

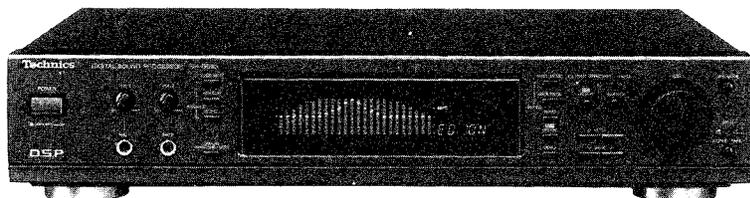
Service Manual

Digital Sound Processor

Digital Sound Processor
SH-GE90

Colour

(K) Black Type



Areas

Suffix for Model No.	Area	Colour
(E)	Europe	(K)
(EB)	Great Britain	
(EG)	Germany and Italy	
(GC)	Asia, Latin America, Middle Near East and Africa	
(GN)	Oceania	

SPECIFICATIONS

(DIN 45 500)

■ EQUALIZER SECTION

Frequency response (center position) 15 Hz–20 kHz, –1 dB
 Maximum output voltage 6 V
 Rated output voltage 1 V
 Rated total harmonic distortion (full scale input) 0.08% (1 kHz)

Input sensitivity 1 V
 S/N (full scale input) 86 dB
 Maximum input voltage 2.3 V (1 kHz)
 Input impedance 47 k Ω
 Gain 0 \pm 1 dB
 Band level controls \pm 12 dB

3 element parametric equalizer

Center frequency

LOW 31.5, 40, 50, 63, 80, 100, 125, 160, 220 (Hz)
HIGH 1, 2 315, 450, 630, 800, 1 k, 1.25 k, 1.6 k, 2.2 k, 3.15 k, 4.5 k, 6.3 k, 8 k, 10 k, 12.5 k, 16 k (Hz)

(Q) control

Narrow 1.8
Wide 0.7

Fixed mode

Equalizer (6 modes) HEAVY, CLEAR, SOFT, VOCAL, HEADPHONE STEREO, CAR STEREO

Sound Field Processor (6 modes)

HALL, LIVE, DISCO, CHURCH, STADIUM, THEATER

■ KARAOKE SECTION

Key control –300~+300 cent
 MIC1, MIC2 1.4 mV/4.7 k Ω
 Mic echo 0.2–1.6 sec

■ GENERAL

Power consumption 17 W
 Power supply
 For (E) (EB) (EG) (GN) area AC 50/60 Hz, 230–240 V
 For (GC) area AC 50/60 Hz, 110 V/127 V/220 V/240 V
 Dimensions (W \times H \times D) 430 \times 92 \times 290 mm
 Weight 3 kg

Notes:

- Specifications are subject to change without notice. Weight and dimensions are approximate.
- Total harmonic distortion is measured by the digital spectrum analyzer.

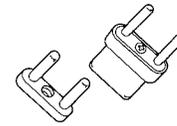
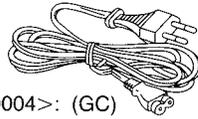
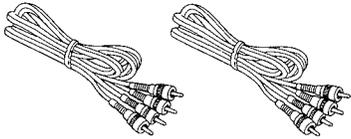
Technics

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ACCESSORIES

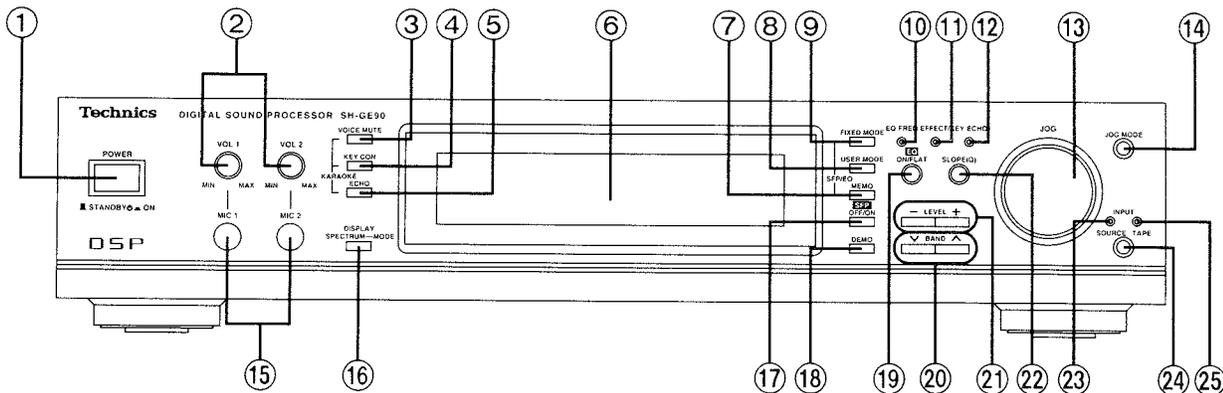
- | | | | | | |
|---------------------------------|---|-----------------------------|---|---------------------------|---|
| •Stereo connection cables | 2 | •AC power supply cord | 1 | •Power plug adaptor | 1 |
| <SJP2276> | | <RJA0019-1K>: (E) (EG) | | <SJP9215>: (GC) | |
| | | <SJA193>: (EG) | | | |



<RJA0004>: (GC)
<SJA173>: (GN)

Note: The configuration of the AC power supply cord differs according to area.

LOCATION OF CONTROLS



Control section

① Power "STANDBY / ON" switch (POWER STANDBY ON)

This switch switches ON and OFF the secondary circuit power only. The unit is in the "standby" condition when this switch is set to the STANDBY position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

Note:

For this unit, even if this switch is switched to the "STANDBY" position, there is still a slight power consumption of about 2.7 watts; this is in order to assure the retention of the "most recent" memory and the preset-memory functions.

"Power-through" function

Discs, radio broadcasts, etc. can be heard even if the power of this unit is switched to STANDBY.

Note, however, that the power plug should be left connected to the AC outlet.

② Microphone volume controls (VOL1, VOL2)

③ Voice mute button (VOICE MUTE)

This button is used to change "KARAOKE" (using microphone with an accompaniment).

④ Key control button (KEY CON)

This button is used to adjust key level when performing "KARAOKE".

⑤ Echo button (ECHO)

This button is used to adjust the reverberation sound when in performing "KARAOKE".

⑥ Display section

⑦ Memory button (MEMO)

This button is used to store an original equalization curve or simulated listening environments.

⑧ User mode select button (USER MODE)

This button is used to select the user mode of equalization curve or simulated listening environments.

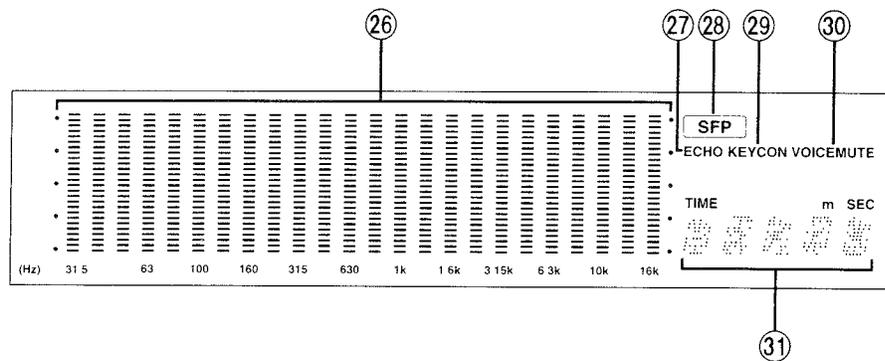
⑨ Fixed mode select button (FIXED MODE)

This button is used to select the fixed mode of equalization curve or simulated listening environments.

⑩ Equalizer frequency indicator (EQ FREQ)

⑪ Effect/key control indicator (EFFECT/KEY)

- ⑫ **Echo indicator (ECHO)**
- ⑬ **Sound effect level control (JOG)**
This control is used for adjusting the level of simulated listening environments effect, equalization level and specific frequency shift.
- ⑭ **Jog mode button (JOG MODE)**
This button is used to control the equalizer frequency, the reverberation sound (effect), the key in the "KARAOKE" mode and the reverberation sound (echo) in the "KARAOKE" mode.
- ⑮ **Microphone jacks (MIC1, MIC2)**
- ⑯ **Display mode select button (DISPLAY, -SPECTRUM -MODE)**
This button is used to select one of three spectrum curves. If you press and hold this button, the display mode will change.
- ⑰ **SFP OFF/ON button (SFP , OFF/ON)**
This button is used to activate Sound Field Processor.
- ⑱ **Demonstration button (DEMO)**
This button is used to change sound effects sequentially.
- ⑲ **Equalizer ON/FLAT button (EQ , ON/FLAT)**
This button is used to switch the equalizer on or flat.
- ⑳ **Equalizer frequency select buttons (v BAND ^)**
These buttons are used to select the equalization frequency.
- ㉑ **Equalizer level-control buttons (- LEVEL +)**
These buttons are used to adjust of equalization level.
- ㉒ **Slope (Q) select button [SLOPE (Q)]**
- ㉓ **Source indicator**
Press the input selector to select "SOURCE", and the source indicator will illuminate to RED.
- ㉔ **Input selector button (INPUT, SOURCE TAPE)**
SOURCE: Set to this position to listen to the radio or a compact disc, etc.
TAPE: Set to this position to listen to a tape deck connected to the back of this unit.
- ㉕ **Tape indicator**
Press the input selector to select "TAPE", and the tape indicator will illuminate to YELLOW.



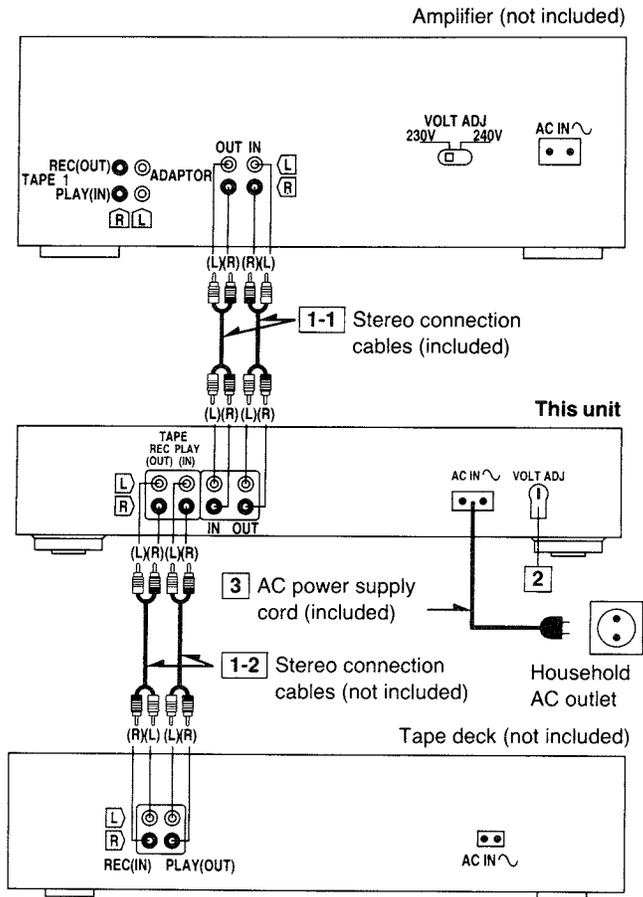
Display section

- ⑳ **Multi level display**
This display shows the equalization/spectrum analysis level.
- ㉑ **Echo indicator (ECHO)**
- ㉒ **SFP indicator (SFP)**
This indicator illuminate to activate simulated listening environments.
- ㉓ **Key control indicator (KEY CON)**
- ㉔ **Voice mute indicator (VOICE MUTE)**
This indicator illuminates to activate "KARAOKE" function.
- ㉕ **Sound effect display**
This display shows the mode of equalization curve or simulated listening environments , or delay time, etc.

■ CONNECTIONS

Make connections in the numbered sequence by using the included cables.

The illustration below shows an example of connections made when this unit is combined with a Technics electronic component system, and shows only the connections to be made to and from this unit in that combination.



1 Connect the stereo connection cables.

Stereo connection cable

White (L) 
Red (R) 

1-1 Connect the stereo connection cables (included).

When you have an amplifier which has the terminals for external units (ADAPTOR/GRAPHIC EQ/EXT), connect this unit to those terminals.

When you have an amplifier which has no terminals for external units, connect this unit to the TAPE MONITOR terminal.

1-2 Connect the stereo connection cables (not included).

2 Setting the voltage selector (VOLT ADJ)

(For areas except continental Europe, United Kingdom and Australia)

Set the voltage selector to the voltage setting for the area in which the unit will be used.

[Use a minus (-) screwdriver]

•Note that this unit will be seriously damaged if this setting is not made correctly. (There is no voltage selector for some countries; the correct voltage is already set.)

•If the power supply in your area is 117 V or 120 V, set to the "127 V" position.

3 Connect the AC power supply cord.

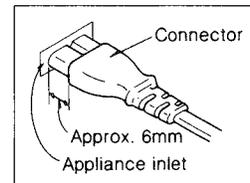
Connect the AC power supply cord (included) after all other cables and cords are connected.

For Continental Europe and United Kingdom

Insertion of Connector

Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing.

However there is no problem using the unit.

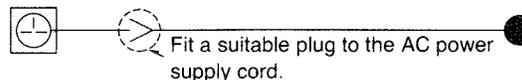


Note:

The configuration of AC power supply cord differs according to area.

