KAISER 1

Aficio FAX 5000L

SERVICE MANUAL

29 November, 1999
Subject to change

Important Safety Notices

LASER_PS3.WMF

Laser Safety

⚠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.

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.**

TABLE OF CONTENTS

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX, ISDN (optional)

Connection
Direct couple

Document Size
Length:
105 - 420 mm [4.1 - 16.5 ins]
Up to 1.2 m [47.2 ins], manually assisted
Width:
148 - 304 mm [5.8 - 12.0 ins]
Thickness:
0.05 to 0.2 mm [2 to 8 mils]
(equivalent to 50 - 80 g/m^2)

Document Feed
Automatic feed, face up

ADF Capacity
75 sheets (using A4 size 75g/m^2 paper)
40 sheets (using B4 size 75g/m^2 paper)
30 sheets (using A3 size 75g/m^2 paper)

Scanning Method
Flat bed, with CCD

Scan Width
219.5 mm [8.64 ins] ± 1% (A4/Letter)
260.1 mm [10.2 ins] ± 1% (B4)
308.9 mm [12.2 ins] ± 1% (A3/Double Letter)

Scan Resolutions
Main scan: 200 dpi
Sub scan:
Standard - 100 lpi
Detail - 200 lpi
Fine - 400 lpi

Memory Capacity
ECM: 128 kbytes

SAF:
Standard: 2.0 Mbytes: 160 pages
With 2 Mbyte option: 320 pages
With 4 Mbyte option: 480 pages
With 40 Mbyte option: 1200 pages
With 40 Mbyte option plus Function Upgrade Card: 3000 pages
Measured using ITU-T #1 test document (Slerexe letter)

Compression
MH, MR, MMR, SSC
JBIG (JBIG option is required)
SAF storage for memory tx: MMR and raw data

Protocol
Group 3 with ECM
Group 4 (ISDN G4 option required)

Modulation
V.34 (TCM), V.33/V.17(TCM), V.29 (QAM), V.27ter (PHM), V.21 (FM), V.8 (FM)

Data Rate (bps)
G3:
33600/31200/28800/26400/24000/21600/ 19200/16800/14400/12000/9600/7200/ 4800/2400
G4 (option): 64 kbps/56 kbps

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

Transmission Time
G3: 3 s at 28800 bps;
Measured with G3 ECM using memory for an ITU-T #1 test document (Slerexe letter) at standard resolution
G4 (option): 3 s at 64 kbps;
Measured with an ITU-T #1 test document (Slerexe letter) at standard resolution

Printing System
Laser printing, plain paper, dry toner

Paper Size and Capacity
Standard Cassette: 250 sheets
USA: Letter, Legal, DLT
Europe: A4, A5 sideways, B4, A3
Asia: A4, A5 sideways, F/F4, B4, A3

Paper Feed Unit (Optional): 500 sheets
USA: Letter, Legal, DLT
Europe: A4, A5 sideways, B4, A3
Asia: A4, A5 sideways, F/F4, B4, A3
Note: Up to two PFUs can be installed.

Maximum Printing Width
208 mm [8.2 ins] (Letter)
202 mm [8.0 ins] (A4)
248 mm [9.8] (B4)
288 mm [11.3] (A3, DLT)

Print Resolutions
Fax and Copy Mode:
Main scan: 400 dpi
Sub scan: 400 dpi
Printer Mode: 600 dpi

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

Power Consumption (Base Machine Only)
Standby:
Minimum 2 W (see Note)
Normal 45 W
Transmitting: 70 W
Receiving: 400 W (Maximum: 850 W)
Copying: 400 W (Maximum: 850 W)

Note: 2W mode is not available if one of the following options is installed.
- Printer interface unit
- G4
- RS232C interface
- G3 interface
- NIC (Internet Fax option)

Operating Environment
Temperature: 10°C - 32°C [50 - 90°F]
Humidity: 10 - 80 %Rh

Dimensions (W x D x H)
505 x 609 x 450 mm [19.9 x 24.0 x 17.7 ins]
Excluding handset, trays, and optional units

Weight
Approx. 26.5 kg [58.6 lbs]
Excluding AIO, maintenance kit, handset, trays, and optional units

1.2 FEATURES

1.2.1 FEATURES LIST

KEY:
O = Used, X = Not Used,
A = With optional memory 2M/4M/40M only
B = With optional function upgrade card only
C = With optional Fax On Demand kit only
D = With optional paper feed unit only
E = With optional counter only
F = With optional handset only (US only)
G = With optional printer interface unit only
H = With optional G4 kit only

Equipment	
ADF	O
Book scan	X
Built-in handset	X
Bypass feed: 1 sheet	O
Cabinet	X
Counter	E
Cutter	X
Handset	F
Hard disk	X
Manual feed mechanism (ADF)	O
Marker (Stamp)	O
Monitor speaker	O
Optional cassette: 100 sheets	X
Optional Fax On Demand kit	C
Optional paper feed unit (up to 2 units)	D
Optional printer interface	G

Video Processing Features	
Contrast	O
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction before tx (B4 -> A4)	O
Reduction before tx (A3 -> B4)	O

Video Processing Features	
Reduction before tx (A3 -> A4)	O
Scanning Resolution - Standard	O
Scanning Resolution - Detail	O
Scanning Resolution - Fine	O
Scanning Resolution - Superfine	X
Smoothing to 400 x 400 dpi when printing	O

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

Communication Features - User Selectable	
Action as a transfer broadcaster	O
AI Redial (last ten numbers)	O
Answering machine interface	X
Authorized Reception	O
Auto-answer delay time	X
Auto dialing (pulse or DTMF)	O
Auto Document	O
Auto image density selection	X
Auto paper size selection	X
Automatic Voice Message	X
Batch Transmission	O
Broadcasting	O
Chain Dialing	O
Communication Result Display	O
Confidential ID Override	O
Confidential Reception	O
Confidential Transmission	O
Direct Fax Number Entry	O
Economy Transmission	O
Fax on demand	C
F code Box	O
Forwarding	O
Free Polling	O
Groups (9 groups)	O
Group Transfer Station	O

Communication Features - User Selectable	
Hold	X
ID Transmission	O
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	O
Length Reduction	X
Memory transmission	O
Multi-step Transfer	O
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O
Page separation mark	O
Parallel memory transmission	O
Personal Codes	X
Personal Codes with Conf. ID	X
Partial Image Area Scanning	B
Polling Reception	O
Polling Transmission	O
Polling tx file lifetime in the SAF	O
Quick Dial (Standard: 64 stations)	O
Reception modes (Fax, Tel)	O
Remote control features	X
Remote Transfer	O
Restricted Access	O
Secured Polling	O
Secured Polling with Stored ID Override	O
Secure Transmission	X
Send Later	O
Silent ringing detection	X
Speed Dial (Standard: 100 stations)	O
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	O
Transmission Deadline (TRD)	X
Turnaround Polling	X
Two-step Transfer	X
Two in one	O
Voice Request (immed. tx only)	X

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Cable Equalizer PSTN ISDN	 O H
Closed Network (tx and rx)	O
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	X
Inch-mm conversion before transmission	O
mm-inch conversion when printing	O
Page retransmission times	O
Protection against wrong conn.	O
Resolutions available for reception 200 x 100 dpi 200 x 200 dpi 200 x 400 dpi 400 x 400 dpi	 O O O X
Resolution stepdown override option	X
Short Preamble	X

Other User Features	
Area code prefix	X
Automatic service call	Service
Center mark	O
Checkered mark	O
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	O
Copy editing (Erase Center/Margin)	X
Copy mode	O
Copy Mode Restriction	O
Counters	O
Daylight Saving Time	O
Destination Check	O
Direct entry of names	O

Other User Features	
File Retention Time	O
File Retransmission	O
Function Programs	O
ID Code	O
Label Insertion (“From xxx”)	O
Language Selection	O
LCD contrast control	O
Memory Lock	O
Memory Lock ID	O
Multi Sort Document Reception	O
Multicopy mode	O
Own telephone number	O
Energy 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	O
Reduction/Enlargement	X
Remaining memory indicator	O
Remote ID	O
Reverse Order Printing	X
RTI, TTI, CSI	O
Service Report Transmission	O
Speaker volume control	O
Specified Tray Selection	D
Substitute reception on/off	O
Telephone line type	O
Toner Saving Mode	O
TTI/CIL on/off	O
User Function Keys (5 keys)	O
User Parameters	O
Wild Cards	O

Reports - Automatic	
Communication Failure Report	O
Confidential File Report	O
Fax On Demand Report	C
Memory Storage Report	O
Polling Clear Report	O
Polling Reserve Report	O
Polling Result Report	X

Reports - Automatic	
Power Failure Report	O
TCR (Journal)	O
Toner Cassette Order Form	X
Transfer Result Report	O
Transmission Result Report	O

Reports - User-initiated	
Authorized Destination List	O
Box List	O
Charge Control Report	X
File List	O
Forwarding List	O
Group List	O
Personal Code List	O
Program List	O
Quick Dial List	O
Specified Tray Selection List	O
Speed Dial List	O
Journal	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	X
Bit switch programming	O
Book mode test	X
Buzzer test	O
Cable equalizer	O
Comm. parameter display	O
Counter check	O
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	O
Line error mark	O
Memory file printout (all files)	O
Modem test	O
NCU parameters	O
Operation panel test	O

Service Mode Features	
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
Transmission Status Report	X
User data transfer	O

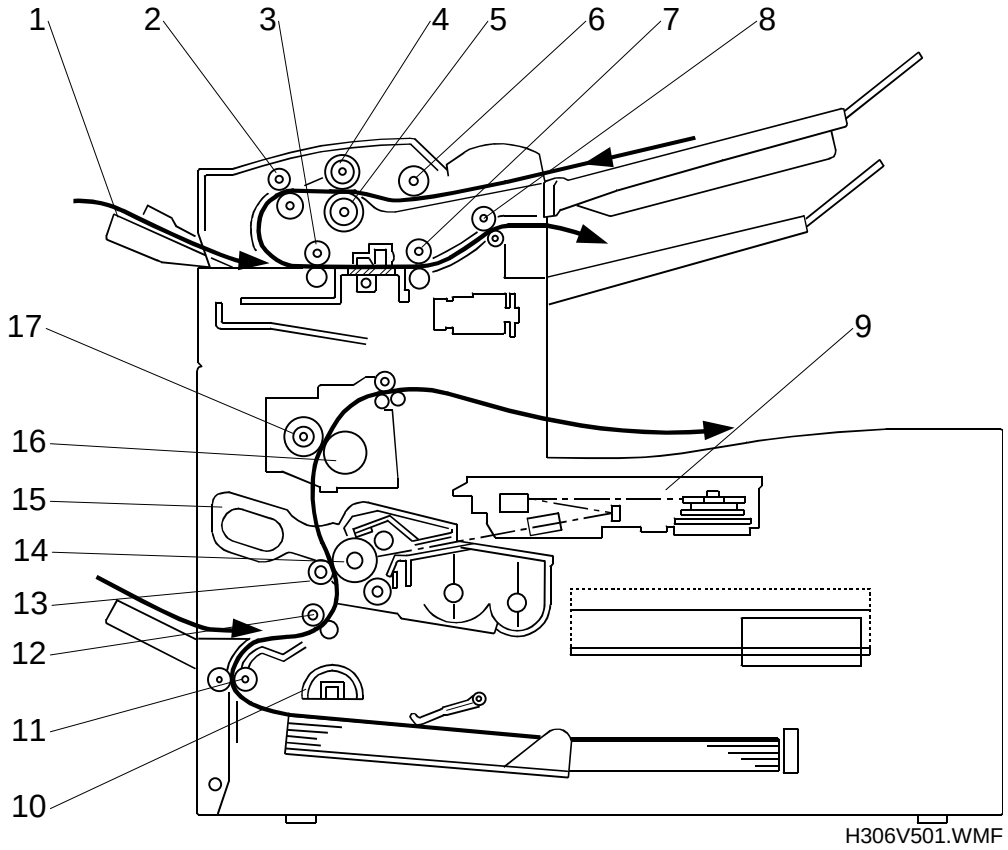
1.2.2 CAPABILITIES OF PROGRAMMABLE ITEMS

The following table shows how the capability of each programmable item changes after the optional function upgrade card is installed.

Maximum number of	Standard	With function upgrade card
Memory files plus polling rx files	250	1000
Memory files	250	1000
Destinations per file	250	1000
Destinations overall	500	2000
Pages overall	1200	3000
Quick Dials	64	64
Speed Dials	100	1000
Groups	9	30
Destinations per Group	250	250
Boxes (Information/Personal/Transfer)	150	400
Destinations dialed from the ten-key pad overall	100	1000
Programs	64 (programmed in 64 Quick Dial keys)	164 (programmed in 64 Quick Dial keys plus 100 Speed Dial codes)
Destinations per program	250	250
Auto Documents	64 (programmed in 64 Quick Dial keys)	164 (programmed in 64 Quick Dial keys plus 100 Speed Dial codes)
Communication records for the Journal stored in the memory	256	1000
Addresses specified for features such as Authorized Reception and Specified Cassette Selection	30	50

1.3 COMPONENT LAYOUT

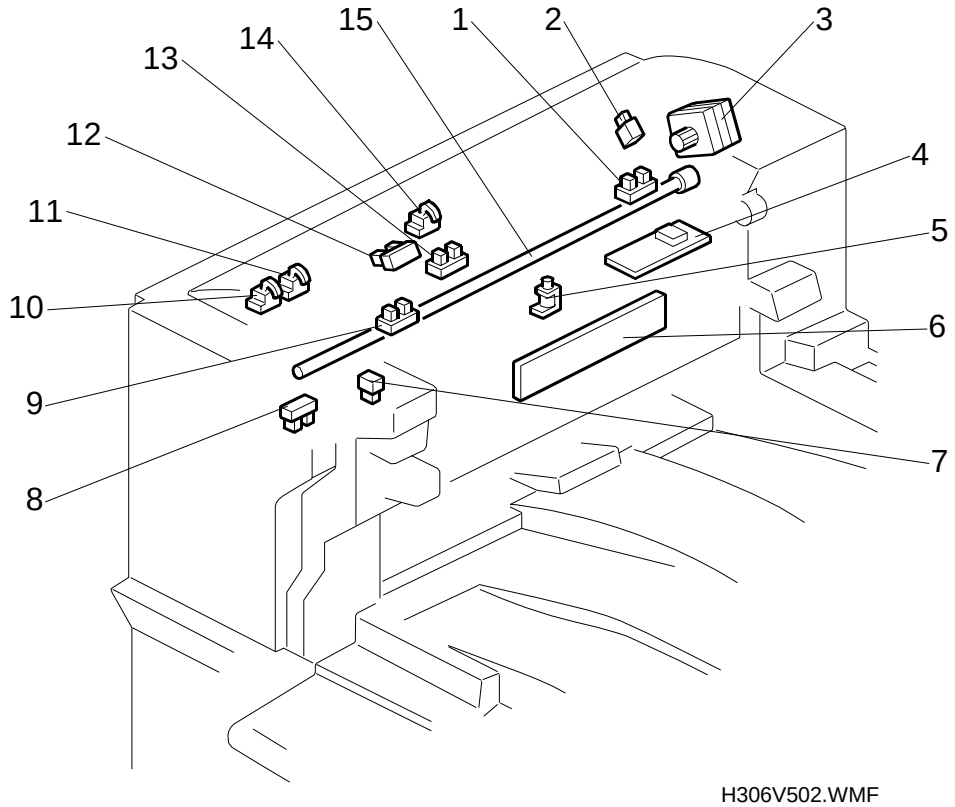
1.3.1 MECHANICAL COMPONENTS



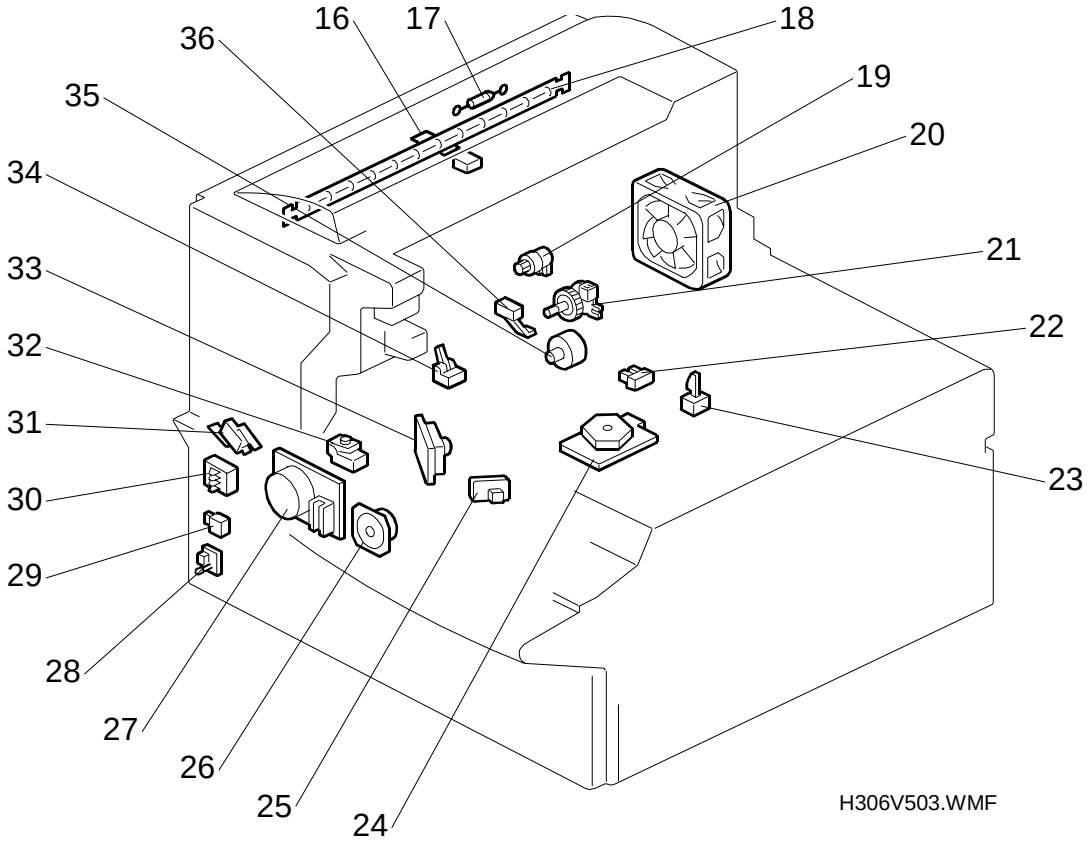
No	Name	Description
1	MDF (Manual Document Feeder)	Feeds non-standard size documents.
2	R0 Roller	Feeds the document through the scanner.
3	R1 Roller	Feeds the document through the scanner.
4	Document Feed Roller	Feeds the document into the scanner.
5	Reverse Roller	Allows one page into the scanner.
6	Pick-up Roller	Picks up pages of the document from the document table one at a time.
7	R2 Roller	Feeds the document through the stamp to the exit
8	Exit Roller	Feeds the document out to the document tray.
9	Laser Unit	Consists of the LDDR (Laser Diode Driver), focusing lens, hexagonal mirror motor, and other laser optic components.
10	Paper Pick-up Roller	Picks up the top sheet of paper from the stack in the tray, and feeds it into the printer.
11	Paper Feed Roller	Feeds the paper towards the registration roller.
12	Registration Roller	Carries out the registration process.
13	Transfer Roller	Transfers toner from the drum to the paper.

No	Name	Description
14	OPC Drum	The latent image is written to this organic photoconductor drum.
15	All-in-One Cartridge	Consists of the toner cartridge, cleaning unit, used toner tank, charge brush roller, development roller and OPC drum.
16	Fusing Pressure Roller	Applies pressure to the paper during the fusing process.
17	Hot Roller	Heat from this roller fuses the toner to the copy paper.

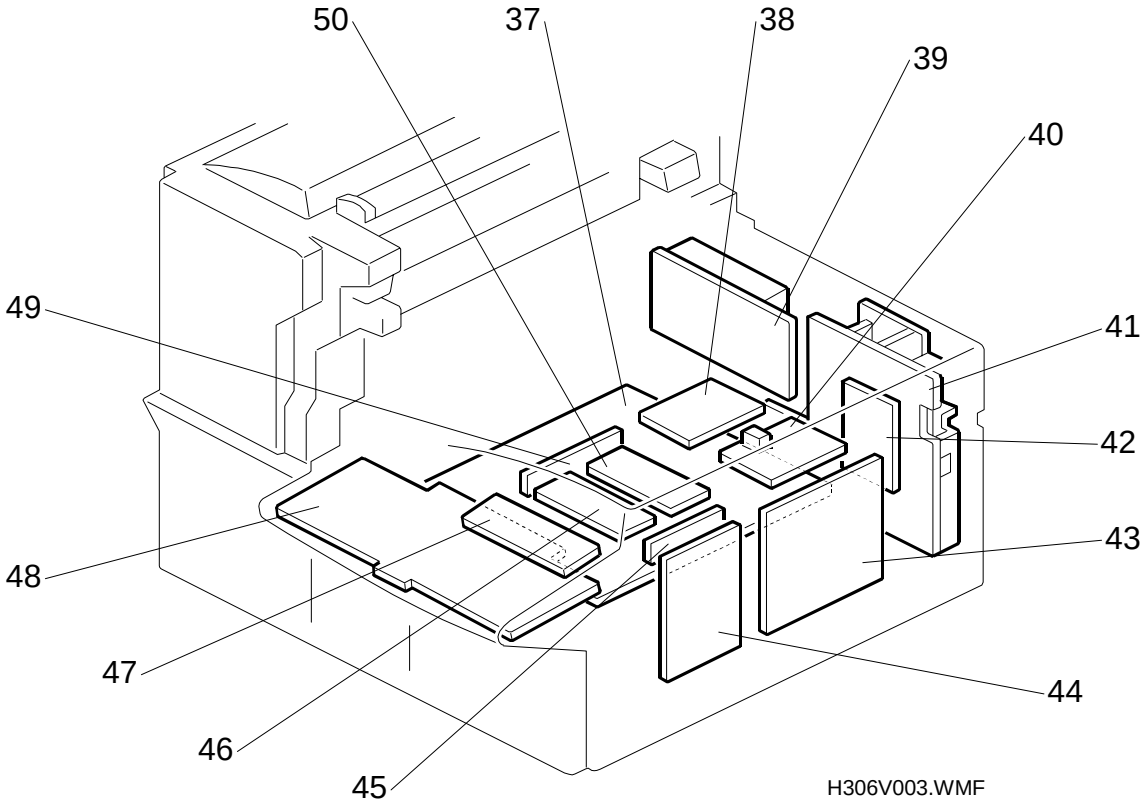
1.3.2 ELECTRICAL COMPONENTS



H306V502.WMF



H306V503.WMF



1. PCBs

No	Name	Description
4	Lamp Stabilizer	Stabilizes the power to the exposure lamp
6	SBU	The sensor on this board (a CCD) reads and converts the light reflected from the document into an analog video signal.
27	Paper End/Near-end Indicator Board	Lights an LED when the paper in the tray has run out.
32	LDDR (Laser Diode Driver)	This board drives the laser diode.
36	FCU (Facsimile Control Unit)	This board controls the machine. It contains the main CPU, flash ROM, system RAM and so on.
37	NCU (Network Control Unit) for optional G3 unit.	This board contains relays and switches for interfacing the machine with the network and the handset.
38	Power Pack	Supplies high voltage to the charge brush roller, transfer roller, and development rollers.
39	NCU (Network Control Unit)	This board contains relays and switches for interfacing the machine with the network.
40	PSU (Power Supply Unit)	This board supplies power to the machine, and switches the fusing lamp on/off.
41 42	Printer Interface Unit (Optional)	This allows the machine to be connected to a computer as a laser printer.
43	NIB (Network Interface Board) (Optional)	This allows the machine with printer unit to be connected to a LAN as a network printer.

No	Name	Description
45	JBIG (Optional)	This allows the machine to communicate using JBIG compression.
46	Internet Fax Board (Optional)	This allows the machine to be connected to a LAN as an internet fax machine.
47	LCD	This displays messages and the status of the machine.
48	OPU (Operation Panel Unit)	This board controls the operation panel.
49	OPIF (Optional Interface)	This allows the machine to be connected to a G4 unit, internet fax unit, and some other options.
50	G4 Interface (SiG4 option) or Optional G3 unit	This is an interface for the machine to connect to an ISDN network or an extra PSTN line. Only one of these two boards can be installed in the machine. The standard G3 line is sometimes called PSTN-1, and the optional G3 line is sometimes called PSTN-2.

2. Motors

No	Name	Description
3	Scanner Motor	This stepper motor drives the scanner.
20	Cooling Fan Motor	Cools the interior of the machine.
24	Polygon Mirror Motor	This high-speed DC motor drives the hexagonal mirror in the laser printer optics.
27	Main Motor	This stepper motor drives the AIO cartridge and the fusing unit.
35	Paper Feed Motor	This stepper motor drives the registration roller and the paper feed mechanisms in the main body.

3. Sensors

No	Name	Description
1	B4-width Sensor	This detects the presence of a B4-width (256 mm, 10.1") document in the feeder.
2	ADF Upper Cover Switch	This detects whether the ADF upper cover is opened or closed.
7	ADF Unit Switch	This detects whether the ADF unit is opened or closed.
8	Paper Exit Sensor	Detects when the paper feeds out of the printer.
9	A3-width Sensor	This detects the presence of an A3-width (297 mm, 11.7")document in the feeder.
10	MDF A3-width Sensor	This detects the presence of an A3-width (297 mm, 11.7")document in the MDF.
11	MDF B4-width Sensor	This detects the presence of a B4-width (256 mm, 10.1")document in the MDF.
12	Scan Line Sensor	This detects when a page is approaching the auto shading position.
13	Document Sensor	This detects the presence of a document in the feeder.

No	Name	Description
14	MDF Sensor	This detects the presence of a document in the MDF.
16	Thermistor	This monitors the temperature at the hot roller surface.
17	Thermofuse	This interrupts the AC power to the fusing lamp if the temperature of the thermistor exceeds 470°C.
22	Paper End Sensor	Detects when the paper in the tray has run out.
23	AIO Cartridge Sensor	This detects whether the AIO cartridge is installed or not.
25	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
28	Paper Tray Side Cover Switch	Detects whether the paper tray side cover is opened or closed.
30	Paper Size Detector	This detects the paper size installed in the tray. The user must set the dial to the correct size.
32	Toner End Sensor	Detects when the toner has run out.
34	Registration Sensor	Detects when paper reaches the registration roller.
36	Paper Near End Sensor	Detects when the paper has almost run out.

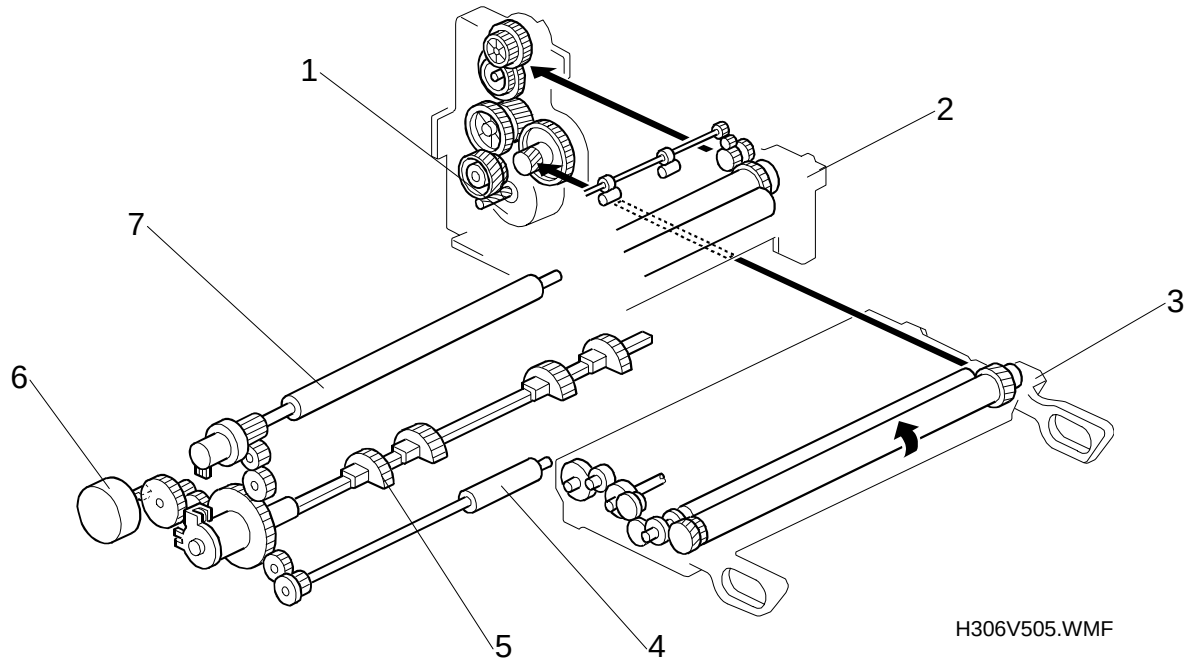
4. Interlock Switch

No	Name	Description
31	Interlock Switch	If the left cover is opened, this switch interrupts the +5VLDL power supply for the laser diode and the +24VM power supply for the fusing lamp.

5. Others

No	Name	Description
5	Stamper Ass'y	This stamps a red circle on each page that is successfully fed through the scanner (for memory transmission) or transmitted (for immediate transmission).
15	Xenon Lamp	Applies high intensity light to the original for exposure.
18	Fusing Lamp	The heat from this lamp fuses the toner to the paper.
19	Registration Clutch	Transfers drive from the paper feed motor to the registration roller.
21	Paper Feed Clutch	Transfers drive from the paper feed motor to the paper feed roller.
26	Monitor Speaker	Allows the user to hear the telephone line condition.

1.3.3 DRIVE LAYOUT

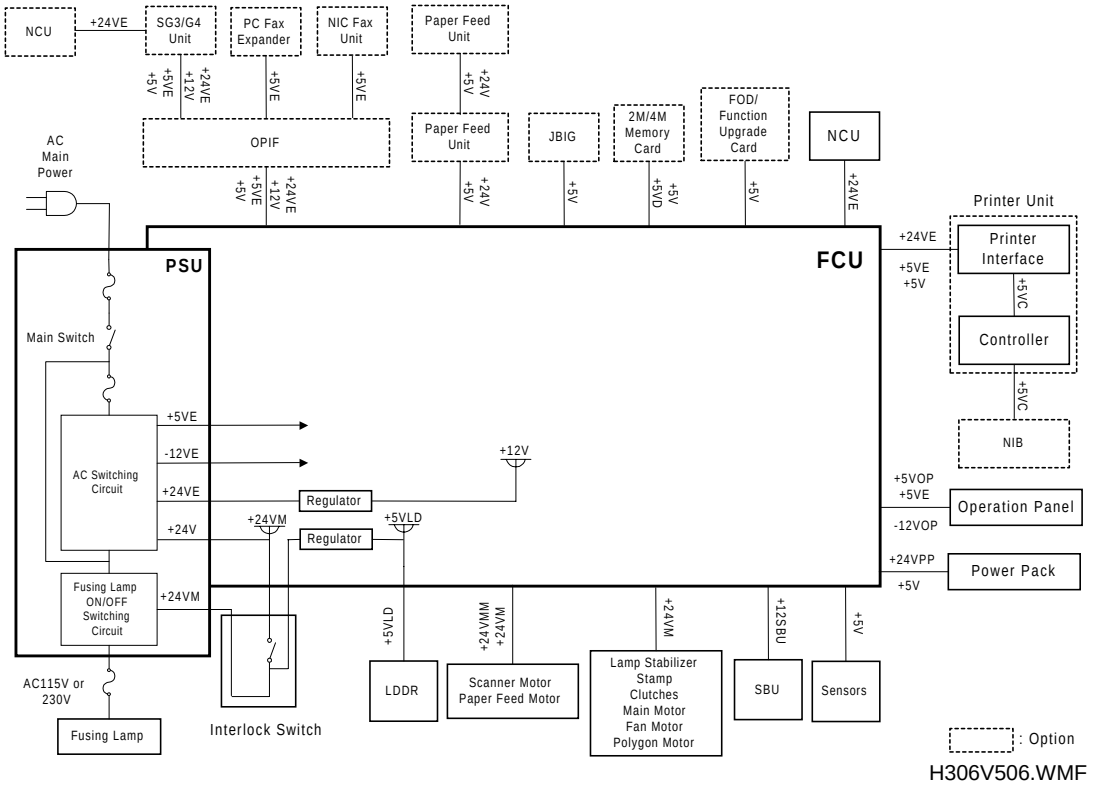


1. Components

No	Name	Description
1	Main Motor	This stepper motor drives the AIO cartridge and the fusing unit.
2	Fusing Unit	This fuses the toner to the paper.
3	All-in-One Cartridge	Consists of the toner cartridge, cleaning unit, used toner tank, charge brush roller, development roller, and OPC drum.
4	Paper Feed Roller	Feeds the paper towards the registration roller.
5	Paper Pick-up Roller	Picks up the top sheet of paper from the stack in the tray, and feeds it into the printer.
6	Paper Feed Motor	This stepper motor drives the registration roller and the paper feed mechanisms in the main body.
7	Registration Roller	Carries out the registration process.

1.4 POWER DISTRIBUTION

1.4.1 DISTRIBUTION DIAGRAM



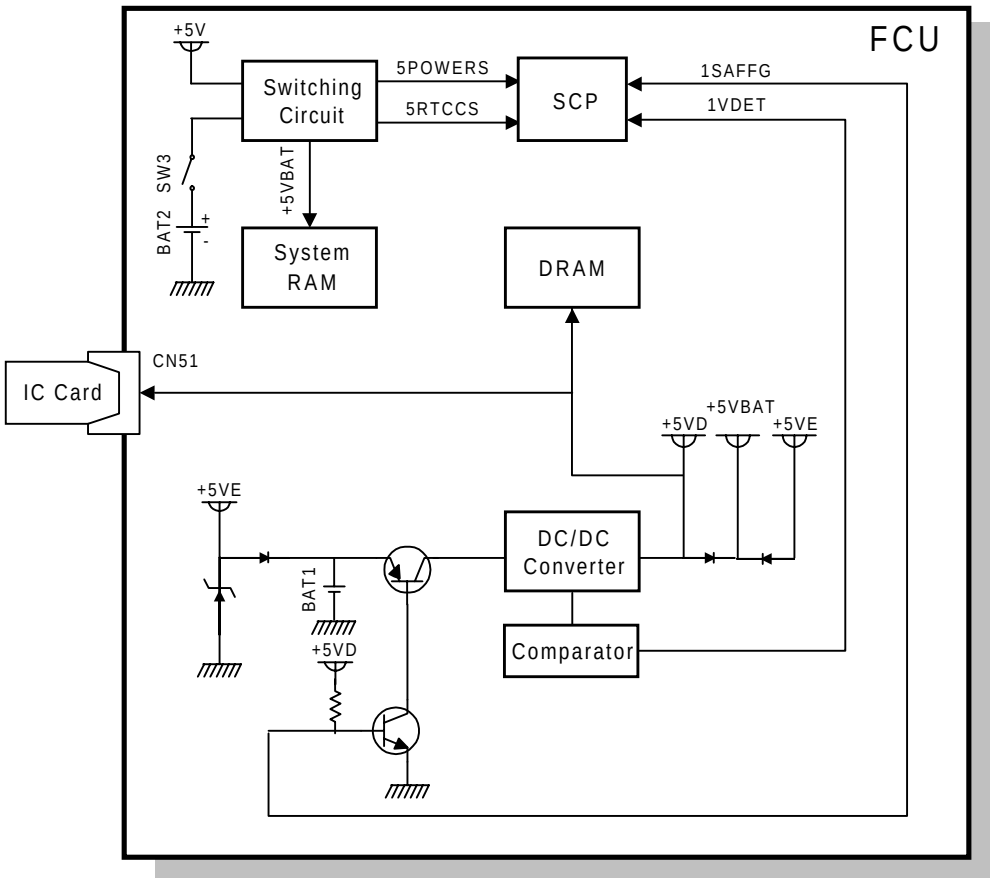
H306V506.WMF

The PSU supplies +24V, -12V and +5V dc power to the FCU. The FCU controls fusing lamp AC power supply

Item	Description
+24V	This is interrupted when the machine is in Level 2 energy saver mode (low power standby).
+24VE	Normally supplied by the PSU when the main switch is on. Activated when the CPU detects an activation signal from the OPIF board, NCU or Printer unit when the machine is in energy saver mode.
+24VM	This is interrupted if the interlock switch opens.
+24VMM	For the scanner, paper feed, and main motors.
+24VPP	For the power pack.
+12V	For the SG3 and SiG4 board though the OPIF board.
+12VP	For the function upgrade card and FOD card.
+12VSBU	For the SBU.
-12VE	Normally supplied by the PSU when the main switch is on.
-12V	For the SG3 and SiG4 board though the OPIF board.
-12VOP	For the operation panel.
+5VE	Normally supplied by the PSU when the main switch is on. Activated when the CPU detects an activation signal from the OPIF board, document feeder, or operation panel when the machine is in energy saver mode.

Item	Description
+5V	This is interrupted when the machine is in Level 2 energy saver mode (low power standby).
+5VC	For the printer interface unit.
+5VD	Supplies back up power for the DRAM and the optional IC card on the FCU. It can back up stored data for one hour after the power is switched off. A rechargeable battery on the FCU generates +5VD.
+5VLDL	Supplies the laser diode. It is interrupted if the interlock switch opens.
+5VOP	For the operation panel.
+5VBAT	For SRAM backup.

1.4.2 MEMORY BACK-UP CIRCUIT



H306V507.WMF

The +5VBAT supply from the lithium battery [BAT2] backs up the system RAM, which contains system parameters, programmed telephone numbers, and the real time clock in the main CPU. The 5RTCCS signal tells the main CPU whether the back-up power (+5VBAT) is coming from the battery or from the +5V power supply.

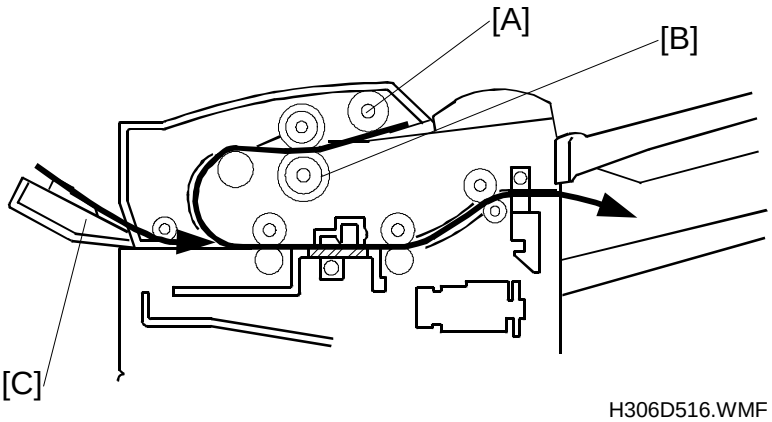
A rechargeable lithium battery [BAT1] and the DC/DC converter on the FCU back up the DRAM (SAF memory) for one hour, if there is data in the SAF memory and the power is switched off. While the main power is on, the +5VE supply recharges the battery. The battery recharges in 5 or 6 days.

There is no battery switch for the battery [BAT1].

2. DETAILED SECTION DESCRIPTIONS

2.1 ADF/SCANNER

2.1.1 OVERVIEW

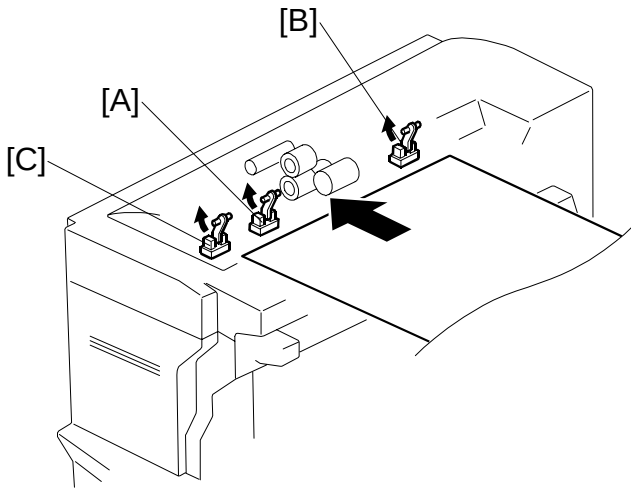


H306D516.WMF

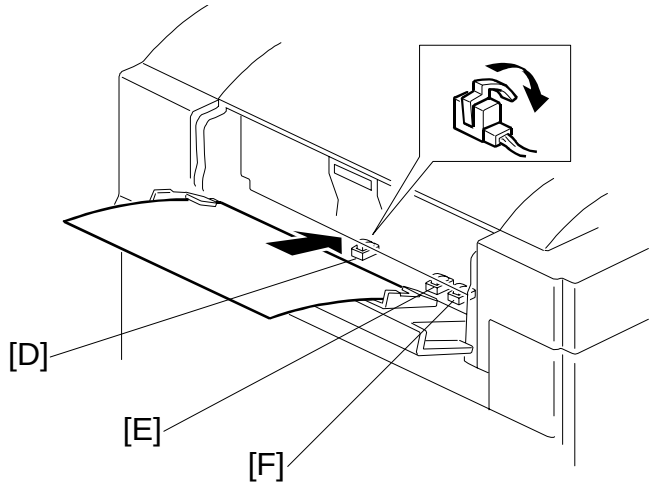
1. Document detection
   - The machine detects when a document is placed in the ADF by monitoring the document sensor (S1).
   - From the combined output of the document (S1), B4 width, and A3 width sensors, the ADF can detect three possible widths: A4, B4, and A3.
2. Document pick-up
   - The vertical movement of the pick-up roller [A] is controlled by a spring clutch.
   - FRR type separation mechanism, using the reverse roller [B].
   - The pick-up roller gear prevents excessive load from being placed on the scanner motor.
   - The spring clutch of the feed roller prevents excessive load from being placed on the scanner motor.
3. Document feed
   - The scanner motor drives all the document feed rollers.
   - MDF [C] (Manual Document Feeder)
4. Returning to ready status
   - The pick-up roller is lifted by reverse rotation of the scanner motor.
5. Image Scanning (CCD)
   - Maximum scanning width: A3
   - Stamp function
6. Jam detection
   - Monitoring of all sensors

2.1.2 DETAILED DESCRIPTIONS

Document Detection



H306D001.WMF



H306D002.WMF

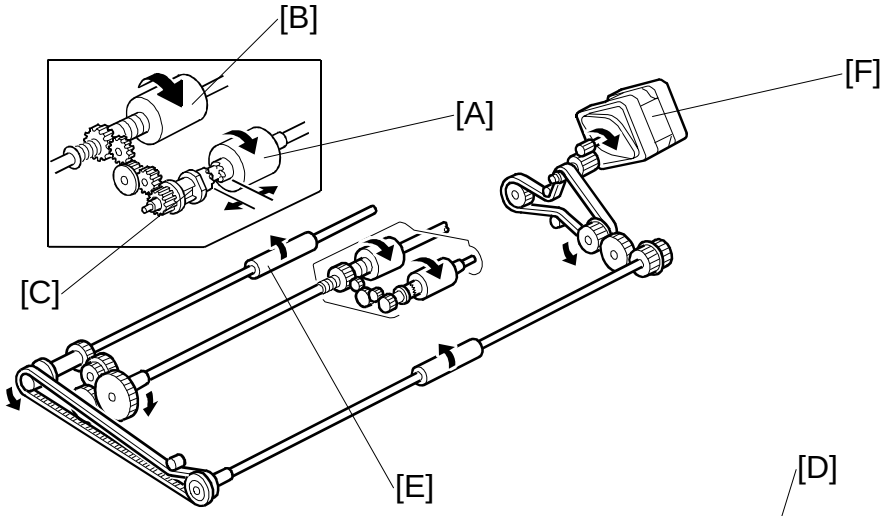
When a document is inserted, the document sensor (S1 sensor) [A] turns on and detects the document. The width of the document is then detected from the combined output of the S1, B4 width [B], and A3 width [C] sensors.

If a document is set on the MDF table, the MDF sensor [D] turns on and detects it. The width is then detected based on the combined output of the MDF-A3 [F] and MDF-B4 [E] sensors.

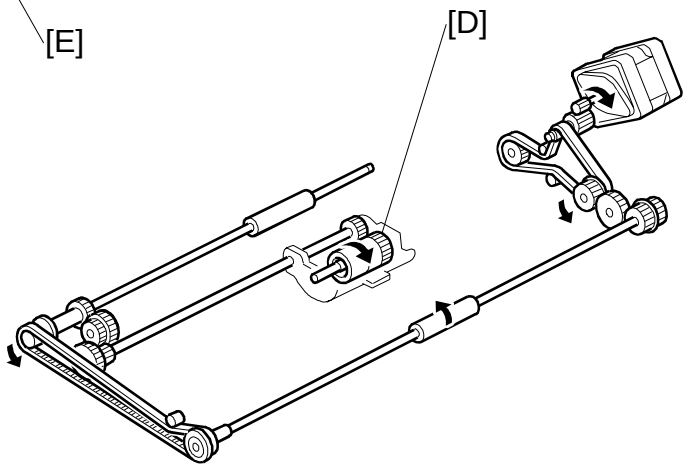
In both cases, the machine can detect three possible widths: A4, B4 and A3.

- Paper size detection parameters:
  A3: 274 mm or greater
  B4: 242 to 262 mm
  A4: 230 mm or less

Document Pick-up



H306D003.WMF



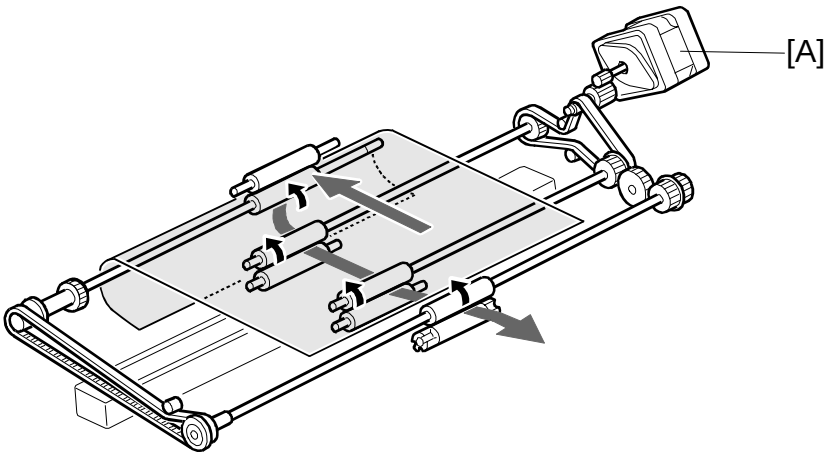
H306D004.WMF

When the scanner motor [F] starts rotating clockwise, the pick-up roller [A] lowers to feed the top sheet of the document. The paper is then separated by the reverse roller [D] and fed to the R0 [E] roller.

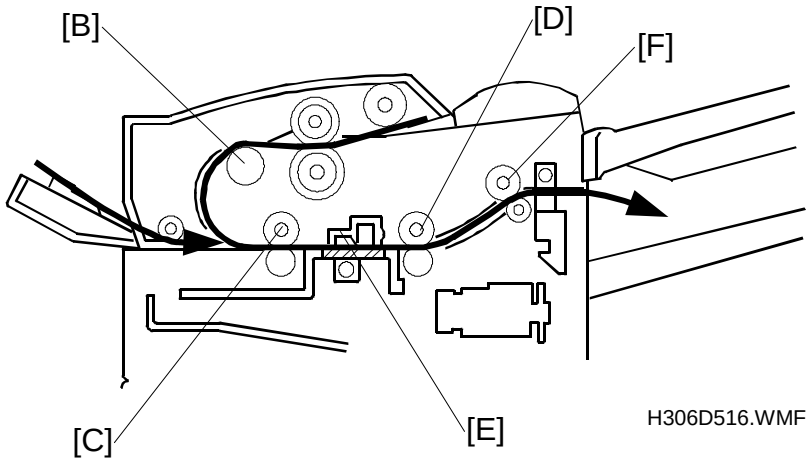
Since the R0 roller rotates faster than the feed roller [B], the pick-up roller and feed roller add to the load on the scanner motor while the R0 roller feeds the document. To prevent overloading, a spring clutch is attached to the feed roller. Also, the pick-up roller gear [C] attached to the pick-up roller disengages from the driving gear train in the case of overload.

The motor is slower during MDF so that the operator can insert the document easily.

Document Feed



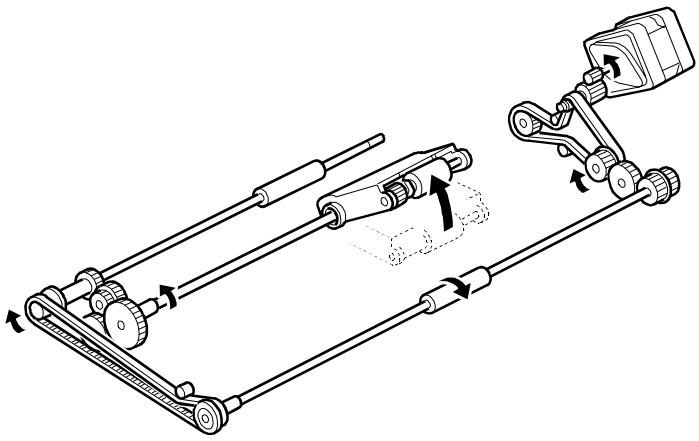
H306D006.WMF



H306D516.WMF

The scanner motor [A] drives the R0 [B], R1 [C], R2 [D] and the document exit rollers [F], all responsible for feeding the document. The scan line lies between the R1 and R2 rollers. The scan line sensor (S2) [E] is between the R1 and R2 rollers, and detects when the leading and trailing edges of the document are at the scan line.

Returning to Ready Status

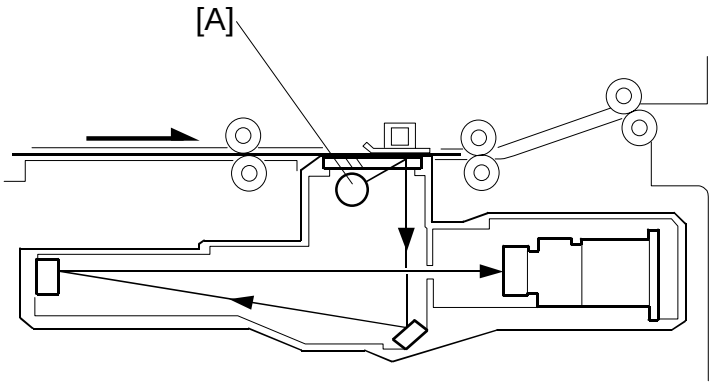


H306D005.WMF

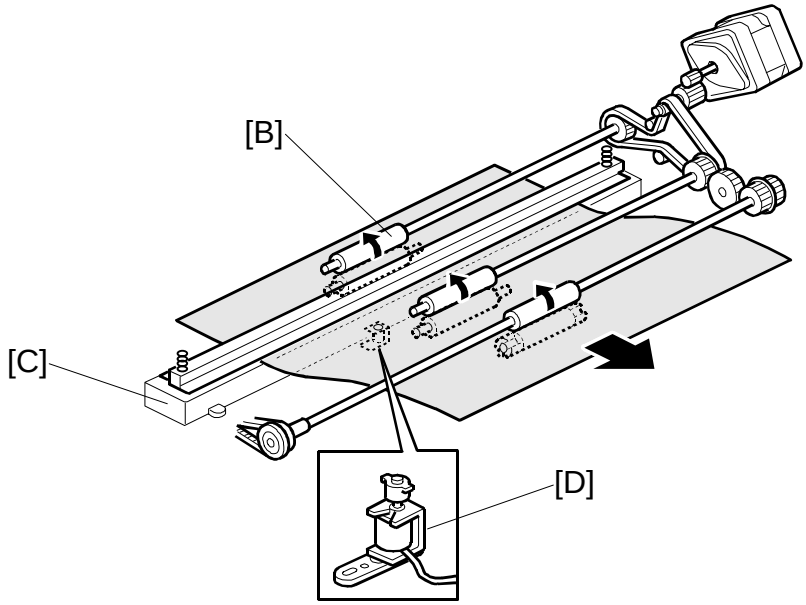
When the last page of the document has been fed out, the scanner motor turns clockwise, then counterclockwise, and clockwise again. This lifts the pick-up roller to its ready position. This is also done at the following times:

- Just after the power is turned on
- Following jam removal
- When the scanner cover is opened and closed
- When a document is removed from the ADF.

Image Scanning



H306D019.WMF



H306D007.WMF

When the document sent by the R1 roller [B] passes over the exposure glass, it is exposed to light from the xenon lamp [A] inside the optical unit [C]. The light reflected from the document is then focused onto the CCD on the SBU.

When the start key is pressed, the xenon lamp activation signal turns the lamp on. The intensity of the lamp output should stabilize within 1 second. Although error code 1-08 will occur if the intensity does not stabilize within 3 seconds, scanning continues uninterrupted.

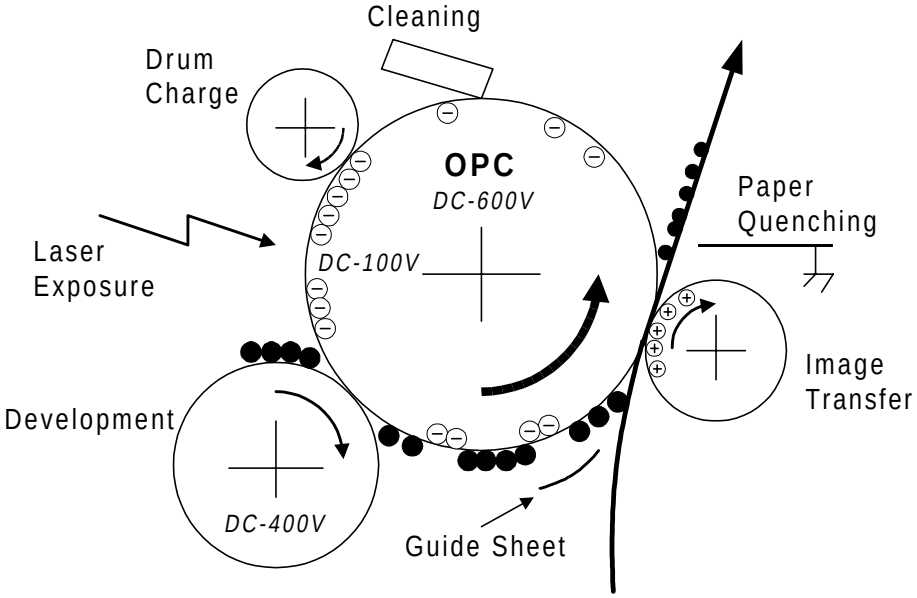
The stamp [D] can be used for both immediate and memory transmission. The stamp is placed within 12 mm of the front side trailing edge.

Jam Detection

1. Non-feed (error code 1-00):
   The S2 sensor does not activate even after the machine tries to feed the document to the scan line three times.
2. MDF Non-feed (no error code):
   The S2 sensor does not activate after manual document feed to the scan line.
3. Maximum document length exceeded (error code 1-01):
   If the S2 sensor does not turn off when a document exceeds the maximum length allowed.
4. Initialization jam (no error code):
   If any of the document sensors in the ADF and/or scanner turn on during pick-up roller unit initialization.
5. Skip scanning error (no error code):
   If the S2 sensor turns off during skip transmission (partial image scanning) while the specified image area is supposed to be at the scan line
6. Document inserted into the MDF while the ADF is running (no error code):
   If any one of the three MDF sensors turns on during ADF operation.
7. Document inserted into the ADF while the MDF is running (no error code):
   If any one of the ADF sensors turns on during MDF operation.
8. Jam detected by the S2 sensor while in ready status:
   If the S2 sensor is activated while the scanner is in ready status, or just after power is switched on.
   On starting the document feed, the S2 sensor is already activated.

2.2 PRINTER

2.2.1 OVERVIEW



H306D529.WMF

Process	Description
Charge	Charges the drum with –600Vdc plus 1.05mA 1kHz ac bias. The ac bias quenches the remaining charge on the OPC.
Laser Exposure	Writes the black parts of the image. The surface voltage of the exposed areas of the drum drops to about –100V.
Development	Negatively charged toner is transferred to the exposed surface of the drum. The development roller does not contact the drum. To prevent the toner from being attracted to a non-image area, the development bias is changed for non-image areas. Bias voltage : -400Vdc plus 1.6kVp-p 2kHz ac
Image Transfer	A transfer roller transfers toner from the drum to the paper. The value of the transfer bias depends on the paper size. To clean the transfer roller, negative bias is applied periodically.
Separation	The paper discharge brush separates the paper from the drum.
Cleaning	The cleaning blade removes any toner remaining on the drum surface after image transfer.

2.2.2 LASER EXPOSURE

Overview

This machine uses a laser diode to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the FCU into laser pulses, and the optical components direct these pulses to the drum.

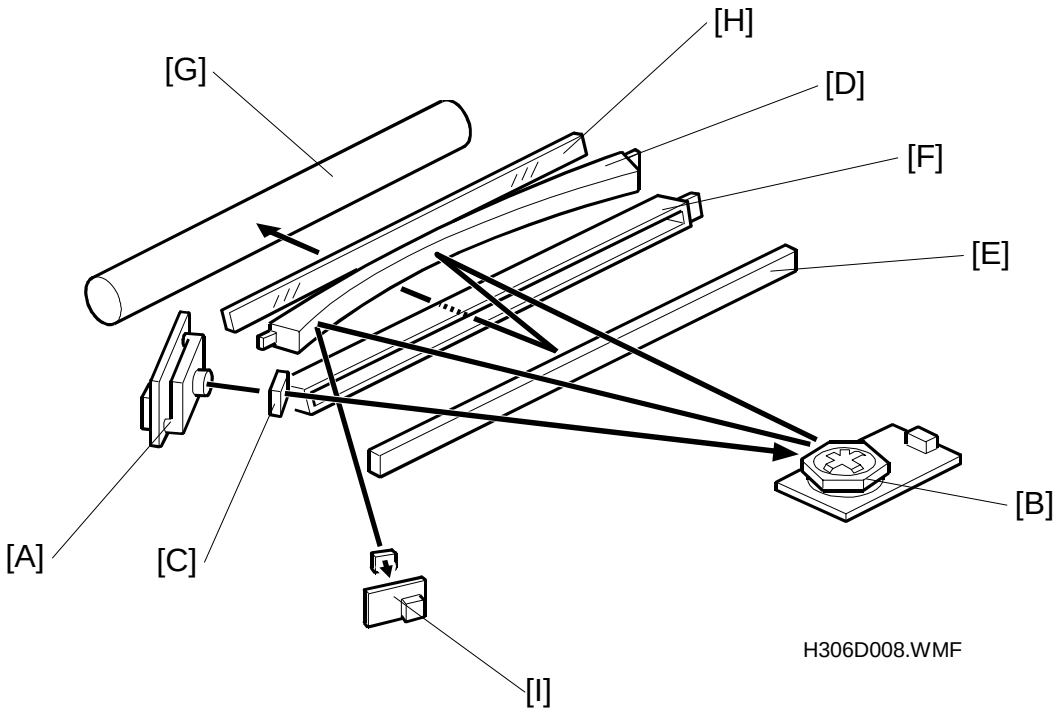
Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

Strength of the beam output	5 mW
Strength of the beam on the drum	0.612 mW
Beam size	72 X 90 μm

The speed of polygonal mirror motor depends on the printing mode.

Printing Mode	Speed of mirror motor (Hz)	Occasion
400dpi printing	1503.9	Copying, printing reports, receiving
15.4 dpmm normal printing	1470.5	Receiving
15.4 dpmm image rotation printing	1527.8	Receiving in image rotation mode
600 dpi printing	2255.9	Printing in printer mode

Optical Path



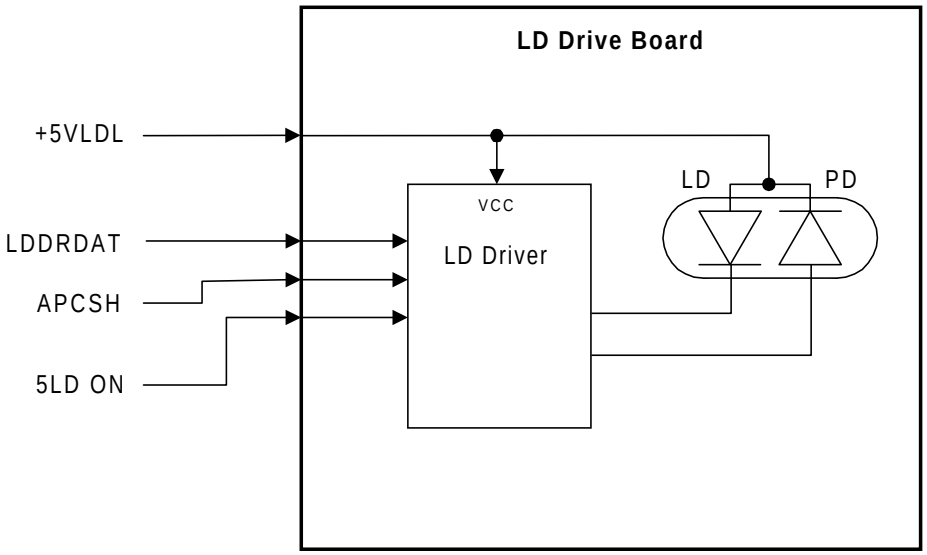
The LD unit [A] outputs the laser beam to the polygonal mirror [B] through the cylindrical lens [C], which focuses the laser beam.

The laser beam goes to the F-theta mirror [D], 1st mirror [E] and BTL [F]. Then, the beam reaches the drum [G] through the shield glass [H].

The beam reflected by the polygonal mirror writes the pixels of the latent image on the drum. The F-theta mirror ensures constant intervals between the pixels. The BTL corrects for irregularities in the polygonal mirror faces.

