

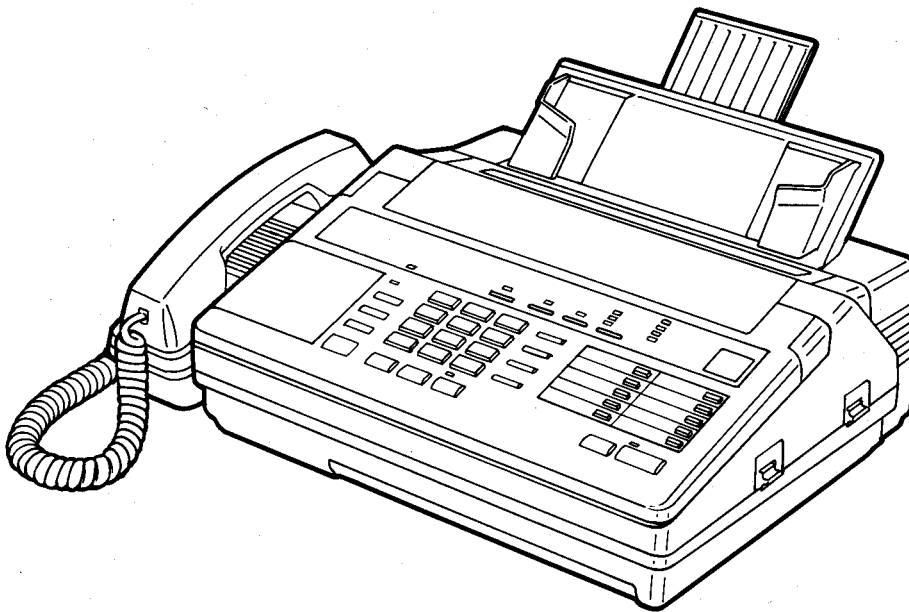
Service Manual

and Technical Guide

TELEPHONE ANSWERING
SYSTEM WITH FACSIMILE

KX-F50

REVISION



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МАТЕРИАЛЫ
 REPLACEMENT PARTS LIST\ **СПИСОК ЗАПАСНЫХ ЧАСТЕЙ**

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SPECIFICATIONS

1. Integrated Telephone System (ITS) Section

Type:	K type handset, Single line ITS Push button type 12 key dial pad
Function:	Line monitor (Volume control type) 10 stations automatic dialer (30 digits) Auto redial Combination dialing 20 speed dialer Ringer control (3-steps control type) Pulse dialing or DTMF (Tone) Dialing

2. Automatic Telephone Answering System (ATAS) Section

Type:	1 micro cassette automatic logic control mode Semiconductor record/playback mode OGM DTMF tone remote control
Function:	Remote turn on Message memo (Remote record/playback type) 2 way record Call counter (Remote listening) Operation selectable 3 digits ID code CPC control TEL/FAX TAD/FAX selector

3. Facsimile Section

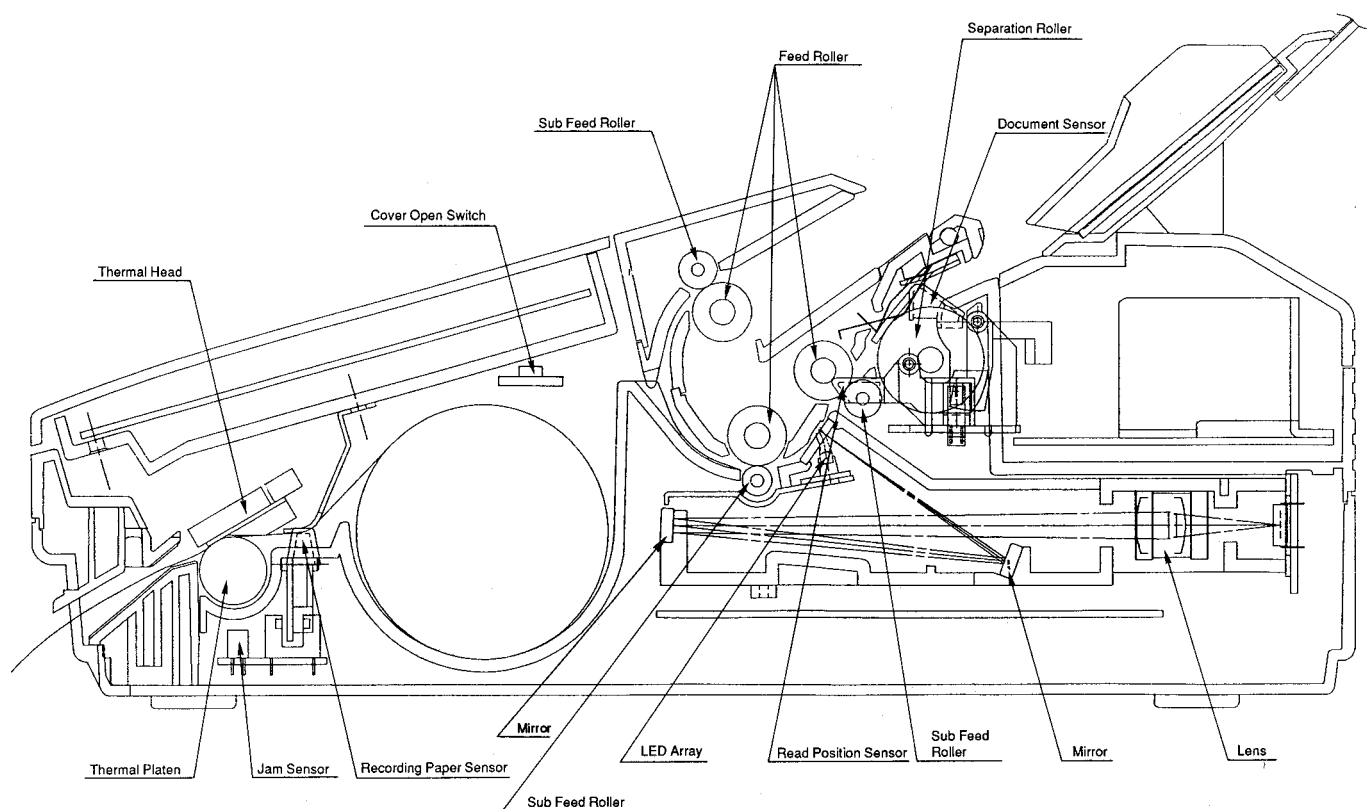
Type:	Desk top
Applicable Lines:	Public switched telephone network
Compatibility:	CCITT G3
Document Size:	MAX. 8 1/2" (216 mm) in width, MAX. 23 5/8" (600 mm) in length
Effective Scanning Width:	MAX. 8 3/16" (208 mm)
Printing Paper Size:	8 1/2" (letter) x 98ft roll (216 mm x 30 m roll)
Effective Printing Width:	8 3/16" (208 mm)
Transmission Time:	Approx. 30 sec/page (G3 Normal mode) Approx. 17 sec/page (Original mode)
Scanning Density:	Horizontal 203 pels/inch (8 pels/mm) Vertical 98 lines/inch (3.85 lines/mm)-Standard 196 lines/inch (7.7 lines/mm)-Fine
Image Sensor Type:	CCD image sensor
Printer Type:	Thermal printer
Data Compression System:	Modified Huffman (MH)
Modem Speed:	9600/7200/4800/2400 bps; Automatic fallback
Function:	10 stations automatic transmission Automatic document feeder (Max. 10 page), Polling

4. General

Power Supply:	AC 120V, 60Hz
Power Consumption:	65W Battery 3V (Lithium Battery)...for Memory Backup
Speaker:	1 31/32" (5 cm) PM dynamic
Microphone:	Condensor microphone (for OGM record)
Dimensions (H x W x D):	4 29/32" x 16 7/8" x 9 9/32" (125 x 429 x 312 mm)
Weight:	11 lb 7.4 oz. (5.2kg)

Design and specifications are subject to change without notice.

2. MAINTENANCE CHECK ITEM



NO.	OPERATION	CHECK ITEM	REMARKS
1	Document Path	Remove any foreign matter such as paper.	-----
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	See page 11.
3	Thermal Platen	If the platen is dirty, clean its with a damp cloth then dry thoroughly. Remove the piece of paper.	See page 11.
4	Thermal Head	If the thermal head is dirty, clean the printing surface with a cloth moistened with denatured alcohol (alcohole without water), then dry thoroughly.	See page 11.
5	LED Array	If the LED Array is dirty, clean the glass dry soft cloth.	See page 11.
6	Sensor & Switch	Jam Sensor(PC801), Recording Paper Sensor(PC802), Document Sensor(PC701), Read position Sensor (PC702), Cover Open Switch (SW901). Confirm operation of sensor.	Pages 26-28.
7	Mirrors and Lens	If the mirror and lens are dirty, clean its with a dry soft cloth.	-----
8	Cassette Deck	If the capstan, pinch roller and heads, clean its.	See page 10.
9	Abnormal, wear and tear or looseness of parts	Exchange the part. Check the tightness of screws on each parts.	-----

1. TEST MODE

Test Mode	Function	Operation
1. Printer Test	Print a test pattern and check the thermal head for abnormalities (missing dots, etc.) and also check the operation of the reception motor.	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 4 and 2 buttons. 3. Press the START button.
2. Motor Test	Rotate the transmission and reception motors to check the operation of the motors.	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 9, 0, 0, 0 and ✕ buttons. 3. Press the 5 and 6 buttons. 4. Press the START button. 5. Press the STOP/CLEAR button.
3. Modem Test	Send four kinds of FAX signals to check the sending function of the modem. 1) 462 Hz: Consecutive signal of PIS for tonal process. 2) 1100 Hz: Consecutive signal of EOM for tonal. 3) 2100 Hz: G2 carrier signal Consecutive of CED signal 4) G3, V29 training signal [modulation wave of carrier signal (1700 Hz)]	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 9, 0, 0, 0 and ✕ buttons. 3. Press the 5 and 4 buttons. 4. Press the START button. (every time press; 462 Hz→1100 Hz→2100 Hz→V29) 5. Press the STOP/CLEAR button.
4. Scanner Test	Turn on the LED lamp for document and operate the read system (there is no need to use paper). Observe the signals obtained to check the read system.	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 9, 0, 0, 0 and ✕ buttons. 3. Press the 5 and 5 buttons. 4. Press the START button. 5. Press the STOP/CLEAR button.
5. ROM Check	Check the ROM (IC102) by means of a check sum to see if the contents have been destroyed and also to check the version.	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 9, 0, 0, 0 and ✕ buttons. 3. Press the 5 and 1 buttons. 4. Press the START button.
6. RAM Check (Memory Clear)	The read and write operations of the RAMs (IC103, 502) can be checked to see whether or not the contents have been destroyed. Note: Before servicing, you must print the telephone and system list and keep the printouts as the memory will be cleared when the RAM is checked.	<ol style="list-style-type: none"> 1. Press the PROGRAM button. 2. Press the #, 9, 0, 0, 0 and ✕ buttons. 3. Press the 5 and 0 buttons. 4. Press the START button.

2. SERVICE HINTS

SYMPTOM	CURE
1. Defective general ATAS/ITS operation.	Defective solder of IC15 or check solder short.
1) Defective OGM record/playback.	Replace IC5 → IC6 → IC7.
2) Does not pull the plunger.	Replace Q27 and Q29.
3) Holds line constantly.	Replace Q6 and SA1.
4) ICM will not cut off.	Check R86, R124, C106 and C108.
5) Does not rewind.	Check Q22, Q23 and Q24.
6) Does not fast forward.	Check Q20.
2. Other defective operation.	Defective solder of IC301 or IC501, check short of solder. (Refer to pages 22 and 23.)

OPERATION:

1. Press the PROGRAM button.
2. Press the #, 9, 0, 0, 0 and ✕ buttons.
3. Input the code No.
4. Set the range (number).
5. Press the SET button. (An exception of code No. 50, 51, 54~57.)

3. SERVICE FUNCTION TABLE

Code	Function	Set Value	Effective Range	Default	Remarks
01	Pause time set	×100 ms.	000~600	050	
02	Flash time set	×10 ms.	01~99	70	
03	Dial speed select	1..10PPS 2..20PPS	1, 2	1	
10	VOX time select	1..6 seconds 2..4 seconds	1, 2	1	
20	CED frequency select	1..2100 Hz 2..1100 Hz	1, 2	1	
21	International mode select	1..On 2..Off	1, 2	1	
22	Auto recovery select	1..On 2..Off	1, 2	1	
23	Receive equalizer select	1..0.0 Km 2..1.8 Km 3..3.6 Km 4..7.2Km	1~4	2	
24	Transmit equalizer select	1..0.0 Km 2..1.8 Km 3..3.6 Km 4..7.2Km	1~4	2	
50	Memory clear (Refer to page 13.) Returns the set values of #1~#34 (#30~E34: user selectable) to default				"START/COPY" input
51	ROM check (Refer to page 13.)				"START/COPY" input
52	DTMF single tone transmit select	1...On 2..Off	1, 2	2	Refer to page 15.
53	Monitor on FAX communication select	1..all phases 2..phase B 3..Off	1~3	3	
54	Modem test (Refer to page 13.)				"START/COPY" input
55	Scanner test (Refer to page 13.)				"START/COPY" input
56	Motor test (Refer to page 13.)				"START/COPY" input
57	LED test				"START/COPY" input
59	Paper jam detection select	1..On 2..Off	1, 2	1	
60	Cutter select	1..1 per page 2..2 per call 3..Off	1~3	1	
63	CCD position adjustment value set	×1 mm	-20~20	00	Press "*" for entering negative values.
70	BREAK % select	1..61% 2..67%	1, 2	1	
71	ITS auto redial time set	×number of times	00~99	14	
72	ITS auto redial line disconnection time set	× second	001~999	30	
73	Remote turn-on ring number set	×number of rings	00~99	15	

Code	Function	Set Value	Effective Range	Default	Remarks
80	TAM sequential tone detection select	1..On 2..Off	1, 2	1	
82	2-way recording select	1..Enable 2..Disable	1, 2	1	
83	2-way beep time set	×10 ms.	00~99	17	
84	Initial OGM reload select	1..On 2..Off	1, 2	1	
86	White line skip 1 select	1..On 2..Off	1, 2	1	
87	White line skip 2 select	1..On 2..Off	1, 2	1	
90	FAX auto redial time set	×number of times	00~99	05	
91	FAX auto redial line disconnection time set	×second	001~999	045	
92	CNG transmit select	1..auto/manual 2..auto 3..Off	1~3	1	
93	Time between CED and 300 bps	×10 ms.	006~999	008	
94	Overseas DIS detection select	1..detects at the 1st time 2..detects at the 2nd time	1, 2	1	
95	Receive error limit value set	×number of times	000~999	100	
96	Transmit level set	× dBm	-15~00	10	The values entered without "minus sign" will be regarded as negative.
97	Transmit speed fixed mode select	1..9600BPS 2..7200BPS 3..4800BPS 4..2400BPS 5..Off	1~5	5	
----	User setting list output				"START/COPY" input (If pressed down for more than 3 seconds, codes will also be output.)
74	Dial Tone Defection set	1. On 2. Off	1, 2	2	
81	ICM Tape End Defection set	1. Off 2. Off	1, 2	2	

DTMF single tone transmit select.

