BRO/BR1

RICOH FAX180/170

SERVICE MANUAL

August 7th, 1995
Subject to change

Lithium Batteries

⚠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.

1. OVERALL MACHINE INFORMATION

1.1. SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX

Connection
Direct couple

Document Size
Length:
105 - 357 mm [4.1 - 14.1 ins]
Up to 0.6 m [23.6 ins], manually assisted
Up to 14.0 m [46 ft], after adjustment
Width:
148 - 257 mm [5.8 - 10.1 ins]
Thickness:
0.05 to 0.15 mm [2 to 6 mils]
(equivalent 50 - 80 g/m^2)

Document Feed
Automatic feed, face down

ADF Capacity
10 sheets (using 20 lb or 80 g/m^2 paper)

Scanning Method
Contact image sensor

Maximum Scan Width
A4 : 210 mm [8.3 ins] ± 0.5% B4
(CHINA) : 256 mm [10.1 ins] ±0.5%
Letter : 216 mm [8.5 ins] ±0.5%

Scan Resolutions
Main scan: 8 dots/mm [203 dpi]
Sub scan:
Standard - 3.85 lines/mm [98 lpi]
Detail - 7.7 lines/mm [196 lpi]
Fine - 15.4 lines/mm [392 lpi]

Memory Capacity (BRO only)
ECM: 64 kbytes
SAF:
BRO:(ECM on) 148 kbytes
(12 pages/Slerexe letter)
(ECM off) 204 kbytes
(16 pages/Slerexe letter)
China BRO:(TAM on) 256 kbytes
(21 pages/Slerexe letter)
(TAM off) 916 kbytes
(75 pages/Slerexe letter)

Compression
BR0: MH, MR, MMR, EFC, SSC
BR1: MH, MR, EFC, SSC

Protocol
Group 3

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

Data Rate (bps)
9600/7200/4800/2400,
Automatic fallback

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

Transmission Time
BRO: 9 s at 9600 bps
BR1: 20 s at 9600 bps
Measured with G3 ECM using memory for a ITU-T #1 test document (Slerexe letter) at standard resolution

Printing System
Thermal Printing

Printer Roll; Thermal paper
North American version:
216 mm X 30 m [8.5 ins X 98.4 ft]
China version:
256 mm X 30 m [10.1 ins X 98.4 ft]
Other versions:
210 mm X 30 m [8.3 ins X 98.4 ft]

Maximum Printing Width
North American version: 210 mm [8.3 ins]
China version: 250 mm [9.8 ins]
Other versions: 204 mm [8.0 ins]

Print Resolutions
Main scan: 8 dots/mm [203 dpi]
Sub scan: 15.4 lines/mm [392 lpi]

Power Supply
USA : 115 ±20 Vac, 60 ±3 Hz
China : 220 ±20 Vac, 50 ±3 Hz
Asia : 220 - 240 V, 50/ 60 ±3 Hz

Operation Enviroment
Temperature: 17 ~ 28 °C [63 ~ 82 F]
Humidity : 40 ~ 70 %Rh

Dimensions (W X D X H)
396 X 281 X 108 mm
[15.6" X 11.1" X 4.2"] excluding trays

Weight
Approx. 5 Kg [11 lbs] excluding trays and thermal paper

1.2. FEATURES

KEY: O = Used, X = Not Used,
A = Chinese version only

Equipment	BR0	BR1
ADF	O	O
Book scan	X	X
Built-in handset	O	O
Optional cassette: 100 sheets	X	X
Cabinet	X	X
Counter	X	X
Cutter	O	O
Hard disk	X	X
Marker (Stamp)	X	X
Monitor speaker	O	O
Optional printer interface	X	X

Video Processing Features	BR0	BR1
Contrast	O	O
Halftone (Basic & Error Diffusion)	O	O
MTF	O	O
Reduction	X	X
Resolution	O	O
Smoothing to 8 x 15.4 l/mm	O	O

Communication Features - Auto	BR0	BR1
Automatic fallback	O	O
Automatic redialing	O	O
Confidential reception	X	X
Dual Access	O	X
Substitute reception	O	X

Communication Features - User Selectable	BR0	BR1
Action as a transfer broadcaster	X	X
AI Redial (last ten numbers)	O	X
Answering machine interface	O	O
Authorized Reception	O	O
Auto-answer delay time	X	X
Auto dialing (pulse or DTMF)	O	O
Auto Document	O	X
Auto image density selection	O	O
Auto paper size selection	X	X
Automatic Voice Message	A	X

Communication Features - User Selectable	BR0	BR1
Batch Transmission	X	X
Broadcasting	O	X
Chain Dialing	O	O
Communication Result Display	X	X
Confidential ID Override	X	X
Confidential Transmission	X	X
Direct Fax Number Entry	O	O
Economy Transmission	X	X
Fax on demand	X	X
Forwarding	O	X
Free Polling	O	O
Groups (3 groups)	O	X
Group Transfer Station	X	X
Hold	X	X
ID Transmission	O	O
Immediate Redialing	O	O
Immediate transmission	O	O
Keystroke Programs	X	X
Memory transmission	O	X
Multi-step Transfer	X	X
Next Transfer Station	X	X
OMR	X	X
On Hook Dial	O	O
Page Count	O	O
Personal Codes	X	X
Personal Codes with Conf. ID	X	X
Polling Reception	O	O
Polling Transmission	O	O
Polling tx file lifetime in the SAF	X	X
Quick Dial (10 stations)	O	O
Reception modes (Fax, Tel, Auto)	O	O
Length Reduction	X	X
Remote control features	X	X
Remote Transfer	X	X
Restricted Access	X	X
Secured Polling	O	O
Secured Polling with Stored ID Override	O	O
Secure Transmission	X	X
Send Later	O	O
Silent Ringing Detection	X	X
Specified Image Area	X	X
Speed Dial	50	20

Communication Features - User Selectable	BR0	BR1
Super Fine Resolution (16 x15.4 l/mm : 400 x 400 dpi)	X	X
Telephone Directory	O	O
Tonal Signal Transmission	X	X
Transfer Request	X	X
Transmission Deadline (TRD)	X	X
Turnaround Polling	X	X
Two-step Transfer	X	X
Two in one	X	X
Voice Request (immed. tx only)	X	X

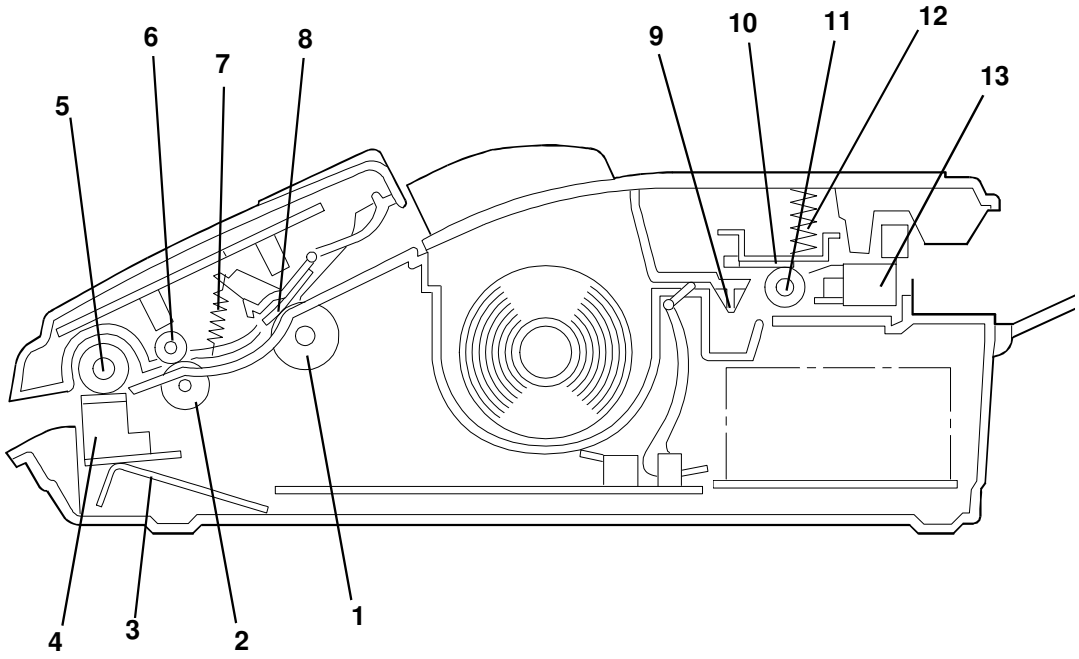
Communication Features - Service Selectable	BR0	BR1
AI Short Protocol	O	X
Auto-reduction Override Option	O	O
Busy tone detection	O	O
Closed Network (tx and rx)	O	O
Continuous Polling Reception	X	X
Dedicated tx parameters	O	O
ECM	O	X
EFC, SSC	O	O
Inch-mm conversion	X	X
Page retransmission times	O	O
Page separation mark	X	X
Protection against wrong connection	O	O
Resol'n stepdown override option	X	X
Short Preamble	X	X
Well log	X	X

Other User Features	BR0	BR1
Area code prefix	X	X
Automatic service call	X	X
Center mark	X	X
Checkered mark	X	X
Clearing a memory file	O	X
Clearing a polling file	O	X
Clock	O	O
Confidential ID	X	X
Copy Editing (Erase Center/Margin)	X	X
Copy mode	O	O

Other User Features	BR0	BR1
Copy Mode Restriction	X	X
Counters	O	O
Daylight Saving Time	O	O
Destination Check	X	X
Direct entry of names	O	O
File Retention Time	X	X
File Retransmission	X	X
Function Programs	X	X
ID Code	O	O
Label Insertion	X	X
Language Selection	O	O
LCD contrast control	X	X
Memory Lock	X	X
Memory Lock ID	X	X
Modifying a memory file	X	X
Multi Sort Document Reception	X	X
Multicopy mode	X	X
Own telephone number	O	O
Power Saver (Night Timer and standby mode)	X	X
Print density control	X	X
Printing a memory file	O	X
RDS on/off	O	O
Reception Mode Switching Timer	O	O
Reception time printing	X	X
Reduction/Enlargement	X	X
Remaining memory indicator	X	X
Remote ID	X	X
Reverse Order Printing	X	X
RTI, TTI, CSI	O	O
Secure ID	X	X
Service Report Transmission	O	O
Speaker Volume Control	O	O
Substitute Reception on/off	O	X
Telephone Line Type	O	O
Paper Saving Mode	O	O
TTI on/off	O	O
User Function Keys	X	X
User Parameters	O	O
Wild Cards	O	O
Cutter on/off	O	O
Curled Paper Cut Off	O	O

1.3. COMPONENT LAYOUT

1.3.1. Mechanical Components



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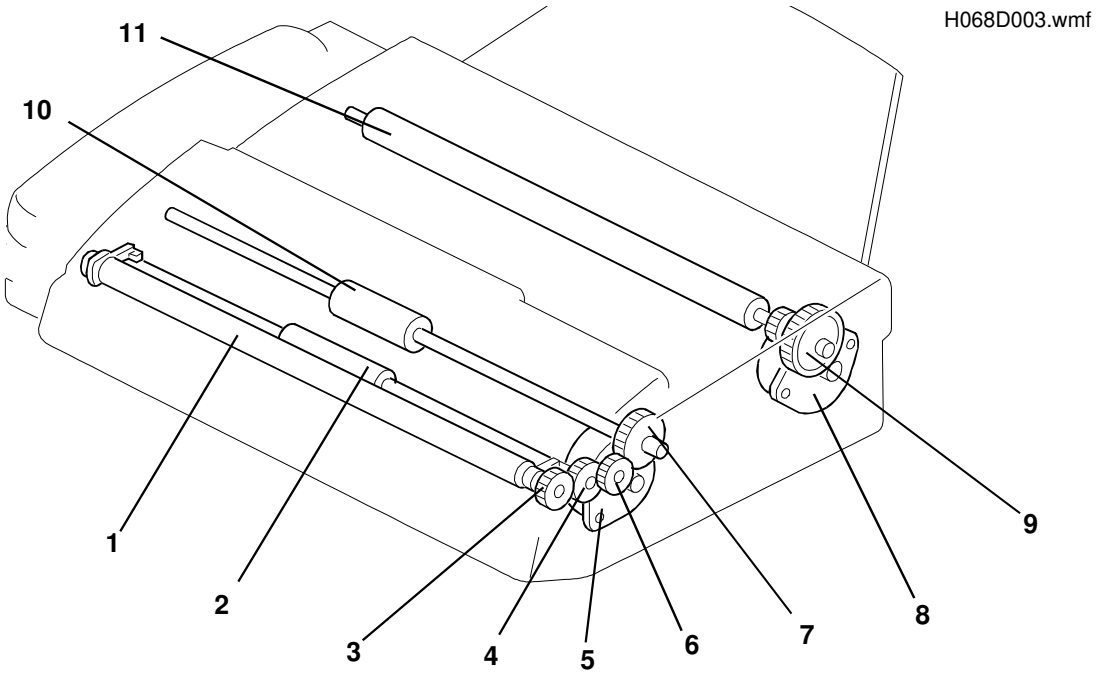
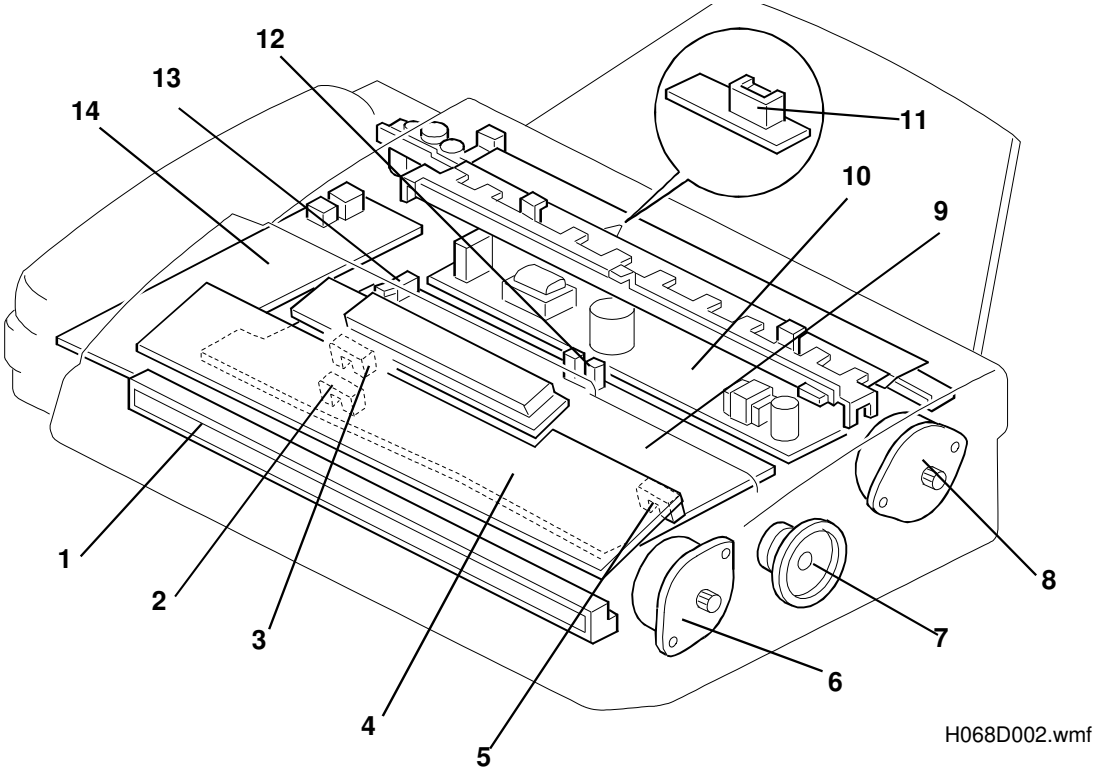
No.	Name	Description
1	ADF Roller	Picks up pages of the document.
2	R1 Roller	Feeds the document through the scanner.
3	CIS Spring	This applies pressure against the scanner roller.
4	Contact Image Sensor (CIS) Assembly	This sensor reads and converts the light reflected from the document into an analog video signal. An LED array, which illuminates the document, is contained in this unit.
5	Scanner Roller	Feeds the document through the scanner.
6	Document Feed Roller	Feeds the document through the scanner.
7	Separation Pad Spring	This applies pressure to prevent the ADF roller from feeding more than one sheet at a time.
8	Separation Pad	Allows one page into the scanner.
9	Decurler	This applies stress to the paper to remove the curl.
10	Thermal Head	This prints by applying heat to the thermal paper.
11	Platen Roller	This feeds printouts out of the machine.
12	Thermal Head Spring	This applies pressure against the platen roller.
13	Cutter Assembly	This consists of the cutter sensor, paper guide frame, rotary cutter blade, cutter motor, and printer jam sensor.

1.3.2. Drive Components



No.	Name	Description
1	Scanner Roller	This feeds the document through the scanner.
2	R1 Roller	This feeds the document through the scanner.
3	Scanner Roller Drive Gear	This drives the scanner roller.
4	R1 Roller Drive Gear	This drives the R1 roller.
5	Tx Motor	This stepper motor drives the scanner.
6	Scanner Drive Gear	This drives the scanner roller.
7	ADF Roller Drive Gear	This drives the ADF roller.
8	Rx Motor	This stepper motor drives the platen roller.
9	Platen Roller Drive Gear	This drives the platen roller.
10	ADF Roller	This picks up pages of the document and feeds them into the scanner.
11	Platen Roller	This feeds the paper out of the machine.

1.3.3. Electrical Components



1. PCBs

No.	Name	Description
1	Contact Image Sensor (CIS) Assembly	This sensor reads and converts the light reflected from the document into an analog video signal. An LED array, which illuminates the document, is contained in this unit.
4	OPU (Operation Panel Unit)	This board controls the operation panel.
9	FCU (Facsimile Control Unit)	This board controls the machine. It contains the main cpu, ROM, system RAM, drivers for the motors, a dc-dc converter, and so on.
10	PSU (Power Supply Unit)	This board supplies dc power to the machine.
14	NCU (Network Control Unit)	This board contains a relay and switches for interfacing the machine to the network and the handset.

2. Motors

No.	Name	Description
6	Tx Motor	This stepper motor drives the scanner.
8	Rx Motor	This stepper motor drives the platen roller.

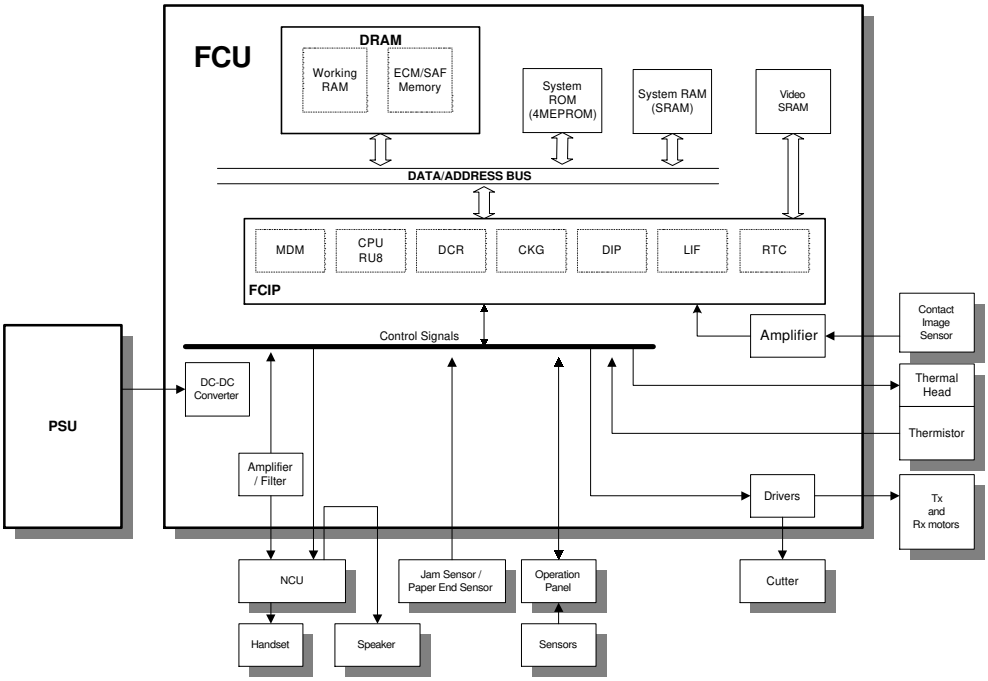
3. Sensors

No.	Name	Description
2	Scan Line Sensor	This detects when a page is approaching the scan line.
3	Document Sensor	This detects the presence of a document in the feeder.
5	B4-width Sensor	This detects when the width of the document is greater than A4/LT size.
11	Printer Jam Sensor	This detects when the paper is approaching the cutter, and detects jams in the printer.
12	Cover Open/Paper End Sensor	This detects when the printer cover has been opened and when the paper has run out.
13	Paper Size Detector	This detects the paper size installed in the paper holder. The user must install the correct size paper guide.

4. Others

No.	Name	Description
7	Monitor Speaker	This allows the user to listen to the condition of the telephone line.