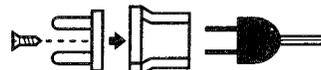
For United Kingdom

Household AC outlet



For areas except continental Europe, United Kingdom and Australia

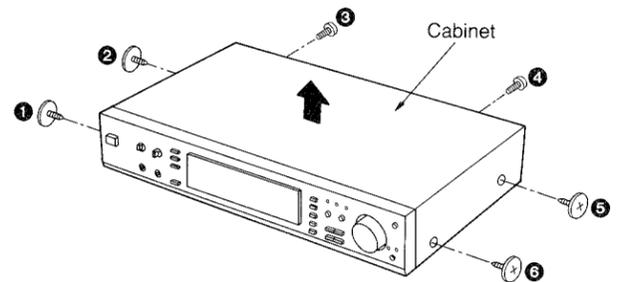
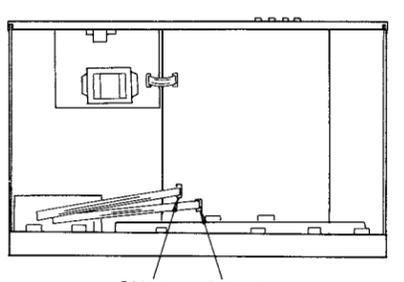
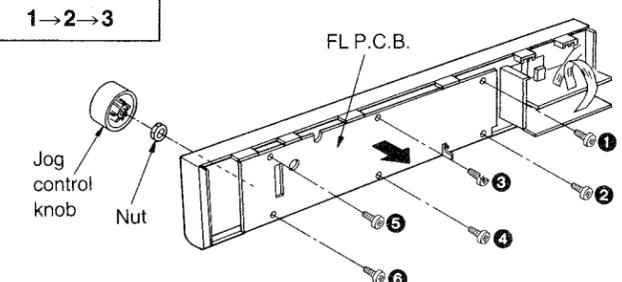
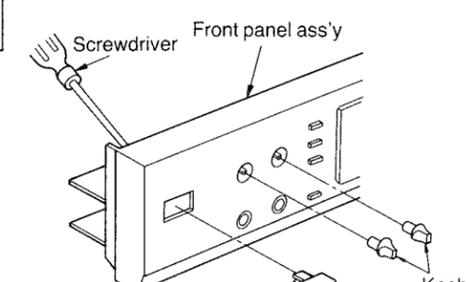
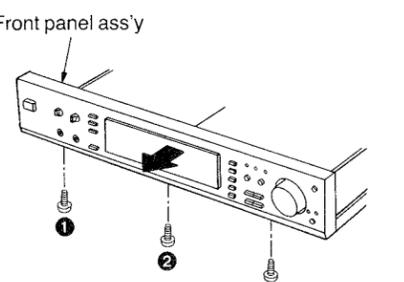
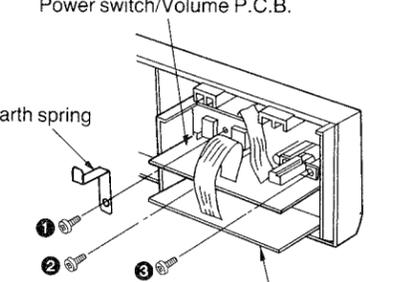
If the power plug will not fit your Household AC outlet, use the power plug adaptor (included).

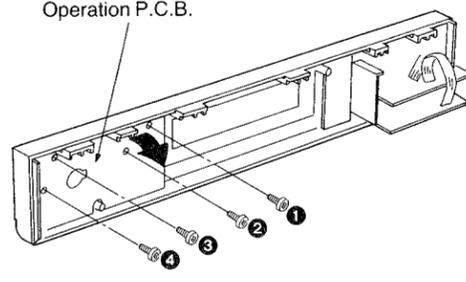
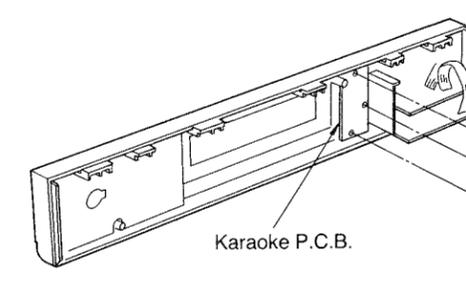
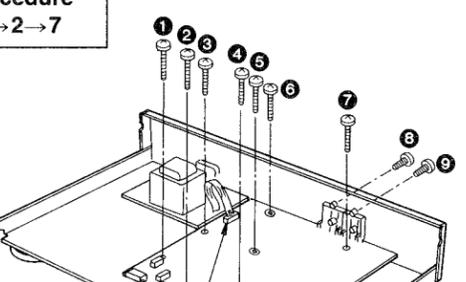
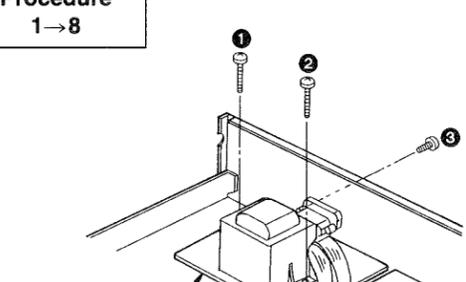
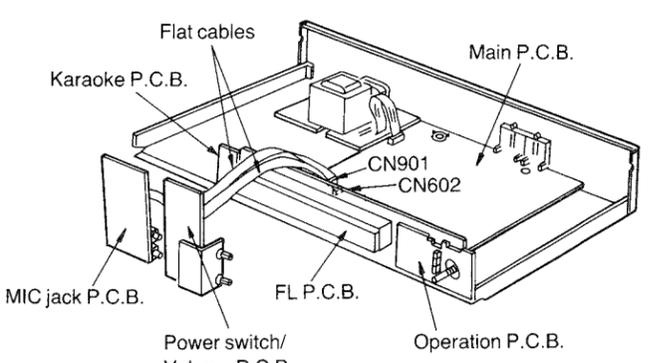


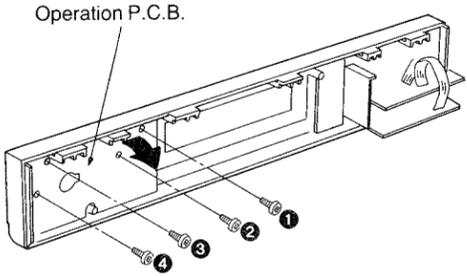
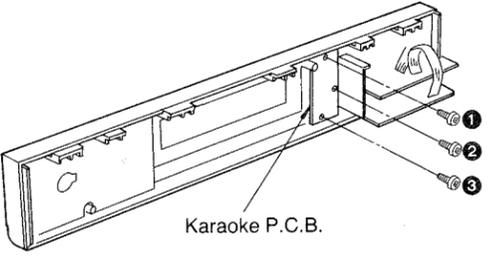
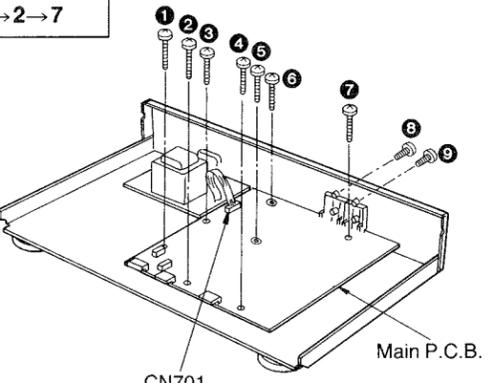
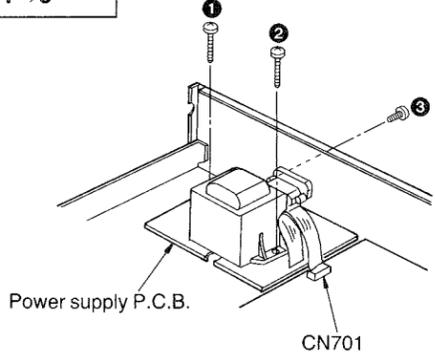
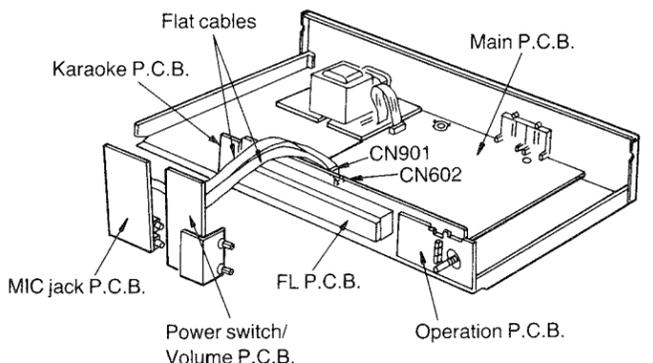
DISASSEMBLY INSTRUCTIONS

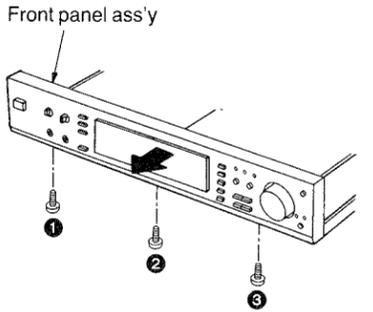
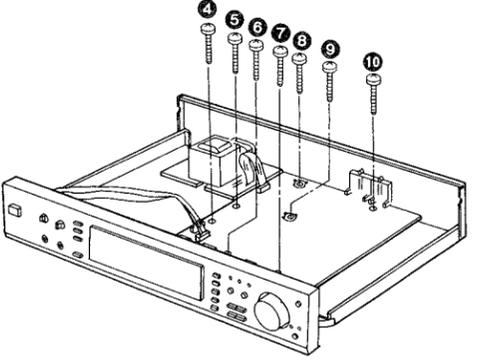
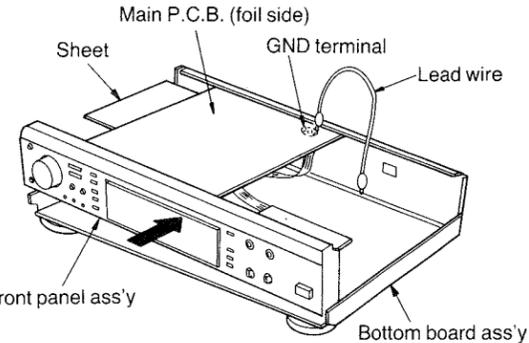
“ATTENTION SERVICER”

Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref. No. 1	Removal of the Cabinet	Ref. No. 2	Removal of the Front Panel Ass'y
Procedure 1	 <p>●Remove the 6 screws (1~6).</p>	Procedure 1→2	 <p>1. Remove the 2 flat cables (CN602, CN901).</p>
Ref. No. 3	Removal of the FL P.C.B.	Ref. No. 4	Power switch/Volume P.C.B. and MIC Jack P.C.B.
Procedure 1→2→3	 <p>1. Pull out the jog control knob. 2. Remove the nut. 3. Remove the 6 screws (1~6). 4. Remove the FL P.C.B. in the direction of arrow.</p>	Procedure 1→2→4	 <p>1. Remove the power switch button by pushing it from behind the front panel ass'y. 2. Pull out the 2 knobs.</p>
		Procedure 1→2	 <p>2. Remove the 3 screws (1~3). 3. Remove the front panel ass'y in the direction of arrow.</p>
		Procedure 1→2→3	 <p>3. Remove the 3 screws (1~3). 4. Remove the earth spring.</p>

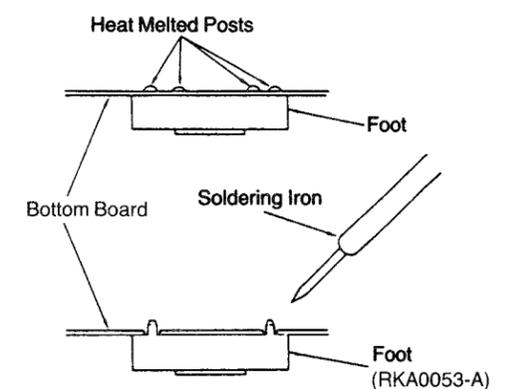
Ref. No. 5	Removal of the Operation P.C.B.	Ref. No. 6	Removal of the karaoke P.C.B.
Procedure 1→2→3→5	 <p>1. Remove the 4 screws (1~4). 2. Remove the operation P.C.B. in the direction of arrow.</p>	Procedure 1→2→3→6	 <p>●Remove the 3 screws (1~3).</p>
Ref. No. 7	Removal of the Main P.C.B.	Ref. No. 8	Removal of the Power Supply P.C.B.
Procedure 1→2→7	 <p>1. Remove the 9 screws (1~9). 2. Remove the 1 flat cable (CN701).</p>	Procedure 1→8	 <p>1. Remove the 1 flat cable (CN701). 2. Remove the 3 screws (1~3).</p>
Ref. No. 9	How to check the Power Switch/Volume P.C.B. MIC Jack P.C.B. and Operation P.C.B.		
Procedure 1→2→4→ 5→6→9	<p>1. Reinstall the FL P.C.B. to the main P.C.B. 2. Install the operation P.C.B. and karaoke P.C.B. to the FL P.C.B. 3. Connect the flat cables of the power switch/volume P.C.B. to the connectors (CN602 and CN901) on the main P.C.B. 4. Place the MIC Jack P.C.B., power switch/volume P.C.B. and operation P.C.B. as shown right to check their foil patterns.</p>		
			

Ref. No. 5	Removal of the Operation P.C.B.	Ref. No. 6	Removal of the karaoke P.C.B.
Procedure 1→2→3→5	 <p>1. Remove the 4 screws (1~4). 2. Remove the operation P.C.B. in the direction of arrow.</p>	Procedure 1→2→3→6	 <p>•Remove the 3 screws (1~3).</p>
Ref. No. 7	Removal of the Main P.C.B.	Ref. No. 8	Removal of the Power Supply P.C.B.
Procedure 1→2→7	 <p>1. Remove the 9 screws (1~9). 2. Remove the 1 flat cable (CN701).</p>	Procedure 1→8	 <p>1. Remove the 1 flat cable (CN701). 2. Remove the 3 screws (1~3).</p>
Ref. No. 9	How to check the Power Switch/Volume P.C.B. MIC Jack P.C.B. and Operation P.C.B.		
Procedure 1→2→4→ 5→6→9	 <p>1. Reinstall the FL P.C.B. to the main P.C.B. 2. Install the operation P.C.B. and karaoke P.C.B. to the FL P.C.B. 3. Connect the flat cables of the power switch/volume P.C.B. to the connectors (CN602 and CN901) on the main P.C.B. 4. Place the MIC Jack P.C.B., power switch/volume P.C.B. and operation P.C.B. as shown right to check their foil patterns.</p>		

