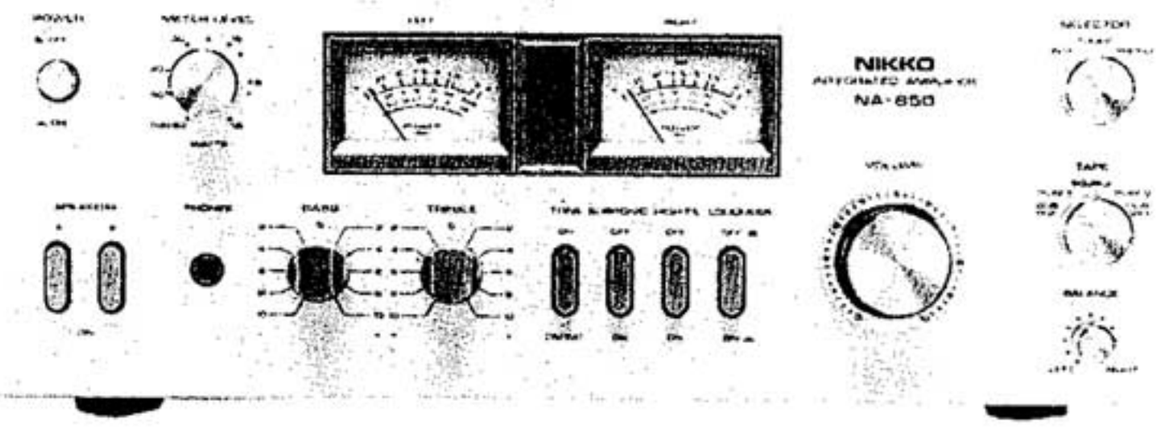
INTEGRATED AMPLIFIER

NA-850

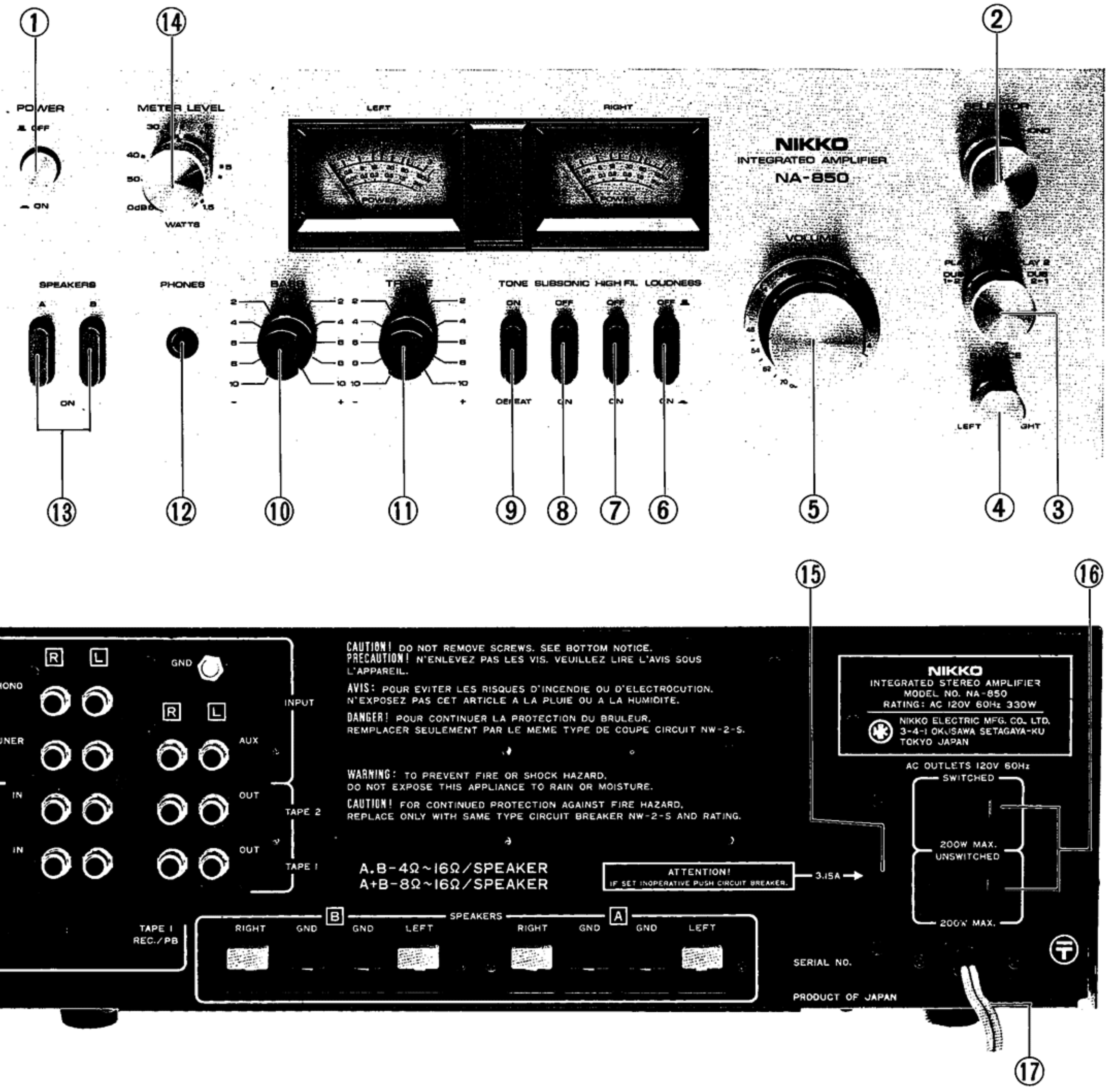


SERVICE MANUAL

TYPE AND VOLTAGE

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

NIKKO



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

CONTENTS

SPECIFICATIONS

	UNIT	NOMINAL	LIMIT
Continuous Power Output per channel, 8 ohm loads:			
20Hz – 20kHz @0.08%THD	watts	65	60
1kHz@0.08%THD	watts	70	60
TH Distortion, 8 ohm loads, 20Hz –20kHz:			
@Continuous Power Output	%		< 0.08
@1 watt Power Output	%		< 0.035
IM Distortion, 8 ohm loads:			
@Continuous Power Output	%		< 0.08
@1 watt Power Output	%		< 0.035
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 60 watts Power Output, @ 1kHz:			
PHONO	mV	2.5	2.5±2dB
TUNER, AUX, TAPE IN, DIN CONNECTOR	mV	160	160±2dB
Maximum Input before Overload Distortion, @1kHz:			
PHONO 0.1%THD	mV	220	220±2dB
Output Level for 2.5mV Input, @1kHz:			
PHONO → TAPE OUT	mV	160	160±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
Low Cut Filter	dB@15Hz	–3	–3±2dB
High Cut Filter	dB@10kHz	–6	–6±2dB
Idling Current	mA	20	20^{+20}_{-10} 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.