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

Key	Frequency(Hz)	Key	Frequency(Hz)
"1"	697	"5"	1209
"2"	770	"6"	1366
"3"	852	"7"	1477
"4"	941		

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

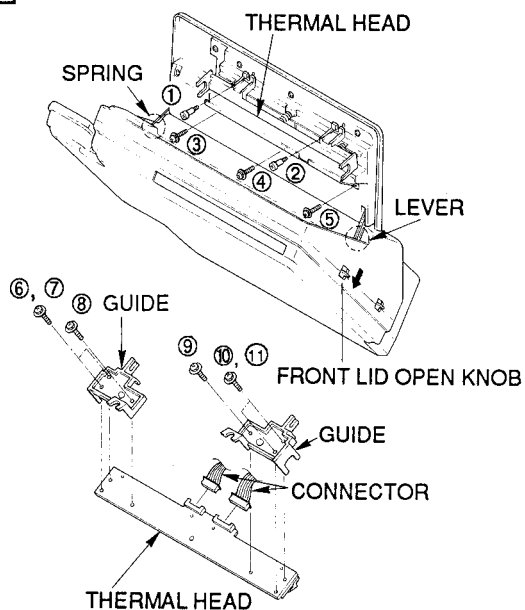
Low(Hz) \ High(Hz)	1209	1366	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	"*"	"0"	"#"

DISASSEMBLY INSTRUCTIONS

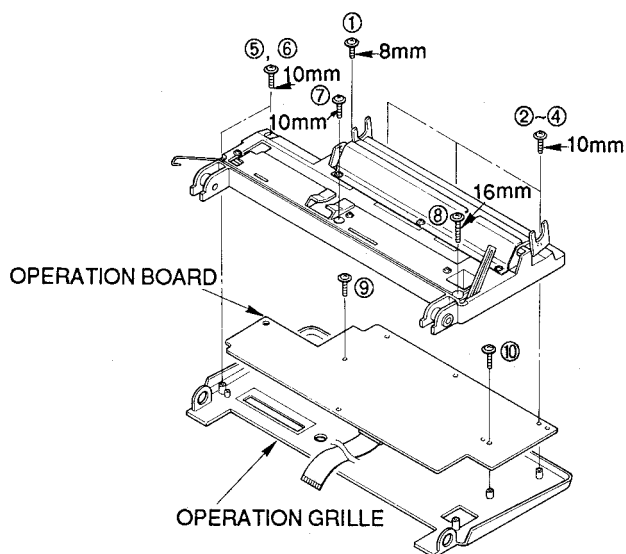
Ref. No. 1 HOW TO REMOVE THE THERMAL HEAD

Procedure 1

Fig. A



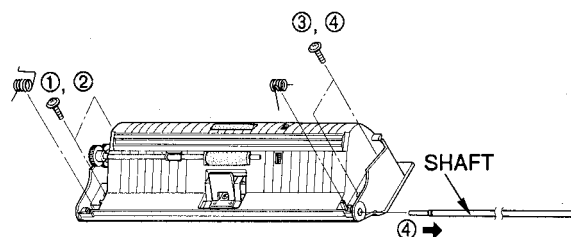
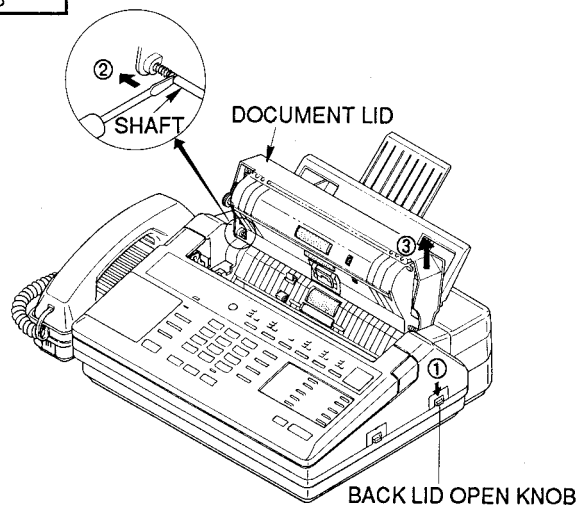
1. Push the front lid open knob.
2. Remove the 2 screws (①, ②).
3. Remove the 3 screws (③-⑤).
4. Remove the thermal head.
5. Remove the 6 screws (⑥-⑪).
6. Pull out the 2 connectors.
7. Remove the guide of the thermal head.
8. Exchange the thermal head.



1. Push the back lid open knob.
2. Remove the 2 shafts.
3. Push the front lid open knob.
4. Remove the spring and lever. (See Fig. A).
5. Remove the 8 screws (①-⑧).
6. Remove the 2 screws (⑨, ⑩).
7. Remove the operation grille and board.

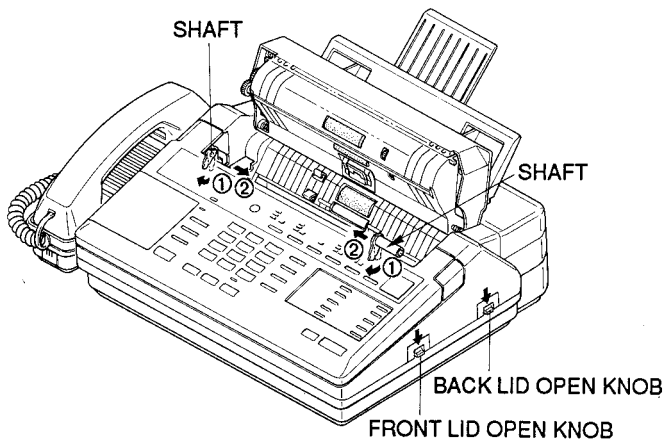
Ref. No. 3 HOW TO REMOVE THE DOCUMENT FEED ROLLERS

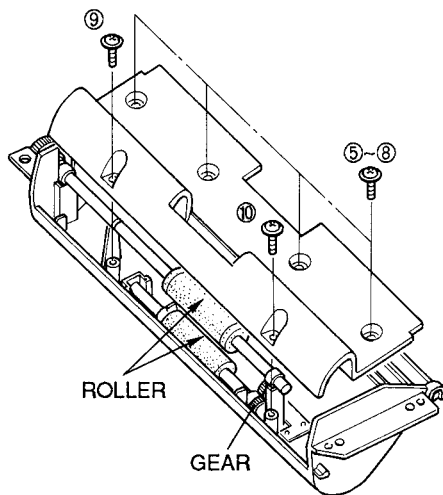
Procedure 3



Ref. No. 2 HOW TO REMOVE THE OPERATION GRILLE AND BOARD

Procedure 2

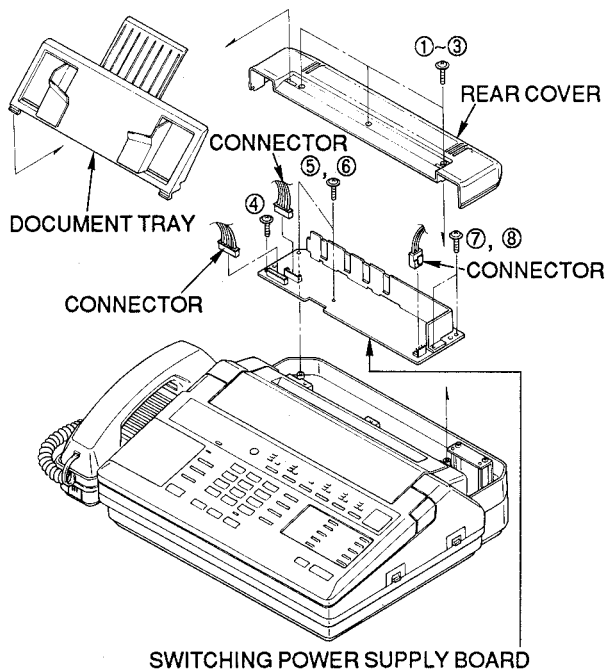




1. Open the back lid open knob.
2. Slide the shaft to the left and remove the document lid.
3. Remove the 4 screws (①-④).
4. Remove the 6 screws (⑤-⑩).
5. Exchange the rollers and gears.

Ref. No. 4 HOW TO REMOVE THE SWITCHING POWER SUPPLY BOARD

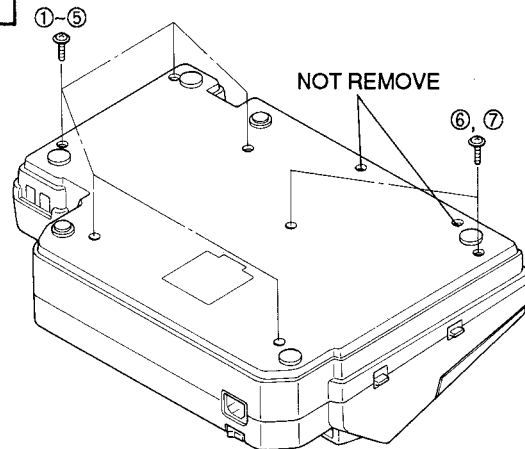
Procedure 4



1. Remove the document tray.
2. Remove the 3 screws (①-③).
3. Remove the rear cover.
4. Remove the 5 screws (④-⑧).
5. Pull out the 3 connectors.
6. Remove the switching power supply board.

Ref. No. 5 HOW TO REMOVE THE LOWER CABINET

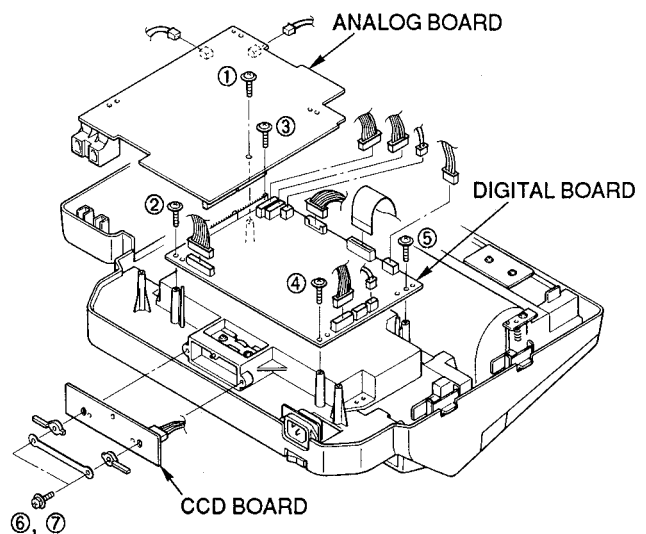
Procedure 5



1. Remove the 7 screws (①-⑦).
2. Remove the lower cabinet.

Ref. No. 6 HOW TO REMOVE THE ANALOG, DIGITAL AND CCD BOARDS

Procedure 5→6

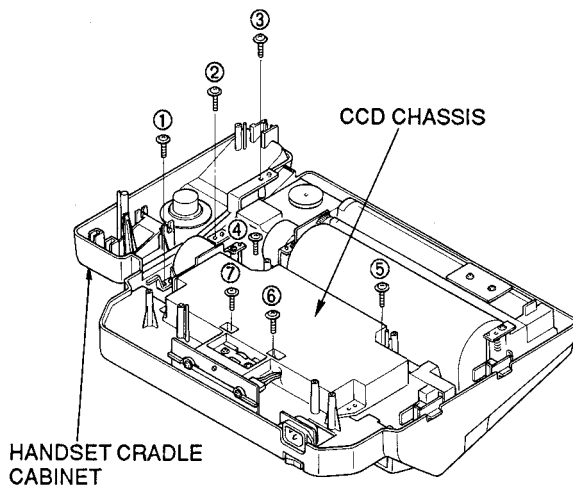


(ANALOG & DIGITAL BOARDS)

1. Remove the 2 connectors.
2. Remove the screws (①).
3. Remove the analog board.
4. Pull out the 12 connectors.
5. Remove the 4 screws (②-⑤).
6. Remove the digital board.

(CCD BOARD)

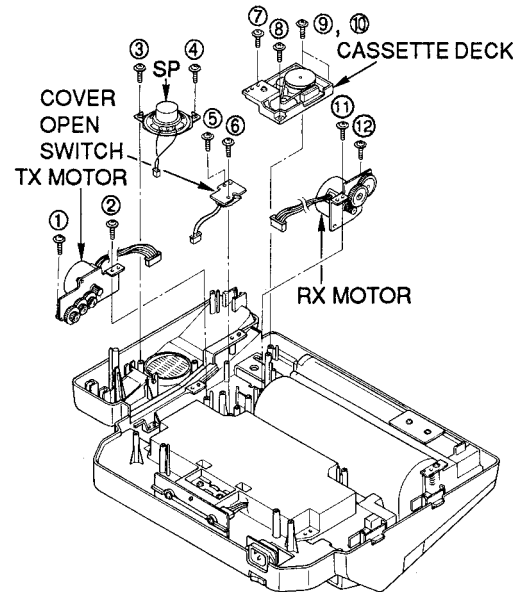
1. Remove the 2 screws (⑥-⑦).
2. Remove the CCD board.
3. CCD adjustment. (See page 52.)

Ref. No. 7 HOW TO REMOVE THE HANDSET CRADLE CABINET AND LED ARRAY
Procedure
5→6→7

(HANDSET CRADLE CABINET)

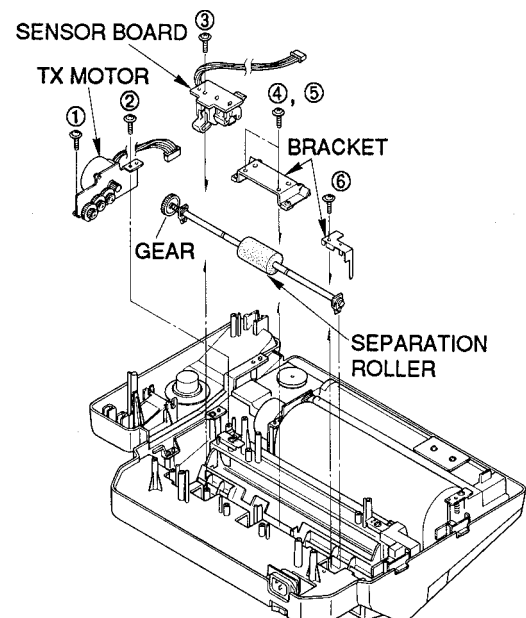
1. Remove the 3 screws (①-③).
2. Remove the handset cradle cabinet.

(LED ARRAY)

1. Remove the 4 screws (④-⑦).
2. Remove the CCD chassis.
3. Remove the 2 screws (⑧, ⑨).
4. Remove the 3 screws (⑩-⑫).
5. Exchange the LED array.

