

FOR THE SETS WITH SERIAL
NUMBER FROM 1001 TO 4000

TA-1120



Specifications (1)

System: All Silicon Transistor integrated stereo amplifier

Circuit: Quasi-complementary symmetry circuit, 46 transistors, 23 diodes

Transistor: 2SC401 (27), 2SC293 (3), 2SC297 (1), 2SC299 (5), 2SD45 (8), 2SA-527 (2)

Diode: DS2M (4), FR-1U (4), IT206 (10), SV6 (4), 2SF-103 (1, SCR)

Power requirement: 100, 117, 220 or 240V AC 50/60 Hz

Power consumption: Approx. 30W at zero signal

Approx. 200W at rated output

Dimensions: 400W×145H×310 mm D (15 $\frac{3}{4}$ ×5 $\frac{3}{4}$ ×12 $\frac{1}{4}$ ") (including knobs)

Weight: Approx. 11 kgs. (24 lbs.)

SONY®

SERVICING GUIDE

Specifications (2)

Amplifier section

Power output: Non-clip music power: 160 W both channels (8 ohms)
 Music power (IHFM): 120 W both channels (8 ohms) ± 0.5 db
 Rated output (IHFM): 50 W per channel (8 ohms) ± 0.5 db
 35 W per channel (16 ohms) ± 0.5 db

Harmonic distortion: At 1 KHz: Less than 0.1% at rated output
 (IHFM) Less than 0.07% at 25 W output
 Less than 0.05% at 0.5 W output

At 20 Hz~80 KHz: Less than 0.5% at rated output

Intermodulation distortion: Less than 0.3% at rated output, 70 Hz: 7 KHz=4:1
 (SMPTE)

Frequency response: 10 Hz~100 KHz $+0$
 -1 db at rated output

S/N ratio: Closed circuit (IHFM) 110 db
 *through weighted network as per ASA Z24,3-1944 (40 db-A)

Input impedance: 100 k ohms or more

Damping factor: More than 70 at 1 KHz

Sensitivity: 1 V at 50 W output

Preamplifier section

Output voltage: Preamp out: 1.5 V, Rec out: 0.2 V

Harmonic distortion: At 1.5 V output: Less than 0.1% at 1 KHz
 Less than 0.1% at 30 Hz
 Less than 0.2% at 15 KHz

Frequency response: Tuner input, Aux input (flat frequency response)
 30 Hz~100 KHz $+0$
 -2 db (twin-T low-cut filter below 30 Hz)
 Phono-1, Phono-2 (zero-reference frequency)
 30 Hz~15,000 Hz ± 0.5 db (RIAA eq. curve)
 Tape head (zero-reference frequency)
 30 Hz~15,000 Hz ± 0.5 db (NAB eq. curve)
 (adjustable ± 3 db at 10 KHz)
 Mic input (flat frequency response)
 30 Hz~50,000 Hz $+0$
 -2 db

Input sensitivity: Tuner, Aux 0.2V (adjustable), Impedance: more than 100 k ohms
 Phono-1 5 mV, " " 47 k ohms
 Phono-2 1 mV, " " 47 k ohms
 Tape head 1 mV, " " 500 k ohms
 (suitable for 4.5 k ohm playback head)
 Mic 2 mV, " " 500 k ohms

Inputs: Mic, Tape head, Phono-1, Phono-2, Tuner, Aux, Tape, Rower Amp in

Outputs: Rec out (0.2V), Preamp out

Integrated record/playback connector: Input sensitivity: 0.5 V
 Output level: 25 mV

Tone controls: Bass 100 Hz ± 10 db 2 db/step
 Treble 10k Hz ± 10 db 2 db/step

Filters: High filter 12 db/oct above 9 KHz
 Low filter 12 db/oct below 50 KHz

S/N ratio: Aux, Tuner (closed circuit) more than 90 db
 (IHFM) Phono-1 (") " 80 db
 Phono-2 (") " 70 db
 Tape head (") " 70 db
 Mic (") " 65 db
 *through weighted network as per ASA Z24,3-1944 (40 db-A)

AC outlets: Switched2
 Unswitched1

Warm-up Time for TA-1120

Integrated Stereo Amplifier TA-1120 which have been in stock or not used for a long time, it takes several minutes to start operation after Power Switch is set on for the first time. It is due to Electrolytic Capacitor in Muting Relay Circuit which serves to give proper time-lag (usually 6~7 seconds) to the Amplifier.

When Electrolytic Capacitor is left unused, leakage current value increases and it takes much more time than usual for Electrolytic Capacitor to charge up to normal voltage.

It gives no affect to the natural performance of Amplifier itself.

Upon the reports so far received and the result of investigation, attention should be paid to the following points.

1. It does not engender excessive time-lag to leave the unit unused for about one month.
2. It takes 2 or 3 minutes at longest to start operation, however only one set took 10 minutes in very rare case.

We hope you will take this phenomena in throughly especially when you set Power Switch on in customer's presence for the first time.

This Service Manual for TA-1120 is mainly written for channel 1 [Left Channel].
That same can be said about channel 2 [Right Channel].

Method of Disassembling the Set

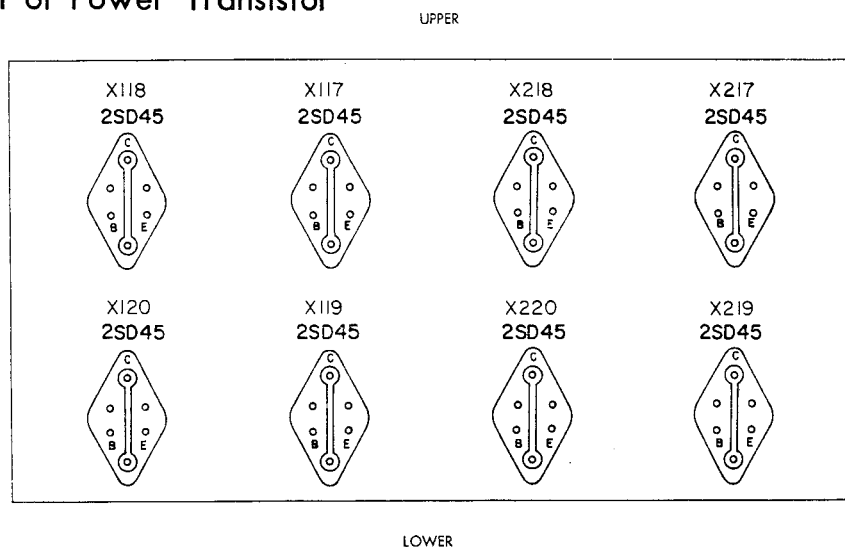
(I) Removal of main amplifier and power supply block.

- (a) Remove four machine screws from both side of the chassis cover to take it off.
- (b) Remove five screws from bottom of chassis to release the back panel block as shown in Fig. 1.
- (c) Unsolder the mylar capacitor (C501) from main amplifier, then remove the two screws as shown in Fig.2. Now the muting circuit board can be removed.
- (d) Remove the five screws from main amplifier and power supply chassis as shown in Fig.3, so you can turn the block to make the circuit board up as shown in Fig.4.

(II) Removal of control panel block. (preamplifier block)

- (a) After take the chassis cover off, remove two screws from the bottom of chassis (Fig.1), and then remove four screws from side of the chassis as shown in Fig. 4, now you can separate control panel block from chassis.
- (b) The service will be easily done after removing control panel and preamplifier block respectively. (Fig. 5)

