

INTEGRATED AMPLIFIER

# NA-550

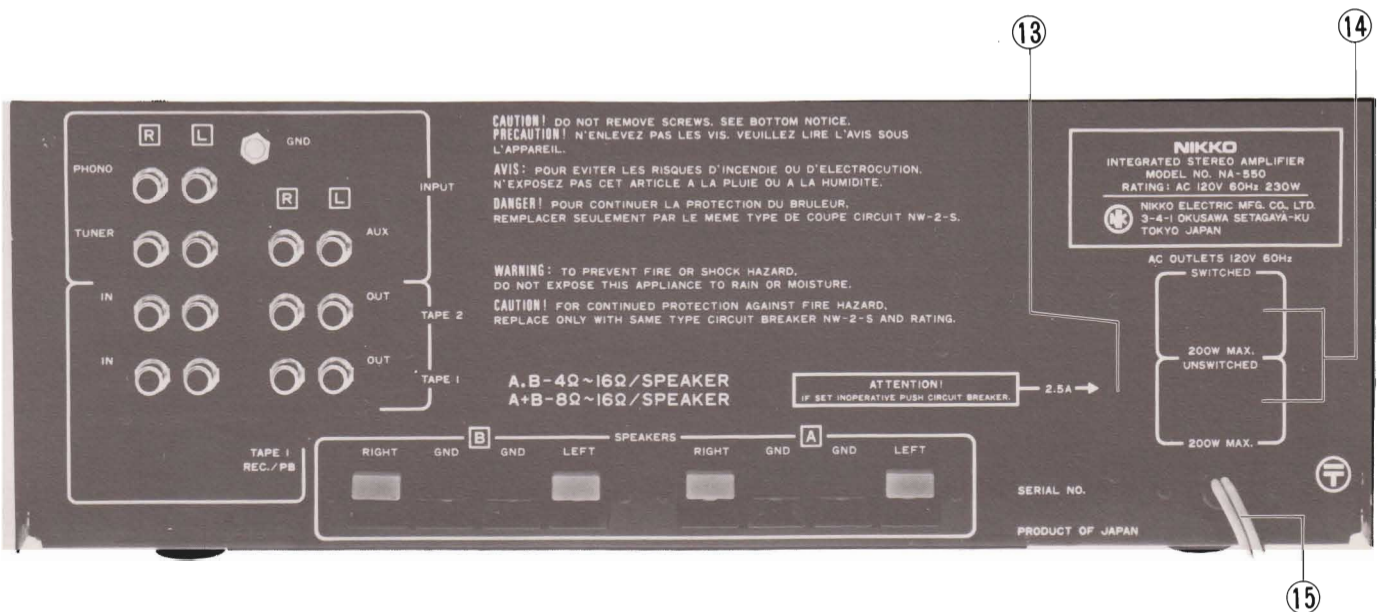
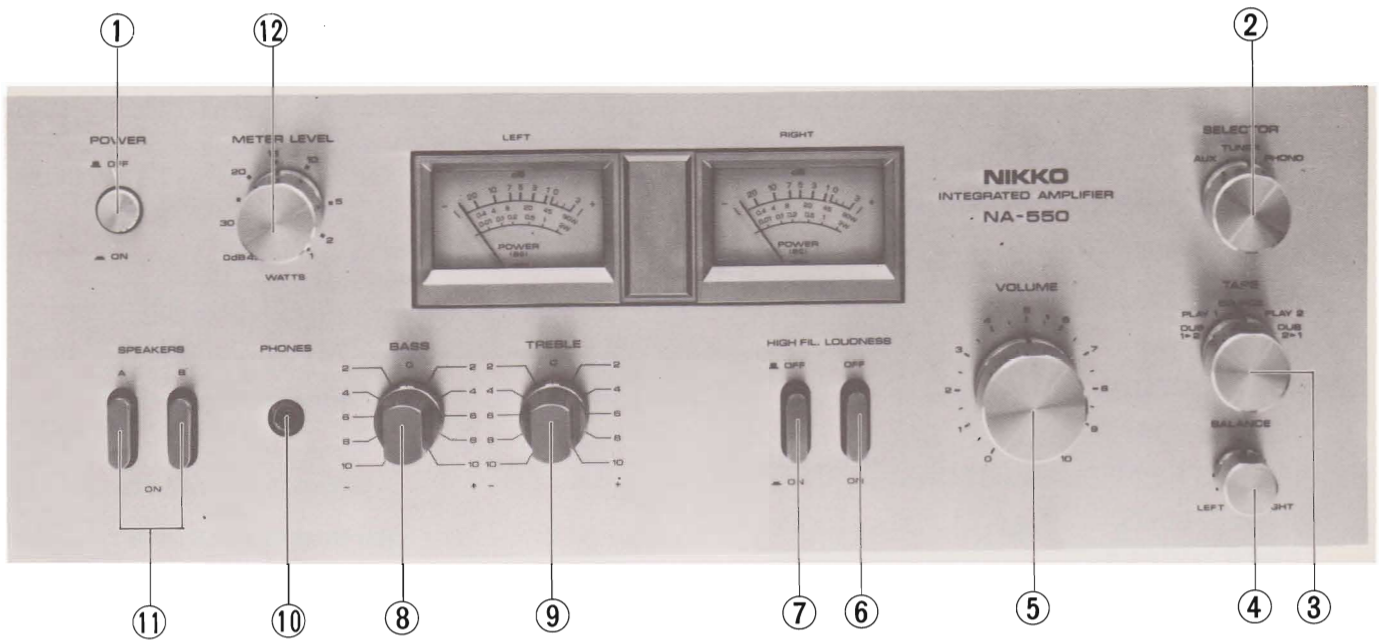


## SERVICE MANUAL

### TYPE AND VOLTAGE

<b>W-TYPE</b> UL and CSA type	120V AC
<b>E-TYPE</b> europe standard (universal) type	100 / 120 / 220 / 240V AC
<b>N-TYPE</b> DEMKO and SEMKO type	220 / 240V AC

# NIKKO



- |                    |                              |
|--------------------|------------------------------|
| 1. POWER SWITCH    | 9. TREBLE CONTROL            |
| 2. SELECTOR SWITCH | 10. HEADPHONES JACK          |
| 3. TAPE SWITCH     | 11. SPEAKERS SELECTOR SWITCH |
| 4. BALANCE CONTROL | 12. METER LEVEL CONTROL      |
| 5. VOLUME CONTROL  | 13. CIRCUIT BREAKER          |
| 6. LOUDNESS SWITCH | 14. AC OUTLETS               |
| 7. HIGH CUT FILTER | 15. AC LINE CORD             |
| 8. BASS CONTROL    |                              |

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# SPECIFICATIONS

	UNIT	NOMINAL	LIMIT
Continuous Power Output per channel, 8 ohm loads:			
20Hz – 20kHz@ 0.08%THD	.watts.	.50	.45
1kHz@ 0.08%THD.	.watts.	.53	.45
TH Distortion, 8 ohm loads, 20Hz –20kHz:			
@Continuous Power Output	.%		< 0.08
@1 watt Power Output.	.%		< 0.04
IM Distortion, 8 ohm loads:			
@Continuous Power Output	.%		< 0.08
@1 watt Power Output.	.%		< 0.04
IHF Power Bandwidth, 8 ohm loads	.Hz – kHz.	.5 – 50.	10 – 30
Damping Factor, 8 ohm loads, @ 1kHz		.60	.40
Frequency Response, 8 ohm loads:			
PHONO → TAPE OUT (RIAA)	.dB@Hz – kHz		< ±1 (@ 30 – 15
AUX, TAPE IN → SP. TER.	.dB@Hz – kHz		< ±2 (@ 10 – 50
Input Sensitivity for 45 watts Power Output, @ 1kHz:			
PHONO	.mV.	.2.2	.2.2±2dB
TUNER, AUX, TAPE IN, DIN CONNECTOR.	.mV.	.150.	150±2dB
Maximum Input before Overload Distortion, @1kHz:			
PHONO@0.1%THD	.mV.	.190.	190±2dB
Output Level for 2.5mV Input, @1kHz:			
PHONO → TAPE OUT	.mV.	.150.	150±2dB
PHONO → DIN CONNECTOR.	.mV.	.30	30±2dB
Hum and Noise (IHF)			
PHONO	.dB	.65	.60
TUNER, AUX, TAPE IN, DIN CONNECTOR.	.dB	.85	.80
Tone Control:			
BASS	.dB@70Hz	±12	±12±2dB
TREBLE	.dB@10kHz.	±10	±10±2dB
Loudness Control (VOLUME: –30dB)			
70Hz.	.dB@70Hz	.+8	+8±2dB
10kHz.	.dB@10kHz.	.+6	+6±2dB
High Cut Filter	.dB@10kHz.	–6	–6±2dB
Idling Current.	.mA	.20	.20 <sup>+20</sup> <sub>–10</sub> mA
Midpoint Voltage	.mV.	.0	.0±50mV
Power Switch Muting Delay Time.	.second.	.5	.5±3 second
Protect Circuit Input Sensitivity.	.DC, V	±3	±2

# DISASSEMBLY

**NOTE:** Three digit numbers circled ( ○ ) in this chapter are represented by a (★) in the parts listing.

## CABINET COVER REMOVAL

Remove seven tapping screws from the top and both sides of the metal cover as shown in photo 1. To reassemble, reverse the procedure.

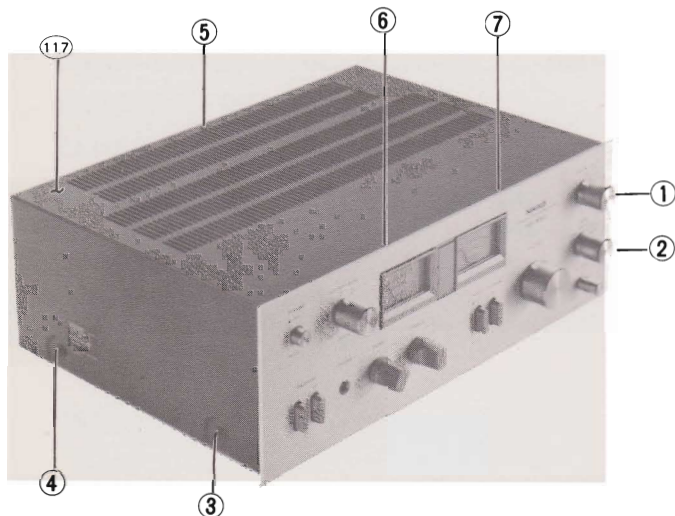


Photo 1

## BOTTOM PLATE REMOVAL

Remove four tapping screws from the bottom of the unit and lift away.

## FRONT PANEL REMOVAL

1. Remove seven knobs (VOLUME, SELECTOR, TAPE, METER LEVEL, BALANCE, BASS and TREBLE) from the front panel.
2. Remove three nuts (1-3) (photo 2) and three tapping screws (1-3) (photo 2) and lift the panel away from the unit.  
—To reassemble, reverse the procedure.

