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Leading Innovation >>>

# **SERVICE MANUAL**

**PLAIN PAPER FACSIMILE**

# **e-STUDIO190F**



## Trademarks

- The official name of Windows 95 is Microsoft Windows 95 Operating System.
- The official name of Windows 98 is Microsoft Windows 98 Operating System.
- The official name of Windows Me is Microsoft Windows Millennium Edition Operating System.
- The official name of Windows 2000 is Microsoft Windows 2000 Operating System.
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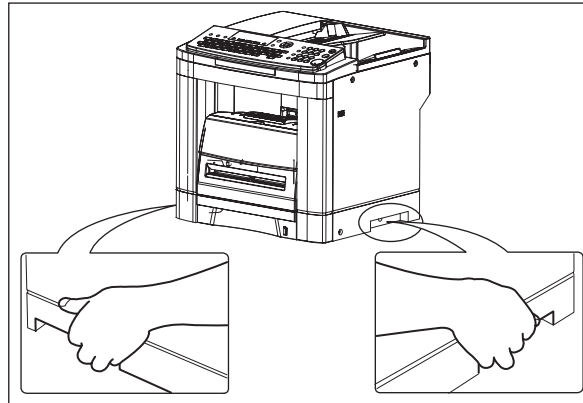
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# GENERAL PRECAUTIONS REGARDING THE SERVICE FOR e-STUDIO190F

The installation and service should be done by a qualified service technician.

## 1) Transportation/Installation

- When transporting/installing the equipment, be sure to hold the positions as shown in the figure.
- The equipment is quite heavy and weighs approximately 22.0 kg (48.50 lb), therefore pay full attention when handling it.



- Be sure not to hold the movable parts or units when transporting the equipment.
- Be sure to use a dedicated outlet with AC 120 V / 8 A for its power source.
- The equipment must be grounded for safety.
- Select a suitable place for installation. Avoid excessive heat, high humidity, dust, vibration and direct sunlight.
- Provide proper ventilation since the equipment emits a slight amount of ozone.
- To insure adequate working space for the copying operation, keep a minimum clearance of 80 cm (32") on the left, 80 cm (32") on the right and 10 cm (4") on the rear.
- The equipment shall be installed near the socket outlet and shall be easily accessible.
- Be sure to fix and plug in the power cable securely after the installation so that no one trips over it.

## 2) General Precautions at Service

- Be sure to turn the power OFF and unplug the power cable during service (except for the service should be done with the power turned ON).
- Unplug the power cable and clean the area around the prongs of the plug and socket outlet once a year or more. A fire may occur when dust lies on this area.
- When the parts are disassembled, reassembly is the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to install small parts such as screws, washers, pins, E-rings, star washers in the wrong places.
- Basically, the equipment should not be operated with any parts removed or disassembled.
- The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband since the ICs on it may be damaged due to static electricity.

**Caution: Before using the wristband, unplug the power cable of the equipment and make sure that there are no charged objects which are not insulated in the vicinity.**

- Avoid expose to laser beam during service. This equipment uses a laser diode. Be sure not to expose your eyes to the laser beam. Do not insert reflecting parts or tools such as a screwdriver on the laser beam path. Remove all reflecting metals such as watches, rings, etc. before starting service.
- Be sure not to touch high-temperature sections such as the exposure lamp, fuser unit, damp heater and areas around them.
- Be sure not to touch high-voltage sections such as the chargers, developer, high-voltage transformer and power supply unit. Especially, the board of these components should not be touched since the electric charge may remain in the capacitors, etc. on them even after the power is turned OFF.
- Make sure that the equipment will not operate before touching potentially dangerous places (e.g. rotating/operating sections such as gears, belts pulleys, fans and laser beam exit of the laser optical unit).
- Be careful when removing the covers since there might be the parts with very sharp edges underneath.

- When servicing the equipment with the power turned ON, be sure not to touch live sections and rotating/operating sections. Avoid exposing your eyes to laser beam.
- Use designated jigs and tools.
- Use recommended measuring instruments or equivalents.
- Return the equipment to the original state and check the operation when the service is finished.

### 3) Important Service Parts for Safety

- The breaker, door switch, fuse, thermostat, thermofuse, thermistor, batteries, IC-RAMs including lithium batteries, etc. are particularly important for safety. Be sure to handle/install them properly. If these parts are short-circuited and their functions become ineffective, they may result in fatal accidents such as burnout. Do not allow a short-circuit or do not use the parts not recommended by Toshiba TEC Corporation.

### 4) Cautionary Labels

- During servicing, be sure to check the rating plate and cautionary labels such as "Unplug the power cable during service", "CAUTION. HOT", "CAUTION. HIGH VOLTAGE", "CAUTION. LASER BEAM", etc. to see if there is any dirt on their surface and if they are properly stuck to the equipment.

### 5) Disposal of the Equipment, Supplies, Packing Materials, Used Batteries and IC-RAMs

- Regarding the recovery and disposal of the equipment, supplies, packing materials, used batteries and IC-RAMs including lithium batteries, follow the relevant local regulations or rules.

**Caution:**

Dispose of used batteries and IC-RAMs including lithium batteries according to this manual.

**Attention:**

Se débarrasser de batteries et IC-RAMs usés y compris les batteries en lithium selon ce manuel.

**Vorsicht:**

Entsorgung der gebrauchten Batterien und IC-RAMs (inclusive der Lithium-Batterie) nach diesem Handbuch.



# Table of Contents

Specifications Table.....	7	Installation .....	234
1.1. Fax, Printer, Network Scanner and Internet Fax Functions .....	7	Options and Supplies .....	235
1.2. Control Panel .....	21	8.1. Service Notes "Firmware Update" for PCL Option Installation .....	235
1.3. System Combination.....	22	8.2. Installing the Printer Controller Module for PCL6 (GA-1230) .....	240
1.4. Options List.....	23	8.3. Installing the Network Scan / Email / Internet Fax Kit (GM-4090).....	243
1.5. External View .....	24	8.4. Installing the G3 Communication Port Kit (GD-1230) .....	245
1.6. Clutches, Switches, Motors and Fan .....	28	8.5. Installing the 2nd Paper Feed Module (KD-1021).....	248
1.7. Sensors and PC Boards .....	28	8.6. Installing the Handset Kit (GJ-1150) .....	251
Disassembly Instructions .....	29	8.7. Installing the SD Memory Card (32 MB up to 512 MB) .....	252
2.1. General Disassembly.....	29	General Network Information.....	253
2.2. Disassembly Instructions .....	30	9.1. Network Protocol .....	253
2.3. Hardware Identification Template .....	63	9.2. Layer Functions and Technology .....	255
Maintenance, Adjustments and Check Points.....	65	9.3. Network Layer .....	259
3.1. Preventive Maintenance .....	65	9.4. Transport Layer .....	263
3.2. Required Tools.....	67	9.5. Upper Layer.....	265
3.3. Preventive Maintenance Points .....	68	9.6. SMTP (Simple Mail Transfer Protocol) .....	270
3.4. Preventive Maintenance Check List.....	69	9.7. ITU T.37 and RFC2305 .....	271
3.5. Updating the Firmware.....	70	9.8. Communication Protocols .....	277
3.6. Adjusting the Printer Registration, LSU Image Side to Side.....	79	9.9. POP (Post Office Protocol Version 3) .....	280
Troubleshooting .....	81	9.10. Troubleshooting from a PC .....	283
4.1. Initial Troubleshooting Flowchart .....	81	9.11. Verifying the Configuration and Mail Account Type (SMTP or POP).....	284
4.2. Improper LCD Display.....	82	9.12. Dynamic Host Configuration Protocol (DHCP) - Extended Feature .....	285
4.3. Printed Copy Quality Problems.....	83	9.13. Message Disposition Notifications (MDN) - Extended Feature .....	288
4.4. Document Feeder (ADF).....	99	9.14. Lightweight Directory Access Protocol (LDAP) - Extended Feature .....	292
4.5. Communications .....	102	9.15. Lightweight Challenge-response Mechanism POP (APOP) - Extended Feature.....	292
4.6. Troubleshooting the LAN Interface .....	108	9.16. SMTP Service Extension for Authentication (SMTP Auth) - Extended Feature.....	294
4.7. Error Codes (For Copier) .....	116	9.17. Direct Internet Fax XMT - Extended Feature.....	296
4.8. Information Code Table (For Facsimile).....	122	Schematic Diagram .....	298
4.9. Diagnostic Codes (For Facsimile).....	129	10.1. General Circuit Diagram.....	298
4.10. Troubleshooting (For Printer).....	136		
Service Modes .....	138		
5.1. Service Modes (For Copier).....	138		
5.2. Service Modes (For Facsimile) .....	154		
System Description .....	183		
6.1. Transmit Mechanism.....	183		
6.2. Control Panel .....	184		
6.3. Printer / Receive Mechanism .....	185		
6.4. Signal Waveform.....	192		

# 1 Specifications Table

## 1.1. Fax, Printer, Network Scanner and Internet Fax Functions

### 1.1.1. Fax Function

Items	Description	Remarks
<b>Main Specifications</b>		
1 Compatibility	Super G3 / G3	ITU-T Std & Non-Std
2 Modem Speed	33.6 - 2.4kbps	T.30/V.34/V.17/V.29/V.27ter
3 Coding Scheme	JBIG/MMR/MR/MH	
4 ECM	Yes	Conforms to ITU-T Rec. T.30 ECM
5 Short Protocol	Yes (B, D)	
6 Transmission Speed	Approx. 2.7 sec	ITU-T Image No. 1 (A4, Std Resolution)
7 Communication Resolution dpi x lpi (pels/mm x lines/ mm)	<b>Transmission</b> Std. : 203 x 98 (8 x 3.85) Fine : 203 x 196 (8 x 7.7) S-Fine : 203 x 391 (8 x 15.4) 406 x 391 (16 x 15.4) 600dpi : 600 x 600 dpi <b>Reception</b> Std. : 203 x 98 (8 x 3.85) Fine : 203 x 196 (8 x 7.7) S-Fine : 203 x 391 (8 x 15.4) 406 x 391 (16 x 15.4) 600dpi : 600 x 600 dpi	600 dpi communication is only possible between T.30 Compliant Toshiba Fax and other T.30 compliant machines.
<b>Communication Ports</b>		
1 PSTN Line Port	Std: 1-Line Max: 2-Lines	2nd G3 Option is available.
2 Leased Line Port	No	
3 V.24 Line Port	No	
4 LAN (Network)	Yes	Ethernet 10Base-T/100Base-TX
5 Centronics Parallel I/F	No	
6 USB Port	Yes	USB1.1
7 IEEE-1394	No	Firewire
8 Communication Port (Max)	3 Ports	
9 Multi Task Operation (Max)	5 Jobs	
<b>Communication Protocols</b>		
1 PSTN	ITU-T G3 (T.30)	
2 Fax over the Internet	ITU-T T.37	
3 G3 Fax over IP Network	ITU-T T.37	
4 TCP/IP	Yes	
5 DHCP	Yes	
6 LDAP	Yes	
7 SMTP	Yes	
8 LPR/LPD	Yes	
9 SNMP	Yes	
10 MIB2	Yes	

Items	Description	Remarks
<b>Scanner Mechanism</b>		
1 Scanning Device	CIS (ADF)	
2 Scanning Resolution / Speed		
Std: 203 x 98 (8 x 3.85) dpi x lpi (pels/mm x lines/mm)	LTR : 0.7 sec A4 : 0.7 sec	Excludes: Initializing Time, ADF slipping factor, and Data XMT Time.
Fine: 203 x 196 (8 x 7.7) dpi x lpi (pels/mm x lines/mm)	LTR : 1.4 sec A4 : 1.5 sec	
S-Fine: 406 x 391 (16 x 15.4) dpi x lpi (pels/mm x lines/mm)	LTR : 2.8 sec A4 : 3.0 sec	
150dpi: 150 x 150	LTR : 1.1 sec A4 : 1.1 sec	
300dpi: 300 x 300	LTR : 2.2 sec A4 : 2.3 sec	
600dpi: 600 x 600	LTR : 4.4 sec A4 : 4.6 sec	
3 Document Size (Max.)	Legal 8.5 x 14 in (216 x 2000 mm)	
4 Effective Scanning Width	LTR : 8.3 in (212 mm) A4 : 8.2 in (207 mm)	
5 ADF Capacity	100 sheets	Face Up, top feed LTR / A4 (20 lb / 75 g/m <sup>2</sup> )
6 Collation Stack	Yes	Face Down
<b>Printer Mechanism</b>		
1 Recording Method	LP	
2 Recording Resolution Fax	600 x 600 dpi	
3 Recording Paper Size		
Paper Tray	Letter / Legal	
Bypass	Letter / Legal / Invoice	
4 Effective Printing Width	LTR : 8.1 in (207mm) A4 : 7.9 in (201 mm)	
5 Recording Paper Capacity	250 sheets	Tray 1 + 2 : Max. 800 sheets LTR / A4: 20 lb (75 g/m <sup>2</sup> )
6 Collation Stack	Yes	Face Down
7 Consumable	All in One Cartridge	
8 Low Toner Warning	Yes	



Items	Description	Remarks
<b>Memory</b>		
1 Fax Memory		
	Standard Memory (Flash)	12 MB (720 pages)
	Optional Memory (SD Memory Card)	32 MB to 512 MB (Max. 1,020 to 12,750 pages)
2 Printer Page Memory	32 MB	ITU-T Image No.1 (A4, Std Resolution)  (Refer to 1.1.5.)
3 Sort Memory	16 MB	
<b>Copy Quality</b>		
1 Halftone	Yes	256-Level Error Diffusion
2 Resolution	600 x 600 dpi	
3 Original Contrast Selection	Yes	5-Levels
4 Smoothing (Rx)		
	Fax, Copy	Yes
	PC Printing Data	No
5 2-Sided Copy	Yes	With Auto Picture / Text Recognition  Scan twice
<b>Power Supply</b>		
1 Power Requirement	99 - 132 VAC 47 - 63 Hz Single phase	120 VAC
2 Power Consumption		
	Standby	13 W
	Transmission	21 W
	Reception	860 W
	Copy	860 W
	Maximum	1000 W
		120 VAC Power Supply
<b>Ambient Conditions</b>		
1 Temperature	50 - 80 °F / 10 - 30 °C	
2 Relative Humidity	30 - 80%RH	
3 Safety	UL60950-1 / CSA C22.2 No.60950-1	
4 EMI	Class B computing device peripheral in FCC Rules Part 15	
5 Lead Free Solder (PbF)	This Product uses Lead Free (PbF) PCBs	
<b>Construction</b>		
1 Dimensions (W x D x H)	17.7 x 17.9 x 18.0 in (450 x 454 x 448 mm)	Excluding projections
2 Weight (Excluding paper)	48.5 lb (22.0 kg)	Excluding consumable supplies and options

Items	Description	Remarks
<b>Consumables</b>		
1 Toner Cartridge	Yield: 10 K (3% coverage), 11.5 K Max Average yield is based on 3% coverage of the printable area with repetitive printing of 10 pages (Letter/A4 size, single side printing, default density). The yield of a Toner Cartridge varies depending on the coverage, temperature, humidity, media, etc. Therefore, the average yield cannot be guaranteed. Continuously printing 6% coverage of printable area will reduce the yield of the Toner Cartridge to about half as compared to 3% coverage printing. The maximum yield of the Toner Cartridge will not exceed 11,500 pages by way of Digital Counter.	
<b>Options</b>		
1 Printer Controller Module (PCL6*)	Yes	
2 Network Scan / Email / Internet Fax Kit	Yes	
3 2nd G3 Communication Port Kit	Yes	
4 Accounting Software	Yes	
5 Expansion Board	Yes	
6 SD Memory Card	Yes 32 MB - 512 MB	Use Genuine SD Memory Cards only.
7 2nd Paper Feed Module	Yes	
8 Handset Kit	Yes	
<b>Multi-Task Operation</b>		
1 Multi Task Operation	Yes	
2 Direct XMT Reserve	Yes	
3 Memory XMT Reserve	Yes	
4 Number of Memory Job Files	Yes	Max. 50 files
<b>Dialing/Telephone Features</b>		
1 Directory Search Dialing	Yes	
2 Directory Search (LDAP Email)	Yes	
3 Directory Search (LDAP Fax)	Yes	
4 One-Touch Auto Dialers	80 (40 x2: Upper/Lower)	
5 Abbr. Auto Dialers	200 (max. 920)	Plus an additional 720 stations available to select from, when the optional SD Memory Card (Minimum 32 MB) is installed.
6 Total Auto Dialers	280 (Max. 1,000)	
7 Program Dials	80	
8 Max. Number Digits (Fax)	36	
9 Max. Number Digits (Email)	60	
10 Max. Station Name Characters	15	

Items	Description	Remarks
11 Full Number Dialing (Buffered Dialing)	Yes	Max. 50 stations
12 Direct Dialing (Monitor Dialing)	Yes	Voice mode
13 Automatic Redialing	Yes	Up to 15 times at 0 to 15 min. intervals
14 Manual Redialing	Yes	Pressing the REDIAL/PAUSE button
15 Line Monitor Speaker	Yes	1st Line only
16 Chain Dialing (Hybrid Dial)	Yes	In Monitor Dialing mode only
17 Pulse / Tone Dialing	Yes	10 pps / DTMF
18 Pulse to Tone Change	Yes	
19 Flash Key	Yes	
20 Handset	Option	
<b>Transmission Features</b>		
1 Direct Transmission	Yes	
2 Memory Transmission	Yes	Page Retransmission
3 Quick Memory Transmission	Yes	
4 Multi-Station Transmission (Sequential Broadcasting)	Yes	Max. 330 stations (280 One-Touch / Abbr. + 50 Full Number Dialing) Max. 1000 stations when the SD Memory Card is installed
5 Direct Deferred Transmission	No	ADF Deferred Transmission
6 Deferred Transmission	Yes	Max. 50 timers
7 Deferred Multi-Station Transmission	Yes	
8 Priority Direct Transmission	Yes	Priority ADF Transmission
9 Priority Memory Transmission	No	
10 Batch Transmission	Yes	Real Time (up to 5 Files)
11 90 Degree Rotation Transmission	No	
12 Cover Sheet	Yes	
13 Confidential Mail Box	No	
14 Multi-Copy Transmission	No	
15 Memory Back-Up	Yes	<b>FAX:</b> Back-up with Flash Memory. <b>Copy / Printer:</b> No Back-up with D-RAM
16 Duplex Scanning	Yes	Scan twice, Fax once

Items	Description	Remarks
<b>Reception Features</b>		
1	Substitute Reception	Yes
2	Fixed Reduction	Yes LTR/A4/LGL: 70 - 100% (in 1% Steps), Top & Left Alignment
3	Auto Reduction	Yes LTR/A4/LGL: 70 - 100% (in 1% Steps), Top & Left Alignment
4	Overlap Printing	Yes Page End Approx. 0.51 in (13 mm)
5	Receive to Memory	Yes
6	Distinctive Ring Detector (DRD)	Yes
7	90 Degree Rotation Reception	No
8	Duplex Printing	Yes
<b>Polling</b>		
1	Polling	Yes
2	Turnaround Polling	No
3	Multi-Station Polling	Yes
4	Deferred Polling	Yes
5	Deferred Multi-Station Polling	Yes
6	Direct Polling Tx	No
7	Memory Polling Tx	Yes 1 File
8	Preset Polling Password	Yes
9	Temporary Polling Password	Yes
10	Continuous Polling	Yes
<b>Convenience</b>		
1	Panel Display	Yes
2	Voice Contact	No
3	Edit File Mode	Yes With View Mode
4	Incomplete File Save	Yes With View Mode
5	Automatic Fax Cover Sheet	Yes

Items	Description	Remarks	
<b>Copy Features</b>			
1	First Copy Time		
	Letter	19 sec.	
	A4		
2	Copy Speed		
	Letter	Approx. 19 cpm	Paper Feed: 1st Paper Tray; Paper Exit: to Exit Tray; Continuous Copy Mode.
	A4	Approx. 18 cpm	
3	Single Copy	Yes	
4	Multiple Copy	Yes	
5	Sort Copy only	Yes	
6	Enlargement	Yes	
7	Reduction	Yes	
8	Zoom	Yes	71% - 141%
<b>Certainty</b>			
1	Verification Stamp	Yes	
2	Header / Total Page Print	Yes	
3	Transaction Journal	Yes	200 Transactions / with View Mode
4	Comm. Journal	Yes	With Image
5	Last Ind. XMT Journal	Yes	
6	Power Failure Report	No	
<b>Printout Lists</b>			
1	One-Touch List	Yes	
2	ABBR. No. List	Yes	
3	Program List	Yes	
4	Address Book Search List	Yes	Auto Dialer List
5	Fax Parameter List	Yes	
6	File List	Yes	With View Mode
7	Ind. XMT Journal	Yes	
8	Directory Sheet	Yes	
<b>Identifications</b>			
1	Logo	Yes	25 Characters
2	Multiple Logo	No	
3	Character ID	Yes	16 Characters
4	Numeric ID	Yes	20 Digits

Items	Description	Remarks
<b>Special Communications</b>		
1 Password XMT / RCV	No	
2 Selective Reception	No	TSI Check
3 Relay XMT Request	No	
4 Relay XMT Center	No	
5 Confidential XMT / Polling	No	
6 Confidential Center	No	
7 Mailbox XMT / Polling	No	
8 Mailbox Center	No	
9 File XMT	No	
10 Received Fax Forward	Yes	Received File Transfer
11 Sub-address XMT	Yes	T. Routing
12 Sub-address Auto Routing	Yes	
13 NYSE	Yes	
14 Internet Fax Relay XMT	Yes	Internet Fax → Internet Fax → G3FAX
15 Email Relay XMT	Yes	PC → Internet Fax → Internet Fax → G3FAX
16 Document Fax	Yes	
<b>Others</b>		
1 Fax Access Code	Yes	
2 PIN Code Access	Yes	
3 Intelligent Redial (AI)	Yes	5 Files
4 Department Code	Yes	50 Departmental Codes
5 Power Saver Mode	Yes	
6 Self Diagnostic Function	Yes	
7 Remote Diagnostic Function	Yes	
8 Check & Call Function	Yes	
9 V.24 / Encryption Interface	No	
<b>Firmware Update</b>		
1 Local Update		
SD Memory Card	Yes	
USB Port	Yes	
2 LAN (Network)	Yes	

### 1.1.2. Printer Function

Items	Description	Remarks
<b>Interface</b>		
1 Centronics Parallel I/F	No	
2 LAN (Network)	Yes	Ethernet 10Base-T/100Base-TX
3 USB Port	Yes	USB1.1
4 IEEE-1394	No	Firewire
<b>Printer Function</b>		
1 Printing Size	LGL / LTR / A4 / A5	
2 Bypass	Yes	
3 Stapling	No	
4 Printing Resolution (dpi)	Max. 1200 (Interpolated) x 600 dpi	Selectable 600 dpi, with Smoothing, the results are similar to PCL6 Printers (1200 dpi Interpolated).
5 Interface	USB / Ethernet	
6 OS	Win 98 / Win Me / Win NT 4.0 / Win 2000 / Win XP	
7 Printer Work Memory Size	20 MB	Not expandable
8 GDI	Yes	
9 PDL (PCL6)	Yes	Requires Optional PCL6 Emulation Kit and Optional Expansion Board.
10 PDL (PS3)	No	
11 Duplex Printing	Yes	Custom Size/Postcard Size is not available.
12 Collation Stack	Yes	
13 Status Monitor		
Network	Yes	
USB	No	
14 Network Status Monitor	Yes	
15 Smoothing	Yes	
16 Applicable PC	IBM PC, AT or Compatible	
17 Multi-Task Operation		
Printing while Fax-XMT from Memory	Yes	
Printing while Fax-RCV into Memory	Yes	
Fax-XMT from Memory while Printing	Yes	
Fax-RCV into Memory while Printing	Yes	

Items	Description	Remarks
18 Output to separate tray for Printing, Fax, Copy	No	
19 Font	Yes	Requires Optional PCL6 Emulation Kit
20 Secure Mailbox	Yes	Requires Optional SD Memory Card (256 MB or 512 MB). Max. 10 mailboxes.



### 1.1.3. Network Scanner Function

Items	Description	Remarks	
<b>Interface</b>			
1 Centronics Parallel I/F	No		
2 LAN (Network)	Yes	Ethernet 10Base-T/100Base-TX	
3 USB Port	No		
4 IEEE-1394	No	Firewire	
<b>Network Scanning Function</b>			
1 Scanning Device	CIS		
2 Scanning Speed (ADF)			
	Mono	Excludes: Initializing Time, ADF slipping factor, and Data XMT Time.	
	150dpi: 150 x 150		LTR : 1.1 sec A4 : 1.1 sec
	300dpi: 300 x 300		LTR : 2.2 sec A4 : 2.3 sec
	600dpi: 600 x 600		LTR : 4.4 sec A4 : 4.6 sec
	Color		No
3 Halftone	256 Halftone shades	With Error Diffusion	
4 Max. Document Size	Legal 8.5 x 14 in (216 x 2000 mm)		
5 Scanning Resolution (dpi)			
	Mono	600 x 600 300 x 300 150 x 150	Default: 300 dpi
6 OS	Win 98 / Me / Win NT 4.0 / Win 2000 / XP		
7 2-Sided Scanning	No		
8 File Format	Multi-page TIFF / PDF		
9 Completion Notice	Yes	Auto Pop-up on the PC Screen	
10 Protocol	TCP/IP / Non-Std		
<b>Network Address Features</b>			
1 One Touch Address Keys	80	Shared with Fax/Internet Fax One-Touch Address, 80 in Total	
2 Abbr. Address Numbers	20	Independent for Network Scanner	

### 1.1.4. Internet Fax Function

Items	Description	Remarks
<b>Main Specifications</b>		
1	Communication Protocols	SMTP / POP3 / MIME
2	Max. Modem Speed	NA
3	Coding Scheme	JBIG/MMR/MR/MH
4	File Format	TIFF / PDF Selectable (PDF formats are used for Scan-to-Email, current Internet Fax standards do not support these file formats)
5	Line Interface	RJ-45 Ethernet LAN
<b>Scanner Mechanism</b>		
1	Max. Document Size	Legal 216 x 2000 mm
2	Effective Scanning Width	LTR : 8.3 in (212 mm) A4 : 8.2 in (207 mm)
3	Scanning Resolution dpi x lpi (pel/mm x lines/mm)	Std : 203 x 98 (8 x 3.85) Fine : 203 x 196 (8 x 7.7) S-Fine : 203 x 391 (8 x 15.4) : 406 x 391 (16 x 15.4) 600dpi : 600 x 600 dpi LAN: 600 dpi, 16 x 15.4 Scanning Resolution is available.
<b>Printer Mechanism</b>		
1	Printing Resolution	600 dpi
2	Effective Recording Width	LTR : 8.1 in (207 mm) A4 : 7.9 in (201 mm)
<b>Transmission Features</b>		
1	Multi-Task Operation	Yes Convenient simultaneous G3 Fax and LAN operation.
2	Memory Transmission	Yes
3	Sequential Multi-Station Transmission	Yes
4	Simultaneous Multi-Station Transmission	Yes Max. 330 stations (280 One-Touch / Abbr. + 50 Full Number Dialing) Max.1000 stations when the SD Memory Card is installed
5	Sender Selection	Yes
6	G3 / Email Mixed Broadcasting	Yes
7	Deferred Transmission	Yes
8	Fax Forward	Yes Received File Transfer
9	Sub-address RCV	Yes Inbound Routing
10	Mail Header	
	Email Header Print Selection	Yes All or From / To / Subject only
	Subject Line	Random Entry

Items	Description	Remarks	
<b>LAN Features</b>			
1	Internet Fax Communication	Yes	
2	Internet Mail Reception	Yes	
3	Internet Fax Server Features		
	Internet Fax Relay XMT	Yes	Internet Fax → Internet Fax → G3FAX
	Email Relay XMT	Yes	PC → Internet Fax → G3FAX
	Received Fax / Email Forward	Yes	Local print available
	PC FAX Transmission	Yes	Document Fax Only (Network)
	Inbound Routing	Yes	Using Sub-Address. Local print available
	Phone Book Registration from PC	Yes	Via Email or Network Address Editor
4	Internet Fax Parameters Registration via Email	Yes	
5	Internet Delivery Confirmation	Yes	With MDN
6	Network Scanning	Yes	600 dpi
7	Network Printing		
	LPR / LPD	Yes	600 dpi
	GDI	Yes	600 dpi
	PDL	Yes	Requires Optional PCL6 Emulation Kit and Optional Expansion Board.
8	DHCP Client	Yes	
9	LDAP	Yes	Lightweight Directory Access Protocol
10	TIFF Viewer	Yes	Selectable, PDMS / TIFF Viewer
11	NYSE	Yes	
<b>Certainty</b>			
1	Comm. Journal (w / Image)	Yes	
<b>ID</b>			
1	Email Address	Yes	

### 1.1.5. SD Memory Card

#### SD Memory Card Formatting Structure and Partitioning by Function

SD Memory Card Formatting Structure					
SD Memory Size (n MB)	32 MB	64 MB	128 MB	256 MB	512 MB
Max. Number of Pages	1,020	2,900	6,800	12,750	12,750
Memory Partition Usage by Function					
Function	32 MB	64 MB	128 MB	256 MB	512 MB
1000-Station Auto-Dialer	Yes				
Job MIB Data	Yes				
G3 Fax/Internet Fax Scan-to-Email Scan-to-PC/File	Yes				
Mail Box Print	N/A	N/A	N/A	Yes	Yes

**Note:**

1. This function is available only when an SD Memory Card is installed.
2. Max. Number of Pages is based on ITU-T Image No.1 (A4, Standard Resolution).
3. Fax/Internet Fax XMT memory storage = Max. 255 pages/file, Max. 50 Files; Scan to PC/File = Max. 999 pages.
4. Fax/Internet Fax RCV memory storage = Max. 999 pages.  
With 2nd G3 Option installed = Max. 999 pages/Channel.
5. One Mail Box accepts a maximum of 20 print jobs. A 512 MB SD Memory Card stores approximately 105 pages of PCL bitmap print data, whereas a 256 MB SD Memory Card stores approximately 50 pages.
6. Once the SD Memory Card is installed, the standard Fax & Internet Fax Flash Memory and the Network Scanning D-RAM is no longer used.
7. Max. page number may differ depending on the manufacturer of the SD Memory Card.

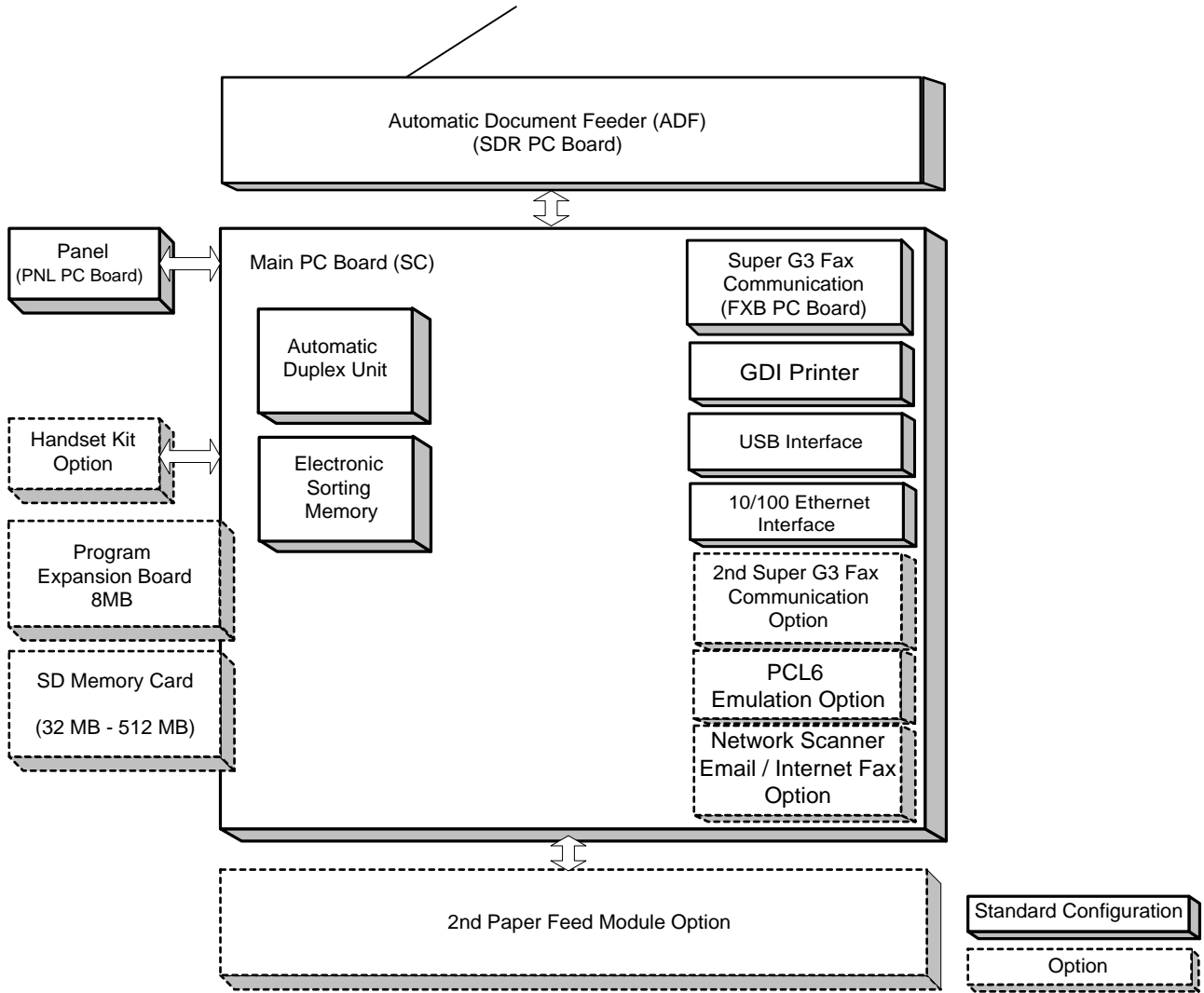
## 1.2. Control Panel

For Americas

e-STUDIO190F



### 1.3. System Combination



## 1.4. Options List

### Options

Option Name	Option Number	Remarks
Printer Controller Module (PCL6*)	<a href="#">GA-1230</a>	F-ROM Board (8 MB) is included
Network Scan / Email / Internet Fax Kit	<a href="#">GM-4090</a>	
2nd G3 Communication Port Kit	<a href="#">GD-1230</a>	
SD Memory Card	----	32 MB up to 512 MB Use Genuine SD Memory Cards only
2nd Paper Feed Module	<a href="#">KD-1021</a>	
Handset Kit	<a href="#">GJ-1150</a>	

### Supplies

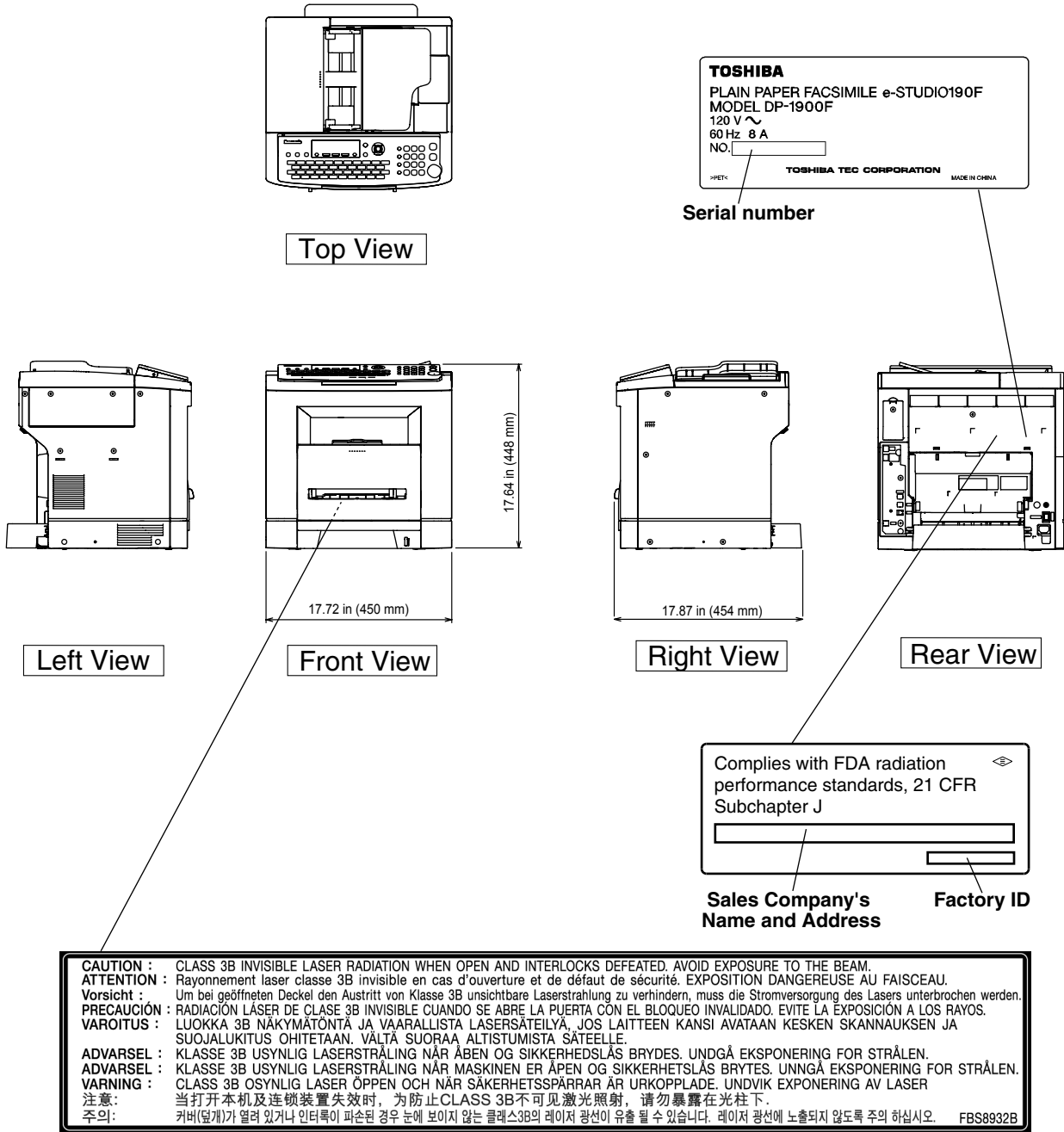
Part Name	Part Number	Remarks
All in One Cartridge	<a href="#">PS-ZT1900</a>	

**Note:**

1. PCL6 is a Page Description Language of the Hewlett-Packard Company.
2. Genuine SD Memory Cards depict an SD Logo on their label.

# 1.5. External View

## 1. Standard Configuration



**CAUTION**

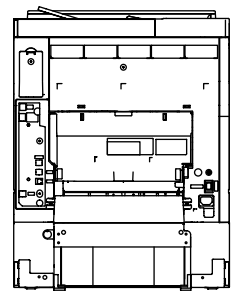
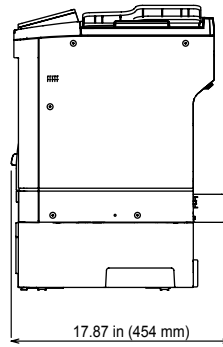
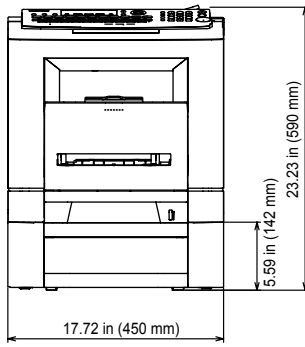
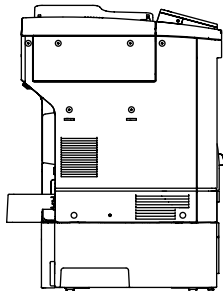
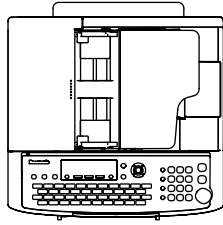
Denotes hazards that could result in minor injury or damage to the machine.

\* THIS PRODUCT CONTAINS A LITHIUM BATTERY. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE. "IMPROPER USE OR REPLACEMENT MAY CAUSE OVERHEATING, RUPTURE OR EXPLOSION RESULTING IN INJURY OR FIRE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS OF YOUR LOCAL SOLID WASTE OFFICIALS AND LOCAL REGULATIONS"

**Note:** The service life of the Battery is approximately 1 year under normal use.

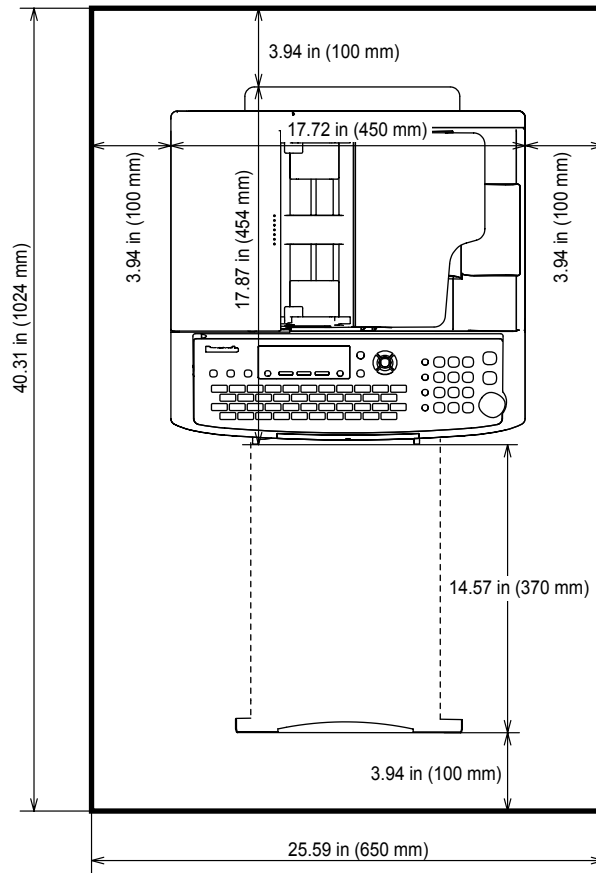


## 2. With Optional 2nd Paper Feed Module Configuration

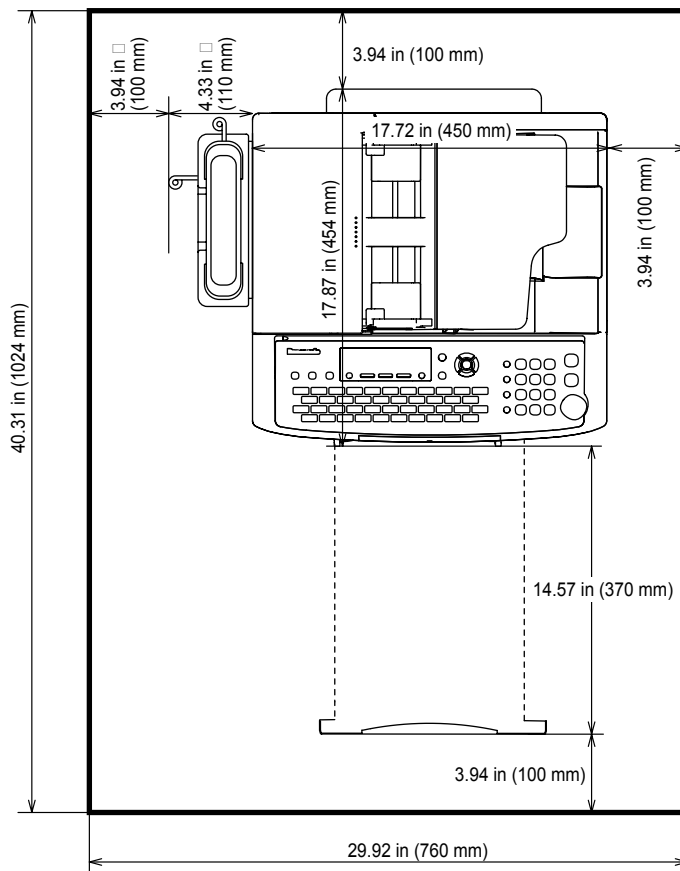


### 3. Space Requirements

#### Main Unit

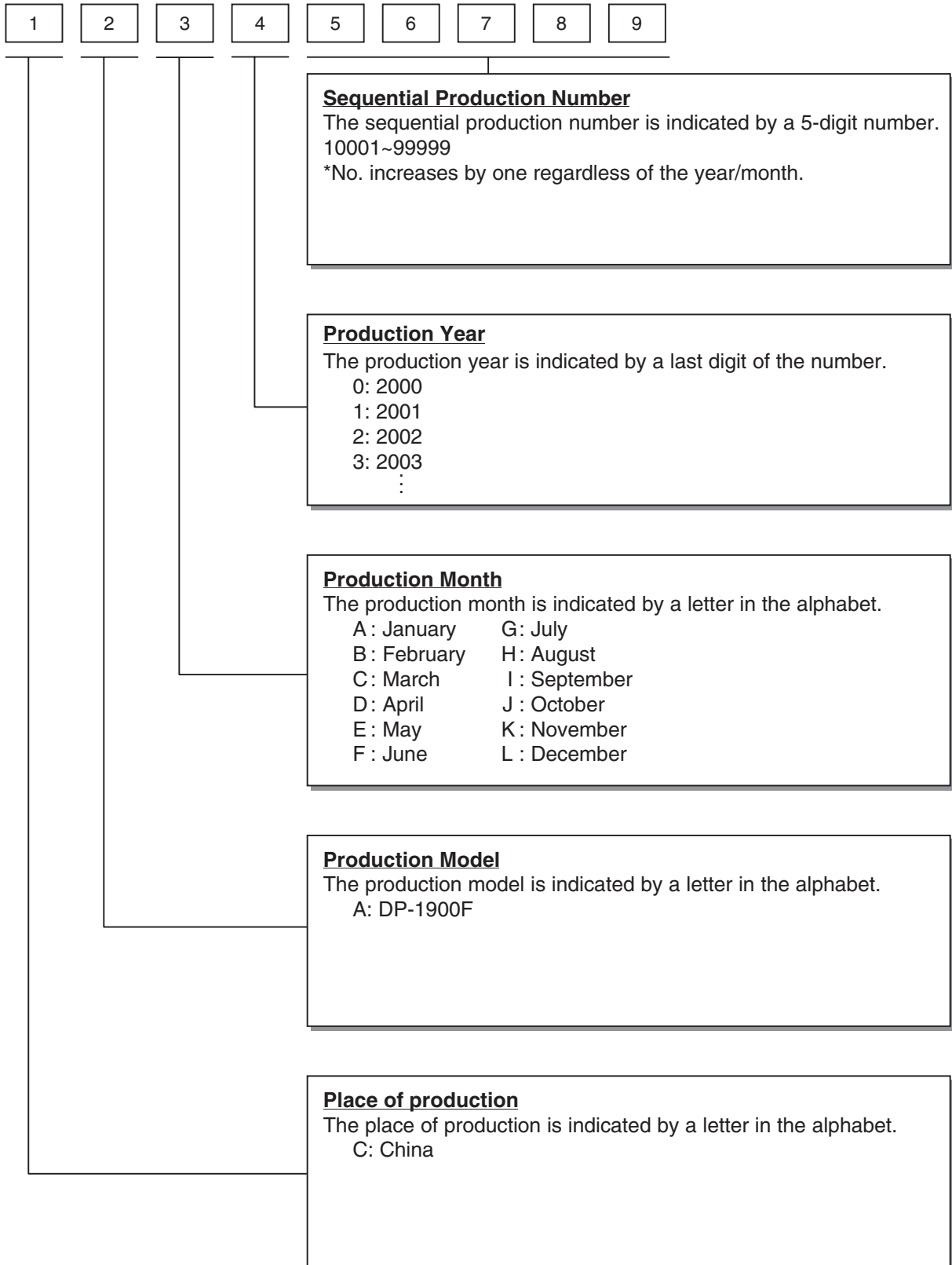


#### Main Unit + Handset Option

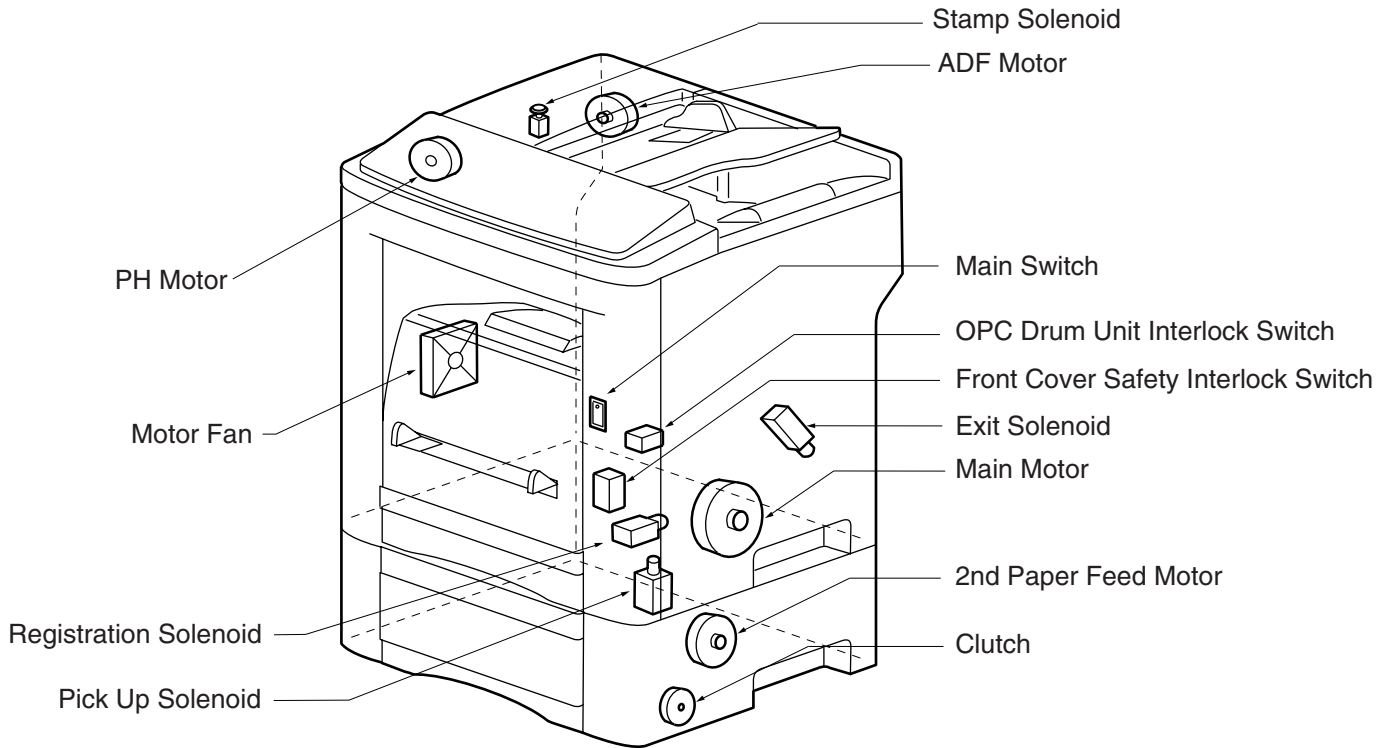


### 1.5.1. Serial Number Contents

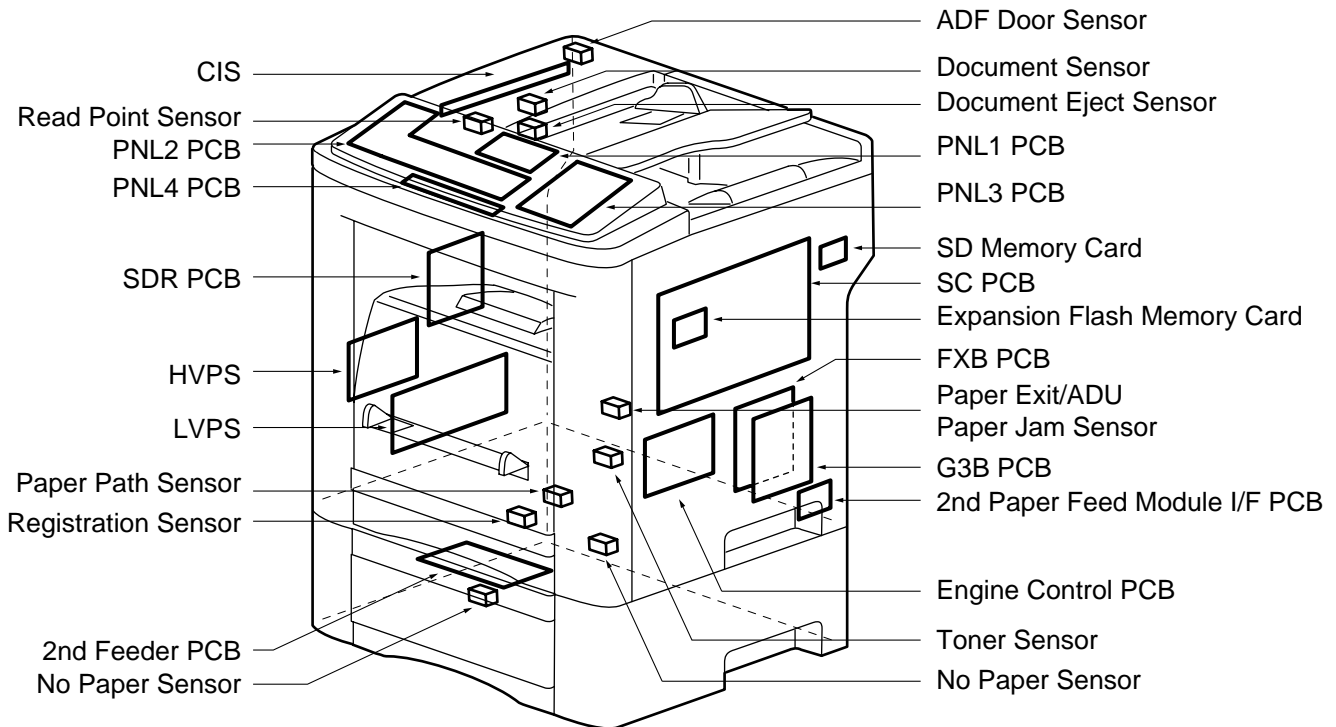
The contents of the 9-digit Serial Number is as follows:



## 1.6. Clutches, Switches, Motors and Fan



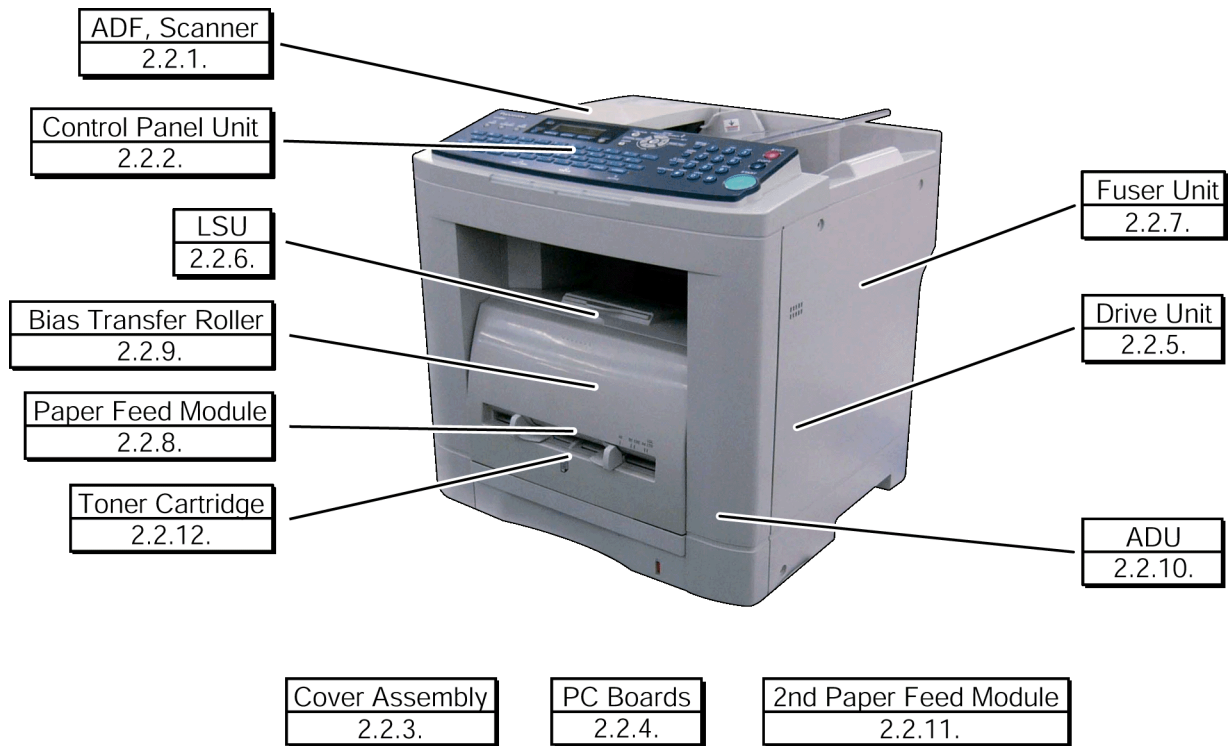
## 1.7. Sensors and PC Boards



## 2 Disassembly Instructions

### 2.1. General Disassembly

Pertinent Disassembly Instruction sections are shown below.



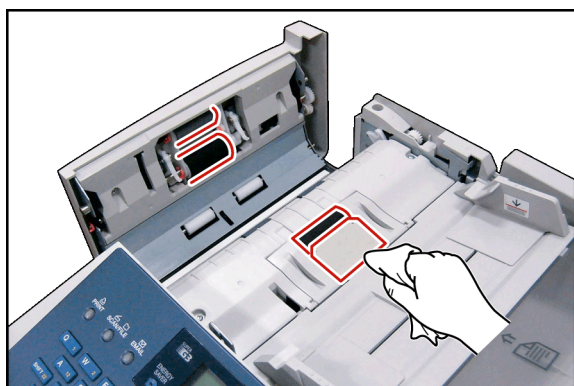
## 2.2. Disassembly Instructions

### 2.2.1. Automatic Document Feeder (ADF) Unit, Scanner

#### 2.2.1.1. Cleaning Separation Roller, Pick Up Roller, Feed Roller, ADF Pad, CIS and White Sheet



(1) Open the **ADF Cover**.

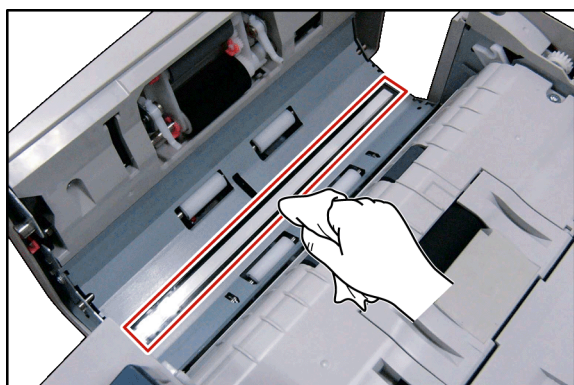


#### <Cleaning Separation Roller, Pick Up Roller and Feed Roller>

Clean the surface of the Rollers with a soft cloth, saturated with water.

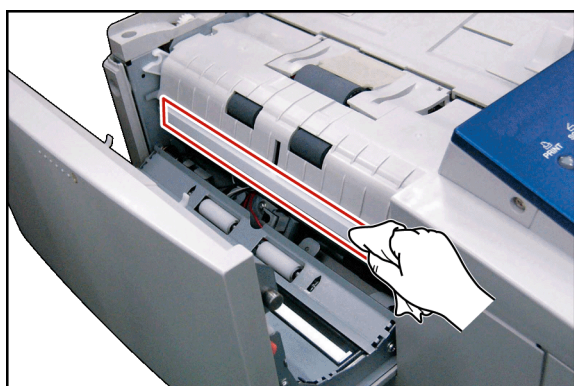
#### <Cleaning ADF Pad>

Clean the surface of the ADF Pad only with a soft dry cloth.



#### <Cleaning CIS (Contact Image Sensor)>

Clean the surface of the CIS only with a soft dry cloth.



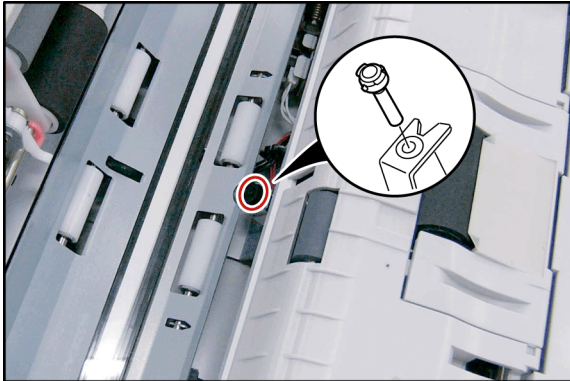
#### <Cleaning White Sheet>

Clean the surface of the White Sheet only with a soft dry cloth.

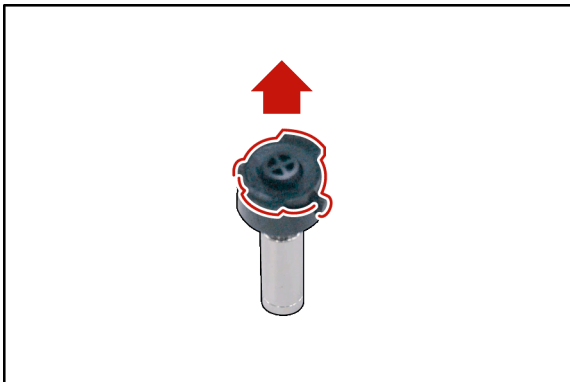
### 2.2.1.2. Stamp Head (453)



(1) Open the **ADF Cover**.



(2) Remove the **Stamp Unit** (453).

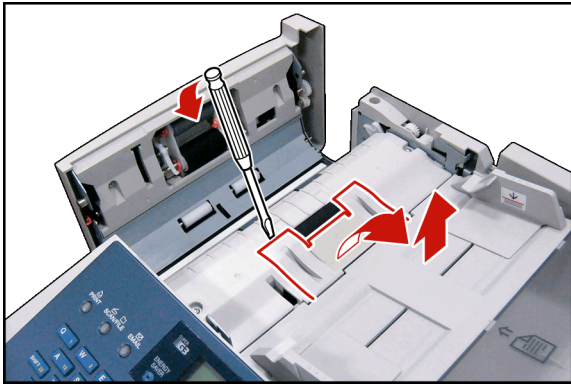


(3) Remove the **Stamp Head** (453).

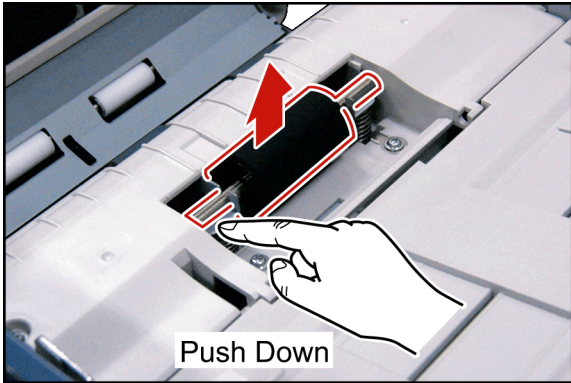
### 2.2.1.3. Feed Roller (419), Pick Up Roller (416), Separation Roller (403)



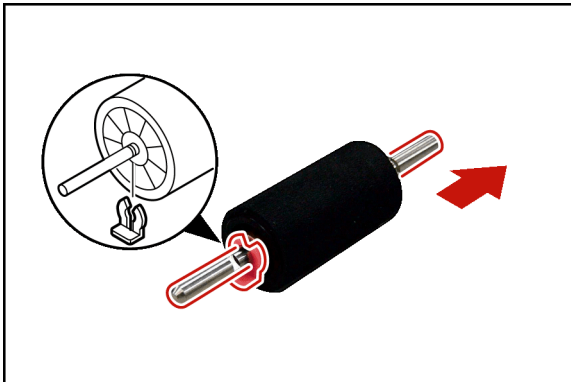
(1) Open the **ADF Cover**.



(2) Remove the **Separation Roller Cover** as illustrated.

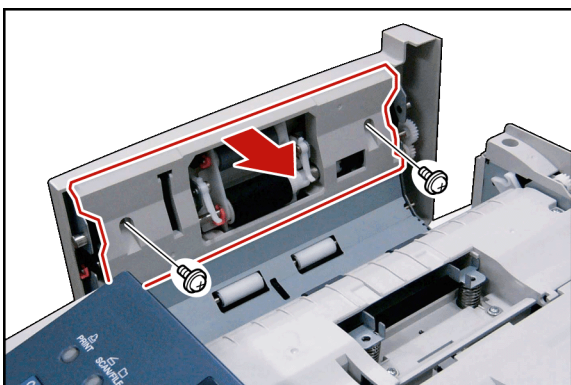


(3) Remove the **Separation Roller Assembly** as illustrated.



(4) Remove the **Snap Ring** (H6).

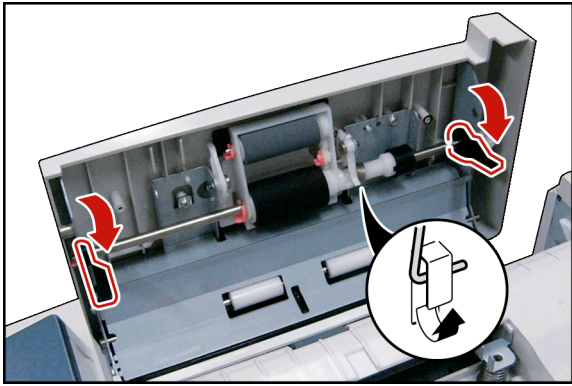
(5) Remove the **Separation Roller Shaft** (442).



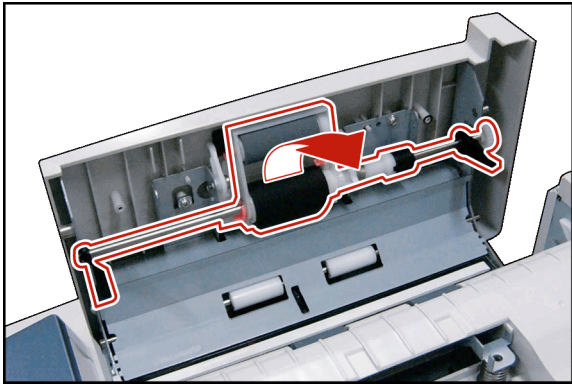
(6) Remove 2 **Screws** (Y14).

(7) Remove the **Upper Paper Guide** (302).

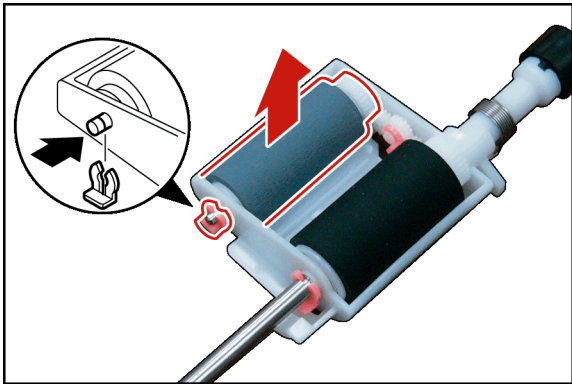




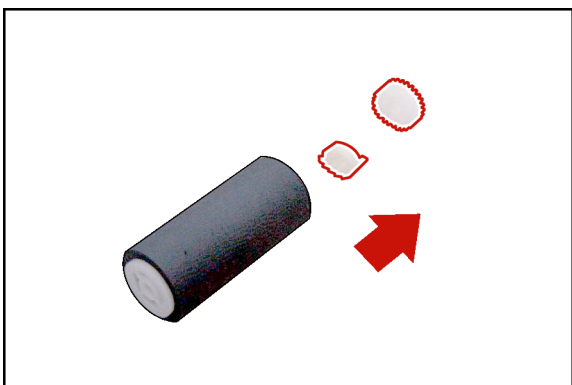
- (8) Release the **Spring** from the hook as illustrated.
- (9) Remove both side **Feed Levers**.



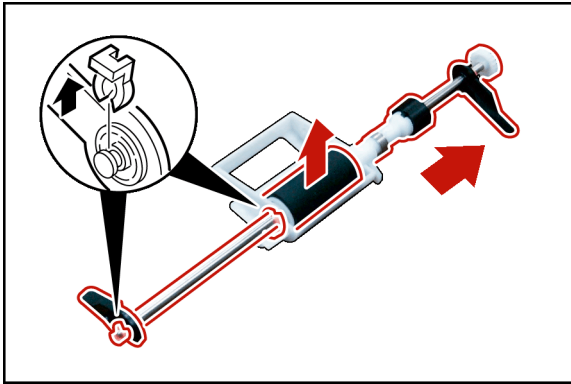
- (10) Remove the **Roller Assembly**.



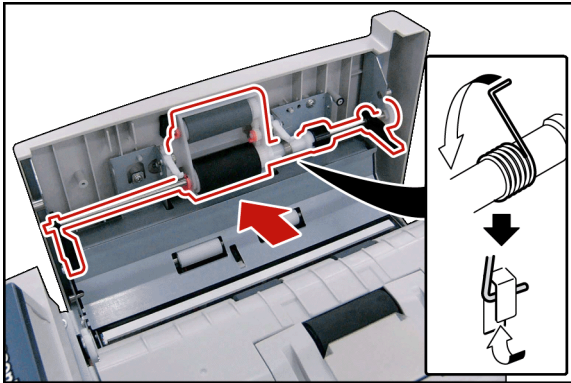
- (11) Remove the **Snap Ring (H7)**.
- (12) Remove the **Pick Up Shaft (415)**.
- (13) Remove the **Pick Up Roller (416) Assembly**.



- (14) Remove the **Pick up 1 Gear (447)** and **Pick UP 2 Gear (446)**.

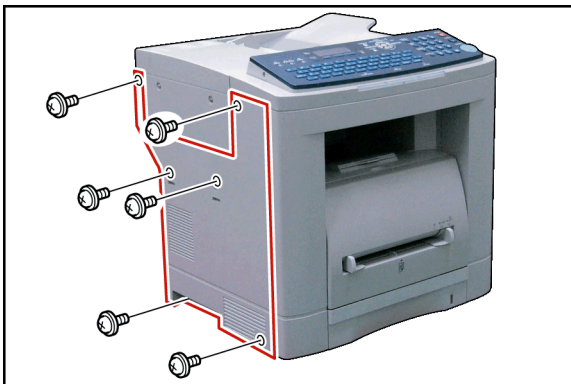


- (15) Remove the **Snap Ring** (H7).
- (16) Remove the **Feed Lever** (411).
- (17) Remove the **Feed Roller Shaft Assembly**.
- (18) Remove the **Feed Roller** (419).

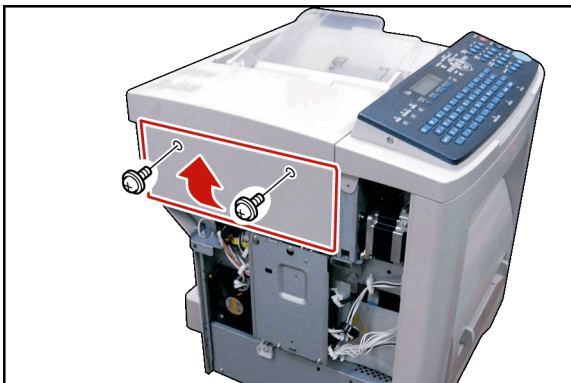


**Note:**  
When reinstalling, make sure that the **Roller Assembly** is properly placed on the ADF Unit.

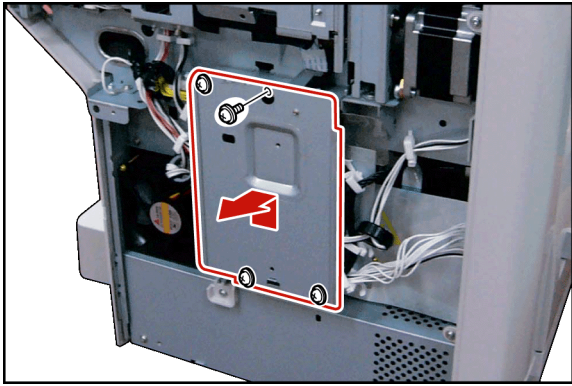
#### 2.2.1.4. CIS (Contact Image Sensor) Assembly



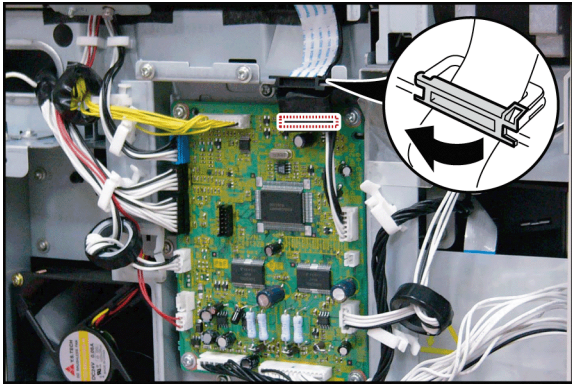
- (1) Remove 6 **Silver Screws** (S6).
- (2) Remove the **Left Cover** (612).



- (3) Remove 2 **Silver Screws** (S6).
- (4) Remove the **Upper Left Cover** (329).



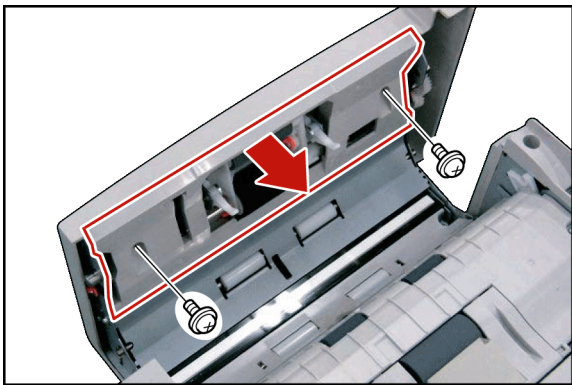
- (5) Remove 1 **Screw** (Y3) and loosen 3 **Screws**.
- (6) Remove the **SDR Cover** (1016) Assembly.



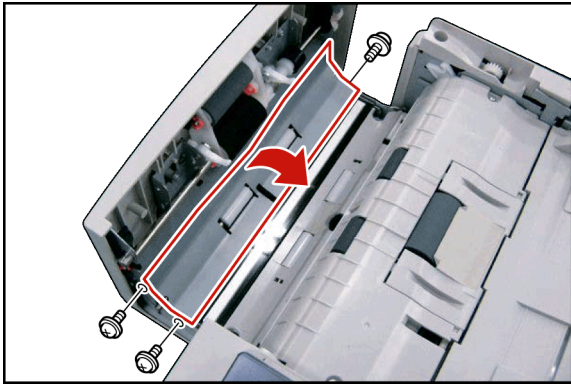
- (7) Release the **Harness** from the Harness Clamp.
- (8) Disconnect the **Harness** on the SDR PC Board (CN707).



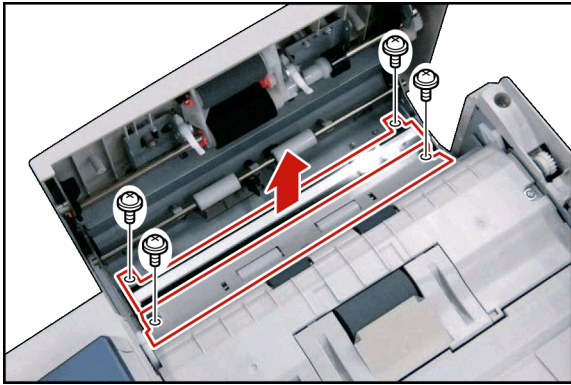
- (9) Open the **ADF Cover**.



- (10) Remove 2 **Screws** (Y14).
- (11) Remove the **Upper Paper Guide** (302).



(12) Remove 3 **Screws** (Y3).

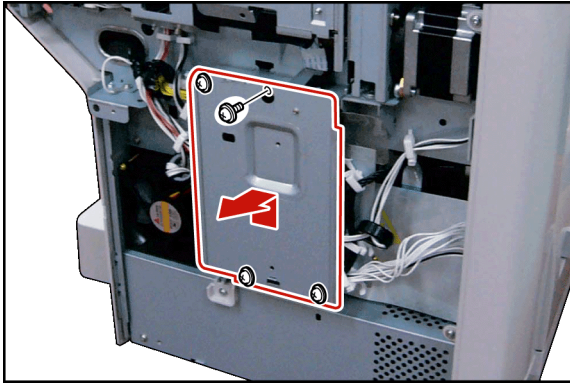


(13) Remove 4 **Screws** (Y3).

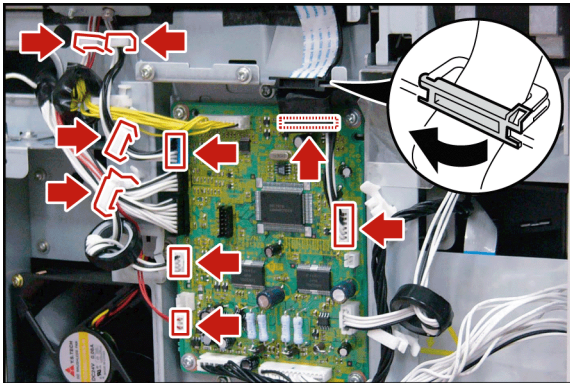
(14) Remove the **Paper Guide** (452).

(15) Remove the **CIS** (440) Assembly.

### 2.2.1.5. Paper Transfer Motor (324), Paper Feed Motor (507)



(1) Remove the **Left Cover**, **Upper Left Cover** and **SDR Cover**. (Refer to 2.2.1.4.)



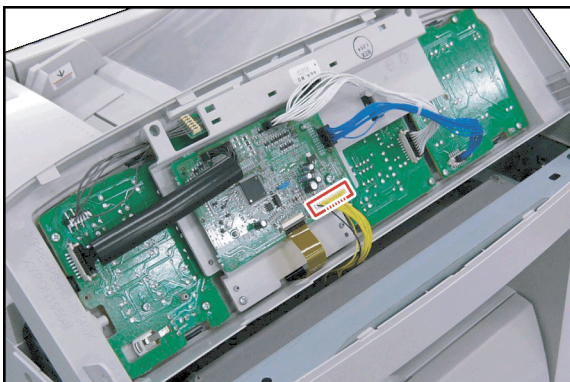
(2) Disconnect the **Harnesses** on the SDR PC Board (CN701, CN706, CN707, CN709 and CN714).

(3) Release the **Harnesses** from the Harness Clamps.

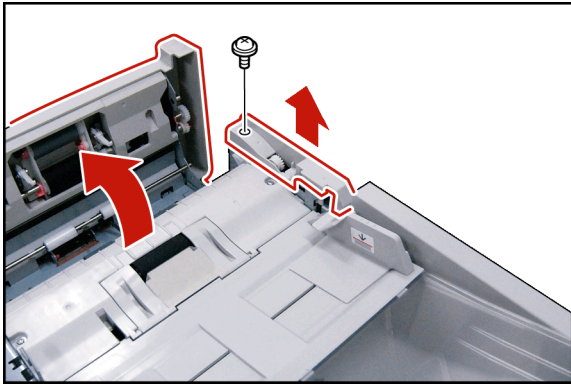


(4) Remove 1 **Silver Screw** (S6).

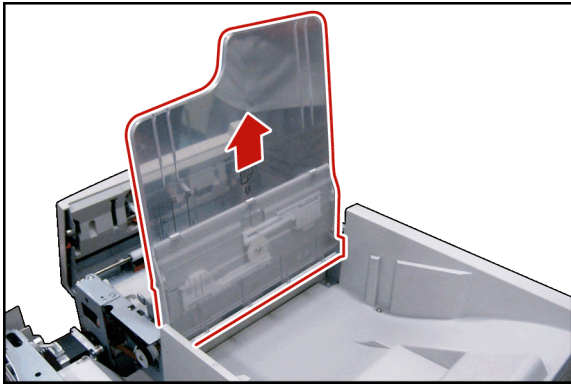
(5) Slightly lift the **Control Panel Unit**.



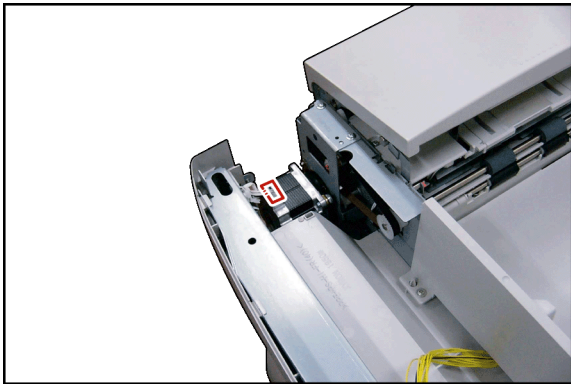
(6) Disconnect the **Harness** on the PNL1 PC Board (CN230).



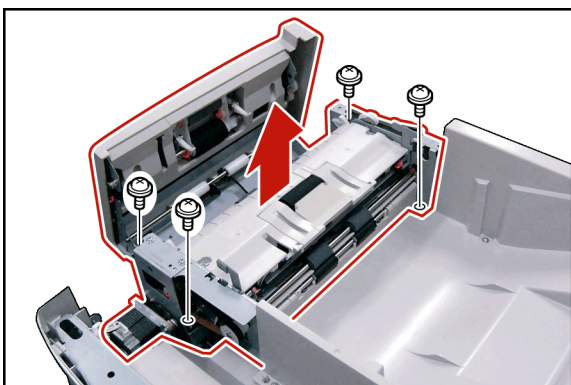
- (7) Open the **ADF Cover**.
- (8) Remove 1 **Screw (Y3)**.



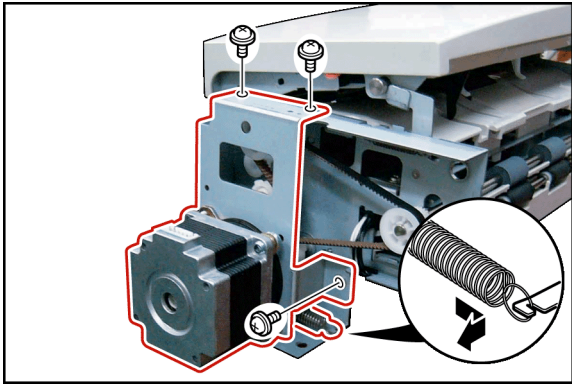
- (9) Remove the **Paper Tray Assembly**.



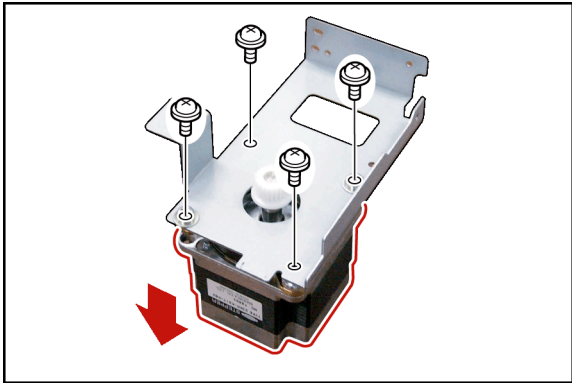
- (10) Disconnect the **Harness** on the Paper Transfer Motor.



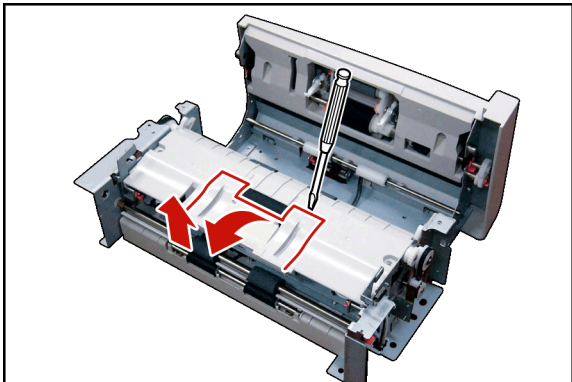
- (11) Remove 4 **Screws (Y15)**.
- (12) Remove the **ADF Drive Assembly**.



