS
TP617
TP191
*C151
セラC101
*C156
セラC101
NCU2_CHRG
NCU2_DPS
S0V
*CN9
NCU1
+24V
S0V
+5V
SL
CML
RL2
RL1
TELSL
N.C.
CI
PLS
TELOFF
M0V
M5V
ANALOG
TXD
*Q55
10k
47k
DTC114YUA
24RET
NCU_CMLH
1-2F/3D
+5V
R230
22k
*C178
セラC101
NCU_CI
*R234
680
TP182
NCU_PLS
*R236
1k
DCP: R192
22KΩ実装
*C187
セラC103
NCU_TELOFF
1-1C/6D
B13B-PH-K-S
B11B-PH-K-S
*C65
セラC100
AT-49 41.472MHZ
*X1
*R113
9.1k
OSCIN
7B
*C58
セラC100
*R104
150
TP145
OSCOUT
7D
ANALOG SW
16pin TSSOP
U14
VCC
GND
HD74LV4053AFP
C164
セラC104
SPKR_VOL3
0V: OPEN
+5V: 0V
TP536
VOL3
NCU_RING
RIN_B
NCU_RNG
TP155
R191
75k
TP161
*R192
1.5k
TP157
TP167
TP160
SPKR_IN
スピーカー出力切替
0V:アラーム/リンガー
+5V:回線/TAD
DCP: R192
0Ω実装
*C162
セラC104
*R197
0Ω ±5%(J)
TP618
*C172
セラC104
*R210
0Ω ±5%(J)
TP619
TP620
TP621
NCU_CMLH
1-2F/2C TP158
RIN
CMLリレーON/OFF
0V or Z:OFF
+5V :ON
US仕様FB（ASSY1）のみ６８KΩを実装
スピーカーヴォリューム表
SPKR_IN
C153
セラC104
TP109
TP112
ANALOG
R176
2.2k
R181
220
R179
100
R190
75k
SPKR_VOL1
TP114
SPKR_VOL2
TP115
VOL3
TP116
C159
セラC104
R201
10k
TP119
TP122
R205
10k
C161 セラC681
R204 100k
SPKR AMP
U16
-VIN
+VIN
VREF
GND
V+
VOUT1
VOUT2
CD
NJM2113M
C7
16V デンC10μ
UVR1C100MAA1FA
(φ5xL11)
TP124
SPKR_ONN
1-3A
R212
10k
TP128
TP133
+3.3V
R213
22k
C171
セラC104
SPEAKER AMP.
0V :ON
+3.3V or Z:OFF
C152
セラC104
C6
SMG10VB-100MFC
(φ5xL11)
TP143
TP144
L50
L51
BLM11A601S
CN5
SPKR
VOUT1
VOUT2
B2B-PH-K-S
R172：ASSY11、ASSY12は75KΩ
*R172
4.7k
TP108
TP111
*C144 セラC331
*R168 120k
+24V
*U10
BA10358F
*C133
セラC104
GRM40F104Z50PB
*R166
4.7k
DCP: R166
0Ω実装
*ZD1
HZS5C
(PITCH=5)
RIN_B
*R163
1k
*C136
セラC103
*C139
セラC104
TP120
TP129
*R150
100k
*C129
セラC221
*C5
16V デンC10μ
UVR1C100MAA1FA
(φ5xL11)
*C132
セラC104
FERERENCE VOLETAGE
*R155 75k
*C140 セラC271
*R164
12k
TP113
TP110
*C130
セラC332
TP118
*R173
1/10W(2125)
1k
*R167
10k
*C145
セラC104
*R146
12k
TP121
*C125
セラC104
TP130
MDM_RSTN
*R127
1k
C78
セラC104
TP123
TP132
14.4K MODEM IC
*U8
MDM_CSN
TP125
IORDN
1-3C/2-1A/2-3A/2-4B/2-8D
IOWRN
1-3C/2-1C/2-3A/2-8D
(NOTE) R134はDCPモデルに実装
(U8未実装のため)
*R134
10k
*R132
100
MDM_INTN
TP126
TP134
RST
CE
MPSEL
RD/STB
WR/R/W
CLK
INT
DREQ
DACK
RTS
CTS
DCU
TXD
RXD
DTCK
RXINA
RXINB
TXOUT
VBIAS
AVDD1
AVDD2
AVSS1
AVSS2
FSIN
FSOUT
HIP0
HIP1
HIP2
HOP0
HOP1
HOP2
NC
TEST6
A0
A1
A2
A3
DVDD01
TEST7
DVDDS-48
DVDD04
DVDDS-24
DVDD06
DVDD07
VOSEL
DVDD09
DVDD10
DVSS01
DVSS02
DVSS03
DVSS04
DVSS05
DVSS06
DVSS07
DVSS08
DVSS09
DVSS10
TEST1
TEST2
TEST3
TEST4
TEST5
EYESYC
EYEDAT
EYECKI
EYECKO
MON1
MON2
MON3
MON4
MON5
MON6
D0
D1
D2
D3
D4
D5
D6
D7
80pin QFP
TC35137F-005
OSCIN
4A
+5V
+3.3V
*C96
*C77
*C101
*C106
*C87
*C74
セラC104
*C111
セラC104
*C104
セラC104
TP146
TP147
TP148
TP149
TP150
TP151
TP152
TP153
TP154
TP140
TP131
TP141
TP142
NCU_TELOFF
1-1C/2D
*R140
10k
SPKR_VOL3
3C
OSCOUT
RDATA[0]
RDATA[1]
RDATA[2]
RDATA[3]
RDATA[4]
RDATA[5]
RDATA[6]
RDATA[7]
ADR[2]
ADR[3]
ADR[4]
ADR[5]
ADR[1-21]
1-3A/2-1C
RDATA[0-7]
2-7D
CR5000

スピーカーヴォリューム表

| VOL | VOL1 | VOL2 | VOL3 |
|---|---|---|---|
| MIN. | 0V | 0V | 0V |
| ↑ | HZ | 0V | 0V |
| | 0V | HZ | 0V |
| | HZ | HZ | 0V |
| | 0V | 0V | OPEN |
| | HZ | 0V | OPEN |
| ↓ | 0V | HZ | OPEN |
| MAX. | HZ | HZ | OPEN |

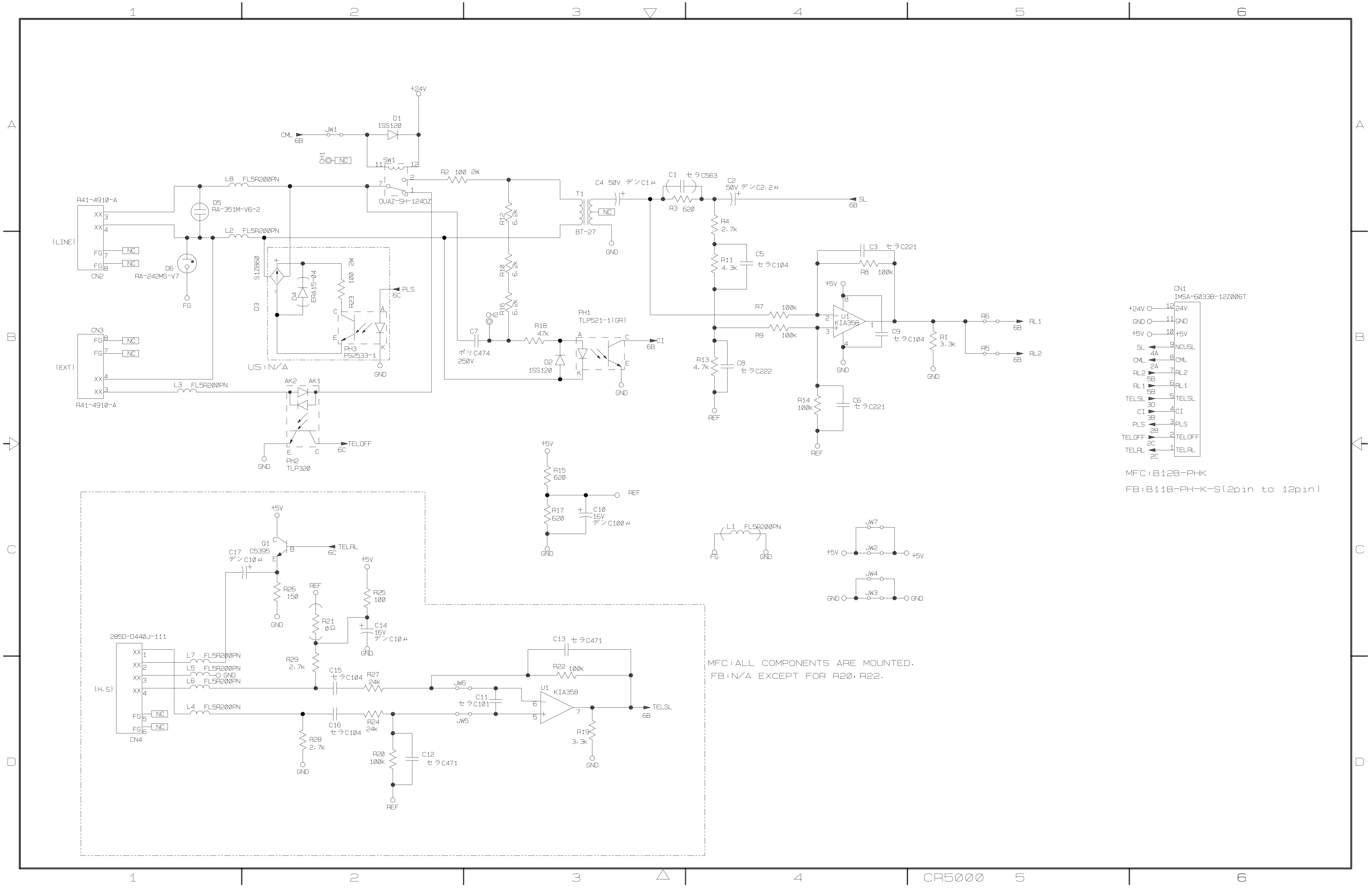
# A. Main PCB (5/5)


