

This service manual is designed for service engineers to repair, adjust, maintain and order the replacement parts of the AU-4400 correctly. When ordering the parts, use the stock number and parts name specifically referring to the Parts Locations & Parts Lists. For general usage and maintenance of the unit, please refer to the Operating Instructions attached with the unit.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.	SPECIFICATIONS	2
2.	BLOCK DIAGRAM AND VALUE OF EACH LEVEL	3
3.	ADJUSTMENT	4
4.	TROUBLESHOOTING CHART	4
	4-1. Troubleshooting on Power Supply Section.....	4
	4-2. Troubleshooting on Audio Section	4
5.	PARTS LOCATIONS AND PARTS LISTS	5
	5-1. F-2400A Equalizer, Tone Control Circuit Board	5
	5-2. F-2402 Main & Power Supply Circuit Board	5
	5-3. F-2406 Selector Switch Circuit Board	6
	5-4. F-2407 Volume Circuit Board	6
	5-5. F-2408A Accessory Circuit Board	6
	5-6. Other Parts (Front Side)	7
	5-7. Other Parts (Top Side)	8
6.	SCHEMATIC DIAGRAM	9
7.	PACKING LIST	10
8.	ACCESSORY PARTS LIST	10

1. SPECIFICATIONS

CONTINUOUS RMS POWER OUTPUT	20 Watts per channel × 2 (both channels driven)
LOAD IMPEDANCE	8Ω
POWER BAND	40 to 20,000Hz
TOTAL HARMONIC DISTORTION	less than 0.3% (from AUX inputs)
Music power (IHF)	96W (4Ω 1,000Hz) 70W (8Ω 1,000Hz) Continuous RMS power output..23+23W (8Ω 1,000Hz)
INTERMODULATION DISTORTION	(at rated power output, 70Hz: 7kHz=4:1 SMPTE method)
OVERALL (from AUX)	less than 0.5%
FREQUENCY RESPONSE (at 1 Watt power output)	OVERALL (from AUX) ..20 to 30,000Hz ± 1 dB
EQUALIZATION (at TAPE REC output)	RIAA Curve (30Hz~15kHz ± 1 dB)
DAMPING FACTOR	50 (8Ω)
CHANNEL SEPARATION (1kHz at rated power output)	PHONObetter than 45dB TUNER, AUX, TAPEbetter than 45dB
IHF HUM AND NOISE	PHONObetter than 70dB MICbetter than 70dB TUNER, AUX, TAPEbetter than 85dB
INPUT SENSITIVITY AND IMPEDANCE (1kHz for rated power output)	PHONO2.5mV 50kΩ (Max. input capability: 100mV at 0.2% distortion) MIC2.5mV 10kΩ TUNER, AUX150mV 50kΩ TAPE RLAY (Pin jack) ..150mV 50kΩ TAPE REC/PLAY (DIN socket)150mV 50kΩ
RECORDING OUTPUT	TAPE REC (Pin jack)150mV TAPE REC/PLAY (DIN socket) ..30mV
SWITCHES AND CONTROLS	BASS+12dB, -12dB (50Hz) TREBLE+12dB, -12dB (15kHz) LOUDNESS (volume control: -30dB)+10dB (50Hz)+8dB (10kHz)
LOW FILTER	-3dB (100Hz, 6dB/oct.)
HIGH FILTER	-3dB (7kHz, 6dB/oct.)

OTHERS

SEMICONDUCTORS

TRANSISTOR	17
DIODES	4
ICs	4
LED	1

POWER REQUIREMENTS

VOLTAGE	100, 117, 220, 240V 50/60Hz
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CONSUMPTION	56W (rated), 156W (max.)
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DIMENSIONS