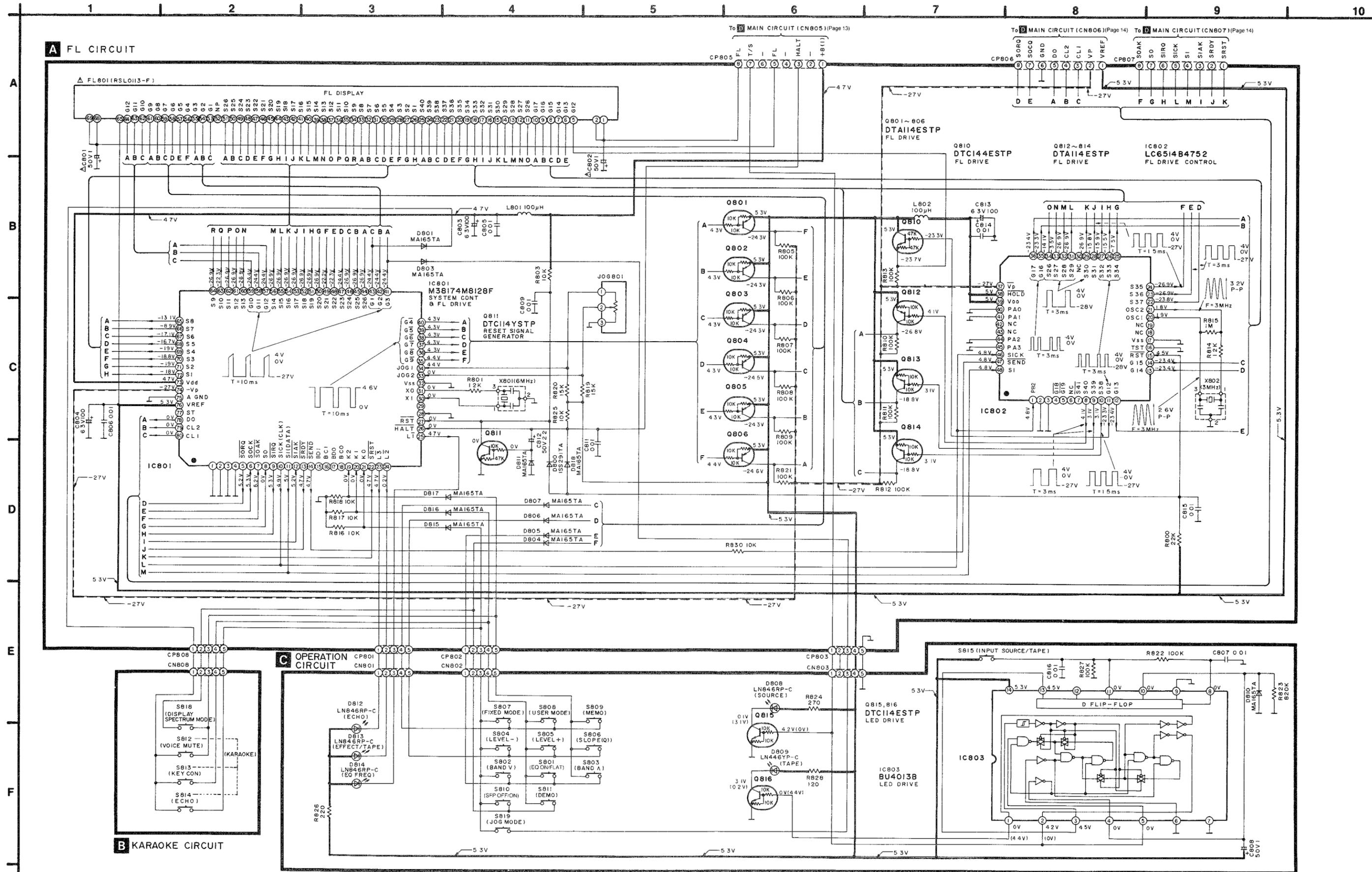
Ref. No. 10	How to check the Main P.C.B.	 <p>1. Remove the 3 screws (1~3). 2. Remove the front panel ass'y in the direction of arrow.</p>
Procedure 1→10	<p>•When checking the soldered surfaces of main P.C.B. and replacing the parts, do as show.</p>	 <p>3. Remove the 7 screws (4~10).</p>  <p>6. As shown left, turn the main P.C.B. over to face the foil pattern toward you. 7. Spread insulating material under the main P.C.B. to prevent short circuit. 8. Connect the G.N.D terminal to the bottom board ass'y by the lead wire. 9. Reinstall the front panel ass'y to the main P.C.B.</p>

•Replacement of the Foot

1. Remove the 4 heat melted posts on the Bottom Board with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom Board, melt the 4 posts with soldering iron.



SCHEMATIC DIAGRAM (Parts list on pages 25-28)

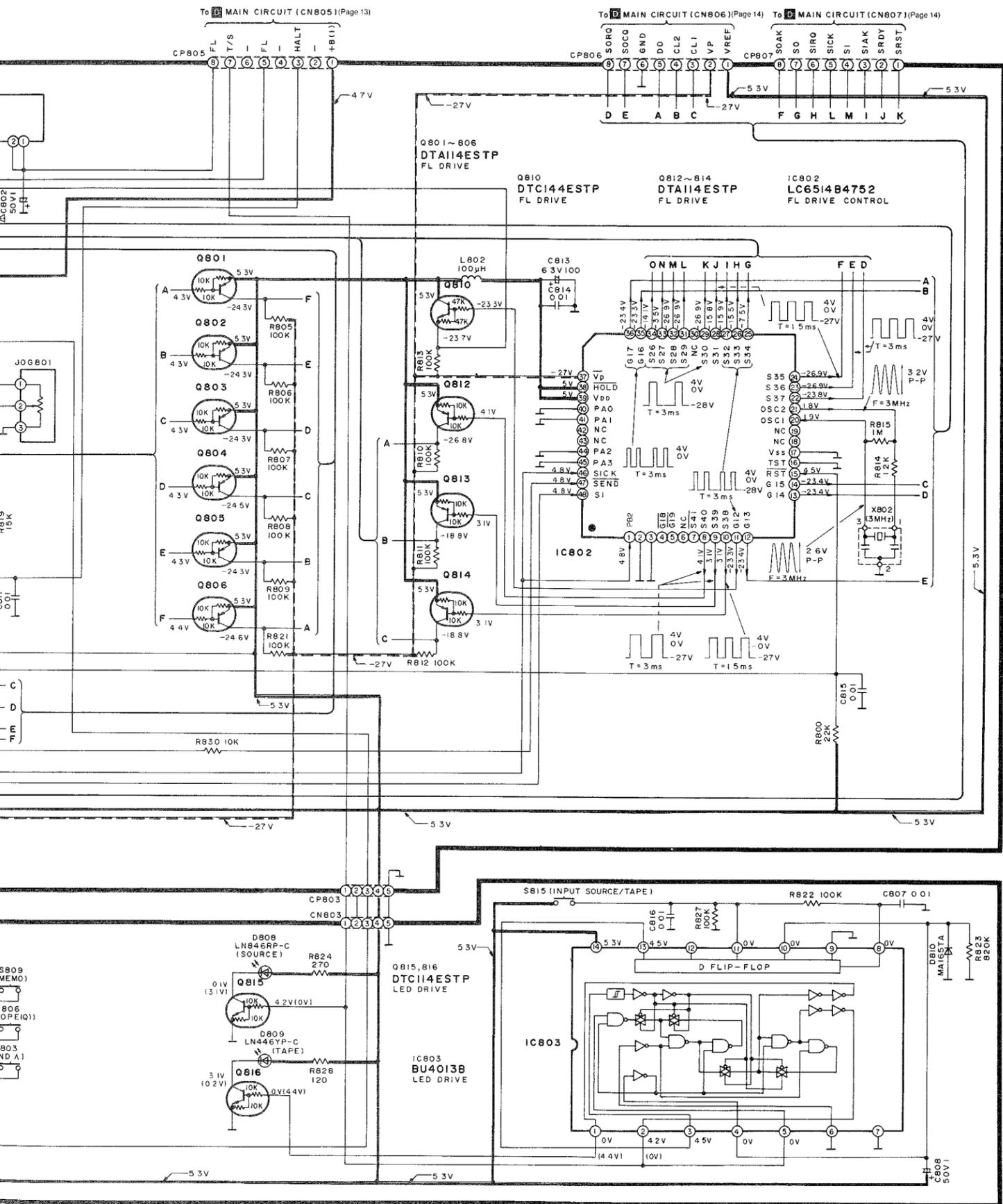


Notes:

- S701 : V
- S801 : E
- S802 : E
- S803 : E
- S804 : E
- S805 : E
- S806 : S
- S807 : U
- S808 : U
- S809 : M
- S810 : S
- S811 : D
- S812 : V
- S813 : K
- S814 : E
- S815 : I
- S818 : D
- S819 : J
- S901-1~ S901-3 : P

•Indicated voltage chassis taken as circuit tester.
No mark...INPU
•Important safety Components ide
Furthermore, sp
are used. When
•This schematic

•Caution!
IC and LSI are se
Secondary troub
•Cover the part
•Ground the sold
•Put a conductive
•Do not touch the



Notes:

- S701 : Voltage select switch (VOL ADJ) in "240 V" position. for (GC) area.
- S801 : Equalizer ON/FLAT switch. (EQ, ON/FLAT)
- S802 : Equalizer-frequency select switch. (BAND V)
- S803 : Equalizer-frequency select switch. (BAND ^)
- S804 : Equalizer level-control switch. (LEVEL-)
- S805 : Equalizer level-control switch. (LEVEL+)
- S806 : Slope (Q) select switch. [SLOPE (Q)]
- S807 : Fixed mode select switch. (FIXED MODE)
- S808 : User mode select switch. (USER MODE)
- S809 : Memory switch. (MEMO)
- S810 : SFP OFF/ON switch. (SFP, OFF/ON)
- S811 : Demonstration switch. (DEMO)
- S812 : Voice mute switch. (VOICE MUTE)
- S813 : Key control switch. (KEY CON)
- S814 : Echo switch. (ECHO)
- S815 : Input select switch. (INPUT, SOURCE TAPE)
- S818 : Display mode select switch. (DISPLAY, -SPECTRUM MODE)
- S819 : Jog mode switch. (JOG MODE)
- S901-1 ~ S901-3 : Power "STANDBY ON" switch (POWER ■ STANDBY ○ ■ ON) in "ON" position.

●Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark...INPUT: SOURCE ()...INPUT: TAPE

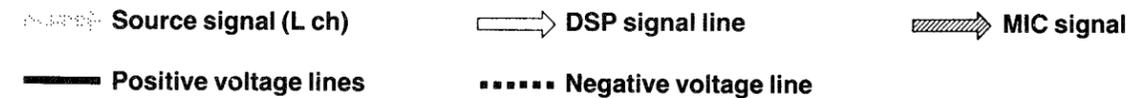
Important safety notice:

Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

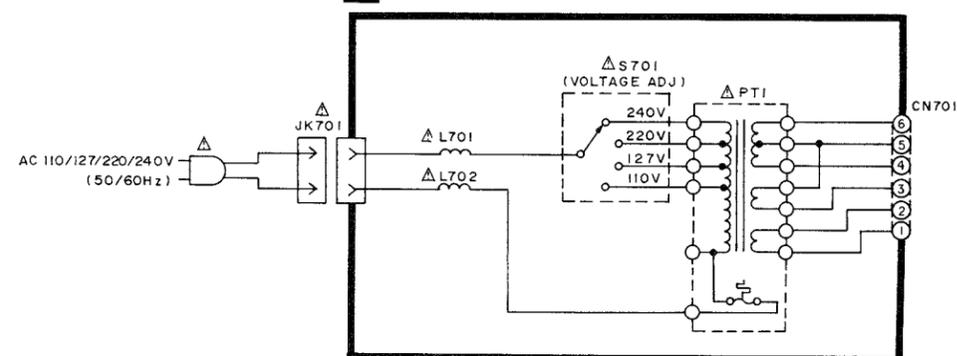
●This schematic diagram may be modified at any time with the development of new technology.

***Caution!**

- IC and LSI are sensitive to static electricity.
- Secondary trouble can be prevented by taking care during repair.
- *Cover the parts boxes made of plastics with aluminum foil.
- *Ground the soldering iron.
- *Put a conductive mat on the work table.
- *Do not touch the legs of IC or LSI with the fingers directly.



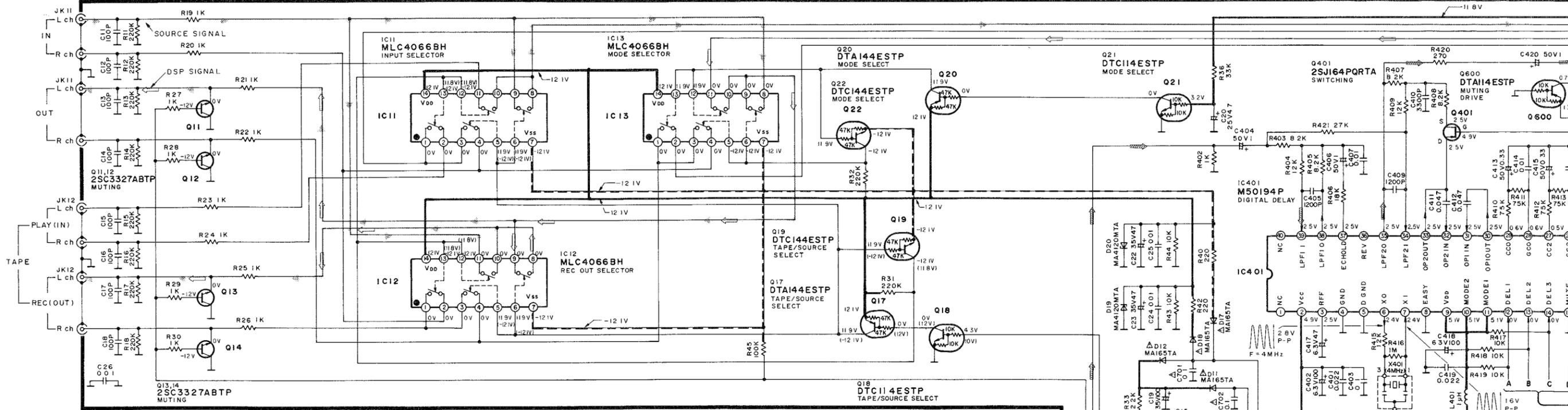
F POWER SUPPLY CIRCUIT For [GC] area.



