

# Service Manual

Stereo Integrated Amplifier

Amplifier

SU-Z980

Color

(K).....Black Type



Area

Color	Area
(K)	(EX) .....Continental Europe.
(K)	(EH) .....Holland.
(K)	(EB) .....Belgium.
(K)	(EF) .....France.
(K)	(EK) .....United Kingdom.
(K)	(Ei) .....Italy.
(K)	(XL) .....Australia.
(K)	(XA) .....Asia, Latin America, Middle Near East, Africa and Oceania.

## SPECIFICATIONS (DIN 45 500)

### ■ AMPLIFIER SECTION

40 Hz ~ 20 kHz continuous power output both channels driven	2 x 85 W (8Ω)
DIN power output	2 x 100 W (8Ω)
Total harmonic distortion	
rated power at 40 Hz ~ 20 kHz	0.09% (8Ω)
rated power at 1 kHz	0.05% (8Ω)
half power at 1 kHz	0.03% (8Ω)
Intermodulation distortion	
rated power at 60 Hz:7 kHz = 4 : 1, SMPTE, 8Ω	0.09%
Power bandwidth	
both channels driven, -3dB	10 Hz ~ 20 kHz (8Ω, THD 0.09%)
Residual hum and noise	1 mV
Damping factor	35 (8Ω)
Input sensitivity and impedance	
PHONO	2.5mV/47 kΩ
TUNER, CD, TAPE, VCR 2/TV, VCR 1/EQ	150mV/47 kΩ
PHONO maximum input voltage (1 kHz, RMS)	140 mV
S/N	
rated power (8Ω)	
PHONO	71 dB (IHF, A:78 dB)
TUNER, CD, TAPE, VCR 2/TV, VCR 1/EQ	70 dB (IHF, A:90 dB)
Frequency response	
PHONO	RIAA standard curve ± 0.8dB (30 Hz ~ 15 kHz)
TUNER, CD, TAPE, VCR 2/TV, VCR 1/EQ	10 Hz ~ 60 kHz (-3 dB)
Tone controls	
BASS	50 Hz, +10 dB ~ -10 dB
TREBLE	20 kHz, +10 dB ~ -10 dB

Super bass	80 Hz, +6 dB
Muting	-20dB
Output voltage	
TAPE, VCR 1/EQ REC OUT	150 mV
Channel balance, CD 250Hz ~ 6,300Hz	± 1dB
Headphones output level and impedance	670 mV/330 Ω
Channel separation, CD, 1 kHz	50dB
Load impedance	
MAIN or REMOTE	8 Ω ~ 16 Ω
MAIN and REMOTE	8 Ω ~ 16 Ω

### ■ GENERAL

Power consumption	510 W
Power supply	
For continental Europe:	AC 50/60 Hz, 220 V
For United Kingdom and Australia:	AC 50/60 Hz, 240 V
For others:	AC 50/60 Hz, 110 V/127 V/220 V/240 V
Dimensions (W x H x D)	430 x 119 x 255 mm (16-15/16" x 4-11/16" x 10-1/32")
Weight	7.2 kg (15.9 lb.)

#### Notes:

Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

# Technics

Matsushita Electric Industrial Co., Ltd.  
Central P.O. Box 288, Osaka 530-91, Japan

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## ■ BEFORE REPAIR

- (1) Turn off the power supply. Using a 10Ω, 5W resistor connect both ends of power supply capacitors(C703,C704,10000μF) in order to discharge the voltage.
- (2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

Power supply voltage	AC110V	AC127V	AC220V	AC240V
Consumed current 50Hz	280 ~ 530mA	250 ~ 500mA	140 ~ 270mA	120 ~ 250mA
Consumed current 60Hz	280 ~ 530mA	250 ~ 500mA	140 ~ 270mA	120 ~ 250mA

## ■ PROTECTION CIRCUITRY

The protection circuitry of the amplifier may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlined below:

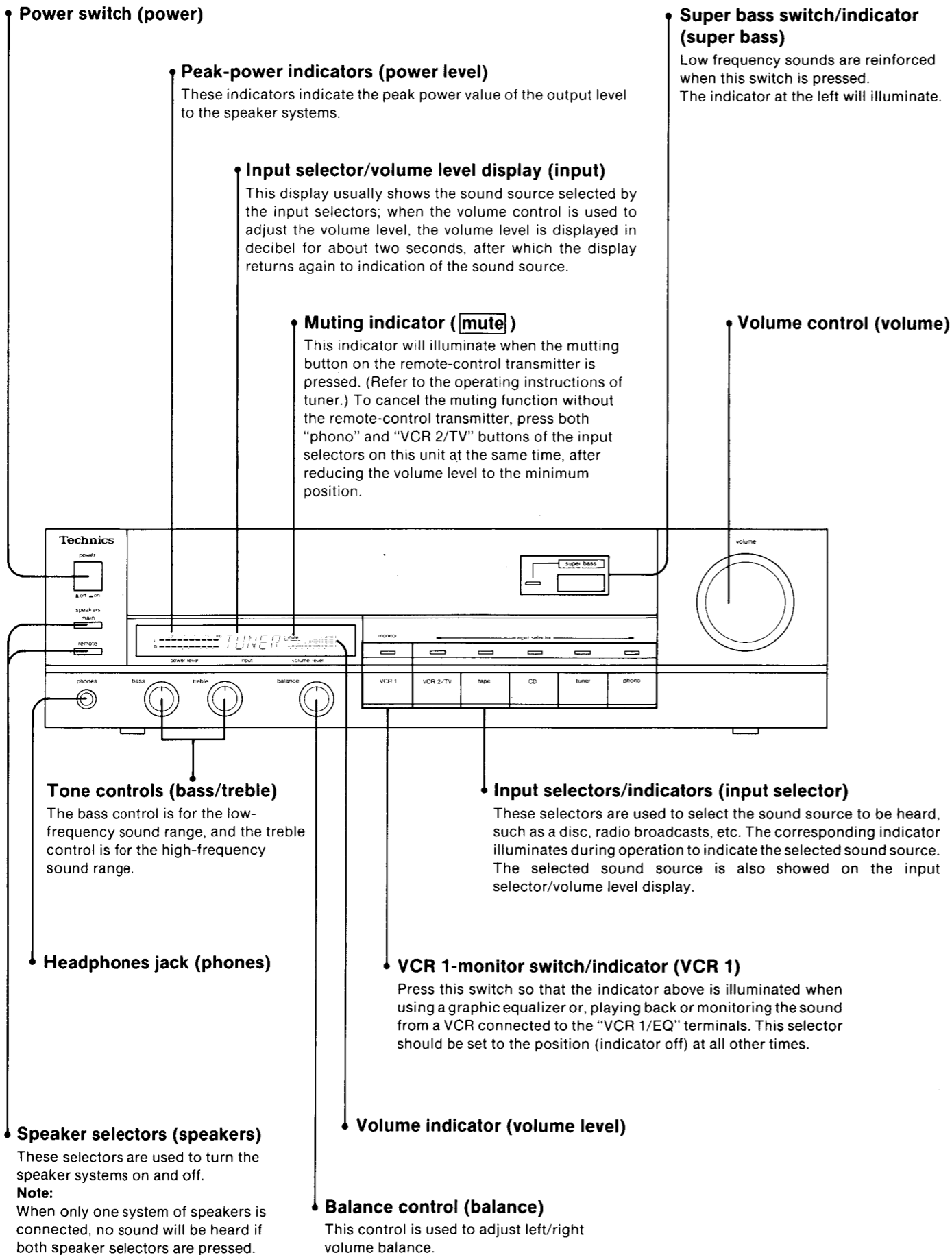
1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again.

**Note:**

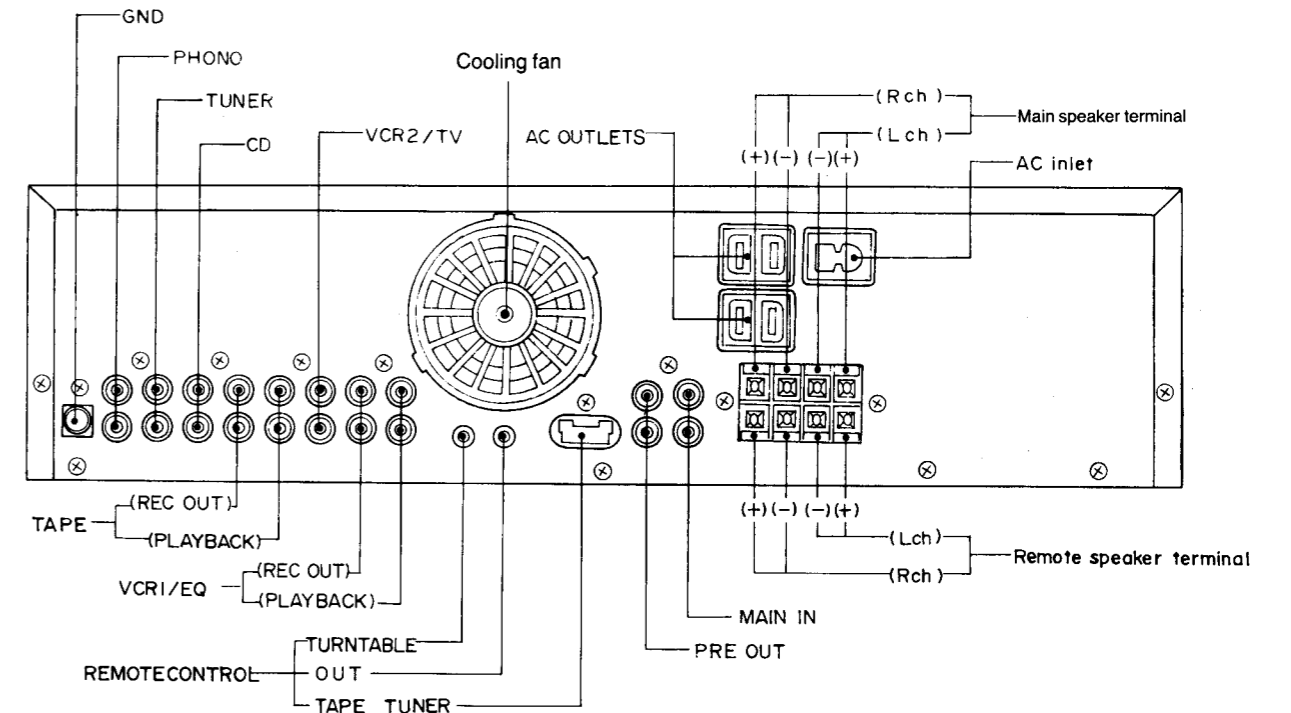
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

**LOCATION OF CONTROLS**

**Front panel**



**Rear panel**



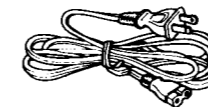
\*Phono input capacitance is about 100 pF.

**ACCESSORIES**

• AC power supply cord ..... 1

• Flat cable for remote-control ..... 1 (SWKUV98KM1)

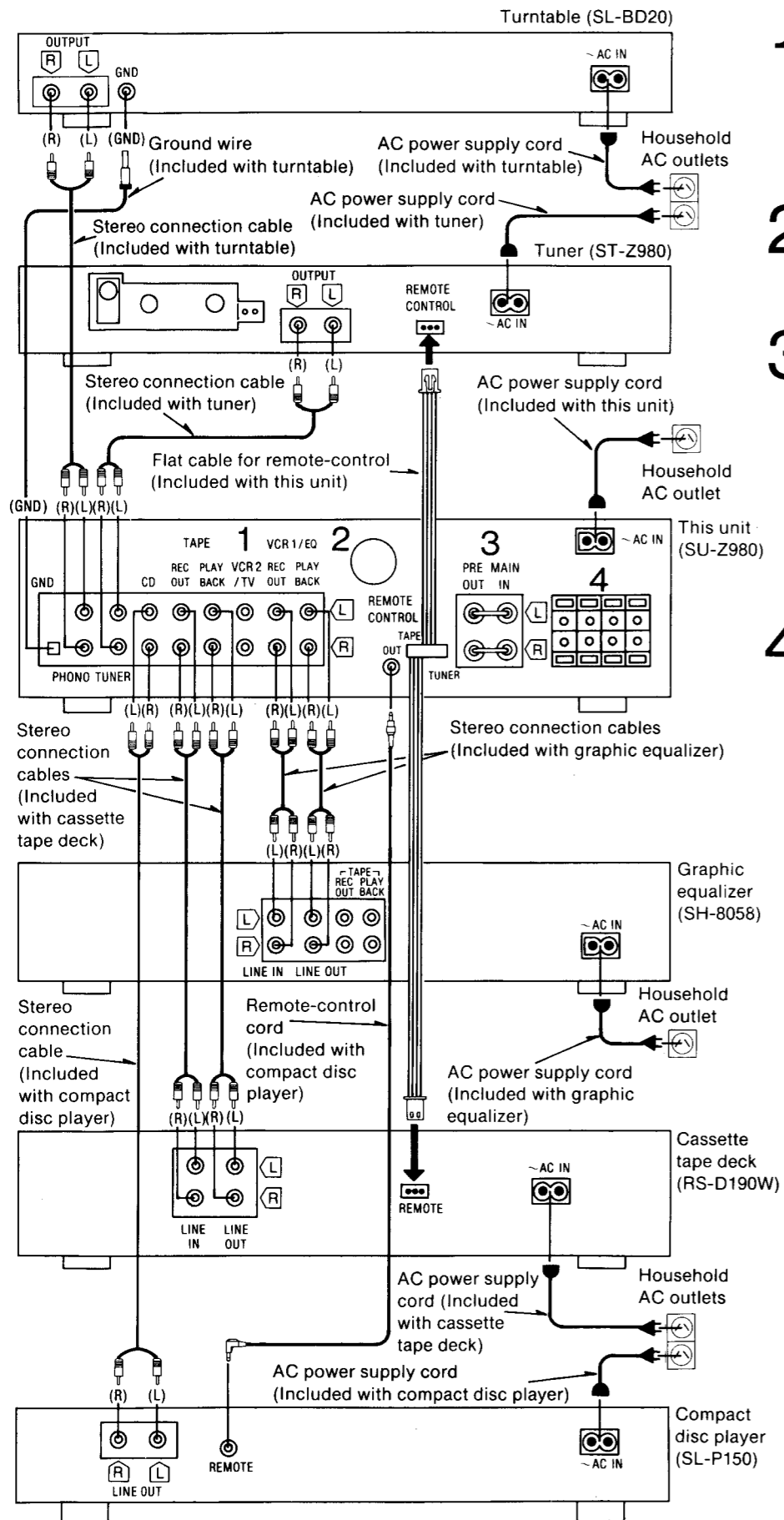
Thick type



- (SJA173) ..... For (XL) area only.
- (SJA185) ..... For (XA) area only.
- (SJA188) ..... For (EK) area only.
- (SJA187) ..... For others.



CONNECTIONS



1 "VCR 2/TV" terminals

For connection to the audio output of a VCR, TV, etc. (Refer to the operating instructions of the optional equipment.)

2 Cooling fan

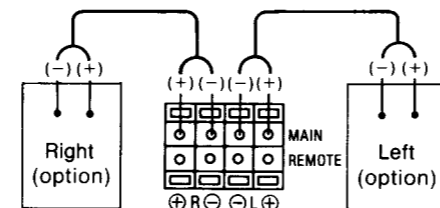
The cooling fan operates only at high output power levels.