1.4. OVERALL MACHINE CONTROL



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

The FCIP consists of the following component blocks:

- RU8 CPU - Main CPU
- MDM - Modem
- LIF- Laser Interface
- DIP - Digital Image Processor
- RTC - Real Time Clock
- CKG - Clock Generator
- DCR - Data Compression and Reconstruction

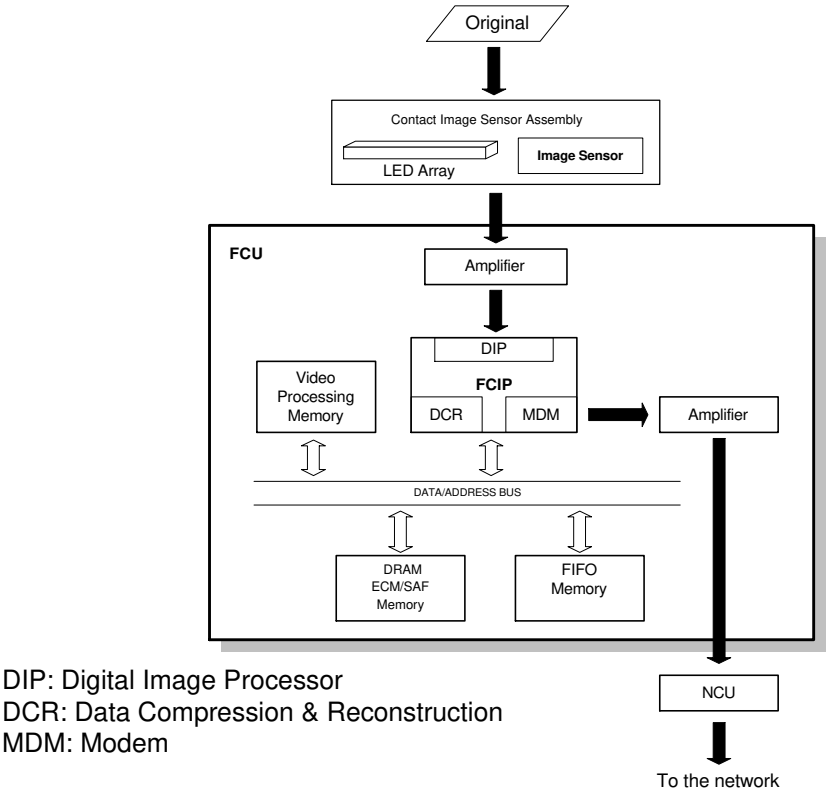
The 256KB DRAM contains the SAF memory, ECM buffer memory, and work area.

A 512 KB (4 Mbit) EPROM is used for the system ROM.

> Note: The LIF (Laser Interface) is the same circuit used for laser fax machines, adapted for use in thermal fax machines.

1.5. VIDEO DATA PATH

1.5.1. Transmission



DIP: Digital Image Processor
DCR: Data Compression & Reconstruction
MDM: Modem

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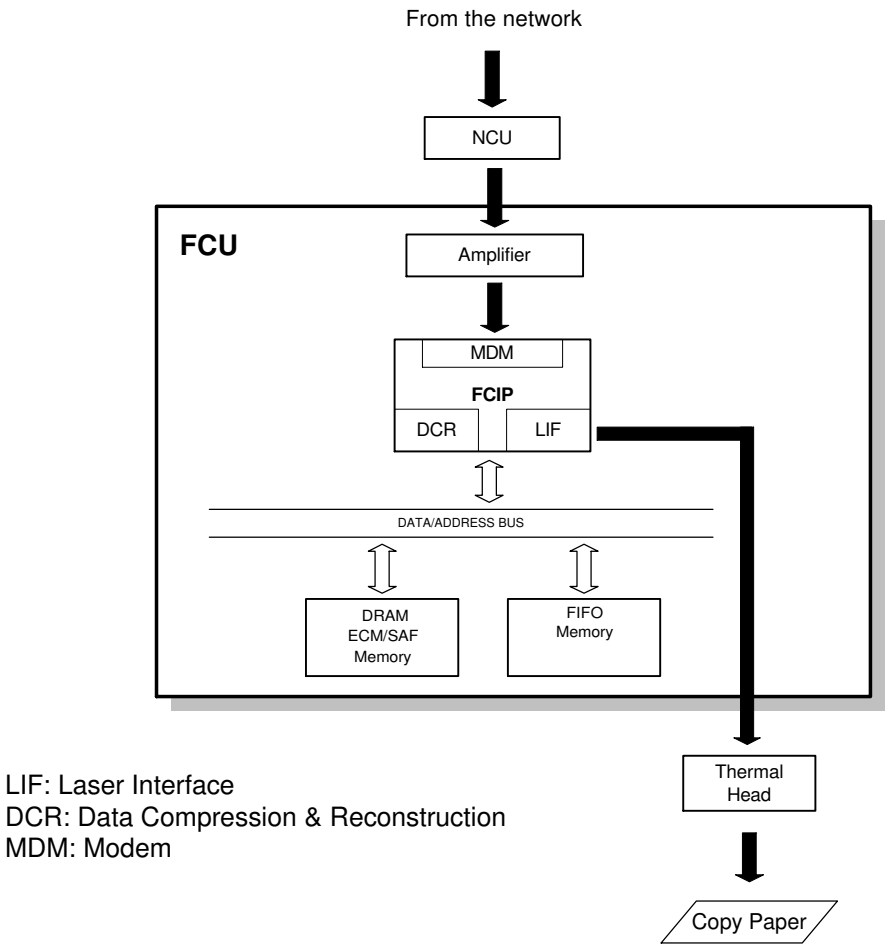
Immediate Transmission:
Scanned data from the contact image sensor passes to the DIP block in the FCIP. After analog/digital video processing, the DCR block compresses the data for transmission. If ECM is switched on (BRO only), the compressed data then passes to the ECM memory, before it is sent to the telephone line through the modem. If ECM is switched off, or in the BR1 which has no ECM, the data passes to the modem through a FIFO memory.

Memory Transmission (BRO only):
First, the scanned data is stored in the SAF memory after compression in the DCR block.

At the time for transmission, the DCR block decompresses the data from the SAF memory, then compresses it again after handshaking with the other terminal is done. If ECM is switched on, the compressed data then passes to the ECM memory, before it is sent to the telephone line through the modem.

1.5.2. Reception



LIF: Laser Interface
DCR: Data Compression & Reconstruction
MDM: Modem

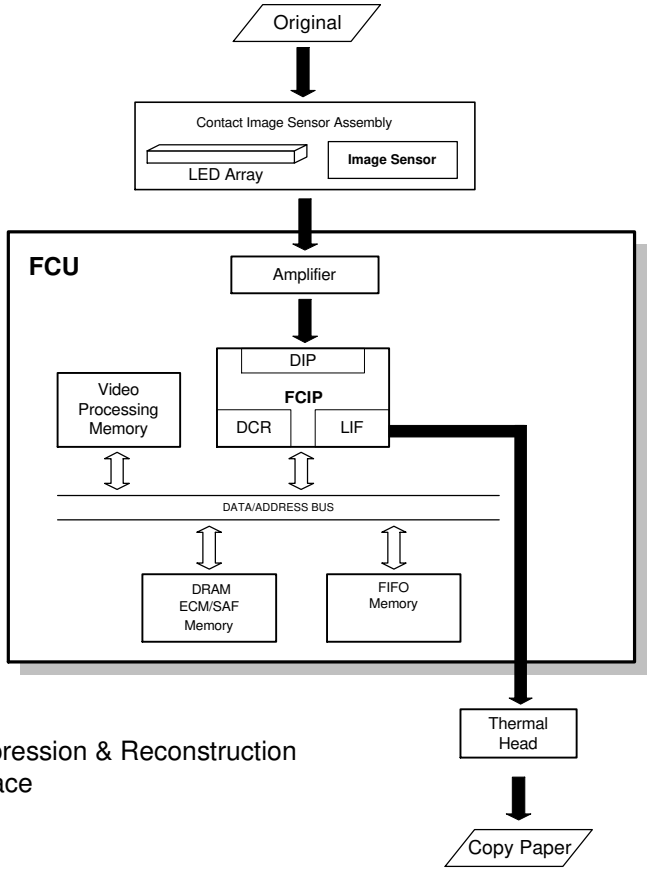
H068V508.wmf

Data from the line passes to the modem through the NCU. After the modem demodulates the data, the decompressed data passes to the DCR block, through the ECM memory, where the data is decompressed to raster image data.

BRO only: At the same time, the compressed data passes to the SAF memory as a backup in case of mechanical problems during printing (substitute reception.

The raster image data is then sent to the thermal head through the LIF block.

1.5.3. Copying



MDM: Modem
DCR: Data Compression & Reconstruction
LIF: Laser Interface

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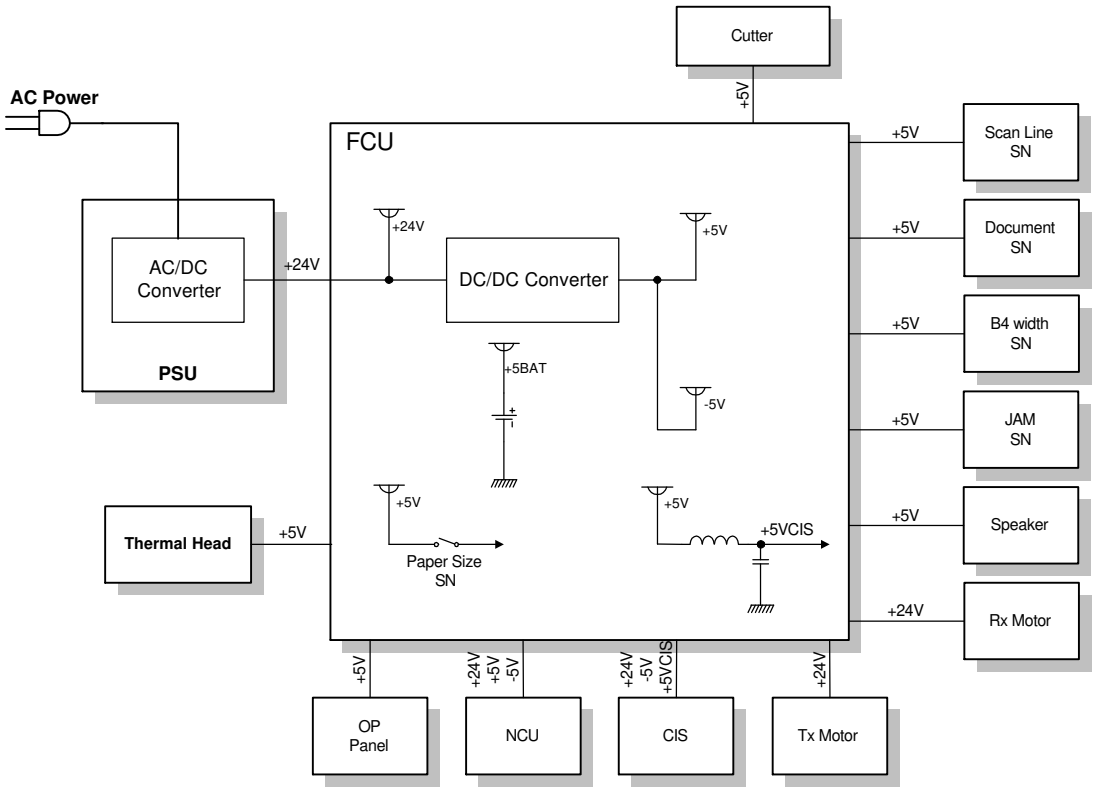
Single copy

The scanned data is sent to the thermal head through the LIF block, after video processing in the DIP block.

1.6. POWER DISTRIBUTION

1.6.1. Distribution Diagram

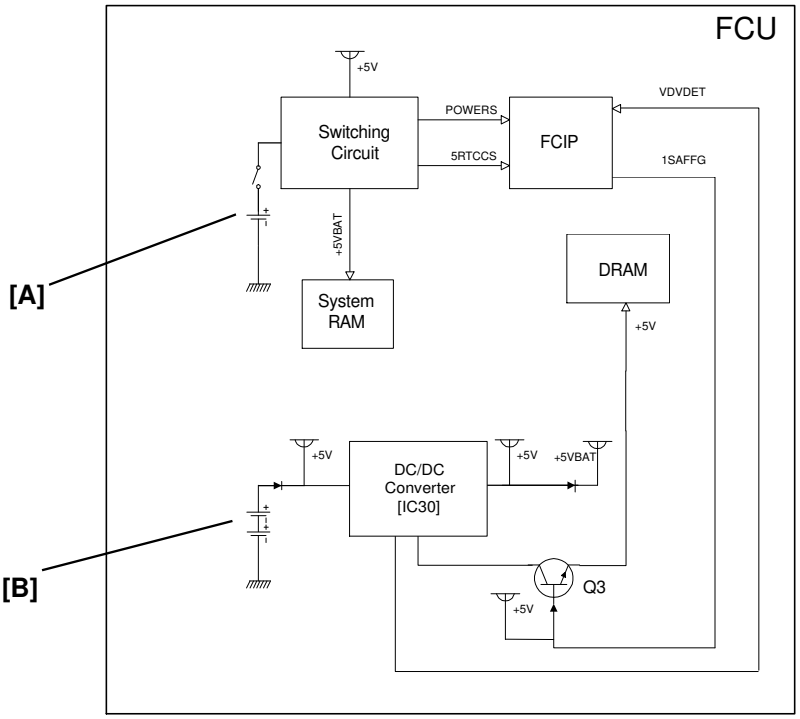


H068V501.wmf

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

+5V	This is normally on when the main switch is on.
+5VBAT	This supplies the system RAM on the FCU to back up the programmed data, if the power is switched off. A lithium battery is used to generate +5VBAT.
+5VCIS	This is a more stable power supply than +5V. It is used for the image sensor.
-5V	This is used for the image sensor.

1.6.2. Memory Back-up



H068V502.wmf

The +5VBAT supply from the lithium battery [A] backs up the system RAM which contains system parameters and programmed telephone numbers, and the real time clock in the main CPU.

BRO China model:
Two dry cells [B] and the dc/dc converter on the FCU back up the DRAM, if there is data in the SAF memory and the power is switched off.
The dry cells generate about 3 volts (max. 3.2 volts). The dc/dc converter (IC30) lifts this voltage to 5 volts so it can be used as the +5VD supply for SAF backup. The CPU monitors the voltage of the +5VD supply with the VDVDET signal. When the dry cells have run down, and the voltage is lower than 4.4 volts, the CPU stops the dc/dc converter by dropping 1SAFFG to low and the machine stops backing up the memory.

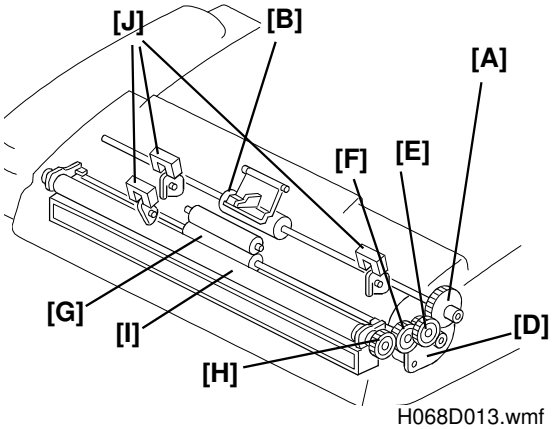
There is no battery switch for the battery [B].

2. DETAILED SECTION DESCRIPTIONS

2.1. SCANNER

2.1.1. Mechanisms

1. Overview



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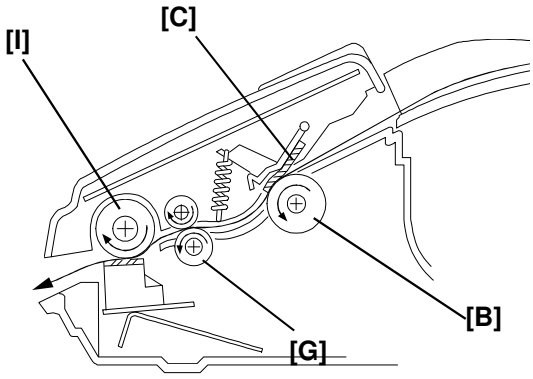


H068D004.wmf

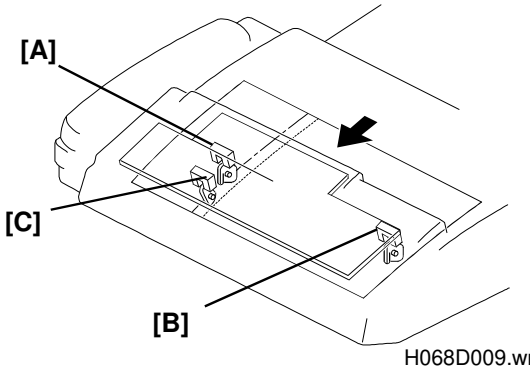
The scanner consists of two mechanisms, a scanning mechanism and a document feed mechanism.

The document feed mechanism consists of the ADF gear [A], ADF roller [B], and separation rubber plate [C] to separate and feed the documents.

The scanning mechanism consists of the tx motor [D], the gear [E], R1 roller driver gear [F], R1 roller [G], scanner roller drive gear [H], scanner roller [I], and sensors [J]. The speed of the R1 and scanner rollers is kept constant.

The machine has no stamp in it.

2. Document Detection



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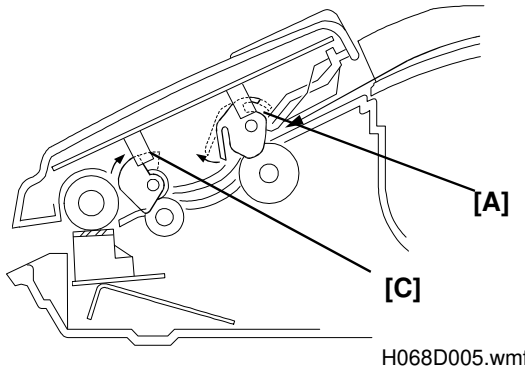
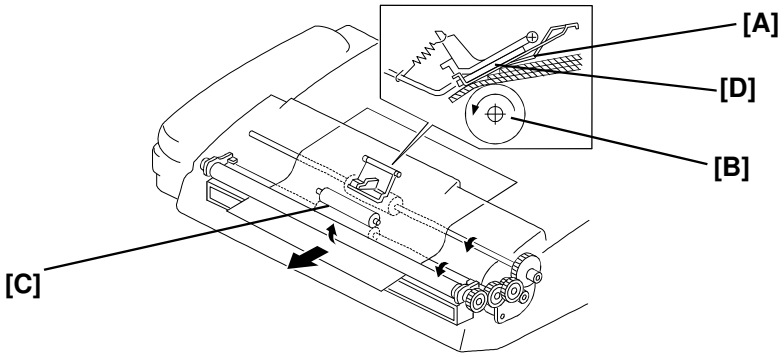


H068D005.wmf

The document sensor [A] detects when a document is placed in the ADF. The B4 width sensor [B] detects when the width of a document is over A4 or LT. The scan line sensor [C] detects the leading edge of the document at the scan line.

3. Prefeeding and Separation

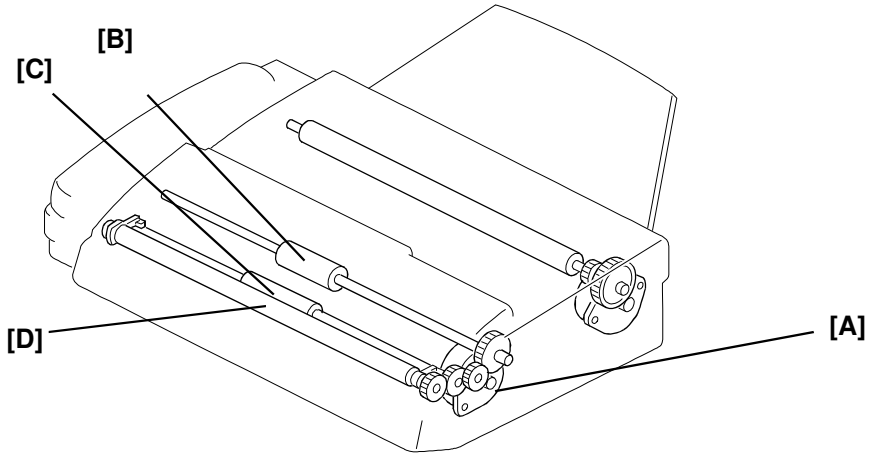


H068D007.wmf

The plate [A] aligns the leading edges of the pages of the document. When the document sensor detects a document in the ADF, the machine starts pre-feeding the document. The ADF roller [A] feeds the bottom sheet of the document. Then, the R1 roller [C] feeds the sheet into the scanner.

The separation rubber plate [D] prevents the ADF roller from feeding more than one sheet at a time.

4. Drive Mechanism



H068D003.wmf

The tx motor [A] drives the ADF roller [B], R1 roller [C], and scanner roller [D]. Because the scanner roller turns a bit faster than the R1 roller, the document is always under tension.

The scanning speed for each resolution mode is as follows.

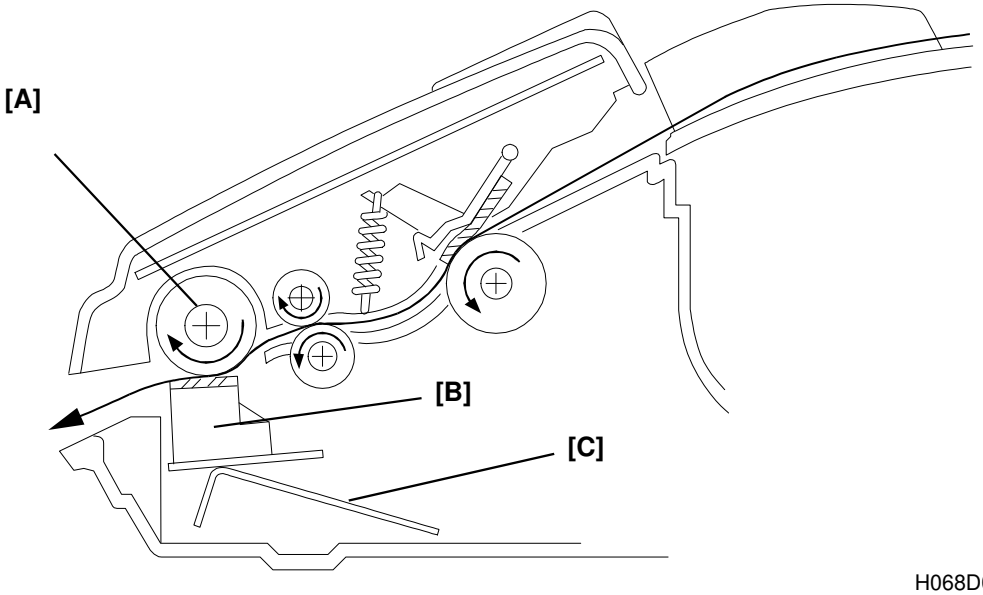
Resolution	Scan speed (/A4)
Standard - Storage to SAF (Memory Tx)	12 s
Detail	23 s
Fine	46 s

The scanner can feed paper up to 257 mm (10.1") wide. However, the actual scan width is 256 mm/B4 [10.1"] (China models), 210 mm/A4 [8.3"] (Asia models) and 216 mm/Letter [8.5"] (USA models).