400mm (15 $\frac{3}{4}$ " W

120mm (4 $\frac{3}{4}$ " H

240mm (9 $\frac{1}{2}$ " D

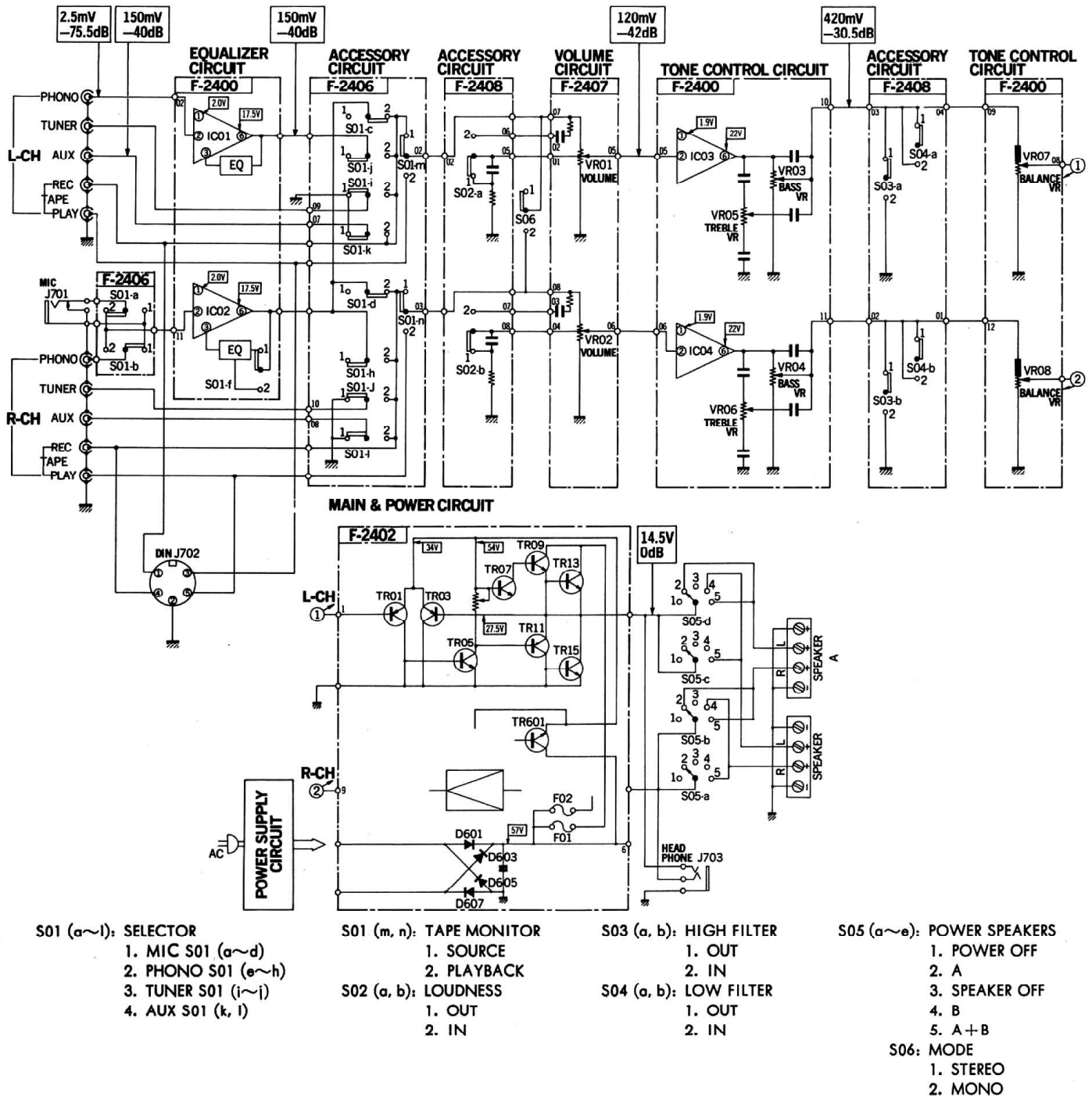
WEIGHT

6.3Kg (13.9 lbs) net

7.6Kg (16.8 lbs) packed

* Design and specification subject to change without notice for improvements.

2. BLOCK DIAGRAM AND VALUE OF EACH LEVEL



Conditions of Level Measuring

*Value of each level in block diagram was measured by the followings.

1. MASTER VOLUME Maximum
2. BASS, TREBLE, BALANCE volume Center
3. Input PHONO 2.5mV 1kHz Sine Wave
AUX 150mV 1kHz Sine Wave
(output impedance of 600Ω at an audio oscillator)

4. Output 14.5V (26W) 8Ω

Note: Each voltage value is for reference and measured by a VTVM. In some recorders, the actual voltage value is in minor difference from the reference value.

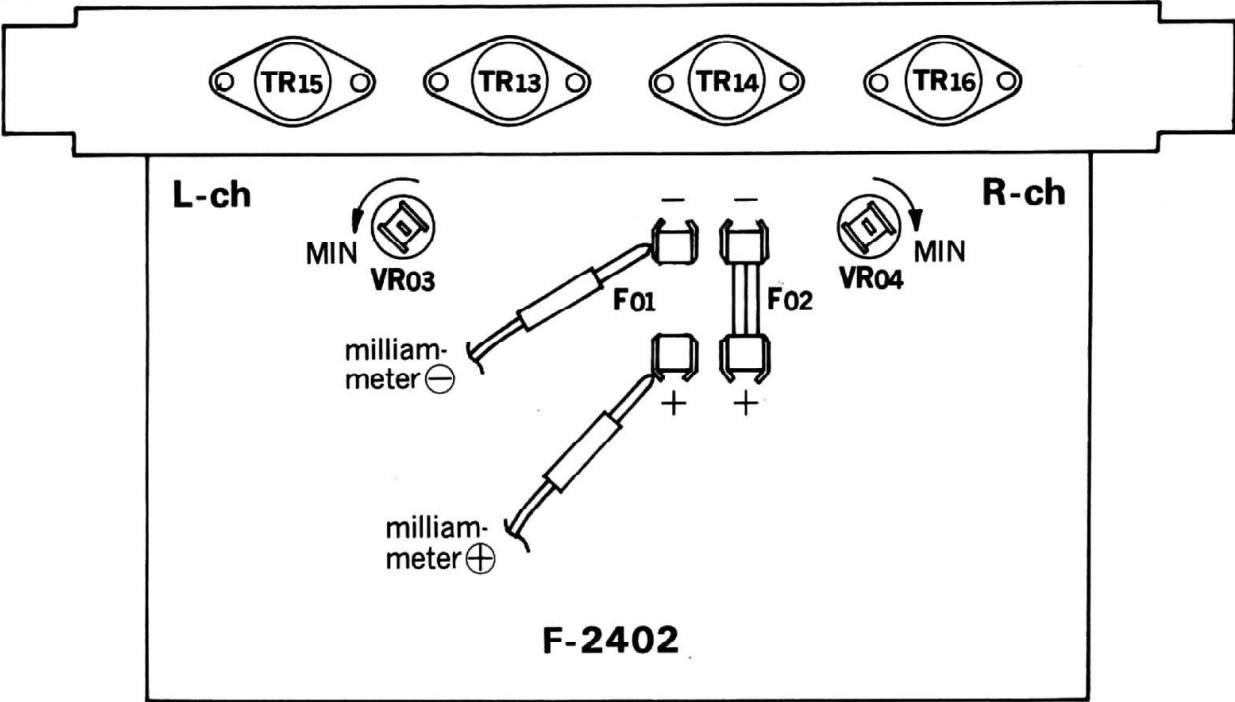
Output Each channel driven 8Ω at 1,000kHz

