

# Service Manual

Facsimile


**DX-600 / 800**



## **WARNING**

This service information is designed for experienced repair technicians only and is not intended for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt within this service information by anyone else could result in serious injury or death.

## **IMPORTANT SAFETY NOTICE**

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

**Panasonic**<sup>®</sup>

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## **This Product Uses Lead (Pb) Free Solder Printed Circuit Boards (PCBs).**

Information regarding Lead-Free (PbF) solder;

Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a **PbF** mark following the PCB part numbers in a label on the PCB.

### **Caution:**

- Pb free solder has a higher melting point than standard solder; typically the melting point is 50 - 70 °F (30 - 40 °C) higher. Please use a soldering iron with temperature control and adjust it to 700±20 °F (370±10 °C). Exercise care while using higher temperature soldering irons, do not heat the PCB for too long to prevent solder splash or damage to the PCB.
- Pb free solder will tend to splash when heated too high (about 1100 °F/600 °C).
- ECO SOLDER M705 (available from Senju Metal Industry Co., Ltd.; URL: <http://www.senju-m.co.jp>) is recommended when repairing PbF PCBs.

The contents of this Service Manual are subject to change without notice.  
Published in Japan.

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# 1 Specifications Table

## 1.1. Fax Function

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Main Specifications</b>			
1 Compatibility	G3		ITU-T Std. & Non-Std. (MGCS)
2 PSTN Line Port	Yes		
3 Leased Line Port	No		
4 V.24 Line Port	No		
5 Modem Speed	33.6 - 2.4 kbps		With Automatic Fallback
6 Coding Scheme	MMR / MR / MH		
7 ECM	Yes		Conforms to ITU-T
8 Short Protocol	Yes (B, D)		
9 Transmission Speed	Approx. 3 sec		ITU-T Image No. 1 (A4, Std. Resolution)
10 Communication Resolution (pels / mm x lines / mm)	<b>Transmission</b> Std 8 x 3.85 Fine 8 x 7.7 S-Fine 8 x 15.4 16 x 15.4*  <b>Reception</b> Std 8 x 3.85 Fine 8 x 7.7 S-Fine 8 x 15.4 16 x 15.4		* Interpolated 16 pels/mm
<b>Scanner Mechanism</b>			
1 Scanning Device	CCD		
2 Scanning Speed			
Std.	2.8 sec		Letter size document
	3.0 sec		A4 size document
Fine	5.0 sec		Letter size document
	5.3 sec		A4 size document
S-Fine	10.1 sec		Letter size document
	10.6 sec		A4 size document
3 Scanning Resolution (pel / mm x lines / mm)	Std. 8 x 3.85 Fine 8 x 7.7 S-Fine 8 x 15.4 16 x 15.4*		* Interpolated 16 pels/mm
4 Document Size (Max.)	10.1 x 78.7 in (257 x 2000 mm)		
5 Document Size (Min.)	5.8 x 5.0 in (148 x 128 mm)		
6 Effective Scanning Width	8.3 in (212 mm)		Letter size for USA and Canada
	8.2 in (208 mm)		A4 size for Other Destinations
7 Reduction XMT	No		

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
8 ADF Capacity	50 sheets*		*For USA and Canada only, documents must be inserted by staggered feed (stairs-shape). Face Down, A4 / Letter; 0.0024 - 0.0039 in, 12 - 16 lb Bond (0.06 - 0.10 mm, 45 - 60 g/m <sup>2</sup> ) Operating Environment 68°F (20°C), 50%RH
	30 sheets*		*For Other Destinations Face Down, A4 / Letter; 0.0024 - 0.0039 in, 12 - 16 lb Bond (0.06 - 0.10 mm, 45 - 60 g/m <sup>2</sup> )
	20 sheets		Face Down, A4 / Letter; 0.0024 - 0.0039 in, 12 - 16 lb Bond (0.06 - 0.10 mm, 45 - 60 g/m <sup>2</sup> )
9 Collation Stack	Yes (Face Down)		
<b>Printer Mechanism</b>			
1 Recording Method	LP		
2 Recording Speed	6.5 ppm		Letter size paper
	6.2 ppm		A4 size paper
3 Recording Resolution			
Copy, Fax	406 x 391 dpi		
	PC Printing Data	600 x 600 dpi	
		300 x 300 dpi	
4 Recording Paper Size	Letter / A4 / Legal		
5 Effective Printing Width	8.2 in (208 mm)		Letter size for USA and Canada
	8.0 in (202 mm)		A4 size for Other Destinations
6 Recording Paper Capacity	250 sheets		A4 / Letter / Legal (20 lb / 75 g/m <sup>2</sup> )
7 Collation Stack	Yes		Memory Collation The Tray capacity is up to 100 sheets
8 Consumables			See Options and Supplies Section
<b>Memory / Clock</b>			
1 Standard Memory	4 MB (240 pages)	2 MB (120 pages)	ITU-T Image No. 1 (A4, Std. Resolution)
2 Memory Backup	Yes		
3 Document Memory type	Flash ROM		
4 Clock Backup	30 minutes		By means of a Gold Capacitor

Items	Description		Remarks	
	DX-600/800	UF-590/790 (Reference)		
<b>Copy Quality</b>				
1 Halftone (Tx)	Yes*		64-Level Error Diffusion * Halftone (S-Fine) only with the Resolution key	
2 Super Fine (Tx & Rx) dpi x lpi (pels / mm x lines / mm)	406 x 391* (16 x 15.4)		* Interpolated 16 pels/mm	
3 Original Contrast Selection (Tx)	Yes		3-Levels	
4 Smoothing (Rx)			With Auto Picture / Text Recognition	
Fax, Copy	Yes			
PC Printing Data	No			
<b>Power Supply</b>				
1 Power Requirement	108 - 132 VAC, 47 - 63 Hz, Single Phase		100 VAC Power Supply	
	198 - 255 VAC, 47 - 63 Hz, Single Phase		200 VAC Power Supply	
2 Power Consumption				
Standby	Sleep Mode	No	1.2 Wh	100 VAC Power Supply (ES = Energy Saver)
	ES=On	8 Wh	6 Wh	
	ES=Off	23 Wh	21 Wh	
	Transmission	19 W	17 W	
	Reception	470 W	460 W	
	Copy	470 W	470 W	
	Maximum	470 W	470 W	
Standby	Sleep Mode	No	2.4 Wh	200 VAC Power Supply (ES = Energy Saver)
	ES=On	8 Wh	6.5 Wh	
	ES=Off	25 Wh	22 Wh	
	Transmission	19 W	17 W	
	Reception	480 W	480 W	
	Copy	480 W	480 W	
	Maximum	490 W	490 W	
<b>Environment</b>				
1 Temperature	Operation	50 to 95°F ( 10 to 35°C)		
	Storage	-4 to 104°F (-20 to 40°C)		
	Transport (Max. 72 hours)	-4 to 122°F (-20 to 50°C)		
	2 Relative Humidity			
Operation	Storage	15 to 70% RH		
	Transport (Max. 480 hours)	5 to 85% RH		
		15 to 85% RH		

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Standards</b>			
1 PSTN	FCC Part 68 Industry Canada No. CS-03		
2 Safety	UL1950 (UL60950 3rd edition) CSA C22.2 No.950		
3 EMI	Class A computing device in FCC Part 15	Class B computing device in FCC Part 15	
<b>Construction</b>			
1 Dimensions (W x D x H)	14.6 x 18.0 x 9.8 in (370 x 457 x 250 mm)		Excluding projections LTR
	14.6 x 18.7 x 9.8 in (370 x 474 x 250 mm)		Excluding projections A4
2 Weight (Excluding paper)	20 lb (9.0 kg)		Excluding consumable supplies and options
<b>Attachment &amp; Accessories</b>			
Toner Cartridge	Yes (1)		UG-5510 for DX-800 / UF-790
Operating Instructions	Yes (1)		
CD-ROM	Yes (1) (PDMS)		
Power Cord	Yes (1)		
Tel Line Cable	Yes (1)		
Doc. Tray (Rx)	Yes (1)		
<b>Consumables</b>			
1 Process Type	Toner Cartridge		
2 Yield (3% Black, ITU-T Image No. 1 Chart)	Approx. 7,500 pages		Multi Copy Mode Operation Environment 68°F (20°C), 50% RH, using Letter/A4 paper.
3 Low Toner Warning	Yes		Magnetic Sensor
<b>Options</b>			
1 Cassette & Deck 250 sheets	Yes		A4 / Letter / Legal (20 lb / 75 g/m <sup>2</sup> )
2 Document Memory	Yes 2 / 4 / 8 MB		Flash Memory
3 Page Memory	No		D-RAM
4 Battery Backup 72 hours	No		
5 G3 Optional Communication Port	No		
6 Handset	Yes		Specific Destinations only. New Option for DX-600 / 800 / UF-590 / 790.
7 V.24/Encryption Interface	No		
8 PDL	No		

Items	Description		Remarks	
	DX-600/800	UF-590/790 (Reference)		
9	Parallel Port Interface	No	Standard	
	LAN (Network)	Standard*	No	*Ethernet 10Base-T / 100Base-Tx
	Printer Interface (GDI)	Standard	Standard	
	Scanner Interface (TWAIN)	No	Standard	
	Class 2 Fax Modem Interface	No	Standard	
	PC Fax Interface (MGCS)	No	Standard	
	PC Fax Interface (LaserFAX)	No*	No*	*HydraFax / LaserFAX Not Supported
	Document Manager	Standard	Standard	
	MFP Utilities	Standard	Standard	
<b>Languages</b>				
Control Panel	English	English	English, C-French, Spanish can be selected for USA, Canada. Determined by the Destination.	
Function Label	English	English		
LCD Display	English	English		
Printouts	English	English		
Operating Instructions	English	English		
<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	70 files	10 files		
<b>Dialing/Telephone Features</b>				
1 One-Touch Keys		28		
2 One-Touch / Program Keys		4		
3 One-Touch Auto Dialers		32		
4 Abbr. Auto Dialers		100		
5 Total Auto Dialers		132		
6 Max. Tel Number Digits		36		
7 Max. Station Name Characters		15		
8 Directory Search Dialing		Yes	With Directory Search key	
9 Full Number Dialing (Buffered Dialing)		Yes	Max. 12 stations	
10 Direct Dialing (Monitor Dialing)		Yes	Voice mode (Monitor Dialing Mode) Requires to press START to start fax communication. Automatic Redialing is not available.	
11 Automatic Redialing		Yes		
12 Manual Redialing		Yes		
13 Chain Dialing (Hybrid Dial)		Yes	On Monitor Dialing mode only	
14 Line Monitor Speaker		Yes		

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
15 Pulse / Tone Dialing	Yes		10 pps / DTMF
16 Pulse to Tone Change	Yes		
17 Flash Key	Yes		
18 External Telephone Jack	1		Handset or External Telephone
<b>Transmission Features</b>			
1 Direct Transmission	Yes		ADF Transmission
2 Memory Transmission	Yes		Page Retransmission
3 Quick Memory Transmission	Yes	No	Dialing after 1st page stored
4 Multi-Station Transmission (Sequential Broadcasting)	Yes (Max.144)	Yes (Max.112)	
5 Direct Deferred Transmission	Yes		ADF Deferred Transmission
6 Deferred Memory Transmission	Yes		Max. 10 timers
7 Deferred Multi-Station Transmission	Yes (Max.144)		Max. 10 timers
8 Priority Direct Transmission	Yes		Priority ADF Transmission
9 Priority Memory Transmission	No		
10 Batch Transmission	No		
<b>Reception Features</b>			
1 Substitute Reception	Yes		
2 Fixed Reduction	Yes		LTR / A4: 70 - 100%, LGL: 80 -100% (in 1% Steps), Top & Center Alignment
3 Auto Reduction	Yes		LTR / A4: 70 - 100%, LGL: 80 -100% (in 1% Steps), Top & Center Alignment
4 Overlap Printing	Yes		Page End Approx. 0.39 in (10 mm)
5 Receive to Memory	Yes		
6 Distinctive Ring Detector (DRD)	Yes		Specific Destinations only
<b>Receive Control</b>			
1 Fax / Tel Auto Switch	Yes		Specific Destinations only
2 Silent Reception	No (PSTN) Yes (LAN)	No (PSTN)	
3 External TAM Interface	Yes		Specific Destinations only
4 Remote Reception	Yes (DTMF)		Specific Destinations only

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Polling</b>			
1	Polling	Yes	
2	Turnaround Polling	No	
3	Multi-Station Polling	Yes (Max.144)	
4	Deferred Polling	Yes	Max. 10 timers
5	Deferred Multi-Station Polling	Yes (Max.144)	Max. 10 timers
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	20 x 2 Alphanumeric LCD
2	Voice Contact	No	
3	Edit File Mode	Yes	With View Mode
4	Incomplete File Save	Yes	With View Mode
5	Automatic Cover Sheet	Yes	
<b>Copy Features</b>			
1	Single Copy	Yes	
2	Multiple Copy	Yes	Multi Sort Copy only
3	Reduction Copy	Yes	
4	Copying Resolution dpi x lpi (pels / mm x lines / mm)	406 x 391* (16 x 15.4)	* Interpolated 16 pels/mm
<b>Certainty</b>			
1	Verification Stamp	Yes	
2	Header / Total Page Print	Yes	
3	Transaction Journal	Yes	32 Transactions / with View Mode
4	Comm. Journal	Yes	With Image
5	Last Ind. XMT Journal	Yes	
6	Power Failure Report	No	
<b>List Printouts</b>			
1	One-Touch List	Yes	
2	ABBR. No. List	Yes	
3	Program List	Yes	
4	Directory Search List	Yes	
5	Fax Parameter List	Yes	
6	File List	Yes	With View Mode
7	Ind. XMT Journal	Yes	
8	Directory Sheet	Yes	
9	Character Code List	No	

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Identifications</b>			
1 Logo		Yes	25 Characters
2 Multiple Logo		No	
3 Character ID		Yes	16 Characters
4 Numeric ID		Yes	20 Digits
<b>Special Communications</b>			
1 Password XMT / RCV		Yes	Closed Network
2 Selective Reception		Yes	TSI Check
3 Relay XMT Request		No	Network (Via a Center Station)
4 Relay XMT Center		No	
5 Confidential XMT / Polling		No	
6 Confidential Center		No	
7 Mailbox XMT / Polling		Yes	
8 Mailbox Center		10 Boxes	
9 File XMT		No	
10 Fax Forward		Yes	Received File Transfer
11 Auto Fax Archive		Yes	NYSE Feature Specific Destinations only
12 Sub-Address XMT		Yes	T. Routing
13 Sub-Address RCV		No	T. Routing with PC interface
14 OMR-XMT		No	
<b>Others</b>			
1 Access Code		Yes	
2 PIN Code Access		Yes	For USA, Canada and Hong Kong only PBX Access Code
3 Intelligent Redial (AI)		Yes	2 Files
4 Department Code		No	
5 Energy Saver Mode		Yes	
6 Daylight Saving Time		Yes	USA, Canada and Germany only
7 Self Diagnostic Function		Yes	
8 Remote Diagnostic Function		Yes	Specific Destinations only
9 Check & Call Function		Yes	
<b>Firmware Update / Download</b>			
1 Remote Update		Yes	Using G3 Protocol
2 Local Update			
Memory Card (FROM)		Yes	
	Parallel Port	No	Yes
3 Download to FROM Card		Yes	



## 1.2. Internet Fax Function

Items	Description	Remarks
	DX-600/800	
<b>Main Specifications</b>		
1	Communication Protocols	TCP / IP SMTP / MIME
2	Coding Scheme	MH / MMR
3	Line Interface	RJ-45 (Ethernet) Ethernet LAN
<b>Scanner Mechanism</b>		
1	Max. Document Size	A4, Letter, Legal
2	Scanning Resolution (pel/mm x lines/mm)	8 x 3.85 8 x 7.7 8 x 15.4 16 x 15.4* LAN:16 x 15.4 Scanning Resolution is available with Parameter setting. * Interpolated 16 pels/mm.
<b>Transmission Features</b>		
1	Multi-Task Operation	Yes Simultaneous operation of G3 Fax and LAN is available.
2	Memory Transmission	Yes
3	Sequential Multi-Station Transmission	-
4	Simultaneous Multi-Station Transmission	Yes
5	Sender Selection	Yes
6	G3 / Email Mixed Broadcasting	Yes
7	Deferred Transmission	Yes
8	Fax Forward	Yes Received File Transfer, only with I-FAX Option
9	Sub-address RCV	Yes Inbound Routing, only with I-FAX Option
10	Mail Header	
	Email Header Print Selection	Yes All or From / To / Subject only
	Subject Line	Random Entry
<b>LAN Features</b>		
1	Internet Fax Communication	Yes A3 Communication is available with Parameter setting.
2	Internet Mail Reception	Yes
3	Internet Fax Server Features	
	Internet Fax Relay XMT	Yes iFAX → iFAX → G3FAX
	Email Relay MXT	Yes PC → iFAX → G3FAX
	Received Fax / Email Forward	Yes Local print available
	PC to FAX Transmission	No
	Inbound Routing	Yes Using Sub-Address. Local print available
	Phone Book Registration from PC	Yes Via Email
4	I-Fax Parameters Registration via Email	Yes
5	Internet Delivery Confirmation	Yes With MDN

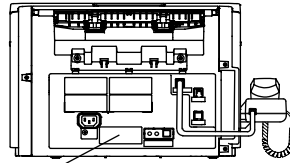
Items	Description	Remarks
	DX-600/800	
6 Network Scanning	Yes (400 dpi*)	* Interpolated
7 Network Printing		
LPR / LPD	Yes (600 dpi)	Win 98 / Me
GDI	Yes	
PDL	No	
8 Secondary DNS	Yes	
9 DHCP Client	Yes	
10 LDAP	Yes	Lightweight Directory Access Protocol (Directory Services)
<b>Certainty</b>		
1 Comm. Journal (w / Image)	Yes	Email from RCV side to Panasonic I-Fax's only.
<b>ID</b>		
1 Email Address	Yes	

### 1.3. Printer Function

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Interface</b>			
1 Centronics Parallel I/F (IEEE-1284)	No	Standard*	*ECP Mode
2 LAN (Network)	Standard*	No	*Ethernet 10Base-T / 100Base-Tx
3 USB Port	No		
4 IEEE-1394	No		
<b>Printer Function</b>			
1 Printing Size	Letter / A4 / Legal		
2 Bypass	No		
3 Stapling	No		
4 Printing Resolution	600 dpi		
5 OS	Win 9x / Me / NT 4.0 / 2000/ XP	Win 9x / Me / NT 4.0 / 2000	
6 GDI	Yes		MH Coding
7 PDL (PCL6)	No		
8 PDL (PostScript 2)	No		
9 Duplex Printing	No		
10 Collation Stack	Yes		Printer Driver setting
11 Status Monitor	No	Yes	Win 9x / Me / NT 4.0 / 2000 : Local Connection
12 Network Printing	Yes	No	
13 Network Status Monitor	Yes*		*From June Production
14 Smoothing	No		
15 Applicable PC	IBM PC, AT or Compatible		
16 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	
17 Output to Separate Tray for Printing, Fax, Copy	No		
18 Font	No		
19 Security Print	No		

Items	Description		Remarks
	DX-600/800	UF-590/790 (Reference)	
<b>Scanning Function</b>			
1 Halftone	Yes		64 Level Error Diffusion
2 Scanning Width	8.3 in (212 mm)		Letter size for USA and Canada
	8.2 in (208 mm)		A4 size for Other Destinations
3 Scanning Resolution	400 dpi*		* Interpolated
4 Network Scanning	Yes*	No	*Via Email
5 Driver	-	TWAIN	
6 2-Sided Scanning	No		

# 1.4. External View



REAR VIEW

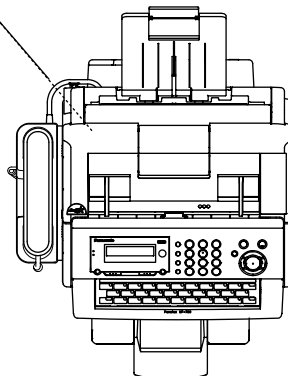
(For USA only)

Product complies with DHHS Rules 21  
CFR Subchapter J in effect at date  
of manufacture.

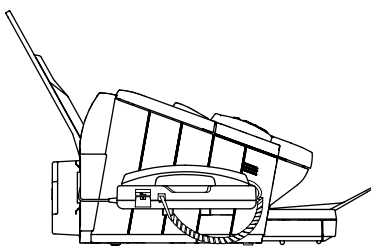
Manufacturer's name and address    Factory ID

- **DANGER** : Invisible laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.
- **CAUTION** : Invisible and hazardous laser radiation when interlocks defeated. AVOID EXPOSURE TO BEAM.
- **ATTENTION** : Rayonnement laser invisible dangereux lorsque la sécurité est neutralisée. EXPOSITION DANGEREUSE AU FAISCEAU.
- **VORSICHT** : Unsichtbare Laserstrahlung, wenn Sicherheitsverriegelung überbrückt. NICHT DEM STRAHL AUSSETZEN.
- **PELIGRO** : Cuando se invalida el bloqueo, se producen radiaciones invisibles de láser. EVITESE LA EXPOSICIÓN DIRECTA A TALES RAYOS.
- **VARO!** : Näkymätöntä ja vaarallista lasersäteilyä suojalukitus ohitettaessa. Vältä suoraa altistumista säteelle.
- **ADVARSEL** : USYNLIG LASERSTRÅLING NÅR SIKKERHEDSÅF- BRYDERE ER UDE AF FUNKTION. UNDGÅ UDSETTELSE FOR STRÅLING.
- **ADVARSEL** : USYNLIG LASERSTRÅLING NÅR SIKKERHEDS- LÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
- **WARNING** : OSYNLIG LASERSTRÅLING NÅR SPÄRRÅR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG.
- **注意** : 为防止激光照射, 当连接本机时, 请勿暴露在光柱下。
- **주의** : 연결장치가 고장 났을 때에는 눈에 보이지않고 위험한 레이저 방사선이 빛에 직접 닿지않도록 해 주십시오.

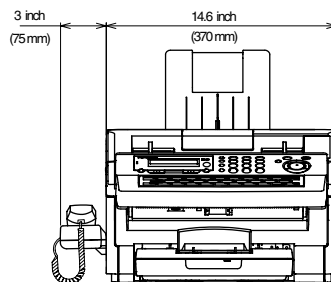
FBS8902



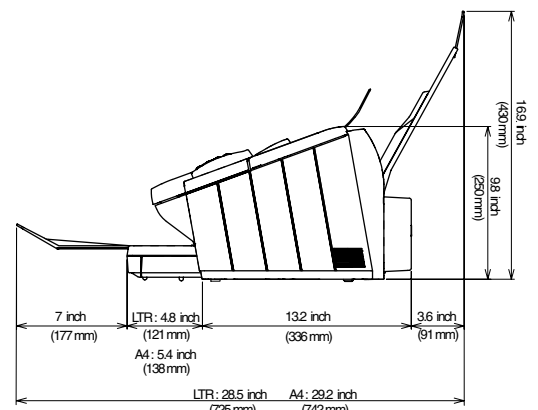
TOP VIEW



LEFT SIDE VIEW



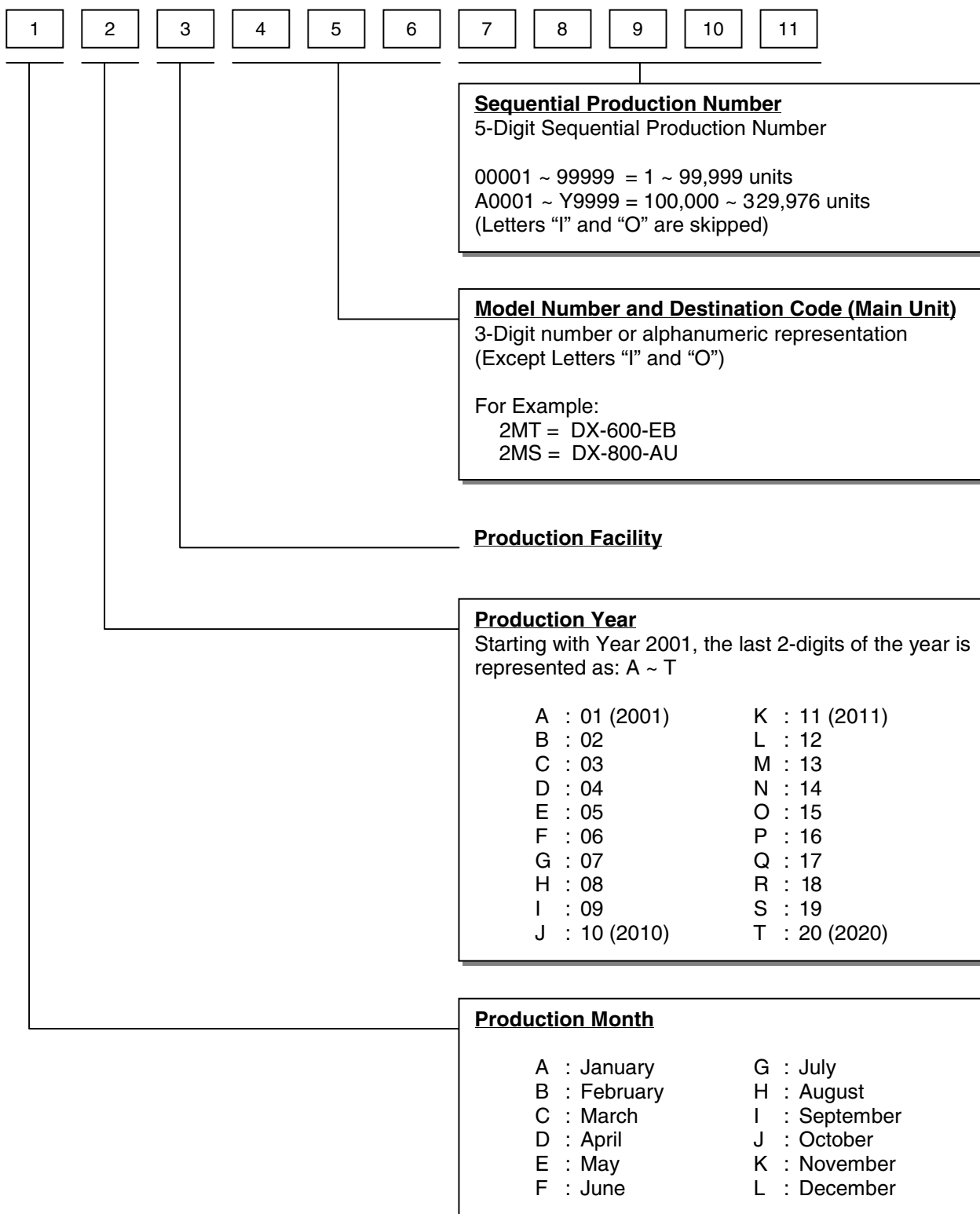
FRONT VIEW



RIGHT SIDE VIEW

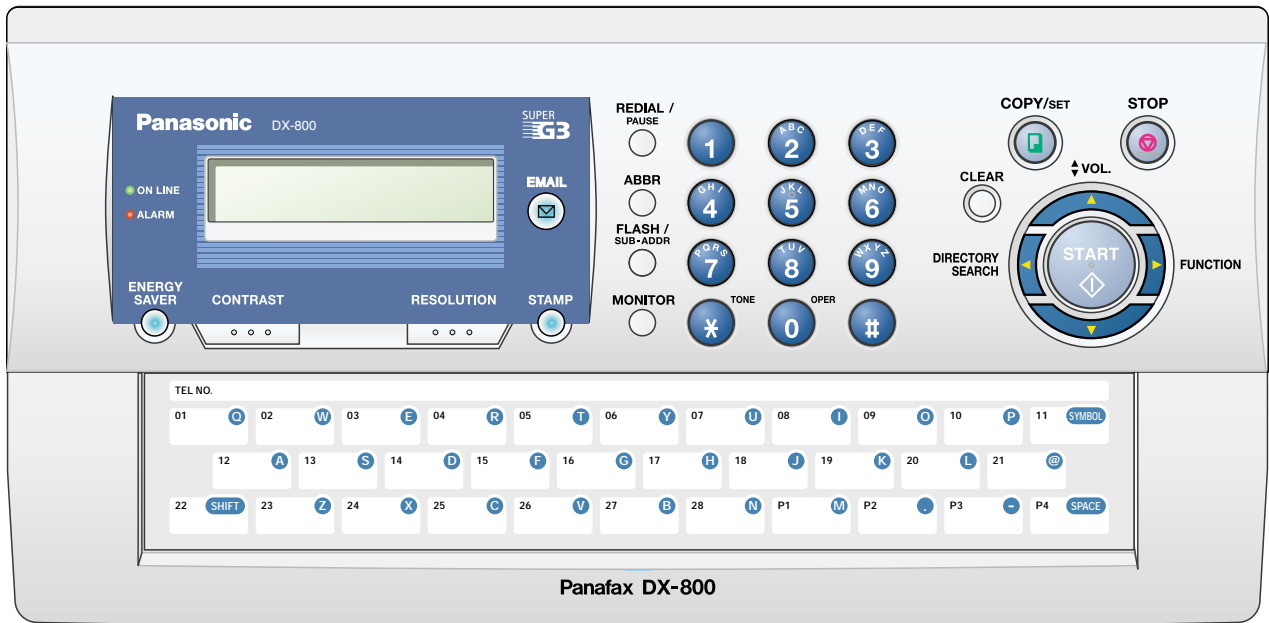
### 1.4.1. Serial Number Contents

The contents of the 11-digit Serial Number is as follows:

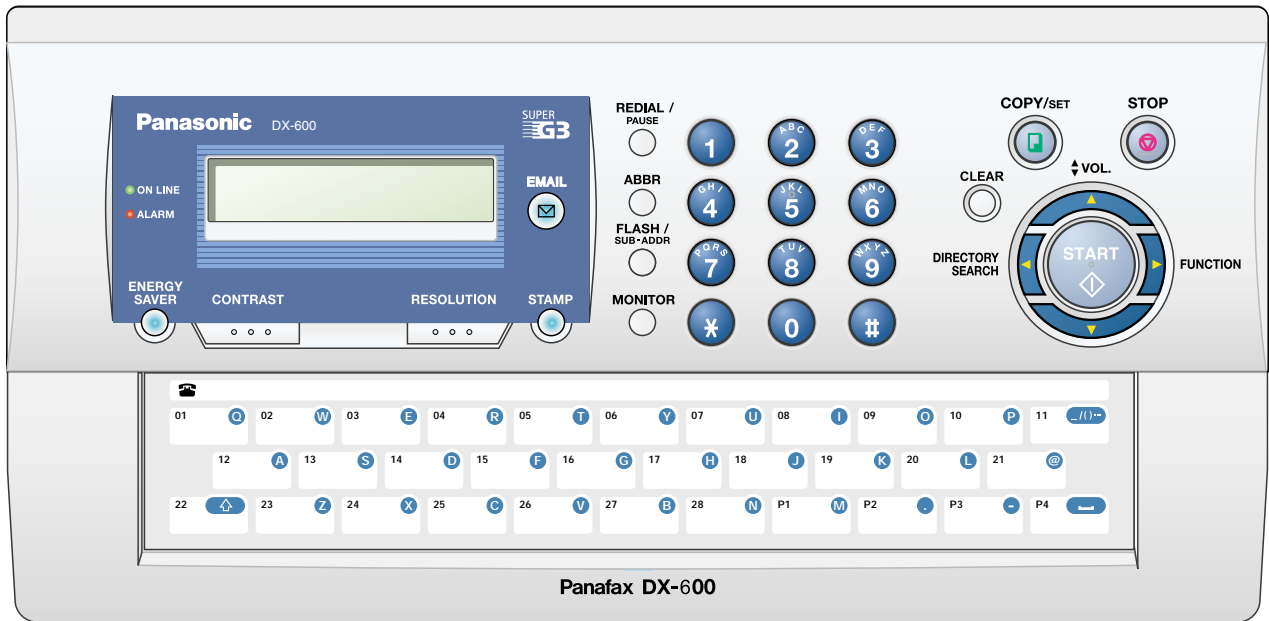


# 1.5. Control Panel

## For USA and Canada



## For Other Destinations

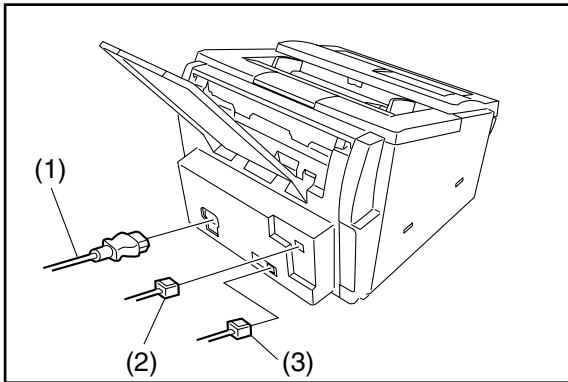




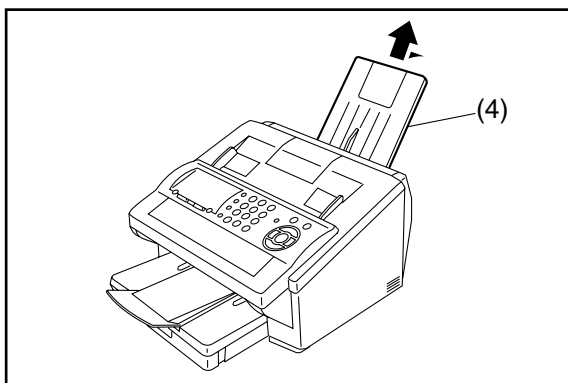


## 2.2. Disassembly Instructions

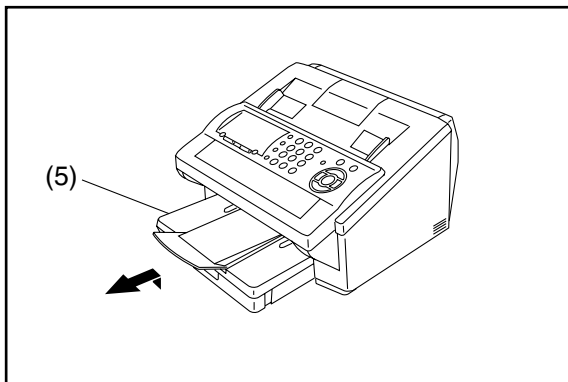
### 2.2.1. Power Cord (1108), Telephone Line Cable (1109), LAN Cable, Recording Paper Tray Assembly (1107), Paper Cassette



- (1) Disconnect the **Power Cord** (1108).
- (2) Disconnect the **Telephone Line Cable** (1109).
- (3) Disconnect the **LAN Cable**.

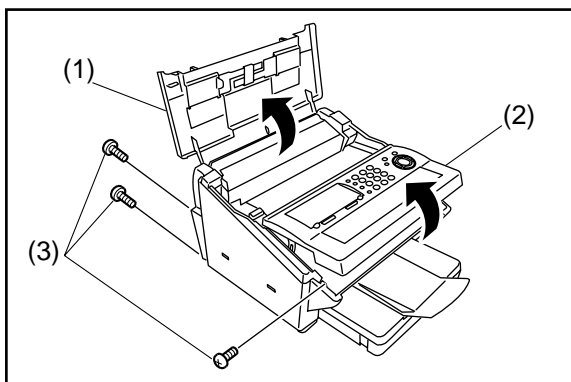


- (4) Remove the **Recording Paper Tray Assembly** (1107).

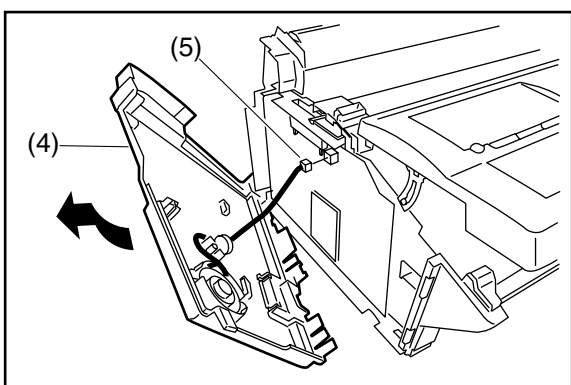


- (5) Remove the **Paper Cassette**.

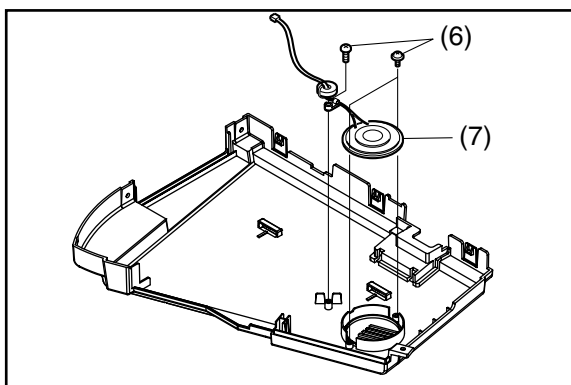
## 2.2.2. Left Cover (103), Right Cover (102), Front Cover (104), Speaker (117), Separation Rubber (207)



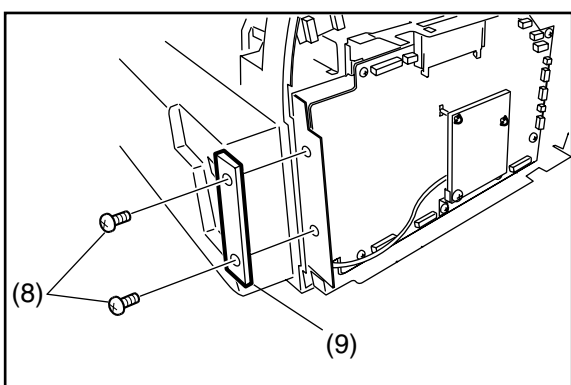
- (1) Open the **Printer Cover** (106).
- (2) Open the Control Panel Unit.
- (3) Remove 3 **Silver Screws** (B1).



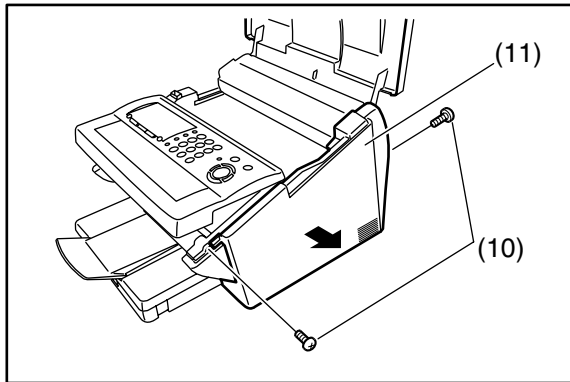
- (4) Remove the **Left Cover** (103).
- (5) Disconnect **Connector CN9** on the **SC PC Board** (1001).



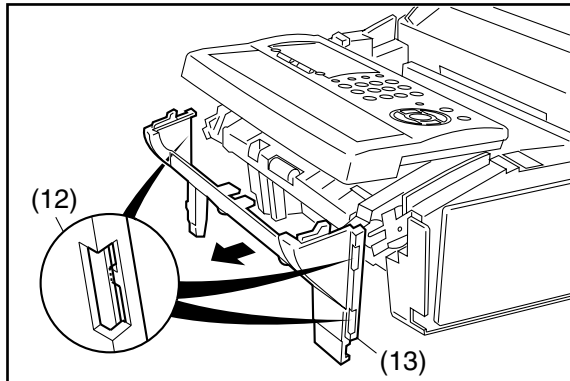
- (6) Remove 2 **Screws** (C2) and 1 **Screw** (1Y).
- (7) Remove the **Speaker** (117).



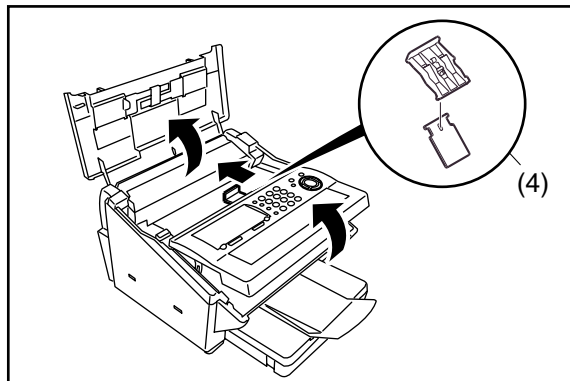
- (8) Remove 2 **Silver Screws** (B1).
- (9) Remove the **SNT Cover** (131).



- (10) Remove 2 **Silver Screws** (B1).  
 (11) Remove the **Right Cover** (102).



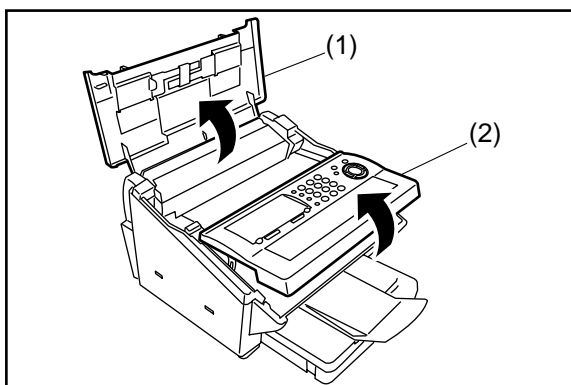
- (12) Release 3 Latch Hooks.  
 (13) Remove the **Front Cover** (104).



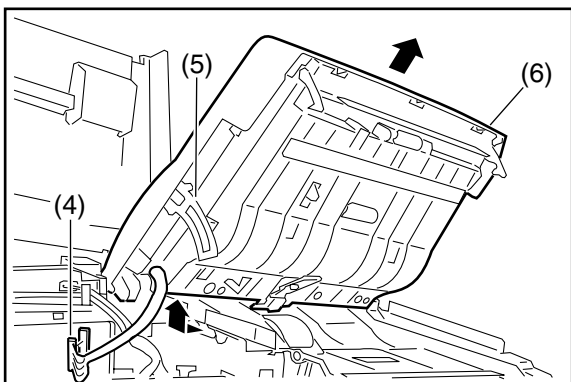
#### <Replacing & Cleaning the Separation Rubber>

- (1) Open the Control Panel Unit.
- (2) Open the **Printer Cover** (106).
- (3) Remove the **Separation Rubber Holder Assy** (202).
- (4) Clean the **Separation Rubber** (207) with a soft cloth, saturated with isopropyl alcohol or replace with a new one.

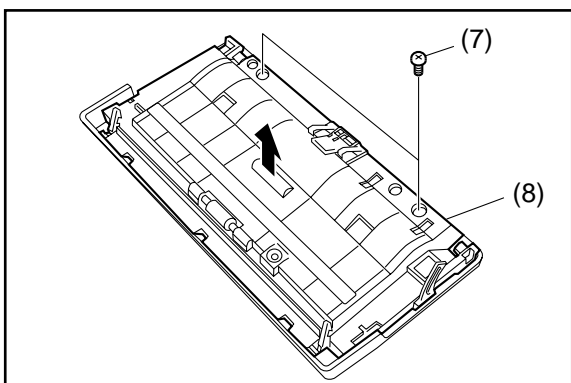
### 2.2.3. Control Panel Unit, PNL1 PC Board (1004)



- (1) Open the **Printer Cover** (106)
- (2) Slightly open the **Control Panel Unit**.



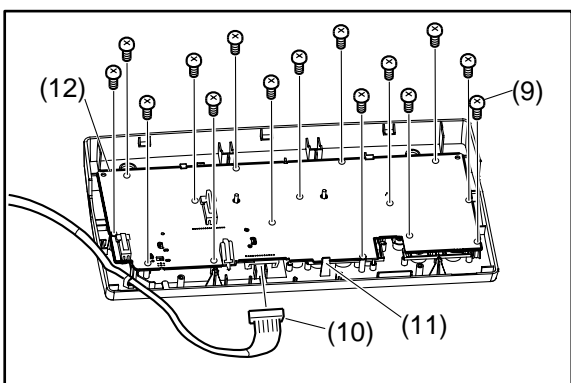
- (3) Remove the **Left Cover** (103) and the **Right Cover** (102). (Refer to 2.2.2.)
- (4) Disconnect **Connector CN14** on the **SC PC Board**.
- (5) Release the **Stopper Latch** (210) and open the **Control Panel Unit**.
- (6) Remove the **Control Panel Unit**.



- (7) Remove 2 **Screws** (19).
- (8) Remove the **Control Panel Chassis** (201) Assembly.

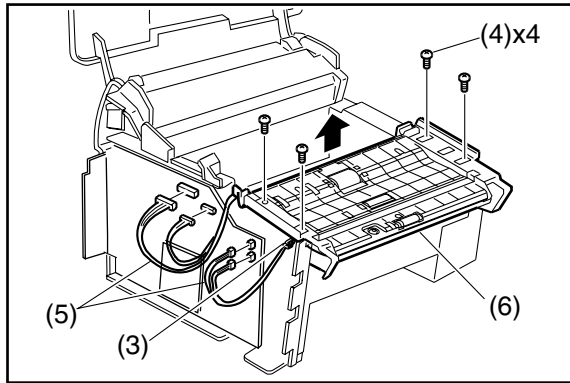
**Note:**

If noise occurs while scanning, clean the **Roller Shaft 2** (235) and the **Feed Pinch Roller** (236) shaft hole with isopropyl alcohol.

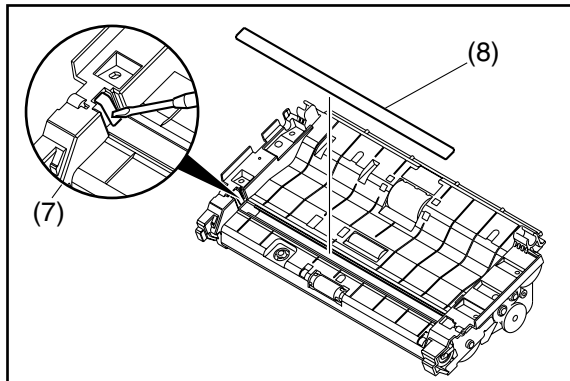


- (9) Remove 15 **Screws** (7B).
- (10) Disconnect **Connector CN50** on the **PNL1 PC Board**.
- (11) Release 1 **Latch Hook**.
- (12) Remove the **PNL1 PC Board** (1004).

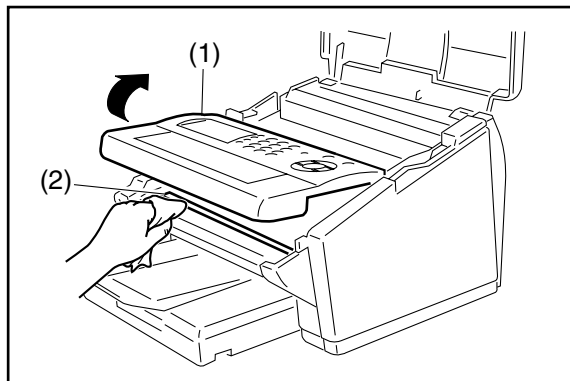
## 2.2.4. Transmit Guide (301) Assembly, Scanning Glass (308)



- (1) Remove the **Left Cover** (103), **Right Cover** (102), and **Front Cover** (104) (Refer to 2.2.2.).
- (2) Remove the **Control Panel Unit** (Refer to 2.2.3.).
- (3) Release the **Harnesses** from the clamps.
- (4) Remove 4 **Screws** (19).
- (5) Disconnect 4 **Connectors** (**CN1, 3, 5** and **7**) on the **SC PC Board**.
- (6) Remove the **Transmit Guide** (301) Assembly.

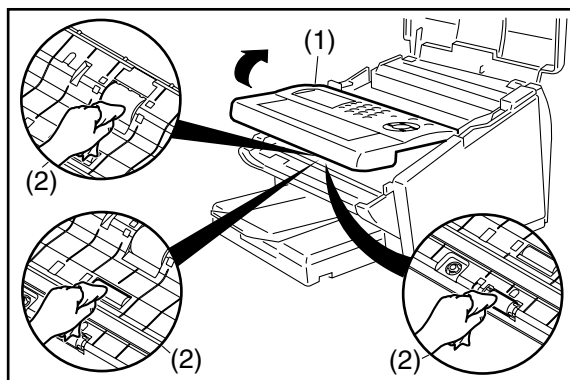


- (7) Carefully release the **Latch Hook** using a **Blade-tip Screwdriver**.
- (8) Remove the **Scanning Glass** (308).



### <Cleaning the Scanning Glass>

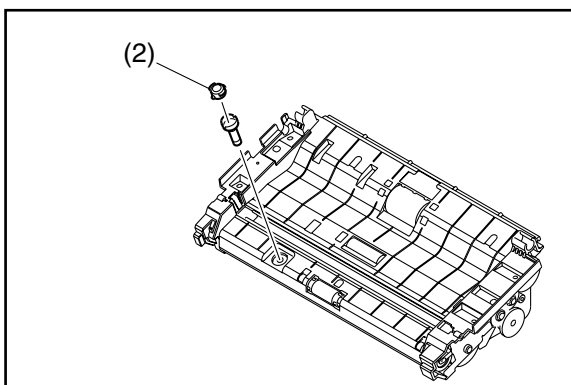
- (1) Open the **Control Panel Unit**.
- (2) Clean the **Scanning Glass** (308) with a soft cloth, soaked with isopropyl alcohol.



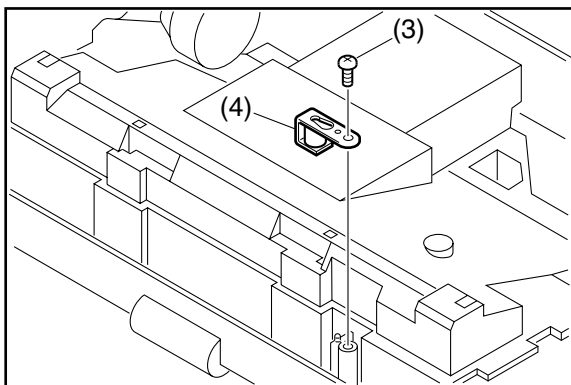
### <Cleaning the Feed Roller, Eject Roller, ADF Roller>

- (1) Open the **Control Panel Unit**.
- (2) Clean the **Feed Roller** (302), **Eject Roller** (303) and **ADF Roller** (331) with a soft cloth, soaked with isopropyl alcohol.

## 2.2.5. Stamp Assembly, Stamp Solenoid (327)

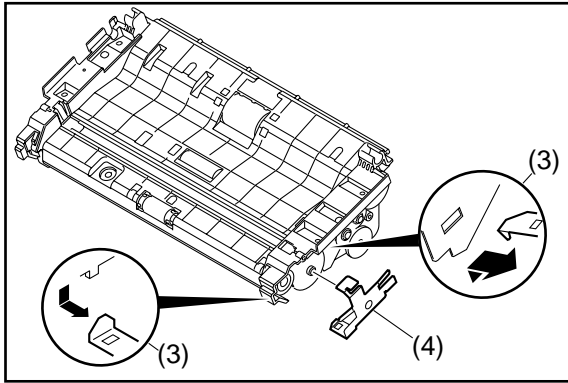


- (1) Remove the **Transmit Guide** (301) Assembly (Refer to 2.2.4.).
- (2) Remove the **Stamp Assembly** (325, 326).

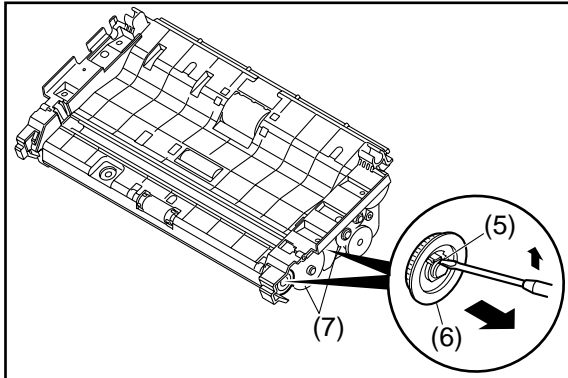


- (3) Remove 1 **Screw** (19).
- (4) Remove the **Stamp Solenoid** (327).

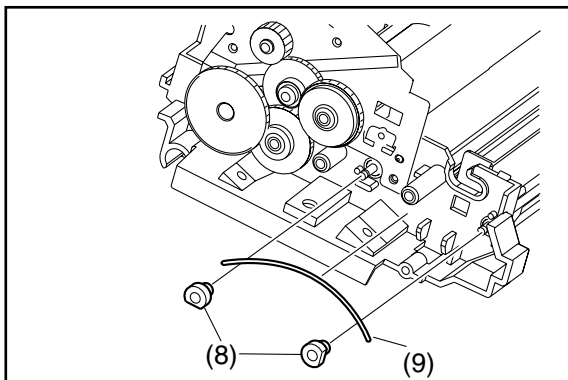
## 2.2.6. Eject Roller (303)



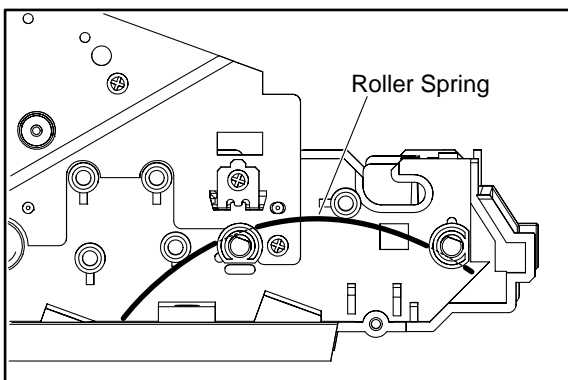
- (1) Remove the **Transmit Guide** (301) Assembly (Refer to 2.2.4.).
- (2) Remove the **Stamp Assembly** (325, 326) (Refer to 2.2.5.).
- (3) Release 2 Latch Hooks.
- (4) Remove the **Ground Plate** (317).



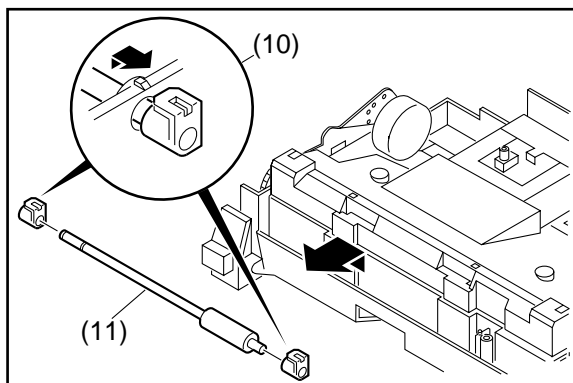
- (5) Release the Latch Hook by using a small Blade-tip Screwdriver.
- (6) Remove 2 **D25F Drive Gears** (332).
- (7) Remove **D17 Gear** (313) and **D50 Gear** (314).



- (8) Remove 2 **P6C Bushings** (342).
- (9) Remove the **Roller Wire Spring** (343).



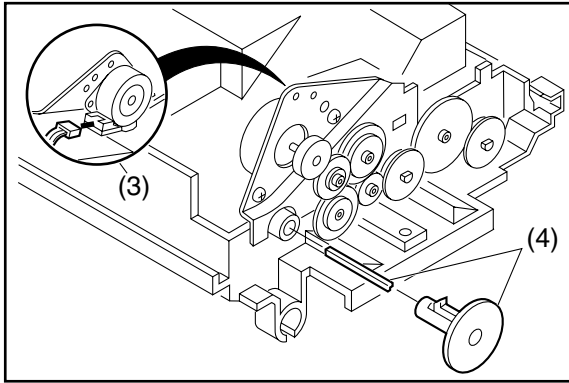
**Caution:**  
Reinstall the Roller Wire Spring (343) as illustrated.



- (10) Remove 2 **P6A Bushings** (316).  
(11) Remove the **Eject Roller** (303).



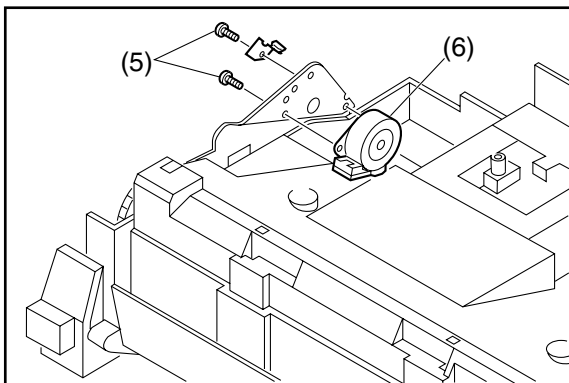
## 2.2.7. Transmit Motor (324)



- (1) Remove the **Transmit Guide (301) Assembly** (Refer to 2.2.4.).
- (2) Remove the **Stamp Assembly (325, 326)** (Refer to 2.2.5.).
- (3) Disconnect the **Connector (1020)** from the **Transmit Motor (324)**.
- (4) Remove the **ADF Gear (305)** and **ADF Angular Shaft (338)**.

**Caution:**

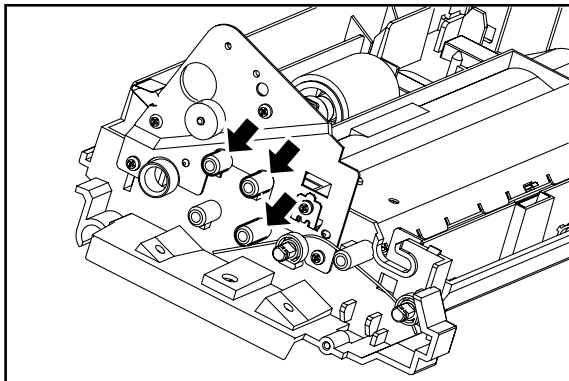
When removing the ADF Gear, rotate the Transmit Motor Gear by hand until the Gear Latch Hook can be seen from the inside, under the Transmit Motor. Push down on the Latch Hook to release the ADF Gear.



- (5) Remove 2 **Screws (19)**.
- (6) Remove the **Transmit Motor (324)**.

**Caution:**

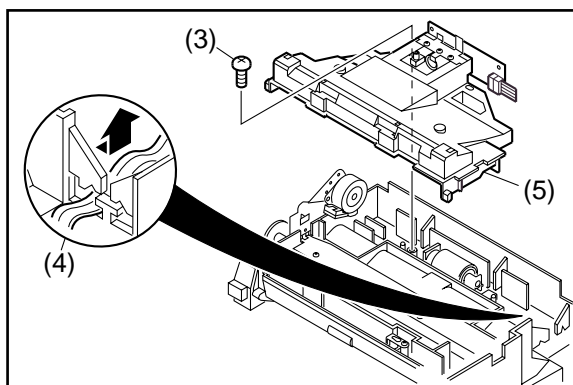
Reinstall the Transmit Motor (324) as illustrated.



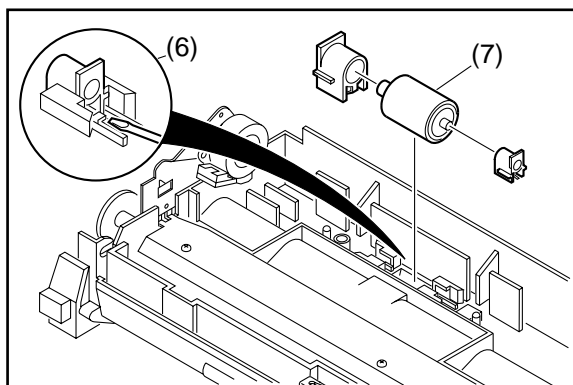
**Caution:**

Before reassembling, apply EM-50L Grease to the Gear Posts as illustrated.

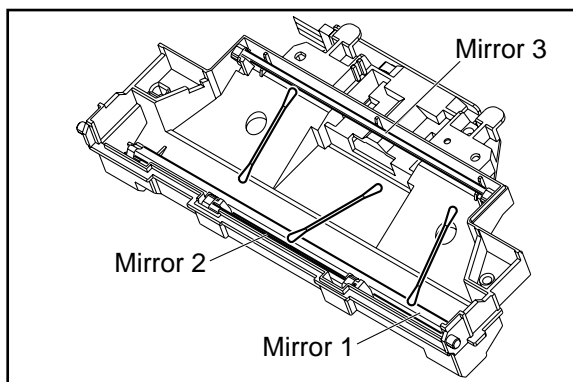
## 2.2.8. Scanner Block (321), Mirror 1 (334), Mirror 2 (335), Mirror 3 (336), ADF Roller (331)



- (1) Remove the **Transmit Guide** (301) Assembly (Refer to 2.2.4.).
- (2) Remove the **Stamp Assembly** (325, 326) (Refer to 2.2.5.).
- (3) Remove 1 **Screw** (19).
- (4) Remove the Harnesses from the hook.
- (5) Remove the **Scanner Block** (321).



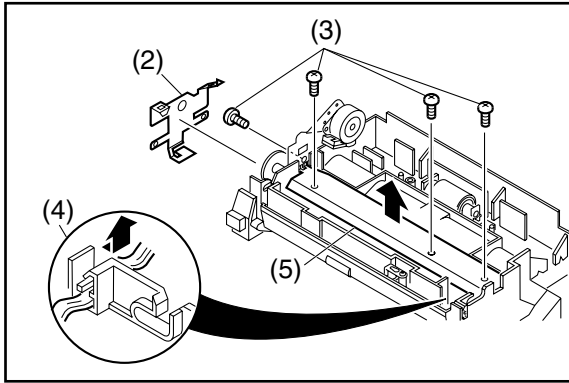
- (6) Remove **P10** and **P6B Bushings** (315, 318) by using Blade-tip Screwdriver.
- (7) Remove the **ADF Roller** (331).



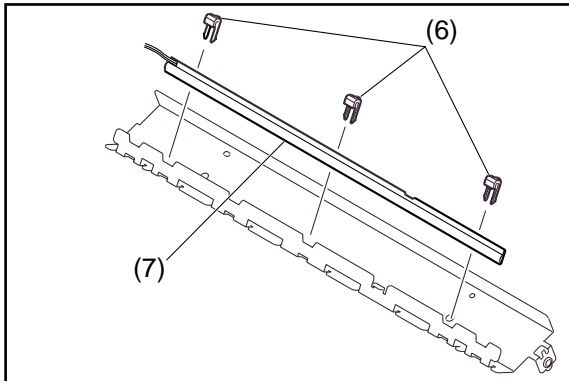
### <Cleaning the Mirror 1, Mirror 2 and Mirror 3>

Clean the **Mirror 1** (334), **Mirror 2** (335) and **Mirror 3** (336) with a soft cloth, soaked with isopropyl alcohol.

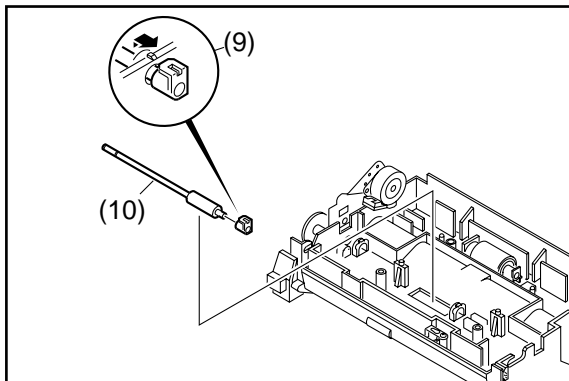
## 2.2.9. LED Array (329), Feed Roller (302)



- (1) Remove the **Scanner Block** (321) (Refer to 2.2.8.).
- (2) Remove the **Ground Plate** (317).
- (3) Remove 4 **Screws** (19).
- (4) Release the Harness from the hook.
- (5) Remove the **LED Bracket** (306) Assembly.

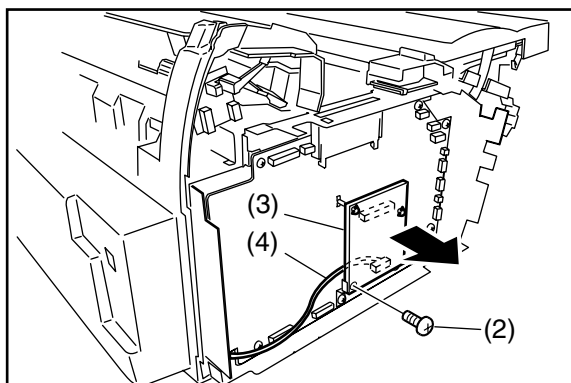


- (6) Remove 3 **LED Clips** (307).
  - (7) Remove the **LED Array** (329).
- Caution:**  
When reinstalling the LED Array, position the 3 LED Clips at the appropriate locations.

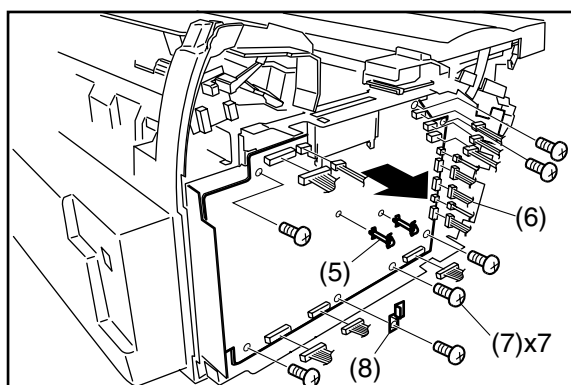


- (8) Remove the **Gears, Bushings** and the **Roller Wire Spring** (Refer to 2.2.6.).
- (9) Remove 2 **P6A Bushings** (316).
- (10) Remove the **Feed Roller** (302).

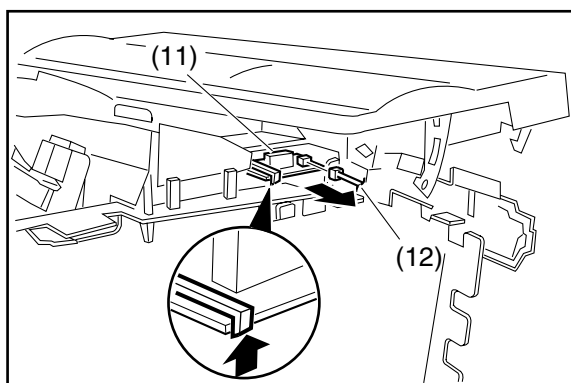
## 2.2.10. LANB PC Board (1036), SC PC Board (1001), ILS PC Board (1006), SNS4 PC Board (1007)



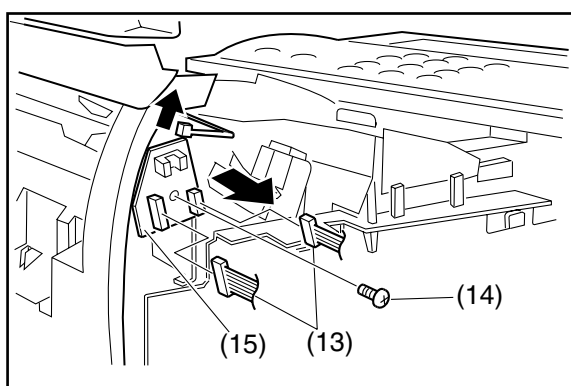
- (1) Remove the **Left Cover** (Refer to 2.2.2.).
- (2) Remove 1 **Screw** (19).
- (3) Release 2 **Locking Spacers** (431) and remove the **LANB PC Board** (1036).
- (4) Disconnect the **LANB-LANC Harness** (1838) on the LANB PC Board (CN97).



- (5) Remove 2 **Locking Spacers** (431).
- (6) Disconnect all **Connectors** on **SC PC Board**.
- (7) Remove 7 **Screws** (19).
- (8) Remove the **LANB Bracket** (430).
- (9) Remove the **SC PC Board** (1001).

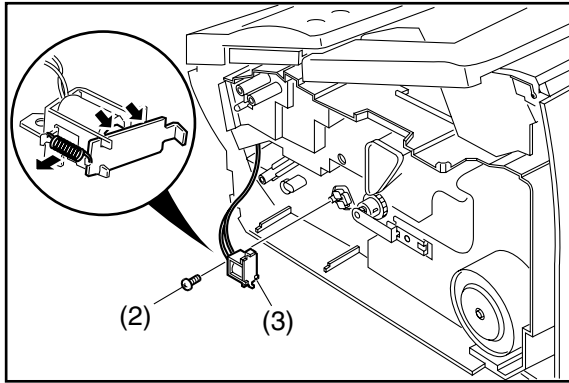


- (10) Move all Harnesses away from the front of the Door Sensor.
- (11) Release the Latch Hook and remove the **ILS PC Board** (1006).
- (12) Disconnect **Connector CN73** on the **ILS PC Board** (1006).



- (13) Disconnect **Connectors CN85** and **87** on the **SNS4 PC Board**.
- (14) Remove 1 **Screw** (19).
- (15) Lift up the **Paper Exit Actuator** (730) and remove the **SNS4 PC Board** (1007).

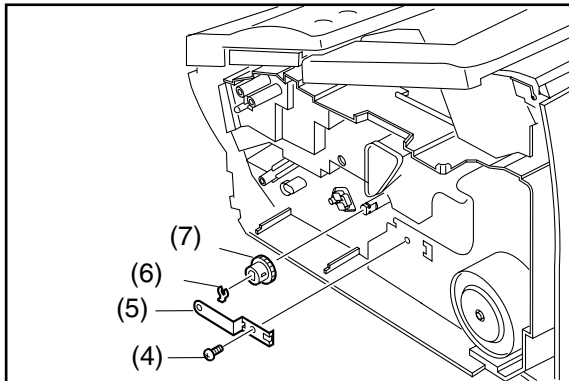
## 2.2.11. Paper Feed Solenoid (531), Clutch Gear Assembly, Paper Feed Roller (518)



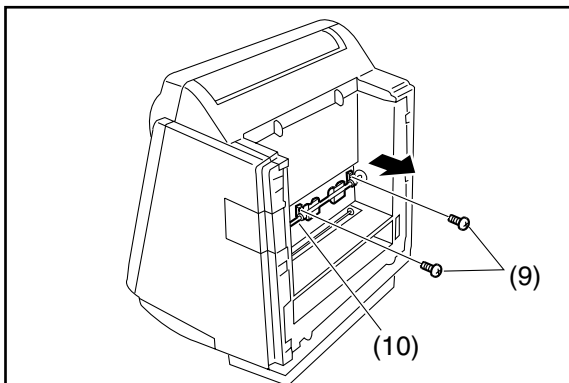
- (1) Remove the **Right Cover** (102) (Refer to 2.2.2.).
- (2) Remove 1 **Screw** (19).
- (3) Remove the **Paper Feed Solenoid** (531).

**Note:**

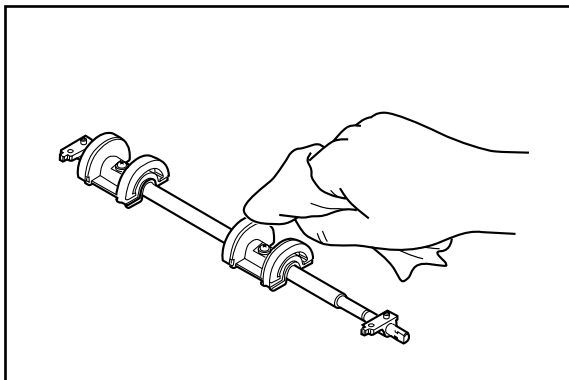
If the Paper Feed Solenoid does not work properly due to dust, etc. Remove the spring to disassemble and clean the magnet and plate as illustrated.



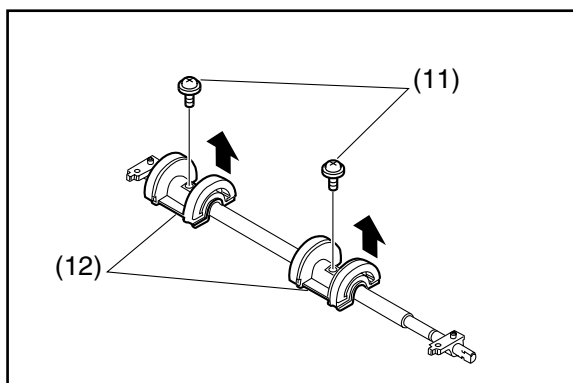
- (4) Remove 1 **Screw** (19).
- (5) Remove the **Feed Roller Ground Spring** (628).
- (6) Remove the **Snap Ring** (B9).
- (7) Remove the **Clutch Gear Assembly**.



- (8) Place the machine on its Rear side.
- (9) Remove 2 **Screws** (19).
- (10) Remove the **Feed Roller Assembly**.



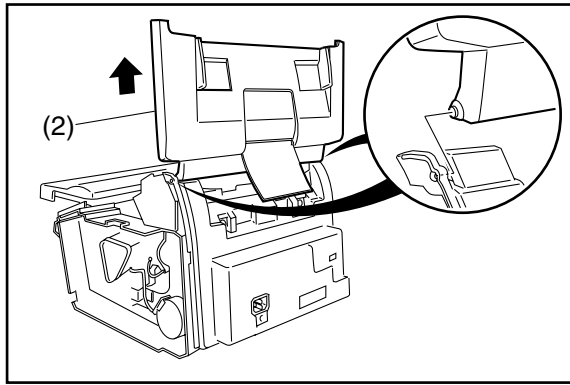
Clean the **Paper Feed Rollers** (518) with a soft cloth, soaked with isopropyl alcohol.



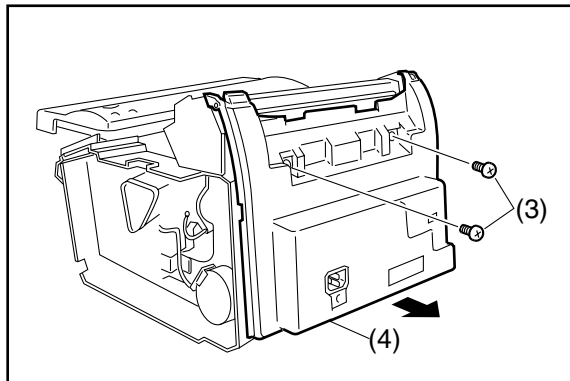
(11) Remove 2 **Screws** (4N).

(12) Remove the **Paper Feed Rollers** (518).

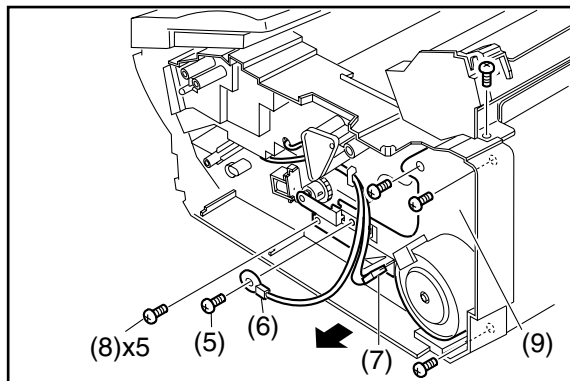
## 2.2.12. Printer Cover (106), Rear Cover (105), Printer Motor (626)



- (1) Remove the **Left Cover** and the **Right Cover** (Refer to 2.2.2.).
- (2) Release the hooks and remove the **Printer Cover (106)**.



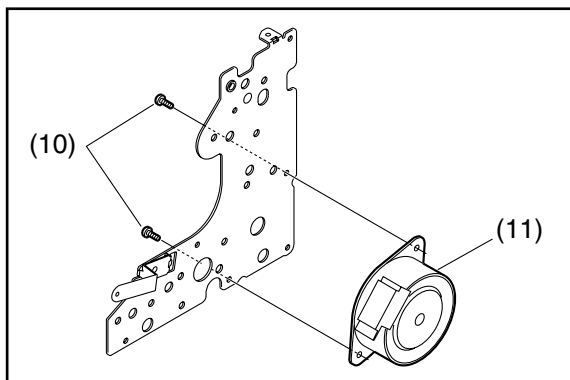
- (3) Remove 2 **Silver Screws (B1)**.
- (4) Remove the **Rear Cover (105)**.



- (5) Remove 1 **Screw (19)**.
- (6) Remove the **Ground Wire (542)**.
- (7) Disconnect the **Connector** from the **Printer Motor**.
- (8) Remove 5 **Screws (19)**.
- (9) Remove the **Printer Motor Bracket (616) Assembly**.

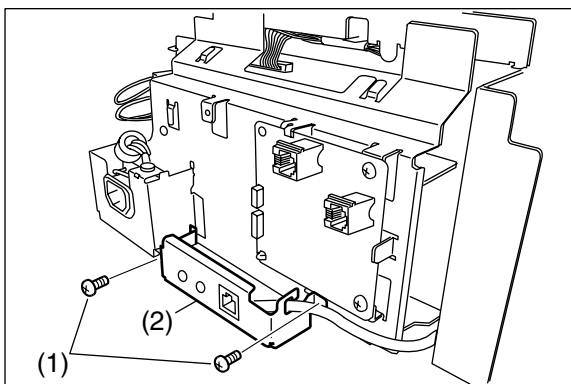
**Caution:**

The Gears underneath may dislodge when the Motor Bracket is removed.

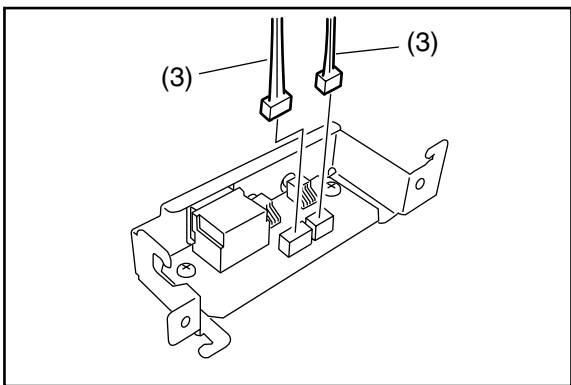


- (10) Remove 2 **Screws (4N)**.
- (11) Remove the **Printer Motor (626)**.

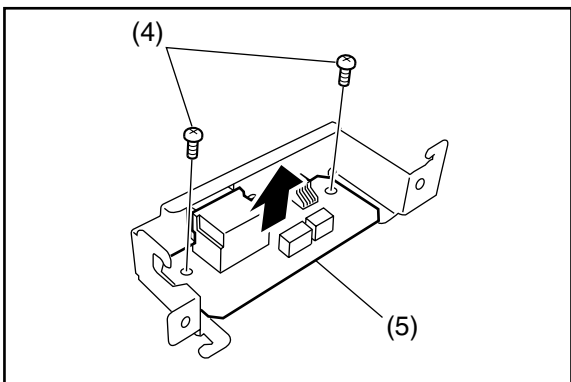
### 2.2.13. LANC PC Board (1037), MJR PC Board (1003), Power Supply Unit (1002)



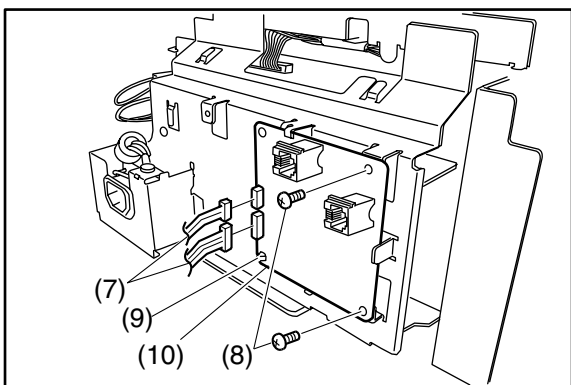
- (1) Remove 2 **Screws** (19).
- (2) Remove the **LANC PC Board** (1037) Assembly.



- (3) Disconnect the **LANB-LANC Harness** (1038).



- (4) Remove 2 **Screws** (C8).
- (5) Remove the **LANC PC Board** (1037).



**Caution:**

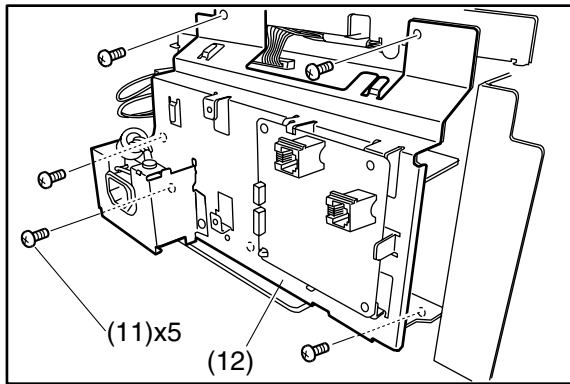
Make sure the **Power Cord** (1108) is unplugged.

**Note:**

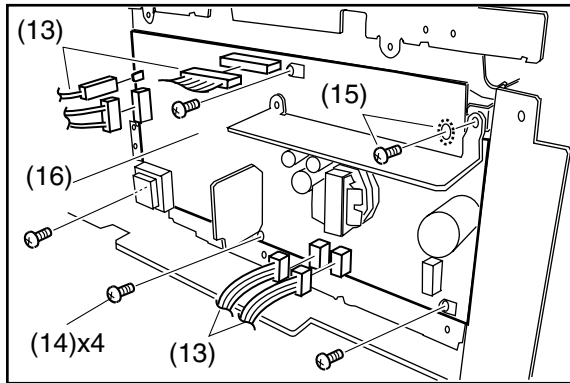
If removing only the **Power Supply Unit**, skip steps (8), (9) and (10).

- (6) Remove the **Rear Cover** (105) (Refer to 2.2.12.).
- (7) Disconnect the **Connectors** (CN28 and 29) on the **MJR PC Board**.
- (8) Remove 2 **Screws** (19).
- (9) Release the **Latch Hook of Locking Card Spacer** (405).
- (10) Remove the **MJR PC Board** (1003).



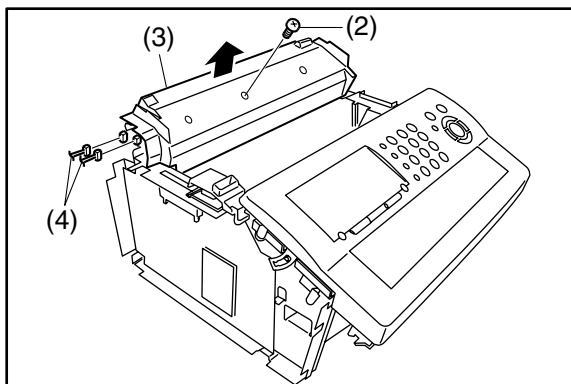


- (11) Remove 5 **Screws** (19).
- (12) Remove the **L Power Plate** (401).

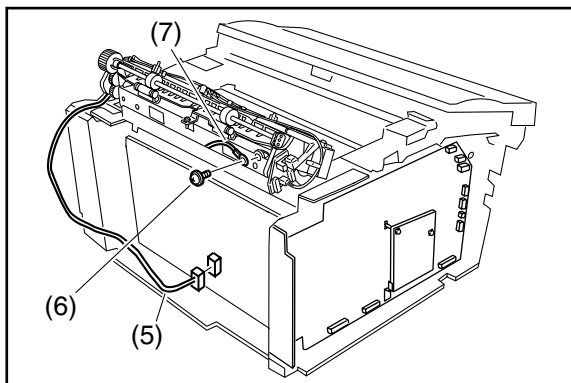


- (13) Disconnect the **Connectors** (CN101, 102, 103, 201 and 202) on the **Power Supply Unit** (1002).
- (14) Remove 4 **Screws** (19).
- (15) Remove 1 **Screw** (19) and 1 **Washer** (G8).
- (16) Remove the **Power Supply Unit** (1002).

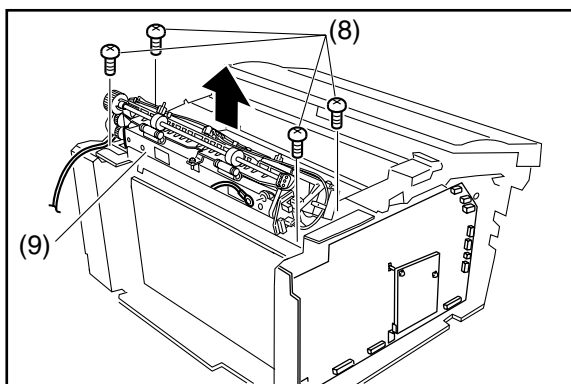
## 2.2.14. Fuser Unit, Thermistor Assembly (728)



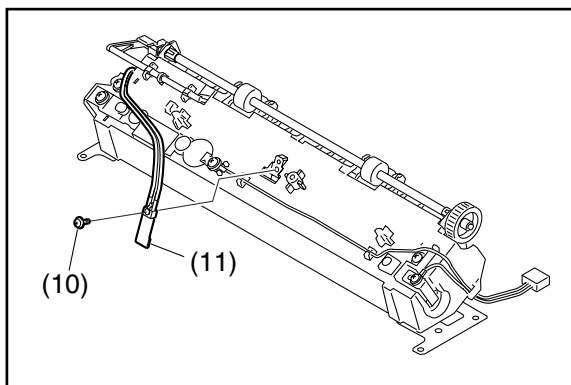
- (1) Remove the **Rear Cover** (Refer to 2.2.12.).
- (2) Remove 1 **Screw** (19).
- (3) Remove the **Fuser Top Cover** (733).
- (4) Disconnect the **Connectors CN85 and CN87** on the **SNS4 PC Board** (1007).



- (5) Disconnect the **Connector CN102** on the **Power Supply Unit** (423).
- (6) Remove 1 **Screw** (4N).
- (7) Remove the **FG1 Harness** (629).

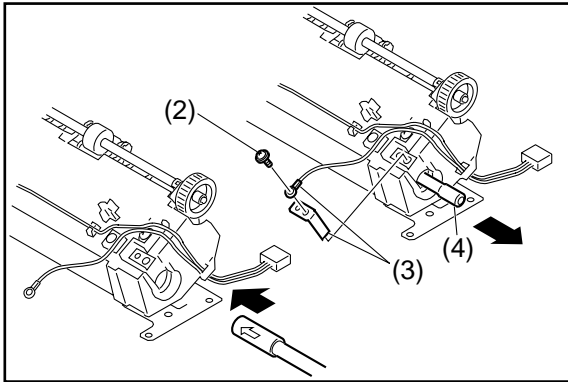


- (8) Remove 4 **Screws** (19).
- (9) Remove the **Fuser Unit**.



- (10) Remove 1 **Screw** (1Q).
- (11) Remove the **Thermistor Assembly** (728).

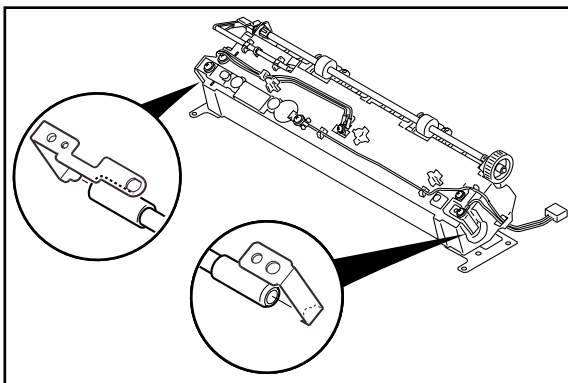
## 2.2.15. Fuser Lamp (732), Exit Roller (719), Fuser Roller (709), Pressure Roller (706)



- (1) Remove the **Rear Cover** (Refer to 2.2.12.) and the **Fuser Unit** (Refer to 2.2.14.).
- (2) Remove 1 **Screw** (4N).
- (3) Remove the **PSU-Fuser Harness** (1028) and **Fuser Lamp Terminal B** (731).
- (4) Remove the **Fuser Lamp** (732).

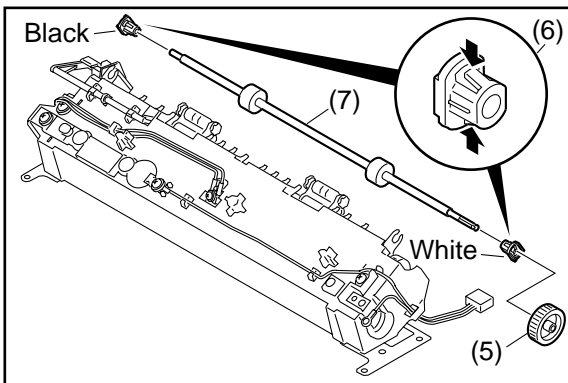
### Caution:

When reinstalling the Fuser Lamp, make sure that the Fuser Lamp is inserted into the Fuser Unit as illustrated. Do not touch the glass portion of the Fuser Lamp with bare hands. Grease from fingerprints will shorten its life cycle, use isopropyl alcohol to clean fingerprints.



### Caution:

When reinstalling the Fuser Lamp, make sure that both ends of the Fuser Lamp fit into the projected area of the **Fuser Lamp Terminal A** (724) and the **Fuser Lamp Terminal B** (731).

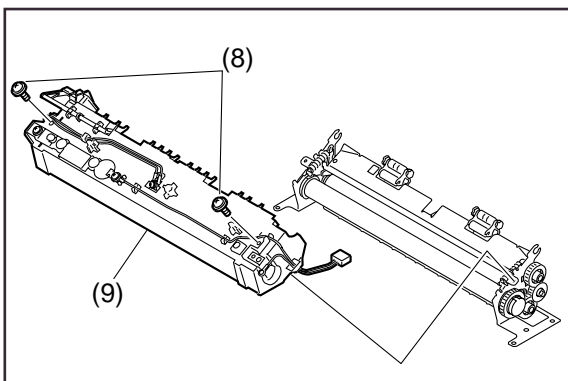


- (5) Remove the **E22 Gear** (722).

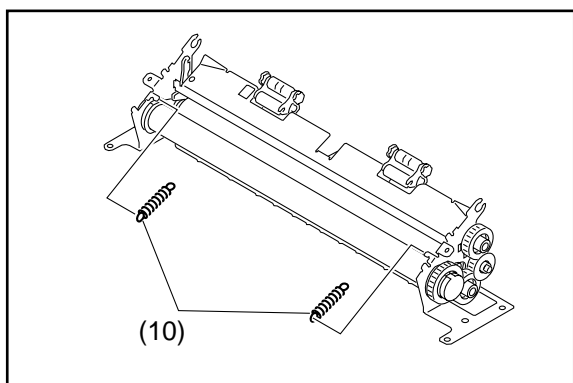
### Caution:

You may need to use force to pull out the Gear.

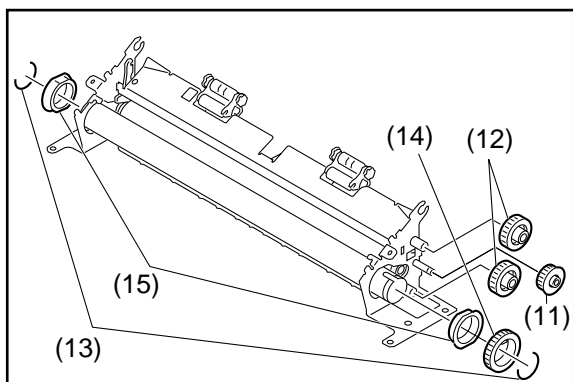
- (6) Remove the **Right** and **Left P3.5L11.2 Bushings** (720 and 721).
- (7) Remove the **Exit Roller** (719).



- (8) Remove 2 **Screws** (4N).
- (9) Remove the **Fuser Cover** (723).



(10) Remove 2 **Pressure Springs** (708).



(11) Remove the **E14 Gear** (714).

**Caution:**

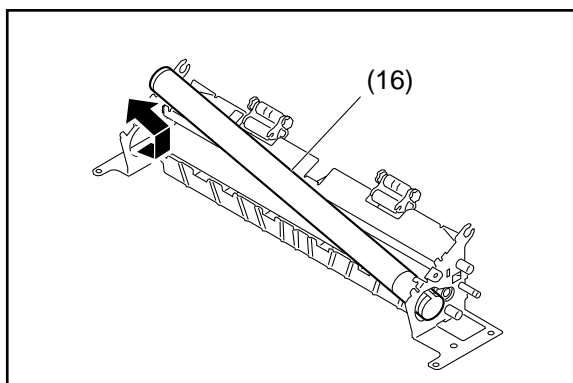
You may need to use force to pull out the Gear.

(12) Remove the 2 **E18 Gears** (713).

(13) Remove 2 **C-Rings** (712).

(14) Remove the **E24 Drive Gear** (711).

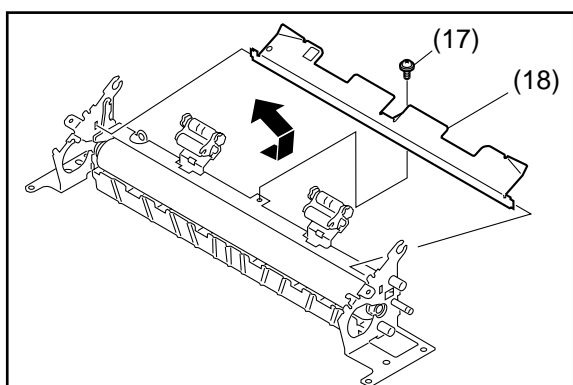
(15) Remove 2 **P17L6.8 Bushings** (710).



(16) Remove the **Fuser Roller** (709).

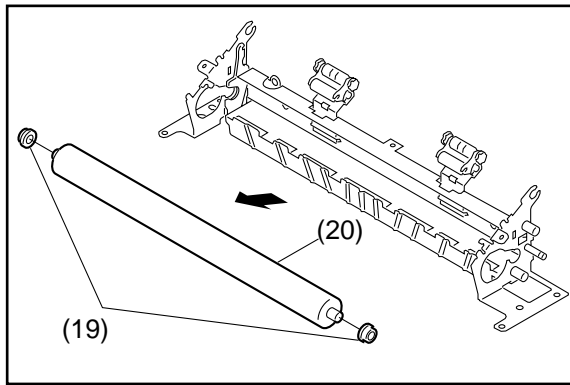
**Caution:**

Do not scratch the surface of the Fuser Roller when removing or reinstalling it.



(17) Remove 1 **Screw** (4N).

(18) Remove the **Lower Paper Exit Guide** (703).



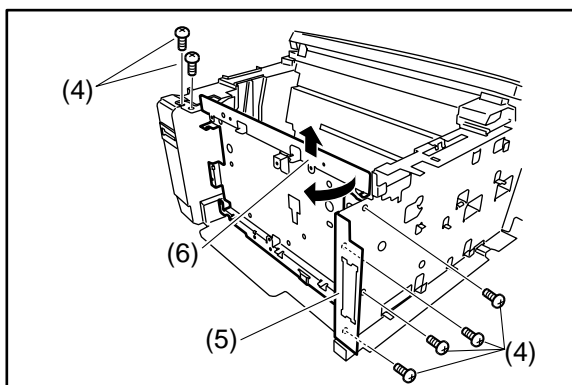
(19) Remove 2 **P6L5.5 Bushings** (707).

(20) Remove the **Pressure Roller** (706).

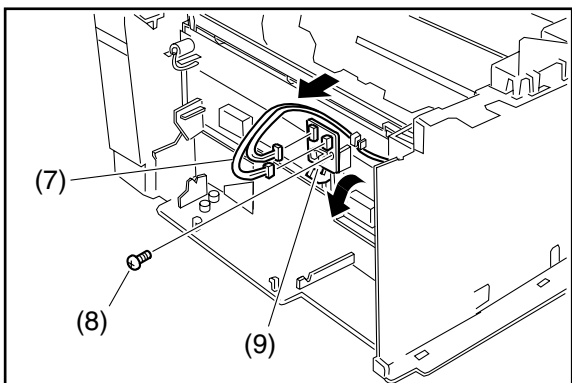
**Caution:**

Do not scratch the surface of the Pressure Roller when removing or reinstalling it.

## 2.2.16. Rear Chassis (505), SNS1 PC Board (1008)

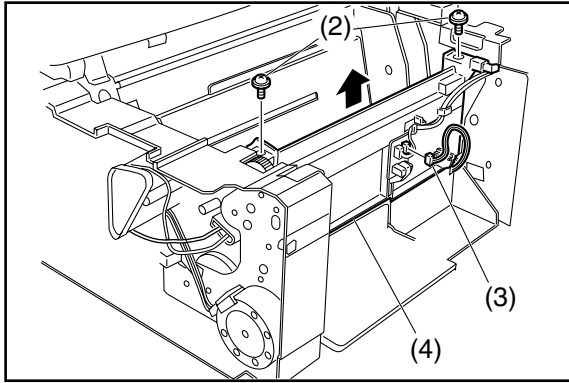


- (1) Remove the **Power Supply Unit** (Refer to 2.2.12.).
- (2) Remove the **SC PC Board** (Refer to 2.2.12.).
- (3) Remove the **Fuser Unit** (Refer to 2.2.14.).
- (4) Remove 6 **Screws** (19).
- (5) Remove the **Bracket** (403).
- (6) Remove the **Rear Chassis** (505).

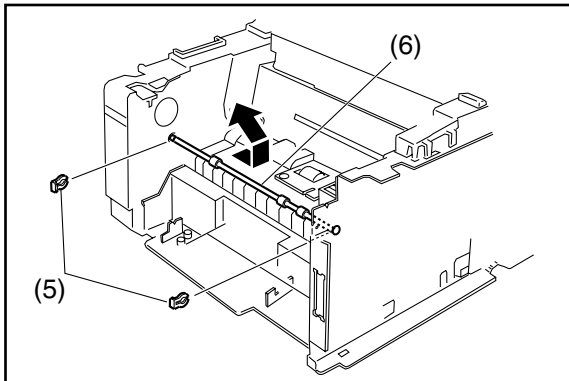


- (7) Disconnect **Connectors CN80** and **CN81** on the **SNS1 PC Board** (1008).
- (8) Remove 1 **Screw** (19).
- (9) Remove the **SNS1 PC Board** (1008).

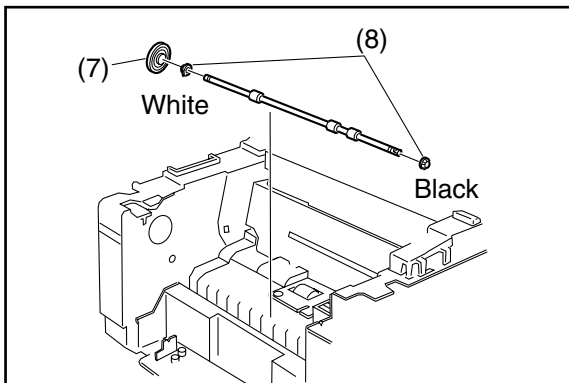
## 2.2.17. Transfer Guide (601) Assembly, Feed Roller (526)



- (1) Remove the **Rear Chassis** (Refer to 2.2.16.).
- (2) Remove 2 **Screws** (C8).
- (3) Disconnect **Connector CN80** on the **SNS1 PC Board** (1008).
- (4) Remove the **Transfer Guide** (601) Assembly.

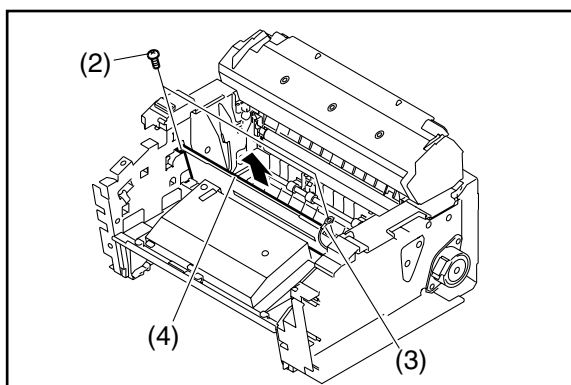


- (5) Remove the 2 **Snap Rings**. (B9).
- (6) Remove the **Feed Roller** (526).

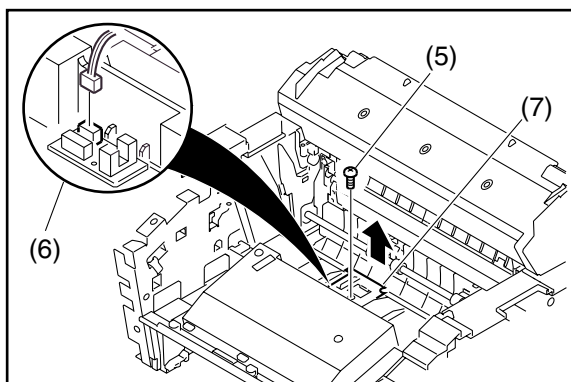


- (7) Remove the **Roller Gear** (529).
- (8) Remove 2 **P6L5 Bushings** (527, 528).

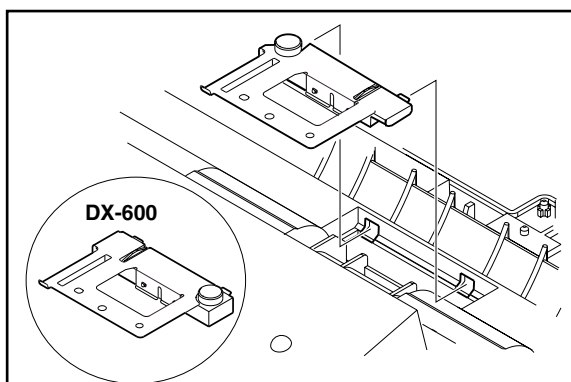
## 2.2.18. Toner Sensor (513), Laser Unit [LSU] (512), SNS3 PC Board (1009)



- (1) Remove the **Transmit Guide Assembly** (Refer to 2.2.4.).
- (2) Remove 2 **Screws** (19).
- (3) Remove **Ground Wire** (542).
- (4) Remove the **CCD Shield Plate** (533).

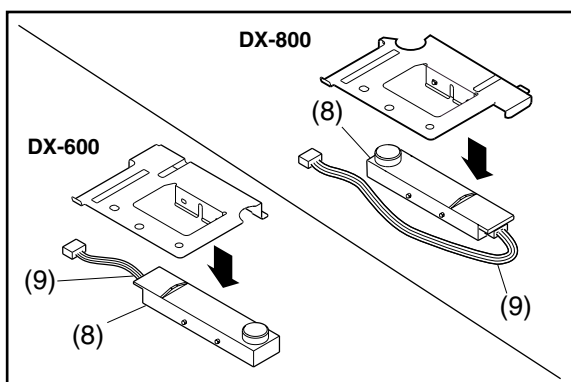


- (5) Remove 1 **Screw** (19).
- (6) Disconnect **Connector CN84** on the **SNS3 PC Board** (1009).
- (7) Remove the **Toner Sensor Spring Plate** (506) Assembly.



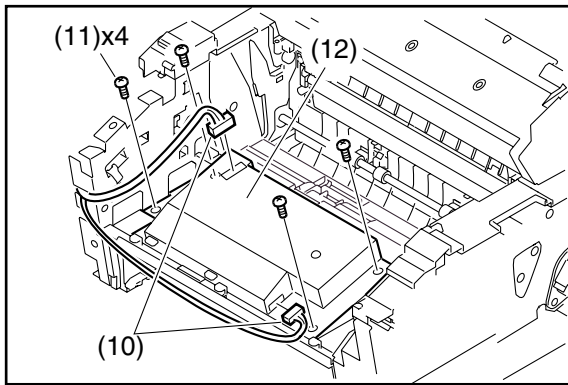
### Note:

When reinstalling, make sure that the Toner Sensor Spring Plate is inserted into the 2 notches in the main frame as shown in the illustration.



- (8) Remove the **Toner Sensor** (513).
- (9) Disconnect the **Connector** on the Toner Sensor.

