LFO

AFICIO FX10

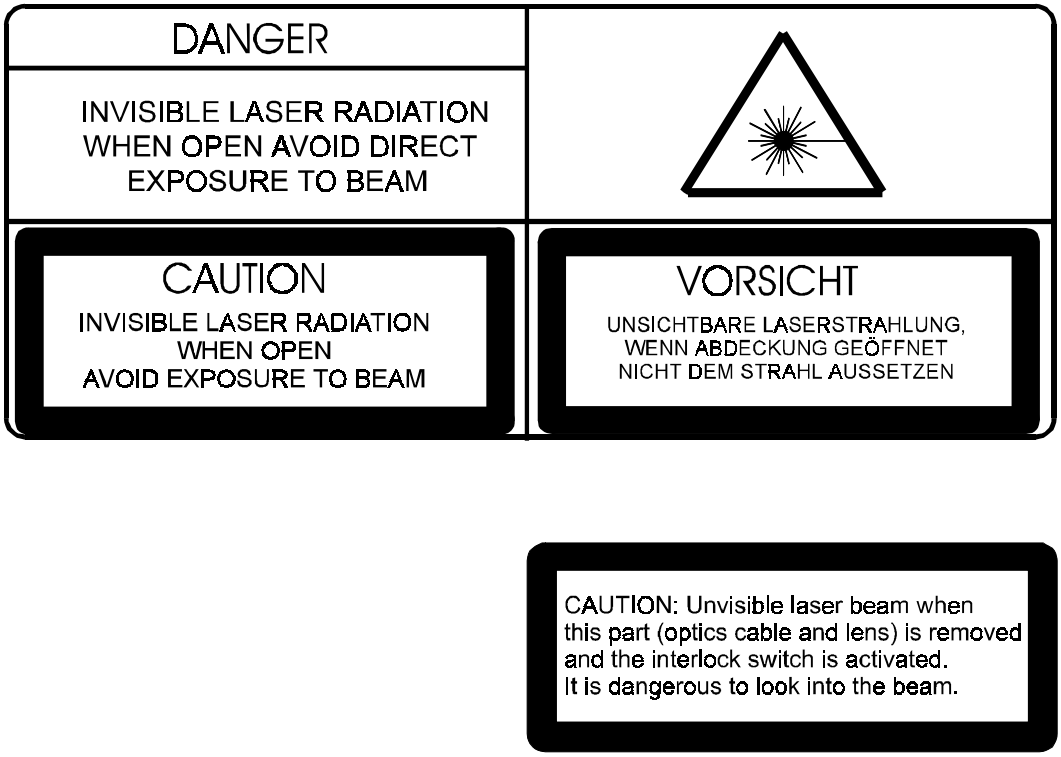
SERVICE MANUAL

June 10th, 1997
Subject to change

LFO AFICIO FX10 SERVICE MANUAL.....

⚠WARNING FOR LASER UNIT
THIS MACHINE CONTAINS A LASER BEAM GENERATOR. LASER BEAMS CAN CAUSE PERMANENT EYE DAMAGE. DO NOT OPEN THE LASER UNIT OR LOOK ALONG THE LASER BEAM PATH WHILE THE MAIN POWER IS ON.

CAUTION MARKINGS:



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Lithium Batteries (Memory Back-up)

⚠CAUTION
The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

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1. OVERALL MACHINE INFORMATION

1.1. SPECIFICATIONS

Type
Desktop transceiver

Circuit
PSTN, PABX

Connection
Direct couple

Book Scanner
Document Size:
Smaller than
USA: 216 x 279.4mm [8.5 x 11 ins]
Europe/Asia: 210 x 297mm [8.3 x 11.7 ins]
Thickness: Less than 25 mm
Weight: Less than 5 kg

ADF
Document Size
Length: 105 - 355.6 mm [4.1 - 14 ins]
Up to 1200 mm [47.2 ins], manually assisted
Width: 148 - 216 mm [5.8 - 8.5 ins]
Thickness: 0.05 to 0.2 mm [2 to 8 mils] (equivalent to 50 - 90 g/m^2)

Document Feed
Automatic feed, face up

ADF Capacity
USA: LT 30 sheets (using 20 lb. paper)
LG 15 sheets (using 20 lb. paper)
Europe/Asia: 30 sheets (using 80 g/m^2)

Scanning Method
Contact image sensor, with xenon lamp

Maximum Scan Width
Book Scanner
USA: 216 mm [8.5 ins] ± 0.25%
Europe/Asia: 210 mm [8.3 ins] ± 0.25%
ADF
216 mm [8.5 ins] ± 0.25%

Scan Resolution
Fax mode
Standard: 200 x 100 dpi
Detail: 200 x 200 dpi
Fine: 200 x 400 dpi
Copy mode:
400 x 400 dpi

Memory Capacity
ECM: 64 or 128 kB; single or double buffer
SAF:
Standard: 240 kB: 19 pages / ITU-T #1
With 1MB option: 102 pages
With 2MB option: 189 pages
With 4MB option: 350 pages

Protocol
Group 3 with ECM

Compression
MH, MR, EFC, MMR, SSC (MMR only with ECM)
Storage to SAF memory for tx: MMR and/or raw data

Modulation
V17(TCM),V.29 (QAM), V.27ter (PHM), V.21 (FM)

Data Rate (bps)
14400/9600/7200/4800/2400, Automatic fall-back

I/O Rate
With ECM: 0 ms/line
Without ECM: 2.5, 5, 10, 20, or 40 ms/line

Transmission Time
6 s at 14400 bps; Measured with G3 ECM using memory for a ITU-T #1 test document (Slerexe letter) using standard resolution

Printing System
Laser printing, plain paper, dry toner

Printing Time
10 cpm for Letter size paper

Paper Size
Standard Cassette:
USA: Letter
Europe/Asia: A4
Optional Cassette:
Paper size actuator
Half-letter, Letter, Legal, A4, A5,F4
Operator input
Width: 100 to 192 mm
Length: 148 to 266.7mm

Paper Capacity
Standard Cassette: - 150 sheets
Multi feeder: - 100 sheets
Bypass Feeder: - 1 page

Maximum Printing Width
USA: 216 mm [8.5 ins]
Europe/Asia: 210 mm [8.3 ins]

Printer Resolution
Fax/Copy Mode: 400 x 400 dpi
Printer Mode: 300 x 300 dpi
(Pseudo 600 x 600 dpi with smoothing)

Power Supply
USA:115 ± 20 Vac, 60 ± 1 Hz
Europe/Asia:
187 to 276 Vac , 50 ± 3 Hz/60 ± 3 Hz

Power Consumption
Standby: 25 W (USA)
29W (Europe and Asia)
Transmitting: 42 W
Receiving: 280 W
Copying:
Normal 370 W, Maximum 770 W

Operating Environment
Temperature: 17 - 28 °C [63 - 82 °F]
Humidity: 40 - 70 %Rh

Dimensions (W x D x H)
505 x 439 x 251 mm [19.9 x 17.3 x 9.9 ins]
Excluding handset, trays, and optional units

Weight
17 kg [37.5 lb.]
Excluding CTM,handset, trays, and optional units

1.2. FEATURES

KEY: O = Used, X = Not Used
A = With optional cassette only
B = With optional memory 1M/2M/4M only
C = With optional handset only
D = With RS422 interface board only
(only available in the U.S.)

Equipment	
ADF	O
Book scanner	O
Built-in handset	X
Bypass feed: 1 sheet	O
Optional cassette	A
Cabinet	X
Counter	X
Cutter	X
Handset	C
Hard disk	X
Manual feed mechanism	X
Marker (Stamp)	X
Monitor speaker	X
Optional Memory	B
Optional RS422 interface	D
Parallel Interface	O

Video Processing Features	
Contrast	O
Auto image density control	O
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction (Fax)	X
Resolution	O
Smoothing to 16 x 15.4 l/mm (Fax)	O

Communication Features - Auto	
Automatic fallback	O
Automatic redialing	O
Confidential reception	X
Dual Access	O
Substitute reception	O

Communication Features - User Selectable	
Action as a transfer broadcaster	X
AI Redial (last ten numbers)	X

Communication Features - User Selectable	
Answering machine interface	O
Authorized Reception	X
Auto-answer delay time	X
Auto dialing (pulse or DTMF)	O
Auto Document	X
Auto image density selection	O
Automatic Voice Message	X
Batch Transmission	X
Broadcasting	O
Chain Dialing	O
Communication Result Display	X
Confidential ID Override	X
Confidential Transmission	X
Direct Fax Number Entry	O
Economy Transmission	X
Fax on demand	X
Forwarding	X
Free Polling	X
Groups (3 groups)	O
Group Transfer Station	X
Hold	X
ID Transmission	X
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	X
Length Reduction	O
Memory transmission	O
Multi-step Transfer	X
Next Transfer Station	X
OMR	X
On Hook Dial (ASIA only)	O
Ordering Toner	X
Page Count	X
Personal Codes	X
Personal Codes with Conf. ID	X
Polling Reception	O
Polling Transmission	X
Polling tx file lifetime in the SAF	X
Quick Dial (10 stations)	O
Reception modes (Fax, Tel, Auto)	O
Remote control features	X
Remote Transfer	X
Restricted Access	X
Secured Polling	X
Secured Polling with Stored ID Override	X

Communication Features - User Selectable	
Send Later	O
Silent ringing detection	X
Specified Image Area	X
Speed Dial (50 stations)	O
Super Fine Resolution (16 x15.4 l/mm : 400 x 400 dpi)	X
Telephone Directory	X
Tonal Signal Transmission	O
Transfer Request	X
Transmission Deadline (TRD)	X
Turnaround Polling	X
Two-step Transfer	X
Two in one	X
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Closed Network (tx and rx)	X
Continuous Polling Reception	X
Dedicated tx parameters	O
ECM	O
EFC	O
Inch-mm conversion	O
Page retransmission	O
Page separation mark	O
Protection against wrong conn.	O
Resol'n step-down override option	X
Short Preamble	X
Well log	O

Copier Features	
Auto Image Density	O
Auto Paper Select	X
Center marks	X
Distribution number printing	X
Erase center/border	O
Reduction/Enlargement	O

Other User Features	
Area Code Prefix	X
Auto Service Call	O

Other User Features	
Center mark	X
Checkered mark	X
Clearing a memory file	O
Clearing a polling file	X
Clock	O
Confidential ID	X
Copy mode	O
Copy Mode Restriction	X
Counters	O
Daylight Saving Time	O
Destination Check	X
Direct entry of names	O
File Retention Time	X
File Retransmission	X
Function Programs	X
ID Code	X
Label Insertion ("From xxx")	X
Language Selection	O
Memory Lock	X
Memory Lock ID	X
Modifying a memory file	X
Multi Sort Document Reception	X
Multicopy mode (up to 99)	O
Own telephone number	O
PC scanner	O
PC FAX	O
PC Print	O
Power Saver (Night Timer and standby mode)	O
Print density control	O
Printing a memory file	O
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	X
Remaining memory indicator	O
Remote ID	X
Reverse Order Printing	X
RTI, TTI, CSI	O
Service Report Transmission	O
Speaker volume control	X
Specified Cassette Selection	X
Substitute reception on/off	O
Telephone line type	O
Toner saving mode	O
TTI on/off	O
User Function Keys	X

Other User Features	
User Parameters	O
Wild Cards	X

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	O
Communication Result Report (Including Polling Result Report)	O
Confidential File Report	X
Error Report	O
File Clear Report (Including polling Clear Report)	X
File Reserve Report (Excluding Polling Reserve Report)	O
Journal	O
Power Failure Report	O
Toner Cassette Order Form	X
Transfer Result Report	X
Transmission Result Report	O

Reports - User-initiated	
Authorized Reception List	X
Charge Control Report	X
File List	O
Forwarding List	X
Group List	O
Journal	O
Personal Code List	X
Printer Status Sheet	O
Program List	X
Quick Dial List	O
Specified Cassette Selection List	X
Speed Dial List	O
Transmission Status Report	X
User Function List	X
User Parameter List	O

Service Mode Features	
Auto Paper Select Test	X
Back-to-back test	O
Bit switch programming	O
Book Test	O
Buzzer test	O
Cable equalizer	O
Comm. parameter display	O
Counter check	O

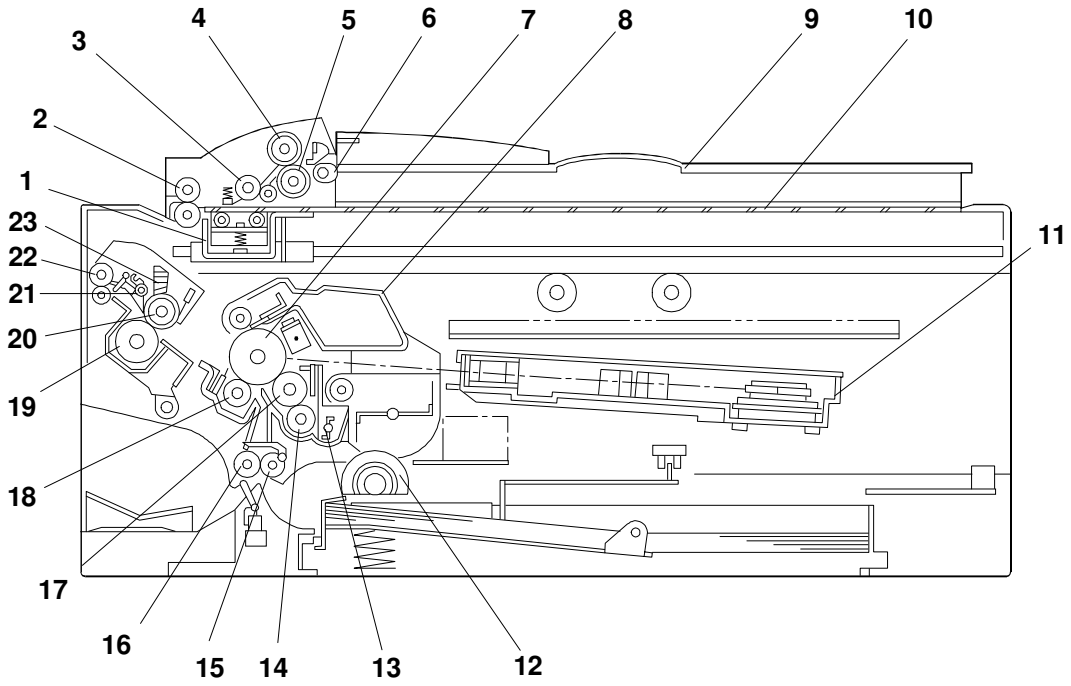
Service Mode Features	
Country code	O
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	O
Error code display	O
Excessive jam alarm	O
File Transfer (all files)	O
Hex Dump List	O
LCD contrast adjustment	O
Line error mark	O
Memory file printout (all files)	O
Modem test	O
NCU parameters	O
Operation panel test	O
Periodic service call	O
PM Call	O
Printer mechanism test	O
Printer test patterns	O
Programmable attenuation	X
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
RAM test	O
Ringer test	X
Scanner lamp test	O
Scanner mechanism test	O
Sensor initialization	X
Serial number	O
Service monitor report	O
Service station number	O
Software upload/download	O
SRAM data download	O
System parameter list	O
Technical data on the Journal	O
Thermal head parameters	X
User data transfer	O

Memory Files

Max. number of files: 100
Max. number of stations/file: 100
Max. number of stations overall: 200
Max. number of pages overall: 128 (200/350)

1.3. COMPONENT LAYOUT

1.3.1. Mechanical Components



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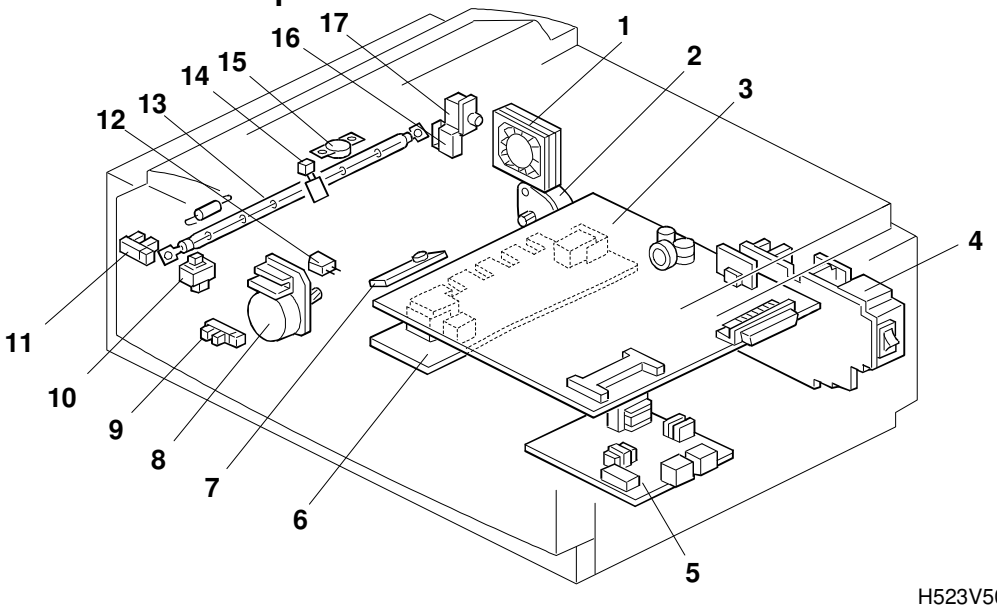
No.	Name	Description
1	Scanner	Contains a contact image sensor and a xenon lamp driver.
2	R2 Roller	Feeds the document out of the scanner.
3	R1 Roller	Feeds the document through the scanner.
4	Separation roller	Prevents more than one sheet from feeding into the scanner.
5	Document Feed Roller	Feeds the document into the scanner.
6	Pick-up Roller	Picks up pages of the document from the document table one at a time.
7	Drum	The latent image is written to this Organic Photoconductor Drum.
8	CTM (Cleaning Toner Magazine)	This consists of the toner cartridge, cleaning unit, used toner tank, charge corona unit, and quenching lamp.
9	Platen Cover	This covers the original which was placed on the exposure glass.
10	Exposure Glass	Book scanner reads the original on it.
11	Laser Unit	This consists of the LDDR (Laser Diode Driver), Focusing lens, Fθ Lenses, Hexagonal mirror motor, and other laser optic components.

No.	Name	Description
12	Paper Feed Rollers	These pick up the top sheet of paper from the stack in the cassette and feed it into the printer.
13	Toner Supply Bar	This stirs up and transfers toner to the toner application roller.
14	Toner Application Roller	This roller transfers toner to the development roller.
15	Paper Feed Pressure Rollers	These feed paper from the cassette or bypass feed slot into the printer.
16	Registration Roller	This carries out the registration process.
17	Development Roller	This roller applies toner to the latent image on the drum.
18	Transfer Roller	This applies a charge to the paper to pull the toner off the drum and onto the copy paper.
19	Fusing Pressure Roller	This applies pressure to the paper during fusing.
20	Hot Roller	Heat from this roller fuses the toner to the copy paper.
21	Hot Roller Strippers	These take the paper off the hot roller after fusing.
22	Paper Feed-out Rollers	These feed the paper out of the printer.
23	Cleaning Pad	This cleans up and spreads silicone oil on the surface of the hot roller.

1.3.2. Electrical Components



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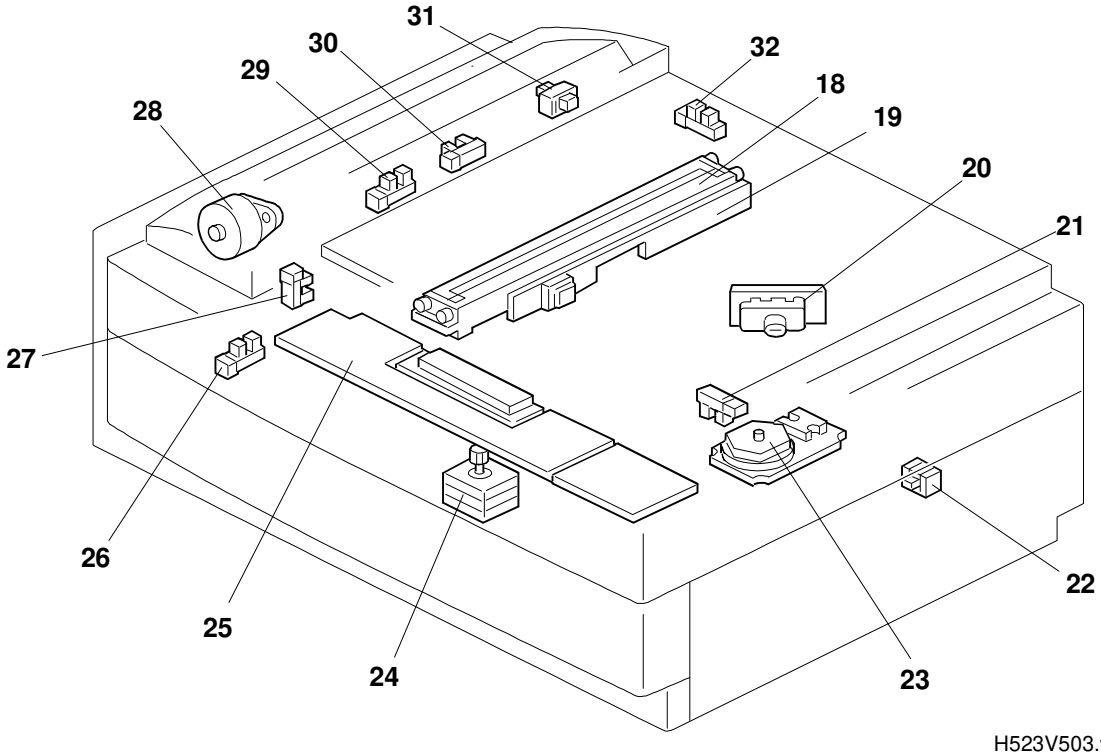

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1. PCBs

No.	Name	Description
3	FCU (Facsimile Control Unit)	This board controls the machine. It contains the main cpu, flash ROM, system RAM, and so on.
4	PSU (Power Supply Unit)	This board supplies power to the machine, and switches the fusing lamp on/off.
5	NCU (Network Control Unit)	This board contains a relay and switches for interfacing the machine to the network and the handset.
6	Power Pack	This supplies high voltages to the corona wire, transfer roller, and development bias terminal.
18	Contact Image Sensor and Xenon Lamp	This sensor reads and converts the light reflected from the document into an analog video signal. It uses an RMLA (Roof Mirror Lens Array) sensor unit. The xenon lamp which illuminates the document is contained in this unit.
20	LDDR (Laser Diode Driver)	This board drives the laser diode.
25	OPU (Operation Panel Unit)	This board controls the operation panel.

2. Motors and Clutches

No.	Name	Description
1	Ozone Fan Motor	This removes ozone-laden air from the vicinity of the drum, and filters out the ozone.
2	Paper Feed Motor	This stepper motor drives the registration roller and the paper feed mechanisms in the cassette.
8	Main Motor	This brushless dc motor drives the drum, fusing unit, development unit, and CTM.
23	Polygon Mirror Motor	This high-speed dc motor drives the hexagonal mirror in the laser printer optics.
24	Scanner Motor	This stepper motor drives the book scanner.
28	ADF Motor	This stepper motor drives the scanner.

3. Sensors

No.	Name	Description
7	Toner End Sensor	This detects when the toner has run out.
9	Registration Sensor	This detects when the paper has reached the registration roller.
10	Paper Exit Cover Switch	This detects when the paper feed-out cover is open or closed.
11	Paper Feed-out Sensor	This detects when the paper has been fed out of the printer.
21	Paper End Sensor	This detects when the paper in the cassette has run out.
22	Cassette Sensor	This detects whether the cassette is open or closed.
26	Bypass Feed Sensor	This detects when a sheet of paper has been inserted into the bypass feed slot.
27	Scanner Home Position Sensor	This detects when the image sensor is at the home position.
29	Document Sensor	This detects the presence of a document in the feeder.
30	Scan Line Sensor	This detects when a page is approaching the auto shading position.
31	ADF Switch	This detects whether the ADF unit is open or closed.
32	Platen Cover Sensor	This detects whether the platen cover is open or closed.

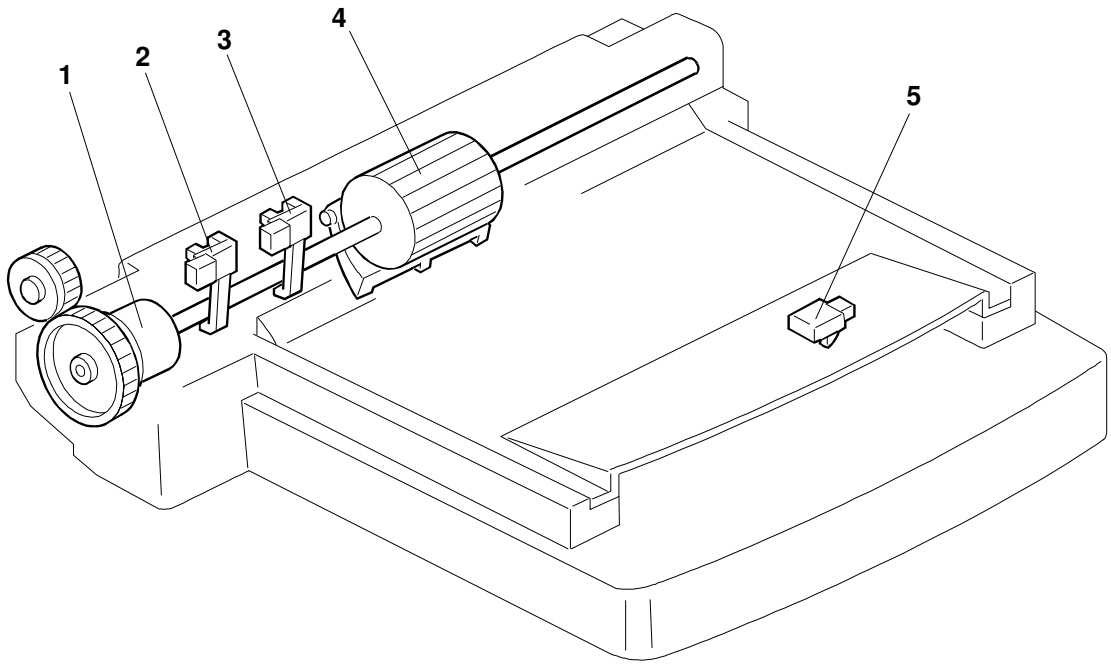
4. Interlock Switches

No.	Name	Description
16 17	Fusing Unit Cover Interlock Switches	If the fusing unit cover is open, these interlock switches interrupt the +5VLD power supply for the laser diode and the +24VD power supply for the power pack, motors, and other components.

5. Others

No.	Name	Description
12	Zener Diode	This ensures that the charge given to the drum by the charge corona wire does not exceed -750 volts.
13	Fusing Lamp	This fuses the toner to the paper.
14	Thermistor	This monitors the temperature inside the fusing unit.
15	Thermostat	This interrupts the ac power supply to the fusing lamp if the temperature of the thermostat surface exceeds 400°C.
19	Lamp Stabilizer	This supplies power to the xenon lamp.

6. Optional Cassette



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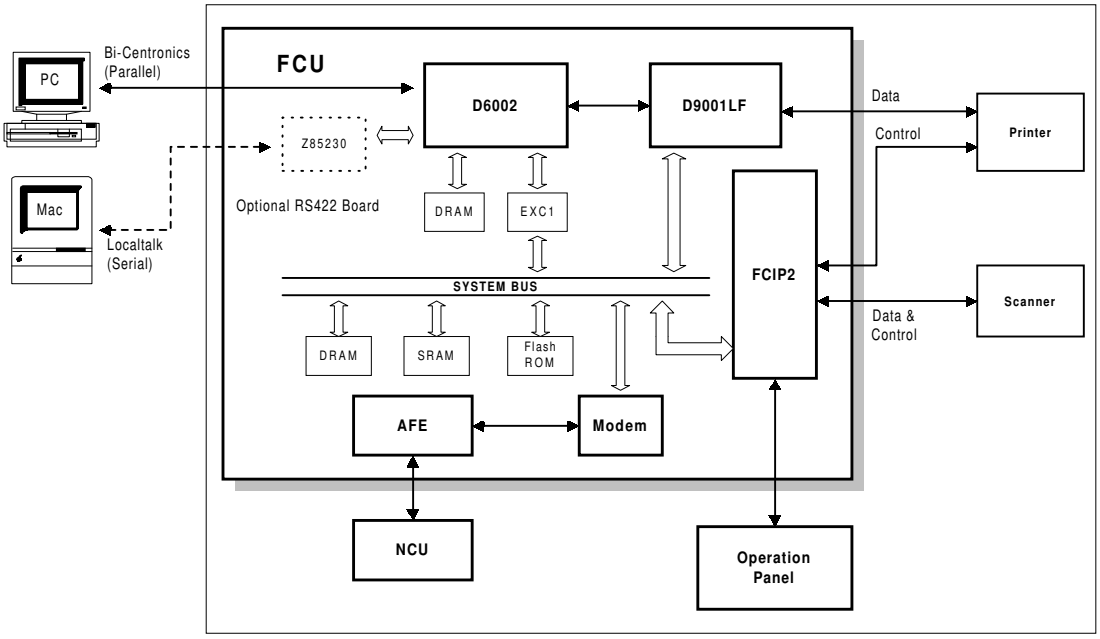
No.	Name	Description
1	Paper Feed Clutch	This transfers motor drive to the mechanisms of the optional cassette.
2	Paper Width Sensor	This detects the paper width installed in the optional cassette.
3	Paper End Sensor	This detects when paper in the optional cassette has run out.
4	Paper Feed Roller	This feeds paper from the optional cassette into the machine.
5	Paper Size Sensor	This detects the paper size installed in the optional cassette.

1.4. OVERALL MACHINE CONTROL



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The FCIP2 on the FCU board controls the entire system.

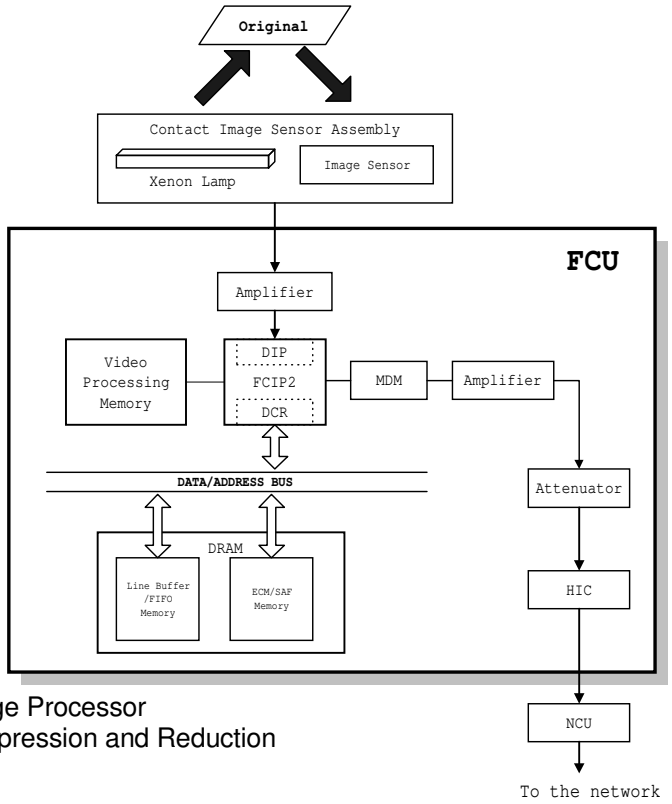
The FCU has some ICs, a bi-directional parallel interface, and an optional serial interface board. Using these interfaces, the machine can communicate with a PC and work as a multi-function machine as a PC printer, PC scanner, and PC fax.

In every case of printing, scanning, or faxing from Windows running on a PC, the control commands sent from the PC are received by the D6002, and forwarded to the FCIP2. In accordance with the firmware, the FCIP2 processes the commands and controls the proper components related to the job. It controls the D6002 and D9001LF when printing, the scanner components when scanning, and the modem when faxing.

For jobs from a Macintosh, the commands are received by the Z85230 IC on the optional interface board and forwarded to the D6002. After that, the control procedure is the same as for jobs from a PC. (RS422 option is available only in the U.S.)

1.5. VIDEO DATA PATH

1.5.1. Transmission



DIP: Digital Image Processor
DCR: Data Compression and Reduction
MDM: Modem

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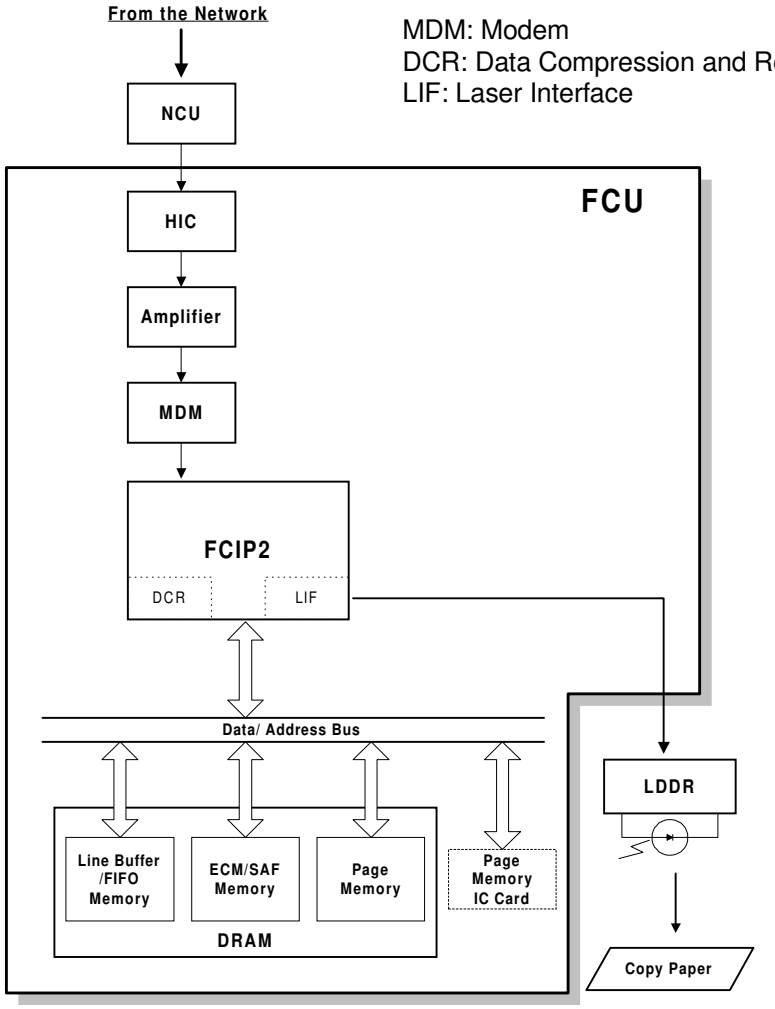
Immediate Transmission:
Scanned data form the contact image sensor passes to the DIP block in the FCIP2. After analog/digital video processing, the DCR block compresses the data for transmission. The compressed data then passes either to the FIFO memory or to the ECM memory, before it is sent to the telephone line through the modem.

Memory Transmission:
First, the scanned data is stored in the SAF memory after compression in the DCR block.
At the time for transmission, the DCR block decompresses the data from the SAF memory, then compresses it again after handshaking with the other terminal is done. The compressed data then passes either to the FIFO memory or to the ECM memory, before it is sent to the telephone line through the modem.

1.5.2. Reception



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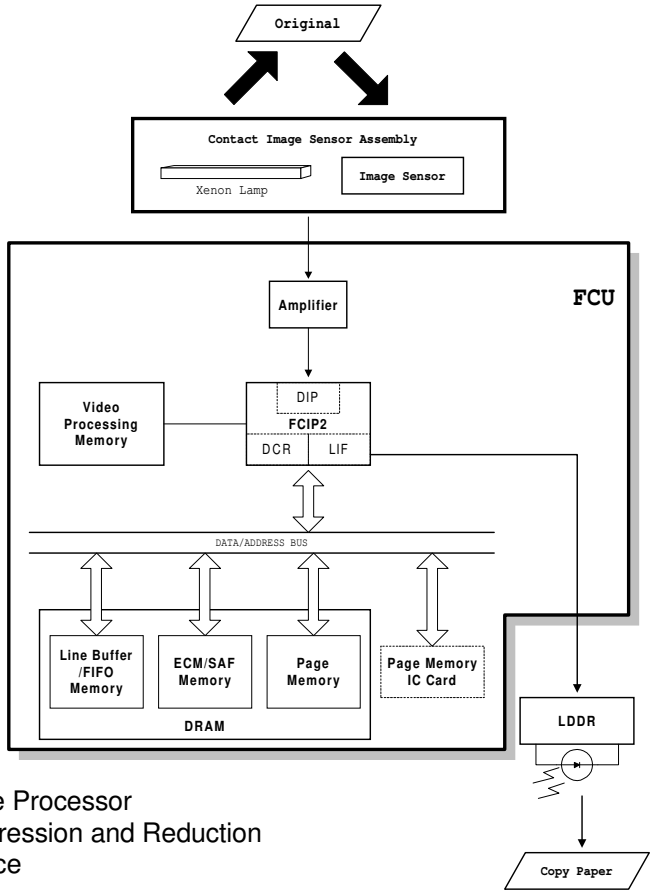
Data from the line passes to the modem through the NCU and hybrid IC. After the modem demodulates the data, the data passes to the DCR block, through either the FIFO or the ECM memory, where the data is decompressed to raster image data. At the same time, the compressed data passes to the SAF memory as a backup in case of mechanical problems during printing (Europe and Asia models only).

The raster image data is then passed to the page memory for printing. After a page of data has been stored in the page memory, the data is sent to the LDDR through the LIF block.

The optional IC card could be used as a page memory.

1.5.3. Copying



DIP: Digital Image Processor
DCR: Data Compression and Reduction
LIF: Laser Interface

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The scanned data passes to the page memory after video processing in the DIP block. After a page of data has been stored in the page memory, the data is sent to the LDDR through the LIF block.

Reduction/Enlargement Ratios

The following reproduction ratios are available:

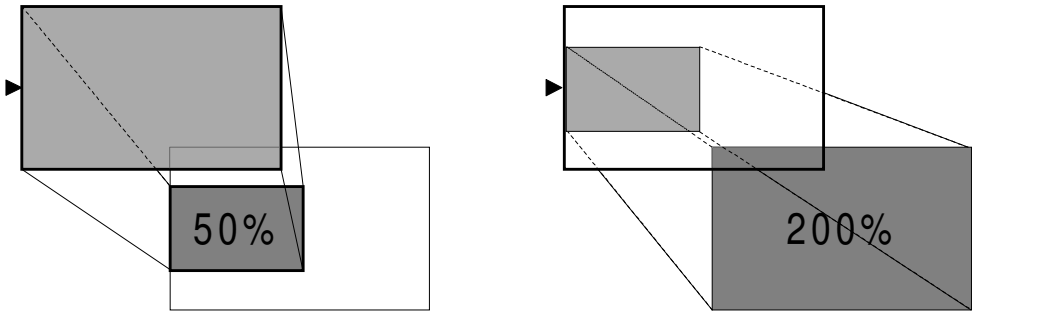
Reduction	50%	65%	71%	74%	77%	82%	87%	93%
US	Yes	Yes	No	Yes	Yes	No	No	Yes
Europe/Asia	Yes	No	Yes	No	No	Yes	Yes	Yes
Enlargement	115%	121%	122%	129%	141%	155%	200%	
US	No	Yes	No	Yes	No	Yes	Yes	
Europe/Asia	Yes	No	Yes	No	Yes	No	Yes	

Reduction and Enlargement

Sub-scan: The machine changes the scanner motor speed.
Main-scan: The machine deletes certain specified bits from each line to reduce the image. The machine changes the laser clock pulse for each pixel to enlarge the image.

During reduction and enlargement, the scanning positions of ADF and book scanner are different as shown. This is because the document set position for ADF is at the center of the scan line, while the book scanner is from the indicated corner.

ADF



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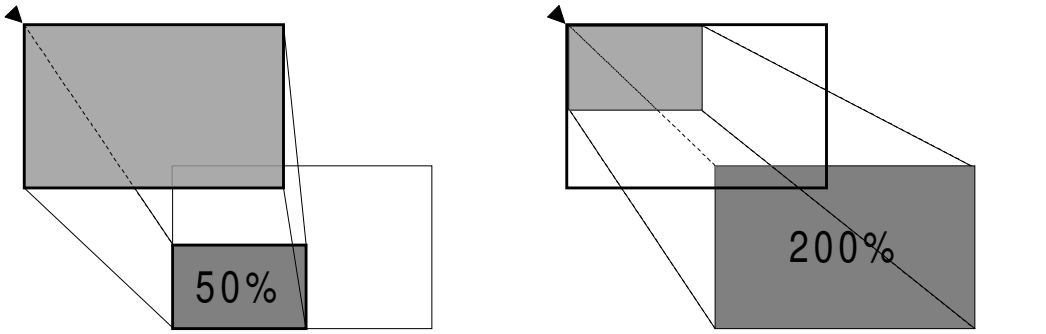
Book Scanner



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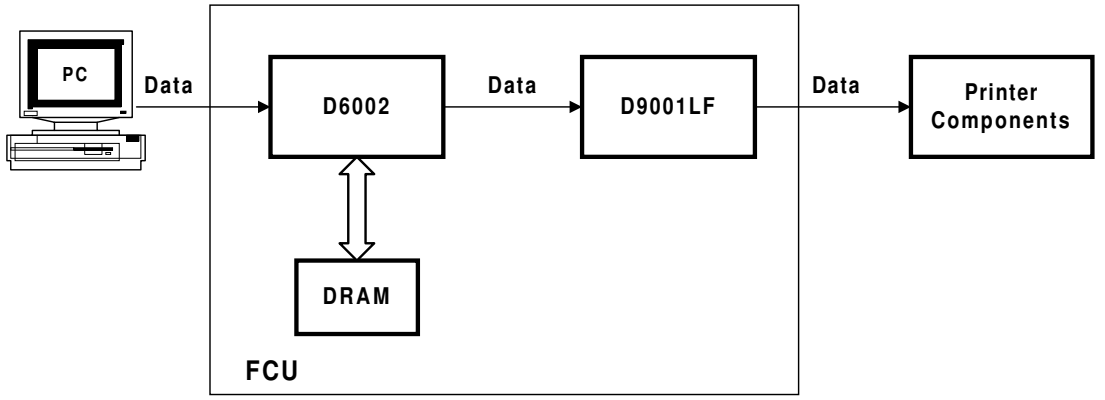
1.5.4. PC Printing



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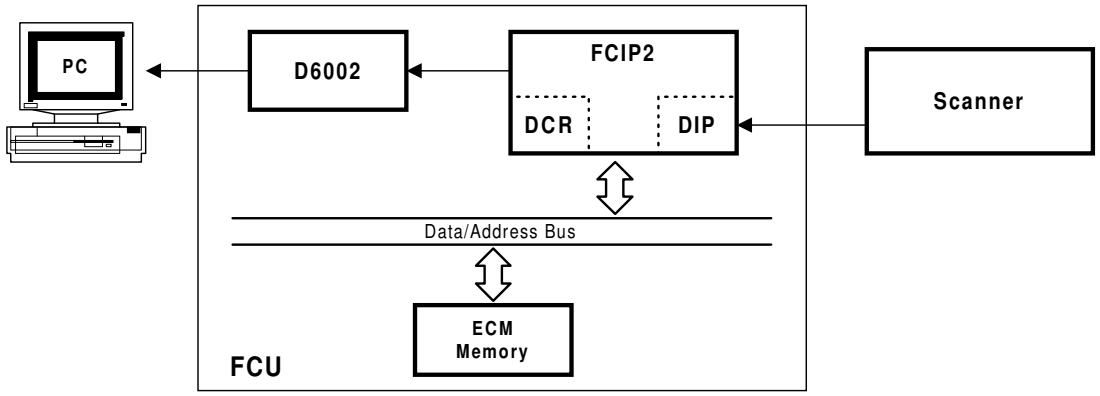
This machine works as a GDI printer when connected to a PC through the parallel cable. GDI printer is a printer which has a built-in support for Windows Graphical Device Interface (GDI), a Windows standard for representing graphical objects to monitors and printers. Since GDI is used by most Windows applications, there is no need to convert the output to another format such as PostScript or PCL.

When printing from the PC, the the video data is compressed by the printer driver (Office Styler) and then sent to the D6002 IC through the parallel interface. The DRAM works as an input / output buffer and sends reconstructed data to the D9001LF where smoothing and toner saving are done. The data is then sent to the LDDR for printing.
Since the D6002 IC works as an I/O buffer, the page memory is not used for PC printing.

1.5.5. PC Scanning



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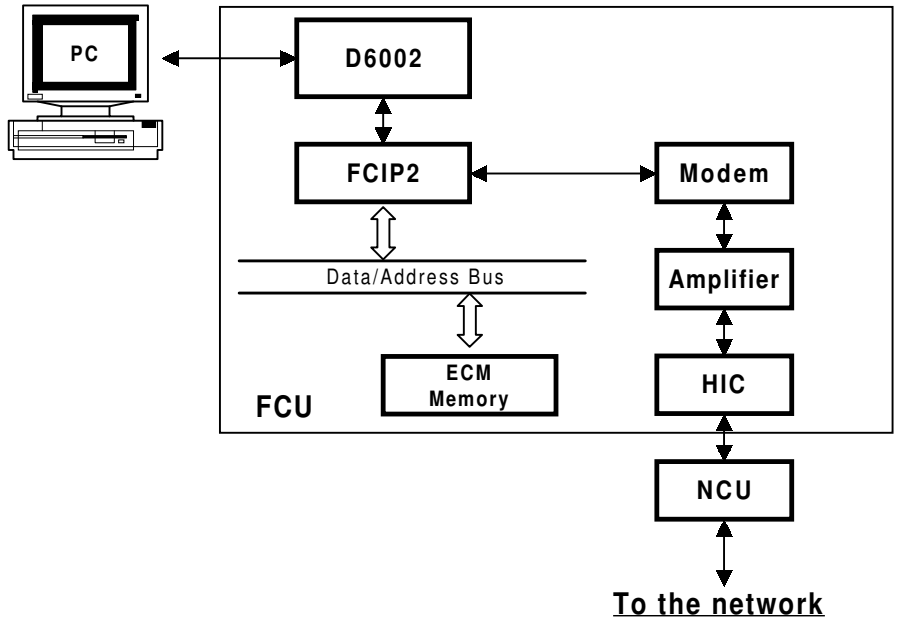
The scanned data passes through the DIP block in the FCIP2 for analog/digital processing. The data is compressed in the DCR block in the FCIP2 and passes through the ECM memory. Then it is sent to the PC through the D6002 without any processing. The data is reconstructed in the driver in the PC (the image processing is done in the same way as for fax scanning).

1.5.6. PC Fax

When transmitting data from a PC, the PC fax software produces the AT commands and sends them to the specified COM port of the PC. The software redirects them to the specified parallel port. Then the commands and data are sent from the parallel port to the machine. The D6002 receives them, and the commands are sent to the FCIP2. The FCIP2 controls the modem in accordance with the AT command sent from the PC, and the data is sent through the modem and the NCU.

When receiving data, the data is stored in the ECM buffer in the same way as for the memory reception mode. The data is then sent to the PC via the D6002.



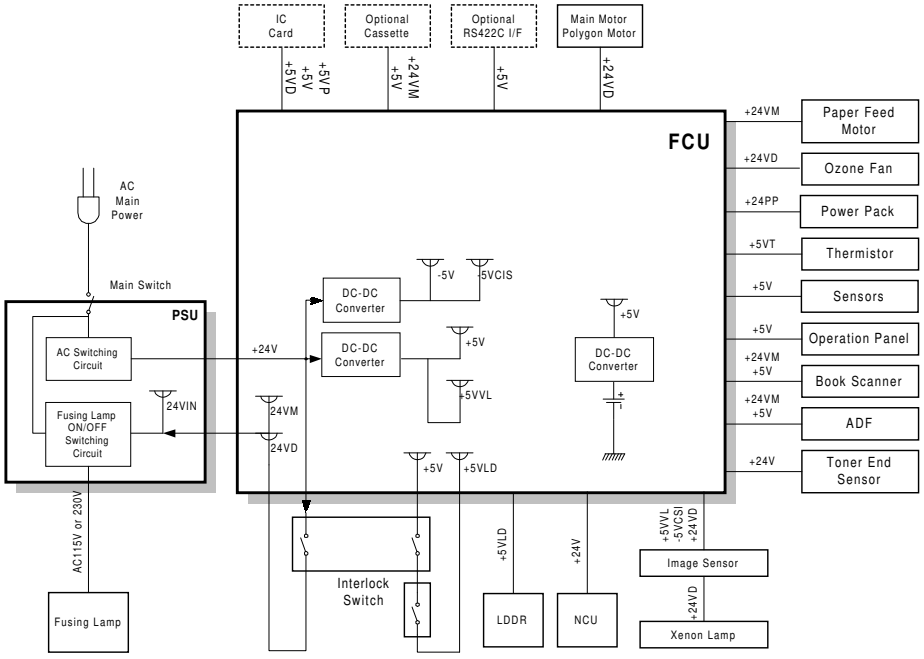
H523v514.wmf

PC Fax Transmission
The PC data is compressed by the application software being used. The data passes to the ECM memory through the D6002 without any processing. Then it is sent to the telephone line through the modem and the NCU.

PC Fax Reception
The data from the line passes to the modem through the NCU. The data demodulated in the modem passes to the D6002 through the ECM memory. The data is reconstructed by the application software being used.

1.6. POWER DISTRIBUTION

1.6.1. Distribution Diagram

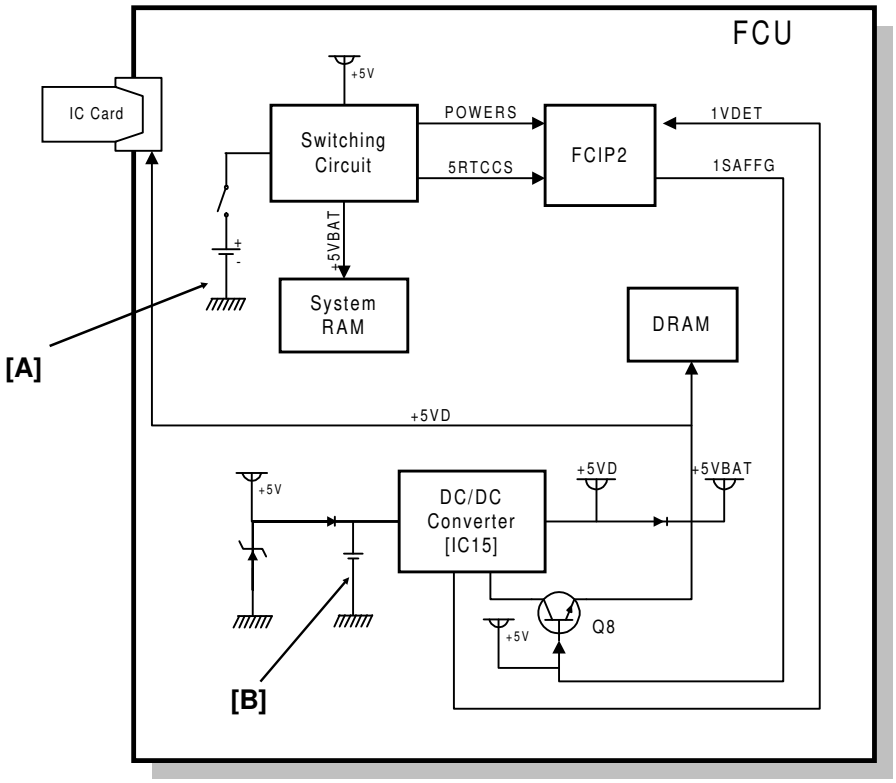


H523V515.wmf

The PSU supplies +24V dc power to the FCU. The FCU converts the +24V dc power supply to the following supplies.

+5V	This is normally on when the main switch is on.
+24VPP	This is used for the power pack.
+5VT	This is used for the thermistor.
+5VLD	This supplies the laser diode. It is interrupted if the fusing unit cover interlock switch opens.
+5VVL	This is a more stable power supply than +5V. It is used for the image sensor.
+5VD	This supplies the DRAM and the page memory card on the FCU to back up the stored data for one hour, if the power is switched off and some data is stored in them. A rechargeable lithium battery is used to generate +5VD.
+5VBAT	This supplies the system RAM on the FCU to back up the programmed data, if the power is switched off. A lithium battery is used to generate +5VBAT. (Europe and Asia only)
+24V	This is normally on when the main switch is on.
+24VD	This is interrupted if the fusing unit cover interlock switch opens.
+24VIN	This supplies +24V to the fusing unit on/off switching circuit. It is interrupted if the fusing unit cover interlock switch opens.
+24VM	This is used for the motors.(ADF, Book Scanner, Paper Feed)
-5VCIS	This is used for the image sensor.
+5VP	This is used for the IC card.

1.6.2. Memory Back-up Circuit



H523V513.wmf

The +5VBAT supply from the lithium battery [A] backs up the system RAM which contains system parameters and programmed telephone numbers, and the real time clock in the cpu. The 5RTCCS signal tells the cpu whether the back-up power (+5VBAT) is coming from the battery or from the +5V power supply.

A rechargeable lithium battery [B](available only for Europe/Asia) and the dc/dc converter on the FCU back up the DRAM (SAF memory) for one hour, if there is data in the SAF memory and the power is switched off. While the main power is on, the +5V supply recharges the battery. The battery re-charges in about one week.

The battery [B] generates about 3 volts (max. 3.2 volts). The dc/dc converter (IC12) lifts this voltage to 5 volts so it can be used as the +5VD supply for SAF backup. The CPU monitors the voltage of the +5VD supply with the 1VDET signal. When the battery has run down, and the voltage is lower than 4.4 volts, the CPU stops the dc/dc converter by dropping 1SAFFG to low and the machine stops backing up the memory.

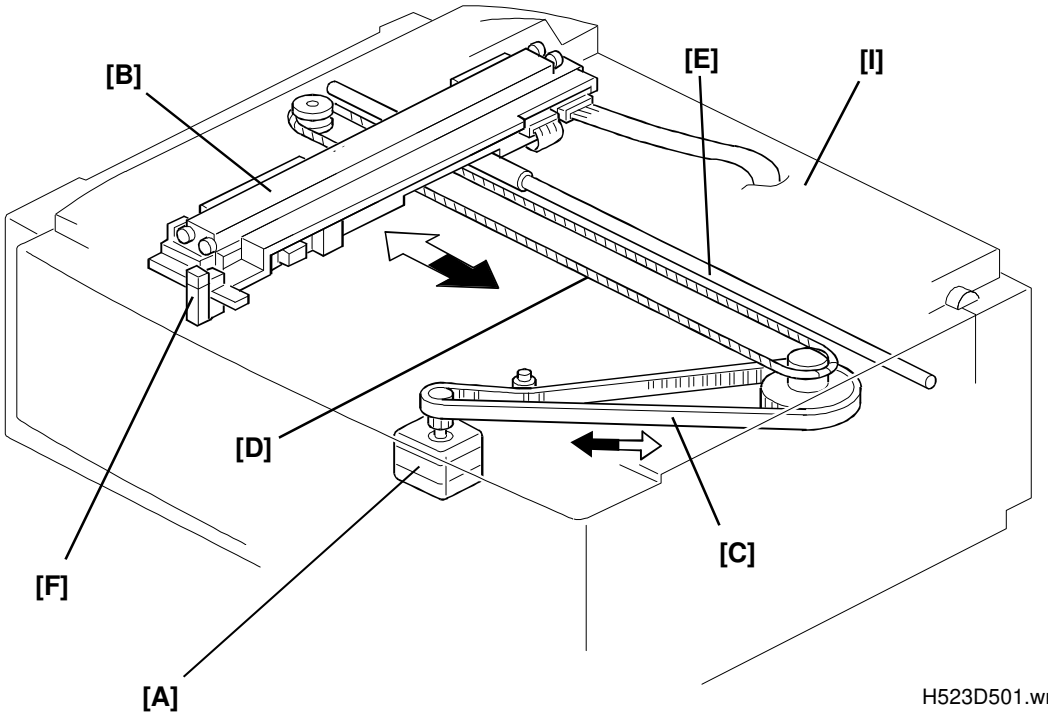
There is no battery switch for the battery [B].

2. DETAILED SECTION DESCRIPTIONS

2.1. SCANNER

2.1.1. Overview

1. Book Scanner



H523D501.wmf

The scanner motor [A] drives the scanner [B] through the timing belt [C] and drive wire [D]. The shaft [E] guides scanner movement in the sub-scan direction. Inside the scanner [B] are a contact image sensor (containing a sensor element and xenon lamp) and a xenon lamp driver.