CN15 LVPS
+24V
GND
+5V
HEATER_ONN
B5B-EH
C13
SMG35VB-100MFC
C206
24RET
S0V
C11
SMG10VB-100MFC
C190
R5V
OM5V (TO MODEM CIR)
PCB (PARTS SIDE VIEW)
FG1
FG2
FG3
(NOTE)FG1~FG3：基板取り付け穴
FAN/SENSOR
CN14
SEN_RESI
FAN_G
FAN_FULL
FAN_HALF
ZD3 BZX85-C3V9
ZD2 BZX85-C3V9
Q59 D1781K
Q58 D1781K
RESI SENSOR 0V :PAPER IN +5V:PAPER NONE
CN11 SOL
SOL_ON
Q57 D1781K
B2B-PH-K-S
HEATER_ON
Q61 DTC114YUA
HEATER ON/OFF 0V→OFF HZ→ON
HEATER HARD-LIMIT CIR
U21 BA10393F
HEATER_THR
RSTN
HARD LIMIT TEMP. ON :250°C(0.38V) OFF:142°C(1.78V)
FAN CNTROL
MOTOR DRIVER
U20 AN8495SB
USOF-280
(NOTE)NCピンの0V接続はメーカー確認済。
CURRENT CONTROL 0V =100%(0.98A) 3.3V= 67%(0.65A)
LFMOT_I
LFMOT_ENB
LFMOT_PH1
LFMOT_PH2
P-MOT CN13 B4B-PH-K
Iout=Vref/(10XRs) =5V/(10X0.51Ω) =0.98A
R5 1W 0.51±2%(G)
R3 1W 0.51±2%(G)
(PITCH=5・H=16.5) R212, R213 = 0.51Ω
*立てて実装
Q2 BA033ST
C12 SMG10VB-100MFC
CN16 HVPS
HV_CLNR
HEATER_THR
HEATER TEMP. 100°C→2.30V 150°C→1.63V 175°C→1.22V 200°C→0.85V 225°C→0.58V
SEN_HAISHI
HV_TRANSFF
HV_TRANSFB
PWM_DEV
HV_CHG
HV_GRIDC
DTC143ZUA
CHRG WIRE 放電 0V :放電検知 +5V:通常
52045-1245
U12 BA00BC0WFP
U11 PQ070XZ5MZZ
(NOTE) U11 Vout(typ.) Vout=Vc*(R158+R155)/R158 =1.25V*(36k+39k)/36k =2.604V
ランド形状は下記の2種両方対応(どちらか実装)
(1)BA00BC0WFP実装の場合
(2)PQ070XZ5MZZ実装の場合
+2.6V (TO ASIC LOGIC)
C3 10V デンC220μ SMG10VB-220MFC
*CN7 BAT
BAT_P
BAT_N
B2B-PH-K-S
NiMH BATT：3CELL 450mAh・3.6V
*U19 R1130H3-3B
+3.3B (TO SDRAM)
C8 16VデンC100μ UVR1C101MAA1FA
C10 SMG10VB-100MFC
CCD_SEL12V
Q60 DTC114YUA
CNT_24VTO12V
CR5000

FAN CNTROL

|  | FAN FULL | FAN HALF |
|---|---|---|
| OFF | 0V | 0V |
| 50% | 0V | +3.3V |
| 100% | +3.3V | —— |

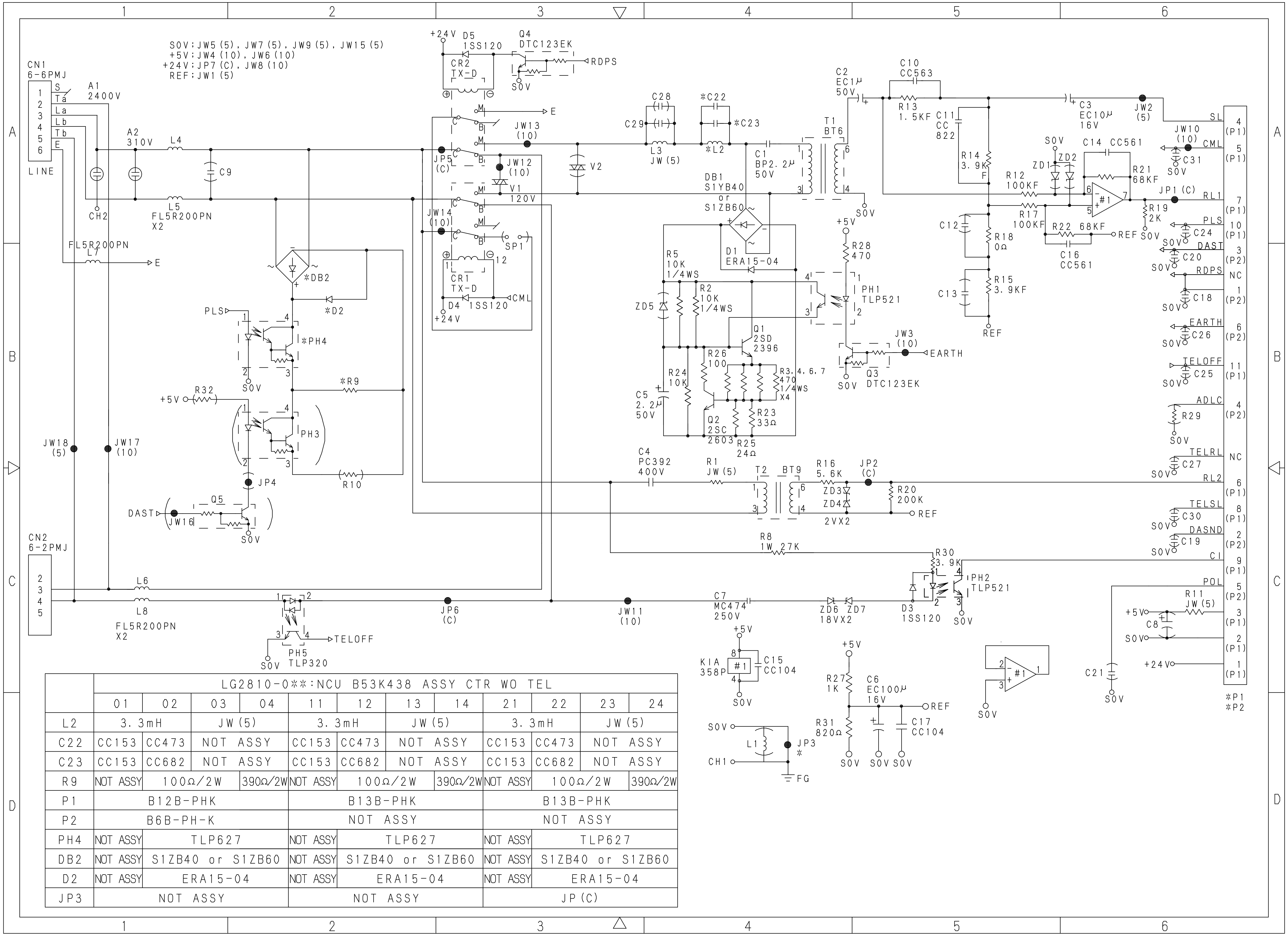
**B. NCU PCB**
(U.S.A., Canada)