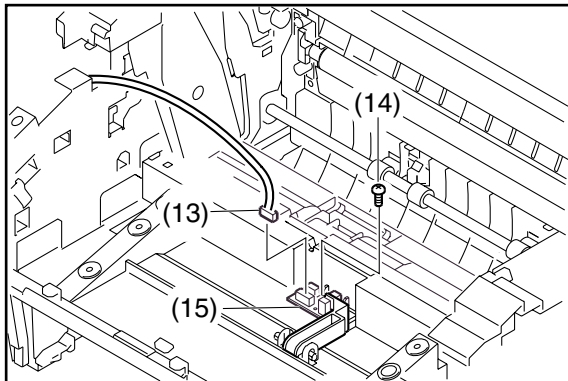




(10) Disconnect 2 **Connectors** on the **Laser Unit** (512).

(11) Remove 4 **Screws** (1Y).

(12) Remove the **Laser Unit** (512).

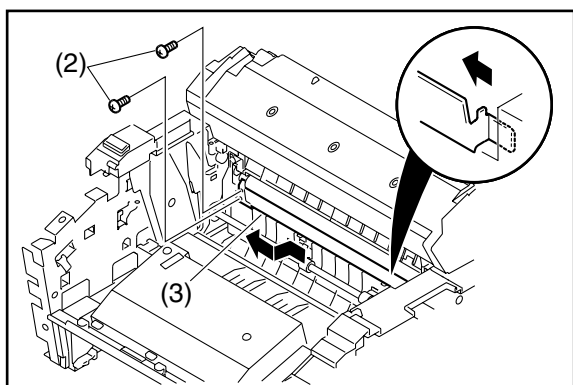


(13) Disconnect **Connectors CN83** and **CN84** on the **SNS3 PC Board** (1009).

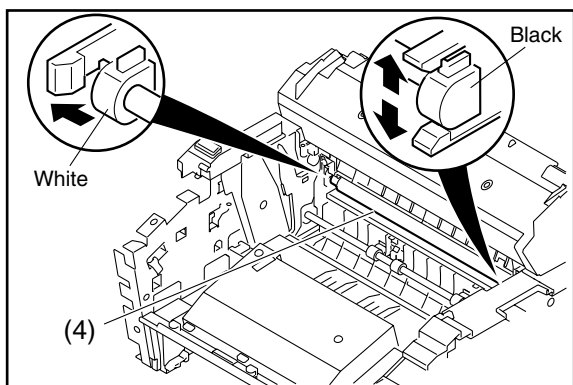
(14) Remove 1 **Screw** (19).

(15) Lift up the **No Paper Actuator** (525) and Remove the **SNS3 PC Board** (1009).

## 2.2.19. Bias Transfer Roller (604)



- (1) Remove the **CCD Shield Plate** (Refer to 2.2.18.).
- (2) Remove 2 **Screws** (19).
- (3) Remove the **BTR Guide** (602).

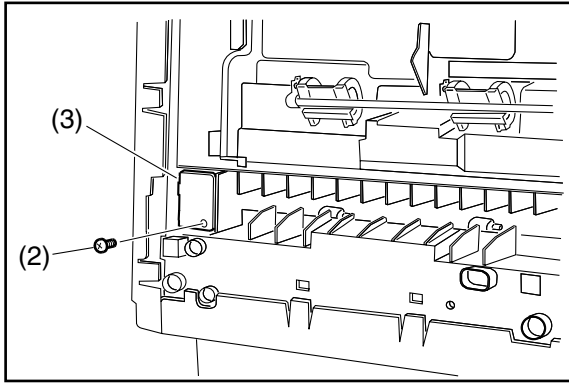


- (4) Release the Latch Hook on the **Transfer Guide** (601) Assembly as illustrated and remove the **Bias Transfer Roller** (604).

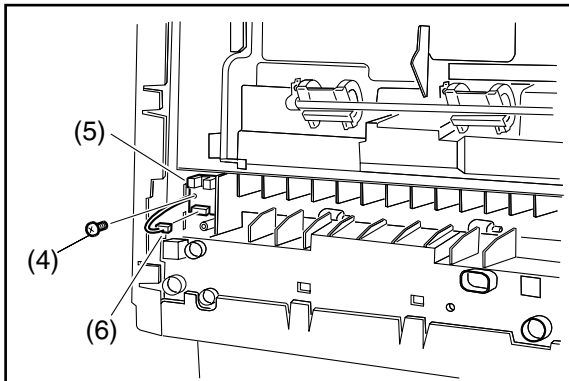
### Caution:

- Do not touch the surface of the Bias Transfer Roller. Clean the Bias Transfer Roller only with a dry cloth.
- When cleaning or replacing the Bias Transfer Roller, clean both sides of the Transfer Guide with isopropyl alcohol.

## 2.2.20. SNS2 PC Board (1010)

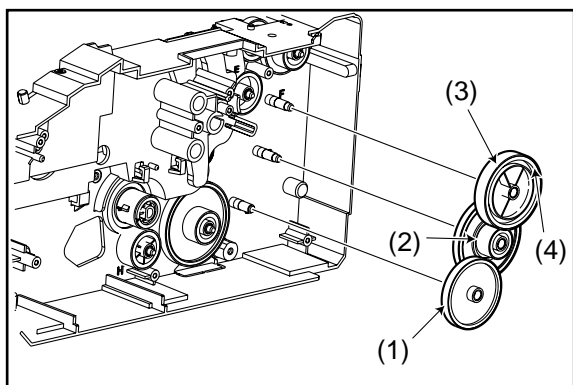


- (1) Place the machine on its rear side.
- (2) Remove 1 **Screw** (19).
- (3) Remove the **Plate A** (507).



- (4) Remove 1 **Screw** (19).
- (5) Disconnect **Connector CN82** (538) on the **SNS2 PC Board** (1010).
- (6) Remove the **SNS2 PC Board** (1010).







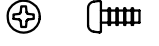







## 2.2.21. Printer Grease Points



Before reassembling, apply EM-50L Grease as described below.

- (1) **B83D22 Gear G (622)** : Gear surface
- (2) **D60D20 Gear B (621)** : Rib surface
- (3) **D55 Gear F (619)** : Gear surface
- (4) **D55 Gear F (619)** : Gear Side surface

### 2.3. Screw Identification Template

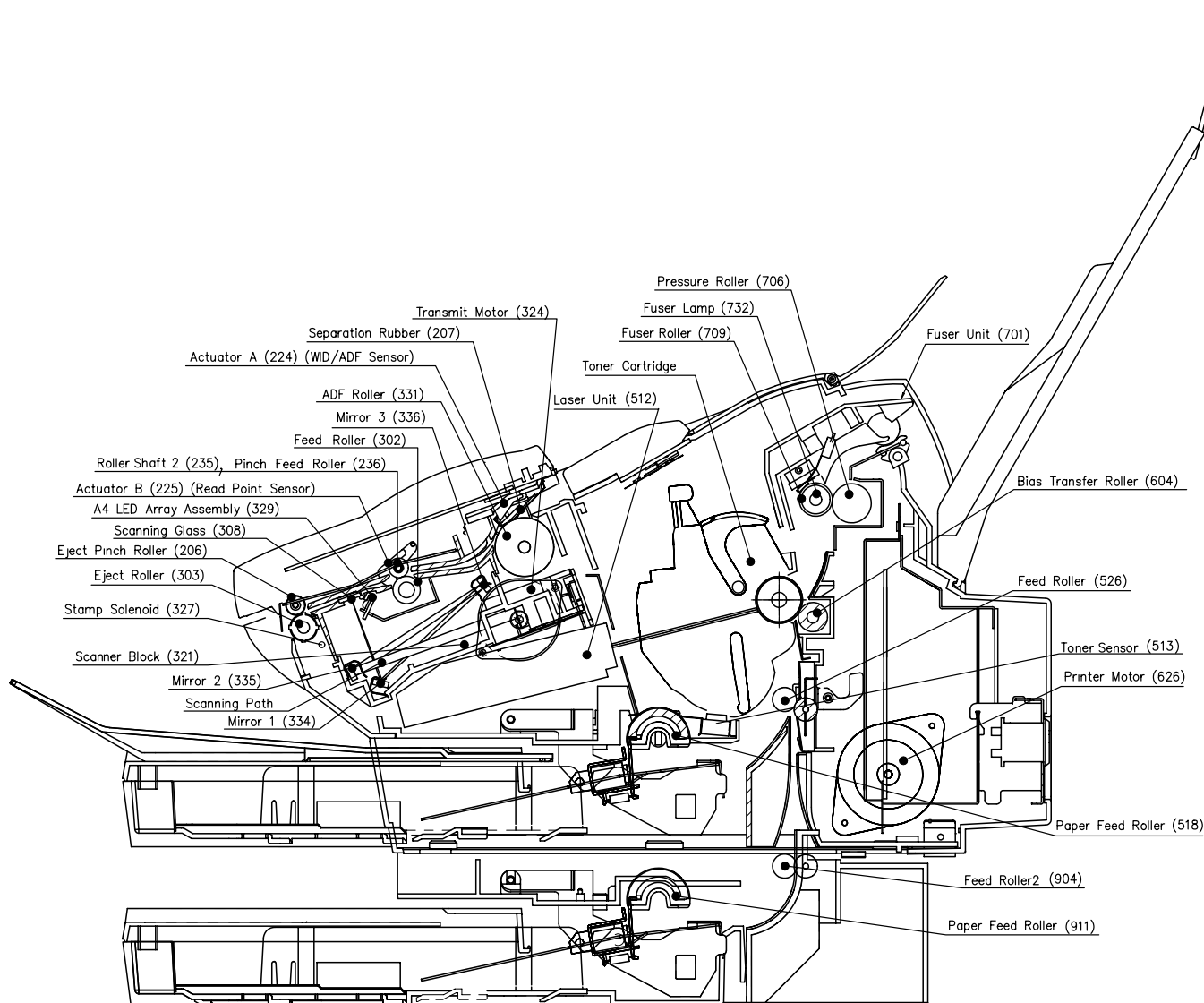
Ref No.	Part No.	Figure	Remark
19	XTB3+8J		Screw
23	XYN3+F8		Screw
24	XYN4+F8		Screw
1Q	XYN3+F10		Screw
1Y	XTB3+10J		Screw
4N	XSN3+W8FC		Screw
7B	XTB26+6J		Screw
A9	DZPA000001		Screw
B1	DZPB000007		Silver Screw
B4	XTB3+8JK		Screw
B5	XSB4+10BN		Screw
B9	DZJM000171		Snap Ring
C2	DZPB000020		Screw
C8	XTW3+8SFC		Screw

## 3 Maintenance, Adjustments and Check Points

### 3.1. Required Tools

No.	Tool	No.	Tool
1	Soft Cloth	6	Tweezer
2	Isopropyl Alcohol	7	Pliers
3	Phillips Screwdriver (#2)	8	Cotton Swab
4	Stubby Phillips Screwdriver (#2)	9	Brush
5	Blade-tip Screwdriver (3/32 in)	10	Molykote EM-50L Grease (Available from Dow Corning, URL: <a href="http://www.dowcorning.com">http://www.dowcorning.com</a> )

### 3.2. Periodic Check Points



### 3.3. Periodic Maintenance Check List

The chart outlined below is a general guideline for maintenance. The example 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.

	Mechanical Parts	Ref. No.	Cleaning		Replacement/Adjustment	
			Cycle	Procedure	Cycle	Procedure
Receiver Unit	Printer Motor	626	-	-	100,000 documents	Refer to Ch 2.2.12.
	Toner Cartridge		-	-	approx 7,500 pages (See Note)	-
	Paper Feed Roller	518	12 months or 10,000 documents	Refer to Ch 2.2.11.	30,000 documents	Refer to Ch 2.2.11.
	Feed Roller	526 904	12 months or 10,000 documents	Refer to Ch 2.2.17.	-	Refer to Ch 2.2.17.
	Bias Transfer Roller	604	12 months or 10,000 documents	Refer to Ch 2.2.19.	30,000 documents	Refer to Ch 2.2.19.
	Fuser Unit	701	When replacing Print Cartridge	Cleaning chart	50,000 documents	Refer to Ch 2.2.14.
	Fuser Roller	709	When the Recording Paper wraps itself around the roller.	Refer to Ch 2.2.15.	(Included as part of the Fuser Unit)	Refer to Ch 2.2.15.
	Pressure Roller	706	When the Recording Paper wraps itself around the roller.	Refer to Ch 2.2.15.	(Included as part of the Fuser Unit)	Refer to Ch 2.2.15.
Transmitter Unit	Roller Shaft 2	235	30,000 documents	Refer to Ch 2.2.3.	-	-
	Feed Pinch Roller * Shaft Hole	236	30,000 documents	Refer to Ch 2.2.3.	-	-
	ADF Roller	331	12 months or 10,000 documents	Refer to Ch 2.2.4.	30,000 documents	Refer to Ch 2.2.8.
	Separation Rubber	207	12 months or 10,000 documents	Refer to Ch 2.2.2.	30,000 documents	Refer to Ch 2.2.2.
	Feed Roller	302	12 months or 10,000 documents	Refer to Ch 2.2.4.	30,000 documents	Refer to Ch 2.2.9.
	Eject Roller	303	12 months or 10,000 documents	Refer to Ch 2.2.4.	30,000 documents	Refer to Ch 2.2.6.
	Scanning Glass	308	12 months or 10,000 documents	Refer to Ch 2.2.4.	-	-
	Mirrors	334 335 336	12 months or 10,000 documents	Refer to Ch 2.2.8.	-	-
	Transmit Motor	324	-	-	100,000 documents	Refer to Ch 2.2.7.
	"x" Stamp Head	325	-	-	5,000 documents	Refer to Ch 2.2.5.

#### Note

The number of pages is based on the ITU-T Image No. 1 Test Chart using Multi-Copy mode. Operation environment 68°F (20°C), 50% RH, using A4 paper.

### 3.4. Updating the Firmware

Unlike other machines with removable EPROM (Erasable Programmable ROM), this machine is equipped with a F-ROM (Flash ROM) as standard. The F-ROM offers the flexibility of quick and easy firmware updates. The firmware of the machine can be updated with the removable F-ROM Card. (Refer to Section 5.1.9)

The following is the basic procedure to update the firmware of the machine. The details are described in the Firmware Update Tool Operating Instructions.

#### 3.4.1. Creating a Master Firmware Card

##### A.Utilizing the Firmware Update Tool

1. Install the Firmware Update Tool.
2. Install a Flash Memory Card (2 MB x 2, 4 MB or higher) into the machine.
3. Follow the instructions included in the Firmware Update Tool Operating Instructions.

##### B.Copy the Firmware from an Existing Machine

1. Unplug the Power Cord to turn the machine OFF.
2. Install a Flash Memory Card (2 MB x 2, 4 MB or higher) into the machine with the Panasonic Logo facing outwards.
3. Plug in the Power Cord to turn the machine ON.
4. Perform the Service Mode 9-2 (Firmware Backup).
5. The firmware is copied into the Flash Memory Card.
6. After the backup is completed, press "STOP" to return to standby.
7. Unplug the Power Cord to turn the machine OFF.
8. Remove the Master Firmware Card that you just created from the machine.
9. Plug in the Power Cord to turn the machine ON.
10. Use this Master Firmware Card to update the firmware on other machines.

#### 3.4.2 Updating the Firmware using the Master Firmware Card

1. Before starting, print the Fax and Function Parameter Lists.
2. Unplug the Power Cord to turn the machine OFF.
3. Install the appropriate Master Firmware Card into the machine with the Panasonic Logo facing outwards.
4. Plug in the Power Cord to turn the machine ON.
5. Perform the Service Mode 9-1-1 (Firmware Update).
6. The firmware is copied into the machine.
7. After the update is completed, the machine reboots itself and returns to standby.
8. Perform the Service Mode 6 (Parameter Initialization).
9. Unplug the Power Cord to turn the machine OFF.
10. Remove the Master Firmware Card from the machine.
11. Plug in the Power Cord to turn the machine ON.
12. Reprogram the Fax and/or Function Parameters according to the lists printed in Step 1 above if the settings are other than factory default.



### 3.4.3. Erasing the Master Firmware Card

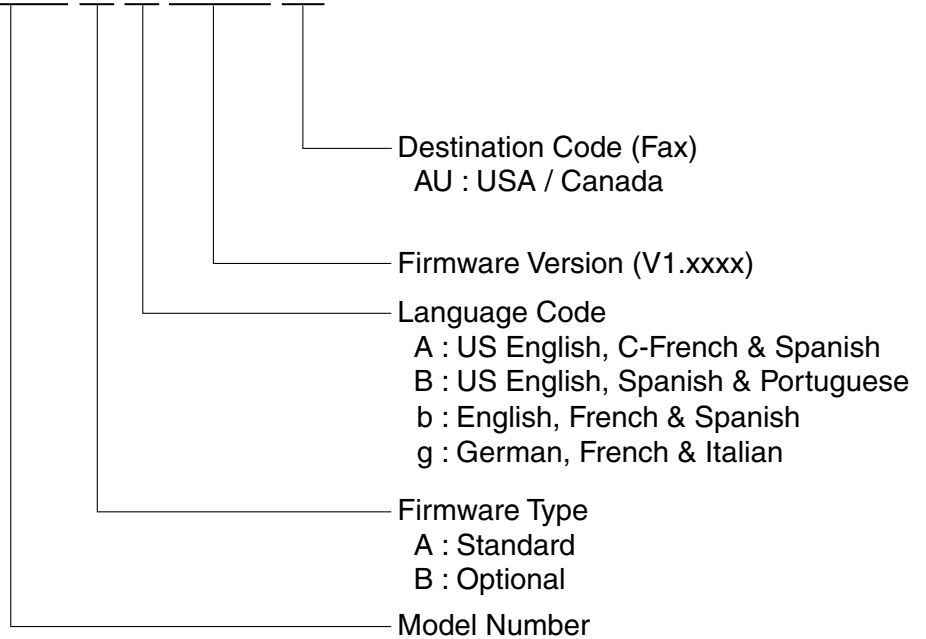
1. Unplug the Power Cord to turn the machine OFF.
2. Install the Master Firmware Card into the machine with the Panasonic Logo facing outwards.
3. Plug in the Power Cord to turn the machine ON.
4. Perform the Service Mode 9-5 (Erase Flash Card).
5. The firmware is erased from the card and return to Service Mode default display.
6. Press "STOP" twice to return to standby.
7. Unplug the Power Cord to turn the machine OFF.
8. Remove the blank Flash Memory Card from the machine.
9. Plug in the Power Cord to turn the machine ON.

### 3.4.4. Firmware Version

<DX-800>

HOST

: DX-800 A A V1.xxxx AU



## &lt;UF-600&gt;

HOST

: DX-600 A A V1.xxxx AB

Destination Code (Fax)  
AB : UK

Firmware Version (V1.xxxx)

Language Code

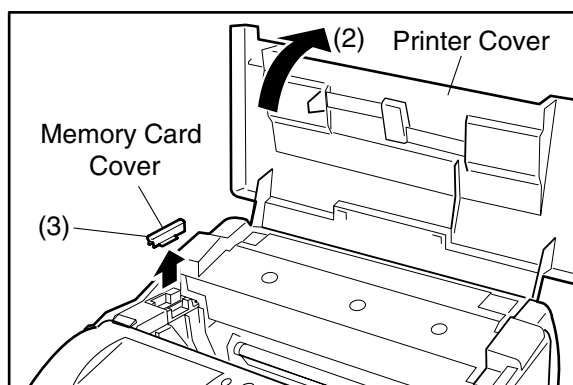
A : US English, C-French & Spanish  
B : US English, Spanish & Portuguese  
b : English, French & Spanish  
g : German, French & Italian

Firmware Type

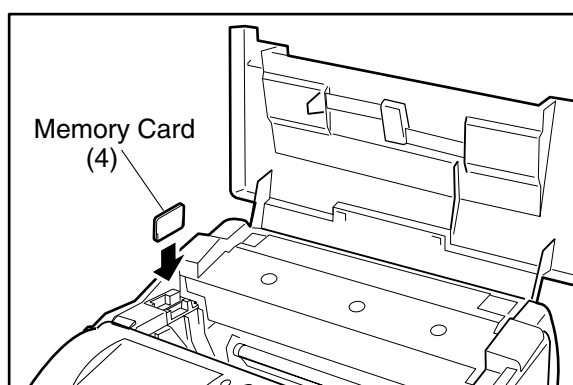
A : Standard  
B : Optional

Model Number

## 3.4.5. Updating the DX-800 Firmware



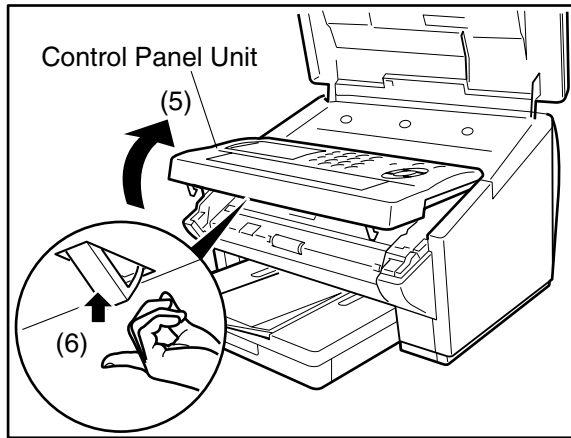
- (1) Unplug the Power Cord.
- (2) Open the Printer Cover.
- (3) Remove the Memory Card Cover.



- (4) Insert the Flash Memory Card gently into the card slot with the Panasonic logo facing to the outside of the machine.

**Caution:**

Installing the Flash Memory Card in the wrong direction may damage the connecting pins inside the machine.



- (5) Open the Control Panel Unit.
- (6) Activate the Read Point Sensor with your finger and plug in the Power Cord.
- (7) Wait approximately 10 seconds, release the Read Point Sensor, close the Control Panel Unit (ADF) and the Printer Cover.
- (8) Allow the unit to complete the Firmware Update (approx. 1-minute). When completed, the unit will reboot and progress to the Standby Mode.
- (9) Unplug the Power Cord.
- (10) Remove the Flash Memory Card.
- (11) Re-install the Memory Card Cover.
- (12) Plug in the Power Cord.
- (13) Perform Parameter Initialization.

### 3.5. Glossary of Electrical Abbreviations

Glossary of Electrical Abbreviations	
Signal Name	Description
+24V	+24 VDC Power Supply
+24VD	+24 VDC Power Supply
+24VM	+24 VDC Power Supply (Motors)
+3.3V	+3.3 VDC Power Supply
+5V	+5 VDC Power Supply
+5VP	+5 VDC Pilot Power Supply (Sleep Mode)
-5V	-5 VDC Power Supply
A1	Address Signal
A2	Address Signal
A3	Address Signal
A4	Address Signal
A5	Address Signal
A6	Address Signal
A7	Address Signal
A8	Address Signal
A9	Address Signal
A10	Address Signal
A11	Address Signal
A12	Address Signal
A13	Address Signal
A14	Address Signal
A15	Address Signal
A16	Address Signal
A17	Address Signal
A18	Address Signal
A19	Address Signal
A20	Address Signal
A21	Address Signal
A22	Address Signal
ACTIVITY	LANB PCB / LANC PCB Activity Signal
AGND	Ground
Black (L)	AC Power Supply
Charge	Charge Current: 200 $\mu$ A (AC 300 Hz Sine Wave) & DC Charge Voltage
D0	Data Signal
D1	Data Signal
D2	Data Signal
D3	Data Signal
D4	Data Signal
D5	Data Signal
D6	Data Signal
D7	Data Signal
D8	Data Signal
D9	Data Signal


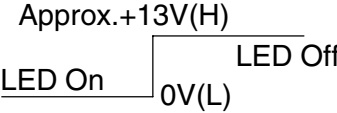
<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Description</b>
D10	Data Signal
D11	Data Signal
D12	Data Signal
D13	Data Signal
D14	Data Signal
D15	Data Signal
DB0	Data Signal
DB1	Data Signal
DB2	Data Signal
DB3	Data Signal
DB4	Data Signal
DB5	Data Signal
DB6	Data Signal
DB7	Data Signal
Development	Development Voltage (AC 1.65 kHz Square Wave) & DC Voltage
DOS	Output Signal
E	Data Read/Write Enable Signal
FCK1	Shift Register Clock
FCK2	Shift Register Clock
FG	Ground
FR	Reset Signal
FSG	Data Transfer Enable Signal
GLED	GND for LED
GND	Ground
HLIN1	Line Signal for the Fax Handset
HLIN2	Line Signal for the Fax Handset
ID0	Flash Memory Card ID
ID1	Flash Memory Card ID
ID2	Flash Memory Card ID
L+5V	Laser Circuit +5 VDC Power Supply
L1 (R)	Line Signal
L2 (T)	Line Signal
LDRE	Timing Sensor and No Cassette Sensor LED Drive Current
LDSC1	No Cassette Sensor LED Drive Current
LDSP1	No Paper Sensor LED Drive Current
LINK	LANB PCB/ LANC PCB Link Signal
MGND	Ground
MIC (-)	Handset Microphone
MIC (+)	Handset Microphone
MMnA	Motor Drive Signal
MMnB	Motor Drive Signal
MMpA	Motor Drive Signal
MMpB	Motor Drive Signal
MTnA	Stepping Signal
MTnB	Stepping Signal

<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Description</b>
MTpA	Stepping Signal
MTpB	Stepping Signal
nADF1	Paper Feed Roller Solenoid Control Signal
nADF2	Paper Feed Roller Solenoid Control Signal
nBPNT	Read Point Detection Signal
nCCHK1	No Cassette Detection Signal
nCCHK2	No Cassette Detection Signal (2nd Cassette)
nCD	Flash Memory Card Detection Signal
nCE1	+5 VDC Power Supply
nCE2	Low Enable
nCR1	Charge Control DC Output
nCRCK	Charge Control DC Output
nDRCK	Development +AC Clock
nESEN	Paper Exit Signal
nFAULT	Data Available / Error Condition (Peripheral→Host)
nFAULT	Fan Ready Signal
nHSYNC	Horizontal Synchronous Signal
nINIT	Reserve Request / Initialize (Host→Peripheral)
nLDON	Laser Control
nLEDON	LED Enable Signal
nMB4	Flash Memory Size
nMPOFF	Energy Saver Mode Control Signal
nOE	Read Signal - Low Enable
nOP	2nd Feeder Unit Detection Signal
nPCHK1	No Paper Sensor Detection Signal
nPCHK2	No Paper Detection Signal (2nd Cassette)
nPMCK	Tetragon Motor Clock
nPMON	Tetragon Motor Control Signal
nPMRY	Tetragon Motor Ready Signal
nPWSAVE	Energy Saver Mode Transport Signal
nRSEN	Timing Sensor Detection Signal
nSSR	Fuser Lamp Control Signal
nSTAMPON	Stamp Control Signal
nS/H	Sample Hold Signal
nTR0	Transfer Control Cleaning Output
nVIDEO	Laser Control
nWEH	Write H Signal - Low Enable
nWEL	Write L Signal - Low Enable
OS	Output Signal
pADF2	Feed Roller Drive Clutch Control Signal (2nd Cassette)
pBZCLK	Buzzer Signal
pPNLRD	Reception Signal
pPNLRST	Panel Reset Signal
pPNLSD	Transmission Signal

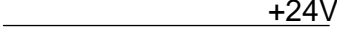
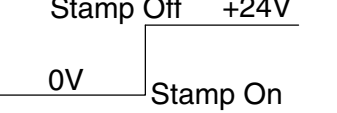
<b>Glossary of Electrical Abbreviations</b>	
<b>Signal Name</b>	<b>Description</b>
pCMLD	Line Switching Relay Drive Signal
pCTON	Ring Detection Signal
pHKOF	External Phone Off-Hook Detection Signal
pSPKOT	Line Signal, Key Tone, Ringer
R/W	Data Read/Write Select Signal
RCV (-)	Handset Receiver
RCV (+)	Handset Receiver
RDY / nBSY	Not Used
RS	Register Select Signal
RSV	Not Used
RX-	Reception Data "-" Signal
RX+	Reception Data "+" Signal
SNCMN	+2 VDC Power Supply
TGND	Ground
TH1	Thermistor Output Signal
TH2	Thermistor Output Signal
TONER	Remaining Toner Level Signal
Transfer	Transfer Current: (+3 $\mu$ A) & Cleaning Voltage: (-1500 V)
TX-	Transmission Data "-" Signal
TX+	Transmission Data "+" Signal
5V	+5 VDC Power Supply
nWAKUP	Energy Saver Mode Enable
White (N)	AC Power Supply

### 3.6. SC PC Board

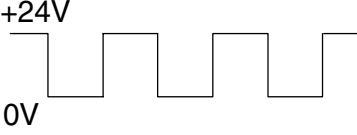
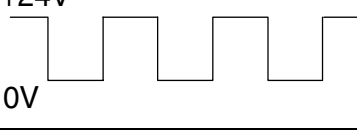
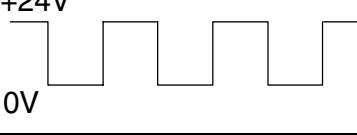
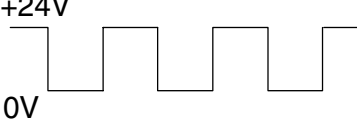
#### CN1

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN1-1	+24V	LED Array		+24 VDC Power Supply
CN1-2	nLEDON	LED Array		LED Enable Signal

#### CN3






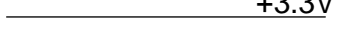





SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN3-1	+24V	Stamp Solenoid		+24 VDC Power Supply
CN3-2	N.C.			Not Used
CN3-3	nSTAMPON	Stamp Solenoid		Stamp Control Signal

#### CN5

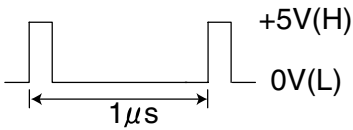
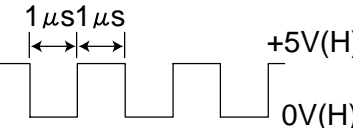
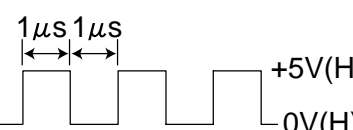



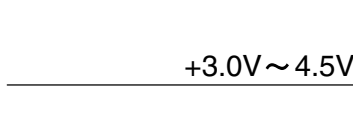
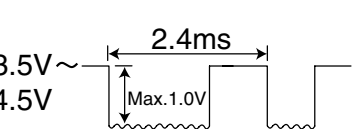
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN5-1	MTnB	Transmit Motor		Stepping Signal
CN5-2	MTpB	Transmit Motor		Stepping Signal
CN5-3	MTnA	Transmit Motor		Stepping Signal
CN5-4	MTpA	Transmit Motor		Stepping Signal



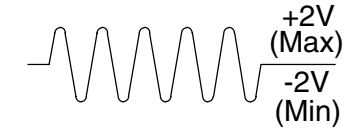

## CN6

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN6-1	+24V	POWER SUPPLY UNIT CN103-1		+24 VDC Power Supply
CN6-2	+24V	POWER SUPPLY UNIT CN103-2		+24 VDC Power Supply
CN6-3	GND	POWER SUPPLY UNIT CN103-3		Ground
CN6-4	GND	POWER SUPPLY UNIT CN103-4		Ground
CN6-5	GND	POWER SUPPLY UNIT CN103-5		Ground
CN6-6	+3.3V	POWER SUPPLY UNIT CN103-6		+3.3 VDC Power Supply
CN6-7	+5V	POWER SUPPLY UNIT CN103-7		+5 VDC Power Supply
CN6-8	-5V	POWER SUPPLY UNIT CN103-8		-5 VDC Power Supply
CN6-9	+5VP	POWER SUPPLY UNIT CN103-9		+5 VDC Pilot Power Supply, that provides power to the active components during the Sleep Mode.
CN6-10	nMPOFF	POWER SUPPLY UNIT CN103-10		Energy Saver Mode Control Signal
CN6-11	nSSR	POWER SUPPLY UNIT CN103-11		Fuser Lamp Control Signal

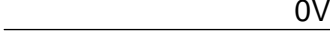
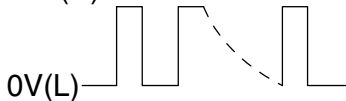
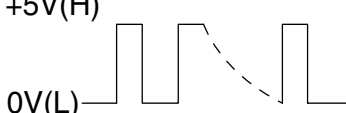
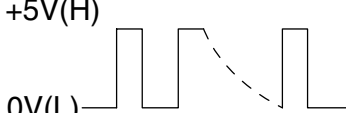



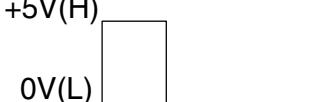

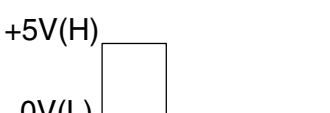
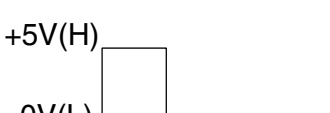
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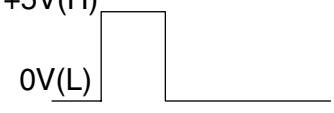
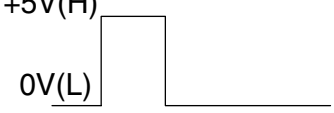
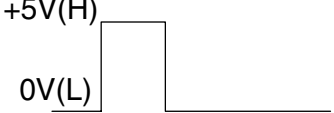
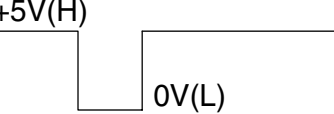

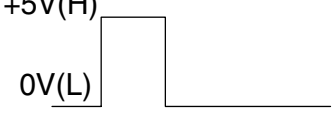
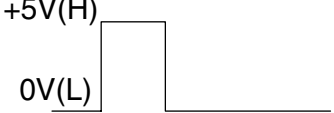
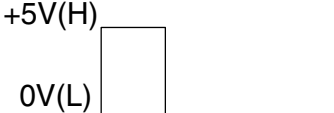
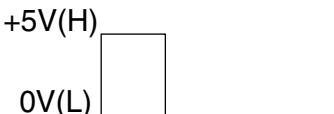
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN7-1	FR	CCD PCB CN30-1		Reset Signal
CN7-2	FCK1	CCD PCB CN30-2		Shift Register Clock
CN7-3	FCK2	CCD PCB CN30-3		Shift Register Clock
CN7-4	FSG	CCD PCB CN30-4		Data Transfer Enable Signal
CN7-5	AGND	CCD PCB CN30-5		Ground
CN7-6	+5V	CCD PCB CN30-6		+5 VDC Power Supply
CN7-7	DOS	CCD PCB CN30-7		Output Signal
CN7-8	OS	CCD PCB CN30-8		Output Signal

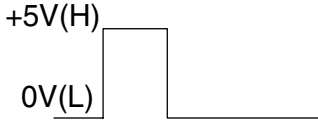
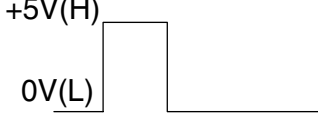
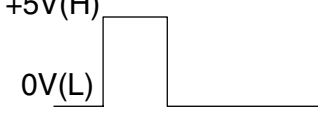
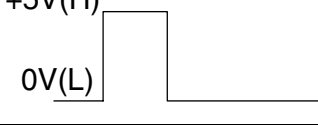
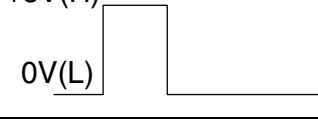
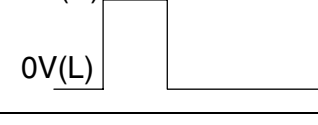
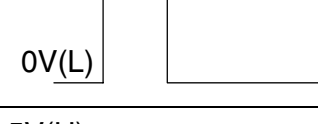
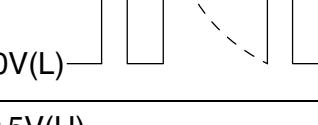
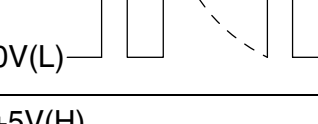
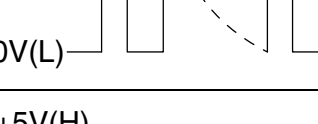
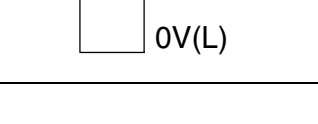
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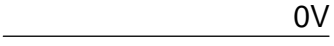

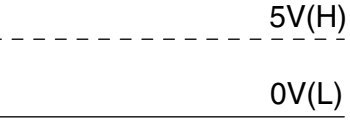
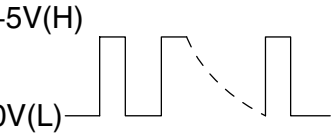
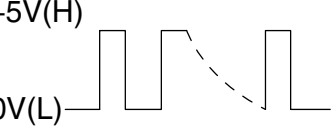
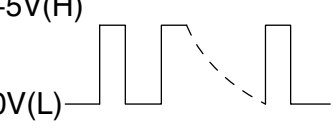
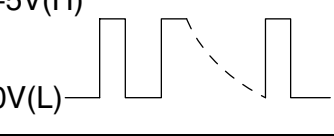
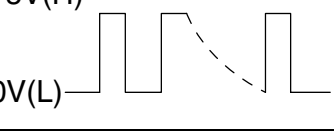
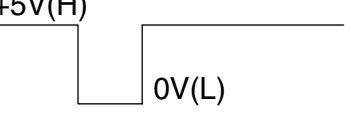
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
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CN9-2	GND	SPEAKER		Ground

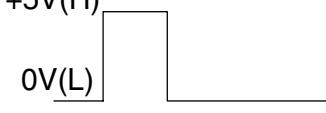
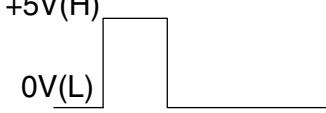
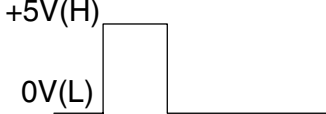
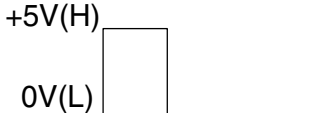
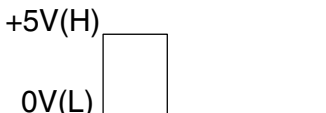

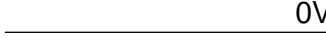
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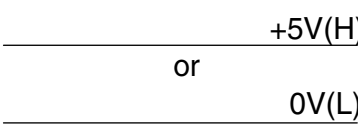
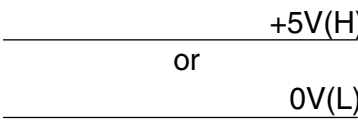
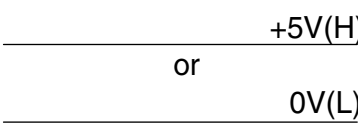
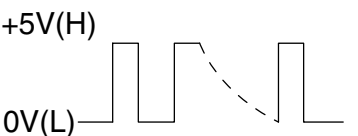
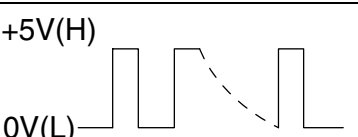
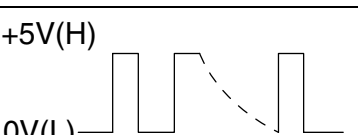
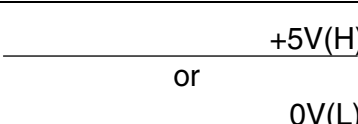

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-1	GND	Flash Memory Card	 0V	Ground
CN12-2	D3	Flash Memory Card		Data Signal
CN12-3	D4	Flash Memory Card		Data Signal
CN12-4	D5	Flash Memory Card		Data Signal
CN12-5	D6	Flash Memory Card		Data Signal
CN12-6	D7	Flash Memory Card		Data Signal
CN12-7	nCE1	Flash Memory Card	 +5V	+5 VDC Power Supply
CN12-8	A11	Flash Memory Card		Address Signal
CN12-9	nOE	Flash Memory Card		Read Signal - Low Enable
CN12-10	A12	Flash Memory Card		Address Signal
CN12-11	A10	Flash Memory Card		Address Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-12	A9	Flash Memory Card		Address Signal
CN12-13	A14	Flash Memory Card		Address Signal
CN12-14	A15	Flash Memory Card		Address Signal
CN12-15	nWEL	Flash Memory Card		Write L Signal - Low Enable
CN12-16	RDY / nBSY	Flash Memory Card		Not Used
CN12-17	+5V	Flash Memory Card		+5 VDC Power Supply
CN12-18	N.C.	Flash Memory Card		Not Used
CN12-19	A17	Flash Memory Card		Address Signal
CN12-20	A16	Flash Memory Card		Address Signal
CN12-21	A13	Flash Memory Card		Address Signal
CN12-22	A8	Flash Memory Card		Address Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-23	A7	Flash Memory Card		Address Signal
CN12-24	A6	Flash Memory Card		Address Signal
CN12-25	A5	Flash Memory Card		Address Signal
CN12-26	A4	Flash Memory Card		Address Signal
CN12-27	A3	Flash Memory Card		Address Signal
CN12-28	A2	Flash Memory Card		Address Signal
CN12-29	A1	Flash Memory Card		Address Signal
CN12-30	D0	Flash Memory Card		Data Signal
CN12-31	D1	Flash Memory Card		Data Signal
CN12-32	D2	Flash Memory Card		Data Signal
CN12-33	nWEH	Flash Memory Card		Write H Signal - Low Enable

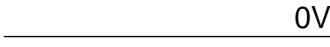
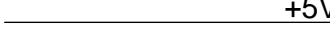
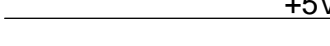
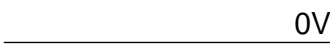
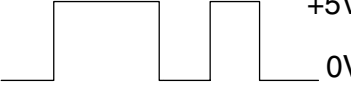
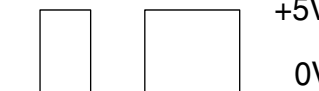
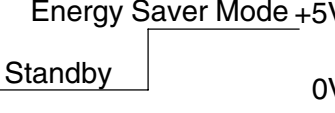

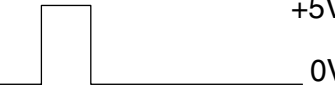
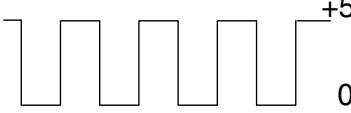

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-34	GND	Flash Memory Card		Ground
CN12-35	GND	Flash Memory Card		Ground
CN12-36	nCD	Flash Memory Card		Flash Memory Card Detection Signal H: Card Not Installed L: Card Installed
CN12-37	D11	Flash Memory Card		Data Signal
CN12-38	D12	Flash Memory Card		Data Signal
CN12-39	D13	Flash Memory Card		Data Signal
CN12-40	D14	Flash Memory Card		Data Signal
CN12-41	D15	Flash Memory Card		Data Signal
CN12-42	nCE2	Flash Memory Card		Low Enable
CN12-43	N.C.			Not Used
CN12-44	RSV	Flash Memory Card		Not Used

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-45	RSV	Flash Memory Card		Not Used
CN12-46	A18	Flash Memory Card		Address Signal
CN12-47	A19	Flash Memory Card		Address Signal
CN12-48	A20	Flash Memory Card		Address Signal
CN12-49	A21	Flash Memory Card		Address Signal
CN12-50	A22	Flash Memory Card		Address Signal
CN12-51	+5V	Flash Memory Card		+5 VDC Power Supply
CN12-52	N.C.	Flash Memory Card		Not Used
CN12-53	GND	Flash Memory Card		Ground
CN12-54-56	N.C.	Flash Memory Card		Not Used
CN12-57	RSV	Flash Memory Card		Not Used
CN12-58	N.C.	Flash Memory Card		Not Used





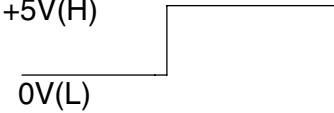
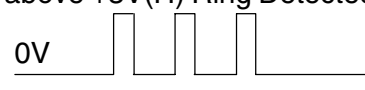
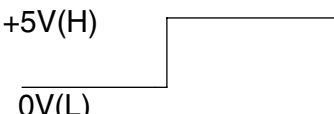
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN12-59	nMB4	Flash Memory Card		Flash Memory Size H: 8MB L: Others
CN12-60	RSV	Flash Memory Card		Not Used
CN12-61	N.C.	Flash Memory Card		Not Used
CN12-62	ID2	Flash Memory Card		Flash Memory Card ID
CN12-63	ID1	Flash Memory Card		Flash Memory Card ID
CN12-64	D8	Flash Memory Card		Data Signal
CN12-65	D9	Flash Memory Card		Data Signal
CN12-66	D10	Flash Memory Card		Data Signal
CN12-67	ID0	Flash Memory Card		Flash Memory Card ID
CN12-68	GND	Flash Memory Card		Ground



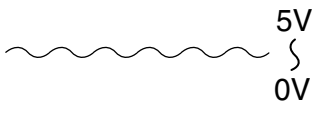
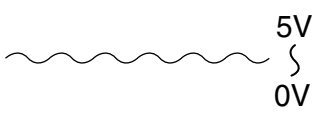
## CN14

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN14-1	GND	PNL PCB CN50-1	 0V	Ground
CN14-2	+5V	PNL PCB CN50-2	 +5V	+5 VDC Power Supply
CN14-3	+5VP	PNL PCB CN50-3	 +5V	+5 VDC Pilot Power Supply, that provides power to the active components during the Sleep Mode.
CN14-4	GND	PNL PCB CN50-4	 0V	Ground
CN14-5	pPNLSD	PNL PCB CN50-5	 +5V 0V	Transmission Signal
CN14-6	pPNLRD	PNL PCB CN50-6	 +5V 0V	Reception Signal
CN14-7	nPWSAVE	PNL PCB CN50-7	 Energy Saver Mode +5V Standby 0V	Energy Saver Mode Transport Signal
CN14-8	nWAKUP	PNL PCB CN50-8	 +5V 0V	Energy Saver Mode Enable H: Enable L: Disable
CN14-9	pPNLRST	PNL PCB CN50-9	 +5V 0V	Panel Reset Signal H: Reset L: Not Reset
CN4-10	pBZCLK	PNL PCB CN50-10	 +5V 0V	Buzzer Signal
CN4-11	nBPNT	PNL PCB CN50-11	 +3.3V ON	Read Point Detection Signal L: Detect


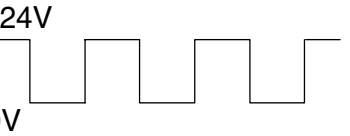
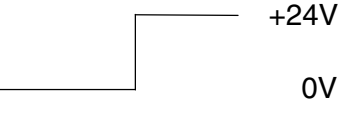
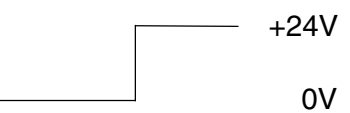
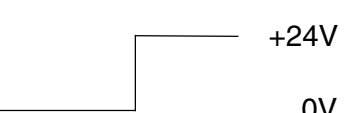
## CN18

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN18-1	L2 (T)	MJR PCB CN28-1		Line Transformer Input Signal
CN18-3	L1 (R)	MJR PCB CN28-3	 0V	Ground
CN18-6	+24V	MJR PCB CN29-1	 +24V	+24 VDC Power Supply
CN18-7	+5VP	MJR PCB CN29-2	 +5V	+5 VDC Power Supply
CN18-8	GND	MJR PCB CN29-3	 0V	Ground
CN18-9	pCMLD	MJR PCB CN29-4	 +5V(H) 0V(L)	Line Switching Relay Drive Signal H : CML On L : CML Off
CN18-10	pCTON	MJR PCB CN29-5	 above +3V(H) Ring Detected 0V	Ring Detection Signal H : Ring Detected L : Ring Not Detected
CN18-11	pHKOF	MJR PCB CN29-6	 +5V(H) 0V(L)	External Phone Off-Hook Detection Signal (Phone Line must be connected) H : Off Hook L : On Hook

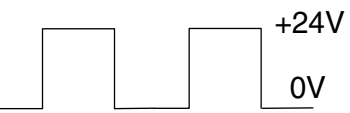
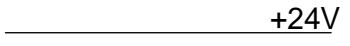
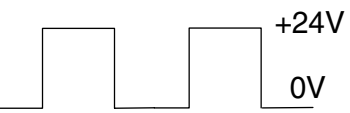
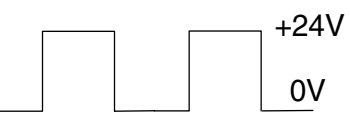
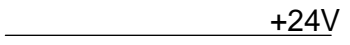
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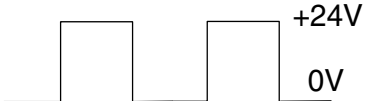
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN52-1	TH1	Thermistor Assembly	 5V 0V	Thermistor Output Signal
CN52-2	TH2	Thermistor Assembly	 5V 0V	Thermistor Output Signal

## CN53


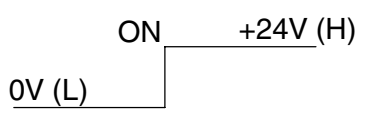
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN53-1	+24VM	POWER SUPPLY UNIT CN103-12	 +24V	+24 VDC Power Supply
CN53-2	nDRCK	POWER SUPPLY UNIT CN103-13	 +24V 0V	Development +AC Clock
CN53-3	nCRCK	POWER SUPPLY UNIT CN103-14	 +24V 0V	Charge Control DC Output
CN53-4	nCR1	POWER SUPPLY UNIT CN103-15	 +24V 0V	Charge Control DC Output
CN53-5	nTR0	POWER SUPPLY UNIT CN103-16	 +24V 0V	Transfer Control Cleaning Output

## CN54

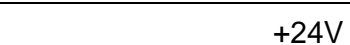
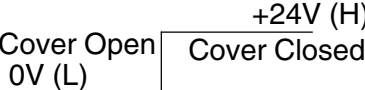
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN54-1	MMpA	Main Motor CN118-1	 +24V 0V	Motor Drive Signal
CN54-2	+24VM	Main Motor CN118-2	 +24V	+24 VDC Power Supply
CN54-3	MMnA	Main Motor CN118-3	 +24V 0V	Motor Drive Signal
CN54-4	MMpB	Main Motor CN118-4	 +24V 0V	Motor Drive Signal
CN54-5	+24VM	Main Motor CN118-5	 +24V	+24 VDC Power Supply

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN54-6	MMnB	Main Motor CN118-6		Motor Drive Signal

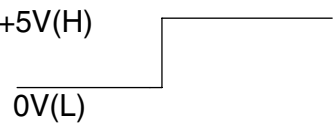

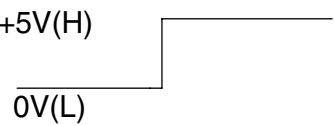
**CN56**


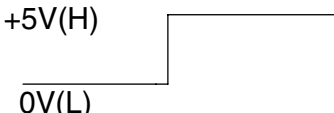
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN56-1	+24VM	Paper Feed Solenoid		+24 VDC Power Supply
CN56-2	nADF1	Paper Feed Solenoid		Paper Feed Roller Solenoid Control Signal

**CN57**

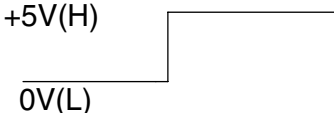

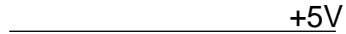
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN57-1	+24V	ILS PCB CN73-1		+24 VDC Power Supply
CN57-2	N.C.			Not Used
CN57-3	+24VD	ILS PCB CN73-3		Printer Cover Detection Signal

**CN58**



SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN58-1	nCCHK1	SNS4 PCB CN87-1		No Cassette Detection Signal L: No Cassette
CN58-2	GND	SNS4 PCB CN87-2		Ground
CN58-3	nRSEN	SNS4 PCB CN87-3		Timing Sensor Detection Signal L: Detect


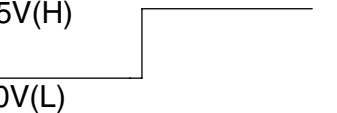
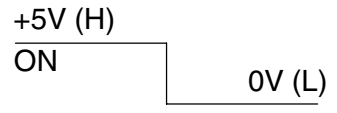
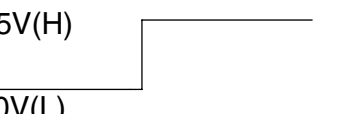
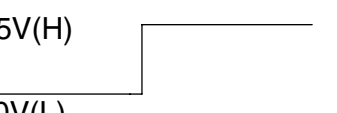
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN58-4	N.C.			Not Used
CN58-5	+5V	SNS4 PCB CN87-5	 +5V	+5 VDC Power Supply
CN58-6	nESEN	SNS4 PCB CN87-6	 +5V(H) 0V(L)	Paper Exit Sensor Detection Signal L: Detect

**CN59**

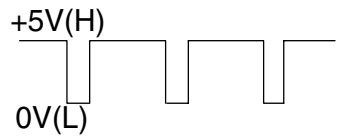
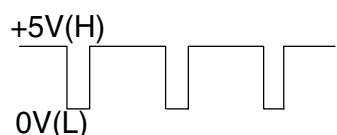
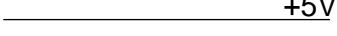

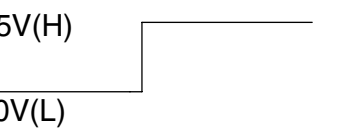
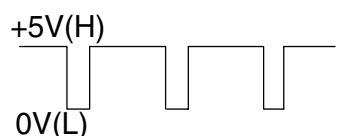
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN59-1	nPCHK1	SNS3 PCB CN83-1	 +5V(H) 0V(L)	No Paper Sensor Detection Signal H: No Paper
CN59-2	LDSP1	SNS3 PCB CN83-2	Approx. +1 VDC	No Paper Sensor LED Drive Current
CN59-3	GND	SNS3 PCB CN83-3	 0V	Ground
CN59-4	TONER	SNS3 PCB CN83-4	Approx. +2 VDC	Remaining Toner Level Signal
CN59-5	+5V	SNS3 PCB CN83-5	 +5V	+5 VDC Power Supply


**CN66**

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN66-1	+24VM	CST2 PCB CN70-1	 +24V	+24 VDC Power Supply
CN66-2	GND	CST2 PCB CN70-2	 0V	Ground

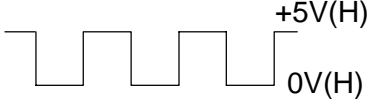
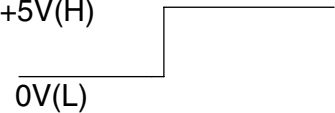
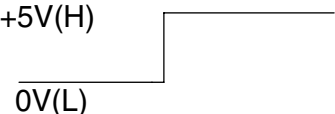


SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN66-3	+5V	CST2 PCB CN70-3	 +5V	+5 VDC Power Supply
CN66-4	nPCHK2	CST2 PCB CN70-4	 +5V(H) 0V(L)	No Paper Detection Signal (2nd Cassette) H: No Paper L: Paper
CN66-5	pADF2	CST2 PCB CN70-5	 +5V (H) ON 0V (L)	Feed Roller Drive Clutch Control Signal (2nd Cassette)
CN66-6	nCCHK2	CST2 PCB CN70-6	 +5V(H) 0V(L)	No Cassette Detection Signal (2nd Cassette) L: No Cassette
CN66-7	nOP	CST2 PCB CN70-7	 +5V(H) 0V(L)	2nd Feeder Unit Detection Signal H: No Feeder Unit

**CN68**

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN68-1	nS/H	LSU CN1-1	 +5V(H) 0V(L)	Laser Power Sample/Hold Timing Signal L : Sampling H : Holding
CN68-2	nHSYNC	LSU CN1-2	 +5V(H) 0V(L)	Horizontal Synchronous Signal 2.136 ms (400 dpi) 1.393 ms (600 dpi)
CN68-3	L+5V	LSU CN1-3	 +5V	Laser Circuit +5 VDC Power Supply (Supplied only while the LP is operating)
CN68-4	GND	LSU CN1-4	 0V	Ground
CN68-5	nLDON	LSU CN1-5	 +5V(H) 0V(L)	Laser Control
CN68-6	nVIDEO	LSU CN1-6	 +5V(H) 0V(L)	Video Data L: Black H: White

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN68-7	GND	LSU CN1-7	 0V	Ground

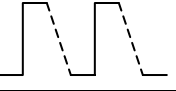


**CN69**







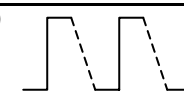
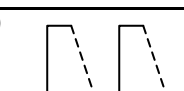
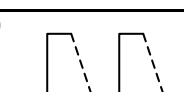
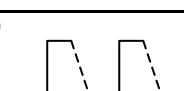

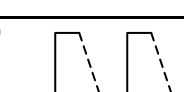
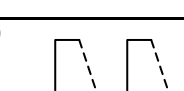
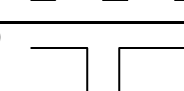
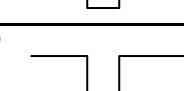
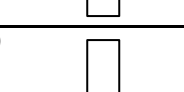
SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN69-1	nPMCK	LSU CN15-1	 +5V(H) 0V(H)	Tetragon Motor Clock 0.702 kHz (400 dpi) 1.076 kHz (600 dpi)
CN69-2	nPMRY	LSU CN15-2	 +5V(H) 0V(L)	Tetragon Motor Ready Signal H: Not Ready L: Ready
CN69-3	nPMON	LSU CN15-3	 +5V(H) 0V(L)	Tetragon Motor Control Signal H: OFF L: ON
CN69-4	MGND	LSU CN15-4	 0V	Ground
CN69-5	+24VM	LSU CN15-5	 +24V	+24 VDC Power Supply

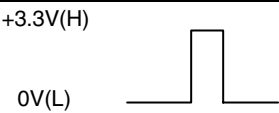

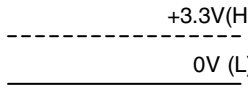





## CN93

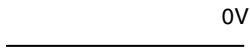
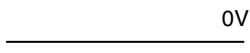
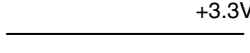
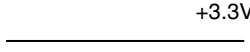
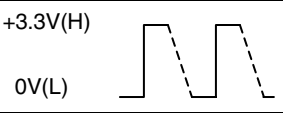
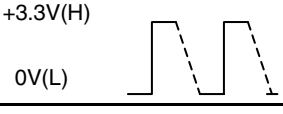

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-1	LEDV	LANB PCB CN95-1	+5V _____	+5V Power Supply for LED
CN93-2	LEDV	LANB PCB CN95-2	+5V _____	+5V Power Supply for LED
CN93-3	GND	LANB PCB CN95-3	_____ 0V	Ground
CN93-4	A16	LANB PCB CN95-4		Not Used
CN93-5	A15	LANB PCB CN95-5		Not Used
CN93-6	A14	LANB PCB CN95-6		Not Used
CN93-7	A13	LANB PCB CN95-7		Not Used
CN93-8	A12	LANB PCB CN95-8		Not Used
CN93-9	A11	LANB PCB CN95-9		Not Used
CN93-10	A10	LANB PCB CN95-10		Not Used
CN93-11	A9	LANB PCB CN95-11		Not Used
CN93-12	A21	LANB PCB CN95-12		Not Used
CN93-13	*WE	LANB PCB CN95-13		Not Used
CN93-14	*RESET	LANB PCB CN95-14		Not Used
CN93-15	A20	LANB PCB CN95-15		Not Used
CN93-16	A19	LANB PCB CN95-16		Not Used









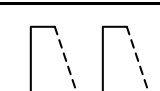
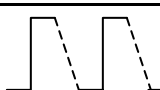

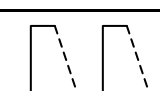
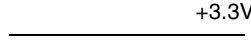





SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-17	A18	LANB PCB CN95-17		Not Used
CN93-18	A17	LANB PCB CN95-18		Not Used
CN93-19	A8	LANB PCB CN95-19		Not Used
CN93-20	A7	LANB PCB CN95-20		Not Used
CN93-21	A6	LANB PCB CN95-21		Not Used
CN93-22	A5	LANB PCB CN95-22		Not Used
CN93-23	A4	LANB PCB CN95-23		Not Used
CN93-24	A3	LANB PCB CN95-24		Not Used
CN93-25	A2	LANB PCB CN95-25		Not Used
CN93-26	A1	LANB PCB CN95-26		Not Used
CN93-27	Vdd	LANB PCB CN95-27	+3.3V	+3.3VDC Power Supply
CN93-28	Vdd	LANB PCB CN95-28	+3.3V	+3.3VDC Power Supply
CN93-29	*CE	LANB PCB CN95-29		Not Used
CN93-30	DD0	LANB PCB CN95-30	+3.3V(H) 0V(L) 	Data Signal
CN93-31	DD1	LANB PCB CN95-31	+3.3V(H) 0V(L) 	Data Signal
CN93-32	DD2	LANB PCB CN95-32	+3.3V(H) 0V(L) 	Data Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-33	DD3	LANB PCB CN95-33	+3.3V(H) 0V(L) 	Data Signal
CN93-34	DD4	LANB PCB CN95-34	+3.3V(H) 0V(L) 	Data Signal
CN93-35	DD5	LANB PCB CN95-35	+3.3V(H) 0V(L) 	Data Signal
CN93-36	DD6	LANB PCB CN95-36	+3.3V(H) 0V(L) 	Data Signal
CN93-37	DD7	LANB PCB CN95-37	+3.3V(H) 0V(L) 	Data Signal
CN93-38	DD8	LANB PCB CN95-38	+3.3V(H) 0V(L) 	Data Signal
CN93-39	DD9	LANB PCB CN95-39	+3.3V(H) 0V(L) 	Data Signal
CN93-40	DD10	LANB PCB CN95-40	+3.3V(H) 0V(L) 	Data Signal
CN93-41	DD11	LANB PCB CN95-41	+3.3V(H) 0V(L) 	Data Signal
CN93-42	DD12	LANB PCB CN95-42	+3.3V(H) 0V(L) 	Data Signal
CN93-43	DD13	LANB PCB CN95-43	+3.3V(H) 0V(L) 	Data Signal
CN93-44	DD14	LANB PCB CN95-44	+3.3V(H) 0V(L) 	Data Signal
CN93-45	DD15	LANB PCB CN95-45	+3.3V(H) 0V(L) 	Data Signal
CN93-46	*WR	LANB PCB CN95-46	+3.3V(H) 0V(L) 	Write Signal - Low Enable
CN93-47	*RD	LANB PCB CN95-47	+3.3V(H) 0V(L) 	Read Signal - Low Enable
CN93-48	RESET	LANB PCB CN95-48	+3.3V(H) 0V(L) 	LAN Reset Signal H: Reset L: Not Reset

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-49	INTRO	LANB PCB CN95-49		High Enable
CN93-50	GND	LANB PCB CN95-50		Ground
CN93-51	*LAN	LANB PCB CN95-51		LANB PCB Connected Detection Signal H: LANB PCB not connect
CN93-52	GND	LANB PCB CN95-52		Ground
CN93-53	GND	LANB PCB CN95-53		Ground
CN93-54	GND	LANB PCB CN95-54		Ground
CN93-55	D11	LANB PCB CN95-55		Not Used
CN93-56	D7	LANB PCB CN95-56		Not Used
CN93-57	D14	LANB PCB CN95-57		Not Used
CN93-58	D6	LANB PCB CN95-58		Not Used
CN93-59	D13	LANB PCB CN95-59		Not Used
CN93-60	D5	LANB PCB CN95-60		Not Used
CN93-61	D12	LANB PCB CN95-61		Not Used
CN93-62	D4	LANB PCB CN95-62		Not Used
CN93-63	Vcc	LANB PCB CN95-63		+3.3VDC Power Supply
CN93-64	Vcc	LANB PCB CN95-64		+3.3VDC Power Supply

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-65	D11	LANB PCB CN95-65		Not Used
CN93-66	D3	LANB PCB CN95-66		Not Used
CN93-67	D10	LANB PCB CN95-67		Not Used
CN93-68	D2	LANB PCB CN95-68		Not Used
CN93-69	D9	LANB PCB CN95-69		Not Used
CN93-70	D1	LANB PCB CN95-70		Not Used
CN93-71	D8	LANB PCB CN95-71		Not Used
CN93-72	D0	LANB PCB CN95-72		Not Used
CN93-73	*OE	LANB PCB CN95-73		Not Used
CN93-74	GND	LANB PCB CN95-74		Ground
CN93-75	GND	LANB PCB CN95-75		Ground
CN93-76	Vdd	LANB PCB CN95-76		+3.3VDC Power Supply
CN93-77	Vdd	LANB PCB CN95-77		+3.3VDC Power Supply
CN93-78	AD15	LANB PCB CN95-78		Address Signal
CN93-79	AD14	LANB PCB CN95-79		Address Signal
CN93-80	AD13	LANB PCB CN95-80		Address Signal

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-81	AD12	LANB PCB CN95-81	+3.3V(H) 0V(L) 	Address Signal
CN93-82	AD11	LANB PCB CN95-82	+3.3V(H) 0V(L) 	Address Signal
CN93-83	AD10	LANB PCB CN95-83	+3.3V(H) 0V(L) 	Address Signal
CN93-84	AD9	LANB PCB CN95-84	+3.3V(H) 0V(L) 	Address Signal
CN93-85	AD8	LANB PCB CN95-85	+3.3V(H) 0V(L) 	Address Signal
CN93-86	AD7	LANB PCB CN95-86	+3.3V(H) 0V(L) 	Address Signal
CN93-87	AD6	LANB PCB CN95-87	+3.3V(H) 0V(L) 	Address Signal
CN93-88	AD5	LANB PCB CN95-88	+3.3V(H) 0V(L) 	Address Signal
CN93-89	AD4	LANB PCB CN95-89	+3.3V(H) 0V(L) 	Address Signal
CN93-90	AD3	LANB PCB CN95-90	+3.3V(H) 0V(L) 	Address Signal
CN93-91	AD2	LANB PCB CN95-91	+3.3V(H) 0V(L) 	Address Signal
CN93-92	AD1	LANB PCB CN95-92	+3.3V(H) 0V(L) 	Address Signal
CN93-93	Vdd	LANB PCB CN95-93	+3.3V 	+3.3VDC Power Supply
CN93-94	Vdd	LANB PCB CN95-94	+3.3V 	+3.3VDC Power Supply
CN93-95	AEN	LANB PCB CN95-95	+3.3V(H) 0V(L) 	Low Enable
CN93-96	ARDY	LANB PCB CN95-96	+3.3V(H) 0V(L) 	Low Enable

SC PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN93-97	GND	LANB PCB CN95-97	_____ 0V	Ground
CN93-98	GND	LANB PCB CN95-98	_____ 0V	Ground
CN93-99	GND	LANB PCB CN95-99	_____ 0V	Ground
CN93-100	GND	LANB PCB CN95-100	_____ 0V	Ground

### 3.7. MJR PC Board

#### CN20

MJR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN20-3	LT2(T)	Telephone Line		Line Signal
CN20-4	LT1(R)	Telephone Line		Line Signal

#### CN23

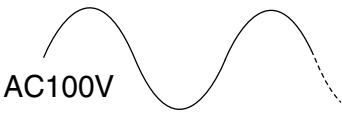
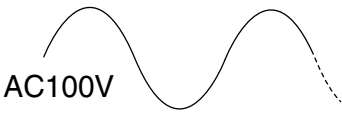
MJR PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN23-1	N.C.			Not Used
CN23-2	N.C.			Not Used
CN23-3	HLIN1	SRU PCB CN90-1		Line Signal for the Fax Handset
CN23-4	HLIN2	SRU PCB CN90-2		Line Signal for the Fax Handset
CN23-5	N.C.			Not Used

#### CN28 and CN29

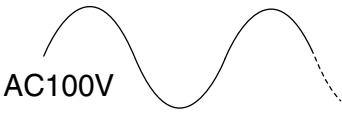
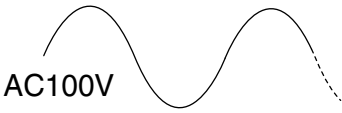
Refer to SC PC Board CN18.

### 3.8. Power Supply Unit

#### CN101

PS Unit Pin No.	Signal Name	Destination	Signal Waveform	Function
CN101-1	Black (L)	ACI PC Board	 AC100V	AC Power Supply
CN101-2	N.C.			Not Used
CN101-3	White (N)	ACI PC Board	 AC100V	AC Power Supply

#### CN102

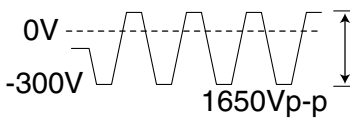
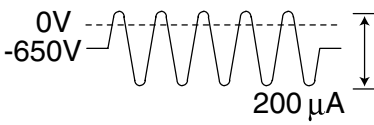
PS Unit Pin No.	Signal Name	Destination	Signal Waveform	Function
CN102-1	Black (L)	Fuser Lamp	 AC100V	AC Power Supply
CN102-2	N.C.			Not Used
CN102-3	White (N)	Thermostat Thermal Fuse	 AC100V	AC Power Supply

#### CN103

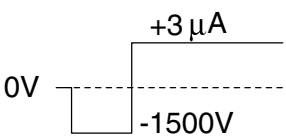
Refer to SC PC Board CN6 and CN53.



## CN201

PS Unit Pin No.	Signal Name	Destination	Signal Waveform	Function
CN201-1	Development	Development Roller		Development Voltage (AC 1.65 kHz Square Wave) & DC Voltage
CN201-2	N.C.			Not Used
CN201-3	N.C.			Not Used
CN201-4	N.C.			Not Used
CN201-5	Charge	Bias Charge Roller		Charge Current: 200 $\mu$ A (AC 300 Hz Sine Wave) & DC Charge Voltage

## CN202

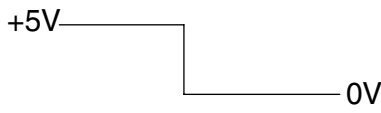
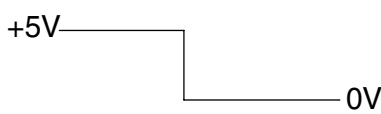
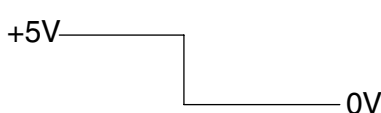
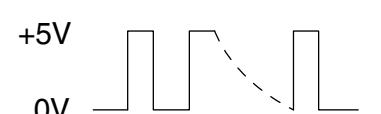
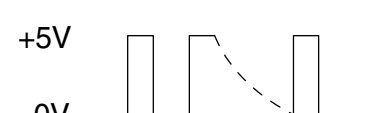
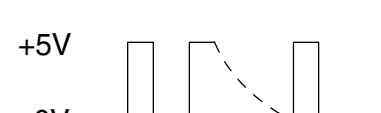

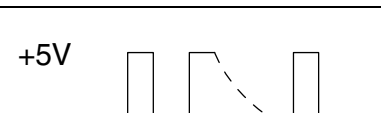
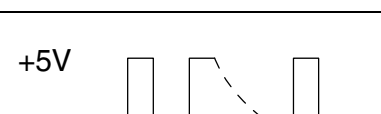
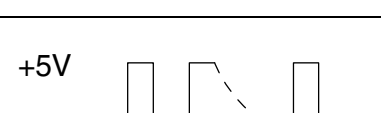
PS Unit Pin No.	Signal Name	Destination	Signal Waveform	Function
CN202	Transfer	Bias Transfer Roller		(1) Transfer Current: (+3 $\mu$ A) (2) Cleaning Voltage: (-1500 V)

### 3.9. PNL PC Board

#### CN50

Refer to SC PC Board CN14.

#### LCD

PNL PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
LCD-1	RS	LCD Module-1		Register Select Signal H: Data Register L: Instruction Register
LCD-2	R/W	LCD Module-2		Data Read/Write Select Signal H: Read L: Write
LCD-3	E	LCD Module-3		Data Read/Write Enable Signal H: Enable L: Disable
LCD-4	DB0	LCD Module-4		Data Signal
LCD-5	DB1	LCD Module-5		Data Signal
LCD-6	DB2	LCD Module-6		Data Signal
LCD-7	DB3	LCD Module-7		Data Signal
LCD-8	DB4	LCD Module-8		Data Signal
LCD-9	DB5	LCD Module-9		Data Signal
LCD-10	DB6	LCD Module-10		Data Signal

PNL PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
LCD-11	DB7	LCD Module-11	<p>The waveform shows a square wave between 0V and +5V. The signal starts at 0V, rises to +5V, falls back to 0V, rises to +5V, falls back to 0V, and then rises to +5V. A dashed line indicates a transition from +5V to 0V.</p>	Data Signal
LCD-12	GND	LCD Module-12	<p>The waveform is a constant horizontal line at 0V.</p>	Ground
LCD-13	+5V	LCD Module-13	<p>The waveform is a constant horizontal line at +5V.</p>	+5 VDC Power Supply
LCD-14	+5V	LCD Module-14	<p>The waveform is a constant horizontal line at +5V.</p>	+5 VDC Power Supply
LCD-15	V5	LCD Module-15	<p>The waveform is a constant horizontal line at +4.8V(Max).</p>	Power Supply for LCD
LCD-16	GND	LCD Module-16	<p>The waveform is a constant horizontal line at 0V.</p>	Ground

### 3.10. SNS3 PC Board

#### CN83

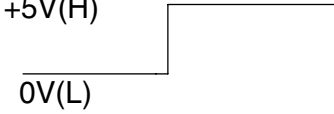
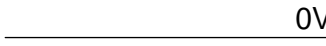
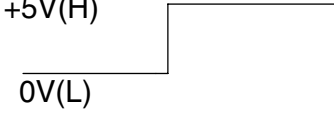
Refer to SC PC Board CN59.

#### CN84

SNS3 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN84-1	GND	Toner Sensor	_____ 0V	Ground
CN84-2	TONER	Toner Sensor	Approx. +2 VDC	Remaining Toner Level Signal
CN84-3	+5V	Toner Sensor	_____ +5V	+5 VDC Power Supply

### 3.11. SNS4 PC Board

#### CN85

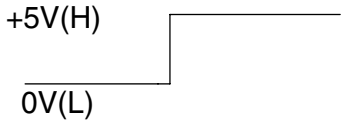
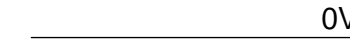
SNS3 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN85-1	nCCHK1	SNS1 PCB CN81-1		No Cassette Detection Signal L: No Cassette
CN85-2	GND	SNS1 PCB CN81-2		Ground
CN85-3	nRSEN	SNS1 PCB CN81-3		Timing Sensor Detection Signal L: Detect
CN85-4	LDRE	SNS1 PCB CN81-4	Approx. +2 VDC	Timing Sensor and No Cassette Sensor LED Drive Current

#### CN87

Refer to SC PC Board CN58.

### 3.12. SNS1 PC Board

#### CN80

SNS1 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN80-1	nCCHK1	SNS2 PCB CN82-1	 +5V(H) 0V(L)	No Cassette Detection Signal L: No Cassette
CN80-2	GND	SNS2 PCB CN82-2	 0V	Ground
CN80-3	LDSC1	SNS2 PCB CN82-3	Approx. +1 VDC	No Cassette Sensor LED Drive Current

#### CN81

Refer to SNS4 PC Board CN85.

### 3.13. SNS2 PC Board

#### CN82

Refer to SNS1 PC Board CN80.

### 3.14. CCD PC Board

#### CN30

Refer to SC PC Board CN7.

### 3.15. ILS PC Board

#### CN73

Refer to SC PC Board CN57.

### 3.16. ACI PC Board

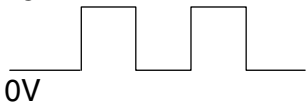

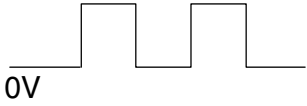
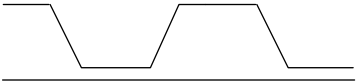
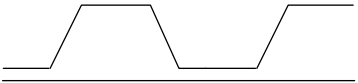
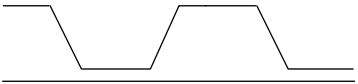
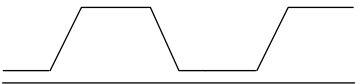
Refer to Power Supply Unit CN101.

### 3.17. LANB PC Board

#### CN96

Refer to SC PC Board CN93.

#### CN97

LANB PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN97-1	ACTIVITY	LANC PCB CN202-1		LANB PCB / LANC PCB Activity Signal
CN97-2	+5V	LANC PCB CN202-2		+5 VDC Power Supply
CN97-3	LINK	LANC PCB CN202-3		LANB PCB/ LANC PCB Link Signal
CN97-4	N.C.			Not Used
CN97-5	RX-	LANC PCB CN200-1		Reception Data "-" Signal
CN97-6	RX+	LANC PCB CN200-2		Reception Data "+" Signal
CN97-7	TX-	LANC PCB CN200-3		Transmission Data "-" Signal
CN97-8	TX+	LANC PCB CN200-4		Transmission Data "+" Signal

### 3.18. LANC PC Board

#### CN200

Refer to LANB PC Board CN97.

#### CN202


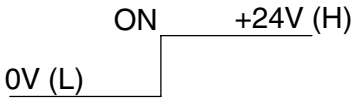
Refer to LANB PC Board CN97.

### 3.19. CST2 PC Board (Optional)

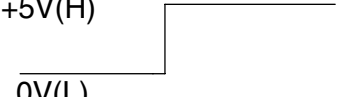
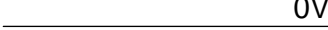

#### CN70

Refer to SC PC Board CN66.

#### CN71

CST2 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN71-1	+24VM	Paper Feed Solenoid	 +24V	+24 VDC Power Supply
CN70-2	nADF2	Paper Feed Solenoid	 ON +24V (H) 0V (L)	Paper Feed Roller Solenoid Control Signal

#### CN74

CST2 PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN74-1	nCCHK2	SNS2 PCB (Optional) CN82-1	 +5V(H) 0V(L)	No Cassette Detection Signal (2nd Cassette) L: No Cassette
CN74-2	GND	SNS2 PCB (Optional) CN82-2	 0V	Ground
CN74-3	SNCMN	SNS2 PCB (Optional) CN82-3	 +2V	+2 VDC Power Supply

### 3.20. SNS2 PC Board (Optional)

#### CN82

Refer to CST2 PC Board CN74.



### 3.21. SRU PC Board (Optional)

#### CN90

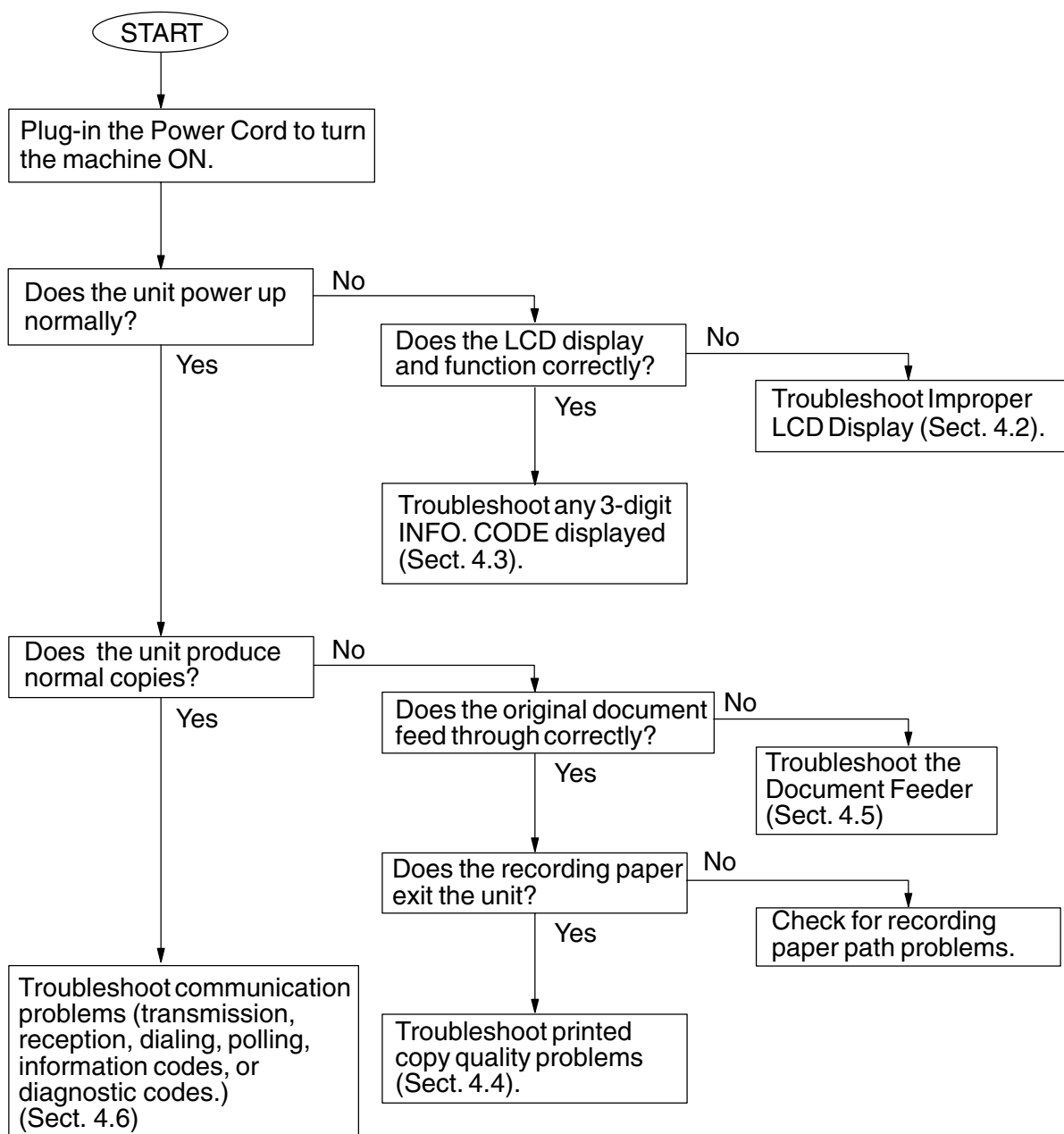
Refer to MJR PC Board CN23.

#### CN91

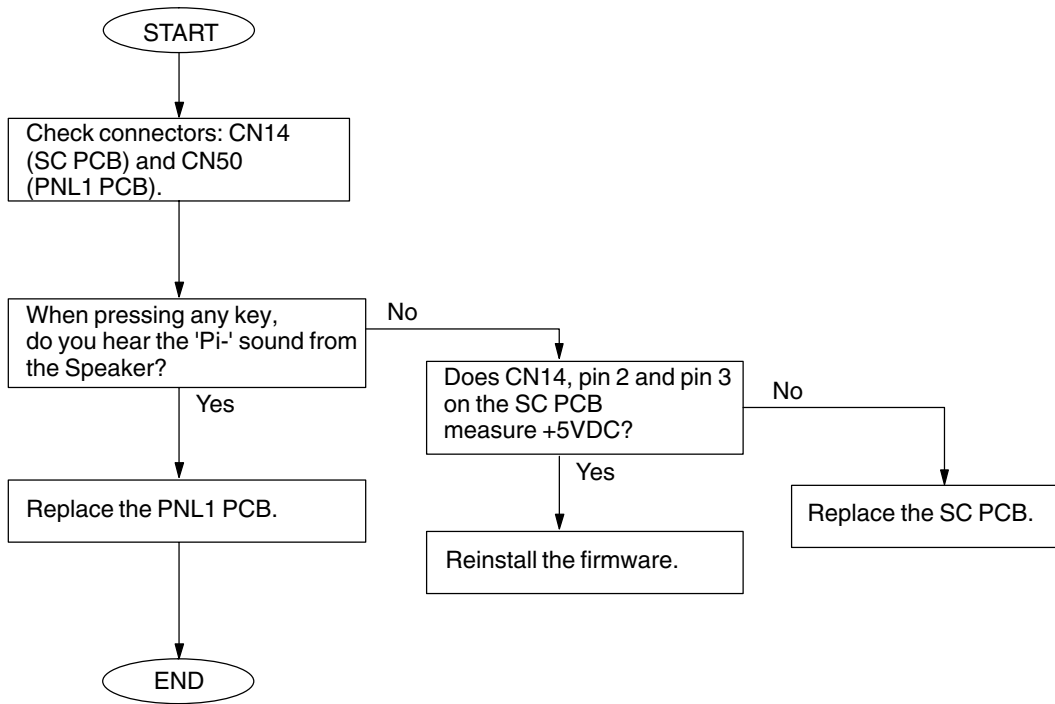
SRU PCB Pin No.	Signal Name	Destination	Signal Waveform	Function
CN91-1	N.C.			Not Used
CN91-2	MIC (+)	Telephone Handset CN		Handset Microphone
CN91-3	RCV (+)	Telephone Handset CN		Handset Receiver
CN91-4	RCV (-)	Telephone Handset CN		Handset Receiver
CN91-5	MIC (-)	Telephone Handset CN		Handset Microphone
CN91-6	TGND		_____ 0V	Ground

## 4 Troubleshooting

### 4.1. Initial Troubleshooting Flowchart



## 4.2. Improper LCD Display

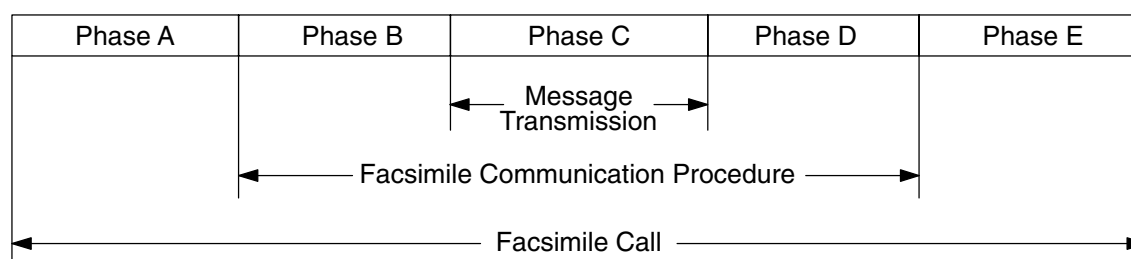


### 4.3. Information Codes (INFO. CODES)

The 3-digit information codes display to show the unit's status. These codes also print on the journal. The following table indicates appropriate sections for troubleshooting.

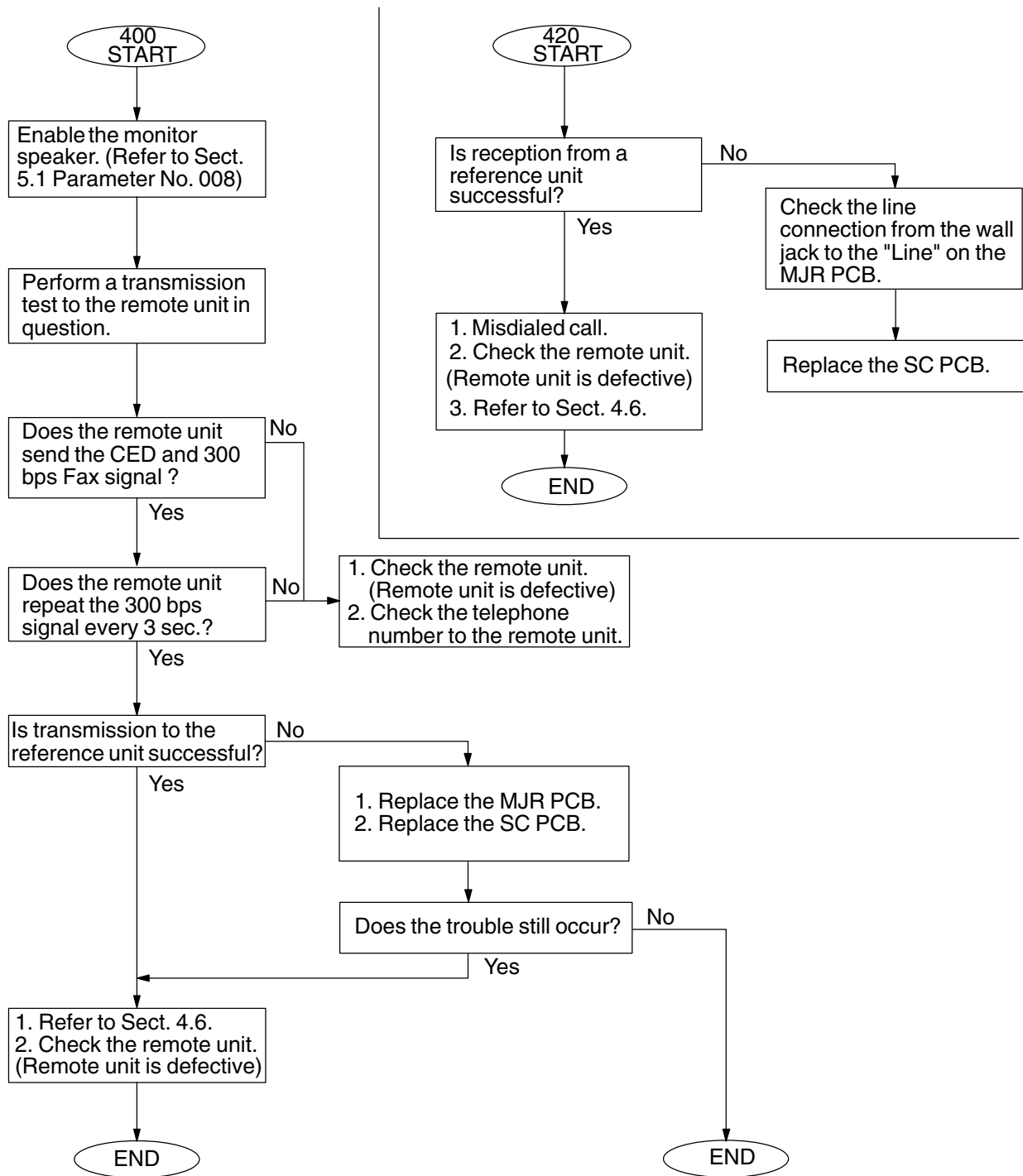
Code	Explanation	Phase	Section
001, 002, 007	Recording paper jam	C, D	4.3.8.
010	No recording paper	B, C	4.3.9.
030	Document misfeeding	B	4.3.10.
031	Document too long	C	4.3.10.
400	Transmission error	B	4.3.1.
401, 402	Transmission error	B	4.3.2.
403	Polling reception error	B	4.3.12.
404, 405, 407	Transmission error	B	4.3.3.
408, 409	Transmission error	D	4.3.5.
411, 414	Polling reception error	B	4.3.12.
415	Remote side mis-operation	B	4.3.12.
416	Reception error	D	4.3.4.
417, 418	Reception error	C	4.3.5.
420	Reception error	B	4.3.1.
422	Transmission error	B	4.3.2.
434	Signal noise level too high	B	4.3.6.
459, 494, 495	Reception error	C	4.3.7.
490	Reception error	C	4.3.5.
630	Remote unit Busy	B	4.3.11.
634	No busy tone detected	B	--
711 - 731	LAN communication error	LAN	--
800 - 870	Advanced Communication error	--	--

#### Phase

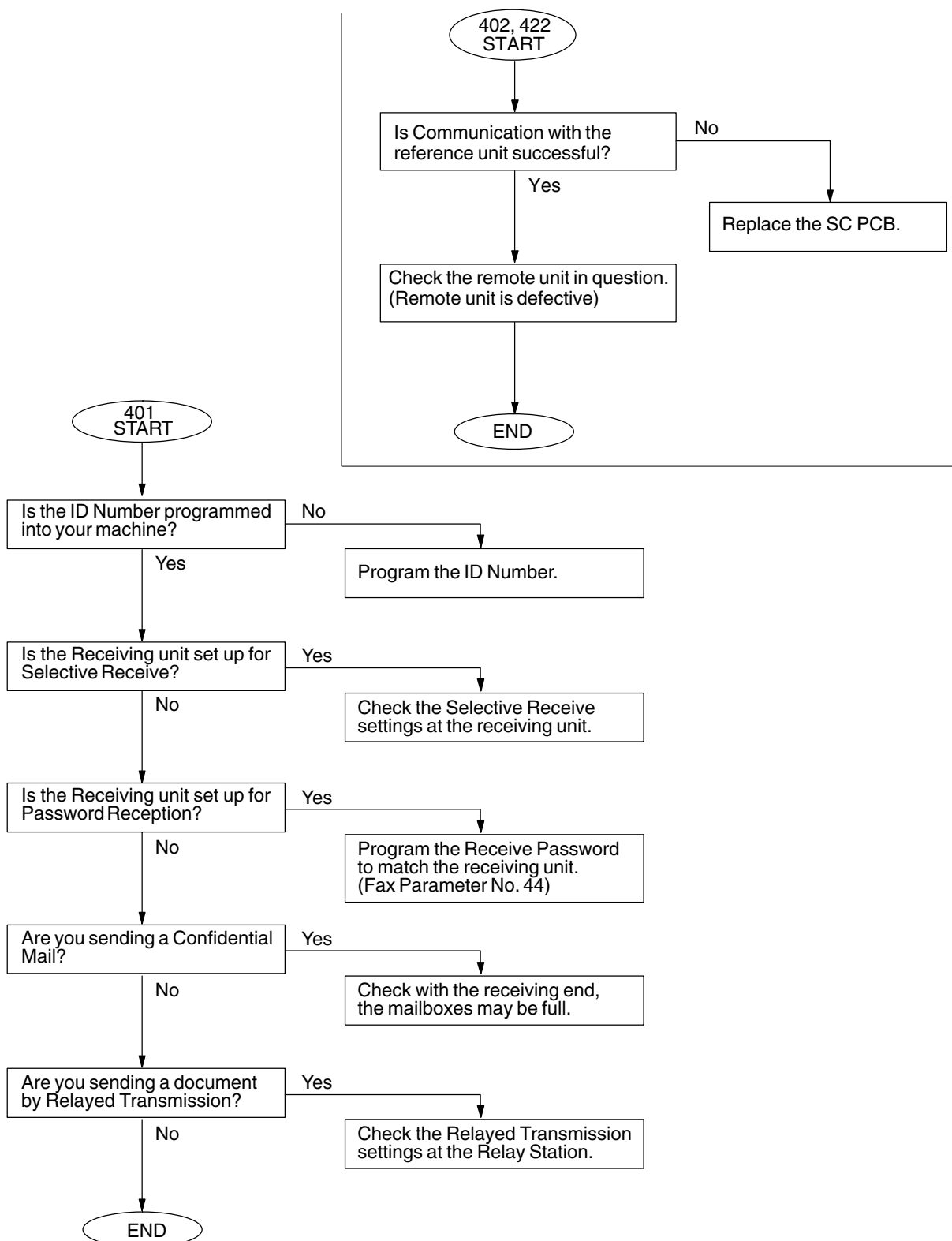


- Phase A : Call establishment
- Phase B : Pre-message procedure
- Phase C : Message transmission
- Phase D : Post-message procedure
- Phase E : Call release

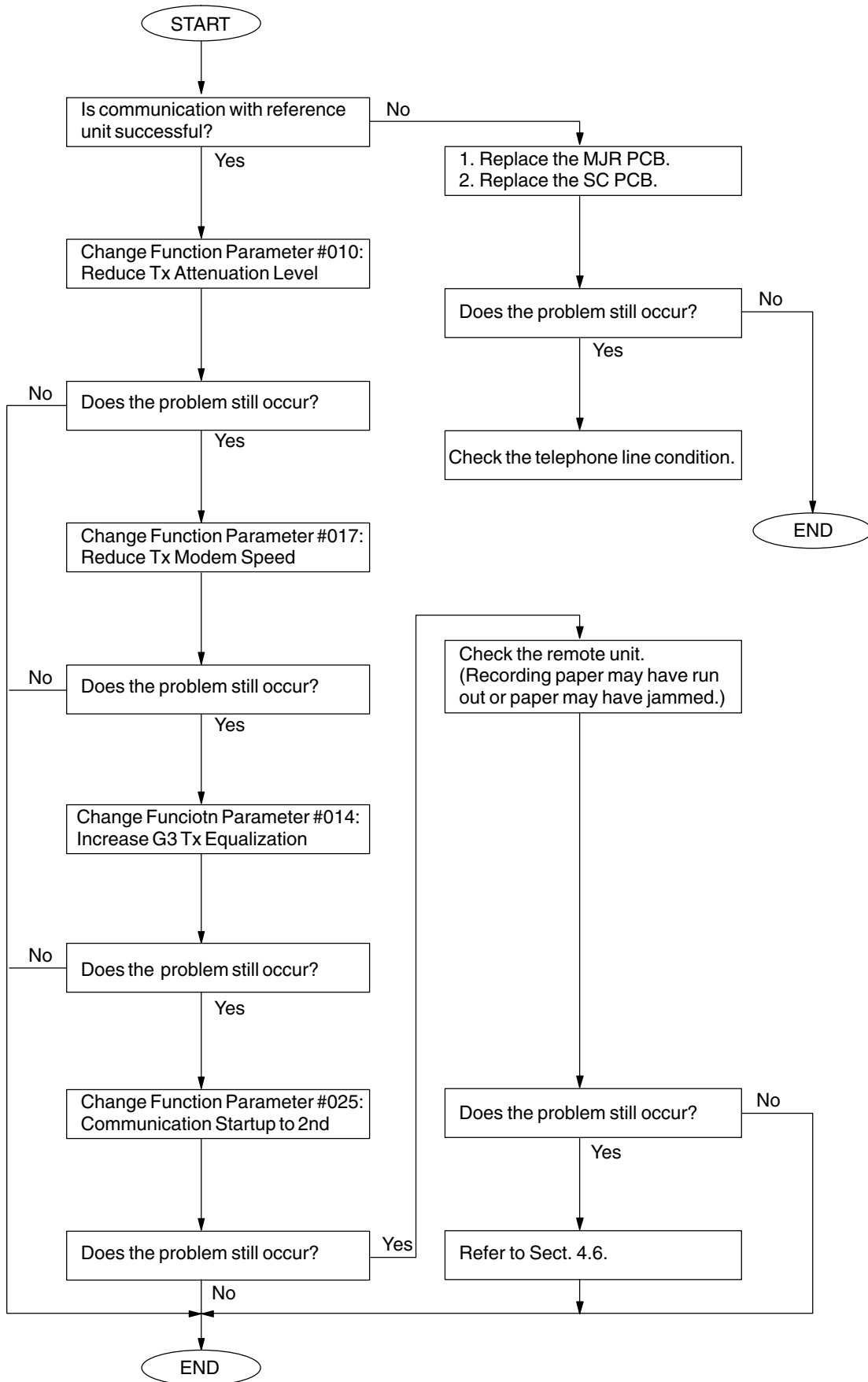
4.3.1. Information Codes: 400, 420



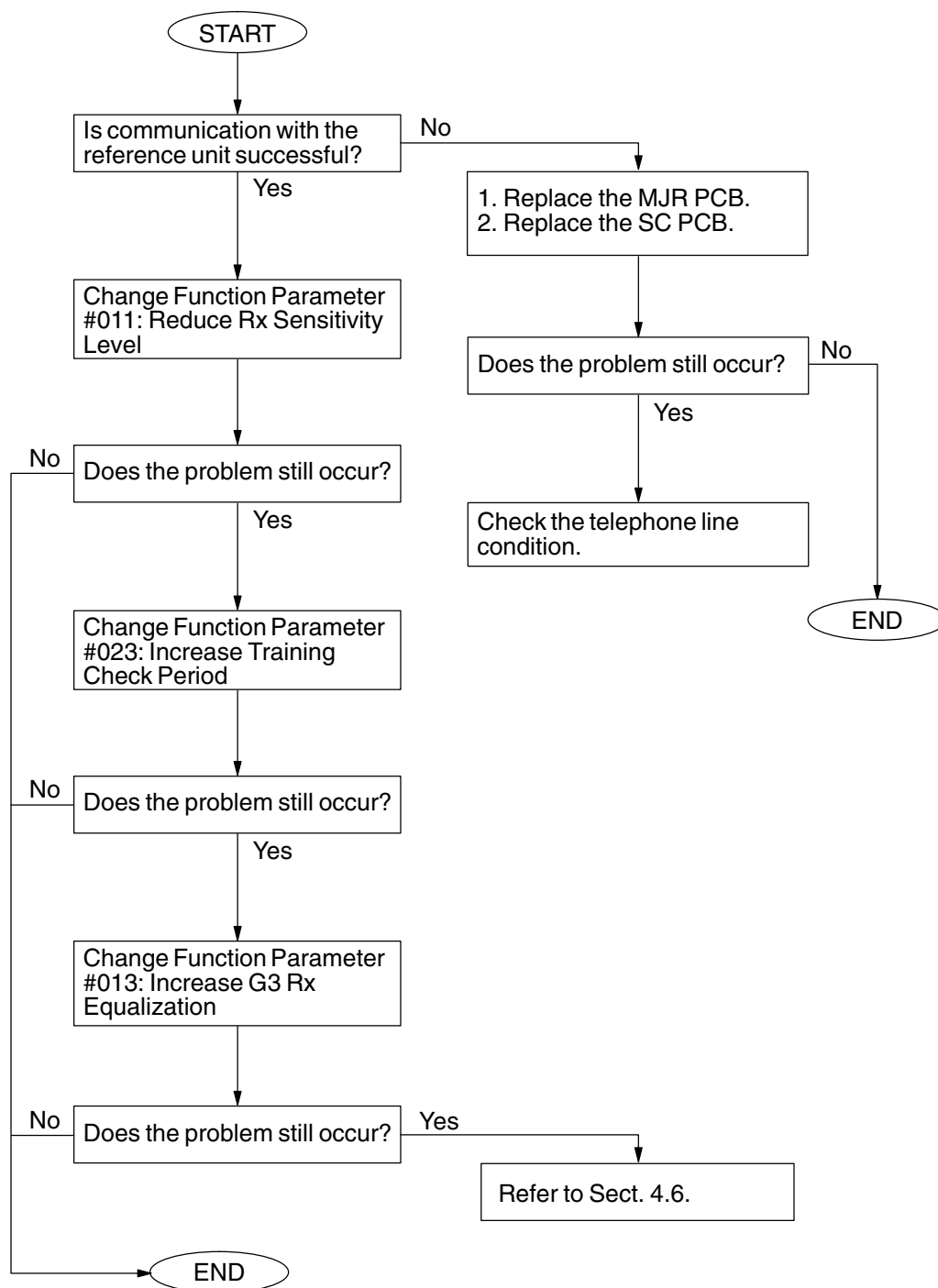
## 4.3.2. Information Codes: 401, 402, 422