The laser synchronization detector [I] synchronizes the start of the main scan.

Auto Power Control (APC)

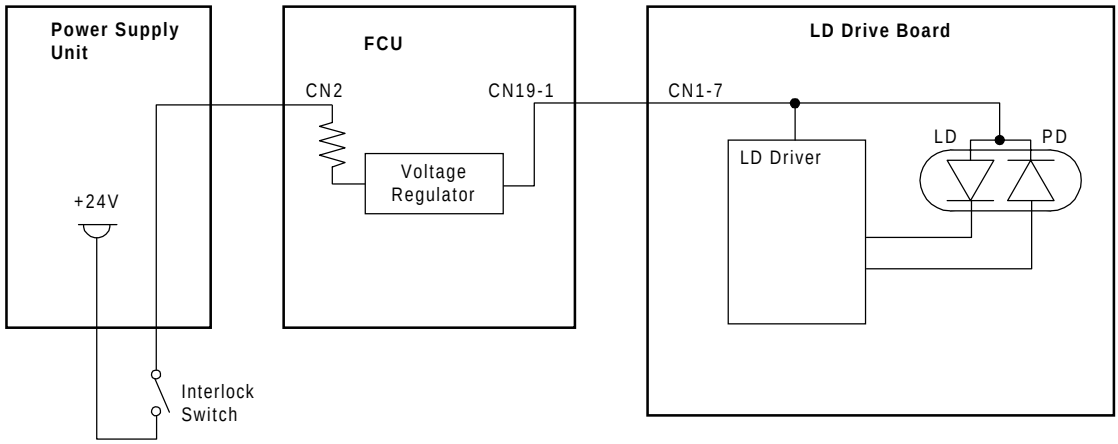


H306D535.WMF

To prevent the intensity of the laser beam from changing because of temperature, the machine monitors the laser beam with a photodiode (PD). The PD is enclosed in the laser diode. The PD passes an electrical current to the LD driver IC and this IC adjusts its output level to keep the laser diode output constant.

The laser diode power level is adjusted on the production line. Do not touch the variable resistors on the LD unit in the field.

LD Safety



H306D500.WMF

Interlock Switch

To ensure that the laser beam does not inadvertently switch on during servicing, there is a safety switch located at the left cover. The switch is on the LD 24 V line.

Mechanical Laser Shutter

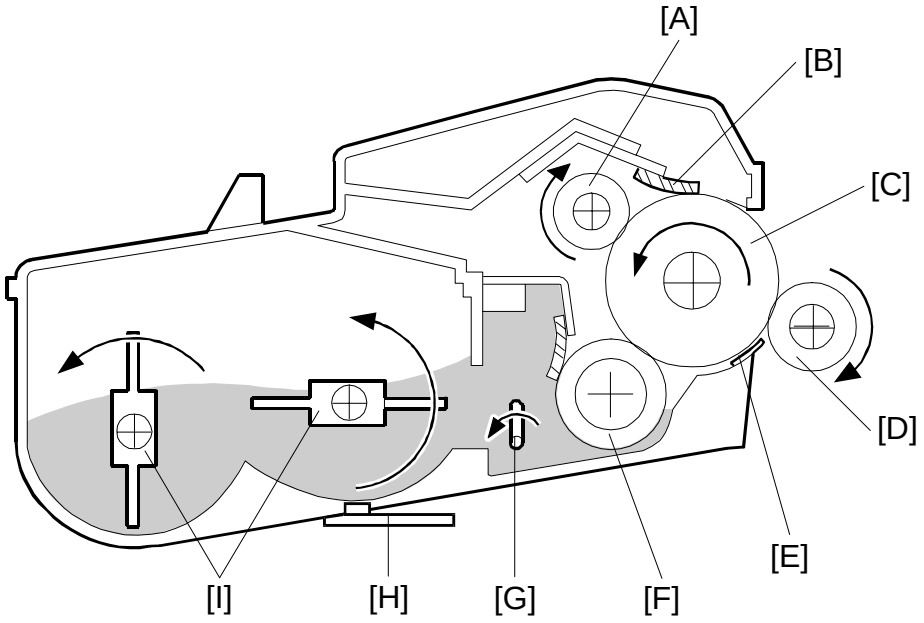
When the AIO cartridge is removed, the laser shutter is released and this interrupts the laser beam.

LD Unit Service Call Condition

Sub-Code	Error Code	Description
21	9-20	No polygonal motor synchronization signal detected
31	9-23	No polygonal motor lock signal detected
32		Polygonal motor lock failure during printing

2.2.3 AIO CARTRIDGE

Overview



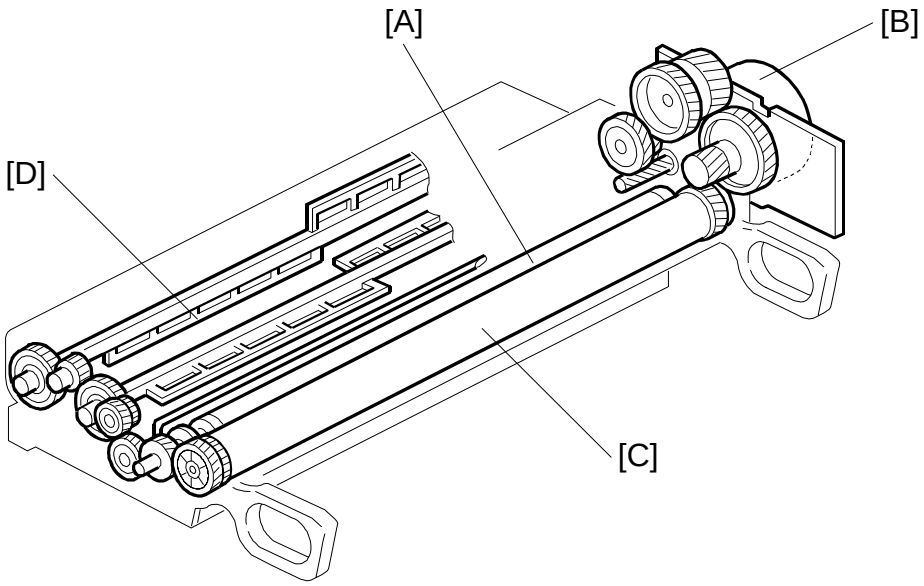
H306D509.WMF

The toner cartridge consists of the components shown above. The toner cartridge contains the OPC drum and the toner cassette, and includes the mechanisms for drum charge, development, and cleaning. The drum is 30 mm in diameter.

[A]: Charge Roller
[B]: Cleaning Blade
[C]: OPC Drum
[D]: Transfer Roller
[E]: Guide Plate
[F]: Development Roller
[G]: Mixing Blade
[H]: Toner Near-end Sensor
[I]: Agitator

The main motor drives the rollers in the toner cartridge. The charge roller [A] charges the drum [C]. Mono-component toner is used. The cleaning blade [B] cleans the drum surface.

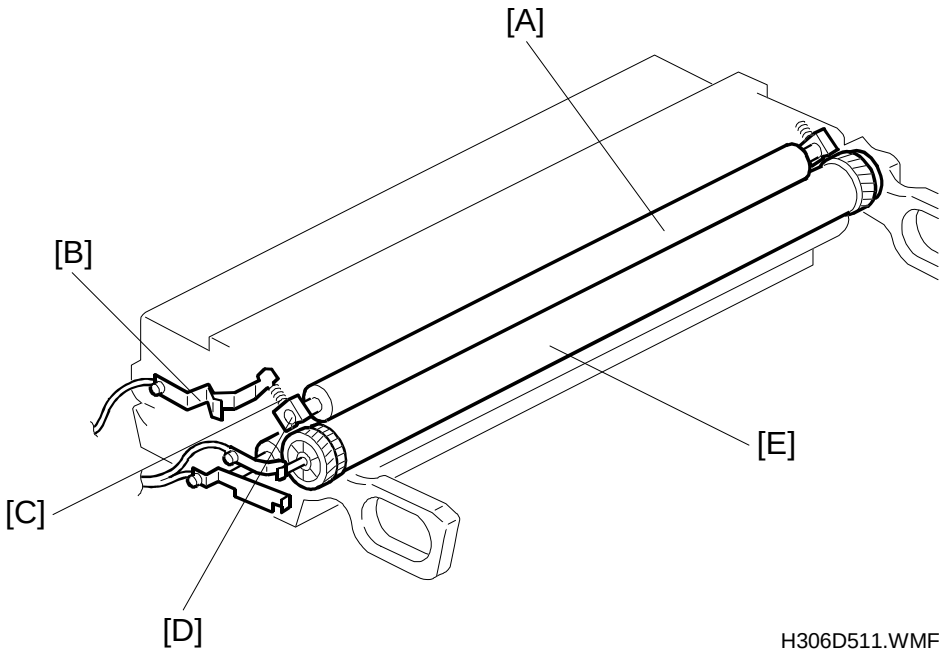
Drive



H306D510.WMF

The main motor [B] drives the drum [C], the development roller [A], and agitators [D] through a series of gears. The main motor speed is controlled by the FCU.

Drum Charge



H306D511.WMF

This machine uses a drum charge roller system instead of a scorotron corona wire system to charge the drum. The drum charge roller [A] always contacts the surface of the drum [E] because of the charge roller pressure springs [C], and gives a negative charge to the drum surface. While the drum is rotating, the drum charge roller also turns because of friction between the roller and the drum.

The drum charge roller system generates less ozone than a scorotron corona wire charge system. Due to this, there is no ozone filter in the machine.

The high voltage supply board applies voltage to the drum charge roller through the charge roller terminal [B], charge roller pressure spring [C], and the charge roller bushing [D]. Both ac and dc are applied.

Before the laser starts to write to the drum, the charge roller receives –600Vdc and 1.05 kV peak-to-peak 1 kHz ac from the high voltage supply board. This gives the drum surface a uniform negative charge of -600 V.

The dc and ac are continually supplied during the printing job. This gives the drum surface a uniform –600 V charge wherever it passes the charge roller.

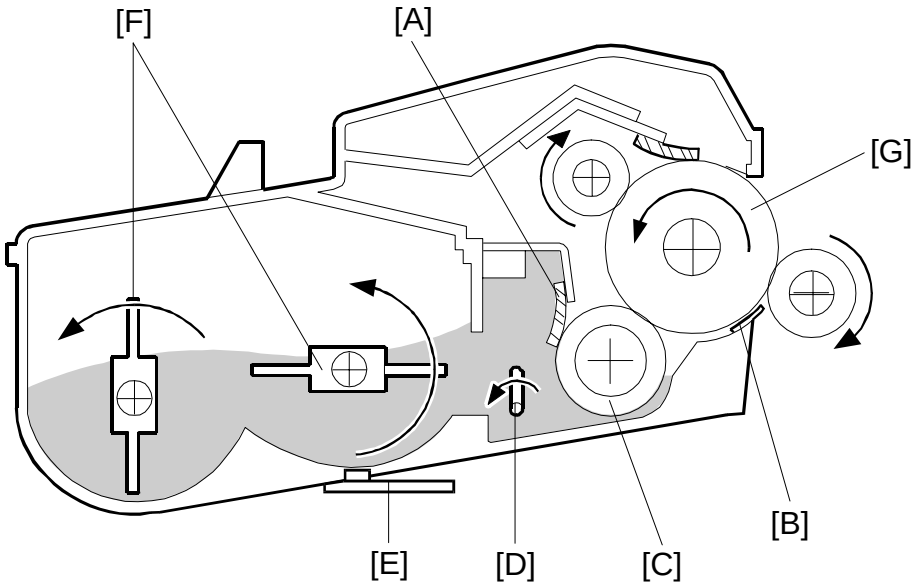
At the end of the job, the dc is set to 0 V, but the ac stays on. While the drum rotates past the charge roller, the ac brings the charge on the drum surface to a uniform 0 V.

The toner cartridge has no cleaning pad, temperature control, or contact mechanism for the drum charge roller (the material of the drum charge roller allows a simple mechanism). The drum charge roller is part of the toner cartridge, so when the toner runs out, the drum charge roller is changed at the same time. This happens before the drum charge roller gets dirty.

To discharge the OPC drum surface, the LD is switched on after every 10 sheets printed (if the 10-page interval expired during a job, the machine waits until the end of the job). There is no quenching lamp in this machine.

Development

Overview



H306D509.WMF

This machine uses mono-component toner. The AIO cartridge contains two agitators [F].

The agitator(s) [F] and the mixing blade [D] mix the toner in the toner cartridge and transport it to the development roller [C]. Friction between the transported toner and the doctor blade [A] gives the toner a negative charge.

Internal permanent magnets in the development roller attract the toner to the development roller sleeve. The doctor blade trims the toner to the desired thickness on the development roller sleeve. The development roller does not contact the drum [G]. There is a small gap between the toner on the surface of the development roller sleeve and the drum. Toner jumps across this gap to develop the latent image.

The development bias consists of ac and dc components. The ac component improves the transfer of toner.

The guide plate [B] is charged to the same voltage as the development bias. This helps to keep the toner on the drum.

The toner near-end sensor [E] is under the toner cartridge.

Toner Near-End Sensor

The toner near-end sensor monitors the toner concentration by checking the magnetic field strength.

When the reading goes down to a threshold value, the machine enters the near-end condition. The threshold value cannot be changed.

A hundred pages can be printed after detecting the near-end condition, and then the machine stops printing and toner end is detected.

When a new cartridge is installed, the machine clears the near-end condition if the toner near-end sensor detects that there is sufficient toner.

No adjustment is required after the sensor is replaced.

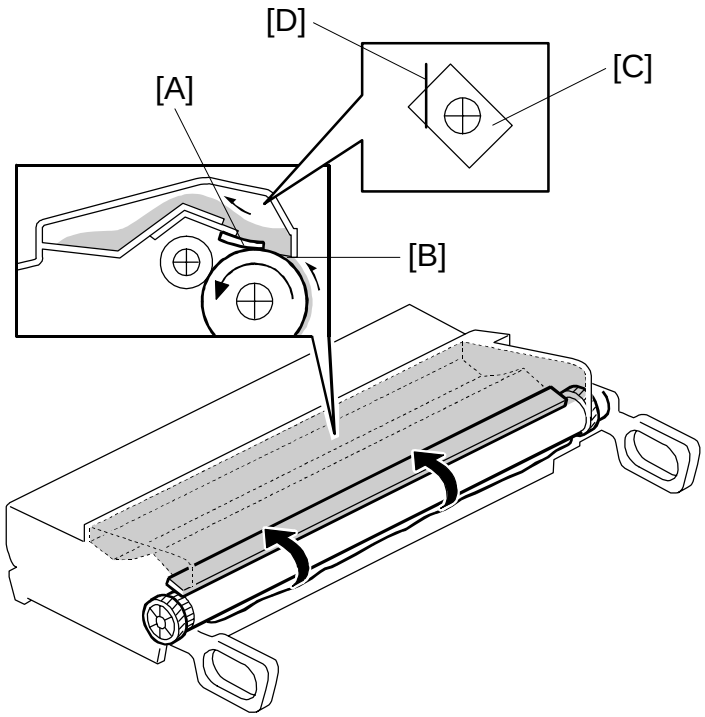
Toner Supply

The toner in the toner cartridge is mixed by the agitator(s) and mixing blade. The toner near-end sensor is not used to control toner supply. When the machine is turned on or the left cover is closed, the agitator(s) and the mixing blade rotate to mix the toner for a brief period.

Development Bias

The high voltage supply unit gives the development roller a charge of –400 V dc and an ac component of 1.6 kVp-p 2 kHz ac is also used. To prevent toner from transferring to non-image areas on the drum, the development bias is different for image areas and non-image areas.

Drum Cleaning



H306D512.WMF

The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. The toner remaining on the drum is scraped off by the cleaning blade and transferred to the collection area. The mylar sheet [B] prevents the toner from dropping out of the cleaning unit.

The toner collection coil [C] and scraper [D] improve the collection of waste toner.

There is no toner recycling mechanism.

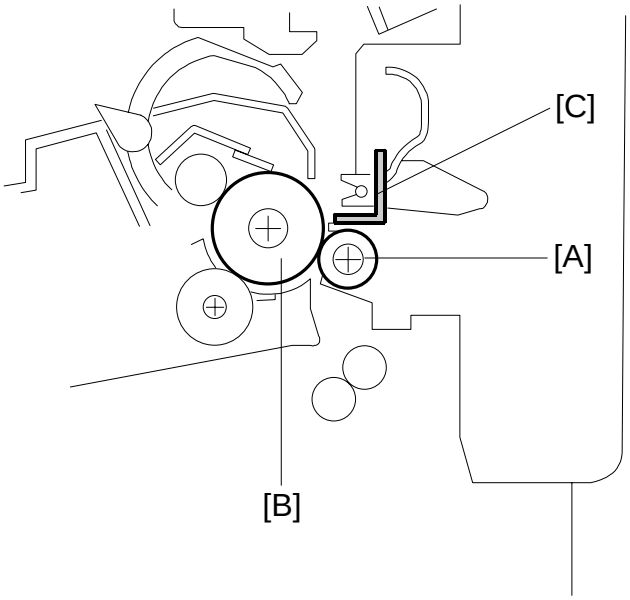
To discharge the OPC drum surface, the LD is switched on after every 10 sheets printed (if the 10-page interval expired during a job, the machine waits until the end of the job).

Service Call Conditions for the Development Section

Sub-Code	Error Code	Description
54	9-29	Development bias PWM is over the upper limit for 200 ms
55		Charge bias PWM is over the upper limit for 200 ms

2.2.4 TRANSFER AND PAPER SEPARATION

Overview



H306D513.WMF

The machine uses a transfer roller [A] which touches the surface of the drum [B].

The high voltage supply unit supplies a positive current to the transfer roller. A feedback circuit inside the machine automatically keeps the transfer current constant. The current depends on the paper size.

The transfer roller attracts the toner from the drum onto the paper.

Drive from the drum through a gear drives the transfer roller.

The discharge brush [C] and the curvature of the drum helps the paper to separate from the drum. The discharge brush is connected to ground.

Transfer Roller Cleaning

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

During transfer roller cleaning, the high voltage supply unit supplies a negative cleaning bias to the transfer roller. The negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning bias is applied to the transfer roller to push back to the drum any toner which was positively charged by the transfer roller.

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

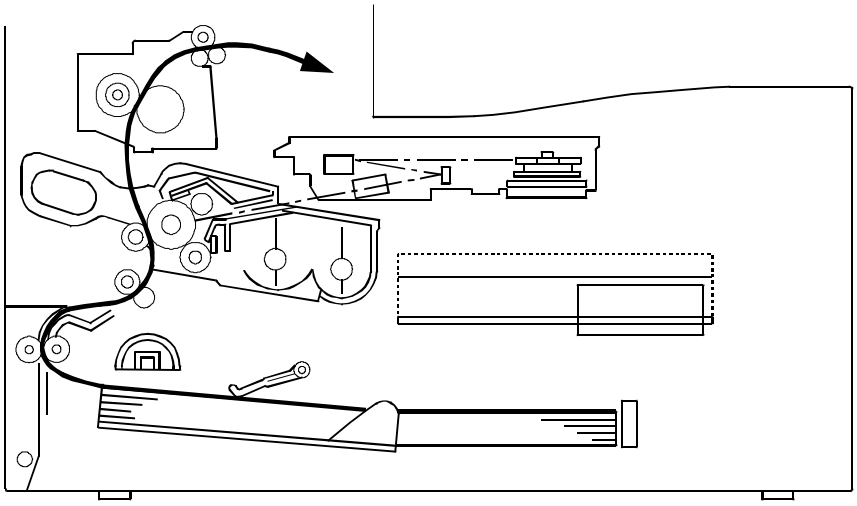
- After a printer jam has been cleared.
- Just after the power is switched on.
- After every 5 sheets printed (if the 5-page interval expired during a job, the machine waits until the end of the job).

Service Call Conditions for the Transfer Section

Sub-Code	Error Code	Description
41	9-42	No motor lock signal detected after starting the main motor
42		Motor lock is released within 3 seconds after locking
53	9-29	Transfer bias is out of control
56		Transfer bias PWM is over the upper limit for 200 ms

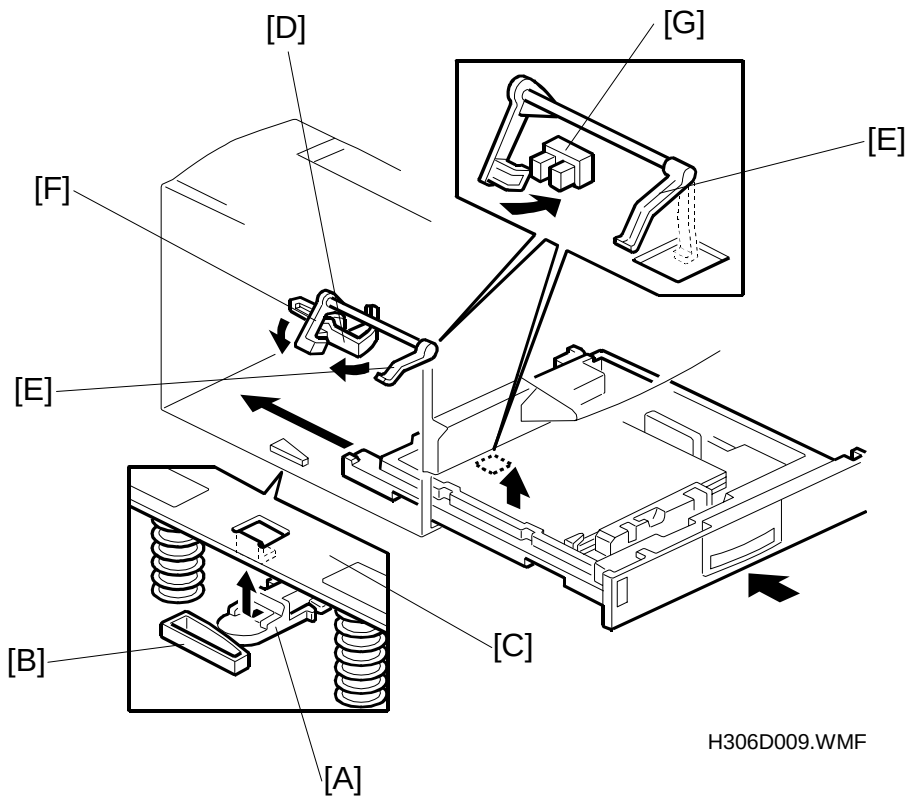
2.2.5 PAPER FEED

Overview



H306D516.WMF

1. Cassette bottom plate lock and release
   - Bottom plate lock and release lever.
   - Pressure from a coil spring under the bottom plate
2. Paper end detection
   - By a photosensor
3. Paper size detection
   - Series of 4 push switches
4. Paper near-end detection
   - By a microswitch
5. Paper feed:
   - Paper fed by pick-up roller and separated by corner pawls
   - Sub-scanning position adjustment performed by registration sensor.
   - Speed of paper feed (low/high) controlled by a stepper motor.
6. Bypass tray (Optional printer I/F unit required)
   - Pre-feed detection by registration sensor.
   - Automatic paper exit



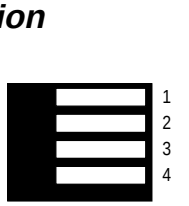
Cassette Bottom Plate Lock and Release

When the cassette is placed in the machine, the lock lever [A] is released when it contacts the guide block [B] attached to the frame base. This releases the bottom plate [C] and springs push it upwards.

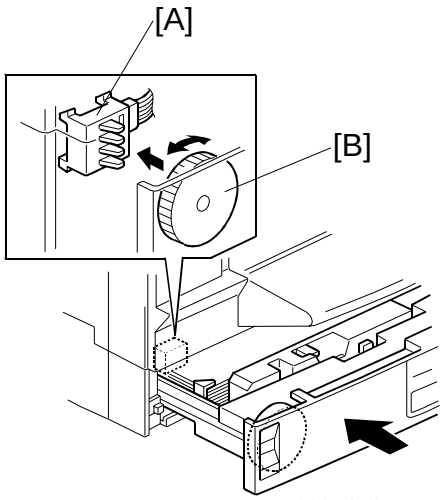
Paper End Detection

When the tray is inserted, the lever [D] is pushed, then the feeler [E] is lowered until it touches the top of the stack. When the paper runs out, the feeler [E] drops, causing the actuator [F] to enter the paper end sensor [G].

Paper Size Detection



H306D515.WMF



H306D010.WMF

Paper Size Detection (Standard tray)

120V	220V	SW1	SW2	SW3	SW4
LT (LEF)	A3	ON	OFF	ON	ON
DTL	A4 (LEF)	OFF	OFF	ON	ON
A4 (SEF)	A4 (SEF)	ON	OFF	OFF	OFF
N/A	A5 (LEF)	ON	ON	OFF	OFF
F4	B4	ON	OFF	ON	OFF
F	F	ON	ON	ON	OFF
LG	F4	ON	ON	OFF	ON
LT (SEF)	LT (SEF)	ON	ON	ON	ON

LEF: Long Edge Feed

SEF: Short Edge Feed

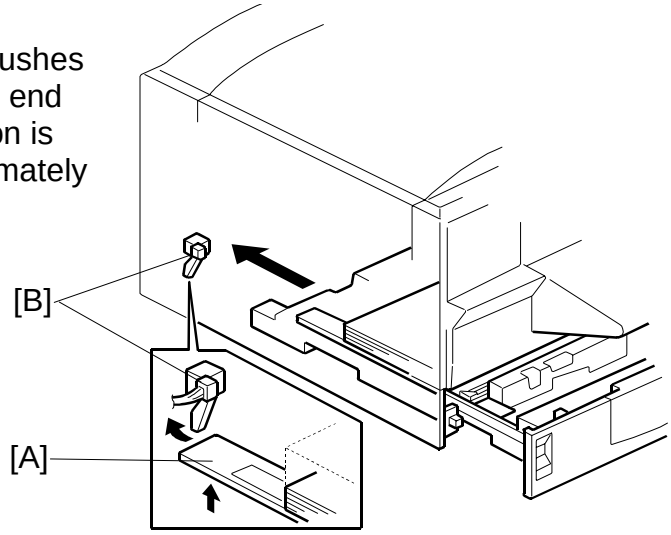
NOTE: LEF and SEF in this table are with relation to the direction of paper feed ('long edge feed' means that the long edge is going into the machine first). They do not refer to the decals on the trays.

Paper size detection is based on the four paper size switches [A] on the main unit, which detect the setting of the paper size dial [B] on the paper tray.

The paper size dial has grooves and ridges on the side facing the paper size switches. Each switch turns off when it falls into a groove, and turns on when a ridge presses it.

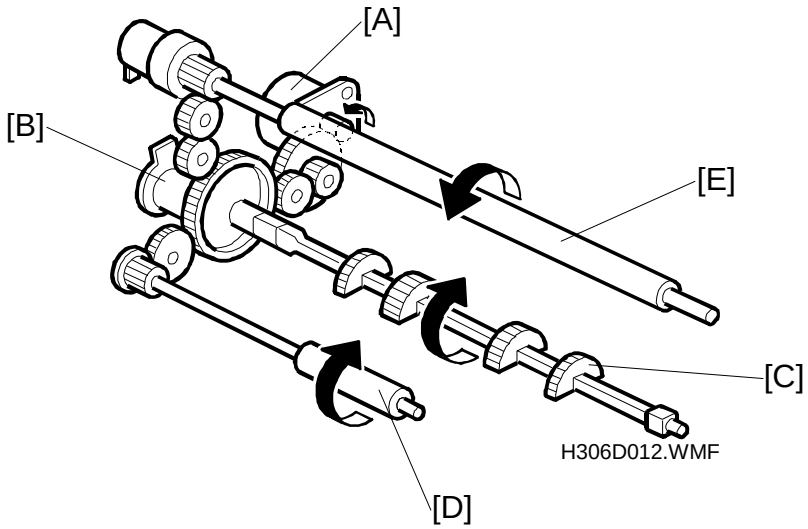
Paper Near-end Detection

When the paper supply in the tray becomes low, the bottom plate [A] pushes up on the actuator of the paper near end sensor [B] and the near end condition is detected. This occurs when approximately 50 sheets are remaining in the tray.



H306D011.WMF

Paper Feed



H306D012.WMF

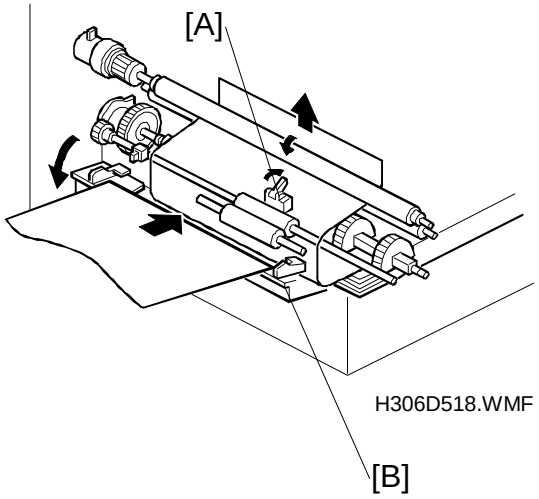
The paper feed motor [A] and the feed clutch [B] turn on, causing the semi-circular pick-up roller [C] to turn. Corner separators prevent multi-sheet feeding.

The feed roller [D] feeds the paper to the registration sensor. When this sensor turns on, the paper feed motor turns off. The feed motor turns back on at the correct time to feed the paper to the image on the drum, and the paper is forwarded to the transfer area.

The paper feed motor rotates in fast mode to feed the paper from the paper feed unit to the registration unit. After the paper has reached the registration roller [E], the motor rotates in slow mode to match the speed of the drum.

By-pass Tray (Printer I/F Unit Required)

When the registration sensor [A] turns on after paper is set on the by-pass tray [B], the paper is fed and held by the registration roller to ensure that it does not fall from the tray. If the paper is left at the tray for more than one minute (default), the paper will be fed through the machine and exited as a blank sheet. This one-minute interval can be adjusted by changing bits 0 and 1 of system switch 0B (this is the 'auto reset timer').



H306D518.WMF

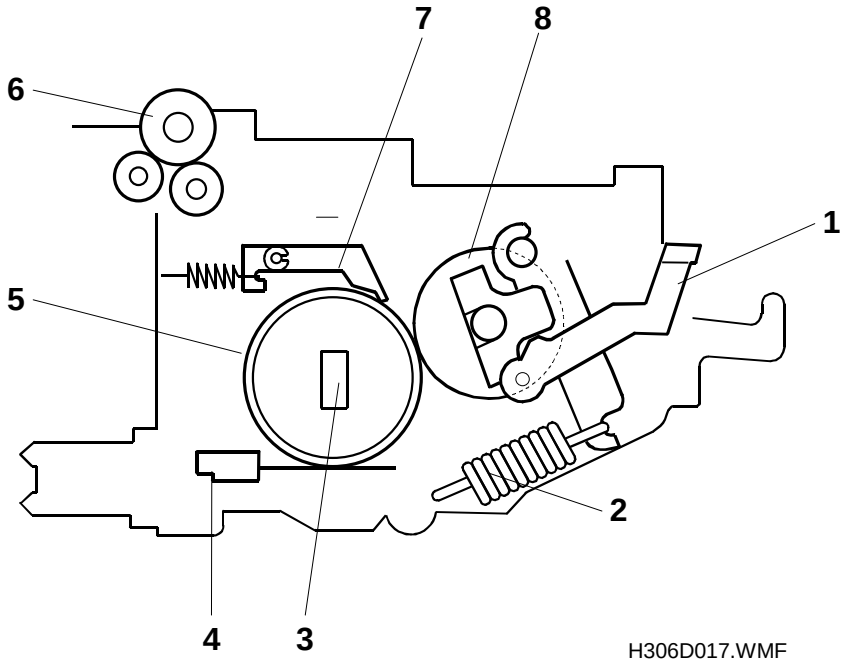
NOTE: If the printer interface unit is not installed, the by-pass tray cannot be used.
If there is any paper on the by-pass tray, received fax data goes into SAF memory.

Jam Detection

1. Paper non-feed at the standard tray (error code 9-07).
   - If the registration sensor does not turn on within two seconds after the paper feed clutch starts.
   - If the registration sensor is already on when the paper is fed from the tray.
2. Registration jam (error code 9-08):
   - If the registration sensor does not turn off within a fixed time period after laser exposure has begun. This interval ranges from 2.0 to 4.9 seconds, depending on the paper size.
   - If the paper exit sensor does not turn on within a fixed time period after laser exposure has begun. This interval ranges from 2.5 to 5.1 seconds, depending on the paper size.
   - If the paper set in the bypass tray is removed just prior to printing.
3. Exit jam (error code 9-09):
   - If the paper exit sensor does not turn off within a fixed time period after laser exposure has begun. This interval ranges from 2.0 to 4.9 seconds, depending on the paper size.

2.2.6 FUSING

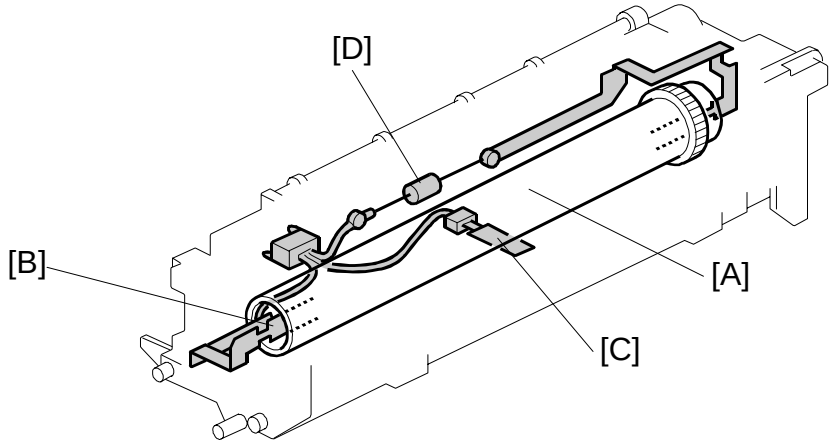
Overview



The fusing unit consists of the following parts.

1. Pressure Roller Release Lever
2. Pressure Spring
3. Fusing Lamp
4. Fusing Thermistor
5. Hot Roller
6. Exit Roller
7. Hot Roller Stripper
8. Pressure Roller

Fusing Process

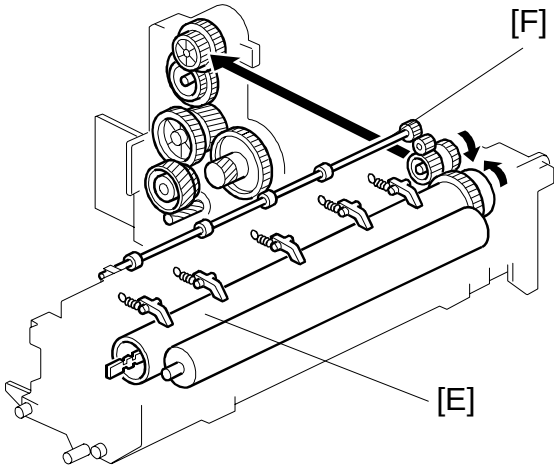


H306D013.WMF

After the image has been transferred, the paper enters the fusing unit. The image is fused to the paper by applying heat and pressure through the combination of the hot roller [A], the fusing lamp [B], and the pressure roller.

The CPU monitors the hot roller temperature through the fusing thermistor [C] that is in contact with the hot roller surface. The thermofuse [D] protects the fusing unit from overheating.

Fusing Unit Drive

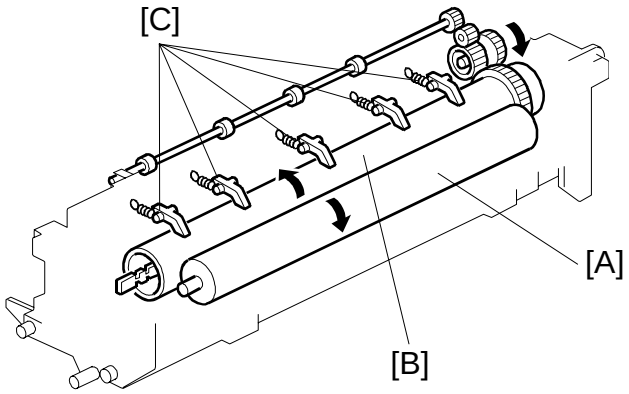


H306D015.WMF

The main motor drives the hot roller [E] through a train of gears.

The hot roller drives the exit roller [F] through a gear.

Pressure Roller/Paper Exit

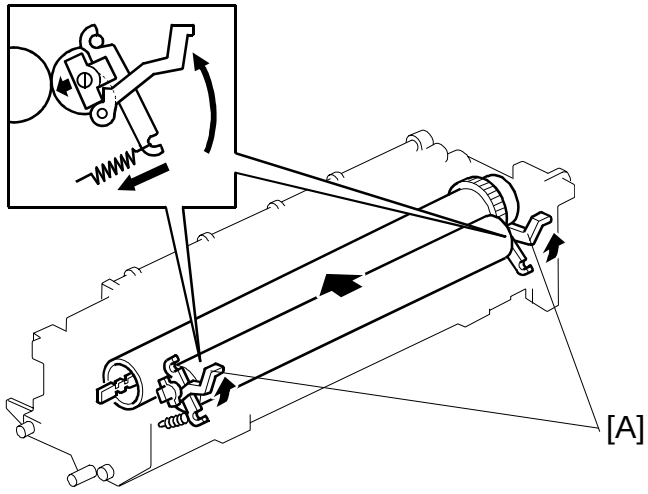


H306D014.WMF

During printing, the pressure roller [A] is pressed against the hot roller [B] by springs.

The hot roller strippers [C] separate the paper from the hot roller and direct it to the exit roller. Then the exit roller feeds the paper to the paper tray.

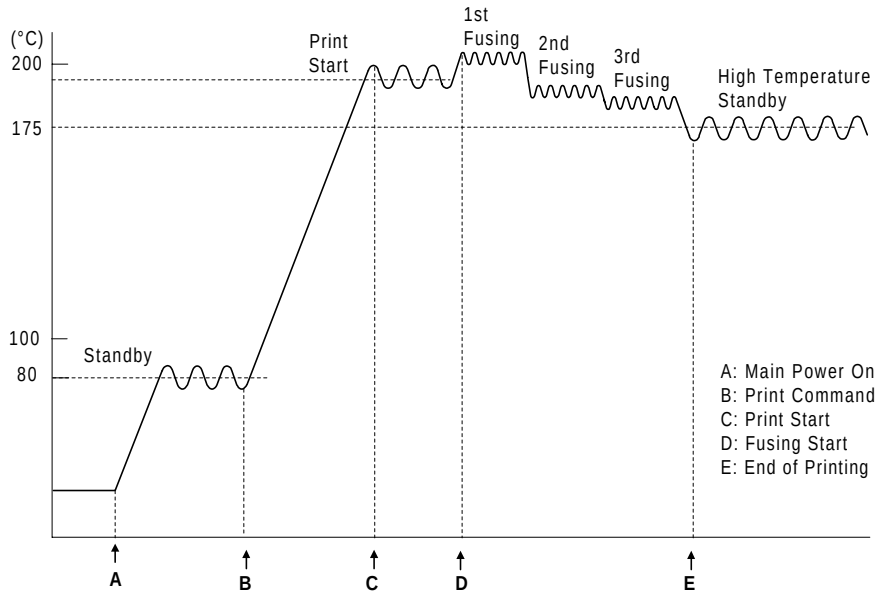
Fusing Unit Drive Release



H306D531.WMF

When the pressure roller release levers [A] are pushed down, the pressure roller moves away so that jammed paper can be removed.

Fusing Temperature Control



H306D533.WMF

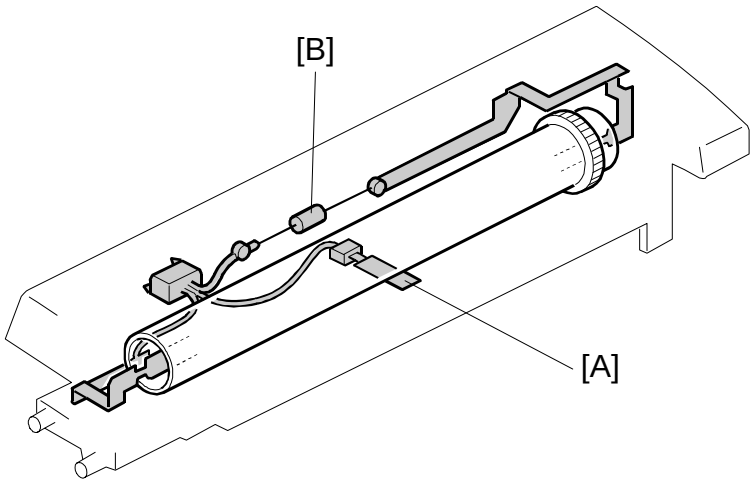
When the main switch turns on, the fusing lamp turns on until the thermistor detects the 'Standby' temperature (80°C). When a print job starts, the lamp stays on until it reaches the 'Print Start' temperature. Printing starts at this temperature, but the paper stays at the registration roller until the thermistor detects the 1st fusing temperature.

The fusing temperature depends on paper size, and is switched down in two steps as shown in the table below. The duration of the first 1st and 2nd fusing phases also depends on the paper size. The 3rd phase continues until the end of the job. At 5 minutes after the end of the job, the machine enters energy saver mode.

- If Level 1 (Fax Standby mode) was selected: Fusing temperature 80°C
- If Level 2 (Low Power Standby mode) was selected: Fusing lamp off

However, if 'high temperature standby' mode is enabled (user switch), the hot roller temperature stays at 175°C for 15 minutes after the end of printing. Then the machine enters the selected energy saver mode.

	Print-Start		1st Fusing		2nd Fusing		3rd Fusing	
	120V	230V	120V	230V	120V	230V	120V	230V
LT (LEF)	180	195	185	200	175	185	170	170
LT (SEF)	190	190	195	195	180	185	180	175
LG	190	190	195	195	175	185	175	175
DLT	190	195	195	200	185	190	170	180
A5 (LEF)	180	190	185	195	175	175	170	175
A4 (LEF)	180	195	185	200	175	185	170	170
A4 (SEF)	190	190	195	195	175	185	175	175
B4	190	195	195	200	185	190	170	180
A3	190	195	195	200	185	190	170	180
F4	190	190	195	195	175	185	175	175
F	190	190	195	195	175	185	175	175



H306D528.WMF

The fusing temperature is monitored using the thermistor [A], and the thermofuse [B] is a back-up safety measure.

The CPU checks the output from the fusing thermistor once every 20 ms. The CPU compares the current, previous and target temperatures, then decides the power-on ratio for the next 20 ms. The relation between these temperatures and the fusing lamp power-on ratio is shown in the following table.

Fusing lamp power-on ratio up to Standby temperature

Current minus Previous	**Current minus Standby temperature**				
	Over –3	Within –3	0	Within +3	Over +3
Over –3	100%	100%	50%	0%	0%
Within –3	100%	67%	50%	0%	0%
0	100%	67%	50%	0%	0%
Within +3	100%	67%	0%	0%	0%
Over +3	100%	50%	0%	0%	0%

Power-on ratio (%): The proportion of time that the fusing lamp power is on

Fusing lamp power-on ratio up to Print Start temperature

Current minus Previous	**Current minus Print-Start temperature**				
	Over –3	Within –3	0	Within +3	Over +3
Over –3	100%	100%	77%	67%	0%
Within –3	100%	100%	77%	59%	0%
0	100%	77%	67%	59%	0%
Within +3	100%	67%	0%	0%	0%
Over +3	100%	67%	0%	0%	0%

Ratio (%): The proportion of time that the fusing lamp power is on

NOTE: The “temperature” shown in the above table is not the absolute temperature but the thermistor output values after 8-bit A/D conversion.

Cooling Fan Control

The cooling fan has 2 speeds. The speed that is used depends on the fusing unit temperature.

High Speed Mode:	More than 160 ºC
Low Speed Mode:	Between 120 ºC and 160 ºC
Stop:	Below 120 ºC

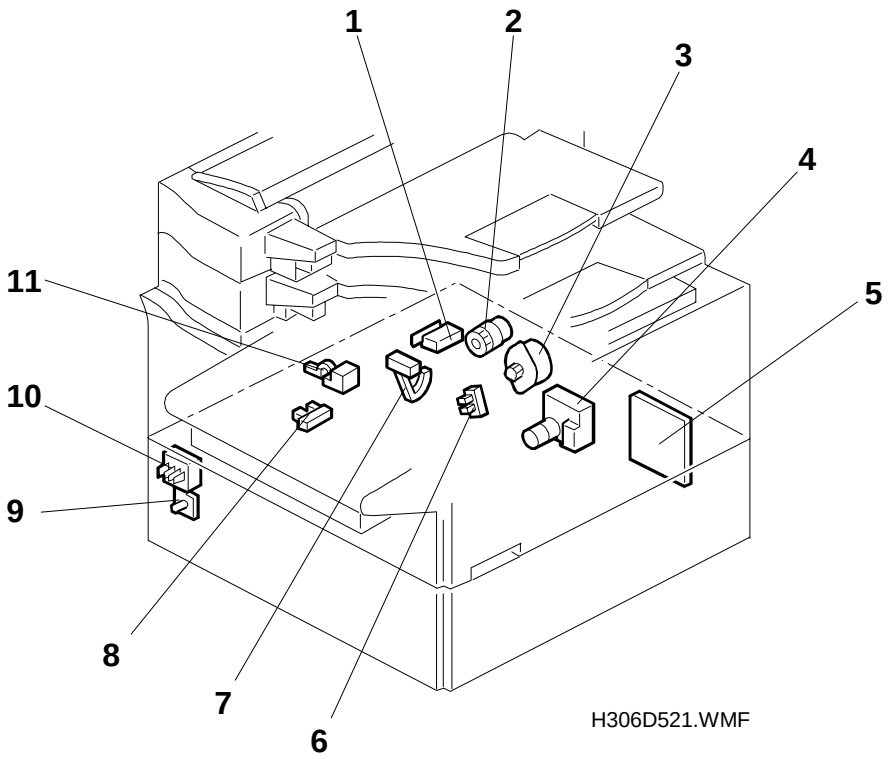
NOTE: The mode will not change until at least 2 seconds has passed since entering that mode.

Fusing Unit Service Call Conditions

	Conditions	Error Code (9-22)
At power on	If there is a problem with the thermistor. (Also for when the machine returns to Normal Mode from Energy Saver Mode Level 2.)	Sub-code 09
	If the fusing temperature stays above 200°C for 60 seconds.	Sub-code 0B
Standby mode	If the fusing temperature stays below 70 °C for more than 180 seconds after selecting fusing lamp ON in Energy Saver Mode Level 1 or when in Standby Mode.	Sub-code 05
	If the fusing temperature takes more than 135 seconds to reach Print start temperature.	Sub-code 02
	If the fusing temperature stays above 110°C for more than 180 seconds after selecting the power saver standby temperature of Energy Saver Mode Level 1.	Sub-code 0A
During printing	If the fusing temperature is 10°C higher than Print start temperature for more than 60 seconds.	Sub-code 01
	If the fusing temperature is 30°C lower than Print start temperature for more than 60 seconds.	Sub-code 06
	If the fusing temperature is below 140 °C for more than 1 second.	Sub-code 07
After printing	If the fusing temperature takes more than 20 minutes to return to 100°C when the machine goes into Energy Saver Mode Level 2. (After selecting fusing lamp Off for Energy 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 Energy Saver Mode Level 2. (After selecting the standby temperature of 80 °C for Energy Saver Mode Level 2.) Or: If the fusing temperature takes more than 5 minutes to go down to 165 °C after selecting the standby temperature for Energy Saver Mode Level 1.	Sub-code 04
At any time	If the fusing temperature reaches 250°C.	Sub-code 08

2.3 OPTIONAL PAPER FEED UNITS

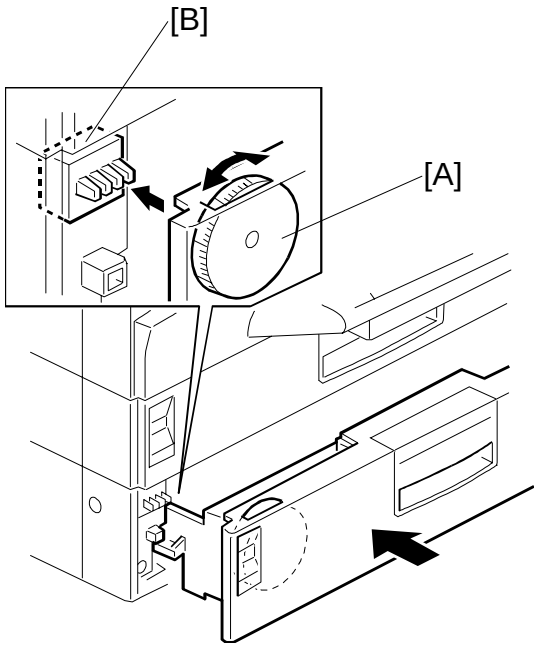
2.3.1 OVERVIEW



1. Cover Switch
2. Paper Feed Clutch
3. Paper Feed Motor
4. Lift Motor
5. PFU Board
6. Paper Near-end Sensor
7. Paper End Sensor
8. Upper Limit Sensor
9. Paper End LED
10. Paper Size Switch
11. Paper Feed Sensor

2.3.2 MECHANISMS

Paper Size Detection



H306D525.WMF

The machine detects paper size based on the setting that the operator chooses on the paper size dial [A]. The paper sizes are detected by the paper size detection switches [B] though its contact with small projections on the paper size dial.
It is therefore necessary to adjust the setting on the dial when a different sized paper is used. If this is not done, images meant for paper sizes larger than the size selected on the dial will be partially cut off.

In addition to paper size detection, this dial setting also provides the basis for jam detection timing. The sensor also detects whether the tray has been inserted or not.

Paper Size Detection (Optional PFU)

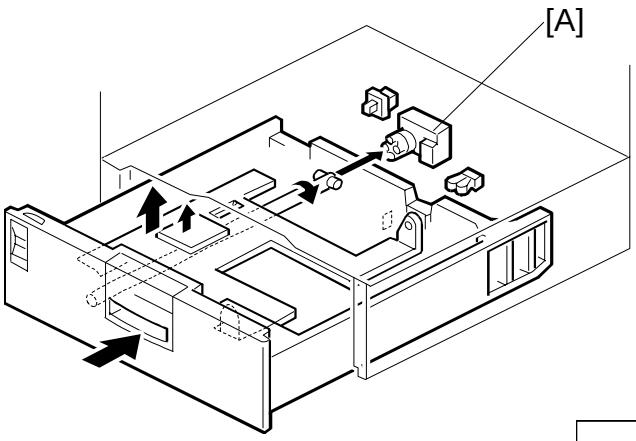
120V	220V		SW1	SW2	SW3	SW4
	Europe	A/P				
LT (LEF)	A3	A3	ON	OFF	ON	ON
N/A	N/A	B4	OFF	OFF	OFF	ON
A4 (SEF)	A4 (SEF)	A4 (SEF)	ON	ON	OFF	ON
N/A	A4 (LEF)	A4 (LEF)	ON	ON	ON	ON
N/A	A5 (LEF)	A5 (LEF)	ON	ON	OFF	OFF
LT (SEF)	LT (SEF)	LT (SEF)	OFF	ON	ON	ON
LG	N/A	N/A	OFF	ON	OFF	ON

LEF: Long Edge Feed

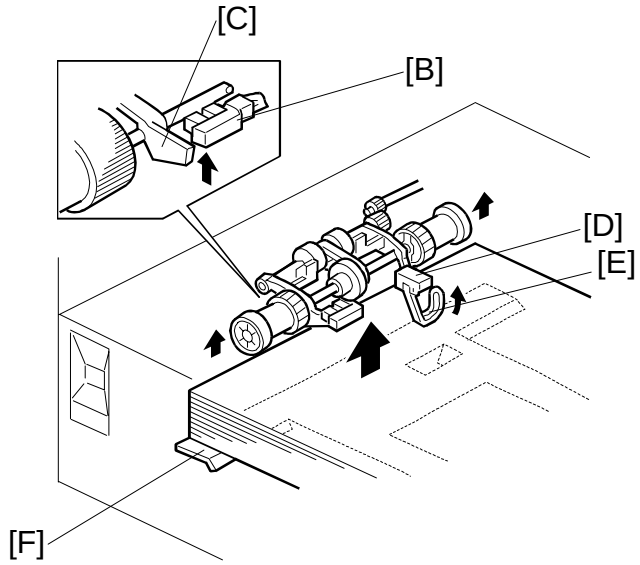
SEF: Short Edge Feed

A/P: Asia/Pacific region

Bottom Plate Lift, Upper Limit Detection and Paper End Detection



H306D522.WMF



H306D524.WMF

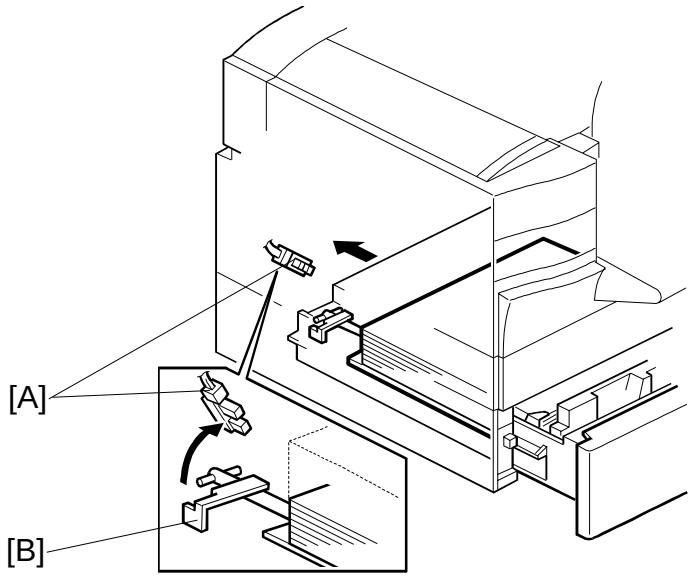
When the tray is placed in the machine, the paper size detection sensor turns on and the lift motor [A] is activated, lifting the bottom plate. The plate rises until the upper limit sensor [B] detects the actuator [C] and stops the motor.

The maximum lifting time for the bottom plate is set at 13 seconds. If the motor lifts the plate for more than 13 seconds, an error results and the motor is stopped. At the same time, the paper end LED will be lit red. The error status can be cleared by turning the machine on and off. The error will be recorded in the machine log but will not trigger an automatic service call.

Error codes: 1-35 (first tray)
1-36 (second tray)

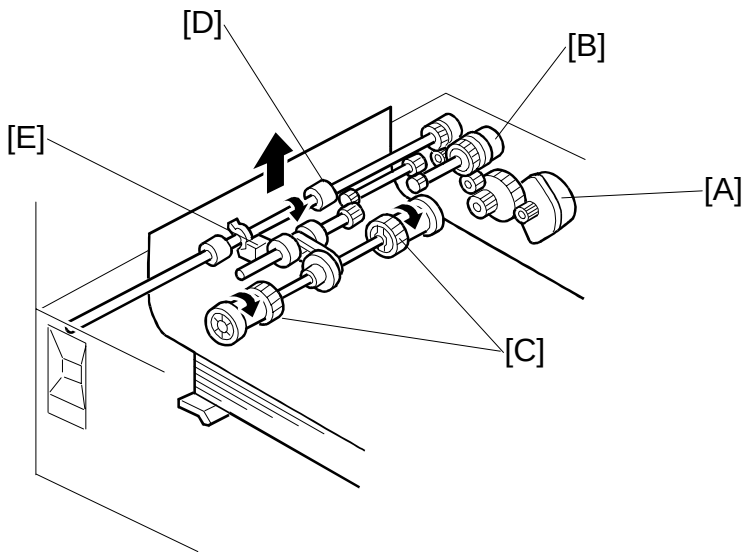
The paper end sensor [D] contains a photosensor. When there is no paper remaining in the tray, the actuator [E] drops through the opening in the bottom plate [F], causing the sensor to detect the paper end condition.

Paper Near-end Detection



When the paper supply in the tray becomes low, the actuator [B] on the paper lift shaft enters the near-end sensor [A]. This occurs when about 50 sheets are remaining in the tray. At the same time, the paper end LED is lit green.

Paper Feed



H306D523.WMF

The paper feed motor [A] and the feed clutch [B] turn on, causing the pick-up roller [C] to turn. The paper is then guided by the paper feed roller [D], which is driven by the paper feed motor. The motor stops when the paper feed sensor [E] turns off.

If the tray immediately above is another optional paper feed unit, the paper feed motor in that unit activates when the paper feed sensor in that unit turns on, and the paper is fed upwards by the upper optional paper feed unit.

When the paper activates the mainframe registration sensor, the motor of the optional paper feed unit will turn off even if the paper feed sensor is still on. The machine's paper feed motor feeds the paper towards the drum. The motor of the optional paper feed unit rotates at a high speed to feed the paper from the paper feed area to the registration roller. After the paper has reached the registration roller and the registration sensor has turned on, the main motor in the base machine turns slowly to match the speed of the OPC drum.

A maximum of two optional paper feed units can be installed. In addition, it is possible to use the lower tray even when the cassette in the upper tray has been removed.

Jam Detection

- If the paper feed sensor does not turn on within two seconds after the optional paper feed clutch starts.

  Error codes: 9-50 (upper optional tray), 9-52 (lower optional tray)

- If the registration sensor does not turn on within 1.8 seconds after the paper feed sensor in the upper optional tray turns on.

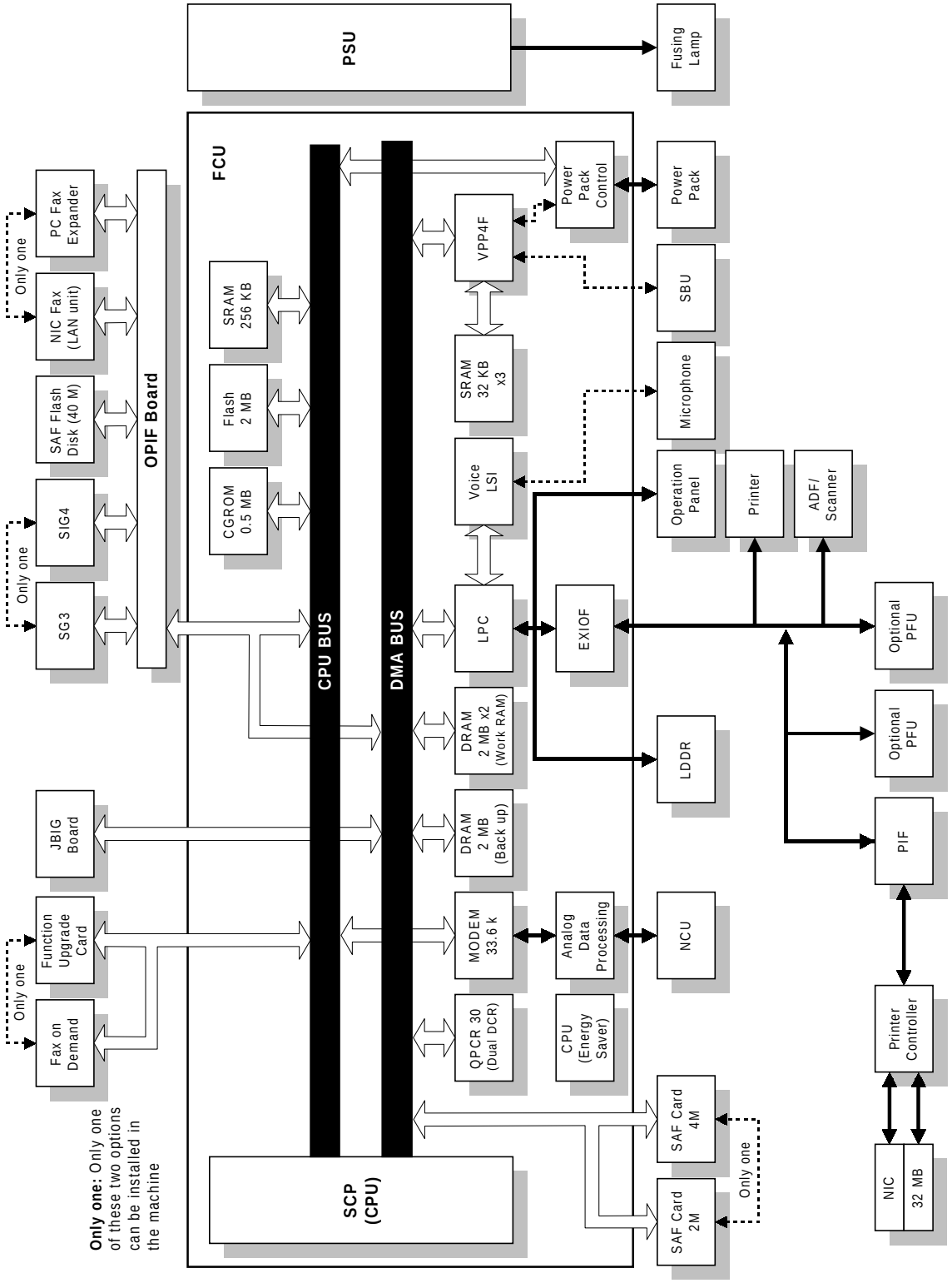
  Error code: 9-51 (upper optional tray)

- If the paper feed sensor in the upper optional tray does not turn on within 1.8 seconds after the paper feed sensor in the lower optional tray turns on.

  Error code: 9-53 (lower optional tray)

2.4 PCBS

2.4.1 FCU



H306D502.WMF

The FCU (Facsimile Control Unit) board contains the SCP (System Control Processor), LPC, QPCR30, VPP4F, V34 modem and Flash ROM. This board controls the entire system and optional units, and the analog data processing, energy saver control and power pack control circuits are also contained on this board.

SCP

- CPU
- DMAC
- DCR

ROM

- 16-Mbit flash ROM for system software storage

CGROM

- Masked ROM containing characters for operation panel display and reports.