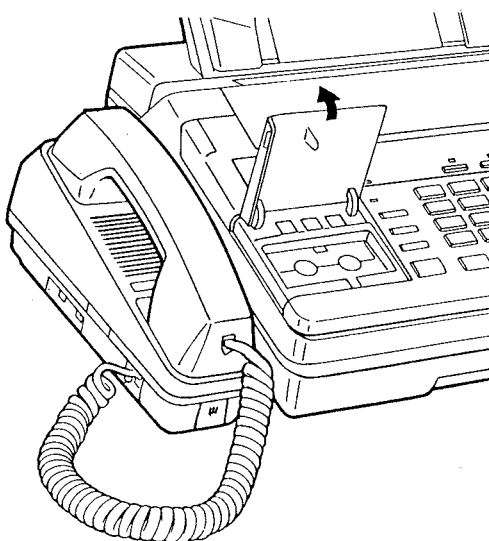
Ref. No. 8 HOW TO REMOVE THE MOTOR, SPEAKER, CASSETTE DECK AND COVER OPEN SWITCH
Procedure
5→6→8


1. Remove the 12 screws (①-⑫).

Ref. No. 9 HOW TO REMOVE THE SEPARATION ROLLER AND GEAR
Procedure
5→6→7→9


1. Remove the 6 screws.
2. Remove the bracket, motor and sensor board.
3. Exchange the separation roller or gear.

Ref. No. 10 HOW TO REMOVE THE CASSETTE LID

Procedure
10

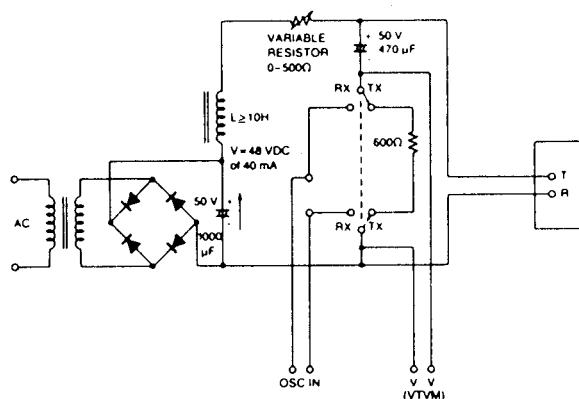
1. When removing the cassette lid, pull out in direction of arrow.
2. To reassemble, reverse the above procedure.

ADJUSTMENTS

1. TABLE OF TEST EQUIPMENTS AND JIG

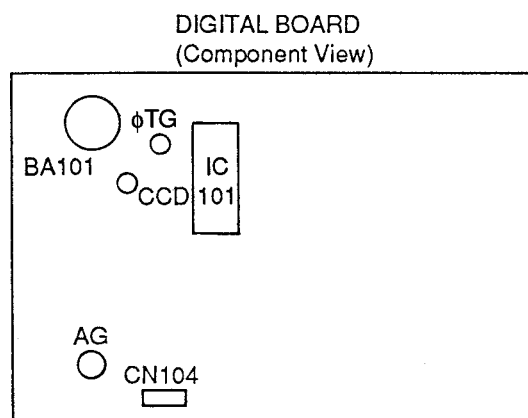
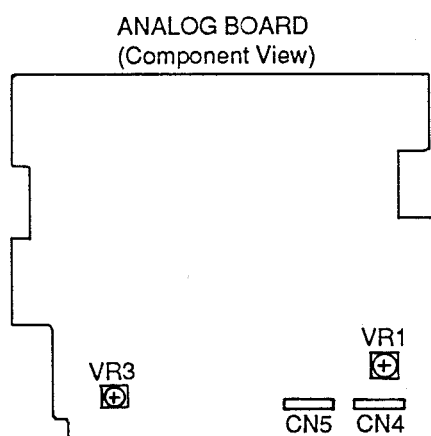
No.	Test Equipment and Jig Name	Jig No.	Adjustment Name
1	VTVM	—	FAX Transmission Level Cassette Deck
2	Loop Simulator	—	FAX Transmission Level
3	Test Tape	QZZMWA	Cassette Deck
4	Oscilloscope	—	Cassette Deck CCD
5	Frequency Counter	—	Cassette Deck
6	CCD Jig	PQZZF50M	CCD

2. SCHEMATIC DIAGRAM OF LOOP SIMULATOR



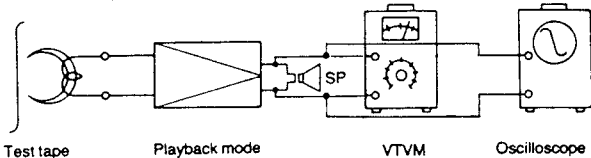
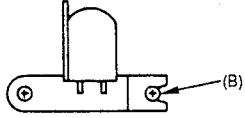
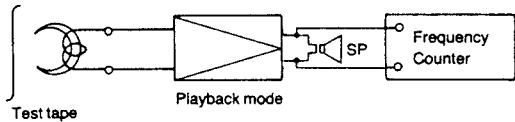
If a 48 V DC power supply is not available a 20V DC power supply can be substituted. However, the variable resistor (0-500Ω) must be set to 0 ohms.

3. LOCATION OF TEST POINT AND VR



4. CASSETTE DECK ADJUSTMENT

- Notes:**
1. Make sure the heads are clean.
 2. Make sure the capstan and pressure roller are clean.
 3. Room temperature for measuring and adjusting: $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$)
 4. Test equipments are not treated as replacement parts.

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
1. Head azimuth adjustment	<ol style="list-style-type: none"> 1. Play back the test tape (QZZMWA). 2. Adjust screw (B) shown in Fig. A for maximum output at SP terminal. (Test equipment connection is shown below.)  <p>Test tape Playback mode VTVM Oscilloscope</p>	<p>* Record/playback head</p>  <p>Fig. A</p>
2. Tape speed adjustment	<ol style="list-style-type: none"> 1. Play back the test tape (QZZMWA). 2. Adjust VR3 for 3000 ± 50 Hz on frequency counter reading.  <p>Test tape Playback mode SP Frequency Counter</p>	

5. FACSIMILE TRANSMISSION LEVEL ADJUSTMENT

Perform the following adjustment after replacing FAX transmission system (IC104, T1 and VR1).

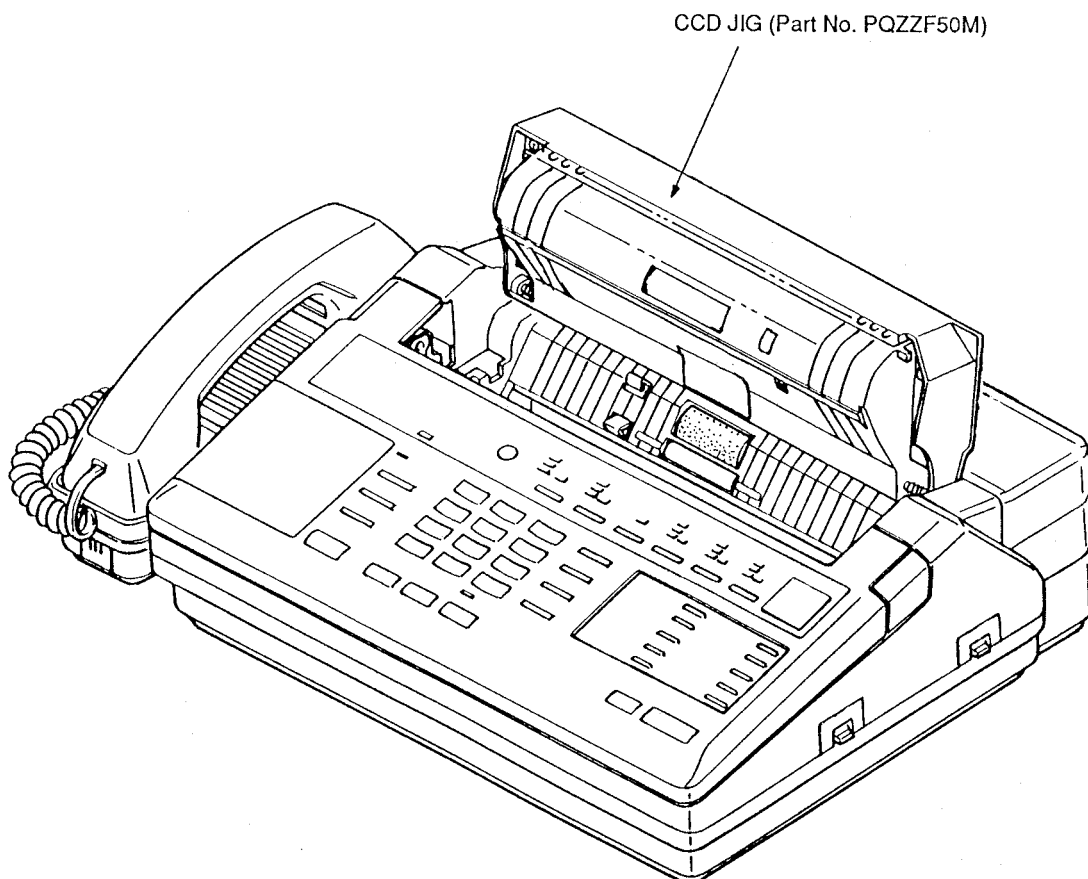
- 1) Connect the unit to loop simulator. (Set the selector switch to "TX".)
- 2) Power switch ON.
- 3) Press the PROGRAM button.
- 4) Press the #, 9, 0, 0, 0 and * buttons.
- 5) Press the 5 and 4 buttons.
- 6) Press the START/COPY button.
- 7) Adjust VR1 for a reading of -10.5 ± 0.5 dBm, on the VTVM.

6. CCD ADJUSTMENT

Perform the following adjustment after replacing lens and CCD board.

PREPARATION:

- 1) Remove the document lid [Refer to page 44 (Ref. No. 3)] and attach the CCD jig (PQZZF50M).
- 2) Oscilloscope connection as shown in the figure right.
- 3) Power switch ON.
- 4) Press the PROGRAM button.
- 5) Press the #, 9, 0, 0, 0 and * buttons.
- 6) Press the 5 and 5 buttons.
- 7) Press the START/COPY button.



Notes:

- 1) When replacing the lens, pay attention to the markings on the lens are white, yellow or orange. The number of the CCD spacers to use differs depending on the markings as follows.
 *Two CCD spacers are provided with the lens.
 *Refer to page 138 for the location of the CCD spacers.

Marking on the lens	Number of CCD Spacer
Orange	0 (not used)
White	1
Yellow	2

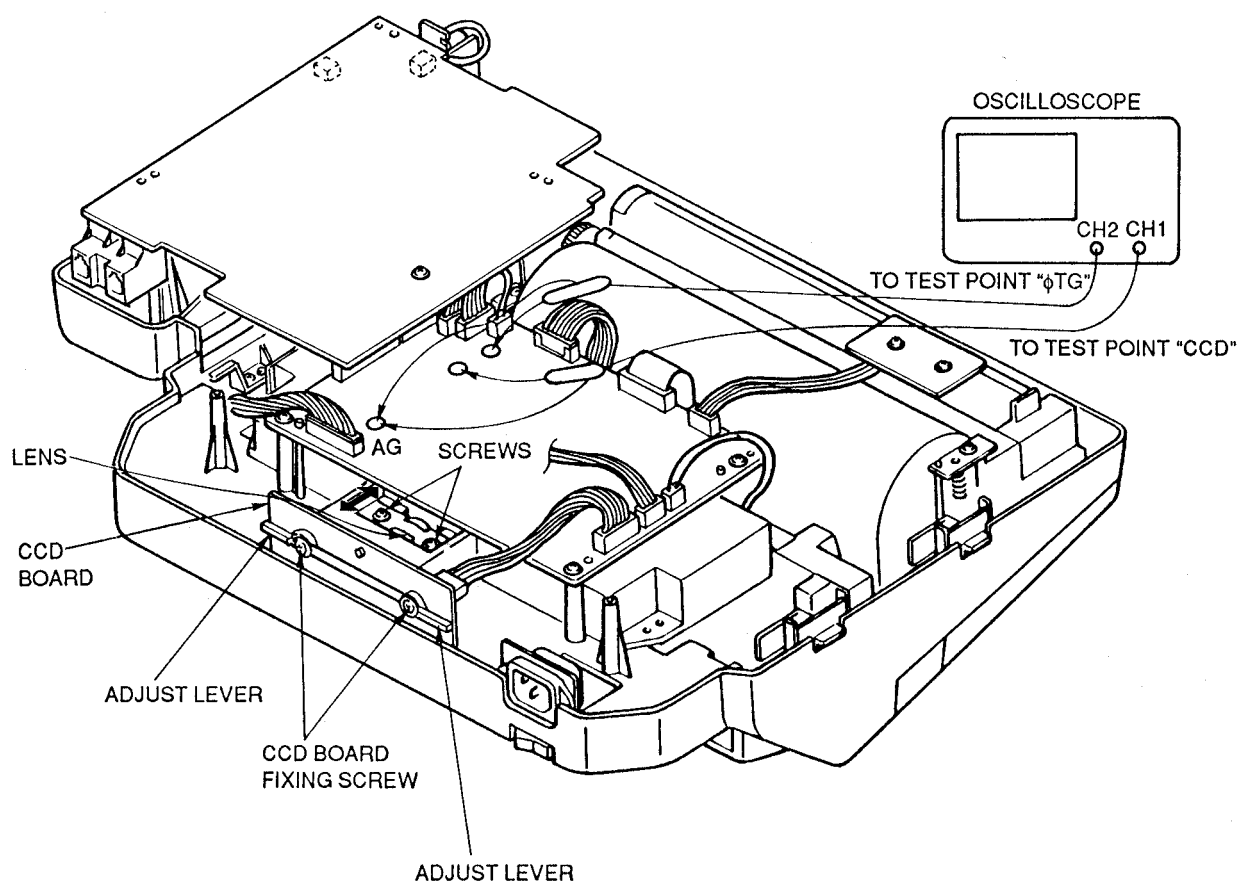
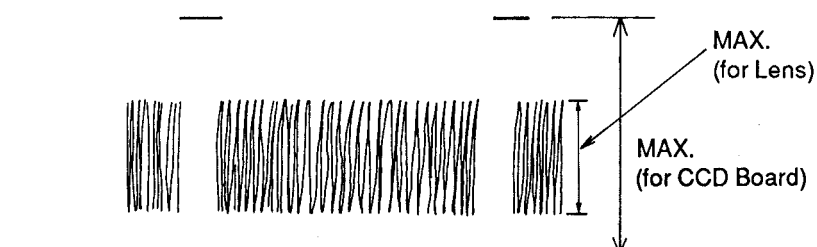
- 2) Install the lens so that the making (White or Yellow or Orange) on it is upper side.
- 3) Do not touch the glass face of the lens with the bare hand.

Cleaning:

If the lens is dirty, clean it with a dry soft cloth.

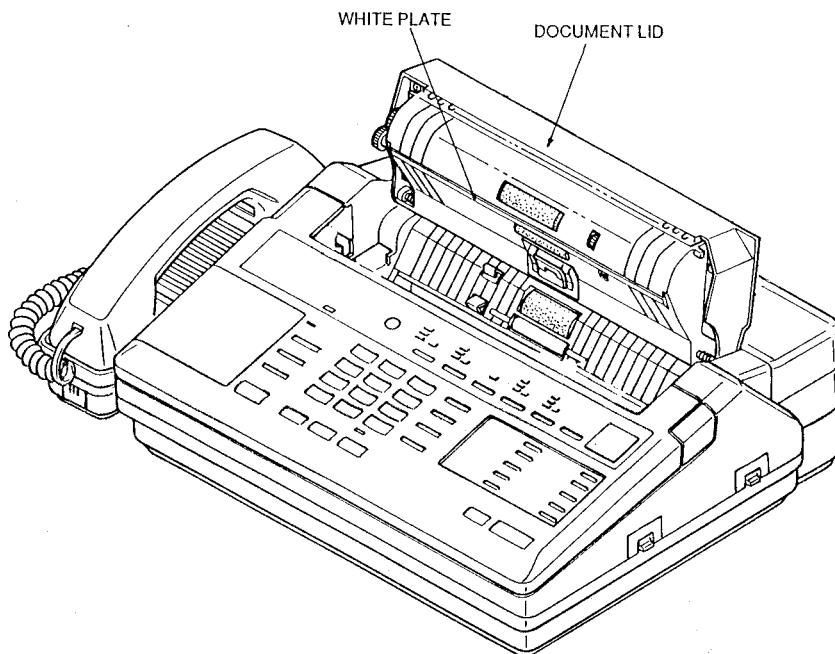
ADJUSTMENT:**LENS AND CCD READ POSITION ADJUSTMENT**

- 1) Loosen the lens fixing screw and CCD board fixing screw.
- 2) Adjust the position of the lens and CCD board so that the waveform appears as shown in the figure below.
- 3) Fix the lens fixing screw and CCD board fixing screw.