3 "PRE-OUT/MAIN-IN" terminals

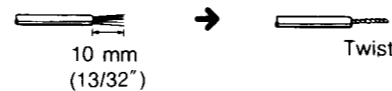
Do not remove the shorting pins from these terminals unless you plan to use the SU-Z980 as an independent preamplifier or main amplifier. (No sound will be heard if they are removed). To use it in this way, consult the operating instructions for the additional amplifier or preamplifier that you plan to use.

4 "SPEAKERS" terminals

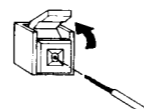
Connection of speaker systems



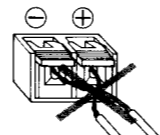
1 Twist the core of the speaker wires.



2 Lift up the lever, and insert the core until it can no longer be seen.



3 Press down the level, and pull the cord gently to be sure that it is secure.



Notes:

- To prevent damage to circuitry, never short plus (+) and minus (-) speaker terminals.
- Be sure to only connect positive (+) cords to positive (+) terminals, and negative (-) cords to negative (-) terminals.
- Connections of speaker wires should be made before connecting the AC power supply cords.

"REMOTE" terminals

For connection to a second pair of speaker systems.

DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the cabinet	
Procedure 1	Remove the 5 screws (1~5).	
Ref. No. 2	How to remove the front panel	
Procedure 1→2	<ol style="list-style-type: none"> <li>Cut the cord clamer.</li> <li>Remove the flat cable (J501).</li> <li>Remove the 5 screws (1~5).</li> <li>Remove from the projection of the bottom chassis.</li> <li>Remove the front panel in the direction of the arrow.</li> </ol>	
Ref. No. 3	How to remove the volume and LED/selector P.C.B.	
Procedure 1→2→3	<ol style="list-style-type: none"> <li>Pull out the 4 knobs (1~4).</li> <li>Remove the 4 nuts (5~8).</li> <li>Remove the 5 screws (9~13).</li> <li>Rotate the Volume Circuit Board and LED/Selector Circuit Board simultaneously in the direction of the arrow.</li> <li>Remove the 1 connector (J901).</li> </ol>	

How to remove the knob.

Wind cellophane tape around the knob and put it the direction of the arrow.

**Ref. No. 4**  
**How to remove the power switch P.C.B.**

**Procedure 1→2→4**

1. Remove the power switch knob by pushing it from behind the front panel.
2. Remove the 2 screws (1, 2).
3. Release the 1 claw.
4. Remove the power switch P.C.B. in the direction of the arrow.

**Ref. No. 5**  
**How to remove rear panel**

**Procedure 1→5**

1. Remove the 11 screws (1~11).
2. Remove the shorting pin.
3. Remove from the projection of the bottom chassis.
4. Remove the rear panel in the direction of the arrow.

**Ref. No. 6**  
**How to check the main P.C.B.**

**Procedure 1→6**

1. Remove the 12 screws (1~12).
2. Remove the front panel in the direction of the arrow (A).
3. Release the main P.C.B from the projection of the bottom chassis.
4. Remove the bottom chassis in the direction of the arrow (B).
5. Reinstall the front panel to the main P.C.B.

**Main P.C.B.**

**Ref. No. 7**  
**How to remove the power IC and regulator transistor**

**Procedure 1→5→6→7**

1. Unsolder the power IC or regulator transistor.
2. Remove the 3 screws (1~3).

**When mounting the power IC or regulator transistor.**  
Apply silicone compound (SZZOL15) to the rear side of power IC or regulator transistor.

**Ref. No. 8**  
**How to remove the fan motor**

**Procedure 1→8**

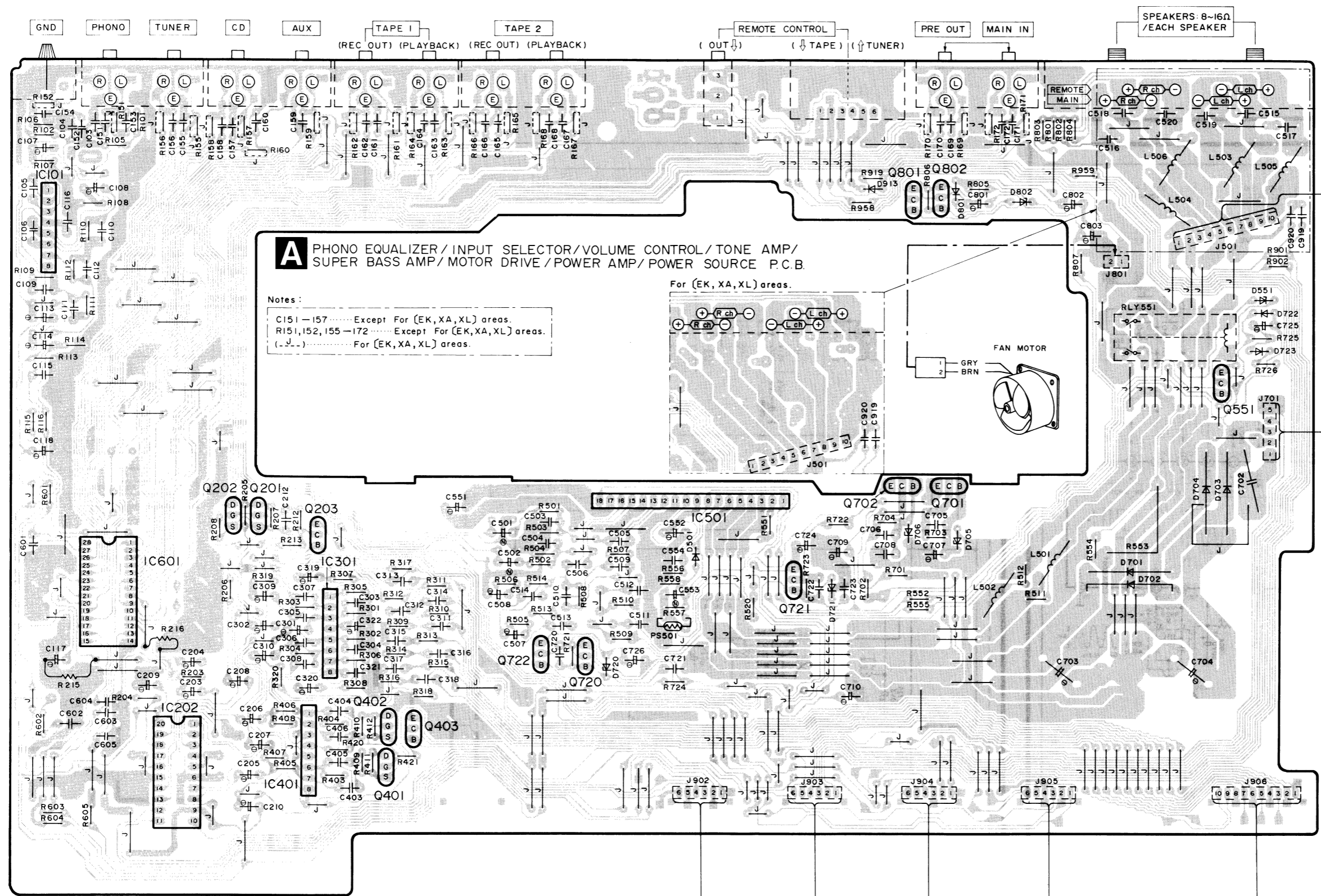
1. Pull out the 1 connector (J801).
2. Release the 3 claws.
3. Insert a screwdriver at the root of the cooling fan. Force it out of the shaft.
4. Remove the motor cover by used ⊖ screwdriver.
5. Remove the motor from the fan casing.
6. When mounting the motor fan, align the fan casing's projection with the hole of the fan motor.

**■ TERMINAL GUIDE OF IC's, TRANSISTORS AND DIODES**

TC9212P 20PIN TC9164N 28PIN M50940-441SP 64PIN		SV13205 18PIN		AN6557	
2SA684, 2SA992 2SC1384	DTA114ESTP DTC114ESTP	2SK301	MA165 MA29WA	ISR35200 SVDS3V40	2SD1285 2SB941QR
2SA933 2SC1740	LN018397PH LN064448P11	MA4240H, MA4150M MA4330M, MA4062-M MA4056-M			

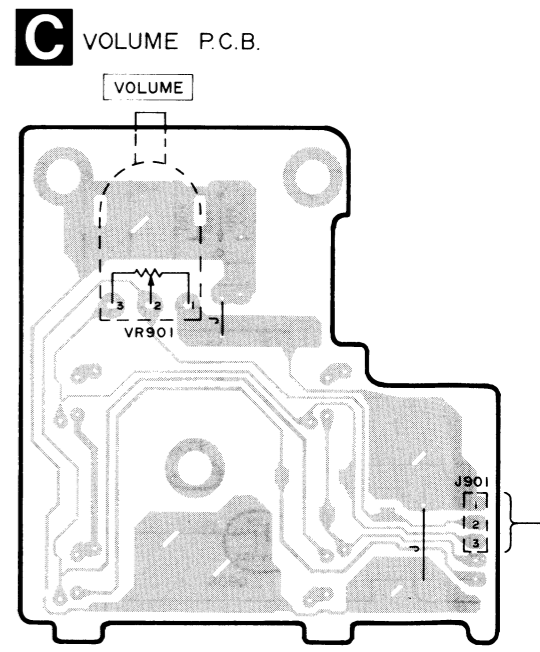
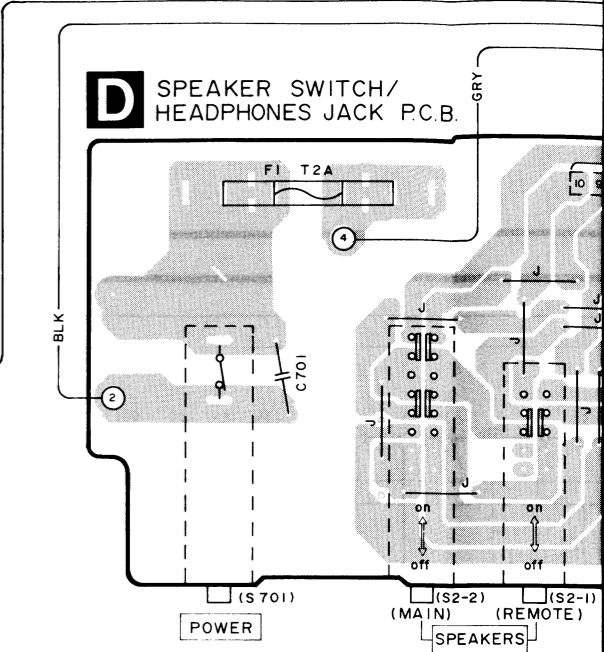
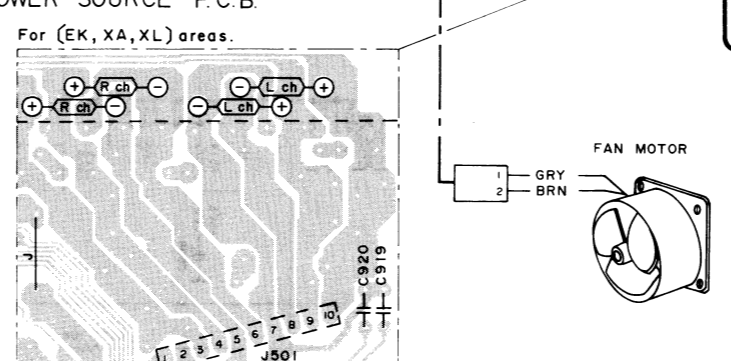
# ■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