LPC

- LDDR control
- IO control
- Interface for the Voice IC
- EOL, RTC, Flag signal detection

VPP4F

- Video data processing
- Receiving data of thermistor
- Receiving feedback data from Power Pack

QPCR30

- Dual DCR (allows dual access)

SRAM Backup

- Backs up SRAM data (machine settings) with a non-rechargeable battery when the machine is switched off. SW3 switches the battery on and off.

DRAM Backup

- Backs up DRAM data (SAF data) with a rechargeable battery when there is data in the SAF and the machine is switched off.

DRAM

- 6 MB DRAM shared by working RAM, ECM buffer, page memory, and SAF. 2 MB is occupied for SAF memory.

Modem

- V.34 modem (Conexant Systems)

Voice IC

- Recording and Playing voice data

EXIOF

- Gate array for controlling the 8-bit parallel port and four serial ports.

Energy Saver Circuit

- 4-bit CPU for controlling the machine during energy saver mode.
- Releases the energy saver mode upon detecting a document (in the ADF), a ringing signal, a wakeup signal from an optional unit, or when the energy saver key is pressed.

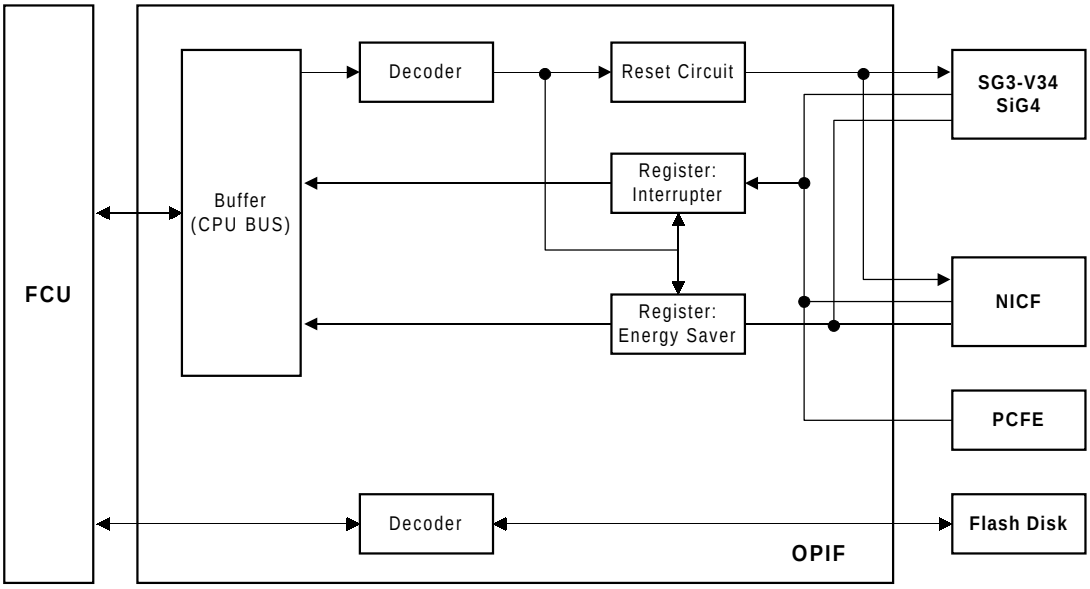
Analog Data Processing Circuit

- AFE (Analog Front End for modem) circuit
- Driving the monitor speaker
- DTMF receiver

Power Pack Control Circuit

- PWM control for power pack DC voltages.

2.4.2 OPIF (OPTION INTERFACE BOARD)



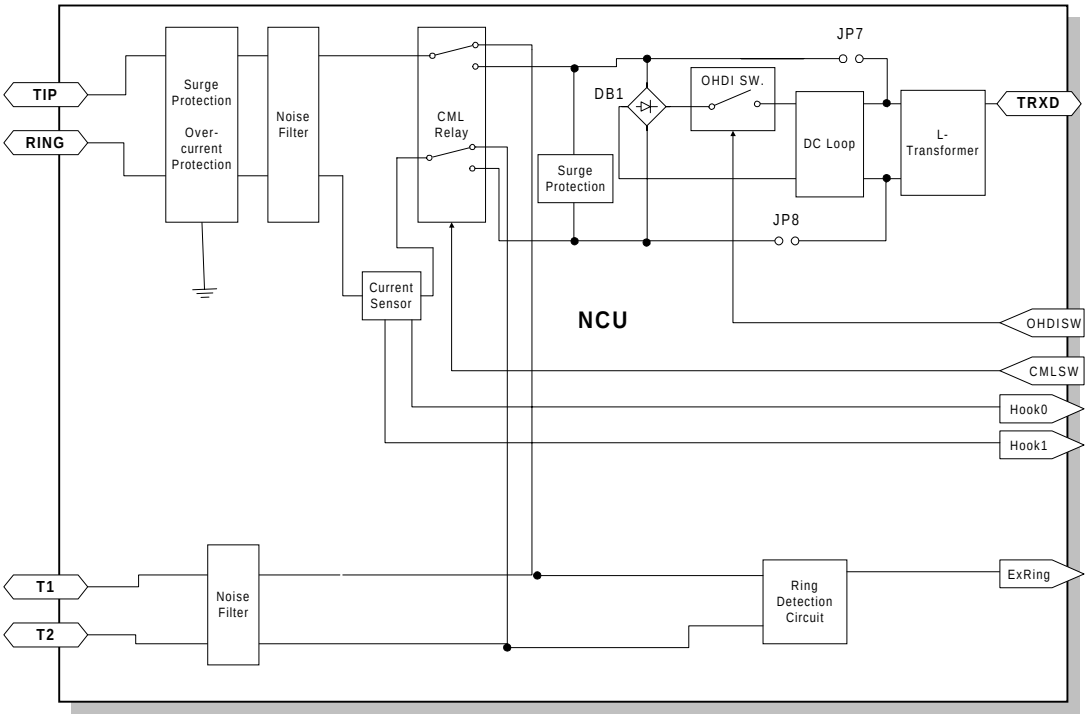
H306D503.WMF

The OPIF is an interface between the FCU and optional boards. This board is included in the installation kits for each of the following boards.

- SG3 board
- SiG4 board
- NICF board
- PCFE board
- Flash Disk (40M memory)

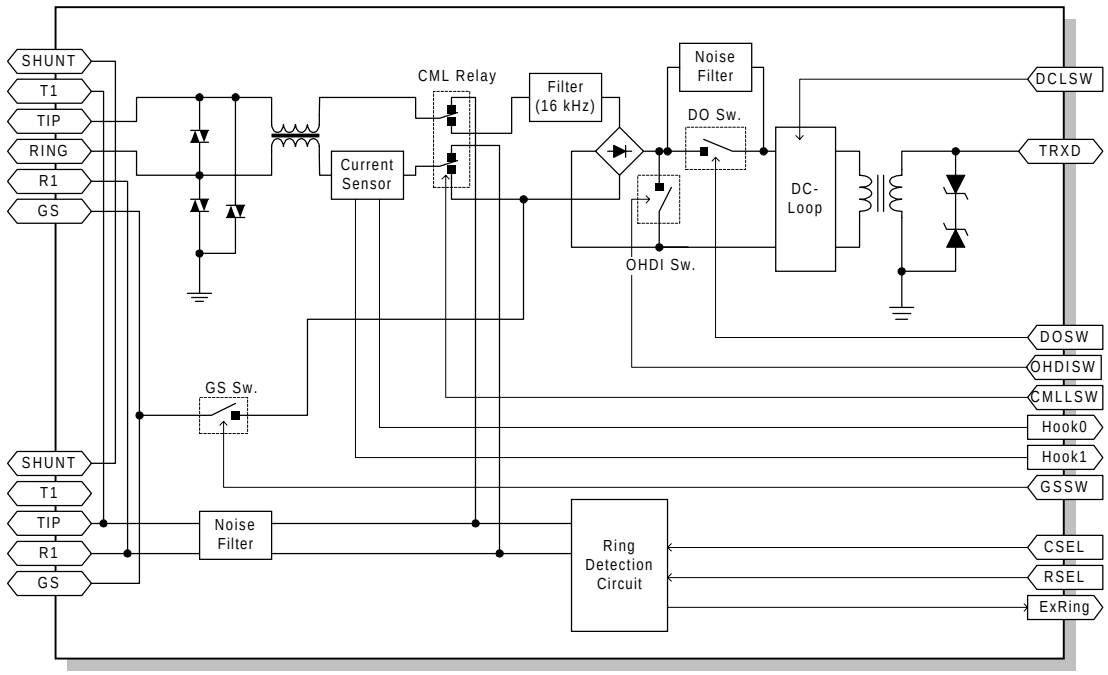
NOTE: The SG3 and SiG4 cannot be installed at the same time.
The NICF and PCFE cannot be installed at the same time.

2.4.3 NCU (US)



H306D505.WMF

2.4.4 NCU (EUROPE/ASIA)



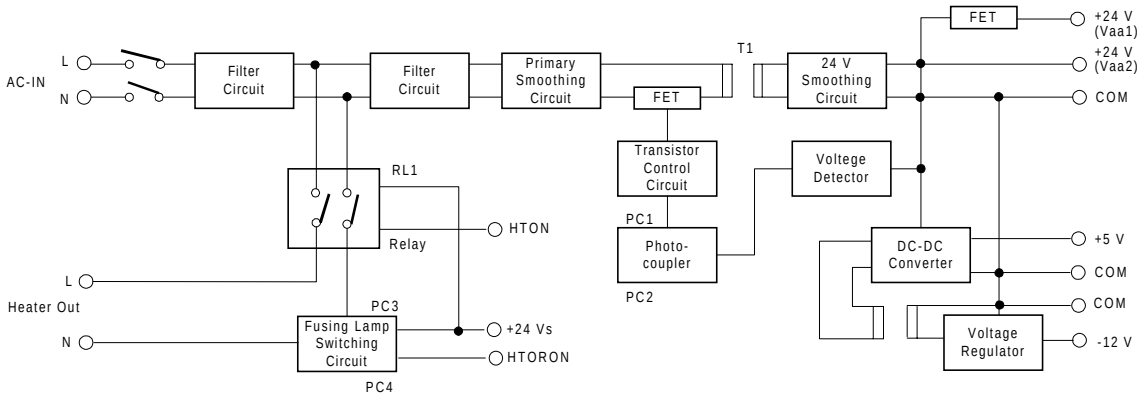
H306D506.WMF

Control Signals

	CSEL1	RSEL
Country	**CN2-5**	**CN1-13**
CTR21	H	H
Australia	H	H
South Africa	H	H
Malaysia	H	H
Hong Kong	L	L
New Zealand	L	L
Singapore	L	L
Asia	L	L
	L: Low, H: High	

CTR21 (Common Technical Regulation 21):
France, Germany, UK, Italy, Austria, Belgium, Denmark, Finland, Ireland, Norway, Sweden, Switzerland, Portugal, Holland, Spain, Israel, Greece

2.4.5 PSU



H306D504.WMF

- +24Vdc, +5Vdc, -12Vdc generation.
- Fusing lamp AC power supply controlled by the FCU.

2.5 SYSTEM FEATURES

2.5.1 PERSONAL/INFORMATION/TRANSFER BOXES

When an incoming message has a SUB or SEP code attached, the machine will look for a Personal Box, Transfer Box or Information Box with an identical SUB or SEP code. If a matching code is found, the message will be stored in the box and not printed, or it will be forwarded to the receiver if registered.

Personal Box (Confidential Box)

The user can create personal boxes in the machine's memory for receiving fax messages. Each box must have a name and a code.

If a sender knows the code that was used to create a personal box, they can specify this as the SUB code during transmission. The message will then go to this personal box. If the sender also sends a SID code, this is ignored; the receiver must input the SID code stored in the receiving machine to print the message (the receiver's SID code acts as a password).

The receiver can set up the personal box as a forwarding station – any messages entering the box will be forwarded to another station.

Items to program at the receiving machine

Items	Note
SUB Code (Box number)	Required
Box name	Required
Password (SID)	Optional
Receiver (1 forwarding destination)	Optional (Quick or Speed Dial)

Items for the sender to specify when setting up the transmission

Items	Note
SUB Code (Box number)	Required (must be the same as the code that was used to set up the personal box)
Password (SID)	Optional

NOTE: 1) An E-mail address can be specified as the forwarding destination if it is programmed in the specified Quick/Speed Dial.
2) Group dial is not available for the forwarding destination
3) If the sender uses a SID code, this code is ignored. The communication can proceed even if the SID code stored in the machine is different. In addition, the SID code stored in the machine must be used to print the stored message, and not the SID code from the sender.
4) If a forwarding destination is programmed, the received file is deleted after delivering the documents to the pre-programmed receiver. If forwarding did not succeed, the forwarding result report is printed out but the file stays in the memory until it is printed out on the machine.

Transfer Box

The user can create transfer boxes in the machine's memory for forwarding incoming fax messages. Each box must have a name and a code. Each box must also have destinations associated with it; any message arriving in this box will automatically be sent on to these destinations.

If a sender knows the code that was used to create a transfer box, they can specify this as the SUB code during transmission. The message will then go to this transfer box, and will be sent on to the transfer destinations associated with that transfer box.

If the sender also sends a SID code, the SID code stored in the receiver must be the same or the communication will be disconnected.

Items to program at the receiving machine

Items	Note
SUB Code (Box number)	Required
Box name	Required
Password (SID)	Optional
Receiver (Final destinations)	Required (Quick or Speed Dial)

Items for the sender to specify when setting up the transmission

Items	Note
SUB Code (Box number)	Required (must be the same as the code that was used to set up the transfer box)
Password (SID)	Optional

NOTE: 1) 5 destinations can be programmed with Group, Quick, or Speed Dial as the delivery destinations.
2) More than 5 destinations are available if a Group is specified as one of the destinations.
3) An E-mail address can be specified as the delivery destination if it is programmed in a specified Quick/Speed Dial.
4) If the SID does not match, the communication is disconnected.
5) A result report is not sent back to the transmitter but it is printed on the receiving machine.

Information Box (Polling Tx)

The user can set up documents in memory to be picked up by another machine. The user makes an information box for each document.

The information box is identified by a code. Anybody who wishes to call the fax machine and receive the document from the information box has to input this code as the SEP code when calling the machine.

In addition, the user who sets up the information box can protect it with a password. This protects the document from other people at the same location (to print the stored document, this password must be input). The person who wishes to receive the document does not have to know this PWD code, but only has to know the SEP code.

Items to program at the machine that has the document on standby for polling

Items	Note
SEP Code (Box number)	Required
Box name	Required
Password (PWD) for printing the stored document	Optional

Items for the caller to specify when picking up the document

Items	Note
SEP Code (Box number)	Required (must be the same as the code that was used to set up the information box)

NOTE: 1) Only one fax message can go in each information box.
2) The SEP code must be different for each box.

2.5.2 BACKUP FILE TRANSMISSION

When backup transmission is enabled and the backup destination is programmed, all transmitted documents are automatically sent to the backup destination in addition to the main destination. E-mail address can be also used as the backup destination if the optional NICF board is installed.

Applicable files

- Memory transmission
- Transfer request transmission
- Confidential transmission
- Mail transmission
- SUB code transmission

Not applicable files

- Transfer broadcasting transmission
- Forwarding
- Polling transmission
- PC fax transmission

NOTE: 1) When backup transmission is enabled, immediate transmission mode is not available.
2) This feature does not use batch transmission.

2.5.3 STATUS INDICATOR

There are two indicators on the front edge of the operation panel. They show the machine's status. The following table describes their function, along with four other indicators on the operation panel.

	Status Indicator		Toner LED	Paper LED	Comm. LED	Printer LED
	Error	Function				
ADF/Paper Feed Error, Cover open, Tx error, Network error, SC	Red Blinking					
Toner near-end	Red Blinking		Blinking			
Toner end	Red Blinking		Lit			
Paper near end				Green Lit		
No Paper	Red Blinking			Red Lit		
Communicating		Green Lit			Lit	
Printing as Printer		Green Blinking				Blinking

2.5.4 IMAGE ROTATION AND PAPER SELECTION

When the Image Rotation is enabled (user switch), all incoming documents go into the SAF memory first and will then be printed on the correct size of paper.

The paper size that the machine declares in the T.30 protocol depends on the paper size dial settings, as shown in the following table.

Declaration in T.30	Paper size in the cassettes
A3	Either: A3, A4(LEF), DLT or LT(LEF) paper is loaded. Or: A3, A4(LEF), DLT or LT(LEF) paper is selected with the paper size dial but there is no paper in the cassettes.
B4	Either: B4 paper is loaded. Or: B4 paper is selected with the paper size dial but there is no paper in the cassettes.
A4	Image rotation is disabled and A4(SEF), A5, LT(SEF), F4 or F size is selected
	Image rotation is enabled and LT(SEF), F4, F or A5 size is selected

Paper selection

The following table shows the priority for which size of paper is selected for each size of documents received.

US model

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
DLT	DLT	LT (LEF) Sep	LT (SEF) Rot/ Sep ***3**	A4 (SEF) Rot/ Sep ***3**						
B4	DLT	LT (LEF) Sep	LT (SEF) Rot/ Sep ***3**	A4 (SEF) Rot/ Sep ***3**						
LG	LG	F/F4 Red	A4 (SEF) Red	LT (SEF) Red	DLT	LT (LEF) Rot/ Sep ***1**	LT (LEF) Sep ***2**			
A4(SEF)	A4(SEF)	LT (SEF) Red	LT (LEF) Rot ***1**	F/F4	LG	DLT Rot ***4**	DLT ***2**	LT (SEF) Sep	LT (LEF) Sep ***2**	
LT(SEF)	LT (SEF)	LT (LEF) Rot ***1**	A4 (SEF)	F/F4	LG	DLT Rot ***4**	DLT ***2**	LT (LEF) Sep ***2**		
LT(LEF)	LT (LEF)	LT (SEF) Rot ***3**	A4 (SEF) Rot ***3**	DLT						
B5	LT (LEF)	DLT	A4 (SEF) Rot ***3**	LT (SEF) Rot ***3**						
A5	LT (LEF)	LT (LEF) Rot ***1**	A4 (SEF)	F/F4	LG	DLT Rot ***4**	LT (LEF) ***2**	DLT ***2**		

Sep: Separation
Rot: Image Rotation
Red: Reduction

*1: Only when Image Rotation is enabled

*2: Only when Image Rotation is disabled

*3: When Image Rotation is enabled and the paper given higher priority runs out during printing.

*4: When Image Rotation is enabled and no paper longer than A4(SEF) is loaded.

Europe/Asia Model

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
A3	A3	A4 (LEF) Sep	A4 (SEF) Rot/ Sep ***3**							
B4	B4	A3	A4 (LEF) Sep	A4 (SEF) Rot/ Sep ***3**						
LG*2	B4	F/F4 Red	A4 (SEF) Red	LT (SEF) Red	A3	A5 Sep	A4 (LEF) Sep			
LG*1	B4	F/F4 Red	A4 (SEF) Red	A3	A4 (LEF) Rot/ Sep	LT (SEF) Red	A5 Sep			
A4 (SEF)	A4(SEF)	A4 (LEF) Rot ***1**	LT (SEF) Red	F/F4	A3 Rot ***4**	B4	A3 ***2**	LT (SEF) Sep	A5 Sep	A4 (LEF) Sep ***2**
LT (SEF)	LT (SEF)	A4 (SEF)	A4 (LEF) Rot ***1**	F/F4	A3 Rot ***4**	B4	A3 ***2**	A5 Sep	A4 (LEF) Sep ***2**	
A4 (LEF)	A4 (LEF)	A4 (SEF) Rot	A3							
B5	B4	A4 (LEF)	A4 (SEF) Rot ***3**	A3						
A5	A5	LT (SEF)	A4 (SEF)	A4 (LEF) Rot ***1**	F/F4	A3 Rot ***4**	B4	A4 (LEF) ***2**	A3 ***2**	

Sep: Separation
Rot: Image Rotation
Red: Reduction

*1: Only when Image Rotation is enabled

*2: Only when Image Rotation is disabled

*3: When Image Rotation is enabled and the paper given higher priority runs out during printing.

*4: When Image Rotation is enabled and no paper longer than A4(SEF) is loaded.

3. INSTALLATION

3.1 INSTALLING THE MACHINE

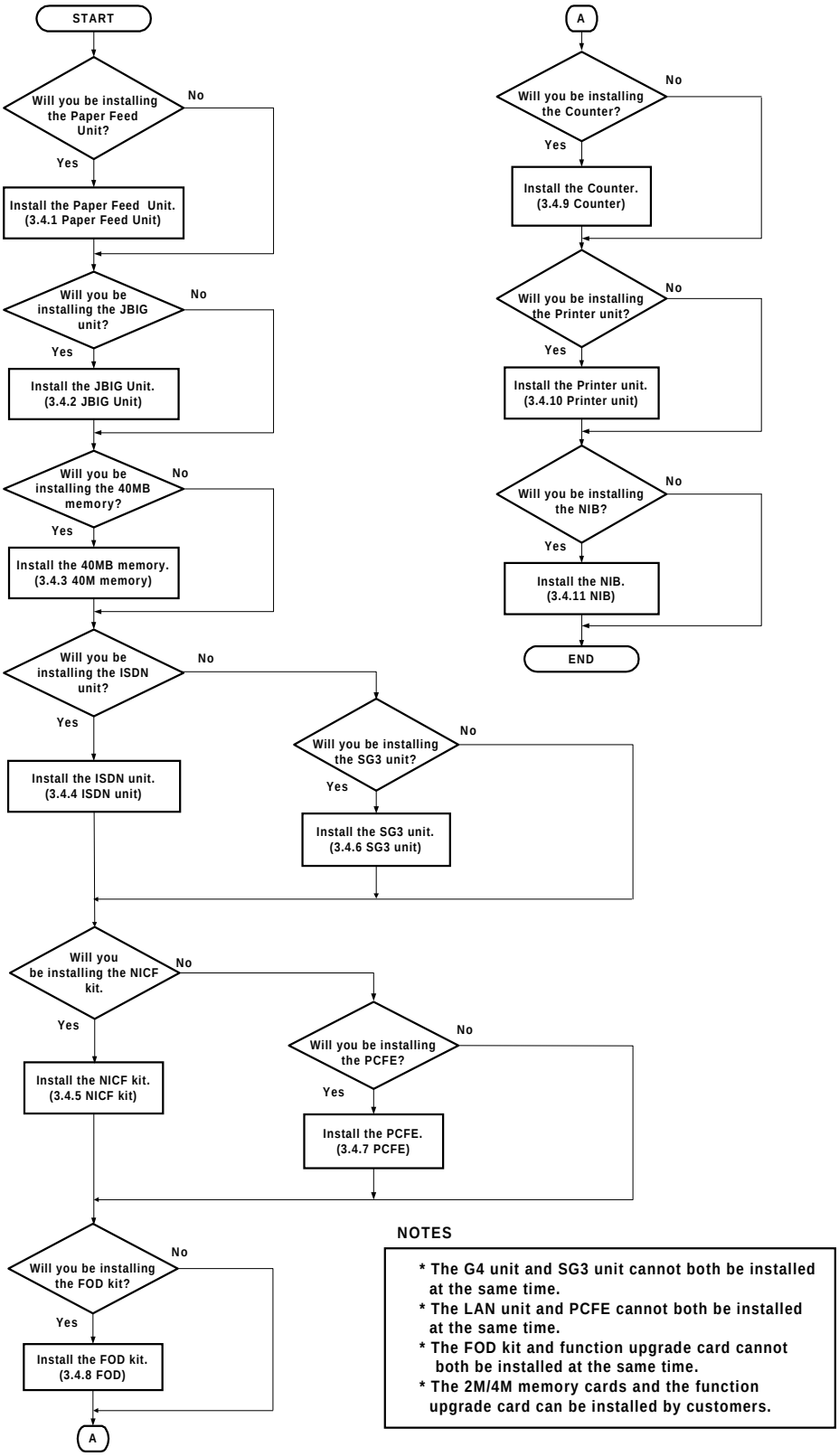
Refer to the Operator's Manual for the installation environment and how to install and set up the machine.

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
PSTN access code (RAM address 4800EB)	Function 06
PSTN access method (RAM address 4800DD)	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 addresses 480439 to 48043D)	Function 06

Items to Program (User Administrator Level)	Function No.
Clock	Key Op. Tools
Initial programming items	Key Op. Tools
On/off switches	Key Op. Tools
Report	Fax Features
Fusing power control during energy saver mode (User parameter switch 05 - bit 6)	Key Op. Tools
Display	Key Op. Tools

3.3 FLOW CHART



H306I500.WMF

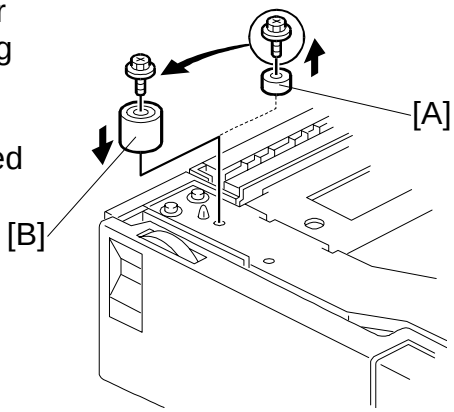
3.4 INSTALLING OPTIONAL UNITS

⚠CAUTION
Do the following before installing an optional unit: **1. Print out all messages stored in the memory.** **2. Print out the lists of user-programmed items and the system parameter list.** **3. Turn off the main switch, and disconnect the power plug.**

NOTE: Refer to the Operator's Manual for how to install the user installable options.

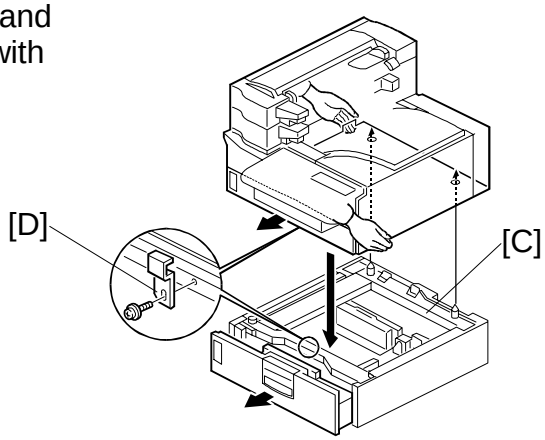
3.4.1 PAPER FEED UNIT TYPE 500

1. When the paper feed unit is installed just under the machine, change the small leg [A] to the big one [B] that is enclosed.
   NOTE: Remove the 2 tie-wraps securing the paper feed rollers (located under the red tag).



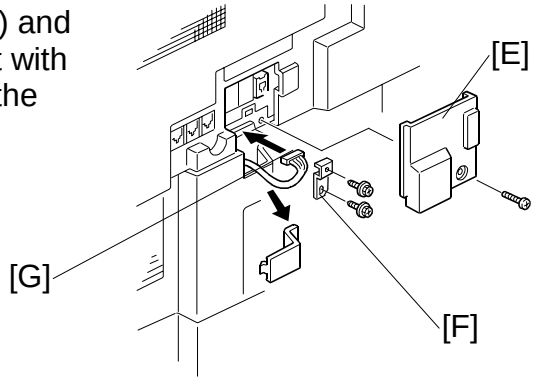
H110I601.WMF

2. Put the machine on the paper feed unit [C] and secure the machine to the paper feed unit with the bracket [D] (1 screw) on the front of the machine.



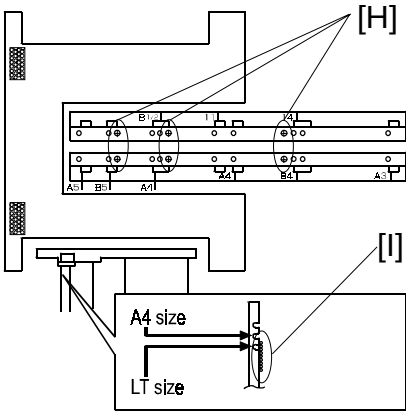
H110I602.WMF

3. Remove the connector cover [E] (1 screw) and secure the machine to the paper feed unit with the bracket [F] (2 screws). Then connect the cable [G] to the machine and replace the connector cover.



H110I603.WMF

4. **European and Asian models only:** When LT or LG size paper will be installed, peel off seals [H] on the tray and the mylar on the side of the side fence [I] as shown.



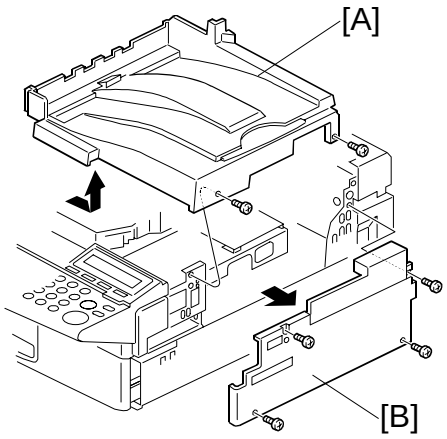
H110I604.WMF

5. Plug in the machine and turn on the main power switch.
6. Enter the service mode and print the system parameter list, then make sure that “CASSETTE” is listed as an option.
7. Add some paper and make a test print using the paper feed unit.

End of Procedure

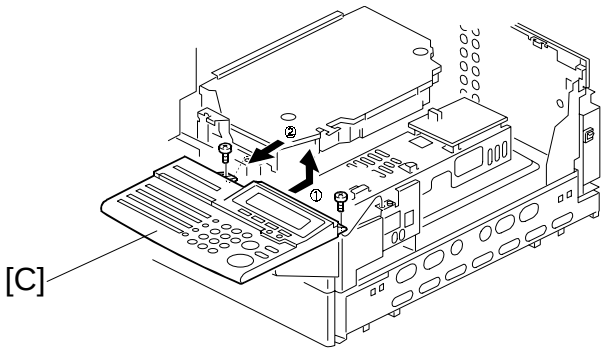
3.4.2 JBIG UNIT TYPE 500

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



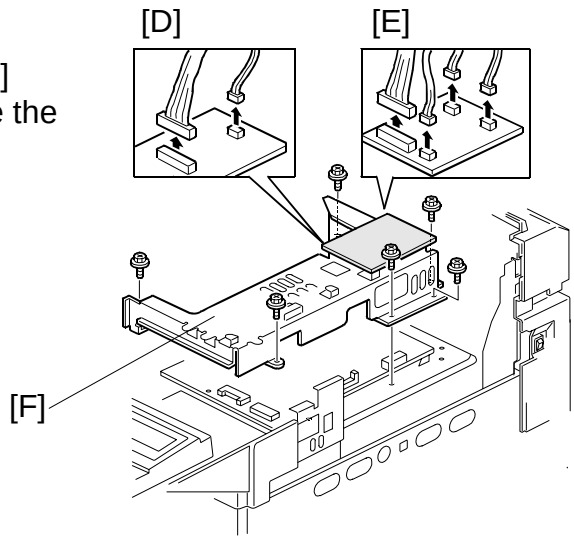
H132I601.WMF

2. Remove the operation panel [C] (2 screws) as shown.



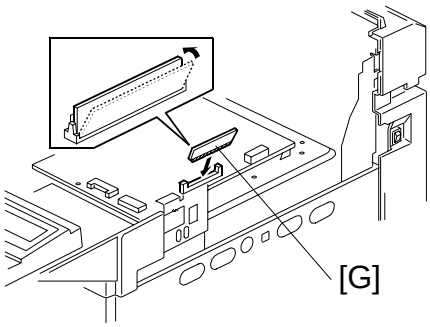
H132I602.WMF

3. Disconnect cable [D] (USA model) or [E] (Europe and Asian models) and remove the assembly [F] (6 screws) as shown.



H132I603.WMF

4. Connect the JBIG unit [G] to the FCU board as shown.



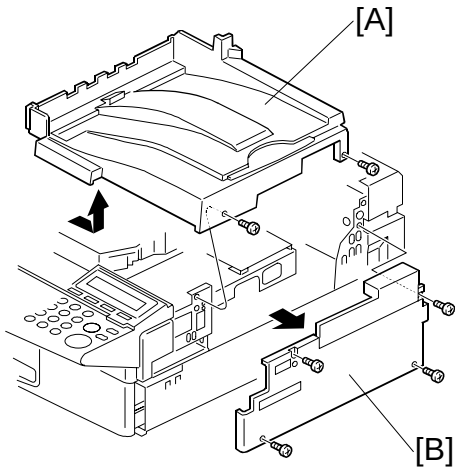
H132I604.WMF

5. Replace the assembly, operation panel, the top and the right covers.
6. Plug in the machine and turn on the main power switch.
7. Enter the service mode and print the system parameter list, then make sure that “JBIG” is listed as an option. Then exit the service mode.

End of Procedure

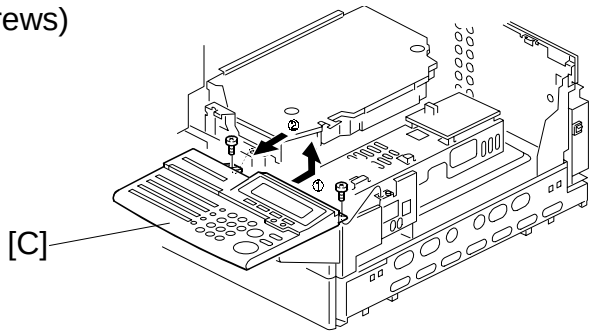
3.4.3 FEATURE EXPANDER TYPE 500 40M

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



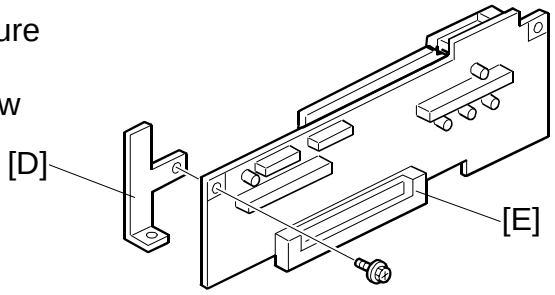
H130I501.WMF

2. Remove the operation panel [C] (2 screws) as shown.



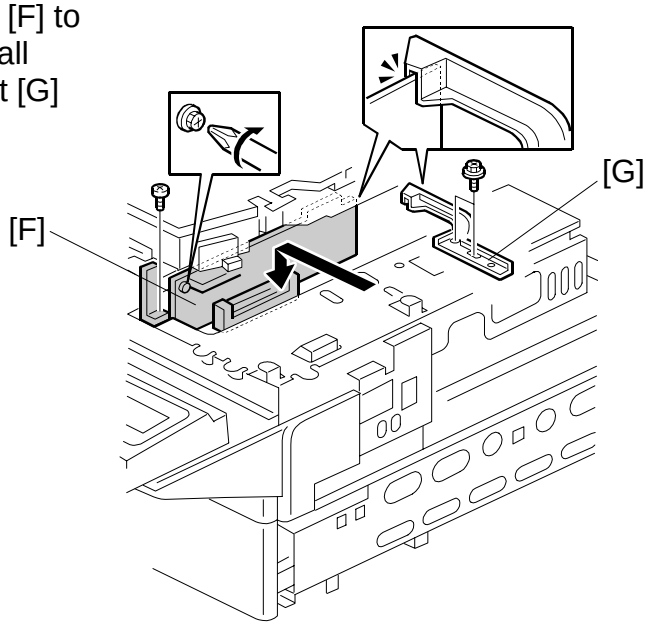
H130I502.WMF

3. Attach the bracket [D] (1 screw) to the interface board [E] as shown. (The feature expander is attached to this board.)
   NOTE: Be sure to only tighten the screw temporarily at this moment.



H130I503.WMF

4. Attach the interface board assembly [F] to the machine (1 screw), then tighten all screws. After that, attach the bracket [G] (2 screws) as shown.



H130I504.WMF

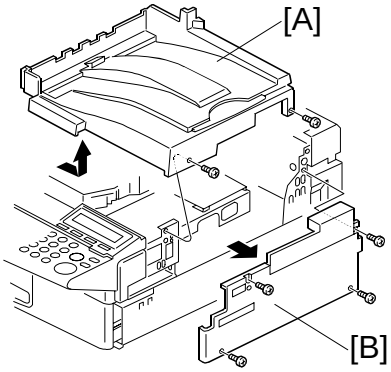
5. Replace the operation panel, the top and the right covers.
6. Plug in the machine and turn on the main power switch.
7. Enter the service mode and set bit 4 of system switch 05 to “1” and set bit 1 of system switch 00 to “1” to initialize (this clears the SAF). Then exit the service mode.
8. Enter the service mode again and print the system parameter list, then make sure that “40 MB” is listed as an option.
9. Exit the service mode.

End of Procedure

3.4.4 ISDN INTERFACE UNIT TYPE 500 (SIG4)

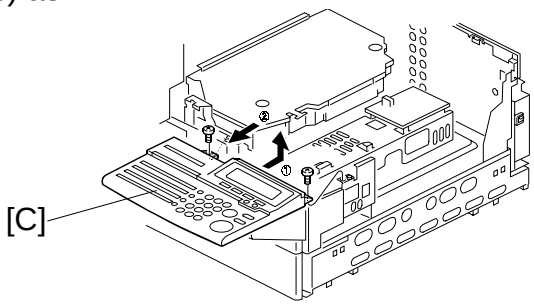
NOTE: This unit cannot be installed at the same time as the G3 interface unit.

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



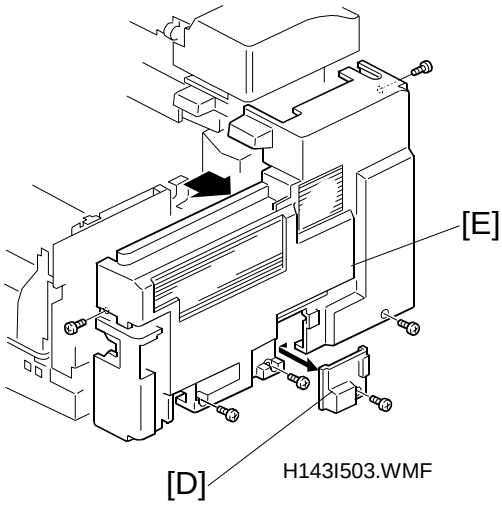
H143I501.WMF

2. Remove the operation panel [C] (2 screws) as shown.



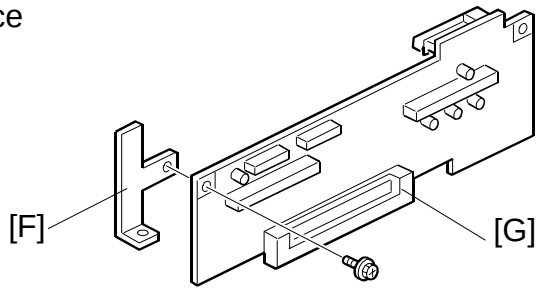
H143I502.WMF

3. Remove the small cover [D] (1 screw) and the rear cover [E] (5 screws).



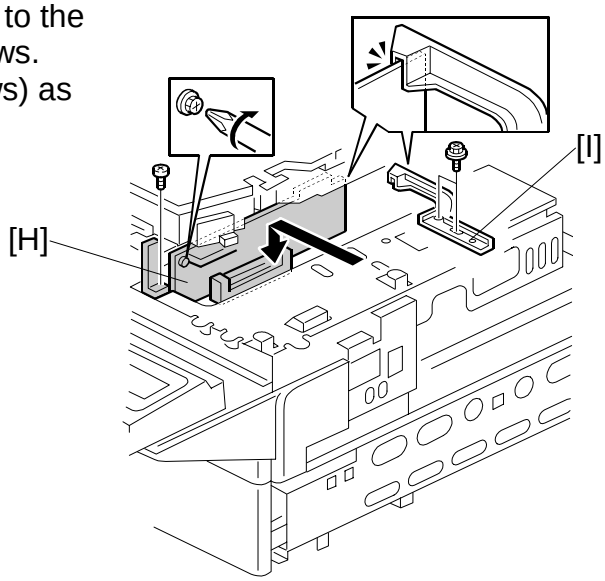
H143I503.WMF

4. Attach bracket [F] (1 screw) to the interface board [G] as shown.
   NOTE: Be sure to only tighten the screw temporarily at this moment.



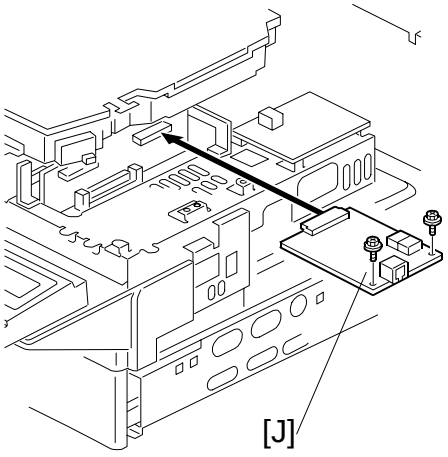
H143I504.WMF

5. Attach the interface board assembly [H] to the machine (1 screw), then tighten all screws. After that, attach the bracket [I] (2 screws) as shown.



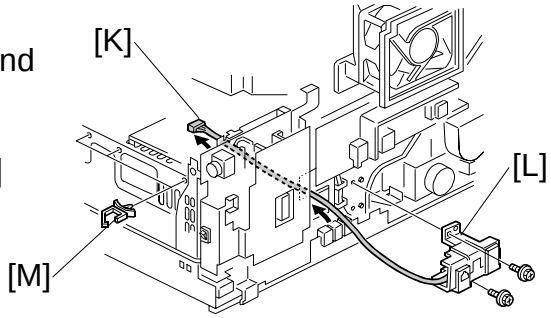
H143I505.WMF

6. Attach the G4 board [J] (2 screws) to the interface board.



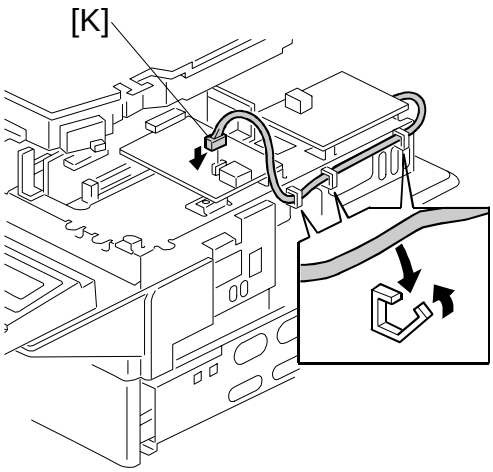
H143I506.WMF

7. First, run cable [K] though the bracket. Then attach the bracket [L] (2 screws) and three cable clamps [M] as shown.
   NOTE: Make sure that the cable is not pinched between the bracket [L] and the machine.



H143I507.WMF

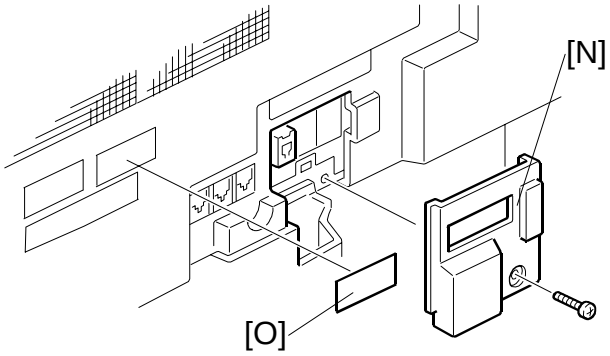
8. Run the cable [K] though the clamps, then connect it to the G4 board.



H143I508.WMF

9. Replace the operation panel, and the top, right, and rear covers.

10. Attach the small cover [N] (1 screw), contained in the ISDN interface unit, to the rear of the machine and attach the FCC / IC approval label [O] to the rear cover as shown.



H143I509.WMF

11. Plug in the machine and turn on the main power switch.
12. Enter the service mode and set bit 2 of communication switch 16 to “1”.
13. Exit the service mode and turn off the machine, then turn the machine back on.
14. Enter the service mode again, print the system parameter list and make sure that “G4” is listed as an option. Then exit the service mode.
15. Program the items required for ISDN communications.
    Please refer to the ISDN option service manual for details.

Important:
Make sure that you input the following items when you connect the machine under the US National ISDN network.

- SPID (Service Profile ID) Number: G4 SPID/ G3 SPID
- Subscriber number: G4 Subscriber Number (G4 Own Number)/ G3 Subscriber Number (G3 Own Number)

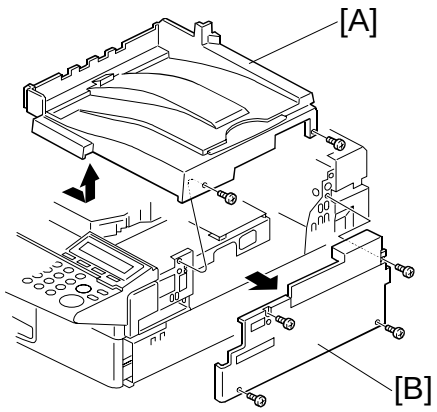
NOTE: SPID is used when the machine is connected under the US National ISDN network. If SPID is not used, or if the machine is not connected under the US National ISDN network, turn it off with user parameter switch 06 bit 6.

End of Procedure

3.4.5 NIC FAX KIT TYPE 500

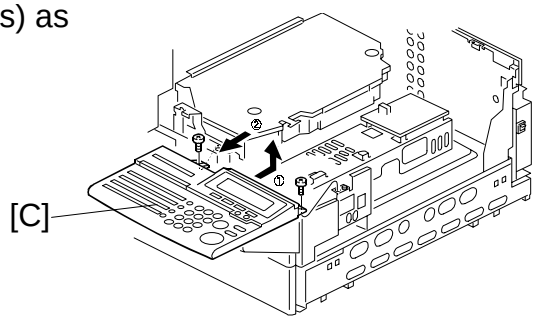
NOTE: This unit cannot be installed at the same time as the PC fax expander.

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



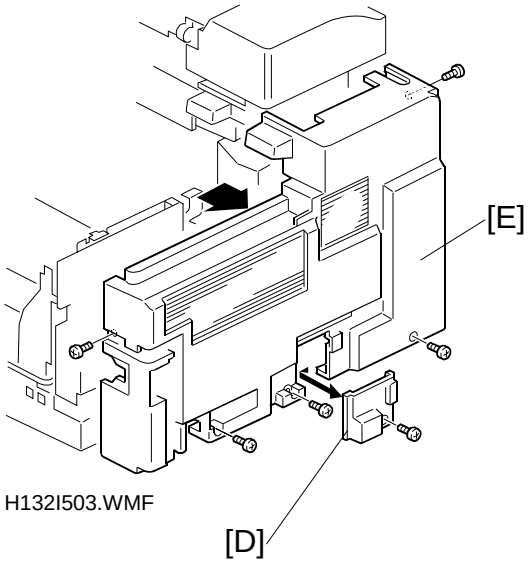
H132I501.WMF

2. Remove the operation panel [C] (2 screws) as shown.



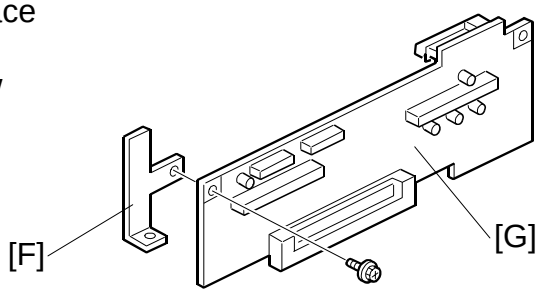
H132I502.WMF

3. Remove the small cover [D] (1 screw) and the rear cover [E] (5 screws).



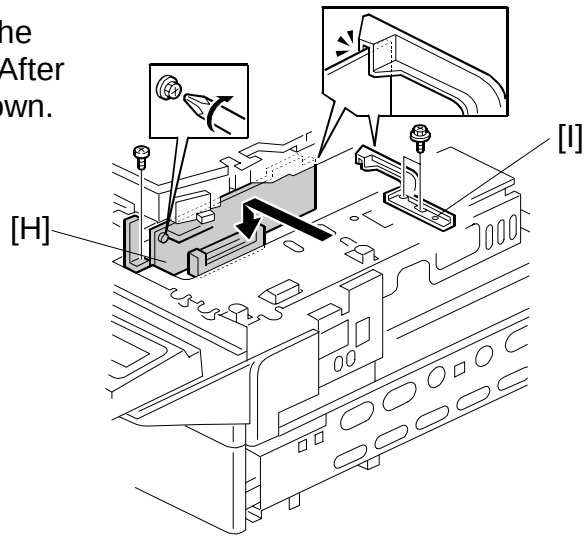
H132I503.WMF

4. Attach bracket [F] (1 screw) to the interface board [G] as shown.
   NOTE: Be sure to only tighten the screw temporarily at this moment.



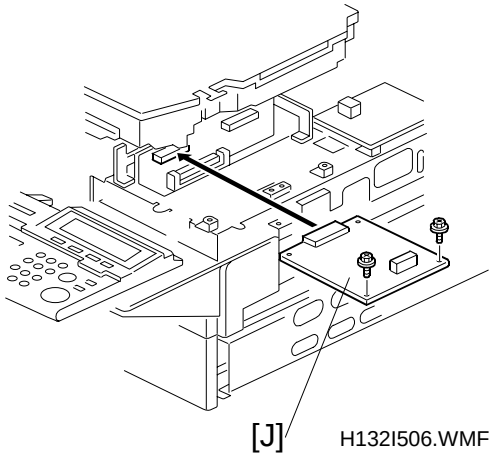
H132I504.WMF

5. Attach the interface board assembly [H] to the machine (1 screw), then tighten all screws. After that, attach the bracket [I] (2 screws) as shown.



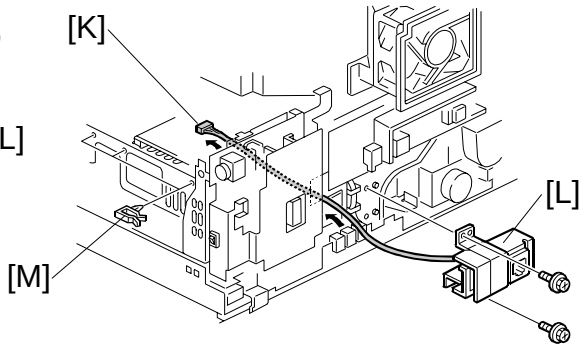
H132I505.WMF

6. Attach the NIC board [J] (2 screws) to the interface board. Then replace the operation panel.



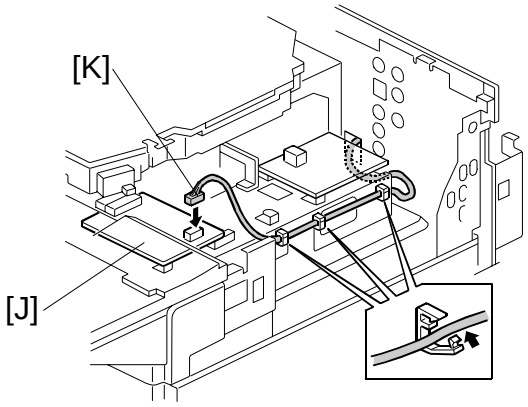
H132I506.WMF

7. First, run cable [K] though the bracket. Then attach the bracket [L] (2 screws), and three cable clamps [M] as shown.
   NOTE: Make sure the cable is not pinched between the bracket [L] and the machine.



H132I509.WMF

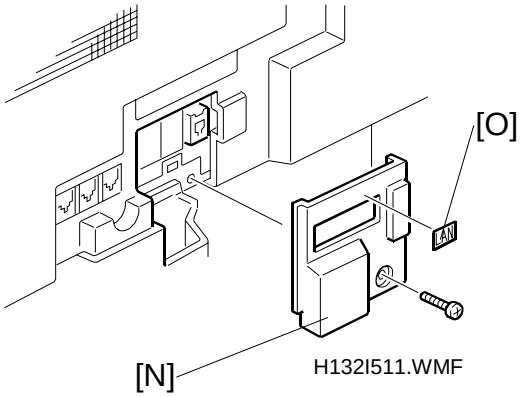
8. Run the cable [K] through the clamps, then connect it to the NIC board [J].



H132I510.WMF

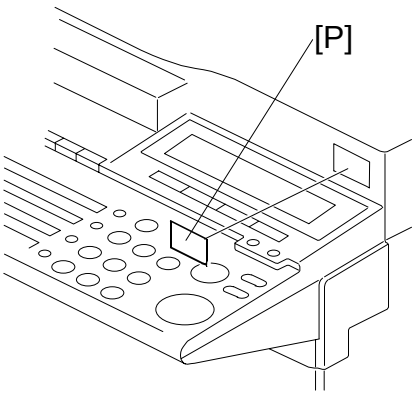
9. Replace the top, right, and rear covers.

10. Attach the small cover [N] (contained in the NIC fax kit) to the rear of the machine. Then attach the decal [O] to the small cover [N] as shown.



H132I511.WMF

11. Attach the “NIC FAX” decal [P] to the front side of the top cover as shown.



H132I512.WMF

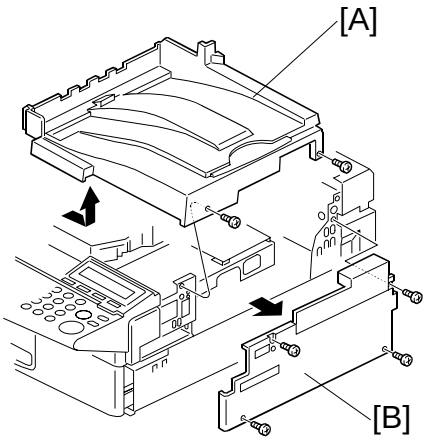
12. Plug in the machine and turn on the main power switch.
13. Enter the service mode and print the system parameter list, then make sure that “NICF” is listed as an option. Then exit the service mode.

End of Procedure

3.4.6 G3 INTERFACE UNIT TYPE 500

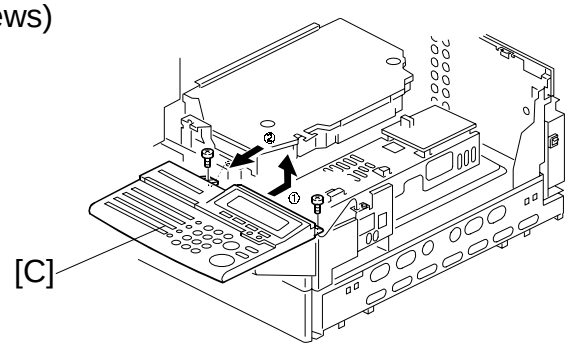
NOTE: This unit cannot be installed at the same time as the ISDN interface unit.

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



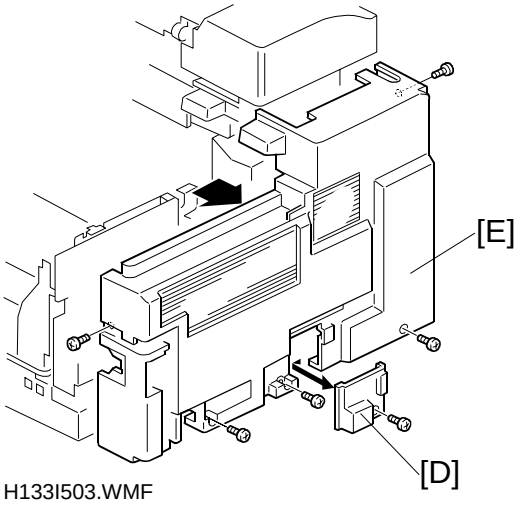
H133I501.WMF

2. Remove the operation panel [C] (2 screws) as shown.



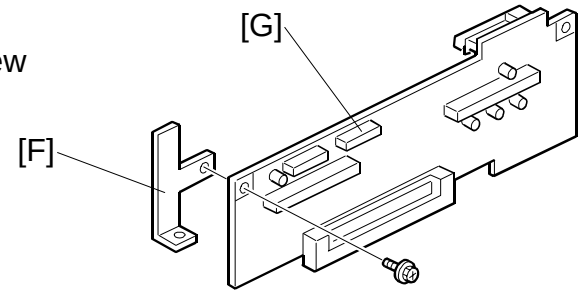
H133I502.WMF

3. Remove the small cover [D] (1 screw) and the rear cover [E] (5 screws).



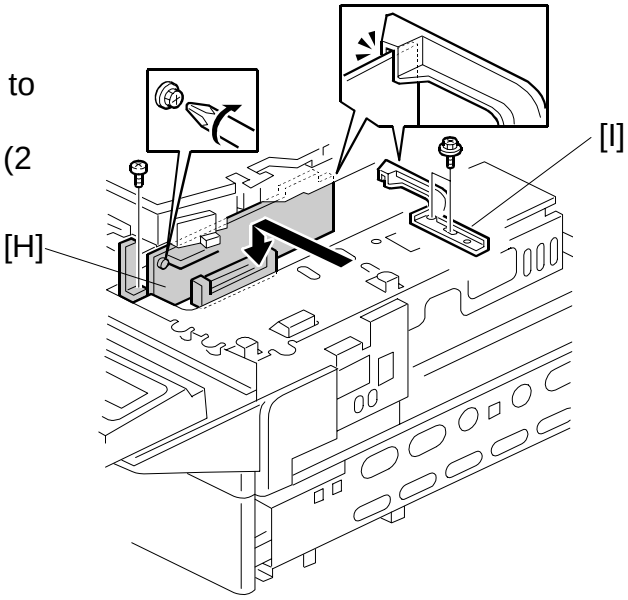
H133I503.WMF

4. Attach bracket [F] (1 screw) to the interface board [G] as shown.
   NOTE: Be sure to only tighten the screw temporarily at this moment.



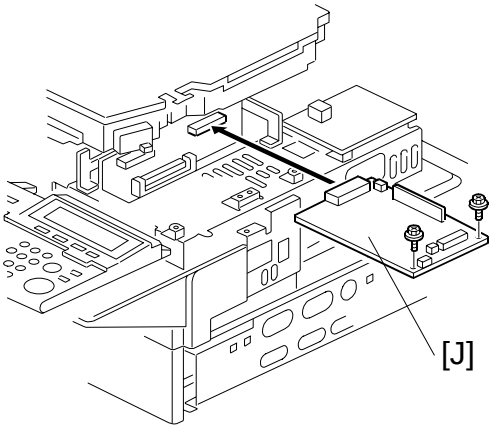
H133I504.WMF

5. Attach the interface board assembly [H] to the machine (1 screw), then tighten all screws. After that, attach the bracket [I] (2 screws) as shown.



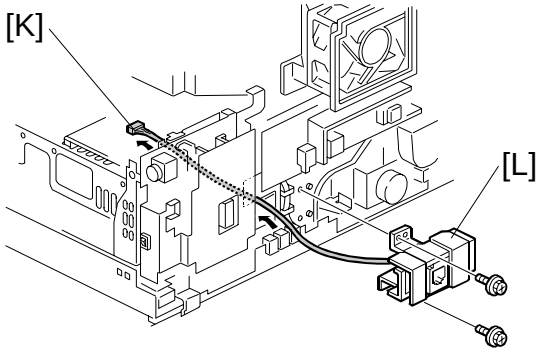
H133I505.WMF

6. Attach the SG3 board [J] (2 screws) to the interface board.



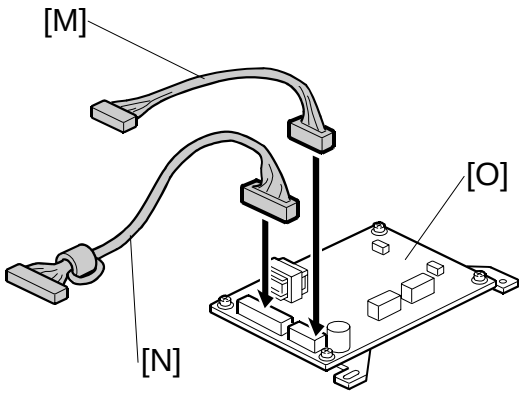
H133I506.WMF

7. First, run cable [K] though the bracket. Then attach the bracket [L] (2 screws).
   NOTE: Make sure that the cable is not pinched between the bracket [L] and the machine.



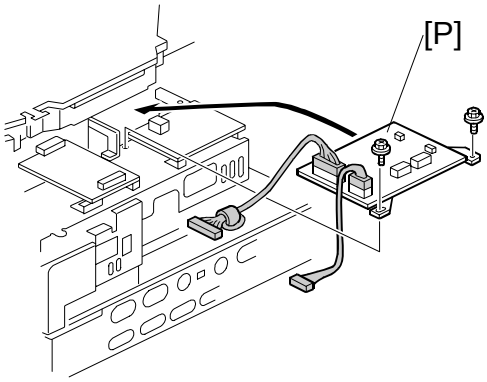
H133I507.WMF

8. Connect cables [M] and [N] to the NCU board [O].
   NOTE: Cable [M] is for European and Asian models only.



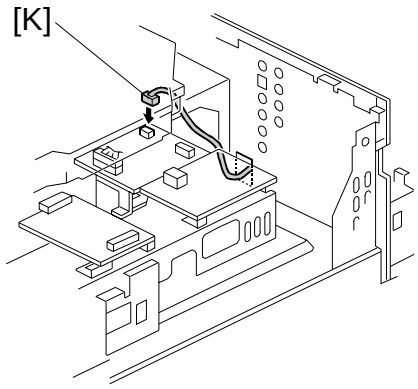
H133I508.WMF

9. Attach the NCU assembly [P] (2 screws) to the machine.



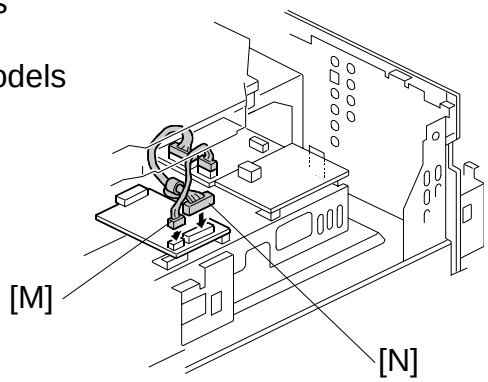
H133I509.WMF

10. Connect cable [K] to the NCU as shown.



H133I510.WMF

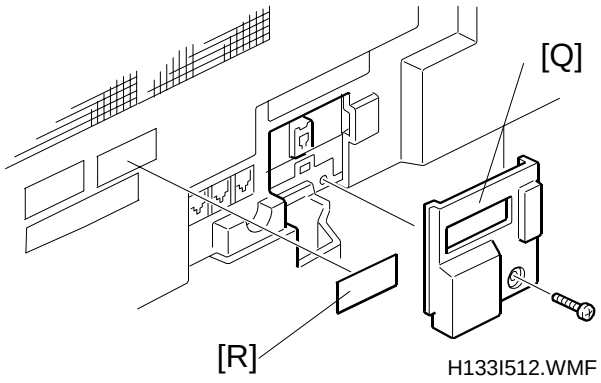
11. Connect cables [M] and [N] to the SG3 board as shown.
    NOTE: Cable [M] is for European and Asian models only.