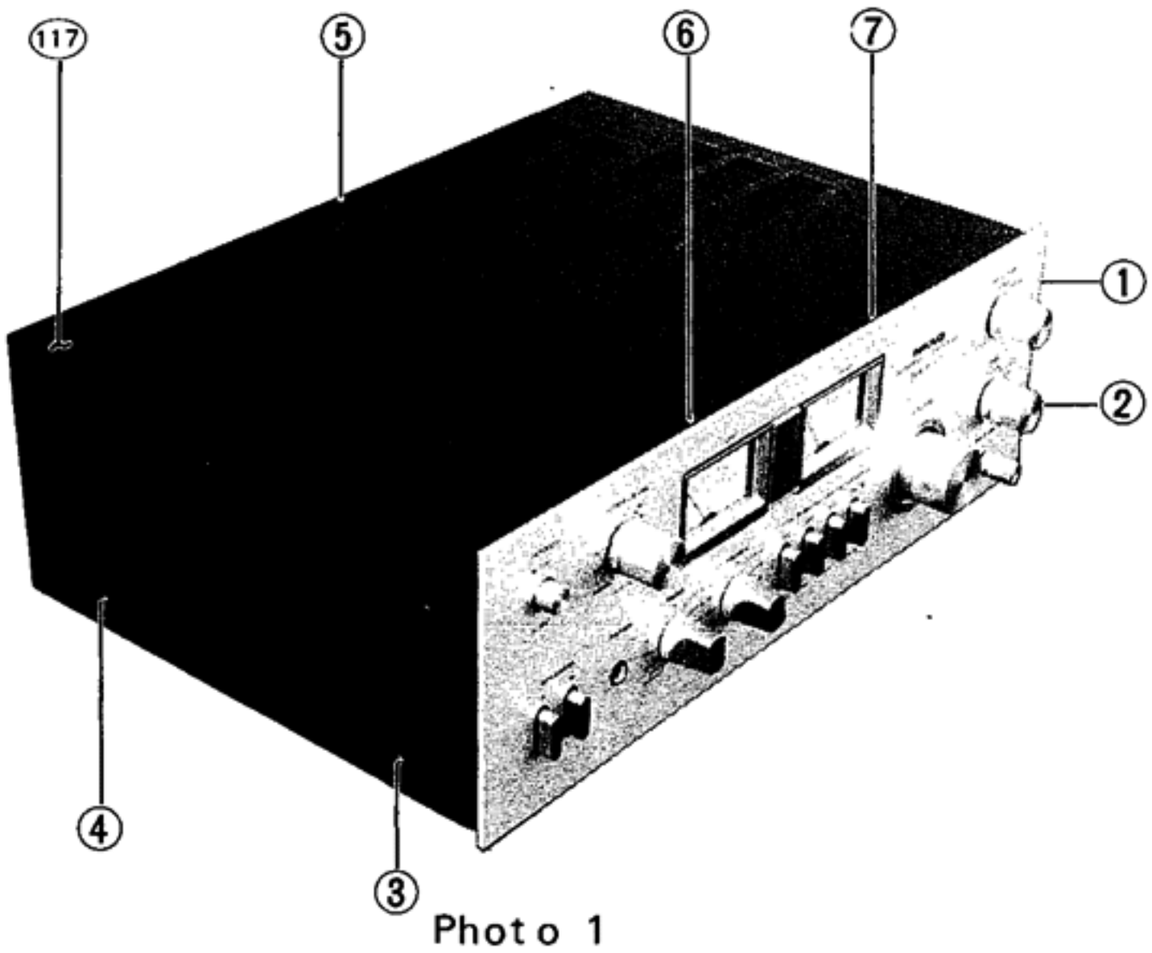


Photo 1

BOTTOM PLATE REMOVAL

Remove four tapping crews 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 3) and lift the panel away from the unit.
   —To reassemble, reverse the procedure.