3. ADJUSTMENT

3-1. Bias Current Adjustment

- Note:** 1. Master VolumeMinimum
2. Speaker SelectorSYSTEM (A)
3. Make the SP terminals free (no load).
4. Confirm the AC power supply voltage.
5. After adjustment, run the unit for more than 3 minutes then check and readjust necessary.
6. Room temperature should be 18~28° (65~83°F) for bias current adjustment.
- * Before adjustment of bias current, set VR03 and VR04 as follows. (Fig. 3-1)
- 1) Turn VR03 (L-ch) fully counterclockwise. (The bias current is minimum)
 - 2) Turn VR04 (R-ch) fully clockwise. (The bias current is minimum)

Fig. 3-1



STEP	SUBJECT	EQUIPMENT	MEASURE OUTPUT	ADJUST	ADJUST FOR	CONDITION
1	Bias current L-ch	DC milliammeter	F-2402 F01 (Fig. 3-1)	F-2402 VR03 (Fig. 3-1)	20mA±1mA	◦Step down meter's range accordingly
2	Bias current R-ch	Same as above	F-2402 F02 (Fig. 3-1)	F-2402 VR04 (Fig. 3-1)	20mA±1mA	◦Change lead's porarity if meter swings backward

4. TROUBLESHOOTING CHART

〈Notices when servicing this unit〉

○On Light Emitted Diode (LED)

The LED used as Pilot Lamp driven by constant current has characteristics of extreme low reverse breakdown voltage (DC 3V) and also it would be easily influenced by discharge voltage from capacitors in power amplifier section.

Therefore, after power switch is turned OFF and lapse of a few seconds, perform the replacement of LED.

○Notice when replacing LED

Please refer to Fig. 4-1 when replacing LED, as the polarity of LED does not show on LED and the socket. If reversely connected, it become defective.

○Notice when replacing IC

- 1) Do not vent the leads of IC more than 3 times.
- 2) When using a soldering iron, IC should be absolutely isolated from current leakage of the iron. In order to protect IC against break-down, connect a

lead wire from the iron to ground (chassis) as shown below. (Fig. 4-2)

- 3) As IC is extremely weak against heat; use a soldering iron as shorter as possible.

Fig. 4-1

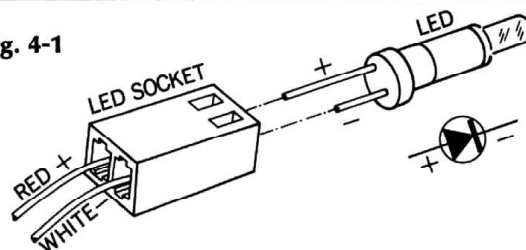
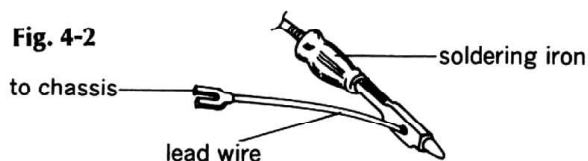


Fig. 4-2



Symptom

Check Point

Cause & What to Do

4-1. Troubleshooting on Power Supply Section

1. No power supplied to each section (Power lamp not light)

- | | |
|--|--|
| 1-1. AC+38.5V not supplied to terminal [4] on F-2402 | 1. Imperfect contact of power supply plug |
| | 2. Defective power switch, S05e |
| | 3. Imperfect contact of voltage selector, PU701 |
| | 4. Power fuse, F701 open |
| | 5. Defective power transformer, T701 |
| 1-2. AC+38.5V supplied to terminal [4] on F-2402 | |
| 1) +57V not supplied to terminal [6] on F-2402 | 6. Defective D601, D602, D605 and D607 on F-2402 |
| 2) +57V supplied to terminal [6] on F-2402 | 7. Defective LED701 |

4-2. Troubleshooting on Audio Section

1. Quick acting fuse open

- | | |
|---|------------------------------------|
| 1-1. After replacement, fuse open again | 1. Speaker terminal short |
| | 2. TR09~TR16 short on F-2402 |
| | 3. TR06 open on F-2402 |
| 1-2. After replacement, fuse not open | 4. TR601, TR01~TR04 open on F-2402 |

2. AUX inoperative

- | | |
|--|--|
| 2-1. +57V not supplied to terminal [03] on F-2400A | 5. Defective power supply section (F-2402) |
| 2-2. +57V supplied to terminal [03] on F-2400A | 6. Imperfect contact of SELECTOR switch S01 (K, I) |
| | 7. Imperfect contact of TAPE MONITOR switch S01 (m, n) |
| | 8. Defective IC03 (IC04) on F-2400A |

3. PHONO inoperative

- | | |
|---------------------------|---|
| | 9. Imperfect contact of SELECTOR switch S01 (e~h) |
| | 10. Defective IC01 (IC02) on F-2400A |
| 3-1. Excessive Distortion | 11. Imperfect contact of SELECTOR switch S01 (f) |

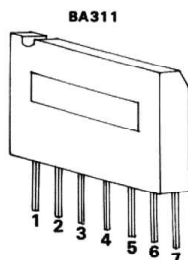
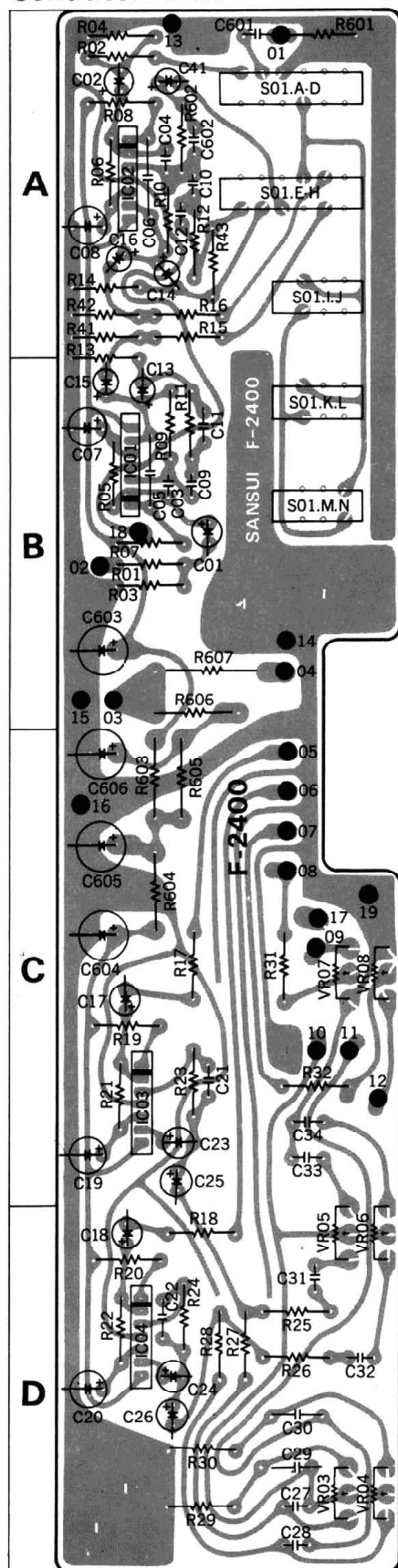
4. MIC inoperative

