IFO

RICOH FAX880 MP
MV 74

SERVICE MANUAL

Lithium Batteries (Memory Back-up)

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

Important:

Before servicing this machine, please read the following notes.

- Do not touch the nozzle section in the ink cartridge. This helps prevent the nozzles from clogging.
- Do not touch the wiper blade on the purge unit. This also helps prevent the nozzles from clogging. (Please refer to section 2.2 for details.)
- Do not touch the aluminum plate on the ink cartridge. The aluminum plate heats up during printing. It becomes quite hot during continuous high duty printing.
- After repairs or maintenance, excessive ink may remain on the contact section of the cartridge, covers, and TIJ unit. Remove this ink with a dry cloth. The ink is electrically conductive and it may short an electrical component.
- Always store an extra cartridge (if unpacked) in the cartridge box included with the machine.
- Ensure that the TIJ unit has completed its cleaning operation before unplugging the machine.
- Ensure that the carriage is at the head capping position (home position) before leaving the machine unplugged for long periods.

Table of Contents

3. INSTALLATION

4. SERVICE TABLES AND PROCEDURES

5. REMOVAL AND ADJUSTMENT

6. TROUBLESHOOTING

1. OVERALL MACHINE INFORMATION

1.1. SPECIFICATIONS

Type
Desktop type transceiver

Circuit
PSTN, PABX

Connection
Direct couple

Document Size
Length: 105 - 600 mm [4.1 - 23.6 ins]
Width: 148 - 220 mm [5.8 - 8.7 ins]
Thickness: 0.05 to 0.15 mm [2 to 6 mils]
(equivalent to 50 - 80 g/m^2)

Document Feed
Automatic feed, face down

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

Scanning Method
Contact image sensor

Maximum Scan Width
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]
Fine - 15.4 lines/mm [391 lpi]

Memory Capacity
ECM: 64 kbytes (single buffer) for tx
SAF: 400 kbytes
(272 kbytes for tx)

Compression
MH, MR, EFC, MMR, SSC (MMR only with ECM)

Protocol
Group 3 with ECM

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

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

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

Printing System
Ink jet printing

Paper Size
Europe/Asia: A4
USA: Letter, Legal

Paper Capacity
150 sheets

Maximum Printing Width
203 mm [8.0 ins]

Maximum Printer Resolutions
Main scan: 360 dpi
(720 dpi in the printer mode)
Sub scan: 360 dpi

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

Power Consumption
Standby: 5 W	**Transmit:** 12 W
Receive: 14 W	**Copying**: 24 W
Printer: 19 W	

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

Dimensions (W x D x H)
370 x 280 x 235 mm [14.6 x 11.0 x 9.3 ins]
Excluding handset, trays, and tables

Weight
Approx. 7 kg [15 lbs]

1.2. FEATURES

KEY: O = Used, X = Not Used,
A = With optional memory only
B = With optional handset only
C = With color cartridge only

Equipment	
ADF	O
Book scan	X
Built-in handset	X
Bypass feed	X
Optional cassette	X
Cabinet	X
Counter	X
Cutter	X
Handset (option)	B
Hard disk	X
Manual feed mechanism	X
Marker (Stamp)	X
Monitor speaker	O
PC printer interface (IBM)	O

Video Processing Features	
Contrast	X
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction	X
Resolution	O

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

Communication Features - User Selectable	
Action as a transfer broadcaster	X
AI Redial (last ten numbers)	X
Answering machine interface	O
Authorized Reception	O
Auto-answer delay time	X
Auto dialing (pulse or DTMF)	O
Auto Document	X

Communication Features - User Selectable	
Auto image density selection	X
Auto paper size selection	X
Automatic Voice Message	X
Batch Transmission (max 35 files)	A
Broadcasting	O
Chain Dialing	O
Communication Result Display	X
Confidential ID Override	O
Confidential Transmission	O
Direct Fax Number Entry	O
Economy Transmission	X
Fax on demand	X
Forwarding	A
Free Polling	O
Groups (3 groups)	O
Group Transfer Station	X
Hold	X
ID Transmission	O
Immediate Redialing	O
Immediate transmission	O
Keystroke Programs	O
Memory transmission	O
Multi-step Transfer	X
Next Transfer Station	X
OMR	X
On Hook Dial	O
Ordering Toner	X
Page Count	O
Personal Codes	X
Personal Codes with Conf. ID	X
Polling Reception	O
Polling Transmission	O
Polling tx file lifetime in the SAF	O
Quick Dial (10 stations)	O
Reception modes (Auto, Tel, TAM)	O
Length Reduction (in Rx mode, called Auto Reduction)	O
Remote control features	X
Remote Transfer	X
Restricted Access	X
Secured Polling	O

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

Communication Features - Service Selectable	
AI Short Protocol	O
Auto-reduction override option	O
Busy tone detection	O
Closed Network (tx and rx)	O
Continuous Polling Reception	X
Dedicated tx parameters	O
ECM	O
EFC	O
Inch-mm conversion	X
Page retransmission: no. of times	O
Page separation mark	O
Protection against wrong conn.	O
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	O
Clearing a polling file	O
Clock	O

Other User Features	
Confidential ID	O
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	O
File Retention Time	X
File Retransmission	X
Function Programs	X
ID Code	O
Label Insertion ("From xxx")	X
Language Selection	O
LCD contrast control	X
Memory Lock	A
Memory Lock ID	A
Modifying a memory file	X
Multi Sort Document Reception	A
Multicopy mode	O
Own telephone number	X
Power Saver	X
Print density control	X
Printing a memory file	O
RDS on/off	O
Reception Mode Switching Timer	X
Reception time printing	X
Reduction/Enlargement	X
Remaining memory indicator	O
Remote ID	X
Reverse Order Printing	A
RTI, TTI, CSI	O
Secure ID	X
Service Report Transmission	X
Speaker volume control	O
Specified Cassette Selection	X
Substitute reception on/off	O
Telephone line type	O
Toner Saving Mode	X
TTI on/off	O
User Function Keys	X
User Parameters	O
Wild Cards	O

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

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

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

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

Memory Files

Max. number of files: 100
Max. number of stations/file: 100

1.3. COMPONENT LAYOUT

1.3.1. Mechanical Components
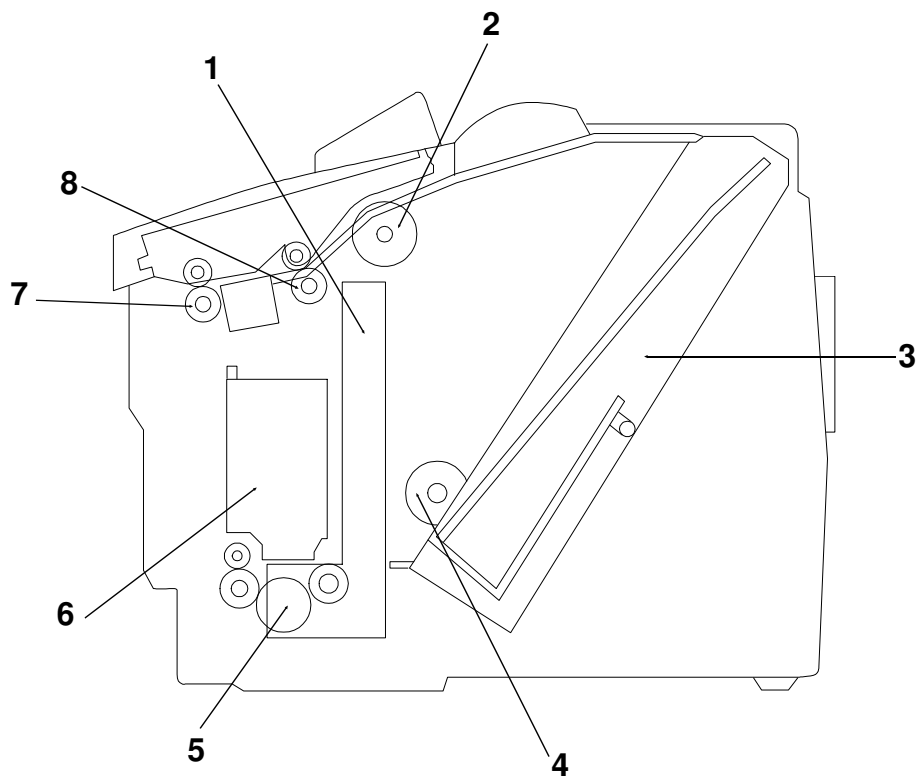
H505V501.wmf

No.	Name	Description
1	TIJ	Thermal ink jet printer unit.
2	Document Feed Roller	This roller feeds the document into the scanner.
3	Paper Feed Unit	This unit can hold up to 150 sheets.
4	Paper Feed Roller	This roller picks up the top sheet of paper, and feeds it into the printer.
5	Registration Roller	This roller carries out the registration process.
6	Carriage Unit / Ink Cartridge	The carriage unit holds the ink cartridge. The cartridge contains the ink jet printer head and the ink.
7	R2 Roller	This roller feeds the document through the scanner.
8	R1 Roller	This roller feeds the document through the scanner.

1.3.2. Electrical Components
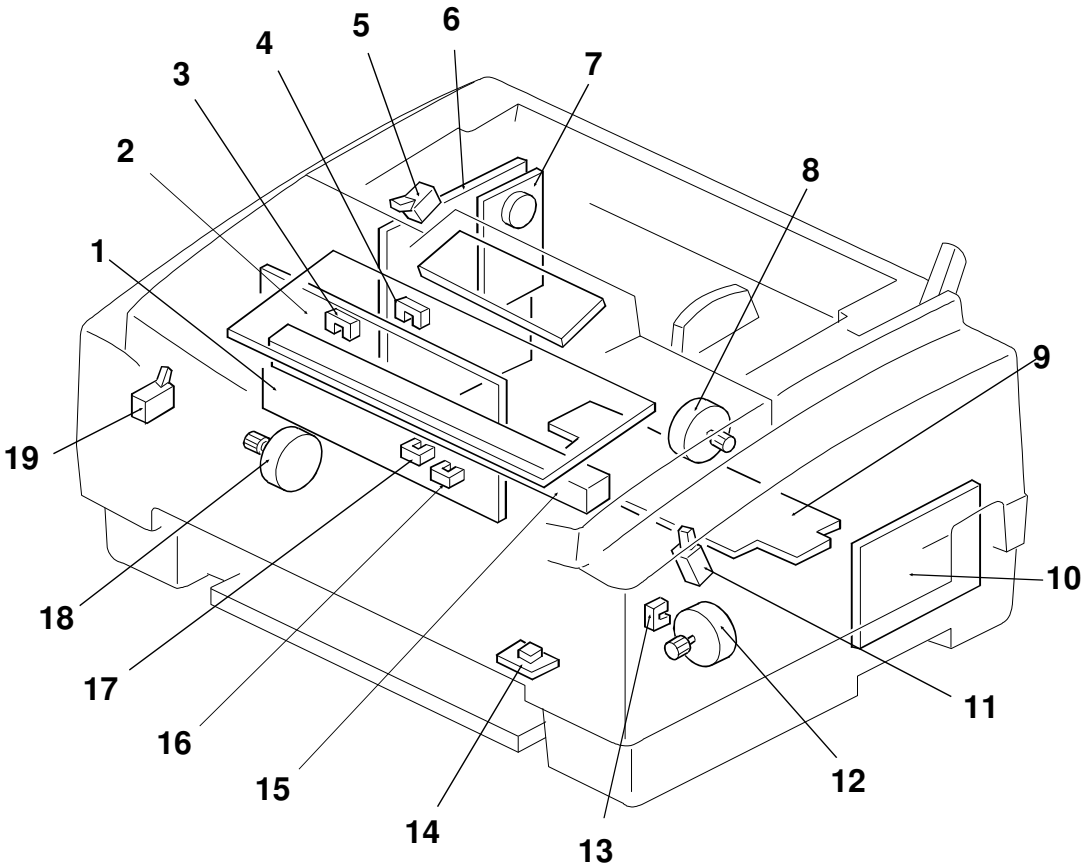
H505V502.wmf

1. PCBs

No.	Name	Description
1	FDU (Facsimile Driver Unit)	This board contains drivers for the motors, a dc-dc converter, and the DRAM backup circuit.
2	OPU (Operation Panel Unit)	This board controls the operation panel.
6	IJC (Ink Jet Controller)	This board controls the ink jet printer.
7	FCE (Facsimile Control Engine)	This board controls the machine. It contains the main cpu, ROM, system RAM, and other control components.
9	PSU (Power Supply Unit)	This board supplies power to the machine.
10	NCU (Network Control Unit)	This board contains a relay and switches to interface the machine to the network.
15	Contact Image Sensor Assembly	This sensor reads and converts the light reflected from the document into an analog video signal. It uses an RLA (Rod Lens Array) sensor unit.

2. Motors

No.	Name	Description
8	Tx Motor	This stepper motor drives the scanner rollers.
12	Carriage Motor	This motor drives the printer's carriage mechanism.
18	Paper Feed Motor	This motor drives the paper feed roller and the registration roller.

3. Sensors

No.	Name	Description
3	Scan Line Sensor	This sensor detects when the document approaches the scanning position.
4	Document Sensor	This sensor detects the presence of a document in the feeder.
5	Top Cover Sensor	This sensor detects whether the top cover is opened or closed.
11	Paper Release Lever Sensor	This sensor detects when the paper release lever is released. (The paper release lever is also known as the paper feed lever.)
13	Carriage Home Position Sensor	This sensor detects when the carriage is at the home position.
14	Ink End Sensor	This sensor detects when the ink in the cartridge has run out.
16	Paper Feed Roller Sensor	This sensor detects the initial rotation position of the paper feed roller.
17	Paper End Sensor	This sensor detects the presence of paper in the printer.
19	Front Cover Sensor	This sensor detects whether the front cover is opened or closed.

1.4. OVERALL MACHINE CONTROL
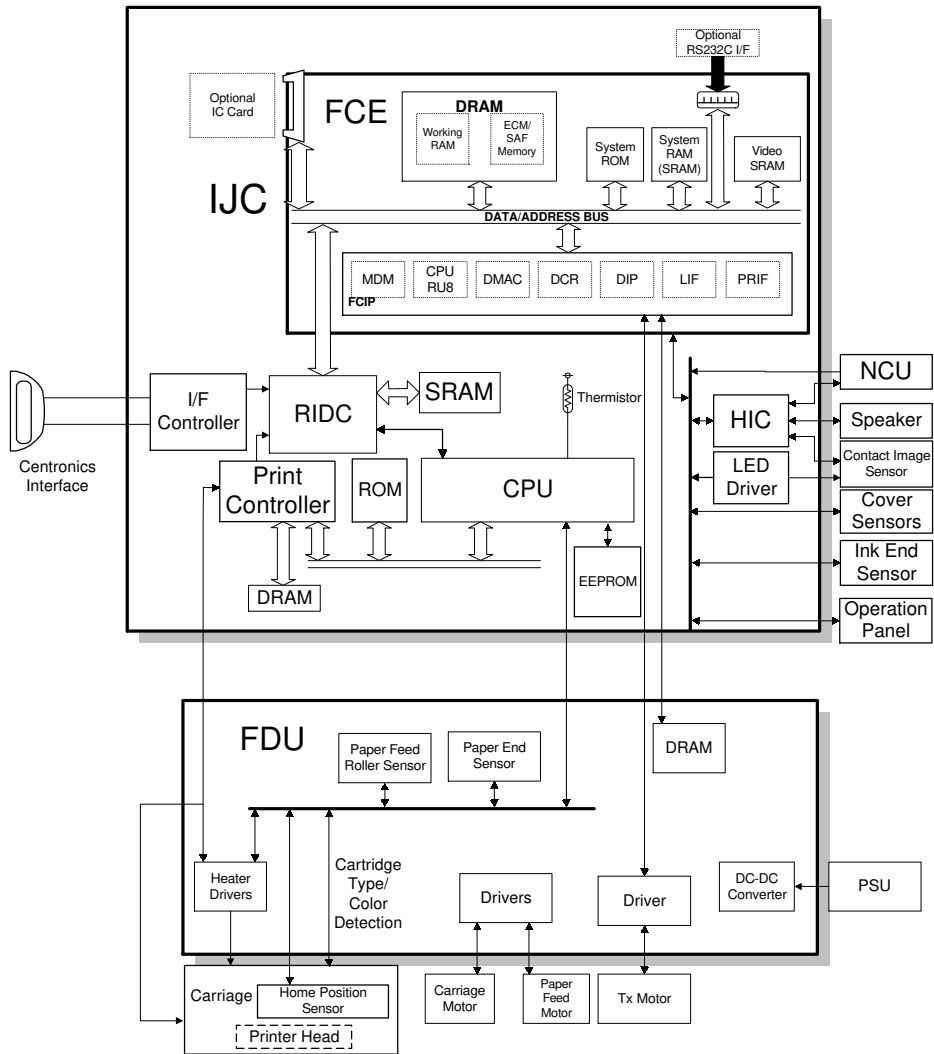
H505V504.wmf

The FCE (Facsimile Control Engine) contains the FCIP (Facsimile Control and Image Processor), DRAM, SRAM, System ROM, and video processing memory. It controls the entire system through the IJC (Ink Jet Controller) and the FDU (Facsimile Driver Unit).

There are two cpus in the machine: the main cpu (FCIP) on the FCE and the ink jet control cpu on the IJC.

The FCIP consists of the following component blocks:
- RU8 CPU - Main CPU
- DMAC - DMA Controller
- DIP - Digital Image Processor
- MDM - Modem
- PRIF - Printer Interface
- DCR - Data Compression and Reconstruction

The 512 KB DRAM contains the SAF memory, ECM buffer memory, and work area. The SAF memory can be extended by 2 or 4 Mbytes with an IC card.

A 512 KB (4 Mbit) ROM is used for the system ROM.
For the USA and some Europe models, the software in this ROM can be re-written from the IC card slot or by RDS (because a Flash ROM is used).

The IJC consists of the following components:
- CPU - 16-bit CPU with 16-MHz external clock input
- Printer Controller - Gate Array
- RIDC - Raster Image Data Controller, interface between FCE and IJC
- ROM - The inkjet printer control program and the bitmap font data
- DRAM - Receive buffer, download buffer, and working area for printing
- I/F Controller - Centronics Interface Controller
- SRAM - Working area
- HIC - Hybrid IC, Tx/Rx Amplifier
- Thermistor - Detects the temperature in the printer
- LED Driver - LED on/off control
- EEPROM - Contains the following data:
    - Total amount of waste ink
    - Total number of pages that have passed through the printer mechanism

1.5. VIDEO DATA PATH

1.5.1. Transmission
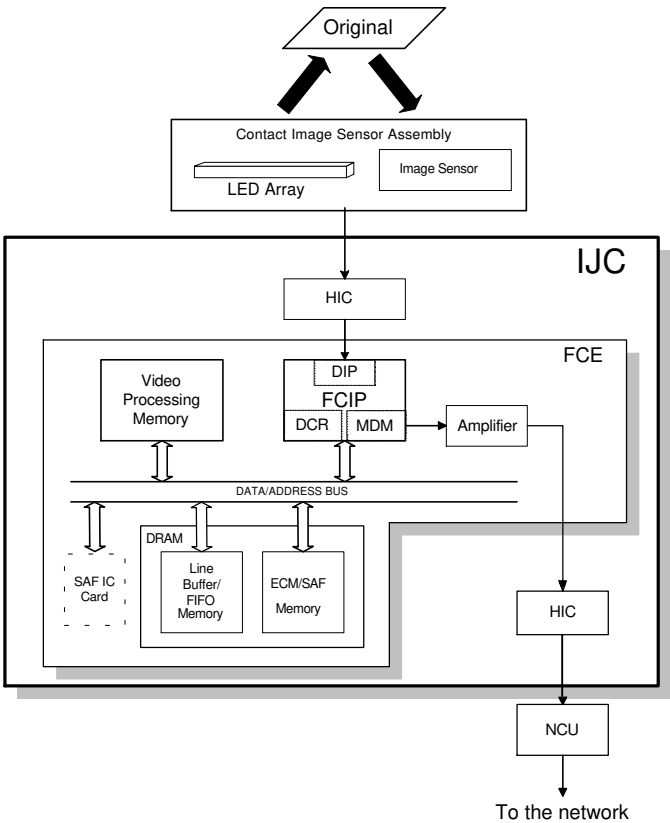
H505V505.wmf

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. The compressed data then passes either to the FIFO
memory or to the ECM memory, before it is sent to the telephone line through
the modem.

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

1.5.2. Reception
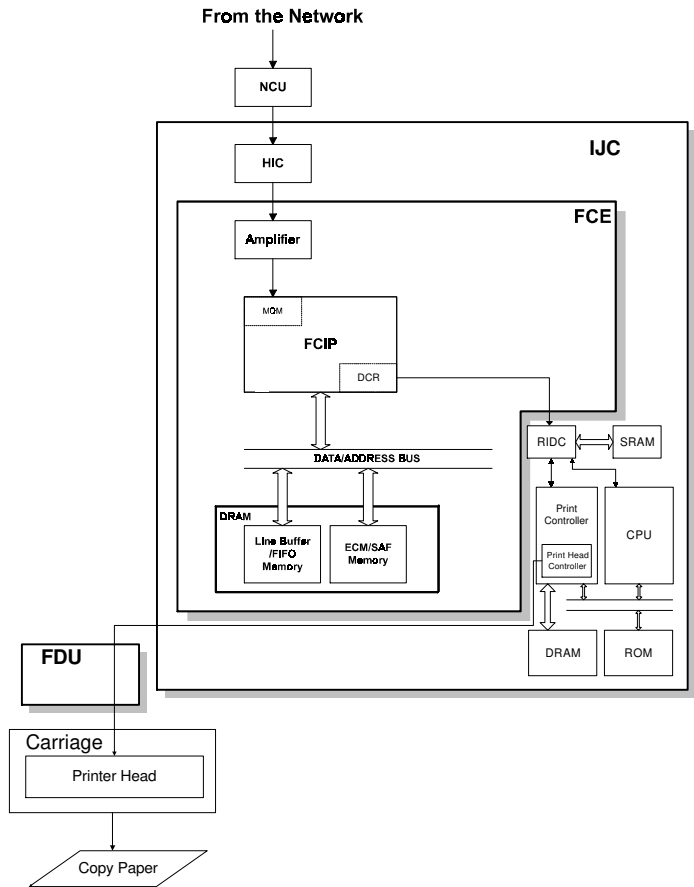
H505V506.wmf

Data from the line passes to the modem through the NCU and hybrid IC. After the modem demodulates the data, the data (which is compressed) passes to the SAF memory. After the data has been stored in the SAF memory, it passes through either the FIFO or the ECM memory to the DCR block, where the data is decompressed to raster image data.

The image data is then passed to the Print Controller for printing, through the RIDC.

After the data has been stored in the DRAM (which acts as a print buffer), the data is sent to the printer head through the printer head control block.

1.5.3. Copying
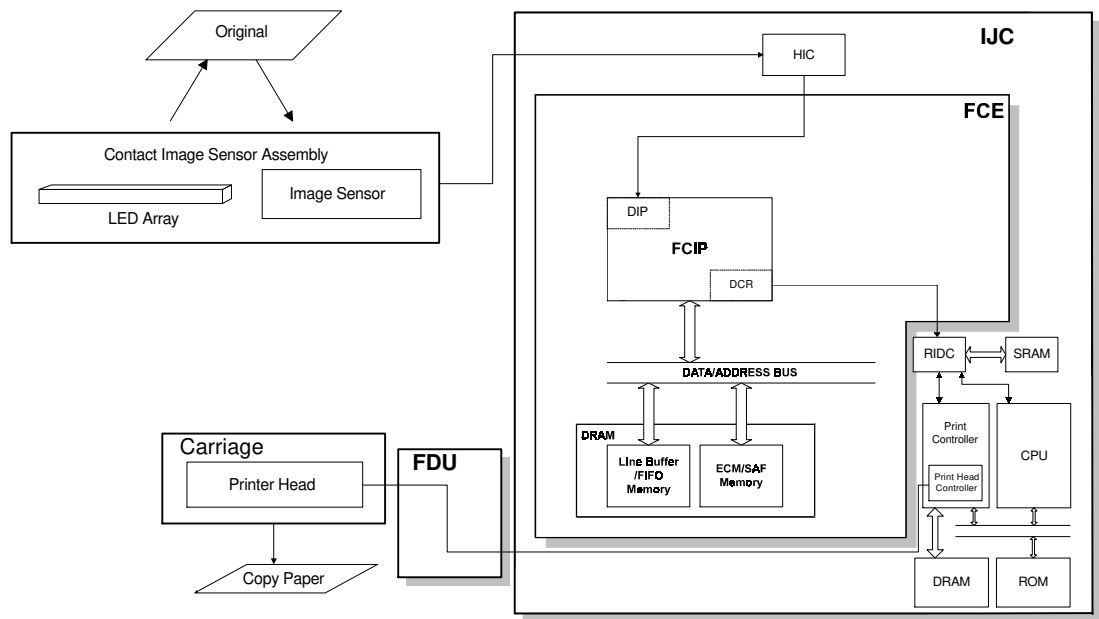
H505V507.wmf

Single copy

The scanned data is processed in the DIP block. After the data has been stored in the DRAM for printing through the RIDC, the data is sent to the printer head through the Print Controller.

Multi-page copy

The scanned data passes to the SAF memory after video processing (DIP) and compression (DCR). After a page of data has been stored in the SAF memory, the data passes to the DCR block again for decompression, then it passes to the print controller for printing through the RIDC.