+24V
D1
1SS120
CML
6B
JW1
CH1
NC
SW1
11
12
7
2
1
OUAZ-SH-124DZ
R2 100 2W
L8 FL5R200PN
L2 FL5R200PN
D5
RA-351M-V6-2
R41-4910-A
XX 3
XX 4
(LINE)
FG 7
FG 8
NC
D6
RA-242MS-V7
CN2
FG
S1ZB60
D3
D4
ERA15-04
R23
100 2W
PLS
6C
C
E
A
K
PH3
PS2533-1
US:N/A
GND
CN3
(EXT)
R41-4910-A
L3 FL5R200PN
AK2
AK1
PH2
TLP320
TELOFF
6C
R12 6.2K
R10 6.2K
R16 6.2K
T1
BT-27
C4 50V デンC1μ
C1 セラC563
R3 620
C2 50V デンC2.2μ
SL
6B
R4 2.7k
C5 セラC104
R11 4.3k
CH2
C7
ポリC474
250V
R18 47k
D2
1SS120
PH1
TLP521-1(GR)
CI
6B
C3 セラC221
R8 100k
+5V
R7 100k
R9 100k
U1
KIA358
C9 セラC104
R1 3.3k
R6
RL1
6B
R5
RL2
6B
R13 4.7k
C8 セラC222
REF
R14 100k
C6 セラC221
CN1
IMSA-6033B-12Z006T
+24V 12 24V
GND 11 GND
+5V 10 +5V
SL 4A 9 NCUSL
CML 2A 8 CML
RL2 5B 7 RL2
RL1 5B 6 RL1
TELSL 3D 5 TELSL
CI 3B 4 CI
PLS 2B 3 PLS
TELOFF 2C 2 TELOFF
TELRL 2C 1 TELRL
MFC:B12B-PHK
FB:B11B-PH-K-S(2pin to 12pin)
+5V
R15 620
REF
R17 620
C10 16V デンC100μ
L1 FL5R200PN
FG
GND
JW7
JW2
+5V
JW4
JW3
+5V
Q1 C5395
TELRL
6C
C17 デンC10μ
R26 150
R25 100
R21 0Ω
C14 16V デンC10μ
285D-D440J-111
(H.S)
L7 FL5R200PN
L5 FL5R200PN GND
L6 FL5R200PN
L4 FL5R200PN
CN4
R29 2.7k
C15 セラC104
R27 24k
C13 セラC471
R22 100k
JW6
C11 セラC101
U1 KIA358
TELSL
6B
C16 セラC104
R24 24k
JW5
R28 2.7k
R20 100k
C12 セラC471
R19 3.3k
MFC:ALL COMPONENTS ARE MOUNTED.
FB:N/A EXCEPT FOR R20.R22.
1
2
3
4
5
6
A
B
C
D
CR5000

## B. NCU PCB

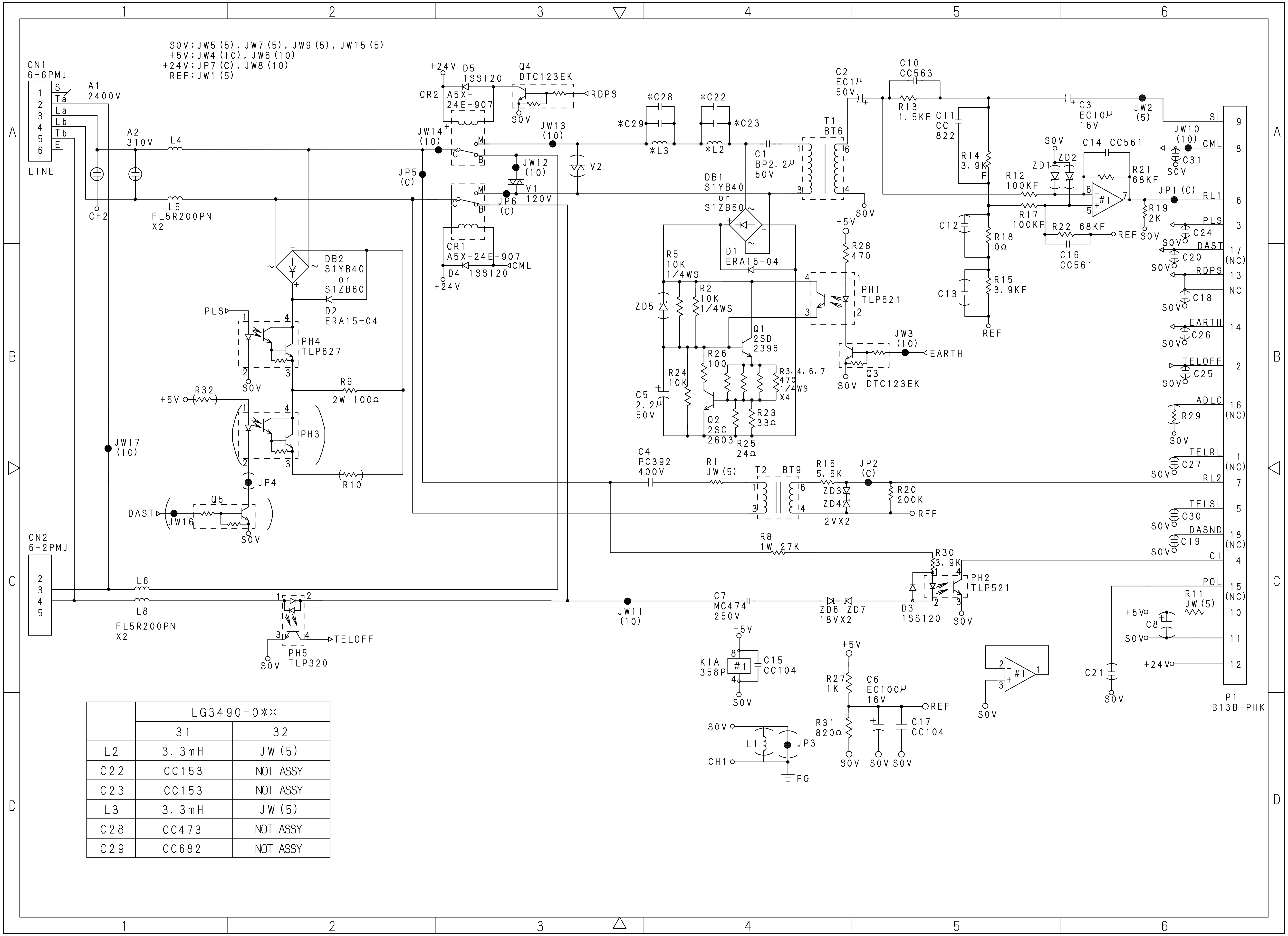
(U.K., Norway, Netherlands, Finland, Denmark, Sweden)


S0V:JW5(5), JW7(5), JW9(5), JW15(5)
+5V:JW4(10), JW6(10)
+24V:JP7(C), JW8(10)
REF:JW1(5)
CN1
6-6PMJ
S
Ta
La
Lb
Tb
E
LINE
A1
2400V
A2
310V
L4
L5
FL5R200PN
X2
C9
CH2
L7
FL5R200PN
E
+24V
D5
1SS120
Q4
DTC123EK
RDPS
S0V
CR2
TX-D
JW13
(10)
JP5
(C)
JW12
(10)
V1
120V
V2
JW14
(10)
SP1
CR1
TX-D
D4
1SS120
CML
C28
C29
※C22
※C23
L3
JW(5)
※L2
C1
BP2.2μ
50V
DB1
S1YB40
or
S1ZB60
D1
ERA15-04
C2
EC1μ
50V
T1
BT6
C10
CC563
R13
1.5KF
C11
CC
822
R14
3.9K
F
C3
EC10μ
16V
JW2
(5)
ZD1
ZD2
C14
CC561
R12
100KF
R17
100KF
R21
68KF
R22
68KF
C16
CC561
#1
R19
2K
JP1(C)
JW10
(10)
C31
C24
C20
C18
C26
C25
R29
C27
C30
C19
C12
C13
R18
0Ω
R15
3.9KF
REF
+5V
R28
470
PH1
TLP521
JW3
(10)
EARTH
Q3
DTC123EK
R5
10K
1/4WS
ZD5
R2
10K
1/4WS
Q1
2SD
2396
R26
100
R24
10K
R3,4,6,7
470
1/4WS
X4
C5
2.2μ
50V
Q2
2SC
2603
R23
33Ω
R25
24Ω
※DB2
※D2
PLS
※PH4
R32
※R9
PH3
R10
JP4
DAST
Q5
JW16
JW18
(5)
JW17
(10)
CN2
6-2PMJ
L6
L8
FL5R200PN
X2
PH5
TLP320
TELOFF
JP6
(C)
JW11
(10)
C4
PC392
400V
R1
JW(5)
T2
BT9
R16
5.6K
JP2
(C)
ZD3
ZD4
2VX2
R20
200K
R8
1W 27K
R30
3.9K
PH2
TLP521
C7
MC474
250V
ZD6
18VX2
ZD7
D3
1SS120
KIA
358P
C15
CC104
R27
1K
C6
EC100μ
16V
R31
820Ω
C17
CC104
L1
JP3
※
CH1
FG
R11
JW(5)
C8
C21
SL
CML
RL1
PLS
DAST
RDPS
NC
EARTH
TELOFF
ADLC
TELRL
RL2
TELSL
DASND
CI
POL
+24V
※P1
※P2
A
B
C
D
1
2
3
4
5
6

| | LG2810-0※※:NCU B53K438 ASSY CTR WO TEL | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01 | 02 | 03 | 04 | 11 | 12 | 13 | 14 | 21 | 22 | 23 | 24 |
| L2 | 3.3mH | | JW(5) | | 3.3mH | | JW(5) | | 3.3mH | | JW(5) | |
| C22 | CC153 | CC473 | NOT ASSY | | CC153 | CC473 | NOT ASSY | | CC153 | CC473 | NOT ASSY | |
| C23 | CC153 | CC682 | NOT ASSY | | CC153 | CC682 | NOT ASSY | | CC153 | CC682 | NOT ASSY | |
| R9 | NOT ASSY | 100Ω/2W | | 390Ω/2W | NOT ASSY | 100Ω/2W | | 390Ω/2W | NOT ASSY | 100Ω/2W | | 390Ω/2W |
| P1 | B12B-PHK | | | | B13B-PHK | | | | B13B-PHK | | | |
| P2 | B6B-PH-K | | | | NOT ASSY | | | | NOT ASSY | | | |
| PH4 | NOT ASSY | TLP627 | | | NOT ASSY | TLP627 | | | NOT ASSY | TLP627 | | |
| DB2 | NOT ASSY | S1ZB40 or S1ZB60 | | | NOT ASSY | S1ZB40 or S1ZB60 | | | NOT ASSY | S1ZB40 or S1ZB60 | | |
| D2 | NOT ASSY | ERA15-04 | | | NOT ASSY | ERA15-04 | | | NOT ASSY | ERA15-04 | | |
| JP3 | NOT ASSY | | | | NOT ASSY | | | | JP(C) | | | |