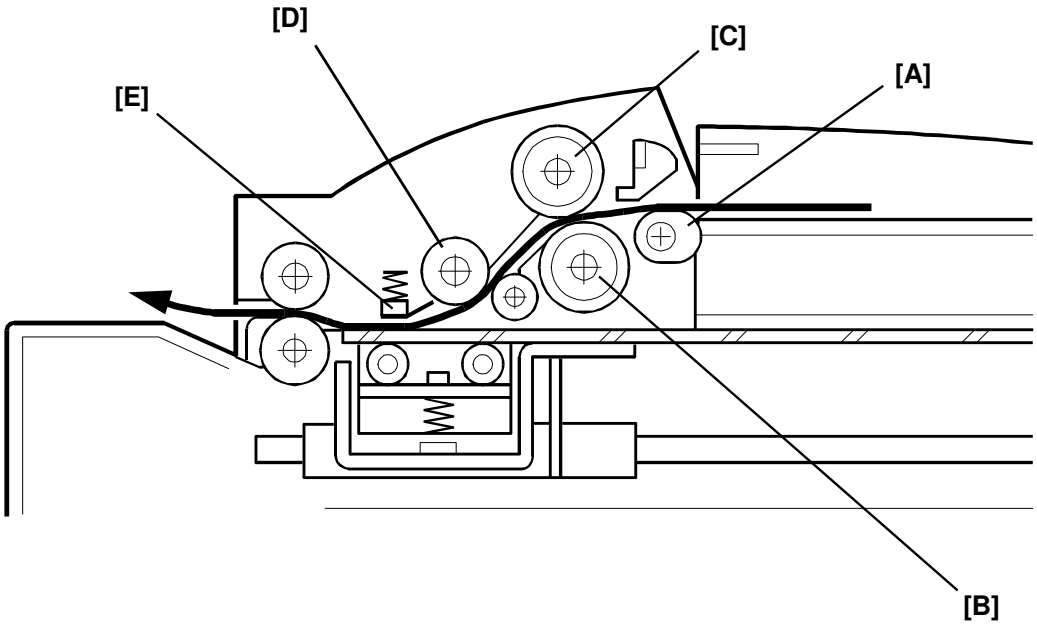
The scanner [B] consists of a contact image sensor and a xenon lamp driver.

The scanner home position sensor [F] allows the scanner return to the same position after scanning.

This machine has no original sensors.

The scan size can be set to A4 or letter by the system bit switch 0D, bit 3.

2. ADF



H523D502.wmf

The sheet through type ADF feeds the document from the bottom page of the document stack on the table.

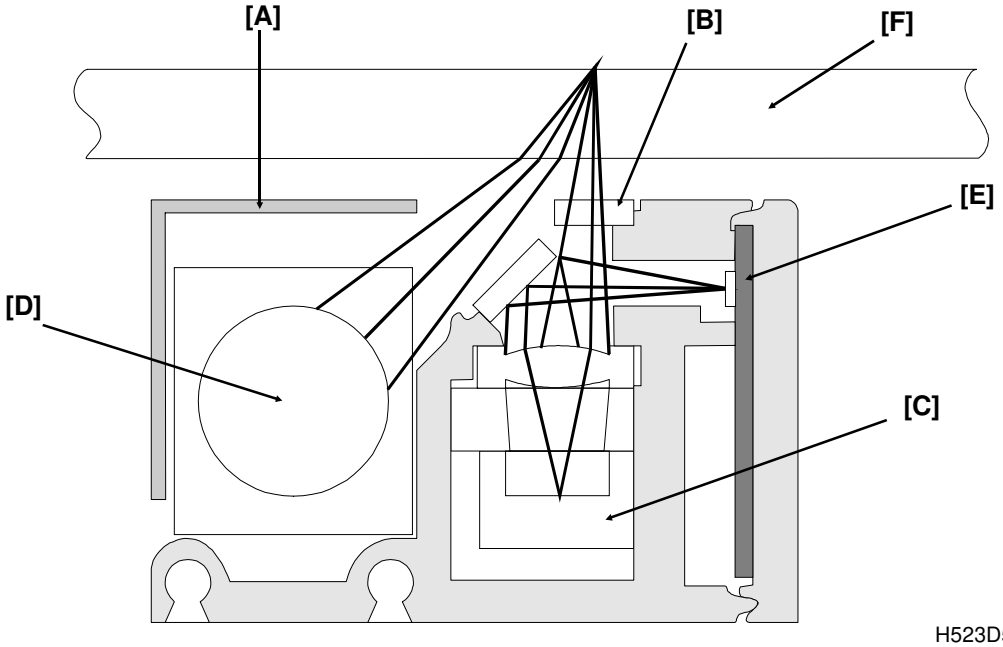
The pick-up [A] and feed roller [B] feed the original into the scanner, and the separation roller [C] helps to feed one sheet at a time. Then, the R1 roller [D], feeds the document through the scanner.

At the time of scanning, the scanner moves to the scanning position. The pressure plate [E] pushes the document to the exposure glass at the scan line, so that the document is within the image sensor's range of focus.

After scanning, the ADF feeds out the document onto the tray, and the scanner moves back to the home position.

2.1.2. Scanning

1. Contact Image Sensor



H523D503.wmf

The contact image sensor (CIS) assembly [A] consists of a dust shield [B], a roof mirror lens array [C], a xenon lamp [D], and an image sensor [E].
The CIS moves under the exposure glass when scanning a book original. When scanning a sheet original using the ADF, the assembly remains at the ADF scan line .

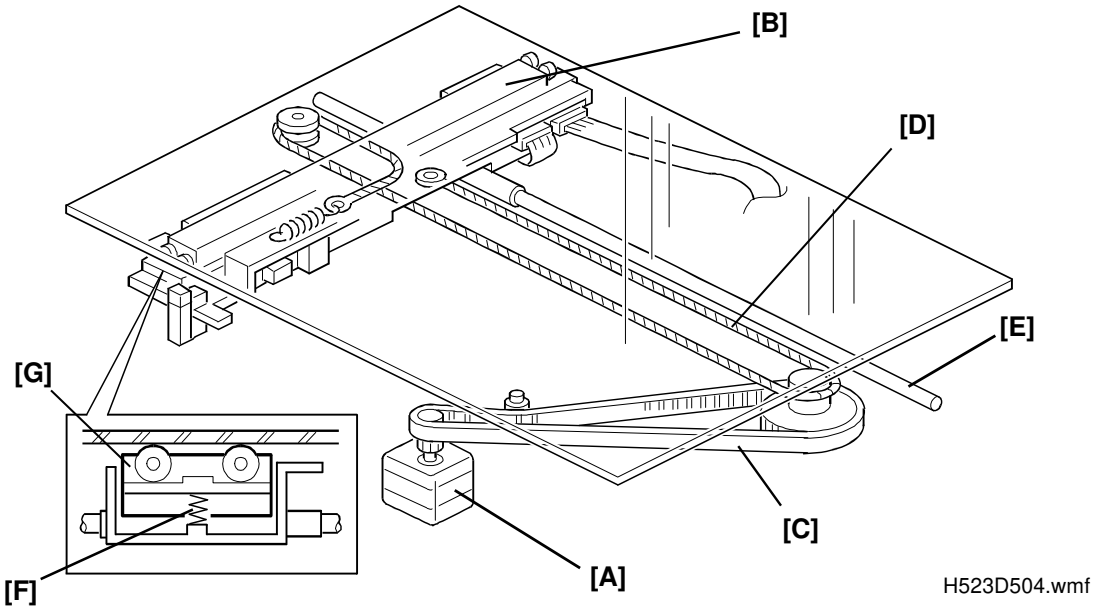
The image sensor is a row of 3456 photosensitive elements (400 dpi). The roof mirror lens array focuses the light reflected from the document onto the image sensor.

Because of the short optical path inside the CIS, the focal depth is much shorter than for a CCD type scanner. Because of this, two springs at each end of the CIS push it against the exposure glass [F], so that the distance from the original is kept the same all the time.

Because the analog output signal is a sawtooth waveform, data sampling timing should be adjusted whenever a new CIS is installed in the machine.

2.1.3. Drive Mechanism

1. Book Scanner



The book scanner motor [A] drives the scanner [B] through the timing belt [C] and drive wire [D]. The scanner moves along the guide shaft [E].

The spring [F] pushes up the contact image sensor [G] to the exposure glass, so that the distance from the image sensor to the exposure glass surface is constant during scanning.

The motor speed depends on the selected resolution. For reference, the following table shows the speed for scanning an A4 size original.

- Fax mode

Standard	4.48 s
Detail	4.48 s
Fine	8.96 s

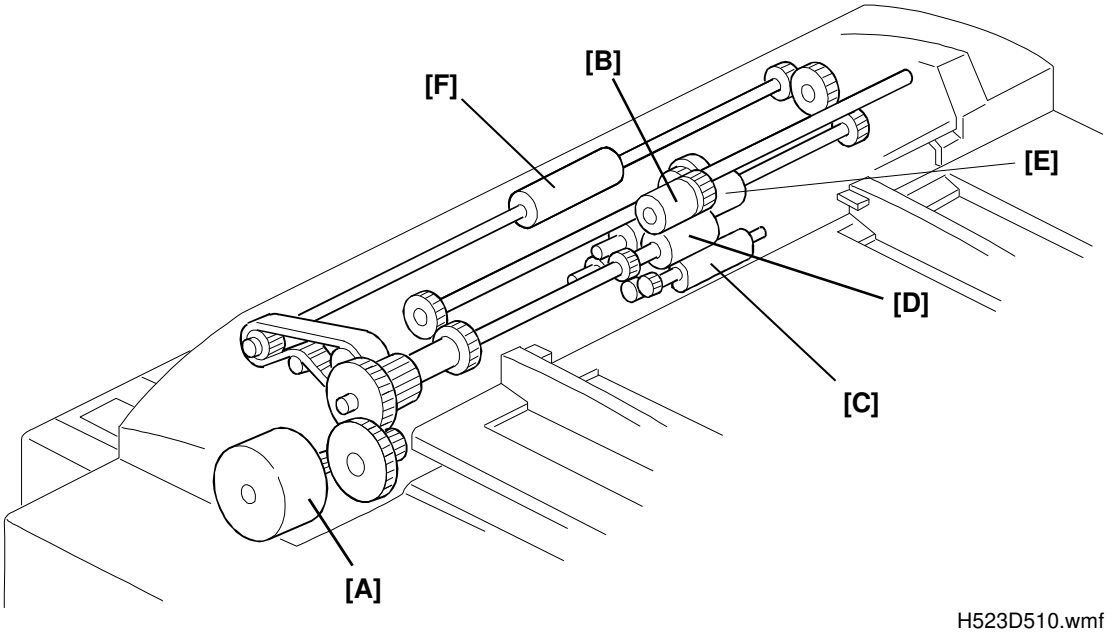
- PC Scanner Mode

200 dpi	4.48 s
400 dpi	4.48 s

- Copy Mode

Reduction	Scan Speed (/A4)	Full Size and Enlargement	Scan speed (/A4)
50 % reduction	2.24 s	Full size	4.48 s
65 % reduction	2.92 s	115 %	5.15 s
71 % reduction	3.18 s	121 %	5.42 s
74 % reduction	3.32 s	122 %	5.47 s
77 % reduction	3.45 s	141 %	6.32 s
82 % reduction	3.68 s	155 %	6.72 s
93 % reduction	4.17 s	200 %	8.96 s

2. ADF



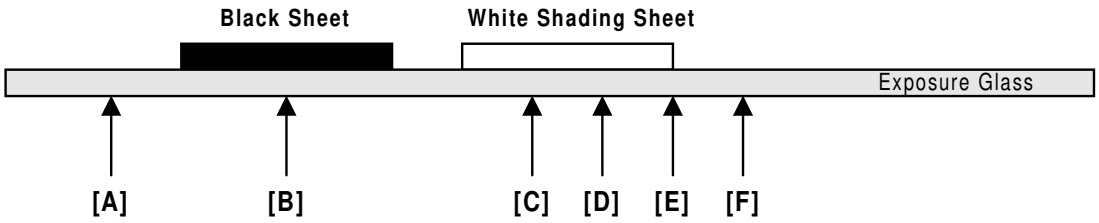
H523D510.wmf

The ADF motor [A] drives the seperation roller [B], the pick-up roller [C], the feed roller [D], the R1 roller [E], and the R2 roller [F].

The motor speed varies in the same way that the book scanner motor does (see the previous page).

Cross reference
Maximum document length: Scanner Switch 00, bits 2 and 3.

3. Scanner Position Adjustment



H523D508.wmf

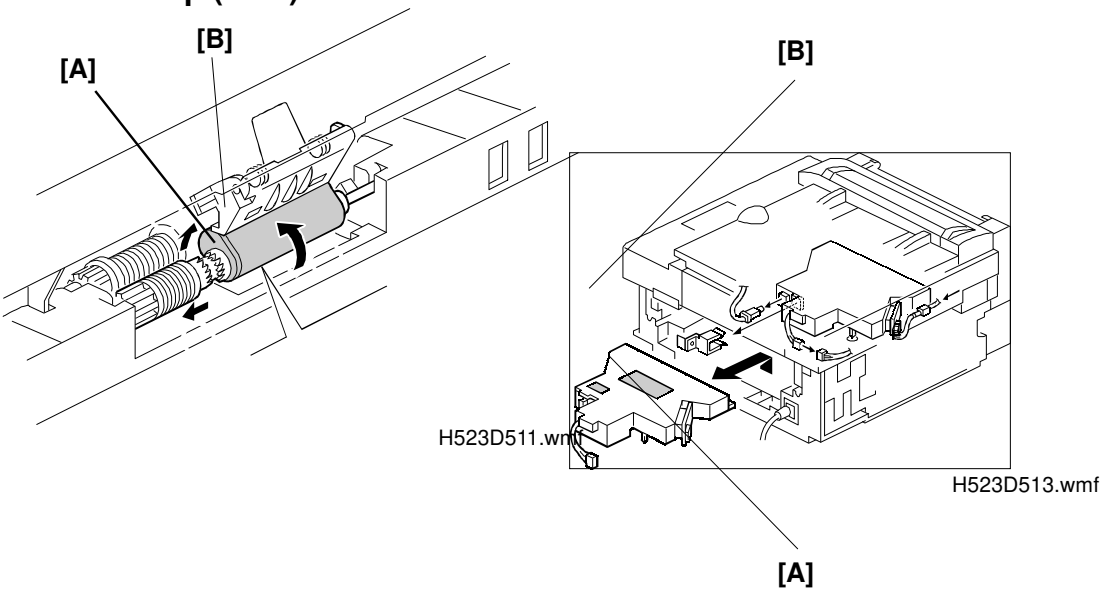
When the machine is turned on, the machine detects scanner home position.(scanner initialization)
During scanner initialization, the scanner moves to the right until the home position sensor turns off. Then it changes the direction until the home position sensor turns back on.

At the start of scanning, the scanner moves from the scanner home position ([E] in the above figure), to the position [B] to scan the black sheet to adjust the black level. At that time, the xenon lamp is turned on. Then the scanner moves to the positions [C] to [D] to adjust shading.

- Book Scanner
  After shading, the scanner moves to the scanning start position (position F) to start scanning. Shading is done before scanning each page.

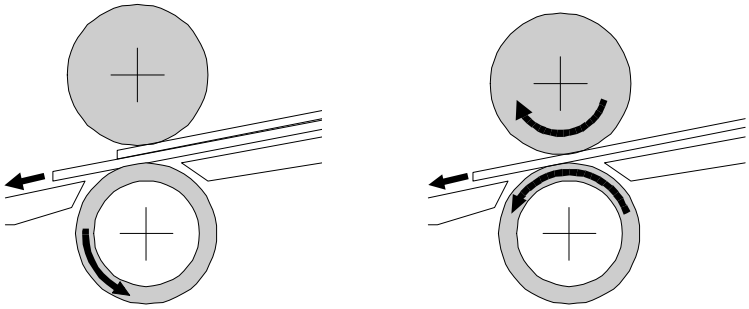
- ADF
  After shading, the scanner moves to the ADF scanning position (position [A]) and stays while the document is fed through the ADF. Shading is done only once before scanning.

2.1.4. Pick-up (ADF)



When the machine is turned on, the the pick-up roller [A] rotates counter-clockwise as shown. It then rotates clockwise until it reaches the stopper [B]. Then again counter-clockwise to the home position.
When the machine starts to feed the document, the pick-up roller feeds the bottom page to the feed roller. After the last page is scanned, the machine moves the pick-up roller back to the home position.

2.1.5. Feed and Separation (ADF)



The feed roller [A] and the separation roller [B] prevent more than one sheet of paper from feeding into the scanner.
When the feed roller feeds a sheet of paper, both the feed and the separation rollers rotate in the feed-in direction. However, if two or more sheets are between these rollers, the separation roller stops to prevent the upper sheet from being fed into the scanner.

Cross reference
Separation mechanism: Group 3 Facsimile Manual, page 2-2-14.

2.1.6. Error Conditions

1. Book Scanner

The FCIP2 detects an error if one of the following conditions occurs.

Condition	Description	Error Code
Incorrect home position sensor condition	The scanner home position sensor did not turn on after the motor moved 350 mm back to the home position after scanning.	9-90
	The scanner home position sensor stayed on after the motor moved 20 mm from the home position at the start of scanning.	9-91
	During initialization, the scanner home position sensor did not turn on after the motor moved 100 mm.	9-92
	During initialization, the scanner home position sensor stayed on after the motor moved 100 mm.	9-93

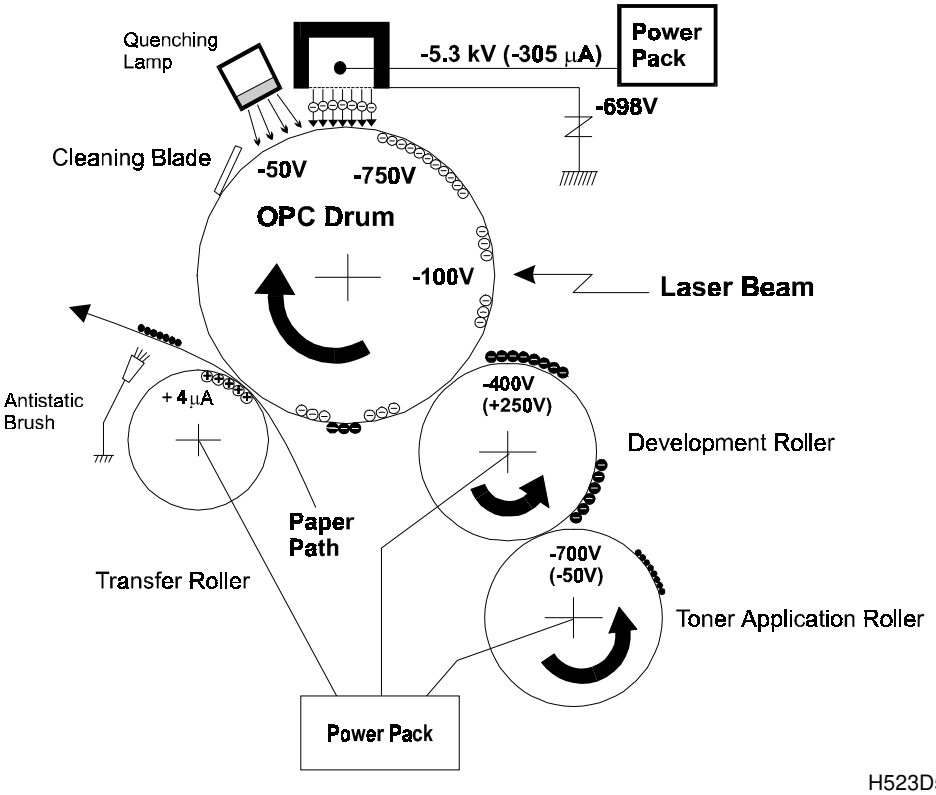
2. ADF

The main cpu detects an error if one of the following conditions occurs.

Jam Condition	Description	Error Code
Non-feed	The scan line sensor does not switch on within 2.0 s of the ADF motor starting.	1-00
Incorrect sensor conditions	The scanner home position sensor did not turn on after the motor moved 100 mm back to the home position after scanning using ADF.	9-94
Maximum document length exceeded	The scan line sensor does not turn off after the maximum document length has been fed since it turned on; this is after 23 s at standard and detail resolution, or 46 s at fine resolution (these times are for a 1.2 m long document).	1-01
Error during feed-out	When the final page of the document has been fed out of the scanner, or when a jammed document has been removed, the ADF initialization is done. The error occurs if a document is placed into the feeder during initialization.	No error code
Cover open	While the machine is working, the ADF cover are opened.	No error code

2.2. PRINTING

2.2.1. Printing Process - Overview

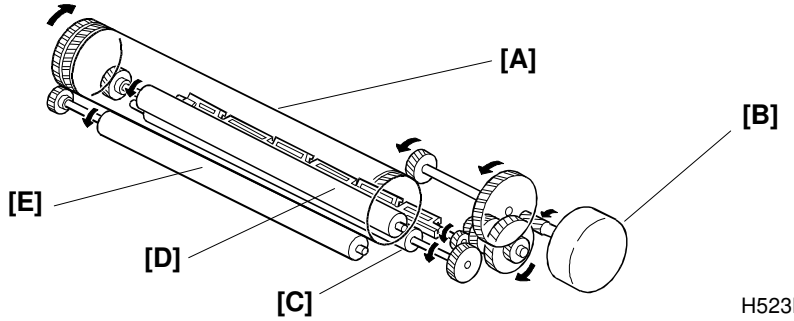


H523D521.wmf

This machine uses a “write to black” system, using negative toner.

- The charge corona wire gives the drum surface a negative charge of -750 V.
- The exposed area on the drum drops to about -100 V.
- The development roller carries toner to the latent image on the drum surface.
  Development bias (during printing):
  Toner application roller : -700 V
  Development roller: -400 V
  Switching bias:
  Toner application roller : -50 V
  Development roller: +250 V
- The transfer roller pulls the toner from the drum onto the paper.
  A constant current of +4 μA is applied. The antistatic brush helps to separate the paper from the drum.
- The cleaning blade removes any toner remaining on the drum after the image is transferred to the paper.
- The quenching lamp reduces the negative charge on the drum to about -50 V.

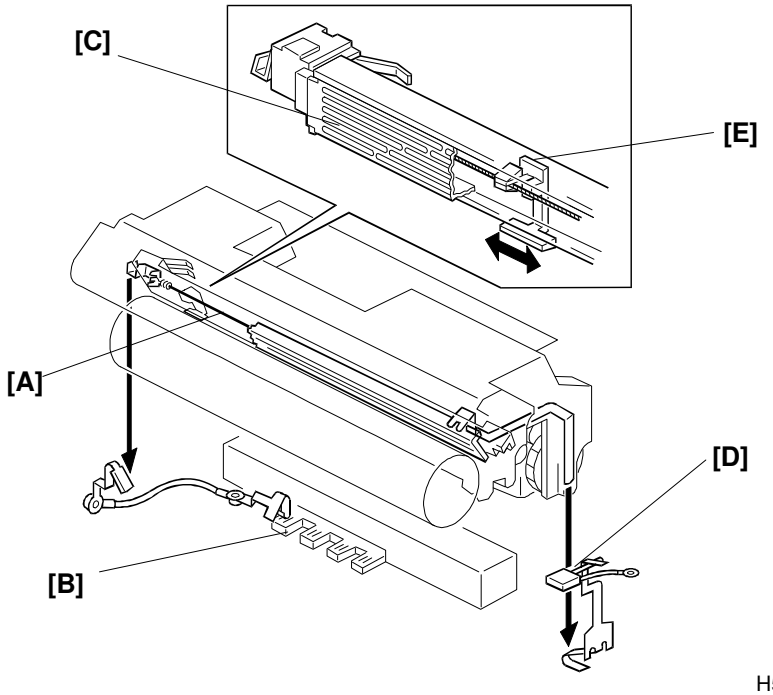
2.2.2. OPC Drum



H523D522.wmf

An organic photoconductor drum [A] is used in this machine. The diameter of the drum is 30 mm. It is driven by the main motor [B] through a gear train. The toner application roller [C], development roller [D], and transfer roller [E] are also driven by the same gear train. The drum unit is replaceable by the customer.

2.2.3. Charge



H523D523.wmf

The CTM contains a charge corona unit. The corona wire [A] generates -ve ions when the power pack [B] applies a constant current of -305 ± 5 μA (the voltage is about -5.3 kV) . The grid plate [C] ensures that the charge is uniformly spread out. The zener diode [D] ensures that the charge on the drum does not exceed -750 ± 50 V.

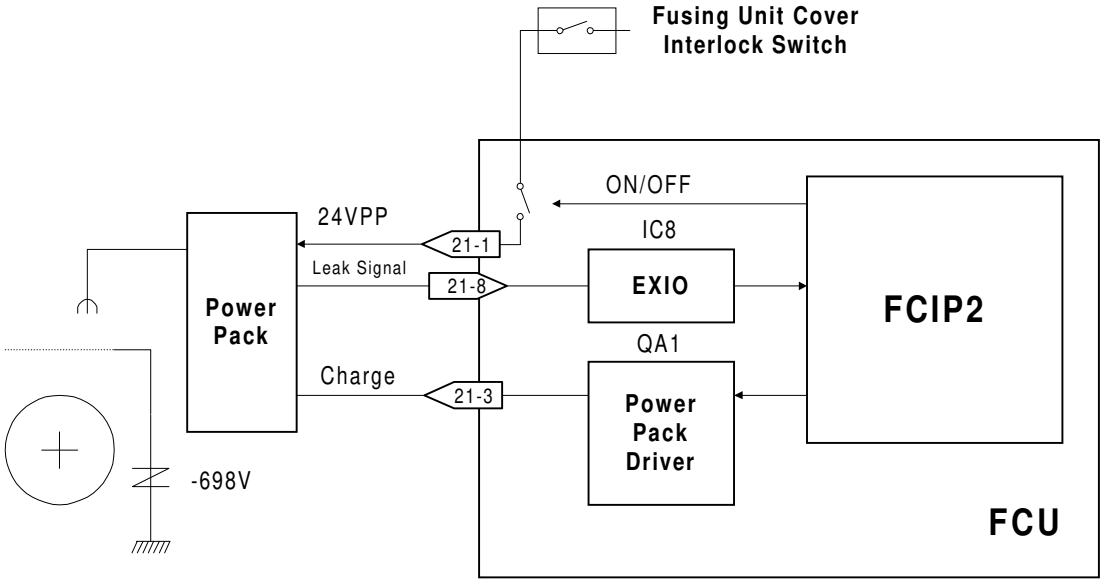
The charge corona unit contains a wire cleaner [E] for user maintenanace.

The ozone fan on the left hand side of the machine provides air flow to the charge corona unit, and the ozone filter (a paper filter coated with carbon) decomposes the ozone generated around the drum by the corona discharge.

Charger Leak Detection:

The machine detects a charger leak error when the FCU CN21-8 stays low for 3 seconds or more (6 seconds or more at power on) either while in standby mode or while the corona wire is being charged. When this occurs, the machine warns the customer by lighting the Call Service indicator (error code 9-17).

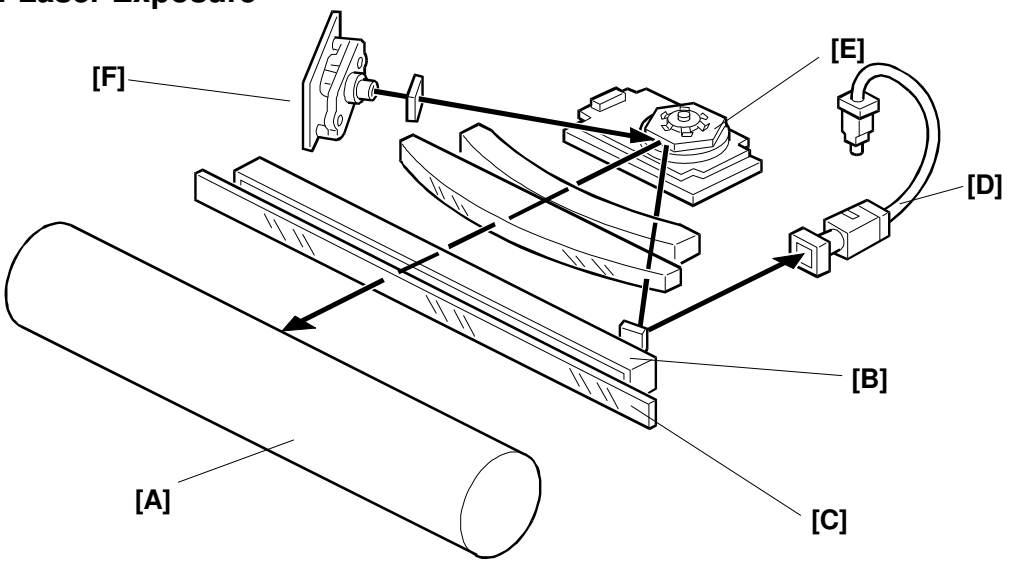
Charge Control



H523D505.wmf

In this machine, a higher corona wire current is used to counter black bands on copies. The charge on the drum exceeds the zener diode voltage as a result of this higher current.

2.2.4. Laser Exposure



H523D524.wmf

1. Overview

The components of the laser section are the same as those described in the section 4-3-3 of the Group 3 Facsimile manual. The drum [A] is positioned in the same plane as the laser unit, so there is no mirror to change the optical path.

Points to note:

- The focusing lens [B] is a barrel toroidal lens.
- The shield glass [C] prevents toner and dust from entering the laser optics area.
- An optical fiber [D] passes the reflected laser beam to the laser sychronization detector circuit in the FCU.
- The shape of the mirror [E] is hexagonal.
- The strength of the beam emitted from the LD unit [F] is 5 mW at a wavelength of 780 nm.
- The dimensions of the dot on the drum are 85 μm by 85 μm.

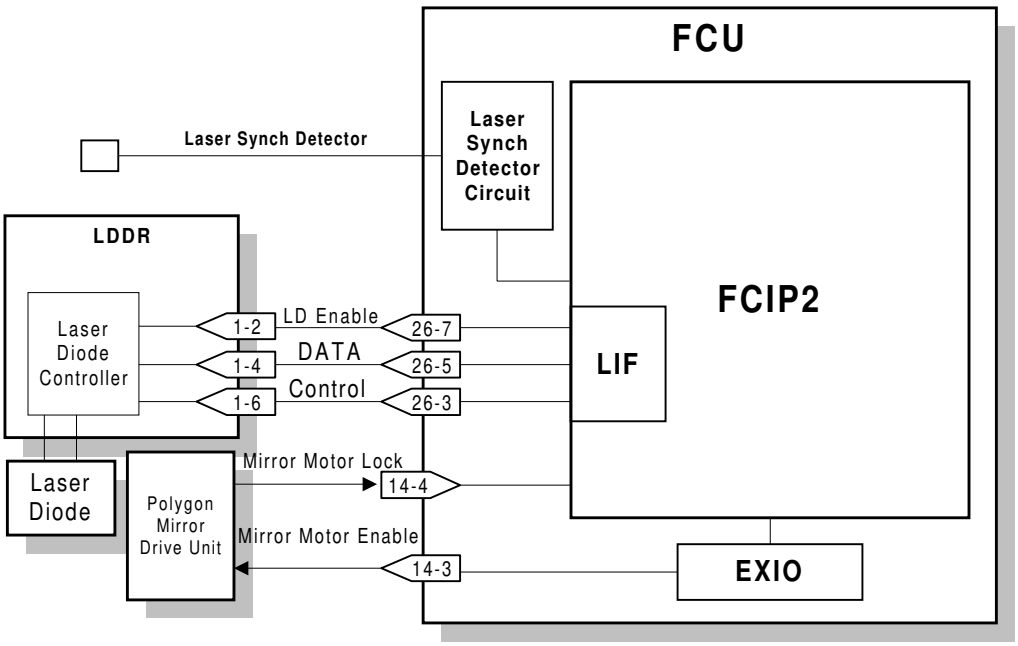
The hexagonal mirror motor speed depends on the printing resolution:

- Copy and G3 l/mm mode (16 x 15.4 dots/mm): 10366.6 rpm
- Copy and G3 l/inch mode (400 x 400 dots/inch): 10566.6 rpm
- Printer mode (300 x 300 dots/inch): 7926.6 rpm

The charge on the exposed section of the drum drops to about -100 V while non-exposed areas it remains at about -750 V.

Cross-reference
Group 3 Facsimile Manual: section 4-3-3

2. Block Diagram



H523D506.wmf

The LIF block in the FCIP2 monitors and controls the laser diode power (FCU CN26-3) and transfers data for printing to the laser diode (FCU CN26-5).

Cross-reference
Group 3 Facsimile Manual: page 4-3-13

3. Error Conditions

LD Failure Detection:

The machine detects LD failure when the Laser Synchronization signal is not detected within 10 ms of the LD ready signal. When this occurs, the machine warns the customer with the Call Service indicator (error code 9-20).

Mirror Motor Error:

The machine detects a mirror motor error when FCU CN14-4 does not go low within 10 seconds of the hexagonal mirror motor being turned on.
The machine also detects a mirror motor error when FCU CN14-4 goes back to high for 3 seconds or more during mirror motor operation. When either of these errors occurs, the machine warns the customer with the Call Service indicator (error code 9-23).

4. Print Density Adjustment

(1).Copy And Facsimle Mode

The FCIP2 controls print image density by changing the laser pulse width to adjust the width of the dots across the page. The beam strength is not adjusted in this model.

The following table shows the relationship between the pulse width and the image density.

Mode			Image Density		
			Normal	Lighten	Darken
Copy Mode	Normal		80 %	40 %	160 %
	Halftone		80 %	40 %	160 %
Enlarge in Copying	115 %	Normal	100 %	40 %	160 %
		Halftone	80 %	40 %	160%
	122 %	Normal	100 %	50 %	150 %
		Halftone	83 %	50 %	150 %
	141 %	Normal	100 %	43 %	157 %
		Halftone	86 %	43 %	157 %
	200 %	Normal	100 %	40 %	160 %
		Halftone	80 %	40 %	160 %
Fax Mode	Normal		100 %	40 %	160 %
	Halftone		20 %	20 %	100 %

To change the pulse width, the duty cycle of the laser pulse is changed. For example, to make the print density 40% of normal, the laser is only kept on for 40% of the normal duration for each pixel.

(2).Print Mode

The FCIP2 controls print image density by changing the toner application roller bias and development roller bias.

Changing bias

Toner application roller bias: from -850V to -550V
Development roller bias : from -500V to -300V

5. Enlargement

For enlargement, the FCIP2 controls the magnification ratio by changing the interval between pulses in the laser clock signals. So, for example, the clock signal pulse interval for 200% enlargement is twice as long as the interval for normal (100%) image reproduction. This makes each image pixel for 200% enlargement become twice as long as each pixel for normal image reproduction.

During copying, a main scan resolution of 16 dots/mm is used, and smoothing is not done on images of this resolution. In enlargement, since each pixel is enlarged, video processing such as smoothing cannot be done.

6. Toner Saving Mode

In this machine, toner saving is done by reducing the number of dots actually printed, not by varying the development bias. In toner saving mode, the image data is filtered through the following four-line matrix.

```
1st line          1 0 1 0 1 0 1 0 1 0 . . . . .
2nd line          0 0 0 0 0 0 0 0 0 0 . . . . .
3rd line          0 1 0 1 0 1 0 1 0 1 . . . . .
4th line          0 0 0 0 0 0 0 0 0 0 . . . . .
```

(1: Actual data printed, black or white; 0: Always a white pixel)

Notes:

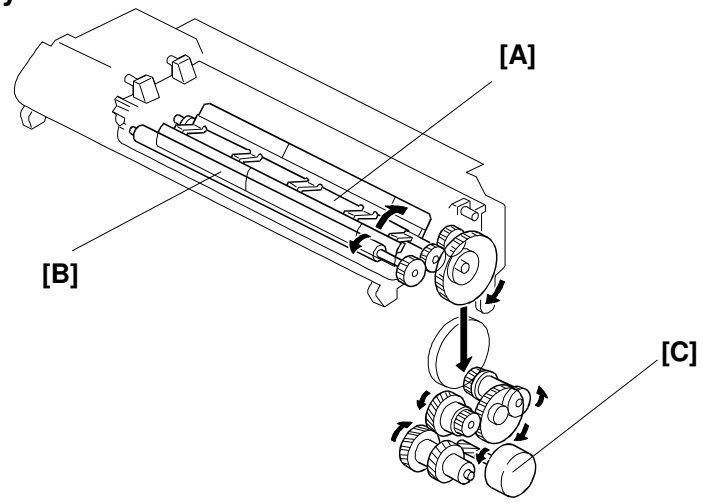
- Toner saving mode only works when printing fax messages and reports. (However, toner saving is disabled in NSF/NSS halftone mode, that is, when bit 126 of the NSF/NSS frame is set to 1.)
- When toner saving mode is selected, the print image density is automatically set to “Normal”; in some cases, the image may become invisible if the Lighter setting is used.

Cross Reference
Toner Saving Mode: User parameter 12, bit 2

Edge Enhancement

In toner saving mode, the machine prints a black pixel whenever the data changes from white to black in the main scan direction. In this way, edges on the image are printed more clearly.

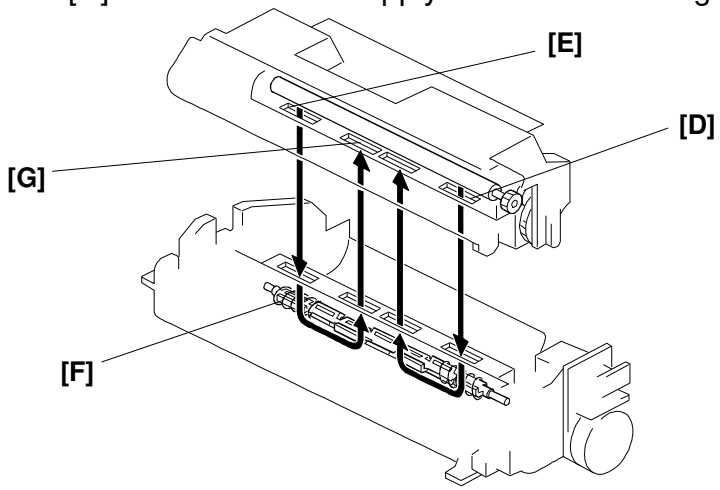
2.2.5. Toner Supply



H523D525.wmf

This machine uses monocomponent toner, which is composed of resin and ferrite. The toner mixing bar [A] stirs and carries toner to the toner supply roller [B]. The toner supply roller supplies toner to the development unit.

The main motor [C] drives the toner supply mechanism through a gear train.



H523D526.wmf

Toner is supplied to the development unit from the outer openings [D, E] of the CTM. The spiral mechanism [F] on the toner supply bar distributes toner through the development unit.

Openings in the central area of the CTM [G] allow toner to circulate upwards from the development unit. This circulation prevents excessive toner supply to the development unit and ensures that the toner remains fresh (this helps to prevent blurred images).

Initial Toner Supply Mode

When the first CTM is installed in a new machine, the machine automatically supplies toner to the development unit for 90 seconds. This will also be done automatically after a RAM reset level 1 or 2 is performed.

Initial toner supply mode must also be executed by a technician when the development unit is replaced.

Cross-reference
Initial toner supply mode: RAM address 8003B0 (See sections 4-5 and 5-4-5 for details)

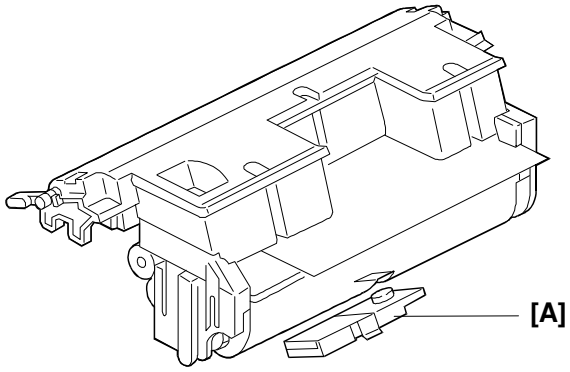
CTM Detection

At the following times, the machine detects whether a CTM is installed by checking the power supply to the quenching lamp (this is part of the CTM).

- At power-up.
- When the machine comes back to normal mode from the Level 2 Power Saver Mode.
- When the cover is opened and then closed.

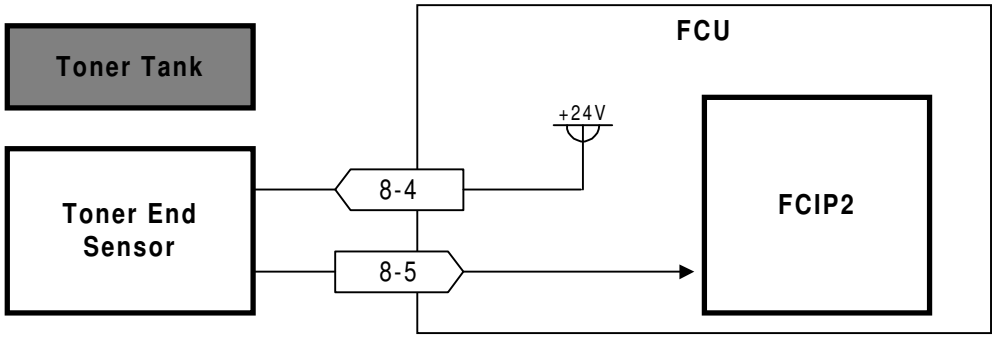
The machine disables all printing processes if a CTM is not installed.

Toner End Detection



H523D527.wmf

Toner near-end is detected by the toner end sensor [A], which is located below the toner tank.



H523D507.wmf

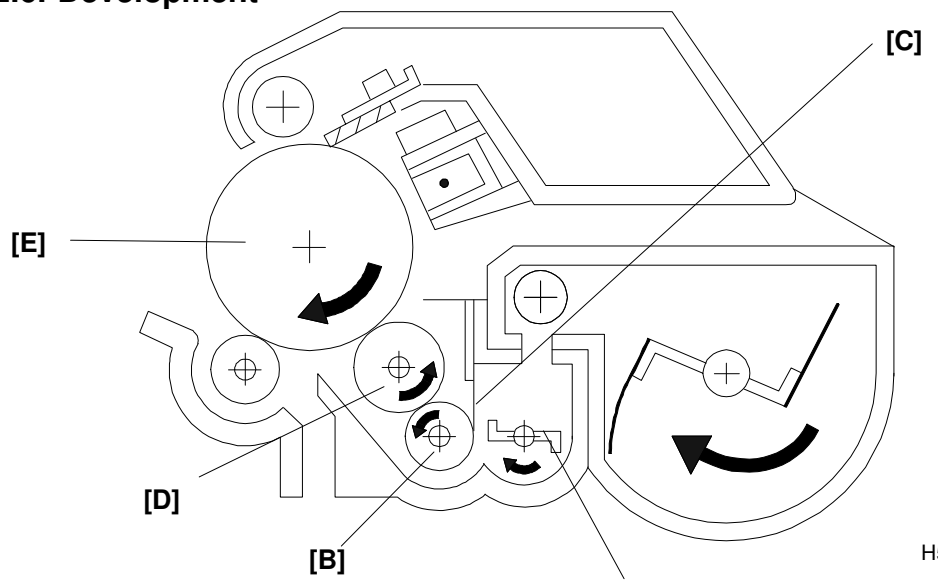
While the main motor is rotating, the machine detects toner end by the voltage output from the toner end sensor . The voltage from the sensor is close to 5 V when the toner tank is full and becomes low when toner is almost empty.

Toner near-end condition: When the cpu detects a low output from the toner end sensor for more than 5 s, the cpu starts to blink the Add Toner indicator (LCD). This is the toner near-end condition.

Toner end condition: After toner near-end is detected, the machine can print 100 more sheets, then the cpu disables printing (this is the toner end condition).

The machine clears the toner near-end or toner end condition when the power is switched off and back on or when the cover is opened and closed, if the output from the toner end sensor goes back high again.

2.2.6. Development



H523D528.wmf

Overview

There are two development rollers in the development unit: the Toner Application Roller and the Development Roller.

The toner supply bar [A] stirs and carries toner to the toner application roller [B]. Toner is attracted to the toner application roller because it has a magnetic layer. As the toner application roller turns past the toner metering blade [C], only a thin coating of negatively charged toner particles stays adhered. (Refer to section 4-4-2 of the Group 3 Facsimile manual.)

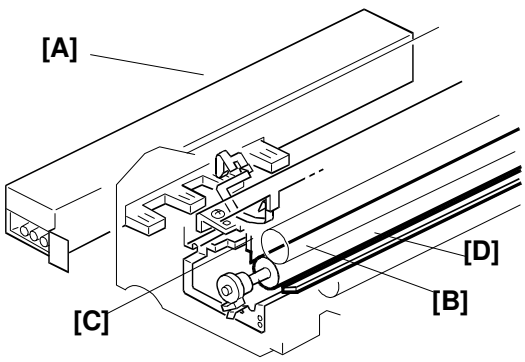
During printing, a bias voltage of -700 V is applied to the toner application roller and another bias voltage of -400 V is applied to the development roller. The toner is carried from the toner application roller to the development roller [D] by the potential difference between these two rollers.

The exposed area on the drum [E] is at -100 V. The development roller applies toner to these areas of the latent image as they turn past the drum.

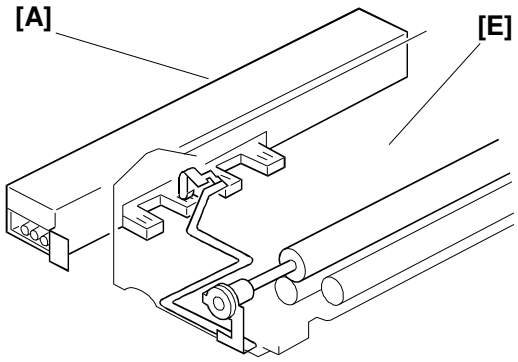
The development roller is made of a soft rubber so it does not damage the surface of the drum. The development roller is provided as a separate spare part because it always contacts the toner application roller, and so may become dented.

The speed ratio between the drum, development roller, and the toner application roller is about 1 : 1 : 3. The toner application roller rotates three times as fast as the development roller, so it deposits a layer of toner three times as thick on the development roller. This leads to a clearer image. Also, the toner application roller rotates in the opposite direction to the development roller, which helps to keep the toner level on the development roller.

Development Bias



H523D529.wmf

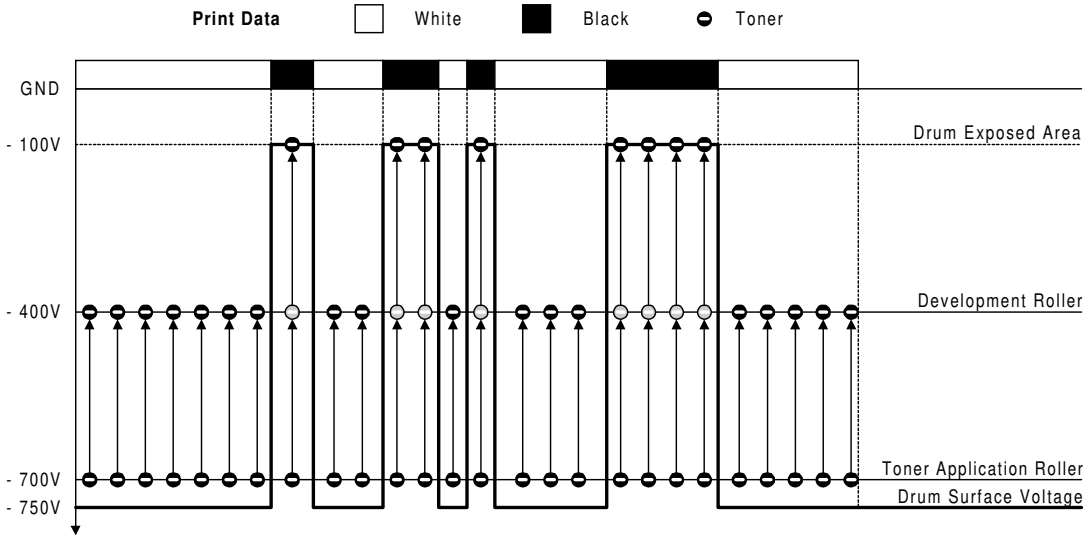


H523D530.wmf

The power pack [A] applies one bias voltage to the toner application roller [B], toner metering blade [C], and bias brush [D], and a different voltage to the development roller [E].

Bias Control (During Printing)

A charge of -700 ± 40 V is applied to the toner application roller, and -400 ±10 V is applied to the development roller. Toner transfers from the toner application roller to the development roller and on to the laser-exposed areas drum as shown below.



H523D531.wmf

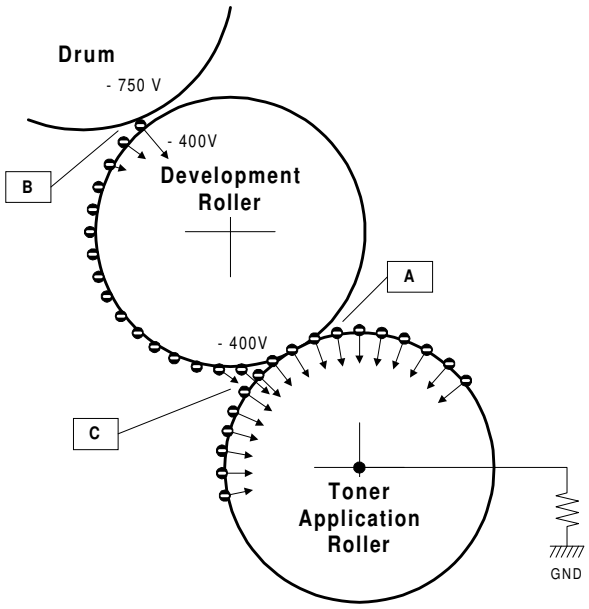
Bias Control (After Each Page)

After each page, the machine removes toner from the development roller and returns it to the development unit. To do this, -400V is applied to the development roller, but no bias is applied to the toner application roller.

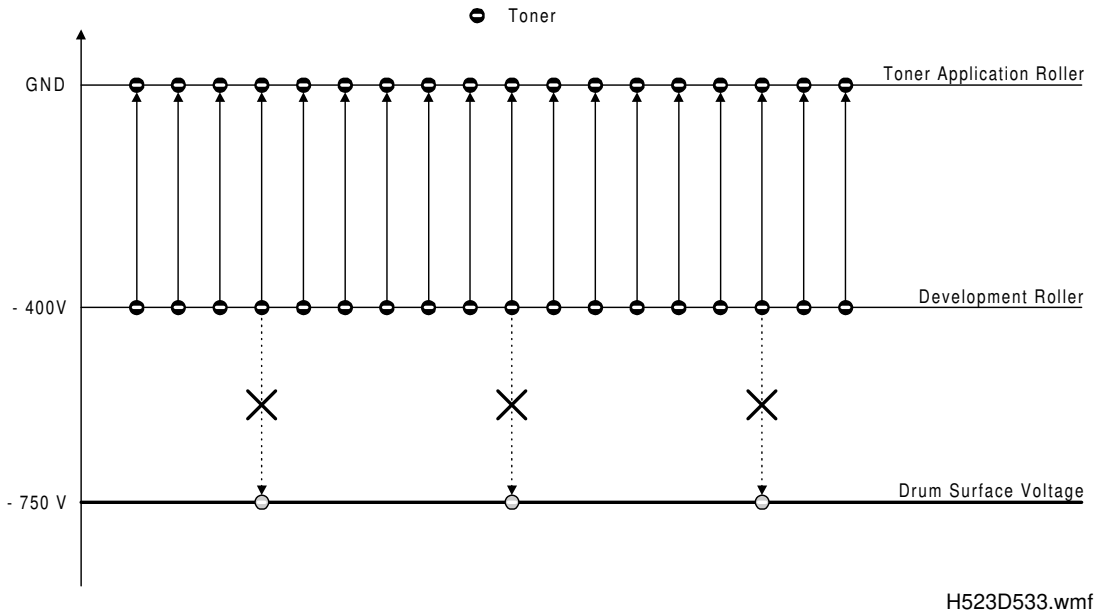
Toner does not transfer to the development roller at “A”, but remains on the toner application roller when it passes between the two rollers.

The remaining toner on the develpment roller does not transfer to the drum at “B”, but transfers to the toner application roller at “C”.

In some cases, positively charged toner may transfer to the drum in this condition. So, a positive current is applied to the transfer roller after each page, so that the positively charged toner does not transfer to the transfer roller.



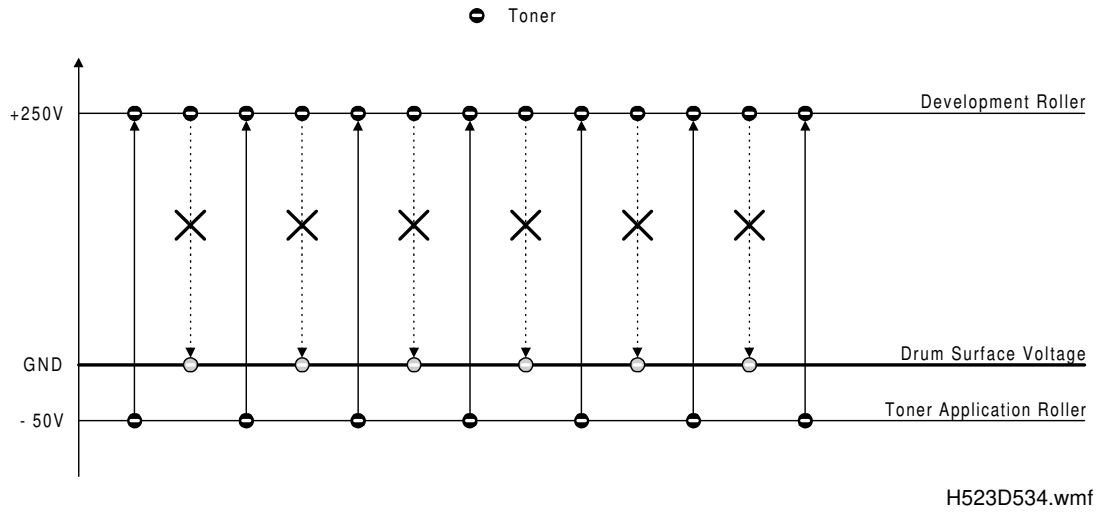
H523D532.wmf



H523D533.wmf

Bias Control (Other)

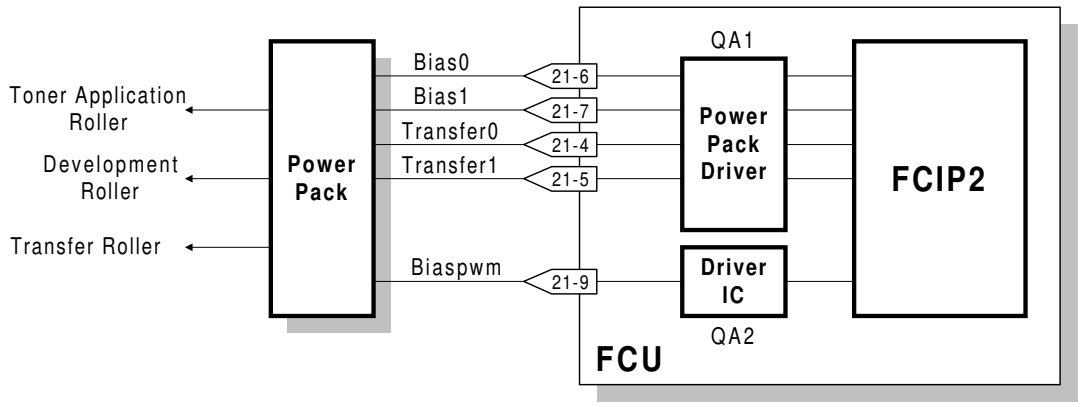
At the start and the end of any print process (including the cleaning and initial toner supply modes), -50 ± 50 V is applied to the toner application roller, and +250 ± 15 V is applied to the development roller. This is to avoid any toner transfer to the drum.



H523D534.wmf

Note that the voltage difference between the toner application and development rollers is kept the same as in printing, at 300 V. This keeps the same amount of toner on the development roller at all times during the print run.

Bias Control Circuit



H523D509.wmf

The FCIP2 controls the voltages to the toner application and development rollers using the Bias 0 and Bias 1 and Biaspwm signals as shown in the following table.

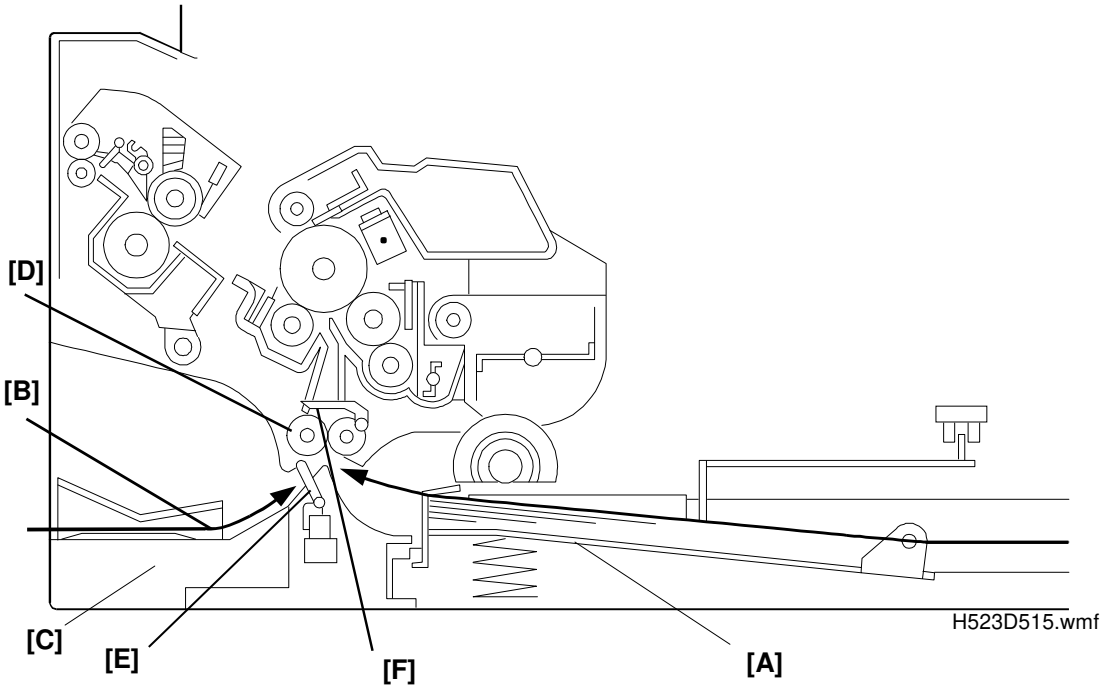
In	Bias 0	Low	High	Low	High
	Bias 1	Low	Low	High	High
	Biaspwm	D%(*1)	-	-	-
Out	Toner Application Roller	BL1	BH1	Off	Off
	Development Roller	BL2	BH2	BL2	Off

(*1):The pulse data changes to apply different biases to the development/application roller when the print image density is changed by the user(user parameter).