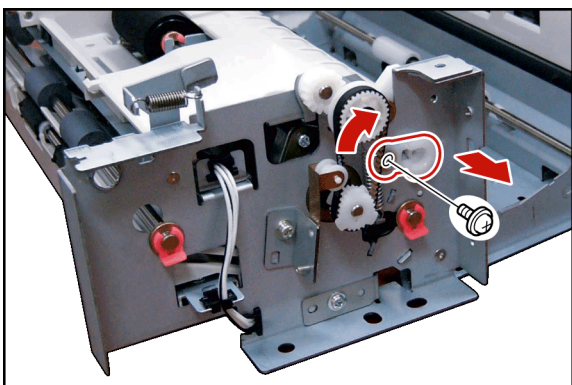
- (13) Unhook the **Tension 2 Spring** (335).
- (14) Remove 3 **Screws** (X8).
- (15) Remove the **Paper Transfer Motor Assembly**.



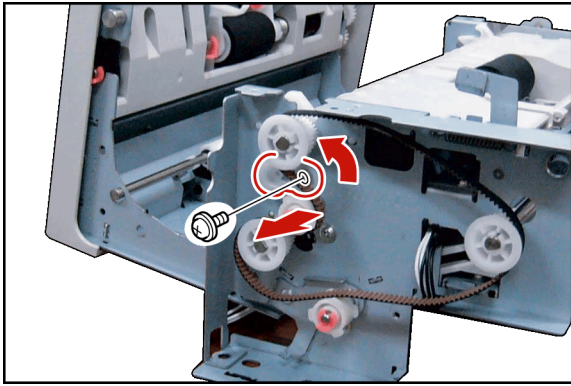
- (16) Remove 4 **Screws** (Y17).
- (17) Remove the **Paper Transfer Motor** (324) Assembly.



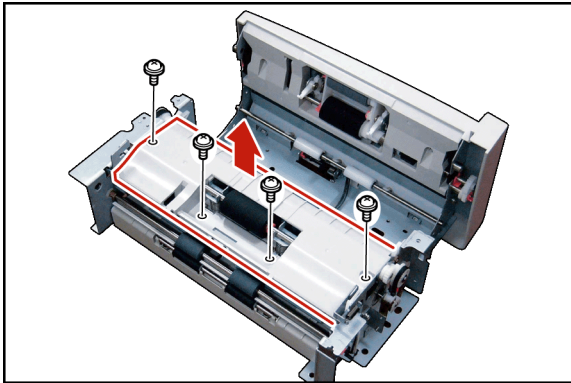
- (18) Remove the **Separation Roller Cover** as illustrated.



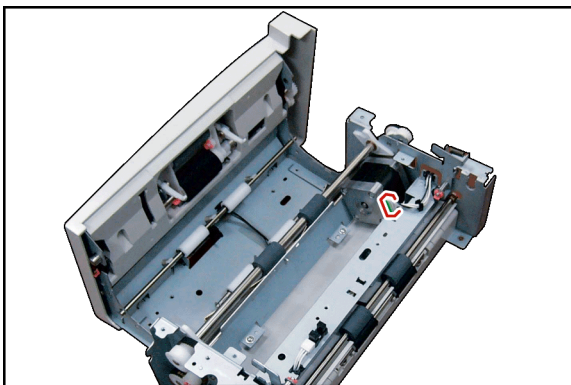
- (19) Remove 1 **Screw** (Y17).
- (20) Remove the **Plate Holder** (531).



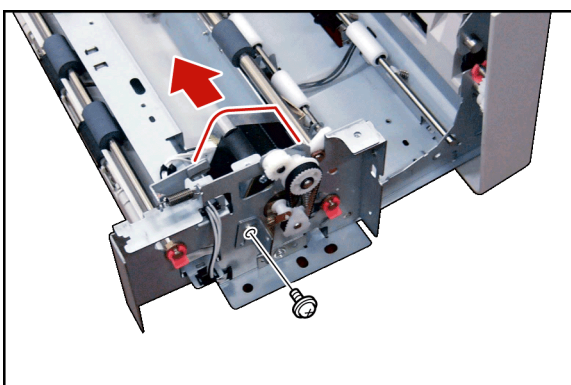
- (21) Remove 1 **Screw** (Y17).
- (22) Remove the **Plate Holder** (531).



- (23) Remove 4 **Screws** (Y3).
- (24) Remove the **Separation Guide Plate Assembly**.



- (25) Disconnect the **Harness** on the Paper Feed Motor.



- (26) Remove 1 **Screw** (Y17).
- (27) Remove the **ADF Motor** (507) Assembly.



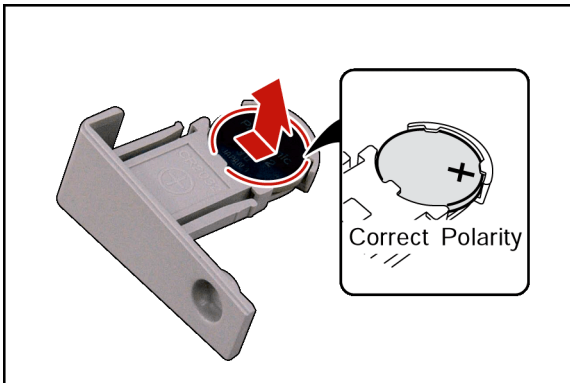
## 2.2.2. Control Panel Unit

### 2.2.2.1. Battery (122), PNL1 PC Board (2102), PNL2 PC Board (2105), PNL3 PC Board (2104), PNL4 PC Board (2106), LCD Module (123)



#### <Replace the Battery>

- (1) Remove 1 **Screw** (X8).
- (2) Remove the **Battery Holder** (110).



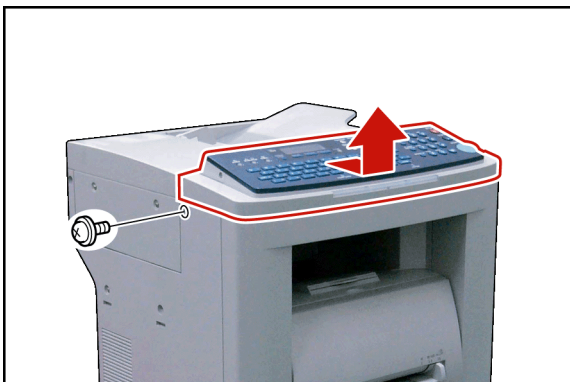
- (3) Replace the **Battery** (122).
- (4) Reinstall the **Battery Holder** and the **Screw**.

#### **Note:**

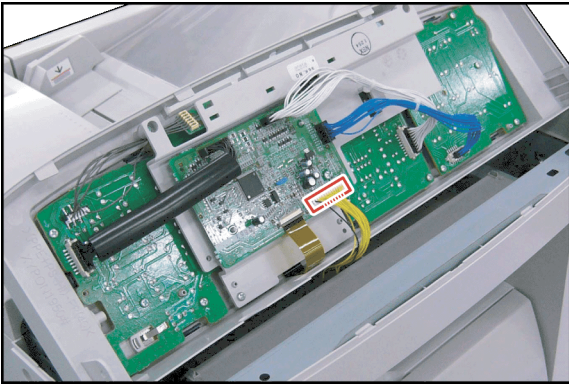
Dispose of used Batteries according to the instructions of your Local Solid Waste Officials and Local Regulations.



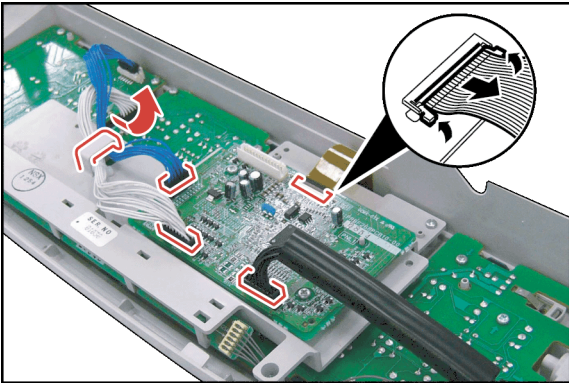
- (5) Remove 1 **Silver Screw** (S6).



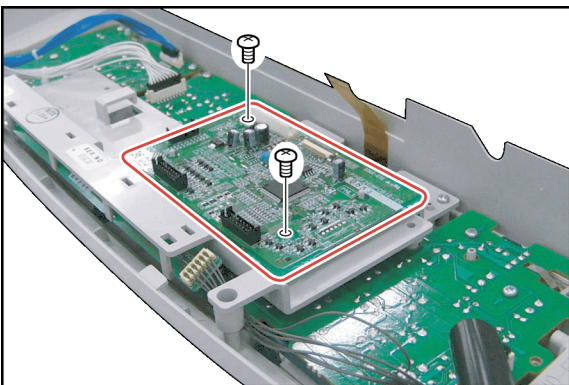
- (6) Remove 1 **Silver Screw** (S6).
- (7) Slightly lift the **Control Panel Unit**.



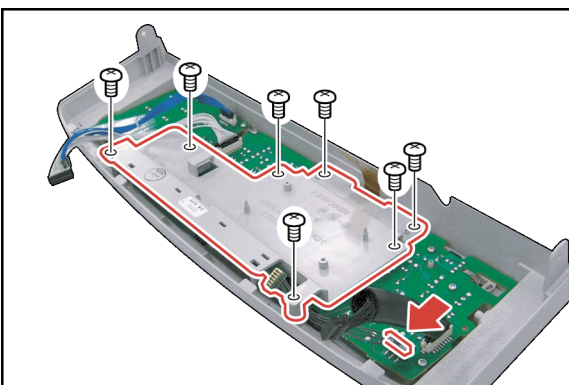
(8) Disconnect the **Harness** on the PNL1 PC Board (CN230).



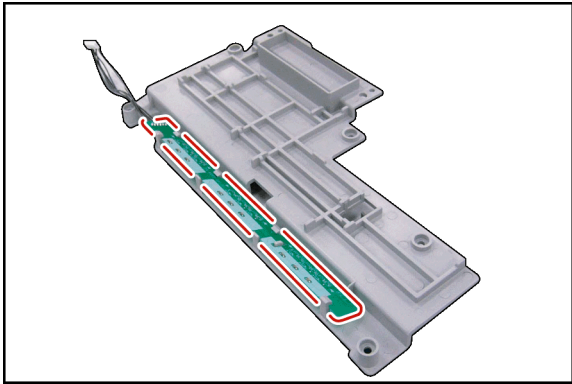
(9) Release the **Harness** from Latch Hook.  
(10) Disconnect all the **Harnesses** on PNL1 PC Board as illustrated.



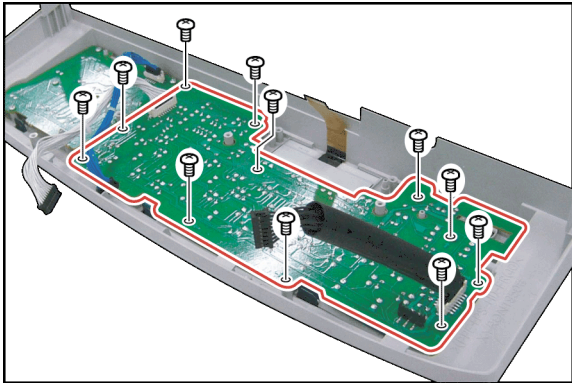
(11) Remove 2 **Screws** (X8).  
(12) Remove the **PNL1 PC Board** (2102).



(13) Disconnect the **Harness** on the PNL2 PC Board (CN253).  
(14) Remove 7 **Screws** (X8).  
(15) Remove the **PCB Holder** (118).

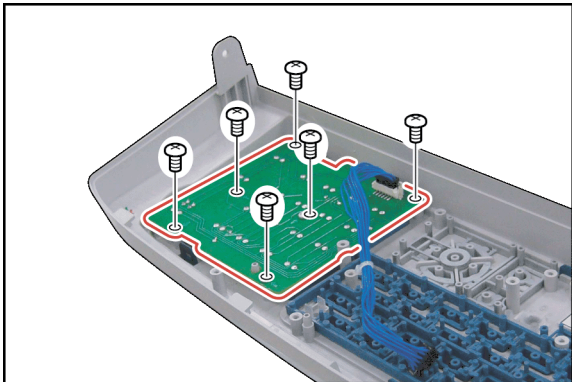


(16) Remove the **PNL4 PC Board** (2106).



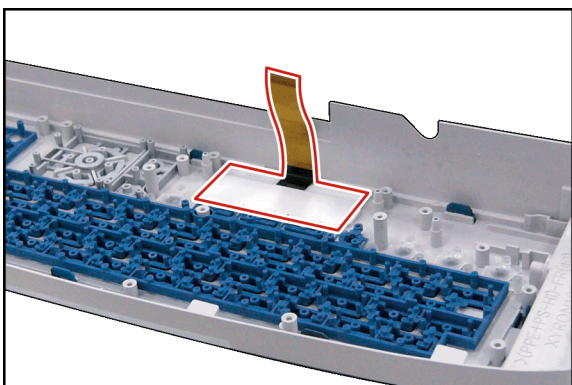
(17) Remove 11 **Screws** (X8).

(18) Remove the **PNL2 PC Board** (2105).



(19) Remove 6 **Screws** (X8).

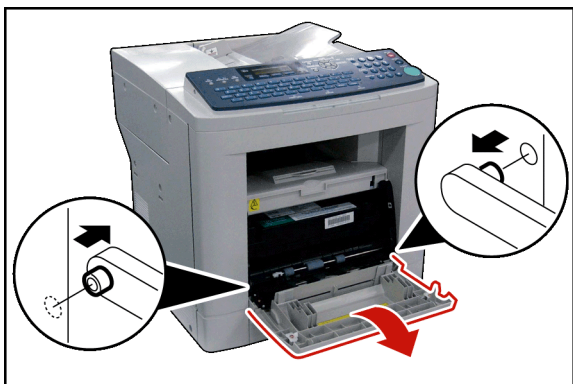
(20) Remove the **PNL3 PC Board** (2104).



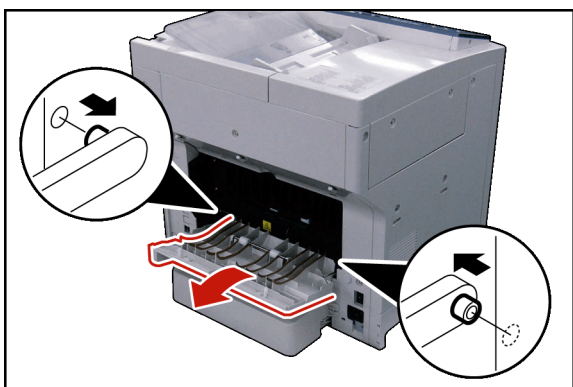
(21) Remove the **LCD Module** (123).

## 2.2.3. Cover Assembly

### 2.2.3.1. Front Cover (615), Rear Cover (633)

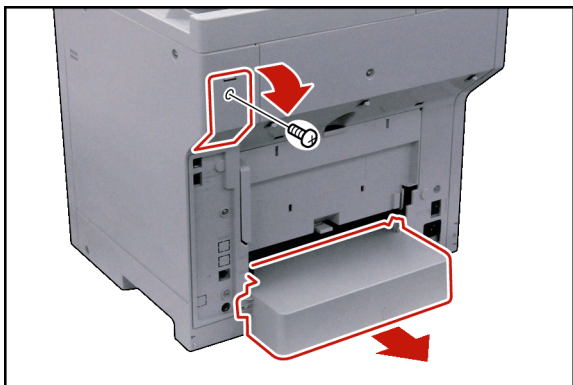


- (1) Open the **Front Cover**.
- (2) Release 2 **Latch Hooks** and remove the **Front Cover (615) Assembly**.



- (3) Open the **Rear Cover**.
- (4) Release 2 **Latch Hooks** and remove the **Rear Cover (633) Assembly**.

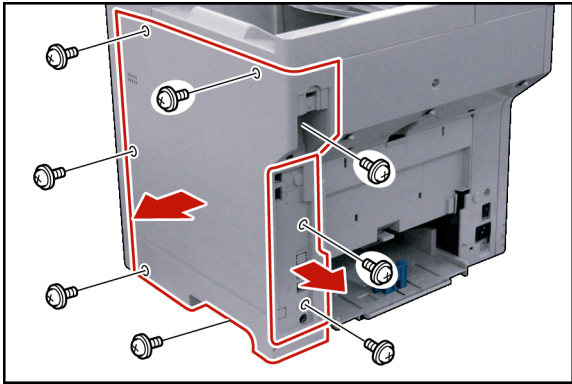
### 2.2.3.2. Right Cover (613), Left Cover (612), Rear 2 Cover (607)



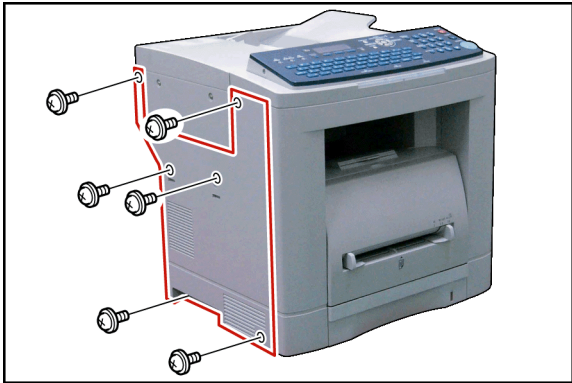
- (1) Remove the **Rear Paper Tray Cover (608)**.
- (2) Remove 1 **Silver Screw (V6)**.
- (3) Remove the **SD Card Cover (610)**.



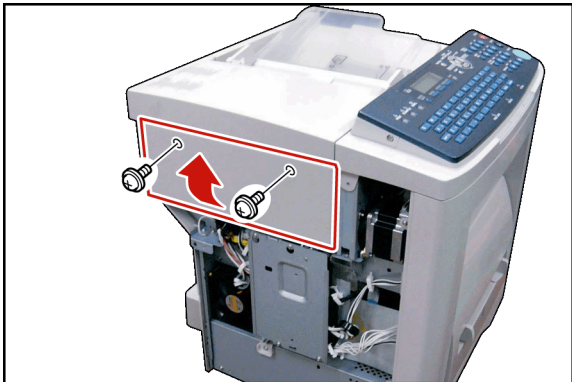
**Caution:**  
Remove the SD Memory Card if it was installed.



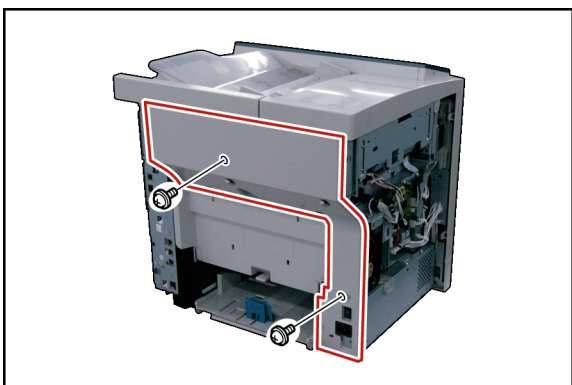
- (4) Remove 2 **Silver Screws (S6)**.
- (5) Remove the **Lower Right Rear Cover (611)** first.
- (6) Remove 6 **Silver Screws (S6)**.
- (7) Remove the **Right Cover (613)**.



- (8) Remove 6 **Silver Screws (S6)**.
- (9) Remove the **Left Cover (612)**.



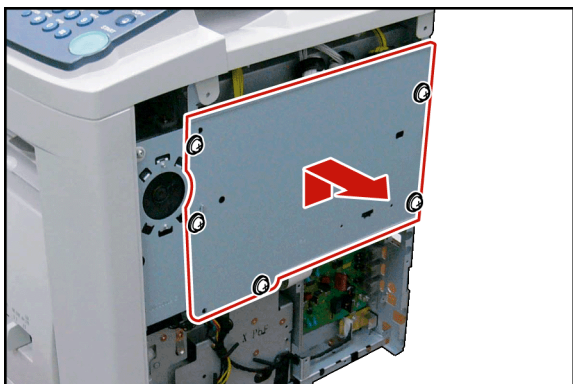
- (10) Remove 2 **Silver Screws (S6)**.
- (11) Remove the **Upper Left Cover (329)**.



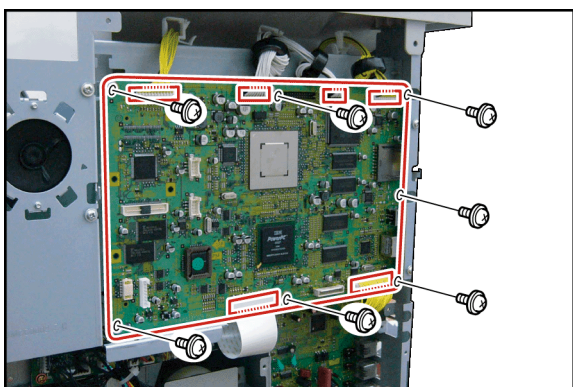
- (12) Remove 2 **Silver Screws (S6)**.
- (13) Remove the **Rear 2 Cover (607)**.

## 2.2.4. PC Board

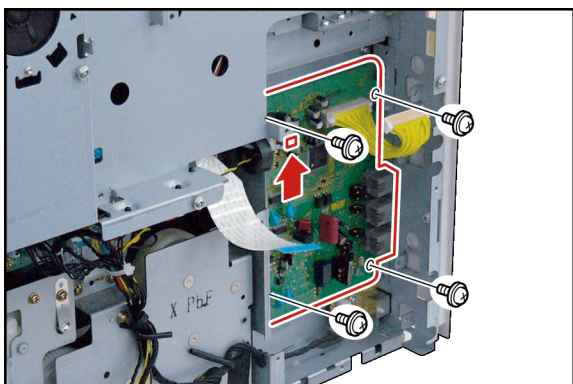
### 2.2.4.1. SC PC Board (2001), FXB PC Board (2005), Engine Control PC Board (2002)



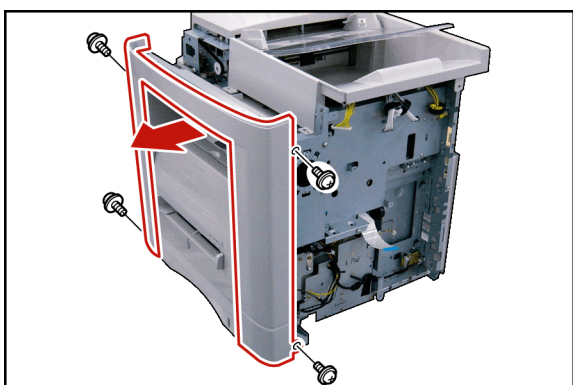
- (1) Remove the **Right Cover**. (Refer to 2.2.3.2.)
- (2) Remove the **Control Panel Unit**. (Refer to 2.2.2.)
- (3) Loosen 5 **Screws** (Y3).
- (4) Remove the **SC Cover** (706).



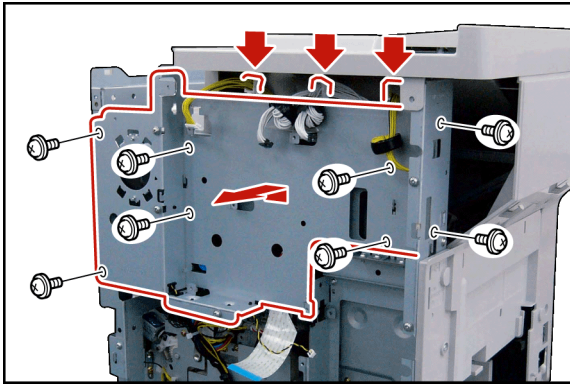
- (5) Disconnect all the **Harnesses** on the SC PC Board.
- (6) Remove 7 **Screws** (Y3).
- (7) Remove the **SC PC Board** (2001).



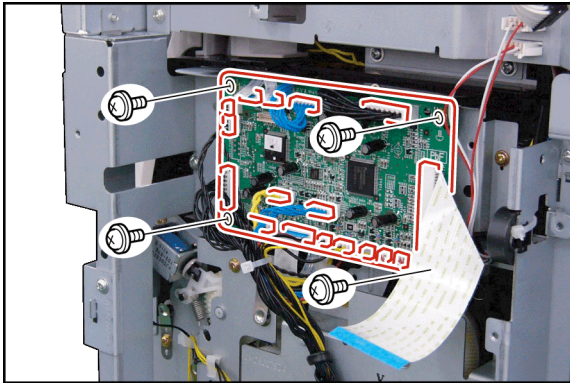
- (8) Disconnect all the **Harnesses** on the FXB PC Board.
- (9) Remove 4 **Screws** (Y3).
- (10) Remove the **FXB PC Board** (2005).



- (11) Remove the **Left Cover**. (Refer to 2.2.3.2.)
- (12) Remove 4 **Screw** (Y3).
- (13) Remove the **Front 2 Cover** (614).

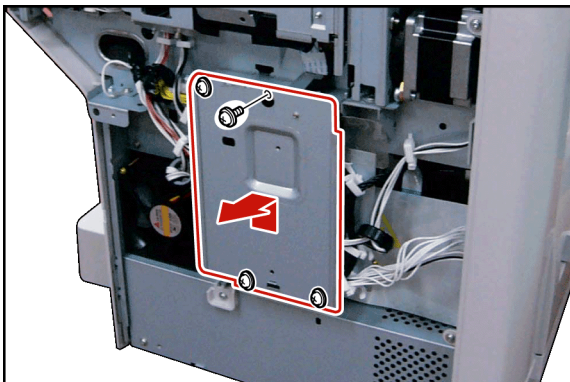


- (14) Release the **Harnesses** from the Harness Clamps.
- (15) Remove 8 **Screws** (Y3).
- (16) Remove the **SC Bracket** (707).

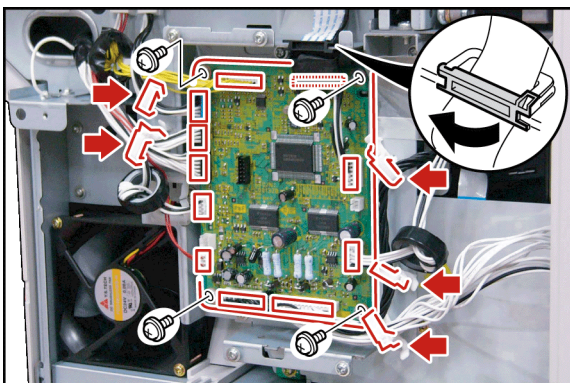


- (17) Disconnect all the **Harnesses** on the Engine Control PC Board.
- (18) Remove 4 **Screws** (U1).
- (19) Remove the **Engine Control PC Board** (2002).

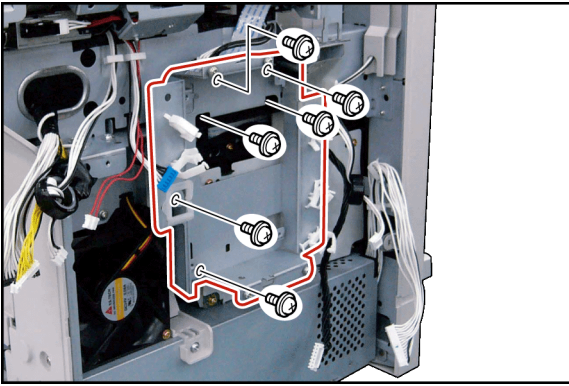
#### 2.2.4.2. SDR PC Board (2101), HVPS (1005), LVPS (2004)



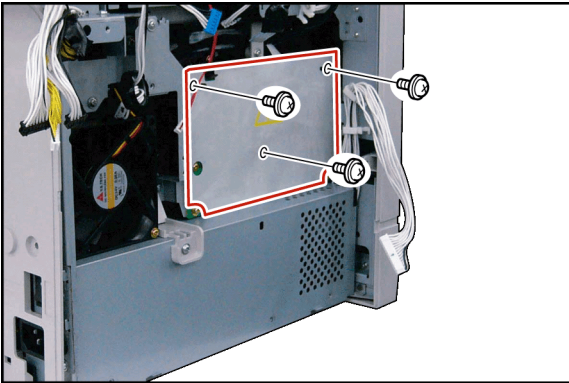
- (1) Remove the **Left Cover**, **Upper Left Cover** and **SDR Cover**. (Refer to 2.2.1.4.)



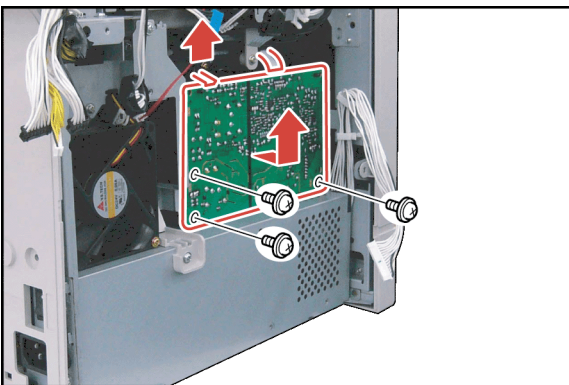
- (2) Disconnect all the **Harnesses** on the SDR PC Board.
- (3) Release the **Harnesses** from the Harness Clamps.
- (4) Remove 4 **Screws** (Y3).
- (5) Remove the **SDR PC Board** (2101).



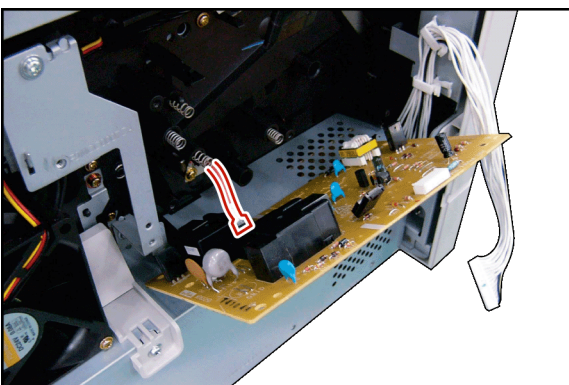
- (6) Remove 6 **Screws** (Y3).
- (7) Remove the **SDR Bracket** (1015).



- (8) Remove 3 **Screws** (T9).
- (9) Remove the **HVPS Insulation Sheet** (1020).

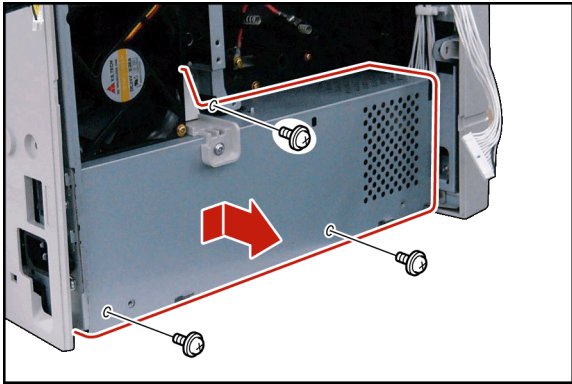


- (10) Remove 2 **Screws** (T9) and 1 **Screw** (U3).
- (11) Disconnect the **Flat Harness**.
- (12) Release the **Latch Hook** and remove the **HVPS** (1005).

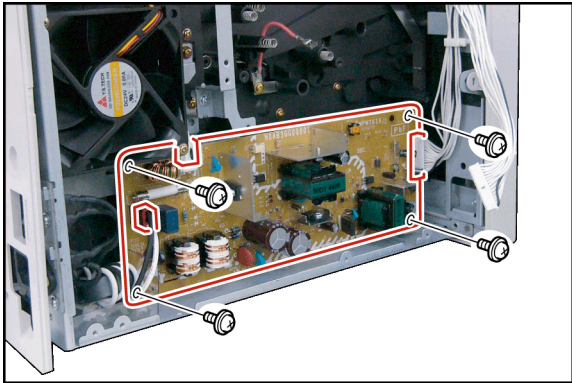


- (13) Disconnect the **Harness** on the HVPS.



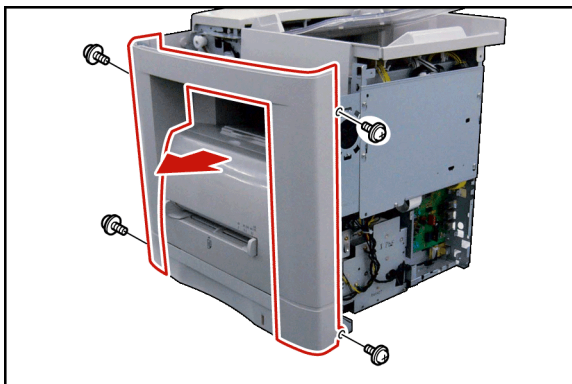


- (14) Remove 3 **Screws** (Y3).
- (15) Remove the **LVPS Cover** (1017).

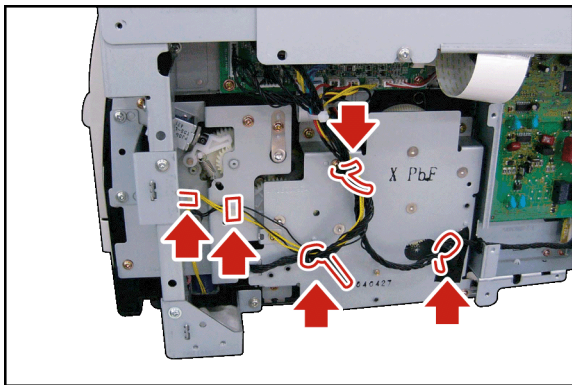


- (16) Disconnect all the **Harnesses** on the LVPS.
- (17) Remove 4 **Screws** (Y3).
- (18) Remove the **LVPS** (2004).

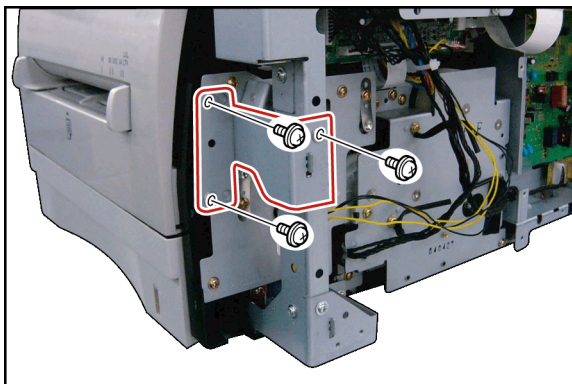
## 2.2.5. Drive Unit



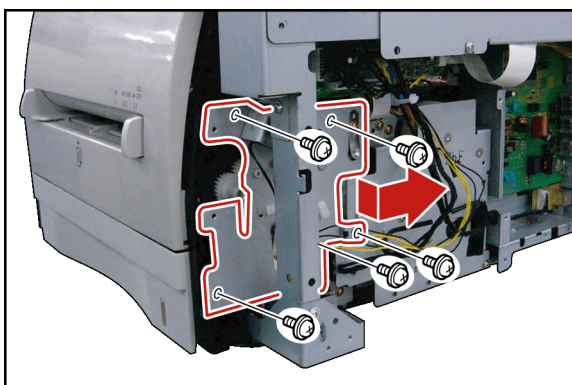
- (1) Remove the **Right Cover** and **Left Cover**. (Refer to 2.2.3.2.)
- (2) Remove the **Control Panel Unit**. (Refer to 2.2.2.)
- (3) Remove 4 **Screw** (Y3).
- (4) Remove the **Front 2 Cover** (614).



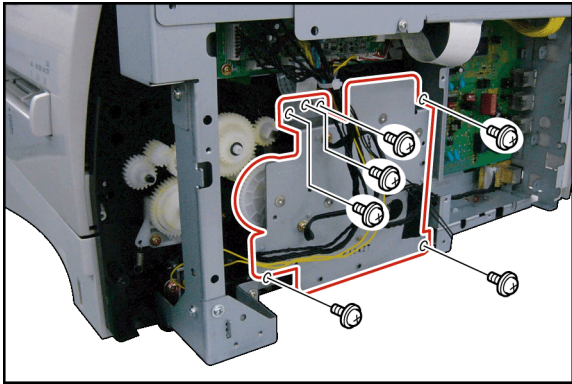
- (5) Release the **Harnesses** from the Harness Clamps.



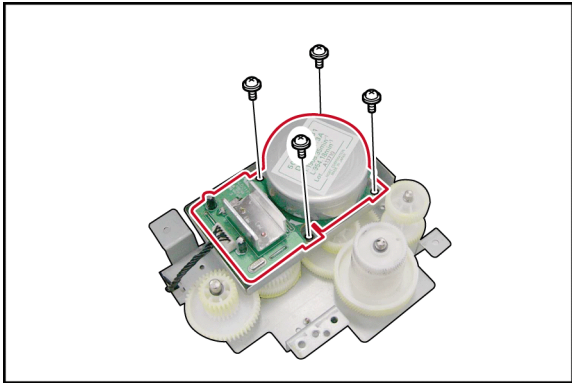
- (6) Remove 3 **Screws** (Y3).
- (7) Remove the **Support 1 Bracket** (709).



- (8) Remove 4 **Screws** (U1) and 1 **Screw** (T9).
- (9) Remove the **Solenoid Assembly**.

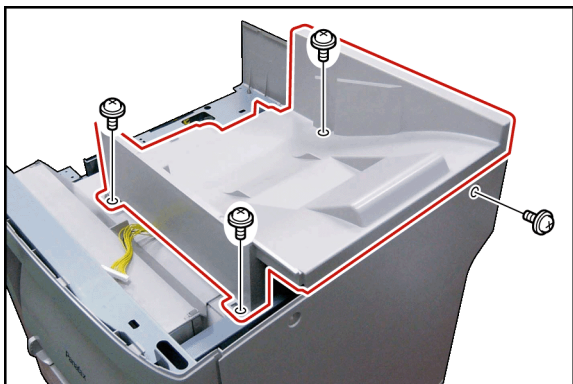


- (10) Remove 6 **Screws** (T9).
- (11) Disconnect the **Harness**.
- (12) Remove the **Drive Assembly**.

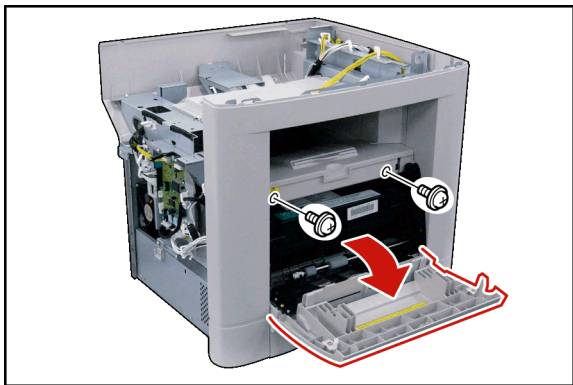


- (13) Remove 4 **Screws** (U1).
- (14) Disconnect the **Harness**.
- (15) Remove the **Motor** (907).

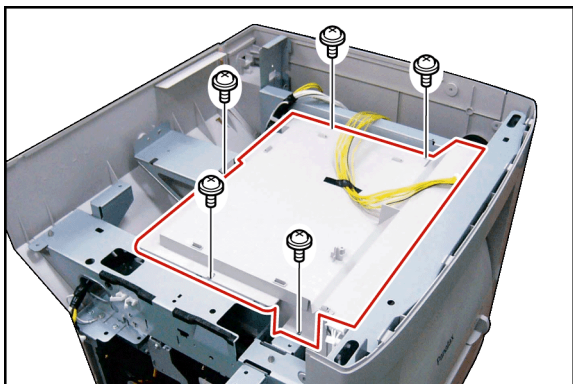
## 2.2.6. LSU Unit



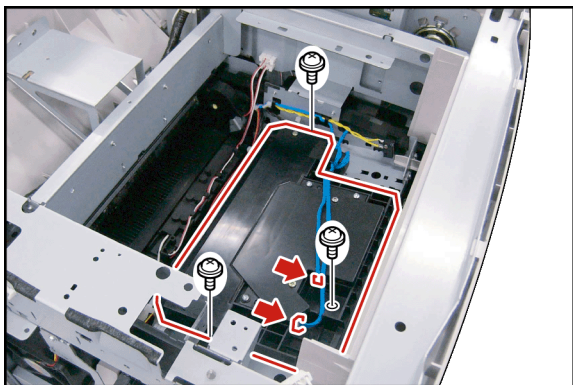
- (1) Remove the **ADF Drive Assembly**. (Refer to 2.2.1.5.)
- (2) Remove 3 **Screws (X8)** and 1 **Screw (Y14)**.
- (3) Remove the **ADF Frame (313)**.



- (4) Open the **Front Cover**.
- (5) Remove 2 **Screws (Y13)**.



- (6) Remove 5 **Screws (Y13)**.
- (7) Remove the **Inner Cover Assembly**.

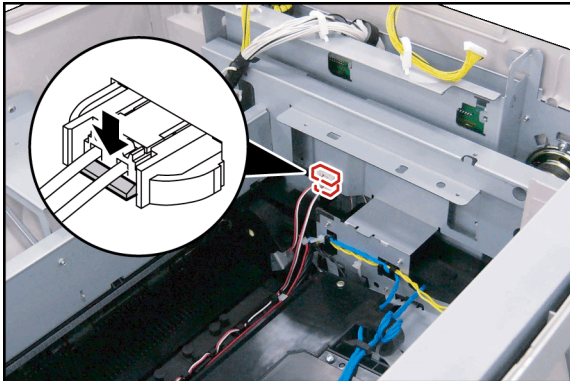


- (8) Disconnect 2 **Harnesses**.
- (9) Remove 3 **Screws (W7)**.
- (10) Remove the **LSU Unit (1214)**.

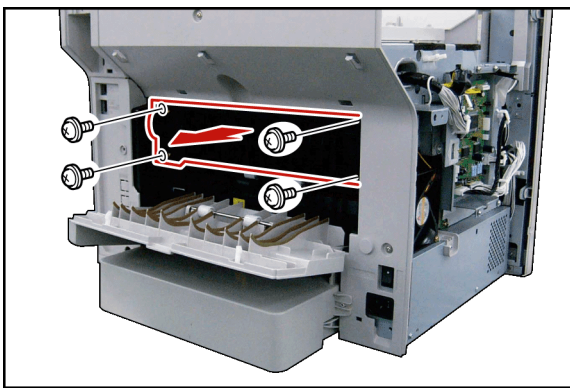
## 2.2.7. Fuser Unit

### CAUTION:

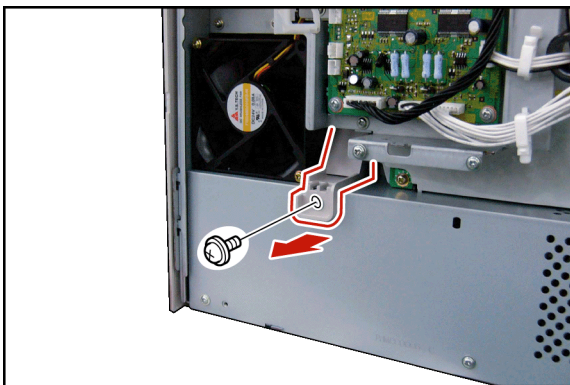
To prevent from getting burned, do not install, remove, clean or make adjustments when the Fuser Unit is hot.



- (1) Remove the **Inner Cover Assembly**. (Refer to 2.2.6.)
- (2) Disconnect 2 **Harnesses** by pressing down on the connector latches with a small screw driver.



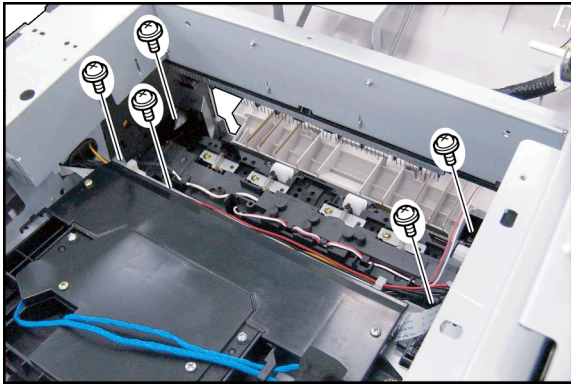
- (3) Open the **Rear Cover**.
- (4) Remove 4 **Screws** (T9).
- (5) Remove the **Upper Exit Roller Holder** (1201).



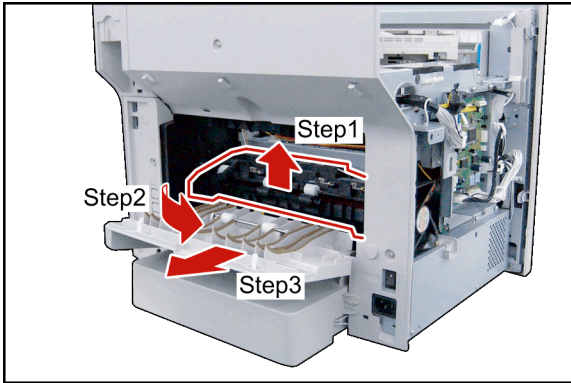
- (6) Remove 1 **Screw** (Y3).
- (7) Remove the **Fuser Harness Cover** (1023).



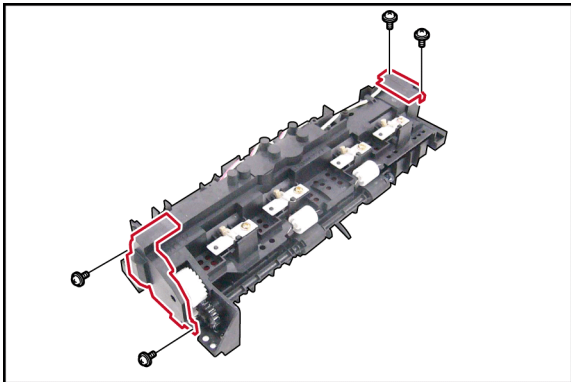
- (8) Disconnect the **Harness** on the LVPS.



(9) Remove 4 **Screws** (U4) and 1 **Screw** (U1).



(10) Remove the **Fuser Unit**.

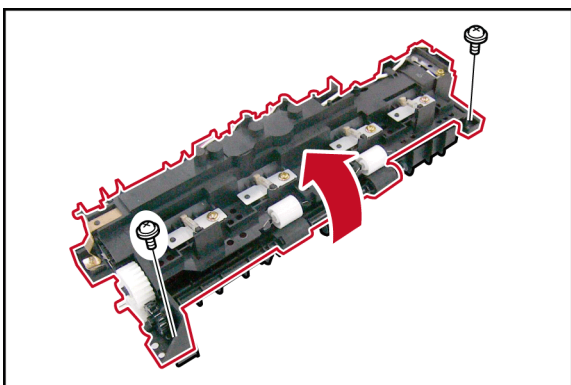


(11) Remove 2 **Screws** (T9).

(12) Remove the **Side Fuser Cover** (1326).

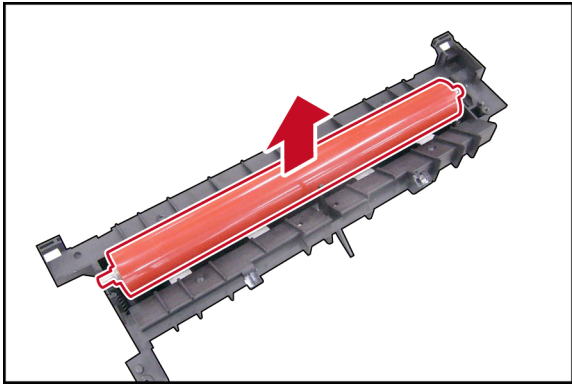
(13) Remove 2 **Screws** (T9).

(14) Remove the **Left Fuser Cover** (1324).

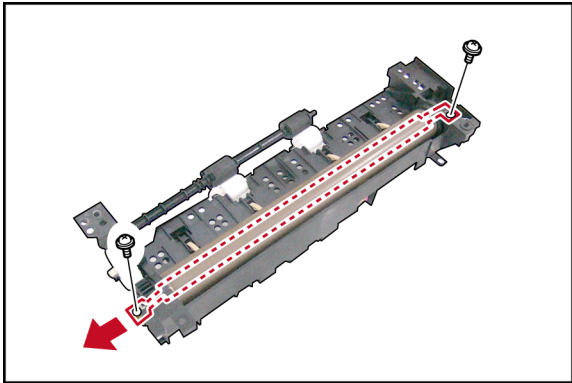


(15) Remove 2 **Black Screws** (U5).

(16) Separate the **Upper Fuser Unit**.



(17) Remove the **Pressure Roller** (1316).



(18) Remove 2 **Screws** (V1).

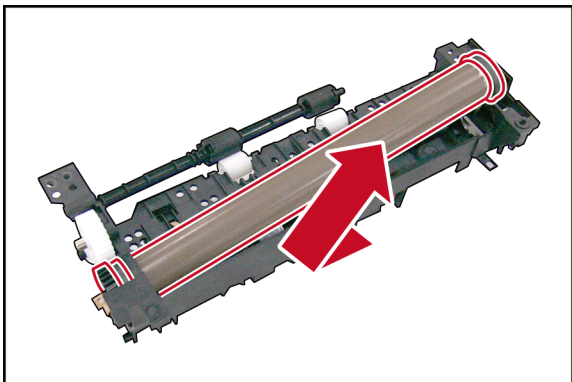
**Caution:**

Exercise caution not to bend the Fuser Lamp Terminal.

(19) Remove the **Halogen Lamp** (1309).

**Note:**

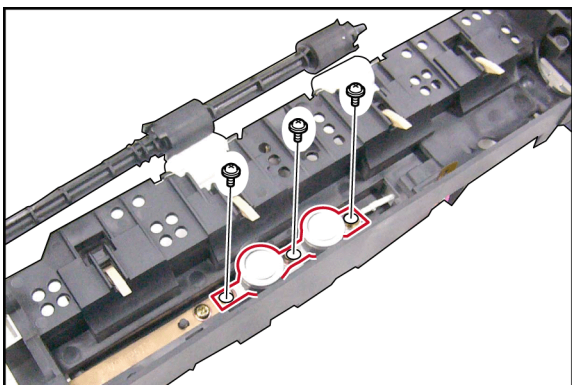
Do not Touch the glass portion of the Fuser Lamp with bare hands. Grease from finger prints will shorten its life cycle, use isopropyl alcohol to clean finger prints.



(20) Shift the **Fuser Roller** and remove the **Left Heat Roller Bushing** (1306).

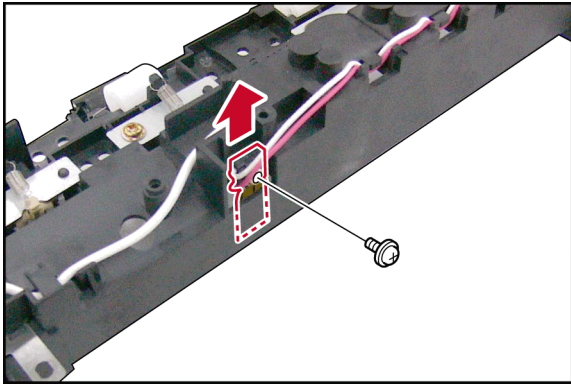
(21) Remove the **Heat Roller** (1305).

(22) Remove the **Heat Roller Gear** (1308) and the **Right Heat Roller Bushing** (1307).

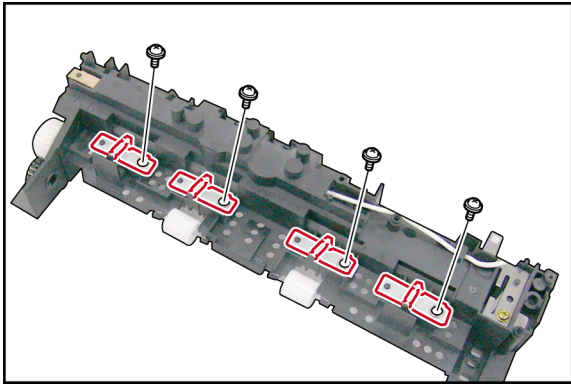


(23) Remove 3 **Screws** (U3).

(24) Remove 2 **Thermostats** (1304).



- (25) Remove 1 **Screw** (U4).
- (26) Remove the **Thermistor** (1329).



- (27) Remove 4 **Separator Springs** (1323).
- (28) Remove 4 **Screws** (T9).
- (29) Remove 4 **Separator Plates** (1322).
- (30) Remove 4 **Separators** (1325).

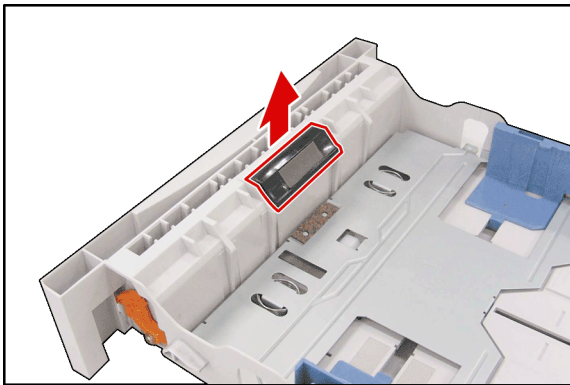


## 2.2.8. Paper Feed Module

### 2.2.8.1. Pick Up Roller (1416) and Separation Pad (1715)



(1) Pull the **Paper Tray** out.

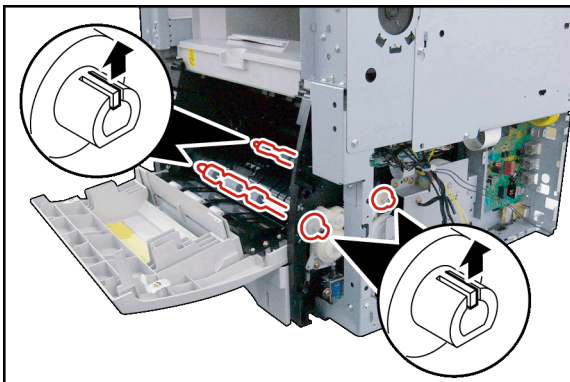


(2) Remove the **Separation Pad** (1715).



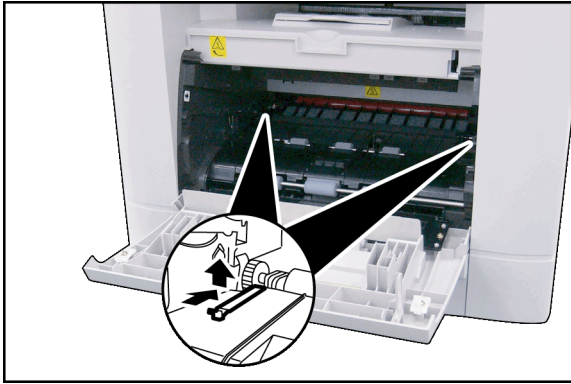
(3) Remove the **Pick Up Roller** (1416) Assembly.

### 2.2.8.2. Registration Roller (1403) and Paper Feed Roller (1405)

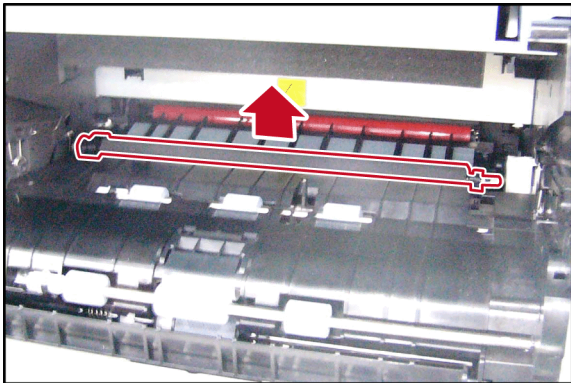


- (1) Open the **Front Cover**.
- (2) Remove the **Toner Cartridge**.
- (3) Remove the **Solenoid Assembly**. (Refer to 2.2.5.)
- (4) Remove the **Registration Gear** (1404) and **Drive Wheel** (1408).
- (5) Remove 2 **Bushings** (1409).
- (6) Remove the **Registration Roller** (1403) and **Paper Feed Roller** (1405).

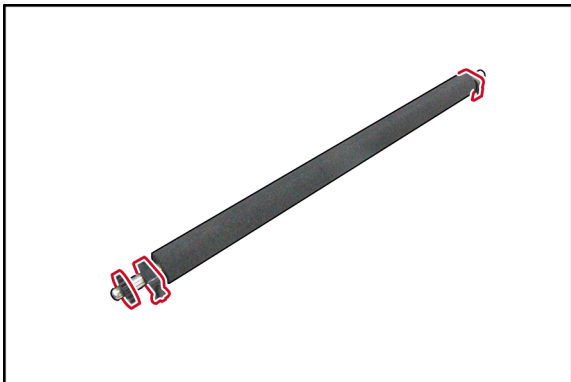
## 2.2.9. Bias Transfer Roller (1603)



- (1) Open the **Front Cover**.
- (2) Remove the **Toner Cartridge**.
- (3) Remove 2 **Transfer Roller Holder** (1601).

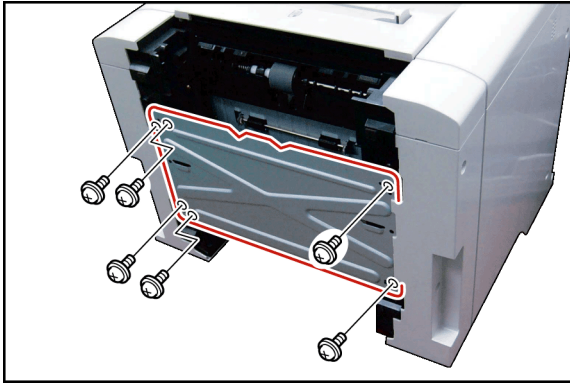


- (4) Remove the **Bias Transfer Roller Assembly**.

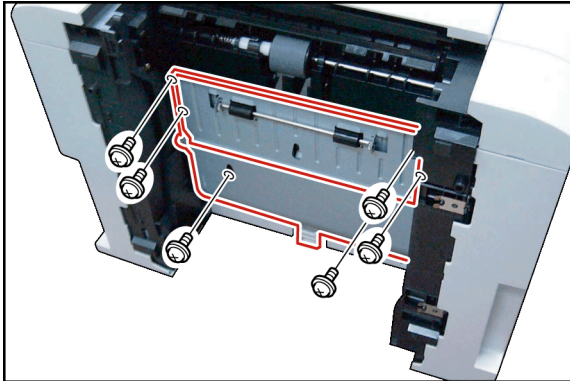


- (5) Remove the **Spacer** (811).
- (6) Remove the **Transfer Gear** (1605).
- (7) Remove 2 **Bushings** (1604).
- (8) Remove 2 **Spacer** (811).

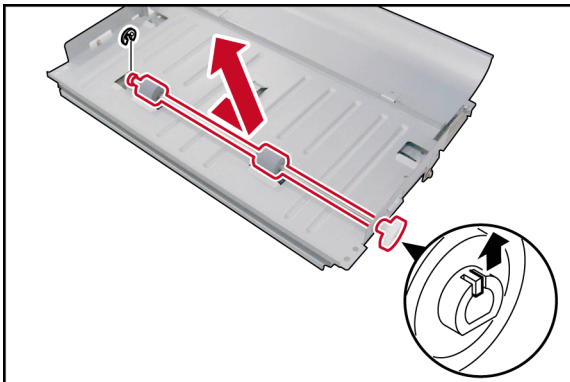
## 2.2.10. ADU



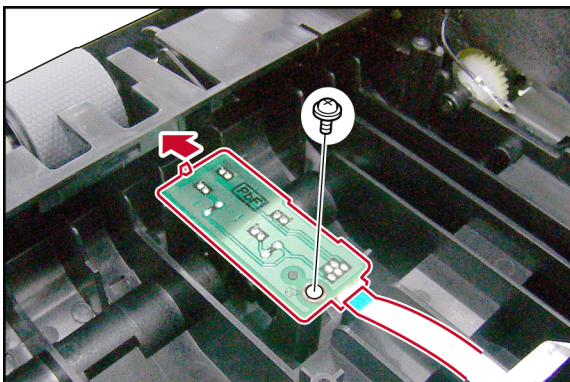
- (1) Slide the **Paper Tray** out.
- (2) Remove the **Rear Paper Tray Cover** (608).
- (3) Push down the Unit backward.
- (4) Remove 6 **Screws** (T9).
- (5) Remove the **Lower Base Plate** (1501).



- (6) Remove 2 **Screws** (U1).
- (7) Remove the **Plate**.
- (8) Remove 4 **Screws** (T9).
- (9) Remove the **ADU Unit**.



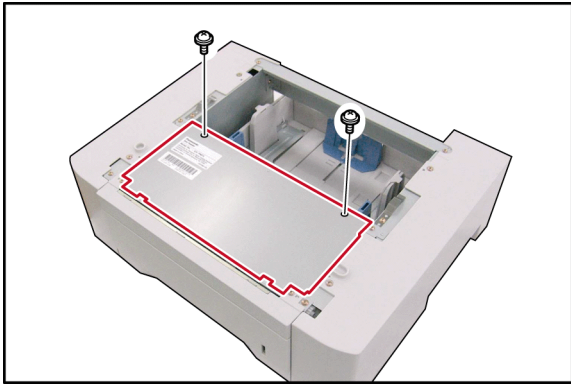
- (10) Remove the **E-Ring** (U6).
- (11) Remove the **A/D Unit Union Gear** (1511).
- (12) Remove the **ADU Registration Roller shaft** (1509).



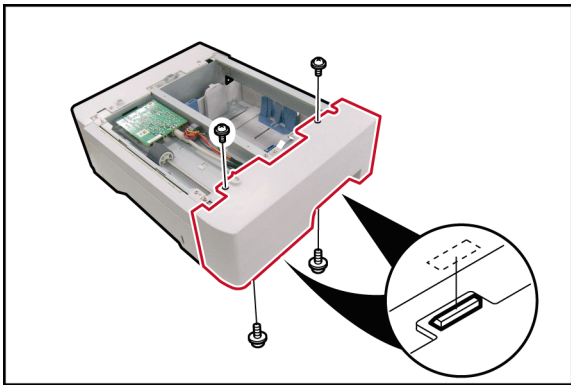
- (13) Disconnect the **Harness** on the Registration / Paper Path Sensor PC Board.
- (14) Remove 1 **Screw** (T9).
- (15) Release the Latch Hook and remove the **Registration / Paper Detect Sensor PC Board** (2031).

## 2.2.11. 2nd Paper Feed Module

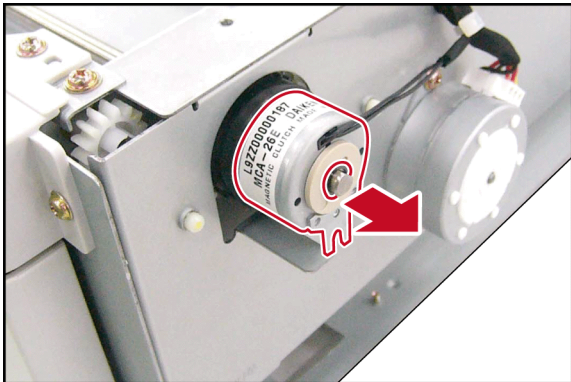
### 2.2.11.1. Pick Up Roller (1833), Separation Pad (1912), 2nd Feeder PC Board (2103)



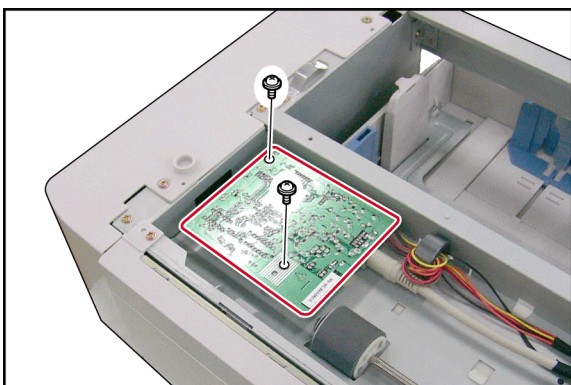
- (1) Separate the **2nd Paper Feed Module** from the Unit.
- (2) Remove 2 **Screws** (U1).
- (3) Remove the **Top Cover Assembly** (1830).



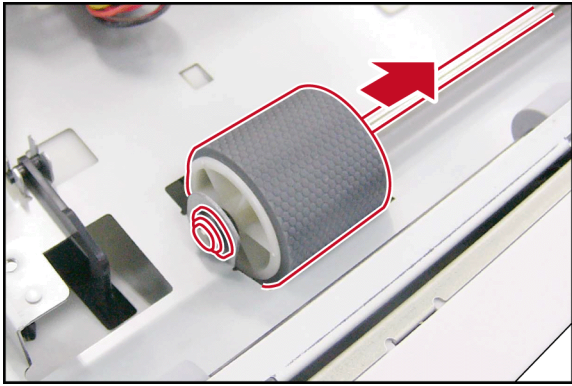
- (4) Remove 4 **Screws** (U1).
- (5) Release 2 Latch Hooks and remove the **Right Cover**.



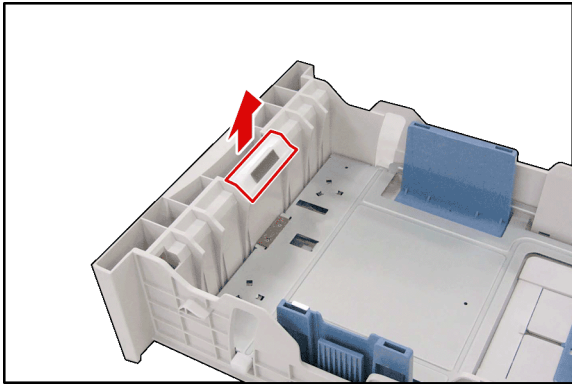
- (6) Remove the **Spacer** (811).
- (7) Remove the **Clutch** (1834).



- (8) Remove 2 **Screws** (U1).
- (9) Remove the **2nd Feeder PC Board** (2103).



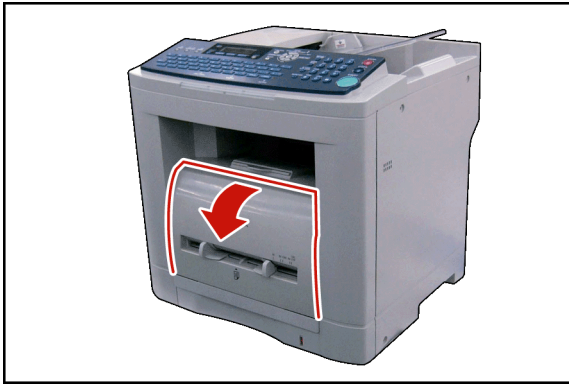
- (10) Remove the **Spacer** (811).
- (11) Remove the **Bearing** (1815).
- (12) Shift the Shaft and remove the **Pick Up Roller** (1833).



- (13) Remove the **Paper Tray**.
- (14) Remove the **Separation Pad** (1912).

## 2.2.12. Toner Cartridge

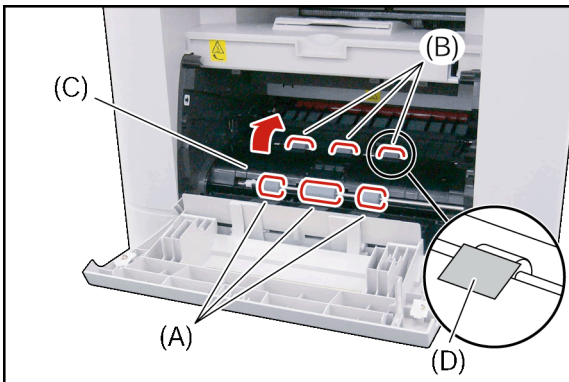
### 2.2.12.1. Cleaning Paper Feed Roller, Registration Roller, Paper Chute and Dust Scraper Assembly



(1) Open the **Front Cover**.



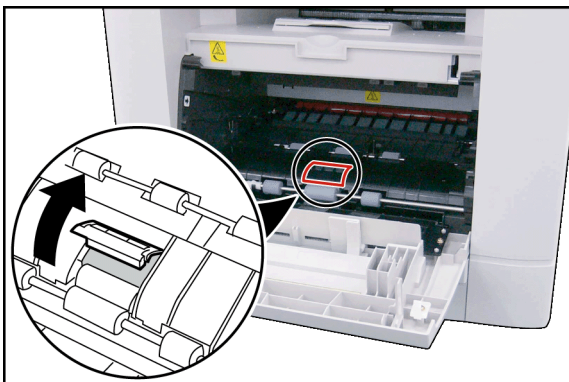
(2) Remove the **Toner Cartridge**.



(3) Wipe the **Paper Feed Roller (A: 1405)**, **Registration Roller (B: 1403)** and **Paper Chute (C)** with a soft cloth that has been moistened with water.

**Note:**

1. Ensure to clean up all the paper dust.
2. Paper Feed Roller (A) can be rotated half way, Registration Roller (B) can be rotated in the direction of the arrow. Exercise care not to damage the Sheets (D) in front of the Registration Roller (B).






































(4) Open the **Dust Scraper Assembly Cover (1415)**.


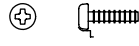

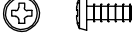


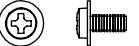



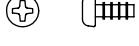
- (5) Clean the inside with the vacuum cleaner.
- (6) Close the Dust Scraper Assembly Cover.

**Note:**

Ensure that the cover is firmly closed as it may damage the OPC Drum.

### 2.3. Hardware Identification Template

Ref. No.	Part No.	Figure	Remark
3F	XYN3+F5	 	Screw
G8	XWC3B	 	Washer, Star
H6	FFPFJ0033B	 	Snap Ring
H7	FFPFJ0041B	 	Snap Ring
J8	XUC7VM	 	E-Ring
P3	XTW3+8L	 	Screw
S6	DZPA000086	 	Screw
T9	XTW3+8S	 	Screw
U1	XTW3+6L	 	Screw
U3	XYC3+FF8C	 	Screw
U4	XTW3+12S	 	Screw
U5	XTW3+12SFZ	 	Screw
U6	XUC4VW-V	 	E-Ring
U7	PJNEB0003Y	 	Screw
U8	XTW3+U8S	 	Screw
U9	XSN3+4	 	Screw
V1	XYC3+FF6	 	Screw
V2	XTW3+6S	 	Screw

Ref. No.	Part No.	Figure	Remark
V3	XWE4		Washer
W4	XTB2+12J		Screw
W7	PJNAC0003Z		Screw
X8	XTB3+8GFJ		Screw
Y3	XTW3+6LFJ		Screw
Y9	XYN4+F8FJ		Screw
Y13	XTW3+8LFJ		Screw
Y14	XTW3+8SFJ		Screw
Y15	XTB4+8FFJ		Screw
Y16	XYN3+F6FJ		Screw
Y17	XTB26+6JFJ		Screw



# 3 Maintenance, Adjustments and Check Points

## 3.1. Preventive Maintenance

Preventive maintenance is performed at specific intervals and consists of machine cleaning and parts replacement.

It is essential to perform these service activities properly and at the specified intervals for customer satisfaction.

The purpose of this service is to maintain machine performance and image quality.

- You should prepare the replacement parts, and cleaning tools beforehand.
- After completing the preventive maintenance, discard the used parts and packaging in accordance with local regulations and clean the surrounding area.
- Before servicing the equipment, disconnect the power cord from the wall outlet.
- Before using solvents such as IPA (Isopropyl alcohol), put on rubber gloves and eye protection.

### 1 Timing

- Perform the preventive maintenance in accordance with the Preventive Maintenance Check List (refer to 3.4) in the service manual.

### 2 Cleaning the Rollers

- Rollers should be cleaned with water and cloth.
- Use the IPA (Isopropyl Alcohol) sparingly.

### 3 Disassembly and Adjustment Precautions

#### **CAUTION!**

**Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord from the wall outlet before disassembling the machine. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)**

- After taking the unit apart, do not attempt to operate the machine.
- When operating the machine with covers removed, be careful and avoid clothing from being caught by moving components.
- While the electricity is applied to the unit, do not connect nor disconnect the connectors on any PC Board.
- Ensure to use correct screws.
- Use toothed lock washers for the installation of ground wires to ensure electrical continuity.
- To reassemble, reverse the sequence of disassembly, unless otherwise specified.
- Blown fuses should only be replaced with fuses of the same specified rating.

#### **4 Laser Handling Precautions**

The optical laser system employed by this photocopier is completely sealed by a protective housing and an external cover. Therefore, the laser beam will not stray or leak during photocopying operation.

However, when servicing the photocopier, take the following precautions:

1. Do not insert any screwdrivers or other tools that have high reflective properties into the laser's path.
2. Before servicing the machine, remove watches, rings, or other metallic objects that you may be wearing. (This is to avoid the danger of the laser striking the eye by reflecting off the metallic objects being worn.)

Since the laser beam cannot be seen with the naked eye, for maximum safety, please follow the above precautions.

### 3.2. Required Tools

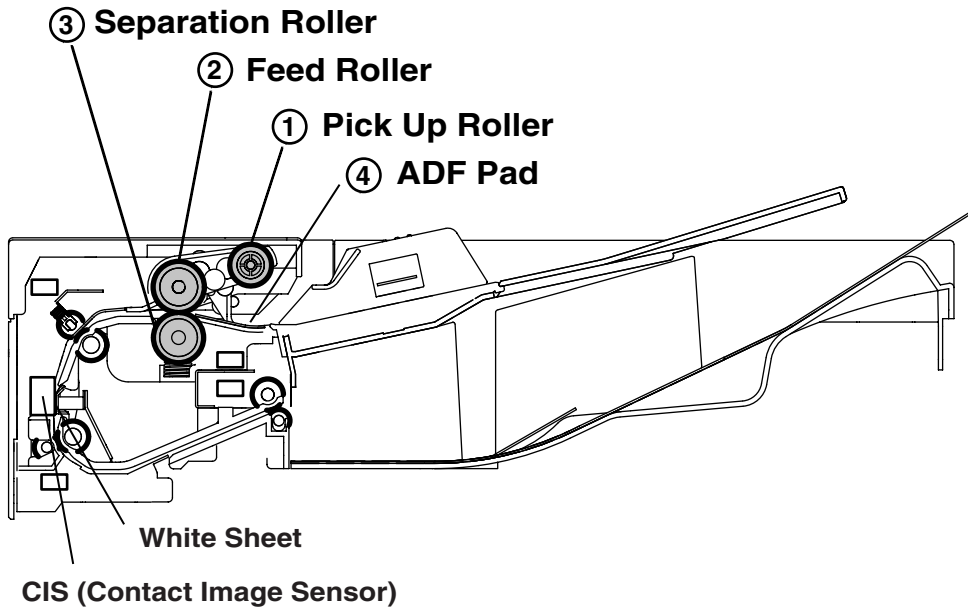
No.	Tools	No.	Tools
1	Soft Cloth	7	Pliers
2	Isopropyl Alcohol	8	Cotton Swab
3	Phillips Screwdriver (#2)	9	Brush
4	Stubby Phillips Screwdriver (#2)	10	KS-660 - Conductive Grease (Available from Shin-Etsu Silicones of America, Inc. URL: <a href="http://www.shinetsusilicones.com">http://www.shinetsusilicones.com</a> )
5	Slotted Screwdriver (3/32 in)	11	Molykote EM-50L Grease (Available from Dow Corning, URL: <a href="http://www.dowcorning.com">http://www.dowcorning.com</a> )
6	Tweezer		

#### 3.2.1. Preventive Maintenance Method

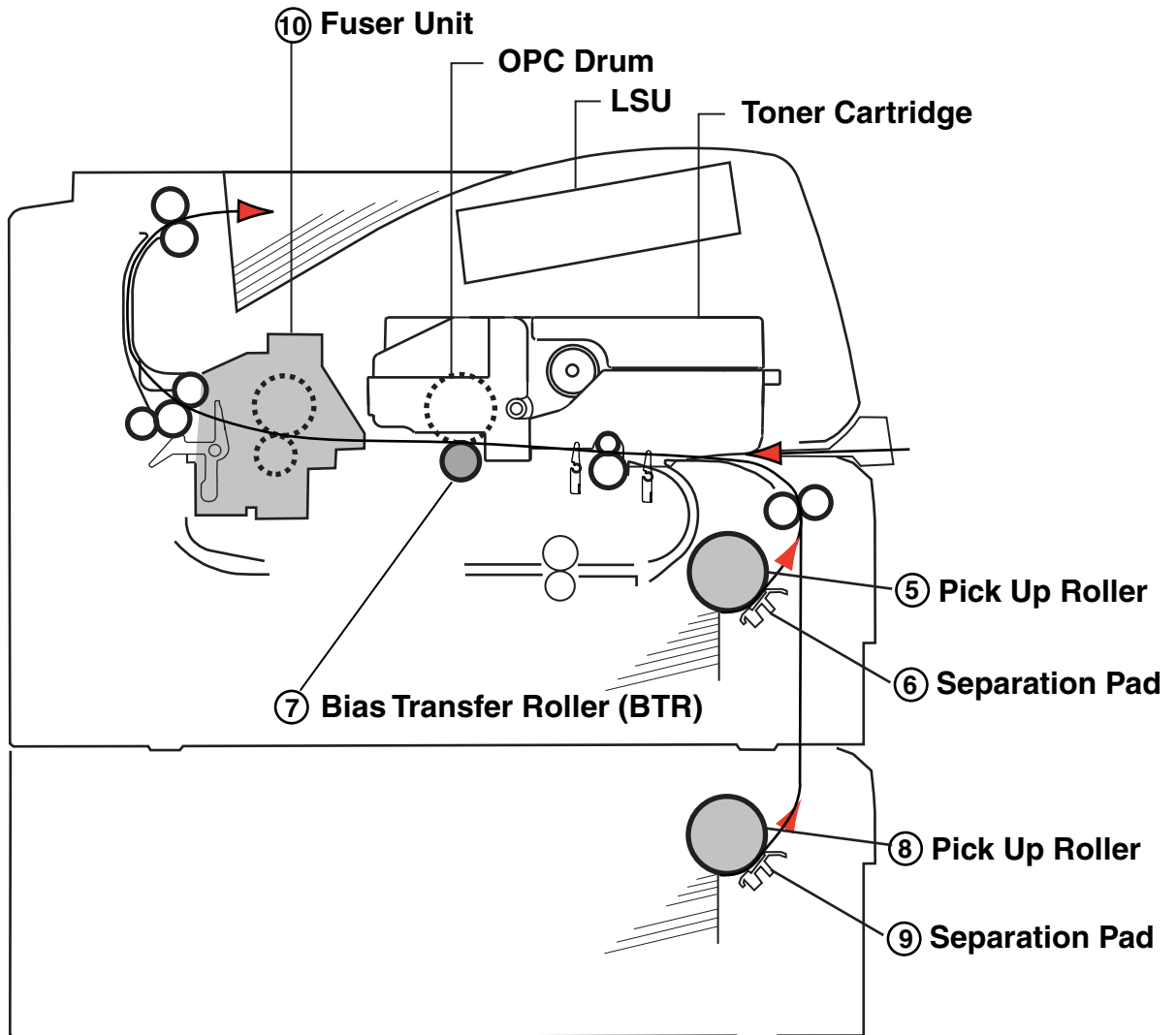
No.	Part Description	Important Action	Comments
1	Memory Data	Check	1. Print the RAM DATA for reference and as a precaution. 2. After completing the task(s), print and compare the RAM DATA with the previously printed one.
2	Auto Document Feeder (ADF)	Check & Clean	1. Clean the Rollers with Wet soft cloth (Water). <b>Note:</b> For stubborn toner accumulation, wipe with a soft cloth saturated with Isopropyl Alcohol first, then follow up with a soft cloth saturated with water.
3	Scanner Unit	Check & Clean	1. Clean the Scanning Glass or White Reference Sheet with Isopropyl Alcohol when required. 2. Clean it with Wet soft cloth.
4	Transmitter Unit	Check & Clean	1. Remove any foreign obstacles. 2. Clean the Rollers with Wet soft cloth (Water).
5	Inspection Items	Check	1. Check the Harnesses. 2. Check the Connectors. 3. Check the Screws. If required, replace consumable parts.
6	Gears, Rollers Shafts	Check & Grease	1. Check and grease the required Gears and Shafts.
7	Timing Belts	Check & Clean	1. Check for belt looseness or abrasion. 2. Adjust the Idle Pulley.

### 3.3. Preventive Maintenance Points

#### ADF & Scanner: Front View



#### Printer: Left Side View



### 3.4. Preventive Maintenance Check List

The chart outlined below is a general guideline for maintenance. The list is for an average usage of 50 transmitted and received documents per day. Needless to say, the environmental conditions and actual use will vary these factors. The chart below is for reference only.

No.	Preventive Maintenance Parts	Ref. No.	Cleaning		Replacement/Adjustment		Ref. Counter
			Cycle (Sheet)	Method	Cycle (Sheet)	Procedure	
<b>ADF Unit</b>							
1	Pick Up Roller	416	10K	Wet soft cloth	85K	Refer to 2.2.1.	F7-08
2	Feed Roller	419	10K	Wet soft cloth	85K		
3	Separation Roller	403	10K	Wet soft cloth	85K		
4	ADF Pad	401	10K	Dry soft cloth	-		
<b>Paper Feed Module</b>							
5	Pick Up Roller	1416	10K	Wet soft cloth	85K	Refer to 2.2.8.	F7-12
6	Separation Pad	1715	10K	Wet soft cloth	85K		
7	Bias Transfer Roller (BTR)	1603	10K	Dry soft cloth	85K	Refer to 2.2.9.	
<b>2nd Paper Feed Module</b>							
8	Pick Up Roller	1833	10K	Wet soft cloth	85K	Refer to 2.2.11.	F7-13
9	Separation Pad	1912	10K	Wet soft cloth	85K		
<b>Fuser Unit</b>							
10	Fuser Unit	1330	-	-	85K	Refer to 2.2.7.	F7-02

**Note:**

1. Wet Cloth represents a soft cloth saturated with water.  
For stubborn toner accumulation, wipe with a soft cloth saturated with Isopropyl Alcohol first, then follow up with a soft cloth saturated with water.
2. The Maintenance Cycle is based on the Counter Information for each individual module.  
To verify the counter information, print the Total Counter List using the Service Mode: F7 - Electronic Counter - 00 (List Print).
3. Cleaning, Replacement and Adjustment Cycle (Sheet) are based on using Toshiba's recommended standard paper and supplies. These cycles may vary with the kind of paper used, Paper size, orientation, print duty, continuous/interval print and/or ambient conditions.

### 3.5. Updating the Firmware

The Quick and Easy Methods of Updating the Firmware are to use the Network Firmware Program Tool (FUP) using Ethernet LAN Port and a Crossover Cable or to use a Master SD Memory Card.

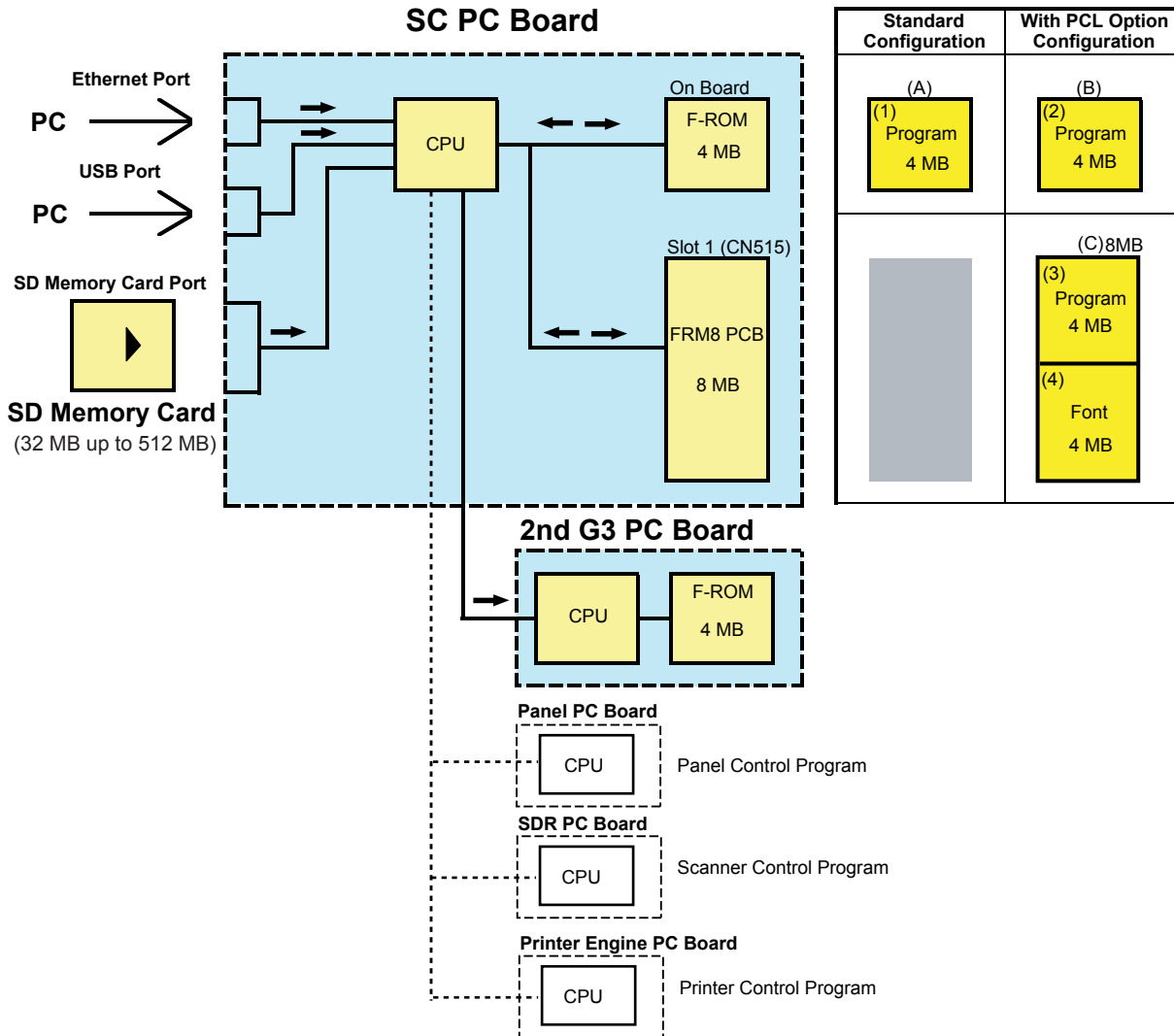
The Network FUP Tool version must be 3.XX or higher, and it can be found on the CD-ROM included with the PCL option.