H133I511.WMF

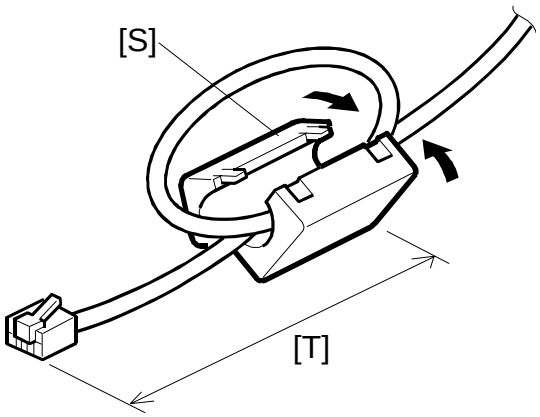
12. Replace the operation panel, and the top, right, and rear covers.

13. Attach the small cover [Q] (1 screw) contained in the G3 interface unit, and attach the FCC/IC approval label [R] to the rear of the machine as shown.



H133I512.WMF

14. Loop the telephone cable and attach the ferrite core [S] as shown. Then connect the telephone cable to the machine.
    NOTE: The telephone cable loop should be about 5 cm (2 inches) [T] from the end of the cable.
15. Plug in the machine and turn on the main power switch.
16. Enter the service mode and set bit 1 of communication switch 16 to "1."



H133I513.WMF

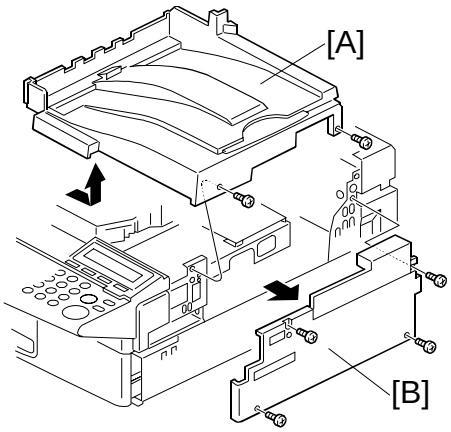
17. Exit the service mode and turn off the machine, then turn the machine back on.
18. Enter the service mode again, print the system parameter list and make sure that "G3" is listed as an option. Then exit the service mode.
19. Program the items required for PSTN-2 communications.
    - RTI for PSTN-2
    - CSI for PSTN-2
    - Telephone line type

End of Procedure

3.4.7 PC FAX EXPANDER TYPE 500

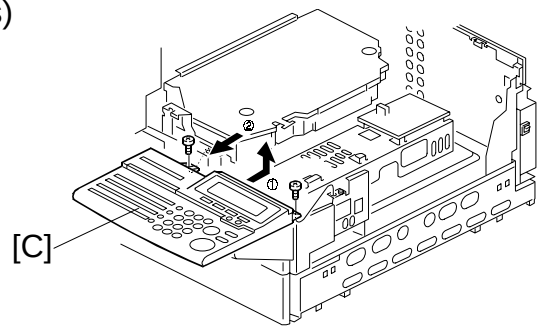
NOTE: This unit cannot be installed at the same time as the LAN unit (NIC fax unit).

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



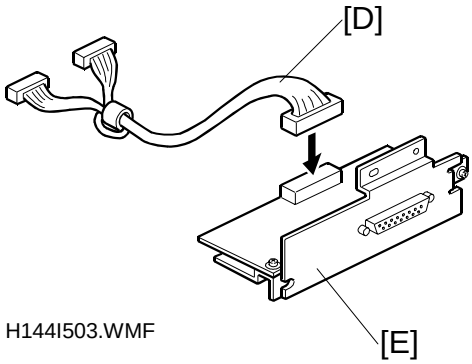
H144I501.WMF

2. Remove the operation panel [C] (2 screws) as shown.



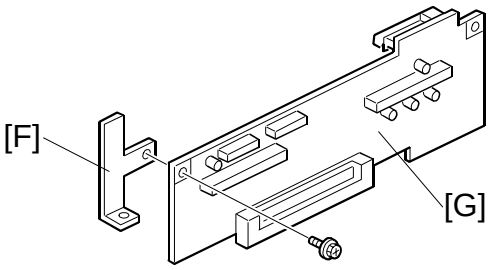
H144I502.WMF

3. Connect cable [D] to the DIU board assembly [E].



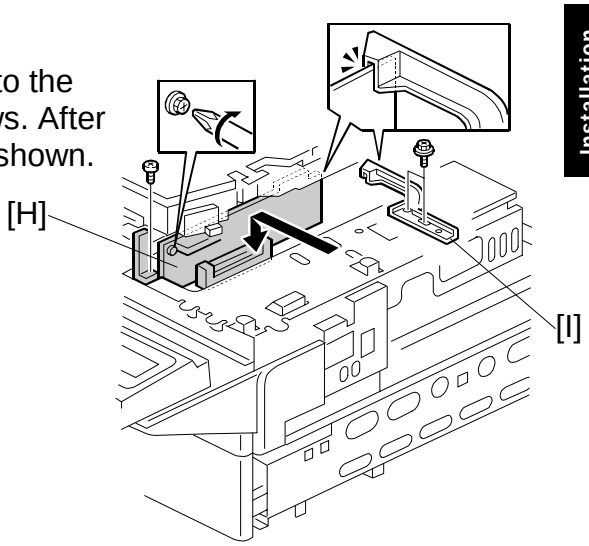
H144I503.WMF

4. Attach bracket [F] (1 screw) to the interface board [G] as shown.
   NOTE: Be sure to tighten the screw only temporarily at this moment.



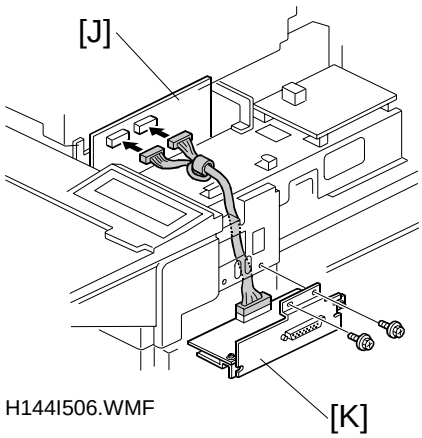
H144I504.WMF

5. Attach the interface board assembly [H] to the machine (1 screw), then tighten all screws. After that, attach the bracket [I] (2 screws) as shown. Then replace the operation panel.



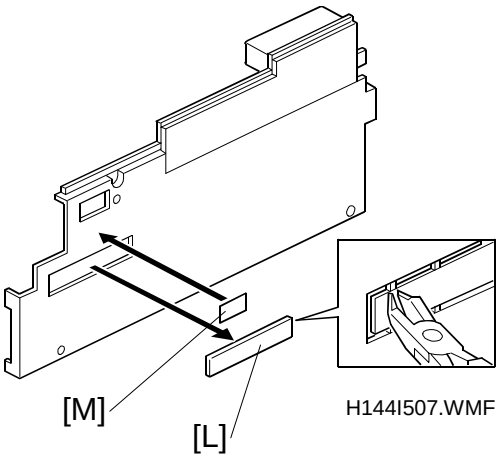
H144I505.WMF

6. Run the cable through the bracket, then connect it to the interface board assembly [J]. Attach the DIU board assembly [K] to the machine (2 screws).



H144I506.WMF

7. Cut away the small cover [L] and attach the decal [M] to the right cover.



8. Replace the top and the right covers.

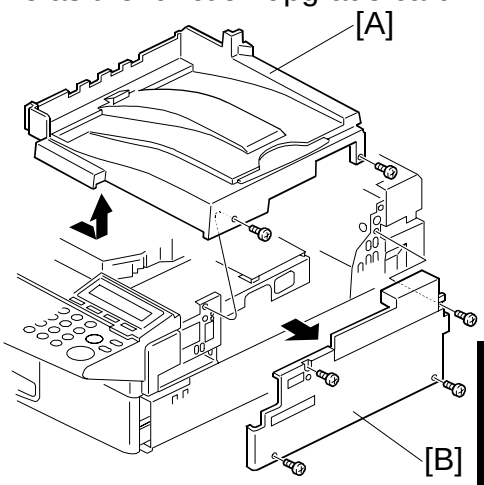
9. Plug in the machine and turn on the main power switch.
10. Enter the service mode and set bit 5 of system switch 06 to “1”.
11. Exit the service mode and turn off the machine, then turn the machine back on.
12. Enter the service mode again, print the system parameter list and make sure that “PC-FAX EXPANDER” is listed as an option. Then exit the service mode.

End of Procedure

3.4.8 FAX ON DEMAND TYPE 500

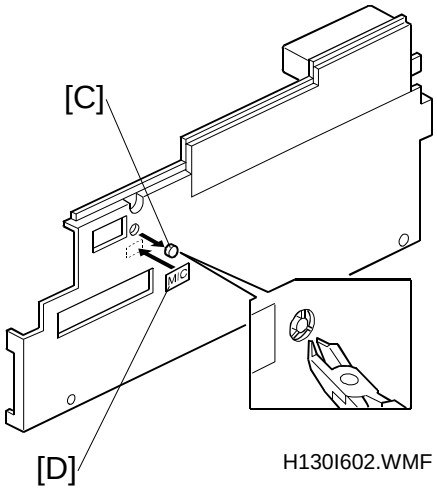
NOTE: This unit cannot be installed at the same time as the function upgrade card.

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



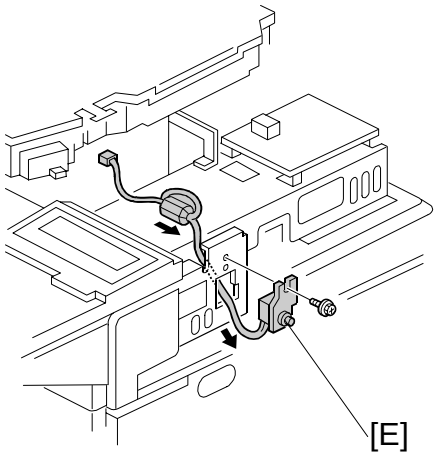
H130I601.WMF

2. Cut away the small cover [C] and attach it to the decal [D] as shown.



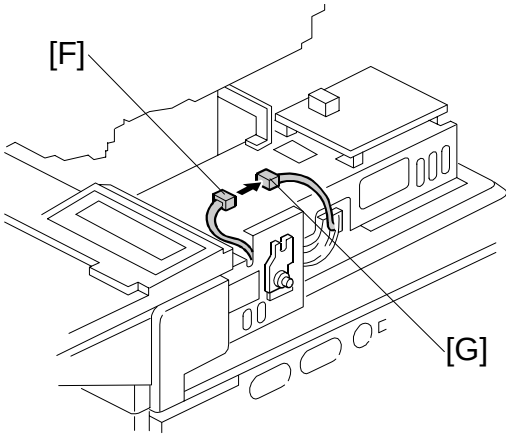
H130I602.WMF

3. Attach the bracket [E] (1 screw) to the machine.



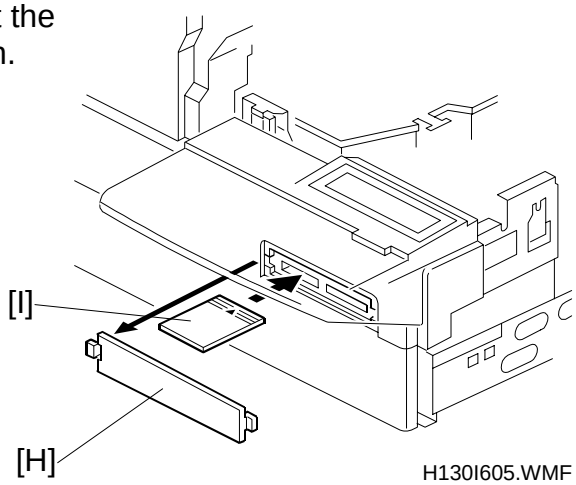
H130I603.WMF

4. Connect the cable with the black connector [F] to connector [G].



H130I604.WMF

5. Remove the small cover [H] and insert the FOD card [I] into the **left** slot as shown. Then replace the small cover [H].



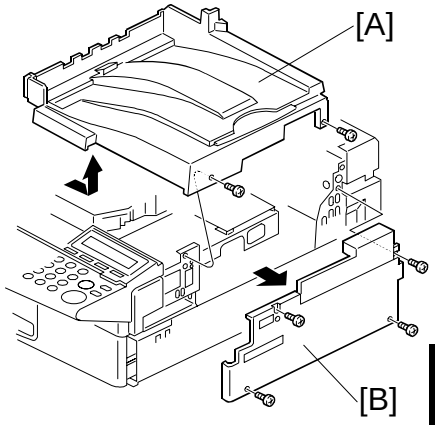
H130I605.WMF

6. Replace the top and the right covers.
7. Plug in the machine and turn on the main power switch.
8. Enter the service mode and set bit 0 of system switch 16 to “1”. Then print the system parameter list, then make sure that “FOD” is listed as an option. Then exit the service mode.
9. Remind the user to connect the microphone from the FOD kit.

End of Procedure

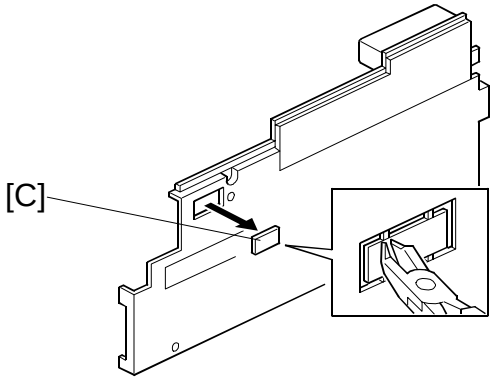
3.4.9 COUNTER TYPE 100

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



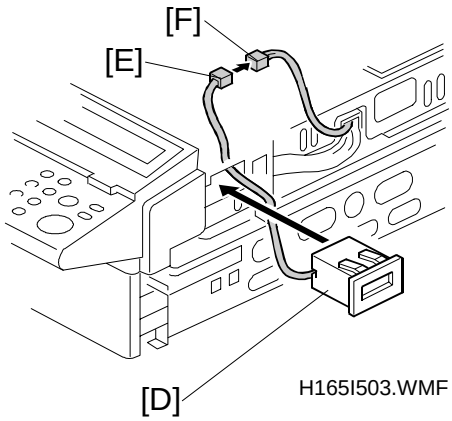
H165I501.WMF

2. Cut away the small cover [C] as shown.



H165I502.WMF

3. Attach the counter [D] to the machine, then connect cable [E] to the white connector [F].



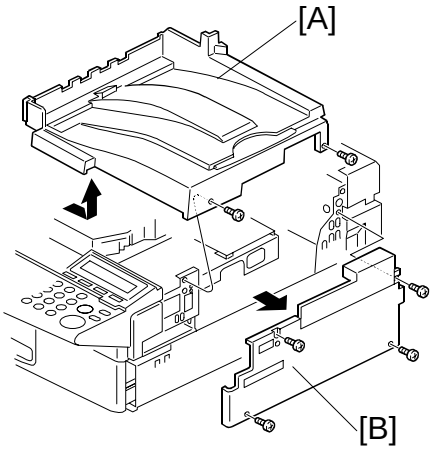
H165I503.WMF

4. Replace the top and the right covers.
5. Make some copies and check whether the counter works or not. If it doesn't, check the cable connection from the counter to the FCU.

End of Procedure

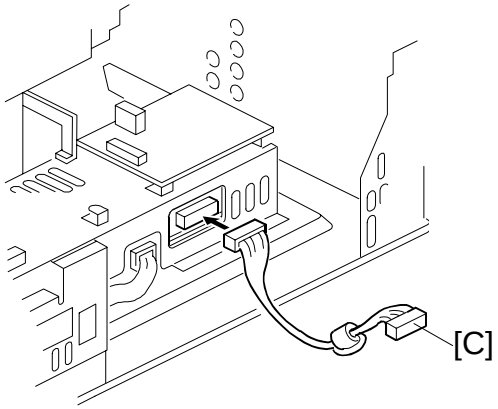
3.4.10 PRINTER INTERFACE TYPE 500

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



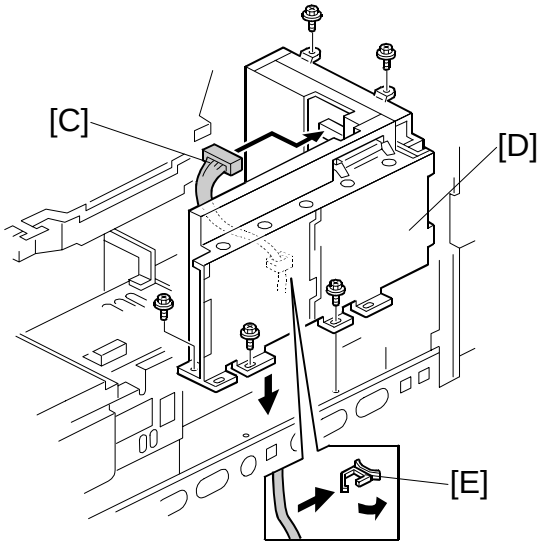
H144I601.WMF

2. Connect cable [C] to the FCU board.



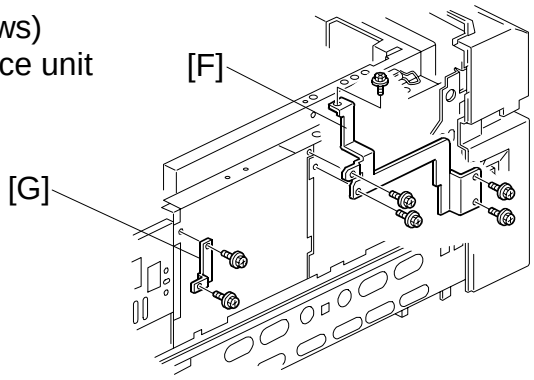
H144I602.WMF

3. Attach the printer interface [D] to the machine (5 screws) and connect cable [C] to the printer interface. Then run the cable [C] through the clamp [E] as shown.
   NOTE: Make sure that the cable is not pinched between the printer interface [D] and the machine.



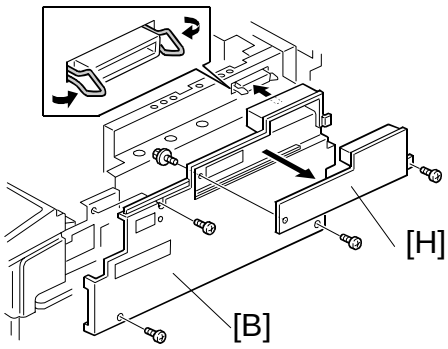
H144I603.WMF

4. Attach the grounding plates [F] (5 screws) and [G] (2 screws) to the printer interface unit as shown.



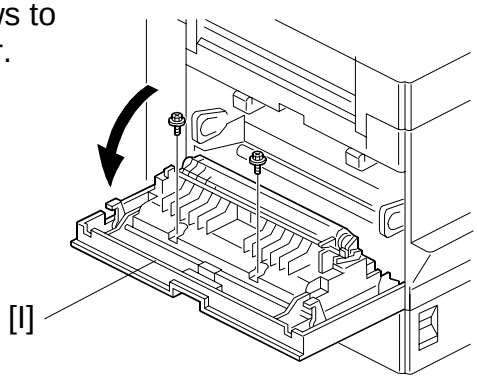
H144I604.WMF

5. Remove the small cover [H] (1 screw) then replace the right cover [B] as shown.



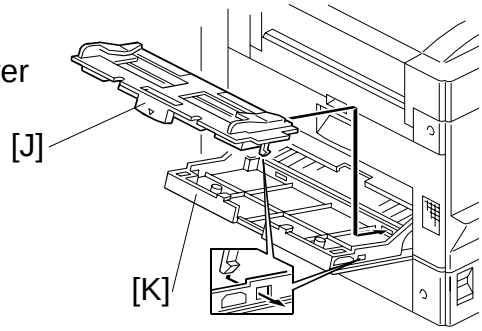
H144I605.WMF

6. Open the left cover [I]. Remove the 2 screws to separate the small cover from the left cover.



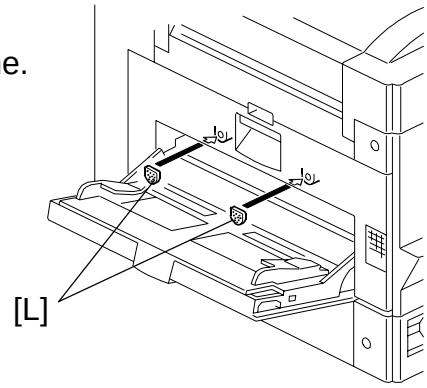
H144I606.WMF

7. Attach the guide plate [J] to the left small cover [K] separated in step 6, as shown.



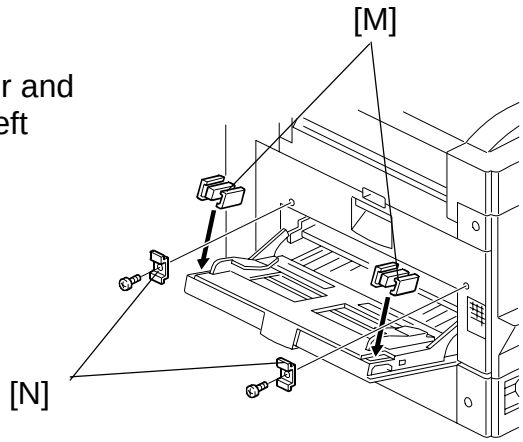
H144I607.WMF

8. Attach cushions [L] to the left side of the machine.



H144I608.WMF

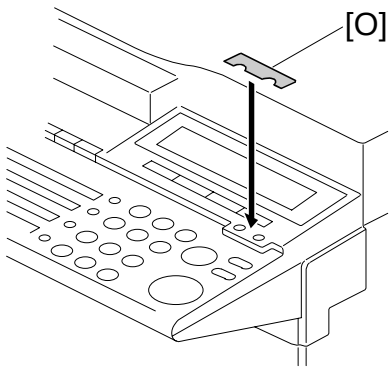
9. Attach magnet catches [M] to the left cover and small brackets [N] (1 screw each) on the left side of the machine as shown.



H144I609.WMF

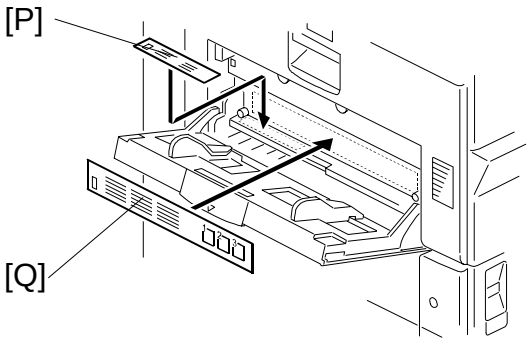
10. Replace the top cover.

11. Attach the decal [O] to the operation panel as shown.



H144I610.WMF

12. Attach decals [P] and [Q] as shown.



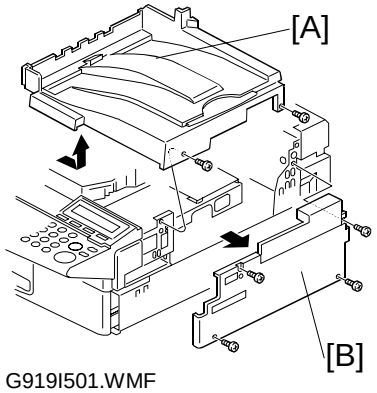
H144I611.WMF

13. Plug in the machine and make sure that the parallel cable is not connected to the controller, then turn the machine on.
14. Enter the printer service mode (User Tools – [Printer] – #+2) and change the Product Name to " "(blank). Then press "ESCAPE".
15. Print the Print Log page to check that the printer controller is connected correctly. Then exit service mode (#+×).
16. Enter the service mode again and print the system parameter list, then make sure that "PRINTER INTERFACE" is listed as an option. Then exit the service mode.
17. If the parallel cable is going to be connected, turn off the machine first, connect the parallel cable, and then turn the machine back on again.

End of Procedure

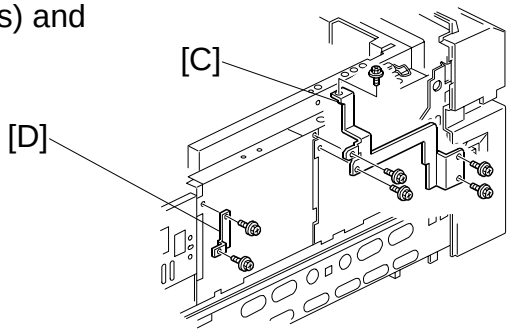
3.4.11 NETWORK INTERFACE BOARD TYPE 2000

1. Remove the top cover [A] (2 screws) and right cover [B] (4 screws).



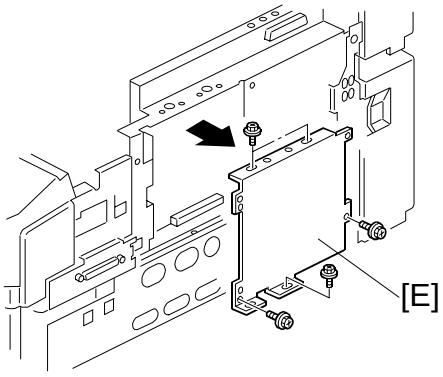
G919I501.WMF

2. Remove the grounding plates [C] (5 screws) and [D] (2 screws).



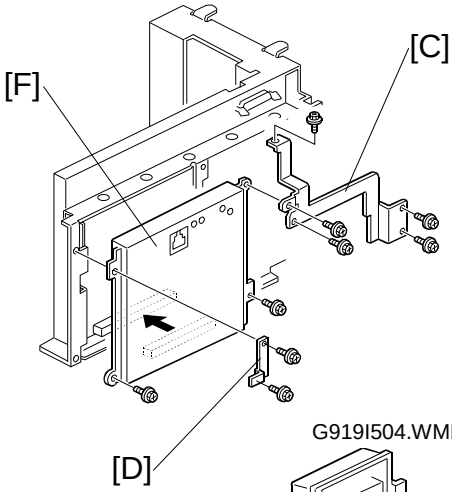
G919I502.WMF

3. Remove the printer interface right plate [E] (5 screws).



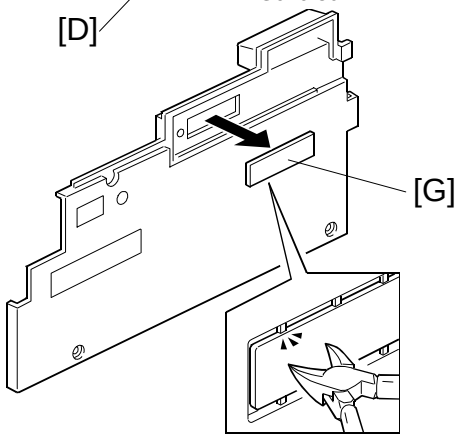
G919I503.WMF

4. Attach the network interface board [F] to the printer interface (2 screws). Then replace the grounding plates [C] and [D] as shown.



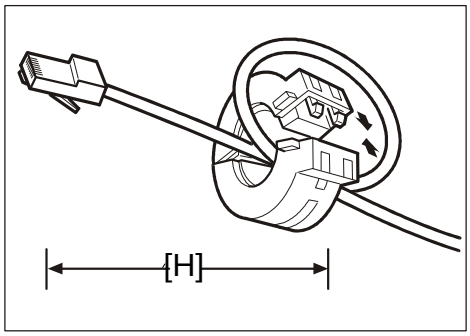
G919I504.WMF

5. Remove the cutout [G] from the right cover. Then replace the top cover and right cover.



G919I505.WMF

6. Loop the network interface cable and attach the ferrite core as shown in the illustration.
   NOTE: The network interface cable loop should be about 15 cm (6") [H] from the end of the cable (on the end closest to the printer).



G919I506.WMF

7. Attach the network interface cable to the jack on the board. Then connect the other end of the network interface cable to the network expansion device.
8. Plug in the machine and turn on the main power switch.

End of Procedure

4. SERVICE TABLES AND PROCEDURES

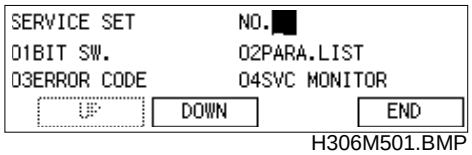
4.1 SERVICE LEVEL FUNCTIONS

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

Start key	Back - Back key	OK – OK Key
Stop key	- Right arrow key	
User Tools – User Tools key	- Left arrow key	
+ - + Key	Up - Up arrow key	
- - - Key	Down - Down arrow key	

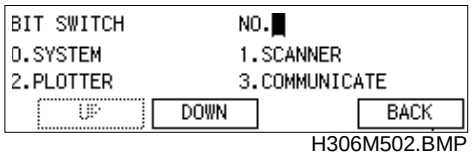
4.1.1 BIT SWITCH PROGRAMMING (FUNCTION 01)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



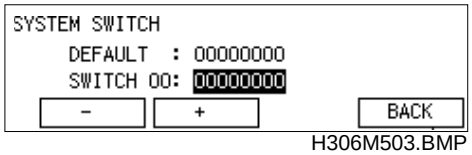
H306M501.BMP

2. 0 1



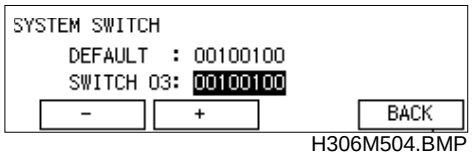
H306M502.BMP

3. To see the system bit switches: 0
   To see the scanner switches: 1
   To see the printer switches: 2
   To see the communication switches: 3
   To see the G3 switches: 4
   Example: Press 0



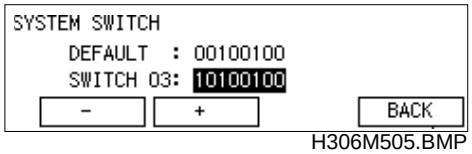
H306M503.BMP

4. Scroll through the bit switches.
   Increment bit switch: +
   Decrement bit switch: -
   Example: Display bit switch 3: + x 3



H306M504.BMP

5. Adjust the bit switch.
   Example: To change the value of bit 7, press 7

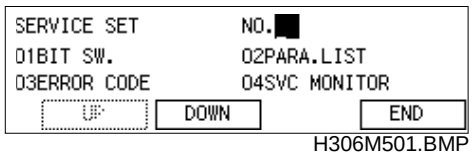


H306M505.BMP

6. Either:
   - Adjust more bit switches - go to step 4.
   - Finish – Back User Tools

4.1.2 SYSTEM PARAMETER LIST (FUNCTION 02)

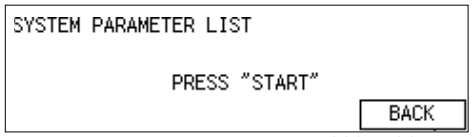
1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

2. 0 2

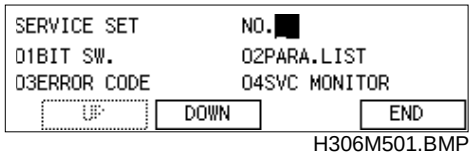
3. ◈



H306M506.BMP

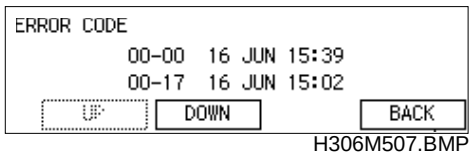
4.1.3 ERROR CODE DISPLAY (FUNCTION 03)

1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

2. 0 3

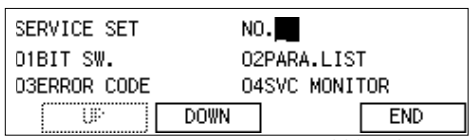


H306M507.BMP

3. Either:
   Scroll through the error codes - Up or Down
   Finish – Back User Tools

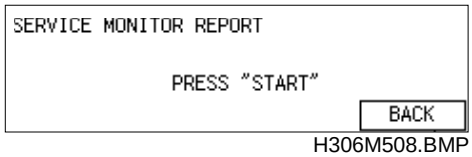
4.1.4 SERVICE MONITOR REPORT (FUNCTION 04)

1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

2. 0 4

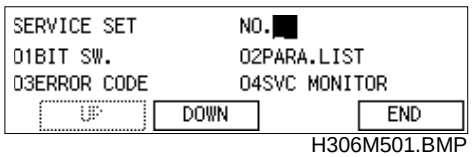


H306M508.BMP

3. ◈

4.1.5 GROUP 3 PROTOCOL DUMP (FUNCTION 05)

1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

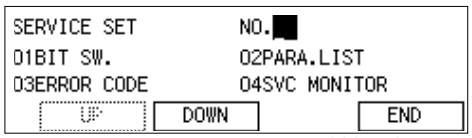
2. 0 5

H306M509.BMP

3. To select the type of list (the most recent communication or all that is stored in the log): ◀ or ▶
4. ◈

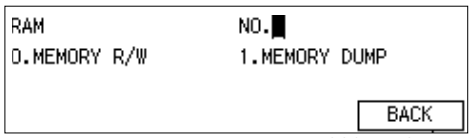
4.1.6 RAM DISPLAY/REWRITE (FUNCTION 06)

1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

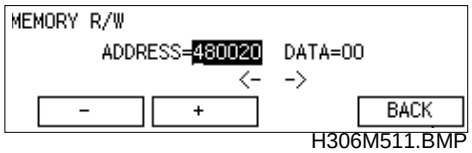
2. 0 6



H306M510.BMP

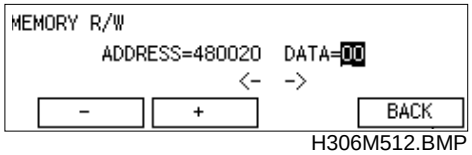
3. 0

4. Input the address that you wish to see.
   Example: Address 480020
   4 8 0 0 2 0



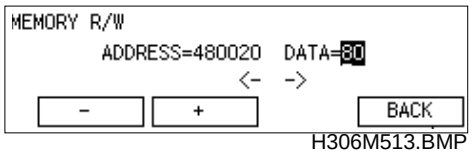
H306M511.BMP

5. If you wish to change the data, move the cursor to the data field: press ▶.



H306M512.BMP

6. Type in the new data.
   Example: 80, press 8 0

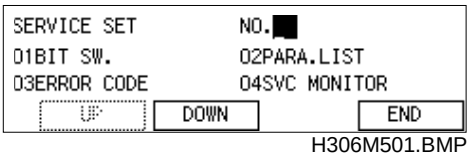


H306M513.BMP

7. Either:
   - View the previous address - press -.
   - View the next address - press +.
   - Finish – Back User Tools

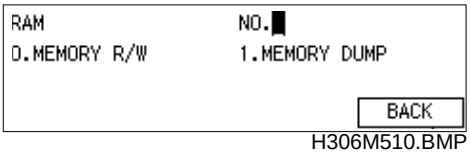
4.1.7 RAM DUMP (FUNCTION 06)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



H306M501.BMP

2. 0 6



H306M510.BMP

3. 1

H306M514.BMP

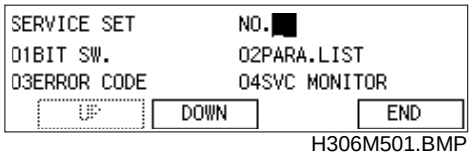
4. Enter the first four digits of the start and end addresses.
   Example: Start at 480000, end at 4801FF.

H306M515.BMP

5. ◇

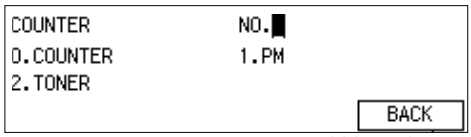
4.1.8 COUNTER DISPLAY/REWRITE (FUNCTION 07)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



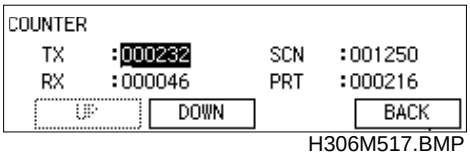
H306M501.BMP

2. 0 7



H306M516.BMP

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



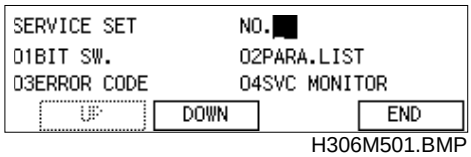
H306M517.BMP

   Check the PM counter - press 1
   Check the Toner counter (AIO counter) - press 2
   Example: Press 0

4. To change the contents of a counter, input the new value, then press Back.
5. To finish: Back User Tools

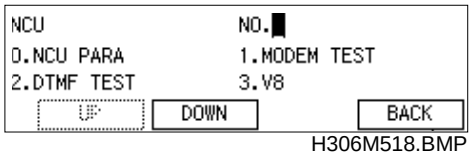
4.1.9 NCU PARAMETERS (FUNCTION 08)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



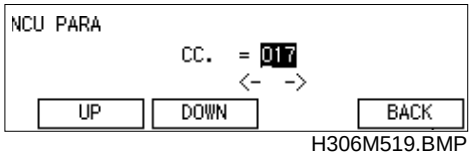
H306M501.BMP

2. 0 8



H306M518.BMP

3. 0



H306M519.BMP

4. Scroll through the parameters using Up or Down. If you want to change a value, enter the new value at the keypad, then press Back.

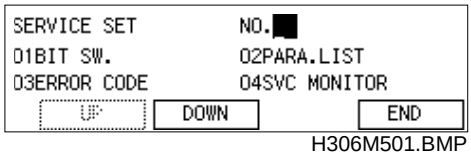
5. To finish : Back User Tools.

   NOTE: Parameter CC is the Country Code, Parameter 01 is the Tx level.

   NOTE: If you change the NCU country code and exit the service mode, the bit switch country code (System Bit Switch 0F) will automatically be changed to the code for the same country as the new NCU code. The bit switch settings also automatically return to the defaults for that country, including bit switches related to optional units. Therefore, for example, if 40MB memory is installed, any data remaining in the memory will be lost.

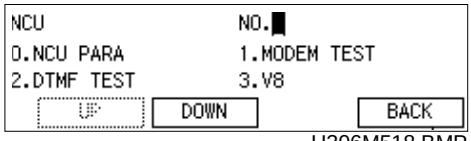
4.1.10 MODEM TEST (FUNCTION 08)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



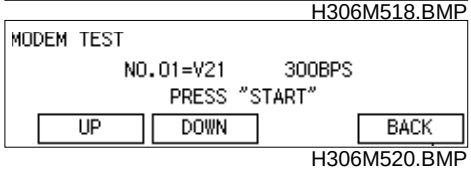
H306M501.BMP

2. 0 8



H306M518.BMP

3. 1



H306M520.BMP

4. Scroll through the available tests using Up or Down .

5. To start a test: ◇

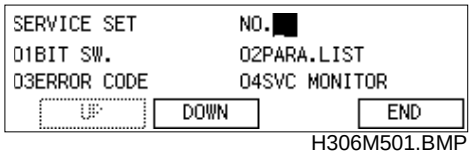
6. To stop the test: ▽

7. To finish: Back User Tools

Service Tables

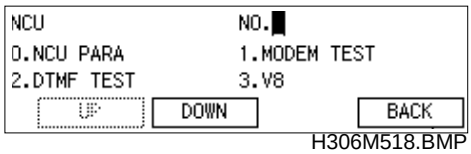
4.1.11 DTMF TONE TEST (FUNCTION 08)

1. [User Tools] [2]
   then immediately [1] [9] [9] [8] [◇]
   within 3 seconds



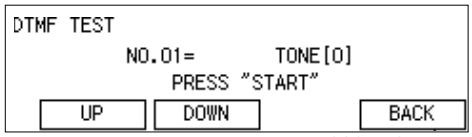
H306M501.BMP

2. [0] [8]



H306M518.BMP

3. [2]

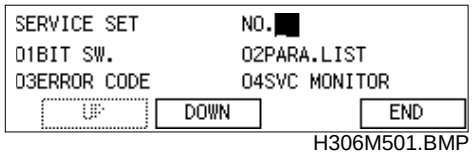


H306M521.BMP

4. Scroll through the available tests using [Up] or [Down].
5. To start a test: [◇]
6. To stop the test: [▽]
7. To finish: [Back] [User Tools]

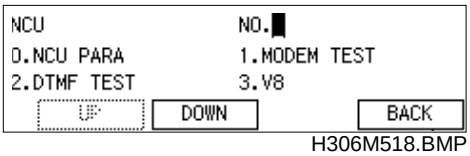
4.1.12 V.8 MODEM TEST (FUNCTION 08)

1. [User Tools] [2]
   then immediately [1] [9] [9] [8] [◇]
   within 3 seconds



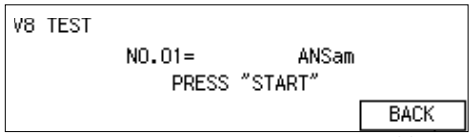
H306M501.BMP

2. [0] [8]



H306M518.BMP

3. [3]

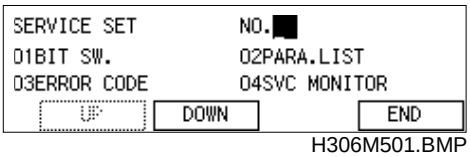


H551M522.BMP

4. Press [◇] to start the test
5. To stop : [▽]
6. To finish: [Back] [User Tools]

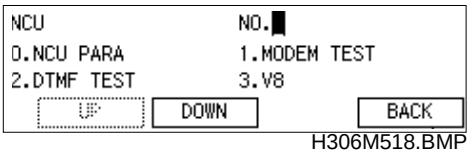
4.1.13 V.34 MODEM TEST (FUNCTION 08)

1. [User Tools] [2]
   then immediately [1] [9] [9] [8] [◇]
   within 3 seconds



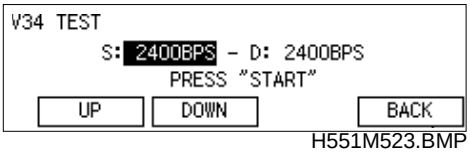
H306M501.BMP

2. [0] [8]



H306M518.BMP

3. [4]



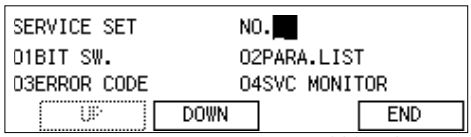
H551M523.BMP

4. Select the data rate using [Up] or [Down]
5. Press [◇]

6. To stop : [▽]
7. To finish: [Back] [User Tools]

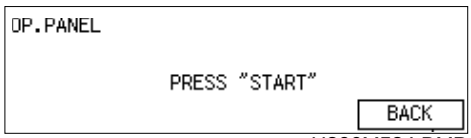
4.1.14 OPERATION PANEL TEST (FUNCTION 09)

1. [User Tools] [2]
   then immediately [1] [9] [9] [8] [◇]
   within 3 seconds



H306M501.BMP

2. [0] [9]



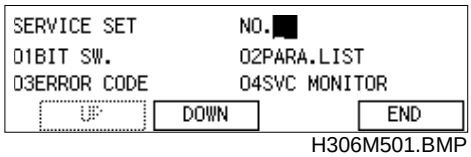
H306M524.BMP

3. To start the test, press [◇].
   The screen should turn black and all LEDs and indicators should light.
4. To stop the test, press [▽]
5. To finish: [Back] [User Tools]

Service Tables

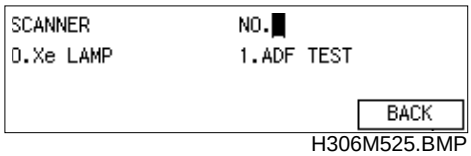
4.1.15 XENON LAMP TEST (FUNCTION 10)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



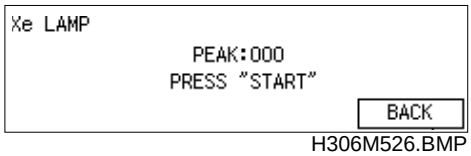
H306M501.BMP

2. 1 0



H306M525.BMP

3. 0

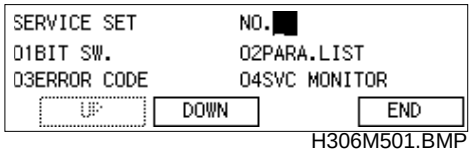


H306M526.BMP

4. To start the test, press ◇
5. To stop the test, press ▽
6. To finish: Back User Tools

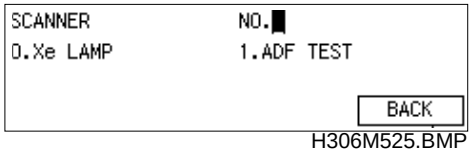
4.1.16 ADF TEST (FUNCTION 10)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



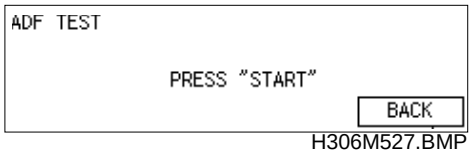
H306M501.BMP

2. 1 0



H306M525.BMP

3. 1

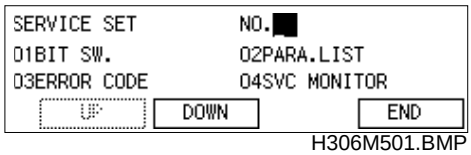


H306M527.BMP

4. Place a document in the feeder, then press ◇ .
5. To stop the test, press ▽ .
6. Finish: Back User Tools

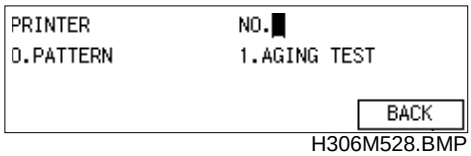
4.1.17 PRINTER TEST PATTERNS (FUNCTION 11)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



H306M501.BMP

2. 1 1



H306M528.BMP

3. 0

H306M529.BMP

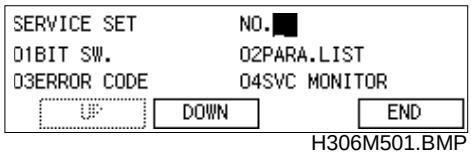
4. Press a key from 0 to 6 or Up Down.

5. Press ◇.
   A test pattern is printed.

6. To finish: Back User Tools

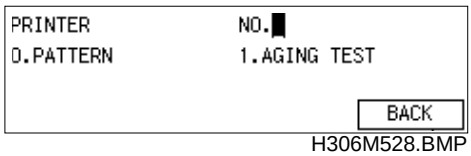
4.1.18 SCANNER AND PRINTER MECHANISM TEST - FREE RUN (FUNCTION 11)

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



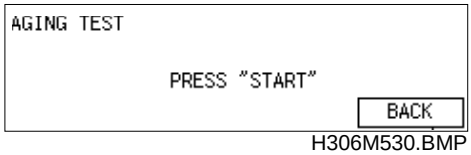
H306M501.BMP

2. 1 1



H306M528.BMP

3. 1



H306M530.BMP

4. To start the free run, press ◇.

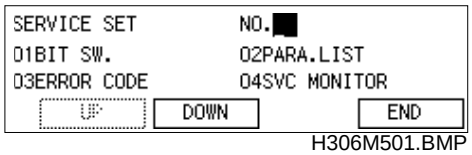
5. To stop the test, press ▽.

6. To finish: Back User Tools

Service Tables

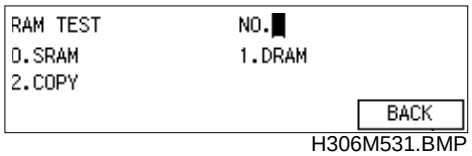
4.1.19 RAM TESTS (FUNCTION 12)

1. User Tools 2
   then immediately 1 9 9 8 ◈
   within 3 seconds



H306M501.BMP

2. 1 2



H306M531.BMP

3. Either:

   Test the SRAM: Press 0 ◈
   Test the DRAM: Press 1 ◈
   If test is successful, the display shows "OK!!".
   If test is unsuccessful, the display shows "ADDRESS=".

4. To finish:
   Back User Tools

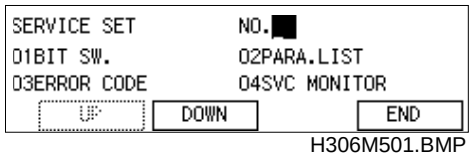
4.1.20 DATA COPY (FUNCTION 12)

This function allows ROM and SRAM data transfer between the FCU/SG3/SiG4/NICF board inside the machine and an external flash memory card or FCU board. Refer to the following sections for details.

- Section 6.9.1 - FCU program download (IC card to machine)
- Section 6.9.2 - FCU program upload (machine to IC card)
- Section 6.9.3 - FCU SRAM restore (IC card or previous FCU to machine)
- Section 6.9.4 - FCU SRAM backup (machine to IC card)
- Section 6.9.5 -Optional G3 unit control program download (IC card to machine
- Section 6.9.6 - Optional G3 unit modem program download (IC card to machine
- Section 6.9.7 - G4 unit program download (IC card to machine)
- Section 6.9.8 - NICF program download (IC card to machine)

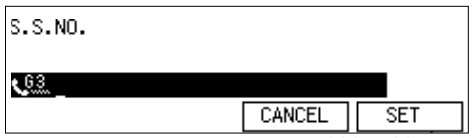
4.1.21 SERVICE STATION FAX NUMBER (FUNCTION 13)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



H306M501.BMP

2. 1 3



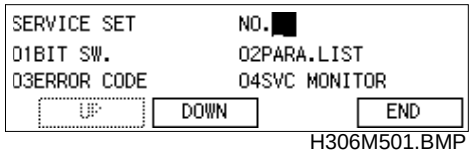
H306M538.BMP

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

4. If the display is correct: Press (Set) then User Tools

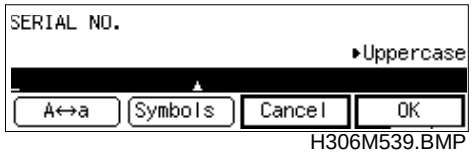
4.1.22 SERIAL NUMBER (FUNCTION 14)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



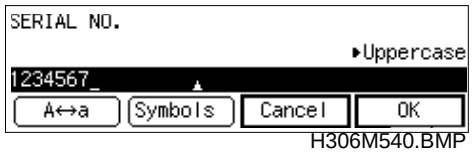
H306M501.BMP

2. 1 4



H306M539.BMP

3. Enter the machine's serial number at the keypad.
   To correct a mistake:



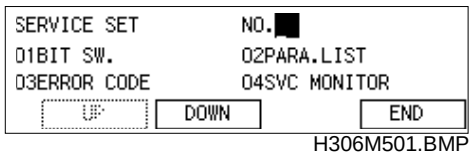
H306M540.BMP

4. If the display is correct: OK

4.1.23 40 MB FLASH MEMORY INITIALIZATION (FUNCTION 16)

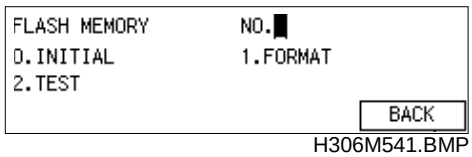
This deletes all files stored in the optional 40MB flash memory card.

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



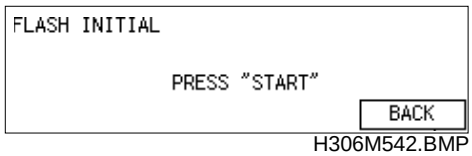
H306M501.BMP

2. 1 6



H306M541.BMP

3. 0



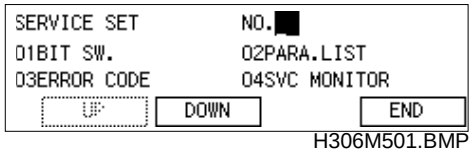
H306M542.BMP

4. ◇
   If the initialization was completed without error, **OK!!** will be displayed.
   If there was an error, **NG!!** will be displayed.

4.1.24 40 MB FLASH MEMORY FORMATTING (FUNCTION 16)

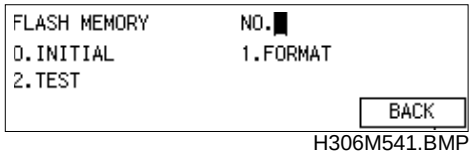
This formats the optional 40MB flash memory card, and deletes all data on the card.

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



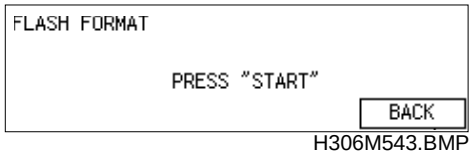
H306M501.BMP

2. 1 6



H306M541.BMP

3. 1

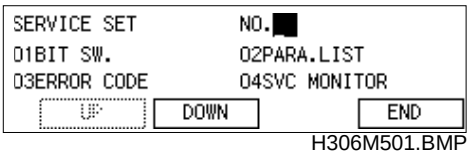


H306M543.BMP

4. ◇
   If the format was completed without error, **OK!!** will be displayed.
   If there was an error, **NG!!** will be displayed.

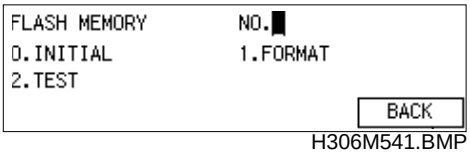
4.1.25 40 MB FLASH MEMORY TEST (FUNCTION 16)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



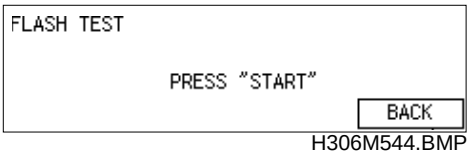
H306M501.BMP

2. 1 6



H306M541.BMP

3. 2



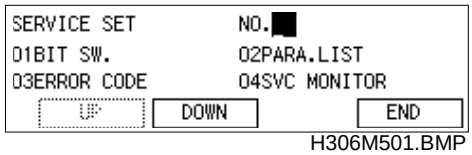
H306M544.BMP

4.
   If the test was completed without error, **OK!!** will be displayed.
   If there was an error, **NG!!** will be displayed.

Service Tables

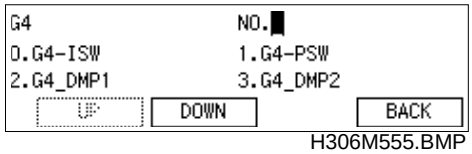
4.1.26 G4 PARAMETER PROGRAMMING (FUNCTION 17)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



H306M501.BMP

2. 1 7



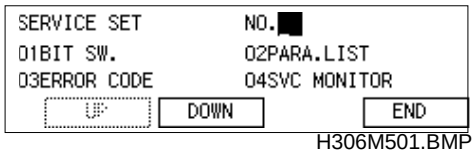
H306M555.BMP

Refer to the service manual for the ISDN G4 option for further details of the G4 parameter programming procedures.

4.1.27 OPTIONAL G3 BIT SWITCHES (FUNCTION 18)

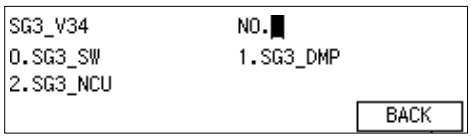
The SG3 bit switches are for the optional G3 NCU. The settings are similar to the usual G3 switches (for the standard G3 NCU), but they are kept separate. This allows the two NCUs to have different settings.

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



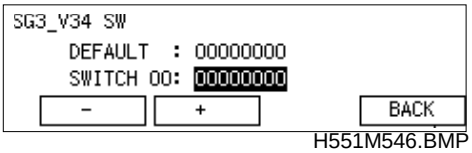
H306M501.BMP

2. 1 8



H551M545.BMP

3. 0



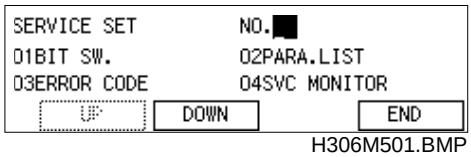
H551M546.BMP

4. Scroll through the bit switches using - or + and adjust the switches as needed.

4.1.28 OPTIONAL SG3 BOARD RAM DUMP (FUNCTION 18)

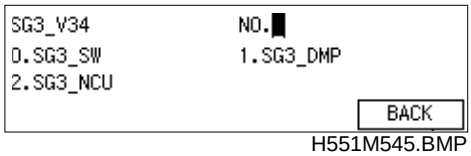
Use this to make a dump of the SG3 board's NCU RAM addresses (see 4.3 NCU Parameters for details).

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



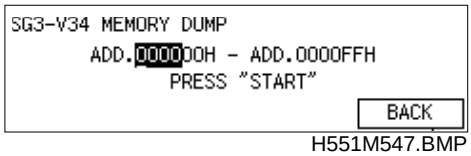
H306M501.BMP

2. 1 8



H551M545.BMP

3. 1



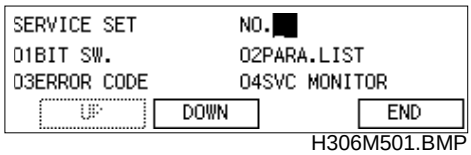
H551M547.BMP

4. Enter the first four digits of the start and end addresses.
5. ◇

4.1.29 OPTIONAL SG3 BOARD NCU PARAMETERS (FUNCTION 18)

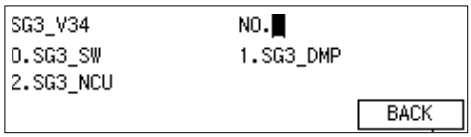
These parameters are for the optional G3 NCU. The parameters are similar to the standard NCU parameters (Function 08), but they are kept separate. This allows the two NCUs to have different settings.

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



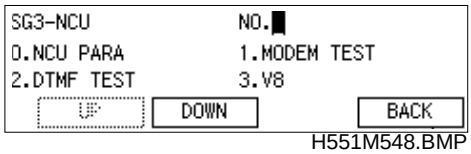
H306M501.BMP

2. 1 8



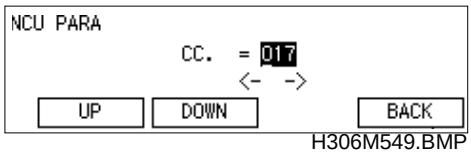
H551M545.BMP

3. 2



H551M548.BMP

4. 0



H306M549.BMP

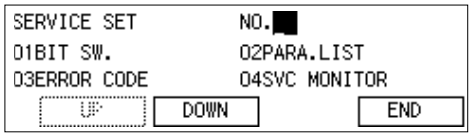
5. Scroll through the parameters using ▲ or ▼ . If you want to change a value, enter the new value at the keypad, then press Back .
6. To finish Back User Tools.

NOTE: 1) Parameter CC is the Country Code, Parameter 01 is the Tx level.
2) If you change the NCU country code and exit the service mode, the bit switch country code (System Bit Switch 0F) will not be changed (compare this with the NCU country code for the standard NCU – see Function 08).

4.1.30 OPTIONAL SG3 BOARD MODEM TEST (FUNCTION 18)

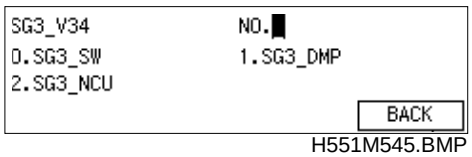
The speaker cannot be used for this test.

1. User Tools 2
   then immediately 1 9 9 8 ◇
   within 3 seconds



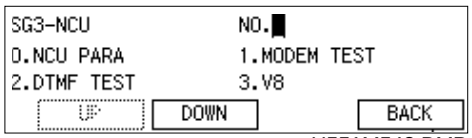
H306M501.BMP

2. 1 8



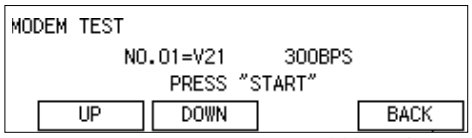
H551M545.BMP

3. 2



H551M548.BMP

4. 1



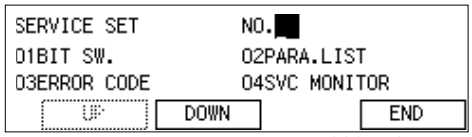
H306M550.BMP

5. Scroll through the available tests using Up or Down.
6. To start a test: ◇
7. To stop the test: ▽
8. To finish: Back User Tools

4.1.31 OPTIONAL SG3 BOARD DTMF TONE TEST (FUNCTION 18)

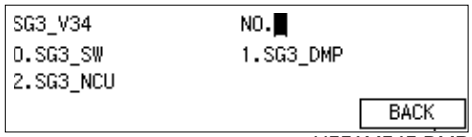
The speaker cannot be used for this test.