	Darker	Normal	Lighter
BL1	-747V	-700V	-653V
BL2	-431V	-400V	-369V

2.2.7. Paper Feed

1. Overview



The standard cassette [A] holds 150 sheets and the bypass feed slot [B] feeds 1 sheet at a time. An Optional cassette can be fitted into cavity [C].

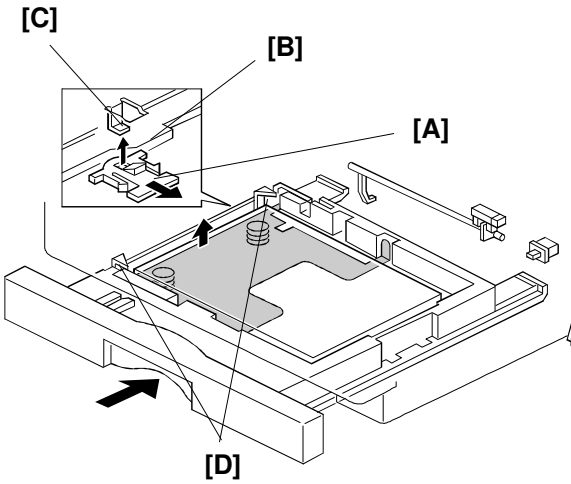
The registration roller [D] rotates clockwise when the standard cassette is used. It rotates counter-clockwise when the bypass feed slot [B] or the 100 sheet cassette is used.

When a sheet of paper is placed in the bypass feed slot, the bypass feed sensor [E] is turned on, and the machine prefeeds the paper until the registration sensor [F] is turned on.

Note: That the bypass feed slot can be used only for copying or for printing from the PC.

2. Paper Lift Mechanism

Standard and Optional Cassette



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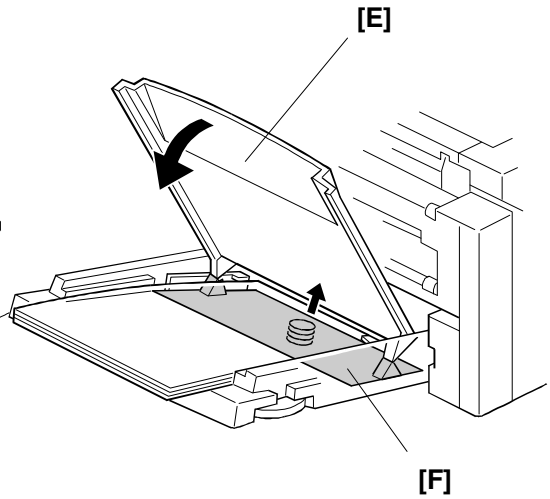


H523D517.wmf

When the standard cassette is closed after paper is loaded, the slide lock [A] is pushed by the projection [B] and comes off the bottom hook [C].

Once the slide lock comes off, the bottom plate is raised by the pressure springs and the top sheet pushes up against the corner separators [D]. This keeps the stack of paper at the correct height.

When the optional cassette cover [E] is closed after paper is loaded, the bottom plate [F] lifts up to push the paper against the feed roller.

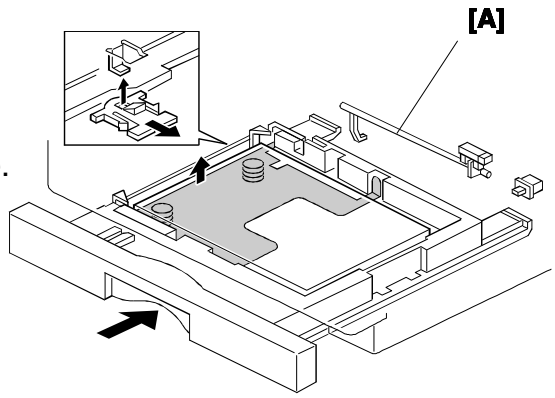
3. Paper Size and Paper End Detection

Standard Cassette

When the cassette runs out of paper, the paper end sensor actuator [A] drops through a slot in the bottom plate.

Selectable cassette paper sizes: A4, Letter (by the user function)

The paper size sensor is not installed for the standard cassette.
Refer to the Operation's Manual for how to set paper size (Function 34).



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Bypass Feed Slot

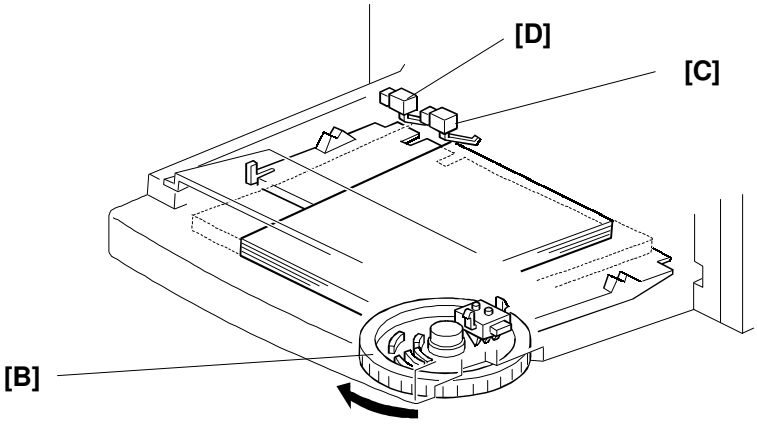
This machine does not detect paper width when the bypass feed slot is used. The maximum feed length for bypass feed is 600 mm. The minimum feedable paper size is 100 mm (width) and 148 mm (length).

Optional Cassette

The paper size detector [B] is located at the right hand side of the optional cassette.

When the optional cassette runs out of paper, the paper end sensor actuator [C] drops through a slot in the bottom plate.

The paper width sensor actuator [D] drops through a slot to detect paper width.



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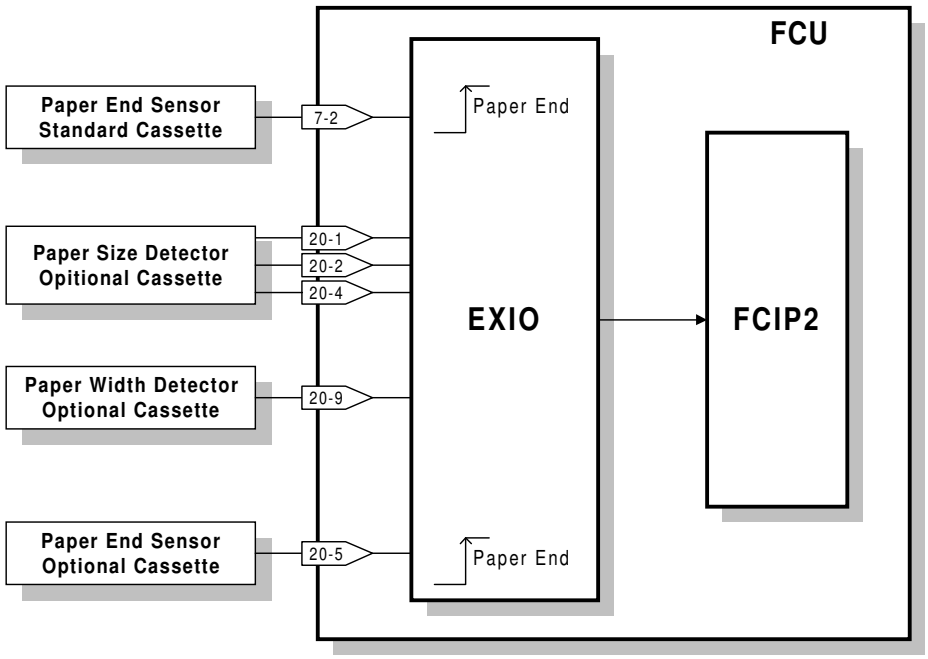
Paper Size / End Detection



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4. Pick-up and Separation

Standard and Optional Cassettes

The pick-up and separation mechanism is a corner separator type.

Cross-reference
Group 3 Facsimile Manual: section 4-5-4

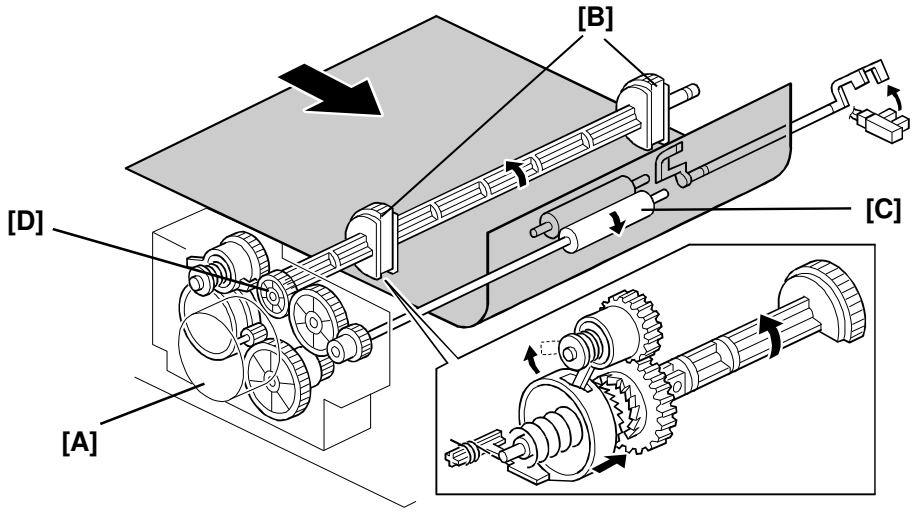
The paper feed motor starts to rotate when the printer is ready for printing.

By-pass Feed Slot

There is no pick-up or separation system in the by-pass feed slot. Only one sheet can be fed from this slot.

5. Drive Mechanism

Standard Cassette



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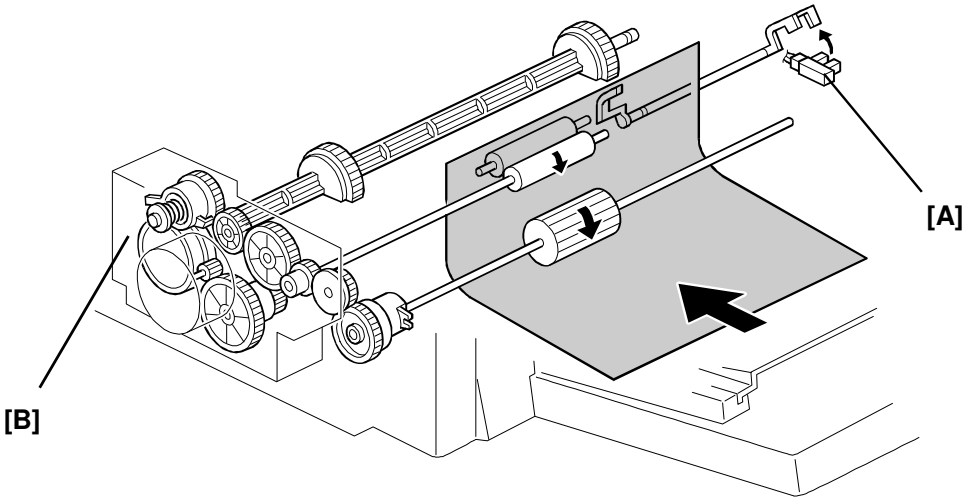
The paper feed motor [A] drives the pick-up and feed mechanism. When the standard cassette is used, the paper feed motor turns clockwise, driving the paper feed rollers [B] and the registration roller [C], as shown in the diagram.

The clutch gear box assembly [D] only allow the paper feed roller to turn only once for each sheet of paper.

While the registration roller turns counter-clockwise, paper cannot be fed into the machine from the Optional cassette or bypass feed slot. This means that if a sheet of paper is placed in the bypass feed slot during printing from the standard cassette, this sheet will not be fed into the machine.

Bypass Feed Slot



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When a sheet of paper is placed in the bypass feed slot, the bypass feed sensor is turned on. The machine turns the paper feed motor counter-clockwise to prefeed the paper until the registration sensor [A] is turned on, or for 1 second, whichever is first.(See section 2-2-8 for a diagram of the registration sensor.)

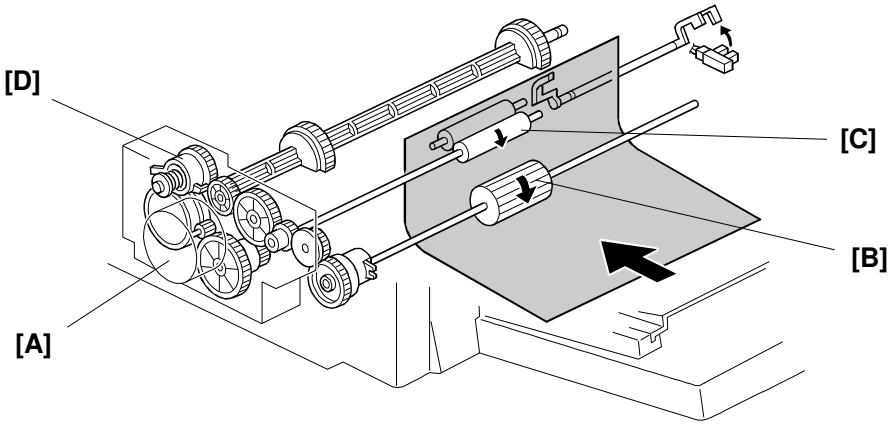
When the paper feed motor turns counter-clockwise, the gear box assembly [B] prevents any drive from being transmittted to the paper feed rollers for the standard cassette.

If a sheet of paper remains in the bypass feed slot for longer than the Auto Reset Time (System Switch 0B), the machine will automatically feed it out. The machine will not print incoming fax messages while there is a sheet of paper in the bypass feed slot, so feeding out the page after the Auto Reset time allows incoming faxes to be printed even if someone leaves paper in the bypass feed slot.

Sheets of paper longer than about 600 mm cannot be fed from the bypass feed slot, or a paper jam will occur (error code 9-81).

Note that the bypass feed slot can be used only for copying and for printing from the PC.

Optional Cassette



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When the machine feeds a sheet of paper from the 100 sheet cassette, the paper feed motor [A] turns counter-clockwise to drive the paper feed rollers [B] and the registration roller [C] as shown in the diagram.

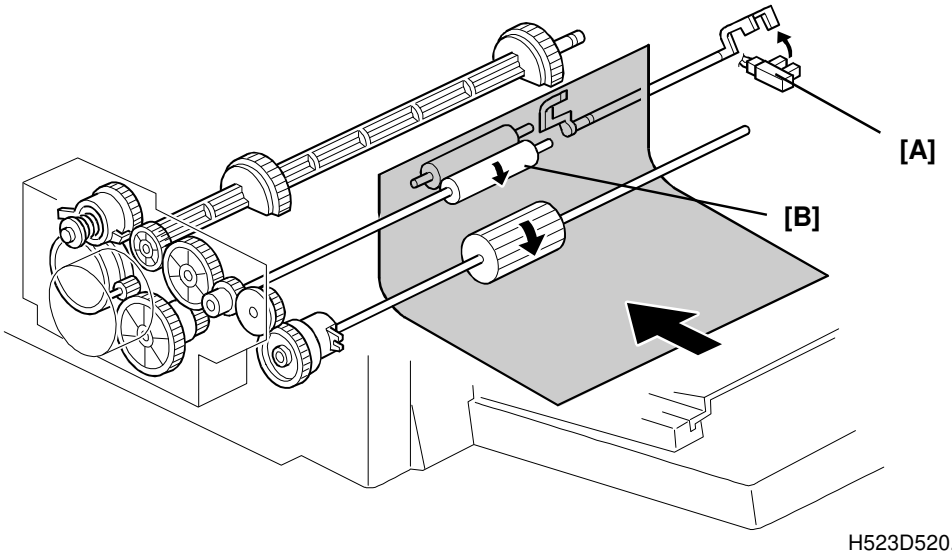
The paper feed clutch [D] ensures that the paper feed roller rotates only once for each sheet of paper.

Paper Feed Priority

If there is an optional cassette installed in the machine, the priority for paper feed is decided in accordance with the following rules.

- The paper in the bypass feed slot has the first priority (for copying and printing from a PC only).
- If the cassettes contain the same paper size, the standard cassette is used first.
- If the cassettes contain different sizes, the machine selects the paper size as explained in section 2-2-13, “Paper Size Selection”.

2.2.8. Registration



H523D520.wmf

The registration sensor [A] is positioned above the registration roller [B].

When a cassette is used, the machine stops the paper feed motor for a few moments when the registration sensor is turned on.

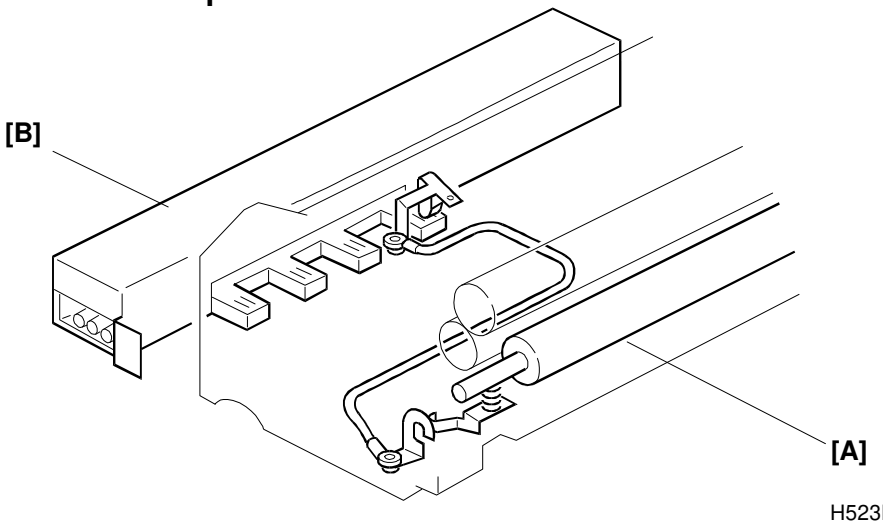
When the bypass feed slot is used, the machine prefeeds the paper until the registration sensor is turned on (or for 1 second, whichever comes first).

Then, the paper feed motor starts rotating immediately after laser scaninng starts.

Jam Detection

	Condition	Error Code
When the standard cassette is used	When the registration sensor is not turned on within 2.0 seconds of the paper feed clutch turning on.	9-07
When the standard, 100 sheet cassette, or bypass feed slot is used	When the paper feed out sensor is not turned on within 5.5 seconds after the paper feed motor starts to feed paper for printing (not for prefeed).	9-08
	When the registration sensor is not turned off within X seconds after it turned on. X seconds = Standard and 100 Sheet Cassette (paper length / 67.11) + 3 seconds (67.11 mm/ s : paper feed speed) Bypass feed slot: 11.94 seconds(600mm)	9-08
	When the paper sensor is not turnded off within 11.94 seconds after feed out sensor is turnde on.	9-09
When the bypass feed slot is used	When the registration sensor is not turned on within 2 seconds after the paper feed motor starts rotating for printing.	9-80
	When the bypass feed sensor is not turned off within 11.94 seconds after it is turned on.	9-81
When the 100 sheet cassette is used.	When the registration sensor is not turned on within 2.0 seconds of the paper feed clutch turning on.	9-82

2.2.9. Transfer and Separation

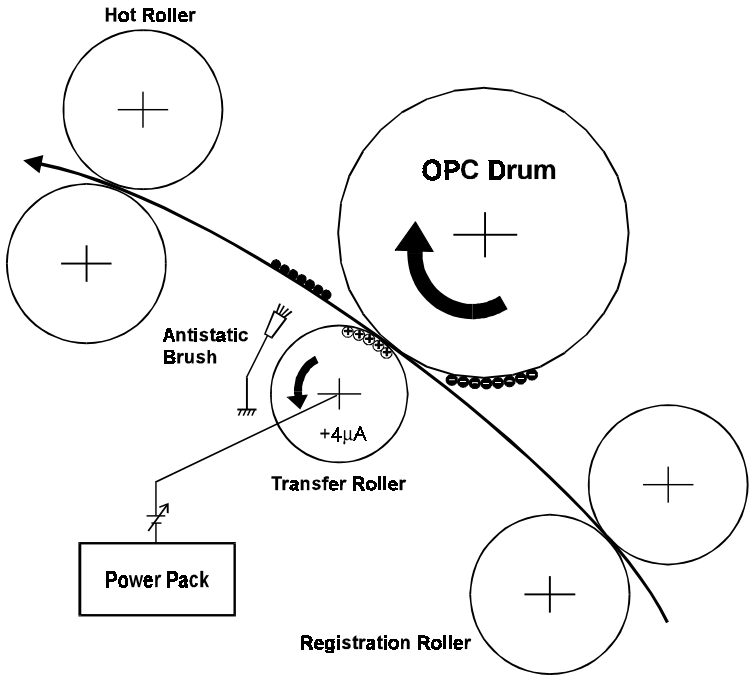


H523D535.wmf

Instead of using a transfer corona wire, this machine uses a transfer roller, which touches the drum surface.

A constant current of +4 ± 0.2 μA is applied to the transfer roller [A] from the power pack [B]. The positively biased transfer roller pulls negatively charged toner off the drum. The curvature of the drum and the antistatic brush helps the paper to drop away from the drum.

Temperature and humidity have less effect on the supply of ions when the transfer current is held constant. With a constant voltage, ions may dissipate in some conditions.



H523D536.wmf

Cleaning Mode

If the paper size is smaller than the printed image, or if a paper jam occurs during printing, toner may be transferred to the the roller surface. To prevent this toner from transferring to the back side of copies, the transfer roller has to be cleaned before the next printing run.

While the machine is in the cleaning mode, the power pack supplies -1000V± 50V to the transfer roller, and charges the drum to -700 V. The negatively charged toner on the transfer roller is then transferred back to the drum.

The machine goes through the cleaning mode in the following conditions:

- At power-up (the process starts when the fusing temperature reaches half of the standby temperature)
- When the cover is opened and then closed during the printing process.
- After a printer jam has been cleared.
- After the bypass feed slot has been used (each page): This is done only if printer switch 00 bit 3 is set to 1.

The cpu controls the transfer roller voltage through the power pack using the Transfer 0 and Transfer 1 signals as shown below (for a circuit diagram, see Bias Control in section 2-2-6).

In	Transfer 0	Low	High	Low	High
	Transfer 1	Low	Low	High	High
Out	Transfer Roller	+ 4 µA	- 1000 V	Off	Off

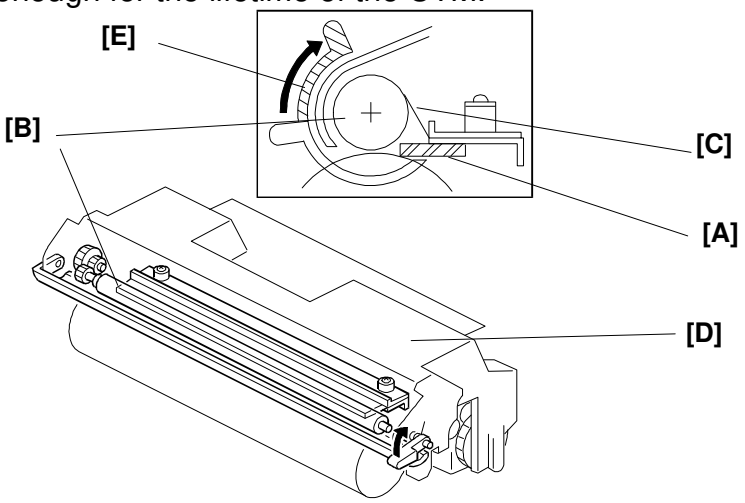
2.2.10. Cleaning

The cleaning unit and the used toner tank are contained in the CTM.

The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. A magnetic roller [B] then brings the toner into the used toner tank [D]. The mylar blade [C] scrapes the toner off the magnetic roller into the used toner tank [D].

When the CTM is removed from the machine, the cleaning roller cover [E] is closed by a spring. This prevents removed toner from falling out of the unit.

There is no used toner overflow detection mechanism because the used toner tank is large enough for the lifetime of the CTM.



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2.2.11. Fusing

Fusing Lamp Control

When the main switch is turned on, the machine turns on the fusing lamp and raises the fusing temperature to 80 °C in about 6 s. For printing, the machine raises the fusing temperature to 185 °C.

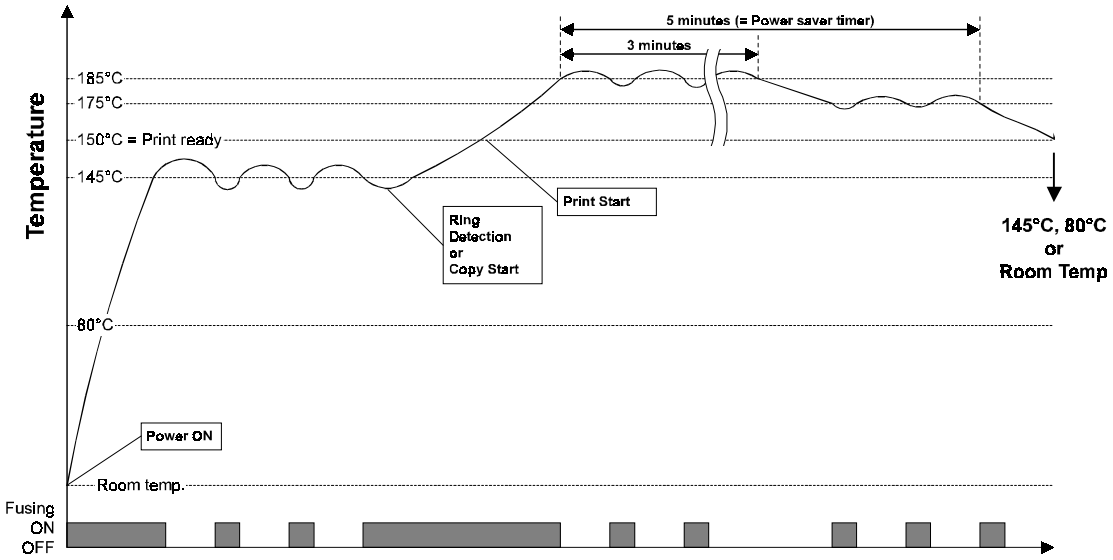
When the power saver timer expires, the machine goes into a power saver mode. In Level 2 Power Saver Mode, the fusing lamp is turned off. For Power Saver Mode Level 1, the user can select whether to keep the fusing lamp off, or at 80 °C or at 145 °C.

Cross Reference:
Power Saver Modes: Section 2-3

If the printing operation continues for more than 3 minutes, the machine keeps the fusing temperature at 175°C.

Points to Note:

- Standby temperature: 145 °C
- Printing start temperature: 150 °C
- Printing temperature: 185 °C (monitored by a comparator)
- Thermistor maximum: 250 °C
- Thermostat maximum: 150 °C (the temperature of the hot roller would be about 400 °C)
- Thermofuse maximum: 169 °C (the temperature of the hot roller would be about 400 °C) - The thermofuse is not used in USA models.



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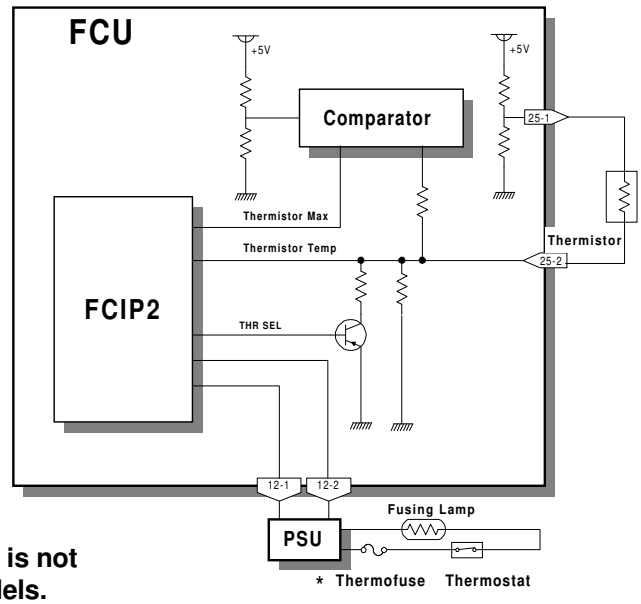
Fusing Control



*** The thermofuse is not used in USA models.**

H523D662.wmf

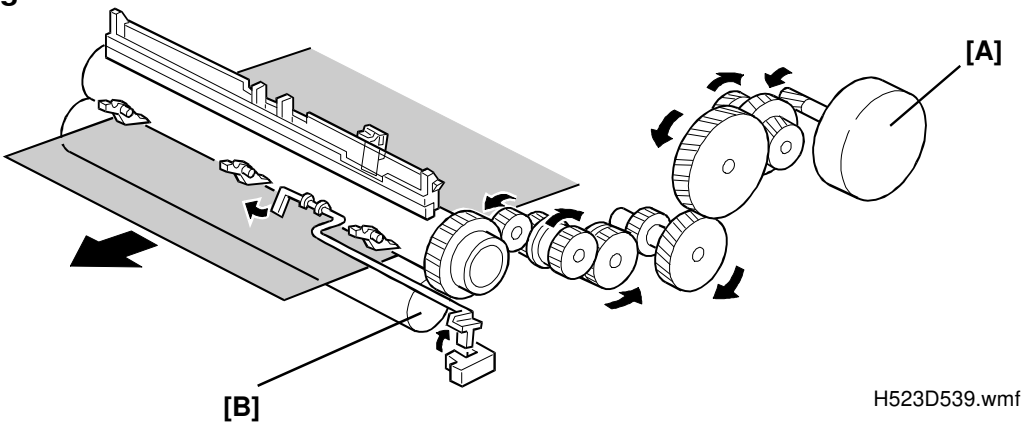
During normal operation, the cpu controls the fusing lamp based on input from the thermistor using the above circuit.

When the machine switches on, or when it comes back from the Level 2 Power Saver Mode, it checks whether the thermistor circuit is intact by temporarily closing the initial detect switch circuit on the FCU. If the thermistor is connected properly, the machine begins normal operation. If it is not, an Auto Service Call (error code 9-22, sub-code 09) is generated.

As a backup safety measure, when the temperature of the hot roller reaches about 400 °C, the thermostat and/or the thermofuse open (the thermofuse is not installed in USA models).

The machine turns on the cooling fan when the fusing temperature reaches 120 °C. It is turned off when the fusing temperature drops below 120 °C.

Fusing Unit Drive



The main motor [A] drives the fusing unit through a gear train. The paper feed-out sensor [B] detects when the paper is fed out of the unit.

Jam Detection - Paper Feed Out

The machine detects a paper jam when the paper feed out sensor is not turned off within X seconds or more after it is turned on (error Code 9-09).

X seconds = (paper length / 67.11) + 3 seconds (67.11 mm/s is the paper feed speed)

These conditions are the same for the standard cassette, bypass feed, and Optional cassette.

Service Call Conditions

	Conditions	Error Code (9-22)
At power on	If there is any problem with the thermistor. (This detection is also done when the machine comes back to the normal mode from the Power Saver Mode Level 2.)	Sub-code 09
Standby mode	If the fusing temperature stays below 70 °C for more than 36 seconds when power saver standby temperature (80 °C) is selected in Power Saver Mode Level 1.	Sub-code 05
	If the fusing temperature takes more than 60 seconds to reach 150 °C from the standby temperature.	Sub-code 02
	Either: If the fusing temperature stays above 110 °C for more than 36 seconds when the power saver standby temperature of 80 °C is selected for Power Saver Mode Level 1. Or: If the fusing temperature stays above 175 °C for more than 36 seconds when the power saver standby temperature of 145 °C is selected for Power Saver Mode Level 1.	Sub-code 0A
During printing	If the fusing temperature stays above 190 °C for more than 60 seconds.	Sub-code 01
	If the fusing temperature comes below 140 °C during printing.	Sub-code 07
After printing	If the fusing temperature takes more than 20 minutes to go down to below 100 °C when the machine goes into the Power Saver Mode Level 2. (When fusing lamp OFF is selected for Power Saver Mode Level 2.)	Sub-code 03
	Either: If the fusing temperature takes more than 20 minutes to go down to below 100 °C when the machine goes into the Power Saver Mode Level 2 (when the power saver standby temperature of 80 °C is selected for Power Saver Mode Level 2.) Or: If the fusing temperature takes more than 20 minutes to go down to the standby temperature (145 °C) when the standby temperature is selected for Power Saver Mode Level 1.	Sub-code 04
At any time	If the fusing temperature reaches 250°C.	Sub-code 08

2.2.12. Page Separation and Data Reduction

Incoming pages that are only slightly longer than the copy paper may be reduced in the sub-scan direction. Whether or not this happens depends on the settings of printer bit switches 04 and 05.

Reduction Enabled

If bit 0 of printer switch 03 is at 1 (Enabled), the data will be reduced in the page memory to fit on the copy paper. However, data will only be reduced if the length of the incoming page is between 5 mm shorter and a certain maximum length. This maximum incoming page length that can be reduced depends on the copy paper size and on the reduction ratio stored in printer switches 04 and 05.

Each paper size can be programmed with a separate reduction ratio. In each of the two bit switches, there is one bit for each possible paper size. The combination of the bit settings determines the ratio for that paper size.

Bit No. / Switch No.	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Not used		Legal	F4	A4	Letter		A5 sideways HLT
Sw 04	0: Not Used	1: 4/3		0: 8/7		1: 12/11		
Sw 05	0:	0:		1:		1:		

The following table shows the maximum incoming page length that can be reduced for each copy paper size. All length are in millimeters. The factory setting of the reduction ratio is 4/3.

USA Model

Copy Paper Type	Copy Paper Length	Maximum reducible incoming page lengths		
		Ratio = 4/3	Ratio = 8/7	Ratio = 12/11
Half-Letter	139.5	179.0	153.2	146.5
Letter	279.2	365.2	313.0	298.7
Legal	355.6	467.0	400.3	382.1

Europe/Asia Model

Copy Paper Type	Copy Paper Length	Maximum reducible incoming page lengths		
		Ratio = 4/3	Ratio = 8/7	Ratio = 12/11
A5	147.8	190.1	162.9	155.3
A4	296.9	388.8	333.2	318.2
F4	330.1	433.2	371.2	354.3

Incoming pages that are longer than the maximum length will not be reduced, but will be printed on two pages and treated in accordance with the setting of bit 1 of bit printer switch 00. If this bit is 1, the bottom few lines of the page will continue from where the first page left off.

Reduction Disabled

If bit 0 of printer switch 03 is at 0 (Disabled), the data will not be reduced. However, if the incoming page is up to x mm longer than the copy paper, the excess portion will not printed. The value of x can be from 0 to 15 mm. It is determined by the setting of bits 4 to 7 of printer switch 03.

Hex value	Value of X
0	0
0	1
and so on until	
F	15

Messages more than x mm longer than the copy paper will be printed out on two pages in accordance with the setting of bit 1 of printer switch 00 as explained earlier.

2.2.13. Paper Size Selection

If there is an optional cassette installed in the machine, the paper size to use is decided in accordance with the following rules.

- If both cassettes contain the same paper size, the 100 sheet cassette will be used.
- If the received page has to be split up and printed on two pages, both pages will be the same size.
- If the cassettes contain different sizes, the paper size chosen for printing the received fax message is selected in accordance with the following table of priorities. The table assumes that reduction is enabled and that the reduction ratio is 4/3.

Received Fax Message Size	Selected Paper Size					
	HLT	A5	LT	A4	F4	LG
Half-Letter	1	2 sideways	4	5	6	7
A5 sideways		1 sideways	3	4	5	6
Letter	7(SR)	6(SR) sideways	1	2	3	4
A4	7(SR)	6(SR) sideways	4(R)	1	2	3
F4	7(SR)	6(SR) sideways	4(R)	3(R)	1	2
Legal	7(SR)	6(SR) sideways	4(R)	3(R)	2(R)	1

- The paper size priority is graded from 1 to 5.
- S: The data has to be separated and printed on more than on page.
- R: The data is reduced to fit on the printer paper.
- Some of the reports can be printed on A5 paper without page separation. However, if only A5 paper is in the cassettes, reports that need larger paper sizes will require page separation.

2.3. SYSTEM FEATURES

2.3.1. Power Saver Modes

- Power Saver Timer -

When the power saver timer expires, the machine automatically goes into a Power Saver Mode. During the power saver mode, the fuisng lamp is turned off or on according to the User Switch 05, bit 6 setting. All the LEDs on the operation panel are turend off and "Saving Energy" is displayed on the LCD.

The CPU is not turned off during the power saver mode.

The machine returns to the standby mode in the following conditions:

- When the document sensor is activated.
- When any key on the operation panel is pressed.
- When the handset goes off-hook.

Cross Reference
Power saver timer initial setting: System Switch 0B, bits 2 and 3
(1 minute, 3 minutes, 5 minutes, or Unlimited: Timer disabled)

The machine will not turn off the fusing lamp if one of the following conditions exists.

- Mechanical error(s)
- Service call error(s)

2.3.2. Automatic Service Calls

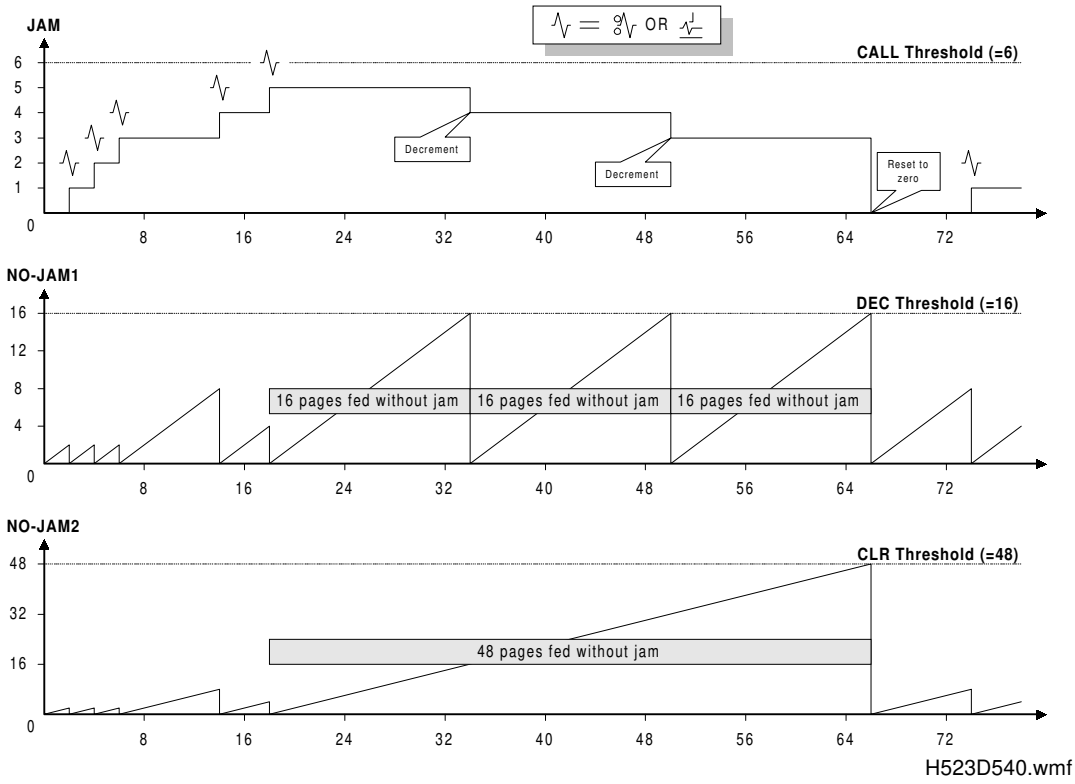
1. Service Call Conditions

The machine makes an automatic service call when one of the following conditions occurs.

Service Call Conditions	Error Code	Sub-code (8003A4H)
Charge corona unit failure	9-17	11 or 12
Laser diode failure	9-20	21
Fusing lamp failure	9-22	01 to 0A
Polygonal mirror motor failure	9-23	31 or 32
Main motor failure	9-24	41 or 42
Excessive jams in the ADF/scanner	None	None
Excessive jams in the printer	None	None
The PM counter has reached the threshold (60,000 prints)	None	None
The PM interval has expired	None	None

Cross reference
Service station number: Service Function 13
Troubleshooting: Chapter 7

2. Excessive Jam Alarms



The excessive jam alarm automatically notifies the service station when the machine's scanner or printer frequently has jam problems.

Each type of jam has three counters allocated to it (JAM, NO-JAM1, NO-JAM2). Each of these counters has a threshold value (CALL, DEC, and CLR respectively; these can be adjusted.) The machine uses these counters to monitor jams as follows.

Each time a jam occurs: The JAM counter is increased by 1, and NO-JAM1 and NO-JAM2 are both set to zero. When JAM reaches CALL (6 by default), the machine sends an Auto Service Report with a System Parameter List.

If a sheet of paper is fed without a jam occuring: NO-JAM1 and NO-JAM2 are both incremented by 1. When NO-JAM1 reaches DEC (16 by default), NO-JAM1 is set to zero, and JAM is decremented by 1. When NO-JAM2 reaches CLR (48 by default), NO-JAM2 and JAM are both reset to zero.

The CALL, DEC, and CLR thresholds can be adjusted for each type of jam by rewriting RAM data. The addresses of these thresholds are given on the next page.

Parameters	Address (H)		Initial Settings	Sys. Para. List
	ADF	Printer		
DEC (1 - 255; 0 = Disabled)	8001E6	8001EA	10 (H)	X
CALL (3 - 15; 0 = Disabled)	8001E7	8001EB	06 (H)	Y
CLR (Low)	8001E8	8001EC	30 (H)	—
(High)	8001E9	8001ED	00 (H)	

Counters	Address (H)		Sys. Para. List
	ADF	Printer	
JAM: Jam counter used to place a service call	8001DE	8001E2	Z
NO-JAM1: Counter used for JAM counter decrement	8001DF	8001E3	—
NO-JAM2: Counter used for clearing the JAM counter	8001E0 (Low)	8001E4 (Low)	—
	8001E1 (High)	8001E5 (High)	

The system parameter list gives the current DEC and CALL thresholds and JAM counter value as X, Y, and Z respectively.

The Call Service indicator does not light for an excessive jam alarm, and the machine can be operated normally after the automatic service call has been made. Also, the counters related to the jam location are reset to zero automatically after the call. Then the alarm is disabled until either bit 3 or bit 4 of address 80033d is reset to zero.

3. Periodic Service Call

The periodic service call notifies the condition of the machine to the service station. The call is made periodically at a time interval programmed in the following RAM addresses.

Parameters		Address (H)
Call interval: 01 through 15 month(s) (BCD) 00: Periodic Service Call Disabled		800262
Date and time of the next call **(Read only)**		
	Year: last two digits of the year (BCD)	800263
	Month: 01 through 12 (BCD)	800264
	Day: 01 through 31 (BCD)	800265
	Hour: 00 through 23 (BCD)	800266

To change these settings after programming, change the call interval. Then the machine automatically changes the remaining parameters by referring to the interval and the current date and time.

The Call Service indicator does not light for a periodic service call, so that the machine can be operated normally after it has sent the service call.

4. PM Call

If PM call is enabled, the machine will make an automatic service call when the PM counter reaches the PM threshold.

Program the PM call interval at the following RAM addresses.
(Default setting: 60,000 sheets)

Address (H)	Bits 7 - 4	Bits 3 - 0
800194	Tens	Units
800195	Thousands	Hundreds
800196	Hundred thousands	Ten thousands

Cross reference
PM call enable/disable: System bit switch 01, bit 0

The Call Service indicator does not light for a PM service call, and the machine can be operated normally after it has made the service call.

5. Effective Term of Service Calls

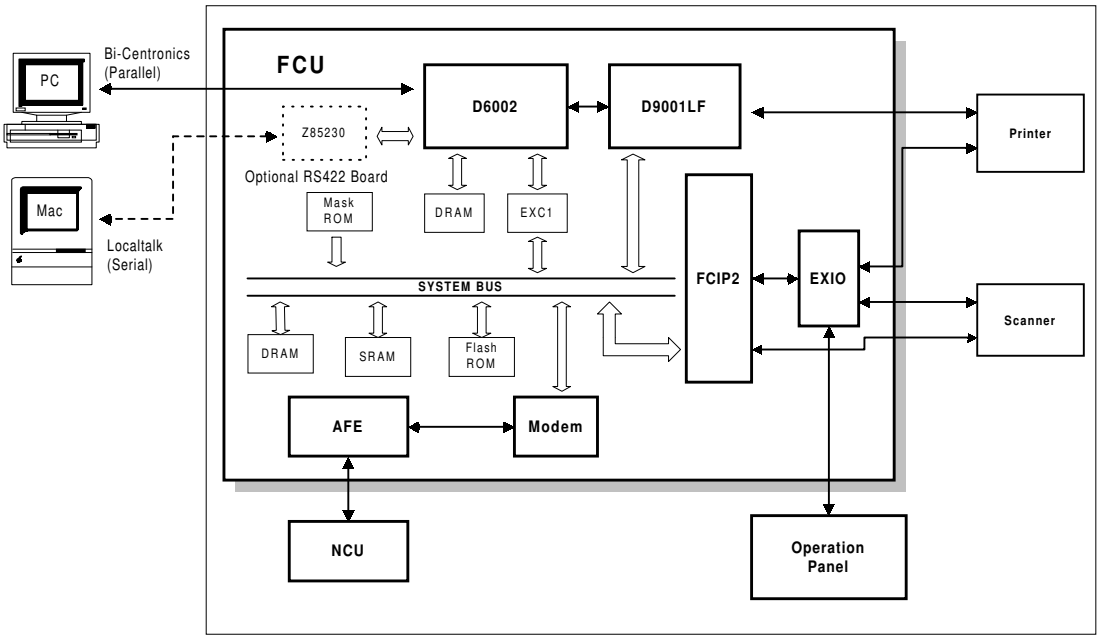
If a time limit for the effectiveness of service calls is programmed, the machine stops making automatic service calls after the time limit.

Program the time limit at the following addresses. This function is disabled when all of these addresses are 00(H).

	Address (H)
Year: last two digits of the year (BCD)	80026D
Month: 01 through 12 (BCD)	80026E
Day: 01 through 31 (BCD)	80026F

2.4. PCBs

2.4.1. FCU



H523D541.wmf

The FCU (Facsimile Control Unit) board contains the FCIP2 (Facsimile Control and Image Processor), DRAM, SRAM, System ROM, and video processing memory, and it controls the entire system.

1. FCIP2 (Facsimile Controller and Image Processor)

- CPU
- Data compression and reconstruction
- Digital image processor
- Laser interface
- DMA controller
- Clock generation
- Stepper motor control
- DRAM backup control
- Fusing lamp control

2. ROM

- 512 kB (4 Mbit) flash ROM for system software storage.
- 128 kB (1 Mbit) mask ROM for LCD and report font and motor tables storage.

3. DRAM

- 1024 kB DRAM shared between the Line Buffer (32 kB), ECM Buffer (64 kB or 128 kB), Page Memory (3 MB), and SAF memory (576 kB).
- Backed up by the battery on the FCU (not available in US).

4. SRAM

- 32 kB SRAM for system and user parameter storage.
- Backed up by the battery on the FCU.

5. Video SRAM

- 32 kB SRAM for video processing.

6. Oscillators

- 29.952 MHz oscillator for system clock generation.
- 32.768 kHz oscillator for the real time clock. This is backed up by the battery on the FCU.
- 38.00053 MHz oscillator for the modem clock.
- 23.9616 MHz and 26.9568 MHz for the printer control clock.

7. EXIO (External I/O)

- Serial interface to the OPU.
- Parallel interface to the main motor, clutches, and sensors.

8. HIC (Hybrid IC)

- 2-4 wire switching
- Filters and amplifiers
- Monitor speaker driver

9. DC/DC Converters

- +5V generation
- - 5V generation

10. Interlock Switches

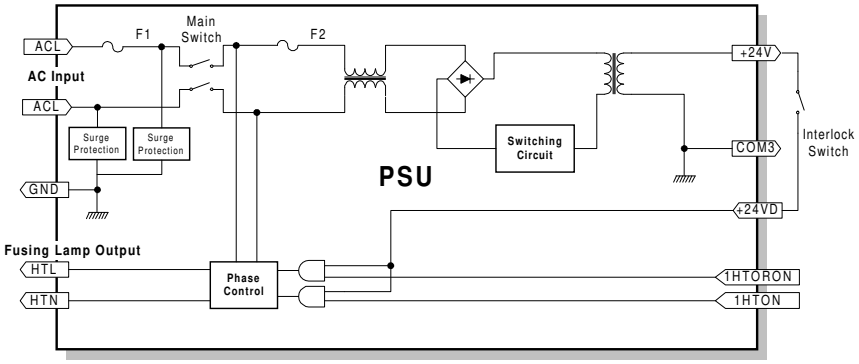
- The fusing unit interlock switch (+24V) disables the power supply to the drive components and the power pack.
- The fusing unit interlock switch (+5V) disables the power supply to the laser diode unit.

11. Jumpers, Switches, and Test Points

Item	Description
CN40-1	Analog video signal
CN40-2	Scanner clock
CN40-3	Synchronization signal
CN40-4	COM1 ground
TB1	Switches the system backup battery ON/Off. **Note:** Make sure to short these pins when you replace the FCU.

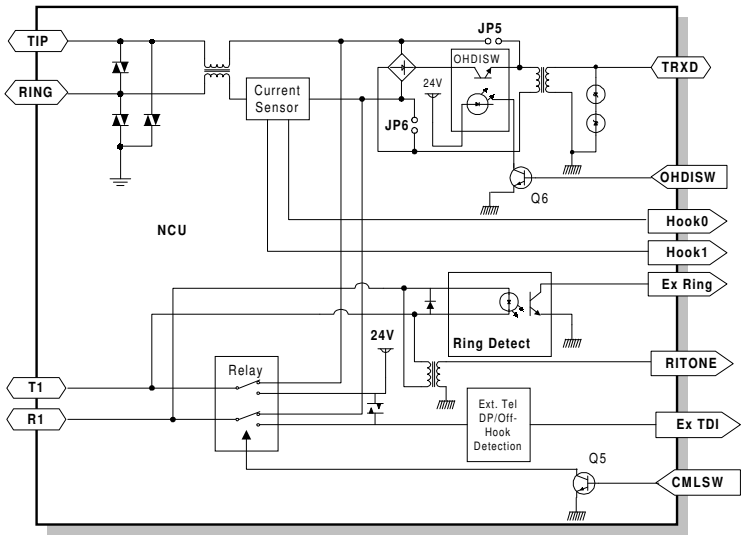
2.4.2. PSU

- +24Vdc generation
- Fusing lamp ac power supply and control.



H523D542.wmf

2.4.3. NCU (USA)

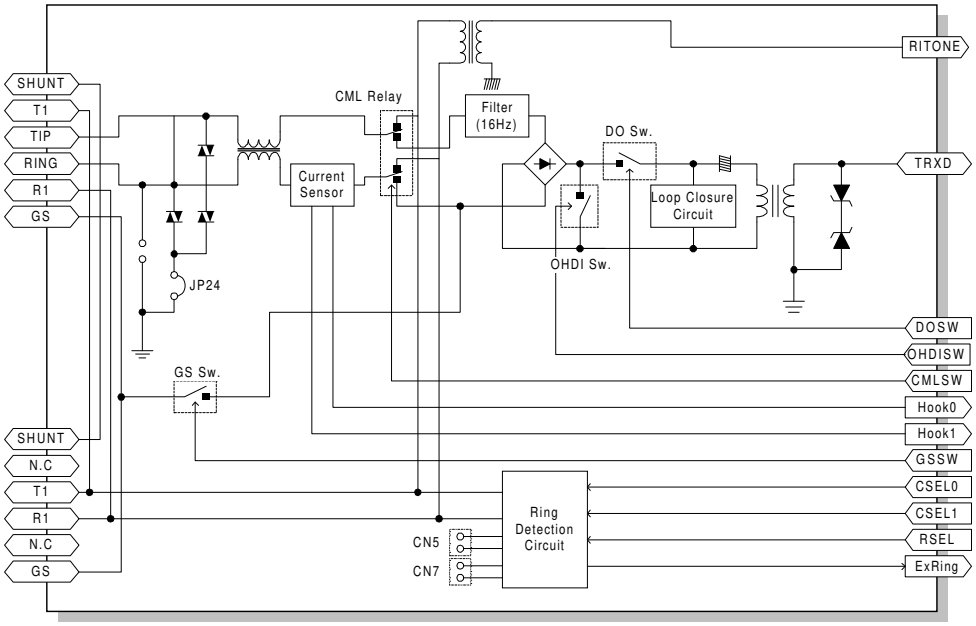


H523D550.wmf

1. Jumpers

Item	Description
JP5	These jumpers should be shorted when the machine is connected to a dry line.
JP6	

2.4.4. NCU (Europe/Asia)



H523D551.wmf

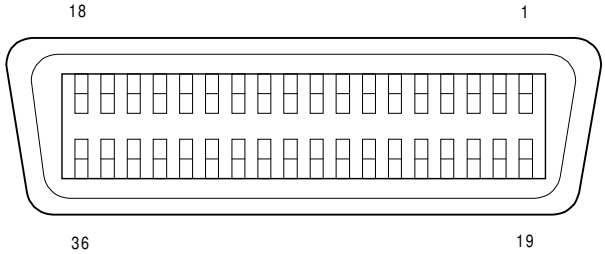
1. Control Signals and Jumpers

Country	CSEL0 CN2-4	CSEL1 CN2-5	RSEL CN1-13	JP24	CN5	CN7
Germany	L	H	H	S	O	O
Holland	L	H	H	S	O	O
Austria	L	H	H	S	O	O
Italy	L	L	L	S	O	O
Spain	L	L	L	S	O	O
Ireland	H	L	L	S	S	S
Finland	L	H	L	S	O	O
Switzerland	L	H	L	O	O	O
Other	L	H	L	S	O	O
	L: Low, H: High			**S: Short, O: Open**		

2.4.5. Interface

1. Host Interface

Parallel Interface

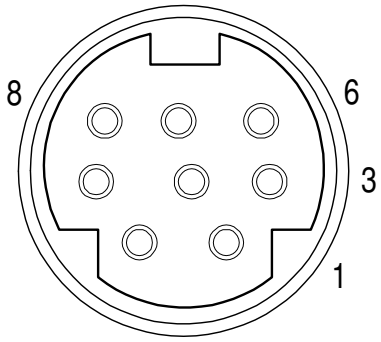


H523D600.wmf

A 36 pin D-SUB Centronics connector (female).

SIGNAL PIN	SIGNAL NAME
1	/STROBE (I)
2-9	DATA1-8 (I)
10	/ACK (O)
11	BUSY (O)
12	PE (O)
13	SELECT (0)
14	/AUTOFEED (I)
15	NC
16	GND
17	CHASSIS GND
18	NC
19-30	GND
31	/INIT (I)
32	/ERROR (O)
33	GND
34	NC
35	+5V
36	/SELECTION (I)

2. RS422



H523D601.wmf

An 8 pin female connector (DIN-8).

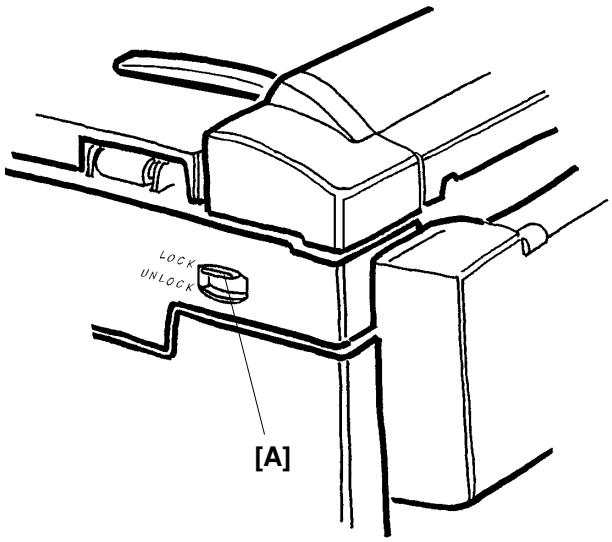
PIN NO.	SIGNAL NAME	DESCRIPTION
1	HSK (0)	Handshake
2	HSK (0)	Handshake
3	TXD- (O)	Transmit data —
4	GND	Signal ground
5	RXD- (I)	Receive data —
6	TXD+ (O)	Transmit data
7	N.C.	No connection
8	RXD+ (I)	Receive data +

3. INSTALLATION

3.1. INSTALLING THE MACHINE

Refer to the Operator's Manual for the installation environment and how to install and set up the machine.The lever [A] prevents the scanner from moving during transportation.