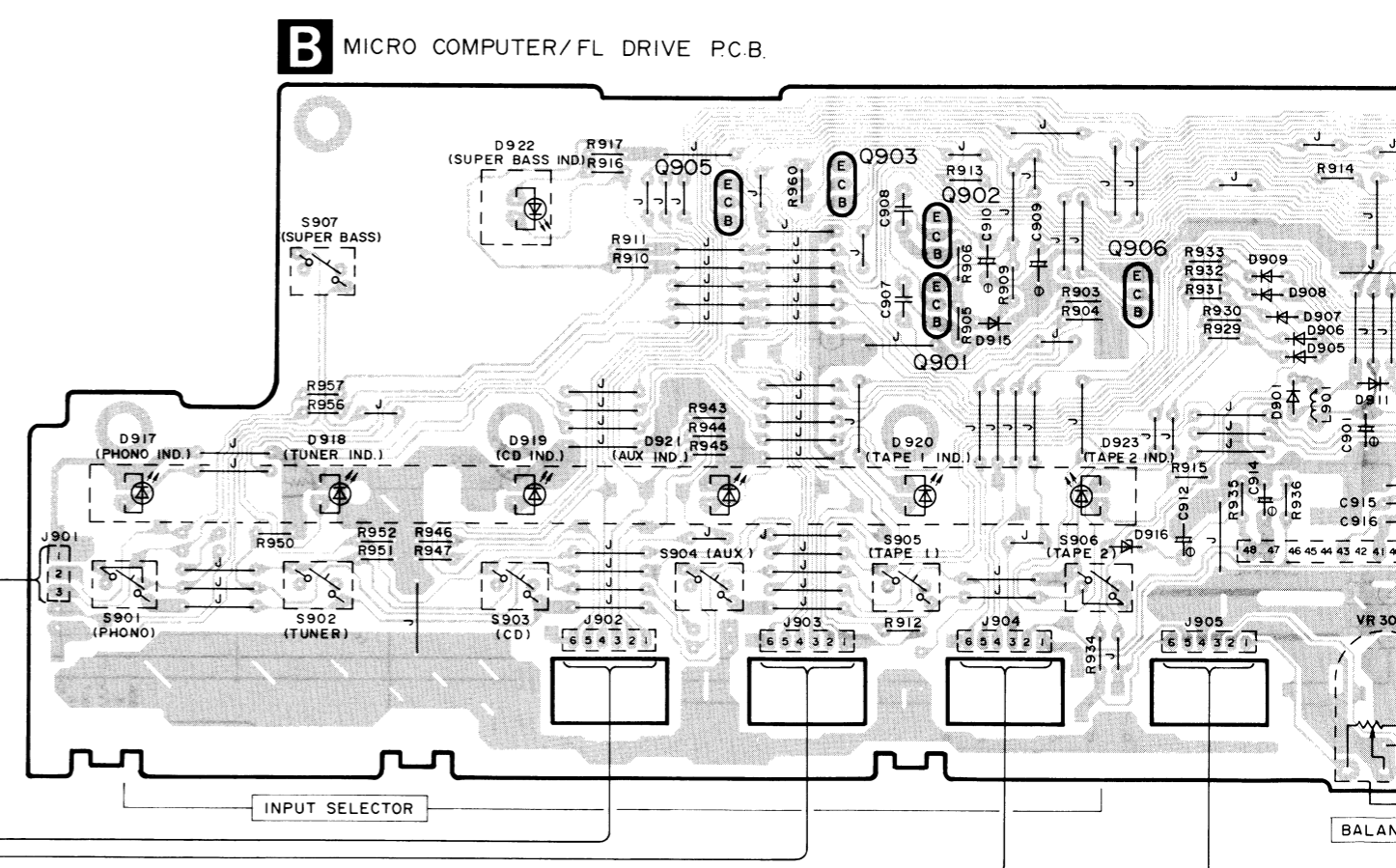
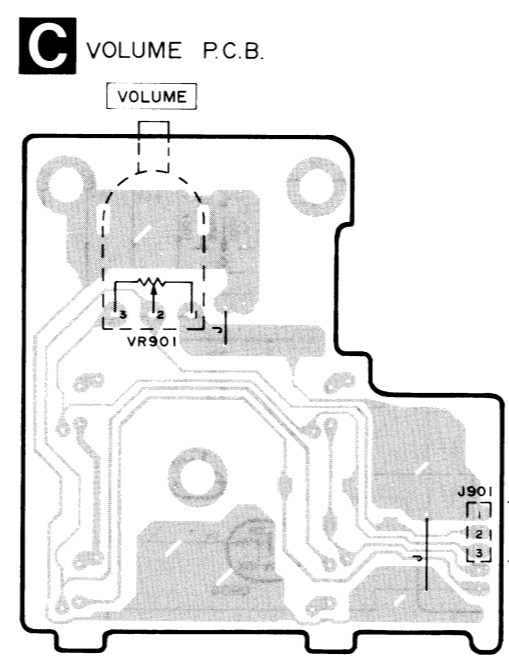
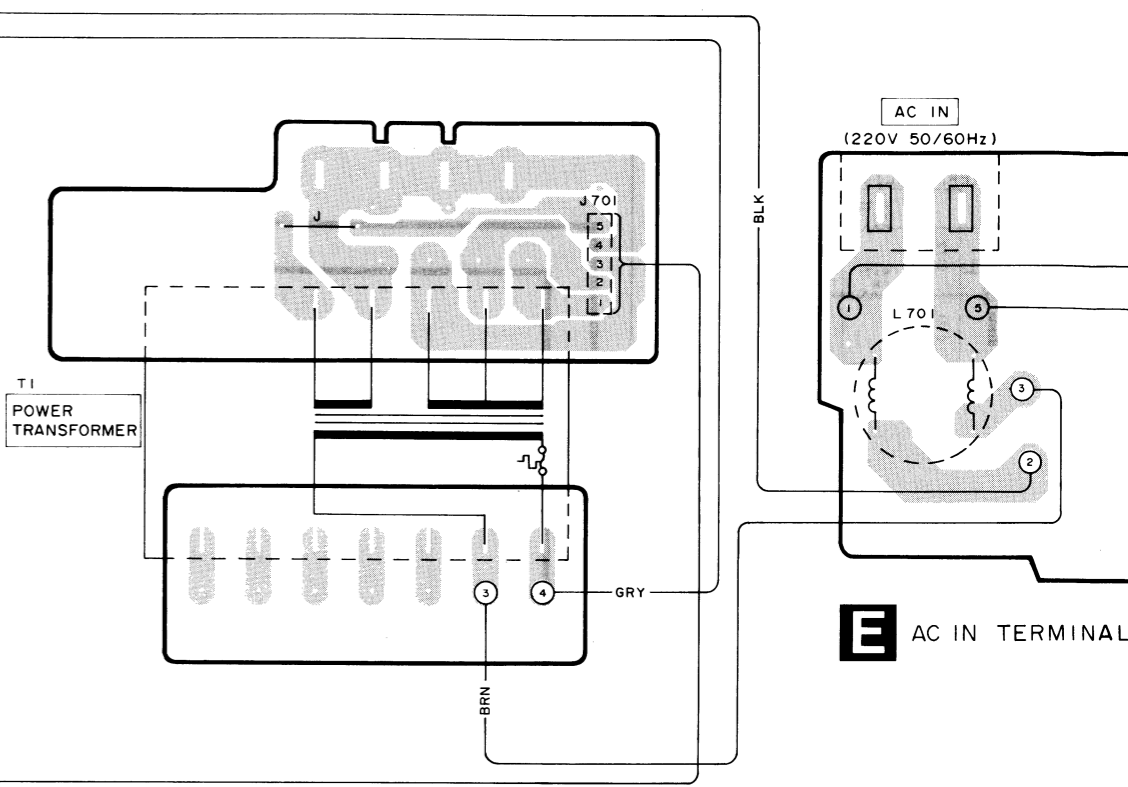
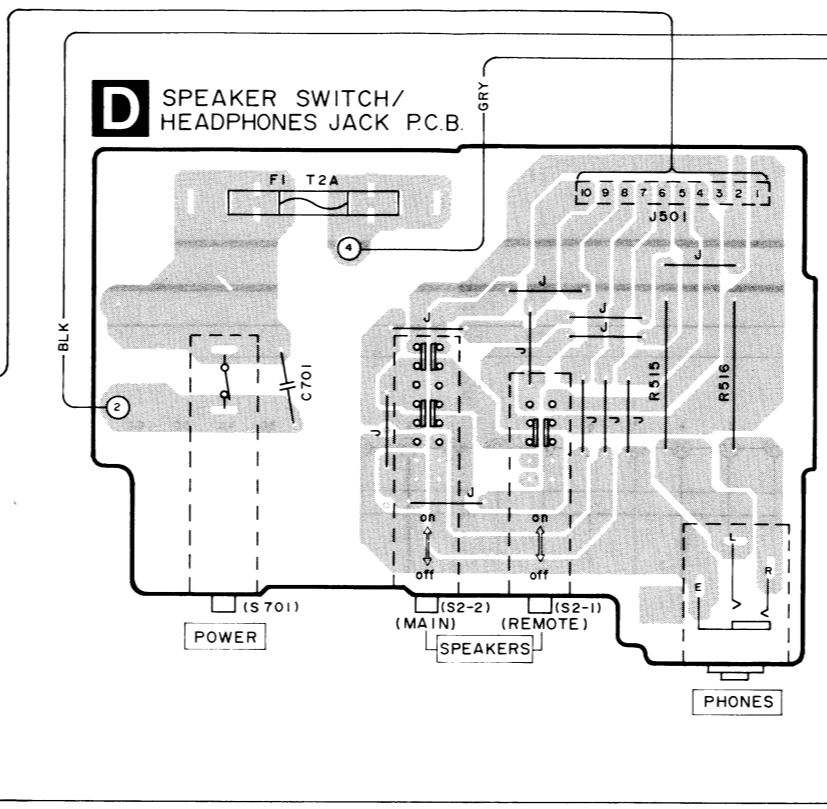
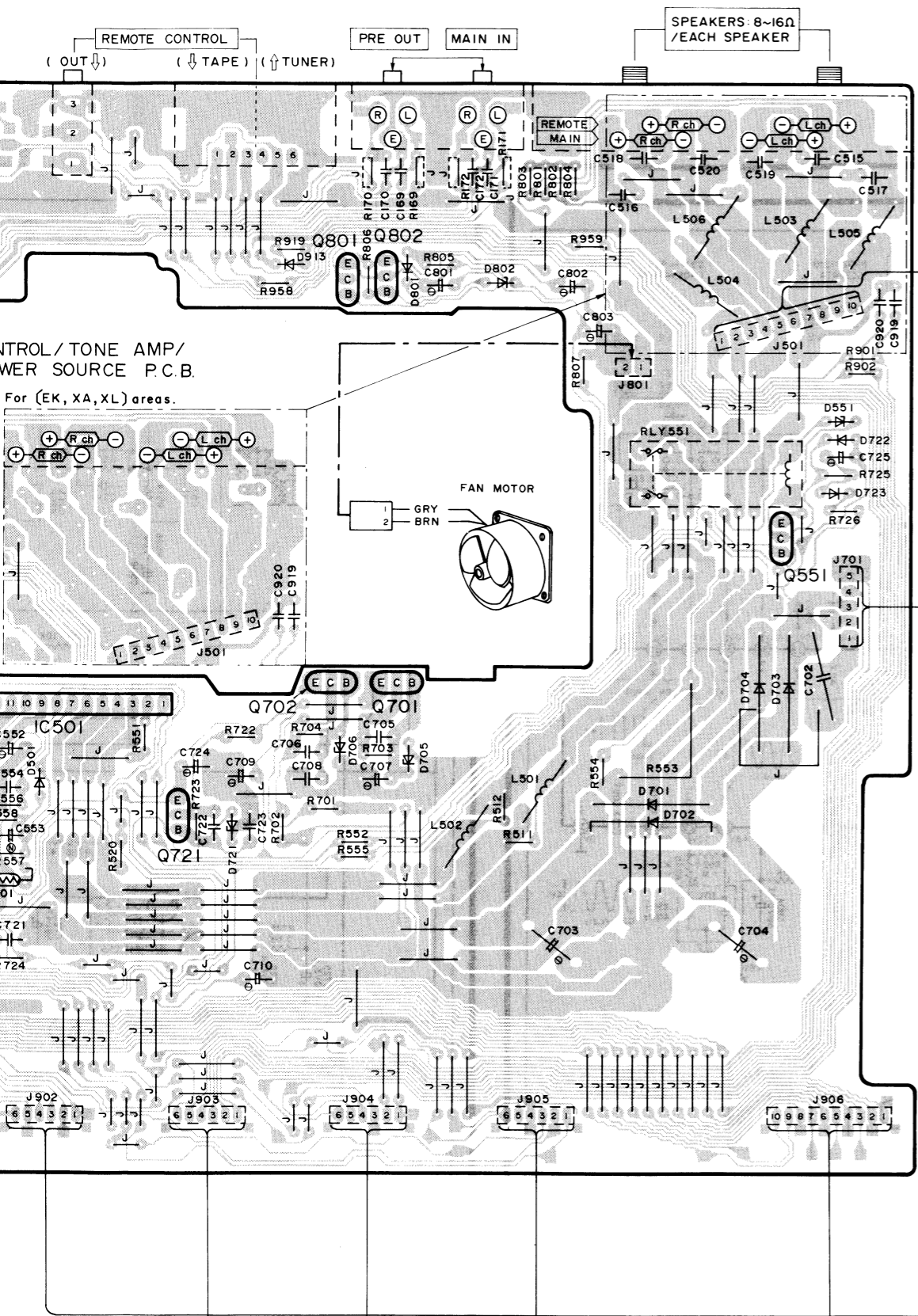
A  
B  
C  
D  
E  
F  
H

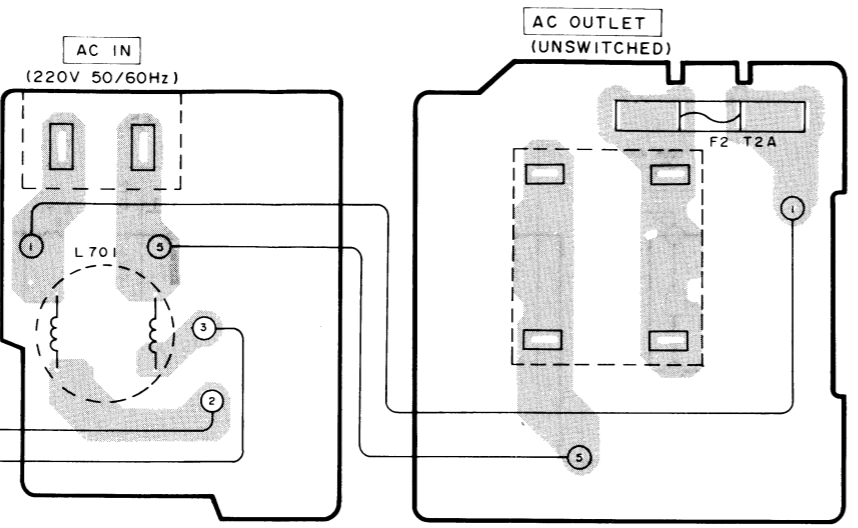
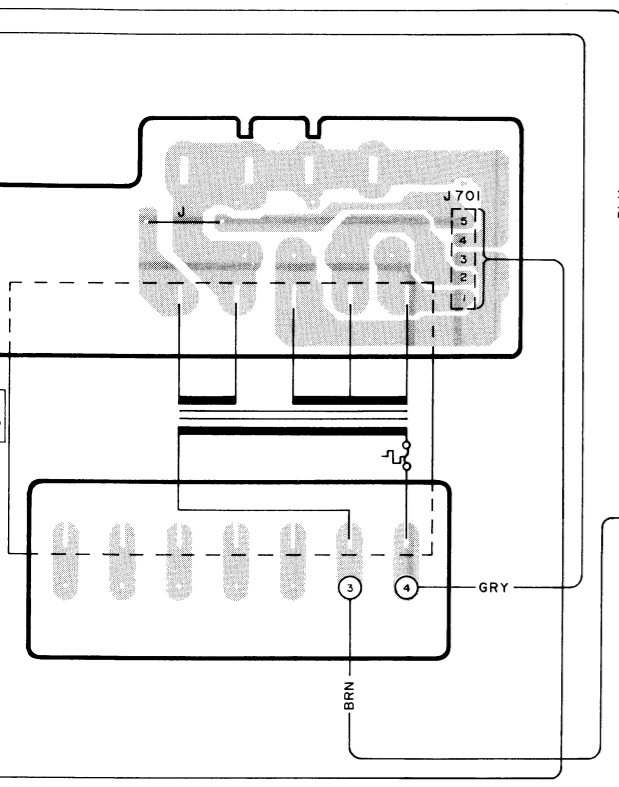


**A** PHONO EQUALIZER / INPUT SELECTOR / VOLUME CONTROL / TONE AMP / SUPER BASS AMP / MOTOR DRIVE / POWER AMP / POWER SOURCE P.C.B.

Notes:  
 C151 - 157 ..... Except For (EK, XA, XL) areas.  
 R151, 152, 155 - 172 ..... Except For (EK, XA, XL) areas.  
 (-.-) ..... For (EK, XA, XL) areas.