**WAVEFORM**

WHITE LEVEL ADJUSTMENT

- 1) Exchange the CCD jig (PQZZF50M) and document lid.
- 2) Adjust VR101 on the CCD board so that the waveform becomes 3 V.

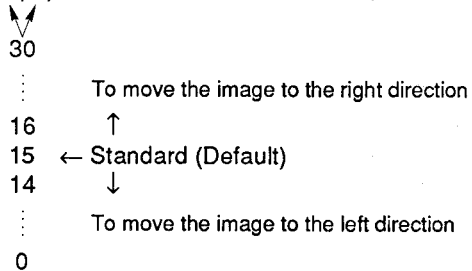


WAVEFORM



7. DOCUMENT READ START POSITION ADJUSTMENT

- 1) Power Switch ON.
- 2) Copy the document, and confirm the read start position of the document.
- 3) If get out of position, adjust the read position.
- 4) Press the PROGRAM button.
- 5) Press the #, 9, 0, 0, 0, * and 6 buttons.
- 6) Press the 3, [], [], SET and PROGRAM buttons.

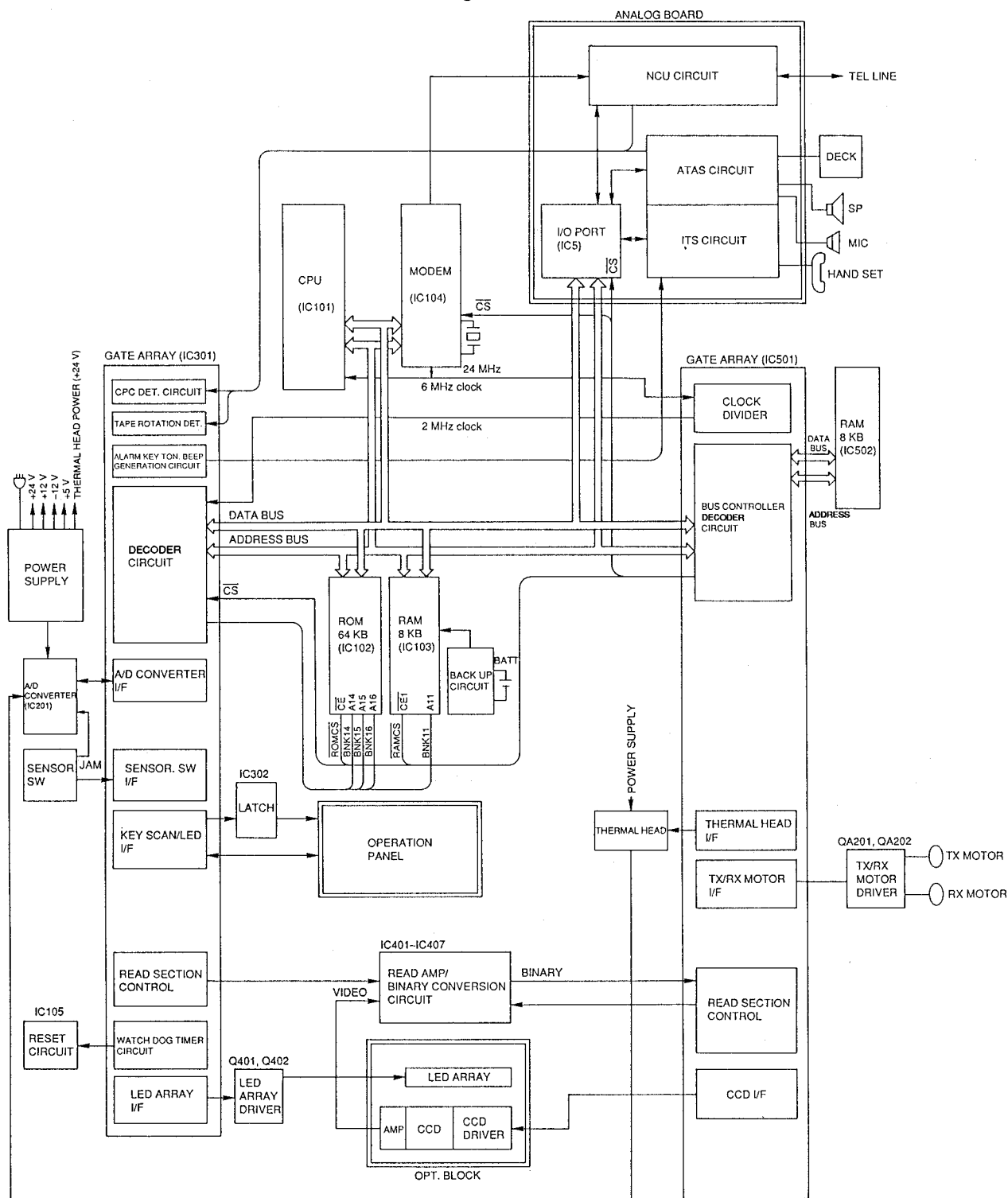


* The starting position of the reading shifts 1 mm as the numbers changes.

1. GENERAL BLOCK DIAGRAM

- | | |
|--------------------------------|---|
| 1) CPU (IC101) | Fetch and executes instruction from ROM, writes (read) data to (from) RAM, writes commands to the gate array IC's and reads status information from gate array IC's. |
| 2) ROM (IC102) | Contains all of the program instructions for unit operation. |
| 3) RAM (IC103) | Working storage area (Auto dial number etc) backed up by a lithium battery. |
| 4) RAM (IC502) | Used mainly for image processing. |
| 5) GATE ARRAY | Composed mainly key scan/LED I/F and some circuits for controlling analog section. |
| (IC301) | |
| 6) GATE ARRAY | Controls the general FAX operation. |
| (IC501) | |
| 7) Reset circuit (IC105) | Provides reset pulse to each of the major IC's. |
| 8) Memory Back up | Back up RAM (IC103). |
| circuit (BA101) | |
| 9) A/D Converter | Detect temperature of thermal head and power supply, and paper Jam condition. |
| (IC201) | |
| 10) MOTOR DRIVER | DRIVE TX MOTOR and RX MOTOR. |
| (QA201, QA202) | |
| 11) READING Section | Composed of Read Amp, Binary conversion circuit and OPT. Block.
OPT Block is composed of LED ARRAY, Mirror Lens, CCD, CCD DRIVER and so on. They execute reading of the transmission document. |
| 12) Thermal Head | Contains heating elements for dot matrix image printing. |
| 13) MODEM (IC104) | Executes modulation and demodulation for FAX communication. |
| 14) Operation grille | Composed of many keys and LEDs. |
| 15) Analog Board | Composed of ITS, ATAS and NCU circuit. each circuit is controlled by I/O port (IC5), +6 V power is regulated from +12 V in this Board. |
| 16) Sensor Section | Document sensor, Reading position sensor, Cover open sensor, recording paper sensor. |
| 17) Switching power supply ... | Supply +24 V, ± 12 V, +5 V and Thermal head power (+24 V). |

Block Diagram



3-5. DOCUMENT AND RECORDING PAPER FEED MECHANISM SECTION AND SENSOR SECTION

1) Document and Recording Paper Feed Mechanism

[Document Path]

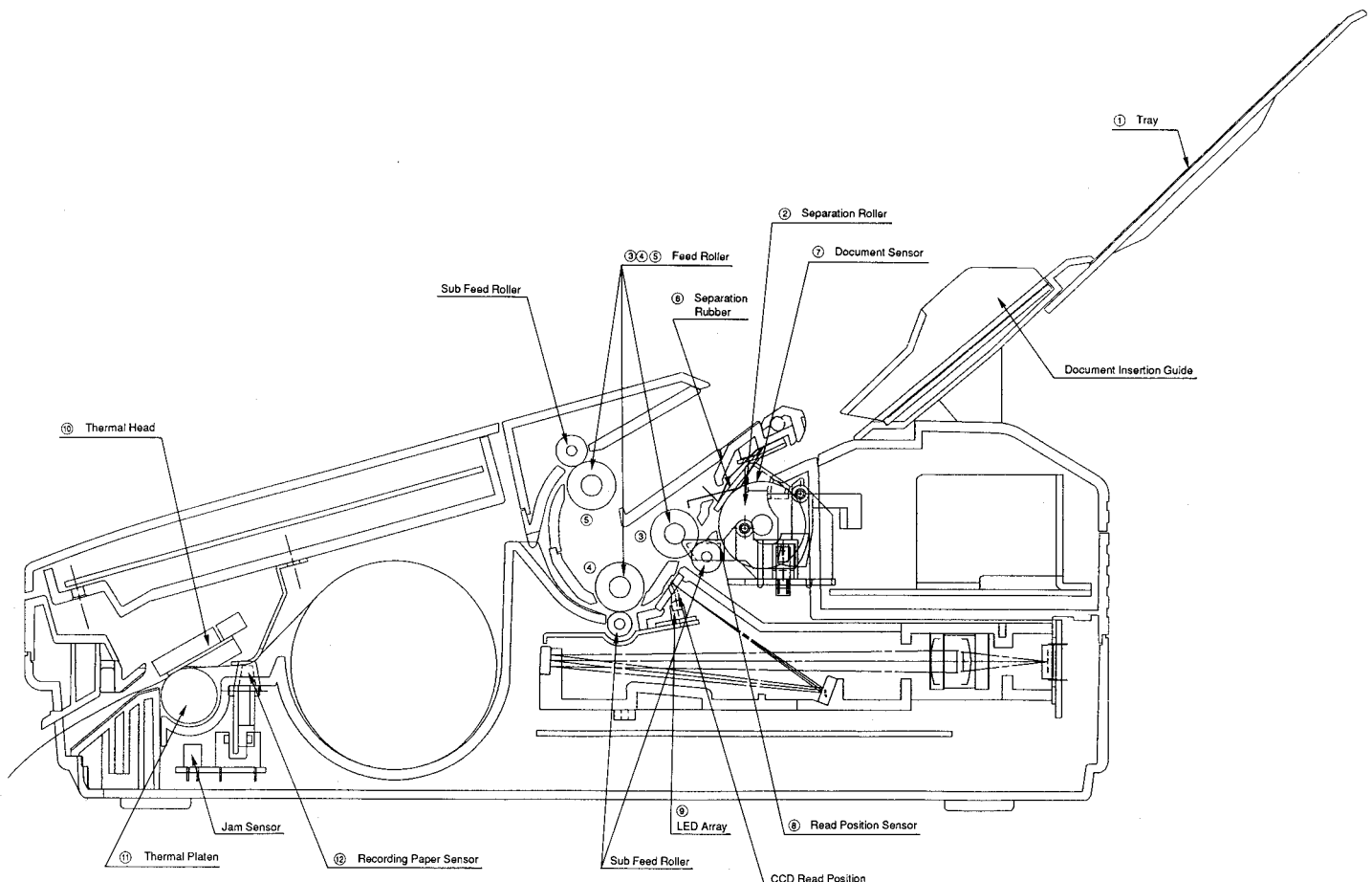
- When the document is aligned in the center, the maximum document width is 218 mm.
- The separation roller (2) and feed rollers (3), (4), (5) are driven by the stepping motor via gears, and rotate in the direction of the arrows as shown in the figure.

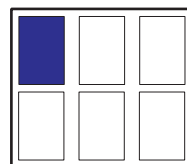
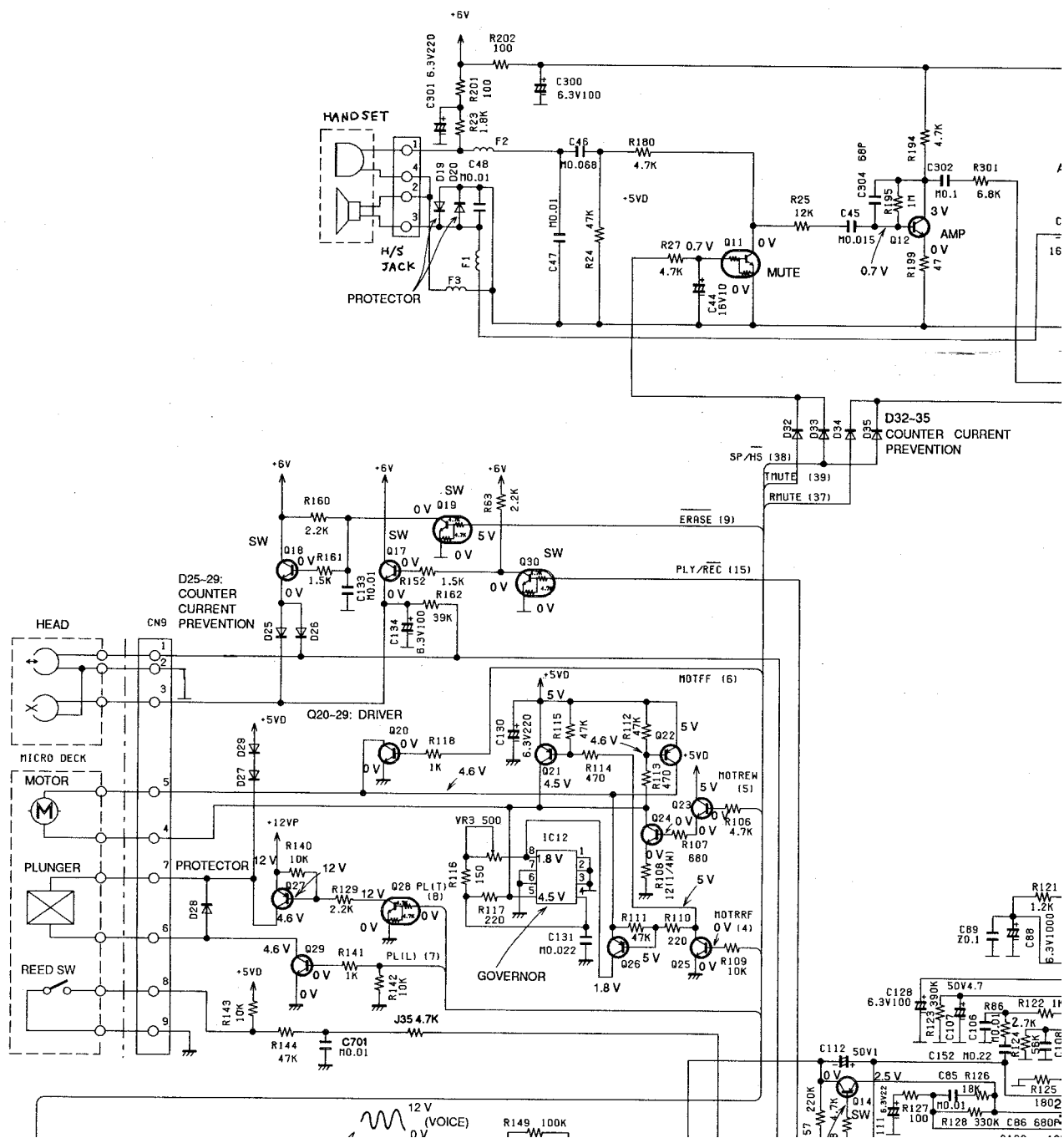
The paper feed sequence is described below.

