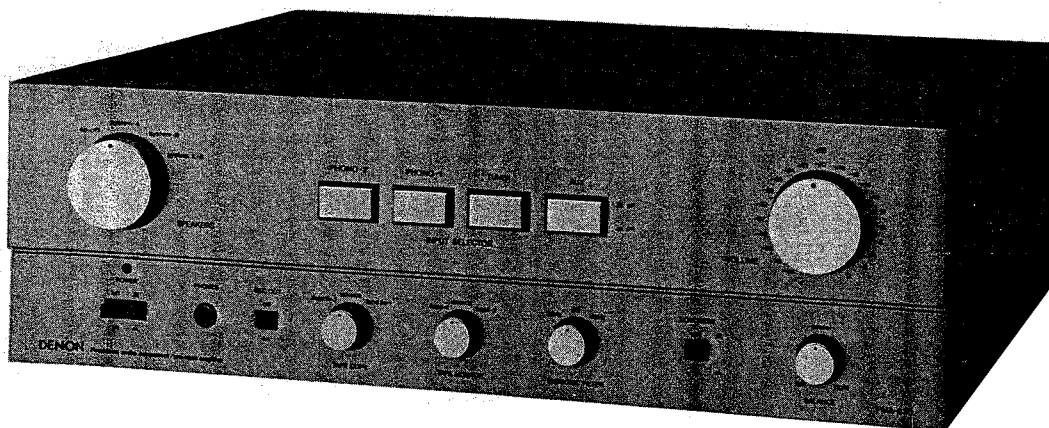


# DENON

Hi-Fi Component Amplifier

## SERVICE MANUAL MODEL PMA-630



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# NIPPON COLUMBIA CO., LTD.

### SPECIFICATIONS

#### MAIN AMPLIFIER SECTION

Type: Pure complementary push-pull system  
DC circuit

Rated Output (Both channels driven)  
20 Hz to 20 kHz: 80 W + 80 W r.m.s. at each channel (T.H.D. 0.008% at 8 ohm)  
1 kHz: 80 W + 80 W r.m.s. at each channel (T.H.D. 0.01% at 4 ohm)

Total Harmonic Distortion: less than 0.01%

Intermodulation Distortion  
60 Hz/7 kHz = 4/1: less than 0.005% (at equivalent rated output)  
less than 0.005% (at 1 watt output)

Power Band width: 5 Hz to 100 kHz (IHF, T.H.D. 0.05%)

Transmission Characteristic: DC to 100 kHz + 0 dB, -1 dB (at 1 watt output)

Input Sensitivity: 320 mV r.m.s.  
Input Impedance: 100 k ohm  
Output Impedance: less than 0.09 ohm  
Signal to Noise Ratio: 112 dB

Output Terminals  
Speakers: A & B, 4 to 16 ohm load  
A + B, 8 to 16 ohm load  
Headphone: for Stereo Headphone

#### PRE AMPLIFIER SECTION

Pre Amplifier Output  
Max. Output: 25 V (at 50 k ohm), T.H.D. 0.01%  
Rated Output: 320 mV  
Total Harmonic Distortion: 0.003% (at 10 V output)

#### Input Sensitivity/Input Impedance

PHONO-1, 2 (MM): 2.5 mV/50 k ohm  
Tuner: 320 mV/30 k ohm  
Aux, Tape: 320 mV/30 k ohm

Maximum Allowable Input  
PHONO-1, 2: 200 mV 1 kHz  
RIAA Deviation: less than ±0.2 dB (20 Hz to 20 kHz)

Signal to Noise Ratio (IHF, A network)  
PHONO-1, 2: Better than 86 dB (input terminal shorted)  
Tuner, Tape, Aux: Better than 112 dB (input terminal shorted)

Filter Characteristic  
Subsonic: 20 Hz, 6 dB/oct  
40 Hz, 6 dB/oct

Loudness Control Characteristic  
Low range: 100 Hz ±9 dB  
High range: 10 kHz + 5 dB

POWER SOURCE: AC 220 V, 50 Hz  
POWER CONSUMPTION: 445 W (MAX OUTPUT)

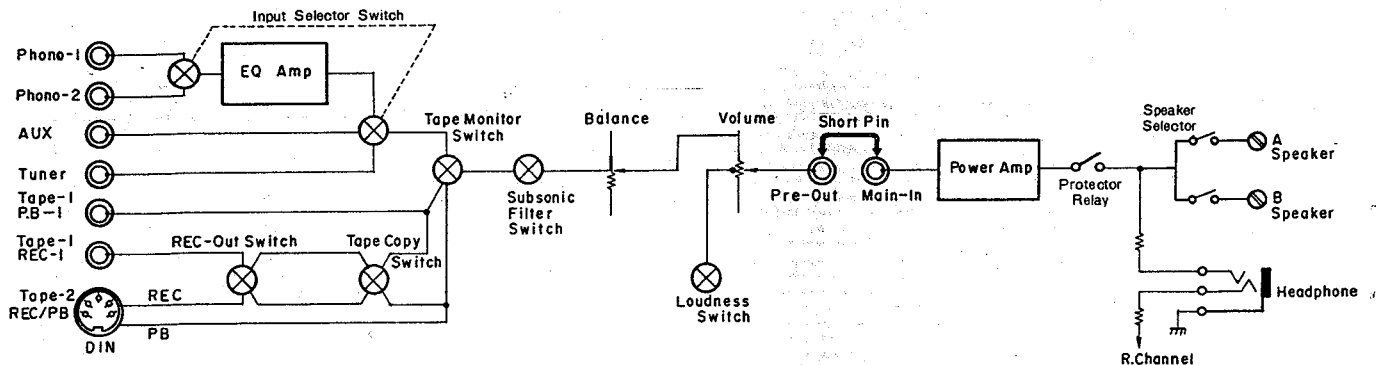
AC OUTLET (for USA and Canada):  
UNSWITCHED: 250 W Max. (Total)  
SWITCHED: 100 W Max.

DIMENSIONS: 434 mm(W) x 145 mm(H) x 390 mm(D)  
17-5/64"(W)x5-45/64"(H)x15-23/64"(D)

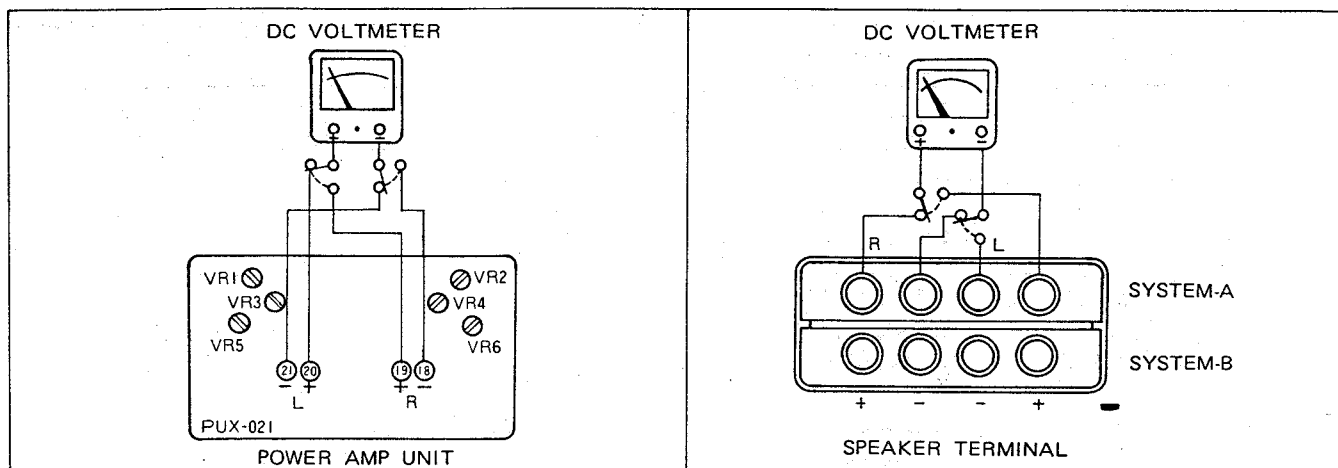
WEIGHT: 16 kg, 35.3 lbs.

These contents are subject to alternation without prior notice.

### BLOCK DIAGRAM



## METHOD OF ADJUSTMENTS



1. Set the switches of the set as specified below.
  1. Set the SPEAKER changeover switch to A SPEAKER SYSTEM.
  2. Set the VOLUME CONTROL knob to minimum.
  3. Turn the POWER switch off.
  4. Confirm that a U-shaped shortcircuiting pin is inserted between the OUTPUT terminal of the preamplifier and INPUT terminal of the main amplifier.
- 2-1. Connect a DC voltmeter to the A SPEAKER terminal. (for both the L- and R-channels)
  2. Connect the DC voltmeter to the test points, 18, 19, 20 and 21 on PUX-021 (power amplifier printed board) (for both L- and R-channels). The voltage polarities of the test point will be + for 20 of the L-channel, - for 21, and - for 18 of the R channel and + for 19.
- 3-1. With the Sliduck set to 0 V, turn on the set's POWER switch.
  2. While keeping an eye on the DC voltmeter, rise the AC power supply by means of the Sliduck from 0 V to Rated V. Then, carry out the preliminary adjustments described in steps 3 through 5 in a swift manner.
  3. Adjust VR3 (L-channel) and VR4 (R-channel) located on PUX-021 (power amplifier circuit board) so as to bring the speaker output voltage to the range within  $0\text{ V} \pm 10\text{ mV}$ .
  4. Pull out the U-shaped shortcircuiting pin inserted between the OUTPUT terminal of the preamplifier and INPUT terminal of the main amplifier.  
Adjust VR1 (L-channel) and VR2 (R-channel) on PUX-021 (power amplifier printed board) so as to bring the speaker output voltage to the range within  $0\text{ V} \pm 10\text{ mV}$ .
  5. Insert the U-shaped shortcircuiting pin between the OUTPUT terminal of the preamplifier and INPUT terminal of the main amplifier.  
Adjust VR5 (L-channel) and VR6 (R-channel) located on PUX-021 (power amplifier printed board) so as to bring the voltage at test points 18, 19, 20 and 21) to  $12\text{ mV}$  ( $10 \sim 14\text{ mV}$ ) (Collector current:  $26\text{ mA}$  ( $22 \sim 30\text{ mA}$ )).
- 4-1. After completing the preliminary adjustments, the following main adjustments are to be carried out, but only after aging of 15 minutes has taken place following completion of the preliminary adjustments.
  2. Again, adjust VR3 (L-channel) and VR4 (R-channel) so as to bring the speaker terminal voltage to the range within  $0\text{ V} \pm 10\text{ mV}$ .
  3. Pull out the U-shaped shortcircuiting pin inserted between in OUTPUT terminal of the preamplifier and INPUT terminal of the main amplifier.  
Adjust VR1 (L-channel) and VR2 (R-channel) in a manner to bring the speaker output voltage to the range within  $0\text{ V} \pm 10\text{ mV}$ .  
With this, all necessary adjustments for the speaker terminal voltage have been completed.
  4. Insert the U-shaped shortcircuiting pin between the OUTPUT terminal of the preamplifier and the INPUT terminal of the main amplifier.  
Again, adjust VR5 (L-channel) and VR6 (R-channel) so as to bring the test point voltages to the range within  $17 \pm 1\text{ mV}$  (Collector current:  $36\text{ mA} \pm 2\text{ mA}$ ).  
With this, all necessary adjustments for the idling current have been completed.