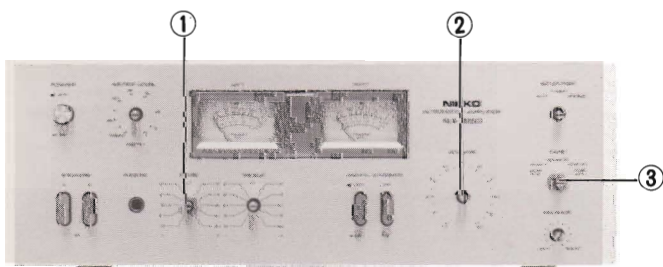


Photo 2

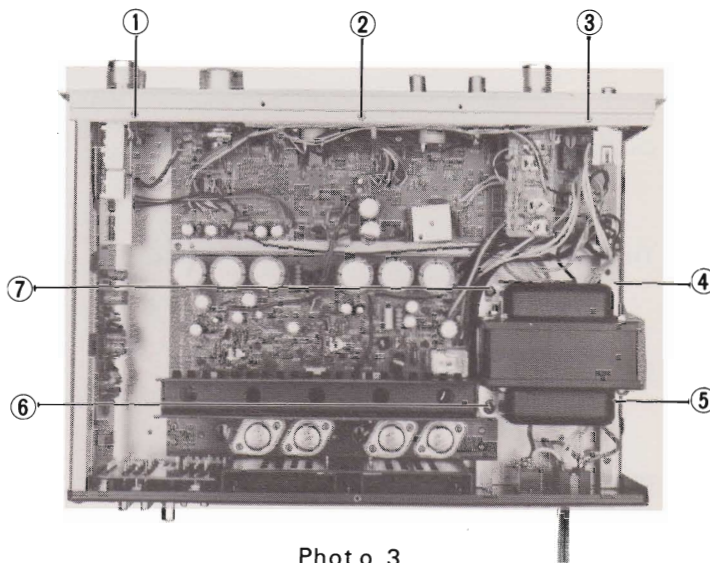


Photo 3

## POWER TRANSFORMER REMOVAL

1. Remove four tapping screws (4-7) (photo 3).
2. Lift Power Transformer up and out of chassis.  
—To reassemble, reverse the procedure.

## METER REMOVAL

1. Two meters are held by a "meter bracket". Remove the two tapping screws (1 and 4) (photo 4) from the bracket.
2. Disconnect all cables connecting to the meters before lifting them out.  
—To reassemble, reverse the procedure.

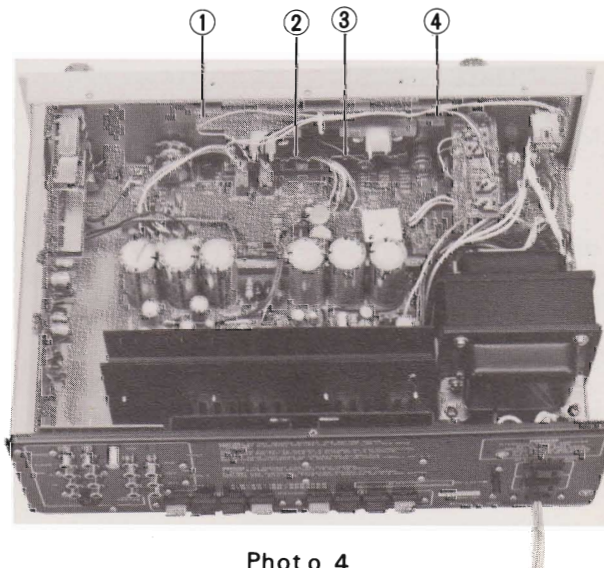


Photo 4

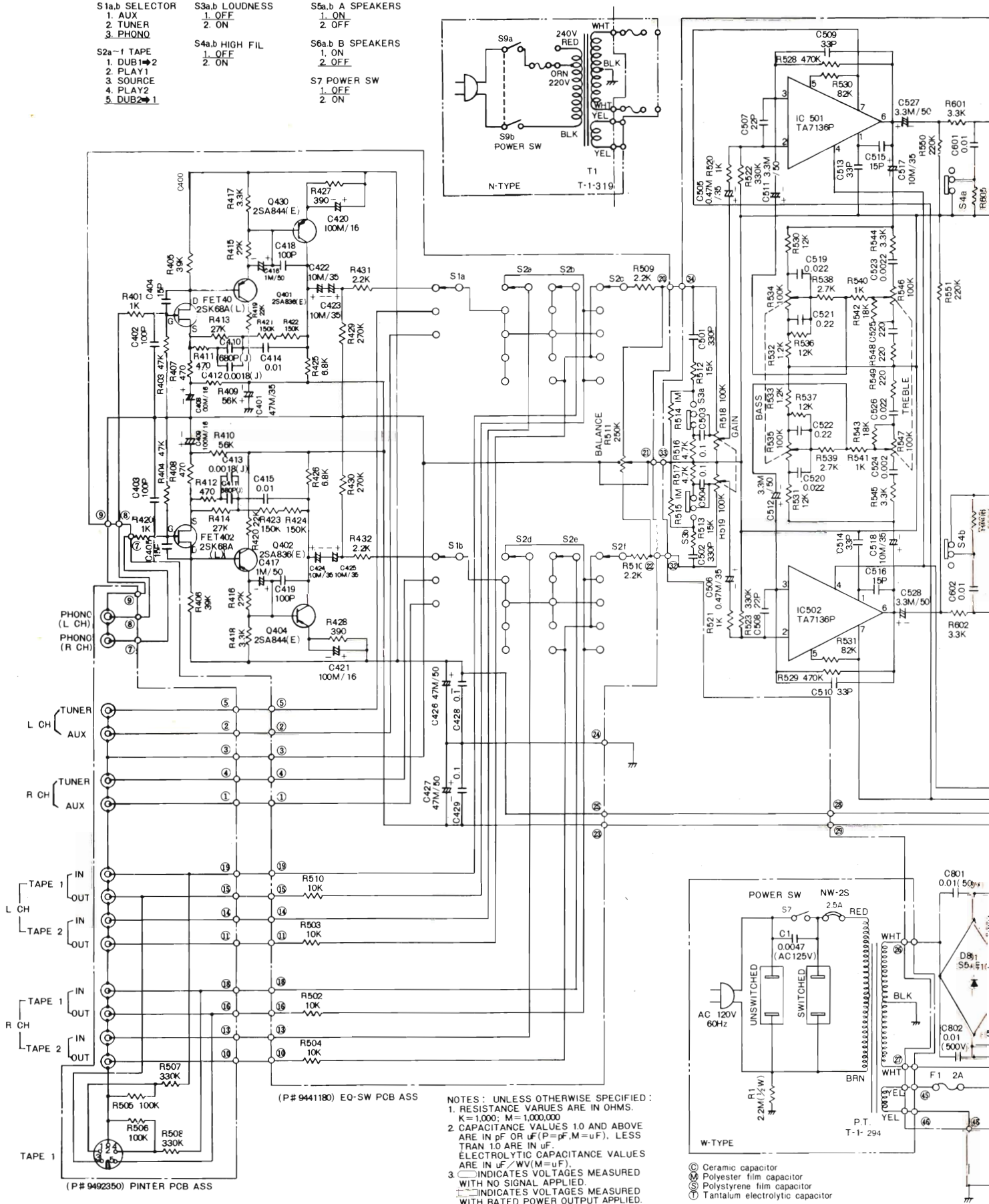
## LAMP REPLACEMENT

1. Remove two tapping screws (2 and 3) (photo 4) and lift the lamp circuit board.
2. Use soldering iron to remove lamps.  
—To reassemble, reverse the procedure.



# SCHEMATIC DIAGRAM

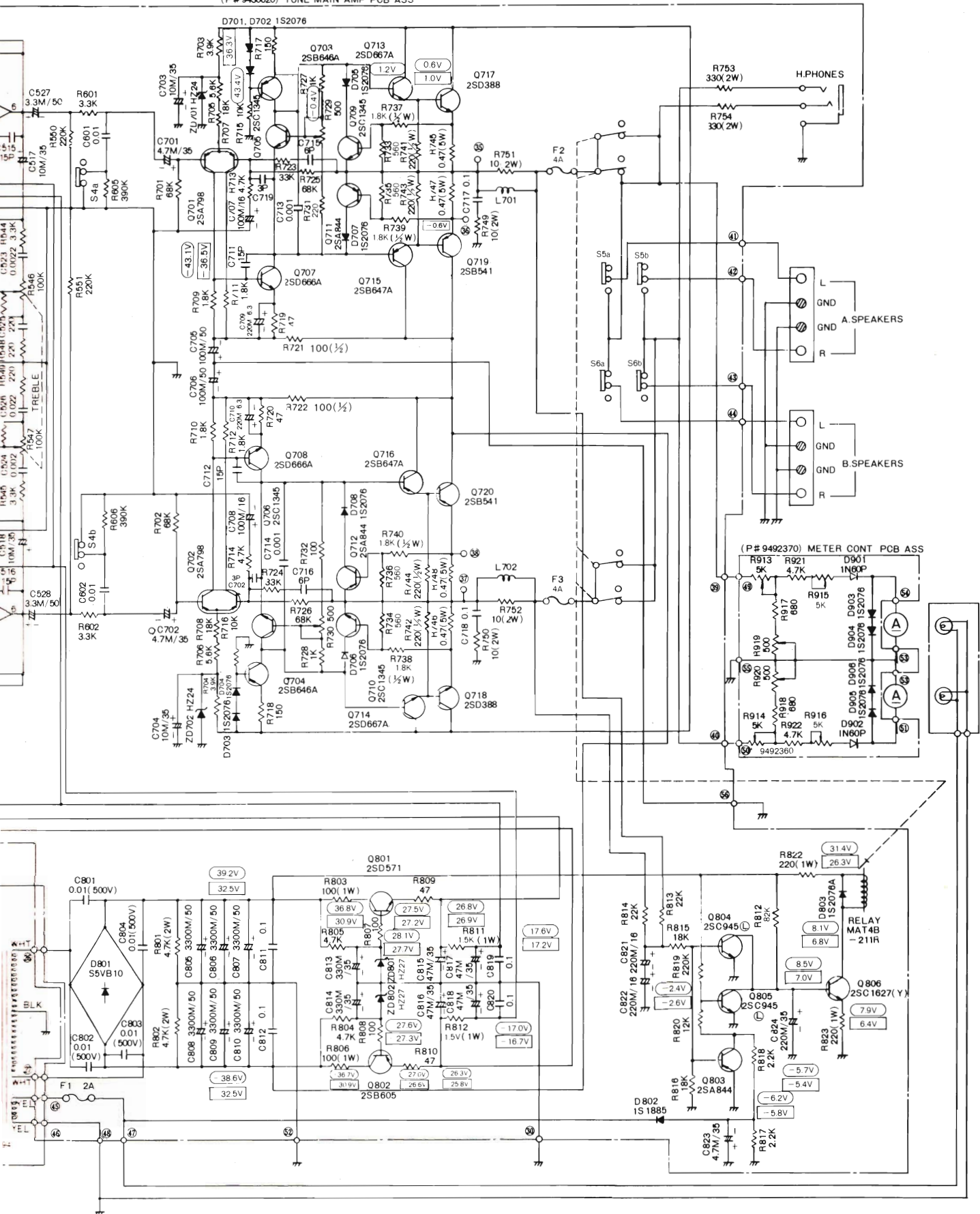
- |                       |                       |                         |
|-----------------------|-----------------------|-------------------------|
| <b>S1a,b SELECTOR</b> | <b>S3a,b LOUDNESS</b> | <b>S5a,b A SPEAKERS</b> |
| 1. AUX                | 1. OFF                | 1. ON                   |
| 2. TUNER              | 2. ON                 | 2. OFF                  |
| 3. PHONO              |                       |                         |
| <b>S2a-1 TAPE</b>     | <b>S4a,b HIGH FIL</b> | <b>S6a,b B SPEAKERS</b> |
| 1. DUB1 → 2           | 1. ON                 | 1. ON                   |
| 2. PLAY 1             | 2. ON                 | 2. OFF                  |
| 3. SOURCE             |                       |                         |
| 4. PLAY 2             |                       |                         |
| 5. DUB2 → 1           |                       |                         |
|                       |                       | <b>S7 POWER SW</b>      |
|                       |                       | 1. OFF                  |
|                       |                       | 2. ON                   |



NOTES: UNLESS OTHERWISE SPECIFIED:  
 1. RESISTANCE VALUES ARE IN OHMS.  
 K=1,000; M=1,000,000  
 2. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pF OR uF (P=uF, M=uF), LESS THAN 1.0 ARE IN uF.  
 ELECTROLYTIC CAPACITANCE VALUES ARE IN uF/WV (M=uF).  
 3. ○ INDICATES VOLTAGES MEASURED WITH NO SIGNAL APPLIED.  
 ⊗ INDICATES VOLTAGES MEASURED WITH RATED POWER OUTPUT APPLIED.