- (1) Insert the document along the document insertion guide on the tray. When the documents are placed into position, the document sensor (7) is turned on and a beep will sound so that the user knows the document is properly set.
- (2) When the START button is pressed, the motor starts and the rollers start rotating.
- (3) One sheet at a time is separated by the separation rubber (6) then sent to the separation roller (2) which rotates and then feeds the document into the unit. (Automated feeding operation)
- (4) The read position sensor (8) is turned on when the document is fed.
- (5) The document is fed to the CCD start reading position according to the ON data of the read position sensor (8).
- (6) When the document reaches the CCD start reading position, the CCD starts reading.
- (7) The document is fed when the document feeding and CCD reading are synchronized.
- (8) When the document is completely fed and the read position sensor (8) is turned off, the CCD stops reading and the document is discharged by the feed roller (5).
- (9) The next sheet separated by the separation roller is fed in.

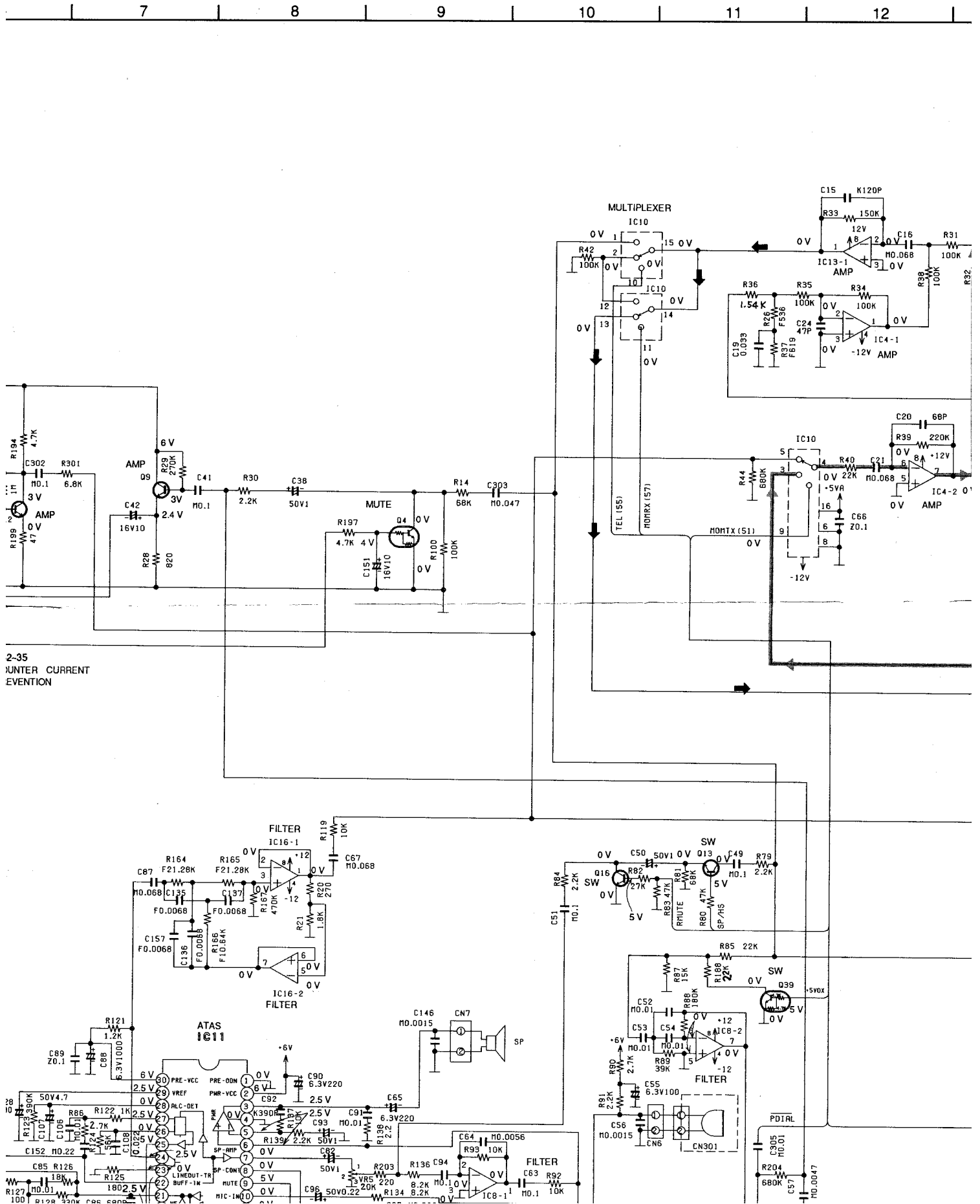
[Recording Paper Path]

- (1) The recording paper is set between the thermal head and thermal platen.
- (2) When the signal is sent to the thermal head, printing on the thermosensible recording paper is started.
- (3) When the recording paper runs out, the recording paper sensor (12) is turned off so as to warn the user.

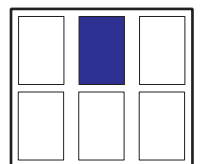


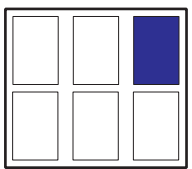
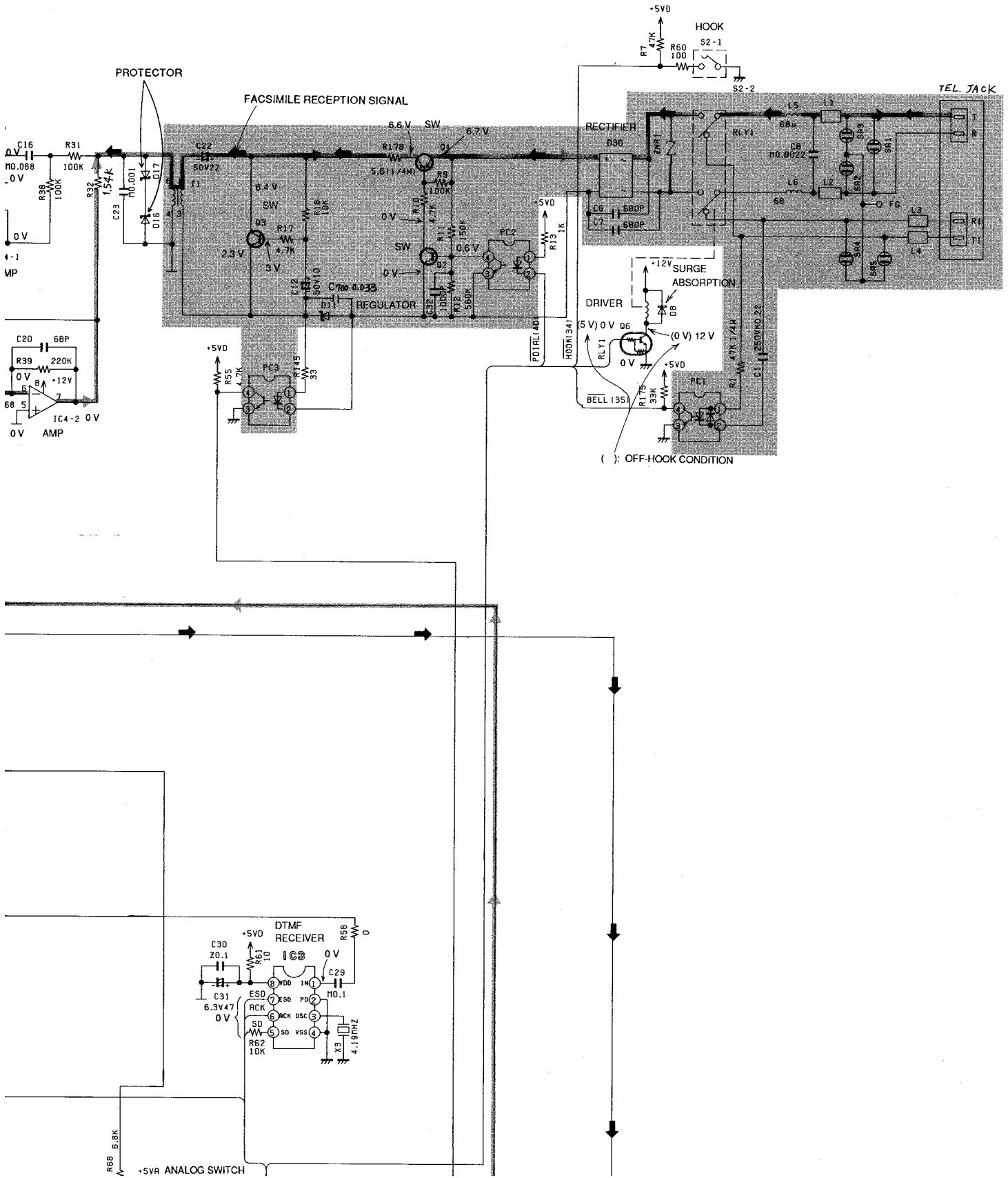


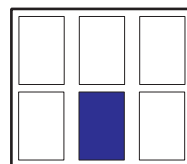
SCHEMATIC DIAGRAM (ANALOG CIRCUIT)



2-35
MUTER CURRENT
EVENTION







SCHEMATIC DIAGRAM (DIGITAL CIRCUIT)

6

7

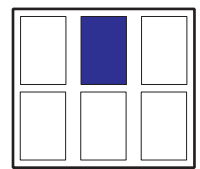
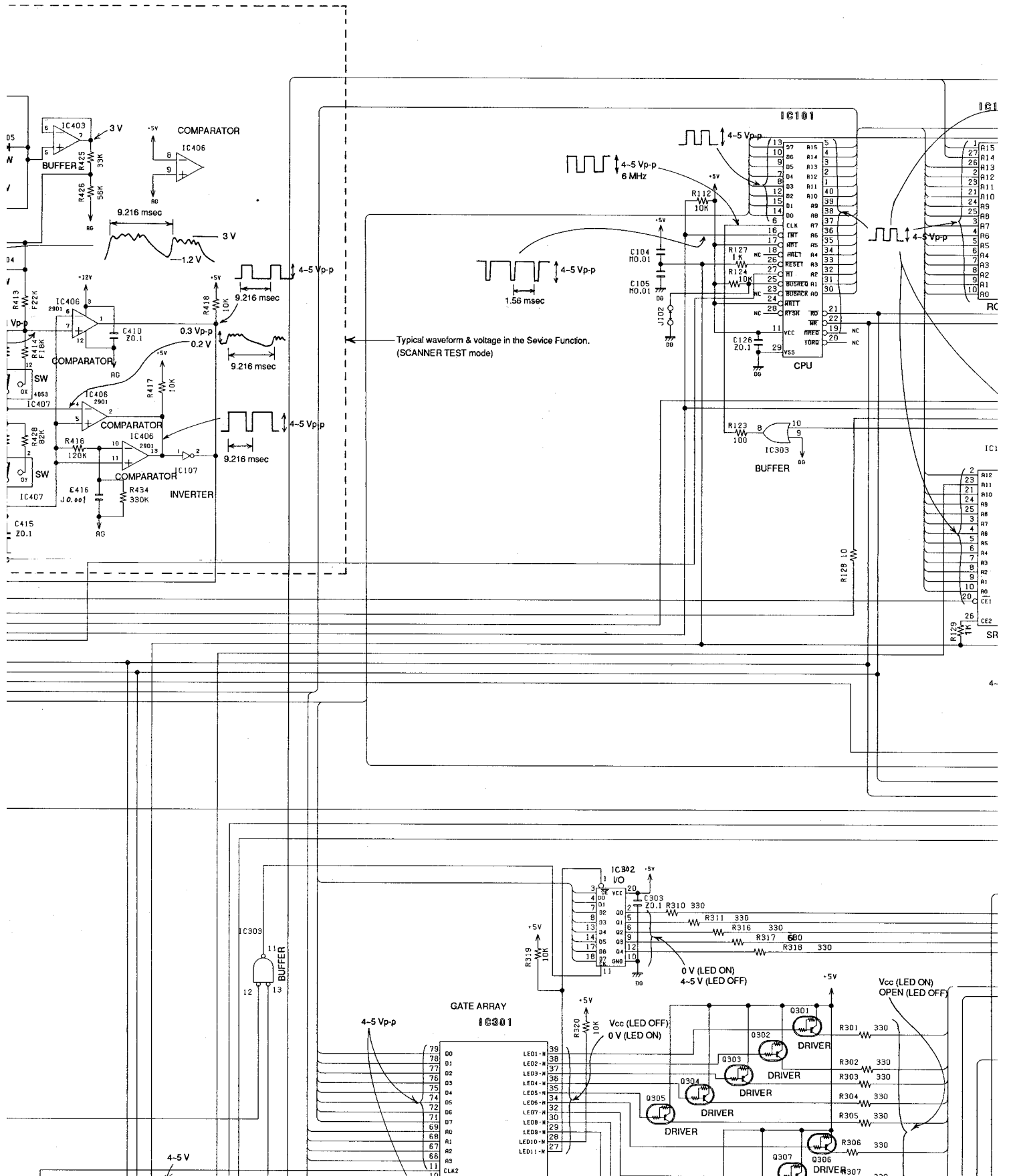
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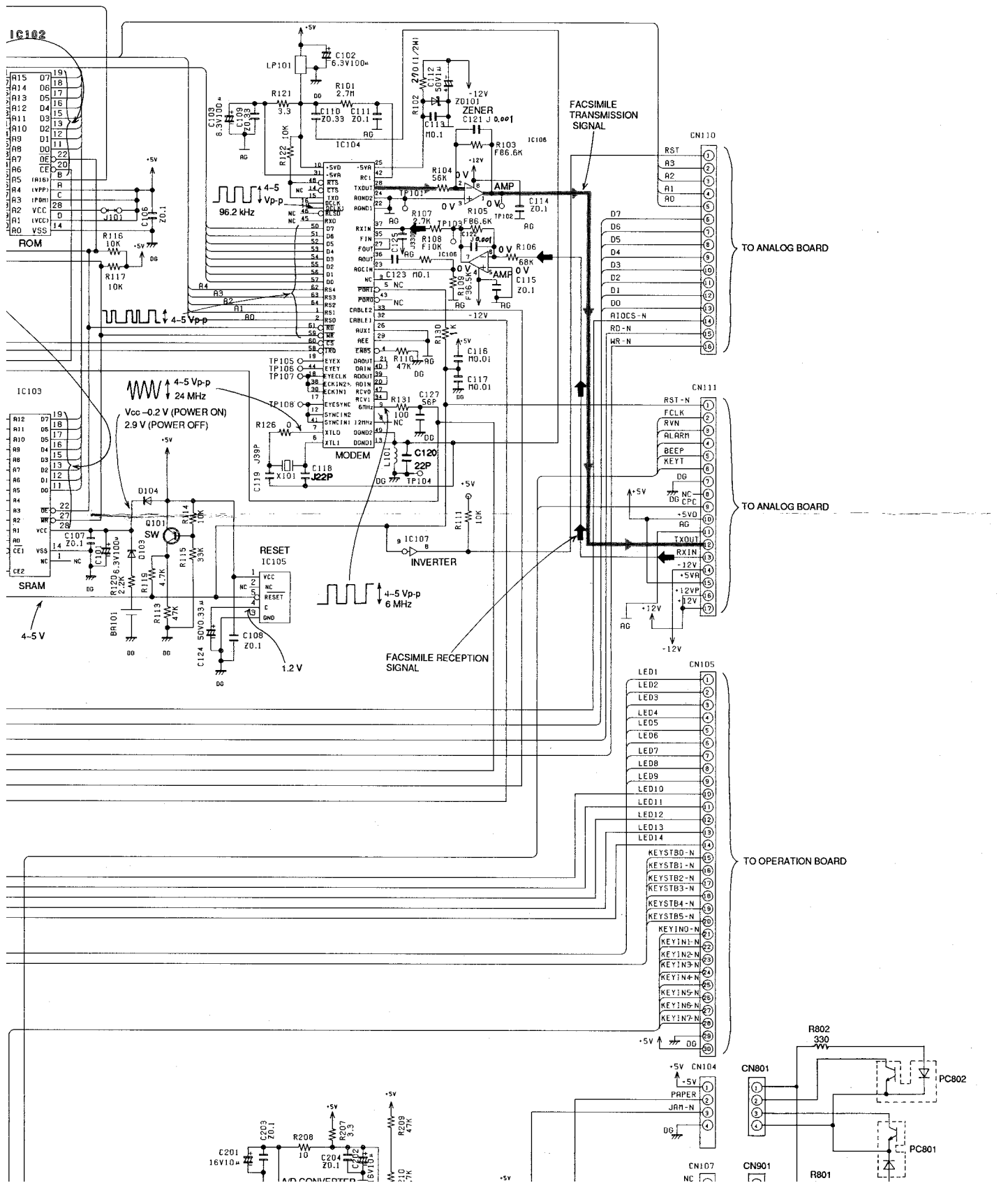
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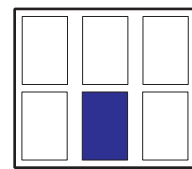
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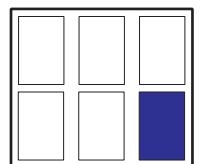
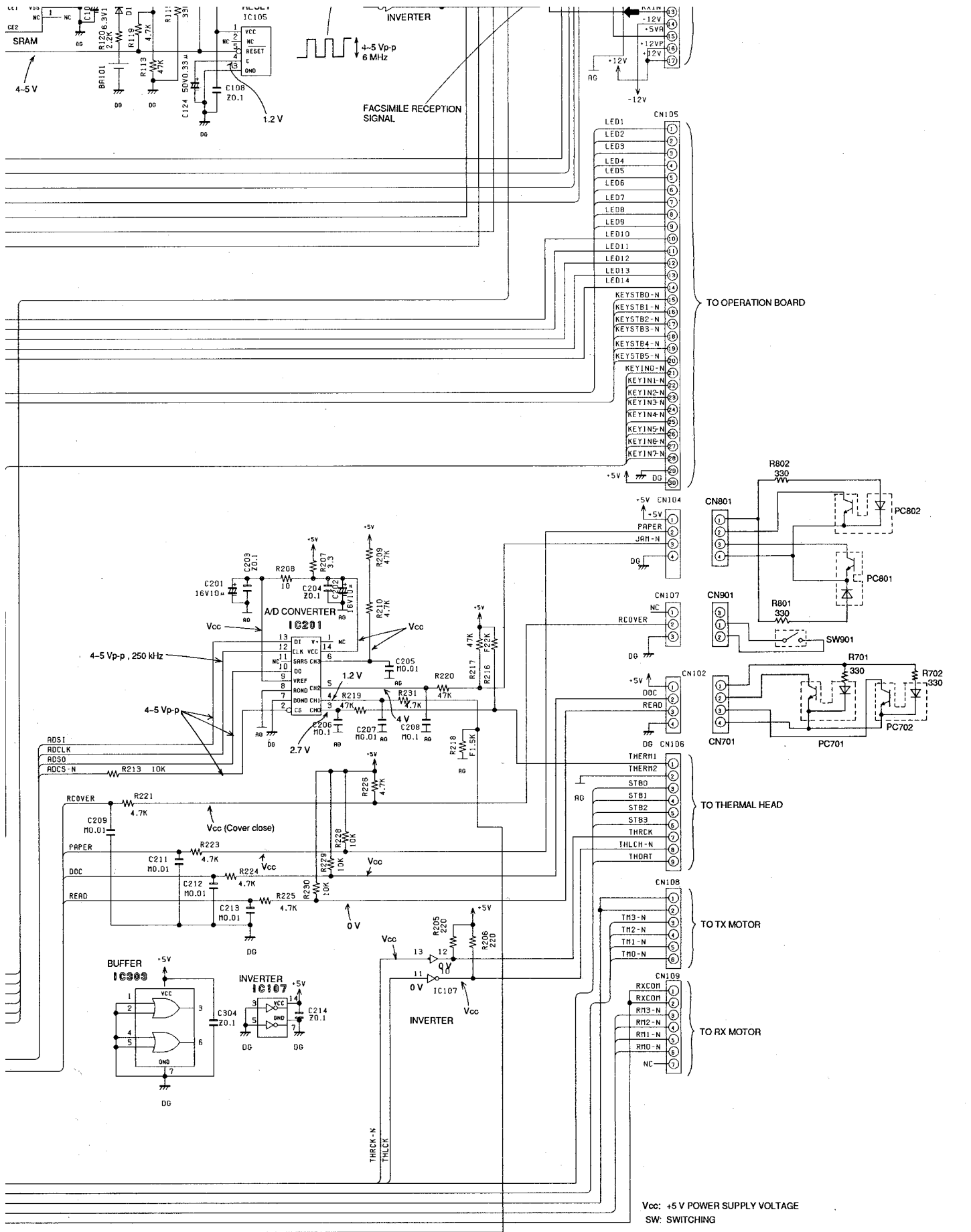
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12



