H1

RICOH FAX111

SERVICE MANUAL

October 3rd, 1996
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 : A4
Length:
105 - 297 mm [4.1 - 11.7 ins]
Up to 0.6 m [23.6 ins], manually assisted
Width:
148 - 216 mm [5.8 - 8.5 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
5 sheets (using 70 g/m^2 paper)

Scanning Method
Contact image sensor

Maximum Scan Width
A4 : 216 mm [8.5 ins]

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]

Memory Capacity
ECM: Not Available
SAF (used for TAM):
512 kbytes (with battery back-up)

Compression
MH, EFC, SSC

Protocol
Group 3

Modulation
V.29 (QAM), 9600bps, 7200bps
V.27ter (PHM), 4800bps, 2400bps
V.21 (FM) , 300bps

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

I/O Rate
10, 20, 40 ms/line

Transmission Time
15 s at 9600 bps, EFC, 10 ms/Line
20 s at 9600 bps, SSC, 20 ms/Line
Measured with G3 for a ITU-T #1 test document (Slerexe letter) at standard resolution, and MTF OFF.

Printing System
Thermal Printing

Printer Roll;
Thermal paper
A4: 210 mm X 30 m [8.3 ins X 98.4 ft]

Maximum Printing Width
210 mm [8.3 ins]

Print Resolutions
Main scan: 8 dots/mm [203 dpi]
Sub scan: 7.7 lines/mm [196 lpi]

Power Consumption
187 - 264 V, 50 ±3 Hz

Operation Enviroment
Temperature: 17 ~ 28 °C [63 ~ 82 F]
(5 ~ 35 °C [41 ~ 95 F])
Humidity : 40 ~ 70 %Rh
(25 ~ 80 %Rh)

Dimensions (W X D X H)
356 X 281.5 X 119 mm
[14.0" X 11.1" X 4.3"]

Weight
Approx. 5.5 Kg [11 lbs] excluding thermal paper

1.2. FEATURES

KEY: O = Used, X = Not Used,

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

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

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

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

Communication Features - User Selectable	
Communication Result Display	X
Confidential ID Override	X
Confidential Transmission	X
Direct Fax Number Entry	O
Economy Transmission	X
Fax on demand	X
Forwarding	X
Groups	X
Group Transfer Station	X
Hold	O
ID Transmission	X
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	X
Memory transmission	X
Multi-step Transfer	X
Next Transfer Station	O
OMR	X
On Hook Dial	O
Page Count	O
Personal Codes	X
Personal Codes with Conf. ID	X
Polling Reception (Free Polling)	O
Polling Transmission	X
Polling tx file lifetime in the SAF	X
Quick Dial (3 stations)	O
Reception modes (Tel, Auto)	O
Length Reduction	X
Remote control features	O
Remote Transfer	X
Restricted Access	X
Secured Polling	X
Secured Polling with Stored ID Override	X
Secure Transmission	X
Send Later	X
Silent Ringing Detection	X
Specified Image Area	X
Speed Dial	20
Super Fine Resolution (16 x15.4 l/mm : 400 x 400 dpi)	X
Telephone Directory	X
Tonal Signal Transmission	X
Transfer Request	X
Transmission Deadline (TRD)	X
Turnaround Polling	X

Communication Features - User Selectable	
Two-step Transfer	X
Two in one	X
Voice Request (immed. tx only)	X

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

Other User Features	
Area code prefix	X
Automatic service call	X
Center mark	X
Checkered mark	X
Clearing a memory file	X
Clearing a polling file	X
Clock	O
Confidential ID	X
Copy Editing (Erase Center/Margin)	X
Copy mode	O
Copy Mode Restriction	X
Counters	O
Daylight Saving Time	X
Destination Check	X
Direct entry of names	X
File Retention Time	X
File Retransmission	X
Function Programs	X
ID Code	X
Label Insertion	X

Other User Features	
Language Selection	X
LCD contrast control	X
Memory Lock	X
Memory Lock ID	X
Modifying a memory file	X
Multi Sort Document Reception	X
Multicopy mode	X
Own telephone number	X
Power Saver (Night Timer and standby mode)	X
Print density control	X
Printing a memory file	X
RDS on/off	X
Reception Mode Switching Timer	X
Reception time printing	X
Reduction/Enlargement	X
Remaining memory indicator	X
Remote ID	O
Reverse Order Printing	X
TTI, CSI	O
Secure ID	X
Service Report Transmission	X
Speaker Volume Control	O
Substitute Reception on/off	X
Telephone Line Type	O
Paper Saving Mode	X
TTI on/off	O
User Function Keys	O
User Parameters	O
Wild Cards	X
Cutter on/off	X
Curled Paper Cut Off	X

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	X
Confidential File Report	X
Error Report	O
Memory Storage Report	X
Mode Change Report	X
Polling Clear Report	X
Polling Reserve Report	X
Polling Result Report	X
Power Failure Report	X
TCR (Journal)	X
Toner Cassette Order Form	X
Transfer Result Report	X
Transmission Result Report	O

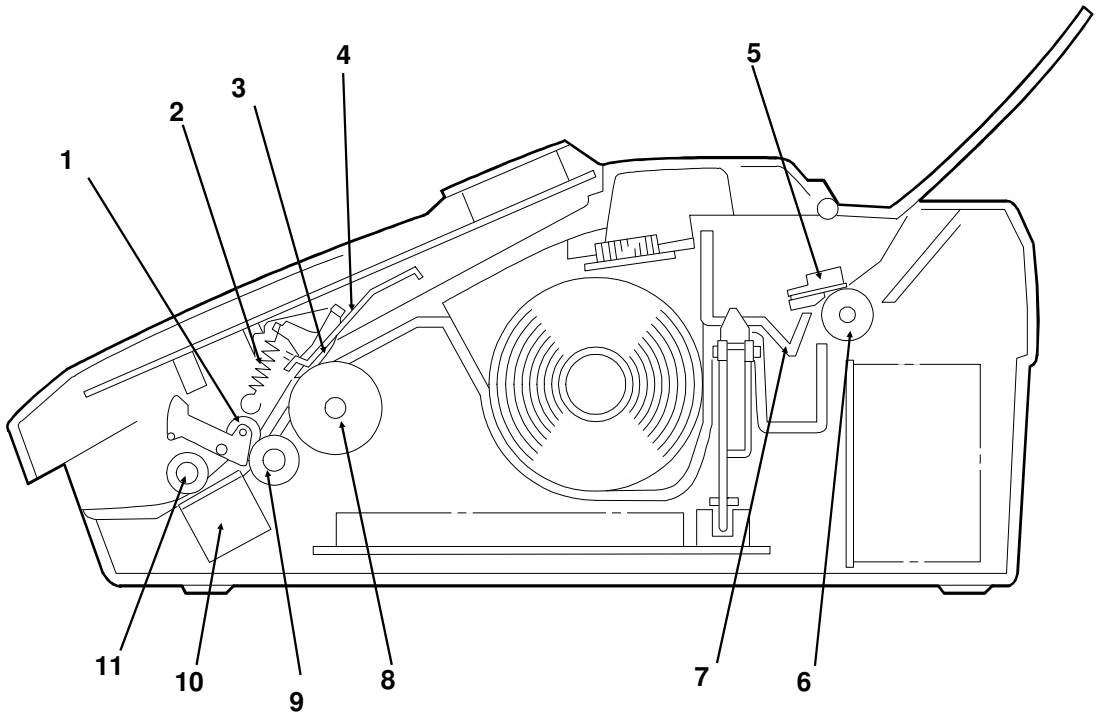
Reports - User-initiated	
Authorized Reception List	X
Charge Control Report	X
File List	X
Forwarding List	X
Group List	X
Personal Code List	X
Program List	X
Quick Dial List	O
Specified Cassette Selection List	X
Speed Dial List	O
TCR	X
Transmission Status Report	X
User Function List	X
User Parameter List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

Service Mode Features	
Auto Paper Select test	X
Back-to-back test	X
Bit switch programming	O
Book mode test	X
Buzzer test	X
Cable equalizer	O
Comm. parameter display	O
Counter check	X
Country code	X
DTMF tone test	O
Echo countermeasure	O
Effective term of service calls	X
Error code display	X
Excessive jam alarm	O

Service Mode Features	
File Transfer	X
LCD contrast adjustment	X
Line error mark	X
Memory file printout (all files)	X
Modem test	O
NCU parameters	O
Operation panel test	O
Periodic service call	X
PM Call	X
Printer mechanism test	X
Printer test patterns	O
Programmable attenuation	O
Protocol dump list	X
RAM display/rewrite	O
RAM dump	O
RAM test	O
Ringer test	X
Scanner lamp test	X
Scanner mechanism test	X
Sensor initialization	X
Serial number	X
Service monitor report	X
Service station number	X
Software upload/download	X
SRAM data download	X
System parameter list	O
Technical data on the TCR	X
Thermal head parameters	X
Transmission Status Report	X
User data transfer	X

1.3. COMPONENT LAYOUT

1.3.1. Mechanical Components



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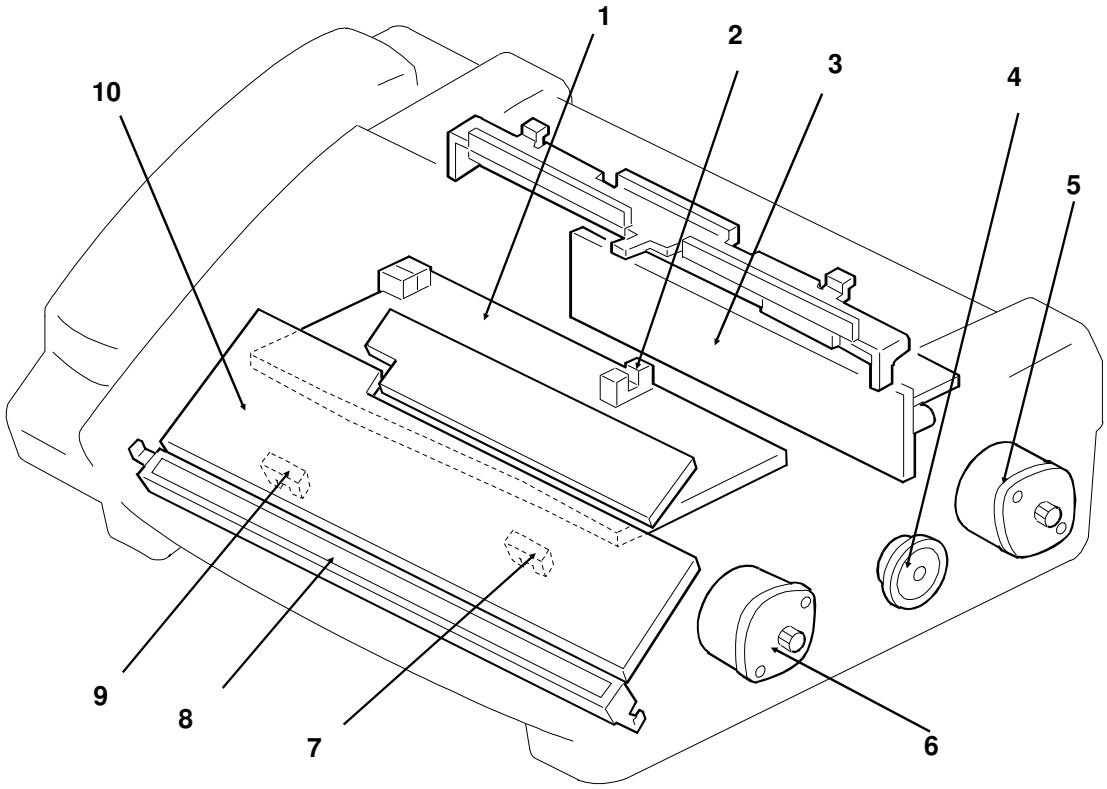
No.	Name	Description
1	Document Feed Roller	Feeds the document through the scanner.
2	Separation Pad Spring	Applies pressure to prevent the ADF roller from feeding more than one sheet at a time.
3	Separation Pad	Allows one page into the scanner.
4	Separation Plate	Aligns the leading edge of the documents.
5	Thermal Head	Prints by applying heat to the thermal paper.
6	Platen Roller	Feeds printouts out of the machine.
7	Decurler	Applies stress to the paper to remove the curl.
8	ADF Roller	Picks up pages of the document.
9	R1 Roller	Feeds the document through the scanner.
10	Contact Image Sensor (CIS) Assembly	Reads and converts the light reflected from the document into an analog video signal. An LED array, which illuminates the document, is included.
11	Scanner Roller	Feeds the document through the scanner.

1.3.2. Electrical Components



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1. PCBs

No.	Name	Description
8	Contact Image Sensor (CIS) Assembly	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.
10	OPU (Operation Panel Unit)	Consists of the LCD and the key switches.
1	FCU (Facsimile Control Unit)	Contains of the FCU block and the NCU block. The FCU block controls the machine and the NCU interfaces the machine with the network.
3	PSU (Power Supply Unit)	Supplies dc power to the machine.

2. Motors

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

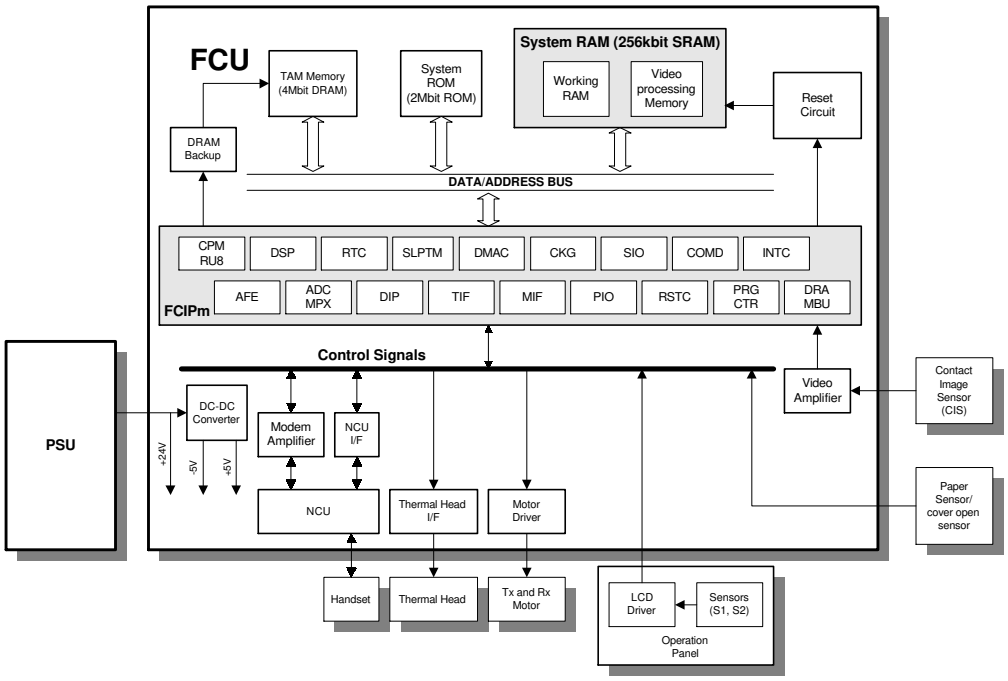
3. Sensors

No.	Name	Description
9	Scan Line Sensor	Is used to detect when a page is approaching the scan line.
7	Document Sensor	Is used to detect the presence of a document in the feeder.
2	Cover Open/Paper End Sensor	Is used to detect when the printer cover has been opened or when the paper has run out.