- ⊗ Ceramic capacitor
- ⊗ Polyester film capacitor
- ⊗ Polystyrene film capacitor
- ⊗ Tantalum electrolytic capacitor

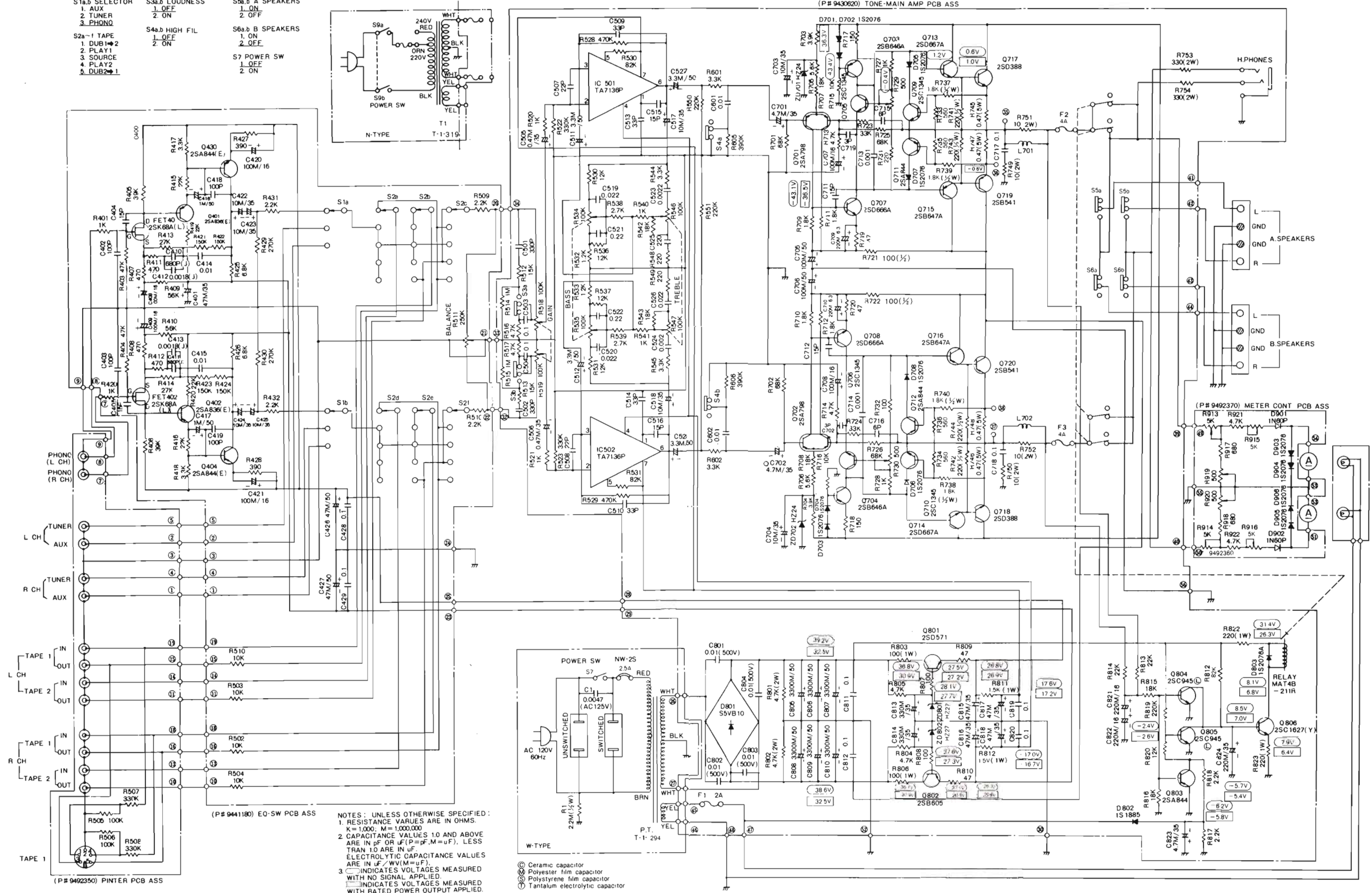
(P# 9430620) TONE-MAIN AMP PCB ASS



# SCHEMATIC DIAGRAM

- S1a,b SELECTOR  
 1. AUX  
 2. TUNER  
 3. PHONO
- S2a-1 TAPE  
 1. DUB1→2  
 2. PLAY1  
 3. SOURCE  
 4. PLAY2  
 5. DUB2→1
- S3a,b LOUDNESS  
 1. OFF  
 2. ON
- S4a,b HIGH FIL  
 1. OFF  
 2. ON
- S5a,b A SPEAKERS  
 1. ON  
 2. OFF
- S6a,b B SPEAKERS  
 1. ON  
 2. OFF
- S7 POWER SW  
 1. OFF  
 2. ON

(P# 9430620) TONE-MAIN AMP PCB ASS



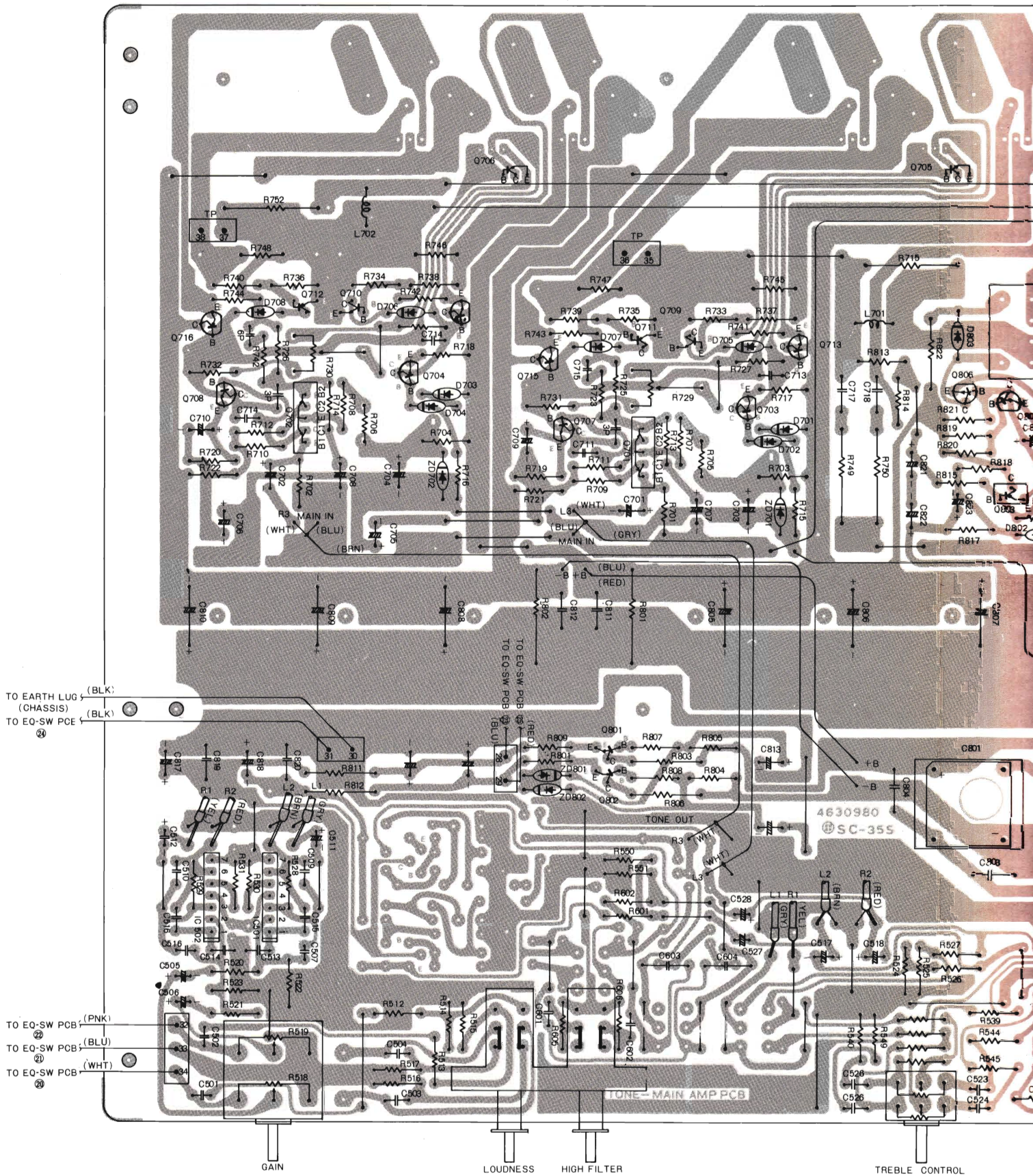
NOTES: UNLESS OTHERWISE SPECIFIED:  
 1. RESISTANCE VALUES ARE IN OHMS.  
 K=1,000; M=1,000,000  
 2. CAPACITANCE VALUES 1.0 AND ABOVE  
 ARE IN pF OR uF (P=pF, M=uF). LESS  
 THAN 1.0 ARE IN uF.  
 ELECTROLYTIC CAPACITANCE VALUES  
 ARE IN uF/WV(M=uF).  
 3. ( ) INDICATES VOLTAGES MEASURED  
 WITH NO SIGNAL APPLIED.  
 ( ) INDICATES VOLTAGES MEASURED  
 WITH RATED POWER OUTPUT APPLIED.