The maximum acceptable document page length can be adjusted to 0.6 m (23.6"), 1.2 m (47.2"), or 14 m (46 ft). The default setting is 0.6 m.

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

5. Image Scanning



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The scanner consists of the scanner roller [A] and a contact image sensor (CIS) assembly [B]. Inside the CIS are an exposure glass, a optical lens array, an image sensor, and an LED array.

The image sensor consists of a row of 2048 photosensitive elements (256 mm width x 8 dots/mm). Light from the LED array is reflected from the document and focused onto the image sensor by the optical lens array. Because of the short optical path inside the CIS, the focal depth is much shorter than for a CCD type scanner. The spring [C] pushes the CIS up, so that the document always touches the exposure glass at the scan line.

The white level is stored in the SRAM on the FCU at the factory. The white level must be adjusted when the ROM or CIS is replaced in the field, after every time a RAM clear is done.

The image sensor scans the original one line at a time, and outputs an analog signal for each line. The voltage from each element depends on the intensity of the light reflected from the original onto the element; the intensity of the light depends on the darkness of the area of the document it was reflected from.

Cross reference
White level adjustment: Service Table and Procedures (chapter 4), section 4.1.15

6. Jam Detection

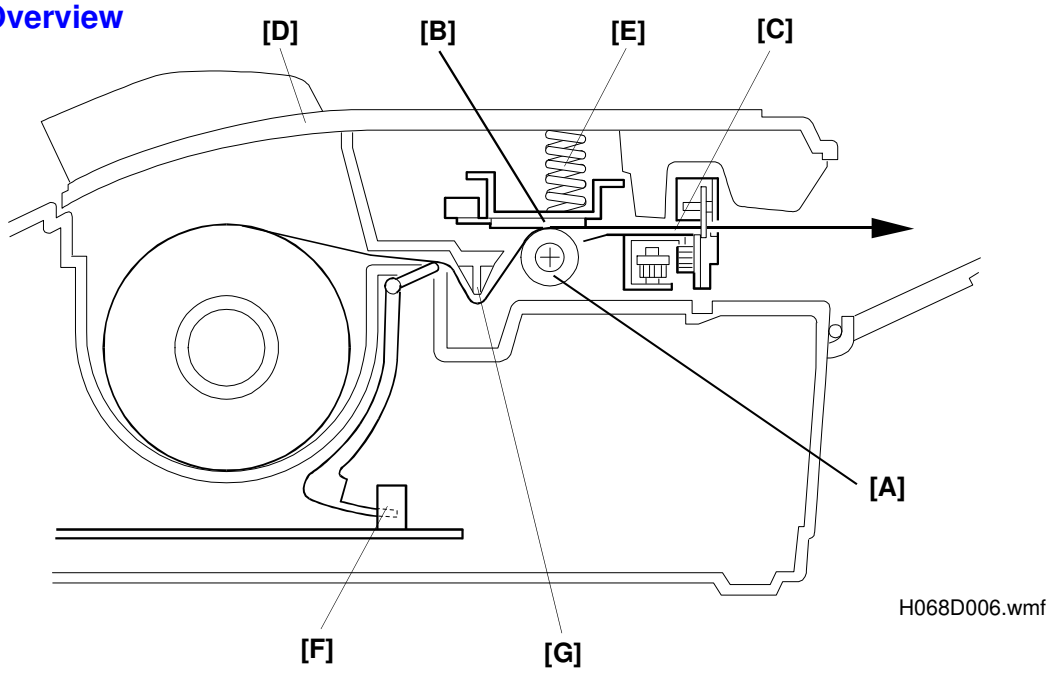
The main cpu detects a document jam if one of the following conditions occurs.

Jam Condition	Description	Error Code
Non-feed	The scan line sensor does not switch on within 6.0 s of prefeeding.	1-00
Maximum document length exceeded	The scan line sensor does not turn off after the maximum document length has been fed since it turned on. The maximum acceptable document page length can be adjusted to 0.6 m (23.6"), 1.2 m (47.2"), or 14 m (46 ft). The default setting is 0.6 m.	1-01
Cover open	The printer cover is open while the machine is working.	1-71
Other	The scan line sensor is on just when the machine turned on.	No error code

2.2. PRINTING

2.2.1. Mechanisms

1. Overview



This printer consists of the platen roller [A], thermal head [B], and cutter unit [C], which is a shuttle cutter type.

Whenever the printer cover [D] is closed, the pressure spring [E] presses the thermal head against the platen roller so that the printing and paper feeding can be performed.

The cutter unit cuts the paper.

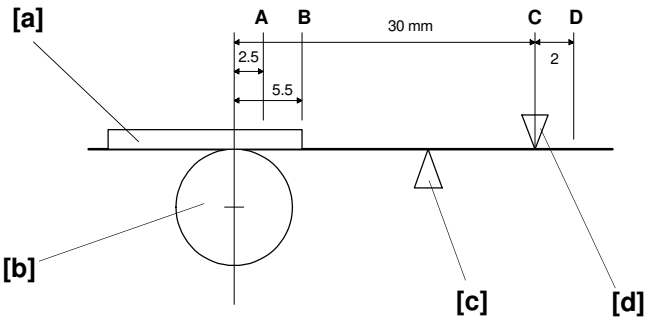
The cover open/paper end sensor [F] is on the FCU. This sensor informs the CPU of both conditions: printer cover open and paper end.

The bend in the decurler [G] always applies the same stress to the curled paper to get rid of the curl regardless of the amount of paper remaining.

2. Paper Feeding

There are three paper feeding modes.

- Image printing (Received images, Copies, Reports)
- Manual paper cut
- Automatic paper cut



H068D502.wmf

[a]: Thermal Head
[b]: Platen Roller
[c]: Printer Jam Sensor
[d]: Cutter

- Image Printing -

At the start of printing, the paper moves back to the printing position [A]. Then, the machine starts to print. After printing, the machine continues to feed the paper until it reaches the cutting position [C] which is 2 mm from the end of the image. After the paper has been cut, it is moved back to the standby position [B].

- Manual Paper Cut -

If the Start key is pressed after the paper has been placed in the machine and the printer cover has been closed, the cutter unit cuts the paper.

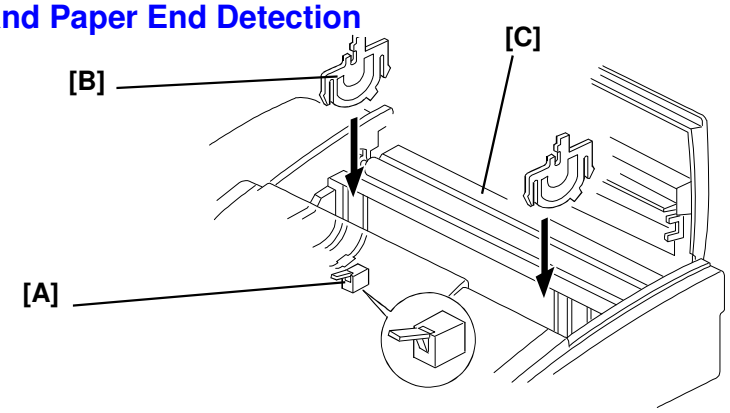
When the Start key is pressed, the platen roller feeds the paper 60 mm. Then, the cutter unit cuts the paper. After cutting, the paper goes back to the standby position.

- Automatic Paper Cut -

In situations where the machine is not copying or receiving messages for more than 24 hours, the leading edge of the paper roll may curl. In such cases, the machine cuts off the leading edge of the paper automatically before printing.

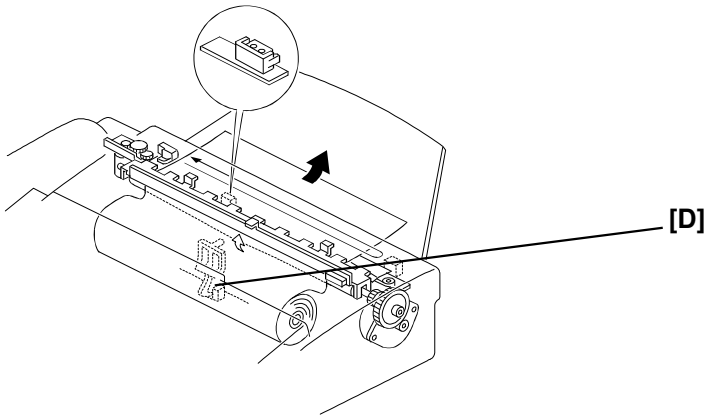
The platen roller feeds 60 mm (the curled part) and feeds 32 mm more. Then the cutter unit cuts the paper. After cutting, the paper goes back to the standby position.

3. Paper Size and Paper End Detection



H068D011.wmf

H068D008



In B4 models, the paper size detector [A] on the FCU is located under the paper holder. When a roll of A4/8 1/2" width paper is placed in the paper holder and the paper guide [B] is installed in the paper holder, the paper guide activates the paper size detector. Thus, the machine determines which paper size has been installed.

When the paper runs out, the actuator of the cover open/paper end sensor [D] pivots into the sensor, and "REPLACE PAPER" is displayed.

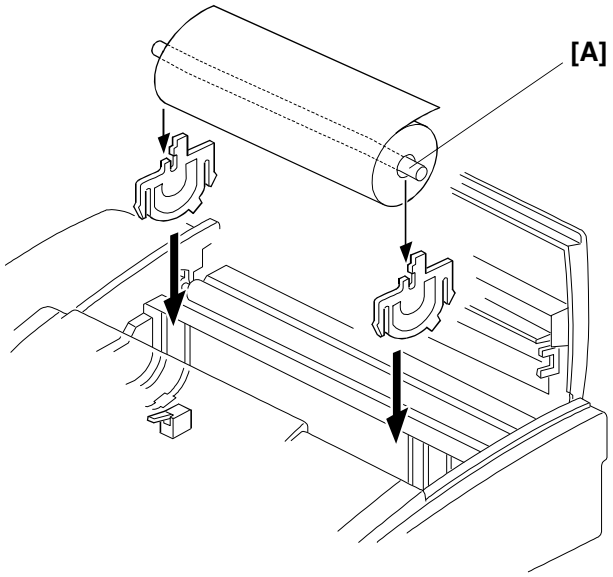
When paper runs out while a received message is being printed, the machine will operate as follows.

Machines without memory: The communication is terminated. Then the machine sends an error protocol signal to the sender.

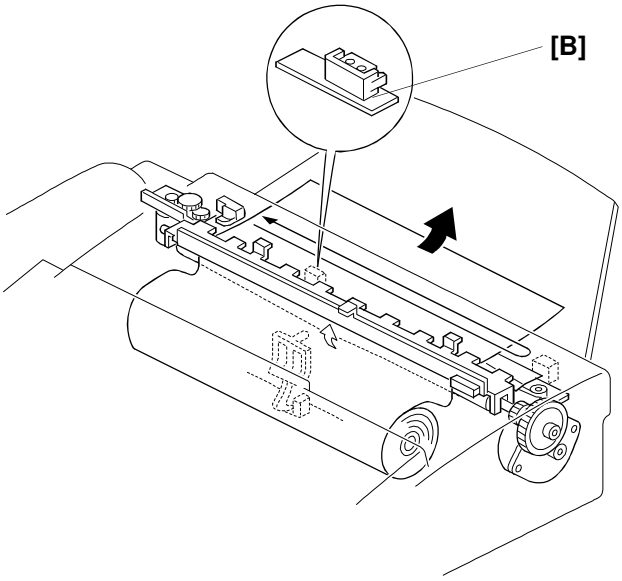
Machines with memory: The received message is stored into the memory (subsutitute reception). After recovering from the error, the message will be printed.

4. Paper Skew and Paper Jam Correction

H068D011.wmf



H068D008.wmf

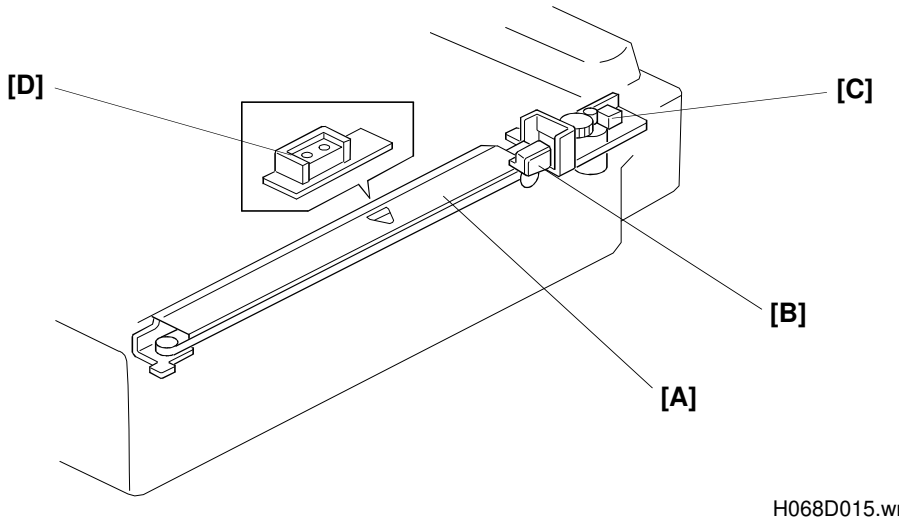


When a roll of the paper is almost used up, the position of the roll in the paper holder becomes unstable. In this case, image skew may occur. In the worst case, paper jams may occur. To prevent such conditions, a paper holder shaft [A] is used to secure the paper.

The printer jam sensor [B] located in the cutter unit detects paper jams. The jam conditions are explained in section 2-2-3.

2.2.2. Cutter

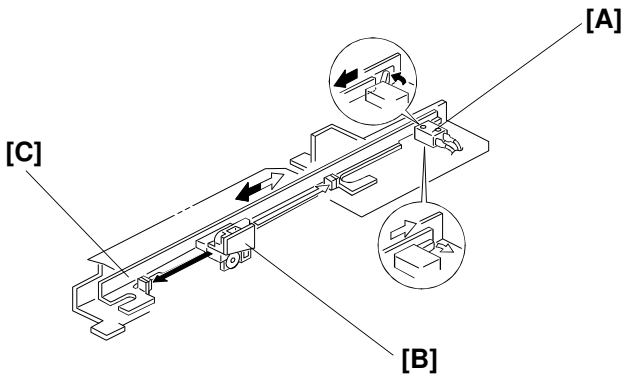
1. Overview



H068D015.wmf

The shuttle cutter consists of a paper guide frame [A], rotary cutter [B], cutter sensor [C], and printer jam sensor [D].

2. Cutter Sensor



H068D014.wmf

In standby mode, the cutter is always at the home position. When the machine has finished printing, the Rx motor stops then the cutter moves across the paper.

The cutter sensor [A] is switched on when the rotary cutter blade [B] is at the home position. When the cutter blade moves to the opposite position to cut the paper, the cutter sensor is turned off. When the cutter blade reaches the far side of the cutter, it moves the bracket [C], which turns on the cutter sensor again. The cpu then reverses the cutter motor to move the cutter back to the home position. After this, the Rx motor feeds out the copy.

2.2.3. Jam Detection

	Condition	Error Code
Cover open Paper end	When the cover open/end sensor detects one of those during printing.	1-17
Non-Feed	When the printer jam sensor does not turn on after the paper has been fed for 20 mm since the rx motor started.	1-20
Paper jam	When the printer jam sensor does not switch off just after printing.	1-21
Cutter jam	When the cutter sensor does not turn off within 1.0 s of the cutter motor starting.	1-23
	Whne the cutter sensor does not turn on within 1.0 s of the rotary cutter returning to home position.	
	The cutter sensor is switched off when the printer cover is closed.	
	The cutter sensor is switched off when the machine is turned on.	1-23
Thermal head short	The cpu checks the thermal head before printing to see if the thermal head has not been shorted. If there is no short, the cpu turns the thermal head on.	2-40

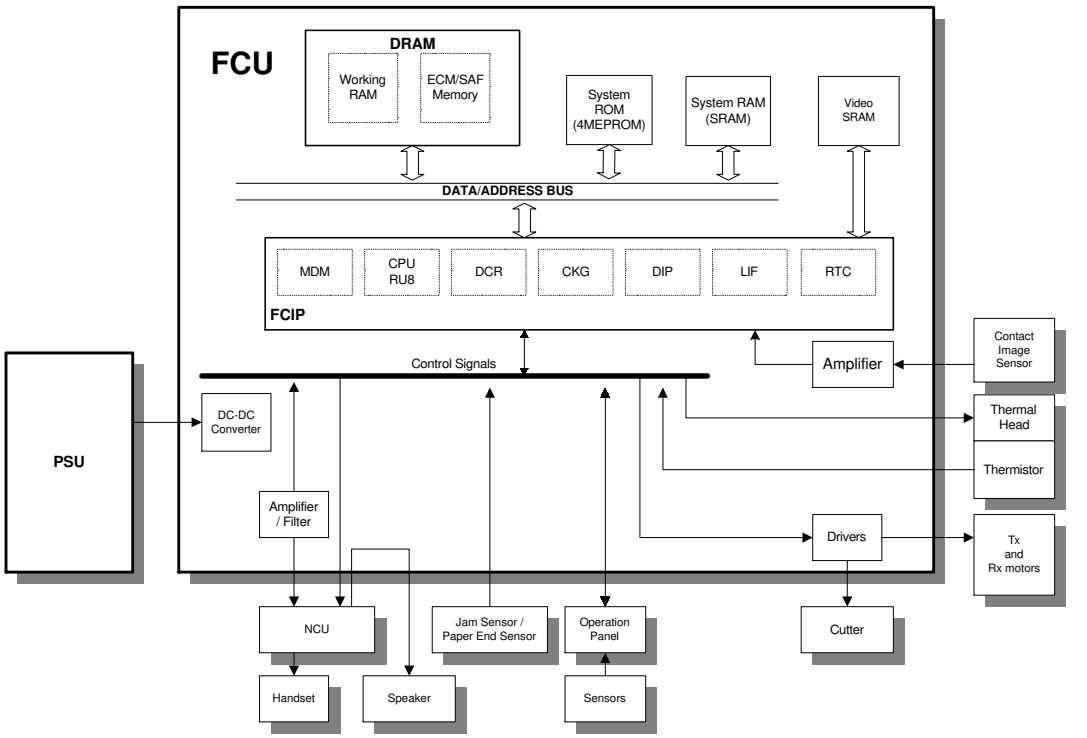
2.2.4. Thermal Head Pulse Width Control

The CPU checks the temperature on the thermal head using the thermistor in the thermal head. Then the CPU decides the pulse width of the print signal to the thermal head.

2.3. PCBs

2.3.1. FCU

1. FCIP (Facsimile Controller and Image Processor)



H068D506.wmf

- CPU
- Modem (V.29, V.27, V.21)
- Data compression and reconstruction (DCR)
- Digital image processor (DIP)
- Laser interface (LIF)
- DMA controller
- Clock generation
- Stepper motor control

2. ROM

- 512 kB (4 Mbit) EP-ROM for system software storage

3. DRAM

- Backed up by the dry cells on the FCU (Only used in the China model)

4. SRAM

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

5. Video SRAM

- 8 kB SRAM for video processing

6. Oscillators

- 29.952 MHz oscillator for system clock generation
- 32.768 MHz oscillator for the real time clock. This is backed up by the lithum battery on the FCU

7. Others

- Stepper motor driver
- Battery back up circuit for back up when the power is turned off
- DC/DC converter which generates +5V
- Cutter motor driver
- Thermal head control
- Telephone answering feature (Only used in the China model)

2.3.2. PSU

- +24Vdc generation
- Overcurrent protection circuit
- Surge protection circuit

2.3.3. NCU

- Surge protection circuit
- DC loop current detection
- Dial pulse creation
- Tone signal detection
- Ringing detection
- Monitor speaker driver

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 CC)	Function 08
Country code (System switch 0F)	Function 01
PABX access code (RAM address; BRO: 8000BB[H] , BR1: 0051BB[H])	Function 06
Machine's serial number	**BRO:**Function 14 **BR1:**Function 13

Items to Program (User Administration Level)	Function No.
Clock	Function 81
Initial programing items (IDs)	Function 61
On/off switches	Function 62
Display/report language	Function 82
PABX access method (User parameter switch 13 - bit 0,1)	Function 63

4. SERVICE TABLES AND PROCEDURES

4.1. SERVICE LEVEL FUNCTIONS

In this section, frequently used keys are referred to with the following symbols.
- Start key
- Stop key
- [Function] - Function key
- [Yes] - Yes key
- [No] - No key
- Up arrow key
- Down arrow key
- Right arrow key
- Left arrow key

4.1.1. Bit Switch Programming (Function 01)

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

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

2. [0] [1] [Yes]

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

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

3. Scroll through the bit switch menu: [*] or [#]
   Example: To see the communication switches : [#] × 3
   Then scroll through the bit switches.
   Increment bit switch:
   Decrement bit switch:
   Example: Display bit switch 3: x 3

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

4. Adjust the bit switch.

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

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

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

4.1.2. System Parameter List (Function 02)

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

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

4.1.3. Error Code Display (Function 03)

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

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

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

4.1.4. Service Monitor Report (Function 04)

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

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

4.1.5. Protocol Dump (Function 05)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 5 Yes

```
                    START
PROTOCOL DUMP
```

3. ⏎

4. Finish: Function

4.1.6. RAM Display/Rewrite (Function 06)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 6 Yes

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

3. 0

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

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

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

5. If you wish to change the data, type in the new data.
   Example: 80, press 8 0
   Note: If you wish to move the cursor, press ▶.