Refer to the Firmware Update Operation Instructions, Service Notes (8.1.) for additional details.

#### 3.5.1. Firmware Configuration

##### A. Hardware Configuration

This machine is controlled by a Main CPU which is located on the System Control (SC) PC Board and other sub CPUs on the PCBs. The Firmware of SC PCB and 2nd G3 PCB can be updated using a PC or an SD Memory Card.



##### B. SC PC Board Firmware

The 4 MB Program Memory (F-ROM) is integrated on the SC PCB. An Optional Expansion 8 MB Program Memory (FRM8 PCB) can be installed into SLOT 1.

The Firmware to be written into the 4 MB onboard and the 8 MB of SLOT 1 depends upon Standard or PCL Option.

###### (1) Standard

The Standard Program (1) is only written into the 4 MB onboard, which is assigned as ROM Code (A).

###### (2) For PCL Option

The PCL Control Program (2) must be written into the 4 MB onboard, which is assigned as ROM Code (B). The PCL Control Program (3) and PCL Font data (4) are written into the 8 MB in the SLOT 1. The Firmware (3) and (4) are assigned as ROM Code (C).

When using SD Memory Card (32 MB to 512 MB), the 8 MB Program (C) can be written onto one card.

### C. 2nd G3 PC Board Firmware

The 4 MB Program Memory (F-ROM) is integrated on the 2nd G3 PCB. The Programs for 2nd Super G3 communication protocol Control is saved on the Board. The Firmware is transferred as Serial Data from the SC PCB.

### D. Firmware Updating Ports

Three (3) types of Ports are available for updating the firmware.

#### (1) Ethernet LAN Port (The Quick and Easy Method)

The machine's Firmware can be updated using a PC via Local Area Network (LAN). Refer to the Firmware Update Operation Instructions, Service Notes (8.1.) for additional details.

#### (2) USB Port (Alternate)

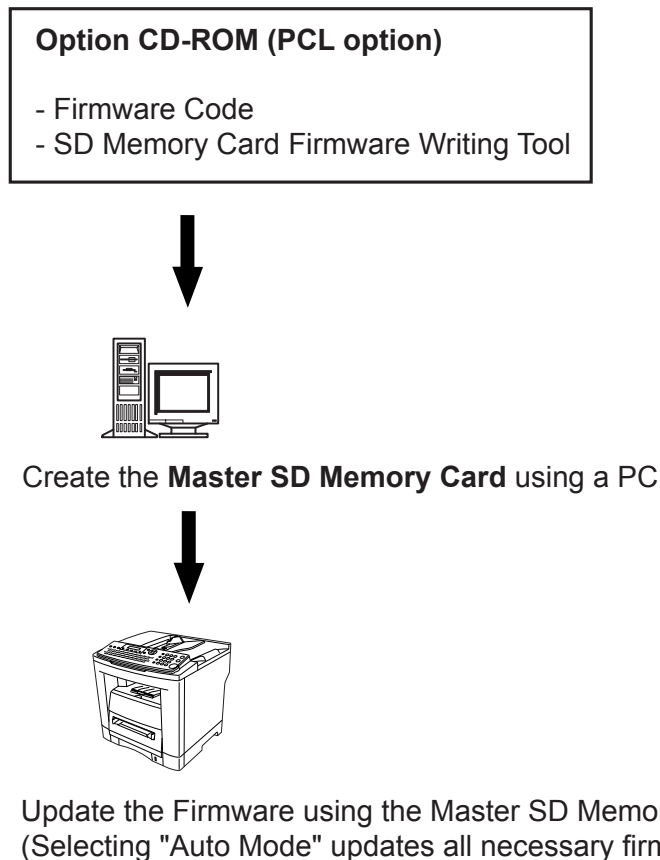
The machine's Firmware can be updated using a PC via USB Port.

Refer to the Firmware Update Operation Instructions, Service Notes (8.1.) for additional details.

#### (3) SD Memory Card (New Method)

The machine's Firmware can be updated using the Master SD Memory Card. The Master SD Memory Card can be created by copying the Firmware from the option CD-ROM using the SD Memory Firmware Writing Tool Software and a PC with SD Memory Card Slot or with an SD Memory Card Reader & Writer.

To update the SC PCB and 2nd G3 PCB, just one Master SD Memory Card (if the Card includes all necessary firmware codes) is required for the Standard or all option configurations, which includes the PCL and the 2nd G3 Fax. The easiest way is to use "Auto Mode" for updating all necessary firmware at once.



#### Note:

If the SD Memory Card will be used to update the Firmware of other machines, format the Card first with the Service Mode F9-15. Refer to 3.5.6. (Formatting the SD Memory Card)

### 3.5.2. Updating through a LAN Port (The Quick and Easy Method)

The firmware code can be easily updated when the main unit is connected to a LAN.

The Network Firmware Update Tool can also be used by connecting to the machine using a **crossover cable**, if the unit is not connected to a LAN.

#### 1) Install the Network Firmware Update Tool to your PC

The option CD-ROM includes the Network Firmware Update Tool and the Main Unit Firmware Code. Please refer to the following Operating Instructions to install the Network Firmware Update Tool.

##### Operating Instructions:

\\xFirmware\Tools\NwFirmup\NwFirmup OI.pdf (Refer to the [NW Firmware Update Tool OI](#) on the CD)

##### Setup:

\\xFirmware\Tools\NwFirmup\Setup\Setup.exe

#### 2) Preparing the Firmware Code

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

##### Example:

##### From:

Destination Shortcut Batch File: D:(CD-ROM Drive) \ xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

##### To:

Firmware Data Folder: C:\Pcc \ Fup \ Data

#### 3) Preparing the Main Unit for the Firmware Upgrade

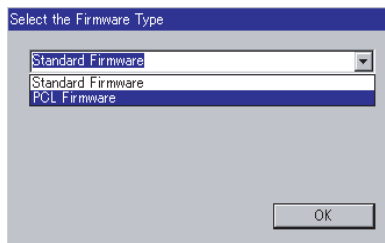
Make sure the unit's Key Operator Password is the same as the tool's password.

Make sure the unit is in an idle state (e.g. not making copies, not printing, etc.).

#### 4) Upgrading the Main Unit's Firmware Code

Start the Network Firmware Update Tool and select the following **Firmware Code Folders** in the **C:\Pcc\Fup\Data** folder, and then follow the display instructions to upgrade the Main Unit's Firmware Codes.

Parent Firmware File Folder	Sub Firmware File Folder
\\UF-8000_xx_xxxxxx	\\ <b>SC_STD</b> \\ UF-8000AxVxxxxx_xx
	\\ <b>SC_PCL</b> \\ UF-8000BxVxxxxx_xx
	\\ <b>fcB</b> \\ UF-8K_G3BAAVxxxxx_xx



When you select the Parent Folder, the following Firmware Type window appears. Proper Sub File Folders are selected automatically by selecting the Firmware Type.

The transferring order is set up automatically.



**Note:**

1. Manual mode must be used, when updating the designated version of the firmware or changing the type of the firmware.  
Please refer to the Section 2.2, "**Setting up the Network Firmware Update Tool, File Selection Tab**" of the Operating Instructions.
2. While updating the firmware code, the display may become garbled, however, it will return to normal upon completion of the firmware update.
3. If the firmware update fails and the unit does not boot up, the Network Firmware Update Tool will not be able to transfer the firmware code. If this occurs, please refer to the next section "**Updating through the USB Port**" and use the Local Firmware Update Tool to recover the unit.
4. The suffix "\_xx" for the Folder Name or File Name may not exist depending on the destination location.

### 3.5.3. Updating through USB Port (Alternate Method)

If the device is not connected to the LAN, upgrade the firmware code using the USB Port.

#### 1) Install the Local Firmware Update Tool to your PC

The option CD-ROM includes the Local Firmware Update Tool and the Main Unit Firmware Code. Please refer to the following Operating Instructions to install the Local Firmware Update Tool.

**Operating Instructions:**

\\xFirmware\Tools\Firmup\FIRMUP OI.pdf (Refer to the [Local Firmware Update Tool OI](#) on the CD)

**Setup:**

\\xFirmware\Tools\Firmup\Setup\Setup.exe

#### 2) Preparing the Firmware Code

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

**Example:****From:**

Destination Shortcut Batch File: D:(CD-ROM Drive) \ xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

**To:**

Firmware Data Folder: C:\ Pcc \ Fup \ Data

#### 3) Preparing the Main Unit for the Firmware Upgrade

**Important: DO NOT connect the USB Cable yet.**

Enter into Test Mode F9-07-01 to enable the unit to accept the programming code from the USB Port by following the steps below.

1. Press "**FUNCTION**", "**ORIGINAL SIZE**" keys and then Key "**3**" on the keypad sequentially to enter Test Mode.

**Note:**

Press "**FUNCTON**" and "**CLEAR**" keys sequentially to exit Test Mode.

2. Press "**9**" and "**START**" keys.
3. Press "**7**" and "**SET**" keys.
4. Press "**1**" and "**SET**" keys.
5. Press "**SET**" key.

**Now connect the USB Cable between the Unit and PC.**

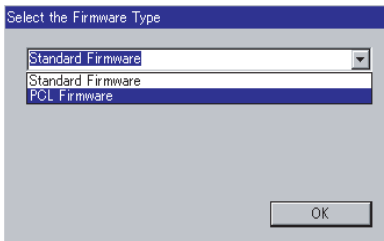
Repeat the above steps if there are additional firmware code files to be updated.

#### 4) Upgrading the Main Unit's Firmware Code

Start the Local Firmware Update Tool and select the following **Firmware Code Parent File Folder** in the **C:\Pcc\Fup\Data** folder, and select the Firmware Code Type then follow the display instructions to upgrade the Main Unit's Firmware Codes.

You must process each firmware file separately in this manner and sequence.

Parent Firmware File Folder	Sub Firmware File Folder	Firmware File
\UF-8000_xx_xxxxxx	\SC_STD \UF-8000Ax\xxxxx_xx	UF-8000Ax\xxxxx_xx.bin
	\SC_PCL \UF-8000Bx\xxxxx_xx	UF-8000Bx\xxxxx_xx.bin UF-8000Cx\xxxxxa_xx.bin UF-8000Cx\xxxxxb.bin
	\fcb \UF-8K_G3BAAVxxxxx_xx	UF-8K_G3BAAVxxxxx_xx.bin



When you select the Parent Folder, the following Firmware Type window appears. Proper Firmware Files are selected automatically by selecting the Firmware Type. The transferring order is set up automatically.

#### Note:

1. While updating the firmware code, the display may become garbled, however, it will return to normal upon completion of the firmware update.
2. Please refer to the service manual for additional details.
3. The suffix "\_xx" for the Folder Name or File Name may not exist depending on the destination location.

#### 3.5.4. Updating the Firmware using the Master Firmware SD Memory Card

##### Caution:

Do not remove the SD Memory Card or turn the power OFF during Formatting or while Updating the Firmware.

##### Note:

1. When a New (Blank) SD Memory Card is detected for the first time, a prompt for Formatting will appear on the LCD. The machine will format the SD Card for DATA (used for Fax Image, 1,000 Station Auto Dialer, JOB MIB Data, etc.), and it takes approximately 3 to 12 min. to format depending on the manufacturer, SD Memory Card size or Data Access Speed of the SD Card.
2. To Update the Firmware or to Format an SD Memory Card using the F9-15 Service Mode takes approximately 5 sec. Refer to 3.5.6. (Formatting the SD Memory Card).

#### 1) When a DATA SD Card is Not installed

1. Before starting, print the F5/F6 Parameters List (Copy Service Mode F9-03-00).
2. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
3. Disconnect the Telephone Line, LAN and/or USB Cables.
4. Install the appropriate Master Firmware SD Memory Card into the machine.
5. Turn the Power Switch on the back of the machine to the ON position.
6. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
7. Perform the Copy Service Mode F9-07-00 (Update From Master SD Card).
8. The firmware is copied into the machine.  
Selecting the "Auto Mode", copies all the necessary firmware at once.
9. After the update is completed, the machine reboots itself and returns to standby.
10. Turn the Power Switch on the back side of the machine to the OFF position.
11. Remove the Master Firmware SD Memory Card from the machine.

12. Reconnect the Telephone Line, LAN and/or USB Cables.
13. Turn the Power Switch on the back of the machine to the ON position.
14. Reprogram the F5 & F6 Parameters according to the lists printed in Step 1 above if the settings are other than factory default.

## 2) When a DATA SD Card is installed

1. Before starting, print the F5/F6 Parameters List (Copy Service Mode F9-03-00).
2. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
3. Disconnect the Telephone Line, LAN and/or USB Cables.
4. Remove the **DATA SD Card** from the machine.
5. Install the appropriate Master Firmware SD Memory Card into the machine.
6. Turn the Power Switch on the back of the machine to the ON position.
7. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
8. Perform the Copy Service Mode F9-07-00 (Update From Master SD Card).
9. The firmware is copied into the machine.  
Selecting the "Auto Mode", copies all the necessary firmware at once.
10. After the update is completed, the machine reboots itself and returns to standby.
11. Turn the Power Switch on the back side of the machine to the OFF position.
12. Remove the Master Firmware SD Memory Card from the machine.
13. Reinstall the **DATA SD Card** into the machine.
14. Reconnect the Telephone Line, LAN and/or USB Cables.
15. Turn the Power Switch on the back of the machine to the ON position.
16. Reprogram the F5 & F6 Parameters according to the lists printed in Step 1 above if the settings are other than factory default.

### Note:

After the update is completed, the machine reboots itself and returns to standby mode. Selecting the "Auto Mode", prompts the unit to check the configuration and installed options, and all the necessary firmware is updated automatically. Confirm that the update was successfully completed by checking the Firmware Version with F9 Parameters F9-02-xx.

### Caution:

If the unit does not boot up properly in Step 8, refer to 3.5.7. (Firmware Emergency Recovery)

## 3.5.5. Creating a Master Firmware SD Memory Card using a PC

### 1) Install the "SD Memory Card Firmware Writing Tool" to your PC.

The "SD Memory Card Firmware Writing Tool" is in the CD. Please refer to the Readme file for additional details.

### 2) Preparing the Firmware Code

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

#### Example:

#### From:

Destination Shortcut Batch File: D:(CD-ROM Drive) \ xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

#### To:

Firmware Data Folder: C:\ Pcc \ Fup \ Data

### 3) Preparing the Master Firmware SD Memory Card

1. Insert the SD Memory Card (32 MB to 512 MB) into the SD Memory Card Slot.
2. Perform the SD Memory Card Firmware Writing Tool.
3. After all firmware codes are copied, remove the SD Memory Card from the Slot.

The SD Memory Card is now ready to use for firmware update.

(Refer to the Local Firmware Update Tool OI on the CD and the SD Memory Card Firmware Writing Tool OI.)

#### 3.5.6. Formatting the SD Memory Card

To make the Master Firmware SD Card, format the Card first by following the steps below. If the Card will be used to update the Firmware of other machines, format the Card first with the Service Mode F9-15.

**Caution:**

Do not remove the SD Memory Card or turn the power OFF during Formatting or while Updating the Firmware.

**Note:**

The Master Firmware SD Card can be installed or removed without turning the power OFF, however, an SD Memory Card formatted for DATA requires the power to be cycled OFF and ON after its installation or removal.

#### 1) When a DATA SD Card is Not installed

1. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
2. Disconnect the Telephone Line, LAN and/or USB Cables.
3. Turn the Power Switch on the back of the machine to the ON position.
4. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
5. Enter the Service Mode F9-15 (SD Card Format).
6. Install the SD Card into the machine.
7. Perform the Service Mode F9-15 (SD Card Format).
8. After the SD Card is formatted, the machine goes to Service Mode F9.
9. Remove the SD Memory Card from the machine.
10. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.
11. Turn the Power Switch on the back of the machine to the OFF position.
12. Reconnect the Telephone Line, LAN and/or USB Cables.
13. Turn the Power Switch on the back of the machine to the ON position.

**Note:**

Repeat steps 5 to 9 to continue formatting other SD Card(s).

#### 2) When a DATA SD Card is installed

1. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
2. Disconnect the Telephone Line, LAN and/or USB Cables.
3. Turn the Power Switch on the back of the machine to the ON position.
4. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
5. Remove the **DATA SD Card** from the machine.
6. Enter the Service Mode F9-15 (SD Card Format).
7. Install the SD Card into the machine.
8. Perform the Service Mode F9-15 (SD Card Format).
9. After the SD Card is formatted, the machine goes to Service Mode F9.
10. Remove the SD Memory Card from the machine.
11. Reinstall the **DATA SD Card** into the machine.

12. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.
13. Turn the Power Switch on the back of the machine to the OFF position.
14. Reconnect the Telephone Line, LAN and/or USB Cables.
15. Turn the Power Switch on the back of the machine to the ON position.

**Note:**

Repeat steps 6 to 10 to continue formatting other SD Card(s).

### 3.5.7. Firmware Emergency Recovery

The easiest method to recover the firmware in an Emergency Recovery routine is to use the Master SD Memory Card method (1 SD Memory Card required if the SD Memory Card capacity is Large enough size for all necessary Firmware).

If the Master SD Memory Card includes all necessary firmware as a package, all necessary firmware can be recovered once which including PCL option configurations, except the 2nd G3 Fax option.

After recovering, if optional 2nd G3 firmware is required, use the Network Firmware Update Tool, the Local Firmware Update Tool or use the Master SD Memory Card to update the firmware selecting the "Auto Mode" to the required level.

If the unit does not boot up properly, follow the steps below:

1. Turn the power OFF.

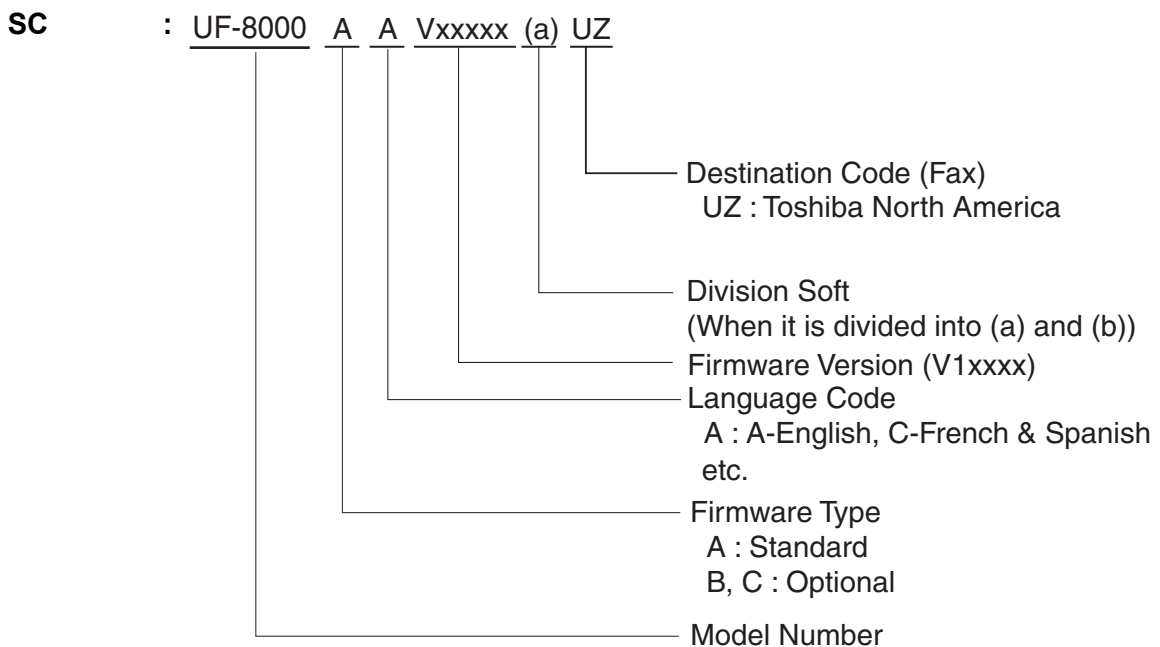
Before proceeding to the next step, you must create the Master SD Memory Card (read the appropriate sections first 3.5.5).

2. Turn the power On while holding the [ENERGY SAVER] button.
3. When the green lamp on the front panel turns On, release the [ENERGY SAVER] button.

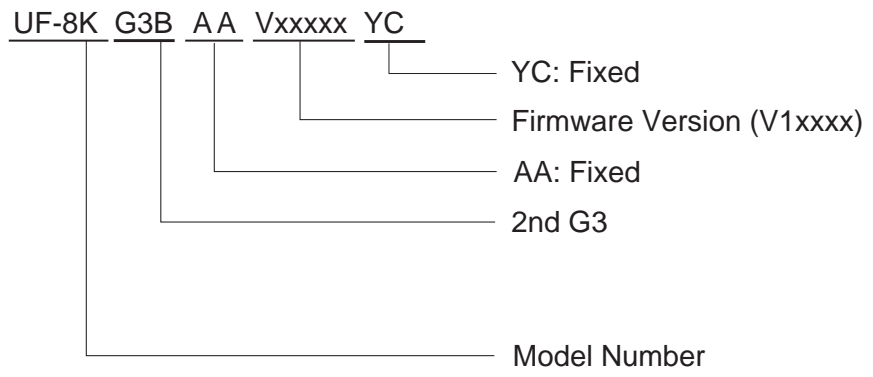
The unit is now ready to accept the firmware code from Master SD Memory Card.

If there is additional 2nd G3 firmware code file to be updated, use the Master SD Memory Card to update the firmware using the "Auto Mode" again.

### 3.5.8. Firmware Version



**2nd G3** :



### 3.6. Adjusting the Printer Registration, LSU Image Side to Side

When installing the Paper Tray option, the following LSU Image Side to Side adjustment may be required. The Printer registration is adjusted at the factory.

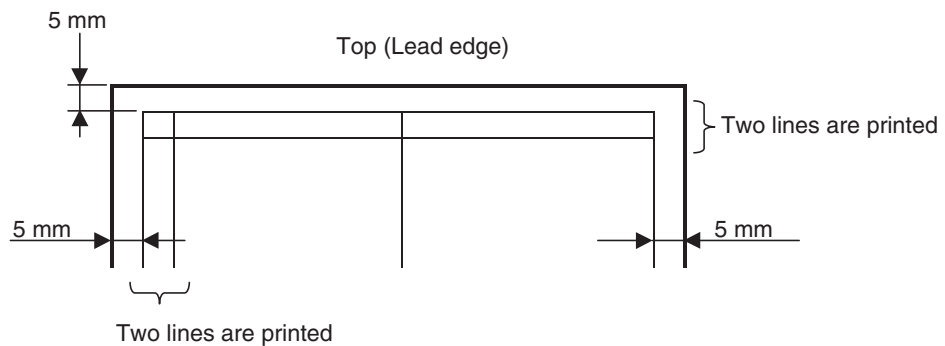
If copy image is abnormal, especially in the Rotation Copy mode, adjust it by the following procedure.

#### 3.6.1. Printer Registration

1. Insert Letter or A4 size paper into the 1st tray and change the tray setting to the appropriate paper size. Empty all the remaining trays (including the bypass tray) to disable them.
2. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
3. Perform the Service Mode F1-03 (Print Test Pattern 1).
4. Check the gap of the print pattern from the paper edge, refer to the Figure below.
5. Perform the Service Mode F6-04 (Printer Registration) to adjust the gap to be 5 mm.
6. If the gap is less than 5 mm, input a (-) value. If more than 5 mm, input a (+) value.
7. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.

<Figure>

Two lines are printed on the top (Lead edge).  
For Letter or A4, place as Portrait.



#### 3.6.2. LSU Image Side to Side Adjustment for the Tray

1. Insert Letter or A4 size paper into the 1st tray and change the tray setting to the appropriate paper size. Empty all the remaining trays (including the bypass tray) to disable them.

**Note:**

Do not pull out the 1st tray to disable it when adjusting the 2nd tray. The 1st tray is required as it acts as a paper path for the paper in the 2nd tray.

2. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
3. Perform the Service Mode F1-03 (Print Test Pattern 1).
4. Check the gap of the print pattern from the paper edge, refer to the Figure above.
5. Perform the Service Mode F6-10 to F6-12, to adjust the gap to be 5 mm.
6. If the gap is less than 5 mm, input a (+) value. If more than 5 mm, input a (-) value.
7. Proceed the above steps for other Tray.
8. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.

### **3.6.3. LSU Image Side to Side Adjustment for the ADU**

1. Insert Letter or A4 size paper into the 1st tray and change the tray setting to the appropriate paper size. Empty all the remaining trays (including the bypass tray) to disable them.
2. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
3. Perform the Service Mode F1-06 (Print Test Pattern 4).
4. Check the gap of the print pattern from the paper edge, refer to the Figure above.
5. Perform the Service Mode F6-16 (ADU Side Adjust), to adjust the gap to be 5 mm.
6. If the gap is less than 5 mm, input a (+) value. If more than 5 mm, input a (-) value.
7. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.

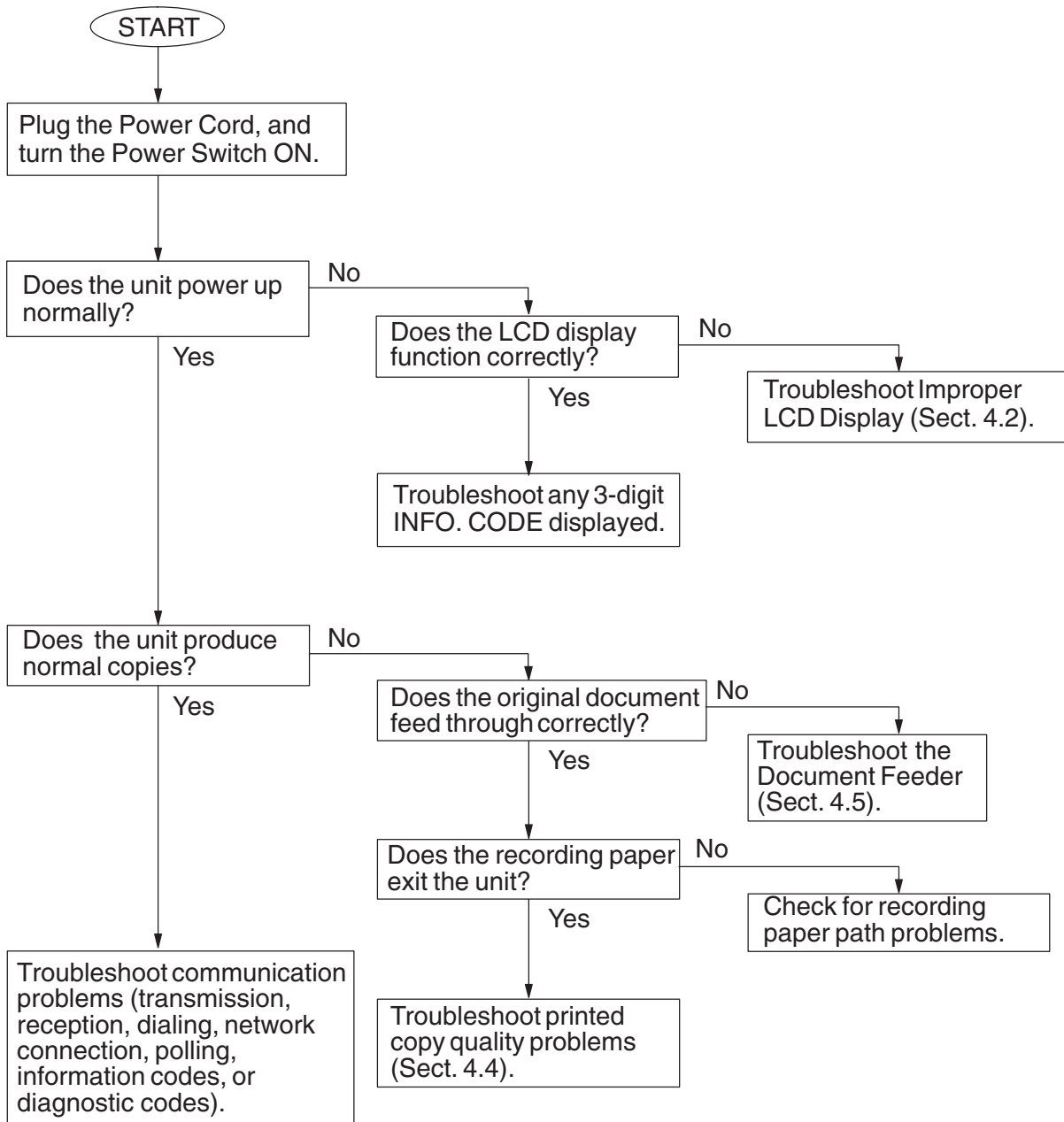
### **3.6.4. ADF Original Read Edge & ADF Main Scan Adjustments**

1. Place the Original Document on the ADF.
2. Insert Letter or A4 size paper into the 1st tray and change the tray setting to the appropriate paper size. Empty all the remaining trays (including the bypass tray) to disable them.
3. Press "FUNCTION", "ORIGINAL SIZE" keys and then Key "3" on the keypad sequentially.
4. Perform the Service Mode F2 (Single Copy Test).
5. Check the Image size of the Copy and the Original as Portrait.
6. Perform the Service Mode F6-91 (Original Read Edge ADF), to adjust the ADF Original Read Edge.
7. If the gap is less than the Original, input a (+) value. If bigger than the Original, input a (-) value.
8. Perform the Service Mode F6-90 (ADF Image Read Start), to adjust the ADF Main Scan for Side position.
9. If the gap is less than the Original, input a (+) value. If bigger than the Original, input a (-) value.
10. Press "STOP" first and then press "FUNCTION" + "CLEAR" keys sequentially to return to standby.

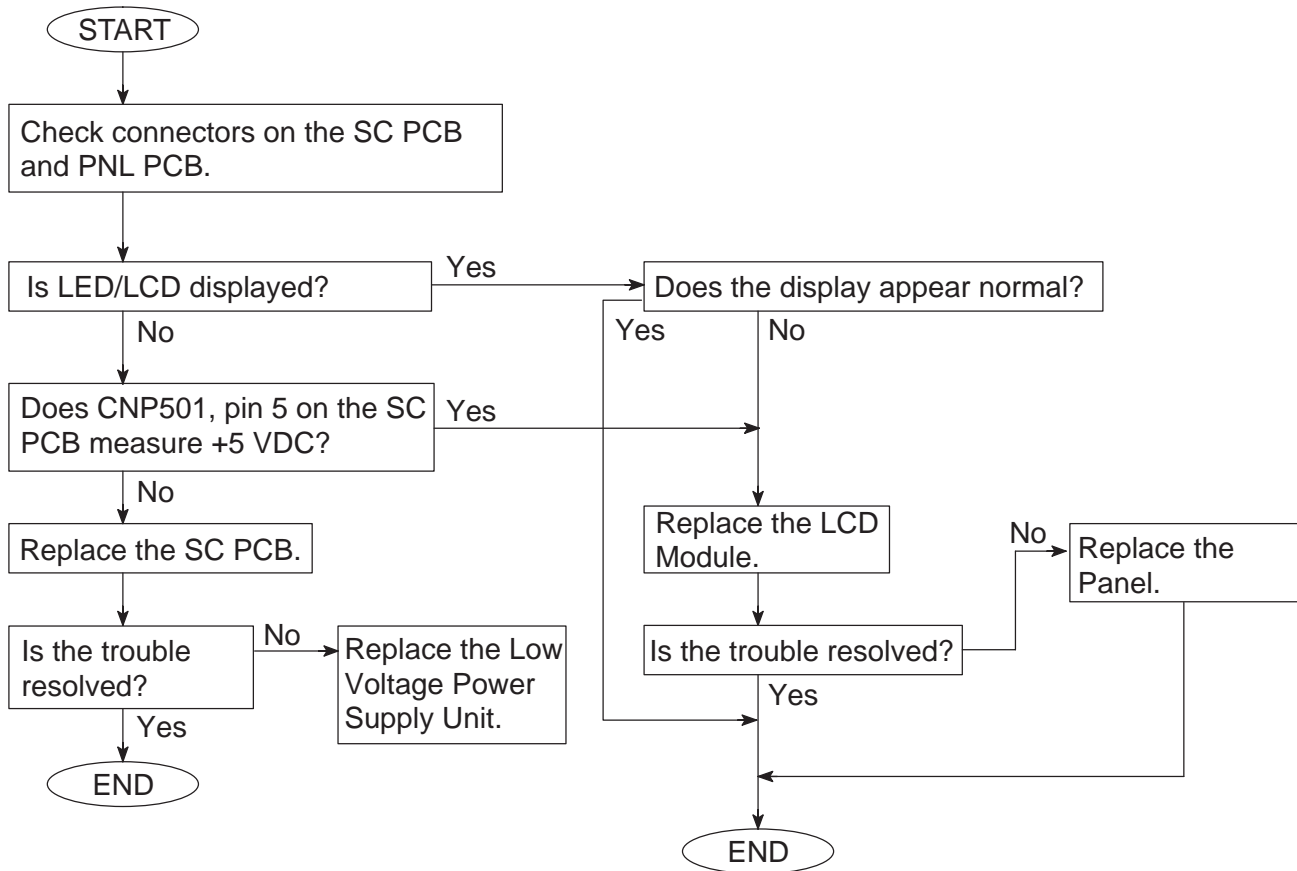


# 4 Troubleshooting

## 4.1. Initial Troubleshooting Flowchart



## 4.2. Improper LCD Display

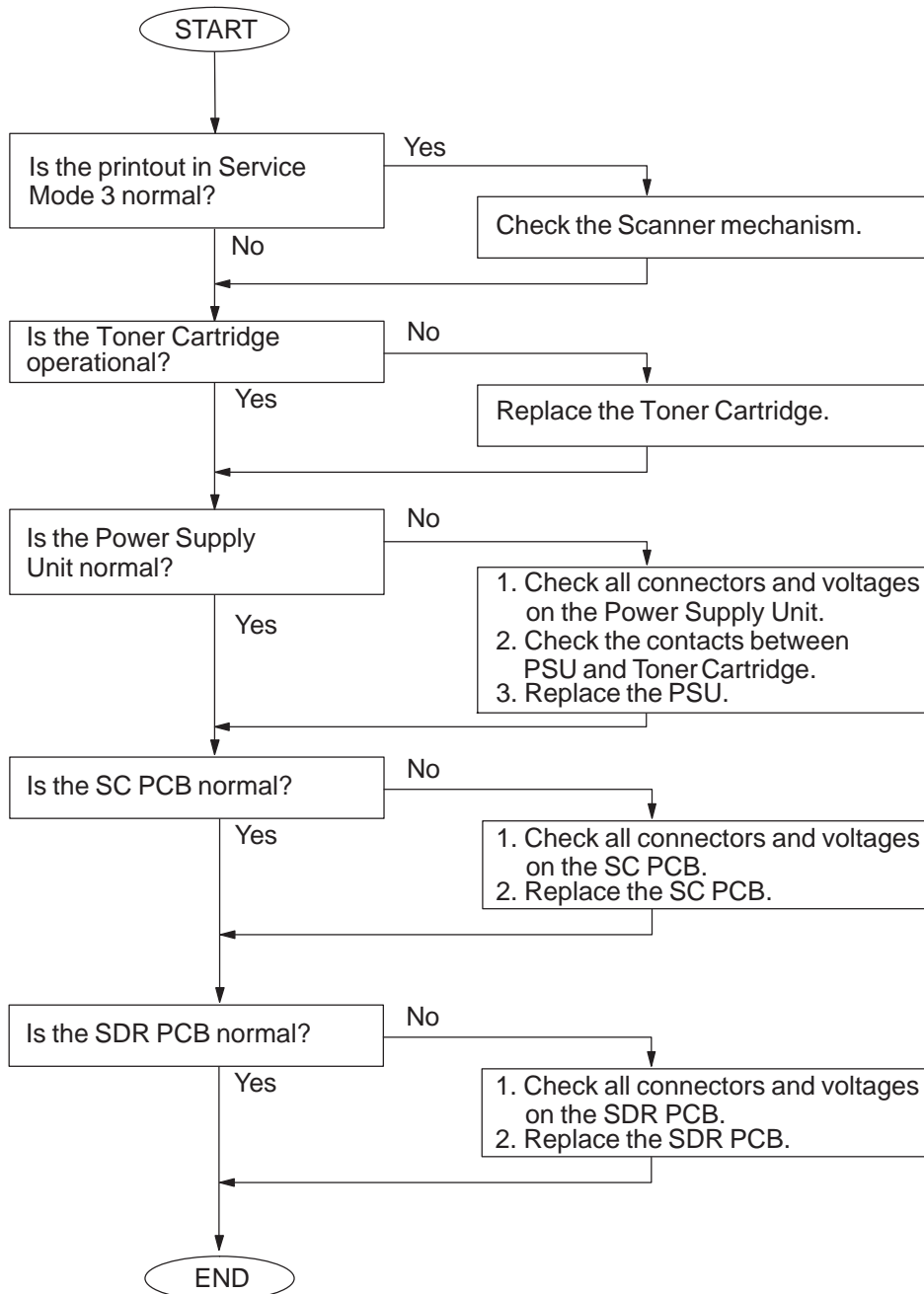
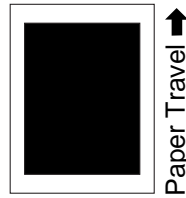


### • LCD Contrast Adjustment

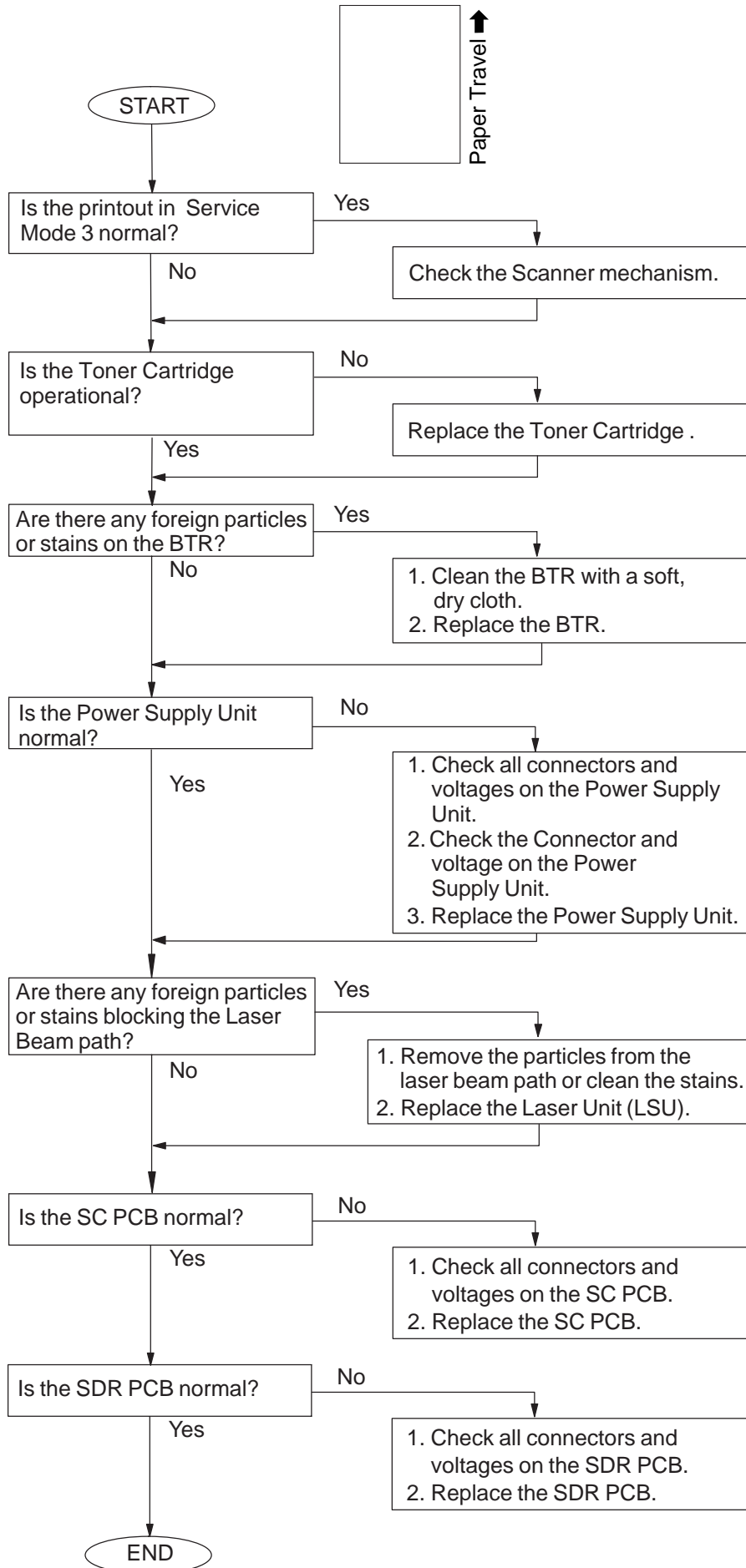
1. Press "FUNCTION", "7", "8" and "SET" keys to enter "8: Maintenance Mode".
2. Press "V" or "Λ" arrow keys to select "6: LCD Brightness?" and press "SET" key.
3. Press "<" cursor key for Lighter or ">" key for Darker.
4. Press "SET" or "STOP".

## 4.3. Printed Copy Quality Problems

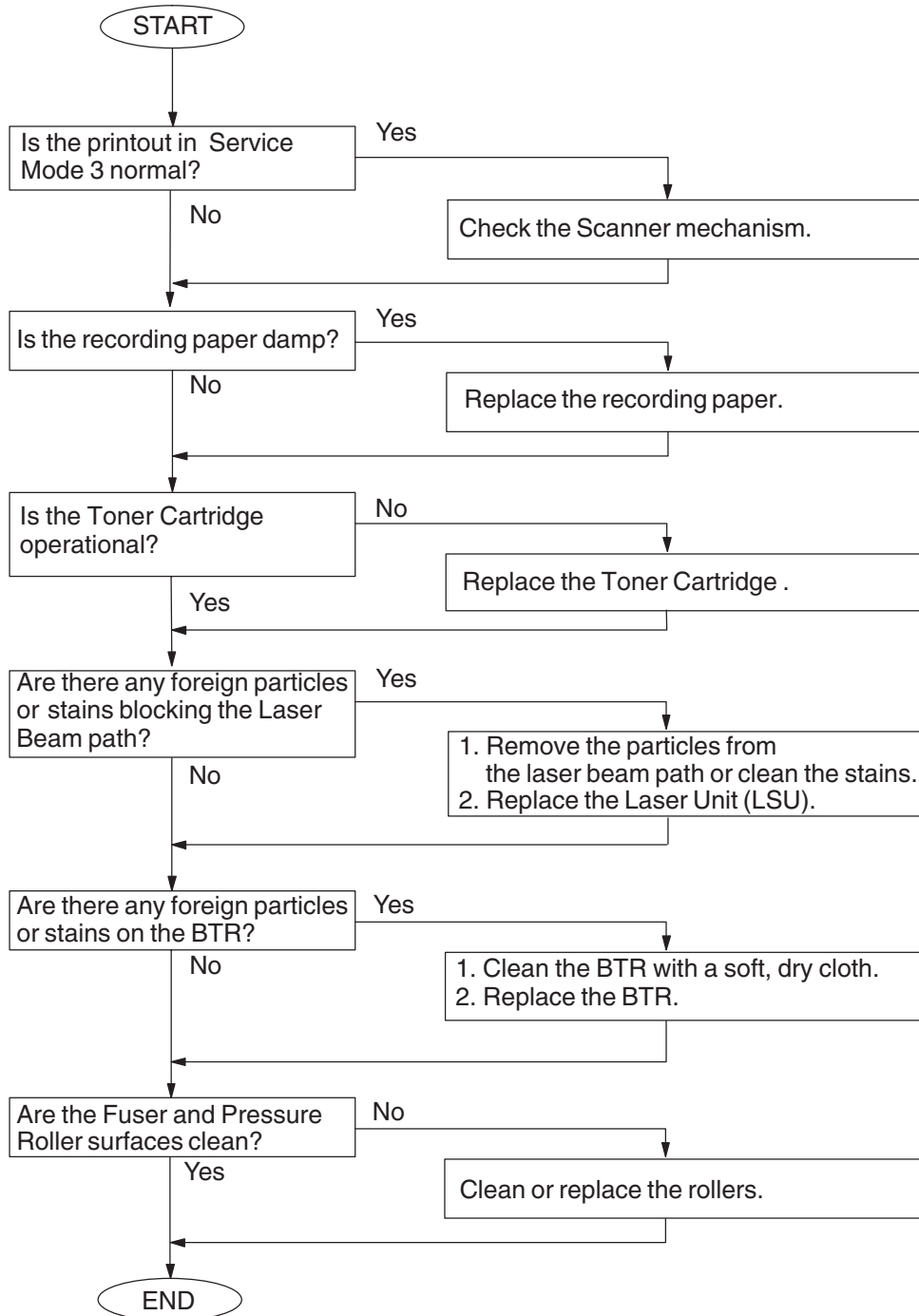
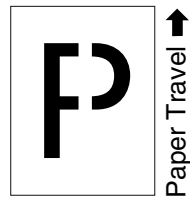
### 4.3.1. Black Copy



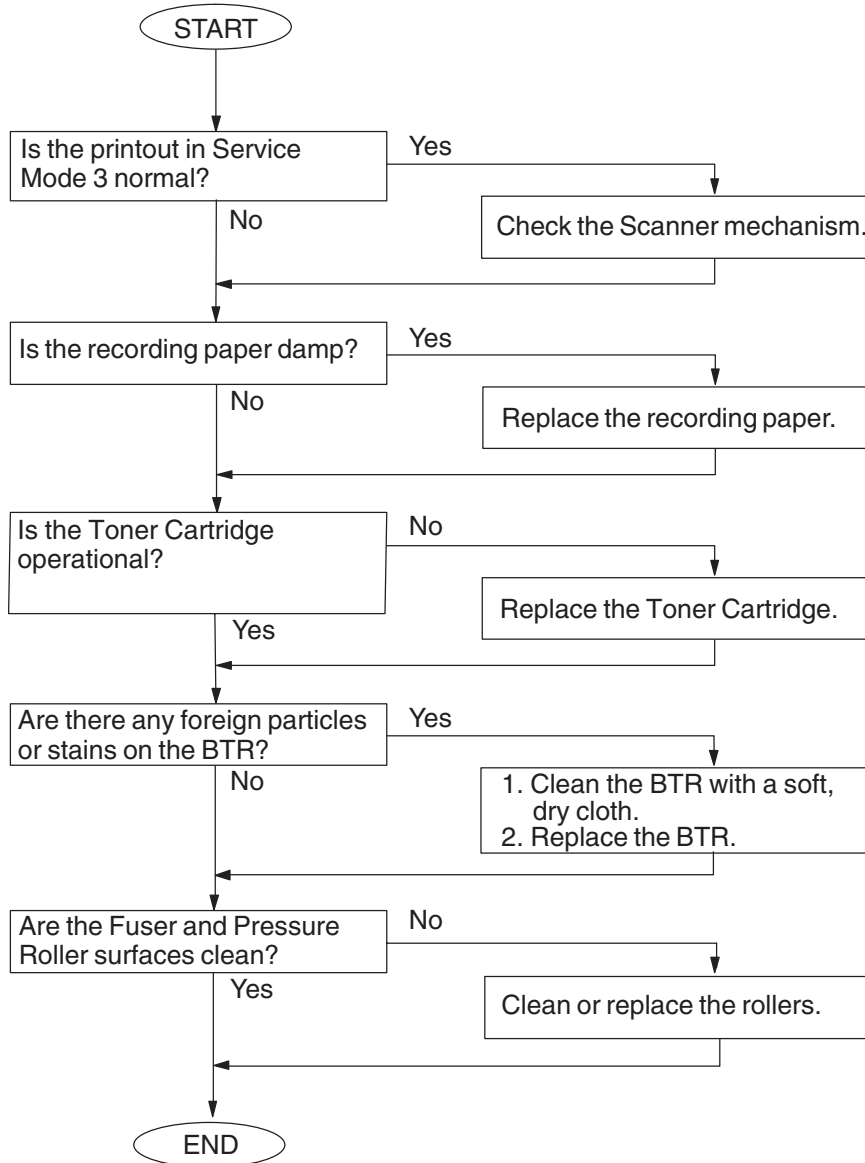
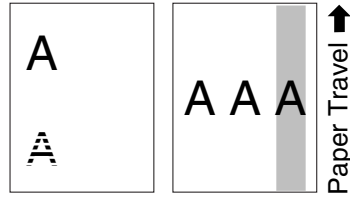
### 4.3.2. Blank Copy



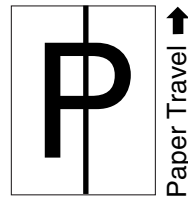
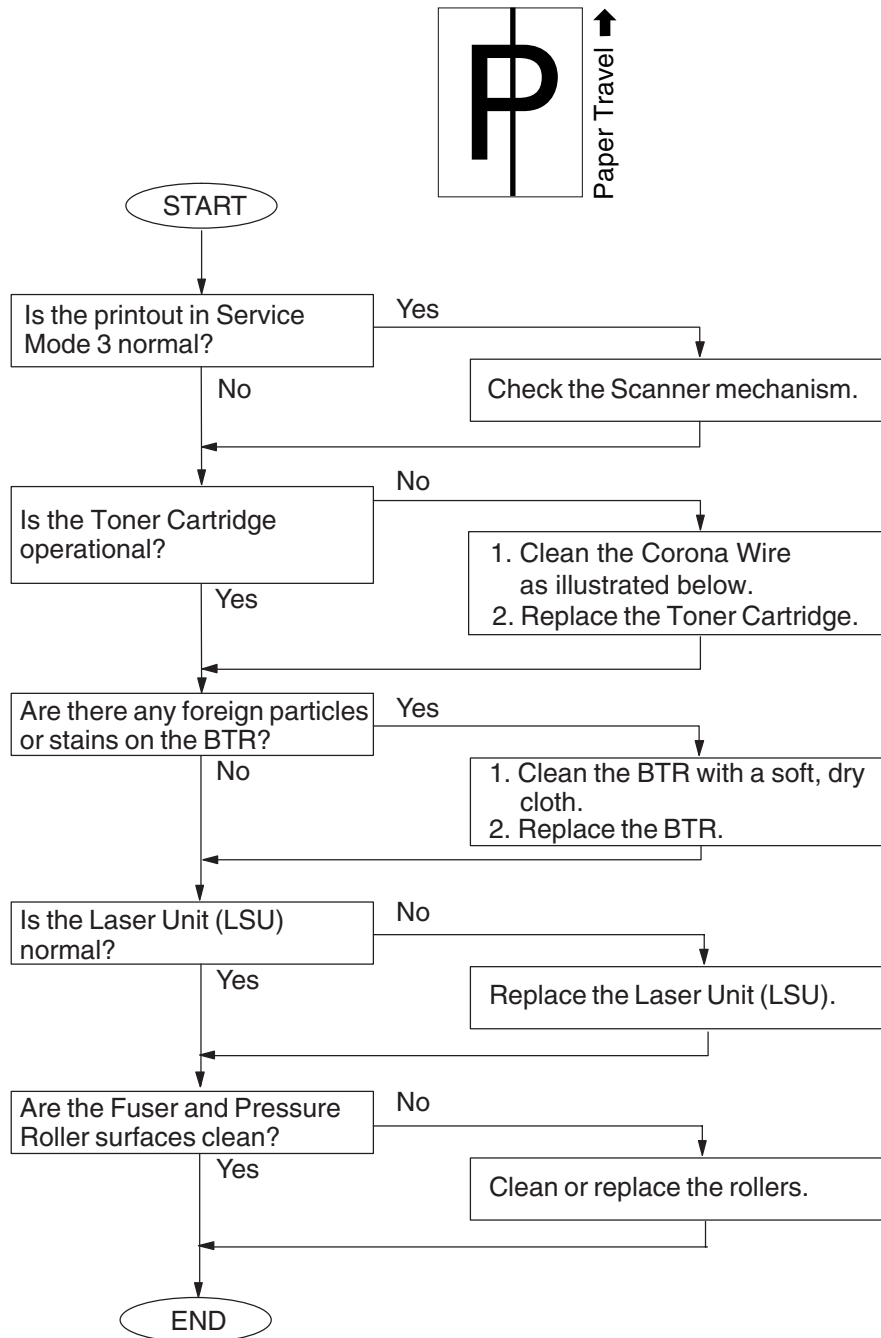
### 4.3.3. Vertical White Lines



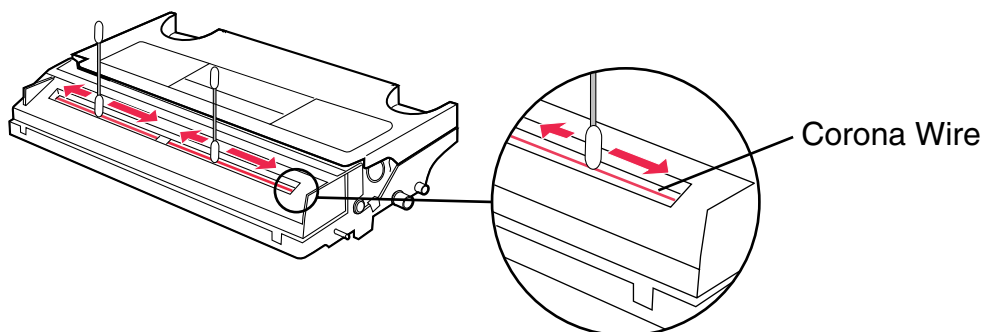
#### 4.3.4. Ghost Images



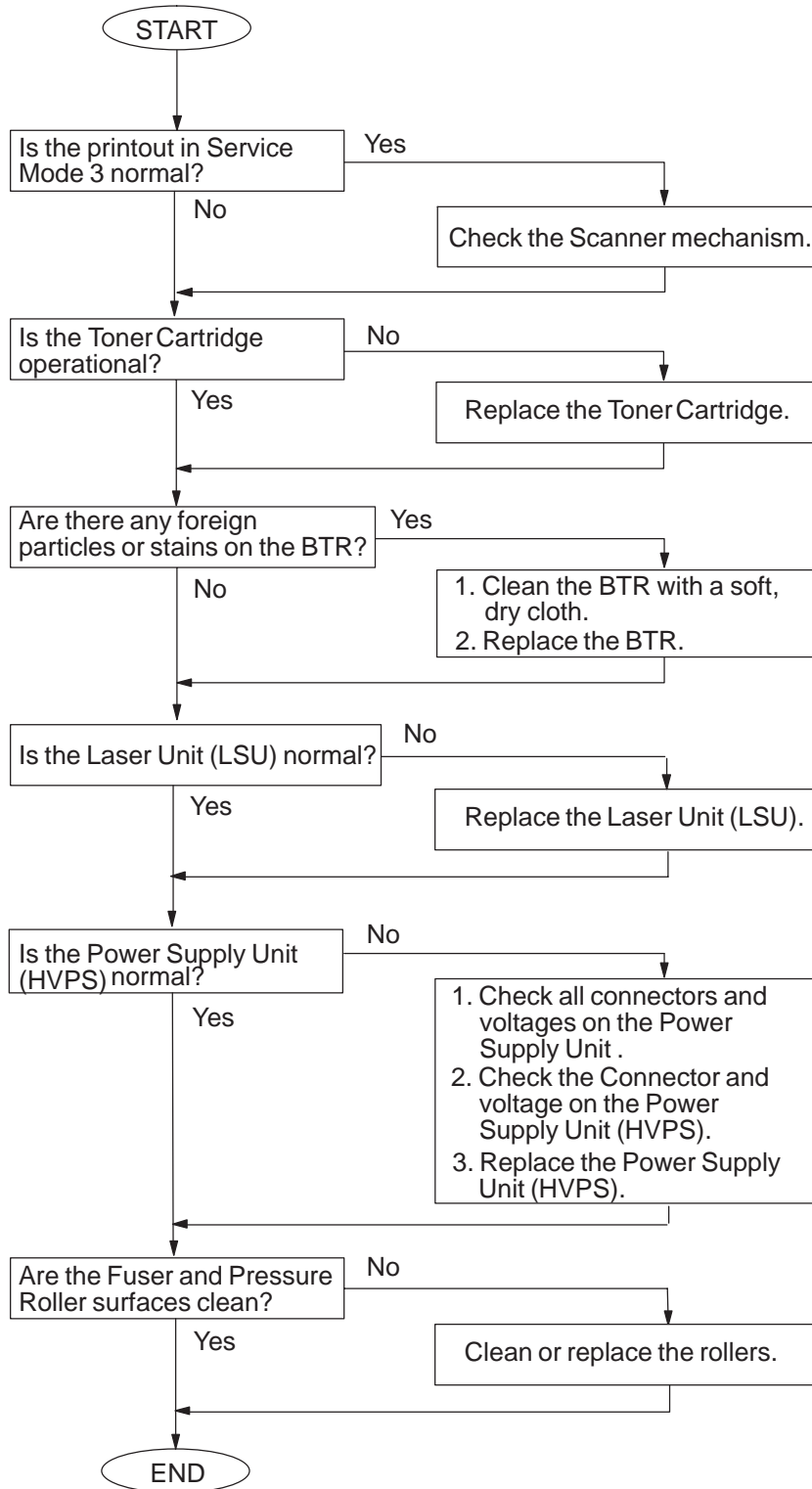
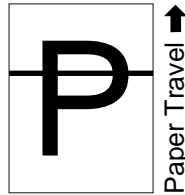
### 4.3.5. Vertical Dark Lines



Carefully wipe the Corona Wire in the Toner Cartridge by sliding a dry Cotton Swab from end to end a few times.

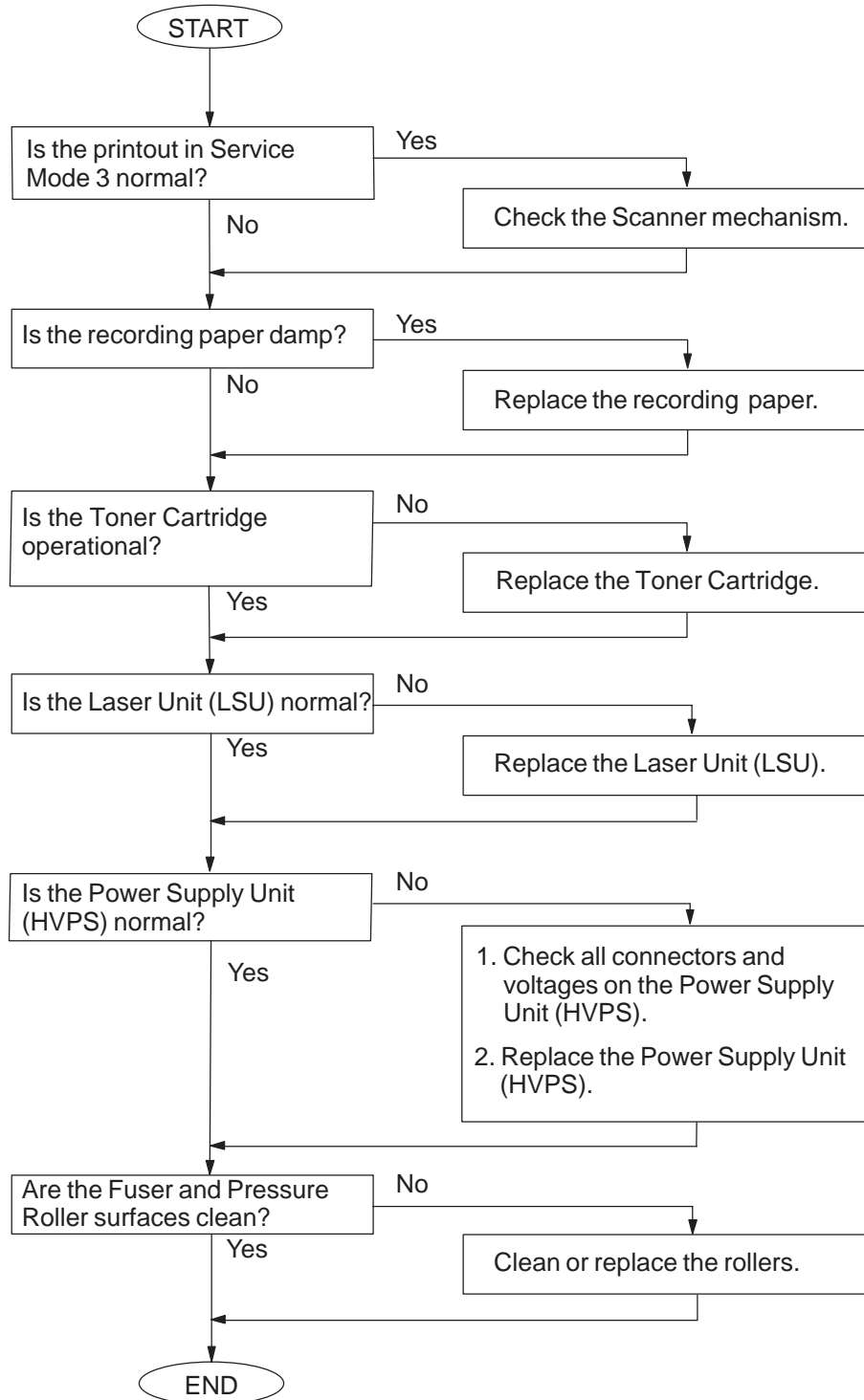
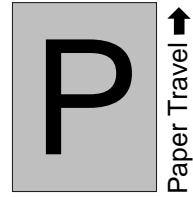


### 4.3.6. Horizontal Dark Lines

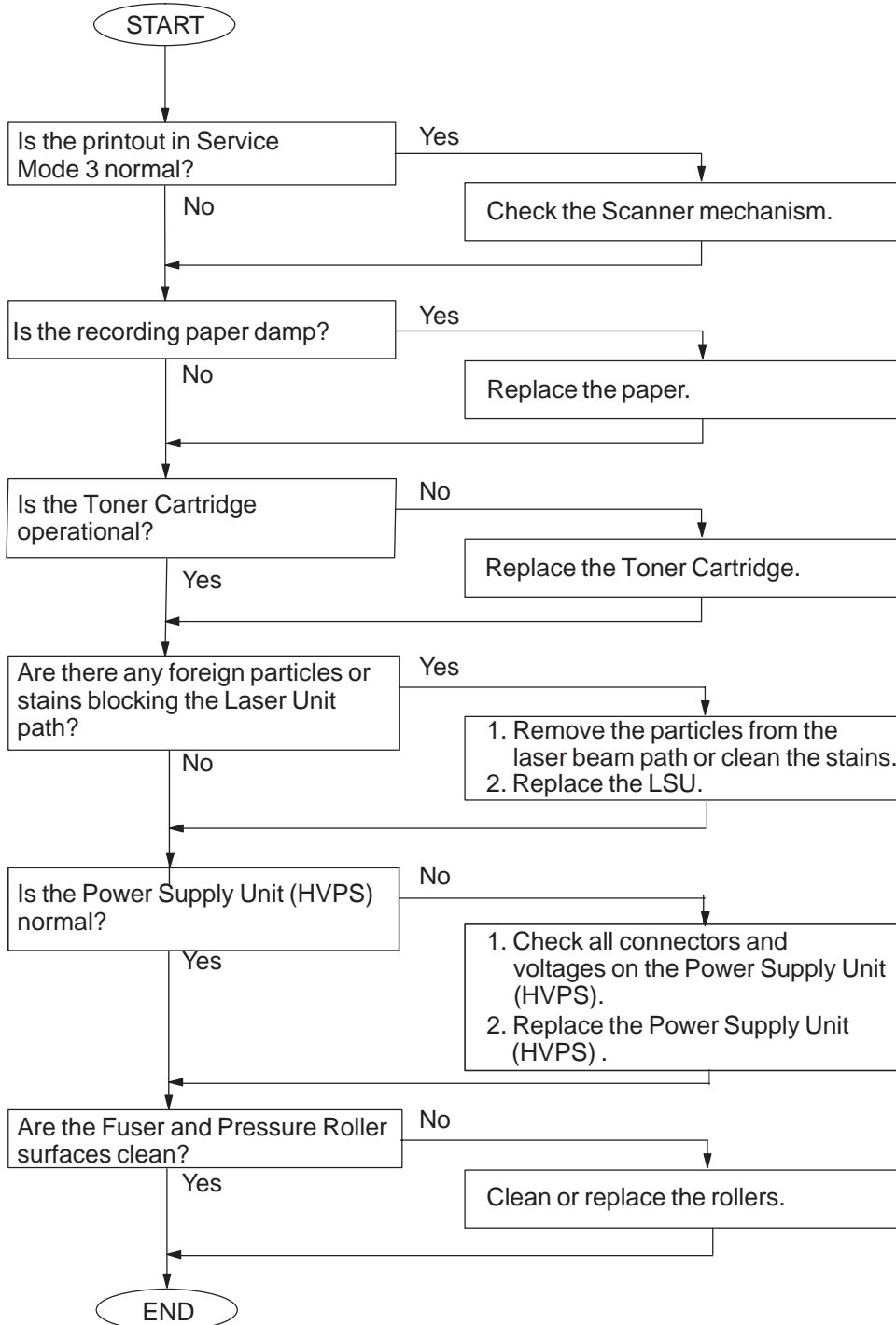
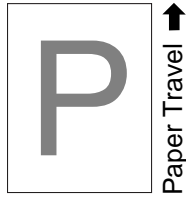




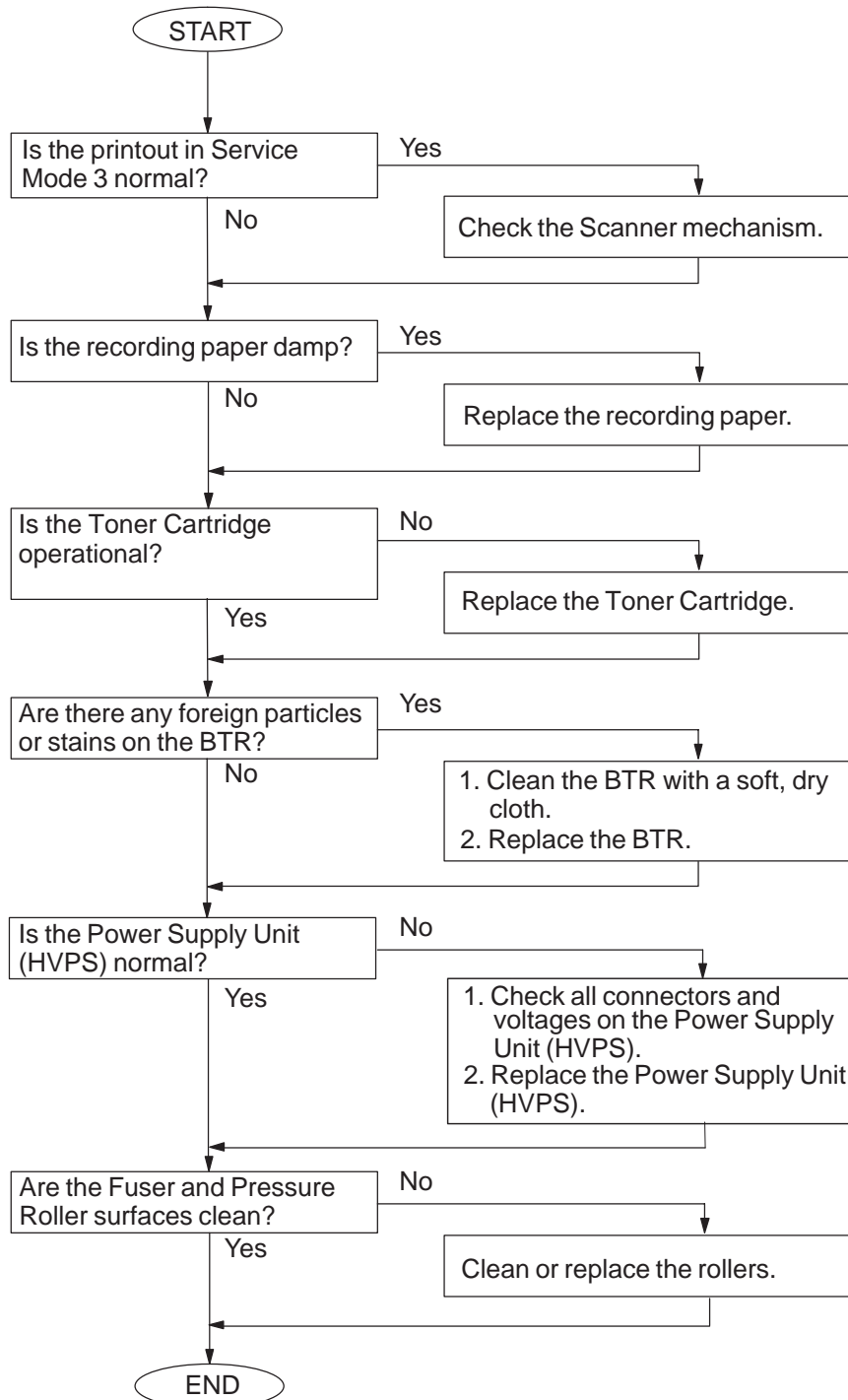
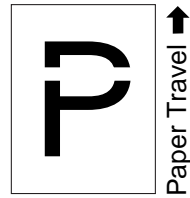
### 4.3.7. Dark Background



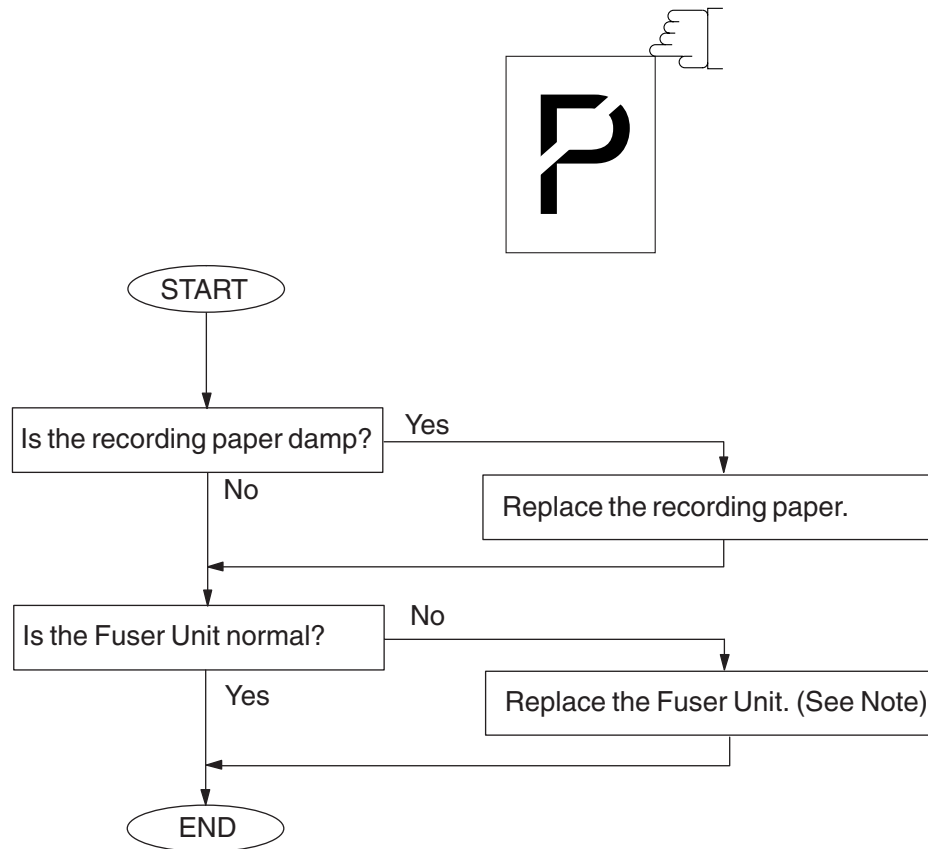
### 4.3.8. Light Print



### 4.3.9. Horizontal White Lines



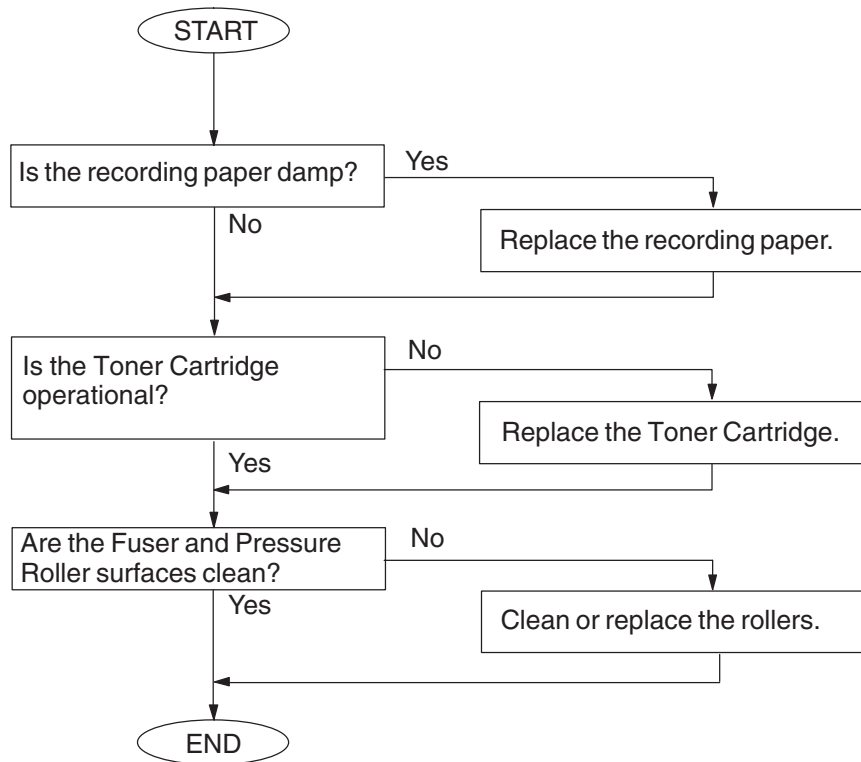
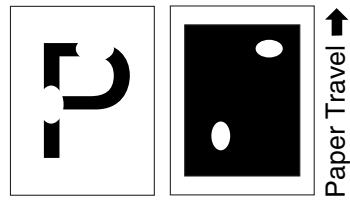
#### 4.3.10. Improper Fusing (Printed image does not bond to the paper)



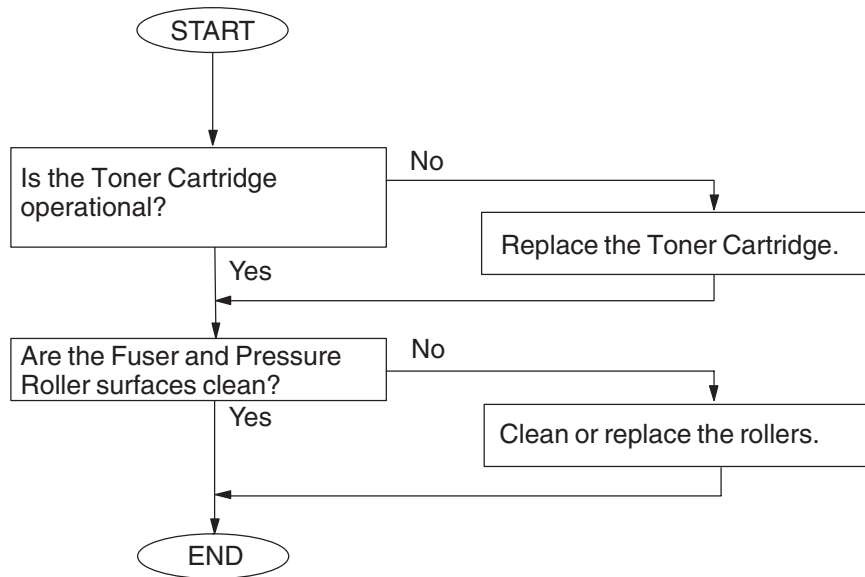
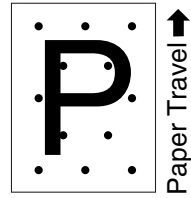
**Note:**

Replace the entire Fuser Unit when the Thermostat, the Thermal Fuse or the Thermistor Assembly becomes an open-circuit.