4.3.3. Information Codes: 404, 405, 407

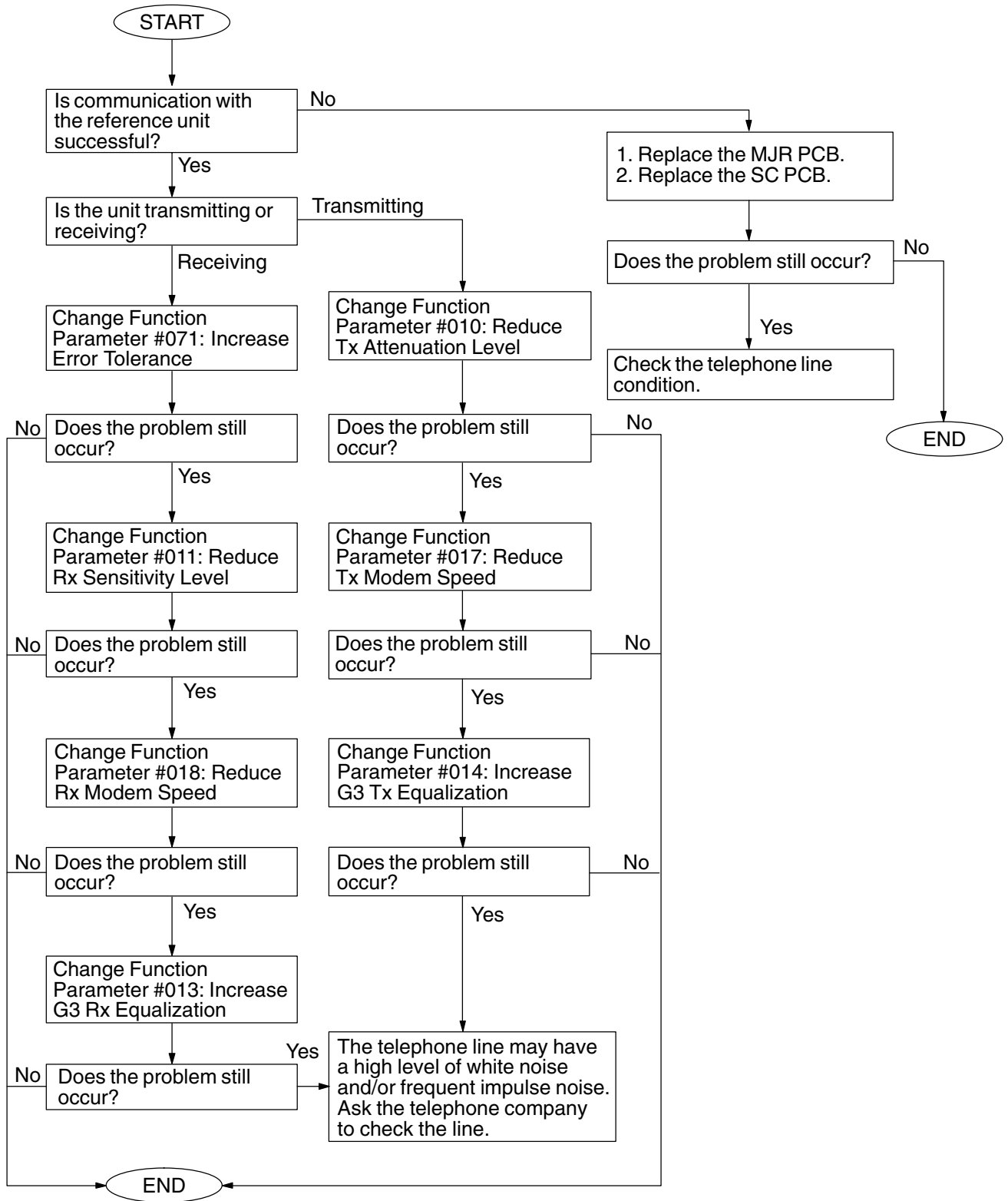


## 4.3.4. Information Code: 416

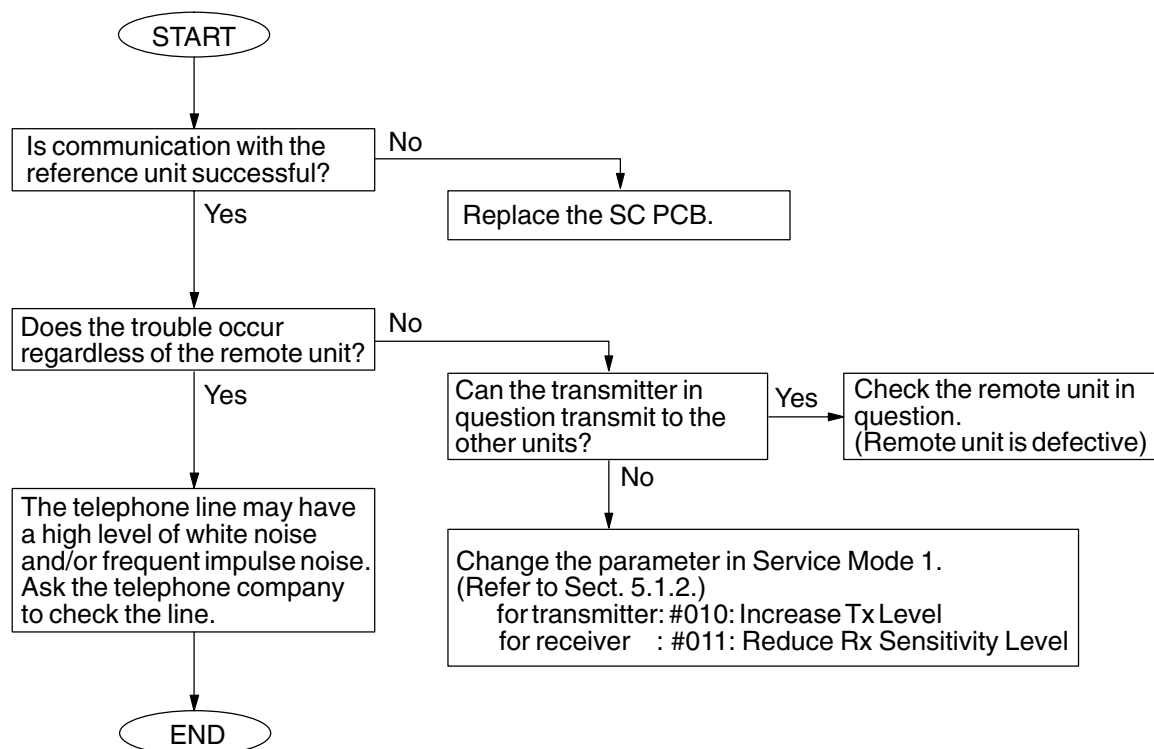




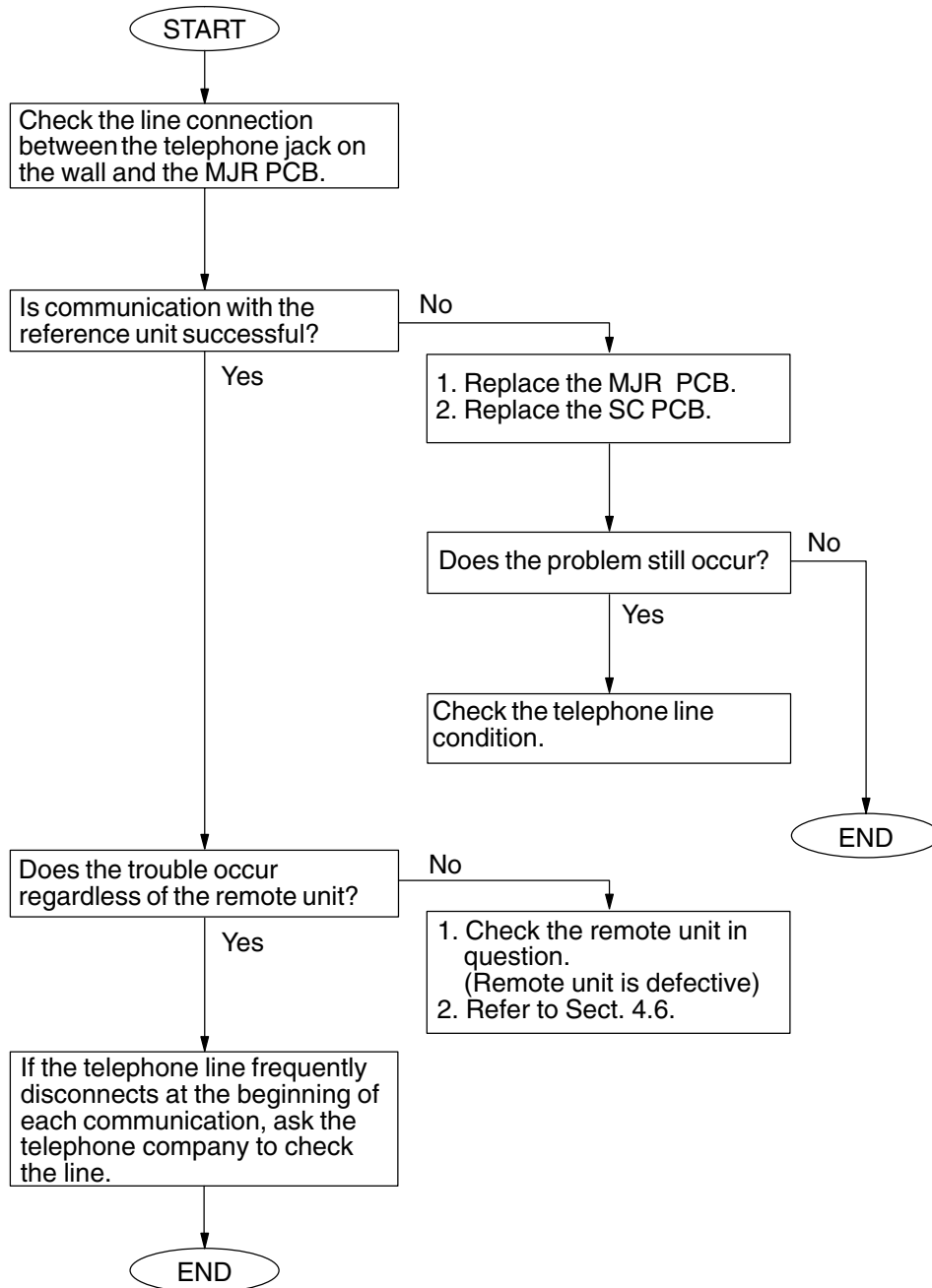
### 4.3.5. Information Codes: 408, 409, 417, 418, 490

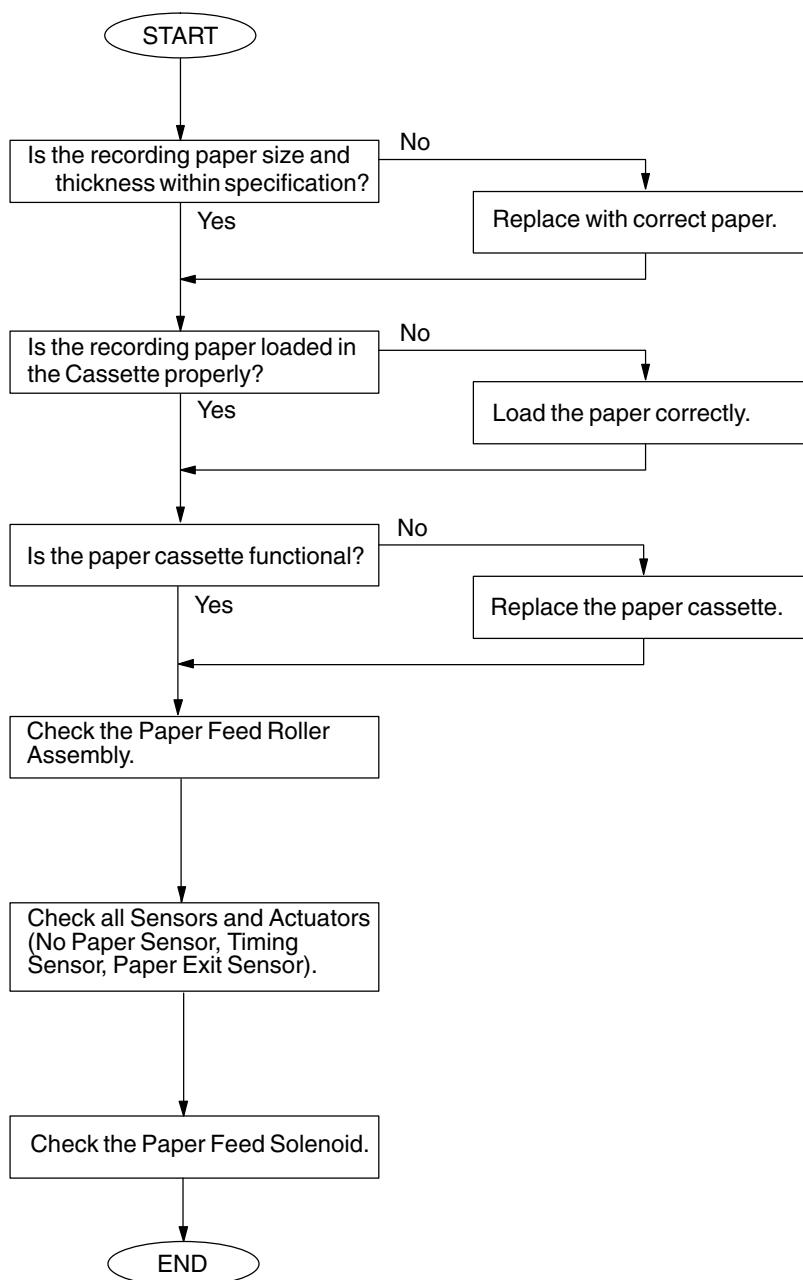


## 4.3.6. Information Code: 434

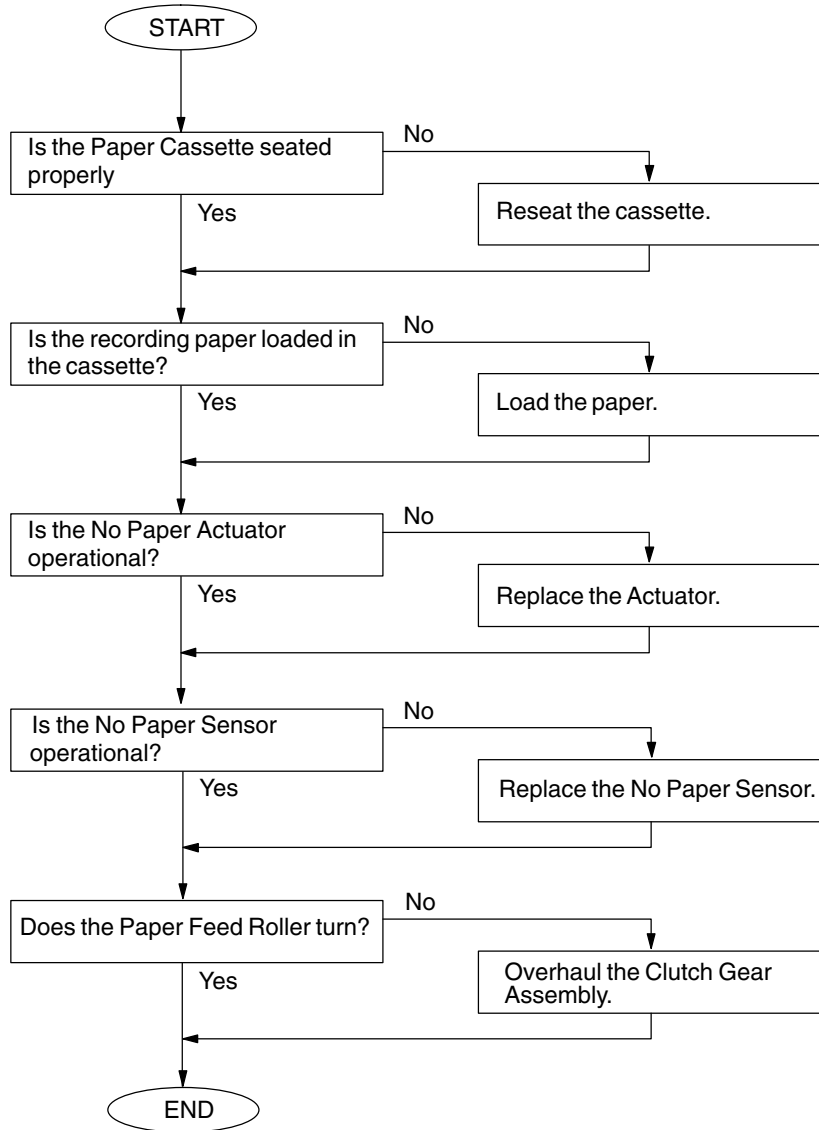


## 4.3.7. Information Codes: 459, 494, 495

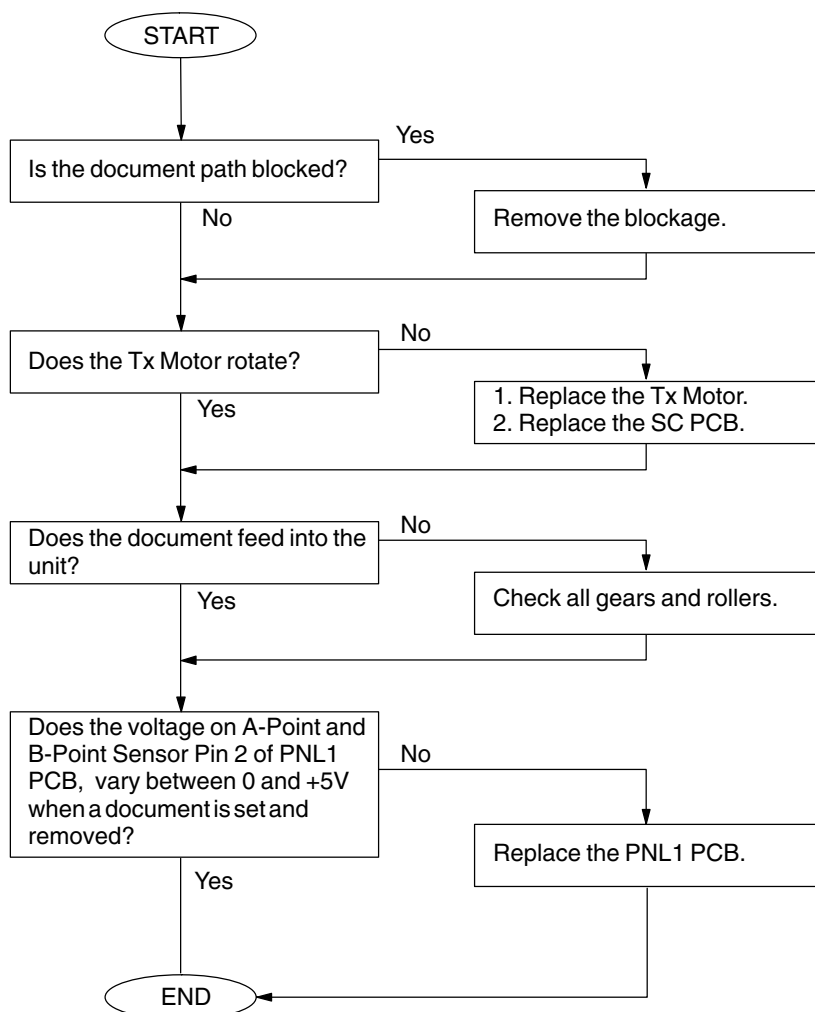


**4.3.8. Information Codes: 001, 002, 007 (Recording Paper Jam)**

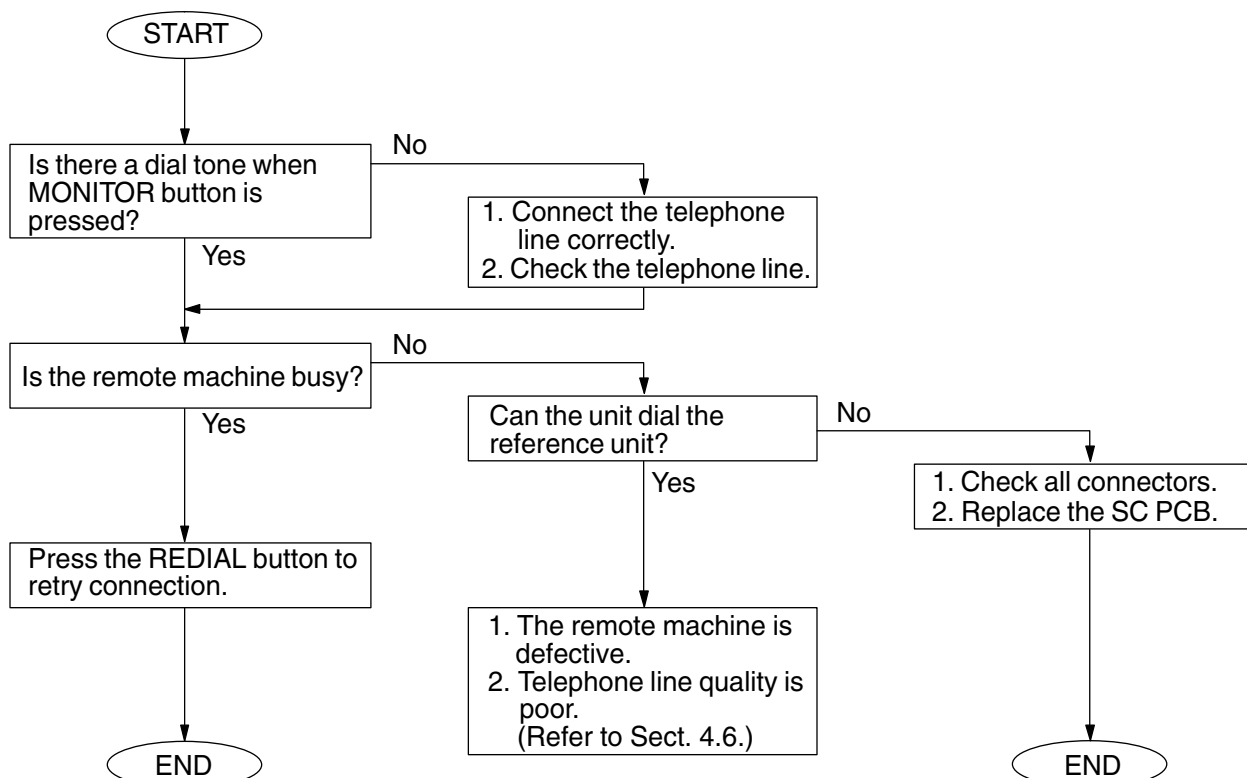
### 4.3.9. Information Code: 010 (No Recording Paper)



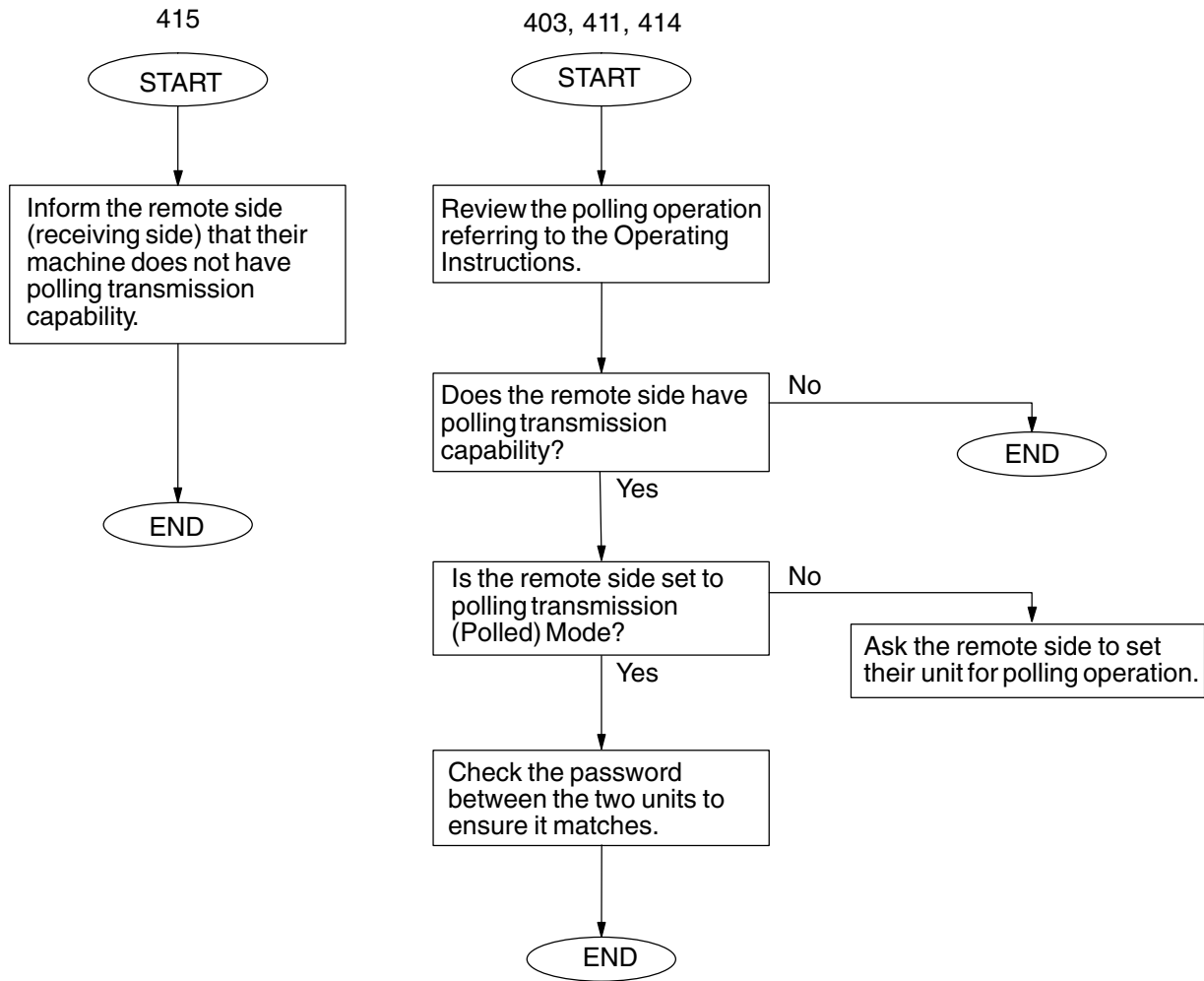
### 4.3.10. Information Codes: 030, 031 (Document Jam)



### 4.3.11. Information Code: 630 (Dialing Error)



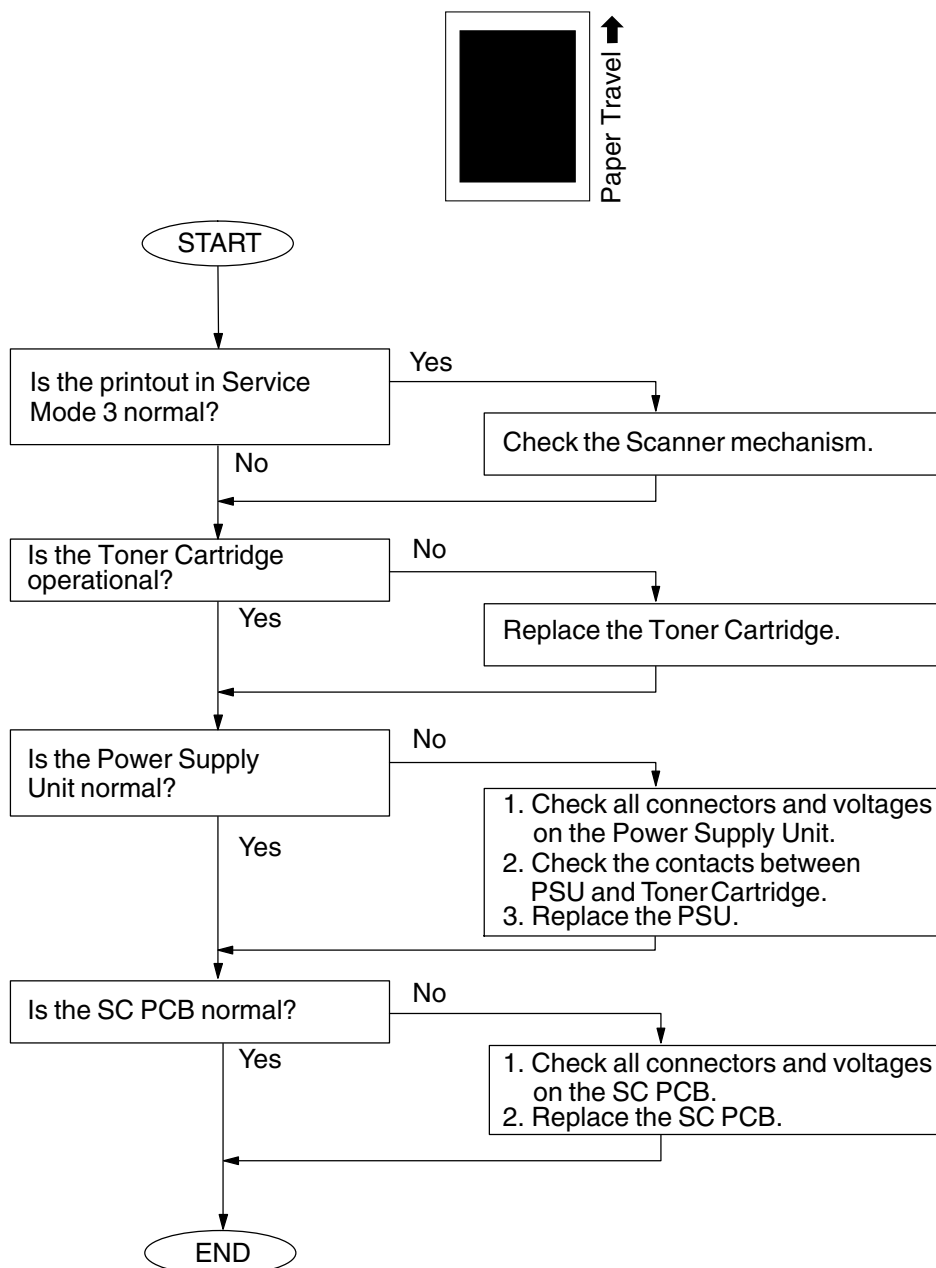
4.3.12. Information Codes: 403, 411, 414, 415 (Polling Operator Trouble)



Polling communication with 4-digit password is not an ITU-T Standard feature. If the transmitter and receiver are of different manufacturers, polling communication with password **may not** be possible.

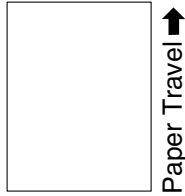
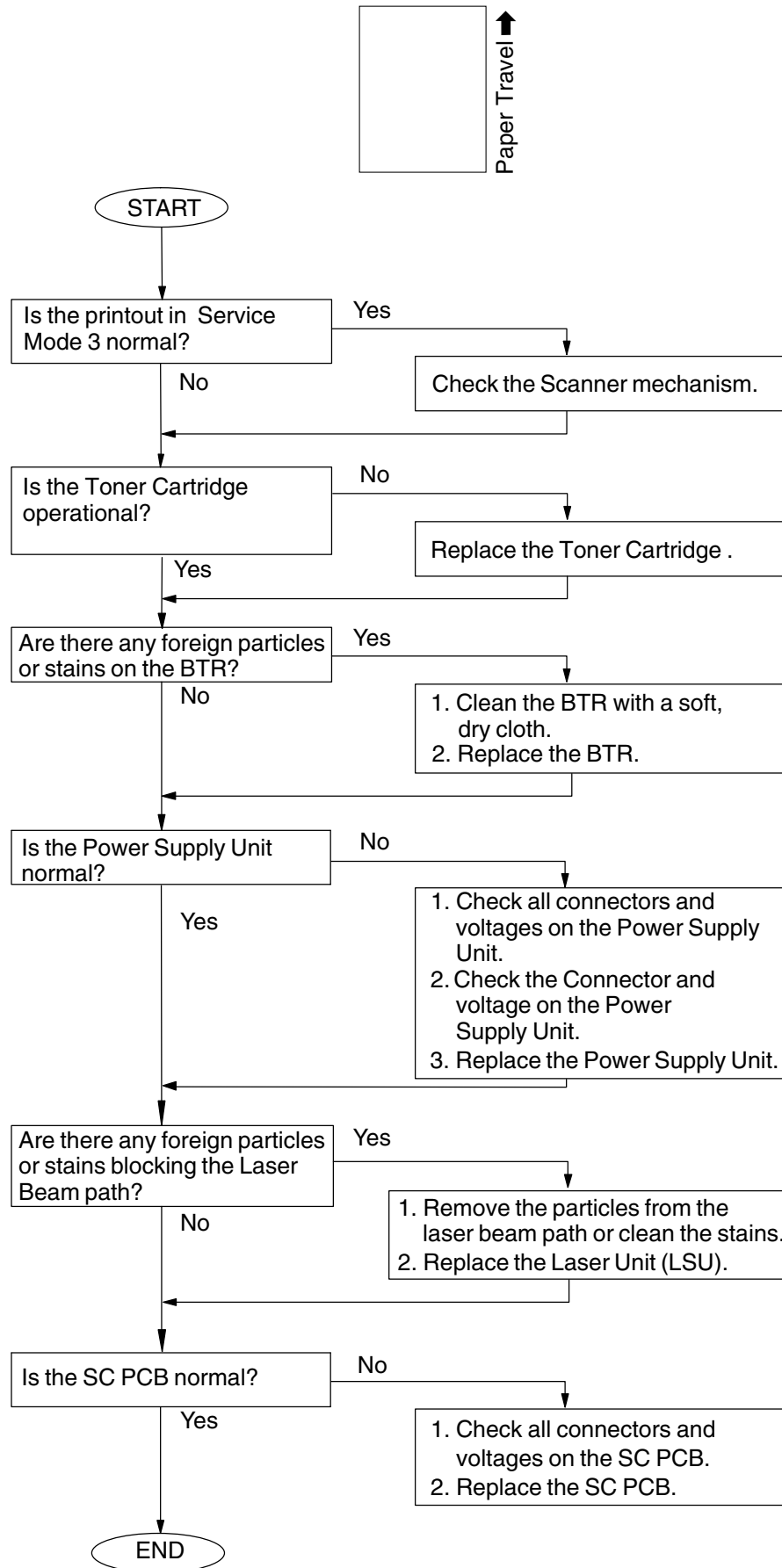
## 4.4. Printed Copy Quality Problems

### 4.4.1. Black Copy

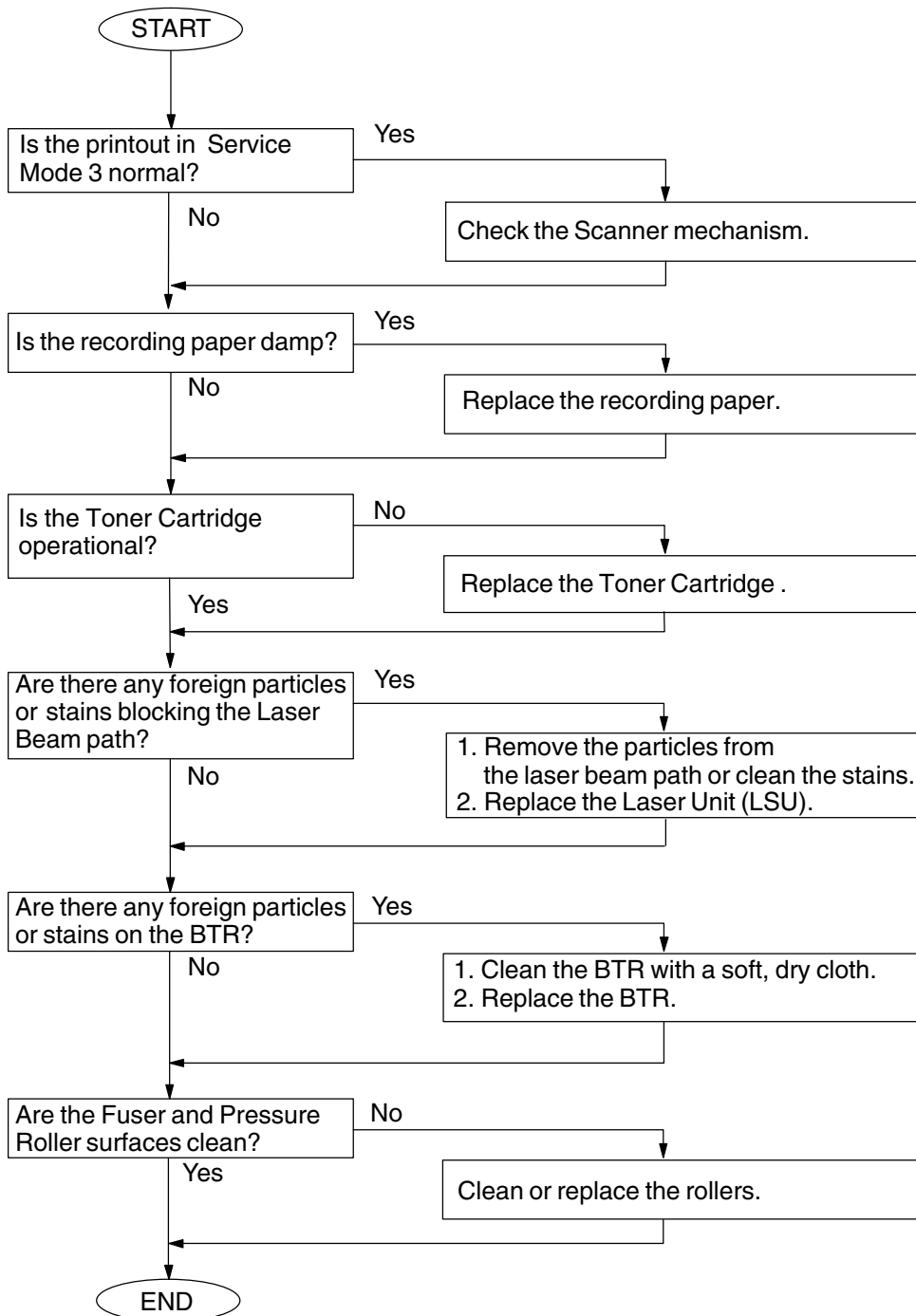
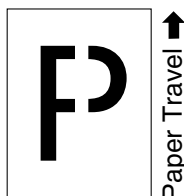




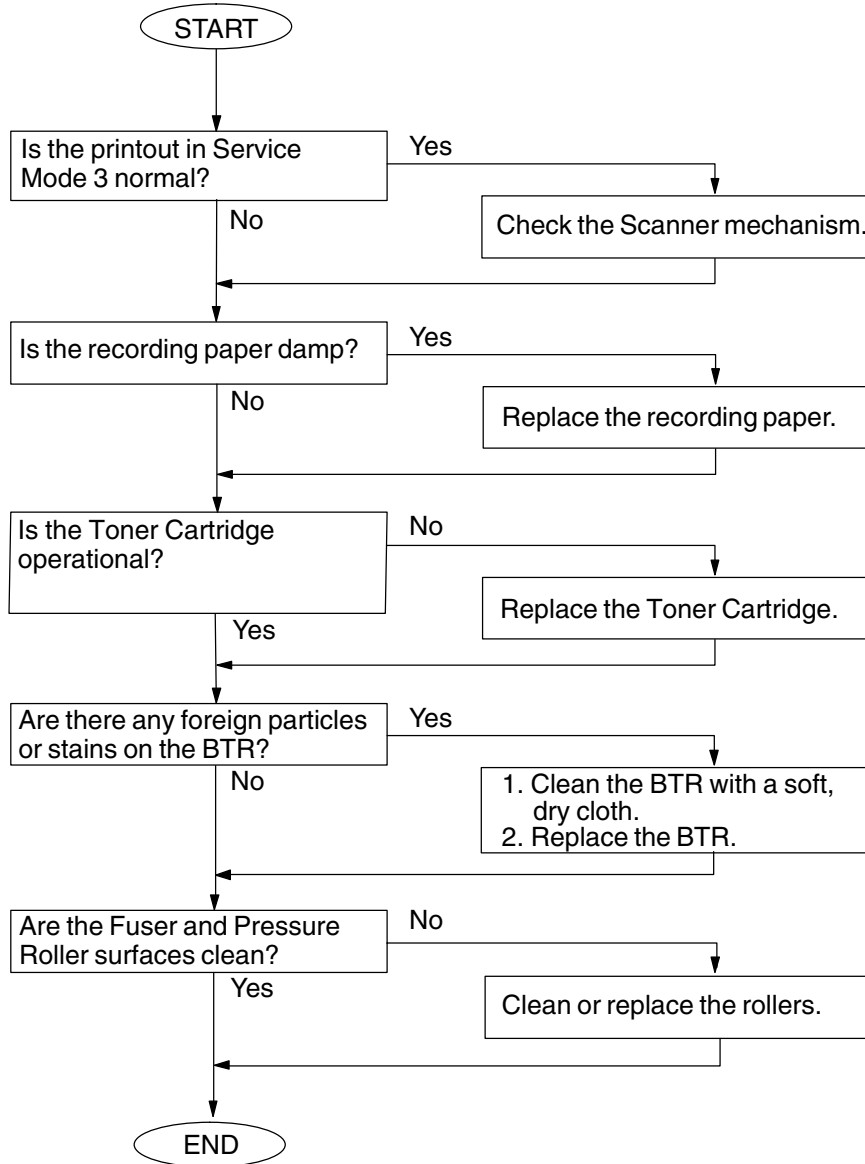
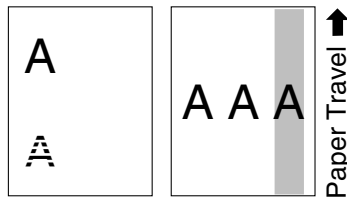
4.4.2. Blank Copy



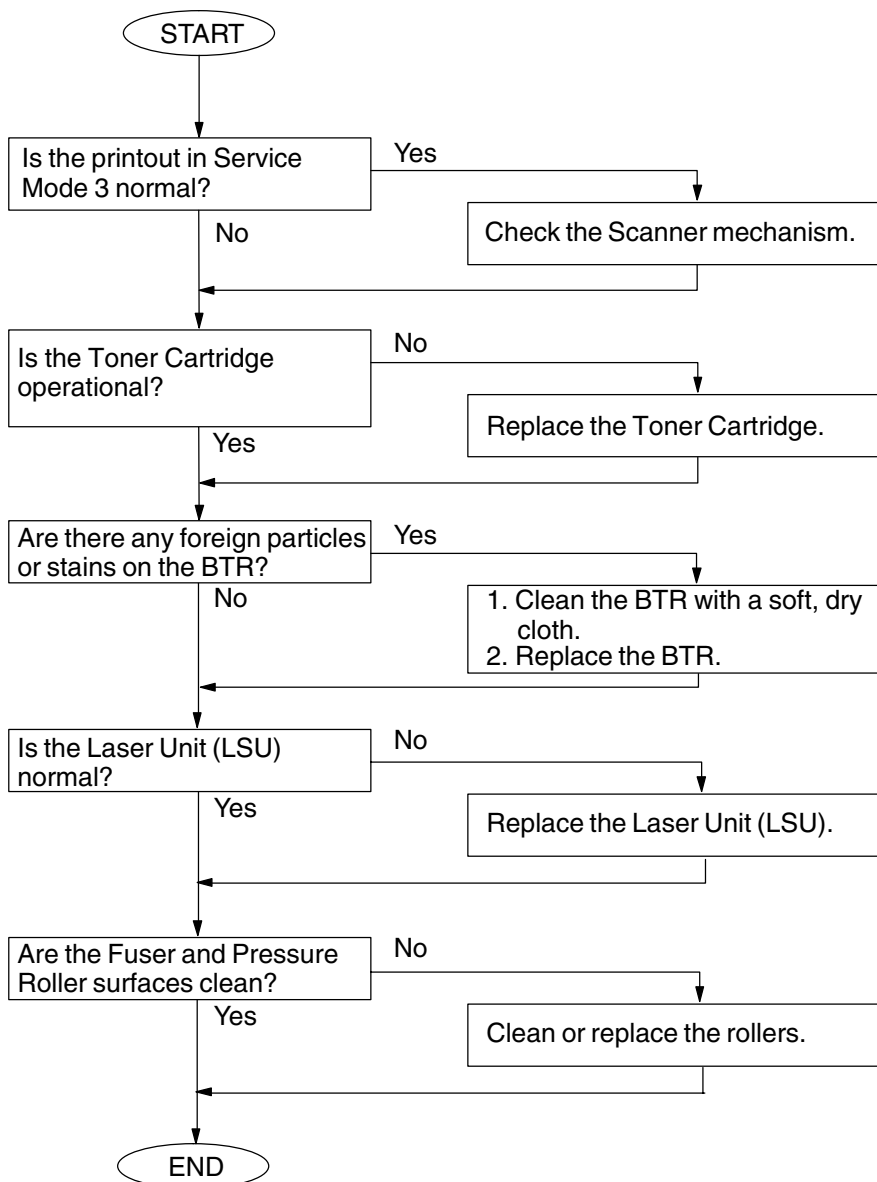
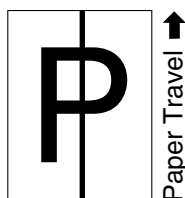
4.4.3. Vertical White Lines



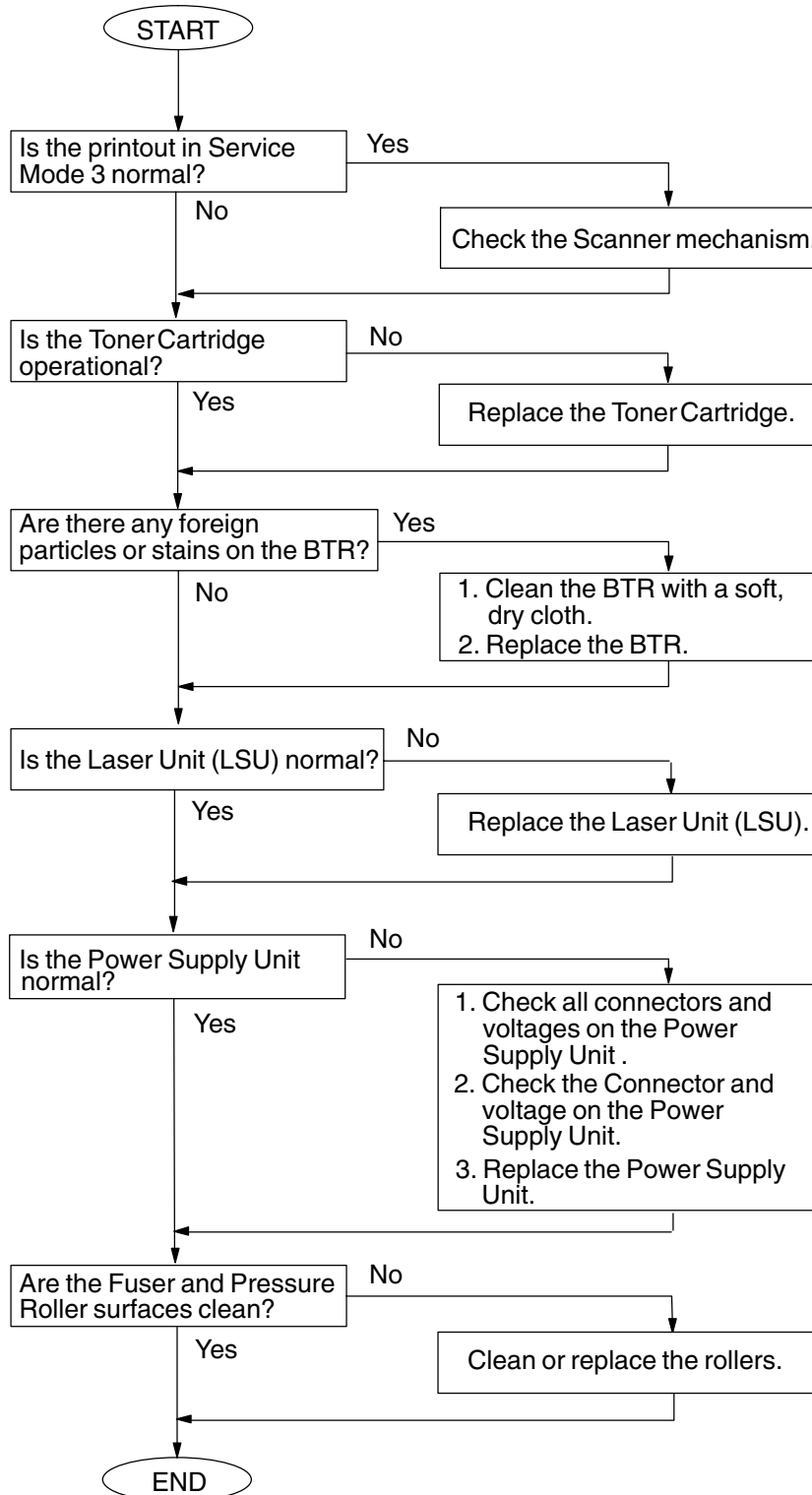
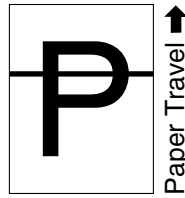
### 4.4.4. Ghost Images



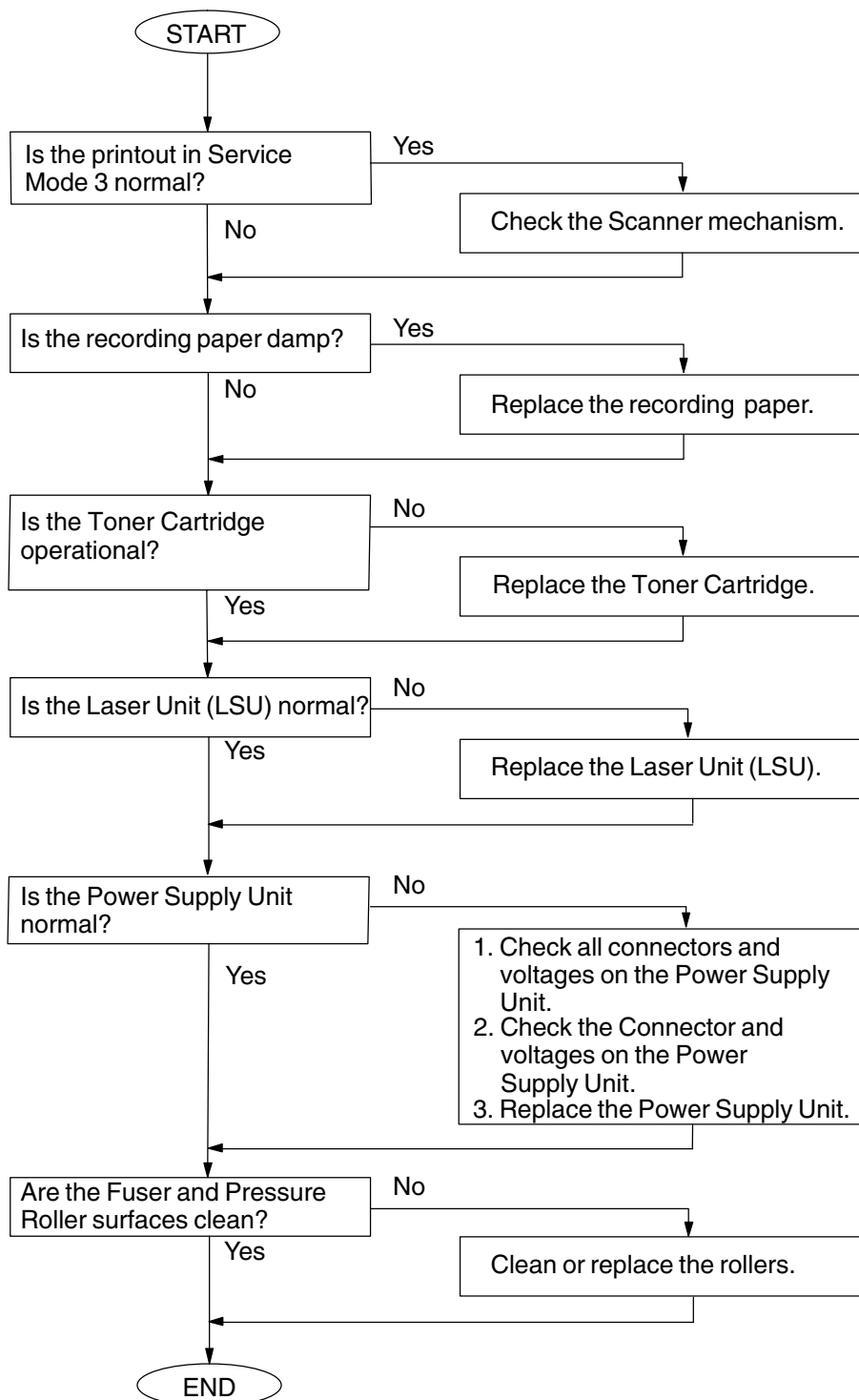
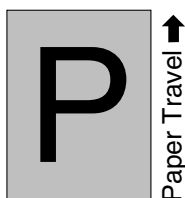
### 4.4.5. Vertical Dark Lines



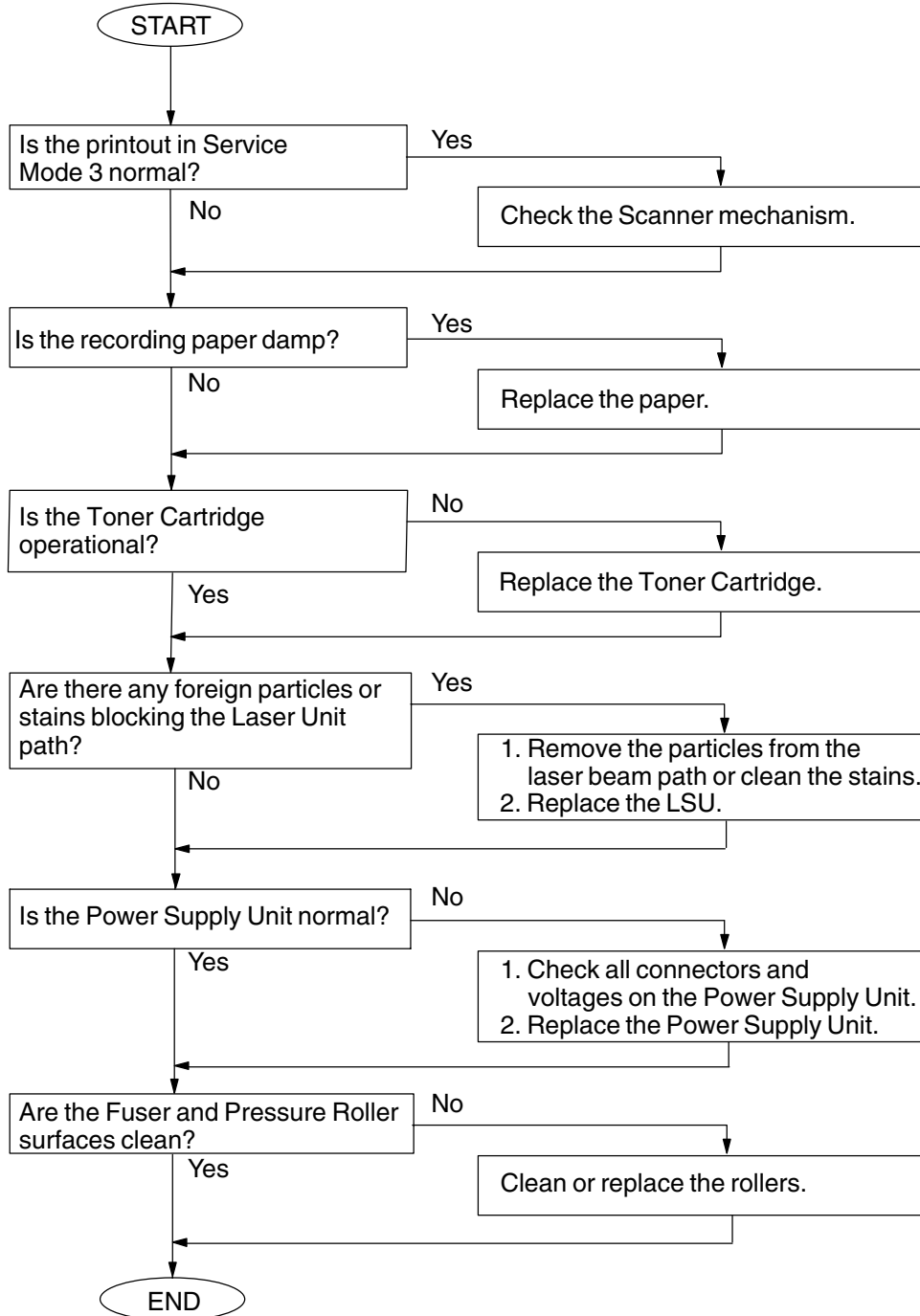
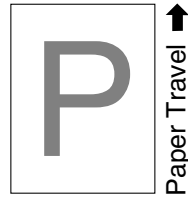
4.4.6. Horizontal Dark Lines



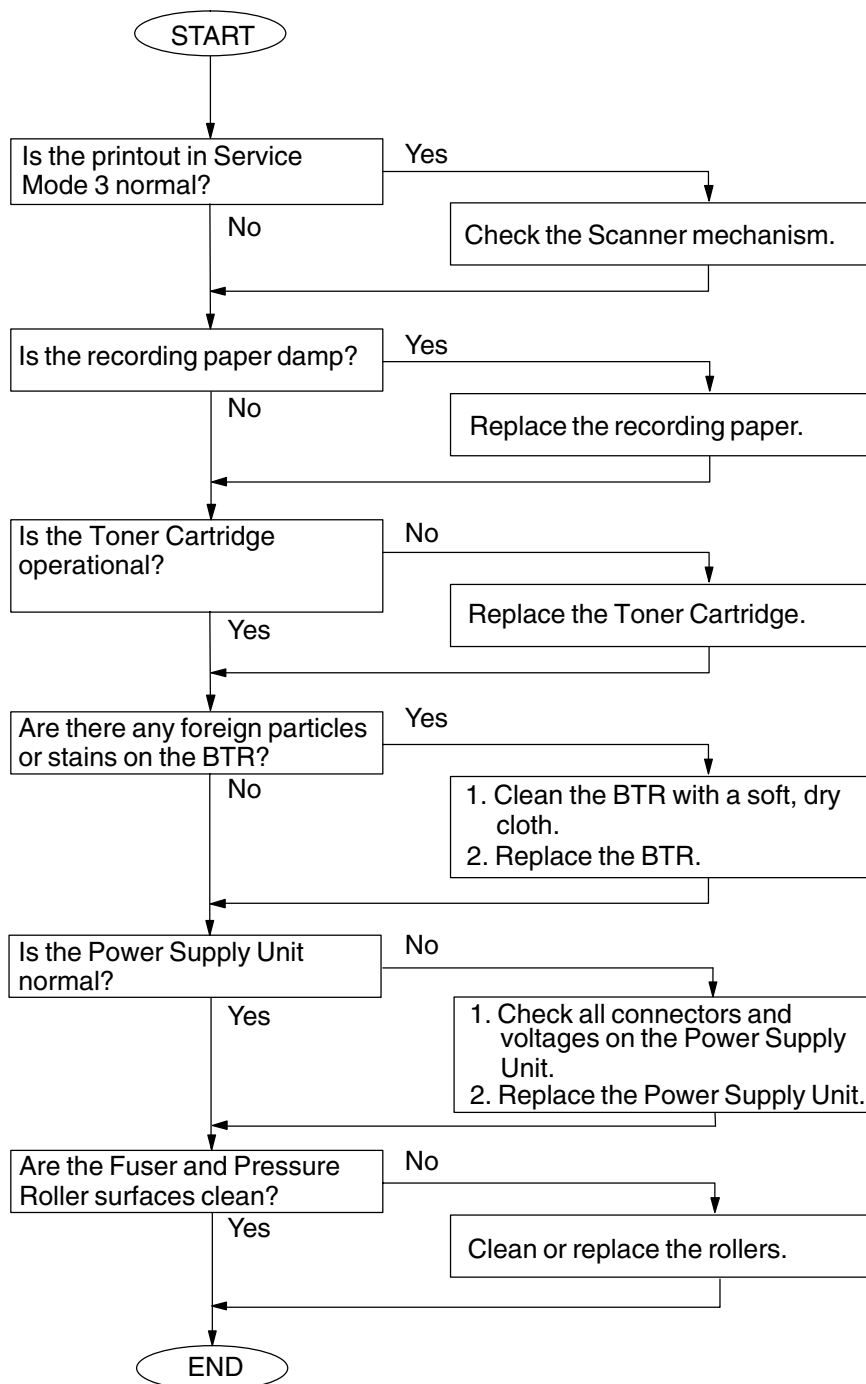
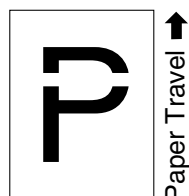
## 4.4.7. Dark Background



### 4.4.8. Light Print

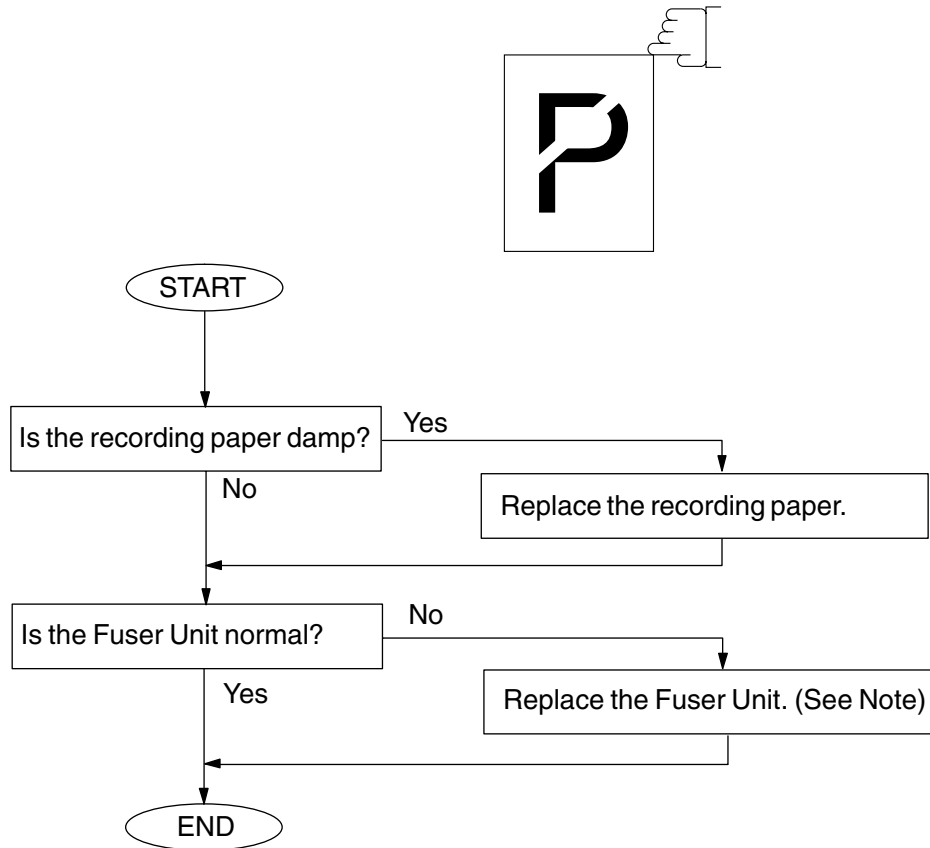


## 4.4.9. Horizontal White Lines





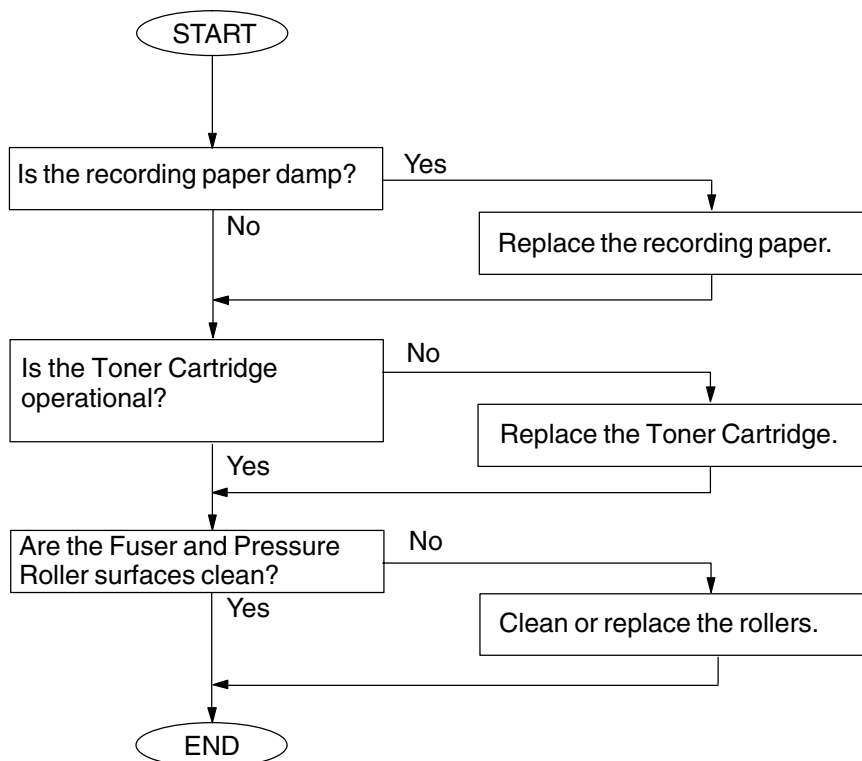
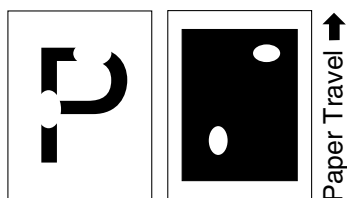
#### 4.4.10. Improper Fusing (Printed image does not bond to the paper)



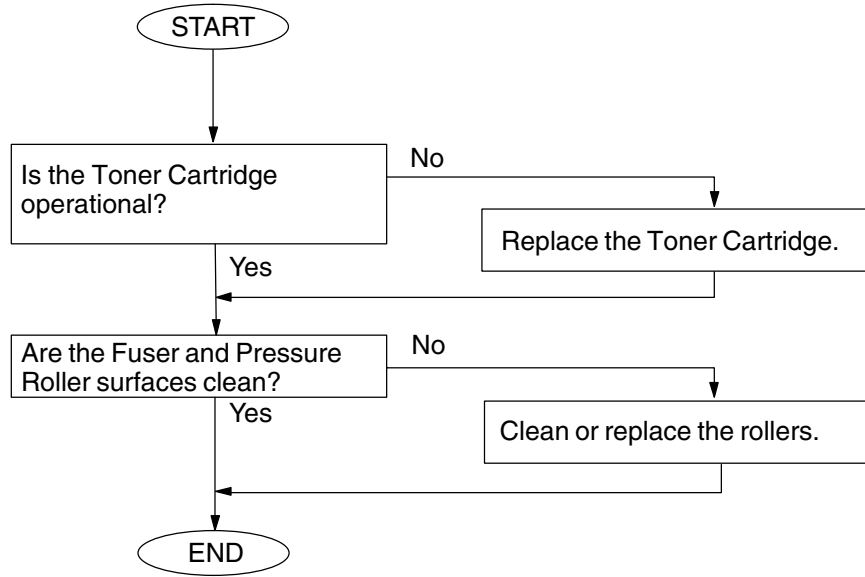
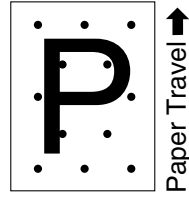
**Note:**

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

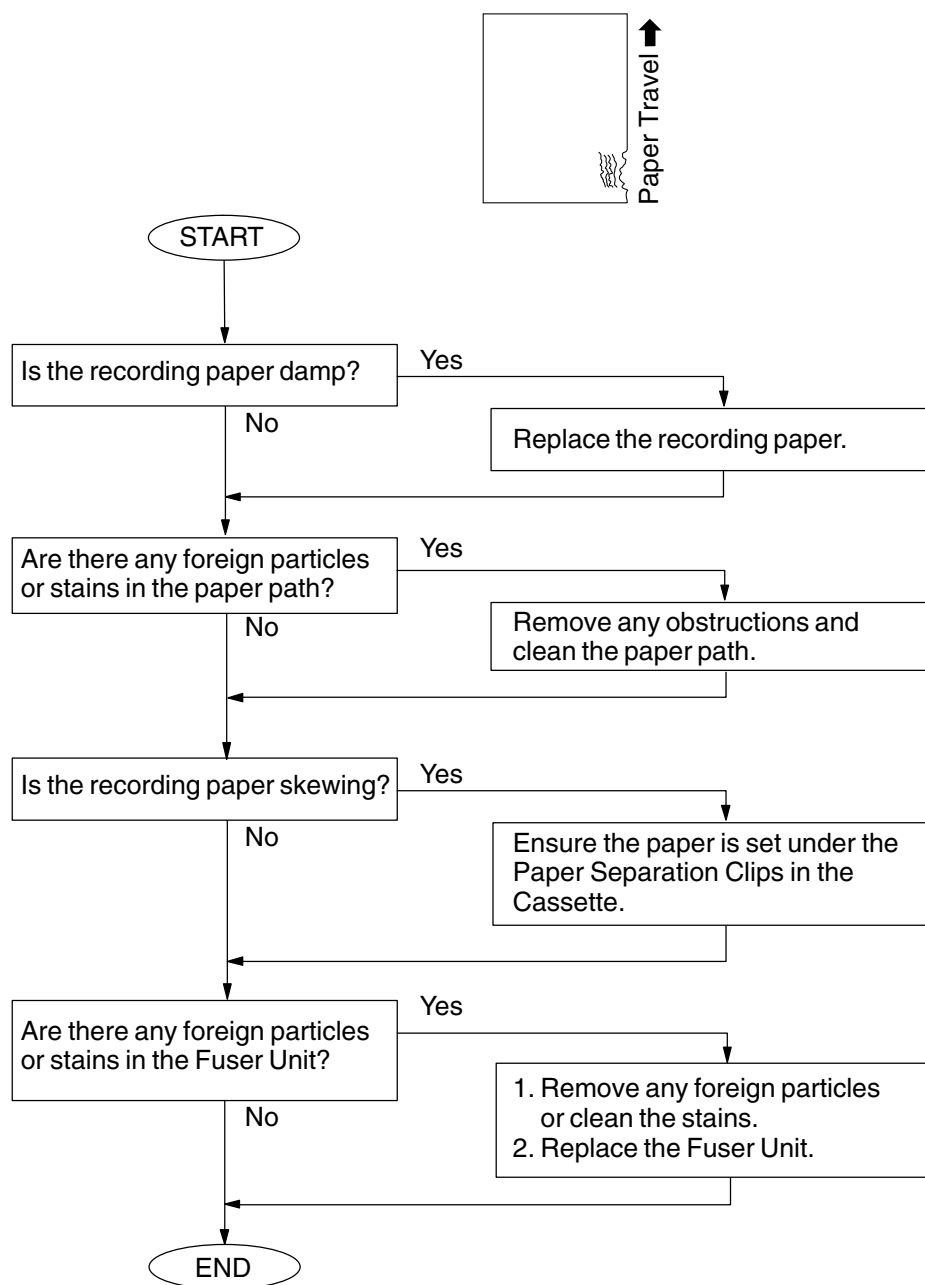
### 4.4.11. Voids in Solid Areas



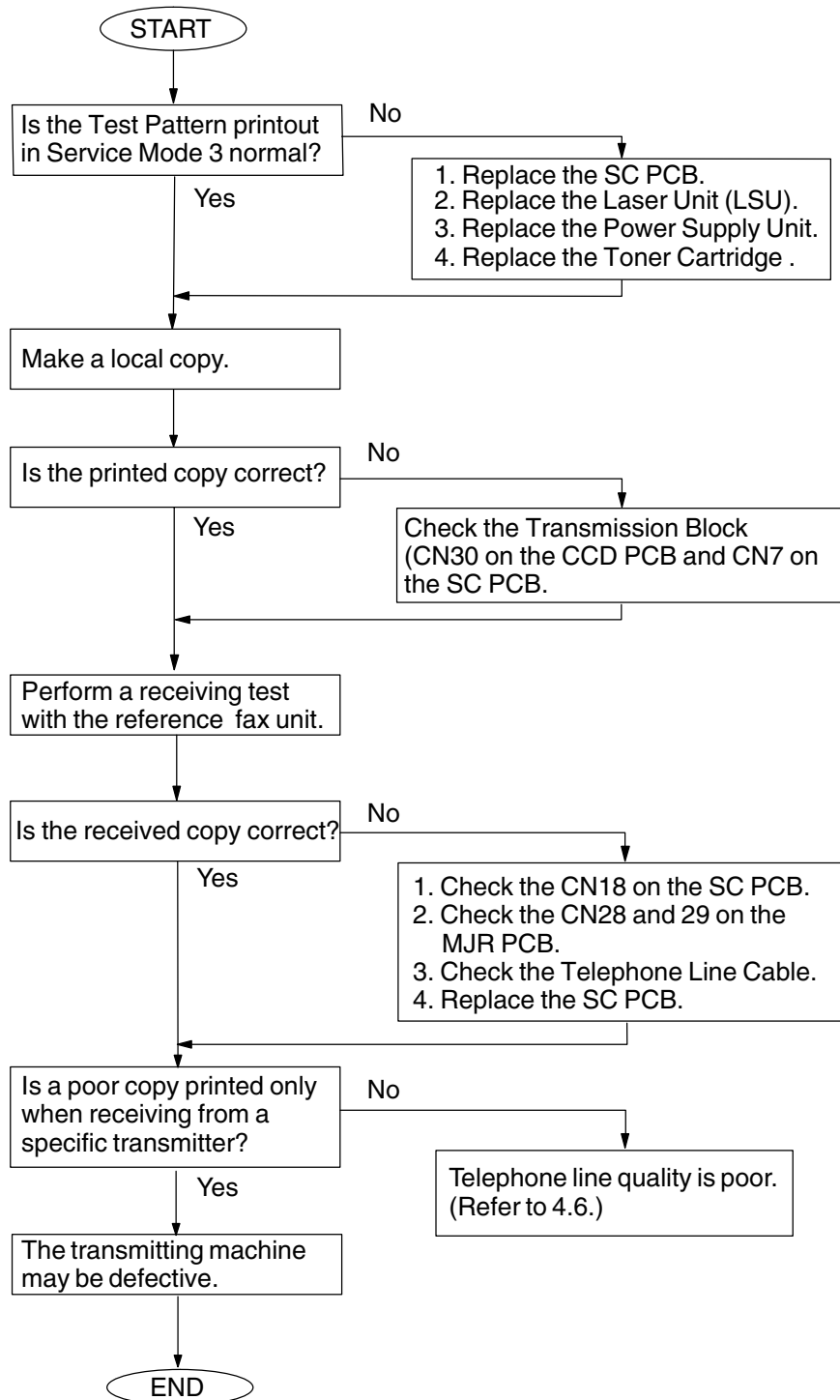
### 4.4.12. Black Dots



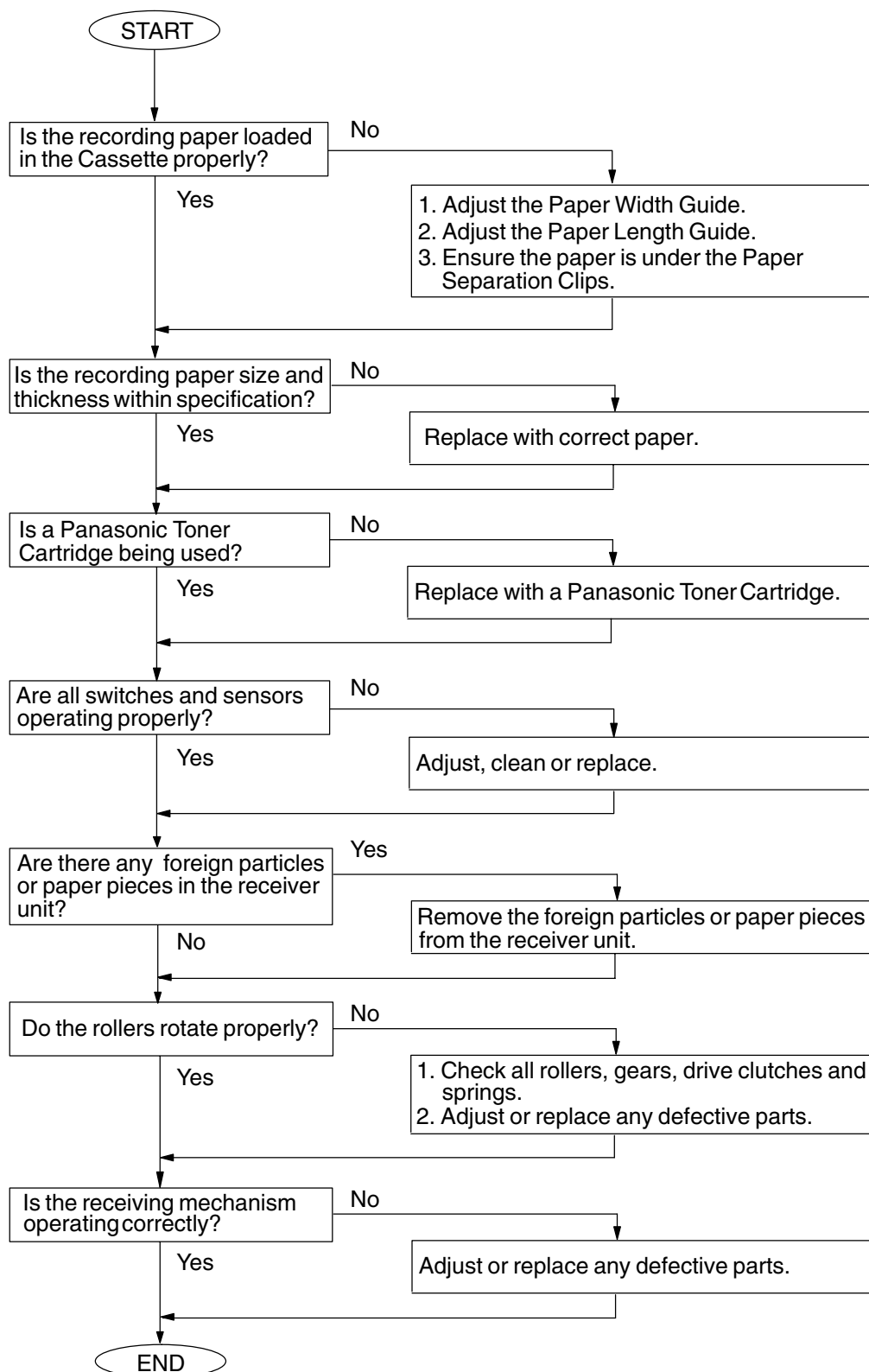
## 4.4.13. Recording Paper Creases



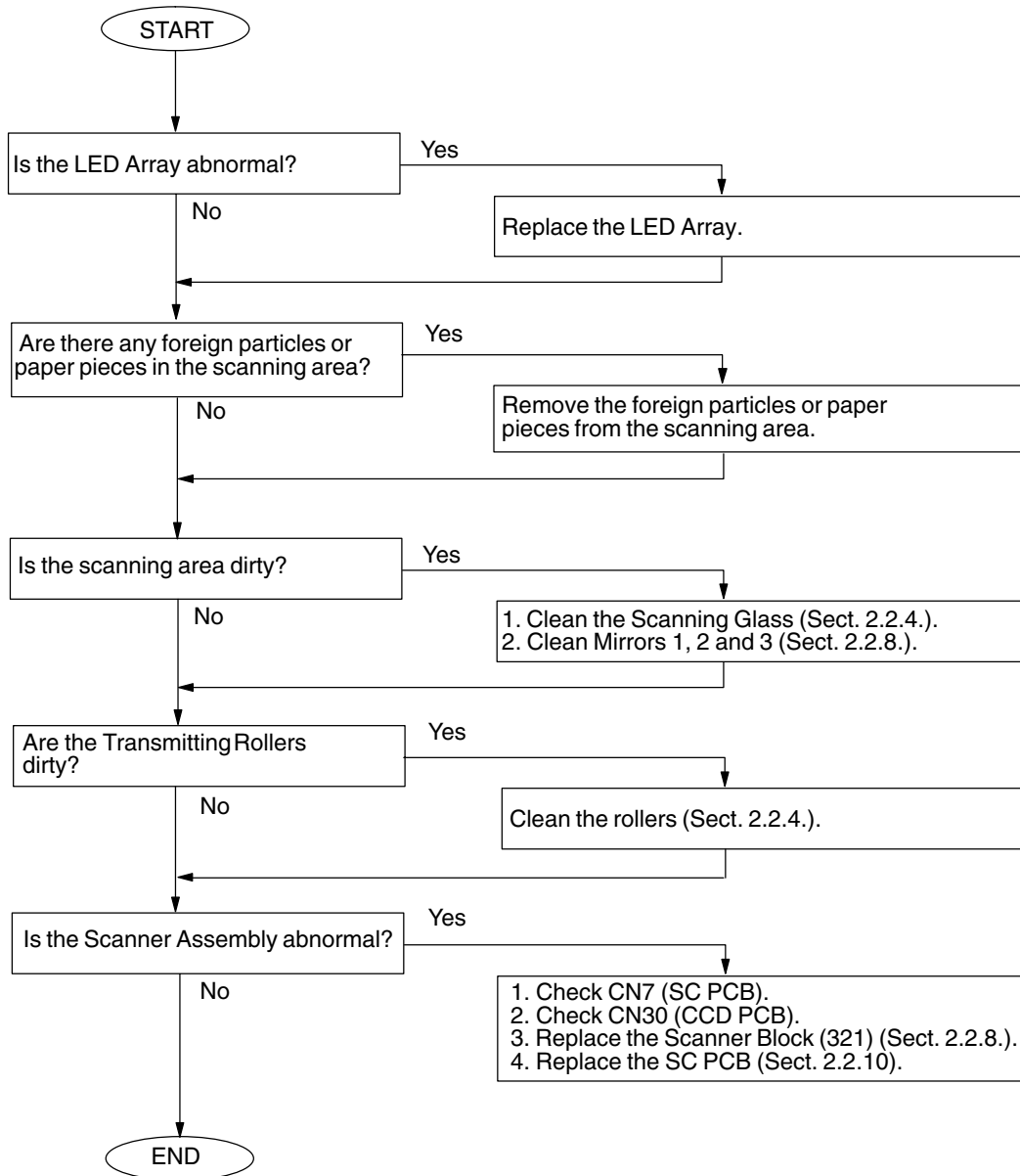
#### 4.4.14. Poor Printed Copy Quality



## 4.4.15. Abnormal Printing

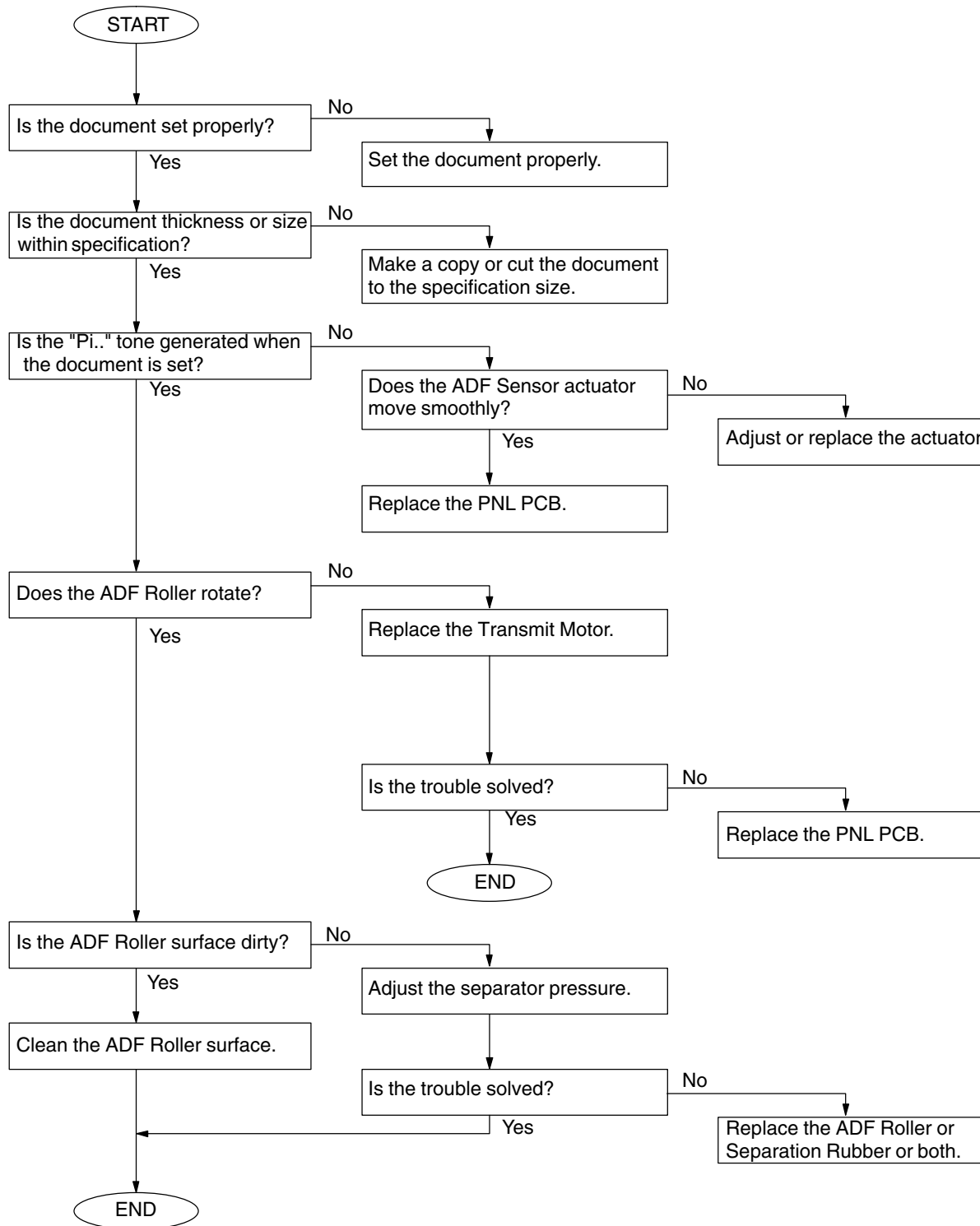


#### 4.4.16. Scanned Copy Quality Problems



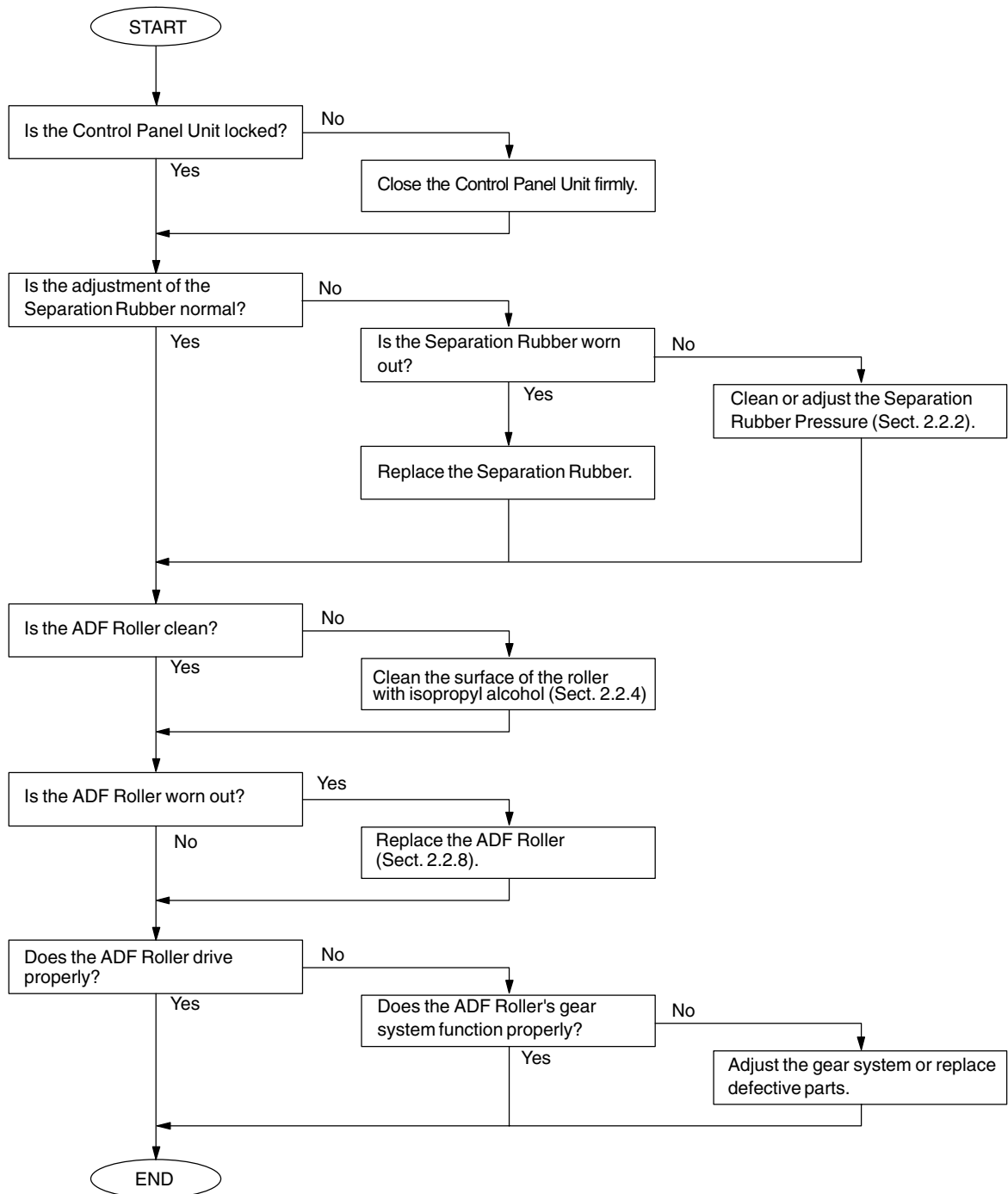
## 4.5. Document Feeder (ADF)

### 4.5.1. No Document Feed

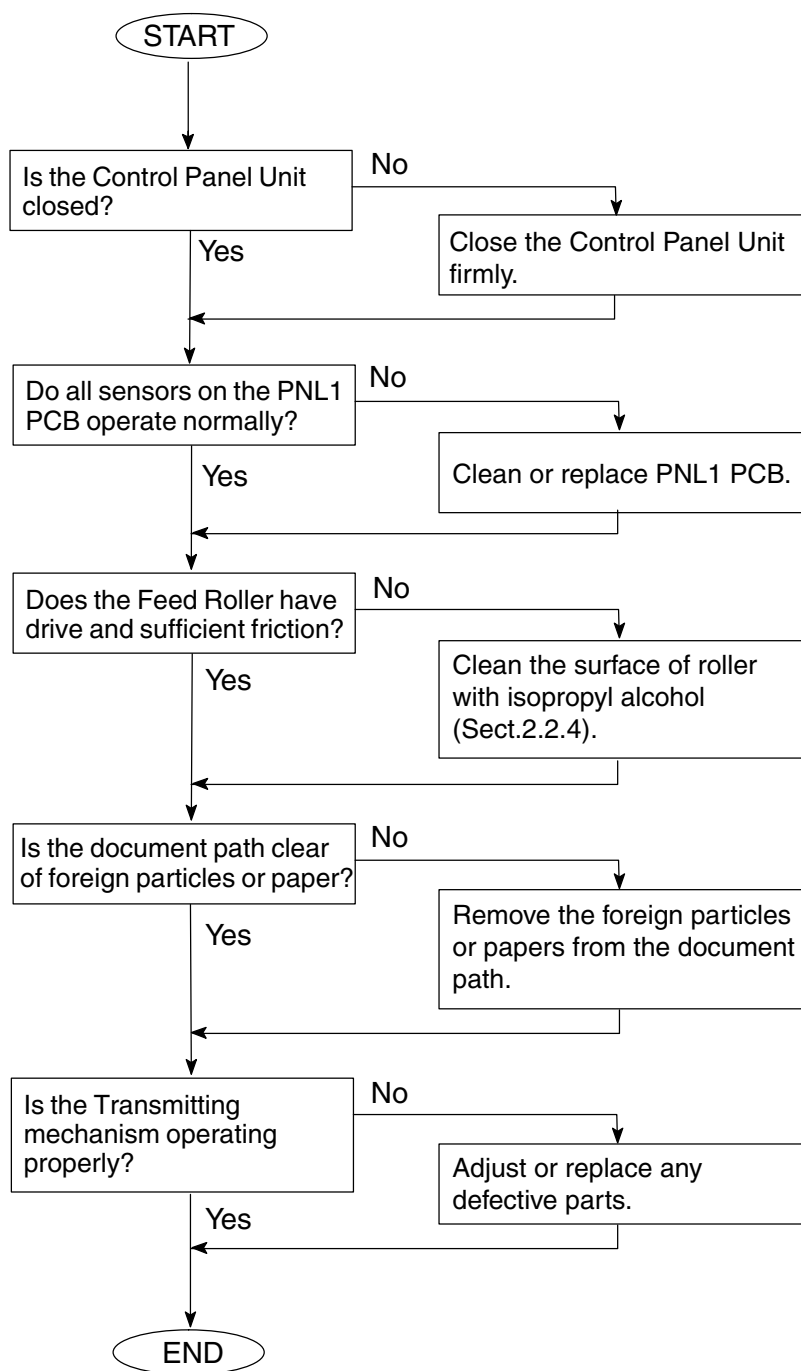
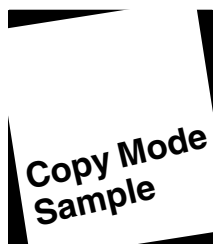




### 4.5.2. Document Does Not Feed or Multiple Feeds



## 4.5.3. Document Jam (030) or Skew

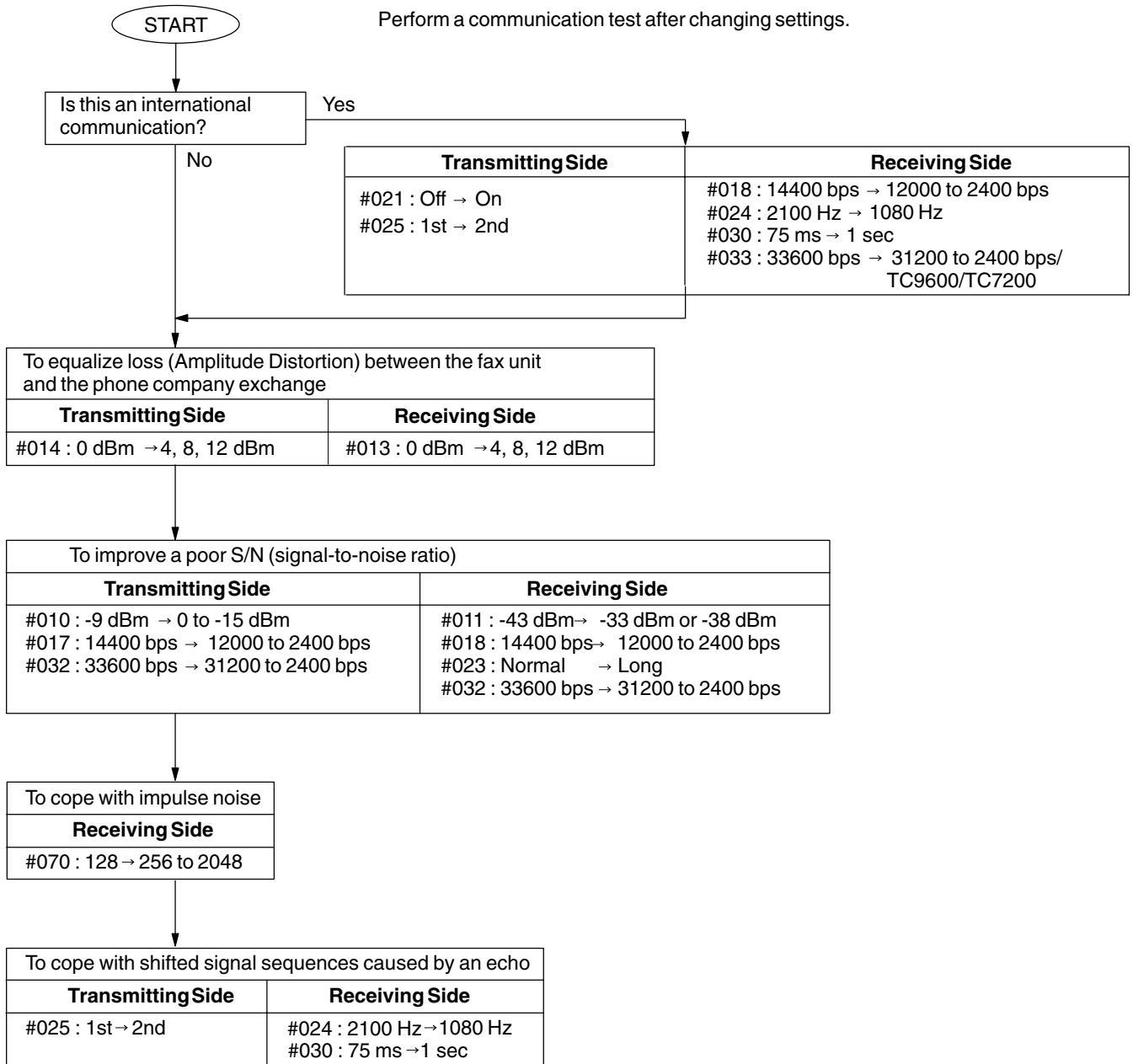


## 4.6. Communications

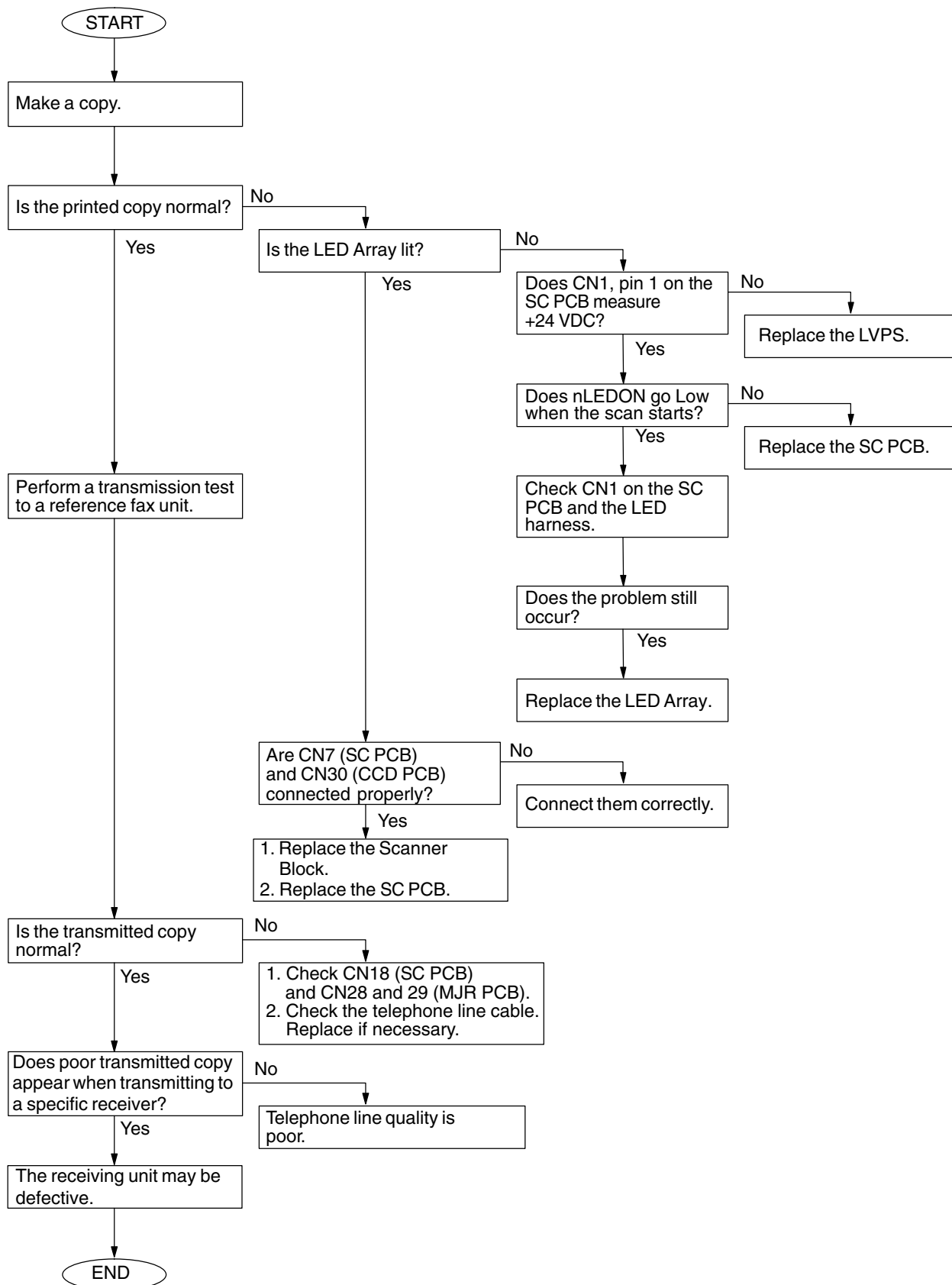
This section explains general troubleshooting procedures for the 400 series of Information Codes. These errors are primarily caused by poor telephone line quality (loss, noise, echo, etc.). This unit is furnished with Service Mode 1 to assist in troubleshooting line quality problems.

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.