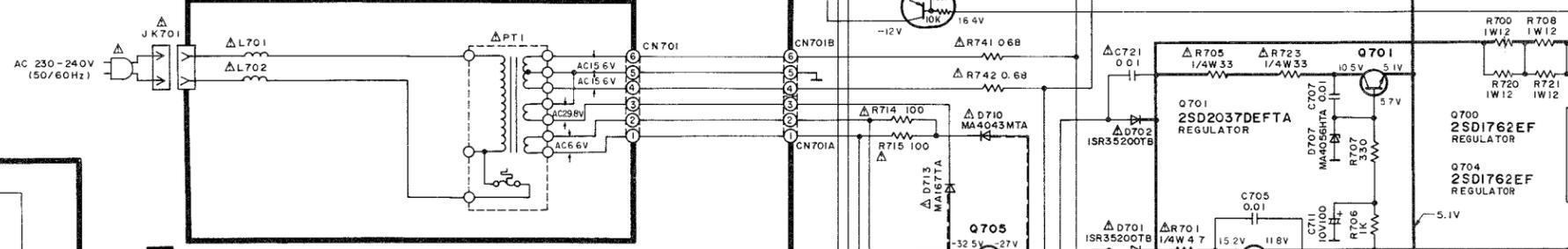
SCHEMATIC DIAGRAM (Parts list on pages 25-28)

1 2 3 4 5 6 7 8 9 10

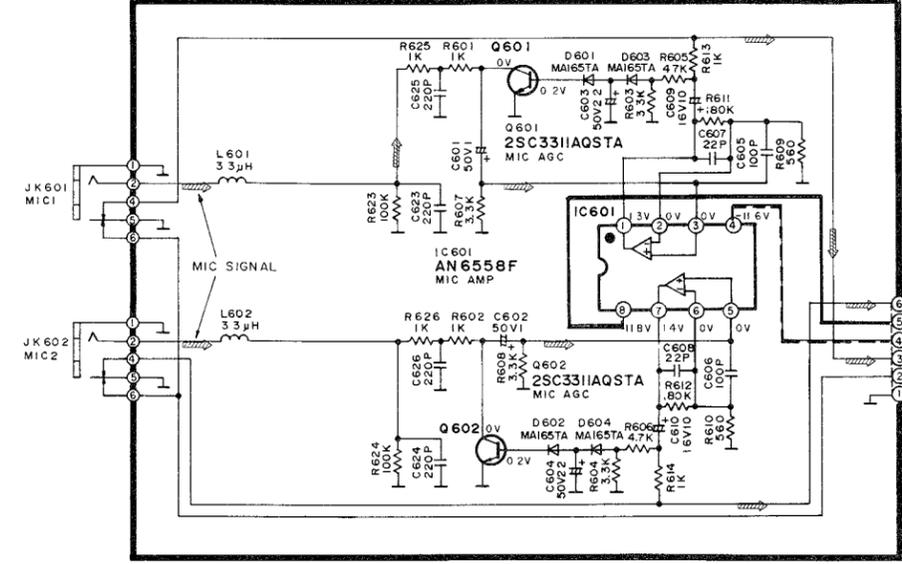
D MAIN CIRCUIT



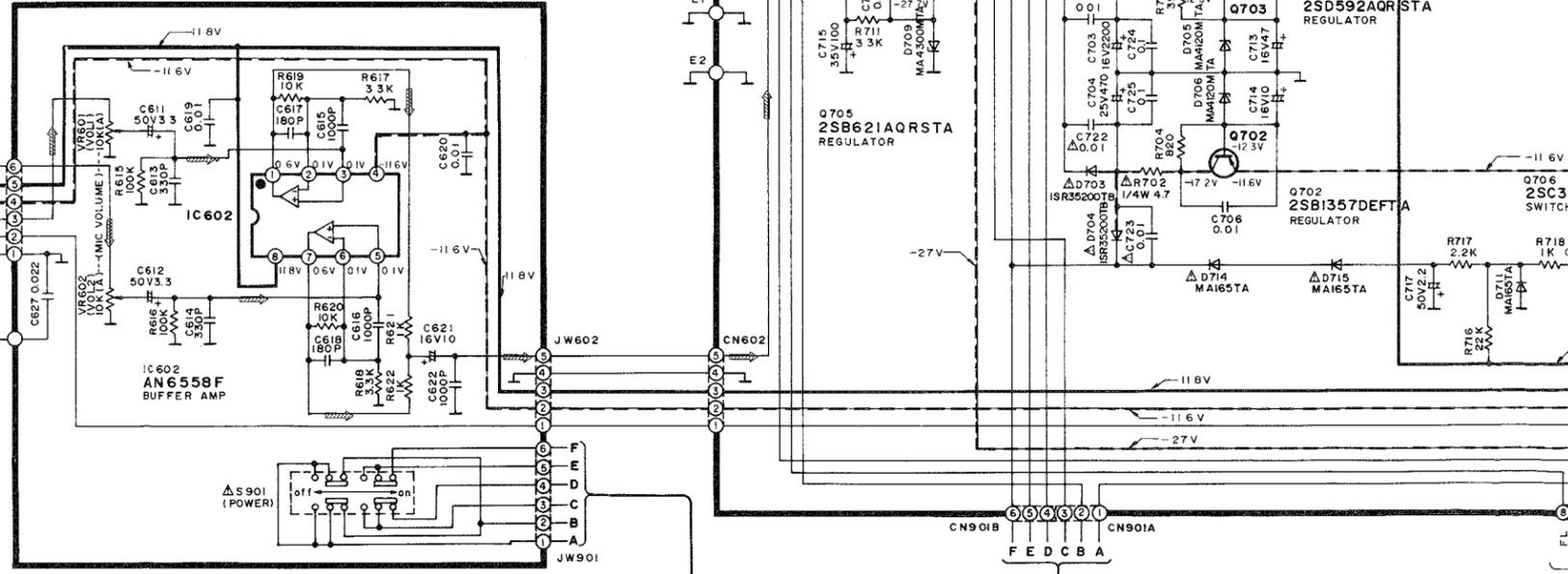
F POWER SUPPLY CIRCUIT For [E,EB,EG,GN] areas.

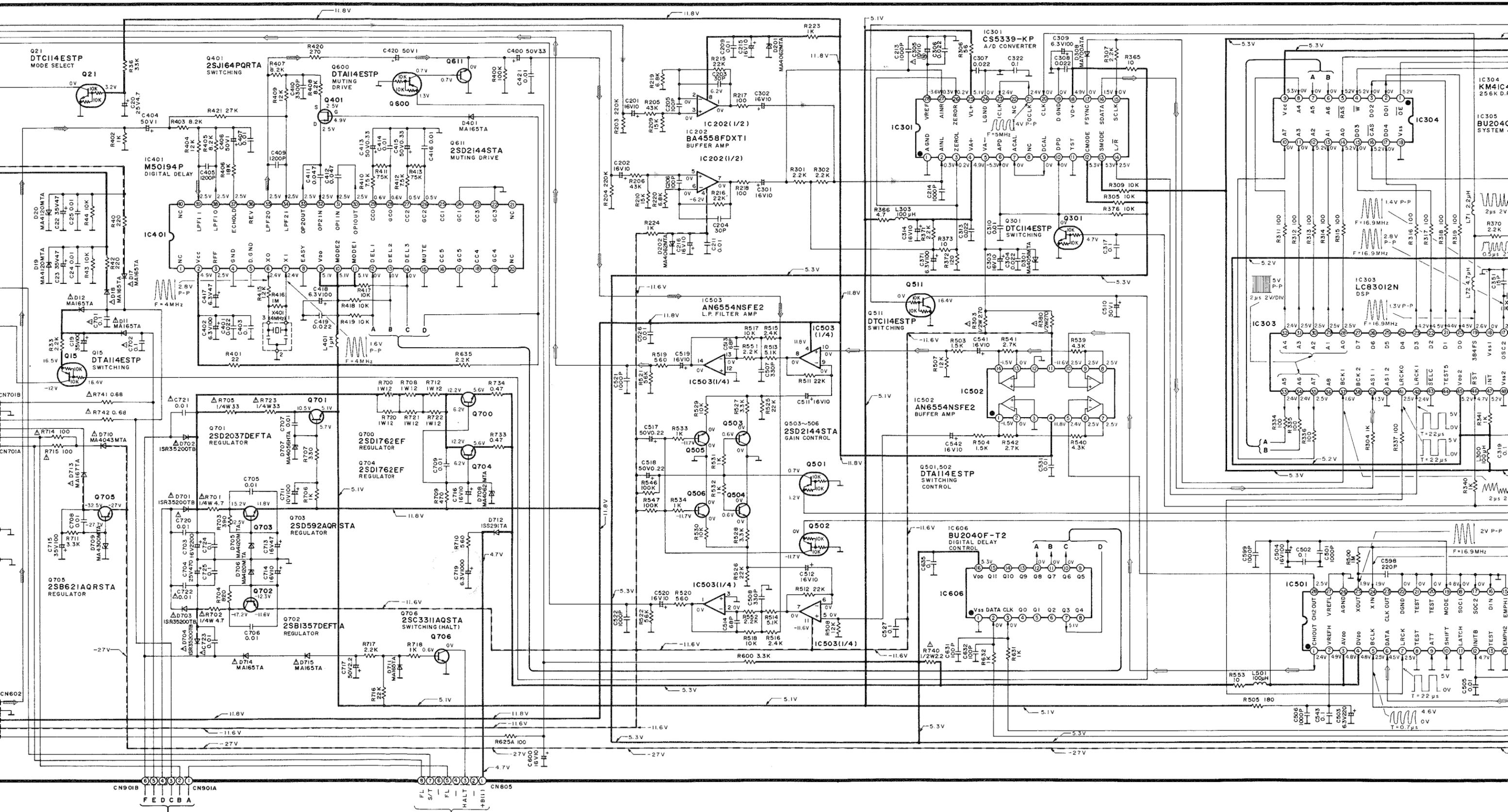


E MIC JACK CIRCUIT

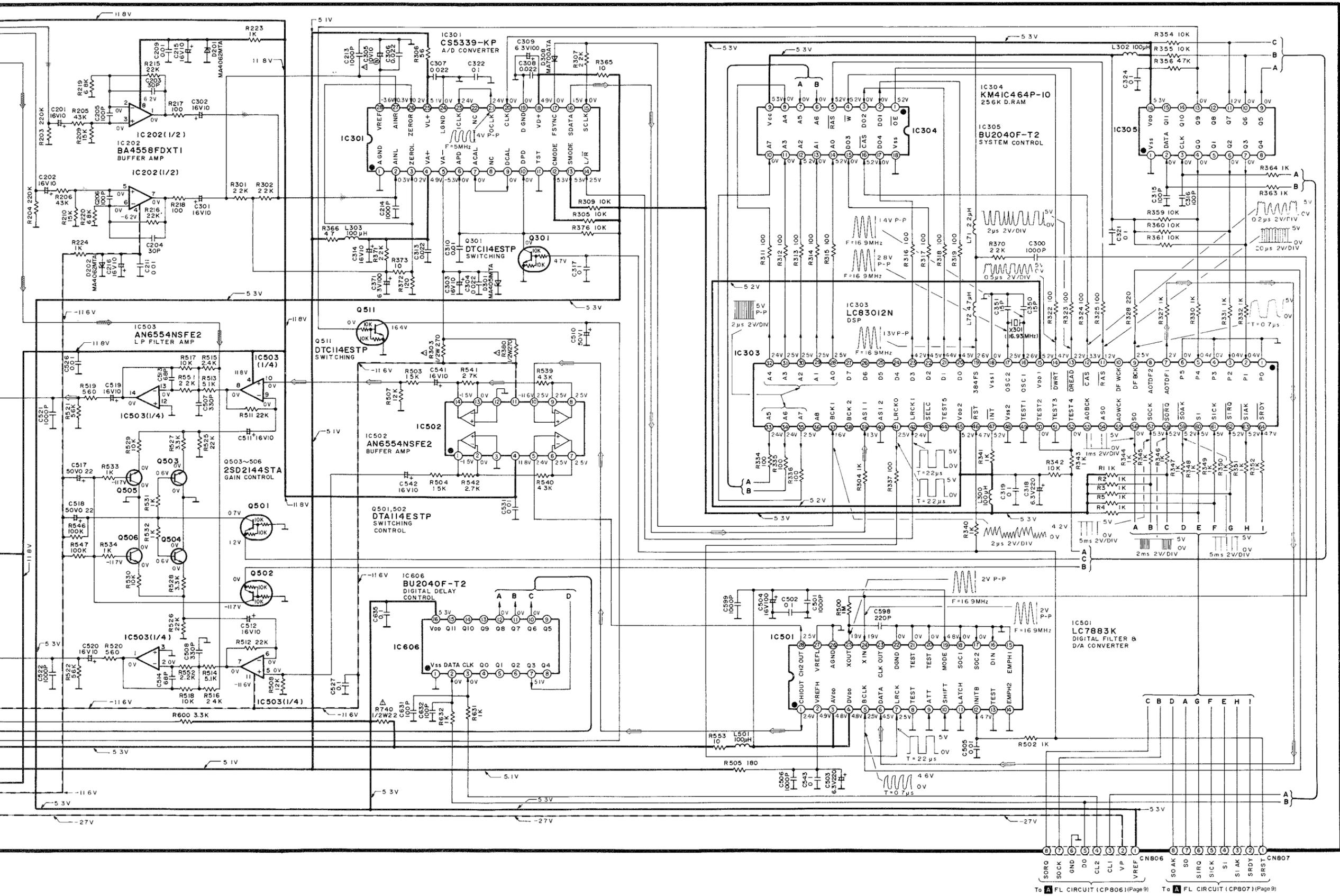


G POWER SWITCH/VOLUME CIRCUIT





Ta FL CIRCUIT (CPB05) (Page 9)

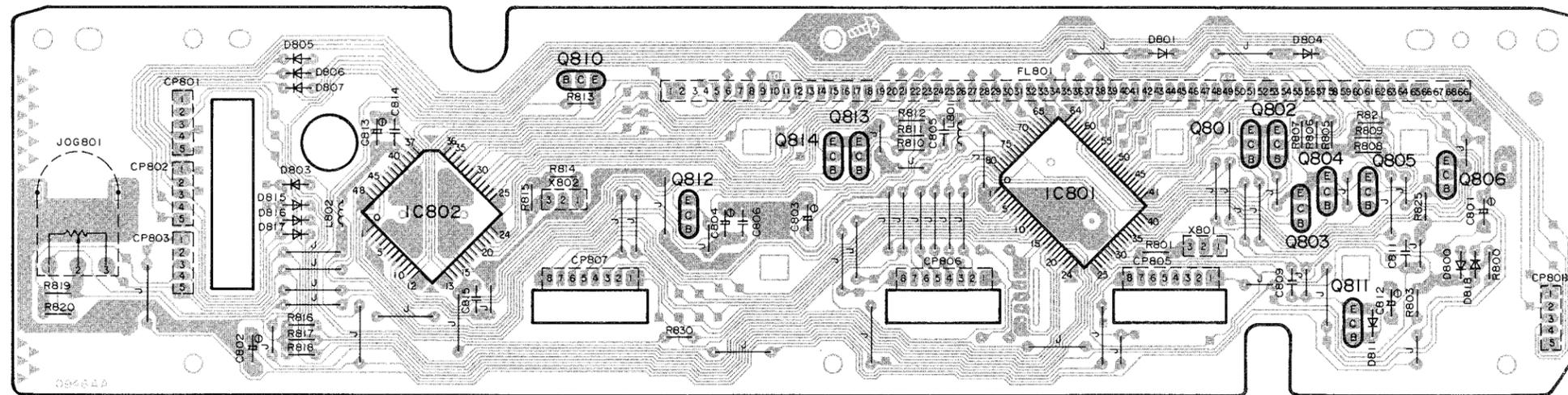


To A FL CIRCUIT (CP806) (Page 9) To A FL CIRCUIT (CP807) (Page 9)