1.5.4. Printing from the Centronics Interface
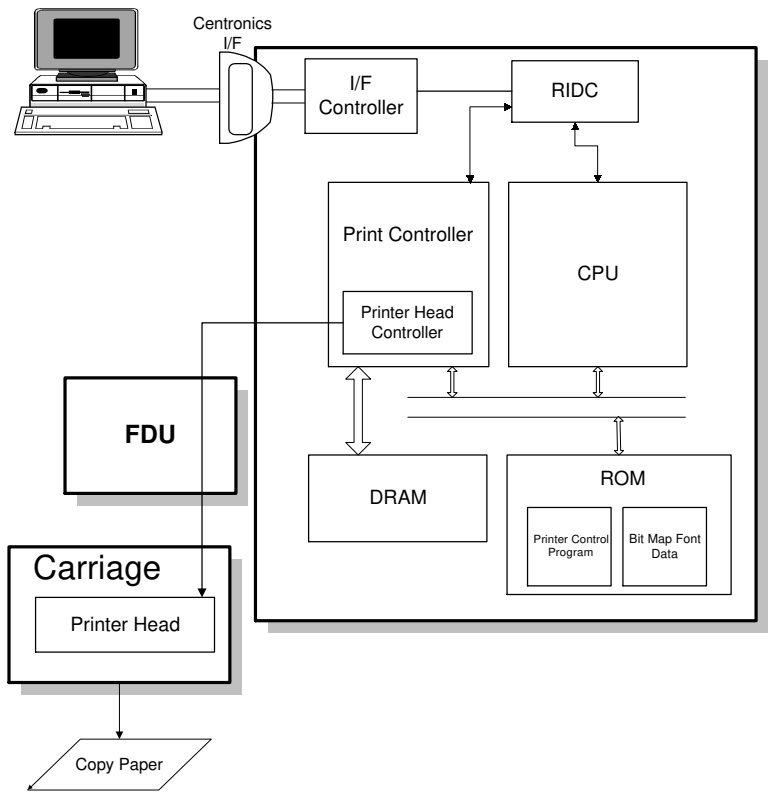
H505V508.wmf

The print data passes from the Centronics interface to the print controller through the I/F controller and the RIDC.

The print data is stored in the DRAM, which acts as a print buffer. At the same time, font data from the ROM is stored in the DRAM, which also acts as a downloaded font buffer if necessary.

After the print data has been stored with the font data in the print buffer, the print data passes through the printer head control block to the print controller for printing.

1.6. POWER DISTRIBUTION

1.6.1. Distribution Diagram

H505V509.wmf
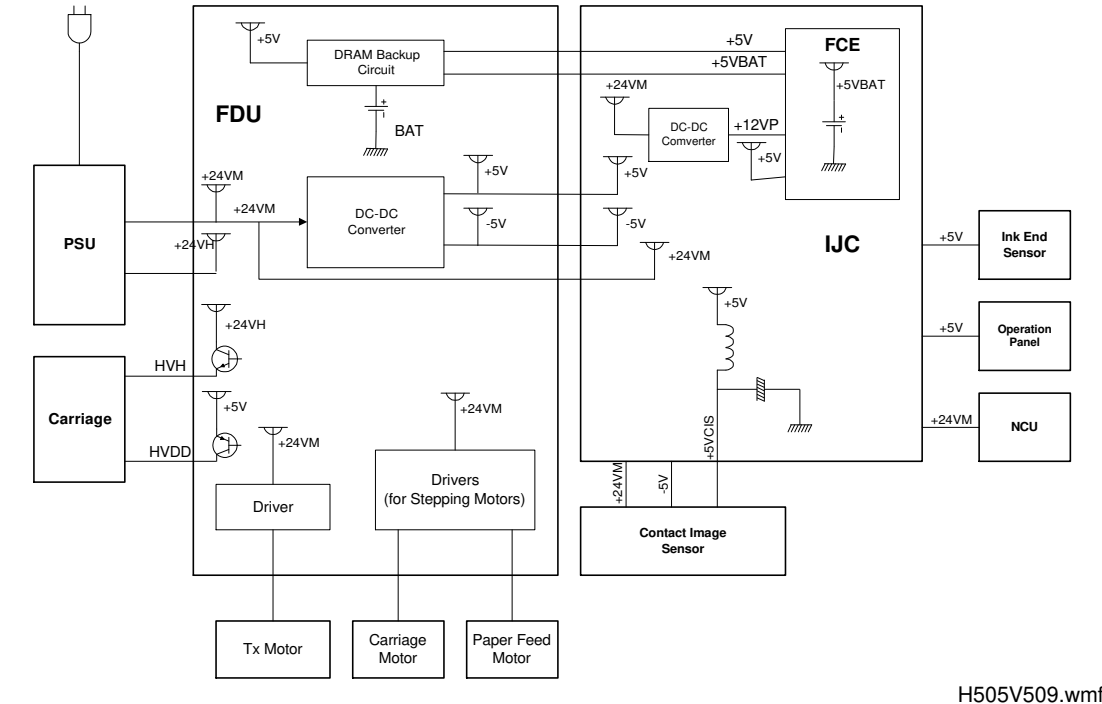
The PSU supplies +24V dc power to the FDU. The FDU converts the +24V dc power supply to the following supplies.

+5V	This is normally on when the main power is supplied.
+5VD	This supplies the DRAM and the optional IC card on the FCE to back up the stored data for one hour. A rechargeable battery on the FDU is used to generate +5VD.
+5VBAT	This supplies the system RAM on the FCE to back up the programmed data. A lithium battery is used to generate +5VBAT.
+24VM	This is normally on when the power code is plugged in.
-5V	This is used for the image sensor.
+24VH/ HVH	This is supplied to the temperature control heater on the printer head.
HVDD	This is supplied to the drive circuit on the printer head.

The FDU supplies + 24V and ±5V dc power to the IJC. The IJC converts the +24V and +5V dc power supplies to the following supplies.

+5VCIS	This is a more stable power supply than +5V. It is used for the Contact Image Sensor.
+12VP	This is supplied to the Flash ROMs on the FCE and the optional IC card.

1.6.2. Memory Back-up Circuit
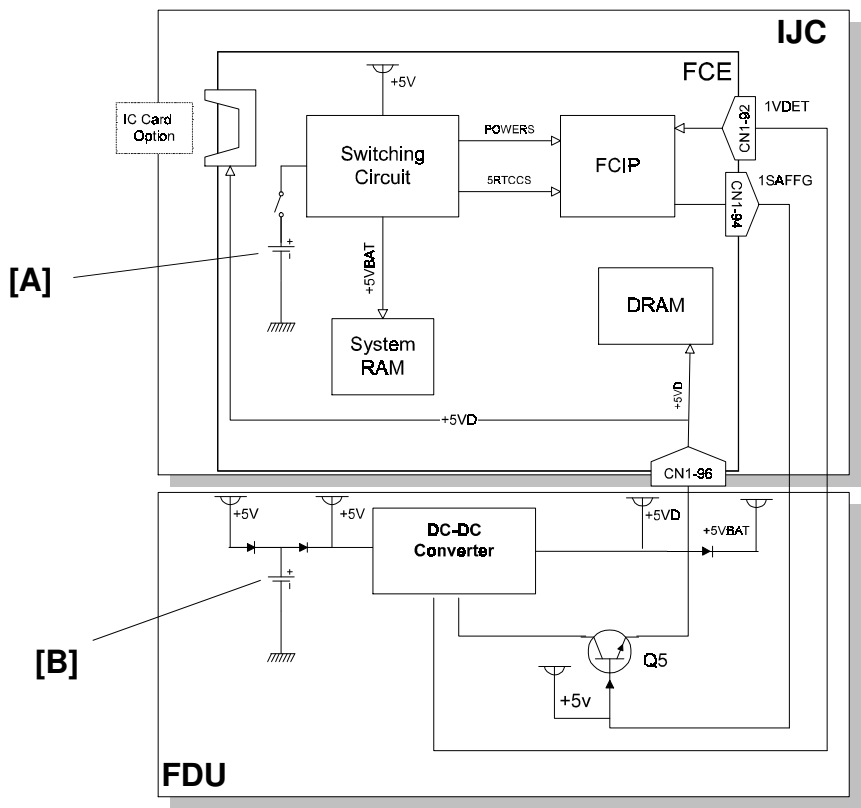
H505V510.wmf

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. The 5RTCCS signal tells the main cpu whether the back-up power (+5VBAT) is coming from the battery or from the +5V power supply.

A rechargeable lithium battery [B] and the dc/dc converter on the FDU back up the DRAM (SAF memory) for one hour. While the main power is on, the +5V supply recharges the battery. The battery recharges in one or two days.

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

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

2. DETAILED SECTION DESCRIPTIONS

2.1. SCANNER

2.1.1. Mechanisms

1. Document Detection, Pick-up and Separation and Drive Mechanism
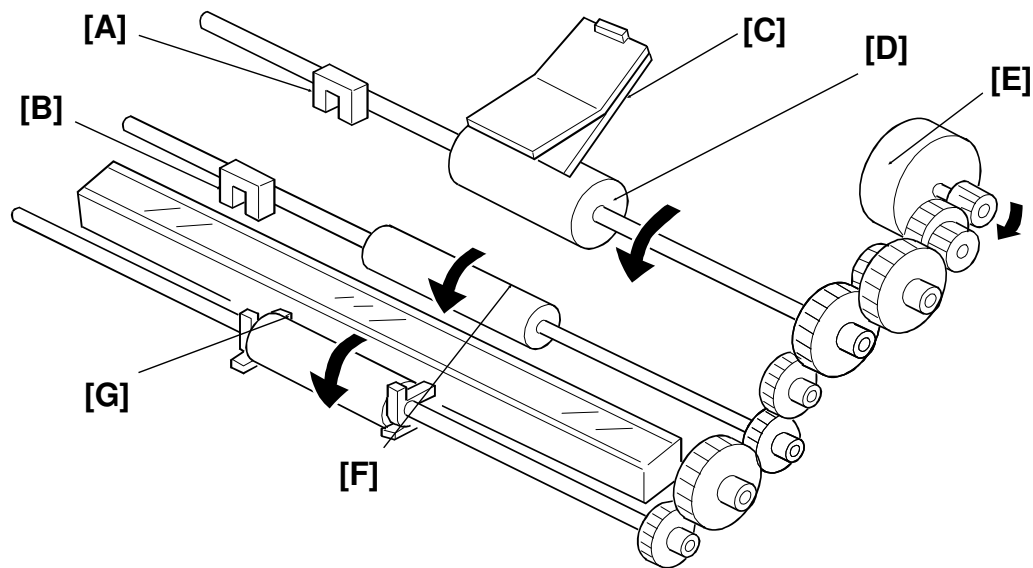
H505D501.wmf

A: Document Sensor
B: Scan Line Sensor
C: Separation Rubber Plate
E: Tx Motor

The document sensor [A] detects when a document is placed in the ADF. The tx motor [E] then starts to prefeed the document until the scan line sensor [B] detects it. The separation rubber plate [C] prevents the feed roller [D] from feeding more than one sheet at a time.

To feed the document throught the scanner, the Tx motor [E] drives the feed roller, the R1 roller [F], and the R2 roller [G].

2.1.2. Image Scanning

H505D522.wmf
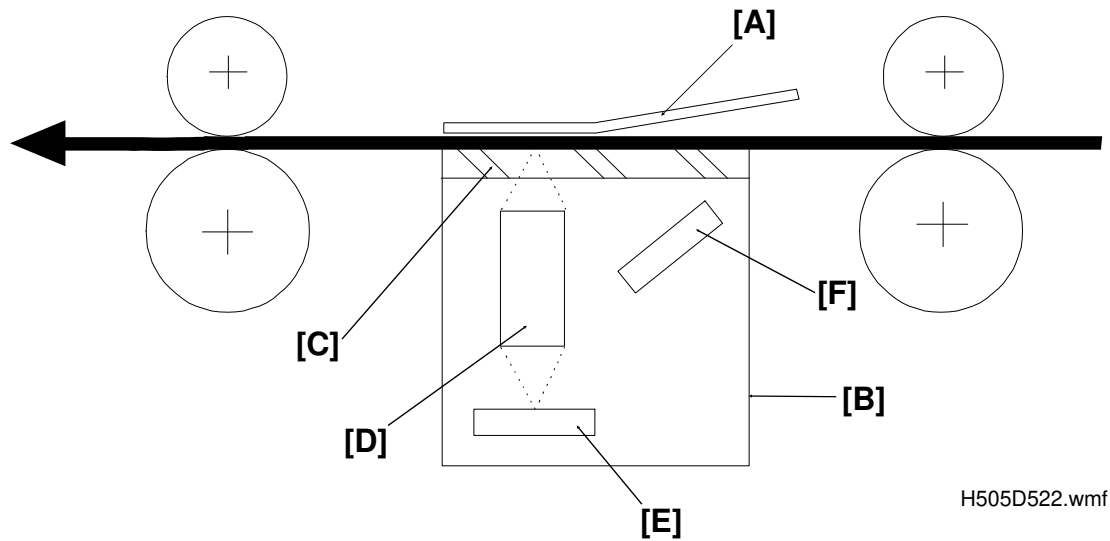
The scanner consists of a shading plate [A] and a contact image sensor (CIS) assembly [B]. Inside the CIS are an exposure glass [C], a rod lens array [D], an image sensor [E], and an LED array [F].

The image sensor consists of a row of 1728 photosensitive elements. Light from the LED array is reflected from the document and focused onto the image sensor by the rod lens array. Because of the short optical path inside the CIS, the focal depth is much shorter than for a CCD type scanner. Because of this, the shading plate pushes the document so that the document surface always touches the exposure glass at the scan line.

The image sensor assembly is not adjusted at the factory, so it does not need any adjustment at replacement in the field.

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 machine feeds the document through the scanner using one of the following step widths: the scanned lines are transmitted without any OR processing.

        3.85 lines/mm in Standard resolution
        7.7 lines/mm in Detail resolution
        15.4 lines/mm in Fine resolution

Auto Contrast Thresholding

This machine determines the contrast thresholds automatically when text mode is used. The machine compares the video data element with the surrounding elements and automatically calculates the threshold level. When this mode is enabled, the contrast threshold setting of scanner bit switch 02 is ignored.

This function can be disabled with scanner bit switch 00.

Jam Conditions

The machine 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 3.0 s of the tx motor starting to prefeed the document.	1-00
Incorrect sensor condition	The scan line sensor does not turn off after the maximum document length has been fed since it turned on.	1-01

2.2. PRINTER

2.2.1. Printer Configuration
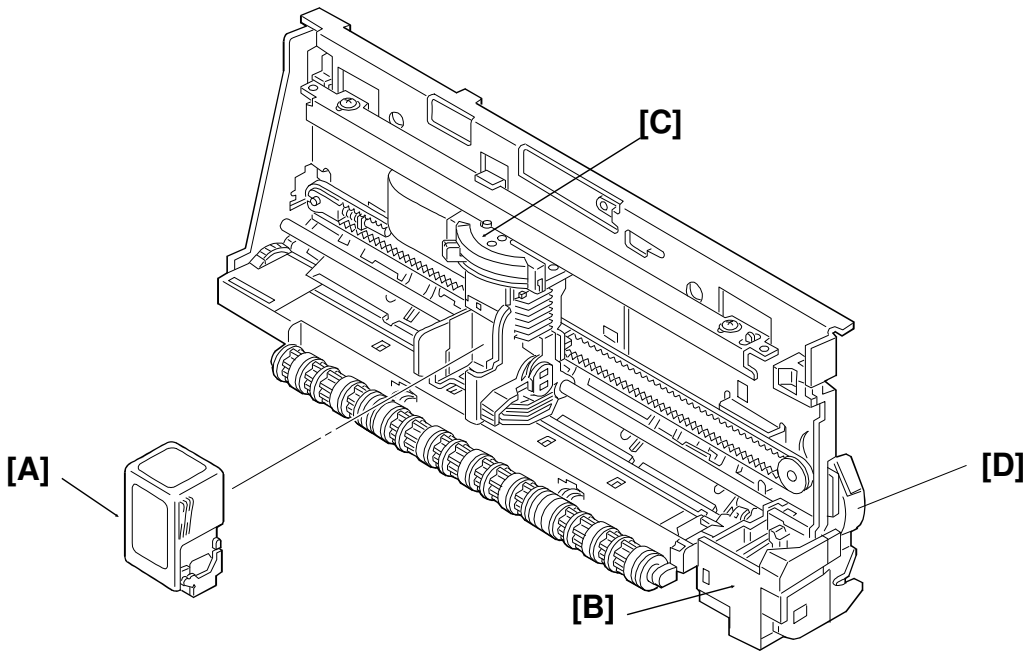
H505D512.wmf

Ink Cartridge [A]: The ink cartridge is made up of the printer head and the cartridge body. The machine can use both black and color ink cartridges. The black ink cartridge is a single unit, but the color ink cartridge has separate ink refills (black and color) which can be replaced.

Purge Unit [B]: To sustain a high quality printing level, the purge unit maintains the ink nozzles with a cap and wiper. The purge unit protects the nozzles with the cap when the printer is not in use.

Carriage [C]: The carriage unit, driven by the carriage motor [D], moves horizontally across the print paper. The print signals are transmitted to the ink cartridge by the carriage ribbon cable. When the carriage unit is at home position, paper feed motor drive can be transferred to the purge unit or the paper feed roller (see "Paper Feed - Drive Mechanism" for details).

2.2.2. Ink Cartridge (Black and Color)

[A]

[H]

[I]

[F]   [J]   Black Ink Cartridge

H505D506.wmf

[H]   [D]   [C]

[I]

[G]

[J]   [E]   [B]

Color Ink Cartridge

H505D507.wmf
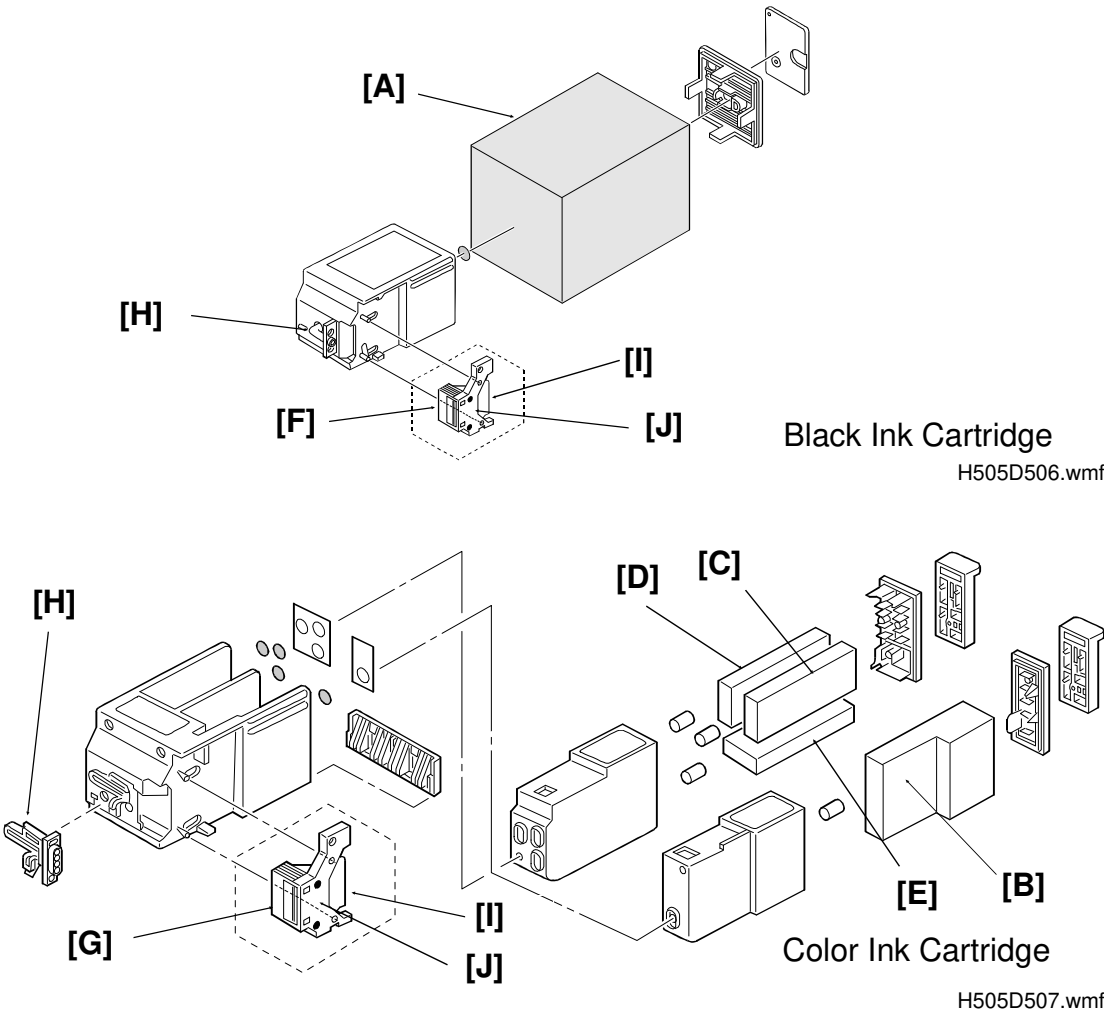
The black ink cartridge contains only the black ink sponge [A] while the color cartridge contains ink sponges for black [B], yellow [C], magenta [D], and cyan [E].

The black printer head face plate [F] contains a row of 128 nozzles and the color printer head face plate [G] contains 136 nozzles. Ink passes to these nozzles through an ink duct section [H]. Printing signals are sent to the printer head from the signal connection point [I].

2.2.3. Printer Head

1. Mechanism
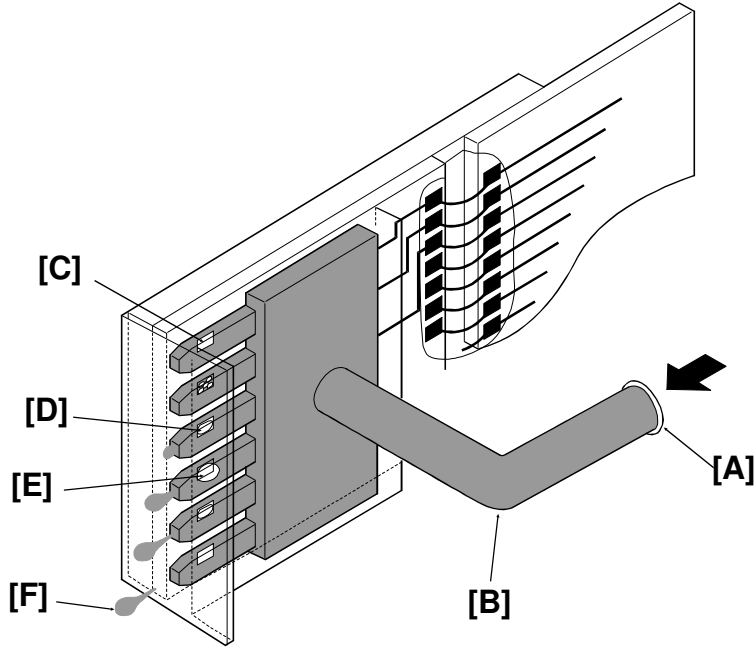
H505D508.wmf

Ink from the sponge is filtered at [A] to remove dust, and then passes to the nozzles through pipe [B]. When the head drive current flows through a nozzle's heater plate [C], the ink at the plate boils. The bubbles formed [D] eventually join into one large bubble [E]. The bubble forces a drop of ink [F] out of the nozzle.

Head drive current stops before the bubble is fully formed. The remaining heat of the heat plate completes the bubble. The plate cools by the time the ink drop is ejected, and fresh ink enters the nozzle from the sponge.

The nozzles are arranged in a straight line at intervals of 1/360 inch.
There are 128 nozzles in the black ink cartridge.
The color ink cartridge has a total of 136 nozzles: 24 yellow nozzles, 24 magenta nozzles, 24 cyan nozzles, and 64 black nozzles.

Nozzle 1   Nozzle 1

Yellow 1~24
Magenta 25~48
Cyan 49~72

Black 73~136

Nozzle 128   Nozzle 136
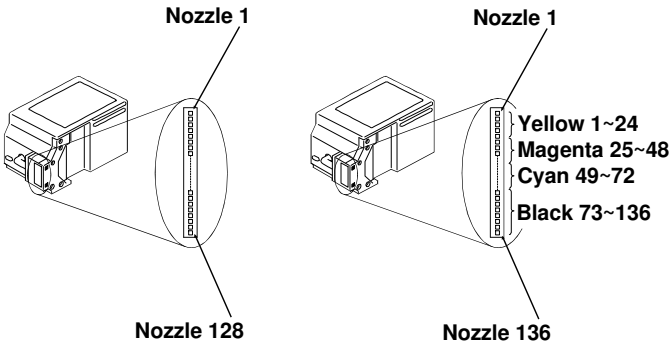
Black Ink Cartridge   **Color Ink Cartridge**

H505D509.wmf

2. Drive Circuitry
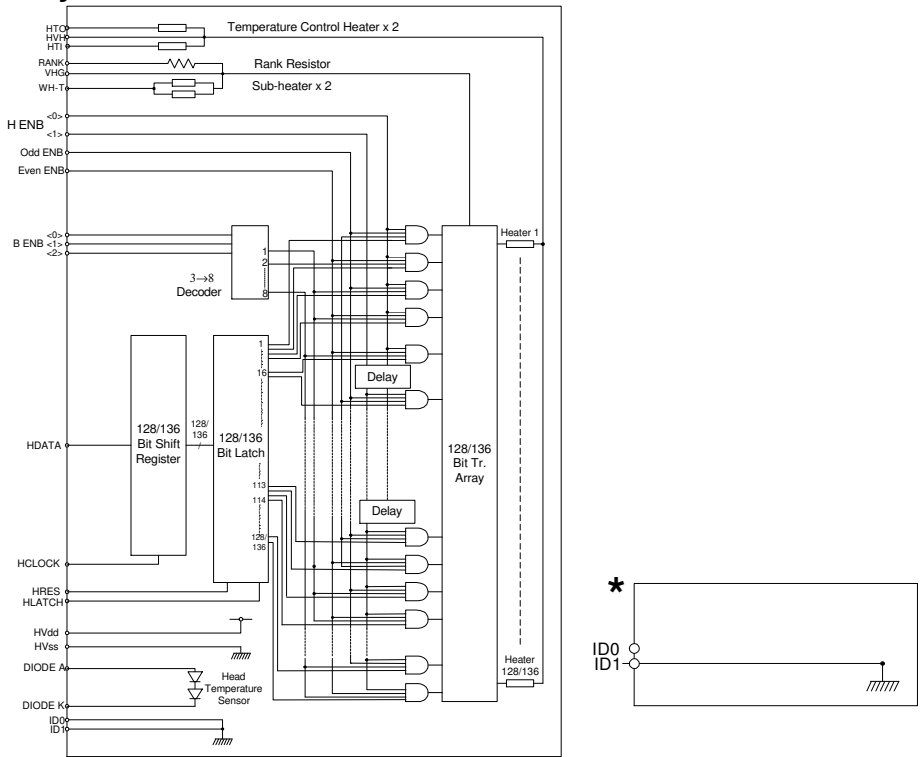
H505D504.wmf

128/136 Bit Shift Register: This register stores the print data (HDATA) sent from the FCE with the HCLOCK timing signal.