- (C) Ceramic capacitor
- (P) Polyester film capacitor
- (S) Polystyrene film capacitor
- (T) Tantalum electrolytic capacitor

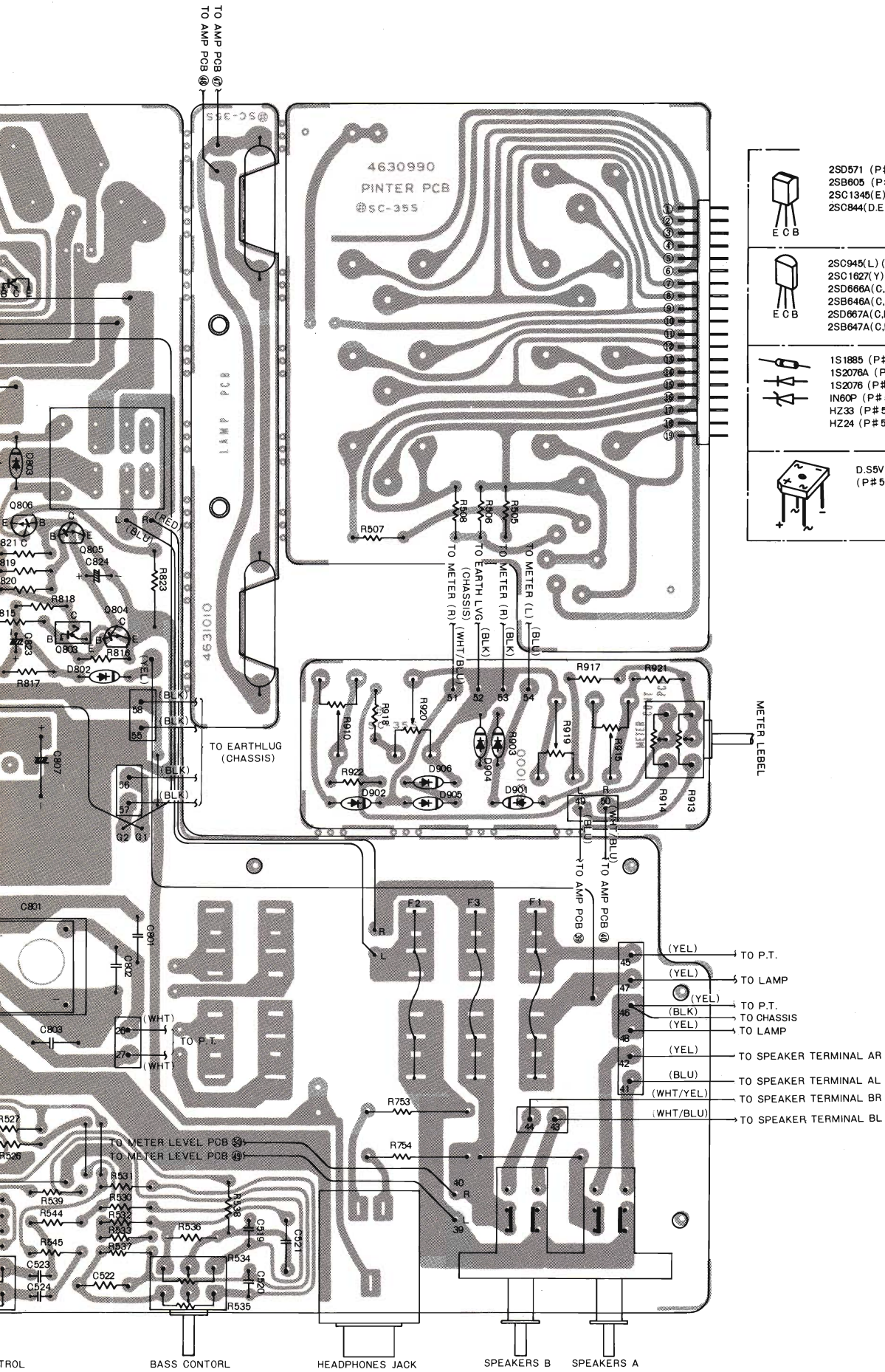


# CIRCUIT BOARDS (BOTTOM VIEW)

TONE/MAIN-LAMP-PIN TERMINAL CIRCUIT BOARDS





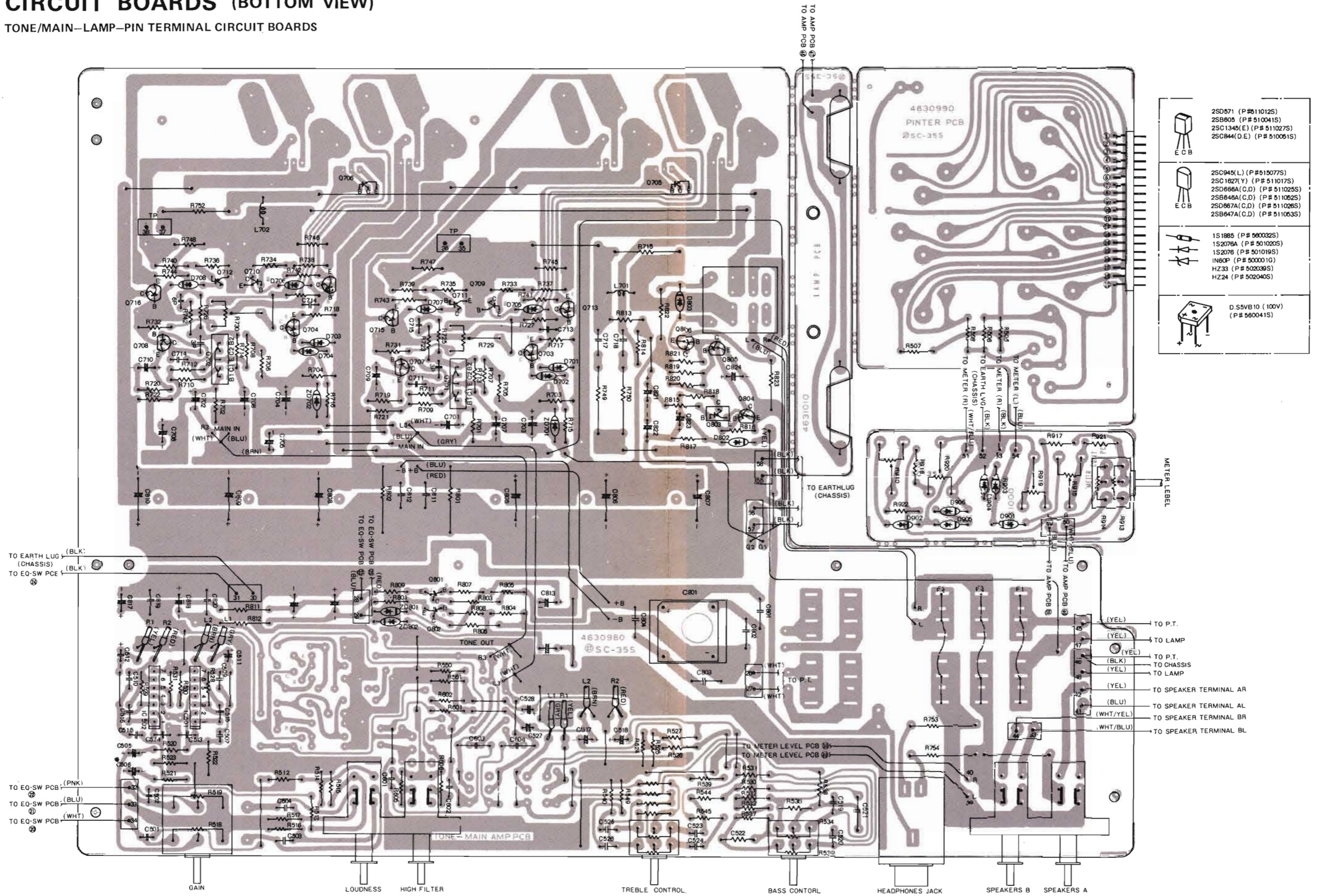


	2SD571 (P#511012S) 2SB605 (P# 510041S) 2SC1345(E) (P# 511027S) 2SC844(D,E) (P# 510051S)
	2SC945(L) (P#515077S) 2SC1627(Y) (P# 511017S) 2SD666A(C,D) (P# 511025S) 2SB646A(C,D) (P# 511062S) 2SD667A(C,D) (P# 511026S) 2SB647A(C,D) (P# 511053S)
	1S1885 (P# 560032S) 1S2076A (P# 501020S) 1S2076 (P# 501019S) IN60P (P# 500001G) HZ33 (P# 502039S) HZ24 (P# 502040S)
	D.S5VB10 (100V) (P# 560041S)



# CIRCUIT BOARDS (BOTTOM VIEW)

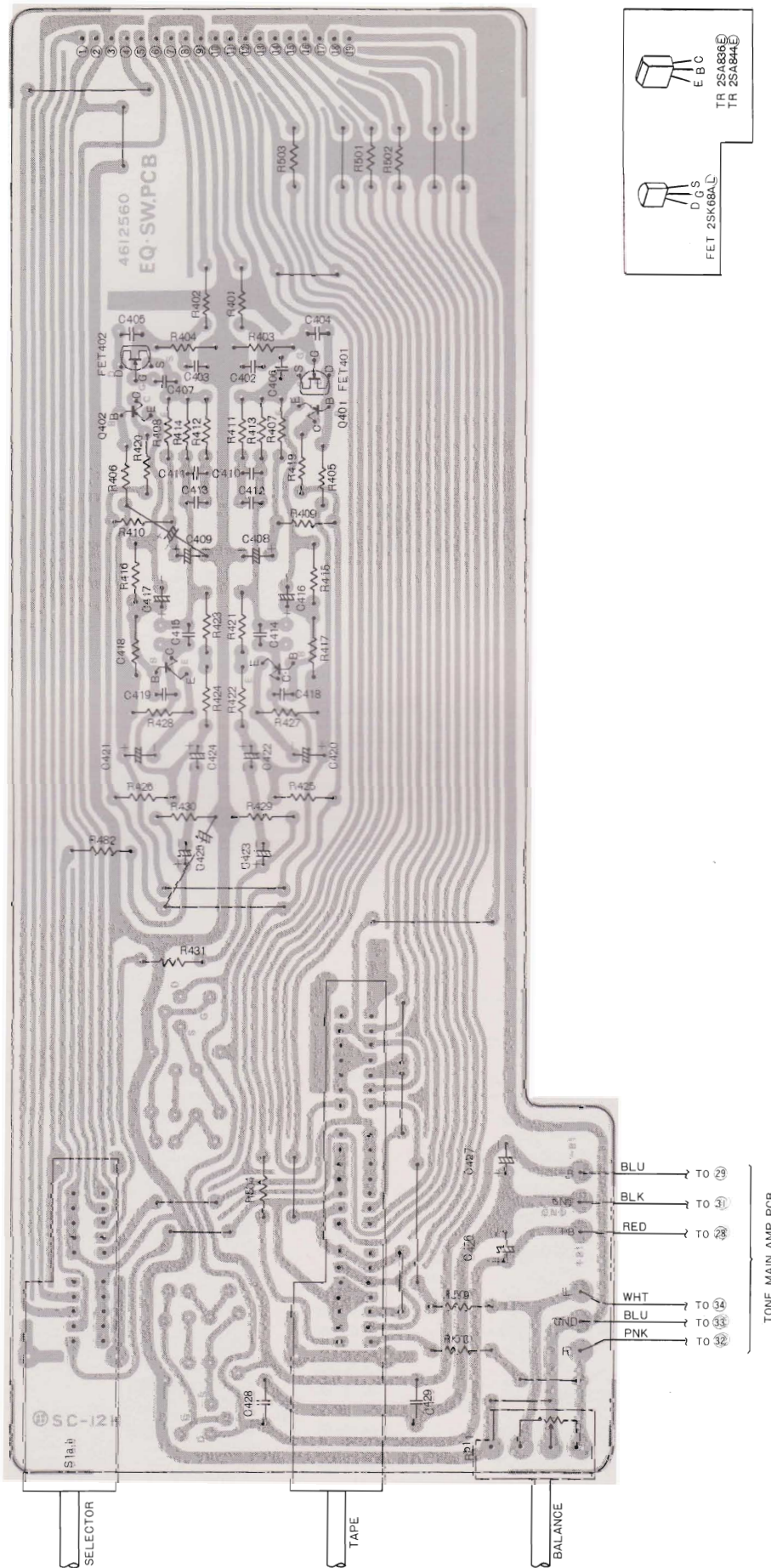
TONE/MAIN-LAMP-PIN TERMINAL CIRCUIT BOARDS