4. Others

No.	Name	Description
4	Monitor Speaker	Allows the user to listen to the condition of the telephone line.

1.4. OVERALL MACHINE CONTROL



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The FCU board contains the FCU block and the NCU block. The FCU controls the entire system of the machine.

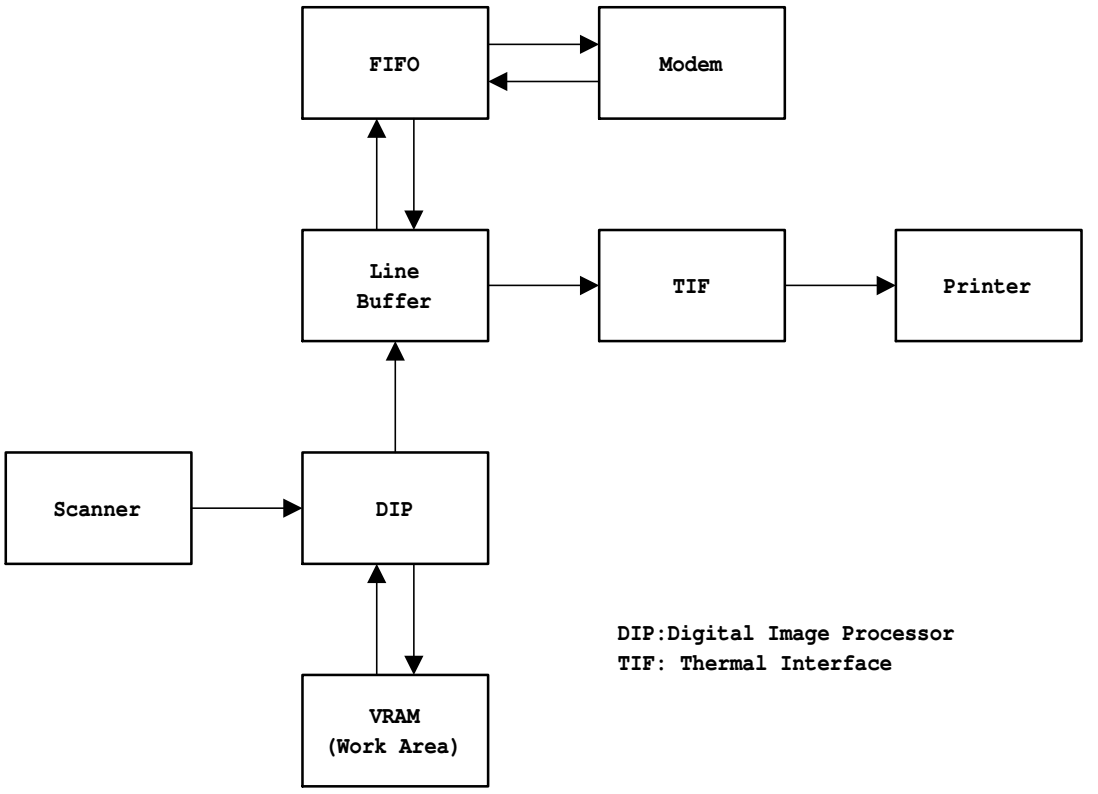
The FCU contains the FCIPm, DRAM, SRAM, System ROM, Modem amplifer circut, DRAM back-up circuit, motor driver, and video amplifer.

The FCIPm controls the scanner components, printer components, and communication with the network.

Incoming telephone messages are stored in the DRAM after compressed in the FCIPm. The DRAM is backed up by the dry cell when the power is off.

The LCD controller in the OPU controls the LEDs, LCD, keys, document sensor, and scanner sensor. The LCD controller is controlled by the FCIPm through a serial interface.

1.5. VIDEO DATA PATH



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1. Transmission

Scanned data from the contact image sensor passes to the DIP block in the FCIPm. After analog/digital video processing, the data is compressed by the DCR software for transmission. The data passes to the modem through a FIFO memory.

2. Reception

Data from the line passes to the modem through the NCU. After the modem demodulates the data, the data is decompressed by the DCR software, and the raster image data is made.

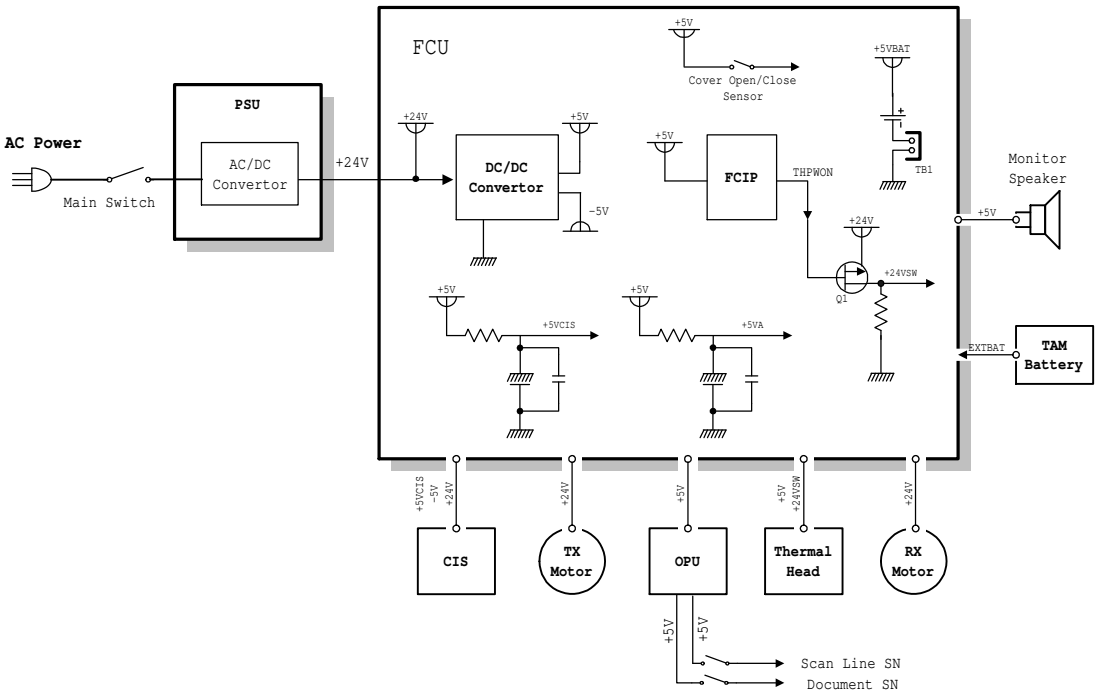
The raster image data is then sent to the thermal head through the TIF block.

3. Copying

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

1.6. POWER DISTRIBUTION

1.6.1. Distribution Diagram



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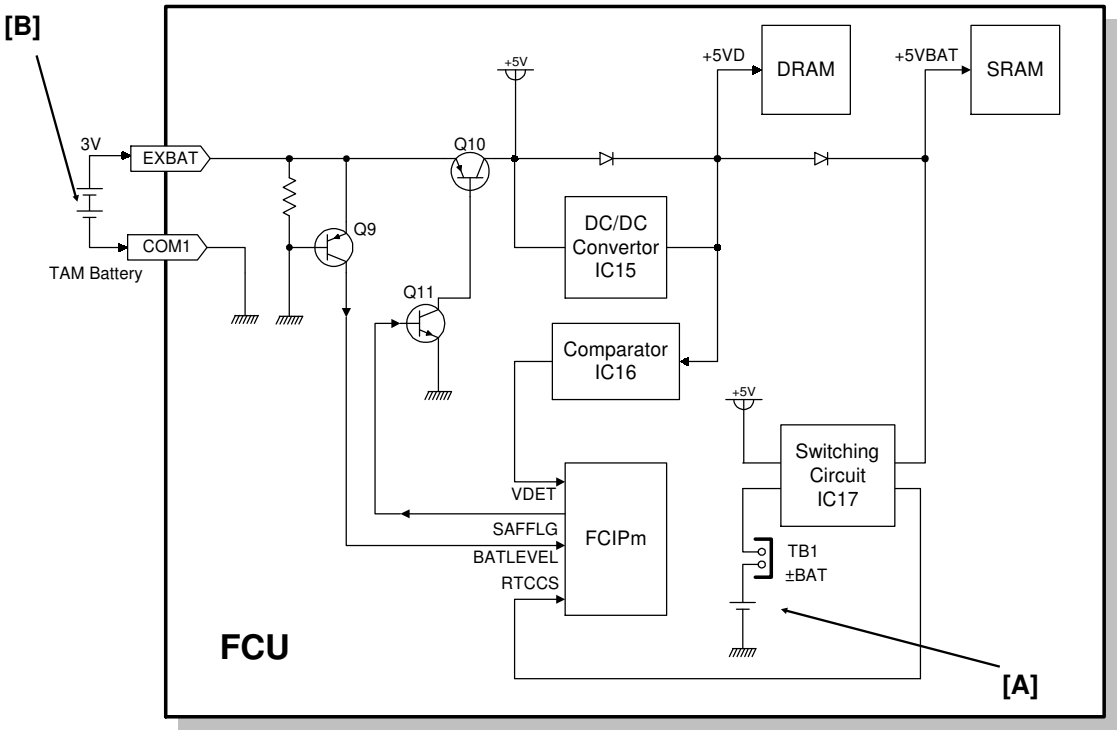
The PSU supplies +24V dc power to the FCU. The FCU converts the +24V dc power supply to the following supplies.

+5V	This is normally on when the main switch is on.
+5VBAT	This supplies back up power for the SRAM, 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.
EXBAT	This supplies back up power for the DRAM, A dry cell is used to generate +3V.
+5VA	This is a more stable power supply than +5V. It is used for the analog data amplifer.
+24VSW	This is used for the thermal head.
-5V	This is used for the image sensor.

1.6.2. Memory Back-up



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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.

Two dry cells [B] and the dc/dc converter on the FCU back up the DRAM, if there is TAM data in the DRAM memory and the power is switched off. The dry cells generate about 3 volts. The dc/dc converter (IC15) lifts this voltage to 5 volts so it can be used as the +5VD supply for DRAM backup. The CPU monitors the voltage of the dry cells with the BATLEVEL 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 SAFFLG to low and the machine stops backing up the memory.

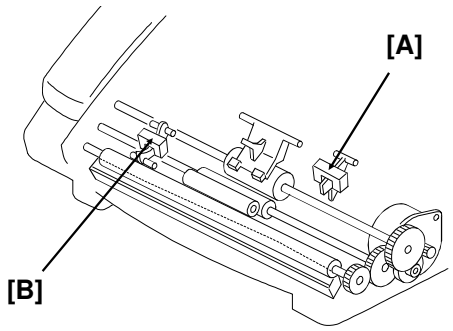
There is no battery switch for the battery [B].

2. DETAILED SECTION DESCRIPTIONS

2.1. SCANNER

2.1.1. Mechanisms

1. Document Detection



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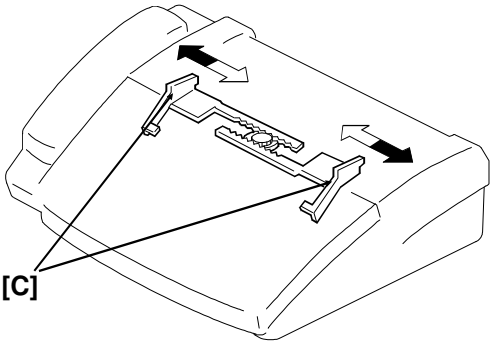

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The document sensor [A] detects when a document is placed in the ADF. The scan line sensor [B] detects the leading edge of the document at the scan line.

The document guides [C] prevent the document from skewing during feeding.

2. Drive Mechanism

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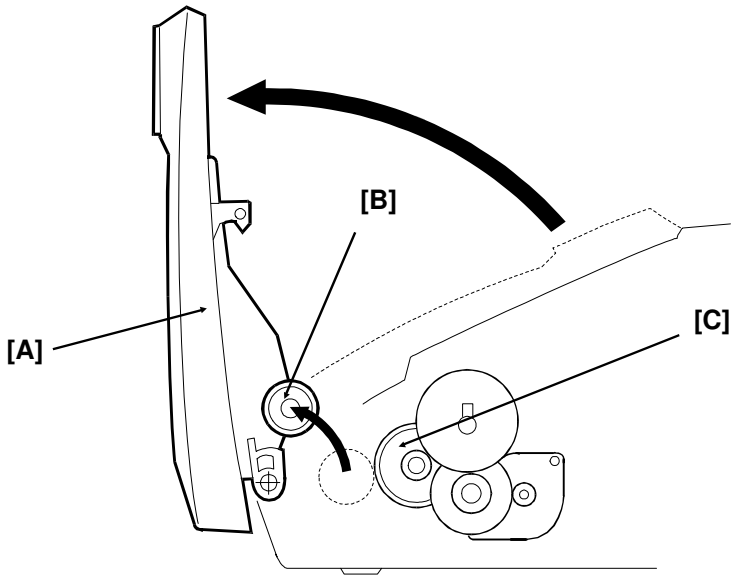


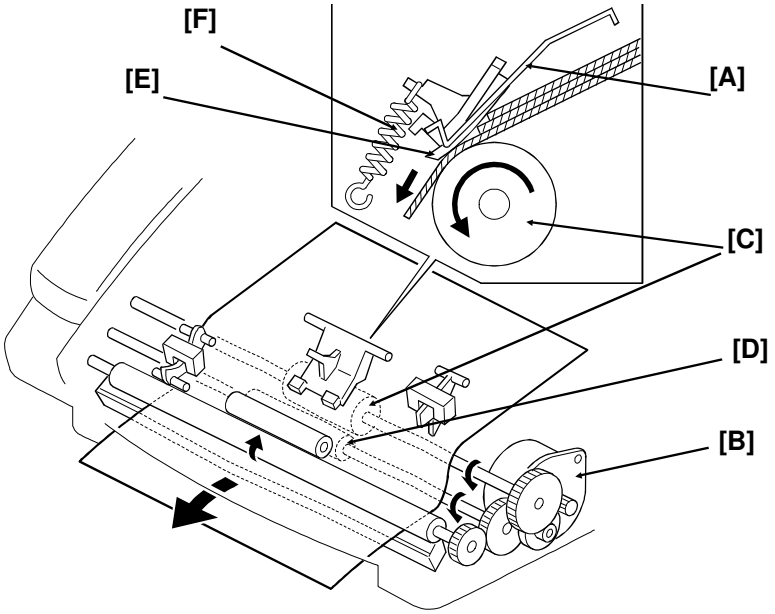
When the ADF cover [A] is opened, the scanner roller gear [B] separates from the R1 roller gear [C], and then the pressure between the CIS and scanner roller is released.

The scanning speed for each resolution mode is as follows.