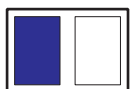
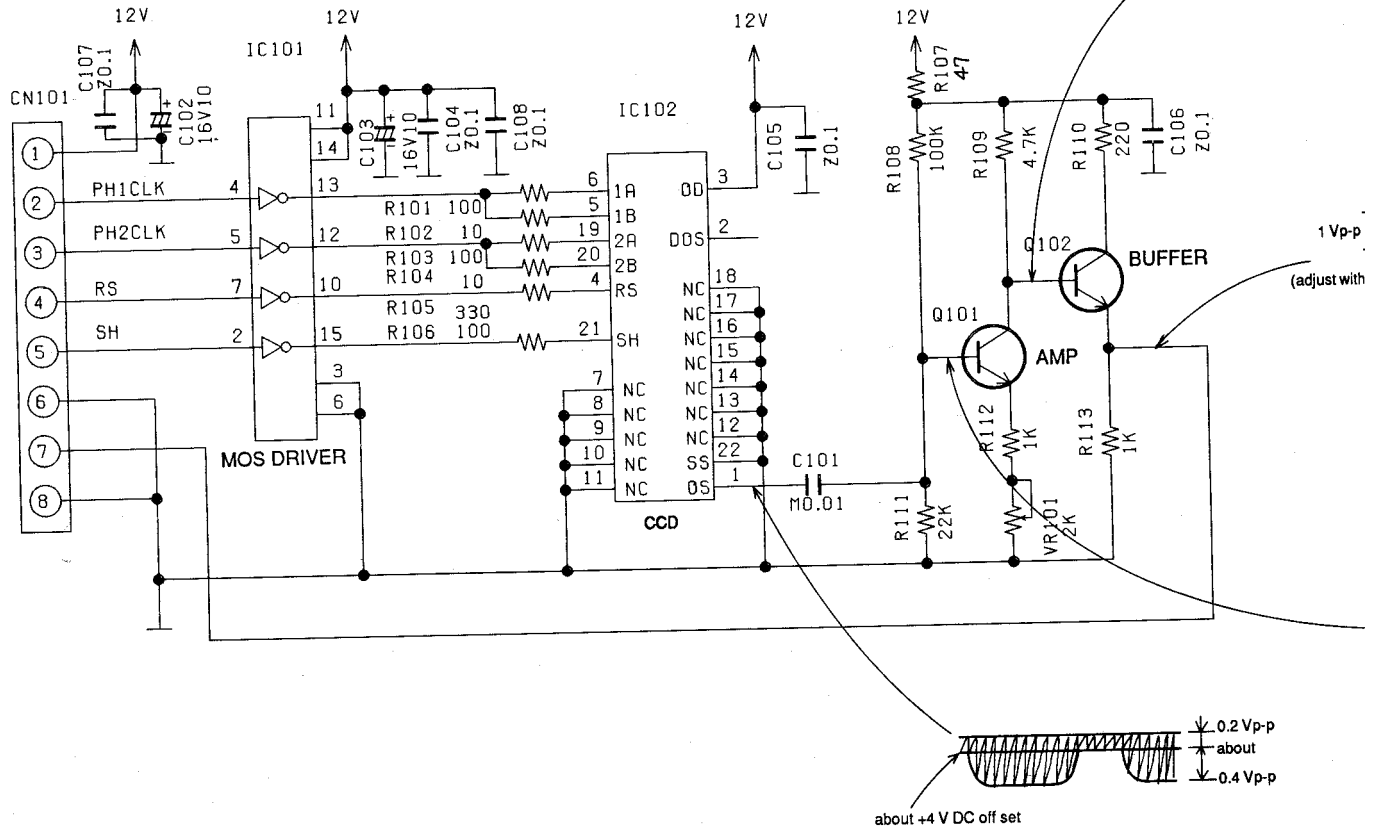






SCHEMATIC DIAGRAM AND P

CCD CIRCUIT



PRINTED CIRCUIT BOARD

7

8

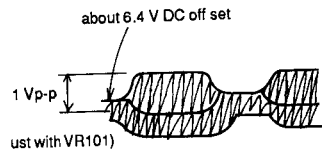
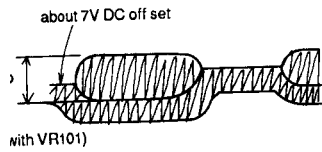
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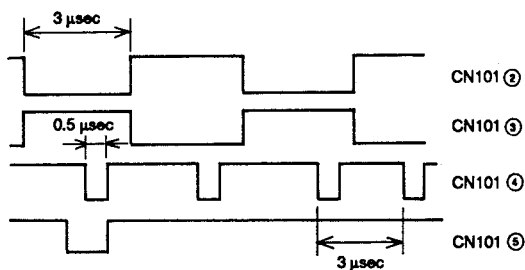
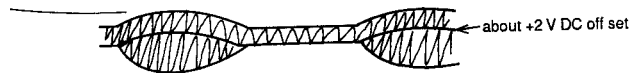
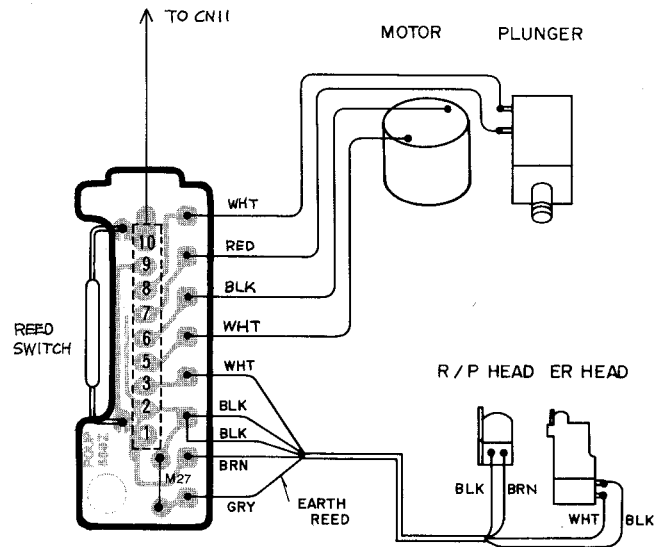
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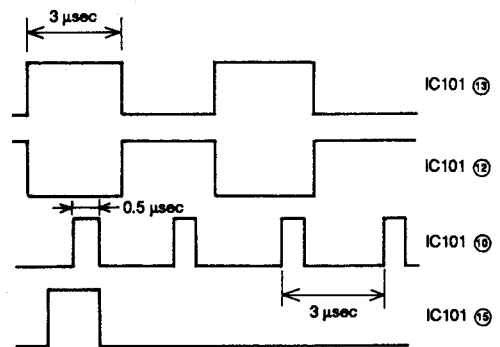
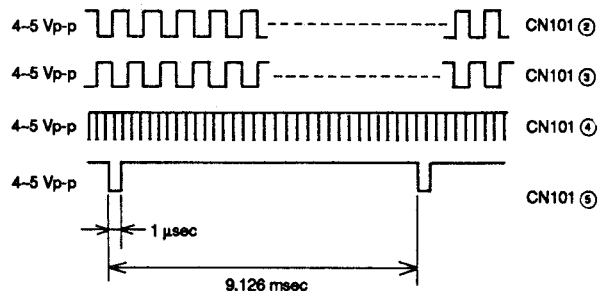
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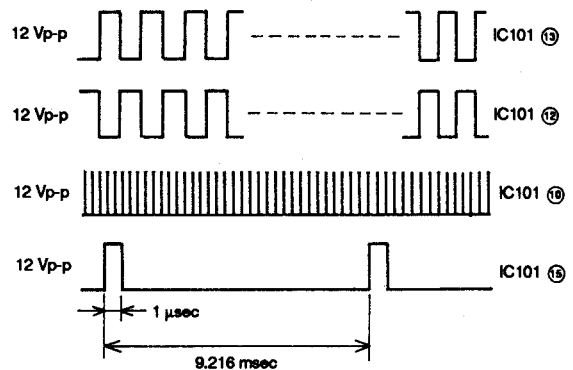
CASSETTE DECK BOARD (COMPONENT VIEW)





Expand

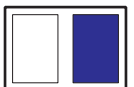


Expand

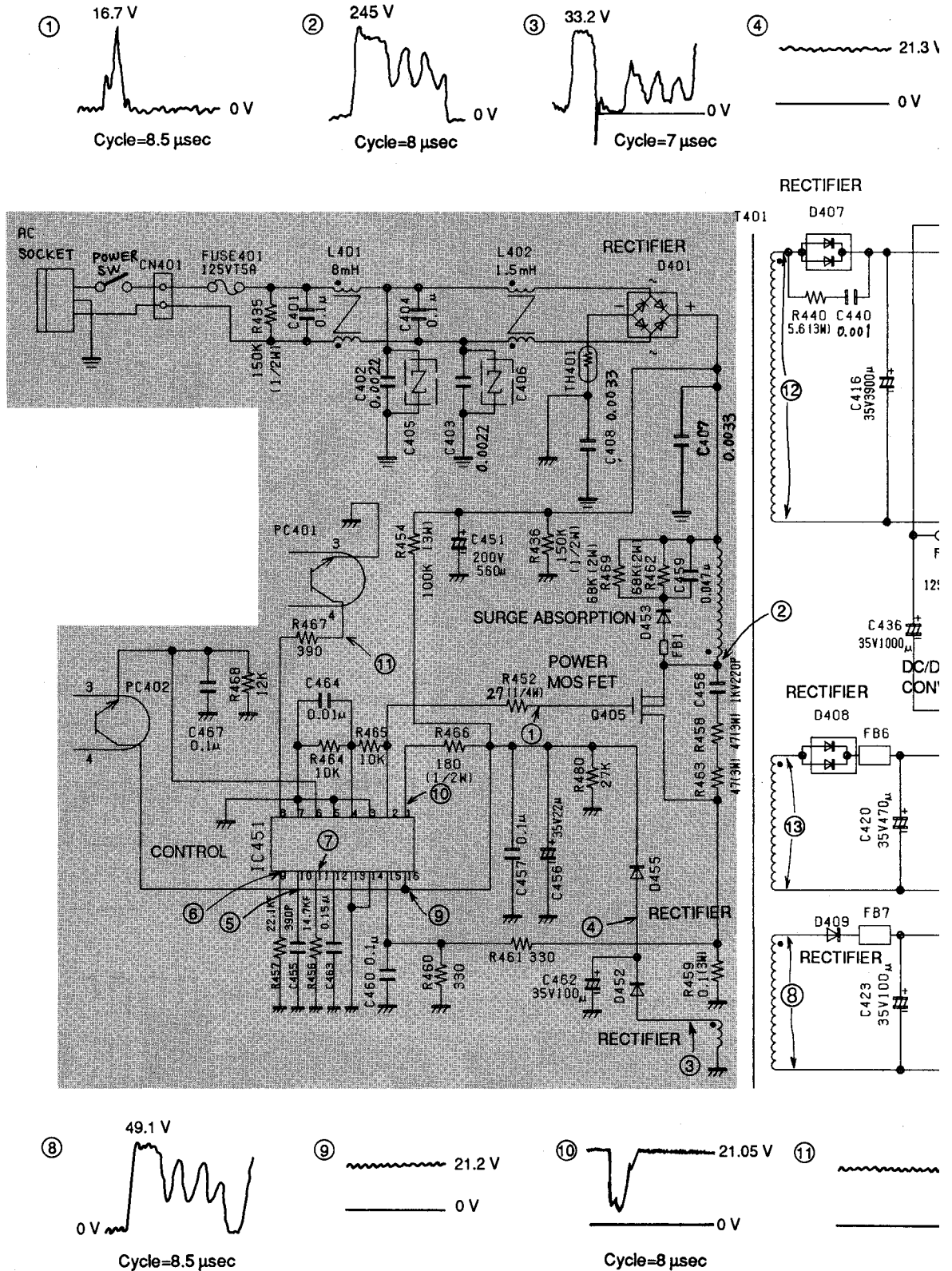


Notes:

1. The circuit shown in  on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in  on the conductor indicates printed circuit on the front side of the printed circuit board.