- |  |   |
|--|---|
|  | 25D571 (P#511012S)<br>25B805 (P#510041S)<br>25C1345(E) (P#511027S)<br>25C844(D,E) (P#510061S)   |
|  | 25C945(L) (P#515077S)<br>25C1627(Y) (P#511017S)<br>25D666A(C,D) (P#511025S)<br>25B646A(C,D) (P#511026S)<br>25D667A(C,D) (P#511026S)<br>25B647A(C,D) (P#511026S) |
|  | 1S1885 (P#560032S)<br>1S2076A (P#501020S)<br>1S2076 (P#501019S)<br>IN60P (P#500001G)<br>HZ33 (P#502039S)<br>HZ24 (P#502040S)                                    |
|  | D.S5VB10 (100V)<br>(P#560041S)  |



# EQUALIZATION/SWITCH CIRCUIT BOARD





# PARTS LOCATION

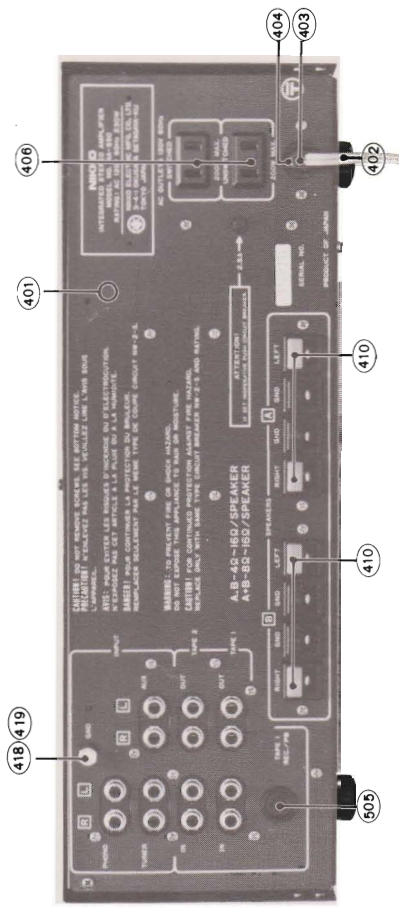


Photo 7

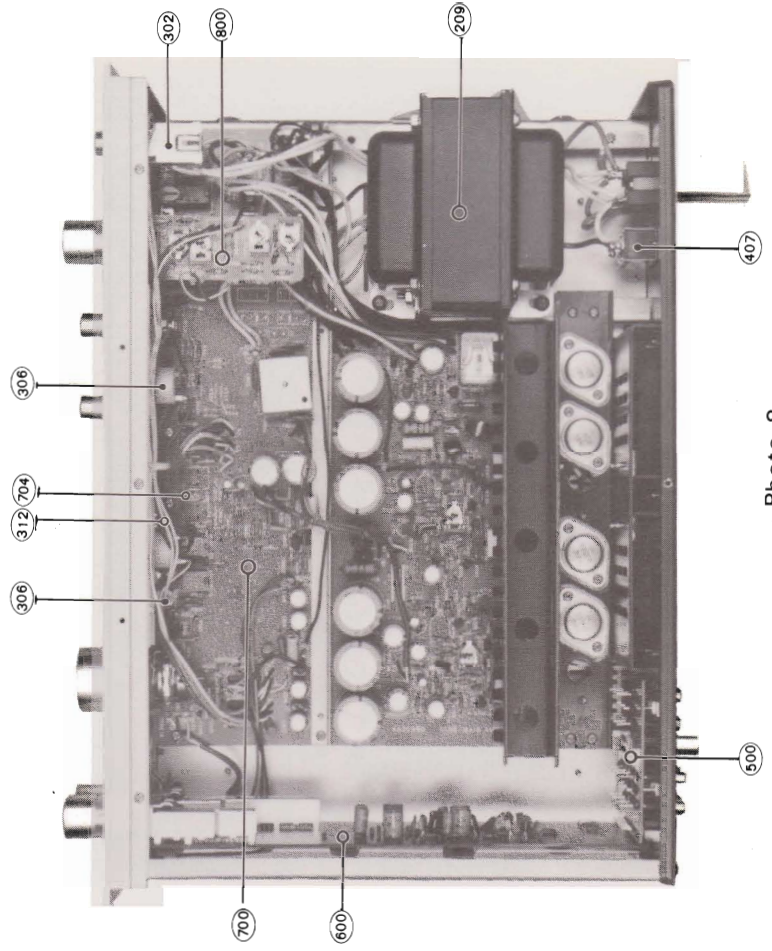


Photo 8

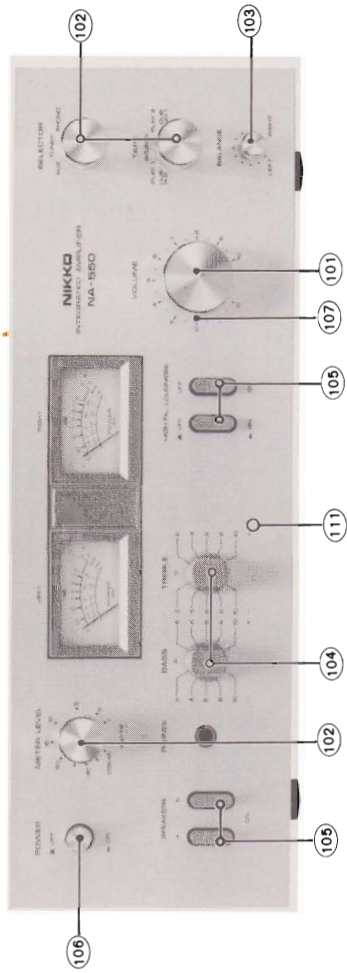


Photo 5

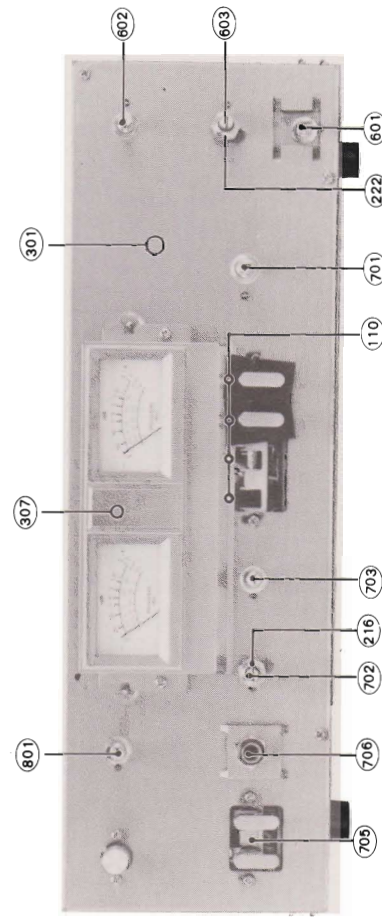


Photo 6

# PARTS LIST

## NOTES

- ★ The KEY NUMBER (#) marked with a (★) on parts list relate to numbers of three digits with a (○). (photo 1-8).
- + Numbers in file indicate the quantity of parts used in one type.
- ++ TR: Transistor  
FET: Field effect transistor  
IC: Integrated circuit  
VR: Volume control (Variable resistor)  
RES: Carbon film fixed resistor  
MO-RES: Metal oxide film fixed resistor  
CEM-RES: Cemented wire-wound fixed resistor  
FP: Flame proof  
C-CAP: Ceramic capacitor  
E-CAP: Aluminium electrolytic capacitor  
M-CAP: Polyester film capacitor

S-CAP: Polystyrene film capacitor  
T-CAP: Tantalum electrolytic capacitor  
BP-CAP: Bipolar electrolytic capacitor

E-CAP, T-CAP and BP-CAP values (1x10uF) are in (1)uF, (10)V.