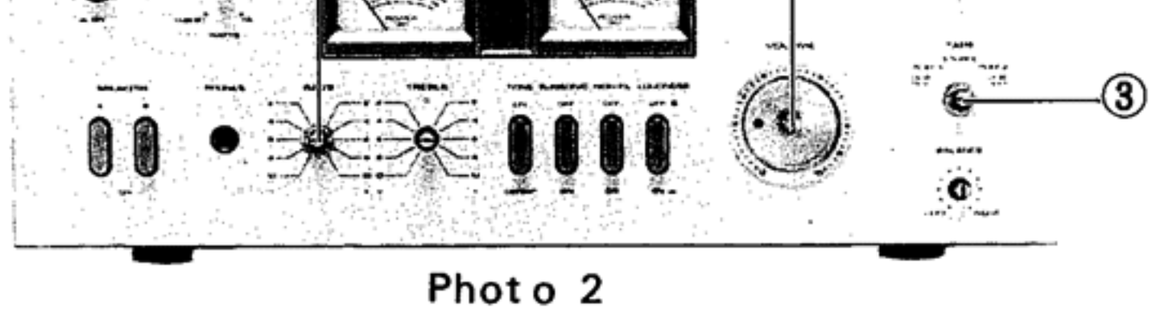


Photo 2

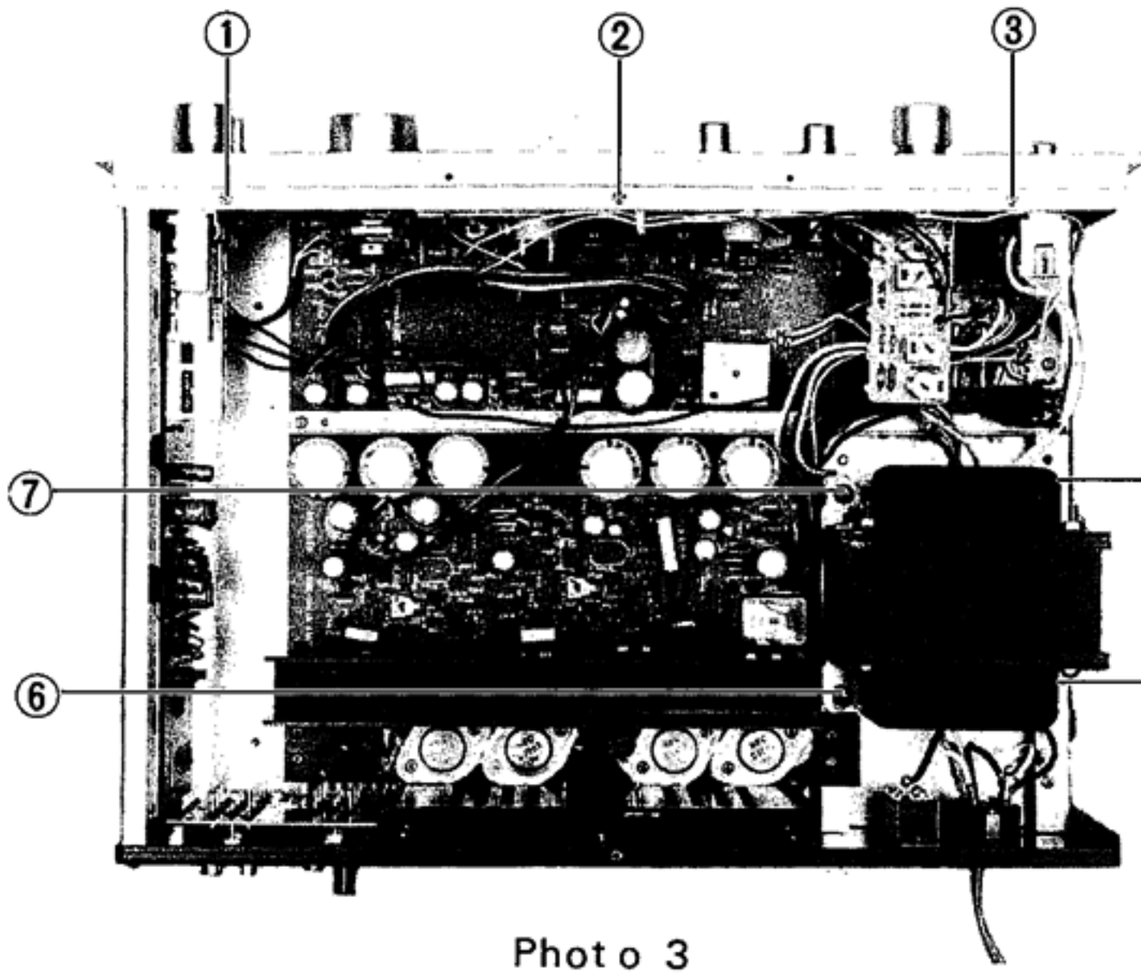


Photo 3

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.