128/136 Bit Latch: This latch stores the print data (HDATA) sent from the 128/136 bit shift register with the HLATCH timing signal.

3→8 Converter: This converts the three BENB (block enable) signals (<0>, <1>, and <2>) into the 8-division timing signals for all heaters.

Heaters 1-128/1-136: These heaters heat the nozzles. They are turned on by a combination of OddENB or EvenENB, HENB (heat enable), the timing signals from the 3→8 converter, and the data signal (HDATA) from the latch.

Sub-heater: This heater keeps the ink in the nozzles warm.

Temperature Control Heater: This heater stabilizes the amount of ink injected.

Heat Temperature Sensor: This sensor uses a diode to detect the temperature variation caused by the flow of ink at the nozzles.

Cartridge ID: The cartridge type (color or black) is detected with the ID0 and ID1 signals.

> *These ID signals identify a color cartridge.
> The main illustration's ID signals identify a black cartridge.

3. Print Signals
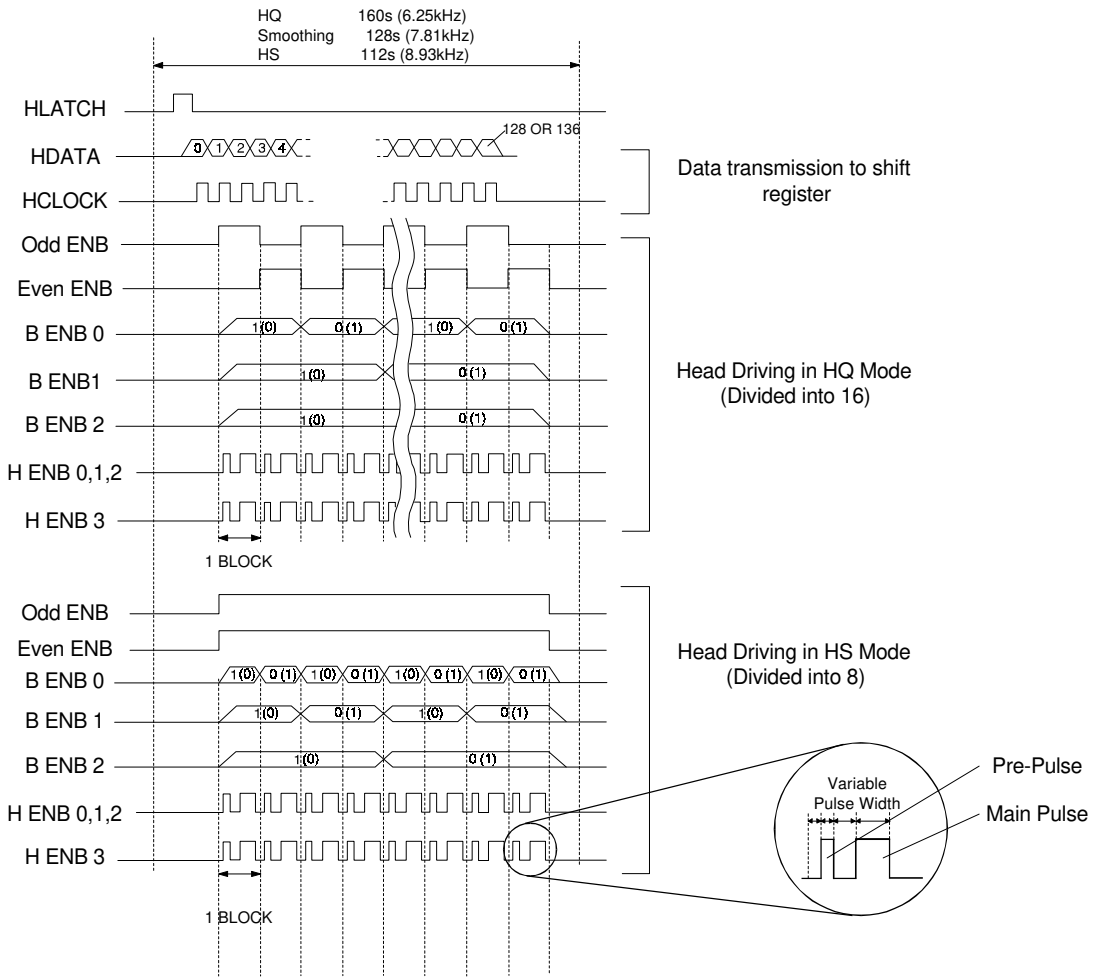
H505D510.wmf

The 3→8 converter changes the three signals, BENB 0, 1, and 2, into 8 signals, dividing the nozzles into 8 blocks. For HQ print mode, these blocks are then further divided with the OddENB and EvenENB signals into 16 nozzle groups.

The HENB signals make up the pre-pulses (which raise the temperature of the printer head to a suitable temperature), and the main pulses (which cause the ink to be ejected). These signals are input with the print data signals for each nozzle into the AND circuits (see the diagram on the previous page). The resulting signal drives the heaters.

2.2.4. Purge Unit

1. Components
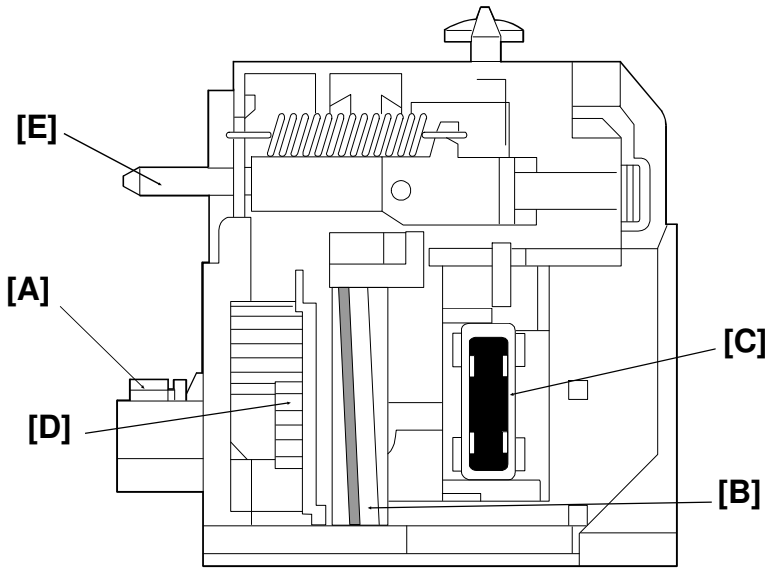
H505D511.wmf

Purge Unit Drive Gear [A]: The paper feed motor drives this gear during cleaning. The gear functions as a cam to control the ink pump inside the purge unit.

Wiper Unit [B]: The wiper unit wipes the ink from the ink cartridge face plate during cleaning.

Cap Unit [C]: The cap unit caps the print head face plate (nozzles) when the nozzles move to the capping position (this is when the carriage is at home position). The cap unit is also connected to the ink pump. It extracts ink from the ink cartridge during cleaning operations. The waste ink is drained down into the waste ink absorbers in the bottom of the unit.

Maintenance Jet Receiving Section [D]: This section receives ink ejected from the nozzles into the purge unit to prevent clogging. The gear feeds the waste ink to the waste ink absorbers in the bottom of the unit.

Slide Pin [E]: The slide pin causes the cap unit [C] to cap the nozzles when the cartridge moves into the capping position. This unlocks the drive transfer mechanism inside the purge unit, allowing the paper feed motor drive to be transferred either to the purge unit drive gear [A] or to the paper feed unit (see section 2-2-5).

2. Purge Unit Functions

Capping

The capping function prevents drying of the nozzle and ink leakage. The cap is automatically over the nozzles when the carriage is at home position.

Cleaning

The cleaning function consists of two operations.

1. Wiping: The wiper unit wipes the face plate to remove paper fiber and ink.

2. Pumping: The ink pump in the purge unit sucks old ink from the capped cartridge and fills the nozzles with fresh ink.

To initiate cleaning, the paper feed motor rotates in reverse. This causes the purge unit drive gear to rotate, which drives the cleaning mechanisms in the purge unit.

The cleaning operations are executed when any one of the following conditions occur:
- The power cord is connected.
- The ink cartridge is replaced.
- The number of print dots has reached a specified value.
- The front or the top cover has been opened and then closed.
- The paper feed lever has been released and then closed.
- Cleaning operation has been executed by the customer.
- The power is switched on or print data is received after more than 72 hours have passed since the last cleaning.
- Every 60 seconds during printing.
- At the start of each new page.
- When the cap unit is opened or closed.

Ink removed from the cartridge goes to the ink absorbers below the TIJ unit. The machine estimates the amount of ink that has gone to the absorbers, and stores the value in EEPROM. When the value reaches a certain threshold, "UNABLE TO PRINT" is displayed. The ink absorbers must be replaced, and the EEPROM must be reset (see section 4-1-17 for how to reset the EEPROM data).

2.2.5. Paper Feed

1. Overview
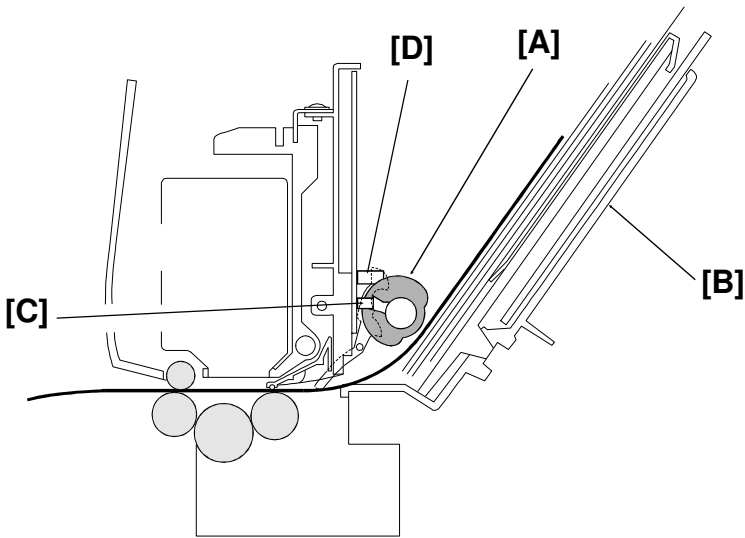
H505D513.wmf

The paper feed roller [A] picks up the top sheet of paper from the paper feed unit [B] and feeds it into the printer. The paper feed roller sensor [C] checks whether the feed roller is at the starting position before printing. The paper end sensor [D] detects the presence of paper in the printer.

2. Drive Mechanism

H505D502.wmf
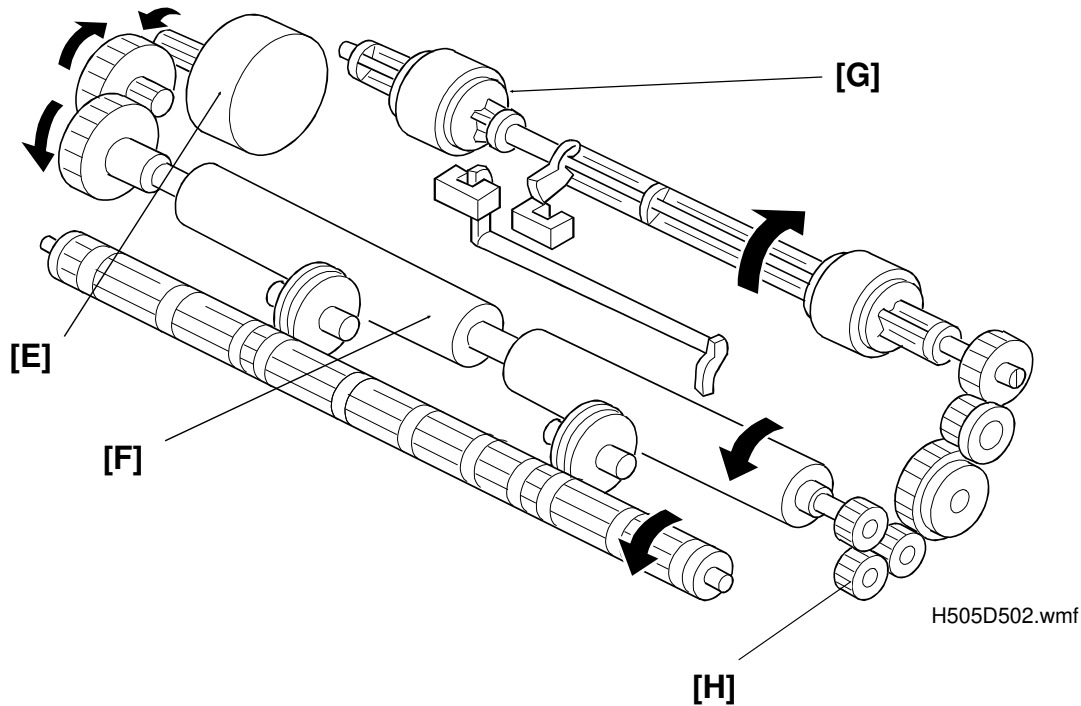
When the carriage is at the home position (this is also the capping position), the drive transfer mechanism in the purge unit is unlocked (see section 2-2-4), and drive from the paper feed motor is transferred either to the paper feed or to the purge unit, depending on the direction that the paper feed motor is rotating.

For paper feed, the paper feed motor [E] turns the registration roller [F] in the paper feed direction. This causes the drive transfer mechanism in the purge unit to move the drive transfer gear [H] into contact with the paper feed mechanism, and the paper feed gears and paper feed roller [G] rotate as shown in the diagram.

For cleaning (see section 2-2-4), the paper feed motor reverses. The registration roller turns in the reverse direction, and this moves the drive transfer gear [H] into contact with the purge drive gear in the purge unit (not shown here). The paper feed motor then drives the cleaning operation.

When the carriage is not at the home position, the drive transfer mechanism is locked. As a result, the paper feed roller does not move when the carriage is away from home position during printing. The paper is fed by the registration roller only.

2.2.6. Ink End Detection

To determine whether ink is present in the cartridge, the machine prints a black dot (known as the ink end mark) after printing the last line on a page. The ink end sensor reads the white level around the mark, and then it looks for the ink end mark itself. If the sensor can detect the mark, the machine determines that ink is present.

If it cannot detect the mark, the machine determines that the cartridge is empty. "Replace Cartridge" is indicated on the LCD and the machine stops printing. The machine keeps the received fax message data stored in the SAF memory until the ink cartridge is replaced.

The machine checks for ink end at the following times.
- When printing an incoming fax message
- When printing a test pattern from 0 to 4 with service function 11
- When printing a report (except when printing EEPROM information with service function 11)
- When the ink end sensor is initialized with service function 11

Ink end detection can be disabled with a user parameter 12 setting.
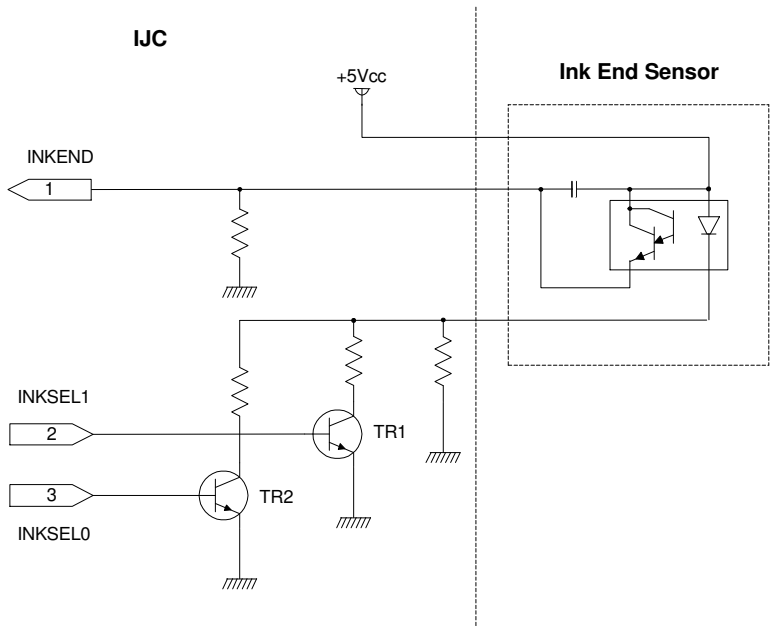
H505D524.wmf

Ink End Sensor

The ink end sensor is a photosensor that uses red light. The machine adjusts the amount of current to the photosensor automatically to correct for the manufacturer's sensor type. The current is determined by the output level the sensor reads during the white level scan on the paper when detecting the ink end mark. The machine also determines the threshold value for detecting ink end based the determined current value.

2.2.7. Maximum Print Lengths

The maximum print length depends on the vertical reduction ratio setting of user function 62. It also differs for printing incoming fax messages and reports, and when in in copy mode. This is to ensure that there is enough space to print the ink end mark on incoming messages and reports. (Ink end detection is not done in copy mode or when printing from a PC.)

The following table shows the maximum print lengths in various modes. All lengths are in millimeters.

Copy Mode

Vertical Reduction Ratio	Maximum Print Length		
	A4	Letter	Legal
100%	286.4	268.8	345.0
94%	304.6	285.9	367.0

Printing Fax Messages and Reports

Maximum Print Length		
A4	Letter	Legal
275.5	256.8	333.6

Any messages longer that the maximum will be printed on two sheets of paper, without reduction.

If the vertical reduction ratio is set to AUTO, page separation and data reduction comes into effect (see section 2-2-8).

2.2.8. Data Reduction and Page Separation

If the vertical reduction ratio is set to AUTO with user function 62, incoming data can be reduced to fit on one output page. Data will only be reduced if the length of the incoming page does not exceed a certain maximum length. This length depends on the reduction ratio set with user function 62 (the other choice visible on the display besides AUTO; this is either 94% or 100%), the print paper size, and the reduction ratio set with printer bit switches 04 and 05.

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

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

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

Europe/Asia Model

Copy Paper Type	Reduction Ratio	Maximum reducible incoming page length.			
		Ratio = 3/2	Ratio = 4/3	Ratio = 8/7	Ratio =12/11
A4	94%	439	390	334	319
	100%	412	367	314	300

USA Model

Copy Paper Type	Reduction Ratio	Maximum reducible incoming page length.			
		Ratio = 3/2	Ratio = 4/3	Ratio = 8/7	Ratio =12/11
Letter	94%	410	365	312	298
Legal		532	473	406	387
Letter	100%	386	343	294	280
Legal		501	445	381	364

Incoming pages that are longer than the maximum length will not be reduced, but will be printed on two pages.

2.3. PCBs

2.3.1. FCE
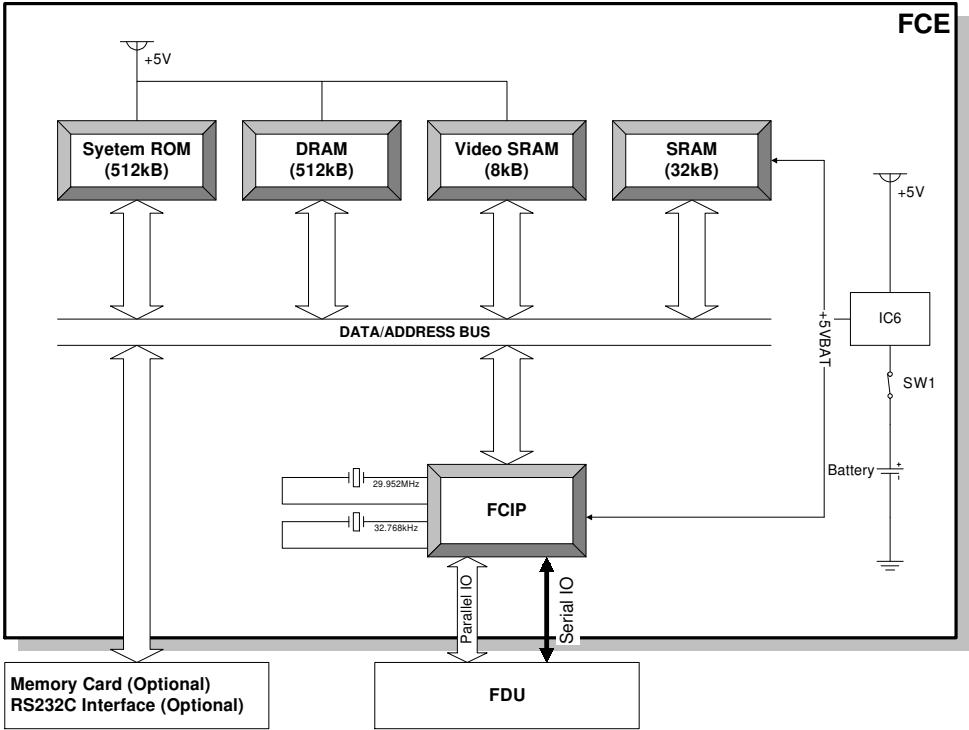
H505D519.wmf

1. FCIP (Facsimile Controller and Image Processor)

- CPU
- Modem (V.29, V.27, V.21)
- Data compression and reconstruction (DCR)
- Digital image processor (DIP)
- DMA controller
- Clock generation
- Tx motor control
- Serial interface to the FDU
- DRAM backup control
- Tone detection
- Ink end detection

2. ROM

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

3. DRAM

- 512 kB DRAM shared between the Line Buffer (32 kB), ECM Buffer (128 kB), and SAF memory (352 kB)
- Backed up by the battery on the FDU

4. SRAM

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

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 battery on the FCE.

7. Jumpers, Switches, and Test Points

Item	Description
SW1	Switches the backup battery ON/OFF

2.3.2. FDU
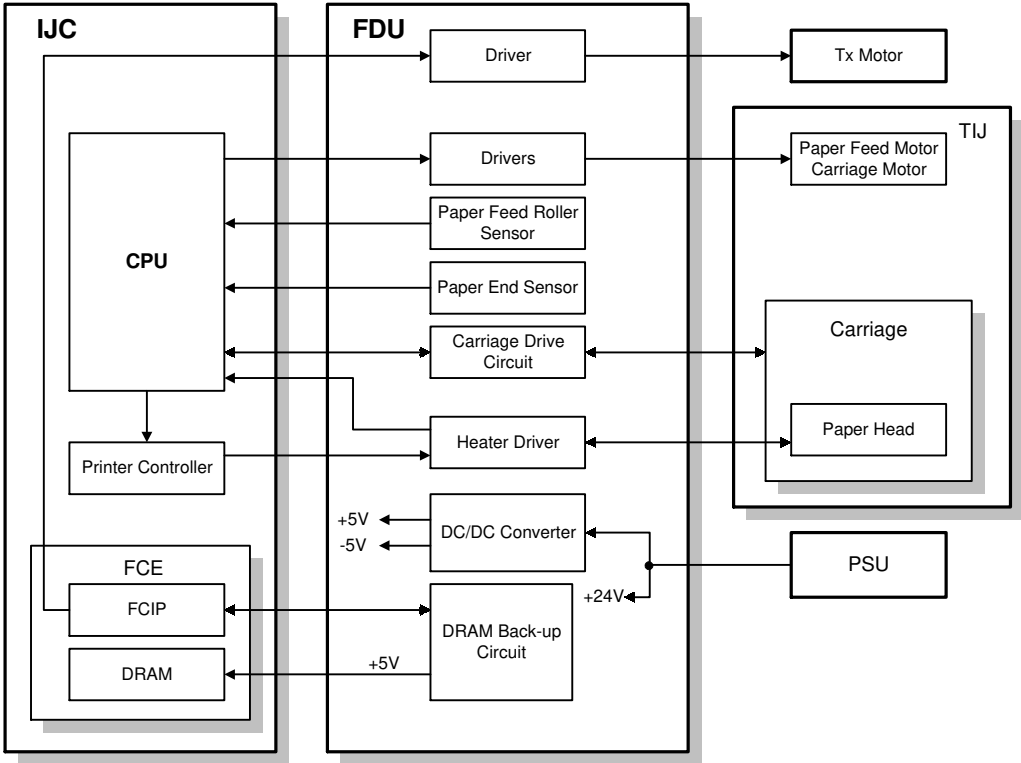
H505D516.wmf

1. Printer Head Drive Circuit

- Heater driver
- Head rank detection
- Head temperature detection
- Home position detection
- Cartridge type detection

2. Drivers

- Carriage motor driver
- Paper feed motor driver
- Tx motor driver

3. Sensors

- Paper end sensor
- Paper feed roller sensor

4. DC/DC Converter

- +5V generation
- -5V generation

5. Battery

- Back-up for the DRAM on the FCE

6. Jumpers, Switches, and Test Points

Item	Description
JP1	Not used

2.3.3. IJC
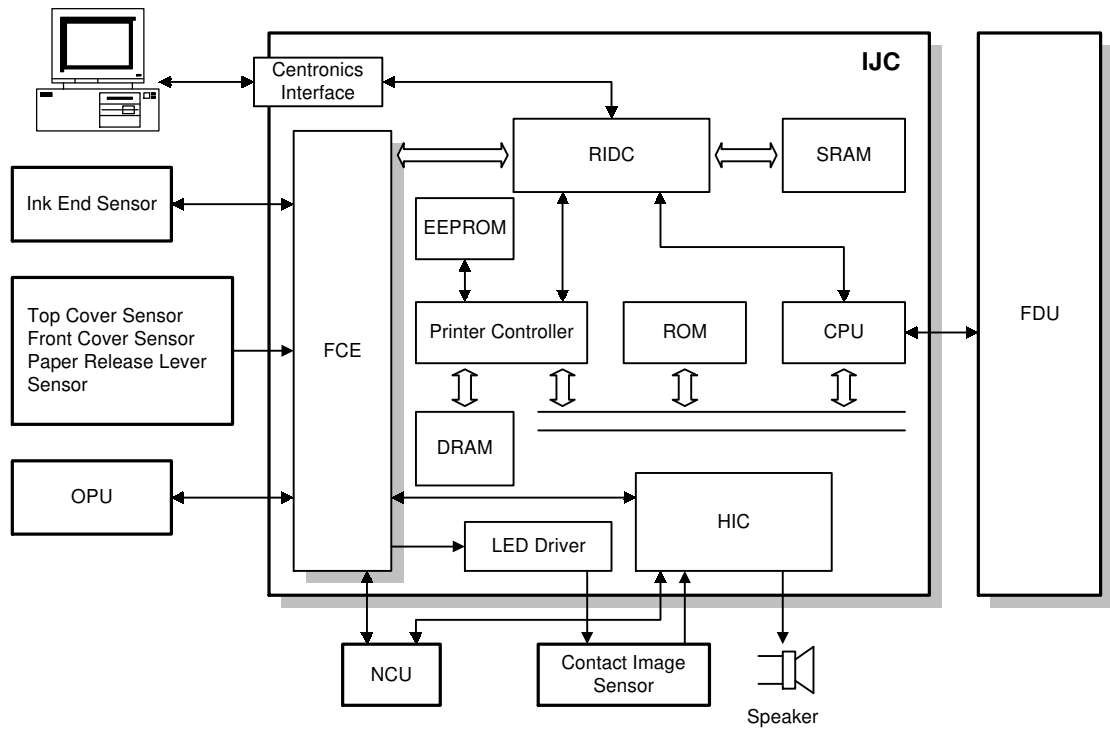
H505D517.wmf

1. CPU (MPU)

- Printer head control
- Carriage motor control
- Paper feed motor control
- Centronics interface control
- Data converter for the character font code