- | | |
|--|--|
| | 12. Imperfect contact of SELECTOR switch S01 (a~l) |
| | 13. Imperfect contact of MIC Jack |

5. PARTS LOCATIONS AND PARTS LISTS

5-1. F-2400A Equalizer, Tone Control Circuit Board (Stock No. 7560860 Complete Circuit Board F-2400)

Conductor Side

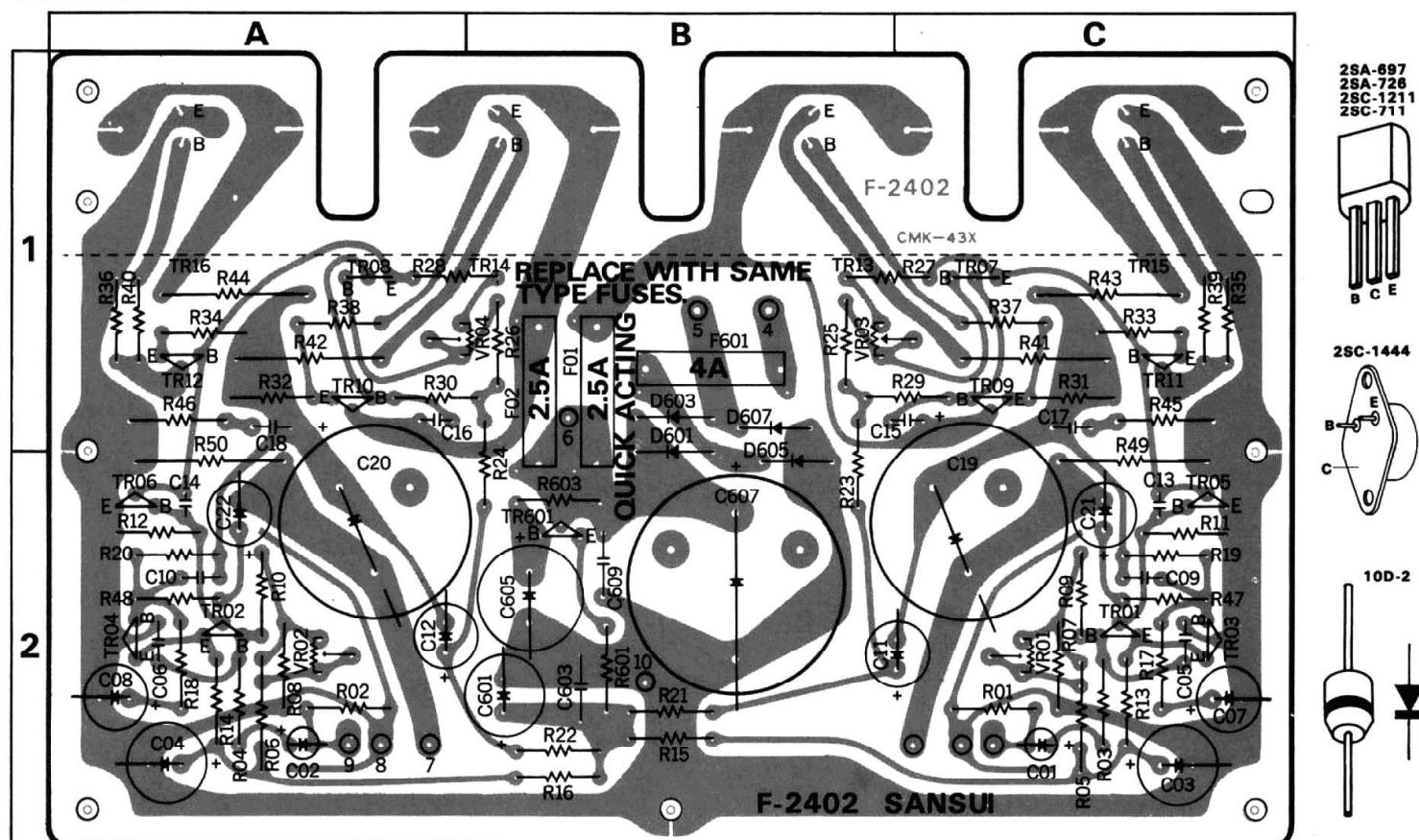


Parts List

Parts No.	Stock No.	Description	Position
IC01, 02	0360171, 2	BA311(E, F)	B. A
IC03, 04	0360181, 2	BA311(S(E, F)	
C01, 02	0519102	3.3 μ F 50V E.C.	A. B
C03, 04	0660470	47pF 50V C.C.	B. A
C05, 06	0660101	100pF 50V C.C.	B. A
C07, 08	0511330	33 μ F 10V E.C.	B. A
C09, 10	0600227	0.022 μ F 50V M.C.	B. A
C11, 12	0600626	0.0062 μ F 50V M.C.	B. A
C13, 14	0513100	10 μ F 25V E.C.	B. A
C15, 16	0519104	1.5 μ F 50V E.C.	B. A
C17, 18	0515339	3.3 μ F 50V E.C.	C. D
C19, 20	0510101	100 μ F 6.3V E.C.	C. D
C21, 22	0660470	47pF 50V C.C.	C. D
C23, 24	0513100	10 μ F 25V E.C.	C. D
C25, 26	0515109	1 μ F 50V E.C.	C. D
C27, 28	0601227	0.022 μ F 50V M.C.	D
C29, 30	0601228	0.22 μ F 50V M.C.	D
C31, 32	0601476	0.0047 μ F 50V M.C.	D
C33, 34	0601477	0.047 μ F 50V M.C.	C
C41	0515109	1 μ F 50V E.C.	A
C601	0601687	0.068 μ F 50V M.C.	A
C602	0660221	220pF 50V C.C.	A
C603	0515221	220 μ F 50V E.C.	B
C604	0515101	100 μ F 50V E.C.	C
C605	0515101	100 μ F 50V E.C.	C
C606	0515101	100 μ F 50V E.C.	C
C901	0660100	10pF 50V C.C.	B. A
C902	0660100	10pF 50V C.C.	
R01, 02	0107222	2.2k Ω	B. A
R03, 04	0107104	100k Ω	B. A
R05, 06	0107104	100k Ω	B. A
R07, 08	0107684	680k Ω	B. A
R09, 10	0107154	150k Ω	B. A
R11, 12	0107123	12k Ω	B. A
R13, 14	0107473	47k Ω	A
R15, 16	0107221	220 Ω	A
R17, 18	0107222	2.2k Ω	C. D
R19, 20	0107684	680k Ω	C. D
R21, 22	0107104	100k Ω	C. D
R23, 24	0107822	8.2k Ω	C. D
R25, 26	0107102	1k Ω	D
R27, 28	0107153	15k Ω	D