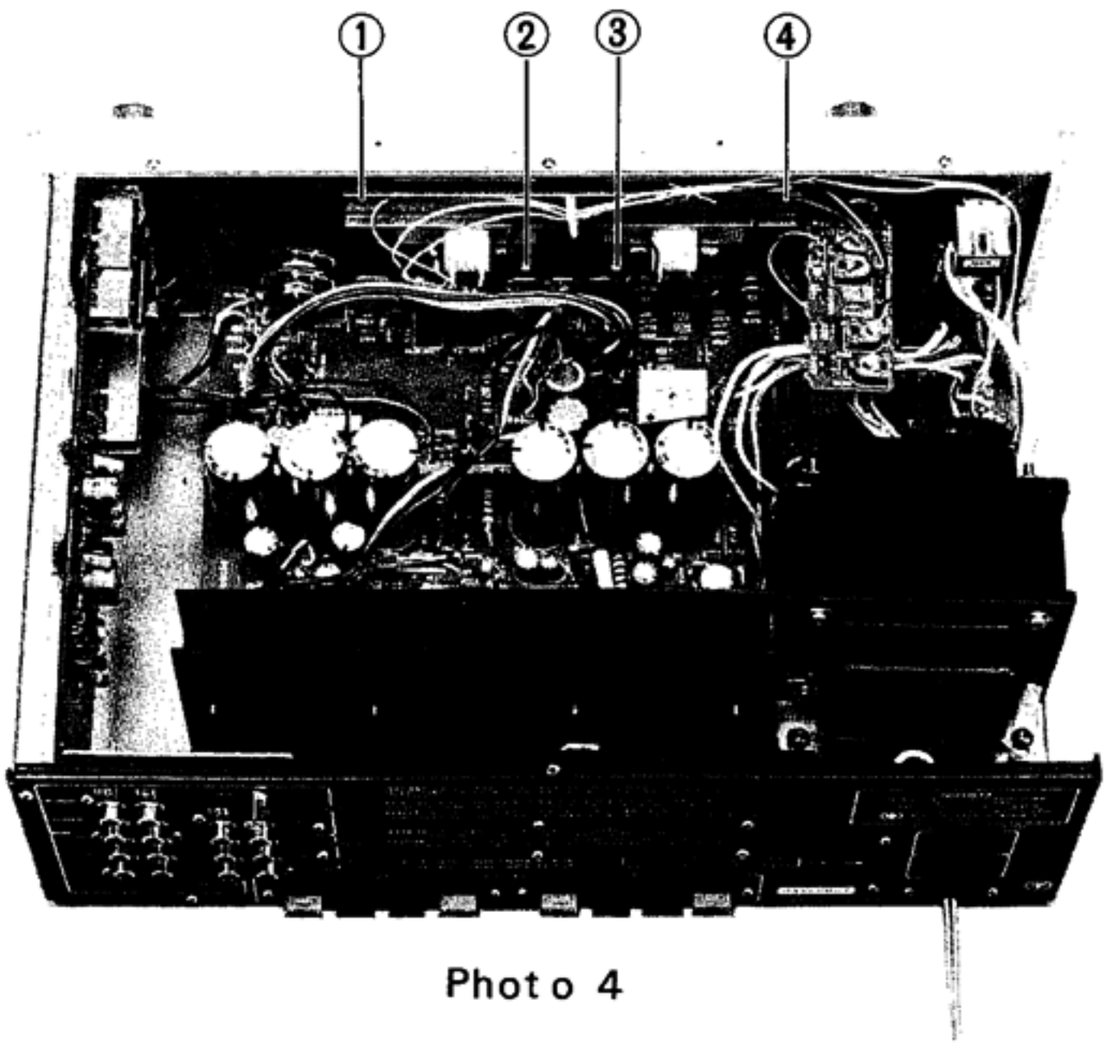
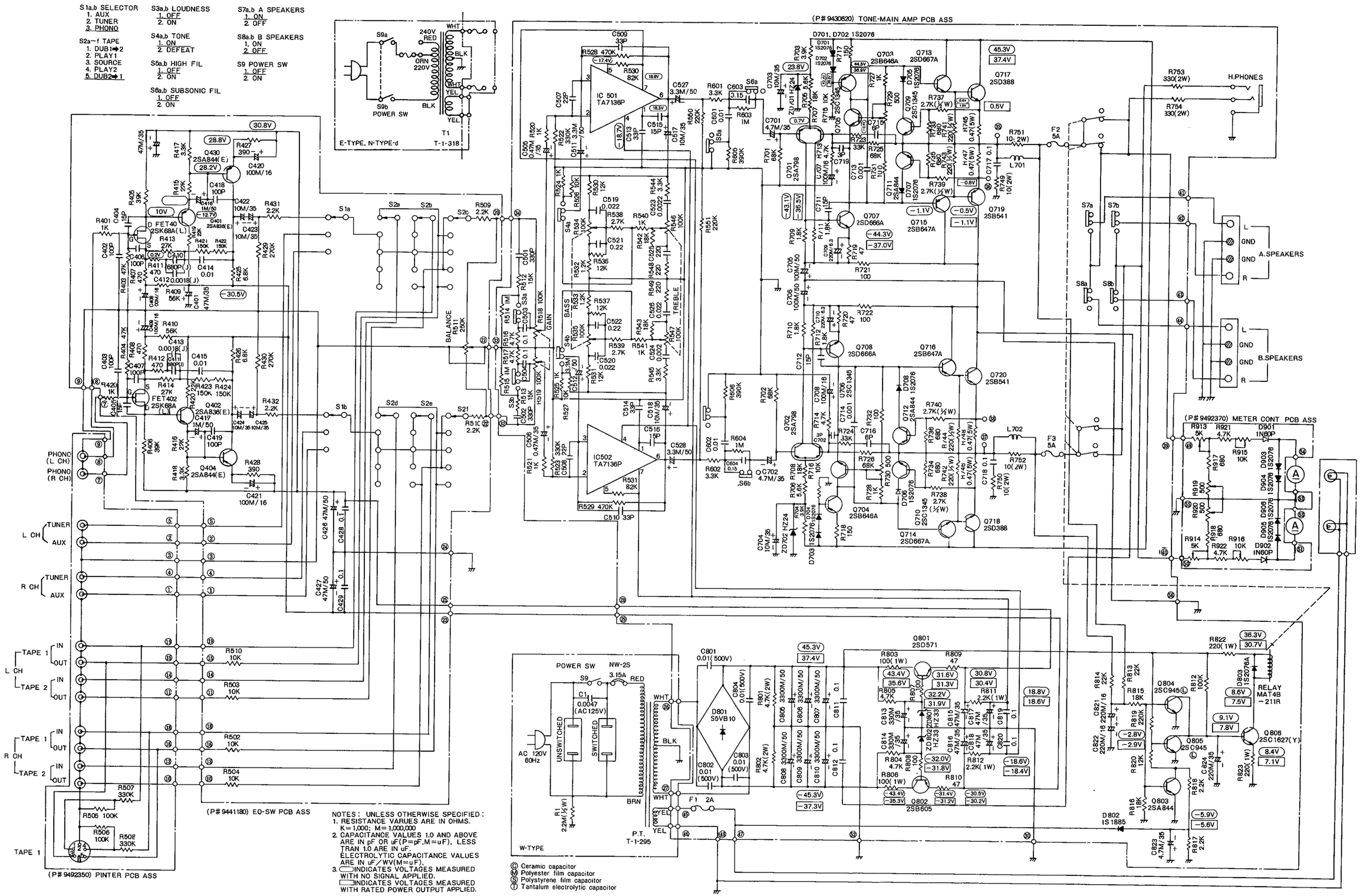