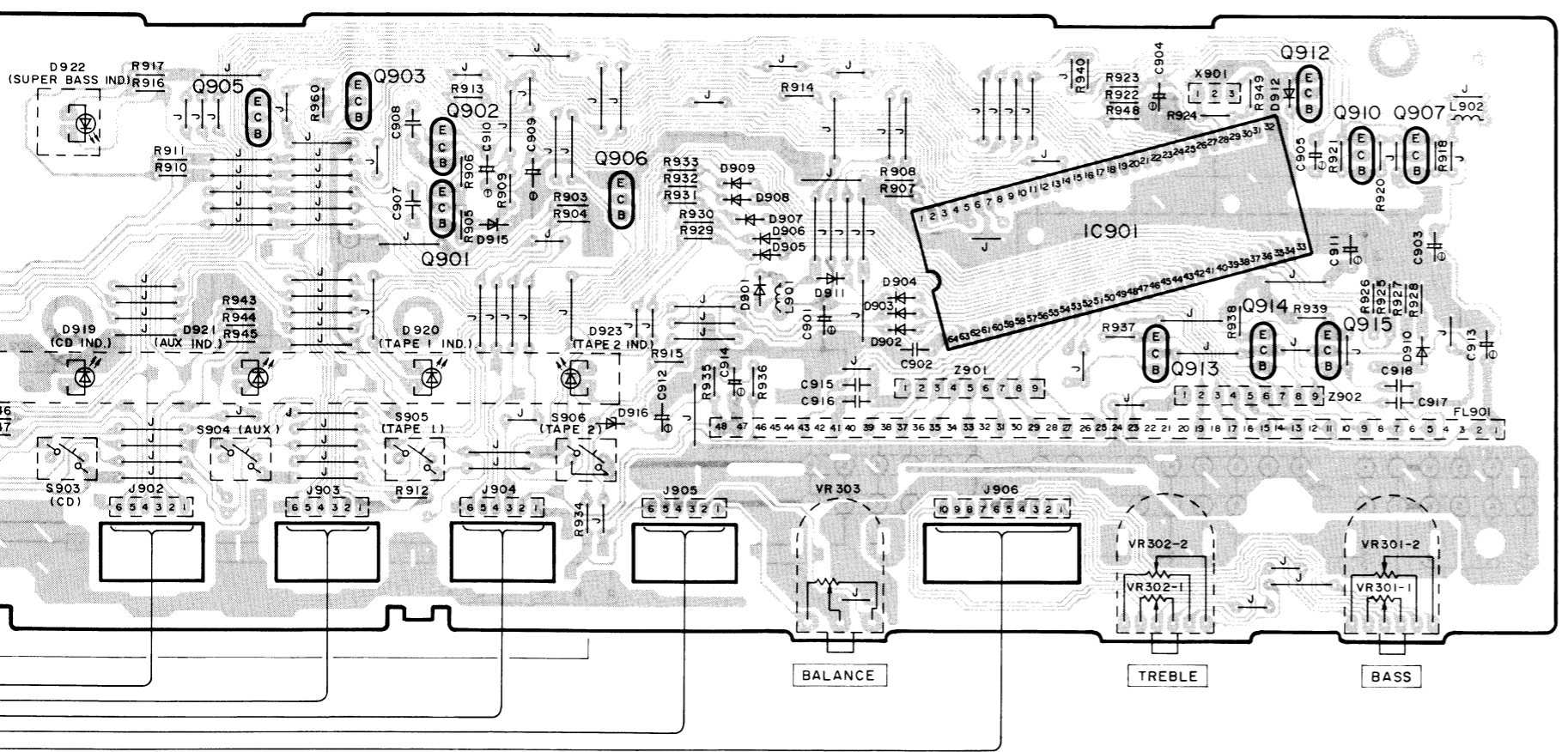






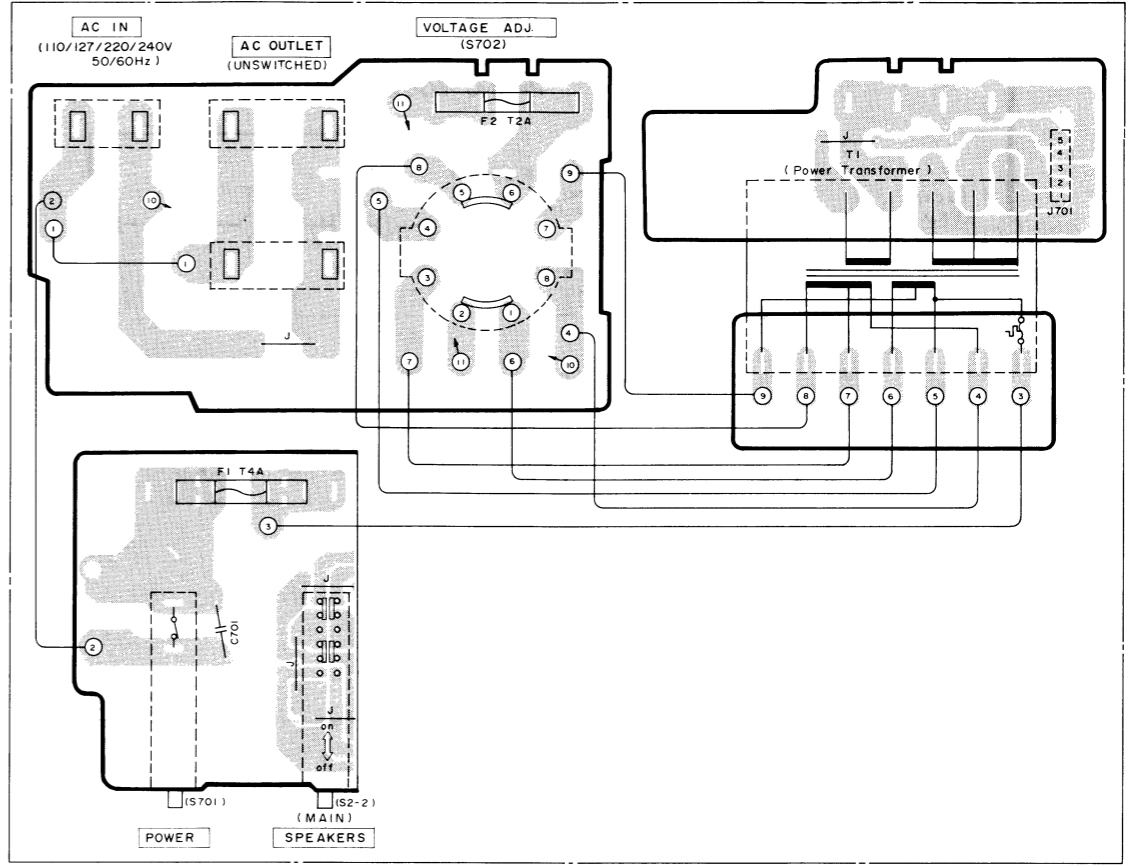
**E** AC IN TERMINAL P.C.B.

COMPUTER/FL DRIVE P.C.B.

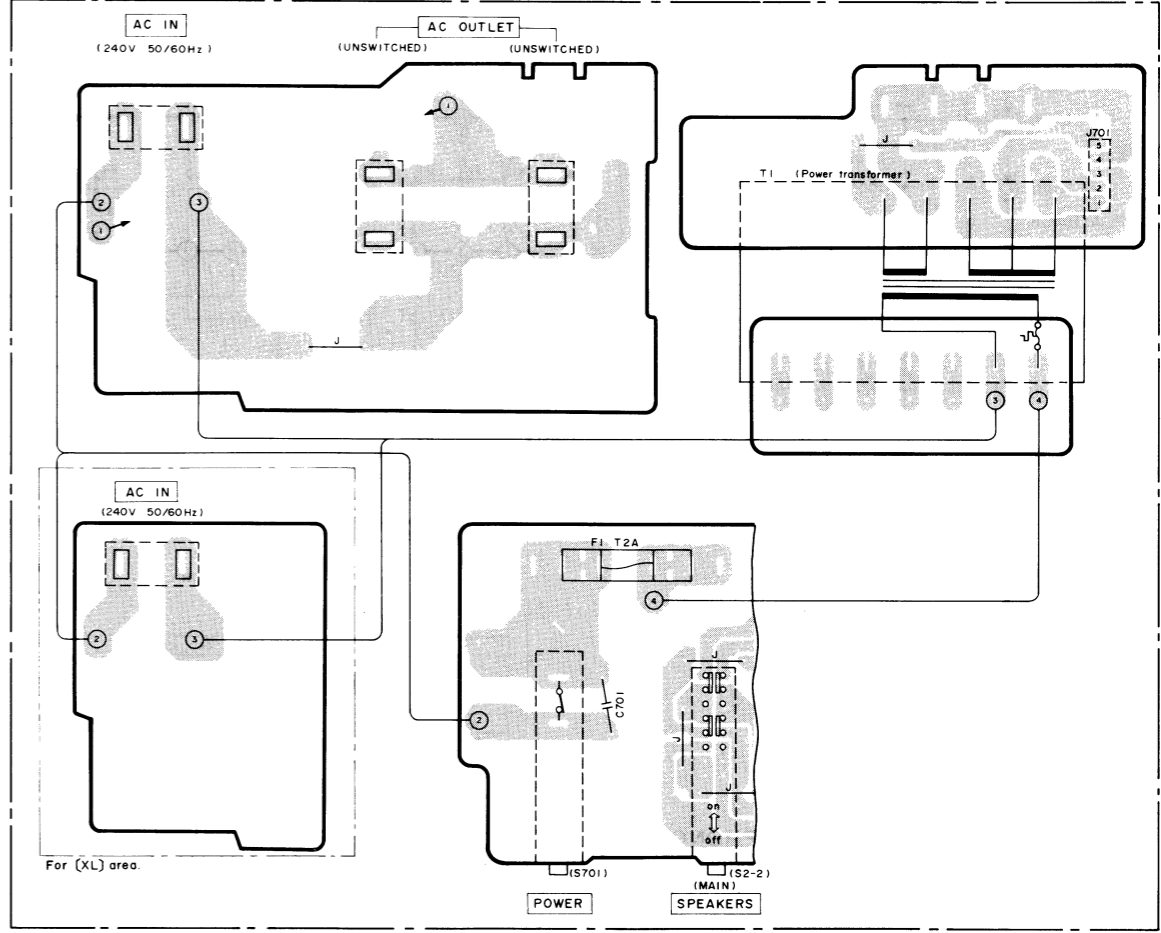


BALANCE TREBLE BASS

Power source For (XA) area.

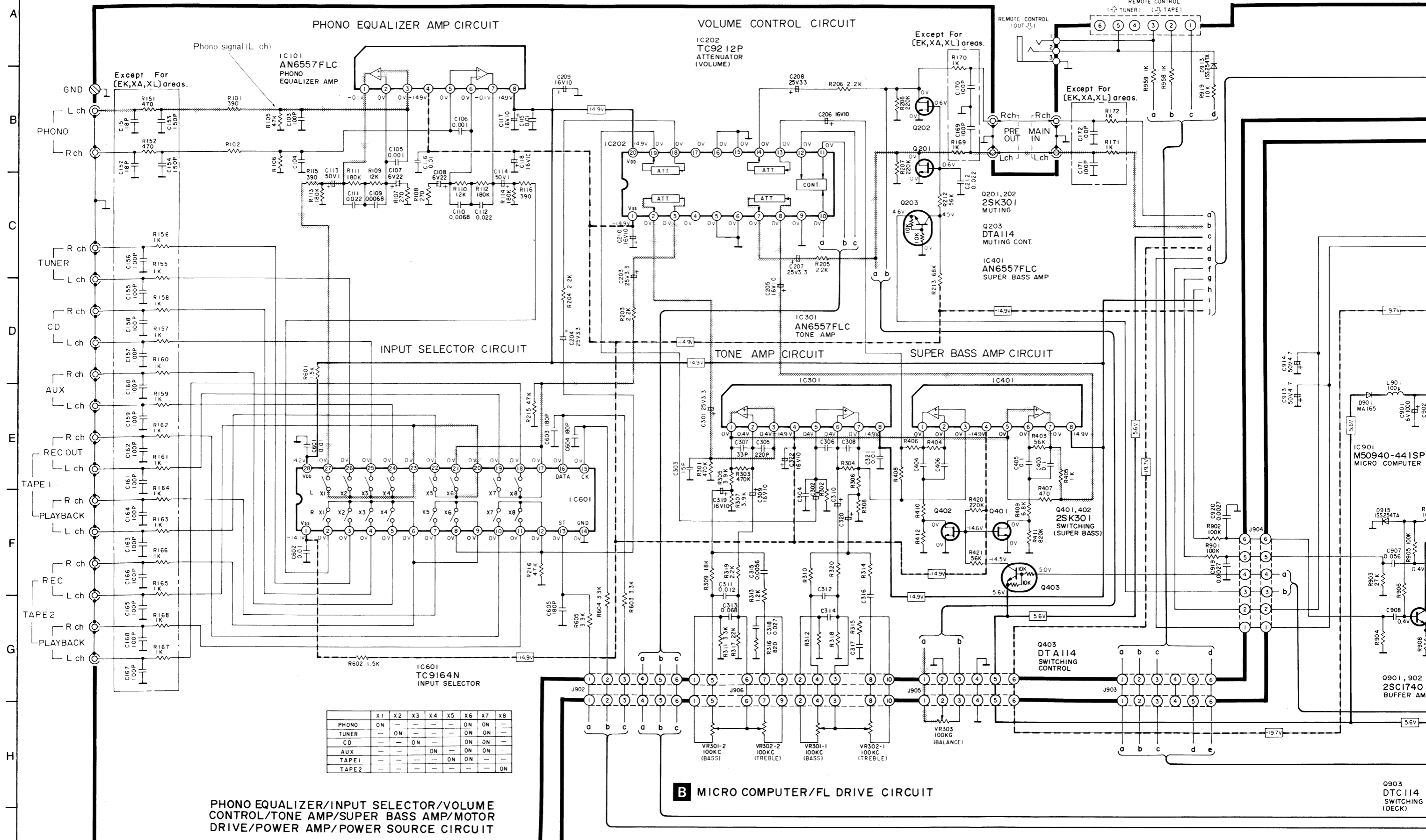


Power Source For (EK,XL) areas.





SCHEMATIC DIAGRAM

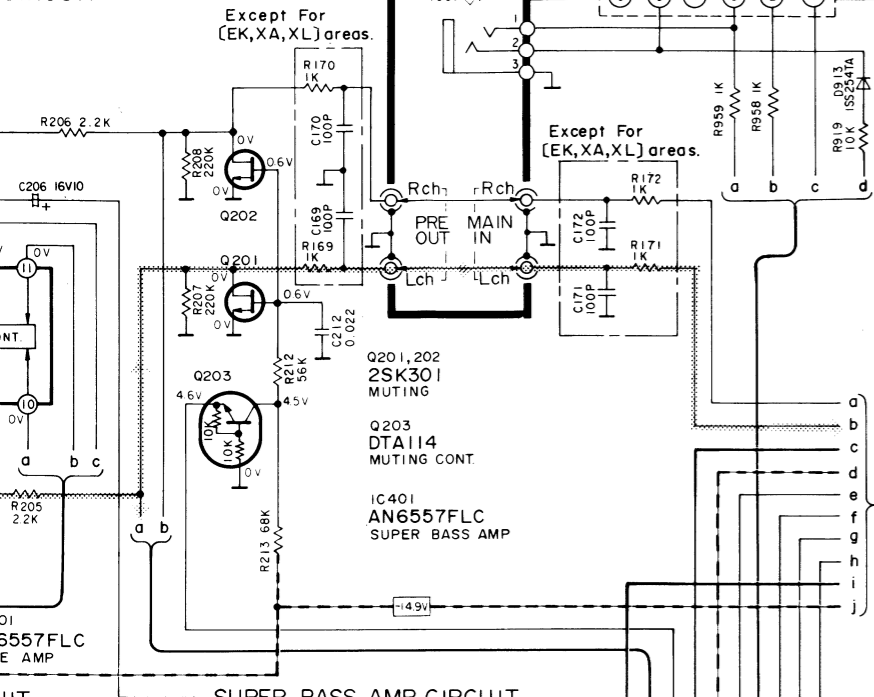


	X1	X2	X3	X4	X5	X6	X7	X8
PHONO	ON	-	-	-	-	ON	ON	-
TUNER	-	ON	-	-	-	ON	ON	-
CD	-	-	ON	-	-	ON	ON	-
AUX	-	-	-	ON	-	ON	ON	-
TAPE 1	-	-	-	-	ON	ON	-	-
TAPE 2	-	-	-	-	-	-	ON	-