Resolution	Scan speed (/A4)
Standard - copy	22.9 s
Standard - Immediate TX	11.5 s
Detail	22.9 s

cWhensmW

3. Prefeeding and Separation

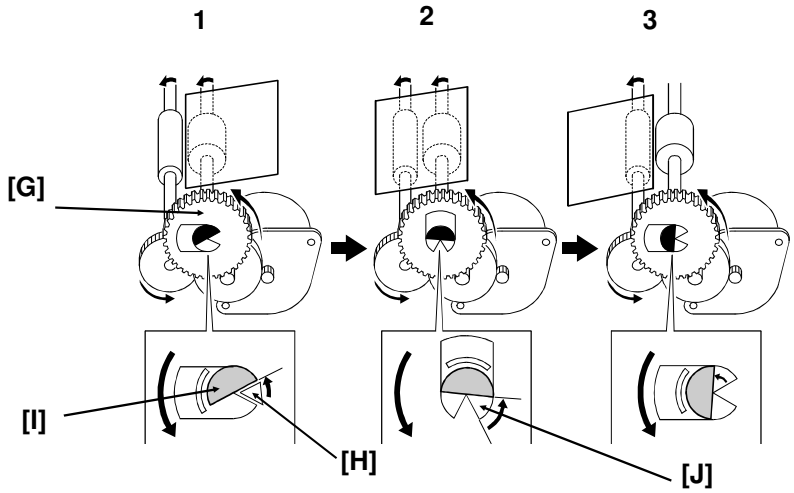


H540D508.wmf

The separation plate [A] aligns the leading edges of the pages of the document. When the document sensor detects a document in the ADF, the tx motor [B] drives the ADF roller [C] to start prefeeding the document. The ADF roller feeds the bottom sheet of the document. Then, the R1 roller [D] feeds the sheet into the scanner.

The separation rubber pad [E] prevents the ADF roller from feeding more than one sheet at a time. The separation pad spring [F] gives a resistant force to the separation pad.

The gap between paper is made by the mechanism illusrated below. The end of the ADF roller shaft [I] is located within the cutout in the center of the ADF roller gear [J].



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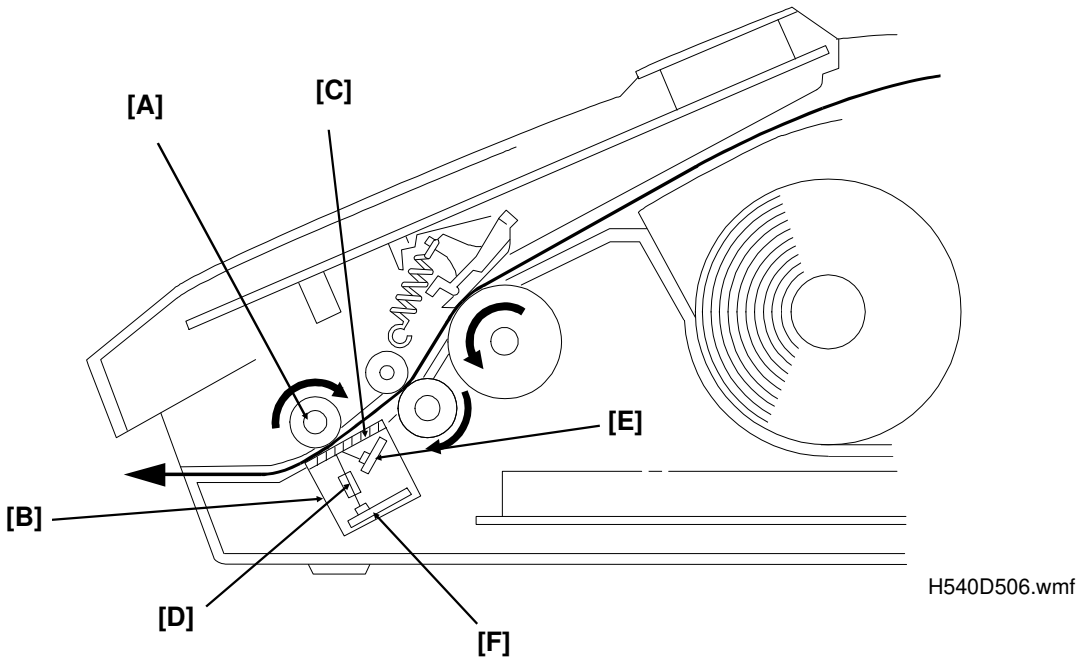
1. At the start of feeding, the Tx motor draw the ADF roller gear [G], and the V-shaped part of the cutout [H] pushes the flat side of the ADF roller shaft end [I] to turn the ADF roller.
2. When the R1 roller takes the leading edge of the paper, the R1 roller pulls the paper faster than the the ADF roller. Because of the difference in the rotation rates of the gear and shaft, a gap [J] opens between them.
3. At the end of the page, the Tx motor still draw the gear. However, the ADF roller stops until the V-shaped part [H] catches up with the flat side of the shaft end. This time interval makes the gap between pages.

4. Image Scanning



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

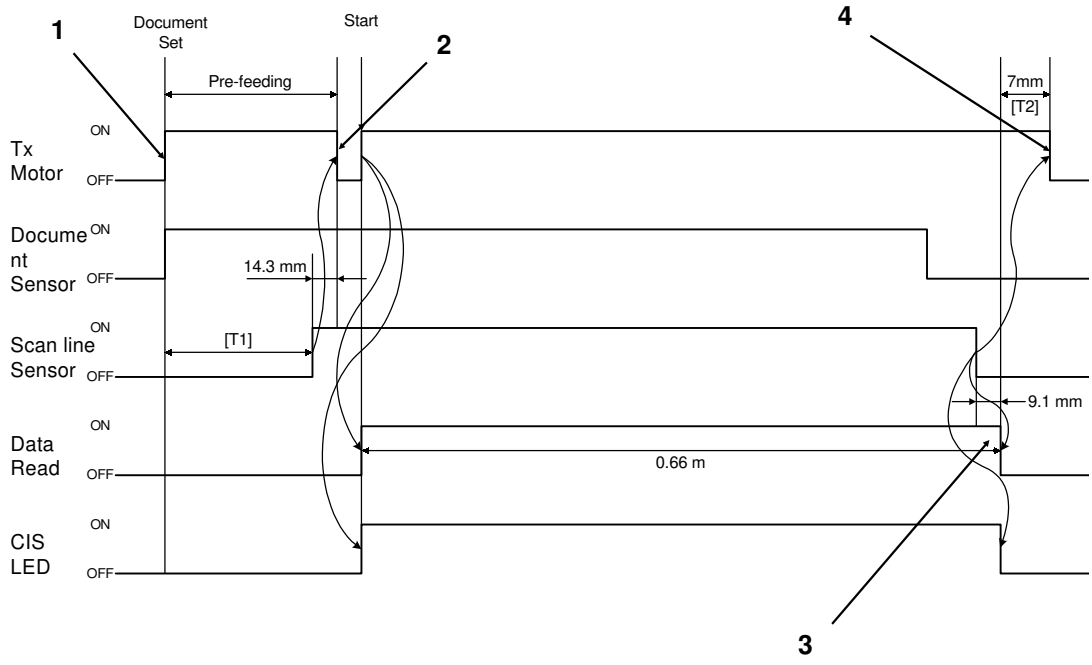
The image sensor consists of a row of 1728 photosensitive elements (216 mm width x 8 dots/mm). Light from the LED array is reflected from the document and focused onto the image sensor by the optical lens array. Because of the short optical path inside the CIS, the focal depth is much shorter than for a CCD type scanner.

The white level is stored in the SRAM on the FCU at the factory. The white level must be adjusted when the FCU or CIS is replaced in the field, or when the SRAM is cleared in the field.

Cross reference
White level adjustment: Service Table and Procedures (chapter 4), section 4.1.11

2.1.2. Scanner Timing Chart

1. Timing Chart



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The following describes what is happening for standard resolution at points 1 to 4 on the timing chart.

1. When the document is set, the document sensor turns on, then the tx motor feeds the document to the scan line sensor.
2. The tx motor stops feeding 14.3 mm after the scan line sensor was turned on.
3. Data reading is finshed after the document was fed 9.1 mm since the scan line sensor was turned off.
4. The tx motor feeds the document out of the scanner by feeding 7.0 mm feeds.

2. Jam Detection

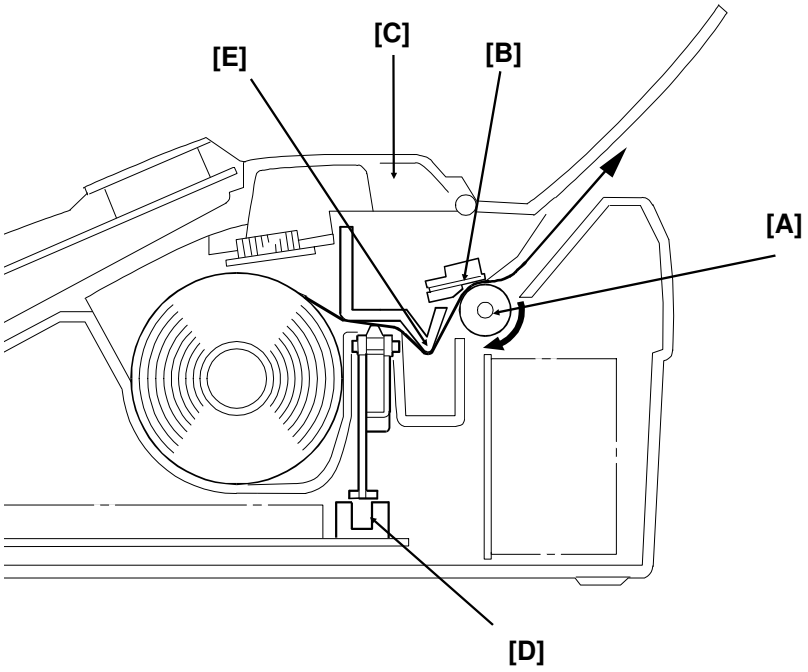
The main cpu detects a document jam if one of the following conditions occurs.

Jam Condition	Description	Error Code
Non-feed	The machine tries to prefeed up to three times for 3 seconds each time. If the scan line sensor does not switch on within the 3rd 3.0 s [T1] interval, an error is detected. The jam condition is reset when the document and scan line sensor are turned off.	1-00
Maximum document length exceeded	The scan line sensor does not turn off after the maximum document length (0.66 m) has been fed since the start key was pressed. The jam condition is reset when the document and scan line sensor are turned off.	1-01
Document jam	The scan line sensor turns on during document feed [T2]. The jam condition is reset when the document and scan line sensor are turned off.	No error code

2.2. PRINTING

2.2.1. Mechanisms

1. Overview



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The printer consists of the platen roller [A] and the thermal head [B].

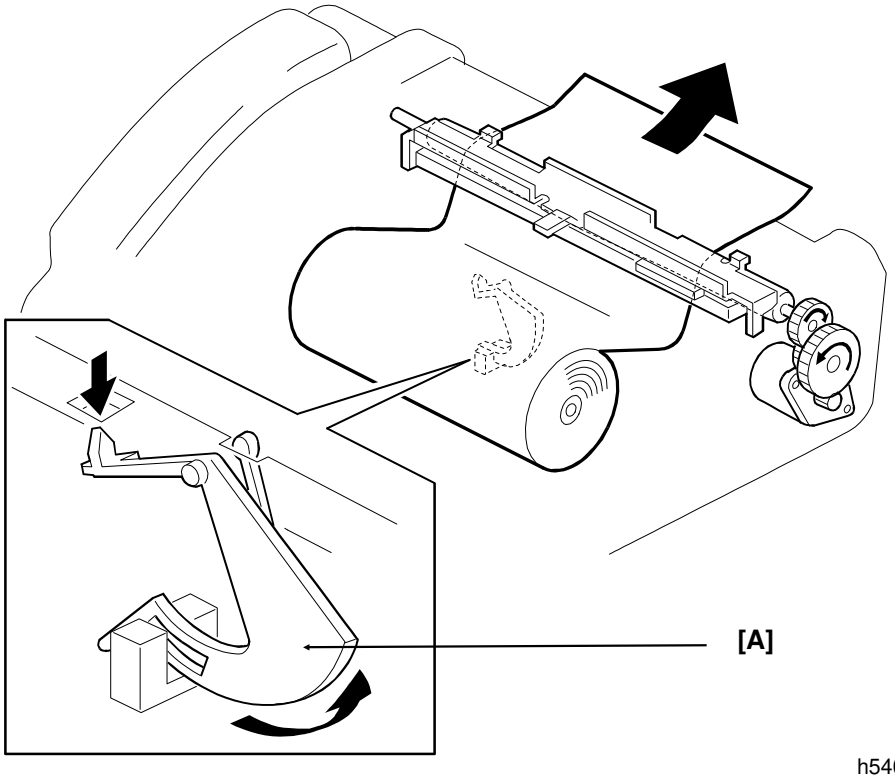
Whenever the printer cover [C] is closed, the thermal head is pressed against the platen roller by the spring so that printing and paper feeding can be done.

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

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

There is no automatic cutter unit in this machine.

2. Paper End Detection



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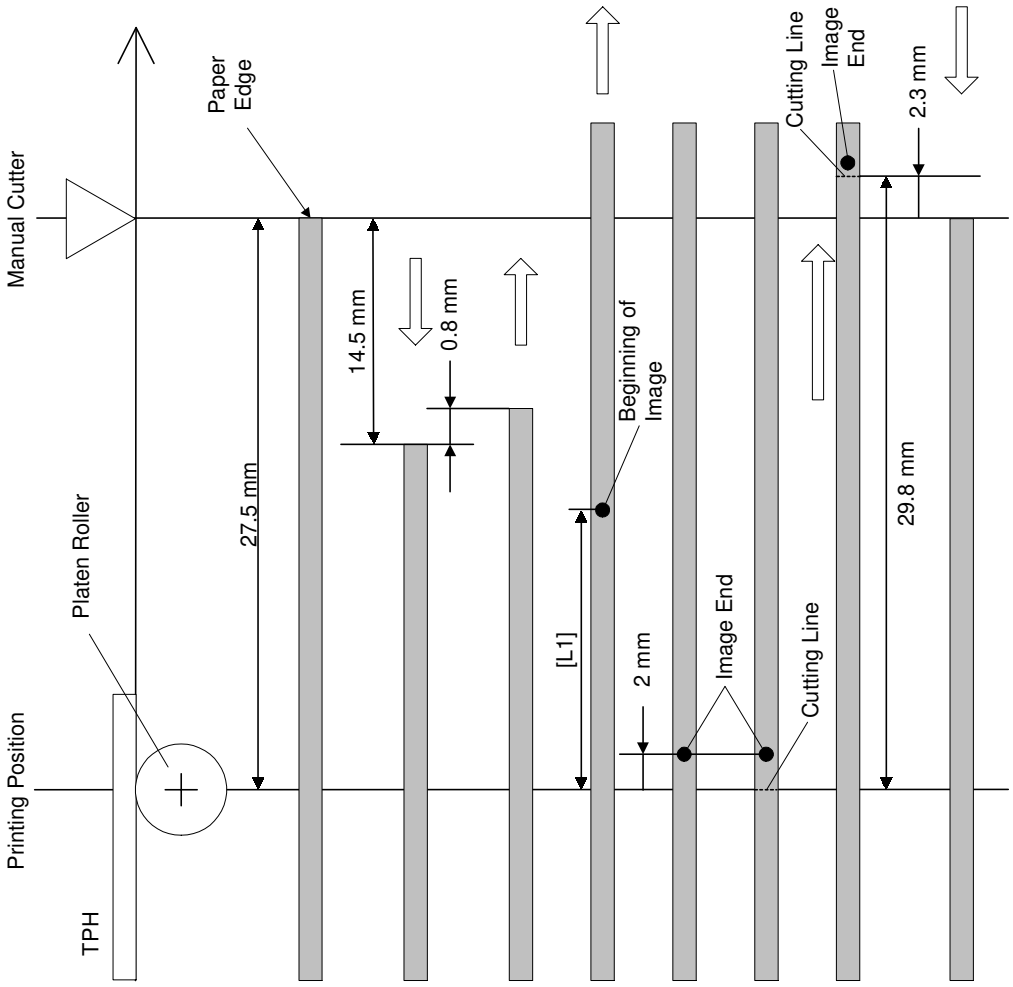
When the paper runs out, the actuator of the cover open/paper end sensor [A] pivots into the sensor, and "REPLACE PAPER" and "COVER OPEN" are alternately displayed.