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

6. Either:
   - View more addresses - go to step 4.
   - Finish - Function

Service Tables

4.1.7. RAM Dump (Function 06)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 6 Yes

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

3. 1

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

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

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

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

```
MEMORY DUMP
```

5. Finish: Function

4.1.8. Counter Display/Rewrite (Function 07)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 7 Yes

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

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

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

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

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

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

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

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

4.1.9. NCU Parameters (Function 08)

1. [Function] [6] [1] [9] [9] [5] then immediately [Yes]
2. [0] [8] [Yes]
3. [0]

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

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

4. Scroll through the parameters using [▶] or [◀] . If you want to change a value, enter the new value at the keypad, then press [Yes] .
   Example: Set NCU parameter 04 to 005.
   [▶][▶][▶][▶] [0] [0] [5] [Yes]
5. To finish : [No] [Function].

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

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

4.1.10. Modem Test (Function 08)

1. [Function] [6] [1] [9] [9] [5] then immediately [Yes]
2. [0] [8] [Yes]

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

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

Service Tables

3. [1]

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

4. Scroll through the available tests using [▶] or [◀].

5. [◇]

6. To stop the test: [▽]

7. To finish: [No] [Function]

4.1.11. DTMF Tone Test (Function 08)

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

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

2. [0] [8] [Yes]

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

3. [2]

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

4. Scroll through the available tests using [▶] or [◀].

5. [◇]

6. To stop the test: [▽]

7. To finish: [No] [Function]

4.1.12. Operation Panel Test (Function 09)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 9 Yes

```
0-LED/LCD
```

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

4.1.13. LED Array Test (Function 10)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 0 Yes

```
0-LAMP      1-ADF
2-SHADING
```

3. 0
4. ◇

```
                  START
LAMP          0  0  0
```

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

Service Tables

4.1.14. ADF Test (Function 10)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 0 Yes

```
0-LAMP       1-ADF
2-SHADING
```

3. 1

```
                    START
 ADF
```

4. Place a document in the feeder,
   then press ◇.

5. To stop the test, press ▽

6. Finish: No Function

4.1.15. Shading (Function 10)

Use this to reset the shading level after a RAM clear has been done.

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 0 Yes

```
0-LAMP       1-ADF
2-SHADING
```

3. 2

```
                    START
SET SHADING
```

4. Place a Shading Chart in the feeder,
   then press ◇

```
NOW SETTING SHADING
```

   If test is successful, the display shows "SET SHADING".
   If test is unsuccessful, the display shows "NG".

5. Finish: No Function

NOTE: A Shading Chart is registrered as a service part, P/N H0689300.

4.1.16. Printer Test Patterns (Function 11)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 1 Yes

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

3. 0

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

5. Press a key from 0 to 4.
6. Press ◇ .
   A test pattern is printed.
7. To finish: No Function

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

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 1 Yes

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

3. 1

```
                    START
 MECH
```

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

Service Tables

4.1.18. RAM Tests (Function 12)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 2 Yes

```
0-SRAM      1-SAF
```

3. Either:

   Test the SRAM: Press 0 ◇

   Test the SAF: Press 1 ◇ (Not available for the BR1)

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

4. To finish: No Function.

4.1.19. Service Station Fax Number (Function 13)

This feature is for the BRO only.

All messages in memory will be sent to the service station when bit 0 of system switch 02 is set to 1.

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 3 Yes

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

3. Input the telephone number that will receive the messages from this machine's memory.

   To erase the telephone number: press No

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

4. If the display is correct: Yes Function

4.1.20. Serial Number (Function 13: BR1) (Function 14: BRO)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 4 Yes

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

3. Enter the machine's serial number at the keypad.
   To correct a mistake: No
4. If the display is correct: Yes

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

5. Finish: Function

4.2. BIT SWITCHES

⚠WARNING

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

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

4.2.1. System Switches

System Switch 00

No	FUNCTION	COMMENTS
0 1	RAM Reset **Bit 1** **Bit 0** **Reset Level** 0 0 No reset 0 1 Reset Level 2 1 0 Reset Level 3 1 1 Not used	**Reset Level 3:** Erases all image data files stored in the SAF memory and communciation files (e.g. polling rx file). This setting is recommended for use when it is necessary to clear the SAF. **Reset Level 2:** In addition to those items erased by Reset Level 3, the following items are erased: own telephone number, bit switches, RTI/TTI/CSI, report data, programmed telephone numbers (Quick/Speed/ Groups, service station, etc.), NCU parameters. After erasing, the machine changes these two bits back to 0 automatically. After a RAM reset, do the shading Reset procedure (Service Function 10; see section 4-1-15). **No reset:** Normal operation **Cross reference** **RAM Reset Level 1 (Factory reset):** Change the data in RAM address 800000[H] to FF[H], (BRO) or 005100[H] to FF (BR1), then turn the machine off and on. In addition to those items erased by Reset Level 2, the clock setting is erased.

System Switch 00		
No	**FUNCTION**	**COMMENTS**
2	Technical data printout on TCR (Journal) **0:** Disabled **1:** Enabled	1: The following data are listed on the TCR for each analog G3 communication. e.g. V29 96 01 03 00 02 **First number:** Final modem type used **Second number:** Final modem rate (for example, 96 means 9,600 bps) **Third and fourth numbers:** Line quality data. Either a measure of the error rate or the rx level is printed, depending on the bit 3 setting below. (An M on the report indicates that it is error rate, and an L indicates Rx level.) The left hand figure is the low byte and the right hand figure is the high byte. If it is a measure of the error rate; a larger number means more errors. **Fifth number (rx mode only):** Total number of error lines that occurred during non-ECM reception. **Sixth number (rx mode only):** Total number of burst error lines that occurred during non-ECM reception. The fifth and sixth numbers are fixed at 00 for transmission records and ECM reception records.
3	Line quality data output method **0:** Measure of error rate (during image data transmission only) **1:** Rx level	This bit determines the data type to be printed on the TCR (Journal) when technical data printout is enabled by bit 2 above.
4	Line error marks **0:** Disabled **1:** Enabled	If this bit is 1, a mark will be printed on the left edge of the page at any place where a line error occured in the data. Such errors are caused by a noisy line, for example.
5	Communication parameter display **0:** Disabled **1:** Enabled	This is a fault-finding aid. The LCD shows the key parameters (see the next page). This is normally disabled because it cancels the CSI display for the user. Be sure to reset this bit to 0 after testing.
6	Protocol dump list output after each communication **0:** Off **1:** On	This is only used for communication troubleshooting. It shows the content of the transmitted facsimile protocol signals. Always reset this bit to 0 after finishing testing.
7	Not used	Do not change the settings.

Communication Parameters

Mode	DCS: ITU-T standard NSS: Non-standard G3
Modem rate	96: 9600 bps 72: 7200 bps 48: 4800 bps 24: 2400 bps
Communication mode	ECM: With ECM SSC: Using SSC EFC: Using EFC NML: With no ECM, SSC, or EFC
Compression mode	MMR: MMR compression MR: MR compression MH: MH compression
Resolution	SSF: Fine, transmitted at 8 x 15.4 dots per mm DTL: Detail, transmitted at 8 x 7.7 dots per mm STD: Standard, transmitted at 8 x 3.85 dots per mm
I/O rate	0M: 0 ms/line 10M: 10 ms/line 2/M: 2.5 ms/line 20M: 20 ms/line 5M: 5 ms/line 40M: 40 ms/line
Width and reduction	=A4: A4 (8.3"), no reduction

System Switch 01		
No	**FUNCTION**	**COMMENTS**
0-7	Not used	Do not change the settings.

System Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Memory file transfer **(BRO only)** **0:** Disabled **1:** Enabled	**1:** All messages in the memory (including substitute rx messages) are sent to the fax number which is programmed as the service station. Always reset this bit to zero after transfer. **Cross reference** Service station number programming: Function 13 (**BR1:** Do not change the setting.)
1	Programmed data transfer (Back-to-back) **0:** Disabled **1:** Enabled	First, connect two machines of the same type back to back. Then set this switch to 1 on the transmitting machine. Then press Start on both machines. The data is transferred. Set this bit to 0 again after finishing.
2	Not used	Do not change the setting.
3	Memory file printout **(BRO only)** **0:** Disabled **1:** Enabled	**1:** All SAF files, including substitute messages, can be printed using Function 51. Always reset this bit after printing the messages. (**BR1:** Do not change the setting.)
4	Not used	Do not change the settings.
5	Not used	Do not change the settings.
6 **7**	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

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

Service Tables

System Switch 04		
No	**FUNCTION**	**COMMENTS**
0-2	Not used	Do not change the settings.
3	Dedicated transmission parameter programming **0:** Disabled **1:** Enabled	This bit must be set to 1 before changing any dedicated transmission parameters.
4-5	Not used	Do not change the settings.
6	CSI programming level **0:** User level **1:** Service level	**1:** The CSI can only be programmed using a service function.
7	Telephone line type programming mode **0:** User level **1:** Service level	**1:** Telephone line type selection can only be programmed using a service function.

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

System Switch 06		
No	**FUNCTION**	**COMMENTS**
0	Use of the Stop key during memory transmission **(BRO only)** **0:** Disabled **1:** Enabled	**1:** Memory transmissions can be stopped by pressing the Stop key. However, users might accidentally cancel another person's memory transmission in progress. (**BR1:** Do not change the setting.)
1-7	Not used	Do not change the settings.

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

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the settings.
1	Inclusion of communications on the TCR when no image data was exchanged. **0:** Disabled **1:** Enabled	0: Communications which reached phase C (message tx/rx) of the T.30 protocol are listed on the TCR (Journal). **1:** Communications which reached phase A (call setup) of T.30 protocol are listed on the TCR (Journal). This will include telephone calls.
2	Automatic error report printout **0:** Disabled **1:** Enabled	**0:** Error reports will not be printed. **1:** Error reports will be printed automatically after failed communications.
3	Printing of the error code on the error report **0:** No **1:** Yes	**1:** Error codes are printed on the error reports.
4	Not used	Do not change the settings.
5	Power failure report **(BRO only)** **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last. (**BR1:** Do not change the settings.)
6	Not used	Do not change the settings.
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 to 3	Not used	Do not change the settings.
4	Dialing on the ten-key pad when the handset is off-hook **0:** Disabled **1:** Enabled	**1:** The user can dial on the machine's ten-key pad when the handset is off-hook.
5	On hook dial **0:** Disabled **1:** Enabled	**0:** On hook dial is disabled.
6	Not used	Do not change the settings.
7		

System Switch 0B		
No	**FUNCTION**	**COMMENTS**
0 **1**	Automatic reset timer **Bit 1 Bit 0 Timer setting** 0 0 1 minute 0 1 3 minutes 1 0 5 minutes 1 1 No limit	**(1, 1):** Automatic reset is disabled. **(Other):** The machine returns to the standby mode when the timer expires after the last operation.
2-3	Not used	Do not change the settings.
4 to 7	Not used	Do not change the settings.

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

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

System Switch 0F

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

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

System Switch 11

No	FUNCTION	COMMENTS
0	TTI printing position **0:** On the image **1:** Outside the image area	**0:** The TTI is superimposed on the machine. **1:** The TTI is printed outside the image area.
1 to 7	Not used	Do not change the settings.

System Switch 12

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

System Switch 13-1F - Not used (do not change the settings)

4.2.2. Scanner Switches

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the settings.
1	Not used	Do not change the settings.
2 **3**	Maximum transmittable document length **Bit 3 2 Setting** 0 0 600 mm 0 1 1200 mm 1 0 14 m 1 1 Not used	If the user wants to send very long documents such as well logs, select 14 m or a higher setting.
4	Not used	Do not change the settings.
5 to 7	Not used	Do not change the settings.

Scanner Switch 01 - Not used (do not change the 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**
0-7	Not used	Do not change the settings

Scanner Switch 04		
No	**FUNCTION**	**COMMENTS**
0-7	Not used	Do not change the settings

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 - 07[H]

Scanner Switch 06 - 0F - Not used (do not change the settings)

4.2.3. Printer Switches

Printer Switch 00 - Not used (do not change the settings)
Printer Switch 01 - Not used (do not change the settings)
Printer Switch 02 - Not used (do not change the settings)
Printer Switch 03 - Not used (do not change the settings)
Printer Switch 04 - Not used (do not change the settings)
Printer Switch 05 - Not used (do not change the settings)
Printer Switch 06 - Not used (do not change the settings)
Printer Switch 07 - Not used (do not change the settings)
Printer Switch 08 - Not used (do not change the settings)
Printer Switch 09 - Not used (do not change the settings)
Printer Switch 0A - Not used (do not change the settings)
Printer Switch 0B - Not used (do not change the settings)
Printer Switch 0C - Not used (do not change the settings)
Printer Switch 0D - Not used (do not change the settings)
Printer Switch 0E - Not used (do not change the settings)
Printer Switch 0F - Not used (do not change the settings)

4.2.4. Communication Switches

Communication Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Compression modes available in receive mode **Bit 1 0 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.
2 **3**	Compression modes available in transmit mode **Bit 3 2 Modes** 0 0 MH only 0 1 MH/MR 1 0 MH/MR/MMR 1 1 Not used	These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol. **Cross reference** EFC compression during transmission: Communication Switch 01, bit 1.
4 to 6	Not used	Do not change the settings.
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	Not used	Do not change the setting.
1	EFC during transmission **0:** Off **1:** On	If this bit is 0, EFC is switched off during transmission.
2 **3**	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will not transmit if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work for manual dialing. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will not transmit if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead.
4	Operator call if no response is received in reply to NSF/DIS **0:** Disabled **1:** Enabled	Set this bit to 1 if the user expects to receive phone calls at the same number which the machine is connected to.
5	Not used	Do not change the setting.
6 **7**	Maximum printable page length available **Bit 7 Bit 6 Setting** 0 0 No limit 0 1 B4 and A4 1 0 A4 1 1 Not used	The setting determined by these bits is informed to the transmitting terminal in the pre-message protocol exchange (in the DIS/NSF frames).

Communication Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Burst error threshold **0:** Low **1:** High	If there are more consecutive error lines in the received page than the threshold, the machine will send a negative response. The Low and High threshold values depend on the sub-scan resolution, and are as follows. **Resolution** **Standard** **Detail** Low settings 3 6 High settings 6 12
1	Acceptable total error line ratio **0:** 5% **1:** 10%	If the error line ratio of a page exceeds the acceptable ratio, RTN will be sent to the other end.
2	Treatment of pages received with errors during G3 reception **(BRO only)** **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed. (**BR1:** Do not change the setting.)
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4 to 7	Not used	Do not change the settings.

Communication Switch 03		
No	**FUNCTION**	**COMMENTS**
0 to 7	Maximum number of page retransmissions (BRO only)	00 - FF (Hex) times. This setting is not used if ECM is switched on. Default setting - 03[H] (**BR1:** Do not change the setting.)

Communication Switch 04		
No	**FUNCTION**	**COMMENTS**
0	Reception mode switchover from TEL mode to FAX mode **0:** Disabled **1:** Enabled	These settings are available when bit 5 of user parameter switch 7 is set to 1. **1:** After picking up the handset, press the switchover digit twice on the external handset's keypad. Then the machine automatically changes the reception mode. For example, if bit 0 is at 1, the machinw will change to FAX mode if it is in TEL mode. **NOTE:** The switchover digit is programmed using bits 0 to 3 of Communication Switch 05. The default setting is "2".
1	Reception mode switchover from FAX mode to TEL mode **0:** Disabled **1:** Enabled	
2	Reception mode switchover from AUTO mode to FAX mode **0:** Disabled **1:** Enabled	
3 to 7	Not used	Do not change the settings.

Communication Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 3	Digit for reception mode switchover	00 - 09 (Hex)
4 to 7	Not used	Do not change the settings.

Communication Switch 06 - Not used (do not change the settings)
Communication Switch 07 - Not used (do not change the settings)
Communication Switch 08 - Not used (do not change the settings)
Communication Switch 09 - Not used (do not change the settings)

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **(BRO only)** **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. (**BR1:** Do not change the settings.)
1 to 6	Not used	Do not change the settings.
7	Emergency calls using 999 **0:** Enabled **1:** Disabled	If this bit is at 1, the machine will not allow you to dial 999 at the auto-dialer. This is a PTT requirement in the UK and some other countries.

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

Communication Switch 0D		
No	**FUNCTION**	**COMMENTS**
0 to 7	The amount of remaining memory below which ringing detection (and therefore reception into memory) is disabled **(BRO only)**	00 to FF (Hex), unit = 2 kbytes (e.g., 0C[H] = 24 kbytes) One page is about 24 kbytes. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory space left. This will result in communication failure. (**BR1:** Do not change the setting.)

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

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

Communication Switch 10		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Maximum number of dialing attempts to the same destination **(BRO only)**	01 - FF (Hex) times (**BR1:** Do not change the settings.)

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

Communication Switch 12		
No	**FUNCTION**	**COMMENTS**
0 to 7	Memory transmission: Interval between dialing attempts to the same destination **(BRO only)**	00 - FF (Hex) minutes (**BR1:** Do not change the settings)

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 - **1F:** Not used (do not change the settings)

4.2.5. G3 Switches

G3 Switch 00		
No	**FUNCTION**	**COMMENTS**
0 **1**	Monitor speaker during communication (tx and rx) **Bit 1 Bit 0 Setting** 0 0 Disabled 0 1 Up to Phase B 1 0 All the time 1 1 Not used	(0, 0): The monitor speaker is disabled all through the communication. **(0, 1):** The monitor speaker is on up to phase B in the T.30 protocol. **(1, 0):** Used for testing. The monitor speaker is on all through the communication. Make sure that you reset these bits after testing.
2	Monitor speaker during memory transmission **(BRO only)** **0:** Disabled **1:** Enabled	**1:** The monitor speaker is enabled during memory transmission. (**BR1:** Do not change the settings.)
3 to 6	Not used	Do not change the settings.
7	Back to back test **0:** Disabled **1:** Enabled	Set this bit to 1 when you wish to do a back to back test. **115 V model:** Be sure to connect jumpers JP2 and JP3 on the NCU before doing the test. **220 V model:** Be sure to apply dc voltage between wires L1 and L2 on the NCU.

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

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	**1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1 to 4	Not used	Do not change the settings.
5	Use of modem rate history during AI short protocol **(BRO only)** **0:** Disabled **1:** Enabled	**0:** Communications using AI short protocol 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. (**BR1:** Do not change the settings.)
6	AI short protocol (transmission and reception) **(BRO only)** **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol. (**BR1:** Do not change the settings.)
7	Not used	Do not change the setting.

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

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

G3 Switch 05		
	FUNCTION	**COMMENTS**
0 to 3	Initial Tx modem rate **Bit 3 2 1 0 Setting (bps)** 0 0 0 1 2.4k 0 0 1 0 4.8k 0 0 1 1 7.2k 0 1 0 0 9.6k Other settings - Not used	These bits set the initial starting modem rate for transmission.
4 to 7	Not used	Do not change the settings.

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

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

G3 Switch 08		
	FUNCTION	**COMMENTS**
0 **1**	PABX cable equalizer (tx mode) **Bit 1 Bit 0 Setting** 0 0 None 0 1 Low 1 0 Medium 1 1 High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error • Modem rate fallback occurs frequently.
2 **3**	PABX 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 to 7	Not used	Do not change the settings.

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

G3 Switch 0A

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

G3 Switch 0B - Not used (do not change the settings)

G3 Switch 0C

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

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

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

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

4.3. NCU PARAMETERS

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

The addresses in brackets are used for BR1.

Address	Function	Unit	Remarks
807F00 (006700)	Country code for NCU parameters	Use the Hex value to program the country code directly into this address, or use the decimal value to program it using Function 08 (parameter CC).	