R29, 30	0107152	1.5k Ω	D
R31, 32	0107222	22k Ω	C
R41, 42	0107104	100k Ω	A
R43	0107105	1M Ω	A
R601	0107123	12k Ω	A
R602	0107153	15k Ω	A
R603	0103102	1k Ω	C
R604	0103471	470 Ω	C
R605	0107221	220 Ω	C
R606	0103102	1k Ω	B
R607	0182392	3.9k Ω	B
R901	0107471	470 Ω	Variable Resistor
VR03, 04	1015080, 1	100k Ω (A) $\times$ 2	
VR05, 06	1015080, 1	100k Ω (A) $\times$ 2	
VR07, 08	1015070, 1	100k Ω (MN) $\times$ 2	
S01(a-n)	1130860	SUB54 Push Switch	A, B

5-2. F-2402 Main & Power Supply Circuit Board (Stock No. 7570950 Complete Circuit Board F-2402)

Conductor Side

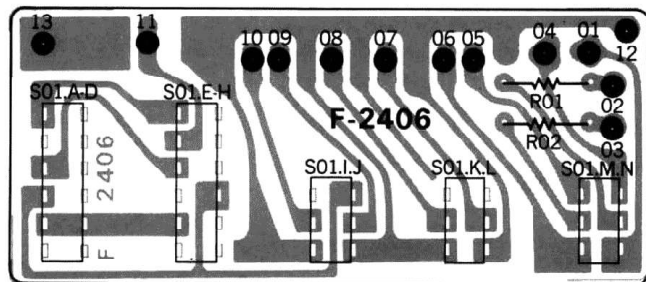


Parts List

Parts No.	Stock No.	Description	Position
TR01, 02	0300470, 1	2SA726W (F, G)	2 C. 2 A
TR03, 04	0300470, 1	2SA726W (F, G)	2 C. 2 A
TR05, 06	0305931	2SC1211D	2 C. 2 A
TR07, 08	0305731	2SC711E	1 C. 1 A
TR09, 10	0305930, 1	2SC1211 (C, D)	1 C. 1 A
TR11, 12	0300310, 1	2SA697 (C, D)	1 C. 1 A
TR13, 14	0306101, 2	2SC1444 (O, Y)	1 B
TR15, 16	0306101, 2	2SC1444 (O, Y)	1 C. 1 A
TR601	0305931	2SC1211D	2 B
D601	0310350	10D-2	1, 2 B
D603	0310350	10D-2	1 B
D605	0310350	10D-2	2 B
D607	0310350	10D-2	1 B
C01, 02	0519103	0.47 μ F 50V E.C.	2 C. 2 A
C03, 04	0515101	100 μ F 50V E.C.	2 C. 2 A
C05, 06	0660331	330pF 50V C.C.	2 C. 2 A
C07, 08	0515470	47 μ F 50V E.C.	2 C. 2 A
C09, 10	0660509	5pF 50V C.C.	2 C. 2 A
C11, 12	0515330	33 μ F 50V E.C.	2B, C. 2A, B
C13, 14	0660220	22pF 50V C.C.	2 C. 2 A
C15, 16	0660221	220pF 50V C.C.	1 C. 1 A
C17, 18	0601477	0.047 μ F 50V M.C.	1 C. 1 A
C19, 20	0549107	1500 μ F 50V E.C.	1, 2B, 2 A
C21, 22	0515100	10 μ F 50V E.C.	2 C. 2 A
C601	0519902	47 μ F 80V E.C.	2 B
C603	0659010	0.0047 μ F 500V C.C.	2 B
C605	0519903	100 μ E 80V E.C.	2 B
C607	0549205	2200 μ F 63V E.C.	2 B
C609	0659011	0.01 μ F 500V C.C.	2 B