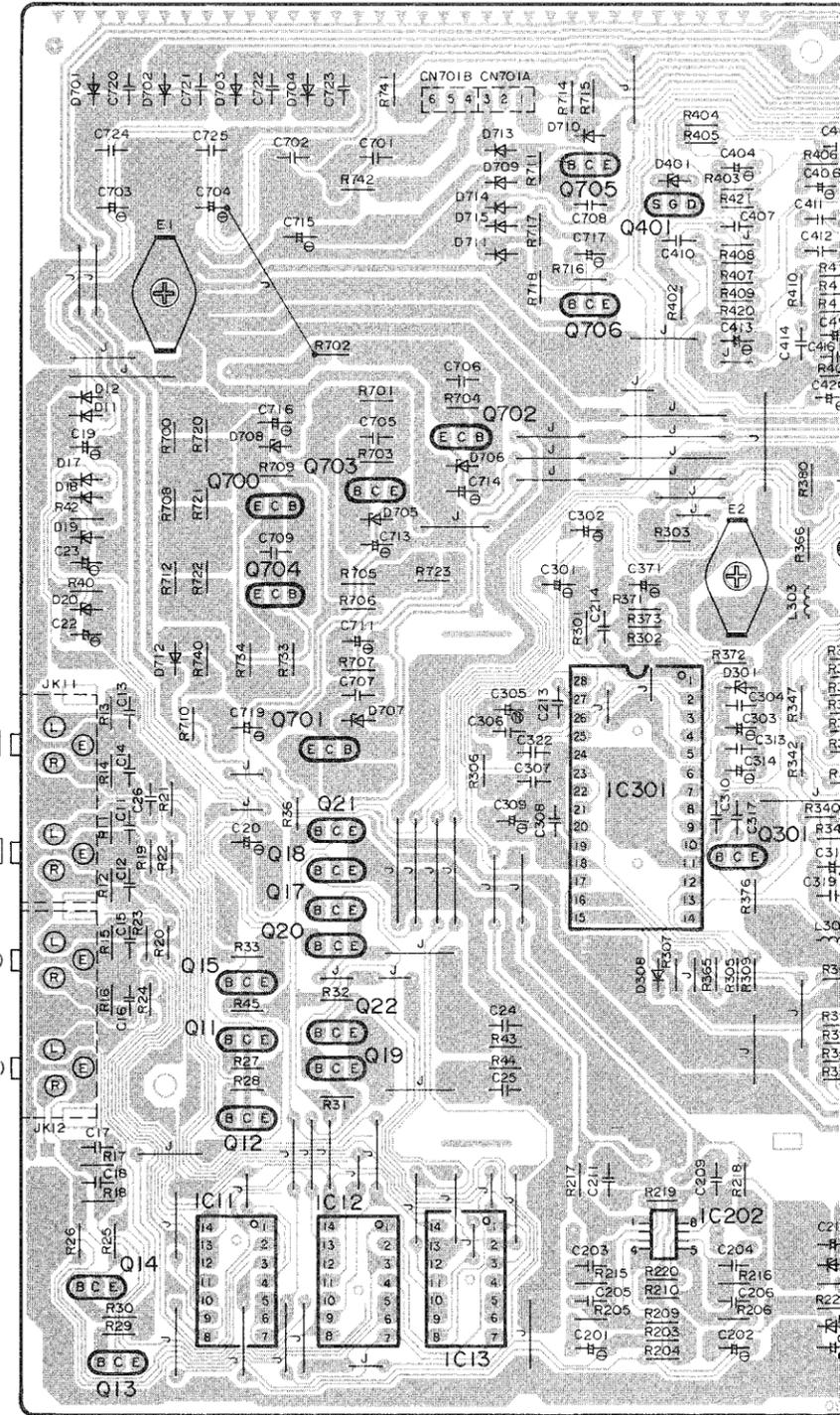
PRINTED CIRCUIT BOARD DIAGRAM

1 2 3 4 5 6 7 8 9 10

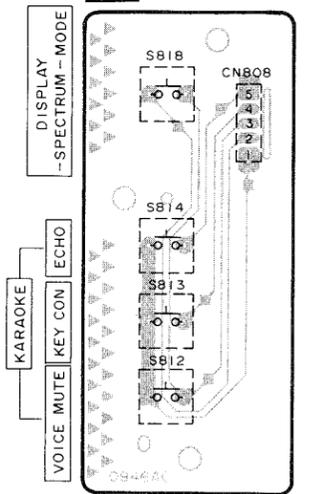
A FL P.C.B. (REP1460A-S)



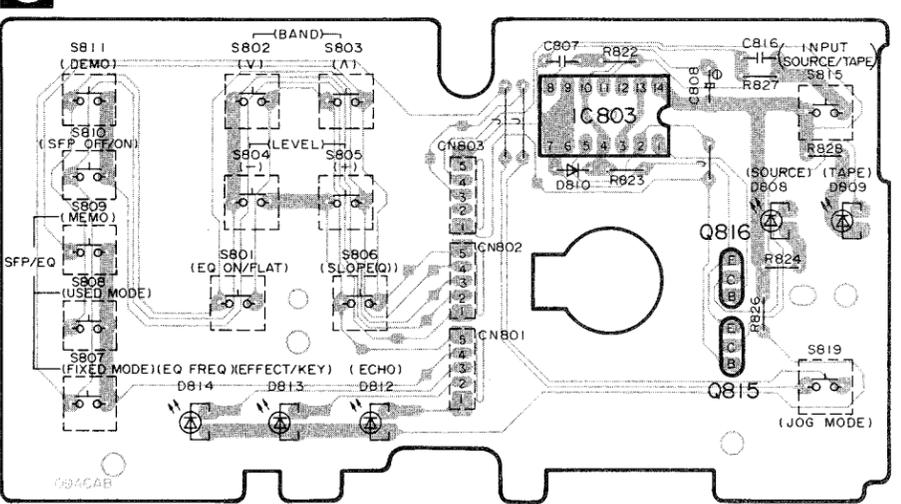
D MAIN P.C.B. (REP1461A-M)



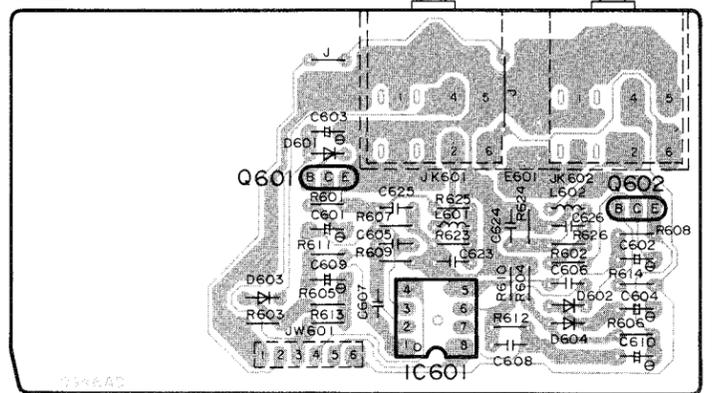
B KARAOKE P.C.B. (REP1460A-S)



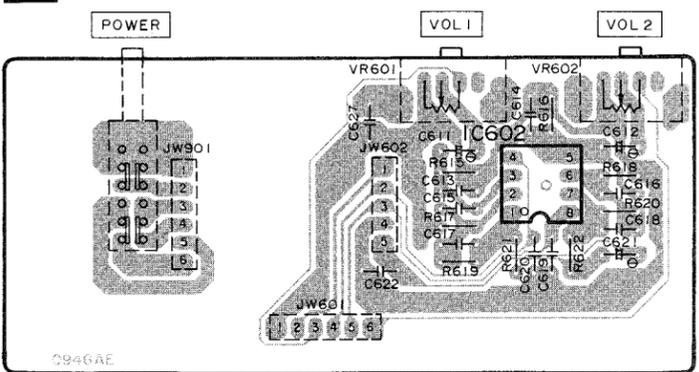
C OPERATION P.C.B. (REP1460A-S)



E MIC JACK P.C.B. (REP1460A-S)

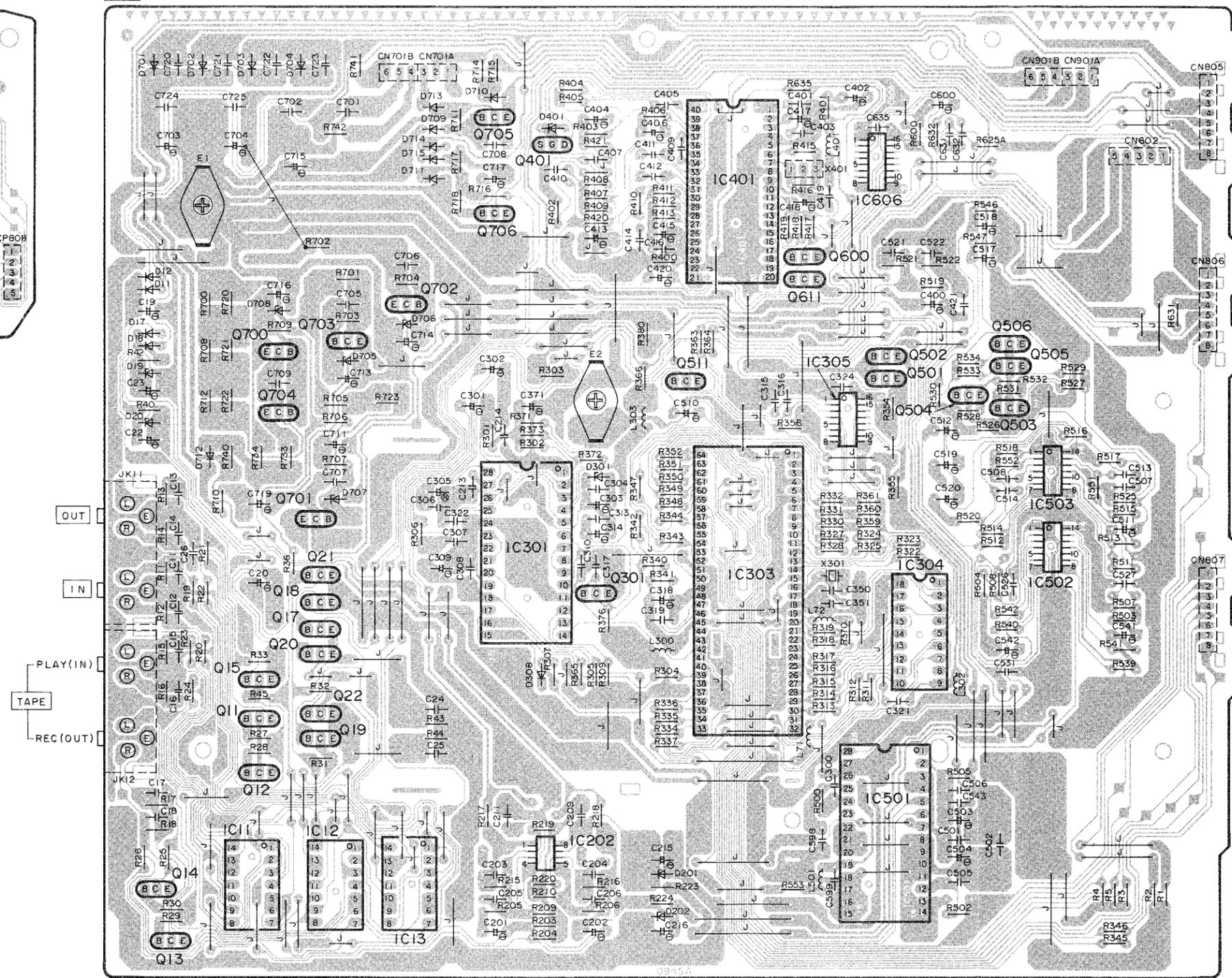


G POWER SWITCH/VOLUME P.C.B. (REP1460A-S)

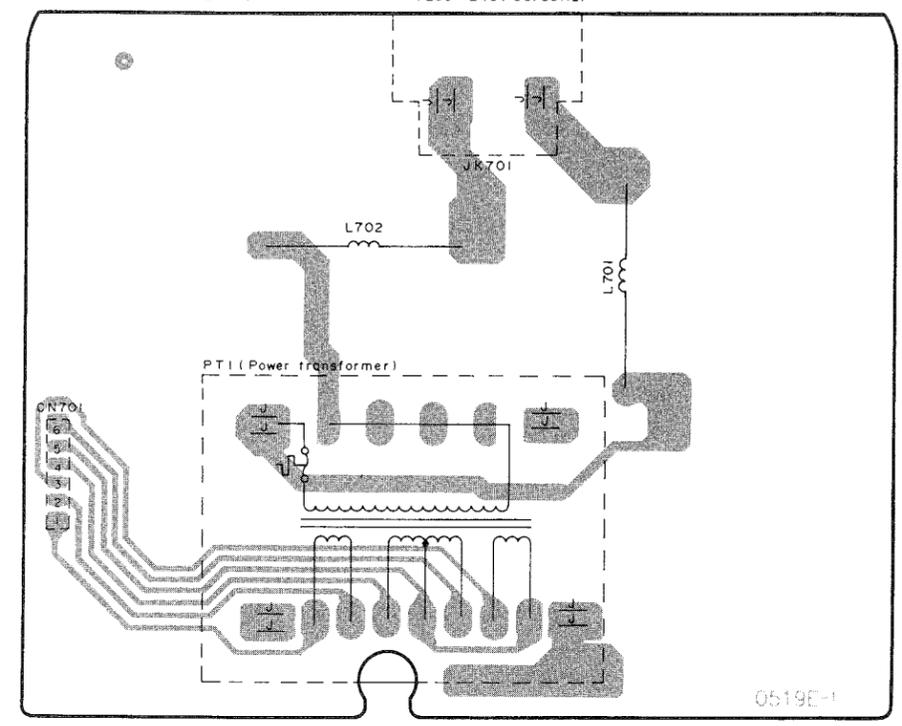


7 8 9 10 11 12 13 14 15 16 17

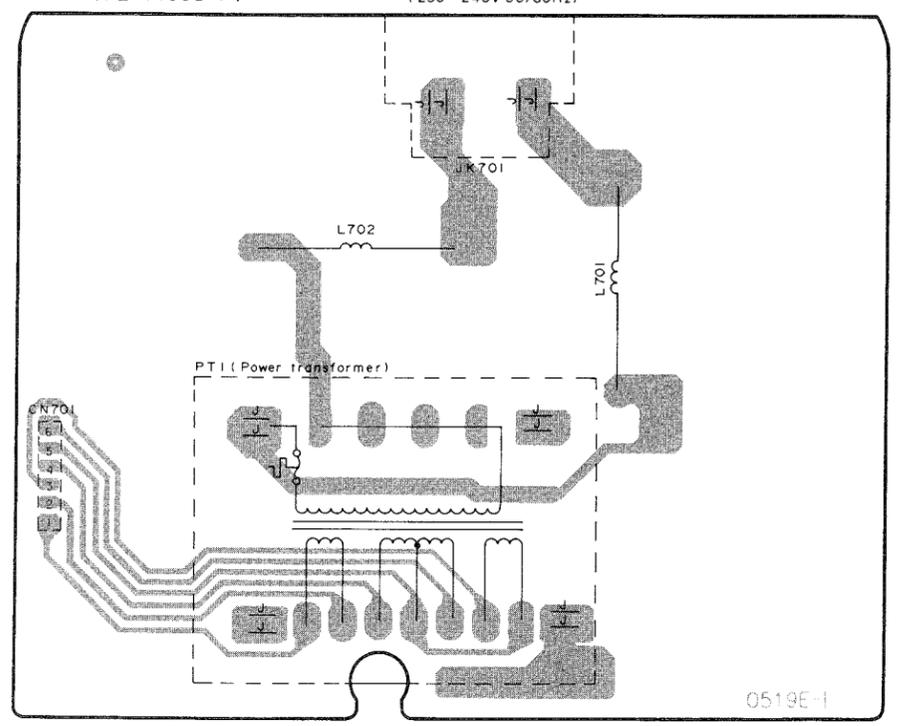
D MAIN P.C.B. (REPI461A-M)