Country	Decimal	Hex
France	00	00
Germany	01	01
UK	02	02
Italy	03	03
Austria	04	04
Belgium	05	05
Denmark	06	06
Finland	07	07
Ireland	08	08
Norway	09	09
Sweden	10	0A
Switzerland	11	0B
Portugal	12	0C
Holland	13	0D
Spain	14	0E
Israel	15	0F
USA	17	11
Asia	18	12
Hong Kong	20	14
South Africa	21	15
Australia	22	16
New Zealand	23	17
Singapore	24	18
Malaysia	25	19
China	26	1A

Address	Function	Unit	Remarks
807F01 (006701)	Line current detection time	20 ms	Line current is not detected if 807F01 contains FF.
807F02 (006702)	Line current wait time		
807F03 (006703)	Line current drop detect time		
807F04 (006704)	PSTN dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F05 (006705)	PSTN dial tone frequency range (low byte)		
807F06 (006706)	Not used		Do not change the factory setting.
807F07 (006707)			
807F08 (006708)	PSTN dial tone detection time	20 ms	If 807F08 contains FF, the machine pauses for the pause time (address 807F0D / 807F0E).
807F09 (006709)	PSTN dial tone reset time (LOW)		
807F0A (00670A)	PSTN dial tone reset time (HIGH)		
807F0B (00670B)	PSTN dial tone continuous tone time		
807F0C (00670C)	PSTN dial tone permissible drop time		
807F0D (00670D)	PSTN wait interval (LOW)		
807F0E (00670E)	PSTN wait interval (HIGH)		
807F0F (00670F)	PSTN ringback tone detection time	20 ms	Detection is disabled if this contains FF.
807F10 (006710)	PSTN ringback tone off detection time	20 ms	
807F11 (006711)	PSTN detection time for silent period after ringback tone detected (LOW)	20 ms	
807F12 (006712)	PSTN detection time for silent period after ringback tone detected (HIGH)	20 ms	
807F13 (006713)	PSTN busy tone frequency range (high byte)	Hz (BCD)	If 807F13 is FF, detection is disabled. See Note 2.
807F14 (006714)	PSTN busy tone frequency range (low byte)		
807F15 (006715)	Not used		Do not change the factory settings.
807F16 (006716)			

Address	Function	Unit	Remarks
807F17 (006717)	PABX dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F18 (006718)	PABX dial tone frequency range (low byte)		
807F19 (006719)	Not used		Do not change the factory settings.
807F1A (00671A)			
807F1B (00671B)	PABX dial tone detection time	20 ms	If 807F1B contains FF, the machine pauses for the pause time (807F20 / 807F21).
807F1C (00671C)	PABX dial tone reset time (LOW)		
807F1D (00671D)	PABX dial tone reset time (HIGH)		
807F1E (00671E)	PABX dial tone continuous tone time		
807F1F (00671F)	PABX dial tone permissible drop time		
807F20 (006720)	PABX wait interval (HIGH)		
807F21 (006721)	PABX wait interval (LOW)		
807F22 (006722)	PABX ringback tone detection time	20 ms	Detection is disabled if this contains FF.
807F23 (006723)	PABX ringback tone off detection time	20 ms	
807F24 (006724)	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	
807F25 (006725)	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	
807F26 (006726)	PABX busy tone frequency range (high byte)	Hz (BCD)	If this is FF, detection is disabled. See Note 2.
807F27 (006727)	PABX busy tone frequency range (low byte)		See Note 2.
807F28 (006728)	Not used		Do not change the factory settings.
807F29 (006729)			

Address	Function	Unit	Remarks
807F2A (00672A)	Busy tone ON time: range 1	20 ms	
807F2B (00672B)	Busy tone OFF time: range 1		
807F2C (00672C)	Busy tone ON time: range 2		
807F2D (00672D)	Busy tone OFF time: range 2		
807F2E (00672E)	Busy tone ON time: range 3		
807F2F (00672F)	Busy tone OFF time: range 3		
807F30 (006730)	Busy tone ON time: range 4		
807F31 (006731)	Busy tone OFF time: range 4		
807F32 (006732)	Busy tone continuous tone detection time		
807F33 (006733)	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance (±) Bit 1 0 0 0 75% 0 1 50% 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		Bits 2 and 3 must always be kept at 0.
807F34 (006734)	International dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F35 (006735)	International dial tone frequency range (low byte)		
807F36 (006736)	Not used		Do not change the factory settings
807F37 (006737)			

Address	Function	Unit	Remarks
807F38 (006738)	International dial tone detection time	20 ms	If 807F38 contains FF, the machine pauses for the pause time (807F3D / 807F3E).
807F39 (006739)	International dial tone reset time (LOW)		
807F3A (00673A)	International dial tone reset time (HIGH)		
807F3B (00673B)	International dial tone continuous tone time		
807F3C (00673C)	International dial tone permissible drop time		
807F3D (00673D)	International dial wait interval (HIGH)		
807F3E (00673E)	International dial wait interval (LOW)		
807F3F (00673F)	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	See Note 2.
807F40 (006740)	Country dial tone upper frequency limit (LOW)		
807F41 (006741)	Country dial tone lower frequency limit (HIGH)		
807F42 (006742)	Country dial tone lower frequency limit (LOW)		
807F43 (006743)	Country dial tone detection time	20 ms	If 807F43 contains FF, the machine pauses for the pause time (807F48 / 807F49).
807F44 (006744)	Country dial tone reset time (LOW)		
807F45 (006745)	Country dial tone reset time (HIGH)		
807F46 (006746)	Country dial tone continuous tone time		
807F47 (006747)	Country dial tone permissible drop time		
807F48 (006748)	Country dial wait interval (LOW)		
807F49 (006749)	Country dial wait interval (HIGH)		
807F4A (00674A)	Time between opening or closing the Ds relay and opening the Di relay	1 ms	See Notes 4 Function 08 (parameter 11).
807F4B (00674B)	Break time for pulse dialling	1 ms	See Note 4 Function 08 (parameter 12).
807F4C (00674C)	Make time for pulse dialling	1 ms	See Note 4 Function 08 (parameter 13).
807F4D (00674D)	Time between final Di relay closure and Ds relay opening or closing	1 ms	See Notes 4 Function 08 (parameter 14).

Address	Function	Unit	Remarks
807F4E (00674E)	Minimum pause between dialled digits (pulse dial mode)	20 ms	See Note 3. Function 08 (parameter 15).
807F4F (00674F)	Time waited when a pause is entered at the operation panel		Function 08 (parameter 16). See Note 3.
807F50 (006750)	DTMF tone on time	1 ms	Function 08 (parameter 17).
807F51 (006751)	DTMF tone off time		Function 08 (parameter 18).
807F52 (006752)	Tone attenuation value in DTMF signals	-dBm x 0.5	Function 08 (parameter 19). See Note 5.
807F53 (006753)	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-Nx0.5 (dB)	Function 08 (parameter 20). See Note 5.
807F54 (006754)	PSTN: DTMF tone attenuation level after dialling	-dBm x 0.5	Function 08 (parameter 21). See Note 5.
807F55 (006755) to 807F58 (006758)	Not used		Do not change the settings.
807F59 (006759)	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
807F5A (00675A)	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
807F5B (00675B)	International dial access code	BCD	For a code of 100: 807F5B - F1 807F5C - 00
807F5C (00675C)			
807F5D (00675D)	PSTN access pause time	20 ms	This time is waited for each pause input after the PSTN access code. Up to 7 of these can be input. If this address contains FF[H], the pause time stored in address 807F4F is used.
807F5E (00675E)	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	
807F5F (00675F)	Polarity detection	Bit 4 1: Enable: Tx Polarity detection Bit 5 1: Enable: Rx Polarity detection	

Address	Function	Unit	Remarks
807F60 (006760) to 807F64 (006764)	Not used		Do not change the settings.
807F65 (006765)	Intercity dial prefix (HIGH)	BCD	For a code of 0: 807F65 - FF 807F66 - F0
807F66 (006766)	Intercity dial prefix (LOW)	BCD	
807F67 (006767) to 807F71 (006771)	Not used		Do not change the settings.
807F72 (006772)	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 08 (parameter 02).
807F73 (006773)	Acceptable ringing signal frequency: range 1, lower limit		Function 08 (parameter 03).
807F74 (006774)	Acceptable ringing signal frequency: range 2, upper limit		Function 08 (parameter 04).
807F75 (006775)	Acceptable ringing signal frequency: range 2, lower limit		Function 08 (parameter 05).
807F76 (006776)	Number or rings until a call is detected	1	Function 08 (parameter 06).
807F77 (006777)	Minimum required length of the first ring	20 ms	See Note 4. Function 09 (parameter 07).
807F78 (006778)	Minimum required length of the second and subsequent rings	20 ms	Function 08 (parameter 08).
807F79 (006779)	Ringing signal detection reset time (LOW)	20 ms	Function 08 (parameter 09).
807F7A (00677A)	Ringing signal detection reset time (HIGH)		Function 08 (parameter 10).
807F7B (00677B) to 807F80 (006780)	Not used		Do not change the settings.
807F81 (006781)	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

Address	Function	Unit	Remarks
807F82 (006782)	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
807FA1 (0067A1)	Acceptable CED detection range (high byte)	BCD (Hz)	See Note 2.
807FA2 (0067A2)	Acceptable CED detection range (low byte)		
807FA3 (0067A3)	Not used		Do not change the factory setting.
807FA4 (0067A4)			
807FA5 (0067A5)	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms
807FA6 (0067A6)	Not used		Do not change the factory setting.
807FA7 (0067A7)			
807FA8 (0067A8)			
807FA9 (0067A9)			
807FAA (0067AA)	CNG detection time	20 ms ± 20 ms	Factory setting: 200 ms
807FAB (0067AB)	CNG on time	20 ms	Factory setting: 500 ms
807FAC (0067AC)	CNG off time	20 ms	Factory setting: 200 ms
807FAD (0067AD)	Number of CNG cycles required for detection		The data is coded in the same way as address 807F33 (BRO:006733). Factory setting: 23[H]

Address	Function	Unit	Remarks
807FAE (0067AE)	Not used		Do not change the settings.
807FAF (0067AF)			
807FB0 (0067B0)			
807FB1 (0067B1)			
807FB2 (0067B2)			
807FB3 (0067B3)	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
807FB4 (0067B4)	PSTN: Tx level from the modem	- dBm	Function 08 (parameter 01).
807FB5 (0067B5)	PSTN: 1100 Hz tone transmission level	- N $_{807FB4}$ - 0.5N $_{807FB5}$ (dB)	
807FB6 (0067B6)	PSTN: 2100 Hz tone transmission level	- N $_{807FB4}$ - 0.5N $_{807FB6}$ (dB)	
807FB7 (0067B7)	PABX: Tx level from the modem	- dBm	
807FB8 (0067B8)	PABX: 1100 Hz tone transmission level	- N $_{807FB7}$ - 0.5N $_{807FB8}$ (dB)	
807FB9 (0067B9)	PABX: 2100 Hz tone transmission level	- N $_{807FB7}$ - 0.5N $_{807FB9}$ (dB)	
807FBA (0067BA) to 807FBC (0067BC)	Not used		Do not change the settings.
807FBD (0067BD)	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	
807FDA (0067DA)	T.30 T1 timer	1 s	

Notes

1. If a setting is not required, store FF in the address.
2. Tone frequencies are stored as look-up tables in hex code. For each parameter, there is a look-up table for each country that uses it. The tables are given following this page. For each parameter, do not input a RAM value that is not included in the table. FF[H] = disabled.
3. Pulse dial parameters (addresses BRO: 807F4A to 807F4F, BR1: 00674A to 00674F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.
4. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.
5. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: - 0.5 x $N_{807F52/807F54}$ dBm;BRO
   - 0.5 x $N_{006752/006754}$ dBm;BR1
   Low frequency tone: - 0.5 x ($N_{807F52/807F54}$ + N_{807F53}) dBm ; BRO
   - 0.5 x ($N_{006752/006754}$ + N_{006753}) dBm ; BR1
   Note: N_{807F52}, for example, means the value stored in address 807F52[H]

Tone Detection Frequency Ranges

- PSTN Dial Tone (BRO: 807F04 - 807F05, BR1: 006704 - 006705) -

France		Germany		Italy	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
040	415 - 465	060	400 - 480	030 (Default)	410 - 440
050	410 - 470	070	390 - 485	040	400 - 450
060 (Default)	400 - 475	080	385 - 490	050	395 - 455
070	395 - 480	090 (Default)	380 - 495	060	385 - 460
080	390 - 485	0A0	370 - 500	070	380 - 465
090	380 - 490	0B0	365 - 505	080	375 - 470
0A0	375 - 495	0C0	360 - 510	090	365 - 475
0B0	465 - 500	0D0	350 - 515		
		0E0	345 - 520		

Austria, Belgium		Denmark		Finland	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
0A8	380 - 505	0B0	360 - 505	0C8	340 - 520
0B8	370 - 515	0C0	350 - 515	0D8	330 - 525
0C8 (Default)	365 - 520	0D0 (Default)	340 - 520	0E8	325 - 535
0D8	355 - 530	0E0	335 - 525	0F8 (Default)	315 - 540
0E8	345 - 535	0F0	325 - 530	108	310 - 545
0F8	340 - 540	100	320 - 540	118	300 - 550
108	335 - 545	110	310 - 545	128	295 - 555
118	320 - 550	120	305 - 550	138	285 - 560
				148	275 - 565

Ireland		Norway		Sweden	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
098	255 - 425	0A0	355 - 475	070	380 - 465
0A8	245 - 430	0B0	345 - 490	080	375 - 470
0B8	235 - 440	0C0	335 - 500	090	365 - 475
0C8	225 - 445	0D0	325 - 505	0A0 (Default)	360 - 480
0D8	210 - 450	0E0 (Default)	320 - 510	0B0	355 - 485
0E8 (Default)	200 - 455	0F0	310 - 515	0C0	345 - 490
		100	305 - 520	0D0	335 - 500
		110	290 - 525	0E0	330 - 505
				0F0	320 - 510

Switzerland		Portugal		Holland	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
0F0	385 - 560	090	315 - 440	120	290 - 580
100	380 - 565	0A0	305 - 450	130	280 - 585
110	370 - 570	0B0 (Default)	295 - 455	140 (Default)	270 - 590
120 (Default)	365 - 575	0C0	285 - 465	150	265 - 595
130	355 - 580	0D0	275 - 470	160	255 - 600
140	350 - 585	0E0	270 - 475		
150	340 - 590	0F0	260 - 480		
160	330 - 595	100	250 - 490		
170	325 - 600				

Spain		Israel		Australia	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
0B0	320 - 480	0AA	350 - 490	FFFF (Default)	Tone not detected
0C0	310 - 490	0BA (Default)	340 - 500	0C0	190 - 425
0D0	305 - 495	0CA	335 - 510	0D0	170 - 435
0E0 (Default)	295 - 500	0DA	325 - 515	0E0	160 - 440
0F0	285 - 510	0EA	320 - 520	0F0	135 - 435
100	275 - 515	0FA	310 - 525	100	130 - 430
110	265 - 520	10A	300 - 530		
120	255 - 525				
130	245 - 530				

- PABX Dial Tone (BRO: 807F17 - 807F18, BR1: 006717 - 006718) -

Italy		Belgium		Denmark	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
098	405 - 495	0A8	370 - 505	0B0	360 - 505
0A8	395 - 505	0B8	380 - 515	0C0	350 - 515
0B8 (Default)	375 - 515	0C8 (Default)	365 - 520	0D0 (Default)	340 - 520
0C8	370 - 520	0D8	355 - 530	0E0	335 - 525
0D8	360 - 525	0E8	345 - 535	0F0	325 - 530
0E8	355 - 530	0F8	340 - 540	100	320 - 540
0F8	345 - 540	108	335 - 545	110	310 - 545
108	340 - 545	118	320 - 550	120	305 - 550

Sweden		Switzerland		Australia	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
070	380 - 465	0F0	385 - 560	FFFF (Default)	Tone not detected
080	375 - 470	100	380 - 565	030	405 - 445
090	365 - 475	110	370 - 570	040	415 - 455
0A0 (Default)	360 - 480	120 (Default)	365 - 575	050	400 - 460
0B0	355 - 485	130	355 - 580	060	390 - 465
0C0	345 - 490	140	350 - 585	070	385 - 470
0D0	335 - 500	150	340 - 590	080	380 - 475
0E0	330 - 505	160	330 - 595	090	370 - 480
0F0	320 - 510	170	325 - 600	0A0	365 - 485

Holland		Israel			
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
120	290 - 580	040	380 - 430		
130	280 - 585	050 (Default)	365 - 435		
140 (Default)	270 - 590	060	355 - 440		
150	265 - 595	070	350 - 445		
160	255 - 600	080	340 - 550		
		090	335 - 555		
		0A0	325 - 565		

- International Dial Tone (BRO: 807F34 - 807F35, BR1: 006734 - 006735) -

Belgium		Holland		Spain	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
08A	1110 - 1160	FFFF (Default)	Tone not detected	0C0	550 - 645
0AA (Default)	1105 - 1165	112	305 - 590	0D0	545 - 650
0CA	1100 - 1170	122	315 - 595	0E0	540 - 655
0EA	1095 - 1175	132	320 - 600	0F0	535 - 660
10A	1090 - 1180	142	300 - 605	100	525 - 665
12A	1085 - 1185	152	290 - 610	110	520 - 670
14A	1080 - 1190	162	285 - 615	120	515 - 675
		188	270 - 620	130	510 - 680
		198	260 - 625	140	505 - 685
		1A8	250 - 630		

- PSTN Busy Tone (BRO: 807F13 - 807F14, BR1: 006713 - 006714) -

France		Germany		U. K.	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
042	415 - 465	058	400 - 480	0A0	330 - 470
052	410 - 470	068	390 - 485	0B0	320 - 460
062	400 - 475	078	385 - 490	0C0 (Default)	300 - 480
072 (Default)	395 - 480	088 (Default)	380 - 495	0D0	290 - 485
082	390 - 485	098	370 - 500	0E0	285 - 490
092	380 - 490	0A8	365 - 505	0F0	275 - 495
0A2	375 - 495	0B8	360 - 510	100	265 - 500
0B2	365 - 500	0C8	350 - 515	110	255 - 505
		0D8	345 - 520		

Italy		Austria		Belgium	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
030	410 - 440	0E0	370 - 555	042	405 - 460
040 (Default)	400 - 450	0F0	360 - 560	052 (Default)	400 - 465
050	395 - 455	100	355 - 565	062	395 - 475
060	385 - 460	110	345 - 570	072	390 - 480
070	380 - 465	120	340 - 575	082	380 - 485
080	375 - 470	130 (Default)	330 - 580	092	375 - 490
090	365 - 475	140	325 - 585	0A2	365 - 495
		150	315 - 590		
		160	310 - 595		

Denmark		Ireland		Norway	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
040	395 - 450	02E	395 - 425	0A4	355 - 475
050	390 - 460	03E (Default)	385 - 435	0B4	345 - 490
060	385 - 465	04E	380 - 440	0C4	335 - 500
070 (Default)	375 - 470	05E	370 - 445	0D4	325 - 505
080	370 - 475	06E	365 - 450	0E4	320 - 510
090	365 - 480	07E	355 - 455	0F4 (Default)	310 - 515
		08E	350 - 465	104	305 - 520
				114	290 - 525

Sweden		Switzerland		Holland	
RAM Value [H]	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**
030 (Default)	410 - 440	0F0	385 - 560	0F0	335 - 540
040	400 - 450	100	380 - 565	100	325 - 545
050	395 - 455	110	370 - 570	110	320 - 555
060	385 - 460	120 (Default)	365 - 575	120	310 - 560
070	380 - 465	130	355 - 580	130	300 - 565
080	375 - 470	140	350 - 585	140 (Default)	295 - 570
090	365 - 475	150	340 - 590	150	285 - 575
		160	330 - 595		
		170	325 - 600		

Spain		Israel		Australia	
RAM Value [H]	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**
0A8	330 - 470	040	380 - 430	028	405 - 445
0B8	320 - 460	050 (Default)	365 - 435	038	415 - 455
0C8	300 - 480	060	355 - 440	048 (Default)	400 - 460
0D8 (Default)	290 - 485	070	350 - 445	058	390 - 465
0E8	285 - 490	080	340 - 450	068	385 - 470
0F8	275 - 495	090	335 - 455	078	380 - 475
108	265 - 500	0A0	325 - 465	088	370 - 480
118	255 - 505			098	365 - 485

Portugal					
RAM Value [H]	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**	**RAM Value [H]**	**Range (Hz)**
FFFF (Default)	Tone not detected				
070	415 - 515				
080	410 - 520				
090	405 - 525				
0A0	395 - 530				
0B0	390 - 535				
0C0	385 - 540				
0D0	380 - 545				

- PABX Busy Tone (BRO: 807F26 - 807F27, BR1: 006726 - 006727) -

Italy		Denmark		Switzerland, Israel	
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
030 (Default)	410 - 440	030	405 - 445	0F0	385 - 560
040	400 - 450	040	415 - 455	100	380 - 565
050	395 - 455	050 (Default)	400 - 460	110	370 - 570
060	385 - 460	060	390 - 465	120 (Default)	365 - 575
070	380 - 465	070	385 - 470	130	355 - 580
080	375 - 470	080	380 - 475	140	350 - 585
090	365 - 475	090	370 - 480	150	340 - 590
		0A0	365 - 485	160	330 - 595

Australia					
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
038 (Default)	395 - 450				
048	390 - 460				
058	385 - 465				
068	375 - 470				
078	370 - 475				
088	365 - 480				

- CED [2100 Hz] (BRO: 807FA1 - 807FA2, BR1: 0067A1 - 0067A2) -

All Areas					
RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)	RAM Value [H]	Range (Hz)
1F0	2100 ± 45				
200 (Default)	2100 ± 50				
230	2100 ± 60				
270	2100 ± 70				
2E0	2100 ± 80				
320	2100 ± 90				
380	2100 ± 100				

Default Settings

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

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

(The RAM address for BR1 is in "( )", exsample for (0067XX))

Country	807F01 (006701)	807F02 (006702)	807F03 (006703)	807F04 (006704)	807F05 (006705)
Israel	FFH	FFH	FFH	0H	BAH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	1H	10H
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F06 (006706)	807F07 (006707)	807F08 (006708)	807F09 (006709)	807F0A (00670A)
Israel	4H	00H	105	E8H	3H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	4H	00H	150	2CH	1H
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F0B (00670B)	807F0C (00670C)	807F0D (00670D)	807F0E (00670E)	807F0F (00670F)
Israel	105	4	200	0	FFH
USA	FFH	FFH	100	0	FFH
Asia	FFH	FFH	200	0	FFH
Hong Kong	FFH	FFH	100	0	FFH
South Africa	FFH	FFH	100	0	FFH
Australia	100	8	150	0	FFH
New Zealand	FFH	FFH	200	0	FFH
Singapore	FFH	FFH	100	0	FFH
Malaysia	FFH	FFH	100	0	FFH
China	FFH	FFH	C8	00	FFH

Country	807F10 (006710)	807F11 (006711)	807F12 (006712)	807F13 (006713)	807F14 (006714)
Israel	FFH	FFH	FFH	0H	50H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	0H	38H
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F15 (006715)	807F16 (006716)	807F17 (006717)	807F18 (006718)	807F19 (006719)
Israel	4H	00H	0H	50H	4H
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	4H	00H	0H	50H	4H
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F1B (00671B)	807F1C (00671C)	807F1D (00671D)	807F1E (00671E)	807F1F (00671F)
Israel	105	E8H	3H	105	4
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	150	2CH	1H	100	1
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F20 (006720)	807F21 (006721)	807F22 (006722)	807F23 (006723)	807F24 (006724)
Israel	200	0	FFH	FFH	FFH
USA	200	0	FFH	FFH	FFH
Asia	200	0	FFH	FFH	FFH
Hong Kong	200	0	FFH	FFH	FFH
South Africa	200	0	FFH	FFH	FFH
Australia	150	0	FFH	FFH	FFH
New Zealand	200	0	FFH	FFH	FFH
Singapore	200	0	FFH	FFH	FFH
Malaysia	200	0	FFH	FFH	FFH
China	C8	00	FFH	FFH	FFH