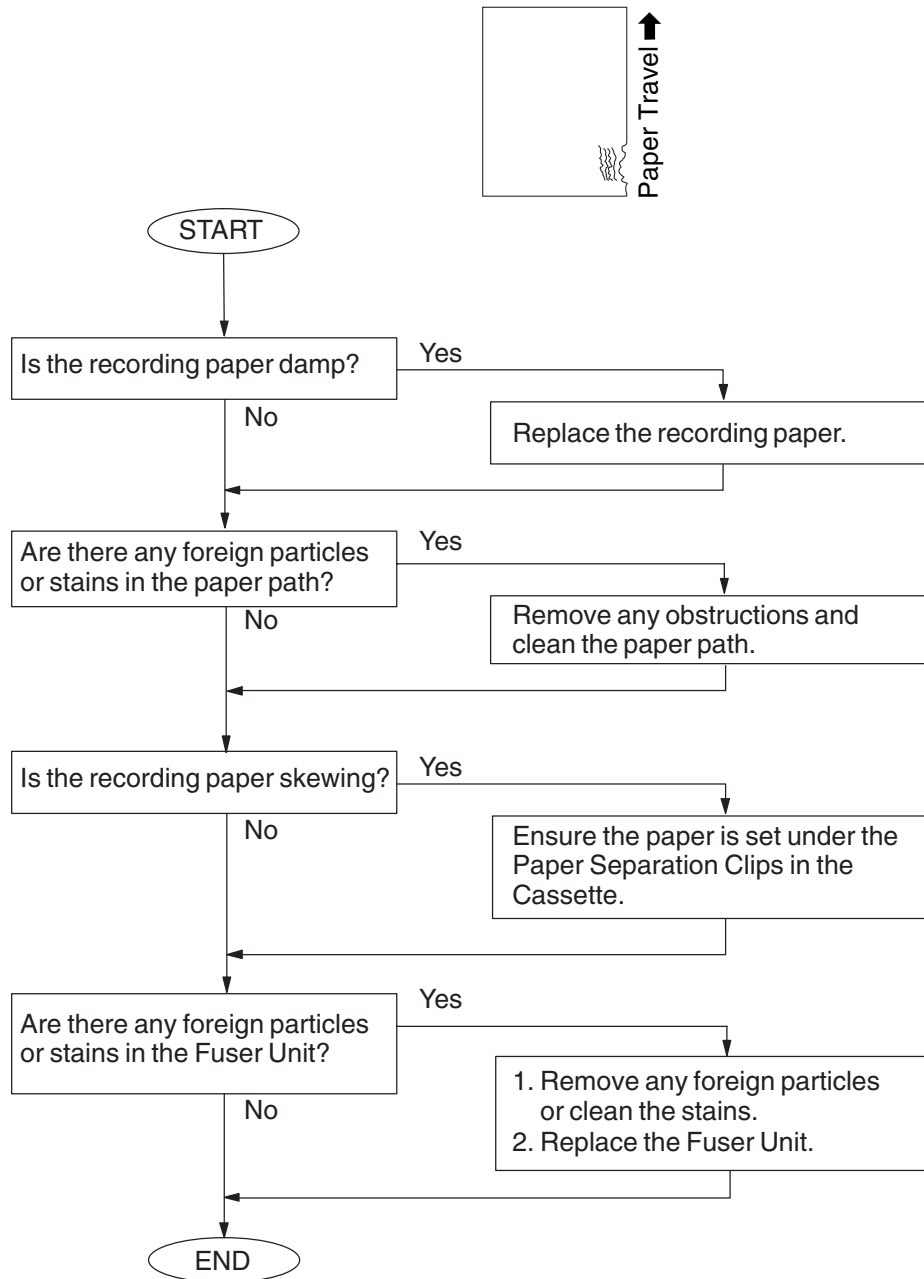
### 4.3.11. Voids in Solid Areas



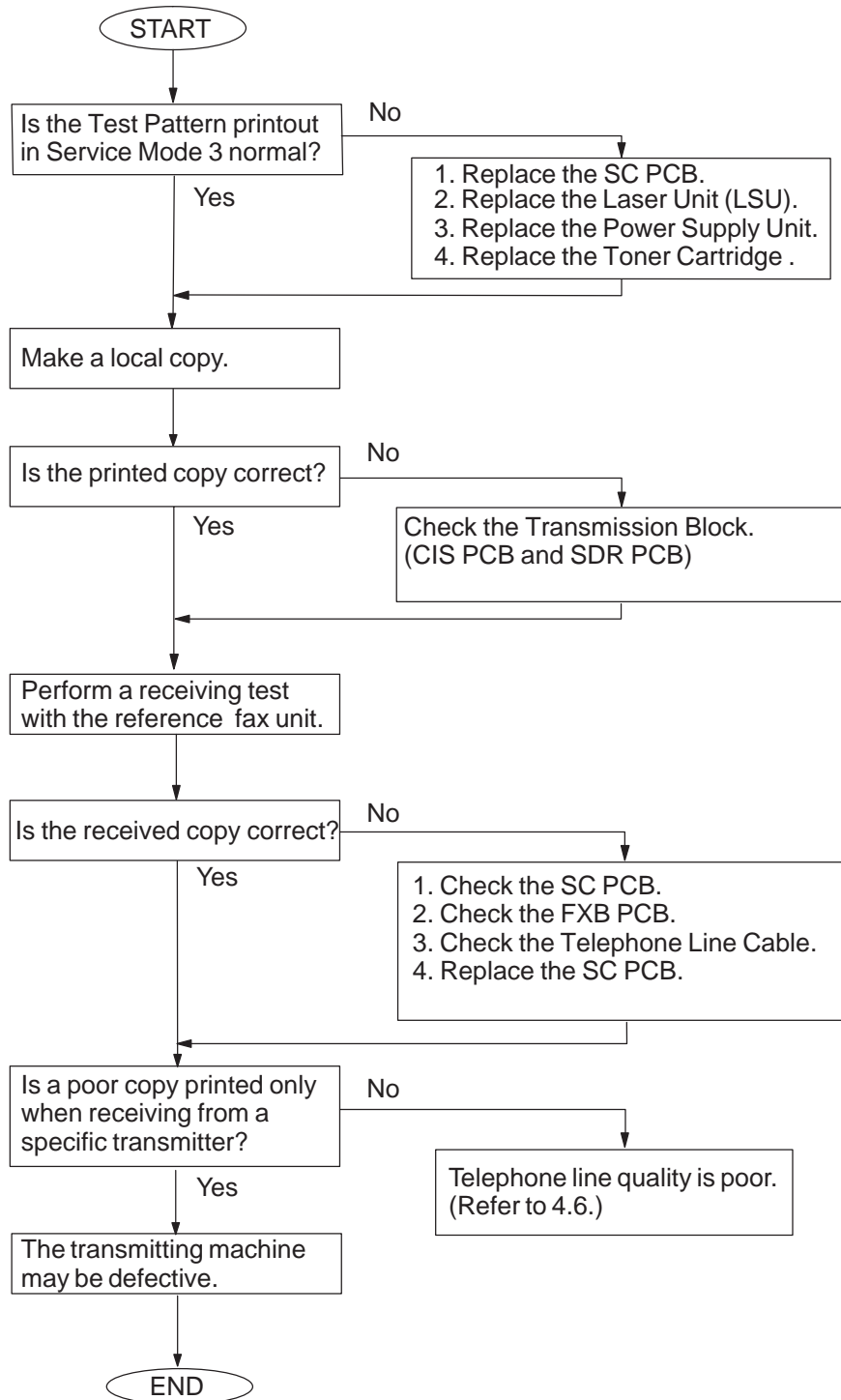
### 4.3.12. Black Dots



### 4.3.13. Recording Paper Creases

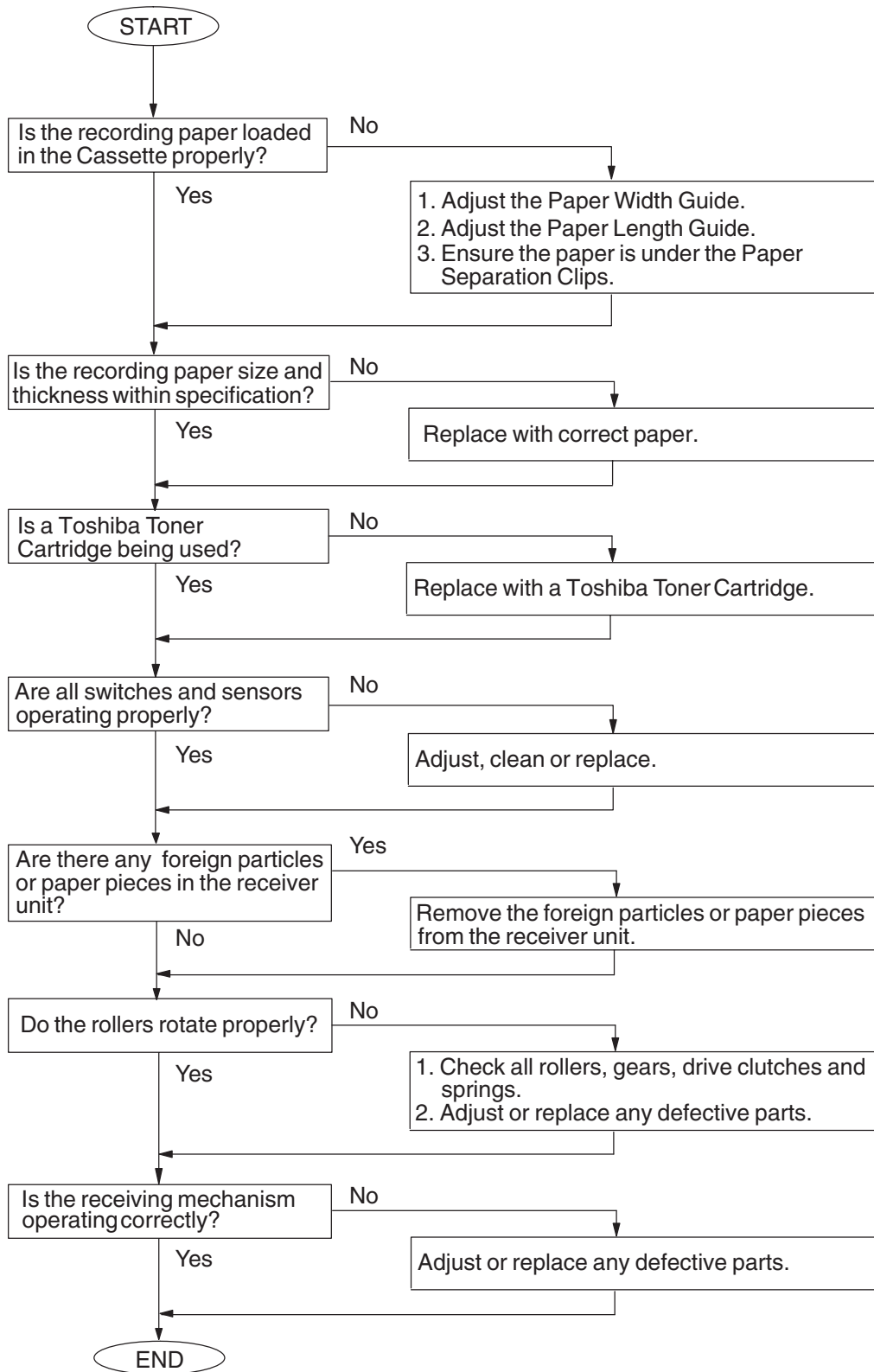


#### 4.3.14. Poor Printed Copy Quality

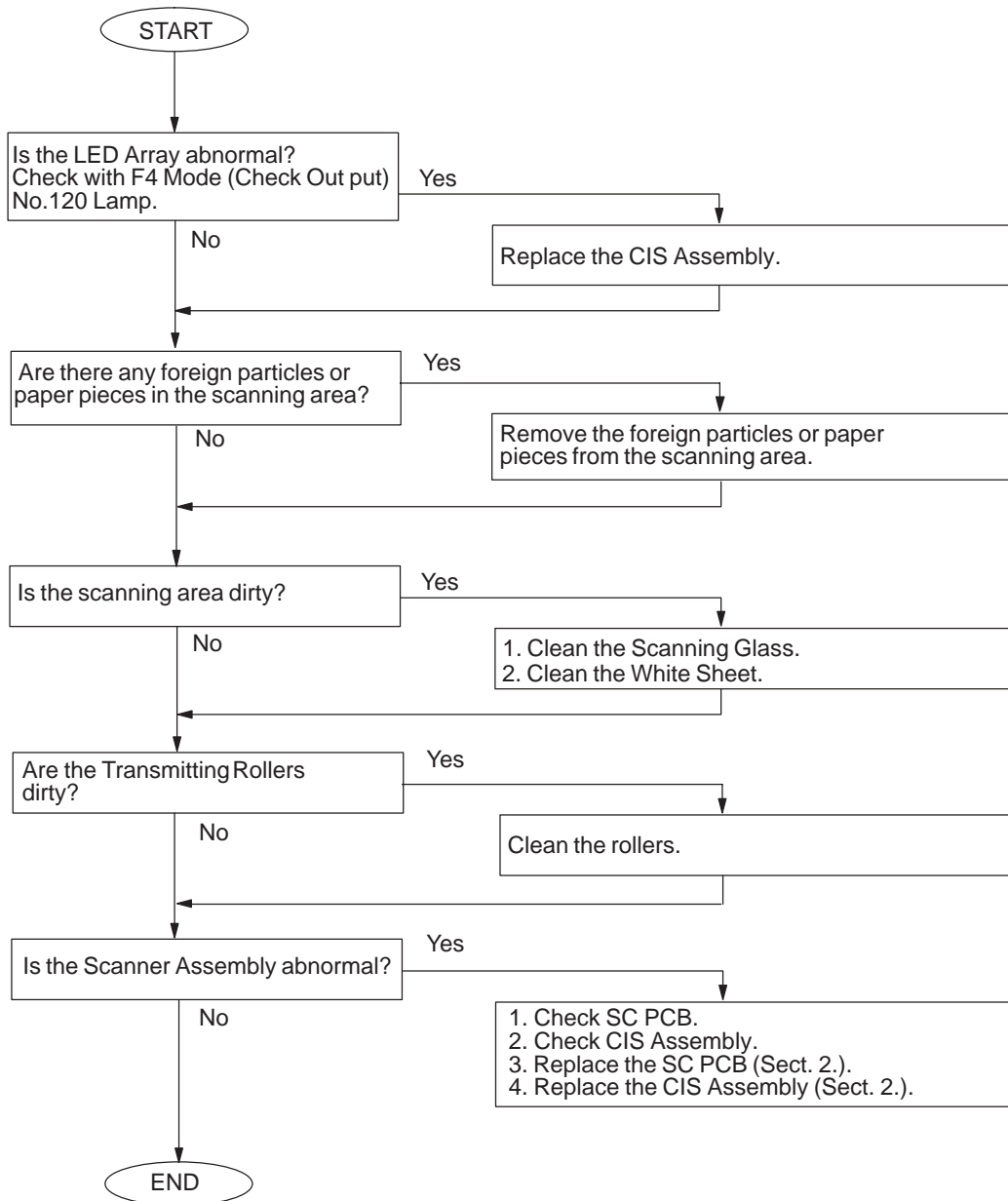




### 4.3.15. Abnormal Printing

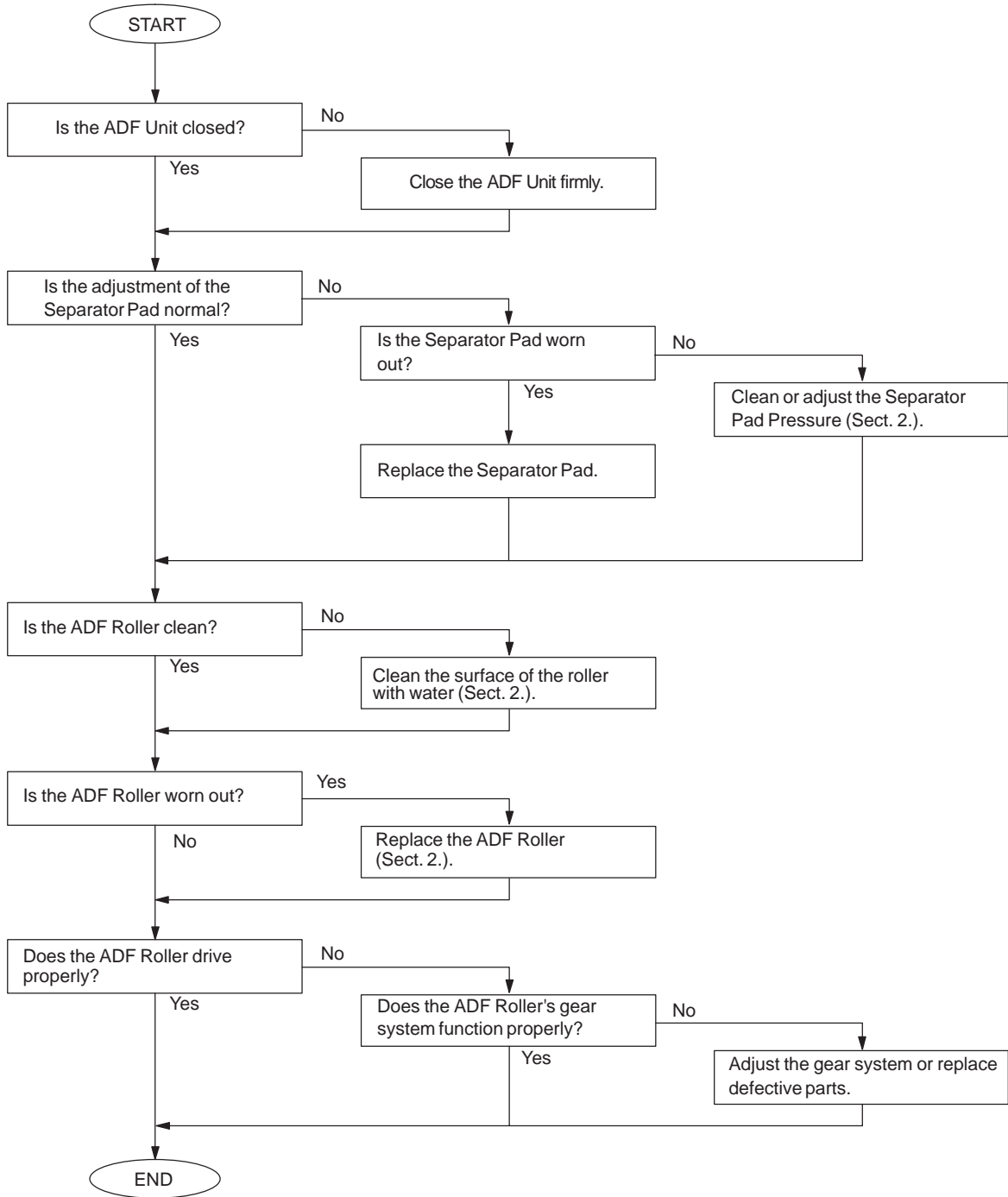


### 4.3.16. Scanned Copy Quality Problems

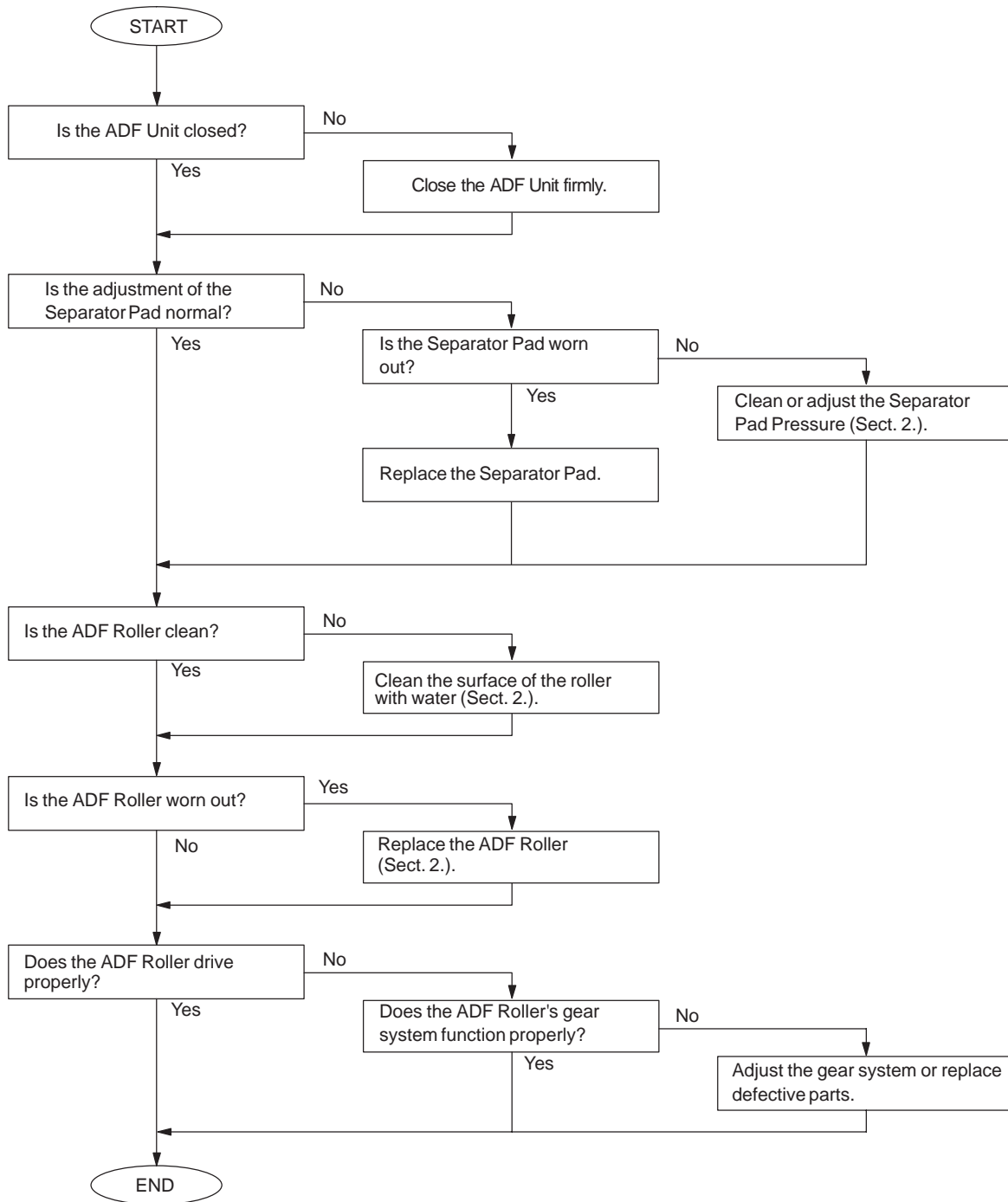


## 4.4. Document Feeder (ADF)

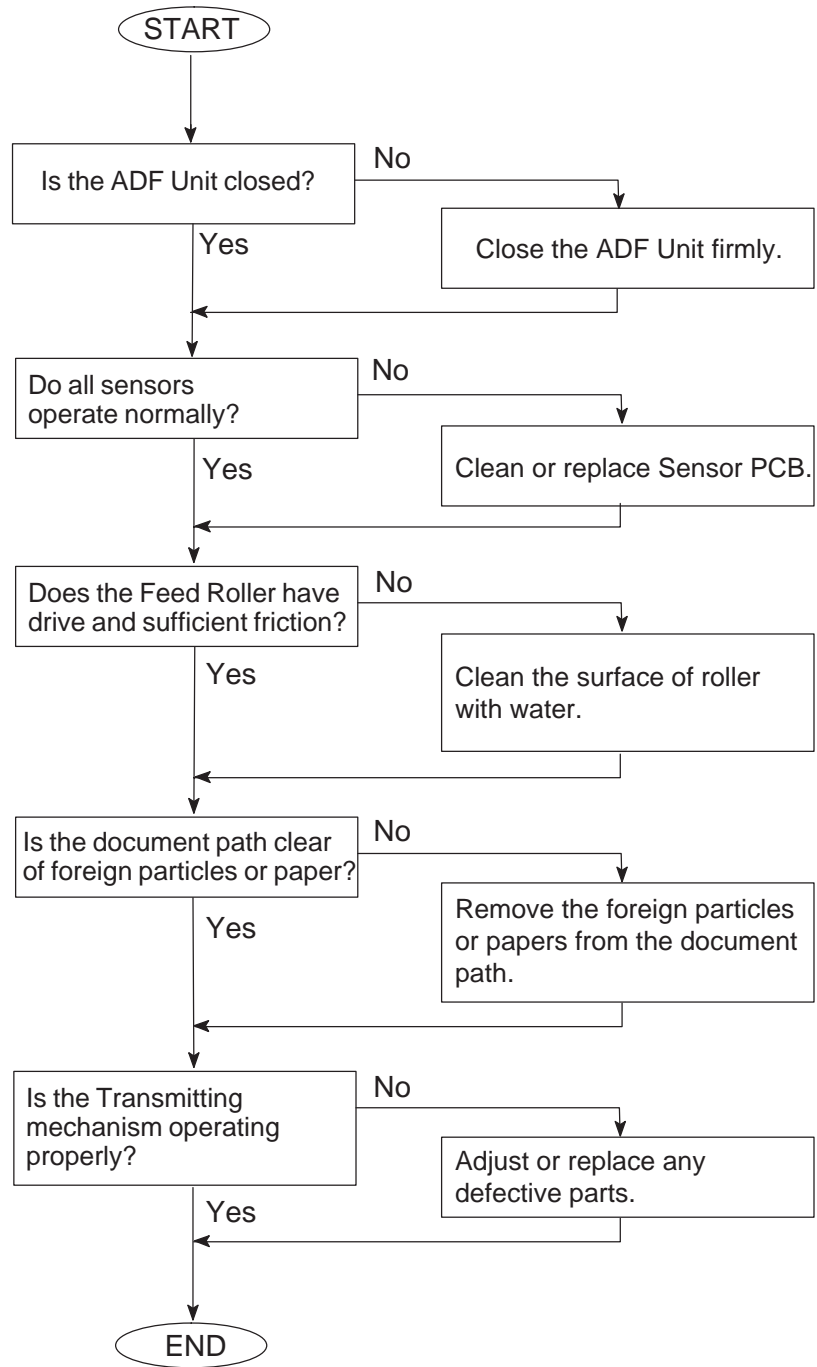
### 4.4.1. No Document Feed



#### 4.4.2. Document Does Not Feed or Multiple Feeds



### 4.4.3. Document Jam (030) or Skew

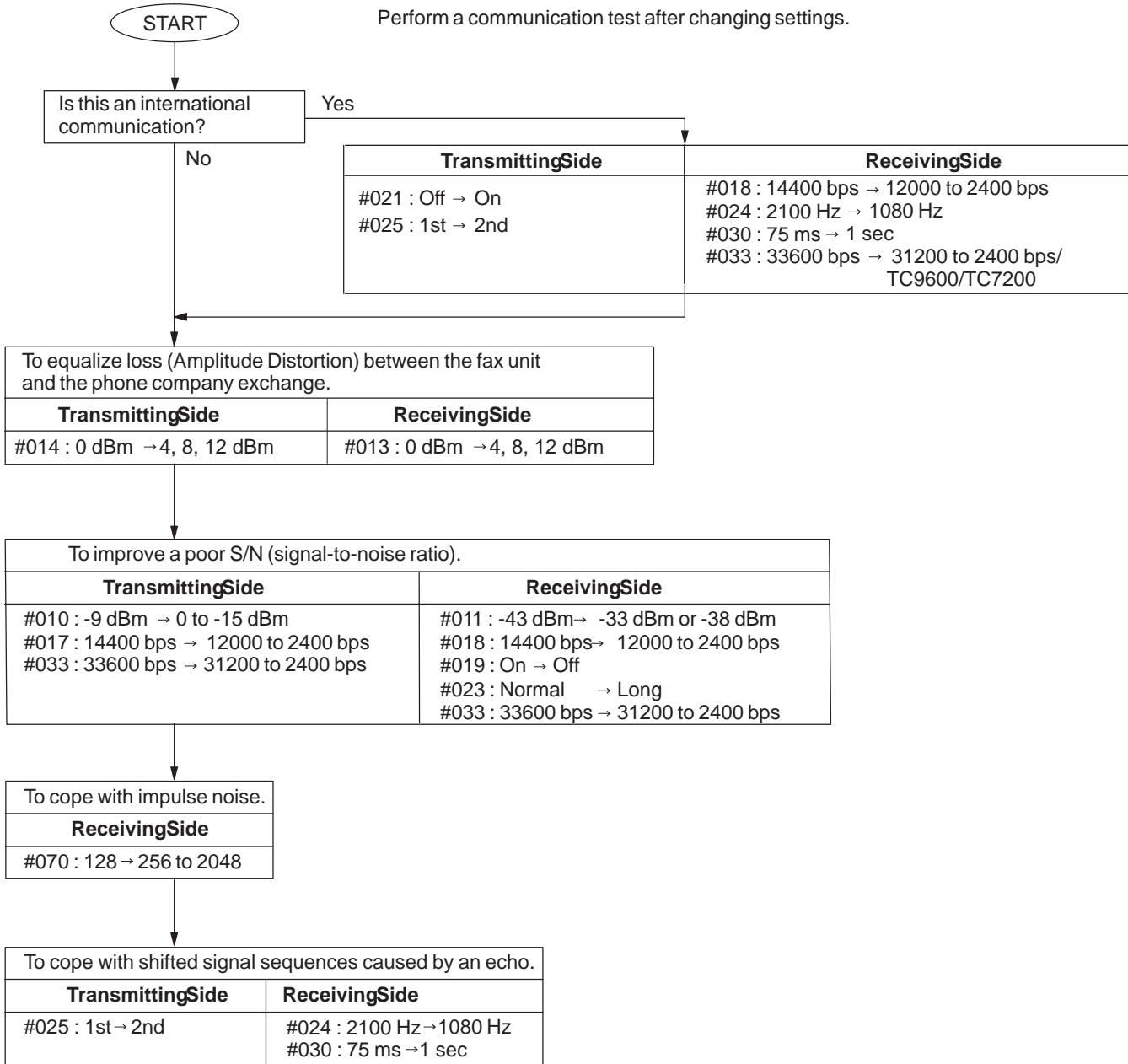


## 4.5. Communications

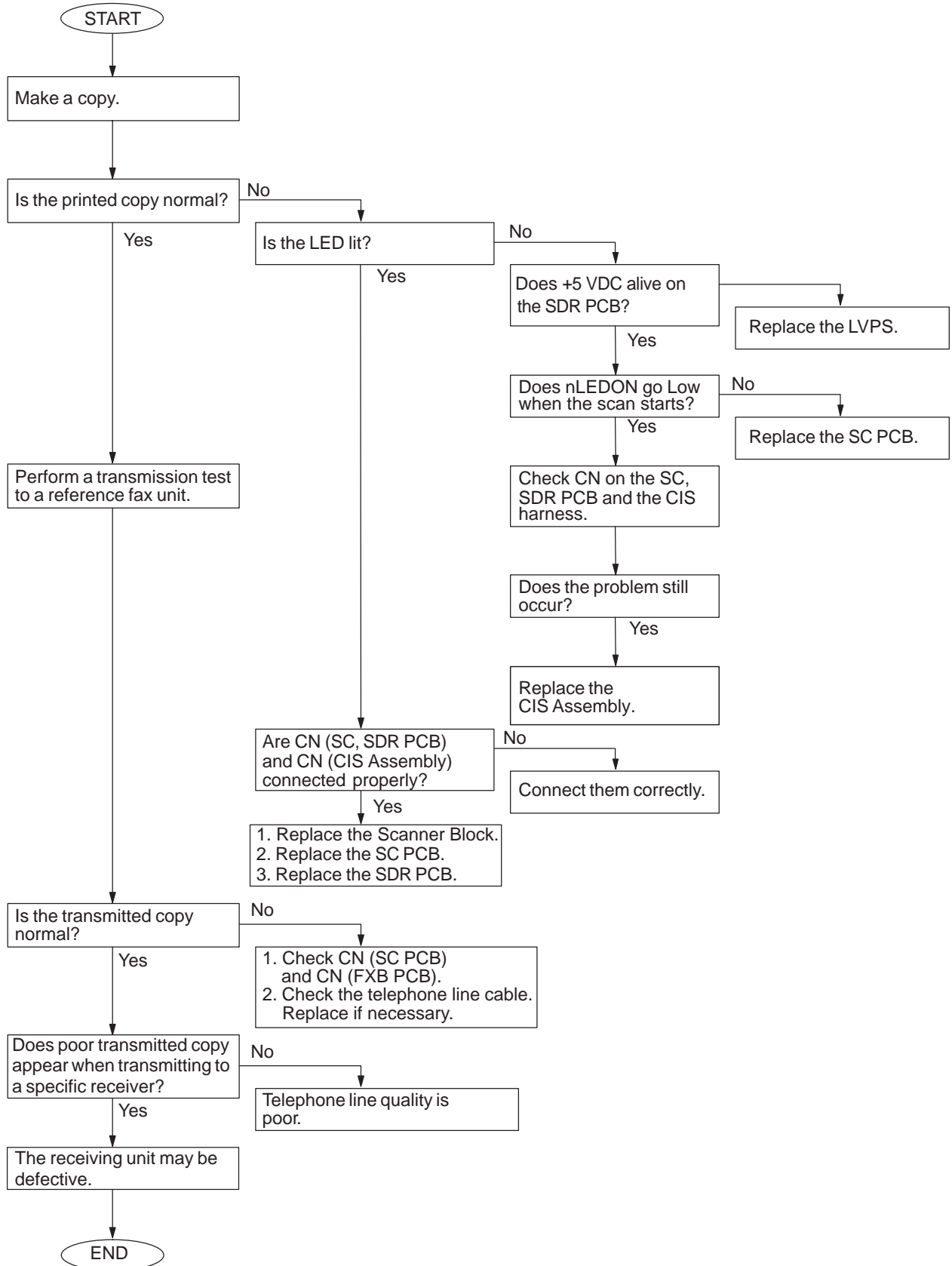
This section explains general troubleshooting procedures for the 400 series of Information Codes. These errors are primarily caused by poor telephone line quality (loss, noise, echo, etc.). This unit is furnished with Service Mode 1 to assist in troubleshooting line quality problems.

It is suggested that both the transmitting unit and receiving unit be adjusted. This section gives relevant parameters in Service Mode 1 for the transmitting and receiving sides. If no improvement is realized after the parameters are adjusted, it is recommended that the parameters be returned to the default settings.

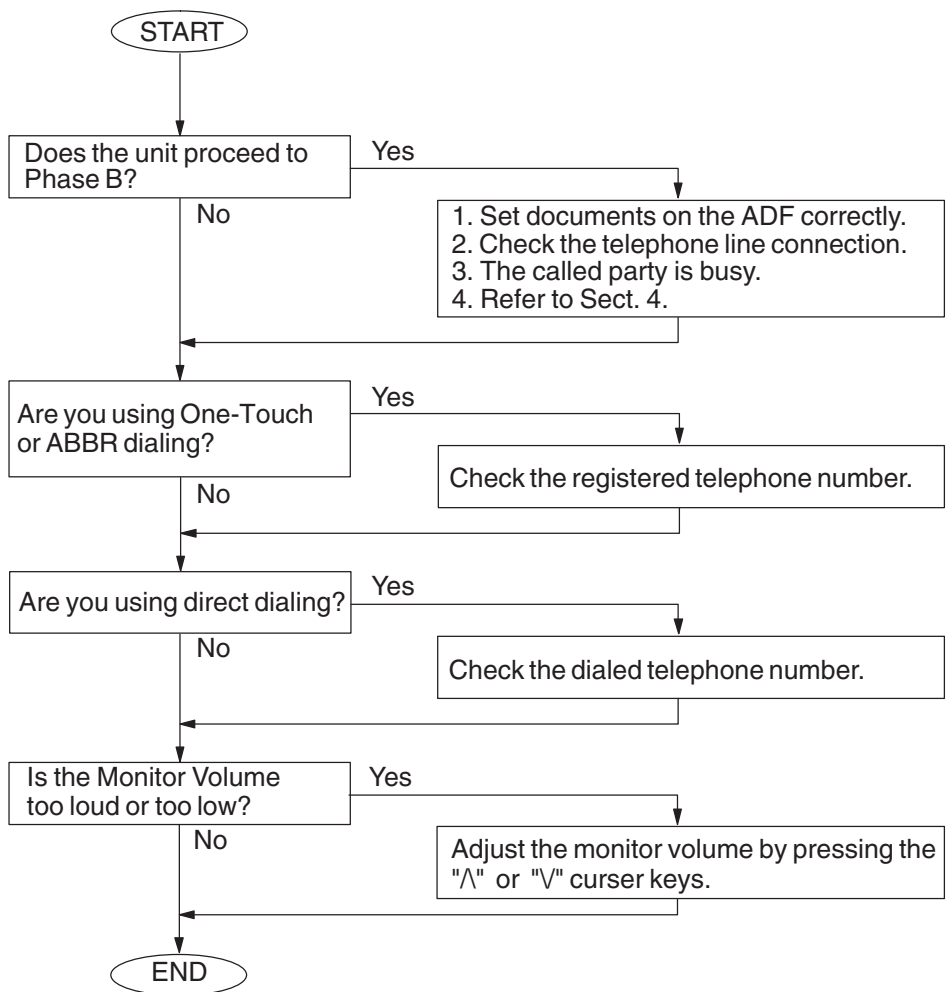
### 4.5.1. Communication Trouble



## 4.5.2. Poor Transmitted Copy Quality

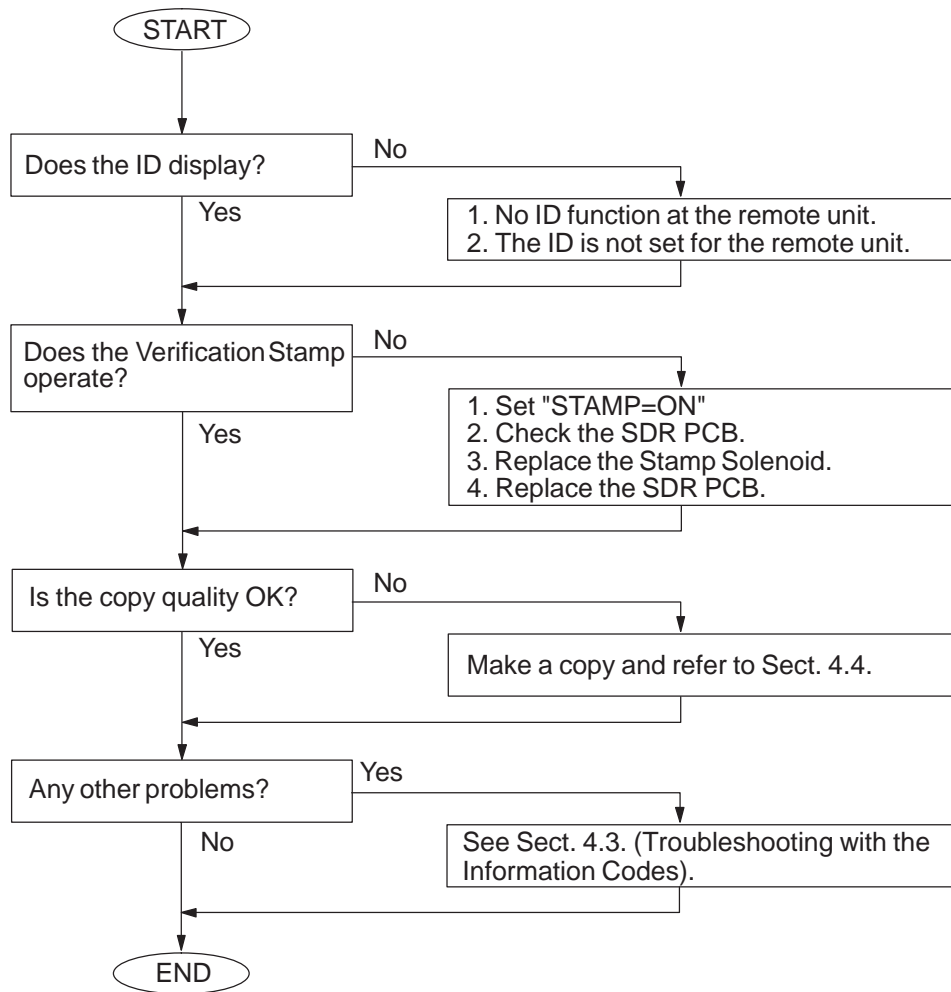


### 4.5.3. Dialing Problems

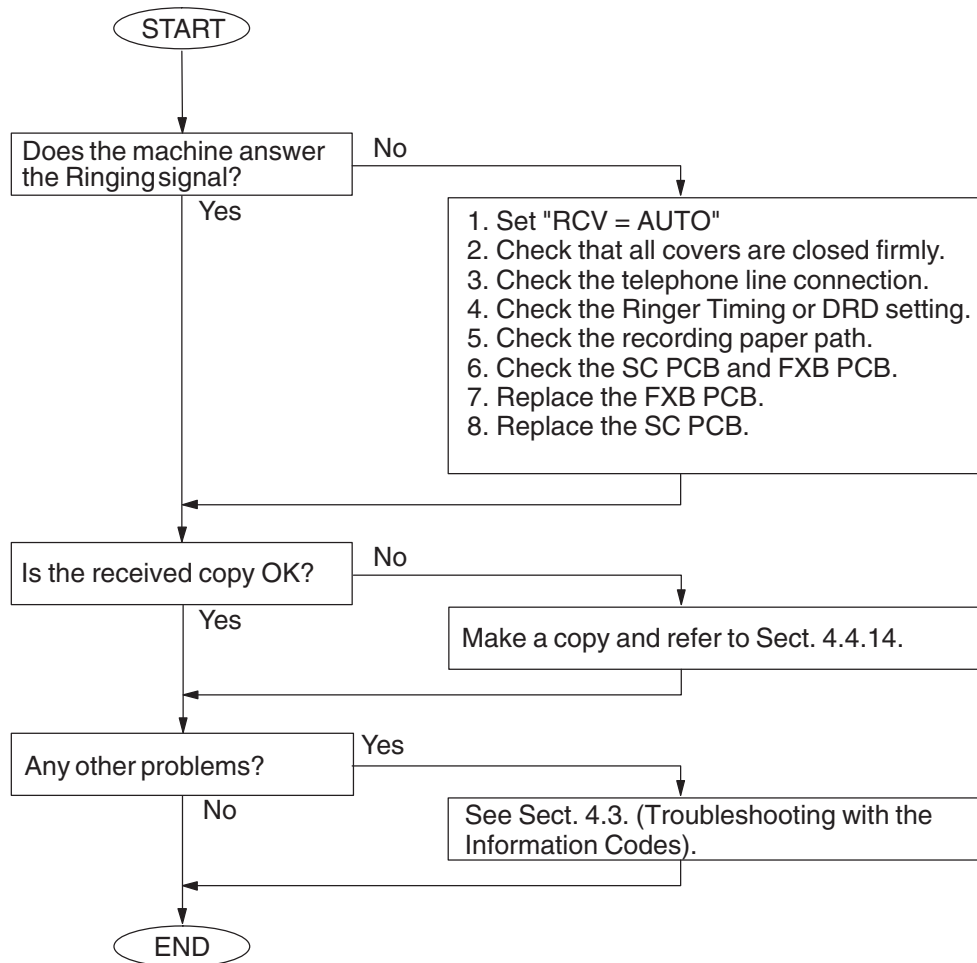




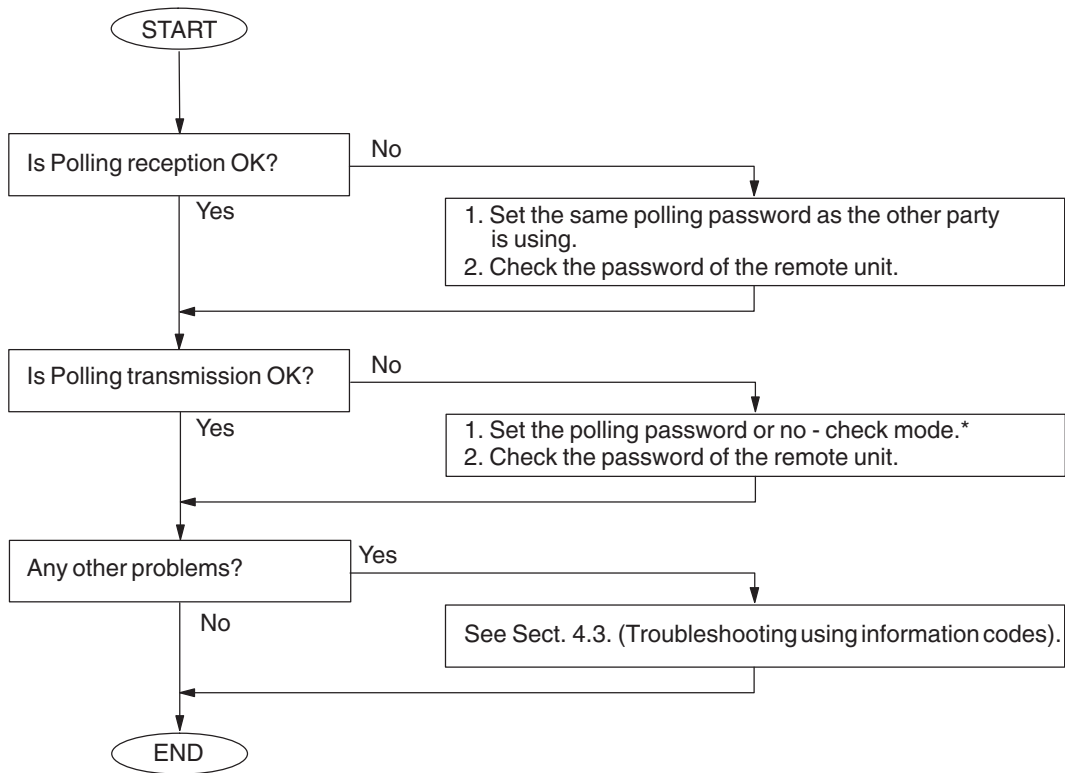
#### 4.5.4. Transmission Problems



### 4.5.5. Reception Problems



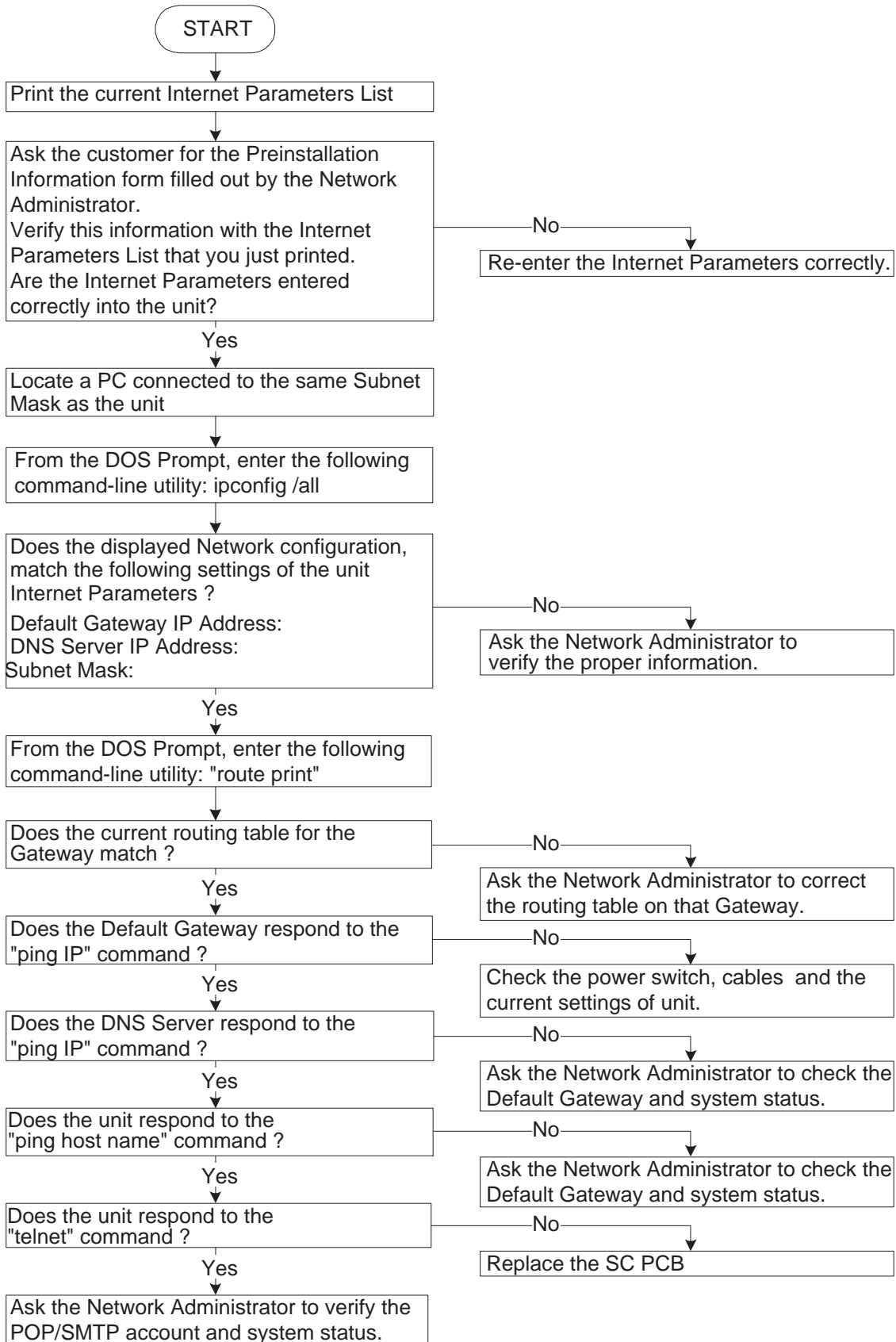
### 4.5.6. Polling Problems



**Note:**  
No-check Mode means that password is not set.

## 4.6. Troubleshooting the LAN Interface

### 4.6.1. Checking Network Configuration



### 4.6.2. Testing the TCP/IP Network

It is beyond the scope of this Service Manual to cover Networking in detail, there are many excellent manuals on this subject, but we hope the information in this section will aid with your troubleshooting efforts. In most cases, the Network Administrator will be able to provide you with needed information or assistance.

When encountering Network problems during an onsite service call or during the installation stage, try to isolate the steps that are not being completed so that you can quickly locate the components that don't work. It is best to organize your troubleshooting efforts by understanding what should be happening, then you can trace the path and see where the problem is occurring.

In our case, we use TCP/IP for transportation of data from one system to another, which involves a whole series of events occurring throughout a number of different layers.

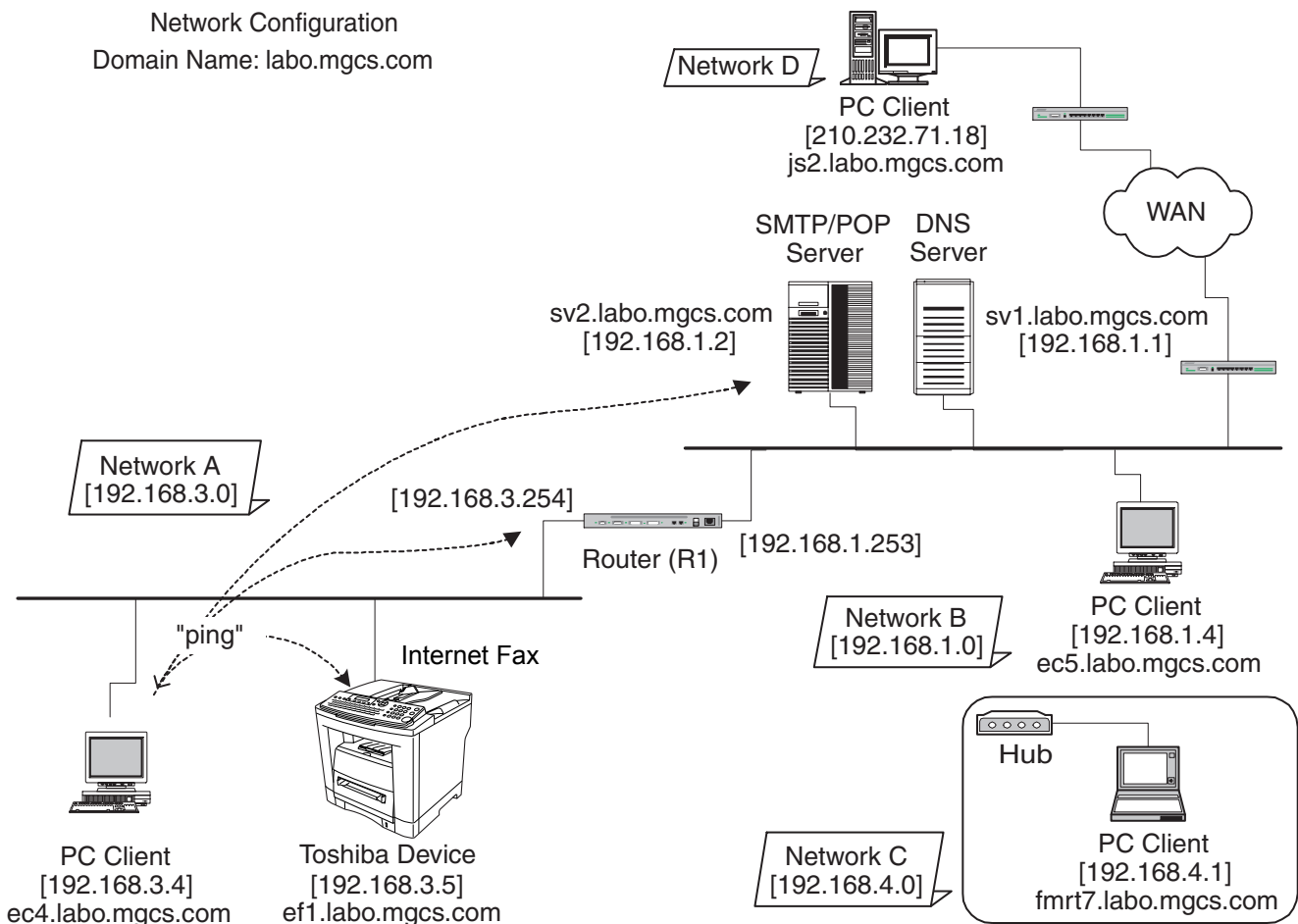
As with all networking, TCP/IP works better when its plugged in, therefore, start your troubleshooting by checking the Physical Connectivity first, the cable(s).

In our examples, we'll use several simple tools readily available in the DOS command-line utility for troubleshooting. There are many other utilities available for checking more detailed information, some are Free of charge, others are available for a nominal fee.

#### 1. System Diagram Model

Ask the customer to provide you with the Pre-Installation Information form, that was filled out by the Network Administrator.

A description or system diagram for the unit, including its physical address, email server and DNS server is required.



## 2. Checking the Current Configuration

Print the current unit Internet Parameters configuration.

Locate a PC connected to the same Subnet Mask as the unit, then from the DOS Prompt, type the following command-line utility: "**ipconfig /all**" for Windows 98/Me/XP/2000/NT.

Verify that the displayed Network configuration on the PC, matches the following Internet Parameter settings of the unit:

Default Gateway IP Address:

DNS Server IP Address:

Subnet Mask: (whether it is valid)

### For Windows 98 / Me / XP / 2000 / NT

The following example shows the output after you type "ipconfig /all" at a command prompt:

```
C:\>ipconfig /all
Windows NT IP Configuration
    Host Name . . . . . : ec4.labo.pcc.com
    DNS Servers . . . . . : 192.168.1.1
    Node Type . . . . . : Hybrid
    NetBIOS Scope ID . . . . . :
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled . . . . . : No
    NetBIOS Resolution Uses DNS . . . . . : No

    Ethernet adapter IBMFE1 . . . . . :
    Description . . . . . : IBM 100/10 EtherJet PCI Adapter

    Physical Address . . . . . : 00-04-AC-EE-9C-E8
    DHCP Enabled . . . . . : No
    IP Address . . . . . : 192.168.3.4
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.3.254
    Primary WINS Server . . . . . : 192.168.3.18
```

From the above examples, you know the Network configuration for the specified Subnet Mask is as follows: IP Address: 192.168.3.4; Subnet Mask: 255.255.255.0; Default Gateway (Default Router IP Address): 192.168.3.254; DNS Server: 192.168.1.1 and the Domain Name: labo.mgcs.com (obtained from the Host Name).

## 3. Using "PING" to Test Physical Connectivity

The Packet Internet Groper (PING) is a command-line tool included with every Microsoft TCP/IP client (any DOS or Windows client with the TCP/IP protocol installed). PING is a simple utility that is used to send a test packet to a specified IP Address or Hostname, then, if everything is working properly, the packet is echoed back (returned).

Sample command-line PINGing and parameters are shown below. There are several available options that can be specified with the PING command. However, for our examples, we will use two options (-n and -w) which are commonly used when the response from the destination location is too long.

- n *count* : The number of echo requests that the command should send. The default is four.
- w *timeout* : Specifies the period PING will wait for the reply before deciding that the host is not responding.

## PINGing the Unit

```
C:\WINDOWS>ping ef1.labo.pcc.com

Pinging ef1.labo.pcc.com [192.168.3.5] with 32 bytes of data:

Reply from 192.168.3.5: bytes=32 time=5ms TTL=253
Reply from 192.168.3.5: bytes=32 time=4ms TTL=253
Reply from 192.168.3.5: bytes=32 time=4ms TTL=253
Reply from 192.168.3.5: bytes=32 time=4ms TTL=253
```

## PINGing the Default Gateway (Default Router IP Address)

```
C:\WINDOWS>ping 192.168.3.254

Pinging 192.168.3.254 with 32 bytes of data:

Reply from 192.168.3.254: bytes=32 time=5ms TTL=253
Reply from 192.168.3.254: bytes=32 time=4ms TTL=253
Reply from 192.168.3.254: bytes=32 time=4ms TTL=253
Reply from 192.168.3.254: bytes=32 time=4ms TTL=253
```

## PINGing the SMTP/POP Server

```
C:\WINDOWS>ping sv2.labo.pcc.com

Pinging sv2.labo.pcc.com [192.168.1.2] with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=5ms TTL=253
Reply from 192.168.1.2: bytes=32 time=5ms TTL=253
Reply from 192.168.1.2: bytes=32 time=5ms TTL=253
Reply from 192.168.1.2: bytes=32 time=5ms TTL=253
```

If for some reason, the physical connection is missing, the echo reply will not be received from the destination and the following output is displayed:

```
C:\WINDOWS>ping fmrt7.labo.pcc.com

Pinging fmrt7.labo.pcc.com [192.168.4.1] with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.4.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

If the physical destination is far and it's connected by WAN (Wide Area Network), the PING option command default value must be changed to compensate for the expected delayed response.

e.g.

- n 10 : The number of echo requests that the command should send.
- w 2000 : Specifies the period PING will wait for the reply before deciding that the host is not responding.

```
C:\WINDOWS>ping js2.labo.pcc.com -n 10 -w 2000

Pinging js2.labo.pcc.com [210.232.71.18] with 32 bytes of data:

Reply from 210.232.71.18: bytes=32 time=633ms TTL=252
Reply from 210.232.71.18: bytes=32 time=645ms TTL=252
Reply from 210.232.71.18: bytes=32 time=810ms TTL=252
Reply from 210.232.71.18: bytes=32 time=455ms TTL=252
Reply from 210.232.71.18: bytes=32 time=645ms TTL=252
Reply from 210.232.71.18: bytes=32 time=633ms TTL=252
Reply from 210.232.71.18: bytes=32 time=677ms TTL=252
Reply from 210.232.71.18: bytes=32 time=703ms TTL=252
Reply from 210.232.71.18: bytes=32 time=633ms TTL=252
Reply from 210.232.71.18: bytes=32 time=633ms TTL=252
```

#### 4. Tracing a Packet Route

Another useful command-line utility is TRACERT, which is used to verify the route a packet takes to reach its destination. The result shows each router crossed and how long it took to get through each particular router to reach the specified destination.

The time it takes to get through a particular router is calculated three times and displayed for each router hop along with the IP Address of each router crossed. If a FQDN (Fully Qualified Domain Name) is available, it will be displayed as well.

##### **This utility is useful for two diagnostic purposes:**

- a. To detect whether a particular router is malfunctioning along a known path. For example, if you know that packets on a network always go through London to get from New York to Berlin, but the communication is failing. A TRACERT to the Berlin address shows all the hops up to the point where the router in London should respond. If it does not respond, the time values are shown with an asterisk (\*), indicating the packet timed out.
- b. To determine whether a router is slow and needs to be upgraded or additional routers should be installed on the network. You can determine this by simply comparing the time it takes for a packet to get through a particular router. If its return time is significantly higher than the other routers, it should be upgraded.

To use this utility, from the DOS command-line, type: `tracert <IP Address or Hostname>`

##### **Tracing the Route to SMTP/POP Server**

```
C:\WINDOWS>tracert sv2.labo.pcc.com
Tracing route to sv2.labo.pcc.com [192.168.1.2]
over a maximum of 30 hops:

  1  4 ms  2 ms  2 ms  192.168.3.254
  2  4 ms  5 ms  5 ms  sv2.labo.pcc.com [192.168.1.2]

Trace complete.
```



## 5. Managing Network Route Tables

In the simplest case a router connects two network segments. In this model, the system used to join the two segments needs to know only about these segments.

The routing table for router R1 in this case is simple; the following table shows its key routes:

Network Address	Netmask	Gateway	Interface
192.168.3.0	255.255.255.0	192.168.3.254	192.168.3.254
192.168.1.0	255.255.255.0	192.168.1.253	192.168.1.253

When the Unit at 192.168.3.5 attempts to communicate with the Unit at 192.168.1.x, IP performs the ANDing process to find two things: The local network ID is 192.168.3.0, and the destination network ID is not. This means, that the destination host is not on the local network.

IP, is responsible to find a route to the remote network, and therefore, it consults the routing table. Here, the local host normally determines that the next step in the route is the Default Gateway, and sends the packet to router R1.

The router R1, receives the packet. After determining that the packet is for another host and not the router itself, it checks the routing table. It finds the route to 192.168.1.0 and sends the packet through the interface to the Unit at 192.168.1.x, which receives the packet. This is a simple route that took only a single hop.

When another network is added as the number of hosts grows, it gets complicated, and the systems on the most distant networks cannot communicate. When the router receives a packet in this case, it cannot find a route to the remote network. It then discards the packet and a message indicating "destination host unreachable" is sent to the originator.

Here, is where the ROUTE command-line utility is useful when dealing with more than two networks, and is used by Administrators to statically manage a route table by adding, deleting, changing and clearing the route table. It has a number of options that are used to manipulate the routing tables, some are shown below:

- MASK  
If this switch is present, the next parameter is interpreted as the netmask parameter.
- Netmask  
If included, specifies a sub-net mask value to be associated with this route entry. If not specified, it defaults to 255.255.255.255.
- Gateway  
Specifies the gateway.
- METRIC  
Specifies the metric / cost for the destination.

All symbolic names used for the destination are looked up in the network database file NETWORKS. The symbolic names for the gateway are looked up the host name database file HOSTS.

When the packet does not reach the specified destination even when the physical connection is properly made, check the registered persistent routes on the same subnet as the Unit by typing "route print" in the DOS command-line. The output display is shown below:

```
C:\WINDOWS>route print
Active Routes:

 Network Address      Netmask          Gateway Address  Interface        Metric
 0.0.0.0              0.0.0.0          192.168.3.254   192.168.3.2      1
 127.0.0.0            255.0.0.0        127.0.0.1       127.0.0.1        1
 192.168.3.0          255.255.255.0    192.168.3.2     192.168.3.2      1
 192.168.3.2          255.255.255.255  127.0.0.1       127.0.0.1        1
 192.168.3.255       255.255.255.255  192.168.3.2     192.168.3.2      1
 224.0.0.0            224.0.0.0        192.168.3.2     192.168.3.2      1
 255.255.255.255     255.255.255.255  192.168.3.2     192.168.3.2      1
```

## 6. Host Name Query on DNS Server

Windows XP/2000/NT 4.0 also has a tool that enables you to test DNS to verify that it is working properly. This utility is not available on Windows 98/Me.

From the DOS command-line, type "NSLOOKUP" to display the following output:

```
C:\>nslookup
Default Server: sv1.labo.pcc.com
Address: 192.168.1.1
```

### NS(Name Server) Record in Domain

From the DOS command-line, type "ls -t NS <Domain Name>" to display the following output:

```
> ls -t NS labo.pcc.com.
[sv1.labo.pcc.com.]
labo.pcc.com.      NS  server = sv1.labo.pcc.com
```

### MX(Mail Exchange) Record in Domain

From the DOS command-line, type "ls -t MX <Domain Name>" to display the following output:

```
> ls -t MX labo.pcc.com
[sv1.labo.pcc.com]
labo.pcc.com.      MX  10  sv2.labo.pcc.com
```

### A (Address) Record in Domain

From the DOS command-line, type "ls -t A <Domain Name>" to display the following output:

```
> ls -t A labo.pcc.com
[sv1.labo.pcc.com]
labo.pcc.com.      NS  server = sv1.labo.pcc.com
sv1                A   192.168.1.1
sv2                A   192.168.1.2
ec5                A   192.168.1.4
ec4                A   192.168.3.4
ef1                A   192.168.3.5
```

(To leave from this menu, type "exit" on the command-line.)

## 7. Testing Unit Using the TELNET Command

TELNET is a terminal emulation protocol. TELNET enables PCs and workstations to function as dumb terminals in sessions with hosts on internet works.

From Windows 98/Me/XP/2000/NT, use the TELNET to test the communication of TCP/IP and SMTP Protocol manually to the Unit. This method eliminates the SMTP Server.

For better understanding, type "telnet" in the DOS Command-line to bring up the Telnet screen. Then, click on the Terminal menu and on Preferences, check the "Local Echo" and "Block Cursor" radio dials and click on the OK button.

Click on the Connect menu, then click on Remote System.

Enter "25" in the "Port:" field and click on Connect button.

For example,

```
C:\WINDOWS>telnet

telnet to ef1.labo.pcc.com[192.168.3.5]
220 ef1.labo.pcc.com DP18xx V.xx

helo
250 Hello

mail from:test
250 Sender OK

rcpt to:fax@labo.pcc.com
250 Receptient OK

data
354 Email, end with "CRLF . CR LF"

[Press the Enter Key]
Toshiba Internet Fax
test
[Press the Enter Key]
[Press the Enter Key]
[Press the Enter Key]
250 OK, Mail accept

quit
221 Closing transaction channel
```

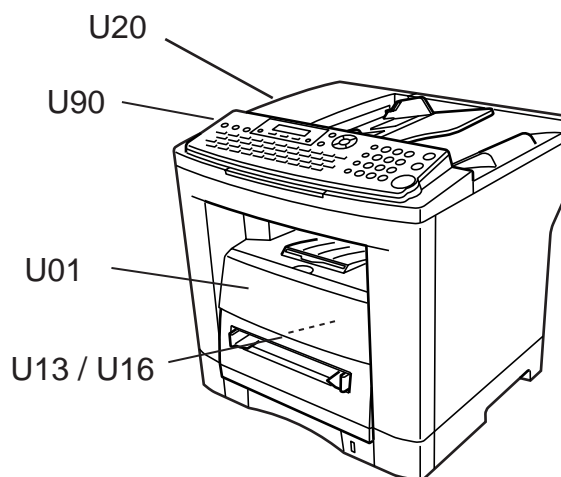
## 4.7. Error Codes (For Copier)

The self-diagnostic functions detect troubles in the important components of the copier. When trouble occurs, the machine stops.

**Note:**

Some Codes are not used in the e-STUDIO190F and are reserved for future use.

### 4.7.1. User Error Codes (U Code)



**Note:**

Uxx and a message will appear on the Display Panel.

User Error Codes (U Code) Table		
Code	Item	Check Points
U01	CLOSE FRONT COVER	<ol style="list-style-type: none"> <li>1. Front Cover is open.</li> <li>2. Front Cover Sensor is disconnected.</li> <li>3. Front Cover Sensor is defective.</li> <li>4. LVPS connector is disconnected.</li> <li>5. LVPS is defective.</li> <li>6. Engine PCB is defective.</li> </ol>
U13	TONER IS RUNNING LOW or OUT OF TONER	<ol style="list-style-type: none"> <li>1. Toner Cartridge is incorrectly installed.</li> <li>2. Low Toner.</li> <li>3. Toner Sensor is disconnected.</li> <li>4. Toner Sensor is defective.</li> <li>5. Engine PCB connector is disconnected.</li> <li>6. Engine PCB is defective.</li> </ol>
U16	NO CARTRIDGE	<ol style="list-style-type: none"> <li>1. No Toner Cartridge.</li> </ol>
U20	CLOSE ADF COVER	<ol style="list-style-type: none"> <li>1. ADF Cover is open.</li> <li>2. ADF is not installed correctly.</li> <li>3. ADF Cover Sensor is disconnected.</li> <li>4. ADF Cover Sensor is defective.</li> <li>5. LVPS connector is disconnected.</li> <li>6. LVPS is defective.</li> </ol>
U90	REPLACE BATTERY	Backup Battery is wearing out.

#### **4.7.1.1. Low Toner Messages / Operation**

The Toner Cartridge Yield is approximately 5,000 pages using Letter or A4 size paper and 5% Black coverage, however, the maximum yield will not exceed 6,000 pages.

The machine controls the printer to maintain good print quality by controlling the Bias Voltage with the Low Toner Sensor and the Print Counter.

There are three Toner warning LCD Displays:

##### **LCD 1: [TONER IS RUNNING LOW: U13]**

Low Toner sensor detects Low Toner or the machine has printed 5,500 pages.

Preparing a new cartridge for replacement is recommended.

##### **LCD 2: [WARNING TONER LOW LESS THAN 50 PAGES]**

450 pages have been printed since the LCD 1 appeared.

Replacement with the new cartridge is recommended.

##### **LCD 3: [OUT OF TONER: U13]**

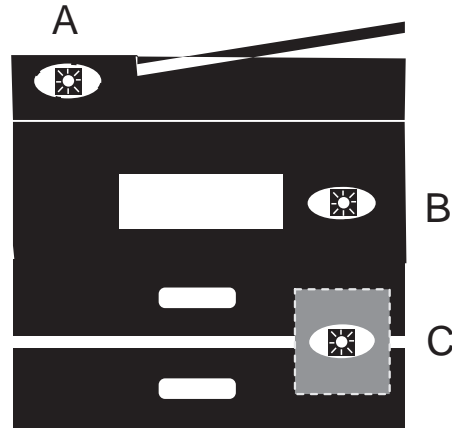
50 pages have been printed after LCD 2 appeared or 6,000 pages have been printed.

Replace with the new cartridge.

When replacing with a New Cartridge, perform the steps below to reset the Print Counter.

1. Press "**FUNCTION**" key.
2. Press "**7**" and "**8**" keys.
3. Press "**SET**" key.
4. Press "**5**" to enter "**05 TONER REPLACEMENT? PRESS SET TO SELECT**".
5. Press "**SET**" key, then "**TONER REPLACEMENT? 1:Yes 2:No**".
6. Press "**1**" key to reset the Print Counter.
7. Press "**STOP**" key to return to the Standby mode.

#### 4.7.2. Jam Error Codes (J Code)

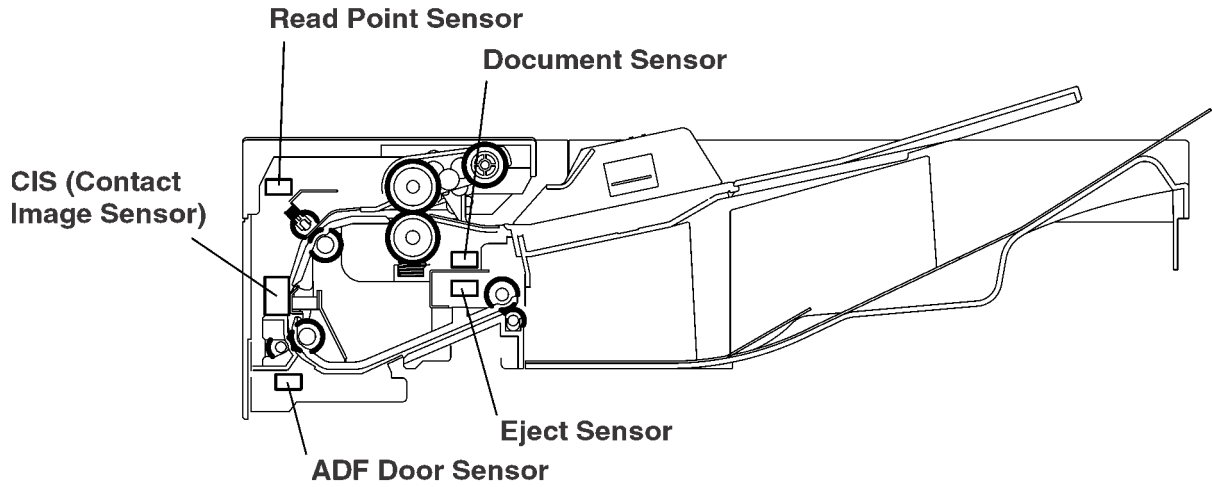


Section	Jam Location
A	ADF
B	Paper Transport / Exit Area
C	Paper Entry Area

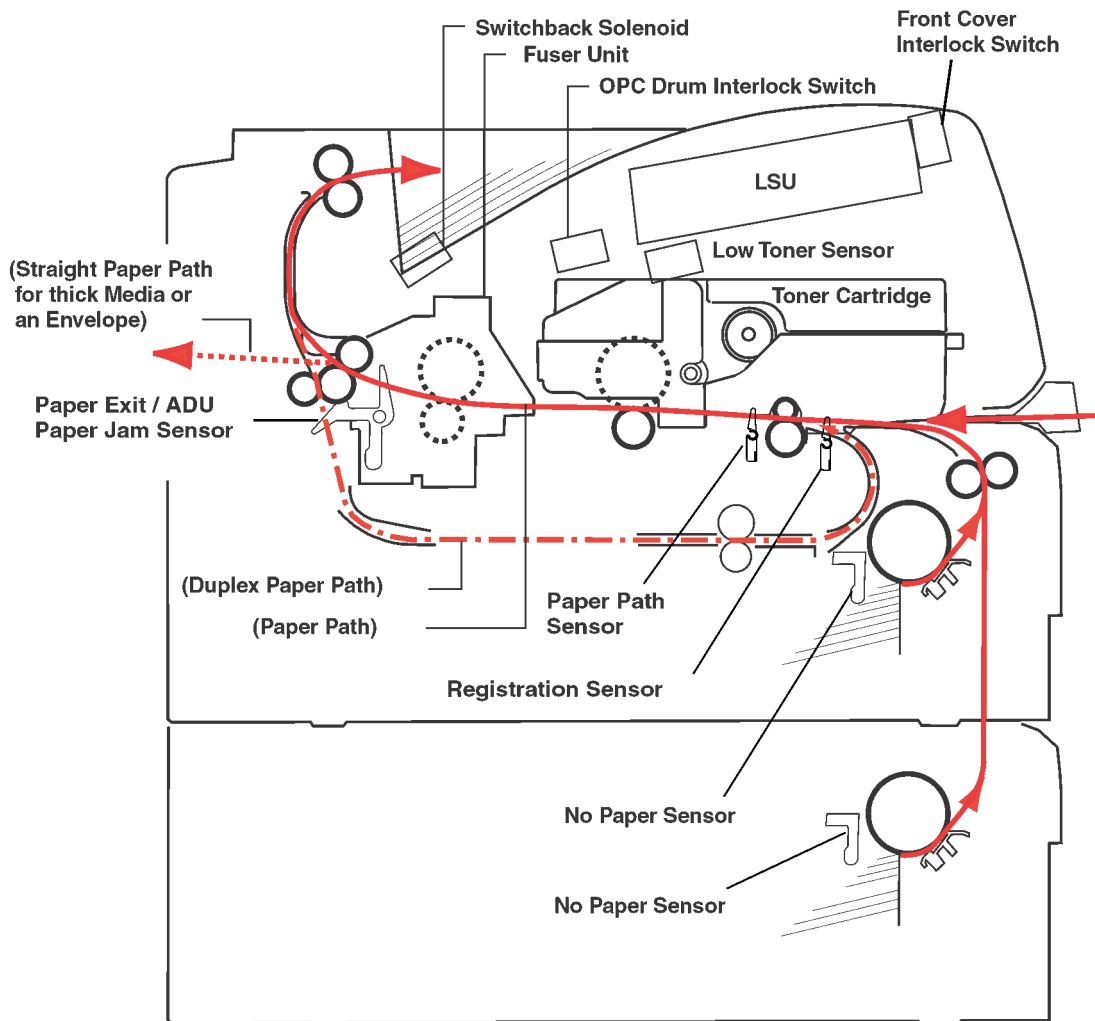
Jam Error Codes (J Codes) Table		
Code	Contents	Section
J00	The Registration Sensor did not detect paper within a predetermined time after paper started feeding. (Sheet Bypass)	C
J01	The Registration Sensor did not detect paper within a predetermined time after the Paper Feed Roller started rotating. (1st Feeder Unit)	
J02	The Registration Sensor does not detect paper within a predetermined time after the Paper Feed Roller started rotating. (2nd Feeder Unit)	
J43	Paper Jam in the Registration Sensor or Paper Path Sensor.	B, C
J44	Paper Jam in the Paper Exit / ADU Paper Jam Sensor.	
J71	Original was longer than 78.7 in (2m). (Information Code 031 or 032 is printed on the Transaction Journal instead.)	A
J72	Read Point Sensor does not go ON within 10 seconds after the original starts feeding. (Information Code 030 is printed on the Transaction Journal instead.)	
J74	The Exit Sensor does not go ON within a predetermined time after the Sensor is activated.	
J75	The Exit Sensor does not go OFF within a predetermined time after the Sensor is activated.	C
J80	The Automatic Duplex Unit (ADU) Entrance Sensor does not detect paper within a predetermined time.	
J82	The ADU Exit Sensor does not detect paper within a predetermined time after ADU Middle Sensor is activated.	
J83	The ADU Entrance Sensor keeps detecting paper after a predetermined time has lapsed.	A
J92	The Original was pulled out when feeding an original.	
J93	The Original remained in the ADF.	
J94	The ADF does not go off after the predetermined time. Unexpected Jam timing (i.e. Original is too short, etc.)	A

• Sensor and Switch Location

ADF: Front View



Printer: Left Side View



### 4.7.3. Mechanical Error Codes (E Code)

<b>E1: Optical Unit Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E1- 22	Polygon Motor Synchronization	<ol style="list-style-type: none"> <li>1. Engine PCB connector is disconnected.</li> <li>2. Engine PCB is defective.</li> <li>3. Laser Unit is defective.</li> <li>4. LVPS connectors is disconnected.</li> <li>5. LVPS is defective.</li> <li>6. SC PCB is defective.</li> </ol>

<b>E2: Lift DC Motor Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E2	Not Applicable	-

<b>E3: Development System Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E3- 20	Main Motor Rotation	<ol style="list-style-type: none"> <li>1. Drive Mechanism is defective.</li> <li>2. Main Motor connector is disconnected.</li> <li>3. Main Motor is defective.</li> <li>4. Engine PCB connector is disconnected.</li> <li>5. Engine PCB is defective.</li> <li>6. LVPS is defective.</li> </ol>

<b>E4: Fuser Unit Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E4- 01	Fuser Warm-up Temperature	<ol style="list-style-type: none"> <li>1. Fuser Thermistor is dirty.</li> <li>2. Thermistor position is incorrect.</li> <li>3. Fuser temperature is low.</li> <li>4. Thermistor is defective.</li> <li>5. Fuser Lamp connector is disconnected.</li> <li>6. Fuser Thermostat is defective.</li> <li>7. Fuser Lamp is defective.</li> <li>8. Engine PCB connector is disconnected.</li> <li>9. Engine PCB is defective.</li> </ol>
E4- 10	Exhaust Fan Motor Rotation (Fuser Unit Side)	<ol style="list-style-type: none"> <li>1. Exhaust Fan connector is disconnected.</li> <li>2. Exhaust Fan is defective.</li> <li>3. LVPS connector is disconnected.</li> <li>4. LVPS is defective.</li> <li>5. Engine PCB is defective.</li> </ol>

<b>E5: System Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E5- 11	Printer Engine Communication Abnormal	<ol style="list-style-type: none"> <li>1. SC/Engine PCB connector is disconnected.</li> <li>2. SC/Engine PCB is defective.</li> </ol>
E5- 12	Main CPU/SDR Interface Error	<ol style="list-style-type: none"> <li>1. SC/SDR PCB connector is disconnected.</li> <li>2. SC/SDR PCB is defective.</li> </ol>
E5- 19	Scanner Line Synchronization	<ol style="list-style-type: none"> <li>1. SC/SDR PCB connector is disconnected.</li> <li>2. SC/SDR PCB is defective.</li> </ol>



<b>E5: System Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E5- 40	Sort Memory Abnormal	<ol style="list-style-type: none"> <li>1. Sort Memory defective.</li> <li>2. SC PCB connector is disconnected.</li> <li>3. SC PCB defective.</li> </ol>

<b>E7: Optional Unit Error</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E7- 90	Hardware Key Abnormal	<ol style="list-style-type: none"> <li>1. Incorrect Hardware Key is installed.</li> <li>2. Hardware Key is defective.</li> </ol>

<b>E13: Low Toner or Out of Toner</b>		
<b>Code</b>	<b>Function</b>	<b>Check Points</b>
E13	TONER IS RUNNIG LOW or OUT OF TONER	<ol style="list-style-type: none"> <li>1. Toner Cartridge is incorrectly installed.</li> <li>2. Out of Toner.</li> <li>3. Low Toner Sensor is disconnected.</li> <li>4. Low Toner Sensor is defective.</li> <li>5. Engine PCB connector is disconnected.</li> <li>6. Engine PCB is defective.</li> </ol>

**Note:**

These error codes will appear only when the optional accessories are installed.

#### 4.8. Information Code Table (For Facsimile)

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
001	RCV COPY	C, D	Leading edge of the recording paper fails to reach the Timing Sensor. (1st Tray)	Recording paper jam. Timing Sensor abnormal.
002	RCV COPY	C, D	Leading edge of the recording paper fails to reach the Timing Sensor. (2nd Tray)	Recording paper jam. Timing Sensor abnormal.
007	RCV COPY	C, D	1. Leading edge of the recording paper fails to reach the Paper Exit Sensor. 2. Recording paper has not completely passed the Paper Exit Sensor.	Recording paper jam. Paper Exit Sensor abnormal.
008			Paper Tray is opened while paper is feeding.	Paper Tray is opened.
010	RCV COPY	B, C	No recording paper.	No recording paper or paper is not set properly. No Paper Sensor is defective.
011	STANDBY	B, C	Paper Tray is not installed properly.	Connector is not installed properly.
012	RCV	C, D	The length of the received document is over 2 m.	Transmitter Document Jam.
017			Incorrect paper size loaded in the Paper Tray.	Paper size is incorrect.
030	XMT	B	Read Point Sensor does not go ON within 10 seconds after the document starts feeding.	Document is not set properly. Defective Read Point Sensor.
031	XMT COPY	C	Transmitting document was longer than 2 meter (or 78.7 in).	The document may jam. Defective Read Point Sensor.
041	STANDBY RCV COPY	B, C, D	Out of Toner.	No toner. Defective Low Toner Sensor.
043	STANDBY RCV COPY	B, C, D	Low Toner.	Toner is getting low. Defective Low Toner Sensor.
045	STANDBY	-	No Toner Cartridge.	Toner Cartridge has not been installed. Defective Toner Cartridge Sensor.
060	-	A	Printer Cover is open.	Cover is not firmly closed. Connectors are not firmly connected.
061	-	A	ADF Door is open.	Door is not firmly closed. Connectors are not firmly connected.
302	XMT RCV	B, C, D	No response of 2nd G3 PCB.	2nd G3 PCB is defective.

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
400	XMT	B	T1 timer (35 ± 5 sec.) elapsed without detecting 300 bps signal.	Incorrect number was dialed and the START button was pushed. Telephone line was disconnected while dialing. SC PCB or FXB PCB is defective. Receiver is defective. (It may only be transmitting CED)
401	XMT	B	DCN was returned from receiver while transmitter is waiting for CFR or FTT.	Your machine's ID Number is not programmed. Possible incompatibility or incorrect Password.
402	XMT	B	DCN was returned from receiver while transmitter is waiting for NSF/DIS.	Receiver working in non-ITU mode only. (Possible incompatibility)
403	RCV (Polling)	B	Transmitter had no polling function.	"POLLED=ON" (polling XMT ready) is not set at the transmitter. Document to be transmitted is not placed at the transmitter.
404	XMT	B	Transmitter sent NSS (or DCS) followed by TCF three times, but the receiver did not respond. (CFR or FTT is usually returned)	Receiver is defective. (Modem) SC PCB or FXB PCB is defective. Receiver disconnects line during first NSS (or DCS) is transmitted.
405	XMT	B	Transmitter received FTT after it transmitted TCF at 2400bps. Received RTN after communicating at 2400 bps.	Line quality is poor. (TCF is damaged due to line noise) Receiver is defective. (Modem, etc.) SC PCB or FXB PCB is defective.
406	RCV (Password Comm.)	B	XMT-Password mismatched. RCV-Password mismatched. Selective RCV incomplete.	XMT, RCV password does not match. Last 4 digits of TSI does not match with the last 4 digits of ONE-TOUCH, ABBR telephone number.
407	XMT	D	Transmitter received no response after it transmitted post message, such as EOP, MPS, EOM, etc...or received DCN.	Receiver is defective. (No paper, paper jamming, etc.) Receiver ceased receiving because of excessive error. (Line quality is poor) SC PCB or FXB PCB is defective.
408	XMT	D	Transmitter received RTN after it transmitted EOP, MPS, or EOM.	Receiver receives data with error. (Line quality is poor) Receiver is defective. (Modem, etc.) SC PCB or FXB PCB is defective.
409	XMT	D	Transmitter receives PIN after it transmitted a post message, such as EOP, MPS, EOM, etc.	Receiver receives data with error due to poor line quality, and receiving operator requests voice contact. Receiver is defective. (Modem, etc.) SC PCB or FXB PCB is defective.
410	RCV	D	Received DCN while waiting for post command. (EOP, MPS, EOM, etc.)	Interface or line is faulty. Transmitter is defective.
411	RCV (Polling)	B	Received DCN after transmitting NSC.	Transmitter is not ready for polling communication. Password does not match between transmitter and receiver.

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
412	G3 RX	B, D	No response within 12 seconds in NSS/DCS/MPS wait state. (After transmitting FTT)	Transmitter is defective. SC PCB is defective.
414	RCV (Polling)	B	No response received after transmitting 3rd NSC.	Password does not match between transmitter and receiver. Transmitter is defective. (No original, document jam, etc.)
415	XMT (Polling)	B	Remote side attempted to receive message from your machine in polling communication.	Inform the remote side that your machine does not have the polling transmission feature.
416	RCV	D	Receiver did not detect post command, such as EOP, MPS, EOM, etc.	Transmitter is defective. Line quality is poor. (RTC signal is distorted due to line noise) SC PCB or FXB PCB is defective.
417	RCV	C	Receiver returned RTN in response to post message.	Line quality is poor. (There are excessive errors in received data) SC PCB or FXB PCB is defective.
418	RCV	C	Receiver transmitted PIN in response to PRI-Q from transmitter. (Transmitting operator requests voice contact)	Line quality is poor. (There are excessive errors in received data) SC PCB or FXB PCB is defective.
420	RCV	B	T1 timer (35 sec.) elapsed without detecting 300 bps signal.	Incorrect incoming call type (voice). (Non-facsimile communication) Transmitter is defective. SC PCB or FXB PCB is defective.
421	RCV	B	Busy Tone is detected after sending NSF Signal.	Remote station disconnected the line. Wrong number is dialed.
422	XMT	B	Content of NSF (or DIS) or NSC (or DTC) was invalid.	There is an incompatibility.
427	G3 RCV	B	DCN received to NSF/CSI/DIS transmitted.	The interface is incompatible.
434	XMT or RCV	B	CD (response from Modem) did not turn OFF within 180 sec. after receiver detected FLAG signal.	Remote unit is defective. SC PCB or FXB PCB is defective.
436	G3 RX	C	DCN received after transmitting FTT.	Transmitter is defective or incompatible. Line quality is poor.
456	RCV	B	Received relay transfer request or confidential document to distribute to an end receiving station or all confidential mailboxes are used.	
457	RELAY XMT CONF. XMT/ POLL	B	Remote unit does not have Relayed XMT or Confidential Comm. capability.	
459	RCV	C	Failed training in Phase C.	Line quality is poor. (Training signal is distorted due to line noise) SC PCB or FXB PCB is defective.
490	RCV	C	Sum of error lines exceeded the limit (Function Parameter No. 70) of 64 lines.	Line quality is poor. SC PCB or FXB PCB is defective.

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
494	RCV	C	Interval between two EOLs was more than 10 sec. when receiver received message data.	Transmitter is defective. Line quality is poor. (EOL is damaged due to line noise) SC PCB or FXB PCB is defective.
495	XMT RCV	C	During reception, CD turned OFF or continued ON for long time. During communication, lost loop - current.	Line is disconnected. Transmitter is defective. SC PCB or FXB PCB is defective.
496	XMT	C	CS of modem is not able to turn ON.	FXB PCB is defective.
501	XMT/ RCV(V.34)	B	Remote unit does not have compatible Modem.	
502	XMT/ RCV(V.34)	B, C, D	During reception, CD turned OFF or continued ON for long time. During communication, lost loop - current.	Line is disconnected. Transmitter is defective. SC PCB or FXB PCB is defective.
503	XMT/ RCV(V.34)	B, C, D	CS of modem is not able to turn ON during training.	FXB PCB is defective. Line is disconnected.
504	RCV/V.34 (Polling)	B	Polling is rejected from the remote station.	No polling original is set.
505	XMT/V.34 (Polling)	B	Polling XMT is rejected.	No polling original is set.
540	XMT ECM	B	No response after transmitting 3rd CTC or DCN received.	Incompatible interface.
541	XMT ECM	D	No response after transmitting 3rd EOR or received DCN.	Line is faulty. FXB PCB abnormal.
542	XMT ECM	D	No response to the 3rd RR transmitted or received DCN.	Remote unit is abnormal.
543	XMT ECM	D	T5 timer (60 sec.) elapsed without MCF.	Remote unit is abnormal.
544	XMT ECM	D	Stopped Transmission after EOR Transmission.	Line is faulty. FXB PCB abnormal.
550	RCV ECM	C	Timer between frames in phase C has elapsed.	Defective remote station.
554	RCV ECM	D	Transmitted ERR after receiving EOR.	Line is faulty.
555	RCV ECM	D	Transmitted PIN after receiving EOR.	Line is faulty and Operator Call requested by RX side.
570	RCV	B	Password or machine code did not match during remote diagnostic communication.	
571	XMT	B	Remote unit did not have the remote diagnostic function.	
580	XMT	B	Sub-address transmission to a unit that has their DIS bit 49 (NSF bit 155) OFF.	Sub-address transmission to a unit that has no Sub-address function.
581	XMT	B	Sub-address Password transmission to a unit that has their DIS bit 50 (NSF bit 156) OFF.	Sub-address transmission to a unit that has no Sub-address function.

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
582	XMT	B	Sub-address SEP (for Polling) transmission to a unit that has their DIS bit 47 (NSF bit 130) OFF.	Sub-address transmission to a unit that has no Sub-address function.
601	XMT		ADF Door was opened during ADF transmission.	
623	XMT	A	No original was in the ADF. (Built-in dialer engaged)	Operator removed the original from the ADF after dialing was completed. Original was not set properly in the ADF.
630	XMT or RCV (Polling)	B	Redial count over.	No dial tone detected. Sensor dial tone is not detected. (Destination dependent) Busy tone is detected. (Destination dependent) T1 timer (35 ± 5 sec.) elapsed without a signal from the receiver.
631	XMT	A	"STOP" button was pressed during Auto Dialing.	
634	XMT	B	Redial count over with no response or busy tone was not detected. <b>Note:</b> U.S.A. and Canadian models will redial only once if a busy tone is not detected.	Telephone line cable is disconnected. Wrong number is dialed. SC or FXB PCB is abnormal.
638	XMT	LAN	Power turned Off with applicable data in memory or during communication.	Power switched off. Power failure occurred.
700	XMT RCV	PSTN LAN	Communication terminated by Operator pressing the "STOP" key.	
711	RCV	LAN	Incorrect LDAP settings.	LDAP Server Name, LDAP Login Name, LDAP Password and/or LDAP Search Base are incorrect.
712	XMT	LAN	Unknown email address replied from the Mail Server.	Mail Server received an incorrect email address. (Dependent on Server's Mail application)
714	XMT RCV	LAN	LAN Interface error. Cannot logon to the LAN.	The 10Base-T/100Base-TX cable is not connected. An unexpected LAN problem occurred. Check the SC PCB connector.
715	XMT	LAN	TCP/IP connection timed out.	Incorrect IP Address is set. Verify the IP Address, Default Router IP Address, SMTP Server IP Address.
716	XMT	LAN	Cannot logon to the LAN.	Incorrect SMTP Server IP Address is set. No email application is activated on the Mail Server.
717	XMT	LAN	Incomplete SMTP Protocol transmission.	Mail Server's hard disk may be full. Mail Server is defective.

<b>Fax Information Codes</b>				
<b>Code</b>	<b>Mode</b>	<b>Phase</b>	<b>Description of Problem</b>	<b>Cause</b>
718	XMT	LAN	Page Memory Overflow occurred while receiving printing data. The paper size selected within your application to print is larger than the paper size loaded in the Tray(s).	Check the document size and resolution. Ask originator to re-send in a supported size and resolution.
719	RCV	LAN	Received data via LAN is in a format that is not supported.	Ask the originator to re-send with a supported file attachment: * In a TIFF-F format. * Image data conforming to A4/Letter size.
720	POP	LAN	Unable to connect with the POP Server.	Incorrect POP Server Address is set. POP Server is down.
721	POP	LAN	Unable to login to the POP Server.	Incorrect User Name or Password is set.
722	RCV	LAN	Failed to obtain the Network Parameters (such as: IP Address, Subnet Mask, Default Gateway IP Address, etc.) from the DHCP server.	LAN Cable is disconnected. DHCP is not available. (Contact the Network Administrator.)
725	XMT POP	LAN	DNS Server connection timed out.	Incorrect DNS Server Address is set. DNS Server is down.
726	XMT POP	LAN	Received an error response from the DNS Server.	Incorrect POP Server Address is set. Incorrect SMTP Server Address is set.
727	XMT	LAN	Received an Error or No Response from the Remote Internet Fax. (SMTP Direct XMT)	Remote Internet Fax Errors: Busy or Job Number Overflow for Relay XMT. (Retry is possible)
728	XMT	LAN		Remote Internet Fax Errors: Memory Overflow or No Power. (Retry is not possible)
729	XMT	LAN	Failed to authenticate (SMTP AUTHENTICATION) when connecting with the SMTP server.	SMTP AUTHENTICATION, User Name and/or Password are incorrect. (Contact the Network Administrator.)
730	RCV	LAN	Unable to program the Internet parameters or the autodialer via Email from a PC.	Verify that the Fax Parameter #158 is set to Valid.
731	RCV	LAN	Dialer full while Relayed Transmission Request was received.	Dial buffer for manual number dialing (70 stations) is being used.
741	XMT, Polling	PSTN	Unable to dial	Deleted the registered station name before dialing with Timer Controlled Communications, etc.
800	Relay Comm.	PSTN	The machine was requested to relay a document but has no Relay Hub capability.	
814	Conf. XMT Conf. Polling Relay Comm.	PSTN	The remote station does not have Relay XMT nor Confidential Communication capability.	
815	Conf. RCV	PSTN	Mailbox full.	

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
816	Conf. Polled	PSTN	The received Polling Password did not match.	
825	Conf. RCV Conf. Polled	PSTN	Parameter settings of the remote station are not properly set.	
870	MEM XMT MEM RCV	PSTN LAN	Memory overflow occurred while storing documents into memory.	Memory overflow on the Fax.
871	MEM XMT MEM RCV	PSTN LAN	Memory management file number and page number exceeded while storing documents into memory.	File number and page number overflow on the Fax.
880	-	-	File Access Error.	
884	-	-	File Access Error.	
961	RCV	LAN	Memory file access error.	SC PCB is defective.
962	XMT	PSTN	Memory file access error.	SC PCB is defective.
		LAN	Memory file access error.	SC PCB is defective.

**Note:**

When 2nd G3 option is installed, check FXB PCB or G3B PCB.



## 4.9. Diagnostic Codes (For Facsimile)

The 13-digit Diagnostic Code is provided for the service technician to analyze how the communication was performed. The code is recorded on the Journal.

### Journal Example

***** -JOURNAL- ***** DATE MMM-dd-yyyy ***** TIME 09:39*****									
NO.	COMM.	PAGES	FILE	DURATION	X/R	IDENTIFICATION	DATE	TIME	DIAGNOSTIC
01	OK	001	129	00:00'42	XMT	123 456 789	MMM-dd	01:55	C8649003C0000
									<div style="display: flex; justify-content: space-around; align-items: center;"> <span>↑ 1st digit</span> <span>↑ 13th digit</span> </div>
-----									
- TOSHIBA									
***** - ***** -12345678901234567890- *****									

### 1st Digit: Manufacturer Code

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Manufacturer Code			
0	-			
1	Casio			
2	Canon			
3	Sanyo			
4	Sharp			
5	Tamura			
6	Toshiba			
7	NEC			
8	Oki			
9	Hitachi			
A	Xerox			
B	Fujitsu			
C	Matsushita			
D	Mitsubishi			
E	Murata			
F	Ricoh			

**2nd Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	ID (TSI, CSI, CIG)	RTN	DCN	STOP Button
0	-	-	-	-
1	Received	-	-	-
2	-	Received	-	-
3	Received	Received	-	-
4	-	-	Received	-
5	Received	-	Received	-
6	-	Received	Received	-
7	Received	Received	Received	-
8	-	-	-	Pressed
9	Received	-	-	Pressed
A	-	Received	-	Pressed
B	Received	Received	-	Pressed
C	-	-	Received	Pressed
D	Received	-	Received	Pressed
E	-	Received	Received	Pressed
F	Received	Received	Received	Pressed

**3rd Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Resolution (dpi)	Paper Width		
0	-	A4		
1	S-Fine	A4		
2	400 x 400	A4		
3	300 x 300	A4		
4	-	-		
5	-	-		
6	-	-		
7	-	-		
8	600 x 600	A4		
9	-	-		
A	-	-		
B	-	-		
C	-	-		
D	-	-		
E	-	-		
F	-	-		

**4th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Scanning Rate	Resolution		
0	20 ms/line	Std		
1	5 ms/line	Std		
2	10 ms/line	Std		
3	-	Std		
4	40 ms/line	Std		
5	-	Std		
6	-	Std		
7	0 ms/line	Std		
8	20 ms/line	Fine		
9	5 ms/line	Fine		
A	10 ms/line	Fine		
B	-	Fine		
C	40 ms/line	Fine		
D	-	Fine		
E	-	Fine		
F	0 ms/line	Fine		

**5th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Deferred Comm.	Dialing/RCV	Memory/ Non-Memory	
0	-	Manual Communication	Non-Memory	
1	Used	Manual Communication	Non-Memory	
2	-	Auto Dialing	Non-Memory	
3	Used	Auto Dialing	Non-Memory	
4	-	Auto RCV	Non-Memory	
5	Used	Auto RCV	Non-Memory	
6	-	Remote RCV	Non-Memory	
7	Used	Remote RCV	Non-Memory	
8	-	Manual Communication	Memory	
9	Used	Manual Communication	Memory	
A	-	Auto Dialing	Memory	
B	Used	Auto Dialing	Memory	
C	-	Auto RCV	Memory	
D	Used	Auto RCV	Memory	
E	-	Remote RCV	Memory	
F	Used	Remote RCV	Memory	

**6th Digit**

-: Not used/defined

<b>Fax Diagnostic Codes</b>				
<b>Data</b>	<b>Definition</b>			
	<b>Polling</b>	<b>XMT/RCV</b>	<b>Selective Comm.</b>	<b>Password Comm.</b>
0	-	RCV	Off	Off
1	Yes	RCV	Off	Off
2	-	XMT	Off	Off
3	Yes	XMT	Off	Off
4	-	RCV	On	Off
5	Yes	RCV	On	Off
6	-	XMT	On	Off
7	Yes	XMT	On	Off
8	-	RCV	Off	On
9	Yes	RCV	Off	On
A	-	XMT	Off	On
B	Yes	XMT	Off	On
C	-	RCV	On	On
D	Yes	RCV	On	On
E	-	XMT	On	On
F	Yes	XMT	On	On

**7th Digit**

-: Not used/defined

<b>Fax Diagnostic Codes</b>				
<b>Data</b>	<b>Definition</b>			
	<b>Sub-Address Comm.</b>	<b>Confidential Comm.</b>	<b>Relayed Comm.</b>	<b>Turnaround Polling</b>
0	-	-	-	-
1	Yes	-	-	-
2	-	Yes	-	-
3	Yes	Yes	-	-
4	-	-	Yes	-
5	Yes	-	Yes	-
6	-	Yes	Yes	-
7	Yes	Yes	Yes	-
8	-	-	-	Yes
9	Yes	-	-	Yes
A	-	Yes	-	Yes
B	Yes	Yes	-	Yes
C	-	-	Yes	Yes
D	Yes	-	Yes	Yes
E	-	Yes	Yes	Yes
F	Yes	Yes	Yes	Yes

**8th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Advanced Comm.	Cover Sheet XMT		
0	-	-		
1	Report XMT	-		
2	Check & Call	-		
3	-	-		
4	Memory Transfer	-		
5	-	-		
6	-	-		
7	-	-		
8	-	Yes		
9	Report XMT	Yes		
A	Check & Call	Yes		
B	-	Yes		
C	Memory Transfer	Yes		
D	-	Yes		
E	-	Yes		
F	-	Yes		

**9th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Short Protocol	Standard/ Non-Standard		
0	-	Standard		
1	-	Standard		
2	-	Standard		
3	-	Standard		
4	-	Standard		
5	-	Standard		
6	-	Standard		
7	-	Standard		
8	-	Non-Standard		
9	B	Non-Standard		
A	-	Non-Standard		
B	D	Non-Standard		
C	-	Non-Standard		
D	-	Non-Standard		
E	-	Non-Standard		
F	-	Non-Standard		

**10th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Coding	ECM		
0	MH	-		
1	MR	-		
2	MMR	-		
3	-	-		
4	-	-		
5	-	-		
6	-	-		
7	-	-		
8	MH	Yes		
9	MR	Yes		
A	MMR	Yes		
B	-	-		
C	-	-		
D	-	-		
E	-	-		
F	-	-		

**11th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Symbol Rate (V.34)	V.34		
0	-	-		
1	-	-		
2	-	-		
3	-	-		
4	-	-		
5	-	-		
6	-	-		
7	-	-		
8	2400 sr	Yes		
9	-	-		
A	2800 sr	Yes		
B	3000 sr	Yes		
C	3200 sr	Yes		
D	3429 sr	Yes		
E	-	-		
F	-	-		

**12th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Modem Speed	Modem Speed (V.34)		
0	2400 bps	-		
1	4800 bps	2400 bps		
2	7200 bps	4800 bps		
3	9600 bps	7200 bps		
4	TC 7200 bps	9600 bps		
5	TC 9600 bps	12000 bps		
6	12000 bps	14400 bps		
7	14400 bps	16800 bps		
8	-	19200 bps		
9	-	21600 bps		
A	-	24000 bps		
B	-	26400 bps		
C	-	28800 bps		
D	-	31200 bps		
E	-	33600 bps		
F	-	-		

**13th Digit**

-: Not used/defined

Fax Diagnostic Codes				
Data	Definition			
	Line Status			
0	-			
1	Private Line			
2	-			
3	-			
4	-			
5	-			
6	-			
7	-			
8	-			
9	-			
A	-			
B	-			
C	-			
D	-			
E	-			
F	-			

## 4.10. Troubleshooting (For Printer)

### 4.10.1. Checking the Basics

This section explains how to solve problems including error messages or unexpected printing results.

If the Printing System is not printing or working as expected, and if you are not sure what to do, start your troubleshooting by checking the basics below:

- Ensure that the Ethernet LAN (10Base-T / 100Base-TX) Cable is connected properly
- Ensure that the Internet Parameters are correct
- Ensure that the Unit is turned On
- Ensure that the Paper is set properly in the Unit
- No error message is displayed on the Unit
- Try printing a test page from the printer driver properties dialog box

### 4.10.2. Document Does Not Print Properly

Problem	Possible Solution(s)
Character is not printing in the correct positions or the characters near the edges of the page are missing.	<ul style="list-style-type: none"><li>• Check and specify the paper size and orientation settings in the printer driver to coincide with the application.</li><li>• Check if the specified paper is loaded in the Toshiba Device.</li><li>• Increase the Page Margins in the application. The Toshiba Device requires minimum margins of ¼ inches (5 mm) on all sides.</li></ul>
The font type is incorrect	<ul style="list-style-type: none"><li>• Check if the selected font is installed in the PC.</li><li>• Check if the selected font is being replaced with a proper printer font in the Font Substitution Table of the Printer Driver Properties dialog box.</li><li>• Select "<b>Always use True Type fonts</b>" from the <b>Font</b> tab of the Printer Driver Properties dialog box.</li></ul>
The character is not smooth.	<ul style="list-style-type: none"><li>• Select an outline font instead of a bit map font.</li></ul>
Fine line print cannot be obtained.	<ul style="list-style-type: none"><li>• Select 600 dpi resolution.</li></ul>
Poor photograph print quality.	<ul style="list-style-type: none"><li>• Select 600 dpi resolution.</li></ul>
Different character or symbol from the document is printed.	<ul style="list-style-type: none"><li>• Check if the Toshiba Printing System (PCL) printer driver is selected.</li></ul>
The printer does not print anything or prints irregular images from the middle of the 1 <sup>st</sup> page.	<ul style="list-style-type: none"><li>• Insufficient Printer Page Memory in the Toshiba Device, install an Expansion D-RAM Card or change the resolution to 300 dpi in the <b>Quality</b> tab of the Printer Driver Properties dialog box.</li></ul>
Printing is exceedingly slow.	<ul style="list-style-type: none"><li>• Select the Spool settings "<b>Start printing after first page is spooled</b>" from the <b>Details</b> tab of the Printer Driver Properties dialog box.</li><li>• Select 300 dpi resolution.</li></ul>



#### 4.10.3. Error Message Appears on the PC

Error Message	Possible Solution(s)
Network Print DLL Error.	<ul style="list-style-type: none"><li>• Check if the Toshiba Device is turned "On", and the 10Base-T / 100Base-TX cable is properly connected.</li><li>• Printer Properties may be incorrectly configured. (i.e. Printer Port)</li></ul>
Network Port is Busy.	<ul style="list-style-type: none"><li>• The Toshiba Device may be processing someone's print job, please wait, and try again later.</li><li>• The Toshiba Device is either Transmitting or Receiving an email.</li></ul>
Cannot print because an error is found in the current printer setting.	<ul style="list-style-type: none"><li>• Verify and specify the paper size or orientation to coincide with the application and the printer driver settings.</li></ul>

#### 4.10.4. Error Message Appears on the Unit

Error Message	Possible Solution(s)
Cannot complete print job Image memory overflow	<ul style="list-style-type: none"><li>• The available Sort Memory in the Toshiba Device may not be enough to complete the print job. Either install an optional Sort Memory or change the resolution to 300 dpi in the Printer Driver Properties dialog box.</li></ul>
Cannot complete Confirm print condition	<ul style="list-style-type: none"><li>• The print settings may not be matched for the system. Change the printing settings in the Printer Driver Properties dialog box. i.e. Multi-sized printing.</li></ul>
Cannot print System error	<ul style="list-style-type: none"><li>• Change the resolution to 300 dpi in the Printer Driver properties dialog box.</li></ul>

#### 4.10.5. System Error (CD Drive Related Error During Installation)

Problem	Possible Solution(s)
Cannot read the drive.	<ul style="list-style-type: none"><li>• Insert the CD into the drive and click "Retry".</li></ul>

## 5 Service Modes

### 5.1. Service Modes (For Copier)

These Service Modes are provided to assist the technician in checking for abnormalities in the copier and a means of making adjustments to the Input/Output of major components.

#### 5.1.1. Service Mode Procedure

1. To select the Service Mode

The service mode is selected when “FUNCTION”, “ORIGINAL SIZE” and “3” keys are sequentially pressed, then F1 will appear in the display.

2. To exit the Service Mode

The service mode is reset when the “FUNCTION” and “CLEAR” keys are pressed sequentially.

#### 5.1.2. Copier Service Mode Functions

Service Modes (For Copier)				
Service Mode	Item			Function
F1	Self Test	00	Scanner LED Test	This test is used for checking the Scanner LED.
		01	LCD/LED Test	This test is used for checking the LCD and LEDs.
		02	Page Memory Test	This test is used for checking the Page Memory.
		03	Print Test Pattern 1	Prints the pattern for setting the Paper position alignment.
		04	Print Test Pattern 2	Prints the Slant pattern for setting the Paper position alignment.
		05	Print Test Pattern 3	Prints the Grid pattern for setting the Paper position alignment.
		06	Print Test Pattern 4	Prints the pattern for setting the Duplex Paper position alignment.
F2	Single Copy Test			One sheet is copied when the Start key is pressed.
F3	Continuous Copy Test			Multi copies are made when the Start key is pressed.
F4	Input / Output Status Test			The functioning of Input / Output items (selected item numbers) is checked.
F5	Function Parameters			Various function settings (selected by code numbers) can be changed.
F6	Adjust Parameters			Various function settings (selected by code numbers) can be adjusted.
F7	Electronic Counter			Electronic Counters for Maintenance
F8	Service Adjustment			Perform pseudo-operation of an item (selected by code numbers)
F9	Unit Maintenance			Fax Service Mode Service Alert Tel # Firmware Version Print Device Info.

## F5 / F6 Information List (Sample)