- Assemblies and parts are subject to change without notice.
- Parts ordering procedure:  
Include in any order  
a. part number.  
b. Part description.  
c. Model number.  
(any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.	KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.
<b>PACKING MATERIALS &amp; ACCESSORIES</b>					<b>CHASSIS ASSEMBLY</b>				
001		1 1 1	CARTON BOX	9825230	201		1 1 1	CHASSIS (L)	7324540
003		2 2 2	STYROL PAD	9840640	202		1	EARTH LUG	4400000
003		1 1 1	POLY SACK—vinyl cloth back	9640550	203		1	TW(I) 3 φ—washer	893403U
004		1 1 1	POLY SACK #13—vinyl cloth back	9640320	204		1	PTS 3 φ x 6—screw	814306S
005a		1 — —	INSTRUCTION MANUAL E	960197E	205	R1	1	RES 2.2mohm 10% 1/2W	315225K
005b			INSTRUCTION MANUAL F	960212F	206		1	EARTH LUG 4P WP	4400100
005c		— 1 1	INSTRUCTION MANUAL K	960190K	207		1	PTS 3 φ x 6—screw	814306S
006		1 — —	WARRANTY CARD (N)	967003A	208		1 1 1	WIRE CLIP 43	7401340
007		1 1 1	POLISHING CLOTH	9690040	★209a		1 — —	POWER TRANSFORMER T-1-294 120V	1102940
008		1 1 1	SILICA GEL—dryer	9690010	209b		— —	POWER TRANSFORMER T-1-317 100/120/220/240V	1103170
<b>CABINET ASSEMBLY</b>					209c		— 1	POWER TRANSFORMER T-1-319 220/240V	1103190
★101		1 1 1	KNOB R15GL-33D (volume)	7851600	210		4 4 4	BLTS 4 φ x 8—screw	874408S
★102		3 3 3	KNOB R15GL-22D (selector, tape, meter level)	7851610	211		1 1 1	CHASSIS (R)	7324550
★103		1 1 1	KNOB R15GL-12D (balance)	7851620	212		6 6 6	PTS 3 φ x 6—screw (FRONT PLATE ASSEMBLY)	814306S
★104		2 2 2	KNOB 8GL-20LVD (bass, treble)	7851650	(700)		4 4 4	PMS 3 φ x 5—screw (TONE/MAIN AMP PCB ASS)	810305S
★105		6 6 6	PUSHBUTTON ABS (speakers, loudness, high filter) (subsonic, tone)	7851560	213		6 6 6	PTS 3 φ x 8—screw	814308S
★106		1 1 1	PUSHBUTTON M12-GL 3.3SQ (power)	7850620	214		1 1 1	W 3 φ—washer	893203D
★110		2 2 2	DUST COVER (S)	7001880	215		1 1 1	SPCR 765—spacer	7152210
★111		1 1 1	PNL NA—550—front panel	7883590	★216		1 1 1	PCB ANGLE	7226060
112	↑	2 2 2	PUSHBUTTON GUIDE (2)	7401210	217		6 6 6	PTS 3 φ x 8—screw (BACK PLATE ASSEMBLY)	814308S
113	↑	1 1 1	PUSHBUTTON GUIDE 12B	7400630	218		2 2 2	PTS 3 φ x 8—screw	814308S
114	↑	3 3 3	PTS 3 φ x 8—screw	814308S	219		6 6 6	BLTS 3 φ x 8—screw	874308S
115	↑	2 2 2	SN 9 φ—nut	892249S	220		4 4 4	PTS 3 φ x 10—screw	814310S
116	↑	2 2 2	W 9 φ—washer	893109S	221		6 6 6	PTS 3 φ x 8—screw (EQ/SW PCB ASS)	7152210
★117		1 1 1	METAL COVER	7820770	(600)		1 1 1	SPCR 765—spacer	7226050
★118	↑	3 3 3	PTS 3 φ x 8 BLK—screw	814308Q	★222		1 1 1	ANGLE	7226050
★119	↑	4 4 4	TFTS 4 φ x 10 BLK—screw	887410W	223		2 2 2	PTS 3 φ x 8—screw	814308S
★120	↑	4 4 4	W 5 φ BLK—screw	893105W	224				
★121		1 1 1	BTM PLT—bottom plate	7324530	<b>FRONT PLATE ASSEMBLY</b>				
★122	↑	4 4 4	PTS 3 φ x 6—screw	814306S	★301		1 1 1	FRONT PLATE (METER CONTROL PCB ASS)	7324560
123		4 4 4	POLY FOOT 23 φ x 12—foot	7401080	(800)				
124	↑	4 4 4	PTS 3 φ x 12—screw	814312S	★302a	S9	1 1 —	PUSHBUTTON SWITCH SDG 1P (power)	4040820

PART ORDERING PROCEDURE ..... Include in any order: A. Part number, B. Part description, C. Model number.  
 (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.	KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.
302b	S9	-- 1	PUSHBUTTON SWITCH SDG- (power)	4040830					
303	↑	2 2 2	PMS 3 φ x 5—screw	810305S					
304a	C1	1 --	C—CAP 0.0047uF AC120V	239472C					
304b	C1	-- 2	C—CAP 0.0047uF AC250V	239472E					
305	↑	-- 2	C—CAP COVER (IM) 23 φ	7400980					
★306		2 2 2	METER	4582100					
★307		1 1 1	METER GUIDE	7401280					
308	↑	2 2 2	PTS 3 φ x 8—screw	814308S					
309		1 1 1	METER BRACKET	7226230					
310	↑	2 2 2	PTS 3 φ x 8—screw	814308S					
311		1 1 1	WIRE CLIP 43	7401340					
★312		1 1 1	LAMP PCB	4631010					
313		2 2 2	LAMP PL-8 8V 0.25A	5808130					
314		2 2 2	PTS 3 φ x 8—screw	814308S					
315		1 1 1	SN 12 φ (headphone)—nut	7121080					
<b>BACK PLATE ASSEMBLY</b>					<b>EQUALIZER/SWITCH CIRCUIT BOARD</b>				
★401a		1 --	BACK PLATE W	708193C	★600	1 1 1	EQ/SW PCB ASS—complete circuit board		9441180
401b		-- 1	BACK PLATE E.N	7081920					
★402a		1 --	POWER SUPPLY CORD KP-2	606002J					
402b		-- 1 1	POWER SUPPLY CORD CEE-2T	600506J					
402c		--	POWER SUPPLY CORD CEE-3T	601809A					
★403a		1 --	CORD STOPPER SR-3P-4	7400620					
403b		-- 1 1	CORD STOPPER SR-4N-4	7400690					
403c		--	CORD STOPPER SR-6W-1	7400740					
★404a		1 --	CORD BRACKET (UL)	7029350					
404b		-- 1 1	CORD BRACKET (EH)	7029800					
405	↑	2 2 2	PTS 3 φ x 8—screw	814308S					
★406		2 2 2	AC SKT—AC outlet	4500160					
★407		1 1	NW-2S 2.50A—circuit breaker	4900680					
408		1 1	BREAKER BRACKET 1P	7026050					
409		2 2	PTS 3 φ x 8—screw	814308S					
★410		2 2 2	4P PUSH TERMINAL	4460480					
411		4 4 4	PTS 3 φ x 10—screw	814310S					
412		--	VOLTAGE CHANGE SOCKET COVER	7400990					
413		--	VOLTAGE CHANGE SOCKET	4530490					
414		--	VOLTAGE CHANGE PLUG	4530480					
415		--	PMS 3 φ x 10—screw	810310S					
416		--	IN 3 φ—nut	892013S					
417		--	TW(I) 3 φ—washer	893403U					
★418		1 1 1	GROUND TERMINAL SHAFT MK-3	7152050					
★419		1 1 1	GROUND TERMINAL NUT MK-2	7152060					
420		1 1 1	W 3 φ—washer	893203D					
421		1 1 1	IN 3 φ—nut	892013S					
422		1 1 1	TW(I) 3 φ—washer	893403U					
(500)			(PIN TER PCB ASS)						
423		7 7 7	PTS 3 φ x 10—screw	814310S					
<b>PIN TERMINAL CIRCUIT BOARD</b>					<b>FET</b>				
500		1 1 1	PIN TER PCB ASS—complete circuit board	9492340	FET401	1 1 1	FET 2SK68A (L)		516023S
501		1 1 1	PIN TER PCB	4630990	FET402	1 1 1	FET 25K68A (L)		516023S
502		1 1 1	CB PIN TERMINAL 2P x 3	4446010	Q401	1 1 1	TR 2SA836 (E)		510050S
503		1 1 1	CB PIN TERMINAL 2P x 2	4444040	Q402	1 1 1	TR 2SA836 (E)		510050S
504		1 1 1	CB PIN TERMINAL 2P x 2D	4444050	Q403	1 1 1	TR 2SA844 (D,E)		510051S
★505		1 1 1	CONNECTOR 19PL	4582050	Q404	1 1	TR 2SA844 (D,E)		510051S
R505		1 1 1	RES 100kohm 5% 1/4W	328104J	R401	1 1 1	RES 1kohm 5% 1/4W		328102J
R506		1 1 1	RES 100kohm 5% 1/4W	328104J	R402	1 1 1	RES 1kohm 5% 1/4W		328102J
R507		1 1 1	RES 330kohm 5% 1/4W	328334J	R403	1 1 1	RES 47kohm 5% 1/4W		328473J
R508		1 1 1	RES 330kohm 5% 1/4W	328334J	R404	1 1 1	RES 47kohm 5% 1/4W		328473J
					R405	1 1 1	RES 39kohm 5% 1/4W		328393J
					R406	1 1 1	RES 39kohm 5% 1/4W		328393J
					R407	1 1 1	RES 470ohm 5% 1/4W		328471J
					R408	1 1 1	RES 470ohm 5% 1/4W		328471J
					R411	1 1 1	RES 470ohm 5% 1/4W		328471J
					R412	1 1 1	RES 470ohm 5% 1/4W		328471J
					R413	1 1 1	RES 27kohm 5% 1/4W		328273J
					R414	1 1 1	RES 27kohm 5% 1/4W		328273J
					R415	1 1 1	RES 22kohm 5% 1/4W		328223J
					R416	1 1 1	RES 22kohm 5% 1/4W		328223J
					R417	1 1 1	RES 3.3kohm 5% 1/4W		328332J
					R418	1 1 1	RES 3.3kohm 5% 1/4W		328332J
					R419	1 1 1	RES 22kohm 5% 1/4W		328223J
					R420	1 1 1	RES 22kohm 5% 1/4W		328223J
					R421	1 1 1	RES 150kohm 5% 1/4W		328154J
					R422	1 1 1	RES 150kohm 5% 1/4W		328154J
					R423	1 1 1	RES 150kohm 5% 1/4W		328154J