Parts No.	Stock No.	Description	Position
R01, 02	0107474	470k Ω	2 C. 2 A
R03, 04	0107222	2.2k Ω	2 C. 2 A
R05, 06	0107223	22k Ω	2 C. 2 A
R07, 08	0107563	56k Ω	2 C. 2 A
R09, 10	0107473	47k Ω	2 C. 2 A
R11, 12	0107222	2.2k Ω	2 C. 2 A
R13, 14	0107123	1.2k Ω	2 C. 2 A
R15, 16	0107123	12k Ω	2 B. 2 B
R17, 18	0107821	820 Ω	2 C. 2 A
R19, 20	0107563	56k Ω	2 C. 2 A
R21, 22	0107182	1.8k Ω	2 C. 2 B
R23, 24	0107472	4.7k Ω	1, 2B, 1, 2B
R25, 26	0107222	2.2k Ω	1 B. 1 B
R27, 28	0107821	820 Ω	1B, C. 1A, B
R29, 30	0107390	39 Ω	1B, C. 1A, B
R31, 32	0107221	220 Ω	1 C. A
R33, 34	0107100	10 Ω	1 C. A
R35, 36	0107221	220 Ω	1 C. A
R37, 38	0107100	10 Ω	1 C. A
R39, 40	0107100	10 Ω	1 C. A
R41, 42	0122338	0.33 Ω	1 C. A
R43, 44	0122338	0.33 Ω	1 C. A
R45, 46	0103479	4.7 Ω $\frac{1}{2}$ W C.R.	1 C. A
R47, 48	0107823	82k Ω $\frac{1}{4}$ W C.R.	2 C. 2 A
R49, 50	0104471	470 Ω 1W C.R.	2 C. 2 A
R601	0107101	100 Ω $\frac{1}{4}$ W C.R.	2 B
R603	0210153	15k Ω $\frac{1}{2}$ W C.R.	2 B
VR03, 04	1035070	1k Ω B Bias Current Volume	1B, C. 1A, B
F01, 02	0433670	2.5A Quick Acting Fuse	1 B. 1 B
	5937080	Heat Sink	

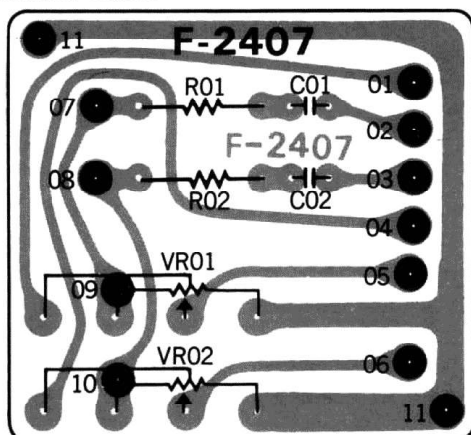
5-3. F-2406 Selector Switch Circuit Board



Parts List

Parts No.	Stock No.	Description
R01, 02	0107103	10k Ω $\frac{1}{4}$ W C.R.
S01	0130860	Push Switch (Selector)
C903	0657473	0.047 μ F 50V C.C.

5-4. F-2407 Volume Circuit Board



Parts List

Parts No.	Stock No.	Description
C01	0621561	560pF 50V P.C.
C02	0621561	560pF 50V P.C.
R01	0107153	15k Ω $\frac{1}{4}$ W C.R.
R02	0107153	15k Ω $\frac{1}{4}$ W C.R.
VR01	1011010, 1	250k Ω (B) $\times$ 2 Variable Resistor
VR02	1011010, 1	250k Ω (B) $\times$ 2 Variable Resistor

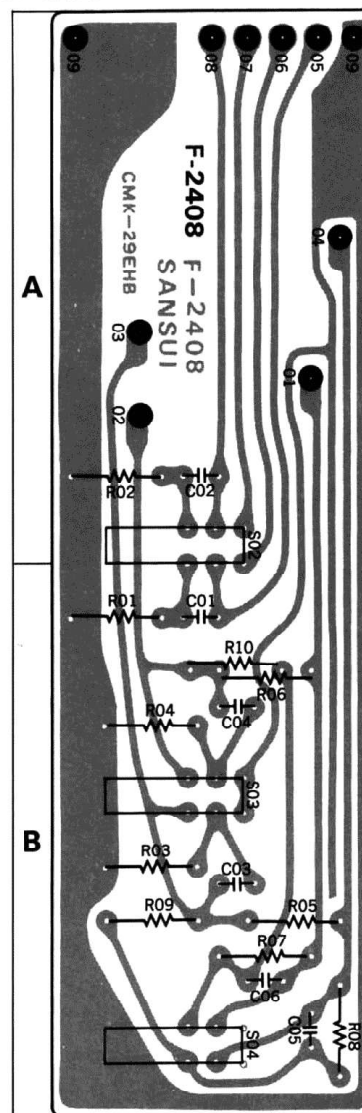
Abbreviations

C.R. : Carbon Resistor	BP.E.C.: Bi-Polar Electrolytic Capacitor
S.R. : Solid Resistor	C.C. : Ceramic capacitor
Ce.R. : Cement Resistor	Mi.C. : Mica Capacitor
M.R. : Metallized Film Resistor	O.C. : Oil Capacitor
M.C. : Mylar Capacitor	P.C. : Polystyrene Capacitor
E.C. : Electrolytic Capacitor	T.C. : Tantalum Capacitor

5-5. F-2408A Accessory Circuit Board

(Stock No. 7592200 Complete Circuit Board F-2408)