When paper runs out while a received message is being printed, the communication is terminated. Then the machine sends an error protocol signal to the sender.

3. Paper Feeding



h540d532.wmf

2.2.2. Jam Detection

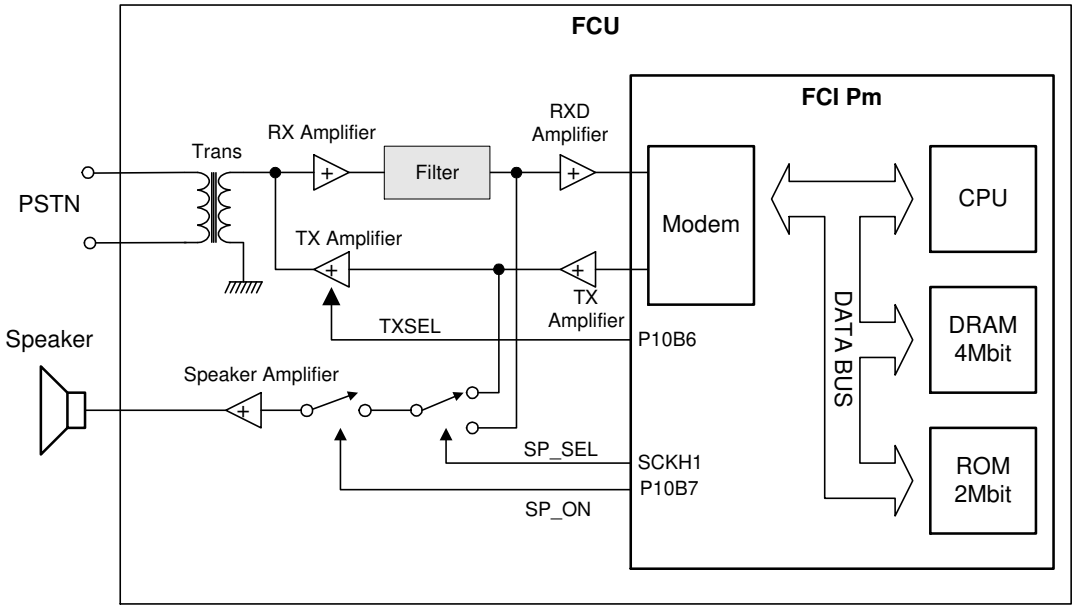
	Condition	Error Code
Cover open Paper end	When the printer cover is opened while the machine is printing.	1-17
Thermal head short	The cpu checks the thermal head before printing to see if the thermal head has not been shorted. If there is no short, the cpu turns the thermal head on.	2-40

2.2.3. 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. SYSTEM FEATURES

2.3.1. Telephone Answering Machine



H540D530.wmf

Incoming voice messages from the line passs to the modem in the FCIPm through the rx amplifer. After the modem modulates and codes the voice data, it is stored in the DRAM.

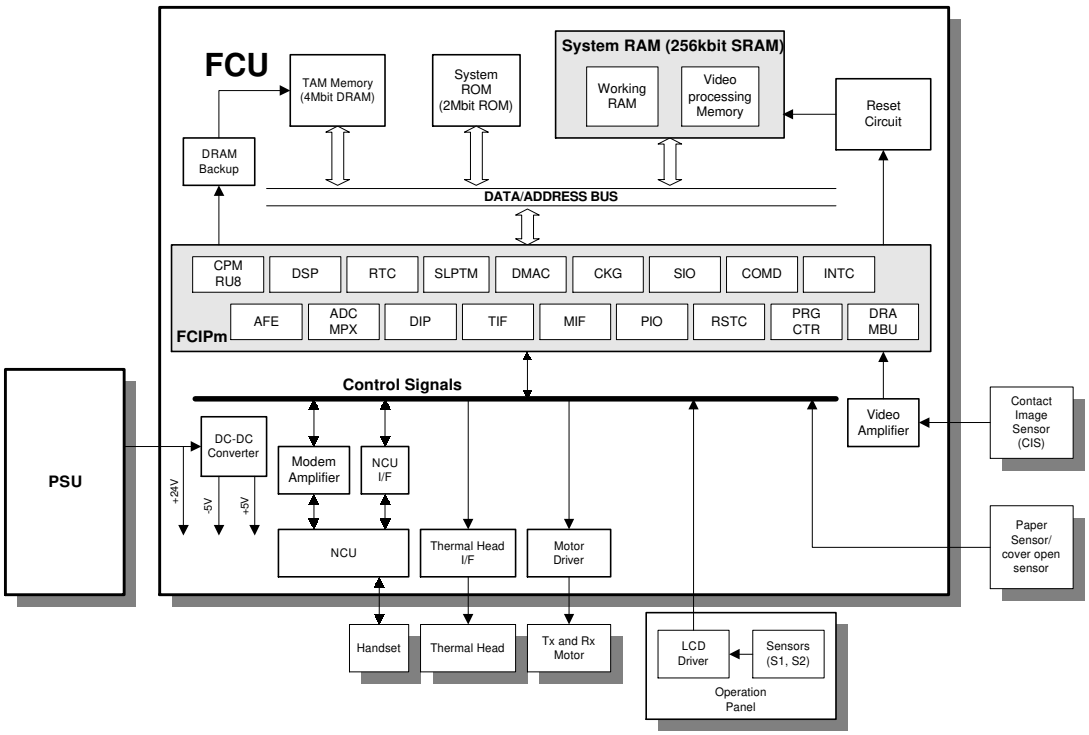
The voice data is sampled 4,800 times per second and coded as 3-bit data.

Outgoing message in the system ROM are passed to the tx amplifer after de-modulation in the modem, then sent out to the line.

2.4. PCBs

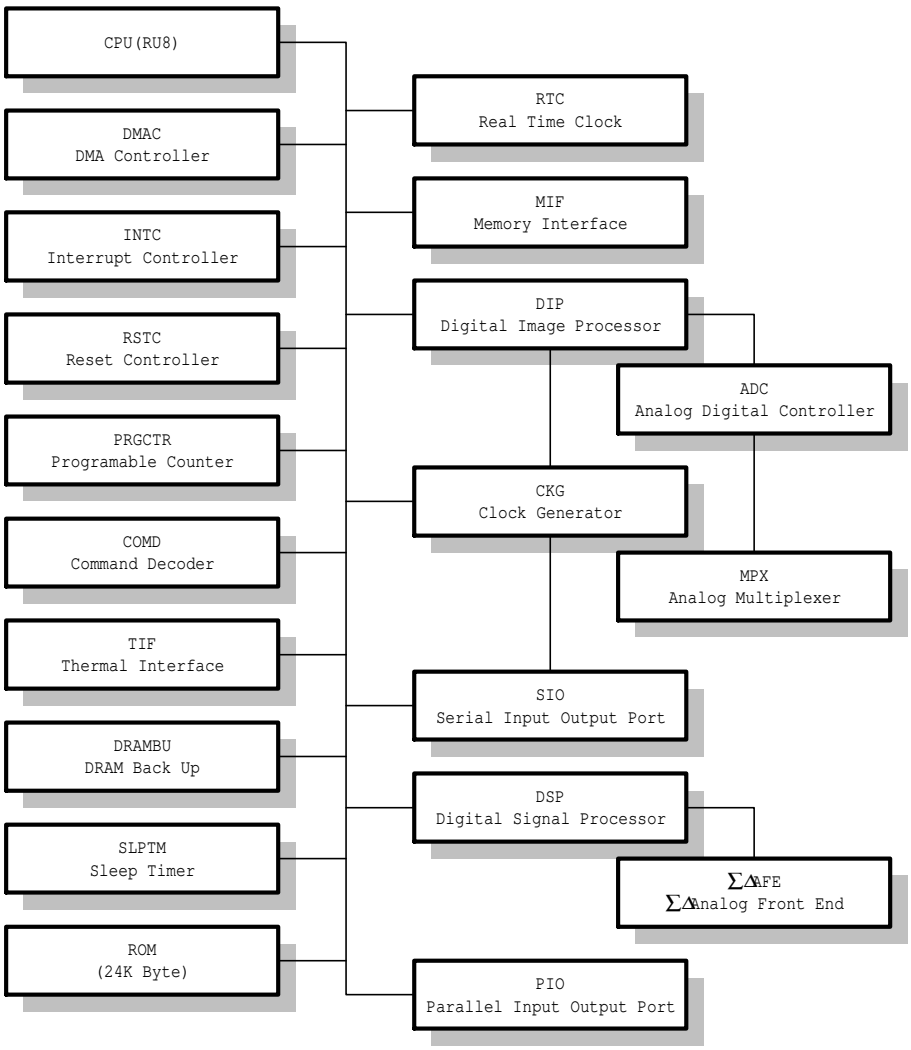
2.4.1. FCU

The FCU board contains the FCU block and the NCU block.



H540D510.wmf

1. FCIPm (Facsimile Controller and Image Processor)



H540D516.wmf

- CPU (RU8 - Main CPU)
- DSP (V.29 modem, DTMF detection, and voice message compression)
- AFE (Analog/Digital converter)
- DIP (Digital image processor)
- TIF (Thermal interface)
- DMA controller
- CKG (Clock generator)
- RTC (Real time clock)
- MIF (Memory interface)

2. ROM

- 256 kbit (2 Mbit) EP-ROM for system software storage

3. SRAM

- 256 kB SRAM shared between the Line Buffer, video processing memory, work area and the memory for system and user parameter storage
- Backed up by the battery on the FCU

4. DRAM

- 4 Mbit DRAM for TAM memory.
- This DRAM is backed up by the dry cells.

5. Oscillators

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

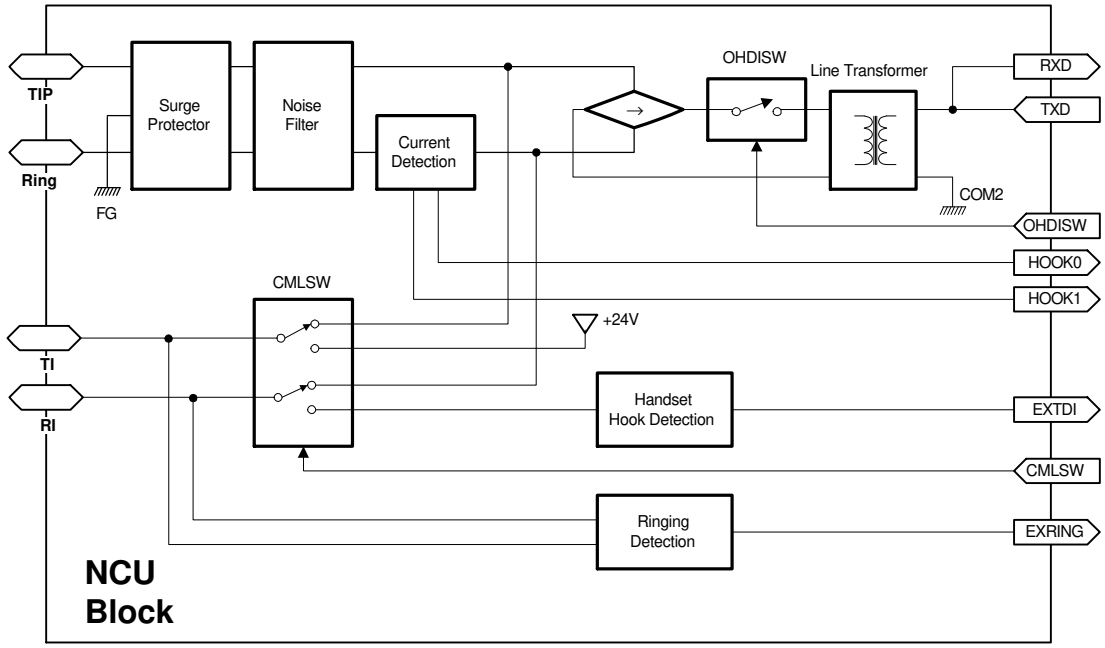
6. Others

- Stepper motor driver
- Battery back up circuit for DRAM back up when the power is turned off
- DC/DC converter which generates +5V and -5V
- Thermal head control
- Telephone answering feature
- Monitor speaker driver

7. Switches, and Test Points

Item	Description
TB1	Switches the backup battery ON/OFF
TP1	COM1 ground
TP2	Scanner clock
TP3	Synchronization signal
TP4	Analog video signal from CIS before amplifer
TP5	Analog video signal after amplifer
TP6	+5VCIS
TP7	-5V

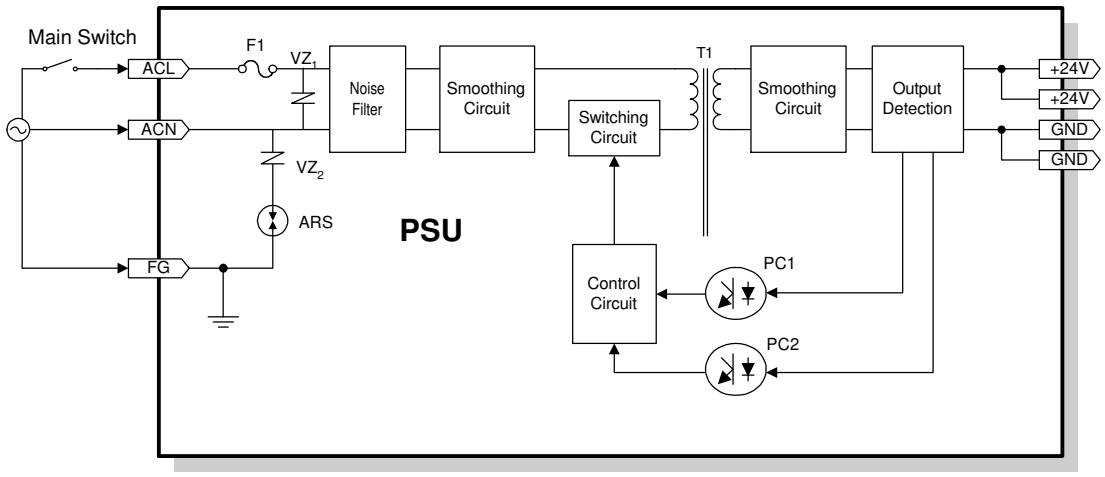
8. NCU



H540D520.wmf

- Surge protection circuit
- DC loop current detection
- Dial pulse creation
- Ringing detection
- Off hook detection

2.4.2. PSU



H540D521.wmf

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

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 (User Administration Level)	Function No.
Clock	Function 11
Initial programing items (TTI, CSI)	Function 09 to 10
On/off switches (Toll Saver, Remote Control, Paging, Notify, Transmission Result Report)	Function 04 to 08
DP/PB selection	Function 12

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
[▶] - Cursor key
[S] - Speed key
[D] - Del key

4.1.1. Bit Switch Programming (Function 21)

1. Press [3][7][D] at the same time.

```
FUNCTION : 21
```

2. [2][1]
   Bit 7 is displayed at the left, and bit 0 at the right.

```
21:SYS SW00=00000000
```

3. Scroll through the bit switch menu: [S]

```
21:COM SW00=00000000
```

   Example: To see the communication switches : [S] × 3
   Then scroll through the bit switches.
   Press # or *
   Example: Display bit switch 3: # x 3

4. Adjust the bit switch.

```
21:COM SW03=10000000
```

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

5. Either: Store the change: Press [◇]

```
PROGRAMMED
```

   Adjust more bit switches - go to step 3.