PART ORDERING PROCEDURE ----- Include in any order: A. Part number, B. Part description, C. Model number.  
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.	KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.
	R424	1 1 1	RES 150kohm 5% 1/4W	328154J		IC501	1 1 1	IC TA3176P	518045S
	R425	1 1 1	RES 6.8kohm 5% 1/4W	328682J		IC502	1 1 1	IC TA3176P	518045S
	R426	1 1 1	RES 6.8kohm 5% 1/4W	328682J					
	R427	1 1 1	RES 390ohm 5% 1/4W	328391J		R512	1 1 1	RES 15kohm 5% 1/4W	328153J
	R428	1 1 1	RES 390ohm 5% 1/4W	328391J		R513	1 1 1	RES 15kohm 5% 1/4W	328153J
	R429	1 1 1	RES 270ohm 5% 1/4W	328274J		R514	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R430	1 1 1	RES 270kohm 5% 1/4W	328274J		R515	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R431	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R516	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R432	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R517	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R501	1 1 1	RES 10kohm 5% 1/4W	328103J	★701	R518,			
	R502	1 1 1	RES 10kohm 5% 1/4W	328103J		R519	1 1 1	VR, V24L5G5PHN25KC15AL, 100kohm X2(41PC) (volume)	4320650
	R503	1 1 1	RES 10kohm 5% 1/4W	328103J		R520	1 1 1	RES 1kohm 5% 1/4W	328102J
	R504	1 1 1	RES 10kohm 5% 1/4W	328103J		R521	1 1 1	RES 1kohm 5% 1/4W	328102J
	R509	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R522	1 1 1	RES 330kohm 5% 1/4W	328334J
	R510	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R523	1 1 1	RES 330kohm 5% 1/4W	328334J
★601	R511	1 1 1	VR V16L4(PH)N30KC5BM250K (C,C) 250kohm (balance)	4310510		R528	1 1 1	RES 470kohm 5% 1/4W	328474J
						R529	1 1 1	RES 470kohm 5% 1/4W	328474J
★602	Si	1 1 1	ROTARY SLIDE SWITCH (selector)	4055120		R530	1 1 1	RES 12kohm 5% 1/4W	328123J
★603	S2	1 1 1	ROTARY SLIDE SWITCH SRZ-V065N (tape)	4055060		R530	1 1 1	RES 82kohm 5% 1/4W	328823J
						R530	1 1 1	RES 12kohm 5% 1/4W	328123J
						R531	1 1 1	RES 82kohm 5% 1/4W	328823J
						R532	1 1 1	RES 1.2kohm 5% 1/4W	328122J
						R533	1 1 1	RES 1.2kohm 5% 1/4W	328122J
					★702	R534,			
						R535	1 1 1	VR, V16L4G3PHN25KC26Z, 100kohmX2(11PC) (bass)	4320660
700a		1 1 -	TONE/MAIN AMP PCB ASS W,E —complete circuit board	9430600		R536	1 1 1	RES 12kohm 5% 1/4W	328123J
700b		- - 1	TONE/MAIN AMP PCB ASS N			R537	1 1 1	RES 12kohm 5% 1/4W	328123J
						R538	1 1 1	RES 2.7kohm 5% 1/4W	328272J
						R539	1 1 1	RES 2.7kohm 5% 1/4W	328272J
						R540	1 1 1	RES 1kohm 5% 1/4W	328102J
						R541	1 1 1	RES 1kohm 5% 1/4W	328102J
						R542	1 1 1	RES 18kohm 5% 1/4W	328183J
						R543	1 1 1	RES 18kohm 5% 1/4W	328183J
						R544	1 1 1	RES 3.3kohm 5% 1/4W	328332J
						R545	1 1 1	RES 3.3kohm 5% 1/4W	328332J
					★703	R546,			
						R547	1 1 1	VR, V16L4G3PHN25KC26Z, 100kohmX2(11PC) (treble)	4320660
	C501	1 1 1	S-CAP 330pF 10% 50V	223331W		R548	1 1 1	RES 220ohm 5% 1/4W	328221J
	C502	1 1 1	S-CAP 330pF 10% 50V	223331W		R549	1 1 1	RES 220ohm 5% 1/4W	328221J
	C503	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R550	1 1 1	RES 220kohm 5% 1/4W	328224J
	C504	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R551	1 1 1	RES 220kohm 5% 1/4W	328224J
	C505	1 1 1	T-CAP 35D0.47uF	252405M					
	C506	1 1 1	T-CAP 35D0.47uF	252405M					
	C507	1 1 1	C-CAP 22pF 10% 50V SL	232220K					
	C508	1 1 1	C-CAP 22pF 10% 50V SL	232220K					
	C509	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C510	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C511	1 1 1	E-CAP 50R3.3uF LC	211513L		R601	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	C512	1 1 1	E-CAP 50R3.3uF LC	211513L		R602	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	C513	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C514	1 1 1	C-CAP 33pF 10% 50V SL	232330K		R605	1 1 1	RES 390kohm 5% 1/4W	328394J
	C515	1 1 1	C-CAP 15pF 10% 50V SL	232150K		R606	1 1 1	RES 390kohm 5% 1/4W	328394J
	C516	1 1 1	C-CAP 15pF 10% 50V SL	232150K					
	C517	1 1 1	E-CAP 35R10uF LC	211420L	★704	S3 S4	1 1 1	TWIN PUSH SW SUE-23 (loudness, high-fil)—double pushbutton switch	4040950
	C518	1 1 1	E-CAP 35R10uF LC	211420L					
	C519	1 1 1	M-CAP 0.022uF 10% 50V	222223K	★705	S7,S8	1 1 1	TWIN PUSH SW (A speakers, B speakers)—double pushbutton switch	4040930
	C520	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C521	1 1 1	M-CAP 0.22uF 10% 50V	222224K					
	C522	1 1 1	M-CAP 0.22uF 10% 50V	222224K					
	C523	1 1 1	M-CAP 0.0022uF 10% 50V	222222K					
	C524	1 1 1	M-CAP 0.0022uF 10% 50V	222222K					
	C525	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C526	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C527	1 1 1	E-CAP 50R3.3uF LC	211513L					
	C528	1 1 1	E-CAP 50R3.3uF LC	211513L					
	C601	1 1 1	M-CAP 0.01uF 10% 50V	222103K		C701	1 1 1	E-CAP 35R4.7uF LC	211415L
	C602	1 1 1	M-CAP 0.01uF 10% 50V	222103K		C702	1 1 1	E-CAP 35R4.7uF LC	211415L
						C703	1 1 1	E-CAP 35R10uF	211420Q
						C704	1 1 1	E-CAP 35R10uF	211420Q
						C705	1 1 1	E-CAP 50R100uF	211530Q

(POWER AMP SECTION)





PART ORDERING PROCEDURE ..... Include in any order: A. Part number, B. Part description, C. Model number.  
 (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.	KEY NO.	SYMBOL NO.	TYPE <sup>+</sup> W-type-u E-type-u N-type-d	DESCRIPTION <sup>++</sup>	PART NO.
	C807		E-CAP 50L3300uF	212543P		D803	1 1 1	DIODE 1S2076A	501020S
	C808		E-CAP 50L3300uF	212543P		Q803	1 1 1	TR 2SA844 (D,E)	510051S
	C809		E-CAP 50L3300uF	212543P		Q804	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	C810		E-CAP 50L3300uF	212543P		Q805	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	C811		M-CAP 0.1uF 10% 50V	222104K		Q806	1 1 1	TR 2SC1627 (O,Y)	511017S
	C812		M-CAP 0.1uF 10% 50V	222104K					
	C813		E-CAP 35R330uF	211433Q		R813	1 1 1	RES 22kohm 5% 1/4W	328223J
	C814		E-CAP 35R330uF	211433Q		R814	1 1 1	RES 22kohm 5% 1/4W	328223J
	C815		E-CAP 35R47uF	211425Q		R815	1 1 1	RES 18kohm 5% 1/4W	328183J
	C816		E-CAP 35R47uF	211425Q		R816	1 1 1	RES 18kohm 5% 1/4W	328183J
	C817		E-CAP 35R47uF	211425Q		R817	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	C818		E-CAP 35R47uF	211425Q		R818	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	C819		M-CAP 0.1uF 10% 50V	222104K		R819	1 1 1	RES 220kohm 5% 1/4W	328224J
	C820		M-CAP 0.1uF 10% 50V	222104K		R820	1 1 1	RES 12kohm 5% 1/4W	328123J
						R821	1 1 1	RES 82kohm 5% 1/4W	328823J
	D801	1 1 1	DIODE S5VB10	560041S		R822	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
	↑	1 1 1	HEATSINK (D)	7081950		R823	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
	↑	1 1 1	PTS 3 φ x 12-screw	814312S					
	Q801	1 1 1	TR 2SD571 (L,M)	511012S			1 1 1	RELAY MAT4B-211R (DC 24V)	1700210
	Q802	1 1 1	TR 2SB605 (L,M)	510041S					
	R801	1 1 1	FP-MO-RES 4.7kohm 5% 2W	362472L					
	R802	1 1 1	FP-MO-RES 4.7kohm 5% 2W	362472L					
	R803	1 1 1	FP-MO-RES 100ohm 5% 1W	361101L	★800	1 1 1	METER CONTROL PCB ASS—		
	R804	1 1 1	RES 4.7kohm 5% 1/4W	328472J			complete circuit board	9492360	
	R805	1 1 1	RES 4.7kohm 5% 1/4W	328472J					
	R806	1 1 1	FP-MO-RES 100ohm 5% 1W	361101L		D901	1 1 1	DIODE 1N60P	500001G
	R807	1 1 1	RES 100ohm 5% 1/4W	328101J		D902	1 1 1	DIODE 1N60P	500001G
	R808	1 1 1	RES 100ohm 5% 1/4W	328101J		D903	1 1 1	DIODE 1S2076	501019S
	R809	1 1 1	RES 47ohm 5% 1/4W	328470J		D904	1 1 1	DIODE 1S2076	501019S
	R810	1 1 1	RES 47ohm 5% 1/4W	328470J		D905	1 1 1	DIODE 1S2076	501019S
	R811	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L		D906	1 1 1	DIODE 1S2076	501019S
	R812	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L					
	ZD801	1 1 1	ZENER DIODE HZ27	502041S	★801	R913,			
	ZD802	1 1 1	ZENER DIODE HZ27	502041S		R914	1 1 1	VR, V16L4G3-1PHN25KC,	
								B5kohmX2(meter level)	4320670
						R915	1 1 1	HVR, EVL-S6A-A00-B53, B5kohm	
								—potentiometer	4300690
						R916	1 1 1	HVR, EVL-S6A-A00-B53, B5kohm	
								—potentiometer	4300690
	C821	1 1 1	E-CAP 16R220uF	211232Q		R917	1 1 1	RES 680ohm 5% 1/4W	328681J
	C822	1 1 1	E-CAP 16R220uF	211232Q		R918	1 1 1	RES 680ohm 5% 1/4W	328681J
	C823	1 1 1	E-CAP 35R4.7uF	211415Q		R919	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm	
	C824	1 1 1	E-CAP 35R220uF	211432Q				—potentiometer	4300700
						R920	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm	
								—potentiometer	4300700
	D802	1 1 1	DIODE 1S1885	560032S					

(PROTECTOR SECTION)

# ALIGNMENT

## TEST EQUIPMENT

Allow a minimum of 10 minutes warm-up for test equipment and the amplifier to be tested.

Maintain rated line voltage.

Generator—Audio Frequency

DC Voltmeter—High Sensitivity

Vacuum Tube Voltmeter

(Oscilloscope)

Connect 8 ohm dummy loads to both L and R channel speaker terminals of the amplifier.

## MIDPOINT VOLTAGE

(See Tone/Main Amp Circuit Board)

**Left Channel:** Apply no signal to the amplifier input.

Using DC Voltmeter, see that the voltage drop across the dummy load is  $0 \pm 20$  milivolts.

**Right Channel:** The same procedure as the left channel.

## IDLING CURRENT ADJUSTMENT (See Tone/Main Amp Circuit Board)

**Left Channel.** Apply no signal to the amplifier input.

Using DC Voltmeter, adjust potentiometer R729 so that the voltage drop at TP35 to TP36 is 9.4 (or 4.7 to 18.8) milivolts.

**Right Channel:** Similarly, adjust Potentiometer R730 so that the voltage drop at across TP37

to TP38 is 9.4 (or 4.7 to 18.8) milivolts.

## METER LEVEL ADJUSTMENT (See Meter Control Circuit Board)

Connect Generator to "AUX" of the amplifier.

Set potentiometers R915, R916, R919 and R920 to mid-range.

### Left Channel:

1. Set "METER LEVEL" fully clockwise. Set Generator and "VOLUME" to obtain 1.0 watts power output. Adjust potentiometer R915 so that power meter reads 0dB.
2. Set "METER LEVEL" fully counter-clockwise. Set Generator and "VOLUME" to obtain 45 watts power output. Adjust potentiometer R919 so that the power meter reads 0dB.
3. Repeat steps 1 and 2 two or three times.

### Right Channel:

1. Set "METER LEVEL" fully clockwise. Set Generator and "VOLUME" to obtain 1.0 watts power output. Adjust potentiometer R916 so that power meter reads 0dB.
2. Set "METER LEVEL" fully counter-clockwise. Set Generator and "VOLUME" to obtain 45 watts power output. Adjust potentiometer R920 so that the power meter reads 0dB.
3. Repeat steps 1 and 2 two or three times.