1. [User Tools] [2]
   then immediately [1] [9] [9] [8] [◇]
   within 3 seconds



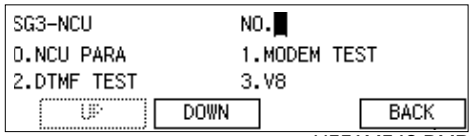
H306M501.BMP

2. [1] [8]



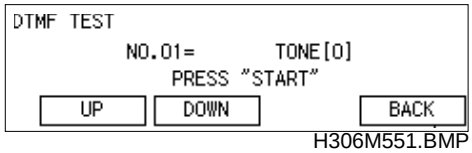
H551M545.BMP

3. [2]



H551M548.BMP

4. [2]



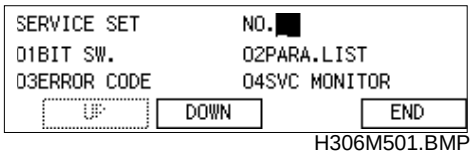
H306M551.BMP

5. Scroll through the available tests using [Up] or [Down] .
6. To start a test: [◇]
7. To stop the test: [▽]
8. To finish: [Back] [User Tools]

Service Tables

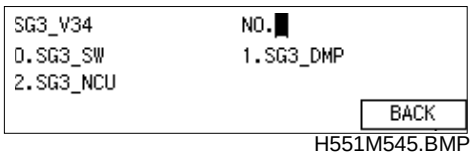
4.1.32 OPTIONAL SG3 BOARD V.8 MODEM TEST (FUNCTION 18)

1. User Tools 2
   then immediately 1 9 9 8
   within 3 seconds



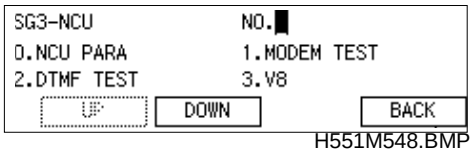
H306M501.BMP

2. 1 8



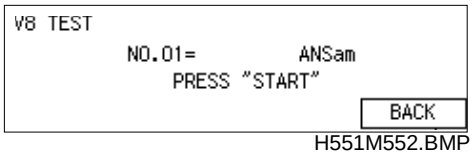
H551M545.BMP

3. 2



H551M548.BMP

4. 3

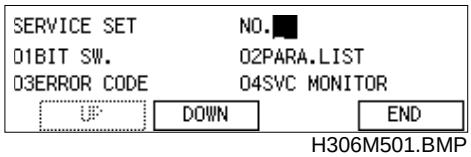


H551M552.BMP

5. Press ◇ to start the test
6. To stop : ▽
7. To finish: Back User Tools

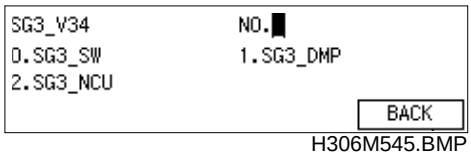
4.1.33 OPTIONAL SG3 BOARD V.34 MODEM TEST (FUNCTION 18)

1. User Tools 2
then immediately 1 9 9 8
within 3 seconds



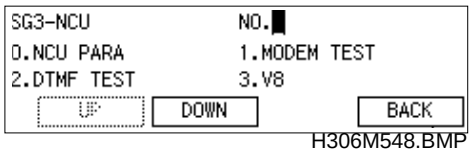
H306M501.BMP

2. 1 8



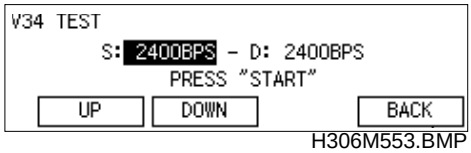
H306M545.BMP

3. 2



H306M548.BMP

4. 4

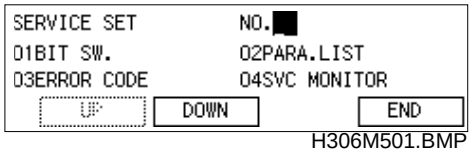


H306M553.BMP

5. Select the data rate using Up or Down
6. Press ◇
7. To stop : ▽
8. To finish: Back User Tools

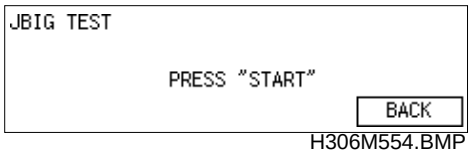
4.1.34 JBIG TEST (FUNCTION 21)

1. User Tools 2
then immediately 1 9 9 8 ◇
within 3 seconds



H306M501.BMP

2. 2 1



H306M554.BMP

3. If the test was completed without error, OK!! will be displayed.
If there was an error, NG!! will be displayed.

Service Tables

4.2 BIT SWITCHES

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

NOTE: This manual does not list default settings for bit switches. Refer to the System Parameter List.
The switches that have been changed from the previous model (FR4) are shaded.

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. substitute RX files). This is the recommended setting when the SAF requires clearing. **Reset Level 2:** This level erases the following items in addition to those erased by Reset Level 3: own telephone number, bit switches (excluding country code), RTI/TTI/CSI, report data, programmed telephone numbers (Quick/Speed/Groups, service station, etc.), NCU parameters. The NCU country code is also set to the same as the bit switch country code (System Bit Switch 0F). After erasing, the machine automatically changes these two bits back to 0. **No reset:** Normal operation **Cross-reference** **RAM Reset Level 1 (Factory reset):** Change the RAM address data from 480005(H) to FF(H), then turn the machine off and on. In addition to those items erased by Reset Level 2, the clock, country code (the default country code is UK), scan margin settings, and print registration settings are erased.

System Switch 00		
No	**FUNCTION**	**COMMENTS**
2	Technical data printout on Journal **0:** Disabled **1:** Enabled	1: Instead of a personal code, the Journal lists the following data for each analog G3 communication. E.g. 32 V34 288 M 01 00 03 02 **First number:** Symbol rate (V.34 only) **Second number:** Final modem type used **Third number:** Final date rate (for example, 288 means 28.8 KBPS) **Fourth number:** M means modem EQM. L means RX level. **Fifth and sixth number:** Line quality data. This is either a measurement of the error rate or the RX level, 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 (refer to the note after this table for how to read the RX level). If it measures the error rate, a larger number means more errors. **Seventh number (RX mode only):** Total number of error lines that occurred during non-ECM reception. **Eighth number (RX mode only):** Total number of burst error lines that occurred during non-ECM reception. The seventh and eighth numbers are fixed at 00 for transmission records and ECM reception records.
3	Line quality data output method **0:** Error rate measurement during image data transmission **1:** Rx level	This bit determines the data type printed in the Journal when bit 2 (above) enables a technical data printout.
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. A noisy line causes such errors, for example.
5	Communication parameter display **0:** Disabled **1:** Enabled	This is a faultfinding 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 **0:** Disabled **1:** Enabled	This is used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after testing. The setting of system switch 09 bit 6 determines the types of communication that the list is printed after.

System Switch 00		
No	**FUNCTION**	**COMMENTS**
7	Amount of protocol dump data in one protocol dump list print operation **0:** Up to the limit of the memory area for protocol dumping **1:** Last communication only	Change this bit to 1 if you want to have a protocol dump list of the last communication only.

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

Example: 32 V34 288 **L 01 00** 00 00

The four-digit hexadecimal value (N) after L indicates the RX level.
The high byte is given first, followed by the low byte. Divide the decimal value of N by -16 to get the RX level.

In this above example, the decimal value of N (=0100[H]) is 256.
So, the actual RX level is 256/-16 = -16 dB.

G3 Communication Parameters

Mode	DCS: ITU-T standard NSS: Non-standard G3
Modem rate	336: 33600 BPS 168: 16800 BPS 312: 31200 BPS 144: 14400 BPS 288: 28800 BPS 120: 12000 BPS 264: 26400 BPS 96: 9600 BPS 240: 24000 BPS 72: 7200 BPS 216: 21600 BPS 48: 4800 BPS 192: 19200 BPS 24: 2400 BPS
Communication mode	ECM: With ECM NML: With no ECM
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression JBO: JBIG optional compression JBB: JBIG standard compression
Resolution	F: Fine, transmitted at 8 x 15.4 dots per mm D: Detail, transmitted at 8 x 7.7 dots per mm S: Standard, transmitted at 8 x 3.85 dots per mm 21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi)
I/O rate	0: 0 ms/line 10: 10 ms/line 25: 2.5 ms/line 20: 20 ms/line 5: 5 ms/line 40: 40 ms/line ”40” is displayed while receiving a fax message using AI short protocol.
Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1") no reduction A3: A3 (11.7"), no reduction

G4 Communication Parameters

Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Resolution	21: Standard (200 x 100 dpi) 22: Detail (200 x 200 dpi) 24: Fine (200 x 400 dpi)
Width and reduction	A4: A4 (8.3"), no reduction B4: B4 (10.1"), no reduction (tx only) A3: A3 (11.7"), no reduction (tx only)
Transfer	T: Transfer - : Other
Confidential	C: Confidential - : Other
Other parameters	The following information is shown in 6-bit format. Bit 1 is the first bit from the left, and bit 6 is at the right end. Bit 1 - Smoothing 0: Enabled, 1: Disabled (Smoothing is disabled in halftone mode.) Bit 2 - CIL printing 0: Enabled, 1: Disabled Bit 3 - Not used Bit 4 - mm/inch conversion 0: Disabled, 1: Enabled Bit 5 - Engine type 0: mm, 1: inch Bit 6 - Resolution unit 0: mm, 1: inch

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.
1-7	Not used	Do not change these 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 that is programmed as the service station. Always reset this bit to zero after transfer. **Cross-reference** Service station number programming: Function 13
1-3	Not used	Do not change these settings.

System Switch 02		
No	**FUNCTION**	**COMMENTS**
4	Automatic reset (during communication) **0:** Disabled **1:** Enabled	**1:** Standard G3 unit - The machine automatically returns to standby mode when a page takes more than a certain time to send (the default setting is 60 minutes). This timer can be adjusted with RAM addresses 4803AC and 4803AD. When the optional G3 or G4 unit is installed – While the machine is in standby mode, it resets the optional G3 or G4 unit at a certain interval (the default setting is 15 min). This timer can be adjusted with RAM addresses 4803AE and 4803AF. For communication, when this timer expires after the communication is finished, the machine resets the optional G3 or G4 unit. **Cross reference** Service RAM Addresses, section 4.5.
5	Not used	Do not change these 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**
0-2	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	Set this bit to 1 before changing any dedicated transmission parameters.
4	Inclusion of the Start key in Keystroke Programs **0:** Not needed **1:** Needed	**0:** The user does not need to press the Start key when operating a keystroke program.
5	Replacement level for the maintenance kits **0:** User **1:** Service	**0:** The machine asks the user to replace the ADF maintenance kit after 30,000 scans with the ADF, and the fusing unit maintenance kit at 60,000 print intervals. After the user replaces the kits, the machine asks the user if the kits have been replaced or not. After the user answers yes, the user has to reset the PM counters using the key operator tools. The replacement intervals are programmed at the following addresses: ADF kit interval: 4802C8 to 4802CA(H) Fusing kit interval: 480314 to 480316 Refer to section 4.5 for more details. **1:** The machine will not ask the user to replace the maintenance kits.
6	CSI programming level **0:** User level **1:** Service level	**1:** Only a technician can program the CSI.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Only a technician can program the telephone line type selection.

System Switch 05		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change these settings.
1	Condition for when Authorized Reception will be enabled **0:**No conditions **1:**RTI/CSI is programmed	**1:** Authorized Reception can not be enabled when RTI/CSI is not programmed.
2-3	Not used	Do not change these settings.
4	Optional 40MB SAF memory **0:** Not installed **1:** Installed	**1:** Change this bit to 1 when installing the optional 40MB SAF memory.
5-7	Not used	Do not change these settings.

System Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Use of the Stop key during memory transmission **0:** Disabled **1:** Enabled	**1:** The Stop key can be used to halt memory transmissions. However, users might accidentally cancel another person's memory transmission in progress.
1-3	Not used	Do not change these settings.
4	Use of the Stop key during memory transmission **0:** Disabled **1:** Enabled	**1:** The Stop key can be used to halt memory transmissions. After pressing the Stop key, a message (STOP & CLR FILE?) appears on the LCD.
5	PC Fax Expander option **0:** Not installed **1:** Installed	Change this bit to 1 when installing the PC Fax Expander option.
6-7	Not used	Do not change these settings.

System Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 7	Date of monthly Fax On Demand report printout	00 - 31 (BCD). [00 (BCD) - 1st day of the month (default setting)] [01 - 31 (BCD) - Programmed day of the month] This setting is only valid if bit 1 of User Parameter 04 is set to "1" (monthly FOD report printout enabled).

System Switch 08		
No	**FUNCTION**	**COMMENTS**
0 to 7	Time of monthly Fax On Demand report printout	00 - 23 hours (BCD). 00 (BCD) - 0 am (default setting) 01 (BCD) - 1 am ↓ 23 (BCD) - 11 pm This setting is only valid if bit 1 of User Parameter 04 is set to "1" (monthly FOD report printout enabled).

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0	Addition of part of the image data from confidential transmissions on the transmission result report **0:** Disabled **1:** Enabled	If this feature is enabled, the top half of the first page of confidential messages will be printed on transmission result reports.
1	Inclusion of communications in the Journal when no image data was exchanged. **0:** Disabled **1:** Enabled	0: The Journal lists communications that reached phase C (message TX/RX) of the T.30 protocol. **1:** The Journal lists communications that reached phase A (call setup) of T.30 protocol. This includes telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports are not printed. **1:** Error reports will print automatically after all failed communications, excluding polling reception and immediate transmissions.
3	Print error code on error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Listing of Confidential IDs on the Personal Code List **0:** Disabled **1:** Enabled	**1:** Confidential IDs registered with Personal Codes by the users will appear on the Personal Code List.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report automatically prints after the power is switched on if a fax message disappears from memory when the power was turned off last.
6	Conditions for printing the protocol dump list **0:** Print for all communications **1:** Print only when there is a communication error	This switch becomes effective only when system switch 00 bit 6 is set to 1. **1:** Set this bit to 1 when you wish to print a protocol dump list only for communications with errors.
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		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change these settings
1	Default communication mode **0:** G3 **1:** G4	These bits determine the machine's standby default communication mode if a G4 option has been installed.
2	Not used	Do not change these settings.
3	Continuous polling reception **0:** Disabled **1:** Enabled	This feature allows a series of stations to be polled in a continuous cycle.
4	Dialing on the ten-key pad when the handset is off-hook **0:** Disabled **1:** Enabled	**1:** The user can dial on the ten-key pad when the handset is off-hook.
5	On-hook dial **0:** Disabled **1:** Enabled	**0:** On-hook dial is disabled.
6	Line used for G3 transmission **0:** PSTN **1:** ISDN	If an ISDN kit has been installed, this bit determines whether G3 transmissions go out over the PSTN or the ISDN.
7	Line used when the machine falls back from G4 to G3if the other end is not a G4 machine **0:** PSTN **1:** ISDN	This bit switch has no effect if Communication Switch 07 bit 0 is set to 0.

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 standby mode when the timer expires after the last operation.
2 **3**	Energy 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 Energy Saver mode is disabled. **(Other):** The machine goes into Energy Saver mode when the timer expires after the last operation.
4-6	Not used	Do not change these settings.
7	Key to be pressed to exit energy saver mode **0:** Only the energy saver key **1:** Any key	**1:** Any key can be pressed to exit energy saver mode

System Switch 0C - Not used (do not change any of these settings)
System Switch 0D - Not used (do not change any of these settings)
System Switch 0E - Not used (do not change any of these 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: Not used 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 20: Turkey 0B: Switz. 21: Greece 0C: Portugal 0D: Holland 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. If you change the NCU country code and exit service mode, the bit switch country code will automatically change to the code for the same country as the new NCU country code. This only happens for the standard NCU country code. Nothing happens if you change the country code for the optional SG3 unit's NCU. **If RAM reset level 1 is done, this bit switch resets as follows.** **Model for USA: 11 (USA)** **Model for Europe/Asia: 02 (UK).**

System Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Threshold memory level for parallel memory transmission	Threshold = N x 64 kbytes N can be between 00 - FF(H) Default setting: 04(H) = 256 kbytes

System Switch 11		
No	**FUNCTION**	**COMMENTS**
0	TTI printing position **0:** Superimposed on the page data **1:** Printed before the data leading edge	Change this bit to 1 if the TTI overprints information that the customer considers to be important (G3 transmissions).
1	CIL printing position **0:** Printed before the data leading edge **1:** Superimposed on the page data	Change this bit to 1 if the CIL overprints information that the customer considers to be important (G4 transmissions).
2-3	Not used	Do not change these settings.
4	Rx time printing position **0:** Superimposed on the end of page data **1:** Printed after the data trailing edge	Change this bit to 1 to avoid any image loss.
5	Not used	Do not change this setting.
6	Memory reception if no RTI or CSI received **0:** Reception disabled **1:** Reception enabled only when there is no problem with the printer mechanism	This switch setting depends on user parameter switch 05 bit 1. This Sw U.P.05 bit 1 -- 0 : Reception always enabled 0 1 : Reception disabled 1 1 : Reception enabled only if there is no problem with the printer mechanism
7	Use of parallel memory transmission with G4 transmission **0:** Disabled **1:** Enabled	This bit determines whether parallel transmission can be used with G4 transmissions.

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

System Switch 13		
No	**FUNCTION**	**COMMENTS**
0-1	Remaining memory threshold for activating the Tx/Rx File Save feature **Bit 1 Bit 0 Threshold** 0 0 25% 0 1 50% (default) 1 0 75% 1 1 Not used	If the remaining space in the 40MB memory is below the threshold value, the Tx/Rx File Save feature cannot be used. Adjust the threshold value to meet the customer's requirements.
2	Not used	Do not change this setting.
3-4	Files that can be stored in the Tx/Rx File Save feature **Bit 1 Bit 0 Files** 0 0 All files 0 1 Received files only 1 0 Transmitted files only 1 1 Not used	The default setting is (0 0). Change the settings to limit the file types that can be stored using the Tx/Rx File Save feature.
5-7	Not used	Do not change this setting.

System Switch 14		
No	**FUNCTION**	**COMMENTS**
0 to 7	Wait time between pages in printer mode (with an optional printer interface unit)	05 to 64 (H) (5 to 100s) During a printer job, a fax message could come in while a page from the computer is still being compiled. If the timer has not run out yet, the machine will continue to compile the page from the printer and the fax message will not be printed. However, if the timer runs out before the page has been compiled, all pages of the fax message will be printed, then the rest of the waiting print job will be output. Therefore, with a longer setting, the fax machine is more likely to wait until the end of print job output before printing any incoming fax message. A shorter setting allows the fax machine to interrupt a print job to print an incoming fax message. Default setting: 0A(H) = 10 s

System Switch 15		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change this setting.
1	Programming with European characters **0:** Disabled **1:** Enabled	**1:** The user can program with European characters (e.g. "**ä**", "**å**") for the TTI, Quick Dial labels, etc.
2	Change NCU country code **0:** Enabled **1:** Disabled	**1:** The machine does not display "c.c." in the service mode 08: NCU, 0: NCU PARA menu.
3-7	Not used	Do not change these settings.

System Switch 16		
No	**FUNCTION**	**COMMENTS**
0	Function Upgrade Card or Fax On Demand Card **0:** Not installed **1:** Installed	Change this bit to 1 after installing a Function Upgrade Card or a Fax On Demand Card in the machine's left IC card slot. **0:** When either a Function Upgrade Card or a Fax On Demand Card is installed in the machine's left IC card slot before power-off, all the data in these cards will be initialized if the machine does not detect the card at the next power-on. **1:** When either a Function Upgrade Card or a Fax On Demand Card is installed in the machine's left IC card slot before power-off, the machine does not start up unless the machine detects the IC card or the data copy tool at the next power-on. This prevents the data inside the card from being initialized while replacing PCBs or downloading software.
1-7	Not used.	Do not change the default setting.

System Switch 17		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change this setting.
1	Direct fax number entry **0:** Disabled **1:** Enabled	**0:** The user must place the original on the ADF or MDF before dialing.
2-4	Not used	Do not change these settings.
5	Inclusion of the Add key when Quick Dials are continuously selected for destinations **0:** Not needed **1:** Needed	**1:** The user must press the Add key after each Quick Dial key. This helps the user to avoid selecting incorrect destinations.
6	Notify users when the communication is complete **0:** Do not notify **1:** Notify	**1:** The machine notifies the user with a beeper when the communication is complete.
7	Not used	Do not change this setting.

System Switch 18		
No	**FUNCTION**	**COMMENTS**
0 **1**	Default communication line for transmission when both lines are outside lines (neither line is connected to a PABX) **Bit 1 Bit 0 Setting** 0 0 Auto select 0 1 PSTN 1 (Standard G3) 1 0 PSTN 2 (Optional G3 unit) 1 1 ISDN (G4 unit required)	**(0,0):** If one line is already being used, the other line is selected. **Others:** The line is fixed in accordance with these switches. However, the user can select another line with the line selection key (or user function key if programmed with the line selection feature). The settings of communication switch 16 bit 5 and system switch 0A bit 6 over-ride these switches.
2	Not used	Do not change the setting
3 **4**	Default communication line for transmission when there is no G3 outside line (both lines connected to a PABX, or one line connected to a PABX and one line connected to an ISDN) **Bit 4 Bit 3 Setting** 0 0 Auto select 0 1 PSTN 1 (Standard G3) 1 0 PSTN 2 (Optional G3 unit) 1 1 ISDN (G4 unit required)	**(0,0):** If one line is already being used, the other line is selected. **Others:** The line is fixed in accordance with these switches. However, the user can select another line with the line selection key (or user function key if programmed with the line selection feature). The settings of communication switch 16 bit 5 and system switch 0A bit 6 over-ride these switches. User switch 13 (0DH) is used to connect a line to a PABX.
5-7	Not used	Do not change the settings.

System Switch 19		
No	**FUNCTION**	**COMMENTS**
0-1	Line used for PC direct transmission Bit 1 Bit 0 Setting 0 0 PSTN 1 or PSTN 2 0 1 PSTN 1 1 0 PSTN 2 Others: Not used	These bits determine the machine's standby default transmission line for PC direct transmission if an optional G3 unit has been installed. **(0,0):** If one line is already being used, the other line is selected. PC direct transmission cannot use the ISDN line.
2-5	Not used	Do not change these settings
6 7	Line used for PC memory transmission when the destination is not selected from the Quick or Speed Dials **Bit 7 Bit 6 Setting** 0 0 G3 0 1 Extension 1 0 G4 1 1 Not used	If an ISDN kit has been installed, or if a line is connected behind a PABX, this bit determines how PC memory transmissions go out. User switch 13 (0DH) is used to connect a line to a PABX.

System Switch 1A - Not used (do not change any of these settings)
System Switch 1B - Not used (do not change any of these settings)
System Switch 1C - Not used (do not change any of these settings)
System Switch 1D - Not used (do not change any of these settings)
System Switch 1E - Not used (do not change any of these settings)
System Switch 1F - Not used (do not change any of these settings)

4.2.2 SCANNER SWITCHES

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0	MTF **0:** Disabled **1:** Enabled	
1	Text/Photo separation in halftone mode **0:** Disabled **1:** Enabled	Normally keep this bit at 1 to get a good halftone quality.
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 the higher setting.
4	OR processing in immediate TX and copying (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 goes through OR processing before transmission or copy making. Toner may be used up earlier if OR processing is enabled.
5-6	Not used	Do not change these settings.
7	Auto Image Density **0:** Disabled **1:** Enabled	**1:** Scanning density is automatically set. User settings are ignored.

Scanner Switch 01 - Not used (do not change any of these settings)

Scanner Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone disabled - Normal setting	The value can be between 00 to 1F. For a darker threshold, input a lower value. Default setting - 0E(H)

Scanner Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone disabled - Lighten setting	The value can be between 00 to 1F. For a darker threshold, input a lower value. Default setting - 10(H)

Scanner Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone disabled - Darken setting	The value can be between 00 to 1F. For a darker threshold, input a lower value. Default setting - 0C(H)

Scanner Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone enabled - Normal setting	The value can be between 00 to 0F. For a darker threshold, input a lower value. Default setting – 0A(H)

Scanner Switch 06		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone enabled - Lighten setting	The value can be between 00 to 0F. For a darker threshold, input a lower value. Default setting - 0D(H)

Scanner Switch 07		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone enabled - Darken setting	The value can be between 00 to 0F. For a darker threshold, input a lower value. Default setting - 02(H)

Scanner Switch 08		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold for text areas when halftone is enabled	The value can be between 00 to 1F. This setting is ignored if Scanner Switch 00 bit 1 is at 0. Default setting - 08H

Scanner Switch 09		
No	**FUNCTION**	**COMMENTS**
0-1	MTF parameter selection with halftone disabled **Bit 1 0 Setting** 0 0 Normal 0 1 Sharp (Sub scan) 1 0 Sharp (Main scan) 1 1 Sharp (Main & Sub scan)	The 'sharp' setting is effective for the accurate reproduction of thin lines.
2-3	MTF parameter selection with halftone enabled **Bit 1 0 Setting** 0 0 Normal 0 1 Sharp (Sub scan) 1 0 Sharp (Main scan) 1 1 Sharp (Main & Sub scan)	
4-7	Not used	Do not change these settings.

Scanner Switch 0A - Not used (do not change any of these settings)
Scanner Switch 0B - Not used (do not change any of these settings)
Scanner Switch 0C - Not used (do not change any of these settings)
Scanner Switch 0D - Not used (do not change any of these settings)
Scanner Switch 0E - Not used (do not change any of these settings)
Scanner Switch 0F - Not used (do not change any of these settings)

4.2.3 PRINTER SWITCHES

Printer Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Page separation mark **0:** Disabled **1:** Enabled	**0:** No marks printed. **1**: If an incoming fax requires two sheets to print, the machine prints an "∗" inside a small box at the bottom right hand corner of the first sheet. Then, it prints a "2" inside a small box at the top right hand corner of the second sheet. This helps the user 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.
2-7	Not used	Do not change the settings.

Printer Switch 01		
No	**FUNCTION**	**COMMENTS**
0	Reset the fusing unit failure **0:** Off **1:** On (Clear)	When a fusing error occurs, set this bit to 1 after fixing the problem. The machine then resets the fusing error. Switch the machine off/on and this bit will reset itself to 0.
1-7	Not used	Do not change the settings.

Printer Switch 02 - Not used (do not change any of these settings)

Printer Switch 03		
No	**FUNCTION**	**COMMENTS**
0	Reduce the length of received data **0:** Disabled **1:** Enabled	**0:** Incoming pages are printed without length reduction. **Cross-reference** Page separation threshold: Printer Switch 03, bits 4 to 7. **1:** Incoming pages are reduced in the lengthwise direction when printing. **Cross-reference** Reduction ratio: Printer Switches 04/05
1-3	Not used	Do not change these settings.
4 **to** **7**	Page separation threshold (with reduction disabled in switch 03 bit 0 above) If the incoming page is up to x mm longer than the copy paper, the excess portion will not print. If the incoming page is more than x mm longer than the copy paper, the excess portion will print on the next page. These four bits determine the value of x. Hex value of bits 4 to 7 — x (mm) 0 — 0 1 — 1 and so on until F — 15 **Cross-reference** 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-bit 0 above) If reduction is enabled, the data will be reduced in the lengthwise direction before printing. These switches determine the maximum reduction ratio for each paper size. Switch 04/05 — Paper used Bit 0 — A5 sideways Bit 1 — LT sideways Bit 2 — LT Bit 3 — A4 Bit 4 — F, F4 Bit 5 — LG Bit 6 — Not used Bit 7 — DTL SW04 / SW05 / Reduction Ratio 1 / 0 / 4/3 0 / 1 / 8/7 1 / 0 / 12/11	

Printer Switch 06 - Not used (do not change any of these settings)
Printer Switch 07 - Not used (do not change any of these settings)
Printer Switch 08 - Not used (do not change any of these settings)
Printer Switch 09 - Not used (do not change any of these settings)
Printer Switch 0A - Not used (do not change any of these settings)
Printer Switch 0B - Not used (do not change any of these settings)
Printer Switch 0C - Not used (do not change any of these settings)
Printer Switch 0D - Not used (do not change any of these settings)
Printer Switch 0E - Not used (do not change any of these settings)
Printer Switch 0F - Not used (do not change any of these 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 MH/MR/MMR/JBIG	These bits determine the compression capabilities declared in phase B (handshaking) of 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 MH/MR/MMR/JBIG	These bits determine the compression capabilities used in the transmission and declared in phase B (handshaking) of T.30 protocol.
4	JBIG priority transmission **0:** Disabled **1:** Enabled	0: If JBIG compression is already in use, MMR compression is used. 1: If JBIG compression is already in use, any jobs following are placed on hold until the JBIG resource becomes free.
5	JBIG reception mode **0:** Standard mode only **1:** Standard and optional mode (default)	If this bit is 0, JBIG optional mode is switched off for reception. Change the setting when communication problems occur using JBIG compression.
6	Priority for JBIG mode used for transmission **0:** Standard mode **1:** Optional mode (default)	This bit determines the priority for the compression mode used for JBIG transmission. Change the setting when communication problems occur using JBIG compression.
7	Closed network (reception) **0:** Disabled **1:** Enabled	**1:** Reception will not go ahead if the ID code of the other terminal does not match the ID code of this terminal. This function is only available in NSF/NSS mode.

Communication Switch 01		
No	**FUNCTION**	**COMMENTS**
0	ECM **0:** Disabled **1:** Enabled	If this bit is 0, ECM is switched off for all communications.
1	Not used	Do not change this setting.
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	(01) - 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. (10) - The same as above, except that only the last 4 digits are compared. (11) - The machine will not transmit if the other end does not identify itself with an RTI or CSI. (00) - Nothing is checked; transmission will always go ahead. **Note:** When enabling wrong connection prevention, disable AI short protocol.
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 telephone calls at the same number that the machine is connected to. The machine will then alert the user if a phone call comes in.
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 B4 1 0 A4 1 1 Not used	The receiving terminal informs the transmitting terminal of the setting determined by these bits 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 the received page has more consecutive error lines than the threshold, the machine sends a negative response. The low and high threshold values depend on the sub-scan resolution, and are as follows. **Resolution Standard Detail** Low settings 6 12 High settings 12 24 This bit is ignored if ECM is in use.
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. This bit is ignored if ECM is in use.

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
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 after receiving a negative code (RTN or PIN) during G3 immediate transmission **0:** No hang-up **1:** Hang-up	**0:** Sends the next page 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 these settings.

Communication Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmission in a G3 memory transmission	00 - FF (Hex) times. This bit is ignored if ECM is in use.

Communication Switch 04 - Not used (do not change any of these settings)
Communication Switch 05 - Not used (do not change any of these settings)

Communication Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Dialing requirements: Germany **0:** Disabled **1:** Enabled	This function automatically sets these switches to the required settings for each country after selecting a country code (System Switch 0F).
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	Dialing requirements: USA **0:** Disabled **1:** Enabled	
7	Not used	Do not change these settings.

Communication Switch 07		
No	**FUNCTION**	**COMMENTS**
0	Fallback from G4 to G3 if the other terminal is not a G4 terminal **0:** Disabled **1:** Enabled	Also see System Switch 0A bit 7. Refer to the ISDN G4 option service manual (G4 Internal Switches 17, 18, 1A, 1B, and 1C) for the CPS code set (Cause Value set) to determine G4 to G3 fallback.
1-2	Not used	Do not change the setting.
3	Fallback from G4 to G3 reflected in programmed Quick/Speed dials **0:** Fallback enabled (Default) **1:** Always start with G4	**0:** If a communication falls back from G4 to G3, the machine will always start with G3 from the next transmission to this number. **1:** The machine will always start to transmit with G4.
4	Fallback from G4 to G3 when G4 communication fails on the ISDN B-channel **0:** Fallback disabled (Default) **1:** Fallback enabled	**1:** Enable this switch only when G4 communication errors occur because the exchanger connects G4 calls to the PSTN. This problem only occurs with some types of exchanger.
5-7	Not used	Do not change the settings.

Communication Switch 08 - Not used (do not change any of these settings)
Communication Switch 09 - Not used (do not change any of these settings)

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Memory transmission resumption point for 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 these 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.

Communication Switch 0B		
No	**FUNCTION**	**COMMENTS**
0	Use of Economy Transmission during a Transfer operation to End Receivers **0:** Disabled **1:** Enabled	These bits determine whether the machine uses the Economy Transmission feature when it is carrying out a Transfer operation as a Transfer Station.
1	Use of Economy Transmission during a Transfer operation to the Next Transfer Stations **0:** Disabled **1:** Enabled	
2	Use of Label Insertion for the End Receivers in a Transfer operation **0:** Disabled **1:** Enabled	This bit determines whether the machine uses the Label Insertion feature when it is carrying out a Transfer operation as a Transfer Station.
3	Conditions required for Transfer Result Report transmission **0:** Always transmitted **1:** Only transmitted if there was an error	**0:** When acting as a Transfer Station, the machine will always send a Transfer Result Report back to the Requesting Station after completing the Transfer Request, even if there were no problems. **1:** The machine will only send back a Transfer Result Report if there were errors during communication so that one or more of the End Receivers could not be contacted.
4	Printout of the message when acting as a Transfer Station **0:** Disabled **1:** Enabled	When the machine is acting as a Transfer Station, this bit determines whether the machine prints the fax message coming in from the Requesting Terminal.
5	Action when there is no fax number in the programmed Quick/Speed dials which meets the requesting terminal's own fax number. **0:** Transfer is Disabled **1:** Transfer is Enabled	After the machine receives a transfer request, the machine compares the last N digits of the requesting terminal's own fax number with all the Quick/Speed dials programmed in the machine. (N is the number programmed in communication switch 0C.) **0:** If there is no matching number programmed in the machine, the machine rejects the transfer request. **1:** Even if there is no matching number programmed in the machine, the machine accepts the transfer request. The result report will be printed at the transfer terminal, but will not be sent back to the requesting terminal.
6-7	Not used	Do not change the settings.

Communication Switch 0C		
No	**FUNCTION**	**COMMENTS**
0 to 4	Number of digits compared to find the requester's fax number from the programmed Quick/Speed Dials when acting as a Transfer Station	00 - 1F (0 to 31 digits) After the machine receives a transfer request, the machine compares the own telephone number sent from the Requesting Terminal with all Quick/Speed Dials programmed in the machine, starting from Quick Dial 01 to the end of the Speed Dials. This number determines how many digits from the end of the telephone numbers the machine compares. If it is set to 00, the machine will send the report to the first Quick/Speed Dial that the machine compared. If Quick Dial 01 is programmed, the machine will send the report to Quick 01. If Quick Dial 01 through 04 are not programmed and Quick Dial 05 is programmed, the machine will send the report to Quick 05. Default setting - 05(H) = 5 digits
5-7	Not used	Do not change the settings.

Communication Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 to 7	The available memory threshold, below which ringing detection (and therefore reception into memory) is disabled	00 to FF (Hex), unit = 2 KB (e.g. 0C(H) = 24 KB) One page is about 24 KB. The machine refers to this setting before each fax reception. If the remaining memory is below this threshold, the machine cannot receive fax messages. If this setting remains at 0, the machine will detect ringing signals and enter receive mode even if there is no available memory. 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 any of these settings)

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

Communication Switch 11		
No	**FUNCTION**	**COMMENTS**
0 to 7	Immediate transmission: Maximum number of dialing attempts to the same destination	01 - FE (Hex) times

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

Communication Switch 14		
No	**FUNCTION**	**COMMENTS**
0	Inch-to-mm conversion during transmission **0:** Disabled (default) **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	Inch/mm format informed to the other terminal during transmission **0:** Always in inch format **1:** Dependent on the other terminal (default)	**0:** The machine always informs the other terminal that the resolution is in inch format and transmits with the inch format. **1:** The machine informs the other terminal that the resolution is in mm format and transmits with the inch format if the other end only has mm-based resolution. This setting is informed to the receiving terminal in the pre-message protocol exchange (in the DCS/NSS frames).
2-4	Not used	Do not change the factory settings.
5	A3 size reception **0:** Enabled **1:** Disabled (Max. B4 size)	**1:** The machine informs the other terminal that the maximum width is B4 size.
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		
No	**FUNCTION**	**COMMENTS**
0 **to** **7**	Available resolution for receiving fax messages **Bit 0 1:** 200 x 100/8 x 3.85 **Bit 1 1:** 200 x 200/8 x 7.7 Other bits: 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 16		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the factory settings.
1	Optional G3 unit **0:** Not installed **1:** Installed	**1:** Change this bit to 1 when installing the optional G3 unit.
2	Optional G4 unit **0:** Not installed **1:** Installed	**1:** Change this bit to 1 when installing the optional G4 unit.
3-4	Not used	Do not change the factory settings.
5	Use of PSTN-2 line **0:** Tx or Rx **1:** Rx only	Change this bit to 1 when the customer requires. Also see system switch 18.
6	Not used	
7	ISDN dual communication **0:** Enabled **1:** Disabled	**1:** The machine uses only one B channel for communication. This enables a customer to occupy another B channel for other purposes such as an internet communication.

Communication Switch 17		
No	**FUNCTION**	**COMMENTS**
0	SEP (selective polling) reception **0:** Disabled **1:** Enabled	**0:** Disables features that require SEP (selective polling) signal reception.
1	SUB reception **0:** Disabled **1:** Enabled	**0:** Disables features (such as confidential reception to another maker's machine) that require SUB (Sub-address) signal reception.
2	PWD (Password) / SID (Sender ID) reception **0:** Disabled **1:** Enabled	**0:** Disables features that require PWD or SID signal reception.
3-6	Not used	Do not change the settings.
7	Action when there is no box with an F-code that matches the received SUB code **0:** Disconnect the line **1:** Receive the message (using normal reception mode)	Change this setting when the customer requires.

Communication Switch 18		
No	**FUNCTION**	**COMMENTS**
0 to 7	Interval for which the machine does not access the PC after a job 01 to FF (Hex), unit = 2 s (e.g. 0C(H) = 24 s) 00 (Hex): 1 s FF (Hex): 510 s	In some cases with PC-fax communication, the machine will stall if this interval is too short.

Communication Switch 19 - Not used (do not change any of these settings)
Communication Switch 1A - Not used (do not change any of these settings)

Communication Switch 1B		
No	**FUNCTION**	**COMMENTS**
0 to 7	Extension access code (0 to 7) to turn V.8 protocol On/Off **0:** On **1:** Off	If the PABX does not support V.8/V.34 protocol procedure, set the appropriate bit to “1” to disable V.8. **Example:** If “0” is the PSTN access code, set bit 0 to 1. When the machine detects “0” as the first dialed number, it automatically disables V.8 protocol. (Alternatively, if “3” is the PSTN access code, set bit 3 to 1.)

Communication Switch 1C		
No	**FUNCTION**	**COMMENTS**
0-1	Extension access code (8 and 9) to turn V.8 protocol On/Off **0:** On **1:** Off	Refer to communication switch 1B. **Example:** If “8” is the PSTN access code, set bit 0 to 1. When the machine detects “8” as the first dialed number, it automatically disables V.8 protocol. (If “9” is the PSTN access code, use bit 1.)
2-7	Not used	Do not change the settings.

Communication Switch 1D - Not used (do not change any of these settings)
Communication Switch 1E - Not used (do not change any of these settings)
Communication Switch 1F - Not used (do not change any of these 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 not in use throughout 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 throughout 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 in use during memory transmission.
3-7	Not used	Do not change these settings.

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change these settings.
4	DIS frame length **0:** No limit **1:** 4 bytes	**1:** Only the first 4 bytes in the DIS frame will transmit (set to 1 if there are communication problems with PC-based faxes, which cannot receive extended DIS frames).
5	Not used	Do not change this setting.
6	CED/ANSam transmission **0:** Enabled **1:** Disabled	Do not change this setting, unless a communication problem is caused by sending CED/ANSam (V.34).
7	Not used	Do not change this setting.

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 in non-standard mode communication).
1-4	Not used	Do not change these 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	Not used	Do not change these settings.

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 waits for the second DIS, caused by echo on the line.
1	Not used	Do not change this setting.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not change this setting unless the line condition is so poor the data rate slows to 14.4 kbps or lower.
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). This bit is ineffective in V.34 communications.
5	Modem rate for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The TX modem rate of the machine will fall back before sending the next page if it receives a negative code. This bit is ignored if ECM is in use.
6	Not used	Do not change this setting.
7	Polarity change after DIS/NSF detection **0:** Disabled **1:** Enabled	This bit should be set to ”1” only to deal with communication problems caused by certain types of exchanger.

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 was successful.
4-7	Not used	Do not change these settings.

G3 Switch 05		
	FUNCTION	**COMMENTS**
0 to 3	Initial TX modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4 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 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.8 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers.
4 to 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 9.6 k and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7	Not used	Do not change these 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 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.8 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	The settings of these bits inform the transmitting terminal of the available modem rate for the receiving machine. Use a lower setting if high speeds pose problems during reception.

G3 Switch 06		
	FUNCTION	**COMMENTS**
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29, V.33 0 1 0 0 V.27ter, V.29, V.33, V17 0 1 0 1 V.27ter, V.29, V.33, V.17, V.34 Other settings - Not used	The settings of these bits inform the transmitting terminal of the available modem type for the receiving machine. V.33 is an exclusive Ricoh mode (NSF).

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. Use the dedicated transmission parameters if you need to change this for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs: • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is ineffective in V.34 communications.
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. **Note:** This setting is ineffective in V.34 communications.
4	PSTN external cable equalizer (V.27ter, V.29, V.33/V.17, V.8 rx mode) **0:** Disabled **1:** Enabled	Keep this bit at “1” in most cases.
5	PSTN external cable equalizer (V.34 rx mode) **0:** Disabled **1:** Enabled	Set this bit to 0 when the line quality is good. (e.g. digital PABX) The V.34 modem rate may decrease from equalizer over correction.
6-7	Not used	Do not change these settings.

G3 Switch 08 - Not used (do not change any of these settings)

G3 Switch 09		
No	**FUNCTION**	**COMMENTS**
0 **1**	ISDN 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. Use the dedicated transmission parameters for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently.
2 **3**	ISDN 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	ISDN external equalizer for V.27ter, V.29, V.33/V.17, V.8 (Rx mode) **0:** Disabled **1:** Enabled	**1:** Keep this bit at “1” in most cases.
5	ISDN external equalizer for V.34 (Rx mode) **0:** Disabled **1:** Enabled	**1:** Keep this bit at “1” in most cases.
6-7	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 this setting.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit determines the maximum interval between each EOL signal (end-of-line) or 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 this setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When a computer controls the sending terminal, 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 this setting.

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 these 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.
2-6	Not used	Do not change these settings.
7	FOD feature using PSTN-1 (standard NCU) **0:** Enabled **1:** Disabled	**1:** FOD will not be available on the PSTN-1 line.

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

4.2.6 G3-2 SWITCHES

These bit switches require an optional G3 interface unit.

G3-2 Switch 00 - Not used (do not change any of these settings)

G3-2 Switch 01		
No	**FUNCTION**	**COMMENTS**
0-3	Not used	Do not change these settings.
4	DIS frame length **0:** No limit **1:** 4 bytes	**1:** Only the first 4 bytes in the DIS frame will transmit (set to 1 if there are communication problems with PC-based faxes, which cannot receive extended DIS frames).
5	Not used	Do not change this setting.
6	CED/ANSam transmission **0:** Enabled **1:** Disabled	Do not change this settings, unless a communication problem is caused by sending CED/ANSam (V.34).
7	Not used	Do not change this setting.

G3-2 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 in non-standard mode communication).
1-4	Not used	Do not change these 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	Not used	Do not change these settings.

G3-2 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 waits for the second DIS, caused by echo on the line.
1	Not used	Do not change this setting.
2	V.8 protocol **0:** Disabled **1:** Enabled	**0:** V.8/V.34 communications will not be possible. **Note:** Do not change this setting unless the line condition is so poor the data rate slows to 14.4 kbps or lower.
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). This bit is ineffective in V.34 communications.
5	Modem rate for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The TX modem rate of the machine will fall back before sending the next page if it receives a negative code. This bit is ignored if ECM is in use.
6	Not used	Do not change this setting.
7	Polarity change after DIS/NSF detection **0:** Disabled **1:** Enabled	This bit should be set to ”1” only to deal with communication problems caused by certain types of exchanger.

G3-2 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 was successful.
4-7	Not used	Do not change these settings.

G3-2 Switch 05		
	FUNCTION	**COMMENTS**
0 to 3	Initial TX 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 12.0 k 0 1 1 0 14.4 k 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.8 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	These bits set the initial starting modem rate for transmission. Use the dedicated transmission parameters if you need to change this for specific receivers.
4 to 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 9.6 k and 7.2 kbps, if the initial modem rate is set at these speeds.
6-7	Not used	Do not change these settings.

G3-2 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 0 1 1 1 16.8 k 1 0 0 0 19.2 k 1 0 0 1 21.6 k 1 0 1 0 24.0 k 1 0 1 1 26.8 k 1 1 0 0 28.8 k 1 1 0 1 31.2 k 1 1 1 0 33.6 k Other settings - Not used	The settings of these bits inform the transmitting terminal of the available modem rate for the receiving machine. Use a lower setting if high speeds pose problems during reception.

G3-2 Switch 06		
	FUNCTION	**COMMENTS**
4 to 7	Modem types available for reception **Bit 7 6 5 4 Setting** 0 0 0 1 V.27ter 0 0 1 0 V.27ter, V.29 0 0 1 1 V.27ter, V.29, V.33 0 1 0 0 V.27ter, V.29, V.33, V17 0 1 0 1 V.27ter, V.29, V.33, V.17, V.34 Other settings - Not used	The settings of these bits inform the transmitting terminal of the available modem type for the receiving machine. V.33 is an exclusive Ricoh mode (NSF).

G3-2 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. Use the dedicated transmission parameters if you need to change this for specific receivers. Also, try using the cable equalizer if one or more of the following symptoms occurs: • Communication error • Modem rate fallback occurs frequently. **Note:** This setting is ineffective in V.34 communications.
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. **Note:** This setting is ineffective in V.34 communications.
4	PSTN external cable equalizer (V.27ter, V.29, V.33/V.17, V.8 rx mode) **0:** Disabled **1:** Enabled	Keep this bit at “1” in most cases.
5	PSTN external cable equalizer (V.34 rx mode) **0:** Disabled **1:** Enabled	Set this bit to 0 when the line quality is good. (e.g. digital PABX) The V.34 modem rate may decrease from equalizer over correction.
6-7	Not used	Do not change these settings.

G3-2 Switch 08 - Not used (do not change any of these settings)
G3-2 Switch 09 - Not used (do not change any of these settings)

G3-2 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 this setting.
4	Maximum allowable frame interval during image data reception. **0:** 5 s **1:** 13 s	This bit determines the maximum interval between each EOL signal (end-of-line) or 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 this setting.
6	Reconstruction time for the first line in receive mode **0:** 6 s **1:** 12 s	When a computer controls the sending terminal, 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 this setting.

G3-2 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 these settings.

G3-2 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.
2-6	Not used	Do not change these settings.
7	FOD feature using PSTN-2 (optional SG3) **0:** Enabled **1:** Disabled	**1:** FOD will not available on the PSTN-2 line.

G3-2 Switch 0D - Not used (do not change these settings)
G3-2 Switch 0E - Not used (do not change these settings)
G3-2 Switch 0F - Not used (do not change these settings)

4.3 NCU PARAMETERS

The following tables give the RAM addresses and the parameter calculation units that the machine uses for ringing signal detection and automatic dialing. The factory settings for each country are also given. The RAM read/write (Function 06) must change most of these, but NCU Parameter programming (Function 08) can change some others; if Function 08 can be used, the Remarks column indicates it. The RAM is in hex code unless (BCD) is included in the Unit column.

NOTE: The following addresses describe settings for the standard NCU. Change the fourth digit from “9” to “A” (e.g. 480**9**00 to 480**A**00) for the settings for PSTN-2 (optional G3 unit).

<table>
<tr><th>Address</th><th>Function</th><th>Unit</th><th>Remarks</th></tr>
<tr><td>480900</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 C.C.).

Country — Decimal — Hex
France 00 00
Germany 01 01
UK (Turkey) 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
Greece 33 21</td></tr>
<tr><td>480901</td><td>Line current detection time</td><td rowspan="3">20 ms</td><td rowspan="3">Line current is not detected if 480901 contains FF.</td></tr>
<tr><td>480902</td><td>Line current wait time</td></tr>
<tr><td>480903</td><td>Line current drop detect time</td></tr>
</table>

Address	Function	Unit	Remarks
480904	PSTN dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480905	PSTN dial tone frequency upper limit (low byte)		
480906	PSTN dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480907	PSTN dial tone frequency lower limit (low byte)		
480908	PSTN dial tone detection time	20 ms	If 480908 contains FF(H), the machine pauses for the pause time (address 48090D / 48090E). See Note 3 (Italy).
480909	PSTN dial tone reset time (low)		
48090A	PSTN dial tone reset time (high)		
48090B	PSTN dial tone continuous tone time		
48090C	PSTN dial tone permissible drop time		
48090D	PSTN wait interval (low)		
48090E	PSTN wait interval (high)		
48090F	PSTN ring-back tone detection time	20 ms	Detection is disabled if this contains FF(H).
480910	PSTN ring-back tone off detection time	20 ms	
480911	PSTN detection time for the silent period after ring-back tone detected (low)	20 ms	
480912	PSTN detection time for the silent period after ring-back tone detected (high)	20 ms	
480913	PSTN busy tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480914	PSTN busy tone frequency upper limit (low byte)		
480915	PSTN busy tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480916	PSTN busy tone frequency lower limit (low byte)		
480917	PABX dial tone frequency range (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480918	PABX dial tone frequency range (low byte)		
480919	PABX dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
48091A	PABX dial tone frequency lower limit (low byte)		

Address	Function	Unit	Remarks
48091B	PABX dial tone detection time	20 ms	If 48091B contains FF, the machine pauses for the pause time (480920 / 480921).
48091C	PABX dial tone reset time (low)		
48091D	PABX dial tone reset time (high)		
48091E	PABX dial tone continuous tone time		
48091F	PABX dial tone permissible drop time		
480920	PABX wait interval (high)		
480921	PABX wait interval (low)		
480922	PABX ring-back tone detection time	20 ms	If both addresses contain FF(H), tone detection is disabled.
480923	PABX ring-back tone off detection time	20 ms	
480924	PABX detection time for the silent period after ring-back tone detected (low)	20 ms	If both addresses contain FF(H), tone detection is disabled.
480925	PABX detection time for the silent period after ring-back tone detected (high)	20 ms	If both addresses contain FF(H), tone detection is disabled.
480926	PABX busy tone frequency upper (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480927	PABX busy tone frequency lower (low byte)		
480928	PABX busy tone frequency lower (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480929	PABX busy tone frequency lower (low byte)		
48092A	Busy tone ON time: range 1	20 ms	
48092B	Busy tone OFF time: range 1		
48092C	Busy tone ON time: range 2		
48092D	Busy tone OFF time: range 2		
48092E	Busy tone ON time: range 3		
48092F	Busy tone OFF time: range 3		
480930	Busy tone ON time: range 4		
480931	Busy tone OFF time: range 4		
480932	Busy tone-continuous tone detection time		

Address	Function	Unit	Remarks
480933	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% Bits 2 and 3 must always 0 1 50% be kept at 0. 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		
480934	International dial tone frequency upper limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480935	International dial tone frequency upper limit (low byte)		
480936	International dial tone frequency lower limit (high byte)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480937	International dial tone frequency lower limit (low byte)		
480938	International dial tone detection time	20 ms	If 480938 contains FF, the machine pauses for the pause time (48093D / 48093E). See Note 4 (Belgium).
480939	International dial tone reset time (low)		
48093A	International dial tone reset time (high)		
48093B	International dial tone continuous tone time		
48093C	International dial tone permissible drop time		
48093D	International dial wait interval (low)		
48093E	International dial wait interval (high)		
48093F	Country dial tone upper frequency limit (high)	Hz (BCD)	If both addresses contain FF(H), tone detection is disabled.
480940	Country dial tone upper frequency limit (low)		
480941	Country dial tone lower frequency limit (high)		If both addresses contain FF(H), tone detection is disabled.
480942	Country dial tone lower frequency limit (low)		
480943	Country dial tone detection time	20 ms	If 480943 contains FF, the machine pauses for the pause time (480948 / 480949).
480944	Country dial tone reset time (low)		
480945	Country dial tone reset time (high)		
480946	Country dial tone continuous tone time		
480947	Country dial tone permissible drop time		
480948	Country dial wait interval (low)		

Service Tables

Address	Function	Unit	Remarks
480949	Country dial wait interval (high)	20 ms	
48094A	Time between opening or closing the Ds relay and opening the Di relay	1 ms	See Notes 5, 8, and 9. Function 08 (parameter 11).
48094B	Break time for pulse dialing	1 ms	See Note 4. Function 08 (parameter 12).
48094C	Make time for pulse dialing	1 ms	See Note 4. Function 08 (parameter 13).
48094D	Time between final Di relay closure and Ds relay opening or closing	1 ms	See Notes 5, 8, and 9. Function 08 (parameter 14).
48094E	Minimum pause between dialed digits (pulse dial mode)	20 ms	See Note 5 and 9. Function 08 (parameter 15).
48094F	Time waited when a pause is entered at the operation panel		Function 08 (parameter 16). See Note 5.
480950	DTMF tone on time	1 ms	Function 08 (parameter 17).
480951	DTMF tone off time		Function 08 (parameter 18).
480952	Tone attenuation level of DTMF signals while dialing (high frequency group)	- N x 0.5 - 3.5 (dBm)	Function 08 (parameter 19). See Note 7.
480953	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	- N x 0.5 (dBm)	Function 08 (parameter 20). See Note 7.
480954	PSTN: DTMF tone attenuation level after dialing (high frequency group)	- N x 0.5 - 3.5 (dBm)	Function 08 (parameter 21). See Note 7.
480955	ISDN: DTMF tone attenuation level after dialing (high frequency group)	- N x 0.5 (dBm)	Function 08 (parameter 21). See Note 7.
480956 to 480958	Not used		Do not change these settings.
480959	Grounding time (ground start mode)	20 ms	The Gs relay remains closed for this interval.
48095A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
48095B	International dial access code	BCD	For a code of 100: 48095B - F1 48095C - 00
48095C			

Address	Function	Unit	Remarks
48095D	PSTN access pause time	20 ms	It waits this amount of time 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 48094F is used.
48095E	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 4.	
48095F	Bit 7 and Bit 6 – Not used Bit5 1: Polarity detection enabled for Rx (detection time = 500ms) Bit4 1: Polarity detection enabled for Tx (detection time = 500ms) Bit 3 to 0 – Not used		
480960 to 480964	Not used		Do not change these settings.
480965	Inter-city dial prefix (high)	BCD	For a code of 0: 480965 - FF 480966 - F0
480966	Inter-city dial prefix (low)	BCD	
480967 to 480968	Not used		Do not change these settings.
480972	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz)	Function 08 (parameter 02).
480973	Acceptable ringing signal frequency: range 1, lower limit		Function 08 (parameter 03).
480974	Acceptable ringing signal frequency: range 2, upper limit		Function 08 (parameter 04).
480975	Acceptable ringing signal frequency: range 2, lower limit		Function 08 (parameter 05).
480976	Number or rings until a call is detected	1	Function 08 (parameter 06).
480977	Minimum required length of the first ring	20 ms	See Note 6. Function 09 (parameter 07).
480978	Minimum required length of the second and subsequent rings	20 ms	Function 08 (parameter 08).
480979	Ringing signal detection reset time (low)	20 ms	Function 08 (parameter 09).
48097A	Ringing signal detection reset time (high)		Function 08 (parameter 10).

Service Tables

Address	Function	Unit	Remarks
48097B to 480980	Not used		Do not change these settings.
480981	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
480982	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		
480983	Bits 7 to 5 – Not used Bit 4 – DTMF detection 0: Disabled 1: Enabled Bits 3 to 0 – Not used		Do not change the setting. If bit 4 is set to 0, Fax On Demand and Transfer operation using DTMF are disabled.
480984	Bits 7 to 5 – DTMF minimum on detection time Bit 7 Bit 6 Bit 5 Setting 0 0 0 30 ms 0 0 1 40 ms 0 1 0 80 ms 0 1 1 140 ms Bits 4 to 2 – DTMF minimum off detection time Bit 4 Bit 3 Bit 2 Setting 0 0 0 30 ms 0 0 1 40 ms 0 1 0 80 ms 0 1 1 140 ms Bits 1 and 0 – Not used		Fax On Demand and Transfer operations: Incoming DTMF tones shorter than the setting will not be detected.
4809A1	Acceptable CED detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809A2	Acceptable CED detection upper frequency upper limit (low byte)		
4809A3	Acceptable CED detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809A4	Acceptable CED detection upper frequency lower limit (low byte)		
4809A5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms

Address	Function	Unit	Remarks
4809A6	Acceptable CNG detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809A7	Acceptable CNG detection upper frequency upper limit (low byte)		
4809A8	Acceptable CNG detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809A9	Acceptable CNG detection upper frequency lower limit (low byte)		
4809AA	Not used		Do not change these settings.
4809AB	CNG on time	20 ms	Factory setting: 500 ms
4809AC	CNG off time	20 ms	Factory setting: 200 ms
4809AD	Number of CNG cycles required for detection		The data is coded in the same way as address 480933. Factory setting: 23(H)
4809AE	Not used		Do not change this setting.
4809AF	Acceptable AI short protocol tone (800Hz) detection frequency upper limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809B0	Acceptable AI short protocol tone (800Hz) detection upper frequency upper limit (low byte)		
4809B1	Acceptable AI short protocol tone (800Hz) detection frequency lower limit (high byte)	BCD (Hz)	If both addresses contain FF(H), tone detection is disabled.
4809B2	Acceptable AI short protocol tone (800Hz) detection upper frequency lower limit (low byte)		
4809B3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
4809B4	PSTN: Tx level from the modem	- N - 3 (dBm)	Function 08 (parameter 01).
4809B5	PSTN: 1100 Hz tone transmission level	- N 4809B4 - 0.5N 4809B5 - 3.5 (dBm)	
4809B6	PSTN: 2100 Hz tone transmission level	- N 4809B4 - 0.5N 4809B6 - 3 (dBm)	
4809B7	PABX: Tx level from the modem	- dBm	
4809B8	PABX: 1100 Hz tone transmission level	- N 4809B7 - 0.5N 4809B8 (dB)	
4809B9	PABX: 2100 Hz tone transmission level	- N 4809B7 - 0.5N 4809B9 (dB)	
4809BA	ISDN: Tx level from the modem	- dBm	The setting must be between -12dBm and -15dBm.
4809BB	ISDN: 1100 Hz tone transmission level	-N 4804BA -0.5N 4804BB (dB)	

Service Tables

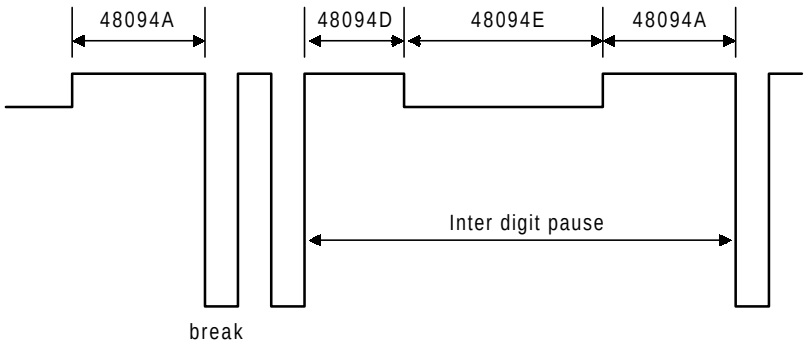
Address	Function	Unit	Remarks
4809BC	ISDN: 2100 Hz tone transmission level	-N 4804BA -0.5N 4804BC (dB)	
4809BD	Modem turn-on level (incoming signal detection level) Standard NCU (Conexant) Turn on level: -37-0.5N (dBm) Turn off level: "Turn on level" – 3 dBm Optional G3 unit (Panasonic) 00 (Hex) : -33 (dBm) 01 – 0A (Hex) : -38 (dBm) 0B – 14 (Hex) : -43 (dBm) 15 – 1F (Hex) : -48 (dBm)		
4809D2	V.8 procedure in manual reception **Bit 3** **0:** Disabled **1:** Enabled ANSam transmission timer **Bit 5 4 Setting** 0 0 3.2 s 0 1 3.7 s 1 0 5.0 s 1 1 Not used		Do not change bits 0 to 2, 6 and 7.
4809DA	T.30 T1 timer	1 s	
4809E0 bit 3	Maximum wait time for post message signal	**0:** 12 s **1:** 30 s	**1:** Maximum wait time for post message (EOP/EOM/MPS) can be changed to 30 s. Change this bit to "1" if communication errors occur frequently during V.17 reception.

NOTES:

1. If you change the NCU country code and exit the service mode, the bit switch country code (System Bit Switch 0F) will automatically be changed to the code for the same country as the new NCU code.
   The bit switch settings also automatically return to the defaults for that country, including bit switches related to optional units. Therefore, for example, if 40MB memory is installed, any data remaining in the memory will be lost.
2. If a setting is unnecessary, store FF in the address.
3. In Europe, if the country code is not specified, set it to UK (02).

4. Italy and Belgium only
   RAM address 48095E: 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 change.
   480908 (if bit 0 = 1) or 480938 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 480933.
   48090B (if bit 0 = 1) or 48093B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   48090C (if bit 0 = 1) or 48093C (if bit 2 = 1): off time, hex code (unit = 20 ms)
5. Pulse dial parameters (addresses 48094A to 48094F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
6. The first ring may remain undetected until 1 to 2.5 wavelengths after the time specified by this parameter.
7. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: - 0.5 x $N_{480952}/_{480954}$ -3.5 dBm (PSTN)
   - 0.5 x N_{480955} dBm (ISDN)
   Low frequency tone: - 0.5 x ($N_{480952}/_{480954}$ + N_{480953}) –3.5 dBm (PSTN)
   - 0.5 x (N_{480955} + N_{480953}) dBm (ISDN)
   Note: N_{480952}, for example, means the value stored in address 480952(H)
8. 48094A: Europe - Between Ds opening and Di opening
   48094D: Europe - Between Ds closing and Di closing
9. The actual inter-digit pause (pulse dial mode) is the sum of the periods specified by the RAM addresses 48094A, 48094D, and 48094E.



H306M500.WMF

Service Tables

4.4 DEDICATED TRANSMISSION PARAMETERS

Each Quick Dial Key and Speed Dial Code has some 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 parameter bytes will be described.

4.4.1 PROGRAMMING PROCEDURE

1. Set bit 3 of System Bit Switch 04 to 1.
2. Access the required user tool (for a Quick Dial number or a Speed Dial number) and select the required number.

   Example: Change the Parameters in Quick Dial 10.

   a) User Tools - 1. Fax Features – 1. Program/Delete – 01. Prog. Quick Dial.
   b) Press the Quick Dial key 10.
   c) Press # .
3. The settings for switch 01 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
4. To scroll through the parameter bytes, either:
   Select the next byte: **"↓ switch"**
   or
   Select the previous byte: **"↑ switch"**
   until the correct byte is displayed. Then go back to step 3.
5. After the setting is changed, press OK .
6. To finish, press User Tools.
7. After finishing, reset bit 3 of System Bit Switch 04 to 0.