**CAUTION:** Particular attention should be paid to the subradiator section of PUX-021 (power amplifier printed board) as a voltage of approximately 50 V is being applied to that section.

## CAUTIONS REGARDING SERVICING WORK AND SERVICING POINTS

### 1. Cautions regarding sub-radiator 16 of power transistors 15 and 34

Unlike other models, in this model, the radiator of the power transistors 15 and 34 is composed of the sub-radiator 16 that is directly attached to the power transistors and the main radiator 13.

As a voltage similar to the collector voltage of the power transistors ( $-52\text{ V}$  for the outer side and  $+52\text{ V}$  for the inner side . . . . . AC Rated V) is being impressed on the sub-radiator, be careful not to touch the chassis with such objects as a screw driver. (The sub-radiator may be easily discerned from the main radiator (coated in black) as no coating aluminum has been applied to it.)

### 2. Removal of protective circuit printed board (ETC-307B-1) 41

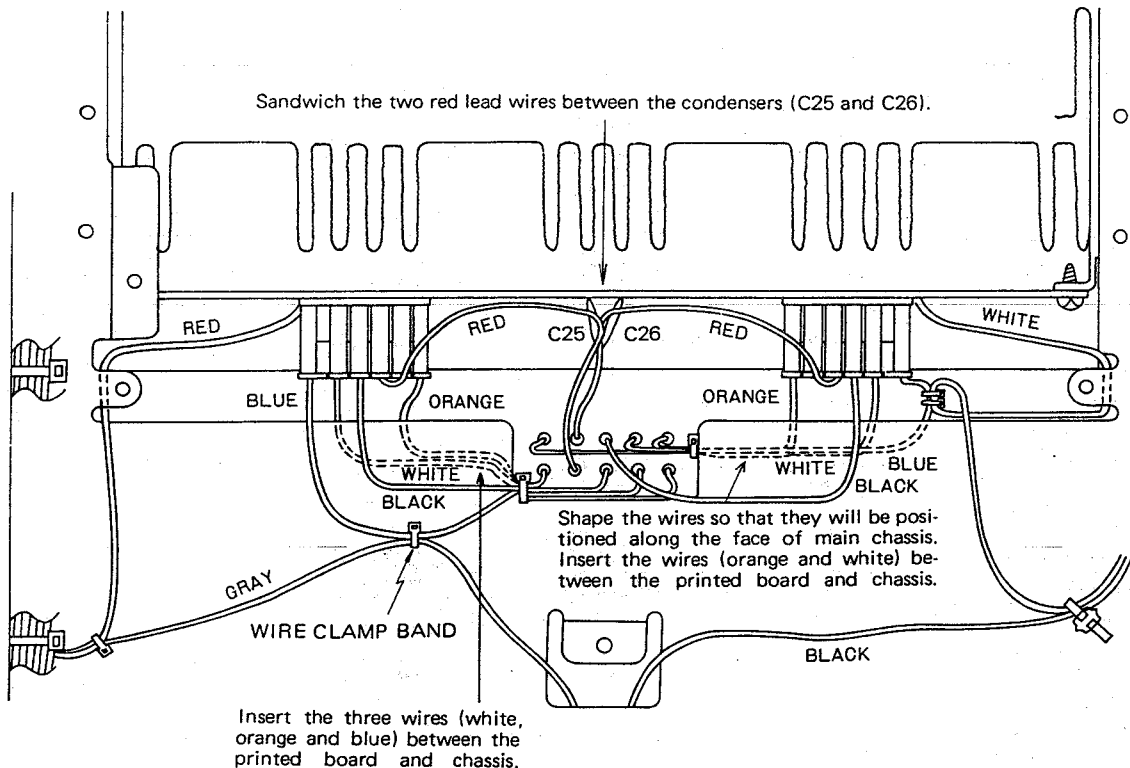
Although voltage checks of the protective circuit printed board can be carried out without removing the printed board, it will be necessary to remove it from the printed board support 42 first when replacing the parts.

The protective circuit printed board can be readily removed by unscrewing the 4 assembly screws 32 of the speaker terminal 50 and by moving the speaker terminal to the inside of the set.

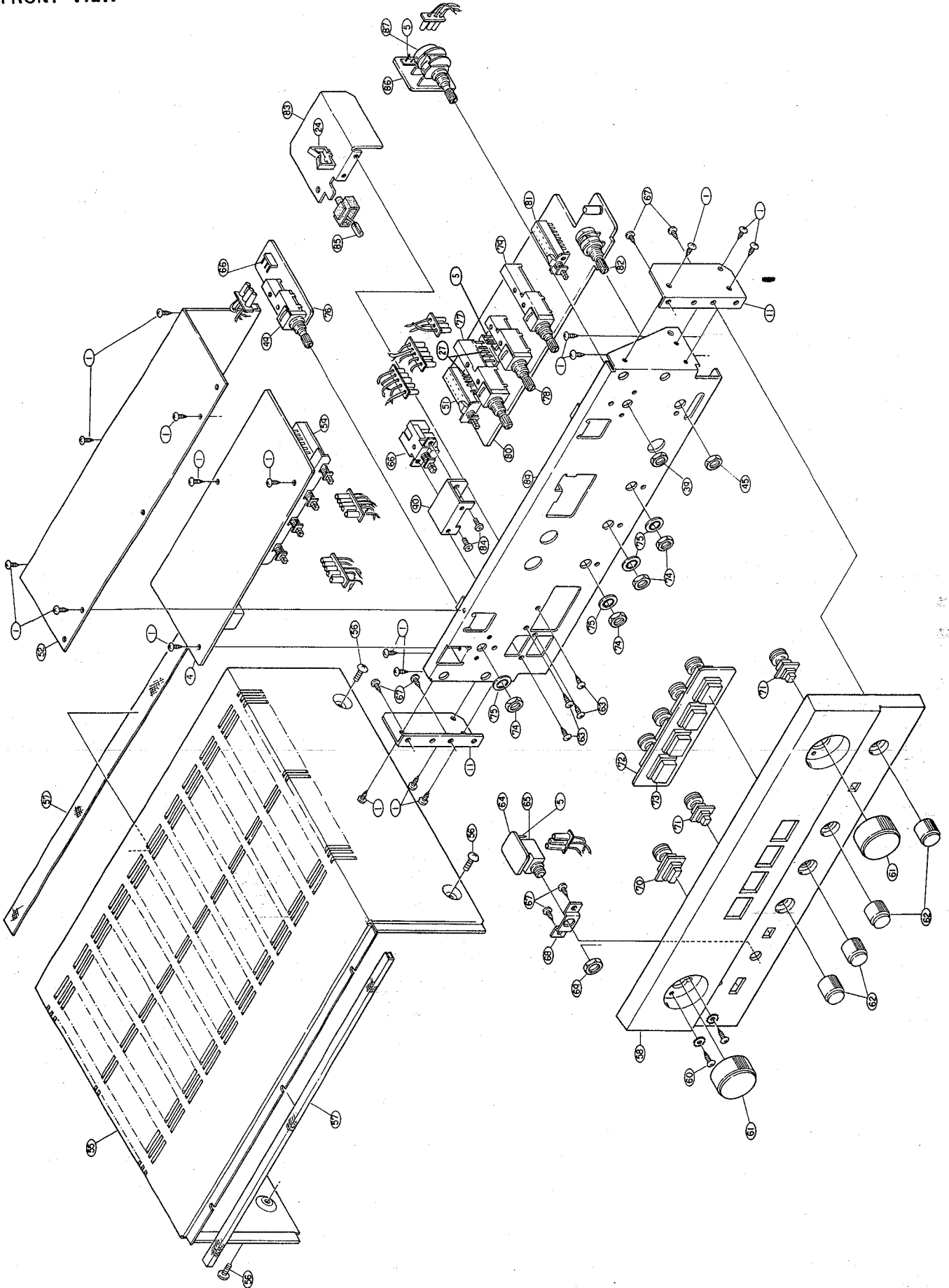
### 3. Shaping of wires during servicing of power amplifier printed board (PUX-021)

Please refer to the following drawing which illustrates the shaping of wires for the power amplifier printed board. On completion of servicing, the wires are to be shaped as shown in the drawing.