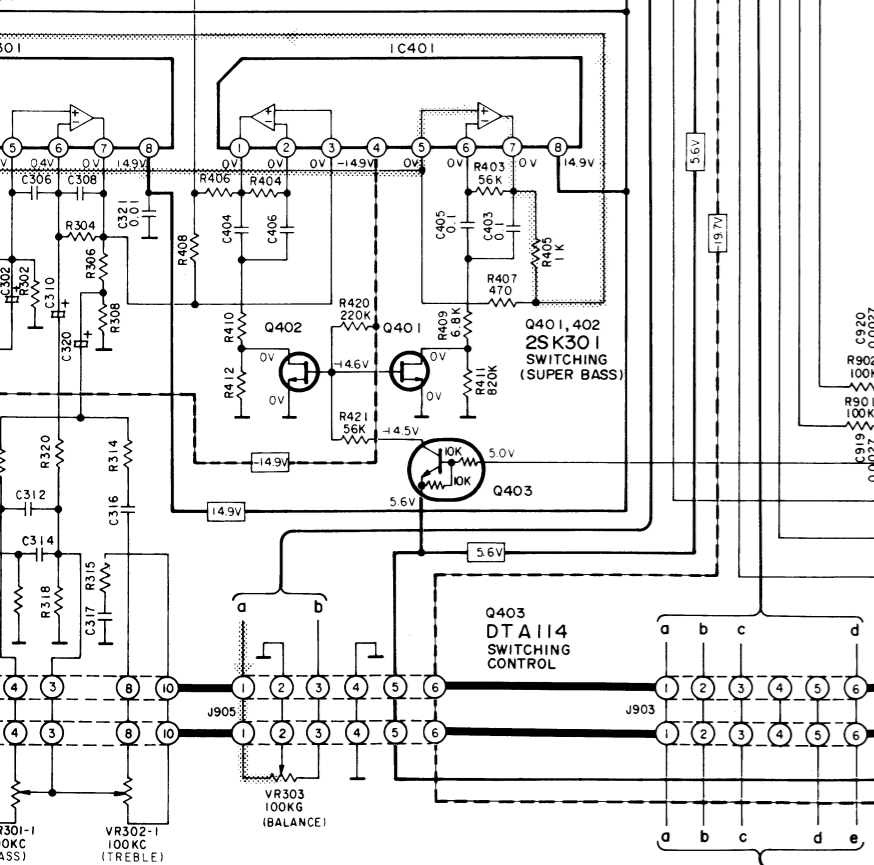
PHONO EQUALIZER/INPUT SELECTOR/VOLUME CONTROL/TONE AMP/SUPER BASS AMP/MOTOR DRIVE/POWER AMP/POWER SOURCE CIRCUIT

B MICRO COMPUTER/FL DRIVE CIRCUIT

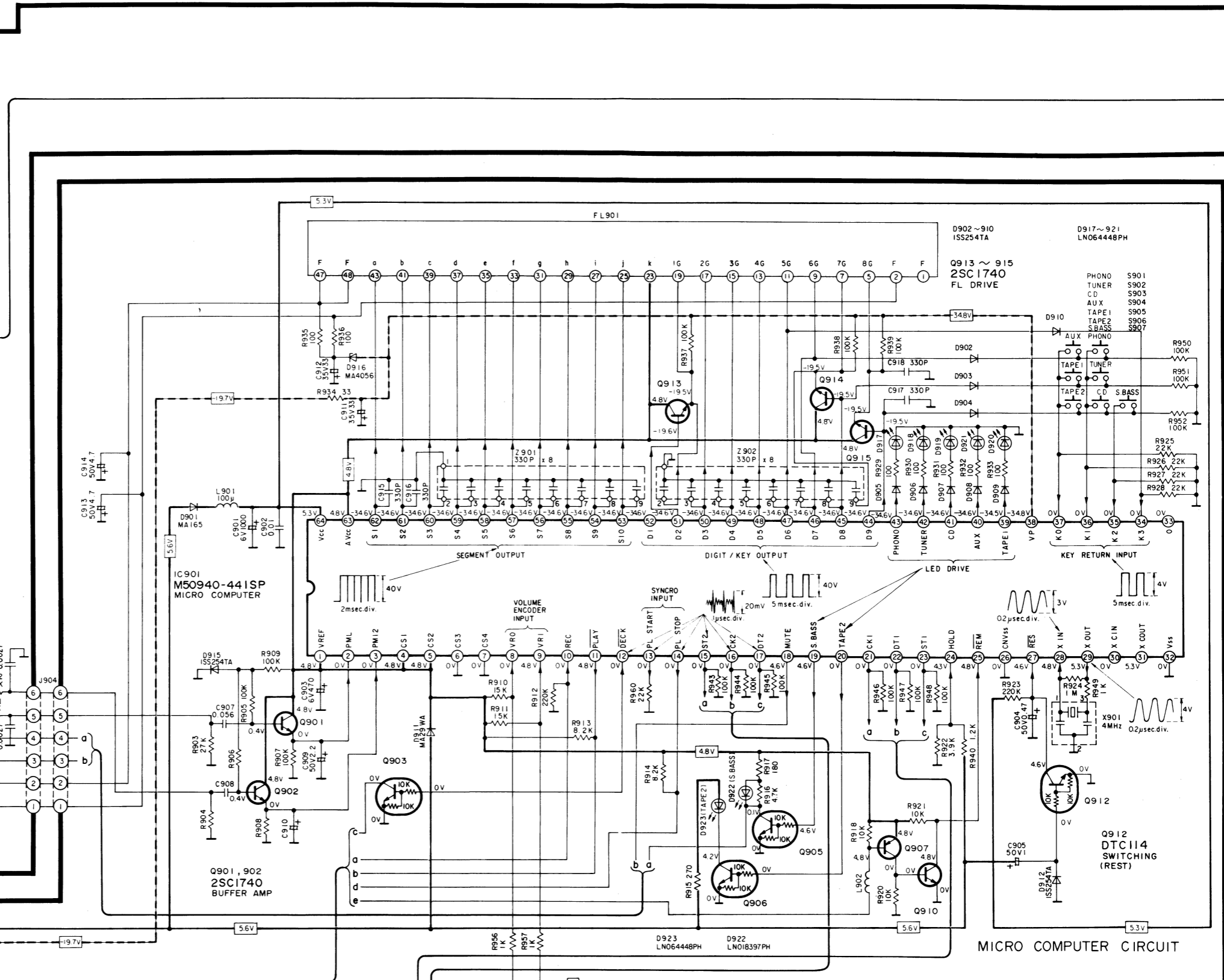
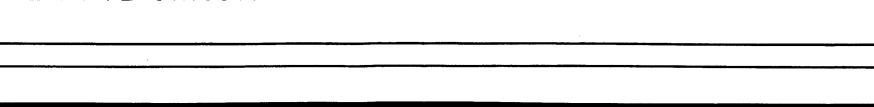
CIRCUIT



SUPER BASS AMP CIRCUIT

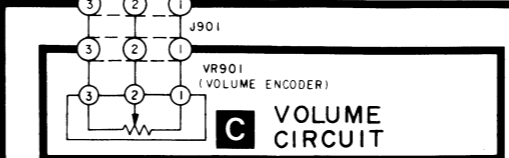


FL DRIVE CIRCUIT



MICRO COMPUTER CIRCUIT

Q903 DTC114 SWITCHING (DECK)



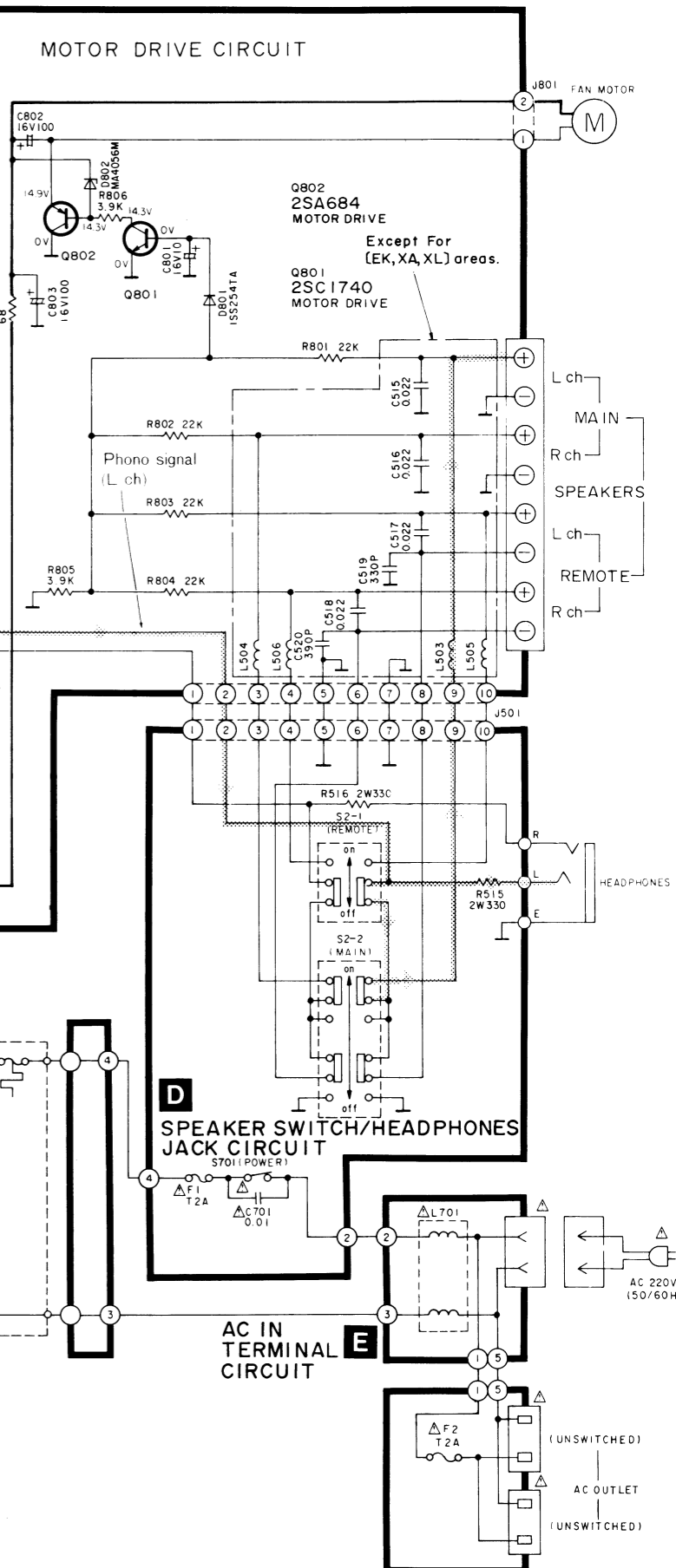
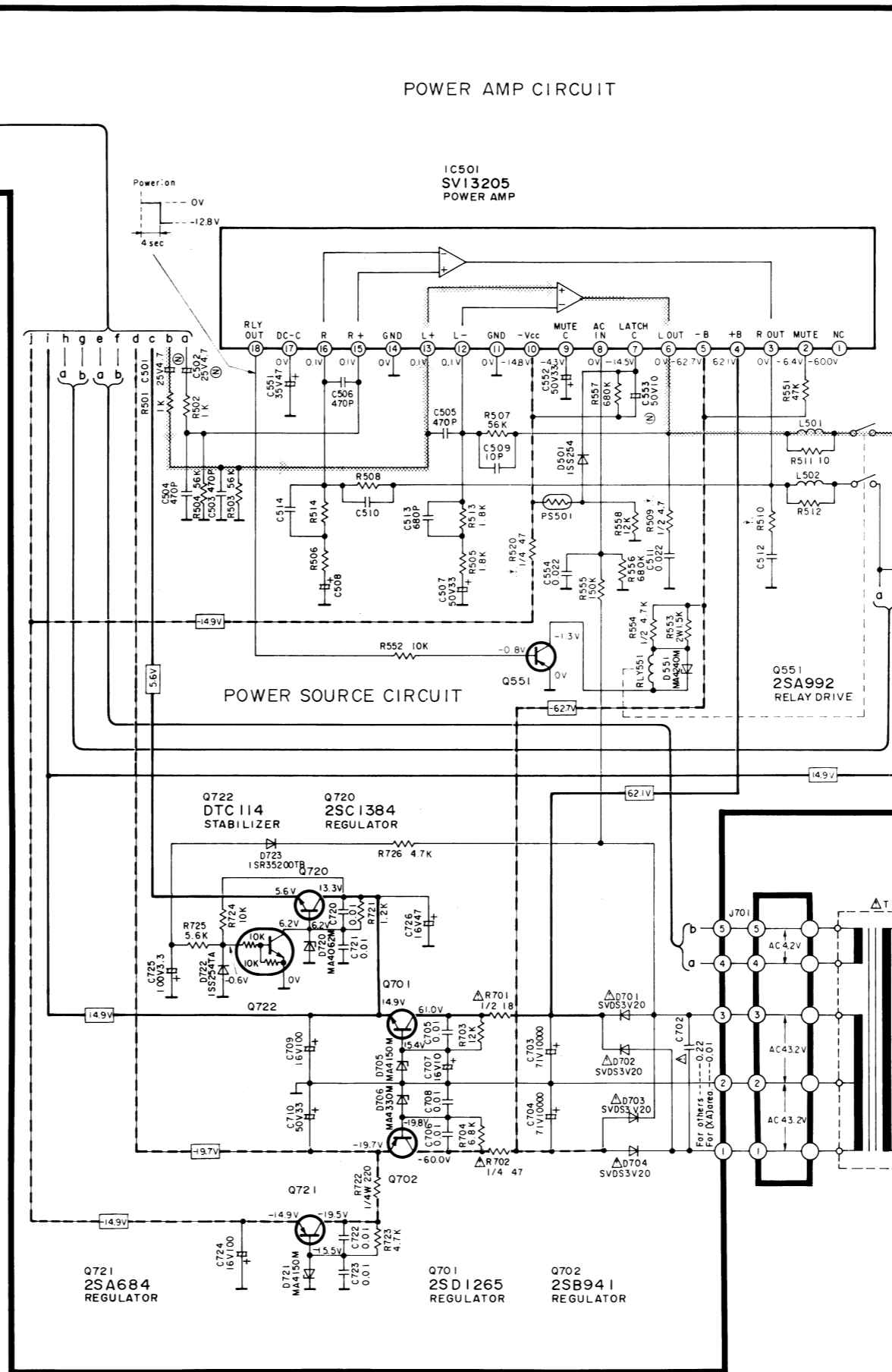
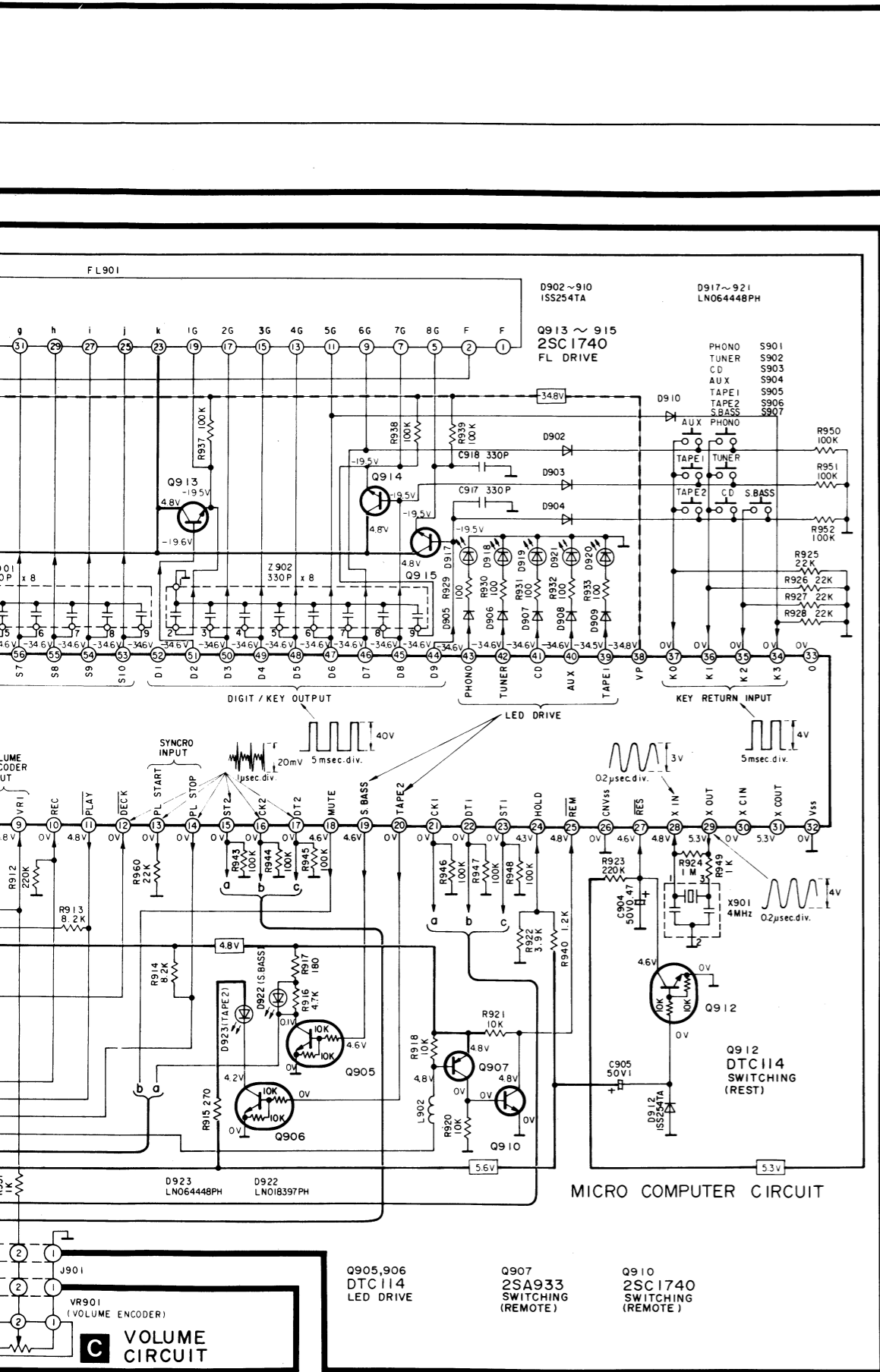
VOLUME CIRCUIT