Location of Power Transistor



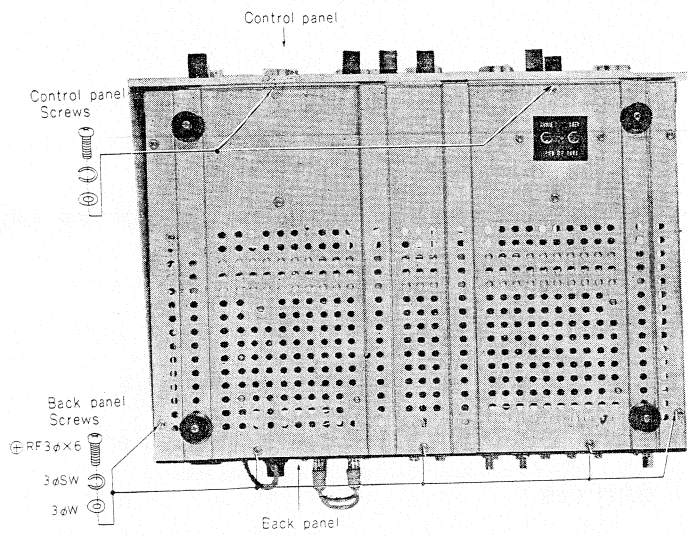


Fig. 1

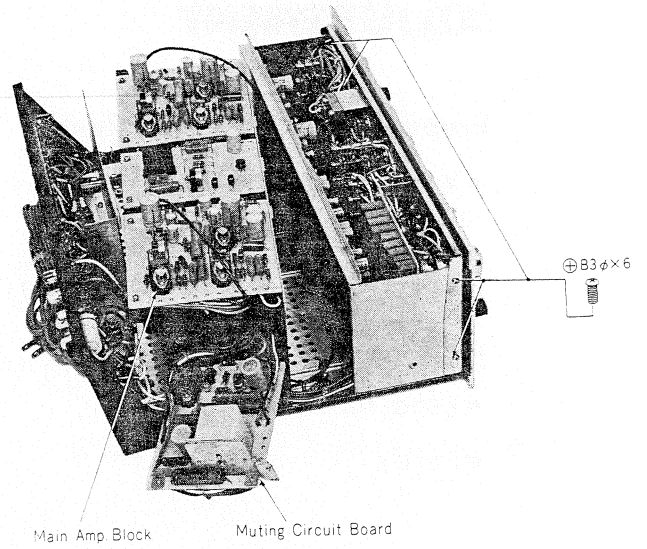


Fig. 4

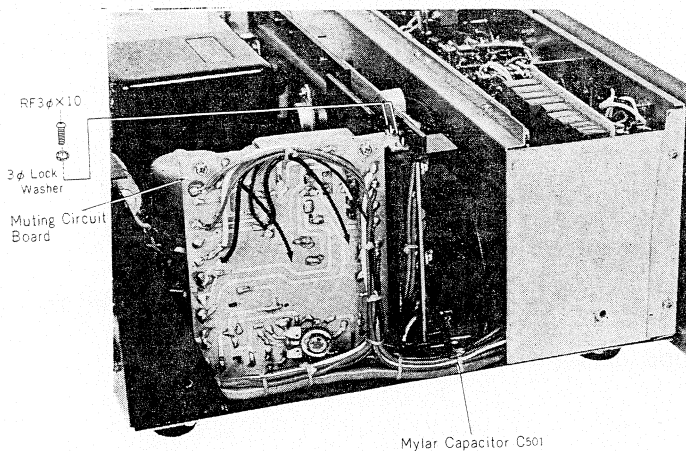


Fig. 2

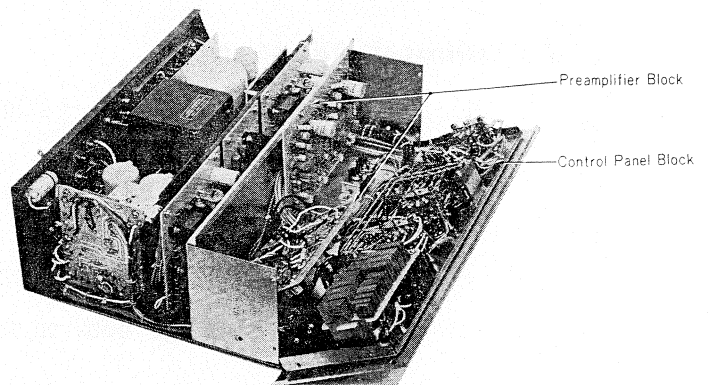


Fig. 5

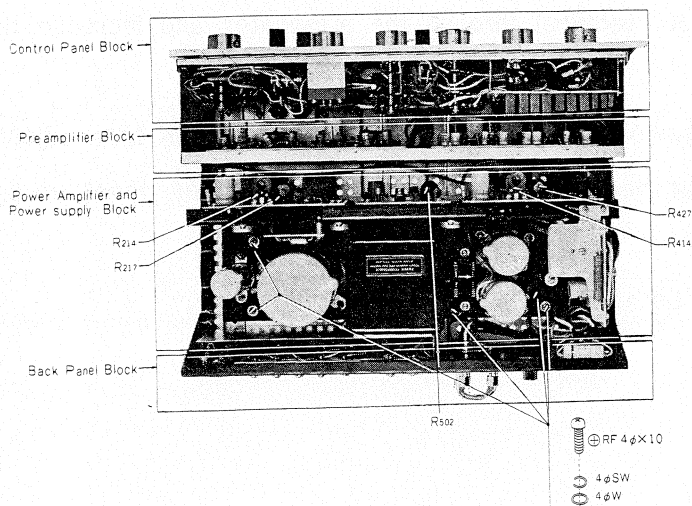


Fig. 3

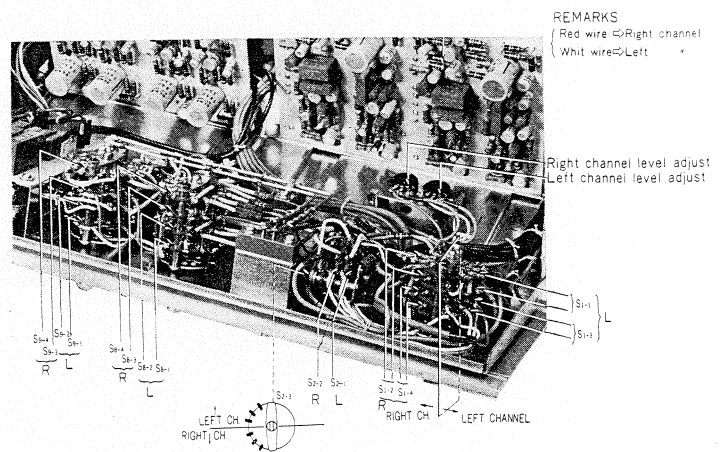


Fig. 6

ADJUSTMENT

Preparation for adjustment

- * Voltage Selector Plug: Insert the Plug so that the top arrow mark of the plug points to the proper voltage figure.
- * DC Balance Control (R217, 417): Turn clockwise to the full.
- * Compensation Diode: Check that the Diode is attached to heat sink.
- * Load for output: Connect an 8 ohms resistor instead of Speaker.
- * Fuse: Set a 5A Fuse.

(A) Balancer Adjustment.

1. Feed a 1KHz signals of -10dBs to the right and left Tuner input terminal.
2. Set Function selector switch (S2) to Tuner position.
3. Connect a V.T.V.M. across the output jack of preamplifier and the ground.
4. Adjust the Balance Control R174, 374 (10K ohms B) so that V.T.V.M. indicates the same output voltage both on left and on right channels.

(B) AC Balance Adjustment.

1. Connect an oscilloscope and V.T.V.M. across the 8 ohms load resistor.
2. Feed a 1KHz Signal to the input terminal through the attenuator and increase the signal gradually.
3. When the wave form on the oscilloscope is slightly clipped, adjust 50K ohms adjustable resistor (R214, 414) so that the both upper side and lower side of waveform are clipped at the same time.
4. Make the above procedures on both channels.

(C) Current Adjustment at Zero Signal.

1. Adjust the input signal to zero (less than -50dBs .)
2. Connect voltmeter (multitester) across the 0.5 ohms resistor (R223~226, R423~426).
3. Adjust the 200 ohms adjustable resistor (R217, 417) to obtain 25mV reading on the voltmeter.
4. Repeat the above (B) procedures adjustment.

(D) Circuit Breaker Adjustment.

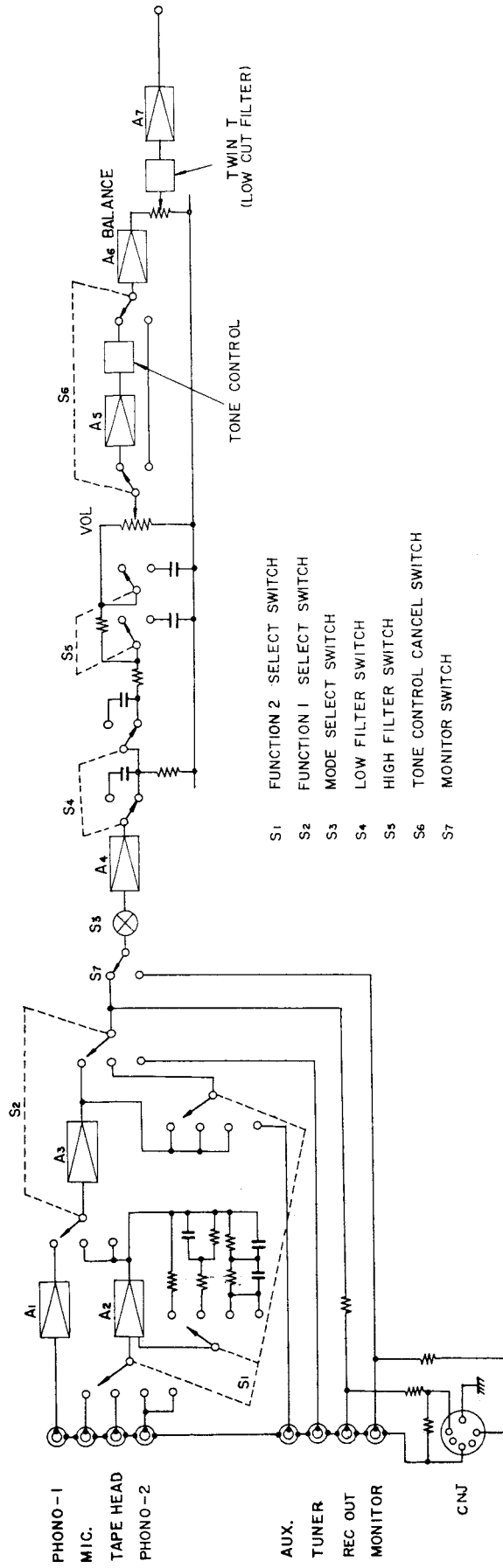
Make it a rule to adjust the circuit breaker block after repairing it, before connect it to amplifier.

1. Turn the 200 ohms adjustable resistor (R502) counter clockwise to the full.
2. Supply the constant voltage of DC $2\text{V} \pm 0.02\text{V}$ to Trigger Input.
3. Supply 85V between B+ and E.
4. Connect the voltmeter across the B-out and E.
5. Turn the 200 ohms adjustable resistor (R502) clockwise, and fix it when the voltmeter indicates 0V on the dial.
6. Check that the circuit breaker works with the input from both D21, D25.

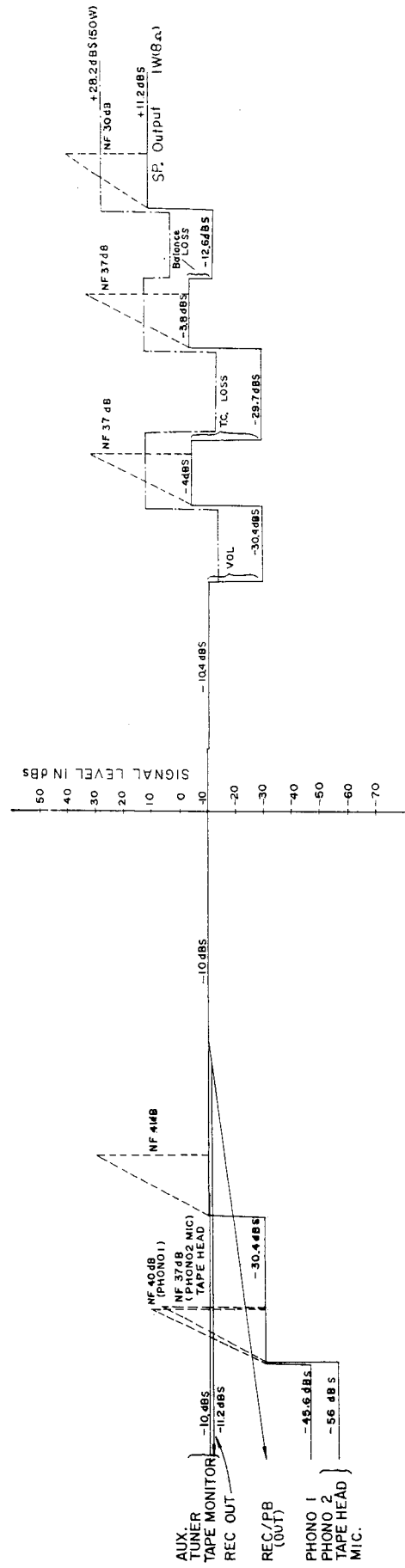
Other Items for Confirmation:

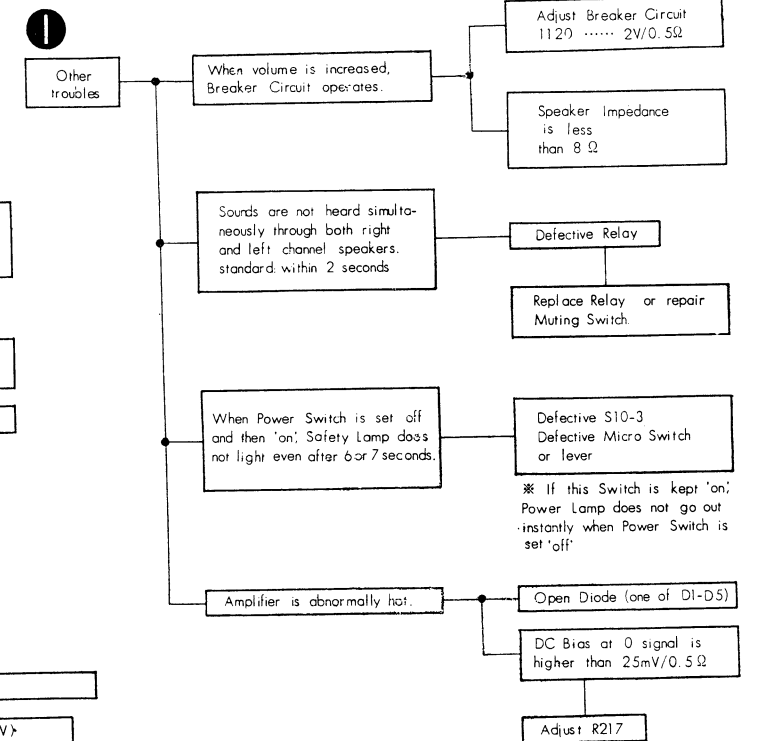
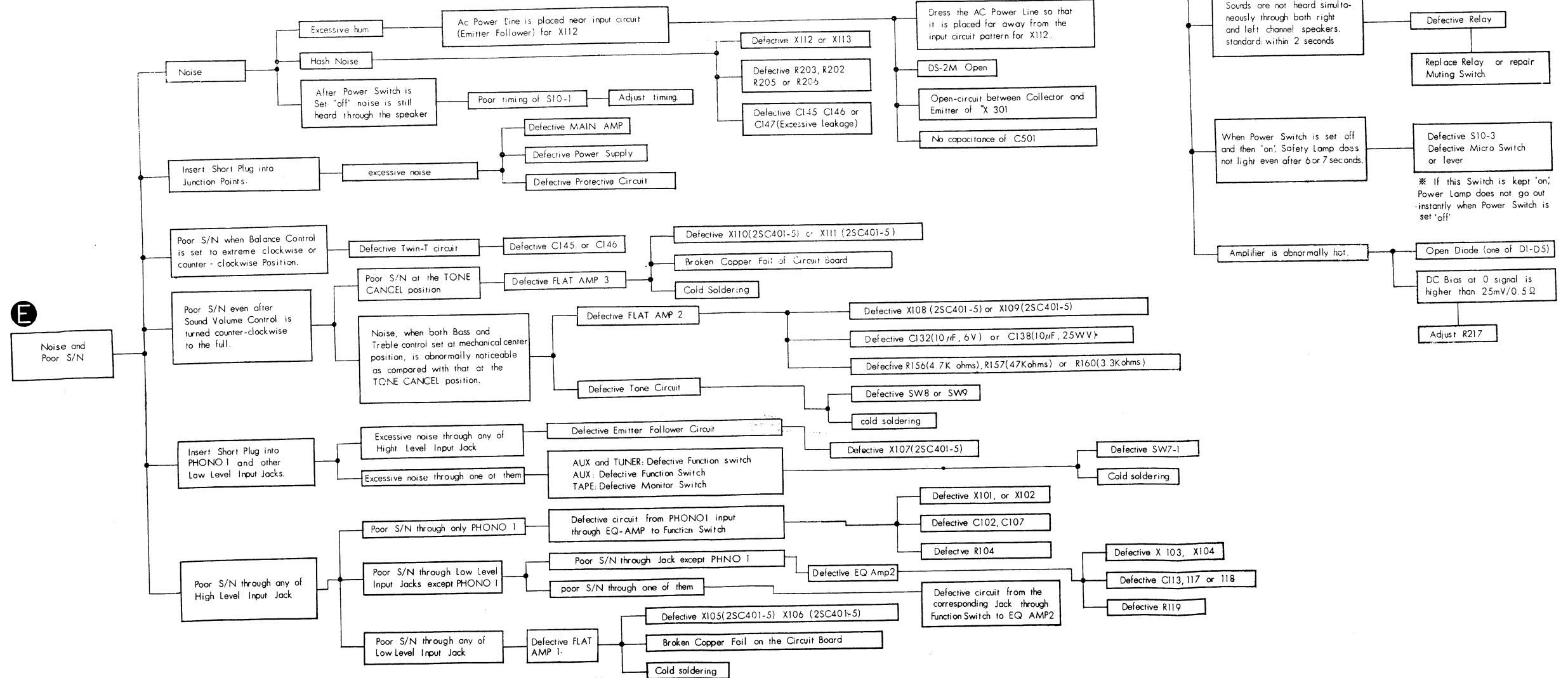
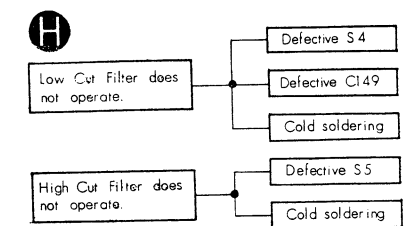
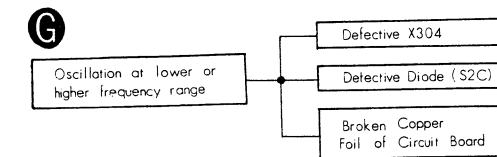
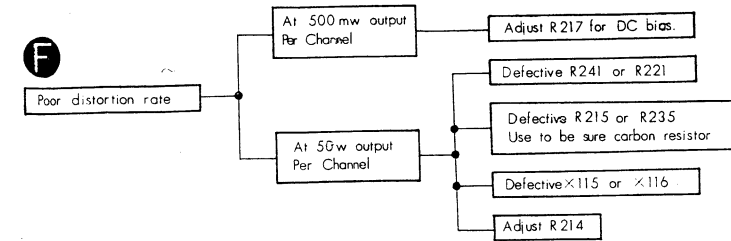
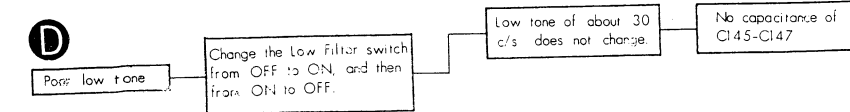
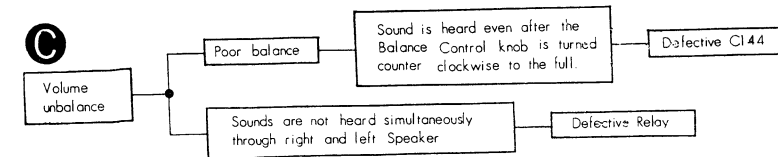
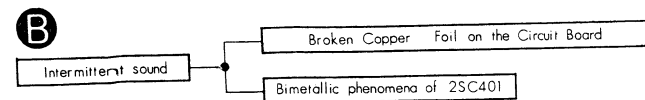
1. Relay works within 15sec. after Power Switch is set on for the first time, and it will be 4~10 sec. for the second time.
The difference of time between channel 1 and channel 2 is within 10 sec.
2. Phase of both channels must be same.
3. The difference of output level between channel 1 and channel 2 must be less than 2 dB., when the input level control knob set to maximum level position.
4. Output level must be decreased to zero by adjusting the input level control knob.
5. When short-circuit the speaker output, the circuit breaker must work perfectly.

TA-1120 BLOCK DIAGRAM



TA-1120 LEVEL DIAGRAM





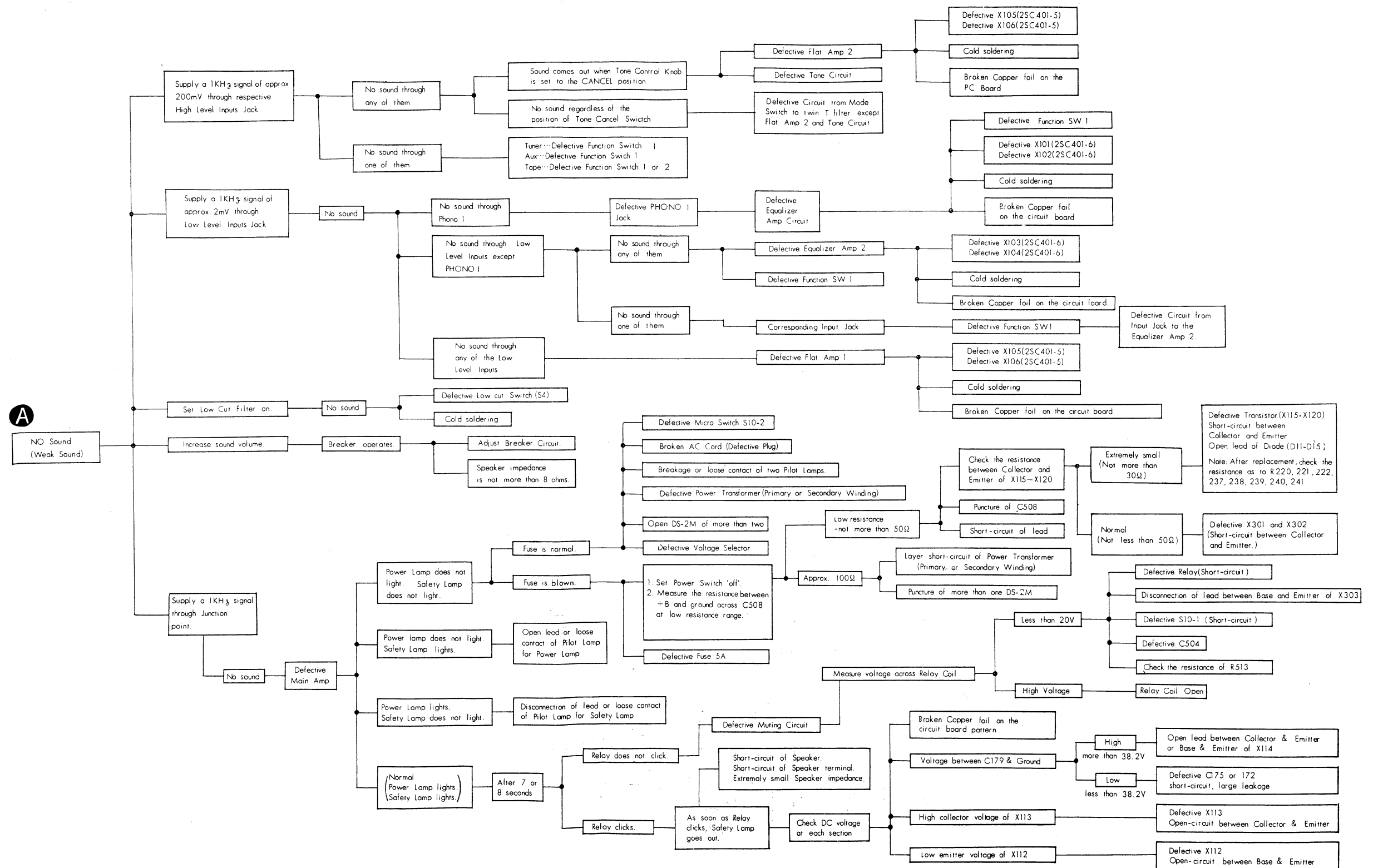
TROUBLE SHOOTING for TA-1120

Poor Sound Volume

- NO Sound (Weak Sound).....A
- Intermittent Sound.....B
- Volume unbalance.....C