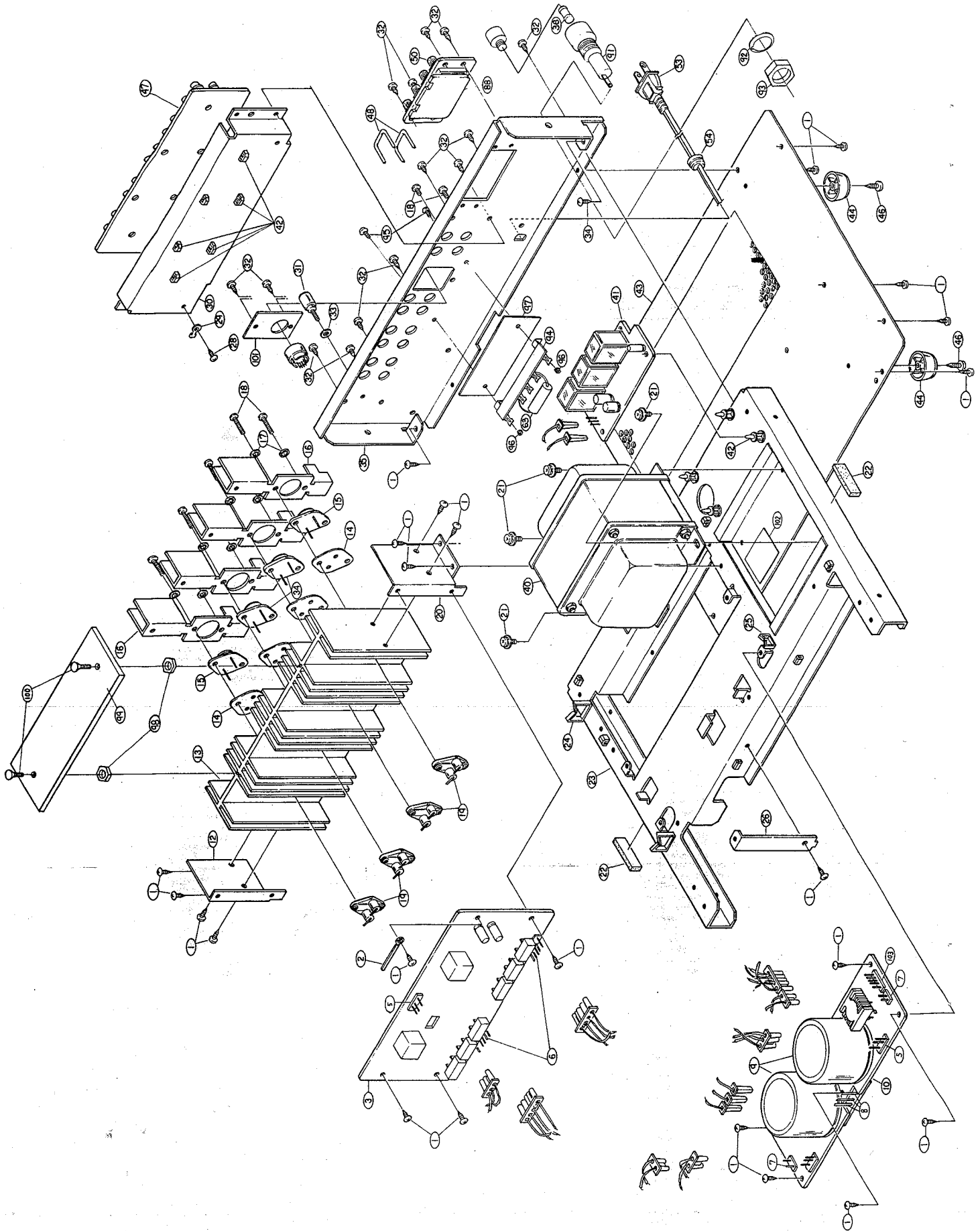
(NOTE: This method of wire shaping is designed so as to produce the best condition for the harmonics distortion factor, crosstalk, and the like.)



# EXPLODED VIEW OF CHASSIS AND CABINET FRONT VIEW



BACK VIEW



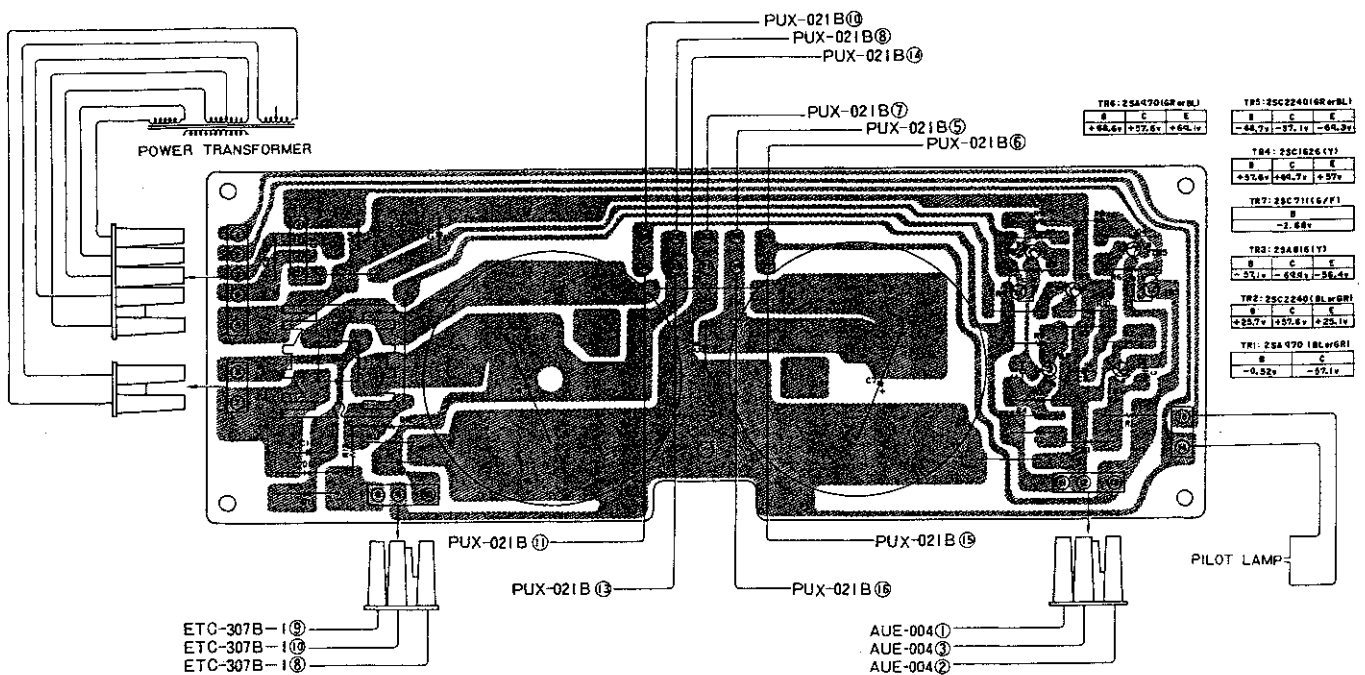
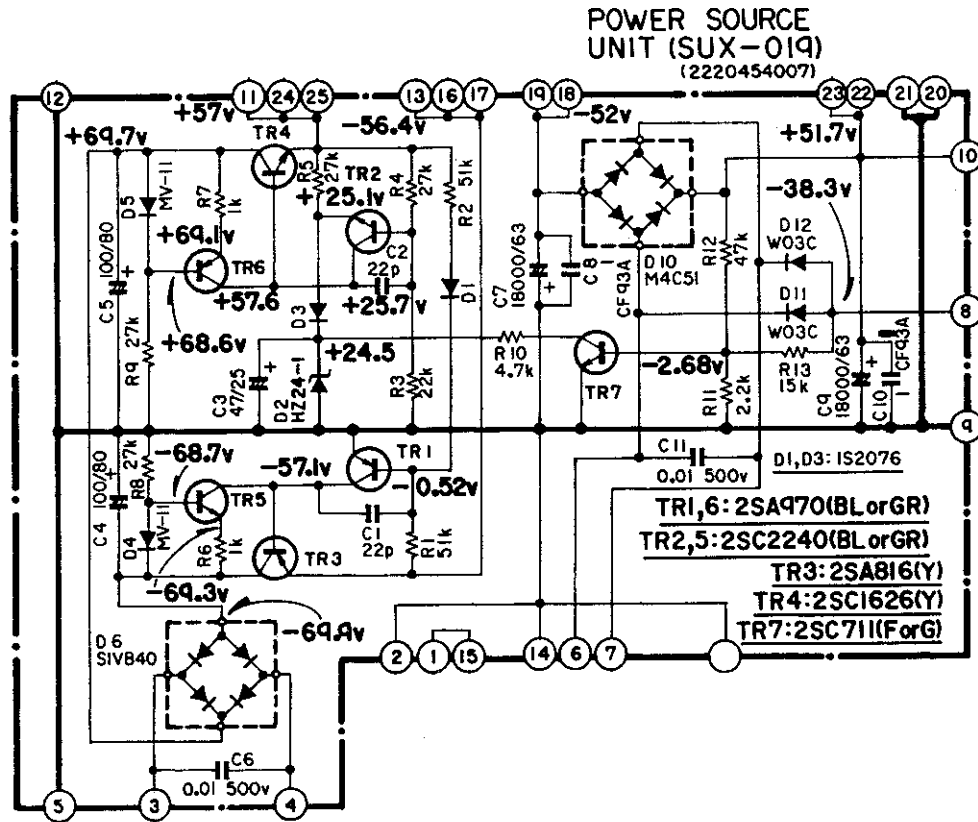
PARTS LIST FOR EXPLODED VIEW

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
1	4730354019	3 x 8 CBRTS	46	4730456014	4 x 12 CBRTS
2	EP-4772	CORD HOLDER	47	ETC-142	INPUT UNIT
3	PUX-021B	POWER AMP UNIT	48	2050109001	SHORT PIN
4	AUE-004	CONTROL UNIT (A)	49	2120134016	ROTARY SWITCH (SPEAKERS)
5	2050112030	3P CONNECTOR PIN	50	2050070004	8P SPEAKER TERMINAL
6	2050112069	6P CONNECTOR PIN	51	2124137006	PUSH SWITCH (REC. OUT)
7	2050112030	CONNECTOR PIN	52	4140116106	SHIELD COVER
8	EP-6071	BASE PIN	55	1020080300	TOP COVER
9	2546034004	CAPACITOR 18000µF 63V	56	4714404053	4 x 8 CTS
10	SUX-019	POWER SOURCE UNIT	57	1220007057	SPACER
11	4120467105	PANEL BRACKET	58		
12	4120469006	RADIATOR BRACKET (L)	59	2124138102	4P PUSH SWITCH (INPUT)
14	--	INSULATING SHEET	60	4700026018	3 x 8 CBRTS (TWB)
15	2720044014	2SB539C(S) TRANSISTOR	61	1120215004	KNOB (A)
16	4170100108	SUB RADIATOR	62	1120216100	KNOB (B)
17	4753001051	3TWA	64	ETC-307-4	HEAD PHONE BOARD
18	4711809033	3 x 18 CPS	65	2048047007	HEAD PHONE JACK
19	2070002007	TRANSISTOR SOCKET	67	4730404011	4 x 8 CBRTS
20	4120470008	RADIATOR BRACKET (R)	68	4120484007	HEAD PHONE BRACKET
21	4700018000	4 x 8 CPS (SW)	69	--	11 mm NUT
22	--	RUBBER SHEET	70	1130134052	PUSH KNOB ASS'Y
23	4110182209	MAIN CHASSIS	71	1130134049	PUSH KNOB ASS'Y
24	MD-4232	WIRE CLIP (D)	72	1190012402	PANEL BUSHING
25	MD-4368	WIRE CLIP	73	1130128107	PUSH KNOB (A)
26	4120468104	SUPPORT BRACKET	74	--	7 mm NUT
27	2050112056	5P CONNECTOR PIN	75	--	7 TWA
28	4730353010	3 x 6 CBRTS	76	AUX-025-3	SPEAKER SWITCH UNIT
29	2030170005	1P CONTACT ASS'Y	77	2120133004	ROTARY SWITCH (TAPE COPY)
30	4140151103	INPUT BRACKET	78	2120133004	ROTARY SWITCH (TAPE MONITOR)
31	2050071016	TERMINAL	79	2120135015	ROTARY SWITCH (SUBSONIC)
32	4770064107	FIXING SCREW	80	AUX-025-1	CONTROL UNIT (B)
33	4770018001	WASHER	81	2124137019	PUSH SWITCH (LOUDNESS)
34	2740062018	2SD287C(S) TRANSISTOR	82	2110190002	VR 100 KOHM (BALANCE CONTROL)
39	--	8NSP	83	4120465408	SHIELD PLATE
41	ETC-307-1	PROTECTOR UNIT	85	3930032006	PILOT LAMP 6.3V 0.15A
42	MD-5271	PCB SUPPORT	86	AUX-025-1	MAIN VOLUME CONTROL UNIT
43	1050241300	BOTTOM COVER	87	2110192000	VR50 KOHM (MAIN VOLUME CONTROL)
44	1040040003	FOOT	89	4110181307	FRONT CHASSIS
45	--	7NSP	90	4120464302	SWITCH BRACKET
			103	2038004005	5P CONNECTOR PIN