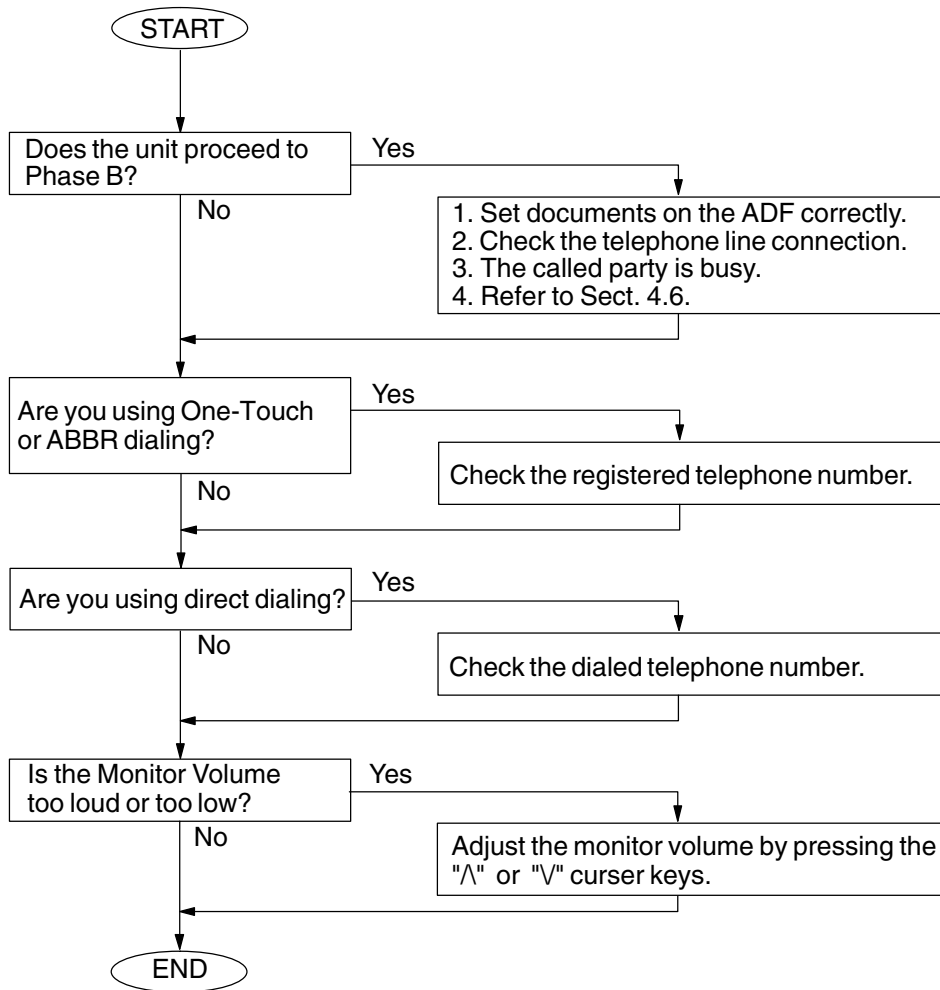
### 4.6.1. Communication Trouble



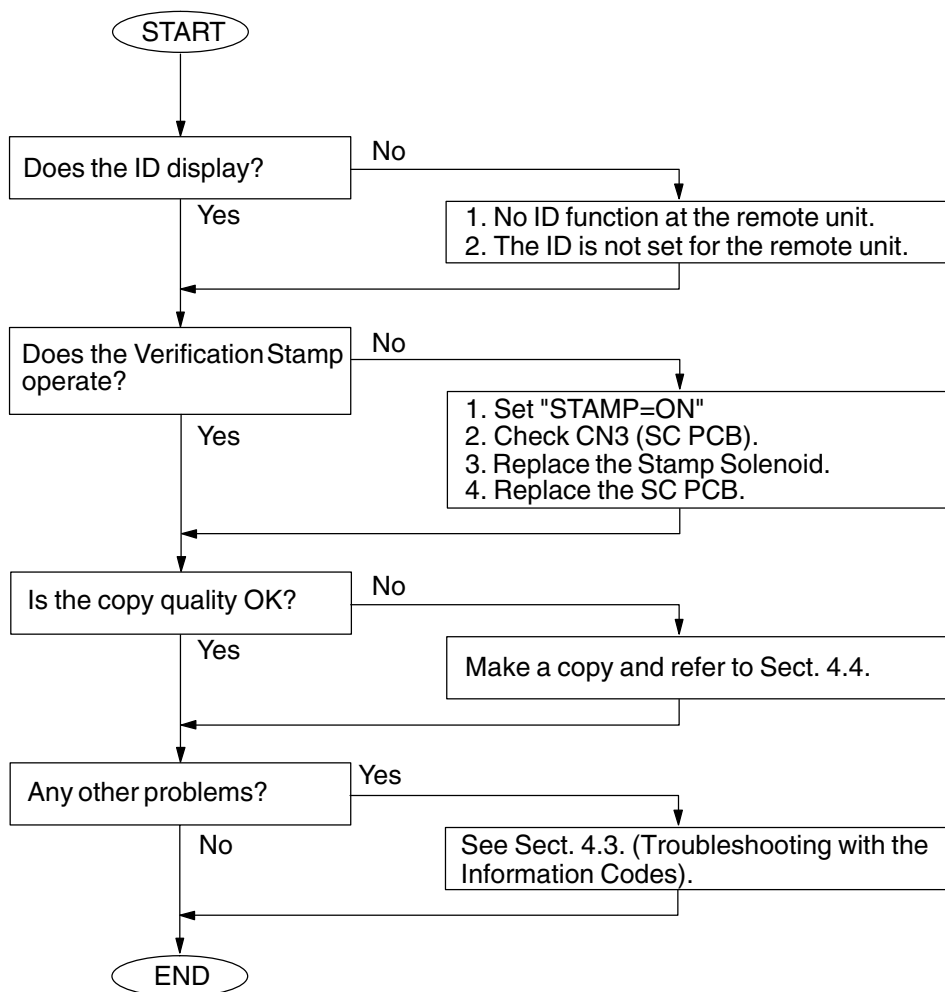
## 4.6.2. Poor Transmitted Copy Quality



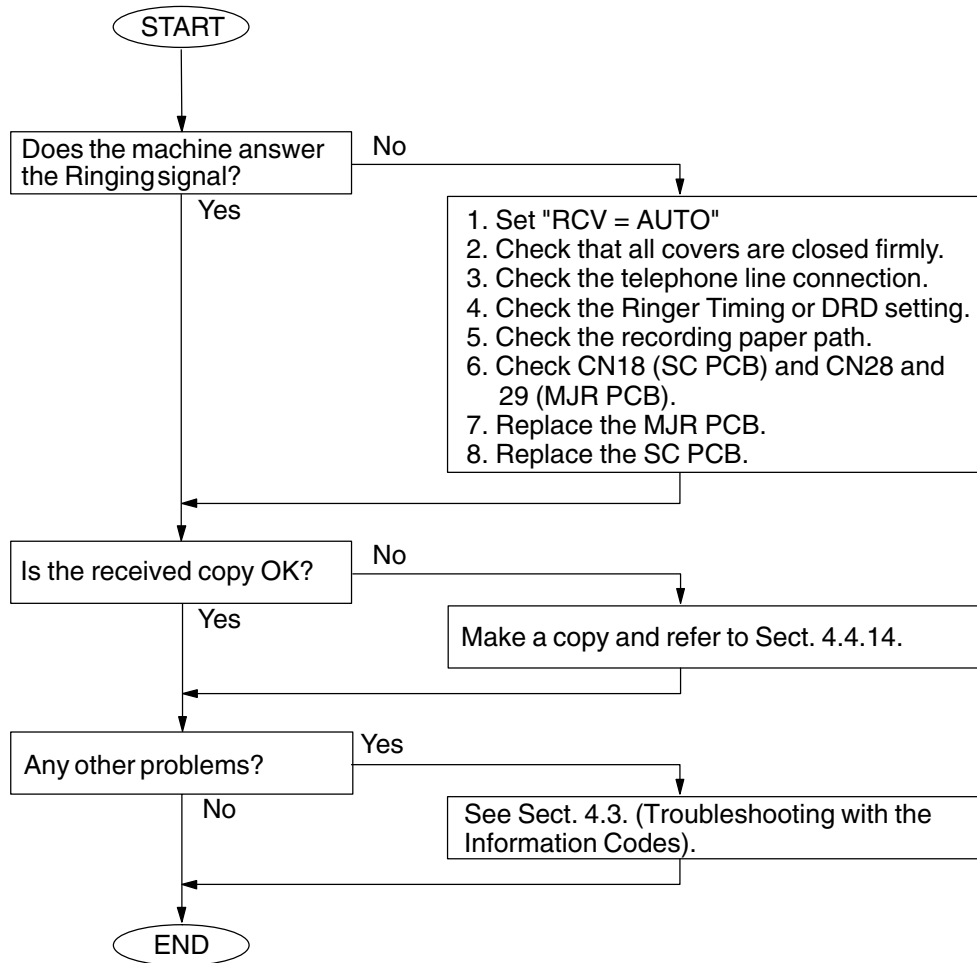
### 4.6.3. Dialing Problems



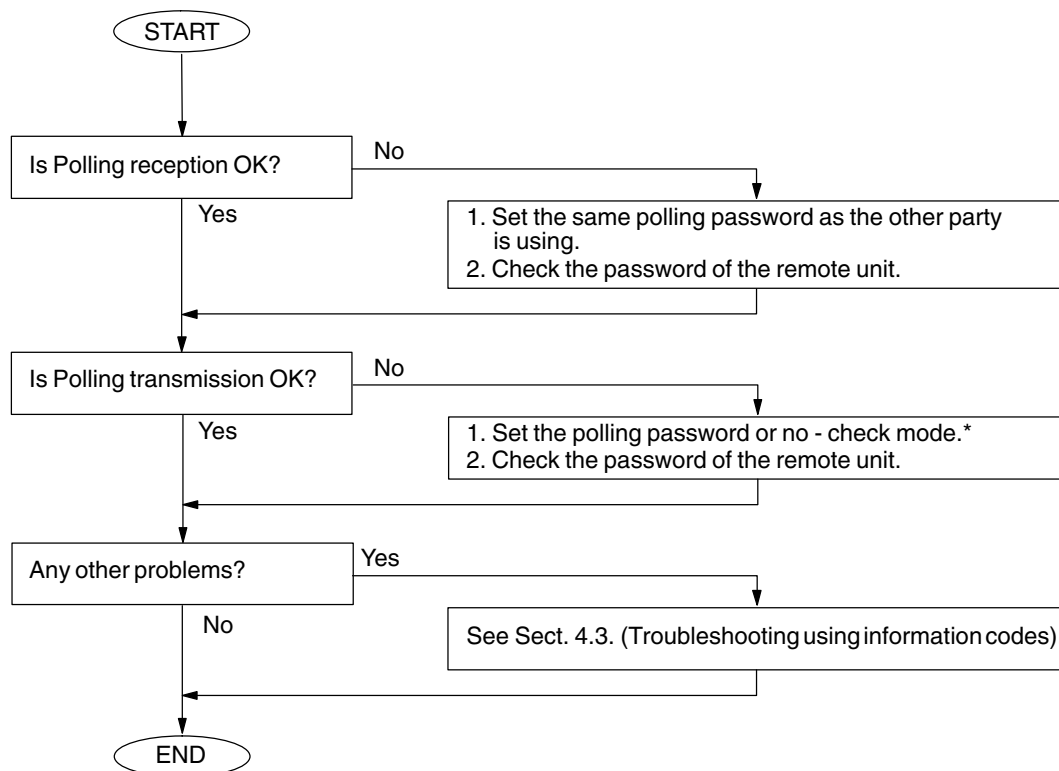
## 4.6.4. Transmission Problems



## 4.6.5. Reception Problems



### 4.6.6. Polling Problems

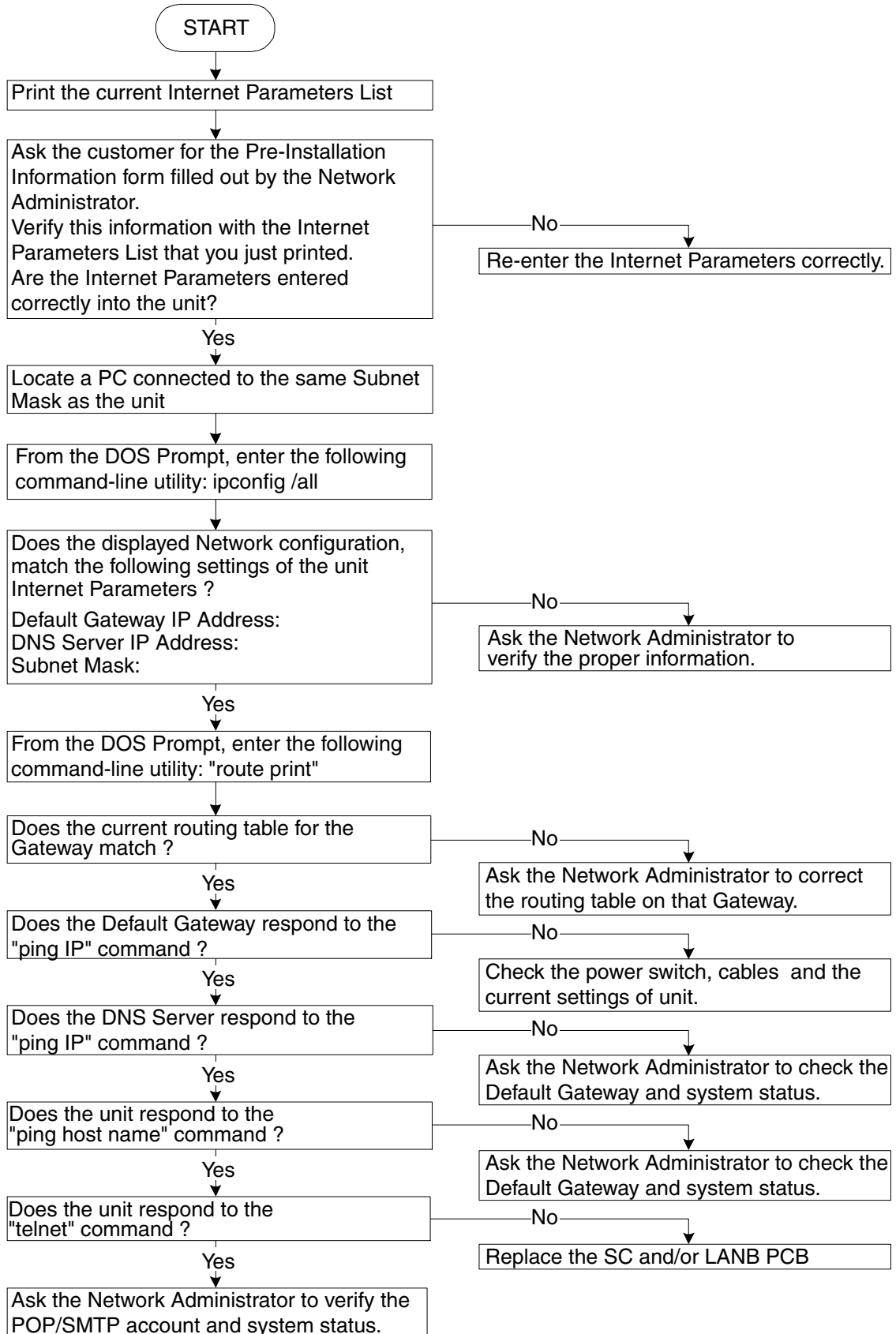


**Note:**  
No-check Mode means that password is not set.



## 4.7. Troubleshooting the LAN Interface

### 4.7.1. Checking Network Configuration



## 4.7.2. 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.

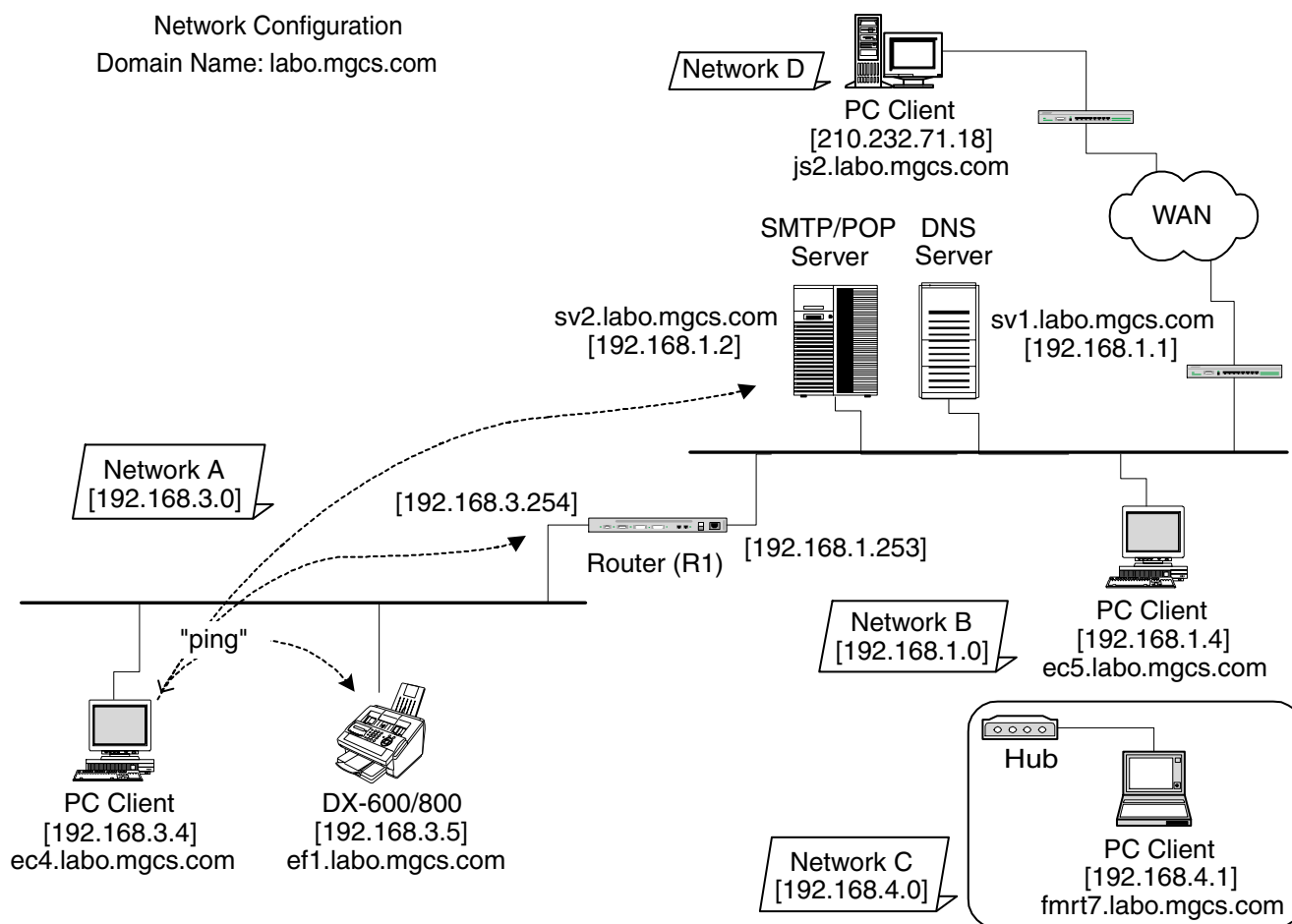
As with all networking, TCP/IP works better when its plugged in, therefore, start your troubleshooting by checking the Physical Connectivity first, the cable(s).

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.mgcs.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.mgcs.com

Pinging ef1.labo.mgcs.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.mgcs.com

Pinging sv2.labo.mgcs.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.mgcs.com

Pinging fmrt7.labo.mgcs.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.mgcs.com -n 10 -w 2000

Pinging js2.labo.mgcs.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.mgcs.com
Tracing route to sv2.labo.mgcs.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.mgcs.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.mgcs.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.mgcs.com.
[sv1.labo.mgcs.com.]
labo.mgcs.com.      NS  server = sv1.labo.mgcs.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.mgcs.com
[sv1.labo.mgcs.com]
labo.mgcs.com.      MX  10  sv2.labo.mgcs.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.mgcs.com
[sv1.labo.mgcs.com]
labo.mgcs.com.      NS  server = sv1.labo.mgcs.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.mgcs.com[192.168.3.5]

220 ef1.labo.mgcs.com DP18xx V.xx

helo
250 Hello

mail from:test
250 Sender OK

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

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

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

quit
221 Closing transaction channel
```



## 4.8. Information Codes 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 Cassette)	Recording paper jam. Timing Sensor abnormal.
002	RCV COPY	C, D	Leading edge of the recording paper fails to reach the Timing Sensor. (2nd Cassette)	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 cassette is opened while paper is feeding.	Paper cassette 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 Cassette is not installed properly.	Connector is not installed properly.
017			Incorrect paper size loaded in the Paper Cassette.	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 Toner Sensor.
043	STANDBY RCV COPY	B, C, D	Low toner.	Toner is getting low. Defective Toner Sensor.
045	STANDBY	-	No Toner Cartridge.	Toner Cartridge has not been installed. Defective Toner Sensor (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.
400	XMT	B	T1 timer (35 ± 5 sec.) elapsed without detecting 300 bps signal.	Wrong number is dialed and the START button is pushed. Telephone line is disconnected while dialing. SC PCB (Modem) or MJR PCB are defective. Receiver is defective. (It may only be transmitting CED)

<b>Fax Information Codes</b>				
<b>Code</b>	<b>Mode</b>	<b>Phase</b>	<b>Description of Problem</b>	<b>Cause</b>
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-CCITT 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, MJR PCB, etc.) SC PCB or MJR PCB are 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 MJR PCB are 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 (Modem) or MJR PCB are 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 MJR PCB are 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 MJR PCB are 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.
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.

<b>Fax Information Codes</b>				
<b>Code</b>	<b>Mode</b>	<b>Phase</b>	<b>Description of Problem</b>	<b>Cause</b>
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 MJR PCB are 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 MJR PCB are 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 MJR PCB are defective.
420	RCV	B	T1 timer (35 sec.) elapsed without detecting 300 bps signal.	There is wrong incoming call. (Non-facsimile communication) Transmitter is defective. SC PCB or MJR PCB are 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 MJR PCB are 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.	
490	RCV	C	Sum of error lines exceeded the limit (Function Parameter No. 70) of 64 lines.	Line quality is poor. SC PCB or MJR PCB are defective.
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 MJR PCB are 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 MJR PCB are defective.
501	XMT/ RCV(V.34)	B	Remote unit does not have compatible Modem.	

Fax Information Codes				
Code	Mode	Phase	Description of Problem	Cause
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 MJR PCB are defective.
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. MJR 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. MJR 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.
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.
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 MJR PCB is abnormal.
638	XMT	LAN	Power turned Off with applicable data in memory or during communication.	Power switched off. Power failure occurred.

<b>Fax Information Codes</b>				
<b>Code</b>	<b>Mode</b>	<b>Phase</b>	<b>Description of Problem</b>	<b>Cause</b>
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 LANC/LANB 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.
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 cassette(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.
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 with Email from a PC.	Verify that the Fax Parameter #158 is set to 2: Valid.

<b>Fax Information Codes</b>				
<b>Code</b>	<b>Mode</b>	<b>Phase</b>	<b>Description of Problem</b>	<b>Cause</b>
731	RCV	LAN	Dialer full while Relayed Transmission Request was received.	Dial buffer for manual number dialing (70 stations) are being used.
800	Relay Comm.		The machine was requested to relay a document but has no Relay Hub capability.	
815	Conf. RCV		Mailbox is full.	
816	Conf. Polled		"The received Polling Password did not match. The machine does not have Confidential Comm. capability."	
825	Conf. RCV Conf. Polled		Parameter settings of the initial sending station are not properly set.	
870	MEM XMT Multi-Copy		Memory overflow occurred while storing documents into memory.	

### 4.9. Diagnostic Codes (For Facsimile)

The 13-digit Diagnostic Code is provided for the service engineer 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
                                     1st digit 13th digit
-----
                                     - PANASONIC PANAFAX DX-800
***** - PANAFAX DX-800 - ***** -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	-	-		
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	-			

## 5 Service Modes

### 5.1. Service Modes (For Facsimile)

#### 5.1.1. 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
1	Function Parameter Setting	Allows changes to the function parameters (the home position, etc.).
2	RAM Edit Mode	Factory use only.
3	Print Parameter List / Reports	Prints the Function Parameter List, Page Memory Test, Printer Report, All Document File, Protocol Trace, Toner Order Form.
4	Modem Tests	Generates various binary, tonal and DTMF signals, by the modem.
5	Diagnostic	Performs various hardware tests.
6	RAM Initialization	Initialize RAM and restore the default value of the function parameters.
7	LBP Service Mode	Changes the Printer Parameters.
8	Check & Call	Allows input of information for Service Alert Report, Maintenance Alert Report, Toner Order Form.
9	System Maintenance	Used for Firmware Update and Sending a Received File during a fatal printer error.

### 5.1.2. Service Mode 1 (Function Parameter Setting)

Use the following procedure to change the function parameters.

Service Mode 1		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V ^
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V ^
4	Press "1".	PARAMETER (000-199) ENTER PARAMETER #_
5	Enter the Function Parameter Number. Ex: Changing the "ALARM STATUS" -- Enter "001" and press [SET].	PARAMETER #001 ALARM STATUS?
6	Press "START".	ALARM STATUS:Timer 1:OFF 2:Tmr 3:CONST
7	Enter the new setting value. Ex: Enter "3" for Constant.	ALARM STATUS:Const. 1:OFF 2:Tmr 3:CONST
8	Press "START". The new value will be stored and the next parameter will be displayed.	PARAMETER #002 STOP COMM.JRNL?
9	Repeat steps 4 through 7 to change other Function Parameters or Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

**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.

Service Mode 1 : Function Parameter Table

No.	Parameter	Selections	Function
000	MON/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 (6 sec.) 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)	Selects whether the Continuous Polling feature is enabled. <b>Stn:</b> Place the document(s) on the ADF then press the Program Key [P4] to store or add the document(s) into a polled file. (See Note 4)
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.
005	Not Used		
006	ID DISPLAY	1 = Number (Numeric ID) 2 = Chara (Character ID)	Selects the priority of displaying the ID.
007	JNL COLUMN	1 = Preset station name 2 = Received 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. (Refer to Chapter 4.3.)
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 = 0 dB 2 = 4 dB 3 = 8 dB 4 = 12 dB	Selects the cable equalizer for G3 reception mode, 0dB, 4dB, 8dB or 12dB.
014	G3 TX EQL	1 = 0 dB 2 = 4 dB 3 = 8 dB 4 = 12 dB	Selects the cable equalizer for G3 transmission mode, 0dB, 4dB, 8dB or 12dB.



Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
015 ~ 016	Not Used		
017	TX START	1 = 2400 bps 2 = 4800 bps 3 = 7200 bps 4 = 9600 bps 5 = TC7200 bps 6 = TC9600 bps 7 = 12000 bps 8 = 14400 bps	Selects the transmission modem start speed, 14400/12000/TC9600/TC7200/9600/7200/4800/2400 bps. <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	1 = 2400 bps 2 = 4800 bps 3 = 7200 bps 4 = 9600 bps 5 = TC7200 bps 6 = TC9600 bps 7 = 12000 bps 8 = 14400 bps	Selects the reception modem start speed, 14400/12000/TC9600/TC7200/9600/7200/4800/2400 bps. <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
025	COMM. START-UP	1 = 1'st response 2 = 2'nd response	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 (Panafax 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.

Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
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 = EOLx12	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.
033	V34 RX START	2400-33600bps	Selects the receiving modem start speed for V.34 communication, 33600-2400 bps.
034	V34 TX Symbol Rate	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 Symbol Rate	2400-3429sr	Selects receiving symbol rate for V.34, 3429/3429/3200/3000/2800/2400 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 "V" or "Λ" to display.
038	Not Used		
039	FLASH TIME	5 = 50 ms ~ 100 = 1000 ms	Selects the pause interval before activating the Flash key.
040	E/F TIME (Except for USA and Canada)	5 = 50 ms ~ 100 = 1000 ms	Selects the pause interval before activating the Flash key.
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.
044	REDIAL COUNT	0 = no redial ~ 15 = 15 times	Selects the redial count from 0 to 15 times in 1 step intervals. <b>Note:</b> In order to comply with the requirements TBR21 in 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	1 = 1 sec. ~ 90 = 90 sec.	Selects the waiting interval for the response after completing the dialing.
048	Not Used		
049	Not Used		

Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
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 (Except for USA and Canada)	1 = Off 2 = On	Selects whether to detect dial tone before dialing the telephone number.
057	DC LOOP CHECK (Except for USA and Canada)	1 = Off (will not check) 2 = On (checks)	Selects whether the unit checks the DC Loop during communication.
058	COMM.JRNL +IMAGE	1 = Off (without image) 2 = On (with image)	Selects whether the machine prints the COMM. Journal with image.
059	CONF. RCV REPORT ON	1 = Off 2 = On	
060	VERSION	Indicates the Host software version.	
061	TX/RX/PRT/CPY COUNTER	TX/RX/PRT/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	Not Used		
064	SILENT DETECTION TIME OUT	01 = 1 sec. ~ 60 = 60 sec.	Select silent detection timeout time (TAM I/F).
065	SILENT INTEGRATION TIME	01 = 1 sec. ~ 10 = 10 sec.	Select ring detection integration time (TAM I/F).
066	RING COUNT (TAM)	01 = 1 sec. ~ 99 = 99 sec.	Select ring detection count 1 to 99 times in one step intervals on TAM I/F mode.
067	Not Used		
068	NYSE FAX FORWARD (For USA and Canada only)	1 = Off 2 = On	Selects whether the machine will forward the incoming and outgoing faxes to a specified station.  <b>Note:</b> Once this parameter is activated, Fax Forwarding via Fax Parameter 054 is automatically disabled.
069	NYSE LOCAL PRINT	1 = INC 2 = ON (Always)	Selects the printing condition for the incoming faxes after FAX Forwarding. <b>INC.</b> : Prints only if FAX Forwarding fails. <b>ON</b> : Always prints.

Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
070	LINE ERROR	1 = 128 lines 2 = 256 lines 3 = 512 lines 4 = 1024 lines 5 = 2048 lines 6 = 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. 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)	Selects the coding scheme.
076	Not Used		
077	RX JAM LENGTH	1 = Off (unlimited) 2 = 2 m 3 = 8 m	Selects the maximum length of a received document that can be printed.
078 079	Not Used		
080	DOC. TOP FEED	-5.0 mm ~ +5.0 mm	Adjusts the distance between the scanning sensor ON position and the scanning start position.
081	DOC. END FEED	-5.0 mm ~ +5.0 mm	Adjusts the distance between the scanning sensor OFF position and the scanning end position.
082	JAM LENGTH	1 = 1 m 2 = 2 m 3 = 8 m 4 = Unlimited	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	Not Used		
086	REDUCTION FINE	1 = Off 2 = On	Selects whether the resolution is preset to Fine, when sending with reduction B4→A4. (For B4 Scanning Model only)

Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
087	DARKER LEVEL	0 = Lightest Contrast	Selects the contrast level. 0← →15 Lightest← →Darkest
088	NORMAL LEVEL	~	
089	LIGHTER LEVEL	15 = Darkest Contrast	
090 091	Not Used		
092	SMOOTHING	1 = Off 2 = On	Selects whether the smoothing function is available.
093 ~ 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	Not Used		
114	SYMBOL SET	1 = Standard 2 = Extended	Selects whether the extended symbols other than "%" is available for Internet Parameters entry.
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 ~ 119	Not Used		
120	FORWARD ALL COM. (Except for USA and Canada)	1 = Off 2 = On	Selects whether the machine will forward the incoming and outgoing faxes to a specified station. <b>Note:</b> If Fax Parameter 054 is activated, Fax Forwarding is enable.
121	FAC LOCAL PRINT (Except for USA and Canada)	1 = INC 2 = ON (Always)	Selects the printing condition for the incoming faxes after FAX Forwarding. <b>INC.</b> : Prints only if FAX Forwarding fails. <b>ON</b> : Always prints.
122	LDAP	1 = Off 2 = On	When LDAP is used, specialize characters may be displayed as different characters. Available from May production.

Service Mode 1 : Function Parameter Table			
No.	Parameter	Selections	Function
123 ~ 129	Not Used		
130	BUSY-ACK TIMING	<ul style="list-style-type: none"> <li>• In Busy</li> <li>• After Busy</li> <li>• While Busy</li> </ul>	Selects the signal timing between the BUSY and ACK signal in Printer Interface Mode.
131	CMD RCV GRD TIMER	1 min. ~ 15 min.	Selects the Guard Timer between each GDI Command in Printer Interface Mode.
132	PRT DATA TIMER	1 min. ~ 15 min.	Selects the Guard Timer between each GDI Data Frame in Printer Interface Mode.
133	COLLATION (PRT)	1 = Off 2 = On 3 = Auto	Selects the Print Collation in Printer Interface Mode. When "Auto" is selected, print collation will operate according to the setting in Fax Parameter #65.
134	COLLATION (PC I/F)	1 = Off 2 = On 3 = Auto	Selects the Print Collation in PC Interface Mode. When "Auto" is selected, print collation will operate according to the setting in Fax Parameter #65.
135 ~ 199	Not Used		

**Note 1:** 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 2:** 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 3:** The default setting of parameters depends on the destination's specifications or regulations. Print the Function Parameter List to confirm the default settings.

**Note 4:**

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 Function Parameter No. 003 to "2:Station". The Program Key [P4] will be assigned with the "Store-4-Polling" name automatically and cannot be changed.

To prepare the document(s) to be polled, simply place the document(s) on the ADF and then press the Program Key [P4] to store or add the document(s) into a polled file.

(**Note:** If a regular polled file ([FUNCTION][3][2]) is stored in memory, the Program Key [P4] for Continuous Polling will not be accepted.)

### 5.1.3. 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.

#### 5.1.3.1. Function Parameter List

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

Service Mode 3 - Function Parameter List		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR VΛ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR VΛ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "START".	* PRINTING * FUNC. PARAMETER LIST
6	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR VΛ
7	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%

## 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 POLL:[Off] Off                053 -----
004 NUMERIC ID SET:[On] On                   054 -----
005 -----                                   055 BUSY TONE CHECK:[On] On
006 ID DISPLAY:[Chara] Chara                 056 -----
007 JNL COLUMN:[Station] Station             057 -----
008 MONITOR:[Off] Off                         058 COMM. JRNL +IMAGE:[On] On
009 DC LOOP:[Off] Off                         059 CONF.RCV REPORT:[On] On

010 TX LEVEL:[-11dBm] -11dBm                 060 VERSION: DX-800 AAV11100AU
011 RX LEVEL:[-43dBm] -43dBm                 061 TX/RX/PRT/CPY:000050/000058/000074/000001
012 DTMF LEVEL:[-5dBm] -5dBm                 062 PRINT COUNTER:[Off] Off
013 G3 RX EQL:[ 0dB] 0dB                      063 -----
014 G3 TX EQL:[ 0dB] 0dB                      064 SILENT DET.T.OUT:[60] 60
015 -----                                   065 SILENT INT. TIME:[5sec] 5sec
016 -----                                   066 RING COUNT(TAM):[5] 5
017 TX START:[14400bps ] 14400bps             067 -----
018 RX START:[14400bps ] 14400bps             068 NYSE FAX FORWARD:[Off] Off
019 ITU-T V34:[On] On                         069 NYSE LOCAL PRINT:[Inc] Inc

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:[MMR] MMR
026 NON-STANDARD:[On] On                       076 -----
027 SHORT PROTOCOL B:[On] On                   077 RX JAM LENGTH:[Off] Off
028 SHORT PROTOCOL D:[On] On                   078 -----
029 REMOTE DIAG.: [On] On                       079 -----

030 CED & 300bps:[75ms] 75ms                  080 DOC TOP FEED:[0.0mm] 0.0mm
031 RTC=EQL x 12:[Off] Off                     081 DOC END FEED:[0.0mm] 0.0mm
032 V34 TX START:[33600bps] 33600bps           082 JAM LENGTH:[ 2 m] 2 m
033 V34 RX 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:[4] 4
038 -----                                   088 NORMAL LEVEL:[8] 8
039 FLASH TIME:[500ms] 500ms                  089 LIGHTER LEVEL:[12] 12

040 -----                                   090 -----
041 PAUSE TIME:[3sec] 3 sec                    091 -----
042 -----                                   092 SMOOTHING:[On] On
043 REDIAL INTERVAL:[3min] 3 min               093 -----
044 REDIAL COUNT:[5] 5                         094 -----
045 RING DET. COUNT:[2] 2                      095 -----
046 ON-HOOK TIME:[5sec] 5 sec                 096 -----
047 RESPONSE WAIT:[55sec] 55 sec              097 -----
048 -----                                   098 -----
049 -----                                   099 -----

```

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

- PANASONIC -

\*\*\*\*\* - PANAFAX DX-800 - \*\*\*\*\* - 12345678901234567890 -\*\*\*\*\*



## 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:0800230078DE 160 -----
111 ----- 161 -----
112 INSERT EMAIL TXT:[Off] Off 162 -----
113 ----- 163 -----
114 SYMBOL SET:[Std] Std 164 -----
115 TIME ZONE:[Scroll] Scroll 165 -----
116 OVERWRITE WARNING:[Yes] Yes 166 -----
117 ----- 167 -----
118 PRT FWD COMM JNL:[Inc] Inc 168 -----
119 ----- 169 -----

120 ----- 170 -----
121 ----- 171 -----
122 ----- 172 -----
123 ----- 173 -----
124 ----- 174 -----
125 ----- 175 -----
126 ----- 176 -----
127 ----- 177 -----
128 ----- 178 -----
129 ----- 179 -----

130 BUSY-ACK TIMING:[In Busy] In Busy 180 -----
131 CMD RCV GRD TIMER:[3min] 3min 181 -----
132 PRT DATA TIMER:[3min] 3min 182 -----
133 COLLATION(PRT):[Off] Off 183 -----
134 COLLATION (PC):[Auto] Auto 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.

-PANASONIC -

\*\*\*\*\* -PANAFAX DX-800- \*\*\*\*\* -12345678901234567890- \*\*\*\*\*

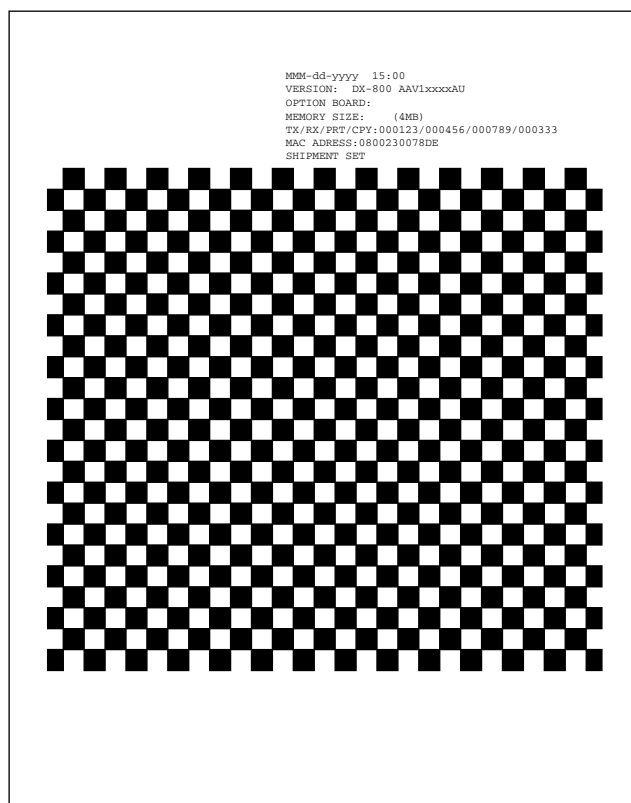
**Note:**

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

### 5.1.3.2. Page Memory Test

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

Service Mode 3 - Page Memory Test		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "**".	SERVICE MODE ENTER NO. OR V Λ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "3" and "START".	* PRINTING * PAGE MEMORY TEST
6	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR V Λ
7	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%



### 5.1.3.3. Printer Report

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

Service Mode 3 - Printer Report		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "4" and "START".	* PRINTING * PRINTER REPORT
7	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR V Λ
8	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%

```
*****-PRINTER REPORT-***** DATE MMM-dd-yyyy ***** TIME 19:02*****  
  
LAST PRINT ERROR      : MMM-dd 15:38 NO. 001-12  
CUSTOMER ID          : 1234567890123456  
FAX ROM VERSION      : DX-800 AAV1xxxxAU  
  
TRANSMIT COUNTER     : 000475  
RECEIVE COUNTER      : 000398  
COPY COUNTER         : 001083  
PRINT COUNTER        : 001575  
  
PRINT ERROR          : 1.MMM-dd-yyyy 15:38 NO.001-12  
                    : 2.MMM-dd-yyyy 10:48 NO.001-11  
                    : 3.MMM-dd-yyyy 15:23 NO.004-36  
                    :  
                    : - PANASONIC -  
***** - PANAFAX DX-800 - ***** - 12345678901234567890 - *****
```

## 1. Printer Error Code Table

Printer Error Code Table		
Error Code	Description of Problems	Cause
00	No problem detected.	
11	Timing Sensor did not turn ON within a certain period of time. (Original Cassette Feeder)	1. Recording Paper misfeeding, Paper Feed Roller defective. 2. Drive Clutch defective. 3. Timing Sensor defective.
12	Timing Sensor did not turn ON within a certain period of time. (250 sheet Optional Cassette Feeder)	1. Recording Paper misfeeding, Paper Feed Roller defective. 2. Drive Clutch defective. 3. Timing Sensor defective.
14	Timing Sensor did not turn OFF within a certain period of time.	1. Recording Paper Jam. 2. Timing Sensor defective. 3. Incorrect paper size setting.
15	Paper Exit Sensor did not turn ON within a certain period of time.	1. Recording Paper Jam. 2. Paper Exit Sensor defective.
16	Paper Exit Sensor did not turn OFF within a certain period of time.	1. Recording Paper Jam. 2. Paper Exit Sensor defective.
17	Timing Sensor detected paper while initializing the unit.	1. Recording Paper jammed in the unit. 2. Timing Sensor defective.
18	Paper Exit Sensor detected paper while initializing the unit.	1. Recording Paper jammed in the unit. 2. Paper Exit Sensor defective.
22	The temperature of the Fuser Roller remained low even after the circuit was activated.	1. Fuser Unit defective. 2. SC PCB defective. 3. Power Supply Unit defective.
23	Abnormally high Fuser Roller temperature after the circuit was de-activated.	1. Fuser Unit defective. 2. SC PCB defective. 3. Power Supply Unit defective.
24	The temperature of the Fuser Roller was not controlled within a certain margin.	1. Fuser Unit defective. 2. SC PCB defective. 3. Power Supply Unit defective.
25	Thermistor open. (See Note)	1. Thermistor defective (Fuser Unit). 2. SC PCB defective.
26	Thermistor detected temperature over 392°F (200°C). (See Note)	1. Thermistor defective (Fuser Unit). 2. SC PCB defective. 3. Power Supply Unit defective.
31	The Tetragon Motor did not reach a constant speed of 8,898 rpm (400 dpi)/13,347 rpm (600 dpi) within a specified period of time.	1. LSU defective.
32	The Tetragon Motor did not maintain a constant speed of 8,898 rpm (400 dpi)/13,347 rpm (600 dpi).	1. LSU defective.
36	HSYNC signal abnormal.	1. LSU defective. 2. SC PCB defective.
54	A/D Converter error.	1. SC PCB defective.
61	Unit detected "No Toner Cartridge".	1. Toner Cartridge not installed. 2. Toner Sensor defective.
63	Unit detected "Printer Cover Open".	1. Printer Cover is not closed. 2. ILS PCB defective.

Printer Error Code Table		
Error Code	Description of Problems	Cause
64	Unit detected "No Cassette".	1. Cassette not installed or partially open. 2. Cassette Sensor defective.
65	Unit detected "Out of Paper".	1. The Paper Cassette is empty. 2. Paper Detect Sensor defective.
81	No response from LP Controller.	1. SC PCB defective.
82	Illegal response from LP Controller.	1. SC PCB defective.

**Note:**

If an 021 series Error Code occurs, 021-25 (Thermistor Open) or 021-26 (Thermistor detected temperature over 392°F (200°C)), a pre-programmed recovery safety software is activated to protect the unit and the service personnel during abnormal increase in temperature.

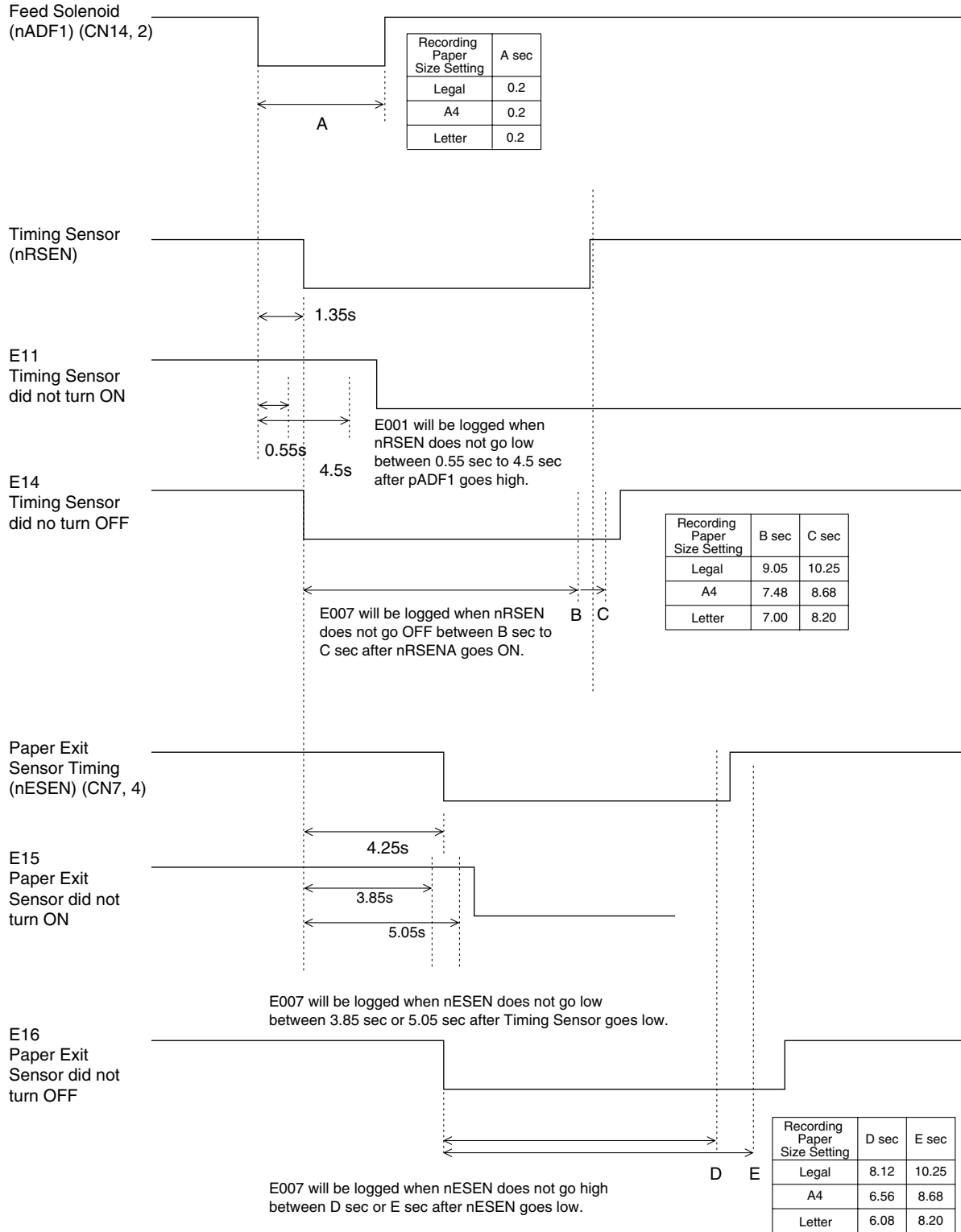
Once activated, this program is downloaded into the LPC PC Board's SRAM, disabling the Fuser Lamp and preventing it from turning ON again.

In order to reset this circuit, please follow the procedure below.

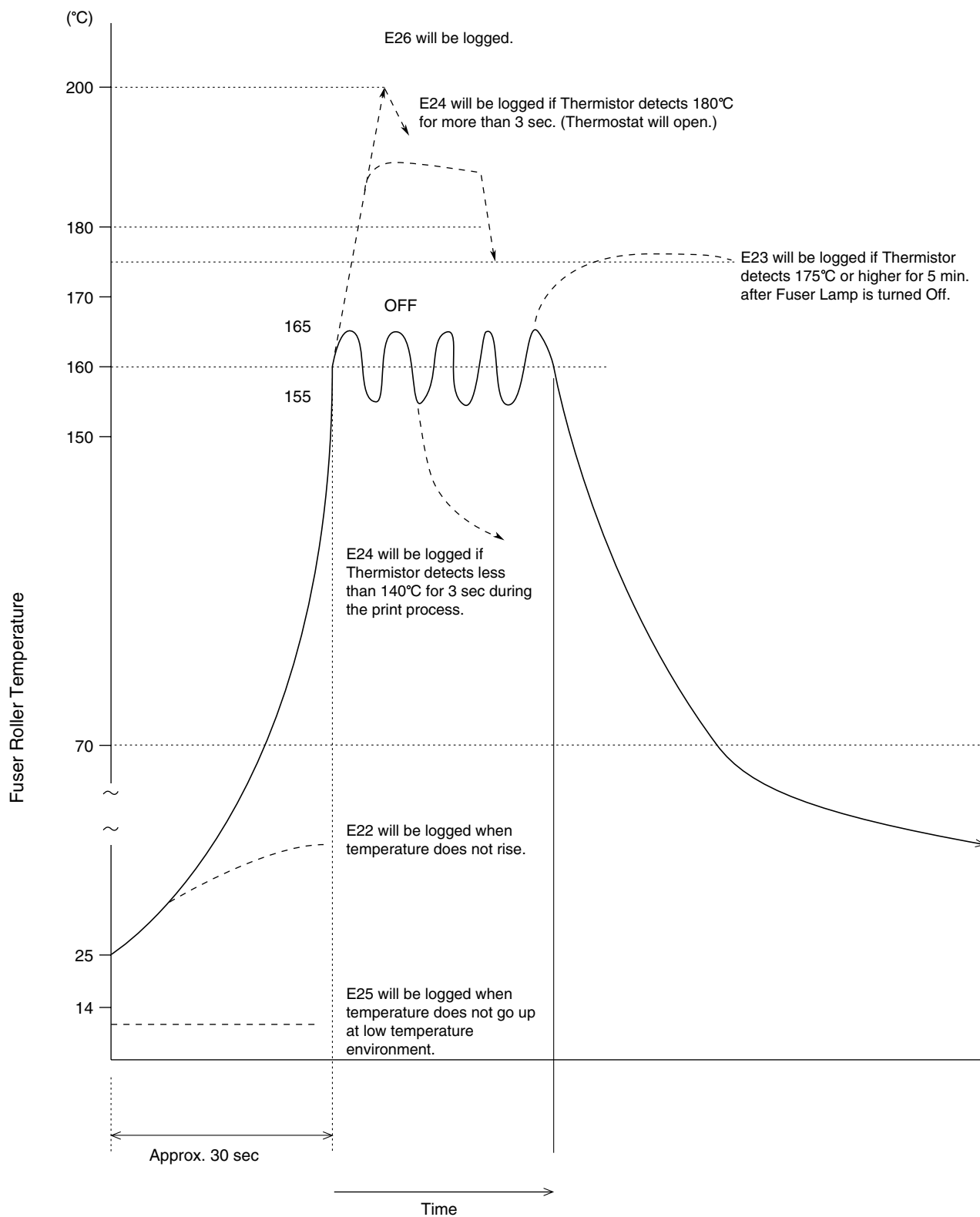
- 1) Reset the LBP Fuser by using Service Mode 7-1-2 (Section 5.1.7.) and Power OFF/ON.
- 2) Replace the Thermistor or Fuser Unit. If the problem persists.
- 3) Replace the SC PCB.

## 2. Printer Error Detail Explanation

### Recording Paper Jam Detection

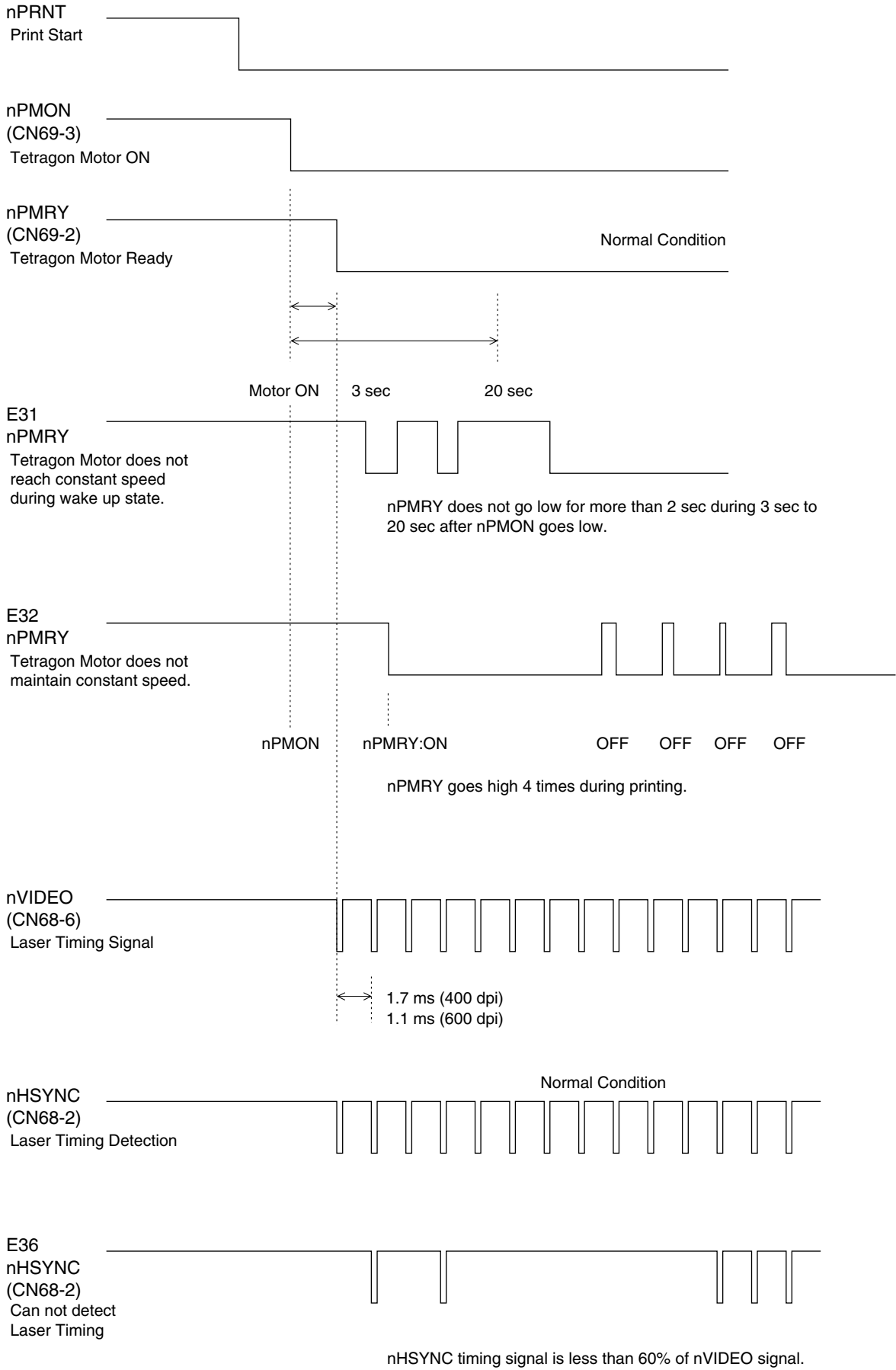


### Fuser Error Detection



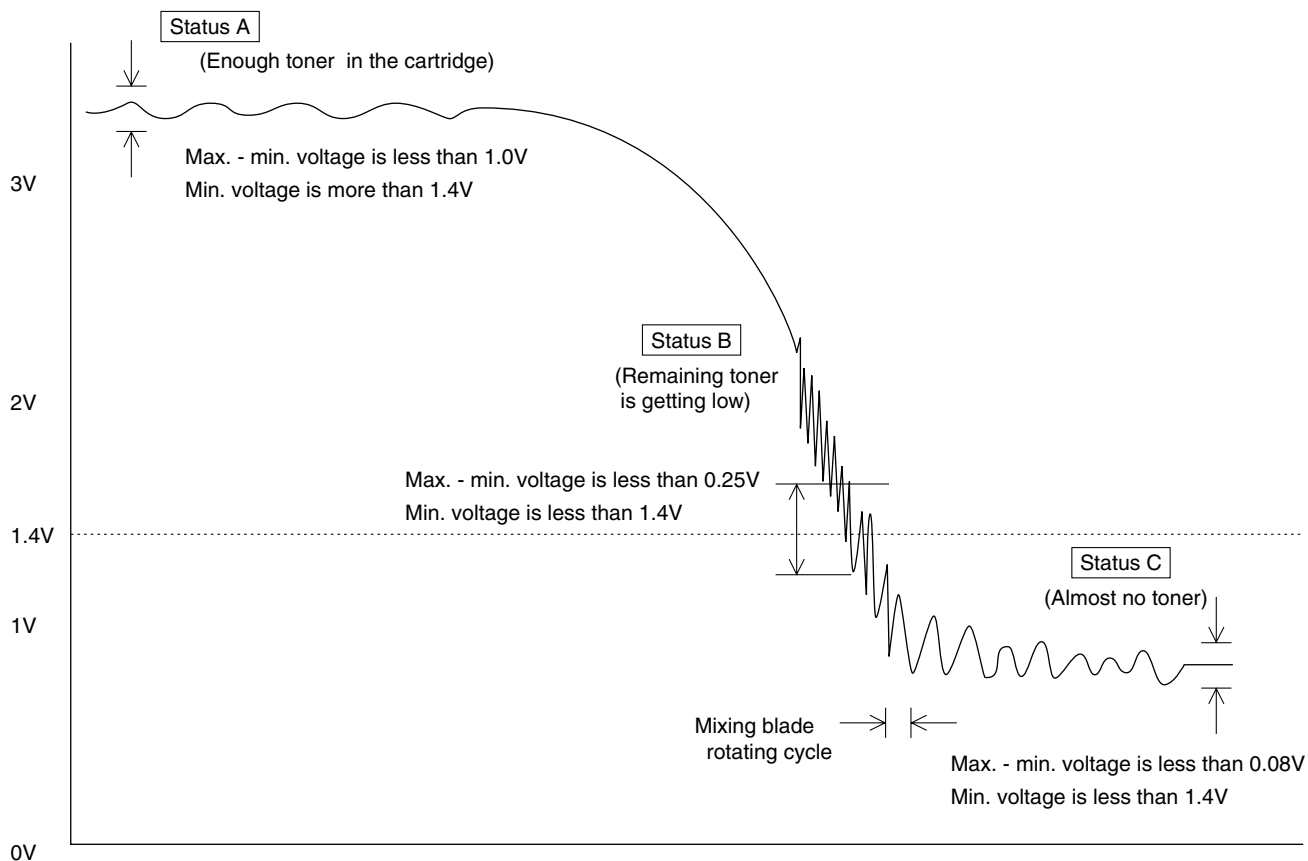


### Laser Unit (LSU) Error Detection



## Out of Toner Detection

### Toner Sensor Output Signal



Toner Sensor output may change when the mixing blade passes above the Toner Sensor. Therefore the output signal has a max. voltage and min. voltage during mixing blade rotation cycle (4.6 sec.).

### E043

If the unit detects Status B, 10 times during printing, the machine recognizes that the remaining toner is low and the display shows "REPLACE TONER CARTRIDGE".

### E041

After detecting E043 and the LBP Print Available Counter Value reaches "0" (after 100 pages are printed), the unit logs E041 (OUT OF TONER).

### E045

If the unit detects Status C when power is On, the unit logs E045 and displays "NO CARTRIDGE". The unit will recover when detecting Status A after a new toner cartridge is installed.

### 5.1.3.4. All Document Files

Print the document files from the Flash Memory.

Service Mode 3 - All Document Files		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "5" and "START".	* PRINTING * ALL DOCUMENT FILES
6	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR V Λ
7	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%

**Note:**

Documents received with a Confidential Code will not be printed by this operation.

### 5.1.3.5. Protocol Trace

Print a Protocol Trace Report for the previous communication.

Service Mode 3 - Protocol Trace		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR VΛ
3	Press "MONITOR" four times, then press "**".	SERVICE MODE ENTER NO. OR VΛ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "6" and "START". <b>Note:</b> If there were no transmission or reception mode after the power is last tured on, you cannot print the Protocol Trace Report.	* PRINTING * PROTOCOL TRACE
6	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR VΛ
7	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%

```

***** PROTOCOL LOG REPORT ***** DATE MMM-dd-yyyy ***** TIME 16:56 ***P.01

STATUS      : OK
MODE        : ECM-TX (STANDARD)
SPEED       : 9600bps 00MS/L
REMOTE CAPA. : DIS 00 CE B9 C4 80 12
LOCAL CAPA. : TSI 2B 20 20 20 3B 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       :
-----
REMOTE      : MCF
LOCAL       :      DCN

-PANASONIC-

***** -PANAFAX DX-800- *****-12345678901234567890-*****

```

### 5.1.3.6. Toner Cartridge Order Form

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

Service Mode 3 - Toner Cartridge Order Form		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "3".	PRINTOUT (1-7) 1:FUNC. PARAM. LIST
5	Press "7" and "START".	* PRINTING * TONER ORDER FORM
6	After printing is completed, the unit returns to the display in step 3.	SERVICE MODE ENTER NO. OR V Λ
7	Press "STOP" to return to standby.	MMM-dd-yyyy 15:00 00%

**For USA and Canada**

```

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

**** The toner supply in your facsimile machine is running low **** (1)

    To order a replacement Cartridge from your Authorized Dealer

                Panafax 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: UG-5510 (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) Order Tel #               | Up to 36 digits                                   |
| (4) Order Fax #               | Up to 36 digits                                   |
| (5) Customer ID               | Up to 16 characters (User Identification Code)    |
| (6) Toner Cartridge #         | UG-5510 (For USA / Canada) for DX-800             |

For Other Destinations

```

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

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

                Panafax 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: UG-3350 (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) Order Tel #               | Up to 36 digits                                   |
| (4) Order Fax #               | Up to 36 digits                                   |
| (5) Customer ID               | Up to 16 characters (User Identification Code)    |
| (6) Toner Cartridge #         | UG-3350 (For Other Destinations) for DX-600       |

## 5.1.4. Service Mode 4 (Modem Test)

### 5.1.4.1. Binary Signal

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

Service Mode 4 - Binary Signal		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR VΛ
3	Press "MONITOR" four times, then press "**".	SERVICE MODE ENTER NO. OR VΛ
4	Press "4".	MODEM TEST (1-5) 1: SIGNAL TEST
5	Press "START".	SIGNAL TEST IDLE (ENTER 1-9)
6	Enter the signal number (1-9) to select the binary signal.	SIGNAL TEST 300bps
7	Press "CLEAR" to end the signal generation. To select another signal, repeat step 6.	SIGNAL TEST IDLE (ENTER 1-9)
8	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

Binary Signal Table

Number	Signals
1	V21 300bps
2	V27ter 2400bps
3	V27ter 4800bps
4	V29 7200bps
5	V29 9600bps
6	V17 TC7200bps
7	V17 TC9600bps
8	V33 12000bps
9	V33 14400bps



### 5.1.4.2. Tonal Signal

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

Service Mode 4 - Tonal Signal		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "4".	MODEM TEST (1-5) 1: SIGNAL TEST
5	Press "2" and "START".	TONAL TEST IDLE (ENTER 1-7)
6	Enter the signal number (1-7) to select the binary signal.	TONAL TEST 1080Hz
7	Press "CLEAR" to end the signal generation. To select another signal, repeat step 6.	TONAL TEST IDLE (ENTER 1-7)
8	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

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

### 5.1.4.3. 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.

Service Mode 4 - DTMF Signal		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "4".	MODEM TEST (1-5) 1: SIGNAL TEST
5	Press "3" and "START".	DTMF TEST (1-2) 1. SINGLE
6a	Press "START" for DTMF Single Tone Generation.	SINGLE TONE ENTER (1-8)
7a	Enter the signal number (1-8) to select the DTMF signal.	SINGLE TONE 697Hz
6b	Press "2" and "START" for Dual Tone Generation.	DUAL TONE ENTER (0-#)
7b	Enter the signal number (0-#) to select the DTMF Dual tone.	DUAL TONE (0)
8	Press "CLEAR" to end the signal generation. To select another signal, repeat step 7a or 7b.	SINGLE TONE ENTER (1-8)
9	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

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

#### 5.1.4.4. 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)

Service Mode 4 - Binary Signal		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "4".	MODEM TEST (1-5) 1: SIGNAL TEST
5	Press "5" and "START".	V.34 MODEM TEST ENTER NO. ■
6	Enter the signal number (01-61) and press [START] to select the binary signal.	V.34 MODEM TEST V34 2400sr 2400bps
7	Press "CLEAR" to end the signal generation. To select another signal, repeat step 6.	V.34 MODEM TEST ENTER NO. ■
8	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

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 3429 sr 14400 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		

## 5.1.5. Service Mode 5 (Diagnostic)

### 5.1.5.1. CCD Test

This Service Mode is used to check the CCD.


Use the following procedure to initiate the test.

Service Mode 5		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "**".	SERVICE MODE ENTER NO. OR V Λ
4	Press "5".	DIAGNOSTIC (1-2) 1:CCD TEST
5	Press "START". The Scanner will be active.	1:CCD TEST * CHECK NOW *
6	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

### 5.1.5.2. LCD / LED Test

This Service Mode is used to check the LCD and LEDs on the Control Panel.

Use the following procedure to initiate the test.

Service Mode 5		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V Λ
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V Λ
4	Press "5".	DIAGNOSTIC (1-2) 1:CCD TEST
5	Press "2" and "START". 1) LCDs display as shown at right. 2) All LEDs will be lit.	2:LCD/LED TEST * CHECK NOW * 
6	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

### 5.1.6. Service Mode 6 (RAM Initialization)

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

**Note:**

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

Service Mode 6		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V ^
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V ^
4	Press "6".	* RAM INITIALIZE * ENTER NO. OR V ^
5	Press "V" or "^" to select the initialization mode. (See Table)	* RAM INITIALIZE * LOGO/ID/PSWD CLEAR
6	Press "START".	LOGO/ID/PSWD CLEAR * COMPLETED *
7	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

RAM Initialization Table

No.	Initialize Mode	Description
99	SHIPMENT SET (A)	Deletes all setting information, except parameter number 80 and 81, then set default values. (See Note)
98	SHIPMENT SET (B)	Deletes all setting information, except parameter number 61, 80 and 81, then set default values. (See Note)
97	FLASH MEMORY CLEAR	Deletes all information in the Flash Memory.
16	LBP LOG CLEAR	Clears the Printer Error Log.
15	LOGO/ID/PSWD CLR	Clears the Logo, ID, Polling Password.
14	ALL JOB CLEAR	Clears all Jobs stored in Flash Memory.
13	PROG. DIAL CLEAR	Clears the Program keys.
12	AUTO DIAL CLEAR	Clears the One-touch, ABBR Numbers and Phone Books.
11	JOURNAL CLEAR	Clears the Journal contents.
*	PARAMETER INIT.	Restores the Fax and Function Parameters to default values.

### 5.1.7. Service Mode 7 (LBP Service Mode)

This Service Mode is used to change printer parameters and verify printer information. Use the following procedure to change printer parameter.

Service Mode 7		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V ^
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V ^
4	Press "7".	LP SERVICE MODE (1-2) 1:LBP PARAMETER SET
5	1) Press "START" for printer parameter settings. Press "2" and "START" to get the printer information. Ex: Enter "START" for printer parameter settings.	LBP PARAMETER SET 1.PRINTER COUNTER
6	Press "3" and "START". Then enter the number of pages. Ex: Enter "50" and press "START".	LBP PARAMETER SET 3.OUT OF TONER
7	Press "V" or "^" to select another Parameter Name (See Table) or press "CLEAR" to return to step 4.	LP SERVICE MODE (1-2) 1.LBP PARAMETER SET
8	Repeat step 5 through 7 to request operation, or press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

Sub-Code	Parameter Name	Description	
1	1	PRINTER COUNTER	Displays and resets the Printer and Paper Cassette(s) counters.
	2	LBP FUSER RESET	Clears the LBP Fuser Error.
	3	OUT OF TONER	Sets the number of pages to print after low toner is detected. (Factory default = 100, adjustable from 0 - 999)
2	V ^	PRINT AVAILABLE	Shows the remaining number of allowable printable pages after low toner has been detected (Counter Only).
	V ^	LBP MEMORY CAPACITY	Shows the Page Memory Capacity.

## 5.1.8. Service Mode 8 (Check & Call)

### 5.1.8.1. Overview

This feature enables the Authorized Servicing Dealers to manage and improve the Fax 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.
4. When the unit detects Low Toner, it can automatically transmit the Maintenance Alert Report to the pre-registered telephone number.
5. When the unit detects Low Toner, it can automatically print out the Toner Order Form with pre-registered order information.

### 5.1.8.2. 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. 5.1.3.1.)

2. Automatic transmission/printout

3. 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. However, the unit will not transmit the Service Alert Report if it finds the same error within the same date in the error log.

4. Maintenance Alert Report

When the unit detects Low Toner, the unit can automatically transmit the Maintenance Alert Report to the pre-registered telephone number. Refer to the Printer Error Code Table.

5. Toner Cartridge Order Form

When the unit detects Low Toner, the unit can automatically print the Toner Order Form with the pre-registered order information.

#### 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).

#### • Printer Error Code Table

Printer Error Code Table						
Info. Code	Printer Error Code	LED/LCD	Log Only	Tx Report	Condition	Content of Error
001	11	JAM	O		R/C	Paper Jam 1st Cassette.
002	12	JAM	O		R/C	Paper Jam 2nd Cassette.
007	14-18	JAM	O		R/C	Paper Exit Error.
010	00	NO PAPER			R/C	No Paper in 1st or 2nd Cassette.
011	64, 65	NO Cassette			S	No 1st or 2nd Cassette.
021	22-26		O	S	R/C	Fuser Problem / LP Thermistor disconnected Problem
041	00	TONER	O		S/R/C	No Toner
043	00	TONER	O	M	S/R/C	Low Toner Warning
045	61	TONER	O		S	No Toner Cartridge

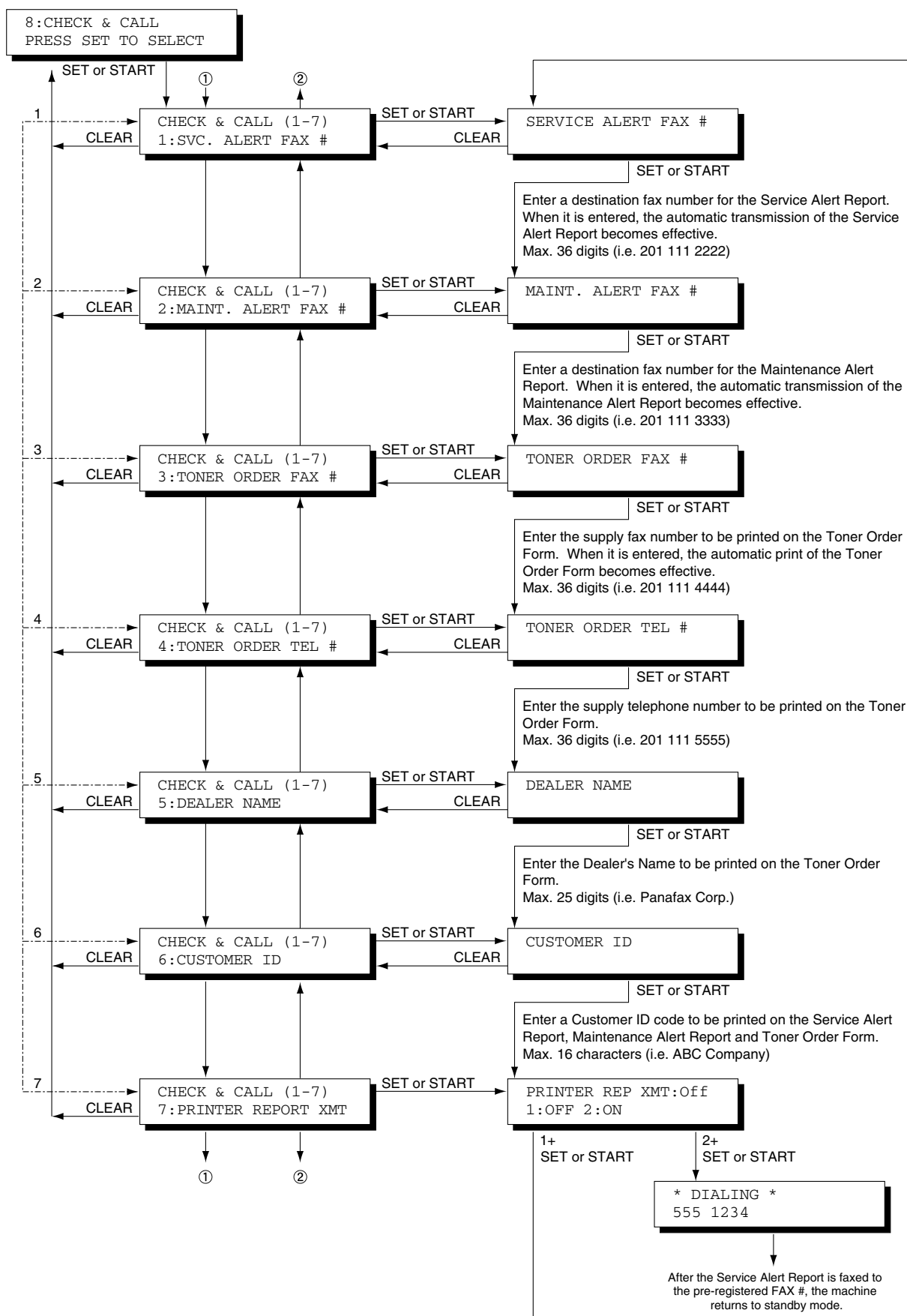


Printer Error Code Table						
Info. Code	Printer Error Code	LED/LCD	Log Only	Tx Report	Condition	Content of Error
051	54		O	S	R/C	Printer Error
054	31,32,36		O	S	R/C	LSU Problem
055	81, 82		O	S	R/C	No response from LP Controller
060						Rx Door Open

**Note:**

1. Tx Report: S = Service Alert Report, M = Maintenance Alert Report
2. Condition: R = Receive Mode, C = Copy Mode, S = Standby Mode, T = Transmit Mode

### 5.1.8.3. Setting Operation



**Note****1. Service Alert Report**

To enable the automatic transmission of Service Alert Report, enter the destination fax telephone number in the "SERVICE ALERT (FAX #)" field. When a printer error occurs, the Service Alert Report is transmitted to the designated number automatically. A blank entry in this field, disables the Automatic transmission of the Service Alert Report.

**2. Maintenance Alert Report**

To enable the automatic transmission of Maintenance Alert Report, enter the destination fax telephone number in the "MAINT. ALERT (FAX #)" field. When a printer error occurs, the Maintenance Alert Report is transmitted to the designated number automatically. A blank entry in this field, disables the Automatic transmission of the Maintenance Alert Report.

**3. Toner Cartridge Order Form**

To enable the automatic printout of the Toner Cartridge Order Form, enter the destination fax telephone numbers in the "Order FAX #" field. When a low toner error occurs, the Toner Order Form is printed automatically.

**4. SERVICE ALERT FAX #**, this would be the fax telephone number for the Dealer's Service Department.

**MAINT. ALERT FAX #**, this could be the fax telephone number for the Dealer's Supply Sales Desk.

**ORDER FAX #**, this could be the fax telephone number for the Dealer's Supply Sales Desk.

**ORDER TEL #**, this could be the voice telephone number for the Dealer's Supply Sales Desk.

**DEALER NAME**, this name is printed on the Toner Order Form.

**CUSTOMER ID**, to identify your customer, enter up to 16 characters user code in this field. This name will be printed on the Service Alert Report, Maintenance Alert Report and Toner Order Form.

**5. Printer Report XMT**

To manually transmit the Service Alert Report to the pre-registered SERVICE ALERT REPORT FAX #, set the Printer Report XMT to "2:ON".





## 5.1.9. Service Mode 9 (System Maintenance)

### 5.1.9.1. Overview

This Service Mode is used to maintain and/or update the firmware of the machine. Use the following procedure for System Maintenance.

Service Mode 9		
Step	Operation or Unit Condition	LCD Display
1	Standby	MMM-dd-yyyy 15:00 00%
2	Press "FUNCTION" and then "7".	SET MODE (1-8) ENTER NO. OR V ^
3	Press "MONITOR" four times, then press "*".	SERVICE MODE ENTER NO. OR V ^
4	Press "9".	SYSTEM MAINT. (1-8) 1:FIRMWARE UPDATE
5	Press "START" to update the firmware. Enter No. or press "V" or "^" to select the maintenance to be performed. Ex: Enter "2".	SYSTEM MAINT. (1-8) 2:FIRMWARE BACKUP
6	Press "SET" and "START".	FIRMWARE BACKUP (1-3) 1:HOST PROGRAM <4MB>
7	Press "SET" or "START".	FIRMWARE BACKUP * IN PROGRESS *
8	After the backup is completed, repeat step 4 through 6 to request an operation.	SERVICE MODE ENTER NO. OR V ^
9	Press "STOP" twice to return to standby.	MMM-dd-yyyy 15:00 00%

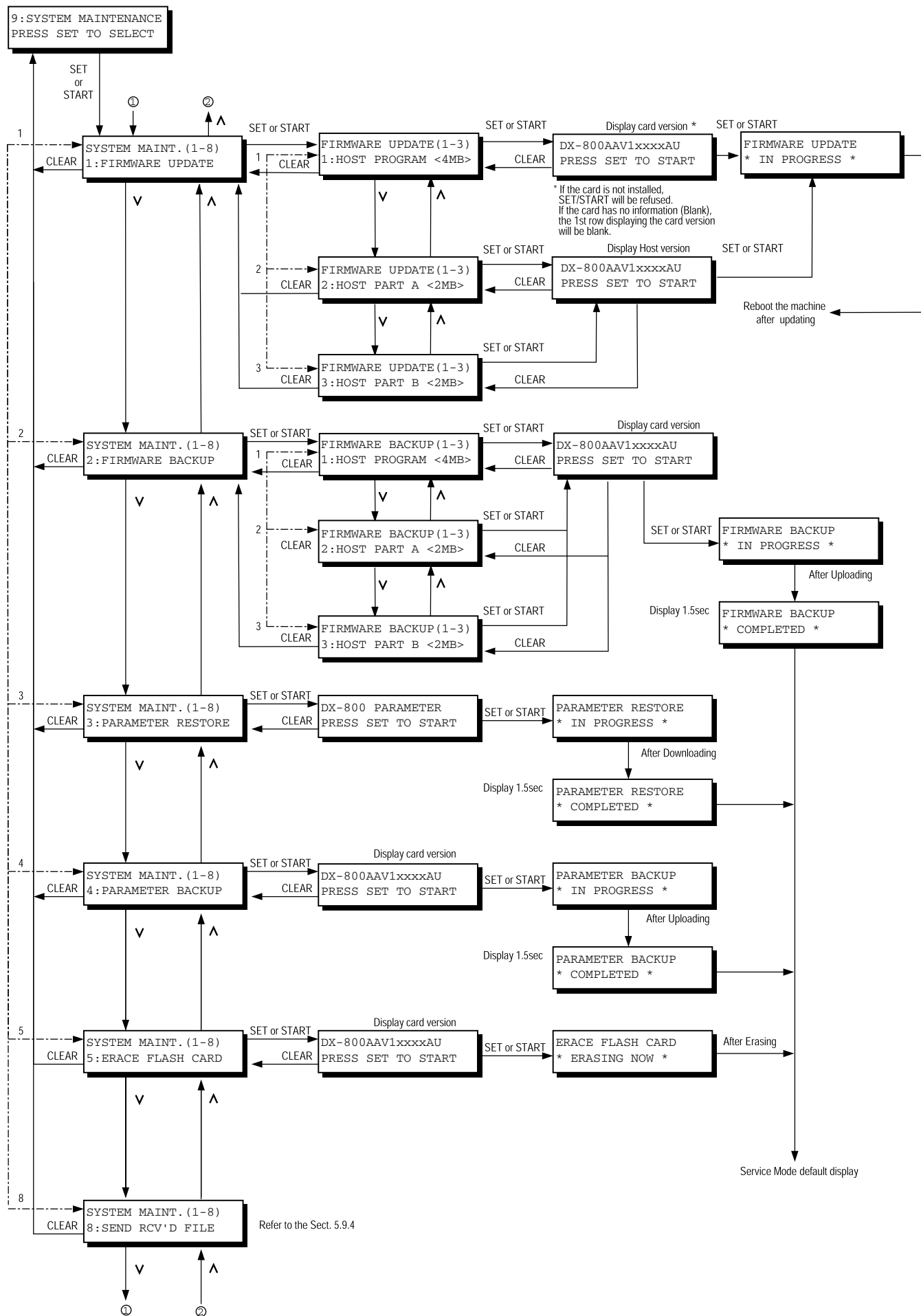
### System Maintenance Table

No.	Maintenance Mode	Description
1	FIRMWARE UPDATE	Updates the firmware in the machine with the Master Firmware Card. Updates the firmware in the machine with the Master Firmware from the PC. After the firmware is updated, the machine reboots automatically and returns to standby. See Note. 1: HOST PROGRAM <4MB> 2: HOST PART A <2MB> 3: HOST PART B <3MB>
2	FIRMWARE BACKUP	Creates a Backup Card of the machine's firmware. (A 2 MB or higher Flash Memory Card is required) See Note. 1: HOST PROGRAM <4MB> 2: HOST PART A <2MB> 3: HOST PART B <3MB>
3	PARAMETER RESTORE	Restores the parameters from the Backup Card into the machine.
4	PARAMETER BACKUP	Creates a Backup Card of the machine's parameters.
5	ERASE FLASH CARD	Erase a Master Firmware Card.
8	SEND RECEIVED FILE	Transfers documents from memory to another fax machine during a fatal printer error.

**Note:**

The created Backup Card must be removed from the machine.

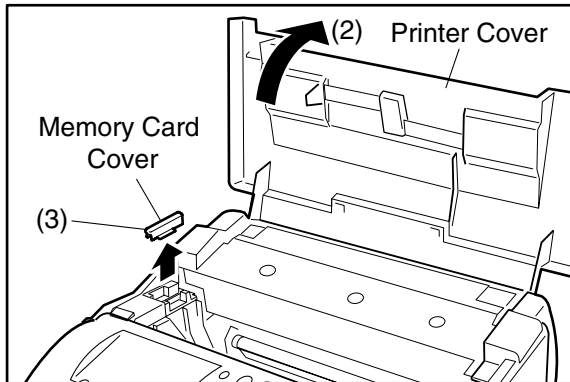
### 5.1.9.2. Operation



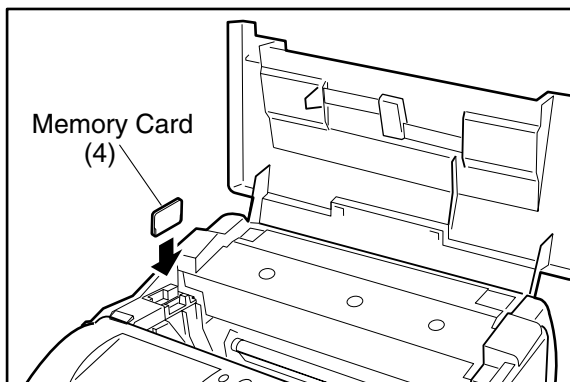


### 5.1.10. Recovering from a Firmware Update Failure

If the Firmware Update is interrupted before completion, the machine will not be able to progress into the Standby Mode and the LCD display will remain Blank. If this happens, please follow the steps described below to recover from a failed firmware update.



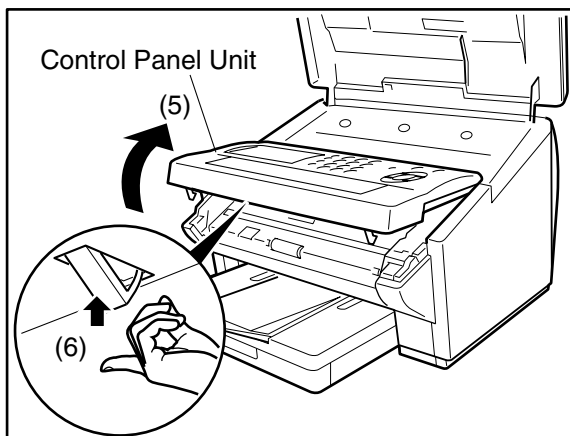
- (1) Unplug the Power Cord.
- (2) Open the Printer Cover.
- (3) Remove the Memory Card Cover.



- (4) Insert the Flash Memory Card gently into the card slot with the Panasonic logo facing to the outside of the machine.

**Caution:**

Installing the Flash Memory Card in the wrong direction may damage the connecting pins inside the machine.



- (5) Open the Control Panel Unit.
- (6) Activate the Read Point Sensor with your finger and plug in the Power Cord.
- (7) Wait approximately 10 seconds, release the Read Point Sensor, close the Control Panel Unit (ADF) and the Printer Cover.
- (8) Allow the unit to complete the Firmware Update (approx. 1-minute). When completed, the unit will reboot and progress to the Standby Mode.
- (9) Unplug the Power Cord.
- (10) Remove the Flash Memory Card.
- (11) Re-install the Memory Card Cover.
- (12) Plug in the Power Cord.
- (13) Perform Parameter Initialization.

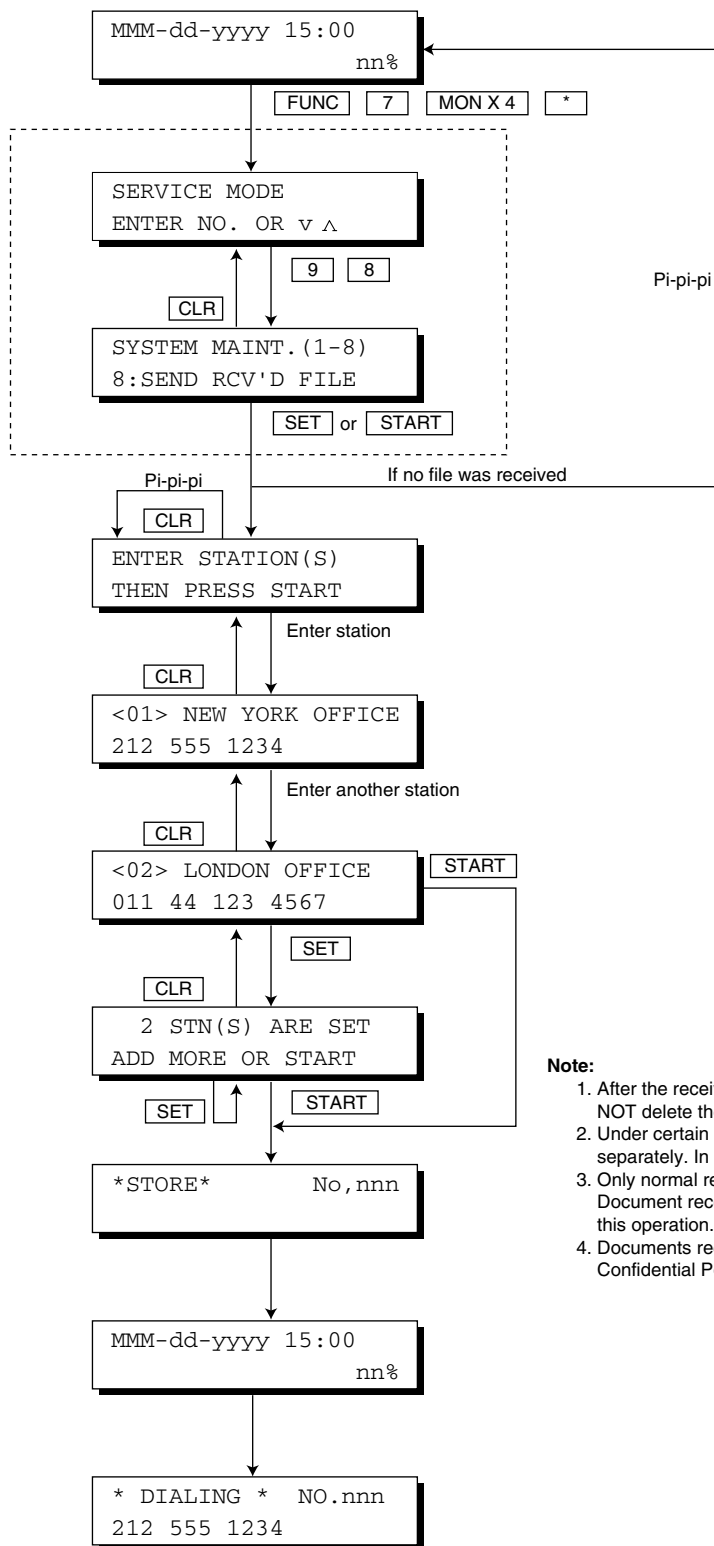
**Note:**

For Updating the Firmware Remotely through the Phone Line, please refer to the Firmware Update Tool (Remote) Operating Instructions.

Please inform to the Customer prior to proceeding with the Remote Firmware Update, to Never Unplug the Power Cord or turn the machine OFF. If the machine is turned OFF during the Remote Firmware Update, it may not be re-coverable at all. During the Remote Firmware Update, the LCD display shows ON LINE \* DIAG \*.

### 5.1.10.1. Send Received File

This function is the relief mode which makes it possible to retrieve memory received documents during a fatal printer error by transferring the documents to another fax machine.



**Note:**

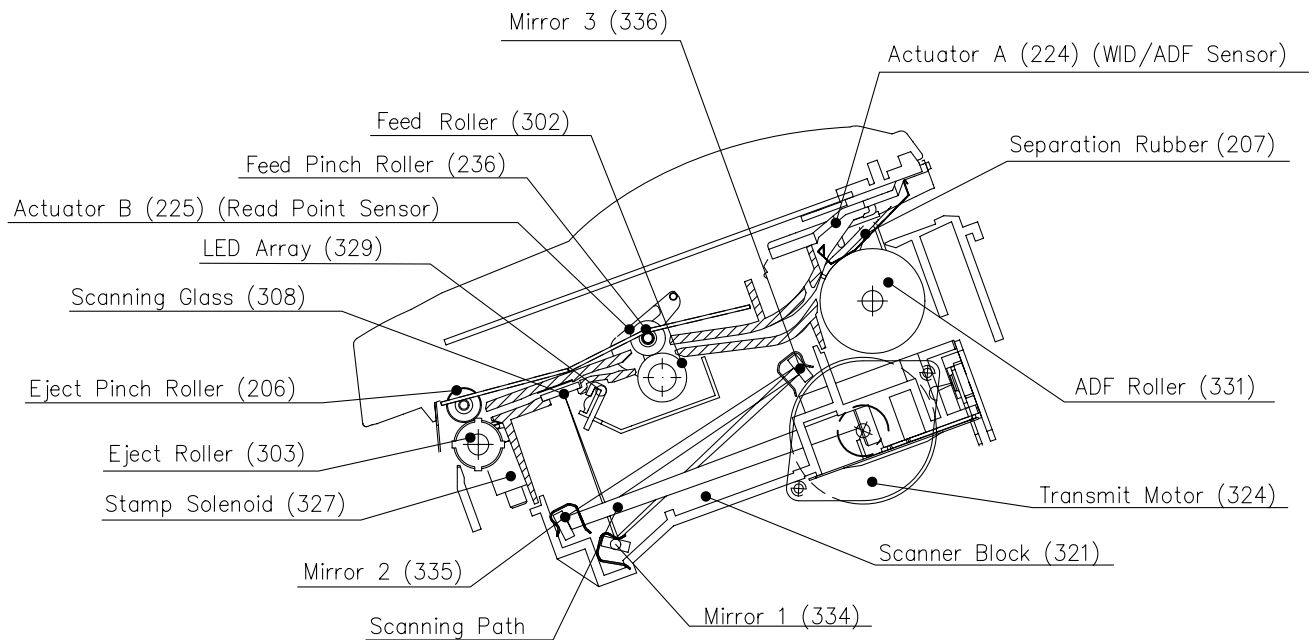
1. After the received document file is successfully transmitted, unit will NOT delete the file automatically.
2. Under certain conditions there could be two (2) received files stored separately. In this case, transmission will be made separately.
3. Only normal received document will be transmitted. Document received with a confidential code will NOT be transmitted by this operation.
4. Documents received with a confidential code, can be retrieved by using Confidential Polling from a remote station.

## 6 System Description

### 6.1. Mechanical Operation

#### 6.1.1. 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:



#### ADF Mechanism

The ADF (Automatic Document Feeder) automatically feeds paper into the unit, and consists of ADF Roller and Separation Rubber. Each document is placed face-down on the **Printer Cover** (106) before being fed into the unit.

- The **ADF Roller** (331) feeds individual pages into the scanning area.
- The **Separation Rubber** (207) separates documents placed on the ADF, preventing multiple feeding.

#### LED Array (329)

The DX-600/800 has one LED Array, used as a light source to illuminate the document. The LED Array turns ON when the Read Point Sensor is activated by the document leading edge.

#### Transmit Guide Unit

The Transmit Guide Unit is an auxiliary part used for feeding and ejecting documents. It consists of the **Transmit Guide** (301), **Control Panel Chassis** (201), **Feed Roller** (302), **Eject Roller** (303), and **Eject Pinch Roller** (206) and **Feed Pinch Roller** (236). This unit also provides the white scanning area and serves as a base for electronic white reference.

#### Transmit Mechanism Drive System

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

- The **Transmit Motor** (324), 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** (302) feeds the document to the scanning point.
- The **Eject Roller** (303) feeds and ejects the document out of the machine.

## Transmit Mechanism Sensors

The **ADF Sensor** (PC1), activated by **Actuator A** (224), detects the presence of documents on the ADF Tray and multiple pages.

The **RP (Read Point) Sensor** (PC3), activated by **Actuator B** (225), detects the lead and trail edges of the document, controlling the reading position. The CPU determines that a document is jammed if Actuator B is not tripped within a specified time after the ADF Roller starts feeding, and disengages the ADF Roller by reversing the Transmit Motor direction.

The **ADF Door Sensor** (PC2), activated by **ADF Door Actuator** (226), halts all scanning operations when the Control Panel Unit is opened.

## Verification Stamp Unit

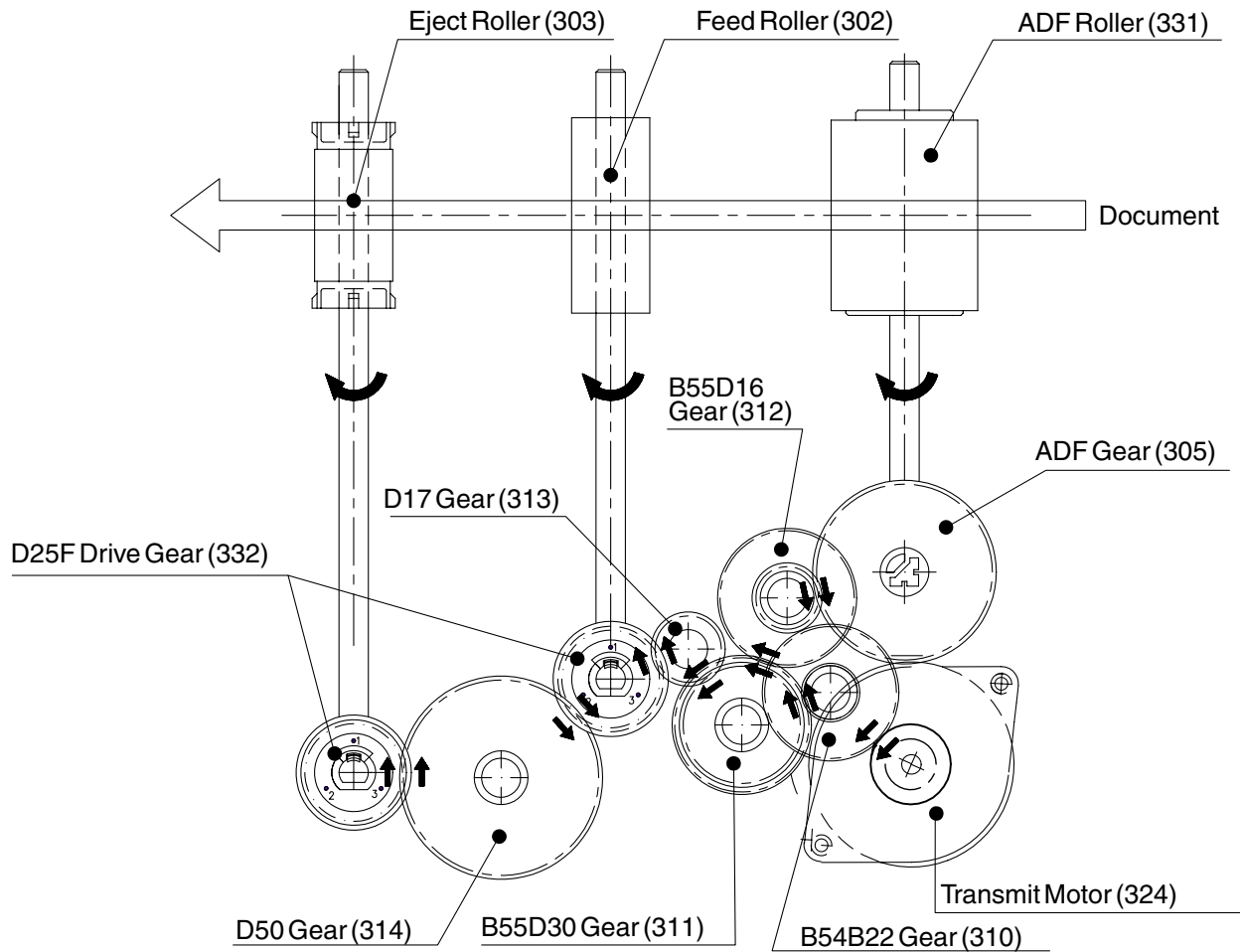
The Verification Stamp Unit stamps an "X" mark on the front of the document after the document is successfully transmitted or stored. It consists of the **Stamp Head** (325), **Stamp Holder** (326) and **Stamp Solenoid** (327).

## Scanner Block (321)

The Scanner Block consists of three mirrors, a **Lens**, and a **CCD PC Board** (1014).

- The mirrors, **Mirror 1** (334), **Mirror 2** (335) and **Mirror 3** (336) reflect image information, in the form of light, through the Lens.
- The **Lens** focuses the image information and passes it to the CCD.
- The **CCD**, mounted on the CCD PC Board, converts the image information into an electronic signal.

## Drive System

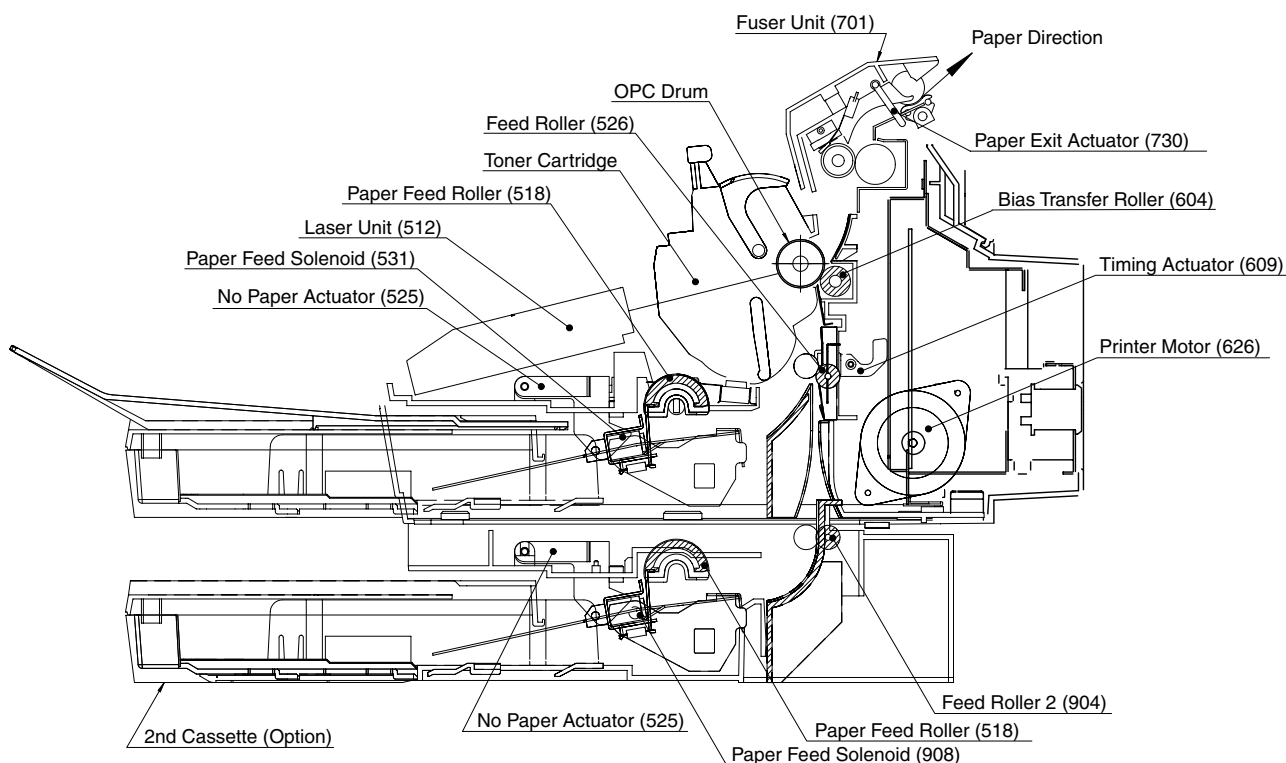


### 6.1.2 Control Panel

The Control Panel consists of the **PNL PC Board (1004)** and **LCD Unit**, which displays the various status messages, and a membrane-type panel.

### 6.1.3. Printing Mechanism

The Receive Mechanism consists of the Laser Unit (LSU), OPC (Organic Photo Conductor) Drum, and various other parts which ensure the normal feeding of recording paper. These components and their functions are as follows:



#### Paper Feed Units No.1 and 2

The Paper Feeder Unit No. 2 is available as an option.

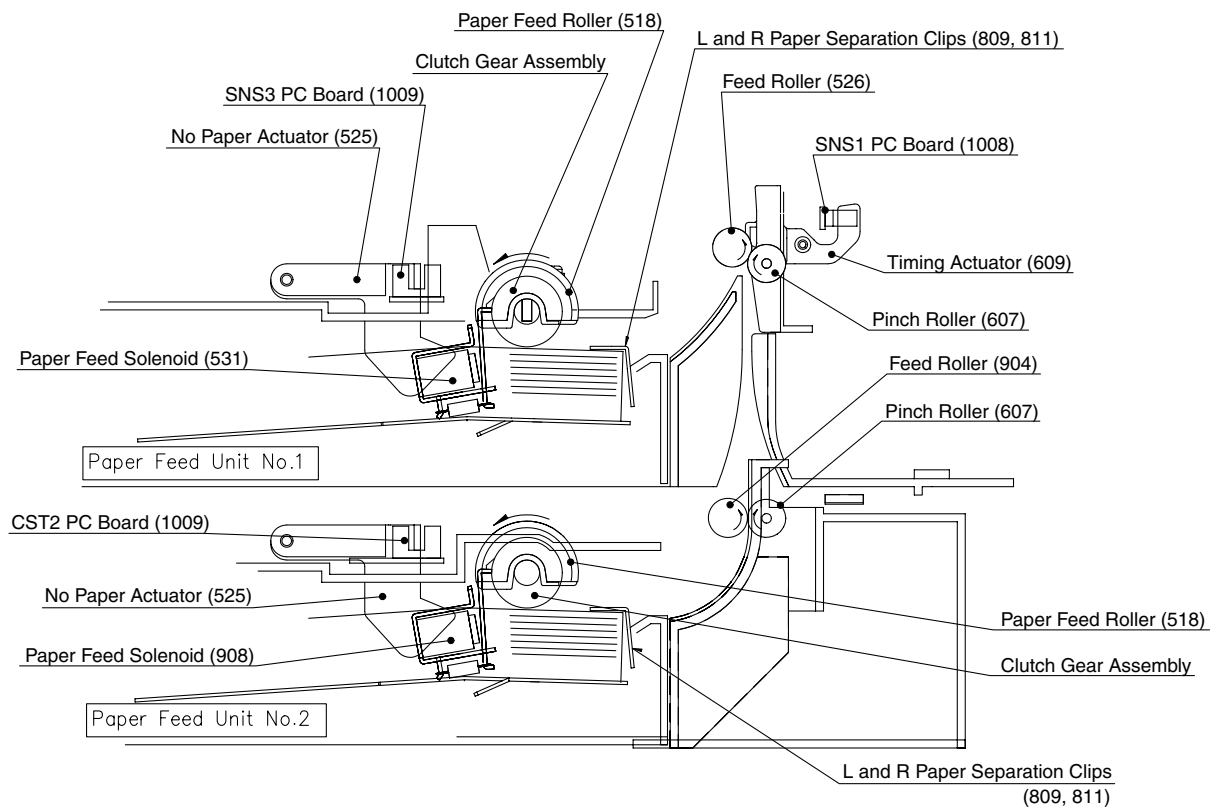
#### Paper Feed Unit No.1 Operation

1. The printing operation begins when the nPRNT (Print Request) output signal level goes Low. The **Printer Motor** (626) is initialized.
2. The **Paper Feed Solenoid** (531) is energized for a specified period of time and turned ON. This activates the **Paper Feed Roller** (518), which rotates one revolution. The paper is separated into individual sheets by the **L and R Paper Separation Clips** (809 and 811) and transported to the **Feed Roller** (526).
3. After one revolution the **Paper Feed Roller** (518) stops, releasing the paper. The **Feed Roller** (526) transports the paper to the drum area.
4. The actual printing process starts at a specified time after the **Timing Actuator** (609) is activated and stops at a specified period of time after the trailing edge clears the **Timing Actuator** (609).