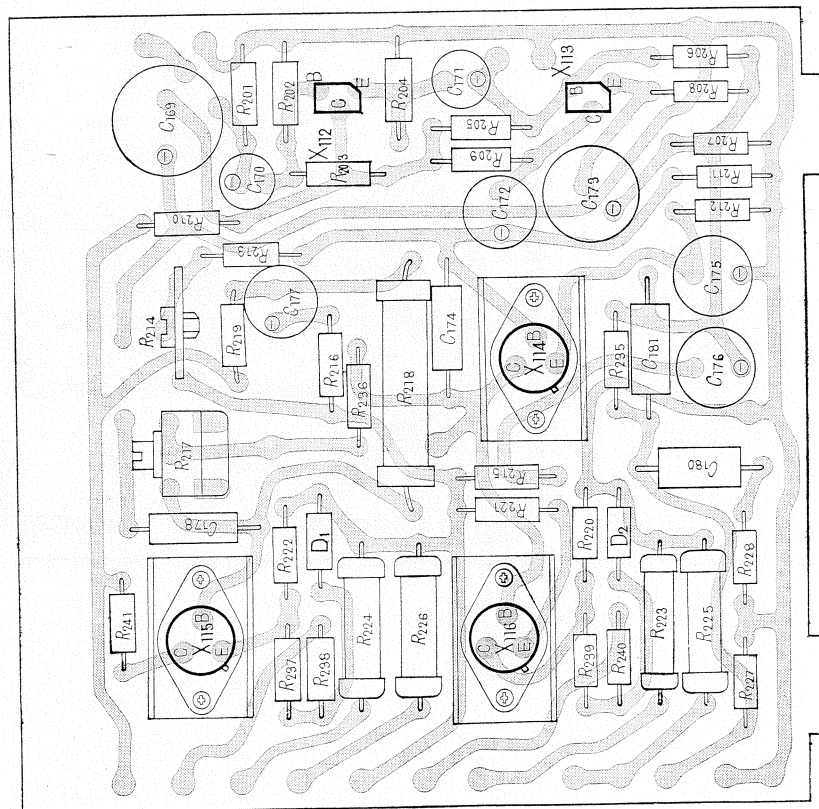
Poor Tone Quality

- Poor low tone.....D
- Noise & Poor S/N.....E
- Poor distortion rate.....F
- Oscillate at low or high frequency range.....G
- Low Cut filter does not operate.....H
- Other troubles.....I