Ref. No.	Part Name	Parts No.	
		For Europe	For Germany
35	BACK PANEL	1050251002	1050293002
36	FUSE	2061015074	2061015074
		(3.15A)	(3.15A)
		NONE	NONE
37	AC OUTLET	2335151004	2335151004
40	POWER TRANSFORMER	2062016001	2062016001
53	POWER CORD	4450020005	4450020005
54	CORD BUSHING	2518001007	2518001007
63	CAPACITOR	2124049055	2124049055
66	PUSH SWITCH (POWER)	2020012005	2020012005
91	FUSE HOLDER	USE	USE
92	WASHER	USE	USE
93	NUT	USE	USE
94	7P WIRING TERMINAL	2050089008	2050089008
95	3 x 8 CPS (SW)	4700042005	4700042005
96	3 mm NUT	4756006008	4756006008
97	INSULATING SHEET	4150088004	4150088004
98	6 mm NUT	4756012005	4756012005
99	F. BOARD	4140174106	4140174106
100	3 x 12 CFTS	4032356031	4032356031
101	DIN PLATE	NONE	4410316005
58	FRONT PANEL	1440421109	1440421112
102	INSULATING SHEET	4150139021	4150139021
13	POWER RADIATOR (MAIN)	4170097211	4170097211

PRINTED CIRCUIT BOARD PATTERNS AND PARTS LIST

SUX-019 POWER SOURCE UNIT

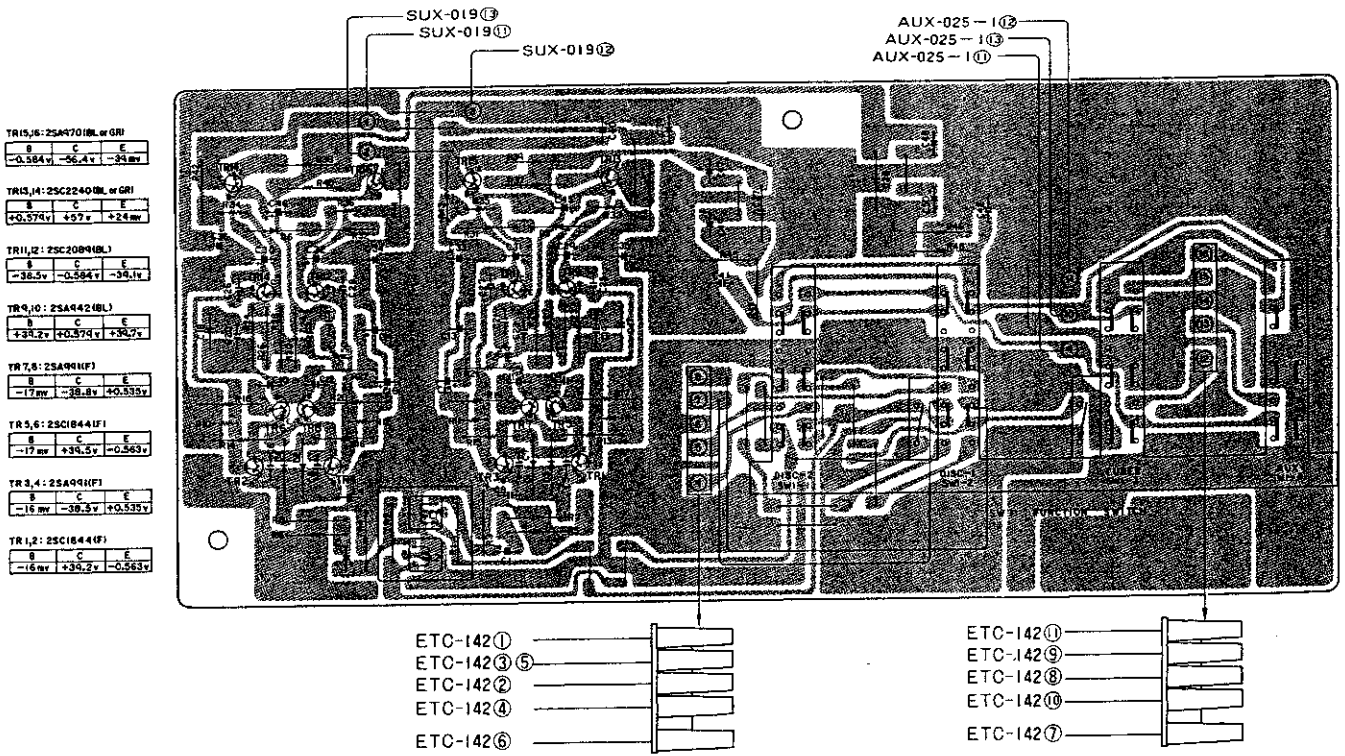
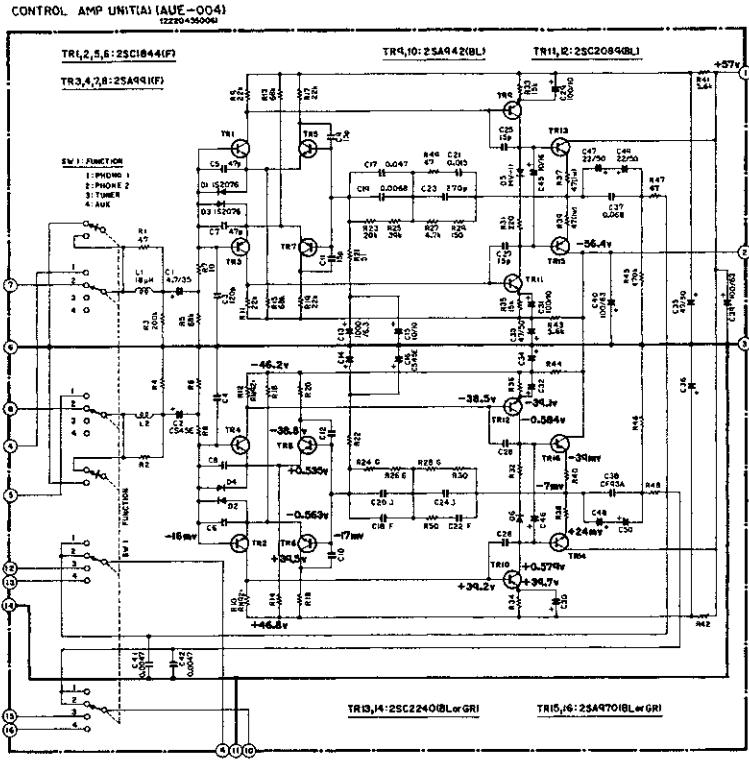




## SUX-019 PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions			
<b>SEMICONDUCTORS</b>					
TR1,6	2710094016 or	2SA970 (BL)			TRANSISTOR
TR1,6	2710094003	2SA970 (GR)			TRANSISTOR
TR2,5	2730187013 or	2SC2240 (BL)			TRANSISTOR
TR2,5	2730187000	2SC2240 (GR)			TRANSISTOR
TR3	2710088006	2SA816 (Y)			TRANSISTOR
TR4	2730177007	2SC1626 (Y)			TRANSISTOR
TR7	2730064068 or	2SC711 (G)			TRANSISTOR
TR7	2730064055	2SC711 (F)			TRANSISTOR
D1,3	2760049008	1S2076			DIODE
D2	2760220018	HZ24-1			DIODE
D4,5	2760200009	MV-11			DIODE
D6	2760248003	SIVB40			DIODE
D10	2760233005	M4C-51			DIODE
D11,12	2760191008	W03C			DIODE
<b>RESISTORS</b>					
R6,7	2410314009	1 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R11	2410322004	2.2 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R10	2410330009	4.7 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R13	2410342000	15 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R3	2410346006	22 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R4,5,8,9	2410348004	27 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R12	2410354001	47 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R1,2	2462003025	51 k ohm	±1%	1/4W	FIXED METAL COMPOSITION RESISTOR
<b>CAPACITORS</b>					
C1,2	2533649004	22pF	±10%	50V	FIXED CERAMIC CAPACITOR
C6,11	2531053003	0.01μF	+100,-0%	500V	FIXED CERAMIC CAPACITOR
C8,10	2561014009	1μF	±10%	250V	FIXED METALIZED PLASTIC FILM CAPACITOR
C3	2544027000	47μF		25V	FIXED ELECTROLYTIC CAPACITOR
C4,5	2544063006	100μF		80V	FIXED ELECTROLYTIC CAPACITOR
C7,9	2546034004	18000μF		63V	FIXED ELECTROLYTIC CAPACITOR
<b>OTHER PARTS</b>					
	2220454007	P.C. BOARD			
	EP-6071	BASE PIN USED 3			
	2050106101	EARTH PLATE			
	2050087026	2P. TERMINAL			
	2050112027	2P. CONNECTOR BASE			
	2050112030	3P. CONNECTOR BASE			
	2050112056	5P. CONNECTOR BASE			
	2050112008	6P. CONNECTOR BASE			
	2090008104	JUMPER SHORTLEAD USED 2 P=12.5 mm			