Photo 4

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

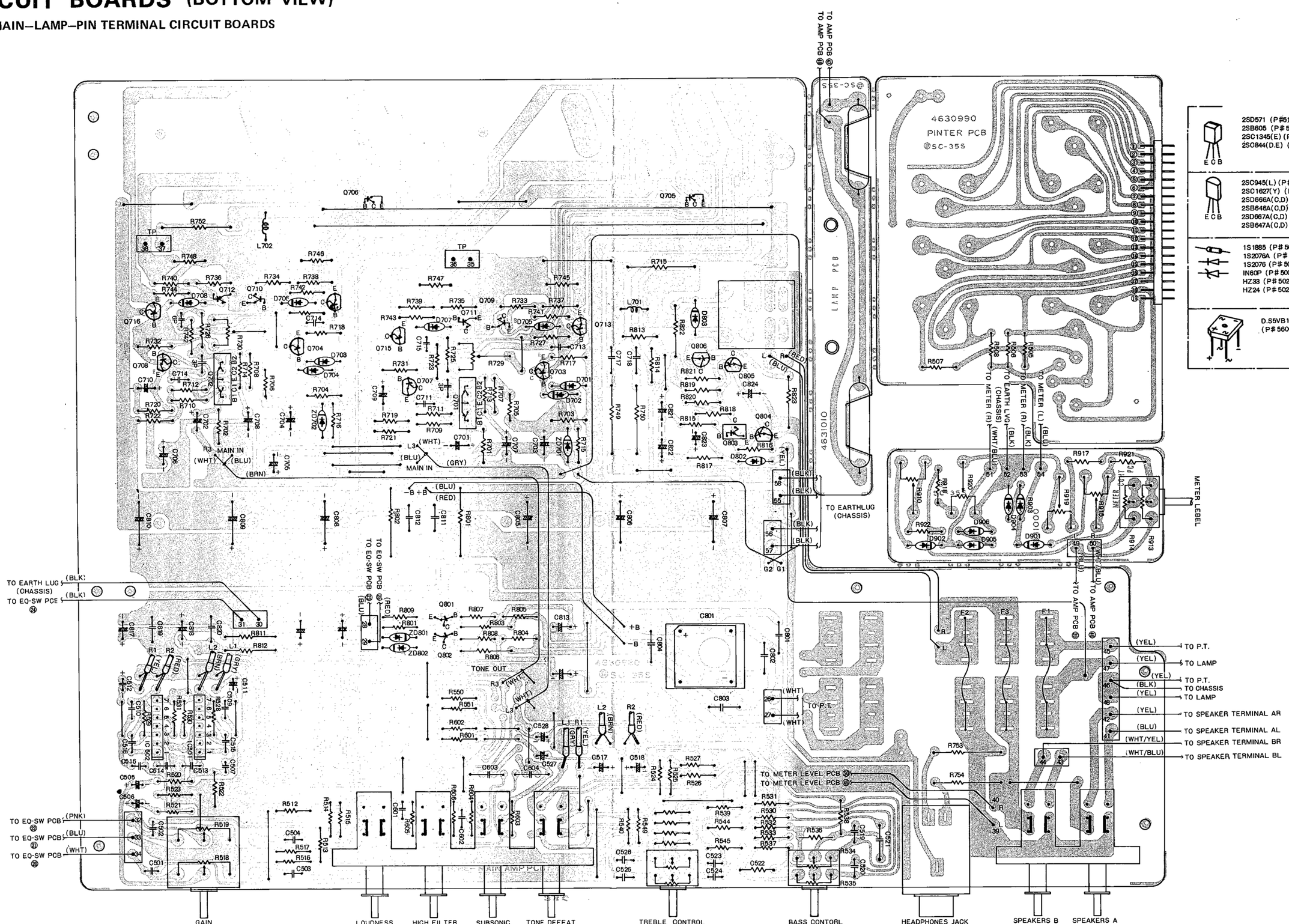


NOTES: UNLESS OTHERWISE SPECIFIED :
1. RESISTANCE VARUES ARE IN OHMS. K=1,000; M=1,000,000
2. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pF OR uF(P=pF,M=uF). LESS THAN 1.0 ARE IN uF. ELECTROLYTIC CAPACITANCE VALUES ARE IN uF,/WV(M=uF).
3. ⬭ INDICATES VOLTAGES MEASURED WITH NO SIGNAL APPLIED.
▭ INDICATES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

Ⓒ Ceramic capacitor
Ⓜ Polyester film capacitor
Ⓢ Polystyrene film capacitor
Ⓣ Tantalum electrolytic capacitor

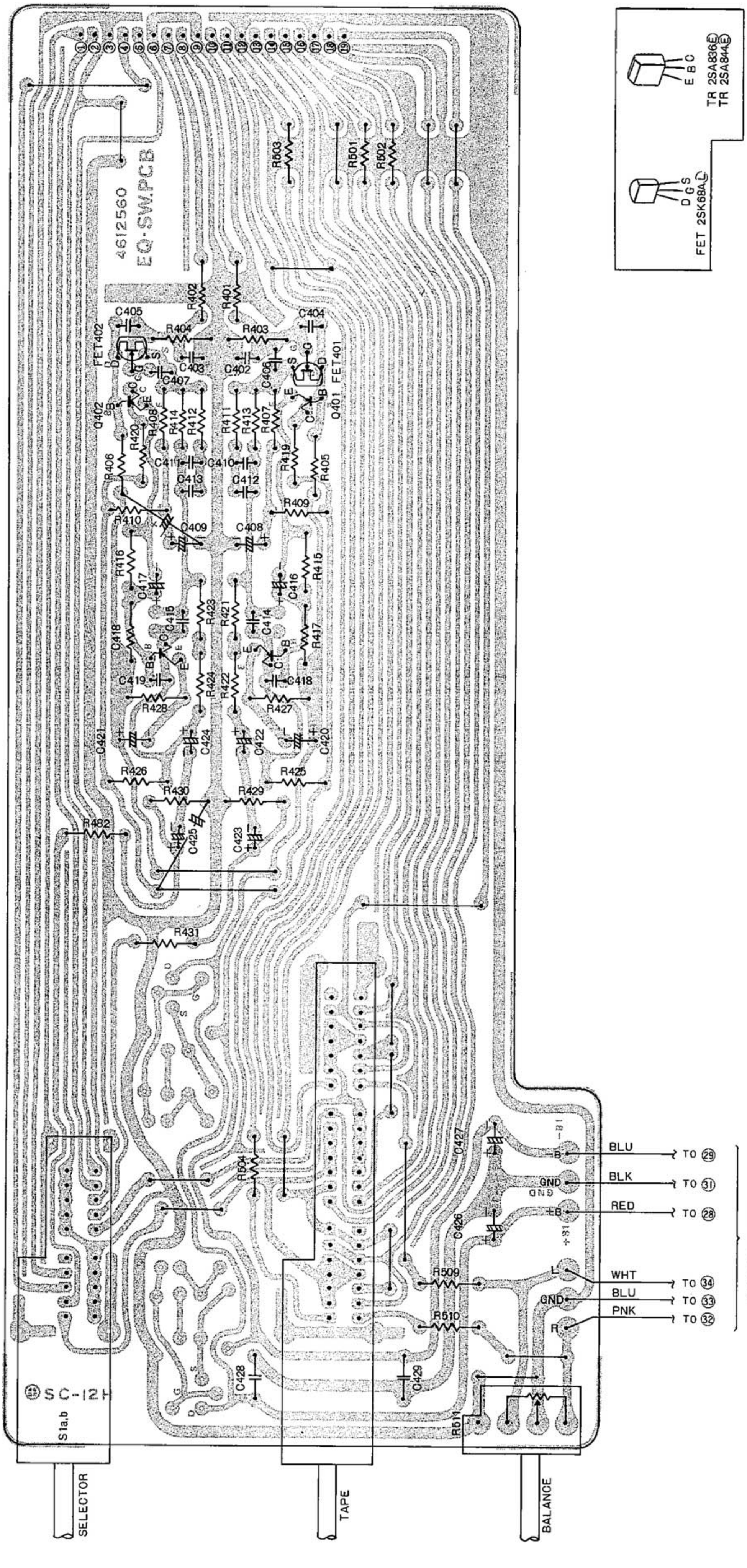
CIRCUIT BOARDS (BOTTOM VIEW)