Q905,906 DTC114 LED DRIVE

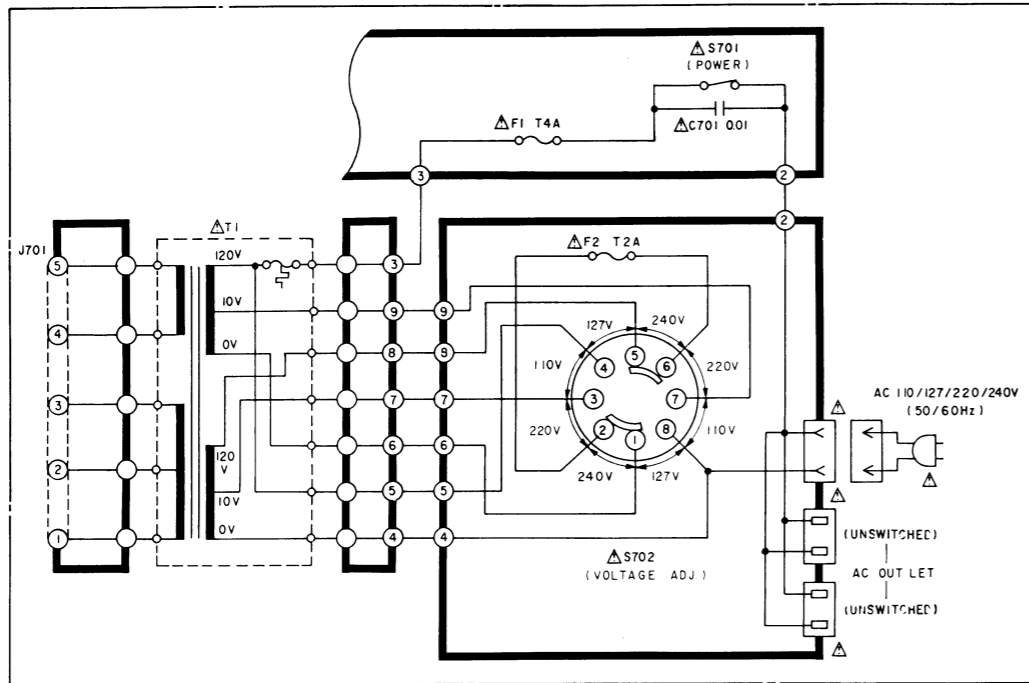
Q907 2SA933 SWITCHING (REMOTE)

Q910 2SC1740 SWITCHING (REMOTE)

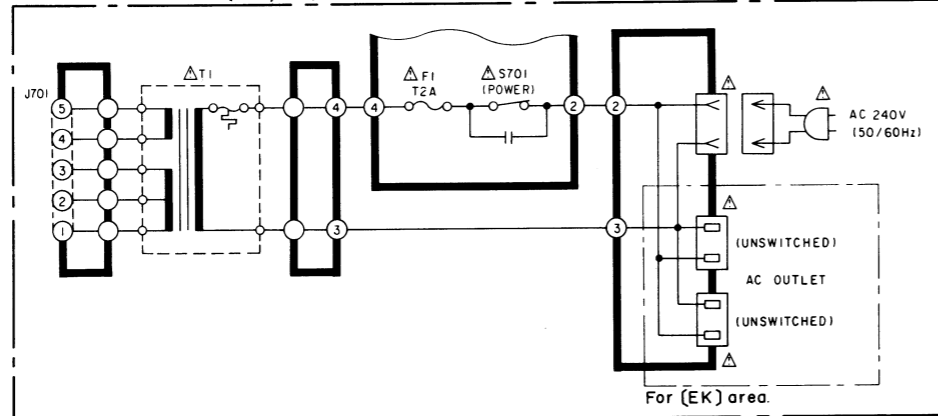
Q721 2SA684 REGULATOR



Power source For (XA) area.



Power Source For (EK, XL) areas.



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

Notes:

- S2-1 : Speaker selector (remote) switch in "off" position.
- S2-2 : Speaker selector (main) switch in "on" position.
- S701 : Power switch in "on" position.
- S702 : Voltage selector switch in "240 V" position. (110 V ↔ 127 V ↔ 220 V ↔ 240 V)  
For (XA) area only.
- S901~S905 : Input selector switches.  
(S901; Phono S902; tuner S903; CD S904; tape S905; VCR2/TV)
- S906 : VCR1-monitor switch.
- S907 : Super bass switch.
- : Phono signal (Lch).
- : Positive voltage lines.
- : Negative voltage lines.

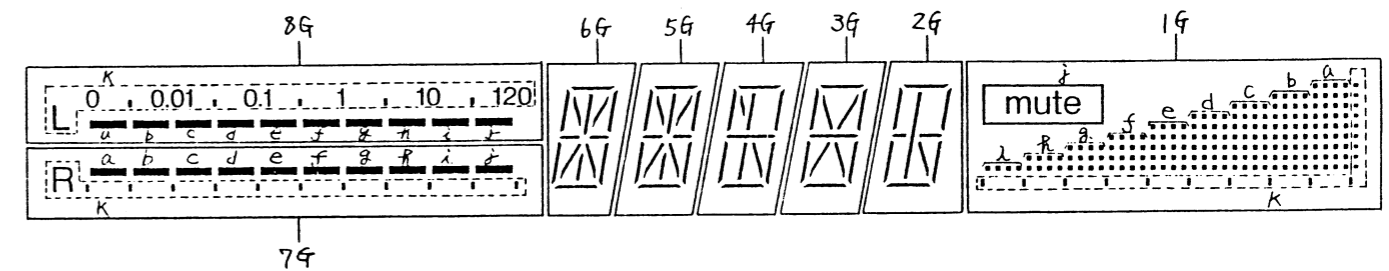
● Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

● Important safety notice:  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

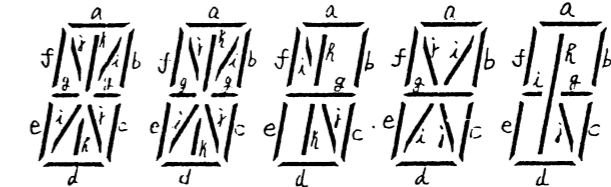
● Caution!  
IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.  
\*Cover the parts boxes made of plastics with aluminum foil.  
\*Ground the soldering iron.  
\*Put a conductive mat on the work table.  
\*Do not touch the legs of IC or LSI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

■ DESCRIPTION OF FL PANEL

● GRID ASSIGNMENT



● SEGMENT DESIGNATION



● PIN CONNECTION

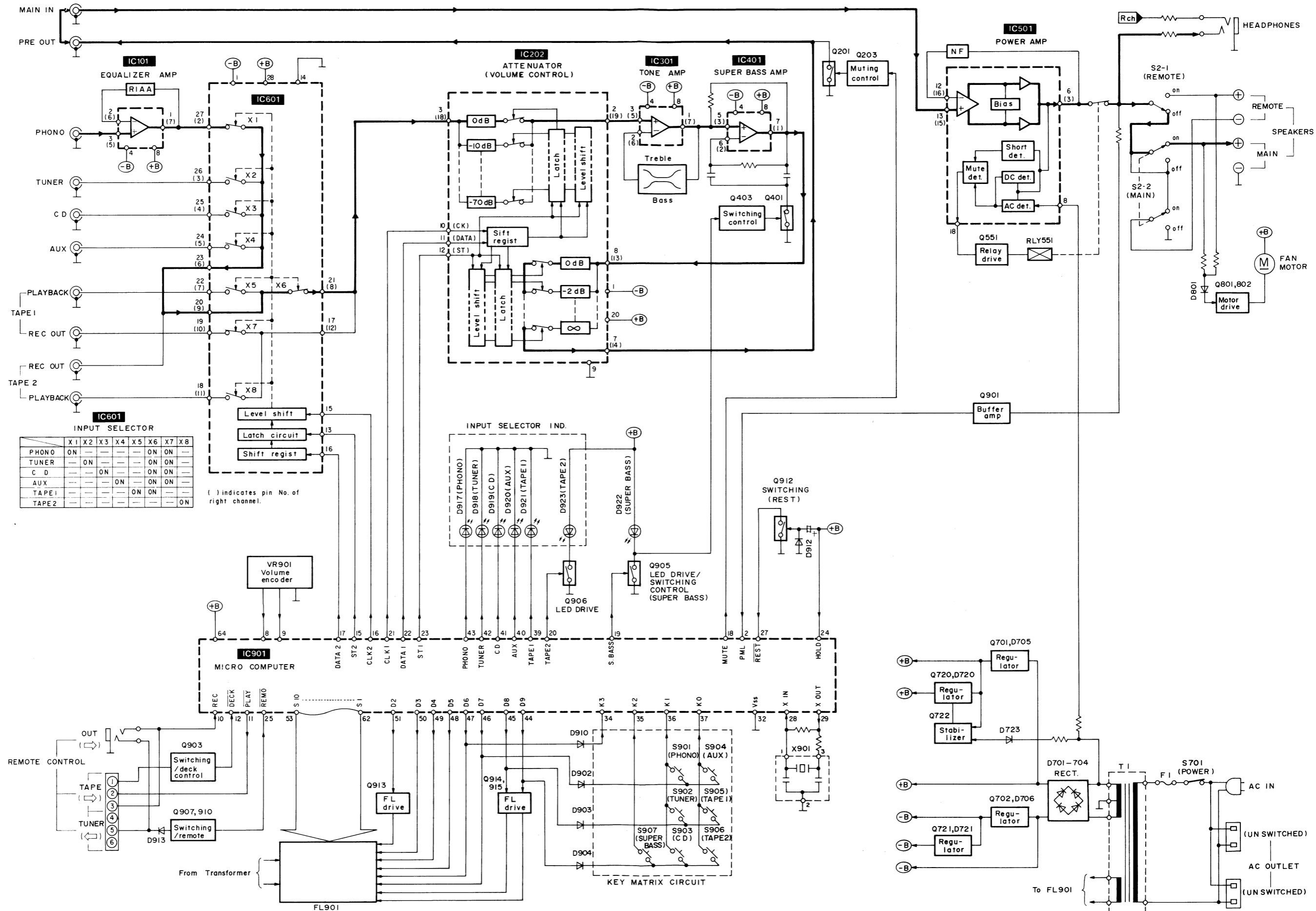
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
CONNECTION	F1	F1	NP	NP	8G	NP	7G	NP	6G	NP	5G	NP	4G	NP	3G	NP	2G	NP	1G	NP	NP	NP	k	NP	j	NP	i	NP	h
PIN NO.	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48										
CONNECTION	NP	g	NP	f	NP	e	NP	d	NP	c	NP	b	NP	a	NP	NP	NP	F2	F2										

● ANODE CONNECTION

	8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G
a	—	—	a	a	a	a	a	■
b	—	—	b	b	b	b	b	■
c	—	—	c	c	c	c	c	■
d	—	—	d	d	d	d	d	■
e	—	—	e	e	e	e	e	■
f	—	—	f	f	f	f	f	■
g	—	—	g	g	g	g	g	■
h	—	—	h	h	h	-	h	■
i	—	—	i	i	i	i	i	■
j	—	—	j	j	j	j	j	mute
k	L 0~120	R ■■■■■	-	-	-	-	-	■■■■■