# SEMICONDUCTOR DATA

+ NOTES

A : Alloy  
 B : Base  
 D : Diffused  
 Si : Silicon  
 Df : Drift-field  
 E : Epitaxial  
 G : Grown  
 J : Junction  
 M : Mesa  
 P : Planar  
 Pc : Point-contact  
 Td : Triple-diffused

## TRANSISTORS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)						ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)														MANUFACTURE
			Collector-to-Base Voltage V <sub>CB0</sub> (V)	Emitter-to-Base Voltage V <sub>EB0</sub> (V)	Collector Current I <sub>C</sub> (mA)	Collector Dissipation P <sub>C</sub> (mW)	Junction Temperature T <sub>J</sub> (°C)	Collector Cutoff Current		Static Forward-Current Transfer Ratio		Collector-Emitter Saturation Voltage			Gain-Bandwidth Product		Base Spreading Resistance		Output Capacitance C <sub>ob</sub> (pF)				
								I <sub>CBO</sub> (μA)	V <sub>CB</sub> (V)	h <sub>FE</sub>	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	V <sub>CE(sat)</sub> (V)	I <sub>C</sub> (mA)	I <sub>B</sub> (mA)	f <sub>T</sub> (MHz)	V <sub>CE</sub> (V)	I <sub>E</sub> (mA)		r <sub>bb</sub> <sup>h</sup> (Ω)	V <sub>CE</sub> (V)	I <sub>E</sub> (mA)	
2SA798(F,G)	AF	PNP Dual Si-EP	-70	-5	-100	200	125	-0.1	-35	250 800	-6	-1	-0.6 max	-10	-1	100	-6	1			3	MITSUBISHI	
2SA836(E)	AF, Low noise	PNP Si-E	-55	-5	-100	200	125	-0.1	-18	400 800	-12	-2	-0.5 max	-10	-1	200	-12	2			1.8	HITACHI	
2SA844(D,E)	AF, Power	PNP Si-E	-55	-5	-100	300	125	-0.1	-18	250 800	-12	-2	-0.5 max	-10	-1	200	-12	2			1.8	HITACHI	
2SB541(R,S)	AF	PNP Si-TdM	-110	-6	-8A	80W (Tc=25°C)	150	-100	-100	40 120	-5	-1A	2 max	-5	-1	7	-10	200			320	NEC	
2SB646(A,C,D)	AF, Prdriver	PNP Si-E	-120	-5	-50	900	150	-10	-100	60 320	-5	-10	-2 max	-30	-3	140	-10	10			4	HITACHI	
2SB647(C,D)	AF, Driver	PNP Si-E	-120	-5	-1A	900	150	-10	-100	60 320	-5	-150	-1 max	-500	-50	140	-5	10			20	HITACHI	
2SB605(L,M)	AF, Driver	PNP Si-E	-60	-5	-700	800	150	max	-0.1	90 270	-1	-100	-0.6 max	-500	-50	120	-6	10				NEC	
2SC945 L (P,Q)	AF, Low noise general	NPN Si-E	60	5	100	250	125	100	60	400	6	1	0.15	100	10	250	6	-10			3.5	NEC	
2SC1345 (E)	AF, Low noise	NPN Si-E, LTP	55	5	100	200	125	max	18	800	12	2	max	10	1	230	12	-2			1.8	HITACHI	
2SC1627(O, Y)	AF, Voltage amp., Driver	NPN Si-E	80	5	300	600	150	0.1	50	240	12	50	0.5	200	10	100	10	-10			10	TOSHIBA	
2SD388(R,S)	AF, Power	NPN Si-TdM	150	100	8A	80W (Tc=25°C)	150	100	100	120	5	1A	2max	5	1	9	10	-200			190	NEC	
2SD571(L,M)	AF, Driver	NPN Si-E	60	5	700	800	150	max	60	270	1	100	0.8 max	500	50	110	6	-10				NEC	
2SD666(A,C,D)	AF, Prdriver	NPN Si-E	120	5	50	900	150	10	100	60 320	5	10	2max	30	3	140	10	10*			3	HITACHI	
2SD667A (C,D)	AF, Driver	NPN Si-E	120	5	1A	900	150	10	100	60 320	5	150	1max	500	50	140	5	150*			12	HITACHI	

## FIELD EFFECT TRANSISTORS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)						ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)														MANUFACTURE
			Gate-to-Drain Voltage V <sub>GD0</sub> (V)	Gate-to-Source Voltage V <sub>GS0</sub> (V)	Gate Current I <sub>G</sub> (mA)	Drain Current I <sub>D</sub> (mA)	Total Power Dissipation P <sub>T</sub> (mW)	Junction Temperature T <sub>J</sub> (°C)	Date Leak Current I <sub>GL</sub> (nA)	Gate to Drain Breakdown Voltage V <sub>(BR)GDO</sub> (V)	Drain Current I <sub>DSS</sub> (mA)	Gate to Source Cutoff Voltage V <sub>GS</sub> (V)	Forward Transfer Admittance  y <sub>fs</sub>   (S)	Feed back Capacitance C <sub>rss</sub> (pF)	Power Gain G <sub>PS</sub> (dB)	Noise Figure NF (dB)							
																	Test Conditions	Test Conditions	Test Conditions	Test Conditions	Test Conditions	Test Conditions	
2SK68A (L,M)	AF, Low noise	N-channel Junction FET	-50	-50	10	20	250	125	V <sub>GS</sub> = -1.0 max V <sub>GS</sub> = -20V V <sub>DS</sub> = 0	0.5 min 10V ID = 3.0 typ 12 max	V <sub>DS</sub> = 10V ID = 10μA	-0.5	V <sub>DS</sub> = 10V ID = 0.5 mA f = 1KHz	5.2	V <sub>DS</sub> = 10V V <sub>GS</sub> = 0 f = 1MHz	2.6		V <sub>DS</sub> = 10V max V <sub>GS</sub> = 10Hz 0 1.5 max RG = 1Kohm (1KHz)	10		NEC		

## DIODES, LEDs

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)								ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)								MANUFACTURE			
			Reverse Surge Voltage V <sub>R surge</sub> (V)	Peak Reverse Voltage V <sub>RM</sub> (V)	Reverse Voltage V <sub>R</sub> (V)	Peak Forward Voltage V <sub>FM</sub> (V)	Peak Forward Current I <sub>FM</sub> (mA)	Average Rectified Current I <sub>A</sub> (mA)	Forward Surge Current I <sub>F surge</sub> (A)	Junction Temperature T <sub>J</sub> (°C)	Total Power Dissipation P <sub>D</sub> (mW)	Forward Current I <sub>F min</sub> (mA)	Test Condition V <sub>F</sub> (V)	Forward Voltage V <sub>F</sub> (V)	Reverse Current I <sub>R max</sub> (μA)	Test Condition V <sub>R</sub> (V)						
																	MIN (V)	TYP (V)		MAX (V)	I <sub>Z</sub> (mA)	TYP (Ω)
5SVB10	Rectifier			-100					6A (Tc=25°C)	200 (Tc=25°C)	150			1.05	3A	10						SHINDENGEN
1N60P	FM detector	Ge-P		-35	-25	500	150	I <sub>F</sub> = 50 (1 sec)	0.5	70			4	1		75	-10					HITACHI
1S1885	Rectifier	Si-A		-100		70		1A (Tc=85°C)	60				1.2	1.5A	10	-100						TOSHIBA
1S2075	Various detector, Modulator, Demodulator	Si-EP		-35	-30		450	150	1	175	250			0.8	10	1	-30					HITACHI
1S2076A	Various detector, Modulator, Demodulator	Si-EP		-70	-60		450	150	1	175	250			0.8	10	1	-30					HITACHI

## ZENER DIODES

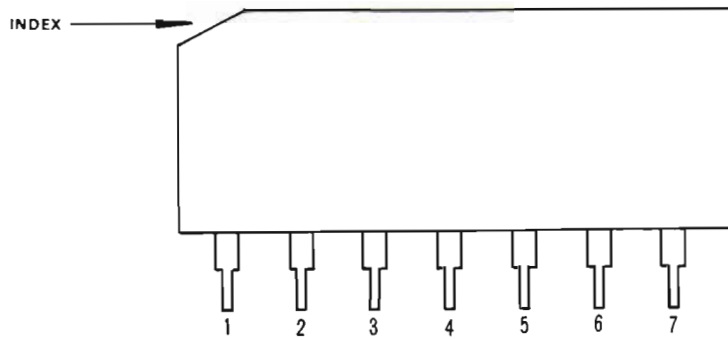
DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)				ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)												MANUFACTURE			
			Total Power Dissipation P <sub>D</sub> (mW)	Zener Current I <sub>Z</sub> (A)	Junction Temperature T <sub>J</sub> (°C)	Zener Voltage V <sub>Z</sub> (V)	Differential Resistance r <sub>d</sub>			Temperature Coefficient %Z			Reverse Current I <sub>R</sub>									
							MIN (V)	TYP (V)	MAX (V)	I <sub>Z</sub> (mA)	TYP (Ω)	MAX (Ω)	I <sub>Z</sub> (mA)	TYP (%/°C)	MAX (%/°C)	I <sub>Z</sub> (mA)	MAX (μA)	V <sub>R</sub> (V)				
HZ24	Stabilized power supply	Si-EP	400		175	-22.8	-23.6	-25.6	-2	62	70	-2		20.3 mV/°C	-2	1	-19					HITACHI
HZ33	Stabilized power supply	Si-EP	400		175	-31.0	-32.8	-35.0	-2	79	120	-2		30.4 mV/°C	-2	1	-25					HITACHI



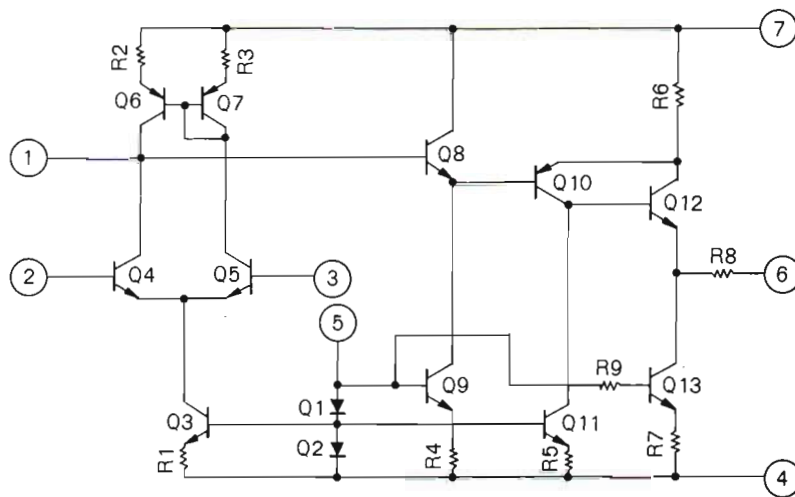
# INTEGRATED CIRCUIT (TA7136P)

DEVICE TYPE	APPLICATION	ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25 °C)				ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C) Typical Values				Manufacture
		Supply Voltage (V)	Power Dissipation (mW)	Operating Temperature Range (°C)	Storage Temperature Range (°C)	Supply Current (mA)	Voltage Gain (Open Loop) (dB)	Maximum Output Voltage (V <sub>rms</sub> )	Equivalent Input Noise Voltage (μV <sub>rms</sub> )	
TA7136P	Preamplifier	40	400	-25 75	-55 125	3.1	92	7.0	1.0	TOSHIBA

## Terminal Guide (Side View)



## Schematic Diagram



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