※※※※※※-XXX T0-007-177 V.1.00

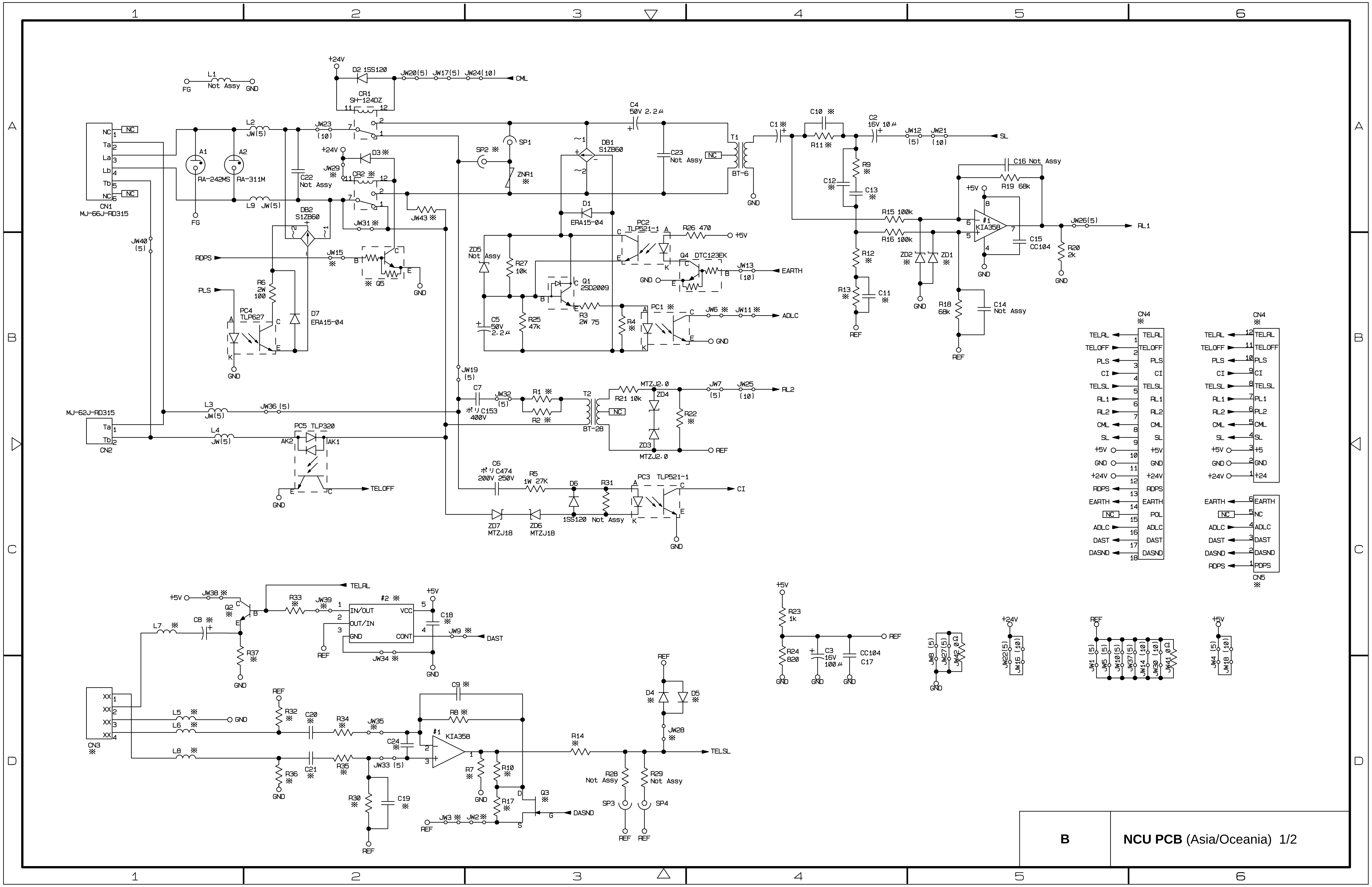
**B. NCU PCB**
(Germany, France, Belgium, Switzerland, Ireland, Austria, Spain, Italy, South Africa)



S0V;JW5(5), JW7(5), JW9(5), JW15(5)
+5V;JW4(10), JW6(10)
+24V;JP7(C), JW8(10)
REF;JW1(5)

| | LG3490-0** | |
|---|---|---|
| | 31 | 32 |
| L2 | 3.3mH | JW(5) |
| C22 | CC153 | NOT ASSY |
| C23 | CC153 | NOT ASSY |
| L3 | 3.3mH | JW(5) |
| C28 | CC473 | NOT ASSY |
| C29 | CC682 | NOT ASSY |

1
2
3
4
5
6
A
B
C
D
CN1
6-6PMJ
S
Ta
La
Lb
Tb
E
LINE
A1
2400V
A2
310V
L4
L5
FL5R200PN
X2
CH2
+24V
D5
1SS120
Q4
DTC123EK
RDPS
CR2
A5X-24E-907
JW14
(10)
JW13
(10)
JW12
(10)
V1
120V
V2
JP5
(C)
JP6
(C)
CR1
A5X-24E-907
D4
1SS120
CML
*C28
*C29
*C22
*C23
*L3
*L2
C1
BP2.2μ
50V
T1
BT6
C2
EC1μ
50V
C10
CC563
R13
1.5KF
C11
CC
822
R14
3.9K
F
C3
EC10μ
16V
JW2
(5)
ZD1
ZD2
C14 CC561
R12
100KF
R17
100KF
R21
68KF
#1
R18
0Ω
R15
3.9KF
C12
C13
R22 68KF
C16
CC561
R19
2K
JP1 (C)
REF
DB1
S1YB40
or
S1ZB60
D1
ERA15-04
R5
10K
1/4WS
R2
10K
1/4WS
ZD5
Q1
2SD
2396
R26
100
R24
10K
C5
2.2μ
50V
Q2
2SC
2603
R25
24Ω
R23
33Ω
R3, 4, 6, 7
470
1/4WS
X4
+5V
R28
470
PH1
TLP521
JW3
(10)
EARTH
Q3
DTC123EK
DB2
S1YB40
or
S1ZB60
D2
ERA15-04
PLS
PH4
TLP627
R32
R9
2W 100Ω
PH3
R10
JP4
DAST
JW16
Q5
JW17
(10)
CN2
6-2PMJ
L6
L8
FL5R200PN
X2
PH5
TLP320
TELOFF
C4
PC392
400V
R1
JW(5)
T2 BT9
R16
5.6K
JP2
(C)
ZD3
ZD4
2VX2
R20
200K
R8
1W 27K
R30
3.9K
PH2
TLP521
JW11
(10)
C7
MC474
250V
ZD6 ZD7
18VX2
D3
1SS120
KIA
358P
C15
CC104
R27
1K
C6
EC100μ
16V
R31
820Ω
C17
CC104
L1
JP3
CH1
FG
S0V
JW10
(10)
C31
SL
CML
RL1
PLS
C24
DAST
(NC)
C20
RDPS
C18
NC
EARTH
C26
TELOFF
C25
ADLC
R29
TELRL
C27
RL2
TELSL
C30
DASND
C19
CI
POL
R11
JW(5)
C8
C21
P1
B13B-PHK
9
8
17
13
14
16
7
18
15
10
11
12