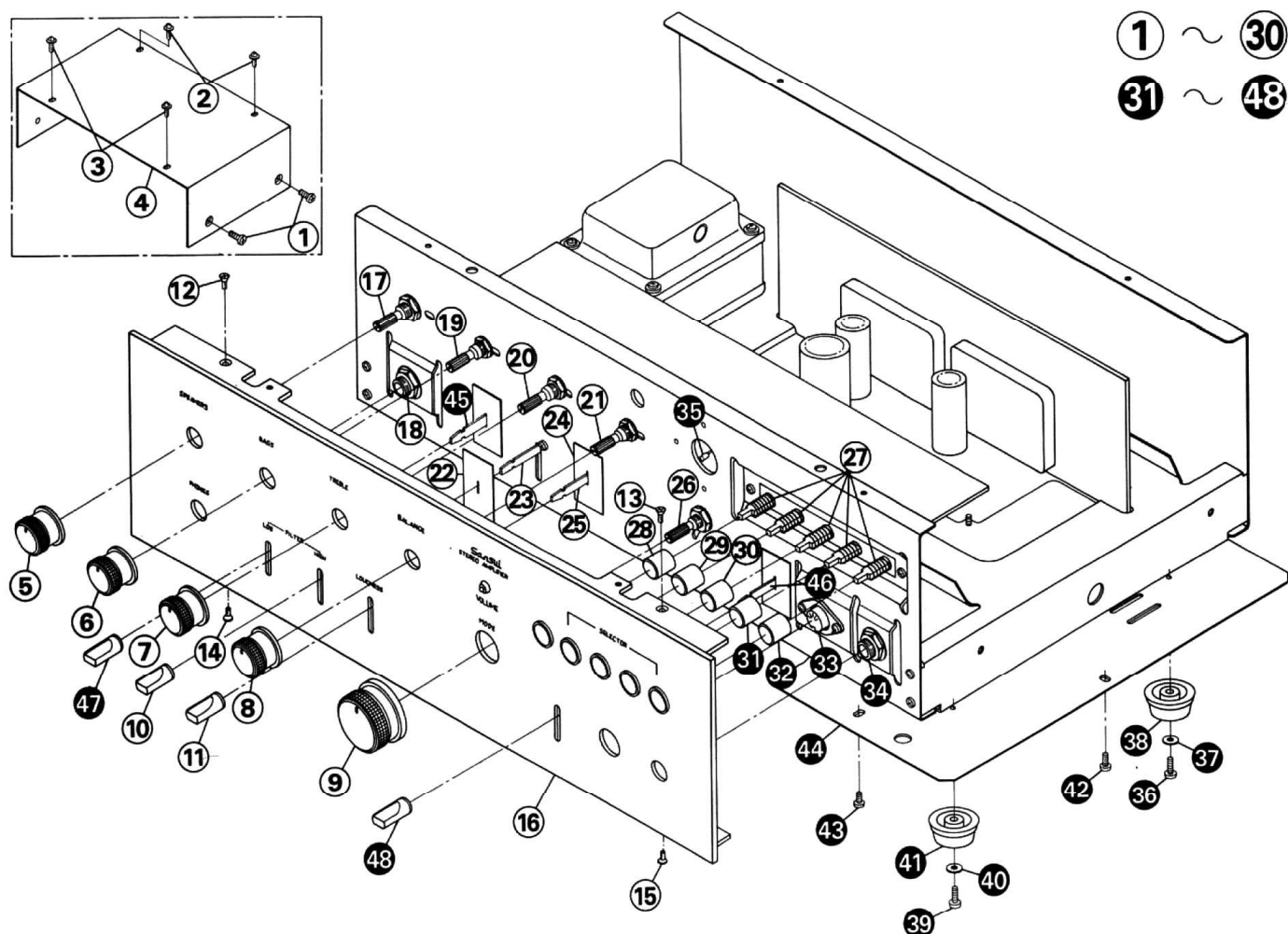
Conductor Side



Parts List

Parts No.	Stock No.	Description	Position
C01, 02	0601157	0.015 μ F	B . A
C03, 04	0601227	0.22 μ F	B
C05, 06	0601477	0.047 μ F	B
R01, 02	0107223	22k Ω	B . A
R03, 04	0107104	100k Ω	B
R07, 08	0107474	470k Ω	B
R09, 10	0107222	2.2k Ω	B
S02(a,b)	1170340	SX15-5	A
S03(a,b)	1170350	SX15-5	B
S04(a,b)	1170340	SX15-5	B

5-6. Other Parts (Front Side)