TONE/MAIN–LAMP–PIN TERMINAL CIRCUIT BOARDS

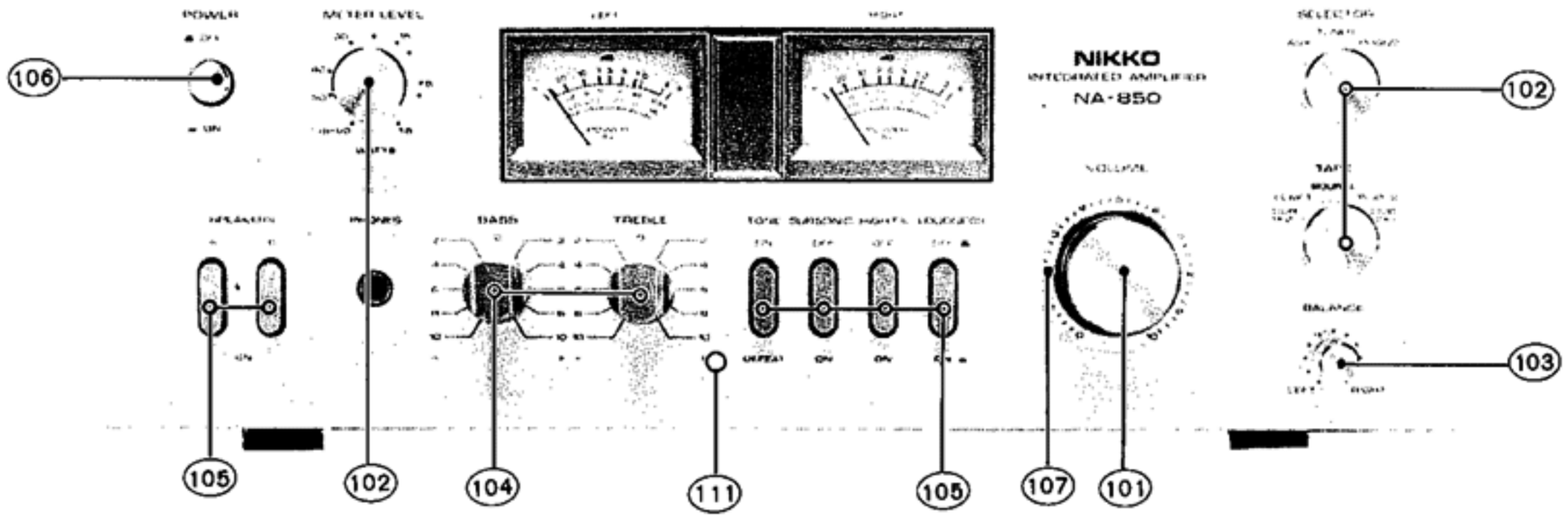


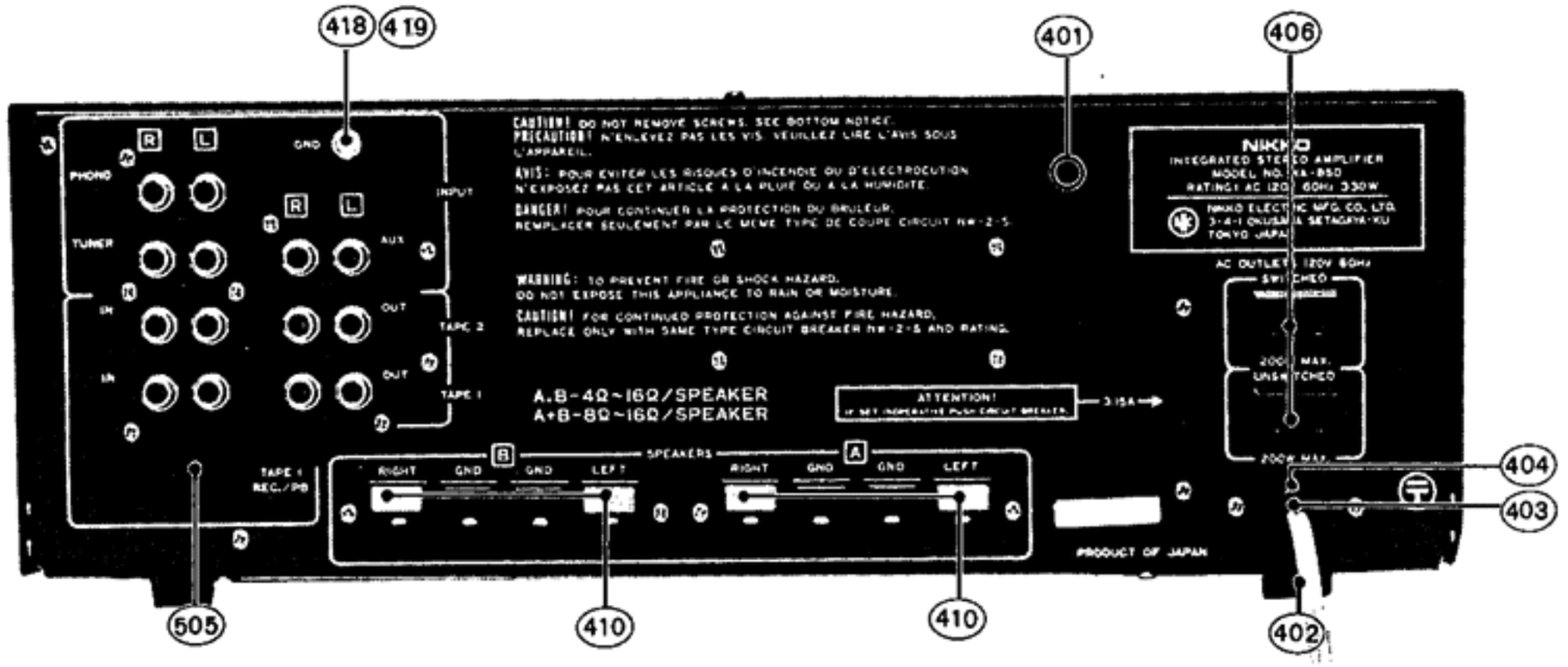
E C B	2SD571 (P#511012S) 2SB605 (P#510041S) 2SC1345(E) (P#511027S) 2SC844(D,E) (P#510051S)
E C B	2SC945(L) (P#515077S) 2SC1627(Y) (P#511017S) 2SD666A(C,D) (P#511025S) 2SB646A(C,D) (P#511052S) 2SD667A(C,D) (P#511026S) 2SB647A(C,D) (P#511053S)
	1S1885 (P#560032S) 1S2076A (P#501020S) 1S2076 (P#501019S) IN60P (P#500001G) HZ33 (P#502039S) HZ24 (P#502040S)
	D.S5VB10 (100V) (P#560041S)