Push down this lever [A] to the "UNLOCK" position before power-on.



H523I001.img

Important:

1. If you forget to "UNLOCK" the scanner, the SC (Service Call) message will appear on the display.
   If this happens, turn off the machine and unlock the scanner before turning back on.
2. If you want to move the machine to a different location, you have to lock the scanner by pushing up the lever [A] to the "LOCK" position, before transportation.

3.2. INITIAL PROGRAMMING

Items to Program (Service Level)	Function No.
Country code (NCU parameter 00)	Function 08
Country code (System switch 0F)	Function 01
Protocol requirements (G3 switch 0B)	Function 01
PABX access code (RAM address 8000B6)	Function 06
PABX access method (RAM address 8000AD)	Function 06
Machine's serial number	Function 14
Service station's fax number	Function 13
PM call (System switch 01 - bit 0)	Function 01
Periodic service call (RAM address 800021)	Function 06

Items to Program (User Level)	Function No.
Clock	Function 91
Intial programming items	Function 61
On/off switches	Function 62
Display/report language	Function 93
Fusing power control during energy saver mode (User parameter switch 05 - bit 6)	Function 63

3.3. INSTALLING OPTIONAL UNITS

A multi-feeder unit is available for this machine. Refer to the Operator's Manual for how to install and set up the paper feed unit.

4. SERVICE TABLES AND PROCEDURES

4.1. SERVICE LEVEL FUNCTIONS

In this section, frequently used keys are referred to with the following symbols.

- Start key
- Stop key
- Function key
- Yes key
- No key
- Up arrow key
- Down arrow key
- Right arrow key
- Left arrow key

4.1.1. Bit Switch Programming (Function 01)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION      KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 0 1 Yes

   Bit 7 is displayed at the left, and bit 0 at the right.

```
SYS DF    :  0000 0000
BITSW 00:    0000 0000
```

3. Scroll through the bit switch menu: * or #

   Example: To see the communication switches : # × 3
   Then scroll through the bit switches.
   Increment bit switch:
   Decrement bit switch:
   Example: Display bit switch 3: x 3

```
COM DF   :   0000 0000
BITSW 00:    0000 0000
```

4. Adjust the bit switch.

   Example: To change the value of bit 7, press 7

```
COM DF   :   0000 0000
BITSW 03:    1000 0000
```

5. Either:
   - Adjust more bit switches - go to step 3.
   - Finish - Function

Service Tables

4.1.2. System Parameter List (Function 02)

1. Function 6 1 9 9 5
   then immediately Yes
2. 0 2 Yes ◇
3. Finish: Function

```
FUNCTION      KPAD/NEXT
    SERVICE FUNCTIONS
```

4.1.3. Error Code Display (Function 03)

1. Function 6 1 9 9 5 ,
   then immediately Yes
2. 0 3 Yes
3. Either:
   Scroll through the error codes - ▶ or ◀
   Finish - Function

```
FUNCTION      KPAD/NEXT
    SERVICE FUNCTIONS
```

```
ERROR CODE      <  >
 1-01  JAN 01 17:30
```

4.1.4. Service Monitor Report (Function 04)

1. Function 6 1 9 9 5
   then immediately Yes
2. 0 4 Yes ◇
3. Finish: Function

```
FUNCTION      KPAD/NEXT
     SERVICE FUNCTIONS
```

4.1.5. Protocol Dump (Function 05)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
   SERVICE FUNCTIONS
```

2. 0 5 Yes

```
                    START
PROTOCOL DUMP
```

3. ◈

4. Finish: Function

4.1.6. RAM Display/Rewrite (Function 06)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
   SERVICE FUNCTIONS
```

2. 0 6 Yes

```
0-MEM.R/W 1-MEM.DUMP
```

3. 0

```
 ADDRESS = 000000
  DATA = 00
```

4. Input the address that you wish to see.
   Example: Address 800020
   8 0 0 0 2 0
   Note: If you wish to move the cursor, press ▶ .

```
 ADDRESS = 800020
  DATA = 20
```

5. If you wish to change the data, type in the new data.
   Example: 80, press 8 0
   Note: If you wish to move the cursor, press ▶
   Pressing # will increment the number at the cursor by one.
   Pressing * will decrement the number at the cursor by one.

```
 ADDRESS = 800020
  DATA = 80
```

6. Either:

Service Tables

- View more addresses - go to step 4.
- Finish - [Function]

4.1.7. RAM Dump (Function 06)

1. [Function] [6] [1] [9] [9] [5]
   then immediately [Yes]

```
FUNCTION      KPAD/NEXT
    SERVICE FUNCTIONS
```

2. [0] [6] [Yes]

```
0-MEM.R/W 1-MEM.DUMP
```

3. [1]

```
MEMORY DUMP   START/N
ADD.000000 - 0000FF
```

4. Enter the first four digits of the start and end addresses . For example, enter “8000” for start address 800000(H), and enter 8001 for end address 8001FF(H). Then, press “Start” to print the dump list.

   Example: Start at 800000, end at 8001FF.
   [8] [0] [0] [0] [8] [0] [0] [1] [◇] .

```
MEMORY DUMP  START/N
ADD. 800000- 8001FF
```

5. Finish: [Function]

```
MEMORY DUMP
```

4.1.8. Counter Display/Rewrite (Function 07)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION      KPAD/NEXT
    SERVICE  FUNCTIONS
```

2. 0 7 Yes

```
0-COUNTER       1-PM
2-DTM           3-OPU
```

3. Either:
   Check the transmitted, received, scanned and printed page counters, and the printer and scanner jam counters - press 0

```
TX:             012345
RX:             012345
```

   (To see the scanned and printed page counters, press #.

```
SCAN     :    012345
PRINT    :    012345
```

   To see the printer and scanner jam counters, press # again.)

```
S.JAM:          000000
P.JAM:          000000
```

   Check the PM counter - press 1

```
PM COUNTER:  001234
```

   Check the DTM counter - press 2

```
DTM COUNTER: 001234
```

   Check the OPC counter - press 3

```
OPU COUNTER:       001234
```

4. To change the contents of a counter, input the new value, then press Yes .
5. To finish: Function

4.1.9. NCU Parameters (Function 08)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION      KPAD/NEXT
    SERVICE  FUNCTIONS
```

2. 0 8 Yes
3. 0

```
0-NCU          1-MODEM
2-DTMF         3-DETECT
```

4. Scroll through the parameters using ▶ or ◀ . If you want to change a value, enter the new value at the keypad, then press Yes .
   Example: Set NCU parameter 04 to 005.
   ▶ ▶ ▶ ▶ 0 0 5 Yes

```
NCU                KPAD/<>
    NO.04 = 005
```

5. To finish : No Function.

Note: Parameter CC is the Country Code, Parameter 01 is the Tx level. Refer to section 4.3 for full details on NCU parameters.

4.1.10. Modem Test (Function 08)

Note: You must install the speaker (H5155049) and the harness (H5235311) to perform this test. (Refer to section 6.6.6)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 0 8 Yes

```
0-NCU          1-MODEM
2-DTMF         3-DETECT
```

3. 1

```
MODEM TEST START/<  >
 800Hz
```

4. Scroll through the available tests using ▶ or ◀ .
5. ◇
6. To stop the test: ▽
7. To finish: No Function

4.1.11. DTMF Tone Test (Function 08)

Note: You must install the speaker (H5155049) and harness (H5235311) to perform this test. (Refer to section 6.6.6)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 0 8 Yes

```
0-NCU       1-MODEM
2-DTMF      3-DETECT
```

3. 2

```
 DTMF TEST   START/<>
  TONE  0
```

4. Scroll through the available tests using ▶ or ◀ .
5. ◇
6. To stop the test: ▽
7. To finish: No Function

4.1.12. Modem Detection Test (Function 08)

Note: This function can be used only when G3 bit switch 0B bit 5 (French PTT requirements) is 1 in European models. It cannot be used in USA models.

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 0 8 Yes

```
0-NCU       1-MODEM
2-DTMF      3-DETECT
```

3. 3

```
 MODEM DET   START/<>
  V21 300BPS
```

4. Scroll through the available tests using ▶ or ◀
5. ◇
6. To stop the test: ▽
7. To finish: Function

4.1.13. Operation Panel Test (Function 09)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 0 9 Yes

```
0-LED/LCD
```

3. 0
4. ◇
5. To stop the test, press ▽
6. To finish: No Function

4.1.14. LED Array Test (Function 10)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 0 Yes

```
0-LAMP      1-ADF
2-BOOK      3-VIDEO
```

3. 0
4. ◇

```
                  START
LAMP          0 0 0
```

5. To stop the test, press ▽
6. To finish: No Function

4.1.15. ADF Test (Function 10)

1. Function 6 1 9 9 5 then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 0 Yes

```
0-LAMP      1-ADF
2-BOOK      3-VIDEO
```

3. 1

```
                  START
 ADF
```

4. Place a document in the feeder, then press ◇.
5. To stop the test, press ▽
6. Finish: No Function

4.1.16. Book Mode Scanner Test (Function 10)

1. Function 6 1 9 9 5 then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 0 Yes

```
0-LAMP      1-ADF
2-BOOK      3-VIDEO
```

3. 2

```
                  START
BOOK
```

4. Press ◇.
   One book mode scan cycle is perfoemed, then the machine stops.
   If you wish to stop the test before this, press ◇.
5. Finish:Finish: No Function

4.1.17. Image Sensor Signal Check/Sampling Clock Reset (Function 10)

Do the following after replacing the contact image sensor unit or the FCU. (Also after RAM reset level 1.)

1. Function 6 1 9 9 5
then immediately Yes

```
FUNCTION    KPAD/NEXT
   SERVICE FUNCTIONS
```

2. 1 0 Yes

```
0-LAMP       1-ADF
2-BOOK       3-VIDEO
```

3. 3

```
                    START
 VIDEO
```

4. Press ◇ .

```
                      STOP
VD  AAA   BBB   CDE FGH
```

Four numbers are displayed on the bottom line of the LCD.

- AAA: Sensor output while scanning (lamp on) the white shading sheet.
- BBB: Sensor output while scanning (lamp on) the black sheet on the exposure glass.
- C: Not used (always 0).
- D: Scanner data offset value.
- E: Selected scanner clock (scanner sampling clock).
- FGH: Result (error code).

Result	Error Details
000	OK
001 002	BBB is out of the specified range
003	AAA is out of the specified range
004	D is out of the specified range.

5. To stop the test: ▽

6. Finish: No Function

4.1.18. Printer Test Patterns (Function 11)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
     SERVICE FUNCTIONS
```

2. 1 1 Yes

```
0-PATTERN   1-MECH
```

3. 0

```
PATTERN PRINT  KPAD
   0-4
```

5. Press a key from 0 to 4.

6. Press ◇ .
   A test pattern is printed.

7. To finish: No Function

4.1.19. Printer Mechanism Test - Free Run (Function 11)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION   KPAD/NEXT
 9 SERVICE FUNCTIONS
```

2. 1 1 Yes

```
0-PATTERN   1-MECH
```

3. 1

```
                  START
 MECH
```

4. ◇

5. To stop the test, press ▽

6. To finish: No Function

4.1.20. RAM Tests (Function 12)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 2 Yes

```
0-SRAM       1-SAF
2-SAFCARD    3-M->R
```

3. Either:

   Test the SRAM: Press 0 ◈

   Test the SAF: Press 1 ◈

   Test the SAF card: Press 2 ◈

   If test is successful, the display shows “OK”.
   If test is unsuccessful, the display shows “ADDRESS=”.

4. To finish: No Function.

4.1.21. Software Download (Function 12)

This function copies software from an external medium to the Flash ROM on the machine's FCU. The external medium for the new software can be an FCU or an EPROM board.

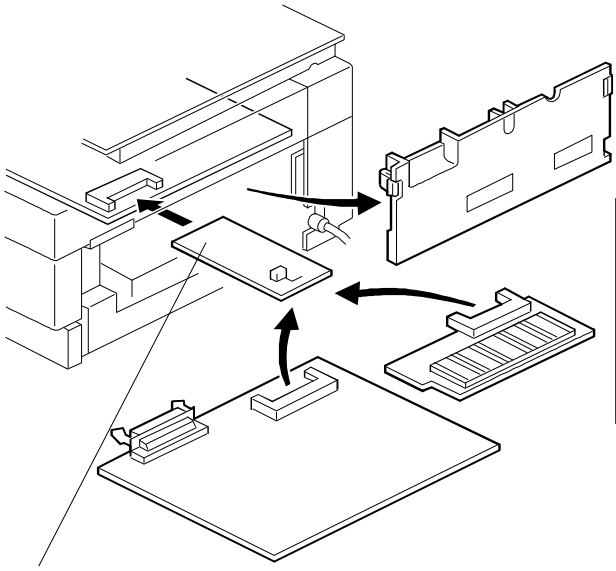
If you are using the EPROM board, you must mount an 1M bit EPROM which contains the LCD wording and also a 4M bit EPROM which contains the machine's program. This is because the machine starts up from the external medium when it is used.

The 1M bit EPROM must contain the same program as the 1M bit Mask ROM on the FCU, and the 4M bit EPROM must contain the new software to be downloaded.

Note:
The new Flash/SRAM data copy board (P/N: A1939351) must be used for this procedure.

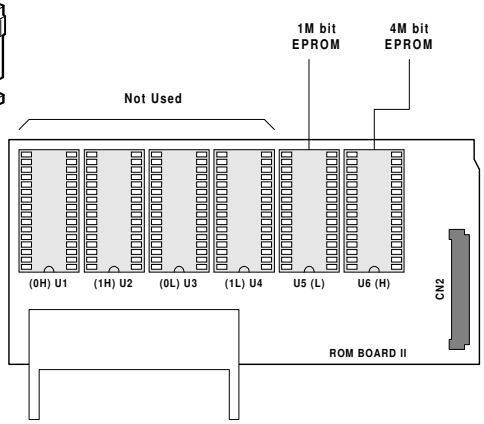
Cross Reference Special Tools and Lubricants: Section 5.1 FCU (ROM): Section 2.4.1

1. Turn off the machine.



H523m501.wmf

Data Copy Tool P/N:A1939353 or H5159100



H523m502.wmf

Data Copy Board P/N: A1939351

2. If the new software is downloaded from an EPROM board, mount the 4M bit EPROM and 1M bit EPROM in the correct ROM sockets as shown in the above diagram.

Note: The switch [D] on the tool [A] must be at the **ON** position.

3. Turn on the machine.
4. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION     KPAD/NEXT
     SERVICE  FUNCTIONS
```

5. 1 2 Yes

```
0-SRAM       1-SAF
2-SAFCARD    3-M->R
```

6. 4
7.
   If the software is successfully downloaded, the display shows "**OK**".

```
OK!!
COPY    MACH <- FLROM
```

   If the software download fails, the display shows "**NG**".

```
NG!!
COPY    MACH <- FLROM
```

8. To finish, press Function.
9. Turn off the machine and disconnect the tool. Then turn the machine back on.
10. Print out the system parameter list and check the ROM version on it.

4.1.22. Software Upload (Function 12)

This function copies the software from the machine's built-in FCU to an external FCU.

1. Turn off the machine.
2. Connect the Flash/SRAM Copy Tool and an FCU as shown in the previous section.
   Note: The switch [D] on the tool must be at the **OFF** position.
3. Turn on the machine.
4. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION     KPAD/NEXT
     SERVICE  FUNCTIONS
```

5. 1 2 Yes

```
0-SRAM       1-SAF
2-SAFCARD    3-M->R
```

6. 3 ◇
   If the software is successfully uploaded, the display shows "**OK**".

```
OK!!
COPY    MACH -> FLROM
```

   If the software upload fails, the display shows "**NG**".

```
NG!!
COPY    MACH -> FLROM
```

7. Finish : Function
8. Turn off the machine and disconnect the tool. Then turn the machine back on again.

4.1.23. SRAM Data Download (Function 12)

This function copies all the data stored in the SRAM on an external FCU to the machine's FCU. Use this after replacing a damaged FCU to save any previous settings that were programmed in the damaged FCU.

1. Turn off the machine.
2. Connect the Flash/SRAM Copy Tool [A] and the damaged FCU [C] as shown in section 4.1.20.

   Note: The switch [D] on the tool could be either ON or OFF.

3. Turn on the machine.
4. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

5. 1 2 Yes ▶

```
0-SRAM      1-SAF
2-SAFCARD   3-M->R
```

6. 5
7. ◇
   If the SRAM data is successfully downloaded, the display shows "**OK**".

```
OK!!
COPY    MACH <- SRAM
```

   If the SRAM download fails, the display shows "**NG**".

```
NG!!
COPY    MACH <- SRAM
```

8. Finish : Function
9. Turn off the machine and disconnect the tool. Then turn the machine back on.

4.1.24. Serial Number (Function 14)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 4 Yes

```
SERIAL #        KPAD
■■■■■■■■■■■■■
```

3. Enter the machine's serial number at the keypad.
   To correct a mistake: No

```
SERIAL #    KPAD/Y/N
 RICOH 1234567
```

4. If the display is correct: Yes
5. Finish: Function

4.1.25. Service Station Fax Number (Function 13)

1. Function 6 1 9 9 5
   then immediately Yes

```
FUNCTION    KPAD/NEXT
    SERVICE FUNCTIONS
```

2. 1 3 Yes

```
S.S. NO.        KPAD
 _
```

3. Input the telephone number of the service station that will receive Auto Service calls from this machine.

   To erase the telephone number: press No

```
S.S. NO.        KPAD
 2125555242
```

4. If the display is correct: Yes Function

4.2. BIT SWITCHES

⚠WARNING

Do not adjust a bit switch that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

Note: Default settings for bit switches are not listed in this manual. Refer to the System Parameter List printed by the machine.

4.2.1. System Switches

System Switch 00

No	FUNCTION	COMMENTS
0 1	RAM Reset **Bit 1 Bit 0 Reset Level** 0 0 No reset 0 1 Reset Level 2 1 0 Reset Level 3 1 1 Not used	**Reset Level 3:** Erases all image data files stored in the SAF memory and communication files (e.g. polling rx files). This setting is recommended for use when it is necessary to clear the SAF. **Reset Level 2:** In addition to those items erased by Reset Level 3, the following items are erased: bit switches, RTI/TTI/CSI, report data, programmed telephone numbers (Quick/Speed/ Groups, service station, etc.), NCU parameters. After erasing, the machine changes these two bits back to 0 automatically. **No reset:** Normal operation **Cross reference** **RAM Reset Level 1 (Factory reset):** Change the data in RAM address 800005(H) to FF(H), then turn the machine off and on. In addition to those items erased by Reset Level 2, the clock and scan/print registration settings are erased.

System Switch 00		
No	**FUNCTION**	**COMMENTS**
2	Technical data printout on TCR (Journal) **0:** Disabled **1:** Enabled	1: Instead of the personal code, the following data are listed on the TCR for each analog G3 communication. e.g. V17 14 01 03 00 02 **First number:** Final modem type used **Second number:** Final modem rate (for example, 14 means 14.4 kbps) **Third and fourth numbers:** Line quality data. Either a measure of the error rate or the rx level is printed, depending on the bit 3 setting below. (An M on the report indicates that it is error rate, and an L indicates Rx level.) The left hand figure is the high byte and the right hand figure is the low byte (see the note below this table for how to read this value). If it is a measure of the error rate; a larger number means more errors. **Fifth number (rx mode only):** Total number of error lines that occurred during non-ECM reception. **Sixth number (rx mode only):** Total number of burst error lines that occurred during non-ECM reception. The fifth and sixth numbers are fixed at 00 for transmission records and ECM reception records.
3	Line quality data output method **0:** Measure of error rate (during image data transmission only) **1:** Rx level	This bit determines the data type to be printed on the TCR (Journal) when technical data printout is enabled by bit 2 above.
4	Line error marks **0:** Disabled **1:** Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occurred in the data. Such errors are caused by a noisy line, for example.
5	Communication parameter display **0:** Disabled **1:** Enabled	This is a fault-finding aid. The LCD shows the key parameters (see the next page). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output after each communication **0:** Off **1:** On	This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing.
7	Protocol dump list output after each communication	This is only used for communication troubleshooting.It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing.

How to calculate the rx level listed on the TCR (when bit 2 of system switch 00 is set to 1)

Example: V29 96 **L 01 0C** 00 00

The four-digit hexadecimal value (N) after L indicates the rx level. Divide the decimal value of N by -16 to get the rx level.

In this example, the decimal value of 010C(H) is 268.
So, the actual rx level is 268/16 = -16.75 dB.

Communication Parameters

Mode	DCS: ITU-T standard NSS: Non-standard G3
Modem rate	144: 14400 bps 120: 12000 bps 96: 9600 bps 72: 7200 bps 48: 4800 bps 24: 2400 bps
Communication mode	ECM: With ECM SSC: Using SSC EFC: Using EFC NML: With no ECM, SSC, or EFC
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Resolution	SSF: Fine, transmitted at 200 x 400 dots per mm DTL: Detail, transmitted at 200 x 200 dots per mm STD: Standard, transmitted at 200 x 100 dots per mm
I/O rate	0M: 0 ms/line 10M: 10 ms/line 2/M: 2.5 ms/line 20M: 20 ms/line 5M: 5 ms/line 40M: 40 ms/line
Width	A4: A4 (8.3"), no reduction

System Switch 01		
No	**FUNCTION**	**COMMENTS**
0	PM call **0:** Disabled **1:** Enabled	This bit switch determines whether the machine will send an Auto Service Call to the service station when it is time for PM. **Cross reference** Auto service calls: Section 2.3.2
1-7	Not used	Do not change the settings.

System Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Memory file transfer **0:** Disabled **1:** Enabled	**1:** All messages in the memory (including confidential rx messages) are sent to the fax number which is programmed as the service station. Always reset this bit to zero after transfer. **Cross reference** Service station number programming: Function 13
1-2	Not used	Do not change the setting.
3	Memory file printout **0:** Disabled **1:** Enabled	**1:** All SAF files, including confidential messages, can be printed using Function 54 or 55. Always reset this bit after printing the messages.
4-5	Not used	Do not change the settings.
6 **7**	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

System Switch 03		
No	**FUNCTION**	**COMMENTS**
0 **to** **7**	Length of time that RDS is temporarily switched on when bits 6 and 7 of System Switch 02 are set to "User selectable"	00 - 99 hours (BCD). This data is only valid if bits 6 and 7 of System Switch 02 are set to "User selectable". The default setting is 24 hours.

System Switch 04		
No	**FUNCTION**	**COMMENTS**
0 **to** **2**	LCD contrast **Bit 2 1 0 Contrast** 0 0 0 Brightest 0 0 1 ↓ ↓ ↓ 1 1 0 ↓ 1 1 1 Darkest	Use these bit switches to adjust the contrast of the LCD on the operation panel.
3	Dedicated transmission parameter programming **0:** Disabled **1:** Enabled	This bit must be set to 1 before changing any dedicated transmission parameters.
4	Not used	Do not change the settings.

System Switch 04		
No	**FUNCTION**	**COMMENTS**
5	OPC (DTM) replacement level **0:** User **1:** Service	**0:** The machine asks the user to replace the OPC drum at 20,000 print intervals (default interval). After the user replaces the drum, the machine asks the user if the drum is replaced or not. If the user answers yes, the machine resets the OPC counter to zero. The drum replacement interval is programmed at addresses 8001E5 to 8001E7(H). **1:** The machine will not ask the user to replace the drum.
6	CSI programming level **0:** User level **1:** Service level	**1:** The CSI can only be programmed using a service function.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Telephone line type selection can only be programmed using a service function.

System Switch 05		
No	**FUNCTION**	**COMMENTS**
0-1	Not used	Do not change the settings.
2	Display of both RTI and CSI on the LCD **0:** Disabled **1:** Enabled	**1:** Both RTI and CSI will be displayed alternately on the LCD.
3-7	Not used	Do not change the settings.

System Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Use of the Stop key during memory transmission **0:** Disabled **1:** Enabled	**1:** Memory transmissions can be stopped by pressing the Stop key. However, users might accidentally cancel another person's memory transmission in progress.
1-3	Not used	Do not change the settings.
4	Use of the Stop key during memori transmission **0:** Disabled **1:** Enabled	**1:** Memory transmissions can be stopped and the file can be cleared by pressing the Stop key. When the Stopkey is pressed, the guidance (Stop & CLR FILE?) appears on the LCD.
1-7	Not used	Do not change the settings.

System Switch 07 - Not used (do not change the settings)
System Switch 08 - Not used (do not change the settings)

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the setting.
1	Inclusion of communications on the TCR when no image data was exchanged. **0:** Disabled **1:** Enabled	0: Communications which reached phase C (message tx/rx) of the T.30 protocol are listed on the TCR (Journal). **1:** Communications which reached phase A (call setup) of T.30 protocol are listed on the TCR (Journal). This will include telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports will not be printed. **1:** Error reports will be printed automatically after failed communications.
3	Printing of the error code on the error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the setting.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last.
6	Not used	Do not change the settings.

System Switch 09

No	FUNCTION	COMMENTS
7	Priority given to various types of remote terminal ID when printing reports **0:** RTI > CSI > Dial label > Tel. number **1:** Dial label > Tel. number > RTI > CSI	This bit determines which set of priorities the machine uses when listing remote terminal names on reports. Dial Label: The name stored with the Quick/Speed Dial number by the user.

System Switch 0A - Not used (do not change the settings)

System Switch 0B

No	FUNCTION	COMMENTS
0 1	Automatic reset timer **Bit 1 Bit 0 Timer setting** 0 0 1 minute 0 1 3 minutes 1 0 5 minutes 1 1 No limit	**(1, 1):** Automatic reset is disabled. **(Other):** The machine returns to the standby mode when the timer expires after the last operation.
2 3	Power Saver Mode timer **Bit 3 Bit 2 Time Limit** 0 0 1 minute 0 1 3 minutes 1 0 5 minutes 1 1 No limit	**(1, 1):** Automatic Power Saver Mode is disabled. **(Other):** The machine goes into a Power Saver Mode when the timer expires after the last operation. **Cross reference** Power Saver Mode: Sections 2.3.1
4-7	Not used	Do not change the settings.

System Switch 0C

No	FUNCTION	COMMENTS
0-2	Not used	Do not change the settings.
3	Original size to be used for ADF original size detection 0:A4, 1: Letter	
4-7	Not used	Do not change the settings.

System Switch 0D

No	FUNCTION	COMMENTS
0-2	Not used	Do not change the settings.
3	Original size to be used for book original size detection. 0: A4, 1: Letter	
4-5	Not used	Do not change the settings.
6	Paper size to be used when GLG size is selected for optional cassette. **0:** F4 **1:** Government Legal	
7	Not used	Do not change the settings.

System Switch 0E		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the settings.
1	Automatic cassette switchover **0:** Disabled **1:** Enabled	If this is enabled, the machine will automatically switch over to the other cassette if paper runs out, if an optional cassette is installed and the paper is of the same size.
2	Copy count progress display **0:** Count up **1:** Count down	This bit determines how the copy count on the LCD behaves during copying.
3-7	Not used	Do not change the settings.

System Switch 0F		
No	**FUNCTION**	**COMMENTS**
0 to 7	Country code for functional settings (Hex) 00: France 10: Not used 01: Germany 11: USA 02: UK 12: Asia 03: Italy 13: Japan 04: Austria 14: Hong Kong 05: Belgium 15: South Africa 06: Denmark 16: Australia 07: Finland 17: New Zealand 08: Ireland 18: Singapore 09: Norway 19: Malaysia 0A: Sweden 1A: China 0B: Switz. 1B: Taiwan 0C: Portugal 20: Turkey 0D: Holland 21: Greece 0E: Spain 0F: Israel	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross reference** NCU country code: Function 08, parameter CC.

System Switch 10 - Not used (do not change the settings)

System Switch 11		
No	**FUNCTION**	**COMMENTS**
0-5	Not used	Do not change the default setting.
6	Memory reception if no RTI or CSI received	The function of this switch depends on the User parameter switch 05 bit 1. This SW U.P.05 bit 1 X 0 :Possible 0 1 :Impossible 1 1 :Only possible when printer mechanism has no problem.
7	Not used	Do not change the default setting.

System Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	TTI printing position in the main scan direction	08 to 92 (BCD) mm. Input even numbers only. This setting determines the TTI print start position from the left edge of the paper. If the TTI is moved too far to the right, it may be obscured by the file number which is on the top right of the page.

System Switch 13 - Not used (do not change the settings)

System Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Wording setting	**0:** Ricoh **1:** Siemens - Set this bit to 1 for Siemens wording on The LCD panel.
1-7	Not used	Do not change the default setting.

System Switch 15 - Not used (do not change the settings)
System Switch 16 - Not used (do not change the settings)
System Switch 17 - Not used (do not change the settings)
System Switch 18 - Not used (do not change the settings)
System Switch 19 - Not used (do not change the settings)
System Switch 1A - Not used (do not change the settings)
System Switch 1B - Not used (do not change the settings)
System Switch 1C - Not used (do not change the settings)
System Switch 1D - Not used (do not change the settings)
System Switch 1E - Not used (do not change the settings)
System Switch 1F - Not used (do not change the settings)

4.2.2. Scanner Switches

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the settings.
1	Not used	Do not change the settings.
2 **3**	Maximum transmittable document length **Bit 3 2 Setting** 0 0 600 mm 0 1 1200 mm 1 0 Not used 1 1 Not used	If the user wants to send very long documents such as well logs, select a higher setting.
4	OR processing in immediate tx (Standard resolution) **0:** Disabled **1:** Enabled	**0:** The machine scans the document in 3.85 line/mm steps, then transmits or makes copies. **1:** The machine scans the document in 7.7 line/mm steps. Each pair of lines is OR processed before transmission or making copies.
5-7	Not used	Do not change the settings.

Scanner Switch 01 - Not used (do not change the settings)
Scanner Switch 02 - Not used (do not change the settings)
Scanner Switch 03 - Not used (do not change the settings)
Scanner Switch 04 - Not used (do not change the settings)
Scanner Switch 05 - Not used (do not change the settings)
Scanner Switch 06 - Not used (do not change the settings)
Scanner Switch 07 - Not used (do not change the settings)
Scanner Switch 08 - Not used (do not change the settings)
Scanner Switch 09 - Not used (do not change the settings)
Scanner Switch 0A - Not used (do not change the settings)
Scanner Switch 0B - Not used (do not change the settings)
Scanner Switch 0C - Not used (do not change the settings)
Scanner Switch 0D - Not used (do not change the settings)
Scanner Switch 0E - Not used (do not change the settings)
Scanner Switch 0F - Not used (do not change the settings)

4.2.3. Printer Switches

Printer Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks are printed. **1**: If a received page has to be printed out on two sheets, an “x” inside a small box is printed at the bottom right hand corner of the first sheet, and a “2" inside a small box is printed at the top right hand corner of the second sheet. This helps the user to identify pages that have been split up.
1	Repetition of data when the received page is longer than the printer paper **0:** Disabled **1:** Enabled	**0:** The next page continues from where the previous page left off. **1:** The final few mm of the previous page are printed at the top of the next page. See section 2.2.12 for details.
2	Not used	Do not change the settings.
3	Cleaning mode after bypass feed **0:** Disabled **1:** After each page is fed from the bypass feed slot	**0:** Cleaning mode is not done at all if bypass feed is used. **1:** Cleaning mode is done every time after a sheet of paper is fed from the bypass feed slot.
4-7	Not used	Do not change the settings.

Printer Switch 01 - Not used (do not change the settings)

Printer Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Cassette selection priority when paper of same size is in optional cassette. **0:** Optional Cassette **1:** Standard Cassette	This bit is available when optional cassette is installed.
1-7	Not used	Do not change the settings.

Printer Switch 03		
No	**FUNCTION**	**COMMENTS**
0	Length reduction of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. **Cross reference** Page separation threshold: Printer Sw. 03, bits 4 to 7. **1:** Incoming pages are reduced in the length direction when printing. **Cross reference** Reduction ratio: Printer Switches 04/05 Page separation and data reduction: section 2-2-12
1-3	Not used	Do not change the settings.
4 to 7	Page separation threshold (with reduction disabled in switch 03-0 above) If the incoming page is up to x mm longer than the copy paper, the excess portion will not be printed. If the incoming page is more than x mm longer than the copy paper, the excess portion will be printed on the next page. The value of x is determined by these four bits. Hex value of bits 4 to 7 — x (mm) 0 — 0 1 — 1 and so on until F — 15 **Cross reference** Page separation and data reduction: section 2-2-12 Length reduction On/Off: Printer Switch 03, Bit 0	

Printer Switches 04 and 05		
No	**FUNCTION**	**COMMENTS**
0 to 7	Reduction ratios used for different paper sizes (with reduction enabled in switch 03-0 above) If reduction is enabled, the data will be reduced in the length direction before printing. These switches determine the maximum reduction ratio for each paper size. **Cross reference** Page separation and data reduction: section 2.2.12 Switch 04/05 Paper Size Bit 0 Not used Bit 1 Not used Bit 2 LT lengthwise Bit 3 A4 lengthwise Bit 4 Not used Bit 5 Not used Bit 6 Not used Bit 7 Not used The available paper sizes depend on the machine's country version. $\left(\frac{Sw.04}{Sw.05}\right):\left(\frac{0}{0}\right)=3/2,\left(\frac{1}{0}\right)=4/3,\left(\frac{0}{1}\right)=8/7,\left(\frac{1}{1}\right)=12/11$	

Printer Switch 06 - Not used (do not change the settings)
Printer Switch 07 - Not used (do not change the settings)
Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)
Printer Switch 0E - Not used (do not change the settings)
Printer Switch 0F - Not used (do not change the settings)

4.2.4. Communication Switches

Communication Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Compression modes available in receive mode **Bit 1 0 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2 **3**	Compression modes available in transmit mode **Bit 3 2 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol. **Cross reference** EFC compression in transmission: Communication Switch 01, bit 1.
4-7	Not used	Do not change the settings.

Communication Switch 01		
No	**FUNCTION**	**COMMENTS**
0	ECM **0:** Off **1:** On	If this bit is 0, ECM is switched off for all communications.
1	EFC during transmission **0:** Off **1:** On	If this bit is 0, EFC is switched off during transmission.
2 **3**	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will not transmit if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work for manual dialing. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will not transmit if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead.
4	Operator call if no response is received in reply to NSF/DIS **0:** Disabled **1:** Enabled	Set this bit to 1 if the user expects to receive phone calls at the same number which the machine is connected to.
5	Not used	Do not change the setting.
6 **7**	Maximum printable page length available **Bit 7 Bit 6 Setting** 0 0 No limit 0 1 Not used 1 0 A4 1 1 Not used	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution** **Standard** **Detail** **Fine** Low settings 3 6 12 High settings 6 12 24
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio of a page exceeds the acceptable ratio, RTN will be sent to the other end.
2	Treatment of pages received with errors during G3 reception **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4-7	Not used	Do not change the settings.

Communication Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmissions in a G3 memory transmission	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03(H)

Communication Switch 04 - Not used (do not change the settings)
Communication Switch 05 - Not used (do not change the settings)

Communication Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Dialing requirements: Germany **0:** Disabled **1:** Enabled	These switches are automatically set to the settings required by each country after a country code (System Switch 0F) is programmed.
1	Dialing requirements: Austria **0:** Disabled **1:** Enabled	
2	Dialing requirements: Norway **0:** Disabled **1:** Enabled	
3	Dialing requirements: Denmark **0:** Disabled **1:** Enabled	
4	Dialing requirements: France **0:** Disabled **1:** Enabled	
5	Dialing requirements: Switzerland **0:** Disabled **1:** Enabled	
6-7	Not used	Do not change the settings.

Communication Switch 07 - Not used (do not change the settings)
Communication Switch 08 - Not used (do not change the settings)
Communication Switch 09 - Not used (do not change the settings)

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page.
1-6	Not used	Do not change the settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the UK and some other countries.

Communication Switch 0B - Not used (do not change the settings)
Communication Switch 0C - Not used (do not change the settings)

Communication Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 to 7	The amount of remaining memory below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 2 kbytes (e.g., 0C(H) = 24 kbytes) One page is about 24 kbytes. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory space left. This will result in communication failure.

Communication Switch 0E		
No	**FUNCTION**	**COMMENTS**
0 to 7	Minimum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (e.g., 06(H) = 12 s) This value is the minimum time that the machine waits before it dials the next destination.

Communication Switch 0F - Not used (do not change the setting)

Communication Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination	01 - FF (Hex) times

Communication Switch 11 - Not used (do not change the setting)

Communication Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Interval between dialing attempts to the same destination	00 - FF (Hex) minutes

Communication Switch 13 - Not used (do not change the setting)

Communication Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled **1:** Enabled	**0:** Transmitting is always done in inch format. **1:** If the other end only has mm-based resolution for printing, the machine converts the scanned data to mm-format before transmission.
1-5	Not used	Do not change the factory settings.
6 **7**	Available unit of resolution in which fax messages are received **Bit 7 Bit 6 Unit** 0 0 mm 0 1 inch 1 0 mm and inch (default) 1 1 Not used	For the best performance, do not change the factory settings. The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 15 - Not used (do not change the settings)
Communication Switch 16 - Not used (do not change the settings)
Communication Switch 17 - Not used (do not change the settings)
Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)
Communication Switch 1B - Not used (do not change the settings)
Communication Switch 1C - Not used (do not change the settings)
Communication Switch 1D - Not used (do not change the settings)
Communication Switch 1E - Not used (do not change the settings)
Communication Switch 1F - Not used (do not change the settings)

4.2.5. G3 Switches

G3 Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Monitor speaker during communication (tx and rx) **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	(0, 0): The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission **0:** Disabled **1:**Enabled	**1:** The monitor speaker is enabled during memory transmission.
3-6	Not used	Do not change the settings.
7	Back to back test **0:** Disabled **1:** Enabled	Set this bit to 1 when you wish to do a back to back test. **115 V model:** Be sure to connect jumpers JP5 and JP6 on the NCU before doing the test. **220 V model:** Be sure to apply dc voltage between wires L1 and L2 on the NCU.

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change the settings.
4	DIS frame length **0:** 6 bytes **1:** 4 bytes	**1:** The 5th and 6th bytes in the DIS frame will not be transmitted (set to 1 if there are communication problems with PC-based faxes which cannot receive the extended DIS frames).
5	Not used	Do not change the settings.
6	CED transmission **0:** Disabled **1:** Enabled	Do not change this setting, unless the communication problem is caused by the CED transmission.
7	Not used	Do not change the settings.

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	**1:** Disables NSF/NSS signals (these are used in non-standard mode communication).
1-4	Not used	Do not change the settings.
5	Use of modem rate history when dialing using Quick/Speed dials **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed dials always start with the highest modem rate. **1:** The machine uses the modem rate history for communications with the same machine when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Short preamble **0:** Disabled **1:**Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about Short Preamble.

G3 Switch 03		
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1-2	Not used	Do not change the setting.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	**1:** The machine transmits with a frame size of 64 bytes. Set this bit to 1 when the other terminal only has a 64 byte frame size.
4	CTC transmission conditions **0:** Ricoh mode (PPR x 1) **1:** ITU-T mode (PPR x 4)	When using ECM, the machine will choose a slower modem rate after receiving PPR once (Ricoh mode) or four times (ITU-T mode). ITU-T: New acronym for the CCITT.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6-7	Not used	Do not change the setting.

G3 Switch 04		
	FUNCTION	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that the training has succeeded.
4-7	Not used	Do not change the settings.

G3 Switch 05		
	FUNCTION	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4k 0 0 1 0 4.8k 0 0 1 1 7.2k 0 1 0 0 9.6k 0 1 0 1 12.0k 0 1 1 0 14.4k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicatated transmssion parameters if you need to change this for specific receivers.
4 5	Initial modem type for 9.6 k or 7.2 kbps. **Bit 5 Bit 4 Setting** 0 0 V.29 0 1 V.17 1 0 Not used 1 1 Not used	These bits set the initial modem type for 14.4, 9.6, and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7		Do not change the settings.

G3 Switch 06		
	FUNCTION	**COMMENTS**
0 to 3	Initial Rx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 k 0 0 1 0 4.8 k 0 0 1 1 7.2 k 0 1 0 0 9.6 k 0 1 0 1 12.0k 0 1 1 0 14.4k Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem rate for the machine in receive mode. Use a lower setting if high speeds pose problems during reception.
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V27ter 0 0 1 0 V27ter and V29 0 1 0 0 V27ter, V29, V17 Other settings - Not used	The setting of these bits is used to inform the transmitting terminal of the available modem type for the machine in receive mode.

G3 Switch 07		
	FUNCTION	**COMMENTS**
0 **1**	PSTN cable equalizer (tx mode) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently.
2 **3**	PSTN cable equalizer (rx mode) **Bit 3 Bit 2 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently.
4-7	Not used	Do not change the settings.

G3 Switch 08 - Not used (do not change the settings)
G3 Switch 09 - Not used (do not change the settings)

G3 Switch 0A		
	FUNCTION	**COMMENTS**
0 **1**	Maximum allowable carrier drop during image data reception **Bit 1 Bit 0 Value (ms)** 0 0 200 0 1 400 1 0 800 1 1 Not used	These bits set the acceptable modem carrier drop time. Try using a longer setting if error code 0-22 is frequent.
2-3	Not used	Do not change the settings.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit set the maximum intervals between each EOL signal (end-of-line) or intervals between each ECM frame from the other end. Try using a longer setting if error code 0-21 is frequent.
5	Not used	Do not change the settings.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When the sending terminal is controlled by a computer, there may be a delay in receiving page data after the local machine accepts set-up data and sends CFR. If this occurs, set this bit to 1 to give the sending machine more time to send data. Refer to error code 0-20.
7	Not used	Do not change the settings.

G3 Switch 0B		
	FUNCTION	**COMMENTS**
0	Protocol requirements: Europe **0:** Disabled **1:** Enabled	Program these bit switches manually to match local requirements.
1	Protocol requirements: Spain **0:** Disabled **1:** Enabled	
2	Protocol requirements: Germany **0:** Disabled **1:** Enabled	
3	Protocol requirements: France **0:** Disabled **1:** Enabled	
4	PTT requirements: Germany **0:** Disabled **1:** Enabled	
5	PTT requirements: France **0:** Disabled **1:** Enabled	
6-7	Not used	Do not change the settings.

G3 Switch 0C		
	FUNCTION	**COMMENTS**
0 **1**	Pulse dialing method **Bit 1 Bit 0 Setting** 0 0 Normal (P=N) 0 1 Oslo (P=10 - N) 1 0 Sweden (N+1) 1 1 Not used	P = Number of pulses sent out, N = Number dialed.
2-7	Not used	Do not change the settings.

G3 Switch 0D - Not used (do not change the settings)
G3 Switch 0E - Not used (do not change the settings)
G3 Switch 0F - Not used (do not change the settings)

4.3. NCU PARAMETERS

The following tables give the RAM addresses and units of calculation of the parameters that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. Most of these must be changed by RAM read/write (Function 06), but some can be changed using NCU Parameter programming (Function 08); if Function 08 can be used, this will be indicated in the Remarks column. The RAM is programmed in hex code unless (BCD) is included in the Unit column.

<table>
<tr><th>Address</th><th>Function</th><th>Unit</th><th>Remarks</th></tr>
<tr><td>807F00</td><td>Country code for NCU parameters</td><td colspan="2">Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 08 (parameter CC).

Country Decimal Hex
France 00 00
Germany 01 01
UK 02 02
Italy 03 03
Austria 04 04
Belgium 05 05
Denmark 06 06
Finland 07 07
Ireland 08 08
Norway 09 09
Sweden 10 0A
Switzerland 11 0B
Portugal 12 0C
Holland 13 0D
Spain 14 0E
Israel 15 0F
USA 17 11
Asia 18 12
Hong Kong 20 14
South Africa 21 15
Australia 22 16
New Zealand 23 17
Singapore 24 18
Malaysia 25 19
China 26 1A
Taiwan 27 1B
Turkey 32 20
Greek 33 21</td></tr>
<tr><td>807F01</td><td>Line current detection time</td><td rowspan="3">20 ms</td><td rowspan="3">Line current is not detected if 807F01 contains FF.</td></tr>
<tr><td>807F02</td><td>Line current wait time</td></tr>
<tr><td>807F03</td><td>Line current drop detect time</td></tr>
</table>

Address	Function	Unit	Remarks
807F04	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
807F05	PSTN dial tone frequency upper limit (low byte)		
807F06	PSTN dial tone frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807F07	PSTN dial tone frequency lower limit (high byte)		
807F08	PSTN dial tone detection time	20 ms	If 807F08 contains FF, the machine pauses for the pause time (address 807F0D / 807F0E). See Note 2 (Italy).
807F09	PSTN dial tone reset time (LOW)		
807F0A	PSTN dial tone reset time (HIGH)		
807F0B	PSTN dial tone continuous tone time		
807F0C	PSTN dial tone permissible drop time		
807F0D	PSTN wait interval (LOW)		
807F0E	PSTN wait interval (HIGH)		
807F0F	PSTN ringback tone detection time	20 ms	Detection is disabled if this contains FF.
807F10	PSTN ringback tone off detection time	20 ms	
807F11	PSTN detection time for silent period after ringback tone detected (LOW)	20 ms	
807F12	PSTN detection time for silent period after ringback tone detected (HIGH)	20 ms	
807F13	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
807F14	PSTN busy tone frequency upper limit (low byte)		
807F15	PSTN busy tone frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807F16	PSTN busy tone frequency lower limit (low byte)		
807F17 to 807F29	Not used		Do not change the settings.

Address	Function	Unit	Remarks
807F2A	Busy tone ON time: range 1	20 ms	
807F2B	Busy tone OFF time: range 1		
807F2C	Busy tone ON time: range 2		
807F2D	Busy tone OFF time: range 2		
807F2E	Busy tone ON time: range 3		
807F2F	Busy tone OFF time: range 3		
807F30	Busy tone ON time: range 4		
807F31	Busy tone OFF time: range 4		
807F32	Busy tone continuous tone detection time		
807F33	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance (±) Bit 1 0 0 0 75% 0 1 50% 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		Bits 2 and 3 must always be kept at 0.
807F34	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
807F35	International dial tone frequency upper limit (low byte)		
807F36	International dial tone frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807F37	International dial tone frequency lower limit (low byte)		
807F38	International dial tone detection time	20 ms	If 807F38 contains FF, the machine pauses for the pause time (807F3D / 807F3E). See Note 2 (Belgium).
807F39	International dial tone reset time (LOW)		
807F3A	International dial tone reset time (HIGH)		
807F3B	International dial tone continuous tone time		
807F3C	International dial tone permissible drop time		
807F3D	International dial wait interval (LOW)		
807F3E	International dial wait interval (HIGH)		

Address	Function	Unit	Remarks
807F3F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
807F40	Country dial tone upper frequency limit (LOW)		
807F41	Country dial tone lower frequency limit (HIGH)		If both addresses contain FF(H), tone detection is disabled.
807F42	Country dial tone lower frequency limit (LOW)		
807F43	Country dial tone detection time	20 ms	If 807F43 contains FF, the machine pauses for the pause time (807F48 / 807F49).
807F44	Country dial tone reset time (LOW)		
807F45	Country dial tone reset time (HIGH)		
807F46	Country dial tone continuous tone time		
807F47	Country dial tone permissible drop time		
807F48	Country dial wait interval (LOW)		
807F49	Country dial wait interval (HIGH)		
807F4A	Time between opening or closing the Ds relay and opening the Di relay	1 ms	See Notes 3 and 6. Function 08 (parameter 11).
807F4B	Break time for pulse dialing	1 ms	See Note 3. Function 08 (parameter 12).
807F4C	Make time for pulse dialing	1 ms	See Note 3. Function 08 (parameter 13).
807F4D	Time between final Di relay closure and Ds relay opening or closing	1 ms	See Notes . Function 08 (parameter 14).
807F4E	Minimum pause between dialed digits (pulse dial mode)	20 ms	See Note 3. Function 08 (parameter 15).
807F4F	Time waited when a pause is entered at the operation panel		Function 08 (parameter 16).
807F50	DTMF tone on time	1 ms	Function 08 (parameter 17).
807F51	DTMF tone off time		Function 08 (parameter 18).
807F52	Tone attenuation value in DTMF signals	-dBm x 0.5	Function 08 (parameter 19). See Note 5.
807F53	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-Nx0.5 (dB)	Function 08 (parameter 20). See Note 5.
807F54	PSTN: DTMF tone attenuation level after dialing	-dBm x 0.5	Function 08 (parameter 21). See Note 5.
807F55 to 807F58	Not used		Do not change the settings.
807F59	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.

Address	Function	Unit	Remarks
807F5A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
807F5B	International dial access code	BCD	For a code of 100: 807F5B - F1 807F5C - 00
807F5C			
807F5D	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. Up to 7 of these can be input. If this address contains FF[H], the pause time stored in address 807F4F is used.
807F5E	Progress tone detection level, and cadence detection enable flags	Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 1 0 0 -40.0 1 1 0 -49.0 Bits 2, 0 - See Note 3.	
807F5F to 807F64	Not used		Do not change the settings.
807F65	Inter-city dial prefix (HIGH)	BCD	For a code of 0: 807F65 - FF 807F66 - F0
807F66	Inter-city dial prefix (LOW)	BCD	
807F67 to 807F71	Not used		Do not change the settings.
807F72	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 08 (parameter 02).
807F73	Acceptable ringing signal frequency: range 1, lower limit		Function 08 (parameter 03).
807F74	Acceptable ringing signal frequency: range 2, upper limit		Function 08 (parameter 04).
807F75	Acceptable ringing signal frequency: range 2, lower limit		Function 08 (parameter 05).
807F76	Number or rings until a call is detected	1	Function 08 (parameter 06).
807F77	Minimum required length of the first ring	20 ms	See Note 4. Function 09 (parameter 07).
807F78	Minimum required length of the second and subsequent rings	20 ms	Function 08 (parameter 08).
807F79	Ringing signal detection reset time (LOW)	20 ms	Function 08 (parameter 09).
807F7A	Ringing signal detection reset time (HIGH)		Function 08 (parameter 10).

Address	Function	Unit	Remarks
807F7B to 807F80	Not used		Do not change the settings.
807F81	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms
807F82	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
807FA1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
807FA2	Acceptable CED detection range frequency upper limit (low byte)		
807FA3	Acceptable CED detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807FA4	Acceptable CED detection frequency lower limit (low byte)		
807FA5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
807FA6	Acceptable CNG detection frequency upper limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807FA7	Acceptable CNG detection frequency upper limit (low byte)		
807FA8	Acceptable CNG detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807FA9	Acceptable CNG detection frequency lower limit (low byte)		
807FAA	CNG detection time	20 ms ± 20 ms	Factory setting: 200 ms
807FAB	CNG on time	20 ms	Factory setting: 500 ms
807FAC	CNG off time	20 ms	Factory setting: 200 ms
807FAD	Number of CNG cycles required for detection		The data is coded in the same way as address 807F33. Factory setting: 23(H)
807FAE	Not used		Do not change the settings.

Address	Function	Unit	Remarks
807FAF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807FB0	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (low byte)		
807FB1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	Hz(BCD)	If both addresses contain FF(H), tone detection is disabled.
807FB2	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (low byte)		
807FB3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
807FB4	PSTN: Tx level from the modem	- dBm	Function 08 (parameter 01).
807FB5	PSTN: 1100 Hz tone transmission level	- N_{807FB4} - 0.5N_{807FB5} (dB)	
807FB6	PSTN: 2100 Hz tone transmission level	- N_{807FB4} - 0.5N_{807FB6} (dB)	
807FB7 to 807FBC	Not used		Do not change the settings.
807FBD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	
807FDA	T.30 T1 timer	1 s	

Notes

1. If a setting is not required, store FF in the address.
2. RAM address 807F5E: the lower four bits have the following meaning.
   Bit 2 1: International dial tone cadence detection enabled (Belgium)
   Bit 1 Not used
   Bit 0 1: PSTN dial tone cadence detection enabled (Italy)

   If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
   807F08 (if bit 0 = 1) or 807F38 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 807F33.
   807F0B (if bit 0 = 1) or 807F3B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   807F0C (if bit 0 = 1) or 807F3C(if bit 2 = 1): off time, hex code (unit = 20 ms)
3. Pulse dial parameters (addresses 807F4A to 807F4F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: - 0.5 x $N_{807F52/807F54}$ dBm
   Low frequency tone: - 0.5 x ($N_{807F52/807F54}$ + N_{807F53}) dBm
   Note: N_{807F52}, for example, means the value stored in address 807F52(H)
6. 807F4A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
   807F4D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing

Default Settings

The factory settings are quoted either in hexadecimal code (the actual contents of the RAM address) if there is a H after the value in the table, or in decimal (converted from the actual hex contents of the RAM address) if there is no H after the value.

Some RAM must be stored using BCD; see the NCU Parameter definition table for details.

Note: Only the settings for the USA are valid.