4.4.2 PARAMETERS

The initial settings of the following parameters are all FF(H) - all the parameters are disabled. 'Disabled' means that the appropriate bit switch or other setting is used.

Switch 01
FUNCTION AND COMMENTS
ITU-T 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.

Switch 02		
	FUNCTION	**COMMENTS**
0 to 3	TX level **Bit 3 2 1 0 Setting (dBm)** 0 0 0 0 0 0 0 0 1 -1 : 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.

Switch 03		
	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 0 1 31,200 1 1 1 0 33,600 1 1 1 1 Setting disabled	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.
4-5	Not used	Do not change these settings.
6	AI short protocol **0:** Disabled **1:** Enabled	**0:** AI short protocol is disabled for transmission
7	Not used	Do not change these settings.

Switch 04		
	FUNCTION	**COMMENTS**
0 **1**	mm-inch conversion before tx **Bit 1 Bit 0 Setting** 0 0 mm-inch conversion available 0 1 mm only 1 0 Not used 1 1 Disabled	The machine uses inch-based resolutions for scanning. If ”mm only” is selected, the printed copy may be slightly distorted at the other end if that machine uses inch-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 First DIS or NSF 1 1 Setting 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	V.8 protocol **0:** Disabled **1:** Enabled	If transmissions to a specific destination always end at a low modem rate (14,400 bps or lower), disable V.8 protocol so that V.34 protocol will not be used. **0:** V.34 communication will not be possible.
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.

Switch 04		
	FUNCTION	**COMMENTS**
6 **7**	ECM during transmission **Bit 7 Bit 6 Setting** 0 0 Disabled 0 1 Enabled 1 0 Disabled 1 1 Setting disabled	For example, if ECM is switched on but is not wanted when sending to a particular terminal, use the (0, 0) setting.

Switches 05 to 08 - Not used (do not change the settings)

Switch 09 (Optional ISDN G4 unit required)		
	FUNCTION	**COMMENTS**
0 to 3	Layer 3 protocol **Bits 3 2 1 0 Setting** 0 0 0 0 ISO 8208 0 0 0 1 T.70 NULL 1 1 1 1 Disabled Other settings: Not used	When disabled, the setting of G4 parameter switch 6 (bit 0) setting is used.
4-7	Not used	Do not change the settings.

Switch 10 (Optional ISDN G4 unit required)		
	FUNCTION	**COMMENTS**
0-1	Attachment of the Higher Layer Capabilities Bit 1 Bit 0 Setting 0 0 Attached 0 1 Not attached 1 0 Not used 1 1 Same as G4ISW 13 bit 4	This bit determines whether Higher Layer Capabilities are informed in the [SETUP] signal or not.
2-3	ISDN G3 information transfer capability for transmission Bit 3 Bit 2 Setting 0 0 Speech 0 1 3.1KHz Audio 1 0 Not used 1 1 Same as G4ISW 14 bit 0	This determines the information transfer capability informed in the [SETUP] message. Set this bit to “Speech” if the ISDN does not support 3.1 kHz audio. **Note:** The setting of this switch has a higher priority than the G4 internal switch 13 bit 1 setting (Information transfer capability shift down on/off): Shift down procedure is disabled if this switch is set to either “Speech” or “3.1 kHz audio.”
4-7	Not used	Do not change the settings.

4.5 SERVICE RAM ADDRESSES

⚠CAUTION
Do not change settings marked as “Not used” or “Read only.”

006003 to 00600A(H) – ROM part number and suffix (ASCII)

480001 to 480004(H) - ROM version (Read only)

480001(H) - Revision number (BCD)
480002(H) - Year (BCD)
480003(H) - Month (BCD)
480004(H) - Day (BCD)

480005(H) - RAM Reset Level 1

Change the data at this address to FF (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).

The country code will be reset to UK when RAM reset level 1 is done.

480006 to 480015(H) - Machine's serial number (17 digits - ASCII)

480018(H) - Total program checksum (low)
480019(H) - Total program checksum (high)

48001A(H) - Boot program checksum (low)
48001B(H) - Boot program checksum (high)

48001C(H) - Main program checksum (low)
48001D(H) - Main program checksum (high)

48001E(H) - RDS program update counter (hex)

480020 to 48003F(H) - System bit switches
480040 to 48004F(H) - Scanner bit switches
480050 to 48005F(H) - Printer bit switches
480060 to 48007F(H) - Communication bit switches
480080 to 48008F(H) - G3 bit switches
480090 to 48009F(H) - SG3 bit switches (for optional G3 interface unit)
4800A0 to 4800AF(H) - LAN bit switches

4800D0(H) - User parameter switch 00
Bit 0: Stamp home position 0: Disabled, 1: Enabled
Bits 1 and 2: Scanning contrast home position

Bit 2	1	Setting
0	0	Normal
0	1	Lighten
1	0	Darken

Bit 3: Do not adjust
Bits 4 and 5: Scanning resolution home position

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

Bit 6: Transmission mode home position 0: Memory TX, 1: Immediate TX
Bit 7: Not used

4800D1(H) - User parameter switch 01
Bits 0 to 6: Not used
Bit 7: Settings return to home position after transmission 0: Disabled, 1: Enabled

4800D2(H) - User parameter switch 02
Bit 0: Forwarding mark printing on forwarded messages 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies 0: Disabled, 1: Enabled
Bit 2: Reception time printing 0: Disabled, 1: Enabled
Bit 3: TSI included in transmitted messages 0: Disabled, 1: Enabled
Bit 4: Checkered mark printing 0: Disabled, 1: Enabled
Bit 5: CIL printing (G4) 0: Disabled, 1: Enabled
Bit 6: TID printing (G4) 0: Disabled, 1: Enabled
Bit 7: Not used

4800D3(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 report 0: Off, 1: On
Bit 3: Polling reserve report (polling reception) 0: Off, 1: On
Bit 4: Polling result report (polling reception) 0: Off, 1: On
Bit 5: Transmission result report (immediate transmissions) 0: Off, 1: On
Bit 6: Polling clear report 0: Off, 1: On
Bit 7: Journal 0: Off, 1: On

4800D4(H) - User parameter switch 04
Bit 0: Confidential reception report 0: Off, 1: On
Bit 1: Fax On Demand report output 0: Off, 1: On
Bits 2 to 6: Not used
Bit 7: Includes a sample image on reports 0: Off, 1: On

4800D5(H) - User parameter switch 05

Bit 0: Substitute reception 0: Off, 1: On
Bit 1: Memory reception if no RTI or CSI received 0: Possible, 1: Impossible
(also see system switch 11 bit 6)
Bit 2: Not used
Bit 3:High temperature standby mode 0: Off, 1: On
The machine maintains the operating temperature for 15 min after printing.
Bits 4 and 5: Restricted Access

Bit 5	4	Setting
0	0	Disabled
0	1	Enabled at all times
1	0	Enabled during Night Timer periods only
1	1	Not used

Bit 6: Fusing lamp control during energy saver mode
0: Lamp off (Level 2, Low Power Standby),
1: Standby temperature (Level 1, Fax Standby)
Bit 7: Not used (keep this bit at 0.)

4800D6(H) - User parameter switch 06

Bit 0: TTI 0: Off, 1: On
Bit 1: Not used
Bit 2: Closed network for transmission 0: Off, 1: On
Bit 3: Not used
Bit 4: Batch transmission 0: Off, 1: On
Bit 5: Partial image scanning during memory tx 0: Off, 1: On
Bit 6: ISDN SPID programming (used only in the USA)
0: Off (G4 directory No.1 and No.2 can be programmed)
1: On (G4 SPID and G4 directory no. can be programmed)
Bit 7: Backup transmission 0: Off, 1: On

4800D7(H) - User parameter switch 07

Bits 0 to 1: Not used
Bit 2: Parallel memory transmission 0: Off, 1: On
Bit 3: Reduction before transmission 0: Off, 1: On
Bit 4: Use of the ☒ key for tonal signals 0: Off, 1: On
Bit 5: Not used
Bits 6 and 7: Fax On Demand

Bit 7	6	Setting
0	0	Disabled
0	1	Enabled without password (Remote ID)
1	0	Enabled with password (Remote ID)
1	1	Not used

4800D8(H) - User parameter switch 08

Bits 0 and 1: Multi-copy reception

Bit 1	0	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are multicopied.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are multicopied.

Bits 2 and 3: Authorized reception

Bit 3	2	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are accepted.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are accepted.

Bits 4 and 5: Specified cassette selection (optional cassette required)

Bit 5	4	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are printed to the paper in a specified cassette.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are printed to the paper in a specified cassette.

Bits 6 and 7: Forwarding (optional memory card required)

Bit 7	6	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are forwarded.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are forwarded.

4800D9(H) - User parameter switch 09

Bits 0 and 1: Memory lock

Bit 1	0	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature are kept in the memory until a memory lock ID is entered.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are kept in the memory until a memory lock ID is entered.

Bits 2 and 3: Tx/Rx file save
(optional 40M Memory and the function upgrade card required)

Bit 3	2	Setting
X	0	Disabled
0	1	Faxes from senders whose RTIs/CSIs are specified for this feature kept in the hard disk for filing.
1	1	Faxes from senders whose RTIs/CSIs are not specified for this feature are kept in the hard disk for filing.

Bits 4 to 7: Not used

4800DA(H) - User parameter switch 10 (SWusr_0A)

Bit 0: Not used
Bit 1: 2 in 1 — 0: Disabled, 1: Enabled
Bit 2: Image Rotation — 0: Disabled, 1: Enabled
Bit 3: Page Reduction — 0: Disabled, 1: Enabled
Bit 4: Rotate Sort — 0: Disabled, 1: Enabled
Bits 5 and 6: Not used
Bit 7: Halftone type — 0: Error diffusion, 1: Dither

4800DB(H) - User parameter switch 11 (SWusr_0B)

Bit 0: Transfer request using DTMF tone signals — 0: Not accepted, 1: Accepted
Bit 1: Method of transmitting numbers after the "Tone" mark over an ISDN line — 0: UUI, 1: Tone
Bits 2 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station — 0: Off, 1: On
Bit 7: Polling Standby duration — 0: Once, 1: No limit

4800DC(H) - User parameter switch 12 (SWusr_0C)

Bits 0 and 1: Not used
Bit 2: Toner saving mode — 0: 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 6: Not used
Bit 7: Copy operation — 0: Possible, 1: Prohibited

4800DD(H) - User parameter switch 13 (SWusr_0D)

Bits 0 and 1: PSTN-1 access method from behind a PABX

Bit 1	0	Setting
0	0	PSTN
0	1	Extension (Loop start)
1	0	Extension (Ground start)
1	1	Extension (Flash start)

Bits 2 and 3: PSTN-2 access method from behind a PABX

Bit 1	0	Setting
0	0	PSTN
0	1	Extension (Loop start)
1	0	Extension (Ground start)
1	1	Extension (Flash start)

Bits 4 and 5: Not used

Bit 6: Action when the received Higher Layer Capabilities is Tel or Bearer Capabilities is Speech
(This switch is not listed on the User Parameter List.)
0: Do not respond to the call
1: Respond to the call

Bit 7: Not used

4800DE(H) – User parameter switch 14 (SWusr_0E)

Bit 0: PC-fax transmission method 0: Direct 1: Memory

Bit 1: To print received messages (normal fax reception) if the PC does not respond in the PC direct reception mode
0: Do not print the message
1: Print the message when the number of rings exceeds the counter

Bit 2: TTI included in memory transmission (when bit 0 is set to “1”)
0: Disabled 1: Enabled

Bits 3 and 4: Destination for reception

Bit 4	3	Destination
0	0	Print from the machine (normal fax reception)
0	1	PC direct reception
1	0	PC memory reception
1	1	PC memory reception and print from the machine

Bits 5 and 6: PC fax application type

Bit 6	5	Application type
0	0	Bitware/ MS Fax (Win 95)
0	1	WinFax 4.0/7.0/8.0
1	0	Not used
1	1	Sopwith/LaserFax

Bit 7: Not used

4800DF(H) – User parameter switch 15 (SWusr_0F)

Bits 0 to 7: Not used.

4800E0(H) – User parameter switch 16 (SWusr_10)

Bits 0 and 1: Leave messages on the POP server after receiving them

Bit	1	0	Setting
	0	0	Do not save
	0	1	Save all
	1	0	Save error only
	1	1	Not used

Bit 2: Not used

Bit 3: If an error occurs during mail reception, whether to mail a notification to the sender.

0: Yes
1: No

Bit 4: Whether to receive e-mail when the Night Timer is in effect.

0: Yes
1: No

Bits 5 to 7: Not used

4800E1(H) – User parameter switch 17 (SWusr_11)

Bits 0 to 7: Not used

4800E2(H) – User parameter switch 18 (SWusr_12)

Bits 0 to 7: Not used

4800E3(H) – User parameter switch 19 (SWusr_13)

Bits 0 to 7: Not used

4800E4(H) – User parameter switch 20 (SWusr_14)

Bits 0 to 7: Not used

4800E5(H) – User parameter switch 21 (SWusr_15)

Bits 0 to 7: Not used

4800E6(H) – User parameter switch 22 (SWusr_16)

Bits 0 to 7: Not used

4800E7(H) – User parameter switch 23 (SWusr_17)

PSTN-2 access code from behind a PABX
(This switch is not printed on the user parameter list.)

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

4800E8(H) – User parameter switch 24 (SWusr_18)
Bits 0 and 1: File retention time

Bit	1	0	Setting
	0	0	File retention impossible
	0	1	24 hours
	1	0	File retention impossible
	1	1	72 hours

Bits 2 to 7: Not used

4800E9(H) – User parameter switch 25 (SWusr_19)
Bits 0 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 time 0: Disabled, 1: Enabled

4800EA(H) – User parameter switch 26 (SWusr_1A)
Bit 0: Not used
Bit 1: PSTN-1 dialing type 0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing
Bits 2 to 4: Not used
Bits 5: PSTN-2 dialing type 0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing

4800EB(H) – User parameter switch 27 (SWusr_1B)
PSTN-1 access code from behind a PABX
(This switch is not printed on the user parameter list.)

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

4800EC(H) – User parameter switch 28 (SWusr_1C)
Bits 0 to 7: Not used

4800ED(H) – User parameter switch 29 (SWusr_1D)
Bits 0 to 7: Not used

4800EE(H) – User parameter switch 29 (SWusr_1E)
Bits 0 to 7: Not used

4800EF(H) – User parameter switch 30 (SWusr_1F)
Bits 0 to 7: Not used

480100 to 48010F(H) - G4 parameter switches
480110 to 48012F(H) - G4 internal switches

480130 to 480143(H) - RTI (Max. 20 characters - ASCII) - **See the following note**
480158 to 480177(H) - TTI (Max. 32 characters - ASCII) - **See the following note**
480198 to 4801AB(H) - CSI (Max. 20 characters - ASCII)
4801AC to 4801BF(H) - CSI for PSTN-2 (Max. 20 characters - ASCII)
4801C0 to 48011D3(H) - ISDN G3 CSI (Max. 20 characters - ASCII)
4801D4(H) - Number of CSI characters (Hex)
4801D5(H) - Number of CSI for PSTN-2 characters (Hex)
4801D6(H) - Number of ISDN G3 CSI characters (Hex)

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

4801D7 to 4801E5(H) - Service station's fax number (Service function 13)

4801F5 to 480203(H) - Own fax number (PSTN) (User function 61)
480204 to 480212(H) - Own fax number (ISDN G4) (User function 61)
480213 to 480221(H) - ISDN G3 Subscriber Number 1 (User function 64)
480222 to 480230(H) - ISDN G3 Subscriber Number 2 (User function 64)
480240 to 48024E(H) - G4 Subscriber Number 1 (User function 64)
8001B7 to 8001C5(H) - G4 Subscriber Number 2 (User function 64)

480250(H) - ID code (low - BCD)
480251(H) - ID code (high - BCD)

480252(H) - Confidential ID (low - BCD)
480253(H) - Confidential ID (high - BCD)

480254(H) - Memory lock ID (low - BCD)
480255(H) - Memory lock ID (high - BCD)

48025C(H) - Network type used for the service station number
00(H) - G3 (PSTN)
01(H) - G4 (ISDN)

480280 to 480287(H) - Last power off time (Read only)
480280(H) - Clock
00(H) - 12-hour clock (AM)
01(H) - 24-hour clock
02(H) - 12-hour clock (PM)
480281(H) - Year (BCD)
480282(H) - Month (BCD)
480283(H) - Day (BCD)
480284(H) - Hour
480285(H) - Minute
480286(H) - Second
480287(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

480294 to 480296(H) - Optional equipment (Read only)

480294(H)
- Bit 0: Future expander 2M/4M
- Bit 1: Future expander 40M
- Bit 2: Function upgrade card
- Bit 3: ADF (Always “1”)

480295(H)
- Bit 0: PFU is not installed
- Bit 1: One PFU is installed
- Bit 2: Two PFUs are installed
- Bit 4: Printer unit
- Bit 6: ISDN unit

480296(H)
- Bit 0: FOD
- Bit 2: JBIG
- Bit 3: G3 interface unit
- Bit 6: NIC fax kit

For the following counters, the wording in brackets indicates how these counters appear on the system parameter list.

4802A0 to 4802A2(H) – LAN tx counter (Mail TX)

Address	High	Low
8001F6(H)	Tens digit	Unit digit
8001F7(H)	Thousands digit	Hundreds digit
8001F8(H)	Hundred thousands digit	Ten thousands digit
8001F9(H)	Ten millions digit	Millions digit

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

4802A4 to 4802A6(H) – LAN rx counter (Mail RX)

4802A8 to 4802AA(H) – LAN AT counter (LAN PC-FAX)

4802AC to 4802AE(H) - TX counter (TX)

4802B0 to 4802B2(H) - RX counter (RX)

4802B4 to 4802B6(H) - Scan counter (SCN)

4802B8 to 4802BA(H) - Print counter (PRT)

4802BC to 4802BE(H) - Printer counter

4802C0 to 4802C2(H) - ADF counter (ADF)

4802C4 to 4802C6(H) - ADF PM counter

4802C8 to 4802CA(H) - ADF PM interval (Default: 30,000)

4802CC to 4802CE(H) - ADF roller counter (ADF (ROLL))

4802D0 to 4802D2(H) - ADF roller interval (Default: 30,000)

4802D4 to 4802D6(H) - MDF counter (MDF)

4802D8 to 4802DA(H) - Paper feed counter (Standard cassette)

4802DC to 4802DE(H) - Paper feed counter (1st PFU)

4802E0 to 4802E2(H) - Paper feed counter (2nd PFU)

4802E4 to 4802E6(H) - Bypass feed counter

4802EC to 4802EE(H) - Scanner total jam counter

4802F0 to 4802F2(H) - Printer total jam counter

4802F4 to 4802F6(H) - Paper jam counter (Standard cassette)

4802F8 to 4802FA(H) - Paper jam counter (1st PFU)

4802FC to 4802FE(H) - Paper jam counter (2nd PFU)

480308 to 48030A(H) - Fusing exit jam counter

48030C to 48030E(H) - Transfer jam counter

480310 to 480312(H) - Printer PM counter

480314 to 480316(H) - Printer PM interval (Default: 60,000)

480318 to 48031A(H) - Copy counter

48031C to 48031E(H) - OPC counter

480320 to 480323(H) - OPC PM interval (Default: 30,000)

480324 to 480326(H) - AIO counter

480328 to 48032A(H) – Previous AIO counter, before replacing (TONER (PRE))

480330 to 48033F(H) - Excessive jam call parameters

Parameters		Address (H)		Initial Setting	Sys. Para. List
		ADF	Printer		
DEC (1 - 255; 0 = Disabled)		480338	48033C	10 (H)	X
CALL (3 – 15; 0 = Disabled)		480339	48033D	06(H)	Y
CLR	(Low)	48033A	48033E	30(H)	-
	(High)	48033B	48033F	00(H)	

Counters	Address (H)		Sys. Para. List
	ADF	Printer	
JAM: Jam counter used to place a service call	480331	480335	Z
NO-JAM1: Counter used for JAM counter decrement	480330	480334	-
NO-JAM2: Counter used for clearing the JAM counter	480332 (Low)	480336 (Low)	-
	480333 (High)	480337 (High)	

480340 to 480342(H) - PC tx counter (PC TX)
480344 to 480346(H) - PC rx counter (PC RX)
480348 to 48034A(H) - PC scan counter (PC SCN)
48034C to 48034E(H) - PC print counter (PC PRT)

480372 to 48037D(H) - G4 NSC code
48037E to 480395(H) - G4 terminal ID (ASCII - Max. 24 characters)
480396 to 480399(H) - ISDN IP
48039A to 48039D(H) - ISDN G3 sub-address
48039E to 4803A1(H) - ISDN G4 sub-address

4803A2(H) - SiG4 board ROM suffix
4803A3(H) - SiG4 ROM version
4803A4 to 4803A6(H) - SiG4 ROM Information
4803A4(H) - Year (BCD)
4803A5(H) - Month (BCD)
4803A6(H) - Day (BCD)

4803A8 to 4803A9(H) - Modem ROM version (FCU)
4803AA to 4803AB(H) - Modem ROM version (Optional G3 unit)

4803AC to 4803AD(H)
Timer adjustment for FCU automatic reset (system switch 02 bit 4)
0000 to 04FF(H): 1 hour
0500 to FFFF(H): N x 500 ms (10.7 minutes to 9.1 hours)

4803AE to 4803AF(H)
Timer adjustment for SG3/G4 automatic reset (system switch 02 bit 4)
0000 to 04FF(H): 15 minutes
0500 to FFFF(H): N x 500 ms (10.7 minutes to 9.1 hours)

4803C0(H) - Number of copies for multi-sort document reception

4803C1(H) - Daylight saving time settings

4803C2 to 4803EB(H) - Night timer period
4803C2 to 4803C4(H) - Setting #1 for Monday
4803C5 to 4803C7(H) - Setting #2 for Monday
4803C8 to 4803CA(H) - Setting #1 for Tuesday
4803CB to 4803CD(H) - Setting #2 for Tuesday
4803CE to 4803D0(H) - Setting #1 for Wednesday
4803D1 to 4803D3(H) - Setting #2 for Wednesday
4803D4 to 4803D6(H) - Setting #1 for Thursday
4803D7 to 4803D9(H) - Setting #2 for Thursday
4803DA to 4803DC(H) - Setting #1 for Friday
4803DD to 4803DF(H) - Setting #2 for Friday
4803E0 to 4803E2(H) - Setting #1 for Saturday
4803E3 to 4803E5(H) - Setting #2 for Saturday
4803E6 to 4803E8(H) - Setting #1 for Sunday
4803E9 to 4803EB(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

480416(H) - Time for economy transmission (hour in 24h clock format - BCD)
480417(H) - Time for economy transmission (minute - BCD)

480424 to 48042B(H) - Last Fax On Demand report printout (Read only)
480424(H) - 01(H): 24-hour clock, 00(H): 12-hour clock (AM), 02(H): 12-hour clock (PM)
480425(H) - Year (BCD)
480426(H) - Month (BCD)
480427(H) - Day (BCD)
480428(H) - Hour
480429(H) - Minute
48042A(H) - Second
48042B(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday

480432(H) - Transmission monitor volume	00 - 07(H)
480433(H) - Reception monitor volume	00 - 07(H)
480434(H) - On-hook monitor volume	00 - 07(H)
480435(H) - Dial monitor volume	00 - 07(H)
480436(H) - Buzzer volume	00 - 07(H)
480437(H) - Key acknowledgment tone volume	00 - 07(H)

480439 to 48043D(H) - Periodic service call parameters
480439(H) - Call interval: 01 through 15 month(s) (BCD)
(00: Periodic service call disabled.)
48043A(H) - Year: Last two digits of the year (BCD)
48043B(H) - Month: 01 to 12 (BCD)
48043C(H) - Day: 01 to 31 (BCD)
48043D(H) - Hour: 00 to 23 (BCD)

480443 to 480445(H) - Effective term of automatic service
480443(H) - Year: Last two digits of the year (BCD)
480444(H) - Month: 01 to 12 (BCD)
480445(H) - Day: 01 to 31 (BCD)

480448 to 48044F(H) - NIC ROM version

480900 to 480AE0(H) - NCU parameters (Refer to section 4.3 for details)

480B00(H) - Print top margin (standard tray)
480B01(H) - Print top margin (1st optional tray)
480B02(H) - Print top margin (2nd optional tray)
480B06(H) - Print top margin (bypass feed)

480B0C(H) - Print left margin (standard tray)
480B0D(H) - Print left margin (1st optional tray)
480B0E(H) - Print left margin (2nd optional tray)
480B12(H) - Print left margin (bypass feed)

Refer to section 6.5.3 for details about these parameters.

480B42(H)) - Excessive jam alarm
Bit 3: Scanner excessive jam alarm 1: An alarm has occurred
Bit 4: Printer excessive jam alarm 1: 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.

480B43(H) - Details of the service call (hardware error)
0X(H): Fusing unit failure
21(H): Laser power is out of the specified range
3X(H): Polygonal mirror motor failure
4X(H): Main motor failure
5X(H): Power pack failure

When a service call was caused by a fusing lamp failure (codes 0X):
After fixing the problem, set printer switch 01 bit 0 to 1 and turn the power off/on. The machine resets this bit to 0, and restarts the machine to clear the service call.

When a service call occurred because of a different hardware failure:
If the problem remains after restarting the machine (power off/on), fix the hardware problem. The service call condition clears after power up.

481232(H) - ADF sensor status 0: No paper detected 1: Paper detected
Bit 0: Scan line sensor (S2)
Bit 2: Document sensor (S1)
Bit 3: B4-width sensor
Bit 4: A3-width sensor
Bit 5 : MDF sensor
Bit 6 : MDF B4-width sensor
Bit 7 : MDF A3-width sensor

481233(H) - ADF sensor status 0: Closed 1: Opened
Bit 0: ADF upper cover
Bit 1: ADF unit

481246(H) - Scanning home position adjustment
Refer to section 6.2.8 for details.

4A86F6 to 4A8C15(H) - Dedicated tx parameters for Quick Dial 01 - 64 and Speed Dial #00 - #99.
Each set of destination data consists of 32 bytes. Last 8 bytes (23rd to 32nd bytes) are used.

4A86F6 to 4A86FD(H) - Dedicated tx parameters for Quick 01
4A86FE to 4A8705(H) - Dedicated tx parameters for Quick 02
4A8706 to 4A870D(H) - Dedicated tx parameters for Quick 03
:
4A88EE to 4A88F5(H) - Dedicated tx parameters for Quick 64
4A88F6 to 4A88FD(H) - Dedicated tx parameters for Speed #00
4A88FE to 4A8905(H) - Dedicated tx parameters for Speed #01
4A8906 to 4A890D(H) - Dedicated tx parameters for Speed #03
:
4A8C0E to 4A8C15(H) - Dedicated tx parameters for Speed #99

4B6D16 to 4B6D17(H) - Line type change
4B6D16(H) - Current line type setting
4B6D17(H) - Line type to be used after the procedure

4B945C to 4B965B(H) - Latest 64 error codes (Read only)

One error record consists of 8 bytes of data.

First error record start address – 4B945C(H)
Second error record start address – 4B9464(H)
Third error record start address – 4B946C(H)
: : :
64th error record start address - 469654(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.
7th byte - Communication line used
00(H): PSTN, 0C(H): ISDN G3, 0D(H): ISDN G4

4BCAB4 to 4BD1BB(H) - Latest 20 error communication records

One error communication record consists of 90 bytes. The format is as follows:

1st byte - Header
Bit 0: Communication result 0: OK, 1: NG
Bit 1: Document jam 1: Occurred
Bit 2: Power down 1: Occurred
Bit 3: Not used
Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes
Bit 5: Type of technical data 0: 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 byte - Not used

3rd to 7th bytes - Date and time when the communication started
3rd byte - Year (BCD)
4th byte - Month (BCD)
5th byte - Day (BCD)
6th byte - Hour (BCD)
7th byte - Minute (BCD)
8th and 9th bytes - Communication time
8th byte - Minutes (BCD)
9th byte - Seconds (BCD)

10th byte - Not used

11th and 12th bytes - Number of pages transmitted or received
11th byte - Low byte (Hex)
12th byte - High byte (Hex)

13th and 14th bytes - Personal code or number of total/burst error lines
If bit 4 of the 1st byte is 0: 13th byte - Personal code (low - BCD)
14th byte - Personal code (high - BCD)
If bit 4 of the 1st byte is 1: 13th byte - Number of total error lines (Hex)
14th byte - Number of burst error lines (Hex)

15th byte - File number (low - Hex)
16th byte - File number (high - Hex)

17th and 18th bytes - Rx level or measure of error rate
If bit 5 of the 1st byte is 0: 17th byte - Rx level (low - Hex)
18th byte - Rx level (high - Hex)
If bit 4 of the 1st byte is 1: 17th byte - Measure of error rate (low - Hex)
18th byte - Measure of error rate (high - Hex)

19th byte - Final modem rate

Bits 0 to 3: Final modem speed

Bit 3	2	1	0	Setting
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
0	1	1	1	16.8k
1	0	0	0	19.2k
1	0	0	1	21.6k
1	0	1	0	24.0k
1	0	1	1	26.4k
1	1	0	0	28.8k
1	1	0	1	31.2k
1	1	1	0	33.6k

Other settings - Not used

Bits 4 to 7: Final modem type

Bit 7	6	5	4	Setting
0	0	0	1	V.27ter
0	0	1	0	V.27ter, V.29
0	0	1	1	Not used
0	1	0	0	V.27ter, V.29, V.17
0	1	0	1	V.27ter, V.29, V.17, V.34

Other settings - Not used

20th to 22nd byte - Not used

23rd to 46th byte - Remote terminal's ID (RTI, TSI or CSI) (ASCII)

47th byte - Communication mode #1
Bits 0 - 1: Resolution used

Bit 1	0	Setting
0	0	Standard
1	0	Detail
1	1	Fine

Bit 2: Communication Protocol 0: G3, 1: G4
Bit 3: ECM 0: Off, 1: On
Bits 4 to 7: Communication mode used

Bit 7	6	5	4	Setting
0	0	0	0	Normal
0	0	0	1	Confidential
0	0	1	0	Polling
0	0	1	1	Transfer
0	1	0	0	Forwarding
0	1	0	1	Automatic Service Call
0	1	1	1	Transfer using DTMF/UUI
1	0	0	0	Fax On Demand

48th 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
Bit 5: Not used
Bits 6 and 7: Network type used

49th byte - Not used

50th byte - Number of errors during communication (Hex)

51st to 90th byte - 1st error code and page number where the error occurred
51st byte - Page number where the error occurred (low - Hex)
52nd byte - Page number where the error occurred (high - Hex)
53rd byte - Error code (low - BCD)
54th byte - Error code (high - BCD)
55th to 58th byte - 2nd error code and page number where the error occurred
59th to 62nd byte - 3rd error code and page number where the error occurred
63rd to 66th byte - 4th error code and page number where the error occurred
67th to 70th byte - 5th error code and page number where the error occurred
71st to 74th byte - 6th error code and page number where the error occurred
75th to 78th byte - 7th error code and page number where the error occurred
79th to 82nd byte - 8th error code and page number where the error occurred
83rd to 86th byte - 9th error code and page number where the error occurred
87th to 90th byte - 10th error code and page number where the error occurred

5. PREVENTIVE MAINTENANCE

5.1 SPECIAL TOOLS AND LUBRICANTS

- Flash memory card -4M (P/N: A2309352)
- Flash/SRAM data copy tool (P/N: A1939353 / H5159100)

5.2 PM TABLE

Scanner/ADF

Item	30K	60K	120K	180K	Notes
Pick-Up Roller Ass^y (Including Feed Roller)	R(user)	R(user)	R(user)	R(user)	ADF Maintenance Kit
Reverse Roller	R(user)	R(user)	R(user)	R(user)	ADF Maintenance Kit
Exposure Glass	C (user)	C (user)	C (user)	C (user)	Soft cloth and water
R0, R1 and R2 Rollers	C (user)	C (user)	C (user)	C (user)	Soft cloth and water
Pressure Roller	C (user)	C (user)	C (user)	C (user)	Soft cloth and water
White Shading Plate	C (user)	C (user)	C (user)	C (user)	Soft cloth and water

Printer

Item	30K	60K	120	180K	Notes
Fusing Unit	-	R(user)	R(user)	R(user)	Fusing Maintenance Kit
Transfer Roller	-	R(user)	R(user)	R(user)	Fusing Maintenance Kit
Pick-up Roller	-	-	-	R(FST)	
Paper Feed Roller		C (user)	C (user)	C (user)	Soft cloth and water
Idle Roller-Paper Feed		C (user)	C (user)	C (user)	Soft cloth and water
Registration Roller	-	C (user)	C (user)	C (user)	Soft cloth and water

Paper Feed Unit (Optional)

Item	30K	60K	120K	180K	Notes
Pick-up Roller	-	-	-	R(FST)	
Feed Roller	-	C (user)	C (user)	C (user)	Soft cloth and water
Idle Roller-Paper Feed	-	C (user)	C (user)	C (user)	Soft cloth and water

FST: Field Service Technician

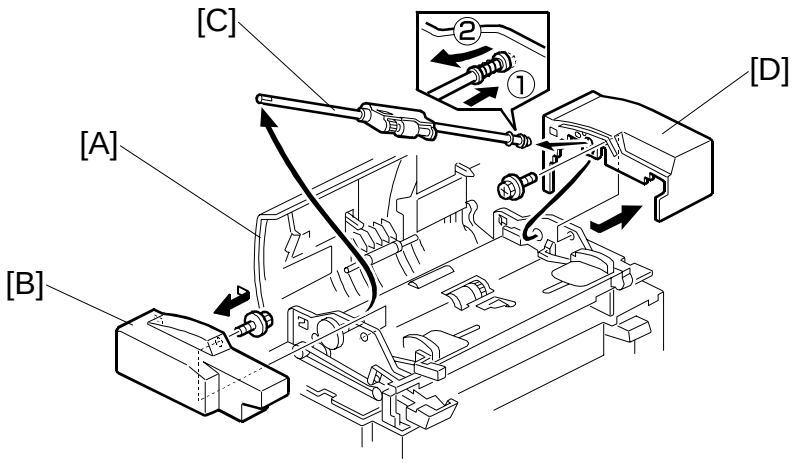
C: Clean, R: Replace

NOTE: After replacing a maintenance kit, make sure to reset the appropriate PM counter through the Key Operator Tools menu.

6. REPLACEMENT AND ADJUSTMENT

6.1 EXTERNAL COVERS

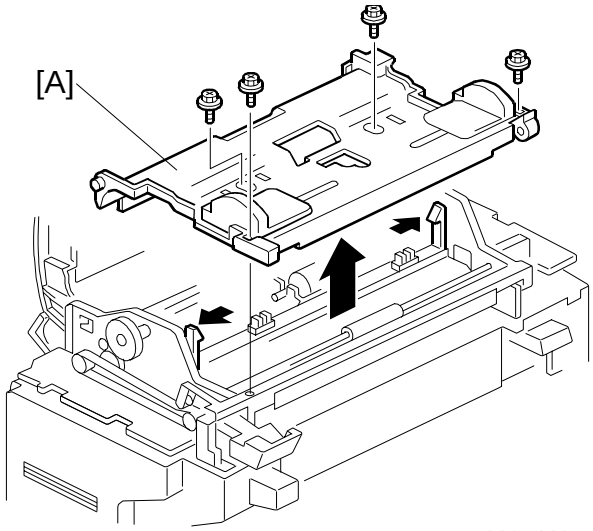
6.1.1 REMOVING THE ADF FRONT AND REAR COVERS



H306R001.WMF

1. Open the ADF upper cover [A].
2. Remove the ADF front cover [B] (1 screw).
3. Remove the pick-up roller unit [C] by sliding the unit toward the back (toward the spring-loaded end).
4. Remove the ADF rear cover [D] (1 screw).

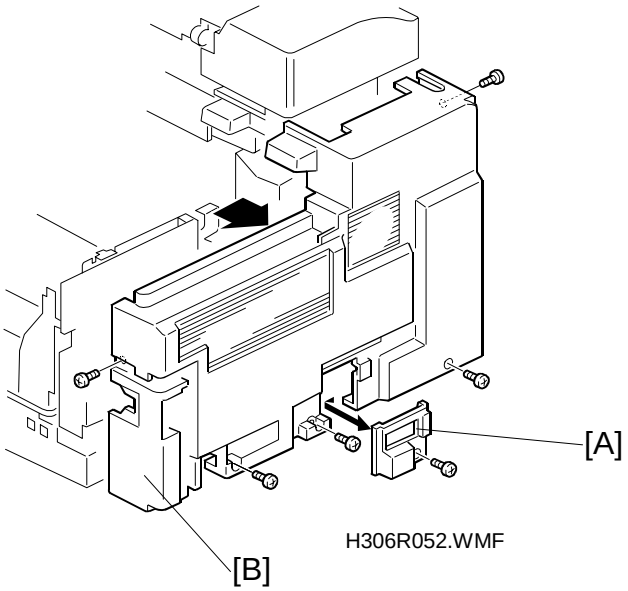
6.1.2 REMOVING THE UPPER GUIDE PLATE



H306R002.WMF

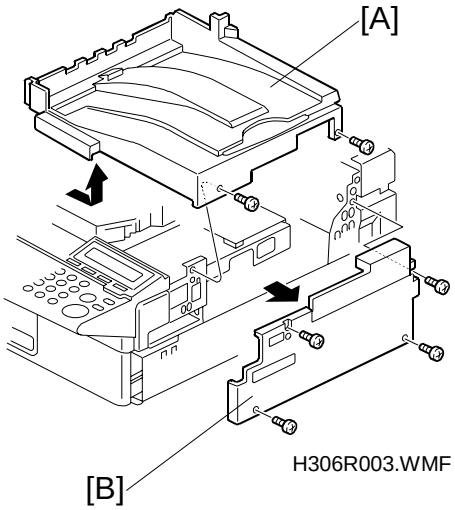
1. Remove the upper guide plate [A] (4 screws).

6.1.3 REMOVING THE REAR COVER

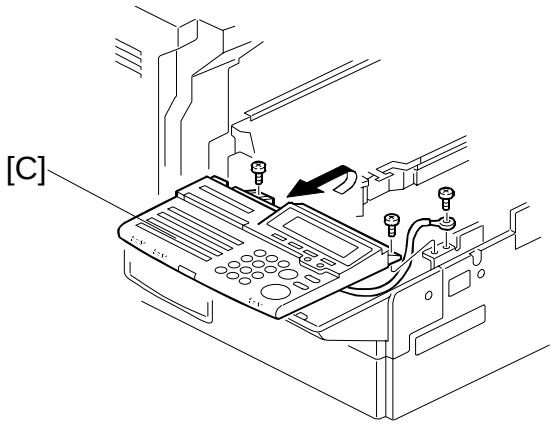


1. Remove the optional connector cover [A] (1 screw).
2. Remove the rear cover [B] (5 screws).

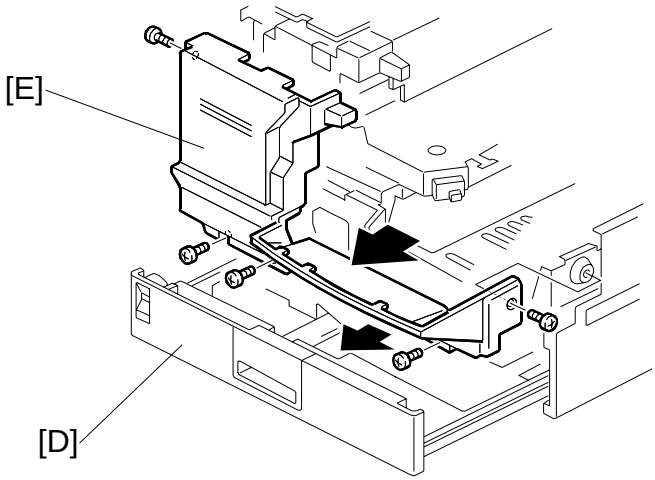
6.1.4 REMOVING THE OPERATION PANEL AND FRONT COVER



H306R003.WMF



H306R004.WMF

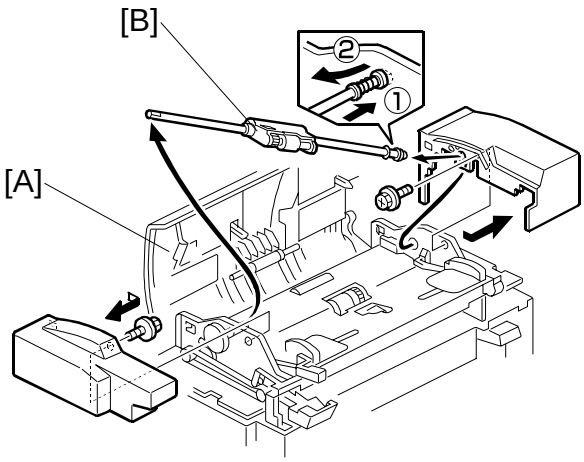


H306R005.WMF

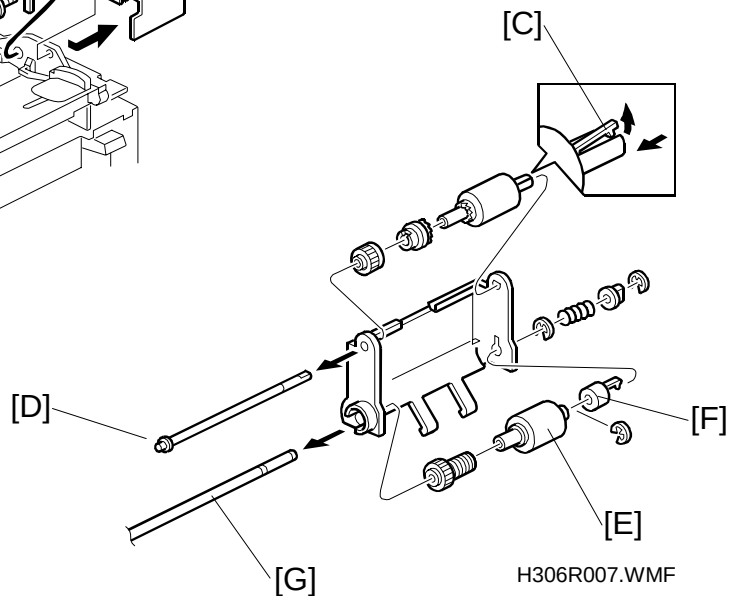
1. Remove the upper cover [A] (2 screws).
2. Remove the right cover [B] (4 screws).
3. Remove the operation panel [C] (3 screws, 1 connector, 1 grounding wire).
4. Pull out the cassette [D].
5. Remove the front cover [E] (5 screws).

6.2 ADF/SCANNER SECTIONS

6.2.1 REPLACING THE PICK-UP ROLLER (PART OF THE ADF MAINTENANCE KIT)



H306R001.WMF



H306R007.WMF

1. Open the ADF upper cover [A].
2. Remove the pick-up roller unit [B].
   NOTE: Slide the unit toward the rear (toward the spring-loaded end). The front bushings will detach and the unit can then be removed.

NOTE: If you install all parts in the ADF maintenance kit at the same time, be sure to reset the PM counter (ADF).

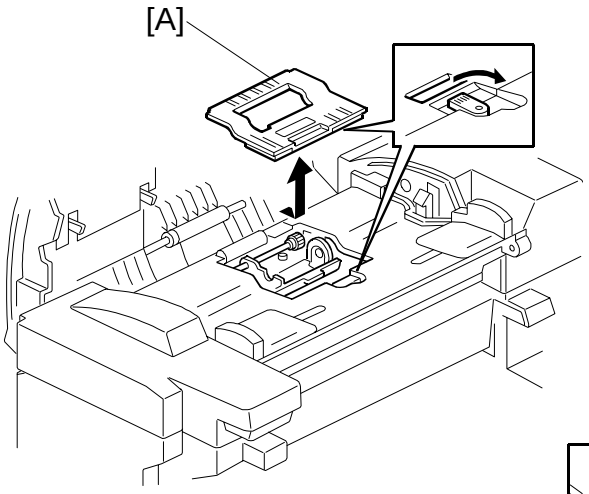
6.2.2 REPLACING THE FEED ROLLER (PART OF THE ADF MAINTENANCE KIT)

First do the first two steps of the pick-up roller replacement procedure above.

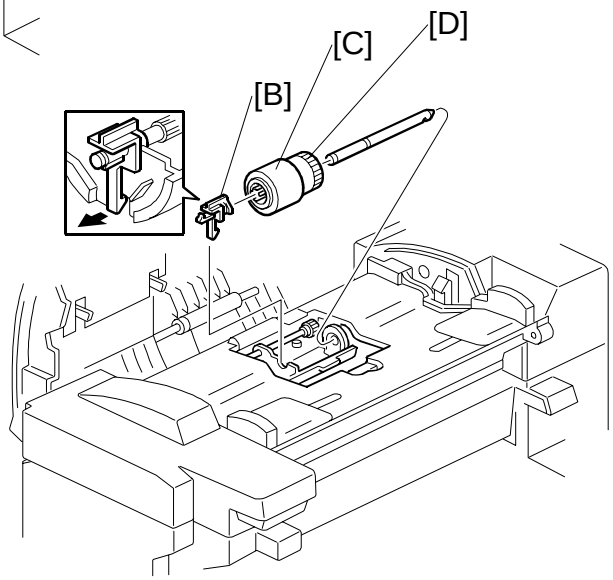
1. Release the pick-up roller stopper [C] and pull the shaft toward the end with the E-clip [D]. This will allow the pick-up roller to be removed.
2. Remove the three E-clips from the feed roller [E].
3. Release the roller clutch stoppers [F], pull out the shaft [G], and remove the feed roller.

NOTE: If you install all parts in the ADF maintenance kit at the same time, be sure to reset the PM counter (ADF).

6.2.3 REPLACING THE REVERSE ROLLER AND TORQUE LIMITER (PART OF THE ADF MAINTENANCE KIT)



H306R050.WMF

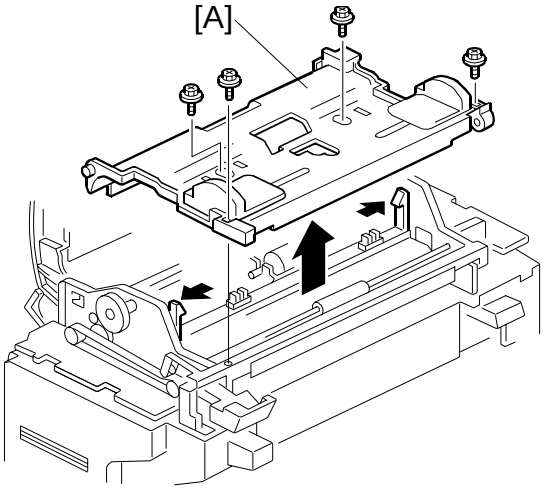


H306R051.WMF

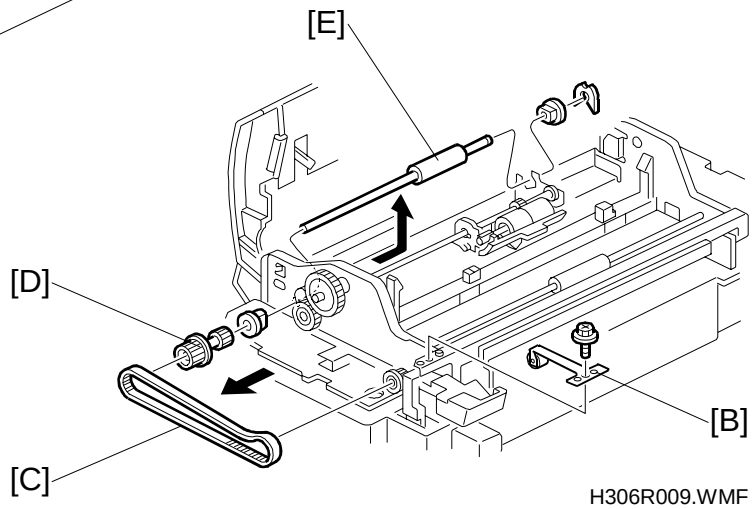
1. Remove the separation roller cover [A].
2. Remove the clip [B] and replace the reverse roller [C] and torque limiter [D].

NOTE: If you install all parts in the ADF maintenance kit at the same time, be sure to reset the PM counter (ADF).

6.2.4 REPLACING THE R0 ROLLER



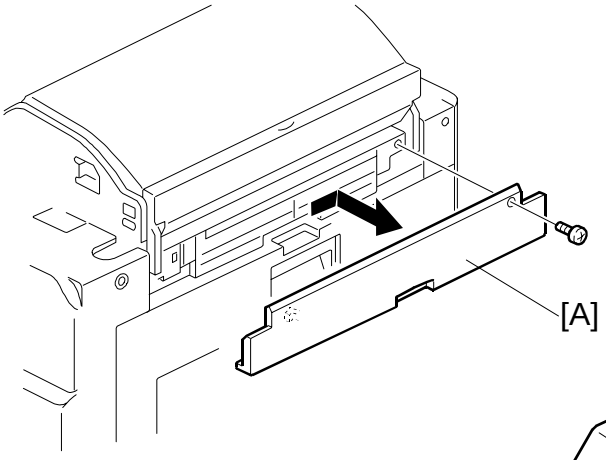
H306R002.WMF



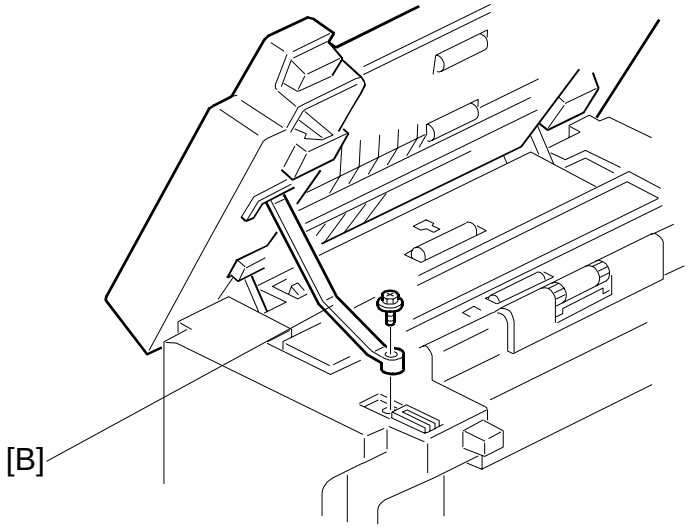
H306R009.WMF

1. Remove the ADF rear cover (see section 6-1, step 1).
2. Remove the ADF front cover.
3. Remove the guide plate [A] (4 screws).
4. Remove the belt tension roller with spring plate [B]. (1 screw)
5. Remove the belt [C].
6. Release the pawl that holds the pulley [D], and remove the pulley.
7. Slide the R0 roller [E] toward the rear and lift the roller out.

6.2.5 REPLACING THE R1, R2 AND DOCUMENT EXIT ROLLERS

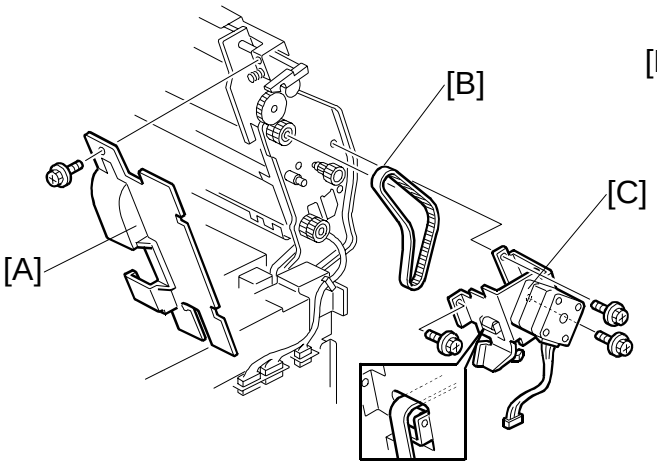


H306R011.WMF

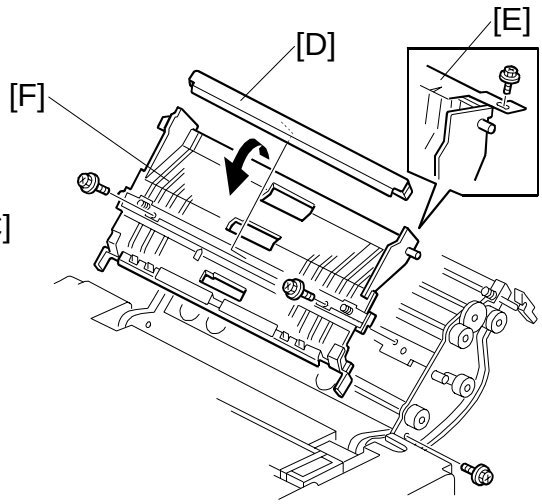


H306R901.WMF

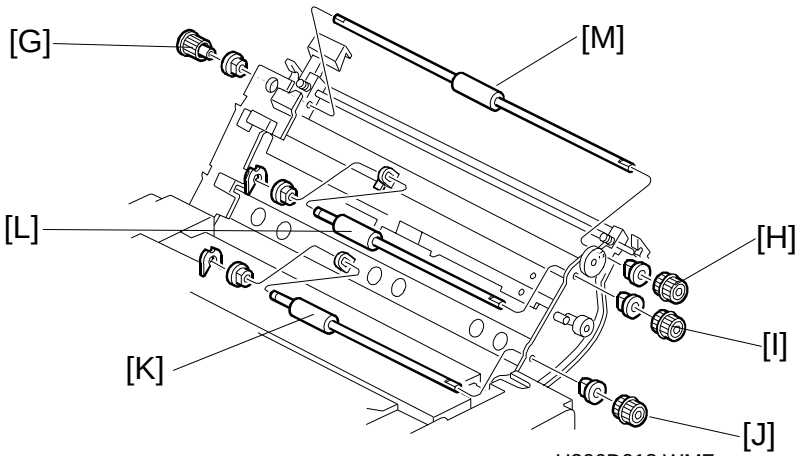
1. Remove the ADF lower cover [A] (1 screw).
2. Remove the ADF rear cover.
3. Remove the ADF front cover.
4. Remove the upper guide plate.
5. Remove the rear cover.
6. Remove the ADF stopper [B] (1 screw).



H306R010.WMF



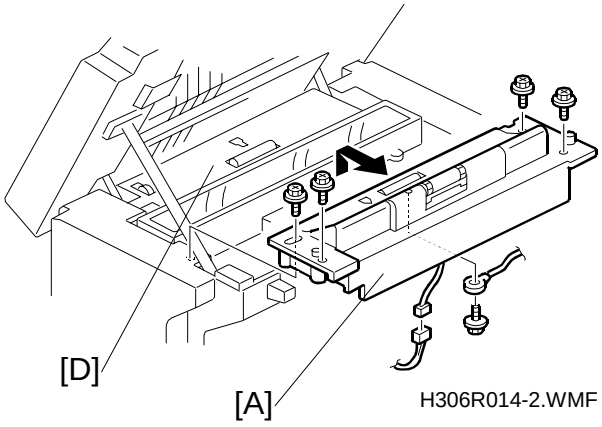
H306R012-2.WMF



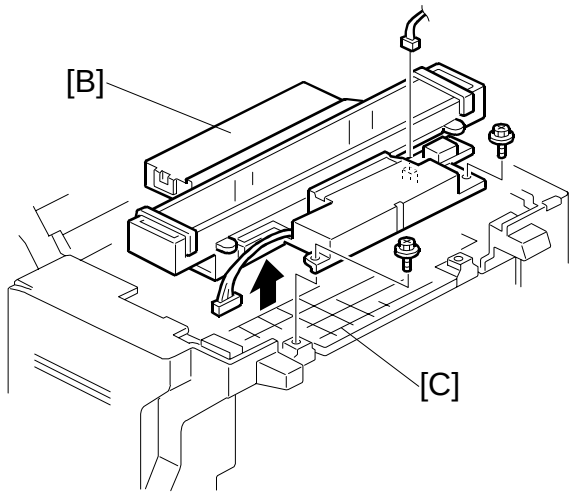
H306D013.WMF

7. Remove the ADF lower cover [A] (1 screw).
8. Remove the belt [B].
9. Remove the scanner motor bracket and scanner motor [C] (3 screws).
10. Remove the white plate [D]. This is done by first sliding the plate toward the front of the machine, then releasing and removing the rear pawl.
11. Remove the screw that fastens the grounding strip [E].
12. Remove the guide plate [F] (4 screws).
13. Remove the gear [G], [H], [I], and [J] (first remove the gear pawls).
14. Remove the clips and bushings, followed by the R1 [K] and R2 [L] rollers, and the exit roller [M].

6.2.6 REPLACING THE OPTICAL UNIT (SCANNER)



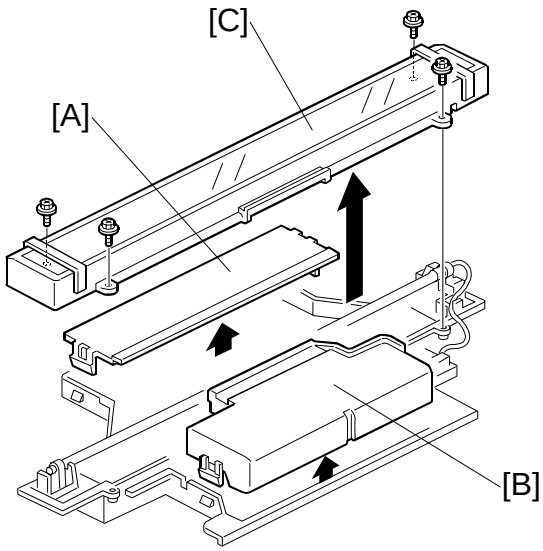
H306R014-2.WMF



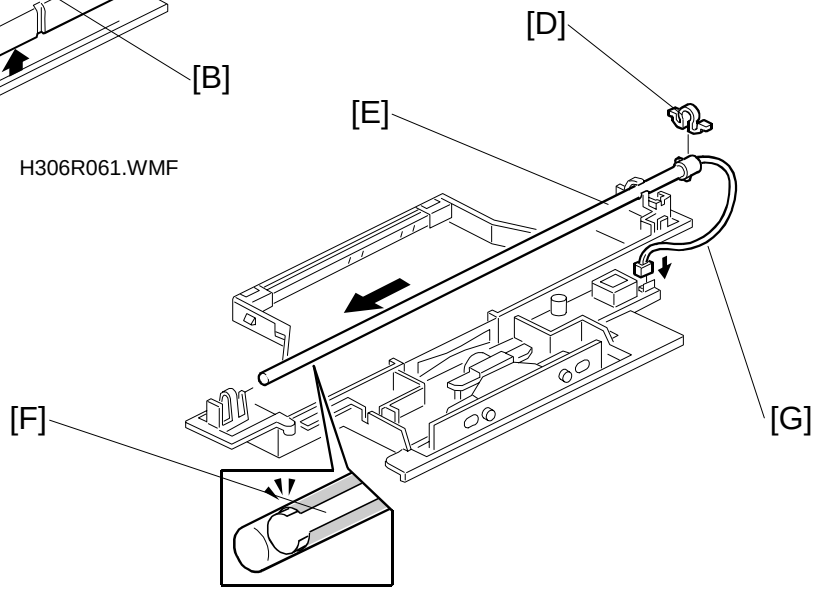
H306R015.WMF

1. With the ADF open, remove the ADF lower unit [A] (5 screws, 1 connector, 1 grounding wire).
2. Remove the optical unit [B] (2 screws, 2 connectors).

NOTE: Do not loosen the screws that fasten the optical unit base [C].
Do not bend two mylar sheets put on the document guide plate [D] when replacing the optical unit.



H306R061.WMF

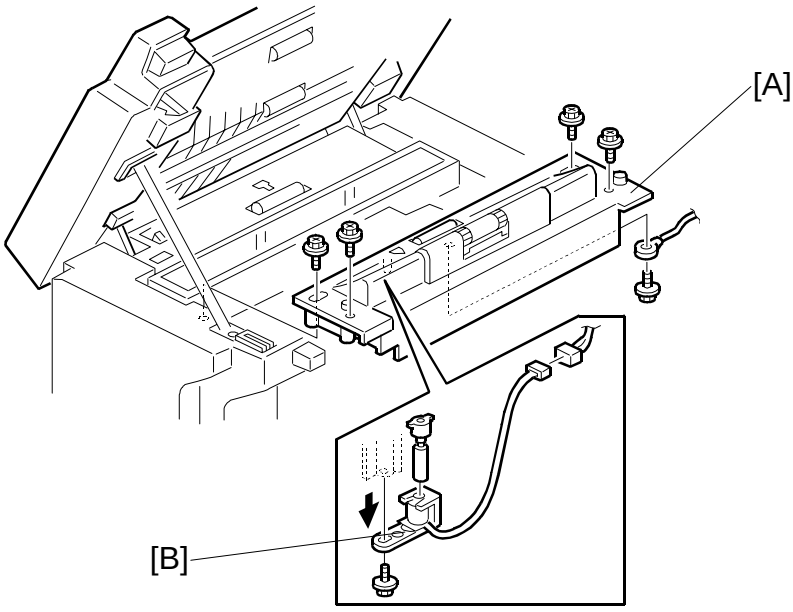


H306R062.WMF

3. Release the pawls of the second mirror cover [A] and SBU cover [B] and remove the covers.
4. Remove the xenon lamp cover [C] (4 screws).
5. Remove the clip [D] and slide out the lamp [E].

NOTE: The transparent part of the xenon lamp [F] must face to the scan line. To keep up the slack in the Xenon lamp harness [G], lead the harness to the left of the pawl under the connector and behind the pawl under the screw. This can prevent the harness from being caught between the optical unit and the ADF lower unit.