2. Printer controller

- Printer head drive control
- Centronics interface control

3. ROM

- 8 bit masked ROM for the TIJ (thermal ink jet) control program and bit map font data storage

4. DRAM

- 1 MB DRAM for working area, receive data buffer, and font download buffer

5. Oscillators

- 16 MHz oscillator for MPU control clock generation (OSC1)
- 22.11 MHz oscillator for printer control clock generation (OSC2)

6. Raster Image Data Controller (RIDC2)

- Raster image data converter
- Interface between FCE and TIJ controller

7. SRAM

- 64 kB SRAM for the RIDC working area

8. HIC (Hybrid IC)

- Filter and amplifier
- Monitor speaker driver

9. EEPROM

- 1 kB electrically erasable and programmable ROM for storing data on the total waste ink amount and the total number of pages that have passed through the TIJ

10. Centronics Interface

11. Jumpers, Switches, and Test Points

Item	Description
JP1	Not used
JP2	Not used
TP1	Received signal output from the modem
TP2	COM1
TP3	Analog video signal input from the Contact Image Sensor
TP4	Synchronization signal
TP5	Scanner clock
TB1	Not used

2.3.4. PSU
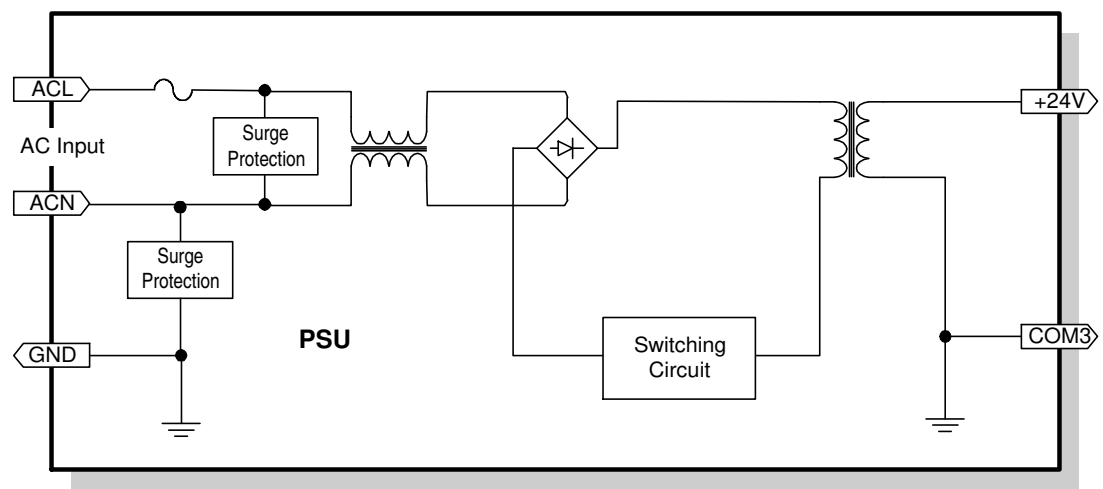
- +24Vdc generation

2.3.5. NCU (USA)
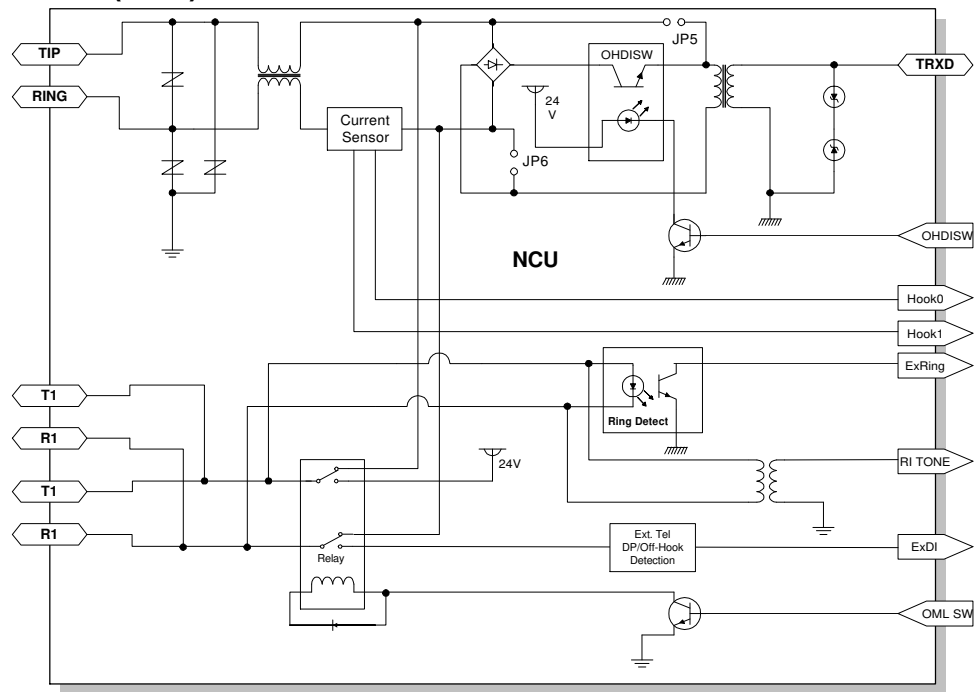
H505D520.wmf

1. Jumpers

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

2.3.6. NCU (Europe/Asia)
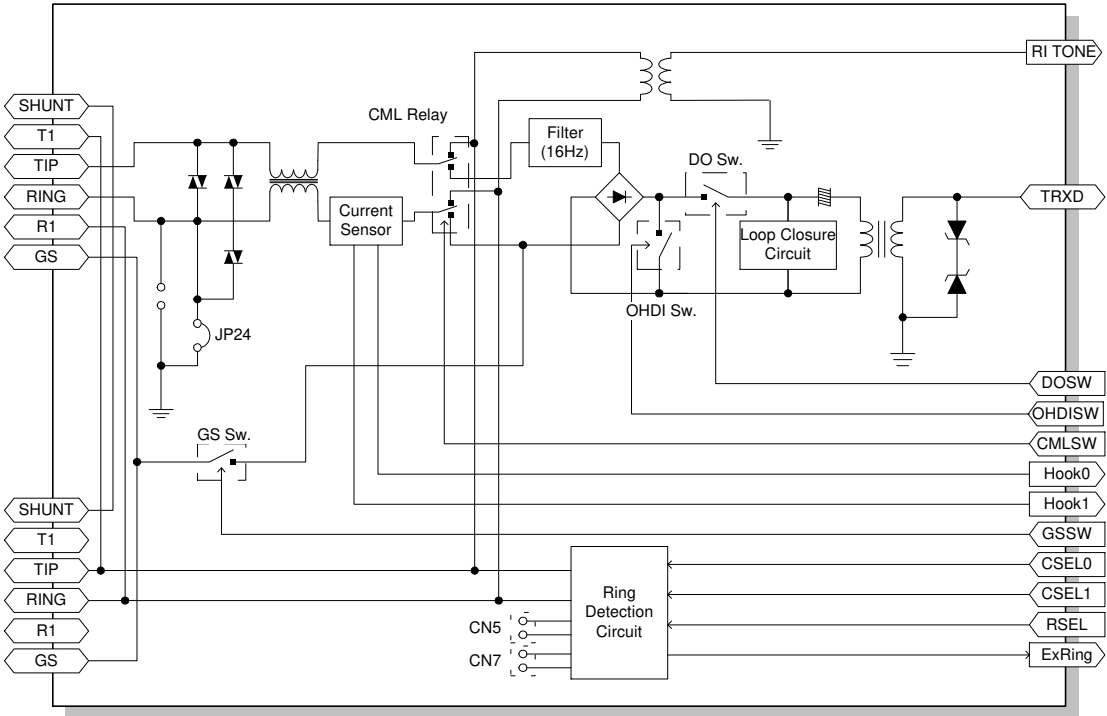
H505D521.wmf

1. Control Signals and Jumpers

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

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.

Refer to section 2.3.6. for how to set up the NCU hardware in each country.

3.2. INITIAL PROGRAMMING

Items to Program (Service Level)	Function No.
Country code (NCU parameter 00)	Function 08
Country code (System bit switch 0F)	Function 01
Protocol requirements (G3 bit switch 0B)	Function 01
PABX access code (RAM address 8000BB)	Function 06
Machine's serial number	Function 14

Items to Program (User Administrator Level)	Function No.
Clock	Function 81
Initial programming items (IDs)	Function 61
On/off switches	Function 62
Display/report language	Function 83
PABX access method (User parameter switch 13 - bits 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

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

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

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

   Example: To see the communication

   switches : # × 3
   Then scroll through the bit switches.

   Increment bit switch: ▶

   Decrement bit switch: ◀

   Example: Display bit switch 3: ▶ x 3

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

4. Adjust the bit switch.

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

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

5. To adjust more bit switches - go to step 3.

To finish: [Function]

4.1.2. System Parameter List (Function 02)

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

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

2. [0] [2] [Yes] [◇]

3. Finish: [Function]

4.1.3. Error Code Display (Function 03)

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

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

2. [0] [3] [Yes]

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

3. Either:
   Scroll through the error codes - [▶] or [◀]
   Finish - [Function]

4.1.4. Service Monitor Report (Function 04)

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

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

2. [0] [4] [Yes] [◇]

3. Finish: [Function]

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`

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
```

3. Press [0].
   The transmitted and received page count-
   ers are displayed.

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

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

5. To finish: [Function]

4.1.9. NCU Parameters (Function 08)

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

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

2. [0] [8] [Yes]

3. [0]

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

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

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

5. To finish : [No] [Function].

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

4.1.10. Modem Test (Function 08)

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

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

2. [0] [8] [Yes]

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

3. [1]

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

4. Scroll through the available
   tests using ⧈ or ⧈ .

5. ⧈

6. To stop the test: ⧈

7. To finish: No Function

4.1.11. DTMF Tone Test (Function 08)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 0 8 Yes

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

3. 2

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

4. Scroll through the available
   tests using ⧈ or ⧈ .

5. ⧈

6. To stop the test: ⧈

7. To finish: No Function

4.1.12. Modem Detection Test (Function 08)

Note: This function can be used only when G3 bit switch 0B bit5 (French
PTT requirements) is 1 in European models. It cannot be used in USA
models.

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

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

2. [0] [8] [Yes]

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

3. [3]

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

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

5. [◇]

6. To stop the test: [▽]

7. To finish: [No] [Function]

4.1.13. Operation Panel Test (Function 09)

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

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

2. [0] [9] [Yes]

```
0-LED/LCD
```

3. [0]

4. [◇]

5. To stop the test, press [▽] .

6. To finish: [No] [Function]

4.1.14. LED Array Test (Function 10)

1. `Function` `6` `1` `9` `9` `5`
   then immediately `Yes`

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

2. `1` `0` `Yes`

```
0-LAMP     1-ADF
```

3. `0`

4. `◇`

```
                 START
LAMP         000
```

5. To stop the test, press `▽` .

6. To finish: `No` `Function`

4.1.15. ADF Test (Function 10)

1. `Function` `6` `1` `9` `9` `5`
   then immediately `Yes`

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

2. `1` `0` `Yes`

```
0-LAMP      1-ADF
```

3. `1`

```
                 START
 ADF
```

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

5. To stop the test, press `▽` .

6. Finish: `No` `Function`

4.1.16. 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-CARRIAGE
2-SENSOR
```

3. 0

```
PATTERN PRINT  KPAD
    0-9,#
```

5. Press a key from 0 to 9, or #.

No.	Test Pattern Type	Remarks
0	Vertical black stripes	
1	2 x 2 dot pattern	
2	Mixed pattern 1	
3	Solid black pattern	
4	Mixed pattern 2	
5	Letter for demonstration	The machine prints the test pattern until paper end is detected.
6	"H"-pattern	
7	" | " pattern	
8	Auto sheet feeder test	The machine feeds the paper until paper end is detected. A serial number is printed on each page to indicate the feed sequence.
9	EEPROM initialize	Refer to the next section for details.
#	EEPROM information sheet	

6. Press ⬙ .
   The selected test pattern is printed.

7. To finish: No Function .

4.1.17. Printing the EEPROM Information Sheet and Initializing the EEPROM (Function 11)

Note: This procedure can be done only when a black ink cartridge is installed.

The machine calculates the amount of ink ejected to the ink absorbers and stores it in the EEPROM on the IJC board. If the amount of ink reaches a certain threshold, the printer stops printing until the ink absorbers are replaced and the counters in the EEPROM are reset.
To check the current amount of ink in the ink absorbers, print test pattern no. # (EEPROM information sheet) as shown below.

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

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

2. [1] [1] [Yes]

```
0-PATTERN   1-CARRIAGE
2-SENSOR
```

3. [0]

```
PATTERN PRINT   KPAD
      0-9,#
```

4. Press [#].
   The machine prints EEPROM information sheet. The format of the sheet is give below.

```
ROM Ver 1.07   Dipsw1~13 1010001000100   XX.X BBBBBB CCCCCC
```

Calculated amount of ink received to the ink absorbers in percentage

Paper feed counter when using a black cartridge

Paper feed counter when using a colour cartridge
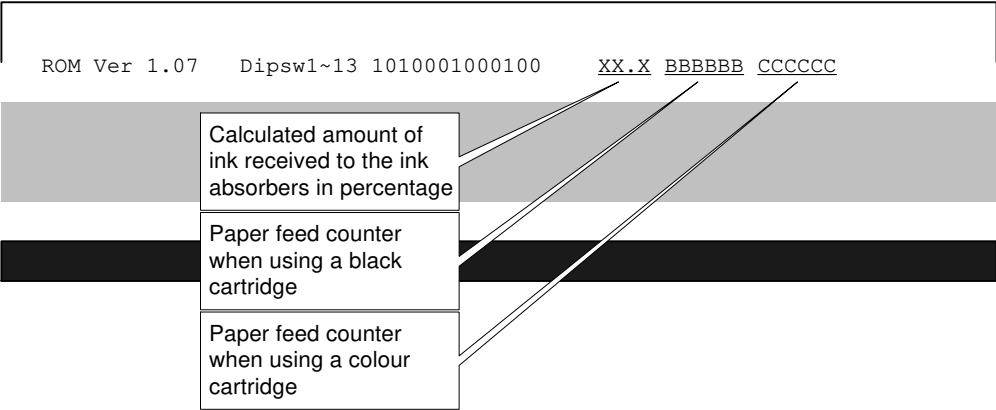
H505M502.wmf

To reset the counters in the EEPROM, select test pattern no. 9 (Initializing the EEPROM) with function 11 as shown below.

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

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

2. 1 1 Yes

```
0-PATTERN  1-CARRIAGE
2-SENSOR
```

3. 0

```
PATTERN PRINT  KPAD
    0-9,#
```

4. Press 9 .

The machine first resets the counters in the EEPROM, then it prints the EEPROM information sheet.

The format of the sheet is the same as shown on the previous page.

4.1.18. 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-CARRIAGE
2-SENSOR
```

3. 1

```
                 START
  CARRIAGE TEST
```

4. ◇

5. To stop the test, press ▽ .

6. To finish: No Function

4.1.19. Ink End Sensor Initialization (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-CARRIAGE
2-SENSOR
```

3. 2

```
                  START
  SET SENSOR
```

4. ◇

   The machine prints a test pattern and initializes the sensor parameters.

6. After the machine finishes initialization: No Function

7. Print the system parameter list (function 02).

Note: Place a clean sheet of white paper in the paper feed unit when doing
         this procedure.

4.1.20. RAM Tests (Function 12)

1. Function 6 1 9 9 5
   then immediately Yes

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

2. 1 2 Yes

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

3. Either:

   Test the SRAM: Press 0 ◇

   Test the SAF: Press 1 ◇

   Test the SAF card: Press 2 ◇

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

4. To finish: No Function

4.1.21. Software Download (Function 12)

Note: This function is only avalable with machines that have FLASH ROM.

Instead of replacing an EPROM to update the machine's software (as in older models), you may use this procedure to update the software in the machine's Flash ROM. This function copies software from an external medium to the Flash ROM on the machine's FCE. The external medium for the new software can be an FCE or an EPROM board.

H505M503.wmf
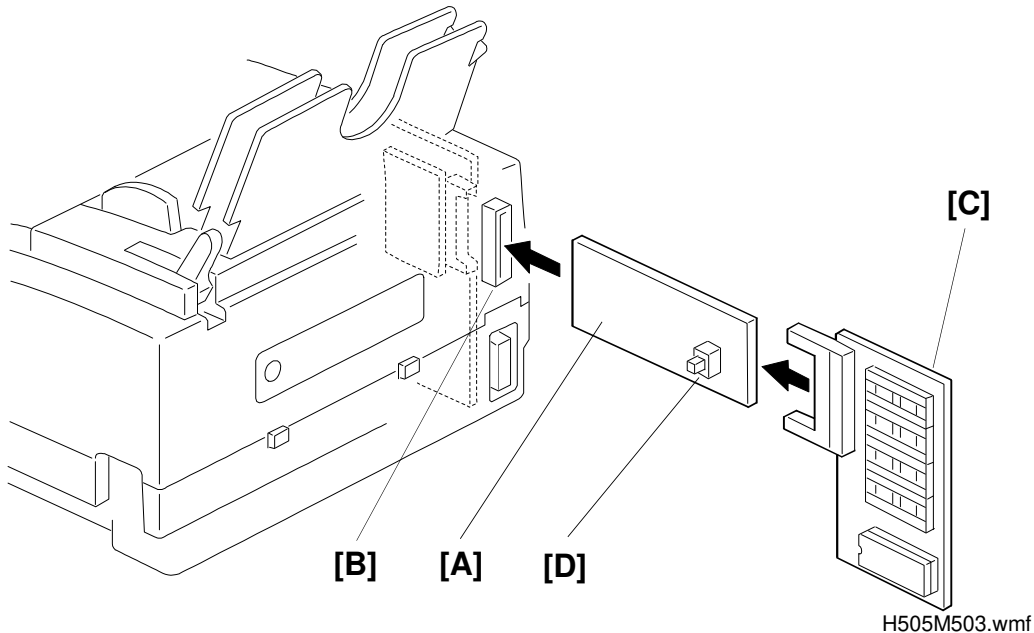
1. Turn off the machine.

2. Insert the Flash/SRAM Copy Tool [A] into the IC card slot [B], then connect the FCE or EPROM board with new software [C] to the opposite side of the tool.

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

3. Turn on the machine.

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

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

5. [1] [2] [Yes] [▶]

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

6. [4]

7. ◇

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

   ```
   OK!!
   COPY    MACH <- FLROM
   ```
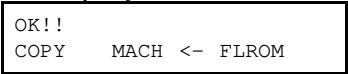
   If the software download fails, the display
   shows "**NG**".

   ```
   NG!!
   COPY    MACH <- FLROM
   ```
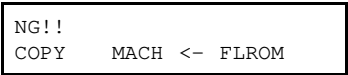
8. To finish, press Function .

9. Turn off the machine, then turn it back on.

10. Print out the system parameter list and check the ROM version.

4.1.22. Software Upload (Function 12)

Note: This function is only avalable with machines that have FLASH ROM.

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

1. Turn off the machine.

2. Connect the Flash/SRAM Copy Tool and an FCE as shown in the previous section.
   Note: The switch [D] on the tool must be at the **OFF** position.

3. Turn on the machine.

4. Function 6 1 9 9 5

   then immediately Yes

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

5. 1 2 Yes

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

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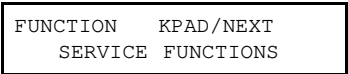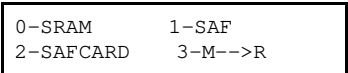
   If the software is successfully uploaded,
   the display shows "**OK**".

   ```
   OK!!
   COPY    MACH -> FLROM
   ```
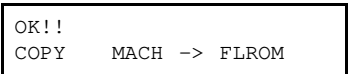
   If the software upload fails, the display
   shows "**NG**".

   ```
   NG!!
   COPY    MACH -> FLROM
   ```
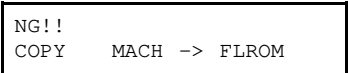
7. Finish : Function

8. Turn off the machine, and turn it on again.

4.1.23. SRAM Data Download (Function 12)

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

1. Turn off the machine.

2. Connect the Flash/SRAM Copy Tool [A] and the damaged FCE [C] as shown in section 4.1.21.

   Note: The setting of switch [D] on the tool will not affect the result of this procedure.

3. Turn on the machine.

4. Function 6 1 9 9 5
   then immediately Yes

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

5. 1 2 Yes ▶

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

6. 5

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

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

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

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

8. Finish : Function

9. Turn off the machine, then turn it back on.

4.1.24. Serial Number (Function 14)

1. `Function` `6` `1` `9` `9` `5`
   then immediately `Yes`

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

2. `1` `4` `Yes`

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

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

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

4. If the display is correct: `Yes`

5. Finish: `Function`

4.1.25. Service Station Fax Number (Function 13)

1. `Function` `6` `1` `9` `9` `5`
   then immediately `Yes`

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

2. `1` `3` `Yes`

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

3. Input the telephone number of the service station. This number will appear on the LCD when the machine is in a service call condition.

   To erase the telephone number: press `No`

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

4. If the display is correct: `Yes` `Function`

Note: This machine does not have an auto service call feature.
The service station number is used only when the memory file transfer function is used.
(Please refer to system bit switch 02 in section 4-2 for the memory file transfer method.)

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 in other countries.

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

4.2.1. System Switches

System Switch 00		
No	**FUNCTION**	**COMMENTS**

0
 	
1
	RAM Reset
	
	Bit 1 Bit 0 Reset Level
	  0 0 No reset
	  0 1 Reset Level 2
	  1 0 Reset Level 3
	  1 1 Not used
		Reset Level 3: Erases all image data files stored in the SAF memory and communication files (e.g. polling rx files). This setting is recommended for use when it is necessary to clear the SAF.
		Reset Level 2: In addition to those items erased by Reset Level 3, the following items are erased: own telephone number, bit switches, RTI/TTI/CSI, report data, programmed telephone numbers (Quick/Speed/Groups, service station, etc.), personal codes.
		
		After erasing, the machine changes these two bits back to 0 automatically.
		
		No reset: Normal operation
		
		Cross reference
		RAM Reset Level 1 (Factory reset):
		Change the data in RAM address 800000(H) to FF(H), then turn the machine off and on. In addition to those items erased by Reset Level 2, NCU parameters, country code setting (system bit switch 0F), the clock settings are erased.
		Note: Place a clean sheet of white paper in the paper feed unit when doing this procedure. The machine immediately initializes the ink end sensor at the end of this procedure.

System Switch 00		
No	**FUNCTION**	**COMMENTS**
2	Technical data printout on TCR (Journal) **0:** Disabled **1:** Enabled	1: Instead of the personal code, the following data are listed on the TCR for each analog G3 communication. e.g. V29 96 01 03 00 02 **First number:** Final modem type used **Second number:** Final modem rate (for example, 96 means 9.6 kbps) **Third and fourth numbers:** Line quality data. Either a measure of the error rate or the rx level is printed, depending on the bit 3 setting below. (An M on the report indicates that it is an error rate, and an L indicates an Rx level.) The left hand figure is the high byte and the right hand figure is the low byte (refer to the note below this table for how to read the rx level.) 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 set at 1, a mark will be printed on the left edge of the page at any place where a line error occurs 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.

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

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

The four-digit hexadecimal value (N) after L indicates the rx level. Divide the decimal value of N by -16 to get the rx level.
In this example, the decimal value of 010C(H) is 268.
So, the actual rx level is 268/16 = -16.75 dB.

Communication Parameters

Mode	DCS: ITU-T standard NSS: Non-standard G3
Modem rate	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 - Not used. (Do not change the settings.)

System Switch 02		
No	**FUNCTION**	**COMMENTS**
0	Memory file transfer **0:** Disabled **1:** Enabled	**1:** All messages in the memory (including confidential rx messages) are sent to the fax number which is programmed as the service station. Always reset this bit to zero after transfer. **Cross reference** Service station number programming: Function 13
1	Programmed data transfer (Back-to-back) **0:** Disabled **1:** Enabled	Do the following steps to transfer the data. 1. Connect two machines of the same type back to back and enable back-to-back communication on both machines. (For this machine, set bit 7 of G3 bit switch 00 to 1.) 2. Set this switch to 1 on the receiving machine. 3. Insert a sheet of paper in the ADF, and press Start on both machines. The data is transferred. 4. Disable back-to-back comminication and set this bit to 0 after finishing.
2	Not used	Do not change the setting.
3	Memory file printout **0:** Disabled **1:** Enabled	**1:** All SAF files, including confidential messages, can be printed using User Function 54 or 55. Always reset this bit after printing the messages.
4	Not used	Do not change the settings.
5		
6 **7**	Memory read/write by RDS **Bit 7 6 Setting** 0 0 Always disabled 0 1 User selectable 1 0 User selectable 1 1 Always enabled	**(0,0):** All RDS systems are always locked out. **(0,1), (1,0):** Normally, RDS systems are locked out, but the user can temporarily switch RDS on to allow RDS operations to take place. RDS will automatically be locked out again after a certain time, which is stored in System Switch 03 (see below). Note that if an RDS operation takes place, RDS will not switch off until this time limit has expired. **(1,1):** At any time, an RDS system can access the machine.