Country	807F26 (006726)	807F27 (006727)	807F28 (006728)	807F29 (006729)	807F2A (00672A)
Israel	0H	50H	4H	00H	12
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	0H	38H	4H	00H	12
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F2B (00672B)	807F2C (00672C)	807F2D (00672D)	807F2E (00672E)	807F2F (00672F)
Israel	12	24	24	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	12	25	25	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F30 (006730)	807F31 (006731)	807F32 (006732)	807F33 (006733)	807F34 (006734)
Israel	FFH	FFH	FFH	41H	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	41H	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F36 (006736)	807F37 (006737)	807F38 (006738)	807F39 (006739)	807F3A (00673A)
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F3B (00673B)	807F3C (00673C)	807F3D (00673D)	807F3E (00673E)	807F3F (00673F)
Israel	FFH	FFH	00H	00H	FFH
USA	FFH	FFH	00H	00H	FFH
Asia	FFH	FFH	00H	00H	FFH
Hong Kong	FFH	FFH	00H	00H	FFH
South Africa	FFH	FFH	00H	00H	FFH
Australia	FFH	FFH	00H	00H	FFH
New Zealand	FFH	FFH	00H	00H	FFH
Singapore	FFH	FFH	00H	00H	FFH
Malaysia	FFH	FFH	00H	00H	FFH
China	FFH	FFH	00H	00H	FFH

Country	807F41 (006741)	807F42 (006742)	807F43 (006743)	807F44 (006744)	807F45 (006745)
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH
China	FFH	FFH	FFH	FFH	FFH

Country	807F46 (006746)	807F47 (006747)	807F48 (006748)	807F49 (006749)	807F4A (00674A)
Israel	FFH	FFH	00H	00H	61
USA	FFH	FFH	00H	00H	77
Asia	FFH	FFH	00H	00H	61
Hong Kong	FFH	FFH	00H	00H	61
South Africa	FFH	FFH	00H	00H	61
Australia	FFH	FFH	00H	00H	255
New Zealand	FFH	FFH	00H	00H	245
Singapore	FFH	FFH	00H	00H	61
Malaysia	FFH	FFH	00H	00H	61
China	FFH	FFH	00H	00H	3D

Country	807F4B (00674B)	807F4C (00674C)	807F4D (00674D)	807F4E (00674E)	807F4F (00674F)
Israel	62	39	50	46	101
USA	60	41	74	46	101
Asia	66	34	50	36	101
Hong Kong	66	34	50	36	101
South Africa	66	34	50	36	101
Australia	68	32	70	36	101
New Zealand	66	34	50	36	101
Singapore	66	34	50	36	101
Malaysia	66	34	50	36	101
China	42	22	19	24	65

Country	807F50 (006750)	807F51 (006751)	807F52 (006752)	807F53 (006753)	807F54 (006754)
Israel	90	90	17	4	34
USA	100	100	14	4	34
Asia	100	110	12	4	34
Hong Kong	100	110	12	4	34
South Africa	100	110	12	4	34
Australia	100	110	14	4	34
New Zealand	100	110	17	4	34
Singapore	100	110	12	4	34
Malaysia	100	110	12	4	34
China	64	6E	0A	04	22

Country	807F59 (006759)	807F5A (00675A)	807F5B (00675B)	807F5C (00675C)	807F5D (00675D)
Israel	15	90	FFH	00H	FFH
USA	00H	00H	FFH	FFH	FFH
Asia	00H	00H	FFH	FFH	FFH
Hong Kong	00H	00H	FFH	FFH	FFH
South Africa	00H	00H	FFH	FFH	FFH
Australia	00H	00H	FFH	FFH	FFH
New Zealand	00H	00H	FFH	FFH	FFH
Singapore	00H	00H	FFH	FFH	FFH
Malaysia	00H	00H	FFH	FFH	FFH
China	00H	00H	FFH	FFH	FFH

Country	807F5E (00675E)	807F5F (00675F)	807F65 (006765)	807F66 (006766)	807F72 (006772)
Israel	C0H	10H	FFH	FFH	16
USA	C0H	10H	FFH	FFH	13
Asia	C0H	10H	FFH	FFH	17
Hong Kong	C0H	10H	FFH	FFH	17
South Africa	C0H	10H	FFH	FFH	17
Australia	C0H	10H	FFH	FFH	14
New Zealand	C0H	10H	FFH	FFH	17
Singapore	C0H	10H	FFH	FFH	17
Malaysia	C0H	10H	FFH	FFH	17
China	C0H	10H	FFH	FFH	11

Country	807F73 (006773)	807F74 (006774)	807F75 (006775)	807F76 (006776)	807F77 (006777)
Israel	43H	FFH	00H	2	14H
USA	83	FFH	00H	1	10
Asia	83	FFH	00H	1	10
Hong Kong	83	FFH	00H	1	10
South Africa	83	FFH	00H	1	10
Australia	83	FFH	00H	3	6
New Zealand	83	FFH	00H	3	10
Singapore	83	FFH	00H	1	10
Malaysia	83	FFH	00H	1	10
China	53	FFH	00H	1	0A

Country	807F78 (006778)	807F79 (006779)	807F7A (00677A)	807F81 (006781)	807F82 (006782)
Israel	14H	90H	1H	25	00H
USA	10	90H	1H	25	00H
Asia	10	90H	1H	25	00H
Hong Kong	10	90H	1H	25	00H
South Africa	10	90H	1H	25	00H
Australia	6	90H	1H	25	00H
New Zealand	10	90H	1H	25	00H
Singapore	10	90H	1H	25	00H
Malaysia	10	90H	1H	25	00H
China	0A	90H	1H	19	00H

Country	807FA1 (0067A1)	807FA2 (0067A2)	807FA3 (0067A3)	807FA4 (0067A4)	807FA5 (0067A5)
Israel	02H	00H	04H	00H	10
USA	02H	00H	04H	00H	10
Asia	02H	00H	04H	00H	10
Hong Kong	03H	00H	04H	00H	10
South Africa	03H	00H	04H	00H	10
Australia	02H	00H	04H	00H	10
New Zealand	02H	00H	04H	00H	10
Singapore	03H	00H	04H	00H	10
Malaysia	03H	00H	04H	00H	10
china	02H	00H	04H	00H	0A

Country	807FA6 (0067A6)	807FA7 (0067A7)	807FA8 (0067A8)	807FA9 (0067A9)	807FAA (0067AA)
Israel	01H	60H	04H	00H	10
USA	01H	60H	04H	00H	10
Asia	01H	60H	04H	00H	10
Hong Kong	01H	E0H	04H	00H	10
South Africa	01H	E0H	04H	00H	10
Australia	01H	60H	04H	00H	10
New Zealand	01H	60H	04H	00H	10
Singapore	01H	E0H	04H	00H	10
Malaysia	01H	E0H	04H	00H	10
China	00H	81H	04H	00H	0A

Country	807FAB (0067AB)	807FAC (0067AC)	807FAD (0067AD)	807FAE (0067AE)	807FAF (0067AF)
Israel	19H	96H	22H	FFH	0H
USA	19H	96H	22H	FFH	0H
Asia	19H	96H	22H	FFH	0H
Hong Kong	19H	96H	22H	FFH	0H
South Africa	19H	96H	22H	FFH	0H
Australia	19H	96H	22H	FFH	0H
New Zealand	19H	96H	22H	FFH	0H
Singapore	19H	96H	22H	FFH	0H
Malaysia	19H	96H	22H	FFH	0H
China	23H	91H	32H	24H	0H

Country	807FB1 (0067B1)	807FB2 (0067B2)	807FB3 (0067B3)	807FB4 (0067B4)	807FB5 (0067B5)
Israel	04H	00H	10	12	00H
USA	04H	00H	10	9	0
Asia	04H	00H	10	5	00H
Hong Kong	04H	00H	10	6	0
South Africa	04H	00H	10	6	0
Australia	04H	00H	10	7	2
New Zealand	04H	00H	10	12	0
Singapore	04H	00H	10	6	0
Malaysia	04H	00H	10	6	0
China	00H	0BH	12	0B	0

Country	807FB6 (0067B6)	807FB7 (0067B7)	807FB8 (0067B8)	807FB9 (0067B9)	807FBD (0067BD)
Israel	00H	6	0	0	0FH
USA	0	9	0	0	10H
Asia	00H	6	0	0	0FH
Hong Kong	0	6	0	0	0FH
South Africa	0	6	0	0	0FH
Australia	00H	11	2	0	0FH
New Zealand	00H	8	0	0	0FH
Singapore	0	6	0	0	0FH
Malaysia	0	6	0	0	0FH
China	0	6	0	0	16H

Country	807FDA (0067DA)				
Israel	59				
USA	53				
Asia	47				
Hong Kong	53				
South Africa	53				
Australia	53				
New Zealand	53				
Singapore	53				
Malaysia	53			,	
China	2F				

4.4. DEDICATED TRANSMISSION PARAMETERS

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

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

4.4.1. Programming Procedure

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

   Example: Change the Parameters in Quick Dial 10.

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

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

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

   Example: Change bit 7 to 1: Press 7

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

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

Byte 1

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

Byte 2

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

Byte 3

	FUNCTION	COMMENTS
0	Not used	Do not change the settings.
1	Not used	
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	Not used	Do not change the settings.
5	Compression modes available in transmit mode **0:** MH only **1:** All available compression modes	This bit determines the capabilities that are informed to the other terminal during transmission.
6 7	ECM during transmission **(BRO only)** **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. (**BR1:** Do not change the settings.)

4.5. SERVICE RAM ADDRESSES

⚠CAUTION

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

BRO and BR1 use different RAM addresses. The addresses for BR1 are in brackets.

800000[H] (005100[H])- RAM Reset Level 1
Change the data at this address to 00 [H], then switch the machine off and on to reset all the system settings.
Caution: Before using this RAM, print the settings of all the system parameters (System Parameter List).

800001 (005101) to 800004[H] (005104[H]) - ROM version (Read only)
800001[H] (005101[H]) - Revision number (BCD)
800002[H] (005102[H]) - Year (BCD)
800003[H] (005103[H]) - Month (BCD)
800004[H] (005104[H]) - Day (BCD)

800006 (005106) to 800016[H] (005116[H]) - Machine's serial number (17 digits - ASCII)

800018[H] (005118[H]) - Total program checksum (low)
800019[H] (005119[H]) - Total program checksum (high)

80001A[H] (00511A[H]) - Boot program checksum (low)
80001B[H] (00511B[H]) - Boot program checksum (high)

80001C[H] (00511C[H]) - Main program checksum (low)
80001D[H] (00511D[H]) - Main program checksum (high)

80001E[H] (00511E[H]) - RDS program update counter (hex)

800020 (005110) to 80003F[H] (00513F[H]) - System bit switches
800040 (005140) to 80004F[H] (005104[H]) - Scanner bit switches
800050 (005150) to 80005F[H] (00515F[H]) - Printer bit switches
800060 (005160) to 80007F[H] (00517F[H]) - Communication bit switches
800080 (005180) to 80008F[H] (00518F[H]) - G3 bit switches

8000A0[H] (0051A0[H]) - User parameter switch 00
Bit 0: Do not adjust
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

Bit 6: Transmission mode home position **(BRO only)** 0: Memory tx, 1: Immediate tx
Bit 7: Halftone home position 0: Disabled, 1: Enabled

8000A1[H] (0051A1[H]) - User parameter switch 01
Bits 0 to 6: Not used
Bit 7: Settings return to home position after transmission 0: Disabled , 1: Enabled

8000A2[H] (0051A2[H]) - User parameter switch 02
Bit 0: Forwarding mark printing on forwarded messages **(BRO only)** 0: Disabled, 1: Enabled
Bit 1: Center mark printing on received copies 0: Disabled, 1: Enabled
Bit 2: Not used
Bit 3: TSI included in transmitted messages 0: Disabled, 1: Enabled
Bits 4 to 7: Not used

8000A3[H] (0051A3[H]) - User parameter switch 03 (Automatic report printout)
Bit 0: Transmission result report (memory transmissions) **(BRO only)** 0: Off, 1: On
Bit 1: Not used
Bit 2: Memory storage report **(BRO only)** 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: TCR (Journal) 0: Off, 1: On

8000A4[H] (0051A4[H]) - User parameter switch 04
Bits 0 to 6: Not used
Bit 7: Inclusion of a sample image on reports 0: Off, 1: On

8000A5[H] (0051A5[H]) - User parameter switch 05
Bit 0: Substitute reception **(BRO only)** 0: Off, 1: On
Bit 1: Memory reception if no RTI or CSI received **(BRO only)**
0: Possible, 1: Impossible
Bits 2 and 7: Not used

8000A6[H] (0051A6[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
Bits 3 to 7: Not used

8000A7[H] (0051A7[H]) - User parameter switch 07

Bits 0 to 4: Not used
Bit 5: Reception mode switchover 0: Disabled, 1: Enabled
Bits 6 to 7: Not used

8000A8[H] (0051A8[H]) - User parameter switch 08

Bit 0 and 1: Not used
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: Not used
Bits 6 and 7: Forwarding **(BRO only)**

Bit 1	0	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.

8000A9[H] (0051A9[H]) - User parameter switch 09

Bits 0 to 7: Not used

8000AA[H] (0051AA[H]) - User parameter switch 10

Bits 0 to 6: Not used
Bit 7: Halftone type 0: Error diffusion, 1: Dither

8000AB[H] (0051AB[H]) - User parameter switch 11

Bits 0 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station **(BRO only)**
0: Off, 1: On
Bit 7: Not used

8000AC[H] (0051AC[H]) - User parameter switch 12

Bits 0 and 7: Not used

8000AD[H] (0051AD[H]) - User parameter switch 13

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

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

Bits 2 and 6: Not used
Bit 7: Automatic cutting of paper after 24 hours of idle time 0: Disabled, 1: Enabled

8000AE (0051AE)- 8000AF[H] (0051AF[H])- User parameter 14 to 15
Not used

8000B9[H] (0051B9[H]) - User function 62 settings
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

8000BA[H] (0051BA[H]) - User function 62 settings
Bit 0: Not used
Bit 1: Dialing type — 0: Pulse dialing (10 pps), 1: Tone (DTMF) dialing
Bits 2 to 7: Not used

8000BB[H] (0051BB[H]) - PSTN access number for loop start

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

8000C8 (0051C2) to 8000DB[H] (0051C5[H]) - RTI (Max. 20 characters - ASCII) - **Note 1**
8000DC (0051D6) to 8000EF[H] (0051E9[H]) - CSI (Max. 20 characters - ASCII)
8000F0 (0051EA) to 80010F[H] (005209[H]) - TTI (Max. 32 characters - ASCII) - **Note 1**
800110[H] (00520A[H]) - Number of CSI characters (Hex)

Note 1: 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.

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

80012F[H] (00520B[H]) - ID code (low - Hex)
800130[H] (00520C[H]) - ID code (high - Hex)

800141 to 800147[H] (BRO only) - Last power off time (Read only)
800140[H] - Year (BCD)
800141[H] - Month (BCD)
800142[H] - Day (BCD)
800143[H] - 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday
800144[H] - Hour
800145[H] - Minute
800146[H] - Second

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

800158 to 80015A[H] - Tx counter (TX)
(005234 to 005236[H])

Address	High	Low
800158[H] (005234[H])	Tens digit	Unit digit
800159[H] (005235[H])	Thousands digit	Hundreds digit
80015A[H] (005236[H])	Millions digit	Ten thousands digit

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

80015B to 80015D[H] - Rx counter (RX)
(005237 to 005239)

80015E to 800160[H] - Scan counter (SCN)
(00523A to 00523C)

800161 to 800163[H] - Print counter (PRT)
(00523D to 00523F)

800179 to 80017B[H] - Scanner total jam counter (DOC. JAM)
(005246 to 005248)

800188 to 80018A[H] - Printer total jam counter (COPY JAM)
(005249 to 00524A)

800197 to 800199[H] - Copy counter (COPY)
(00524F to 005251)

800245 to 80024C[H] - Last RDS operation (Read only)
(005283 to 005289[H])

800245[H] (005283[H]) - Year (BCD)
800246[H] (005284[H])- Month (BCD)
800247[H] (005285[H])- Day (BCD)
800248[H] (005286[H])- 00: Monday, 01: Tuesday, 02: Wednesday, ... , 06: Sunday
800249[H] (005287[H])- Hour
80024A[H] (005288[H])- Minute
80024B[H] (005289[H])- Second

80024D[H] (00528B[H]) - Daylight saving time setting (User function 62)

80034A (0052F9[H]) - Time after which automatic thermal paper cutting is done if the printer has been idle. (00 - FF[H])

8003FD to 800404 [H] - Scanner Video Processing Parameters
(005309 to 005310[H])

Mode	Resolution	Bit no.	7	6	5	4	3	2	1	0
		Address	The functions of each bit are described below this table.							
Text	Standard (Memory tx)	8003FD[H] (005309[H])	1	0	0	0	0	0	0	0
	Standard (Immediate tx)	8003FE[H] (00530A[H])	1	0	0	0	0	0	0	0
	Detail	8003FF[H] (00530B[H])	1	0	0	0	0	0	0	0
	SSF	800400[H] (00530C[H])	1	0	0	0	0	0	0	0
Halftone	Standard (Memory tx)	800401[H] (00530D[H])	1	0	1	0	0	0	0	0
	Standard (Immediate tx)	800402[H] (00530E[H])	1	0	1	0	0	0	0	0
	Detail	800403[H] (00530F[H])	1	0	1	0	0	0	0	0
	SSF	800404[H] (005310[H])	1	0	1	0	0	0	0	0

Bit 0: Edge detection 1: On
Bit 1: Not used; do not adjust the factory setting
Bit 2: Threshold value for edge detection 0: Normal, 1: High
Bit 3: Background detection threshold 0: Low, 1: High
Bit 4: Not used; do not adjust the factory setting
Bit 5: MTF algorithm 0: Low, 1: High
Bit 6: Not used; do not adjust the factory setting
Bit 7: MTF 0: Off, 1: On

800C20 to 800D9F[H] - Latest 64 error codes (Read only)
(0054D4 to 005593[H])

One error record consists of 6 bytes of data.

First error record start address - 803382[H]
Second error record start address - 803388[H]
Third error record start address - 80338E[H]
: : :
64th error record start address - 80349D[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.]

801426 to 801637[H] - Latest 10 error communication records (005730to 005838[H])

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

1st byte - Header
Bit 0: Communication result 0: OK, 1: NG
Bit 1: Document jam 1: Occurred
Bits 2 - 3: Not used
Bit 4: Technical data printout instead of personal codes 0: No, 1: Yes
Bit 5: Type of technical 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 to 5th bytes - Date and time when the communication started
2nd byte - Month (BCD)
3rd byte - Day (BCD)
4th byte - Hour (BCD)
5th byte - Minute (BCD)

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

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

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

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

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

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

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

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

$$\begin{pmatrix} Bit\,4 \\ Bit\,5 \\ Bit\,6 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} : V.27ter \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} : V.29 \begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} : V.33$$

Bit 7: Not used

Service Tables

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

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

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

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

$$\begin{pmatrix} Bit\,4 \\ Bit\,5 \\ Bit\,6 \\ Bit\,7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} : Normal\ \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix} : Not\ used\ \begin{pmatrix} 0 \\ 1 \\ 0 \\ 0 \end{pmatrix} : Polling\ \begin{pmatrix} 1 \\ 1 \\ 0 \\ 0 \end{pmatrix} : Transfer$$

$$\begin{pmatrix} Bit\,4 \\ Bit\,5 \\ Bit\,6 \\ Bit\,7 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 1 \\ 0 \end{pmatrix} : Forwarding\ \begin{pmatrix} 1 \\ 0 \\ 1 \\ 0 \end{pmatrix} : Not\ used$$

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

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

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

5. REPLACEMENT AND ADJUSTMENT

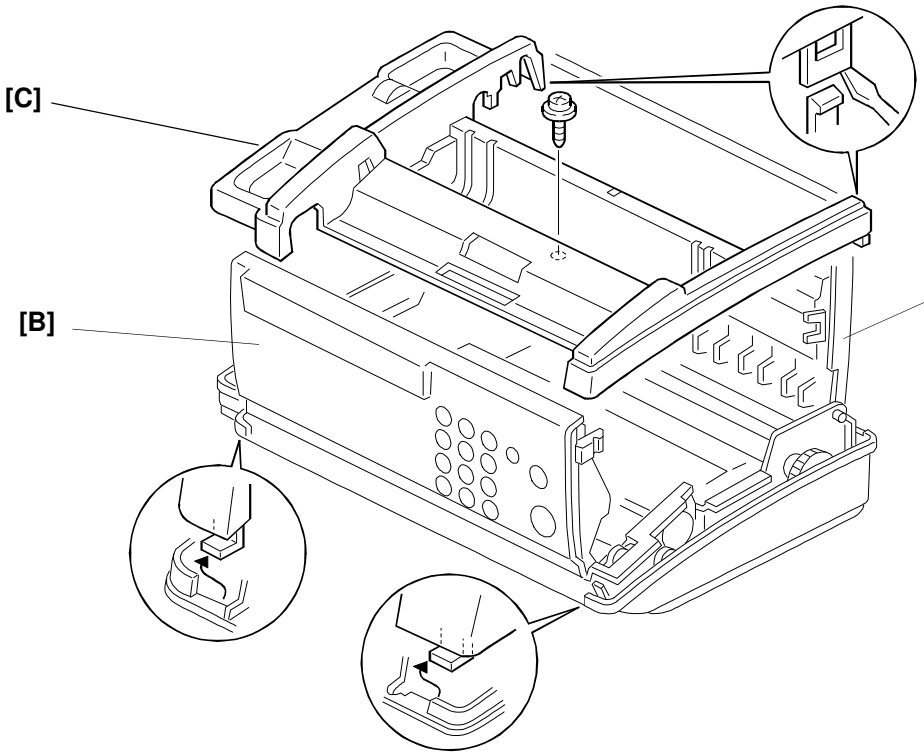
⚠CAUTION

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

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

5.1. EXTERIOR

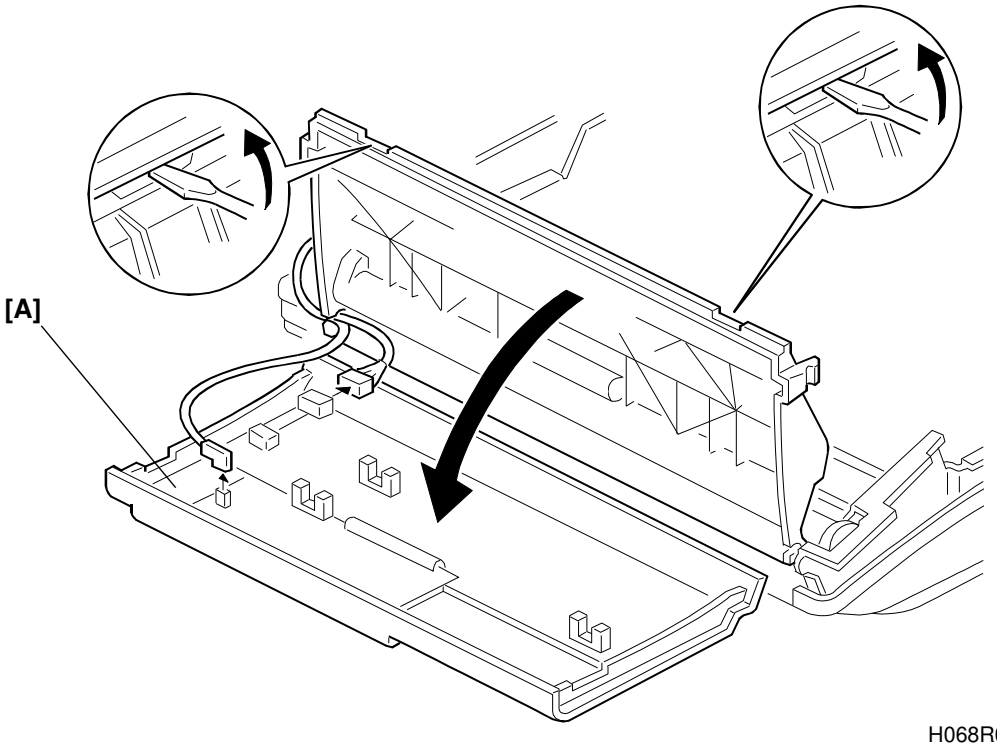
5.1.1. Upper Cover [C]