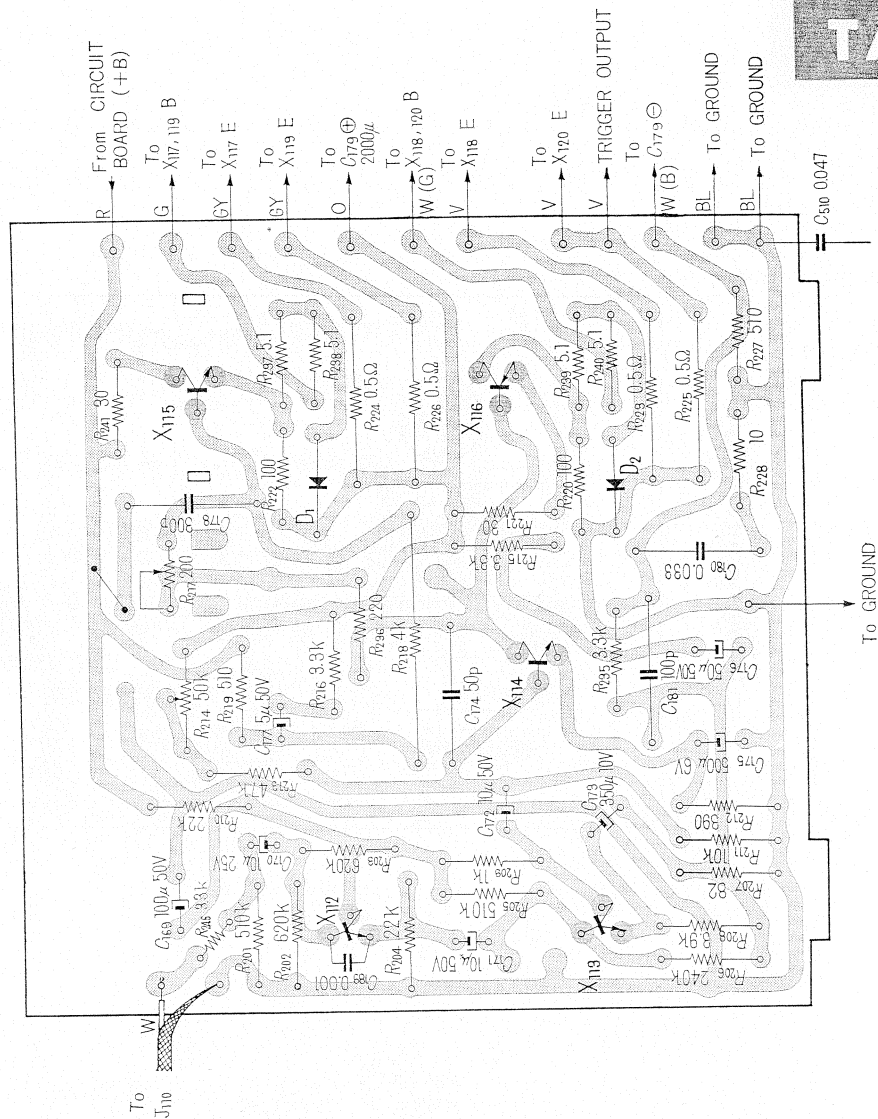


POWER AMPLIFIER BOARD

— Components Side —



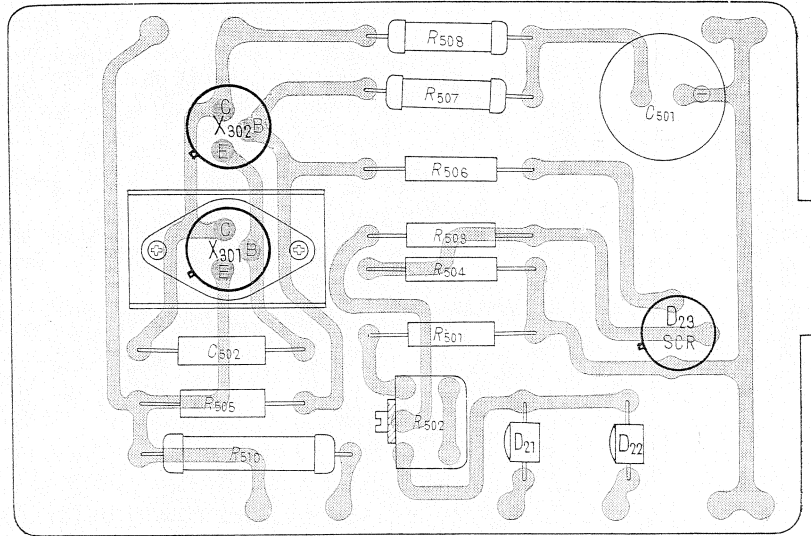
— Conductor Side —



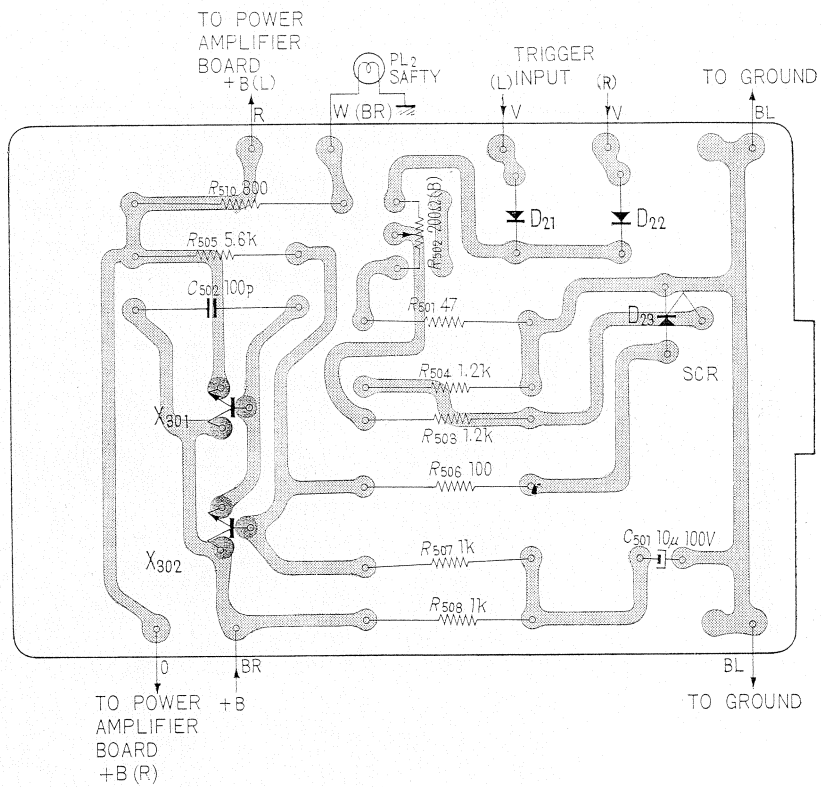
TA-1120

CIRCUIT BREAKER BOARD

— Components Side —



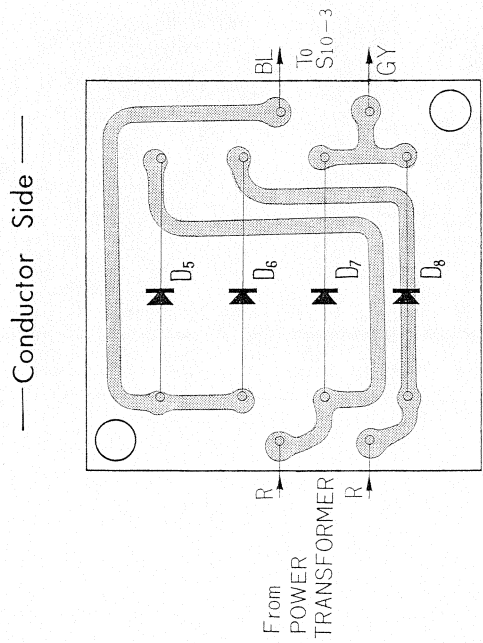
— Conductor Side —



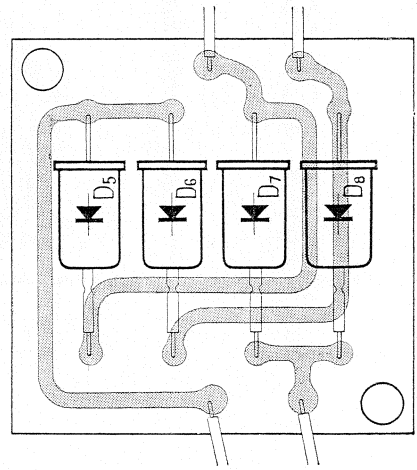
— Conductor Side —



POWER SUPPLY DIODE BOARD

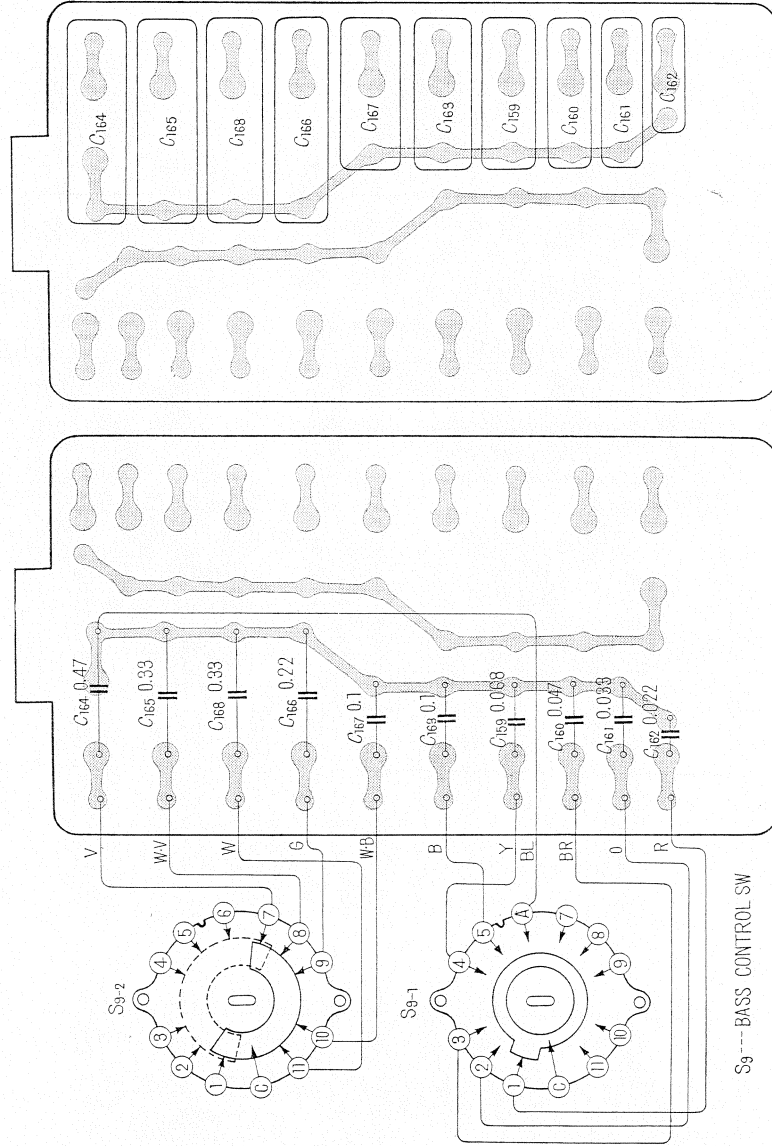


— Components Side —



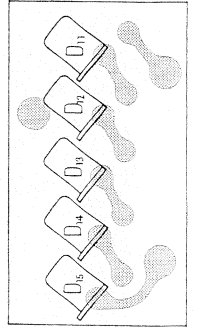
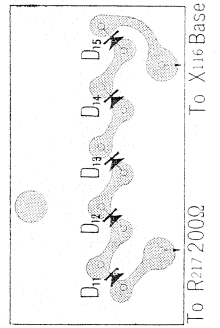
tone CONTROL CAPACITOR BOARD