```

*****-F5/F6 INFORMATION LIST-***** DATE MMM-dd-yyyy *** TIME12:01 *** P.01

```

F5-00	. . . . .		F5-50 Auto contrast adj.	Yes
F5-01	Frequency desired	60Hz	F5-51 Dept. Counter (COPY)	No
F5-02	. . . . .		F5-52 Dept. Counter (FAX)	No
F5-03	. . . . .		F5-53 2-sided auto shift	No
F5-04	LSU off timer	5 Sec.	F5-54 . . . . .	
F5-05	. . . . .		F5-55 . . . . .	
F5-06	. . . . .		F5-56 . . . . .	
F5-07	. . . . .		F5-57 . . . . .	
F5-08	. . . . .		F5-58 . . . . .	
F5-09	. . . . .		F5-59 Oper.add toner alarm	Stop
F5-10	Exit Tray Limitation	None	F5-60 Auto Tray selection	Yes
F5-11	. . . . .		F5-61 . . . . .	
F5-12	. . . . .		F5-62 . . . . .	
F5-13	Paper out Indicator	On	F5-63 . . . . .	
F5-14	Paper size (Tray1)	Letter-R	F5-64 Dept. Counter (SCAN)	No
F5-15	Paper size (Tray2)	Letter-R	F5-65 Dept. Counter (PRINT)	No
F5-16	. . . . .		F5-66 . . . . .	
F5-17	. . . . .		F5-67 . . . . .	
F5-18	. . . . .		F5-68 . . . . .	
F5-19	. . . . .		F5-69 Reduce N in 1 space	No
F5-20	ADF	Auto	F5-70 PM cycle	120K
F5-21	. . . . .		F5-71 . . . . .	
F5-22	. . . . .		F5-72 . . . . .	

```

*****-F5/F6 INFORMATION LIST-***** DATE MMM-dd-yyyy *** TIME12:01 *** P.02

```

F6-00	. . . . .		F6-50 T/P Image Density	0
F6-01	. . . . .		F6-51 Photo Image Density	0
F6-02	. . . . .		F6-52 . . . . .	
F6-03	Orig. Registration	0	F6-53 CCD Read Position	0
F6-04	Printer Registration	0	F6-54 Text Mode Contrast	0
F6-05	. . . . .		F6-55 T/P Mode Contrast	0
F6-06	. . . . .		F6-56 Photo Mode Contrast	0
F6-07	Registration Void	6	F6-57 . . . . .	
F6-08	Trail Edge Read Tim.	0	F6-58 . . . . .	
F6-09	Trail Edge Prt Tim.	-6	F6-59 . . . . .	
F6-10	Side Adjust (Bypass)	0	F6-60 . . . . .	
F6-11	Side Adjust (Tray 1)	0	F6-61 . . . . .	
F6-12	Side Adjust (Tray 2)	0	F6-62 . . . . .	
F6-13	. . . . .		F6-63 Lead Edge Read Tim.	0
F6-14	. . . . .		F6-64 Side Edge Read Adj.	0
F6-15	. . . . .		F6-65 . . . . .	
F6-16	. . . . .		F6-66 . . . . .	
F6-17	. . . . .		F6-67 ADF Image Density	0
F6-18	. . . . .		F6-68 . . . . .	
F6-19	. . . . .		F6-69 Stamp Position Adj.	0
F6-20	. . . . .		F6-70 . . . . .	
F6-21	. . . . .		F6-71 ADF Read Scan Pos.	0
F6-22	. . . . .		F6-72 Original Lead ADF:S	0

## Machine Setup Information List (Sample)

\*\*\*\*\*-MACHINE SETUP INFORMATION-\*\*\*\*\* DATE MMM-dd-yyyy \*\*\* TIME12:01 \*\*\* P.01

1.MACHINE INFORMATION

MACHINE NAME : e-STUDIO190F  
 MAC ADDRESS : 08002301D3E5  
 SERIAL NUMBER :

2.FIRMWARE VERSION

SC : BAT208xxAU  
 SC BOOT : V803  
 PNL : V010018  
 SCANNER(SDR) : V00000  
 PRINTER : V00029  
 FAX MODEM : Ver 0801  
 G3B BOARD :  
 PDL FONT1 : CAV00000b  
 SC2 : CAT120810aAU

3.MEMORY CAPACITY

PAGE MEMORY : 32 MB  
 SORT MEMORY : 16 MB  
 FAX MEMRY : 12 MB

4.OPTION

2nd PAPER FEED MODULE : No  
 NETWORK SCANNER : Yes  
 EMAIL : Yes  
 PCL PRINTER : Yes  
 2nd G3 Board : Yes

5.ERROR LOG

TOTAL PRINT COUNT : 503

NO.	DATE & TIME	ERROR CODE	ERROR COUNT	NO.	DATE & TIME	ERROR CODE	ERROR COUNT
01	MMM-dd-yyyy 11:11	J97	XX-00000008				
02	MMM-dd-yyyy 11:31	J44	XX-00000140				
			(See Remarks)				

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\*\*\*\*\* - \*\*\*\*\* - 0001- \*\*\*\*\*

Remarks:

XX-00000140

|  
 |  
 | Page Count

00 : Printer Error  
 02 : Scanner Error

## F7 Total Counter List (Sample)

\*\*\*\*\*-F7 TOTAL COUNTER LIST-\*\*\*\*\* DATE MMM-dd-yyyy \*\*\* TIME12:01 \*\*\* P.01

F7-01	Key Operator ID Code	:	000
F7-02	Total Count	:	295
F7-03	PM Count	:	295
F7-04	Scanner PM Count	:	61
F7-05	. . . . .	:	
F7-06	OPC Drum Count	:	295
F7-07	Process Unit Count	:	295
F7-08	ADF PM Count	:	50
F7-09	. . . . .	:	
F7-10	. . . . .	:	
F7-11	Sheet Bypass Count	:	147
F7-12	1st Paper Tray Count	:	90
F7-13	2nd Paper Tray Count	:	0
F7-14	. . . . .	:	
F7-15	. . . . .	:	
F7-16	2-Sided Count	:	28
F7-29	. . . . .	:	
F7-30	A4R/LTR Count	:	73
F7-31	. . . . .	:	
F7-32	FLS/LG Count	:	0
F7-17	ADF Count	:	26
F7-18	ADF Read Count	:	26
F7-19	Scanner Count	:	61
F7-20	Scanner Read Count	:	18
F7-21	Copy Rint Count	:	59
F7-22	Copy Scan Count	:	180
F7-23	PC Rint Count	:	0
F7-24	PC Scan Count	:	3
F7-24	Fax Transmit Count	:	24
F7-24	Fax Receive Count	:	27
F7-24	Fax Print Count	:	21

Serial Number :

### 5.1.3. F4 Mode: Input/Output Status Test

Set the machine to Service Mode and press "4" key on the Keypad.



Press the "START" key.



Select "1:Check Input" or "2:Check Output" to activate the test then press "START" key.



Press "STOP" key to cancel the test.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.

#### 1. Check Input

F4 Mode (Check Input)											
No.	Function	Condition	Message Display							Remarks	
			7	6	5	4	3	2	1		0
030	ADF B2 Sensor	Original is detected.								1	
	ADF Paper Exit Detection Sensor	Original is detected.							1		
	ADF Cover Open Detection Sensor	Cover is open.				1					
031	ADF Original Sensor	Original is detected.								1	

#### 2. Check Output

Press the "START" key to start and press the "STOP" key to reset.

F4 Mode (Check Output)			
No.	Item	Function	Remark
120	Lamp	When the SDR PCB P705-9 signal level changes to 0V from 3.5V, Lamp operates.	The CIS shall be replaced as the Assembly
160	ADF Paper Feed Motor Rotating (35% speed rotating)	ADF paper feed motor rotates at 35% speed.	
161	ADF Paper Feed Motor Rotating (100% speed rotating)	ADF paper feed motor rotates at 100% speed.	
162	ADF Paper Feed Motor Rotating (400% speed rotating)	ADF paper feed motor rotates at 400% speed.	
163	ADF Paper Feed Motor Reverse Rotating (35% speed rotating)	ADF paper feed motor rotates in reverse at 35% speed.	
164	ADF Paper Feed Motor Reverse Rotating (100% speed rotating)	ADF paper feed motor rotates in reverse at 100% speed.	
165	ADF Paper Feed Motor Reverse Rotating (400% speed rotating)	ADF paper feed motor rotates in reverse at 400% speed.	

<b>F4 Mode (Check Output)</b>			
<b>No.</b>	<b>Item</b>	<b>Function</b>	<b>Remark</b>
175	ADF Stamp Solenoid	When the ADF PCB CN25-2 signal level changes to 0V from +24V, Solenoid operates for 1 second.	

### 5.1.4. F5 Mode: Function Parameters (For Copier)

Set the machine to Service Mode and press "5" key on the Keypad.



Press the "START" key.



Enter the desired code number or press "V", "Λ" arrow keys.



If you wish to select another code number, scroll the menu with the arrow keys.



Press the "SET" key.



Enter the desired function code number and press "SET" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.



Reboot the machine after setting the parameter(s) to activate the setting(s).

F5 Mode			
No.	Item	Function	Default Setting
00	Not Used		
01	Frequency Desired	0 : Auto 1 : 50 Hz 2 : 60Hz	2
02-03	Not Used		
04	LSU Off Timer	1 : 5 sec. 2 : 10 sec. 3 : 15 sec. 4 : 20 sec. 6 : 30 sec. 8 : 40 sec. 10 : 50 sec. 12 : 60 sec.	3
05-09	Not Used		
10	Exit Tray Limitation (Up to 150 Sheets)	0 : None 1 : Accumulate 2 : Job	0
11-12	Not Used		
13	Paper Out Indicator	0 : On 1 : Off	0
14	Paper Size (Tray 1)	4 : A4-R 12 : LEGAL 14 : LETTER-R	14



<b>F5 Mode</b>			
<b>No.</b>	<b>Item</b>	<b>Function</b>	<b>Default Setting</b>
15	Paper Size (Tray 2)	4 : A4-R 12 : LEGAL 14 : LETTER-R	14
16-37	Not Used		
38	Duplex Mode Default	0 : No 1 : 1 to 2 2 : 2 to 2	0
39	Not Used		
40	Double Count	0 : No 2 : LGL	0
41	Count Up Timing	0 : At feed 1 : At exit	1
42	KEY/DEPT. Counter	0 : No 2 : DEPT.	0
43	Key Counter Timing	Same as F5-41	0
44-49	Not Used		
50	Auto Contrast Adj.	0 : No 1 : Yes	1
51	Dept. Counter (COPY)	0 : No 1 : Yes	1
52	Dept. Counter (FAX)	0 : No 1 : Yes	0
53-58	Not Used		
59	Oper. Add Toner Alarm	0 : Stop 1 : Continue	0
60	Auto Tray Selection	0 : No 1 : Yes	1
61-62	Not Used		
63	U13 Clear (for Europe / Others only)	0 : Any keys 1 : Func + 1	0
64	Dept. Counter (SCANNER)	0 : No 1 : Yes	0
65	Dept. Counter (PRINTER)	0 : No 1 : Yes	0
66-68	Not Used		
69	Reduce N in 1 Space	0 : No 1 : Yes	0

F5 Mode			
No.	Item	Function	Default Setting
70	PM Cycle	0 : No 1 : 1.5 K 2 : 2.5 K 3 : 5 K 4 : 10 K 5 : 15 K 6 : 20 K 7 : 30 K 8 : 40 K 9 : 60 K 10 : 85 K 11 : 90 K 12 : 120 K 13 : 150 K 14 : 200 K 15 : 240 K	0
71-78	Not Used		
79	Image Process Method	0 : Error Diffusion 1 : Dither	0
80	Paper Size Priority	4 : A4-R 5 : B5 7 : A5 9 : FLS1 10 : FLS2 12 : LEGAL 14 : LETTER-R	14
81	Foolscap Size	1 : FLS1 2 : FLS2	1
82-83	Not Used		
84	Paper Tray Priority	0 : S > C > B 1 : C > S > B	1
85	Side Void Setting (ADF)	0 : No 1 : Yes	0
86	PM Cycle (Optics)	0 : No 1 : 40 K 2 : 60 K 3 : 120 K 4 : 240 K 5 : 360 K 6 : 480 K 7 : 600 K	0
87	PM Cycle (ADF)	0 : No 1 : 40 K 2 : 60 K 3 : 120 K 4 : 240 K 5 : 360 K 6 : 480 K 7 : 600 K	0
88	USB Port Function	0 : Off 1 : Once 2 : On	0

<b>F5 Mode</b>			
<b>No.</b>	<b>Item</b>	<b>Function</b>	<b>Default Setting</b>
89	LAN Speed/Duplex	0 : Auto 1 : 10 Half 2 : 10 Full 3 : 100 Half 4 : 100 Full	0
90	Beep Sound	0 : Off 1 : Soft 2 : Loud	1
91-94	Not Used		
95	Paper Size (FA) <b>(Factory use only)</b>	0 : Japan 1 : USA/CAN 2 : Europe 3 : Other	1
96-97	Not Used		

### 5.1.5. F6 Mode: Adjust Parameters (For Copier)

Set the machine to Service Mode and press "6" key on the Keypad.



Press the "START" key.



Enter the desired code number or press "V", "Λ" arrow keys.



If you wish to select another code number, scroll the menu with the arrow keys.



Press the "SET" key.



Enter the desired function code number and press "SET" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.



Reboot the machine after setting the parameter(s) to activate the setting(s).

**Note:**

1. The Factory Setting is different for each model.
2. To change the input value +/-, press "<", ">" cursor keys.
3. The machine may accept a (+/-) input value that exceeds the specified Setting Range for the parameters in the table; however, the actual registered value will not exceed the Upper/Lower Limitation value.

F6 Mode			
No.	Item	Remarks	Setting Range
00-03	Not Used		
04	Printer Registration	Delay time is adjusted from registration roller clutch ON.	-50 - +16 0.5mm
05-06	Not Used		
07	Registration Void	Registration void should be adjusted.	0 - +99 0.5mm
08	Not Used		
09	Trail Edge PRT Tim.	Adjustment of trail edge void.	-9 - +15 0.5mm
10	Side Adjust (Bypass)	Adjustment of LSU side-side (Sheet Bypass).	-8 - +7 0.5mm
11	Side Adjust (Tray 1)	Adjustment of LSU side-side (1st Tray).	-8 - +7 0.5mm
12	Side Adjust (Tray 2)	Adjustment of LSU side-side (2nd Tray).	-8 - +7 0.5mm
13-15	Not Used		
16	Side Adjust (ADU)	Adjustment of LSU side-side (ADU).	-8 - +7 0.5mm
17-38	Not Used		
39	LSU Unit PWM Adjust	Adjustment of PWM value of LSU.	-32 - +32
40	Trans Current Side 1	Adjustment of Transfer Current.	-77 - +76 0.15uA

<b>F6 Mode</b>			
<b>No.</b>	<b>Item</b>	<b>Remarks</b>	<b>Setting Range</b>
41-43	Not Used		
44	FAX Laser Duty Adj.	Printer Density Adjustment for FAX. (-) : Darker. (+) : Lighter.	-99 - +99
45	Not Used		
46	PRT Laser Duty Adj.	Printer Density Adjustment for Printer. (-) : Darker. (+) : Lighter.	-99 - +99
47-48	Not Used		
49	TEXT Image Density	Image density adjustment for Text mode. (-) : Darker. (+) : Lighter.	-99 - +99
50	Not Used		
51	PHOTO Image Density	Image density adjustment for Photo mode. (-) : Darker. (+) : Lighter.	-99 - +99
52-53	Not Used		
54	TEXT Mode Contrast	Adjustment of Contrast for Text Mode.	-128 - +127
55	Not Used		
56	PHOTO Mode Contrast	Adjustment of Contrast for Photo Mode.	-128 - +127
57-68	Not Used		
69	Stamp Position Adj.	Adjustment of verification stamp position.	-50 - +50 0.3mm
70-90	Not Used		
91	Original Lead ADF	Adjustment of original detection timing.	-99 - +99 0.3mm
92	Original Trail ADF	Adjustment of trail edge detection timing.	-90 - 127 0.3mm
93-98	Not Used		
99	F5/F6 Initialize	Initialize F5/F6 parameter settings.	

### 5.1.6. F7 Mode: Electronic Counter

Set the machine to Service Mode and press "7" key on the Keypad.



Press the "START" key.



Enter the desired code number or press "V", "Λ" arrow keys.



If you wish to select another code number, scroll the menu with the arrow keys.



Press the "SET" key.



Enter the desired function code number and press "SET" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.



Reboot the machine after setting the parameter(s) to activate the setting(s).

F7 Mode		
No.	Item	Remarks
01	Key Operator ID Code	Key Operator's identification code for access to the counter mode.
02	Total Count	Total count for all copies / prints.
03	PM Count	Preventive Maintenance count.
04-05	Not Used	
06	OPC Drum Count	PM count of recording paper fed through the OPC Drum.
07	Process Unit Count	PM count of recording paper fed through the Process Unit.
08	ADF PM Count	PM count of originals fed through the ADF.
09-10	Not Used	
11	Sheet Bypass Count	Total count of paper fed from the sheet bypass.
12	1st Paper Tray Count	Total count of paper fed from the 1st paper tray.
13	2nd Paper Tray Count	Total count of paper fed from the 2nd paper tray.
14-15	Not Used	
16	2-sided Count	Total count of 2-sided Print.
17	ADF Count	Total count of originals fed through the ADF.
18	ADF Read Count	Total count of originals scanned through the ADF.
19-20	Not Used	
21	Copy Print Count	Total count of copies printed.
22	Copy Scan Count	Total count of copies scanned.
23	PC Print Count	Total count printed from PC.
24	PC Scan Count	Total count scanned to PC.
25	Fax Transmit Count	Total count of Fax transmitted.
26	Fax Receive Count	Total count of Fax received.
27	Fax Print Count	Total count of Fax printed.
28-29	Not Used	
30	A4R / LTR Count	Total count of A4-R / Letter-R Print.

F7 Mode		
No.	Item	Remarks
31	Not Used	
32	FLS / LG Count	Total count of FLS / Legal Print.
99	All Counter Clear	All counters are cleared.

### 5.1.7. F8 Mode: Service Adjustment

Set the machine to Service Mode and press "8" key on the Keypad.



Press the "START" key.



Enter the desired code number or press "V", "Λ" arrow keys.



If you wish to select another code number, scroll the menu with the arrow keys.



Press the "SET" key.



Enter the desired function code number and press "SET" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.



Reboot the machine after setting the parameter(s) to activate the setting(s).

F8 Mode		
No.	Item	Remarks
00-05	Not Used	
06	Error Log View	a) Each time the arrow key is pressed, the machine errors or paper jam codes stored in memory are displayed, beginning with the oldest code. <b>Note:</b> Only the 30 most recent codes are displayed.
07	Error Log Clear	a) Press the Reset key. A Message "Error code can be cleared with the Start key" is displayed on the LCD.* b) Press the Start key.
08-17	Not Used	
18	C18 PRT PWM ADJ.PTN. (LSU PWM Pattern)	Print out the Test Pattern. Proceed when the LSU is replaced.
19-46	Not Used	
47	C47 ADF Scan Test	Place the document on the ADF first. Press START key to begin.
48-54	Not Used	

### 5.1.8. F9 Mode: Unit Maintenance

Set the machine to Service Mode and press "9" key on the Keypad.



Press the "START" key.



Enter the desired code number or press "V", "Λ" arrow keys.



If you wish to select another code number, scroll the menu with the arrow keys.



Press the "SET" key.



Enter the desired function code number and press "SET" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.



Reboot the machine after setting the parameter(s) to activate the setting(s).

F9 Mode						
Service Mode	Item			Remarks		
F9	Unit Maintenance	00	Fax Function Parameter			
		01	Service Alert Tel #		Displays the contact number when a machine malfunction occurs.	
		02	Firmware Version	00	SC	Displays the firmware version for SC.
				01	SC Boot	Displays the firmware version for SC Boot.
				02	PNL	Displays the firmware version for PNL.
				03	Scanner	Displays the firmware version for SDR.
				04	Printer	Displays the firmware version for finisher.
				05	FAX Modem	Displays the firmware version for FAX.
				06	G3B Board	Displays the firmware version for G3B.
				07	SC2	Displays the firmware version for Slot 1.
		03	Print Device Info.	00	F5/F6 Parameters	Prints the memory contents of the F5 and F6 modes.
				01	Machine Information	Prints the machine setup information list.
				02	Counter Information	Prints the Counter information list.
				03	System Address Info.	Prints the system memory setting.
				04	RAM Address Information	Prints the RAM data dump list.
		04	RAM Edit Mode	1	Relative Address	Setting of Relative address.
				2	Absolute Address	Setting of Real address.
		05	Serial Number		Registration of Serial Number for Maintenance. Clears with Shipment Set.	



F9 Mode						
Service Mode	Item				Remarks	
F9	Unit Maintenance	06	RAM Initialize	00	Parameter Initialize	Resets the Fax and Function parameters to default values.
				01	All Job Clear	Clears all Jobs stored in Flash Memory.
				02	LBP Error Log Clear	Clears LBP Error log
				03	Shipment Set	Clears All Jobs, All Preset Data, Parameter Initialize & Resets the Counters (Fax).
				04	LBP Fuser Reset	Clears the LBP fuser error.
				05	Dept. Counter Clear	
				06	Flash Memory Clear	
		07	Firmware Update	00	Update from Card (SD Memory Card)	Updates the firmware in the machine with the Master Firmware SD Memory Card.
				01	Update from USB	Updates the firmware in the machine using a PC via the USB port.
		11	Parameter Backup			Backup the Parameter.
		12	Parameter Restore			Restore the Parameter.
		13	Page Memory Size			Displays the page memory size (MB).
		14	Sort Memory Size			Displays the sort memory size (MB).
		15	SD Card Format (SD Memory Card)			Format the SD Memory Card.

## 5.2. Service Modes (For Facsimile)

### 5.2.1. Fax Service Mode Procedure

1. To enter the Fax Service Mode
  - a. Press "**FUNCTION**" and then "**7**" keys.
  - b. Press "**MONITOR**" four times, then press "**\* (TONE)**".
  - c. Enter the desired code number or press the "**V**", "**^**" arrow keys.
2. To exit the Fax Service Mode  
Press "**STOP**" key.

**Note:**

The following buttons provide these functions in the Service Mode:

- "START": : The new setting value is stored in the machine.  
"V" : Scroll the function parameter number down.  
"^" : Scroll the function parameter number up.

### 5.2.2. FAX Service Mode Table

The following service modes are provided to assist you in setting operational functions of the unit and determining the condition of the unit.

No.	Service Mode	Description
00	Not Used	
01	Function Parameter Setting	Allows changes to the function parameters (the home position, etc.).
02	RAM Edit Mode	<b>Factory use only.</b>
03	Print Parameter List / Report	Prints the Function Parameter List, Page Memory Test, Printer Report, All Document File, Protocol Trace and Toner Order Form.
04	Modem Tests	Generates various binary, tonal and DTMF signals, by the modem.
05	Not Used	
06	RAM Initialize	Initialize RAM and restore the default value of the function parameters. <b>Note:</b> Turn the Power Switch to the <b>OFF</b> and back to the <b>ON</b> position to enable the parameter settings.
07	Not Used	
08	Check & Call	Allows input of information for Service Alert Report, Maintenance Alert Report and Toner Order Form.
09	System Maintenance	Used for Firmware Update, Firmware Backup, Parameter Restore, Parameter Backup, Transferring Firmware from the PC to the Flash Card and Sending a Received File during a fatal printer error.
10	Firmware Version	Displays Firmware Version for SC, SC Boot, Panel, etc.

### 5.2.3. Fax Service Mode 1 (Function Parameter Setting)

Use the following procedure to change the function parameters.

Enter the desired code number and press "START" key.



If you wish to select another code number, scroll the menu with the "V", "Λ" arrow keys.



Select the desired function code and press the "START" key.



When the "CLEAR" key is pressed, the selected code input will not be accepted.



Press "STOP" key, then press "FUNCTION" and "CLEAR" keys sequentially to exit the service mode.

Function Parameter Table			
No.	Parameter	Selections	Function
000	Monitor/Tel Dial	1 = Monitor 2 = Tel/Dial	Selects whether the machine starts to TX automatically during On-Hook dialing. <b>Monitor</b> : Start to TX after pressing START <b>TEL/DIAL</b> : Start to TX automatically
001	Alarm Status	1 = Off 2 = Timer 3 = Constant	Selects the No Paper or No Toner alarm status. <b>OFF</b> : Alarm is disabled. <b>Timer</b> : Alarm will shut off after 6 seconds. <b>Constant</b> : Alarm will not stop until "STOP" is pressed or the error is cleared/ corrected.
002	Stop Comm. JRNL	1 = Off 2 = On	Selects whether the machine prompts to print the COMM. Journal when the printout condition is set to INC and STOP is pressed during communication.
003	Continuous Poll	1 = Off 2 = Stn (Tx only) 3 = Hub (Rx only)	Selects whether the Continuous Polling feature is enabled. <b>Stn</b> : Place the document(s) on the ADF, then press the assigned One-Touch Key to store or add the documents into a polled file. (See Note 1) <b>Hub</b> : When the polling command is initiated, the machine will continuously poll originals from the remote stations until it is interrupted by pressing "STOP".
004	Numeric ID Set	1 = Off (will not accept) 2 = On (accepts)	Selects whether the machine accepts and allows to set or change the Numeric ID.

Function Parameter Table			
No.	Parameter	Selections	Function
005	Destination Code (UF-for Europe / Others only)	000 : Austria 001 : U.K. 002 : Canada 003 : Denmark 004 : Taiwan 005 : Finland 006 : Germany 007 : Netherlands 008 : Italy 009 : Spanish 010 : Hong Kong 011 : Australia 012 : Switzerland 013 : Norway 015 : Portuguese 016 : Ireland 017 : Belgium 018 : Sweden 019 : Turkey 020 : U.S.A. 021 : France 022 : New Zealand 025 : Japan 029 : Poland 030 : Czech 031 : Russia 032 : Greece 033 : Hungary 034 : Indonesia 035 : South Korea 038 : Malaysia 039 : China 045 : Thailand 048 : South Africa 049 : Singapore 050 : Universal 051 : East Euro 999 : Initialize	Specified destinations only.
006	ID Display	1 = Number (Numeric ID) 2 = Chara (Character ID)	Selects the priority of displaying the ID.
007	JRNL Column	1 = Station 2 = RCV'D ID	Selects the contents of the ID to display on the Journal.
008	Monitor	1 = Off 2 = On	Selects whether the Monitor is ON/OFF for monitoring fax signals. <b>(FOR SERVICE USE ONLY)</b>
009	DC Loop	1 = Off (Normal) 2 = On (Off Hook)	Selects a false Off Hook state for back to back communication test.
010	TX Level	00 = 0 dBm ~ 15 = -15 dBm	Selects the TX signal output level, 0 to -15 dBm in 1 dBm steps.

Function Parameter Table			
No.	Parameter	Selections	Function
011	RX Level	1 = -43 dBm 2 = -38 dBm 3 = -33 dBm 4 = -48 dBm	Selects the receiving sensitivity of -33/-38/-43/-48 dBm.
012	DTMF Level	00 = 0 dBm ~ 15 = -15 dBm	Selects the DTMF output level, 0 to -15 dBm in 1 dBm steps.
013	G3 RX EQL	1 = 0dB 2 = 4dB 3 = 8dB 4 = 12dB	Selects the cable equalizer for G3 reception mode, 0dB, 4dB, 8dB or 12dB.
014	G3 TX EQL	1 = 0dB 2 = 4dB 3 = 8dB 4 = 12dB	Selects the cable equalizer for G3 transmission mode, 0dB, 4dB, 8dB or 12dB.
015 ~ 016	Not Used		
017	TX Start	2400 bps 4800 bps 7200 bps 9600 bps TC7200 TC9600 12000 bps 14400 bps	Selects the transmission modem start speed, 14400/12000/TC9600/TC7200/9600/7200/4800/2400 bps. (Press "V" or "Λ" to select the symbol rate.) <b>Note:</b> This parameter is applicable only when communicating with regular G3 machines. When communicating with Super G3 (V.34) machines, use Parameter No. 32.
018	RX Start	2400 bps 4800 bps 7200 bps 9600 bps TC7200 TC9600 12000 bps 14400 bps	Selects the reception modem start speed, 14400/12000/TC9600/TC7200/9600/7200/4800/2400 bps. (Press "V" or "Λ" to select the symbol rate.) <b>Note:</b> This parameter is applicable only when communicating with regular G3 machines. When communicating with Super G3 (V.34) machines, use Parameter No. 33.
019	ITU-T V.34	1 = Off 2 = On 3 = Select	Selects whether the ITU-T V.34 is Off, On or Select. <b>Select:</b> Select whether the ITU-T V.34 is Off or On, when entering Phone Book Dialing Numbers or Manual Number Dialing.
020	ITU-T ECM	1 = Off (Invalid) 2 = On (Valid)	Select the ECM mode.
021	EP Tone	1 = Off (without EP Tone) 2 = On (with EP Tone)	Selects whether to add the echo protect tone on V.29 mode. (Used when Echo Suppression is disabled.) <b>On</b> : Add <b>Off</b> : Do not add
022	Signal Interval	1 = 100 ms 2 = 200 ms 3 = 500 ms	Selects the time interval between the receiving signal and the transmitting signal.
023	TCF Check	1 = Normal (Short) 2 = Long	Selects the TCF check interval Long/Short
024	CED Frequency	1 = 1080 Hz (non ITU-T) 2 = 2100 Hz	Selects the CED frequency 2100/1080 Hz

<b>Function Parameter Table</b>			
<b>No.</b>	<b>Parameter</b>	<b>Selections</b>	<b>Function</b>
025	COMM. Start-Up	1 = First 2 = Second	Selects the communication start-up condition (XMT and Polling). (Used when Echo Suppression is disabled.)
026	Non-Standard	1 = Off (Invalid) 2 = On (Valid)	Selects own mode (e-STUDIO190F mode).
027	Short Protocol B	1 = Off (Invalid) 2 = On (Valid)	Selects the short protocol mode.
028	Short Protocol D	1 = Off (Invalid) 2 = On (Valid)	Selects the short protocol mode. When activated, it allows the machine to automatically store the modem speed for each Auto Dial Number.
029	Remote Diagnostics	1 = Off (will not accept) 2 = On (accepts)	Selects whether the machine accepts Remote Diagnostics from the service station.
030	CED & 300 bps	1 = 75 ms 2 = 1 sec	Selects the pause interval between the CED and the 300 bps signal. (Used when Echo Suppression is disabled.)
031	RTC = EOL x 12	1 = Off (EOLx6) 2 = On (EOLx12)	Selects the RTC signal, EOLx6 or EOLx12.
032	V34 TX Start	2400-33600bps	Selects the transmission modem start speed for V.34 communication, 33600-2400 bps. (Press "V" or "Λ" to select the symbol rate.)
033	V34 RX Start	2400-33600bps	Selects the receiving modem start speed for V.34 communication, 33600-2400 bps. (Press "V" or "Λ" to select the symbol rate.)
034	V34 TX SR	2400-3429sr	Selects the transmission symbol rate for V.34, 3429/3200/3000/2800/2400 sr. (Press "V" or "Λ" to select the symbol rate.)
035	V34 RX SR	2400-3429sr	Selects receiving symbol rate for V.34, 3429/3200/3000/2800/2400 sr. (Press "V" or "Λ" to select the symbol rate.)
036	Not Used		
037	Protocol Display	1 = Off (not displayed) 2 = On (displayed)	Selects whether to display the modem speed during communication. (Press the Job Status Key to display)
038	Not Used		
039	Flash Time	5 = 50 ms ~ 100 = 1000 ms	Selects the pause interval before activating the Flash key.
040	Flash Time (PSTN)	5 = 50 ms ~ 100 = 1000 ms	Selects the pause interval before activating the Flash key. (For Germany, Austria and Czech)
041	Pause Time	1 = 1 sec. ~ 10 = 10 sec.	Selects the pause interval from 1 sec. ~ 10 sec. for dialing through a switchboard or for international calls.
042	Not Used		
043	Redial Interval	0 = no waiting ~ 15 = 15 minutes	Selects the redial interval from 0 to 15 minutes in 1 minute steps.

Function Parameter Table			
No.	Parameter	Selections	Function
044	Redial Count	0 = no redial ~ 15 = 15 times  0 ~ 9 (For Australia Only)	Selects the redial count from 0 to 15 times in 1 step intervals. <b>Note:</b> In order to comply with the TBR21 requirement for the EC destinations, do not select 15 times.
045	Ring Detect Count	1 = 1 ring ~ 9 = 9 rings	Selects the ring detection count from 1 to 9 rings in 1 ring step intervals.
046	On-Hook Time	0 = 0 sec. ~ 90 = 90 sec.	Selects the on-hook time between sequential communication calls in 1 second step intervals.
047	Response Wait Interval	1 = 1 sec. ~ 90 = 90 sec.  20 ~ 150 sec. (For France Only)	Selects the waiting interval for the response after completing the dialing.
048~ 049	Not Used		
050	Ring Detect Mode	1 = Normal 2 = Rough	Selects the quality of ringer detection. Use if the line signal is out of regulation, set to "Rough" so that the unit may detect the ringing signals.
051	Not Used		
052	Pulse Rate	1 = 10 pps 2 = 20 pps	Selects the dial pulse rate 10/20 pps.
053~ 054	Not Used		
055	Busy Tone Check	1 = Off 2 = On	Selects whether to detect the Busy Tone.
056	Dial Tone Check	1 = Off 2 = On	Selects whether to detect Dial Tone before dialing the telephone number.
057	Not Used		
058	Comm. JRNL + Image	1 = Off (without image) 2 = On (with image)	Selects whether the machine prints the COMM. Journal with image.
059	Not Used		
060	Version	Indicates the Host software version.	
061	TX/RX/PRT/CPY	TX:***** PRT:***** RX:***** CPY:*****	Displays the transmitted, received, total printed and copied document count.
062	Print Counter	1 = Off 2 = On	Selects whether to print in the Fax Parameter List, the counter information that is displayed in the Function Parameter No. 61.
063~ 069	Not Used		

Function Parameter Table			
No.	Parameter	Selections	Function
070	Line Error	128 lines 256 lines 512 lines 1024 line 2048 lines Off (will not disconnect line)	1. Selects the line disconnect condition during reception. If the number of line errors exceed this setting, the unit will disconnect the line. Press "V" or "Λ" to select the symbol rate. 2. Selects the transmit condition of RTP/PIP or RTN/PIN. (Available if No.73 Error Detect is set to "LINES") (See Note 1)
071	Total Error	1 = 5% 2 = 10% 3 = 15% 4 = 20%	Selects the transmit condition of RTP/PIP or RTN/PIN. (Available if No.73 Error Detect is set to "RATE".) (See Note 2)
072	Continuous Error	1 = Off (unlimited) 2 = 3 lines/STD 3 = 6 lines/STD 4 = 12 lines/STD	Selects the continuous total error criteria of Off/3/6 or 12 lines in Standard mode. If continuous total error exceeds this setting, the unit will transmit RTN/PIN. (Available if No.73 Error Detect is set to "RATE".)
073	Error Detect	1 = Lines 2 = Rate	Selects the error detect condition Lines/Rate.
074	RTN Receive	1 = Disconnect 2 = Continue	Selects whether to disconnect the phone line or continue when "RTN" is received.
075	Coding	1 = MH (MH only) 2 = MR (MH or MR) 3 = MMR (MH or MR or MMR) 4 = JBIG	Selects the coding scheme.
076	Batch TX	1 = Off 2 = On	Selects whether the batch transmission is available.
077	RX JAM Length	1 = Off (unlimited) 2 = 2 m	Selects the maximum length of a received document that can be printed.
078~ 079	Not Used		
080	Doc Top Feed	-99 ~ +99	Adjusts the distance between the scanning sensor ON position and the scanning start position.
081	Doc End Feed	-90 ~ +127	Adjusts the distance between the scanning sensor OFF position and the scanning end position.
082	JAM Length	1 = 1 m 2 = 2 m	Selects the maximum length of the original that can be scanned.
083	Not Used		
084	Line As No Paper	1 = Ring (ring) 2 = Busy (keep line busy)	Selects whether to ring or send a busy tone to the remote station when the recording paper runs out or the unit cannot receive because of any trouble.
085~ 086	Not Used		
087	Darker Level	0 = Lightest Contrast	Selects the contrast level. 0← →15 Lightest← →Darkest
088	Normal Level	~	
089	Lighter Level	15 = Darkest Contrast	



Function Parameter Table			
No.	Parameter	Selections	Function
090~091	Not Used		
092	Smoothing	1 = Off 2 = On	Selects whether the smoothing function is available.
093 ~ 094	Not Used		
095	Reduction Ratio	(70-100)	Selects Print Reduction Ratio(%).
096 ~ 109	Not Used		
110	MAC Address		Indicates the MAC Address.
111	Not Used		
112	Insert EMAIL TXT	1 = Off 2 = On	Selects whether the Text Template (email message) is programmable and added on all email sent in the message body above the top line of text. (Up to 40 characters Programmed in the User Parameters.) <b>Note:</b> After enabling this feature, aside from entering the text in the User Parameters, it also has to be activated in each Auto Dial Number before it will take effect. It does not work for Direct Dialed Numbers.
113 ~ 114	Not Used		
115	Time Zone	1 = Scroll 2 = Direct	Selects the setting method for Time Zone. <b>Scroll</b> : Allows using "Scroll Keys" to scroll through the Time Zone Table. <b>Direct</b> : Allows you to input the Time Zone directly, (*) key to be used as a switch between +/-.
116	Overwrite Warning	1 = Yes 2 = No	Selects whether the Overwrite Warning is included on the Internet FAX Result Receipt when programming the Auto Dialer via email.
117~121	Not Used		
122	LDAP	1 = Off 2 = On	Selects whether to use the LDAP Server. Special characters used in the LDAP, may not be recognized and display incorrectly.
123	One Ring Sound	1 = Off 2 = On	When Function Parameter No. 45 "Ring Detect Count" is set to 1 Ring, and this parameter is enabled (On), the machine will only ring once out loud, answering on the second ring count.
124 ~ 199	Not Used		
200 ~ 299	-		See Note 5

**Note 1:** Continuous Polling (Station Mode)

This feature allows you to Store or Add documents into a Polled file in memory.

To enable the Continuous Polling feature set the **Function Parameter No. 003** to "**2:STN**" (Station).

Depending on the setting of the **User Parameter (Facsimile) "No. 119: QWERTY KEYBOARD"**, one of the following operations is available:

### 1. One-Touch

The upper "40" (40↑) Key is reserved for "Store 4 Polling" function, and cannot be changed. To prepare document(s) to be polled, simply place the document(s) on the ADF, then press the "-" (40) Key on the Keyboard (40↑ = LOWER Indicator turned OFF) to Store or Add document(s) into a Polled file.

### 2.Quick Name Search

Press "S" (13) Key to search the "Store 4 Polling" name instead. To prepare document(s) to be polled, simply place the document(s) on the ADF and press the "S" (13) Key to search for "Store 4 Polling", then press "START" Key to Store or Add document(s) into a Polled file.

(Note: If a regular polled file is stored in memory, the Program Key for Continuous Polling will not be accepted.)

**Note 2:** Function Parameter No. 070 (Line Error)-Transmit condition of RTP/PIP or RTN/PIN

Signal	Setting					
	1:128	2:256	3:512	4:1024	5:2048	6:Off
MCF/PIP	0-31	0-63	0-127	0-255	0-511	Always
RTP/PIP	32-63	64-127	128-255	256-511	512-1023	-
RTN/PIN	64-127	128-255	256-511	512-1023	1024-2047	-

**Note 3:** Function Parameter No. 071 (Total Error)-Transmit condition of RTP/PIP or RTN/PIN

Signal	Setting			
	1:5%	2:10%	3:15%	4:20%
MCF/PIP	0-2	0-4	0-7	0-9
RTP/PIP	3-4	5-9	8-14	10-19
RTN/PIN	5-	10-	15-	20-

**Note 4:** The default setting of parameters depends on the country's specifications or regulations. Print the Function Parameter List to confirm the default settings.

**Note 5:** 200 Series Function Parameters Only appear when the G3 Communications Port Kit is installed and follow the same numbering order.

#### **5.2.4. Fax Service Mode 3 (Printout of Lists, Reports and Test Results)**

From this Service Mode you can print the Function Parameter List, Page Memory Test, Printer Report, All Document File, Protocol Trace and the Toner Order Form.

##### **5.2.4.1. Function Parameter List**

A list of all Function Parameters can be printed by the following procedure.

Press the "V", "∧" arrow keys to select the "3: Print Report/List" on the display.

↓

Press the "SET" key to select the "1: Function Parameter List".

↓

Press the "SET" key.

↓

Press the "STOP" key twice to exit the service mode.

## Function Parameter List (Sample)

```

***** -FUNCTION PARAMETER- ***** DATE MMM-dd-yyyy ***** TIME 12:07 ***P.01

000 Mon/Tel Dial:[Monitor] Monitor      050 Ring Det Mode:[Normal] Normal
001 Alarm Status:[Timer] Timer          051 -----
002 Stop Comm. JRNL:[On] On             052 Pulse Rate:[10pps] 10pps
003 Continuous Polling:[Off] Off        053 -----
004 Numeric ID Set:[On] On              054 -----
005 -----                               055 Busy Tone Check:[On] On
006 ID Display:[Chara] Chara            056 -----
007 JRNL Column:[Station] Station       057 -----
008 Monitor:[Off] Off                   058 Comm.JRNL +Image:[On] On
009 DC Loop:[Off] Off                   059 -----

010 TX Level:[-11dBm] -11dBm            060 Version: UF-8000 BAT.....
011 RX Level:[-43dBm] -43dBm            061 TX/RX/PRT/CPY: 000080/000168/000003/000000
012 DTMF Level:[-5dBm] -5dBm           062 Print Counter:[Off] Off
013 G3 RX EQL:[0dB] 0dB                 063 -----
014 G3 TX EQL:[0dB] 0dB                 064 -----
015 -----                               065 -----
016 -----                               066 -----
017 TX Start:[14400bps] 14400bps        067 -----
018 RX Start:[14400bps] 14400bps        068 -----
019 ITU-T V.34:[On] On                  069 -----

020 ITU-T ECM:[On] On                   070 Line Error:[128] 128
021 EP Tone:[Off] Off                   071 Total Error:[10] 10
022 Sig. Interval:[500ms] 500ms         072 Conti. Error:[Off] Off
023 TCF Check:[Normal] Normal           073 Error Detect:[Rate] Rate
024 CED Freq.: [2100Hz] 2100Hz          074 RTN Receive:[Discon] Discon
025 Comm. Start-Up:[1'st] 1'st          075 Coding:[JBIG] JBIG
026 Non-Standard:[On] On                 076 Batch TX:[On] On
027 Short Protocol B:[On] On             077 RX JAM Length:[2 m] 2 m
028 Short Protocol D:[On] On             078 -----
029 Remote Diag.: [On] On                079 -----

030 CED & 300bps:[75ms] 75ms           080 Doc Top Feed:[0] 0
031 RTC=EQL x 12:[Off] Off               081 Doc End Feed:[0] 0
032 V34TX Start:[33600bps] 33600bps     082 JAM Length:[2 m] 2 m
033 V34RX Start:[33600bps] 33600bps     083 -----
034 V34 TX SR:[3429sr] 3429sr           084 Line As Nopaper:[Ring] Ring
035 V34 RX SR:[3429sr] 3429sr           085 -----
036 -----                               086 -----
037 Protocol Display:[Off] Off           087 Darker Level:[2] 2
038 -----                               088 Normal Level:[8] 8
039 Flash Time:[500ms] 500ms            089 Lighter Level:[14] 14

040 -----                               090 -----
041 Pause Time:[3sec] 3sec               091 -----
042 -----                               092 Smoothing:[On] On
043 Redial Interval:[3min] 3min          093 -----
044 Redial Count:[5] 5                   094 -----
045 Ring Det. Count:[2] 2                095 Reduction Ratio:[100%] 100%
046 On-Hook Time:[5sec] 5sec             096 -----
047 Response Wait:[55sec] 55sec          097 -----
048 -----                               098 -----
049 -----                               099 -----

```

Note: The power must be reset for the new parameter settings to take effect.

\*\*\*\*\* - \*\*\*\*\* -12345678901234567890- \*\*\*\*\*

**Note:**

1. The contents of the Function Parameter List may vary depending on the country's regulations.
2. " \* " mark will be shown on the left side of number when setting was changed from default.

## Function Parameter List (Sample)

\*\*\*\*\* -FUNCTION PARAMETER- \*\*\*\*\* DATE MMM-dd-yyyy \*\*\*\*\* TIME 12:07 \*\*\*P.02

100 -----	150 -----
101 -----	151 -----
102 -----	152 -----
103 -----	153 -----
104 -----	154 -----
105 -----	155 -----
106 -----	156 -----
107 -----	157 -----
108 -----	158 -----
109 -----	159 -----
110 MAC Address: 08002301D3E5160	-----
111 -----	161 -----
112 Insert EMAIL TXT:[Off] Off62	-----
113 -----	163 -----
114 -----	164 -----
115 Time Zone:[Direct] Direct165	-----
116 Overwrite Warning:[Yes] Yes	166 -----
117 -----	167 -----
118 -----	168 -----
119 -----	169 -----
120 -----	170 -----
121 -----	171 -----
122 LDAP:[On] On	172 -----
123 -----	173 -----
124 -----	174 -----
125 -----	175 -----
126 -----	176 -----
127 -----	177 -----
128 -----	178 -----
129 -----	179 -----
130 -----	180 -----
131 -----	181 -----
132 -----	182 -----
133 -----	183 -----
134 -----	184 -----
135 -----	185 -----
136 -----	186 -----
137 -----	187 -----
138 -----	188 -----
139 -----	189 -----
140 -----	190 -----
141 -----	191 -----
142 -----	192 -----
143 -----	193 -----
144 -----	194 -----
145 -----	195 -----
146 -----	196 -----
147 -----	197 -----
148 -----	198 -----
149 -----	199 -----

Note: The power must be reset for the new parameter settings to take effect.

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\*\*\*\*\* \*\*\*\*\* - \*\*\*\*\* -12345678901234567890- \*\*\*\*\*

**Note:**

1. The contents of the Function Parameter List may vary depending on the country's regulations.
2. "\*" mark will be shown on the left side of number when setting was changed from default.

### 5.2.4.2. Page Memory Test

A test pattern prints out for checking the page memory and printer mechanism using the following procedure.

Press the "V", "Λ" arrow keys to select the "3: Print Report/List" on the display.



Press the "SET" key to select the "1: Function Parameter List".



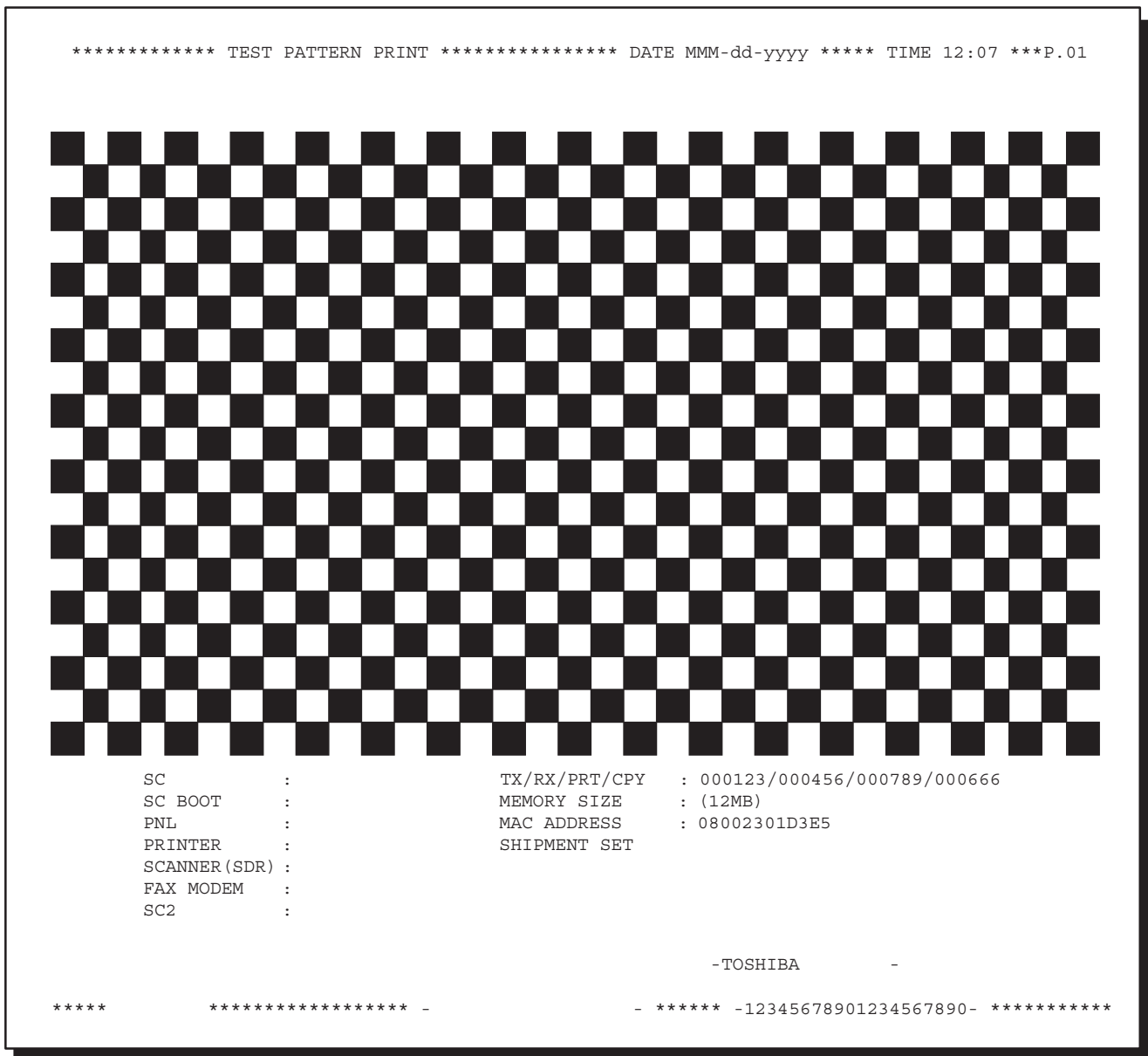
Press the "V", "Λ" arrow keys to select the "3: Page Memory Test".



Press the "SET" key.



Press the "STOP" key twice to exit the service mode.



### 5.2.4.3. Printer Report

All printer errors are logged on the Printer Report which can be printed by the following procedure.

Press the "V", "Λ" arrow keys to select the "3: Print Report/List" on the display.

↓

Press the "SET" key to select the "1: Function Parameter List".

↓

Press the "V", "Λ" arrow keys to select the "4: Printer Report".

↓

Press the "SET" key.

↓

Press the "STOP" key twice to exit the service mode.

```
*****-PRINTER REPORT-***** DATE MMM-dd-yyyy ***** TIME 19:02*****

      LAST PRINT ERROR      : MMM-dd-yyyy 15:38 J00      00-00000016
      SERIAL NUMBER         :
      CUSTOMER ID          : 1234567890123456

      FIRMWARE VERSION
      SC                    :
      PNL                   :
      SCANNER (SDR)         :
      PRINTER               :

      TRANSMIT COUNTER      : 000475
      RECEIVE COUNTER       : 000398
      COPY COUNTER          : 000083
      PRINT COUNTER         : 000016

      NO.DATE & TIME        ERROR CODE RRROR COUNT | NO.DATE & TIME        ERROR CODE RRROR COUNT
      -----
      01.MMM-dd-yyyy 15:38 J00      00-00000016 |
      02.MMM-dd-yyyy 10:48 J02      00-00000016 |
      -----

                                  -TOSHIBA-
*****      ***** - - *****-12345678901234567890-*****
```

#### 5.2.4.4. All Document Files

Print the document files from the Flash Memory.

Press the "V", "Λ" arrow keys to select the "3: Print Report/List" on the display.



Press the "SET" key to select the "1: Function Parameter List".



Press the "V", "Λ" arrow keys to select the "5: All Document Files".



Press the "SET" key.



Press the "STOP" key twice to exit the service mode.



### 5.2.4.5. Protocol Trace

Print a Protocol Trace Report for the previous communication.

Press the "V", "Λ" arrow keys to select the "3: Print Report/List" on the display.

↓

Press the "SET" key to select the "1: Function Parameter List".

↓

Press the "V", "Λ" arrow keys select the "6: Protocol Trace".

↓

Press the "SET" key.

↓

Press the "V", "Λ" arrow keys select the "1: L-1".

↓

Press the "SET" key.

↓

Press the "STOP" key twice to exit the service mode.

```
***** PROTOCOL LOG. REPORT ***** DATE MMM-dd-yyyy ***** TIME 16:56 *****

STATUS      : OK
MODE        : ECM-TX (STANDARD)
SPEED       : 9600bps 0MS/L
REMOTE CAPA. : DIS 00 CE B9 C4 80 12
LOCAL CAPA.  : TSI 2B 20 20 20 38 37 2B 2B 2B 2B
                39 38 36 36 35 34 37 38 38 30
                DCS 00 C6 F8 44

COMMAND LOG.
REMOTE      : NSF  CSI  DIS          CFR
LOCAL       :                TSI  DCS          PIX  PPS-EOP
-----
REMOTE      : MCF
LOCAL       :          DCN

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*****-TOSHIBA -*****-12345678901234567890-*****
```

#### 5.2.4.6. Toner Order Form

The Toner Order Form can be printed out manually by the following procedure.

Press the "V", "Λ" arrow keys to select the "3: Print Report/List" on the display.



Press the "SET" key to select the "1: Function Parameter List".



Press the "V", "Λ" arrow keys to select the "7: Toner Order Form".



Press the "SET" key.



Press the "STOP" key twice to exit the service mode.

\*\*\*\*\*  
 > TONER CARTRIDGE ORDER FORM <  
 \*\*\*\*\*

\*\*\*\* The toner supply in your machine is running low \*\*\*\* (1)  
 To order a replacement Cartridge from your Authorized Dealer

Toshiba Corp. (2)

by Phone: 1 201 111 5555 (3)  
 by Fax: 1 201 111 4444 (4)

Thank you for your order.

Customer Name and Address  
 =====

Ship to: \_\_\_\_\_ Bill to: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Attention: \_\_\_\_\_ Attention: \_\_\_\_\_

Phone No.: \_\_\_\_\_ Phone No.: \_\_\_\_\_

Customer ID: ABC COMPANY (5) P.O. No.(if required): \_\_\_\_\_

Toner Cartridge No.: (6) Serial No.: \_\_\_\_\_

Quantity Required:

\_\_\_\_\_  
 Print your name and title

\_\_\_\_\_  
 Signature & Date

**Explanation of Contents**

- |                               |   |
|-------------------------------|---|
| (1) Low Toner Message (Fixed) | “The toner supply in your machine is running low” |
| (2) Dealer Name               | Up to 25 digits                                   |
| (3) Toner Order Tel #         | Up to 36 digits                                   |
| (4) Toner Order Fax #         | Up to 36 digits                                   |
| (5) Customer ID               | Up to 16 characters (User Identification Code)    |
| (6) Toner Cartridge No.       | Refer to the Supply list                          |

## 5.2.5. Fax Service Mode 4 (Modem Test)

### 5.2.5.1. Binary Signal

This Service Mode is used to check the binary signal output. Signals can be output to the line using the following procedure.

Press the "V", "Λ" arrow keys to select the "4: MODEM Test" on the display.



Press the "SET" key.



Press the "V", "Λ" arrow keys select the "1: LINE-1".



Press the "SET" key to select the "1: Signal Test".



Press the "SET" key.



Press the desired number.



Press the "SET" key.



Press the "STOP" key twice to exit the service mode.

**Binary Signal Table**

<b>Number</b>	<b>Signals</b>
1	V21 300bps
2	V27ter 2400bps
3	V27ter 4800bps
4	V29 7200bps
5	V29 9600bps
6	V17 TC7200bps
7	V17 TC9600bps
8	V17 12000bps
9	V17 14400bps

### 5.2.5.2. Tonal Signal

This Service Mode is used to check the tonal signal output. Signals can be output to the line using the following procedure.

Press the "V", "Λ" arrow keys to select the "4: MODEM Test" on the display.



Press the "SET" key.



Press the "V", "Λ" arrow keys select the "1: LINE-1".



Press the "SET" key to select the "2: Tonal Test".



Press the "SET" key.



Press the desired number and press the "START" key.



Press the "STOP" key twice to exit the service mode.

**Tonal Signal Table**

Number	Signals
1	462 Hz
2	1080 Hz
3	1100 Hz
4	1300 Hz
5	1650 Hz
6	1850 Hz
7	2100 Hz

### 5.2.5.3. DTMF Signal

This Service Mode is used to check the DTMF (Dual Tone Multi Frequency) signal output. The DTMF signal can be generated using the following procedure.

- DTMF Single Tone

Press the "V", "Λ" arrow keys to select the "4: MODEM Test" on the display.



Press the "SET" key.



Press the "V", "Λ" arrow keys select the "1: LINE-1".



Press the "SET" key to select the "3: DTMF Test".



Press the "SET" key.



Press the "V", "Λ" arrow keys to select the "1. Single".



Press the desired number and press the "START" key.



Press the "STOP" key twice to exit the service mode.

- DTMF Dual Tone

Press the "V", "Λ" arrow keys to select the "4: MODEM Test" on the display.



Press the "SET" key.



Press the "V", "Λ" arrow keys select the "1: LINE-1".



Press the "SET" key to select the "3: DTMF Test".



Press the "SET" key.



Press the "V", "Λ" arrow keys to select the "2. Dual".



Press the desired number and press the "START" key.



Press the "STOP" key twice to exit the service mode.

**DTMF Single Tone Table**

Number	DTMF Signal Tones
1	697 Hz
2	770 Hz
3	852 Hz
4	941 Hz
5	1209 Hz
6	1336 Hz
7	1477 Hz
8	1633 Hz

**DTMF Dual Tone Table**

Number	DTMF Dual Tones
0	941 Hz + 1336 Hz
1	697 Hz + 1209 Hz
2	697 Hz + 1336 Hz
3	697 Hz + 1477 Hz
4	770 Hz + 1209 Hz
5	770 Hz + 1336 Hz
6	770 Hz + 1477 Hz
7	852 Hz + 1209 Hz
8	852 Hz + 1336 Hz
9	852 Hz + 1477 Hz
*	941 Hz + 1209 Hz
#	941 Hz + 1477 Hz

#### 5.2.5.4. Binary Signal (V.34)

This Service Mode is used to check the binary signal output. Signals can be output to the line using the following procedure. (V.34)

Press the "V", "Λ" arrow keys to select the "4: MODEM Test" on the display.



Press the "SET" key.



Press the "V", "Λ" arrow keys select the "1: LINE-1".



Press the "SET" key to select the "4: V34 MODEM".



Press the "SET" key.



Press the desired number and press the "START" key.



Press the "STOP" key twice to exit the service mode.

**Binary Signal Table**

Number	Signals	Number	Signals	Number	Signals
01	V34 2400 sr 2400 bps	22	V34 3000 sr 9600 bps	43	V34 3429 sr 4800 bps
02	V34 2400 sr 4800 bps	23	V34 3000 sr 12000 bps	44	V34 3429 sr 7200 bps
03	V34 2400 sr 7200 bps	24	V34 3000 sr 14400 bps	45	V34 3429 sr 9600 bps
04	V34 2400 sr 9600 bps	25	V34 3000 sr 16800 bps	46	V34 3429 sr 12000 bps
05	V34 2400 sr 12000 bps	26	V34 3000 sr 19200 bps	47	V34 3000 sr 19200 bps
06	V34 2400 sr 14400 bps	27	V34 3000 sr 21600 bps	48	V34 3429 sr 16800 bps
07	V34 2400 sr 16800 bps	28	V34 3000 sr 24000 bps	49	V34 3429 sr 19200 bps
08	V34 2400 sr 19200 bps	29	V34 3000 sr 26400 bps	50	V34 3429 sr 21600 bps
09	V34 2400 sr 21600 bps	30	V34 3000 sr 28800 bps	51	V34 3429 sr 24000 bps
10	V34 2800 sr 4800 bps	31	V34 3200 sr 4800 bps	52	V34 3429 sr 26400 bps
11	V34 2800 sr 7200 bps	32	V34 3200 sr 7200 bps	53	V34 3429 sr 28800 bps
12	V34 2800 sr 9600 bps	33	V34 3200 sr 9600 bps	54	V34 3429 sr 31200 bps
13	V34 2800 sr 12000 bps	34	V34 3200 sr 12000 bps	55	V34 3429 sr 33600 bps
14	V34 2800 sr 14400 bps	35	V34 3200 sr 14400 bps	56	ANSam
15	V34 2800 sr 16800 bps	36	V34 3200 sr 16800 bps	57	CM
16	V34 2800 sr 19200 bps	37	V34 3200 sr 19200 bps	58	JM
17	V34 2800 sr 21600 bps	38	V34 3200 sr 21600 bps	59	INFO0c & TONEB
18	V34 2800 sr 24000 bps	39	V34 3200 sr 24000 bps	60	INFO0c & TONEA
19	V34 2800 sr 26400 bps	40	V34 3200 sr 26400 bps	61	PPh & AC & ALT
20	V34 3000 sr 4800 bps	41	V34 3200 sr 28800 bps		
21	V34 3000 sr 7200 bps	42	V34 3200 sr 31200 bps		

### 5.2.6. Fax Service Mode 6 (RAM Initialization)

Initializes RAM and restores the Function Parameters to their default values.

**Note:**

This operation should be performed when the unit is first installed.

Press the "V", "Λ" arrow keys to select the "6: RAM initialize" on the display.



Press the "SET" key to select the desired Mode number.



Press the "SET" key to initialize RAM.



Press the "STOP" key twice to exit the service mode.

**RAM Initialization Table**

No.	Initialize Mode	Description
01	PARAMETER INITIALIZE	Restores the Fax and Function Parameters to default values. <b>Note:</b> Turn the Power Switch to the <b>OFF</b> and back to the <b>ON</b> position to enable the parameter settings.
02	JOURNAL CLEAR	Clears the Journal contents.
03	AUTO DIAL CLEAR	Clears the One-touch, ABBR Numbers and Phone Books.
04	PROGRAM DIAL CLEAR	Clears the Program keys.
05	LOGO/ID/PSWD CLEAR	Clears the Logo, ID, Polling Password.
06	LBP ERROR LOG CLEAR	Clears the Printer Error Log.
07	SHIPMENT SET	Deletes all setting information, except parameter number 80 and 81, then set default values.
08	FLASH MEMORY CLEAR	Deletes all information in the Flash Memory.
09	ALL JOB CLEAR	Clears all Jobs stored in Flash Memory.



## 5.2.7. FAX Service Mode 8 (Check & Call)

### 5.2.7.1. Overview

This feature enables the Authorized Servicing Dealers to manage and improve the machine maintenance to their customers by alerting them of equipment problems. It also can be used as a Supply Sales Tool by alerting the Dealer that the unit is running Low on Toner. The function overview is as follows:

1. The machine's printer error information is stored in the Printer Report.
2. The printer report can be manually printed when required.
3. When printer errors occurs, the unit can automatically transmit the Service Alert Report to the pre-registered telephone number or email address.
4. When the unit detects Low Toner or PM counter reached the maintenance timing, it can automatically transmit the Maintenance Alert Report to the pre-registered telephone number or email address.

Press the "V", "Λ" arrow keys to select the "08 Check & Call" on the display.



Press the "SET" key to select the desired code number.

(i.e. 01 Service Alert Fax #, input the telephone No. or for an email address, press the "FAX/EMAIL" Mode key and input the email address.)



Press the "SET" key.



Press the "STOP" key twice to exit the service mode.

### 5.2.7.2. Printer Reports

#### • Conditions under which a report can be printed or transmitted

1. Manual print  
The Printer Report can be printed by Service Mode 3. (See Sect. 5.2.4.3.)
2. Automatic transmission/printout
  - a. Service Alert Report  
When the unit detects an Emergency Printer Error, the unit will immediately transmit the Service Alert Report to the pre-registered telephone number or email address. However, the unit will not transmit the Service Alert Report if it finds the same error within the same date in the error log.
  - b. Maintenance Alert Report  
When the unit detects Low Toner, the unit can automatically transmit the Maintenance Alert Report to the pre-registered telephone number or email address. Refer to the Error Code Table.
  - c. Toner Order Form  
When the unit detects Low Toner, the unit can automatically print the Toner Order Form with the pre-registered order information.
  - d. Call Counter Report  
When the printer counter reaches the pre-set number, the unit can automatically transmit the Call Counter Report to the pre-registered telephone number or email address.

#### **Note:**

The Service and Maintenance Alert Reports are managed in the same manner as the normal memory transmission (Retry, Incomplete, File List, Display while it is transmitting, Journal).

<b>Error Code</b>	<b>Log</b>	<b>Tx Report</b>	<b>Remarks</b>
Ex-xx	O	S	Refer to the Mechanical Error Code (E Code) Table. (Sect. 4.7.3.)
E13	O		Out of Toner.
Jxx	O		Refer to the Jam Error Code (J Code) Table. (Sect. 4.7.2.)
Uxx			Refer to the User Error Code (U Code) Table. (Sect. 4.7.1.)
U13	O	M	Low Toner.

**Note:**

TX (Transmission) Report: S = Service Alert Report, M = Maintenance Alert Report

### 5.2.7.3. SERVICE ALERT REPORT FORMAT