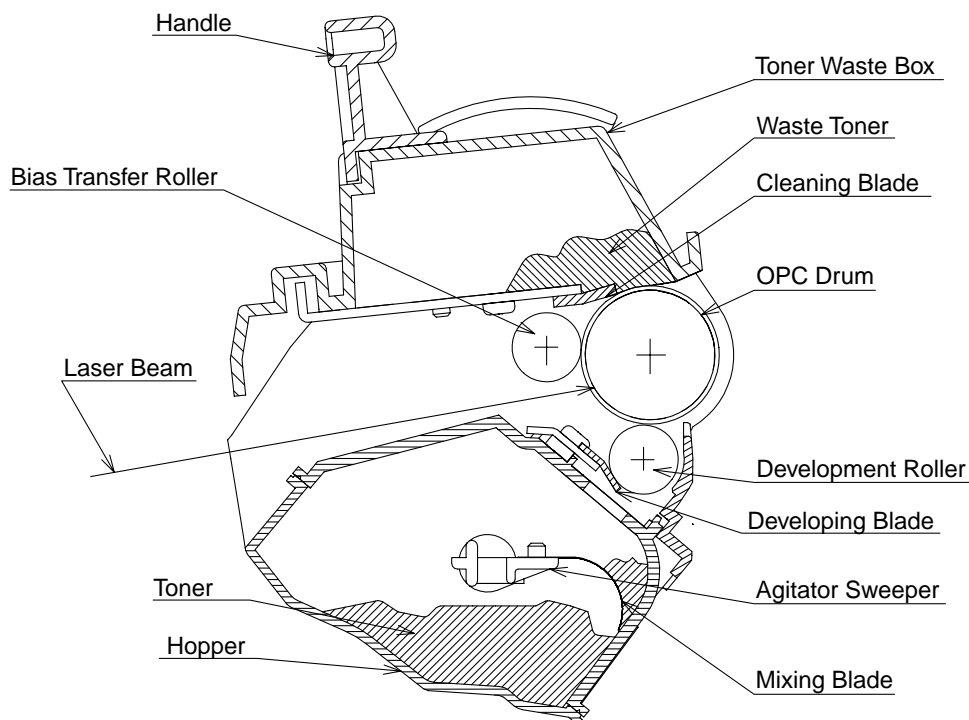
## Paper Feed Unit No. 2 (Optional) Operation

The Paper Feed Unit No.1 always takes priority. The Paper Feed Unit No. 2 becomes operational only when the cassette No.1 runs out of paper and the NP Sensor is deactivated, causing the nPCHK1 output signal level to go High.

1. The printing operation begins when the nPRNT (Print Request) output signal level goes Low. The **Printer Motor** (626) is initialized.
2. The **Paper Feed Solenoid** (908) is energized for a specified period of time and is turned ON. This activates the **Paper Feed Roller** (518), which rotates one revolution. The paper is separated into individual sheets by the **L and R Paper Separation Clips** (809, 811) and transported to the **Feed Roller 2** (904).
3. After one revolution the **Paper Feed Roller** (518) stops, releasing the paper. The **Feed Roller 2** (904) and the **Feed Roller** (526) transports the paper to the drum area.
4. The actual printing process starts at a specified time after the **Timing Actuator** (609) is activated and stops at a specified period of time after the trailing edge clears the **Timing Actuator** (609).



## 6.1.4. Printing Process Operation



### Charge

In the dark, the Bias Charge Roller (BCR) applies a high, uniform negative charge to the surface of the OPC Drum. The surface potential is approximately -650 VDC and remains because the drum has a high electric resistance in the dark.

### Exposure

A portion of the laser beam is deflected to the timing sensor [Beam Detection (BD) Sensor], which controls the start timing of scanning on the OPC Drum. The CPU also uses the timing sensor to detect abnormal signals. The light beam from the laser diode is modulated by the digital signal (nVIDEO) and converted to parallel light waves by the collimator lens. The beam is then directed to the rotating tetragon mirror, where it is reflected to the f- $\theta$  lens and then focused onto the OPC Drum surface. The laser beam moves across the surface of the OPC Drum in the scanning direction. Where the laser beam is applied, the negative charge on the drum dissipates, and where the laser is not applied, the negative charge remains. This action forms a latent, electrostatic image on the OPC Drum, corresponding to the original image.

### Development

This development process uses a conventional method, where toner coats a Development Roller and transfers to the latent image on the OPC Drum. In the Toner Cartridge, the (mono-component) toner is negatively charged by the friction between the rotating Development Roller (Mag Roller) and the Developing Blade. This combination and the rotation of the Mixing Blade transfers the toner from the reservoir and forms a brush effect on the Mag roller. Where the magnetic brush lightly touches the OPC Drum, the negatively charged toner is attracted to the latent image on the drum, forming a mirror image of the original on the drum. Any remaining toner is removed from the Mag Roller by the Developing Blade and is recycled back into the toner reservoir. A bias voltage of approximately 1.65 kVACp-p at 1.875 kHz, riding on a -300 VDC bias is applied to the magnetic brush to achieve maximum print quality.

The **Toner Sensor** (513), a magnetic sensor, detects the remaining quantity of toner in the Toner Cartridge. When the "TONER" lamp starts to blink, there is still enough toner left in the cartridge to print 100 pages (based on ITU-T Image No.1). When the toner runs out, the display will show: "OUT OF



TONER & INFO CODE 041” and the machine is disabled from printing any copies.

The **Toner Cartridge** consists of OPC Drum, Bias Charge Roller, Development Roller, Developing Blade, Cleaning Blade, Mixing Blades and Toner Waste Box. The **OPC Drum** is an aluminum cylinder coated with an OPC (Organic Photo Conductor) sensitive material. This surface is photoelectric (retains the charge in the dark and releases the charge in the light). The potential differences on the surface (a static latent image) form a printed image. The **Bias Charge Roller** provides a uniform charge on the OPC Drum surface. The **Development Roller** supplies toner to the drum by rotating over the magnet. The **Developing Blade** evens the toner on the Development Roller surface and also charges the toner by friction. The **Cleaning Blade** cleans by scraping the remaining toner off the OPC Drum surface after transfer.

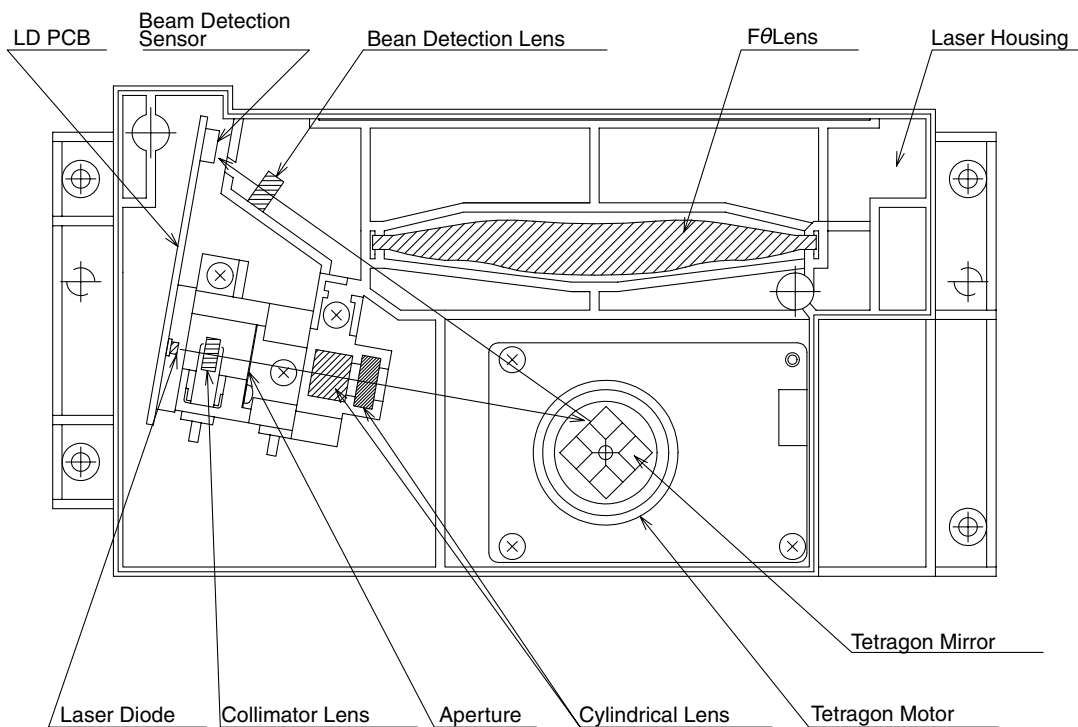
## Transfer and Separation

As the paper is fed between the OPC Drum and the **Bias Transfer Roller (BTR)** (604), a positive charge of approximately  $+3.0 \mu\text{A}$  steady current is applied to the backside of the paper by the BTR. The toner particles are attracted away from the drum towards the surface of the paper. During cleaning, the BTR is charged to approximately  $-1500 \text{ VDC}$  to repel toner on the OPC Drum and prevent toner from being attracted to the BTR. After transfer has occurred, the paper passes over the **Discharge Plate** (612) in the **Transfer Guide** (601), reducing the difference of potential between the OPC Drum and the paper. The stiffness of the paper causes the paper to separate from the drum.

## Cleaning

After transfer, some toner may remain on the surface of the OPC Drum. A Cleaning Blade scrapes the OPC Drum surface, and the removed toner is moved into the Toner Waste Box, inside the Toner Cartridge.

## Laser Unit



## Laser

A 5 mW Laser Diode, with a wave length of 780 nm ( $\pm 20$  nm), provides a modulated beam controlled by nVIDEO. The beam power on the drum surface is approximately 0.15 mW, and is controlled by the monitor circuit.

## Collimator Lens

This lens converges and focuses the laser beam, converting it to parallel light.

## Aperture

This controls the size of the laser beam.

## Tetragon Mirror and Motor

The tetragon scanner consists of a 4-sided mirror, directly driven by a tetragon motor, revolving at 8,898 rpm (400 dpi) or 13,347 rpm (600 dpi). Scanning speed for 400 dpi and 600 dpi are controlled by motor clock supplied from SC PCB. Motor clock for 400 dpi is 890 Hz and 600 dpi is 1,335 Hz. The laser beam is reflected against these mirrors and swept over the recorded width in the scanning direction. This unit features a stable line scanning speed, a precision mirror reflection angle, a reflection free surface, and instant start.

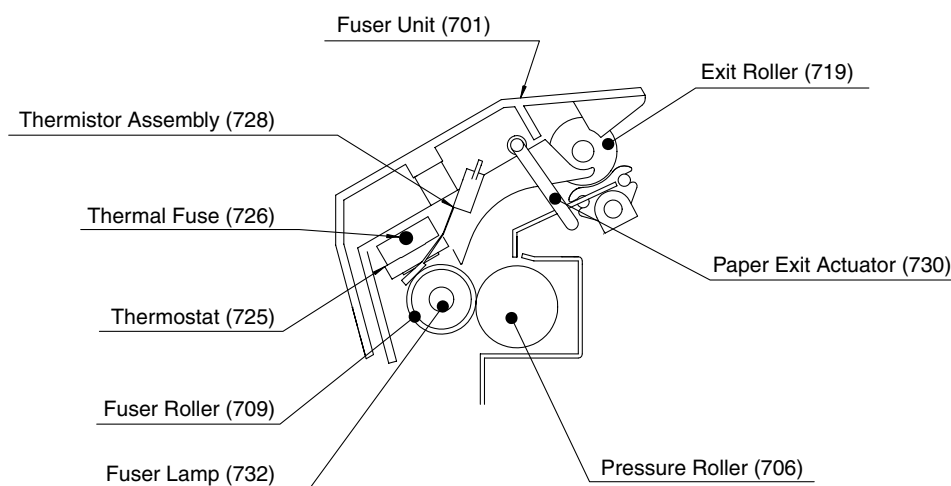
## Beam Detection (BD) Lens and Beam Detection (BD) Sensor

The BD Lens receives the reflected light from the Polygon Mirror and redirects it into the BD Sensor, which converts the laser beam into electrical signals and sets the start timing for the scanning line.

## f- $\theta$ Lens

This amorphous plastic, molded lens is designed to provide parallel laser light across the surface of the drum, providing a constant scanning speed.

## Fusing and Paper Exit



## Fuser Unit (701)

The Fuser Unit, consisting of the Fuser Lamp, Fuser Roller, Pressure Roller, Thermistor, and Thermostat, bonds the toner into the paper using heat and pressure.

### **Fuser Lamp (732)**

Located in the Fuser Roller is a Halogen lamp that serves as the heat source for the Fuser Roller.

### **Fuser Roller (709)**

A Teflon coated roller supplies the heat for bonding the toner to the paper. The temperature of the surface is kept constant at approximately  $160 \pm 5^{\circ}\text{C}$  or ( $320^{\circ}\text{F}$ ).

### **Pressure Roller (706)**

This converted PFA tube Silicon Rubber Roller applies pressure to the Fuser Roller, assisting in bonding the toner to the paper.

### **Thermistor Assembly (728)**

The Thermistor, a heat sensitive resistor, in contact with the Fuser Roller, monitors the surface temperature. The temperature detected is used to control the ON/OFF switching of the Fuser Lamp. It also acts as the primary overheat prevention device. A comparator circuit on the FCB PC Board acts as a secondary overheat protection and becomes active at approximately  $185^{\circ}\text{C}$  ( $365^{\circ}\text{F}$ ).

### **Thermostat (725)**

A Thermostatic Fuse, part of the power line for the Fuser Lamp, provides an extra overheat protection by opening when the Fuser Roller surface temperature reaches approximately  $200^{\circ}\text{C}$  ( $392^{\circ}\text{F}$ ) and remains there for 1 minute. If the primary and secondary overheat protection does not halt the rise in temperature, the thermostat opens, removing power from the Fuser Lamp. When the Thermostat opens, it must be replaced.

### **SNS4 PC Board (1007) [Paper Exit Sensor]**

This sensor detects the presence of printed paper at the exit. If no paper passes, or if paper is over the sensor too long, a "RECORDING PAPER JAM" message is displayed. When paper passes over the sensor, the output is Low (Low Active).

### **Thermal Fuse (726)**

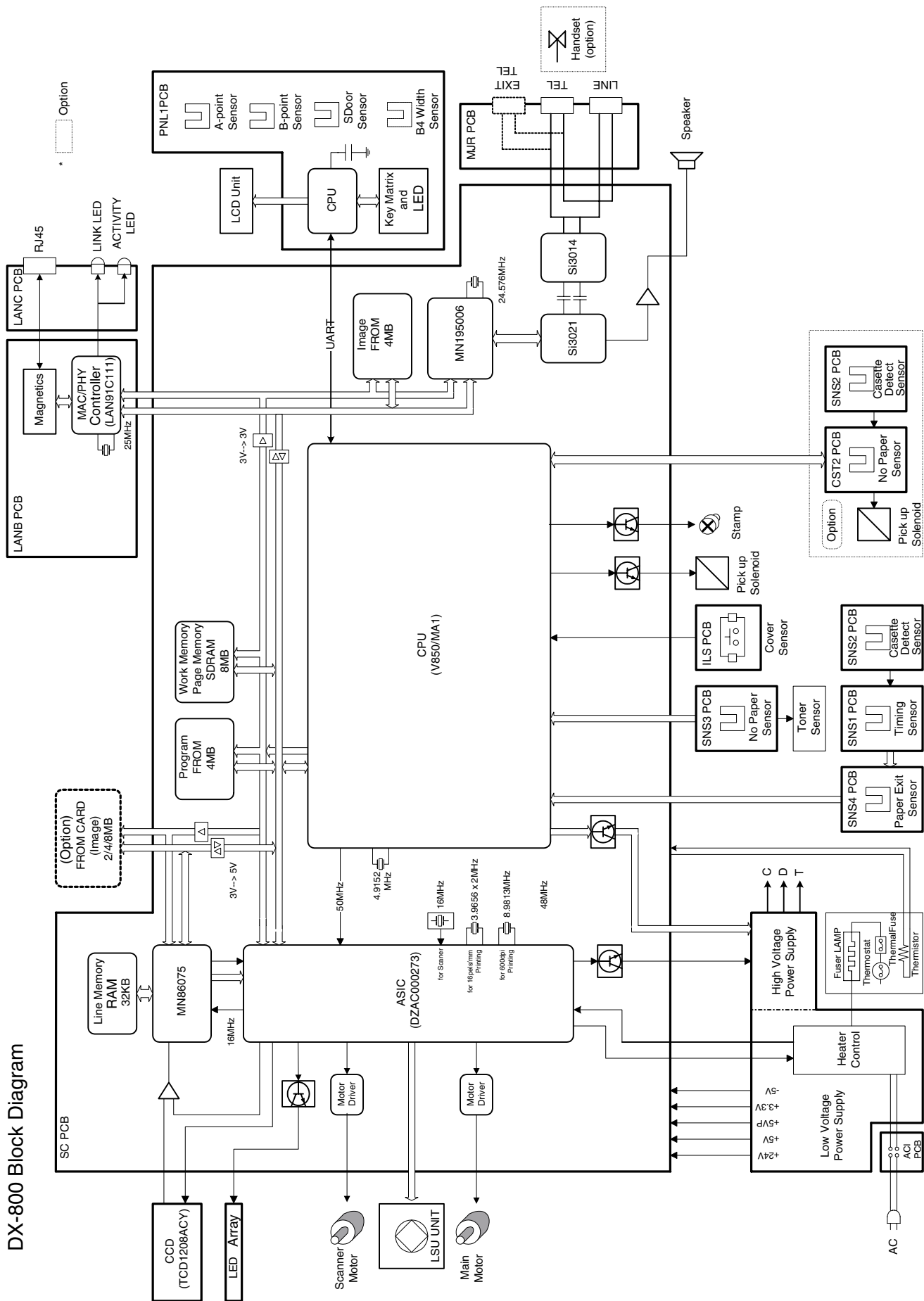
It is placed in series with the Thermostat on the power line of the Fuser Lamp and performs the tertiary overheating prevention (in case the Thermostat fails) by opening when the surrounding temperature reaches approximately  $216^{\circ}\text{C}$  ( $420.8^{\circ}\text{F}$ ).

## **6.1.5 Covers and Enclosures**

The **Printer Cover** (106) contains the **R and L Document Guides** (107 and 108), which adjust to the paper width to properly feed the original documents. The **Left Cover** (103) has a **Speaker** (117) mounted inside and shields the circuit boards. The **Rear Cover** (105) contains the **Recording Paper Tray** (111) and **Recording Paper Sub Tray** (112), used to support legal size documents.

## 6.2. Electrical Circuit Explanation

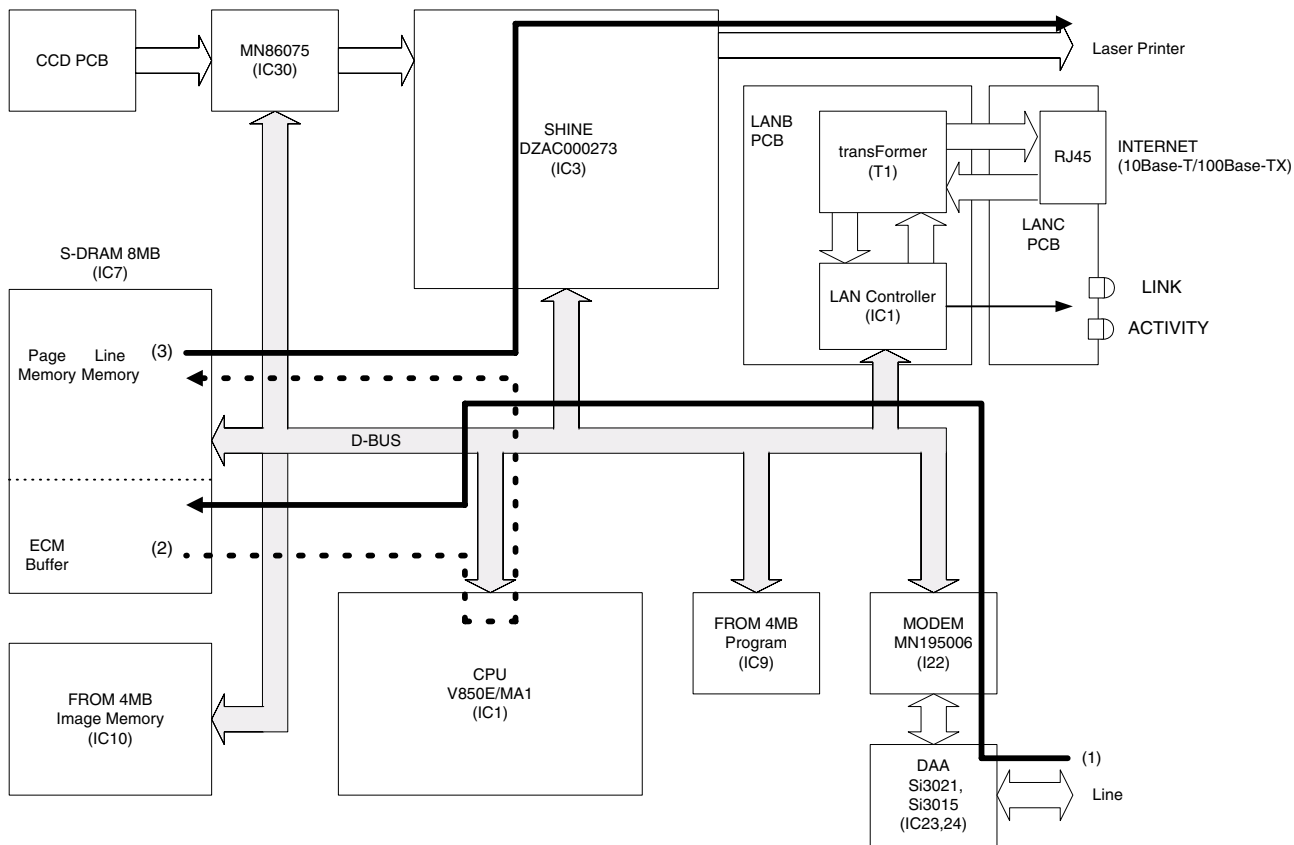
### 6.2.1. Fax Block Diagram



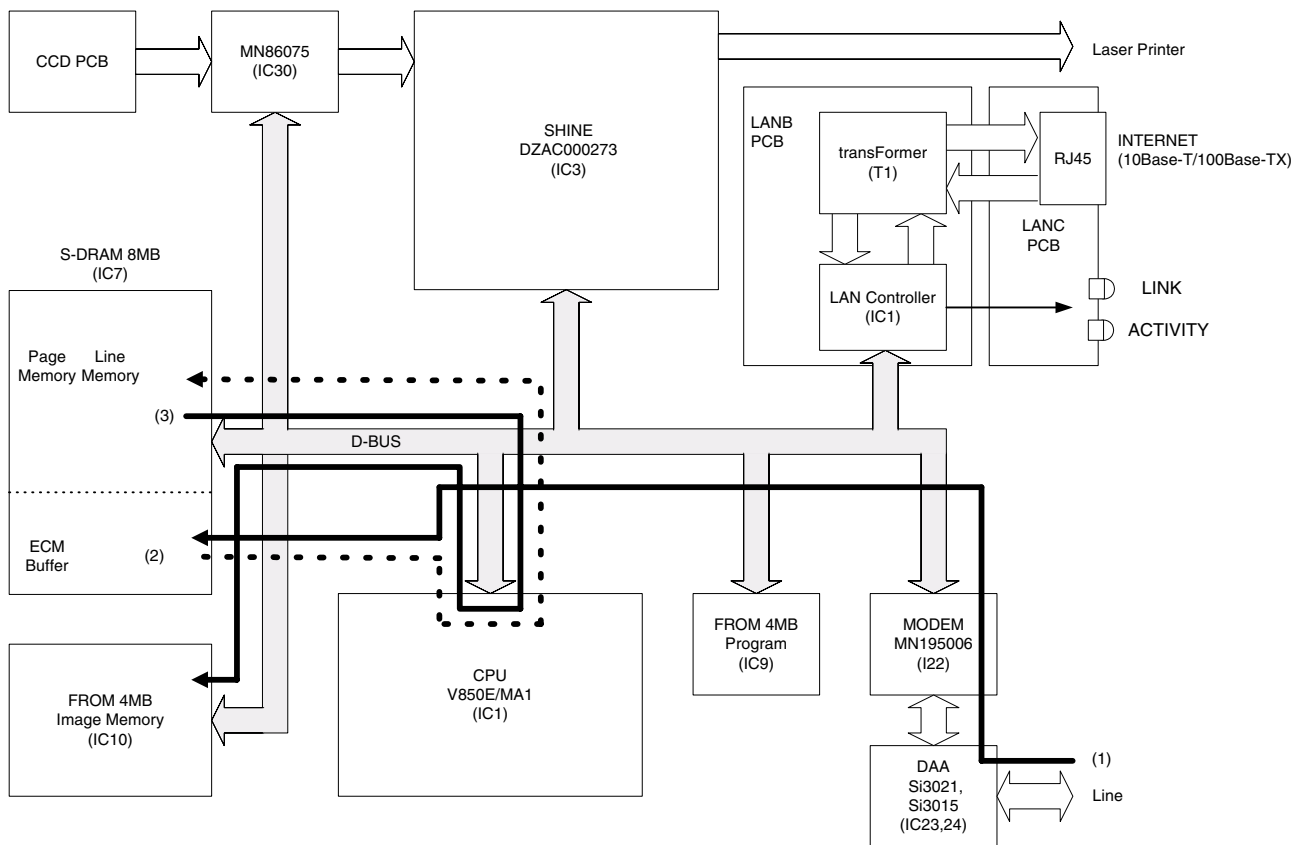
DX-800 Block Diagram



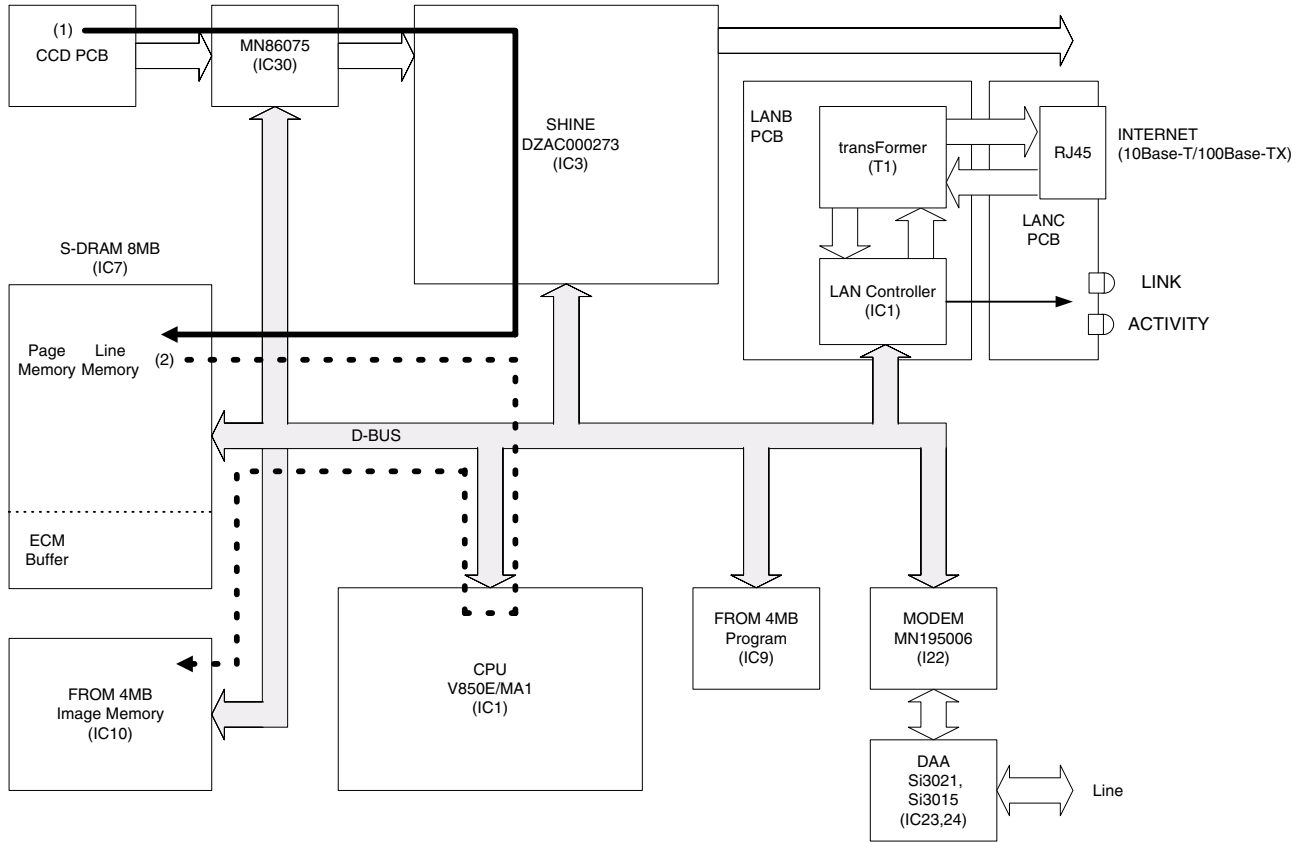
### 3. Direct Reception



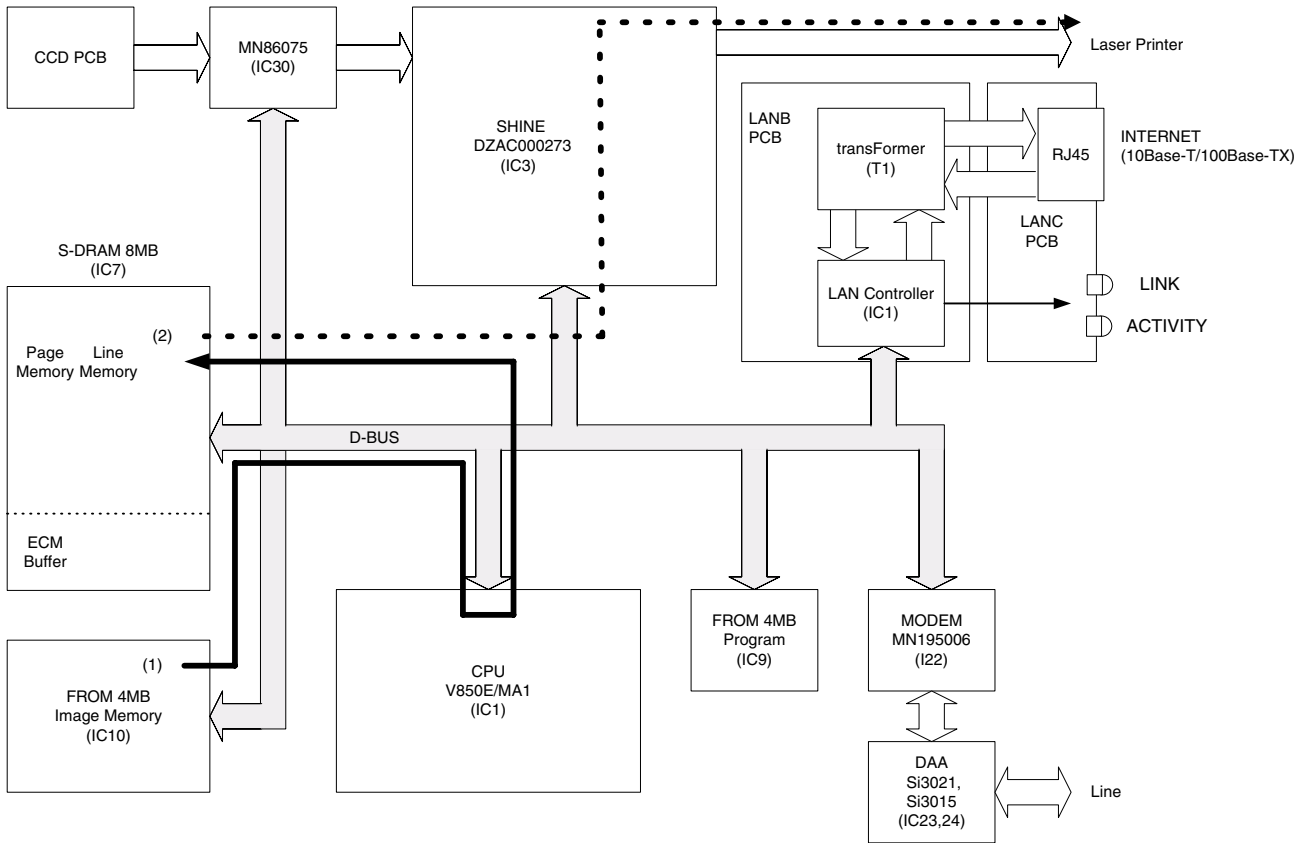
### 4. Memory Reception



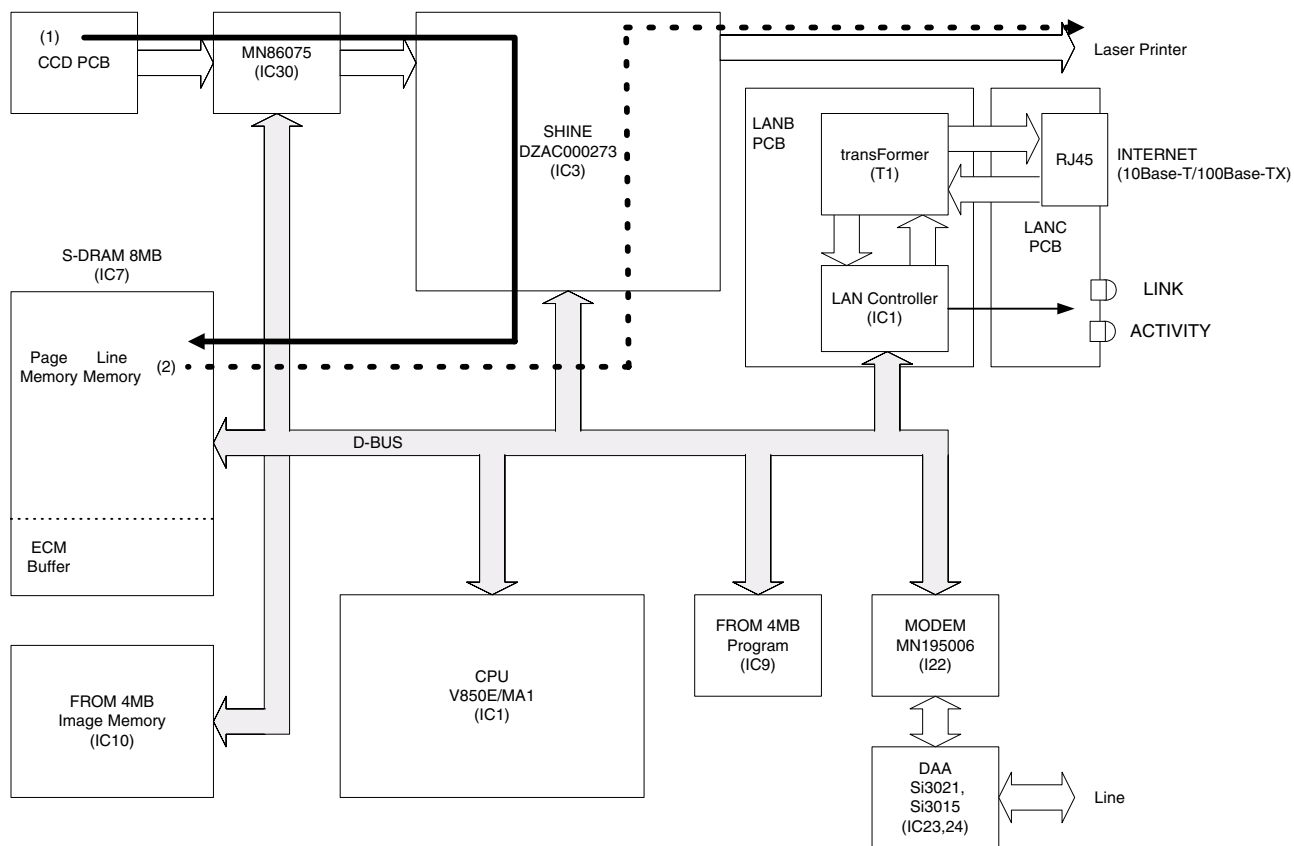
### 5. Scan into Memory



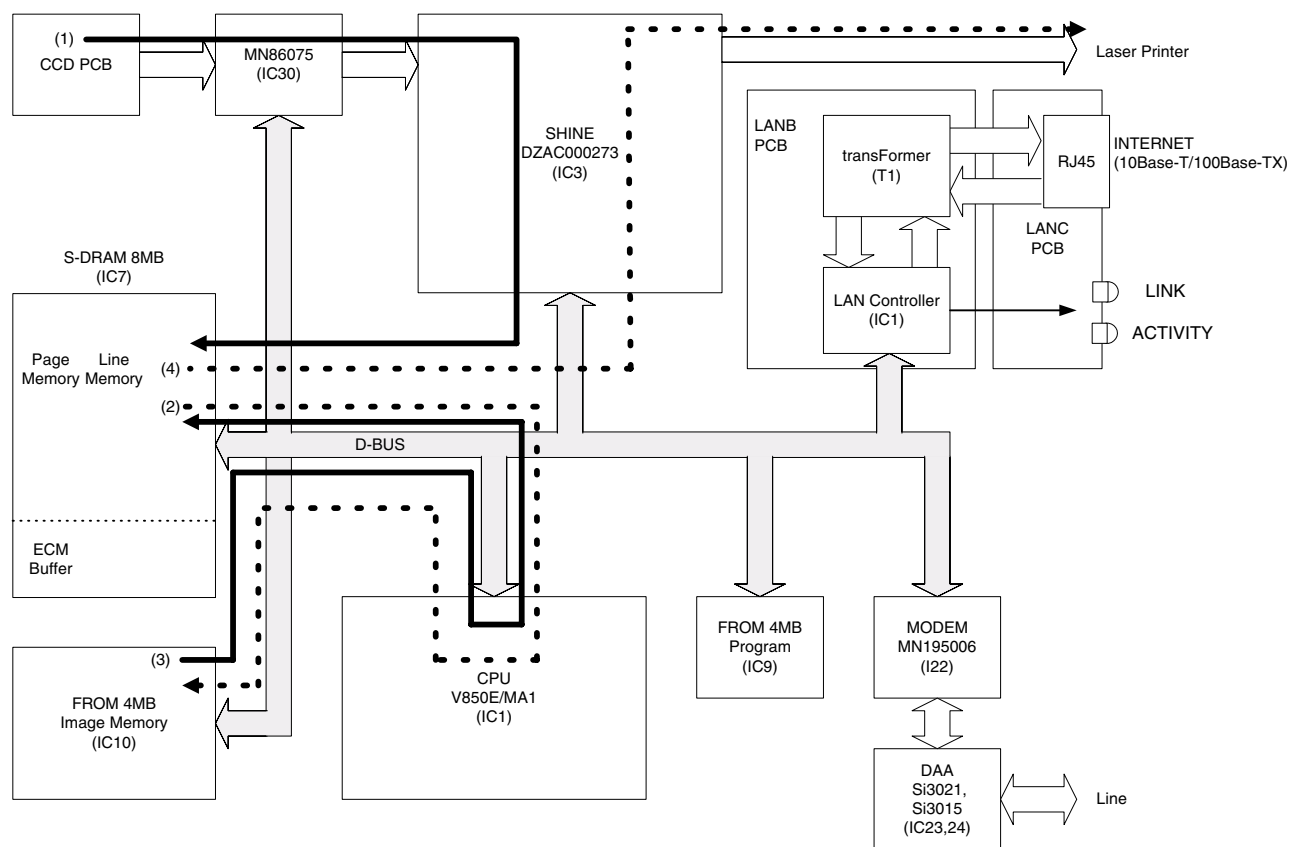
### 6. File Print from Memory



### 7. Single Copy

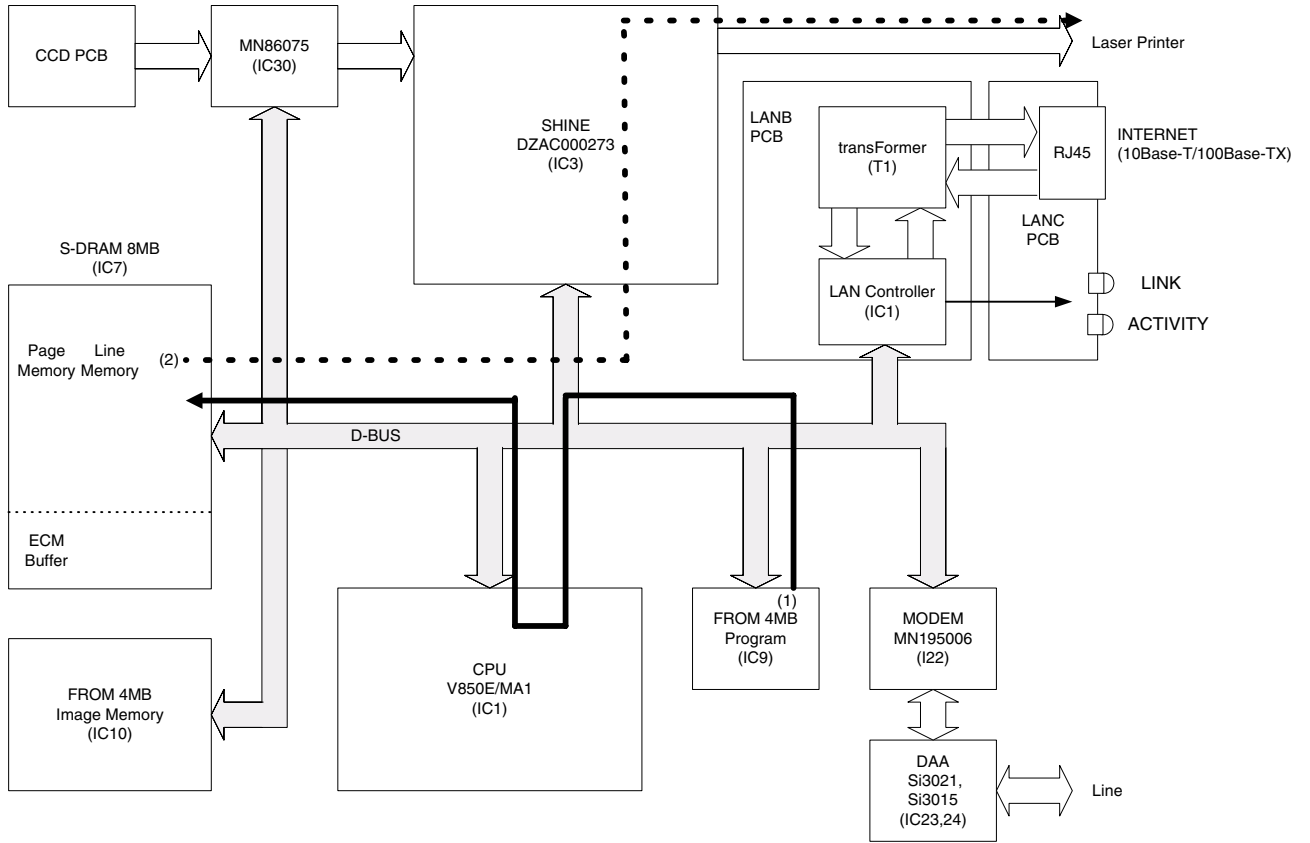


### 8. Multiple Copies

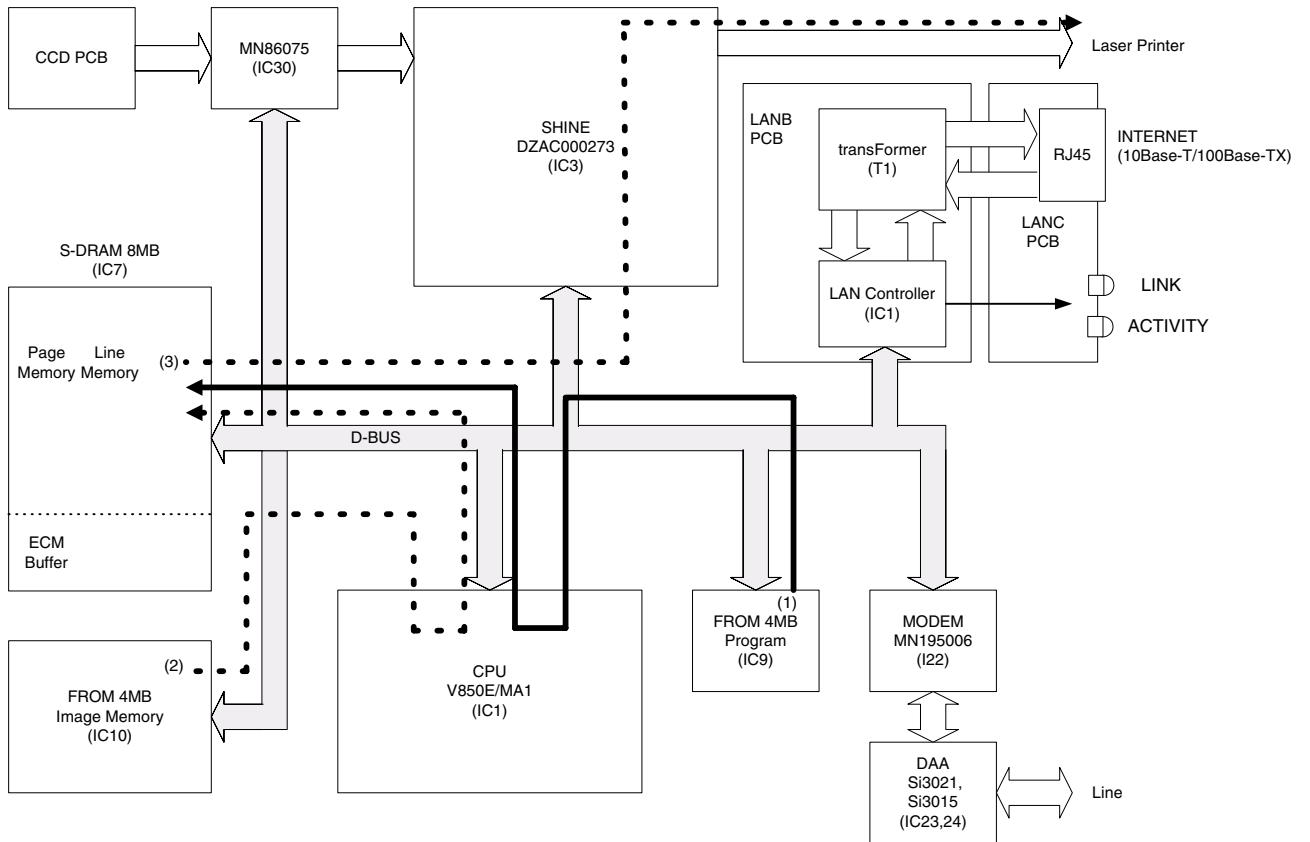




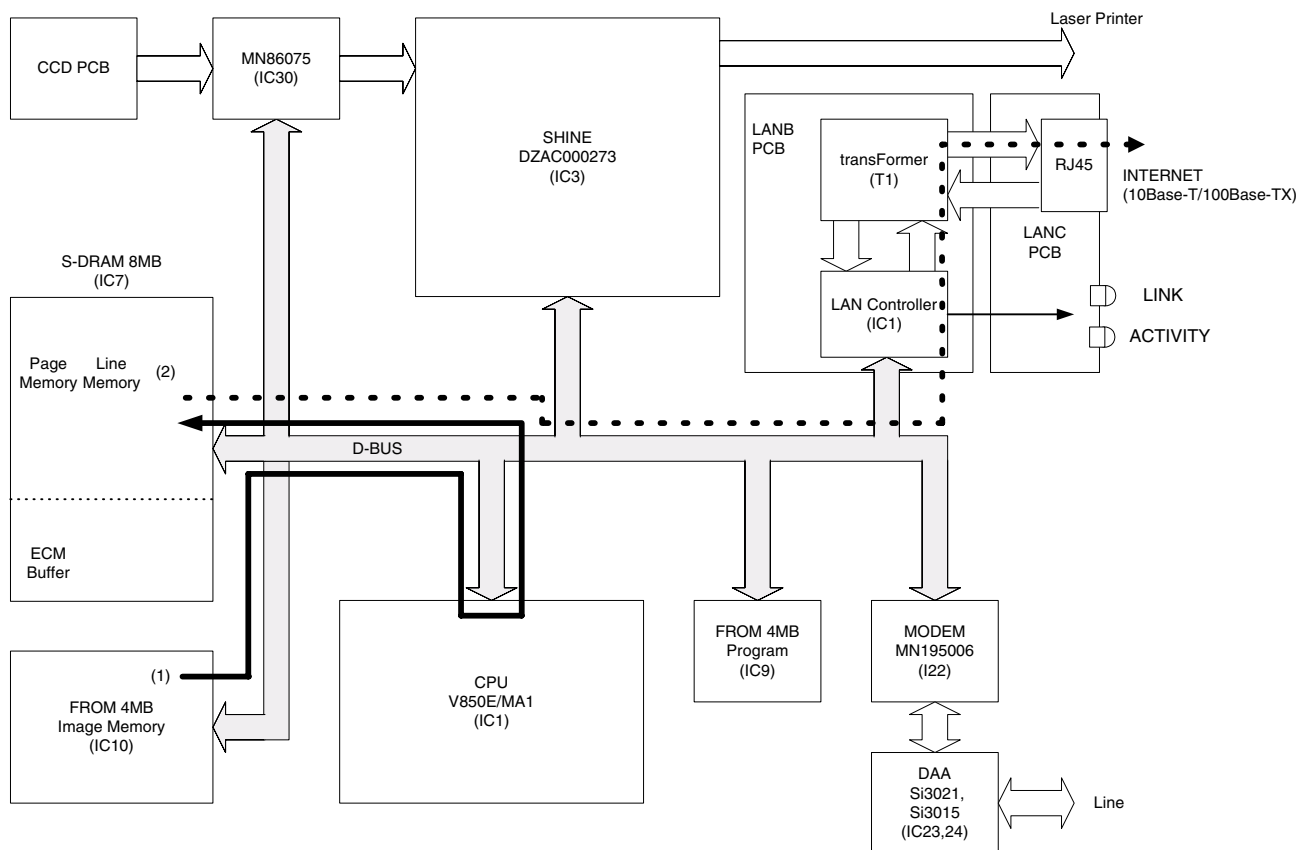
### 9. Report/List Printing



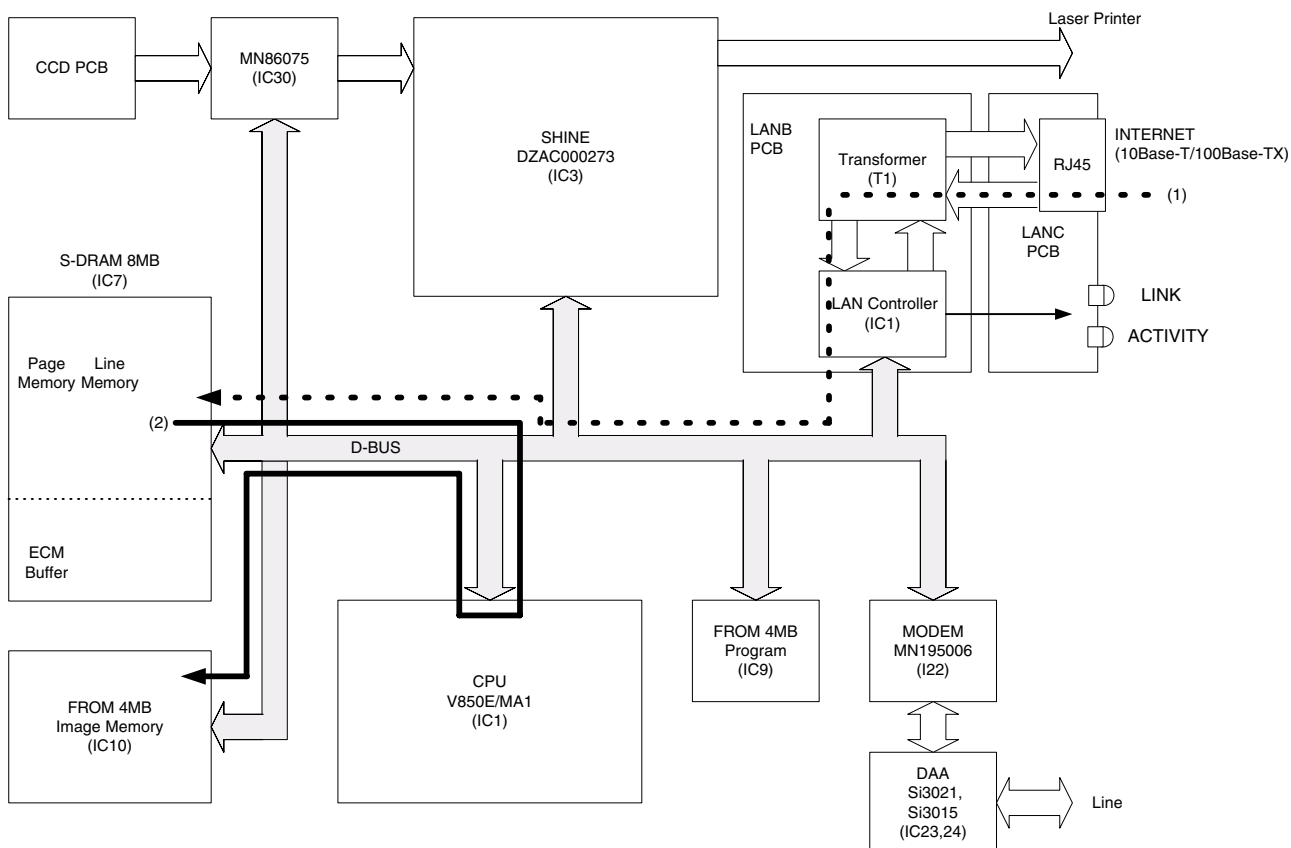
### 10. Report with Image Data



### 11. LAN Transmission

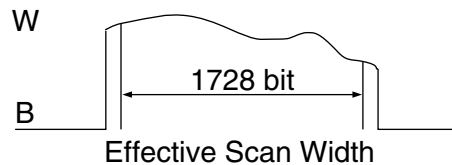
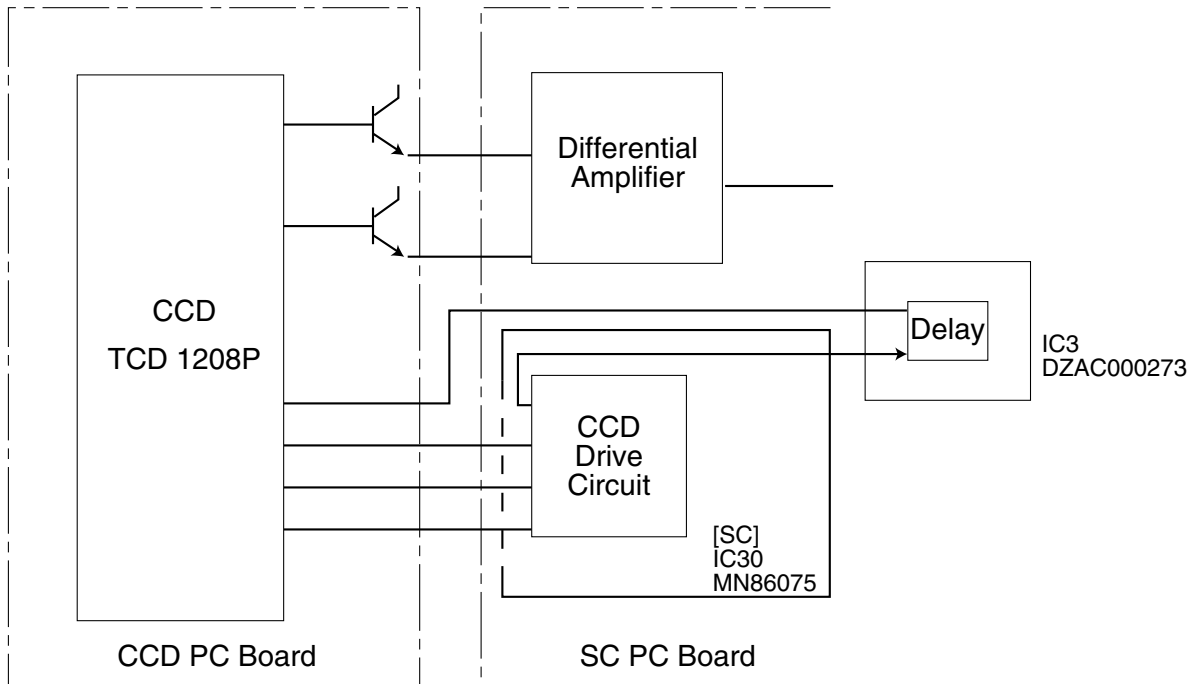


### 12. LAN Reception



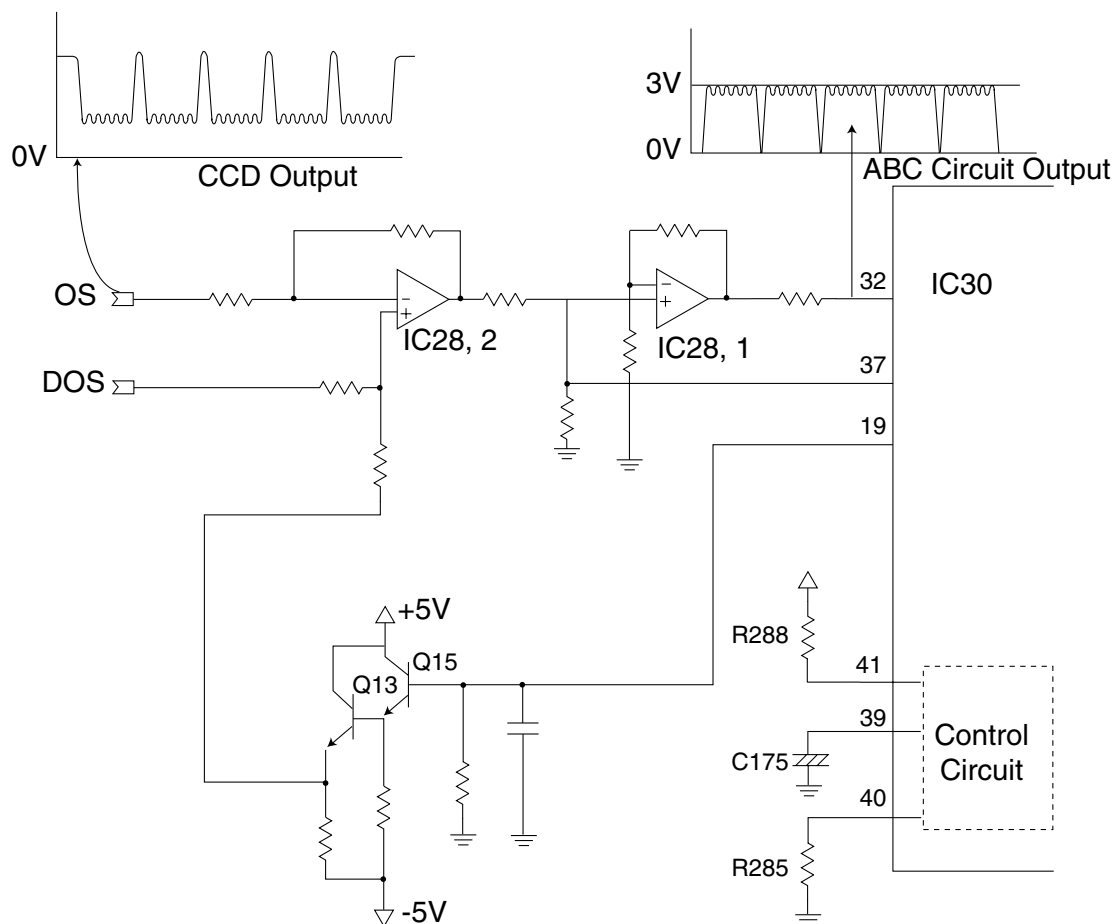
### 6.2.3 Picture Signal Scanning Block

The image data read by the optical unit is input to the CCD mounted on the CCD PC Board, then transferred to the SC PC Board after the optical information is converted into an electrical signal by the CCD. The following shows a block diagram of the picture signal scanning circuit. This picture signal scanning circuit consists of (1) ABC circuit, (2) shading correction circuit, (3) offset control circuit, (4) picture signal binary coding correction circuit and (5) reducing circuit.



#### ABC Circuit

This circuit consists of IC28, IC30, C175, R288 and R285. Its function is to prevent deterioration of picture quality due to dirt on the document or degrading of the luminous energy of the Xenon Lamp light source. The picture signal from the CCD is amplified in IC28 and input to IC30, where it is converted from analog to digital and the shading is corrected. When the signal exceeds +5V as the result of this amplification and correction, capacitor C175 is charged through R288. This charging voltage lowers the level of the picture signal input to IC28. When the picture signal voltage rises, this charge voltage becomes higher. When the picture signal level lowers due to the background color, etc., of a transmitting document, the voltage of the charged capacitor C175 is discharged through R285. Consequently, the output of the ABC circuit is kept constant to maintain the picture quality, regardless of changes in the CCD output level.



### Shading Correction Circuit

The Shading Correction Circuit, included in IC30, is provided to correct for reduction in LED lamp intensity around the optical lens and LED lamp intensity distortion due to shading of each bit. This circuit scans the white reference on the transmitting document plate immediately before the document reaches the scanning position and writes a compensation value according to the distortion of the waveform, at the time, into the S-RAM (IC31). When the actual picture signal is input, the circuit corrects the picture signal shading, according to this compensation value. This shading is carried out for each page during transmission or copy.

### Offset Control Circuit

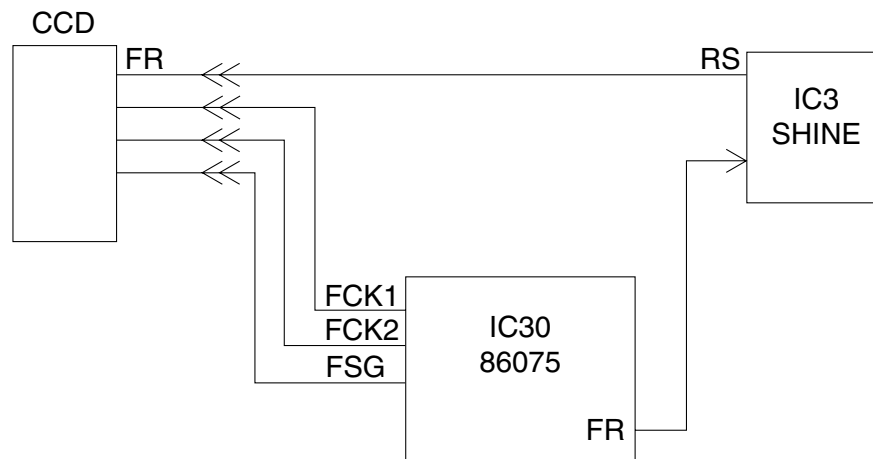
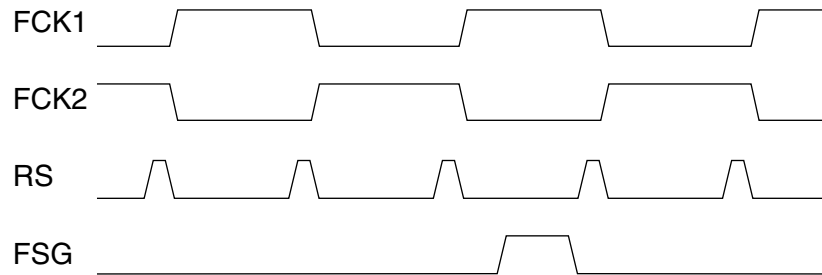
The Offset Control Circuit consists of Q15, Q13, IC30 and IC28, and controls the black level of the CCD output to be at 0V by using the input.

### Picture Signal Binary Coding Correction Circuit

The Picture Signal Binary Coding Correction Circuit is included in IC30. It is used to obtain a binary coding signal which is a corrected picture and error diffused signal of a false halftone signal, which is detected from a shaded picture signal.

## 6.2.4 CCD Drive Clock Generator Circuit

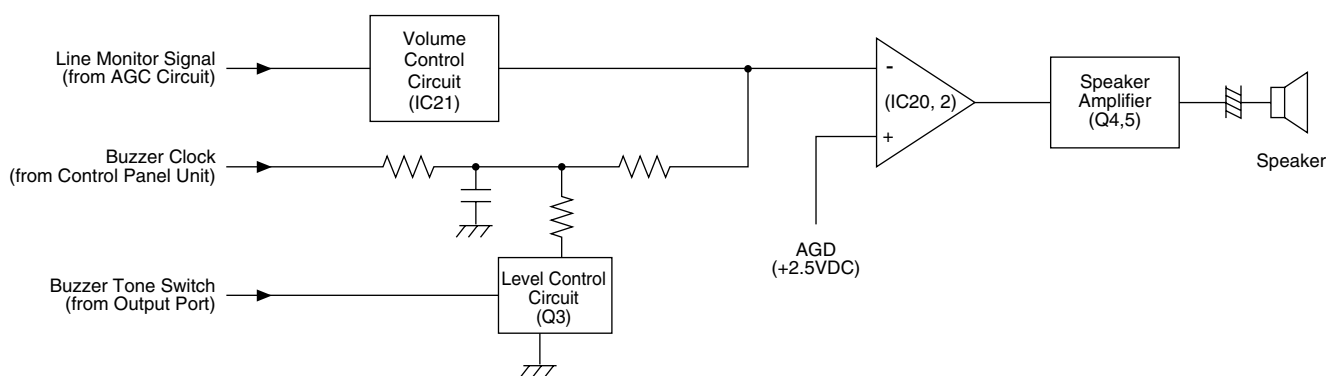
This circuit is also contained in IC30. Its function is to generate FSG, FCK1, FCK2 and RS clock signals, which are required for driving the CCD. These clock signals are generated by the system clock generator circuit derived from the 4 MHz clock signal that is input to IC30. Its timing chart is shown below. The FR clock supplied to the CCD is output from the RS of IC3. The RS clock of IC3 is derived from the FR clock of IC30 [MN86075] generates the timing of the RS clock to drive the CCD.



## 6.2.5 Line Monitor Circuit

The Line Monitor Circuit consists of an operational DAA (The secondary side chip) and its peripheral circuits. Its function is to monitor the dial tone, DTMF tone, response signals, etc. over the speaker. It also sounds the output of the key touch tones, alarm tones, etc. from the panel CPU over the speaker. The Received Signals are output from DAA of Secondary circuit, and through Analog AGC, Electronic Volume, Amplifier and over the speaker.

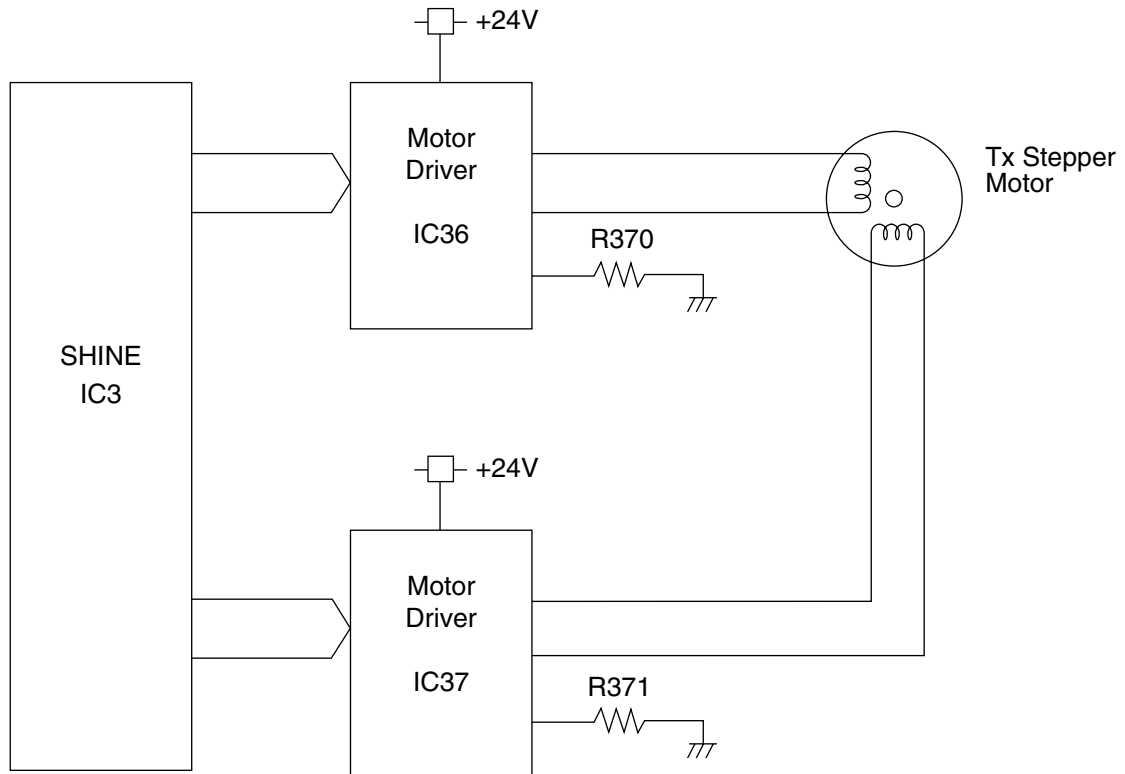
The monitor tone from the phone line and the buzzer tone from the panel can be adjusted from the Control Panel.



Line Monitor Circuit  
Block Diagram

## 6.2.6 Transmit Motor Control Circuit

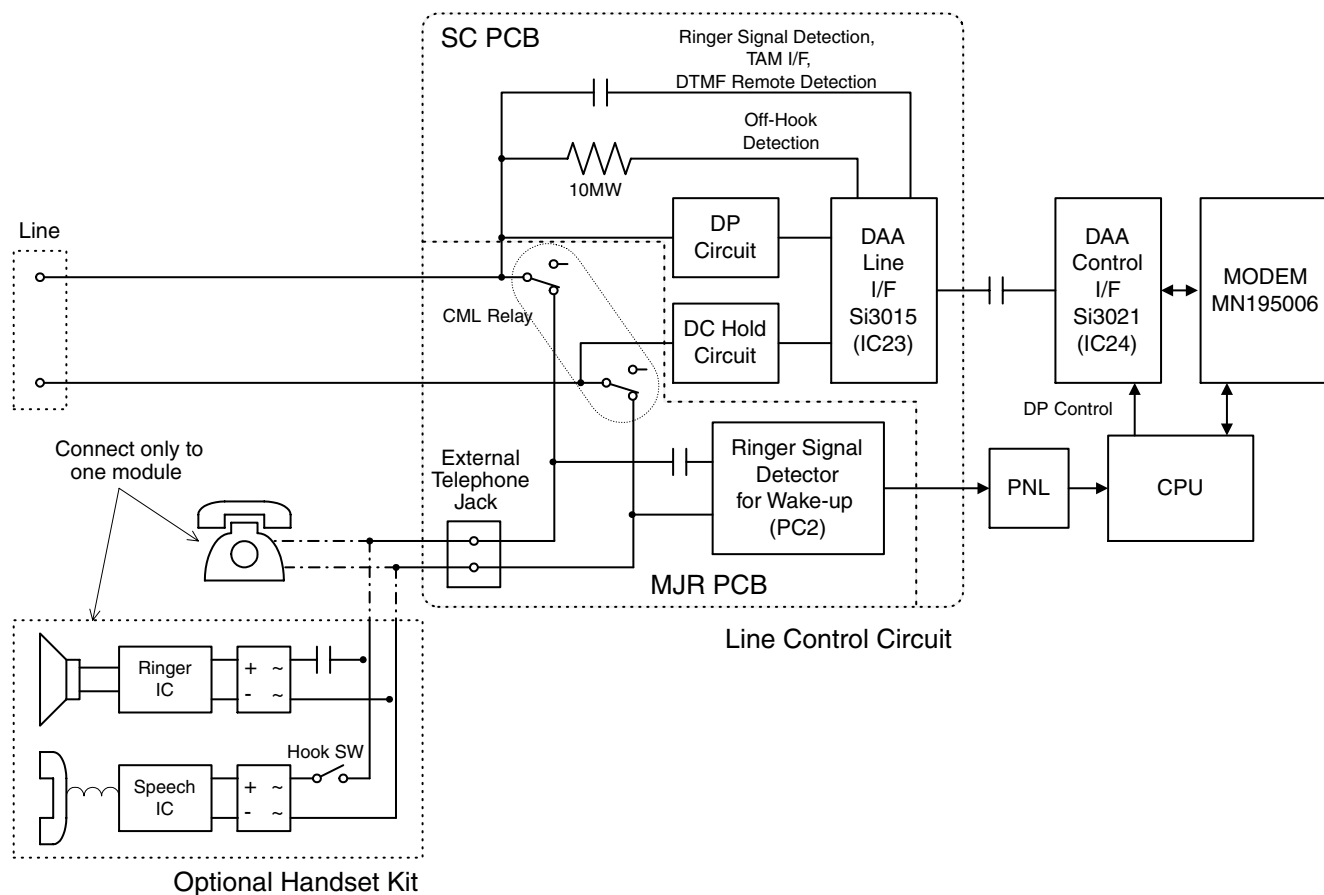
The transmit motor is a PM type, two-phase bi-polar motor. The stepping signal and chopping current control signals (pTAPH, pTBPH, pTA10, pTA11, pTB10 and pTB11) are sent to the chopper drive circuit, comprised of IC36, IC37 and its peripheral circuitry, from IC3 SHINE output port. The motor is powered by +24 VDC and is driven by a 1/2-phase excitation, and greater step division is provided by controlling the phase circuit in steps (micro-step control).



Tx Motor Driver Circuit Block Diagram

## 6.2.7 Line Control Circuit

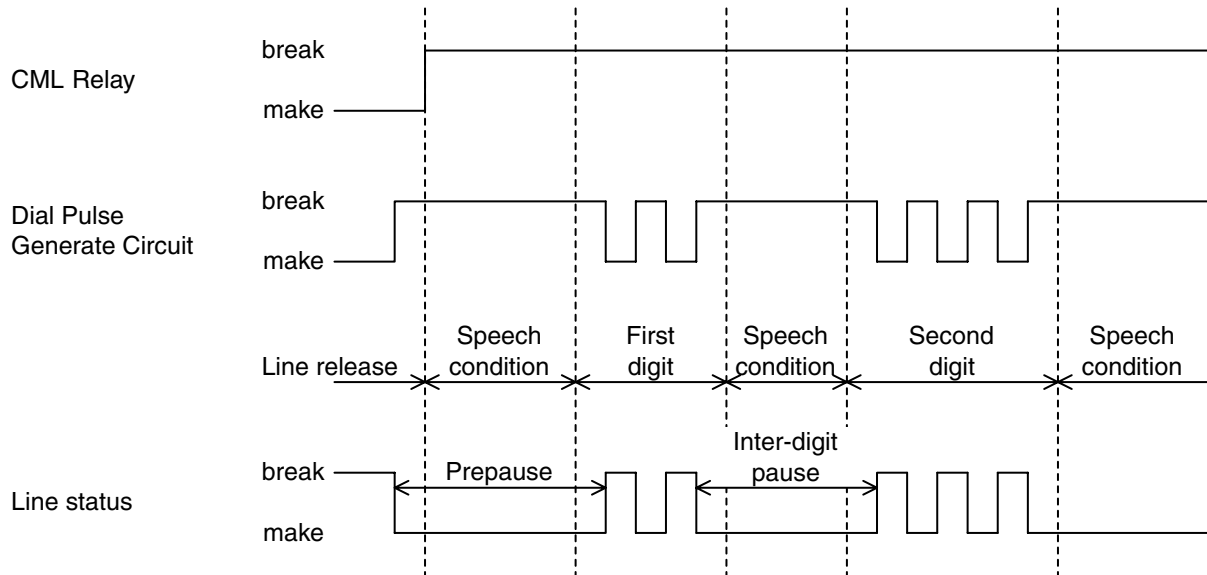
The Line Control Circuit consists of CML relay, DP circuit, DAA (Direct Access Arrangement), Ring Detect Circuit for power-save and DC hold circuit. A Jack for an external telephone, which can be used for either an external telephone or an optional Handset Kit. The block diagram of the Line Control Circuit is shown below.





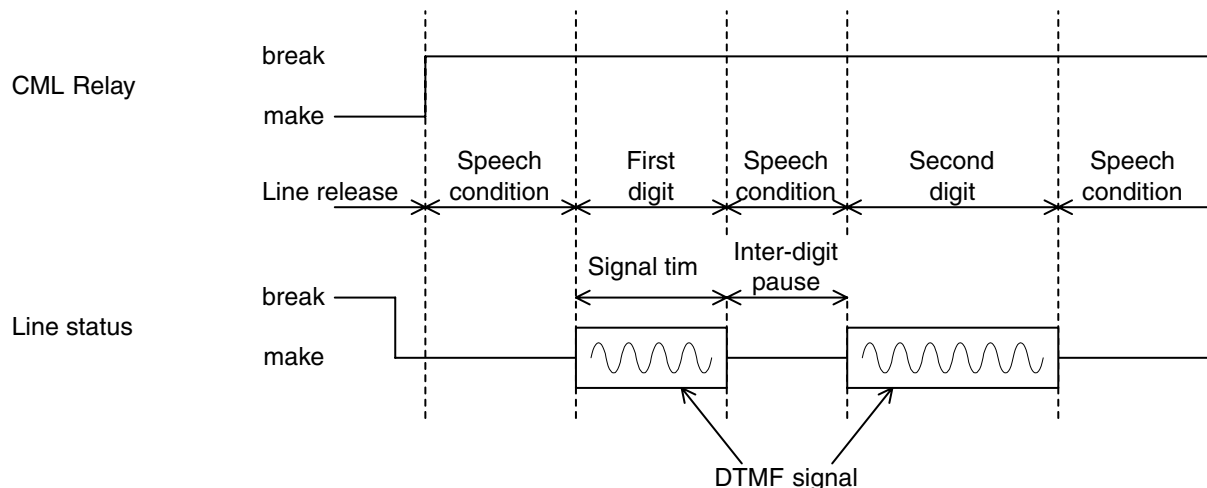
## Dial Pulse Generator

The Dial Pulse Generator consists of a CML relay, a DC hold circuit, a dial pulse generate circuit and their peripheral circuits. The generator generates dial pulses. The CPU on the SC PC Board controls all dial pulse generation sequences. When the absence of the terminating message is confirmed by the Off-Hook detector in DAA (IC23), the CPU turns the CML relay ON and the dial pulse generate circuit ON through DAA to develop loop status (DC loop). After a few seconds, the CPU turns the PLS relay ON and OFF to generate dial pulses, making and breaking the loop. The line status during dialing is shown below.



## DTMF Tone Generator

The DTMF Tone Generator is incorporated in the MODEM on the SC PC Board. The DTMF tone is conveyed to the telephone line using the same route as the facsimile signal. The DTMF tone selection is controlled by the CPU. Digital amplitude signal is conveyed as analog amplitude signal through D/A converter in the DAA (IC23). The line status during dialing is shown below.



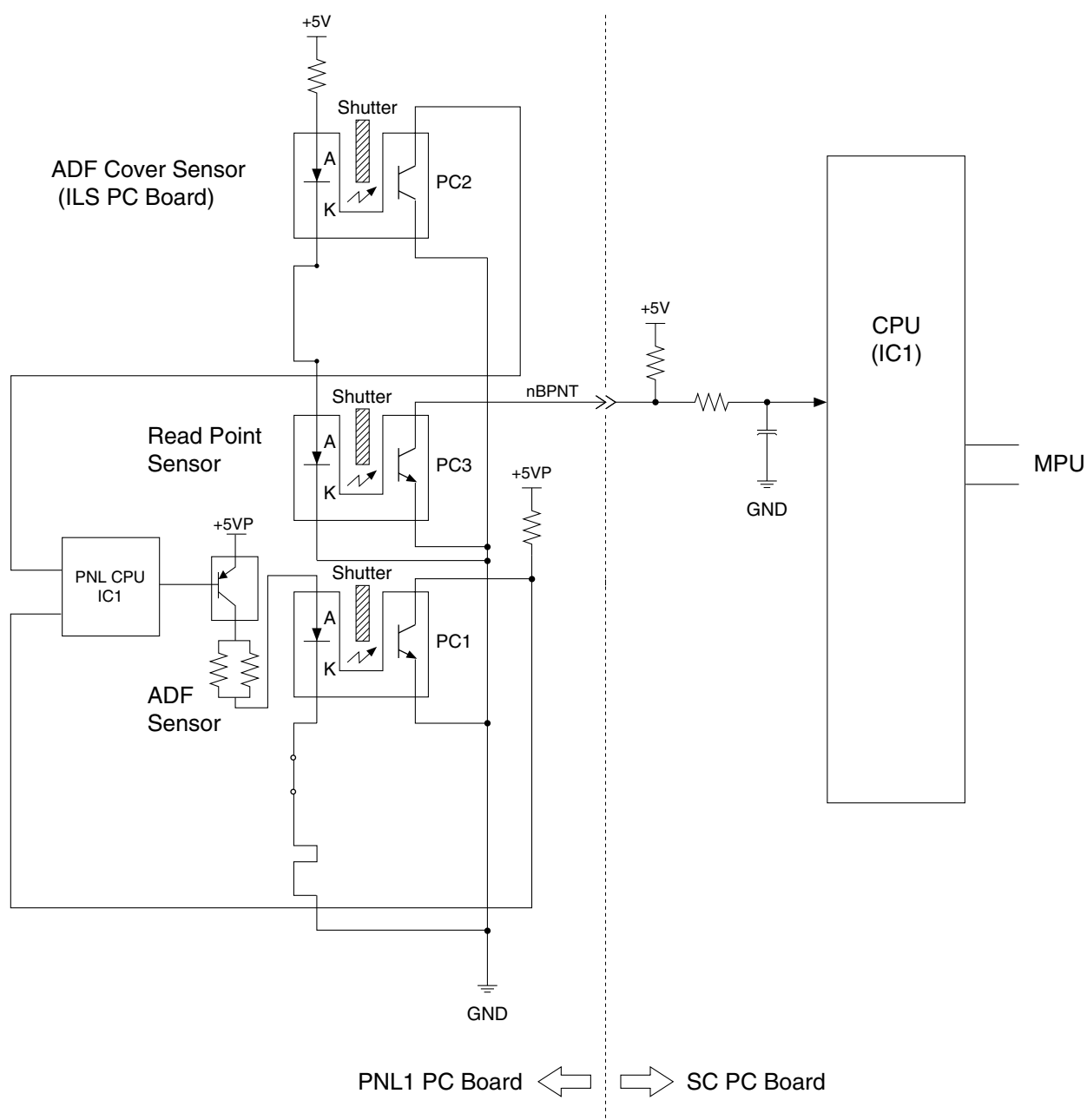
## Ring Detector

When the unit is in the Sleep Mode status, a Ringing signal is detected by a photo-coupler (PC2) in Ring Detector to cancel the power-save for waking up. Then DAA (IC23) detects the ringing signal for receive mode.

When the unit is normal operating status, DAA (IC23) detects the ringing signal immediately.

## 6.2.8 SNS PC Board

Each sensor consists of an LED and photo transistor. When documents are placed on the ADF tray or are moving, a shutter in the document sensor opens. The light from the LED turns the photo transistor "ON", and the output voltage from the sensor becomes a "Low" level. With no document on the ADF tray, the shutter interrupts the light path, and output from the sensor is kept at a "High" level. Operation of the RP Sensor is exactly the same as the ADF Sensor. The ADF Cover Sensor operation is similar, except that the output from the sensor is kept at a "Low" level when the cover is closed and becomes a "High" level when the Printer Cover is opened.



### 6.2.9 Control Panel

The Control Panel consists of the Display PCB and Panel Unit, which display various status information. It is normally interfaced to the main CPU. Keyed input signals are received by the Panel CPU and the data is transferred to the main CPU on the SC PC Board.

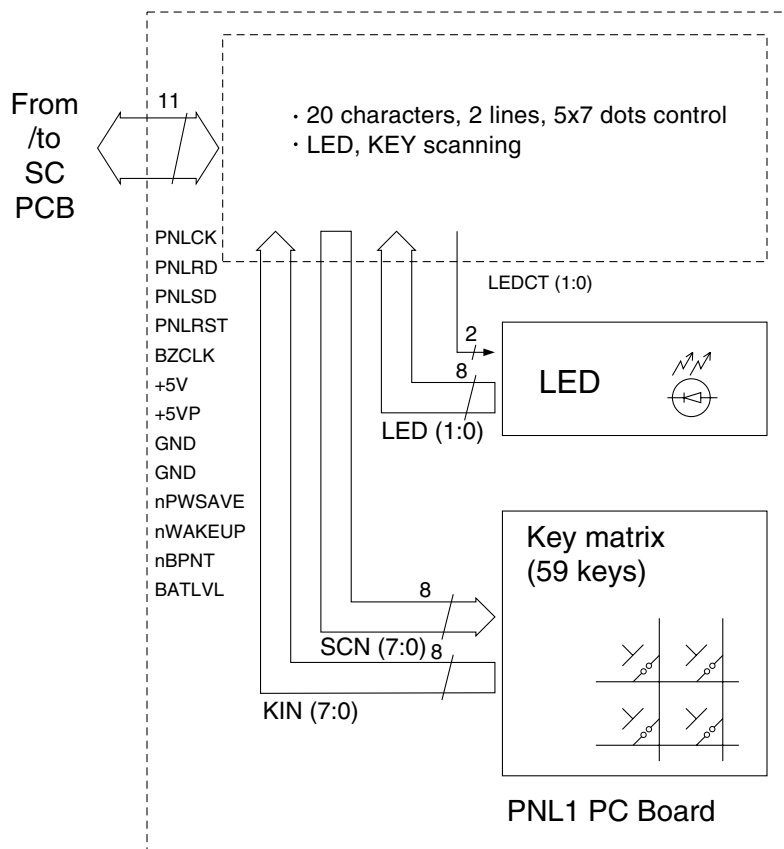
The Control Panel performs the following processes simultaneously:

- Key inputting
- LED, LCD display
- Data transmission / reception

#### Interface to main CPU

The interfacing between the main CPU and the panel CPU are all executed with commands and responses in the following two formats:

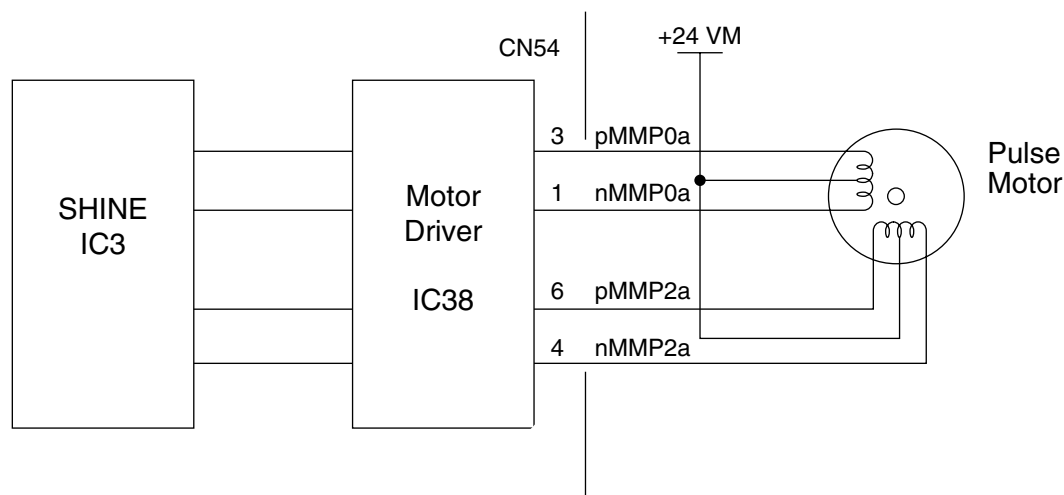
- Command / response (1 byte) + number of data + check sum
- Command / response (1 byte) + number of data + data 1 + data 2..... + data n + check sum.



## 6.2.10 Printer Motor Drive Circuit

### Motor Drive Circuit

The Printer Motor is a 4-phase uni-polar PM-type step motor. The step signals (pMMP0A to pMMP3A) are transmitted to IC38 (the Chopper Drive Circuit) from IC3 SHINE output ports. The chopper current is determined by the voltage at IC38, Pin3 and Pin13. The Printer Motor has two speeds, Slow and Constant. The Printer Motor is powered by a +24 VDC supply. When the interlocks are open, the +24 VDC supply is cut off and the Printer Motor stops rotating.



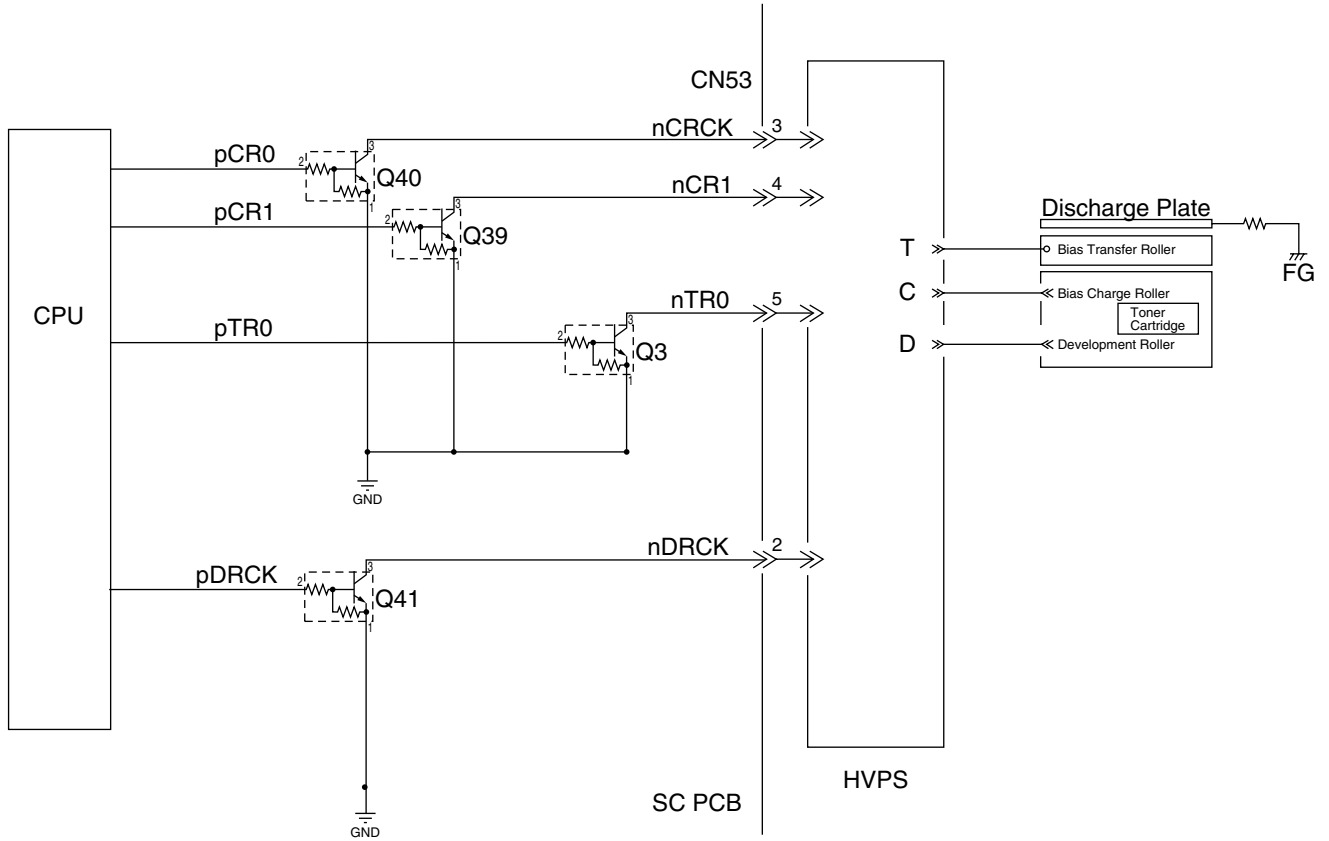
Laser Printer Motor Drive Circuit Block Diagram





### High Voltage Drive Circuit (Charging, Development and Transfer)

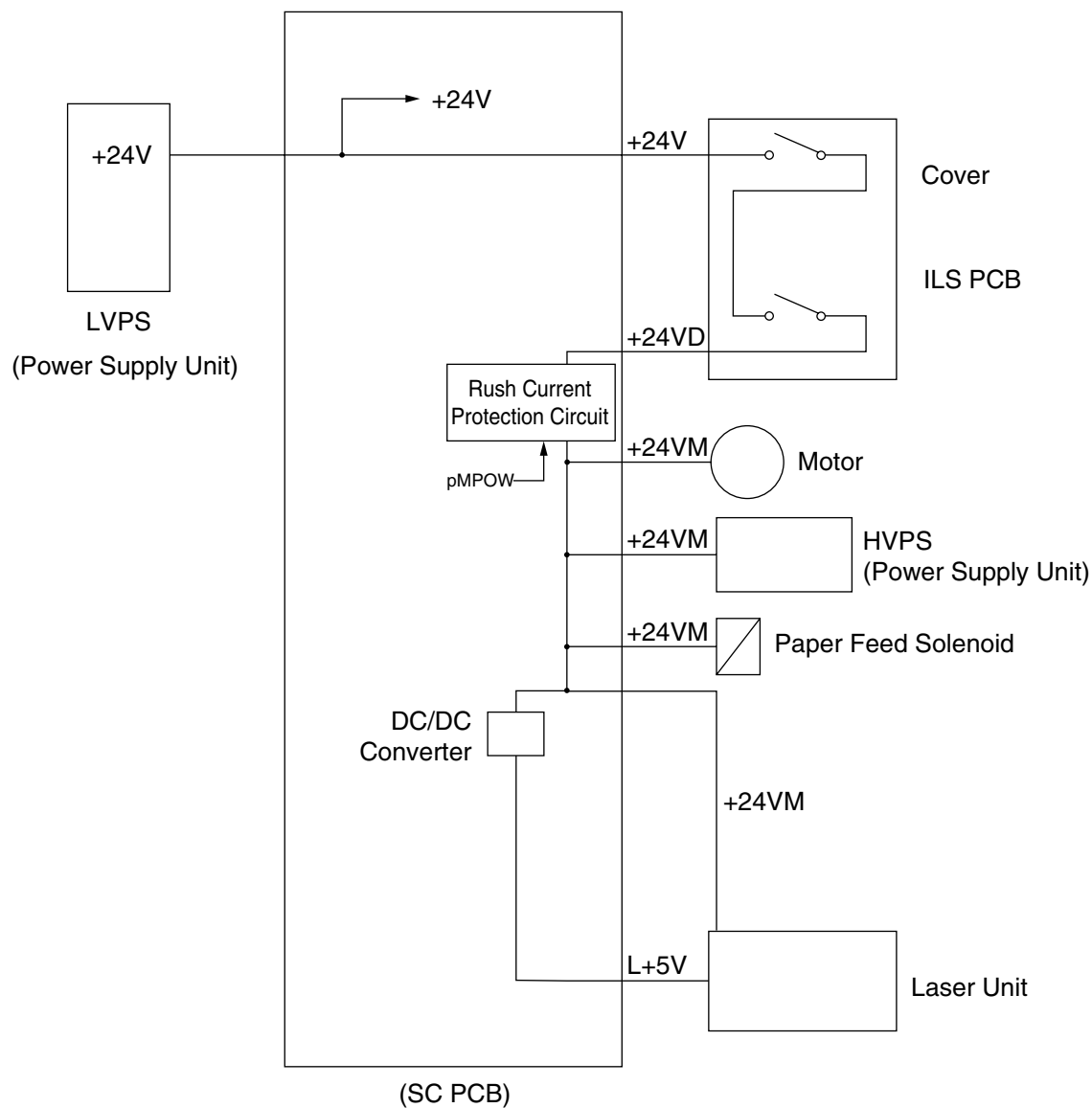
High Voltage is provided through a DC to DC converter, which changes the +24 VDC supply voltage to -650 VDC, and output approximately 0.64 KVAC (Steady current: 200  $\mu$ A) for the Charging Block. The Developer Circuit converts the +24 VDC to between -300 VDC for the development bias, and outputs 1,500 VAC (p-p) at a frequency of 1.650 kHz to charge the toner. The Transfer Circuit changes the +24 VDC supply voltage to approximately +280 VDC (MAX) (steady current:3  $\mu$ A/-1500 VDC steady voltage).



High Voltage Drive Circuit

## 6.2.11. Interlock Safety Circuit

This safety circuit turns OFF the +24 VDC supply voltages when the Cover is opened. When the Cover is opened, the microswitch(es) on the ILS PC Board are de-actuated, turning OFF +24 VDC to the Printer Drive Circuit, the High Voltage Power Supply, and the Paper Feed Solenoid Circuits, turning OFF the +5 VDC supply voltage for the Laser Driver circuits on the Laser Unit.



Interlock Safety Circuit Block Diagram



## 6.2.12 Laser Unit (LSU) Control Circuit

The laser control signals are described below.

### nLDEN

The LSU is activated when this output signal is LOW. If an error occurs, the nLDEN output signal level goes High and the LSU is deactivated.

### nVIDEO

This is the actual Data Signal. The Laser is ON when the nVIDEO output signal level is LOW.

### nHSYNC

This horizontal synchronization signal transmitted from the Beam Detection Sensor sets the horizontal position of the laser beam as it crosses the OPC Drum.

### nSTART

This is the Scanner Motor Control Signal. The Scanner Motor rotates when the nSTART output signal level is LOW.

### nREADY

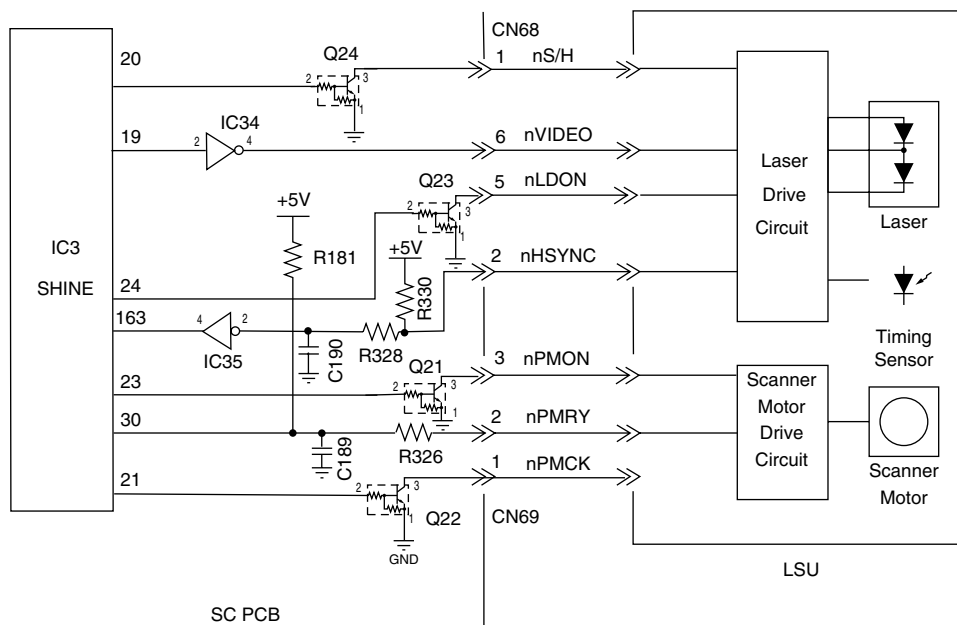
A Phased-Lock Loop (PLL) circuit keeps the Scanner Motor speed constant when the nREADY is at a Low output signal level.

### CLK

This is the Scanner Motor Clock.