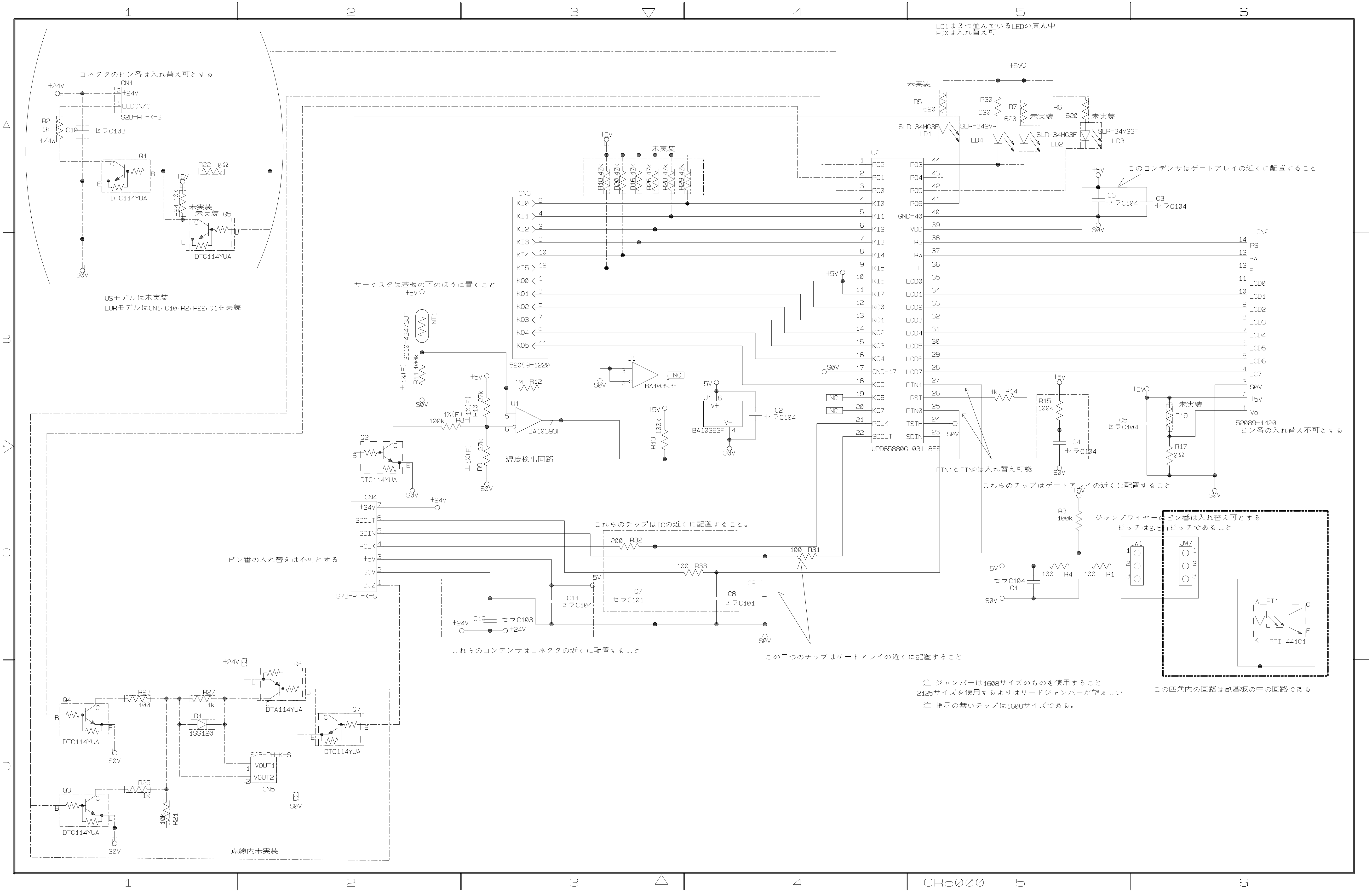

CN1
MJ-66J-RD315
NC
Ta
La
Lb
Tb
L1
Not Assy
FG
GND
A1
RA-242MS
A2
RA-311M
L2
JW(5)
L9
JW(5)
C22
Not Assy
DB2
S1ZB60
+24V
D2 1SS120
CR1
SH-124DZ
JW20(5)
JW17(5)
JW24(10)
CML
JW23
(10)
D3 ※
JW29
CR2 ※
JW31 ※
JW43 ※
SP2 ※
SP1
ZNR1
C4
50V 2.2μ
DB1
S1ZB60
C23
Not Assy
T1
BT-6
C1 ※
C10 ※
R11 ※
C2
16V 10μ
JW12
(5)
JW21
(10)
SL
R9
C12
C13
C16 Not Assy
R19 68k
+5V
R15 100k
R16 100k
#1
KIA358
C15
CC104
JW26(5)
RL1
R20
2k
R12
ZD2
ZD1
R13
C11
R18
68k
C14
Not Assy
REF
D1
ERA15-04
PC2
TLP521-1
R26 470
Q4 DTC123EK
JW13
(10)
EARTH
ZD5
Not Assy
R27
10k
Q1
2SD2009
R3
2W 75
R25
47k
C5
50V
2.2μ
R4
PC1
JW6
JW11
ADLC
RDPS
JW15
Q5
PLS
R6
2W
100
PC4
TLP627
D7
ERA15-04
JW40
(5)
JW19
(5)
C7
C153
400V
JW32
R1
R2
T2
BT-28
R21 10k
MTZJ2.0
ZD4
ZD3
JW7
JW25
RL2
R22
MJ-62J-RD315
CN2
L3
JW(5)
JW36(5)
L4
PC5 TLP320
AK2
AK1
TELOFF
C6
C474
200V 250V
R5
1W 27K
D6
1SS120
R31
Not Assy
PC3 TLP521-1
CI
ZD7
MTZJ18
ZD6
MTZJ18
CN4
TELRL
TELOFF
PLS
CI
TELSL
RL1
RL2
CML
SL
+5V
GND
+24V
RDPS
EARTH
POL
ADLC
DAST
DASND
+24
+5
CN5
PDPS
TELRL
JW38 ※
Q2
R33
JW39
#2 ※
IN/OUT
OUT/IN
GND
VCC
CONT
C18
JW9 ※
DAST
JW34 ※
L7
C8
R37
CN3
XX
L5
L6
L8
R32
C20
R34
JW35
C9 ※
R8 ※
C24
KIA358
R36
C21
R35
JW33 (5)
R30
C19
R7
R10
R17
Q3
DASND
JW3 ※
JW2 ※
R14
R28
Not Assy
R29
Not Assy
SP3
SP4
D4
D5
JW28
TELSL
R23
1k
R24
820
C3
16V
100μ
CC104
C17
JW8 (5)
JW27(5)
JW42 0Ω
JW22(5)
JW16 (10)
JW1 (5)
JW5 (5)
JW10 (5)
JW37(5)
JW14 (10)
JW30 (10)
JW41 0Ω
JW4 (5)
JW18 (10)
1
2
3
4
5
6
A
B
C
D