```

***** DATE MMM-dd-yyyy ***** TIME 03:47 *****

*****
> SERVICE ALERT REPORT <
*****

LAST PRINT ERROR : MMM-dd-yyyy 20:07 E04-01 00-00000013
SERIAL NUMBER :
(1) CUSTOMER ID : ABC COMPANY
(2) FIRMWARE VERSION
    SC :
    PNL :
    SCANNER (SDR) :
    PRINTER :
(3) COUNTER INFORMATION:
                                CURRENT PM CYCLE
F7-02 Total Count : 13 240000
F7-03 PM COUNT : 13 (-----)
F7-04 ..... :
F7-05 ..... :
F7-06 OPC Drum Count : 13 -----
F7-07 Process Unit Count : 13 (-----)
F7-08 ADF PM Count : 1
F7-10 ..... :
F7-11 Sheet Bypass Count : 13
F7-12 1st Paper Tray Count : 13
F7-13 ..... :
F7-14 ..... :
F7-15 ..... :
F7-16 2-Sided Count : 02
F7-17 ADF Count : 0
F7-18 ADF Read Count : 3
F7-19 ..... :
F7-20 ..... :
F7-21 Copy Print Count : 5
F7-22 Copy Scan Count : 10
F7-23 PC Print Count : 9
F7-24 PC Scan Count : 9
F7-25 FAX Transmit Count : 9
F7-26 FAX Receive Count : 3
F7-27 FAX Print Count : 4
F7-28 ..... :
F7-29 ..... : 0
F7-30 A4R/LTR Count : 6
F7-31 ..... :
F7-32 FLS/LG Count : 0

(4) PRINT ERROR:
NO. DATE & TIME ERROR CODE ERROR COUNT | NO. DATE & TIME ERROR CODE ERROR COUNT
-----|-----
01 MMM-dd-yyyy 20:07 E04-01 00-00000013 |
02 MMM-dd-yyyy 20:04 E04-01 00-00000013 |
-----|-----

                                -LOGO TOSHIBA -
***** ***** -CHARACTER ID - ***** -31415926535897932384-*****

```

#### Explanation of Contents

- (1) Customer ID
- (2) Firmware Version
- (3) Counter Information
- (4) Print Error

Last 30 records (Latest on top)

## 5.2.7.4. MAINTENANCE ALERT REPORT FORMAT

```

***** DATE MMM-dd-yyyy ***** TIME 12:00 *****
*****
> MAINTENANCE ALERT REPORT <
*****

LAST PRINT ERROR : MACHINE IS RUNNING OUT OF TONER (1)

SERIAL NUMBER      :
CUSTOMER ID        : ABC COMPANY (2)

FIRMWARE VERSION   (3)
SC                 :
PNL                :
SCANNER (SDR)     :
PRINTER           :

TRANSMIT COUNTER   : 000244 (4)
RECEIVE COUNTER   : 000082
COPY COUNTER       : 000000
PRINT COUNTER      : 000000

NO.DATE & TIME      ERROR CODE  ERROR COUNT   NO.DATE & TIME      ERROR CODE  ERROR COUNT
-----
-----

-LOGO TOSHIBA -

***** -CHARACTER ID - ***** -31415926535897932384-*****

```

### Explanation of Contents

- |  |  |
|--|--|
| (1) Low Toner Message (Fixed)                        | “MACHINE IS RUNNING OUT OF TONER”              |
| (2) Customer ID                                      | Up to 16 characters (User Identification Code) |
| (3) Firmware Version                                 |  |
| (4) Transmission / Reception / Copy / Print Counters |  |

## 5.2.7.5. CALL COUNTER REPORT

```

***** DATE MMM-dd-yyyy ***** TIME 03:47 *****

*****
> SCHEDULED REPORT - CALL COUNTER HAS REACHED PRE-SET VALUE <
*****

LAST PRINT ERROR : MMM-dd-yyyy 20:07 E04-01 00-00000013

SERIAL NUMBER :
(1) CUSTOMER ID : ABC COMPANY

(2) FIRMWARE VERSION
    SC :
    PNL :
    SCANNER (SDR) :
    PRINTER :

(3) COUNTER INFORMATION:

CURRENT PM CYCLE
F7-02 Total Count : 13 (-----)
F7-03 PM COUNT : 13 120000
F7-04 . . . . . :
F7-05 . . . . . :
F7-06 OPC Drum Count : 13 (-----)
F7-07 Process Unit Count : 13 (-----)
F7-08 ADF PM Count : 1
F7-10 . . . . . :
F7-11 Sheet Bypass Count : 0 F7-23 PC Print Count : 0
F7-12 1st Paper Tray Count : 3 F7-24 PC Scan Count : 6
F7-13 . . . . . : 0 F7-25 FAX Transmit Count : 0
F7-14 . . . . . : 0 F7-26 FAX Receive Count : 0
F7-15 . . . . . : 0 F7-27 FAX Print Count : 0
F7-16 2-Sided Count : 0 F7-28 . . . . . : 0
F7-17 ADF Count : F7-29 . . . . . : 0
F7-18 ADF Read Count : 0 F7-30 A4R/LTR Count : 0
F7-19 : 0 F7-31 . . . . . : 0
F7-20 . . . . . : 0 F7-32 FLS/LG Count : 0
F7-21 Copy Print Count : 0
F7-21 Copy Scan Count : 0

Call Counter Pri-set Value : 1

(4) PRINT ERROR:

NO. DATE & TIME ERROR CODE ERROR COUNT | NO. DATE & TIME ERROR CODE ERROR COUNT
-----|-----
01 MMM-dd-yyyy 20:07 E04-01 00-00000013 |
02 MMM-dd-yyyy 20:04 E04-01 00-00000013 |
-----|-----