Country	807F01	807F02	807F03	807F04	807F05
France	FFH	FFH	FFH	04H	65H
Germany	FFH	FFH	FFH	04H	70H
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	04H	50H
Austria	FFH	FFH	FFH	05H	00H
Belgium	FFH	FFH	FFH	04H	70H
Denmark	FFH	FFH	FFH	05H	10H
Finland	FFH	FFH	FFH	04H	85H
Ireland	FFH	FFH	FFH	04H	60H
Norway	FFH	FFH	FFH	05H	10H
Sweden	FFH	FFH	FFH	05H	60H
Switzerland	FFH	FFH	FFH	05H	60H
Portugal	FFH	FFH	FFH	04H	60H
Holland	FFH	FFH	FFH	05H	60H
Spain	FFH	FFH	FFH	04H	80H
Israel	FFH	FFH	FFH	04H	20H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F06	807F07	807F08	807F09	807F0A
France	04H	15H	75	F4H	01H
Germany	03H	80H	105	CFH	03H
UK	FFH	FFH	FFH	FFH	FFH
Italy	04H	00H	21H	21H	02H
Austria	03H	70H	52	F4H	01H
Belgium	04H	05H	35	20H	03H
Denmark	03H	40H	65	C2H	01H
Finland	03H	65H	125	F4H	01H
Ireland	03H	90H	105	C2H	01H
Norway	03H	40H	55	B6H	03H
Sweden	02H	90H	40	00H	01H
Switzerland	03H	65H	50	21H	02H
Portugal	02H	90H	105	C2H	01H
Holland	00H	90H	75	EEH	02H
Spain	03H	10H	75	3FH	02H
Israel	03H	80H	105	E8H	03H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	04H	00H	150	2CH	01H
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F0B	807F0C	807F0D	807F0E	807F0F
France	75	02	100	00	FFH
Germany	105	04	200	00	FFH
UK	FFH	FFH	250	00	FFH
Italy	30	50	200	00	FFH
Austria	39	03	200	00	FFH
Belgium	30	04	200	00	FFH
Denmark	65	04	200	00	FFH
Finland	64H	04	200	00	FFH
Ireland	105	04	200	00	FFH
Norway	55	04	175	00	FFH
Sweden	18	04	200	00	FFH
Switzerland	38	02	200	00	05
Portugal	105	04	200	00	FFH
Holland	55	0AH	200	00	FFH
Spain	64	05	150	00	FFH
Israel	105	04	200	00	FFH
USA	FFH	FFH	100	00	FFH
Asia	FFH	FFH	200	00	FFH
Hong Kong	FFH	FFH	100	00	FFH
South Africa	FFH	FFH	100	00	FFH
Australia	100	08	150	00	FFH
New Zealand	FFH	FFH	200	00	FFH
Singapore	FFH	FFH	100	00	FFH
Malaysia	FFH	FFH	100	00	FFH

Country	807F10	807F11	807F12	807F13	807F14
France	FFH	FFH	FFH	04H	65H
Germany	FFH	FFH	FFH	00H	10H
UK	FFH	FFH	FFH	04H	80H
Italy	FFH	FFH	FFH	04H	50H
Austria	FFH	FFH	FFH	05H	30H
Belgium	FFH	FFH	FFH	04H	70H
Denmark	FFH	FFH	FFH	04H	60H
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	04H	40H
Norway	FFH	FFH	FFH	05H	10H
Sweden	FFH	FFH	FFH	04H	60H
Switzerland	50	26H	02H	05H	60H
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	05H	60H
Spain	FFH	FFH	FFH	04H	90H
Israel	FFH	FFH	FFH	04H	20H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	05H	00H
New Zealand	FFH	FFH	FFH	04H	50H
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F15	807F16	807F17	807F18	807F19	807F1A	807F1B
France	04H	15H	FFH	FFH	04H	00H	100
Germany	03H	90H	FFH	FFH	FFH	FFH	FFH
UK	03H	80H	FFH	FFH	FFH	FFH	FFH
Italy	04H	00H	05H	12H	03H	91H	100
Austria	03H	70H	FFH	FFH	FFH	FFH	FFH
Belgium	04H	05H	05H	20H	03H	00H	30
Denmark	03H	90H	05H	12H	03H	40H	65
Finland	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Ireland	04H	10H	FFH	FFH	FFH	FFH	FFH
Norway	03H	40H	FFH	FFH	FFH	FFH	FFH
Sweden	03H	90H	05H	12H	03H	40H	40
Switzerland	03H	65H	06H	08H	03H	38H	40
Portugal	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Holland	03H	30H	05H	63H	00H	80H	55
Spain	03H	10H	FFH	FFH	FFH	FFH	FFH
Israel	03H	80H	05H	63H	03H	70H	105
USA	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Australia	03H	25H	FFH	FFH	04H	00H	150
New Zealand	03H	50H	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH	FFH	FFH

Country	807F1C	807F1D	807F1E	807F1F	807F20
France	58H	02H	50	02H	100
Germany	FFH	FFH	FFH	FFH	200
UK	FFH	FFH	FFH	FFH	200
Italy	F9H	01H	09	04	200
Austria	FFH	FFH	FFH	FFH	200
Belgium	150	00	30	04	200
Denmark	F4H	01H	65	04	200
Finland	FFH	FFH	FFH	FFH	200
Ireland	FFH	FFH	FFH	FFH	200
Norway	FFH	FFH	FFH	FFH	200
Sweden	00H	01H	40	03	200
Switzerland	EFH	01H	40	04	200
Portugal	FFH	FFH	FFH	FFH	200
Holland	EEH	02H	55	04	200
Spain	FFH	FFH	FFH	FFH	150
Israel	E8H	03H	105	04	200
USA	FFH	FFH	FFH	FFH	200
Asia	FFH	FFH	FFH	FFH	200
Hong Kong	FFH	FFH	FFH	FFH	200
South Africa	FFH	FFH	FFH	FFH	200
Australia	2CH	01H	100	01	150
New Zealand	FFH	FFH	FFH	FFH	200
Singapore	FFH	FFH	FFH	FFH	200
Malaysia	FFH	FFH	FFH	FFH	200

Country	807F21	807F22	807F23	807F24	807F25
France	00	FFH	FFH	FFH	FFH
Germany	00	FFH	FFH	FFH	FFH
UK	00	FFH	FFH	FFH	FFH
Italy	00	FFH	FFH	FFH	FFH
Austria	00	FFH	FFH	FFH	FFH
Belgium	00	FFH	FFH	FFH	FFH
Denmark	00	FFH	FFH	FFH	FFH
Finland	00	FFH	FFH	FFH	FFH
Ireland	00	FFH	FFH	FFH	FFH
Norway	00	FFH	FFH	FFH	FFH
Sweden	00	FFH	FFH	FFH	FFH
Switzerland	00	FFH	FFH	FFH	FFH
Portugal	00	FFH	FFH	FFH	FFH
Holland	00	FFH	FFH	FFH	FFH
Spain	00	FFH	FFH	FFH	FFH
Israel	00	FFH	FFH	FFH	FFH
USA	00	FFH	FFH	FFH	FFH
Asia	00	FFH	FFH	FFH	FFH
Hong Kong	00	FFH	FFH	FFH	FFH
South Africa	00	FFH	FFH	FFH	FFH
Australia	00	FFH	FFH	FFH	FFH
New Zealand	00	FFH	FFH	FFH	FFH
Singapore	00	FFH	FFH	FFH	FFH
Malaysia	00	FFH	FFH	FFH	FFH

Country	807F26	807F27	807F28	807F29	807F2A
France	FFH	FFH	FFH	FFH	25
Germany	FFH	FFH	FFH	FFH	12
UK	FFH	FFH	FFH	FFH	19
Italy	06H	00H	01H	00H	13H
Austria	FFH	FFH	FFH	FFH	0DH
Belgium	FFH	FFH	FFH	FFH	25
Denmark	04H	60H	03H	90H	14H
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	25
Norway	FFH	FFH	FFH	FFH	10
Sweden	FFH	FFH	FFH	FFH	12
Switzerland	06H	08H	03H	38H	16H
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	FFH	14H
Spain	FFH	FFH	FFH	FFH	8
Israel	05H	63H	03H	70H	12
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	04H	50H	03H	90H	12
New Zealand	FFH	FFH	FFH	FFH	0DH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F2B	807F2C	807F2D	807F2E	807F2F
France	25	FFH	FFH	FFH	FFH
Germany	12	24	24	7	24
UK	19	20	17	11	26
Italy	10H	11H	14H	FFH	FFH
Austria	0DH	10H	10H	FFH	FFH
Belgium	23	08	08	08	06
Denmark	14H	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	25	37	37	18	18
Norway	00	21	00	FFH	FFH
Sweden	12	12	37	FFH	FFH
Switzerland	16H	0DH	0CH	09H	02H
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	14H	FFH	FFH	FFH	FFH
Spain	08	FFH	FFH	FFH	FFH
Israel	12	24	24	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	12	25	25	FFH	FFH
New Zealand	0DH	1EH	14H	19H	19H
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F30	807F31	807F32	807F33	807F34
France	FFH	FFH	FFH	41H	04H
Germany	FFH	FFH	FFH	31H	FFH
UK	FFH	FFH	100	42H	FFH
Italy	FFH	FFH	FFH	40H	FFH
Austria	FFH	FFH	FFH	40H	FFH
Belgium	FFH	FFH	FFH	42H	11H
Denmark	FFH	FFH	FFH	40H	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	35	43H	FFH
Norway	FFH	FFH	FFH	40H	FFH
Sweden	FFH	FFH	FFH	42H	FFH
Switzerland	FFH	FFH	FFH	40H	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	40H	FFH
Spain	FFH	FFH	FFH	41H	06H
Israel	FFH	FFH	FFH	41H	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	41H	FFH
New Zealand	FFH	FFH	FFH	52H	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F35	807F36	807F37	807F38	807F39
France	74H	04H	06H	57	26H
Germany	FFH	FFH	FFH	FFH	FFH
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	FFH	FFH
Austria	FFH	FFH	FFH	FFH	FFH
Belgium	60H	11H	10H	32H	E8H
Denmark	FFH	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	FFH
Norway	FFH	FFH	FFH	FFH	FFH
Sweden	FFH	FFH	FFH	FFH	FFH
Switzerland	FFH	FFH	FFH	FFH	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	04H	00H	55	EEH
Spain	40H	05H	60H	75	3FH
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F3A	807F3B	807F3C	807F3D	807F3E
France	02	57	06	00	00
Germany	FFH	FFH	FFH	00H	00H
UK	FFH	FFH	FFH	00H	00H
Italy	FFH	FFH	FFH	00H	00H
Austria	FFH	FFH	FFH	00H	00H
Belgium	03H	16	33	00H	00H
Denmark	FFH	FFH	FFH	00H	00H
Finland	FFH	FFH	FFH	00H	00H
Ireland	FFH	FFH	FFH	00H	00H
Norway	FFH	FFH	FFH	00H	00H
Sweden	FFH	FFH	FFH	00H	00H
Switzerland	FFH	FFH	FFH	00H	00H
Portugal	FFH	FFH	FFH	00H	00H
Holland	02H	55	04	00H	00H
Spain	02H	55	05	150	00
Israel	FFH	FFH	FFH	00H	00H
USA	FFH	FFH	FFH	00H	00H
Asia	FFH	FFH	FFH	00H	00H
Hong Kong	FFH	FFH	FFH	00H	00H
South Africa	FFH	FFH	FFH	00H	00H
Australia	FFH	FFH	FFH	00H	00H
New Zealand	FFH	FFH	FFH	00H	00H
Singapore	FFH	FFH	FFH	00H	00H
Malaysia	FFH	FFH	FFH	00H	00H

Country	807F3F	807F40	807F41	807F42	807F43
France	FFH	FFH	FFH	FFH	FFH
Germany	FFH	FFH	FFH	FFH	FFH
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	FFH	FFH
Austria	FFH	FFH	FFH	FFH	FFH
Belgium	FFH	FFH	FFH	FFH	FFH
Denmark	FFH	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	FFH
Norway	FFH	FFH	FFH	FFH	FFH
Sweden	05H	12H	03H	40H	40
Switzerland	FFH	FFH	FFH	FFH	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	FFH	FFH
Spain	FFH	FFH	FFH	FFH	FFH
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F44	807F45	807F46	807F47	807F48
France	FFH	FFH	FFH	FFH	00
Germany	FFH	FFH	FFH	FFH	00H
UK	FFH	FFH	FFH	FFH	00H
Italy	FFH	FFH	FFH	FFH	00H
Austria	FFH	FFH	FFH	FFH	00H
Belgium	FFH	FFH	FFH	FFH	00H
Denmark	FFH	FFH	FFH	FFH	00H
Finland	FFH	FFH	FFH	FFH	00H
Ireland	FFH	FFH	FFH	FFH	00H
Norway	FFH	FFH	FFH	FFH	00H
Sweden	00H	01H	40	03	200
Switzerland	FFH	FFH	FFH	FFH	00H
Portugal	FFH	FFH	FFH	FFH	00H
Holland	FFH	FFH	FFH	FFH	00H
Spain	FFH	FFH	FFH	FFH	00H
Israel	FFH	FFH	FFH	FFH	00H
USA	FFH	FFH	FFH	FFH	00H
Asia	FFH	FFH	FFH	FFH	00H
Hong Kong	FFH	FFH	FFH	FFH	00H
South Africa	FFH	FFH	FFH	FFH	00H
Australia	FFH	FFH	FFH	FFH	00H
New Zealand	FFH	FFH	FFH	FFH	00H
Singapore	FFH	FFH	FFH	FFH	00H
Malaysia	FFH	FFH	FFH	FFH	00H

Country	807F49	807F4A	807F4B	807F4C	807F4D
France	00	67	64	32	45
Germany	00H	50	57	38	44
UK	00H	252	65	32	44
Italy	00H	58	58	38	44
Austria	00H	53	57	38	50
Belgium	00H	61	64	32	50
Denmark	00H	53	64	32	50
Finland	00H	61	57	38	50
Ireland	00H	255	64	32	50
Norway	00H	61	57	39	50
Sweden	00	100	58	38	70
Switzerland	00H	60	58	38	60
Portugal	00H	61	64	32	50
Holland	00H	58	59	38	42
Spain	00H	75	64	32	75
Israel	00H	61	59	38	50
USA	00H	77	60	41	74
Asia	00H	61	62	32	50
Hong Kong	00H	61	62	32	50
South Africa	00H	61	62	32	50
Australia	00H	255	64	32	70
New Zealand	00H	245	62	33	50
Singapore	00H	61	62	32	50
Malaysia	00H	61	62	32	50

Country	807F4E	807F4F	807F50	807F51	807F52
France	40	00	70	70	11
Germany	46	46	90	90	11H
UK	27	33	100	100	12
Italy	40	150	70	70	11
Austria	44	140	80	80	11
Belgium	43	26	70	70	11
Denmark	26	26	90	90	11H
Finland	40	60	70	75	11H
Ireland	30	33	70	70	11H
Norway	33	33	70	70	11H
Sweden	18	26	70	70	10H
Switzerland	26	00H	70	70	08
Portugal	33	33	70	70	11H
Holland	33	33	70	70	11H
Spain	32	100	70	140	0BH
Israel	46	101	90	90	11H
USA	46	101	100	100	14
Asia	36	101	100	110	0EH
Hong Kong	36	101	100	110	0EH
South Africa	36	101	100	110	0EH
Australia	36	101	100	110	0BH
New Zealand	25	101	100	110	0DH
Singapore	36	101	100	110	0EH
Malaysia	36	101	100	110	0EH

Country	807F53	807F54	807F59	807F5A	807F5B
France	04	34	00	00	FFH
Germany	05	34	15	90	FFH
UK	05	34	15	90	FFH
Italy	04	34	15	90	FFH
Austria	04	34	15	100	FFH
Belgium	04	34	100	90	FFH
Denmark	04	34	15	90	F0H
Finland	04	34	15	90	F9H
Ireland	04	34	15	90	FFH
Norway	04	34	25	90	FFH
Sweden	05	34	15	90	F0H
Switzerland	04	34	10	90	FFH
Portugal	04	34	15	202	FFH
Holland	04	34	15	90	FFH
Spain	04	34	100	90	FFH
Israel	04	34	15	90	FFH
USA	04	34	00H	00H	FFH
Asia	04	34	00H	00H	FFH
Hong Kong	04	34	00H	00H	FFH
South Africa	04	34	00H	00H	FFH
Australia	03	34	00H	00H	FFH
New Zealand	04	34	00H	00H	FFH
Singapore	04	34	00H	00H	FFH
Malaysia	04	34	00H	00H	FFH

Country	807F5C	807F5D	807F5E	807F65
France	19H	FFH	20H	FFH
Germany	00H	FFH	20H	FFH
UK	00H	50	C0H	FFH
Italy	00H	FFH	C1H	FFH
Austria	00H	FFH	80H	FFH
Belgium	00H	FFH	44H	FFH
Denmark	9H	FFH	80H	FFH
Finland	90H	100	80H	FFH
Ireland	16H	FFH	40H	FFH
Norway	00H	FFH	80H	FFH
Sweden	09H	FFH	80H	FFH
Switzerland	00H	FFH	80H	FFH
Portugal	00H	FFH	80H	FFH
Holland	00H	FFH	00H	FFH
Spain	07H	FFH	80H	FFH
Israel	00H	FFH	C0H	FFH
USA	FFH	FFH	C0H	FFH
Asia	FFH	FFH	C0H	FFH
Hong Kong	FFH	FFH	C0H	FFH
South Africa	FFH	FFH	C0H	FFH
Australia	FFH	FFH	C0H	FFH
New Zealand	FFH	FFH	C0H	FFH
Singapore	FFH	FFH	C0H	FFH
Malaysia	FFH	FFH	C0H	FFH

Country	807F66	807F72	807F73	807F74	807F75
France	16H	17	28	FFH	00H
Germany	FFH	15H	36H	FFH	00H
UK	FFH	20	84	FFH	00H
Italy	FFH	18	77	FFH	00H
Austria	FFH	13	3FH	FFH	00H
Belgium	FFH	21	72	FFH	00H
Denmark	FFH	11H	43H	16	24
Finland	FFH	16	58	FFH	00H
Ireland	FFH	36	53H	FFH	00H
Norway	FFH	16	43H	FFH	00H
Sweden	FFH	17	43H	FFH	00H
Switzerland	FFH	16	58	FFH	00H
Portugal	FFH	1AH	53H	16	24
Holland	FFH	16	3FH	FFH	00H
Spain	FFH	25	43H	FFH	00H
Israel	FFH	16	43H	FFH	00H
USA	FFH	13	83	FFH	00H
Asia	FFH	17	83	FFH	00H
Hong Kong	FFH	17	83	FFH	00H
South Africa	FFH	17	83	FFH	00H
Australia	FFH	14	86	FFH	00H
New Zealand	FFH	17	83	FFH	00H
Singapore	FFH	17	83	FFH	00H
Malaysia	FFH	17	83	FFH	00H

Country	807F76	807F77	807F78	807F79	807F7A
France	02	15	15	04H	01H
Germany	01H	07	07	90H	01H
UK	01	10	10	90H	01H
Italy	03	10	10	90H	01H
Austria	01	09	10	90H	01H
Belgium	02	05	10	90H	01H
Denmark	02	10	10	90H	01H
Finland	02	09	09	90H	01H
Ireland	02	13	13	90H	01H
Norway	01	10	10	90H	01H
Sweden	01	10	10	90H	01H
Switzerland	03	10	10	90H	01H
Portugal	01	0FH	0FH	90H	01H
Holland	02	15	15	90H	01H
Spain	02	28H	28H	2CH	01H
Israel	02	14H	14H	90H	01H
USA	01	10	10	90H	01H
Asia	01	10	10	90H	01H
Hong Kong	01	10	10	90H	01H
South Africa	01	10	10	90H	01H
Australia	03	10	10	90H	01H
New Zealand	04	10	10	90H	01H
Singapore	01	10	10	90H	01H
Malaysia	01	10	10	90H	01H

Country	807F81	807F82	807FA1	807FA2	807FA3
France	25	0	22H	00H	20H
Germany	25	00H	22H	00H	20H
UK	25	00H	22H	00H	20H
Italy	25	00H	22H	00H	20H
Austria	25	00H	22H	00H	20H
Belgium	25	00H	22H	00H	20H
Denmark	25	00H	22H	00H	20H
Finland	25	00H	22H	00H	20H
Ireland	25	00H	22H	00H	20H
Norway	25	00H	22H	00H	20H
Sweden	25	00H	22H	00H	20H
Switzerland	25	00H	22H	00H	20H
Portugal	25	00H	22H	00H	20H
Holland	25	00H	22H	00H	20H
Spain	25	00H	22H	00H	20H
Israel	25	00H	22H	00H	20H
USA	25	00H	22H	00H	20H
Asia	25	00H	22H	00H	20H
Hong Kong	25	00H	22H	00H	20H
South Africa	25	00H	22H	00H	20H
Australia	25	00H	22H	00H	20H
New Zealand	25	00H	22H	00H	20H
Singapore	25	00H	22H	00H	20H
Malaysia	25	00H	22H	00H	20H

Country	807FA4	807FA5	807FA6	807FA7	807FA8
France	00H	16	00H	A0H	75H
Germany	00H	10	00H	A0H	75H
UK	00H	10	00H	A0H	75H
Italy	00H	10	00H	A0H	75H
Austria	00H	10	00H	A0H	75H
Belgium	00H	10	00H	A0H	75H
Denmark	00H	10	00H	A0H	75H
Finland	00H	10	00H	A0H	75H
Ireland	00H	10	00H	A0H	75H
Norway	00H	10	00H	A0H	75H
Sweden	00H	10	00H	A0H	75H
Switzerland	00H	10	00H	A0H	75H
Portugal	00H	10	00H	A0H	75H
Holland	00H	10	00H	A0H	75H
Spain	00H	10	00H	A0H	75H
Israel	00H	10	00H	A0H	75H
USA	00H	10	00H	A0H	75H
Asia	00H	10	00H	A0H	75H
Hong Kong	00H	10	00H	A0H	75H
South Africa	00H	10	01H	A0H	75H
Australia	00H	10	00H	A0H	75H
New Zealand	00H	10	00H	A0H	75H
Singapore	00H	10	00H	A0H	75H
Malaysia	00H	10	00H	A0H	75H

Country	807FA9	807FAA	807FAB	807FAC	807FAD
France	00H	12	1CH	96H	15H
Germany	00H	12	1CH	96H	32H
UK	00H	12	1CH	96H	32H
Italy	00H	12	1CH	96H	32H
Austria	00H	12	1CH	96H	32H
Belgium	00H	12	1CH	96H	32H
Denmark	00H	12	1CH	96H	32H
Finland	00H	12	1CH	96H	32H
Ireland	00H	12	1CH	96H	32H
Norway	00H	12	1CH	96H	32H
Sweden	00H	12	1CH	96H	32H
Switzerland	00H	12	1CH	96H	32H
Portugal	00H	12	1CH	96H	32H
Holland	00H	12	1CH	96H	32H
Spain	00H	12	1CH	96H	32H
Israel	00H	12	1CH	96H	32H
USA	00H	12	1CH	96H	32H
Asia	00H	12	1CH	96H	32H
Hong Kong	00H	12	1CH	96H	32H
South Africa	00H	12	1CH	96H	32H
Australia	00H	12	1CH	96H	32H
New Zealand	00H	12	1CH	96H	32H
Singapore	00H	12	1CH	96H	32H
Malaysia	00H	12	1CH	96H	32H

Country	807FAF	807FB0	807FB1	807FB2	807FB3
France	08H	80H	07H	20H	18
Germany	08H	80H	07H	20H	18
UK	08H	80H	07H	20H	18
Italy	08H	80H	07H	20H	18
Austria	08H	80H	07H	20H	18
Belgium	08H	80H	07H	20H	18
Denmark	08H	80H	07H	20H	18
Finland	08H	80H	07H	20H	18
Ireland	08H	80H	07H	20H	18
Norway	08H	80H	07H	20H	18
Sweden	08H	80H	07H	20H	18
Switzerland	08H	80H	07H	20H	18
Portugal	08H	80H	07H	20H	18
Holland	08H	80H	07H	20H	18
Spain	08H	80H	07H	20H	18
Israel	08H	80H	07H	20H	18
USA	08H	80H	07H	20H	18
Asia	08H	80H	07H	20H	18
Hong Kong	08H	80H	07H	20H	18
South Africa	08H	80H	07H	20H	18
Australia	08H	80H	07H	20H	18
New Zealand	08H	80H	07H	20H	18
Singapore	08H	80H	07H	20H	18
Malaysia	08H	80H	07H	20H	18

Country	807FB4	807FB5	807FB6	807FB7	807FB8
France	09	00	00	09	00
Germany	07	02	00H	06	03
UK	08	02H	00H	08	02
Italy	05	00H	00H	06	00
Austria	09	00H	00H	06	00
Belgium	06	00H	00H	06	00
Denmark	10	00H	00H	10	00
Finland	10	00H	00H	10	00
Ireland	10	00H	00H	10	00
Norway	10	00H	00H	09	02H
Sweden	09	02H	00H	10	00
Switzerland	07	00H	00H	05	01
Portugal	06	00H	00H	06	00
Holland	0CH	00H	00H	07	00
Spain	10	00H	00H	10	00
Israel	13	00H	00H	06	00
USA	10	00	00	09	00
Asia	09	00H	00H	06	00
Hong Kong	09	00H	00H	06	00
South Africa	09	00H	00H	06	00
Australia	08	00	01H	11	02
New Zealand	09	00	00H	08	00
Singapore	09	00H	00H	06	00
Malaysia	09	00H	00H	06	00

Country	807FB9	807FBD	807FDA		
France	00	16H	8CH		
Germany	FEH	15H	53		
UK	00	11H	53		
Italy	00	16H	53		
Austria	00	16H	59		
Belgium	00	16H	59		
Denmark	00	16H	53		
Finland	00	16H	53		
Ireland	00	16H	53		
Norway	00	16H	60		
Sweden	00	16H	53		
Switzerland	FFH	13H	92		
Portugal	00	16H	53		
Holland	00	16H	53		
Spain	00	16H	80		
Israel	00	16H	59		
USA	00	14H	53		
Asia	00	16H	47		
Hong Kong	00	16H	47		
South Africa	00	16H	47		
Australia	00	11H	53		
New Zealand	00	16H	53		
Singapore	00	16H	47		
Malaysia	00	16H	47		

4.4. DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has four bytes of programmable parameters allocated to it. If transmissions to a particular machine often experience problems, store that terminal's fax number as a Quick Dial or Speed Dial, and adjust the parameters allocated to that number.

The programming procedure will be explained first. Then, the four bytes will be described.

4.4.1. Programming Procedure

1. Set bit 3 of System Switch 04 to 1.
2. Either use Function 31 (for a Quick Dial number) or Function 32 (for a Speed Dial number)

   Example: Change the Parameters in Quick Dial 10.

3. Function 3 1 Yes
4. Press Quick Dial key 10.

   Note: When selecting Speed Dial 10 with Function 32, press 1 0 at the ten key pad.

5. Press Yes four times.
6. The settings for byte 0 are now displayed. Press a number from 0 to 7 corresponding to the bit that you wish to change.

   Example: Change bit 7 to 1: Press 7

7. To scroll through the parameter bytes, either:
   Select the next byte:
   or
   Select the previous byte:
   until the correct byte is displayed. Then go back to step 6.
8. After the setting is changed, press Yes .
9. To finish, press Function .
10. After finishing, reset bit 3 of System Switch 04 to 0.

4.4.2. Parameters

The initial settings of the following parameters are all FF(H) - all the parameters are disabled.

Byte 0
FUNCTION AND COMMENTS
CCITT T1 time If the connection time to a particular terminal is longer than the NCU parameter setting, adjust this byte. The T1 time is the value stored in this byte (in hex code), multiplied by 1 second. **Range:** 1 to 127 s (01h to 7Fh) 00h or FFh - The local NCU parameter factory setting is used. Do not program a value between 80h and FEh.

Byte 1

	FUNCTION	COMMENTS
0 to 3	Tx level **Bit 3 2 1 0 Setting (dBm)** 0 0 0 0 0 0 0 0 1 -1 0 0 1 0 -2 0 0 1 1 -3 0 1 0 0 -4 : : 1 1 1 1 -15	If communication with a particular remote terminal often contains errors, the signal level may be inappropriate. Adjust the Tx level for communications with that terminal until the results are better.
4	Tx level setting **0:** Enabled **1:** Disabled (bits 0 to 4 must all be at 1 to disable)	**0:** When enabling the tx level setting, change this bit to 0, then change the settings of bits 0 through 3 above. **1:** When disabling the tx level setting, change all of the bits 0 through 4 to 1.
5 **6**	Cable equalizer **Bit 6 Bit 5 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange when calling the number stored in this Quick/Speed Dial. Also, try using the cable equalizer if one or more of the following symptoms occurs. •Communication error with error codes such as 0-20, 0-23, etc. •Modem rate fallback occurs frequently.
7	Cable equalizer setting **0:** Enabled **1:** Disabled (bits 5 to 7 must all be at 1 to disable)	**0:** When enabling the cable equalizer setting, change this bit to 0, then change the settings of bits 5 and 6 above. **1:** When disabling the cable equalizer setting, change all of the bits 5, 6 and 7 to 1.

Byte 2

	FUNCTION	COMMENTS
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 0 Not used 0 0 0 1 2,400 0 0 1 0 4,800 0 0 1 1 7,200 0 1 0 0 9,600 0 1 0 1 12,000 0 1 1 0 14,400 1 1 1 1 Disabled Other settings: Not used	If training with a particular remote terminal always takes too long, the initial modem rate may be too high. Reduce the initial Tx modem rate using these bits.
4 to 7	Not used	Do not change the settings.

Byte 3

	FUNCTION	COMMENTS
0 **1**	Inch-mm conversion before tx **Bit 1 Bit 0 Setting** 0 0 Inch-mm conversion available 0 1 Inch only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. if “inch only is selected, the printed copy may be slightly distorted at the other end if that machine uses mm-based resolutions.
2 **3**	DIS/NSF detection method **Bit 3 Bit 2 Setting** 0 0 First DIS or NSF 0 1 Second DIS or NSF 1 0 Not used 1 1 Disabled	**(0, 1):** Use this setting if echoes on the line are interfering with the set-up protocol at the start of transmission. The machine will then wait for the second DIS or NSF before sending DCS or NSS.
4	Not used	Do not change the settings.
5	Compression modes available in transmit mode **0:** MH only **1:** All available compression modes	This bit determines the capabilities that are informed to the other terminal during transmission.
6 **7**	ECM during transmission **Bit 7 Bit 6 Setting** 0 0 Disabled 0 1 Enabled 1 0 Not used 1 1 Disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the setting of (0, 0).

4.5. SERVICE RAM ADDRESSES

⚠CAUTION

Do not change the settings which are marked as "Not used" or "Read only."

800001 to 800004(H) - ROM version (Read only)
- 800001(H) - Revision number (BCD)
- 800002(H) - Year (BCD)
- 800003(H) - Month (BCD)
- 800004(H) - Day (BCD)

800005(H) - RAM Reset Level 1
Change the data at this address to 00 (H), then switch the machine off and on to reset all the system settings.
Caution: Before using this RAM, print the settings of all the system parameters (System Parameter List).

800006 to 800016(H) - Machine's serial number (17 digits - ASCII)

800018(H) - Total program checksum (low)
800019(H) - Total program checksum (high)

80001A(H) - Boot program checksum (low)
80001B(H) - Boot program checksum (high)

80001C(H) - Main program checksum (low)
80001D(H) - Main program checksum (high)

80001E(H) - RDS program update counter (hex)

800020 to 80003F(H) - System bit switches
800040 to 80004F(H) - Scanner bit switches
800050 to 80005F(H) - Printer bit switches
800060 to 80007F(H) - Communication bit switches
800080 to 80008F(H) - G3 bit switches

8000A0(H) - User parameter switch 00
Bit 0: Not used
Bits 1, 2 and 3: Scan density home position

Bit	3	2	1	Setting
	0	0	0	Normal
	0	0	1	Lightest
	0	1	0	Darkest
	1	0	1	Lighter
	1	1	0	Darker

Bits 4 and 5: Scanning resolution home position

Bit	5	4	Setting
	0	0	Standard
	0	1	Detail
	1	0	Fine

Bit 6: Transmission mode home position — 0: Memory tx, 1: Immediate tx
Bit 7: Halftone home position — 0: Disabled, 1: Enabled

8000A1(H) - User parameter switch 01
Bit 0: Auto Image Density home position 0: Off, 1: On
Bit 1: Not used
Bit 2: Copy/Fax key home position 0: Fax, 1: Copy
Bits 3 to 6: Not used
Bit 7: Settings return to home position after transmission 0: Disabled, 1: Enabled

8000A2(H) - User parameter switch 02
Bits 0 to 2: Not used
Bit 3: TSI inclusion in transmitted messages 0: Disabled, 1: Enabled
Bits 4 to 7: Not used

8000A3(H) - User parameter switch 03 (Automatic report printout)
Bit 0: Transmission result report (memory transmissions) 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report0: Off, 1: On
Bit 3: Not used
Bit 4: Polling result report (polling reception)0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Not used
Bit 7: TCR (Journal) 0: Off, 1: On

8000A4(H) - User parameter switch 04
Bits 0 to 6: Not used
Bit 7: Inclusion of a sample image on reports0: Off, 1: On

8000A5(H) - User parameter switch 05
Bit 0: Substitute reception0: Off, 1: On
Bit 1: Memory reception if no RTI or CSI received 0: Possible, 1: Impossible
Bits 2 to 5: Not used
Bit 6: Fusing lamp during the energy saver mode
0: Lamp of, 1:Standby temperature (80 °C)
Bit 7: Not used

8000A6(H) - User parameter switch 06
Bit 0: TTI0: Off, 1: On
Bits 1 to 7: Not used

8000A7- 8000A9(H) - User parameter switch 07 to 09
Bits 0 to 7: Not used

8000AA(H) - User parameter switch 10
Bits 0 to 6: Not used
Bit 7: Halftone type0: Error diffusion, 1: Dither

8000AB(H) - User parameter switch 11
Bits 0 to 7: Not used

8000AC(H) - User parameter switch 12
Bits 0, 1: Not used
Bit 2: Toner saving mode0: Disabled, 1: Enabled
Bits 3 and 4: Printout image density (Fax mode)

Bit	4	3	Setting
	0	0	Normal
	0	1	Lighten
	1	0	Darken
	1	1	Not used

Bits 5 to 7: Not used

8000AD(H) - User parameter switch 13
Bits 0 to 1: PSTN access method from behind a PABX

Bit	1	0	Setting
	0	0	PSTN
	0	1	Loop start
	1	0	Ground start
	1	1	Flash start

Bits 2 to 3: Not used
Bits 4: PC-FAX Default baud rate 0: 2400bps 1: 19200bps
Bits 5 to 7: Not used

8000B1(H) - Maximum number of copies 1 - 99 (BCD)
8000B2(H) - Center erase width 1 - 50 mm (BCD)
8000B3(H) - Border erase width 1 - 50 mm (BCD)

8000B4(H) - User function 62 settings*
Bit 0: Use of the memory card0: SAF, 1: Page memory
Bits 1 to 7: Not used

8000B9(H) - User function 62 settings
Bit 0: Night timer 0: Disabled, 1: Enabled
Bits 1 to 3: Not used
Bit 4: RDS operation 0: Not acceptable
1: Acceptable for the limit specified by
system switch 03
Bits 5 and 6: Not used
Bit 7: Daylight saving time0: Disabled, 1: Enabled

8000BA(H) - User function 62 settings
Bit 0: Not used
Bit 1: Dialing type0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing
Bits 2 to 7: Not used

8000BB(H) - PSTN access number for loop start

Access number	Hex value to program (BCD)
0	F0
⇩	⇩
0	F0
00	00
⇩	⇩
99	99

8000BC(H) - User function 61 settings
Bits 0 to 7: The number of rings when auto mode is selected0 - 99 (BCD)

8000BE(H) - User function 62 settings*
Bits 0 to 3: Not used
Bits 4 to 5: Receive mode home position

Bit 5	4	Setting
0	0	AUTO
0	1	Fax
1	0	Tel
1	1	Not used

Bits 6 to 7: Not used

8000BF(H) - User function 62 settings
Bit 0: PC-FAX reception0: Disabled, 1: Enabled
Bits 1 to 7: Not used

8000C8 to 8000DB(H) - RTI (Max. 20 characters - ASCII) - **Note 1**
8000DC to 8000EF(H) - CSI (Max. 20 characters - ASCII)
8000F0 to 80010F(H) - TTI (Max. 32 characters - ASCII) - **Note 1**
800110(H) - Number of CSI characters (Hex)

Note 1: If the number of characters is less than the maxumum (20 for RTI, 32 for TTI), add a stop code (FF[H]) after the last character.

800111 to 80011F(H) - Service station's fax number (Service function 13)

800120 to 80012E(H) - Own fax number (User function 61)

800140 to 800146(H) - Last power off time (Read only)
800140(H) - Year (BCD)
800141(H) - Month (BCD)
800142(H) - Day (BCD)
800143(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday
800144(H) - Hour
800145(H) - Minute
800146(H) - Second

800150(H) - Optional equipment (Read only)
Bit 0: Memory card 0: Not installed, 1: Installed
Bits 1 to 4: Not used
Bit 5: Optional cassette0: Not installed, 1: Installed
Bits 6 and 7: Not used

The following counters are listed on the System Parameter List. The names used on the system parameter list are given in brackets.

800158 to 80015A(H) - Tx counter (TX)

Address	High	Low
800158(H)	Tens digit	Unit digit
800159(H)	Thousands digit	Hundreds digit
80015A(H)	Millions digit	Ten thousands digit

Note: The following counters have the same data format as above.

80015B to 80015D(H) - Rx counter (RX)

80015E to 800160(H) - Scan counter (SCN)

800161 to 800163(H) - Print counter (PRT)

800164 to 800166(H) - Paper feed counter: standard cassette (MAIN CASSETTE)

80016A to 80016C(H) - Paper feed counter: optional cassette (OPEN CASSETTE)

80016D to 80016F(H) - Paper feed counter: bypass feeder (BY-PASS)

800170 to 800172(H) - ADF counter (ADF)

800173 to 800175(H) - Book scan counter (BOOK)

800176 to 800178(H) - Printer total jam counter (COPY JAM)

800179 to 80017B(H) - Paper jam counter: standard cassette (MAIN CST JAM)

80017F to 800181(H) - Paper jam counter: optional casseete (OPEN CST JAM)

800182 to 800184(H) - Paper jam counter: bypass feeder (BY-PASS JAM)

800185 to 800187(H) - Scanner total jam counter (DOC. JAM)

800188 to 80018A (H) - Fusing exit fam counter (EJECT JAM)

80018B to 80018D(H) - Registration jam counter (PAPER JAM)

80018E to 800190(H) - PM counter (PM)

800191 to 800193(H) - PM call interval: default 30,000 (PM DEFAULT)

800194 to 800196(H) - Copy counter (COPY)

800197 to 800199(H) - OPC (master drum) counter (OPC)

80019A to 80019C(H) - DTM counter (TONER)

80019D to 80019F(H) - PC Tx counter (PC TX)*

8001A0 to 8001A2(H) - PC Rx counter (PC RX)*

8001A3 to 8001A5(H) - PC Scan counter (PC SCN)*

8001A6 to 8001A8(H) - PC purint counter (PC PRT)*

8001DE to 8001ED(H) - Excessive jam call parameters (Refer to section 2.3.* for details)

8001EE to 8001F0(H) - OPC (master drum) replacement interval (default: 20,000 prints)
The machine asks the user to replace the drum at this interval, if bit 5 of system switch 04 is 0.

8001FA to 800223(H) - Night timer period (User function 71)
- 8001FA to 8001FC(H) - Setting #1 for Monday
- 8001FD to 8001FF(H) - Setting #2 for Monday
- 800200 to 800202(H) - Setting #1 for Tuesday
- 800203 to 800205(H) - Setting #2 for Tuesday
- 800206 to 800208(H) - Setting #1 for Wednesday
- 800209 to 80020B(H) - Setting #2 for Wednesday
- 80020C to 80020E(H) - Setting #1 for Thursday
- 800206 to 800211(H) - Setting #2 for Thursday
- 800212 to 800214(H) - Setting #1 for Friday
- 800215 to 800217(H) - Setting #2 for Friday
- 800218 to 80021A(H) - Setting #1 for Saturday
- 80021B to 80021D(H) - Setting #2 for Saturday
- 80021E to 800220(H) - Setting #1 for Sunday
- 800221 to 800223(H) - Setting #2 for Sunday

Program format
First byte - Hour (BCD)
Second byte - Minute (BCD)
Third byte - 00(H): Timer start time, 01(H): Timer end time

80024F to 800254(H) - Last RDS operation (Read only)
- 80024F(H) - Year (BCD)
- 800250(H) - Month (BCD)
- 800251(H) - Day (BCD)
- 800252(H) - Hour
- 800253(H) - Minute
- 800254(H) - Second

800256(H) - Daylight saving time setting (User function 62)

80025C(H) - Transmission monitor volume00 - 07(H)
80025D(H) - Reception monitor volume00 - 07(H)
80025E(H) - On-hook monitor volume00 - 07(H)
80025F(H) - Dial monitor volume00 - 07(H)
800260(H) - Buzzer volume00 - 07(H)
800261(H) - Key acknowledgement tone volume 00 - 07(H)

800262 to 800266(H) - Periodic service call parameters (Refer to section 2.3.2 for details)

80026D to 80026F(H) - Effective term of automatic service calls (Refer to section 2.3.2 for details)

80028E to 80028F(H) - Book mode: scan top margin adjustment
Refer to section 6.11 for details.

800296 to 800297(H) - ADF mode: scan top margin adjustment
800298 to 800299(H) - ADF mode: scan bottom margin adjustment
Refer to section 6.11 for details.

8002A2(H) - Book mode: scan left margin adjustment
8002A3(H) - Book mode: scan left margin adjustment
Refer to section 6.11 for details.

8002AA(H) - Peak hold control during the scanning (only text mode)*
If the original contains solid black data on the top of the page, this data may not be scanned as a black image due to peak hold control. Set this bit to 1 to turn off peak hold control. (initial setting 0)
NOTE: The scanned image tend to become darker when the peak hold control is turned off.
Bit 0 to 5: Not used
Bit 6: Copy mode 0: on, 1: off
Bit 7: Fax mode 0: on, 1: off

80032C(H) - Fusing unit failure
When a service call was caused by a fusing unit failure (code 0X)
When a fusing error occurs, the contents of this RAM are changed to 0X. After fixing the problem, reset the data at this address to 00(H), then restart the machine to clear the service call. (Refer to address 8003A4(H) for other hardware failures.)

80032D(H) - Excessive jam alarm
Bit 3: Scanner excessive jam alarm1: An alarm has occurred
Bit 4: Printer excessive jam alarm1: An alarm has occurred
Either or both of these bits will change to 1 when an excessive jam alarm occurs. Reset each bit to 0 when you have solved the problem. The machine will not be able to detect excessive jams in future if you do not reset these bits.

80033C(H) - Print top margin (standard paper cassette)
800341(H) - Print top margin (optional cassette)
800342(H) - Print top margin (bypass feeder)
800346(H) - Print left margin (standard paper cassette)
80034B(H) - Print left margin (optional cassette)
80034C(H) - Print left margin (bypass feeder)
Refer to section 6.11 for details.

8003A4(H) - Details of the service call (hardware error)
0X(H): Fusing unit failure
1X(H): Charge corona unit failure
21(H): Laser power is out of the specified range
3X(H): Polygonal mirror motor failure
4X(H): Main motor failure
71(H): Home position not detected in book scanner mode

When a service call was caused by a fusing unit failure (codes 0X):
The same code is stored at address 80032C(H).
After fixing the problem, reset the data at address 80032C(H) to 00(H), then restart the machine to clear the service call.

When a service call was caused by another hardware failure:
If the problem remains after restarting the machine (power off/on), fix the hardware problem. The service call condition is cleared after power on.

8003B0(H) - Initial Toner Supply
Bit 3: Initial toner supply 0: Off, 1: On
Whenever the development unit is replaced, do the following procedure.
1. Make sure that the drum, CTM, and the new development unit are correctly installed.
2. Turn on the machine and change this bit to 1.
3. Turn off the machine.
4. Turn on the machine. The machine starts filling up the empty development unit hopper with new toner. (This bit is reset to zero automatically.)
5. Make test copies or test patterns to check the print quality.

800512 to 800522(H) - Scanning contrast threshold*
The smaller the setting, the darker the density.
The settings in between Darkest and Normal, and Lightest and Normal are automatically calculated.

Mode	Text / Photo	Image Density	Initial Settings	Range	Address
Copy	Text	Auto	23	0 - 30	800512
		Darkest	8	0 - 31	800514
		Normal	15	0 - 31	800515
		Lightest	22	0 - 31	800516
	Photo	Darkest	9	0 - 30	800517
		Normal	17	0 - 30	800518
		Lightest	25	0 - 30	800519
Fax	Letter	Auto	19	0 - 30	80051B
		Darkest	13	0 - 31	80051D
		Normal	15	0 - 31	80051E
		Lightest	17	0 - 31	80051F
	Photo	Darkest	6	0 - 30	800520
		Normal	12	0 - 30	800521
		Lightest	18	0 - 30	800522

800523 to 800562 (H) - Scanner Video Processing Parameters
Refer to section 6.11 for details.

800579 (H) - Peak reset value for the peak hold control (only text mode)*
When the original contains solid black data on the top of the page, a higher setting will reduce instances of horizontal white line. (initial setting 40(H))
However, the larger the setting, the darker the image density.

802BB9 to 802D38(H) - Latest 64 error codes (Read only)

One error record consists of 6 bytes of data.

First error record start address - 802BB9(H)
Second error record start address - 802BBF(H)
Third error record start address - 802BC5(H)
: : :
64th error record start address - 802D33(H)

The format is as follows:
1st byte - Minute (BCD)
2nd byte - Hour (BCD)
3rd byte - Day (BCD)
4th byte - Month (BCD)
5th byte - Error code (low) [If the error code is 1-23, 23 is stored here.]
6th byte - Error code (high) [If the error code is 1-23, 01 is stored here.]

803CDE to 803EEF(H) - Latest 10 error communication records

One error communication record consists of 53 bytes. The format is as follows:

1st byte - Header
Bit 0: Communication result0: OK, 1: NG
Bit 1: Document jam 1: Occurred
Bits 2 - 3: Not used
Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes
Bit 5: Type of technical data0: Rx level, 1: Measure of error rate
Bit 6: Error report 0: Not printed, 1: Printed
Bit 7: Data validity 0: Not valid, 1: Valid

2nd to 5th bytes - Date and time when the communication started
2nd byte - Month (BCD)
3rd byte - Day (BCD)
4th byte - Hour (BCD)
5th byte - Minute (BCD)

6th and 7th bytes - Communication time
6th byte - Minutes (BCD)
7th byte - Seconds (BCD)

8th byte - Number of pages transmitted or received (Hex)

9th and 10th bytes - Personal code or number of total/burst error lines
If bit 4 of the 1st byte is 0:
9th byte - Personal code (low - BCD)
10th byte - Personal code (high - BCD)
If bit 4 of the 1st byte is 1:
9th byte - Number of total error lines (Hex)
10th byte - Number of burst error lines (Hex)

11th byte - File number (low - Hex)
12th byte - File number (high - Hex)

13th and 14th bytes - Rx level or measure of error rate
If bit 5 of the 1st byte is 0:
13th byte - Rx level (low - Hex)
14th byte - Rx level (high - Hex)
If bit 4 of the 1st byte is 1:
13th byte - Measure of error rate (low - Hex)
14th byte - Measure of error rate (high - Hex)

15th byte - Final modem rate
Bits 0 to 2: Final modem speed

$$\begin{pmatrix} Bit\ 0 \\ Bit\ 1 \\ Bit\ 2 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : 2.4k \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : 4.8k \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} : 7.2k \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} : 9.6k \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} : 12.0k \begin{pmatrix} 0 \\ 1 \\ 1 \end{pmatrix} : 14.4k$$

Bit 3: Not used
Bits 4 to 6: Final modem type

$$\begin{pmatrix} Bit\ 4 \\ Bit\ 5 \\ Bit\ 6 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : V.27ter \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : V.29 \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} : T.B.D.$$

Bit 7: Not used

16th byte to 35th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

36th byte - Communication mode #1
Bits 0 - 1: Resolution used

$$\begin{pmatrix} Bit\,0 \\ Bit\,1 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} : Standard, \begin{pmatrix} 0 \\ 1 \end{pmatrix} : Detail, \begin{pmatrix} 1 \\ 1 \end{pmatrix} : Fine$$

Bit 2: Not used
Bit 3: ECM 0: Off, 1: On
Bits 4 to 7: Communication mode used

$$\begin{pmatrix} Bit\,4 \\ Bit\,5 \\ Bit\,6 \\ Bit\,7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : Normal \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : Confidential \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : Polling \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : Transfer$$

$$\begin{pmatrix} Bit\,4 \\ Bit\,5 \\ Bit\,6 \\ Bit\,7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : Forwarding \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : \begin{matrix} Automatic \\ Service\ Call \end{matrix}$$

37th byte - Communication mode #2
Bit 0: Tx or Rx 0: Tx, 1: Rx
Bit 1: Reduction in Tx 0: Not reduced, 1: Reduced
Bit 2: Batch transmission 0: Not used, 1: Used
Bit 3: Send later transmission 0: Not used, 1: Used
Bit 4: Transmission from 0: ADF, 1: Memory
Bits 5 to 7: Not used

38th byte - Number of errors during communication (Hex)

39th to 41st byte - 1st error code and page number where the error occurred
39th byte - Page number where the error occurred (Hex)
40th byte - Error code (low - BCD)
41st byte - Error code (high - BCD)
42th to 44th byte - 2nd error code and page number where the error occurred
45th to 47th byte - 3rd error code and page number where the error occurred
48th to 50th byte - 4th error code and page number where the error occurred
51st to 53rd byte - 5th error code and page number where the error occurred

FB0006 to FB000E(H) - ROM part number and suffix (ASCII)

5. PREVENTIVE MAINTENANCE

5.1. SPECIAL TOOLS AND LUBRICANTS

- Flash/SRAM data copy tool (P/N: A1939353/H5159100)
- Flash/SRAM data copy board (P/N: A1939351)
- Launa Oil - 40 (P/N: 54429103) for scanner guide shaft

5.2. PM TABLE

Scanner

Item	30K	60K	90K	Notes
Exposure Glass	C (user)	C (user)	C (user)	Soft cloth and water
Platen Cover	C (user)	C (user)	C (user)	Soft cloth and water
Shading Sheet	C	C	C	Soft cloth and water

ADF

Item	30K	60K	90K	Notes
R1 and R2 Rollers	C (user)	C (user)	C (user)	Soft cloth and water
ADF Feed Roller	R	R	R	
ADF Pick-up Roller	R	R	R	
Separation Roller	R	R	R	

Printer

Item	30K	60K	90K	Notes
Paper Feed Roller	C	C	C	Soft cloth and water
Registration Roller		C		Soft cloth and water
Fusing Thermistor		R		
Hot Roller Strippers		R		4 pcs. used
Hot Roller		R		
Pressure Roller (Fusing)		R		
Cleaning Pad	R (user) Replaced when a new CTM (toner cassette) is installed.			A cleaning pad is enclosed in the drum unit.
Ozone Filter	R	R	R	
Development Unit		R		Transfer Roller is included.

Optional Paper Cassette

Item	30K	60K	90K	Notes
Feed Roller	C (user)	C (user)	C (user)	Soft cloth and water
Separation Pad Ass'y	C	C	C	Soft cloth and water

C: Clean, R: Replace

6. REPLACEMENT AND ADJUSTMENT

⚠WARNING

The machine contains a laser beam generator. Laser beams can cause permanent eye damage. Do not open the laser unit or look along the laser beam path while the main power is on.

⚠CAUTION

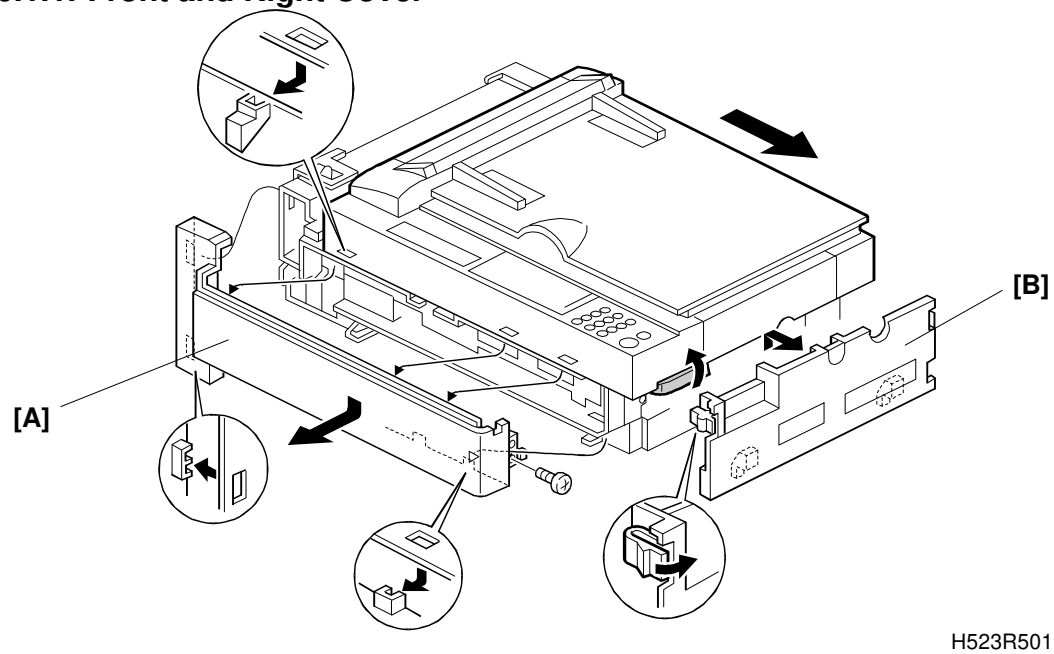
Before starting disassembly, be sure to print all message files in the SAF memory. Then, turn off the main switch and disconnect the power cord for safety.