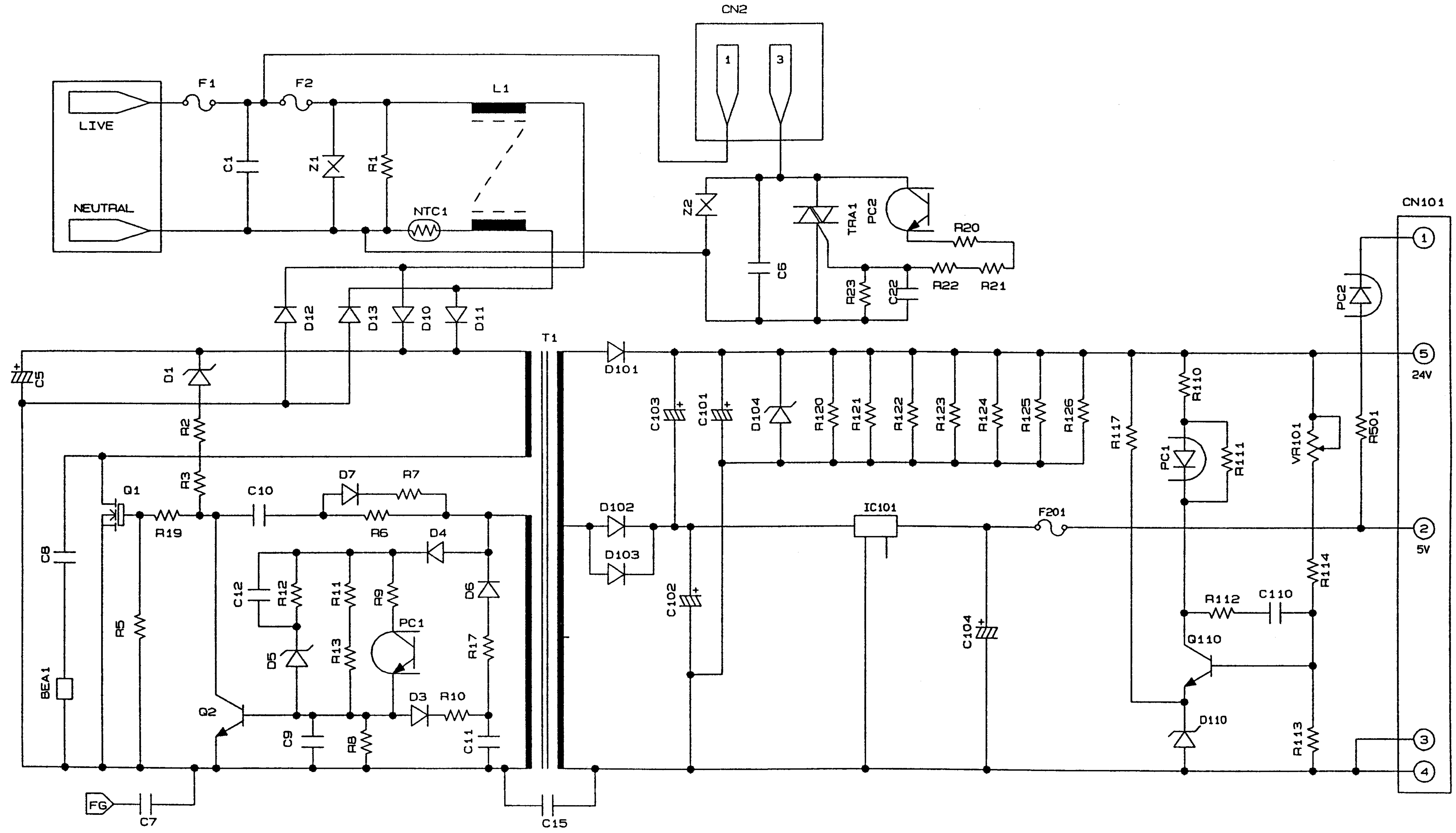
**B**

**NCU PCB** (Asia/Oceania) 1/2

| ASSY | NCU B53K479 ASSY ASIA W/O TEL | NCU B53K479 ASSY OCEANIA W/O TEL |
|---|---|---|
| ADRS. | NAME | NAME |
| ZNR1 | Not Assy | ENC121D07A |
| SP2 | Not Assy | 1/16W 0 |
| CR2 | Not Assy | SH-124DZ |
| Q5 | Not Assy | DTC123EK |
| D3 | Not Assy | 1SS120 |
| JW15 | Not Assy | JW(10) |
| JW29 | Not Assy | JW (5) |
| JW31 | JW (5) | Not Assy |
| JW43 | 1/16W 0 | Not Assy |
| PC1 | Not Assy | Not Assy |
| R4 | JW (5) | JW (5) |
| JW6;JW11 | Not Assy | Not Assy |
| ZD1;ZD2 | Not Assy | Not Assy |
| R1 | 1/4W 22K | Not Assy |
| R2 | 1/4W 22K | JW (5) |
| R9 | 1/16W 1% 4.7K | 1/16W 1% 2.7K |
| R11 | 1/16W 1% 910 | 1/16W 1% 1.10K |
| R12 | 1/16W 1% 2K | CERAMIC 16C224B |
| R13 | 1/16W 1% 9.1K | 1/16W 1% 3.9K |
| R22 | Not Assy | 1/16W 20K |
| C1 | ALUM-ELEC 16B100 | ALUM-ELEC 50B10-1 |
| C10 | Not Assy | CERAMIC 50C563B |
| C11 | CERAMIC 50C103B | Not Assy |
| C12 | Not Assy | CERAMIC 50C562B |
| C13 | CERAMIC 16C224B | RESISTOR 0 |
| CN3 | Not Assy | Not Assy |
| CN5 | Not Assy | Not Assy |
| CN4 | B13B-PH | B13B-PH |
| Q2 | Not Assy | Not Assy |
| R7 | Not Assy | Not Assy |
| R8;R30 | 1/16W 0 | 1/16W 0 |
| R14 | Not Assy | Not Assy |
| R32;R36 | Not Assy | Not Assy |
| R34;R35 | Not Assy | Not Assy |
| R37 | Not Assy | Not Assy |
| C8 | Not Assy | Not Assy |
| C9;C19 | Not Assy | Not Assy |
| C20;C21 | Not Assy | Not Assy |
| C24 | Not Assy | Not Assy |
| JW35;JW38;L5;L6;L7;L8 | Not Assy | Not Assy |
| D4;D5 | Not Assy | Not Assy |
| JW28 | Not Assy | Not Assy |
| #2 | Not Assy | Not Assy |
| R33 | Not Assy | Not Assy |
| C18 | Not Assy | Not Assy |
| JW9;JW34;JW39 | Not Assy | Not Assy |
| Q3 | Not Assy | Not Assy |
| R10 | 1/16W 0 | 1/16W 0 |
| R17 | Not Assy | Not Assy |
| JW2;JW3 | Not Assy | Not Assy |
| L1 | JW (5) | JW (5) |