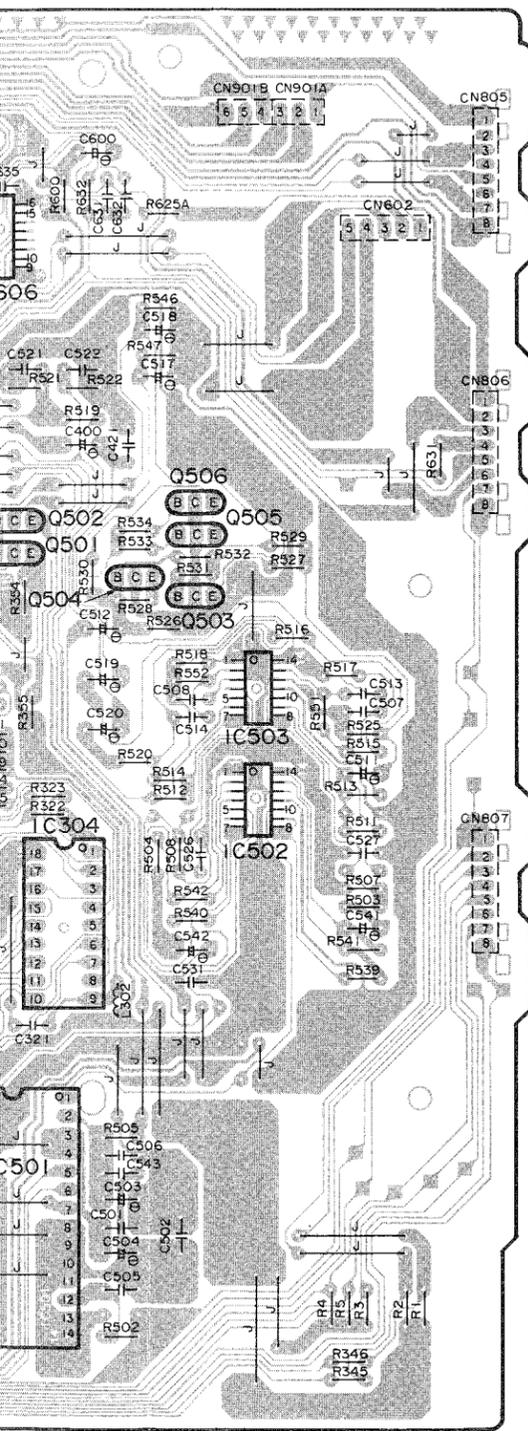


F POWER SUPPLY P.C.B. FOR (E, E B, EG) AREAS. (REPI463B-P)

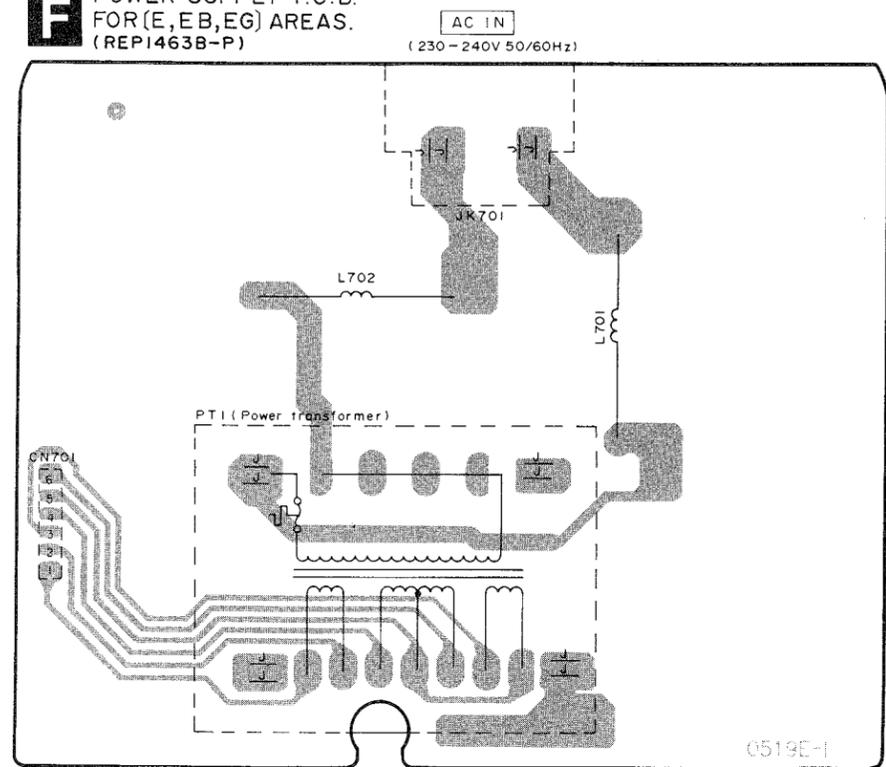


F POWER SUPPLY P.C.B. FOR (GN) AREA. (REPI463D-P)

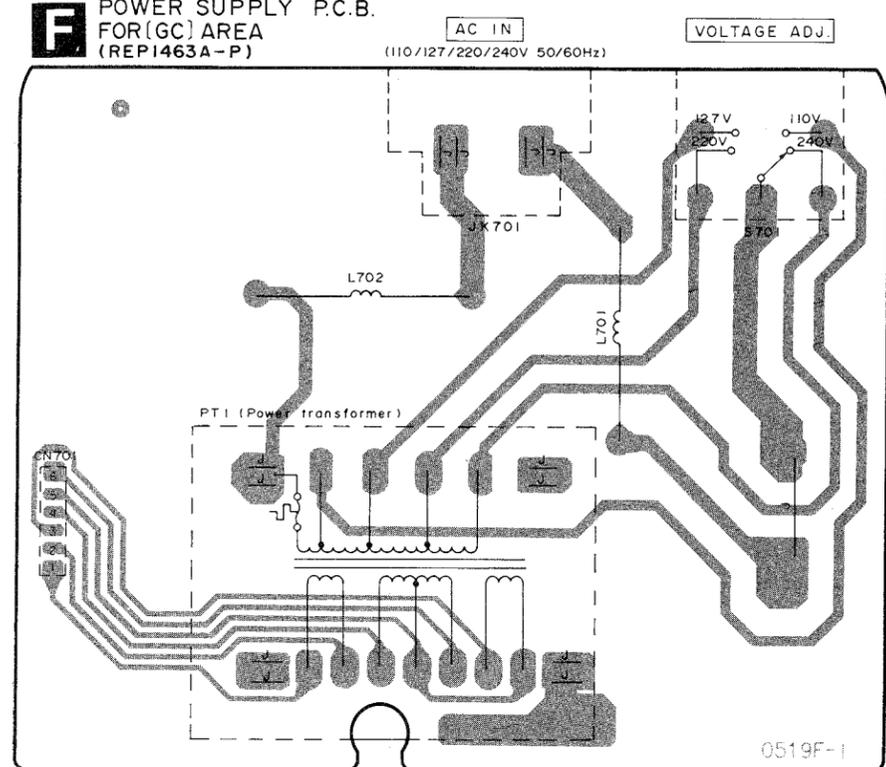




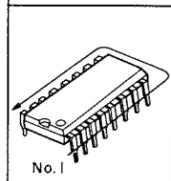
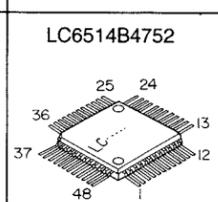
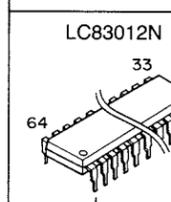
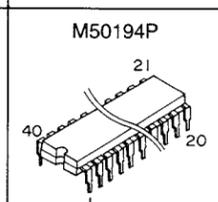
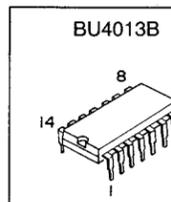
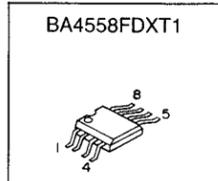
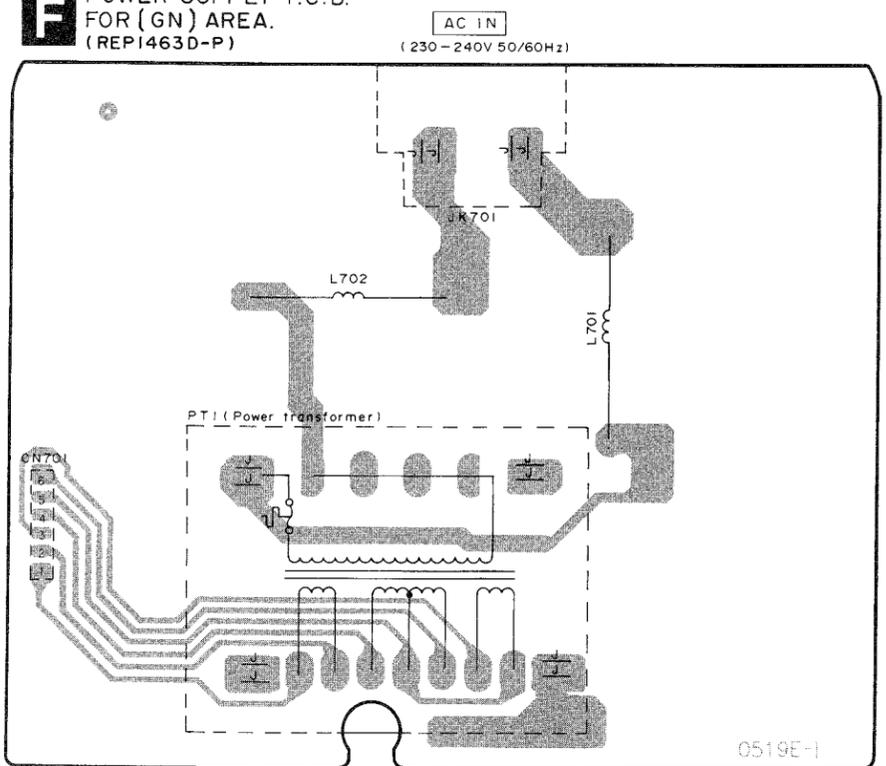
F POWER SUPPLY P.C.B.
FOR (E, E B, E G) AREAS.
(REP1463B-P)



F POWER SUPPLY P.C.B.
FOR (G C) AREA
(REP1463A-P)



F POWER SUPPLY P.C.B.
FOR (G N) AREA.
(REP1463D-P)



AN6558F	8 Pin
MLC4066BH	14 Pin
KM41C464P-10	18 Pin
CS5339-KP	28 Pin
LC7883K	28 Pin

 M38174M8128F No. 1	<table border="1"> <tr> <td>AN6554NSFE2</td> <td>14 Pin</td> </tr> <tr> <td>BU2040F-T2</td> <td>16 Pin</td> </tr> </table>	AN6554NSFE2	14 Pin	BU2040F-T2	16 Pin	 2SC3311AQSTA	 2SC3327ABTP
AN6554NSFE2	14 Pin						
BU2040F-T2	16 Pin						
 2SB621AQRSTA 2SD592AQRSTA	 2SD1762EF	 DTA114ESTP DTA144ESTP DTC114ESTP DTC114YSTP DTC144ESTP 2SD2144STA	 2SB1357DEFTA 2SD2037DEFTA	 2SJ164PQRSTA			
 Anode Cathode	1SR35200TB 1SS291TA MA165TA MA167TA MA700ATA	 Anode Cathode	MA4120MTA MA4300MTA	 Anode Cathode	MA4043MTA MA4051MTA MA4056HTA MA4062MTA		
 Anode Cathode	LN446YP-C LN846RP-C						

FUNCTION OF IC TERMINALS

IC303 (LC83012N)

Pin No.	Terminal Name	I/O	Function
1, 4, 6	P0, P3, P5	I/O	Not used (connect to GND)
2, 3, 5	P1, P2, P4	I	Mode signal input terminal
7	AOTDF1	O	Audio data output terminal
8	AOTDF2	O	Not used
9	DFBCK	O	Bit clock signal output terminal
10	DFWCK	O	Word clock signal output terminal
11	RAS	O	Random access signal output terminal
12	CAS	O	CAS signal output terminal
13	DREAD	O	Data read signal output terminal
14	DWRT	O	Data writing signal output terminal
15	V _{DD1}	I	Power supply (+5 V)
16	OSC1	I	Clock signal input terminal (384Fs)
17	OSC2	O	Not used
18	V _{SS1}	I	GND terminal
19	384FS	O	Not used
20~23	D0~D3	I/O	IC304 (DRAM) Data signal input/output terminal
24~27	D4~D7	I/O	Not used
28~35	A0~A7	O	IC304 (DRAM) Address data signal output terminal
36	A8	O	Not used
37	BCK1	I	Bit clock signal output terminal
38	BCK2	I	Bit clock signal output terminal
39	AS11	I	Audio data signal input terminal
40	AS12	I	Not used
41	LRCK0	O	L-R ch Identifier signal output terminal
42	LRCK1	I	L-R ch Identifier signal input terminal
43, 44	SELCTEST5	—	Not used
45	V _{DD2}	I	Power supply (+5 V)
46	RST	I	Reset terminal
47	INT	I	Interrupt signal input terminal
48	V _{SS2}	I	GND terminal
49~52	TEST1~TEST4	I	Not used
53~55	AOBCK ASO AOWCK	—	Not used
56	SO	O	8 bit serial data output terminal
57	SOCK	I	Serial clock signal input terminal
58	SORQ	I	Serial data control signal input terminal (request signal input)
59	SOAK	O	Precise (serial data output) control signal output terminal
60	SI	I	8 bit serial data input terminal
61	SICK	I	Serial clock signal input terminal
62	SIRQ	I	Serial data request signal input
63	SIACK	O	Precise (serial data input) control signal output terminal
64	SRDY	I	Ready signal input terminal

IC501 (LC7883K)

Pin No.	Terminal Name	I/O	Function
1	CH1OUT	O	DAC signal output (L-ch out)
2	VREFH	I	Reference voltage input
3	AV _{DD}	I	Analog power supply
4	DV _{DD}	I	Digital power supply
5	BCLK	I	Bit-clock signal input
6	DATA	I	Digital audio tape signal input
7	LRCK	I	L-R Clock signal input
8	TEST	I	Connected to GND
9	ATT	I	Connected to GND
10	SHIFT	I	Connected to GND
11	LATCH	I	Connected to GND
12	INITB	I	Initial signal input
13	TEST	I	Connected to GND
14, 15	EMPH2 EMPH1	I	Deemphasis institute signal input
16	DIN	—	Connected to GND
17	SOC2	—	Connected to GND
18	SOC1	—	Connected to GND
19	MODE	I	Mode select signal input
20	TEST	—	Connected to GND
21	TEST	—	Connected to GND
22	DGND	—	Connected to GND
23	CLK OUT	—	Not used
24, 25	XIN XOUT	I O	Clock signal input/output terminal
26, 27	AGND VREFL	—	Connected to GND
28	CH2OUT	O	DAC signal output (R-ch out)