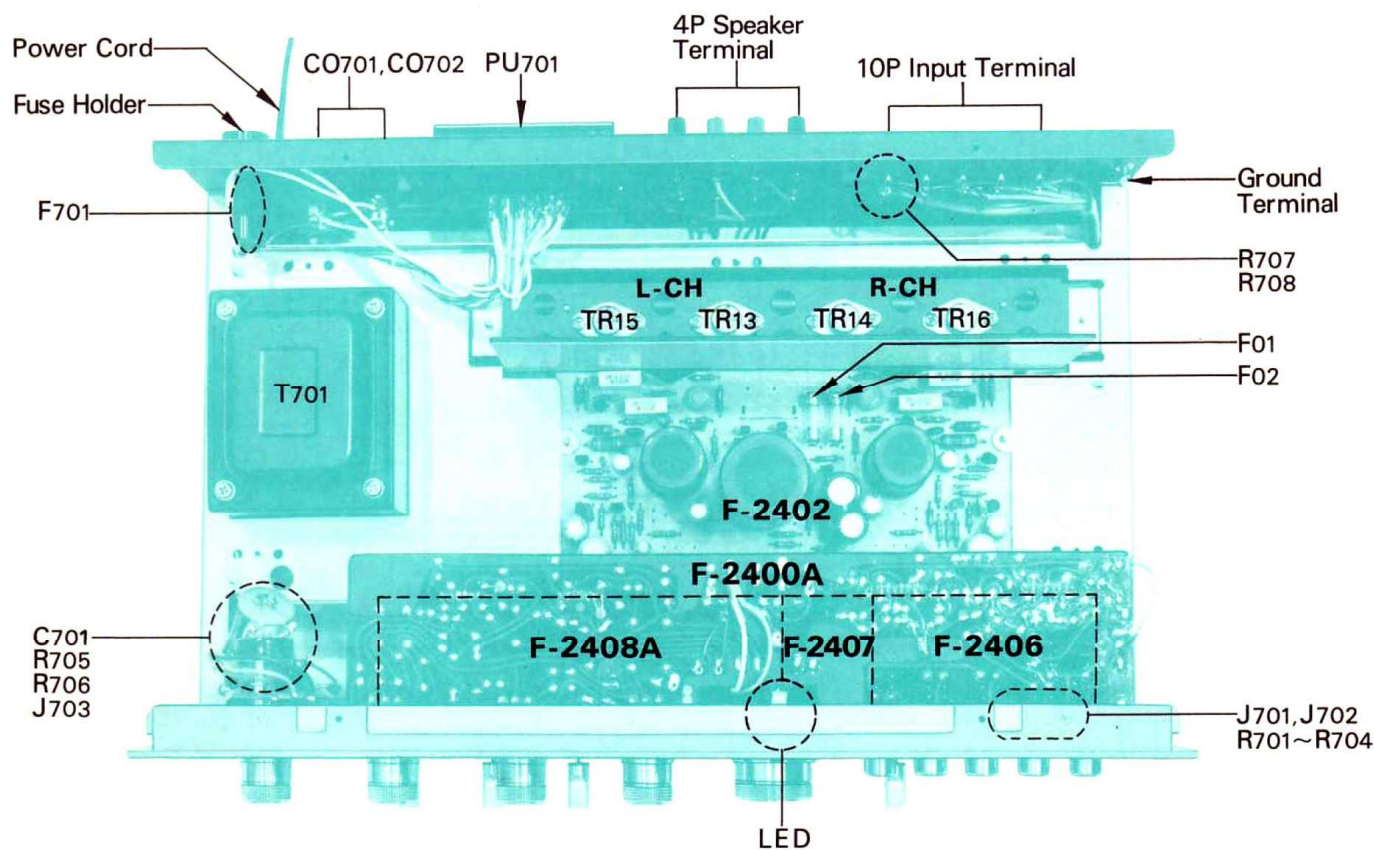


Parts List

Parts No.	Stock No.	Description
1	5101161	Binding Head Screw, M4×6
2	5109222	Binding Head Tapping Screw, 3×8
3	5109222	Binding Head Tapping Screw, 3×8
4	5006350	Bonnet
5	5317880	S-5 Type Knob, SPEAKERS
6	5317880	S-5 Type Knob, BASS volume
7	5317880	S-5 Type Knob, TREBLE volume
8	5317880	S-5 Type Knob, BALANCE volume
9	5317911	M-5 Type Knob, VOLUME
10	5326460	E-1 Type Knob, LEVER Switch
11	5326460	E-1 Type Knob, LEVER Switch
12	5102543	F Type Screw, M3×6
13	5102543	F Type Screw, M3×6
14	5109122	Binding Head Tapping Screw, 3×8
15	5109122	Binding Head Tapping Screw, 3×8
16	5309332	Front Panel
17	1101550	Rotary Switch Y-1-2-5, SPEAKERS
18	2430190	Headphone Jack
19	1015080	100kΩ (A)×2 BASS volume
20	1015080	100kΩ (A)×2 TREBLE volume
21	1015070	100kΩ (MN)×2 BALANCE volume
22	5047460	Masking, High Filter Switch
23	1170350	LEVER Switch, High Filter
24	5047460	Masking, Loudness Switch

Parts No.	Stock No.	Description
25	1170340	LEVER Switch, Loudness
26	1011010, 1	250kΩ (B)×2 VOLUME
27	1130860	Push Switch (5 Stage)
28	5326500	B Type Push Button
29	5326500	B Type Push Button
30	5326500	B Type Push Button
31	5326500	B Type Push Button
32	5326500	B Type Push Button
33	2430050	DIN Connector
34	2430160	Mic Jack
35	7726080	LED Ass'y (Light Emitted Diode)
36	5166520	Binding Head Screw, M3×12
37	5121340	Washer, M3φ
38	5516940	Rubber Foot
39	5166520	Binding Head Screw, M3×12
40	5121340	Washer, M3φ
41	5516940	Rubber Foot
42	5109222	Binding Head Screw, M3×8
43	5109222	Binding Head Screw, M3×8
44	5058190	Bottom Plate
45	1170340	Lever Switch, LOW FILTER
46	1170340	Lever Switch, MODE
47	5326460	E-1 TYPE Knob, LOW FILTER switch
48	5326460	E-1 TYPE Knob, MODE switch

5-7. Other Parts (Top Side)



Parts List

Parts No.	Stock No.	Description
TR13~16	0306101, 2	2SC1444 (O, Y) Transistor
C701	0659801	0.01 μ F 1.4kV C.C.
R701, 702	0107224	220k Ω } $\frac{1}{4}$ W C.R.
R703, 704	0107104	100k Ω }
R705, 706	0103331	330 Ω $\frac{1}{2}$ W C.R.
R707, 708	0106334	330k Ω $\frac{1}{4}$ W C.R. (E.L.R)
LED	7726080	Light Emitted Diode Ass'y
J701	2430160	Mic Jack
J702	2430050	DIN Jack
J703	2430190	Phone Jack
CO701,702	2450060	AC Outlet

Parts No.	Stock No.	Description
T701	4002120	Power Transformer
F701	{ 0431242 0431232 2300060 }	{ 2A (100~117V) 1.5A (220~240V) Fuse Holder } Power Fuse
PU701	{ 2410080 2410090 }	{ Voltage Selector, Socket Voltage Selector, Plug }
	2200350	10P Input Terminal
	2210200	4P Speaker Terminal
	2230050	Ground Terminal
	3800020	Power Cord (KP-200)
	3910490	Power Cord Clip

Abbreviations

C.C.: Ceramic Capacitor
C.R.: Carbon Resistor

6. SCHEMATIC DIAGRAM

* Design and specifications subject to change without notice for improvements.