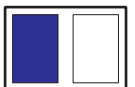


SCHEMATIC DIAGRAM (SWI)



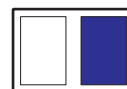
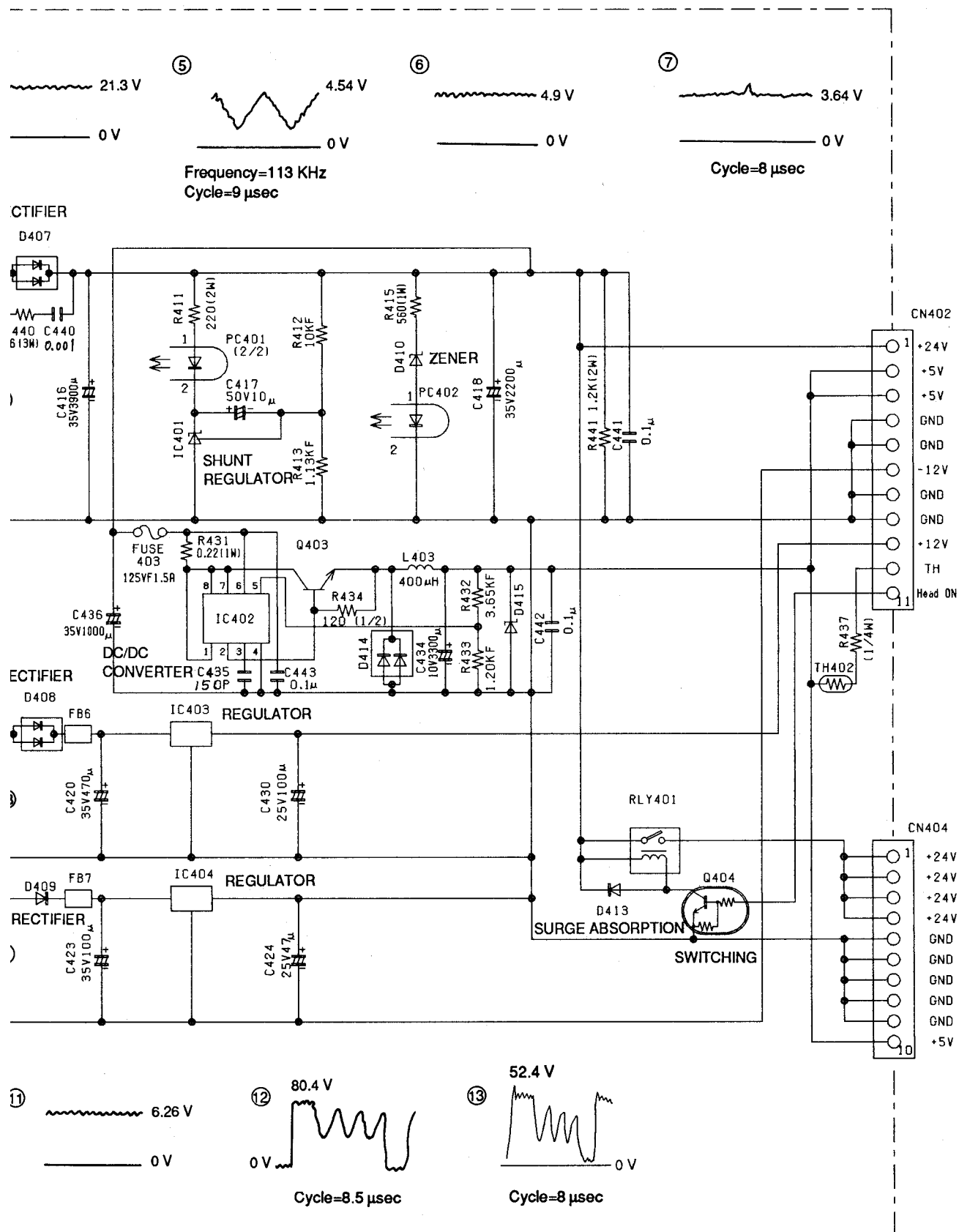
Note:

When measuring the waveform on the primary circuit of the Switching Power Supply Board, be sure to insulate the ground of the oscilloscope's probe from the ground of its power supply.

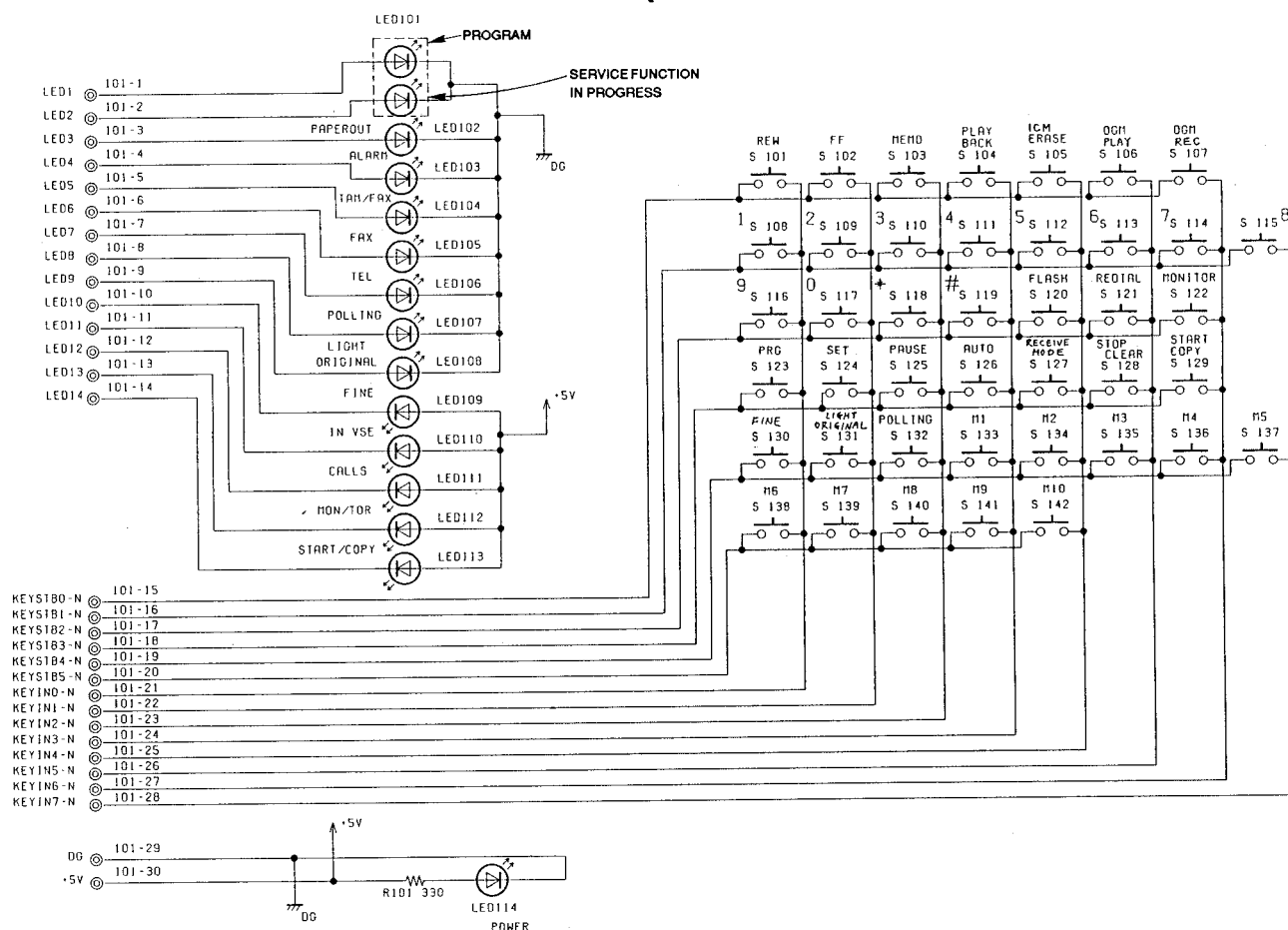


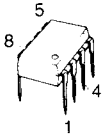
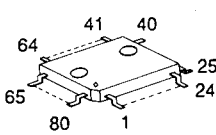
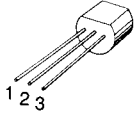
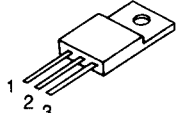
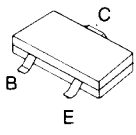
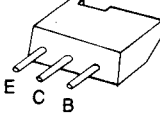
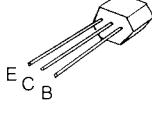
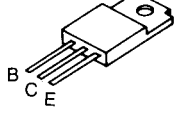
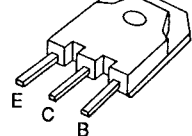
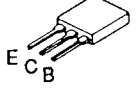
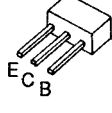
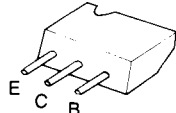
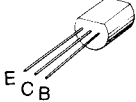
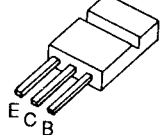
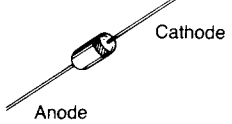

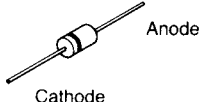
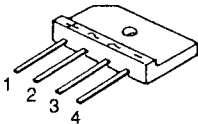
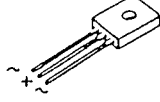
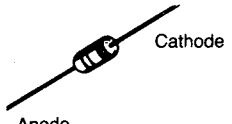
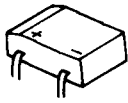
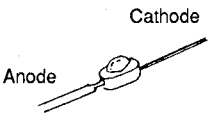
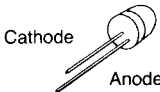
IAM (SWITCHING POWER SUPPLY)

7 8 9 10 11 12

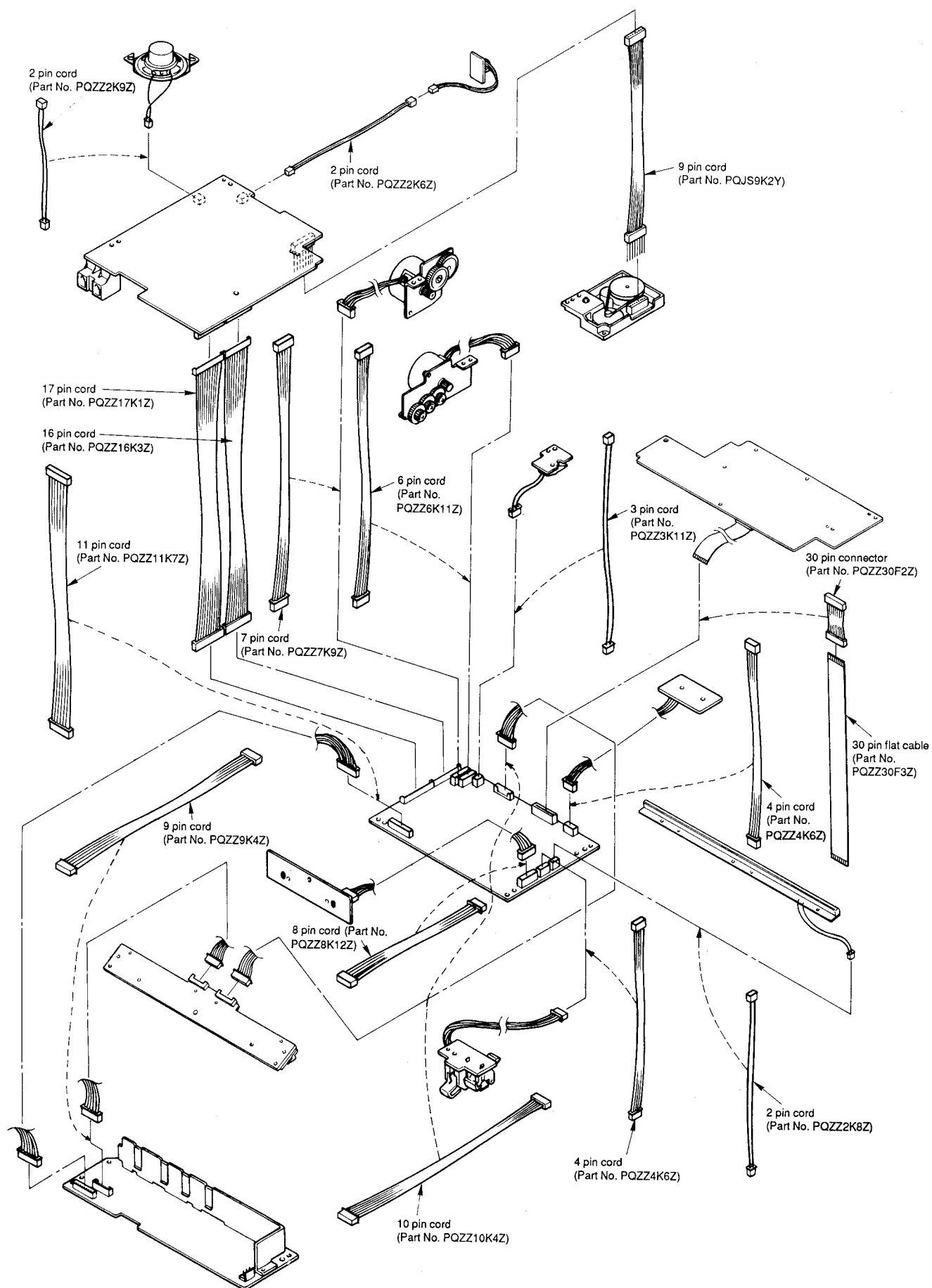


SCHEMATIC DIAGRAM (OPERATION CIRCUIT)