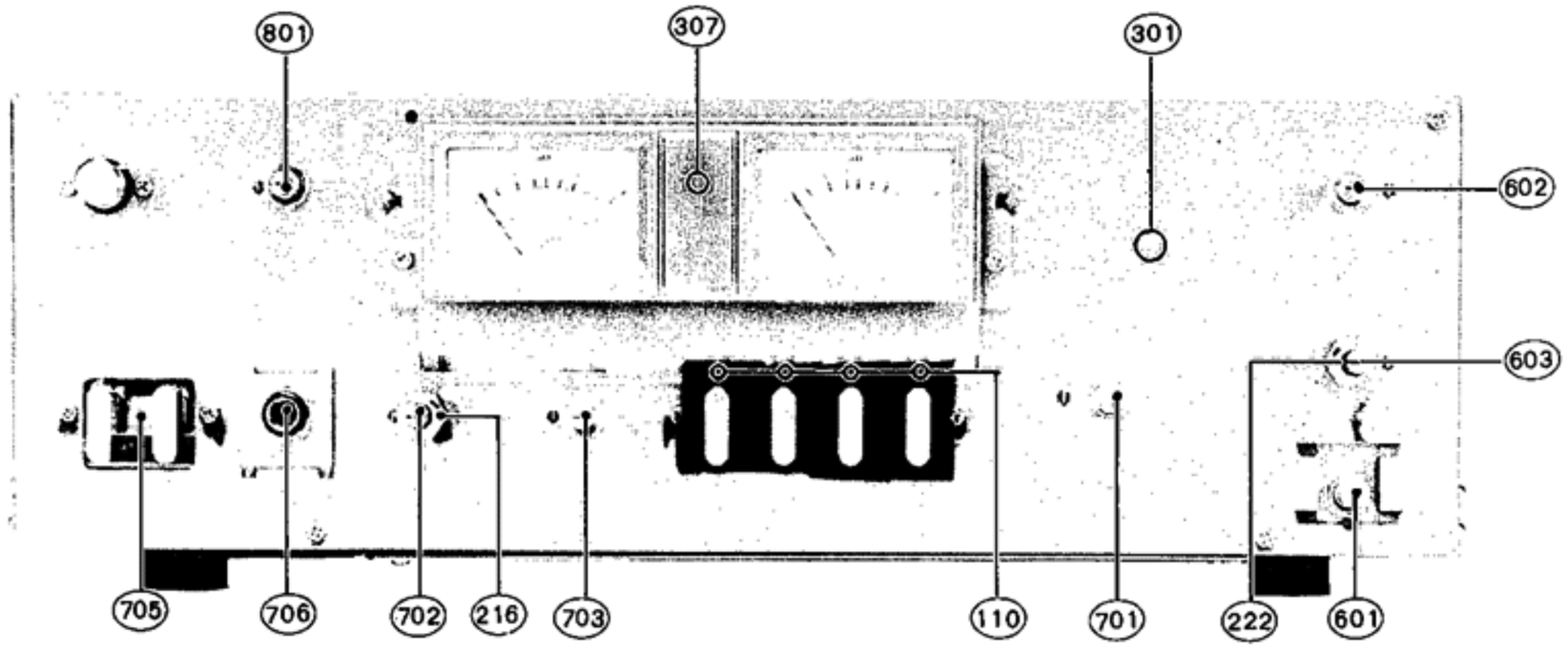
EQUALIZATION/SWITCH CIRCUIT BOARD

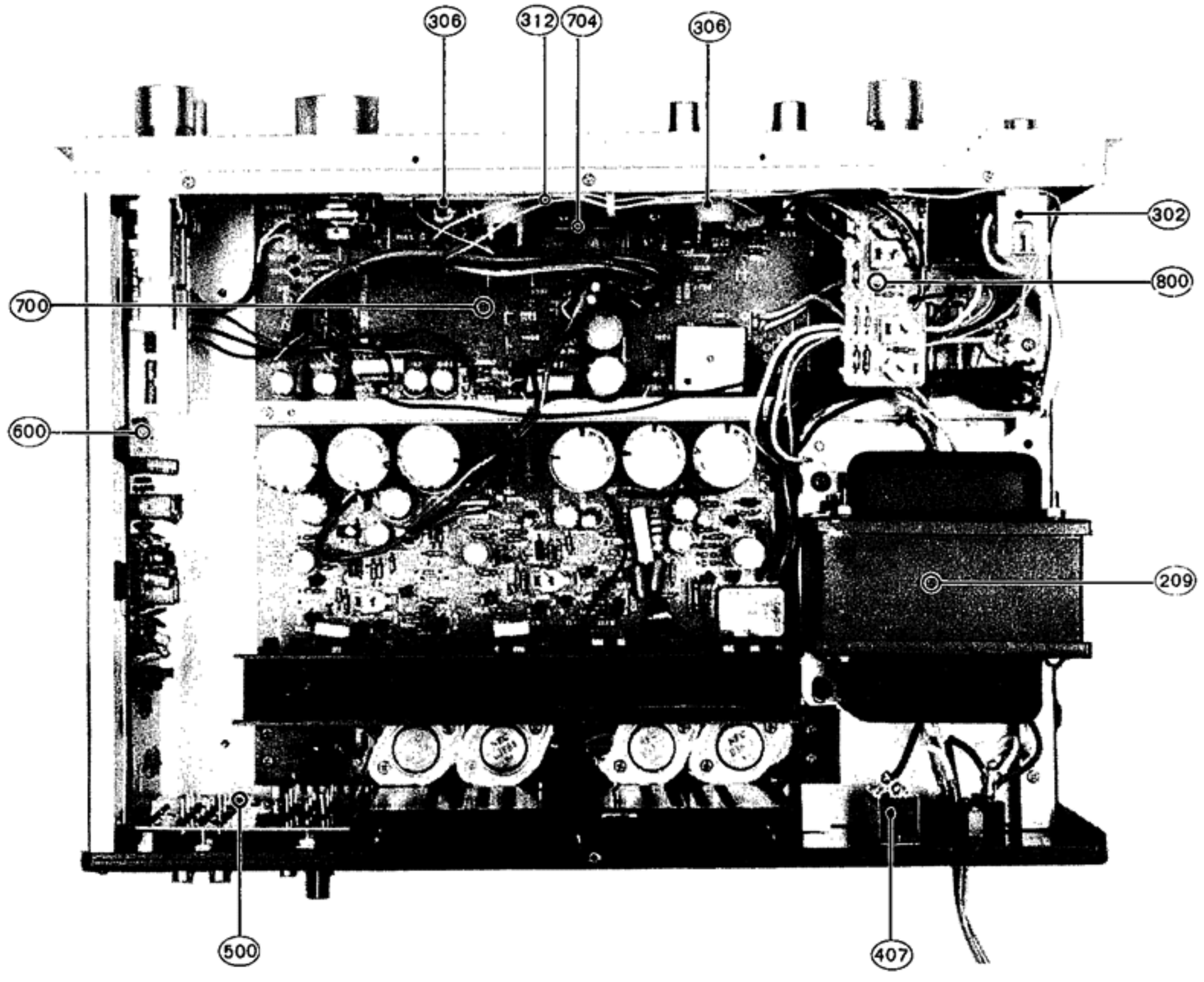


PARTS LOCATION









PARTS LIST

NOTES

1. ★ The KEY NUMBER (#) marked with a (★) on parts list relate to numbers of three digits with a (◯). (photo 1–8).

2. + Numbers in file indicate the quantity of parts used in one type.

3. ++ TR: Transistor
FET: Field effect transistor
IC: Integrated circuit
VR: Volume control (Variable resistor)
RES: Carbon file 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.

4. Assemblies and parts are subject to change without notice.

5. 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+ (W-type-u / E-type-u / N-type-d)	DESCRIPTION++	PART NO.
			PACKING MATERIALS & ACCESSORIES	
001		1 1 1	CARTON BOX	9825220
002		2 2 2	STYROL PAD	9840640
003		1 1 1	POLY SACK—vinyl cloth back	9640550
004		1 1 1	POLY SACK #13—vinyl cloth back	9640320
005a		1 – –	INSTRUCTION MANUAL E	960196E
005b			INSTRUCTION MANUAL F	960211F
005c		– 1 1	INSTRUCTION MANUAL K	960189K
006		1 – –	WARRANTY CARD (N)	967003A
007		1 1 1	POLISHING CLOTH	9690040
008		1 1 1	SILICA GEL—dryer	9690010
			CABINET ASSEMBLY	
★101		1 1 1	KNOB R15GL-33D (volume)	7851640
★102		3 3 3	KNOB R15GL-22D (selector, tape, meter level)	7851610