AUE-004 CONTROL (A) UNIT



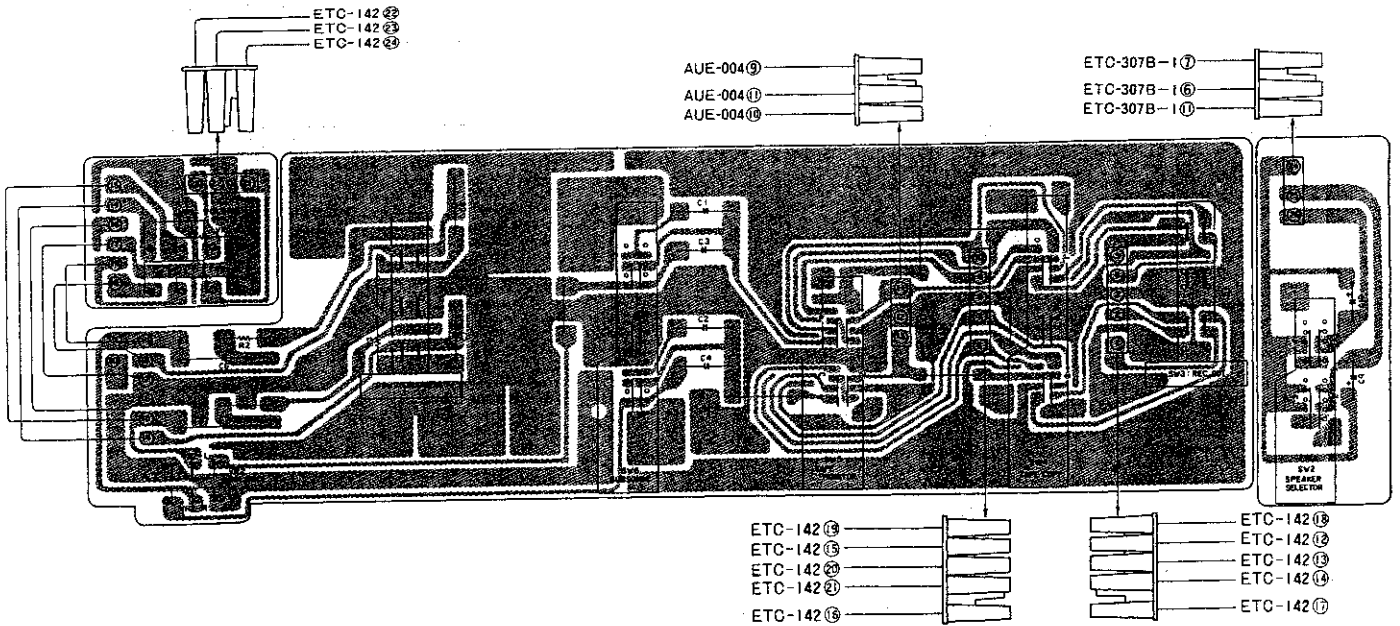
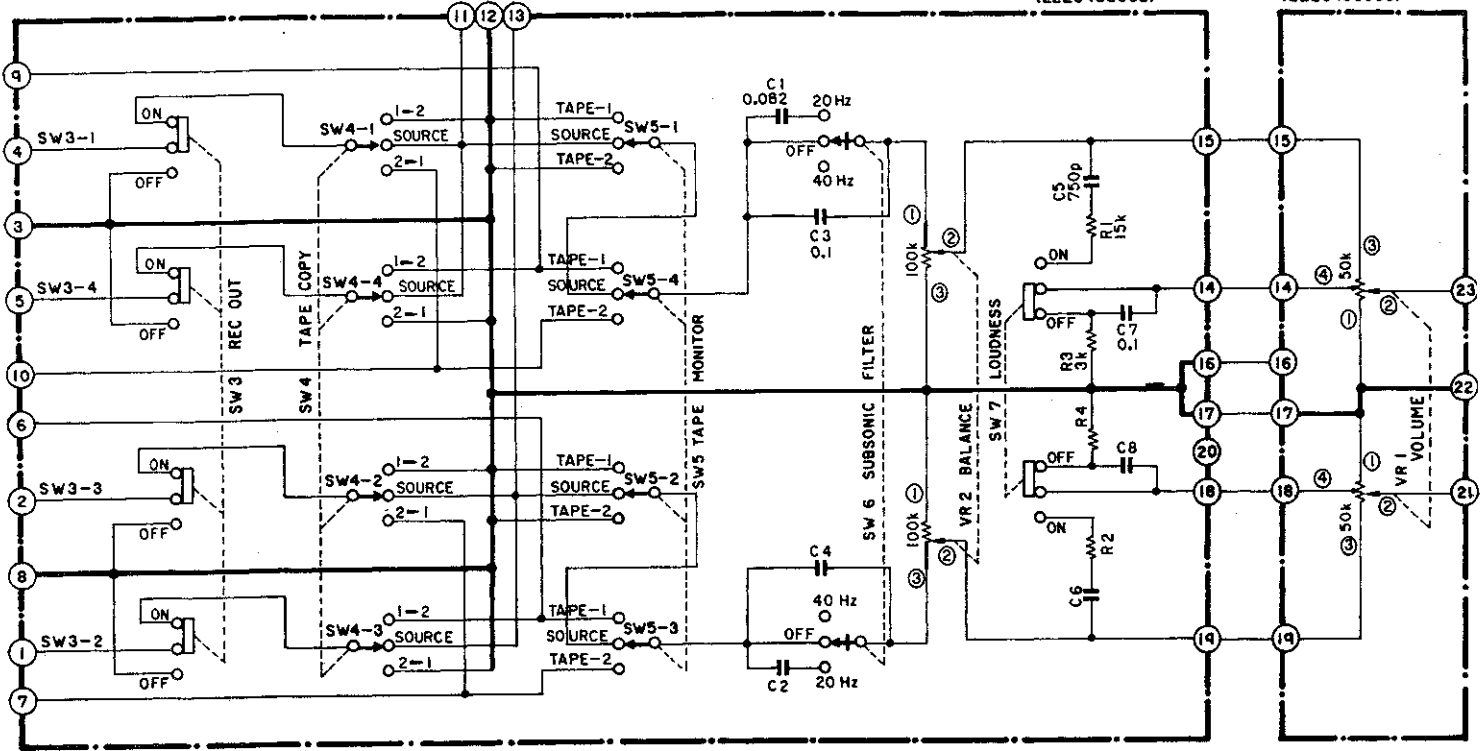
## AUE-004 PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions			
<b>SEMICONDUCTOR</b>					
TR1,2,5,6	2730188009	2SC1844 (F)			TRANSISTOR
TR3,4,7,8	2710095002	2SA991 (F)			TRANSISTOR
TR9,10	2710092005	2SA942 (BL)			TRANSISTOR
TR11,12	2730184003	2SC2089 (BL)			TRANSISTOR
TR13,14	2730187013 or	2SC2240 (BL)			TRANSISTOR
TR13,14	2730187000	2SC2240 (GR)			TRANSISTOR
TR15,16	2710094016	2SA970 (BL)			TRANSISTOR
TR15,16	2710094003	2SA970 (GR)			TRANSISTOR
D1,2,3,4	2760049008	1S2076			DIODE
D5,6	2760200009	MV-11			DIODE
<b>COILS</b>					
L1,2	2318017001	INDUCTOR (18mH)			
<b>RESISTORS</b>					
R7,8	2410266005	10 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R1,2,47,48	2410282005	47 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R21,22	2410283004	51 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R29,30	2410294006	150 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R31,32	2410298002	220 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R41,42,43,44	2410332007	5.6 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R17,18,19,20	2410346006	22 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R33,34,35,36	2412022014	15 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR STANDING TYPE
R5,6	2410358007	68 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R3,4	2410369009	200 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R45,46	2410378003	470 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R13,14,15,16	2410358007	68 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R49,50	2412001022	47 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R27,28	2412032046	4.7 k ohm	±2%	1/4W	FIXED CARBON FILM RESISTOR
R23,24	2412012053	20 k ohm	±2%	1/4W	FIXED CARBON FILM RESISTOR
R25,26	2412032059	39 k ohm	±2%	1/4W	FIXED CARBON FILM RESISTOR
R9,10,11,12	2452011085	22 k ohm		1/4W	FIXED METAL OXIDE COMPOSITION RESISTOR
R37,38,39,40	2440025025	47 k ohm	±5%	1W	FIXED METAL OXIDE FILM RESISTOR
<b>CAPACITORS</b>					
C9,10,11,12 25,26,27,28	2533647006	15pF	±10%	50V	FIXED CERAMIC CAPACITOR
C5,6,7,8	2533653003	47pF	±10%	50V	FIXED CERAMIC CAPACITOR
C3,4	2533658008	120pF	±10%	50V	FIXED CERAMIC CAPACITOR
C23,24	2533637003	270pF	±10%	50V	FIXED CERAMIC CAPACITOR
C41,42	2554078065	0.0047μF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C21,22	2554073086	0.015μF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C19,20	2554079006	0.0068	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C17,18	2554075000	0.047μF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C37,38	2561016007	0.068μF	±10%	630V	FIXED PLASTIC FILM CAPACITOR
C45,46	2544015009	10μF		16V	FIXED ELECTROLYTIC CAPACITOR
C15,16	2541048105	10μF		10V	FIXED TANTALUM SOLID CAPACITOR
C1,2	2541050009	4.7μF		35V	FIXED TANTALUM SOLID CAPACITOR
C47,48,49,50	2544066016	22μF		50V	FIXED ELECTROLYTIC CAPACITOR
C13,14	2544007004	1000μF		6.3V	FIXED ELECTROLYTIC CAPACITOR
C29,30,31,32	2544010004	100μF		10V	FIXED ELECTROLYTIC CAPACITOR
C33,34,35,36	2544049004	47μF		50V	FIXED ELECTROLYTIC CAPACITOR
C39,40	2544059007	100μF		63V	FIXED ELECTROLYTIC CAPACITOR
<b>OTHER PARTS</b>					
SW1	2220455103	P.W. BOARD			
	2050112056	5P. CONN. BASE USED 2			
	2034111002	3P. CONNECTOR			
	2034118005	3P. CONNECTOR			
	2090008117	JUMPER SHORTLEAD USED 13 P=12.5 mm			
	2090008133	JUMPER SHORTLEAD USED 4 P= 7.5 mm			
	2124138102	4P. PUSH SWITCH			
	4140116106	SHIELD COVER			