### nS/H

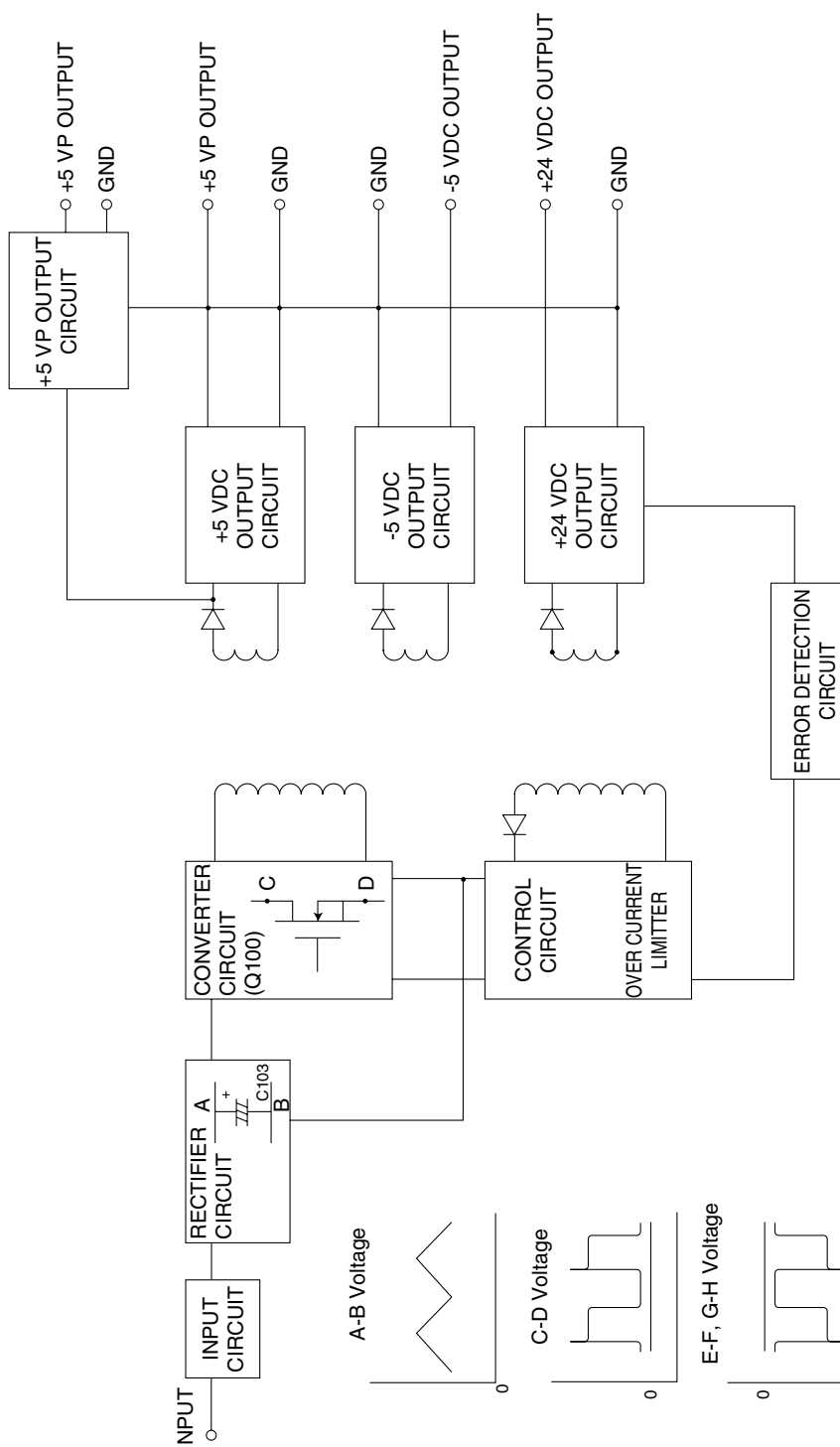
This is the Sample Hold Signal in order to adjust the Laser power. When the Laser switches on compulsorily, the Laser Power is adjusted to a suitable level and held until the next duty cycle in order to keep the Laser Power stable.



Laser Unit Control Circuit Block Diagram

### 6.2.13 Power Supply Unit (LVPS)

#### Block Diagram of DZEA000057



**DZEA000057****Input Circuit**

AC line voltage travels to the rectifying circuit through the line filter. The line filter eliminates RFI noise which may otherwise pass to the AC line from the power supply unit. It also protects the power supply unit from transient noise which may pass into the unit from the AC line.

**Rectifying Circuit**

AC power is rectified by D100 and charges C103 to make high DC voltage, then supply power to converter circuit.

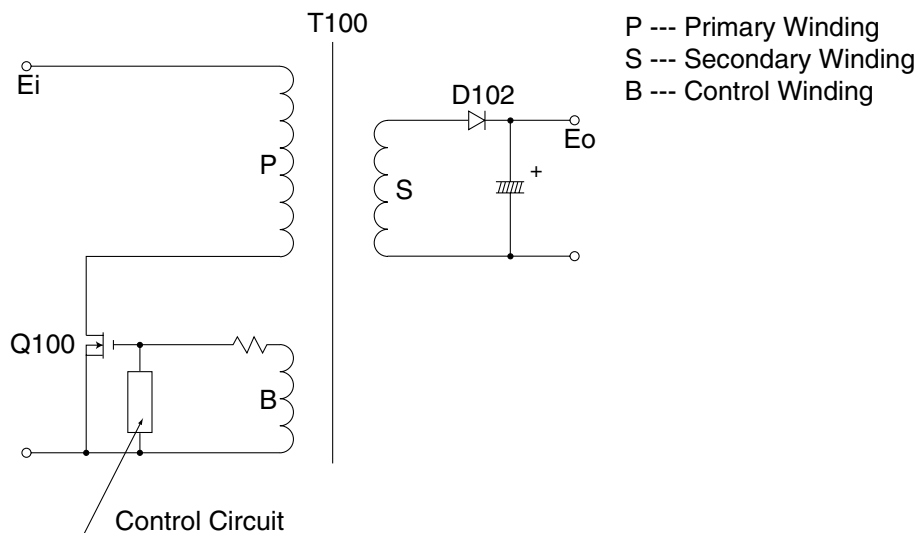
Kick-on voltage for control IC (IC105) is supplied AC power through R134, R135 and R136.

Inrush current is limited by TH100.

**Converter Circuit**

A IC (IC105), in combination with transformer T100, form a switching power supply circuit using the RCC (Ringing Choke Converter) system.

As soon as power is applied to the Power Supply Unit, AC line voltage is rectified by D100 and is smoothed by capacitor C103. The protection circuit at the time of start-up is controlled by an IC (IC105) and resistors R134, R135 and R136.

**Main Switching Circuit**

In the above circuit, when the main switching transistor, Q100, is turned On, input voltage,  $E_i$ , is supplied to the primary winding of transformer T100. However, no current will flow through diode D102 of the secondary side, due to reverse polarity of the secondary winding causing no current flow within T100. But the transformer charges with energy. When Q100 is turned Off, the supply voltage to the primary winding shuts off and the windings of T100 change polarity, allowing D102 to conduct, releasing the energy accumulated in T100 to the circuit. When the energy is discharged through D102, Q100 turns on, once again reversing the polarity on T100 windings, creating a self-oscillation circuit.

The value of output voltage is

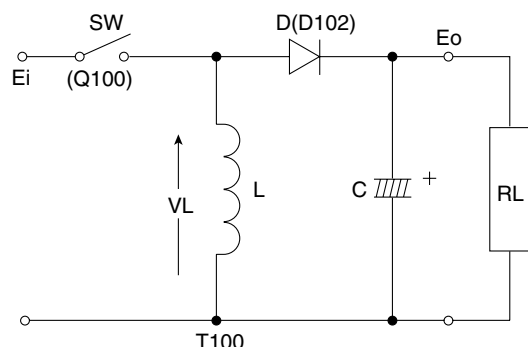
$$E_o = d / (1 - d) * E_i$$

$$d = T_{on} / T_s$$

$T_{on}$  : ON time of Q100

$T_s$  : Period of oscillation

Equivalent circuit model for the RCC.



In the equivalent circuit ; When SW is ON, current flows

$$SW \rightarrow L$$

When SW is OFF, current flows

$$L \rightarrow D \rightarrow RL$$

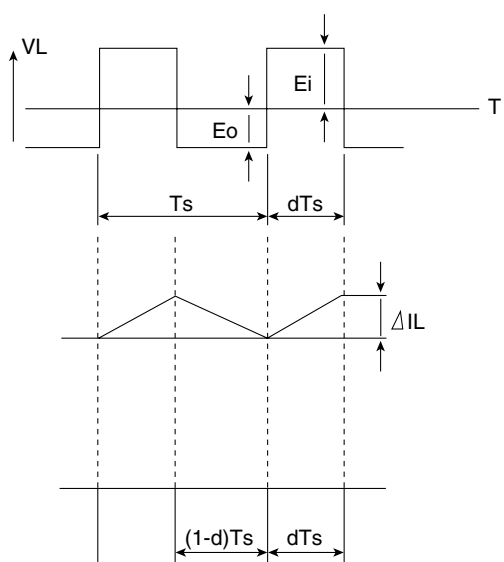
The value of inductance increase current between ON period. ( $d * T_s$ )

$$I_L = E_i / L * d * T_s \dots \dots \dots (1)$$

The value of inductance decrease current between OFF period. ( $(1 - d) * T_s$ ) \dots \dots \dots (2)

From equation (1) and (2),

$$E_0 = d / (1 - d) * E_i$$



In the actual circuit, the fixed output voltages are obtained by changing the winding ratio of transformer T100. In this converter circuit, the output voltages are stabilized by controlling the duty cycle of the ON and OFF timing of the transistor. In this power supply, the bias winding is built into the transformer. The power supply has four outputs, +24 VDC, -5 VDC, +5 VP and +5 VDC. The +24 VDC output is protected by the Error Detection Circuit, and the +5VDC, +5 VP and -5 VDC outputs are protected by the circuitry inside of the voltage regulator IC.

### Control Circuit and Error Detection Circuit

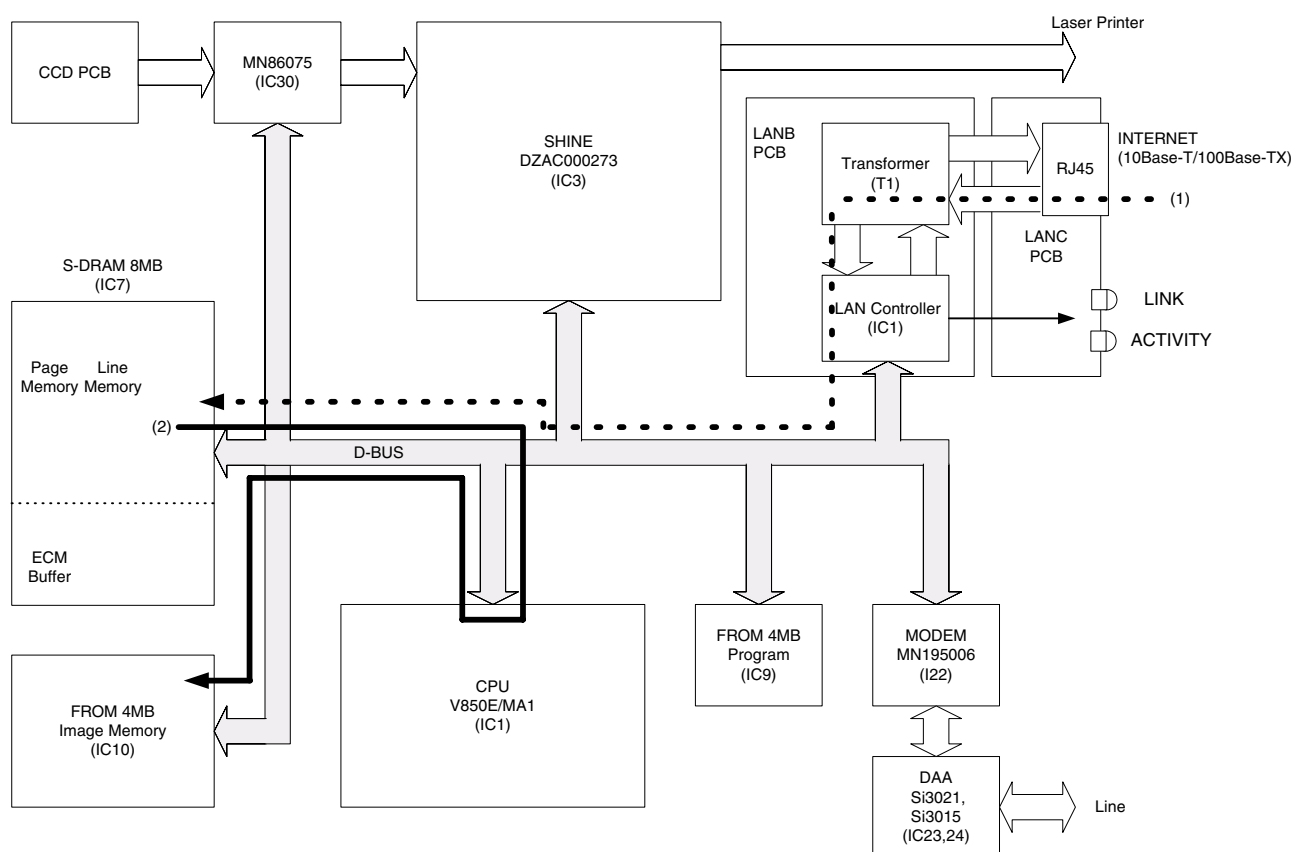
The control circuit amplifies the output of the duty cycle according to the error voltage detected by the Error Detection Circuit, and drives the main transistor Q100. The method used to change the duty cycle is to change the ON time period. When the output voltage of the +24 VDC circuit rises, the current of photo coupler PC103 increases, the output pulse width of the control circuit decreases and the ON time period of Q100 decreases. This control circuit decides the minimum OFF time period by itself. When the oscillation frequency becomes higher and the OFF time period becomes minimum, the OFF time period remains unchanged and only the ON time period decreases. This way, there is a upper limit of the oscillation frequency and the duty cycle is expanded.

**Over Current Limiter (O.C.L)**

The +24 VDC output is limited by Ton MAX Limiter (ON time period of transistor Q100) which is part of the control circuit. The +5 VP, -5 VDC and +5 VDC outputs have over current limiters provided inside the voltage regulator.

## 6.2.14 LAN Control Circuit

### LAN Controller



#### 1. LAN Controller (IC1)

This conforms to IEEE 802.3 Ethernet Controller. The CPU (SC PCB) bus is directly connected and the data interrupt is controlled by pLANINT. The 25 MHz clock is supplied by OSC 1. The LAN Controller for the system timing clock divides the frequency provided from OSC1. The clock signal is also supplied for the Manchester encoding/decoding circuit for data conversion.

The LAN Controller is a mixed signal Analog/Digital device that implements the MAC and PHY portion of the CSMA/CD protocol at 10 and 100Mbps.

The LAN controller contains a built in 8 KByte RAM for transmission and reception buffer.

#### 2. EEPROM (IC2)

This memory stores the configuration registers and MAC (Media Access Control) address for the LAN controller. Data is transferred to LAN controller (serial transfer) when the power is turned "On". The MAC address for the LAN controller represents the location on the LAN.

#### 3. Filter Transformer (T1)

A choke module transformer with a EMI filter. The output TX signal from the LAN controller is differentiated and transmitted on to the LAN via this module. Similarly, the input RX signal (differential input pair) is terminated by an externally connected 75 ohms resistor and input to the LAN controller via this module.

#### 4. Ethernet Interface

Provides the 10Base-T/100Base-TX Ethernet interface.

**LED**

## 1. LINK LED (LED1)

The LINK LED normally illuminates when the LAN cable is connected and when a link pulse is detected. Consequently, LED can be used to determine whether the 10Base-T/100Base-TX cable has become disconnected (RX side).

## 2. Activity LED (LED2)

This LED illuminates when reception data is present on the LAN.

(The LED also illuminates when reception data for other devices is present.)

**Signal Routing**

## 1. LAN Transmission

- a. Transfers the MMR coded data from Image Memory (FROM) to CPU (SC PCB) and converts the MH coded data.
- b. Transfer the MH coded data of CPU (SC PCB) to SDRAM.
- c. Transfer the converted text data to buffer RAM on LAN controller (LANB PCB) sequentially.
- d. The transmission packet is processed by FIFO transfer to buffer RAM and then converted for Manchester code. Finally, they are converted for differential pair signal and transmitted to Internet.

## 2. LAN Reception

- a. Processed received data for Manchester coded signal at LAN controller.
- b. The decoded received packet goes to buffer RAM through the FIFO. The data stored in buffer RAM is transferred to SDRAM (SC PCB) by requests from SC PCB.
- c. Decodes the Base 64 for MH coded image data at SDRAM and transfers CPU (SC PCB).
- d. Inputs MMR coded data from CPU transfers Image Memory (FROM).

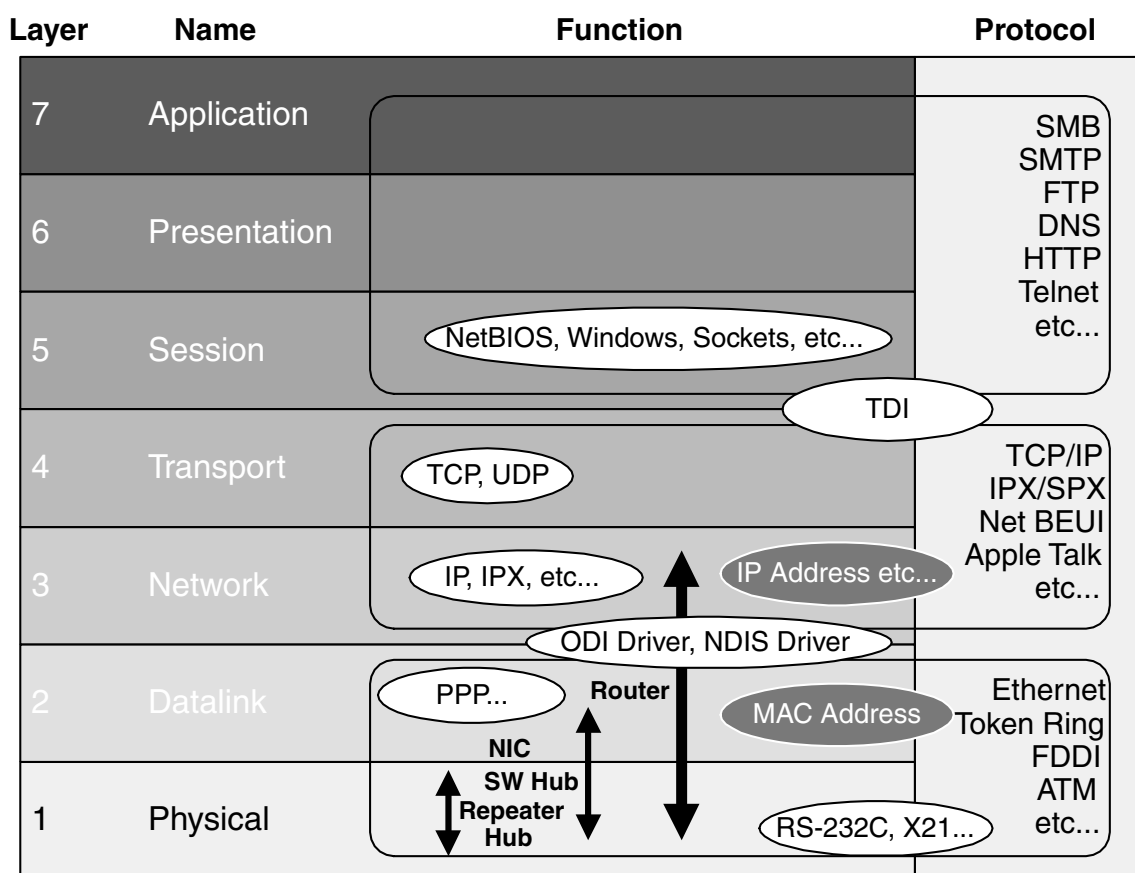
## 7 General Network Information

### 7.1. Network Protocol

#### 7.1.1. 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



### 7.1.2. 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

### 7.1.3. Cable

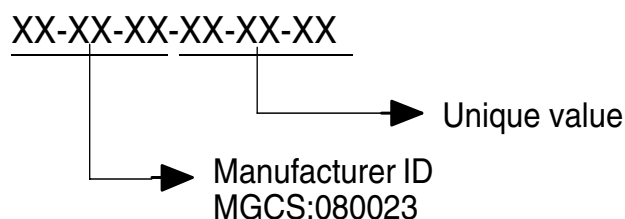
For the network transmission media at the Physical layer on the OSI reference model, there are several cable categories available. Category 5, 8 wire Unshielded Twisted Pair (UTP) cable is commonly used. Shielded Twisted Pair cables are also available. The Impedance for the STP / UTP Ethernet cable is 100 Ω. 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)

## 7.2. Layer Functions and Technology

### 7.2.1. 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.



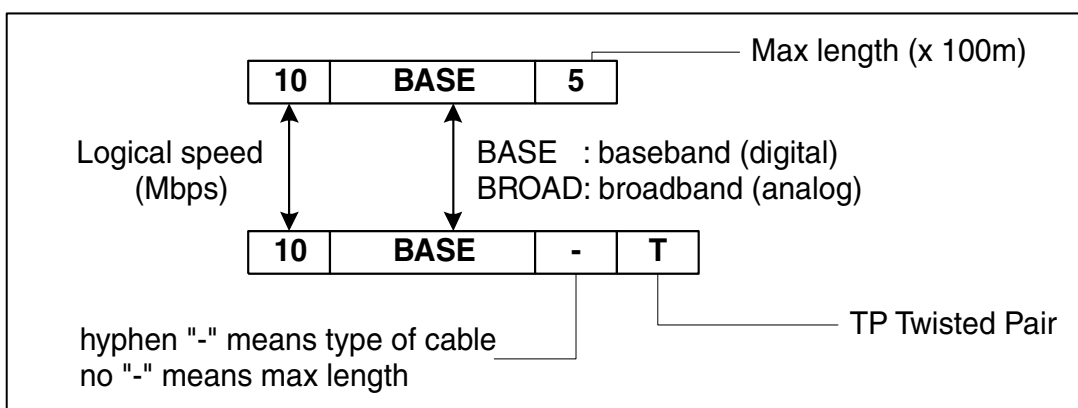


### 7.2.3. Ethernet

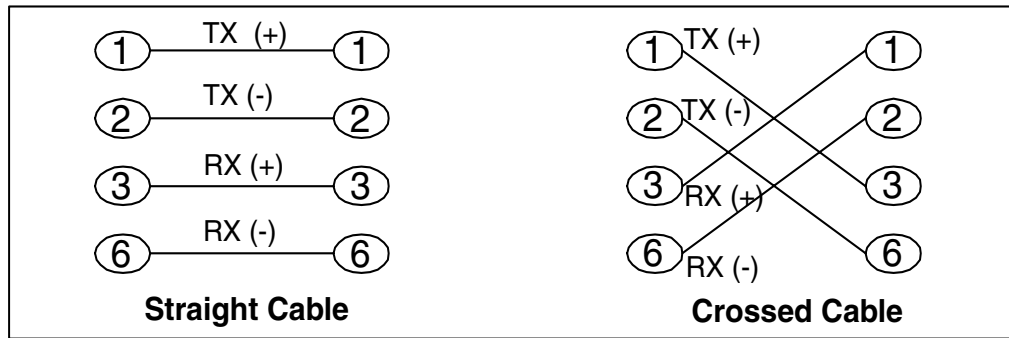
Ethernet is a very popular local area network architecture based on the CSMA/CD access method. The original ethernet specification was the basis for the IEEE 802.3 specifications. Typically, ethernet networks can use a bus physical topology, although, many varieties of ethernet such as 10Base-T uses 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

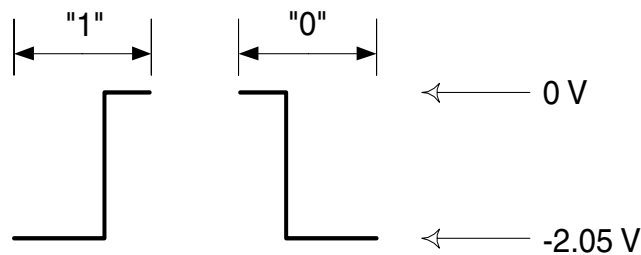


#### Ethernet Configuration



### 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.

#### 7.2.4. 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.

#### 7.2.5. 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.

## 7.3. Network Layer

### 7.3.1. 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.

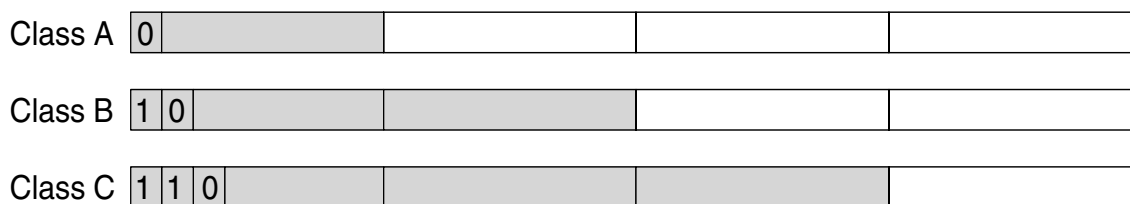
Class A IP addresses contain a number between 1 and 127 before the first dot. In class A address, this first octet represents the network address, and the last three octets represent the node or host number.

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



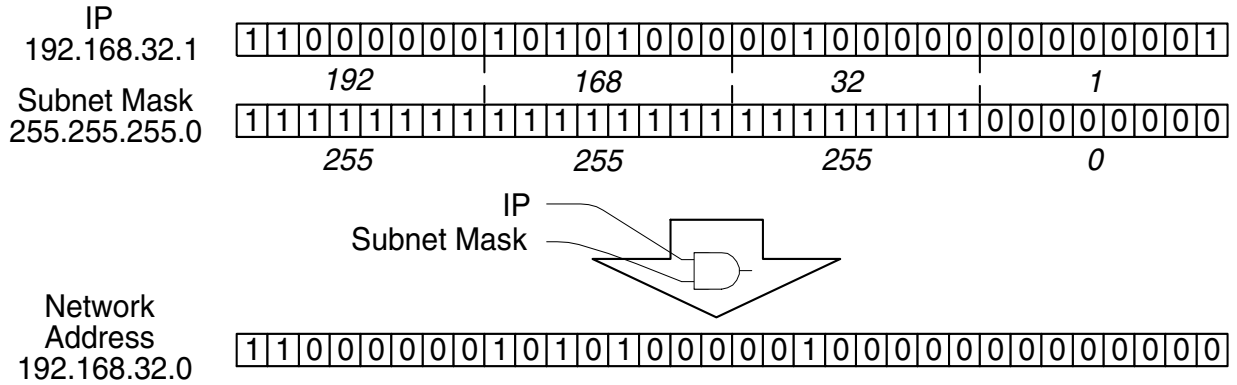
Network address represented as [shaded]

Private networks that do not connect to the Internet (operate internally) allow additional flexibility with IP addresses. Three classifications are available as shown below:

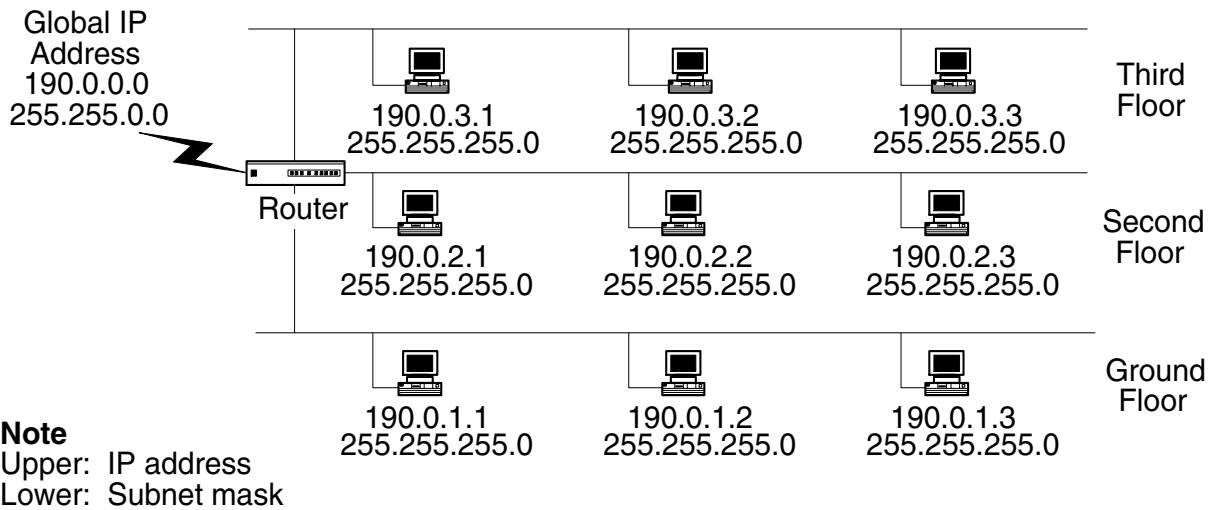
- Class A : 10.0.0.0 - 10.255.255.255
- Class B : 172.16.0.0 - 172.31.255.255
- Class C : 192.168.0.0 - 192.168.255.255

### 7.3.2. 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.

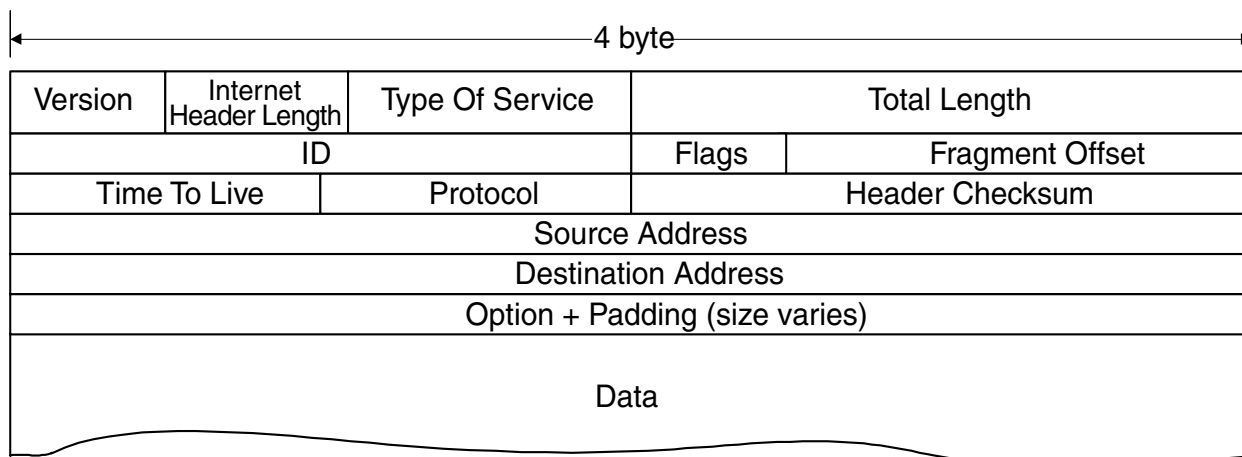
1. Host address is set to all "0"
2. Host address is set to all "1"  
Reserved for IP broadcasting to all subnet stations.
3. All 4 octets are set to all "1"  
IP broadcast of 255.255.255.255 can be passed over the router when the network address is specified. Normally, this is used for DHCP (Dynamic 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

### 7.3.3. 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



### 7.3.4. 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.

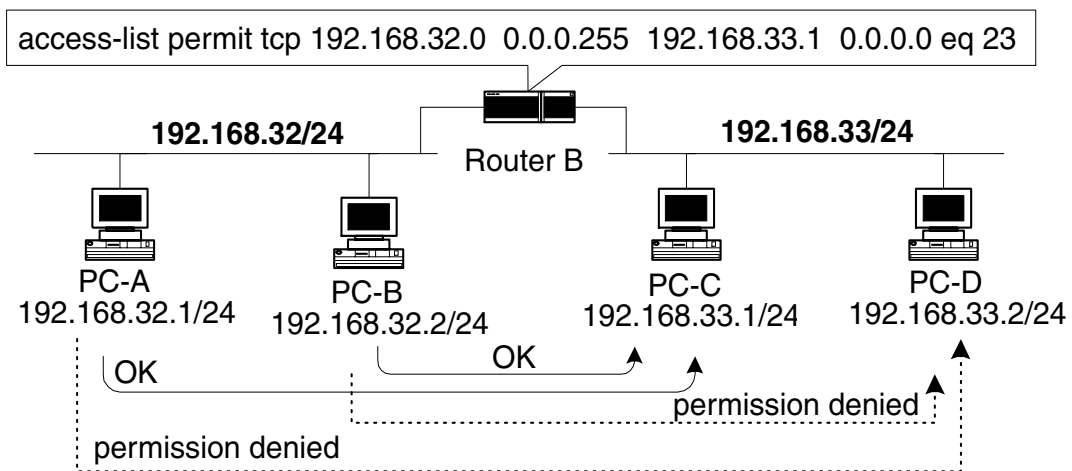
These are the typical functions:

#### 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.

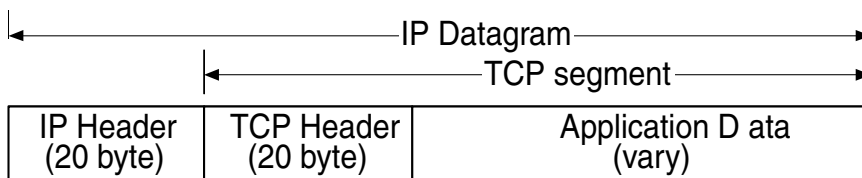
Watch Dog in IPX/SPX, TCP/IP in TCP, and Net BT (NetBIOS on TCP/IP) in Windows NT are all well known techniques to keep a live connection.

## 7.4. Transport Layer

### 7.4.1. 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

Source Port (2 byte)		Destination Port (2 byte)	
Sequence Number (4 byte)			
Acknowledgment Number (4 byte)			
Header Length (4 bit)	Reserved (6 bit)	Control Flag (6 bit)	Window (6 byte)
Checksum (2 byte)		Urgent Pointer (2 byte)	
Option			PAD
Data (Segment)			

### 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

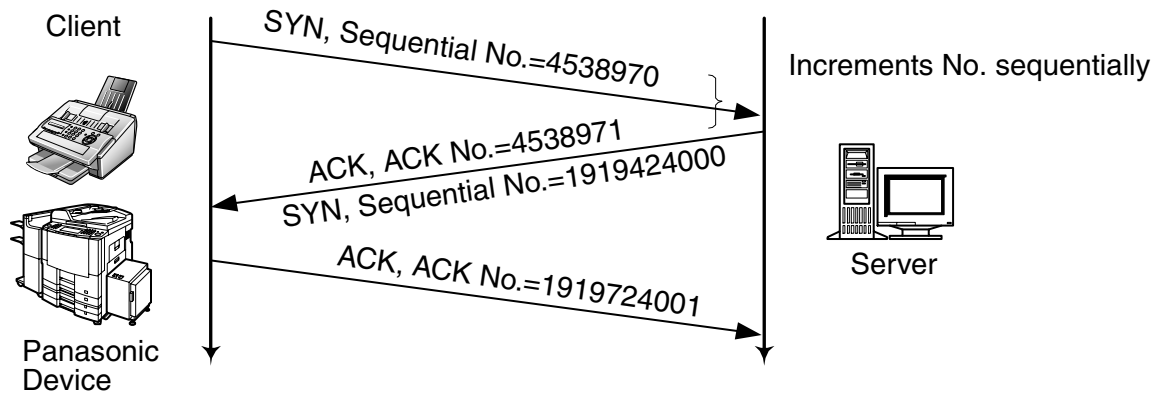
```

```

- 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.

## 7.5. Upper Layer

### 7.5.1. 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:

Panasonic.com  
Mail.panasonic.com  
ifax.panasonic.com

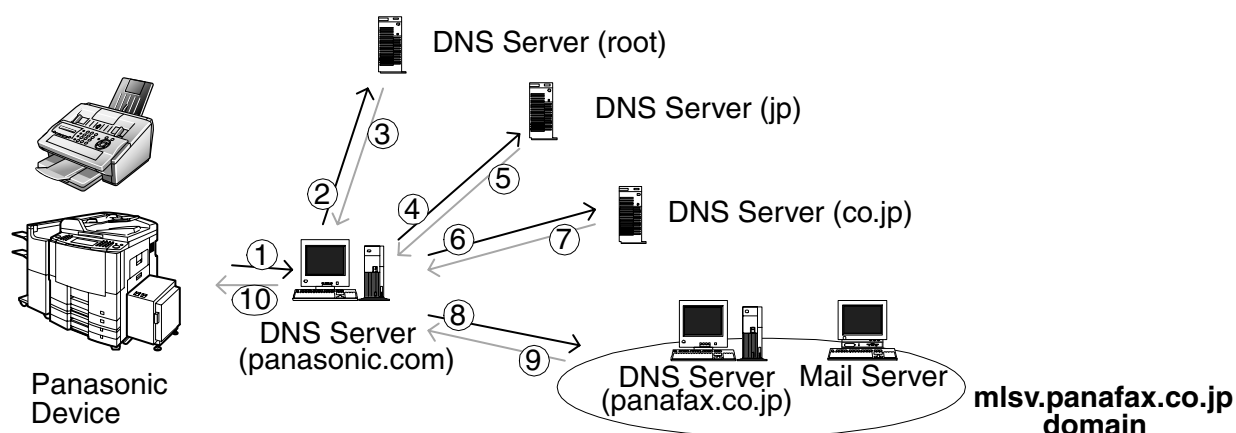
can all refer to the same device, but each domain name can refer to no more than one device.

Usually, all of the devices on a given network will have the same right-hand portion of their Domain Names (i.e. panasonic.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. 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 panafax.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.

### **7.5.2. 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.

### **7.5.3. 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.



### 7.5.5. 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.mgcs.mei.co.jp' last serial 720
; from 133.185.245.7 at Sun Mmm dd:11:35 yyyy
$ORIGIN mgcs.mei.co.jp.
rdmg      IN      SOA      nwmgr.mgcs.mei.co.jp. postmaster.rdmg.mgcs.mei.co.jp. (
          721 10800 3600 604800 86400 )
          IN      NS      nwmgr.mgcs.mei.co.jp.
          IN      MX      10 mlsv2.rdmg.mgcs.mei.co.jp.
$ORIGIN rdmg.mgcs.mei.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

### 7.5.6. 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.mgcs.mei.co.jp.
1        IN PTR     localhost.rdmg.mgcs.mei.co.jp.
;

```

PTR record (Bind 4.9.5 for NT) in "db.127.0.0" file.

### 7.5.7. 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, it's usually a good idea to have a CNAME record so people still using the old name, will get to the right place.

### 7.5.8. 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.mgcs.mei.co.jp
```

The "@" symbol indicates the local domain. The server "nwmgr" in the domain "mgcs.mei.co.jp" is the name server.

### 7.5.9. 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/>.

### 7.5.10. 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.

### 7.5.11. 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.

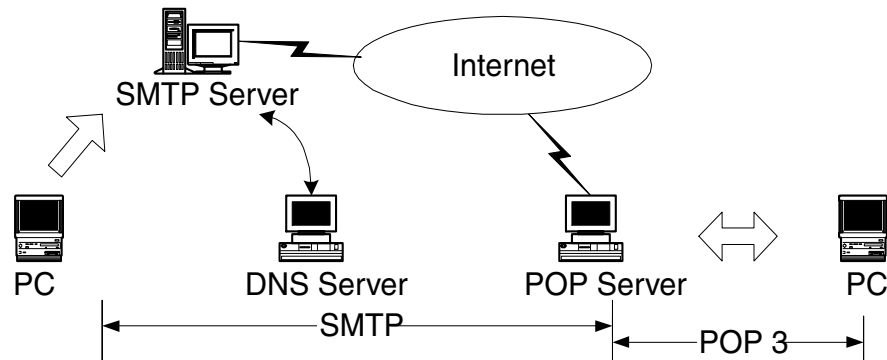


## 7.6. SMTP (Simple Mail Transfer Protocol)

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**

### 7.6.1. Mail Header Sample

Received: from nwr35 by labo.mgcs.com (8.9.3/3.7W-RDMG) with SMTP id PAA09157 for <freeport@labo.mgcs.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.mgcs.com>	Message ID
Mime-Version: 1.0	
X-Mailer: Internet FAX, MGCS	
From: "MGCS" <ifax98-us@labo.mgcs.com>	
Subject: IMAGE from Internet FAX	
To: freeport@labo.mgcs.com	
Content-Type: multipart/mixed; boundary="+++-MGCS-+-++"	Content-Type
X-UIDL: 8f32e4b1d691fdfc28daa812d913f572	

## 7.7. ITU T.37 and RFC2305

### 7.7.1. 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.

### 7.7.2. 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

**7.7.3. 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

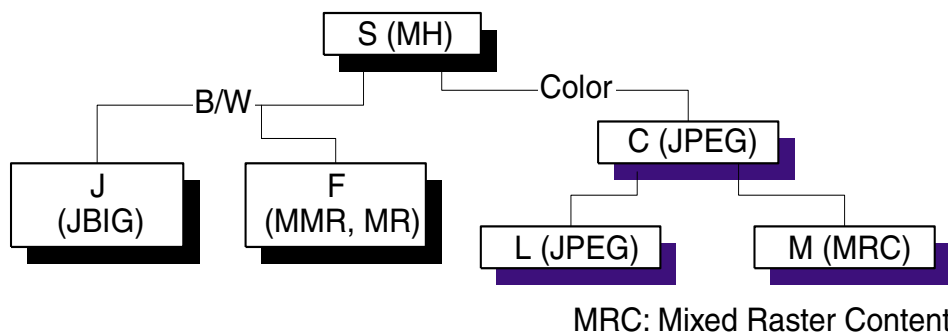
**RFC reference <http://www.imc.org/ietf-fax/>**

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

### 7.7.4. 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



**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**

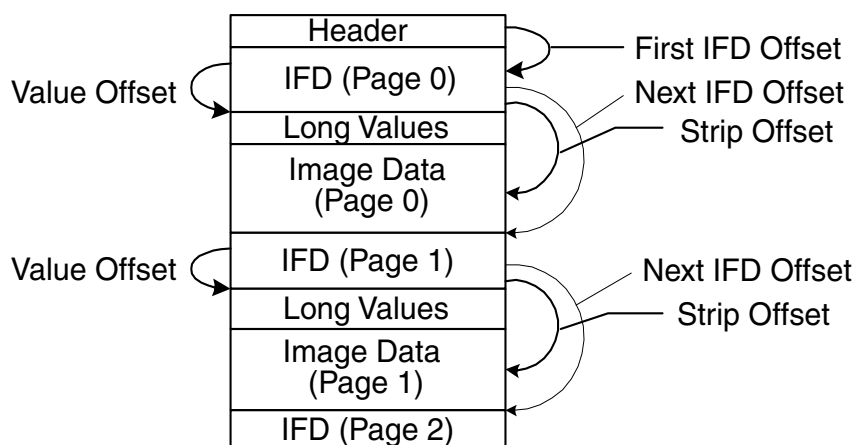
This phrase, or the phrase “SHALL NOT”, means that the definition is an absolute prohibition of the specification.

**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.

**7.7.7. 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

#### 7.7.8. 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.

#### 7.7.9. 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.

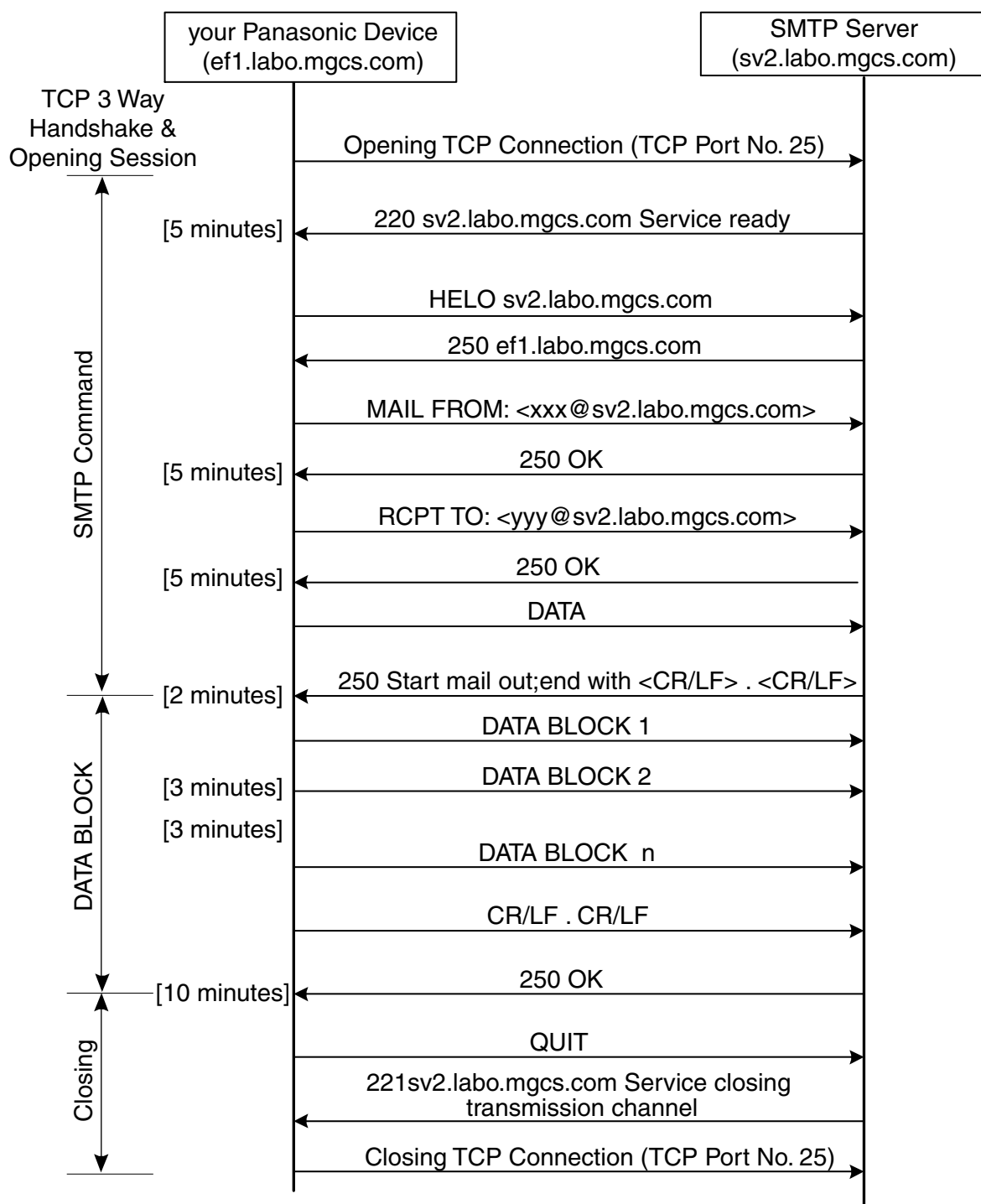
The Receiving Internet Fax devices must be able to read minimum set TIFF files.

## 7.8. 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 Panasonic 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.



### 7.8.1. 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>".

### 7.8.2. Mail (MAIL)

This command is used to initiate a mail transaction in which the mail data is delivered to one or more mailboxes.

### 7.8.3. 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.

### 7.8.4. 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.

### 7.8.5. 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.

### 7.8.6. 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.

### 7.8.7. 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.

### 7.8.8. Quit (QUIT)

This command specifies that the receiver must send an OK reply, and then close the transmission channel.

### 7.8.9. 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.

## 7.8.10. 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

## 7.9. POP (Post Office Protocol Version 3)

### 7.9.1. 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)

### 7.9.2. 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.

### 7.9.3. 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:

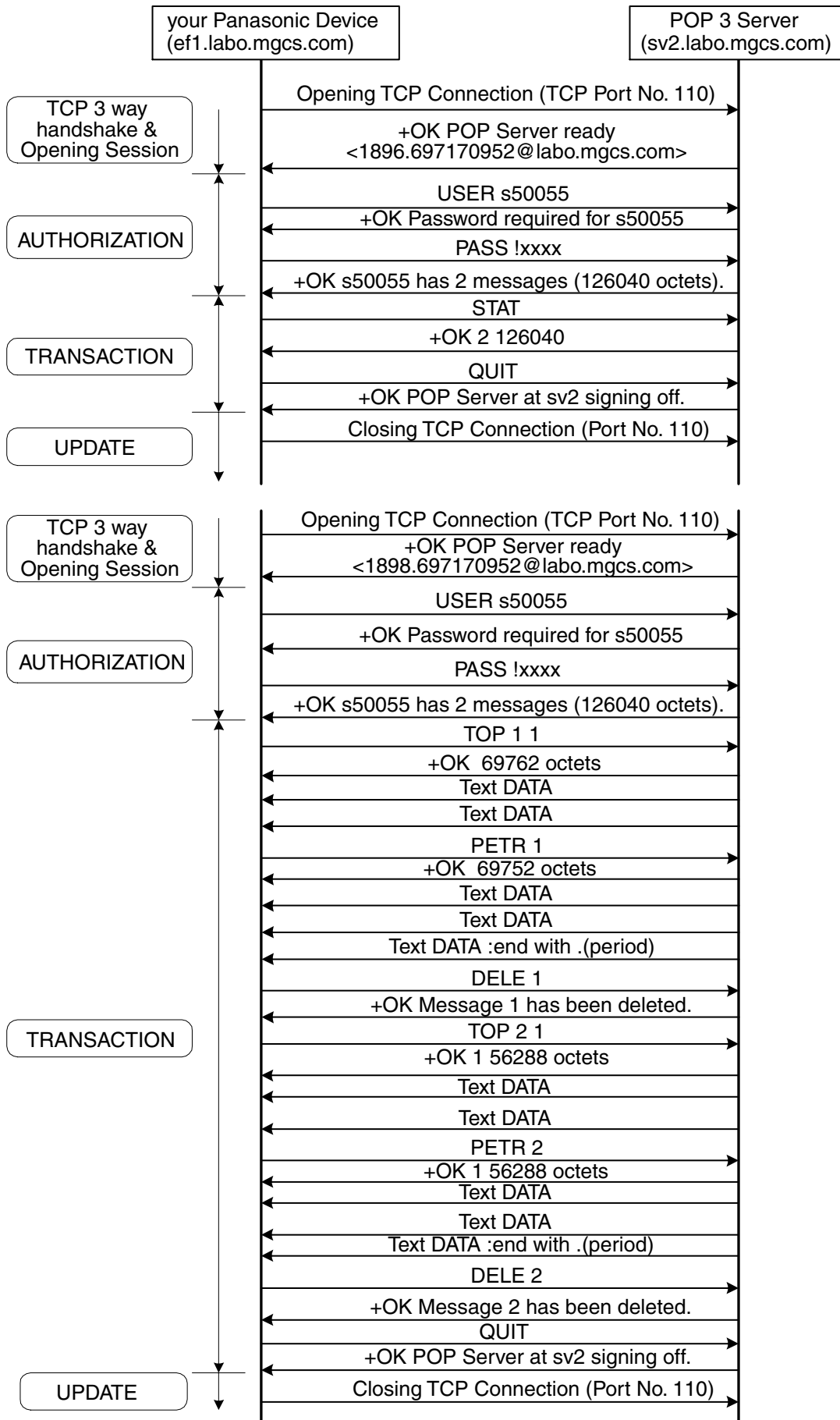
+OK  
 -ERR

**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:	
<input type="checkbox"/> 1	ok [172. 21. 11. 19]	[133. 185. 245. 20]	TCP D=110 S=12270 SYN SEQ=14220350 LEN=0 WIN=2144
<input type="checkbox"/> 2	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 SYN ACK=14220351 SEQ=1205248000 LEN=0 WIN=4
<input type="checkbox"/> 3	ok [172. 21. 11. 19]	[133. 185. 245. 20]	TCP D=110 S=12270 ACK=1205248001 WIN=2144
<input type="checkbox"/> 4	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK UCB Pop server (version 1.831beta) at
<input type="checkbox"/> 5	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 USER p50019
<input type="checkbox"/> 6	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK Password required for p50019.
<input type="checkbox"/> 7	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 PASS p50019
<input type="checkbox"/> 8	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 ACK=14220377 WIN=4096
<input type="checkbox"/> 9	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK p50019 has 1 message(s) (788 octets).
<input type="checkbox"/> 10	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 STAT
<input type="checkbox"/> 11	ok [133. 185. 245. 20]	[172. 21. 11. 19]	POP3 R PORT=12270 +OK 1 788
<input type="checkbox"/> 12	ok [172. 21. 11. 19]	[133. 185. 245. 20]	POP3 C PORT=110 QUIT
<input type="checkbox"/> 13	ok [133. 185. 245. 20]	[172. 21. 11. 19]	TCP D=12270 S=110 ACK=14220389 WIN=4096
<input type="checkbox"/> 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



## 7.10. Troubleshooting from a PC

Troubleshooting is an art of seeking out the cause of a problem and eliminating the problem by managing of 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, 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.



## 7.12. 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.

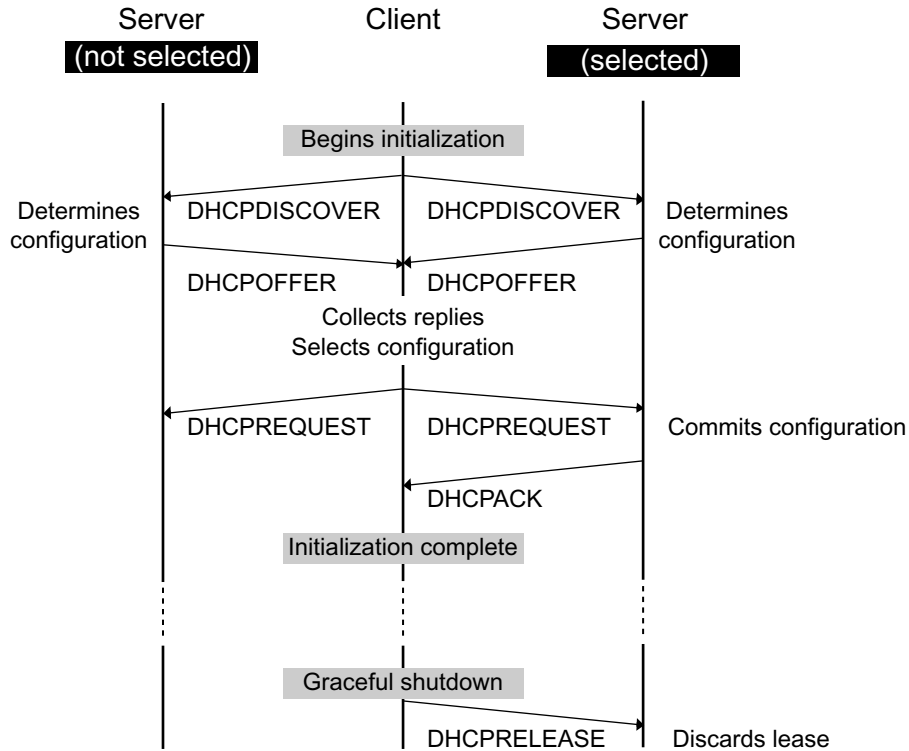
Table 1 describes a DHCP message and its purpose of use.

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

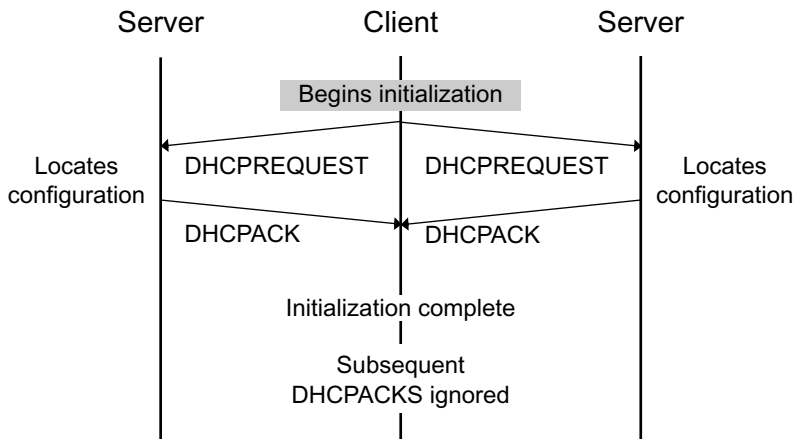


Following figure shows the timeline diagram of messages exchanged between DHCP client and servers when allocating a new network address.



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



### 7.13. 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.

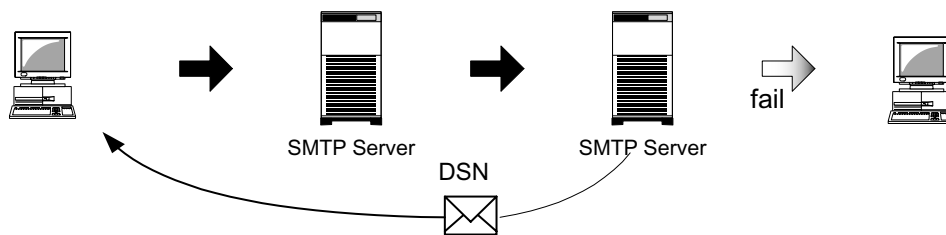
- (1) Delivery confirmation (required)
- (2) Additional document features (optional)

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.

MGCS supports MDN.

#### Delivery Status Notification (DSN)

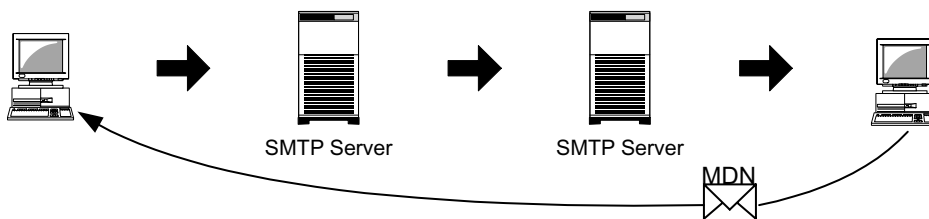
A DSN can be used to notify the sender of a message of any of several conditions: failed delivery, delayed delivery, successful delivery, or the gatewaying of a message into an environment that may not support DSNs. MGCS Internet FAX does not request DSN while sending.



DSN returned to sender by Reporting MTAs (Message Transfer Agent) if fail of delivery is occurred.

#### Message Disposition Notifications (MDN)

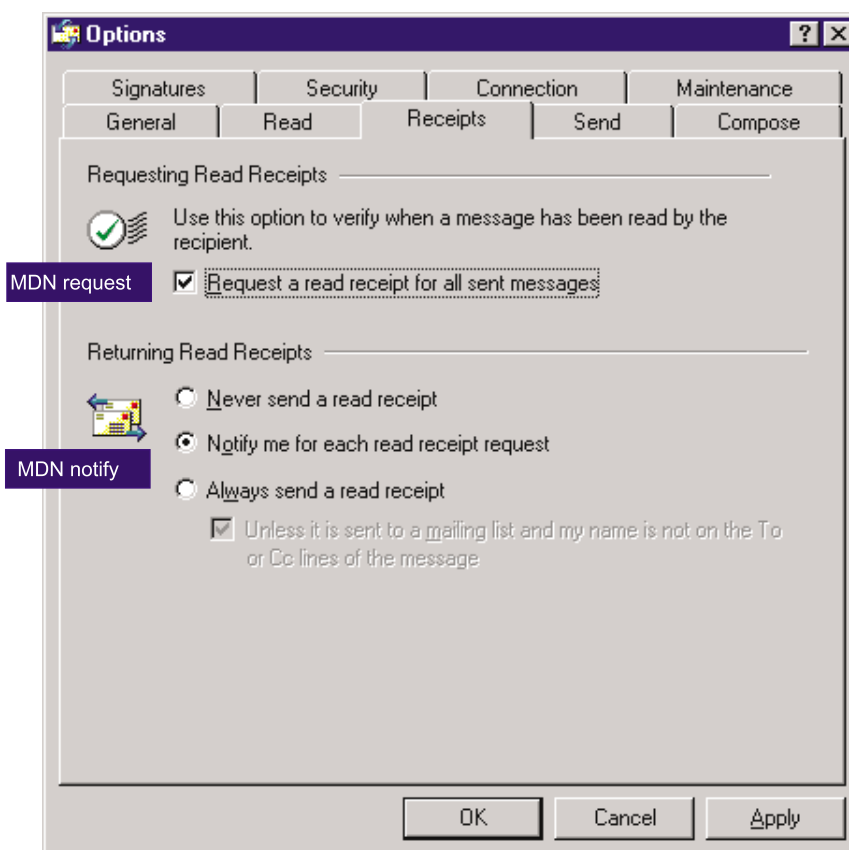
A MDN can be used to notify the sender of a message of any of several conditions that may occur after successful delivery, such as display of the message contents, printing of the message, deletion (without display) of the message, or the recipient's refusal to provide MDNs.



Recipient notifies that the message contents have been displayed properly.

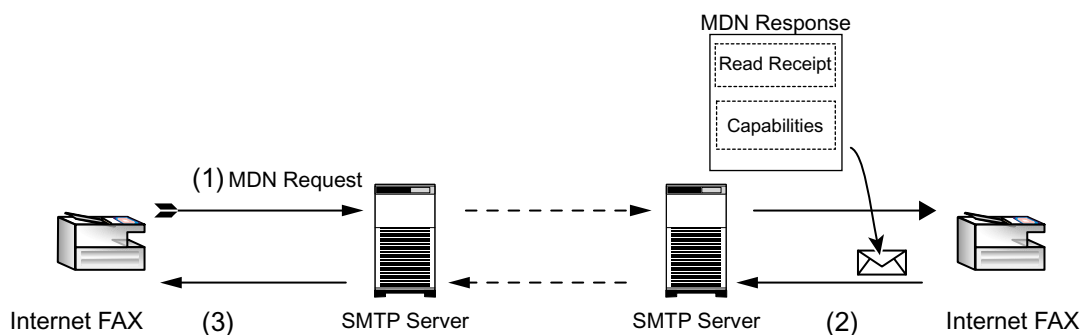
The MDNs are expected to serve several purposes such as allow mail user agents (Outlook Express) to keep track of the disposition of messages sent, by associating returned MDNs with earlier message transmissions.

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 Process

#### (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 as following formula.

## MDN Request Sample

```
Mime-Version: 1.0
X-Mailer: Internet FAX, MGCS
Content-Transfer-Encoding: 7bit
Date: Wed, dd Mmm yyyy 15:20:00 -0500
Message-Id: <200202060018.12345@core.mega.edu>
From: "MGCS 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="+-+-MGCS-+-+-"
```

## (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, MGCS
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="+-+-MGCS-+-+-"
```

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.

## 7.14. 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.

## 7.15. 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.

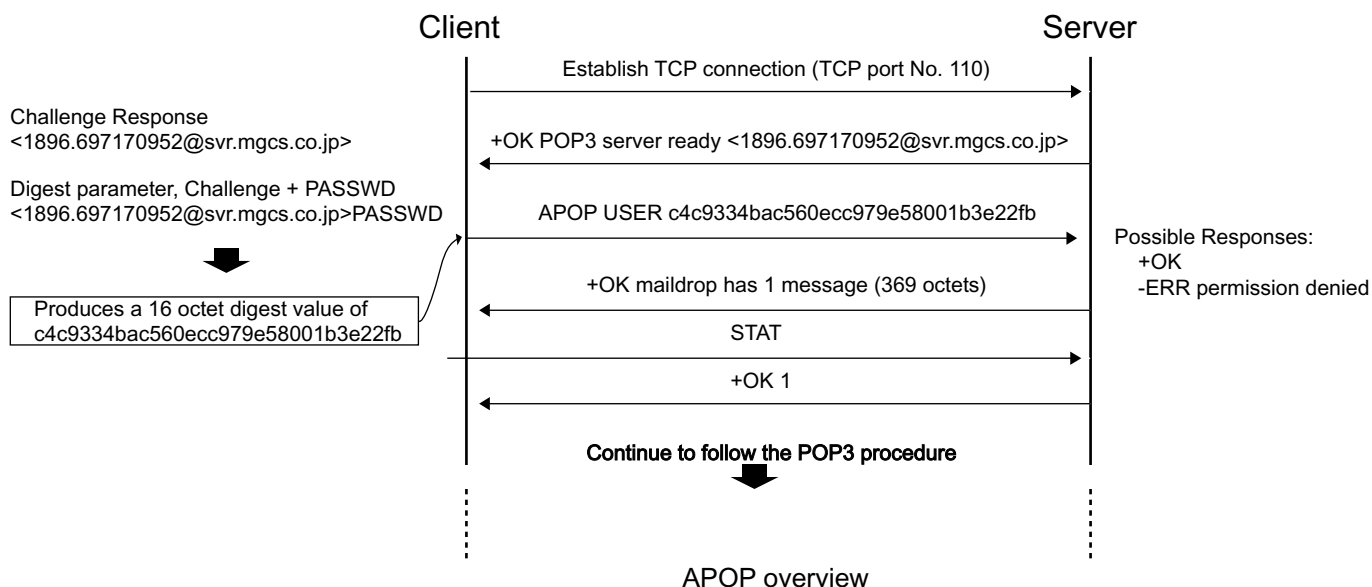
Normally, each POP3 session starts with a USER/PASS exchange. This results in a server/user-id specific password being sent in the clear on the network. For intermittent use of POP3, this may not introduce a sizable risk. However, many POP3 client implementations connect to the POP3 server on a regular 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.

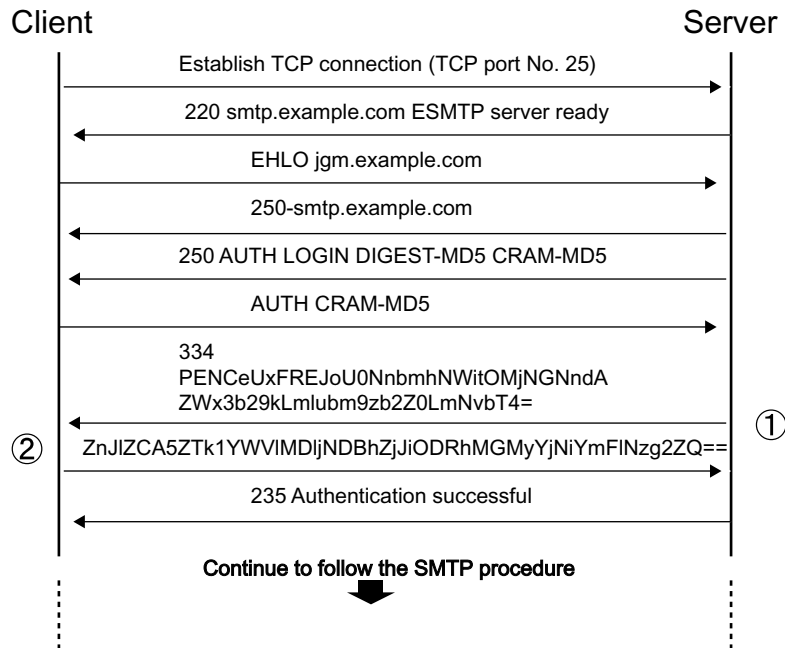
When the POP3 server receives the APOP command, it verifies the digest provided. If the digest is correct, the POP3 server issues a positive response, and the POP3 session enters the TRANSACTION state. Otherwise, a negative response is issued and the POP3 session remains in the AUTHORIZATION state.

Note that as the length of the shared secret increases, so does the difficulty of deriving it.



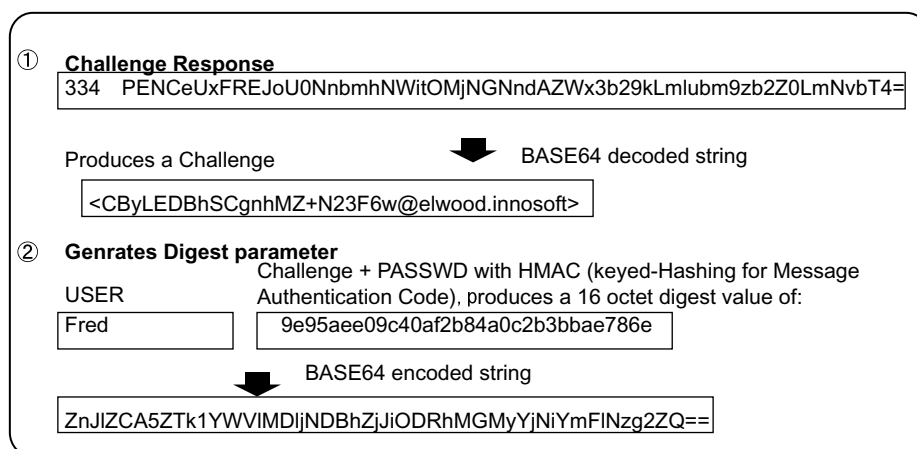
## 7.16. SMTP Service Extension for Authentication (SMTP Auth) - Extended Feature

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.

## 7.17. Direct SMTP Transfer - Extended Feature

Simple Mail Transfer Protocol (SMTP) is 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 relaying by employing SMTP server.

Direct SMTP transfer allows you to transmit documents to another Internet Fax directly employing no SMTP server. To enable this feature, you must configure its static IP address, subnetmask, default gateway and etc. accordingly. Domain Name System (DNS) must be required to run the system, so that hosts and some additional records must be properly existed in DNS entries.

Please note that the system runs under DHCP dynamic updates with DNS meets its requirement also.

In other words, DHCP runs non-Dynamic Updates in the Domain Name System can not be applied for Internet Fax who wish to enable Direct SMTP transfer function.

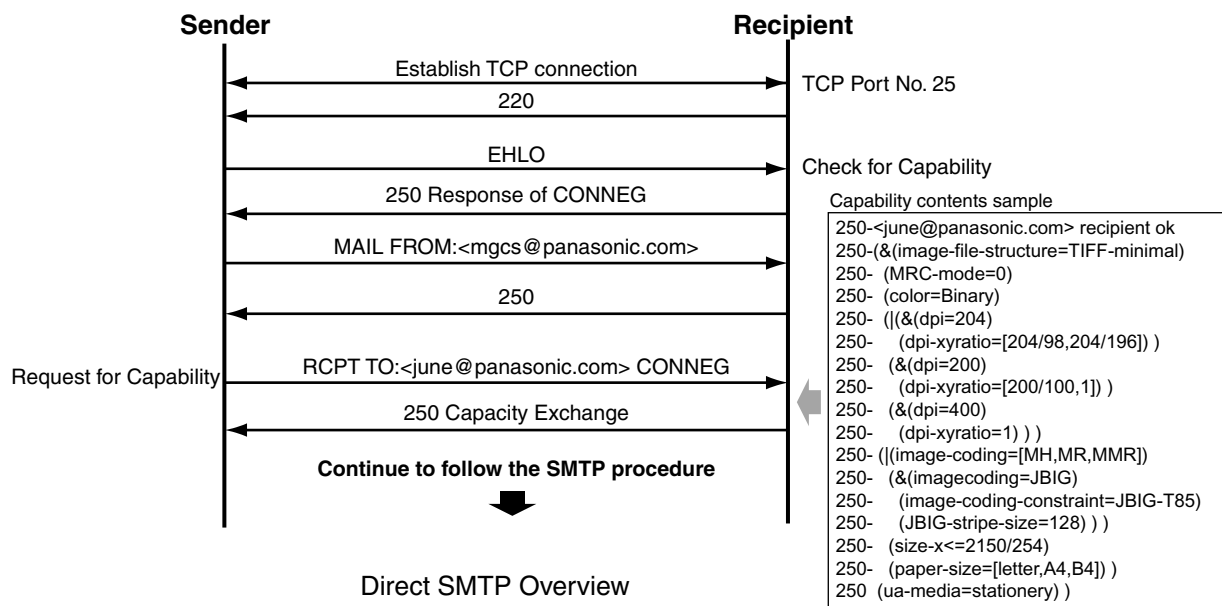
Furthermore, in common cases only email and web service from the Internet are permitted into the corporate intranet, and corporate network administrators are extremely reticent to open the firewall for other, incoming services, since each opened path represents additional, potential security threats.

So the Direct SMTP transfer can be operating throughout the organization's Intranet.

Capability exchanges and content negotiations are also available to take advantageous communication between Internet Fax communications.

Several service extensions are newly assigned.

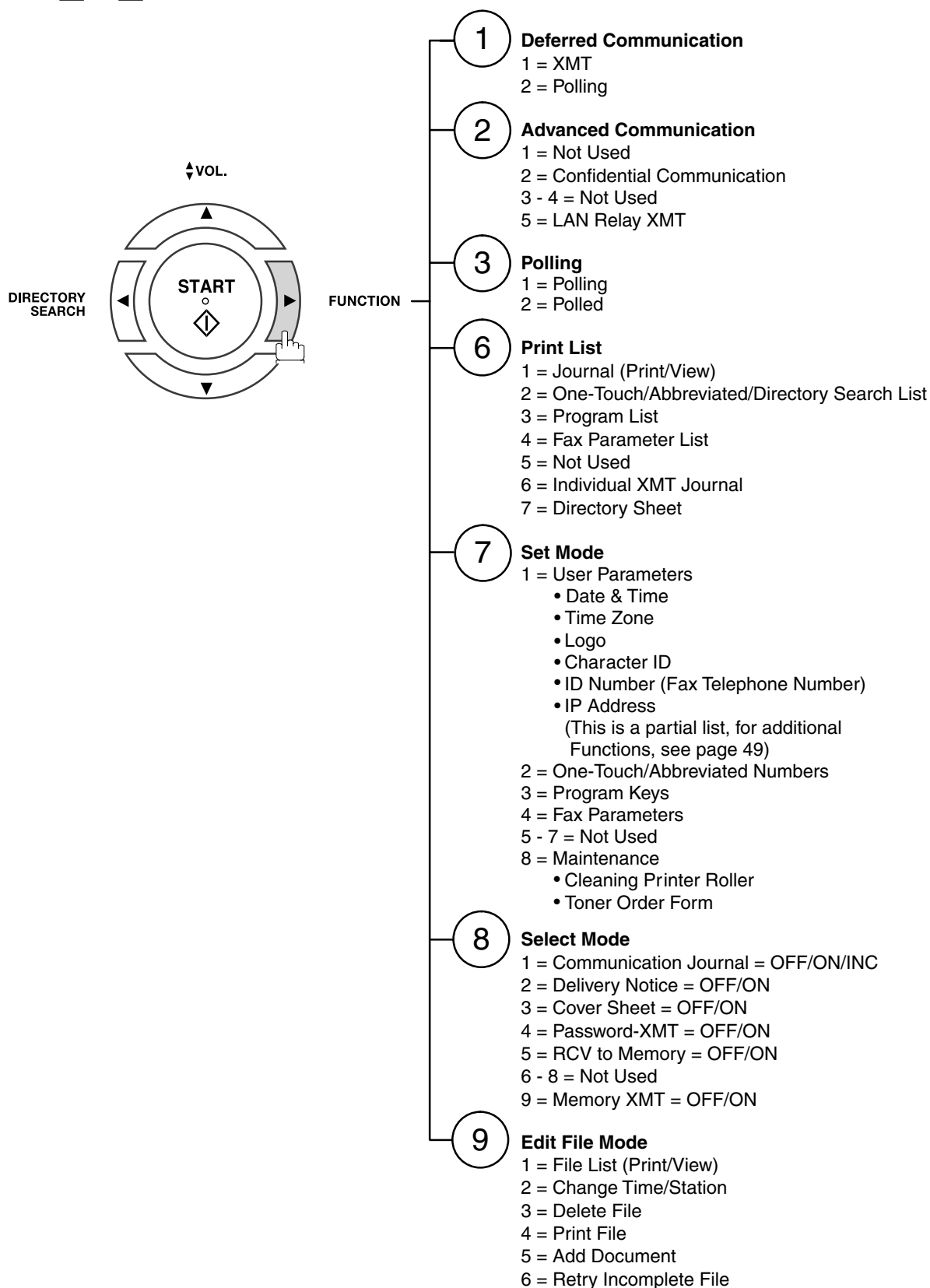
- (1) The EHLO keyword value associated with this extension is "CONNEX"
- (2) A parameter using the keyword "CONNEX" is added to the RCPT-TO command



## 8 Installation

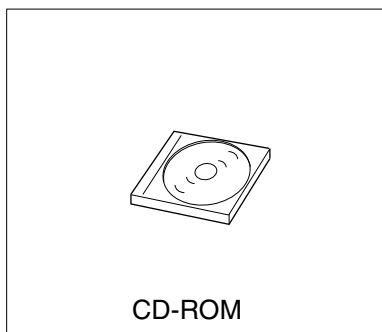
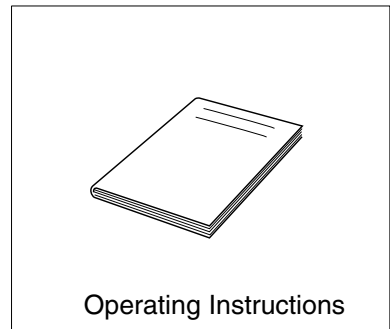
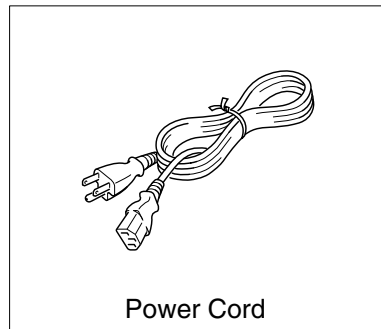
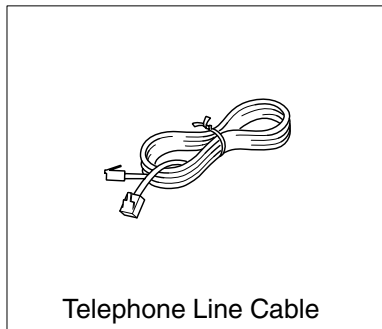
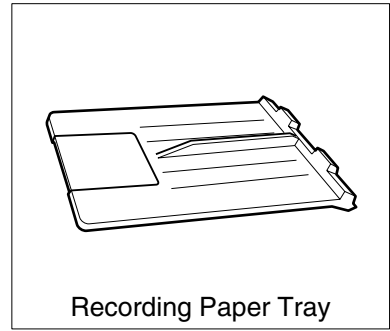
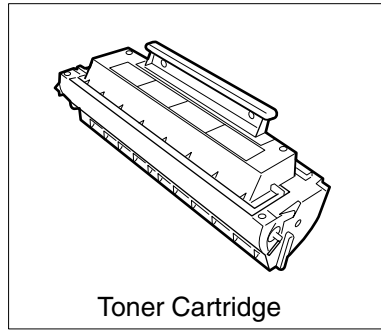
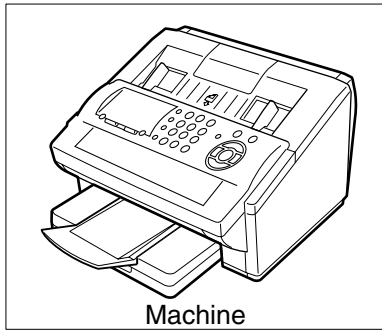
### 8.1. Function Key

Any function can be started by first pressing **FUNCTION** and then enter the function number, or by pressing **▼** or **▲** scroll key repeatedly until the desired function appears on the display.

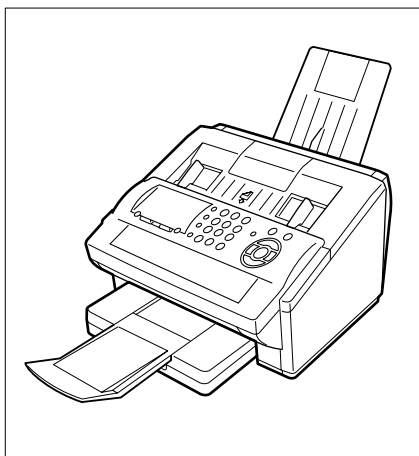


## 8.2. Main Unit and Accessories

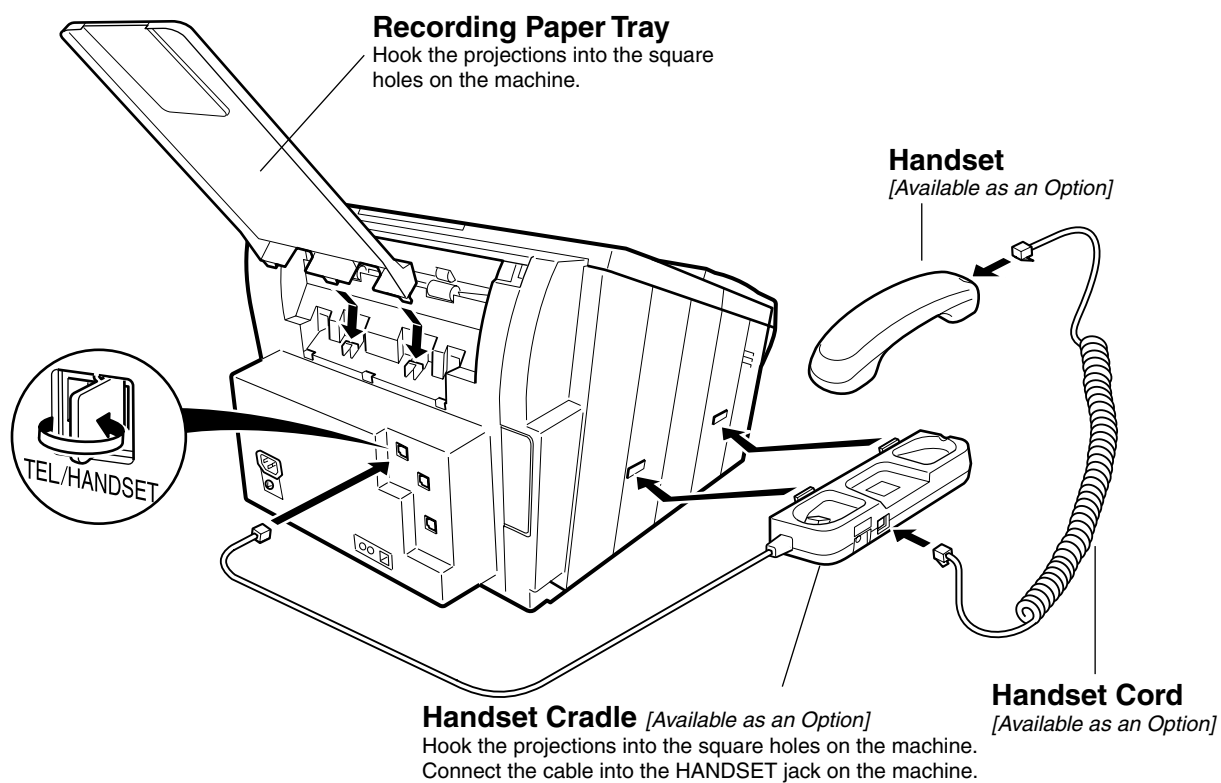
Unpack the carton and check that you have all the accessories illustrated.



### 8.3. Installing the Accessories



Final Installed View

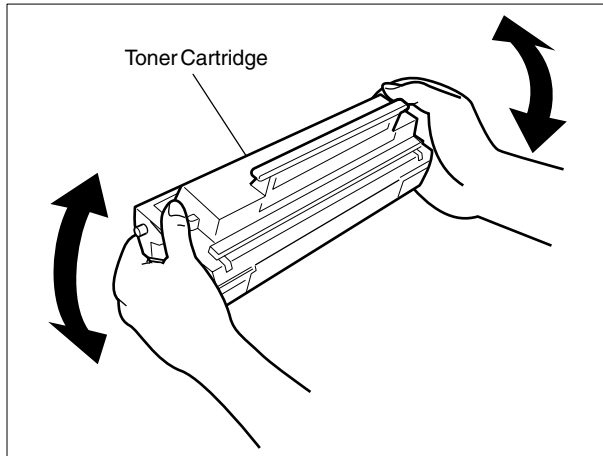


#### NOTE

The handset may not be available in certain destinations due to its regulation or specification.

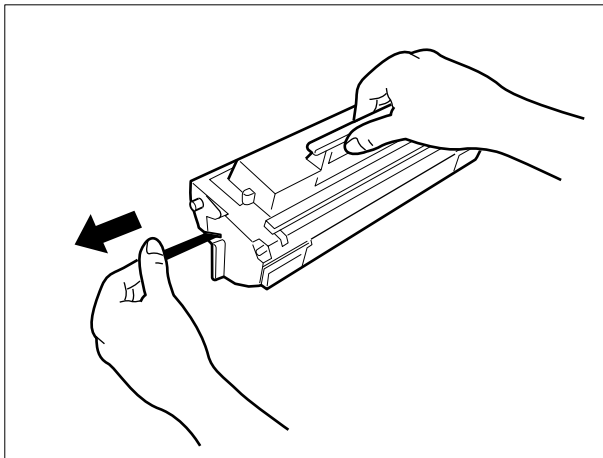
## 8.4. Installing the Toner Cartridge

1



Unpack the Toner Cartridge and rock it back and forth as shown 5 or 6 times to even the toner inside.

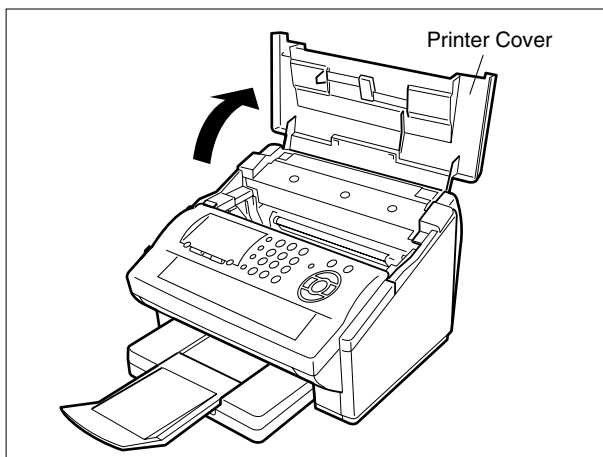
2



Remove the protective seal.

**Note:** Pull on the seal slowly and straight out

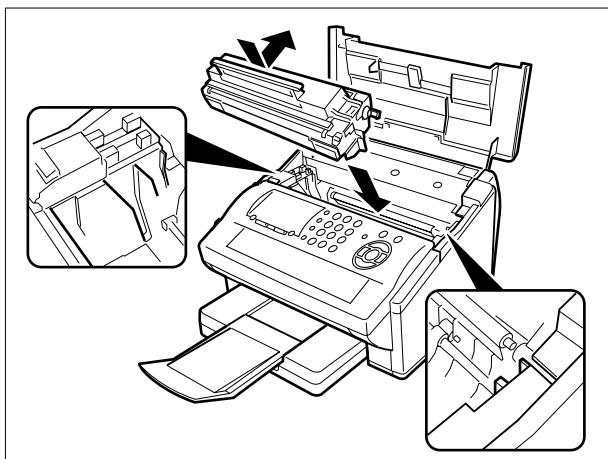
3



Open the Printer Cover.

*Continued on the next page...*

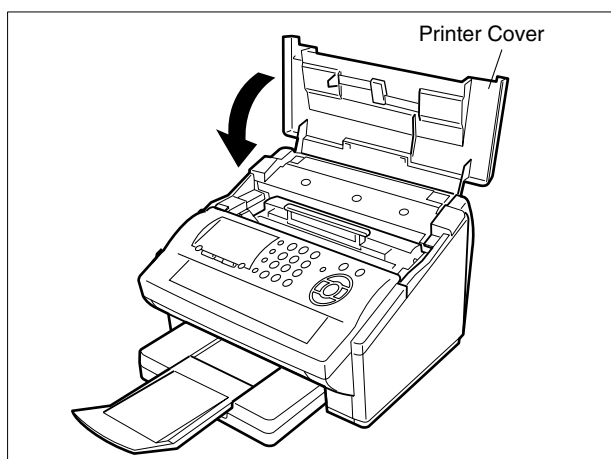
4



Align the projections on both sides of the Toner Cartridge with the grooves in the machine as shown and insert the Toner Cartridge into the machine.

**Note:** Lock the Toner Cartridge into place by pressing the handle down and then pushing towards the rear of the machine.

5



Close the Printer Cover.

6

If you are replacing the Toner Cartridge, it is recommended to clean the Printer Roller to maintain good printing quality. To clean the Printer Roller, follow the procedure on next page.

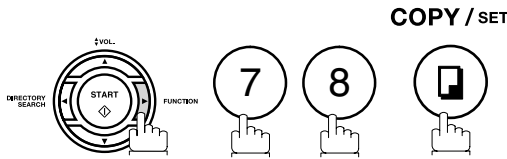


# Cleaning the Printer Roller

If you find toner on the back of the recording paper, the printer roller in the fuser unit is probably dirty.

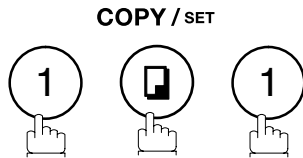
## To clean the Printer Rollers

**1**



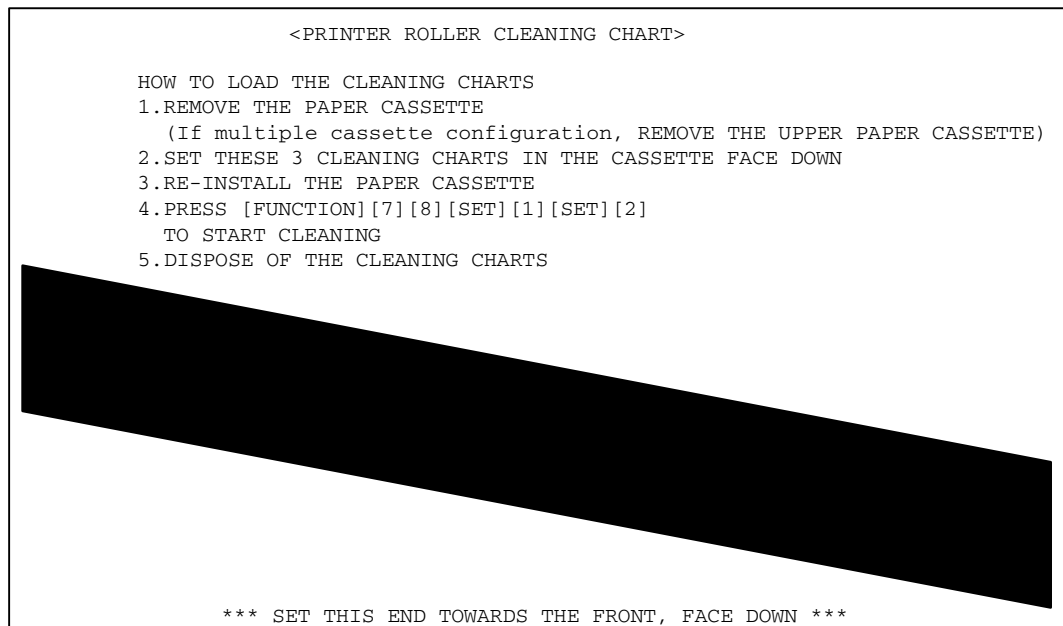
MAINTENANCE (1-9)  
ENTER NO. OR

**2**



\* PRINTING \*  
CLEANING CHARTS

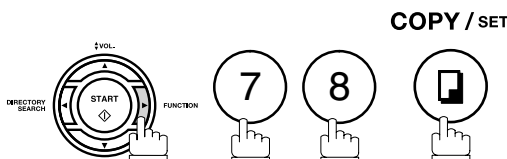
The machine will print out 3 Cleaning Charts.  
Then, return to standby.



**3**

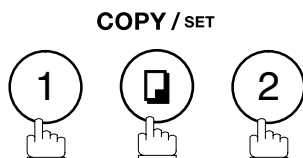
Load the Cleaning Charts into the cassette face down.  
(See Note 1)

**4**



MAINTENANCE (1-9)  
ENTER NO. OR

**5**



\* CLEANING \*  
PRINTER ROLLER

The Machine will feed out the charts and clean the printer roller.

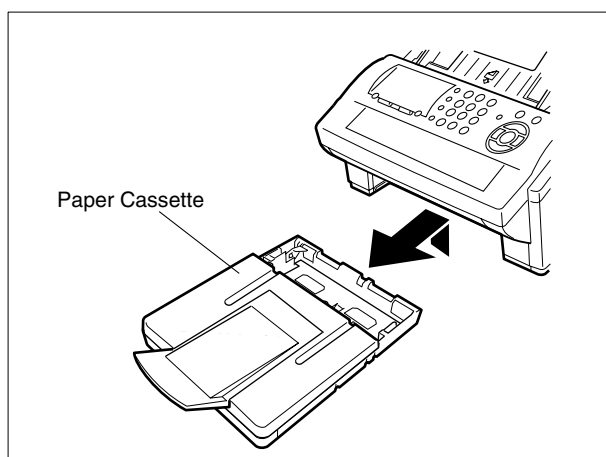
**NOTE**

1. If you have installed the optional cassette(s), load the Cleaning Charts into the upper cassette.

## 8.5. Loading the Recording Paper

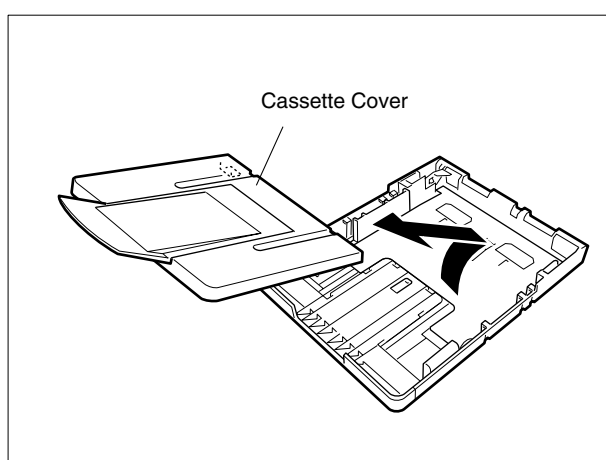
### How to Load the Recording Paper

**1**



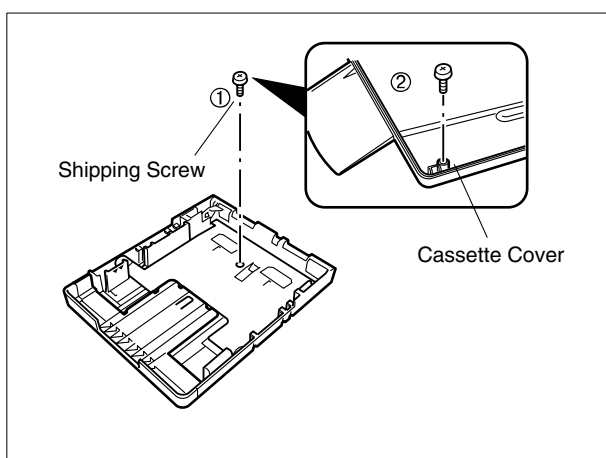
Lift up the Paper Cassette slightly and slide it out from the machine.

**2**



Remove the Paper Cassette Cover.

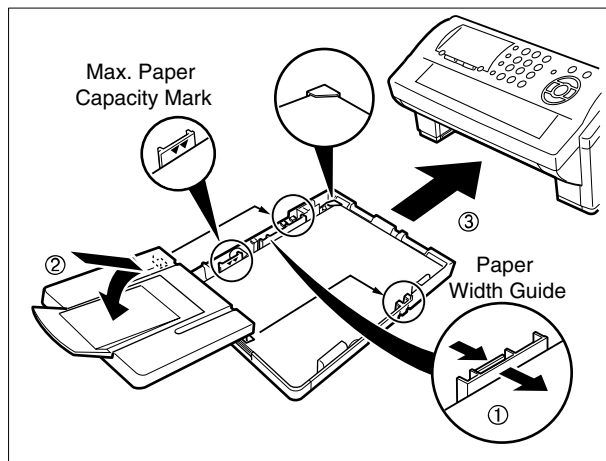
**3**



1. Remove the Shipping Screw securing the Pressure Plate.

2. Store the screw by attaching it to the post provided under the Paper Cassette Cover for future use.

4



1. Load the paper into the Paper Cassette. Slide the paper width guide to the left until it lightly touches the stack of paper without bending the paper. The paper must fit squarely and firmly between the Paper Width Guide and the right side of tray. If it does not, the paper may feed into the printer incorrectly resulting in a paper jam.

**Caution:** Make sure that the paper is set under the metal Paper Separation Clips and that it does not exceed the Maximum Paper Capacity Mark. You can load about 250 sheets (20 lb weight).

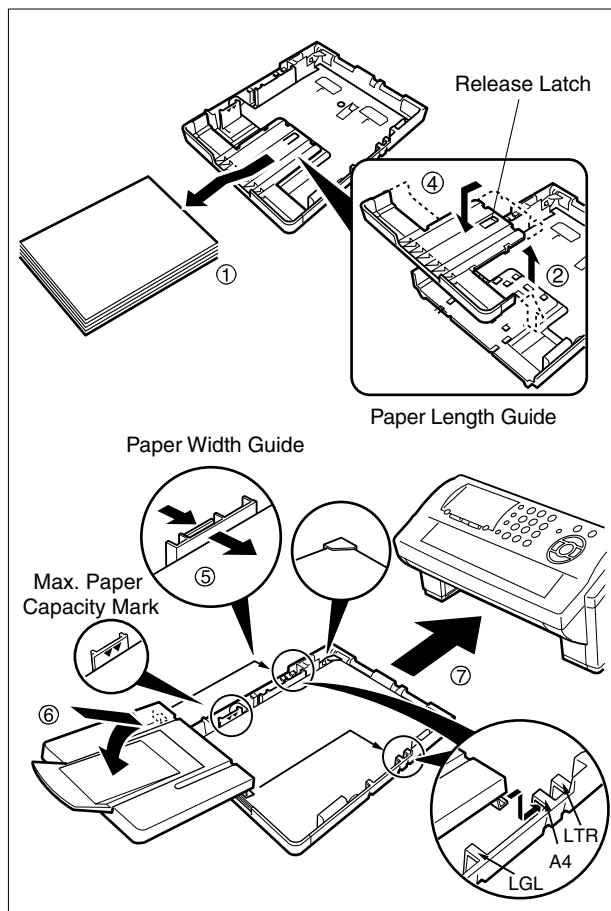
2. Re-install the Paper Cassette Cover.
3. Slide the Paper Cassette into the machine.

## 8.6. Adjusting the Paper Cassette for the Paper Length

### How to Adjust the Paper Cassette for the Paper Length

The factory default Paper Length setting for the Paper Cassette is on Letter size. To change the paper length to A4 or Legal size, follow the steps below.

# 1



1. Remove the paper from the Paper Cassette and place the cassette upside down on a flat surface.
2. While pushing down on the release latch, pull out the Paper Length Guide.
3. Turn the Paper Cassette upright.
4. Insert the Paper Length Guide hooks into the appropriate paper length slots (A4 or Legal) and slide the guide towards the back of the cassette until it locks in place.
5. Load the paper into the Paper Cassette.

Slide the paper width guide to the left until it lightly touches the stack of paper without bending the paper. The paper must fit squarely and firmly between the Paper Width Guide and the right side of tray. If it does not, the paper may feed into the printer incorrectly resulting in a paper jam.

**Caution:** Make sure that the paper is set under the metal Paper Separation Clips and that it does not exceed the Maximum Paper Capacity Mark. You can load about 250 sheets (20 lb weight).

6. Replace the Paper Cassette Cover to the appropriate paper position (LTR, A4 or LGL).
7. Slide the Paper Cassette into the machine.

# 2

The Recording Paper Size setting of the Fax Parameter No. 23 must match the paper loaded in the cassette. If you change the Recording Paper Size, please change the setting accordingly.

### NOTE

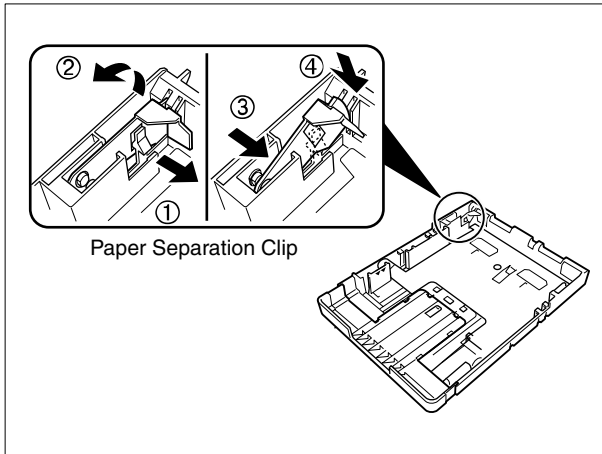
1. If you forget to change the Recording Paper Size setting in Fax Parameter No. 23 when different paper is installed in the cassette, the unit will Stop printing after the 1st page of an Incoming Fax and display a "PAPER SIZE MISMATCH" error. Then, the Recording Paper Size setting automatically adjusts to the proper size and the unit resumes printing the Incoming Fax from the 1st page.

## 8.7. Adjusting the Paper Cassette for the Paper Width

### How to Adjust the Paper Cassette for the Paper Width

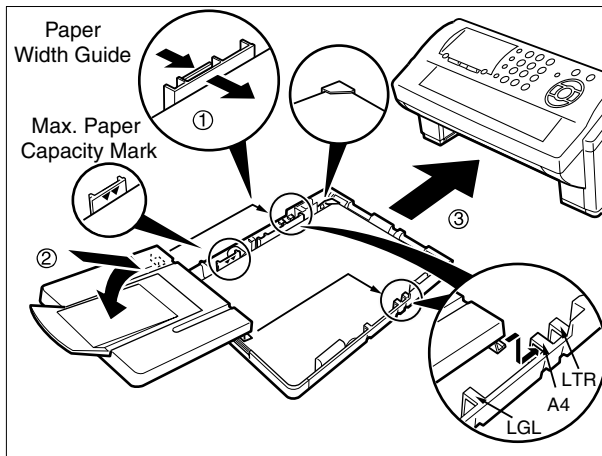
The factory default Paper Width setting for the Paper Cassette is on Letter/Legal size. To change the paper width to A4 size, follow the steps below.

# 1



1. Release the left Paper Separation Clip latch.
2. Pull up the Paper Separation Clip to remove it.
3. Reposition the Paper Separation Clip into the A(A4) slot.
4. Swing the Paper Separation Clip downward to latch it in place.

# 2



1. Load the paper into the Paper Cassette. Slide the paper width guide to the left until it lightly touches the stack of paper without bending the paper. The paper must fit squarely and firmly between the Paper Width Guide and the right side of tray. If it does not, the paper may feed into the printer incorrectly resulting in a paper jam.

**Caution:** Make sure that the paper is set under the metal Paper Separation Clips and that it does not exceed the Maximum Paper Capacity Mark. You can load about 250 sheets (20 lb weight).

2. Replace the Paper Cassette Cover to the appropriate paper position (LTR, A4 or LGL).
3. Slide the Paper Cassette into the machine.

# 3

The Recording Paper Size setting of the Fax Parameter No. 23 must match the paper loaded in the cassette. If you change the Recording Paper Size, please change the setting accordingly.

### NOTE

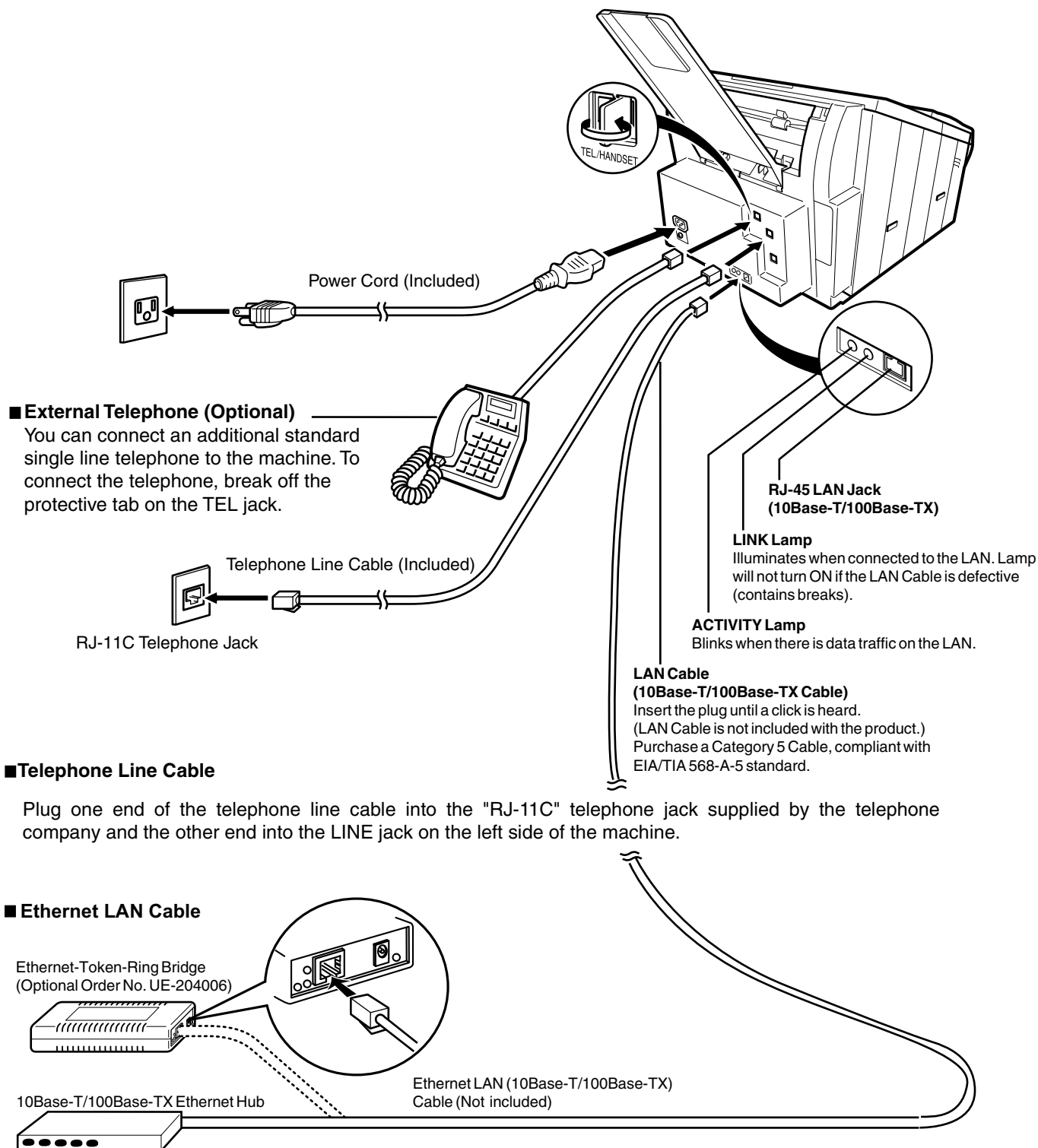
1. If you forget to change the Recording Paper Size setting in Fax Parameter No. 23 when different paper is installed in the cassette, the unit will Stop printing after the 1st page of an Incoming Fax and display a "PAPER SIZE MISMATCH" error. Then, the Recording Paper Size setting automatically adjusts to the proper size and the unit resumes printing the Incoming Fax from the 1st page.

## 8.8. Connecting the Telephone Line Cable and Power Cord

### ■ Power Cord

Plug one end of the power cord into an ordinary 3 prong AC outlet and the other end into the receptacle on the rear of the machine.

**Warning: This apparatus must be properly grounded through an ordinary 3 prong AC outlet. Do not break off the earth (ground) prong to fit a 2 prong outlet.**



### NOTE

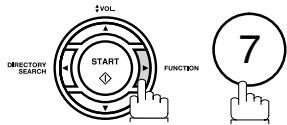
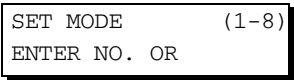
1. Your machine uses little power and you should keep it ON at all times. If the power is turned OFF for too long, the clock contents may be lost.

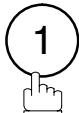
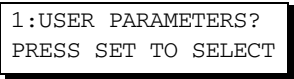
## 8.9. Setting the Internet Parameters


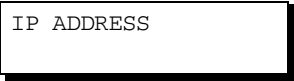
Before starting, you will need a completed copy of page 19 (Pre Installation Information). For your machine to be able to operate on the Network properly, the following five (5) Basic Parameters must be pre-programmed into the machine.

- IP Address
- Subnet Mask
- Default Gateway IP Address
- SMTP Server Name or IP Address
- Email Address



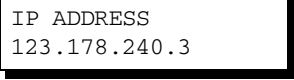
**Note:** If DHCP server is available on your network, the IP Address, Subnet Mask and Default Gateway IP Address will be acquired automatically.


**1**  



**2**  


**3** **COPY / SET**  

repeatedly until display shows;





**4** Enter the IP Address using the keypad. Press  or  to enter the period ".". (See Note 3) 

**Ex:** 

**5** **COPY / SET**  

To continue setting other parameters, or press  to return to standby.

### NOTE

1. To scroll the display to desired User Parameter in Step 3, press  or .
2. If the DNS Server is not available, change the setting of the Fax Parameter No. 161 (DNS SERVER) to "Invalid", then enter the IP Address instead.
3. For convenience, you can use  to enter a period "." while programming IP Addresses only. Otherwise  is used to enter an asterisk under other conditions.

## Setting the User Parameters for the LAN Interface

Depending on how your machine will be configured to communicate on the LAN, the appropriate parameters listed in the table below must be stored first.

No.	Parameter	Comments
1	DATE & TIME	Current Date and Time.
2	TIME ZONE	The Time Zone is required as part of the Email header information when sending Internet faxes.
3	LOGO	Up to 25 characters & digits.
4	CHARACTER ID	Up to 16 characters & digits.
5	ID NO.	Your Fax Telephone Number. (Up to 20 digits)
6	(MAC ADDRESS)	Hardware Address hard-coded into your machine. (If required, can be obtained from the Fax Parameter List printout, by pressing [FUNCTION] [6] [4] [SET])
7*	IP ADDRESS	IP Address assigned to your machine by the Network Administrator or the DHCP Server.
8*	SUBNET MASK	Subnet Mask assigned by the Network Administrator or the DHCP Server.
9*	DEFAULT GATEWAY IP ADDR	Default Gateway IP Address assigned by the Network Administrator or the DHCP Server.
10*	PRIMARY DNS SERVER IP ADDRESS	IP Address of the primary DNS Server. If the DNS Server is not available, change the setting of the Fax Parameter No. 161 (DNS SERVER) to "Invalid", then enter the IP Address instead.
11*	SECONDARY DNS SERVER IP ADDRESS	IP Address of the secondary DNS Server.
12*	EMAIL ADDRESS	The Email Address assigned to your machine for sending and receiving. (Up to 60 characters)
13*	SMTP SERVER NAME	The name of the SMTP Mail Server. (Up to 60 characters)
14	SMTP SERVER IP ADDR	IP Address of the SMTP Mail Server.
15*	SMTP AUTH NAME	User name required to login to the SMTP Server before it allow to send email messages. (Up to 40 characters).
16*	SMTP PASSWORD	Password assigned to your machine. (Up to 10 characters)
17*	POP SERVER NAME	The name of the POP Mail Server. (Up to 60 characters).
18*	POP SERVER IP ADDR	IP Address of the POP Mail Server.
19*	POP USER NAME	User Name assigned to your machine. (Up to 40 characters)
20	POP PASSWORD	Password assigned to your machine. (Up to 10 characters)
21	LDAP SERVER NAME	The name of the LDAP Server. (Up to 60 characters)
22	LDAP LOG IN NAME	Login Name assigned to your machine. (Up to 40 characters)
23	LDAP PASSWORD	Password assigned to your machine. (Up to 10 characters)
24	LDAP SEARCH BASE	ID for starting the search in the directory on the LDAP server. (Up to 60 Characters)
25	HOST NAME	The Host Name assigned to your machine. (Up to 60 characters)
26	DEFAULT SUBJECT	The default information to be added to the Subject Line for all outgoing Email (up to 40 characters). To manually input this information before transmission, change the Fax Parameter No. 159 (SUBJECT LINE ENTRY) to "2:Valid".
27	DEFAULT DOMAIN	When the outgoing email address is incomplete by SMTP standards, the Frequently Sent Domain specified here will be automatically added to the email address. This feature is also useful as a shortcut when manually entering email addresses to a frequently used Domain. (Up to 50 characters)



No.	Parameter	Comments
28	SELECTABLE DOMAINS (01) ~ (10)	Enter up to 10 Domain Names that can be selected after the Domain "@" key is pressed using the "V or ^" key during Manual email addressing. (Up to 30 characters)
29	REMOTE PASSWORD	This is a security password that allows Remote Programming of the Internet Parameters and Auto Dialer or the retrieval of the Journal via an Email. (Up to 10 characters)
30	RELAY XMT PASSWORD	A password that provides Network security for your Relay Station (used exclusively for G3 relay purposes). (Up to 10 characters)
31	MANAGER'S EMAIL ADDR	Department Manager's Email Address for notification of all Internet relayed transmissions for supervision and cost control purposes. (Up to 60 characters)
32	RELAY DOMAIN (01) ~ (10)	Enter up to 10 Domain Name(s) that have been authorized to access your Internet Fax for Relayed XMT Request. (Up to 30 characters) Relay Domain, a.k.a. Domain Name in your machine.
33	COMMUNITY NAME (01) ~ (02)	Community Name used for the Network Device Locator.
34	DEVICE NAME	Device Name used for the Network Device Locator.
35	DEVICE LOCATION	Device Location for the Network Device Locator.

\* Contact your Network Administrator for this Information.

## 8.10. Programming or Retrieving Parameters via Email

### Using Email to Program or Retrieve Parameters

This feature is a powerful tool, which provides a convenient and easy way of retrieving or programming Internet Parameters, One-Touch, ABBR Dialing Numbers, Program keys and Journal retrieval from your PC by sending a text email message to your machine.

Using your email application's "Subject:" line as a command-input field, you can request your machine to perform the following commands:

	"Subject:" Line Command	Function
1	#set parameters(password)#	Programs the Internet Parameters
2	#get parameters(password)#	Retrieves the Internet Parameters
3	#set abbr(password)#	Programs the Auto Dialer
4	#get abbr(password)#	Retrieves the Auto Dialer Data
5	#get jnl(password)#	Retrieves the current Journal data

Where:

"set" is used to program the data

"get" is used to retrieve the data

"parameters" represents Internet Parameters

"abbr" represents Auto Dialer

"jnl" represents Journal

"password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789). Must be enclosed within the parenthesis "()".

The command must be enclosed within the hash (#) signs.

### Using a PC to Input the Internet Parameters Remotely

This feature provides a convenient and an easy way to input the Internet Parameters right from your PC by sending a text email message to your machine.

The following parameters can be input remotely via a PC. The other parameters must be entered from the machine in the User Parameters.

- Sender Selection (up to 24 User Names)
- Default Domain
- Selectable Domains (up to 10 additional Domain Names)
- Remote Password
- Manager's Email Address
- Relay XMT Password
- Relay Domain (up to 10 Domain Names authorized for Relay XMT Request)
- LDAP Server Name
- LDAP Login Name
- LDAP Password
- LDAP Search Base
- Community Name (up to 2 Community Names)
- Device Name
- Device Location

Your machine interprets the command that you enter in the "Subject" line of your email message and performs one of the following functions, it Retrieves or Stores data into the Internet Parameters (User Parameters).

The two types of commands that can be entered in the "Subject" line of your email:

- 1) To Store : **#set parameters(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789).  
data, type  
You can enter the Internet Parameters shown above with this command the first time. However, if these fields already contain data, do not use this command as the existing information will be deleted and overwritten. Use the Retrieve command below instead.
- 2) To Retrieve : **#get parameters(123456789)#**  
data, type

#### NOTE

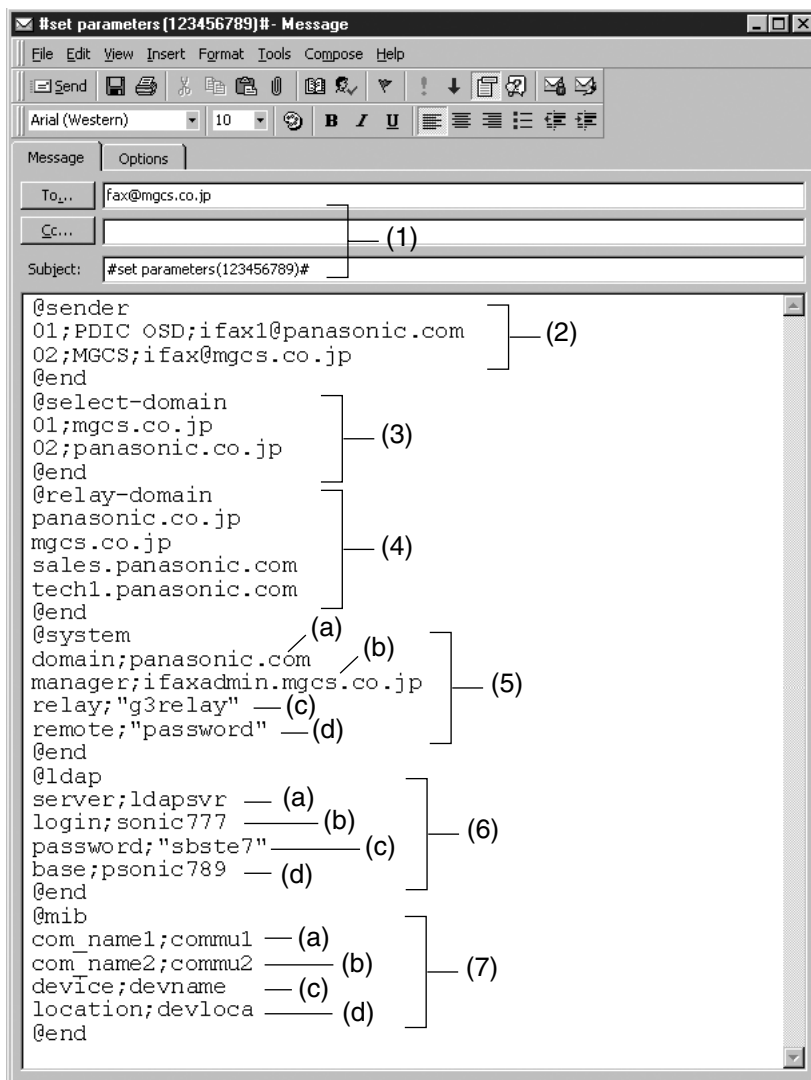
1. To activate this feature, change the Fax Parameter No. 158 (PC REMOTE UPDATE) to "Valid".

## To Input the Internet Parameters for the First Time

Create a script in the message body of a plain text email and send it to your machine's email address. The "Subject" line of the email must be as follows:

- #set parameters(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters. For security, always input a Remote Password in the User Parameters. [If the password was not programmed, represent it with "( )" and assign a password now.  
Ex: #set parameters( )#].
- Important** : Do not use the above command if these fields already contain data, the existing information will be deleted and overwritten. Retrieve and backup the existing data onto your PC first by following the procedures for Retrieving and Editing the Internet Parameters.

The script sample to input the Internet Parameters is shown below.



- (1) To : Your machine's email address.  
From : This field is normally not visible when creating new email message(s). It is your default email address (email application), for retrieving the Internet Parameters and for error message notification. (Can be programmed with the configuration tool of your email program.)  
Subject : To Store data, type: #set parameters(password)#

## To Input the Internet Parameters for the First Time

- (2) @sender to @end : Defines the Sender information to be set in section (2) between @sender to @end block. Register up to 24 User Names and their Email Addresses for the Sender Selection feature (See page 149).  
Separate each data field with a semicolon (;). (If the remaining fields are to remain blank, insert a semicolon (;) for each blank field)  
The data string for each Sender Selection should be defined within a single line.  
The syntax is: <Sender Selection Number>;<User Name>;<Email Address>  
(a) 01 to 24: Indicates the Sender Selection Numbers  
(b) User Name (25-characters maximum)  
(c) Email Address (60-characters maximum)
- (3) @select-domain to @end : Defines the Selectable Domains to be set in section (3) between @select-domain to @end block. Register up to 10 Domain Names that can be selected during manual email addressing. (30-characters maximum)  
The syntax is: <Number>;<Domain>
- (4) @relay-domain to @end : Defines the Domain Names to be set in section (4) between @relay-domain to @end block. Register up to 10 Domain Names that have been authorized to access your Internet Fax for Relayed XMT Request. (30-characters maximum)
- (5) @system to @end : Defines the Internet Parameters to be set in section (5) between @system to @end block. Register the following Internet Parameters.  
(a) Default Domain (50-characters maximum).  
The syntax is: domain; <Default domain name>  
(b) Manager's Email Address (60-characters maximum).  
The syntax is: manager; <Manager's Email Address>  
(c) Relay XMT Password (10-characters maximum).  
The syntax is: relay; <Relay XMT Password>. Quotation marks " " enclosing the password, is required, as shown in the example above.  
(d) Remote Password (10-characters maximum).  
The syntax is: remote; <Remote Password>. Quotation marks " " enclosing the password, is required, as shown in the example above.
- (6) @ldap to @end : Defines the LDAP Parameters to be set in section (6) between @ldap to @end block. Register the following Internet Parameters.  
(a) LDAP Server Name (60-characters maximum).  
The syntax is: server;<LDAP Server Name>  
(b) LDAP Login Name (40-characters maximum).  
The syntax is: login;<LDAP Login Name>  
(c) LDAP Password (10-characters maximum).  
The syntax is: password;<LDAP Password>Quotation marks " " enclosing the password, is required, as shown in the example above.  
(d) LDAP Search Base (40-characters maximum).  
The syntax is: base;<LDAP Search Base>
- (7) @mib to @end : Defines the MIB to be set in section (7) between @mib to @end block. Register the following Internet Parameters.  
(a) Community Name(1) (32-characters maximum).  
The syntax is: com\_name1;<Community Name(1)>  
(b) Community Name(2) (32-characters maximum).  
The syntax is: com\_name2;<Community Name(2)>  
(c) Device Name(32-characters maximum).  
The syntax is: device;<Device Name>  
(d) Device Location(32-characters maximum).  
The syntax is: location;<Device Location>

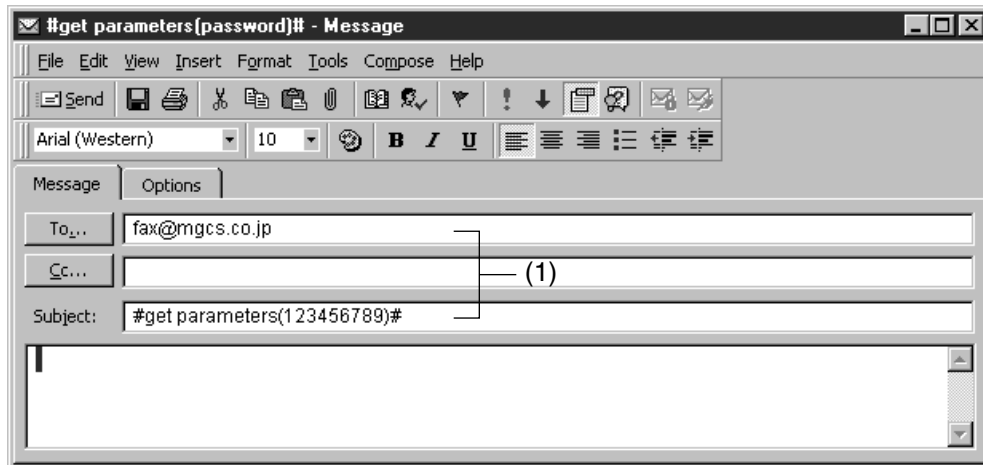
### NOTE

1. The machine cannot be programmed via email while it is communicating or printing.

## To Retrieve the Internet Parameters for Backup

To retrieve the existing Internet Parameters, send a plain text email to the your machine's email address with the following command in the "Subject" line:

**#get parameters(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789). For security, always input a Remote Password in the User Parameters. If it was not programmed, signify with "()" (i.e. #get parameters()#). Make sure that the CC..., Bcc... lines and the body of the email message is Blank.



- (1) To : Your machine's email address.
- From : This field is normally not visible when creating new email message(s). It is your default email address (email application), for retrieving the Internet Parameters and for error message notification. (Can be programmed with the configuration tool of your email program.)
- Subject : To Retrieve data, type: #get parameters(password)#

## To Retrieve the Internet Parameters for Backup

After receiving the email message requesting the Internet Parameters, your machine sends back an email to the address specified in the "From:" line with the Internet Parameters in the body of the email.

### Your Machine s Internet Parameters Email Sample