-LOGO TOSHIBA -
***** -CHARACTER ID - ***** -31415926535897932384-*****

```

### Explanation of Contents

- (1) Customer ID
- (2) Firmware Version
- (3) Counter Information
- (4) Call Counter Pre-Set Value

## 5.2.8. Service Mode 9 (System Maintenance)

### 5.2.8.1. Overview

This Service Mode is used to maintain the machine. Use the following procedure for System Maintenance.

Press the "V", "Λ" arrow keys to select the "9: System Maintenance" on the display.



Press the "SET" key to select the "8: Send RCV'D File". The display changes to the Fax Mode.



Select the desired Fax number.



Press "START" to send the Fax.

After the transmission, the machine returns to the Stand-by Mode.

#### Note:

If there is NO File in the machine, this operation will not function.

Press the "STOP" key twice to exit the service mode.

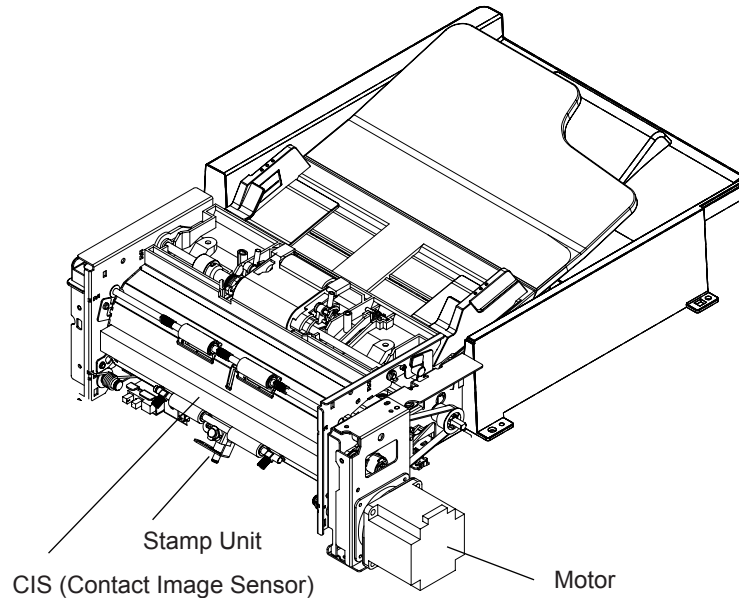
**System Maintenance Table**

No.	Maintenance Mode	Description
08	Send RCV'D File	Transfers documents from memory to another fax machine during a fatal printer error.

## 6 System Description

### 6.1. Transmit Mechanism

The transmit mechanism consists of components which feed, scan and eject documents, as well as send signals. These components and their functions are as follows:



#### 6.1.1. ADF Mechanism

The ADF (Automatic Document Feeder) automatically feeds paper into the unit, and consists of ADF Roller and Separation Roller. The document is placed face up on the Document Tray before being fed into the unit. The ADF Roller feeds individual pages into the scanning area.

The Separation Roller and ADF Pad separates documents placed on the ADF, preventing multiple feeding.

#### 6.1.2. Transmit Guide Unit

The Transmit Guide Unit is an auxiliary part used for feeding and ejecting documents. It consists of the Transmit Guide, Control Panel Chassis, Feed Roller, Eject Roller, and Eject Pinch Roller and Feed Pinch Roller. This unit also provides the white scanning area and serves as a base for electronic white reference.

#### 6.1.3. Transmit Mechanism Drive System

This system feeds documents through the transmitting mechanism, and consists of rollers, gears, belts and a stepper motor.

The motor, a Stepper Motor, controlled by the CPU, drives the ADF Roller, Feed Roller and Eject Roller, with the speed based on the density of the picture information.

The Feed Roller feeds the document to the scanning point and ejects the document out of the machine.

#### 6.1.4. Verification Stamp Unit

The Verification Stamp Unit stamps the "X" mark on the face of the document after the document is successfully transmitted or stored.

#### 6.1.5. Scanner Block

The scanner block consists of the CIS (Contact Image Sensor) Assembly.

The in-line Lens Array focus the image information and pass it to the CIS.

The CIS array converts the image information into the electronic signals.

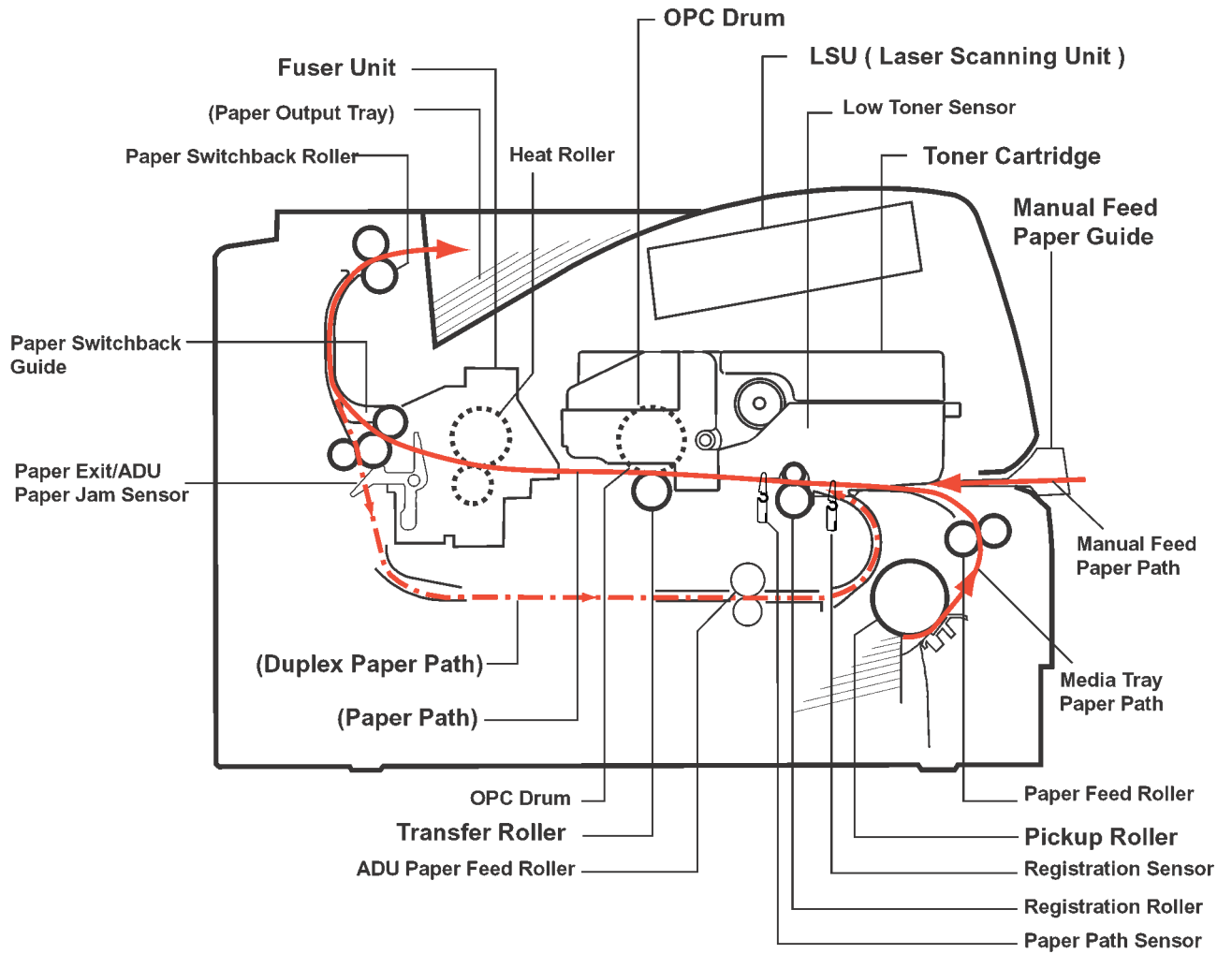
## **6.2. Control Panel**

The Control Panel consists of the PNL PC Board and LCD Unit, which displays the various status messages, and a hard key-type panel, or a membrane-type panel depend on the destinations.

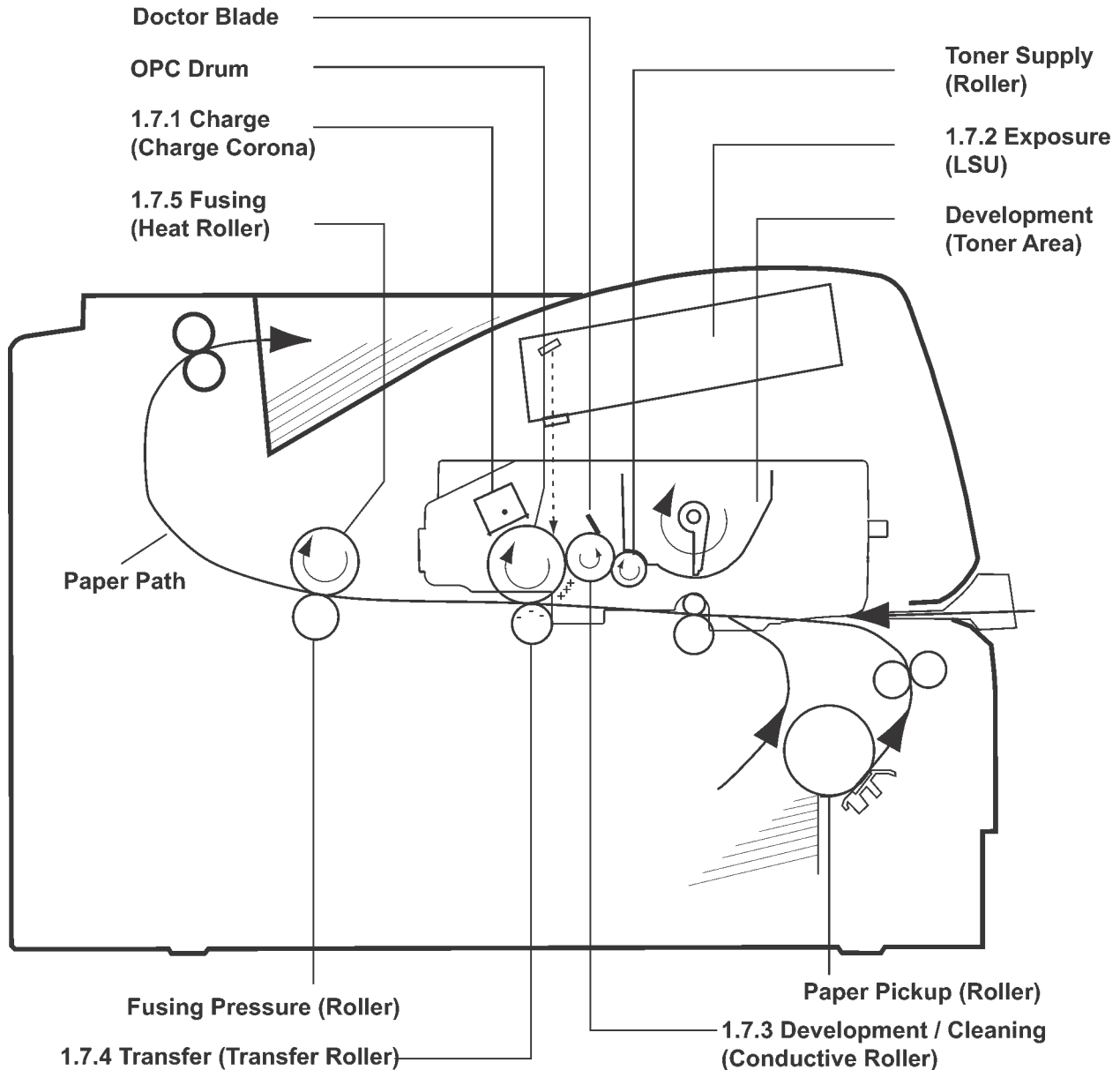


## 6.3. Printer / Receive Mechanism

### 6.3.1. Component Layout and Paper Path



## 6.3.2. Print Process



### 6.3.2.1. Charge

The Charge Corona applies a high, uniform positive charge to the surface of the Organic Photo Conductor (OPC) Drum. The charge level is approximately 900 VDC and remains because the OPC Drum has a high electrical resistance when concealed in darkness.

### 6.3.2.2. Exposure

The laser beam passes through the Collimator Lens, is reflected by the Polygon Mirror, and is focused onto the drum after passing through an image-forming ( $F-\theta$ ) Lens and a Reflection Mirror. Wherever the laser beam strikes the drum, the positive charge dissipates. A latent electrical image of two different voltages potentials, which corresponds to the original page, is formed on the OPC Drum.

### 6.3.2.3. Development / Cleaning

#### Development:

Non-magnetic Toner is supplied to the Conductive Roller by the Toner Supply Roller. The Toner on the Conductive Roller is positively charged by friction with the Toner Supply Roller, and the Doctor Blade ensures a thin layer on the surface of the Conductive Roller. Wherever the Conductive Roller touches the drum, the positively charged toner is attracted to the latent image on the drum, and the latent image is converted to a visible toner image. A bias voltage of approx. 350 VDC is applied to the Conductive Roller to achieve maximum print quality.

**Cleaning:**

After transfer, residual toner remains on the drum surface, and for next printing, the residual toner reaches to the development area via charge and exposure. The charge level of the OPC corresponds to the white background is +900VDC, and the bias voltage of the Conductive Roller is approx. +350VDC. Therefore, the positively charged residual toner on the OPC Drum is attracted and collected to the Conductive Roller. The charge level of OPC after exposure is +100VDC. So, the printing area of the OPC is cleaned.

**6.3.2.4. Transfer**

As the paper is fed between the drum and the Transfer Roller, a high negative charge is applied to the back of the paper. The positive toner particles are then attracted from the drum surface to the paper. After transfer, the paper is separated from the drum surface by the curvature of the drum.

**6.3.2.5. Fusing**

The paper passes through the Fuser Rollers and is subjected to heat and pressure. The fusing temperature is approximately 190°C (374°F), and the pressure is approximately 0.36kg/cm (3.53N/cm). This bonds, or fuses the toner into the paper.

**6.3.3. Paper Feed**

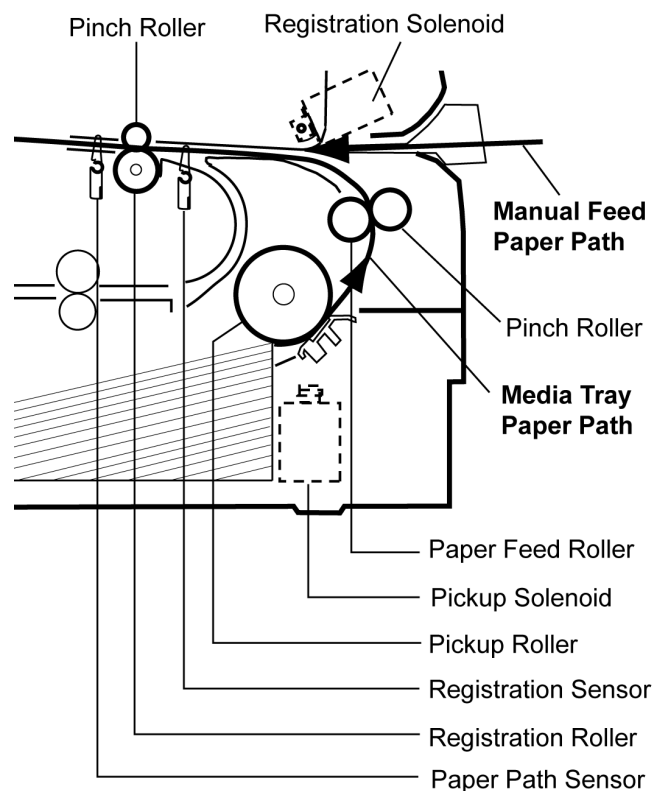
**Media Tray**

The main motor drives the Pick Up Roller after the Pick Up Solenoid is energized, which engages the Pick Up Roller Clutch and feeds a sheet of paper. The paper is pushed to the Paper Feed Roller, which overdrives the paper slightly causing a buckle to ensure the paper is aligned with the stationary Registration Roller.

While triggering the Registration Sensor notifying the CPU paper is ready to feed. The paper at this point is at the same position as with manual feed.

**Manual Feed**

When paper is inserted, it activates the Registration Sensor. At the predetermined period of time, the CPU energizes the Registration Solenoid that allows the Registration Roller to rotate, feeding paper to the Paper Path Sensor.

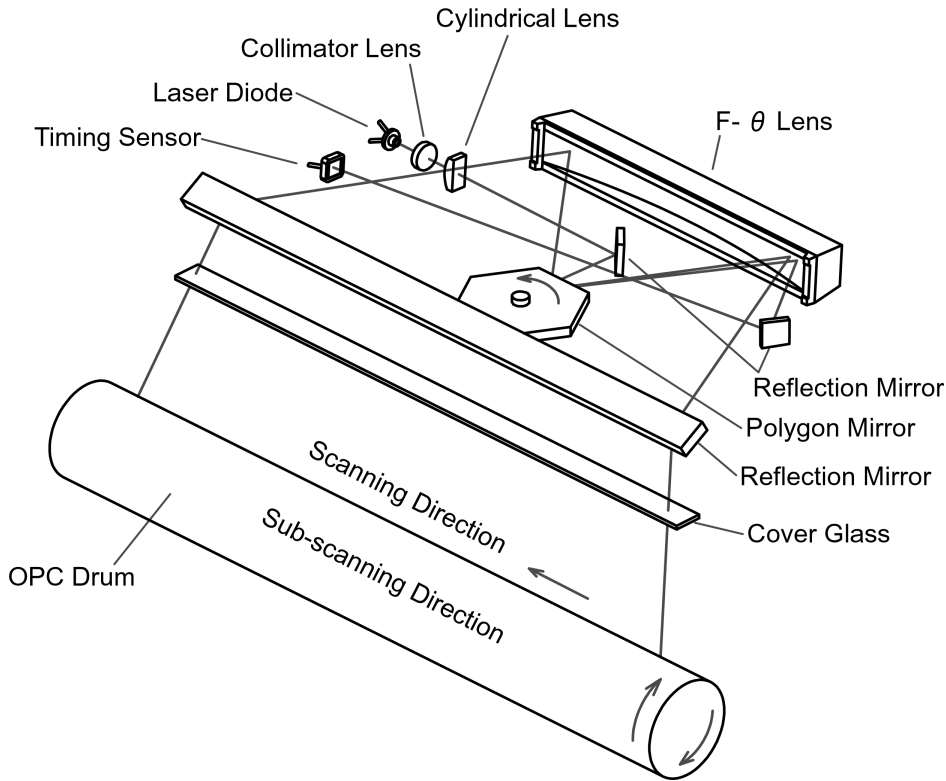


### 6.3.4. Laser Scan Unit (Exposure)

#### 6.3.4.1. Operation Theory

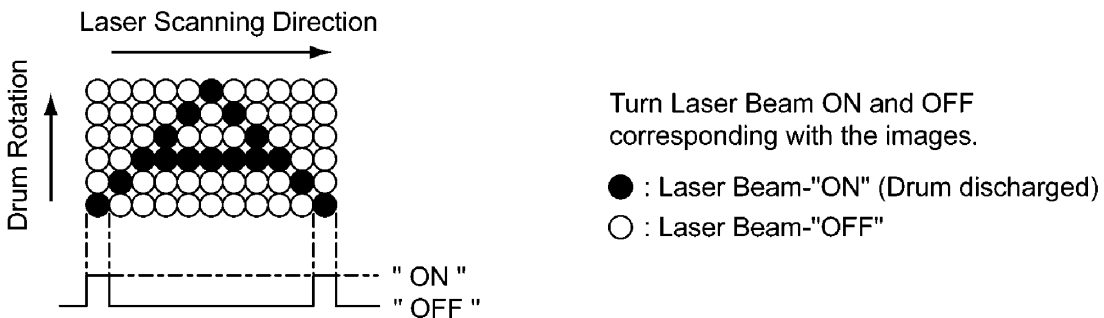
The light beam from the Laser Diode (light source) is modulated by the digital signal (nVIDEO) and converted to parallel light waves by the Collimator Lens. The beam is then sent to the rotating Polygon Mirror (polygon scanner), where it is reflected through the F- $\theta$  Lens and then focused onto the OPC Drum surface. The diameter of the beam is about 80  $\mu\text{m}$ , and the light moves across the surface of the OPC Drum in the scanning direction of right to left. As the drum rotates (sub-scans), a static image is formed where the laser beam touches the drum surface.

The laser beam is also deflected to the Timing Sensor. This sensor controls the start timing of scanning on the drum, providing a consistent left margin. The CPU uses the Timing Sensor to detect abnormal signals.



#### 6.3.4.2. Laser Beam

The laser beam is pulsed On and Off by the digital signal (nVIDEO) to form a latent image of two different voltage potentials on the drum, as shown below.

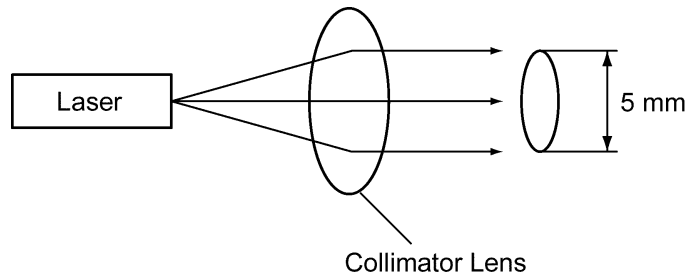


**Laser Diode Specification**

Item	Minimum	Standard	Maximum	
Oscillation Wavelength	770	785	800	nm
Output Light Power (OPC Drum Surface)	0.315	0.350	0.385	mW

**6.3.4.3. Collimator Lens**

The Collimator Lens converts light from the Laser Diode to parallel light. This aids in scanning and provides better convergence to a dot.



**6.3.4.4. Polygon Scanner**

The Polygon Scanner consists of a 6-sided Mirror directly driven by a brushless DC Motor at a rate 20,078.74 rpm. The laser beam is reflected across the OPC Drum by the mirror faces and produces the scan. One mirror face is equal to one main scan. This unit features stable line scanning speed, precision mirror surface reflection angle, reflect-free surfaces, and instant start.

**Polygon Scanner Specifications**

Item	Specification	
Mirror	6	faces
Revolution	20,078.74	rpm

**6.3.4.5. Cylindrical Lens and F-θ Lens**

Each of the Polygon Mirror surfaces has a slight imperfection. This prevents the beam from scanning the OPC Drum surface at the constant interval in the sub-scan direction. The Cylindrical Lens and F-θ Lens are used for correcting this uneven laser scanning.

**6.3.4.6. F-θ Lens**

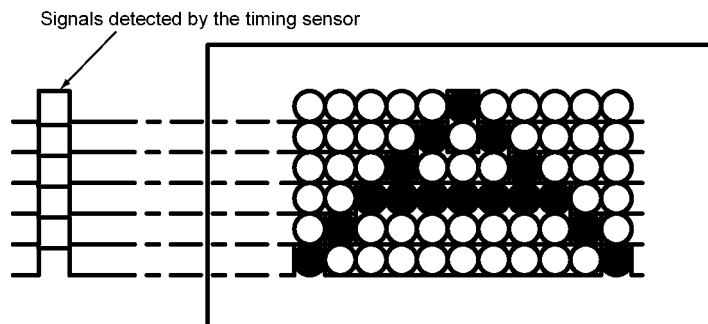
This lens ensures that the beam scans across the surface of the OPC Drum at a constant rate. The beam is refracted to parallel light as it passes through the lens to ensure that the dots at the edge of the drum and at the center of the drum are equally spaced. This lens also provides a set focal length for laser beam.

**F-θ Specifications**

Item	Specification	
Scanning Width	207.43	mm
Focusing Light Spot Size	80 x 90	μm

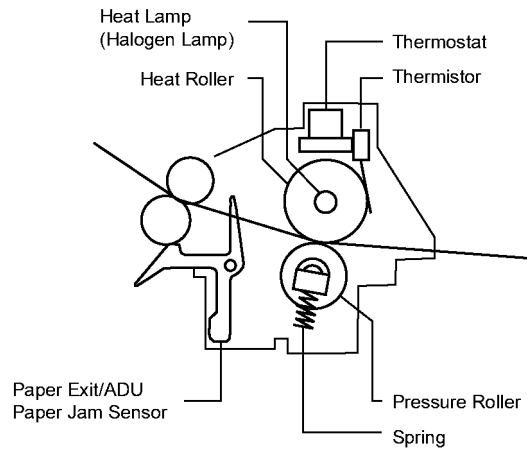
**6.3.4.7. Timing Sensor**

This sensor detects the laser beam and determines the start timing for scanning. A pin photodiode is used as the Timing Sensor.



### 6.3.5. Fuser Unit

A 600W Heat Lamp (Halogen Lamp) heats the surface of the teflon-coated Heat Roller to approximately 190°C (374°F), a Thermistor monitors the Heat Roller temperature, and the CPU controls the ON/OFF timing of the lamp.



The Thermostat is mounted 2.5mm away from the Heat Roller. If the ambient temperature reaches 190°C (374°F), the Thermostat is opened, and power is removed from the Heat Lamp. The surface of the Thermostat is not as hot as that of the Heat Roller. When the Thermostat opens, the surface of the Heat Roller may reach 210°C (410°F), and the system displays E4-01. If the Thermistor opens, the system displays

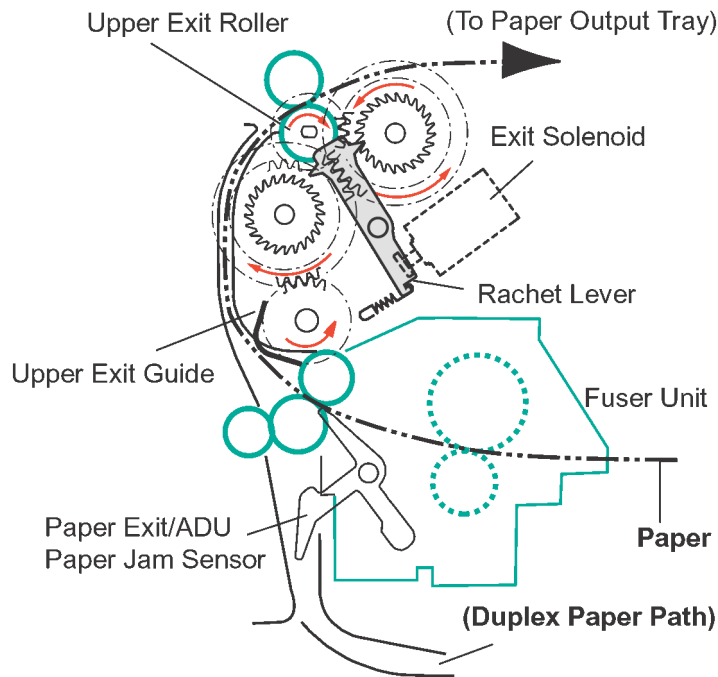
E4-01. If by chance the Thermostat malfunctions a Thermal Fuse opens.

The Pressure Roller is kept in contact with the Heat Roller through 2 pressure springs, which apply a pressure of approximately 0.36 kg/cm (3.56 N/cm). Drive is supplied from the Main Motor via Intermediate Gears.

### 6.3.6. Paper Ejection and Paper Switchback

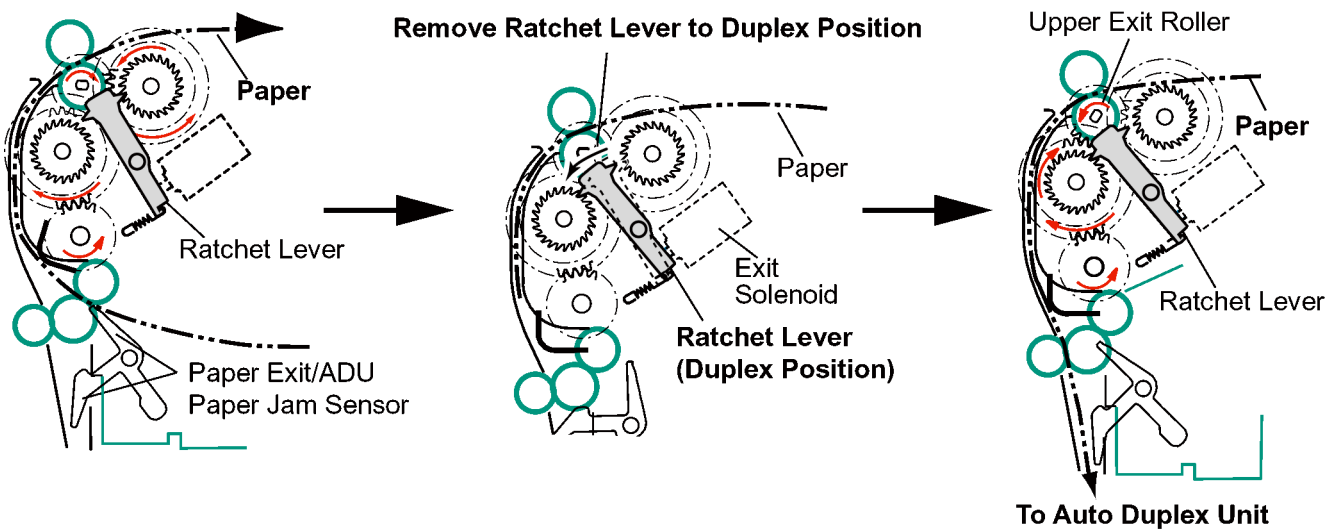
#### A. Normal Printing Mode (Not Duplex Mode)

After fusing, paper is fed to the Output Tray by the Upper Exit Roller and Upper Exit Pinch Roller. The Paper Exit/ADU Paper Jam Sensor detects paper. If paper does not arrive at the sensor within a predetermined period of time, "Jam at A" is displayed, and if paper remains at the sensor beyond a predetermined period, "Jam at B" is displayed on the computer screen. Paper is ejected face down and stored in the Output Tray.



#### B. Duplex Mode

After fusing, paper is fed to the Output Tray by the Upper Exit Roller and Upper Exit Pinch Roller. The Paper Exit/ADU Paper Jam Sensor detects paper. If paper does not arrive at the sensor within a predetermined period of time, "Jam at A" is displayed on the computer screen. At the specified time after the sensor detects the bottom of paper, the Upper Exit Roller rotates in reverse direction, turning on the Exit Solenoid to move the Ratchet Lever to Duplex Position. As a result, the paper is fed to the development area through the Auto Duplex Unit (ADU). If paper remains at the sensor beyond a predetermined period, "Jam at E" is displayed. Paper is ejected face down and stored in the Output Tray.



## 6.4. Signal Waveform

### 6.4.1. Glossary of Electrical Abbreviations

Glossary of Electrical Abbreviations	
Signal Name	Function
+24V	+24 VDC Power Supply
+24VIR	+24 VDC Power Supply
+3.3V	+3.3 VDC Power Supply
+5V	+5 VDC Power Supply
+5V(LD)	+5 VDC through Process Interlock SW
+5VA	+5 VDC Power Supply
+5VB	+5 VDC Power Supply
+5VP	+5 VDC Power Supply
+5VSP	+5 VDC Energy Saver Control
+ACT	ACTIVE Lamp LED Power Supply
+ALM	ALARM Lamp LED Power Supply
+DAT	DATA Lamp LED Power Supply
+SLP	Energy Saver Lamp LED Power Supply
24VGND	Ground
5V(LD)	+5 VDC through Process Interlock SW
5VGND	Ground
A	Motor Control Signal
ACL	AC Power Supply (Live)
ACN	AC Power Supply (Neutral)
ACT[+24V]	DATA Lamp LED Power Supply
ALM[+24V]	ALARM Lamp LED Power Supply
B	Motor Control Signal
BAT+	Lithium Battery
BZCLK	Buzzer Signal Output
CCLK	Serial I/F Clock
CISCLK	CIS Clock
CLK	Scan Data Transmit Clock
CLOCK_OP	CLOCK
CXD	Serial Data Command
DAT[+24]	ACTIVE Lamp LED Power Supply
Dref	Dark Reference Control
EBC3A[20]	System Address Bus
EBC3A[21]	System Address Bus
EBC3A[22]	System Address Bus
EBC3A[23]	System Address Bus
EBC3A[24]	System Address Bus
EBC3A[25]	System Address Bus
EBC3A[26]	System Address Bus
EBC3A[27]	System Address Bus
EBC3A[28]	System Address Bus
EBC3A[29]	System Address Bus
EBC3A[30]	System Address Bus



<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Function</b>
EBC3A[31]	System Address Bus
EBC3D[0]	System Data Bus
EBC3D[1]	System Data Bus
EBC3D[2]	System Data Bus
EBC3D[3]	System Data Bus
EBC3D[4]	System Data Bus
EBC3D[5]	System Data Bus
EBC3D[6]	System Data Bus
EBC3D[7]	System Data Bus
EXITSOL_CTL	Exit Solenoid Control
FANNERR	Fan Error Detection Signal
FANPER	+24VDC Fan Power
FCTL	Fuser ON/OFF Control
GND	Ground
IIC_SCL	IIC-Bus Clock
IIC_SDA	IIC-Bus Data
KIN[0]	PNL Key Signal (Key Line)
KIN[1]	PNL Key Signal (Key Line)
KIN[2]	PNL Key Signal (Key Line)
KIN[3]	PNL Key Signal (Key Line)
KIN[4]	PNL Key Signal (Key Line)
KIN[5]	PNL Key Signal (Key Line)
KIN[6]	PNL Key Signal (Key Line)
KIN[7]	PNL Key Signal (Key Line)
KIN0	PNL Key Signal (Key Line)
KIN1	PNL Key Signal (Key Line)
KIN2	PNL Key Signal (Key Line)
KIN3	PNL Key Signal (Key Line)
LEDb	bLED ON/OFF Control
LEDg	gLED ON/OFF Control
LEDr	rLED ON/OFF Control
MGND	Ground
N.C.	No Connection
n5VMTON	Monitor ON / OFF Select Signal
n5VMVDL0	Monitor Volume Control Signal
n5VMVDL1	Monitor Volume Control Signal
n5VMVDL2	Monitor Volume Control Signal
NA	Motor Control Signal
nADF_DOOR	ADF Door Open/Close signal
nADUST	LSU APC timing
nAPNT	ADF Paper Detection Sensor Signal
NB	Motor Control Signal
nBPNT	ADF Read Point Detection signal
nCBSY	Busy Command
nCHGCTL	HVPS Charge Control (ON/OFF)
nCPNT	ADF Paper Ejection Sensor Signal







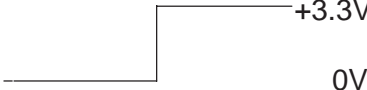
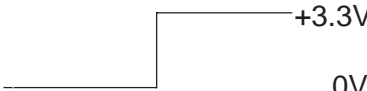

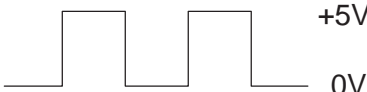

<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Function</b>
nCSMDN	Modem Chip Select Signal
nCTON	Ringer Detection Signal
nDB	Developer (+ Voltage PWM Pulse)
nDBCH	Developer Charge (+/- Change)
nEBCOE	Output Enable
nEBCWBE[0]	Write Control Signal
nEXITSEN	EXIT Sensor Signal
nFXBSET	FXB Detection Signal
nFXBWUP	Wake Up Signal
nHKOF5V	Off-Hook Detection Signal
nHSYNC	Horizontal Synchronization Signal
NIRQOUT	G3B Interrupt Request Signal
nLDON	LD Light Enable
nLED3	PNL LED Control Signal
nLED4	PNL LED Control Signal
nLED5	PNL LED Control Signal
nLED6	PNL LED Control Signal
nLED7	PNL LED Control Signal
nLED8	PNL LED Control Signal
nLED9	PNL LED Control Signal
nLEDACT	ACTIVE Lamp LED Control Signal
nLEDALM	ALARM Lamp LED Control Signal
nLEDDAT	DATA Lamp LED Control Signal
nLEDSLP	Energy Saver Lamp LED Control Signal
nLPOW1	24V/5V Power Control Signal
nLPOW2	Buzzer Signal
nMDMINT	Modem Interruption Signal
nMDMRST	Modem Reset Signal
nMMCTL	Main Motor Control Signal
nMMHALF	Motor Rotation Speed Control
nMMLD	Main Motor Rotation Signal
nMOEN_OP	2nd Feeder Motor Control Signal
nMPON1	Power Save Control
nMPOW1	Power Supply Control Signal
nOPG3B	G3B Detection Signal
nOPTION	2nd Feeder Option Detection Signal
nPNLRST	PNL Reset Signal
nPON_OP	2nd Feeder No Paper Detection Signal
nPRDY	Printer Ready
nPRINT	Print Start
nPUCTL_OP	2nd Feeder Paper Pick up Control
nPURGE	Paper End Detection Signal
nREGSEN	Registration Sensor Signal
nRES	Printer Reset
nSBSY	Busy Status
nSCN[1]	PNL Key Signal (Scan Line)


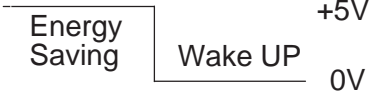
<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Function</b>
nSCN[10]	PNL Key Signal (Scan Line)
nSCN[11]	PNL Key Signal (Scan Line)
nSCN[2]	PNL Key Signal (Scan Line)
nSCN[3]	PNL Key Signal (Scan Line)
nSCN[4]	PNL Key Signal (Scan Line)
nSCN[5]	PNL Key Signal (Scan Line)
nSCN[6]	PNL Key Signal (Scan Line)
nSCN[7]	PNL Key Signal (Scan Line)
nSCN[8]	PNL Key Signal (Scan Line)
nSCN[9]	PNL Key Signal (Scan Line)
nSLPKY	Energy Saver Key Signal
nSNRCLK	LSU Motor Clock
nSNRCTL	LSU Motor Control Signal
nSNRLD	LSU Motor Lock Signal
nSPCWAKE	Wake Up Control
nTECTL	Low Toner LED Control
nTESEN	Low Toner Sensor Signal
nTOP	Paper Top Detection Signal
nTOPSEN	Paper Detect Sensor Signal
nTR	Transfer (- Voltage PWM Pulse)
nTRCTL	HVPS Transfer Control (+/- Change)
nVIDEO	Video Signal
nWAKE	Wake Up Signal
pCMLD	CML ON / OFF Select Signal
PIX	Scanner Serial Data
pLEDBON	bLED ON/OFF Control
pLEDGON	gLED ON/OFF Control
pLEDRON	rLED ON/OFF Control
PNLRXD	PNL Reception Data Signal
PNLTXD	PNL Transmission Data Signal
PNON	No Paper Sensor Signal
pSAVE	Power Save Control Signal
pSDRST	SDR Reset
pSENTIM	Scanner Horizontal Synchronous Signal
pSPKOT	Line Signal Dial Tone
pSREQ	Scanner Request Signal
PUSOL_CTL	Pick Up Solenoid Control
PUSOL_CTL1	Pick Up Solenoid Control
pVREQ	Scanner Vertical Synchronous Request Signal
REGSOL_CTL	Registration Solenoid Control
RESET	G3B Reset Signal
SCLD	IIC-Bus Data
SDAD	IIC-Bus Clock
SDRIIC	IIC-Bus SDR Interrupt
SI	Scan Data Flame Signal
SI3	Scanner Data Frame Signal

<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Function</b>
SIG	Scanner Serial Data
SXD	Serial Data Status
TH	Fuser Thermistor Signal
VDD	Scanner Power Supply (5V)
VLED	LED Power Supply (5V)
ZCIN	Zero Crossing Signal
ZCIN(GND)	Zero Crossing Signal


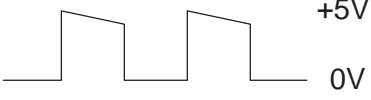


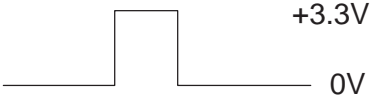

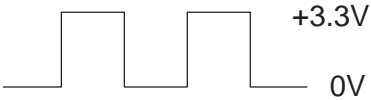

## 6.4.2. SC PC Board

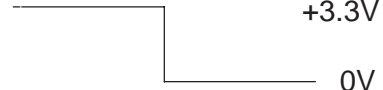
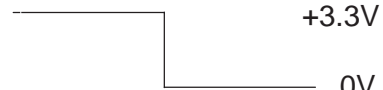

### CN501

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN501-1	+24V	PNL1 PCB CN230-1	 +24V	+24 VDC Power Supply
CN501-2	GND	PNL1 PCB CN230-2	 0V	Ground
CN501-3	GND	PNL1 PCB CN230-3	 0V	Ground
CN501-4	GND	PNL1 PCB CN230-4	 0V	Ground
CN501-5	+5VP	PNL1 PCB CN230-5	 +5V	+5 VDC Power Supply
CN501-6	+5V	PNL1 PCB CN230-6	 +5V	+5 VDC Power Supply
CN501-7	PNLRXD	PNL1 PCB CN230-7	 +3.3V 0V	PNL Reception Data Signal
CN501-8	PNLTXD	PNL1 PCB CN230-8	 +3.3V 0V	PNL Transmission Data Signal
CN501-9	nPNLRST	PNL1 PCB CN230-9	 +5V 0V	PNL Reset Signal
CN501-10	nLPOW2	PNL1 PCB CN230-10	 +5V 0V	Buzzer Signal
CN501-11	nLPOW1	PNL1 PCB CN230-11	 +5V 0V	24V/5V Power Control Signal









SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN501-12	nSLPKY	PNL1 PCB CN230-12		Energy Saver Key Signal
CN501-13	nWAKE	PNL1 PCB CN230-13		Wake Up Signal


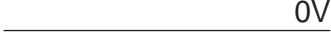


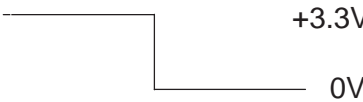


### CN502

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN502-1	GND	SDR PCB P705-1		Ground
CN502-2	PIX	SDR PCB P705-2		Scanner Serial Data
CN502-3	Dref	SDR PCB P705-3		Dark Reference Control
CN502-4	GND	SDR PCB P705-4		Ground
CN502-5	SI3	SDR PCB P705-5		Scanner Data Frame Signal
CN502-6	GND	SDR PCB P705-6		Ground
CN502-7	CISCLK	SDR PCB P705-7		CIS Clock
CN502-8	GND	SDR PCB P705-8		Ground


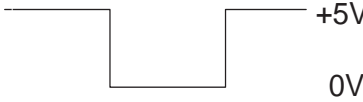
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN502-9	pLEDGON	SDR PCB P705-9		gLED ON/OFF Control
CN502-10	pLEDRON	SDR PCB P705-10		rLED ON/OFF Control
CN502-11	pLEDBON	SDR PCB P705-11		bLED ON/OFF Control

#### CN504


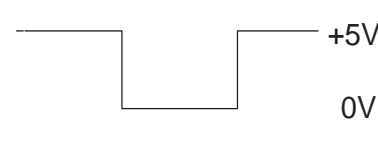

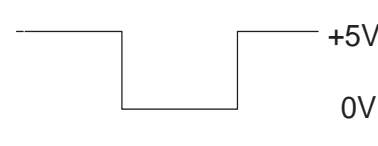

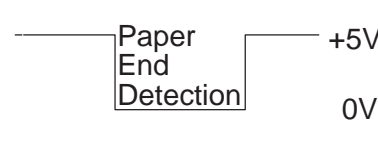

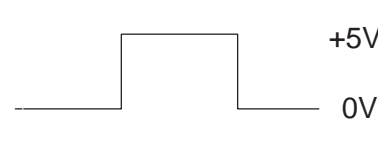
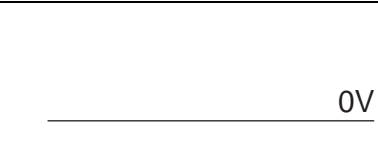
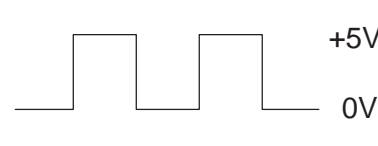
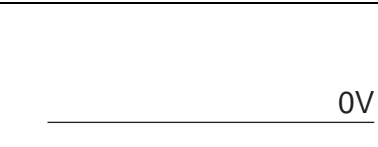
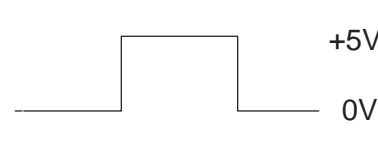
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN504-1	GND	SDR PCB CN704-1		Ground
CN504-2	GND	SDR PCB CN704-2		Ground
CN504-3	+5V	SDR PCB CN704-3		+5 VDC Power Supply
CN504-4	+5V	SDR PCB CN704-4		+5 VDC Power Supply
CN504-5	MGND	SDR PCB CN704-5		Ground
CN504-6	MGND	SDR PCB CN704-6		Ground
CN504-7	+24V	SDR PCB CN704-7		+24 VDC Power Supply
CN504-8	+24V	SDR PCB CN704-8		+24 VDC Power Supply



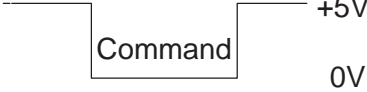


SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN504-9	GND	SDR PCB CN704-9	 0V	Ground
CN504-10	GND	SDR PCB CN704-10	 0V	Ground
CN504-11	+5VA	SDR PCB CN704-11	 +5V	+5 VDC Power Supply
CN504-12	+5VP	SDR PCB CN704-12	 +5V	+5 VDC Power Supply
CN504-13	nMPON1	SDR PCB CN704-13	 +3.3V 0V	Power Save Control
CN504-14	ZCIN	SDR PCB CN704-14		Zero Crossing Signal
CN504-15	GND	SDR PCB CN704-15	 0V	Ground
CN504-16	GND	SDR PCB CN704-16	 0V	Ground

### CN505


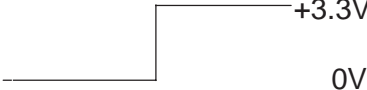
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN505-1	nTOP	Engine Control PCB CN001-24	 Paper Top Detection +5V 0V	Paper Top Detection Signal
CN505-2	ZCIN(GND)	Engine Control PCB CN001-23		Zero Crossing Signal
CN505-3	nSBSY	Engine Control PCB CN001-22	 +5V 0V	Busy Status

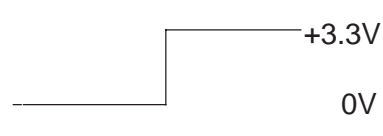
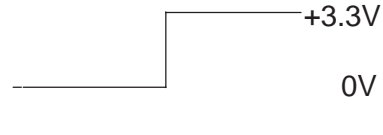
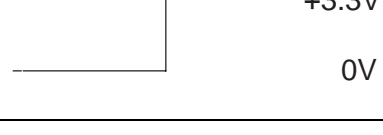
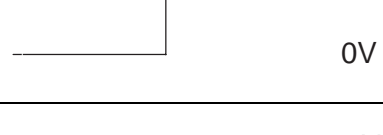
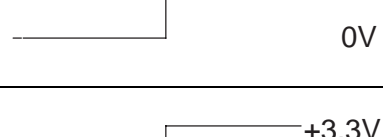
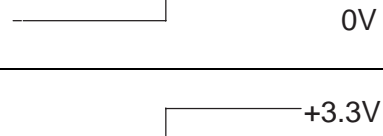
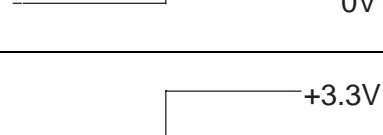
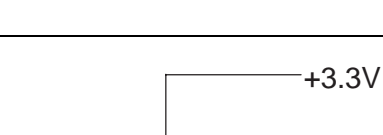
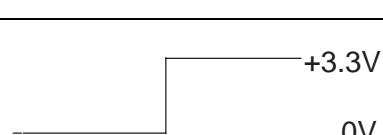
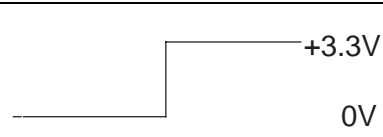



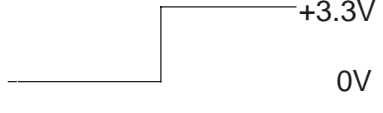
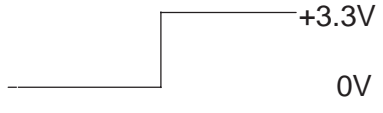
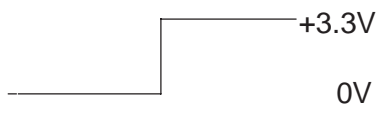




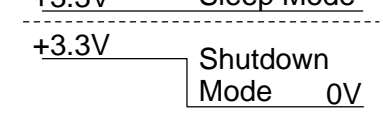

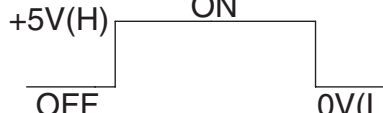
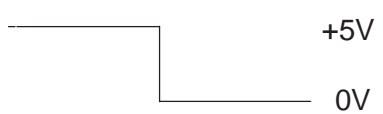
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN505-4	GND	Engine Control PCB CN001-21		Ground
CN505-5	nVIDEO	Engine Control PCB CN001-20		Video Signal
CN505-6	GND	Engine Control PCB CN001-19		Ground
CN505-7	nHSYNC	Engine Control PCB CN001-18		Horizontal Synchronization Signal
CN505-8	nRES	Engine Control PCB CN001-17		Printer Reset
CN505-9	nPURGE	Engine Control PCB CN001-16		Paper End Detection Signal
CN505-10	GND	Engine Control PCB CN001-15		Ground
CN505-11	CXD	Engine Control PCB CN001-14		Serial Data Command
CN505-12	GND	Engine Control PCB CN001-13		Ground
CN505-13	CCLK	Engine Control PCB CN001-12		Serial I/F Clock
CN505-14	GND	Engine Control PCB CN001-11		Ground
CN505-15	SXD	Engine Control PCB CN001-10		Serial Data Status

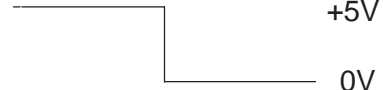
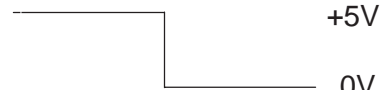





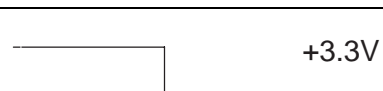
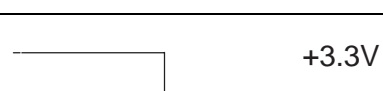


SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN505-16	GND	Engine Control PCB CN001-9		Ground
CN505-17	nPRINT	Engine Control PCB CN001-8		Print Start
CN505-18	N.C.	Engine Control PCB CN001-7		No Connection
CN505-19	nCBSY	Engine Control PCB CN001-6		Busy Command
CN505-20	N.C.	Engine Control PCB CN001-5		No Connection
CN505-21	nPRDY	Engine Control PCB CN001-4		Printer Ready
CN505-22	N.C.	Engine Control PCB CN001-3		No Connection
CN505-23	GND	Engine Control PCB CN001-2		No Connection
CN505-24	pSAVE	Engine Control PCB CN001-1		Power Save Control Signal


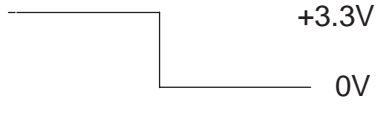
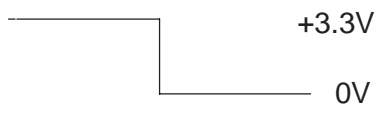
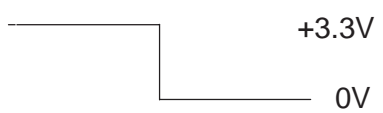
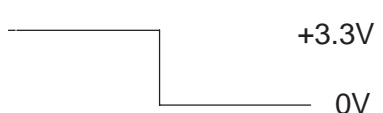
### CN509

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN509-1	EBC3A[27]	FXB PCB CN110-20		System Address Bus
CN509-2	EBC3A[26]	FXB PCB CN110-19		System Address Bus






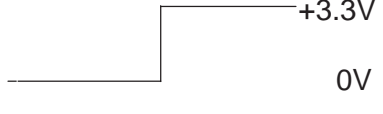
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN509-3	EBC3A[25]	FXB PCB CN110-18		System Address Bus
CN509-4	EBC3A[24]	FXB PCB CN110-17		System Address Bus
CN509-5	EBC3A[23]	FXB PCB CN110-16		System Address Bus
CN509-6	EBC3A[22]	FXB PCB CN110-15		System Address Bus
CN509-7	EBC3A[21]	FXB PCB CN110-14		System Address Bus
CN509-8	EBC3A[20]	FXB PCB CN110-13		System Address Bus
CN509-9	EBC3D[7]	FXB PCB CN110-12		System Data Bus
CN509-10	EBC3D[6]	FXB PCB CN110-11		System Data Bus
CN509-11	EBC3D[5]	FXB PCB CN110-10		System Data Bus
CN509-12	EBC3D[4]	FXB PCB CN110-9		System Data Bus
CN509-13	EBC3D[3]	FXB PCB CN110-8		System Data Bus

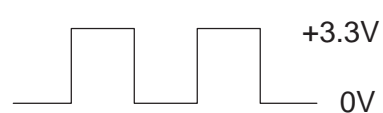


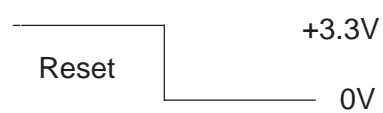


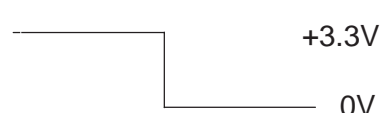
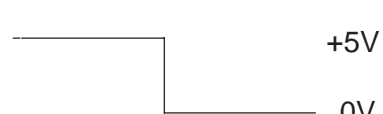
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN509-14	EBC3D[2]	FXB PCB CN110-7		System Data Bus
CN509-15	EBC3D[1]	FXB PCB CN110-6		System Data Bus
CN509-16	EBC3D[0]	FXB PCB CN110-5		System Data Bus
CN509-17	GND	FXB PCB CN110-4		Ground
CN509-18	GND	FXB PCB CN110-3		Ground
CN509-19	+5VP	FXB PCB CN110-2		+5 VDC Power Supply
CN509-20	+24V	FXB PCB CN110-1		+24 VDC Power Supply
CN509-21	+3.3V	FXB PCB CN110-40		+3.3 VDC Power Supply
CN509-22	+5VB	FXB PCB CN110-39		+5 VDC Power Supply
CN509-23	pCMLD	FXB PCB CN110-38		CML ON / OFF Select Signal H : CML On L : CML Off
CN509-24	nHKOF5V	FXB PCB CN110-37		Off-Hook Detection Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN509-25	n5VMVDL2	FXB PCB CN110-36		Monitor Volume Control Signal
CN509-26	n5VMVDL1	FXB PCB CN110-35		Monitor Volume Control Signal
CN509-27	n5VMVDL0	FXB PCB CN110-34		Monitor Volume Control Signal
CN509-28	n5VMTON	FXB PCB CN110-33		Monitor ON / OFF Select Signal
CN509-29	nMDMRST	FXB PCB CN110-32		Modem Reset Signal
CN509-30	nCSMDN	FXB PCB CN110-31		Modem Chip Select Signal
CN509-31	nMDMINT	FXB PCB CN110-30		Modem Interruption Signal
CN509-32	nEBCOE	FXB PCB CN110-29		Output Enable
CN509-33	nEBCWBE[0]	FXB PCB CN110-28		Write Control Signal
CN509-34	BZCLK	FXB PCB CN110-27		Buzzer Signal Output
CN509-35	nFXBWUP	FXB PCB CN110-26		Wake Up Signal

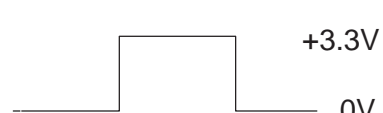
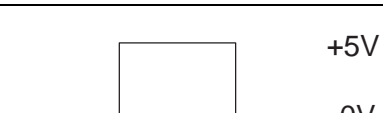
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN509-36	nFXBSET	FXB PCB CN110-25		FXB Detection Signal
CN509-37	EBC3A[31]	FXB PCB CN110-24		System Address Bus
CN509-38	EBC3A[30]	FXB PCB CN110-23		System Address Bus
CN509-39	EBC3A[29]	FXB PCB CN110-22		System Address Bus
CN509-40	EBC3A[28]	FXB PCB CN110-21		System Address Bus


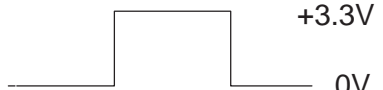


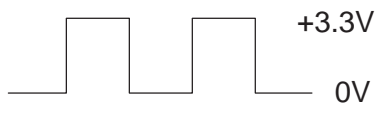
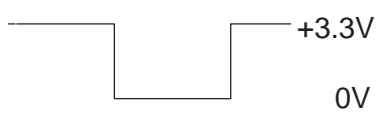
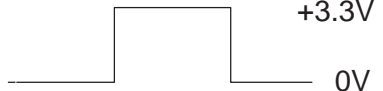

#### CN510

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN510-1	+5VB	G3B PCB CN363-1		+5 VDC Power Supply
CN510-2	+5VP	G3B PCB CN363-2		+5 VDC Power Supply
CN510-3	+3.3V	G3B PCB CN363-3		+3.3 VDC Power Supply
CN510-4	GND	G3B PCB CN363-4		Ground
CN510-5	GND	G3B PCB CN363-5		Ground
CN510-6	SDAD	G3B PCB CN363-6		IIC-Bus Data

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN510-7	SCLD	G3B PCB CN363-7		IIC-Bus Clock
CN510-8	GND	G3B PCB CN363-8		Ground
CN510-9	GND	G3B PCB CN363-9		Ground
CN510-10	RESET	G3B PCB CN363-10		G3B Reset Signal
CN510-11	nOPG3B	G3B PCB CN363-11		G3B Detection Signal
CN510-12	GND	G3B PCB CN363-12		Ground
CN510-13	NIRQOUT	G3B PCB CN363-13		G3B Interrupt Request Signal
CN510-14	nCTON	G3B PCB CN363-14		Ringer Detection Signal

### CN518

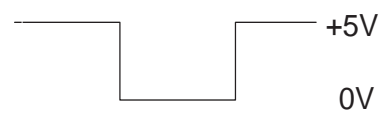

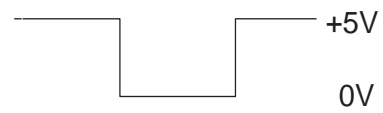

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN518-1	pSENTIM	SDR PCB P716-1		Scanner Horizontal Synchronous Signal
CN518-2	pVREQ	SDR PCB P716-2		Scanner Vertical Synchronous Request Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN518-3	pSREQ	SDR PCB P716-3		Scanner Request Signal
CN518-4	pSDRST	SDR PCB P716-4		SDR Reset
CN518-5	IICSDA	SDR PCB P716-5		IIC-Bus Data
CN518-6	GND	SDR PCB P716-6		Ground
CN518-7	IIC SCL	SDR PCB P716-7		IIC-Bus Clock
CN518-8	nSPCWAKE	SDR PCB P716-8		Wake Up Control
CN518-9	SDRIIC	SDR PCB P716-9		IIC-Bus SDR Interrupt
CN518-10	GND	SDR PCB P716-10		Ground



### 6.4.3. SDR PC Board

#### CN701

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN701-1	nAPNT	Document Sensor-1		ADF Paper Detection Sensor Signal
CN701-2	N.C.	Document Sensor-2		No Connection
CN701-3	+5VP	Document Sensor-3		+5 VDC Power Supply
CN701-4	nCPNT	Ejection Sensor-1		ADF Paper Ejection Sensor Signal
CN701-5	N.C.	Ejection Sensor-2		No Connection
CN701-6	+5V	Ejection Sensor-3		+5 VDC Power Supply

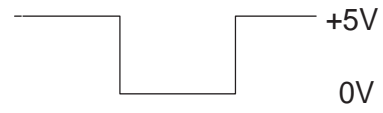

#### CN704



Refer to SC PC Board CN504.

#### CN705

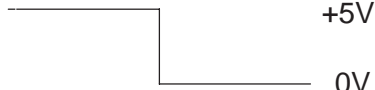
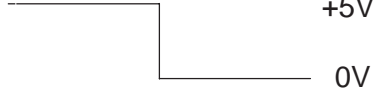


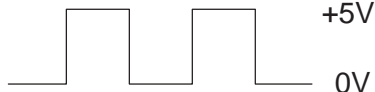

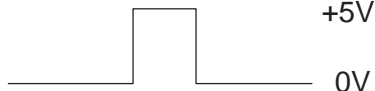
Refer to SC PC Board CN502.




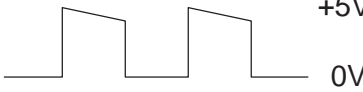
#### CN706

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN706-1	nBPNT	Read point Sensor-1		ADF Read Point Detection Signal
CN706-2	N.C.	Read point Sensor-2		No Connection
CN706-3	+5V	Read point Sensor-3		+5 VDC Power Supply



SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN706-4	nADF DOOR	ADF Door Sensor-1		ADF Door Open/Close Signal
CN706-5	N.C.	ADF Door Sensor-2		No Connection
CN706-6	+5V	ADF Door Sensor-3		+5 VDC Power Supply

### CN707

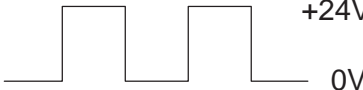
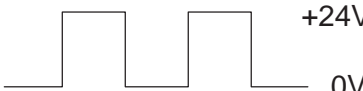

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN707-1	LEDb	CIS-1		bLED ON/OFF Control
CN707-2	LEDr	CIS-2		rLED ON/OFF Control
CN707-3	LEDg	CIS-3		LED ON/OFF Control
CN707-4	VLED	CIS-4		LED Power Supply (5V)
CN707-5	CLK	CIS-5		Scan Data Transmit Clock
CN707-6	GND	CIS-6		Ground
CN707-7	SI	CIS-7		Scan Data Frame Signal

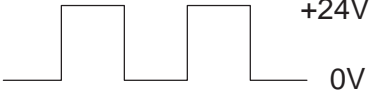
SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN707-8	GND	CIS-8	 0V	Ground
CN707-9	N.C.	CIS-9		No Connection
CN707-10	VDD	CIS-10	 +5V	Scanner Power Supply (5V)
CN707-11	GND	CIS-11	 0V	Ground
CN707-12	SIG	CIS-12	 +5V 0V	Scanner Serial Data

#### CN709

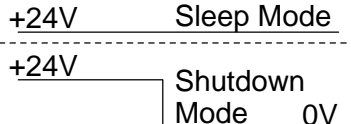
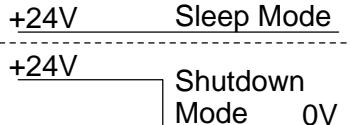
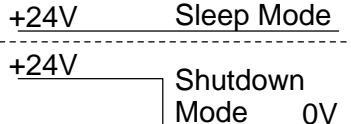
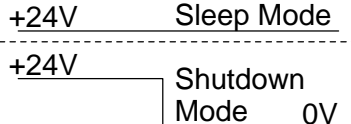





SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN709-1	+24V	STAMP Solenoid-1	 +24V	+24 VDC Power Supply
CN709-3	MGND	STAMP Solenoid-3	 0V	Ground






#### CN710

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN710-1	nB	PH Motor-1	 +24V 0V	PH Motor Control Signal
CN710-2	B	PH Motor-3	 +24V 0V	PH Motor Control Signal
CN710-3	nA	PH Motor-4	 +24V 0V	PH Motor Control Signal






SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN710-4	A	PH Motor-6		PH Motor Control Signal



### CN712

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN712-1	+24V	LVPS CN103-1		+24 VDC Power Supply
CN712-2	+24V	LVPS CN103-2		+24 VDC Power Supply
CN712-3	+24V	LVPS CN103-3		+24 VDC Power Supply
CN712-4	+24V	LVPS CN103-4		+24 VDC Power Supply
CN712-5	MGND	LVPS CN103-5		Ground
CN712-6	MGND	LVPS CN103-6		Ground
CN712-7	MGND	LVPS CN103-7		Ground
CN712-8	+5V	LVPS CN103-8		+5 VDC Power Supply
CN712-9	+5V	LVPS CN103-9		+5 VDC Power Supply

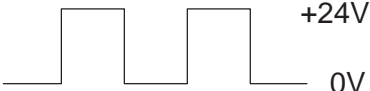
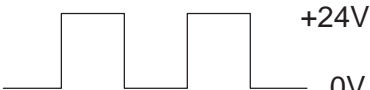
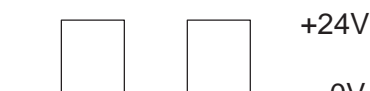

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN712-10	GND	LVPS CN103-10	 0V	Ground
CN712-11	+5VP	LVPS CN103-11	 +5V	+5 VDC Power Supply
CN712-12	GND	LVPS CN103-12	 0V	Ground
CN712-13	nMPOW1	LVPS CN103-13	 +5V Power Saving 0V	Power Supply Control Signal
CN712-14	nFCTL	LVPS CN103-14	 +5V Heater ON 0V	Fuser ON/OFF Control
CN712-15	ZCIN	LVPS CN103-15		Zero Crossing Signal (Not Used)

### CN713

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN713-1	nFCTL	Engine Control PCB CN005-1	 +5V Heater ON 0V	Fuser ON/OFF Control
CN713-2	5VGND	Engine Control PCB CN005-2	 0V	Ground
CN713-3	+5V	Engine Control PCB CN005-3	 +5V	+5 VDC Power Supply
CN713-4	24VGND	Engine Control PCB CN005-4	 0V	Ground
CN713-5	24VGND	Engine Control PCB CN005-5	 0V	Ground

SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN713-6	+24V	Engine Control PCB CN005-6	 +24V	+24 VDC Power Supply
CN713-7	+24V	Engine Control PCB CN005-7	 +24V	+24 VDC Power Supply

#### CN714

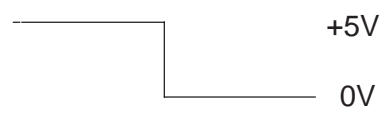
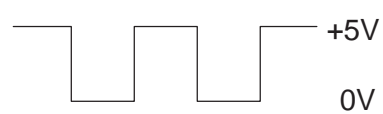
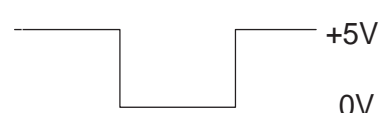



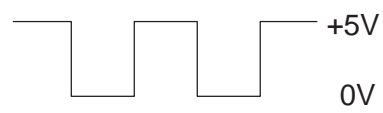
SDR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN714-1	nA	ADF Motor-1	 +24V 0V	ADF Motor Control Signal
CN714-2	A	ADF Motor-3	 +24V 0V	ADF Motor Control Signal
CN714-3	nB	ADF Motor-4	 +24V 0V	ADF Motor Control Signal
CN714-4	B	ADF Motor-6	 +24V 0V	ADF Motor Control Signal

### 6.4.4. Engine Control PC Board


#### CN001


Refer to SC PC Board CN505.

#### CN002


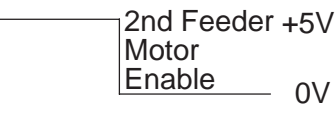
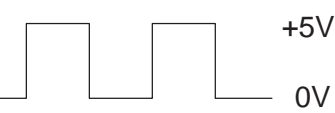

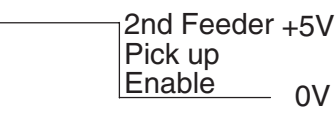

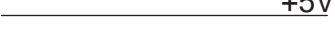
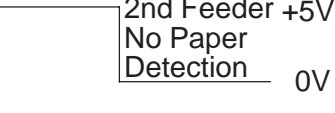

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN002-1	nADUST	LSU PCB Laser Diode-1	 +5V 0V	LSU APC Timing
CN002-2	nVIDEO	LSU PCB Laser Diode-2	 +5V 0V	Video Signal
CN002-3	nLDON	LSU PCB Laser Diode-3	 +5V 0V	LD Light Enable
CN002-4	5VGND	LSU PCB Laser Diode-4	 0V	Ground
CN002-5	5V(LD)	LSU PCB Laser Diode-5	 +5V	+5 VDC through Process Interlock SW
CN002-6	5VGND	LSU PCB Laser Diode-6	 0V	Ground
CN002-7	nHSYNC	LSU PCB Laser Diode-7	 +5V 0V	Horizontal Synchronization Signal

#### CN003

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN003-1	+5V	Process Interlock SW-1	 +5V 0V Sleep & Shutdown	+5 VDC Power Supply
CN003-2	N.C.	Process Interlock SW-2		No Connection

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN003-3	+5V(LD)	Process Interlock SW-3	 +5V	+5 VDC through Process Interlock SW

#### CN004




Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN004-1	24VGND	2nd Paper Feed Module I/F PCB CN452-1	 0V	Ground
CN004-2	nMOEN_OP	2nd Paper Feed Module I/F PCB CN452-2	 2nd Feeder Motor Enable +5V 0V	2nd Feeder Motor Control Signal
CN004-3	CLOCK_OP	2nd Paper Feed Module I/F PCB CN452-2	 +5V 0V	CLOCK
CN004-4	+24V	2nd Paper Feed Module I/F PCB CN452-2	 +24V	+24 VDC Power Supply
CN004-5	nPUCTL_OP	2nd Paper Feed Module I/F PCB CN452-2	 2nd Feeder Paper Pick up Enable +5V 0V	2nd Feeder Paper Pick up Control
CN004-6	nOPTION	2nd Paper Feed Module I/F PCB CN452-2	 2nd Feeder Detection +5V 0V	2nd Feeder Option Detection Signal
CN004-7	+5V	2nd Paper Feed Module I/F PCB CN452-2	 +5V	+5 VDC Power Supply
CN004-8	nPON_OP	2nd Paper Feed Module I/F PCB CN452-2	 2nd Feeder No Paper Detection +5V 0V	2nd Feeder No Paper Detection Signal
CN004-9	5VGND	2nd Paper Feed Module I/F PCB CN452-2	 0V	Ground



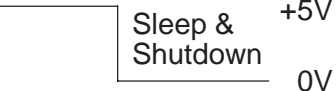

**CN005**

Refer to SDR PC Board CN713.




**CN006**

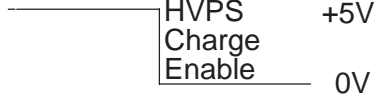
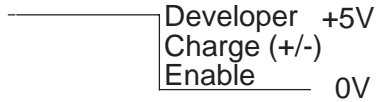
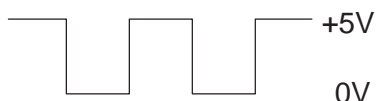
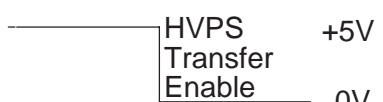
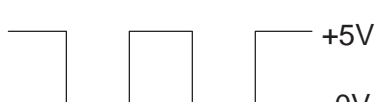


Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN006-1	+24V	Front Cover Safety Interlock SW-3	 +24V	+24 VDC Power Supply
CN006-2	24VGND	Front Cover Safety Interlock SW-5	 0V	Ground
CN006-3	+24VIR	Front Cover Safety Interlock SW-1	 +24V	+24 VDC Power Supply

**CN007**



Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN007-1	+5V	Thermistor-2	 +5V Sleep & Shutdown 0V	+5 VDC Power Supply
CN007-2	TH	Thermistor-1	 5V 0V	Fuser Thermistor Signal

**CN008**

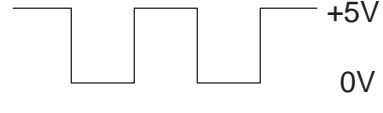
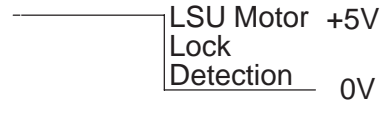



Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN008-1	+24VIR	HVPS PCB CN501-10	 Cover Open +24V Sleep & Shutdown +5V	+24 VDC Power Supply
CN008-2	24VGND	HVPS PCB CN501-9	 0V	Ground
CN008-3	24VGND	HVPS PCB CN501-8	 0V	Ground

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN008-4	nCHGCTL	HVPS PCB CN501-7		HVPS Charge Control (ON/OFF)
CN008-5	nDBCH	HVPS PCB CN501-6		Developer Charge (+/- Change)
CN008-6	nDB	HVPS PCB CN501-5		Developer (+ Voltage PWM Pulse)
CN008-7	nTRCTL	HVPS PCB CN501-4		HVPS Transfer Control (+/- Change)
CN008-8	nTR	HVPS PCB CN501-3		Transfer (- Voltage PWM Pulse)
CN008-9	+5V	HVPS PCB CN501-2		+5 VDC Power Supply
CN008-10	nTECTL	HVPS PCB CN501-1		Low Toner LED Control



### CN009

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN009-1	nTESEN	Low Toner Sensor CN451-1		Low Toner Sensor Signal
CN009-2	5VGND	Low Toner Sensor CN451-2		Ground


**CN010**


Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN010-1	nSNRCLK	LSU Motor-1		LSU Motor Clock
CN010-2	nSNRLD	LSU Motor-2		LSU Motor Lock Signal
CN010-3	nSNRCTL	LSU Motor-3		LSU Motor Control Signal
CN010-4	24VGND	LSU Motor-4		Ground
CN010-5	+24V	LSU Motor-5		+24 VDC Power Supply

**CN011**



Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN011-1	PUSOL_CTL	Pick Up Solenoid-1		Pick Up Solenoid Control
CN011-2	24VGND	Pick Up Solenoid-2		Ground

**CN012**



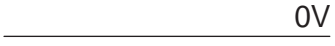


Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN012-1	REGSOL_CTL	Registration Solenoid-1		Registration Solenoid Control

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN012-2	24VGND	Registration Solenoid-2	 0V	Ground





#### CN013

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN013-1	EXITSOL_C TL	Exit Solenoid-1	 +24V Exit Solenoid ON 0V	Exit Solenoid Control
CN013-2	24VGND	Exit Solenoid-2	 0V	Ground




#### CN014

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN014-1	+5V	Registration/ Paper Detect Sensor PC Board CN401-1	 +5V	+5 VDC Power Supply
CN014-2	5VGND	Registration/ Paper Detect Sensor PC Board CN401-2	 0V	Ground
CN014-3	5VGND	Registration/ Paper Detect Sensor PC Board CN401-3	 0V	Ground
CN014-4	nREGSEN	Registration/ Paper Detect Sensor PC Board CN401-4	 +5V Registration Sensor ON 0V	Registration Sensor Signal
CN014-5	nTOPSEN	Registration/ Paper Detect Sensor PC Board CN401-5	 +5V Paper Detect Sensor ON 0V	Paper Detect Sensor Signal

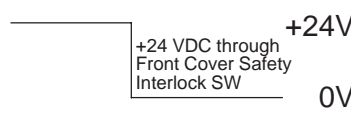
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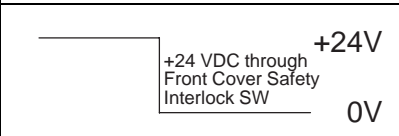


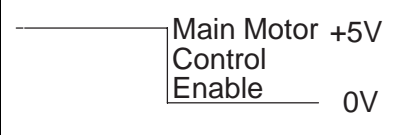
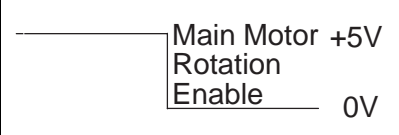
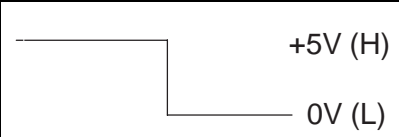
Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN015-1	+5VSP	Paper Exit/ADU Paper Jam Sensor PC Board CN402-1	 +5V	+5 VDC Energy Saver Control
CN015-2	5VGND	Paper Exit/ADU Paper Jam Sensor PC Board CN402-2	 0V	Ground
CN015-3	5VGND	Paper Exit/ADU Paper Jam Sensor PC Board CN402-3	 0V	Ground
CN015-4	nEXITSEN	Paper Exit/ADU Paper Jam Sensor PC Board CN402-4	 +5V Exit Sensor ON 0V	EXIT Sensor Signal

**CN016**

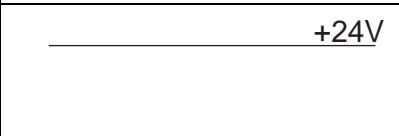

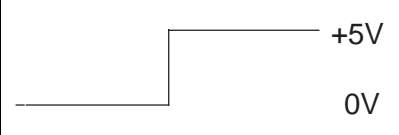
Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN016-1	5VGND	No Paper Sensor CN450-1	 0V	Ground
CN016-2	PNON	No Paper Sensor CN450-2	 +5V No Paper Sensor ON 0V	No Paper Sensor Signal
CN016-3	+5VSP	No Paper Sensor CN450-3	 +5V	+5 VDC Energy Saver Control

**CN017**

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN017-1	+24VIR	Main Motor-1	 +24V +24 VDC through Front Cover Safety Interlock SW 0V	+24 VDC Power Supply

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN017-2	+24VIR	Main Motor-2		+24 VDC Power Supply
CN017-3	24VGND	Main Motor-3		Ground
CN017-4	24VGND	Main Motor-4		Ground
CN017-5	nMMCTL	Main Motor-5		Main Motor Control Signal
CN017-6	nMMLD	Main Motor-6		Main Motor Rotation Signal
CN017-7	nMMHALF	Main Motor-7		Motor Rotation Speed Control H: 1908.35 RPM L: 954.18 RPM

### CN018

Engine Control PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN018-1	FANPER	Fan Motor-1		+24VDC Fan Power
CN018-2	24VGND	Fan Motor-2		Ground
CN018-3	FANNERR	Fan Motor-3		Fan Error Detection Signal








### 6.4.5. PNL1 PC Board

#### CN230




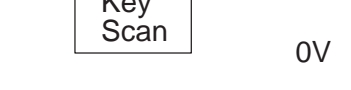
Refer to SC PC Board CN501.

#### CN234


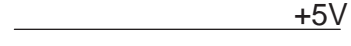






PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN234-1	KIN0	PNL2 PCB CN251-1		PNL Key Signal (Key Line)
CN234-2	KIN1	PNL2 PCB CN251-2		PNL Key Signal (Key Line)
CN234-3	KIN2	PNL2 PCB CN251-3		PNL Key Signal (Key Line)
CN234-4	KIN3	PNL2 PCB CN251-4		PNL Key Signal (Key Line)
CN234-5	nSCN[1]	PNL2 PCB CN251-5		PNL Key Signal (Scan Line)
CN234-6	nSCN[2]	PNL2 PCB CN251-6		PNL Key Signal (Scan Line)
CN234-7	nSCN[7]	PNL2 PCB CN251-7		PNL Key Signal (Scan Line)
CN234-8	+5V	PNL2 PCB CN251-8		+5 VDC Power Supply
CN234-9	nLED3	PNL2 PCB CN251-9		PNL LED Control Signal
CN234-10	nLED4	PNL2 PCB CN251-10		PNL LED Control Signal
CN234-11	nLED5	PNL2 PCB CN251-11		PNL LED Control Signal

PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN234-12	nLED6	PNL2 PCB CN251-12		PNL LED Control Signal
CN234-13	+SLP	PNL2 PCB CN251-13		Energy Saver Lamp LED Power Supply
CN234-14	nLEDSL	PNL2 PCB CN251-14		Energy Saver Lamp LED Control Signal
CN234-15	nSLPKY	PNL2 PCB CN251-15		Energy Saver Key Signal
CN234-16	GND	PNL2 PCB CN251-16		Ground
CN234-17	BAT+	PNL2 PCB CN251-17		Lithium Battery
CN234-18	GND	PNL2 PCB CN251-18		Ground

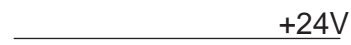


### CN235



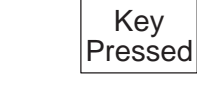

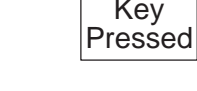

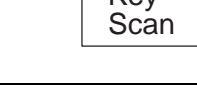
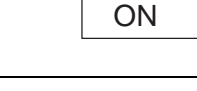
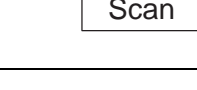
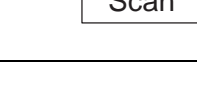
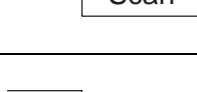
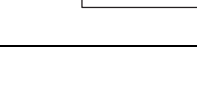
PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN235-1	nSCN[4]	PNL3 PCB CN261-1		PNL Key Signal (Scan Line)
CN235-2	nSCN[5]	PNL3 PCB CN261-2		PNL Key Signal (Scan Line)
CN235-3	nSCN[3]	PNL3 PCB CN261-3		PNL Key Signal (Scan Line)
CN235-4	nSCN[6]	PNL3 PCB CN261-4		PNL Key Signal (Scan Line)



PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN235-5	KIN[3]	PNL3 PCB CN261-5		PNL Key Signal (Key Line)
CN235-6	+5V	PNL3 PCB CN261-6		+5 VDC Power Supply
CN235-7	KIN[2]	PNL3 PCB CN261-7		PNL Key Signal (Key Line)
CN235-8	KIN[7]	PNL3 PCB CN261-8		PNL Key Signal (Key Line)
CN235-9	KIN[1]	PNL3 PCB CN261-9		PNL Key Signal (Key Line)
CN235-10	KIN[0]	PNL3 PCB CN261-10		PNL Key Signal (Key Line)
CN235-11	nLED8	PNL3 PCB CN261-11		PNL LED Control Signal
CN235-12	nLED9	PNL3 PCB CN261-12		PNL LED Control Signal

### CN236

PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN236-1	+DAT	PNL2 PCB CN252-1		DATA Lamp LED Power Supply
CN236-2	+ALM	PNL2 PCB CN252-2		ALARM Lamp LED Power Supply
CN236-3	+ACT	PNL2 PCB CN252-3		ACTIVE Lamp LED Power Supply

PNL1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN236-4	KIN[7]	PNL2 PCB CN252-4		PNL Key Signal (Key Line)
CN236-5	KIN[4]	PNL2 PCB CN252-5		PNL Key Signal (Key Line)
CN236-6	KIN[5]	PNL2 PCB CN252-6		PNL Key Signal (Key Line)
CN236-7	nLEDACT	PNL2 PCB CN252-7		ACTIVE Lamp LED Control Signal
CN236-8	KIN[6]	PNL2 PCB CN252-8		PNL Key Signal (Key Line)
CN236-9	nLEDALM	PNL2 PCB CN252-9		ALARM Lamp LED Control Signal
CN236-10	nSCN[8]	PNL2 PCB CN252-10		PNL Key Signal (Scan Line)
CN236-11	nLEDDAT	PNL2 PCB CN252-11		DATA Lamp LED Control Signal
CN236-12	nSCN[9]	PNL2 PCB CN252-12		PNL Key Signal (Scan Line)
CN236-13	nSCN[10]	PNL2 PCB CN252-13		PNL Key Signal (Scan Line)
CN236-14	nSCN[11]	PNL2 PCB CN252-14		PNL Key Signal (Scan Line)
CN236-15	nLED7	PNL2 PCB CN252-15		PNL LED Control Signal

<b>PNL1 PCB Pin No.</b>	<b>Signal Name</b>	<b>Destination</b>	<b>Signal Waveform</b>	<b>Function</b>
CN236-16	N.C.	PNL2 PCB CN252-16		No Connection

### 6.4.6. PNL2 PC Board




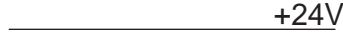
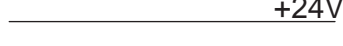

#### CN251

Refer to PNL1 PC Board CN234.

#### CN252

Refer to PNL1 PC Board CN236.

#### CN253

PNL2 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN253-1	nLEDDAT	PNL4 PCB CN254-1		DATA Lamp LED Control Signal
CN253-2	nLEDALM	PNL4 PCB CN254-2		ALARM Lamp LED Control Signal
CN253-3	nLEDACT	PNL4 PCB CN254-3		ACTIVE Lamp LED Control Signal
CN253-4	ACT[+24V]	PNL4 PCB CN254-4		DATA Lamp LED Power Supply
CN253-5	ALM[+24V]	PNL4 PCB CN254-5		ALARM Lamp LED Power Supply
CN253-5	DAT[+24]	PNL4 PCB CN254-6		ACTIVE Lamp LED Power Supply

### 6.4.7. PNL3 PC Board

#### CN261



Refer to PNL1 PC Board CN235.

### 6.4.8. FXB PC Board

#### CN110

Refer to SC PC Board CN509.

#### CN114

FXB PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN114-1	pSPKOT	Speaker		Line Signal, Dial Tone
CN114-2	GND	Speaker		Ground

### 6.4.9. G3B PC Board

#### CN363

Refer to SC PC Board CN510.

**6.4.10. Registration/Paper Detect Sensor PC Board  
CN401**

Refer to Engine Control PC Board CN014.

**6.4.11. Paper Exit/ADU Paper Jam Sensor PC Board  
CN402**

Refer to Engine Control PC Board CN015.

**6.4.12. No Paper Sensor PC Board  
CN450**

Refer to Engine Control PC Board CN016.

**6.4.13. Low Toner Sensor PC Board  
CN451**


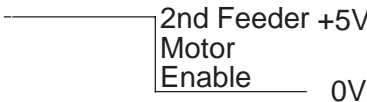
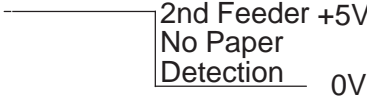

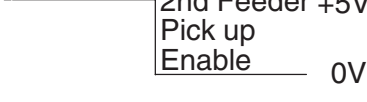



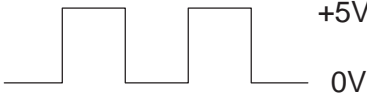
Refer to Engine Control PC Board CN009.

### 6.4.14. 2nd Paper Feed Module I/F PC Board

#### CN452

Refer to Engine Control PC Board CN004.

#### CN453

I/F PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN453-1	5VGND	2nd Feeder PC Board CN602-1	 0V	Ground
CN453-2	nMOEN_OP	2nd Feeder PC Board CN602-1	 2nd Feeder +5V Motor Enable 0V	2nd Feeder Motor Control Signal
CN453-3	nPON_OP	2nd Feeder PC Board CN602-1	 2nd Feeder +5V No Paper Detection 0V	2nd Feeder No Paper Detection Signal
CN453-4	nOPTION	2nd Feeder PC Board CN602-1	 2nd Feeder +5V Detection 0V	2nd Feeder Option Detection Signal
CN453-5	nPUCTL_OP	2nd Feeder PC Board CN602-1	 2nd Feeder +5V Pick up Enable 0V	2nd Feeder Paper Pick up Control
CN453-6	24VGND	2nd Feeder PC Board CN602-1	 0V	Ground
CN453-7	+5V	2nd Feeder PC Board CN602-1	 +5V	+5 VDC Power Supply
CN453-8	+24V	2nd Feeder PC Board CN602-1	 +24V	+24 VDC Power Supply
CN453-9	CLOCK_OP	2nd Feeder PC Board CN602-1	 +5V 0V	CLOCK

### 6.4.15. HVPS

#### CN501

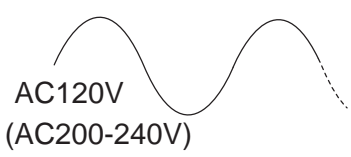
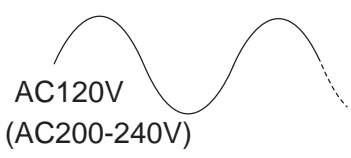
Refer to Engine Control PC Board CN008.

### 6.4.16. LVPS

#### CN103

Refer to SC PC Board CN712.




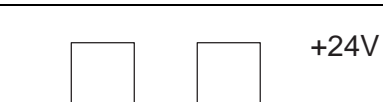
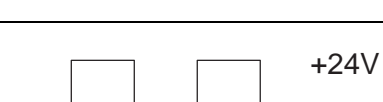
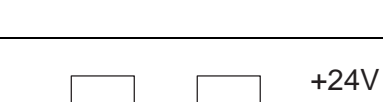
#### CN102

LVPS Pin No.	Signal Name	Destination	Signal Waveform	Function
CN102-1	ACL	Fuser Unit	 <p>AC120V (AC200-240V)</p>	AC Power Supply (Live)
CN102-3	ACN	Fuser Unit	 <p>AC120V (AC200-240V)</p>	AC Power Supply (Neutral)





### 6.4.17. 2nd Feeder PC Board

#### CN600

2nd Feeder PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN600-1	+24V	2nd Feeder Motor-1	 +24V 0V	+24 VDC Power Supply
CN600-2	+24V	2nd Feeder Motor-2	 +24V 0V	+24 VDC Power Supply
CN600-3	A	2nd Feeder Motor-3	 +24V 0V	2nd Feeder Motor Control Signal
CN600-4	NA	2nd Feeder Motor-4	 +24V 0V	2nd Feeder Motor Control Signal
CN600-5	B	2nd Feeder Motor-5	 +24V 0V	2nd Feeder Motor Control Signal
CN600-6	NB	2nd Feeder Motor-6	 +24V 0V	2nd Feeder Motor Control Signal

#### CN601

2nd Feeder PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN601-1	PUSOL_CTL 1	Pick Up Solenoid-1	 +24V 0V	Pick Up Solenoid Control
CN601-2	+24V	Pick Up Solenoid-2	 +24V 0V	+24 VDC Power Supply

#### CN602

Refer to 2nd Feed Module I/F PC Board CN453.

## **7 Installation**

Refer to Quick Guide (For Facsimile and Copy Functions).

## 8 Options and Supplies

### 8.1. Service Notes "Firmware Update" for PCL Option Installation

To use **PCL** option individually, changing to **Type B** SC firmware is required. The required firmware is in the CD included with the option.

Before proceeding, it is important to determine the Final Configuration of your machine in order to correctly identify the required firmware from the table below. Carefully read and follow the Installation Instructions for the appropriate option.

The firmware for SC and G3B must be updated in this sequence as a set. Please update the firmware with the latest version as a set by referring to the following table.

#### Firmware Version Table

	<b>Standard Firmware (SC = Type A)</b>	<b>PCL Firmware (SC = Type B)</b>
<b>SC</b>	UF-8000AxVxxxxx_xx	UF-8000BxVxxxxx_xx
<b>G3B</b>	UF-8K_G3BAxVxxxxx	←
<b>Slot 1 FROM PCB</b>	Not Required	Required

## **Main Unit Firmware Code Updating Instructions**

### **1. Updating through a LAN Port (The Quickest and Most Easiest Method)**

The firmware code can be easily updated when the main unit is connected to a LAN.

The Network Firmware Update Tool can also be used by connecting to the machine using a **crossover cable**, if the unit is not connected to a LAN.

#### **1) Install the Network Firmware Update Tool to your PC**

The option CD-ROM includes the Network Firmware Update Tool and the Main Unit Firmware Code. Please refer to the following Operating Instructions to install the Network Firmware Update Tool.

##### **Operating Instructions:**

\xFirmware\Tools\NwFirmup\NwFirmup OI.pdf (Refer to the [NW Firmware Update Tool OI](#) on the CD)

##### **Setup:**

\xFirmware\Tools\NwFirmup\Setup\Setup.exe

#### **2) Preparing the Firmware Code**

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

##### **Example:**

##### **From:**

Destination Shortcut Batch File: D:(CD-ROM Drive) \xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

##### **To:**

Firmware Data Folder: C:\Pcc\Fup\Data

#### **3) Preparing the Main Unit for the Firmware Upgrade**

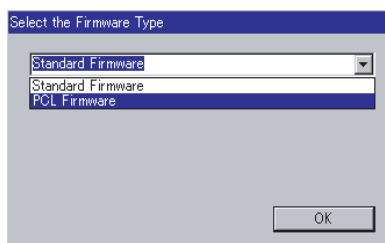
Make sure the unit's Key Operator Password is the same as the tool's password.

Make sure the unit is in an idle state (e.g. not making copies, not printing, etc.).

#### **4) Upgrading the Main Unit's Firmware Code**

Start the Network Firmware Update Tool and select the following **Firmware Code Folders** in the **C:\Pcc\Fup\Data** folder, and then follow the display instructions to upgrade the Main Unit's Firmware Codes.

<b>Parent Firmware File Folder</b>	<b>Sub Firmware File Folder</b>
\UF-8000_xx_xxxxxx	\ <b>SC_STD</b> \ UF-8000AxVxxxxx_xx
	\ <b>SC_PCL</b> \ UF-8000BxVxxxxx_xx



When you select the Parent Folder, the following Firmware Type window appears. Proper Sub File Folders are selected automatically by selecting the Firmware Type.

The transferring order is set up automatically.

**Note:**

1. Manual mode must be used, when updating the designated version of the firmware or changing the type of the firmware.  
Please refer to the Section 2.2, "**Setting up the Network Firmware Update Tool, File Selection Tab**" of the Operating Instructions.
2. While updating the firmware code, the display may become garbled, however, it will return to normal upon completion of the firmware update.
3. If the firmware update fails and the unit does not boot up, the Network Firmware Update Tool will not be able to transfer the firmware code. If this occurs, please refer to the next section "**Updating through the USB Port**" and use the Local Firmware Update Tool to recover the unit.
4. The suffix "\_xx" for the Folder Name or File Name may not exist depending on the destination location.

**2. Updating through the USB Port (Alternate Method)**

If the device is not connected to the LAN, upgrade the firmware code using the USB Port.

**1) Install the Local Firmware Update Tool to your PC**

The option CD-ROM includes the Local Firmware Update Tool and the Main Unit Firmware Code. Please refer to the following Operating Instructions to install the Local Firmware Update Tool.

**Operating Instructions:**

\\xFirmware\Tools\Firmup\FIRMUP OI.pdf (Refer to the [Local Firmware Update Tool OI](#) on the CD)

**Setup:**

\\xFirmware\Tools\Firmup\Setup\Setup.exe

**2) Preparing the Firmware Code**

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

**Example:****From:**

Destination Shortcut Batch File: D:(CD-ROM Drive) \ xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

**To:**

Firmware Data Folder: C:\ Pcc \ Fup \ Data

**3) Preparing the Main Unit for the Firmware Upgrade****Important: DO NOT connect the USB Cable yet.**

Enter into Test Mode F9-07-01 to enable the unit to accept the programming code from the USB Port by following the steps below.

1. Press "**FUNCTION**", "**ORIGINAL SIZE**" keys and then Key "**3**" on the keypad sequentially to enter Test Mode.

**Note:**

Press "**FUNCTION**" and "**CLEAR**" keys sequentially to exit Test Mode.

2. Press "**9**" and "**START**" keys.
3. Press "**7**" and "**SET**" keys.
4. Press "**1**" and "**SET**" keys.
5. Press "**SET**" key.

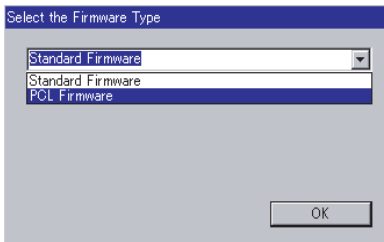
**Now connect the USB Cable between the Unit and PC.**

#### 4) Upgrading the Main Unit's Firmware Code

Start the Local Firmware Update Tool and select the following **Firmware Code Parent File Folder** in the **C:\Pcc\Fup\Data** folder, and select the Firmware Code Type then follow the display instructions to upgrade the Main Unit's Firmware Codes.

You must process each firmware file separately in this manner and sequence.

Parent Firmware File Folder	Sub Firmware File Folder	Firmware File
\UF-8000_xx_xxxxxx	\SC_STD \UF-8000Ax\xxxxx_xx	UF-8000Ax\xxxxx_xx.bin
	\SC_PCL \UF-8000Bx\xxxxx_xx	UF-8000Bx\xxxxx_xx.bin UF-8000Cx\xxxxxa_xx.bin UF-8000Cx\xxxxxb.bin



When you select the Parent Folder, the following Firmware Type window appears. Proper Firmware Files are selected automatically by selecting the Firmware Type. The transferring order is set up automatically.

#### Note:

1. While updating the firmware code, the display may become garbled, however, it will return to normal upon completion of the firmware update.
2. Please refer to the service manual for additional details.
3. The suffix "\_xx" for the Folder Name or File Name may not exist depending on the destination location.

### 3. Updating the Firmware using the Master Firmware SD Memory Card

1. Before starting, print the F5/F6 Parameters List (Copy Service Mode F9-03-00).
2. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
3. Install the appropriate Master Firmware SD Memory Card into the machine.
4. Turn the Power Switch on the back of the machine to the ON position.
5. Press "**FUNCTION**", "**ORIGINAL SIZE**" keys and then Key "**3**" on the keypad sequentially.
6. Perform the Copy Service Mode F9-07-00 (Update From Master Card).
7. The firmware is copied into the machine.  
Selecting the "Auto Mode", copies all the necessary firmware at once.
8. After the update is completed, the machine reboots itself and returns to standby.
9. Turn the Power Switch on the back side of the machine to the OFF position.
10. Remove the Master Firmware SD Memory Card from the machine.
11. Turn the Power Switch on the back of the machine to the ON position.
12. Reprogram the F5 & F6 Parameters according to the lists printed in Step 1 above if the settings are other than factory default.

#### Note:

After the update is completed, the machine reboots itself and returns to standby mode. Selecting the "Auto Mode", prompts the unit to check the configuration and installed options, and all the necessary firmware is updated automatically. Confirm that the update was successfully completed by checking the Firmware Version with F9 Parameters F9-02-xx.

#### Caution:

If the unit does not boot up properly in Step 8, refer to 3.5.7. (Firmware Emergency Recovery)

### 3.1. Creating a Master Firmware SD Memory Card using a PC

#### 1) Install the “SD Memory Card Firmware Writing Tool” to your PC.

The “SD Memory Card Firmware Writing Tool” is in the CD. Please refer to the Readme file for additional details.

#### 2) Preparing the Firmware Code

Double click the appropriate Destination Shortcut Batch File and copy the Firmware Code File on the CD-ROM to the Firmware Data Folder in your PC. Note that the files in the Archive will be extracted automatically into the designated folder when the Archived file (.exe) is Double-clicked.

##### Example:

##### From:

Destination Shortcut Batch File: D:(CD-ROM Drive) \ xFirmware \ USA.bat

Firmware Code File: UF-8000\_xx\_xxxxxx.exe

##### To:

Firmware Data Folder: C:\ Pcc \ Fup \ Data

#### 3) Preparing the Master Firmware SD Memory Card

1. Insert the SD Memory Card (32 MB to 512 MB) into the SD Memory Card Slot.
2. Perform the SD Memory Card Write Tool.
3. After all firmware codes are copied, remove the SD Memory Card from the Slot.

The SD Memory Card is now ready to use for firmware update.

### 3.2. Formatting the SD Memory Card

1. Turn the Power Switch on the back of the machine to the OFF position. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)
2. Install the SD Memory Card into the machine.
3. Turn the Power Switch on the back of the machine to the ON position.  
The machine goes to Self Test mode and return to standby.
4. Press “**FUNCTION**”, “**ORIGINAL SIZE**” keys and then Key “**3**” on the keypad sequentially.
5. Perform the Service Mode F9-15 (SD Memory Card Format).
6. After the SD Memory Card is formatted, the machine goes to Self Test Mode and return to standby.
7. Turn the Power Switch on the back of the machine to the OFF position.
8. Remove the SD Memory Card from the machine.

## 8.2. Installing the Printer Controller Module for PCL6 (GA-1230)

### 8.2.1. Contents

Qty.	Description	Remarks
1	Hardware Key	PCL KEY
1	Expansion F-ROM Board	
2	PC Board Support	
1	Software CD	Includes Operator's Manual
1	License Agreement	
1	Installation Instructions	

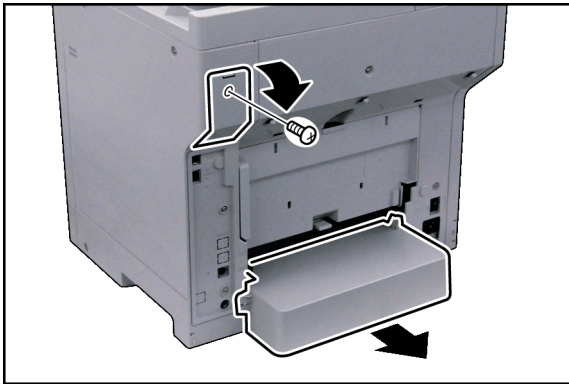
**Note:**

1. The part number(s) may differ depending on the Destination.
2. Refer to the Parts List.

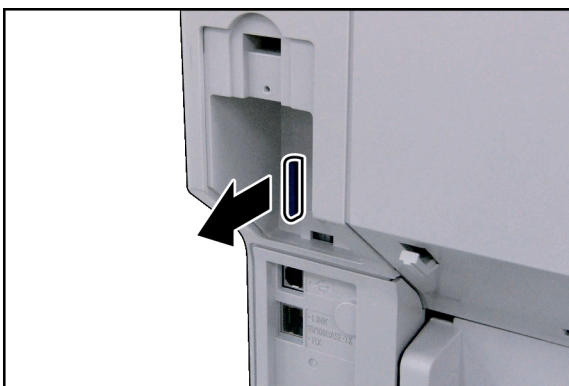
### 8.2.2. Installation

**CAUTION!**

Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord before beginning installation. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)



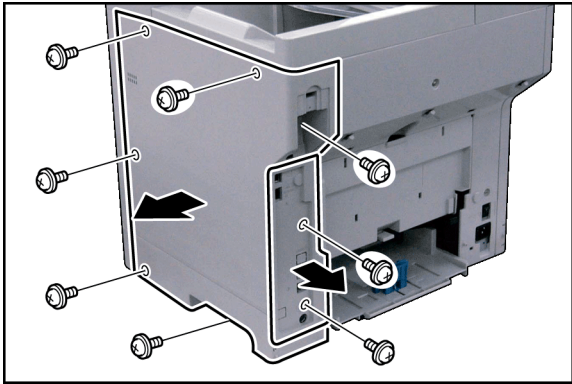
- (1) Remove the **Rear Paper Tray Cover**.
- (2) Remove 1 **Silver Screw**.
- (3) Remove the **SD Card Cover**.



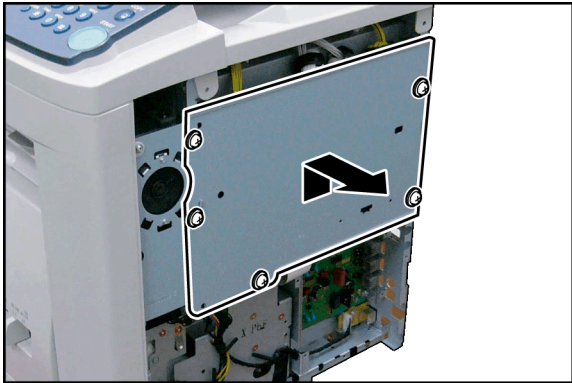
**Caution:**

Remove the SD Memory Card if it was installed.

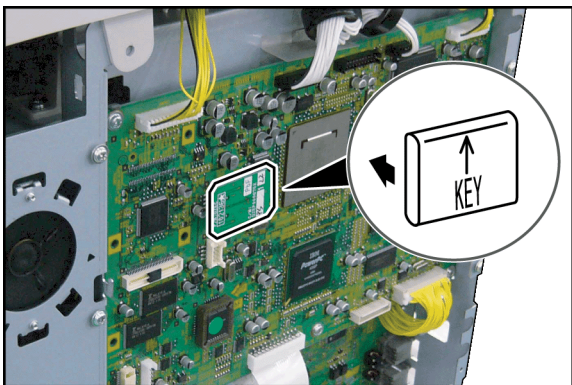




- (4) Remove 2 **Silver Screws**.
- (5) Remove the **Lower Right Rear Cover** first.
- (6) Remove 6 **Silver Screws**.
- (7) Remove the **Right Cover**.

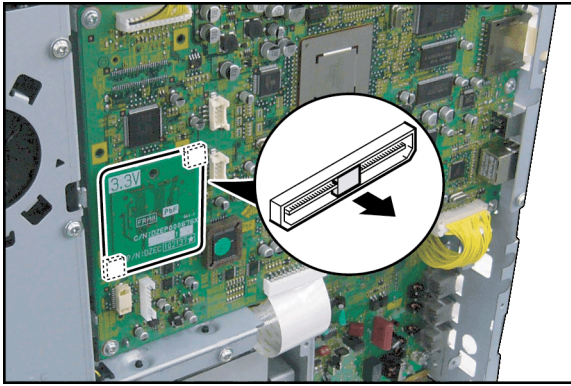


- (8) Loosen 5 Screws.
- (9) Remove the **SC Cover**.



- (10) Install the **Hardware Key** into one of the two available connectors (CN516 or CN517) on the SC PC Board.

**Note:** The connector is keyed, to prevent damage to the SC PC Board, install the Hardware Key as illustrated. Do not force the Hardware Key into the connector if facing the wrong way.



- (11) Remove the **Black Pin Protector** from Slot 1 (CN515), if it was preinstalled.
- (12) Install 2 **PC Board Supporters** for the Slot 1 on the SC PC Board.
- (13) Install the **Program Expansion Board** into **Slot 1 (CN515)** on the SC PC Board and secure with the Supporters.

**Note:**

The Program Extension F-ROM Board must always be installed into Slot 1 (CN515) for the PCL Printer Option to function.

- (14) Proceed with the installation of other options. If finished, reinstall the SD Memory Card if it was removed, and all Harnesses and Covers.
- (15) Plug the **AC Power Cord** and turn the Power Switch on the Rear Side of the machine to the ON position.
- (16) Reconnect the **Telephone Line Cable** if it was disconnected.
- (17) Update the firmware of the unit to the PCL Option firmware. Refer to section 8.1 Service Notes of this manual.
- (18) Install the PCL6 Software into the PC with the Operator's Manual by following the prompts of the Installation Wizard.

## 8.3. Installing the Network Scan / Email / Internet Fax Kit (GM-4090)

### 8.3.1. Contents

Qty.	Description	Remarks
1	Hardware Key	NWS KEY
1	Quick Guide	
1	Installation Instructions	

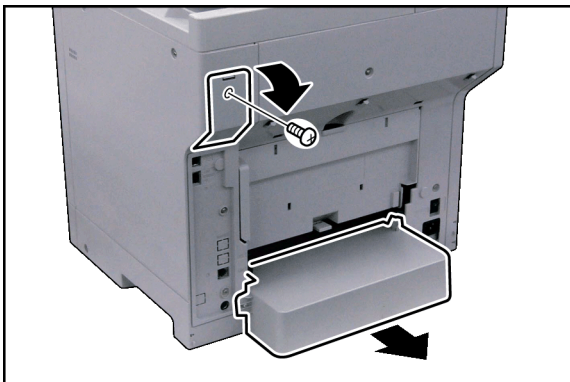
**Note:**

1. The part number(s) may differ depending on the Destination.
2. Refer to the Parts List.

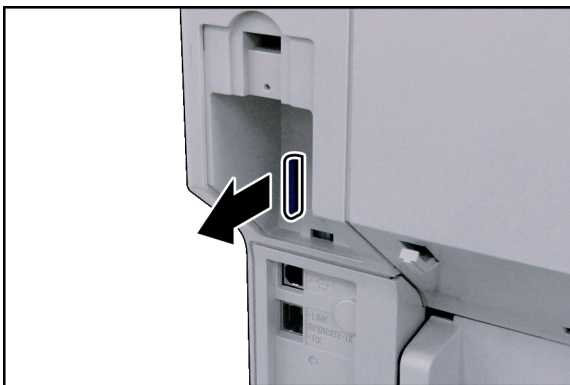
### 8.3.2. Installation

**CAUTION!**

Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord before beginning installation. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)

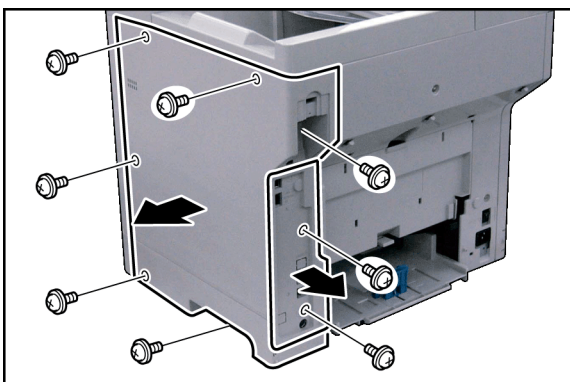


- (1) Remove the **Rear Paper Tray Cover**.
- (2) Remove 1 **Silver Screw**.
- (3) Remove the **SD Card Cover**.

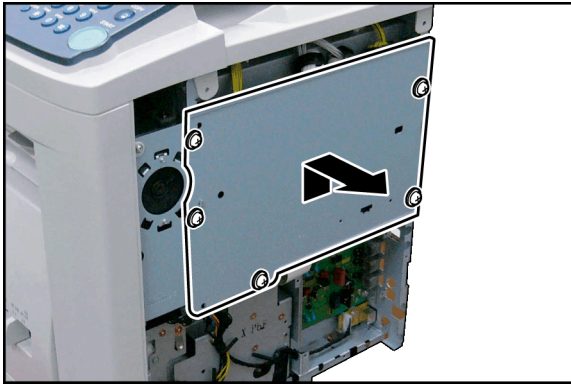


**Caution:**

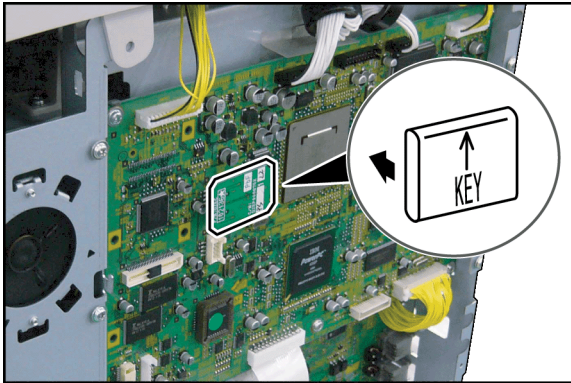
Remove the SD Memory Card if it was installed.



- (4) Remove 2 **Silver Screws**.
- (5) Remove the **Lower Right Rear Cover** first.
- (6) Remove 6 **Silver Screws**.
- (7) Remove the **Right Cover**.



- (8) Loosen 5 Screws.
- (9) Remove the **SC Cover**.



- (10) Install the **Hardware Key** into one of the two available connectors (CN516 or CN517) on the SC PC Board.


**Note:**

The connector is keyed, to prevent damage to the SC PC Board, install the Hardware Key as illustrated. Do not force the Hardware Key into the connector if facing the wrong way.

- (11) Proceed with the installation of other options.  
If finished, reinstall the SD Memory Card if it was removed, and all Harnesses and Covers.
- (12) Plug the **AC Power Cord** and turn the Power Switch on the Rear Side of the machine to the ON position.
- (13) Reconnect the **Telephone Line Cable** if it was disconnected.
- (14) Install the Internet Fax/Email Software into the PC with the Operator's Manual by following the prompts of the Installation Wizard.

## 8.4. Installing the G3 Communication Port Kit (GD-1230)

### 8.4.1. Contents

Qty.	Description	Remarks
1	Fax Cover	
1	G3B PCB Bracket	
1	G3B PC Board	
1	G3B Harness	
1	Telephone Line Cable	
1	G3 Line Label	
14	Screw	
1	Installation Instructions	

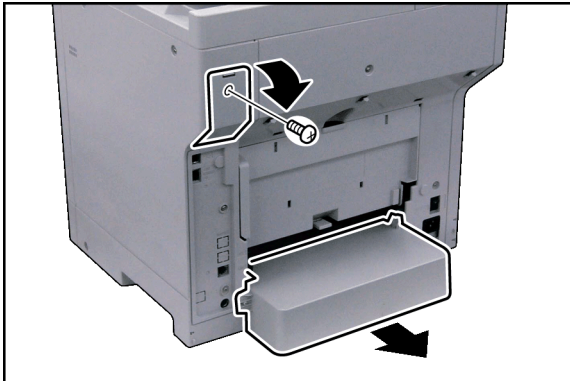
**Note:**

1. The part number(s) may differ depending on the Destination.
2. Refer to the Parts List.

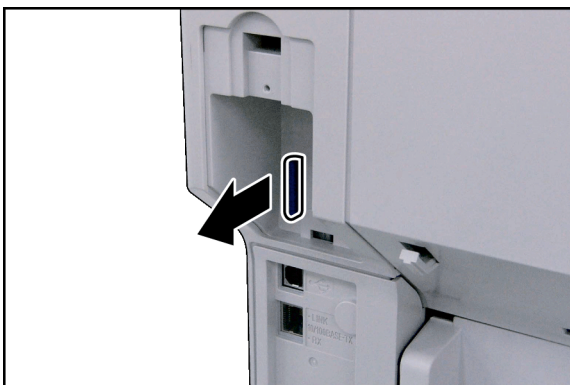
### 8.4.2. Installation

**CAUTION!**

Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord before beginning installation. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)

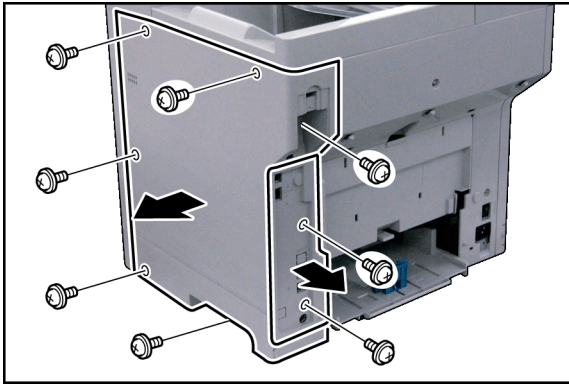


- (1) Remove the **Rear Paper Tray Cover**.
- (2) Remove 1 **Silver Screw**.
- (3) Remove the **SD Card Cover**.

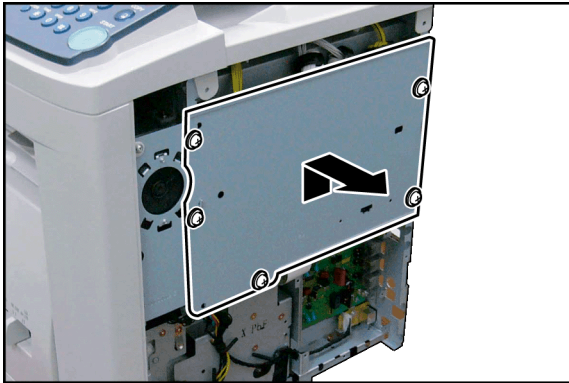


**Caution:**

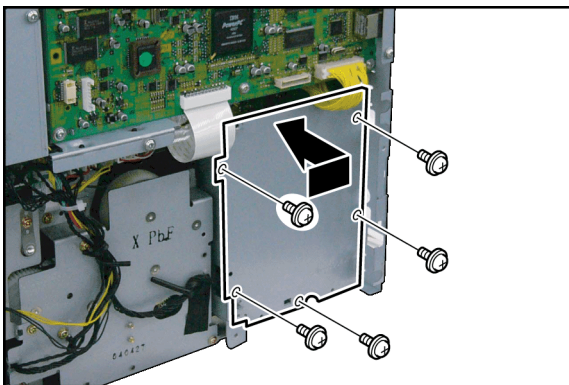
Remove the SD Memory Card if it was installed.



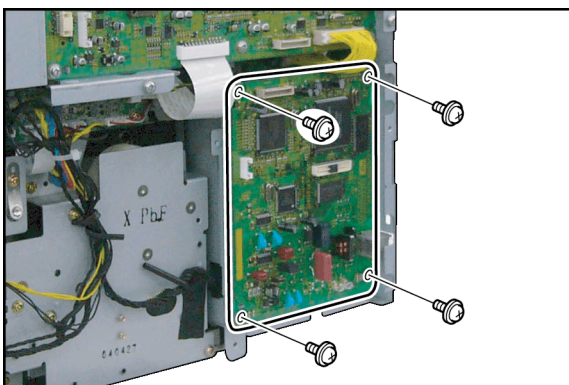
- (4) Remove 2 **Silver Screws**.
- (5) Remove the **Lower Right Rear Cover** first.
- (6) Remove 6 **Silver Screws**.
- (7) Remove the **Right Cover**.



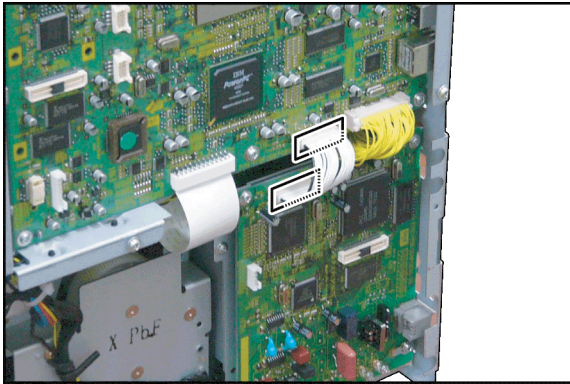
- (8) Loosen 5 **Screws**.
- (9) Remove the **SC Cover**.



- (10) Install the **G3B PCB Bracket**.
- (11) Secure the **G3B PCB Bracket** with 5 **Screws**.

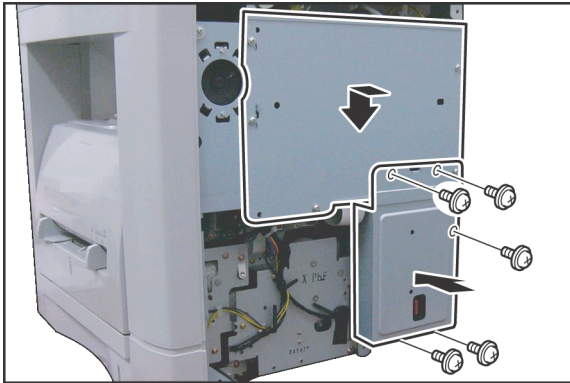


- (12) Install the **G3B PC Board**.
- (13) Secure the **G3B PC Board** with 4 **Screws**.

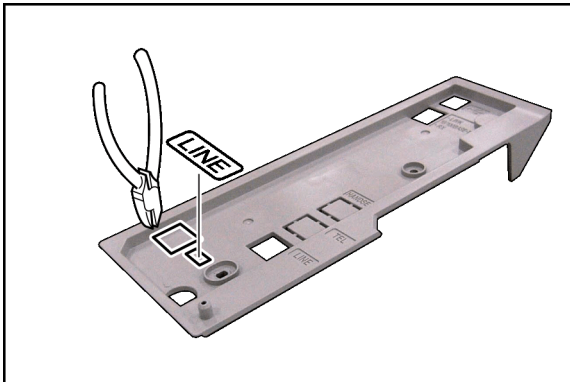


- (14) Connect one end of the **G3B Harness** to CN510 on the SC PC Board.
- (15) Connect other end of the **G3B Harness** to CN363 on the G3B PC Board.

**Caution:** Ensure that the **Black Wire** is on the **Left Side**, and that it connects to **Pin 1** of the female connector as illustrated.



- (16) Reinstall the **SC Cover** and secure it with 5 Screws.
- (17) Install the **Fax Cover**.
- (18) Secure the **Fax Cover** with 5 Screws.



- (19) Remove the **Protective Tab** covering the G3 Communication Port on the Rear Cover.
- (20) Attach the **G3 Line Label** to the Rear Cover as illustrated.
- (21) Proceed with the installation of other options. If finished, reinstall the SD Memory Card if it was removed, and all Harnesses and Covers.
- (22) Plug the **AC Power Cord** and turn the Power Switch on the Rear Side of the machine to the ON position.
- (23) Reconnect the **Telephone Line Cable** if it was disconnected.





- (24) Execute Parameter Initialize by following the steps below.
  - a. Press "**FUNCTION**" and then "**7**" keys.
  - b. Press "**MONITOR**" four times, then press "**\* (TONE)**" to enter the "**SERVICE MODE**".
  - c. Press "**6**" key or "**V**", "**^**" arrow keys to enter "**6 RAM INITIALIZE**".
  - d. Press "**V**", "**^**" arrow keys to enter "**PARAMETER INITIALIZE**".
  - e. Press "**START**" key. Wait approximately 10-20 seconds. unit displays "**COMPLETED**", then the unit will return to Service Mode.
  - f. Turn the Power Switch on the Rear side of the machine to the **OFF** and back to the **ON** position to enable the parameter settings.

## 8.5. Installing the 2nd Paper Feed Module (KD-1021)

### 8.5.1. Unpacking

Visually check the condition and contents of the box for completeness or any shipping damage before installation.

Remove all filament tapes and the packing materials used to secure the Unit during shipment.

Qty.	Description	Remarks
1	2nd Paper Feed Module	
1	Bracket R	
1	Bracket L	
2	Bracket	
8	Silver Screw	  See Note
2	Screw	 
1	Installation Instructions	

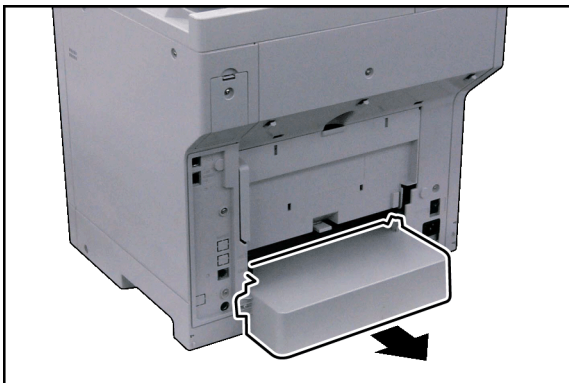
#### Note:

1. The part number(s) may differ depending on the Destination.
2. Refer to the Parts List.
3. Seven(7) Screws are use and the rest is a spare.

### 8.5.2. Installation

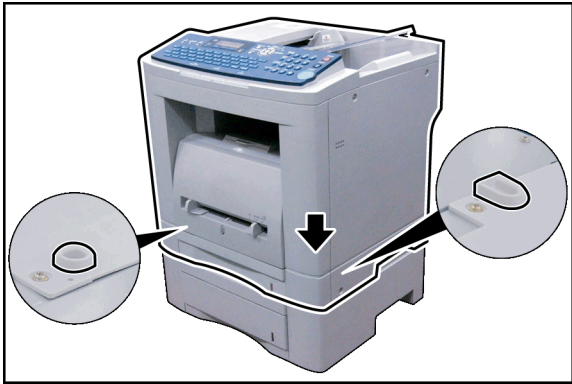
#### CAUTION!

Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord before beginning installation. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)

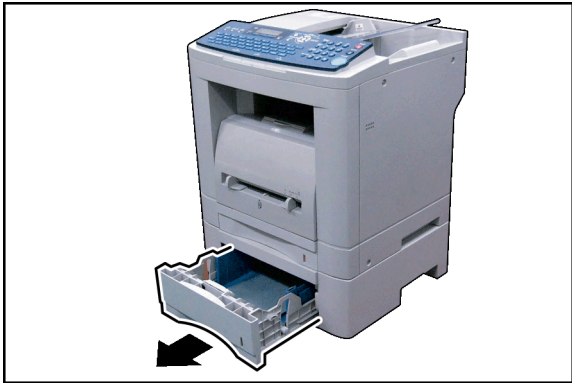


(1) Remove the **Rear Paper Tray Cover**.

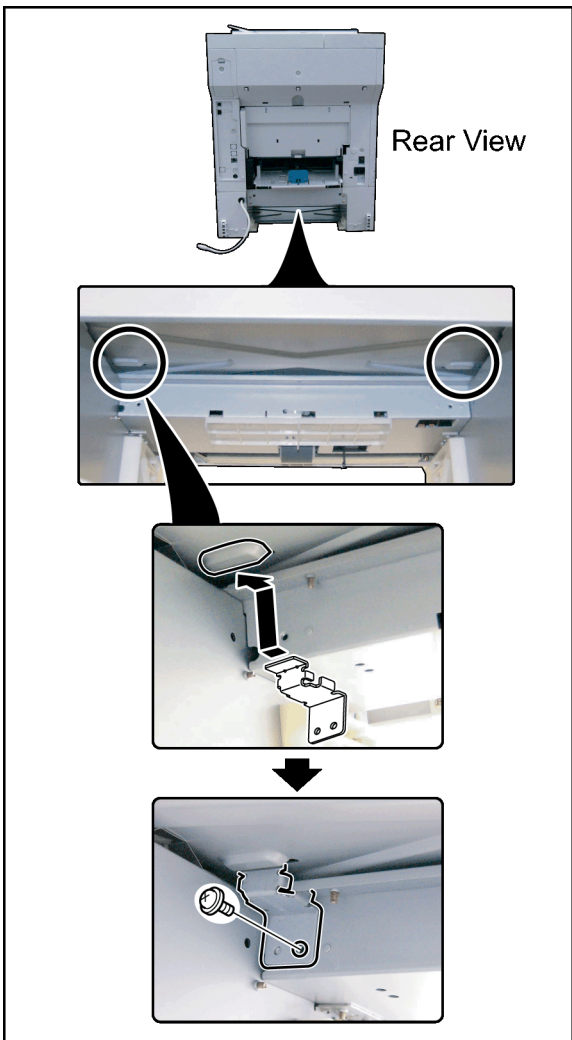




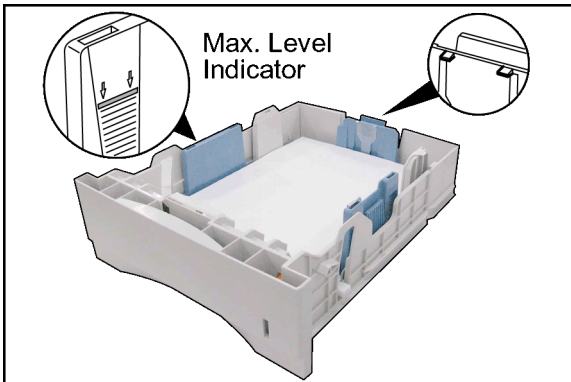
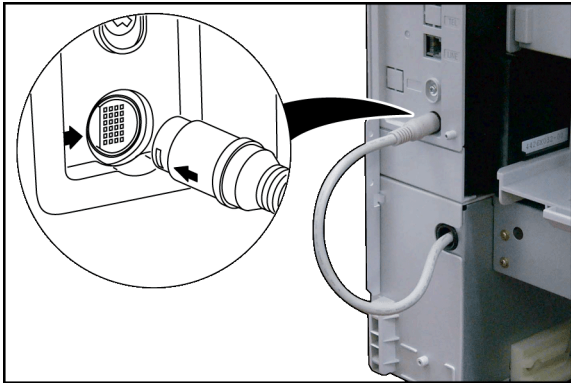
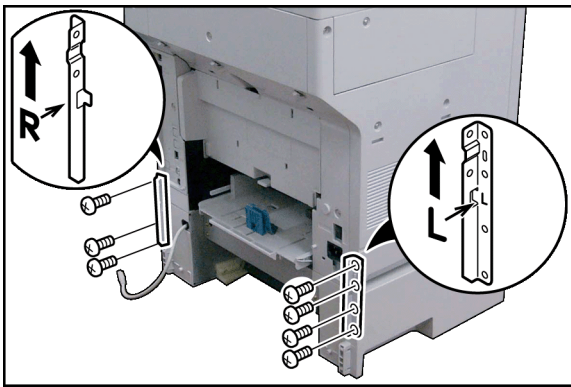
(2) Place the **machine** on top of the 2nd Paper Feed Module aligning with the 2 Guides.



(3) Remove the **2nd Paper Tray**.



(4) Install the 2 smaller **Brackets** on the underside of the machine (from the rear) as illustrated.  
 (5) Secure the 2 Brackets with 2 **Screws** using an 8" (21cm) or longer phillips screwdriver. Access to the screws may be gained using two holes in the rear frame of the 2nd paper feed module.



- (6) Proceed with the installation of other options.  
If finished, reinstall all Harnesses and Covers.
- (7) Install the **Bracket L** and **Bracket R** as illustrated.
- (8) Secure the 2 Brackets with 7 **Silver Screws**.

- (9) Connect the **Harness** of the 2nd Paper Feed Module to the machine.

**Note:**

Make sure the **Connector** is inserted securely as illustrated.

- (10) Reinstall the **2nd Paper Tray**.
- (11) Reinstall the **Rear Paper Tray Cover**.
- (12) Plug the **AC Power Cord** and turn the Power Switch on the Rear Side of the machine to the ON position.
- (13) Reconnect the **Telephone Line Cable** if it was disconnected.
- (14) Load paper into the 2nd Paper Tray.

**Caution:**

Make sure that the paper is set under the Ribs and that it does not exceed the Max. Level Indicator.  
You can load up to 550 sheets (20 lb / 75 g/m<sup>2</sup>).

## 8.6. Installing the Handset Kit (GJ-1150)

### 8.6.1. Contents

Qty.	Description	Remarks
1	Cradle Assembly	
1	Handset	
1	Handset Cord	
1	Installation Instructions	

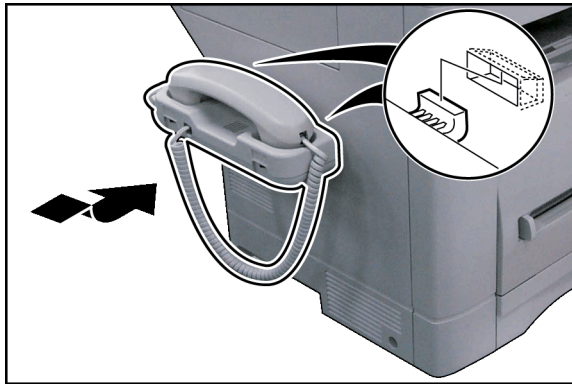
**Note:**

1. The part number(s) may differ depending on the Destination.
2. Refer to the Parts List.

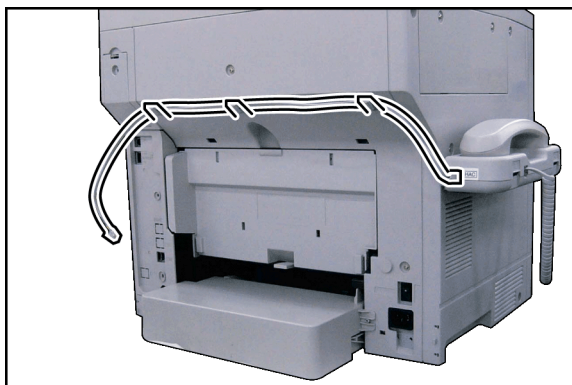
### 8.6.2. Installation

**CAUTION!**

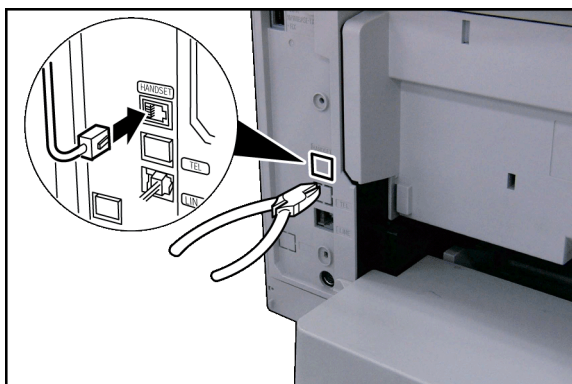
Turn the Power Switch on the Rear Side of the machine to the OFF position, and then unplug the AC Power Cord before beginning installation. (During a Lightning Storm, to prevent electrocution disconnect the Telephone Line Cable first before unplugging the AC Power Cord.)



- (1) Hook the projections of the **Cradle Assembly** into the holes on the Left Cover.
- (2) Connect the **Handset Cord** to the Cradle Assembly and the Handset as illustrated.



- (3) Fasten the **Cradle Assembly Cable** onto the Hooks on the Rear Cover as illustrated.



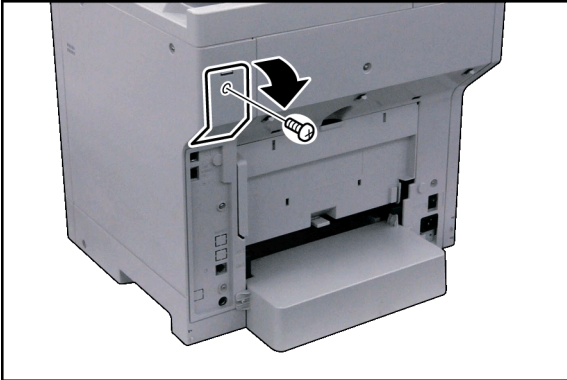
- (4) Remove the **Protective Tab** covering the HANDSET Jack on the Rear Cover.
- (5) Connect the **Cradle Assembly Cord**.
- (6) Plug the **AC Power Cord** and turn the Power Switch on the Rear Side of the machine to the ON position.
- (7) Reconnect the **Telephone Line Cable** if it was disconnected.

## 8.7. Installing the SD Memory Card (32 MB up to 512 MB)

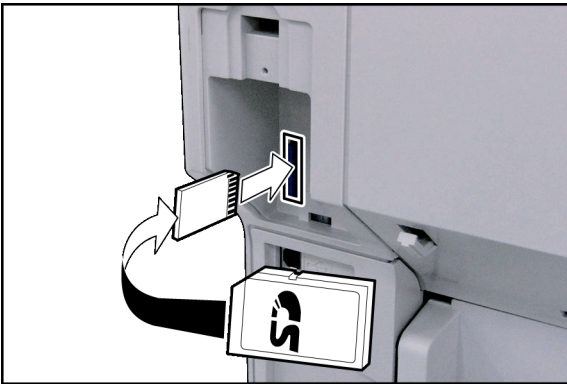
### 8.7.1. Installation

#### **CAUTION!**

Turn the **Power Switch** on the **Rear Side** of the machine to the **OFF** position, and then unplug the **AC Power Cord** before beginning installation. (During a **Lightning Storm**, to prevent electrocution disconnect the **Telephone Line Cable** first before unplugging the **AC Power Cord**.)



- (1) Disconnect the **Telephone Line**, **LAN** and/or **USB Cables** if connected.
- (2) Remove 1 **Silver Screw**.
- (3) Remove the **SD Card Cover**.



- (4) Gently insert the **SD Memory Card** as illustrated (Logo facing outward).

#### **Caution:**

Forcing the card into the slot may cause damage to the card or machine.

- (5) Reinstall the **SD Card Cover**.
- (6) Plug the **AC Power Cord** and turn the **Power Switch** on the **Rear Side** of the machine to the **ON** position.
- (7) Reconnect the **Telephone Line**, **LAN** and/or **USB Cables**.

#### **Caution:**

Do not remove the SD Memory Card or turn the power OFF during Formatting or while Updating the Firmware.

#### **Note:**

1. When a New (Blank) SD Memory Card is detected for the first time, a prompt for Formatting will appear on the LCD. The machine will format the SD Card for DATA (used for Fax Image, 1,000 Station Auto Dialer, JOB MIB Data, etc.), and it takes approximately 3 to 12 min. to format depending on the manufacturer, SD Memory Card size or Data Access Speed of the SD Card.
2. To Update the Firmware or to Format an SD Memory Card using the F9-15 Service Mode takes approximately 5 sec. Refer to 3.5.6. (Formatting the SD Memory Card).

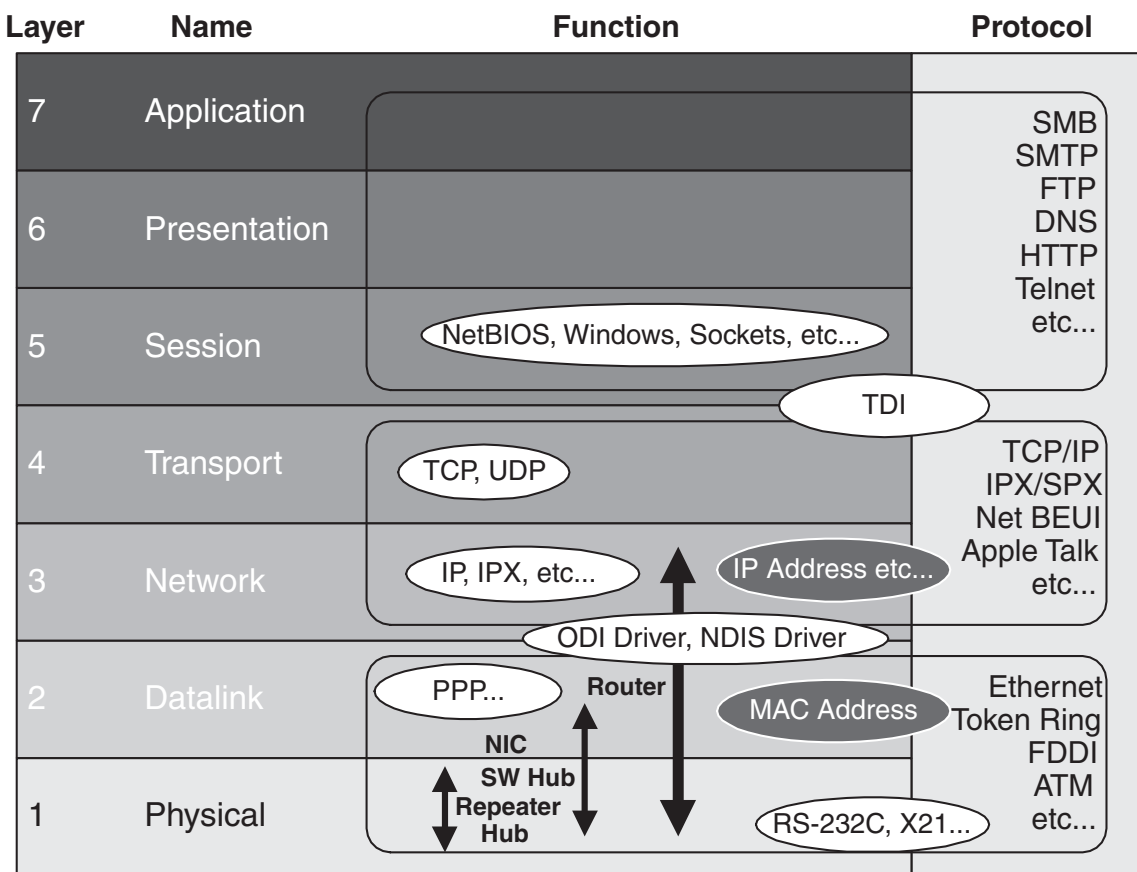
# 9 General Network Information

## 9.1. Network Protocol

### 9.1.1. OSI Reference Mode

Having a model in mind helps you understand how the pieces of the network puzzle fit together. The most commonly used model is the Open System Interconnection (OSI) reference model. The OSI model, first released in 1984 by the International Standards Organization (ISO), provides a useful structure for defining and describing the various processes underlying networking communications.

The OSI model organizes communication protocols into seven layers. Layer 1, the Physical (Hardware) layer, consists of protocols that deal with how data is transferred across the transmission media. At the opposite end, Layer 7, the Application layer, interfaces the network services with the applications (software) in use on the computer. The five layers in between, Data Link, Network, Transport, Session and Presentation - perform intermediate communication tasks. In essence the OSI model is a framework that describes how a function from one computer is transmitted to another computer on the network.



OSI Reference Model and Network Terms

### 9.1.2. Protocol

One reason for the popularity of TCP/IP is that no one vendor owns it, unlike the IPX/SPX, DNA, SNA or Apple Talk protocol suites, all of which are controlled by specific companies. TCP/IP evolved in response to input from a wide variety of industry sources. Consequently, it is the most open of the protocol suites and is supported by the widest variety of vendors. One huge advantage of using TCP/IP is that, it is required for communication over the Internet, thus the Internet can be used as a communication backbone.

TCP/IP was originally designed by ARPANET (Advanced Research Project Agency) in 1969 for the UNIX operating system. In early 1980, UNIX 4.2 BSD version was released. For more detailed information, an RFC (Request for Comment) document is available from the IETF (Internet Engineering Task Force) on the Internet at <http://www.ietf.org/>.

The Internet protocols do not map cleanly to the OSI reference model. The model for the Internet protocol suite has four layers. From the illustration below, you can see the approximate relationship of the layers.

Layer	OSI Reference Model	TCP/IP Base	Function
7	Application	Application	This layer embraces functions of the OSI Session, Presentation and Application layers. Protocols at this layer provide network services.
6	Presentation		
5	Session		
4	Transport	Transport	Compares to OSI Transport layer. Enables peer communication between hosts on the internetwork.
3	Network	Internet	Corresponds roughly to the OSI Network layer. Protocols move data between devices on networks.
2	Data Link	Network Interface	Corresponds to the bottom two layers of the OSI model. This correspondence enables the TCP/IP protocols to coexist with existing Data Link and Physical layer standards. This layer is concerned with all aspects of transmitting and receiving data on the network.
1	Physical		

#### Comparison of the TCP/IP layers to the OSI model

### 9.1.3. Cable

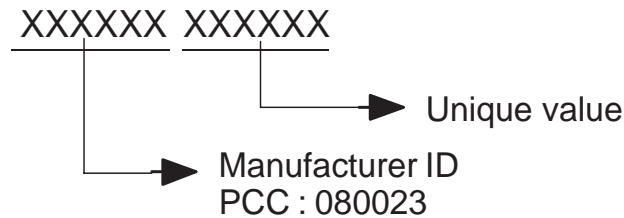
For the network transmission media at the Physical layer on the OSI reference model, there are several cable categories available. Category 5, 8 wire Unshielded Twisted Pair (UTP) cable is commonly used. Shielded Twisted Pair cables are also available. The Impedance for the STP / UTP Ethernet cable is 100  $\Omega$ . Category 3 is also used for the 10Base-T Ethernet.

Category	Purpose
1	Voice grade telephone line
2	ISDN
3	10Base-T Token Ring (4M)
4	Token Ring (16M)
5	100Base-TX, ATM (155M)

## 9.2. Layer Functions and Technology

### 9.2.1. MAC (Media Access Control)

The MAC address is burnt into each network card for establishing addresses for nodes on the network. These addresses are hexadecimal in nature and are unique for each card. The First three bytes from the left end identify the manufacturer's code that must be approved by IEEE (Institute of Electrical and Electronics Engineers). The Remaining three bytes on the right half should be kept in a unique manner. For Ethernet connections, multiple stations share the topology, therefore, the identification packet from each station should be unique.



### 9.2.2. Network Control

CSMA/CD (Carrier Sense Multiple Access with Collision Detection) If a node is trying to make a link to the network, transmission from another station is prohibited and halted until the data transfer is completed and the link is off. CSMA/CD and Token Passing are typical techniques used to control the connection.

The General sequence is as follows:

- Wait for the next available timing to send,
  - Send out a frame,
  - Perform collision sensing simultaneously,
  - Retry to send the same frame up to 16 times if necessary.
- (Sequence goes by a binary exponential back-off algorithm to avoid periodical incident)

### 802.3 (Ethernet) Frame Format

← Most significant bit			Least significant bit →		
Pre-amble 8 byte	Destination MAC address 6 byte	Source MAC address 6 byte	Data type 2 byte	Data 46~1500 byte	FCS 4 byte

Destination MAC address: 6 byte (uni-cast or broadcast)

If all "1" on 6 byte (FF-FF-FF-FF-FF) means broadcast frame, it is detected by an applicable node, it must be passed to the upper layer.

Also, if the destination MAC address is not matched with that node, the frame is discarded at that node immediately.

### Token Passing

Token passing utilizes a frame called a token, which circulates around the network. A computer that needs to transmit must wait until it receives the token, at which time the computer is permitted to transmit. When the computer is done transmitting, it passes the token frame to the next station on the network.

The first station that is powered up on a token-ring network automatically becomes the active monitor station. Its responsibility is to announce itself to the next active downstream station as the active monitor station and request that station to announce itself to its next active downstream station. After each station announces itself to its next active downstream neighbor, the announcing station becomes the nearest active upstream neighbor (NAUN) to the downstream station. After each station becomes aware of its NAUN, the beaconing process continues every seven seconds.



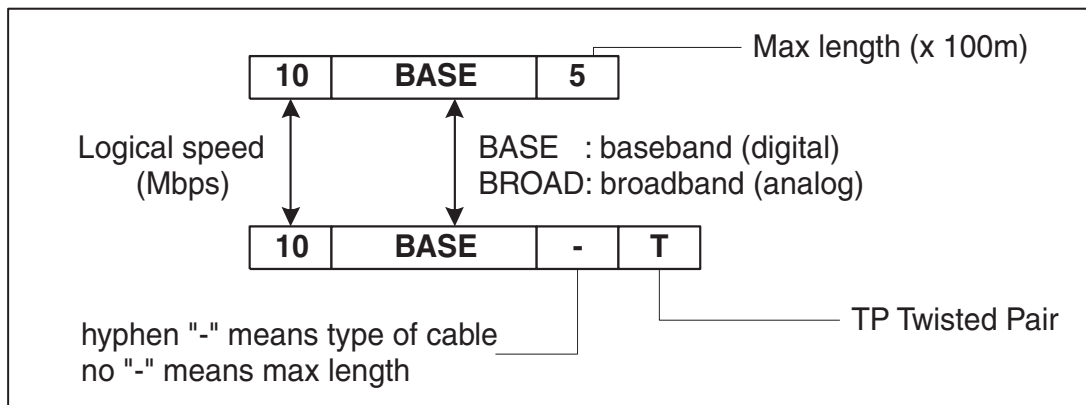


### 9.2.3. Ethernet

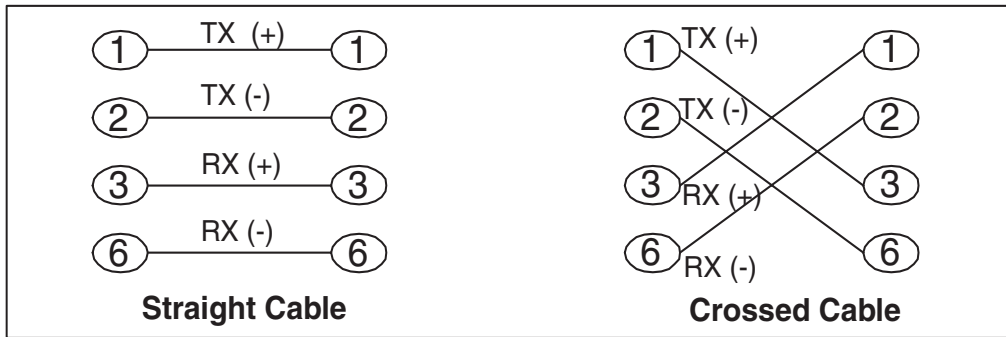
Ethernet is a very popular local area network architecture based on the CSMA/CD access method. The original ethernet specification was the basis for the IEEE 802.3 specifications. Typically, ethernet networks can use a bus physical topology, although, many varieties of ethernet such as 10Base-T uses a star physical topology and a bus logical topology. (Microsoft uses the term "star bus topology" to describe 10Base-T)

	Speed (bps)	Topology	Cable Type	Max Length
10Base-5	10M	Bus	Yellow cable	500 m (1640 ft)
10Base-T	10M	Star	Twisted Pair (Cat. 3, 4, 5)	100 m (328 ft)
100Base-TX	100M	Star	Twisted Pair (Cat. 5)	200 m (656 ft)

#### 802.3 (CSMA/CD) Network Type

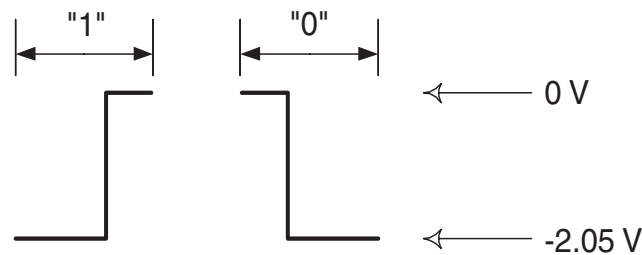


#### Ethernet Configuration



### Ethernet Cable Pin Configuration

All eight pins on the Ethernet cable are normally wired in this configuration accordingly. The Electrical level follows the Manchester code configuration.



Out of balance in electrical levels indicates that a collision is occurring in a certain area. To avoid from further malfunctions, terminating the physical end is required for coaxial cables.

If a collision is detected, transmission is stopped and a maximum of 4.8 usec. of JAM packet is sent. The node that receives the JAM packet, discards the applicable received data. The maximum timing for collision detection is called slot time, normally set to 49.9 usec. The interval of 9.6 usec to 10 usec after the end of transmission frame is reserved for non-transmission period.

There are several merits to Ethernet wiring, the physical connection is easy and flexible for future expansion due to the star topology.

#### 9.2.4. Repeater

The main purpose of a repeater is to extend the maximum range for the network cabling. They operate at the OSI Physical layer, and do not filter or interpret the signal - they merely repeat (regenerate) the signal, passing all network traffic in all directions.

They perform signal amplitude, delete errors and reschedule the timing. Repeaters also follow the 5-4-3 rule, where no more than 5 network segments connected by 4 repeaters, with no more than 3 of the segments being populated.

Active Hubs function in part as repeaters (amplify and regenerate network signals), they occasionally are called multiport repeaters.

#### 9.2.5. NIC (Network Interface Card)

NIC is an acronym for Network Interface Card, which plugs into a computer and adapts the network interface to the appropriate standard. ISA, PCI, and PCMCIA cards are all examples of NICs.

## 9.3. Network Layer

### 9.3.1. IP Address

An IP address is a set of four numbers, or octets, that can range in value between 0 and 255. Each octet is separated by a period (i.e. 192.168.31.1). All devices on a network that runs the TCP/IP protocol suite need a unique IP address. Most machines use a Domain Name, which are easier for people to remember.

The IP addresses are actually broken down into three distinct classes, known as class A, class B and class C addresses.

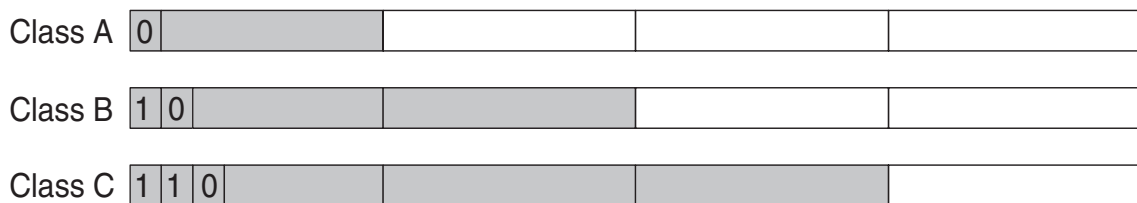
Class A IP addresses contain a number between 1 and 127 before the first dot. In class A address, this first octet represents the network address, and the last three octets represent the node or host number.

Class B IP addresses can range in value from 128 to 191 for the first octet, but it is the first two octets that make up the network address, and the last two octets that make up the host ID.

Class C IP addresses can range in value from 192 to 223 for the first octet, and the first three octets make up the host ID.

There are class D and E addresses as well. For these addresses, the first octet is a number greater than 223. These addresses are not currently available to be used and are reserved for other purposes.

- Class A : First octet reserved for the network address
- Class B : First two octets reserved for the network address
- Class C : First three octets reserved for the network address



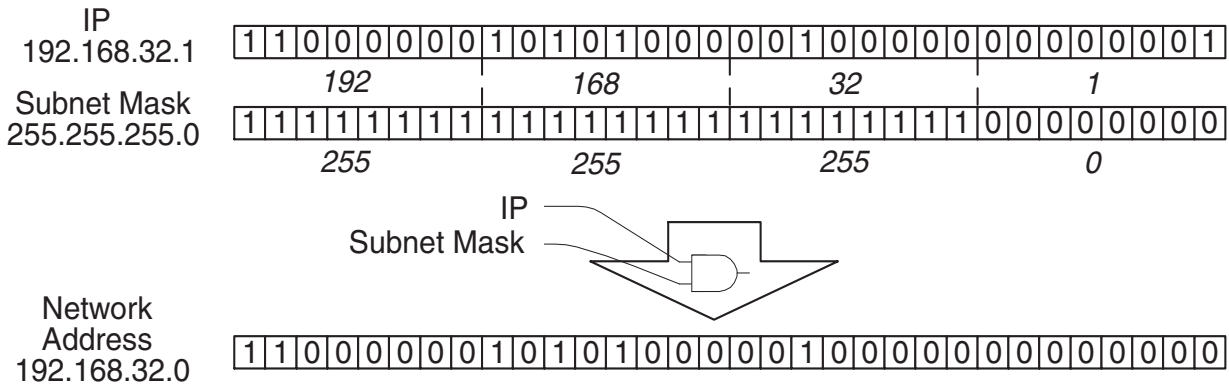
Network address represented as [shaded]

Private networks that do not connect to the Internet (operate internally) allow additional flexibility with IP addresses. Three classifications are available as shown below:

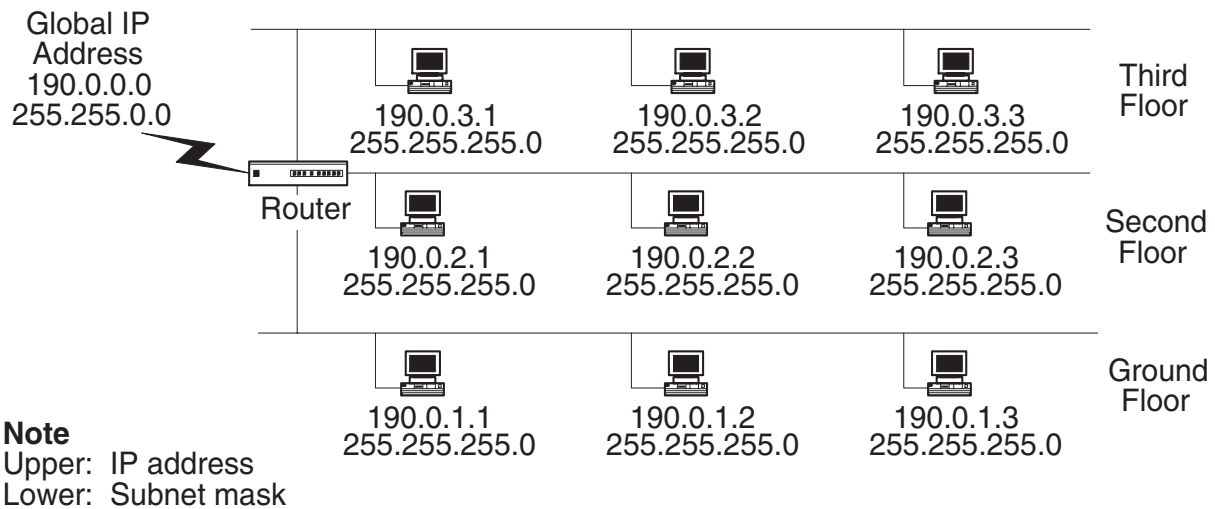
- Class A : 10.0.0.0 - 10.255.255.255
- Class B : 172.16.0.0 - 172.31.255.255
- Class C : 192.168.0.0 - 192.168.255.255

### 9.3.2. Subnet Mask

A subnet mask defines how sub-segments of a network are treated.



#### Network Address Configuration



#### Class B Subnet Outline

For network management purposes, special IP addresses are assigned.

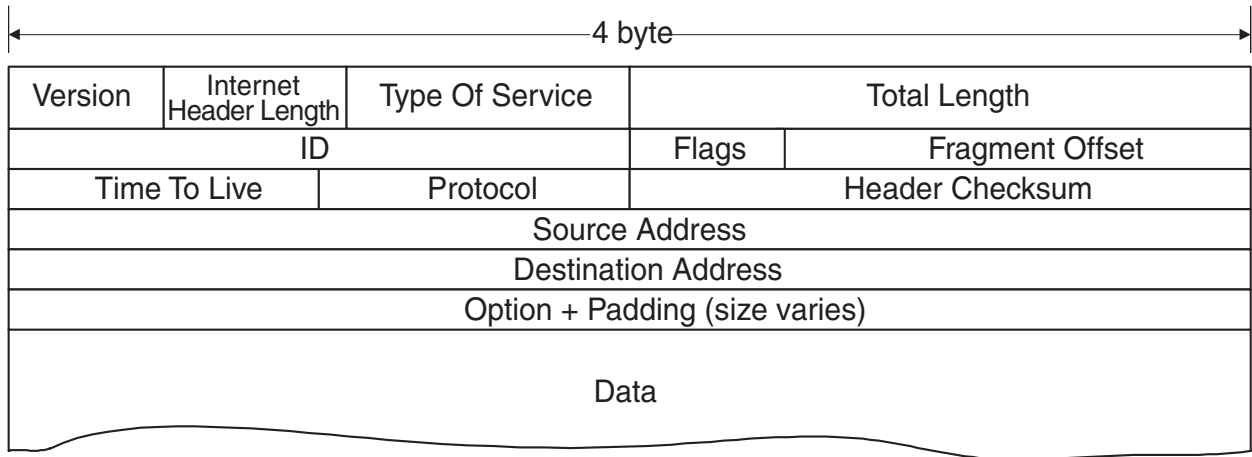
1. Host address is set to all "0"
2. Host address is set to all "1"  
Reserved for IP broadcasting to all subnet stations.
3. All 4 octets are set to all "1"  
IP broadcast of 255.255.255.255 can be passed over the router when the network address is specified. Normally, this is used for DHCP (Dynamic Host Configuration Protocol) network.
4. All 4 octets are set to all "0"  
Reserved for default route for non-destination address
5. Most significant bit starting with "127"  
Reserved for loop back address

### 9.3.3. Internet Protocol

The IP (Internet Protocol) operating at the OSI Network layer, is a connectionless protocol that provides datagram service, and IP packets are most commonly referred to as IP data grams.

It performs the following typical functions:

1. Identifies the IP address
2. Packet disassembly and reassembly of the IP datagram
3. Routing of the IP address



**IP Datagram**

Terms	Detail
Version	Currently version 4
Internet Header Length	IP Header field length
Type Of Service	Service priority requested by IP Datagram (3 bits are reserved for precedence)
ID	Identification frame number for upper layer communication
Flags	Packet disassembly information
Fragment Offset	Offset from most significant bit
Time To Live	Decrement the counter until 0 every time packet pass over the router
Protocol	Upper layer protocol identification number. ie TCP (06h), UDP (11h)
Header Checksum	Checksum is used for error checking on the header data
Source Address	Sender's IP Address
Destination Address	Destination's IP Address
Option	When implemented
Padding	Fill bit field to add up to 32 bit

### 9.3.4. Router

Routers, operating at the OSI Network layer, organize the large network in terms of logical network segments. Each network segment is assigned an address so that every packet has both a destination network address and a destination device address.

Routers are more intelligent than bridges. Not only do routers build tables of network locations, but they also use algorithms to determine the most efficient path for sending a packet to any given network by identifying its header information.

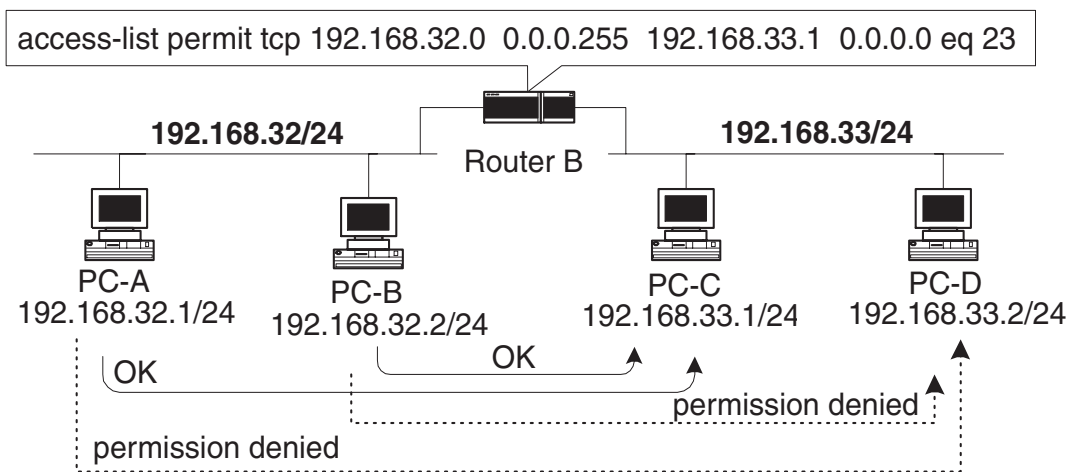
These are the typical functions:

#### 1. Routing

This controls the traffic according to a specified routing table.

#### 2. Packet Filtering

This performs the access and security control for specified routing.



**Packet Filtering Sample**

#### 3. Address Conversion

NAT (Network Address Translator), This performs conversion of a single global IP Address from/to single private IP Address.

#### 4. IP Masquerade:

This performs a conversion of single global IP Address from/to multiple private IP Address.

At the same time the port number is automatically assigned.

Occasionally, the conversion creates a bottleneck in the network overhead. For a typical solution, PIX (Private address Internet address exchange) is available from Cisco, which is a well-known manufacturer.

#### 5. Designated Reply

These are reply that keep a connection alive by responding with a signal periodically.

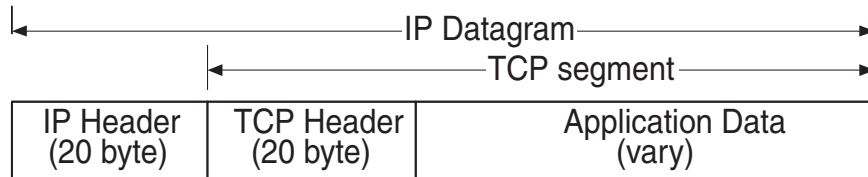
Watch Dog in IPX/SPX, TCP/IP in TCP, and Net BT (NetBIOS on TCP/IP) in Windows NT are all well known techniques to keep a live connection.

## 9.4. Transport Layer

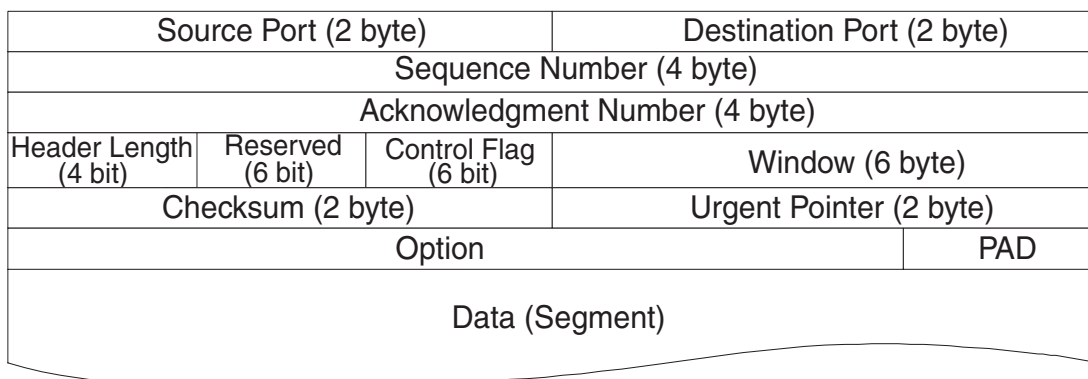
### 9.4.1. TCP (Transmission Control Protocol)

The TCP (Transmission Control Protocol) is an internetwork connection-oriented protocol that corresponds to the OSI Transport layer. TCP provides full-duplex, end-to-end connections. When the end-to-end communication acknowledgement is not required, the UDP (User Datagram Protocol) can be substituted for the TCP at the Transport (host-to-host) level. TCP and UDP operate at the same layer.

The UDP is a connectionless oriented protocol.



### TCP Segment in IP Datagram



### TCP Segment Outline

```

1 0k [172.21.11.21] [133.185.245.102] TCP D=110 S=23900 SYN SEQ=4538970 LEN=0 WIN=2144 64
2 0k [133.185.245.102] [172.21.11.21] TCP D=23900 S=110 SYN ACK=4538971 SEQ=1919424000 64
3 0k [172.21.11.21] [133.185.245.102] TCP D=110 S=23900 ACK=1919424001 WIN=2144 64

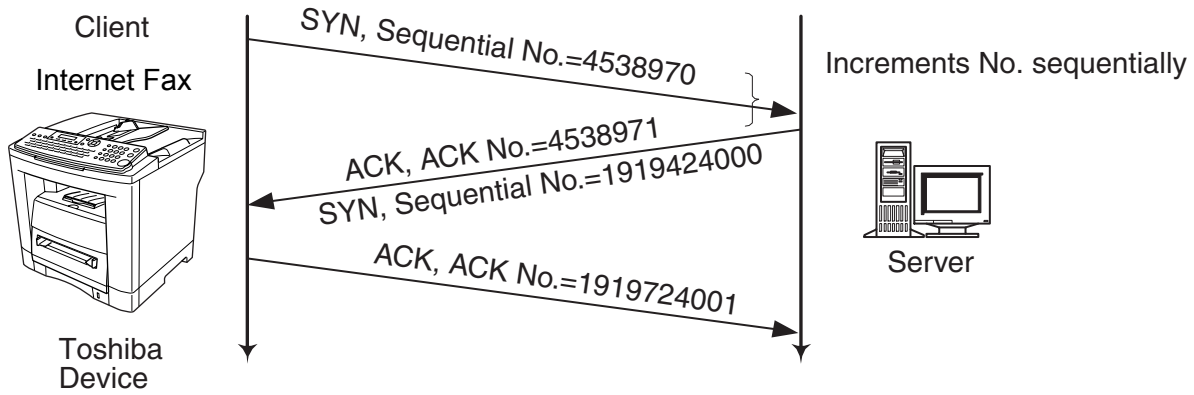
```

```

TCP: ----- TCP header -----
TCP:
TCP: Source port = 23900
TCP: Destination port = 110 (POP3)
TCP: Initial sequence number = 4538970
TCP: Data offset = 24 bytes
TCP: Flags = 02
TCP: ...0... = (No urgent pointer)
TCP: ...0... = (No acknowledgment)
TCP: ...0... = (No push)
TCP: ...0... = (No reset)
TCP: ...1... = SYN
TCP: ...0... = (No FIN)
TCP: Window = 2144
TCP: Checksum = COAE (correct)
TCP:
TCP: Options follow
TCP: Maximum segment size = 536
TCP:

```

### TCP Header Monitoring Sample



### TCP 3 Handshake General Flowchart

The client generates random sequential numbers initially and sends them to the server. The initial sequential numbers are synchronized with the clock and increments the counter every 4 msec.

The Server responds with an acknowledgement that increments the initial sequential number by one. The ACK bit number is also changed to a "1" value. The "SYN" can have an identical "ACK" response for each packet, thus, the server and the client can establish a connection.



## 9.5. Upper Layer

### 9.5.1. DNS (Domain Name System)

The DNS (Domain Name System) protocol provides host name and IP address resolution as a service to client applications. DNS servers enable humans to use logical node names, utilizing a fully qualified domain name structure, to access network resources.

Domain Names are comprised of 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general. A given device may have more than one Domain Name but a given Domain Name points to only one device. For example, the Domain Names below:

Toshibatec.com  
Mail.toshibatec.com  
ifax.toshibatec.com

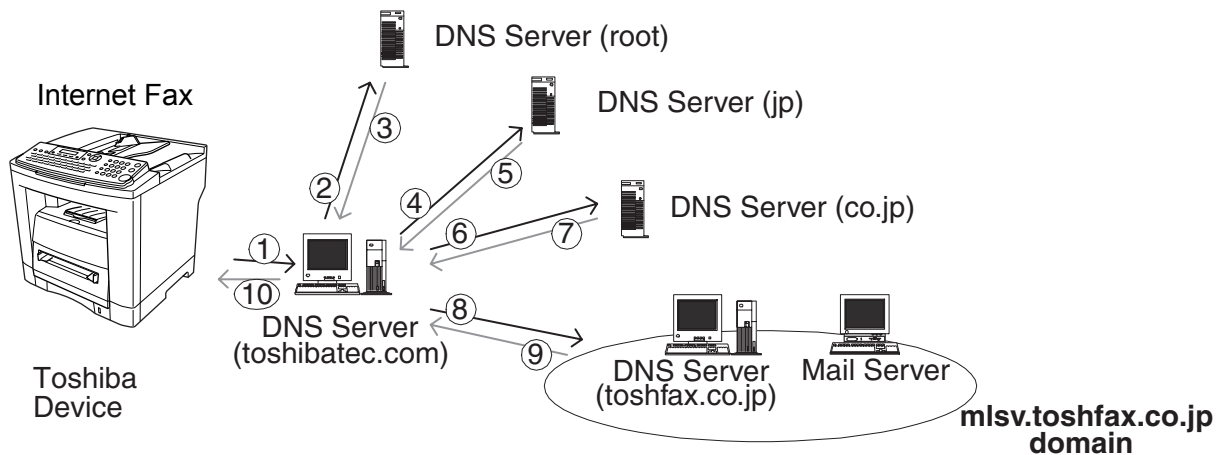
can all refer to the same device, but each domain name can refer to no more than one device.

Usually, all of the devices on a given network will have the same right-hand portion of their Domain Names (i.e. toshibatec.com in the examples above). It is also possible for a Domain Name to exist but not be connected to an actual device.

This is often done so that a group or business can have an Internet email address without having to establish a real Internet site. In these cases, some real Internet machine must handle the email on behalf of the listed Domain Name.

Specification for this name system follows this basic guideline.

- The name must be separated by dots and must start with ASCII code.
- Only Alpha numeric and hyphen are available.
- Up to 63 characters maximum, separated by dots.
- Up to 255 characters maximum, including all dots.
- Capital letters and small letters are not identical. (Case Sensitive.)



### DNS Name Resolution Sample

The advantage of using a DNS server over a host lookup table, for host name resolution, is to avoid the need for a single centralized clearinghouse for all names. The authority for this information can be delegated to different organizations on the network responsible for it.

There are at least 10 Root DNS servers installed all over the world.

The Name resolution flow is shown in the illustration above and follows the sequence below:

1. Query the local DNS Server.
2. Query the root DNS Server because the domain belongs to a destination outside of the company.
3. The “Com” root DNS Server sends the query to the “jp” root DNS Server.
4. The procedure repeats until a final name resolution is available.
5. The toshfax.co.jp server responds with an IP address for the query name.
6. Finally, the name resolution is completed and the destination IP address is determined.

All DNS servers makes an effort to resolve the query name with an IP address, however, a response is not always sent out every time. Once a name resolution is completed, the information from the DNS Server IP address table is kept in cache memory at each DNS server in accordance with a minimum TTL (Time To Live) of SOA (Start Of Authority) record. There are two types of Name Servers, Primary and Secondary Name Server.

### **9.5.2. Primary Name Server**

A primary server has the original copy of a zone file. Any changes made to the zone file are made to the copy on the primary server. When a primary server receives a query about a host name in its own zone, it retrieves the host resolution locally from its own zone files.

### **9.5.3. Secondary Name Server**

A secondary server gets a copy of zone files from another server. This zone file is a read-only copy of the original file from the primary server. Any changes made to the zone file are made at the primary server, then the changes are copied down to the secondary server through a zone transfer. Multiple secondary servers in a domain improves performance.

#### 9.5.4. SOA (Start of Authority) Record

Each database file starts with a Start of Authority (SOA) record for the file. This record specifies the zone's primary server, the server that maintains the read/write copy of the file. The syntax of this record is as follows:

IN SOA <source host><contact email><serial No.><refresh time><retry time><expiration time><TTL>

An example of the syntax is shown below:

```
;  
;  
; File:      db.127.0.0 file  
; Purpose:   This file establishes the identity of this DNS.  
;           SOA stands for 'start of authority' and sets the  
;           default parameters for information this DNS is  
;           authorized for:  
;  
;  
@      IN SOA   nwr42.rdmg.pcc.co.jp. hostmaster.rdmg.pcc.co.jp. (  
          951213   ; serial number  
          43200   ; refresh every 12 hours  
          7200    ; retry after 2 hours  
          1209600 ; expire after 2 weeks  
          172800) ; default ttl is 2 days  
;  
      IN NS    nwr42.rdmg.pcc.co.jp.  
1     IN PTR   localhost.rdmg.pcc.co.jp.  
;
```

SOA Record (Bind 4.9.5 for NT) in "db.127.0.0" file

The "@" symbol in this example indicates the local server; "IN" indicates an Internet record. The FQDN for the name server NWR18 must end in a period. Note that the email address for the administrator must have a period instead of the "@" symbol. Also, if the SOA record is on more than one line, an open parenthesis must end the first line, and a close parenthesis must end the last line.

The following list explains the other parameters:

- \* **Source host:** The name of the host that has the read/write copy of the zone file.
- \* **Contact email:** The Internet email address of the person who maintains this file. This address must be expressed with a period instead of the "@" that is usually found in email addresses (i.e. hostmaster.rdmg.mgcs.mei.co.jp instead of hostmaster@rdmg.mgcs.mei.co.jp).
- \* **Serial number:** A version number for the zone file. This number should be changed each time the zone file changes, it changes automatically if you use DNS Manager to change the zone file.
- \* **Refresh time:** The time, in seconds, that a secondary server waits before checking the master server for changes to the database file. If the file has changed, the secondary server requests a zone transfer.
- \* **Retry time:** The time, in seconds, that a secondary server waits before trying again if a zone transfer fails.
- \* **Expiration time:** The time, in seconds, that a secondary server keeps trying to transfer a zone. After the expiration time passes, the old zone information is deleted.
- \* **TTL:** The time, in seconds, that a server can cache resource records from this database file. The TTL is sent as part of the response for any queries that are answered from this database file. An individual resource record can have a TT: that overrides this value.

### 9.5.5. A (Address) Record

The A (Address) Record, lists the addresses for a given machine. The name field is the machine's name and the address is the network address. There should be one A record for each address on the machine.