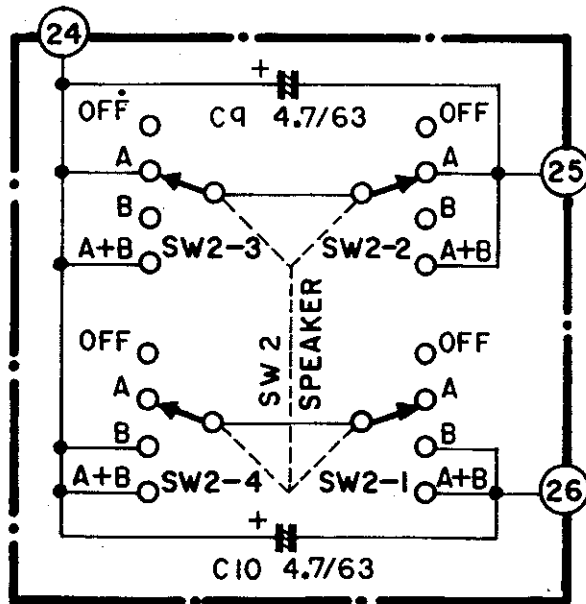
AUX-025

CONTROL UNIT(B)(AUX-025-1)  
(2220456005)

MAIN VOLUME CONTROL UNIT  
(AUX-025-2)  
(2220456005)



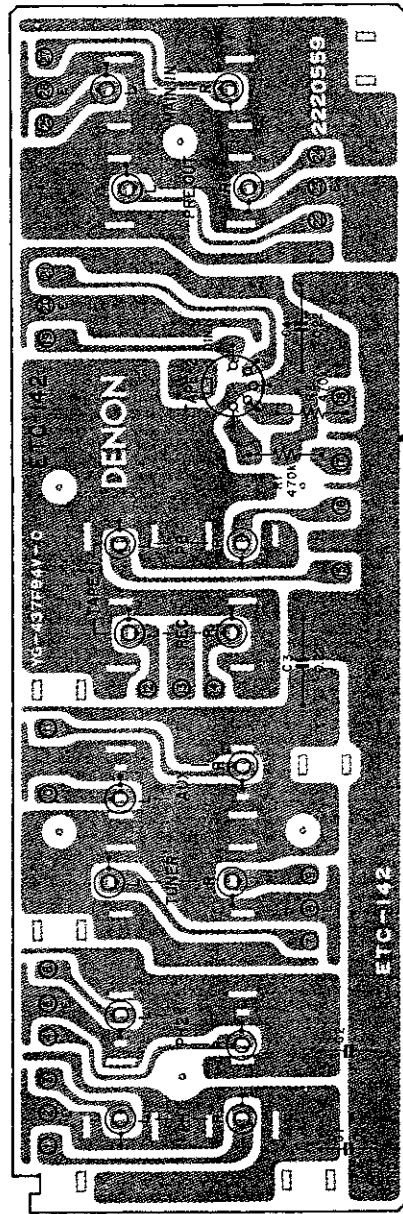
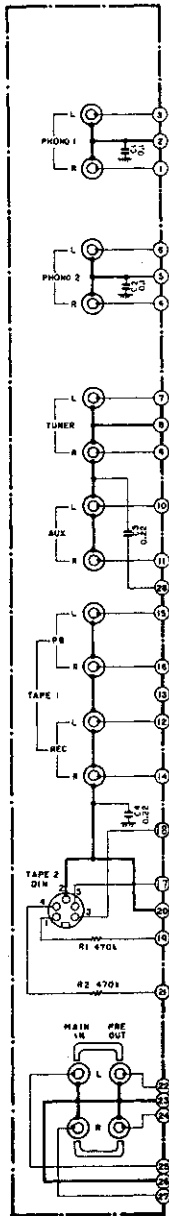
SP SW UNIT (AUX-025-3) (2220456005)



AUX-025-1 CONTROL(B) UNIT; AUX-025-2 MAIN VR UNIT; AUX-025-3 SP SW UNIT;

Ref. No.	Part No.	Part Name & Descriptions			
<b>RESISTORS</b>					
R3,4	2410325001	3 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R1,2	2410342000	15 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
<b>CAPACITORS</b>					
C5,6	2556022006	750pF	±5%	50V	FIXED PLASTIC FILM CAPACITOR
C3,4,7,8	2554081081	0.1µF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C1,2	2554081065	0.082µF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C9,10	2544059036	4.7µF		63V	FIXED ELECTROLYTIC CAPACITOR
<b>OTHER PARTS</b>					
	2220456102	P.W. BOARD			
	2034117006	3P. CON BASE			
	2050112030	3P. CON BASE			
	2050112056	5P. CON BASE			
	2090008117	JUMPER			
	2090008104	JUMPER			
	2120134016	ROTARY SWITCH			
	2120135002	ROTARY SWITCH			
	2120133004	ROTARY SWITCH			
	2120135015	ROTARY SWITCH			
	2124137019	1P. PUSH SWITCH			
	2124137006	7P. PUSH SWITCH			
	2110192000	V2420V25KA503	VR50 k ohm	FOR MAIN VOLUME	
	2110190002	V1620V25KW104K	VR100 k ohm	FOR BALANCE CONTROL	
	3930017021	PILOT LAMP 6.3V 0.15A			
	MD-4232	WIRE CLIP			

ETC-142 INPUT TERMINAL UNIT

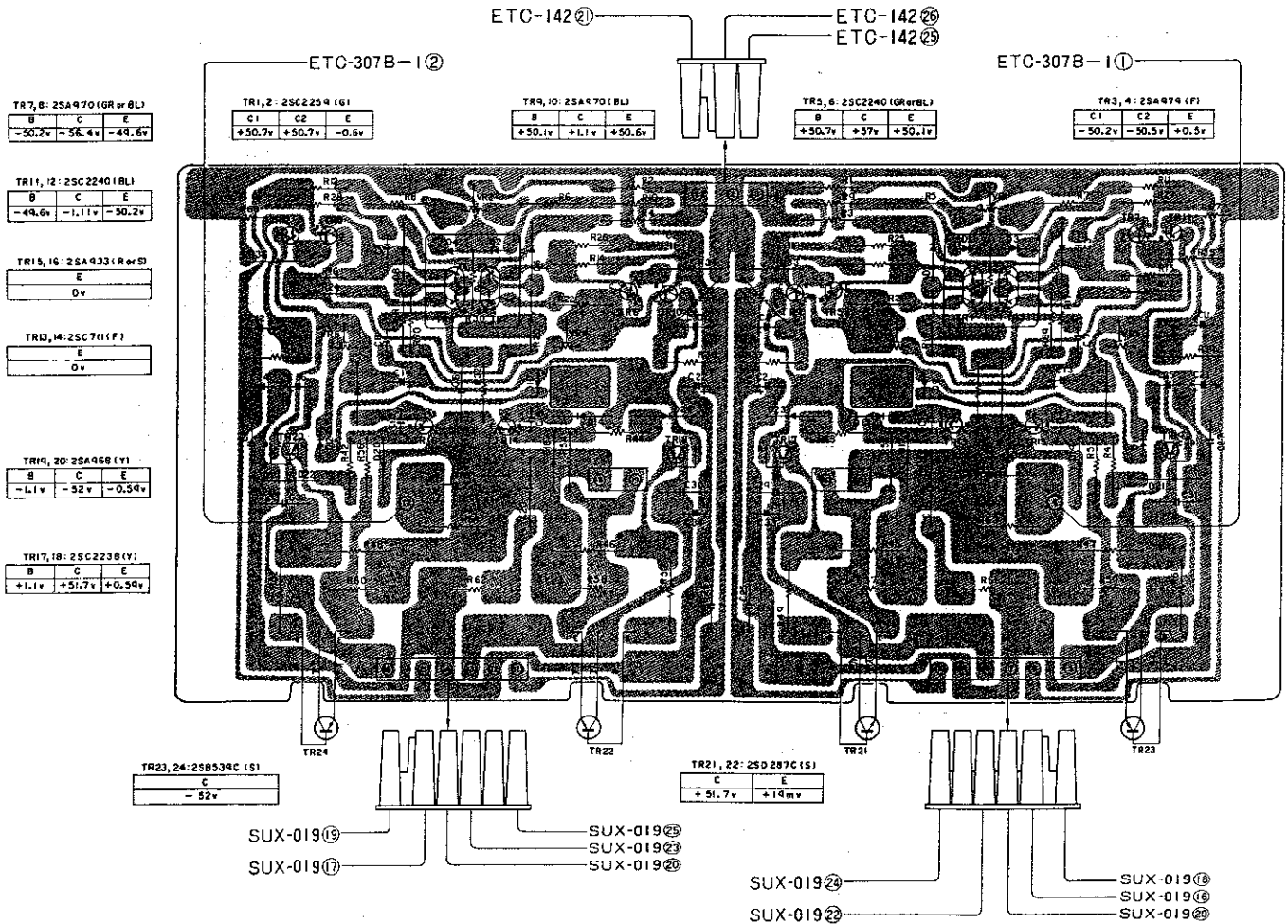
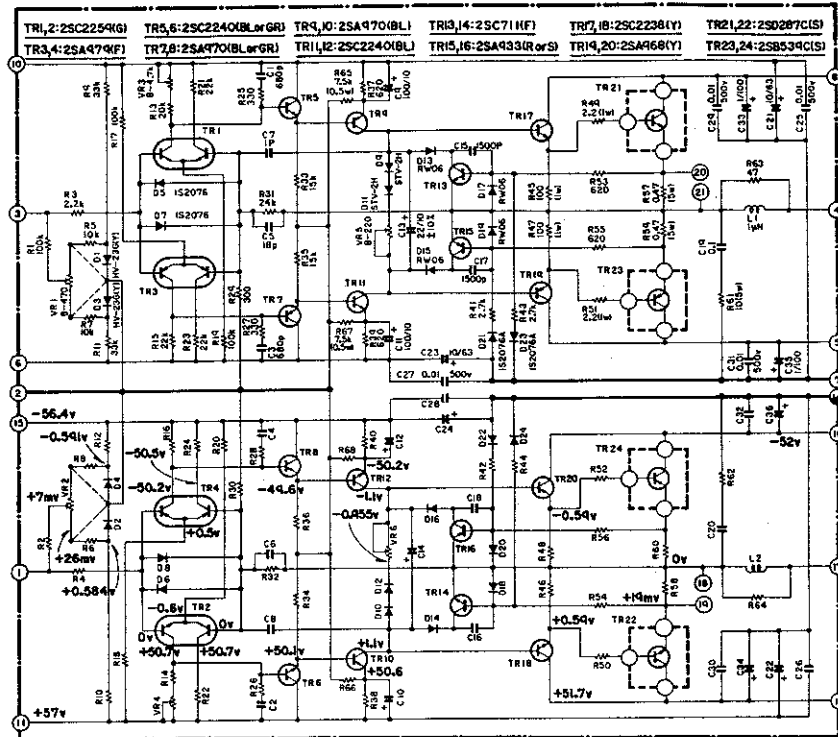