```

#set parameters(123456789)# - Message
File Edit View Insert Format Tools Compose Help
Send [Icons]
Arial (Western) 10 [Icons] B I U [Icons]
Message Options
To: Fax@mgcs.co.jp
Cc: (1)
Subject: #set parameters(123456789)#

From: "Your Machine" <fax@mgcs.co.jp>
Subject: Your Machine's SYSTEM PARAMETER List (8)
To: user@mgcs.co.jp
[Delete this header before sending the email.]
#-----
# Your Machine's SYSTEM PARAMETER List
#
# STATION      : Your Machine
# EMAIL       : fax@mgcs.co.jp
# DATE/TIME   : MMM-dd-yyy 12:34
#-----
# Internet parameters
#
# IP ADDRESS   :192.168.1.100
# SUBNET MASK :255.255.255.0
# SMTP SERVER :smtp.server.mgcs.co.jp
# DEF.ROUTER  :192.168.1.1
# DNS SERVER  :192.168.1.10
# POP SERVER  :pop3.server.mgcs.co.jp
# POP USER NAME :Internet_Fax
#-----
@sender
01;PDIC OSD;ifax1@panasonic.com (2)
02;MGCS;ifax@mgcs.co.jp
@end
@select-domain
01;mgcs.co.jp (3)
02;panasonic.co.jp
@end
@relay-domain
panasonic.co.jp (4)
mgcs.co.jp
sales.panasonic.com
tech1.panasonic.com
@end
@system
domain;panasonic.com (5)
manager;postmaster@mgcs.co.jp
relay;"rlypass"
remote;"rmtpass"
@end
@ldap
server;ldapsvr (6)
login;sonic777
password;"sbste7"
base;psonic789
@end
@mib
com_name1;commu1 (7)
com_name2;commu2
device;devname
location;devloca
@end

```

- (1) To : Your email address that was used to retrieve the Internet Parameters.  
 From : Your machine's email address.  
 Subject : Your machine s System Parameter List
- (2) @sender to @end : Defines up to 24 User Names and their Email Addresses programmed in your machine for the Sender Selection in section (2) between @sender to @end block.

## To Retrieve the Internet Parameters for Backup

- (3) @select-domain to @end : Defines up to 10 alternate Domain Names programmed in your machine for the Selectable Domains in section (3) between @select-domain to @end block.
- (4) @relay-domain to @end : Defines up to 10 Domain Names programmed in your machine that have been authorized to access your Internet Fax for Relayed XMT Request in section (4) between @relay-domain to @end block.
- (5) @system to @end : Defines the following Internet Parameters programmed in your machine in section (5) between @system to @end block.
  - (a) Default Domain
  - (b) Manager s Email Address
  - (c) Relay XMT Password
  - (d) Remote Password
- (6) @ldap to @end : Defines the following Internet Parameters programmed in your machine in section (6) between @ldap to @end block.
  - (a) LDAP Server Name
  - (b) LDAP Login Name
  - (c) LDAP Password
  - (d) LDAP Search Base
- (7) @mib to @end : Defines the following Internet Parameters programmed in your machine in section (7) between @mib to @end block.
  - (a) Community Name(1)
  - (b) Community Name(2)
  - (c) Device Name
  - (d) Device Location
- (8) : This header must be deleted before the email is sent to your machine for reprogramming of Internet Parameters. The information following the "#" sign is ignored by your machine, therefore, you can leave it as is, or delete it if you wish.

## To Edit the Retrieved or Backup Internet Parameters File

After receiving your machine's email with the Internet Parameters, store the email file as text (.txt) on your PC for backup purposes.

To change or update the Internet Parameters, follow the steps below:

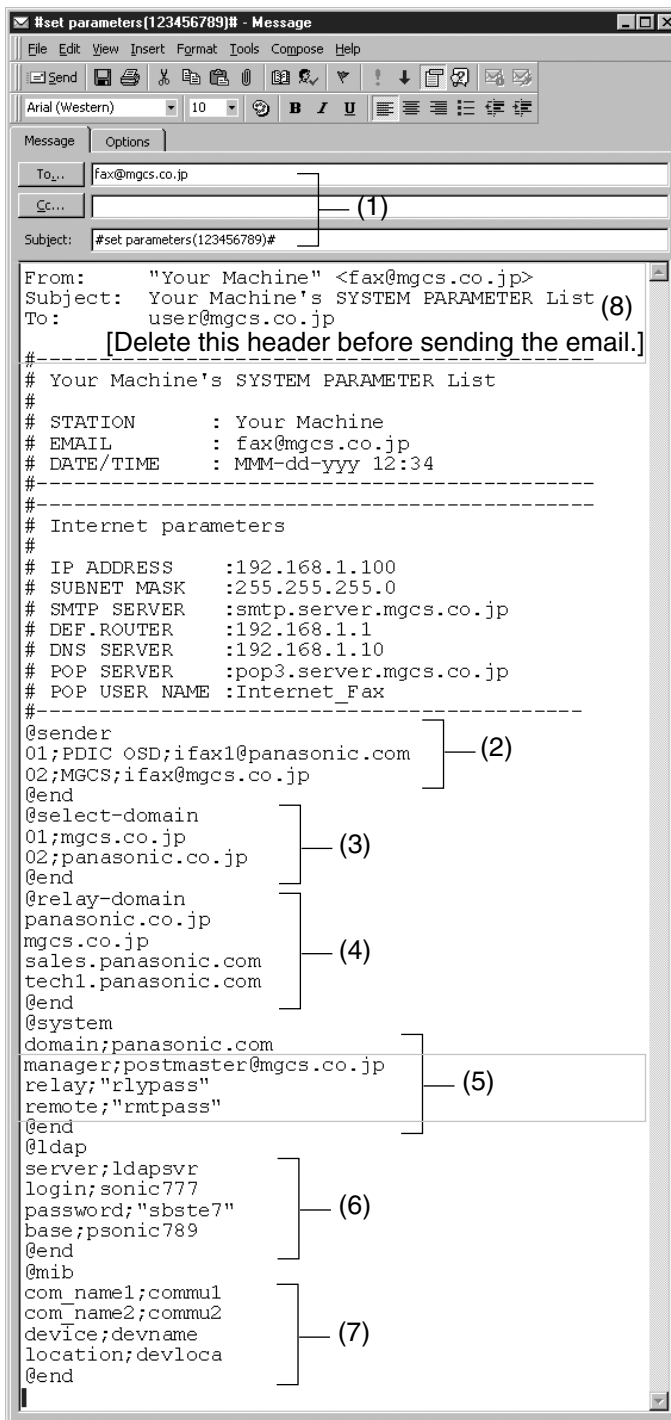
1. Create a New Email Message, fill out the "To" and "From" Address line and the Subject line information for section (1) below:

To	:	Your machine's email address.
From	:	This field is normally not visible when creating new email message(s). It is your default email address (email application), for retrieving the Internet Parameters and for error message notification.
Subject	:	To Store data, type: #set parameters(password)#

2. Open the backup, Internet Parameter text file. Copy the body text and paste it on the body of the newly created email message.
3. Delete any headers that may be present in the body of the email, as unsupported data will be rejected. The information following the "#" sign is ignored by your machine.
4. Edit a parameter and/or add additional Sender Name(s) or Domain Name(s).
5. When finished, use the "File/Save as..." command and save the updated file with ".txt" extension as a backup.
6. Send the email message to your machine to update the Internet Parameters.

# To Edit the Retrieved or Backup Internet Parameters File

## Your Machine's Internet Parameters Email Sample



- (1) To : Your machine's email address.
- From : This field is normally not visible when creating new email message(s).  
It is your default email address (email application), for retrieving the Internet Parameters and for error message notification.  
(Can be programmed with the configuration tool of your email program.)
- Subject : To Store data, type: #set parameters(password)#



## To Edit the Retrieved or Backup Internet Parameters File

- (2) @sender to @end : Defines the Sender information to be set in section (2) between @sender to @end block. Edit, Delete or Register up to 24 User Names and their Email Addresses for the Sender Selection feature (See page 149).  
Separate each data field with a semicolon (;). (If the remaining fields are to remain blank, insert a semicolon (;) for each blank field)  
The data string for each Sender Selection should be defined within a single line.  
The syntax is: <Sender Selection Number>;<User Name>;<Email Address>  
(a) 01 to 24: Indicates the Sender Selection Numbers  
(b) User Name (25-characters maximum)  
(c) Email Address (60-characters maximum)
- (3) @select-domain to @end : Defines the Selectable Domains to be set in section (3) between @select-domain to @end block. Register up to 10 alternate Domain Names that can be selected during manual email addressing. (30-characters maximum)  
The syntax is: <Number>;<Domain>
- (4) @relay-domain to @end : Defines the Domain Names to be set in section (4) between @relay-domain to @end block. Register up to 10 Domain Names that have been authorized to access your Internet Fax for Relayed XMT Request. (30-characters maximum)
- (5) @system to @end : Defines the Internet Parameters to be set in section (5) between @system to @end block. Register the following Internet Parameters.  
(a) Default Domain (50-characters maximum).  
The syntax is: domain; <Default domain name>  
(b) Manager s Email Address (60-characters maximum).  
The syntax is: manager; <Manager s Email Address>  
(c) Relay XMT Password (10-characters maximum).  
The syntax is: relay; <Relay XMT Password>. Quotation marks " " enclosing the password, is required, as shown in the example above.  
(d) Remote Password (10-characters maximum).  
The syntax is: remote; <Remote Password>. Quotation marks " " enclosing the password, is required, as shown in the example above.  
(Notice that for the above example, we have changed the Manager s Email Address, Relay XMT Password and the Remote Password)
- (6) @ldap to @end : Defines the LDAP Parameters to be set in section (6) between @ldap to @end block. Register the following Internet Parameters.  
(a) LDAP Server Name (60-characters maximum).  
The syntax is: server;<LDAP Server Name>  
(b) LDAP Login Name (40-characters maximum).  
The syntax is: login;<LDAP Login Name>  
(c) LDAP Password (10-characters maximum).  
The syntax is: password;<LDAP Password>Quotation marks " " enclosing the password, is required, as shown in the example above.  
(d) LDAP Search Base (40-characters maximum).  
The syntax is: base;<LDAP Search Base>
- (7) @mib to @end : Defines the MIB to be set in section (7) between @mib to @end block. Register the following Internet Parameters.  
(a) Community Name(1) (32-characters maximum).  
The syntax is: com\_name1;<Community Name(1)>  
(b) Community Name(2) (32-characters maximum).  
The syntax is: com\_name2;<Community Name(2)>  
(c) Device Name(32-characters maximum).  
The syntax is: device;<Device Name>  
(d) Device Location(32-characters maximum).  
The syntax is: location;<Device Location>
- (8) : This header must be deleted before the email is sent to your machine for reprogramming of Internet Parameters.  
The information following the "#" sign is ignored by your machine, therefore, you can leave it as is, or delete it if you wish.

## Using a PC to Update the Auto Dialer Remotely

This feature provides a convenient and an easy way to Update, Backup or Restore the Phone Book data right from your PC by sending a text email message to your machine.

Your machine interprets the command that you enter in the "Subject" line of your email message and performs one of the following functions, it Retrieves or Stores data into the Auto Dialer (Phone Book).

The two types of commands that can be entered in the "Subject" line of your email:

- 1) To Store : **#set abbr(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789).  
data, type  
You can program any known unused Auto Dialer location(s) with this command for the first time, without having to Retrieve the Phone Book data first. If the desired Auto Dialer location already contains data, your machine will overwrite the existing data, therefore, we recommend that you use the Retrieve command below instead.  
To edit existing Auto Dialer locations, refer to pages 65 to 66.
- 2) To Retrieve : **#get abbr(123456789)#**  
data, type

### NOTE

1. To activate this feature, change the Fax Parameter No. 158 (PC REMOTE UPDATE) to "Valid".

## Deleting the Entire Auto Dialer

If you wish to delete the entire Auto Dialer data in your machine, type the following command in the body of the email message:

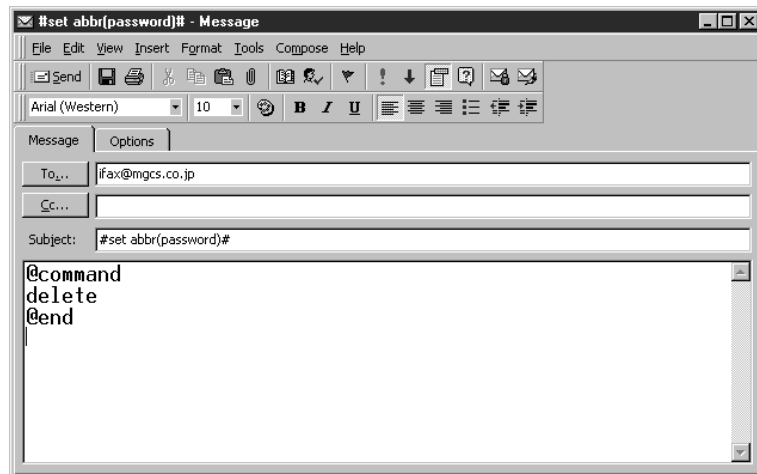
```
@command
delete
@end
```

This command can also be inserted before the @begin to @end block, to erase the entire Auto Dialer data first, then reprogram it with new data.

This method will also prevent the "Overwrite Warning Message" that is sent back from your machine, when the current Auto Dialer station is overwritten.

To erase the entire Auto Dialer data, type the following command in the "Subject" line of your email:

**#set abbr(password)#** : where the password is the Remote Password programmed in your machine's User Parameters.  
Retrieve and backup the existing data onto your PC first by following the procedures for Retrieving and Editing.



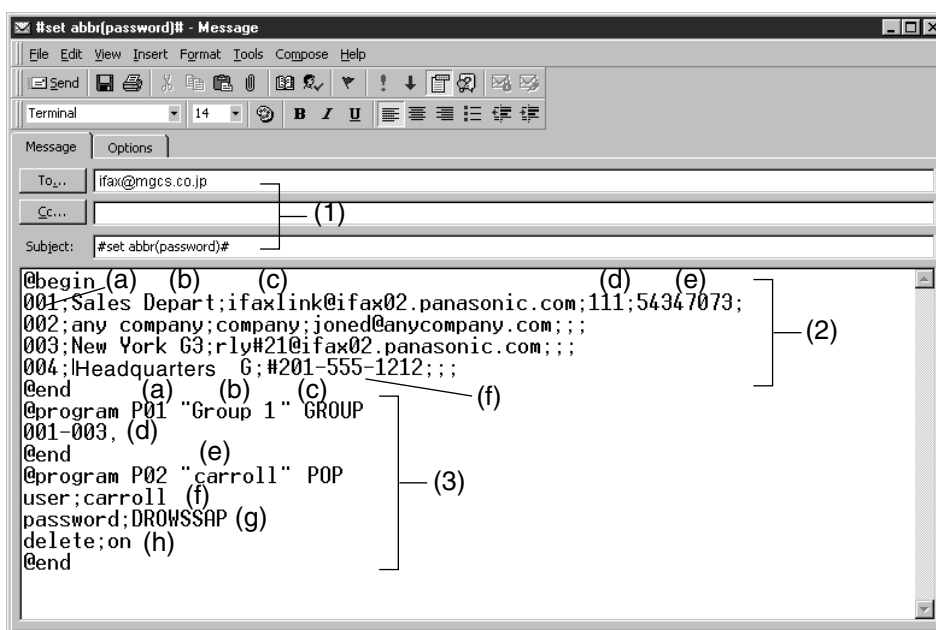
## To Program One-Touch/ABBR. No. for the First Time

Create a script in the message body of a plain text email and send it to your machine's email address. The "Subject" line of the email must be as follows:

**#set abbr(password)#** : where the password is the Remote Password programmed in your machine's User Parameters.

The script sample to program the One-Touch/ABBR. No. for the first time is shown in the illustration below:

### First Time Remote Programming of One-Touch/ABBR. No. Sample



# To Program One-Touch/ABBR. No. for the First Time

## Explanation of Contents

- (1) To : Your machine's email address.
- From : This field is normally not visible when creating new email message(s).  
It is your default email address (email application), for retrieving the Phone Book data and for error message notification.  
(Can be programmed with the configuration tool of your email program.)
- Subject : To Store data, type: #set abbr(password)#  
To Retrieve data, type: #get abbr(password)#
- (2) @begin to @end block : Defines the data to be set into the Phone Book between @begin to @end block.  
Separate each data field with a semicolon (;). (If the remaining fields are to remain blank, insert a semicolon (;) for each blank field)  
The data string for each station should be defined within a single line.
- (a) Entry-number: One-Touch, ABBR. No. or Program Keys to be programmed  
001 to 100: indicates ABBR. No. 001 to 100 (100 stations maximum)  
1001 to 1028: indicates One-Touch numbers from 01 to 28  
2001 to 2004: indicates Program Keys (P1 to P4 programmed as One-Touch dialing number)
- (b) Station-name: Name of the station being programmed (15 alpha-numeric characters maximum)
- (c) Station-address: email address or telephone number of the station being programmed
- (d) Routing-subaddress: sub-address to be used for routing (20-digit maximum)
- (e) Routing-id-number: TSI to be used for routing (20-digit maximum)
- (f) The End Receiving Station's telephone number is entered after the hash sign (#).
- (3) @program to @end : Defines the data to be set into Program Keys as a Group Key or POP Access Key between @program to @end block.
- (a) Program Key: P01 - P04
- (b) Station-name as a Group Key: Name of the station being programmed (15 alpha-numeric characters maximum)
- (c) GROUP: The syntax used to set the Program Key as a Group Key
- (d) Entry-number: One-Touch, ABBR. No. or Program Keys to be programmed  
001 to 100: indicates ABBR. No. 001 to 100 (100 stations maximum)  
1001 to 1028: indicates One-Touch numbers from 01 to 28  
2001 to 2004: indicates Program Keys (P1 to P4 programmed as One-Touch dialing number)
- (e) POP: The syntax used to set the Program Key as a POP Access Key
- (f) POP User-name: Name of the station being programmed (40 alpha-numeric characters maximum)
- (g) POP Password: POP Password (10 alpha-numeric characters maximum)
- (h) Set whether the emails on the POP Server are deleted after retrieving the emails.

### NOTE

1. If a POP user account is programmed into the P1 to P4 program keys, the data programmed for this key cannot be deleted, even when the delete command is specified.
2. The email address and the telephone number cannot be programmed via email when:  
One-Touch Number has been used for communication reservation.  
Received documents are stored in the image data memory of the machine.  
While the machine is communicating or printing.
3. When the email address and telephone number are programmed via email, a program result email is sent back.
4. Some email applications automatically insert a line feed in the middle of a line when the number of characters in a line exceed a specific number. Turn "Off" the automatic line feed, or define the number of characters per line to prevent a line feed, or the data will be ignored.

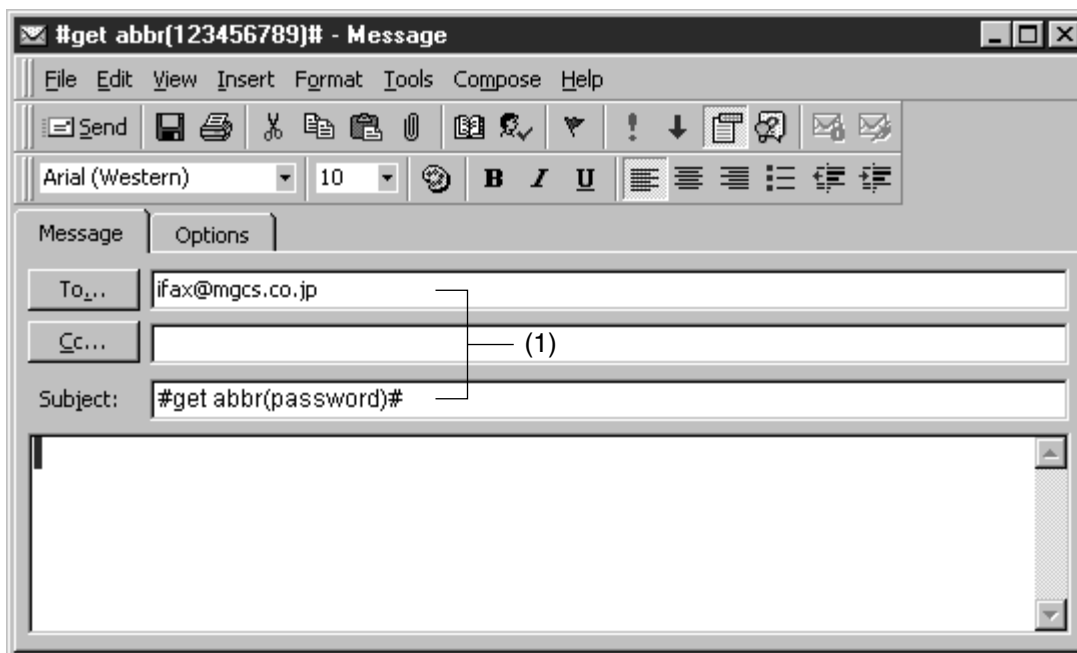
## To Retrieve One-Touch/ABBR. No. Data for Backup

To retrieve the existing auto dialer data, send a plain text email to your machine's email address with the following command in the "Subject" line:

**#get abbr(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789).

Make sure that the Cc, Bcc lines and the body of the email message is Blank.

### Retrieving One-Touch/ABBR. No. Data Sample

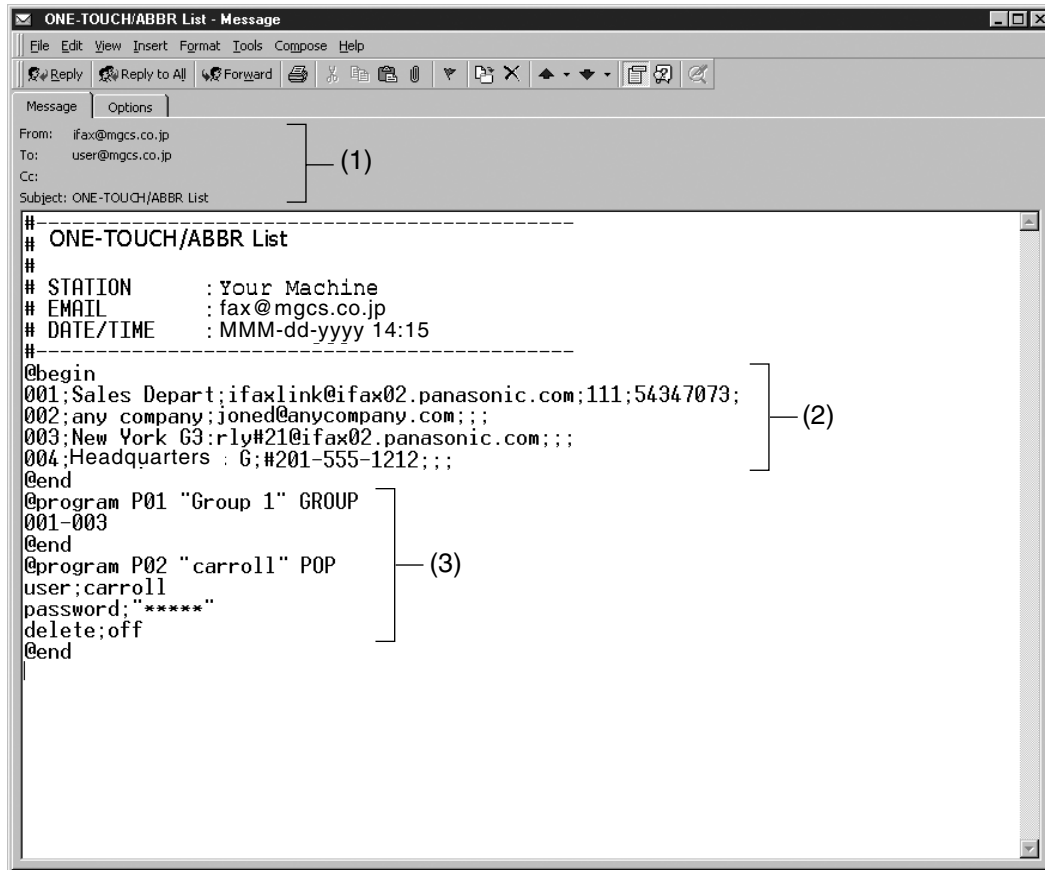


- (1) To : Your machine's email address.
- From : This field is normally not visible when creating new email message(s). It is your default email address (email application), for retrieving the One-Touch/ABBR. No. data and for error message notification. (Can be programmed with the configuration tool of your email program.)
- Subject : To Retrieve data, type: #get abbr(password)#

## To Retrieve One-Touch/ABBR. No. Data for Backup

After receiving the email message requesting the existing auto dialer data, your machine sends back an email to the address specified in the "From:" line with the auto dialer information in the body of the email.

### Your Machine's Auto Dialer Email Sample



- (1) To : Your email address that was used to retrieve the Auto Dialer data.  
 From : Your machine's email address.  
 Subject : ONE-TOUCH/ABBR. List
- (2) @begin to @end block : Defines One-Touch Keys, Abbreviated Dialing Numbers and Program Keys stored as a One-Touch Key programmed in your machine in section (2) between @begin to @end block.
- (3) @program to @end : Defines Program Keys stored as a Group Key or POP Access Key programmed in your machine in section (3) between @program to @end block.

## To Edit the Retrieved or Backup One-Touch/ABBR. No. Data File

After receiving your machine email with the auto dialer data, store the email file as text (.txt) on your PC for backup purposes.

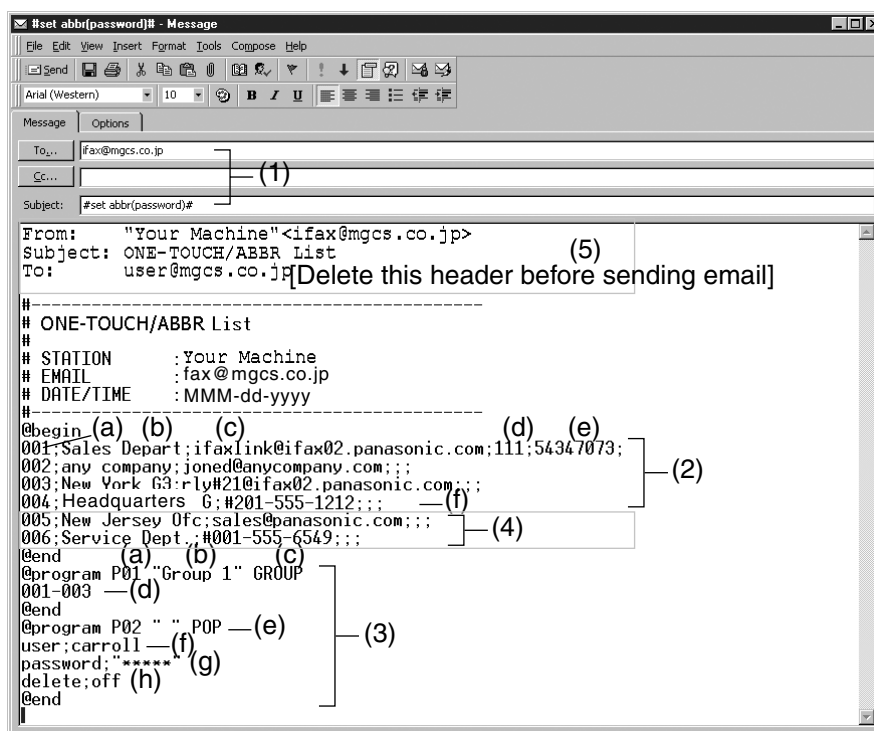
To change or update the auto dialer, follow the steps below:

1. Create a New Email Message, fill out the "To" and "From" Address line and the Subject line information for section (1) below:

To : Your machine's email address.  
 From : This field is normally not visible when creating new email message(s). It is your default email address (email application), for retrieving the One-Touch/ABBR. No. data and for error message notification.  
 Subject : To Store data, type: #set abbr(password)#

2. Open the backup, auto dialer text file. Copy the body text and paste it on the body of the newly created email message.
3. Delete any headers that may be present in the body of the email, as unsupported data will be rejected. The information following the "#" sign is ignored by your machine.
4. Edit and/or add additional One-Touch/ABBR. No. stations.
5. When finished, use the "File/Save as..." command and save the updated file with ".txt" extension as a backup.
6. Send the email message to your machine to update the auto dialer.

### Your Machine s Auto Dialer Email Sample





## To Edit the Retrieved or Backup One-Touch/ABBR. No. Data File

- (1) To : Your machine's email address.  
 From : This field is normally not visible when creating new email message(s).  
 It is your default email address (email application), for retrieving the One-Touch/  
 ABBR. No. data and for error message notification.  
 (Can be programmed with the configuration tool of your email program.)  
 Subject : To Store data, type: #set abbr(password)#
- (2) @begin to @end block : Defines the One-Touch Keys, Abbreviated Dialing Numbers and Program Keys  
 stored as a One-Touch Key to be set in section (2) between @begin to @end  
 block.  
 Edit, Delete or Register the information.  
 Separate each data field with a semicolon (;). (If the remaining fields are to remain  
 blank, insert a semicolon (;) for each blank field)  
 The data string for each station should be defined within a single line. The syntax  
 is:<Entry-number>;<Station-name>;<Station-address>;<Routing-  
 subaddress>;<Routing-id-number>  
 (a) Entry-number: One-Touch, ABBR. No. or Program Keys to be programmed  
     001 to 100: indicates ABBR. No. 001 to 100 (100 stations maximum)  
     1001 to 1028: indicates One-Touch numbers from 01 to 28  
     2001 to 2004: indicates Program Keys (P1 to P4 programmed as  
                   One-Touch dialing number)  
 (b) Station-name: Name of the station being programmed (15 alpha-numeric  
 characters maximum)  
 (c) Station-address: email address or telephone number of the station being  
 programmed  
 (d) Routing-subaddress: sub-address to be used for routing (20-digit maximum)  
 (e) Routing-id-number: TSI to be used for routing (20-digit maximum)  
 (f) The End Receiving Station's telephone number is entered after the hash sign  
 (#).
- (3) @program to @end : Defines the Program Keys stored as a Group Key or POP Access Key to be set in  
 section (3) between @program to @end block.  
 Edit, Delete or Register the information.  
 (a) Program Key: P01 - P04  
 (b) Station-name as a Group Key: Name of the station being programmed (15  
 alpha-numeric characters maximum)  
 (c) GROUP: The syntax used to set the Program Key as a Group Key  
 (d) Entry-number: One-Touch, ABBR. No. to be programmed  
     001 to 100: indicates ABBR. No. 001 to 100 (100 stations maximum)  
     1001 to 1028: indicates One-Touch numbers from 01 to 28  
     2001 to 2004: indicates Program Keys (P1 to P4 programmed as  
                   One-Touch dialing number)  
 (e) POP: The syntax used to set the Program Key as a POP Access Key.  
 (f) POP User-name: Name of the POP user account (40 alpha-numeric characters  
 maximum)  
 (g) POP Password: POP Password (10 alpha-numeric characters maximum)  
 (h) Set whether the emails on the POP Server are deleted after retrieving the  
 emails.
- (4) These 2 ABBR. No. stations were added to the list.
- (5) This header must be deleted before the email is sent to your machine for reprogramming of One-Touch/ABBR. No.  
 The information following the "#" sign is ignored by your machine, therefore, you can leave it as is or delete it if you  
 wish.

## Using Email to Retrieve the Journal

To retrieve the existing Journal data, send an email to your machine's email address with the following command in the "Subject" line:

**#get jnl(password)#** : where the "password" is the Remote Password programmed in your machine's User Parameters (i.e. 123456789).

The Journal will be send back to the originating station s email address.

After receiving the journal, use a fixed width font (i.e. Courier), in order to align the received journal s contents on the PC.

A separate email message is sent by your machine, an "Internet Fax Return Receipt" to the Manager s email address programmed in the User Parameters, informing of the Journal transfer.

### NOTE

1. To activate this feature, change the Fax Parameter No. 158 (PC REMOTE UPDATE) to "Valid".

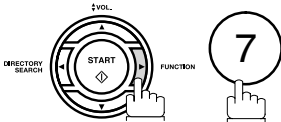
## 8.11. Customizing Your Machine

### General Description

Your facsimile machine has a variety of adjustable Fax Parameters. These parameters, listed in the Parameter Table, are preset for you and do not need to be changed. If you do want to make a change, read the table carefully. Some parameters, such as the Resolution and Contrast parameters, can be temporarily changed by simple key operation just before a transmission is made. When the transmission ends, however, these parameters return to their preset values (Home position). Other parameters can only be changed by the procedure described below.

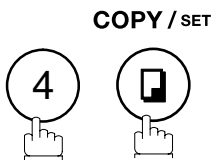
### Setting the Fax Parameters

**1**



```
SET MODE      (1-8)
ENTER NO. OR ∨ ^
```

**2**



```
FAX PARAMETER (01-174)
NO. = ■
```

**3**

Enter Fax Parameter number from the Parameter Table.  
Ex: ① ① for **CONTRAST**

```
FAX PARAMETER (01-174)
NO. = 01
```

**4**



```
01 CONTRAST
1: NORMAL
```

**5**

Enter the new setting value.  
Ex: ② for **LIGHTER**