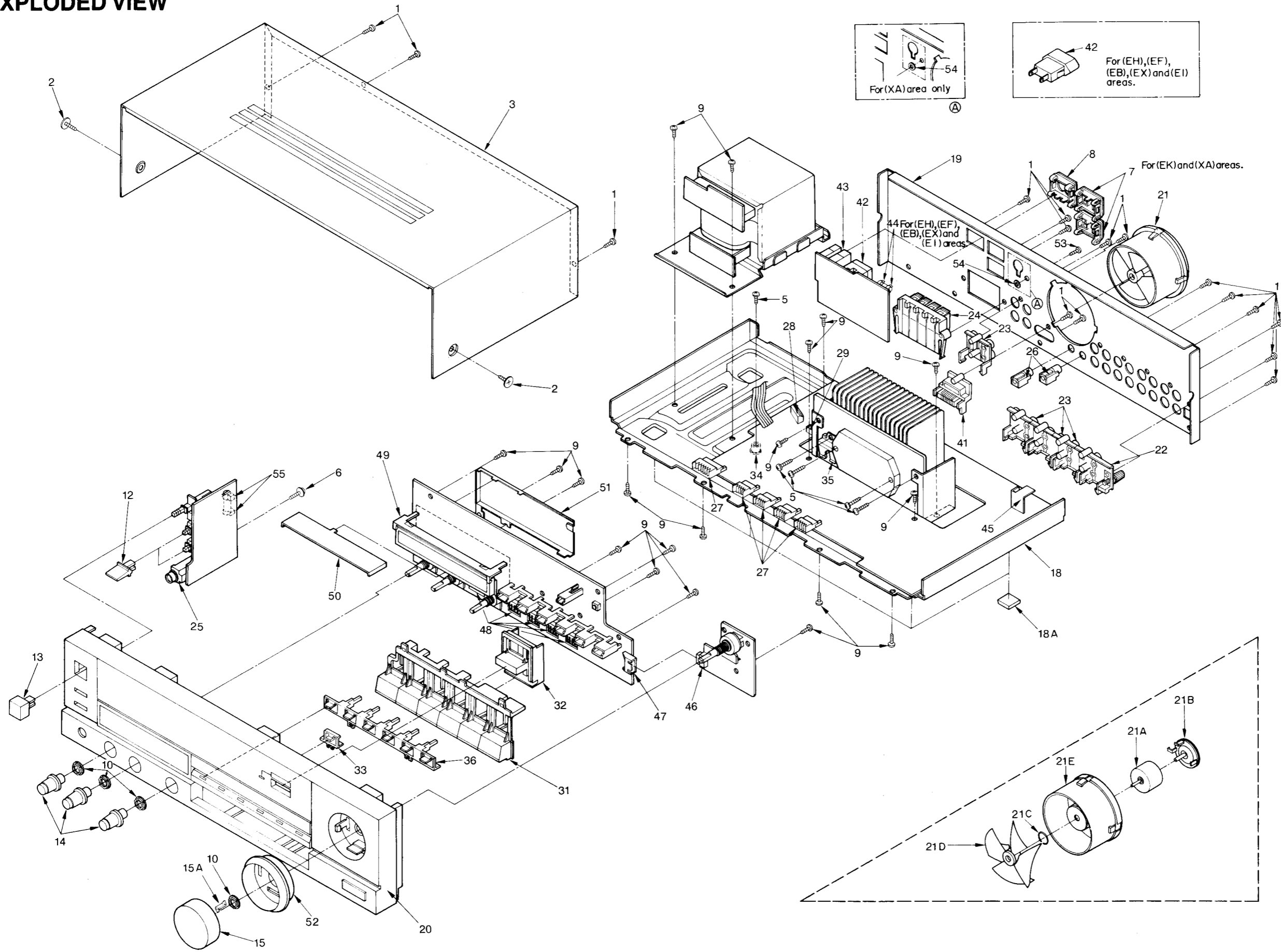
# SU-Z980 SU-Z980

## ■ BLOCK DIAGRAM



EXPLODED VIEW

A  
B  
C  
D  
E  
F  
G  
H



Notes : \*

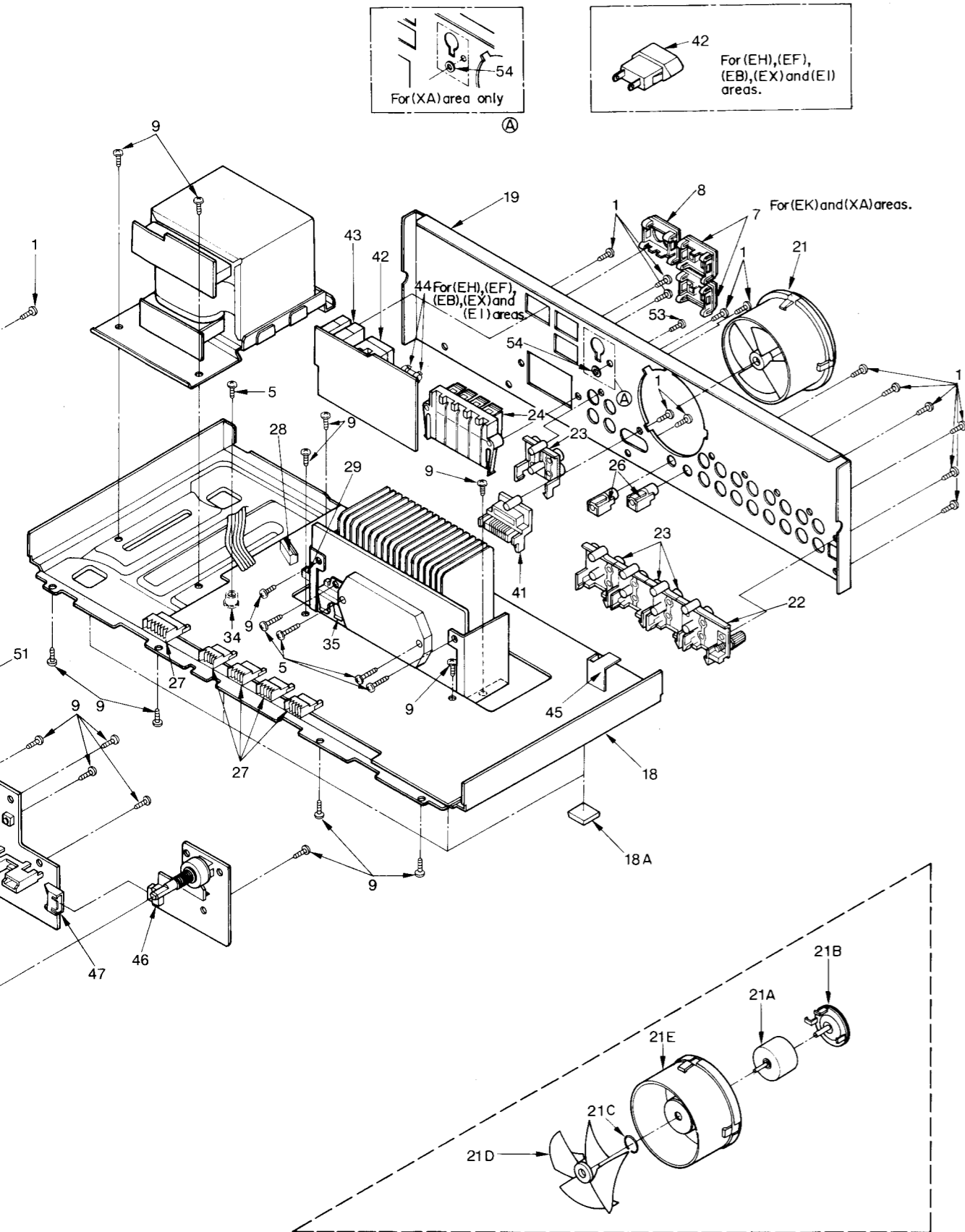
CABINET

Ref. No	CABINET A
1	
2	
3	
5	
6	
7	
8	(EK, XA)
8	(EB, EF, EH)
8	(E1, EK, EX)
8	(XA)
8	(XL)
9	
10	
12	
13	
14	
15	
15A	
18	
18A	
19	(EB, EF, EH)
19	(E1)
19	(XA)
19	(XL)
19	(EX)
19	(EK)
20	(EB, EF, EH)
20	(E1, EK, EX)
20	(XA, XL)
21	
21A	
21B	
21C	
21D	
21E	
22	

REPLACEMENT PARTS LIST

Notes : \* Important safety notice :  
 Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.  
 \* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)  
 Parts without these indications can be used for all areas.

5 | 7 | 8 | 9 | 10 | 11 | 12 | 13



CABINET PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
<b>CABINET AND CHASSIS</b>					
1	XTBS3+8JFZ1	SCREW	23	SJF3069N	TERMINAL
2	SNE2129-1	SCREW	24	SJF5813	TERMINAL
3	SKC2200K991	CABINET	25	QJA0455YC	JACK
5	XTB3+14J	TAPPING SCREW	26	SJJ141-1	JACK
6	XTWS3+8T	SCREW	27	SJS50680WL	CONNECTOR(6P)
7	SJS9332A	AC OUTLET COVER	27	SJS51080WL	CONNECTOR(10P)
(EK, XA)			28	SJT31043-V	CONNECTOR(10P)
8	SJS9231A	AC INLET COVER	29	SJT3213	CONNECTOR(2P)
(EB, EF, EH)			31	SBC1027	BUTTON, INPUT SELECTOR
(E1, EK, EX)			[XA, XL]		
(XA)			31	SBC1027B	BUTTON, INPUT SELECTOR
8	SJS9234A	AC INLET COVER	(EB, EF, EH)		
[XL]			(E1, EK, EX)		
9	XTB3+8JFZ	SCREW	32	SBC1028	BUTTON, S.BASS
10	SNE4021	NUT	33	SGLUV98-KM1	LENS
12	SBC315-7	BUTTON, SPEAKER	34	SHE185-1	SPACER
13	SBC666-5	BUTTON, POWER	35	SUS894	COIL SPRING
14	SBN1221	KNOB, TONE/BALANCE	36	SGLUV98-KM2	LENS
15	SBN1239	KNOB, M.VOL	41	SJS604	CONNECTOR
15A	SHR9451	SPACER	42	$\Delta$ SJS9225	AC OUTLET
18	SKUUV98-KM	BOTTOM BOARD	(EB, EF, EH)		
18A	SKL293	FOOT	(E1, EX)		
19	SGPUZ980-KEB	REAR PANEL ASS'Y	42	$\Delta$ SJS9232B	AC OUTLET
(EB, EF, EH)			[XA, EK]		
(E1)			43	$\Delta$ SJS9231-1B	AC INLET
19	SGP7340-1A	PANEL	(EB, EF, EH)		
[XA]			(E1, EK, EX)		
19	SGP7340-2A	PANEL	[XA]		
[XL]			43	$\Delta$ SJS9234B	AC INLET
(EX)			[XL]		
19	SGP7342A	PANEL	44	$\Delta$ SJT388	FUSE HOLDER
(EK)			(EB, EF, EH)		
20	SGYUZ980-KEB	PANEL	(E1, EX, XA)		
(EB, EF, EH)			45	SMC6379	SHIELD COVER
(E1, EK, EX)			46	SJS50382JQH	CONNECTOR(3P)
[XA, XL]			47	SJT30345JQ	TERMINAL (3P)
21	SYE1128-1	FAN MOTOR ASS'Y	48	SJT30647WL	CONNECTOR(6P)
21A	MDN-4RB4MXB	MOTOR	48	SJT31047WL	CONNECTOR(10P)
21B	SHE234	HOLDER	49	SHR9861	FL HOLDER
21C	SUS271	SPRING	50	SMC1291	SHIELD COVER
21D	SHE232	FAN	51	SMC1292	SHIELD COVER
21E	SHE233	MOTOR CASE	52	SGX7982	ORNAMENT
22	SJF3067N	TERMINAL	53	XNS3+C10FZ	NUT
			[XA]		
			54	SHW35K150-1	WASHER
			[XA]		
			55	$\Delta$ SJT390	FUSE HOLDER

●ELECTRICAL PARTS LIST

Table with columns: Ref. No., Part No., Description. Rows include INTEGRATED CIRCUITS, TRANSISTORS, DIODES, VARIABLE RESISTORS, POSISTORS, COILS AND TRANSFORMERS, COMPONENT COMBINATIONS, OSCILLATORS, DISPLAYS, FUSES, SWITCHES, and RELAYS.

■ RESISTORS AND CAPACITORS

Notes : \* Important safety notice : Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts. \* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.) Parts without these indications can be used for all areas.

Numbering System of Resistor Example: ERD 25 F J 102. Type Wattage (1/4W) Shape Tolerance Value (1KΩ).

Numbering System of Capacitor Example: ECKD 1H 102 Z F. Type Voltage (50V) Value (0.001μF) Tolerance Peculiarity.

● Capacity values are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F). ● Resistance values are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ.

Table with columns: Resistor Type, Wattage, Tolerance. Rows include ERD, ERG, ERQ, ERX, ERD L, ERO K, ERC, ERF, ERM, RRJ, ERJ.

Table with columns: Capacitor Type, Voltage, Tolerance. Rows include ECE, ECCD, ECKD, ECOM, ECOP, ECG, ECEA N, QCU, ECUX, ECF, EECW.

Main resistor and capacitor list table with columns: Ref. No., Part No., Value. Rows include ERD, ERG, ERQ, ERX, ERD L, ERO K, ERC, ERF, ERM, RRJ, ERJ, ECE, ECCD, ECKD, ECOM, ECOP, ECG, ECEA N, QCU, ECUX, ECF, EECW.

Vertical list of Ref. No. from R511 to R940.



# RESISTORS AND CAPACITORS

**Notes :** \* Important safety notice :

Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

\* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)  
Parts without these indications can be used for all areas.

**Numbering System of Resistor**

**Example:**

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

**Numbering System of Capacitor**

**Example:**

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Peculiarity	Value (33μF)	

- Capacity values are in microfarads (μF) unless specified otherwise. P=Pico-farads (pF) F=Farads (F).
- Resistance values are in ohms (Ω), unless specified otherwise. 1K=1,000Ω. 1M=1,000kΩ