6. Finish: [▽]

4.1.2. System Parameter List (Function 22)

1. Press [3] [7] [D] at the same time.

```
FUNCTION : 22
```

2. Then input [2] [2]

```
22:SYSTEM REPORT
```

3. Print: 
4. Finish: 

4.1.3. Memory Display/Rewrite (Function 23)

1. Press [3] [7] [D] at the same time.

```
FUNCTION : 23
```

2. Then input [2] [3]

```
23: MEM R/W
```

3. Press 
4. Input the address that you wish to see.
   Example: Address 123456
   [1] [2] [3] [4] [5] [6]

```
ADD:123456 = 15
```

5. If you wish to change the data, type in the new data.

```
ADD:123456 = 15
```

   Example: F5:
   Upper byte: Press # or * until F is displayed, then press the cursor key.
   Lower byte: Press [5]

   Note: If you wish to move the cursor, press 

```
     PROGRAMMED
```

6. Enter: 
7. Finish: 

4.1.4. RAM Dump (Function 24)

1. Press [3][7][D] at the same time.

```
FUNCTION : 24
```

2. Then input [2][4]

```
24:MEM DUMP LIST
```

3. Press [◇]
4. Enter the first four digits of the start and end addresses . For example, enter “0123” for start address 012300(H), and enter 9876 for end address 9876FF(H). Then, press "Start" to print the dump list.

```
012300 - 0000FF
```

Example: Start at 012300, end at 9876FF.
[0][1][2][3][9][8][7][6] [◇]

```
24:MEM DUMP LIST
```

4. Finish: Press [▽]

4.1.5. NCU Parameters (Function 25)

1. Press [3][7][D] at the same time.

```
FUNCTION : 25
```

2. Then input [2][5]

```
25:NCU CC=026
```

4. Scroll through the parameters using [*] or [#]. If you want to change a value, enter the new value at the keypad, then press Start .
Example: Set NCU parameter 01 to 005.
[*][0][0][5] [◇]

```
25:NCU 01=005
```

```
     PROGRAMMED
```

5. To finish : [▽]

Note: Parameter CC is the Country Code, Parameter 01 is the Tx level. Refer to section 4.4 for full details on NCU parameters.

4.1.6. Modem Test (Function 26)

1. Press [3][7][D] at the same time.

```
FUNCTION : 26
```

2. Then input [2][6]

```
26:MODEM TEST
```

3. To Start the test, press [◇]

```
MODEM TEST 96
```

```
MODEM TEST 72
```

4. Scroll through the available tests using [*] or [#] then press [◇]

6. To stop the test: Press [▽]

7. To finish: Press [▽]

4.1.7. DTMF Tone Test (Function 27)

1. Press [3][7][D] at the same time.

```
FUNCTION : 27
```

2. Then input [2][7]

```
27:DTMF TEST
```

3.To start the test, press [◇]

```
DTMF 0
```

4.Then, enter the available number of the keypad

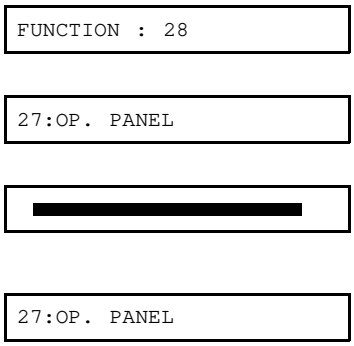
5. To stop the test, press [▽]

```
27:DTMF TEST
```

6. To finish: Press [▽]

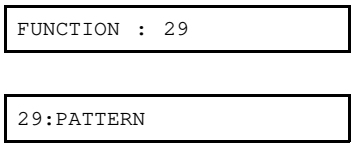
4.1.8. Operation Panel Test (Function 28)

1. Press 3 7 D at the same time.
2. Then input 2 8
3. To start the test, press
4. To stop the test, press
5. To finish: Press



4.1.9. Printer Test Pattern (Function 29)

1. Press 3 7 D at the same time.
2. Then input 2 9
3. To print; Press
4. To finish: Press



Service Tables

4.1.10. RAM Tests (Function 30)

1. Press [3][7][D] at the same time.

```
FUNCTION : 30
```

2. Then input [3][0]

```
30:RAM TEST = SRAM
```

```
30:RAM TEST = SAF
```

3. Scroll through the available tests using [*] or [#] , tnen press [◇]

   Test the SRAM: Press [◇]

   Test the SAF: Press [*] or [#], then [◇]

```
NOW CHECKING
```

   If test is successful, the display shows "OK".

```
OK !!
```

   If test is unsuccessful, the display shows "ADD;".

```
ADD;123456  R:12 W:34
```

   Example: "ADD"; The error address.
   "R" ; Value of the read data
   "W" ; Value of the write data

4. To stop the test, press [▽]

```
S30:RAM TEST = SAF
```

5. To finish: Press [▽]

4.1.11. Shading Operation

Do the following after replacing the CIS or the FCU.

1. The power turns off.
2. Open the ADF cover and place a Shading Chart on the CIS, then close the ADF cover.

Note: The Shading Chart should be placed to cover with the contact glass of the CIS and not to contact the scan line and document sensor.

3. The power turns on with pressing the key.

The machine goes to stand by automatically after the shading was done. After the Shading Operation was done, make a copy and make sure of the image.

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

4.2. REPORT FORMATS

4.2.1. SYSTEM PARAMETER LIST

Refer to the following table for the meaning of each item in the list.

Name	Remarks
ROM VER.	ROM version (Model name, Version, Year/Month/Date)
ROM NO.	ROM Part number (Part number, Suffix, Total Check sum)
TTI	TTI (Transmit Terminal Identification) 32 digits max.
CSI	CSI (Called Subscriber Identification) 20 digits max.
REMOTE CONTROL ID.	TAM remote control ID (0000 to 9999)
PAGING TEL NO.	Pager tel number, 80 digits max.
NOTIFY TEL NO.	Notify tel number, 80 digits
NCU PARAMETER	NCU parameters
COUNTER	
SCN	Scanned page counter (6 digits)
PRT	Printed page counter (6 digits)
TX	Transmitted page counter (6 digits)
RX	Received page counter (6 digits)
SERVICE MONITOR LIST	
DATE	Date when the communication error occurred.
TIME	Start time when the communication error occurred.
ADDRESS	Remote terminal where the communication error occurred.
MODE	Communicated mode
QUICK SERVICE CODE	Upper: Error codes (max. 5 errors) of each communications. (max. 5 communications) Lower: latest error codes. max. 40 codes
SWITCH	
USR	Upper: Default user setting Lower: Current user setting @: Different from the default.
SYS, SCN, PLT, COM, G3	Upper: Default switch setting Lower: Current switch setting @: Different from the default.

A sample system parameter list is given below.

```
          *  *  *  SYSTEM REPORT (Date and Time) *  *  *
                                                    TTI

ROM VER.     [Version]   [Software release no.]   [Software release date]
ROM NO.      [Software part no.] [Check sum values (total) (boot) (main)]

T  T  I
C  S  I
REMOTE CONTROL ID
PAGING TEL NO.
NOTIFY TEL NO.
NCU PARAMETER

COUNTER

                    *       *       *       *       *       *
                              SERVICE MONITOR LIST
   DATE    TIME      ADDRESS                    MODE       QUICK SERVICE CODE
   ---------------------------------------------------------------------------

   DATE    TIME      ERRROR CODE                DATE       TIME    ERROR CODE
   ---------------------------------------------------------------------------

    P : POLLING    S : STANDARD   D : DETAIL
```

```
              *  *  *  SYSTEM REPORT (Date and Time) *  *  *
                                                    TTI
SWITCH (UPPER:DEFAULT LOWER:CURRENT)
   (SWSYS) - System Bit Switch Settings

   (SWSYS) - System Bit Switch Settings

   (SWSCN) - Scanner Bit Switch Settings

   (SWPLT) - Printer Bit Switch Settings

   (SWCOM) - Communication Bit Switch Settings

   (SWG3)  - G3 Bit Switch Settings
```

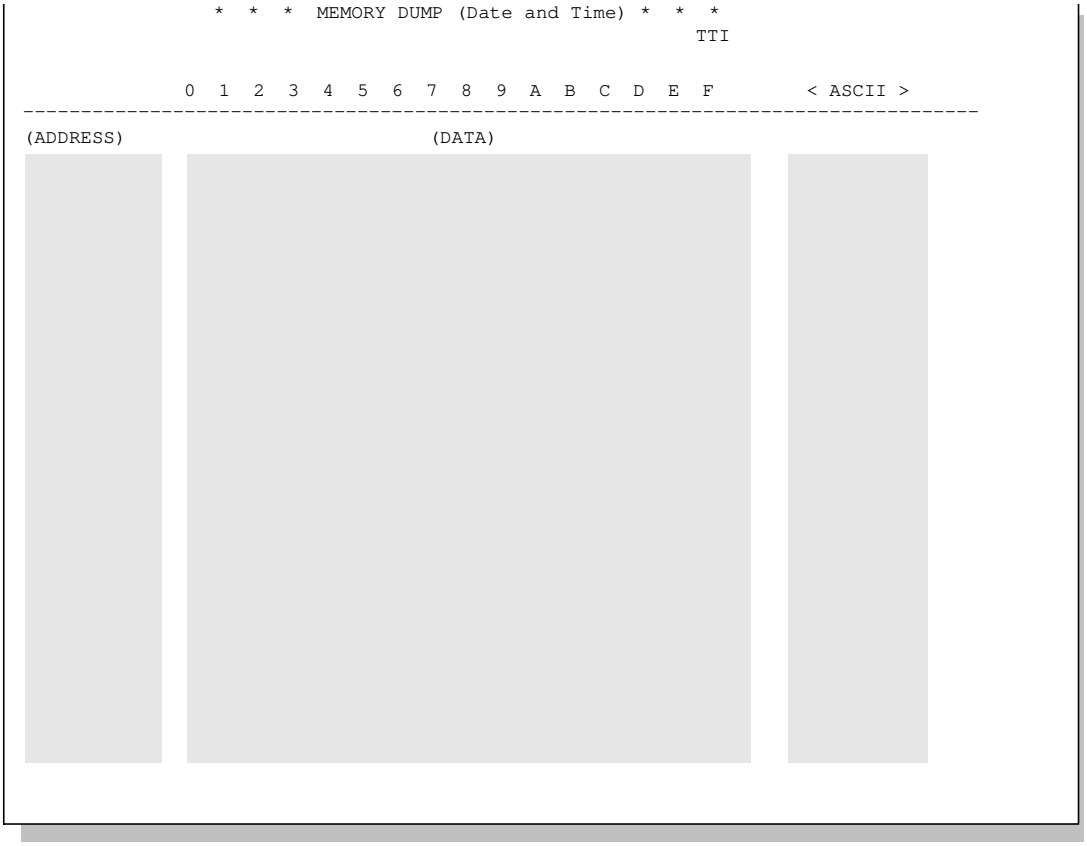
H540M550.wmf

4.2.2. Memory Dump List

Refer to the following table for the meaning of each item in the list.

Name	Remarks
ADDRESS	000000 to 0FFFFF (H)
DATA	16 hex values on one line
ASCII	" . " : 00 to 1F (H), 80 to 9F (H), 0E0 to 0FF (H)

A sample memory dump list is given below.



H540M551.wmf

4.3. 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: A * mark beside the bit switch shows the default setting.

4.3.1. 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 memory and communciation files. This setting is recommended for use when it is necessary to clear the SAF. **Reset Level 2:** In addition to those items erased by Reset Level 3, the following items are erased: bit switches, TTI/CSI, report data, programmed telephone numbers (Quick/Speed, etc.), NCU parameters. After erasing, the machine changes these two bits back to 0 automatically. **No reset:** Normal operation
2 to 4	Not used	Do not change the settings.
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 to 7	Not used	Do not change the settings.

Service Tables

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 Switches 01 to 08- Not used (do not change the settings)

System Switch 09		
No	**FUNCTION**	**COMMENTS**
0 to 1	Not used	Do not change the settings.
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 to 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 - Not used (do not change the settings)

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

System Switches 0C to 11 - 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. (Default setting - 00011000)

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

4.3.2. Scanner Switches

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0 to 6	Not used	Do not change the settings.
7	Scanning image density **0:** Disabled **1*:** Automatically	1: Tha machine will determine the image density automatically in scanning.

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 0F. For a darker threshold, input a lower value. Default setting - 06[H]

Scanner Switches 03 to 04 - 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 - 0A[H]

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

4.3.3. Printer Switches

Printer Switches 00 to 0F - Not used (do not change the settings)

4.3.4. Communication Switches

Communication Switch 00 - Not used (do not change the settings)

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 (Estimated Fillbit Control) is switched off during transmission.
2 to 3	Not used	Do not change the settings.
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	Not used	Do not change the settings.
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.
4 to 7	Not used	Do not change the settings.

Service Tables

Communication Switches 03 to 0D - Not used (do not change the settings)

Communication Switch 0E		
No	**FUNCTION**	**COMMENTS**
0 to 7	Minumum interval between automatic dialing attempts	06 to FF (Hex), unit = 2 s (12 - 510 sec Hex) (e.g., 06[H] = 12 s) This value is the minimum time that the machine waits before it dials the next destination. Default setting - 06[H]

Communication Switches 0F to 10 - Not used (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 (1 - 255 times) Default setting - 03[H]

Communication Switch 12: Not used (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 Default setting - 05[H]

Communication Switches 14 - **1F:** Not used (do not change the settings)

4.3.5. 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 to 7	Not used	Do not change the settings.