— Conductor Side — — Components Side —



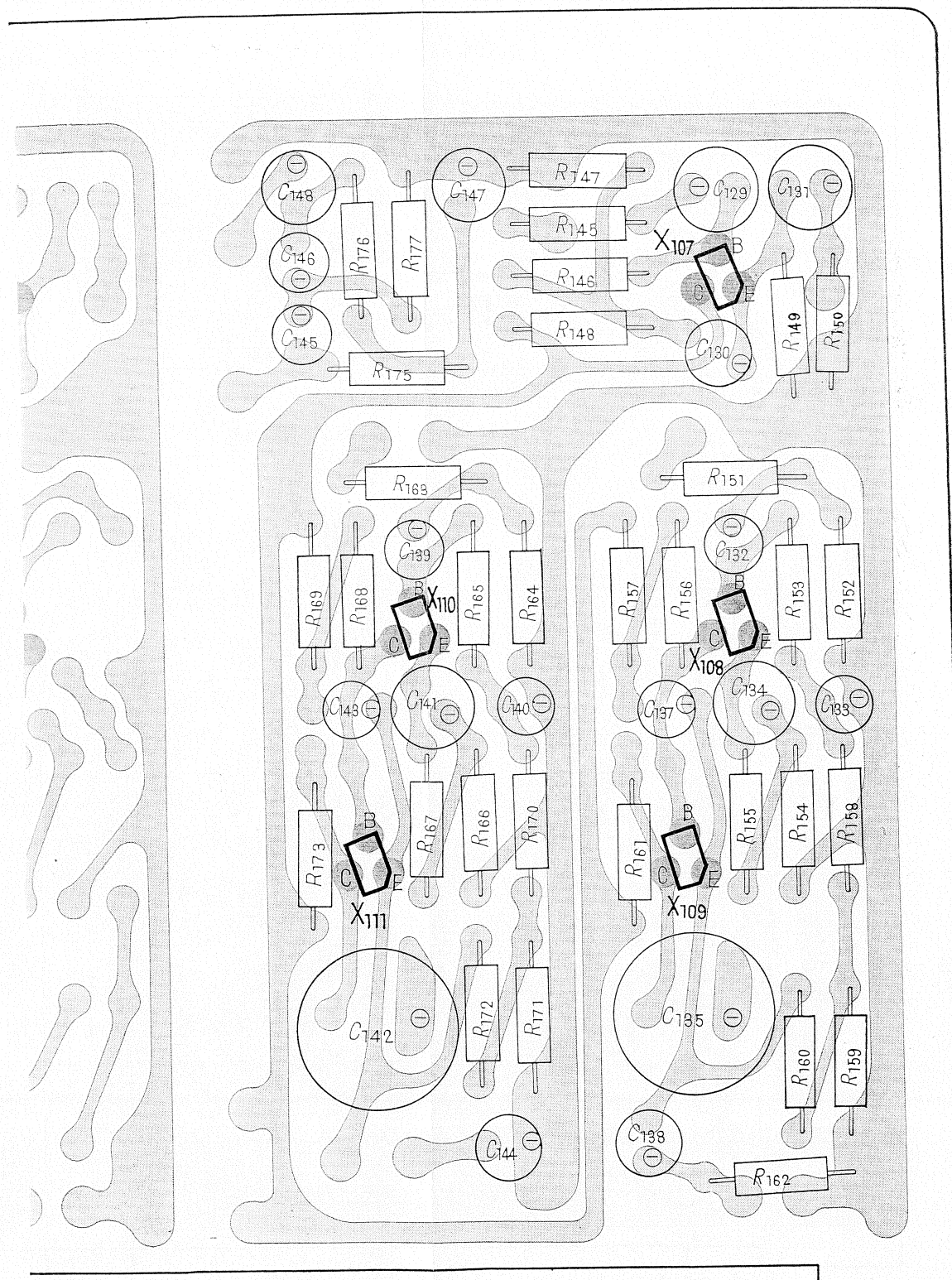
THERMO COMPENSATION DIODE BOARD

— Conductor Side — — Components Side —



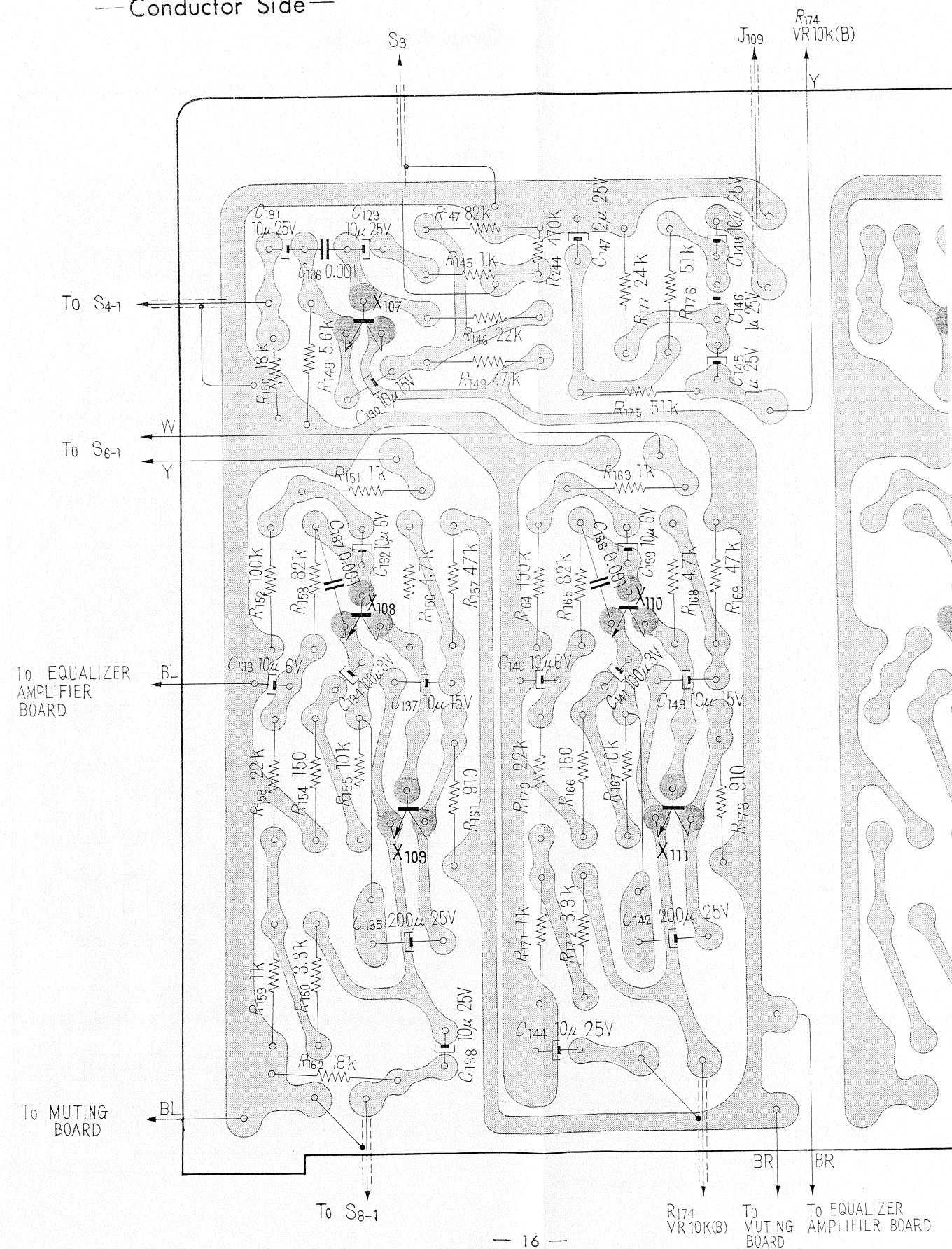
LINE AMPLIFIER BOARD

— Components Side —



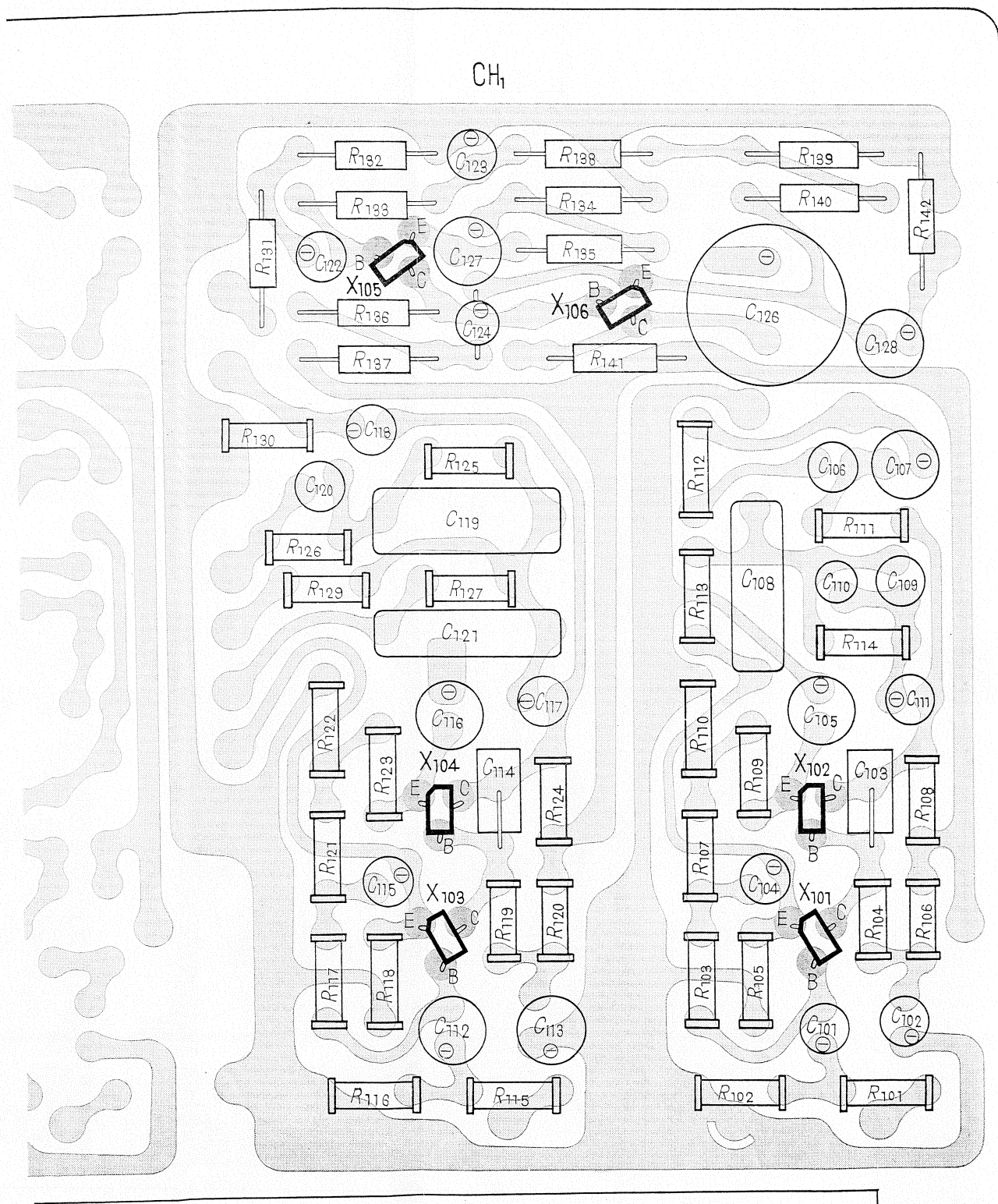
R244
C186, 187, 188 } are mounted on conductor side