H068R001.WMF

First, open the printer cover [A] and the operation panel ass'y [B]. Then, take out the paper.
[C]: Upper cover (1 screw, 4 hooks)

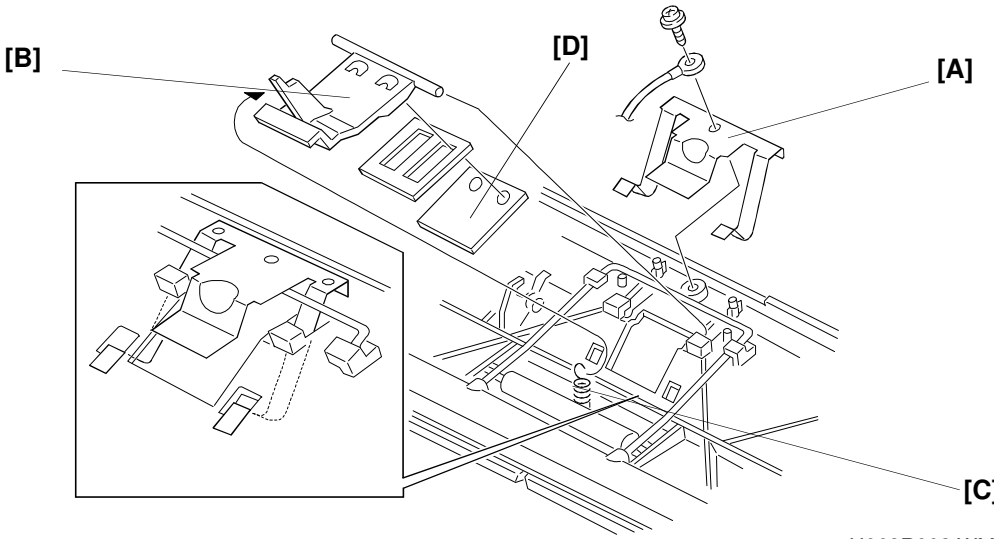
5.1.2. Operation Panel Assembly [A]



H068R002.WMF

[A]: Operation Panel Cover (1 connector, 1 grounding connector)

5.1.3. Separation Pad [D]

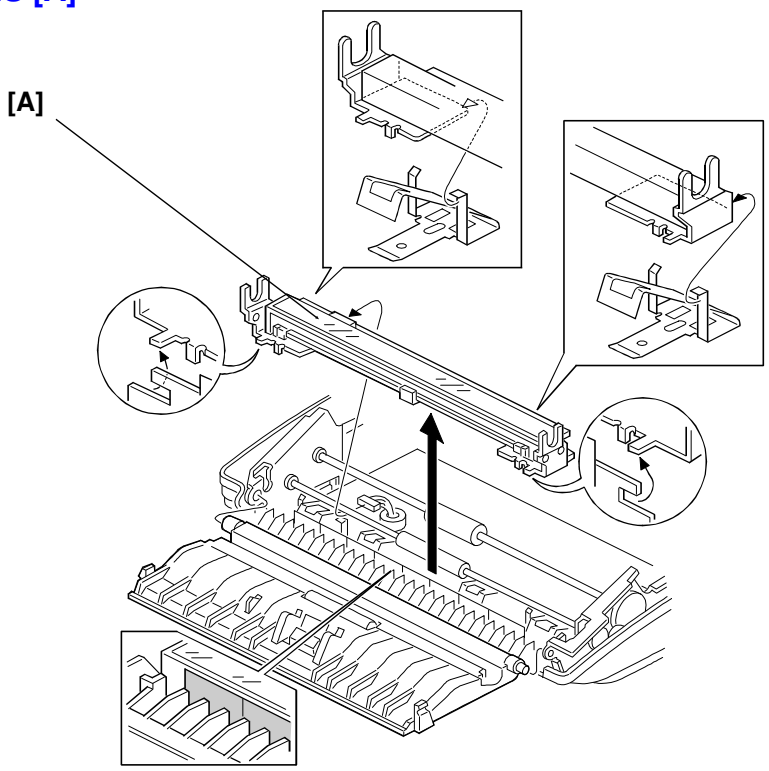


H068R003.WMF

First, remove the operation panel cover.
[A]: Spring Plate (1 grounding wire)
[B]: Separaton Pad Ass'y (1 spring [C])
[D]: Separation Pad
NOTE: Make sure that the spring plate is installed correctly as shown above.

5.2. SCANNER

5.2.1. CIS [A]



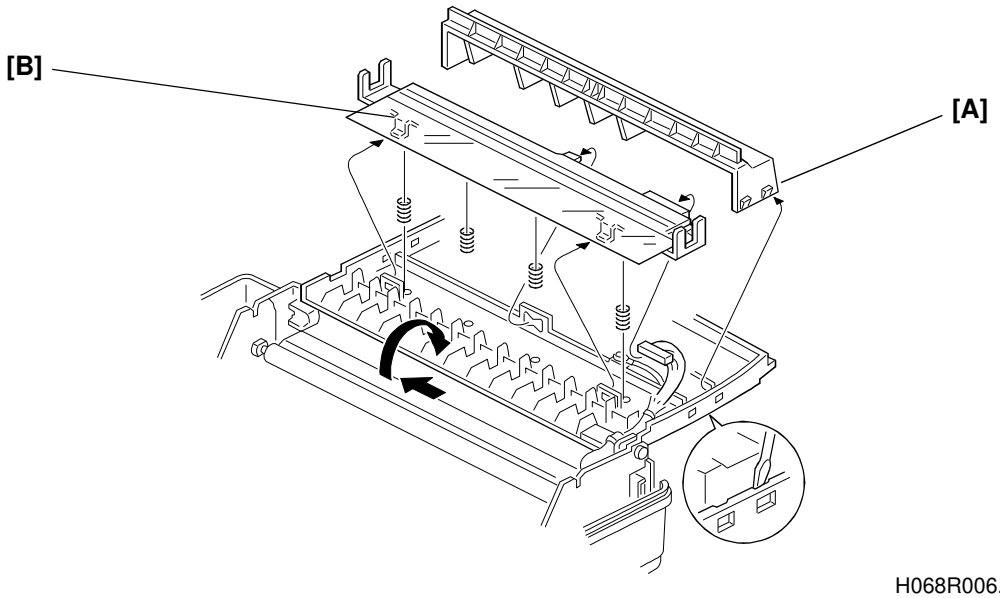
H068R004.WMF

First, remove the upper cover and the scanner roller.
[A]: CIS (2 tabs, 1 connector)
After installing the CIS, the shading adjustment should be done using service function no. 10 (see section 4.1.15).

NOTE:
1. Make sure the spring plate guides [B] are arranged as shown.
2. Do not touch the glass surface of the CIS with bare hands.

5.3. PRINTER

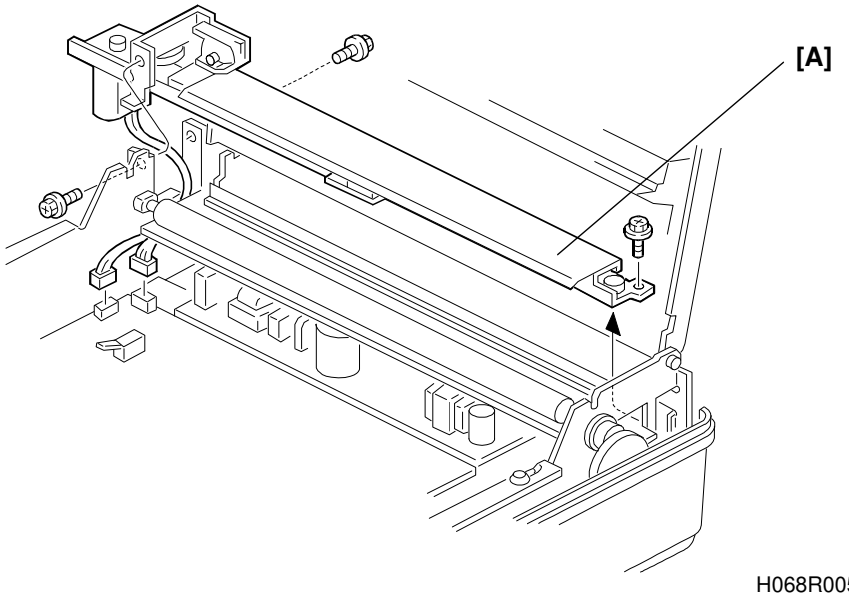
5.3.1. Thermal Head Assembly [B]



H068R006.WMF

First, open the printer cover.
[A]: Decurler (4 tabs)
[B]: Thermal Head (2 hooks, 1 tab)

5.3.2. Cutter Assembly [A]

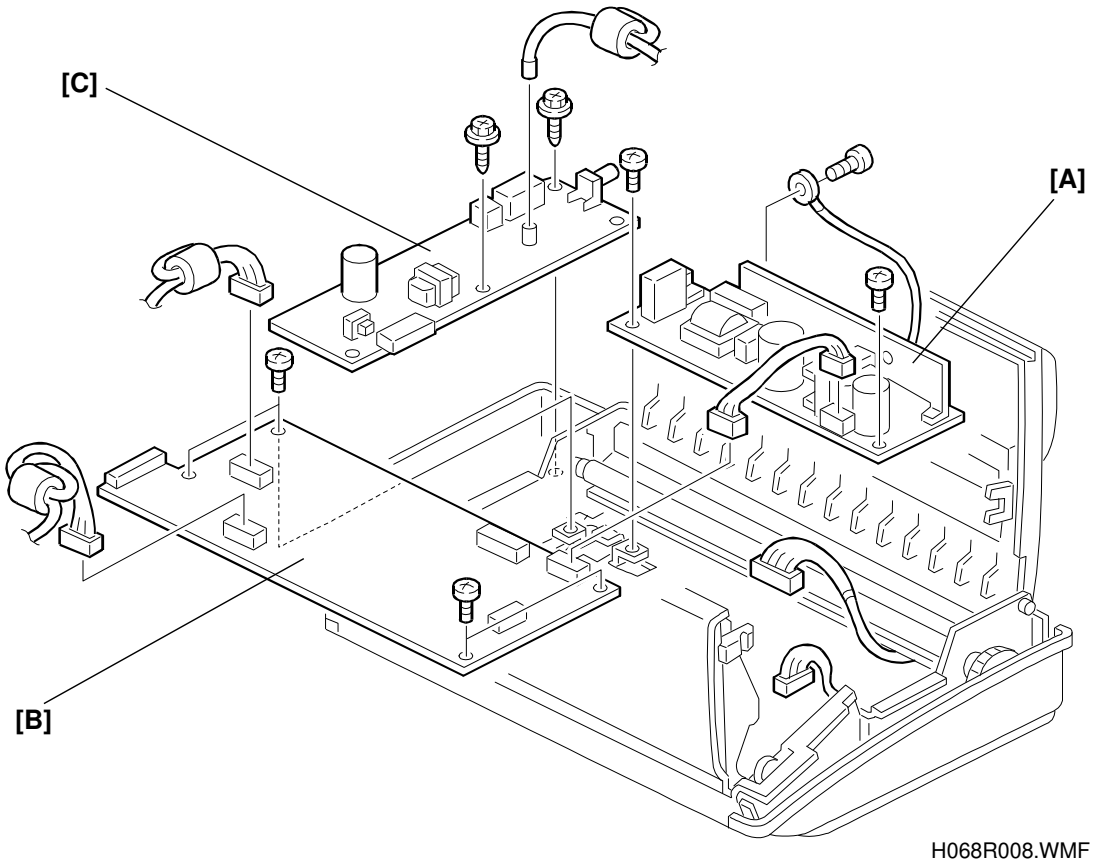


H068R005.WMF

First, remove the upper cover.
[A]: Cutter Ass'y (3 screws, 2 connectors)

5.4. PCBs

5.4.1. PSU, FCU and NCU



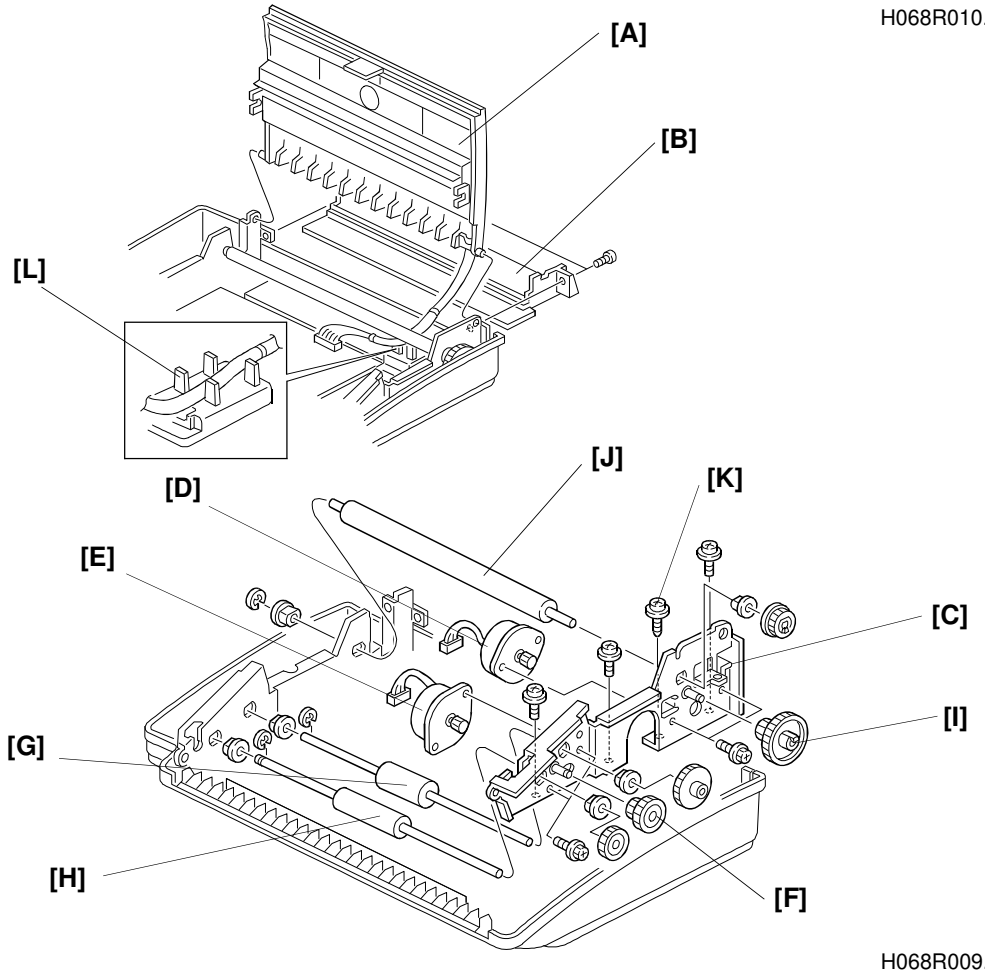
H068R008.WMF

First, remove the upper cover.
[A]: PSU (2 screws, 2 connectors, 1 grounding wire)
[B]: FCU (8 connectors, 4 screws)
[C]: NCU (2 screws, 1 connector, 1 grounding wire)

NOTE:
The FCU and NCU are attached by the same connector.

5.5. ROLLERS AND MOTORS

H068R010.wmf



H068R009.wmf

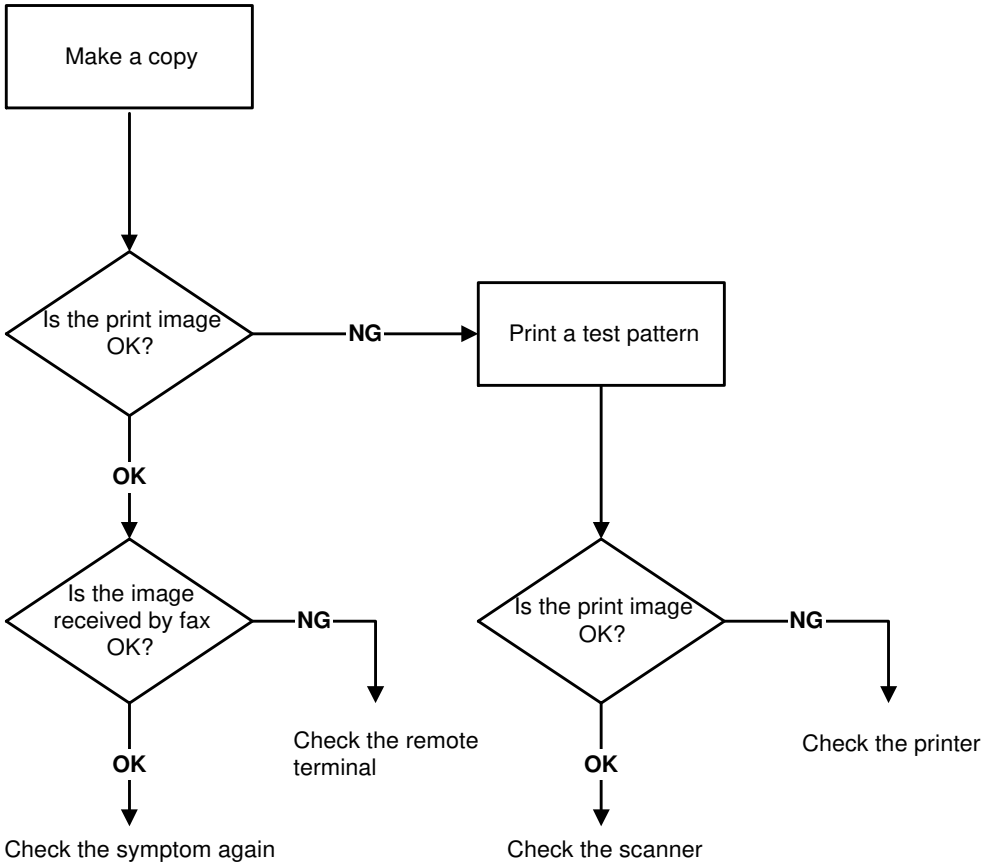
First, remove the upper cover, scanner roller, CIS, and the cutter ass'y.
[A]: Rear Cover (2 screws)
[B]: Printer Cover (1 connector)
[C]: Right side plate (4 screws)
[D]: Rx Motor (2 screws, 1 connector)
[E]: Tx Motor (2 screws, 1 connector)
[F]: Idle Gear
[G]: Feed Roller (1 gear, 2 bushings, 1 E-ring)
[H]: R1 Roller (1 gear, 2 bushings, 1 E-ring)
[I]: Idle Gear
[J]: Platen Roller (1 gear, 2 bushings, 1 E-ring)

NOTE:
1. When installing the right side plate, the screw [K] should be a tapping screw.
2. When installing the printer cover, the harness of the thermal head should be routed between tabs [L]. Otherwise, the machine may not work correctly.

6. TROUBLESHOOTING

6.1. COPY QUALITY TROUBLESHOOTING

If there is a copy quality problepm 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.



H516T514.wmf

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

6.1.1. Blank Copies

Possible Cause (Printer):

- The harness conneted to the FCU is out of position.
- The thermal head or the platen roller is not in the correct position.
- The thermal head is defective.
- The FCU is defective.

Action:

1. Check the connection between the FCU (CN13) and the thermal head.
2. Check if the thermal head and the platen roller are in the correct position.
3. Replace the thermal head.
4. Replace the FCU.

6.1.2. Black Copies

Possible Cause (Scanner)

- The harness connecetd to the FCU is out of position.
- The contact image sensor is defective.

Action:

1. Check the connection between the FCU (CN6) and the contact image sensor.
2. Replace the contact image sensor.

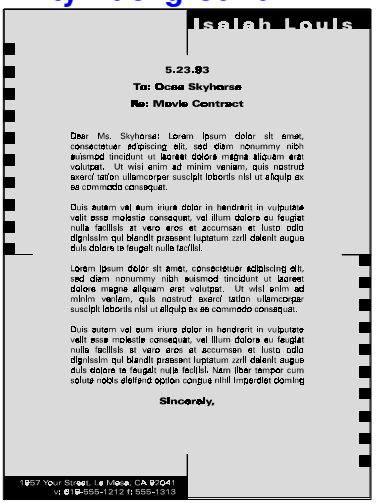
Possible Cause (Printer)

- The thermal head is defective.
- The FCU is defective.