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0 to 3	Not used	Do not change the settings.
4	DIS/DCS 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 setting.
6	CED 0: Sent* 1:Not Sent	2100 Hz
7	Not used	Do not change the setting.

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0*:** Standard and non-standard **1:** Standard only	**1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1 to 7	Not used	Do not change the settings.

G3 Switch 03		
No	**FUNCTION**	**COMMENTS**
0	DIS detection number (Echo countermeasure) **0*:** 1 **1:** 2	**0:** The machine will hang up if it receives the same DIS frame twice. **1:** Before sending DCS, the machine will wait for the second DIS which is caused by echo on the line.
1 to 4	Not used	Do not change the settings.
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.
6 to 7	Not used	Do not change the settings.

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. Default setting - 0F (H)
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 Switches 08 to 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 setting.
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 setting.

G3 Switches 0B to 0F - Not used (do not change the settings)

4.3.6. User Parameter Switches

User Parameter Switch 00		
	FUNCTION	**COMMENTS**
0 to 3	Not used	Do not change the settings.
4 5	Scanning resolution home position **Bit 5 Bit 4 Setting** 0 0 Standard* 0 1 Detail 1 0 Not Used 1 1 SF or HT	This bits determine the LED home position of the scannning resolution.
6 to 7	Not used	Do not change the settings.

User Parameter Switch 01		
	FUNCTION	**COMMENTS**
0 to 6	Not used	Do not change the settings.
7	Settings return to home position after transmission or copy. **0:** Disabled **1:** Enabled*	This bit determines whether the LED position of the scanning resolution returns to the home position.

User Parameter Switch 02 - Not used (do not change the setting)

User Parameter Switch 03		
	FUNCTION	**COMMENTS**
0 to 4	Not used	Do not change the settings.
5	Immadiate transmission result report **0*:** Disabled 1:Automatically	0: Transmission result report will not be printed. **1:** Transmission result report will be printed automatically after immadiate transmissions.
6 to 7	Not used	Do not change the settings.

User Parameter Switches 04 to 05 - Not used (do not change the settings)

User Parameter Switch 06		
	FUNCTION	**COMMENTS**
0	TTI **0:** Disabled **1:** Enabled*	This setting has the same meaning of the user function 09.
1 to 7	Not used	Do not change the settings.

User Parameter Switches 07 to 18 - Not used (do not change the settings)

User Parameter Switch 19		
	FUNCTION	**COMMENTS**
0 to 4	Not used	Do not change the settings.
5	Remote control **0:** Disabled* **1:** Enabled	This setting has the same meaning of the user function 05.
6 to 7	Not used	Do not change the settings.

User Switch 1A		
	FUNCTION	**COMMENTS**
0 **1**	Dialing type **Bit 1 Bit 0 Setting** 0 0 10 pps 0 1 20 pps 1 0 DTMF* 1 1 reserved	This setting has the same meaning of the user function 12.
2 to 7	Not used	Do not change the settings.

User Parameter Switch 1B - Not used (do not change the setting)

User Switch 1C		
	FUNCTION	**COMMENTS**
0 to 7	Ringing times of detection.	00 - 99 (BCD) times This setting determines the ringing times when the tall saving and TAM are off. (Default setting is 3)

User Parameter Switch 1D - Not used (do not change the setting)

User Switch 1E		
	FUNCTION	**COMMENTS**
0	Paging **0:** Disabled* **1:** Enabled	This setting has the same meaning of the user function 06.
1	Notifying **0:** Disabled* **1:** Enabled	This setting has the same meaning of the user function 07.
2	Toll Saving **0:** Disabled 1: Enabled*	This setting has the same meaning of the user function 04.
3 to 7	Not used	Do not change the settings.

User Parameter Switch 1f - Not used (do not change the setting)

4.4. 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 are also given. Most of these must be changed by RAM read/write (Function 23), but some can be changed using NCU Parameter programming (Function 25); if Function 25 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.

Address	Function	Default	Unit	Remarks
004F00	Country code for NCU parameters		**Country** China (Do not change the setting)	**Decimal** 26 **Hex** 1A
004F01	Line current detection time	FF	20 ms	Line current is not detected if 004F01 contains FF.
004F02	Line current wait time	FF		
004F03	Line current drop detect time	FF		
004F04	PSTN dial tone frequency range (high byte)	FF	Hz (BCD)	See Note 2.
004F05	PSTN dial tone frequency range (low byte)	FF		
004F06	Not used			Do not change the factory setting.
004F07				
004F08	PSTN dial tone detection time	FF	20 ms	If 004F08 contains FF, the machine pauses for the pause time (address 004F0D / 004F0E).
004F09	PSTN dial tone reset time (LOW)	FF		
004F0A	PSTN dial tone reset time (HIGH)	FF		
004F0B	PSTN dial tone continuous tone time	FF		
004F0C	PSTN dial tone permissible drop time	FF		
004F0D	PSTN wait interval (LOW)	C8		
004F0E	PSTN wait interval (HIGH)	00		
004F0F	PSTN ringback tone detection time	FF	20 ms	Detection is disabled if this contains FF.
004F10	PSTN ringback tone off detection time	FF	20 ms	
004F11	PSTN detection time for silent period after ringback tone detected (LOW)	FF	20 ms	
004F12	PSTN detection time for silent period after ringback tone detected (HIGH)	FF	20 ms	

Address	Function	Default	Unit	Remarks
004F13	PSTN busy tone frequency range (high byte)	00	Hz (BCD)	If 004F13 is FF, detection is disabled. See Note 2.
004F14	PSTN busy tone frequency range (low byte)	6C		
004F15 to 004F29	Not used			
004F2A	Busy tone ON time: range 1	11	20 ms	
004F2B	Busy tone OFF time: range 1	11		
004F2C	Busy tone ON time: range 2	FF		
004F2D	Busy tone OFF time: range 2	FF		
004F2E	Busy tone ON time: range 3	FF		
004F2F	Busy tone OFF time: range 3	FF		
004F30	Busy tone ON time: range 4	FF		
004F31	Busy tone OFF time: range 4	FF		
004F32	Busy tone continuous tone detection time	FF		
004F33	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 2 and 3 must always be kept at 0. Bits 7, 6, 5, 4 - number of cycles required for cadence detection (Default setting - 42[H])			
004F34	International dial tone frequency range (high byte)	FF	Hz (BCD)	See Note 2.
004F35	International dial tone frequency range (low byte)	FF		
004F36	Not used			Do not change the factory settings
004F37				

Service Tables

Address	Function	Default	Unit	Remarks
004F38	International dial tone detection time	FF	20 ms	If 004F38 contains FF, the machine pauses for the pause time (004F3D / 004F3E).
004F39	International dial tone reset time (LOW)	FF		
004F3A	International dial tone reset time (HIGH)	FF		
004F3B	International dial tone continuous tone time	FF		
004F3C	International dial tone permissible drop time	FF		
004F3D	International dial wait interval (HIGH)	00		
004F3E	International dial wait interval (LOW)	00		
004F3F	Country dial tone upper frequency limit (HIGH)	FF	Hz (BCD)	See Note 2.
004F40	Country dial tone upper frequency limit (LOW)	FF		
004F41	Country dial tone lower frequency limit (HIGH)	FF		
004F42	Country dial tone lower frequency limit (LOW)	FF		
004F43	Country dial tone detection time	FF	20 ms	If 004F43 contains FF, the machine pauses for the pause time (004F48 / 004F49).
004F44	Country dial tone reset time (LOW)	FF		
004F45	Country dial tone reset time (HIGH)	FF		
004F46	Country dial tone continuous tone time	FF		
004F47	Country dial tone permissible drop time	FF		
004F48	Country dial wait interval (LOW)	00		
004F49	Country dial wait interval (HIGH)	00		
004F4A	Time between opening or closing the Ds relay and opening the Di relay	3D	1 ms	See Notes 4 Function 25 (parameter 11).
004F4B	Break time for pulse dialling	44	1 ms	See Note 4 Function 25 (parameter 12).
004F4C	Make time for pulse dialling	22	1 ms	See Note 4 Function 25 (parameter 13).
004F4D	Time between final Di relay closure and Ds relay opening or closing	19	1 ms	See Notes 4 Function 25 (parameter 14).

Address	Function	Default	Unit	Remarks
004F4E	Minimum pause between dialled digits (pulse dial mode)	24	20 ms	See Note 3. Function 25 (parameter 15).
004F4F	Time waited when a pause is entered at the operation panel	65		Function 08 (parameter 25). See Note 3.
004F50	DTMF tone on time	64	1 ms	Function 25 (parameter 17).
004F51	DTMF tone off time	6E		Function 25 (parameter 18).
004F52	Tone attenuation value in DTMF signals	05	-dBm x 0.5	Function 25 (parameter 19). See Note 5.
004F53	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	04	-Nx0.5 (dB)	Function 25 (parameter 20). See Note 5.
004F54	PSTN: DTMF tone attenuation level after dialling	22	-dBm x 0.5	Function 25 (parameter 21). See Note 5.
004F55 to 004F5C	Not used			Do not change the settings.
004F5D	PSTN access pause time	FF	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 004F4F is used.
004F5E	Progress tone detection level, and cadence detection enable flags	C0	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	
004F5F	Polarity detection	00	Bit 4 1: Enable: Tx Polarity detection Bit 5 1: Enable: Rx Polarity detection	
004F60 to 004F71	Not used			Do not change the settings.

Address	Function	Default	Unit	Remarks
004F72	Acceptable ringing signal frequency: range 1, upper limit	11	1000/ N (Hz).	Function 25 (parameter 02).
004F73	Acceptable ringing signal frequency: range 1, lower limit	53		Function 25 (parameter 03).
004F74	Acceptable ringing signal frequency: range 2, upper limit	FF		Function 25 (parameter 04).
004F75	Acceptable ringing signal frequency: range 2, lower limit	00		Function 25 (parameter 05).
004F76	Number or rings until a call is detected	01	1	Function 25 (parameter 06).
004F77	Minimum required length of the first ring	0A	20 ms	See Note 4. Function 25 (parameter 07).
004F78	Minimum required length of the second and subsequent rings	0A	20 ms	Function 25 (parameter 08).
004F79	Ringing signal detection reset time (LOW)	90	20 ms	Function 25 (parameter 09).
004F7A	Ringing signal detection reset time (HIGH)	01		Function 25 (parameter 10).
004F7B to 004F80	Not used			Do not change the settings.
004F81	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.	19	20 ms	Factory setting: 500 ms
004F82	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			Default setting - 00[H]
004FA1	Acceptable CED detection range (high byte)	02	BCD (Hz)	See Note 2.
004FA2	Acceptable CED detection range (low byte)	00		

Address	Function	Default	Unit	Remarks
004FA3	Not used			Do not change the factory setting.
004FA4				
004FA5	CED detection time	0A	20 ms ± 20 ms	Factory setting: 200 ms
004FA6 to 004FA9	Not used			Do not change the factory setting.
004FAA	CNG detection time	0A	20 ms ± 20 ms	Factory setting: 200 ms
004FAB	CNG on time	23	20 ms	Factory setting: 500 ms
004FAC	CNG off time	91	20 ms	Factory setting: 200 ms
004FAD	Number of CNG cycles required for detection	32		The data is coded in the same way as address 004F33.Factory setting: 23[H]
004FAE to 004FB2	Not used			Do not change the settings.
004FB3	Detection time for 800 Hz AI short protocol tone	12	20 ms	Factory setting: 360 ms
004FB4	PSTN: Tx level from the modem	04	- dBm	Function 25 (parameter 01).
004FB5	PSTN: 1100 Hz tone transmission level	00	- N_{004FB4} - 0.5N_{004FB5} (dB)	
004FB6	PSTN: 2100 Hz tone transmission level	00	- N_{004FB4} - 0.5N_{004FB6} (dB)	
004FB7 to 004FBC	Not used			Do not change the settings.
004FBD	Modem turn-on level (incoming signal detection level)	14	-37-0.5N (dBm)	
004FDA	T.30 T1 timer	2F	1 s	

Notes

1. If a setting is not required, store FF in the address.
2. Tone frequencies are stored in hex code. FF[H] = disabled.
3. Pulse dial parameters (addresses 004F4E) 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 $N_{\mathbf{004F52/004F54}}$ dBm
   Low frequency tone: - 0.5 x ($N_{\mathbf{004F52/004F54}}$ + $N_{\mathbf{807F53}}$) dBm
   Note: $N_{\mathbf{004F52}}$, for example, means the value stored in address 004F52[H]

4.5. SERVICE RAM ADDRESSES

⚠CAUTION

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

003D00[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).

003D01 to 003D04[H] - ROM version (Read only)
003D01[H] - Revision number (BCD)
003D02[H] - Year (BCD)
003D03[H] - Month (BCD)
003D04[H] - Day (BCD)

003D05[H] - Total program checksum (low)
003D06[H] - Total program checksum (high)

003D10 to 003D2F[H] - System bit switches
003D30 to 003D3F[H] - Scanner bit switches
003D40 to 003D4F[H] - Printer bit switches
003D50 to 003D6F[H] - Communication bit switches
003D70 to 003D7F[H] - G3 bit switches
003D90 to 003DAF[H] - User Parameter switches

003DC8 to 003DDB[H] - CSI (Max. 20 characters - ASCII)
003DDC to 003DFB[H] - TTI (Max. 32 characters - ASCII) - **Note 1**
003DFC[H] - Number of CSI characters (Hex)

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

003E03[H] - Remote control ID code (low - Hex)
003E04[H] - Remote control ID code (high - Hex)

The following counters are listed on the System Parameter List.

003E12 to 003E14[H] - Tx counter (TX)

Address	High	Low
003E12[H]	Tens digit	Unit digit
003E13[H]	Thousands digit	Hundreds digit
003E14[H]	Millions digit	Ten thousands digit

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

003E15 to 003E17[H] - Rx counter (RX)

003E18 to 003E1A[H] - Scan counter (SCN)

003E1B to 003E1D[H] - Print counter (PRT)

0046F4 to 0046F5 [H] - Scanner Video Processing Parameters

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, Detail	0046F5[H]	0	0	1	1	0	0	0	0
Half Tone	Detail	0046F4H]	0	1	1	0	0	0	1	0

Bit 0: Peak level adjustment in Halftone mode 0: Fixed, 1: Altered
Bit 1: Edge detection 1: On
Bit 2: Threshold value for edge detection 0: Normal, 1: High
Bit 3: Background detection threshold 0: Low, 1: High
Bit 4: MTF 0: On, 1: Off
Bit 5: MTF algorithm 0: Low, 1: High
Bit 6: Automatic image density (Scanning) 0: On, 1: Off
Bit 7: Erasure of irregular dots 0: On, 1: Off

00427B to 00436A[H] - Latest 40 error codes (Read only)

One error record consists of 6 bytes of data.

First error record start address - 00427B[H]
Second error record start address - 004281[H]
Third error record start address - 004287[H]
: : :
40th error record start address - 004265[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.]

00436D to 004503[H] - Latest 11 error communication records

One error communication record consists of 37 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: Not used.	
Bit 5: Not used.	
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 - Not used

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

13th and 14th bytes - Not used.

15th byte - Not used.