```
; BIND version named 4.9.5-Rel+-Monday-dd-Month-yy
; BIND version GregSchueman-LarryKahn-VirajBais
; zone 'rdmg.pcc.co.jp' last serial 720
; from 133.185.245.7 at Sun Mmm dd:11:35 yyyy
$ORIGIN pcc.co.jp.
rdmg      IN      SOA      nwmgr.pcc.co.jp. postmaster.rdmg.pcc.co.jp. (
          721 10800 3600 604800 86400 )
          IN      NS       nwmgr.pcc.co.jp.
          IN      MX       10 mlsv2.rdmg.pcc.co.jp.
$ORIGIN rdmg.pcc.co.jp.
ifax-gz03 IN      A        172.21.94.216
qmc-cco1  IN      A        133.185.254.212
ifaxos01 IN      A        172.21.97.26
ifpdyna   IN      A        202.244.202.29
```

A Record (Bind 4.9.5 for NT) in "db zone.info" file

### 9.5.6. PTR (Pointer) Record

Pointer records are the reverse-lookup file entries that enable IP addresses to be resolved to host names. DNS is used to resolve host names to IP addresses, so the opposite process is called reverse lookup.

They specify the IP address in reverse order (like a DNS name, with the most specific information first) and then corresponding host name. The files are named according to the class of network, but with the octets in reverse order. The syntax for a PTR record is shown below:

<ip reverse domain name> IN PTR <host name>

```
          IN NS      nwr42.rdmg.pcc.co.jp.
1        IN PTR     localhost.rdmg.pcc.co.jp.
;
```

PTR record (Bind 4.9.5 for NT) in "db.127.0.0" file.

### 9.5.7. CNAME (Canonical Name) Record

The CNAME (or canonical name) record is an alias (nickname), enabling you to specify more than one name for each IP address. The syntax of a CNAME is shown below:

<alias name> CNAME <host name>

Using CNAME records, you can combine an FTP and a Web server on the same host. Nicknames are useful when a well-known host changes its name. In this case, its usually a good idea to have a CNAME record so people still using the old name, will get to the right place.

### 9.5.8. NS (Name Server) Record

The Name Server record specifies the other name servers for a domain. The syntax for a name server record is shown below:

```
<domain> IN NS <nameserver host>
```

An example of a name server record follows below:

```
@ IN NS nwmgr.pcc.co.jp
```

The "@" symbol indicates the local domain. The server "nwmgr" in the domain "pcc.co.jp" is the name server.

### 9.5.9. MX (Mail Exchange) Record

The Mail Exchange (MX) record specifies the name of the host that processes mail for this domain. If you list multiple mail servers, you can set a preference number (value) that specifies the order in which the mail server should be used. Note that lower values indicate higher precedence, and that mailers are supposed to randomize same-value MX hosts so as to distribute the load evenly if values are equal. If the first preferred mail server does not respond, the second one is contacted, and so on.

If you want a host to receive its own mail, you should create an MX record for your host's name, pointing at your host's name. The syntax of this record is shown below:

```
<domain> IN MX <preference> <mailserver host>
```

For a more detail, please refer to RFC974 document at URL <http://www.ietf.org/>.

### 9.5.10. Reverse Lookup

This is a special domain for allowing address to name mapping. As Internet host addresses do not fall within domain boundaries, this special domain was formed to allow inverse mapping. The IN-ADDR.ARPA domain has four labels preceding it. These labels correspond to the 4 octets of an Internet address. All four octets must be specified even if an octet contains zero. The Internet address 128.32.0.4 is located in the domain 4.0.32.128.IN-ADDR.ARPA. This reversal of the address is awkward to read but allows for the natural grouping of hosts in a network.

### 9.5.11. Forwarding

A Slave Server is a server that always forwards queries it cannot satisfy from its cache, to a fixed list of forwarding servers instead of interacting with the name servers for the root and other domains. The queries to the forwarding servers are recursive queries. There may be one or more forwarding servers, and they are tried in turn until the list is exhausted. A Slave and forwarder configuration is typically used when you do not wish all the servers at a given site to interact with the rest of the Internet servers. A typical scenario would involve a number of workstations and a departmental timesharing machine with Internet access. The workstations might be administratively prohibited from having Internet access. To give the workstations the appearance of access to the Internet domain system, the workstations could be Slave servers to the timesharing machine, which would forward the queries and interact with other name servers to resolve the query before returning the answer. An added benefit of using the forwarding feature is that the central machine develops a much more complete cache of information that all the workstations can take advantage of. The use of Slave mode and forwarding is discussed further under the description of the named bootfile commands.

There is no prohibition against declaring a server to be a slave even though it has primary and/or secondary zones as well; the effect will still be that anything in the local server's cache or zones will be answered, and anything else will be forwarded using the forwarders list.

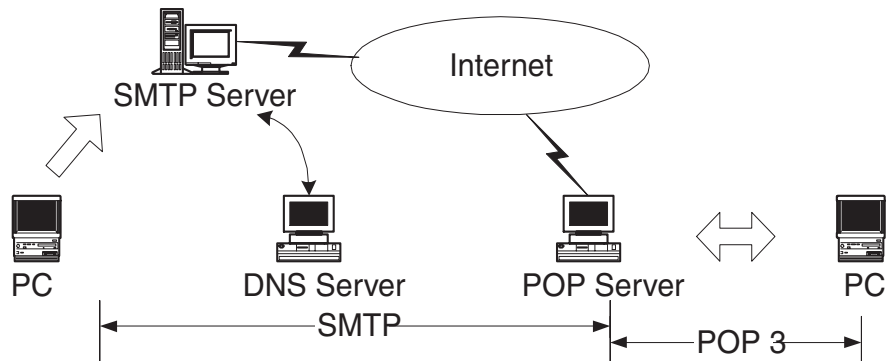
For more detail, please refer to published book (i.e. DNS and BIND etc) provided from O' Reilly & Associates, Inc.

## 9.6. SMTP (Simple Mail Transfer Protocol)

The objective of Simple Mail Transfer Protocol (SMTP) is to transfer mail reliably and efficiently. SMTP is independent of the particular transmission subsystem and requires only a reliable ordered data stream channel.

The SMTP design is based on the following model of communication: as the result of a user mail request, the sender-SMTP establishes a two-way transmission channel to a receiver-SMTP. The receiver-SMTP may be either the ultimate destination or an intermediate. SMTP commands are generated by the sender-SMTP and sent to the receiver-SMTP. SMTP replies are sent from the receiver-SMTP to the sender-SMTP in response to the commands. Once the transmission channel is established, the SMTP-sender sends a MAIL command indicating the sender of the mail. If the SMTP-receiver can accept mail it responds with an OK reply.

The SMTP-sender then sends a RCPT command identifying a recipient of the mail. If the SMTP-receiver can accept mail for that recipient it responds with an OK reply, if not, it responds with a reply rejecting that recipient (but not the whole mail transaction). The SMTP-sender and SMTP-receiver may negotiate several recipients. When the recipients have been negotiated the SMTP-sender sends the mail data, terminating with a special sequence. If the SMTP-receiver successfully processes the mail data it responds with an OK reply. The dialog is purposely lock-step, one-at-a-time. For more detail, please refer to the URL <http://www.imc.org/rfc821>



Internet Mail Sending and Receiving

### 9.6.1. Mail Header Sample

Received: from nwr35 by labo.pcc.com (8.9.3/3.7W-RDMG) with SMTP id PAA09157 for <freeport@labo.pcc.com>; Sun, dd Mmm yyyy 15:04:48 +0900 (JST)	Delivery route
Date: Sun, dd Mmm yyyy 15:04:48 +0900 (JST)	
Message-Id: <199908200604.PAA09157@mlsv2.labo.pcc.com>	Message ID
Mime-Version: 1.0	
X-Mailer: Internet FAX, Toshiba	
From: "Toshiba" <ifax98-us@labo.pcc.com>	
Subject: IMAGE from Internet FAX	
To: freeport@labo.pcc.com	
Content-Type: multipart/mixed; boundary="+--+Toshiba+--+"	Content-Type
X-UIDL: 8f32e4b1d691dfc28daa812d913f572	

## 9.7. ITU T.37 and RFC2305

### 9.7.1. Mode of Operation

The Unit conforms to the ITU T.37 standards and RFC2305. This Internet store and forward facsimile uses approved IETF protocols for posting, relaying and delivery of documents. It requires no changes to Internet standards or to ITU Facsimile Recommendations.

Store and forward facsimiles may operate in one of two modes.

Communicating in the Simple Mode as defined below provides inter operability. All terminals conforming to this recommendation and capable of reception must be able to receive in Simple Mode. It is recommended that terminals conforming to this recommendation and capable of transmitting should, as a minimum, be capable of transmitting in Simple Mode.

Simple Mode supports the transfer of image data. Capability exchange and confirmation of receipt are not required for Simple Mode but may be provided using optional email functions outside the scope of this recommendation.

### 9.7.2. Implementation Requirements for T.37 Simple Mode Table

#### Sender

Required	Send data as a single MIME multi-page TIFF Profile S file Provide notice in case of local transmission problem Provide a return address of an Internet email receiver which is MIME compliant
Strongly Recommended	Include Message-ID Use Base 64 encoding for image data
Optional	Use other TIFF Profiles if it has prior knowledge that such profiles are supported by the receiver Provide notice on receipt of DSN or other notifications

#### Receiver

Required	Be MIME compliant except that it is not required to offer to place MIME attachment in a file and may print a received file rather than display
	Be capable of processing multiple MIME TIFF Profile S image files within a single message
	Provide notice in case of reception or processing problems
Optional	Use other TIFF Profiles

### Offramp Gateway (when implemented)

Required	Be SMTP compliant
	Provide delivery failure notification
	Be able to process PSTN/FAX email address
	Comply with the relevant ITU Recommendations relating to facsimile transmission
	Attempt to relay authorized email to the corresponding G3 facsimile terminals
	Ensure DSN for delivery failure notification
Strongly Recommended	Use DSN for delivery failure notification
	Use an approved mailbox access protocol when serving multiple users
Optional	Translate image data into a format acceptable by the receiving G3 facsimile terminal
	Use a mailbox access protocol when serving a single mail recipient

### 9.7.3. Definitions and Abbreviations

IETF	Internet Engineering Task Force
RFC	Request For Comment
MIME	Multipurpose Internet Mail Extensions
POP3	Post Office Protocol version 3
SMTP	Simple Mail Transfer Protocol
DSN	Delivery Status Notification
MDN	Message Disposition Notification
TIFF	Tagged Image File Format
IFD	TIFF Image File Directory
Offramp gateway	Equipment capable of receiving email and relaying to one or more G3/G4 facsimile terminals
Mailstore	Equipment capable of receiving email and storing it for retrievals by receiver
Notice	Provision of status information to the originator or recipient in a manner to be determined by the device

#### RFC reference <http://www.imc.org/ietf-fax/>

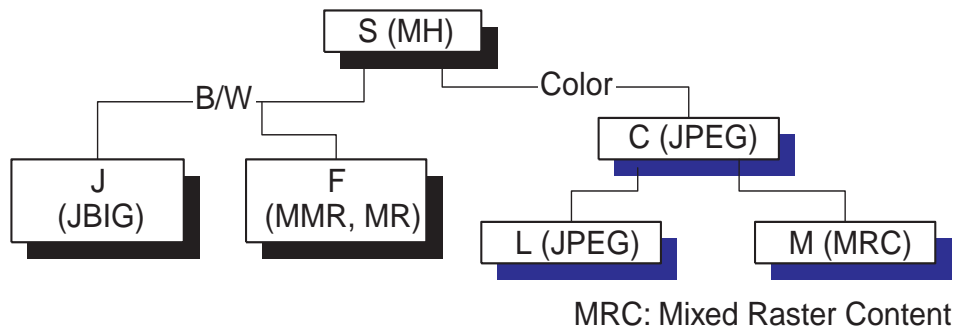
File Format for Internet Fax	RFC2301
Tag Image File Format (TIFF) Image/TIFF MIME Sub-type Registration	RFC2302
Minimal PSTN address format in Internet Mail	RFC2303
Minimal FAX address format in Internet Mail	RFC2304
A simple Mode of Facsimile Using Internet Mail	RFC2305
Tag Image File Format (TIFF)-F Profile for Facsimile	RFC2306



### 9.7.4. File Format for Internet Fax

Sending Internet Fax devices must be able to write minimum set TIFF files, according to the rules for creating minimum set TIFF files defined in TIFF for Facsimile (the S profile) [RFC2301], which is also compatible with the specification for the minimum subset of TIFF-F in [RFC2306]. Receiving Internet Fax devices MUST be able to read minimum set TIFF files.

The Following tree diagram shows the relationship among profiles and between profiles and coding methods.



A profile is based on a collection of ITU-T facsimile coding methods.

Class	Color	Coding Method	Remarks
S	B/W	MH	Internet Fax minimal set
F	B/W	MMR, MR	Internet Fax full mode
J	B/W	JBIG	Internet Fax mixed mode
C	Color	JPEG (lossy)	Color minimal set
L	Color	JPEG (lossless, grayscale)	One bit per color, palletized color image, continuous tone color and grayscale images
M	Color	Mixed Raster Content	Multiple coders and resolution within a page

### 9.7.5. Minimal Set

The minimum interchange set of TIFF fields that must be supported by all implementations in order to assure that some form of an image, albeit black-and-white, can be interchanged.

The table below summarizes the TIFF fields that comprise the minimal interchange set for black-and-white facsimile. The Baseline and Extension fields and fields values must be supported by all implementations.

Baseline Fields	Values
Bits Per Sample	1
Compression	3:1 dimension MH coding set T4 Options = 0 or 4
Fill Order	Least significant bit first
Image Width	1728 (A-4)
Image Length	N: total number of scan lines in image
New Sub File Type	2: Bit 1 identifies single page of a multi-page document
Page Number	N, m: page number n followed by total page count m
Photometric Interpretation	0: pixel value 1 means black
Resolution Unit	2: inch
Rows Per Strip	Number of scan lines per strip = Image length, with one strip
Samples Per Pixel	1
Strip Byte Counts	Number of byte in TIFF strip
Strip Offsets	Offsets from beginnings of file to single TIFF strip
X Resolution	204, 200 (pixels/inch)
Y Resolution	98, 196, 100, 200 (pixels/inch)
Extensions Fields	
T4 Options	0: MH coding, EOLs not byte aligned; 4: MH coding, EOLs byte aligned

### 9.7.6. Addressing

A simple method of encoding PSTN addresses in the local-part of Internet email addresses, along with an extension mechanism to allow encoding of additional standard attributes needed for email gateway to PSTN-based services.



**Note:**

For RFC2305, a PSTN address in an email address should follow the above style. The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in RFC 2119. URL <http://www.imc.org/rfc2119>

**1. MUST**

This word, or the terms “REQUIRED” or “SHALL”, means that the definition is an absolute requirement of the specification.

**2. MUST NOT**

This phrase, or the phrase “SHALL NOT”, means that the definition is an absolute prohibition of the specification.

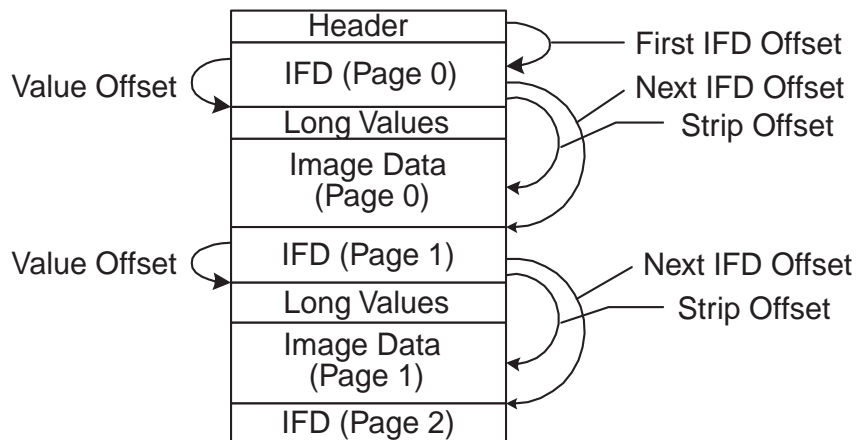
**3. SHOULD**

These words, or the adjective “RECOMMENDED”, means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.

**4. SHOULD NOT**

This phrase, or the phrase “NOT RECOMMENDED” means that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.

**9.7.7. Coding Example of a TIFF Header, IFD and Image Data**



**File Structure**

14	Ok	mlsv2.rdmg.mgcs.mei.co.jp	nwr35 (Internet FAX)	SMTP	R	PORT=25	250	<
15	Ok	nwr35 (Internet FAX)	mlsv2.rdmg.mgcs.mei.co.jp	SMTP	C	PORT=25	RCPT	
16	Ok	mlsv2.rdmg.mgcs.mei.co.jp	nwr35 (Internet FAX)	SMTP	R	PORT=25	250	<
17	Ok	nwr35 (Internet FAX)	mlsv2.rdmg.mgcs.mei.co.jp	TCP		D=25 S=32424		
18	Ok	nwr35 (Internet FAX)	mlsv2.rdmg.mgcs.mei.co.jp	SMTP	C	PORT=25	DATA	
19	Ok	mlsv2.rdmg.mgcs.mei.co.jp	nwr35 (Internet FAX)	SMTP	R	PORT=25	354	E
20	Ok	nwr35 (Internet FAX)	mlsv2.rdmg.mgcs.mei.co.jp	SMTP	C	PORT=25	Text	
21	Ok	mlsv2.rdmg.mgcs.mei.co.jp	nwr35 (Internet FAX)	TCP		D=32424 S=25		
22	Ok	nwr35 (Internet FAX)	mlsv2.rdmg.mgcs.mei.co.jp	SMTP	C	PORT=25	Text	
23	Ok	mlsv2.rdmg.mgcs.mei.co.jp	nwr35 (Internet FAX)	TCP		D=32424 S=25		

```

IP: Destination address = [133.185.245.7], mlsv2.rdmg.mgcs.mei.co.jp
IP: No options
IP:
TCP: ----- TCP header -----
TCP:
TCP: Source port          = 32424
TCP: Destination port     = 25 (SMTP)
TCP: Sequence number      = 54954
TCP: Acknowledgment number = 3085635849
TCP: Data offset          = 20 bytes
TCP: Flags                 = 18
TCP:          ..0. .... = (No urgent pointer)
TCP:          ...1 .... = Acknowledgment
TCP:          .... 1... = Push
TCP:          .... .0.. = (No reset)
TCP:          .... ..0. = (No SYN)
TCP:          .... ...0 = (No FIN)
TCP: Window                = 2144
TCP: Checksum               = 2BAA (correct)
TCP: No TCP options
TCP: [220 byte(s) of data]
SMTP: ----- Simple Mail Transfer Protocol -----
SMTP:
SMTP: Line 1:  Mime-Version: 1.0
SMTP: Line 2:  Content-Type: multipart/mixed; boundary="~+----MGCS~+----"
SMTP: Line 3:  X-Mailer: Internet FAX, MGCS
SMTP: Line 4:  From: "MGCS" <ifax98-us@rdmg.mgcs.mei.co.jp>
SMTP: Line 5:  Subject: IMAGE from Internet FAX
SMTP: Line 6:  To: freeport@mgcs.mei.co.jp
SMTP: Line 7:
SMTP:

```

### Message Header Contents

#### 9.7.8. Delivery Failure

In the event of relay failure, the sending relay must generate a failure message, which should be in the format of a DSN.

#### 9.7.9. Image File Format

The Sending Internet Fax devices MUST be able to write minimum set TIFF files, according to the rules for creating minimum set TIFF files defined in TIFF for Facsimile (the S profile), which is also compatible with the specifications for the minimum subset of TIFF-F in F Profile for Facsimile, RFC 2306.

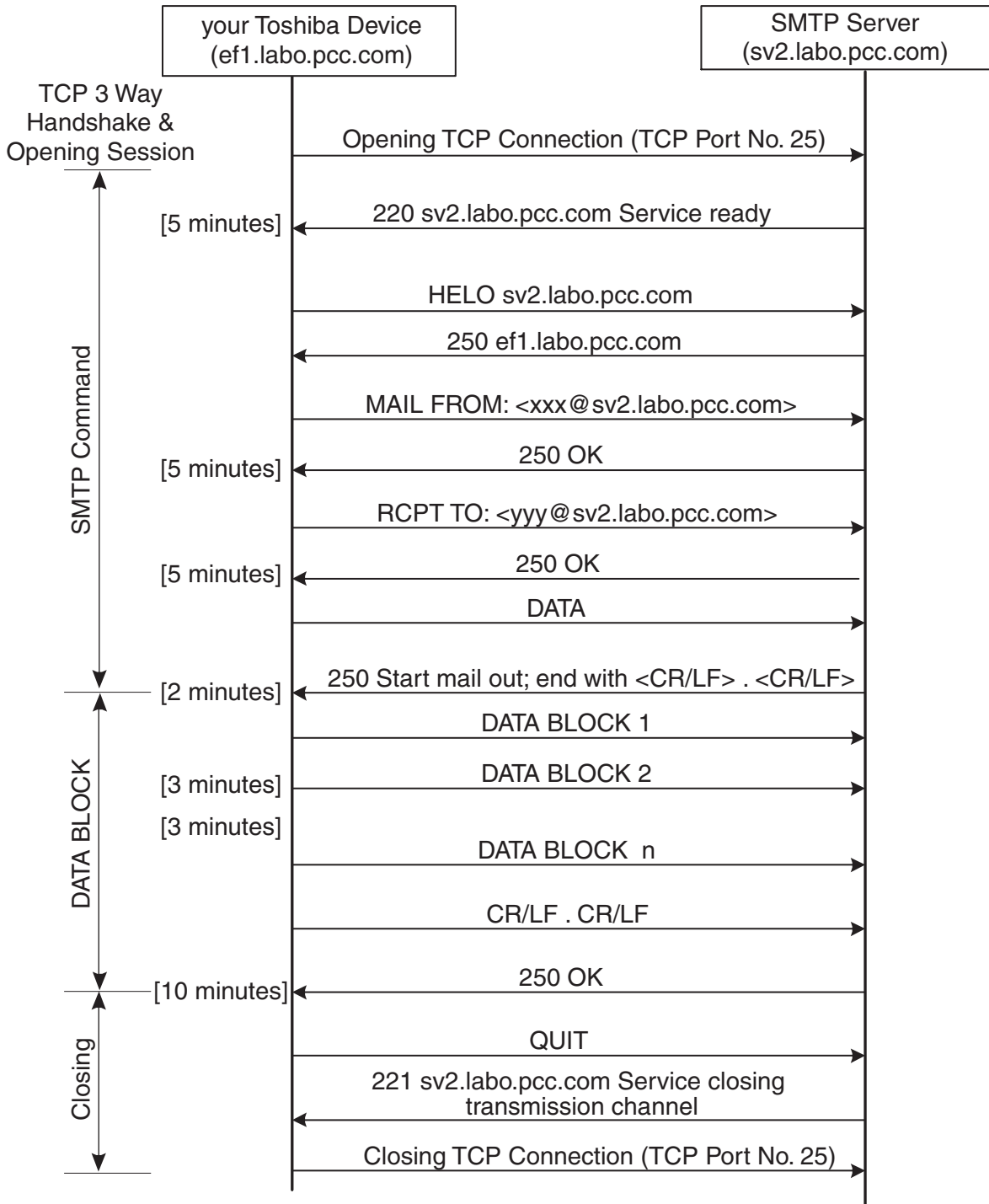
The Receiving Internet Fax devices must be able to read minimum set TIFF files.

## 9.8. Communication Protocols

The set of conventions necessary to achieve facsimile-compatible service covers basic data transport, document data formats, message (document) addressing, delivery confirmation, and message security.

Protocol supported by the your Toshiba Device is as follows:

### SMTP Command & Reply Procedure



According to RFC1123, there are two approaches for time-outs in the sender-SMTP:

1. limit the time for each SMTP command separately, or
2. limit the time for the entire SMTP dialogue for a single mail message.

A sender-SMTP SHOULD use option (a), per-command timeouts. Timeouts SHOULD be easily reconfigurable, preferably without recompiling the SMTP code.

The value of timer [ ] shown above are recommended by RFC1123.

### **9.8.1. Opening and Closing**

At the time the transmission channel is opened there is an exchange of commands to ensure that the hosts are communicating with the hosts they think they are. The following two commands are used in the transmission channel for opening and closing:

```
HELO:<SP> <domain> <CRLF>  
QUIT:<CRLF>
```

In the HELO command, the host sending the command identifies itself; the command may be interpreted as saying, "Hello, I am <domain>".

### **9.8.2. Mail (MAIL)**

This command is used to initiate a mail transaction in which the mail data is delivered to one or more mailboxes.

### **9.8.3. RECIPIENT (RCPT)**

This command is used to identify an individual recipient of the mail data; multiple recipients are specified by multiple uses of this command.

### **9.8.4. Data (DATA)**

The receiver treats the lines following the command as mail data from the sender. This command causes the mail data from this command to be appended to the mail data buffer. The mail data may contain any of the 128 ASCII character codes. The mail data is terminated by a line containing only a period, that is the character sequence "<CRLF>.<CRLF>". This is the end of mail data indication.

### **9.8.5. Send**

This command is used to initiate a mail transaction in which the mail data is delivered to one or more terminals. This command is successful if the message is delivered to a terminal.

### **9.8.6. Reset (RSET)**

This command specifies that the current mail transaction is to be aborted. Any stored sender, recipients, and mail data must be discarded, and all buffers and state tables cleared. The receiver must send an OK reply.

### **9.8.7. Verify (VRFY)**

This command asks the receiver to confirm that the argument identifies a user. If it is a user name, the full name of the user (if known) and the fully specified mailbox are returned.

### **9.8.8. Quit (QUIT)**

This command specifies that the receiver must send an OK reply, and then close the transmission channel.

### **9.8.9. Reply Codes from SMTP Server**

SMTP is independent of the particular transmission subsystem and requires only a reliable ordered data stream channel. The SMTP design is based on the following model of communication: as the result of a user mail request, the sender-SMTP establishes a two-way transmission channel to a receiver-SMTP. The receiver-SMTP may be either the ultimate destination or an intermediate. SMTP commands are generated by the sender-SMTP and sent to the receiver-SMTP. SMTP replies are sent from the receiver-SMTP to the sender-SMTP in response to the commands.

## 9.8.10. NUMERIC ORDER LIST OF REPLY CODES

211	System status or system help reply
220	<domain> Service ready
221	<domain> Service closing transmission channel
250	Requested mail action okay# completed
251	User not local; will forward to <forward-path>
354	Start mail input; end with <CRLF>.<CRLF>
421	<domain> Service not available: closing transmission channel [This may be a reply to any command if the service knows it must shut down]
450	Requested mail action not taken: mailbox unavailable [E.g.# mailbox busy]
451	Requested action aborted: local error in processing
452	Requested action not taken: insufficient system storage
500	Syntax error# command unrecognized [This may include errors such as command line too long]
501	Syntax error in parameters or arguments
502	Command not implemented
503	Bad sequence of commands
504	Command parameter not implemented
550	Requested action not taken: mailbox unavailable [E.g.# mailbox not found# no access]
551	User not local; please try <forward-path>
552	Requested mail action aborted: exceeded storage allocation
553	Requested action not taken: mailbox name not allowed [E.g.# mailbox syntax incorrect]
554	Transaction failed

## 9.9. POP (Post Office Protocol Version 3)

### 9.9.1. Introduction

On certain types of smaller nodes in the Internet it is often impractical to maintain a message transport system (MTS). For example, a workstation may not have sufficient resources (cycles, disk space) in order to permit a SMTP server and associated local mail delivery system to be kept resident and continuously running. Similarly, it may be expensive (or impossible) to keep a personal computer interconnected to an IP-style network for long amounts of time.

The Post Office Protocol - Version 3 (POP3) is intended to permit a workstation to dynamically access a mail drop on a server host in a useful fashion. Usually, this means that the POP3 protocol is used to allow a workstation to retrieve mail that the server is holding for it.

For more detail, please refer to URL of [http:// www.imc.org/rfc1939](http://www.imc.org/rfc1939)

### 9.9.2. Basic Operation

Initially, the server host starts the POP3 service by listening on TCP Port No. 110. When a client host wishes to make use of the service, it establishes a TCP connection with the server host. When the connection is established, the POP3 server sends a greeting. The client and POP3 server then exchange commands and responses (respectively) until the connection is closed or aborted.

Commands in the POP3 consist of a case-insensitive keyword, possibly followed by one or more arguments. All commands are terminated by a CRLF pair. Keywords and arguments consist of printable ASCII characters. Keywords and arguments are each separated by a single SPACE character. Keywords are three or four characters long. Each argument may be up to 40 characters long.

Responses in the POP3 consist of a status indicator and a keyword possibly followed by additional information. All responses are terminated by a CRLF pair. Responses may be up to 512 characters long, including the terminating CRLF. There are currently two status indicators: positive ("OK") and negative ("-ERR"). Servers MUST send the "+OK" and "-ERR" in upper case.

Responses to certain commands are multi-line. In these cases, which are clearly indicated below, after sending the first line of the response and a CRLF, any additional lines are sent, each terminated by a CRLF pair. When all lines of the response have been sent, a final line is sent, consisting of a termination octet (decimal code 046, ".") and a CRLF pair. If any line of the multi-line response begins with the termination octet, the line is "byte-stuffed" by pre-pending the termination octet to that line of the response.

Hence a multi-line response is terminated with the five octets "CRLF.CRLF". When examining a multi-line response, the client checks to see if the line begins with the termination octet. If so and if octets other than CRLF follow, the first octet of the line (the termination octet) is stripped away. If so and if CRLF immediately follows the termination character, then the response from the POP server is ended and the line containing ".CRLF" is not considered part of the multi-line response.

A POP3 session progresses through a number of states during its lifetime. Once the TCP connection has been opened and the POP3 @server has sent the greeting, the session enters the AUTHORIZATION state. In this state, the client must identify itself to the POP3 server. Once the client has successfully done this, the server @acquires resources associated with the client's mail drop, and the session enters the TRANSACTION state. In this state, the client requests actions on the part of the POP3 server. When the client has issued the QUIT command, the session enters the UPDATE state. In this state, the POP3 server releases any resources acquired during @the TRANSACTION state and says goodbye. The TCP connection is then closed.

A server MUST @respond to an unrecognized, unimplemented, or @syntactically invalid command by responding with a negative status @indicator. A server MUST respond to a command issued when the session is in an incorrect state by responding with a negative status indicator. There is no general method for a client to distinguish between a server which does not implement an optional command and a server which is unwilling or unable to process the command.



A POP3 server MAY have an inactivity auto logout timer. Such a timer MUST be of at least 10 minutes' duration. The receipt of any command from the client during that interval should suffice to reset the auto logout timer. When the timer expires, the session does NOT enter the UPDATE state--the server should close the TCP connection without removing any messages or sending any response to the client.

### 9.9.3. POP3 Command Summary

Minimal POP3 Commands:

USER name                    valid in AUTHORIZATION state  
 PASS string  
 QUIT

STAT                            valid in the TRANSACTION state  
 LIST [msg]  
 RETR msg  
 DELE msg  
 NOOP  
 RSET  
 QUIT

Optional POP3 Commands:

APOP name digest            valid in AUTHORIZATION state

TOP msg n                    valid in the TRANSACTION state  
 UIDL [msg]

POP3 Replies:

+OK  
 -ERR

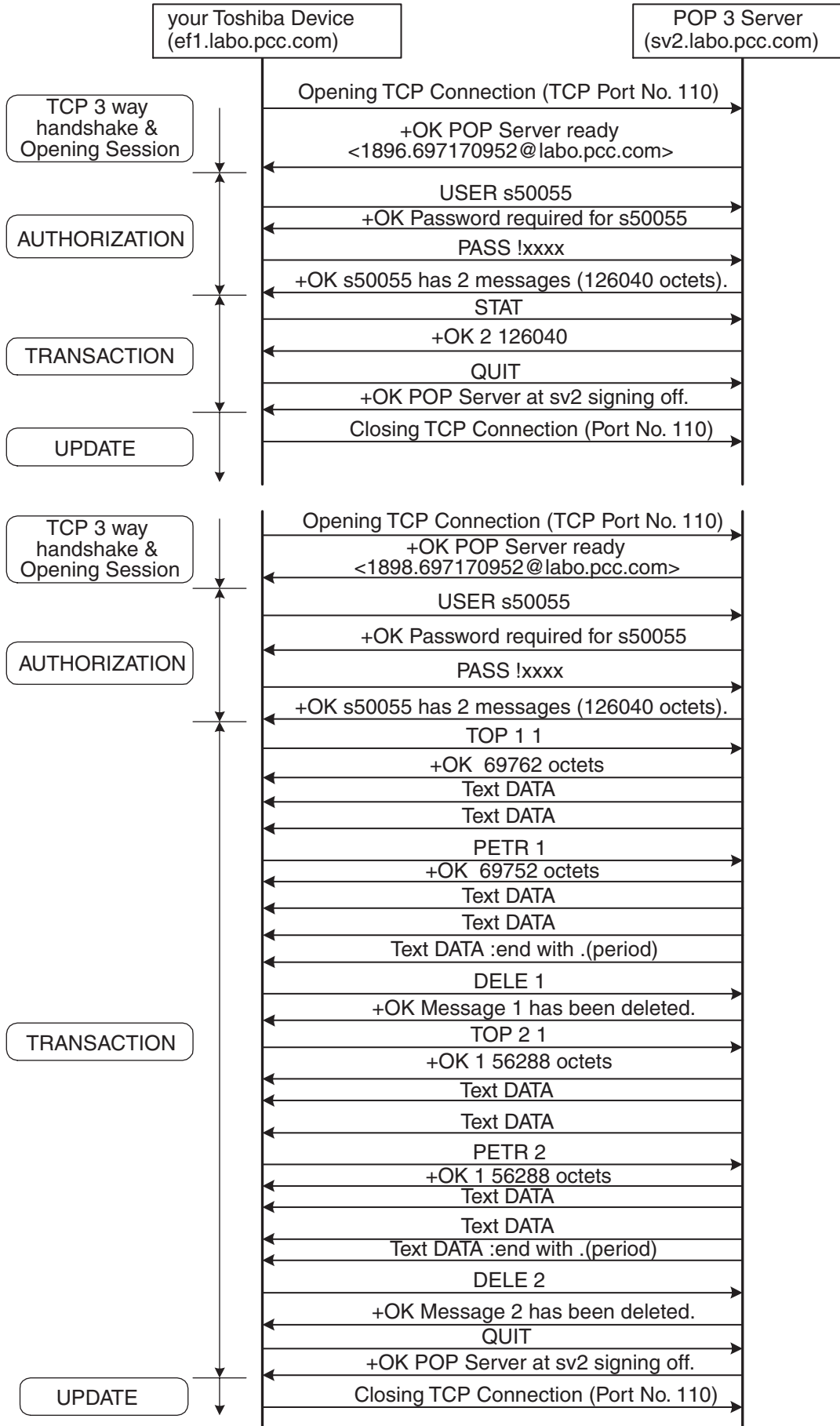
**Note:**

With the exception of the STAT, LIST, and UIDL commands, the reply given by the POP3 server to any command is significant only to "+OK" and "-ERR". The client may ignore any text occurring after this reply.

	From:	To:	
1	ok [172. 21. 11. 19]	[133. 185. 245. 20]	TCP D=110 S=12270 SYN SEQ=14220350 LEN=0 WIN=2144
2	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 SYN ACK=14220351 SEQ=1205248000 LEN=0 WIN=4
3	ok [172. 21. 11. 19]	[133. 185. 245. 20]	TCP D=110 S=12270 ACK=1205248001 WIN=2144
4	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK UCB Pop server (version 1.831beta) at
5	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 USER p50019
6	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK Password required for p50019.
7	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 PASS p50019
8	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 ACK=14220377 WIN=4096
9	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK p50019 has 1 message(s) (788 octets).
10	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 STAT
11	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK 1 788
12	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 QUIT
13	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 ACK=14220389 WIN=4096
14	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK Pop server at popm1 signing off.

Sample of a POP3 Protocol Log

### POP 3 Command & Reply Procedure



## 9.10. Troubleshooting from a PC

Troubleshooting is an art of seeking out the cause of a problem and eliminating the problem by managing or eliminating the cause. No matter what the problem is on your network, the OSI Reference Model serves as an excellent reference tool to help you locate the area of trouble.

One of the simplest tools available, is the DOS command-line prompt from your Windows PC.

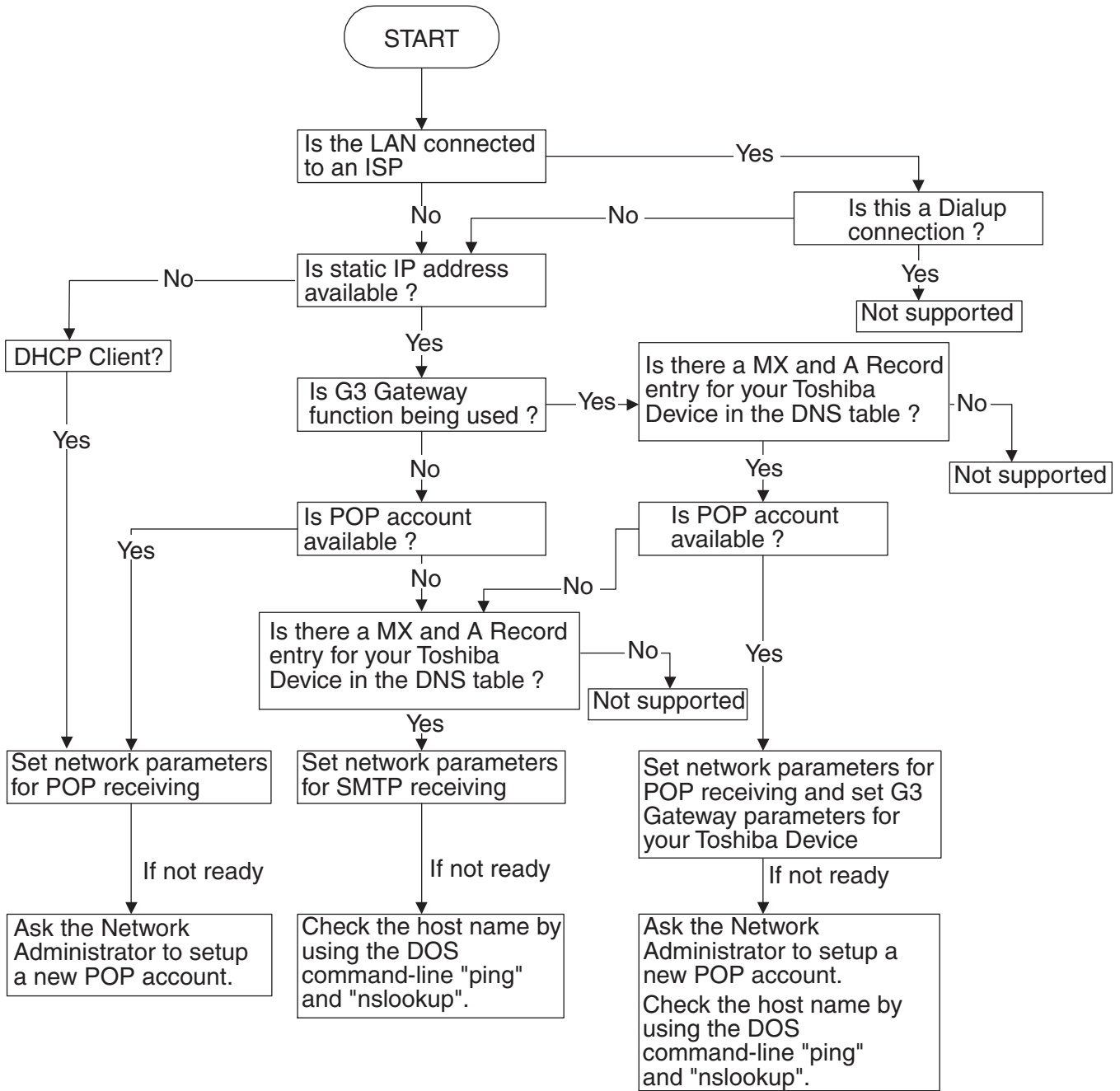
Listed below are the most often used command-line prompts that you can use at the customer's network PC. Some commands are available as an option for checking with more detail.

Command	Sample	Purpose
Ping	Ping 192.168.1.30	Checking for physical connection between your PC and the target destination (192.168.1.30)
Ipconfig /all	Ipconfig /all	Checking for current network configuration (Host Name, DNS server, IP address, Subnet Mask, Default Gateway, MAC address, WINS etc) For Windows 95/98/Me, please type "winipcfg" instead of Ipconfig/all
Tracert	Tracert 192.168.2.245	Checking for the datagram route between your PC and the target destination (192.168.2.245)
Netstat	Netstat Netstat -nr	Active connection list Active route for your subnet. All special assigned IP addresses are also shown
Net view	Net view	Checking for the current file sharing Host Name
Nslookup	Nslookup	Checking for the DNS server IP address. This command is available for Windows NT only.

**Note:**

Before taking corrective action, you must check the physical connections or wiring first.

## 9.11. Verifying the Configuration and Mail Account Type (SMTP or POP)



### Important Notice:

The customer who supposed to operate G3 Gateway function for Toshiba models, the total Network Security such as Anti Spam Mail protection must be aware how the system performs sufficient security levels as designed. So you may ask Security Policy Manager to allow relay message by changing configuration of Message Transfer Agent like Sendmail. Otherwise the system will deny any relay operation.

## 9.12. Dynamic Host Configuration Protocol (DHCP) - Extended Feature

DHCP is based on the Bootstrap Protocol (BOOTP), adding the capability of automatic allocation of reusable network addresses and additional configuration options.

The Dynamic Host Configuration Protocol (DHCP) provides configuration parameters to Internet hosts. The Bootstrap Protocol (BOOTP) is a UDP/IP-based protocol which allows a booting host to configure itself dynamically and without user supervision. BOOTP provides a means to notify a host of its assigned IP address, the IP address of a boot server host, and the name of a file to be loaded into memory and executed. Other configuration information such as the local subnet mask, the local time offset, the addresses of default routers, and the addresses of various Internet servers can also be communicated to a host using BOOTP.

DHCP consists of two components: a protocol for delivering host-specific configuration parameters from a DHCP server to a host and a mechanism for allocation of network addresses to hosts.

DHCP supports three mechanisms for IP address allocation.

In "automatic allocation", DHCP assigns a permanent IP address to a client.

In "dynamic allocation", DHCP assigns an IP address to a client for a limited period of time (or until the client explicitly relinquishes the address).

In "manual allocation", a client's IP address is assigned by the network administrator, and DHCP is used simply to convey the assigned address to the client. A particular network will use one or more of these mechanisms, depending on the policies of the network administrator.

### "DHCP client"

A DHCP client is an Internet host using DHCP to obtain configuration parameters such as a network address.

### "DHCP server"

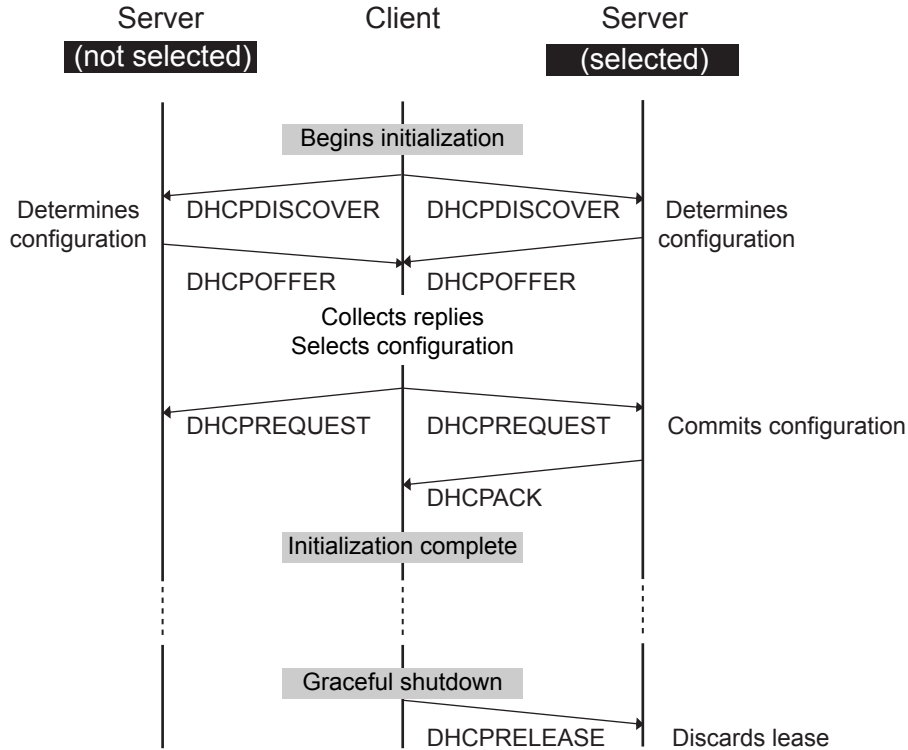
A DHCP server is an Internet host that returns configuration parameters to DHCP clients.

Table 1 describes a DHCP message and its purpose of use.

Message	Use
DHCPDISCOVER	Client broadcast to locate available servers.
DHCPOFFER	Server to client in response to DHCPDISCOVER with offer of configuration parameters.
DHCPREQUEST	Client message to servers either (a) requesting offered parameters from one server and implicitly declining offers from all others, (b) confirming correctness of previously allocated address after, e.g., system reboot, or (c) extending the lease on a particular network address.
DHCPACK	Server to client with configuration parameters, including committed network address.
DHCPNAK	Server to client indicating client's notion of network address is incorrect (e.g., client has moved to new subnet) or client's lease as expired
DHCPDECLINE	Client to server indicating network address and in use.
DHCPRELEASE	Client to server indicating network address and canceling remaining lease.
DHCPINFORM	Client to server, asking only for local configuration parameters; client already has externally configured network address.

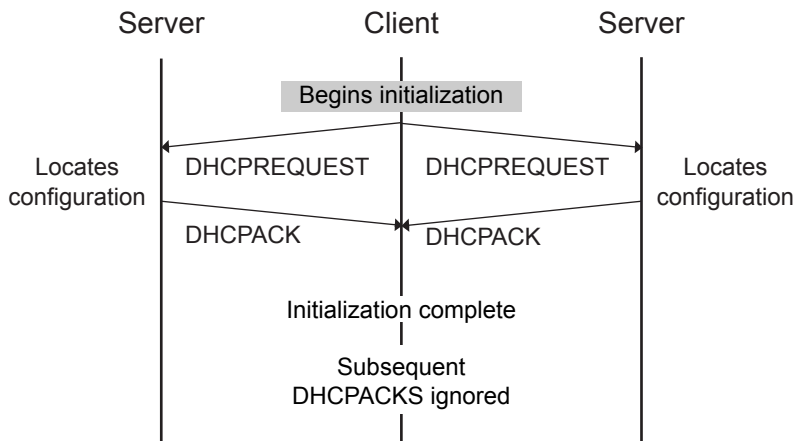
Table 1: DHCP messages and purpose of use

Following figure shows the timeline diagram of messages exchanged between DHCP client and servers when allocating a new network address.



Timeline diagram of messages exchanged between DHCP client and servers when allocating a new network address

Following figure shows the timeline diagram of messages exchanged between DHCP client and servers when reusing a previously allocated network address.



Timeline diagram of messages exchanged between DHCP client and servers when reusing a previously allocated network address



### 9.13. Message Disposition Notifications (MDN) - Extended Feature

The confirmation of delivery and processing are extensions to "Simple Mode of Facsimile Using Internet Mail" [RFC2305]. These are designed to be interoperable with the existing base of mail transfer agents (MTAs) and mail user agents (MUAs), and take advantage of existing standards for advanced functionality such as positive delivery confirmation and disposition notification. The following two features are combined.

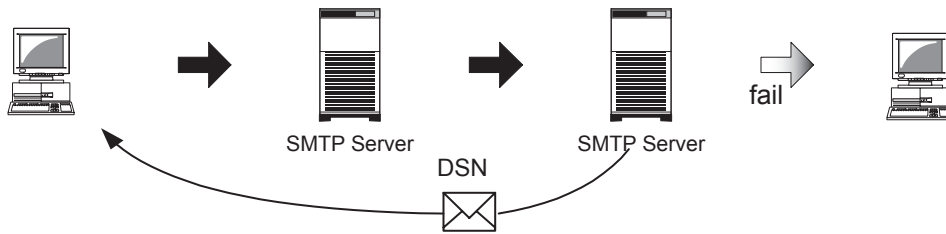
- (1) Delivery confirmation (required)
- (2) Additional document features (optional)

In Internet Mail, the operations of Delivery (to the mailbox) and Disposition (to paper or a screen) may be separated in time (due to store and forwarding of messages) and location (due to separation of delivery agent (MTA) and user agent (MUA)). The confirmations of these two operations are supplied by two different standards-track mechanisms: Delivery Status Notifications (DSN) [RFC1891, RFC1894] and Message Disposition Notifications (MDN) [RFC2298], respectively.

Your Toshiba device supports MDN.

#### Delivery Status Notification (DSN)

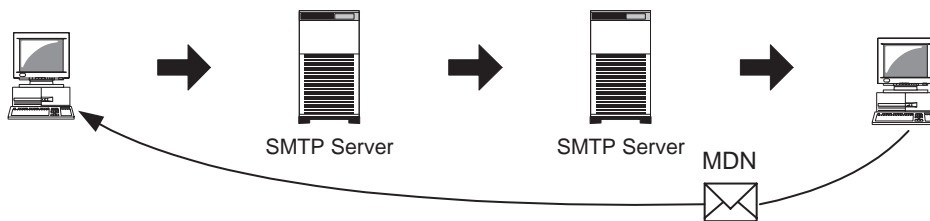
A DSN can be used to notify the sender of a message of any of several conditions: failed delivery, delayed delivery, successful delivery, or the gatewaying of a message into an environment that may not support DSNs. Toshiba Internet FAX does not request DSN while sending.



**N returned to sender by Reporting MTAs (Message Transfer Agent) if fail of delivery is occurre**

#### Message Disposition Notifications (MDN)

A MDN can be used to notify the sender of a message of any of several conditions that may occur after successful delivery, such as display of the message contents, printing of the message, deletion (without display) of the message, or the recipient's refusal to provide MDNs.

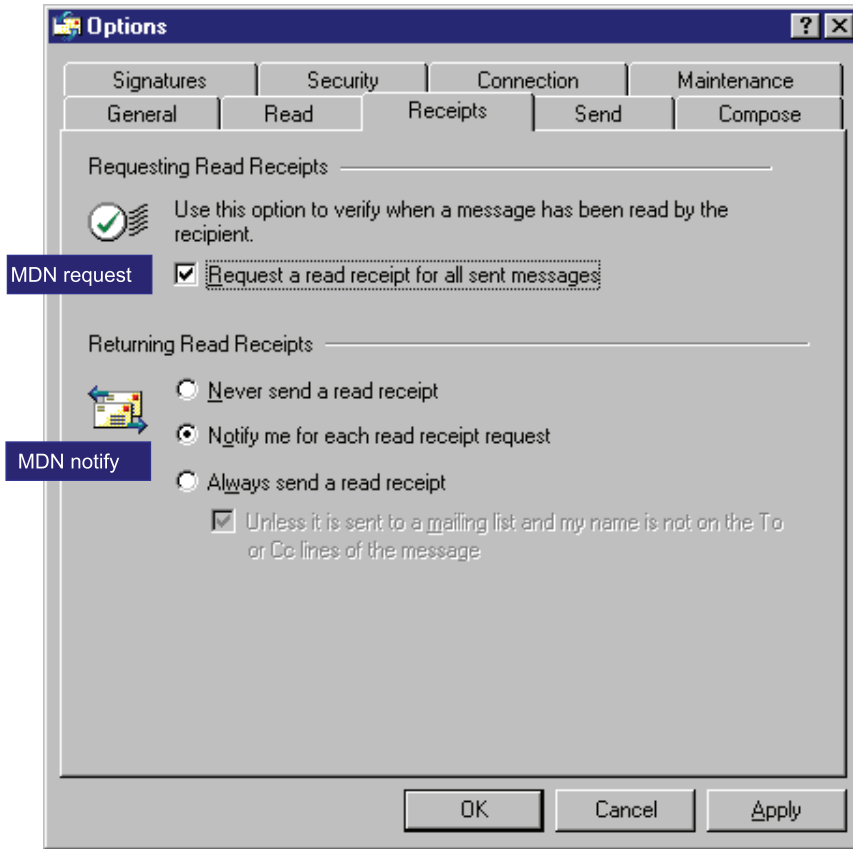


**Recipient notifies that the message contents have been displayed**

The MDNs are expected to serve several purposes such as allow mail user agents (Outlook Express) to keep track of the disposition of messages sent, by associating returned MDNs with earlier message transmissions.

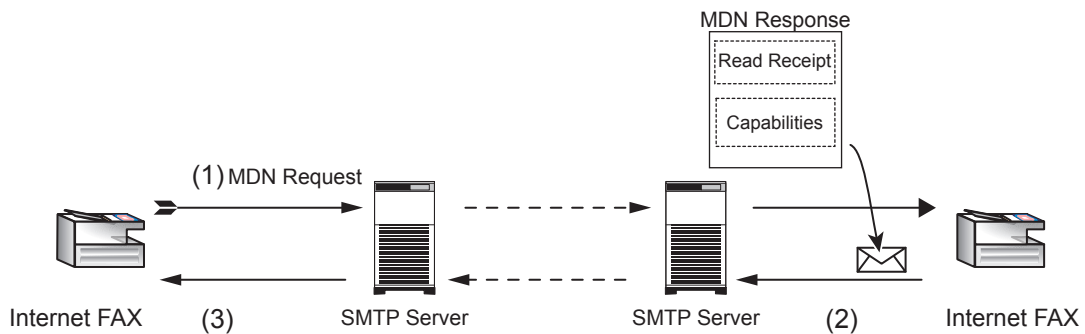


For example, you may configure the MDN parameter from Options menu of Outlook Express.



**Additional Document Capabilities**

Section 4 of "A Simple Mode of Facsimile Using Internet Mail" [RFC2305] allows sending only the minimum subset of TIFF for Facsimile "unless the sender has prior knowledge of other TIFF fields or values supported by the recipient." A recipient may support any or all (or any combination) of the TIFF profiles defined in RFC 2301, in addition to profile S. As a consequence, a sender may use those additional TIFF profiles when sending to a recipient with the corresponding capabilities.



**Additional Document Capabilities Exchanging**

**(1) Request**

If the sender (Internet FAX) desires processing confirmation, the sender must request Message Disposition Notification when sending the message itself.

Sender provides the Disposition-Notification-To field on address using following formula.

## MDN Request Sample

```
Mime-Version: 1.0
X-Mailer: Internet FAX, Toshiba
Content-Transfer-Encoding: 7bit
Date: Wed, dd Mmm yyyy 15:20:00 -0500
Message-Id: <200202060018.12345@core.mega.edu>
From: "Toshiba Internet FAX" <fax@core.mega.edu>
Subject: IMAGE from Internet FAX
To: fax@huge.com
Disposition-Notification-To: <fax@core.mega.edu>
Content-Type: multipart/mixed; boundary="+-+-Toshiba-+-+-"
```

## (2) Recipient's MDN Response

Recipient (Internet FAX) starts printing process when the message is received properly. If the Disposition-Notification-To field is contained in message, recipient generates MDN capability response after successful delivery and sends to the address indicated on Disposition-Notification-To field as convey. However, the envelope-from (Return-Path: address) of original sender does not match with address indicated on Disposition-Notification-To field, and then no MDN response is sent.

## MDN Response Sample

### MESSAGE HEADER

```
Mime-Version: 1.0
X-Mailer: Internet FAX, Toshiba
Content-Transfer-Encoding: 7bit
Date: Wed, dd Mmm yyyy 15:42:00 -0500
Message-Id: <20020206154203470001.BE948.fax@huge.com>
From: <fax@huge.com>
Subject: Read Receipt:IMAGE from Internet FAX
To: fax@core.mega.edu
In-Reply-To: <5.0.2.5.2.20020206153721.00c44448@huge.com>
References: <5.0.2.5.2.20020206153721.00c44448@huge.com>
Content-Type: multipart/report; report-type=disposition-notification; boundary="+-+-Toshiba-+-+-"
```

### BODY TEXT

\*\*\*\*\* Read Receipt \*\*\*\*\*

This message was opened by  
'fax@huge.com'  
dd Mmm yyyy 15:42

\*\*\*\*\*

### ATTACHED FILE

```
Final-Recipient: rfc822;fax@huge.com
Original-Message-ID: <5.0.2.5.2.20020206153721.00c44448@huge.com>
Disposition: automatic-action/MDN-sent-automatically; dispatched
Media-Accept-Features:
(& (type="image/tiff")
 (color=Binary)
 (image-file-structure=TIFF-minimal)
 (MRC-mode=0)
 (ua-media=stationery)
 (paper-size=[A4,B4,letter,legal])
 (image-coding=[MH,MR,MMR])
 (| (& (dpi=200) (dpi-xratio=[200/100,1]) )
 (& (dpi=204) (dpi-xratio=[204/98,204/196,204/391]) )
 (& (dpi=408) (dpi-xratio=408/391) ) ) )
```

### **(3) Processing Confirmation**

The processing confirmation provided by recipient is received and take specific services for expected several conditions respectively. This is unit independent issue.

To see more detailed information, please refer to RFC2532 document.

## **9.14. Lightweight Directory Access Protocol (LDAP) - Extended Feature**

The protocol is designed to provide access to directories supporting the X.500 models, while not incurring the resource requirements of the X.500 Directory Access Protocol (DAP).

This protocol is specifically targeted at management applications and browser applications that provide read/write interactive access to directories. When used with a directory supporting the X.500 protocols, it is intended to be a complement to the X.500 DAP.

X.500 is an overall model for Directory Services in the OSI world. The model encompasses the overall namespace and the protocol for querying and updating it. A major part of X.500 is that it defines a global directory structure.

It is essentially a directory web in much the same way that "http" & "html" are used to define & implement the global hypertext web. Anyone with an X.500 or LDAP client may peruse the global directory just as they can use a web browser to peruse the global Web.

From the "Start" menu of Windows client PC, you can search for people on the Internet, using of server at directory services.

## **9.15. Lightweight Challenge-response Mechanism POP (APOP) - Extended Feature**

The base POP3 specification (POP3) also contains a lightweight challenge-response mechanism called APOP. APOP is associated with most of the risks associated with such protocols: in particular, it requires that both the client and server machines have access to the shared secret in clear text form. Challenge-Response Authentication Mechanism (CRAM) offers a method for avoiding such clear text storage while retaining the algorithmic simplicity of APOP in using only MD5.

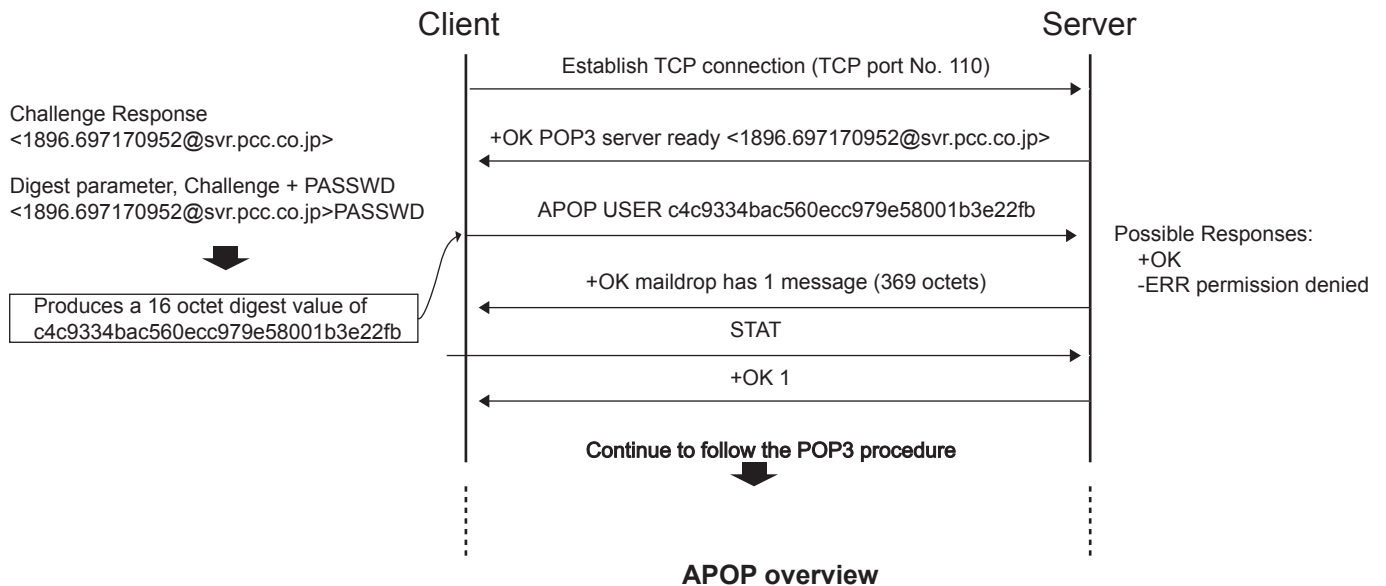
Normally, each POP3 session starts with a USER/PASS exchange. This results in a server/user-id specific password being sent in the clear on the network. For intermittent use of POP3, this may not introduce a sizable risk. However, many POP3 client implementations connect to the POP3 server on a regular basis to check for new mail. Further the interval of session initiation may be on the order of five minutes. Hence, the risk of password capture is greatly enhanced.

An alternate method of authentication is required which provides for both origin authentication and replay protection, but which does not involve sending a password in the clear over the network. The APOP command provides this functionality.

A POP3 server which implements the APOP command will include a timestamp in its banner greeting. For example, on a UNIX implementation in which a separate UNIX process is used for each instance of a POP3 server, the syntax of the timestamp might be:

```
<process-ID.clock@hostname>
```

where "process-ID" is the decimal value of the process's PID, clock is the decimal value of the system clock, and hostname is the fully-qualified domain-name corresponding to the host where the POP3 server is running.



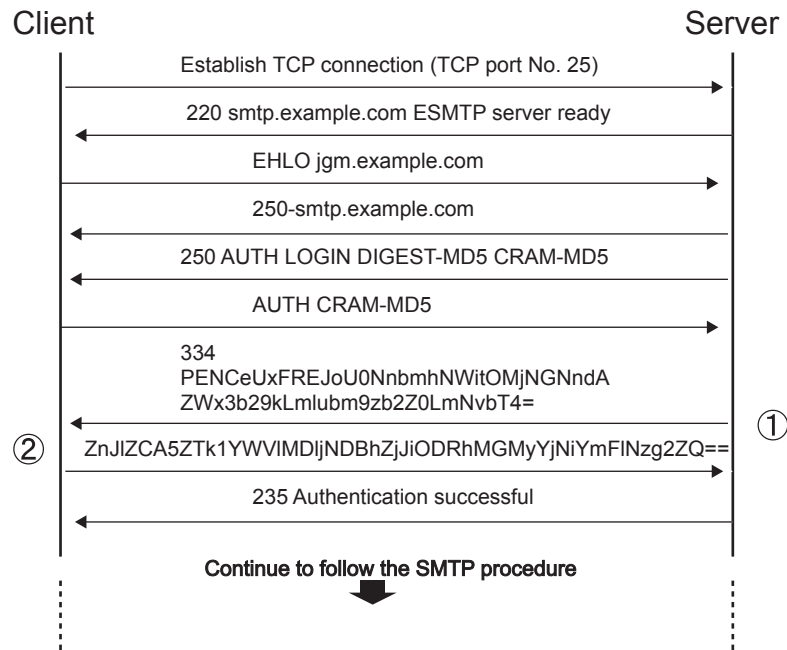
The POP3 client makes note of this timestamp, and then issues the APOP command. The "name" parameter has identical semantics to the "name" parameter of the USER command. The "digest" parameter is calculated by applying the MD5 algorithm to a string consisting of the timestamp (including angle-brackets) followed by a shared secret. This shared secret is a string known only to the POP3 client and server. Great care should be taken to prevent unauthorized disclosure of the secret, as knowledge of the secret will allow any entity to successfully masquerade as the named user. The "digest" parameter itself is a 16-octet value which is sent in hexadecimal format, using lower-case ASCII characters.

When the POP3 server receives the APOP command, it verifies the digest provided. If the digest is correct, the POP3 server issues a positive response, and the POP3 session enters the TRANSACTION state. Otherwise, a negative response is issued and the POP3 session remains in the AUTHORIZATION state.

Note that as the length of the shared secret increases, so does the difficulty of deriving it.

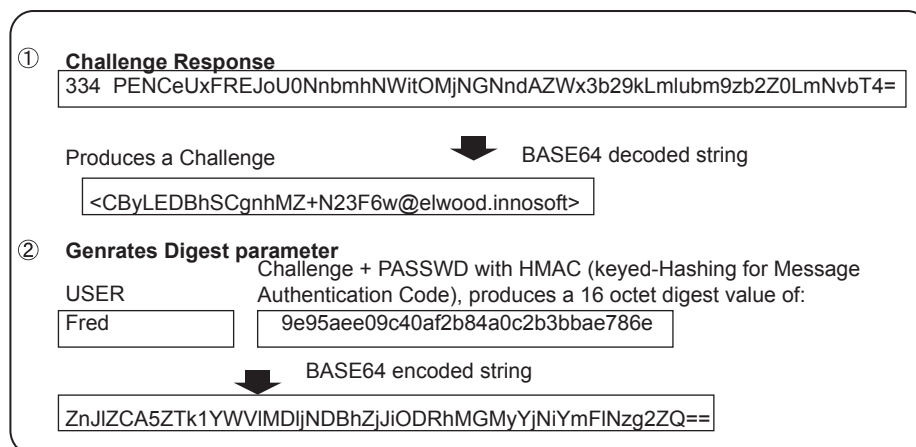
## 9.16. SMTP Service Extension for Authentication (SMTP Auth) - Extended Feature

SMTP is widely deployed and high-quality implementations have proven to be very robust. However, the Internet community now considers some services to be important that SMTP AUTH is an SMTP service extension (ESMTP) whereby an SMTP client may indicate an authentication mechanism to the server, perform an authentication protocol exchange, and optionally negotiate a security layer for subsequent protocol interactions. This extension is a profile of the Simple Authentication and Security Layer (SASL). To use SASL, a protocol includes a command for identifying and authenticating a user to a server and for optionally negotiating protection of subsequent protocol interactions.



SMTP AUTH overview

The AUTH command indicates an authentication mechanism to the server. If the server supports the requested authentication mechanism, it performs an authentication protocol exchange to authenticate and identify the user. Optionally, it also negotiates a security layer for subsequent protocol interactions. If the requested authentication mechanism is not supported, the server rejects the AUTH command with a 504 reply.



The authentication protocol exchange consists of a series of server challenges and client answers that are specific to the authentication mechanism. A server challenge, otherwise known as a ready response, is a 334 reply with the text part containing a BASE64 encoded string. The client answer consists of a line

containing a BASE64 encoded string. If the client wishes to cancel an authentication exchange, it issues a line with a single "". If the server receives such an answer, it must reject the AUTH command by sending a 501 reply.

If the server cannot BASE64 decode the argument, it rejects the AUTH command with a 501 reply. If the server rejects the authentication data, it should reject the AUTH command with a 535 reply unless a more specific error code, such as one listed in Error Codes below, is appropriate. Should the client successfully complete the authentication exchange, the SMTP server issues a 235 reply.

The service name specified by this protocol's profile of SASL is "smtp".

### **Error Codes**

The following error codes may be used to indicate various conditions as described.

432: A password transition is needed

This response to the AUTH command indicates that the user needs to transition to the selected Authentication mechanism. This is typically done by authenticating once using the plain authentication mechanism.

538: Encryption required for requested authentication mechanism

This response to the AUTH command indicates that the selected authentication mechanism may only be used when the underlying SMTP connection is encrypted.

454: Temporary authentication failure

This response to the AUTH command indicates that the authentication failed due to a temporary server failure.

530: Authentication required

This response may be returned by any command other than AUTH, EHLO, HELO, NOOP, RSET, or QUIT. It indicates that server policy requires authentication in order to perform the requested action.

## 9.17. Direct Internet Fax XMT - Extended Feature

Direct Internet Fax XMT uses Simple Mail Transfer Protocol (SMTP) to transfer mail reliably and efficiently. An important feature of SMTP is its capability to transport mail across networks, usually referred to as SMTP mail relay by employing SMTP server.

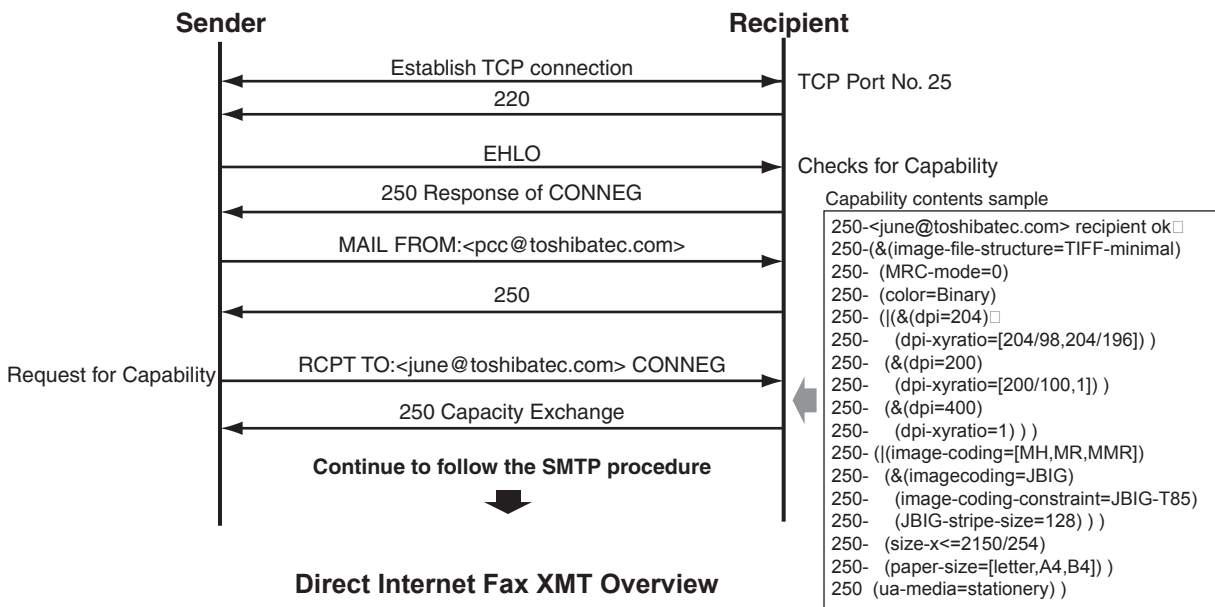
Direct Internet Fax XMT allows you to transmit documents to another Internet Fax directly without using an SMTP Server. For this feature to work reliably, configure the IP Address to remain unchanged (static), ask the Network Administrator to reserve the IP Address. The Subnet Mask and Gateway must be configured as well. The Domain Name of the machine and other record information must be properly registered on the DNS Server.

For the Direct Internet Fax XMT to function properly, the DHCP Parameter No. 22 setting must be disabled in the General Settings (For Key Operator).

Furthermore, in common cases only email and web service from the Internet are permitted into the corporate intranet, and corporate network administrators are extremely unwilling to open the firewall for other, incoming services, since each opened path represents additional, potential security threats. This makes Direct Internet Fax XMT attractive because it can operate throughout the organization's Intranet.

Several new service extensions were assigned.

- (1) The EHLO keyword value associated with this extension is "CONNEX"
- (2) A parameter using the keyword "CONNEX" is added to the RCPT-TO command

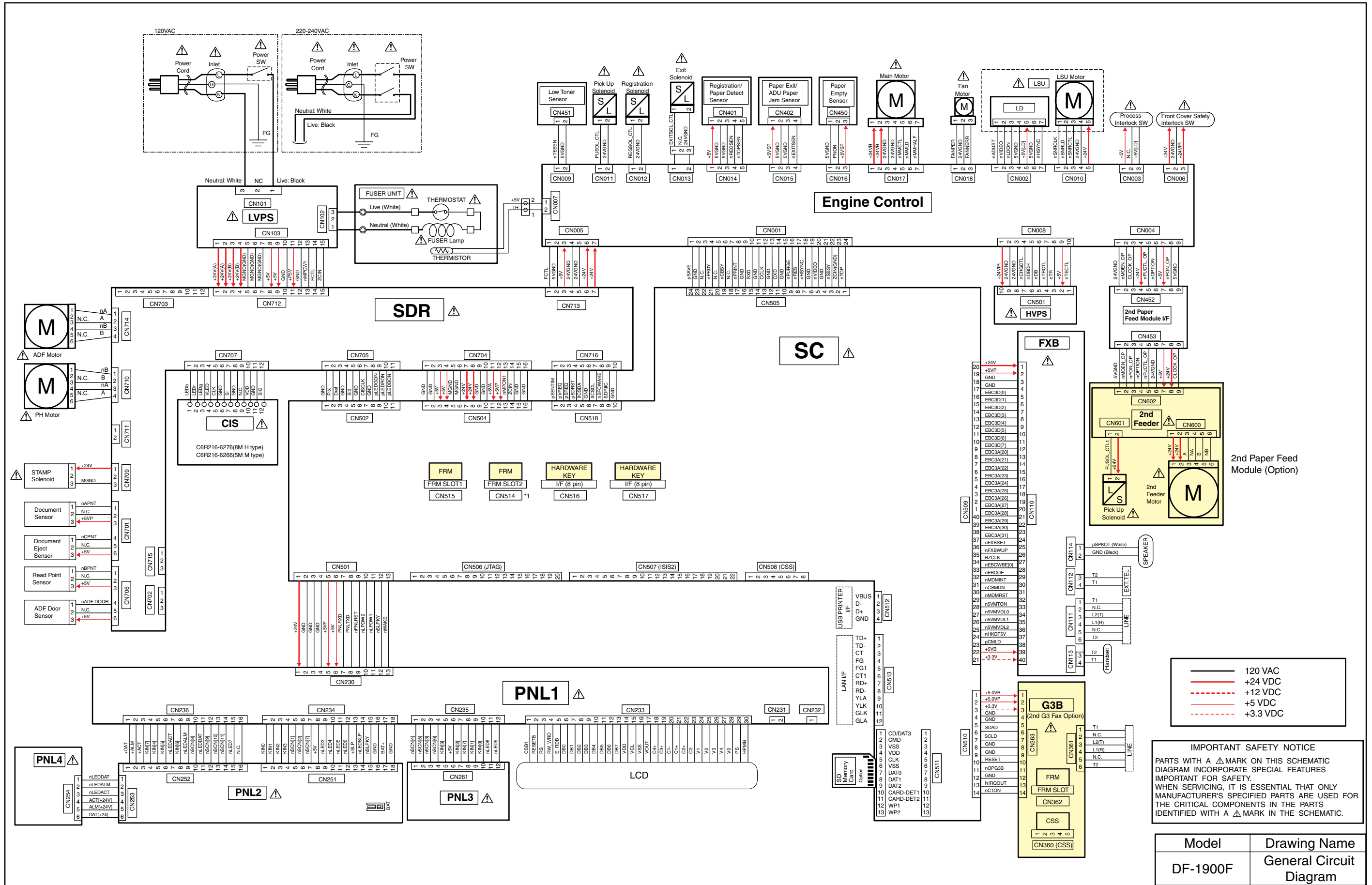




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# 10 Schematic Diagram

## 10.1. General Circuit Diagram



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