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

System Switch 04		
No	**FUNCTION**	**COMMENTS**
0 to 2	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	Inclusion of the Start key in Keystroke Programs **0:** Not needed **1:** Needed	**0:** The user does not need to press the Start key when operating a keystroke program.
5	Not used	Do not change the setting.
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 **0:** Disabled **1:** Enabled	**1:** Memory transmissions can be stopped by pressing the Stop key. However, users might accidentally cancel another person's memory transmission in progress.
1-7	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	Addition of part of the image data from confidential transmissions on the transmission result report **0:** Disabled **1:** Enabled	If this feature is enabled, the top half of the first page of confidential messages will be printed on transmission result reports.
1	Inclusion of communications 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	Listing of Confidential IDs on the Personal Code List **0:** Disabled **1:** Enabled	**1:** Confidential IDs registered with Personal Codes by the users will appear on the Personal Code List.
5	Power failure report **0:** Disabled **1:** Enabled	**1:** A power failure report will be automatically printed after the power is switched on if a fax message disappeared from the memory when the power was turned off last.
6	Not used	Do not change the settings.
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 7	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 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 10: Not used 01: Germany 11: USA 02: UK 12: Asia 03: Italy 13: Japan 04: Austria 14: Hong Kong 05: Belgium 15: South Africa 06: Denmark 16: Australia 07: Finland 17: New Zealand 08: Ireland 18: Singapore 09: Norway 19: Malaysia 0A: Sweden 1A: China 0B: Switz. 1B: Taiwan 0C: Portugal 20: Turkey 0D: Holland 21: Greece 0E: Spain 0F: Israel	This country code determines the factory settings of bit switches and RAM addresses. However, it has no effect on the NCU parameter settings and communication parameter RAM addresses. **Cross reference** NCU country code: Function 08, parameter CC.

System Switch 10 - Not used (do not change the settings)
System Switch 11 - 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 - Not used (do not change the settings)

System Switch 14		
No	**FUNCTION**	**COMMENTS**
0 to 7	Wait time between pages in printer mode	05 to 64 (H) (5 to 100s) - This setting determines the machine's wait time between pages in the printer mode.

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

4.2.2. Scanner Switches

Scanner Switch 00		
No	**FUNCTION**	**COMMENTS**
0	Not used	Do not change the settings.
1		

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 a higher setting.

4-6	Not used	Do not change the settings.
7	Auto-contrast threshold **0:** Disabled **1:** Enabled	**0:** Set this bit to 0 to disable the auto-contrast threshold function. **Cross reference**: Auto-contrast threshold: Section 2-1

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

Scanner Switch 02		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone disabled	The value can be between 00 to FF. For a darker threshold, input a lower value.

Scanner Switch 03 - Not used (do not change the settings)
Scanner Switch 04 - Not used (do not change the settings)

Scanner Switch 05		
No	**FUNCTION**	**COMMENTS**
0 to 7	Contrast threshold with halftone enabled	The value can be between 00 to FF. For a darker threshold, input a lower value.

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

4.2.3. Printer Switches

Printer Switch 00 - 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 Switches 04 and 05		
No	**FUNCTION**	**COMMENTS**
0 **to** **7**	Reduction ratios used for different paper sizes (with reduction enabled in switch 03-0 above) If reduction is enabled, the data will be reduced in the length direction before printing. These switches determine the maximum reduction ratio for each paper size. **Cross reference** Page separation and data reduction: section 2.2.8. Switch 04/05 US Europe/Asia Bit 0 Not used Not used Bit 1 Not used Not used Bit 2 LT lengthwise Not used Bit 3 Not used A4 lengthwise Bit 4 Not used Not used Bit 5 LG lengthwise Not used Bit 6 Not used Not used Bit 7 Not used Not used The available paper sizes depend on the machine's country version. $$\left(\frac{Sw.04}{Sw.05}\right):\binom{0}{0}=\binom{3}{2},\binom{1}{0}=\binom{4}{3},\binom{0}{1}=\binom{8}{7},\binom{1}{1}=\binom{12}{11}$$	

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

4.2.4. Communication Switches

Communication Switch 00		
No	**FUNCTION**	**COMMENTS**

0
 	
1
	Compression modes available in receive mode
	Bit 1 0 Modes
	    0 0 MH only
	    0 1 MH/MR
	    1 0 MH/MR/MMR
	    1 1 Not used
		These bits determine the compression capabilities to be declared in phase B (handshaking) of the T.30 protocol.

2
 	
3
	Compression modes available in transmit mode
	Bit 3 2 Modes
	    0 0 MH only
	    0 1 MH/MR
	    1 0 MH/MR/MMR
	    1 1 Not used
		These bits determine the compression capabilities to be used in the transmission and to be declared in phase B (handshaking) of the T.30 protocol.
		Cross reference
		EFC compression in transmission: Communication Switch 01, bit 1.

4 **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	ECM **0:** Off **1:** On	If this bit is 0, ECM is switched off for all communications.
1	EFC during transmission **0:** Off **1:** On	If this bit is 0, EFC is switched off during transmission.
2 **3**	Wrong connection prevention method **Bit 3 Bit 2 Setting** 0 0 None 0 1 8 digit CSI 1 0 4 digit CSI 1 1 CSI/RTI	**(0,1) -** The machine will not transmit if the last 8 digits of the received CSI do not match the last 8 digits of the dialed telephone number. This does not work for manual dialing. **(1,0) -** The same as above, except that only the last 4 digits are compared. **(1,1) -** The machine will not transmit if the other end does not identify itself with an RTI or CSI. **(0,0) -** Nothing is checked; transmission will always go ahead.
4	Operator call if no response is received in reply to NSF/DIS **0:** Disabled **1:** Enabled	Set this bit to 1 if the user expects to receive phone calls at the same number which the machine is connected to.
5	Not used.	Do not change the setting.
6 **7**	Maximum printable page length available **Bit 7 Bit 6 Setting** 0 0 No limit 0 1 B4 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 **0:** Deleted from memory without printing **1:** Printed	**0:** Pages received with errors are not printed.
3	Hang-up decision when a negative code (RTN or PIN) is received during G3 immediate transmission **0:** No hang-up, **1:** Hang-up	**0:** The next page will be sent even if RTN or PIN is received. **1:** The machine will send DCN and hang up if it receives RTN or PIN. This bit is ignored for memory transmissions or if ECM is being used.
4 to 7	Not used	Do not change the settings.

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

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

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

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

Communication Switch 0A		
No	**FUNCTION**	**COMMENTS**
0	Point of resumption of memory transmission upon redialing **0:** From the error page **1:** From page 1	**0:** The transmission begins from the page where transmission failed the previous time. **1:** Transmission begins from the first page.
1 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	00 to FF (Hex), unit = 2 kbytes (e.g., 0C(H) = 24 kbytes) One page is about 24 kbytes. If this setting is kept at 0, the machine will detect ringing signals and go into receive mode even if there is no memory space left. This will result in communication failure.

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

Communication Switch 0F		
No	FUNCTION	COMMENTS
0 to 7	Minimum number of times that a destination will be dialed when TRD is being used	01 - FF (Hex) times

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

Communication Switch 11		
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	00 - FF (Hex) minutes

Communication Switch 13		
No	**FUNCTION**	**COMMENTS**
0 to 7	Immediate transmission: Interval between dialing attempts to the same destination	00 - FF (Hex) minutes

Communication Switch 14 - Not used (do not change the settings)
Communication Switch 15 - Not used (do not change the settings)
Communication Switch 16 - Not used (do not change the settings)
Communication Switch 17 - Not used (do not change the settings)
Communication Switch 18 - Not used (do not change the settings)
Communication Switch 19 - Not used (do not change the settings)
Communication Switch 1A - Not used (do not change the settings)
Communication Switch 1B - Not used (do not change the settings)
Communication Switch 1C - Not used (do not change the settings)
Communication Switch 1D - Not used (do not change the settings)
Communication Switch 1E - Not used (do not change the settings)
Communication Switch 1F - Not used (do not change the settings)

4.2.5. G3 Switches

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

G3 Switch 01		
No	**FUNCTION**	**COMMENTS**
0 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 to 7	Not used	Do not change the settings.

G3 Switch 02		
No	**FUNCTION**	**COMMENTS**
0	G3 protocol mode used **0:** Standard and non-standard **1:** Standard only	**1:** Disables NSF/NSS signals (these are used in non-standard mode communication)
1 to 4	Not used	Do not change the settings.
5	Use of modem rate history for each Quick/Speed dial **0:** Disabled **1:** Enabled	**0:** Communications using Quick/Speed dials always start with the highest modem rate. **1:** The machine uses the modem rate history for communications using the Quick/Speed dials when determining the most suitable rate for the current communication.
6	AI short protocol (transmission and reception) **0:** Disabled **1:** Enabled	Refer to Appendix B in the Group 3 Facsimile Manual for details about AI Short Protocol.
7	Not used	Do not change 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 **2**	Not used	Do not change the setting.
3	ECM frame size **0:** 256 bytes **1:** 64 bytes	**1:** The machine transmits with a frame size of 64 bytes. Set this bit to 1 when the other terminal only has a 64 byte frame size.
4	CTC transmission conditions **0:** Ricoh mode (PPR x 1) **1:** ITU-T mode (PPR x 4)	When using ECM, the machine will choose a slower modem rate after receiving PPR once (Ricoh mode) or four times (ITU-T mode). ITU-T: New acronym for the CCITT.
5	Modem rate used for the next page after receiving a negative code (RTN or PIN) **0:** No change **1:** Fallback	**1:** The machine's tx modem rate will fall back before sending the next page if a negative code is received. This bit is ignored if ECM is being used.
6 **7**	Not used	Do not change the setting.

G3 Switch 04		
	FUNCTION	**COMMENTS**
0 to 3	Training error detection threshold	0 - F (Hex); 0 - 15 bits If the number of error bits in the received TCF is below this threshold, the machine informs the sender that the training has succeeded.
4 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** 0 0 1 1	 **Bit 0** 0 1 0 1	 **Setting** None Low Medium 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** 0 0 1 1	 **Bit 2** 0 1 0 1	 **Setting** None Low Medium High	Use a higher setting if there is signal loss at higher frequencies because of the length of wire between the modem and the telephone exchange. Also, try using the cable equalizer if one or more of the following symptoms occurs. • Communication error with error codes such as 0-20, 0-23, etc. • Modem rate fallback occurs frequently.
4-7	Not used			Do not change the settings.

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

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

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

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	Not used	Do not change the settings.
3	TAM interface type (Germany only) 0: Normal 1: German type	0: The normal type of TAM interface monitors the line current on the NCU to detect whether the external TAM goes off-hook or on-hook. 1: The German type of TAM interface does not monitor the line current on the NCU, because the TAM and the fax are connected in parallel to the line.
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.

Address	Function	Unit	Remarks
807F00	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
807F01	Line current detection time	20 ms	Line current is not detected if 807F01 contains FF.
807F02	Line current wait time		
807F03	Line current drop detect time		
807F04	PSTN dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F05	PSTN dial tone frequency range (low byte)		

Address	Function	Unit	Remarks
807F06	Not used		Do not change the factory setting.
807F07			
807F08	PSTN dial tone detection time	20 ms	If 807F08 contains FF, the machine pauses for the pause time (address 807F0D / 807F0E). See Note 3 (Italy).
807F09	PSTN dial tone reset time (LOW)		
807F0A	PSTN dial tone reset time (HIGH)		
807F0B	PSTN dial tone continuous tone time		
807F0C	PSTN dial tone permissible drop time		
807F0D	PSTN wait interval (LOW)		
807F0E	PSTN wait interval (HIGH)		
807F0F	PSTN ringback tone detection time	20 ms	Detection is disabled if this contains FF.
807F10	PSTN ringback tone off detection time	20 ms	
807F11	PSTN detection time for silent period after ringback tone detected (LOW)	20 ms	
807F12	PSTN detection time for silent period after ringback tone detected (HIGH)	20 ms	
807F13	PSTN busy tone frequency range (high byte)	Hz (BCD)	If 807F13 is FF, detection is disabled. See Note 2.
807F14	PSTN busy tone frequency range (low byte)		
807F15	Not used		Do not change the factory settings.
807F16			
807F17	PABX dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F18	PABX dial tone frequency range (low byte)		
807F19	Not used		Do not change the factory settings.
807F1A			
807F1B	PABX dial tone detection time	20 ms	If 807F1B contains FF, the machine pauses for the pause time (807F20 / 807F21).
807F1C	PABX dial tone reset time (LOW)		
807F1D	PABX dial tone reset time (HIGH)		
807F1E	PABX dial tone continuous tone time		
807F1F	PABX dial tone permissible drop time		
807F20	PABX wait interval (HIGH)		
807F21	PABX wait interval (LOW)		
807F22	PABX ringback tone detection time	20 ms	Detection is disabled if this contains FF.
807F23	PABX ringback tone off detection time	20 ms	

Address	Function	Unit	Remarks
807F24	PABX detection time for silent period after ringback tone detected (LOW)	20 ms	
807F25	PABX detection time for silent period after ringback tone detected (HIGH)	20 ms	
807F26	PABX busy tone frequency range (high byte)	Hz (BCD)	If this is FF, detection is disabled. See Note 2.
807F27	PABX busy tone frequency range (low byte)		See Note 2.
807F28	Not used		Do not change the factory settings.
807F29			
807F2A	Busy tone ON time: range 1	20 ms	
807F2B	Busy tone OFF time: range 1		
807F2C	Busy tone ON time: range 2		
807F2D	Busy tone OFF time: range 2		
807F2E	Busy tone ON time: range 3		
807F2F	Busy tone OFF time: range 3		
807F30	Busy tone ON time: range 4		
807F31	Busy tone OFF time: range 4		
807F32	Busy tone continuous tone detection time		
807F33	Busy tone signal state time tolerance for all ranges, and number of cycles required for detection (a setting of 4 cycles means that ON-OFF-ON or OFF-ON-OFF must be detected twice). Tolerance ($\pm$) Bit 1 0 0 0 75% 0 1 50% 1 0 25% 1 1 12.5% Bits 7, 6, 5, 4 - number of cycles required for cadence detection		Bits 2 and 3 must always be kept at 0.
807F34	International dial tone frequency range (high byte)	Hz (BCD)	See Note 2.
807F35	International dial tone frequency range (low byte)		
807F36	Not used		Do not change the factory settings
807F37			

Address	Function	Unit	Remarks
807F38	International dial tone detection time	20 ms	If 807F38 contains FF, the machine pauses for the pause time (807F3D / 807F3E).
807F39	International dial tone reset time (LOW)		
807F3A	International dial tone reset time (HIGH)		See Note 3 (Belgium).
807F3B	International dial tone continuous tone time		
807F3C	International dial tone permissible drop time		
807F3D	International dial wait interval (LOW)		
807F3E	International dial wait interval (HIGH)		
807F3F	Country dial tone upper frequency limit (HIGH)	Hz (BCD)	See Note 2.
807F40	Country dial tone upper frequency limit (LOW)		
807F41	Country dial tone lower frequency limit (HIGH)		
807F42	Country dial tone lower frequency limit (LOW)		
807F43	Country dial tone detection time	20 ms	If 807F43 contains FF, the machine pauses for the pause time (807F48 / 807F49).
807F44	Country dial tone reset time (LOW)		
807F45	Country dial tone reset time (HIGH)		
807F46	Country dial tone continuous tone time		
807F47	Country dial tone permissible drop time		
807F48	Country dial wait interval (LOW)		
807F49	Country dial wait interval (HIGH)		
807F4A	Time between opening or closing the Ds relay and opening the Di relay	1 ms	See Notes 4 and 7. Function 08 (parameter 11).
807F4B	Break time for pulse dialling	1 ms	See Note 4. Function 08 (parameter 12).
807F4C	Make time for pulse dialling	1 ms	See Note 4. Function 08 (parameter 13).
807F4D	Time between final Di relay closure and Ds relay opening or closing	1 ms	See Notes 4 and 7. Function 08 (parameter 14).
807F4E	Minimum pause between dialled digits (pulse dial mode)	20 ms	See Note 4. Function 08 (parameter 15).
807F4F	Waiting time when a pause is entered at the operation panel		Function 08 (parameter 16). See Note 4.
807F50	DTMF tone on time	1 ms	Function 08 (parameter 17).
807F51	DTMF tone off time		Function 08 (parameter 18).

Address	Function	Unit	Remarks
807F52	Tone attenuation value in DTMF signals	-dBm x 0.5	Function 08 (parameter 19). See Note 6.
807F53	Tone attenuation value difference between high frequency tone and low frequency tone in DTMF signals	-Nx0.5 (dB)	Function 08 (parameter 20). See Note 6.
807F54	PSTN: DTMF tone attenuation level after dialling	-dBm x 0.5	Function 08 (parameter 21). See Note 6.
807F55 to 807F58	Not used		Do not change the settings.
807F59	Grounding time (ground start mode)	20 ms	The Gs relay is closed for this interval.
807F5A	Break time (flash start mode)	1 ms	The OHDI relay is open for this interval.
807F5B 807F5C	International dial access code	BCD	For a code of 100: 807F5B - F1 807F5C - 00
807F5D	PSTN access pause time	20 ms	The time waited for each pause input after the PSTN access code. Up to 7 of these can be input. If this address contains FF[H], the pause time stored in address 807F4F is used.
807F5E	Progress tone detection level, and cadence detection enable flags	Bit 7 Bit 6 Bit 5 dBm 0 0 0 -25.0 0 0 1 -35.0 0 1 0 -30.0 1 0 0 -40.0 1 1 0 -49.0 Bits 2, 0 - See Note 3.	
807F5F	Polarity detection	Bit 4 1: Enable: Tx Polarity detection Bit 5 1: Enable: Rx Polarity detection	
807F60 to 807F64	Not used		Do not change the settings.
807F65	Intercity dial prefix (HIGH)	BCD	For a code of 0: 807F65 - FF 807F66 - F0
807F66	Intercity dial prefix (LOW)	BCD	
807F67 to 807F71	Not used		Do not change the settings.

Address	Function	Unit	Remarks
807F72	Acceptable ringing signal frequency: range 1, upper limit	1000/ N (Hz).	Function 08 (parameter 02).
807F73	Acceptable ringing signal frequency: range 1, lower limit		Function 08 (parameter 03).
807F74	Acceptable ringing signal frequency: range 2, upper limit		Function 08 (parameter 04).
807F75	Acceptable ringing signal frequency: range 2, lower limit		Function 08 (parameter 05).
807F76	Number or rings until a call is detected	1	Function 08 (parameter 06).
807F77	Minimum required length of the first ring	20 ms	See Note 5. Function 09 (parameter 07).
807F78	Minimum required length of the second and subsequent rings	20 ms	Function 08 (parameter 08).
807F79	Ringing signal detection reset time (LOW)	20 ms	Function 08 (parameter 09).
807F7A	Ringing signal detection reset time (HIGH)		Function 08 (parameter 10).
807F7B to 807F80	Not used		Do not change the settings.
807F81	Interval between dialing the last digit and switching the Oh relay over to the external telephone when dialing from the operation panel in handset mode.	20 ms	Factory setting: 500 ms
807F82	Bits 0 and 1 - Handset off-hook detection time **Bit 1 0 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 2 and 3 - Handset on-hook detection time **Bit 3 2 Setting** 0 0 200 ms 0 1 800 ms Other Not used Bits 4 to 7 - Not used		
807FA1	Acceptable CED detection range (high byte)	BCD (Hz)	See Note 2.
807FA2	Acceptable CED detection range (low byte)		
807FA3	Not used		Do not change the factory setting.
807FA4			
807FA5	CED detection time	20 ms ± 20 ms	Factory setting: 200 ms

Address	Function	Unit	Remarks
807FA6	Not used		Do not change the factory setting.
807FA7			
807FA8			
807FA9			
807FAA	CNG detection time	20 ms $\pm$ 20 ms	Factory setting: 200 ms
807FAB	CNG on time	20 ms	Factory setting: 500 ms
807FAC	CNG off time	20 ms	Factory setting: 200 ms
807FAD	Number of CNG cycles required for detection		The data is coded in the same way as address 807F33. Factory setting: 23(H)
807FAE	Not used		Do not change the settings.
807FAF			
807FB0			
807FB1			
807FB2			
807FB3	Detection time for 800 Hz AI short protocol tone	20 ms	Factory setting: 360 ms
807FB4	PSTN: Tx level from the modem	- dBm	Function 08 (parameter 01).
807FB5	PSTN: 1100 Hz tone transmission level	- N_{807FB4} - 0.5N_{807FB5} (dB)	
807FB6	PSTN: 2100 Hz tone transmission level	- N_{807FB4} - 0.5N_{807FB6} (dB)	
807FB7	PABX: Tx level from the modem	- dBm	
807FB8	PABX: 1100 Hz tone transmission level	- N_{807FB7} - 0.5N_{807FB8} (dB)	
807FB9	PABX: 2100 Hz tone transmission level	- N_{807FB7} - 0.5N_{807FB9} (dB)	
807FBA to 807FBC	Not used		Do not change the settings.
807FBD	Modem turn-on level (incoming signal detection level)	-37-0.5N (dBm)	
807FDA	T.30 T1 timer	1 s	

Notes

1. If a setting is not required, store FF in the address.

2. 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. Italy and Belgium only

   RAM address 807F5E: the lower four bits have the following meaning.
   Bit 2 1: International dial tone cadence detection enabled (Belgium)
   Bit 1 Not used
   Bit 0 1: PSTN dial tone cadence detection enabled (Italy)

   If bit 0 or bit 2 is set to 1, the functions of the following RAM addresses are changed.
   807F08 (if bit 0 = 1) or 807F38 (if bit 2 = 1): tolerance for on or off state duration (%), and number of cycles required for detection, coded as in address 807F33.
   807F0B (if bit 0 = 1) or 807F3B (if bit 2 = 1): on time, hex code (unit = 20 ms)
   807F0C (if bit 0 = 1) or 807F3C(if bit 2 = 1): off time, hex code (unit = 20 ms)

4. Pulse dial parameters (addresses 807F4A to 807F4F) are the values for 10 pps. If 20 pps is used, the machine automatically compensates.

5. The first ring may not be detected until 1 to 2.5 wavelengths after the time specified by this parameter.

6. The calculated level must be between 0 and 10.
   The attenuation levels calculated from RAM data are:
   High frequency tone: $- 0.5 \times N_{807F52/807F54}$ dBm
   Low frequency tone: $- 0.5 \times (N_{807F52/807F54} + N_{807F53})$ dBm
   Note: N_{807F52}, for example, means the value stored in address 807F52(H)

7. 807F4A: Europe - Between Ds opening and Di opening, France - Between Ds closing and Di opening
   807F4D: Europe - Between Ds closing and Di closing, France - Between Ds opening and Di closing

Tone Detection Frequency Ranges

- PSTN Dial Tone (807F04 - 807F05) -

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 (807F17 - 807F18) -

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 (807F34 - 807F35) -

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 (807F13 - 807F14)

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)	375 - 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 (807F26 - 807F27)

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	??? - 465	120 (Default)	365 - 575
070	380 - 465	070	??? - 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] (807FA1 - 807FA2) -

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 an 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.