6.2.7 REMOVING THE STAMP UNIT



H306R902.WMF

1. With the ADF open, remove the ADF lower unit [A] (5 screws, 1 connector, 1 grounding wire).
2. Replace the stamp unit [B] (1 screw).

NOTE: When removing the stamp unit, ensure that ink does not leak out of it.

6.2.8 ADJUSTING THE SCANNING TOP MARGIN

To adjust the scanner home position, change the following RAM data. When the value is increased (with respect to the default value), the image on the printed copy moves down the page.

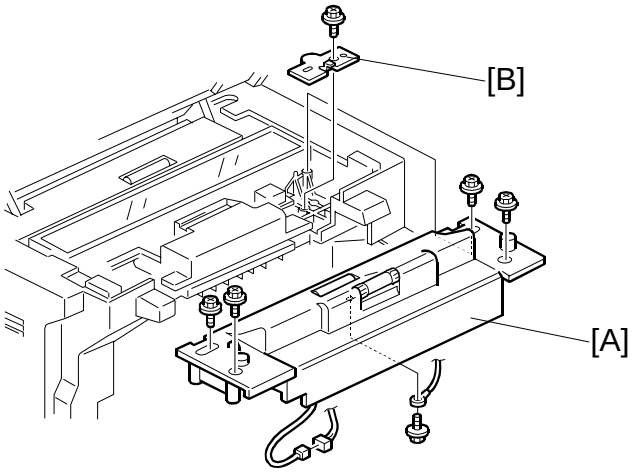
Address: 481246 default value: 18H Unit: 0.5mm
Adjustable range: 00 to 40H

6.3 LASER UNIT

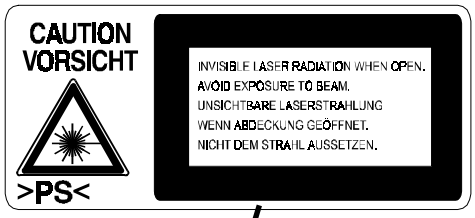
⚠WARNING

Turn off the main switch and unplug the machine plus remove the AIO cartridge before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

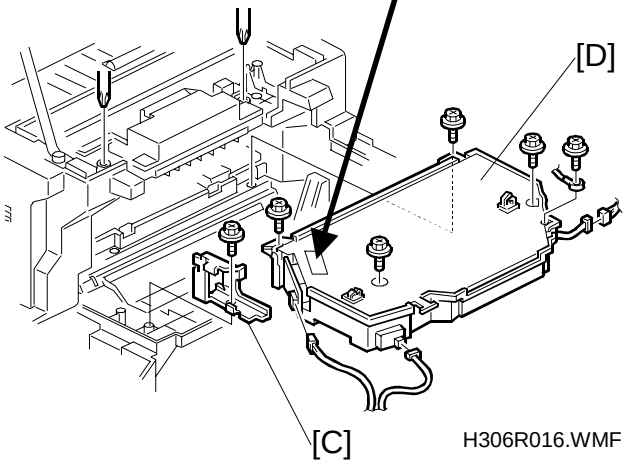
6.3.1 REPLACING THE LASER SYNCHRONIZATION DETECTOR AND LD UNITS



H306R017-2.WMF

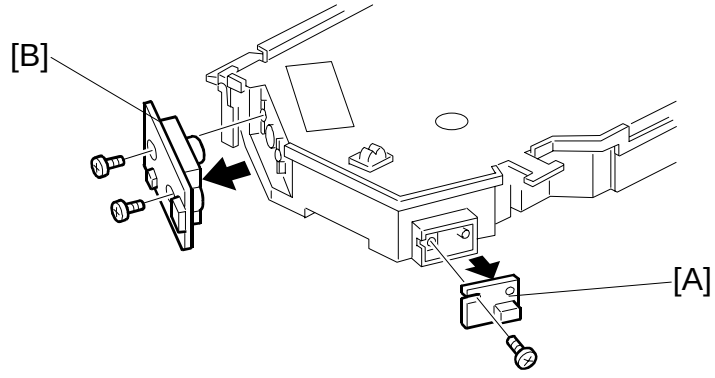


LASER_PS3.WMF



H306R016.WMF

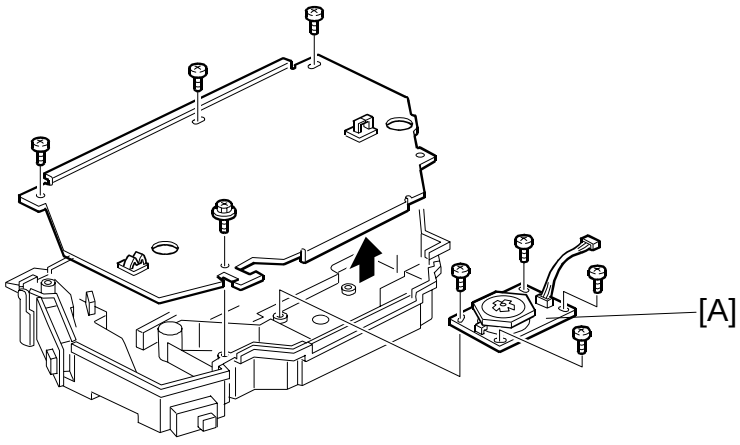
1. Remove the ADF stopper. (See section 6.2.5.)
2. Remove the ADF lower unit [A] (5 screws, 1 connector).
3. Remove the bracket [B] (1 screw).
4. Remove the upper cover. (See section 6.1.4.)
5. Remove the operation panel. (See section 6.1.4.)
6. Remove the bracket [C] (1 screw).
7. Remove the laser unit [D] (5 screws, 3 connectors).
   Loosen the two screws in the back of the machine by inserting a screwdriver through the two openings.



H306R019.WMF

8. Replace the laser synchronization detector [A] (1 screw).
9. Replace the LD unit [B] (2 screws).

6.3.2 REPLACING THE POLYGON MOTOR



H306R018-2.WMF

1. Remove the laser unit cover (5 screws).
2. Replace the polygon motor [A] (4 screws, 1 connector).

6.3.3 ADJUSTING THE PRINTING SIDE-TO-SIDE REGISTRATION

Adjust the laser beam main scan start position when the offset is large. The procedure is as follows:

1. Make copies using the mainframe cassette, bypass unit, and optional feed units and check the amount that the image is shifted.
2. Adjust by changing the contents of the following addresses:

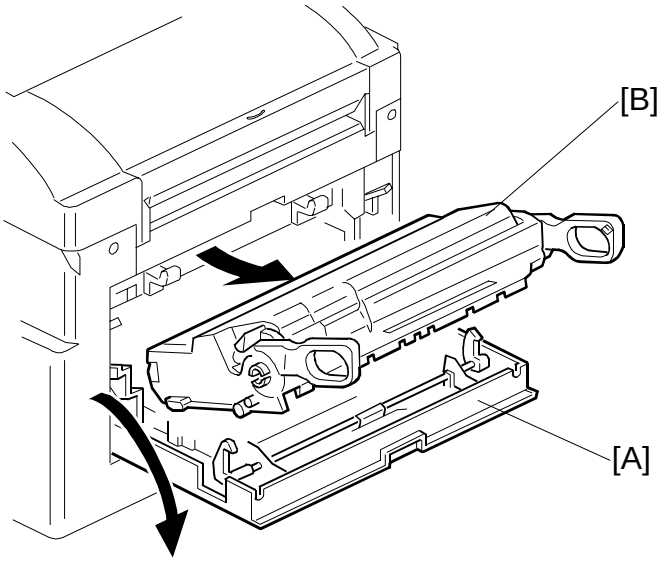
Source	Address	Default	Unit
Main Frame	480B0C	0EH	0.5 mm
1st Optional Unit	480B0D	0EH	0.5 mm
2nd Optional Unit	480B0E	0EH	0.5 mm
By-pass Unit	480B12	0EH	0.5 mm

3. To move the start position to the right, increase the value.
   To move the start position to the left, decrease the value.

   For example:
   - To move the start position to the right 2 mm (with respect to the default value):
     0EH + (2 / 0.5) H = 12H
   - To move the start position to the left 1 mm (with respect to the default value):
     0EH - (1 / 0.5) H = 0CH

6.4 AIO CARTRIDGE

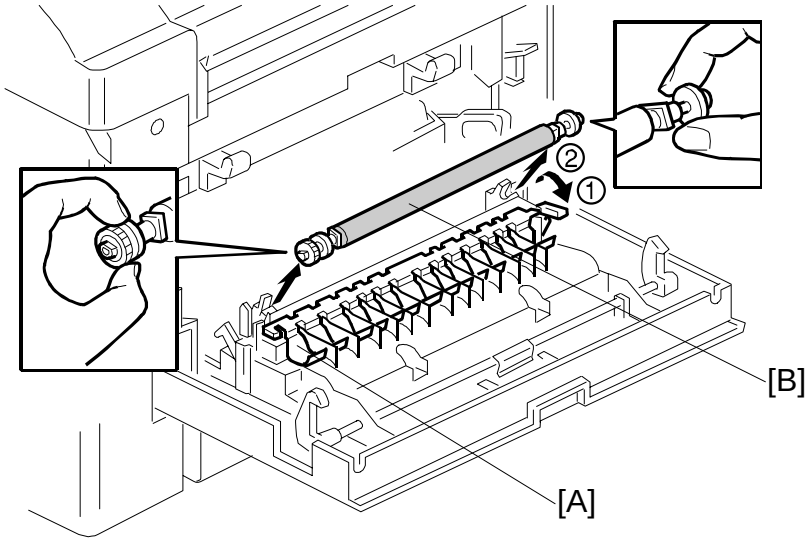
6.4.1 REPLACING THE AIO CARTRIDGE



H306R020.WMF

1. Open the (mainframe) left cover [A].
2. Tilt the AIO cartridge [B] upward slightly (to prevent it from touching other parts) and remove the unit from the machine.

6.4.2 REPLACING THE TRANSFER ROLLER (PART OF THE FUSING MAINTENANCE KIT)



H306R021.WMF

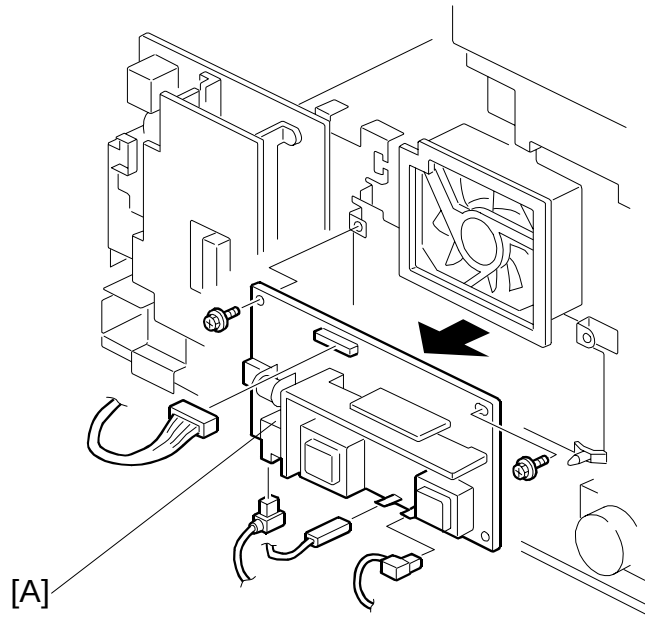
1. Open the transfer roller cover [A] as shown in the illustration (note the direction of the arrow).
2. While holding both ends of the roller (by the green gears on each end), lift and remove the roller [B].

   NOTE: 1) Do not touch the surface of the roller. Oils from the skin stuck on the roller surface may result in roller failure.
   2) If you install all parts in the fusing maintenance kit at the same time, be sure to clear the PM counter (Fusing Unit).

⚠CAUTION

When removing the power pack, make sure to first turn off the main power and unplug the power cord. This is done to eliminate the risk of electrical shock.

6.4.3 REPLACING THE POWER PACK



H306R029.WMF

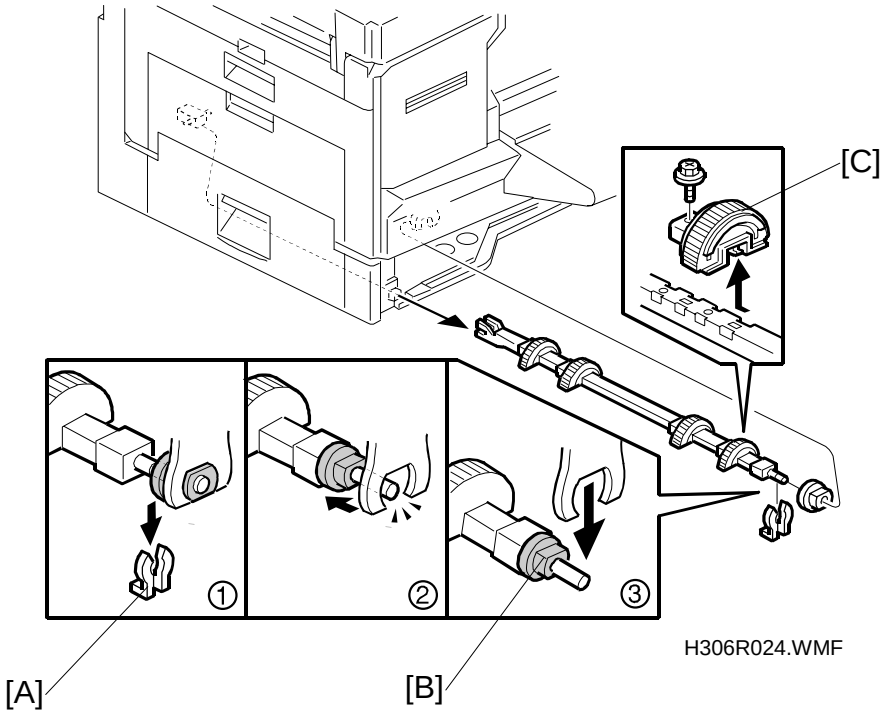
1. Remove the rear cover. (See section 6.1.3.)
2. After removing the connectors and screws, remove the power pack [A] (2 screws, 4 connectors).

⚠CAUTION

When removing the power pack, make sure to first turn off the main power and unplug the power cord. This is done to eliminate the risk of electrical shock.

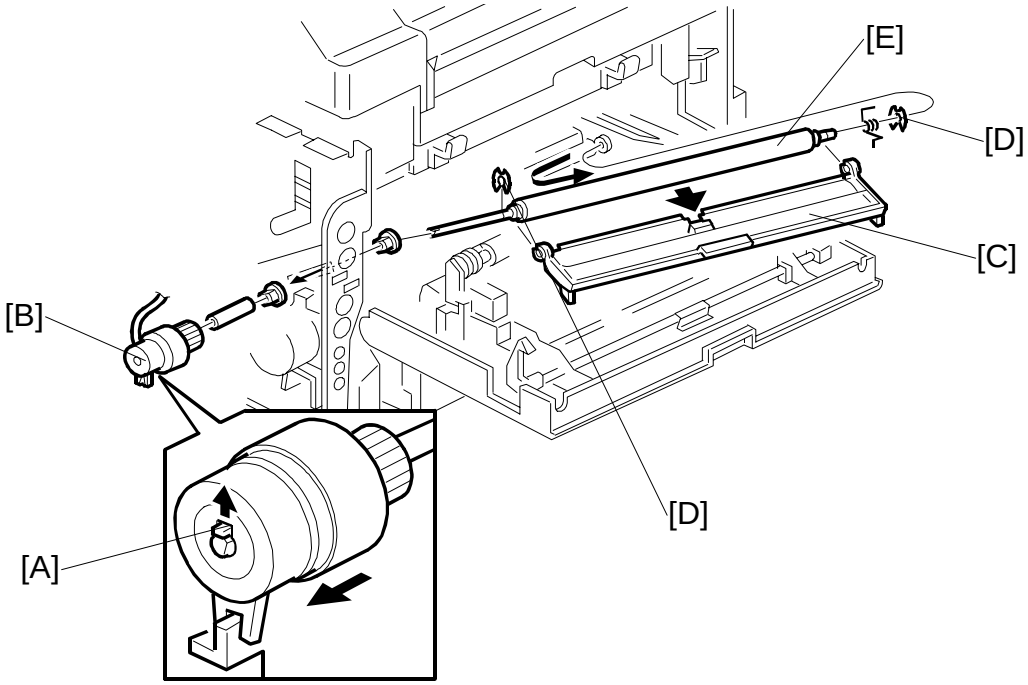
6.5 PAPER FEED AND REGISTRATION

6.5.1 REPLACING THE PAPER FEED ROLLER



1. Remove the paper feed cassette.
2. Remove the clip [A] and slide the bushing [B] back to release the paper feed roller unit [C]. Next, lower and remove the unit.
3. Remove the screws and replace the paper feed rollers [C].

6.5.2 REPLACING THE REGISTRATION ROLLER



H306R023-2.WMF

1. Remove the rear cover. (See section 6.1.3.)
2. Open the left side cover.
3. Release the pawl [A] of the magnetic clutch [B] and remove the clutch.
4. Remove the registration guide plate [C].
5. Remove the two clips [D].
6. Slide the registration roller toward the back (toward the left in the illustration). When the front shaft is free, guide it upward and then remove the other side (spring-loaded side), removing the roller itself [E].

   NOTE: This procedure is easier to perform when the AIO cartridge and fusing unit are removed.

6.5.3 ADJUSTING THE PRINTING TOP MARGIN

Adjust the start position at the top of the page when the offset is large. The procedure is as follows:

1. Make copies using the mainframe cassette, bypass unit, and optional feed units and check the amount that the image is shifted.
2. Adjust by changing the contents of the following addresses:

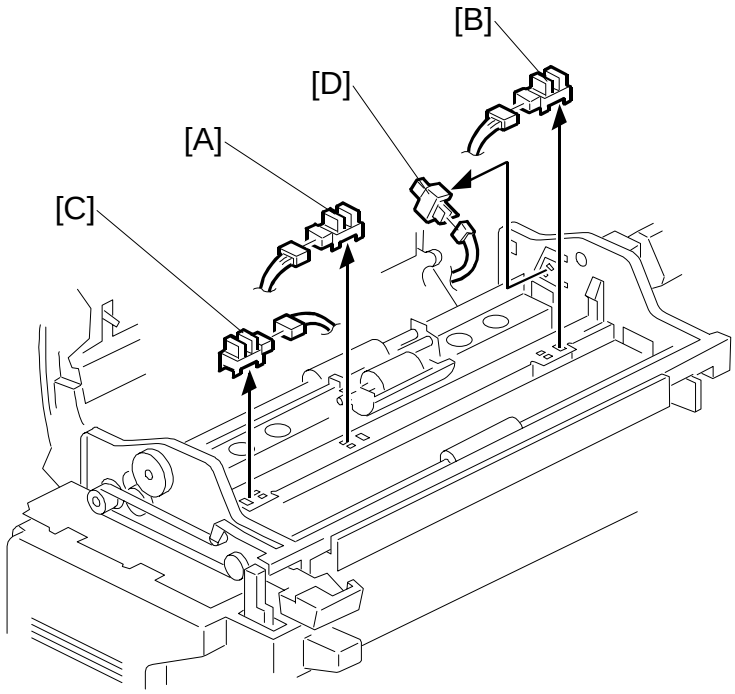
Source	Address	Default	Unit
Main Frame	480B00	1AH	0.25 mm
1st Optional Unit	480B01	1AH	0.25 mm
2nd Optional Unit	480B02	1AH	0.25 mm
By-pass Unit	480B06	1AH	0.25 mm

3. To lower the start position, increase the default value.
   To raise the start position, reduce the default value.

   For example:
   - To lower the start position by 2 mm (with respect to the default value):
     1AH + (2 / 0.25) H = 22H

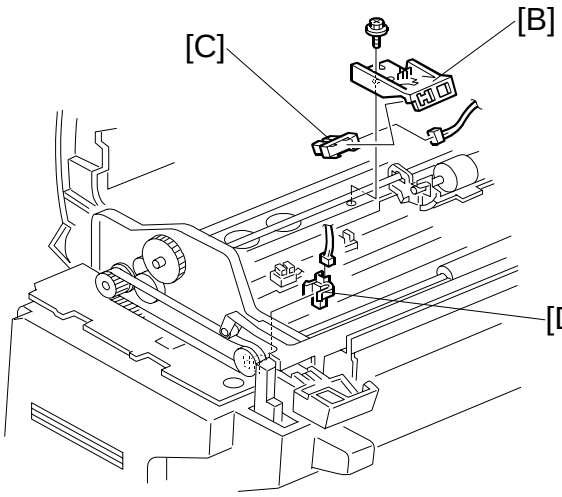
6.6 SENSORS

6.6.1 REPLACING THE ADF/MDF SENSORS AND SWITCHES

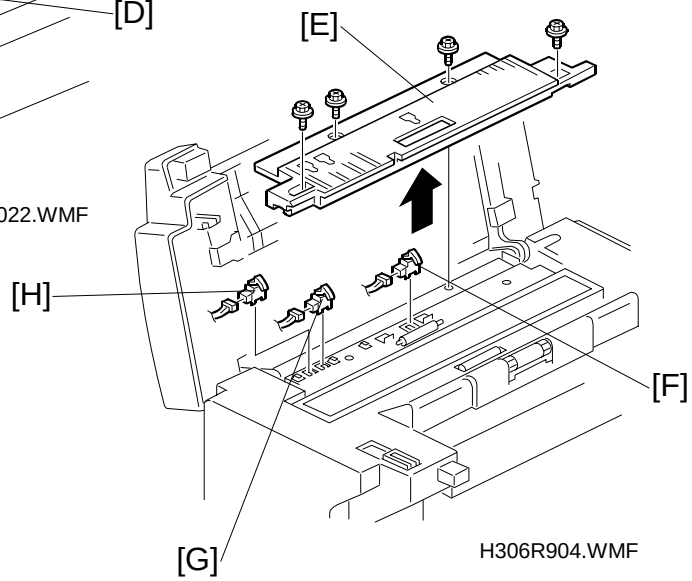


H306R903.WMF

1. Open the ADF upper cover. (See section 6.1.1.)
2. Remove the ADF front cover (1 screw).
3. Remove the pickup-roller unit.
4. Remove the ADF rear cover (1 screw).
5. Remove the upper guide plate (4 screws). (See section 6.1.2.)
6. Release the pawls of the S1 [A], B4 [B], A3 [C] sensors (at the connector sides) and remove the sensors (1 connector each).
7. Release and remove the pawl located on the rear face of the ADF upper cover switch [D] (1 connector).



H306R022.WMF

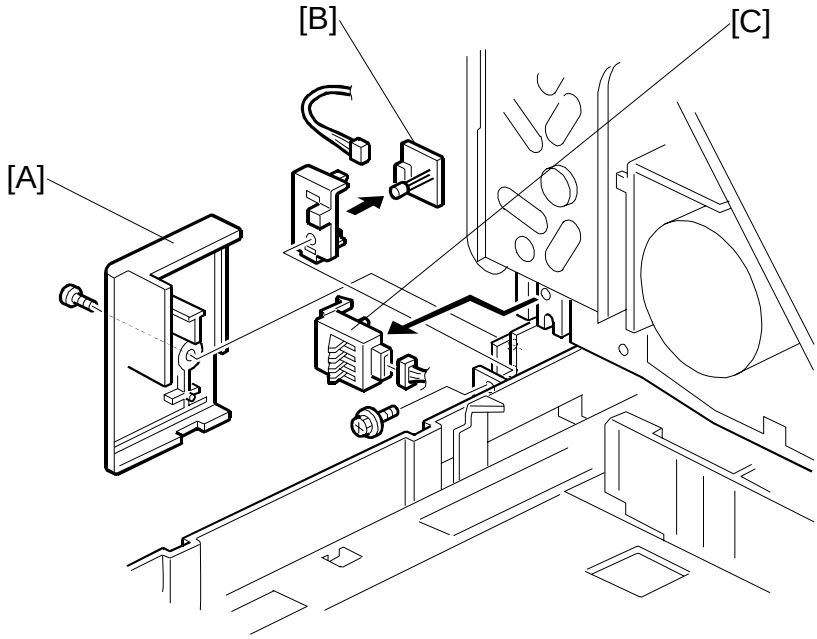


H306R904.WMF

8. Remove the sensor bracket [B] (1 screw).
9. Remove the S2 sensor [C] (1 connector).
10. Remove the ADF stopper (1 screw). (See section 6.2.5.)
11. Remove the ADF lower cover (1 screw). (See section 6.2.5.)
12. Remove the ADF unit switch [D] (1 connector).
13. Remove the optional connector cover (1 screw). (See section 6.1.3.)
14. Remove the rear cover (5 screws).
15. Open the ADF unit.
16. Remove the ADF lower guide plate [E] (4 screws).
17. Release the MDF S1 [F], B4 [G], A3 [H] sensor pawls and remove the sensors (1 connector each).

    NOTE: If the rear cover is not removed, damage will result when opening the ADF.

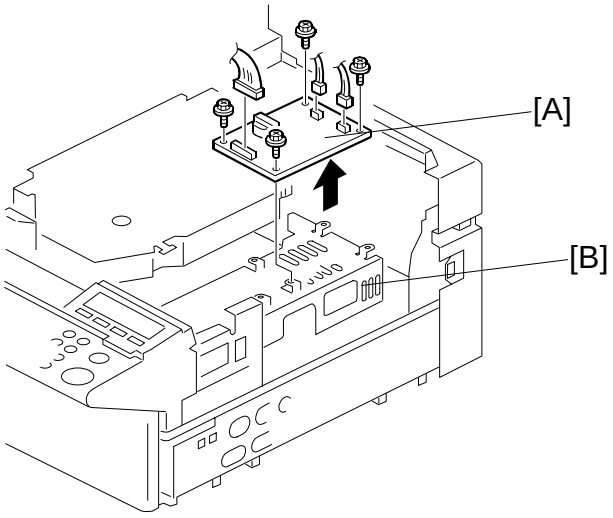
6.6.2 REPLACING THE PAPER-END LED BOARD AND PAPER SIZE SENSOR SWITCH



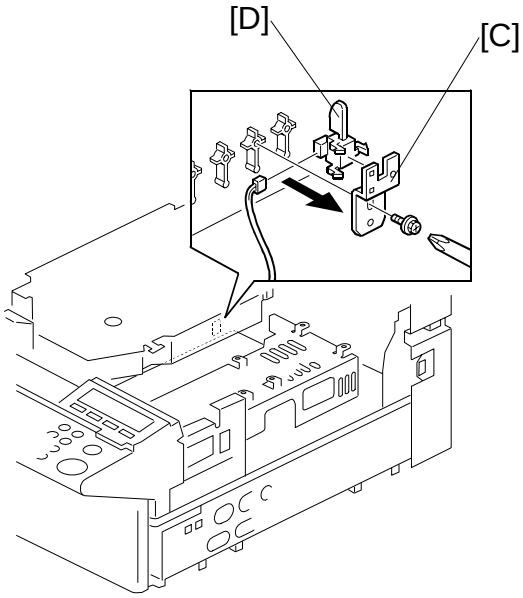
H306R911.WMF

1. Remove the paper feed tray.
2. Remove the front cover (See section 6.1.4)
3. Remove cover [A] (1 screw).
4. Remove the paper end LED board [B] (1 connector).
5. Remove the paper size sensor switch [C] (1 connector).

6.6.3 REPLACING THE AIO CARTRIDGE SENSOR



H306R906.WMF

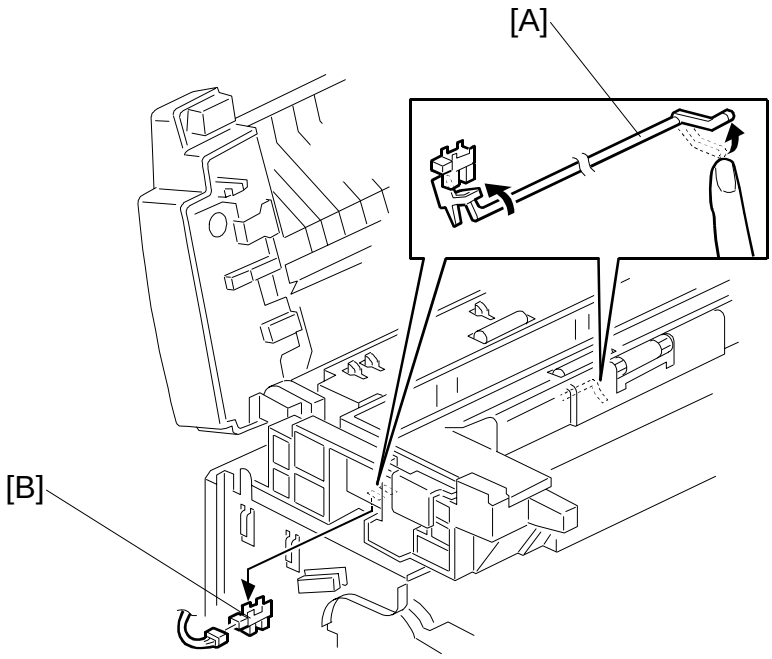


H306R907.WMF

1. Remove the upper cover (2 screws). (See section 6.1.4.)
2. Remove the right cover (4 screws).
3. Remove the NCU [A] and the FCU cover [B]. (See section 6.8.2.)
4. Remove the screw that fastens the AIO cartridge sensor bracket [C].
5. Remove the AIO cartridge sensor [D] from the bracket (1 connector).

NOTE: This procedure is easier to perform if the AIO cartridge is first removed. Be sure to put the AIO cartridge sensor back to the original position.

6.6.4 REPLACING THE PAPER EXIT SENSOR

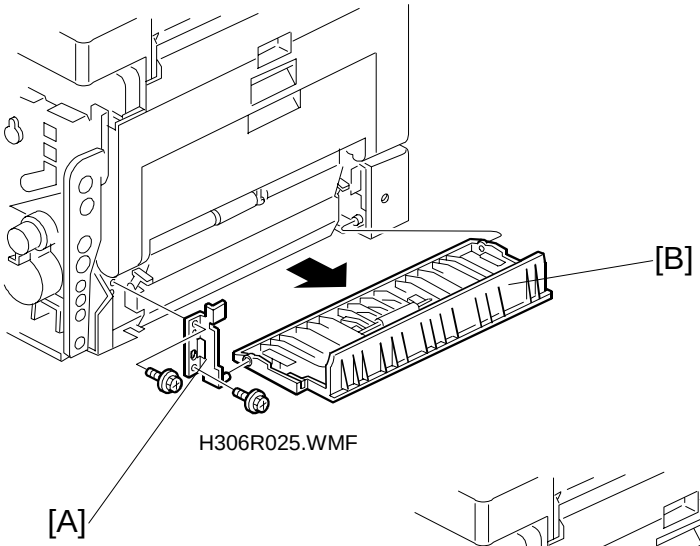


H306R905.WMF

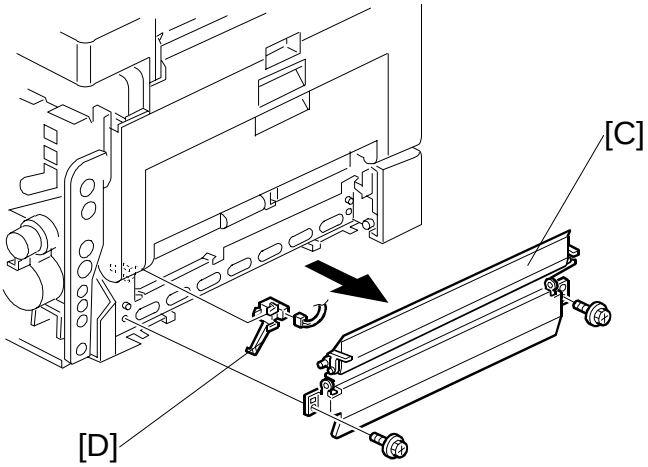
1. Remove the upper cover (2 screws). (See section 6.1.4.)
2. Remove the operation panel (3 screws, 1 connector, 1 ground wire). (See section 6.1.4.)
3. Pull out the paper cassette and remove the front cover (5 screws). (See section 6.1.4.)
4. Remove the connectors of the paper exit sensor.
5. While holding up the actuator [A] of the paper exit sensor, release the front pawl and remove the paper exit sensor [B].

NOTE: This procedure is easier to perform if the optical unit is first removed. (See section 6.2.6)

6.6.5 REPLACING THE PAPER NEAR-END SENSOR



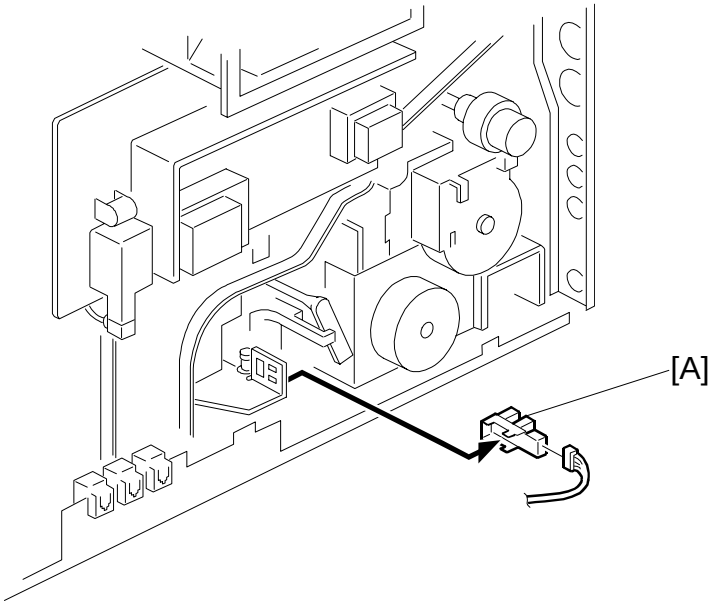
H306R025.WMF



H306R026.WMF

1. Remove the rear cover. (See section 6.1.3.)
2. Pull out the paper feed cassette.
3. Remove the guide bracket [A] and transport guide plate [B] (2 screws).
4. Remove the paper feed guide plate [C] (2 screws).
5. Remove the paper near-end sensor [D] from the left side (1 connector).

6.6.6 REPLACING THE PAPER END SENSOR

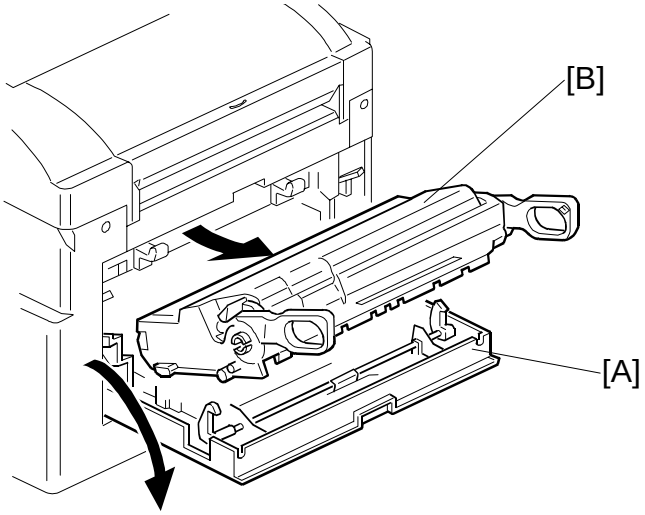


H306R099.WMF

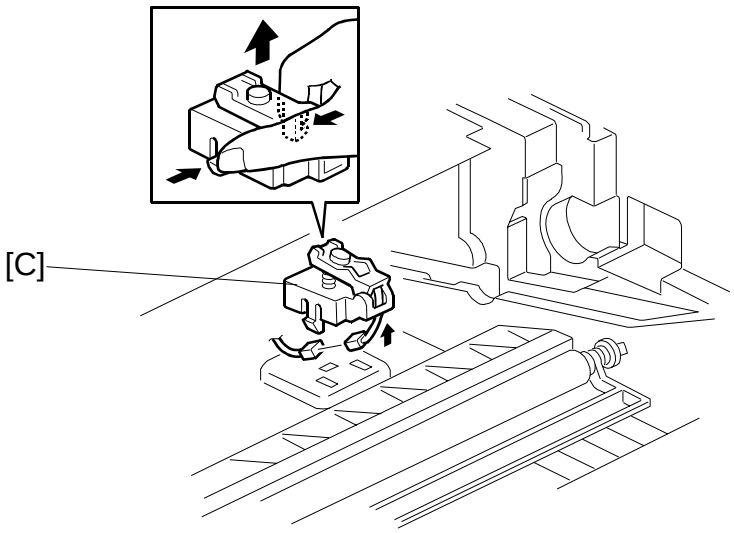
1. Remove the rear cover.
2. Remove the connector of the paper end sensor [A].
3. Release the pawl and remove the sensor.

NOTE: This procedure is easier to perform if the paper feed cassette is pulled out.

6.6.7 REPLACING THE TONER END SENSOR



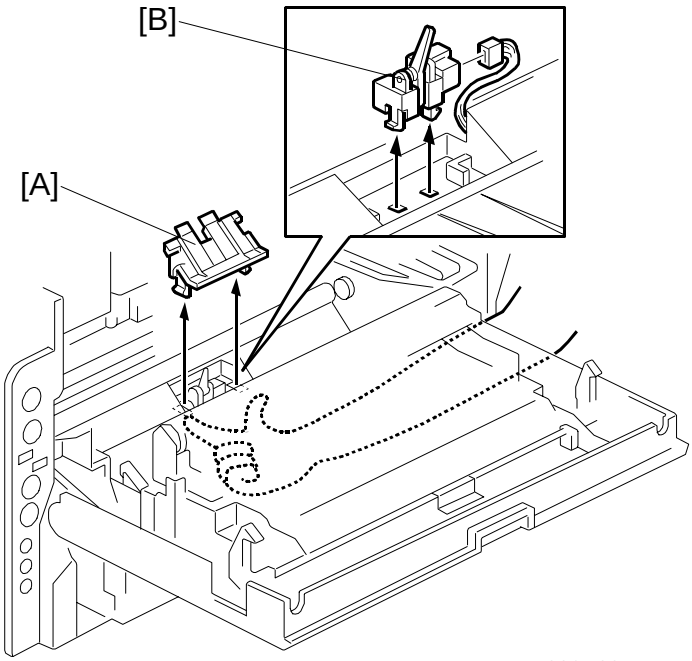
H306R020.WMF



H306R038.WMF

1. Open the left cover [A].
2. Remove the AIO cartridge [B].
3. Remove the pawls on both sides of the toner end sensor [C] and remove the sensor (1 connector).

6.6.8 REPLACING THE REGISTRATION SENSOR

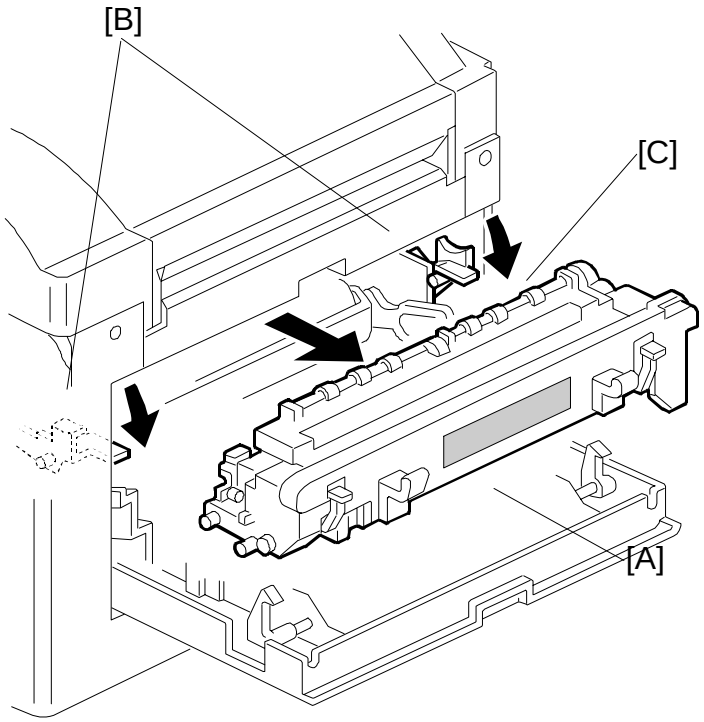


H306R037.WMF

1. Open the left cover.
2. Pull out the paper feed cassette.
3. Remove the registration roller. (See section 6.5.2.)
4. Remove the sensor cover by releasing the pawl of the registration sensor cover [A] from the bottom.
5. Release the pawl of the registration sensor in the same manner and remove the sensor [B] from the cover (1 connector).

6.7 FUSING UNIT

6.7.1 REPLACING THE FUSING UNIT (PART OF THE FUSING MAINTENANCE KIT)



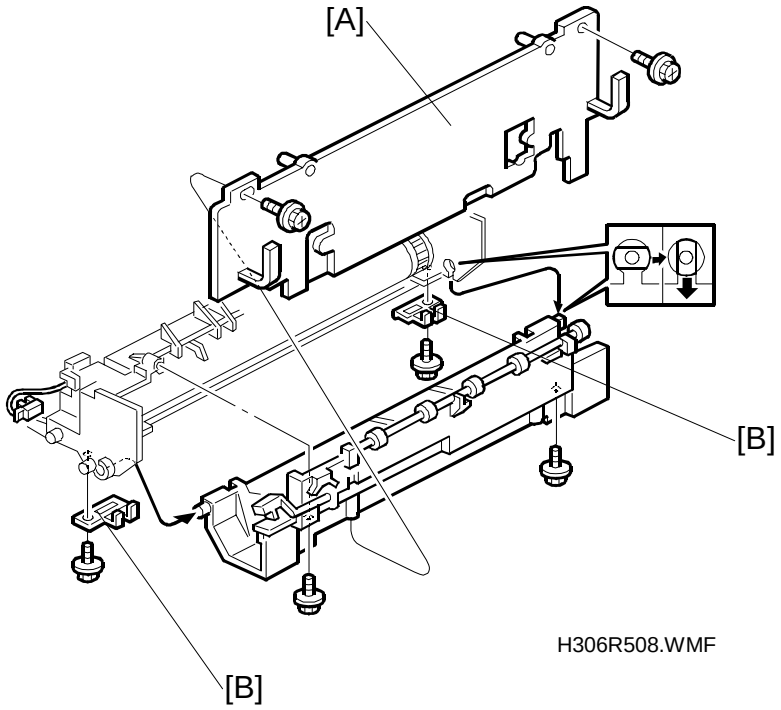
H306R028.WMF

1. Open the left cover [A].
2. Remove the stopper screw (green) located below rear side lever [B] (brown).
3. Push down levers [B] and [C].
4. Remove the fusing unit [D].

⚠CAUTION

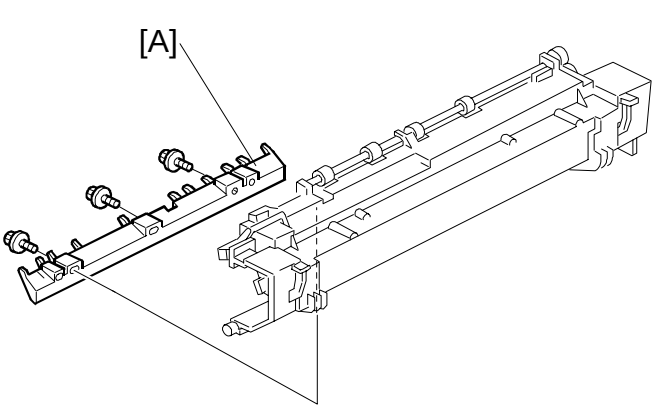
1. **Since the temperature of the fusing unit is very high, exercise caution to avoid being burned.**
2. **If you install all parts in the fusing maintenance kit at the same time, be sure to clear the PM counter (Fusing Unit).**

6.7.2 DISASSEMBLING THE FUSING UNIT

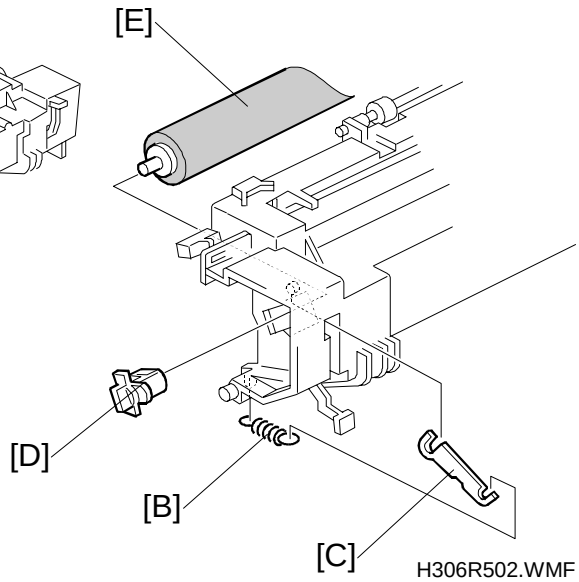


1. Remove the fusing unit cover [A] (2 screws).
2. Remove two support plates [B] (2 screws).

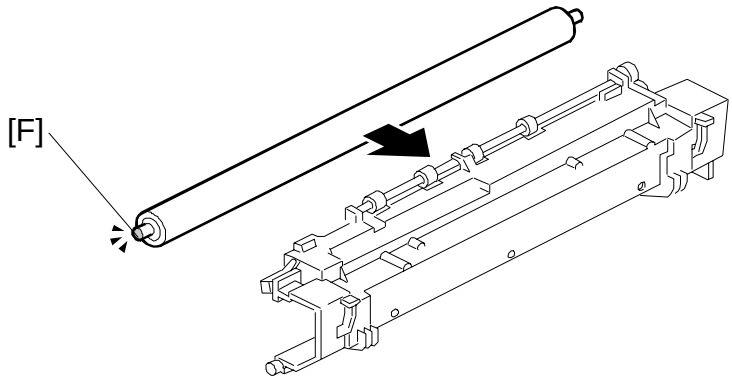
6.7.3 REPLACING THE PRESSURE ROLLER



H306R505.WMF



H306R502.WMF

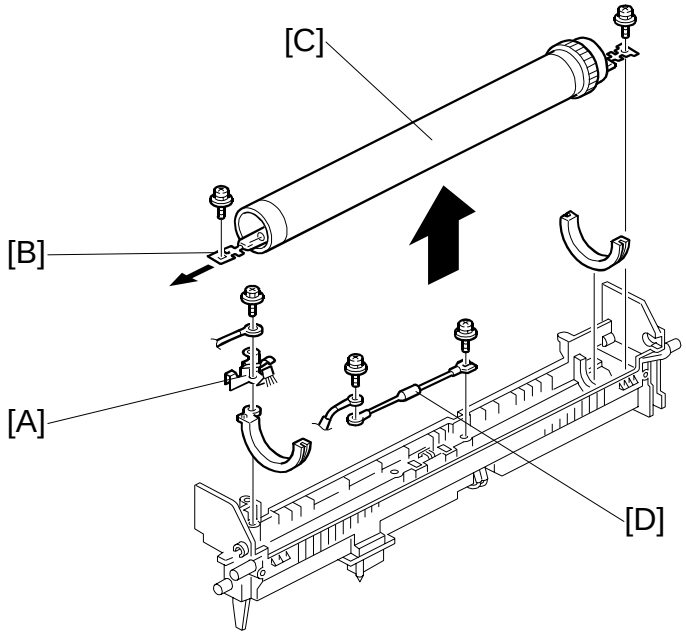


H306R506.WMF

1. Remove the paper entrance guide plate [A] (3 screws).
2. Remove the pressure spring [B] and pressure lever [C].
3. Remove the bushing [D] and the pressure roller [E].

NOTE: The marked end of the roller [F] must be at the front side of the machine.

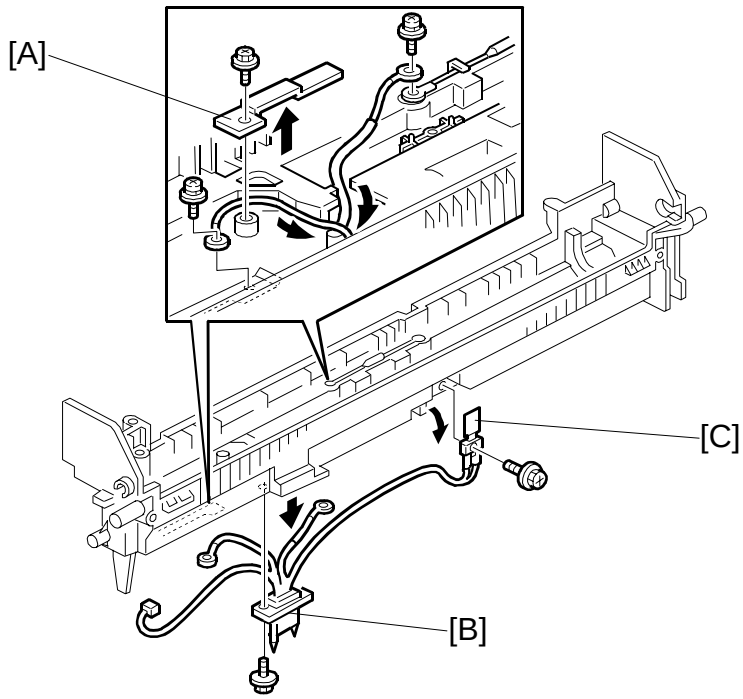
6.7.4 REPLACING THE HOT ROLLER, FUSING LAMP, AND THERMOFUSE



H306R503.WMF

1. Remove the hot roller stripper springs and the grounding plate [A] (1 screw).
2. Remove the fusing lamp [B] (2 screws), bushings, and hot roller [C].
3. Remove the thermofuse [D] (2 screws).

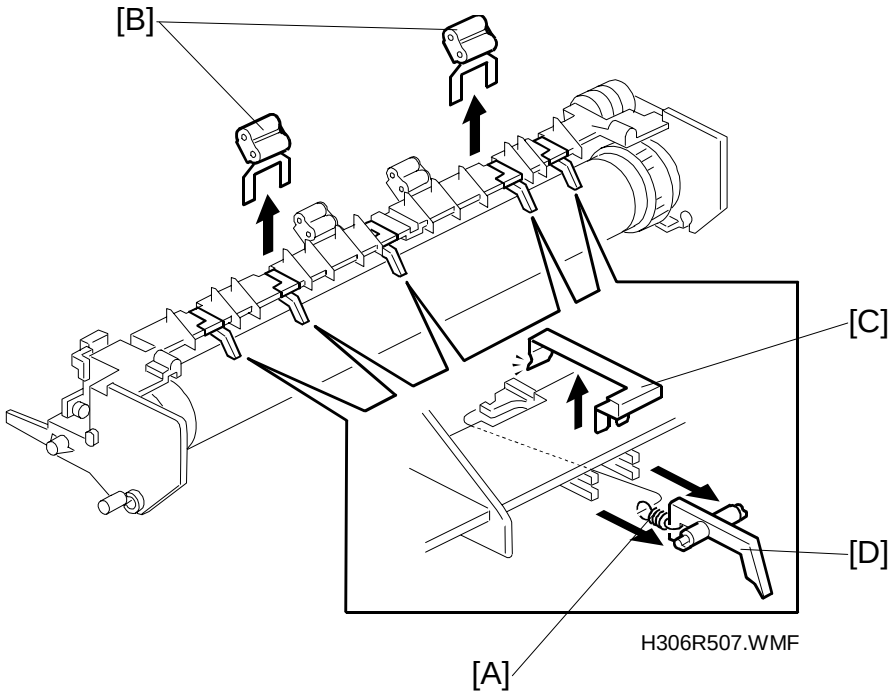
6.7.5 REPLACING THE THERMISTOR



H306R504.WMF

1. Remove the cable cover [A] (1 screw).
2. Remove the cable terminal [B] and the thermistor [C].

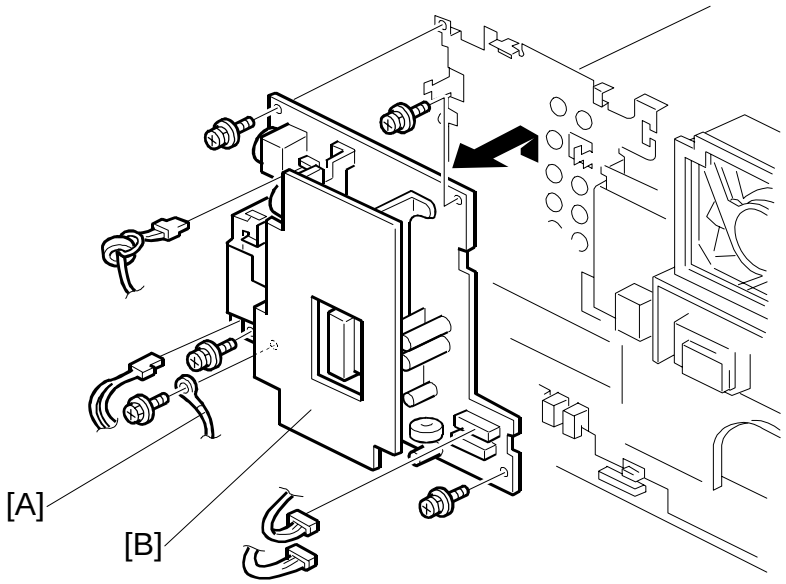
6.7.6 REPLACING THE HOT ROLLER STRIPPERS



1. Disconnect the springs [A].
2. Remove two outer exit rollers [B].
3. Release the stoppers [C] and remove the hot roller strippers [D].

6.8 PCBS

6.8.1 REPLACING THE PSU



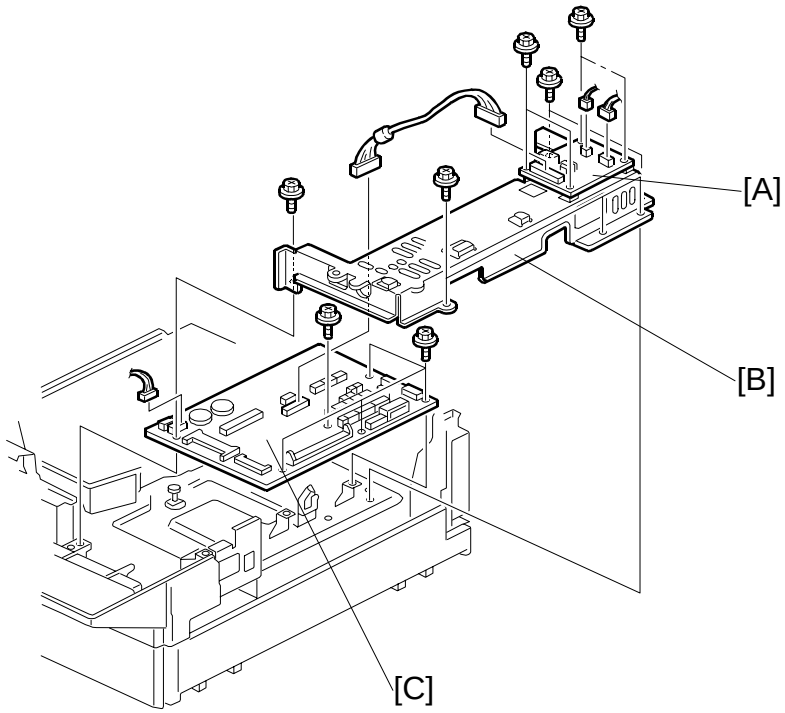
H306R027.WMF

1. Remove the rear cover. (See section 6.1.3.)
2. Lift the PSU [B] out of the machine (5 screws, 4 connectors, 1 grounding wire [A]).

⚠CAUTION

When removing the PSU, make sure to first turn off the main power and unplug the power cord. This is done to eliminate the risk of electrical shock.

6.8.2 REPLACING THE NCU/FCU



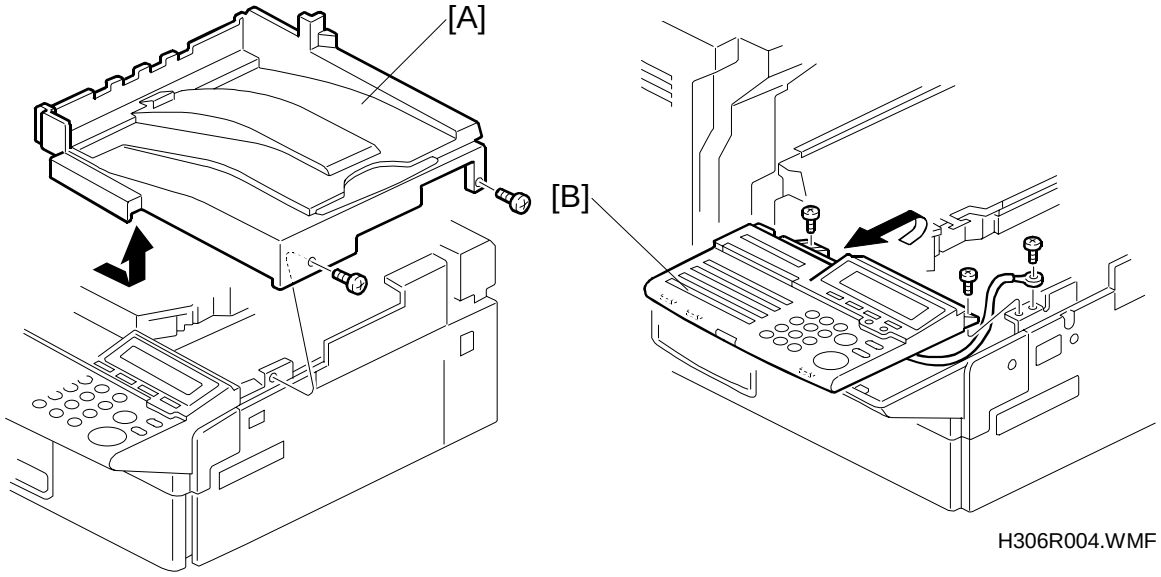
H306R034-2.WMF

⚠CAUTION

Make sure to first turn off the main power and unplug the power cord. This is done to eliminate the risk of electrical shock.

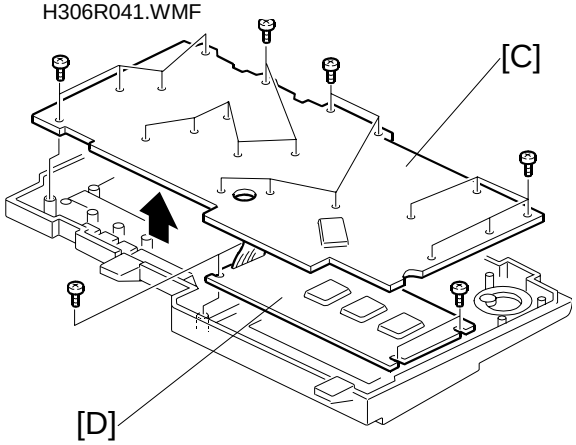
1. Remove the upper cover. (See section 6.1.4.)
2. Remove the right cover.
3. Remove the operation panel.
4. Remove the NCU [A] (4 screws, 3 connectors).
5. If any options have been installed, remove all boards.
6. Remove the FCU cover [B] (6 screws).
7. Remove the FCU [C] (5 screws, 24 connectors).

6.8.3 REPLACING THE OPERATION PANEL, LCD CONTROLLER, AND INVERTER BOARD



H306R004.WMF

H306R041.WMF



H306R030.WMF

1. Remove the upper cover [A] (2 screws).
2. Remove the operation panel [B] (3 screws).
3. Remove the LCD controller board [C] (20 screws).
4. Remove the inverter board [D] (4 screws).

6.9 DATA AND FIRMWARE DOWNLOAD/UPLOAD

⚠CAUTION

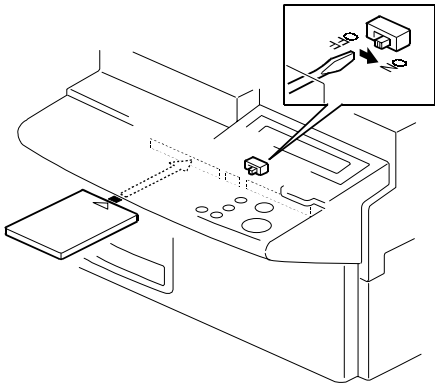
1. **Make sure to turn the power off before inserting the IC card.**
2. **If the function expansion card or FOD card was installed, make sure to re-install it before turning the power on. Otherwise programmed data may be lost.**

Preparation

For all firmware for this model (with or without options installed), the start address should be set to **200000** when preparing the IC card with the "SwapFTL" utility.

6.9.1 FCU PROGRAM DOWNLOAD (IC CARD TO MACHINE)

This downloads the FCU program from the IC card to the machine.



H306R500.WMF

1. After turning off the main power, insert the IC card containing the program into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be on.
2. Turn on the power and select "1. ROM (ROM → MACHINE)" and press START.
   NOTE: The LCD display should be "FLASH ROM → MACHINE".
3. If "OK" is displayed, exit the function and turn the power off.
   If "NG!!" is displayed, repeat from step 2.
4. Put the FCU switch back to OFF.
5. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover
6. After turning the power back on, print out the system parameter list and confirm the ROM version, date, and suffix.

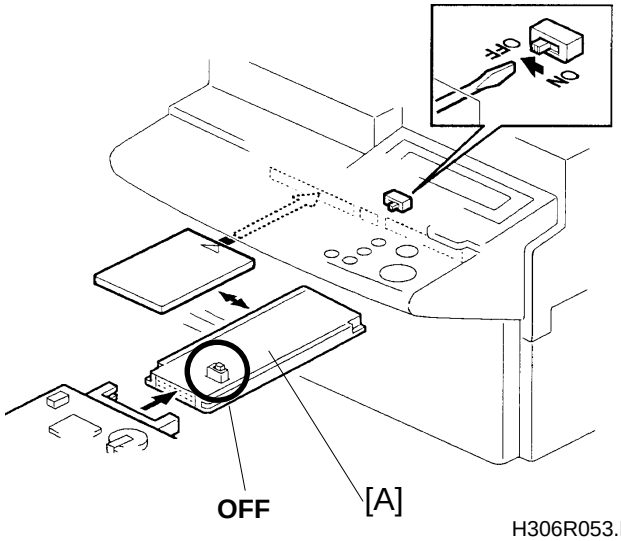
6.9.2 FCU PROGRAM UPLOAD (MACHINE TO IC CARD)

This uploads the FCU program from the machine to an IC card.