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

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

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

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

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

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

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

5. REPLACEMENT AND ADJUSTMENT

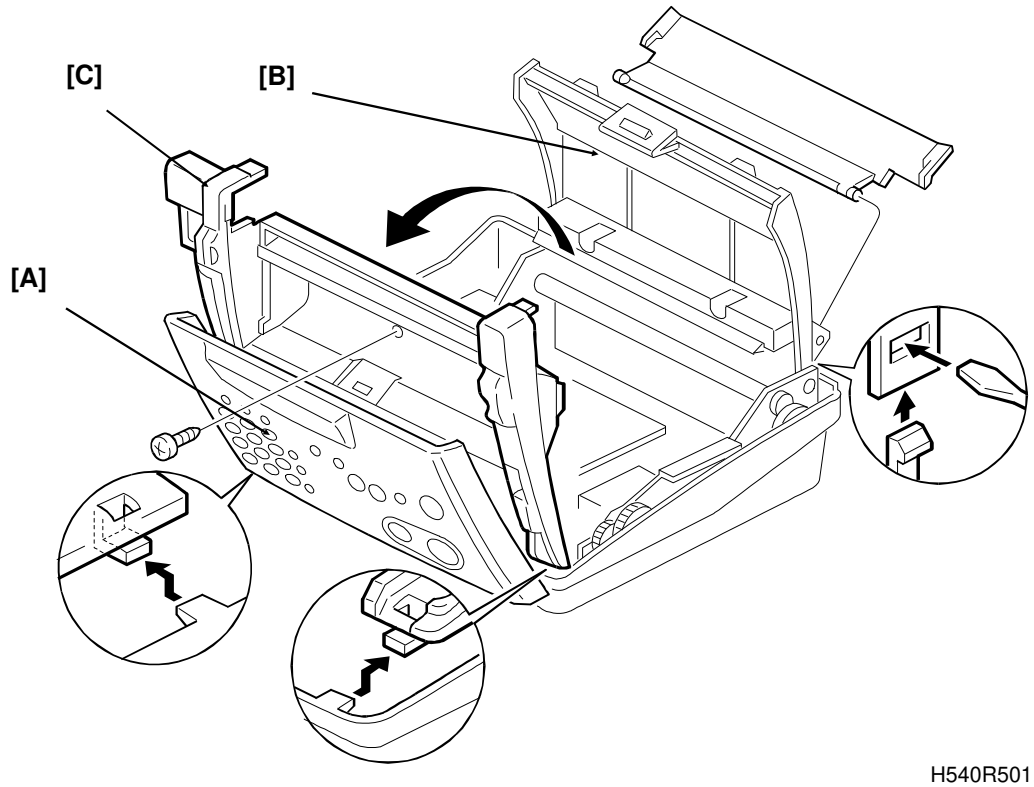
⚠CAUTION

Before starting disassembly, be sure that the user has finished with TAM message files in the memory. 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

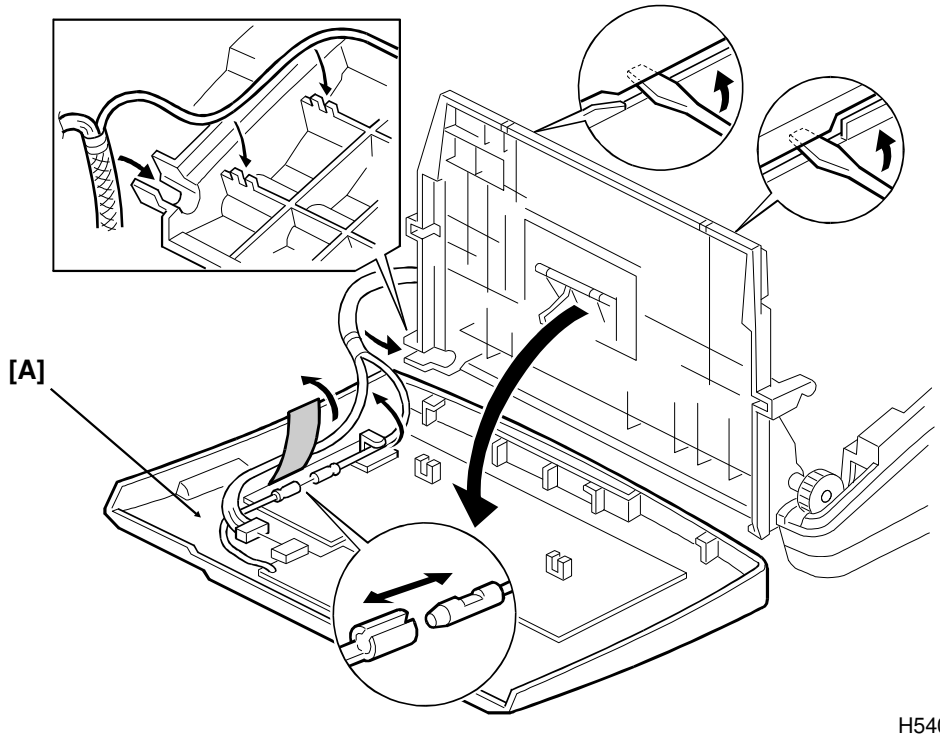
5.1.1. Upper Cover [C]



H540R501.WMF

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

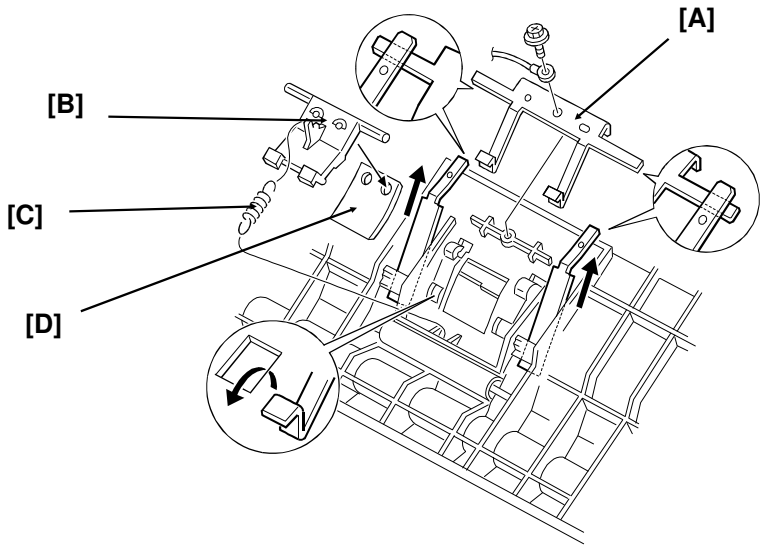
5.1.2. Operation Panel Assembly [A]



H540R502.wmf

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

5.1.3. Separation Pad [D]

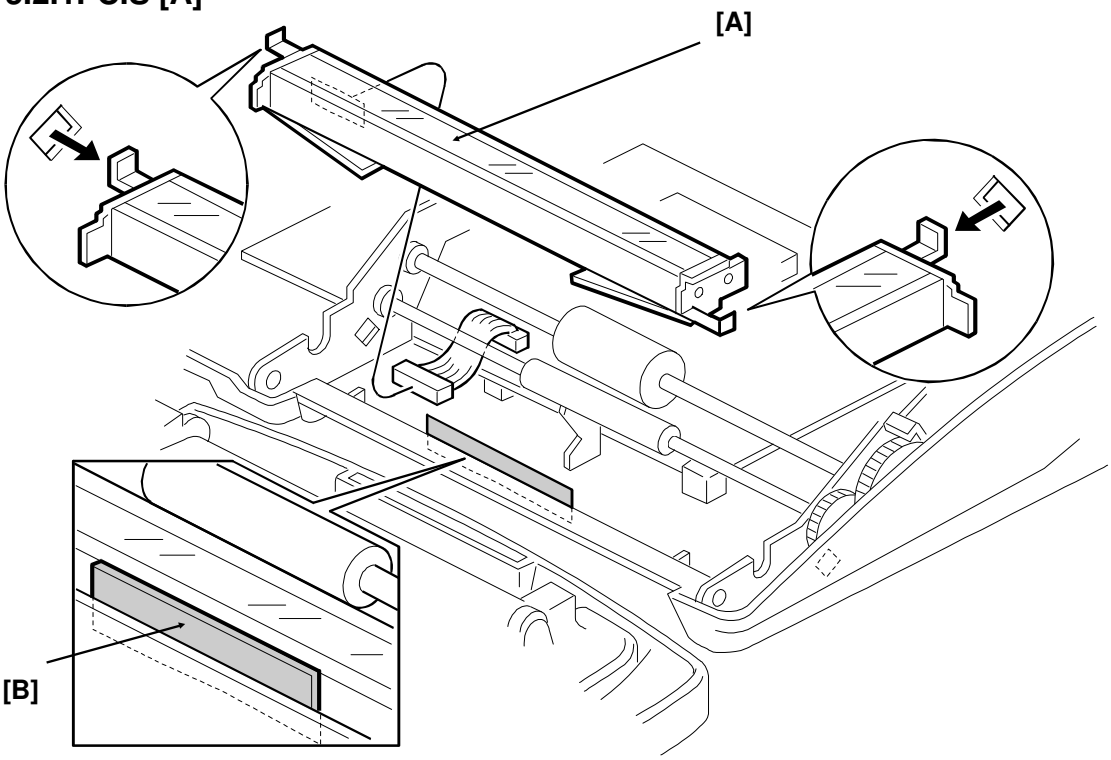


H540R503.wmf

First, remove the operation panel cover.
[A]: Spring Plate (1 grounding wire)
[B]: Separation 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]



H540R504.wmf

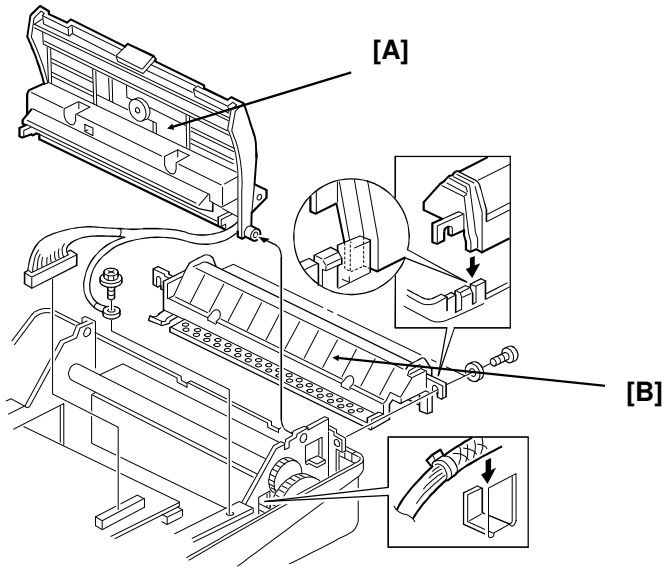
First, remove the upper cover and the operation panel ass'y.
[A]: CIS (2 tabs, 1 connector)
After installing the CIS, the shading adjustment should be done using shading operation (see chapter 4).

NOTE:
1. Make sure the antistatic brush [B] is arranged as shown.
2. Do not touch the glass surface of the CIS with bare hands.

5.3. PRINTER

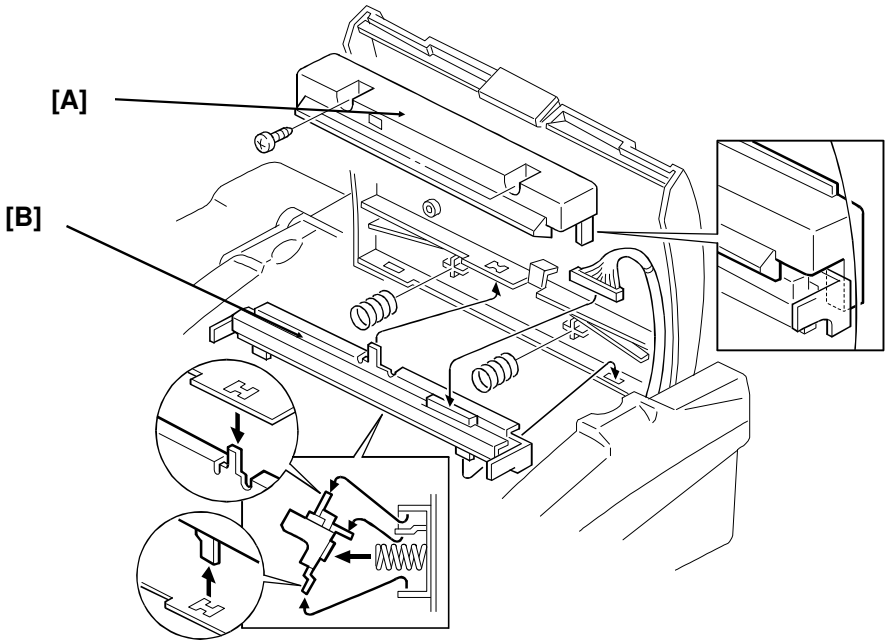
5.3.1. Printer Cover [A] and Rear Cover [B]

H540R505.wmf



[A]: Printer cover (1 connenctor, 1 grounding wire)
[B]: Rear cover (2 screws)

5.3.2. Thermal Head Assembly [B]

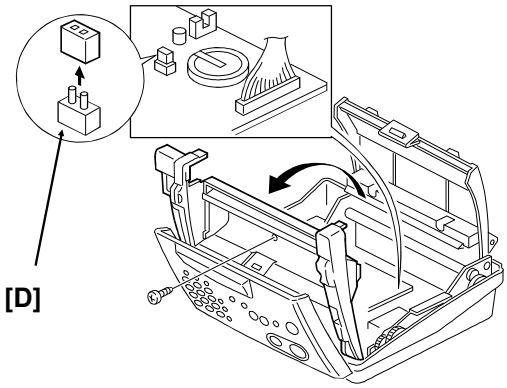


h540r507.wmf

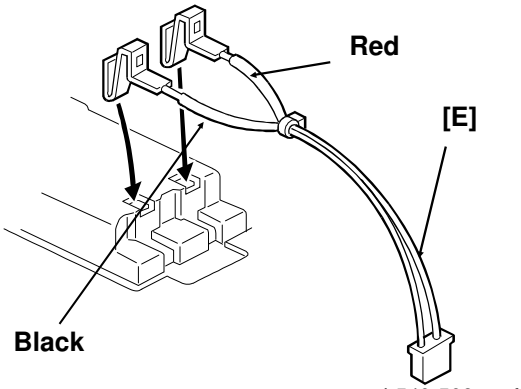
First, remove the printer cover.
[A]: Decurler (2 screws)
[B]: Thermal Head (2 hooks, 1 tab)