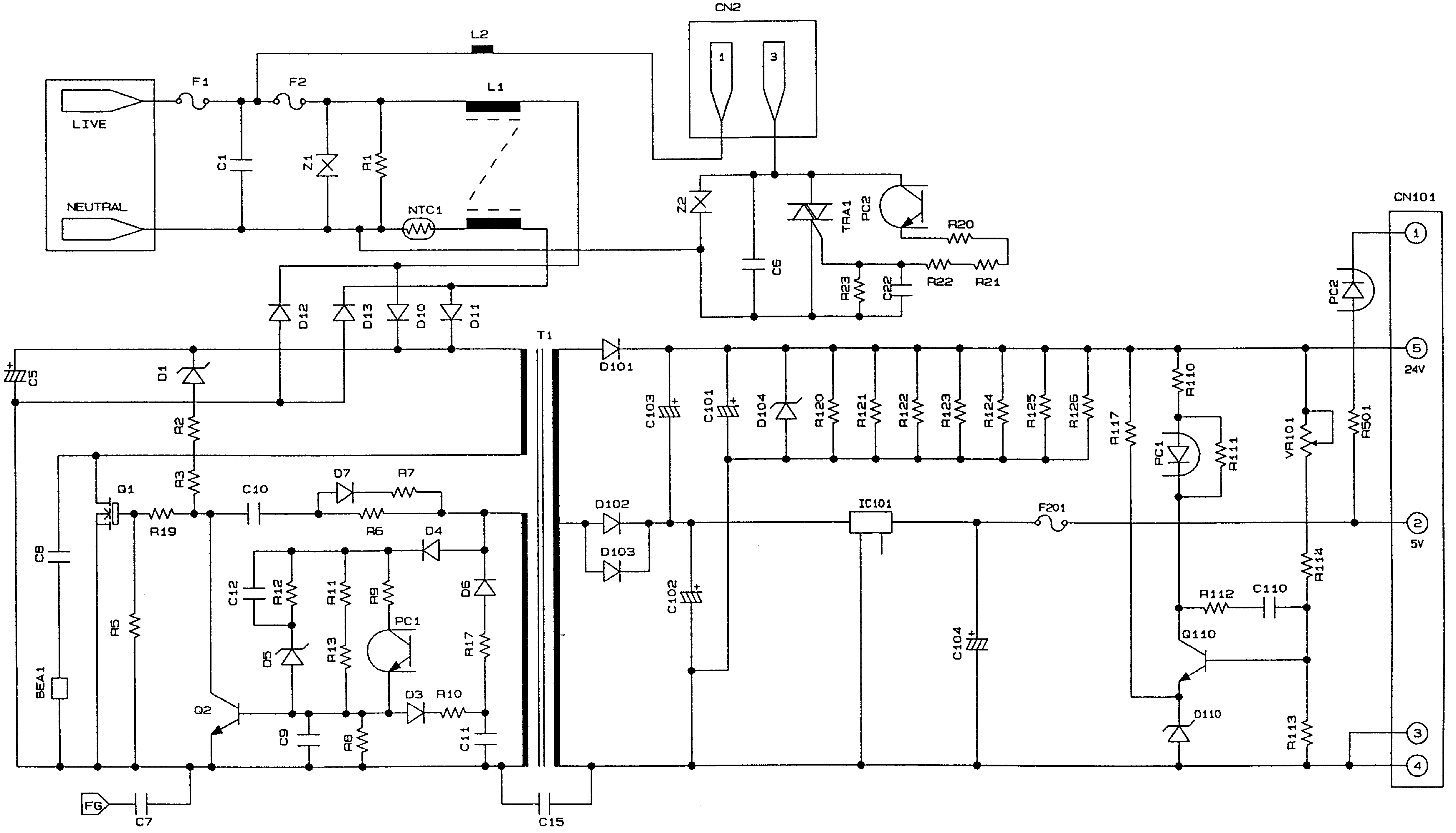
## C. Control Panel PCB


1
2
3
4
5
6
A
B
C
D
E
LD1は３つ並んでいるLEDの真ん中
P0Xは入れ替え可
コネクタのピン番は入れ替え可とする
+24V
CN1
+24V
LEDON/OFF
S2B-PH-K-S
R2 1k 1/4W
C10 セラC103
Q1
DTC114YUA
R22 0Ω
R24 10k
未実装
Q5
S0V
USモデルは未実装
EURモデルはCN1, C10, R2, R22, Q1を実装
+5V
未実装
R18 47k
R20 47k
R16 47k
R26 47k
R28 47k
R29 47k
CN3
KI0
KI1
KI2
KI3
KI4
KI5
KO0
KO1
KO2
KO3
KO4
KO5
52089-1220
サーミスタは基板の下のほうに置くこと
NT1
SC10-4B473JT
±1%(F) R11 100k
Q2
DTC114YUA
±1%(F) 100k R8
±1%(F) R10 27k
±1%(F) R9 27k
1M R12
U1
BA10393F
温度検出回路
U1
BA10393F
NC
V+
V-
R13 100k
C2 セラC104
U2
P02
P01
P00
KI0
KI1
KI2
KI3
KI4
KI5
KI6
KI7
KO0
KO1
KO2
KO3
KO4
GND-17
KO5
KO6
KO7
PCLK
SDOUT
P03
P04
P05
P06
GND-40
VDD
RS
RW
E
LCD0
LCD1
LCD2
LCD3
LCD4
LCD5
LCD6
LCD7
PIN1
RST
PIN0
TSTH
SDIN
UPD65880G-031-8ES
未実装
R5 620
SLR-34MG3F LD1
R30 620
SLR-342VR LD4
R7 620
SLR-34MG3F LD2
R6 620
SLR-34MG3F LD3
このコンデンサはゲートアレイの近くに配置すること
C6 セラC104
C3 セラC104
CN2
RS
RW
E
LCD0
LCD1
LCD2
LCD3
LCD4
LCD5
LCD6
LC7
S0V
+5V
Vo
52089-1420
ピン番の入れ替え不可とする
1k R14
R15 100k
C4 セラC104
C5 セラC104
R19
R17 0Ω
PIN1とPIN2は入れ替え可能
これらのチップはゲートアレイの近くに配置すること
R3 100k
ジャンプワイヤーのピン番は入れ替え可とする
ピッチは2.5mmピッチであること
JW1
JW7
100 R4
100 R1
セラC104 C1
PI1
RPI-441C1
CN4
+24V
SDOUT
SDIN
PCLK
+5V
S0V
BUZ
S7B-PH-K-S
ピン番の入れ替えは不可とする
これらのチップはICの近くに配置すること。
200 R32
100 R33
100 R31
C7 セラC101
C8 セラC101
C9
C11 セラC104
C12 セラC103
これらのコンデンサはコネクタの近くに配置すること
この二つのチップはゲートアレイの近くに配置すること
注 ジャンパーは1608サイズのものを使用すること
2125サイズを使用するよりはリードジャンパーが望ましい
注 指示の無いチップは1608サイズである。
この四角内の回路は割基板の中の回路である
Q6
DTA114YUA
Q4
DTC114YUA
R23 100
R27 1k
D1 1SS120
Q7
DTC114YUA
S2B-PH-K-S
VOUT1
VOUT2
CN5
Q3
DTC114YUA
R25 1k
R21 10k
点線内未実装
CR5000

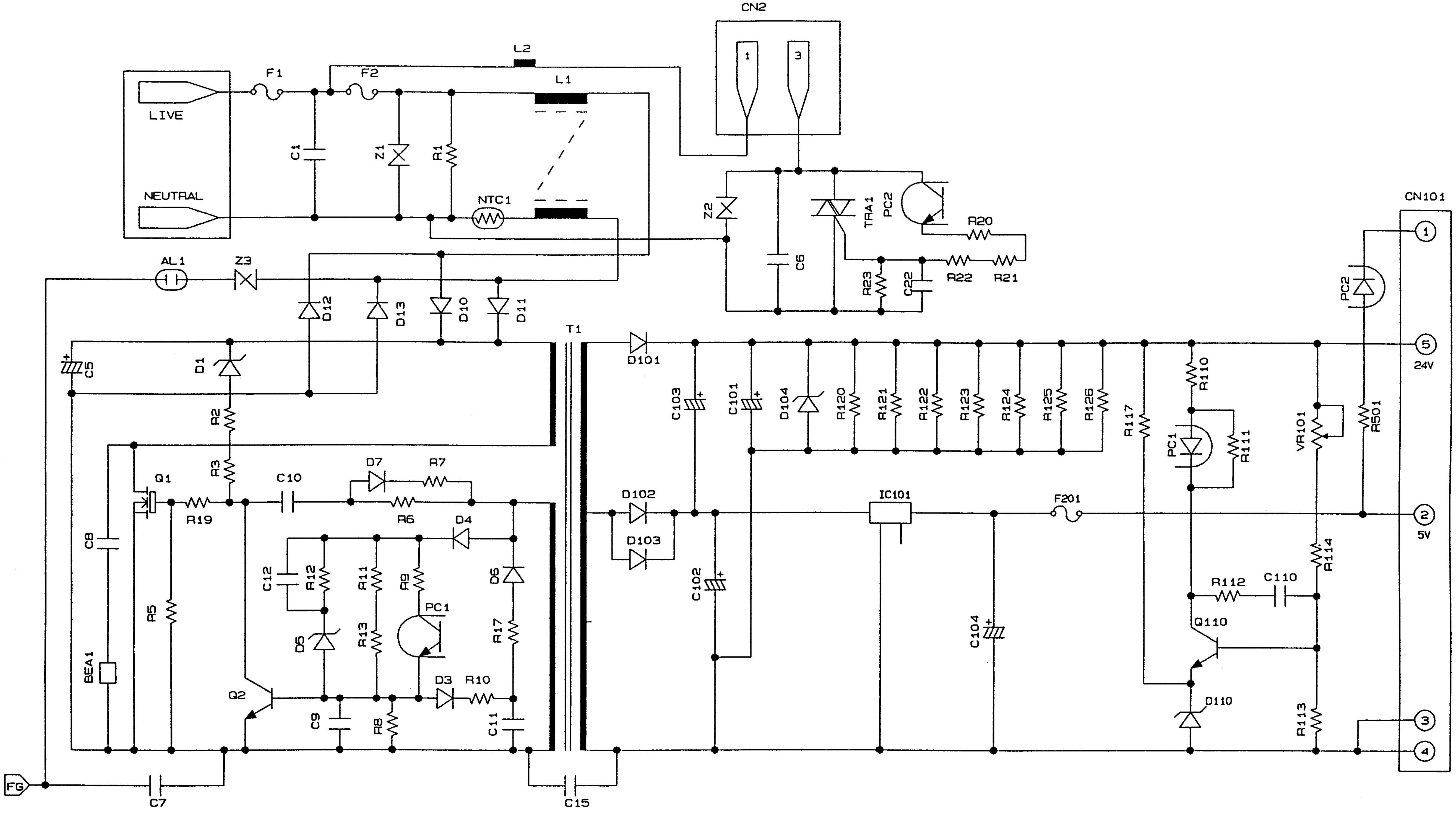

CN2
1
3
F1
F2
L1
LIVE
NEUTRAL
C1
Z1
R1
NTC1
Z2
C6
TRA1
PC2
R20
R23
C22
R22
R21
CN101
D12
D13
D10
D11
T1
D101
C5
D1
R2
R3
Q1
R19
C10
D7
R7
R6
D4
C8
C12
R12
R11
R9
PC1
D6
R5
D5
R13
R17
BEA1
Q2
C9
R8
D3
R10
C11
FG
C7
C15
D102
D103
C103
C101
D104
R120
R121
R122
R123
R124
R125
R126
R117
R110
PC1
R111
VR101
R501
PC2
C102
IC101
C104
F201
R112
C110
R114
Q110
D110
R113
1
5
24V
2
5V
3
4