⚠CAUTION

Lithium Battery: The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

6.1. EXTERIOR

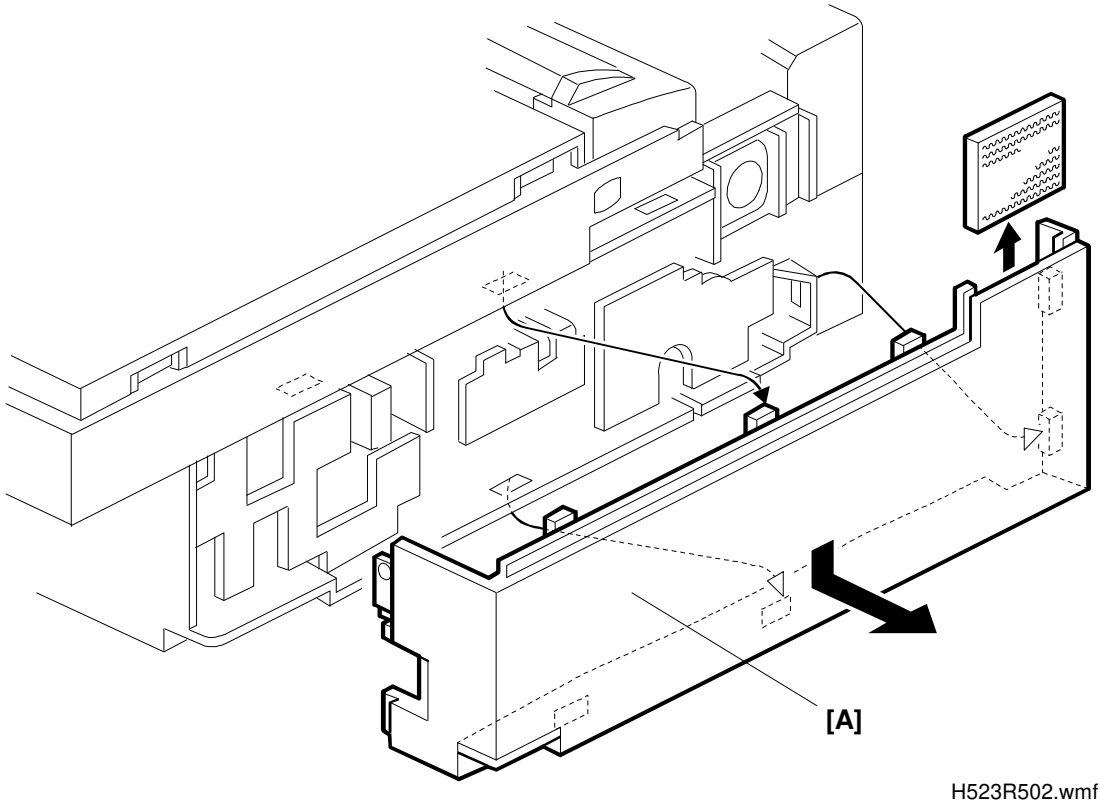
6.1.1. Front and Right Cover



H523R501.wmf

A: Front Cover (1 screw, 7 positioning hooks)
B: Right Cover (2 tabs, 2 positioning hooks)

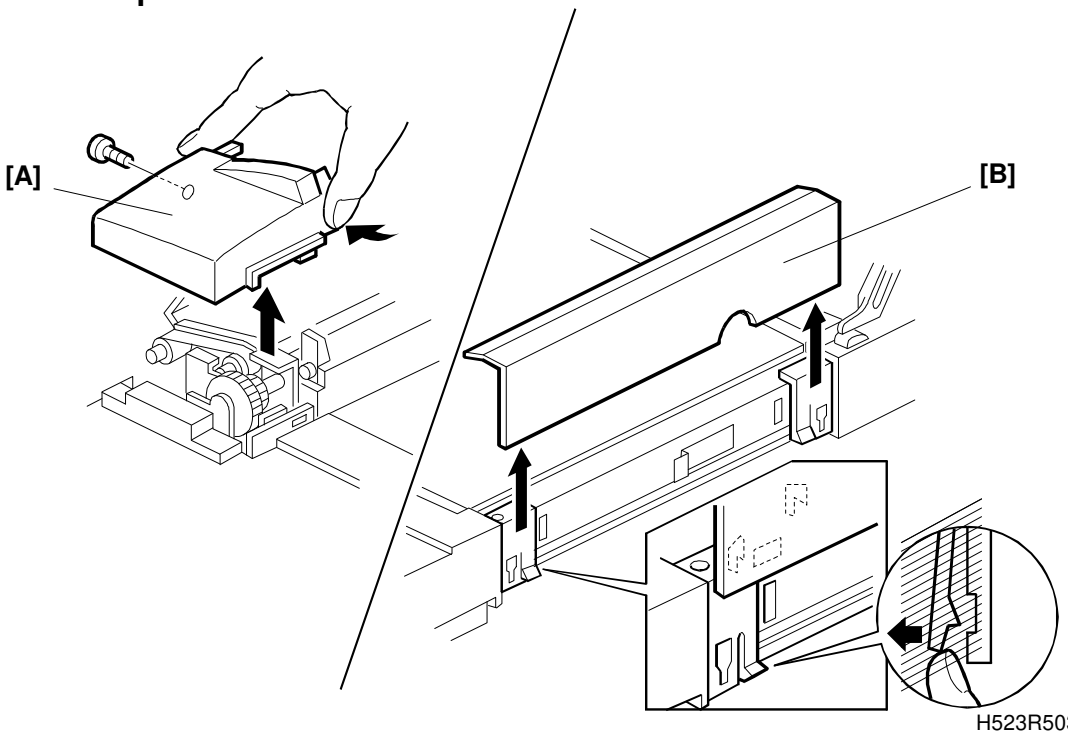
6.1.2. Rear Cover



H523R502.wmf

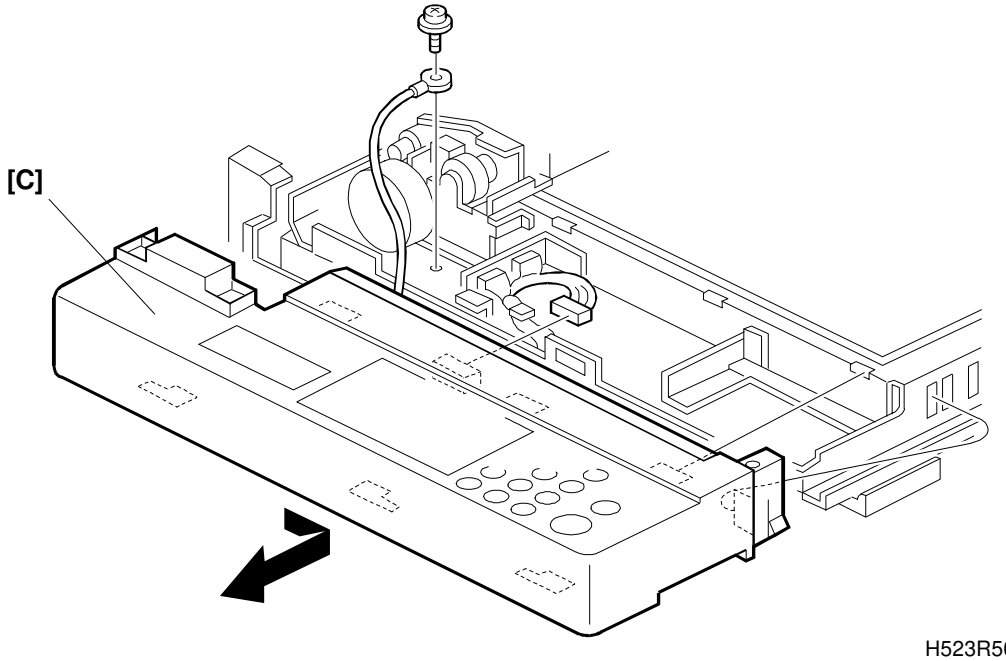
A: Rear Cover (1 screw, 7 positioning hooks)

6.1.3. Operation Panel



H523R503.wmf

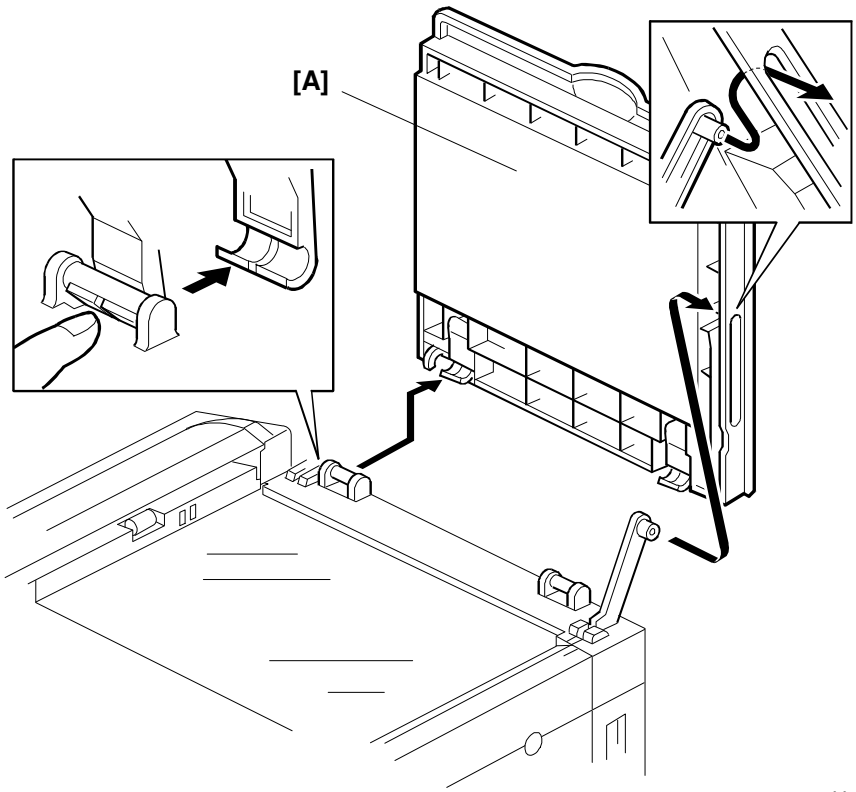
A: ADF Upper Front Cover (1 screw)
B: Upper right Cover (2 hooks)



H523R504.wmf

C: Operation Panel (1 connector, 1 grounding wire)

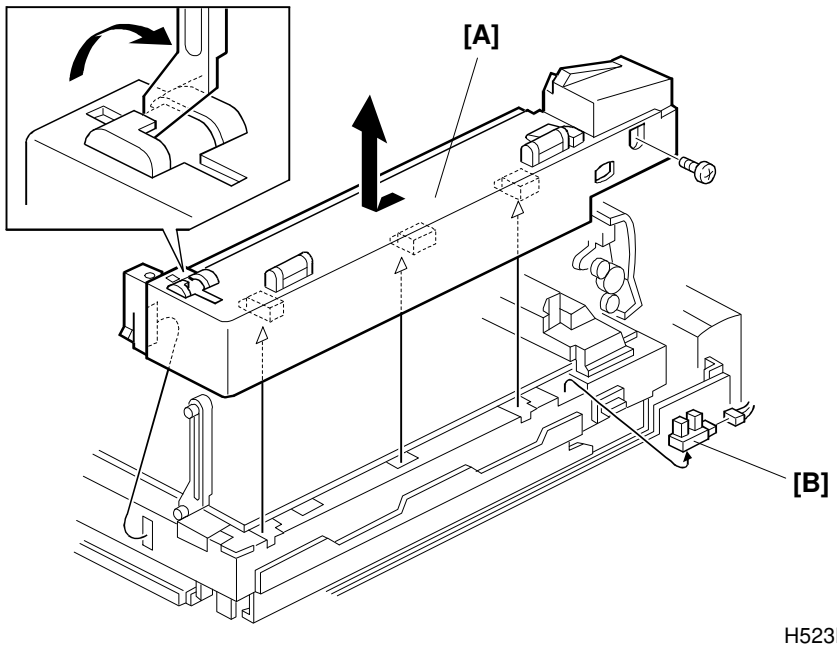
6.1.4. Platen Cover



H523R505.wmf

A: Platen Cover (2 hooks)

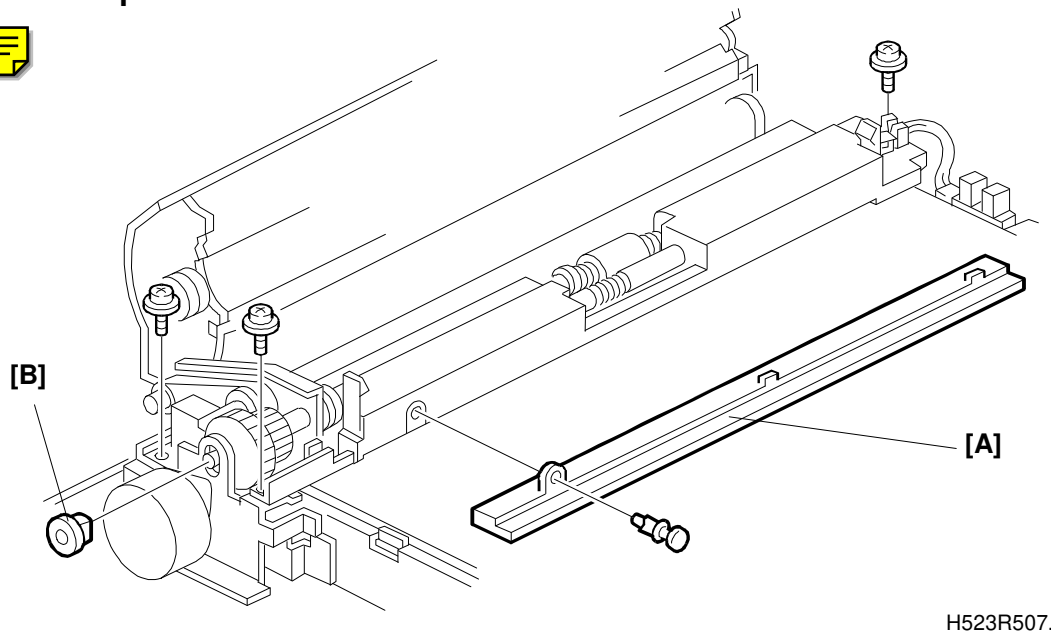
6.1.5. Upper Rear Cover



H523R506.wmf

A: Upper Rear Cover (5 positioning hooks)
B: Platen Cover Sensor (1 connector, 3 hooks)

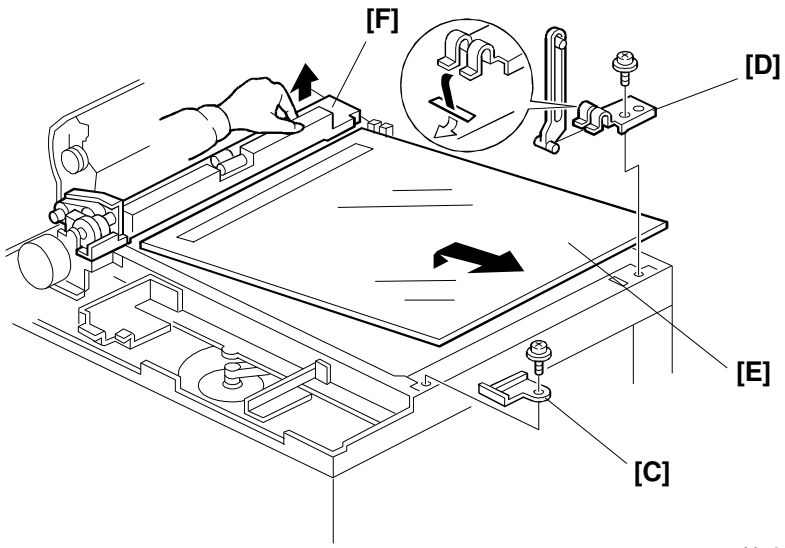
6.1.6. Exposure Glass



H523R507.wmf

A: White Shading Plate (1 snap)
B: Bushing

Note: First remove the white shading plate [A]. Leave the 3 screws in the ADF. Then remove the bushing.



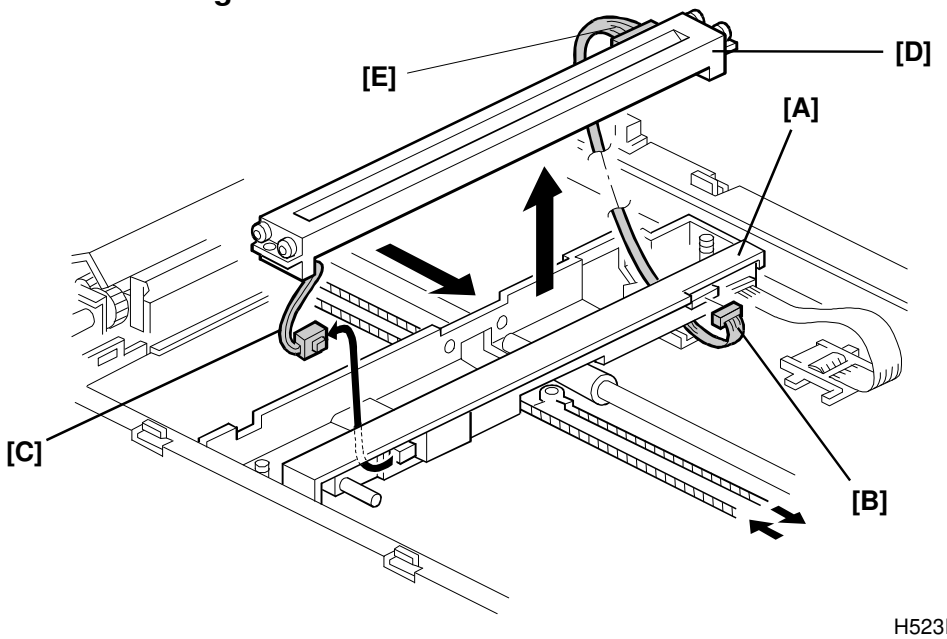
H523R508.wmf

C, D: Brackets (1 screw each)
E: Exposure Glass

Note: Remove the brackets [C] and [D] first. Then while lifting the ADF [F], remove the exposure glass [E], as shown.

6.2. SCANNER

6.2.1. Contact Image Sensor



H523R509.wmf

Move the image sensor [A] to the middle of scanning path. Then disconnect harnesses [B] and [C].
D: Contact Image Sensor Assembly (2 connectors)

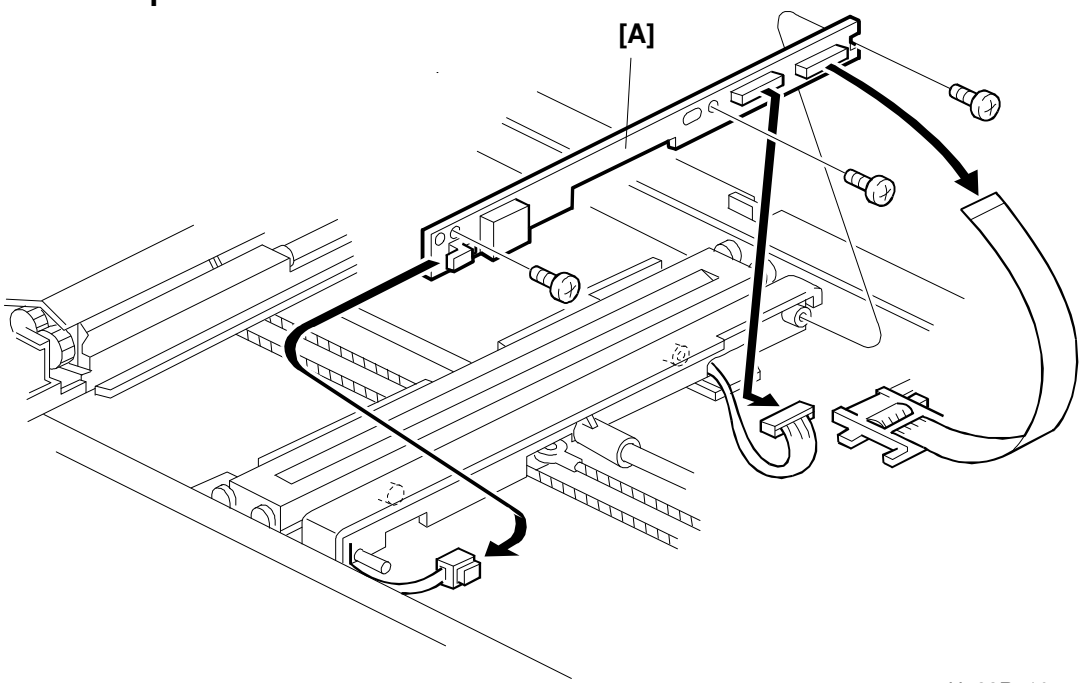
After replacing the image sensor, do the following.

1. Reset the sensor clock signal using service function 10-3.
   (See section 4-1-17; the clock is reset automatically when this function is used.)
2. Make some test copies using book scanner and ADF mode.
   A blank copy might be made when using the ADF after replacing the image sensor. Refer to section 7.1.1 for more details.

Note: 1. Scanner guide shaft replacement:
If you replace the scanner guide shaft, put Launa Oil 40 on all surfaces of the shaft (P/N: 54429103 - Launa Oil 40).

2. Do not remove the connector [E]. This may change the position of the sensor element.

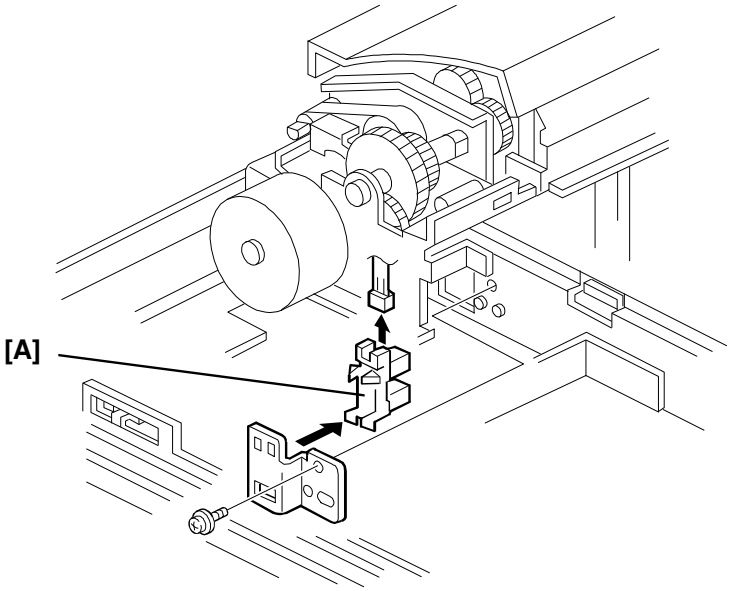
6.2.2. Lamp Stabilizer



H523R510.wmf

A: Lamp Stabilizer [A] (3 tapping screws, 3 connectors)

6.2.3. Scanner Home Position Sensor

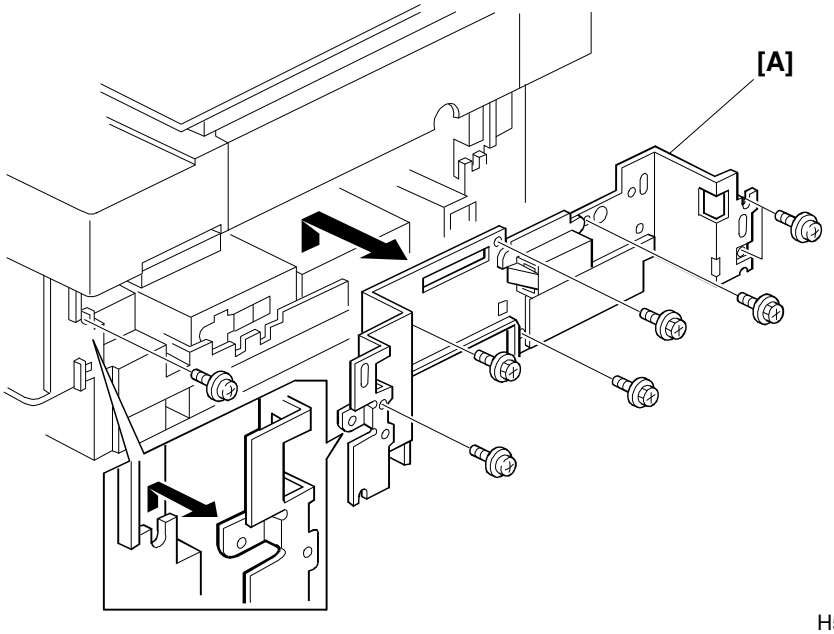


H523R546.wmf

First remove the Operation Panel.

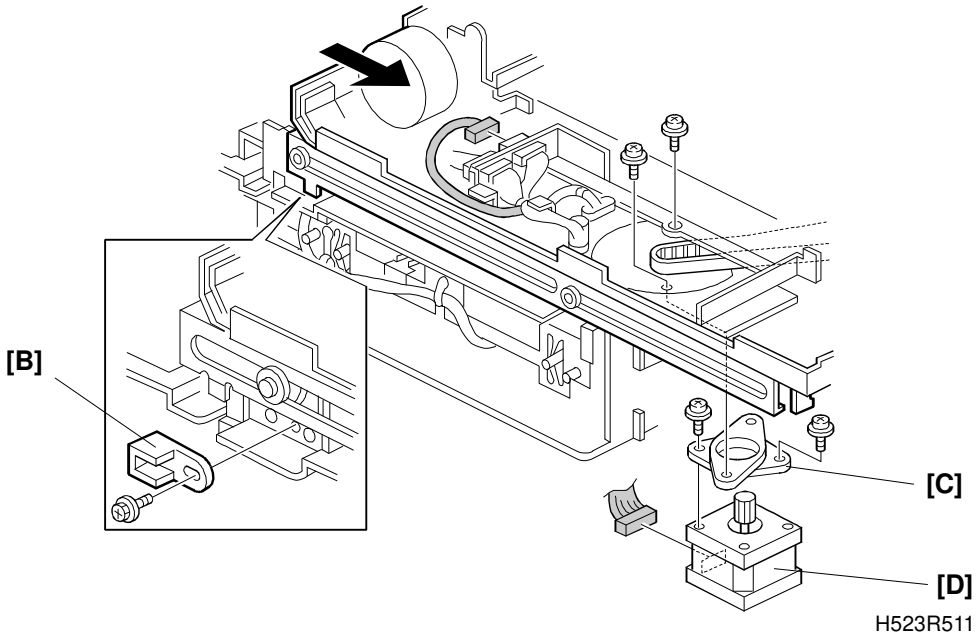
A: Scanner Home Position Sensor (1 screw, 1 connector, 4 hooks)

6.2.4. Scanner Motor



H523R537.wmf

First remove the Front, Right and Rear Covers; then remove the Operation Panel.
A: Bracket (10 screws)

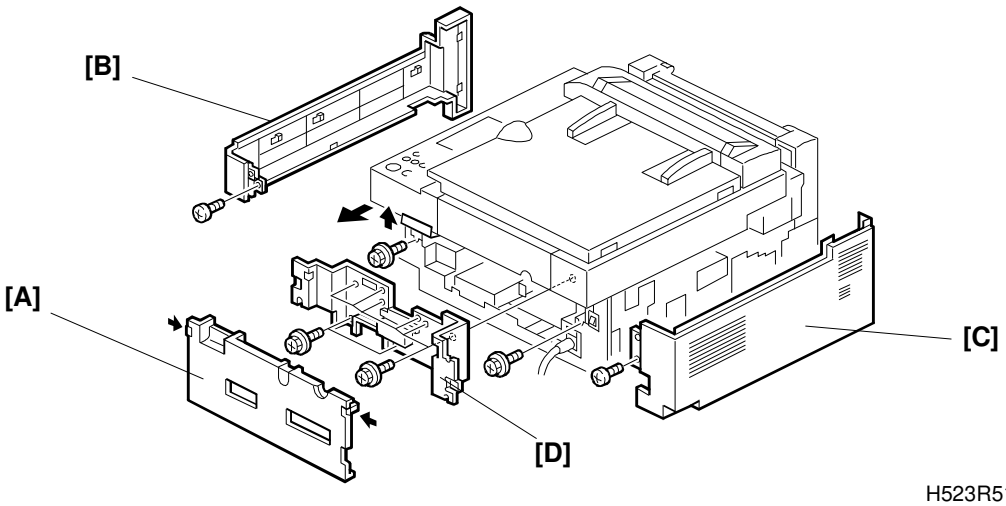


H523R511.wmf

B: Stopper (1 screw)
C: Bracket (4 screws)
D: Scanner Motor (1 connector)

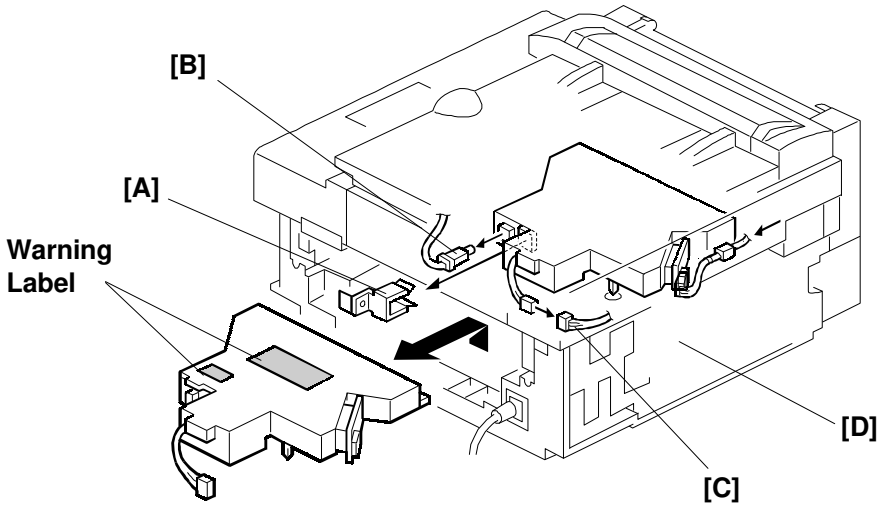
6.3. LASER PRINTING COMPONENTS

6.3.1. Laser Unit



H523R512.wmf

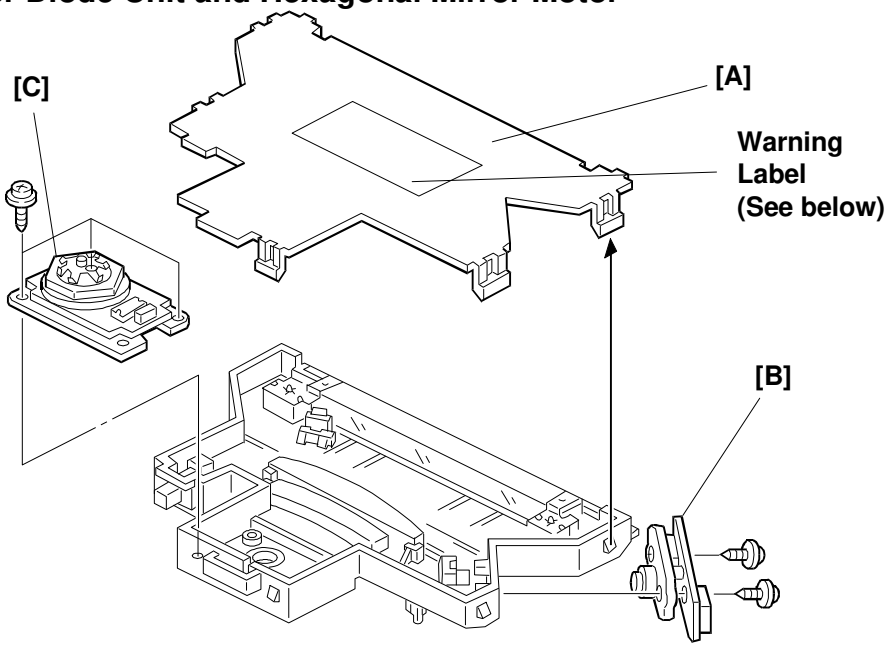
A: Right Cover (2 tabs)
B: Front Cover (1 screw)
C: Rear Cover (1 screw)
D: Inner Bracket (9 screws)



H523R513.wmf

First, remove the clip [A] and the harnesses [B], [C], and [D]. Then while lifting up the Laser Unit [E], remove the unit, as shown.

6.3.2. Laser Diode Unit and Hexagonal Mirror Motor

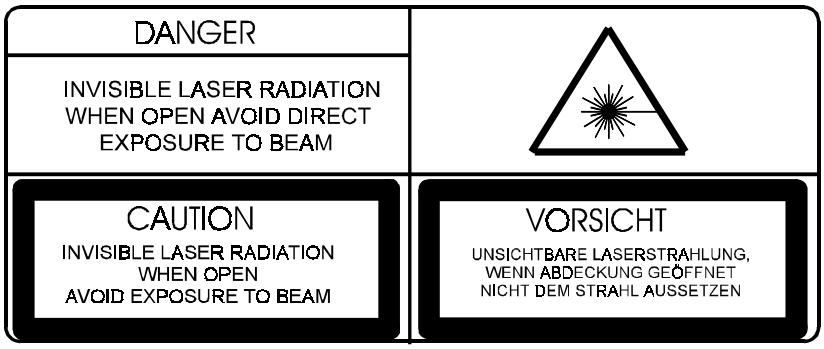


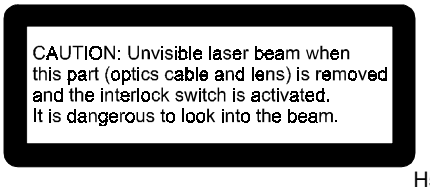
H523R514.wmf

A: Laser Unit (7 hooks)
B: Laser Diode (2 tapping screws)
C: Polygon Motor (3 tapping screws)

⚠WARNING

Laser beams can cause permanent eye damage. Do not open the laser unit or look along the laser beam path while the main power is on.

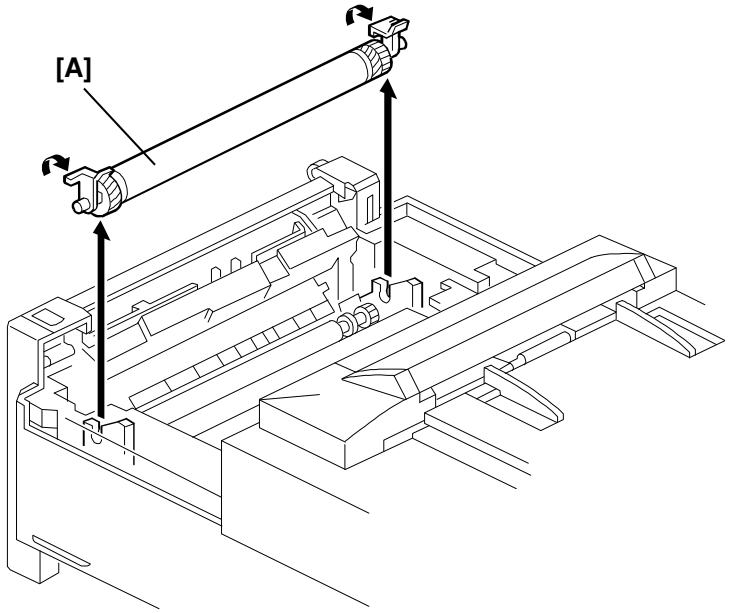




H523R559.wmf

6.4. DEVELOPMENT

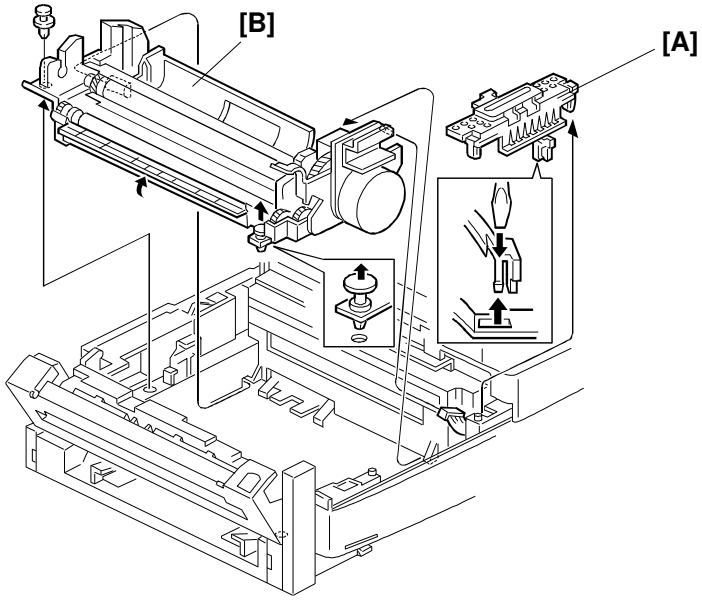
6.4.1. Drum



H523R515.wmf

A: Drum

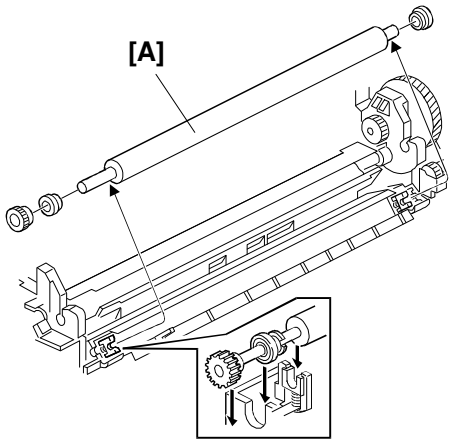
6.4.2. Development Unit



H523R516.wmf

First remove the inner cover [A].
B: Development Unit (2 clips, 1 connector)

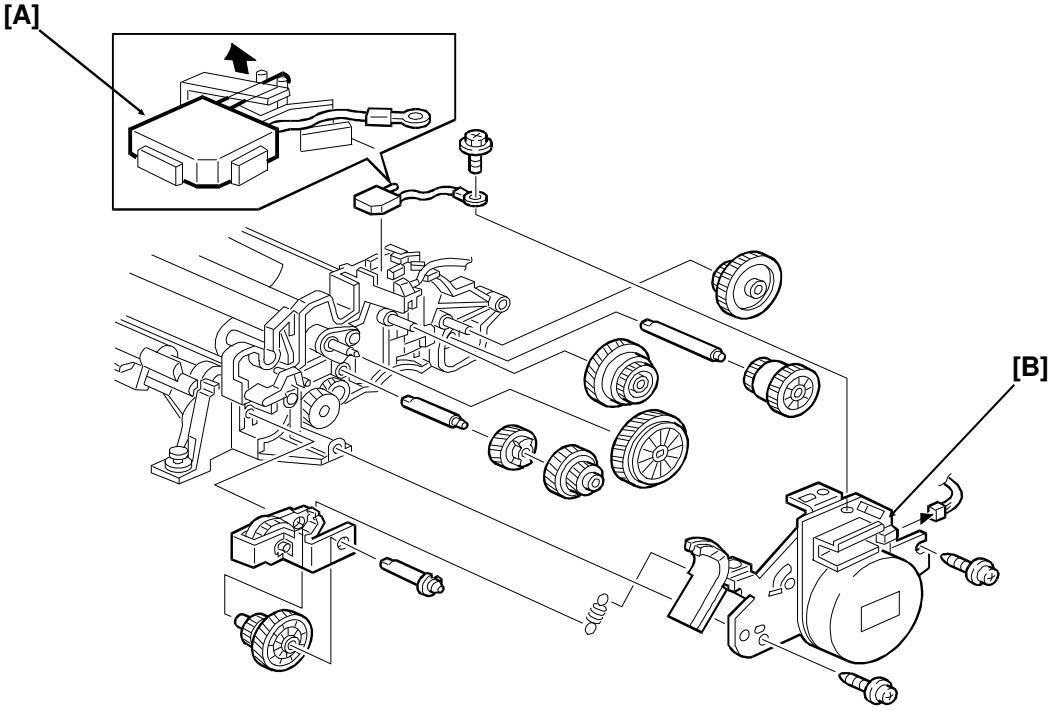
6.4.3. Transfer Roller



H523R517.wmf

A: Transfer Roller (1 gear, 2 spacers)

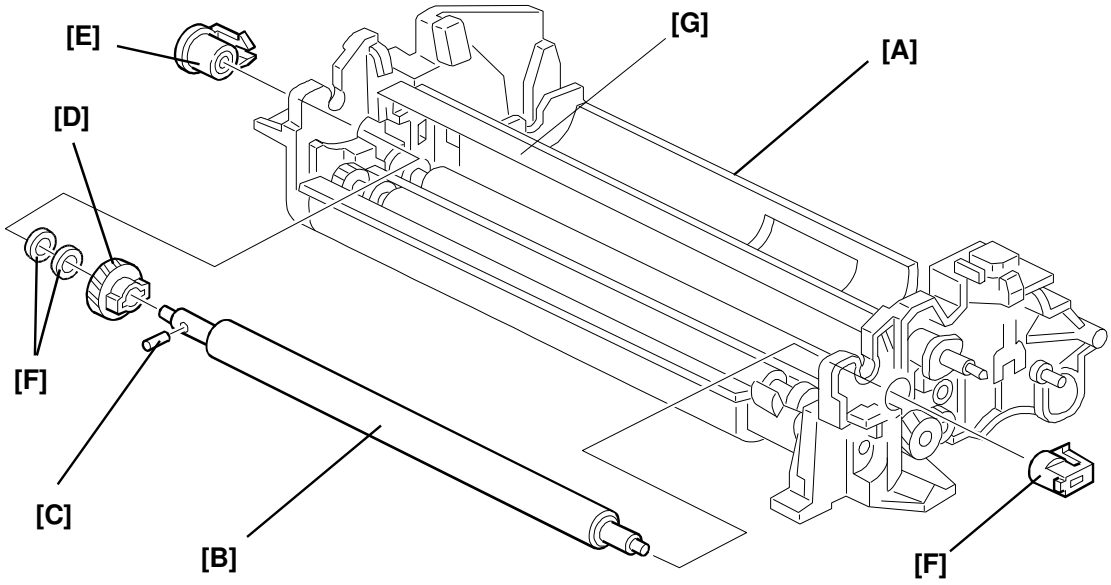
6.4.4. Main Motor and Gears



H523R518.wmf

First, remove the zener diode [A], then remove the main motor assembly [B].
Note: Once the main motor assembly is removed, the gears and the shafts will come off the unit easily.
A: Zener Diode (1 screw)
B: Main Motor Assembly (2 tapping screws, 1 connector, 1 spring)

6.4.5. Replacing the Development Unit



H523R519.wmf

The spare development unit does not come with the development roller installed. So, assemble the roller first, as shown above, before replacing the unit.
A: Development Unit
B: Development Roller
C: Pin
D: Development Roller Gear
E, F: Bushings
G: Mylar Strip
F: Spacer

After every 60,000 prints, the development unit be replaced.
The development unit ass'y (P/N: H5239570) includes all the components such as the development roller, transfer roller, main motor, zener diode.

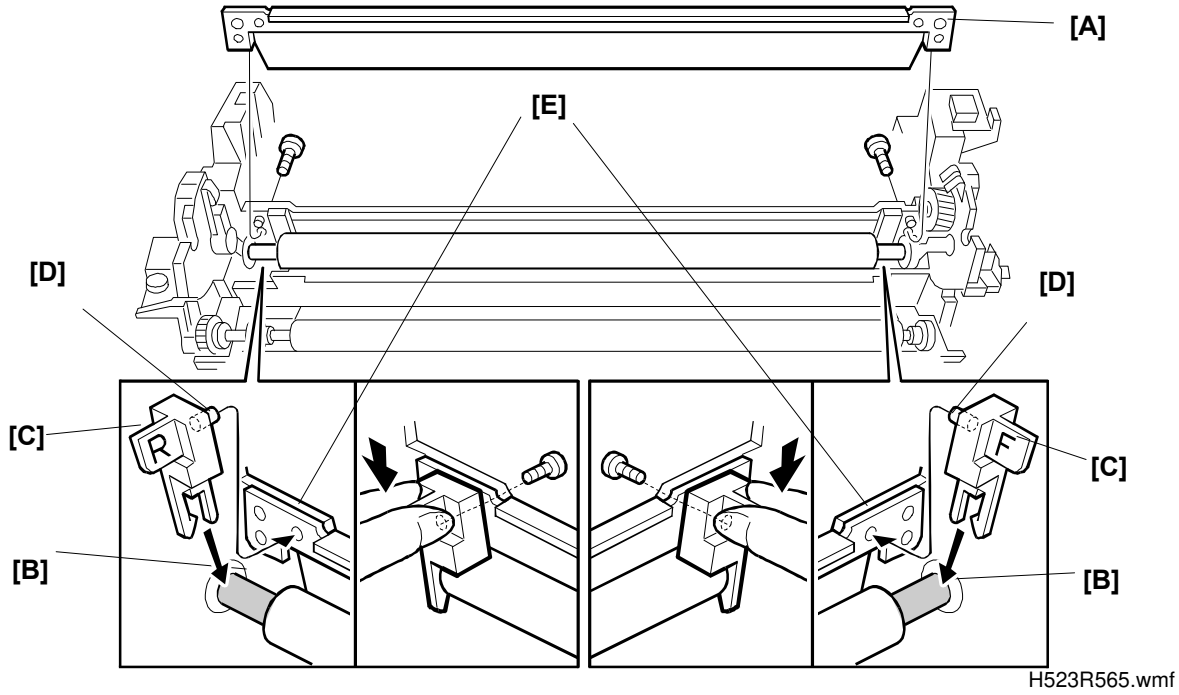
To install a new development unit, do the following:

1. Install a new development roller into the new development unit as shown above.
2. Install the new development unit into the machine.
3. Install the drum and CTM, and check that the following points are connected to frame ground.
   - Drum shaft
   - Main motor bracket
   - Anti static brush on the transfer roller unit

Initial Toner Supply
After installing a new development unit, do the following:

1. Set bit 3 of RAM address 8003B0 to 1.
2. Turn off the machine and wait for 10 seconds.
3. Turn on the machine.
4. The machine will supply new toner to the development unit.

6.4.6. Toner Metering Blade

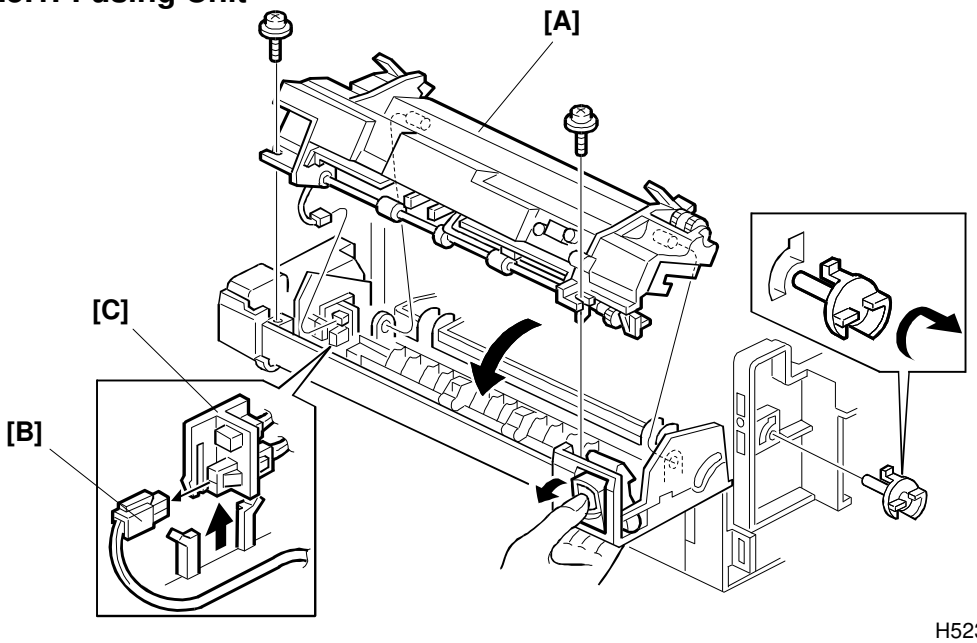


To install a new toner metering blade [A], do the following:

1. Set a new toner metering blade, as shown.
2. Set the Blade tools [C] (P/N: H5239520) on the development roller shaft [B].
3. Set the pins [D] into the holes [E] on the metering blade frame.
4. Fasten with the screw each end of the metering blade while holding down the tool [C].
5. Remove the tools [C].

6.5. FUSING

6.5.1. Fusing Unit

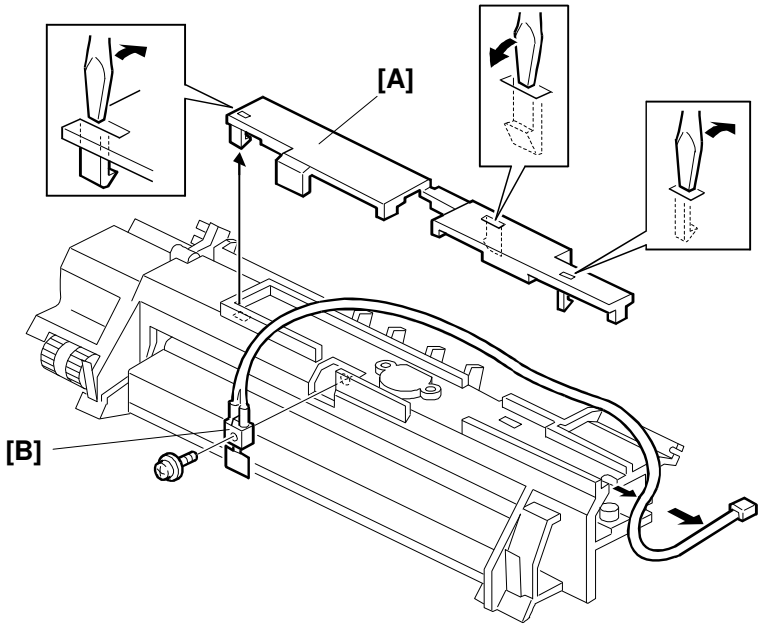


H523R520.wmf

A: Fusing Unit (2 screws, 1 connector)

Note: The harness [B] is located under the bracket [C], as shown.

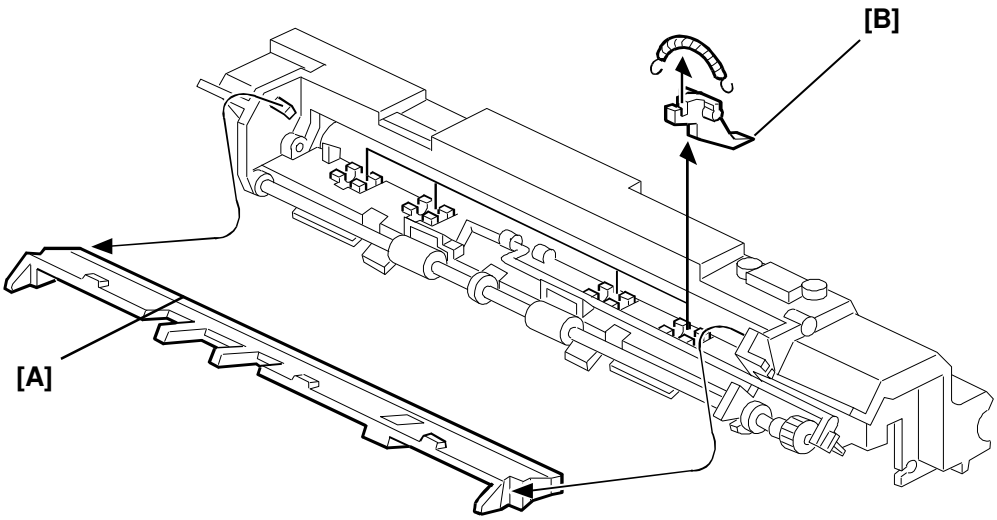
6.5.2. Thermistor



H523R521.wmf

A: Thermistor Cover (3 hooks)
B: Thermistor (1 screw, 1 connector)

6.5.3. Hot Roller Strippers



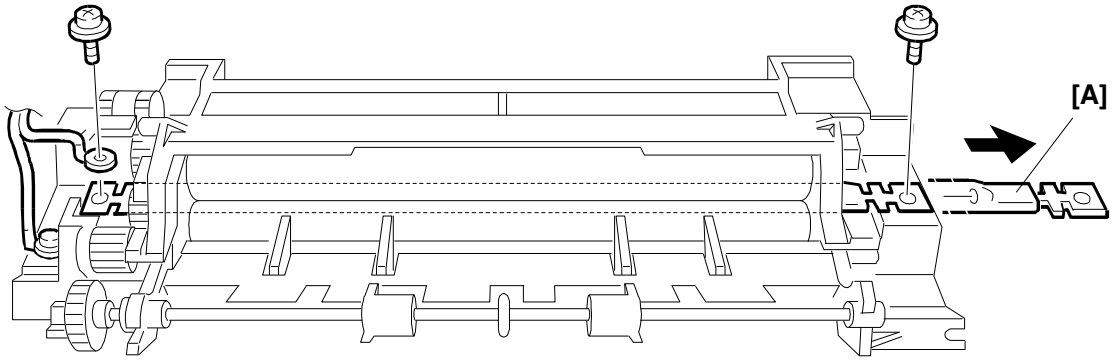
H523R522.wmf

First remove the cleaning felt [A]
B: Hot Roller Strippers (1 spring each)

Note: Be careful not to lose the springs.

6.5.4. Fusing Lamp

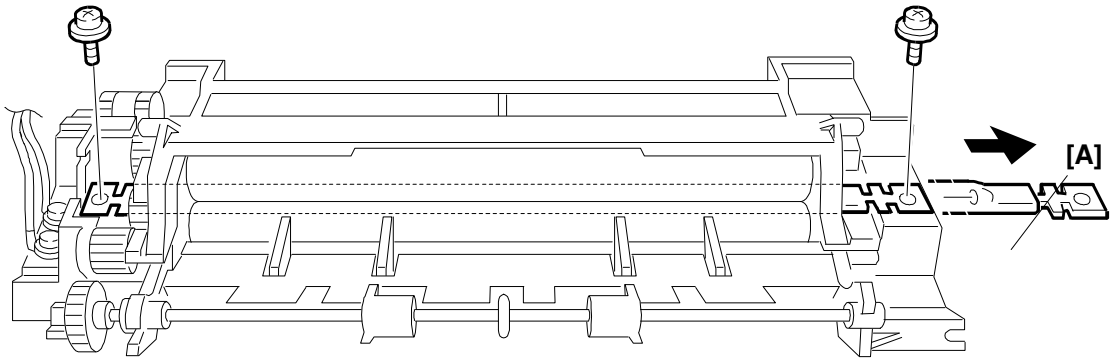
115 V Models



H523R523.wmf

A: Fusing Lamp

220 V Models

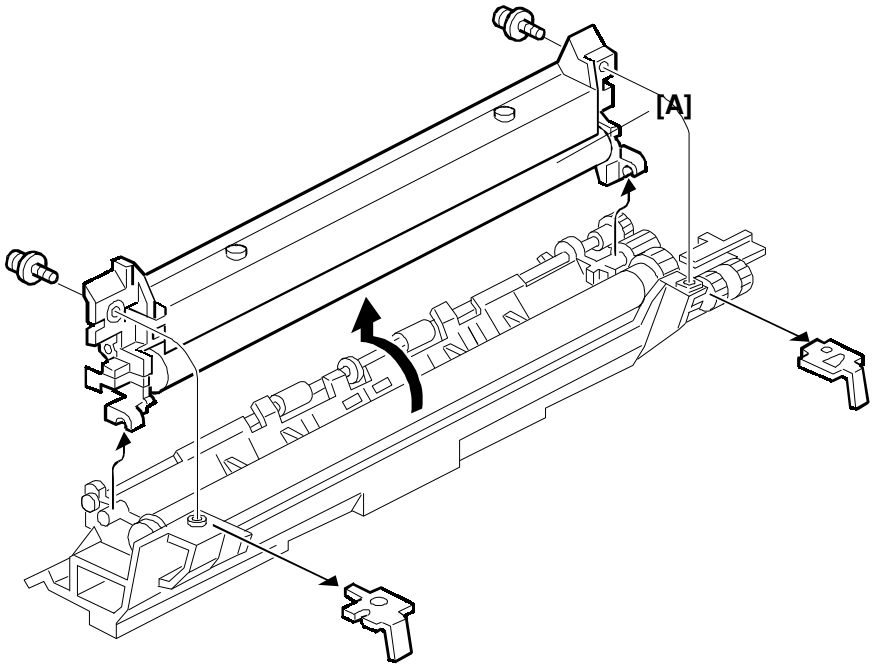


H523R524.wmf

⚠CAUTION

Do not touch the glass surface. Skin oils on the surface of the lamp may affect copy quality.

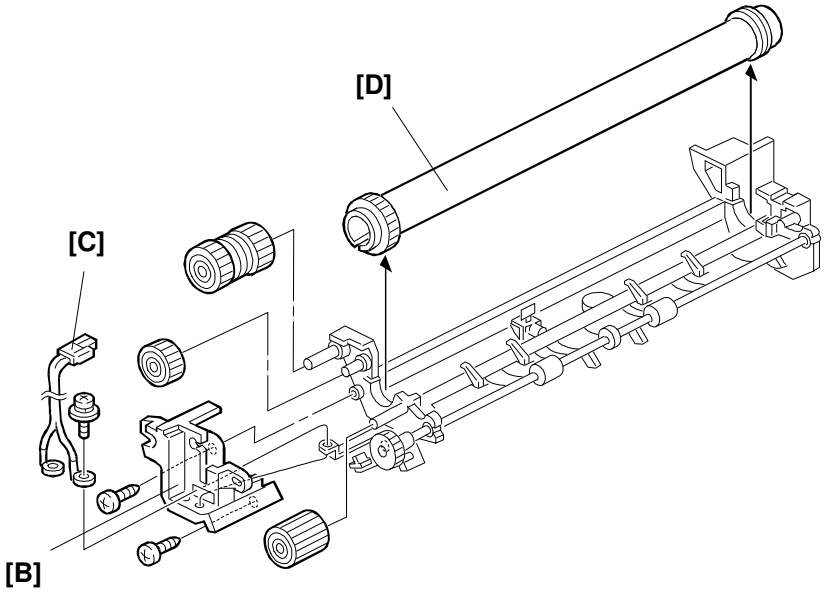
6.5.5. Hot Roller



H523R525.wmf

A: Fusing Upper Unit (2 screws)

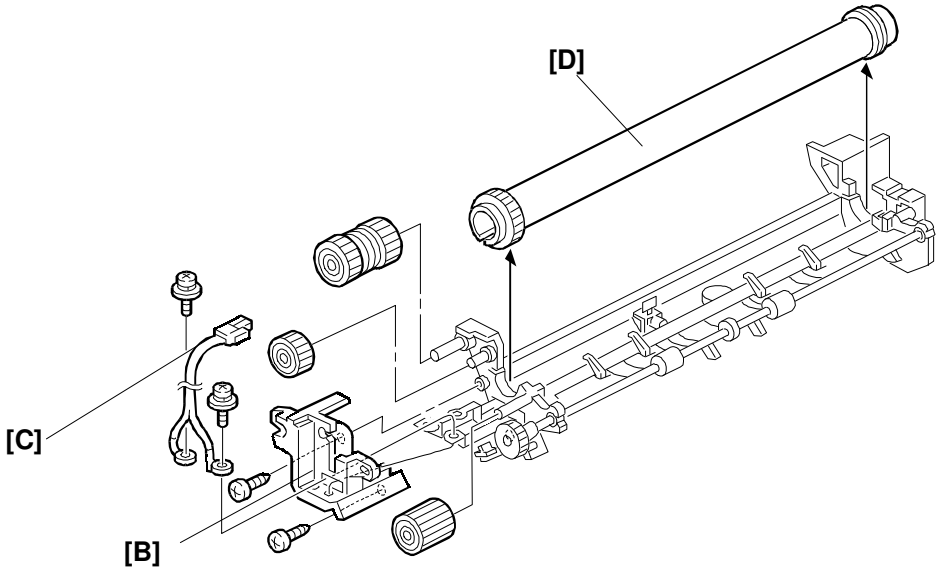
115 V Machines



H523R526.wmf

B: Bracket (2 screws)
C: Fusing Lamp Connector (1 screw)
D: Hot Roller

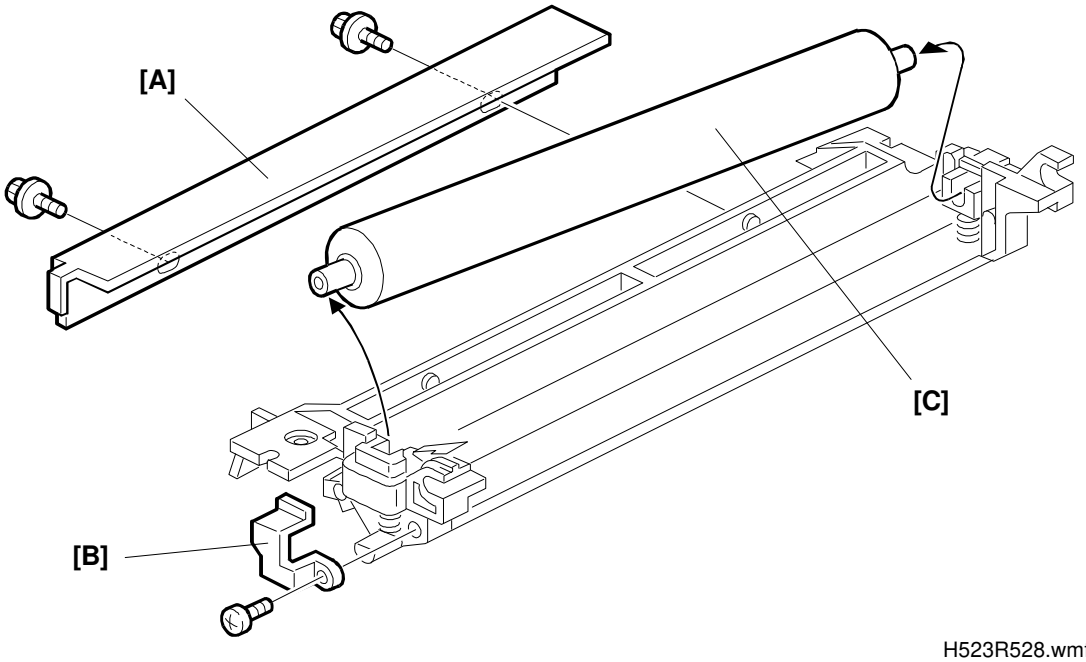
220 V Models



H523R527.wmf

B: Bracket (2 screws)
C: Fusing Lamp Connector (2 screws)
D: Hot Roller

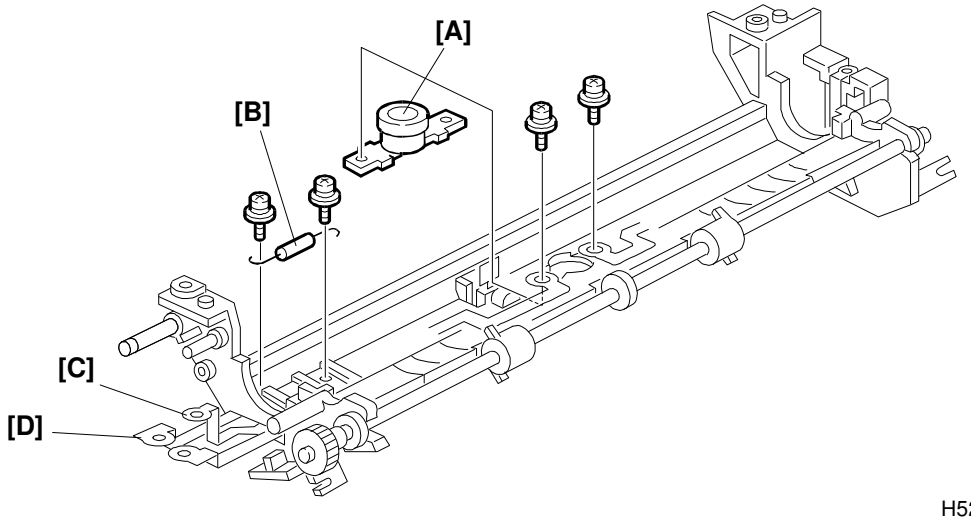
6.5.6. Pressure Roller



H523R528.wmf

A: Bracket (2 screws)
B: Bracket (1 screw)
C: Pressure Roller

6.5.7. Thermostat and Thermofuse

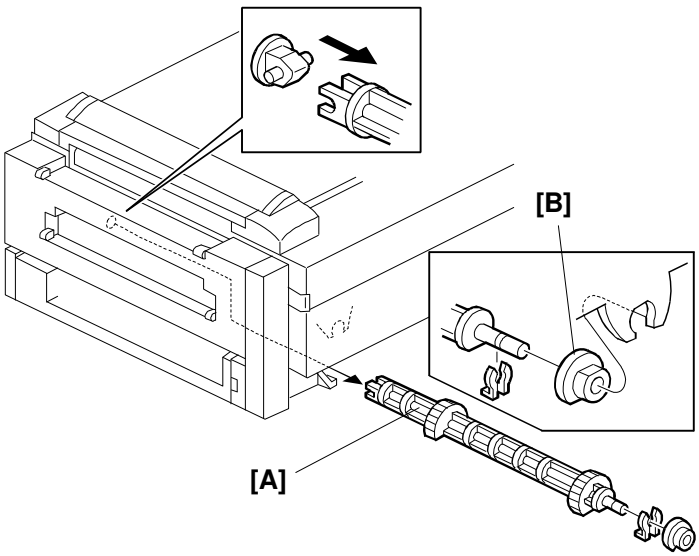


H523R529.wmf

A: Thermostat (2 screws)
B: Thermofuse (2 screws) - 220 V Machines Only
C, D: Terminal Plates - 220 V Machines Only

6.6. PAPER FEED

6.6.1. Paper Feed Roller

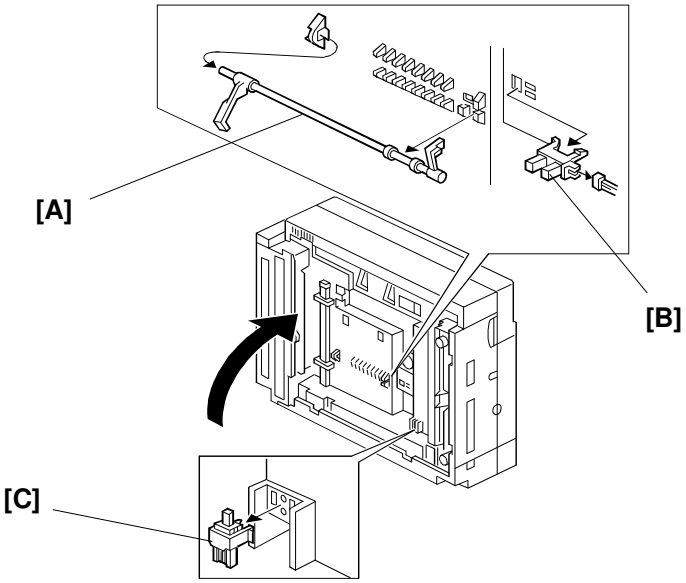


H523R530.wmf

A: Paper Feed Roller (1 clip and 1 bushing)

Note: Ensure the flat side of the paper feed roller [A] and the bushing [B] face downward at reinstallation.