Country	807F01	807F02	807F03	807F04	807F05
France	FFH	FFH	FFH	0H	60H
Germany	FFH	FFH	FFH	0H	90H
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	0H	30H
Austria	FFH	FFH	FFH	0H	C8H
Belgium	FFH	FFH	FFH	0H	C8H
Denmark	FFH	FFH	FFH	0H	D0H
Finland	FFH	FFH	FFH	0H	F8H
Ireland	FFH	FFH	FFH	0H	E8H
Norway	FFH	FFH	FFH	0H	E0H
Sweden	FFH	FFH	FFH	0H	A0H
Switzerland	FFH	FFH	FFH	1H	20H
Portugal	FFH	FFH	FFH	0H	B0H
Holland	FFH	FFH	FFH	1H	40H
Spain	FFH	FFH	FFH	0H	E0H
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	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F08	807F09	807F0A	807F0B	807F0C
France	75	F4H	1H	75	2
Germany	105	CFH	3H	105	4
UK	FFH	FFH	FFH	FFH	
Italy	21H	21H	2H	30	60
Austria	40	F4H	1H	39	3
Belgium	35	20H	03H	30	4
Denmark	65	C2H	1H	65	4
Finland	125	F4H	1H	64H	4
Ireland	105	C2H	1H	105	4
Norway	55	B6H	3H	55	4
Sweden	40	00H	1H	35	4
Switzerland	40	21H	2H	38	2
Portugal	105	C2H	1H	105	4
Holland	75	EEH	2H	55	4
Spain	75	3FH	2H	50	5
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	8
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F0D	807F0E	807F0F	807F10	807F11
France	100	0	FFH	FFH	FFH
Germany	200	0	FFH	FFH	FFH
UK	250	0	FFH	FFH	FFH
Italy	200	0	FFH	FFH	FFH
Austria	200	0	FFH	FFH	FFH
Belgium	200	0	FFH	FFH	FFH
Denmark	200	0	FFH	FFH	FFH
Finland	200	0	FFH	FFH	FFH
Ireland	200	0	FFH	FFH	FFH
Norway	175	0	FFH	FFH	FFH
Sweden	200	0	FFH	FFH	FFH
Switzerland	200	0	5	50	26H
Portugal	200	0	FFH	FFH	FFH
Holland	200	0	FFH	FFH	FFH
Spain	150	0	FFH	FFH	FFH
Israel	200	0	FFH	FFH	FFH
USA	100	0	FFH	FFH	FFH
Asia	200	0	FFH	FFH	FFH
Hong Kong	100	0	FFH	FFH	FFH
South Africa	100	0	FFH	FFH	FFH
Australia	150	0	FFH	FFH	FFH
New Zealand	200	0	FFH	FFH	FFH
Singapore	100	0	FFH	FFH	FFH
Malaysia	100	0	FFH	FFH	FFH

Country	807F12	807F13	807F14	807F17	807F18
France	FFH	0H	72H	FFH	FFH
Germany	FFH	0H	98H	FFH	FFH
UK	FFH	0H	C0H	FFH	FFH
Italy	FFH	0H	40H	0H	B8H
Austria	FFH	1H	28H	FFH	FFH
Belgium	FFH	0H	50H	0H	C8H
Denmark	FFH	0H	46H	0H	D0H
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	0H	3EH	FFH	FFH
Norway	FFH	0H	F9H	FFH	FFH
Sweden	FFH	0H	32H	0H	A0H
Switzerland	2H	1H	20H	1H	20H
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	1H	40H	1H	40H
Spain	FFH	0H	D8H	FFH	FFH
Israel	FFH	0H	50H	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	0H	38H	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F1B	807F1C	807F1D	807F1E	807F1F
France	100	58H	2H	50	2H
Germany	FFH	FFH	FFH	FFH	FFH
UK	FFH	FFH	FFH	FFH	FFH
Italy	100	F9H	1H	9	4
Austria	FFH	FFH	FFH	FFH	FFH
Belgium	30	150	0	30	4
Denmark	65	F4H	1H	65	4
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	FFH
Norway	FFH	FFH	FFH	FFH	FFH
Sweden	40	00H	1H	40	3
Switzerland	40	EFH	1H	40	4
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	55	EEH	2H	55	4
Spain	FFH	FFH	FFH	FFH	FFH
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

Country	807F20	807F21	807F22	807F23	807F24
France	100	0	FFH	FFH	FFH
Germany	200	0	FFH	FFH	FFH
UK	200	0	FFH	FFH	FFH
Italy	200	0	FFH	FFH	FFH
Austria	200	0	FFH	FFH	FFH
Belgium	200	0	FFH	FFH	FFH
Denmark	200	0	FFH	FFH	FFH
Finland	200	0	FFH	FFH	FFH
Ireland	200	0	FFH	FFH	FFH
Norway	200	0	FFH	FFH	FFH
Sweden	200	0	FFH	FFH	FFH
Switzerland	200	0	FFH	FFH	FFH
Portugal	200	0	FFH	FFH	FFH
Holland	200	0	FFH	FFH	FFH
Spain	150	0	FFH	FFH	FFH
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

Country	807F25	807F26	807F27	807F2A	807F2B
France	FFH	FFH	FFH	25	25
Germany	FFH	FFH	FFH	12	12
UK	FFH	FFH	FFH	19	19
Italy	FFH	0H	30H	13H	10H
Austria	FFH	FFH	FFH	00H	0DH
Belgium	FFH	FFH	FFH	25	23
Denmark	FFH	0H	50H	14H	14H
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	25	25
Norway	FFH	FFH	FFH	10	0
Sweden	FFH	FFH	FFH	12	12
Switzerland	FFH	1H	20H	16H	16H
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	14H	14H
Spain	FFH	FFH	FFH	8	8
Israel	FFH	0H	50H	12	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	FFH	0H	38H	12	12
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F2C	807F2D	807F2E	807F2F	807F30
France	FFH	FFH	FFH	FFH	FFH
Germany	24	24	7	24	FFH
UK	20	17	11	26	FFH
Italy	11H	14H	FFH	FFH	FFH
Austria	10H	10H	FFH	FFH	FFH
Belgium	8	8	FFH	FFH	FFH
Denmark	FFH	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	37	37	18	18	FFH
Norway	21	0	FFH	FFH	FFH
Sweden	12	37	FFH	FFH	FFH
Switzerland	0DH	0CH	09H	09H	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	FFH	FFH
Spain	FFH	FFH	FFH	FFH	FFH
Israel	24	24	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	25	25	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F31	807F32	807F33	807F34	807F35
France	FFH	FFH	41H	4H	74H
Germany	FFH	FFH	31H	FFH	FFH
UK	FFH	100	42H	FFH	FFH
Italy	FFH	FFH	40H	FFH	FFH
Austria	FFH	FFH	40H	FFH	FFH
Belgium	FFH	FFH	42H	00H	AAH
Denmark	FFH	FFH	40H	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	35	43H	FFH	FFH
Norway	FFH	FFH	40H	FFH	FFH
Sweden	FFH	FFH	42H	FFH	FFH
Switzerland	FFH	FFH	40H	FFH	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	40H	FFH	FFH
Spain	FFH	FFH	41H	0H	F0H
Israel	FFH	FFH	41H	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	41H	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F38	807F39	807F3A	807F3B	807F3C
France	57	58H	2	57	6
Germany	FFH	FFH	FFH	FFH	FFH
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	FFH	FFH
Austria	FFH	FFH	FFH	FFH	FFH
Belgium	42H	E8H	3H	16	33
Denmark	FFH	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	FFH
Norway	FFH	FFH	FFH	FFH	FFH
Sweden	FFH	FFH	FFH	FFH	FFH
Switzerland	FFH	FFH	FFH	FFH	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	55	EEH	2H	55	4
Spain	75	3FH	2H	55	5
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F3D	807F3E	807F3F	807F40	807F41
France	0	0	FFH	FFH	FFH
Germany	00H	00H	FFH	FFH	FFH
UK	00H	00H	FFH	FFH	FFH
Italy	00H	00H	FFH	FFH	FFH
Austria	00H	00H	FFH	FFH	FFH
Belgium	00H	00H	FFH	FFH	FFH
Denmark	00H	00H	FFH	FFH	FFH
Finland	00H	00H	FFH	FFH	FFH
Ireland	00H	00H	FFH	FFH	FFH
Norway	00H	00H	FFH	FFH	FFH
Sweden	00H	00H	0H	D0H	4H
Switzerland	00H	00H	FFH	FFH	FFH
Portugal	00H	00H	FFH	FFH	FFH
Holland	00H	00H	FFH	FFH	FFH
Spain	150	0	FFH	FFH	FFH
Israel	00H	00H	FFH	FFH	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

Country	807F42	807F43	807F44	807F45	807F46
France	FFH	FFH	FFH	FFH	FFH
Germany	FFH	FFH	FFH	FFH	FFH
UK	FFH	FFH	FFH	FFH	FFH
Italy	FFH	FFH	FFH	FFH	FFH
Austria	FFH	FFH	FFH	FFH	FFH
Belgium	FFH	FFH	FFH	FFH	FFH
Denmark	FFH	FFH	FFH	FFH	FFH
Finland	FFH	FFH	FFH	FFH	FFH
Ireland	FFH	FFH	FFH	FFH	FFH
Norway	FFH	FFH	FFH	FFH	FFH
Sweden	00H	40	00H	1H	40
Switzerland	FFH	FFH	FFH	FFH	FFH
Portugal	FFH	FFH	FFH	FFH	FFH
Holland	FFH	FFH	FFH	FFH	FFH
Spain	FFH	FFH	FFH	FFH	FFH
Israel	FFH	FFH	FFH	FFH	FFH
USA	FFH	FFH	FFH	FFH	FFH
Asia	FFH	FFH	FFH	FFH	FFH
Hong Kong	FFH	FFH	FFH	FFH	FFH
South Africa	FFH	FFH	FFH	FFH	FFH
Australia	FFH	FFH	FFH	FFH	FFH
New Zealand	FFH	FFH	FFH	FFH	FFH
Singapore	FFH	FFH	FFH	FFH	FFH
Malaysia	FFH	FFH	FFH	FFH	FFH

Country	807F47	807F48	807F49	807F4A	807F4B
France	FFH	0	0	67	65
Germany	FFH	00H	00H	50	61
UK	FFH	00H	00H	252	66
Italy	FFH	00H	00H	58	60
Austria	FFH	00H	00H	53	62
Belgium	FFH	00H	00H	61	67
Denmark	FFH	00H	00H	53	67
Finland	FFH	00H	00H	61	60
Ireland	FFH	00H	00H	255	67
Norway	FFH	00H	00H	61	59
Sweden	3	200	0	100	60
Switzerland	FFH	00H	00H	60	60
Portugal	FFH	00H	00H	61	66
Holland	FFH	00H	00H	58	62
Spain	FFH	00H	00H	75	60
Israel	FFH	00H	00H	61	62
USA	FFH	00H	00H	77	60
Asia	FFH	00H	00H	61	66
Hong Kong	FFH	00H	00H	61	66
South Africa	FFH	00H	00H	61	66
Australia	FFH	00H	00H	255	68
New Zealand	FFH	00H	00H	245	66
Singapore	FFH	00H	00H	61	66
Malaysia	FFH	00H	00H	61	66

Country	807F4C	807F4D	807F4E	807F4F	807F50
France	35	50	40	0	70
Germany	41	44	46	46	90
UK	35	44	27	33	100
Italy	40	44	40	150	70
Austria	39	50	44	46	80
Belgium	33	50	43	26	70
Denmark	33	50	26	26	90
Finland	42	50	40	60	70
Ireland	33	50	30	33	70
Norway	41	50	33	33	70
Sweden	40	70	18	26	70
Switzerland	40	60	26	00H	70
Portugal	34	50	33	33	70
Holland	40	42	33	33	70
Spain	32	75	32	100	70
Israel	39	50	46	101	90
USA	41	74	46	101	100
Asia	34	50	36	101	100
Hong Kong	34	50	36	101	100
South Africa	34	50	36	101	100
Australia	32	70	36	101	100
New Zealand	34	50	25	101	100
Singapore	34	50	36	101	100
Malaysia	34	50	36	101	100

Country	807F51	807F52	807F53	807F54	807F59
France	70	12	4	34	0
Germany	90	0CH	5	34	15
UK	100	17	4	34	15
Italy	70	11	4	34	15
Austria	80	11	4	34	15
Belgium	70	11	4	34	100
Denmark	90	17	4	34	15
Finland	75	17	4	34	15
Ireland	70	17	4	34	15
Norway	70	17	4	34	25
Sweden	70	17	4	34	15
Switzerland	70	8	4	34	10
Portugal	70	17	4	34	15
Holland	70	17	4	34	15
Spain	140	11	4	34	100
Israel	90	17	4	34	15
USA	100	14	4	34	00H
Asia	110	0EH	4	34	00H
Hong Kong	110	12	4	34	00H
South Africa	110	12	4	34	00H
Australia	110	14	4	34	00H
New Zealand	110	17	4	34	00H
Singapore	110	12	4	34	00H
Malaysia	110	12	4	34	00H

Country	807F5A	807F5B	807F5C	807F5D	807F5E
France	0	FFH	19H	FFH	20H
Germany	90	FFH	00H	FFH	20H
UK	90	F0H	10H	50	C0H
Italy	90	FFH	00H	FFH	C1H
Austria	100	FFH	00H	FFH	80H
Belgium	90	FFH	00H	FFH	80H
Denmark	90	F0H	9H	FFH	80H
Finland	90	F9H	90H	100	80H
Ireland	90	FFH	40H	FFH	40H
Norway	90	FFH	00H	FFH	20H
Sweden	90	F0H	09H	FFH	20H
Switzerland	90	FFH	00H	FFH	20H
Portugal	202	FFH	00H	FFH	80H
Holland	90	FFH	00H	FFH	60H
Spain	90	FFH	07H	FFH	80H
Israel	90	FFH	00H	FFH	C0H
USA	00H	FFH	FFH	FFH	C0H
Asia	00H	FFH	FFH	FFH	C0H
Hong Kong	00H	FFH	FFH	FFH	C0H
South Africa	00H	FFH	FFH	FFH	C0H
Australia	00H	FFH	FFH	FFH	C0H
New Zealand	00H	FFH	FFH	FFH	C0H
Singapore	00H	FFH	FFH	FFH	C0H
Malaysia	00H	FFH	FFH	FFH	C0H

Country	807F5F	807F65	807F66	807F72	807F73
France	10H	FFH	16H	17	28
Germany	10H	FFH	FFH	15H	36H
UK	10H	FFH	FFH	20	84
Italy	10H	FFH	FFH	18	77
Austria	10H	FFH	FFH	13	54
Belgium	10H	FFH	FFH	21	72
Denmark	10H	FFH	FFH	11H	43H
Finland	10H	FFH	FFH	16	56
Ireland	10H	FFH	FFH	36	53H
Norway	10H	FFH	FFH	16	43H
Sweden	10H	FFH	FFH	17	43H
Switzerland	10H	FFH	FFH	16	55H
Portugal	10H	FFH	FFH	1AH	53H
Holland	10H	FFH	FFH	16	52
Spain	10H	FFH	FFH	25	43H
Israel	10H	FFH	FFH	16	43H
USA	10H	FFH	FFH	13	83
Asia	10H	FFH	FFH	17	83
Hong Kong	10H	FFH	FFH	17	83
South Africa	10H	FFH	FFH	17	83
Australia	10H	FFH	FFH	14	83
New Zealand	10H	FFH	FFH	17	83
Singapore	10H	FFH	FFH	17	83
Malaysia	10H	FFH	FFH	17	83

Country	807F74	807F75	807F76	807F77	807F78
France	FFH	00H	2	15	15
Germany	FFH	00H	1H	7	7
UK	FFH	00H	1	10	10
Italy	FFH	00H	3	10	10
Austria	FFH	00H	1	9	10
Belgium	FFH	00H	2	5	10
Denmark	16	24	2	10	10
Finland	FFH	00H	2	25	25
Ireland	FFH	00H	1	10	10
Norway	FFH	00H	1	10	10
Sweden	FFH	00H	1	5	5
Switzerland	FFH	00H	3	10	10
Portugal	16	24	1	0FH	0FH
Holland	FFH	00H	2	15	15
Spain	FFH	00H	2	28H	28H
Israel	FFH	00H	2	14H	14H
USA	FFH	00H	1	10	10
Asia	FFH	00H	1	10	10
Hong Kong	FFH	00H	1	10	10
South Africa	FFH	00H	1	10	10
Australia	FFH	00H	3	10	10
New Zealand	FFH	00H	3	10	10
Singapore	FFH	00H	1	10	10
Malaysia	FFH	00H	1	10	10

Country	807F79	807F7A	807F81	807F82	807FA1
France	04H	1H	25	0	02H
Germany	90H	1H	25	00H	02H
UK	90H	1H	25	00H	02H
Italy	90H	1H	25	00H	02H
Austria	90H	1H	25	00H	02H
Belgium	90H	1H	25	00H	02H
Denmark	90H	1H	25	00H	02H
Finland	90H	1H	25	00H	02H
Ireland	90H	1H	25	00H	02H
Norway	90H	1H	25	00H	02H
Sweden	90H	1H	25	00H	02H
Switzerland	90H	1H	25	00H	02H
Portugal	90H	1H	25	00H	02H
Holland	90H	1H	25	00H	02H
Spain	2CH	1H	25	00H	02H
Israel	90H	1H	25	00H	02H
USA	90H	1H	25	00H	02H
Asia	90H	1H	25	00H	02H
Hong Kong	90H	1H	25	00H	03H
South Africa	90H	1H	25	00H	03H
Australia	90H	1H	25	00H	02H
New Zealand	90H	1H	25	00H	02H
Singapore	90H	1H	25	00H	03H
Malaysia	90H	1H	25	00H	03H

Country	807FA2	807FA5	807FAA	807FAB	807FAC
France	00H	16	10	23H	91H
Germany	00H	10	10	23H	91H
UK	00H	10	10	23H	91H
Italy	00H	10	10	19H	91H
Austria	00H	10	10	23H	91H
Belgium	00H	10	10	23H	91H
Denmark	00H	10	10	23H	91H
Finland	00H	10	10	23H	91H
Ireland	00H	10	10	23H	91H
Norway	00H	10	10	23H	91H
Sweden	00H	10	10	23H	91H
Switzerland	00H	10	10	23H	91H
Portugal	00H	10	10	23H	91H
Holland	00H	10	10	23H	91H
Spain	00H	10	10	23H	91H
Israel	00H	10	10	23H	91H
USA	00H	10	10	23H	91H
Asia	00H	10	10	23H	91H
Hong Kong	00H	10	10	19H	96H
South Africa	00H	10	10	19H	96H
Australia	00H	10	10	23H	91H
New Zealand	00H	10	10	23H	91H
Singapore	00H	10	10	19H	96H
Malaysia	00H	10	10	19H	96H

Country	807FAD	807FB3	807FB4	807FB5	807FB6
France	32H	18	9	0	0
Germany	32H	18	9	2	00H
UK	32H	18	9	02H	00H
Italy	32H	18	5	00H	00H
Austria	32H	18	8	00H	00H
Belgium	32H	18	5	00H	00H
Denmark	32H	18	9	00H	00H
Finland	32H	18	9	00H	00H
Ireland	32H	18	9	00H	00H
Norway	32H	18	9	00H	00H
Sweden	32H	18	9	00H	00H
Switzerland	32H	18	3	00H	01H
Portugal	32H	18	5	00H	00H
Holland	32H	18	0BH	00H	00H
Spain	32H	18	9	00H	00H
Israel	32H	18	12	00H	00H
USA	32H	18	9	0	0
Asia	32H	18	8	00H	00H
Hong Kong	22H	10	6	0	0
South Africa	22H	10	6	0	0
Australia	32H	18	7	0	01H
New Zealand	32H	18	12	0	00H
Singapore	22H	10	6	0	0
Malaysia	22H	10	6	0	0

Country	807FB7	807FB8	807FB9	807FBD	807FDA
France	10	0	0	11H	53
Germany	6	3	FEH	15H	53
UK	8	2	0	12H	53
Italy	6	0	0	11H	53
Austria	6	0	0	11H	59
Belgium	6	0	0	11H	59
Denmark	10	0	0	11H	53
Finland	10	0	0	11H	53
Ireland	10	0	0	11H	53
Norway	9	2H	0	12H	60
Sweden	10	0	0	11H	53
Switzerland	5	1	FFH	11H	92
Portugal	6	0	0	11H	53
Holland	7	0	0	11H	53
Spain	10	0	0	11H	80
Israel	6	0	0	11H	59
USA	9	0	0	16H	53
Asia	6	0	0	16H	47
Hong Kong	6	0	0	0FH	53
South Africa	6	0	0	0FH	53
Australia	11	2	0	0FH	53
New Zealand	8	0	0	12H	53
Singapore	6	0	0	0FH	53
Malaysia	6	0	0	0FH	53

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: 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
		The signal level may be inappropriate if communication with a particular remote terminal often results in errors. 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
	Bit 7 Bit 6 Setting
	   0 0 Disabled
	   0 1 Enabled
	   1 0 Disabled
	   1 1 Setting disabled
		Example given: If ECM is switched on undesirably when sending to a particular terminal, use the setting of (0, 0).

4.5. SERVICE RAM ADDRESSES

⚠️**CAUTION**

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

800000(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 before using this RAM.
Caution: Print the settings of all the system parameters (System Parameter List).
Please set clean sheets of white paper in the cassette when doing this procedure, because the machine automatically goes on to initialize the ink end sensor.

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

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

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

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

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

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

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

8000A0(H) - User parameter switch 00
Bit 0 to 3: Not used. 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   0: Memory tx, 1: Immediate tx
Bit 7: Halftone home position   0: Disabled, 1: Enabled

8000A1(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) - User parameter switch 02
Bit 0: Forwarding mark printing on forwarded messages   0: Disabled, 1: Enabled
Bit 1: Not used
Bit 2: Not used
Bit 3: TSI included in transmitted messages   0: Disabled, 1: Enabled
Bits 4 to 7: Not used

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

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

8000A5(H) - User parameter switch 05
Bit 0: Substutute reception   0: Possible, 1: Impossible
Bit 1: Memory reception if no RTI or CSI received   0: Possible, 1: Impossible
Bits 2 to 7: Not used.

8000A6(H) - User parameter switch 06
Bit 0: TTI   0: Off, 1: On
Bit 1: Not used
Bit 2: Closed network for transmission   0: Off, 1: On
Bit 3: Not used
Bit 4: Batch transmission (memory card required)   0: Off, 1: On
Bits 5 to 7: Not used

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

8000A8(H) - User parameter switch 08
Bit 0 and 1: Multi-copy reception (optional memory card required)

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

Bits 2 and 3: Authorized reception

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

Bits 4 and 5: Not used
Bits 6 and 7: Forwarding (optional memory card required)

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) - User parameter switch 09
Bits 0 and 1: Memory lock (optional memory card required)

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

Bits 2 to 7: Not used

8000AA(H) - User parameter switch 10
Bit 0: Reverse order printing   0: Disabled, 1: Enabled
Bits 1 to 6: Not used
Bit 7: Halftone type   0: Error diffusion, 1: Dither

8000AB(H) - User parameter switch 11
Bits 0 to 5: Not used
Bit 6: Printout of messages received while acting as a forwarding station   0: Off, 1: On
Bit 7: Not used

8000AC(H) - User parameter switch 12
Bits 0 to 4: Not used
Bit 5: Ink end detection   0: Off,   1: On
Bit 6: Ink end test pattern printing
(The machine automatically prints this test pattern and initializes the ink end sensor every time after no ink has been detected and the cartridge has been replaced.)
                                        0: Off,   1: On
Bit 7: Not used

8000AD(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

Bit 2 to 7: Not used

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

8000B9(H) - User function 62 settings
Bit 0: Not used
Bits 1 to 3: Not used
Bit 4: RDS operation   0: Not acceptable
                                        1: Acceptable for the limit specified by
                                        system switch 03

Bits 5 and 6: Not used
Bit 7: Daylight saving time   0: Disabled, 1: Enabled

8000BA(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) - PSTN access number for loop start

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

8000C0(H) - TIJ switch 00
Bit 0: Main scan magnification setting (User function 62) 0: 100%, 1: 94%
Bit 1: Sub scan magnification setting (User function 62)

　　　　　　　　　　　　　　　　　　　　　0: Same as the main scan setting.
　　　　　　　　　　　　　　　　　　　　　1: Auto setting.
Note: Refer to section 2-2-8 for details on Auto setting.
Bit 2 and 3: Printer paper size.

Bit	3	2	Setting
	0	0	LT
	0	1	A4
	1	0	LG
	1	1	Not used

Bit 4 and 5: Fax print mode (User function 62)

Bit	5	4	Setting
	0	0	HS mode
	0	1	HQ mode
	1	0	Fine mode
	1	1	Not used

Bit 6 and 7: PC print mode (User function 35)

Bit	5	4	Setting
	0	0	HS mode
	0	1	HQ mode
	1	0	Fine mode
	1	1	Not used

8000C1(H) - TIJ switch 01
Bit 0: Not used
Bit 1: Printer paper size setting.　　　　　　　　　0: User level,　1: Technician only
Bit 2: PC printer mode.　　　　　　　　　　　　　0: Off,　1: On
Bit 3 to 7: Not used

8000C2(H) - TIJ switch 02
Bit 0 to 7: Printer emulation switch digits 1 to 8.

8000C3(H) - TIJ switch 03
Bit 0 to 4: Printer emulation switch digits 9 to 13.

TIJ switches 02 and 03 correspond to the printer emulation switch settings of user function 64. (Please refer to Emulation Switch Settings in the operation manual.)

The settings are different for BJ mode and LQ mode which is set by bit 2 of address 8000C3(H) (printer emulation switch digit 11).

BJ mode: (when 8000C3 bit 2 is set to 0)
8000C2(H)
Bit 0: Do not adjust.
Bit 1: Text scale mode.   0: Off,   1: On
Bit 2: Do not adjust.
Bit 3: Character set.   0: Set 1,   Set 2
Bit 4 to 6: Code page setting

Bit	6	5	4	Setting
	0	0	0	437 (USA)
	1	0	0	850 (multilingual)
	0	1	0	850 (multilingual)
	1	1	0	850 (multilingual)
	0	0	1	850 (multilingual)
	1	0	1	860 (Portuguese)
	0	1	1	863 (French Canadian)
	1	1	1	865 (Norwegian)

Bit 7: Automatic carriage return   0: Normal line feed,   1: Line feed with carrage rerturn

8000C3(H)
Bit 0: Alternate graphics mode   0: Disabled,   1: Enabled
Bit 1: Buffer size setting   0: Input buffer 64 KB, Download buffer 0 KB
                                            1: Input buffer 32 KB, Download buffer 40 KB
Bit 2: Printer control mode   0: BJ mode,   1: Epson LQ mode
Bit 3: Automatic emulation   0: Disabled,   1: Enabled
Bit 4: Smoothing   0: Disabled,   1: Enalbled

Epson LQ mode: (when 8000C3 bit 2 is set to 1)
8000C2(H)
Bit 0: Do not adjust.
Bit 1: Text scale mode.   0: Off,   1: On
Bit 2: Do not adjust.
Bit 3: Character set.   0: Set 1,   Set 2
Bit 4 to 6: International character setting

Bit	6	5	4	Setting
	0	0	0	USA
	1	0	0	United Kingdom
	0	1	0	Germany
	1	1	0	France
	0	0	1	Denmark
	1	0	1	Sweden
	0	1	1	Italy
	1	1	1	Spain

Bit 7 to 8000C3(H) bit 1: Typeface

Bit	1	0	7	Setting
	0	0	0	Roman
	1	0	0	Sans serif
	0	1	0	Draft
	1	1	0	Courier
	0	0	1	Prestige
	1	0	1	Script
	0	1	1	Orator
	1	1	1	Orator-S

8000C3(H)
Bit 2: Printer control mode   0: BJ mode,   1: Epson LQ mode
Bit 3: Automatic emulation   0: Disabled,   1: Enabled
Bit 4: Smoothing   0: Disabled,   1: Enalbled

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

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

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

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

80012F(H) - ID code (low - Hex)
800130(H) - ID code (high - Hex)

800131(H) - Confidential ID (low - BCD)
800132(H) - Confidential ID (high - BCD)

800133(H) - Memory lock ID (low - Hex)
800134(H) - Memory lock ID (high - Hex)

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

800150(H) - Optional equipment (Read only)
Bit 0: Memory card   0: Not installed, 1: Installed
Bit 1-7: Not used

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)

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

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

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

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

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

800164 to 800166(H) - Printer interface output counter (PRN)

800179 to 80017B(H) - Scanner total jam counter (DOC. JAM)

80017C to 80017E(H) - Printer total jam counter (COPY JAM)

800197 to 800199(H) - Copy counter (COPY)

8001F0(H) - Number of copies in multi-sort document reception (User function 83)

800245 to 80024C(H) - Last RDS operation (Read only)
800245(H) - Year (BCD)
800246(H) - Month (BCD)
800247(H) - Day (BCD)
800248(H) - 00: Monday, 01: Tuesday, 02: Wednesday, ..., 06: Sunday
800249(H) - Hour
80024A(H) - Minute
80024B(H) - Second

80024D(H) - Daylight saving time setting (User function 62)

800250(H) - Transmission monitor volume   00 - 07(H)
800251(H) - Reception monitor volume   00 - 07(H)
800252(H) - On-hook monitor volume   00 - 07(H)
800254(H) - Buzzer volume   00 - 07(H)
800255(H) - Key acknowledgement tone volume 00 - 07(H)

8002A5 to 8002A6(H) - Scanning top margin adjustment
8002A7 to 8002A8 (H) - Scanning bottom margin adjustment
Refer to section 5.12 for details.