D

**Power Supply PCB (100-120V)**
Low-voltage power supply

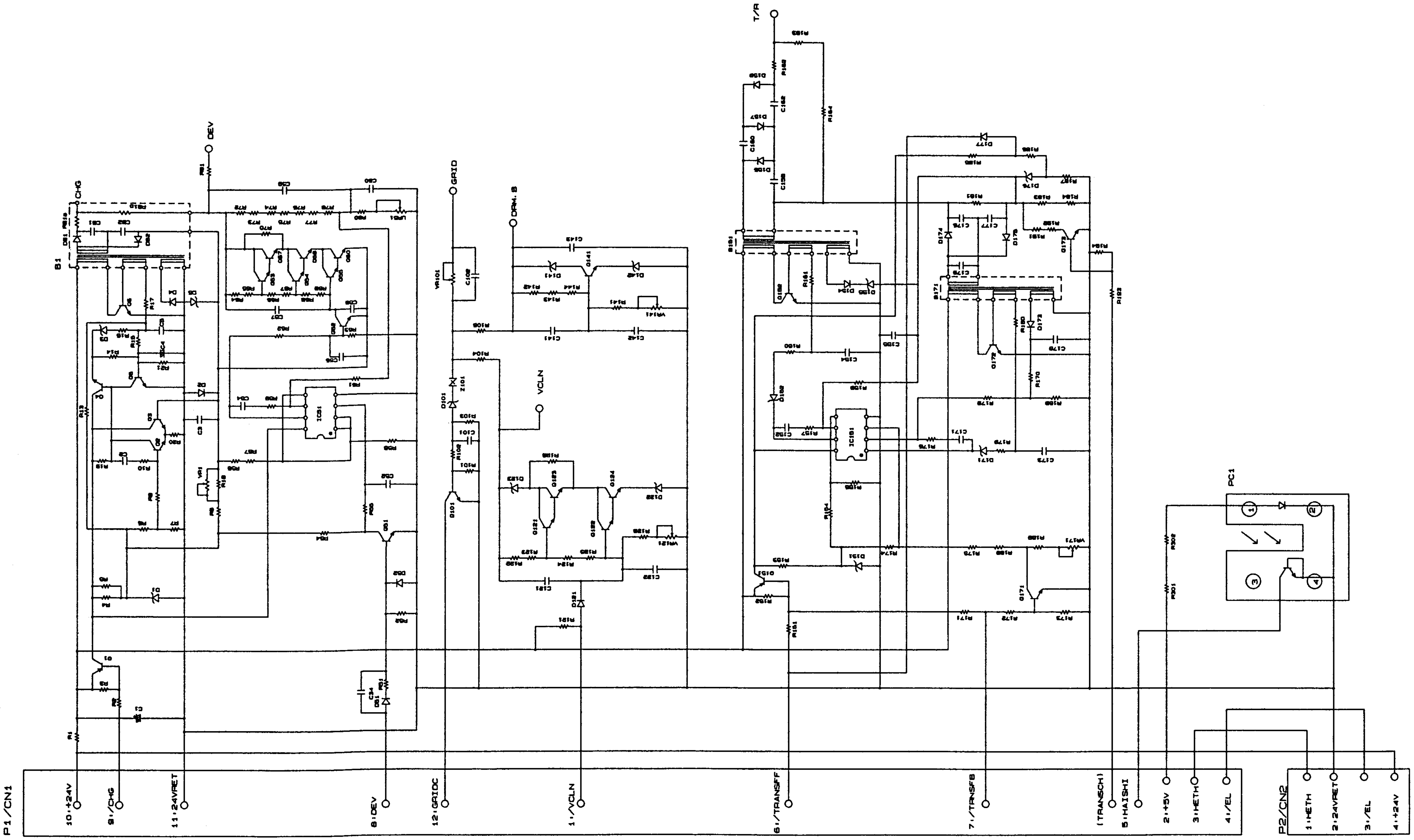

CN2
1
3
L2
F1
F2
L1
LIVE
NEUTRAL
C1
Z1
R1
NTC1
Z2
C6
TRA1
PC2
R20
R23
C22
R22
R21
CN101
1
PC2
D12
D13
D10
D11
T1
C5
D1
R2
R3
Q1
R19
C10
D7
R7
R6
D4
C8
R5
BEA1
C12
R12
R11
R9
PC1
D6
D5
R13
R17
Q2
D3
R10
C9
R8
C11
FG
C7
C15
D101
C103
C101
D104
R120
R121
R122
R123
R124
R125
R126
R117
R110
PC1
R111
VR101
R501
5
24V
D102
D103
IC101
F201
2
5V
C102
C104
R112
C110
R114
Q110
D110
R113
3
4

| D | **Power Supply PCB (200-240V)**<br>Low-voltage power supply<br>(Europe) |
|---|---|


CN2
1
3
L2
F1
F2
L1
LIVE
NEUTRAL
C1
Z1
R1
NTC1
Z2
C6
TRA1
PC2
R20
R22
R21
R23
C22
AL1
Z3
D12
D13
D10
D11
T1
CN101
1
PC2
5
24V
C5
D1
R2
R3
Q1
R19
C10
D7
R7
R6
D4
C8
R5
BEA1
C12
R12
R11
R9
PC1
D6
D5
R13
R17
Q2
C9
R8
D3
R10
C11
FG
C7
C15
D101
C103
C101
D104
R120
R121
R122
R123
R124
R125
R126
R117
R110
PC1
R111
VR101
R501
D102
D103
C102
IC101
F201
2
5V
C104
R114
R112
C110
Q110
D110
R113
3
4

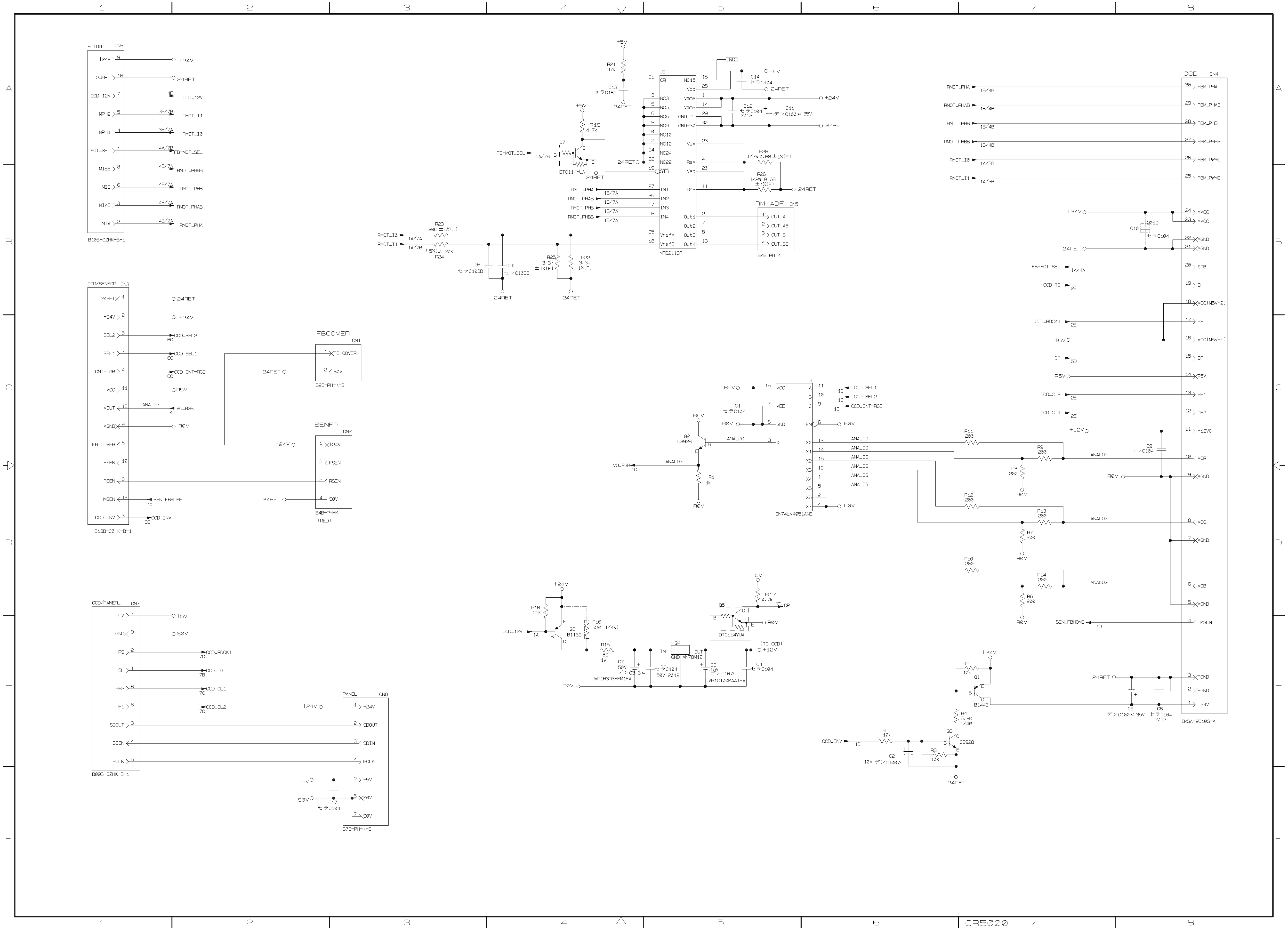
**D**

**Power Supply PCB (200-240V)**
Low-voltage power supply
(Asia, Oceania)


CHG
DEV
GRID
DRM.B
VCLN
T/R
B1
IC51
IC101
PC1
P1/CN1
10:+24V
9:/CHG
11:24VRET
8:DEV
12:GRIDC
1:/VCLN
6:/TRANSFF
7:/TRNSFB
(TRANSCH)
5:HAISHI
2:+5V
3:HETH
4:/EL
P2/CN2
1:HETH
2:24VRET
3:/EL
4:+24V

| D | **Power Supply PCB**<br>High-voltage power supply |
|---|---|

## E. Relay PCB



MOTOR CN6
B10B-CZHK-B-1
CCD/SENSOR CN3
B13B-CZHK-B-1
CCD/PANEL CN7
B09B-CZHK-B-1
FBCOVER CN1
B2B-PH-K-S
SENFR CN2
B4B-PH-K
(RED)
PANEL CN8
B7B-PH-K-S
RM-ADF CN5
B4B-PH-K
CCD CN4
IMSA-9610S-A
U2
MTD2113F
U1
SN74LV4051ANS
Q4
AN78M12
Q7
DTC114YUA
Q5
DTC114YUA
Q6
B1132
Q1
B1443
Q2
C3928
Q3
C3928
R20
1/2W 0.68 ±1%(F)
R26
1/2W 0.68 ±1%(F)
R21
47k
R19
4.7k
R23
20k ±5%(J)
R24
20k ±5%(J)
R25
3.3k ±1%(F)
R22
3.3k ±1%(F)
R15
82 1W
R16
10Ω 1/4W
R17
4.7k
R18
22k
R1
1k
R11
200
R12
200
R10
200
R9
200
R13
200
R14
200
R3
200
R7
200
R6
200
R2
10k
R4
6.2k 1/4W
R5
10k
R8
10k
C11
デンC100μ 35V
C12
セラC104 2012
C13
セラC102
C14
セラC104
C15
セラC103B
C16
セラC103B
C7
50V デンC3.3μ
UVR1H3R3MFM1FA
C6
セラC104 50V 2012
C3
16V デンC10μ
UVR1C100MAA1FA
C4
セラC104
C1
セラC104
C9
セラC104
C10
2012 セラC104
C5
デンC100μ 35V
C8
セラC104 2012
C2
10V デンC100μ
C17
セラC104
(TO CCD)
+5V
+12V
+24V
24RET
R5V
R0V
S0V
ANALOG
CR5000

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