— Conductor Side —



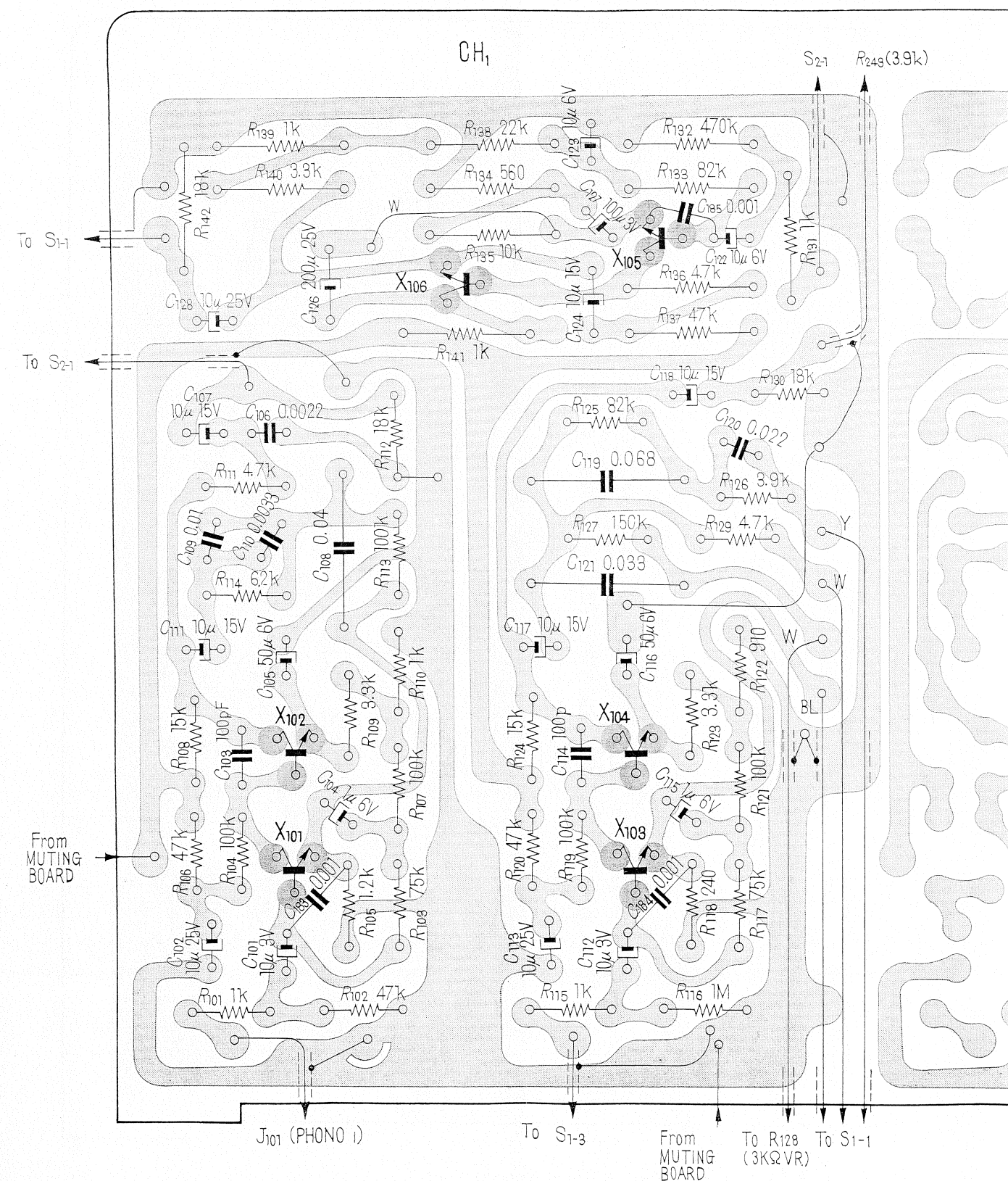
EQUALIZER AMPLIFIER BOARD

— Components Side —

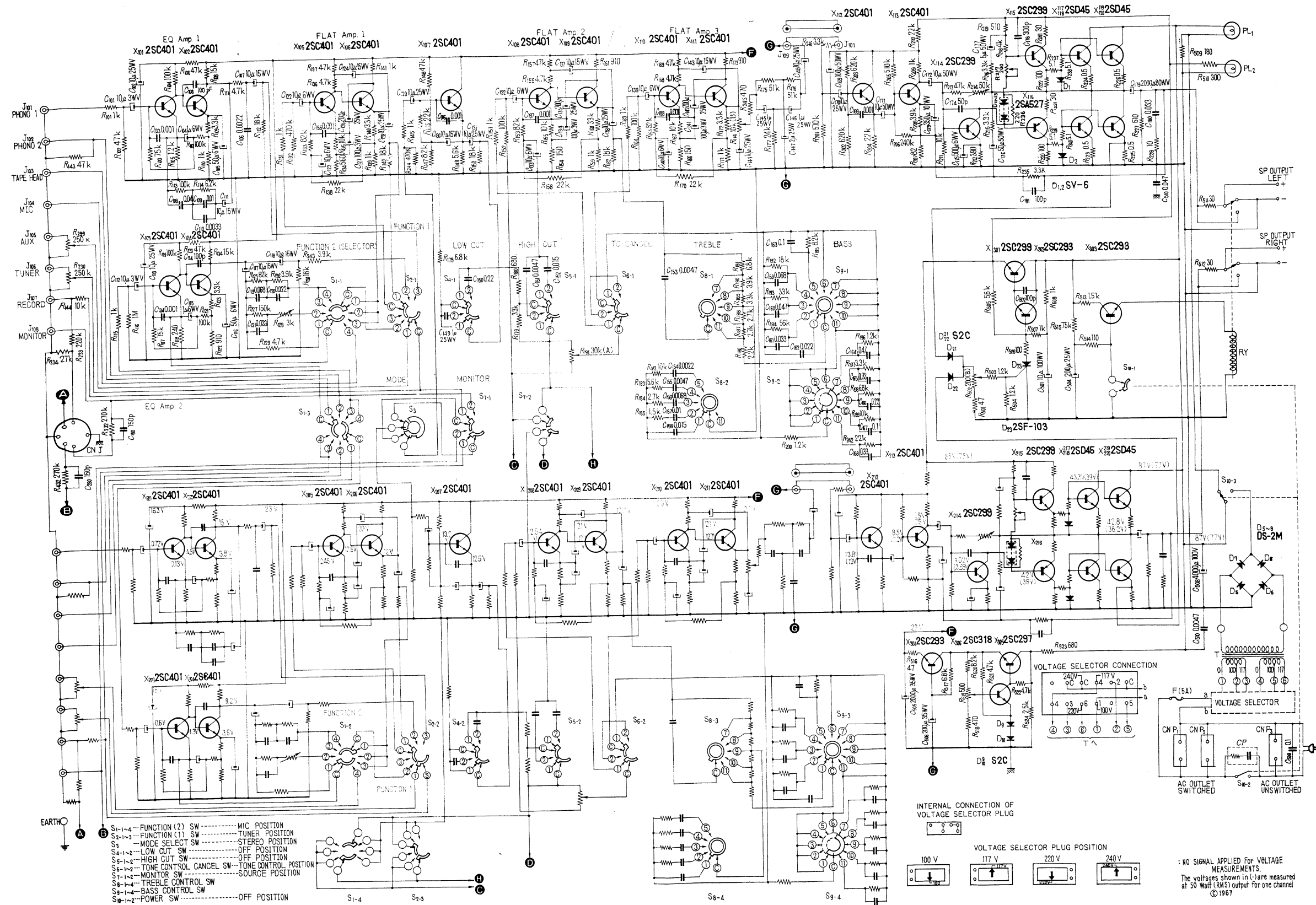


C183, 184, 185 are mounted on conductor side

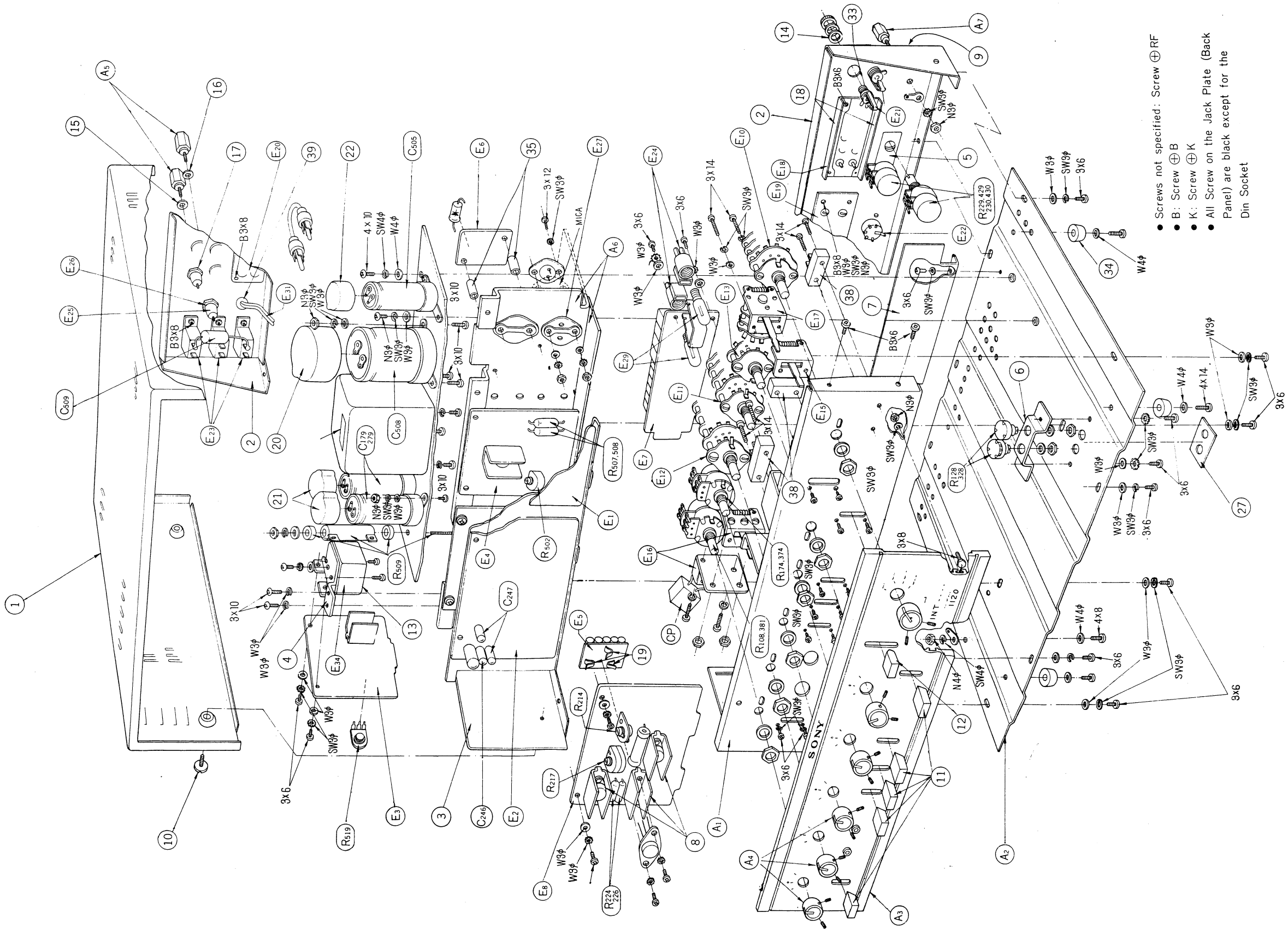
— Conductor Side —



TA-1120 CIRCUIT DIAGRAM



EXPLODED DIAGRAM



Mechanical Parts

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
A1	X-20299-01-	Panel Ass'y, chassis; front	1	28	-949-	Felt, vibration absorber; white	1
A2	X-20299-02-	Plate Ass'y, chassis; bottom	1	29	-950-	Spacer t=0.5	1
				30	-951-	Plate, nut	1
A3	X-20299-03-	Panel Ass'y, control incl.	1	31	-952-	Wire Retainer	2
A3-1	2-029-908	Panel, control	(1)	32	-953-	Label, voltage	1
A3-2	2-031-956-01	Escutcheon, pilot lamp	(2)	33	0-051-113-	Spacer, jack; white	2
A3-3	-955-01	Lens, pilot lamp; red	(1)	34	-263-	Foot, rubber	4
A3-4	-955-02	Lens, pilot lamp; green	(1)	35	3-002-403-05	Spacer, 6 φ	2
				36	-408-15	Spacer, 6 φ	2
A4	X-20299-04-	Knob Ass'y, control incl.; gold	6	37	3-413-100-	Bag, polyethylene	1
A4-1	2-029-911-	Knob, control; gold	(1)	38	3-418-169-	Board, 2P terminal	4
A4-2	7-621-715-40	Screw, control knob 4×8	(2)	39	3-410-032-	Stopper, cord; small	1
				40	3-103-527-	Staple, wire retainer; rubber	3
A5	X-20299-05-	Terminal Ass'y, speaker output; middle type	4	41	3-701-030-	Label, serial No.	1
				42	3-790-702-11	Instruction Manual	1
A6	X-20299-06-	Chassis Ass'y, power amplifier	1	43	X-44900-02	Cloth; polishing	1
A7	X-20319-01-	Terminal Ass'y, earth; small type	1	44	1-506-113-11	Plug, phonolock; black	6
1	2-029-921-	Cabinet, cover; black	1	45	-105-01	Plug, phono; red	7
2	-922-	Plate, jack	1	46	-105-02	Plug, phono; black	7
3	-923-	Chassis, pre-amplifier	1	47	2-029-946-	Bag, vinyl	1
4	-924-	Plate, relay	1	48	3-793-038-	Sheet, check	1
5	-925-	Plate, volume control	1	49	3-701-020-	Bag, check sheet	1
6	-926-	Bracket, tape equalizer adjustable resistor	1	50	-026-	Label, tuck	1
				51	7-491-001-	Desiccant	1
7	-927-	Plate, hum shield; terminal side	1	52	3-793-009-11	Card, inspection	1
8	-928-	Heat Sink 2SC299	8		7-621-261-23	Screw, machine +RF 3 φ×4	6
9	-929-	Label, specification	1		-43	" +RF 3 φ×6	46
10	-930-	Screw, case cover	4		-53	" +RF 3 φ×8	13
11	-931-	Knob, power on/off, tone and monitor; dark brown	5		-63	" +RF 3 φ×10	15
					-268-53	" +RF 4 φ×8	5
12	-932-	Knob, function; dark, brown	1		-63	" +RF 4 φ×10	5
13	-933-	Case Cover, relay; white	1		-83	" +RF 4 φ×14	4
14	-934-	Spacer, microphone jack; black	2		-261-73	" +RF 3 φ×12	16
15	-934-02	Spacer, speaker output; blue	2		-770-25	" +B 3 φ×6	2
16	-935-12	Spacer, speaker output; red	2		-22	" +B 3 φ×6	4
17	-936-	Spacer, speaker output; fiber	4		-49	" +B 3 φ×6	4
18	-937-	Plate, phono jack mounting plate reinforcing	2		-39	" +B 3 φ×8	14
					-561-43	" +K 3 φ×6	1
19	-938-	Plate, printed circuit board	6		7-621-999-01	Screw, hexagonal, 3 φ×8	6
20	-939-	Cover, electrolytic capacitor; large	1		7-623-208-24	Washer, spring 3 φ	92
					-210-24	" 4 φ	9
21	-940-	Cover, electrolytic capacitor; middle	2		-108-12	Washer, plain 3 φ	62
					-110-12	" 4 φ	10
22	-941-	Cover, electrolytic capacitor; small	1		-508-01	Solder Lug 3 φ	6
					-510-01	" 4 φ	1
23	-942-	Bracket, wire retainer	1		-408-04	Washer, external tooth 3 φ	36
24	-943-	Cushion	1		-410-04	" 4 φ	1
25	-944-	Cushion, styro-foam	2		7-622-108-02	Nut 3 φ	57
26	-945-	Carton	1		-110-02	" 4 φ	1
27	-947-	Label, "TAPE EQ. Adj."	1				

Electrical Parts (General)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
E1'		Circuit Board, equalizer amp.; mounted	1	E1	1-538-341-	Circuit Board, equalizer amp.;	1
E2'		" , line amp.; mounted	1	E2	-342-	" , line amp.;	1
E3'		" , muting; mounted	1	E3	-343-	" , muting;	1
E4'		" , circuit breaker; mounted	1	E4	-344-	" , circuit breaker;	1
E5'		Circuit Board, thermo compensation diode; mounted	1	E5	-345-	" , thermo compensation diode;	2
E6'		" , power supply diode; mounted	1	E6	-346-	" , power supply diode;	1
E7'		" , tone control capacitor; mounted	1	E7	-347-	" , tone control capacitor;	1
E8'		" , power amplifier; mounted	1	E8	-348-	" , power amp.;	1
				E9	1-441-227-	Transformer, power	1

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
E10	1-513-290-	Switch, function; rotary; S1	1	E21	1-507-108-	Jack, microphone input; phono J104, 204	2
E11	1-513-288-	Switch, treble; rotary S8	1	E22	1-509-029-	Socket, Rec./P.B. CNJ	1
E12	-289-	Switch, bass; rotary S9	1	E23	-015-	Socket, AC CNP1-3	3
E13	-295-	Switch, mode; rotary S3	1	E24	1-517-021-	Socket, pilot lamp	2
E14	-291-	Switch, low cut, high cut and cancel; lever action S4, 5, 6	3	E25	1-533-012-	Fuse Post	1
E15	-292-	Switch, monitor; lever action S7	1	E26	1-532-017-	Fuse 5A	1
E16	-293-	Switch, power on/off; micro S10	1	E27	1-526-502-	Socket, transistor 2SD45	8
E17	-294-	Switch, function; lever action S2	1	E28	-165-	Socket, voltage adaptor; special	1
E18	1-507-162-	Jack, tape head, phono 1, phono 2 tuner and auxiliary; phono J101-103, 201-203, 105, 205, 106, 206	1	E29	1-518-050-	Lamp, pilot	2
E19	-163-	Jack, rec. output and monitor; phono J107, 207, 102, 208	1	E30	1-536-074-	Terminal Strip 1L2P	2
E20	-164-	Jack, pre-amplifier, power amplifier junction check point; phono J109, 209, 110, 210	1	E31	1-534-330-	Cord, AC Power	1
				E32	-286-11	Cord, connection	1
				E33	-21	Cord, connection	1
				E34	1-515-050-	Relay	1

Electrical Parts

Part No.	Description	Q'ty	Part No.	Description	Q'ty
Semi-conductors			Resistor		
Equalizer Amplifier Section			General Items		
	Transistor 2SC401-6 X101-104, 201-204	8	1-221-760-	Balance Control 30K ohms combination R181, 381	1
	Transistor 2SC401-5 X105, 205, 106, 206	4	1-221-704-	Volume Control 10K ohms combination R174, 374	1
			-705-	Adjustable; auxiliary and tuner input level 250K ohms	
				R229, 429, 230, 430	4
			-702-	Adjustable 3K ohms R128, 328	
				Composition Resistor	2
			1-201-041-	10K ohms RC1/2 $\pm 10\%$ R144, 344	2
			-054-	47K " " " R143, 343	2
			-693-	27K " " " R234, 434	2
			-326-	270K " " " R232, 432	2
			-085-	3.9K " " " R243, 443	2
			-075-	6.8K " RC1/4 " R178, 378, 191, 391, 198, 398	6
			-030-	3.3K " " " R179, 379, 189, 389, 197, 397	6
			-779-	68K " " " R180, 380	2
			-039-	10K " " " R182, 382, 199, 399	4
			-034-	5.5K " " " R183, 383	2
			-237-	2.7K " " " R184, 384, 187, 387, 188, 388	6
			-024-	1.5K " " " R185, 385	2
			-028-	2.2K " " " R186, 386	2
			-033-	3.0K " " " R190, 390	2
			-230-	18K " " " R192, 392	2
			-047-	33K " " " R193, 393	2
			-057-	56K " " " R194, 394	2
			-037-	8.2K " " " R195, 395	2
			-288-	1.2K " " " R196, 396, 200, 400	4
			-243-	22K " " " R242, 442	2
			-802-	220K " RC1/2 " R233, 433	2
			-096-	470 " " " R245, 445	2
			1-205-100-	Enameled 180 ohms 10W $\pm 10\%$ R509 w/mounting bracket	1
Circuit Braker Section			Equalizer Amplifier Section		
	Transistor 2SC299-30 (Red Mark) X301	1	Carbon Resistor		
	Transistor 2SC293-30 (Red Mark) X302	1			
	Diode S2C D21, 22	2			
	Diode 2SF-103 D23	1			
Muting Section					
	Transistor 2SC299-30 (Red Mark) X303	1			
	Transistor 2SC293-40 (Red Mark) X304	1			
	Transistor 2SC297-03 (Red Mark) X305	1			
	Transistor 2SC318-242 (Red Mark) X306	1			
	Diode S2C D9, 10	2			