ETC-142 PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions			
<b>RESISTORS, CAPACITORS</b>					
R1,2	2410378003	470 k ohm	±5%	1/4W	CARBON FILM RESISTOR
C1,2	2531027000	0.1µF	+80,-20%	50V	FIXED CERAMIC CAPACITOR
C3,4	2551088003	0.22µF	±10%	50V	FIXED PLASTIC FILM CAPACITOR
<b>OTHER PARTS</b>					
	2220559009	P.W. BOARD			
	2048009003	1P. JACK			
	2048007005	1P. JACK			
	2030170005	1P. CONTACT		FOR GND	
	2034089082	3P. CONN.		FOR VOL.	
	2034089037	3P. CONN.		FOR POWER AMP	
	2038066001	5P. CONN.		FOR TAPE PB1,2	
	2038067000	5P. CONN.		FOR TAPE REC1,2	
	2038060023	5P. CONN.		FOR PHONO	
	2038068009	5P. CONN.		FOR TU, AUX	
	4450033005	WIRE CLAMP BAND		USED 5	
	2040046006	5P. DIN SOCKET			
	MD-5271	P.C.B. SUPPORT		USED 6	
	4140151103	INPUT BRACKET			
	4730353010	TAPPING SCREW (2) 3 x 6			
	4770064107	FIXING SCREW			

PUX-021B POWER AMP UNIT

POWER AMP UNIT (PUX-021B)  
(22D-43800B)



TR7,8: 2SA970 (GR or BL)

B	C	E
-50.2v	-56.4v	-44.6v

TR1,2: 2SC2254 (G)

C1	C2	E
+50.7v	+50.7v	-0.6v

TR9,10: 2SA970 (BL)

B	C	E
+50.1v	+1.1v	+50.6v

TR5,6: 2SC2240 (GR or BL)

B	C	E
+50.7v	+57v	+50.1v

TR3,4: 2SA979 (F)

C1	C2	E
-50.2v	-50.3v	+0.5v

TR11,12: 2SC2240 (BL)

B	C	E
-44.6v	-1.11v	-50.2v

TR15,16: 2SA933 (R or S)

E
0v

TR13,14: 2SC71 (F)

E
0v

TR19,20: 2SA968 (Y)

B	C	E
-1.1v	-52v	-0.54v

TR17,18: 2SC2238 (Y)

B	C	E
+1.1v	+51.7v	+0.54v

TR23,24: 2SB534C (S)

C
-52v

TR21,22: 2SD287C (S)

C	E
+51.7v	+14mv

SUX-019⑨  
SUX-019⑩  
SUX-019⑪

SUX-019⑫  
SUX-019⑬  
SUX-019⑭

SUX-019⑮  
SUX-019⑯

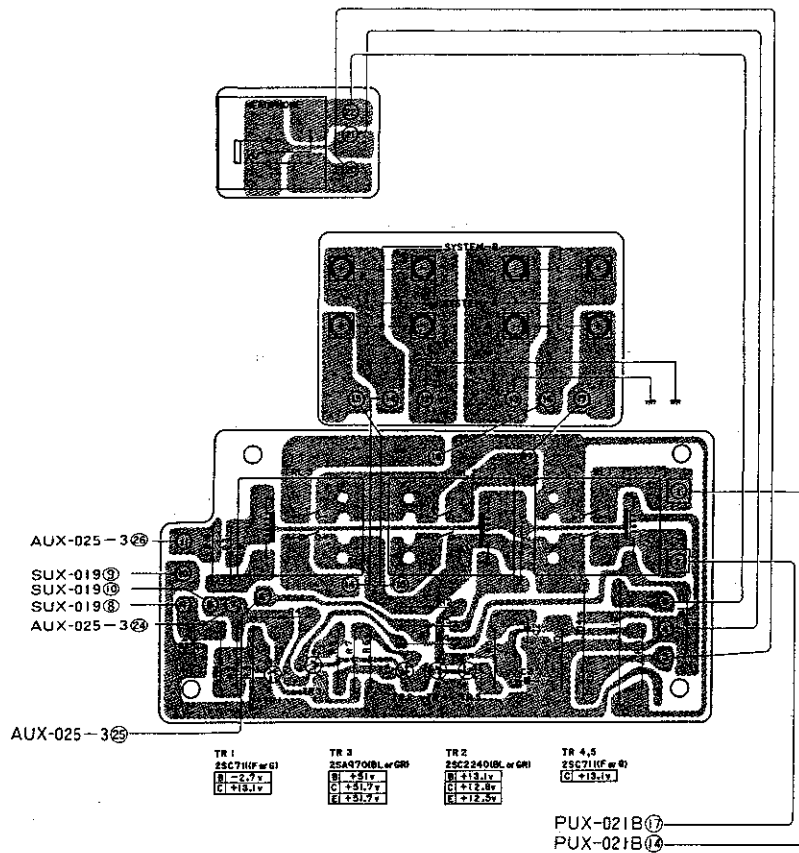
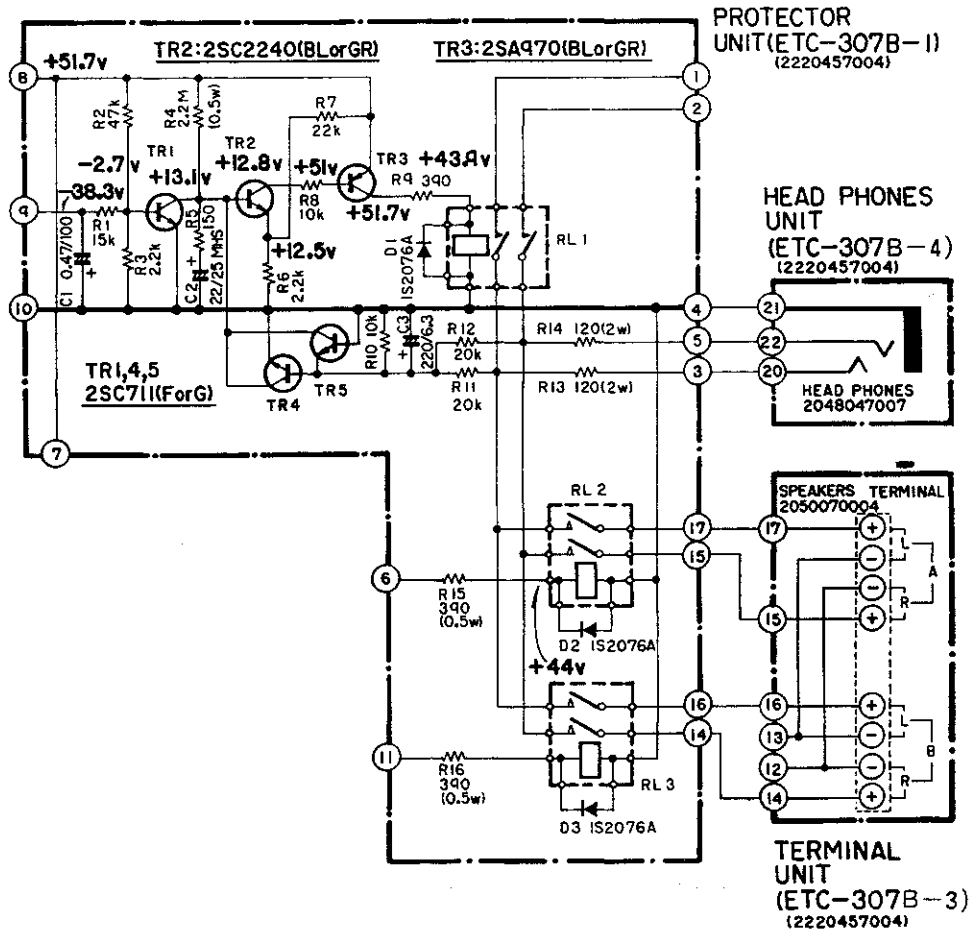
SUX-019⑰  
SUX-019⑱  
SUX-019⑲