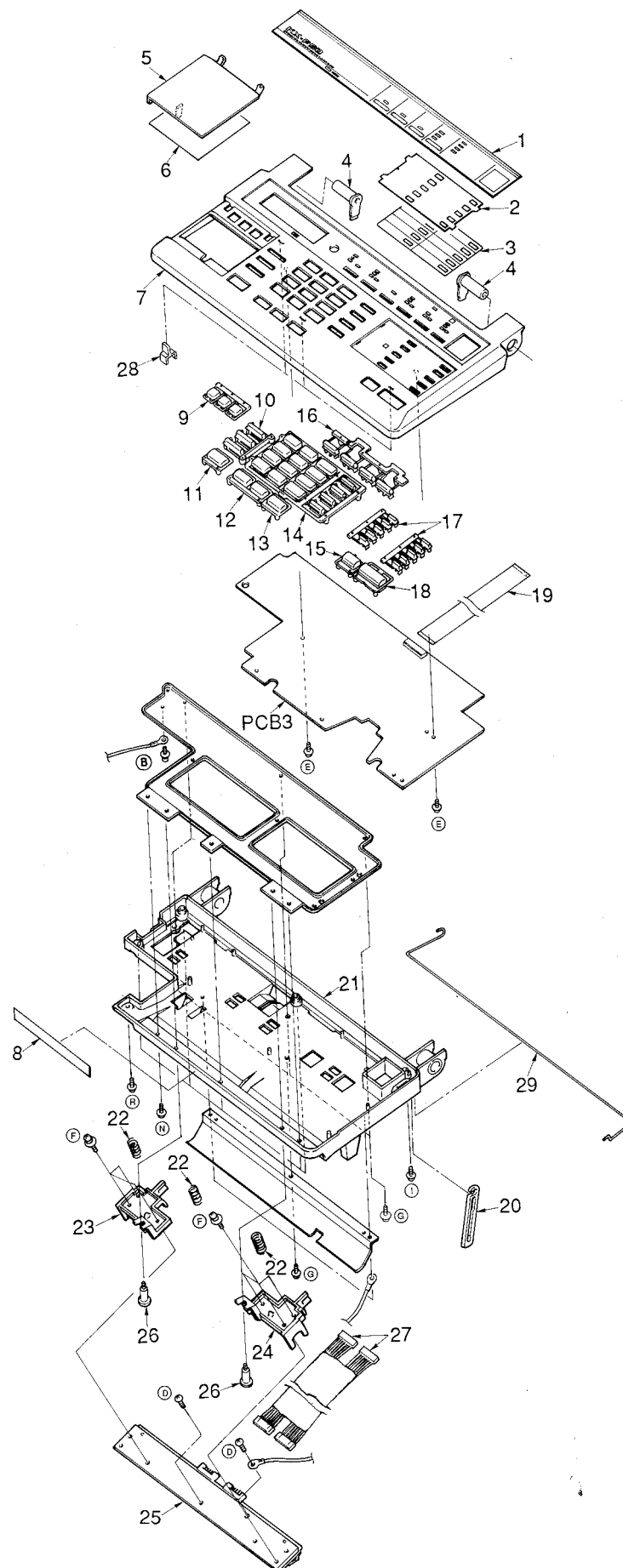


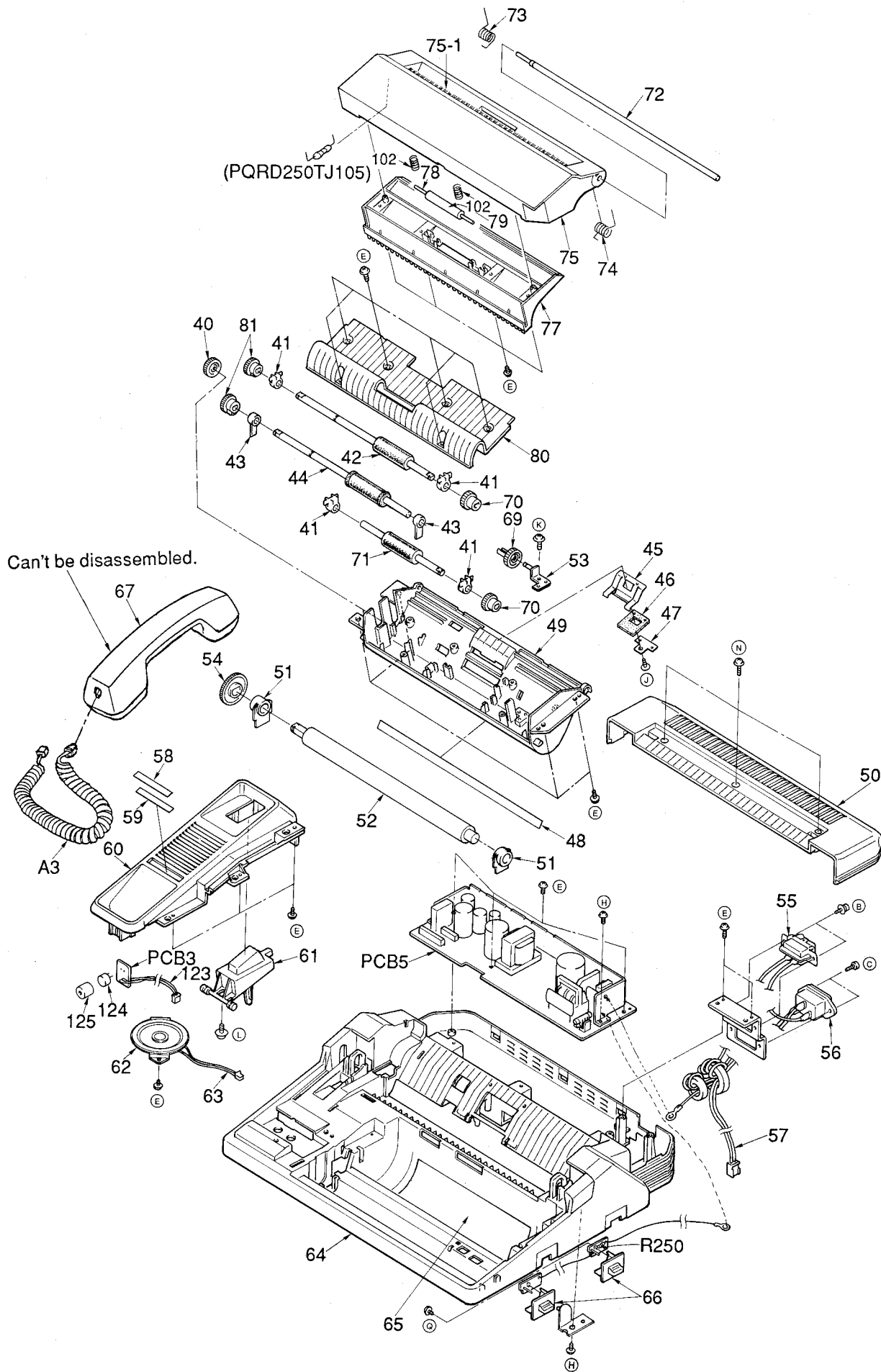
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 <p>2SC1652 2SB1322, 2SD1994A</p>	 <p>PQVTDTC143XS 2SC1740S, 2SA933</p>	 <p>2SD1266</p>	 <p>2SK1488</p>	 <p>2SA1626</p>
 <p>PQVTBB1A4A</p>	 <p>2SD662B</p>	 <p>2SC2235</p>	 <p>2SD2136</p>	 <p>PQVDHVS3A1, 1SS131, MA700A</p>
 <p>MA7200 1SS147, MA4270</p>	 <p>PQVD1GU42, PQVD1JU41 1S1588</p>	 <p>PQVDD5SBA40S</p>	 <p>PQVDD5LC20U PQVDD10LC20U</p>	 <p>MA4068 MA4039, MA4056 MA7062, MA4051</p>
 <p>PQVDS1YB40F1</p>	 <p>PQVDGL1E11C PQVDGL1D11E</p>	 <p>LN38GP LN28RPXTA3 LN086WP38</p>		

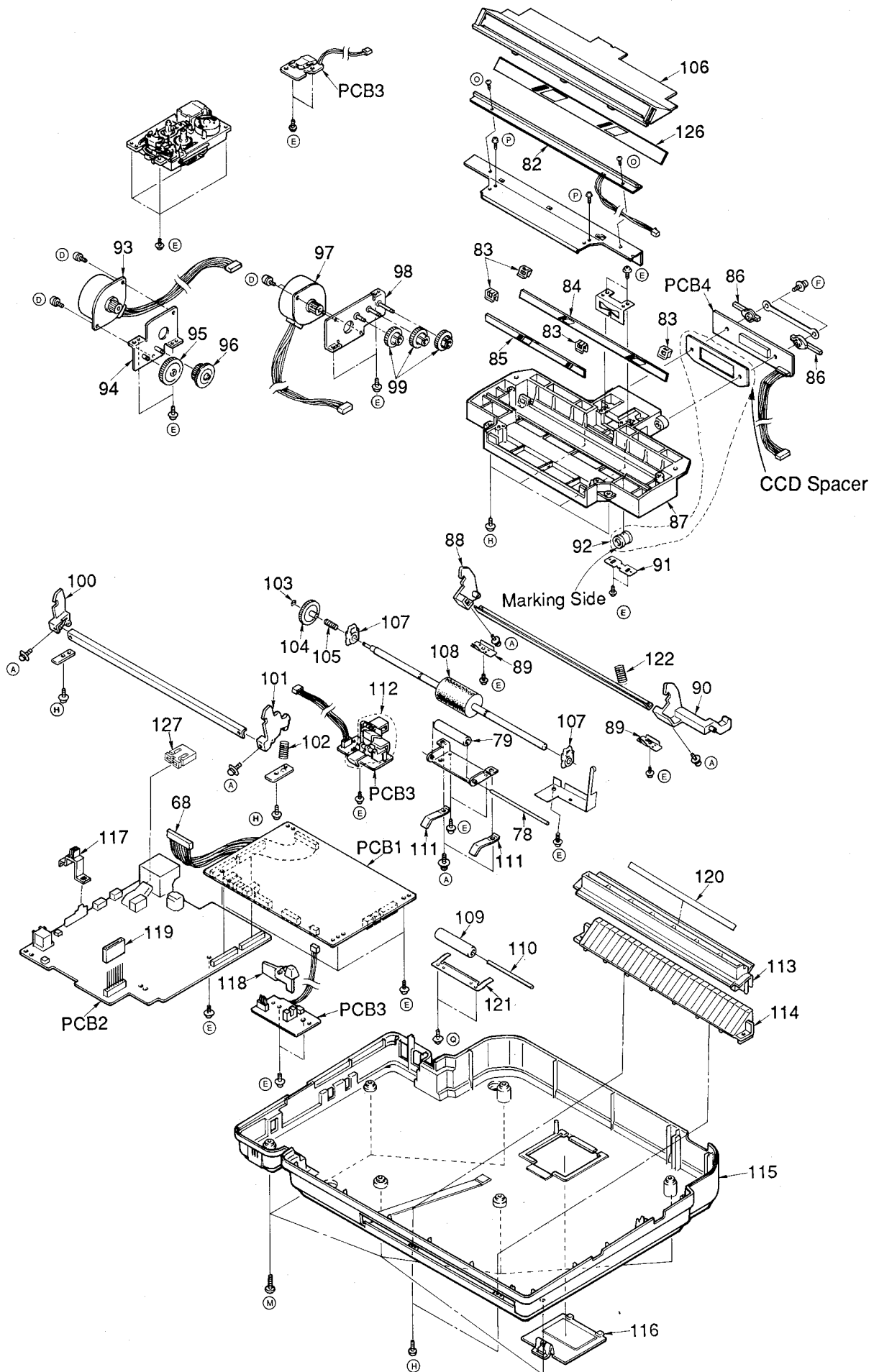
CONNECTOR LEAD AND EXTENSION CORD CONNECTING METHOD

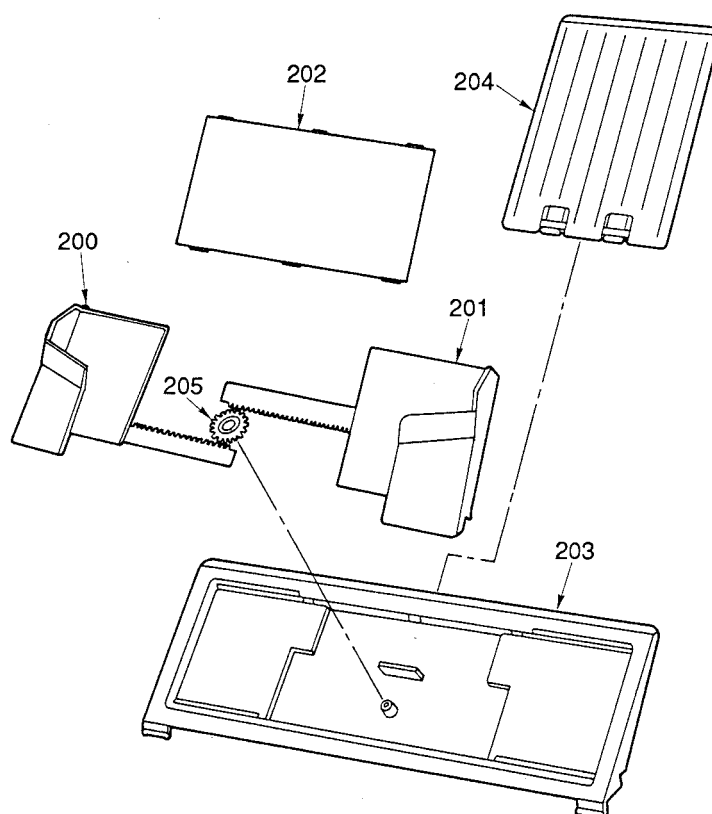


CABINET, MECHANICAL AND ELECTRICAL PARTS LOCATION









ACTUAL SIZE OF SCREWS

Ref. No.	Figure	Part No.	Ref. No.	Figure	Part No.
Ⓐ		XYN3+F6	Ⓛ		PJHE5065Z
Ⓑ		XYN3+C6	Ⓜ		XTW3+S14P
Ⓒ		XSS3+6	Ⓝ		XTW3+S10PFZ
Ⓓ		XYN3+C4	Ⓞ		XSN26+4
Ⓔ		XTW3+S8M	Ⓟ		XTW3+S12M
Ⓕ		XYN3+F10	Ⓠ		XTW26+6F
Ⓖ		XYN3+F8	Ⓡ		XTB3+8GFZ
Ⓗ		XTW3+S10M	Ⓢ		XSN17+10FN-3
Ⓘ		XTW3+S16M	Ⓣ		XSN17+6FZ-3
Ⓙ		XTS26+6C	Ⓤ		XTW26+5LF
Ⓚ		XTW3+S6P	Ⓥ		XSN17+7FN-3

CASSETTE DECK PARTS LOCATION