```
01 CONTRAST
2: LIGHTER
```

**6**



```
02 RESOLUTION
1: STANDARD
```

To set another parameter, press **CLEAR** to return to step 3 or press **STOP** to return to standby.

#### NOTE

1. To scroll the Fax Parameters in Step 2 or 4, press ▼ or ▲.

## Fax Parameter Table

No.	Parameter	Setting Number	Setting	Comments
01	CONTRAST	*1	Normal	Setting the home position of the CONTRAST key.
		2	Lighter	
		3	Darker	
02	RESOLUTION	1	Standard	Setting the home position for the RESOLUTION.
		*2	Fine	
		3	S-Fine	
		4	Halftone (Fine)	
		5	Halftone (S-Fine)	
04	STAMP	*1	Off	Setting the home position of the STAMP key. To select the stamp function when document is stored in memory, see Fax Parameter No. 28.
		2	On	
05	MEMORY	1	Off	Setting the home position for memory transmission/copy mode. (This setting can be temporarily changed by using F8-9 (MEMORY XMT))
		*2	On	
06	DIALING METHOD	1	Pulse	Selecting the dialing method.
		*2	Tone	
07	HEADER PRINT	*1	Inside	Selecting the printing position of the header. <b>Inside</b> : Inside TX copy area. <b>Outside</b> : Outside TX copy area. <b>No Print</b> : Header is not printed.
		2	Outside	
		3	No Print	
08	HEADER FORMAT	*1	Logo, ID No.	Selecting the header format.
		2	From To	
09	RCV'D TIME PRINT	*1	Invalid	Selecting whether the machine prints the received date & time, remote ID, percentage of reduction and page number on the bottom of each received page.
		2	Valid	
10	KEY/BUZZER VOLUME	1	Off	Selecting the volume of the Key/Buzzer tone.
		*2	Soft	
		3	Loud	
12	COMM. JOURNAL	1	Off	Selecting the home position of printout mode for COMM. Journal Off/Always/INC. <b>Off</b> : Does not print <b>Always</b> : Always prints <b>Inc. Only</b> : Prints only when communication has failed.
		2	Always	
		*3	Inc. Only	
13	AUTO JOURNAL PRINT	1	Invalid	Selecting whether the machine prints the journal automatically after every 32 transactions.
		*2	Valid	

No.	Parameter	Setting Number	Setting	Comments
17	RECEIVE MODE	1	TEL	Setting the receive mode.
		*2	FAX	
		3	FAX/TEL SW.	
		4	TAM/FAX	
18	OPERATOR CALL TIMER	*1	20 sec.	Selecting the length of time that your machine signals (rings) for an incoming voice call in Fax/Tel Auto Switching mode.
		2	30 sec.	
		3	40 sec.	
		4	50 sec.	
19	OGM LENGTH (TAM I/F)	1	1 sec.	Setting for the OGM length of your TAM from 1 to 60 seconds. The machine will not start to detect SILENCE until the time setting has lapsed. (Default = 20 sec.)
		---	---	
		60	60 sec.	
20	SILENT DETECTION (TAM I/F)	1	Invalid	Selecting the Silent Detection Mode.
		*2	Valid	
22	SUBSTITUTE RCV	1	Invalid	Selecting whether the machine receives to memory when recording paper runs out, toner runs out or recording paper is jammed.
		*2	Valid	
23	RECORDING PAPER SIZE	1	A4	Setting the recording paper size installed in your machine.
		*2	Letter	
		3	Legal	
24	PRINT REDUCTION	1	Fixed	Selecting print reduction mode. <b>Fixed</b> :Reduce received document according to setting of Parameter No. 25. <b>Auto</b> :Reduce received document according to the length of received documents.
		*2	Auto	
25	REDUCTION RATIO	70	70%	Selecting fixed print reduction ratio from 70% to 100%. This parameter functions only when fixed print reduction is selected on Fax Parameter No. 24.
		----	----	
		*100	100%	
26	POLLING PASSWORD		(----	Setting a 4-digit password for secured polling.
27	POLLED FILE SAVE	*1	Invalid	Selecting whether the machine retains the polled document in memory even after the document is polled once.
		2	Valid	
28	STAMP AT MEM. XMT	1	Invalid	Selecting whether the machine stamps the original documents when storing the documents into memory. (Depending on the Stamp setting on the Control Panel)
		*2	Valid	

No.	Parameter	Setting Number	Setting	Comments
31	INCOMPLETE FILE SAVE	*1	Invalid	Selecting whether the machine retains the document in memory if the document is not successfully transmitted.
		2	Valid	
32	COPY REDUCTION Z	1	Manual	Selecting whether the machine performs the copy reduction ratio automatically or manually. <b>Manual</b> :The machine will prompt you for the Zoom ratio (100% to 70%) when making copies. <b>Auto</b> :The machine will automatically determine the reduction ratio according to the length of the original document.
		*2	Auto	
34	ENERGY SAVER MODE	1	Off	To reduce the power consumption in standby, select either Energy-Saver or Sleep mode and specify the Delay Time (1 to 120 minutes) for the machine to enter into the selected mode. The Delay Timer setting is only available in the Energy-Saver or Sleep Modes. <b>Off</b> : The unit will remain in standby mode and consume more energy than when in Energy-Saver or Sleep modes. <b>Energy-Saver Mode</b> : Saves energy by consuming less power than when in standby mode by turning off the fuser unit after the specified time.
		2	Energy-Saver	
35	DAYLIGHT TIME	1	Invalid	Selecting whether the clock adjusts for Daylight Saving Time automatically. The built-in clock will advance 1 hour at 2:00 am on the first Sunday in April and fallback 1 hour at 2:00 am on the last Sunday in October.
		*2	Valid	
36	RING PATTERN DETECT (DRD) (See Note 2)	*1	Invalid	All ring patterns.
		2	Valid	Select a ring pattern for automatic answering. 1: A Standard ring pattern. 2: B Double ring pattern. 3: C Triple ring pattern (Short-Short-Long). 4: D All other triple ring patterns, except the type C described above.
37	RCV TO MEMORY		(----	Enter a 4-digit password used to print out the received document in memory by using F8-5 (RCV TO MEMORY). When F8-5 is set to On, this parameter will not be shown on the LCD display.
38	ACCESS CODE		(----	Enter a 4-digit Access Code to secure the machine from unauthorized use.
39	PIN CODE ACCESS	*1	None	Selecting the access method (Prefix or Suffix) to dial a number with PIN Code.
		2	Suffix	
		3	Prefix	
42	CONF. POLLED FILE SAVE	*1	Invalid	Selecting whether the machine saves the confidential polled file even after the file is polled once.
		2	Valid	

No.	Parameter	Setting Number	Setting	Comments
43	PASSWORD-XMT	*1	Off	Setting a 4-digit XMT-Password and selecting whether the machine performs and checks the XMT-Password of the receiving station when transmitting.
		2	On	
44	PASSWORD-RCV	*1	Off	Setting a 4-digit RCV-Password and selecting whether the machine performs and checks the RCV-Password of the transmitting station when receiving.
		2	On	
46	SELECT RCV	*1	Invalid	Selecting whether the machine performs selective reception.
		2	Valid	
47	REMOTE RECEPTION	1	Invalid	Selecting whether or not the machine accepts remote reception command.
		*2	Valid	
51	REMOTE DIAGNOSTIC	*1	Invalid	Selecting whether or not the machine accepts to update the firmware or Remote Diagnostics from the remote station. Please ask your Panasonic Authorized Dealer for details.
		2	Valid	
52	DIAGNOSTIC PASSWORD		(----	Setting the password for Remote Diagnostic Mode. Please ask your Panasonic Authorized Dealer for details.
53	SUB-ADDRESS PASSWORD		(----	Setting a 20-digit password for secured sub-address communication.
54	FAX FORWARD	*1	Invalid	Selecting whether the machine performs Fax Forwarding to the specified destination.
		2	Valid	
56	COVER SHEET	*1	Off	Setting the home position of the Cover Sheet parameter in the Select Mode.
		2	On	
58	LANGUAGE	*1	A-English	Selecting the language to be shown on the display and reports.
		2	C-French	
		3	Spanish	
65	PRINT COLLATION	1	Invalid	Selecting whether the machine prints out documents in sequence.
		*2	Valid	
82	QUICK MEMORY XMT	1	Invalid	Selecting whether the machine performs Quick Memory Transmission. <b>Invalid:</b> Stores all documents into memory first before dialing the telephone number. <b>Valid :</b> Starts dialing the telephone number immediately after storing the first page.
		*2	Valid	
99	MEMORY SIZE (Flash Memory)	-	-	Displays the amount of base and optional memory installed. (Base Memory + Optional Memory)
140	LAN RELAY XMT REQUEST	*1	Invalid	Selecting whether the machine performs LAN Relay XMT Request.
		2	Valid	
142	RELAY XMT (a.k.a. LAN RELAY STATION on UF-770i)	1	Invalid	Selecting whether the machine accepts and performs G3 relayed transmission. (Relay Station Functions)
		*2	Valid	

No.	Parameter	Setting Number	Setting	Comments
143	RELAY XMT REPORT	1	Off	Setting how the COMM. Journal for relayed transmission is sent to the originator. <b>Off</b> : Don't send. <b>Always</b> : Always send. <b>Inc. Only</b> : Send only if communication has failed.
		*2	Always	
		3	Inc. Only	
144	EMAIL CHARACTER SET	1	Japanese	Selecting the Character Set when receiving or sending email text.
		*2	English	
145	SENDER SELECTION	*1	Invalid	Selecting a pre-programmed sender's name and email address before each transmission.
		2	Valid	
146	POP TIMER	----	0 to 60 min.	Setting the time interval for the machine to check for email on the POP Server. (0 = Does not check the POP Server for email.)
		3		
147	AUTO POP RCV	1	Invalid	Selecting whether the machine automatically downloads an email from the POP Server.
		*2	Valid	
148	DELETE POP RCV EMAIL	1	Invalid	Selecting whether the email will be deleted automatically after retrieval from the POP Server.
		*2	Valid	
149	DELETE POP ERR EMAIL	*1	Invalid	Selecting whether to delete the email that includes an incompatible file attachment from the POP Server.
		2	Valid	
150	IFAX RETURN RECEIPT	1	Invalid	Selecting whether to send a return receipt when receiving from another Panasonic Internet Fax.
		*2	Valid	
151	EMAIL HEADER FORMAT	1	All	Selecting the header information to print when an email is received. (Normally used for Troubleshooting. It shows the path of the email transmission before arriving at your machine.)
		*2	Subject/From/To	
		3	Off	
152	SUB-ADDRESS ROUTING	*1	Invalid	Selecting whether to automatically route a received fax or email using ITU-T Sub-address.
		2	Valid	
153	TSI ROUTING	*1	Invalid	Selecting whether to route a received fax to a telephone number or an email address preprogrammed in Phone Book using the originating fax's Numeric ID (TSI frame information).
		2	Valid	
154	ROUTING HEADER FORMAT	*1	Originator	Selecting the type of email header to be included in the "From" field of each routed faxes. <b>Originator</b> : The originating fax machine's TSI will appear in the "From" field of the routed email. <b>Relay Station</b> : The routing station's email address will appear in the "From" field of the routed email.
		2	Relay Station	
155	PRINT ROUTED DOCUMENT	*1	Inc. Only	Selecting whether a received fax to be routed is always printed or only when the routing operation fails.
		2	Always	
156	PRINT FORWARDED DOCUMENT	*1	Inc. Only	Selecting whether a memory received fax or email to be forwarded is always printed or only when forwarding is incomplete.
		2	Always	



No.	Parameter	Setting Number	Setting	Comments
157	TRANSACTION JOURNAL	*1	Invalid	Selecting whether the machine sends a transaction journal to the pre-programmed email address.
		2	Valid	
158	PC REMOTE UPDATE	*1	Invalid	Selecting whether the machine will accept commands from an email application, to: (a) Program the Internet Parameters (b) Program the Auto Dialer (c) Allow retrieval of the Journal
		2	Valid	
159	SUBJECT LINE ENTRY	*1	Invalid	Selecting whether the "Subject" line can be programmed during each transmission.
		2	Valid	
160	DEFAULT DOMAIN	1	Invalid	Selecting whether the machine accepts to insert the Default Domain when entering Manual Number Dialing.
		*2	Valid	
161	DNS SERVER	1	Invalid	Selecting whether to use the DNS Server for the Internet communication.
		*2	Valid	
162	TIFF VIEWER URL	1	None	Selecting whether to include the URL address in the email message body.
		*2	English	
		3	English+ Japanese	
163	ROUTING HEADER	*1	Invalid	Selecting whether to add the Header Print information of the Routing Station on the top edge of each routed pages.
		2	Valid	
164	IFAX XMT HEADER (Email only)	*1	Included	Selecting whether to include the header when sending a document to an addressee in the same Domain as specified in the Default Domain parameter. (This is useful when using the machine to scan documents back to your PC) <b>Note:</b> When sending to a Domain other than as specified in the Default Domain parameter, the header will be included regardless of the selection.
		2	Not Included	
169	DHCP CLIENT	1	Invalid	Select whether the machine would automatically acquire the Network Parameters from the DHCP Server. (Such as IP Address, Subnet Mask, Default Gateway IP Address, etc.) <b>Note:</b> If you change the setting of this parameter, the machine will reboot automatically.
		*2	Valid	
170	SMTP AUTHENTICATION (See Note 3)	*1	Invalid	Selecting whether your SMTP Server (Outgoing Mail Server) requires authentication with a user name and password before accepting email. After change the setting to "Valid", you can enter the user name and password assigned to your machine by your network administrator.
		2	Valid	
171	POP BEFORE SMTP (See Note 3)	*1	Invalid	Selecting whether your SMTP Server (Outgoing Mail Server) requires authentication by first retrieving incoming email from the POP Server before accepting email. (Please consult with your network administrator).
		2	Valid	

No.	Parameter	Setting Number	Setting	Comments
172	DIRECT IFAX XMT	*1	Invalid	Selecting whether to be prompted during One-Touch/ABBR registration if the station you are programming is to receive Internet Fax directly without going through a Mail Server.
		2	Valid	
173	DELIVERY NOTICE (HOME)	1	Off	Setting the home position of requesting a Delivery Notice (MDN) on the Function Select Mode (F8-2) when sending an email/Internet Fax. The delivery notice received will not be printed. It is used to update the communication status on the Transaction Journal of the original email sent.
		*2	On	
174	APOP AUTHENTICATION (See Note 3)	*1	Invalid	Selecting whether to use APOP authentication method when retrieving email/Internet Fax from the POP Server. (This setting is server dependant; consult with your network administrator).
		2	Valid	

**NOTE**


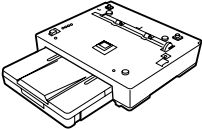

1. Setting number marked with an asterisk (\*) indicates the factory standard setting.
2. This parameter supports an optional telephone service "Distinctive Ring Service" provided by your local telephone company. It allows up to 4 different telephone numbers to be assigned on a single telephone line with a distinctive ring for each telephone number. By selecting the appropriate ring pattern associated with the telephone number assigned for your fax machine. It can differentiate and answer the incoming call on the fax number. All other calls on the other telephone numbers will not be answered. This optional service from your local phone company is also called Custom Ringing, Distinctive Ringing, Ident-a-call, Ident-a-ring, Personalized Ringing, RingMaster, RingMate, Selective Ringing, Smart Ring or something similar. Check with your local telephone company on the availability of this service in your area.
3. "Valid" can be selected when the SMTP server or the POP server support the capabilities.

## 9 Options and Supplies


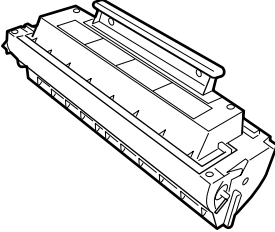
### 9.1 Options and Supplies

Please contact your local Panasonic dealer for availability.

#### 1. Options

Order No.	Picture	Description
UE-403176		Handset Kit
UE-409070		250 Sheet Letter / Legal / A4 Size Paper Cassette with the Feeder Unit
UE-410046		Expansion Flash Memory Card, 2 MB
UE-410047		Expansion Flash Memory Card, 4 MB
UE-410048		Expansion Flash Memory Card, 8 MB

#### 2. Supplies

Order No.	Picture	Description
DZHT000027 (For USA / Canada)		Verification Stamp
DZHT000004		
UG-5510 (For USA / Canada)		Toner Cartridge
UG-3350		

**Note:**

For some destinations, the Handset Kit may not be available because of the destination's regulation or specification.

## 9.2 Installing Optional 250 Sheet Paper Cassette (UE-409070)

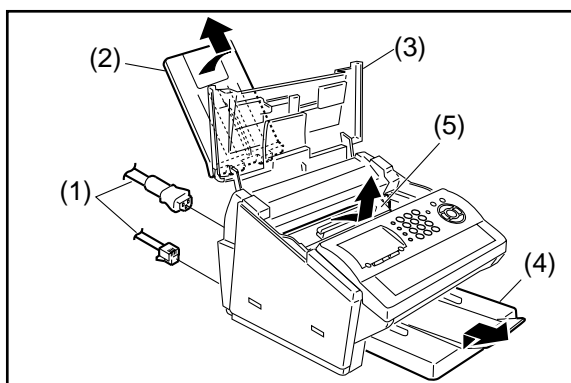
### 1. Contents

Qty.	Description	Part No.	Remarks
1	250 Sheet Paper Cassette with Feeder Unit	UE-409070	

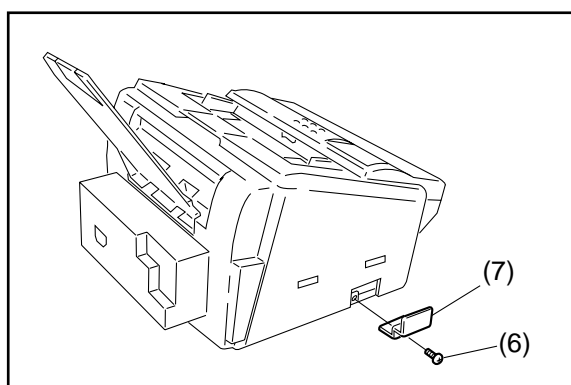
### 2. Installation

#### Note:

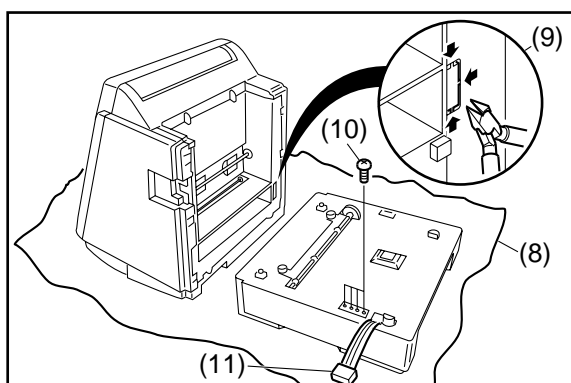
Install this Feeder Unit as the 2nd Feeder Unit only.



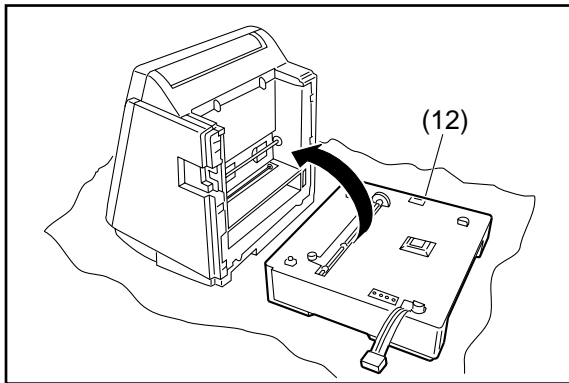
- (1) Disconnect the **Telephone Line Cable** (1009) and the **Power Cord** (1008).
- (2) Remove the **Recording Paper Tray Assembly** (1107).
- (3) Open the **Printer Cover** (106).
- (4) Remove the **Paper Cassette** from the machine.
- (5) Remove the **Toner Cartridge** from the machine.



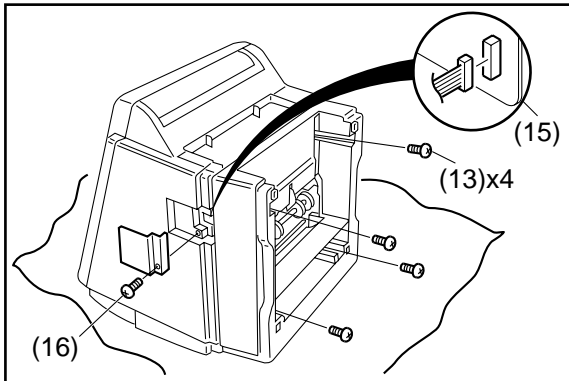
- (6) Remove 1 **Screw** (B1).
- (7) Remove the **Connector Access Cover** (114).



- (8) Place the machine on its **Rear side** over a clean cloth to prevent damaging the **Rear Cover**.
- (9) Break off the **protective tab** on the machine.
- (10) Remove 4 **Screws** from the top of the 250 Sheet Paper Cassette.
- (11) Remove the shipping tape and place the **CST2-SNS2 Harness** (1035) to the outside of the cassette.



- (12) Insert the 250 Sheet Paper Cassette into the machine.



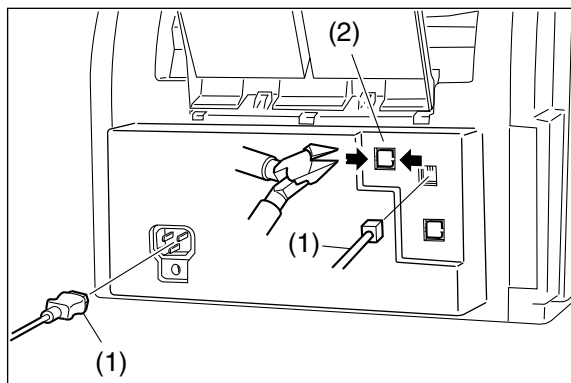
- (13) Secure the 250 Sheet Paper Cassette with the 4 screws removed in step 10.  
 (14) Place the machine upright.  
 (15) Connect the **CST2-SNS2 Harness** (1035) into the **Connector CN66** on the SC PC Board.  
 (16) Re-install the **Connector Access Cover** (114).  
 (17) Re-install the **Recording Paper Tray Assembly** (1107), **Paper Cassettes** and the **Toner Cartridge**.  
 (18) Re-connect the **Telephone Line Cable** (1109) and the **Power Cord** (1108).  
 (19) Print some pages from the Optional Paper Cassette to confirm its operation.

## 9.3 Installing Handset Kit (UE-403176)

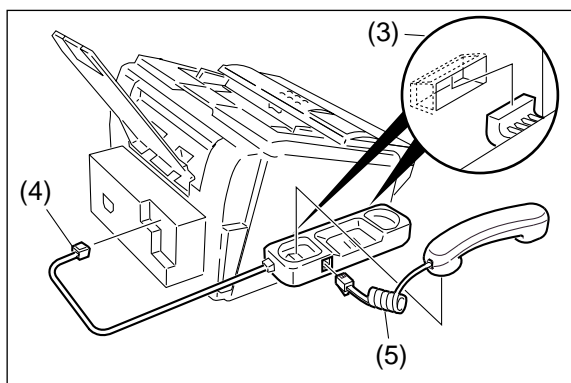
### 1. Contents

Qty.	Description	Part No.	Remarks
1	Handset	DZDU000031	
1	Handset Cord	DZFN000066	
1	Cradle Assembly	DZML000436	

### 2. Installation



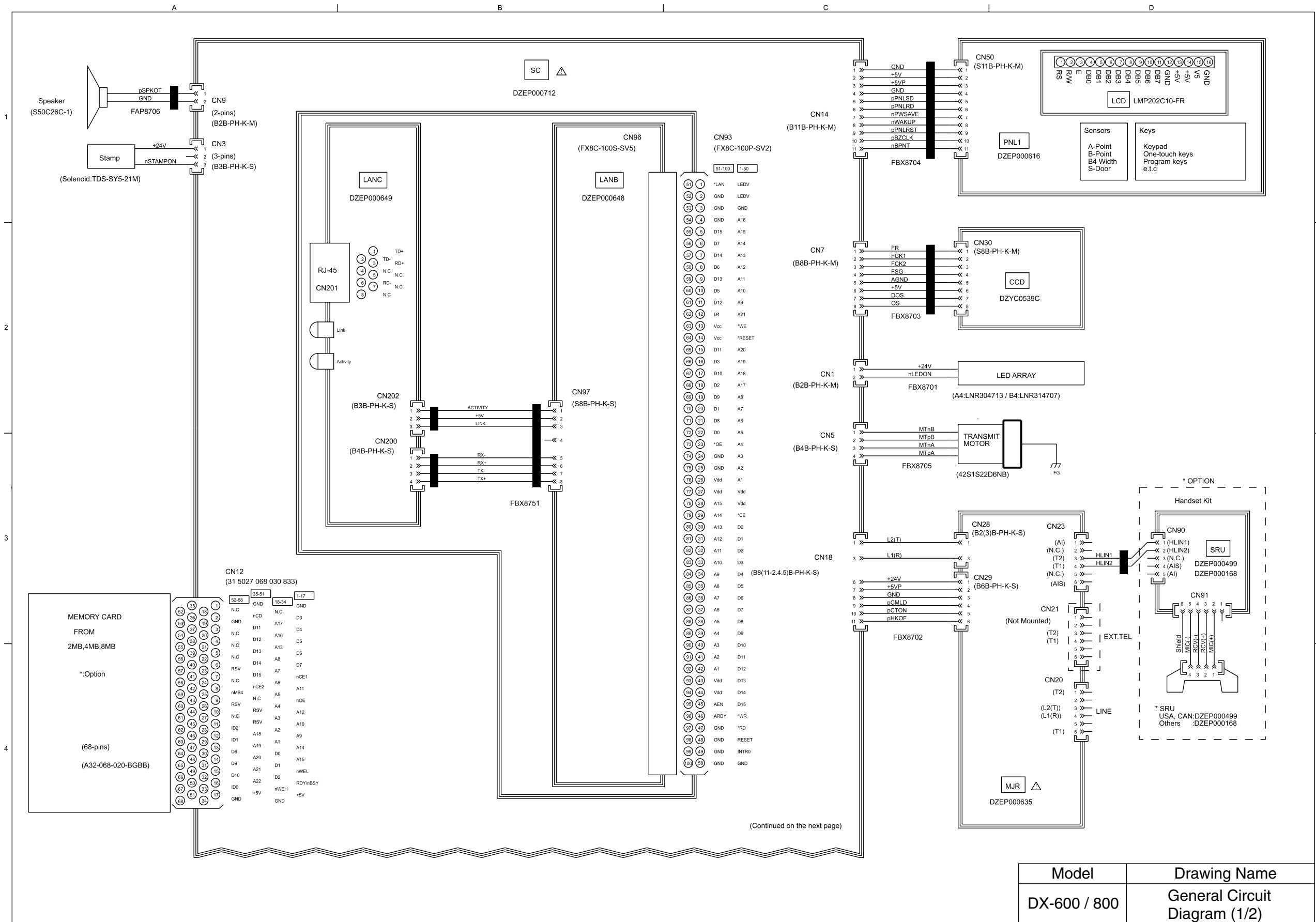
- (1) Disconnect the **Power Cord** (1108) and the **Telephone Line Cable** (1109).
- (2) Break off the protective tab on the **TEL/HANDSET Jack** on the machine.



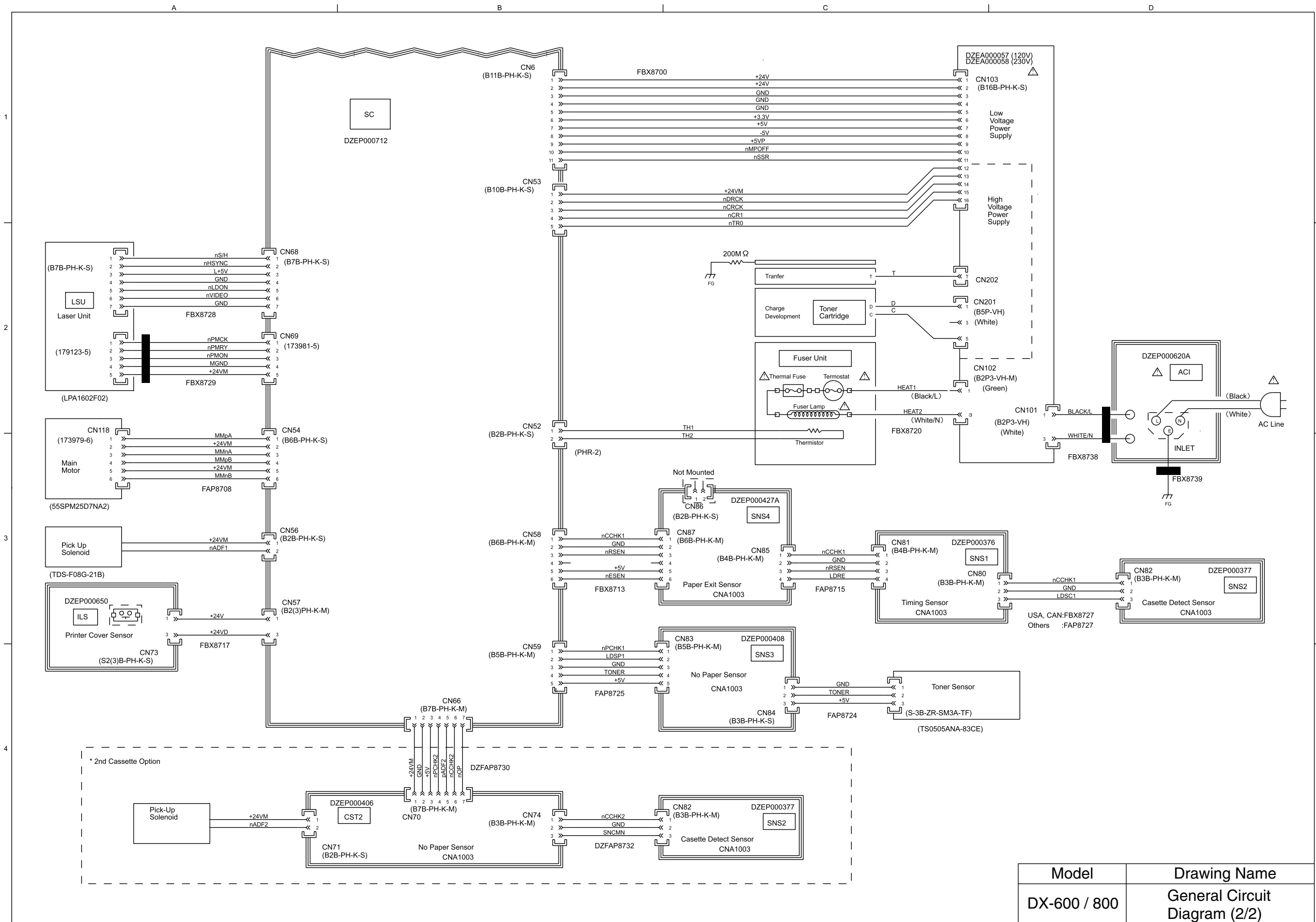
- (3) Hook the projections of the Cradle Assembly into the holes on the Left Cover.
- (4) Connect the **Cradle Cable** (123) to the **TEL/HANDSET Jack** on the rear of the machine.
- (5) Connect the **Handset Cable** (121).
- (6) Re-connect the **Telephone Line Cable** (1109) and the **Power Cord** (1108).

# 10 Schematic Diagram

## 10.1. General Circuit Diagram



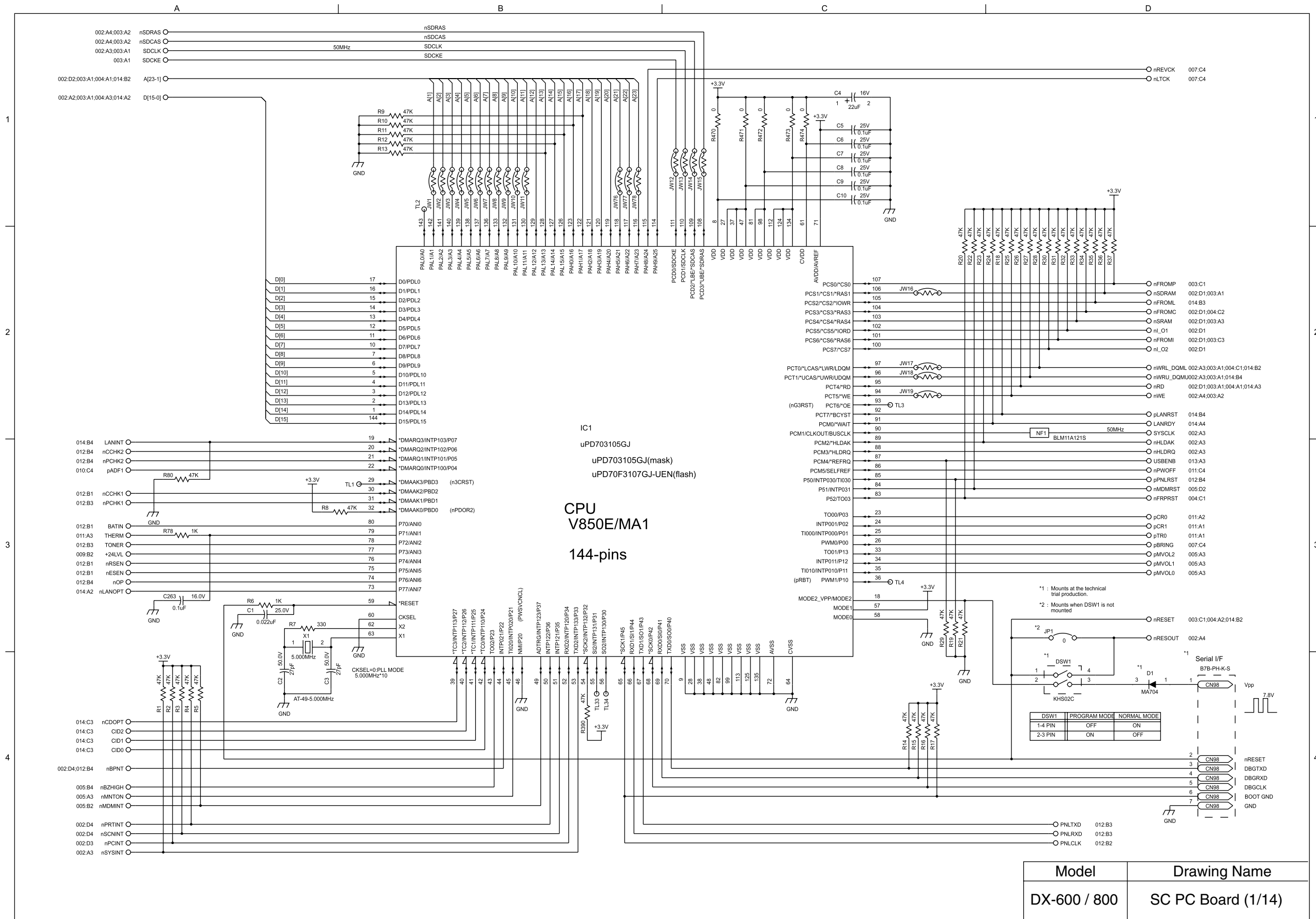
Model	Drawing Name
DX-600 / 800	General Circuit Diagram (1/2)

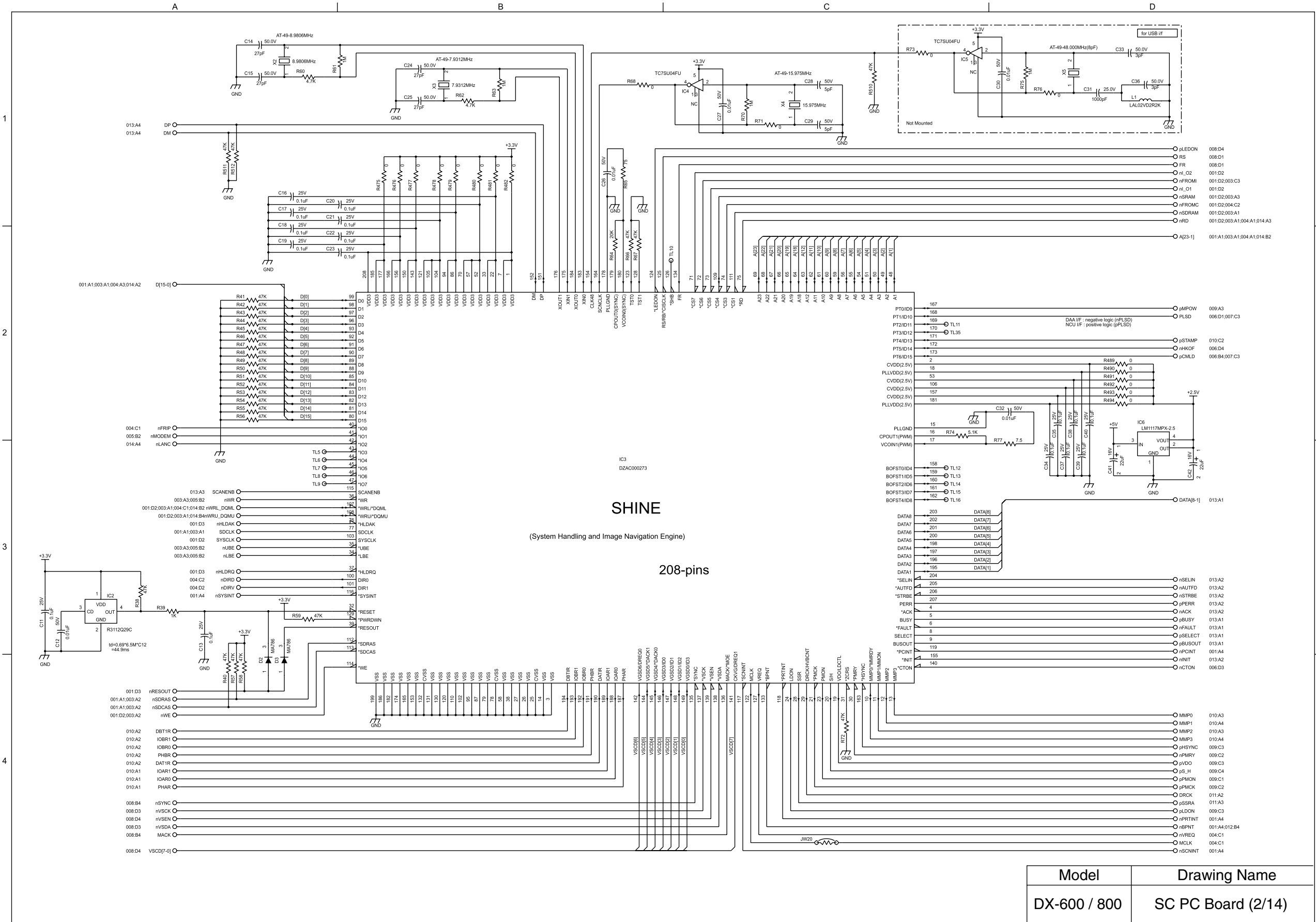


Model	Drawing Name
DX-600 / 800	General Circuit Diagram (2/2)

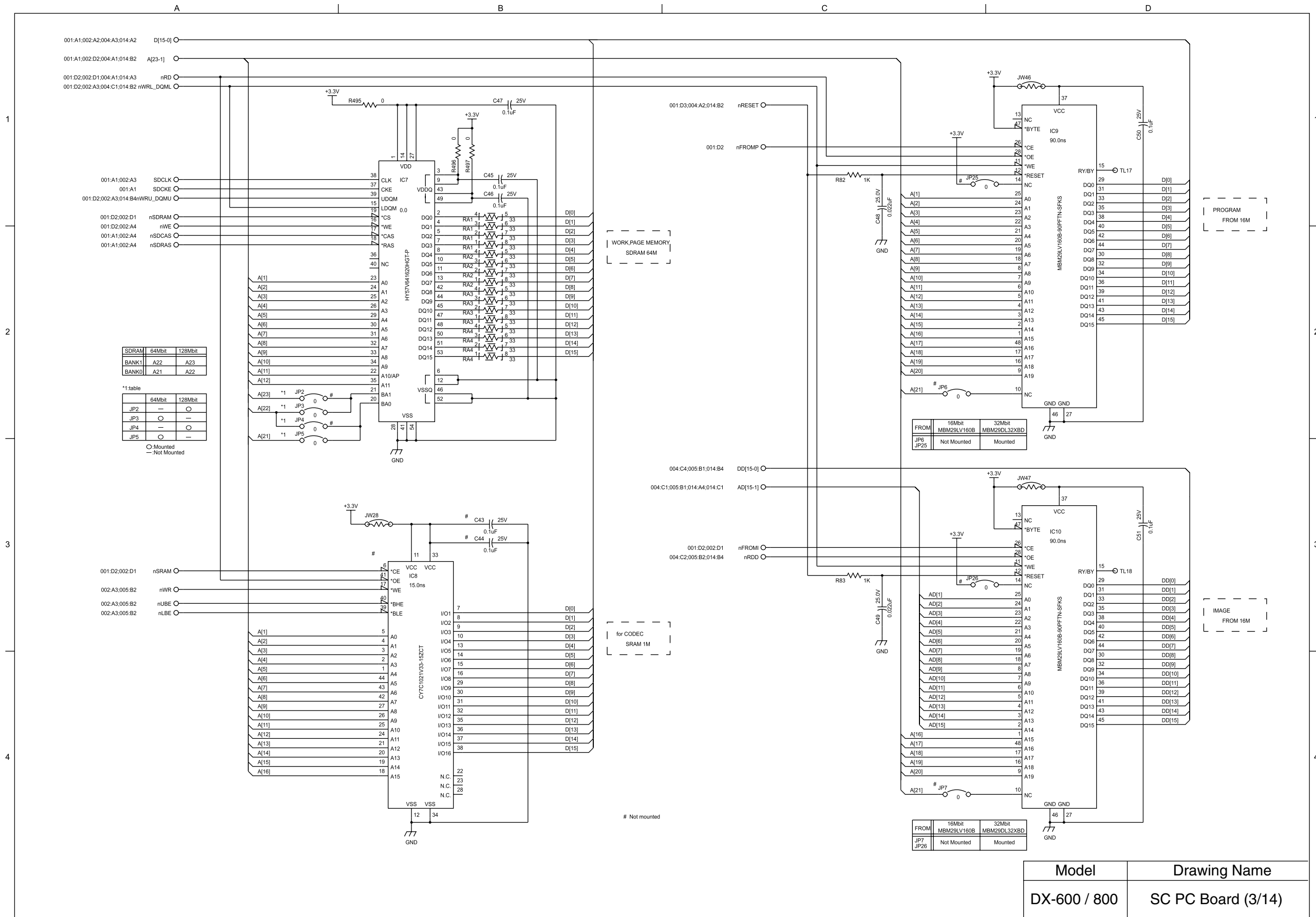


# 10.2. SC PC Board

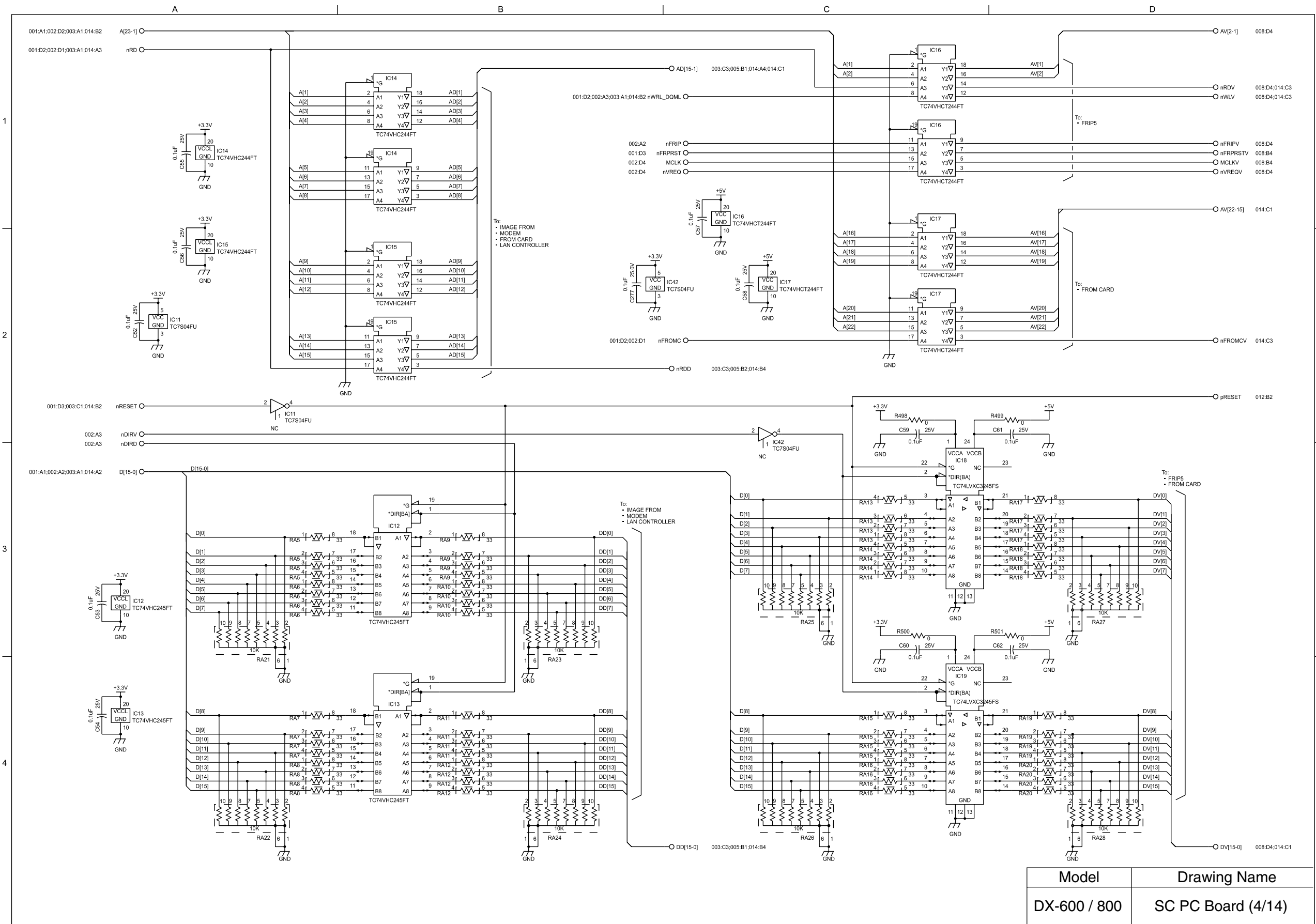




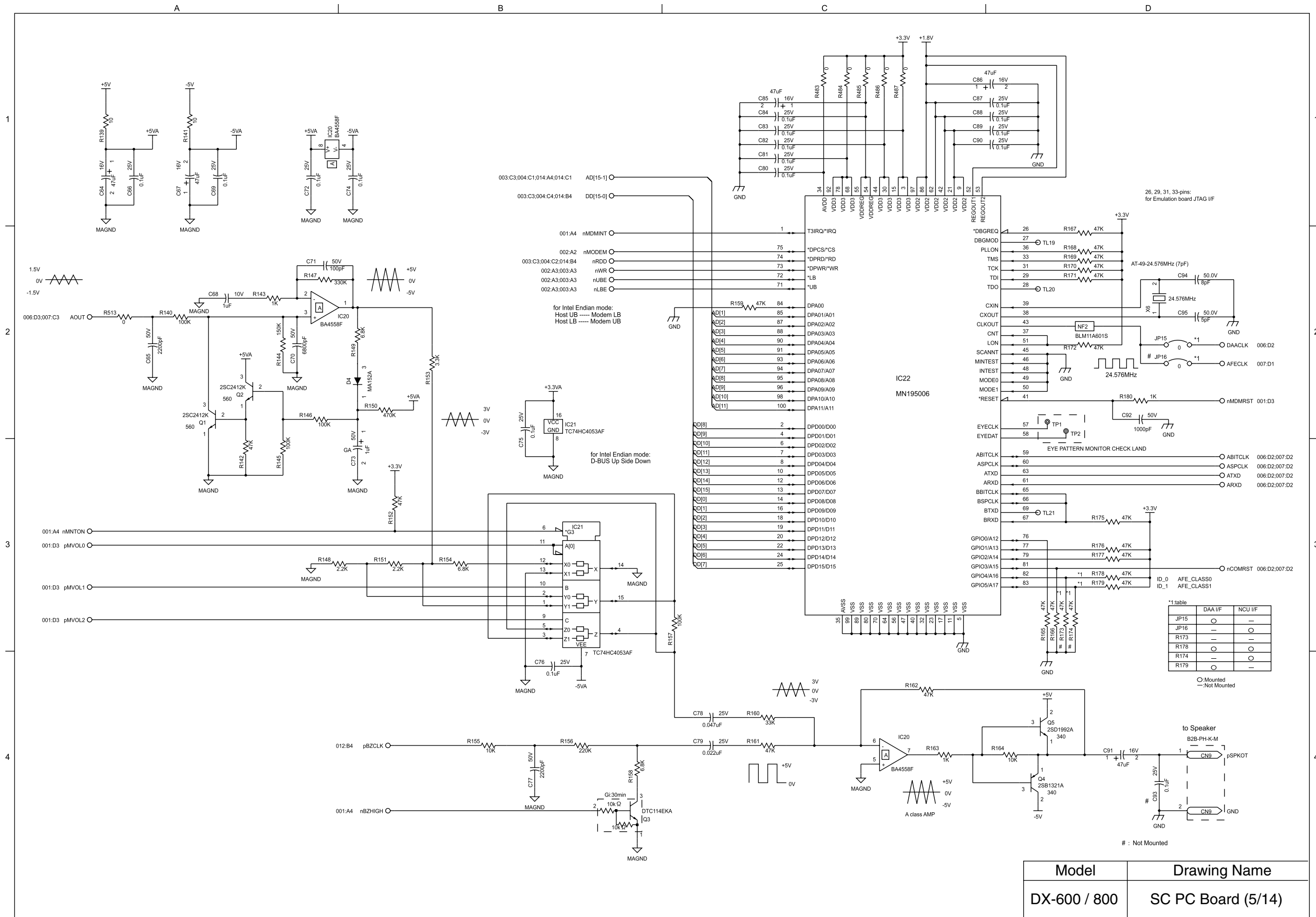
Model	Drawing Name
DX-600 / 800	SC PC Board (2/14)



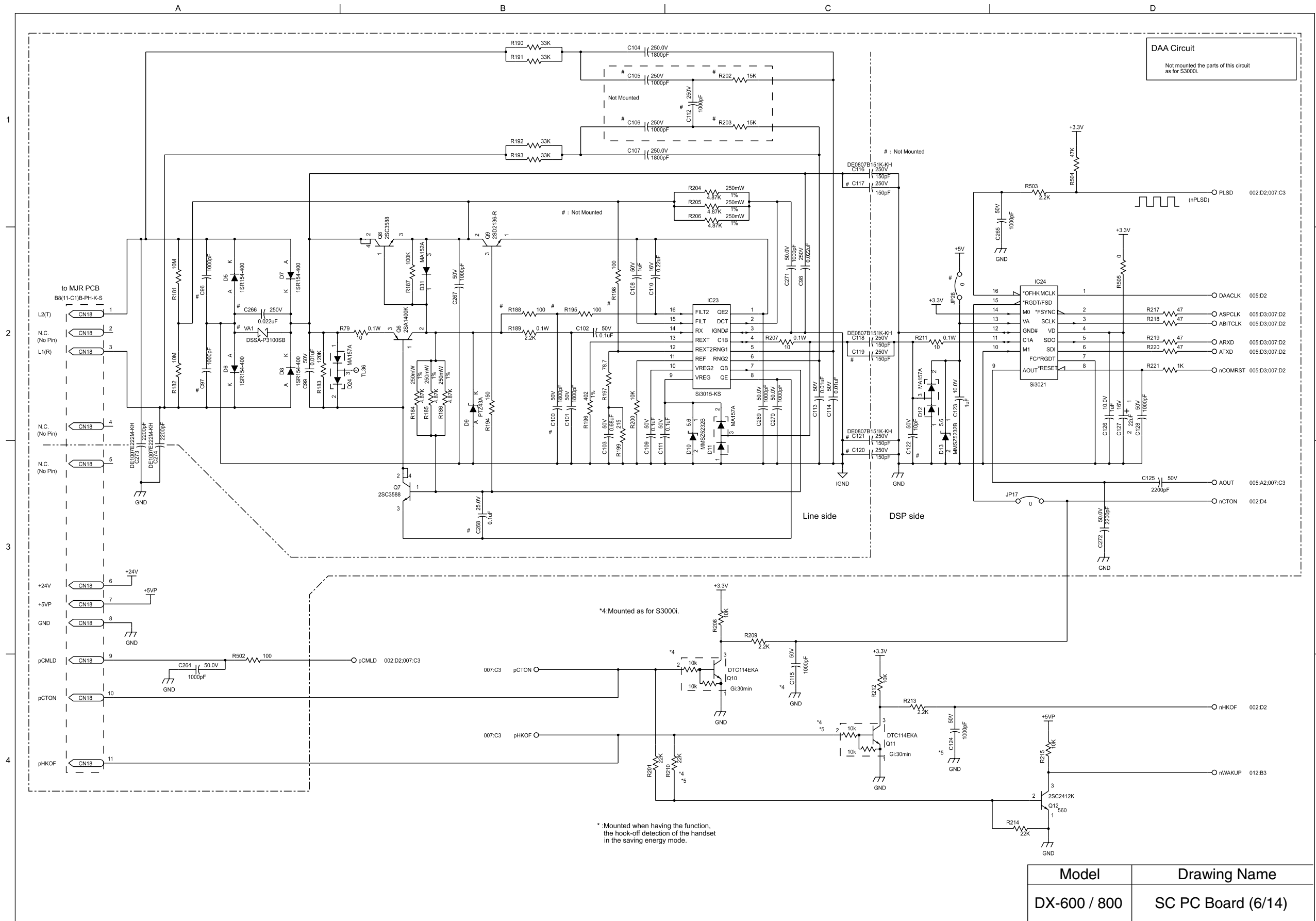
Model	Drawing Name
DX-600 / 800	SC PC Board (3/14)

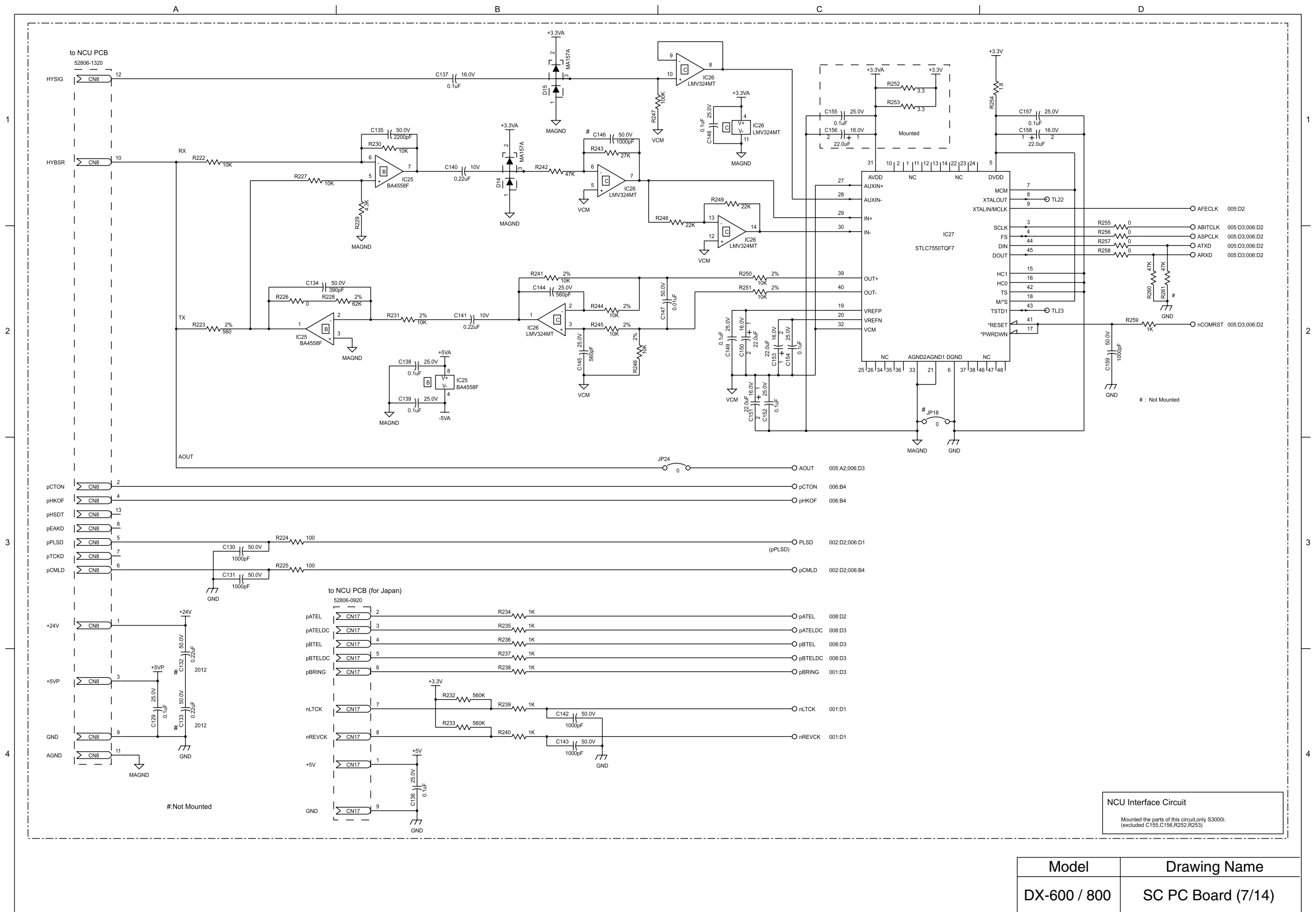


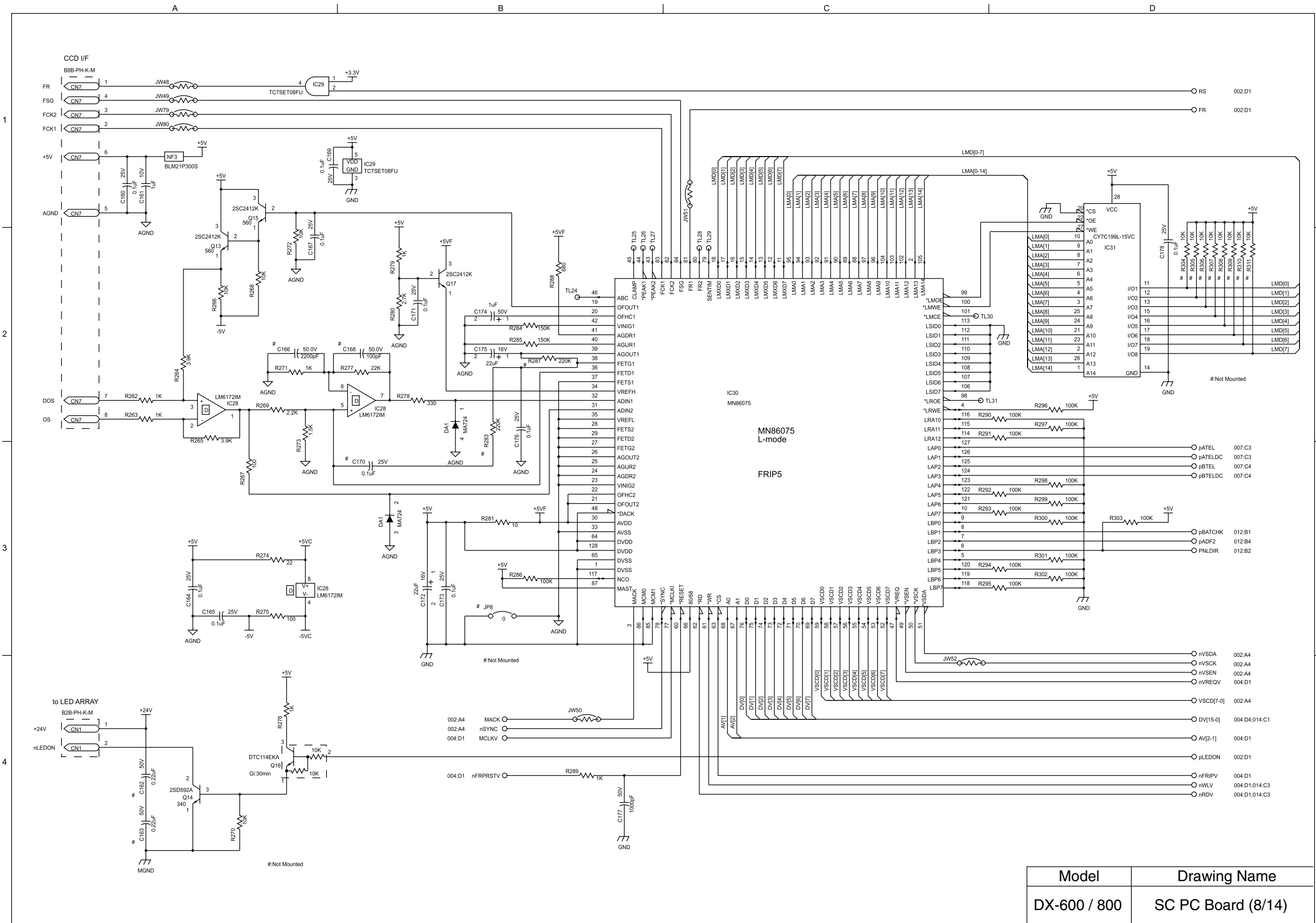
Model	Drawing Name
DX-600 / 800	SC PC Board (4/14)



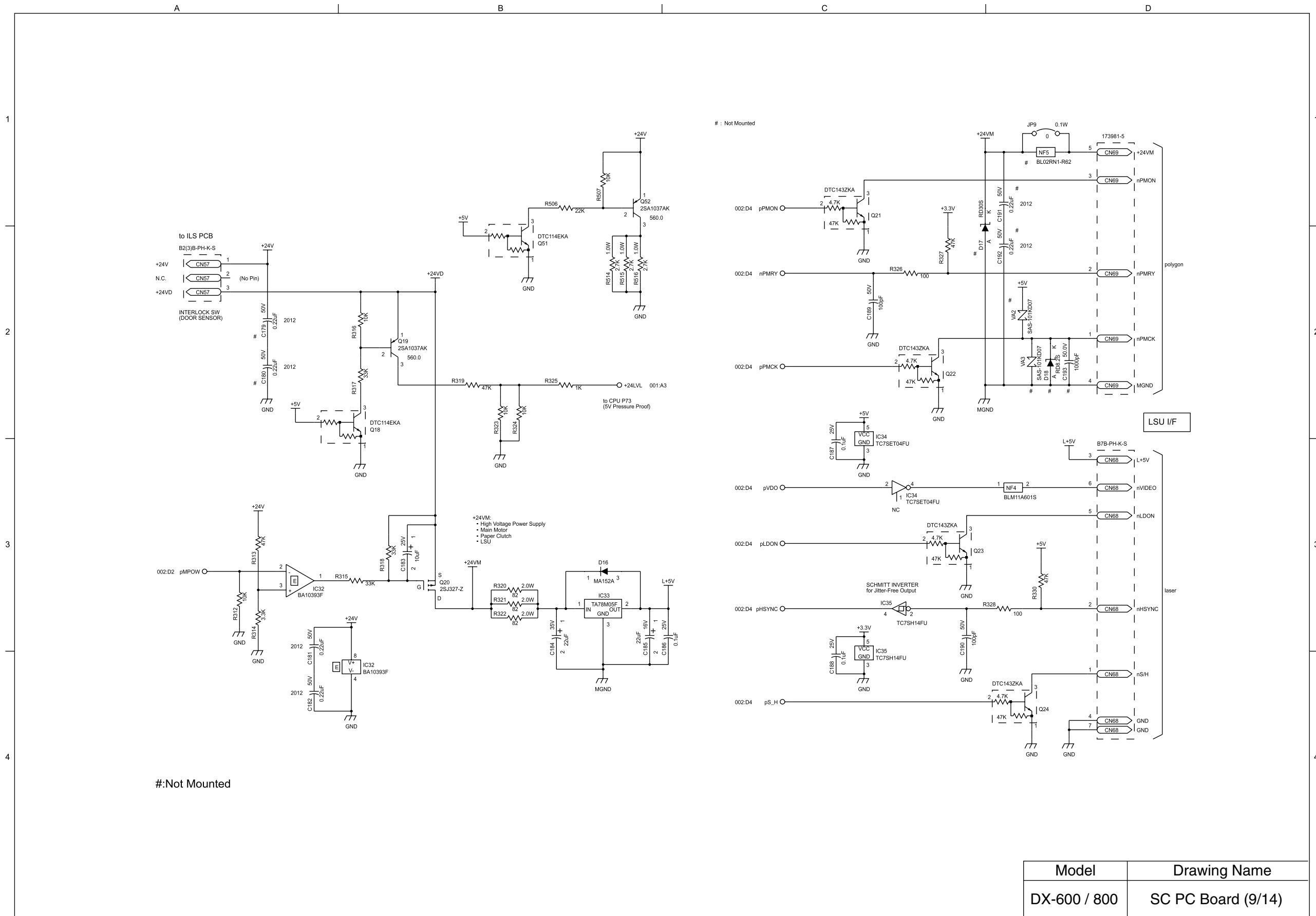
Model	Drawing Name
DX-600 / 800	SC PC Board (5/14)

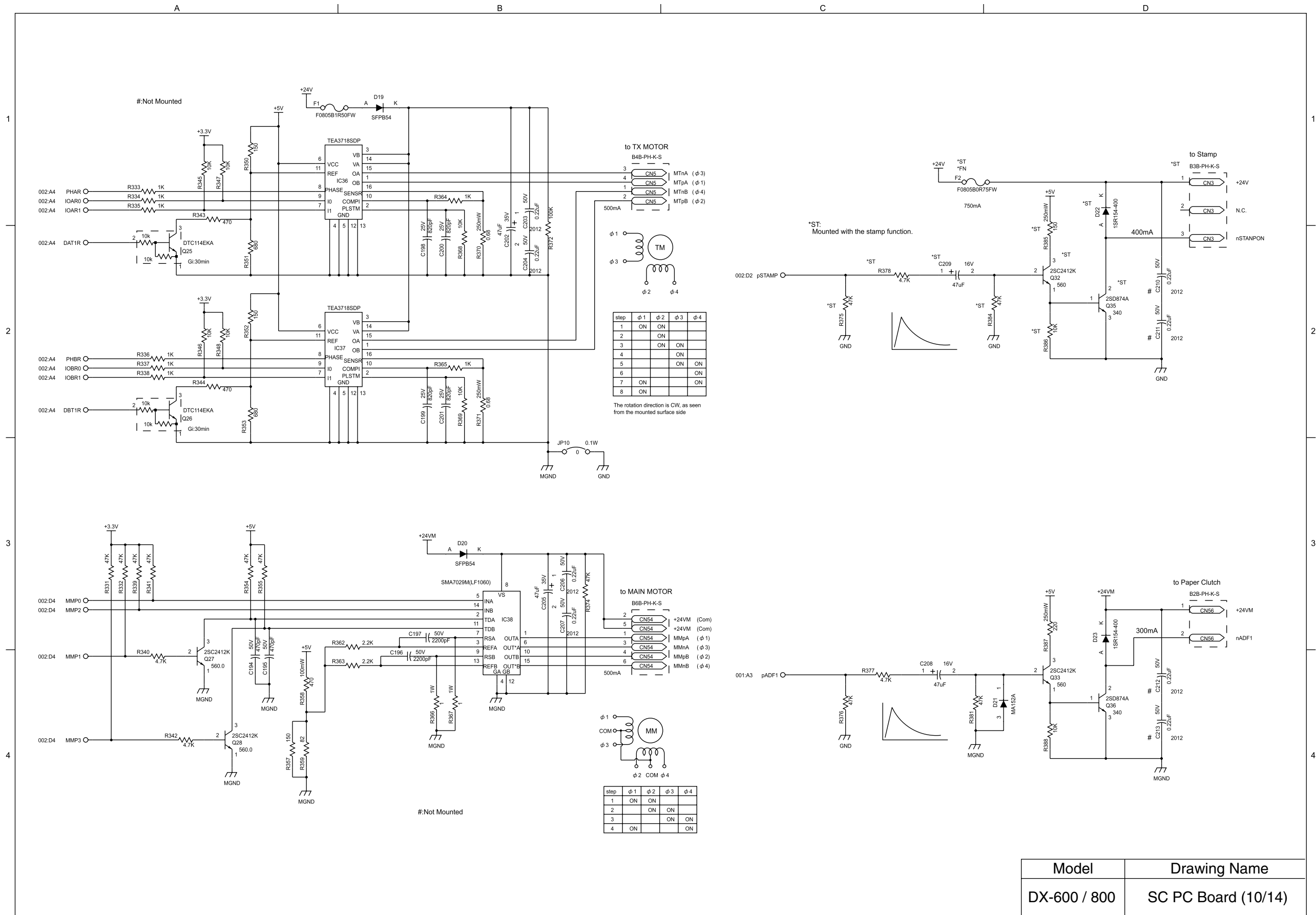




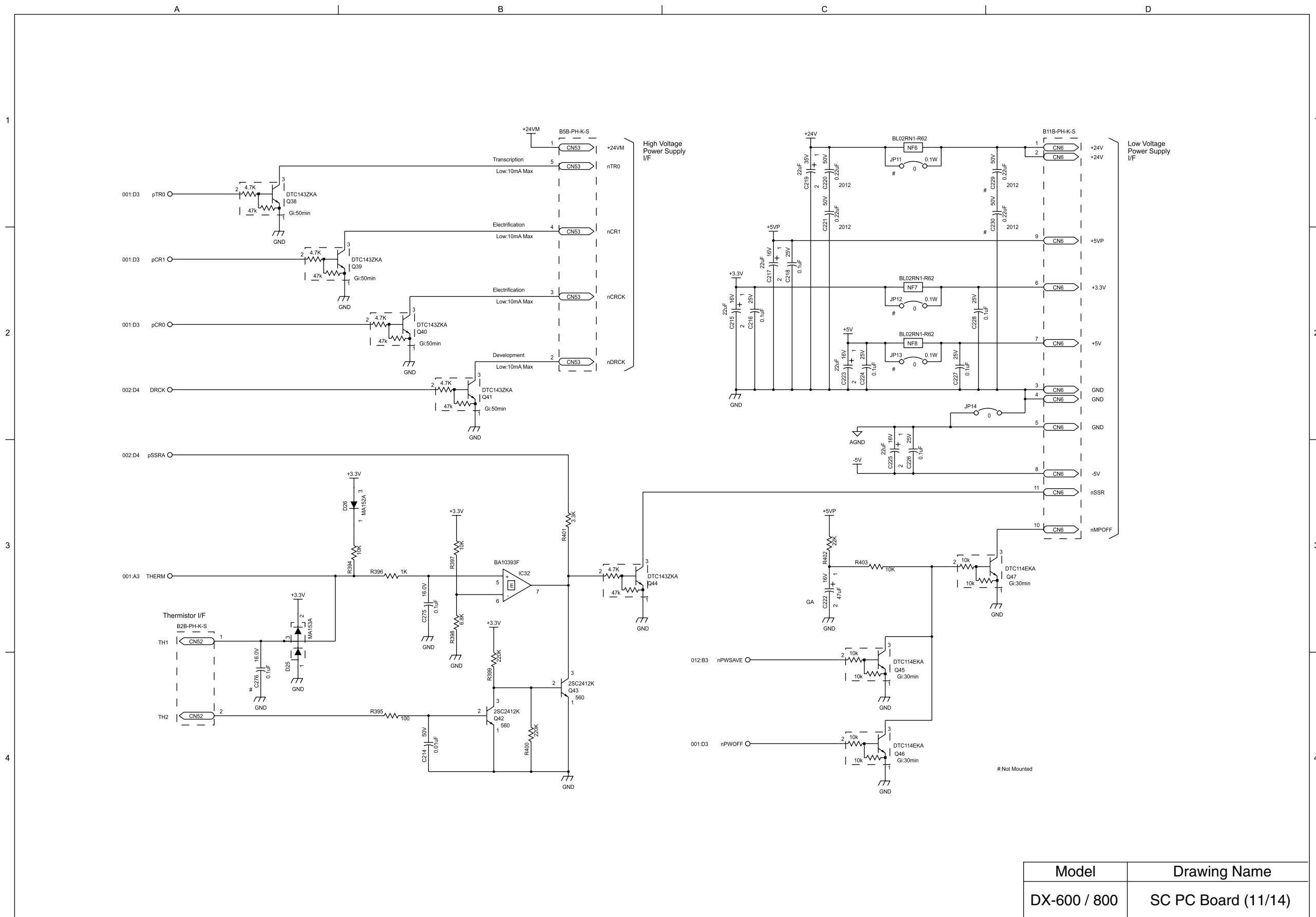




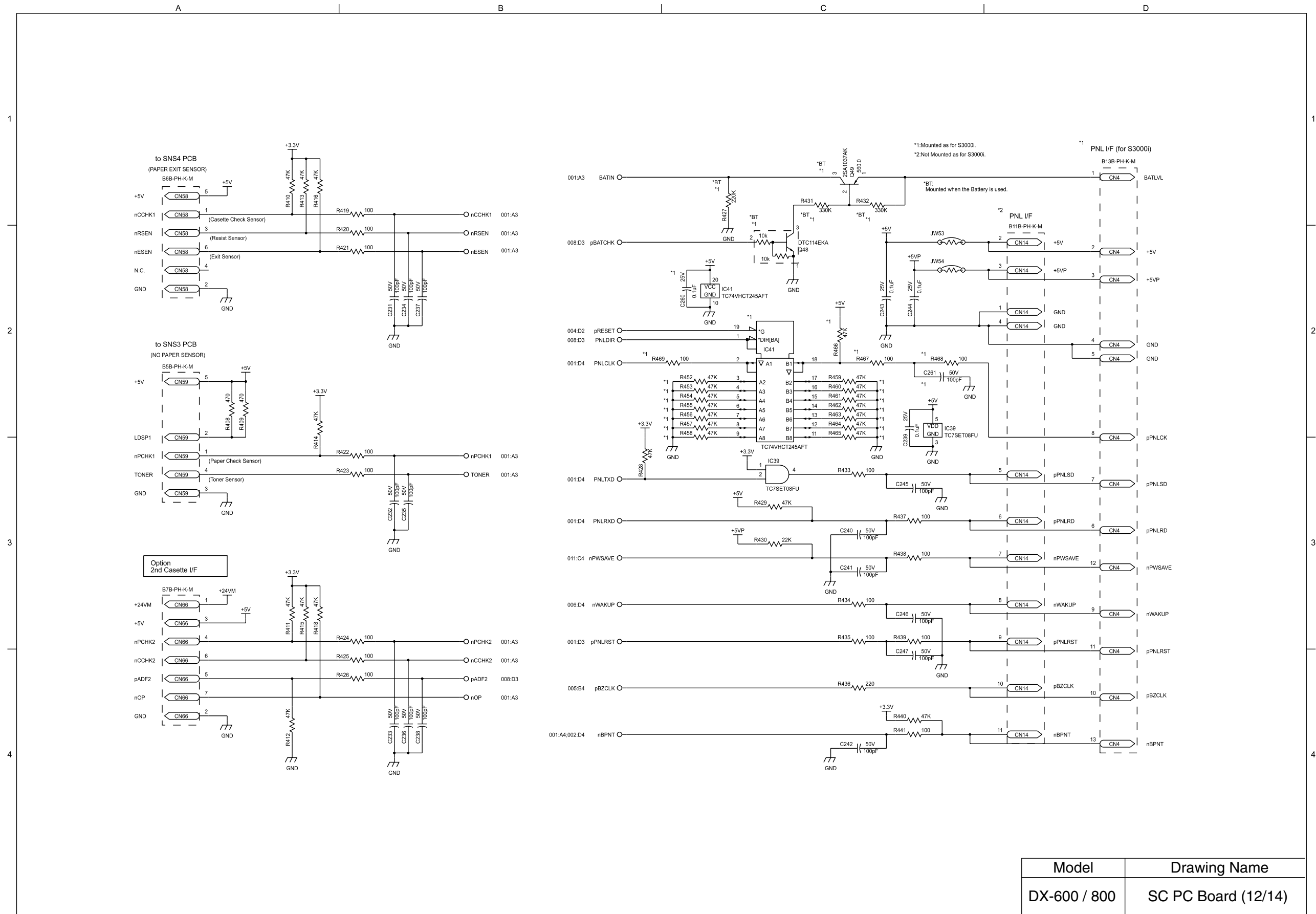


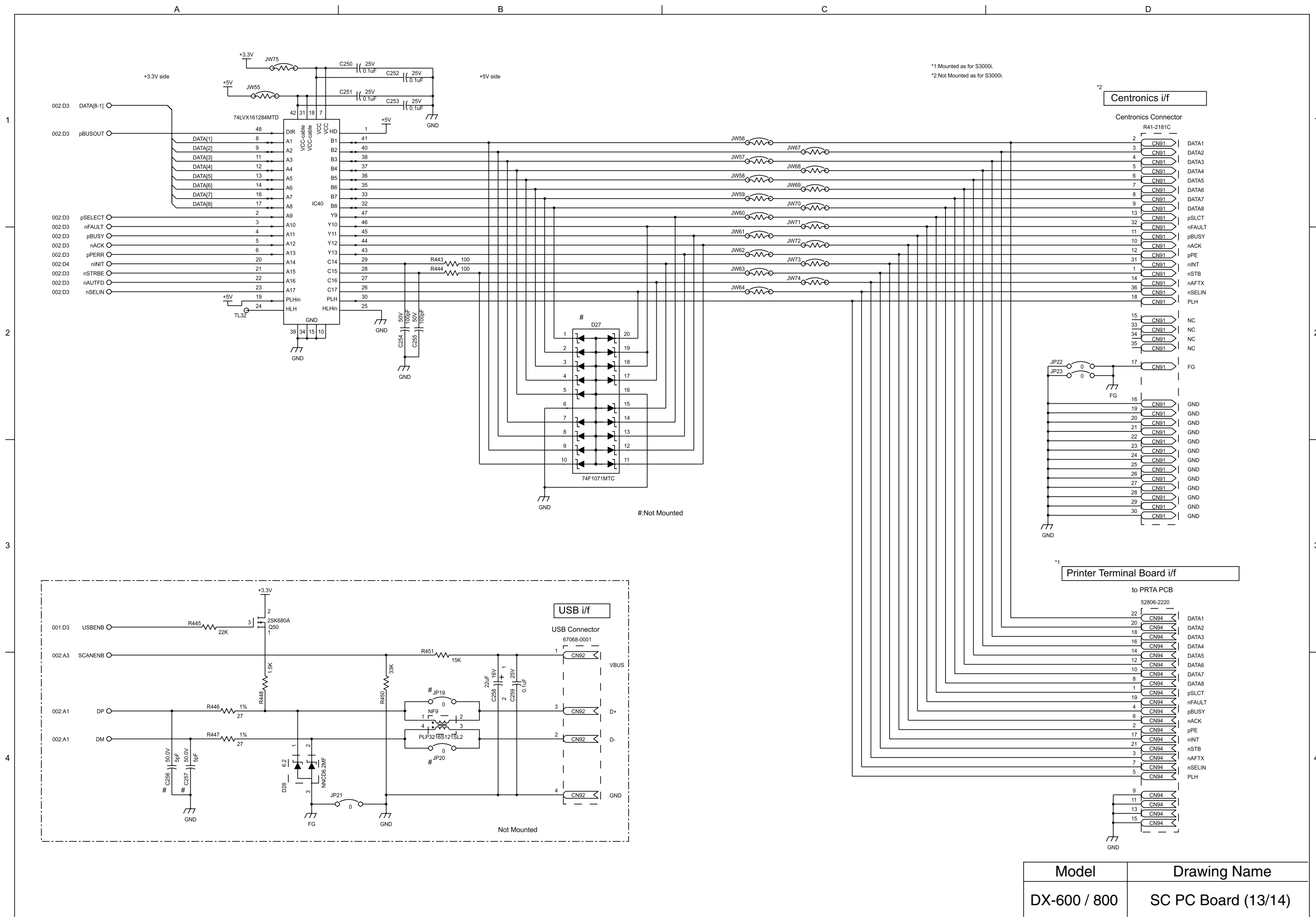


Model	Drawing Name
DX-600 / 800	SC PC Board (10/14)

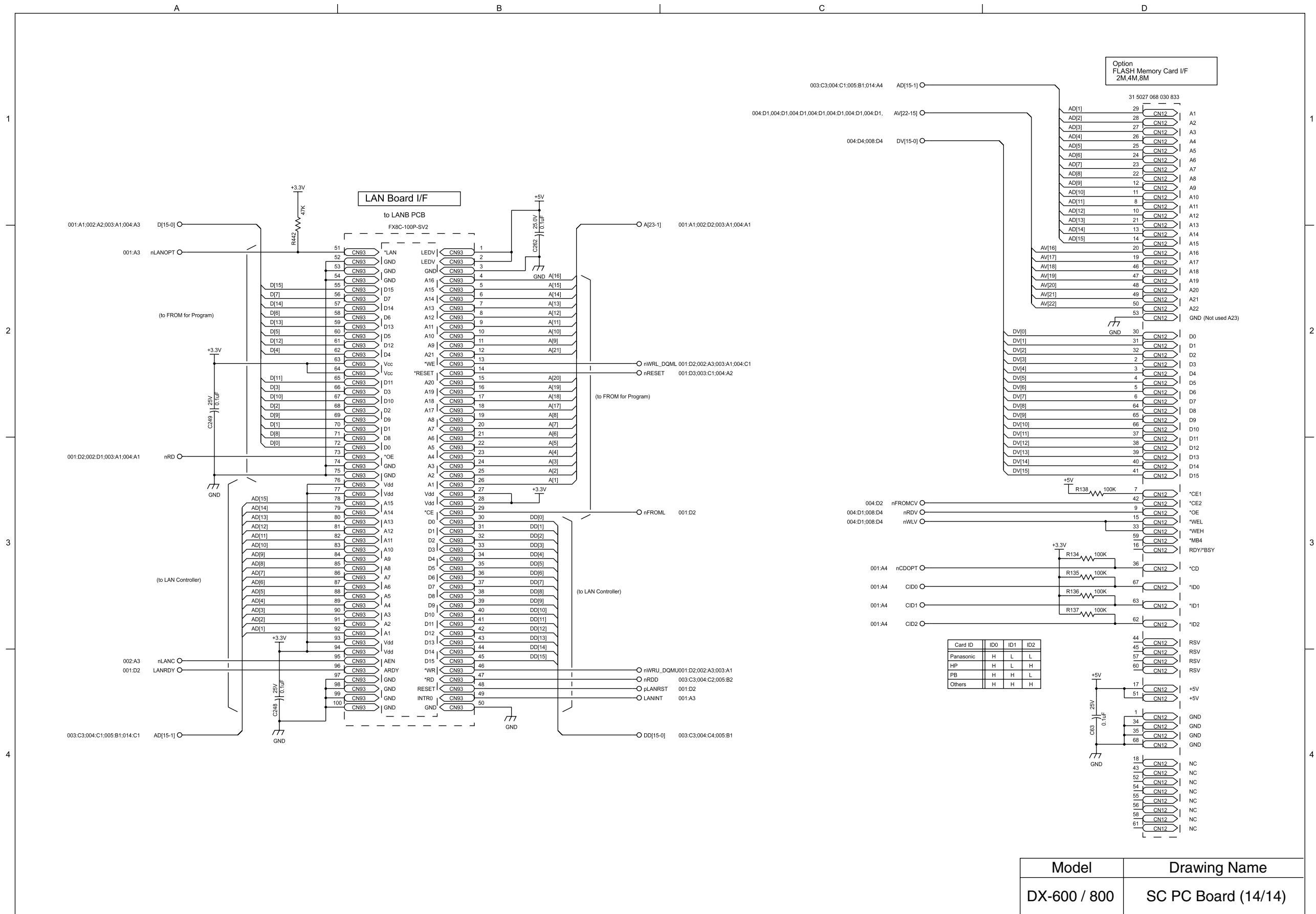


Model	Drawing Name
DX-600 / 800	SC PC Board (11/14)

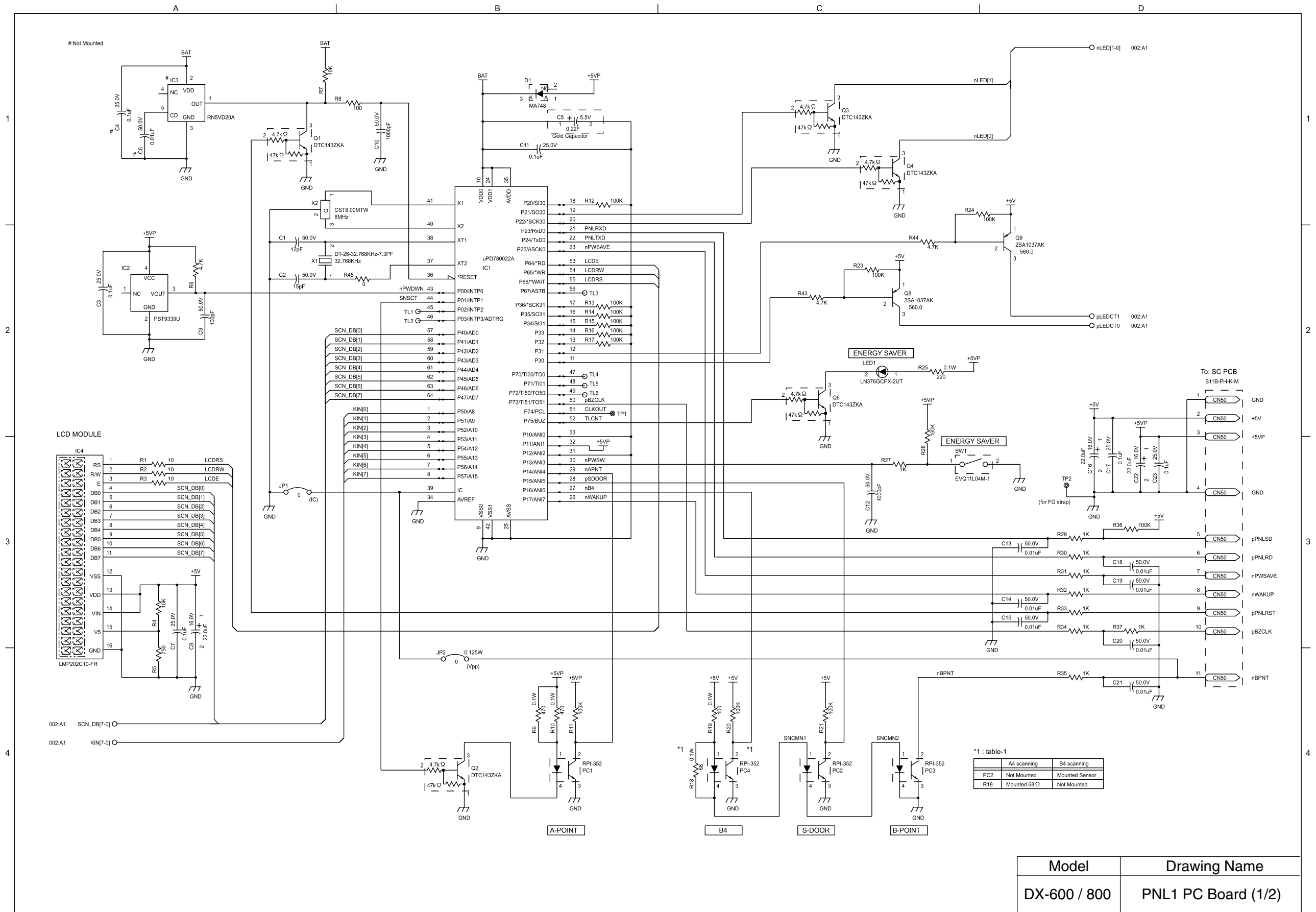


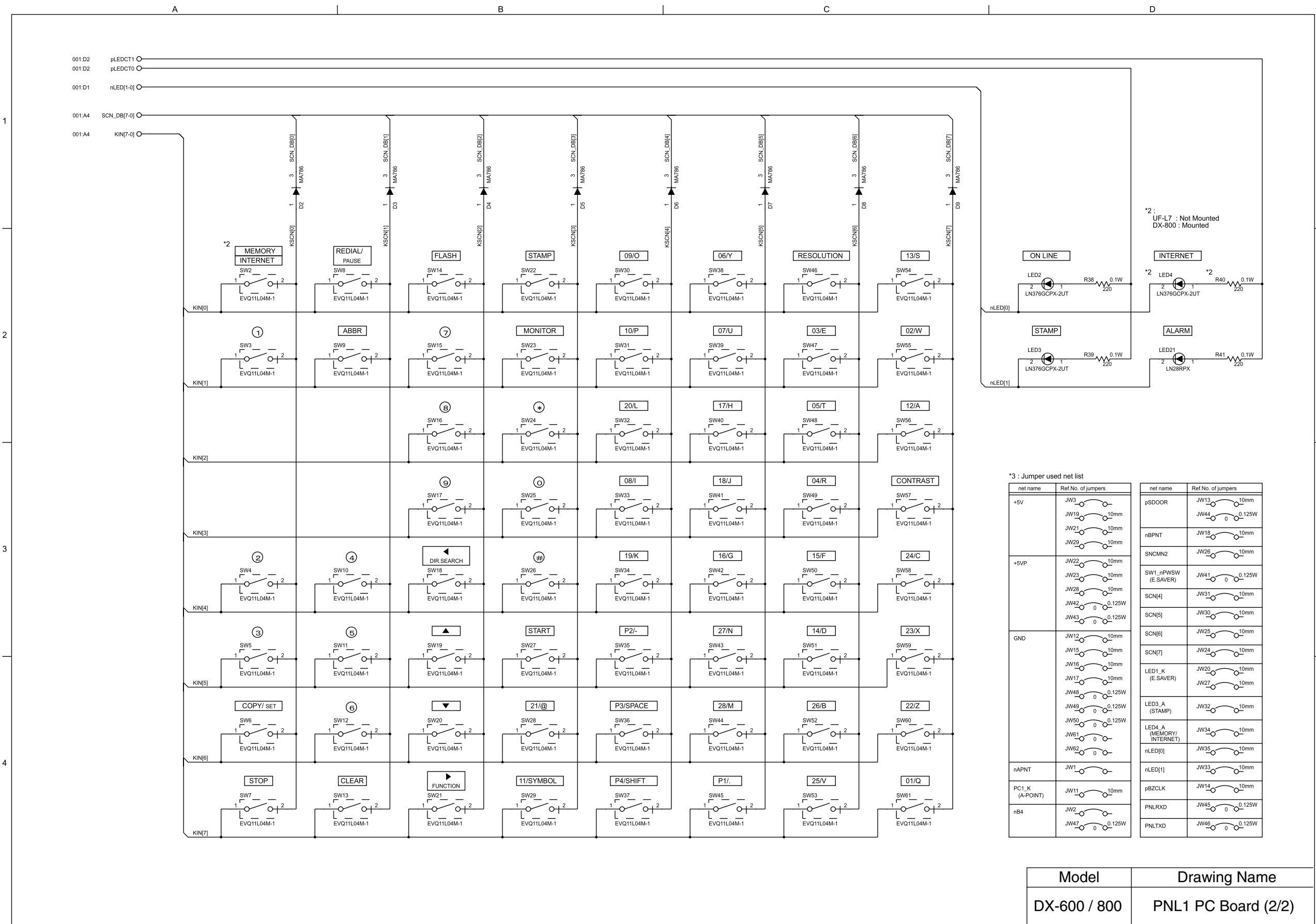


Model	Drawing Name
DX-600 / 800	SC PC Board (13/14)



### 10.3. PNL1 PC Board

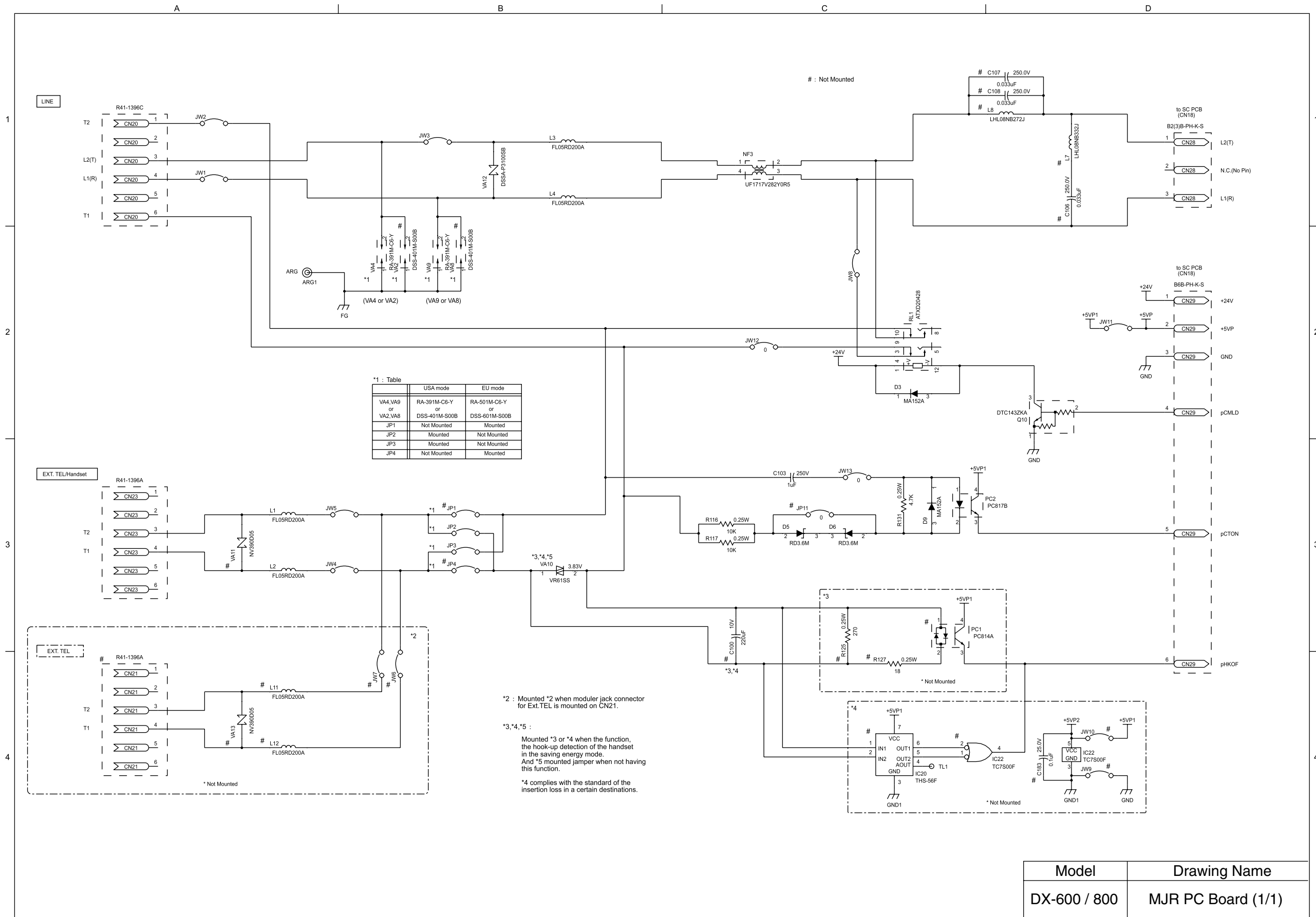




Model	Drawing Name
DX-600 / 800	PNL1 PC Board (2/2)

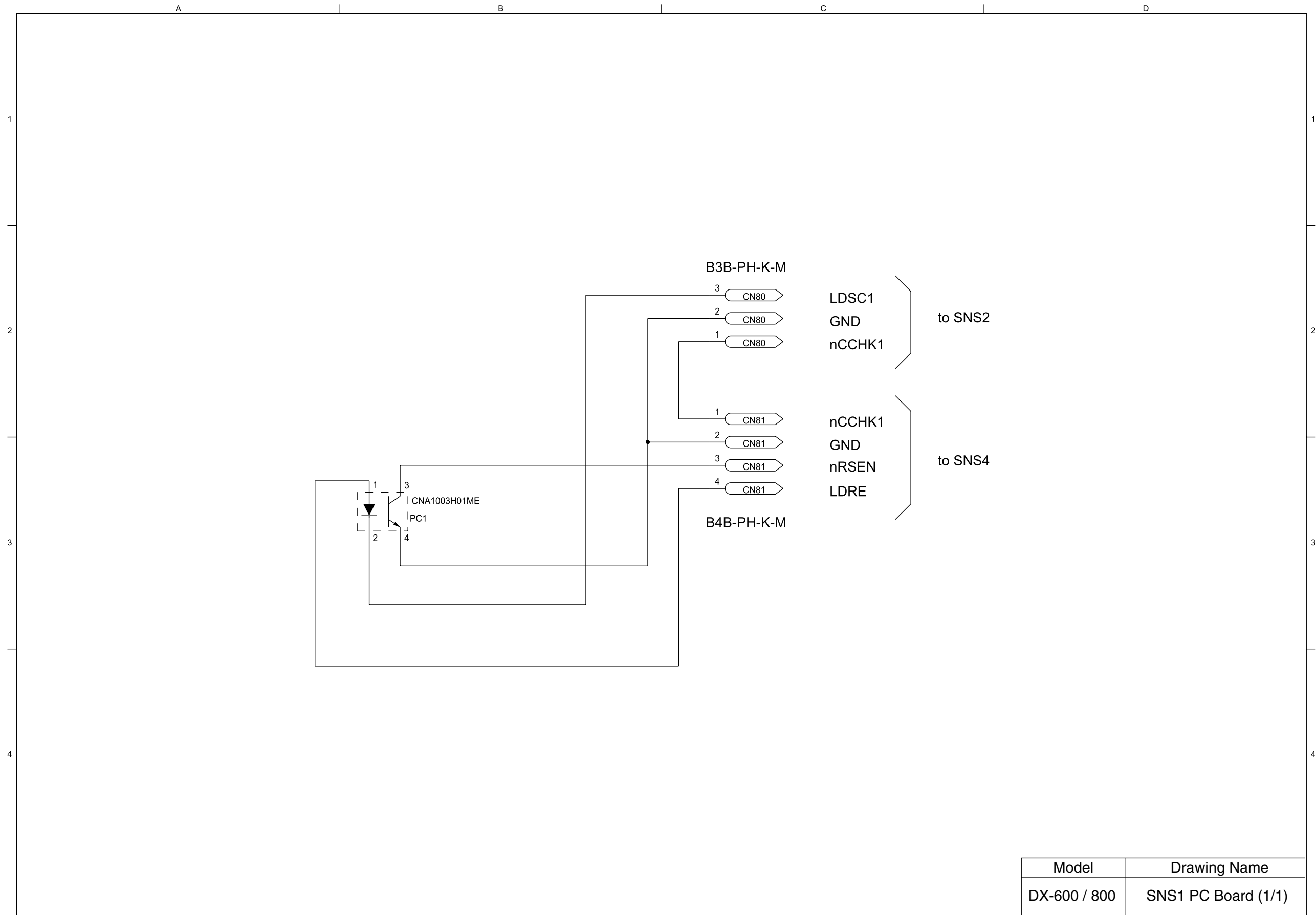


# 10.4. MJR PC Board



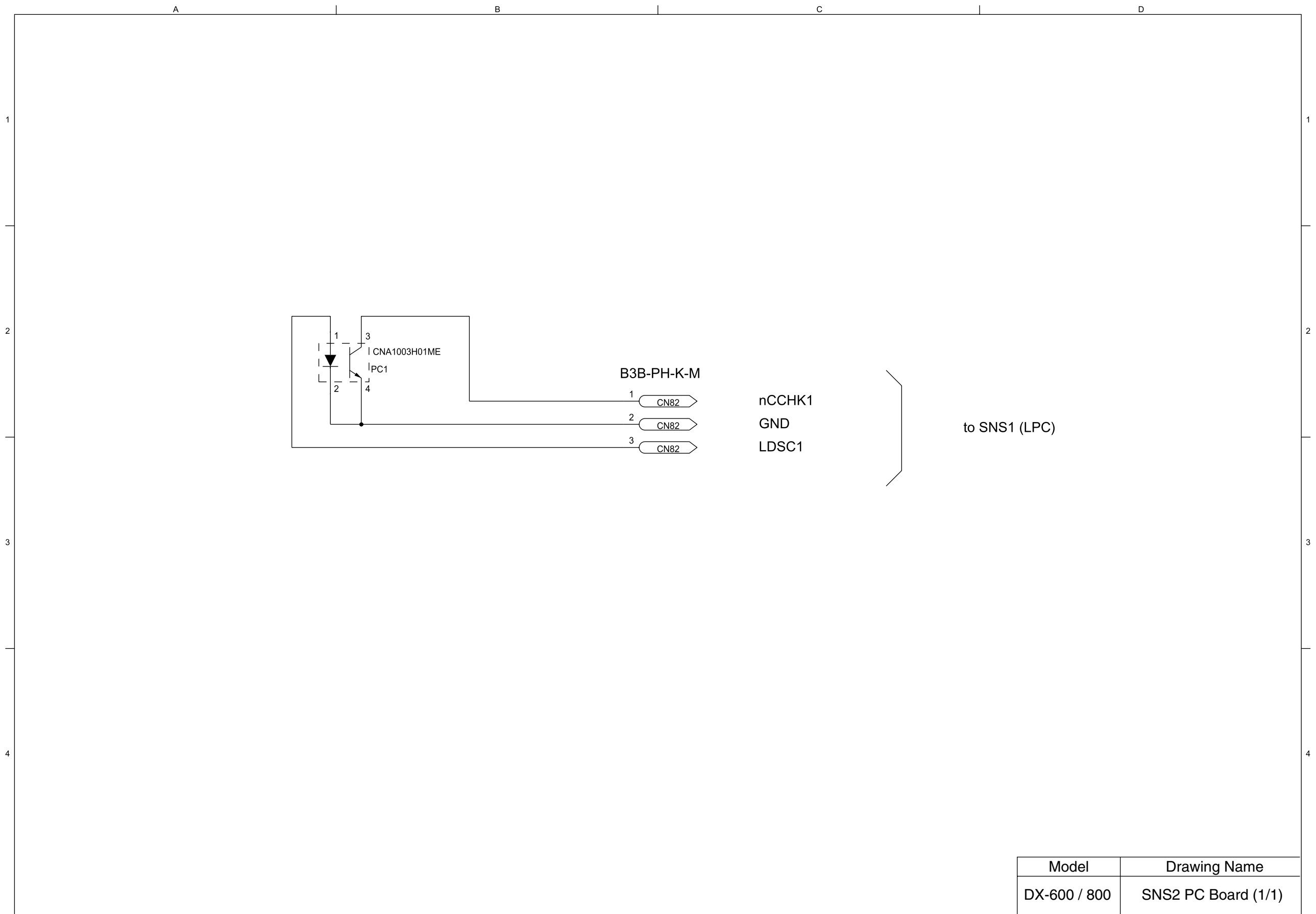
Model	Drawing Name
DX-600 / 800	MJR PC Board (1/1)

10.5. SNS1 PC Board



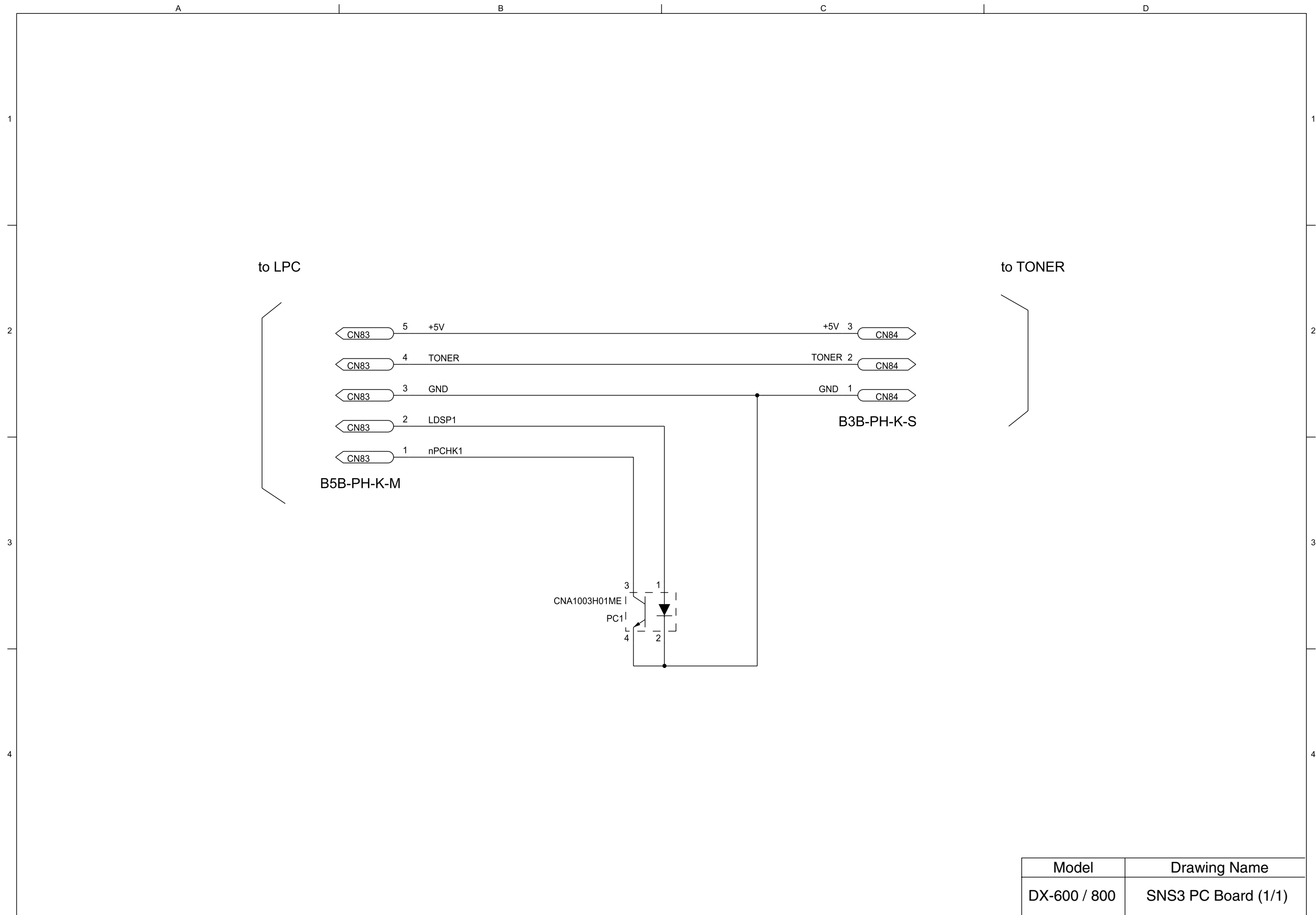
Model	Drawing Name
DX-600 / 800	SNS1 PC Board (1/1)

10.6. SNS2 PC Board

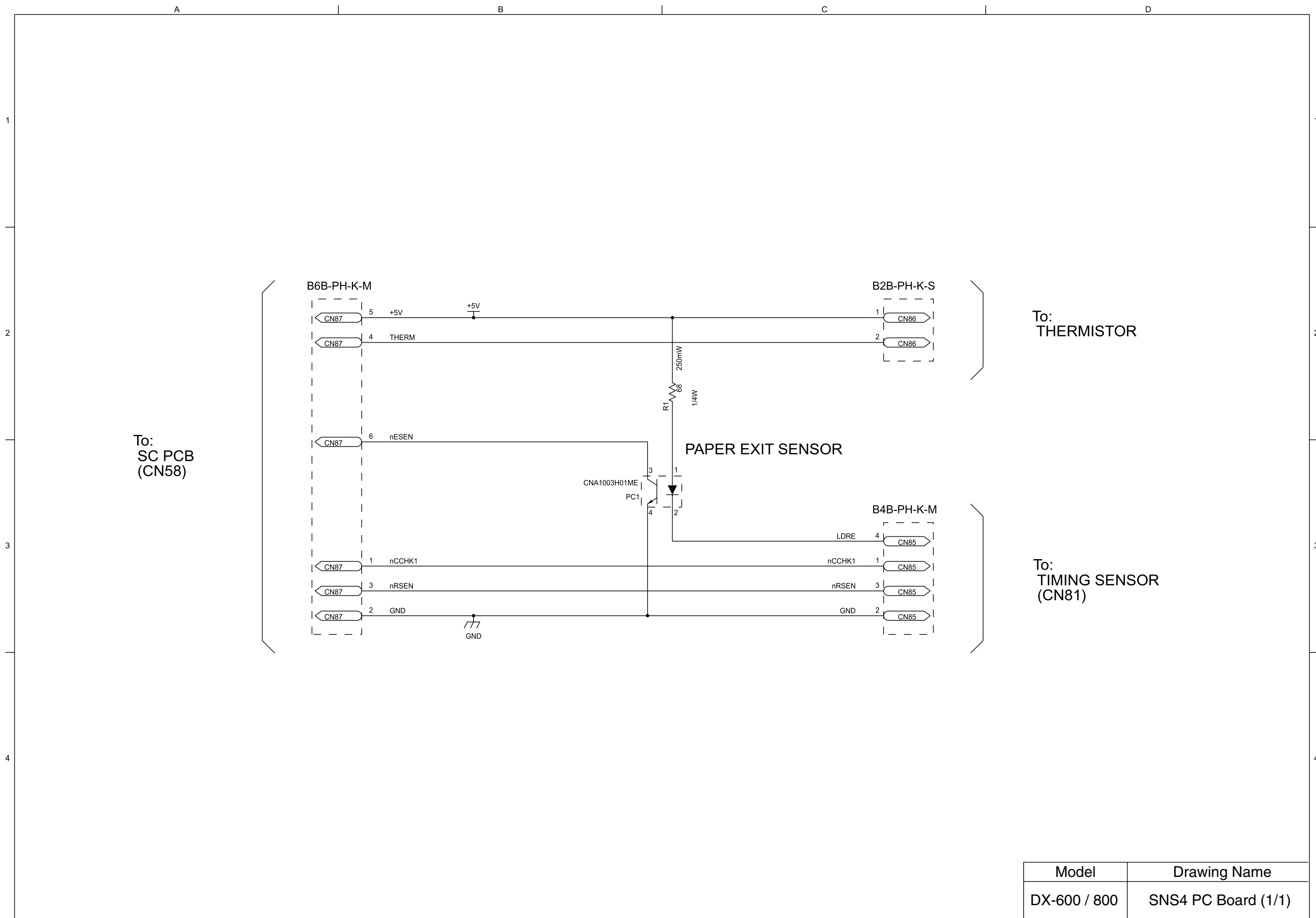


Model	Drawing Name
DX-600 / 800	SNS2 PC Board (1/1)

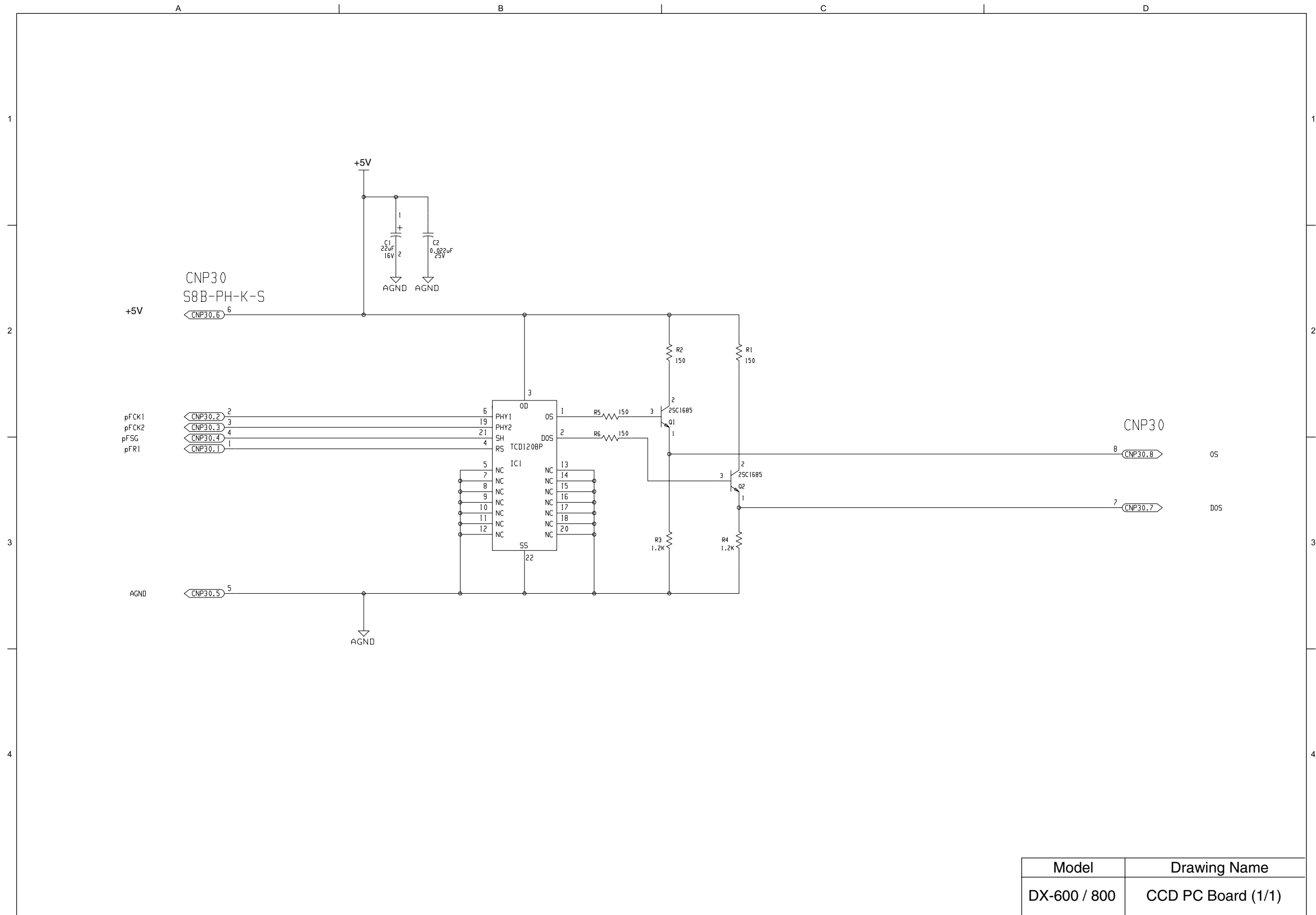
10.7. SNS3 PC Board



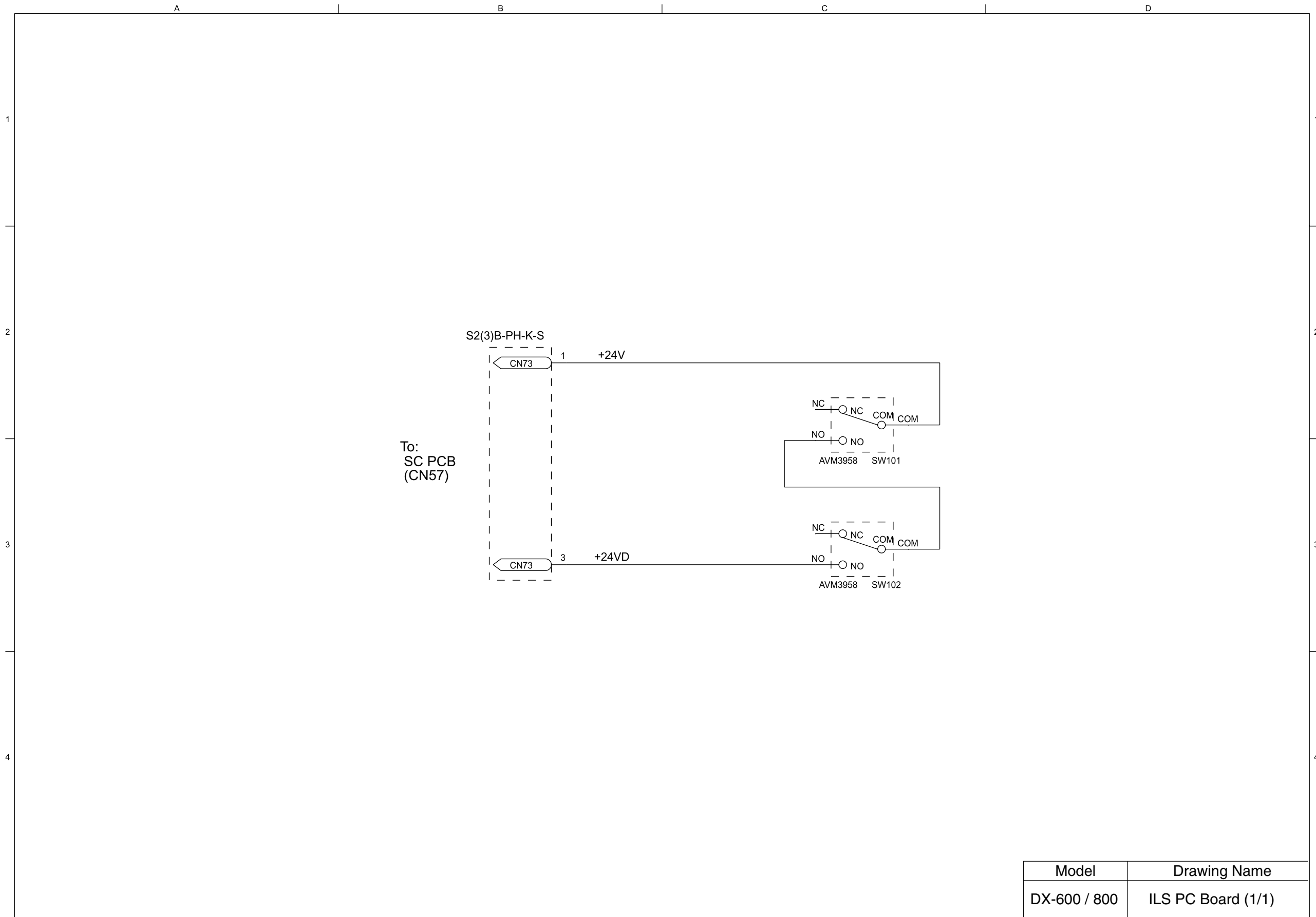
### 10.8. SNS4 PC Board



10.9. CCD PC Board

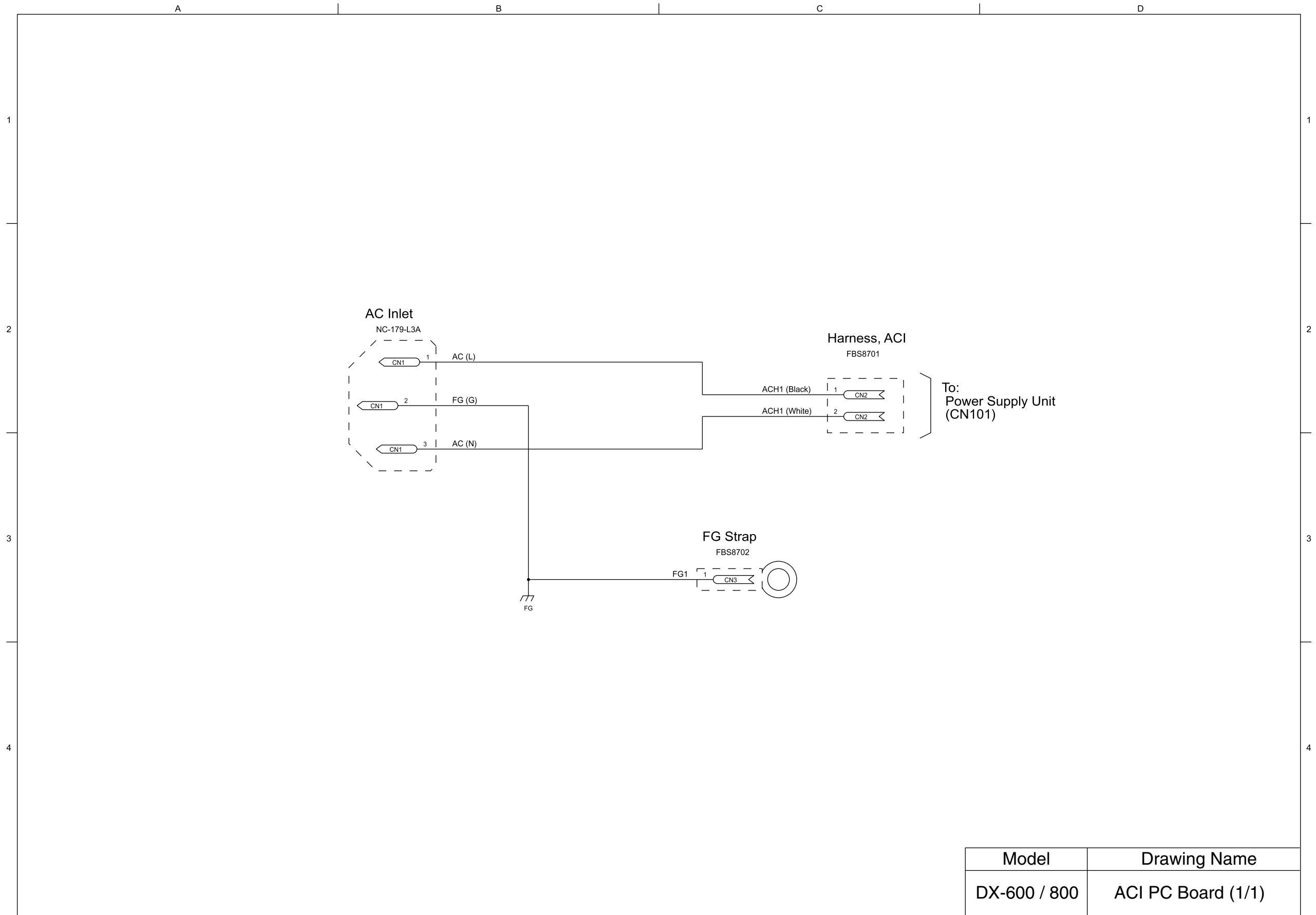


10.10. ILS PC Board



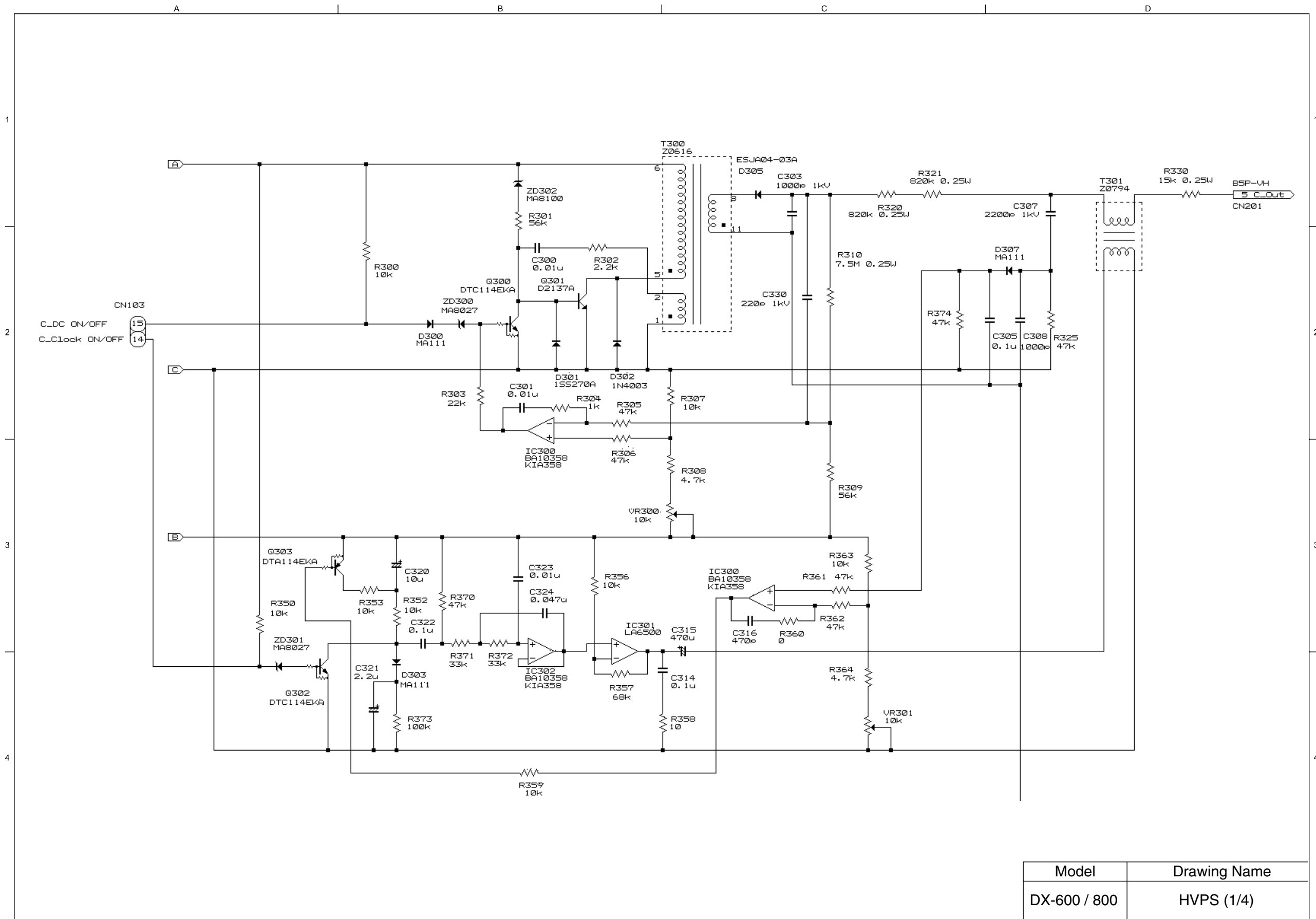
Model	Drawing Name
DX-600 / 800	ILS PC Board (1/1)

10.11. ACI PC Board

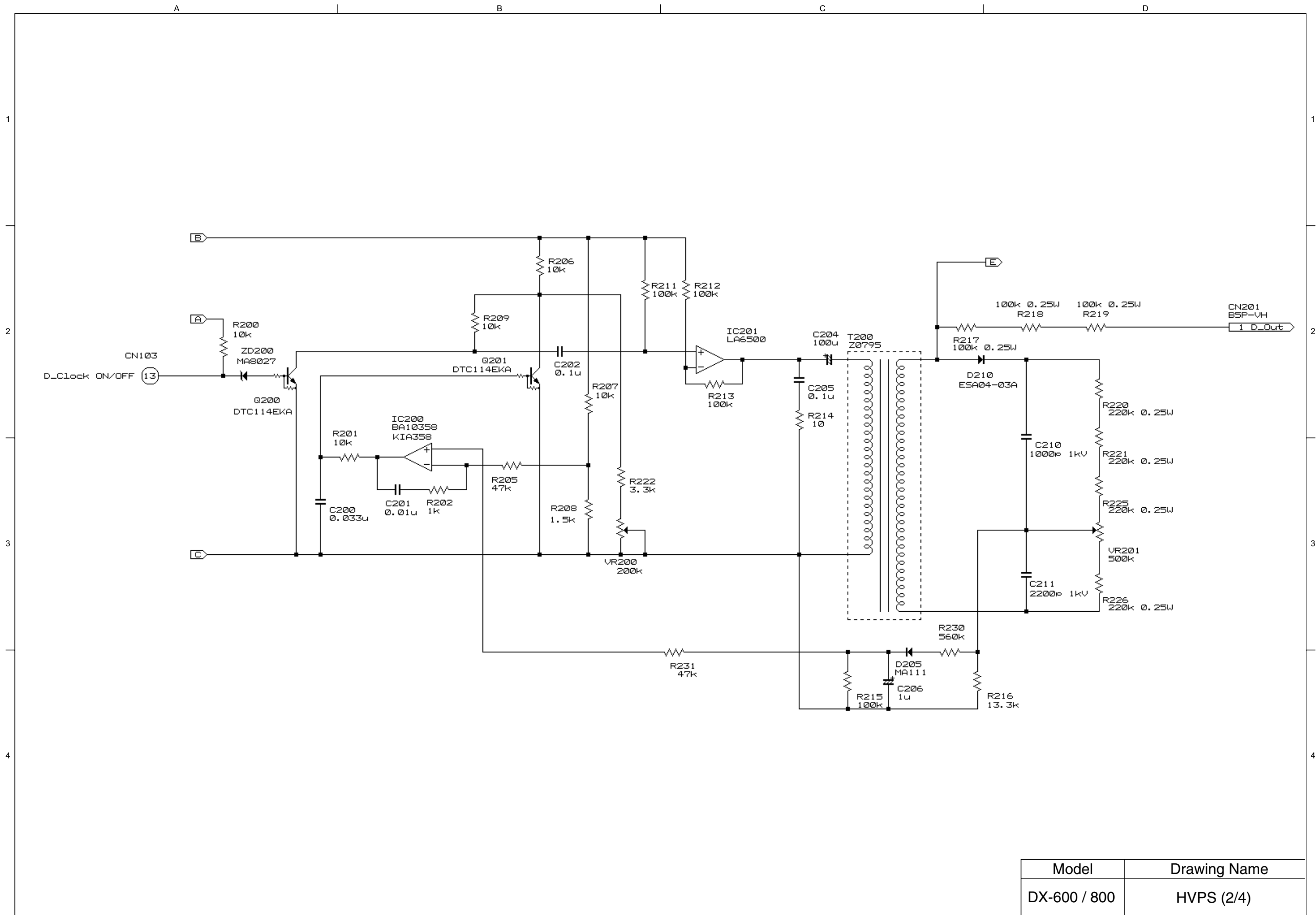




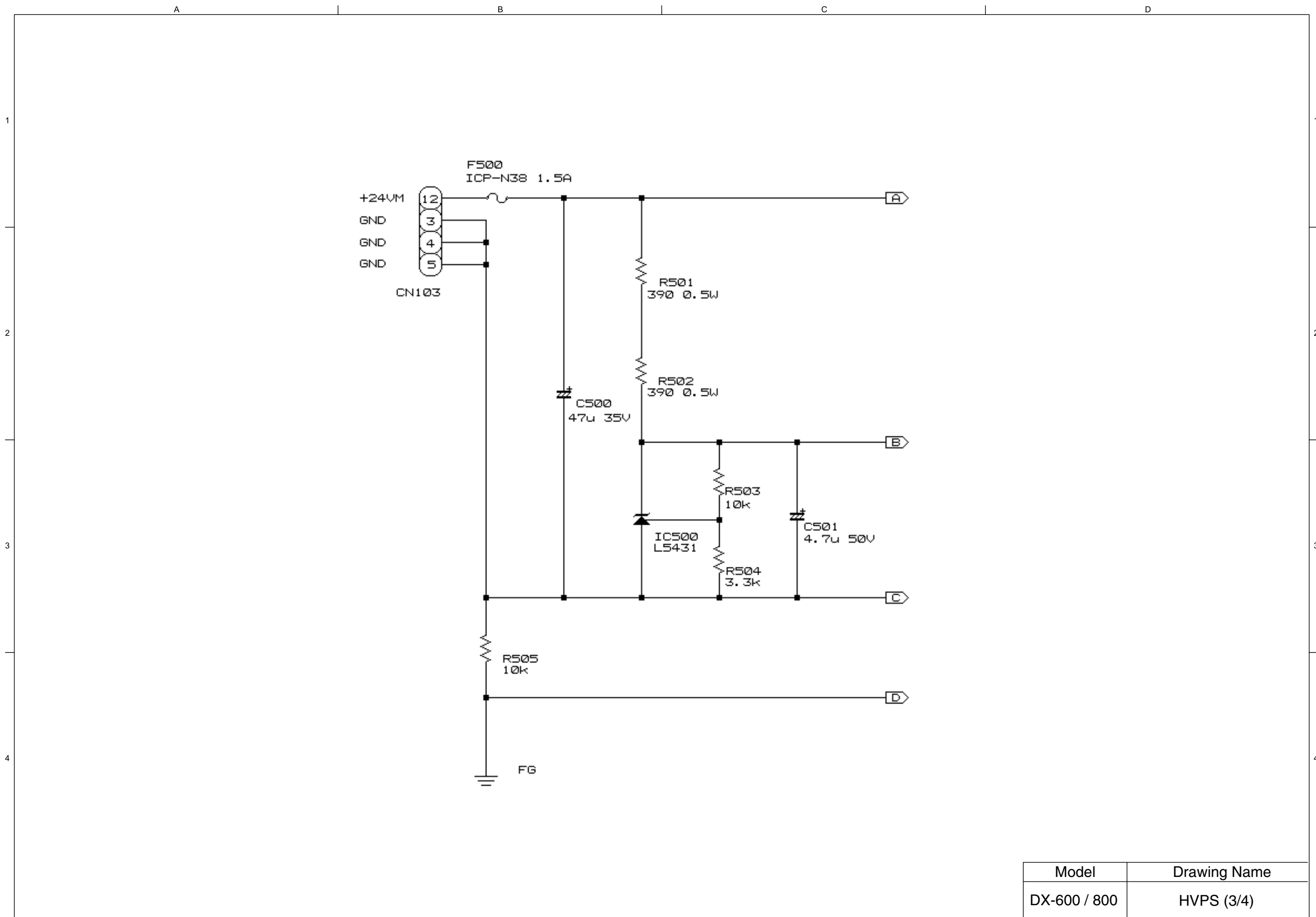
### 10.12. Power Supply Unit

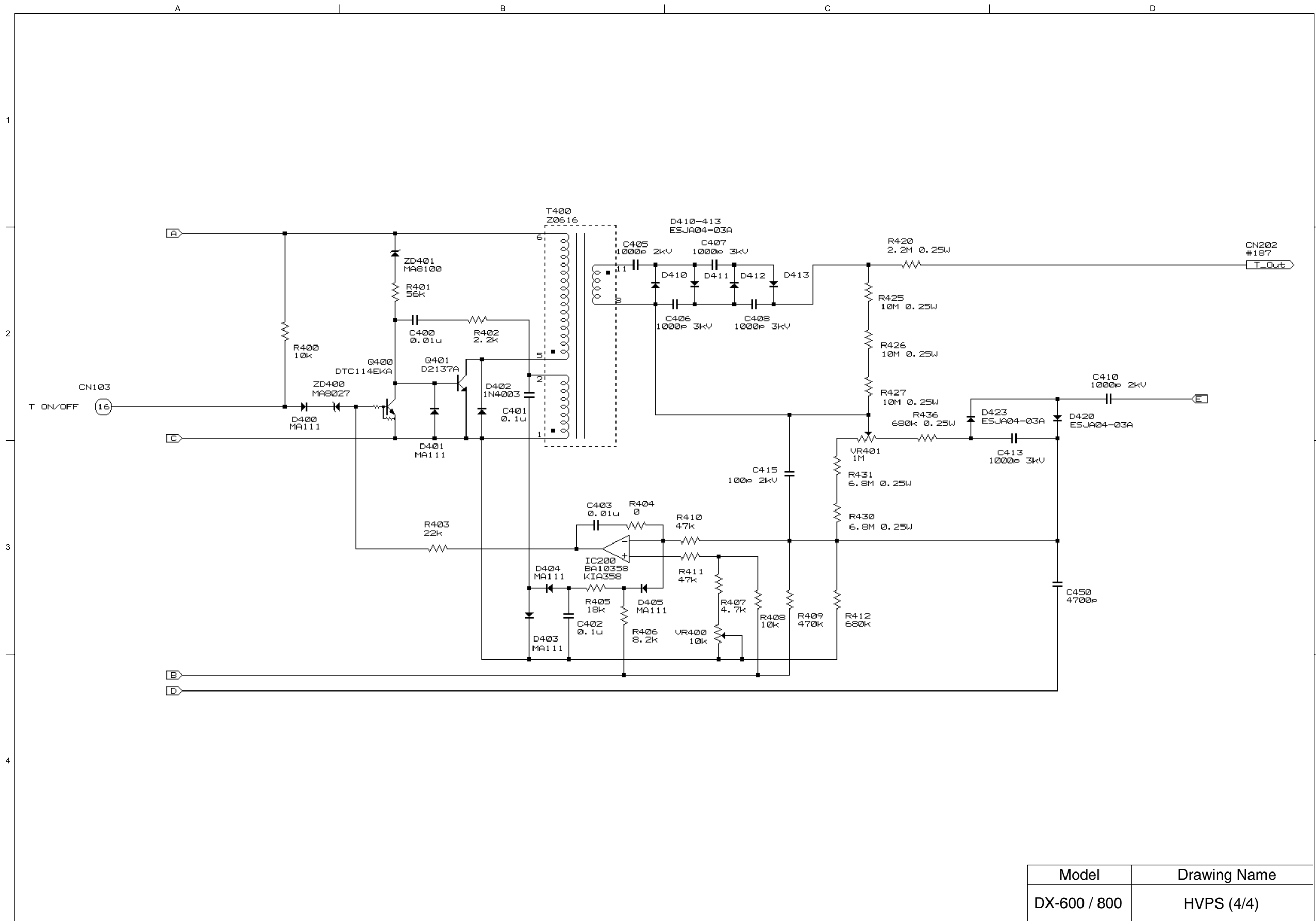


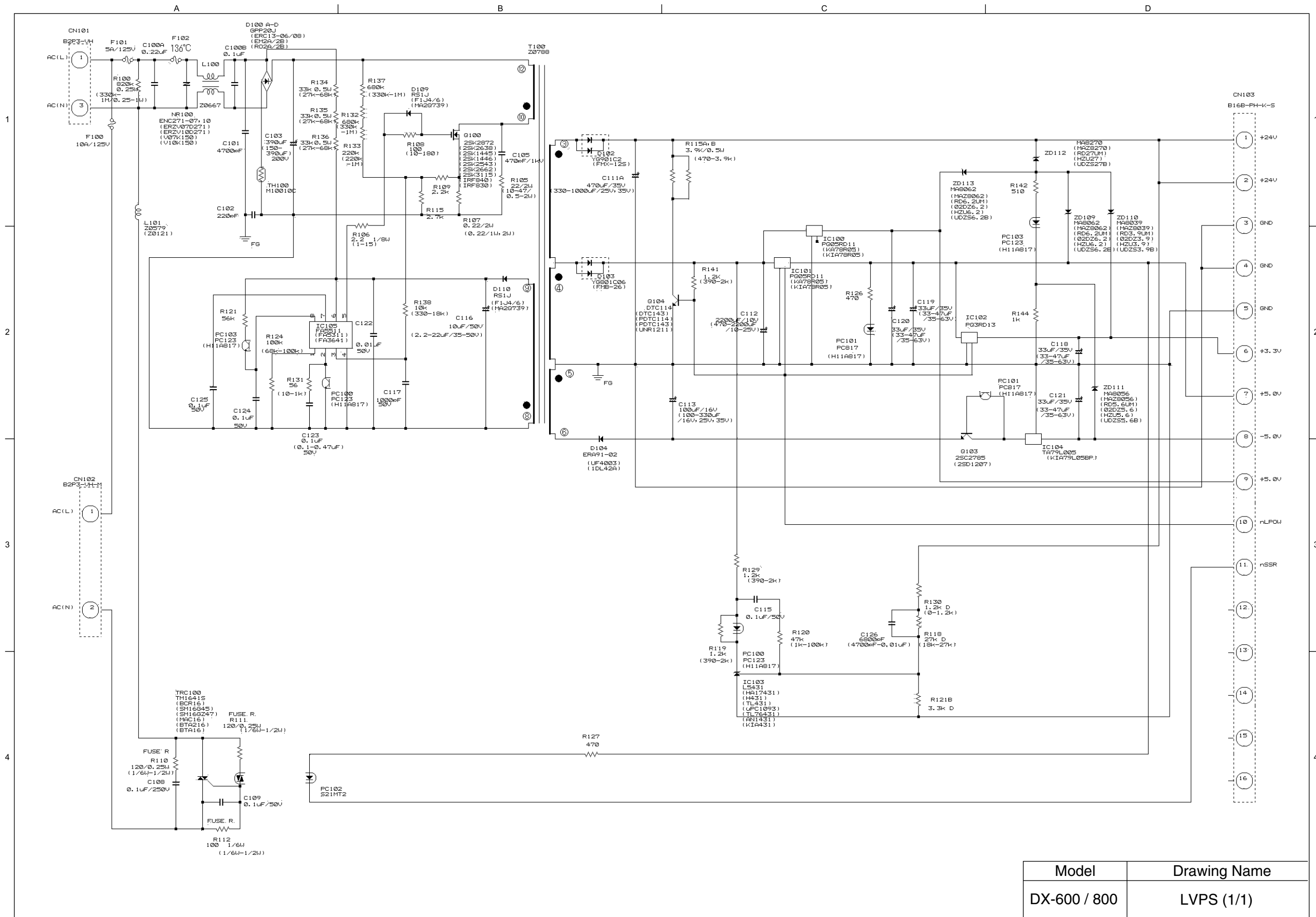
Model	Drawing Name
DX-600 / 800	HVPS (1/4)



Model	Drawing Name
DX-600 / 800	HVPS (2/4)

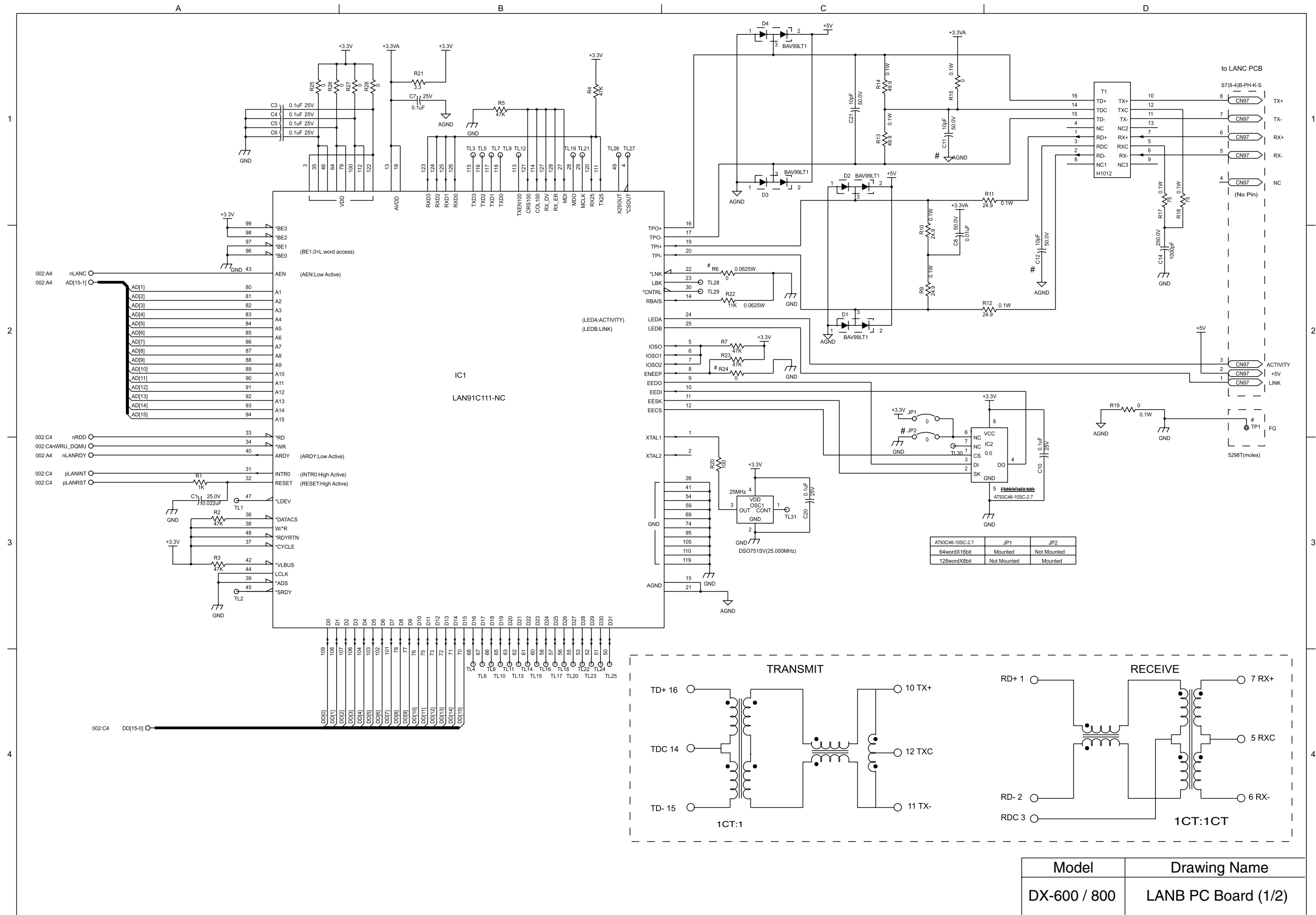




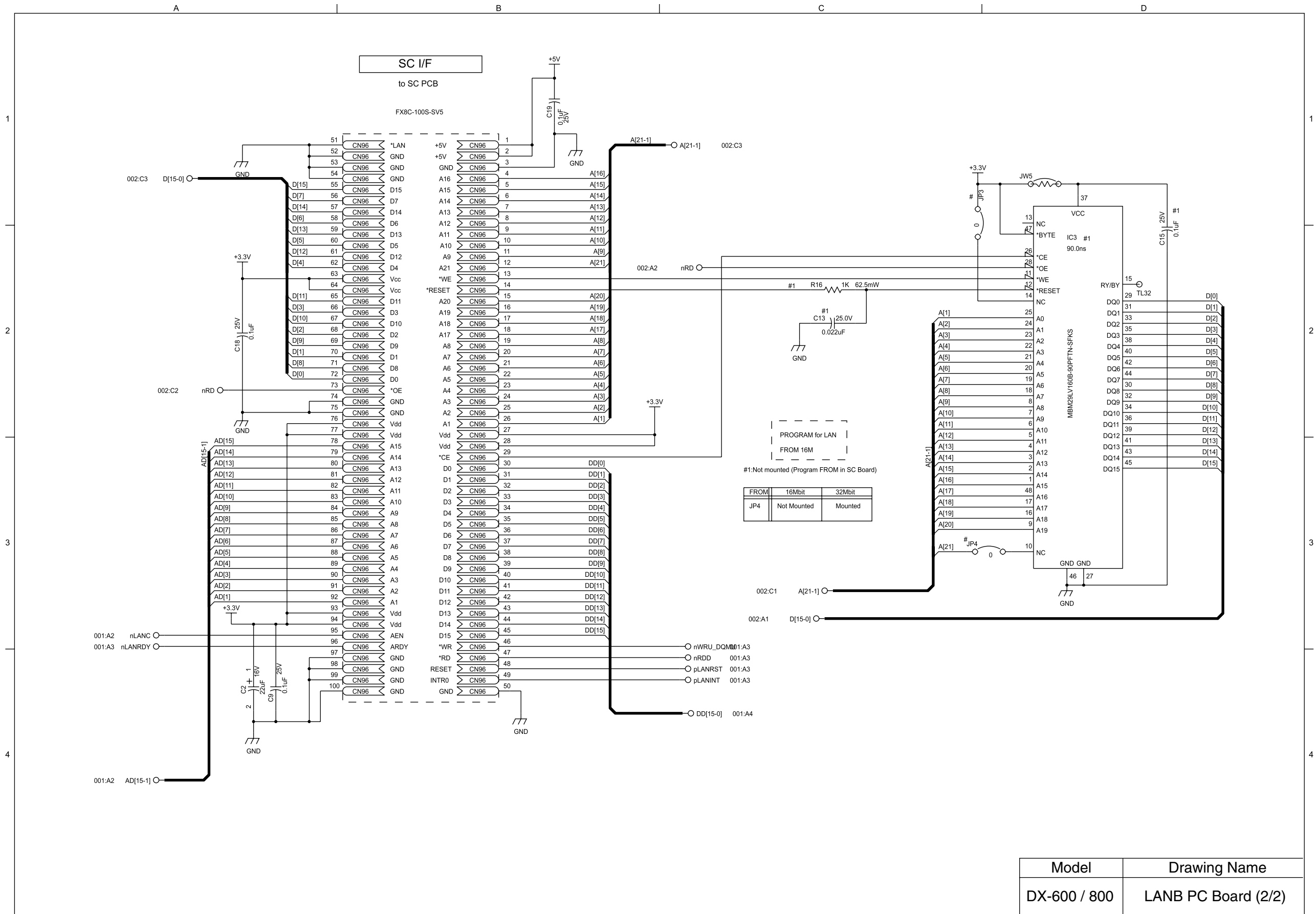


Model	Drawing Name
DX-600 / 800	LVPS (1/1)

# 10.13. LANB PC Board

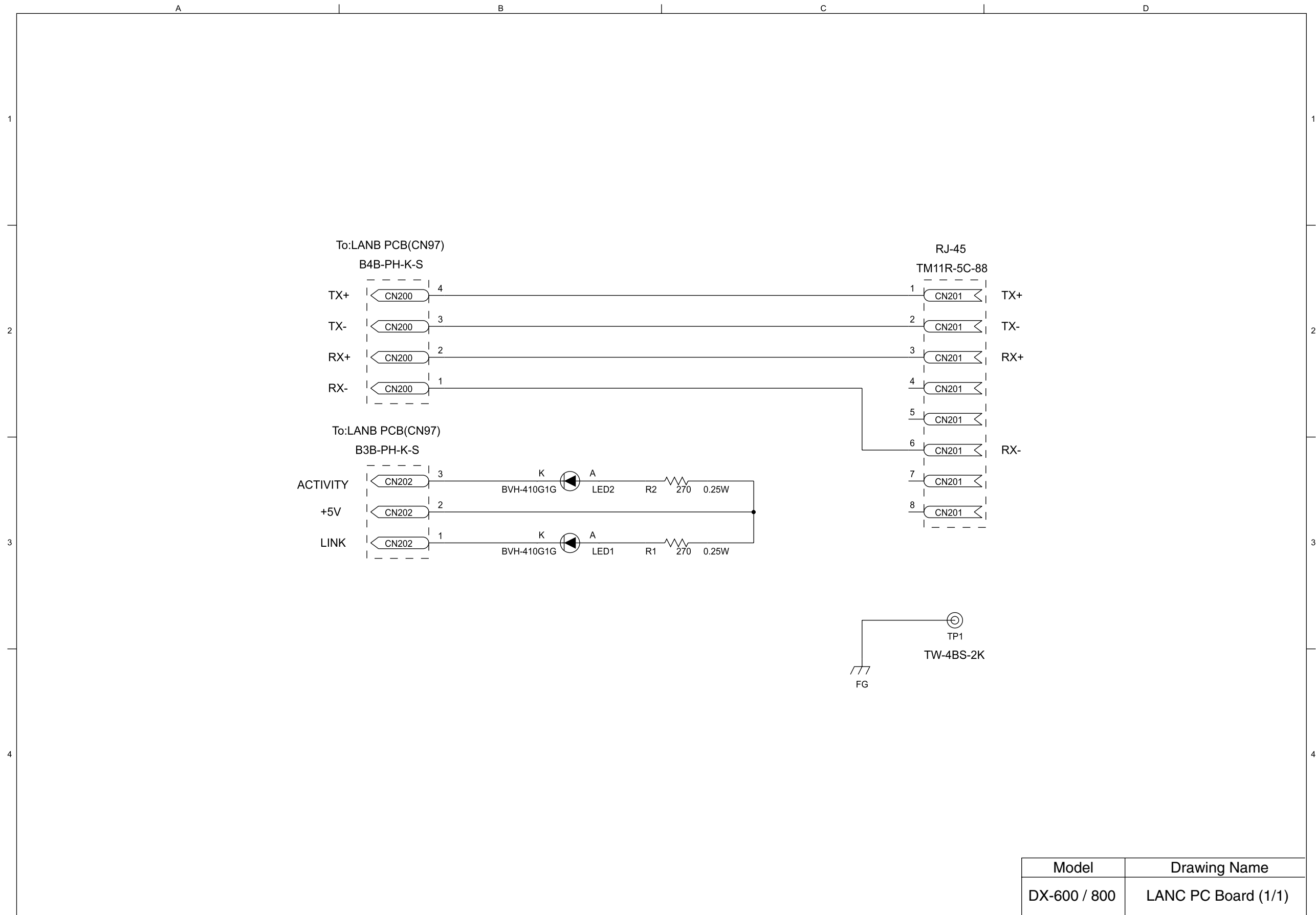


Model	Drawing Name
DX-600 / 800	LANB PC Board (1/2)



Model	Drawing Name
DX-600 / 800	LANB PC Board (2/2)

10.14. LANC PC Board



Model	Drawing Name
DX-600 / 800	LANC PC Board (1/1)



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