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W 12 : 1/2W	J : ±5%
ERG : Metal Oxide	14 : 1/4W 25 : 1/4W	F : ±1%
ERQ : Fuse Type Metal	1A : 1W 18 : 1/8W	G : ±2%
ERX : Metal Film	S2 : 1/4W S1 : 1/2W	J : ±5%
ERD L : Carbon (chip)	2F : 1/4W 50 : 1/2W	K : ±10%
ERO K : Metal Film (chip)	2A : 2W 3A : 3W	M : ±20%
ERC : Solid	6G : 1/10W 8G : 1/8W	
ERF : Incomoustible Box-Shaped		
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V 1A : 10V	K : ±10%
ECCD : Ceramic	1C : 16V 1E : 25V	M : ±20%
ECKD : Ceramic Capacitor	1H : 50V 1V : 35V	Z : +80 %
ECQM : Polyester	50 : 50V 05 : 50V	-20
ECOP : Polypropylene	2H : 500V 2A : 100V	J : ±5%
ECG : Ceramic	1 : 100V 1J : 63V	G : ±2%
ECEA N : Non Polar Electrolytic	KC : 400V AC	F : ±1%
QCU : Ceramic (Chip Type)	KC : 125V AC	C : ±0.25pF
ECUX : Ceramic (Chip Type)	(UL)	D : ±0.5pF
ECF : Semiconductor		
EECW : Liquid electrolyte double layer capacitor		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)			(E1, EX)					
R101	ERDS2TJ391	390 1/4	R162	ERDS2TJ102	1K 1/4	R215	ERDS2TJ473	47K 1/4
R102	ERDS2TJ391	390 1/4	(EB, EF, EH)			R216	ERDS2TJ473	47K 1/4
R105	ERDS2TJ473	47K 1/4	(E1, EX)			R301	ERDS2TJ474	470K 1/4
R106	ERDS2TJ473	47K 1/4	R163	ERDS2TJ102	1K 1/4	R302	ERDS2TJ474	470K 1/4
R107	ERDS2TJ271	270 1/4	(EB, EF, EH)			R303	ERDS2TJ474	470K 1/4
R108	ERDS2TJ271	270 1/4	(E1, EX)			R304	ERDS2TJ474	470K 1/4
R109	ERDS2TJ123	12K 1/4	R164	ERDS2TJ102	1K 1/4	R305	ERDS2TJ392	3.9K 1/4
R110	ERDS2TJ123	12K 1/4	(EB, EF, EH)			R306	ERDS2TJ392	3.9K 1/4
R111	ERDS2TJ184	180K 1/4	(E1, EX)			R307	ERDS2TJ392	3.9K 1/4
R112	ERDS2TJ184	180K 1/4	R165	ERDS2TJ102	1K 1/4	R308	ERDS2TJ392	3.9K 1/4
R113	ERDS2TJ184	180K 1/4	(EB, EF, EH)			R309	ERDS2TJ183	18K 1/4
R114	ERDS2TJ184	180K 1/4	(E1, EX)			R310	ERDS2TJ183	18K 1/4
R115	ERDS2TJ391	390 1/4	R166	ERDS2TJ102	1K 1/4	R311	ERDS2TJ332	3.3K 1/4
R116	ERDS2TJ391	390 1/4	(EB, EF, EH)			R312	ERDS2TJ332	3.3K 1/4
R151	ERDS2TJ471	470 1/4	(E1, EX)			R313	ERDS2TJ122	1.2K 1/4
(EB, EF, EH)			R167	ERDS2TJ102	1K 1/4	R314	ERDS2TJ122	1.2K 1/4
(E1, EX)			(EB, EF, EH)			R315	ERDS2TJ821	820 1/4
R152	ERDS2TJ471	470 1/4	(E1, EX)			R316	ERDS2TJ821	820 1/4
(EB, EF, EH)			R168	ERDS2TJ102	1K 1/4	R317	ERDS2TJ223	22K 1/4
(E1, EX)			(EB, EF, EH)			R318	ERDS2TJ223	22K 1/4
R155	ERDS2TJ102	1K 1/4	(E1, EX)			R403	ERDS2TJ563	56K 1/4
(EB, EF, EH)			R169	ERDS2TJ102	1K 1/4	R404	ERDS2TJ563	56K 1/4
(E1, EX)			(EB, EF, EH)			R405	ERDS2TJ102	1K 1/4
R156	ERDS2TJ102	1K 1/4	(E1, EX)			R406	ERDS2TJ102	1K 1/4
(EB, EF, EH)			R170	ERDS2TJ102	1K 1/4	R407	ERDS2TJ471	470 1/4
(E1, EX)			(EB, EF, EH)			R408	ERDS2TJ471	470 1/4
R157	ERDS2TJ102	1K 1/4	(E1, EX)			R409	ERDS2TJ682	6.8K 1/4
(EB, EF, EH)			R171	ERDS2TJ102	1K 1/4	R410	ERDS2TJ682	6.8K 1/4
(E1, EX)			(EB, EF, EH)			R411	ERDS2TJ824	820K 1/4
R158	ERDS2TJ102	1K 1/4	(E1, EX)			R412	ERDS2TJ824	820K 1/4
(EB, EF, EH)			R172	ERDS2TJ102	1K 1/4	R420	ERDS2TJ224	220K 1/4
(E1, EX)			(EB, EF, EH)			R421	ERDS2TJ563	56K 1/4
R159	ERDS2TJ102	1K 1/4	(E1, EX)			R501	ERDS2TJ102	1K 1/4
(EB, EF, EH)			R203	ERDS2TJ222	2.2K 1/4	R502	ERDS2TJ102	1K 1/4
(E1, EX)			R204	ERDS2TJ222	2.2K 1/4	R503	ERDS2TJ563	56K 1/4
R160	ERDS2TJ102	1K 1/4	R205	ERDS2TJ222	2.2K 1/4	R504	ERDS2TJ563	56K 1/4
(EB, EF, EH)			R206	ERDS2TJ222	2.2K 1/4	R505	ERDS2TJ182	1.8K 1/4
(E1, EX)			R207	ERDS2TJ224	220K 1/4	R506	ERDS2TJ182	1.8K 1/4
R161	ERDS2TJ102	1K 1/4	R208	ERDS2TJ224	220K 1/4	R507	ERDS2TJ563	56K 1/4
(EB, EF, EH)			R212	ERDS2TJ563	56K 1/4	R508	ERDS2TJ563	56K 1/4
			R213	ERDS2TJ683	68K 1/4	R509	ERDS1FJ100	10 1/2
						R510	ERDS1FJ100	10 1/2

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
R511	ERDS2TJ100	10 1/4	R943	ERDS2TJ104	100K 1/4	(E1, EX)		
R512	ERDS2TJ100	10 1/4	R944	ERDS2TJ104	100K 1/4	C166	RCBS1H101KB	100P 50
R513	ERDS2TJ182	1.8K 1/4	R945	ERDS2TJ104	100K 1/4	(EB, EF, EH)		
R514	ERDS2TJ182	1.8K 1/4	R946	ERDS2TJ104	100K 1/4	(E1, EX)		
R515	ERG2ANJ331	330 2	R947	ERDS2TJ104	100K 1/4	C167	RCBS1H101KB	100P 50
R516	ERG2ANJ331	330 2	R948	ERDS2TJ104	100K 1/4	(EB, EF, EH)		
R520	ERD25FJ470	47 1/4	R949	ERDS2TJ102	1K 1/4	(E1, EX)		
R551	ERDS2TJ473	47K 1/4	R950	ERDS2TJ104	100K 1/4	C168	RCBS1H101KB	100P 50
R552	ERDS2TJ103	10K 1/4	R951	ERDS2TJ104	100K 1/4	(EB, EF, EH)		
R553	ERG2ANJ152	1.5K 2	R952	ERDS2TJ104	100K 1/4	(E1, EX)		
R554	ERDS1FJ472	4.7K 1.2	R956	ERDS2TJ102	1K 1/4	C169	RCBS1H101KB	100P 50
R555	ERDS2TJ154	150K 1/4	R957	ERDS2TJ102	1K 1/4	(EB, EF, EH)		
R556	ERDS2TJ684	680K 1/4	R958	ERDS2TJ102	1K 1/4	(E1, EX)		
R557	ERDS2TJ684	680K 1/4	R959	ERDS2TJ102	1K 1/4	C170	RCBS1H101KB	100P 50
R558	ERDS2TJ123	12K 1/4	R960	ERD25FJ223	22K 1/4	(EB, EF, EH)		
R601	ERDS2TJ152	1.5K 1/4	CAPACITORS(VALUE,VOLTAGE)			(E1, EX)		
R602	ERDS2TJ152	1.5K 1/4	C103	RCBC1H101KBY	100P 50	C171	RCBS1H101KB	100P 50
R603	ERDS2TJ332	3.3K 1/4	C104	RCBC1H101KBY	100P 50	(EB, EF, EH)		
R604	ERDS2TJ332	3.3K 1/4	C105	ECKD1H102KB	0.001 50	(E1, EX)		
R605	ERDS2TJ332	3.3K 1/4	C106	ECKD1H102KB	0.001 50	C172	RCBS1H101KB	100P 50
R701	ERDS1FJ180	18 1/2	C107	ECEA0JK220	22 6.3	(EB, EF, EH)		
R702	ERD25FJ470	47 1/4	C108	ECEA0JK220	22 6.3	(E1, EX)		
R703	ERDS2TJ123	12K 1/4	C109	ECFTD682KXL	0.0068 25	C203	ECEA1EK3R3B	3.3 25
R704	ERDS2TJ682	6.8K 1/4	C110	ECFTD682KXL	0.0068 25	C204	ECEA1EK3R3B	3.3 25
R721	ERDS2TJ122	1.2K 1/4	C111	ECFTD223KXL	0.022 25	C205	ECEA1CKS100	10 16
R722	ERD25FJ221	220 1/4	C112	ECFTD223KXL	0.022 25	C206	ECEA1CKS100	10 16
R723	ERDS2TJ472	4.7K 1/4	C113	ECEA1HK010	1 50	C207	ECEA1EK3R3B	3.3 25
R724	ERDS2TJ103	10K 1/4	C114	ECEA1HK010	1 50	C208	ECEA1EK3R3B	3.3 25
R725	ERDS2TJ562	5.6K 1/4	C115	ECKD1H103PF	0.01 50	C209	ECEA1CKS100	10 16
R726	ERDS2TJ472	4.7K 1/4	C116	ECKD1H103PF	0.01 50	C210	ECEA1CKS100	10 16
R801	ERDS2TJ223	22K 1/4	C117	ECEA1CKS100	10 16	C212	ECFTD223KXL	0.022 25
R802	ERDS2TJ223	22K 1/4	C118	ECEA1CKS100	10 16	C301	ECEA1EK3R3B	3.3 25
R803	ERDS2TJ223	22K 1/4	C151	RCBS1H180KBY	18P 50	C302	ECEA1EK3R3B	3.3 25
R804	ERDS2TJ223	22K 1/4	(EB, EF, EH)			C303	RCBC1H150JLY	15P 50
R805	ERDS2TJ392	3.9K 1/4	(E1, EX)			C304	RCBC1H150JLY	15P 50
R806	ERDS2TJ392	3.9K 1/4	C152	RCBS1H180KBY	18P 50	C305	RCBS1H221KBY	220P 50
R807	ERDS2TJ680	68 1/4	(EB, EF, EH)			C306	RCBS1H221KBY	220P 50
R901	ERDS2TJ104	100K 1/4	(E1, EX)			C307	RCBS1H330JLY	33P 50
R902	ERDS2TJ104	100K 1/4	C153	RCBC1H151KBY	150P 50	C308	RCBS1H330JLY	33P 50
R903	ERDS2TJ273	27K 1/4	(EB, EF, EH)			C309	ECEA1CKS100	10 16
R904	ERDS2TJ273	27K 1/4	(E1, EX)			C310	ECEA1CKS100	10 16
R905	ERDS2TJ104	100K 1/4	C154	RCBC1H151KBY	150P 50	C311	ECFTD123KXL	0.012 25
R906	ERDS2TJ104	100K 1/4	(EB, EF, EH)			C312	ECFTD123KXL	0.012 25
R907	ERDS2TJ104	100K 1/4	(E1, EX)			C313	ECFTD683KXL	0.068 25
R908	ERDS2TJ104	100K 1/4	C155	RCBS1H101KB	100P 50	C314	ECFTD683KXL	0.068 25
R909	ERDS2TJ104	100K 1/4	(EB, EF, EH)			C315	ECFTD562KXL	0.0056 25
R910	ERDS2TJ153	15K 1/4	(E1, EX)			C316	ECFTD562KXL	0.0056 25
R911	ERDS2TJ153	15K 1/4	C156	RCBS1H101KB	100P 50	C317	ECFTD273KXL	0.027 25
R912	ERDS2TJ224	220K 1/4	(EB, EF, EH)			C318	ECFTD273KXL	0.027 25
R913	ERDS2TJ822	8.2K 1/4	(E1, EX)			C319	ECEA1CKS100	10 16
R914	ERDS2TJ822	8.2K 1/4	C157	RCBS1H101KB	100P 50	C320	ECEA1CKS100	10 16
R915	ERDS2TJ271	270 1/4	(EB, EF, EH)			C321	ECKD1H103PF	0.01 50
R916	ERDS2TJ472	4.7K 1/4	(E1, EX)			C322	ECEA1CKS100	10 16
R917	ERDS2TJ181	180 1/4	C158	RCBS1H101KB	100P 50	C403		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
C517 {EB, EF, EH} {E1, EX}	ECKD1H223PF	0.022 50	C701 $\Delta$ C702 $\Delta$ {XA}	ECKWNS103ZVS ECKD2H103PE	0.01 0.01 500	C801 C802 C803	ECEA1CKS100 ECEA1CU101 ECEA1CU101	10 16 100 16 100 16
C518 {EB, EF, EH} {E1, EX}	ECKD1H223PF	0.022 50	C702 {EB, EX, EF} {EH, E1, EK} {XL}	ECQP1224JZW	0.22 100	C901 C902 C903 C904 C905 C907	ECEA0JS102 ECKD1H103PF ECEA0JU471 ECEA1HKR47 ECEA1HK010 ECFTD563KXL	1000 6.3 0.01 50 470 6.3 0.47 50 1 50 0.056 25
C519 {EB, EF, EH} {E1, EX}	ECKD1H331KB	330P 50	C703 C704 C705 C706 C707 C708 C709	ECES71V103VN ECES71V103VN ECKD1H103PF ECKD1H103PF ECEA1CKS100 ECKD1H103PF ECEA1CU101	10000 71 10000 71 0.01 50 0.01 50 10 16 0.01 50 100 16	C908 C909 C910 C911 C912	ECFTD563KXL ECEA1HK2R2B ECEA1HK2R2B ECEA1VU330 ECEA1VU330	0.056 25 2.2 50 2.2 50 33 35 33 35
C520 {EB, EF, EH} {E1, EX}	ECKD1H331KB	330P 50	C710 C720 C721 C722 C723 C724 C725 C726	ECEA1HS330 ECKD1H103PF ECKD1H103PF ECKD1H103PF ECKD1H103PF ECEA1CU101 ECEA2AU3R3B ECEA1CU470	33 50 0.01 50 0.01 50 0.01 50 0.01 50 100 16 3.3 100 47 16	C913 C914 C915 C916 C917 C918 C919 C920	ECEA1HK4R7 ECEA1HK4R7 RCBS1H331KBY RCBS1H331KBY RCBS1H331KBY RCBS1H331KBY RCBS1C272MYX RCBS1C272MYX	4.7 50 4.7 50 330P 50 330P 50 330P 50 330P 50 0.0027 16 0.0027 16
C551 C552 C553 C554 {EK, XA, XL}	ECEA1VU470 ECEA1HS330 ECEA1HN100S ECKD1H223PF	47 35 33 50 10 50 0.022 50	C601 C602 C603 C604 C605	ECKD1H103PF ECKD1H103PF RCBS1H181KB RCBS1H181KB RCBS1H181KB	0.01 50 0.01 50 180P 50 180P 50 180P 50			

**●PACKING PARTS LIST**

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
PACKING MATERIAL			A1	SQF13363	INSTRUCTION BOOK
P1 {EB, EH, E1} {EK, XA, XL} {EX}	SPG6369	PACKING CASE	{E1}	SQF13364	INSTRUCTION BOOK
P1 {EF}	SPG6370	PACKING CASE	{XA}	SQF13365	INSTRUCTION BOOK
P2	SPS5246	PAD	A1 {XL}	SWKUV98KM1	FLAT CABLE
P3	SPS5185	PAD	A6 $\Delta$	SJA173	POWER CORD
P3	SPS5247	PAD	{XL}	SJA185	POWER CORD
P4	SPP723	PROTECTION COVER	A6 $\Delta$ {XA}	SJA187	POWER CORD
ACCESSORIES			A6 {EB, EF, EH} {E1, EX}	SJA188	POWER CORD
A1 {EH, EX}	SQF13360	INSTRUCTION BOOK	A6 $\Delta$ {EK}	RJP120ZBS-H	AC PLUG ADAPTOR
A1 {EK}	SQF13361	INSTRUCTION BOOK	A7 $\Delta$ {XA}		
A1 {EF}	SQF13362	INSTRUCTION BOOK			