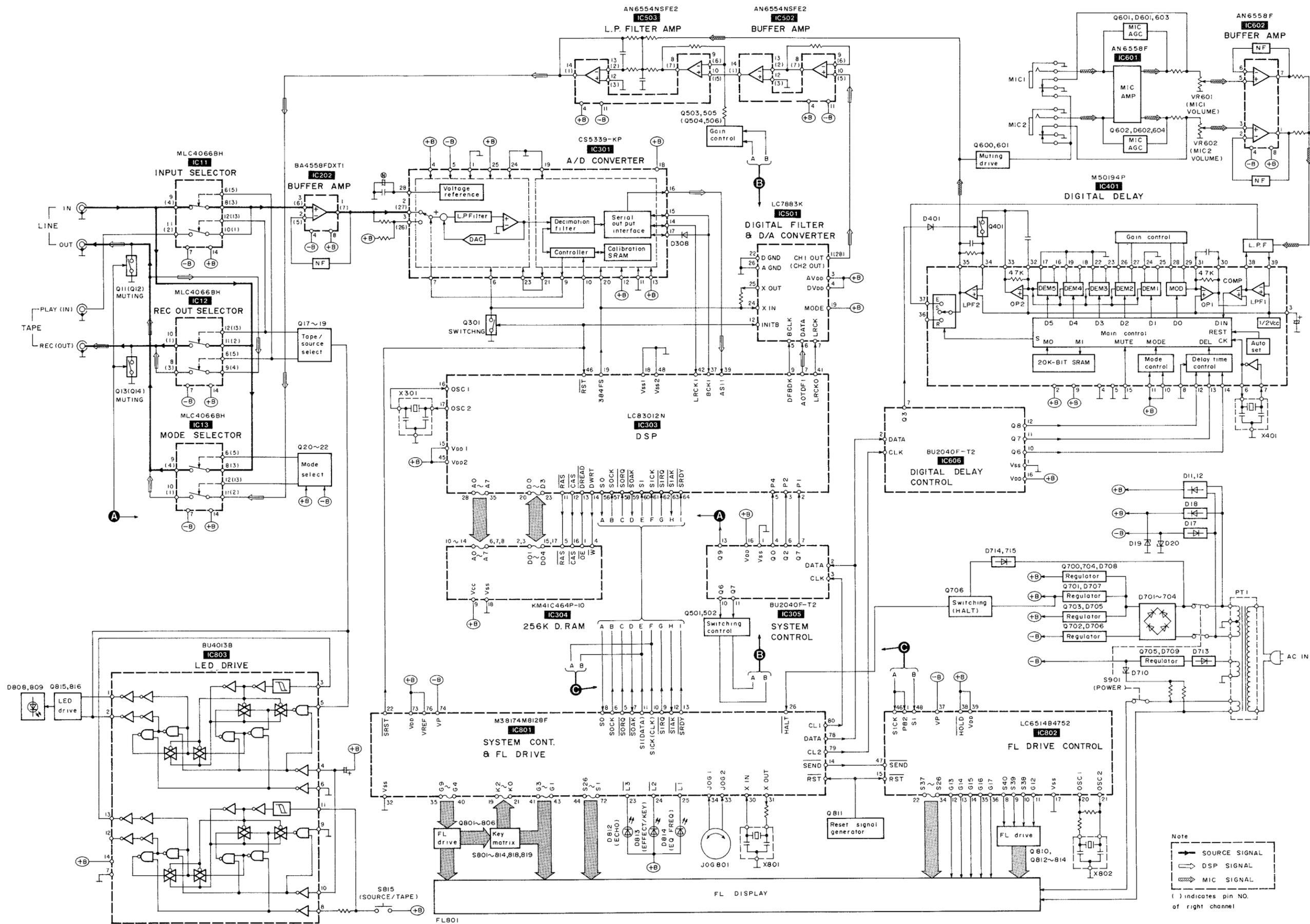
IC801 (M38174M8128F)

Pin No.	Terminal Name	I/O	Function
1	—	—	Connected to GND
2	—	—	Connected to GND
3	—	—	Connected to GND
4	—	—	Connected to GND
5~9	SORQ, SOCK, SOAK, SO, SIRQ	I/O	Display control signal input-output terminal
10~13	SICK (CLK), SI (DATA), SIACK, SRDY	I/O	Display control signal, data signal and clock signal input-output terminal
14	SEND	O	Display control signal output
15	BDI	—	Not used
16	BCI	—	Not used
17	BDO	—	Not used
18	BCO	—	Not used
19~21	K2~K0	I	Key scan signal input terminal
22	SRST	O	System reset signal output
23~25	L3, L2, L1	O	JOG mode display control signal output
26	HALT	I	Backup detect signal input
27	RST	I	Reset signal input terminal
28	—	—	Connected to GND
29	—	—	Not used
30, 31	X I X O	I O	Crystal oscillator (X801 6 MHz) connect terminal
32	V _{SS}	I	GND terminal
33, 34	JOG2 JOG1	I	JOG Encoder signal input terminal
35	G9	O	FL Grid control signal output
36~43	G8~G4, G3~G1	O	FL Grid control signal and key scan control signal output
44~56	S26~S14	O	FL Segment control signal output
57~59	G12~G10	O	FL Grid control signal output
60~72	S13~S1	O	FL Segment control signal output
73	V _{DD}	I	Power supply (+5 V)
74	-VP	I	FL Pull-up voltage input
75	A. GND	I	GND terminal
76	VREF	I	A/D Converter reference voltage input terminal
77	ST	O	Strobe signal output terminal
78	DO	O	Data signal output terminal
79, 80	CL2 CL1	O	Clock signal output terminal

IC802 (LC6514B4752)

Pin No.	Terminal Name	I/O	Function
1, 46	PB2, SICK	I	Clock signal input terminal
2, 3	—	—	Connected to GND
4, 5	G18 G19	—	Not used
6, 7	NC S14	—	Not used
8~10	S40~S38	O	FL Segment control signal output terminal
11	G12	O	FL Grid control signal output terminal
12~14	G13~G15	O	FL Grid control signal output terminal
15	RST	I	Reset terminal
16	TST	I	Not used
17	V _{SS}	I	GND terminal
18, 19	NC	—	Not used
20, 21	OSC1 OSC2	I O	Crystal oscillator (X802 3 MHz) connect terminal
22~25	S37~S34	O	FL Segment control signal output terminal
26~29	S33~S30	O	FL Grid control signal output terminal
30	NC	—	Not used
31~34	S29~S26	O	FL Segment control signal output terminal
35, 36	G16 G17	O	FL Grid control signal output terminal
37	VP	I	FL Pull-down voltage input
38	HOLD	I	Connect V _{DD}
39	V _{DD}	I	Power supply (+5 V)
40, 41	PA0 PA1	—	Connected to GND
42, 43	NC	—	Not used
44, 45	PA2 PA3	—	Connected to GND
47	SEND	I	Display control signal input
48	SI	I	Serial data input terminal

■ BLOCK DIAGRAM

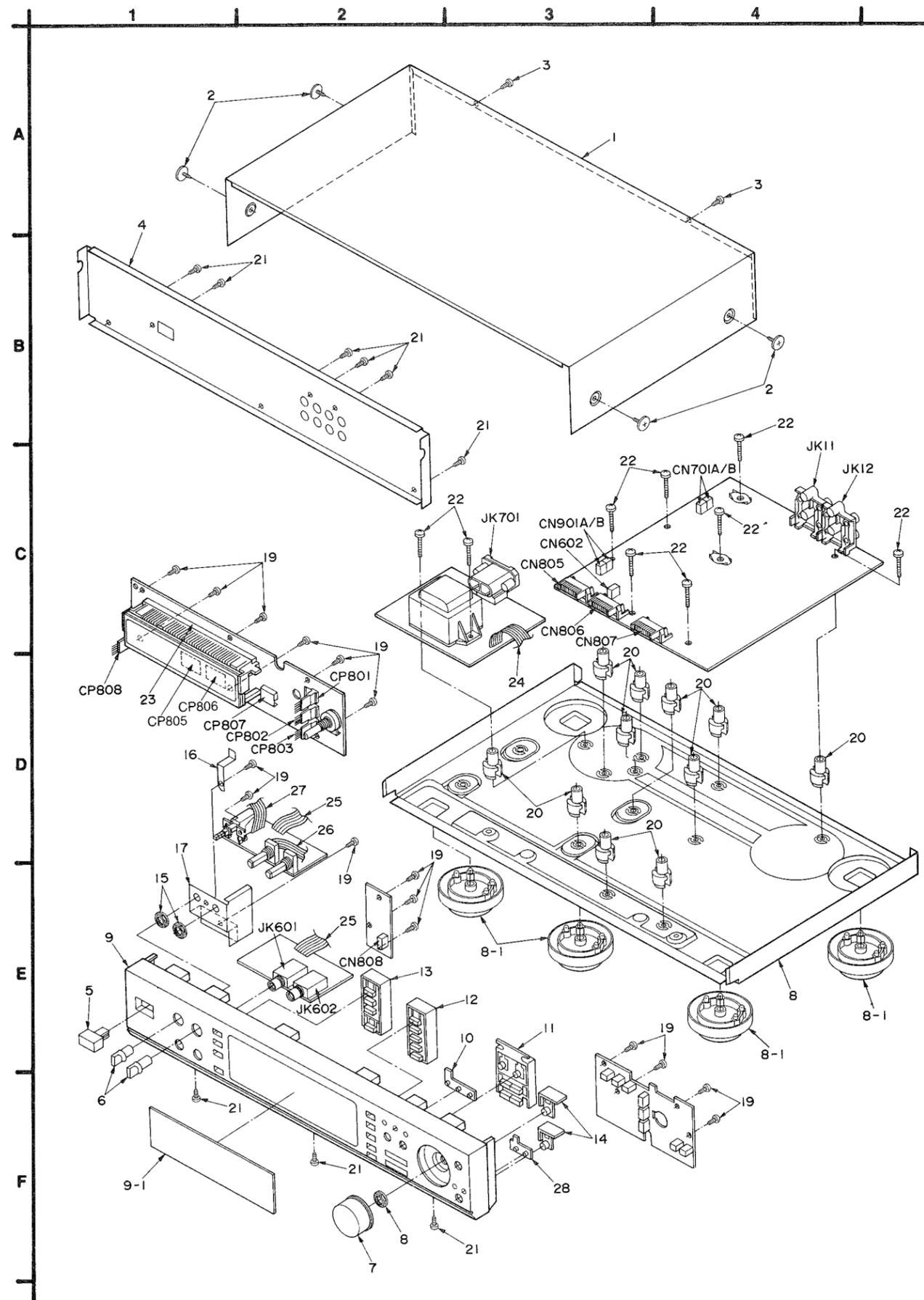


Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R402	ERDS2TJ102	1/4W 1K	R625A	ERDS2TJ101	1/4W 100
R1-5	ERDS2TJ102	1/4W 1K	R403	ERDS2TJ822	1/4W 8.2K	R625	ERDS2TJ102	1/4W 1K
R11-18	ERDS2TJ224T	1/4W 220K	R404	ERDS2TJ123	1/4W 12K	R626	ERDS2TJ102	1/4W 1K
R19-30	ERDS2TJ102	1/4W 1K	R405	ERDS2TJ822	1/4W 8.2K	R631, 632	ERDS2TJ102	1/4W 1K
R31, 32	ERDS2TJ224T	1/4W 220K	R406	ERDS2TJ183T	1/4W 18K	R635	ERDS2TJ222	1/4W 2.2K
R33	ERDS2TJ222	1/4W 2.2K	R407, 408	ERDS2TJ822	1/4W 8.2K	R700	ERG1SJ120E	1W 12
R36	ERDS2TJ333	1/4W 33K	R409	ERDS2TJ123	1/4W 12K	R701, 702	ERD2FCVJ4R7T	1/4W 4.7 Δ
R40	ERDS2TJ221	1/4W 220	R410	ERDS2TJ752T	1/4W 7.5K	R703	ERDS2TJ391	1/4W 390
R42	ERDS2TJ221	1/4W 220	R411	ERDS2TJ753T	1/4W 75K	R704	ERDS2TJ821	1/4W 820
R43, 44	ERDS2TJ103	1/4W 10K	R412	ERDS2TJ752T	1/4W 7.5K	R705	ERD25FJ330	1/4W 33 Δ
R45	ERDS2TJ104	1/4W 100K	R413	ERDS2TJ753T	1/4W 75K	R706	ERDS2TJ102	1/4W 1K
R203, 204	ERDS2TJ224T	1/4W 220K	R415	ERDS2TJ122	1/4W 1.2K	R707	ERDS2TJ331	1/4W 330
R205, 206	ERDS2TJ433	1/4W 43K	R416	ERDS2TJ105T	1/4W 1M	R708	ERG1SJ120E	1W 12
R209, 210	ERDS2TJ153	1/4W 15K	R417-419	ERDS2TJ103	1/4W 10K	R709	ERDS2TJ471	1/4W 470
R215, 216	ERDS2TJ223	1/4W 22K	R420	ERDS2TJ271	1/4W 270	R710	ERDS2TJ561	1/4W 560
R217, 218	ERDS2TJ101	1/4W 100	R421	ERDS2TJ273	1/4W 27K	R711	ERDS2TJ332	1/4W 3.3K
R219, 220	ERDS2TJ682T	1/4W 6.8K	R500	ERDS2TJ105T	1/4W 1M	R712	ERG1SJ120E	1W 12
R223, 224	ERDS2TJ102	1/4W 1K	R502	ERDS2TJ102	1/4W 1K	R714, 715	ERDS2TJ101	1/4W 100
R301, 302	ERDS2TJ222	1/4W 2.2K	R503, 504	ERDS2TJ152	1/4W 1.5K	R716	ERDS2TJ223	1/4W 22K
R303	ERDS1FVJ271T	1/2W 270 Δ	R505	ERDS2TJ181T	1/4W 180	R717	ERDS2TJ222	1/4W 2.2K
R304	ERDS2TJ102	1/4W 1K	R507, 508	ERDS2TJ123	1/4W 12K	R718	ERDS2TJ102	1/4W 1K
R305	ERDS2TJ103	1/4W 10K	R511, 512	ERDS2TJ223	1/4W 22K	R720-722	ERG1SJ120E	1W 12
R306	ERDS2TJ560T	1/4W 56	R513, 514	ERDS2TJ512T	1/4W 5.1K	R723	ERD25FJ330	1/4W 33 Δ
R307	ERDS2TJ222	1/4W 2.2K	R515, 516	ERDS2TJ242	1/4W 2.4K	R733, 734	ERDS2TJR47T	1/4W 0.47
R309	ERDS2TJ103	1/4W 10K	R517, 518	ERDS2TJ103	1/4W 10K	R740	ERDS1FVJ2R2T	1/2W 2.2 Δ
R311-319	ERDS2TJ101	1/4W 100	R519, 520	ERDS2TJ561	1/4W 560	R741, 742	ERQ16NKR68E	1W 0.68 Δ
R322-325	ERDS2TJ101	1/4W 100	R521, 522	ERDS2TJ563	1/4W 56K	R800	ERDS2TJ223	1/4W 22K
R327	ERDS2TJ102	1/4W 1K	R525, 526	ERDS2TJ223	1/4W 22K	R801	ERDS2TJ122	1/4W 1.2K
R328	ERDS2TJ221	1/4W 220	R527, 528	ERDS2TJ332	1/4W 3.3K	R803	ERDS2TJ103	1/4W 10K
R330-332	ERDS2TJ102	1/4W 1K	R529, 530	ERDS2TJ103	1/4W 10K	R805-813	ERDS2TJ104	1/4W 100K
R334-337	ERDS2TJ101	1/4W 100	R531-534	ERDS2TJ102	1/4W 1K	R814	ERDS2TJ122	1/4W 1.2K
R340, 341	ERDS2TJ102	1/4W 1K	R539, 540	ERDS2TJ432T	1/4W 4.3K	R815	ERDS2TJ105T	1/4W 1M
R342	ERDS2TJ103	1/4W 10K	R541, 542	ERDS2TJ272T	1/4W 2.7K	R816-818	ERDS2TJ103	1/4W 10K
R343-352	ERDS2TJ102	1/4W 1K	R546, 547	ERDS2TJ104	1/4W 100K	R819, 820	ERDS2TJ153	1/4W 15K
R354, 355	ERDS2TJ103	1/4W 10K	R551, 552	ERDS2TJ222	1/4W 2.2K	R821, 822	ERDS2TJ104	1/4W 100K
R356	ERDS2TJ472	1/4W 4.7K	R553	ERDS2TJ100	1/4W 10	R823	ERDS2TJ824	1/4W 820K
R359-361	ERDS2TJ103	1/4W 10K	R600	ERDS2TJ332	1/4W 3.3K	R824	ERDS2TJ271	1/4W 270
R363, 364	ERDS2TJ102	1/4W 1K	R601, 602	ERDS2TJ102	1/4W 1K	R825	ERDS2TJ103	1/4W 10K
R365	ERDS2TJ100	1/4W 10	R603, 604	ERDS2TJ332	1/4W 3.3K	R826	ERDS2TJ221	1/4W 220
R366	ERDS2TJ4R7T	1/4W 4.7	R605, 606	ERDS2TJ472	1/4W 4.7K	R827	ERDS2TJ104	1/4W 100K
R370, 371	ERDS2TJ222	1/4W 2.2K	R607, 608	ERDS2TJ332	1/4W 3.3K	R828	ERDS2EJ121	1/4W 120
R372	ERDS2EJ121	1/4W 120	R609, 610	ERDS2TJ561	1/4W 560	R830	ERDS2TJ103	1/4W 10K
R373	ERDS2TJ100	1/4W 10	R611, 612	ERDS2TJ184T	1/4W 180K			CAPACITORS
R376	ERDS2TJ103	1/4W 10K	R613, 614	ERDS2TJ102	1/4W 1K			
R380	ERDS1FVJ271T	1/2W 270 Δ	R615, 616	ERDS2TJ104	1/4W 100K	C11-18	ECBT1H101KB5	50V 100P
R400	ERDS2TJ104	1/4W 100K	R617, 618	ERDS2TJ332	1/4W 3.3K	C19	ECA1VM101B	35V 100U
R401	ERDS2TJ220T	1/4W 22	R619, 620	ERDS2TJ103	1/4W 10K	C20	ECEA1EKA4R7B	25V 4.7U
			R621, 622	ERDS2TJ102	1/4W 1K	C22, 23	ECEA1VU470	35V 47U
			R623, 624	ERDS2TJ104	1/4W 100K			