5.4. PCBs

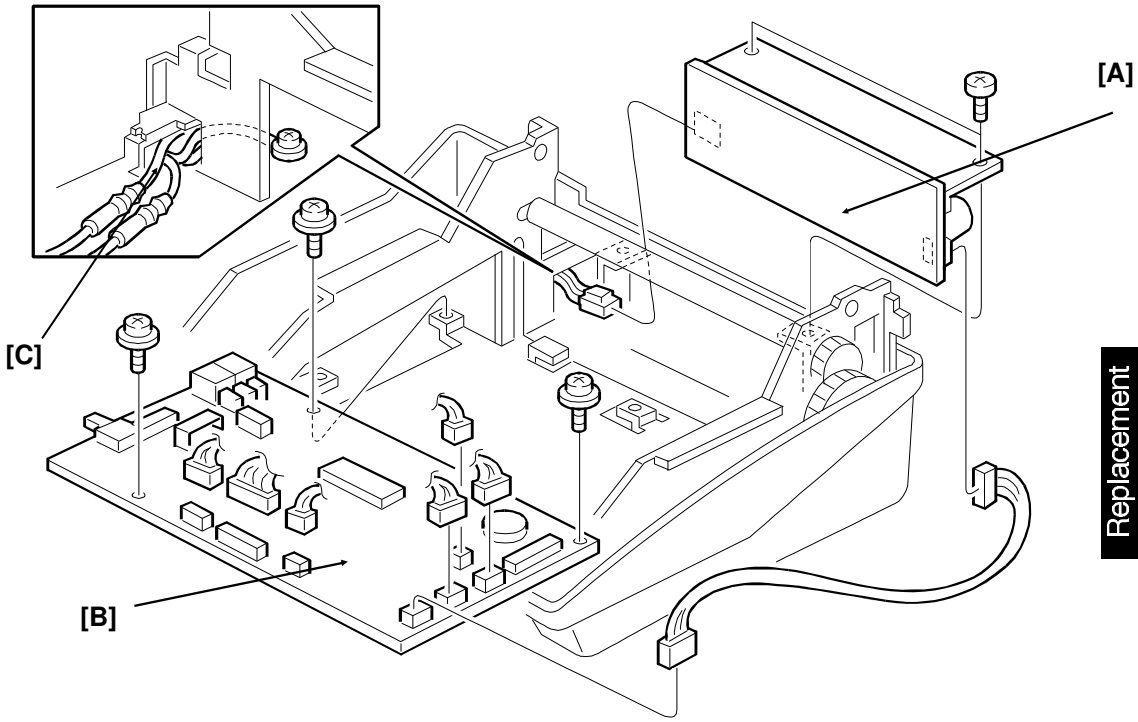
5.4.1. PSU [A] and FCU [B]



h540r510.wmf



h540r509.wmf

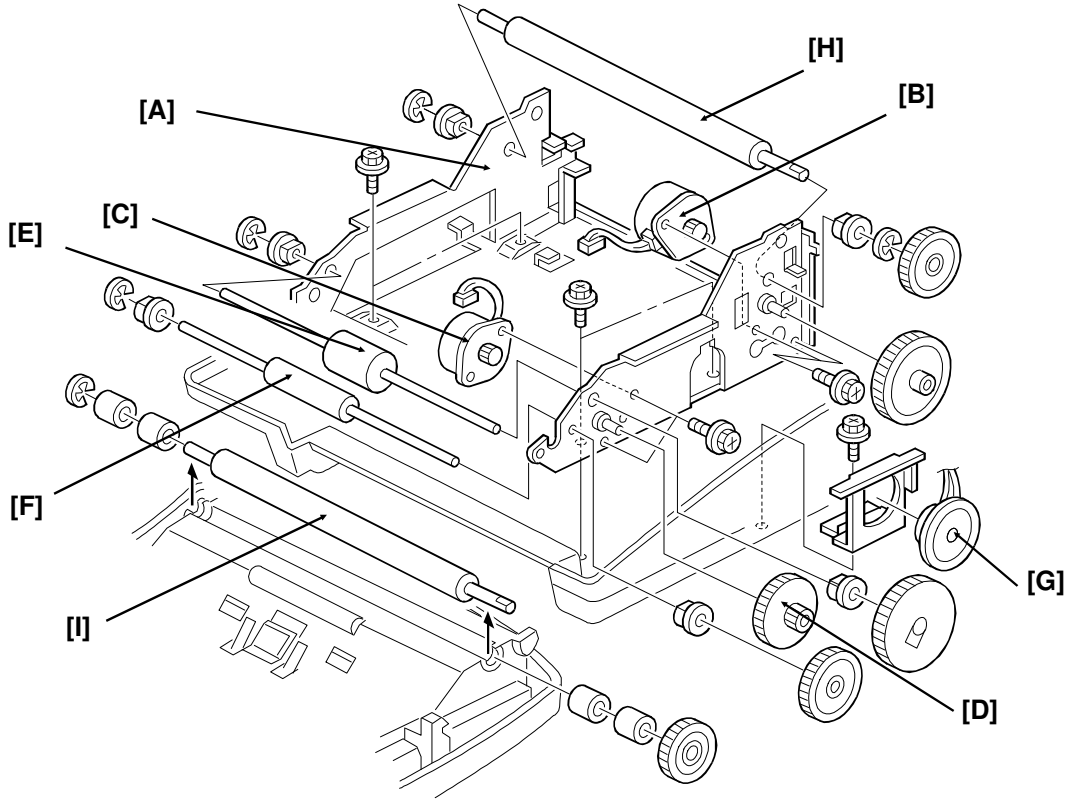


h540r508.wmf

First, remove the upper cover.
[A]: PSU (2 screws, 2 connectors, 1 grounding wire)
[B]: FCU (8 connectors, 3 screws)

NOTE:
1. When installing the PSU, the main switch harness [C] should be routed as shown above.
2. When installing the FCU, the jumper pin [D] should be installed. Otherwise, the SRAM is not backed up by the lithium battery.
3. The battery harness [E] should be connected correctly as shown above.

5.5. ROLLERS, MOTORS and SPEAKER



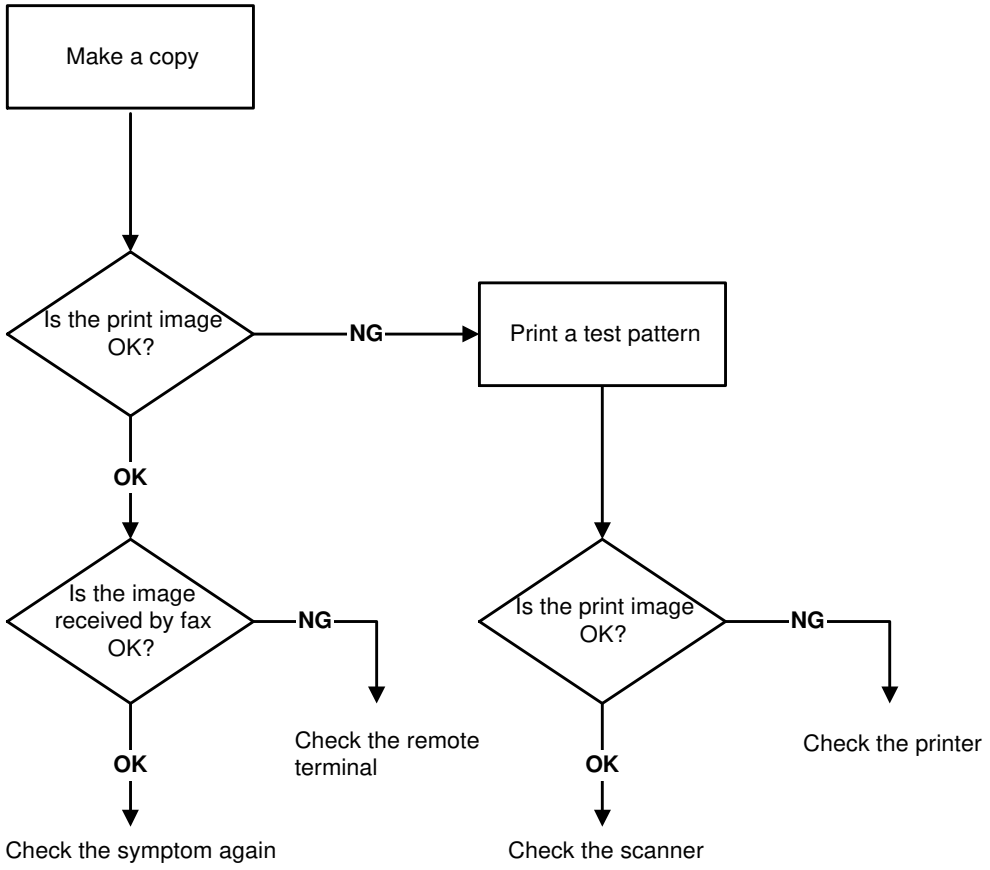
H540R506.wmf

First, remove the upper cover, printer cover, rear cover, FCU and PSU.
[A]: Base frame (4 screws)
[B]: Rx Motor (2 screws, 1 connector)
[C]: Tx Motor (2 screws, 1 connector)
[D]: Idle Gear
[E]: ADF Roller (1 gear, 2 bushings, 1 E-ring)
[F]: R1 Roller (1 gear, 2 bushings, 1 E-ring)
[G]: Speaker (1 screw)
[H]: Platen Roller (1 gear, 2 bushings, 1 E-ring)
[I]: Scanner Roller (1 gear, 4 bushings, 1 E-ring)

6. TROUBLESHOOTING

6.1. COPY QUALITY TROUBLESHOOTING

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



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 (CN6) 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 connected to the FCU is out of position.
- The contact image sensor is defective.

Action:

1. Check the connection between the FCU (CN5) 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 or Dark Background

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. (see chapter 4 shading operation)

6.1.4. Uneven Image Density Across the Main Scan

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

Possible Cause (Scanner)

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

Action:

1. Clean the exposure glass.
2. Adjust the scanner contrast threshold settings (see chapter 4 shading operation).
3. 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

Possible Cause (Printer)

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

Action:

1. Check the connection between the FCU (CN6) and the thermal head.
2. Replace the thermal head.
3. Replace the FCU.

6.1.7. Vertical White Lines

Possible Cause (Scanner)
- Defective image sensor element(s).
- Dust in the CIS.

Action:
- Adjust the scanner contrast threshold settings (see chapter 4 shading operation).
- Replace the image sensor.

Possible Cause (Printer)
- Dust on the thermal head.
- The thermal head is defective.
- The FCU is defective.

Action:

1. Clean the face of the thermal head.
2. Replace the thermal head.
2. Replace the FCU.

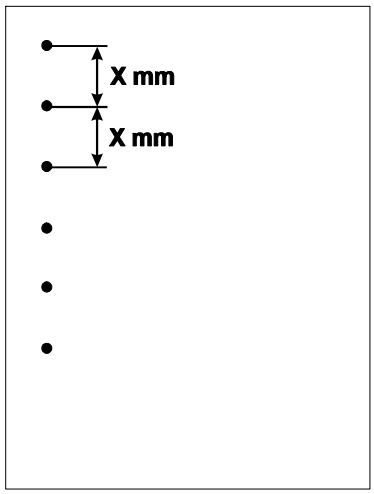
6.1.8. Horizontal White Lines

Possible Cause (Printer)
- The thermal head is defective.
- The FCU is defective.

Action:

1. Check the connection between the FCU (CN6) and the thermal head.
2. Replace the thermal head.
3. Replace the FCU.

6.1.9. Black Dots/Spots



H516T502.wmf

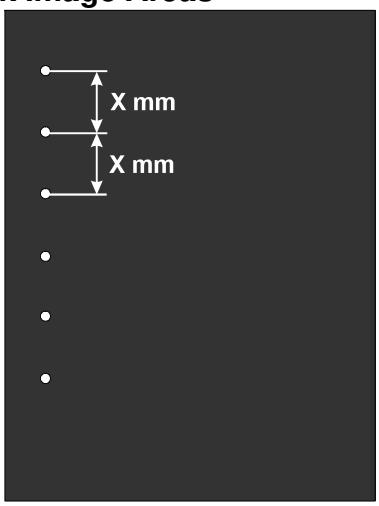
Possible Cause (Scanner)

- 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 (see chapter 4 shading operation).
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 (see chapter 4 shading operation).
3. Replace the FCU.

6.1.11. Faint Copies

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 (see chapter 4 shading operation).
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 are 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, R1 roller and feed roller 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, R1 roller and feed roller 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 (CN3) 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 installed. 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 installed.
- The Rx motor 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. If the problem still remains, do the following.
   - Check the connections between the FCU (CN4) and the Rx motor.
   - Replace the Rx motor.

2. Paper Jam - Inside Printer

Possible Cause:

- A non-recommended type of paper is being used.
- The thermal head is not properly installed.
- The platen roller is dirty.
- 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 thermal head is correctly set.
2. Check for obstructions in the paper path.
3. Check the platen roller. Clean or replace if necessary.
4. Check that the cover open/paper end sensor is working properly.
5. If the problem still remains, do the following.
   - Check the connections between the FCU (CN4) and the Rx motor.
   - Replace the Rx motor.
   - Check the FCU output of power and drive signals to the Rx motor (CN4-5, 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 installed.
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.

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	Check the line connection. The machine at the other end may be incompatible. Replace the 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. Try changing the tx level and/or cable equalizer settings. Replace the FCU. 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 004FB4 Cable equalizer - G3 Switch 07 (PSTN)
0-05	Unsuccessful after modem training at 2400 bps	Check the line connection. Try adjusting the tx level and/or cable equalizer. Replace the FCU. 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. Try adjusting the tx level and/or cable equalizer settings. Replace the 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.
0-07	No post-message response from the other end after a page was sent	Check the line connection. Replace the 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.

Code	Meaning	Suggested Cause/Action
0-08	The other end sent RTN or PIN after receiving a page, because there were too many errors	Check the line connection. Replace the 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 004FB4 Cable equalizer - G3 Switch 07 (PSTN)
0-14	Non-standard post message response code received	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 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 OPU.
0-20	Facsimile data not received within 6 s of retraining	Check the line connection. Replace the FCU. Check for line problems. Try calling another fax machine. Try adjusting the reconstruction time for the first line and/or rx cable equalizer setting. **Cross reference** Reconstruction time - G3 Switch 0A, bit 6 Rx cable equalizer - G3 Switch 07 (PSTN)
0-21	EOL signal (end-of-line) from the other end not received within 5 s of the previous EOL signal	Check the connections between the FCU and the line. Check for line noise or other line problems. Replace the FCU. The remote machine may be defective or may have disconnected. **Cross reference** Maximum interval between EOLs - 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. Replace the 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

Code	Meaning	Suggested Cause/Action
0-23	Too many errors during reception	Check the line connection. Replace the FCU. Defective remote terminal. Check for line noise or other line problems. Try asking the other end to adjust their tx level. Try adjusting the rx cable equalizer setting and/or rx error criteria. **Cross reference** Rx cable equalizer - G3 Switch 07 (PSTN), Rx error criteria - Communication Sw 02, bits 0 and 1
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
1-01	Document length exceeded the maximum	Divide the document into smaller pieces. Check the ADF drive components and sensors. **Cross reference** 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
1-71	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.
2-40	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 for line problems. Replace the FCU.
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.
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 DOCUMENT" or "DIAL FAX NO." is displayed at power-up.
	"READY" is still displayed after a document is placed in the feeder.
Scan line sensor	"CLEAR DOCUMENT" is displayed at power-up.
	"CLEAR DOCUMENT" is displayed soon after the start of copying.
Cover open/Paper end sensor	"REPLACE PAPER" and "CLOSE COVER" are displayed at power-up.