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1-203-973-	3.3K ohms RD1/4L $\pm 5\%$ R109,309, 123,314	4	1-203-058-	3.3K ohms RD1/4L $\pm 5\%$ R160,172 360,372	4
1-203-058-	3.3K " " " R140,340	2	Power Amplifier Section		
-031-	1K ohm " " R101,301	2	1-221-334-	Adjustable 50K ohms (B) R214,414	2
-095-	47K ohms " " R102,302,106, 306,120,320, 137,337	8	1-223-010-	Adjustable, wire wound 200 ohms (B) R217,417	2
-064-	4.7K " " " R111,211,129, 329,136,336	6	1-201-837-	Composition Resistor 510K ohms RC1/2 $\pm 10\%$ R201,401, 405,205	4
-130-	18K " " " R112,312 130,330	4	-842-	620K " " " R202,402,203, 403	4
-100-	100K " " " R113,313	2	-087-	22K " " " R204,404,210, 410	4
-124-	6.2K " " " R114,314	2	-843-	82 " " " R206,406	2
-125-	82K " " " R125,325	2	-683-	240K " " " R207,407	2
-061-	3.9K " " " R126,326	2	-085-	3.9K " " " R208,408	2
-104-	150K " " " R127,327	2	-021-	1K ohm " " R209,409	2
1-204-910-	Carbon Resistor 1K ohm RD1/4L $\pm 5\%$ R110,310, 115,315	4	-041-	10K ohms " " R211,411	2
-913-	75K ohms " " R103,303,117, 317	4	-472-	390 " " " R212,412	2
-901-	100K " " " R104,304,107, 119,319,307, 121,321	8	-054-	47K " " " R213,413	2
-909-	15K " " " R108,124,324, 308	4	-084-	3.3K " " " R216,416,246, 446	4
-911-	* 240 " " " R118,318	2	-845-	510 " " " R219,419,227, 427	4
-912-	* 910 " " " R122,322	2	-100-	100 " " " R220,420,222, 422	4
1-209-903-	* 1.2K " " " R105,305	2	-838-	30 " " " R221,421,241, 441	4
-902-	* 1M ohm " " R116,316	2	-094-	10 " " " R228,428	2
1-201-021-	Composition Resistor 1K ohm RC1/2 $\pm 10\%$ R131,331, 139,339,141, 341	6	-081-	220 " " " R236,436	2
-597-	470K ohms " " R132,332	2	-794-	5.1 " " " R237,437,238, 438,239,439, 240,440	8
-591-	82K " " " R133,333	2	1-203-058-	Carbon 3.3K ohms RD1/4L $\pm 5\%$ R215,235,415, 435	4
-083-	560 " " " R134,334	2	1-207-151-	Wire Wound 0.5 ohms 2P $\pm 10\%$ R223,423,224,424, 225,425,226,426	8
-041-	10K " " " R135,335	2	1-209-576-	Carbon 4K ohms RD2L $\pm 5\%$ R218,418	2
-087-	22K " " " R138,338	2	Circuit Breaker Section		
-099-	18K " " " R142,342	2	1-223-010-	Adjustable, wire wound 200 ohms (B) R502	1
Line Amplifier Section			Composition Resistor		
1-201-021-	Composition Resistor 1K ohm RC1/2 $\pm 10\%$ R145,345, 151,351,159, 359,163,363, 171,371	10	1-201-079-	47 ohms RC1/2 $\pm 10\%$ R501	1
-591-	82K ohms " " R147,347,153, 353,165,365,	6	-685-	1.2K " " " R503,504	2
-041-	10K " " " R155,355,167, 367	4	-086-	5.6K " " " R505	1
-054-	47K " " " R148,348	2	-100-	100 " " " R506	1
-087-	22K " " " R146,346,158, 358,170,370	6	1-207-157-	Wire Wound 1K ohm 2P $\pm 10\%$ R507,508	2
-099-	18K " " " R150,350,162, 362	4	-156-	Wire Wound 300 ohms 4P $\pm 10\%$ R510	1
-086-	5.6K " " " R149,349	2	Muting Section		
-061-	100K " " " R152,352,164, 364	4	1-221-427-	Adjustable 500 ohms (B) R519	1
-316-	150 " " " R154,354,166, 366	4	1-207-104-	Wire Wound 30 ohms 6P(4W) $\pm 10\%$ R511,512	2
-840-	910 " " " R161,361,173, 373	4	-153-	1.5K " 6P(4W) " R514	1
-283-	51K " " " R175,375,176, 376	4	-152-	110 " 2P(1.5W) " R514	1
-282-	24K " " " R177,377	2	-154-	680 " 8P(5W) " R523	1
-597-	470K " " " R244,444	2	-155-	2.5K " 6P(4W) " R524	1
1-203-095-	Carbon Resistor 47K ohms RD1/4L $\pm 5\%$ R157,169, 357,369	4	1-201-844-	Composition Resistor 75K ohms RC1/2 $\pm 10\%$ R515	1
-064-	4.7K " " " R156,168,356, 368	4	-079-	47 " " " R516	1
			-090-	6.8K " " " R517	1
			-096-	470 " " " R518	1
			-459-	8.2K " " " R520	1
			-089-	4.7K " " " R521,522	2

* Noiseless Carbon Resistor

Part No.	Description	Q'ty	Part No.	Description	Q'ty
Capacitors					
General Items					
1-101-534-	Encapsulated Component 120 ohms + 0.1 μ F 500WV	1	1-121-111-	C135,235,142,242 Electrolytic 100 μ F 3WV	4
1-105-669-	Mylar 0.0047 μ F $\pm 10\%$ C151,251,253,155,255	6	-324-	C134,234,141,241 " 1 μ F 25WV $\pm 20\%$	4
1-105-675-	Mylar 0.015 μ F $\pm 10\%$ 50WV C152,252,158,258	4	-325-	C145,245,146,246 " 2 μ F 25WV $\pm 20\%$	4
-665-	Mylar 0.0022 μ F $\pm 10\%$ 50WV C154,254	2	1-105-661-	C147,247 Mylar 0.001 μ F 50WV $\pm 10\%$	2
-671-	Mylar 0.0068 μ F $\pm 10\%$ 50WV C156,256	2		C186-188,286-288	6
-673-	Mylar 0.01 μ F $\pm 10\%$ 50WV C157,257	2	Tone Control Capacitor Section		
-689-	Mylar 0.022 μ F $\pm 10\%$ 50WV C150,250	2	1-113-142-	Mylar 0.068 μ F 50WV $\pm 10\%$ C159,259	2
-841-	Mylar 0.047 μ F $\pm 20\%$ 50WV C510	1	-141-	" 0.047 μ F 50WV $\pm 10\%$ C160,260	2
1-115-045-	Oil tublar 0.1 μ F 500WV $\pm 20\%$ C509	1	-140-	" 0.033 μ F 50WV $\pm 10\%$ C161,261	2
1-121-326-	Electrolytic 1 μ F 25WV $\pm 20\%$ C149,249	2	-139-	" 0.022 μ F 50WV $\pm 10\%$ C162,262	2
-323-	Electrolytic 4000 μ F 100WV C508	1	-143-	" 0.1 μ F 50WV $\pm 10\%$ C163,263,167,267	4
-327-	Electrolytic 2000 μ F 80WV C179,279	2	-135-	" 0.47 μ F 50WV $\pm 10\%$ C164,264	2
-328-	Electrolytic 2000 μ F 35WV C505	1	-134-	" 0.33 μ F 50WV $\pm 10\%$ C165,265,168,268	4
1-109-040-	Mica 150pF 1000TV $\pm 10\%$ C190,290	2	-133-	" 0.22 μ F 50WV $\pm 10\%$ C166,266	2
Equalizer Amplifier Section			Power Amplifier Section		
1-131-029-	Tantalum 10 μ F 3WV $\pm 20\%$ C101,201,112,212	4	1-121-172-	Electrolytic 100 μ F 50WV C169,269	2
1-121-179-	Electrolytic 10 μ F 25WV C102,202,113,213,128,228	6	-179-	" 10 μ F 25WV C170,270	2
-145-	" 1 μ F 6WV C104,204,115,215	4	-143-	" 10 μ F 50WV C171,271,172,272	4
-135-	" 50 μ F 6WV C105,205,116,216	4	-140-	" 350 μ F 10WV C173,273	2
-192-	" 10 μ F 15WV C107,207,111,211,117, 217,118,218,124,224	10	-161-	" 500 μ F 6WV C175,275	2
-104-	" 10 μ F 6WV C122,222,123,223	4	-163-	" 50 μ F 50WV C176,276	2
-190-	" 200 μ F 25WV C126,226	2	-142-	" 5 μ F 50WV C177,277	2
-111-	" 100 μ F 3WV C127,227	2	1-190-001-	Mica 50pF 1KV $\pm 10\%$ C174,274	2
1-109-002-	Mica 100pF 1KV $\pm 10\%$ C114,214,103,203	4	-006-	" 300pF 1KV $\pm 10\%$ C178,278	2
1-105-665-	Mylar 0.0022 μ F 50WV $\pm 10\%$ C106,206	2	-002-	" 100pF 1KV $\pm 10\%$ C181,281	2
-513-	" 0.01 μ F 50WV $\pm 5\%$ C109,209	2	1-105-679-	Mylar 0.033 μ F 50WV $\pm 10\%$ C180,280	2
-667-	" 0.0033 μ F 50WV $\pm 10\%$ C110,210	2	-661-	" 0.001 μ F 50WV $\pm 10\%$ C189,289	2
-517-	" 0.022 μ F 50WV $\pm 5\%$ C120,220	2	Circuit Breaker Section		
1-113-137-	" 0.04 μ F 50WV $\pm 5\%$ C108,208	2	1-121-126-	Electrolytic 10 μ F 100WV C501	1
-138-	" 0.068 μ F 50WV $\pm 5\%$ C119,219	2	1-109-002-	Mylar 100pF 1KV $\pm 10\%$ C502	1
-136-	" 0.033 μ F 50WV $\pm 5\%$ C121,221	2	Muting Section		
1-105-661-	" 0.001 μ F 50WV $\pm 10\%$ C183-185,283-285	6	1-121-190-	Electrolytic 200 μ F 25WV C504	1
			-261-	" 200 μ F 35WV C506	1
Line Amplifier Section					
1-121-179-	Electrolytic 10 μ F 25WV C129,229,131,231,138, 238,144,244,148,248	10			
-192-	" 10 μ F 15WV C130,230,137,237,143,243	6			
-104-	" 10 μ F 6WV C132,232,133,233,139, 239,140,240	8			
-190-	" 200 μ F 25WV				

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