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C24-26	ECBT1E103ZF	25V 0.01U	C507, 508	ECBT1H331KB5	50V 330P	C814-816	ECBT1E103ZF	25V 0.01U
C201, 202	ECEA1CKA100B	16V 10U	C510	ECEA1HKA010B	50V 1U			
C203, 204	ECBT1H300J5	50V 30P	C511, 512	ECEA1CKA100B	16V 10U			
C205, 206	ECBT1H101KB5	50V 100P	C513, 514	ECBT1H680J5	50V 68P			
C209	ECBT1E103ZF	25V 0.01U	C517, 518	ECEA1HKA22B	50V 0.22U			
C211	ECBT1E103ZF	25V 0.01U	C519, 520	ECEA1CKA100B	16V 10U			
C213, 214	ECBT1H102KB5	50V 1000P	C521, 522	ECBT1H102KB5	50V 1000P			
C215, 216	ECEA1CKA100B	16V 10U	C526	ECBT1E103ZF	25V 0.01U			
C300	ECBT1H102KB5	50V 1000P	C527	ECBT1H104ZF5	50V 0.1U			
C301-303	ECEA1CKA100B	16V 10U	C531	ECBT1E103ZF	25V 0.01U			
C304	ECBT1E223ZF	25V 0.022U	C541, 542	ECEA1CKA100B	16V 10U			
C305	ECEA1AKN100B	10V 10U Δ	C543	ECBT1H104ZF5	50V 0.1U			
C306-308	ECBT1E223ZF	25V 0.022U	C598	ECBT1H221KB5	50V 220P			
C309	ECEA0JKA101B	6.3V 100U	C599	ECBT1H102KB5	50V 1000P			
C310	ECBT1E103ZF	25V 0.01U	C600	ECEA1CKA100B	16V 10U			
C313	ECBT1E223ZF	25V 0.022U	C601, 602	ECEA1HKA010B	50V 1U			
C314	ECEA1CKA100B	16V 10U	C603, 604	ECEA1HKA2R2B	50V 2.2U			
C315, 316	ECBT1H101KB5	50V 100P	C605, 606	ECBT1H101KB5	50V 100P			
C317	ECBT1H104ZF5	50V 0.1U	C607, 608	ECBT1H220J5	50V 22P			
C318	ECEA0JKA221B	6.3V 220U	C609, 610	ECEA1CKA100B	16V 10U			
C319	ECBT1H104ZF5	50V 0.1U	C611, 612	ECEA1HKA3R3B	50V 3.3U			
C321	ECBT1H104ZF5	50V 0.1U	C613, 614	ECBT1H331KB5	50V 330P			
C322	ECQV1H104JM3	50V 0.1U	C615, 616	ECBT1H102KB5	50V 1000P			
C324	ECBT1H104ZF5	50V 0.1U	C617, 618	ECBT1H181KB5	50V 180P			
C350, 351	ECBT1H150J5	50V 15P	C619, 620	ECBT1E103ZF	25V 0.01U			
C371	ECEA0JKA101B	6.3V 100U	C621	ECEA1CKA100B	16V 10U			
C400	ECEA1HKA3R3B	50V 3.3U	C622	ECBT1H102KB5	50V 1000P			
C401	ECBT1E223ZF	25V 0.022U	C623-626	ECBT1H221KB5	50V 220P			
C402	ECEA0JKA101B	6.3V 100U	C627	ECBT1E223ZF	25V 0.022U			
C403	ECBT1H104ZF5	50V 0.1U	C631, 632	ECBT1H101KB5	50V 100P			
C404	ECEA1HKA010B	50V 1U	C635	ECBT1H104ZF5	50V 0.1U			
C405	ECBT1C122KR5	16V 1200P	C701, 702	ECQV1H104JM3	50V 0.1U Δ			
C406	ECEA1HKA010B	50V 1U	C703	ECA1CM222E	16V 2200U			
C407	ECBT1C103KS5	16V 0.01U	C704	ECA1EM471B	25V 470U			
C409	ECBT1C122KR5	16V 1200P	C705-709	ECKR1H103ZF5	50V 0.01U			
C410	ECBT1H332KR5	50V 3300P	C711	ECEA1AKA101B	10V 100U			
C411, 412	ECFR1E473KR	25V 0.047U	C713	ECEA1CKA470B	16V 47U			
C413	ECEA1HKA3R3B	50V 0.33U	C714	ECEA1CKA100B	16V 10U			
C414	ECBT1E103ZF	25V 0.01U	C715	ECA1VM101B	35V 100U			
C415	ECEA1HKA3R3B	50V 0.33U	C716	ECEA1CKA100B	16V 10U			
C416	ECBT1E103ZF	25V 0.01U	C717	ECEA1HKA2R2B	50V 2.2U			
C417	ECEA0JKA470B	6.3V 47U	C719	ECA0JM102B	6.3V 1000U			
C418	ECEA0JKA101B	6.3V 100U	C720-723	ECBT1E103ZF	25V 0.01U Δ			
C419	ECBT1E223ZF	25V 0.022U	C724, 725	ECQV1H104JM3	50V 0.1U			
C420	ECEA1HKA010B	50V 1U	C801, 802	ECEA1HKA010B	50V 1U Δ			
C421	ECBT1E103ZF	25V 0.01U	C803, 804	ECEA0JKA101B	6.3V 100U			
C501	ECBT1H102KB5	50V 1000P	C805-807	ECBT1E103ZF	25V 0.01U			
C502	ECQV1H104JM3	50V 0.1U	C808	ECEA1HKA010B	50V 1U			
C503	ECEA0JKA221B	6.3V 220U	C809	ECBT1E103ZF	25V 0.01U			
C504	ECEA1CKA101B	16V 100U	C811	ECBT1E103ZF	25V 0.01U			
C505	ECBT1E103ZF	25V 0.01U	C812	ECEA1HKA2R2B	50V 2.2U			
C506	ECBT1H102KB5	50V 1000P	C813	ECEA0JKA101B	6.3V 100U			

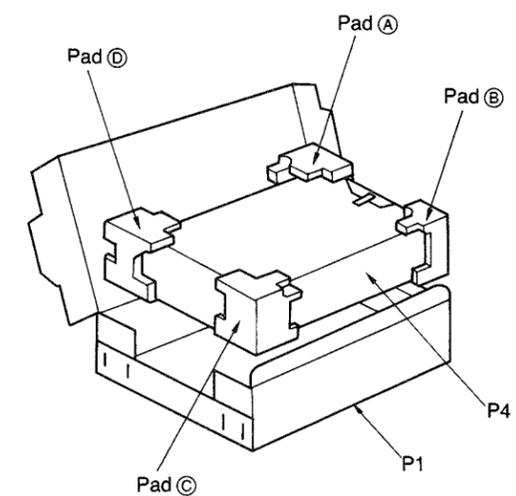
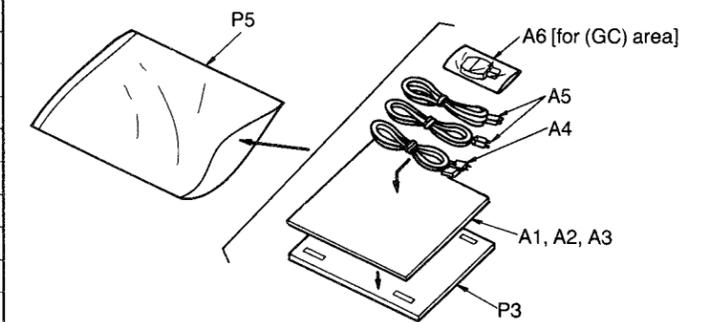
■ CABINET PARTS LOCATION



Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	RQM0078-1K	CABINET	
2	SNE2129-1	SCREW	
3	XTBS3+8JFZ1	SCREW	
4	RGR0151A-B1	REAR PANEL	(E)
4	RGR0151A-C1	REAR PANEL	(EB)
4	RGR0151A-A1	REAR PANEL	(EG)
4	RGR0151B-A1	REAR PANEL	(GC)
4	RGR0151A-C1	REAR PANEL	(GN)
5	RGU0030	POWER BUTTON	
6	RGW0048	MIC VOLUME KNOB	
7	RGW0155-K	JOG CONTROL KNOB	
8	RFKJHGE90E-K	BOTTOM BORAD ASS'Y	
8-1	RKA0053-A	FOOT	
9	RFKJHGE90E-K	FRONT PANEL ASS'Y	
9-1	RKW0231-K	FL. PANEL	
10	RFKNHGE90EAK	ORNAMENT (A) ASS'Y	
11	RGU0780-K	SELECT BUTTON (A)	
12	RGU0781-K	SELECT BUTTON (B)	
13	RGU0781A-K	SELECT BUTTON (C)	
14	RGU0782-K	MONITOR BUTTON	
15	RHN90001	NUT	
16	RMCO183	EARTH SPRING	
17	RMNO188	ANGLE	
18	SNE4021-1	NUT	
19	XTBS26+8J	SCREW	
20	SHE187-2	P. C. B. SPACER	
21	XTBS3+8JFZ1	SCREW	
22	XTB3+20JFZ	SCREW	
23	RMNO156	FL. HOLDER	
24	FWJ1806110KQ	FLAT CABLE (6P)	
25	FWJ1806110KK	FLAT CABLE (6P) (JW601)	
26	FWJ1805230KQ	FLAT CABLE (5P) (JW602)	
27	FWJ1806230KQ	FLAT CABLE (6P) (JW901)	
28	RFKNHGE90EBK	ORNAMENT (B) ASS'Y	
		PACKING MATERIALS	
P1	RPG1344	PACKING CASE	
P2	RPN0628	PAD	
P3	RPQ0164	ACCESSORY PAD	
P4	XZB50X65A02Z	PROTECTION COVER	
P5	XZB24X34C04	PROTECTION COVER	
		ACCESSORIES	
A1	RFKSHGE90E-K	INSTRUCTIONS MANUAL	(E)
A1	RQT1633-B	INSTRUCTIONS MANUAL	(EB)
A1	RFKSHGE90EGK	INSTRUCTIONS MANUAL	(EG)
A1	RFKSHGE90GCK	INSTRUCTIONS MANUAL	(GC)

Ref. No.	Part No.	Part Name & Description	Remarks
A1	RQT1633-B	INSTRUCTIONS MANUAL	(GN)
A2	RQA0013	WARRANTY CARD	(E, EB, EG)
A2	RQX7433ZA	WARRANTY CARD	(GN)
A3	RQCB0169	SERVICE CENTER LIST	
A4	RJA0019-1K	AC POWER SUPPLY CORD	△ (E, EG)
A4	SJA193	AC POWER SUPPLY CORD	△ (EB)
A4	RJA0004	AC POWER SUPPLY CORD	△ (GC)
A4	SJA173	AC POWER SUPPLY CORD	△ (GN)
A5	SJP2276	STEREO CONNECTION CABLE	
A6	SJP9215	POWER PLUG ADAPTOR	△ (GC)

■ PACKAGING



P2
Pad (A) (B) (C) (D) ass'y: RPN0628