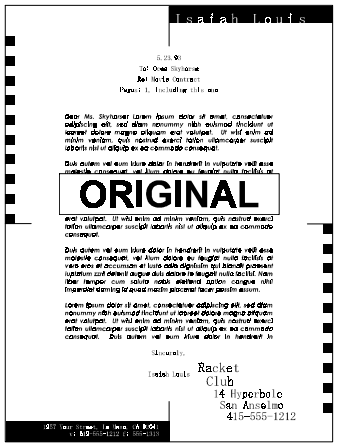
Action:

1. Replace the thermal head.
2. Replace the FCU.

6.1.3. Dirty Background



H516T507.wmf



H516T512.wmf

Possible Cause (Scanner)

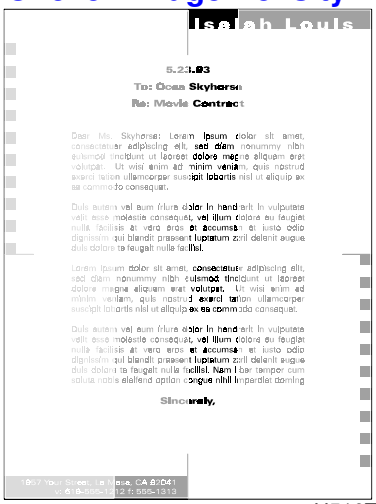
- Scanner shading correction error or wrong threshold.

Action:

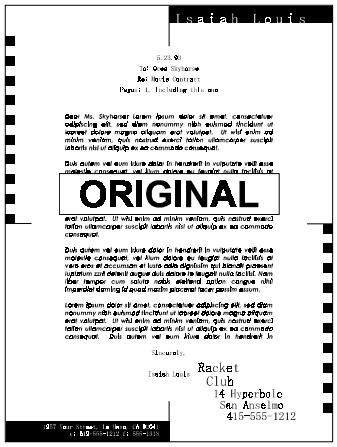
1. Clean the exposure glass of the image sensor.
2. Adjust the scanner contrast threshold settings using Function 10-2. (See section 4.1.15.)

Trouble- shoot- ing

6.1.4. Uneven Image Density



H516T508.wmf



H516T512.wmf

Possible Cause (Scanner)

- Dirty exposure glass
- The contact image sensor is broken.

Action

1. Clean the exposure glass of the image sensor.
2. Replace the image sensor.

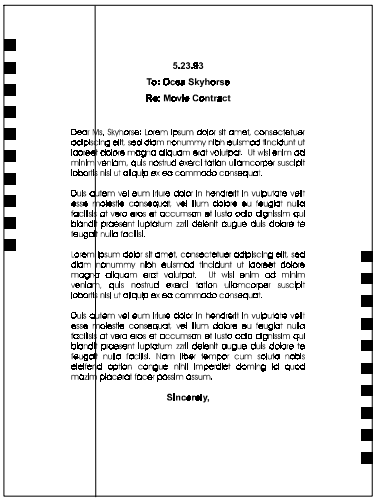
Possible Cause (Printer)

- The thermal head or the platen roller is not in the correct position.
- The thermal head is defective.

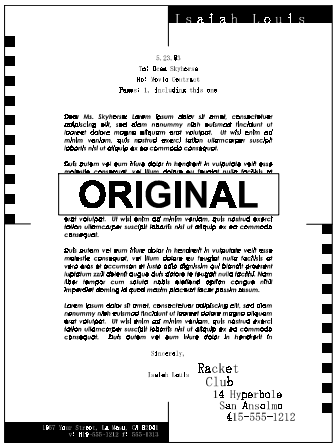
Action:

1. Check if the thermal head and the platen roller are in the correct position.
2. Replace the thermal head.

6.1.5. Vertical Black Lines



H516T503.wmf



H516T512.wmf

Possible Cause (Scanner)

- Defective contact image sensor element(s).
- Dirt or dust on the exposure glass.

Action:

1. Clean the exposure glass.
2. Replace the contact image sensor.

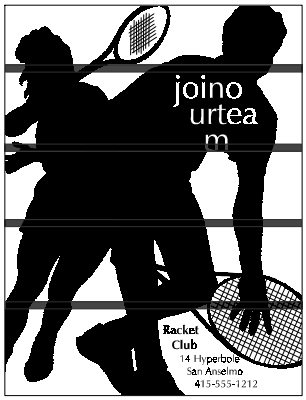
Possible Cause (Printer)

- The thermal head is defective.
- The paper in the machine is scratched.

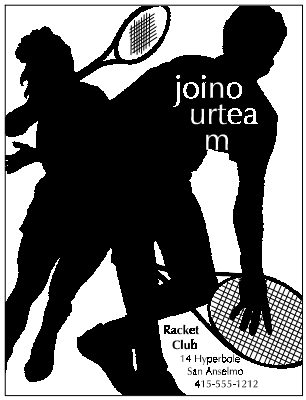
Action:

1. Replace the thermal head.
2. Check the paper path if paper is damaged.

6.1.6. Horizontal Black Lines



H516T510.wmf



H516T511.wmf

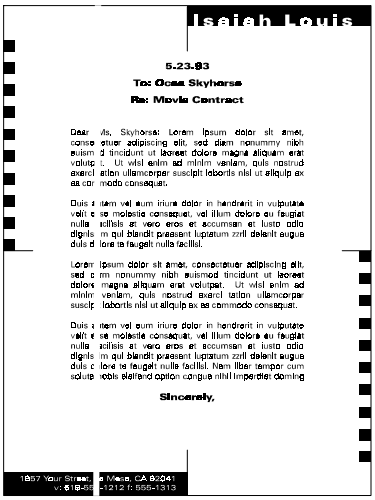
Possible Cause (Printer)

- The thermal head is defective.
- The FCU is defective.

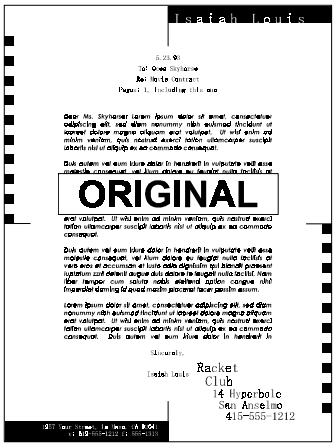
Action:

1. Check the connection between the FCU (CN13) and the thermal head.
2. Replace the thermal head.
3. Replace the FCU.

6.1.7. Vertical White Lines



H516T506.wmf



H516T512.wmf

Possible Cause (Scanner)

- Defective image sensor element(s).

Action:

- Replace the image sensor.

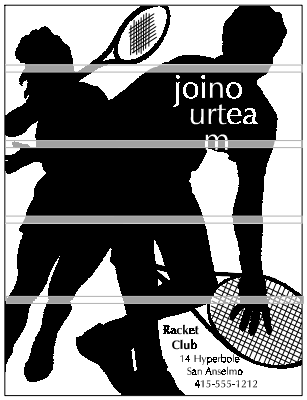
Possible Cause (Printer)

- The thermal head is defective.
- The FCU is defective.

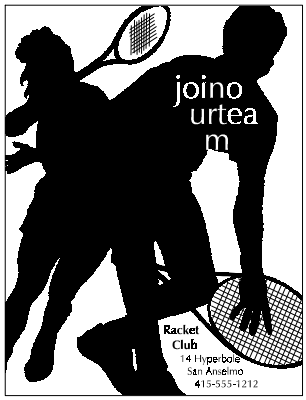
Action:

1. Replace the thermal head.
2. Replace the FCU.

6.1.8. Horizontal White Lines



H516T509.wmf



H516T511.wmf

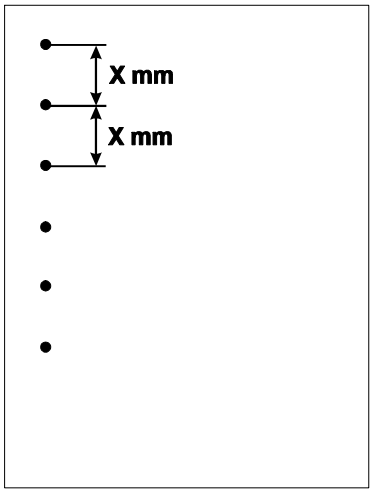
Possible Cause (Printer)

- The thermal head is defective.
- The FCU is defective.

Action:

1. Check the connection between the FCU (CN13) and the thermal head.
2. Replace the thermal head.
3. Replace the FCU.

6.1.9. Black Dots/Spots



H516T502.wmf

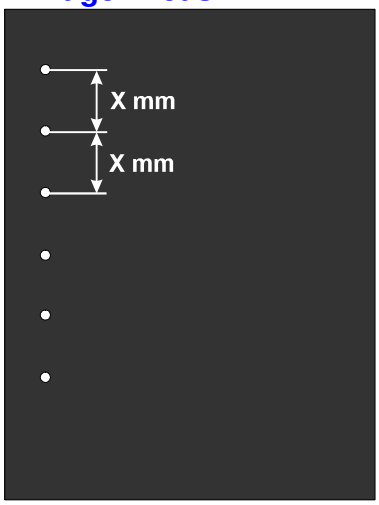
Possible Cause (Scanner)

- Dust on the exposure glass.
- Scanner shading correction error or wrong threshold.
- The FCU is defective.

Action:

1. Clean the exposure glass of the image sensor.
2. Adjust the scanner contrast threshold settings using Function 10-2. (See section 4.1.15.)
3. Replace the FCU.

6.1.10. White Spots in Black Image Areas



H516T501.wmf

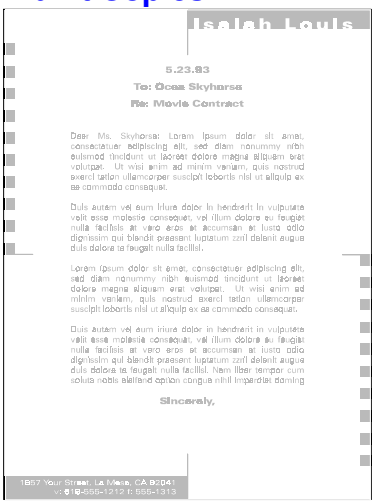
Possible Cause (Scanner)

- Dust on the exposure glass.
- Scanner shading correction error or wrong threshold.
- The FCU is defective.

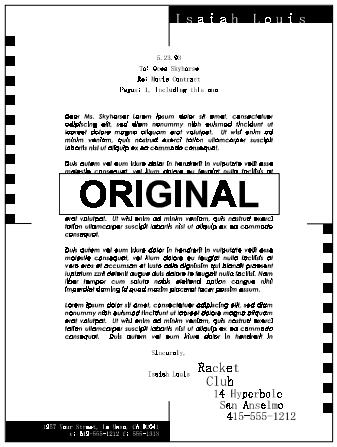
Action:

1. Clean the exposure glass of the image sensor.
2. Adjust the scanner contrast threshold settings using Function 10-2. (See section 4.1.15)
3. Replace the FCU.

6.1.11. Faint Copies



H516T504.wmf



H516T512.wmf

Possible Causes (Scanner)

- Dirty exposure glass
- Wrong scan threshold
- Contact image sensor (LED, sensor element) defect

Action:

1. Clean the exposure glass.
2. Adjust the scan threshold settings using Function 10-2. (See section 4.1.15)
3. Replace the image sensor.

Possible Causes (Printer)

- The thermal head or the platen roller is not in the correct position.

Action:

1. Check if the thermal head and the platen roller is in the correct position.

6.1.12. Misaligned Output (Data shifted to the right or left)

Possible Cause (Scanner)
- Incorrect setting of the document guide.

Action:
- Align the document guides to each side of the document.

Possible Cause (Printer)
- Incorrect setting of the printing paper.

Action:
- Re-install the paper roll.

6.2. MECHANICAL PROBLEMS

6.2.1. ADF/Scanner

1. Non Feed

Possible Cause:
- An incorrect type or size of document is used.
- The operation panel is not properly closed.
- The ADF and feed rollers are dirty or worn out.
- Incorrect positioning of the separation pad, or the pad is missing.
- The Tx motor is defective.

Action:

1. Check that a correct type of document is being used.
2. Check that the operation panel is securely closed.
3. If the problem still remains, do the following.
   - Clean the ADF and feed rollers with a soft cloth and water, and replace them if they are damaged.
   - Check the spring of the separation pad and replace it if it is damaged.
   - Check the connection between the FCU (CN4) and the Tx motor.
   - Replace the Tx motor.

2. Jam

Possible Cause:

- An incorrect type or size of document is used.
- The document is too long.
- The scanner rollers (ADF, feed, R1, and scanner rollers) are dirty.
- Obstruction in the document paper path.
- The scan line sensor is defective.
- Defective tx motor

Action:

1. Check that a correct type of document is being used, and that the document length is within the maximum setting.
2. Check for obstructions in the paper path.
3. If the problem still remains, do the following.
   - Clean the rollers with a soft cloth and water, and replace them if they are damaged.
   - Check that the scan line sensor is working correctly.
   - Replace the Tx motor.

3. Skew

Possible Cause:

- An incorrect type or size of document is used.
- The document guide is not properly set.
- The operation panel is not properly closed.
- The scanner rollers (ADF, feed, R1, and scanner rollers) are dirty.
- Obstruction in the document paper path.
- The separation pad is out of position.

Action:

1. Check that a correct type of document is being used.
2. Check that the operation panel is securely closed and also check that the document guide is properly set.
3. Check for obstructions in the paper path.
4. If the problem still remains, do the following.
   - Check that the separation pad is properly set. Replace it if it is damaged.
   - Clean the rollers with a soft cloth and water, and replace them if they are damaged.

4. Multi-feed

Action:

- Check the spring of separation pad and replace it if it is damaged.
- Clean or replace the separation pad.

6.2.2. Printer

1. Non-feed

Possible Cause:

- A non-recommended type of paper is being used.
- The platen roller and/or the thermal head is/are not properly set.
- The Rx motor is defective.
- The cutter jam is defective.

Action:

1. Check that a correct type of paper is being used.
2. Check that the platen roller is properly installed. Clean or replace if necessary.
3. Check the thermal head spring and its mechanism. Re-install or replace if necessary.
4. Check that the cutter jam sensor is correctly working.
5. If the problem still remains, do the following.
   - Check the connections between the FCU (CN5) and the Rx motor.
   - Check the connections between the FCU (CN10) and the cutter jam sensor.
   - Replace the Rx motor.

2. Paper Jam - Inside Printer

Possible Cause:

- A non-recommended type of paper is being used.
- The cutter ass'y and/or thermal head is not properly set.
- The platen roller is dirty.
- The cutter jam sensor is defective.
- Obstruction in the paper path.
- The Rx motor is defective.

Action:

1. Check if a correct type of paper is being used, and check that the cutter ass'y and/or thermal head are correctly set.
2. Check for obstructions in the paper path.
3. Check the platen roller. Clean or replace if necessary.
4. Check that the printer jam sensor is working properly.
5. If the problem still remains, do the following.
   - Check the connections between the FCU (CN5) and the Rx motor.
   - Replace the Rx motor.
   - Check the FCU output of power and drive signals to the Rx motor (CN5-5, 6). If signals are not output, replace the FCU.
   - Check the drive mechanism. Check that all the gears are properly installed.

3. Skew

Possible Cause:

- A non-recommended type of paper is being used.
- Incorrect positioning of the platen roller and/or thermal head.
- The platen roller is damaged.
- Obstruction in the paper path.
- Malfunction in the paper feed mechanism.

Action:

1. Check if a correct type of paper is being used.
2. Re-install the paper roll.
3. Check that the platen roller and thermal head ass'y are correctly set.
4. Clean or replace the platen roller if necessary.
5. Check for obstructions in the paper path.
6. Check the paper feed mechanism and clean or replace the rollers if necessary.

6.3. ERROR CODES

If an error code occurs, retry the communication. If the same problem occurs, try to fix the problem as suggested below. Note that error codes 4-00, 01, 02, and 10 only appear in the error code display and on the service report.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	Check the line connection. Check the NCU - FCU connectors. The machine at the other end may be incompatible. Replace the NCU or FCU. Check for DIS/NSF with an oscilloscope. If the rx signal is weak, there may be a bad line.
0-01	DCN received unexpectedly	The other party is out of paper or has a jammed printer. The other party pressed Stop during communication.
0-03	Incompatible modem at the other end	The other terminal is incompatible.
0-04	CFR or FTT not received after modem training	Check the line connection. Check the NCU - FCU connectors. Try changing the tx level and/or cable equalizer settings. Replace the FCU or NCU. The other terminal may be faulty; try sending to another machine. If the rx signal is weak or defective, there may be a bad line. **Cross reference** Tx level - NCU Parameter 01 (PSTN), RAM **BRO;** 807FB7, **BR1;** 0067B7 (PABX) Cable equalizer - G3 Switch 07 (PSTN), G3 Switch 08 (PABX) Dedicated Tx parameters - Section 4-4
0-05	Unsuccessful after modem training at 2400 bps	Check the line connection. Check the NCU - FCU connectors. Try adjusting the tx level and/or cable equalizer. Replace the FCU or NCU. Check for line problems. **Cross reference** See error code 0-04.
0-06	The other terminal did not reply to DCS	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. The other end may be defective or incompatible; try sending to another machine. Check for line problems. **Cross reference** See error code 0-04.

Code	Meaning	Suggested Cause/Action
0-07	No post-message response from the other end after a page was sent	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed or run out of paper. The other end user may have disconnected the call. Check for a bad line. The other end may be defective; try sending to another machine.
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. The other end may have jammed, or run out of paper or memory space. Try adjusting the tx level and/or cable equalizer settings. The other end may have a defective modem/NCU/FCU; try sending to another machine. Check for line problems and noise. **Cross reference** Tx level - NCU Parameter 01 (PSTN), RAM **BRO;** 807FB7, **BR1;** 0067B7 (PABX) Cable equalizer - G3 Switch 07 (PSTN), G3 Switch 08 (PABX) Dedicated Tx parameters - Section 4-4
0-14	Non-standard post message response code received	Check the FCU - NCU connectors. Incompatible or defective remote terminal; try sending to another machine. Noisy line: resend. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCU. **Cross reference** See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel or OPU.
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)

Code	Meaning	Suggested Cause/Action
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	Check the connections between the FCU, NCU, & line. Check for line noise or other line problems. Replace the NCU or FCU. The remote machine may be defective or may have disconnected. **Cross reference** Maximum interval between EOLs and ECM frames - G3 Bit Switch 0A, bit 4
0-22	The signal from the other end was interrupted for more than the acceptable modem carrier drop time (default: 0.2 s)	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try adjusting the acceptable modem carrier drop time. **Cross reference** Acceptable modem carrier drop time - G3 Switch 0A, bits 0 and 1
0-23	Too many errors during reception	Check the line connection. Check the FCU - NCU connectors. Replace the NCU or FCU. Defective remote terminal. Check for line noise or other line problems. Try asking the other end to adjust their tx level. Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN), 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.
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	Check the line connection. Check the FCU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. The other terminal may not be compatible. **Cross reference** Dedicated tx parameters - Section 4-4
0-52	Polarity changed during communication	Check the line connection. Retry communication.
1-00	Document jam	Incorrectly inserted document or unsuitable document type. Check the ADF drive components and sensors. **Cross reference** ADF mechanical problems - Section 6-2-1

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 ADF mechanical problems - Section 6-2-1
1-17	Document jam in the feed-out area	Clear any debris from the sensor actuator. Check the ADF drive components and sensors. **Cross reference** ADF mechanical problems - Section 6-2-1
1-20	Paper did not reach the cutter exit at the end of printing	Remove the paper. Check the printer drive components and sensors. **Cross reference** Printer mechanical problems - Section 6-2-2
1-21	Paper present at the cutter exit after printing	Remove the paper. Check the printer drive components and sensors. **Cross reference** Printer mechanical problems - Section 6-2-2
1-23	Paper jam in the cutting area	Clear any debris from the sensor and the paper path. Clean the printer jam sensor. Check the cutter mechanism. Check the connections from the FCU to the cutter motor and cutter sensor. Replace the cutter motor, cutter, or FCU.
1-71	The cover was opened or the paper ran out during printing	Close the cover or install the new paper.
2-10	The modem cannot enter tx mode	Replace the FCU.
2-11	Only one V.21 connection flag was received	Change the FCU.
2-12	Modem clock irregularity	Replace the FCU.
2-20	Abnormal coding/decoding (cpu not ready)	Replace the FCU.
2-40	Thermal head short	Check the FCU - thermal head connectors. Replace the thermal head. Replace the FCU.
2-50	The machine reset itself	Replace 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.

Code	Meaning	Suggested Cause/Action
4-10	Communication failed because of ID Code mismatch (Closed Network) or Tel. No./CSI mismatch (Protection against Wrong Connections)	Get the ID Codes the same and/or the CSIs programmed correctly, then resend. The machine at the other end may be defective.
5-00	Data reconstruction not possible	Replace the FCU.
5-10	DCR timer expired	Replace the FCU.
5-20	Storage impossible because of a lack of memory	Temporary memory shortage. Test the SAF memory. Replace the FCU.
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	Test the SAF memory. Ask the other end to resend the message. Replace the FCU.
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.
5-30	Mode table for the first page to be printed was not effective	Replace the FCU.
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	
6-04	G3 ECM - RTC not detected	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU or NCU.
6-05	G3 ECM - facsimile data frame not received within 18 s of CFR, but there was no line fail	Check the line connection. Check connections from the NCU to the FCU. Check for a bad line or defective remote terminal. Replace the FCU,or NCU. Try adjusting the rx cable equalizer **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN), 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.
6-39	V.21 signal not stopped within 6 s	Replace the FCU.

6.4. ELECTRICAL COMPONENT DEFECTS

6.4.1. Defective Sensor Table

Sensor	Symptoms if Defective
Document sensor	"CLEAR ORIGINAL" or "DIAL FAX NO." is displayed at power-up.
	"SET DOC. OR DIAL NO." is still displayed after a document is placed in the feeder.
Scan line sensor	"CLEAR ORIGINAL" is displayed at power-up.
	"CLEAR ORIGINAL" is displayed soon after the start of copying.
Cover open/Paper end sensor	"REPLACE PAPER" and "CLOSE COVER" are displayed at power-up.