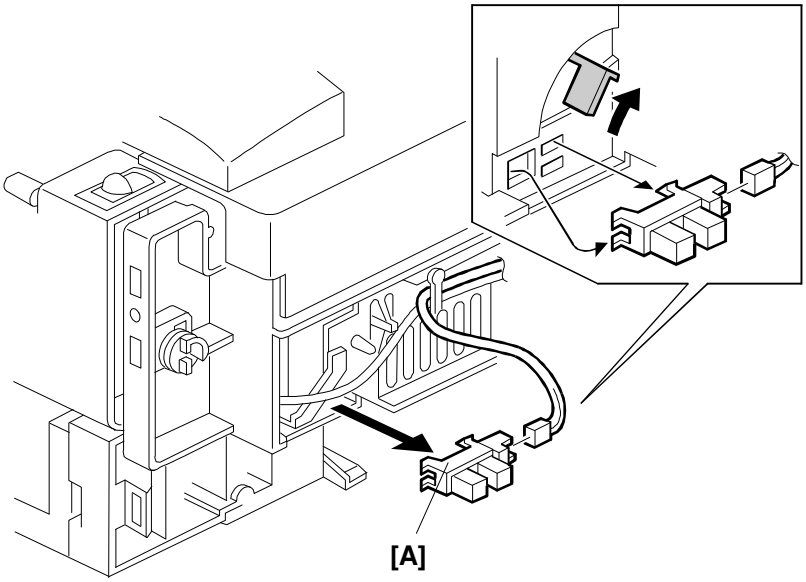
6.6.2. Paper End Sensor and Cassette Sensor



H523R531.wmf

First remove the development unit.
A: Paper End Actuator (1 hook)
B: Paper End Sensor (3 hooks)
C: Cassette Sensor (2 hooks)

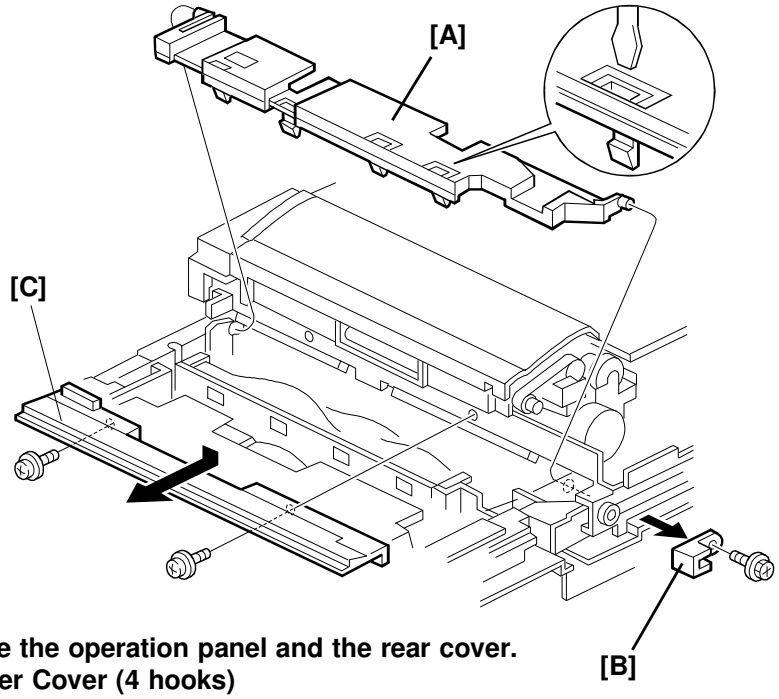
6.6.3. Registration Sensor



H523R532.wmf

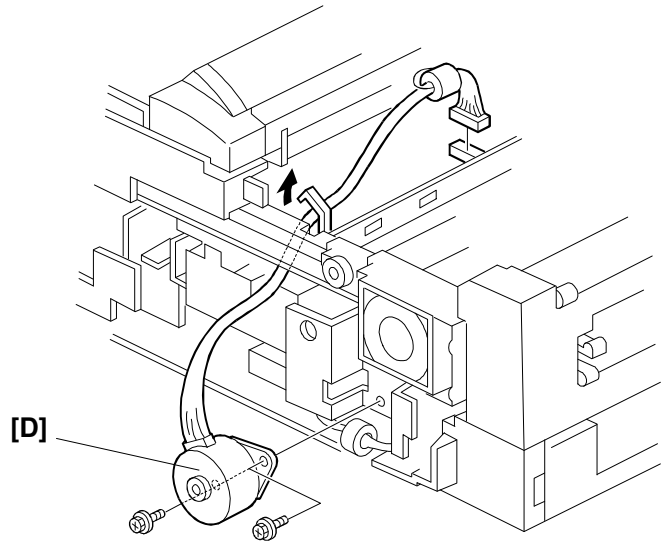
First remove the front cover.
A: Registration Sensor (4 hooks, 1 connector)

6.6.4. Paper Feed Motor



H523R533.wmf

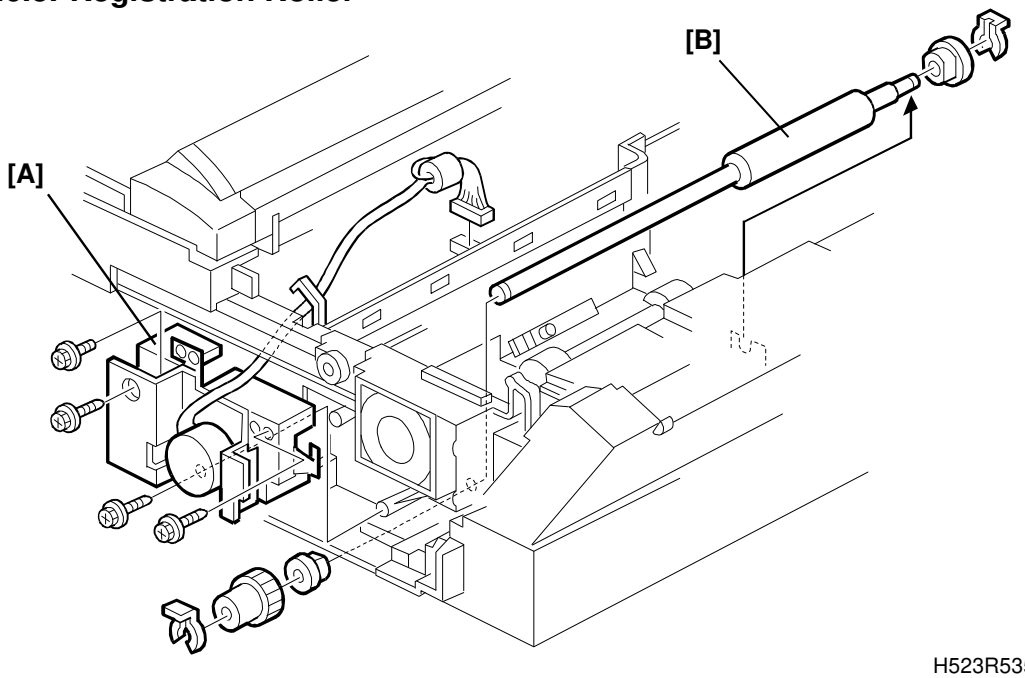
First, remove the operation panel and the rear cover.
A: PCB Lower Cover (4 hooks)
B: Stopper (1 screw)
C: PCB Upper Cover (2 screws)



H523R534.wmf

D: Paper Feed Motor (2 screws, 1 connector)

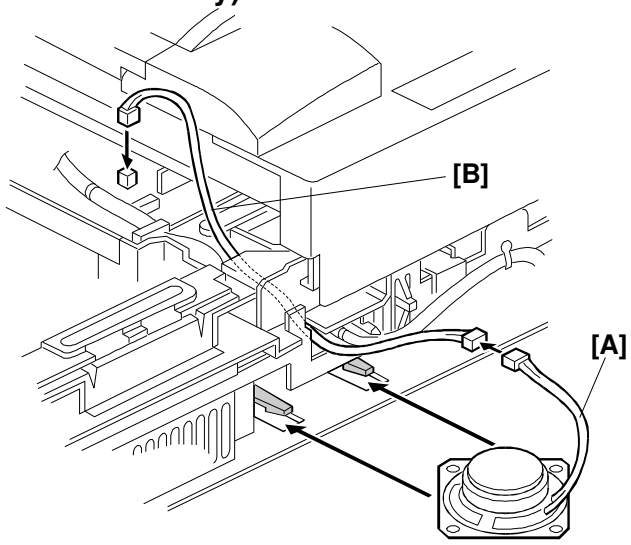
6.6.5. Registration Roller



H523R535.wmf

First remove the gear box [A] (3 tapping screws, 1 screw).
B: Registration Roller (2 clips, 1 gear, 2 bushings).

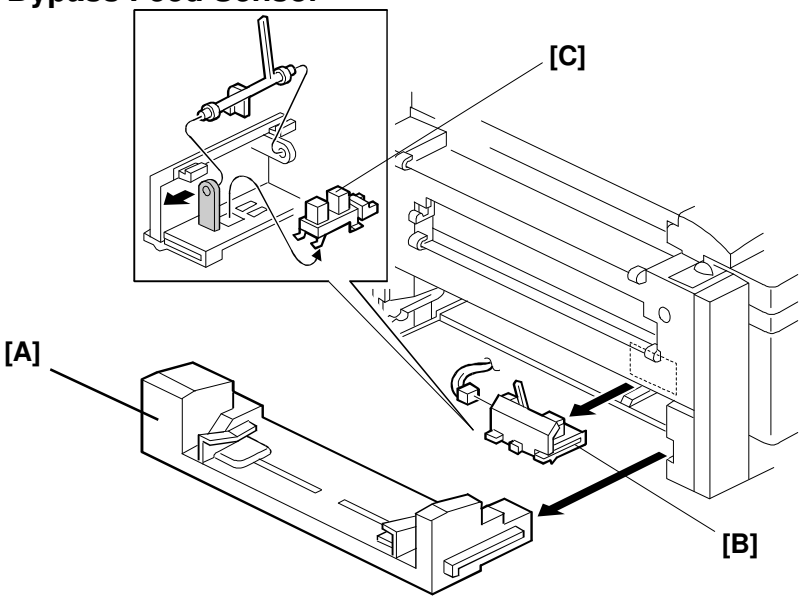
6.6.6. Speaker (Asia Model Only)



H523R564.WMF

A: Speaker (1 connector)
B: Harness (2 connector)

6.6.7. Bypass Feed Sensor

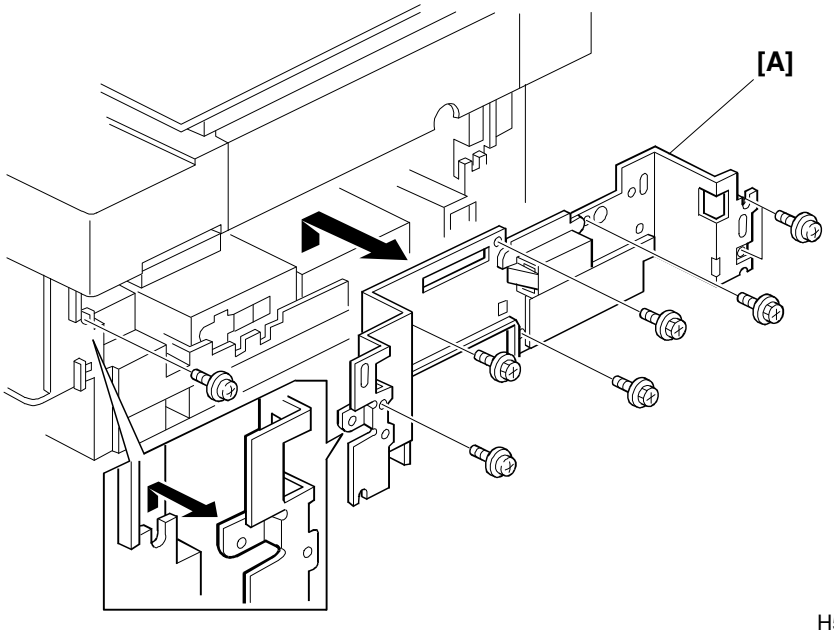


H523R536.wmf

A: Bypass Feed Table (2 tabs, 1 connector)
B: Bypass Feed Sensor Assembly (2 tabs, 1 connector)
C: Bypass Feed Sensor (3 hooks)

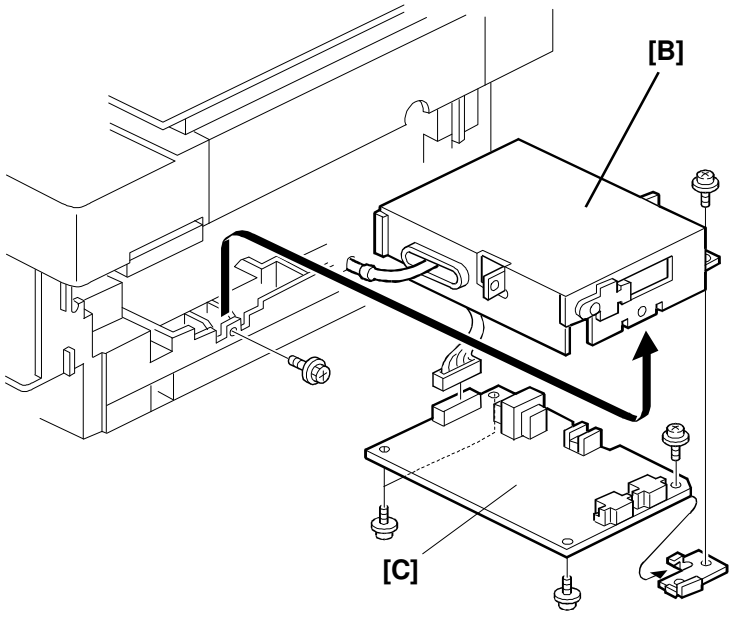
6.7. PCBs

6.7.1. NCU



H523R537.wmf

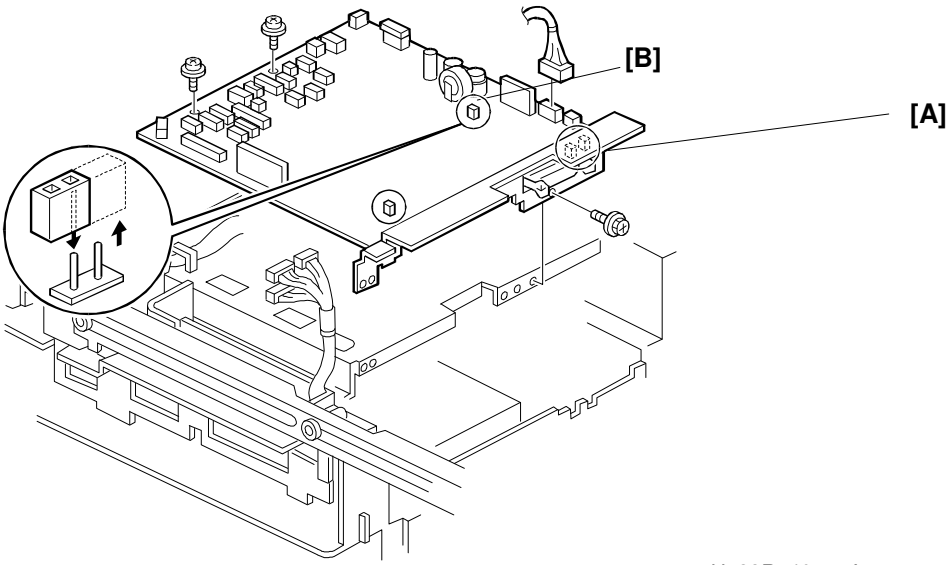
First remove the Front, Right and Rear Covers
A: Bracket (10 screws)



H523R538.wmf

B: NCU Cover (1 screw)
C: NCU (4 screws, 1 connector)

6.7.2. FCU

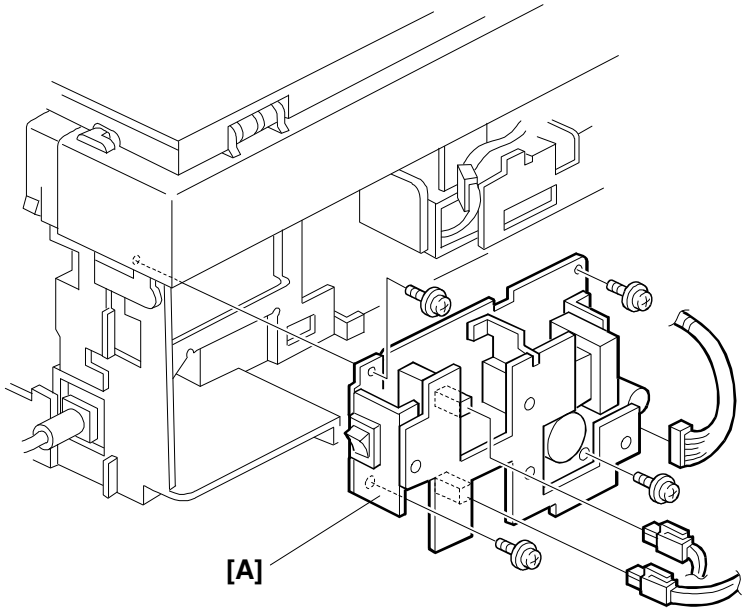


H523R540.wmf

First remove the Front, Right , Rear Covers and bracket (refer to section 6.7.1).
A: FCU (1 screws)
After installing the new FCU, transfer the RAM data from the old FCU using service function 12 (refer to section 4.1.23)

Note: When installing a new FCU, be sure to short jumper TB1[B], as shown.

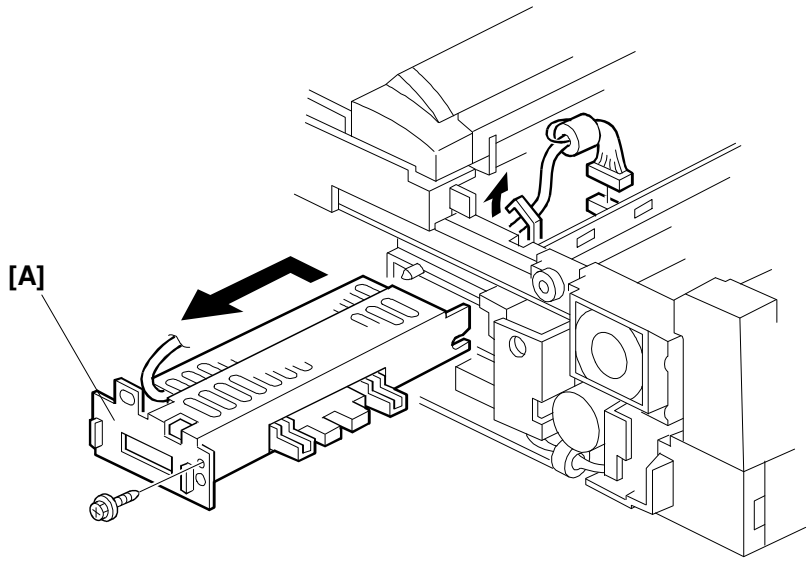
6.7.3. PSU



H523R541.wmf

A: PSU (4 screws, 3 connectors)

6.7.4. Power Pack

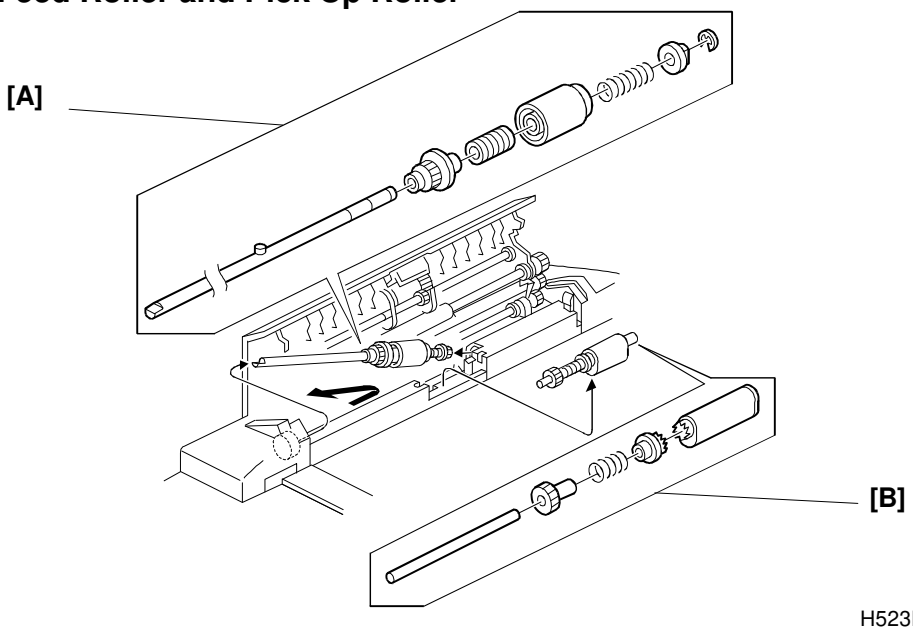


H523R542.wmf

First remove the PCB lower cover.
A: Power Pack (1 screw, 1 connector)

6.8. ADF

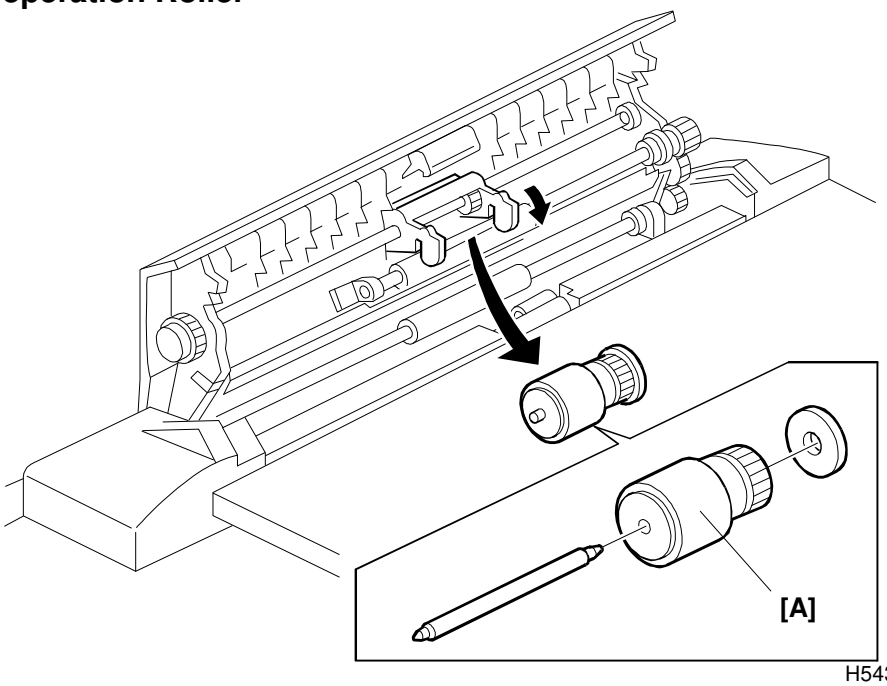
6.8.1. Feed Roller and Pick Up Roller



H523R543.wmf

A: Feed Roller Assembly
B: Pick Up Roller Assembly (1 hook)

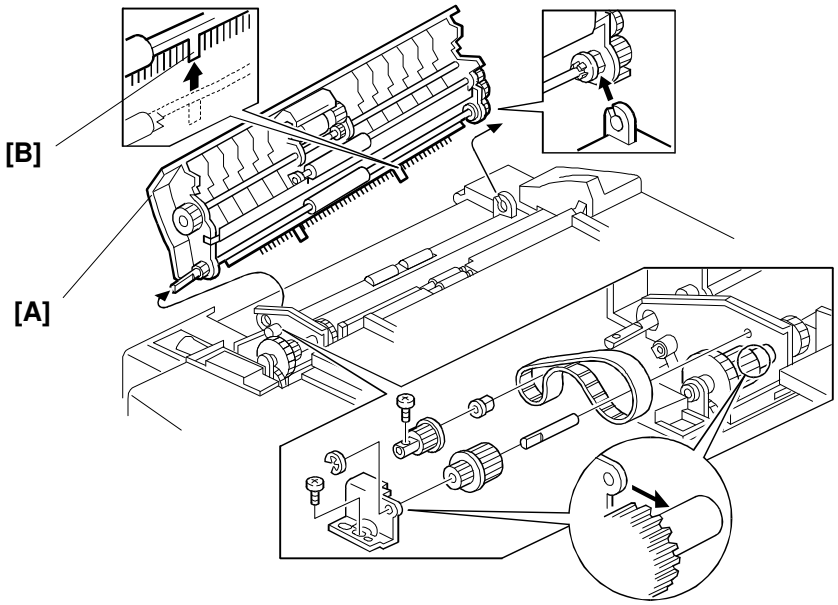
6.8.2. Seperation Roller



H543R544.wmf

A: Separation Roller

6.8.3. R1 and R2 Rollers

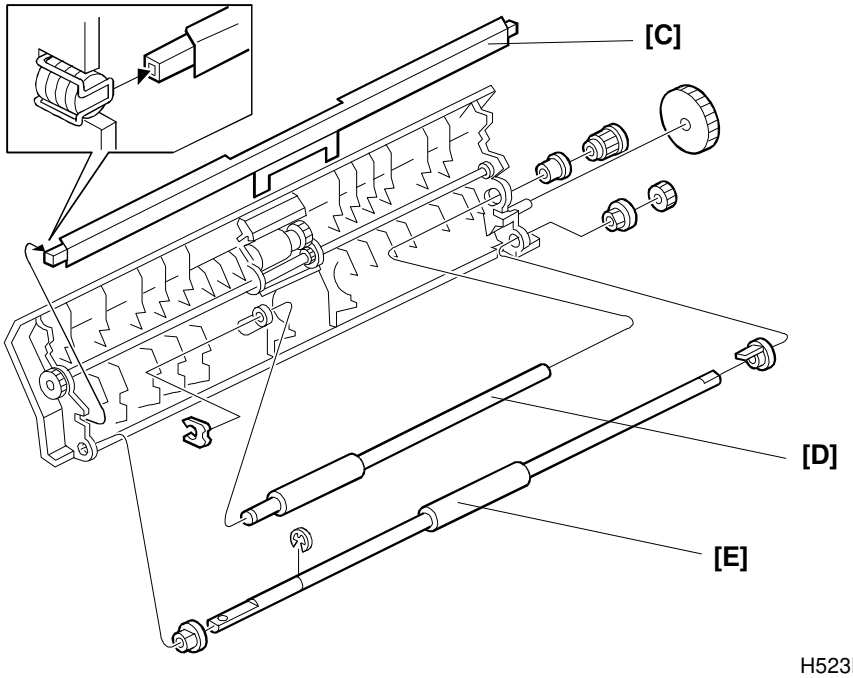


H523R545.wmf

First remove the ADF Upper Front Cover.
A: ADF Upper Unit

Note: 1. Take care not to bend the mylar shield [B] when installing the upper unit.

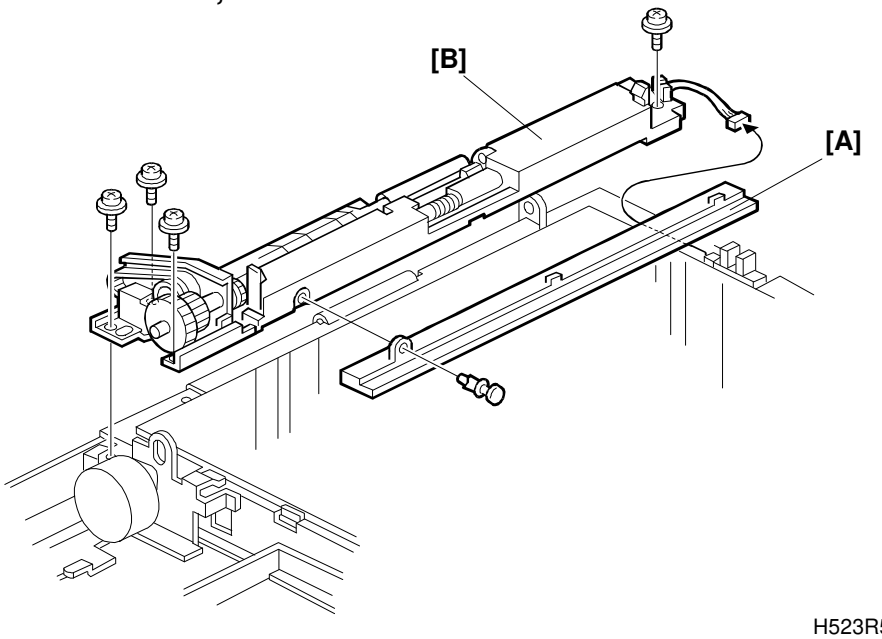
2. At reinstallation, ensure bracket [C] is flush with gear shaft [D].



H523R547.wmf

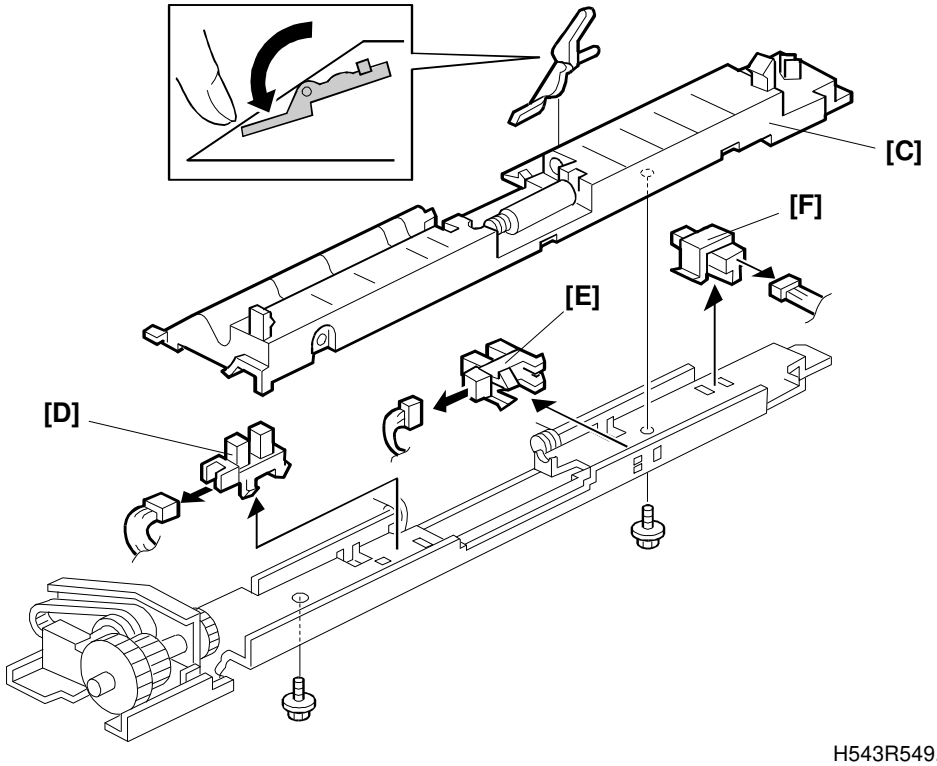
C: White Plate
D: R1 Roller (1 stopper, 1 gear, 2 bushings)
E: R2 Roller (1 e-ring, 2 gears, 3 bushings, 1 stopper, 1 screw)

6.8.4. Scan Line Sensor, Cover Sensor and Document Sensor



H523R548.wmf

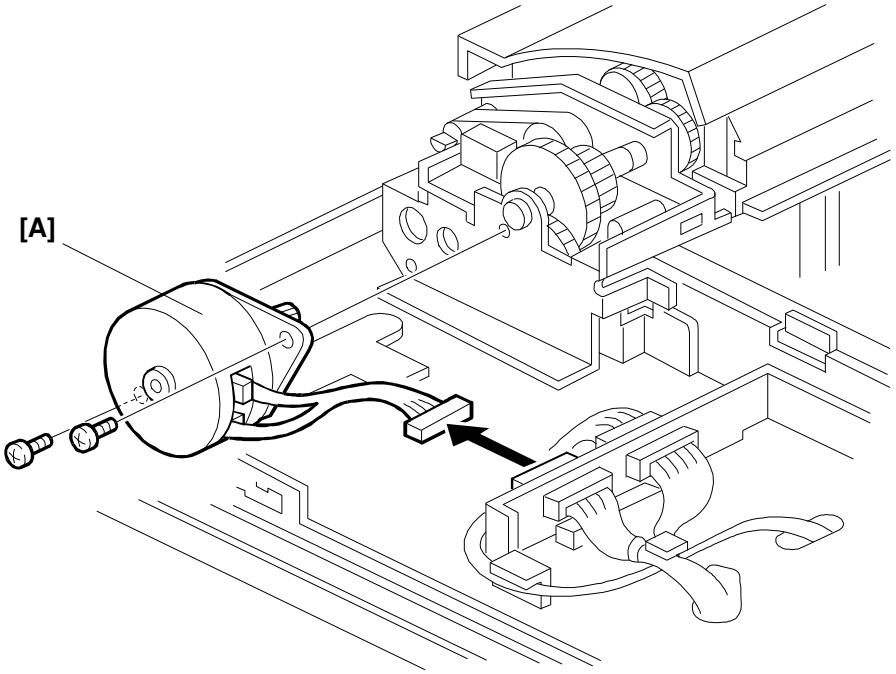
A: White Shading Sheet (1 snap)
B: ADF Lower Unit (4 screws, 1 connector)



H543R549.wmf

C: ADF Lower Unit Guide (2 screws)
D: Document Sensor (4 hooks)
E: Scan Line Sensor (4 hooks)
F: Cover Sensor (2 hooks)

6.8.5. ADF Motor

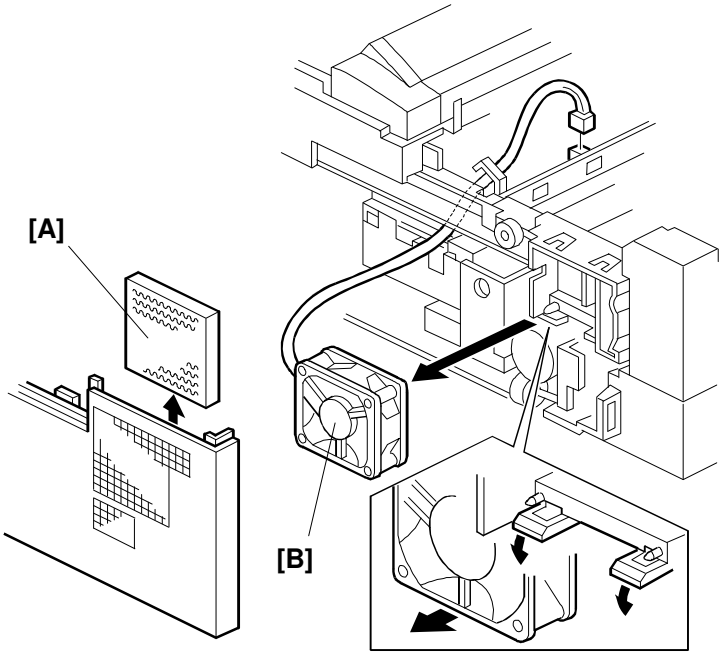


H523R550.wmf

First remove the Operation Panel
A: ADF Motor (2 screws, 1 connector)

6.9. OTHERS

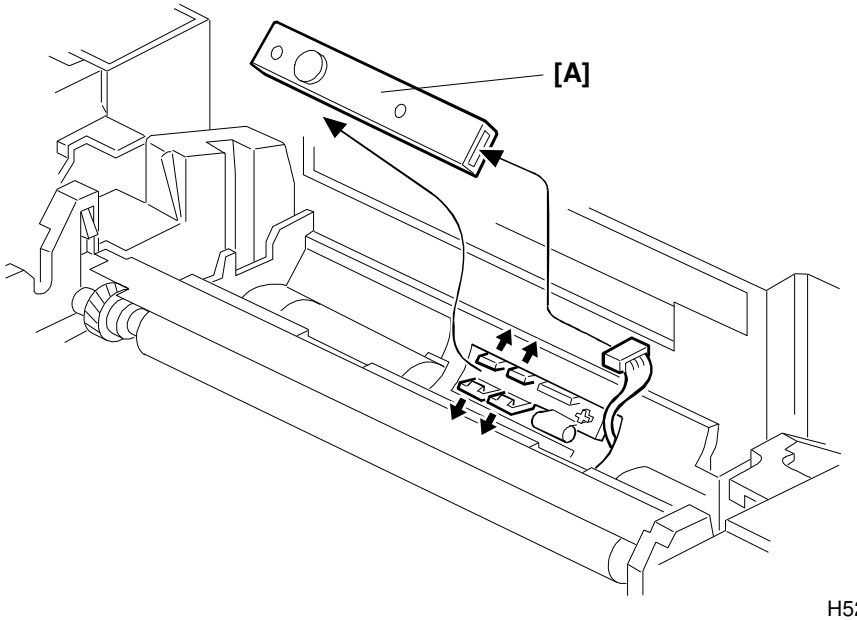
6.9.1. Ozone Filter and Fan Motor



H523R551.wmf

A: Ozone Filter
First remove the Rear Cover
B: Fan Motor (4 hooks, 1 connector)

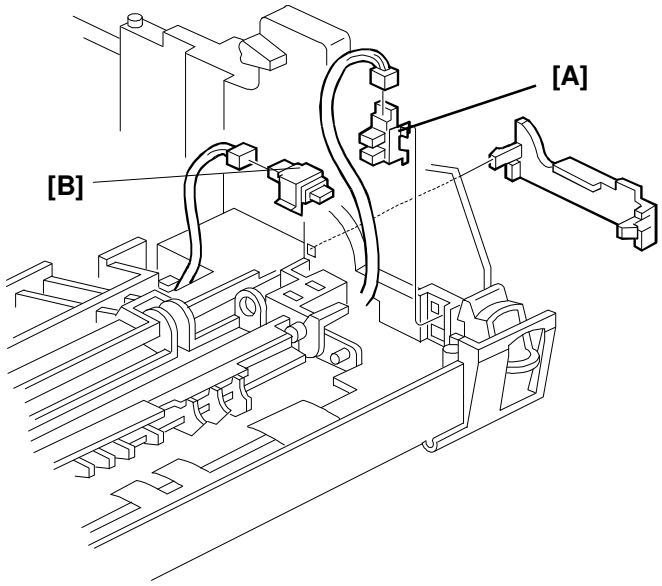
6.9.2. Toner End Sensor



H523R552.wmf

First remove the development unit.
A: Toner End Sensor (4 hooks, 1 connector)

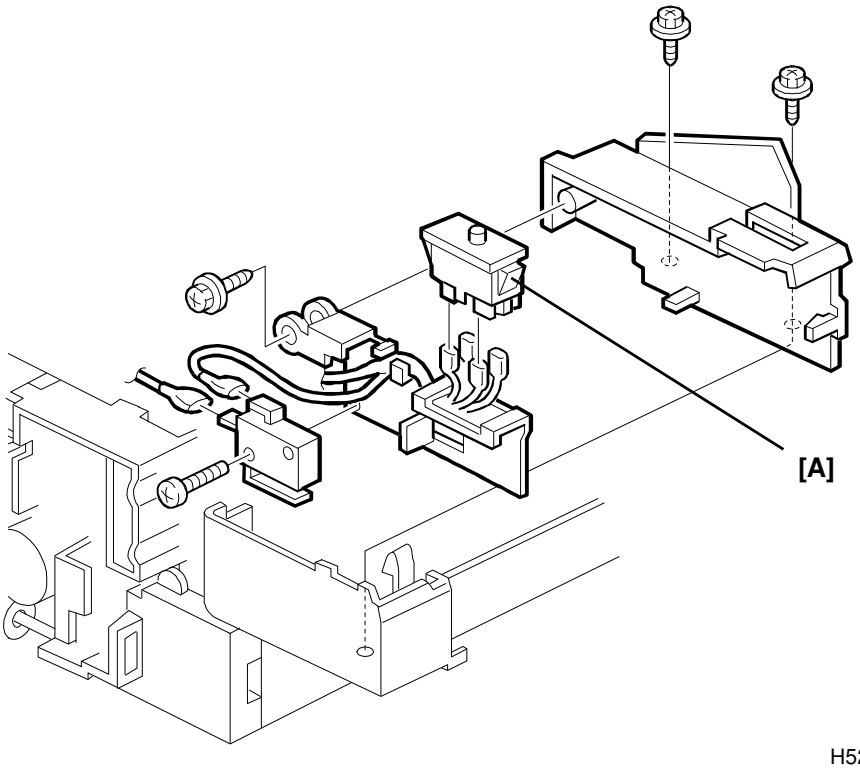
6.9.3. Feed-out Sensor and Exit Cover Sensor



H523R553.wmf

First remove the Fusing Unit.
A: Feed-out Sensor (4 hooks)
B: Exit Cover Switch (2 hooks)

6.9.4. Interlock Switch

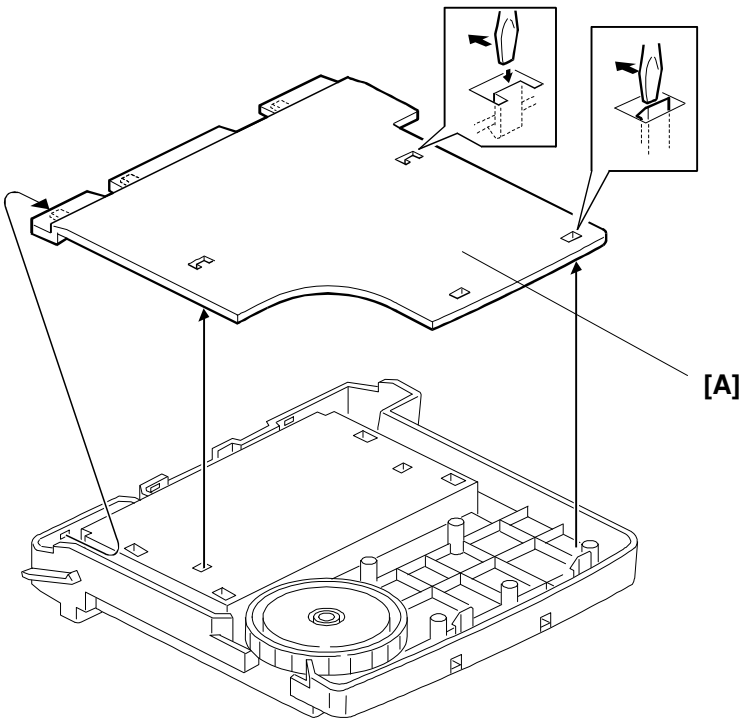


H523R554.wmf

First remove the fusing unit.
A: Interlock Switch A (4 hooks)
B: Interlock Switch B (1 screw, 2 cables)

6.10. OPTIONAL PAPER CASSETTE

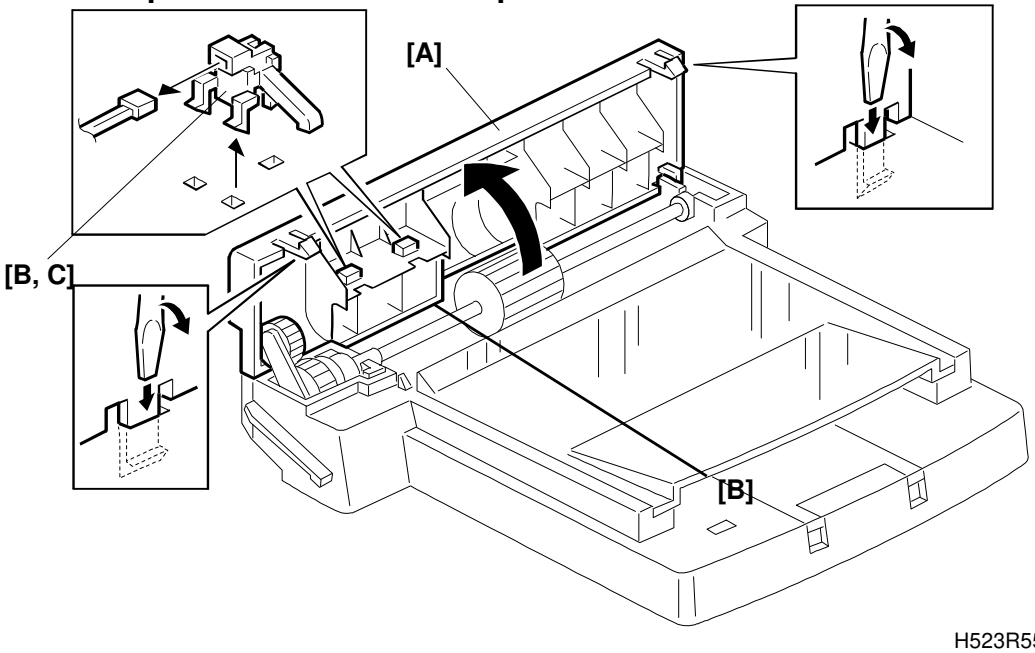
6.10.1. Bottom Cover



H523R555.wmf

A: Bottom Cover (4 hooks)

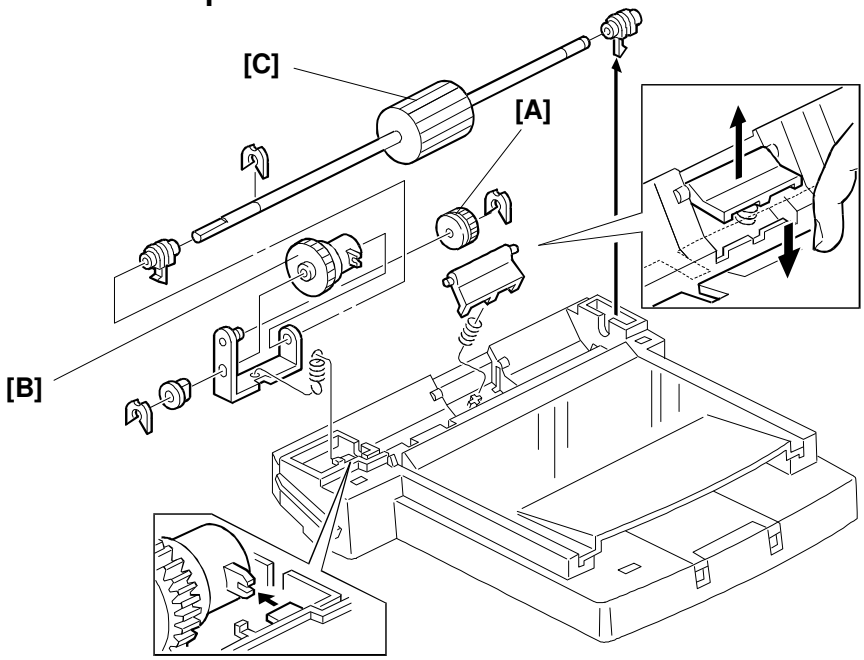
6.10.2. Paper End Sensor and Paper Width Sensor



H523R556.wmf

A: Upper Cover (2 hooks)
B, C: Paper End Sensor and Paper Width Sensor (3 hooks and 1 connector each)

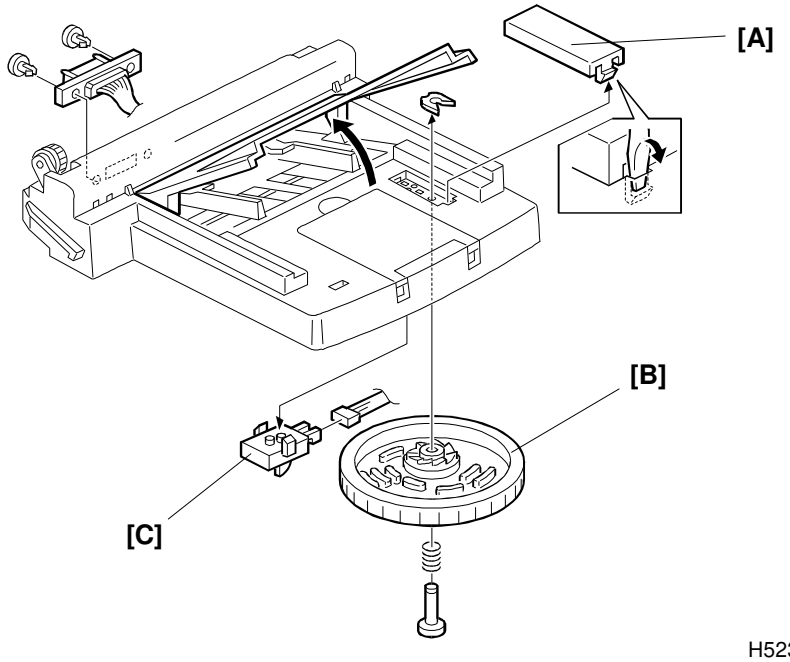
6.10.3. Drive Components



H523R557.wmf

A: Idle Gear (1 clip)
B: Paper Feed Clutch (1 clip, 1 bushing)
C: Feed Roller (1 clip, 2 white bushings)

6.10.4. Paper Size Sensor and Interface Connector

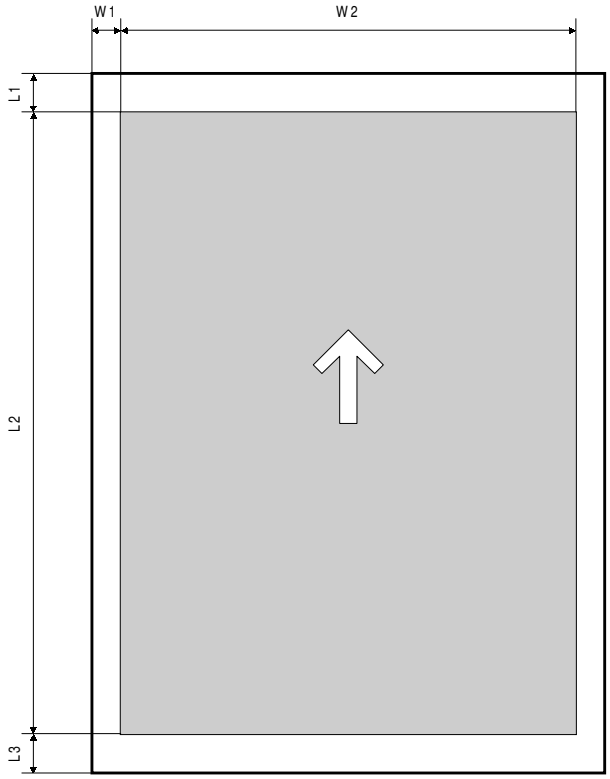


H523R558.wmf

A: Sensor Cover (1 hook)
B: Paper Size Indicator (1 clip, 1 spring)
C: Paper Size Sensor (2 hooks)
D: Interface Connector (2 clips)

6.11. IMAGE ADJUSTMENT

6.11.1. Overview



H523R560.wmf

This section explains how to adjust various scanning and printing parameters. Among these are the margin parameters shown in the diagram below, which are named in accordance with the table below the diagram.

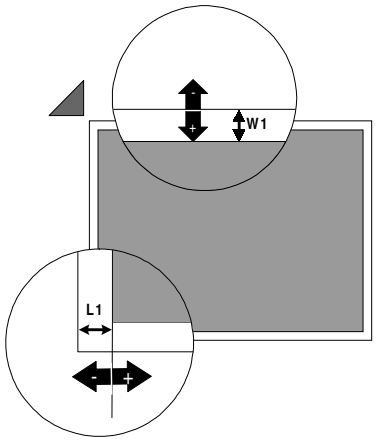
Parameters	Description	Adjustable by		
		Fax - Tx	Fax - Rx	Copying
W1	Left margin	Not adjustable	Scanner/Printer	Scanner/Printer
W2	Print/Scan width	Not adjustable	Not adjustable	Not adjustable
L1	Top margin	Scanner	Printer	Scanner/Printer
L2	Print/Scan length	Not adjustable	Not adjustable	Not adjustable
L3	Bottom margin	Scanner (ADF only)	Not adjustable	Not adjustable

⚠CAUTION

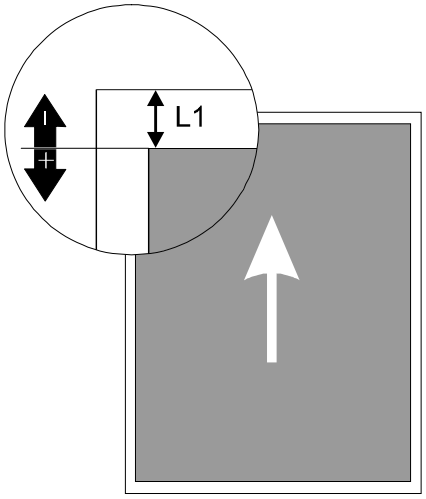
The factory settings may not be the same as the "Initial settings" described in the following procedures. The RAM reset level 1 will reset all the scan and print margin parameters to the "Initial settings."

6.11.2. Scanner Parameters

1. Book Scanner

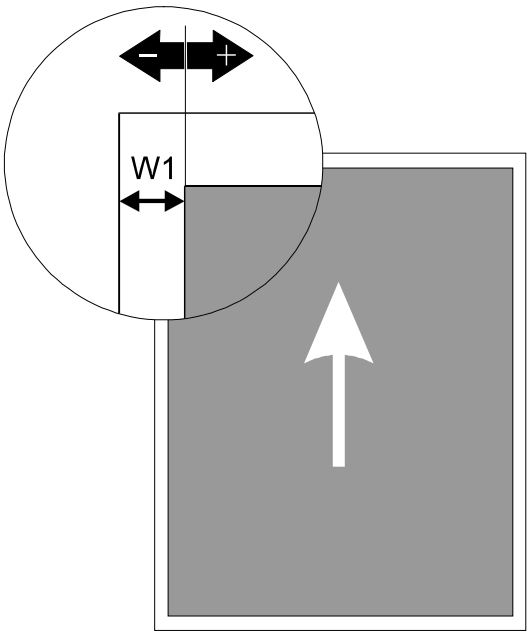
Parameter	Formula	RAM Address	Unit	Initial Setting
W1	This parameter changes the start bit of the main scan. To increase the margin by X mm: **New setting = Current setting + X/0.508** To decrease the margin by X mm: **New setting = Current setting - X/0.508**	8002A3(H)	0.508mm	02(H) (02to04)
W2	Not adjustable			
L1	 H523R561.wmf This parameter changes the number of tx motor steps from the home position. To increase the margin by x mm: **New setting = Current setting + 15.75x** To decrease the margin by x mm: **New setting = Current setting - 15.75x**	80028E(H)	$\frac{1}{15.75}$ *mm*	18(H) (0toFF)
L2	Not adjustable (Original length - L1 - L3)			
L3	Not adjustable			

2. 2.ADF

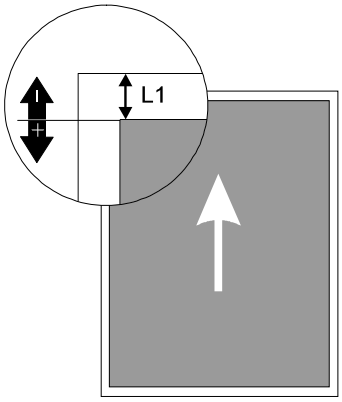
Parameter	Formula	RAM Address	Unit	Initial Setting
W1	This parameter changes the start bit of the main scan. To increase the margin by X mm: **New setting = Current setting + X/0.508** To decrease the margin by X mm: **New setting = Current setting + X/0.508**	8002A2(H)	0.508mm	02(H) (02to04)
W2	Not adjustable			
L1	 H523R562.WMF This parameter changes the number of tx motor steps after the scan line sensor is activated. To increase the margin by x mm: **New setting = Current setting + 7.875x** To decrease the margin by x mm: **New setting = Current setting - 7.875x** Initial setting of L1: 2 mm	800296(H) (low) 800297(H) (high)	$\frac{1}{7.875}$ *mm*	3F(H) (0to200)
L2	Not adjustable (Original length - L1 - L3)			
L3	This parameter changes the number of tx motor steps after the scan line sensor is deactivated. To increase the margin by x mm: **New setting = Current setting - 7.875x** To decrease the margin by x mm: **New setting = Current setting + 7.875x** Initial setting of L3: 2 mm	800298(H) (low) 800299(H) (high)	$\frac{1}{7.875}$ *mm*	5C(H) (0to200)

6.11.3. Printer Parameters

1. Margin (Main Scan Direction)

Parameter	Formula	RAM Address	Unit	Initial Setting
W1	 H523R563.WMF To increase the margin by x mm: **New setting = Current setting + x/0.5** To decrease the margin by x mm: **New setting = Current setting - x/0.5** Initial setting of W1: 2 mm	Standard cassette: 800346(H) Optional cassette: 80034B(H) Bypass feed: 80034C(H)	0.5mm	07(H)
W2	Not adjustable			

2. Margin (Sub Scan Direction)

Parameter	Formula	RAM Address	Unit	Initial Setting
L1	 H523R562.WMF To increase the margin by x mm: **New setting = Current setting + x/0.64(0.32)** To decrease the margin by x mm: **New setting = Current setting - x/0.64(0.32)** Initial setting of L1: 2 mm	Standard cassette: 80033C(H) Optional cassette: 800341(H) Bypass feeder: 800342(H)	0.64mm 0.64mm 0.32mm	0D(H) 10(H) 18(H)
L2	Not adjustable			
L3	Not adjustable			

6.11.4. Scanner Video Processing Parameters

The tables in the following pages show the following video processing parameter settings for each of scanning mode.
One byte of parameter is assigned for each mode, and they all have the same definitions as follows.