## PUX-021B PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions			
<b>SEMICONDUCTORS</b>					
TR1,2	2730191012	2SC2259 (G) Wt			TRANSISTOR
TR3,4	2710098025	2SA979 (F) Wt			TRANSISTOR
TR5,6	2730187000 or	2SC2240 (GR)			TRANSISTOR
TR5,6	2730187013	2SC2240 (BL)			TRANSISTOR
TR7,8	2710094003 or	2SA970 (GR)			TRANSISTOR
TR7,8	2710094016	2SA970 (BL)			TRANSISTOR
TR9,10	2710094016	2SA970 (BL)			TRANSISTOR
TR11,12	2730187013	2SC2240 (BL)			TRANSISTOR
TR13,14	2730064055	2SC711 (F)			TRANSISTOR
TR15,16	2710101006 or	2SA933 (R)			TRANSISTOR
TR15,16	2710101019	2SA933 (S)			TRANSISTOR
TR17,18	2730199001 or	2SC2238 (Y)			TRANSISTOR
TR17,18	2730199019	2SC2238 (F)			TRANSISTOR
TR19,20	2710104003	2SA968 (Y)			TRANSISTOR
TR19,20	2710104016	2SA968 (O)			TRANSISTOR
TR21,22	2740062018	2SD287C (S)			TRANSISTOR
TR23,24	2720044014	2SB539C (S)			TRANSISTOR
D1,2,3,4	2760171028	HV-23G (YL)			DIODE
D5,6,7,8	2760049008	1S2076			DIODE
D9,10,11,12	2760217005	STV-2H			DIODE
D13,14,15,16 17,18,19,20	2760214008	RW06			DIODE
D21,23,24,25	2760049011	1S2076A			DIODE
<b>COILS</b>					
L1,2	2320017001	INDUCTOR (1mH)			
<b>RESISTORS</b>					
R13,14	2410345007	20 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R63,64	2410282005	47 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R25,26,27,28	2410302008	330 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R29,30	2410301009	300 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R37,38,39,40	2410309001	620 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R41,42,43,44	2410324002	2.7 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R3,4	2410322004	2.2 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R5,6,7,8	2410338001	10 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R21,22,23,24	2410346006	22 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R33,34,35,36	2410342000	15 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R31,32	2410347005	24 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R9,10,11,12	2410350005	33 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R17,18,19,20	2412032088	100 k ohm	±2%	1/4W	FIXED CARBON FILM RESISTOR
R53,54,55,56	2410309001	620 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R65,66,67,68	2410206007	7.5 k ohm	±5%	1/2W	FIXED CARBON FILM RESISTOR
R1,2	2410362006	100 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R15,16	2412032075	22 k ohm	±2%	1/4W	FIXED CARBON FILM RESISTOR
R45,46,47,48	2440029021	100 ohm	±5%	1W	FIXED METAL OXIDE FILM RESISTOR FORMING TYPE
R49,50,51,52	2440009025	2.2 ohm	±5%	1W	FIXED METAL OXIDE FILM RESISTOR FORMING TYPE
R57,58,59,60	2430037007	0.47 ohm	±10%	5W	FIXED WIRE WOUND RESISTOR
R61,62	2430045002	10 ohm	±10%	5W	FIXED WIRE WOUND RESISTOR
<b>CAPACITORS</b>					
C7,8	2533594007	1pF	±0.25pF	50V	FIXED CERAMIC CAPACITOR
C5	2533609002	18pF	±5%	50V	FIXED CERAMIC CAPACITOR
C1,2,3,4	2531003008	680pF	±10%	50V	FIXED CERAMIC CAPACITOR
C15,16,17,18	2531005006	0.0015μF	±10%	50V	FIXED CERAMIC CAPACITOR
C25,26,27,28 29,30,31,32	2531053003	0.01μF	+10%, -0%	500V	FIXED CERAMIC CAPACITOR
C19,20	2554081081	0.1μF	±5%	100V	FIXED PLASTIC FILM CAPACITOR
C9,10,11,12	2544010004	100μF		10V	FIXED ELECTROLYTIC CAPACITOR
C13,14	2549015004	22μF	±10%	10V	FIXED ELECTROLYTIC CAPACITOR
C33,34,35,36	2544060025	1μF		100V	FIXED ELECTROLYTIC CAPACITOR
C21,22,23,24	2544059081	10μF		63V	FIXED ELECTROLYTIC CAPACITOR
<b>OTHER PARTS</b>					
	2220453105	P.C. BOARD			
	2050075025	2P. TERMINAL			
	2050112030	3P. CONN. BASE			
	2030079067	1P. CONNECTOR			
	2030196005	1P. CONNECTOR			
	2050112069	6P. CONN. BASE			
	2116003025	V10QB221			
VR5,6	2116003041	V10QB471			
VR1,2	2116001001	V10QB472			
VR3,4	4170097211	POWER RADIATOR			
	4120469006	RADIATOR BRACKET			
	4120470008	RADIATOR BRACKET			
	4730354019	TAPPING SCREW (2) 3 x 8			
	4170100108	RADIATOR			
	2070002007	TRANSISTOR SOCKET			
	4753001051	3 mm TOOTH WASHER			
	4711809033	CROSS PAN SCREW 3 x 18			
		USED 2			
		USED 2			
		VARIABLE RESISTOR 200 ohm			
		VARIABLE RESISTOR 470 ohm			
		VARIABLE RESISTOR 4.7 k ohm			
		USED 4			
		USED 4 FOR TR21 ~ 24			
		USED 4			
		USED 8			
		USED 8			



ETC-307B PROTECTOR UNIT

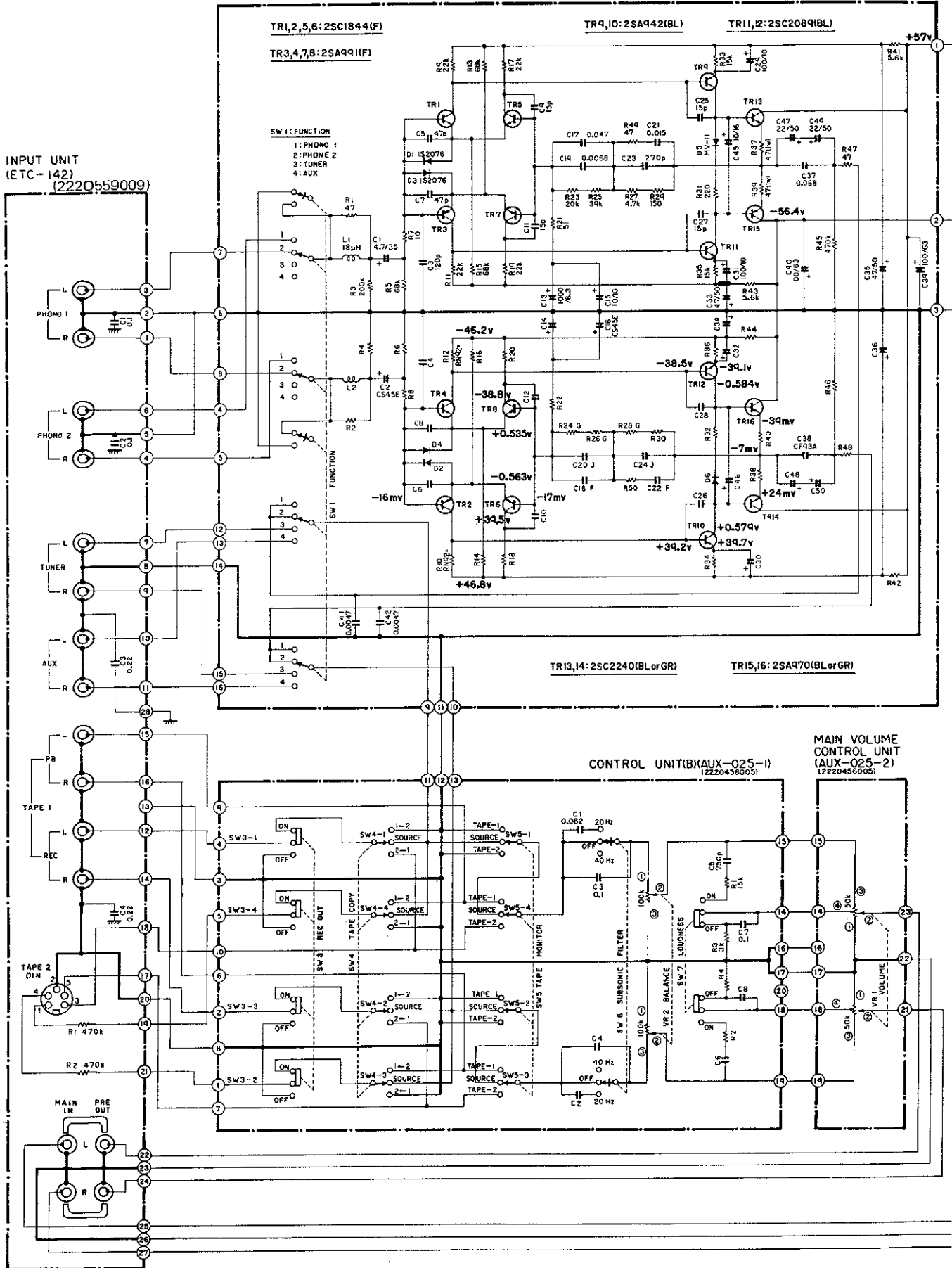


## ETC-307B PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions			
<b>SEMICONDUCTORS</b>					
TR1,4,5	2730064068	2SC711 (G)	TRANSISTOR		
TR2	2730187000	2SC2240 (GR)	TRANSISTOR		
TR3	2710094003	2SA970 (GR)	TRANSISTOR		
D1,2,3	2760049011	1S2076A	DIODE		
<b>RESISTORS</b>					
R5	2410294006	150 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R9	241304006	390 ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R3,6	2410322004	2.2 k ohm	±5%	1/4W	FIXED CARBON FILM RESISTOR
R11,12	2410345007	20 k ohm		1/4W	FIXED CARBON FILM RESISTOR
R8,10	2410338001	10 k ohm		1/4W	FIXED CARBON FILM RESISTOR
R1	2410342000	15 k ohm		1/4W	FIXED CARBON FILM RESISTOR
R7	2410346006	22 k ohm		1/4W	FIXED CARBON FILM RESISTOR
R2	2410354001	47 k ohm		1/4W	FIXED CARBON FILM RESISTOR
R4	2410757006	2.2 M ohm		1/2W	FIXED CARBON FILM RESISTOR
R15,16	2410175002	390 ohm		1/2W	FIXED CARBON FILM RESISTOR
R13,14	2440087018	120 ohm		2W	FIXED METAL OXIDE FILM RESISTOR FORMING TYPE
<b>CAPACITORS</b>					
C1	2544060038	0.47μF		100V	FIXED ELECTROLYTIC CAPACITOR
C3	2544004007	2.20μF		6.3V	FIXED ELECTROLYTIC CAPACITOR
C2	2549005027	22μF		25V	FIXED ELECTROLYTIC CAPACITOR
<b>OTHER PARTS</b>					
	2220457101	P.W. BOARD			
	EP-6071	BASE PIN			
	2050112030	3P. CONN. BASE			
	2048047007	HEAD PHONE JACK			
	4450033005	WIRE CLAMP BAND			
	2140037009	RELAY			
	2050070004	8P. TERMINAL			
	2034118018	3P. CONN.			FOR H/PHONE
	2034118021	3P. CONN.			FOR SW.
	2034114038	3P. CONN.			FOR +B
	2030195006	1P. CONN.			FOR SP TERMINAL (L)
	2030078013	1P. CONN.			FOR SP TERMINAL (R)
	4770064107	FIXING SCREW			FOR SP TERMINAL FIXED
	2050071016	TERMINAL			FOR GND TERMINAL

# WIRING DIAGRAM

## CONTROL AMP UNIT(A) (AUE-004) (2220455006)



POWER AMP UNIT (PUX-021B)  
(222045300)