8002ED to 8002E4 (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 (Memory tx)	8002ED(H)	0	0	0	0	0	0	0	0
	Standard (Immediate tx)	8002EE(H)	0	0	0	0	0	0	0	0
	Detail	8002EF(H)	0	0	0	0	0	0	0	0
	Fine	8002F0(H)	0	0	0	0	0	0	0	0
Halftone	Standard (Memory tx)	8002F1(H)	1	0	0	0	0	0	0	0
	Standard (Immediate tx)	8002F2(H)	1	0	0	0	0	0	0	0
	Detail	8002F3(H)	1	0	0	0	0	0	0	0
	Fine	8002F4(H)	1	0	0	0	0	0	0	0

Bit 0: Not used; do not adjust the factory setting
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: Edge detection　　　　　　　　　　　　　　1: On
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

802209 to 802388(H) - Latest 64 error codes (Read only)

One error record consists of 6 bytes of data.

First error record start address - 802209(H)
Second error record start address - 80220F(H)
Third error record start address - 80220F(H)
　　　　　:　　　　　　:　　　　　　　:
64th error record start address - 802383(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.]

4-76

802A0F to 802C20(H) - Latest 10 error communication records

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

1st byte - Header
Bit 0: Communication 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
Note: Personal code is not available with this model.
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
Note: 12.0k and 14.4k are not available with this model.

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

Bit 3: Not used
Bits 4 to 6: Final modem type
Note: V.33 is not available with this model.

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

Bit 7: Not used

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
Note: Transfer and Service Call are not available with this model.

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

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

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

38th byte - Number of errors 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

F80006 to F8000E(H) - ROM part number and suffix (ASCII)

4.6. SPECIAL TOOLS AND LUBRICANTS

- Flash/SRAM data copy harness (P/N: H5159100)
  (Only needed for machines with the Flash ROM.)

5. REMOVAL AND ADJUSTMENT

> ⚠ **CAUTION**
>
> **Unplug the machine from the power outlet before removing any covers. The danger of explosion exists if the lithium battery on the FDU is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer's instructions.**

5.1. COVERS

> Before unplugging the machine for an extended period, print all reports and fax messages from memory.
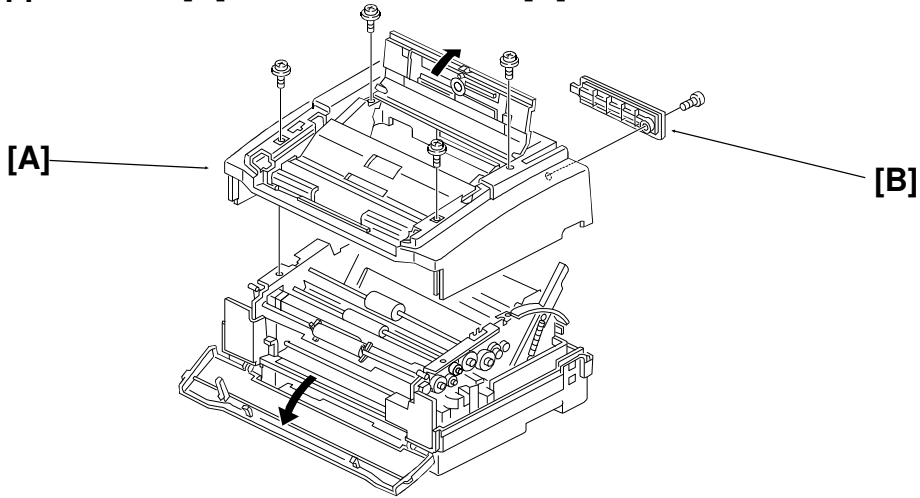
5.1.1. Operation Panel Assembly [A and B]
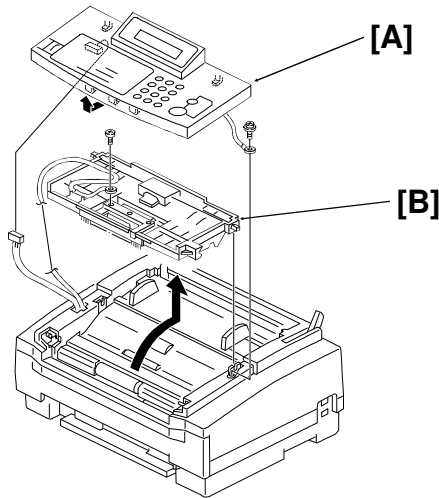
H505R501.wmf

A: Operation Panel Cover (1 grounding wire, 1 connector)
B: Lower Operation Panel Assembly (1 grounding wire)

5.1.2. Upper Cover [A] and IC Card Cover [B]

H505R502.wmf

A: Upper Cover (4 screws)
B: IC Card Cover (1 screw)

First, remove the operation panel assembly (see section 5-1-1).

5.2. Paper Feed Unit and Roller Assembly
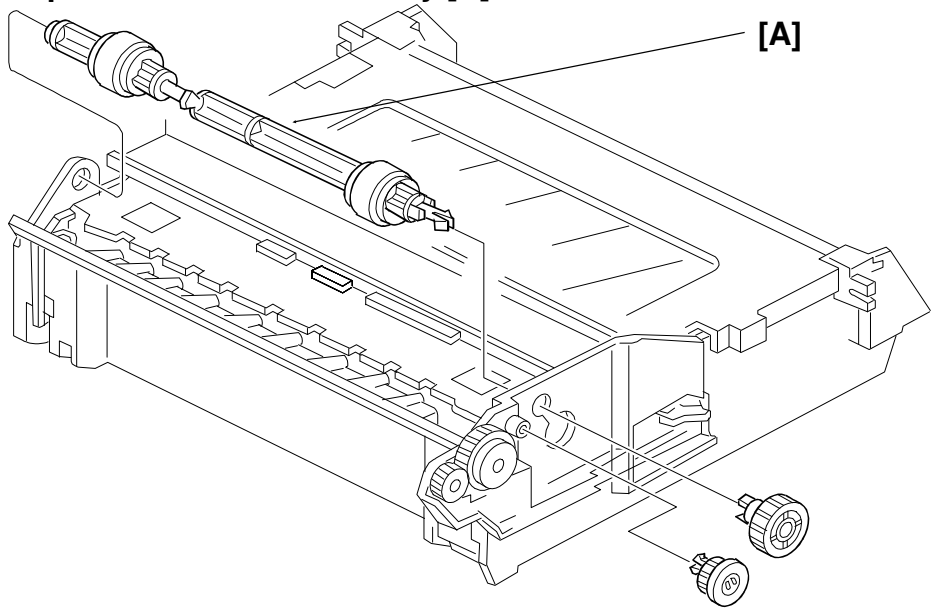
5.2.1. Paper Feed Unit [A]
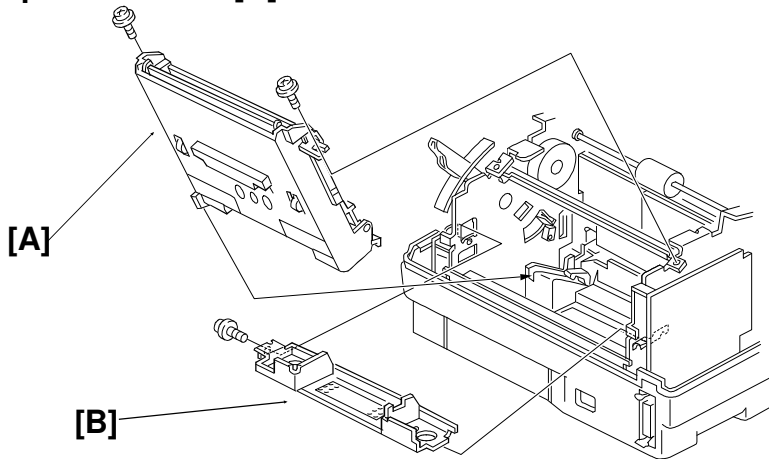
H505R503.wmf

A: Paper Feed Unit (2 screws)
B: Paper Feed Unit Stay (1 black screw)

First, remove the operation panel assembly and upper cover (see section 5-1).
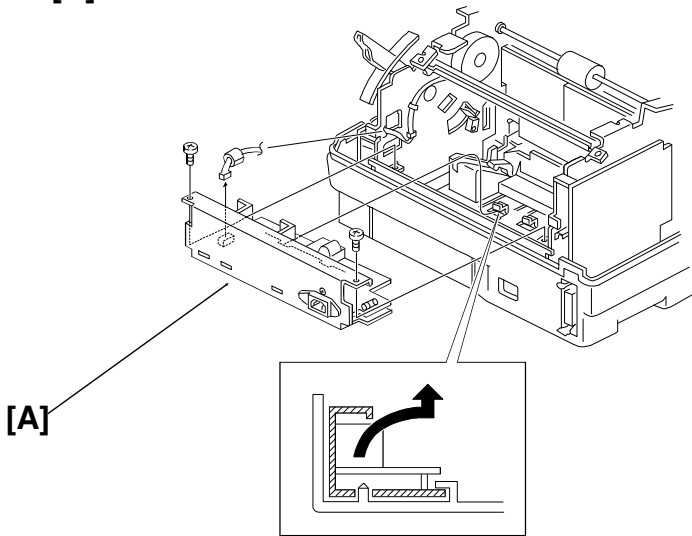
5.2.2. Paper Feed Roller Assembly [A]

[A]

H505R504.wmf

5.3. PCBs

Before removing all PCBs: First, remove the operation panel assembly and upper cover (see section 5-1) and the paper feed unit (see section 5-2-1).
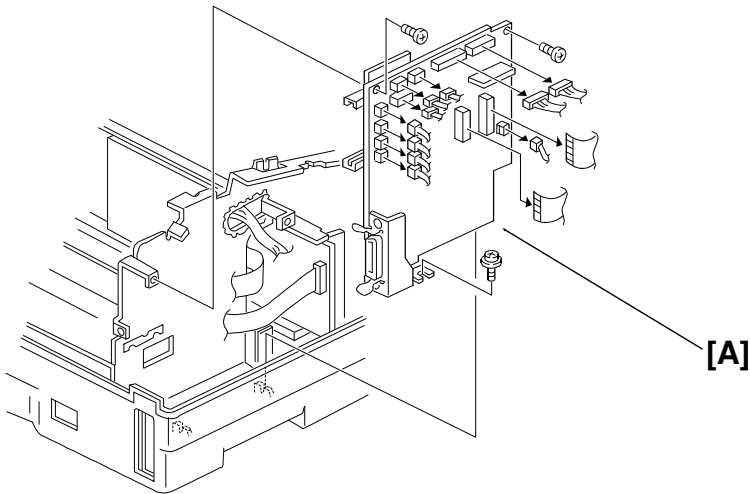
5.3.1. PSU [A]

[A]

H505R505.wmf
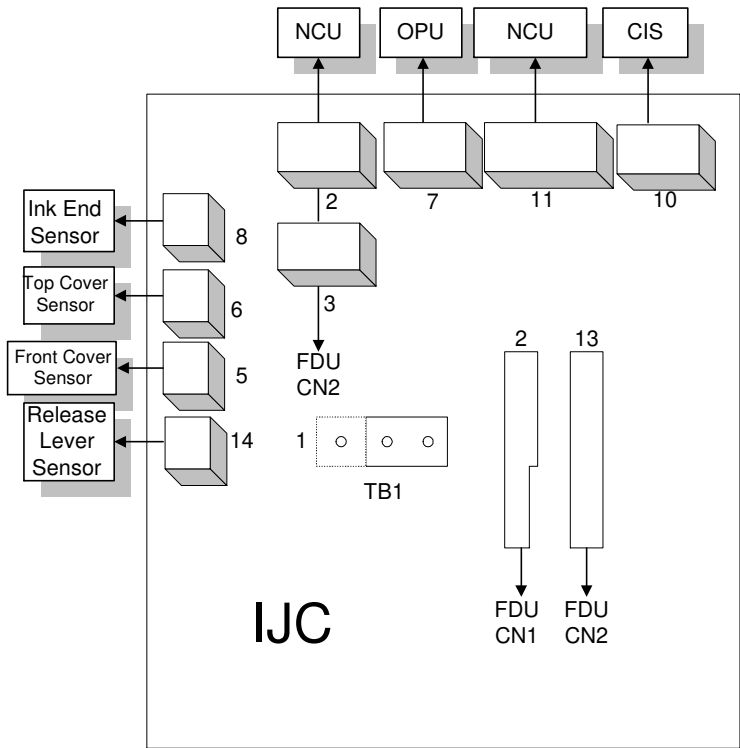
A: PSU (2 screws, 1 connector)

5.3.2. IJC [A]

H505R506.WMF

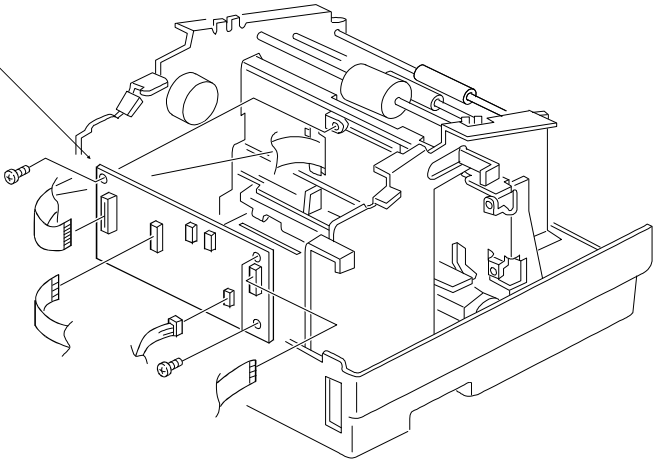**A: IJC (3 screws, 12 connectors)**

IJC Connectors

H505R514.wmf

Note: Before replacing the IJC, print the EEPROM information sheet with service function 11 and check the amount of ink received to the ink absobers. Replace the absobers if necessary. Please refer to section 4-1-17 for details.
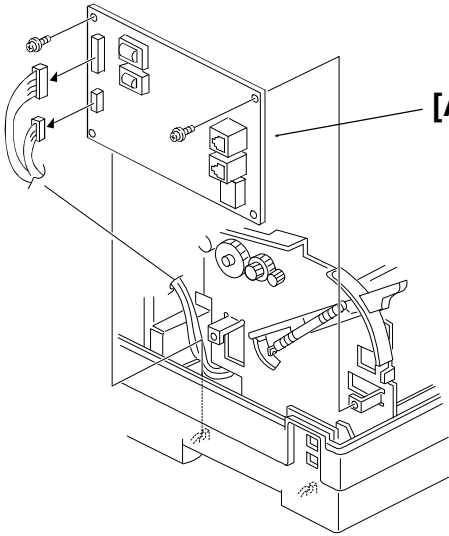
5.3.3. FDU [A]

[A]

H505R508.WMF

A: FDU (2 screws, 7 connectors)
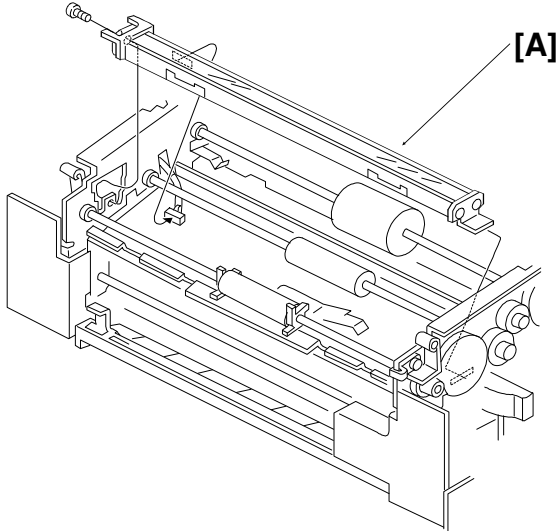
5.3.4. NCU [A]

[A]

H505R507.WMF

A: NCU (2 screws, 2 connectors)

Note: RAM backup lasts for a maximum of 1 hour (when the battery is fully charged). Print all reports and fax messages from memory before removing any PCBs.

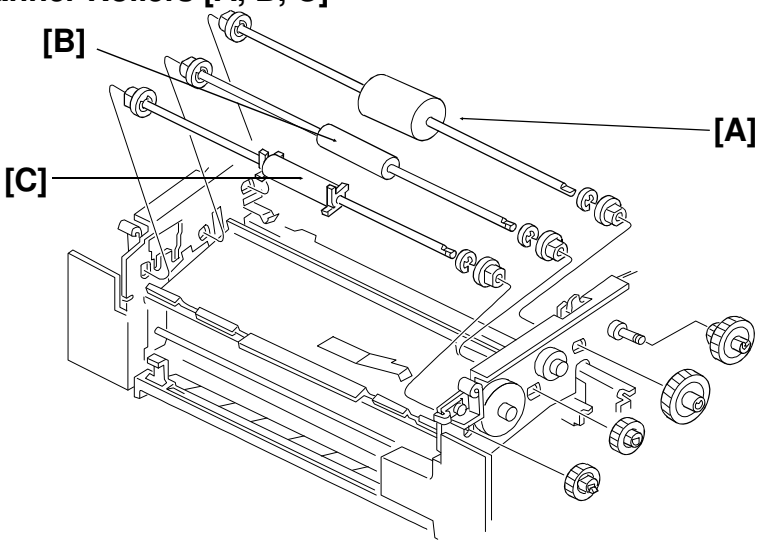# 5.4. SCANNER

5.4.1. Contact Image Sensor [A]

First, remove the operation panel assembly (see section 5-1-1), upper cover (see section 5-1-2), and paper feed unit (see section 5-2-1).

H505R509.WMF

A: Contact Image Sensor Assembly (1 screw, 1 connector)

5.4.2. Scanner Rollers [A, B, C]

H505R510.WMF

A: Feed Roller
B: R1 Roller
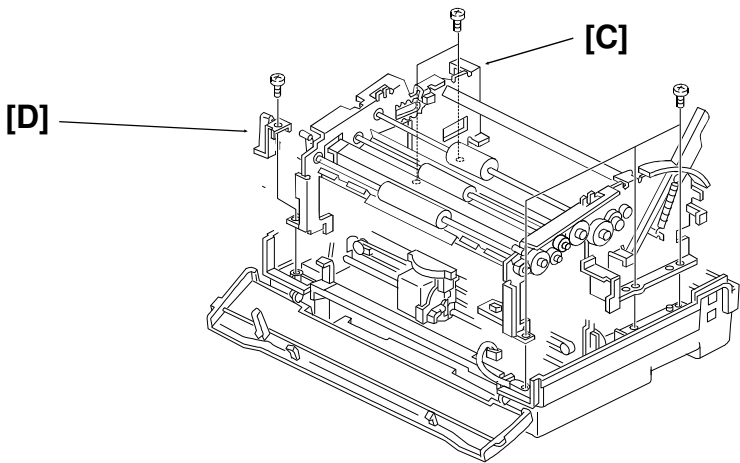**C: R2 Roller**

5.5. PRINTER

5.5.1. Chassis [C]

First, remove the operation panel assembly (see section 5-1-1), upper cover (see section 5-1-2), paper feed unit (see section 5-2-1), and all PCBs.
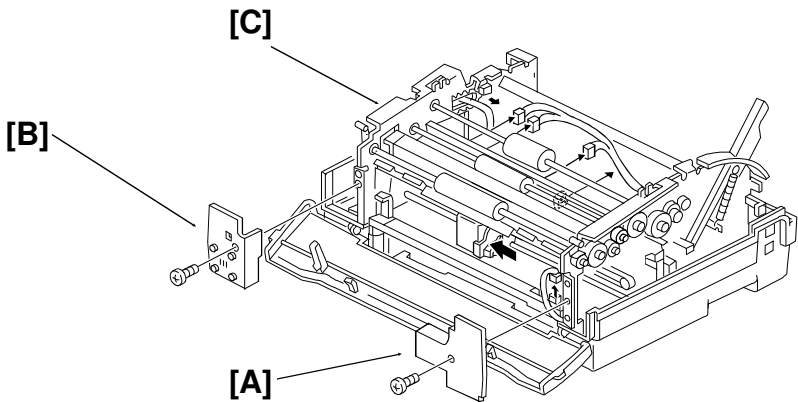
H505R511.WMF

A: Right Bracket (1 screw, 1 connector)
Note: The speaker connector should already be disconnected.
B: Left Bracket (1 screw)
C: Chassis
D: Spring

H505R512.WMF

5.5.2. Thermal Ink Jet (TIJ) Unit [A] and Paper Output Guide [B]
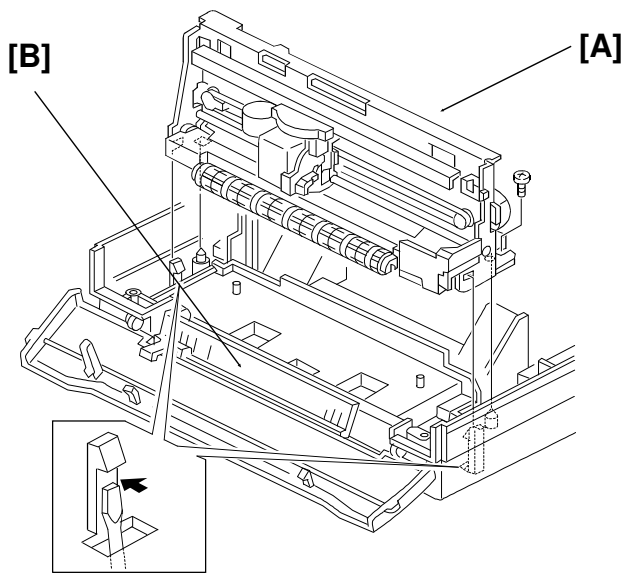
H505R513.WMF

A: TIJ Unit (1 screw, 2 hooks)　　　　　　　**B: Paper Output Guide**

5.5.3. Purge Unit
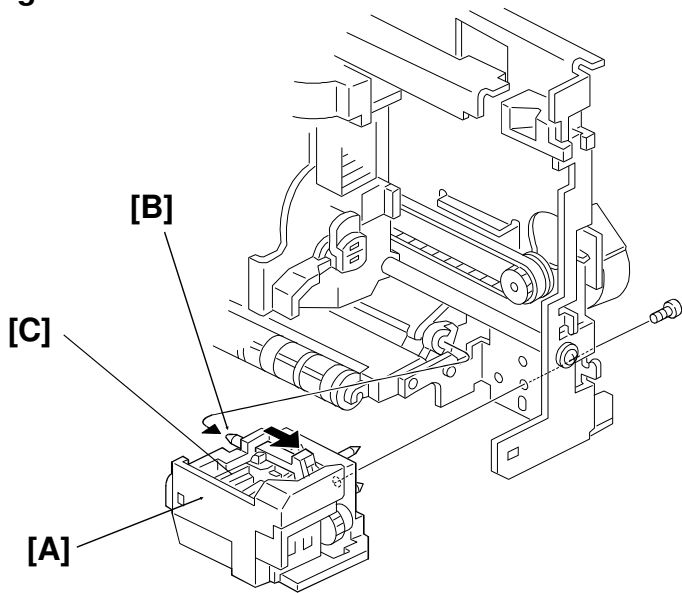
H505R516.wmf

A: Purge Unit (1 screw)　　　　　　　　　**B: Slide Pin**

When removing the purge unit, slide the slide pin as shown in the diagram.

⚠**CAUTION**

Do not touch the wiper blade [C] of the purge unit. This may damage the printer head.