1. After turning off the main power, insert the IC card into the IC card slot located on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select “0. ROM (MACHINE → ROM)” and press START.
   NOTE: The LCD display should be “MACHINE → FLASH ROM”.
3. If “OK” is displayed, exit the function and turn the power off.
   If “NG!!” is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.

6.9.3 FCU SRAM RESTORE (IC CARD OR PREVIOUS FCU TO MACHINE)

This restores SRAM data (customer's programmed data) from the FCU used prior to replacement (or from an IC card) to the new FCU inside the machine.



H306R053.BMP

1. Turn off the main power.
2. **If using an old FCU card,** use a ROM/RAM copy tool [A] to connect the old FCU and the FCU inside the machine (left side slot). The switch on the copy tool must be off.
   If using an IC card, insert it into the IC card slot located on the front of the machine (left side).
   NOTE: The FCU switch must be off.
3. Turn on the power select "3. RAM (ROM → MACHINE)" and press START.
   NOTE: The LCD display should be "FLASH ROM → MACHINE".
4. If "OK" is displayed, exit the function and turn the power off.
   If "NG!!" is displayed, repeat from step 3.
5. Remove the IC card or copy tool, insert the function upgrade card or FOD card (if it was installed), and replace the cover.
6. After turning the power back on, print out the system parameter list and dial list. Check the contents of these lists to confirm data transfer.

6.9.4 FCU SRAM BACKUP (MACHINE TO IC CARD)

This makes a backup SRAM data (customer's programmed data) from the machine to an IC card.

1. Turn off the main power. Insert the IC card into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select "2. RAM (MACHINE → ROM)" and press START.
   NOTE: The LCD display should be "MACHINE → FLASH ROM".
3. If "OK" is displayed, exit the function and turn the power off.
   If "NG!!" is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.

6.9.5 OPTIONAL G3 UNIT CONTROL PROGRAM DOWNLOAD (IC CARD TO MACHINE)

This updates the optional G3 unit control program (downloads it from an IC card).

1. After turning off the main power, insert the IC card containing the optional G3 unit program into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select "5. SG3 ROM" and press START.
   NOTE: The LCD display should be "FLASH ROM → MACHINE".
3. If "OK" is displayed, exit the function and turn the power off.
   If "NG!!" is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.
5. After turning the power back on, print out the system parameter list and check that the program has been successfully downloaded.

6.9.6 OPTIONAL G3 UNIT MODEM PROGRAM DOWMLOAD (IC CARD TO MACHINE)

This updates the optional G3 unit modem program (downloads it from an IC card).

1. After turning off the main power, insert the IC card containing the modem program into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select “6. SG3 MDM” and press START.
   NOTE: The LCD display should be “FLASH ROM → MACHINE”.
3. If “OK” is displayed, exit the function and turn the power off.
   If “NG!!” is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.
5. After turning the power back on, print out the system parameter list and check that the program has been successfully downloaded.

6.9.7 G4 UNIT PROGRAM DOWNLOAD (IC CARD TO MACHINE)

This updates the G4 unit program in the machine (downloads it from an IC card).

1. After turning off the main power, insert the IC card containing the G4 unit program into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select “7. SIG4 ROM” and press START.
   NOTE: The LCD display should be “FLASH ROM → MACHINE”.
3. If “OK” is displayed, exit the function and turn the power off.
   If “NG!!” is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.
5. After turning the power back on, print out the system parameter list and check that the program has been successfully downloaded.

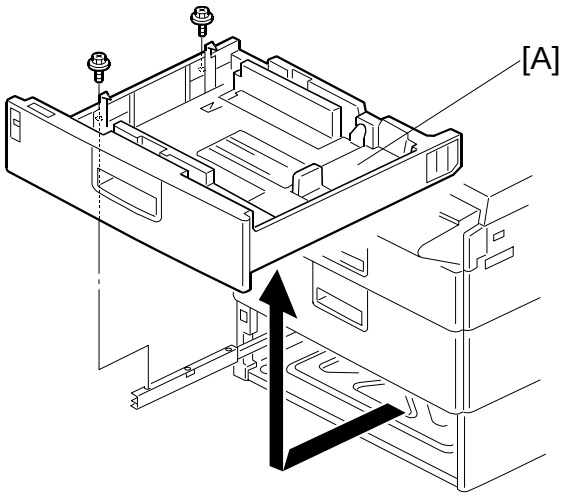
6.9.8 NICF PROGRAM DOWNLOAD (IC CARD TO MACHINE)

This updates the NICF program in the machine (downloads it from an IC card).

1. After turning off the main power, insert the IC card containing the NICF program into the IC card slot on the front of the machine (left side).
   NOTE: The FCU switch must be off.
2. Turn on the power and select “8. NICF ROM” and press START.
   NOTE: The LCD display should be “FLASH ROM → MACHINE”.
3. If “OK” is displayed, exit the function and turn the power off.
   If “NG!!” is displayed, repeat from step 2.
4. Remove the IC card, insert the function upgrade card or FOD card (if it was installed), and replace the cover.
5. After turning the power back on, print out the system parameter list and check that the program has been successfully downloaded.

6.10 OPTIONAL PAPER FEED UNIT

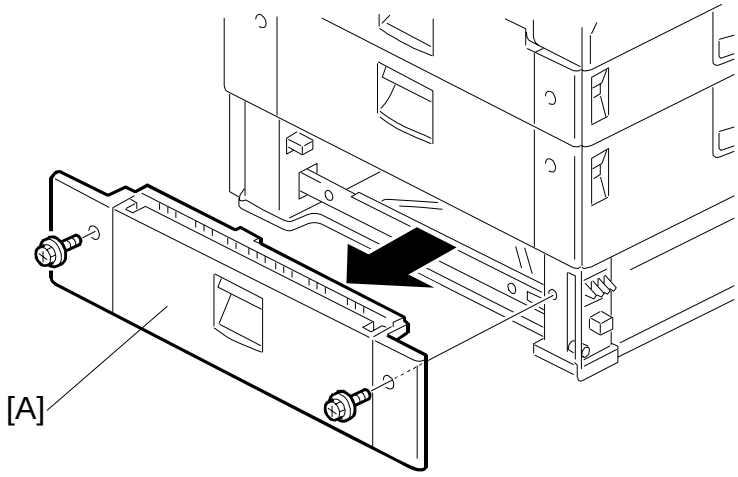
6.10.1 REMOVING THE PAPER FEED TRAY



H306R908.WMF

1. Slide out the paper feed tray [A].
2. Remove the two screws attaching the tray to the rail.

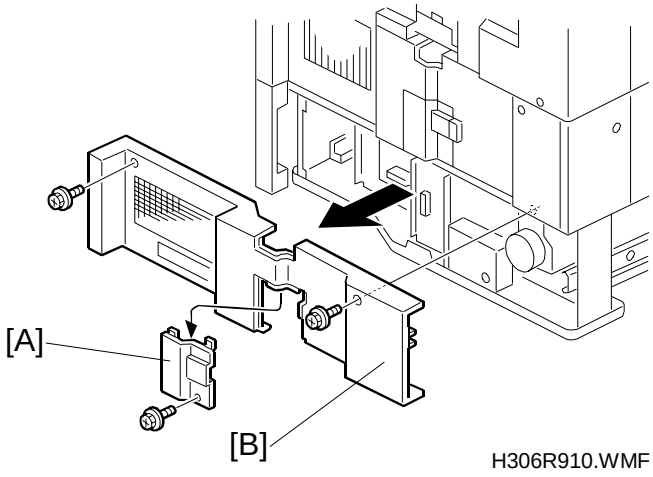
6.10.2 REMOVING THE VERTICAL FEED UNIT



H306R909.WMF

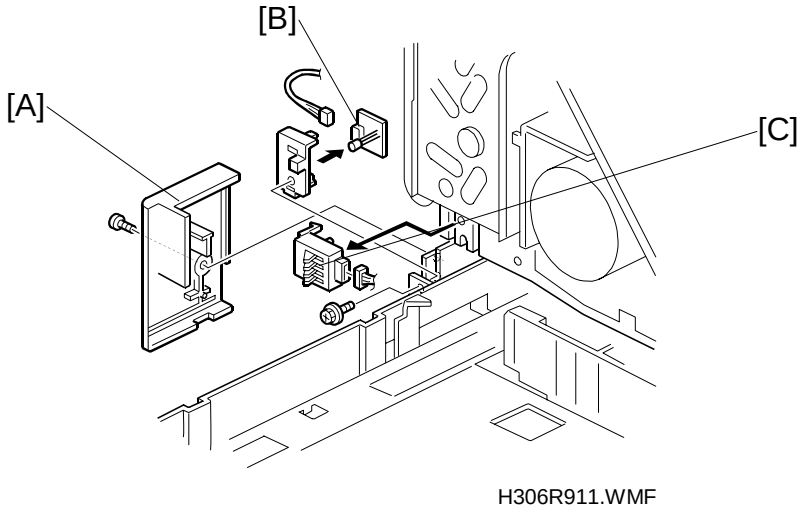
1. Remove the vertical feed unit [A] (2 screws).

6.10.3 REMOVING THE REAR COVER



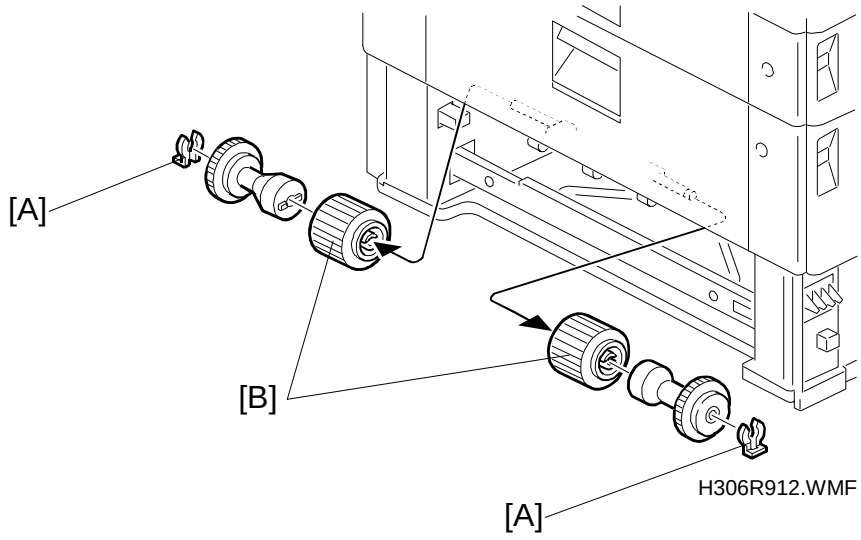
1. Remove the optional connector cover [A] (1 screw).
2. Remove the rear cover [B] (2 screws).

6.10.4 REPLACING THE PAPER-END LED BOARD AND PAPER SIZE SENSOR SWITCH



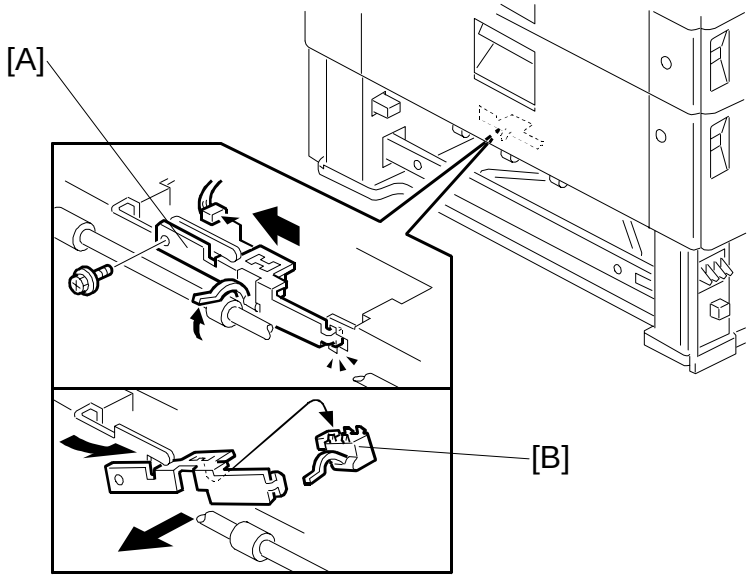
1. Remove the paper feed tray.
2. Remove cover [A] (2 screws).
3. Remove the paper end LED board [B] (1 connector).
4. Remove the paper size detection switch [C] (1 connector).

6.10.5 REPLACING THE PAPER FEED ROLLERS



1. Remove the vertical feed unit (2 screws). (See section 6.10.2.)
2. Pull out the paper feed tray.
3. After removing the clips [A], remove the paper feed rollers [B].

6.10.6 REPLACING THE PAPER FEED SENSOR

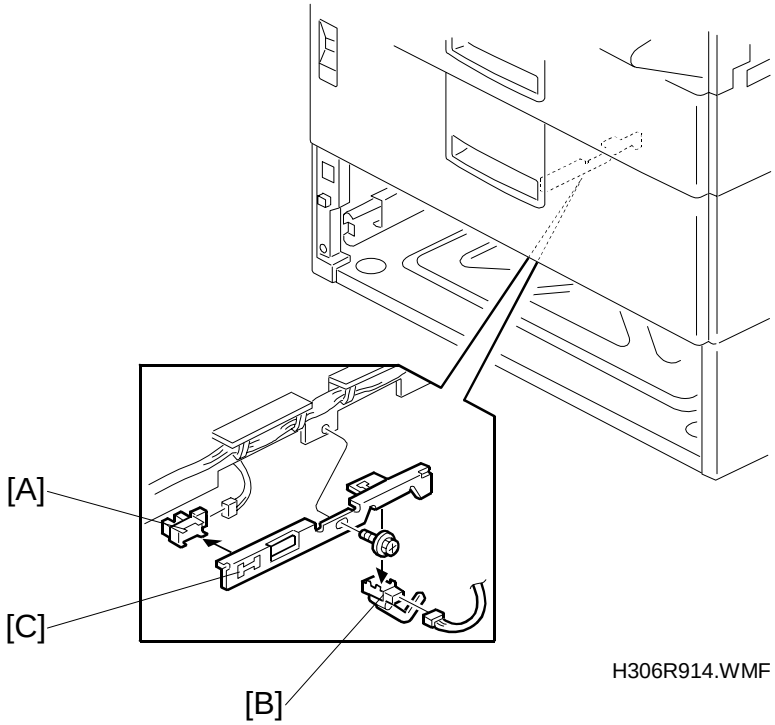


H306R913.WMF

1. Remove the vertical feed unit (2 screws). (See section 6.10.2.)
2. Pull out the paper feed tray.
3. Remove the screw that fastens the paper feed sensor bracket [A].
4. While pushing the actuator up, slide the paper feed sensor bracket to the left, release the pawl on the right side, and remove the bracket.
5. After removing the connector, remove the sensor [B] from the bracket.

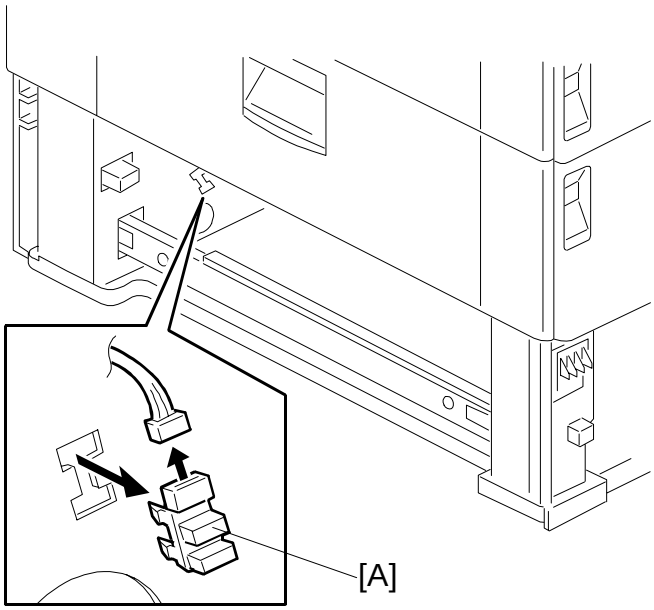
NOTE: This procedure is easier if you first remove the vertical feed unit or cover above the unit that has the defective sensor.

6.10.7 REPLACING THE UPPER LIMIT AND PAPER END SENSORS



1. Remove the paper feed tray (2 screws). (See section 6.10.1.)
2. Remove the connectors attached to the upper limit sensor [A] and paper end sensor [B].
3. Remove the screw that holds the sensor bracket [C] in place, and remove the bracket by pulling downward.
4. Remove the sensors from the bracket.

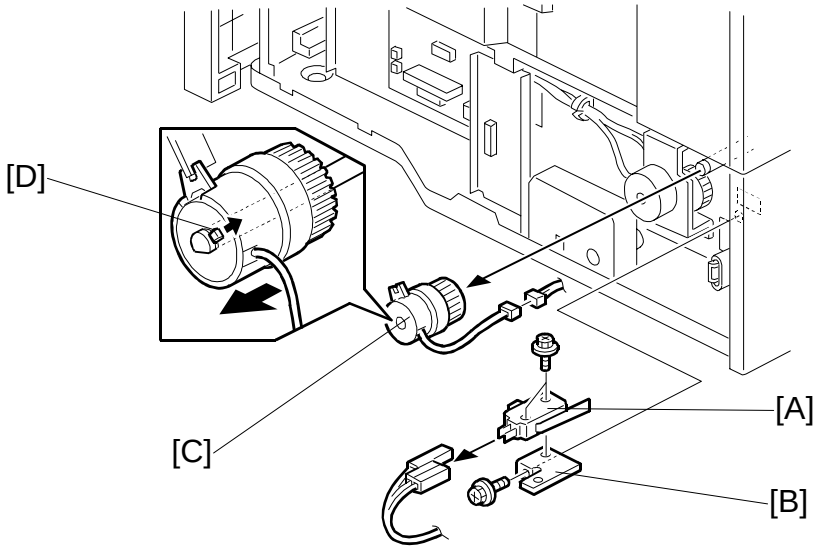
6.10.8 REPLACING THE PAPER NEAR-END SENSOR



H306R916.WMF

1. Remove the paper feed tray (2 screws). (See section 6.10.1.)
2. Remove the vertical feed unit (2 screws). (See section 6.10.2.)
3. Release the sensor pawl (connector side) and remove the paper near-end sensor [A].

6.10.9 REPLACING THE LEFT SIDE COVER SWITCH AND PAPER FEED CLUTCH



H306R916.WMF

1. Remove the rear cover (3 screws). (See section 6.10.3.)

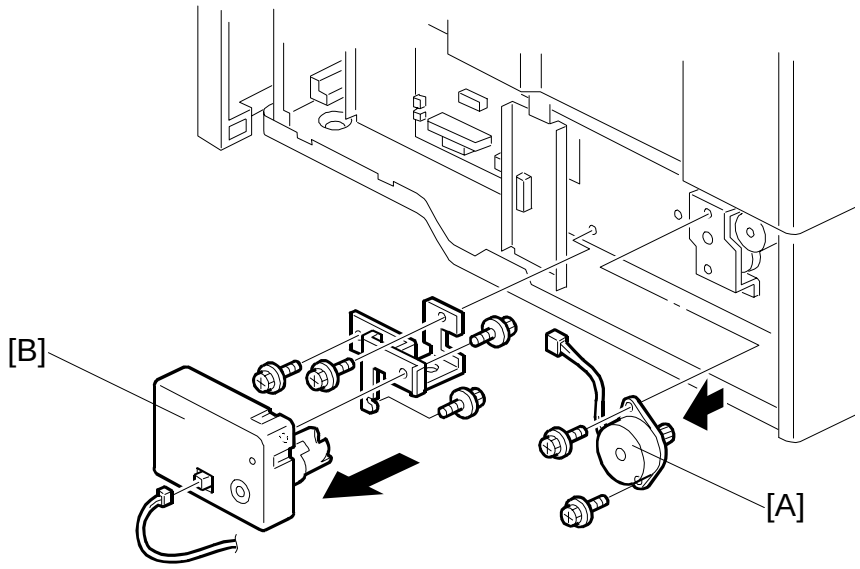
Left Side Cover Switch [A]

1. Remove the switch bracket [B] (1 screw).
2. Remove the switch from the bracket. (2 screws, 3 connectors).

Paper Feed Clutch [C]

1. Release the clutch pawl [D] and remove the clutch (1 connector).

6.10.10 REPLACING THE PAPER FEED AND LIFT MOTORS



H306R917.WMF

1. Remove the rear cover (3 screws). (See section 6.10.3.)

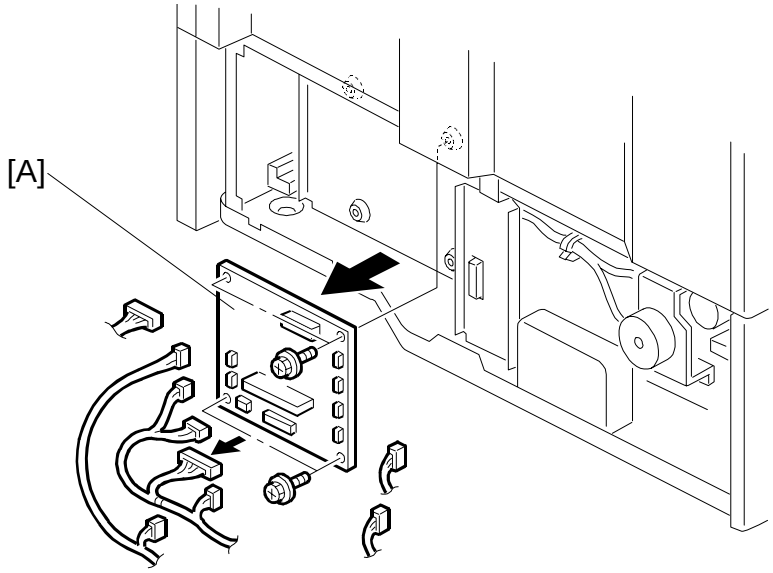
Paper Feed Motor [A]

1. Remove the paper feed motor (2 screws, 1 connector).

Lift Motor [B]

1. Remove the motor together with the bracket (2 screws, 1 connector).
2. Remove the motor from the bracket (2 screws).

6.10.11 REPLACING THE PFU BOARD



H306R918.WMF

1. Remove the rear cover (3 screws). (See section 6.10.3.)
2. Remove the PFU board [A] (4 screws, 9 connectors).

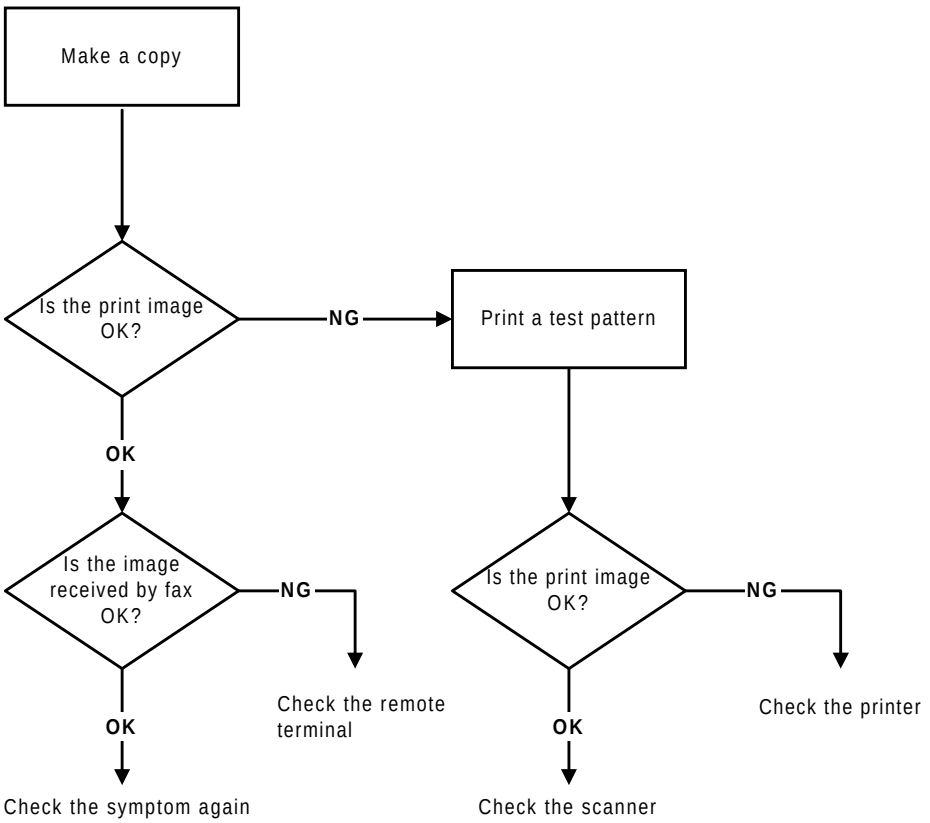
⚠CAUTION

When replacing the PFU, make sure to first turn off the main power and unplug the power cord. This is done to eliminate the risk of electrical shock.

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.



H306T501.WMF

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

NOTE: To make it easier, it is recommended to replace the optical unit instead of the SBU if there is a problem with the scanner.

7.1.1 BLANK COPIES

Possible Cause (Printer)

- Poor drum sensitivity.
- Laser optic components are out of position.
- The proper bias voltages are not applied to 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 to see if there is toner adhered to the drum surface.
   If there is, do the following. If not, go to step 3.
   - Check to see if the cartridge is correctly installed.
   - Check to see if the transfer roller is correctly positioned.
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 to see if the laser optic components are properly positioned.
4. Check to see if the cartridge is empty. If it is, replace the cartridge.
   If not, do the following.
   - Check the connection between the FCU (CN17) and the toner end sensor
   - Replace the toner end sensor.

7.1.2 BLACK COPIES

Possible Cause (Scanner)

- The SBU is defective.

Action:

1. Check the connection between the FCU (CN24) and the SBU.
2. Replace the optical unit or SBU.

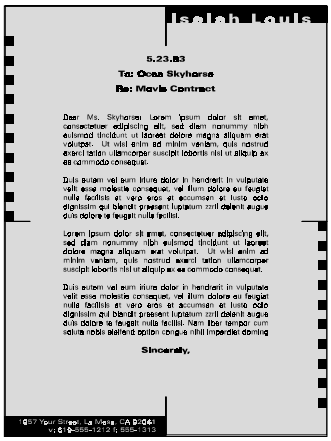
Possible Cause (Printer)

- The charge is improperly applied.

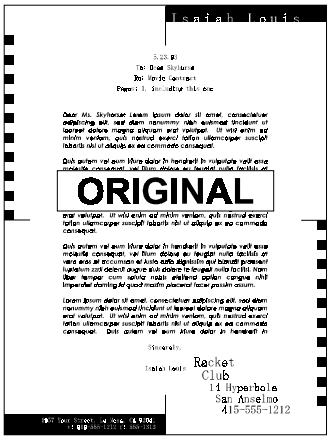
Action:

1. Check the connections between the power pack, the charge voltage terminals, and the cartridge.
   - If they are OK, go to step 2.
   - If not, fix the connections.
2. Check the connections behind the power pack.

7.1.3 DIRTY BACKGROUND



H306T502.WMF



H306T503.WMF

Possible Cause (Scanner)

- Scanner shading correction error

Action:

1. Clean the shading white plate.
2. Replace the optical unit or SBU if necessary.

Possible Cause (Printer)

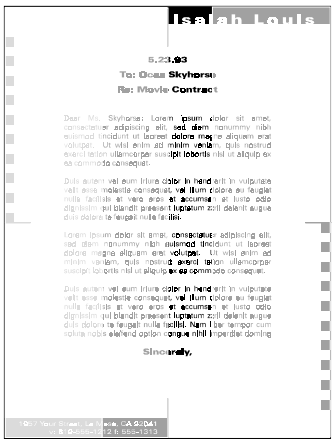
- Poor drum sensitivity.
- The charge is improperly applied.
- The hot roller is dirty.

Action:

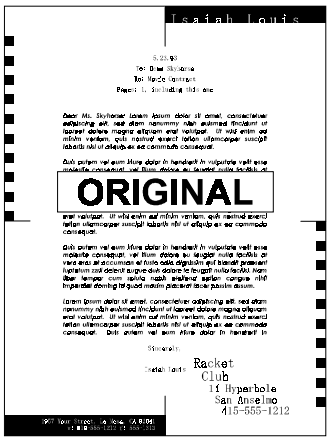
1. Try replacing the cartridge.
2. Check to see if the hot roller surface is dirty.
   - If it is, clean the roller.
   - If not, go to step 3.
3. Check to see if all the charge bias terminals and the cartridge.
   - If they are, check or replace the power pack.
   - If not, fix the connections.

Trouble-shooting

7.1.4 UNEVEN IMAGE DENSITY



H306T504.WMF



H306T503.WMF

Possible Cause (Scanner)

- Dirty exposure glass
- Partial scanner lamp defect

Action

- Clean the exposure glass.
- Replace the optical unit or SBU.

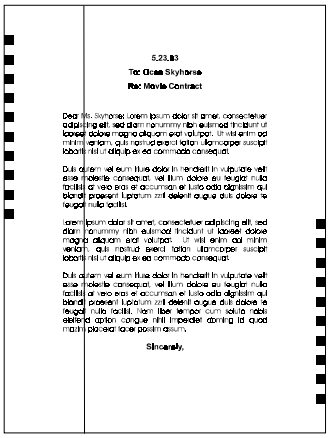
Possible Cause (Printer)

- Poor drum sensitivity.
- Dirty laser optic components.
- A deformed toner doctor blade.
- Uneven toner supply in the toner hopper.

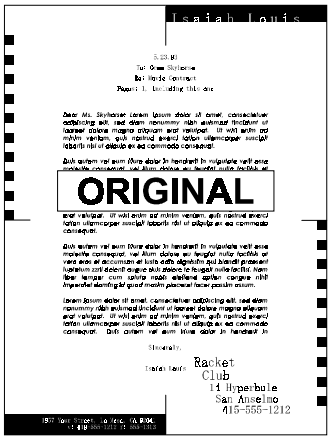
Action:

1. Print a solid black test pattern, and open the cover in the middle of printing.
2. If the image is lighter in the center of the image, the toner may be low. Replace the cartridge. If it is not, go to step 3.
3. Check to see if the toner is evenly distributed on the drum.
   - If it is not, check the cartridge and the laser optic components.
   - If it is, check if there is any dirt on the transfer roller surface.

7.1.5 VERTICAL BLACK LINES



H306T505.WMF



H306T503.WMF

Possible Cause (Scanner)

- Dirt or dust on the exposure glass and/or optical mirror(s).
- Dirty white plate in the ADF.
- Defective SBU.

Action:

1. Clean the exposure glass and the shading white plate.
2. Clean the optical mirrors in the optical unit.
3. Replace the optical unit or SBU.

Possible Cause (Printer)

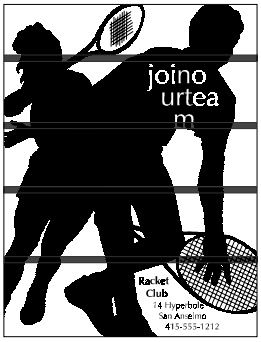
- Damaged cleaning blade.
- Dirty hot roller stripper(s).

Action:

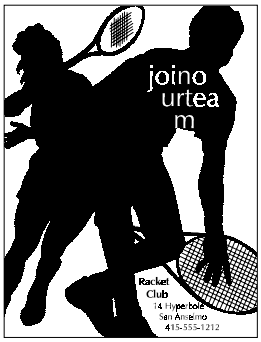
1. Replace the cartridge.
2. Clean the hot roller strippers.

Trouble-shooting

7.1.6 HORIZONTAL BLACK LINES



H306T506.WMF



H306T507.WMF

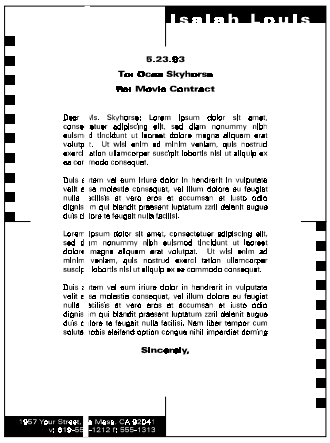
Possible Cause (Printer)

- The drum surface is scratched or damaged.

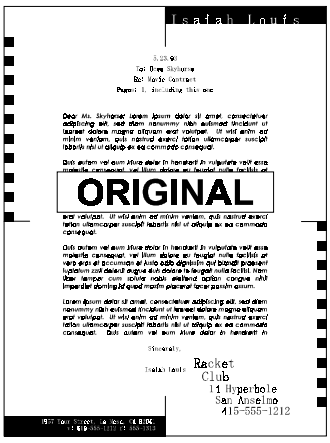
Action:

1. Check to see if the surface of the drum is damaged.
   - Change the cartridge if it is damaged.

7.1.7 VERTICAL WHITE LINES



H306T508.WMF



H306T503.WMF

Possible Cause (Scanner)

- Dirt or dust on the exposure glass and/or optical mirror(s).
- Dirty white plate in the ADF.
- Defective SBU.

Action:

1. Clean the exposure glass and the shading white plate.
2. Clean the optical mirrors in the optical unit.
3. Replace the optical unit or SBU.

•

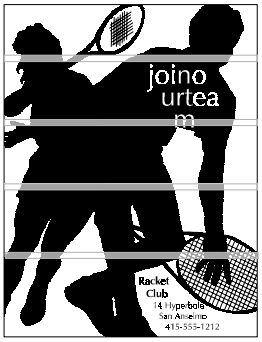
Possible Cause (Printer)

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

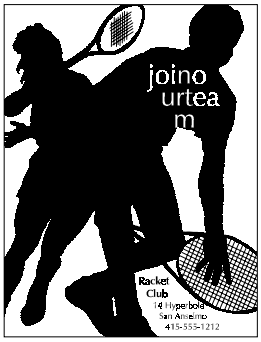
Action:

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

7.1.8 HORIZONTAL WHITE LINES



H306T509.WMF



H306T511.WMF

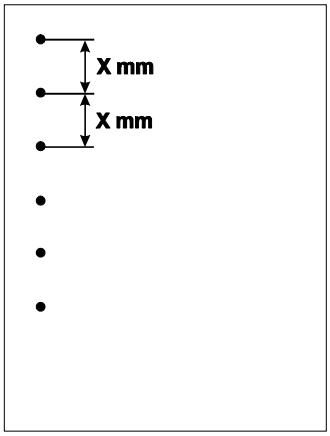
Possible Cause (Printer)

- A damaged or deformed development roller surface.
- The development bias is unstable.
- The transfer current is unstable.

Action:

1. Print a test pattern, and open the cover in the middle of printing.
2. Check to see if horizontal white lines (where toner is not adhered) appear on the drum surface or not.
   - If not, check the transfer roller surface and the transfer bias terminal connections. If they are OK, check or replace the power pack.
   - Change the cartridge.

7.1.9 BLACK DOTS/SPOTS



H306T510.WMF

Rollers	Diameter (mm)	Circumference (mm)
Registration Roller	14.24	44.7
OPC Drum	30	94.2
Charge Roller	14	44.0
Development Roller	20	62.8
Transfer Roller	16.15	50.7
Hot Roller	30.8	96.9
Pressure Roller	25	78.5

Possible Cause (Scanner)

- Dust on the exposure glass.

Action:

- Clean the exposure glass.
- Try disabling MTF.

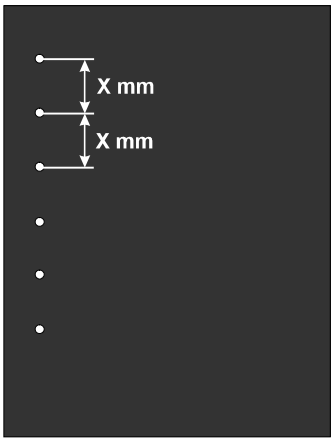
Possible Cause (Printer)

- The surface of a roller is damaged or dirty (See the table above)

Action:

- Clean the rollers
- Replace the rollers if necessary.

7.1.10 WHITE SPOTS IN BLACK IMAGE AREAS



H306T501.WMF

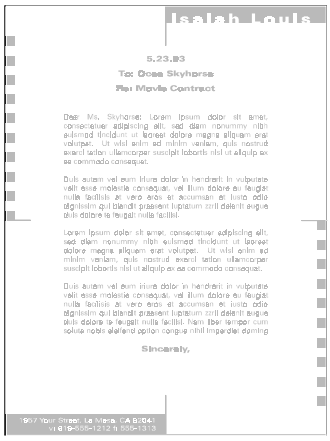
Possible Cause (Printer)

- The surface of a roller is damaged or dirty

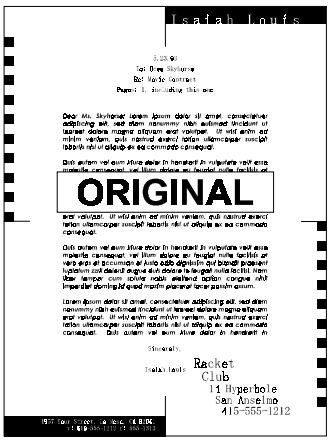
Action:

- Clean the rollers
- Replace the rollers if necessary.

7.1.11 FAINT COPIES



H306T504.WMF



H306T512.WMF

Possible Causes (Scanner)

- Dirty shading plate and/or exposure glass
- Dirty optical mirrors
- SBU defect

Action:

- Clean the white roller in the ADF.
- Clean the optical mirrors
- Replace the optical unit or SBU.

Possible Causes (Printer)

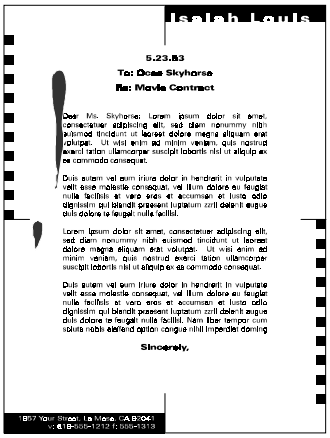
- Poor drum sensitivity.
- Dirty laser optic components.
- Incorrect development/ transfer bias
- Low toner
- Low fusing temperature

Trouble-shooting

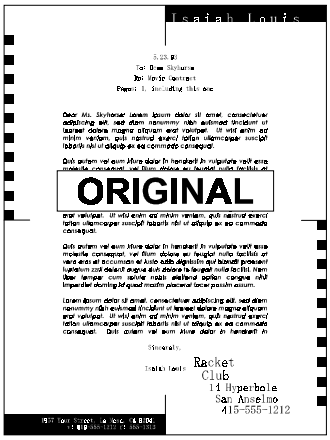
Action:

1. Print a test pattern, and open the cover in the middle of printing.
2. Check to see if the toner on the paper at the entrance of the fusing unit appears faint.
   - If it does, check or replace the fusing lamp, thermistor, and PSU.
   - If it does not, go to step 3.
3. Check to see if the toner on the drum looks faint.
   - If it does, go to step 4.
   - If it does not, check the contacts between the transfer bias terminals and power pack.
4. Check all the contacts between the development bias terminals.
   - If it does not, try replacing the cartridge.

7.1.12 VERTICAL BLACK BAND



H306T505.WMF



H306T512.WMF

Possible Cause (Printer)

- A deformed, damaged, or incorrectly positioned doctor blade.

Action:

- Replace the cartridge.

7.1.13 UNFUSED COPIES

Possible Cause (Printer)

- The thermistor is defective.
- The spring mechanism for the fusing pressure roller is defective.
- Incorrect toner type.
- Non-recommended paper type.

Action:

1. Check to see if the correct type of paper and toner are in use.
   - If it is, go to step 2.
   - If not, use recommended types of paper and toner.
2. Try replacing the fusing unit.

7.1.14 GHOST IMAGE

Possible Cause (Printer)

- Poor drum sensitivity.
- The cleaning blade is deformed or incorrectly positioned.
- Dirty hot roller

Action:

- Replace the cartridge.
- Clean the hot roller surface and/or replace the cleaning pad.

7.1.15 TONER ON THE BACK OF THE PRINTER PAPER

Possible Cause (Printer)

- Dirty transfer roller
- Dirty fusing pressure roller

Action:

1. Check to see if the transfer roller is dirty with toner.
   - If it is, clean the roller surface by copying a sheet of white paper three times or more. (For better results, copy one sheet at a time)
   - If not, go to step 2.
2. Check to see if the fusing pressure roller is dirty with toner.
   - If it is, clean the fusing pressure roller.
   - If not, check for any other dirty rollers and clean them.

7.1.16 INCORRECTLY ALIGNED OUTPUT (DATA SHIFTED TO THE RIGHT OR LEFT)

Possible Cause (Scanner)

- Incorrect setting of the document guide.

Action:

- Align each side of the document with the document guides.

Possible Cause (Printer)

- Laser optics are aligned incorrectly.
- Improper print margin setting (main scan direction).

Action:

- Adjust the main scan print margin.
- Check that the laser optics are aligned correctly.

7.1.17 INCORRECTLY ALIGNED OUTPUT (IMAGE SHIFTED VERTICALLY)/REDUCED IMAGE

Possible Cause:

- Improper print margin (sub-scan direction).
- Dirty registration roller.

Action:

- Adjust the sub-scan print margin.
- Clean the registration roller.

7.2 MECHANICAL PROBLEMS

7.2.1 ADF/SCANNER

1. Non Feed

Possible Cause:

- Use of the incorrect document type or size.
- The operation panel is not closed properly.
- The pick-up rollers and feed belt are dirty or worn out.
- The mechanical clutch mechanism for document pick-up is defective.
- Incorrect positioning of the separation roller.
- The scanner motor is defective.

Action:

1. Check whether a correct document type is being used.
2. Check that the operation panel is closed securely.
3. If the problem remains, do the following:
   - Clean the pick-up rollers and feed belt with a soft cloth and water, and replace them if damaged.
   - Check the connection between the FCU (CN33) and the scanner motor.
   - Replace the scanner motor.

2. Jam

Possible Cause:

- Incorrect document type or size.
- The document is too long.
- The scanner rollers (pick-up, feed, R0, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.
- The scan line sensor is defective.
- Defective scanner motor

Action:

1. Check whether a correct document type is being used, and that the document length is within the maximum limit.
2. Check for obstructions in the paper path.
3. If the problem remains, do the following.
   - Clean the rollers with a soft cloth and water, and replace them if damaged.
   - Check that the S2 sensor is working correctly.
   - Replace the scanner motor.

3. Skew

Possible Cause:

- Incorrect document type or size.
- The document guide is set incorrectly.
- The operation panel is not closed properly.
- The scanner rollers (pick-up, feed, R0, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.
- The reverse roller is out of position.

Action:

1. Check whether a correct document type is being used.
2. Check that the operation panel is closed securely and that the document guide is set properly.
3. Check for obstructions in the paper path.
4. If the problem remains, do the following.
   - Check that the separation roller is set properly. Replace it if damaged.
   - Clean the rollers with a soft cloth and water, and replace them if damaged.

4. Multi-feed

Action:

- Clean or replace the reverse roller.

7.2.2 PRINTER

1. Non-feed

Possible Cause:

- Use of a non-recommended paper type.
- The paper cassette end fence is set incorrectly.
- The paper lift mechanism is not working properly.
- Malfunction in the paper feed clutch.
- The paper feed roller is set incorrectly.
- The paper feed motor is defective.
- The registration sensor is defective.

Action:

1. Check whether a correct paper type is being used.
2. Check that the paper cassette end fence is set correctly and check the paper lift mechanism.
3. Check that the feed clutch for the cassette is working properly.
4. Check that the paper feed roller is installed properly. Clean or replace if necessary.
5. Check the registration roller and its mechanism. Clean or replace if necessary.
6. Check that the sensor is working correctly.
7. If the problem remains, do the following:
   - Check the connections between the FCU (CN34) and the paper feed motor.
   - Replace the paper feed motor.

3. Jam - Inside and Exit

Possible Cause:

- Use of a non-recommended type of paper.
- Obstruction in the paper path.
- The exit sensor is defective.
- Malfunction in the AIO cartridge drive mechanism.
- Malfunction in the fusing drive mechanism.
- Malfunction in the hot roller stripper(s) mechanism.
- Malfunction in the pressure mechanism in the fusing unit.

Action:

1. Check whether a correct type of paper is being used.
2. Check for obstructions in the paper path.
3. Check that the exit sensor is working correctly.
4. Check all the gears in the fusing drive mechanism.
5. Check that the exit sensor is working correctly.
6. Check that the main motor is working correctly.
7. Check the hot roller strippers and the pressure mechanism in the fusing unit.

4. Skew

Possible Cause:

- Use of a non-recommended type of paper.
- Incorrect positioning of the paper guides in the paper cassette.
- The separation pad is out of position.
- The paper feed roller is worn out or damaged.
- Obstruction in the paper path.
- Malfunction in the registration mechanism.

Action:

1. Check whether a correct type of paper is being used.
2. Check that the paper guides and the end fence are set correctly.
3. Check if the paper feed roller is installed correctly and clean. Replace 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:

- Use of a non-recommended type of paper.
- Incorrect positioning of the paper guides and/or end fence in the paper cassette.
- The separation pad is out of position.

Action:

1. Check whether a correct type of paper is being used.
2. Check that the paper guides and the end fence are set correctly.

7.3 SERVICE CALL CONDITIONS

If the Call Service indicator is lit, one of the following conditions has occurred.

Symptom	Error Code	Sub-code	SC-code
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 fax standby mode)	9-22	04	0-04
Fusing unit failure (fusing lamp at low temperature in fax standby mode)	9-22	05	0-05
Fusing unit failure (fusing lamp at low temperature during printing)	9-22	06	0-06
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 fax standby mode)	9-22	0A	0-0A
Fusing unit failure (fusing lamp at continuous high temperature)	9-22	0B	0-0B
Hexagonal mirror motor startup error	9-23	31	3-31
Hexagonal 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
Power Pack failure (Bias voltage to development roller is too high)	9-29	51	5-51
Power Pack failure (Bias voltage to charge brush roller is too high)	9-29	52	5-52
Power Pack failure (Transfer bias is out of control)	9-29	53	5-53
Power Pack failure (Development bias PWM is over the upper limit for 200 ms)	9-29	54	5-54
Power Pack failure (Charge bias PWM is over the upper limit for 200 ms)	9-29	55	5-55
Power Pack failure (Transfer bias PWM is over the upper limit for 200 ms)	9-29	56	5-56
Power Pack failure (Bias level error to development roller)	9-29	57	5-57

Symptom	Error Code	Sub-code	SC-code
Power Pack failure (Bias level error to development roller)	9-29	58	5-58
Power Pack failure (Bias level error to transfer roller)	9-29	59	5-59

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.
  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.

To release an SC code indication relating to the fusing unit (9-22), check and replace the fusing unit first. Then set printer switch 01 bit 0 to 1 and turn the power off and on.

7.4 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.
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.
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, transfer, or SEP/SUB/PWD function	The other terminal does not have the confidential rx or transfer function, or the other terminal does not have SEP/SUB/PWD function. 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 the operation panel drive board.

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), G3 Switch 08 (PABX)
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, FCU 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), G3 Switch 08 (PABX) 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 asking the user to add optional extra memory.
0-29	Data block format failure in ECM reception	Check for line noise or other line problems. Check the FCU - NCU connectors. Replace the NCU or FCU.

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
0-32	Incompatible capability command was received.	The machine at the other end could not detect DIS/NSF signal correctly.
0-33	DCR timer runs out without receiving certain amount of data.	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.
0-52	Polarity changed during communication	Check the line connection. Retry communication.
0-54	SG3 board did not respond to disconnect command.	Check the connections between the FCU and optional SG3 board Replace the SG3 board or FCU
0-55	SG3 board did not respond to initializing command.	
0-70	Communication mode specified in CM/JM was not available. V.8 sequence: Tx/Rx	The other terminal did not have a compatible communication mode. A polling Tx file was not ready at the other terminal when polling reception was initiated from the Tx terminal.
0-74	Fallback to T.30 protocol, after transmitting CI because ANSam was not detected V.8 sequence: Tx	The Tx terminal could not detect ANSam due to noise, poor line condition, etc. Check for line noise, or line connection.
0-75	Fallback to T.30 protocol, because CM was not detected. (ANSam timeout) V.8 sequence: Rx	
0-76	Fallback to T.30 protocol because JM was not detected. (CM timeout) V.8 sequence: Tx	The Tx terminal could not detect JM due to noise, poor line condition, etc. Check for line noise, or line connection.
0-77	Fallback to T.30 protocol because CJ was not detected. (JM timeout) V.8 sequence: Rx	The Tx terminal could not detect CJ due to noise, poor line condition, etc. Check for line noise, or line connection.

Code	Meaning	Suggested Cause/Action
0-79	CI signal is detected while waiting V21 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.
0-80	Line was disconnected due to timeout during line probing. V.34: line probing	Check the line connection or line noise. Check the connection between the NCU and the FCU. Increase the Tx level or adjust the cable equalizer setting. Use the V.17 or slower modem (with the dedicated Tx parameter).
0-81	Line was disconnected due to timeout during equalizer training. V.34: equalizer training	
0-82	Line was disconnected due to timeout during control channel start-up sequence. V.34: phase 4	
0-83	Line was disconnected due to time out during control channel restart sequence.	
0-84	Line was disconnected because error detected in control channel start-up sequence. V.34: phase 4	Check the connection between the NCU and the FCU. Replace the SG3 board or the FCU.
0-85	Line was disconnected because error detected in control channel restart.	
0-86	Line was disconnected because the other terminal requested a data rate by MPh that was not available in the selected symbol rate.	The other terminal may be defective or incompatible.
0-87	Control channel started after unsuccessful primary channel.	The Rx terminal restarted the control channel because data reception in the primary channel was not successful.
0-88	Line was disconnected because PPR was transmitted or received 9 times (default) times within the same ECM frame.	Use a lower data rate at the start. Increase the Tx level or adjust the cable equalizer setting.
1-00	Document jam	Incorrectly inserted document or unsuitable document type. Check the ADF drive components and sensors.

Code	Meaning	Suggested Cause/Action
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
1-02	Shading error (Interval of original documents is too short)	Check the ADF drive components and sensors.
1-08	Shading error (No Xenon lamp turns on)	Check the xenon lamp connection Replace the xenon lamp or FCU
1-10	Paper at the scan line when the power was turned on.	Remove the paper. Check the scan line sensor.
1-17	Document jam in the feed-out area	Clear any debris from the sensor actuator. Check the ADF drive components and sensors.
1-20	Paper did not reach the fusing exit at the end of printing	Remove the paper. Check the printer drive components and sensors.
1-21	Paper present at the fusing exit after printing	
1-30	Paper ran out during printing	Add paper in the cassette.
1-34	Paper ran out after printing	
1-35	Paper lift mechanism error at the 1st optional paper tray	Check the printer drive components and sensors of optional paper tray.
1-36	Paper lift mechanism error at the 2nd optional paper tray	
1-71	The cover was opened or the cassette was pulled out during printing	Close the cover or put back the cassette.
2-10	The modem cannot enter Tx mode	Replace the FCU.
2-11	Only one V.21 connection flag was received	
2-12	Modem clock irregularity	
2-13	Modem initializing error	
2-20	Abnormal coding/decoding (cpu not ready)	
2-23	JBIG compression/ reconstruction error	Check the connection between FCU, optional SG3 and optional NCU board. Replace the optional SG3 board or the FCU.
2-24	JBIG ASIC error	Replace the optional SG3 board or the FCU.

Code	Meaning	Suggested Cause/Action
2-25	JBIG data reconstruction error (BIH error)	Check the connection between FCU, optional SG3 and optional NCU board. Replace the optional SG3 board or the FCU.
2-26	JBIG data reconstruction error (Float marker error)	
2-27	JBIG data reconstruction error (End marker error)	
2-50	The machine reset itself	If this is frequent, replace the FCU.
2-51	Fail safe timer runs out while communication	Replace the FCU.
2-52	Memory resource releasing error after communication	Check the connection between FCU, optional SG3 and optional NCU board.
3-00	G4 interface board reset	Replace the G4 interface board or FCU.
3-10	Disconnection during ISDN G3 communication	Check the other terminal and the ISDN line. The other terminal may dialed a wrong number.
3-11	Disconnection during ISDN G4 communication	Check the other terminal and the ISDN line.
3-20	A SAC signal was received during ISDN G4 communication	The operator at the other terminal may have interrupted the communication.
3-21	A CSA was sent during ISDN G4 communication, because the Stop key was pressed	The local operator has interrupted the communication.
3-30	Mismatched specifications (rx capability)	Check the receive capabilities requested from the other terminal.
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.

Code	Meaning	Suggested Cause/Action
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, the IC memory card, or the hard disk.
5-30	Mode table for the first page to be printed was not effective	Replace the FCU, the IC memory card, the function upgrade card, or the hard disk.
6-00	G3 ECM - Flag detection timer runs out while receiving image data	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.
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, 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, FCU or NCU. Try adjusting the rx cable equalizer **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN), G3 Switch 08 (PABX)
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.

Code	Meaning	Suggested Cause/Action
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.
6-99	V.21 signal not terminated within 6 s	Replace the FCU.
9-00	PIN code response because of printer SC error	Fix and release the SC error
9-02	DMA receiving error (PLU)	Replace the FCU.
9-03	Paper eject error at the last page (with image data)	Check the printer drive components and sensors
9-04	Paper eject error at the last page (without image data)	
9-05	Paper eject error	
9-07	Paper non-feed or jam at the cassette entrance	If the problem persists, replace the FCU.
9-08	Paper jam inside the development area	If the problem persists, replace the FCU.
9-09	Paper jam in the fusing exit area	If the problem persists, replace the FCU.
9-10	Toner end detected	Replace the AIO.
9-12	Cover open detected during printing	Close the cover, or check the cover sensors.
9-13	LD interlock error	Replace the polygon motor Replace the LD unit
9-14	PSU overheat	Check the machine's environment Replace the PSU
9-17	Charge corona unit failure	If the problem persists, replace the FCU.
9-20	Laser diode failure	If the problem persists, replace the FCU.
9-22	Fusing lamp failure	
9-23	Hexagonal mirror motor failure	
9-24	Main motor failure	
9-29	Power pack error	Check the connections Replace the power pack or FCU

Code	Meaning	Suggested Cause/Action
9-40	CRC error while receiving a frame	Check and adjust the host PC's RS232C port settings. Check if a proper cable is used and connected securely. Check if the application is working correctly. If the problem persists, replace the FCU. **Note:** The optional PC fax expander may not be available in some countries.
9-41	Command 3rd try failed	
9-42	DCN received unexpectedly	
9-43	Unexpected frame received	
9-44	Response time over	
9-45	Frame transmission error	
9-50	Paper non-feed or jam inside the upper paper feed unit	Check if a recommended type of paper is used. Check if the paper guides are aligned to the paper correctly. Check the paper feed mechanism in the unit.
9-51	Jam at the paper exit of the upper paper feed unit.	Check for a blockage in the paper feed path. Check the paper feed mechanisms inside the unit. Check if the sensor is defective.
9-52	Paper non-feed or jam inside the lower paper feed unit	Check if a recommended type of paper is used. Check if the paper guides are aligned to the paper correctly. Check the paper feed mechanism in the unit.
9-53	Jam at the paper exit from the lower paper feed unit.	Check for a blockage in the paper feed path. Check the paper feed mechanisms inside the unit. Check if the sensor is defective.
9-80	Bypass feed - paper non-feed or jam at the entrance	Check the registration roller and sensor.
9-81	Bypass feed - paper length exceeds the maximum limit (600 mm)	Check the paper feed mechanism and sensors.
9-84	Paper non-feed or jam at the cassette entrance	Same as 9-07
10-**	Refer to the optional NIC fax board manual.	

7.5 MODEM STATUS CODES IN V.34 PROTOCOL DUMP

The following sections explain the meaning of modem status codes which appear on the G3 protocol dump list after V.34 communications.

The machine sometimes does not print all the status codes.

In polling communication, the signals are exchanged in the opposite direction after phase 2.

7.5.1 CALLING SIDE

Phase 1 (V.8)

FIF	Description
0010	Idle
0110	Idle
0111	ANSam reception
0011	CM transmission
0112	JM reception
0012	CJ transmission
0013	Phase 1 end

Phase 2 (Line Probing)

FIF	Description
0020	Idle
0021	75 ms interval
0121	Waiting for INFO0a
0022	INFO0c transmission
0122	INFO0a reception
0123	A reception
0023	INFO0c retransmission due to missing INFO0a
0024	INFO0c retransmission due to the second INFO0a reception
0031	B transmission
0032	B bar transmission
0033	L1 transmission
0034	L2 transmission
0041	B transmission during INFOh reception.
0127	INFOh reception
0042	Phase 2 end
0043	Waiting for A due to recovery from phase 3 (control channel)

Phase 3 (Equalizer Training)

FIF	Description
0050	Idle
0051	70 ms interval
0130	Phase 3
0052	S transmission
0053	S bar transmission
0054	PP transmission
0055	TRN transmission
0056	Phase 3 end

Phase 4 and 5 (Control Channel)

FIF	Description
0060	Idle
0141	Waiting for PPh
0061	70 ms interval
0062	PPh transmission
0142	PPh reception
0063	ALT transmission
0143	ALT reception
0064	MPh transmission
0144	MPh reception
0065	E transmission
0145	E reception
0066	T.30 control signal transmission (e.g., NSS or DCS)
0151	Flag reception
0152	T.30 control signal reception (e.g., NSF, DIS or CFR)
0067	Phase 5 end

Phase 6 (Primary Channel)

FIF	Description
00A0	Idle
00A1	70 ms interval
0160	Phase 6
00A2	S transmission
00A3	S bar transmission
00A4	PP transmission
00A5	B1 transmission
00A6	Image data transmission
00A7	Phase 6 end

Control Channel (Post Message - Sh)

FIF	Description
0070	Idle
0071	70 ms interval
0141	Waiting for Sh or PPh
0072	Sh transmission
0073	Sh bar transmission
0146	Sh/Sh bar reception
0074	ALT transmission
0143	ALT reception
0075	E transmission
0076	T.30 control signal transmission (e.g., PPS-EOP)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0077	End

Control Channel (Post Message – PPh)

FIF	Description
0080	Idle
0081	PPh transmission
0142	PPh reception
0082	ALT transmission
0143	ALT reception
0083	MPh transmission
0144	MPh reception
0084	E transmission
0085	T.30 control signal transmission (e.g., PPS-MPS)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0086	End

Control Channel Recovery (AC)

FIF	Description
0090	Idle
0091	AC transmission
0092	PPh transmission
0142	PPh reception
0093	ALT transmission
0143	ALT reception
0094	MPh transmission
0144	MPh reception
0095	E transmission
0096	T.30 control signal transmission (e.g., PPS-EOP)
0151	Flag reception
0152	T.30 control signal reception (e.g., MCF)
0097	End

V.34 End

FIF	Description
00B0	Modem idle

7.5.2 CALLED SIDE

Phase 1 (V.8)

FIF	Description
0010	Idle
0110	Idle
0111	CM reception
0012	JM transmission
0112	CI reception
0113	CJ reception
0013	Phase 1 end

Phase 2 (Line Probing)

FIF	Description
0020	Idle
0121	Waiting for INFO0c
0021	75 ms interval
0122	INFO0c reception
0022	INFO0a transmission
0023	INFO0a retransmission due to missing INFO0c
0024	INFO0a retransmission due to the second INFO0c reception
0123	B reception
0124	B bar reception
0031	A transmission
0032	A bar transmission
0033	No signal. Waiting for L1/L2
0125	L1/L2 reception
0126	B reception
0041	A transmission
0042	INFOh transmission
0043	Phase 2 end
0044	Waiting for B due to recovery from phase 3 (control channel)

Phase 3 (Equalizer Training)

FIF	Description
0050	Idle
0131	No signal
0051	70 ms interval
0052	Waiting for S
0132	S reception
0053	Waiting for S bar
0133	S bar reception
0054	Waiting for PP
0134	PP reception
0055	Waiting for TRN
0135	TRN reception
0056	Phase 3 end

Phase 4 and 5 (Control Channel)

FIF	Description
0060	Idle
0141	No signal
0061	70 ms interval
0142	PPh reception
0062	PPh transmission
0143	ALT reception
0063	ALT transmission
0144	MPh reception
0064	MPh transmission
0145	E reception
0065	E transmission
0066	T.30 control signal transmission (e.g., NSF and DIS)
0067	Phase 5 end

Phase 6 (Primary Channel)

FIF	Description
00A0	Idle
0161	No signal
00A1	70 ms interval
0162	S reception
00A2	Waiting for S
0163	S bar reception
00A3	Waiting for S bar
0164	PP reception
00A4	Waiting for PP
0165	B1 reception
00A5	Waiting for B1
0166	Flag reception
0167	Image data reception
00A6	Waiting for image data
0168	Turn off
00A7	Phase 6 end

Control Channel (Post Message - Sh)

FIF	Description
0070	Idle
0071	70 ms interval
0041	No signal
0072	Detecting Sh and Sh bar
0146	Sh/Sh bar reception
0073	Sh transmission
0074	Sh bar transmission
0143	ALT reception
0075	ALT transmission
0145	E reception
0076	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-EOP)
0077	T.30 control signal transmission (e.g., MCF)
0078	End

Control Channel (Post Message – PPh)

FIF	Description
0080	Idle
0142	PPh reception
0081	PPh transmission
0143	ALT reception
0082	ALT transmission
0144	MPh reception
0083	MPh transmission
0145	E reception
0084	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-MPS)
0085	T.30 control signal transmission (e.g., MCF)
0086	End

Control Channel Recovery (AC)

FIF	Description
0090	Idle
0091	AC transmission
0147	AC reception
0142	PPh reception
0092	PPh transmission
0143	ALT reception
0093	ALT transmission
0144	MPh reception
0094	MPh transmission
0145	E reception
0095	E transmission
0151	Flag reception
0152	T.30 control signal reception (e.g., PPS-MPS)
0096	T.30 control signal transmission (e.g., MCF)
0097	End

V.34 End

FIF	Description
00B0	Modem idle

Point to Point Diagram Model: Kaiser1 (Aficio FAX 5000L)