MTF / Edge detection / Edge enhancement

Bit No.	FUNCTION	COMMENTS
0	Not used	
1	Not used	
2	Not used	
3	Not used	
4	MTF 0: On 1: Off	In halftone mode, the MTF process is disabled. 0: The thickness of thin lines and dots are enhanced, but small letters might become filled in. 1: Thin lines may not be reproduced clearly.
5	Edge enhancement during the halftone process 0: Off 1: On	0: Suitable for photo originals (default setting). 1: Suitable for originals with photo and text. The edges of text become much sharper, but moire might appear in photo areas.
6	Edge detection during the halftone process 0: Off 1: On	This bit can be used in halftone mode only. 0: The image becomes lighter, and thin lines become paler. 1: Suitable for most photo originals.
7	Not used	

Copy Mode Parameters

Mode				Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	Full Size	800523H	0	1	0	0	0	0	0	0
			Enlargement	800527H	0	1	0	0	0	0	0	0
		ADF	Full Size	80052BH	0	1	0	1	0	0	0	0
			Enlargement	80052FH	0	1	0	1	0	0	0	0
	AID OFF	BOOK	Full Size	800533H	0	1	0	0	1	0	0	0
			Enlargement	800537H	0	1	0	0	1	0	0	0
		ADF	Full Size	80053BH	0	1	0	1	1	0	0	0
			Enlargement	80053FH	0	1	0	1	1	0	0	0
HALF TONE		BOOK	Full Size	800543H	1	0	0	0	1	1	1	1
			Enlargement	800547H	1	0	0	0	1	1	1	1
		ADF	Full Size	80054BH	1	0	0	1	1	1	1	1
			Enlargement	80054FH	1	0	0	1	1	1	1	1

Notes

Bits in the shaded part of the table must not be changed.

Fax Mode Parameters

Mode			Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	800553H	0	1	0	0	0	0	0	0
		ADF	800557H	0	1	0	1	0	0	0	0
	AID OFF	BOOK	80055BH	0	1	0	0	1	0	0	0
		ADF	80055FH	0	1	0	1	1	0	0	0
HALF TONE		BOOK	800563H	1	0	0	0	1	1	1	1
		ADF	800567H	1	0	0	1	1	1	1	1

Notes

Bits in the shaded part of the table must not be changed.

MTF algorithm

Bit No.	FUNCTION	COMMENTS
0	Not used	
1	Not used	
2	Not used	
3	Not used	
4	Not used	
5	MTF algorithm	The “High” setting enhances the thickness of thin lines and dots more than the “Low” setting.
6	bit 5 6 setting 0 0 lowest 0 1 lower 1 0 higher 1 1 highest	
7	Not used	

Copy Mode Prameters

Mode				Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	Full Size	800524H	1	0	1	0	1	0	1	1
			Enlargement	800528H	1	0	1	0	1	0	1	1
		ADF	Full Size	80052CH	1	0	1	0	1	0	1	1
			Enlargement	800530H	1	0	1	0	1	0	1	1
	AID OFF	BOOK	Full Size	800534H	1	0	1	-	-	-	-	-
			Enlargement	800538H	1	0	1	-	-	-	-	-
		ADF	Full Size	80053CH	1	0	1	-	-	-	-	-
			Enlargement	800540H	1	0	1	-	-	-	-	-
HALF TONE		BOOK	Full Size	800544H	-	0	1	-	-	-	-	-
			Enlargement	800548H	-	0	1	-	-	-	-	-
		ADF	Full Size	80054CH	-	0	1	-	-	-	-	-
			Enlargement	800550H	-	0	1	-	-	-	-	-

Fax Mode Parameters

Mode			Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	800554H	1	0	1	0	1	0	1	1
		ADF	800558H	1	0	1	0	1	0	1	1
	AID OFF	BOOK	80055CH	1	0	1	-	-	-	-	-
		ADF	800560H	1	0	1	-	-	-	-	-
HALF TONE		BOOK	800564H	-	0	1	-	-	-	-	-
		ADF	800568H	-	0	1	-	-	-	-	-

Notes

Bits in the shaded part of the table must not be changed.

Background detection Threshold

Bit No.	FUNCTION	COMMENTS
0	Not used	
1	Not used	
2	Background detection threshold during the text mode 0: Low 1: High	0: Suitable for originals that have dark background 1: The “High” setting enhances the dots more than the “Low” setting.
3	Not used	
4	Not used	
5	Not used	
6	Not used	
7	Not used	

Copy Mode Prameters

Mode				Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	Full Size	800526H	1	1	0	0	0	1	0	0
			Enlargement	80052AH	1	1	0	0	0	1	0	0
		ADF	Full Size	80052EH	1	1	0	0	0	0	0	0
			Enlargement	800532H	1	1	0	0	0	0	0	0
	AID OFF	BOOK	Full Size	800536H	1	1	0	0	0	1	0	0
			Enlargement	80053AH	1	1	0	0	0	1	0	0
		ADF	Full Size	80053EH	1	1	0	0	0	0	0	0
			Enlargement	800542H	1	1	0	0	0	0	0	0
HALF TONE		BOOK	Full Size	800546H	1	1	0	0	0	0	0	0
			Enlargement	80054AH	1	1	0	0	0	0	0	0
		ADF	Full Size	80054EH	1	-	0	0	0	0	0	0
			Enlargement	800552H	1	-	0	0	0	0	0	0

Fax Mode Parameters

Mode			Address	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
W/O HALF TONE	AID ON	BOOK	800556H	1	1	0	0	0	0	0	0
		ADF	80055AH	1	1	0	0	0	0	0	0
	AID OFF	BOOK	80055EH	1	1	0	0	0	0	0	0
		ADF	800562H	1	1	0	0	0	0	0	0
HALF TONE		BOOK	800566H	1	-	0	0	0	0	0	0
		ADF	80056AH	1	-	0	0	0	0	0	0

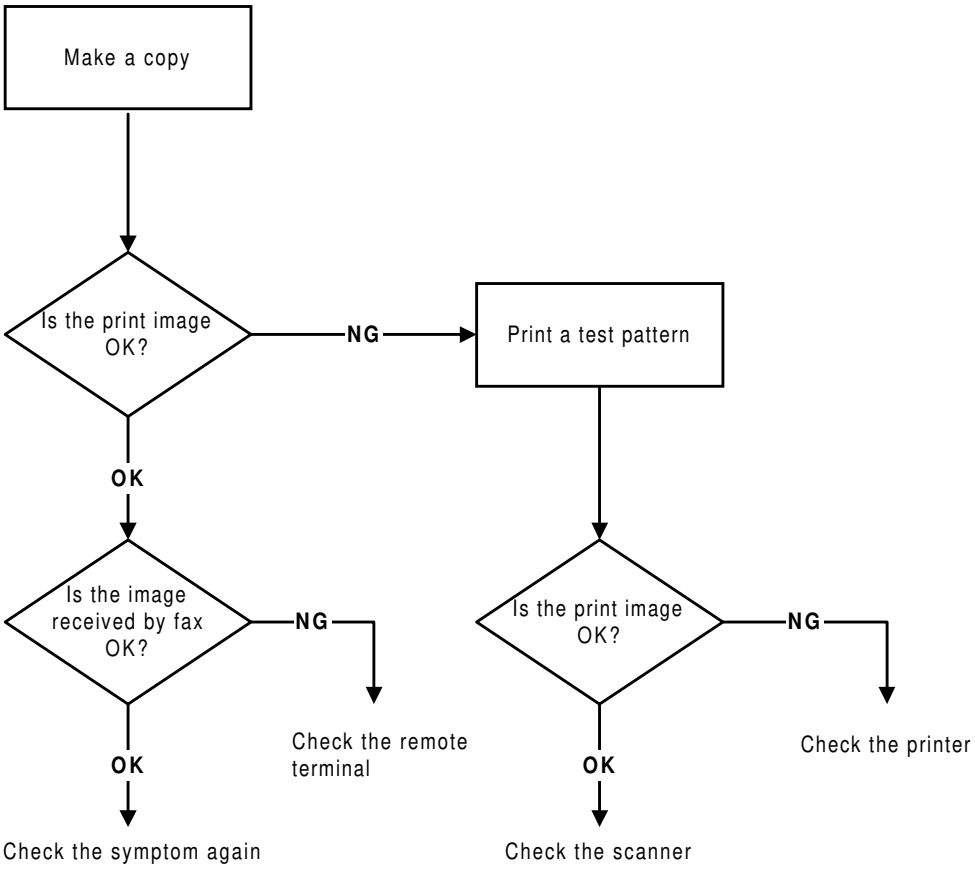
Notes

Bits in the shaded part of the table must not be changed.

7. TROUBLESHOOTING

7.1. COPY QUALITY TROUBLESHOOTING

If there is a copy quality problem that cannot be solved easily, try using the following troubleshooting procedures, while referring to the point-to-point diagram. The procedures may not be exhaustive, but they may help you to find the problem.



h523t501.wmf

First, distinguish whether the problem is caused by the remote terminal or by your machine. If the problem is caused by your machine, distinguish whether it is due to a scanner problem or a printer problem.

7.1.1. Blank Copies

Possible Cause (Scanner):

- Malfunction in the scanner drive mechanism.
- Obstructions in the scanner drive path.

Action:

1. Do the ADF test (service function 10) and check that the scanner moves correctly. Also, check for any obstrctions in the scanner drive path.
2. If the problem occurs only during ADF copying, check that the scanner moves to the correct ADF scanning position.

Possible Cause (Printer):

- Poor drum sensitivity.
- Laser optic components are out of position.
- The proper bias voltages are not applied to the toner application roller and/or the development roller.
- The proper current is not applied to the transfer roller.

Action:

1. Print a test pattern, and open the cover in the middle of printing.
2. Check if there is toner adhered to the drum surface.
   If there is, do the following. If not, go to step 3.
   - Check if the transfer roller is installed correctly or not.
   - Check if the development unit is installed correctly or not.
   - If the resistance is OK, check the connections behind the power pack and the power pack itself.
3. Check if there is toner on the surface of the development roller.
   If there is, do the following. If not, go to step 4.
   - Check if all the laser optic components are properly positioned.
   - Try replacing the drum.
4. Check if the toner cartridge is empty or not. If it is, do the following. If not, go to step 5.
   - Check or replace the toner end sensor.

7.1.2. Black Copies

Possible Cause (Scanner)
- The contact image sensor is defective.
- The xenon lamp, or the xenon lamp driver is defective.

Action:

1. Check the connection between the FCU (CN60) and the contact image sensor.
2. Do the ADF lamp test (service function 10) and check that the xenon lamp is working properly.
3. Check that the two springs which push up the contact image sensor against the exposure glass are correctly installed.
4. Replace the contact image sensor.

Possible Cause (Printer)
- The charge is not properly applied.

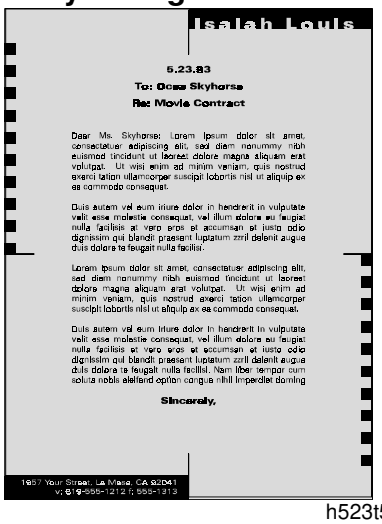
Action:

1. Check if all the charge bias terminals on the development unit and the CTM, and the charge wire are properly connected or not.
   - If they are, go to step 2.
   - If not, fix the connections.

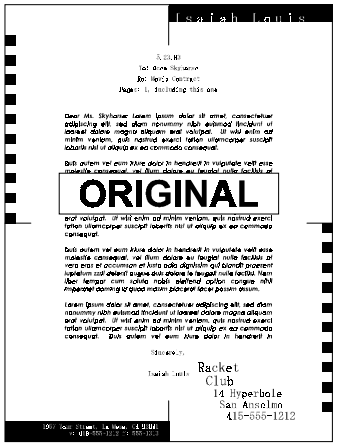
2. Check if the zener diode is not shorted.
   - If the zener diode is shorted, replace the zener diode.
   - If it is not, go to step 3.

3. Check the connections behind the power pack.

7.1.3. Dirty Background



h523t502.wmf



h523t503.wmf

Possible Cause (Scanner)

- Scanner shading correction error or wrong threshold.

Action:

1. Clean the shading plate (for both book and ADF).
2. Adjust the scanner contrast threshold settings.

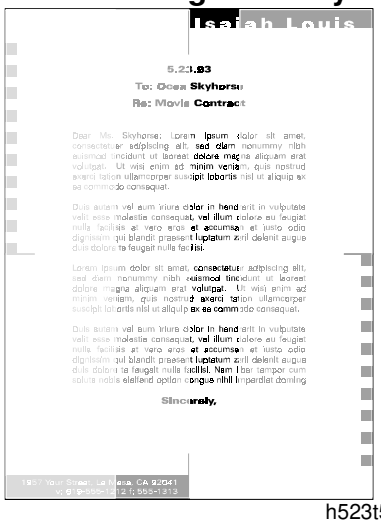
Possible Cause (Printer)

- Poor drum sensitivity.
- The charge is not properly applied.
- The hot roller is dirty.

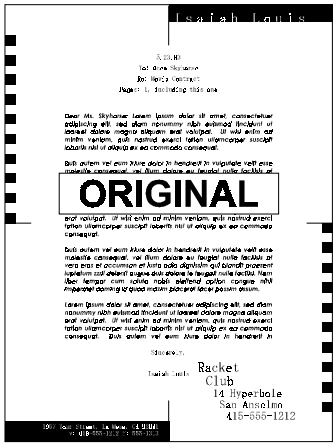
Action:

1. Try replacing the drum.
2. Check if the hot roller surface is dirty or not.
   - If it is, clean the roller or replace the cleaning pad.
   - If not, go to step 3.
3. Check if all the charge bias terminals on the development unit and the CTM, and the charge wire are properly connected or not.
   - If they are, check or replace the power pack.
   - If not, fix the connections.

7.1.4. Uneven Image Density



h523t504.wmf



h523t503.wmf

Possible Cause (Scanner)

- Dirty exposure glass

Action

- Clean the exposure glass (for both book and ADF).
- Replace the image sensor.

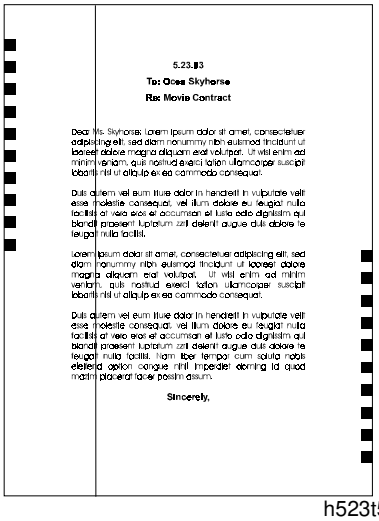
Possible Cause (Printer)

- Poor drum sensitivity.
- Dirty laser optic components.
- The toner metering blade is deformed, or incorrectly positioned.
- Uneven toner supply in the development toner hopper.
- Quenching lamp defect.

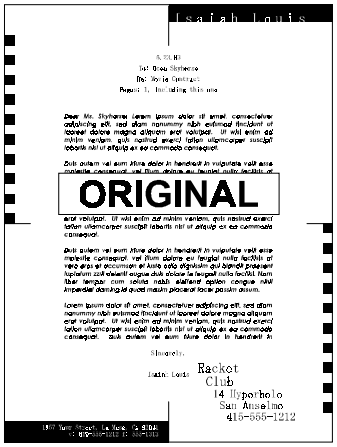
Action:

1. Print a solid black test pattern, and open the cover in the middle of printing.
2. Check if the toner is evenly distributed on the development roller.
   - If it is not, check the toner metering blade, and the toner supply mechanism in the toner hopper. If yes, go to step 3.
   - If the image is lighter in the center of the image, toner may be low. Replace the CTM and supply more toner.
3. Check if the toner is evenly distributed on the drum.
   - If it is not, check the drum sensitivity, the laser optic components, and the quenching lamp on the CTM.
   - If it is, check if there is any dirt on the transfer roller surface.

7.1.5. Vertical Black Lines



h523t505.wmf



h523t503.wmf

Possible Cause (Scanner)

When the problem occurs during book copying:

- Defective contact image sensor element(s).

When the problem occurs during ADF copying:

- Dirt or dust on the ADF exposure glass.
- Dirty white plate in the ADF.

Action:

1. Clean the exposure glass and the shading plate (for both book and ADF).
2. Replace the contact image sensor.

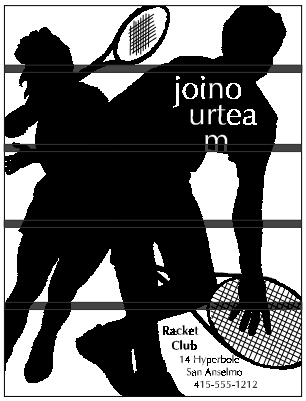
Possible Cause (Printer)

- Damaged cleaning blade.
- Dirty hot roller stripper(s).

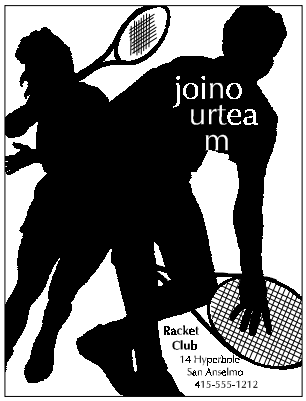
Action:

1. Replace the CTM.
2. Clean the hot roller strippers.

7.1.6. Horizontal Black Lines



h523t506.wmf



h523t507.wmf

Possible Cause (Printer)

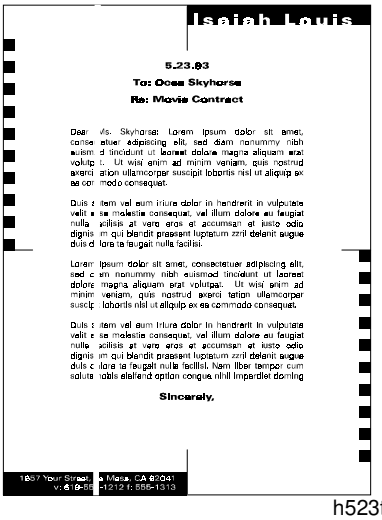
- The drum surface is scratched or damaged.
- Charge corona leak failure.

Action:

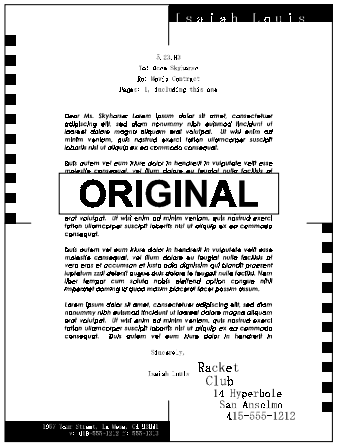
1. Check that the surface of the drum is not damaged.
   - Change the drum if it is damaged.

2. If the problem still remains, do the following.
   - Clean the charge wire.
   - Change the CTM.

7.1.7. Vertical White Lines



h523t508.wmf



h523t503.wmf

Possible Cause (Scanner)

- Defective image sensor element(s).

Action:

- Replace the image sensor.

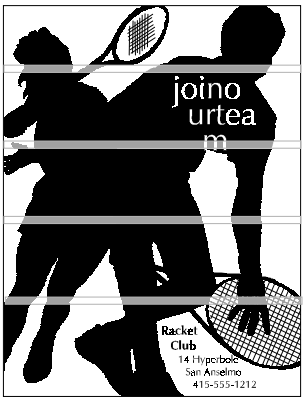
Possible Cause (Printer)

- The laser optic components are dirty.
- The hot roller stripper scrapes off toner from the print paper.

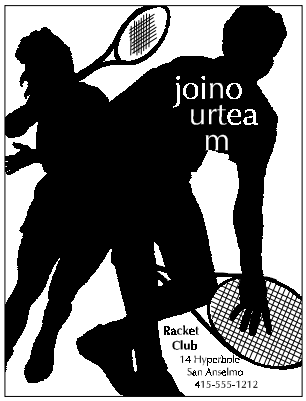
Action:

- Clean the laser optic components.
- Check the hot roller stripper mechanism. Clean the strippers and replace them if they are damaged.

7.1.8. Horizontal White Lines



h523t509.wmf



h523t507.wmf

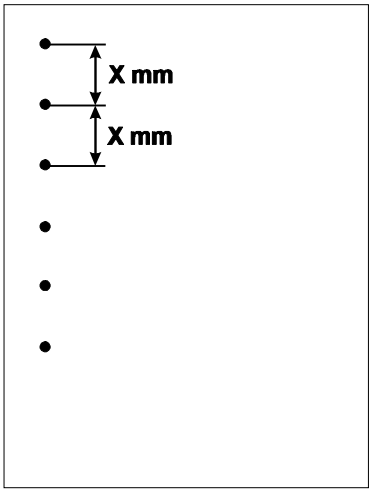
Possible Cause (Printer)

- The surface of the development roller is damaged or deformed.
- The development bias is not stable.
- Transfer current is not stable.

Action:

1. Print a test pattern, and open the cover in the middle of printing.
2. Check if horizontal white lines (where toner is not adhered) appear on the drum surface or not.
   - If they do, go to step 3.
   - If not, check the transfer roller surface and the transfer bias terminals connections. If they are OK, check or replace the power pack.
3. Check if horizontal white lines (where toner is not adhered) appear on the development roller surface or not.
   - If they do, check if the development roller surface is not deformed. If it is OK, check or replace the power pack.
   - If not, check for damage on the drum surface.

7.1.9. Black Dots/Spots



h523t510.wmf

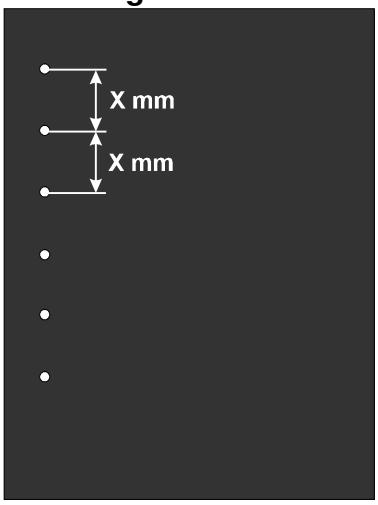
Possible Cause (Scanner)
- Dust on the exposure glass.

Action:
- Clean the exposure glass.
- Try disabling MTF.

Possible Cause (Printer)
- The drum surface is damaged (this is likely if the dots appear at 94.2 mm intervals).

Action:
- Replace the drum.

7.1.10. White Spots in Black Image Areas



h523t511.wmf

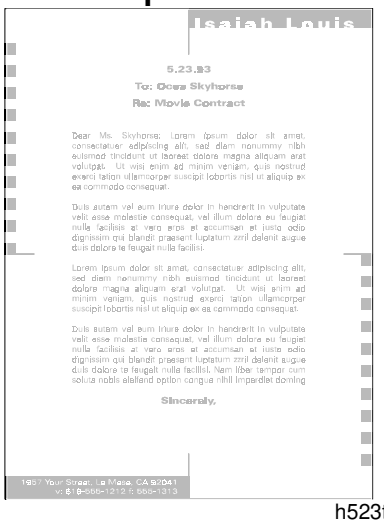
Possible Cause (Printer)

- The drum surface is damaged (this is likely if the dots appear at 94.2 mm intervals).
- The development roller surface is damaged (this is likely if the dots appear at 62.8 mm intervals).
- The toner application roller surface is damaged (this is likely if the dots appear at about 16.75 mm intervals).

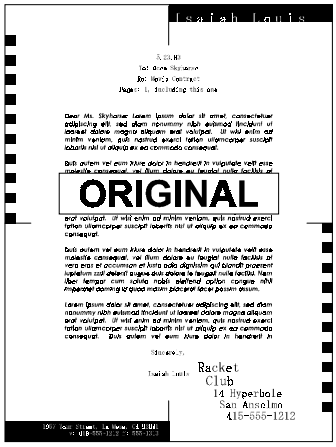
Action:

- Replace the drum.
- Clean the surface of the development roller and change the roller if it is damaged.
- Change the development unit.

7.1.11. Faint Copies



h523t512.wmf



h523t503.wmf

Possible Causes (Scanner)

- Dirty shading plate and/or exposure glass
- Wrong scan threshold
- Contact image sensor (xenon lamp, sensor element) defect

Action:

- Clean the white plate (for both book and ADF).
- Clean the exposure glass.
- Adjust the scan threshold settings.
- Replace the image sensor.

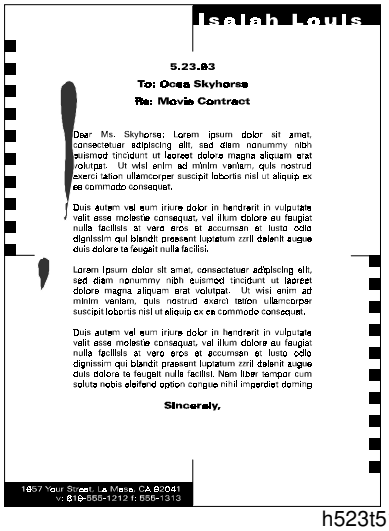
Possible Causes (Printer)

- Poor drum sensitivity.
- Dirty laser optic components.
- Incorrect development/ transfer bias
- Defective quenching lamp
- Low toner
- Low fusing temperature

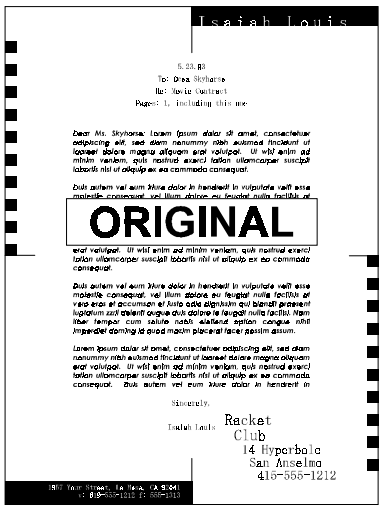
Action:

1. Check whether the toner saving feature has not been selected with the user parameters. (If it has been selected, there is no problem.)
2. Print a test pattern, and open the cover in the middle of printing.
3. Check if the toner on the paper at the entrance of the fusing unit looks faint or not.
   - If it does, check or replace the fusing lamp, thermistor, and PSU.
   - If it does not, go to step 4.
4. Check if the toner on the drum looks faint or not.
   - If it does, go to step 5.
   - If it does not, check the contacts between the transfer bias terminals and power pack.
5. Check if the toner on the development roller looks faint or not.
   - If it does, check all the contacts between the development and toner application rollers' bias terminals.
   - If it does not, try replacing the CTM and drum.

7.1.12. Vertical Black Band



h523t513.wmf



h523t503.wmf

Possible Cause (Printer)

- Dirty charge corona wire.
- The toner metering blade is deformed, damaged, or incorrectly positioned.

Action:

- Clean the charge corona wire. The wire cleaner is on the CTM.
- Replace the CTM.
- Check the toner metering blade and replace if it is damaged.

7.1.13. Unfused Copies

Possible Cause (Printer)

- The thermistor is defective.
- The fusing pressure roller spring mechanism is defective.
- The wrong type of toner is being used.
- A non-recommended type of paper is being used.

Action:

1. Check if the correct type of paper and toner are being used.
   - If it is, go to step 2.
   - If not, use recommended types of paper and toner.

2. Try replacing the fusing lamp and the roller.

7.1.14. Ghost Image

Possible Cause (Printer)

- Poor drum sensitivity.
- The cleaning blade is deformed or incorrectly positioned.
- Dirty hot roller

Action:

- Clean the cleaning blade.
- Replace the CTM.
- Clean the hot roller surface and/or replace the cleaning pad.
- Replace the drum.

7.1.15. Toner on the Back of the Printer Paper

Possible Cause (Printer)

- Dirty transfer roller
- Dirty fusing pressure roller

Action:

1. Check if the transfer roller is dirty with toner or not.
   - If it is, clean the roller surface.
     1) Take the roller off the machine.
     2) Gently tap the roller shaft to remove the toner.
     3) Turn the roller against a clean sheet of paper to let the toner transfer onto the paper.
   - If not, go to step 2.
2. Check if the fusing pressure roller is dirty with toner or not.
   - If it is, clean the fusing pressure roller.
   - If not, check for any other dirty rollers and clean them.

7.1.16. Misaligned Output (Data shifted to the right or left)

Possible Cause (Scanner)
- Incorrect setting of the document guide.

Action:
- Align each side of the document to the document guides.

Possible Cause (Printer)
- The laser optics are misaligned.
- Improper print margin setting (main scan direction).

Action:
- Adjust the main scan print margin. (Refer to Section 5-12.)
- Check that the laser optics are aligned correctly.

7.1.17. Misaligned Output (Image shifted vertically)/Reduced Image

Possible Cause:
- Improper print margin (sub scan direction).
- Dirty registration roller.

Action:
- Adjust the sub scan print margin. (Refer to Section 5-12.)
- Clean the registration roller.

7.2. MECHANICAL PROBLEMS

7.2.1. ADF

1. Non Feed

Possible Cause:

- An incorrect type or size of document is used.
- The ADF roller assembly is not properly installed.
- The pick-up and feed rollers are dirty or worn out.
- The mechanical clutch mechanism for document pick-up is defective.
- The ADF motor is defective.
- The platen cover sensor is defective.

Action:

1. Check that a correct type of document is being used.
2. Check that the ADF roller assembly is properly installed. Replace the assembly if it is damaged.
3. If the problem still remains, do the following.
   - Clean the pick-up and feed rollers with a soft cloth and water, and replace them if they are damaged.
   - Check the spring mechanism of the pick-up roller and replace it if it is damaged.
   - Check the connection between the FCU (CN62) and the ADF motor.
   - Check that the platen cover sensor is working properly and replace if it is damaged.
   - Replace the ADF motor.

2. Jam

Possible Cause:

- An incorrect type or size of document is used.
- The document is too long.
- The ADF rollers (pick-up, feed, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.
- The scan line sensor is defective.
- Defective ADF motor

Action:

1. Check that a correct type of document is being used, and that the document length is within the maximum setting.
2. Check for obstructions in the paper path.
3. If the problem still remains, do the following.
   - Clean the rollers with a soft cloth and water, and replace them if they are damaged.
   - Check that the scan line sensor is working correctly.
   - Replace the ADF motor.

3. Skew

Possible Cause:

- An incorrect type or size of document is used.
- The document guide is not properly set.
- The ADF cover is not properly closed.
- The ADF roller assembly is not properly installed.
- The scanner rollers (pick-up, feed, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.

Action:

1. Check that a correct type of document is being used.
2. Check that the ADF cover is securely closed and check that the document guide is properly set. Also, check that the ADF roller assembly is properly installed.
3. Check for obstructions in the paper path.
4. If the problem still remains, do the following.

Clean the rollers with a soft cloth and water, and replace them if they are damaged.

4. Multi-feed

Possible Cause:

- An incorrect type or size of document is used.
- The separation roller is worn or dirty.

Action:

- Clean or replace the separation roller.
- Check that the spring under the separation roller is properly installed.

7.2.2. Book Scanner

1. Abnormal Noise

Possible Cause:
- Obstruction in the scanner drive path.
- Malfunction in the scanner drive components.

Action:
- Do the scanner test (service function 10) and check that the scanner moves correctly. If not, check that the scanner drive components are working properly, and also check for obstructions in the scanner drive path.
- If there is noise coming from the guide shaft, lubricate all surfaces of the shaft with Launa oil (refer to section 6.2.1 for details).

2. Scanner Home Position Error (Error Code 9-11)

Possible Cause:
- The scanner drive wire is out of position.
- The scanner drive wire is damaged or broken.
- Malfunction in the scanner drive components.
- Obstruction in the scanner drive path.
- The red clip which secures the scanner has not been removed. (This clip should be removed at installation.)

Action:
- Check that the scanner drive components are in the correct position.
- Check that the scanner drive wire is positioned correctly.
- Check for obstructions in the scanner drive path.
- Check that the spring which secures the drive wire to the scanner is working properly and replace if it is damaged.
- Check that the scanner release lever is unlocked.

7.2.3. Printer

1. Non-feed

Possible Cause:

- A non-recommended type of paper is being used.
- The paper cassette end fence is not properly set.
- The paper lift mechaninsm (slide lock) is not working properly.
- Malfunction in the paper feed clutch.
- The paper feed roller(s) is not properly set.
- The paper feed motor is defective.
- The registration sensor is defective.

Action:

1. Check that a correct type of paper is being used.
2. Check that the paper cassette end fence is correctly set and check the paper lift mechanism (slide lock and the springs).
3. Check that the feed clutch is working properly.
4. Check that the paper feed roller(s) is properly installed. Clean or replace if necessary.
5. Check the registration roller and its mechanism. Clean or replace if necessary.
6. Check that the registration sensor is correctly working.
7. If the problem still remains, do the following.
   - Check the connections between the FCU (CN63) and the paper feed motor.
   - Replace the paper feed motor.

2. Paper Jam - Inside the Printer

Possible Cause:

- A non-recommended type of paper is being used.
- The paper end fence and/or the paper guides in the cassette is not properly set.
- The registraton roller is dirty.
- The registration sensor is defective.
- Obstruction in the paper path.
- The main motor is defective.

Action:

1. Check if a correct type of paper is being used, and check that the paper end fence and the paper guides are correctly set.
2. Check for obstructions in the paper path.
3. Check the registration roller and its mechanism. Clean or replace if necessary.
4. Check that the registration sensor is working properly.
5. If the problem still remains, do the following.
   - Check the connections between the FCU (CN15) and the main motor.
   - Replace the main motor.
   - Check the fusing unit drive mechanism. Check that all the gears are properly installed.

3. Jam - Fusing Exit

Possible Cause:

- A non-recommended type of paper is being used.
- Obstruction in the paper path.
- The registration sensor is defective.
- Malfunction in the fusing drive mechanism.
- The paper feed out sensor is defective.
- Malfunction in the hot roller stripper(s) mechanism.
- Malfunction in the pressure mechanism in the fusing unit.

Action:

1. Check if a correct type of paper is being used.
2. Check for obstructions in the paper path.
3. Check that the registration sensor is working correctly.
4. Check all the gears in the fusing drive mechanism.
5. Check that the paper feed out sensor is working correctly.
6. Check the hot roller strippers and the pressure mechanism in the fusing unit.

4. Skew

Possible Cause:

- A non-recommended type of paper is being used.
- Incorrect positioning of the paper guides in the paper cassette.
- The corner separators are out of position.
- The paper feed rollers are worn out or damaged.
- Obstruction in the paper path.
- Malfunction in the registration mechanism.

Action:

1. Check if a correct type of paper is being used.
2. Check that the paper guides and the corner separators in the paper cassette are correctly set.
3. Check that the paper feed rollers are correctly installed and clean or replace them if necessary.
4. Check for obstructions in the paper path.
5. Check the registration mechanism and clean or replace the rollers if necessary.

5. Multi-feed

Possible Cause:

- A non-recommended type of paper is being used.
- Incorrect positioning of the paper guides and/or end fence in the paper cassette.

Action:

- Check if a correct type of paper is being used.
- Check that the paper guides and the end fence are correctly set.

7.3. PC Connectivity Problems

If there is a problem related to PC connection, try doing the following procedure. First, distinguish whether the problem is caused by the PC or by your machine.

1. Print out the test pattern (Service Function 11).
   If the printout is defective, the FCU (FCIP2) is defective.

2. Take a copy.
   If the printout is defective, either the Image Sensor or the FCU (FCIP2) is defective.

3. Print the PC test page. (If a problem occurs during PC print.)
   Turn EET or Toner Saving on/off to check whether the D9001LF is working properly.

4. Scan a page from the PC. (If a problem occurs during PC scan.)
   If a problem occurs, either the Image Sensor or the FCU (FCIP2) is defective.

5. Do a PC fax transmission. (If a problem occurs during PC fax.)
   If a problem occurs, the NCU or FCU (HIC, Modem, FCIP2) is defective.

> **Note:**
> If a problem occurs during PC print/scan/fax, there is always a chance that the problem is caused by the driver (OfficeStyler) or by the application software.

Use the table below to distinguish where the problem is caused.

Components used in each procedure:

	CIS	NCU	MDM	FICP2	D6002	D9001	LDDR	Centro I/F
Fax to Fax Transmission	✓	✓	3	3	---	---	---	---
Fax to Fax Reception	---	✓	3	3	---	Thru	3	---
Test Print (Function 11)	---	---	---	✓	---	Thru	3	---
Copying	✓	---	---	3	---	Thru	3	---
PC Printing	---	---	---	Cntrl	✓	3	3	3
PC Scanning	✓	---	---	3	Thru	---	---	3
PC Fax Transmission	---	✓	3	3	Thru	---	---	3
PC Fax Reception	---	✓	3	3	Thru	---	---	3

✓: Used ---: Not used Thru: Data passes thru.
Cntrl: Control only, data does not pass through.

7.4. SERVICE CALL CONDITIONS

If the Call Service indicator is lit, one of the following conditions has occurred. (Please refer to the section 2-2-11 for details of the service call conditions.)

Symptom	Error Code	Sub-code	SC-code
Scanner home position error	9-11	71	7-71
Charge leak current detected while the charge corona unit was activated.	9-17	11	1-11
Charge leak current detected while the charge corona unit was not activated.	9-17	12	1-12
Laser diode failure	9-20	21	2-21
Fusing unit failure (fusing lamp at high temperature during printing)	9-22	01	0-01
Fusing unit failure (fusing lamp not at printing temperature after warm-up)	9-22	02	0-02
Fusing unit failure (fusing lamp at high temperature in power saver mode)	9-22	03	0-03
Fusing unit failure (fusing lamp at high temperature in power saver mode)	9-22	04	0-04
Fusing unit failure (fusing lamp at low temperature in power saver mode)	9-22	05	0-05
Fusing unit failure (fusing lamp at low temperature during printing)	9-22	07	0-07
Fusing unit failure (fusing lamp at an extremely high temperature)	9-22	08	0-08
Fusing unit failure (thermistor error)	9-22	09	0-09
Fusing unit failure (fusing lamp at high temperature in power saver mode)	9-22	0A	0-0A
Polygon mirror motor startup error	9-23	31	3-31
Polygon mirror motor error while printing	9-23	32	3-32
Main motor startup error	9-24	41	4-41
Main motor error while printing	9-24	42	4-42

To find out which problem has occurred, either:

- See the Auto Service Call report that was sent to the service station by the machine. This report lists a sub-code, as well as the error message; this sub-code may help you find the problem.
  Or, check the sub-code stored at RAM addresses 80032C(H) and 8003A4(H).
- Check the error code history using service function 03.
- Try to clear the service call condition (for failures which are not related to the fusing unit): switch the power off, wait 10 seconds, then switch back on.
- An SC-code is displayed on the LCD panel when the error occurs.

If the failure is related to the fusing unit, after fixing the problem, reset the data at address 80032C(H) to 00(H), then restart the machine.

7.5. ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that error codes 4-00, 01, 02, and 10 only appear in the error code display and on the service report.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	Check the line connection. Check the NCU - FCU connectors. The machine at the other end may be incompatible. Replace the NCU or FCU. Check for DIS/NSF with an oscilloscope. If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	The other party is out of paper or has a jammed printer. The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	Check the line connection. Check the NCU - FCU connectors. Try changing the tx level and/or cable equalizer settings. Replace the FCU or NCU. The other terminal may be faulty; try sending to another machine. If the rx signal is weak or defective, there may be a bad line. **Cross reference** Tx level - NCU Parameter 01 (PSTN) Cable equalizer - G3 Switch 07 (PSTN) Dedicated Tx parameters - Section 4-4
0-05	Unsuccessful after modem training at 2400 bps	Check the line connection. Check the NCU - FCU connectors. Try adjusting the tx level and/or cable equalizer. Replace the FCU or NCU. Check for line problems. **Cross reference** See error code 0-04.
0-06	The other terminal did not reply to DCS	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. The other end may be defective or incompatible; try sending to another machine. Check for line problems. **Cross reference** See error code 0-04.

Code	Meaning	Suggested Cause/Action
0-07	No post-message response from the other end after a page was sent	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed or run out of paper. The other end user may have disconnected the call. Check for a bad line. The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed, or run out of paper or memory space. Try adjusting the tx level and/or cable equalizer settings. The other end may have a defective modem/NCU/FCU; try sending to another machine. Check for line problems and noise. **Cross reference** Tx level - NCU Parameter 01 (PSTN) Cable equalizer - G3 Switch 07 (PSTN) Dedicated Tx parameters - Section 4-4
0-14	Non-standard post message response code received	Check the FCU - NCU connectors. Incompatible or defective remote terminal; try sending to another machine. Noisy line: resend. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. **Cross reference** See error code 0-08.
0-15	The other end does not have the confidential or transfer function	The other terminal does not have the confidential rx or transfer function, or the other terminal's memory is full.
0-16	CFR or FTT not detected after modem training in confidential or transfer mode	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Try adjusting the tx level and/or cable equalizer settings. The other end may have disconnected, or it may be defective; try calling another machine. If the rx signal level is too low, there may be a line problem. **Cross reference** See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel or OPU.

Code	Meaning	Suggested Cause/Action
0-20	Facsimile data not received within 6 s of retraining	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Check for line problems. Try calling another fax machine. Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. **Cross reference** Reconstruction time - G3 Switch 0A, bit 6 Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	Check the connections between the FCU, NCU, & line. Check for line noise or other line problems. Replace the NCU or FCU. The remote machine may be defective or may have disconnected. **Cross reference** Maximum interval between EOLs and ECM frames - G3 Bit Switch 0A, bit 4
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 0.2 s)	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try adjusting the acceptable modem carrier drop time. **Cross reference** Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1
0-23	Too many errors during reception	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try asking the other end to adjust their tx level. Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN) Rx error criteria - Communication Switch 02, bits 0 and 1
0-24	Printer failure occurred while the memory was full during non-ECM reception; negative response returned	There is no memory space available, or substitute reception is disabled. Try changing the post-message command tx timing. Try asking the user to add optional extra memory. **Cross reference** Post-message command tx timing -

Code	Meaning	Suggested Cause/Action
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. The other terminal may not be compatible. **Cross reference** Dedicated tx parameters - Section 4-4
0-52	Polarity changed during communication	Check the line connection. Retry communication.
1-00	Document jam	Incorrectly inserted document or unsuitable document type. Check the ADF drive components and sensors. **Cross reference** ADF mechanical problems - Section 7-2-1
1-01	Document length exceeded the maximum	Try changing the maximum acceptable document length. Divide the document into smaller pieces. Check the ADF drive components and sensors. **Cross reference** Max. document length - Scanner switch 00, bits 2 and 3 ADF mechanical problems - Section 7-2-1
1-09	Scanning start position mark not detected (scanning continues as normal)	Clean the start position mark (square black mark) and the area surrounding it. Replace the image sensor. **Cross reference** Book scanner mechanical problem - Section 7-2-2
1-10	Paper at the scan line when the power was turned on.	Remove the paper. Check the scan line sensor. **Cross reference** ADF mechanical problems - Section 7-2-1
1-17	Document jam in the feed-out area	Clear any debris from the sensor actuator. Check the ADF drive components and sensors. **Cross reference** ADF mechanical problems - Section 7-2-1
1-20	Paper did not reach the fusing exit at the end of printing	Remove the paper. Check the printer drive components and sensors. **Cross reference** Printer mechanical problems - Section 7-2-2
1-21	Paper present at the fusing exit after printing	Remove the paper. Check the printer drive components and sensors. **Cross reference** Printer mechanical problems - Section 7-2-2
1-30	Paper ran out during printing	Add paper in the cassette.
1-34	Paper ran out after printing	Add paper in the cassette.
1-71	The cover was opened or the cassette was pulled out during printing	Close the cover or put back the cassette.

Code	Meaning	Suggested Cause/Action
2-10	The modem cannot enter tx mode	Replace the FCU.
2-11	Only one V.21 connection flag was received	Change the FCU.
2-12	Modem clock irregularity	Replace the FCU.
2-20	Abnormal coding/decoding (cpu not ready)	Replace the FCU.
2-50	The machine reset itself	Replace the FCU.
4-00	One page took longer than 8 minutes to transmit	Check for a bad line. Try the communication at a lower resolution, or without halftone. Change the FCU.
4-01	Line current was cut	Check the line connector. Check the connection between FCU and NCU. Check for line problems. Replace the FCU or the NCU.
4-02	The other end cut the received page as it was longer than the maximum limit.	Split the page into smaller pieces, or ask the other end to change their maximum receive length setting, then resend.
4-10	Communication failed because of ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	Get the ID Codes the same and/or the CSIs programmed correctly, then resend. The machine at the other end may be defective.
5-00	Data reconstruction not possible	Replace the FCU.
5-10	DCR timer expired	Replace the FCU.
5-20	Storage impossible because of a lack of memory	Temporary memory shortage. Test the SAF memory. Replace the FCU or optional IC card.
5-21	Memory overflow	
5-22	Mode table overflow after the second page of a scanned document	Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	Test the SAF memory. Ask the other end to resend the message. Replace the FCU or IC memory card.
5-24	Memory overflow after the second page of a scanned document	Try using a lower resolution setting. Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	Replace the FCU or IC memory card.
5-30	Mode table for the first page to be printed was not effective	Replace the FCU or IC memory card.

Code	Meaning	Suggested Cause/Action
6-01	G3 ECM - no V.21 signal was received	Try adjusting the rx cable equalizer. Replace the FCU or NCU.
6-02	G3 ECM - EOR was received	
6-03	G3 ECM - non-standard V.21 code received	The other terminal may be defective.
6-04	G3 ECM - RTC not detected	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU or NCU. Try adjusting the rx cable equalizer **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN)
6-06	G3 ECM - coding/decoding error	Defective FCU. The other terminal may be defective.
6-08	G3 ECM - PIP/PIN received in reply to PPS.NULL	The other end pressed Stop during communication. The other terminal may be defective.
6-09	G3 ECM - ERR received	Check for a noisy line. Adjust the tx levels of the communicating machines. See code 6-05.
6-10	G3 ECM - error frames still received at the other end after all communication attempts at 2400 bps	Check for line noise. Adjust the tx level (use NCU parameter 01 or the dedicated tx parameter for that address). Check the line connection. Defective remote terminal.
6-11	G3 ECM - printing impossible because of a missing first line in the MMR coding	Check for problems in the printer mechanism.
6-21	V.21 flag detected during high speed modem communication	The other terminal may be defective or incompatible.
6-39	V.21 signal not stopped within 6 s	Replace the FCU.
9-07	Paper non-feed or jam at the cassette entrance	If the problem persists, replace the FCU. **Cross reference** Paper non-feed - Section 7-2-2 Jam at the cassette entrance - Section 7-2-2
9-08	Paper jam inside the development area	If the problem persists, replace the FCU. **Cross reference** Paper jam - Section 7-2-2
9-09	Paper jam in the fusing exit area	If the problem persists, replace the FCU. **Cross reference** Paper jam - Section 7-2-2
9-10	Toner end detected	Replace the CTM.

Code	Meaning	Suggested Cause/Action
9-11	Home position not detected in book scanner mode	If the problem persists, replace the FCU. **Cross reference** Charge corona failure - Section 7-3
9-12	Cover open detected during printing	Close the cover, or check the cover sensors.
9-17	Charge corona unit failure	If the problem persists, replace the FCU. **Cross reference** Charge corona failure - Section 7-3
9-20	Laser diode failure	If the problem persists, replace the FCU. **Cross reference** LD failure - Section 7-3
9-22	Fusing lamp failure	If the problem persists, replace the FCU. **Cross reference** Fusing lamp failure - Section 7-3
9-23	Hexagonal mirror motor failure	If the problem persists, replace the FCU. **Cross reference** Mirror motor failure - Section 7-3
9-24	Main motor failure	If the problem persists, replace the FCU. **Cross reference** Main motor failure - Section 7-3
9-80	Bypass feed - paper non-feed or jam at the entrance	Check the registration roller and sensor. **Cross reference** Printer mechanical problems - Section 7-2-2
9-81	Bypass feed - paper length exceeds the maximum limit (600 mm)	Check the paper feed mechanism and sensors. **Cross reference** Printer mechanical problems - Section 7-2-2
9-82	Optional 100 sheet cassette - paper non-feed or jam at the cassette entrance	Check the paper feed mechanism and sensors. **Cross reference** Printer mechanical problems - Section 7-2-2
9-83	Optional 100 sheet cassette - paper length exceeds the maximum limit (600 mm)	Check the paper feed mechanism and sensors. **Cross reference** Printer mechanical problems - Section 7-2-2

7.6. ELECTRICAL COMPONENT DEFECTS

7.6.1. Defective Sensor Table

Sensor	Status	Symptoms if Defective
ADF document sensor	ON	"CLEAR ORIGINAL" is displayed at power on.
	OFF	"SET DOCUMENT" is still displayed after a document is placed in the feeder.
ADF scan line sensor	ON	"CLEAR ORIGINAL" is displayed at power-up.
	OFF	"CLEAR ORIGINAL" is displayed soon after the start of copying.
ADF cover switch	ON	No error message appears if the cover is opened.
	OFF	“CLOSE COVER” is displayed at power on.
Book scanner home position sensor	ON	SC code 7-71 is displayed soon after starting a copy operation. (Error code 9-11)
	OFF	SC code 7-71 is displayed soon after power on. (Error code 9-11)
Platen cover sensor	ON (Open)	ADF does not work.
	OFF (Close)	The Automatic Paper Select function does not work correctly. The original size is not reset even if an original of a different size is placed under the platen cover.
Interlock switches	ON	There is no alarm on opening the cover, and "CLOSE COVER" is not displayed.
	OFF	"CLOSE COVER" is displayed at power on.
Registration sensor Fusing exit sensor	ON	"CLEAR COPY" is displayed at power on.
	OFF	"CLEAR COPY" is displayed after the start of copying.
Bypass feed sensor	ON	"CLEAR COPY" is displayed after the automatic reset timer expires.
	OFF	Bypass feed cannot be used.
Toner end sensor	ON	“ADD TONER” is displayed.
	OFF	Toner end is not indicated.
Paper size sensor - Standard cassette	---	"ADD PAPER" or the wrong paper size is displayed at power on.
	---	Page separation may be done even if the original is the same size as the copy paper.
Paper end sensor - Standard cassette	ON	The Add Paper indicator lights even if paper is remaining.
	OFF	The Add Paper indicator does not light when the paper has run out.
Paper size sensor - optional cassette	---	"ADD PAPER" or the wrong size is displayed at power on.
	---	Page separation may be done even if the original is the same size as the copy paper.

Sensor	Status	Symptoms if Defective
Paper end sensor - optional cassette	ON	The Add Paper indicator on the operation panel lights even if paper is remaining.
	OFF	The Add Paper indicator on the operation panel does not light when the paper has run out.
Thermistor	Open	SC code 0*09 is displayed at power on. (Error code 9-22)
	Short	SC code 0*08 is displayed at power on. (Error code 9-22)
Thermostat	Open	SC code 0*xx is displayed at power on or at the start of printing depending on the fusing standby temperature setting.

7.6.2. Blown Fuse Table

The only service-replaceable fuses are the following.

Fuse	Symptoms if Defective
PSU - F1/ F2/F3	No power to the machine. (F3 - 220V PSU only)
Thermofuse (Not installed in the US model.)	Fusing power is not supplied.

Point-to-Point Diagram
Model: Aficio FX10

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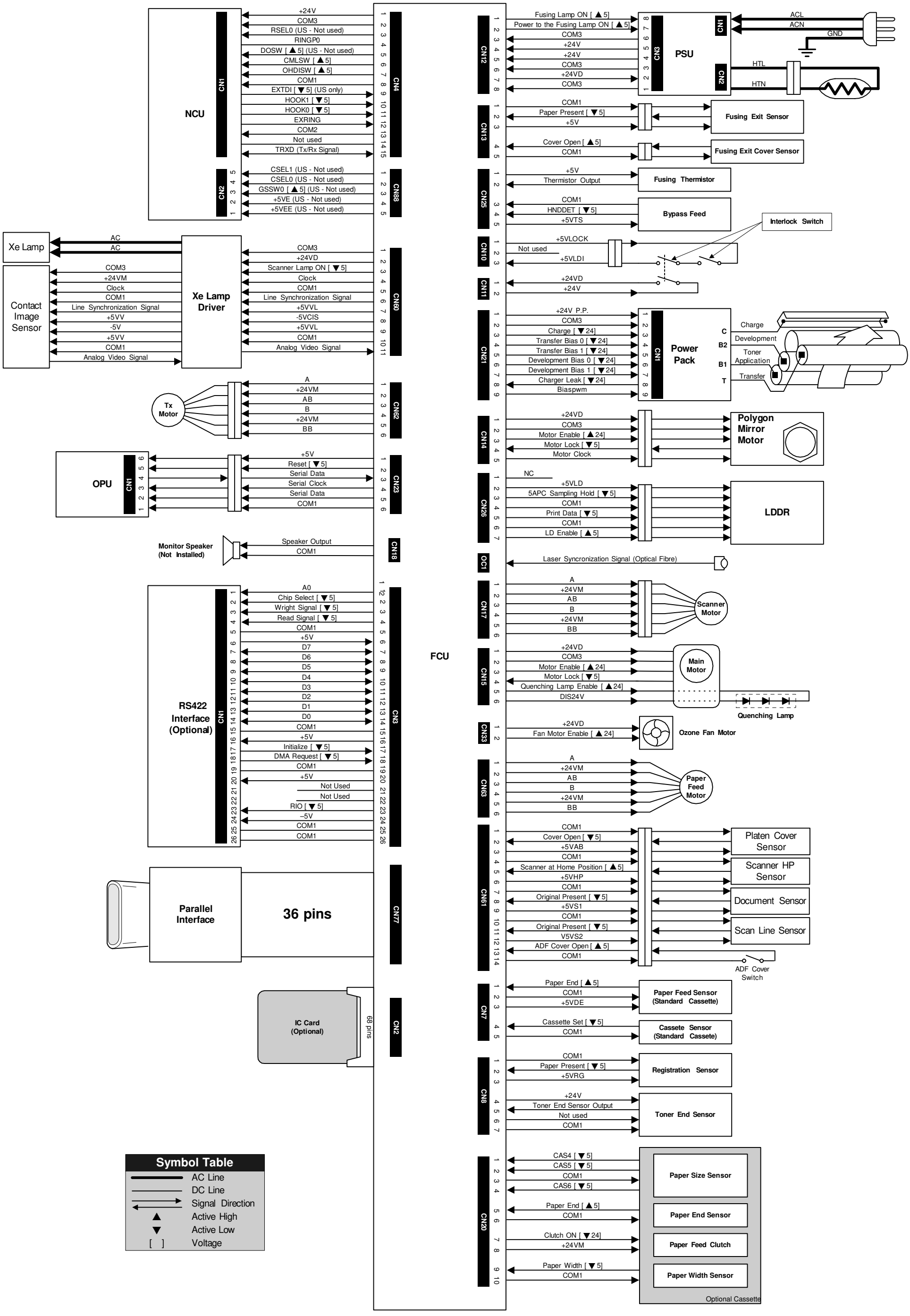

Symbol Table

———	AC Line
———	DC Line
⟶ ⟵	Signal Direction
▲	Active High
▼	Active Low
[ ]	Voltage