5.5.4. Ink Absorbers
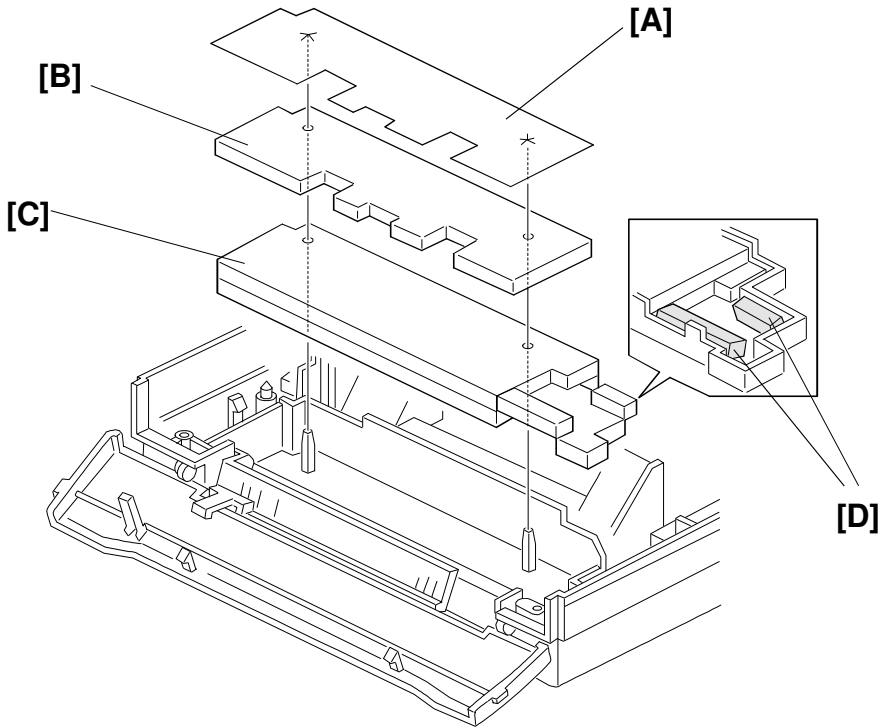
H505R515.WMF

A: Ink Absorber Sheet
B: Upper Ink Absorber
C: Lower Ink Absorber
D: Bend Sections

**Note: When reinstalling the ink absorbers, ensure that the bend sections are stood
upright.
When you have replaced the ink absobers, make sure that you also initialize the
EEPROM on the IJC (service function 11). Please refer to section 4-1-17 for details.**

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.
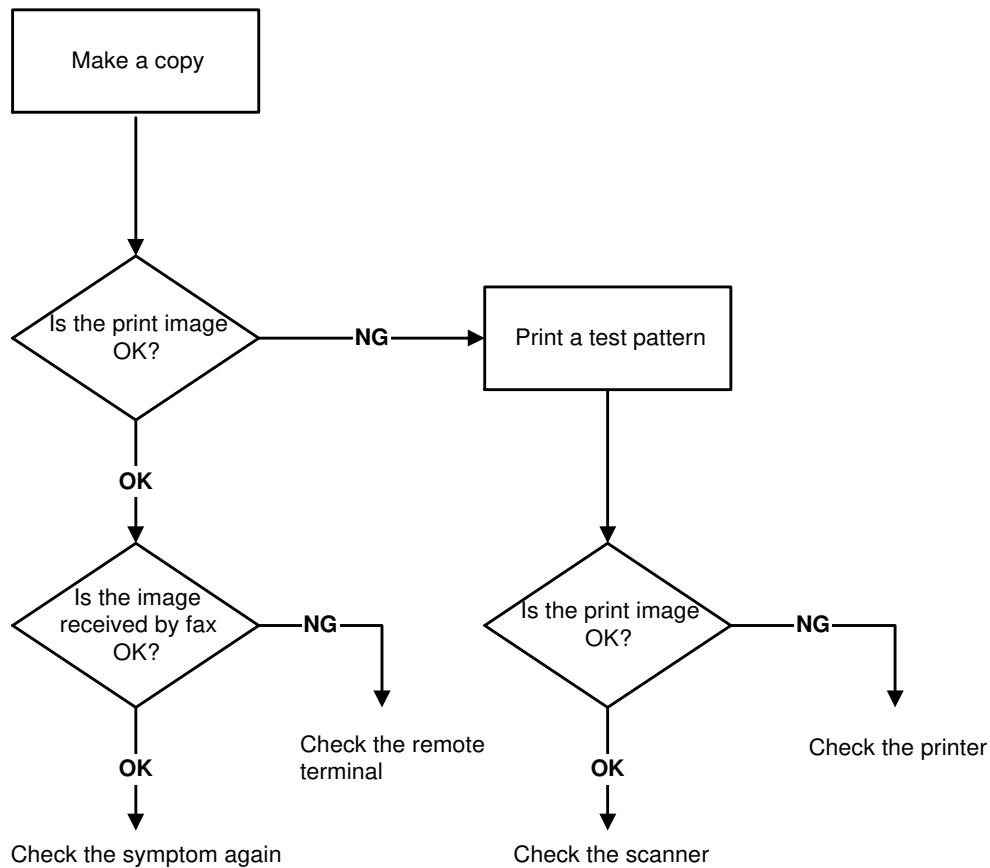
H505T514.wmf

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.

When there is a copy quality problem, do the following.

Print the nozzle pattern with user function 35.
In this test pattern, the machine uses all the nozzles installed in the printer head. If the test printout shows any defects such as thin, unclear printing or no printing, do the printer head cleaning procedure more than 5 times (refer to the Operation Manual). If the problem still remains, replace the cartridge.

H505T519.wmf   H505T520.wmf

Printed by the first nozzle   Printed by the first nozzle

                                                                    Yellow
                                                                    Magenta
                                                                    Cyan
                                                                    Black

Printed by the 128th nozzle   Printed by the 138th nozzle

Black Cartridge   **Color Cartridge**

6.1.1. Blank Copies

Possible Cause (Printer):
- Malfunction in the ink jet printing mechanism
- Defective printer head

Action:

1. Print the nozzle test pattern and do the printer head cleaning procedure more than 5 times (refer to the Operation Manual). If the problem still remains, replace the cartridge.

2. Clean the place where the ink cartridge contacts the carriage with a soft dry cloth.

Important: Do not touch the printer head.

3. Check the flat cable connection between the FDU (CN3) and the carriage. Also, check the harness connection between the IJC (CN2 and CN13) and the FDU (CN2 and CN1). Replace the cable if it is damaged.

6.1.2. Black Copies

Possible Cause (Scanner)
- The contact image sensor is defective.

Action:

1. Check the connection between the IJC (CN10) and the contact image sensor.

2. Replace the contact image sensor.

6.1.3. Dirty Background

Possible Cause (Scanner)
- Scanner shading correction error or wrong threshold.

Action:

1. Clean the shading plate.

6.1.4. Uneven Image Density

Possible Cause (Scanner)
- Dirty exposure glass
- Dirty white plate on the ADF
- Partial LED array defect
- The contact image sensor is defective

Action
- Clean the exposure glass of the image sensor and the shading plate.
- Replace the image sensor.

6.1.5. Vertical Black Lines
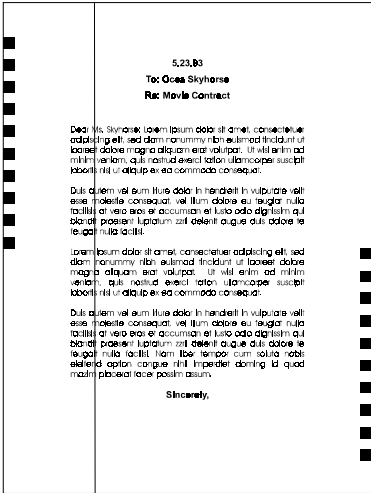
H505T503.wmf
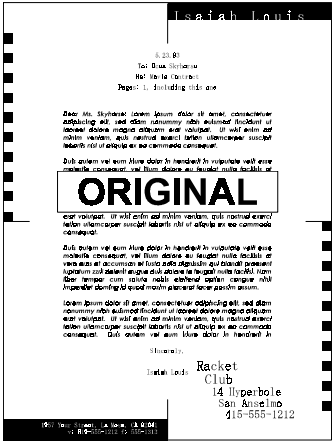
H505T512.wmf

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

Action:

1. Clean the exposure glass and the shading plate.

2. Replace the contact image sensor.

6.1.6. Vertical White Lines
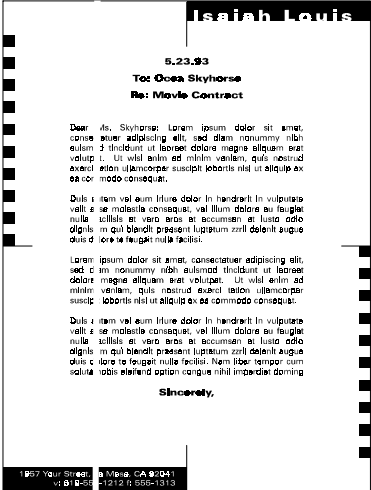
H505T506.wmf
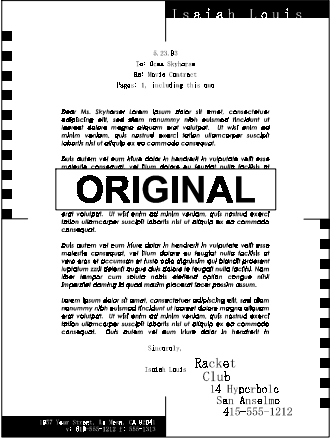
H505T512.wmf

Possible Cause (Scanner)
- Defective image sensor element(s)

Action:
- Replace the image sensor.

6.1.7. Horizontal White Lines

H505T509.wmf

H505T511.wmf

Possible Cause (Printer)
- Malfunction in the ink jet printing mechanism
- Defective printer head

Action:

1. Print the nozzle test pattern (see page 6-2) and do the printer head cleaning procedure more than 5 times (see the Operation Manual). If the problem still remains, replace the cartridge.

2. If the problem still remains:
   Replace the ink cartridge if a black cartridge is being used.
   Replace the corresponding color ink refill if a color cartridge is being used.

3. Check the purge unit for excessive amounts of ink staining on the head wiper and the head cap. Also, check for excessive amounts of paper dust and other contaminants. Replace the purge unit if necessary.

Important: Do not touch or clean the wiper blade in the purge unit.

6.1.8. Faint Copies
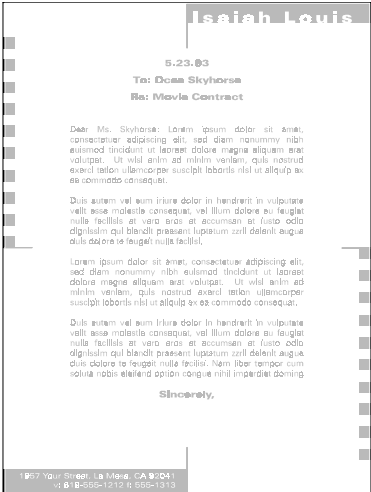
H505T504.wmf
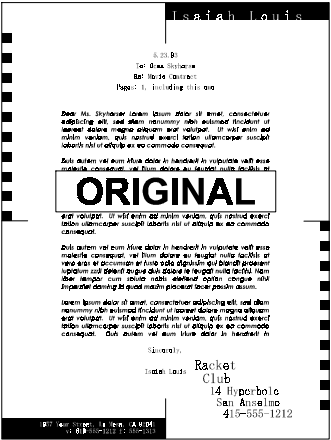
H505T512.wmf

Possible Causes (Scanner)
- Dirty shading plate and/or exposure glass
- Contact image sensor (LED, sensor element) defect

Action:
- Clean the white plate on the ADF.
- Replace the image sensor.

Possible Causes (Printer)
- The ink cartridge is empty.

Action:

1. Replace the ink cartridge if a black cartridge is being used.
   Replace the corresponding color ink refill if a color cartridge is being used.

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

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

Action:
- Align each side of the document to the document guides. Also, check that an acceptable type of document is being used.

Possible Cause (Printer)
- The printer paper is not set correctly.

Action:
- Check the paper size and the type of the paper being used and reinstall.

6.1.10. Replace Cartridge Still Displayed After Cartridge Replacement

Possible Cause:
- The ink cartridge is empty.
- Incorrect paper size or setting (user function 36).

Action:
- Check that the correct size of paper is being used.
  For the USA model, check that the paper size being used is the same as that is set with user function 36 (Letter or Legal).
- Replace the ink cartridge. If a color cartridge is being used, replace the black ink refill.

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 feed roller is dirty or worn out.
- Incorrect positionng of the separation pad.
- The Tx motor is defective.

Action:

1. Check that an acceptable 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 feed roller with a soft cloth and water, and replace if it is damaged.
   - Check the connection between the FDU (CN5) 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 (feed, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.
- The scan line sensor is defective.
- Defective tx motor

Action:

1. Check that an acceptable type of document is being used, and that the document length is within the 600 mm limit.

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 set properly.
- The operation panel is not properly closed.
- The scanner rollers (feed, R1, and R2 rollers) are dirty.
- Obstruction in the document paper path.
- The separation pad is out of position.

Action:

1. Check that the 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 scanner rollers with a soft cloth and water, and replace them if they are damaged.

4. Multi-feed

Action:
- Check that the spring on the separation pad is properly installed.
- 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 paper feed roller(s) is not installed properly.
- The paper feed motor is defective.

Action:

1. Check that a correct type of paper is being used.

2. Check that the paper feed roller(s) is properly installed. Clean or replace if necessary.

3. If the problem still remains, do the following.
   - Check the connection between the FDU (CN7) and the paper feed motor.
   - Replace the TIJ unit.

2. Paper Jam

Possible Cause:
- A non-recommended type of paper is being used.
- Obstruction in the paper path.
- The paper feed motor is defective.

Action:

1. Check if an acceptable type of paper is being used, and check that the paper end fence and the paper guides are correctly set.

2. Check for obstructions in the paper path.

3. Check that all the gears in the drive mechanism are properly installed. Also, check the registration roller and its mechanism. Clean if necessary.

4. If the problem still remains, do the following.
   - Check the connections between the FDU (CN7) and the paper feed motor.
   - Check the FDU output of power and drive signals to the paper feed motor (CN7, 1 to 4). If the signals are not output, replace the FDU or IJC.
   - Replace the TIJ unit.

3. Skew

Possible Cause:
- A non-recommended type of paper is being used.
- The corner separators in the paper feed unit are out of position.
- The paper feed rollers are worn out or damaged.
- Obstructions in the paper path.
- Malfunction in the registration mechanism.

Action:

1. Check if an acceptable type of paper is being used.

2. Check that the corner separators in the paper cassette are correctly positioned.

3. Check that the paper feed rollers are correctly installed and clean or replace them if necessary.

4. Check for obstructions in the paper path.

5. Clean the registration roller and replace the TIJ unit if necessary.

4. Multi-feed

Possible Cause:
- A non-recommended type of paper is being used.
- Incorrect positioning of the corner separator in the paper feed unit.

Action:
- Check if an acceptable type of paper is being used.
- Check that the corner separators are properly positioned.

6.3. SERVICE CALL CONDITIONS

If "Call Service" is shown on the display, one of the following conditions has occurred.

Symptom	SC Code
Carriage control error: This is a carriage position error.	5-51
Cleaning error: Cleaning operation error.	5-52
Temperature error: The temperature inside the machine is too high. This is detected by TH1 on the IJC.	5-53
Cartiridge error: The machine detects that there is no ink cartridge at any time other than during the cartridge replacement procedure.	5-54
Printer initializing error: The machine detects a IJC ROM/RAM error during the system initialization.	5-55
Waste ink overflow error: The amount of total waste ink has exceeded a certain value. (Refer to section 4.1.17 for details.)	5-56
Printer head temperature error: The head temperature is too high.	5-57
Head temperature sensor error: The output value from the head temperature sensor is abnormal.	5-58
Ink end sensor error	5-5A
Unexpected printer error	5-5F

Error code 9-70 is generated when any of the above failures is detected.
The SC code is displayed on the LCD panel when the error occurs.
To clear the service call condition, unplug the power cord, wait 3 minutes, then put the plug back in.

Note: The auto service call feature is not available with this machine.

6.4. ERROR CODES

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

Code	Meaning	Suggested Cause/Action
0-00	DIS/NSF not detected within 40 s of Start being pressed	Check the line connection. Check the NCU - FDU connectors. The machine at the other end may be incompatible. Replace the NCU or FCE. 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 - FDU connectors. Try changing the tx level and/or cable equalizer settings. Replace the FCE 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 807FB7 (PABX) Cable equalizer - G3 Switch 07 Dedicated Tx parameters - Section 4-4
0-05	Unsuccessful after modem training at 2400 bps	Check the line connection. Check the NCU - FDU connectors. Try adjusting the tx level and/or cable equalizer. Replace the FCE 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 FDU - NCU connectors. Try adjusting the tx level and/or cable equalizer settings. Replace the NCU or FCE. 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 FDU - NCU connectors. Replace the NCU or FCE. 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 FDU - NCU connectors. Replace the NCU or FCE. 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/FDU; try sending to another machine. Check for line problems and noise. **Cross reference** Tx level - NCU Parameter 01 (PSTN), RAM 807FB7 (PABX) Cable equalizer - G3 Switch 07 Dedicated Tx parameters - Section 4-4
0-14	Non-standard post message response code received	Check the FDU - 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 FCE. **Cross reference** See error code 0-08.
0-15	The other end does not have the confidential or transfer function	The other terminal does not have the confidential rx or transfer function, or the other terminal's memory is full.
0-16	CFR or FTT not detected after modem training in confidential or transfer mode	Check the line connection. Check the FDU - NCU connectors. Replace the NCU or FCE. Try adjusting the tx level and/or cable equalizer settings. The other end may have disconnected, or it may be defective; try calling another machine. If the rx signal level is too low, there may be a line problem. **Cross reference** See error code 0-08.
0-17	Communication was interrupted by pressing the Stop key.	If the Stop key was not pressed and this error keeps occurring, replace the operation panel or OPU.

Code	Meaning	Suggested Cause/Action
0-20	Facsimile data not received within 6 s of retraining	Check the line connection. Check the FDU - NCU connectors. Replace the NCU or FCE. 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
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 FDU, NCU, & line. Check for line noise or other line problems. Replace the NCU or FCE. 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 FDU - NCU connectors. Replace the NCU or FCE. 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 FDU - NCU connectors. Replace the NCU, FDU or FCE. 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 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.

Code	Meaning	Suggested Cause/Action
0-30	The other terminal did not reply to NSS(A) in AI short protocol mode	Check the line connection. Check the FDU - 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
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
1-20	Paper jam inside the printer	Remove the paper. Check the printer drive components and sensors. **Cross reference** Printer mechanical problems - Section 6-2-2
2-10	The modem cannot enter tx mode	Replace the FCE.
2-11	Only one V.21 connection flag was received	Change the FCE.
2-12	Modem clock irregularity	Replace the FCE.
2-20	Abnormal coding/decoding (cpu not ready)	Replace the FCE.
2-50	The machine reset itself	Replace the FCE.
4-00	One page took longer than 8 minutes to transmit	Check for a bad line. Try the communication at a lower resolution, or without halftone. Change the FCE.
4-01	Line current was cut	Check the line connector. Check the connection between FDU and NCU. Check for line problems. Replace the FDU 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 FCE.
5-10	DCR timer expired	Replace the FCE.
5-20	Storage impossible because of a lack of memory	Temporary memory shortage. Test the SAF memory. Replace the FCE or optional IC card.
5-21	Memory overflow	
5-22	Mode table overflow after the second page of a scanned document	Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-23	Print data error when printing a substitute rx or confidential rx message	Test the SAF memory. Ask the other end to resend the message. Replace the FCE or IC memory card.
5-24	Memory overflow after the second page of a scanned document	Try using a lower resolution setting. Wait for the messages which are currently in the memory to be sent or delete some files from memory.
5-25	SAF file access error	Replace the FCE or IC memory card.
5-30	Mode table for the first page to be printed was not effective	Replace the FCE or IC memory card.
6-01	G3 ECM - no V.21 signal was received	Try adjusting the rx cable equalizer. Replace the FCE, FDU or NCU.
6-02	G3 ECM - EOR was received	
6-03	G3 ECM - non-standard V.21 code received	The other terminal may be defective.
6-04	G3 ECM - RTC not detected	Check the line connection. Check connections from the NCU to the FDU. Check for a bad line or defective remote terminal. Replace the FCE, FDU 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 FDU. Check for a bad line or defective remote terminal. Replace the FCE, FDU or NCU. Try adjusting the rx cable equalizer **Cross reference** Rx cable equalizer - G3 Switch 07
6-06	G3 ECM - coding/decoding error	Defective FDU. 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 FCE.
9-70	TIJ failure	Check the TIJ mechanisms and components. **Cross reference** Service call conditions - Section 6-3

6.5. ELECTRICAL COMPONENT DEFECTS

6.5.1. Defective Sensor Table

Sensor	Symptoms if Defective
Document sensor	"CLEAR ORIGINAL" or "DIAL FAX NO" is displayed at power-on.
	"SET DOCUMENT" is still displayed after a document is placed in the ADF.
Scan line sensor	"CLEAR ORIGINAL" is displayed at power-on.
	"CLEAR ORIGINAL" is displayed soon after the start of copying.
Cover switches (Top cover, front cover, and paper release lever sensor)	There is no alarm on opening the cover, and "CLOSE COVER" is not displayed.
	"CLOSE COVER" is displayed at power on.
Paper end sensor	"CLEAR COPY" is displayed at power on.
	"CLEAR COPY" is displayed soon after the start of copying.
Paper feed roller sensor	Paper cannot be fed.
Ink end sensor	Ink end is not detected.

6.5.2. Blown Fuse Table

The only service-replaceable fuses are the following.

Fuse	Symptoms if Defective
PSU - F1	No power to the machine
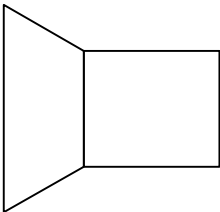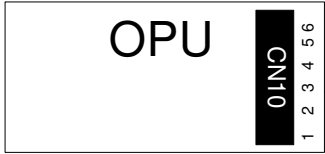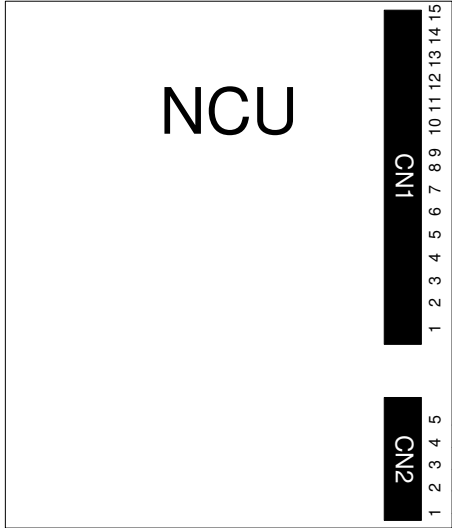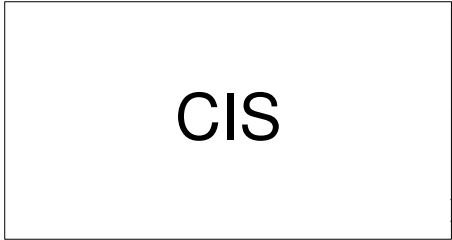
Point-to-Point Diagram
Model:IFO(FAX880MP/MV74)

Issued on:November 7th, 1995, Revision 1.0
Subject to change

CIS

CN10
- +24VM
- Scanner LED Drive
- Clock
- COM1
- Line Synchronization Signal
- COM1
- -5V
- +5VCIS
- COM1
- Analog Video Signal

NCU

CN1 / CN11
- +24V
- COM3
- RSEL (US - Not used)
- Not used
- DOSW [▲ 5] (US - Not used)
- CMLSW [▲ 5]
- OHDISW [▲5]
- COM1
- EXTDI [▼ 5] (US only)
- HOOK1 [▼ 5]
- HOOK0 [▼ 5]
- EXRING
- COM2
- CNG
- TRXD (Tx/Rx Signal)

CN2 / CN12
- CSEL1 (US - Not used)
- CSEL0 (US - Not used)
- GSSW [▲ 5] (US - Not used)
- +5V (US - Not used)
- +5V (US - Not used)

OPU

CN10 / CN7
- +5V
- Serial Clock
- Serial Data
- Serial Data
- Reset [▼5]
- COM1

Speaker

CN4
- Speaker Output
- COM1

Ink End Sensor

CN8
- Ink End Sensor Output
- + 5V
- Sensor Power Control

Top Cover Sensor

CN6
- Door Open[5▲]
- COM1

Front Cover Sensor

CN5
- Door Open [▲5]
- COM1

Release Lever Sensor

CN14
- Door Open [▲5]
- COM1

IJC

CN9 — Centronics

FDU

CN2 / CN1
- Head Rank Control
- Head Power Control
- Feed Roller Sensor [▼ 5] (H:HP)
- Sensor Power Control
- CR Motor Control (PWMB)
- CR Motor Control (PWMA)
- PF Motor Control (LIB1)
- PF Motor Control (LIB0)
- PF Motor Control (LIA1)
- PF Motor Control (LIA0)
- CR Motor Drive (CR3)
- CR Motor Drive (CR2)
- CR Motor Drive (CR1)
- CR Motor Drive (CR0)
- Tx Motor Serial Data
- Reset Signal [▼ 5]
- Tx Motor Serial Clock
- DRAM Backup (SAFFLG)
- DRAM Backup (1VDET)

CN13 / CN2
- Head Rank
- Head Temp.
- Head Power Control
- Paper End Sensor [▼5] (L:EXIST)
- Home Position Sensor
- Cartridge Detection (ID1)
- Cartridge Detection (ID0)
- PF Motor Drive (LFB)
- PF Motor Drive (LFA)
- Heater Drive (MCH0)
- Heater Drive (MCH1)
- Sub-Heater Drive (WHEAT)
- Data Latch
- Data Latch Reset
- Data Clock
- Data
- Heat Enable Control (BENB2)
- Heat Enable Control (BENB1)
- Heat Enable Control (BENB0)
- Even Nozzle Heat Enable
- Odd Nozzle Heat Enable
- Heat Enable (HENB1)
- Heat Enable (HENB0)

CN3 / CN8
- COM3
- +24VM
- COM2
- -5V
- +5V
- +5VBAT
- +5VD
- COM1

Printer Head

CN3
- GND
- GND
- Heater Drive (HT0)
- Heater Drive (HT1)
- Head Voltage (HVH)
- Head Voltage (HVH)
- Sub Heat Drive
- Not Used
- Head Resistor Rank
- Head Temp (DI0DEA)
- Black/Color Detect (ID0)
- Black/Color Detect (ID1)
- Not Used
- COM1
- Heat Enable (HENB0)
- Even Nozzle Heat Enable
- Heat Enable (HENB1)
- Heat Enable (HENB2)
- Odd Nozzle Heat Enable
- Head Signal (BENB0)
- Head Signal (BENB1)
- Head Signal (BENB2)
- Head Signal (HVDD)
- Head Signal (HCLK)
- Latch Signal
- Latch Reset
- Heat Enable (HENB3)
- Data
- Head Temp (D0DEK)
- Home Position Sensor [▲5]
- COM1
- Sensor Drive

PSU

CN4 / CN1
- COM3
- +24VM
- COM4
- +24VH

TX Motor

CN5
- A
- AB
- B
- BB
- +24VM
- +24VM

Carriage Motor

CN6
- A
- AB
- B
- BB

Paper Feed Motor

CN7
- A
- B
- BB
- AB

FCE

CN1 — 100 pins

CN2 — IC Card (Optional) — 68 pins

CN3
- COM1
- 5WR [▼ 5]
- COM1
- 5RD [▼ 5]
- +5V
- D0
- 5RSRES [▼ 5]
- D1
- 5EXCS0 [▼ 5]
- D2
- A0
- D3
- A1
- D4
- A2
- D5
- A3
- D6
- 1DEIT2 [▲ 5]
- D7

RS232C Interface (Option for USA only)