★103		1 1 1	KNOB R15GL-12D (balance)	7851620
★104		2 2 2	KNOB 8GL-20LVD (bass, treble)	7851650
★105		6 6 6	PUSHBUTTON ABS (speakers, loudness, high filter) (subsonic, tone)	7851560
★106		1 1 1	PUSHBUTTON M12-GL 3.3SQ (power)	7850620
★107		1 1 1	VR RING 47	7883530
108	†	1 1 1	SN 8 ϕ–nut	892248S
109	†	1 1 1	W 8 ϕ–washer	893108S
★110		4 4 4	DUST COVER (S)	7001880
★111		1 1 1	PNL NA–850 – front panel	7883570
112	†	3 3 3	PUSHBUTTON GUIDE (2)	7401210
113	†	1 1 1	PUSHBUTTON GUIDE 12B	7400630
114	†	3 3 3	PTS 3 ϕx 8 BLK–screw	814308S
115	†	2 2 2	SN 9 ϕ–nut	892249S
116	†	2 2 2	W 9 ϕ–washer	893109S
★117		1 1 1	METAL COVER	7820770
★118		3 3 3	PTS 3 ϕx 8 BLK–screw	814308Q
★119		4 4 4	TFTS 4 ϕ x 10 BLK–screw	887410W
★120		4 4 4	W 5 ϕBLK–screw	893105W
★121		1 1 1	BTM PLT–bottom plate	7324530
★122	†	4 4 4	PTS 3 ϕx 6–screw	814306S
123		4 4 4	POLY FOOT 23 ϕx 12–foot	7401080
124	†	4 4 4	PTS 3 ϕx 12–screw	814312S

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u / E-type-u / N-type-d)	DESCRIPTION++	PART NO.
			CHASSIS ASSEMBLY	
201		1 1 1	CHASSIS (L)	7324540
202		1	EARTH LUG	4400000
203	†	1	TW(I) 3 ϕ–washer	893403U
204	†	1	PTS 3 ϕx 6–screw	814306S
205	R1	1	RES 2.2M ohm 10% 1/2W	315225K
206		1	EARTH LUG 4P WP	4400100
207	†	1	PTS 3 ϕx 6–screw	814306S
208		1 1 1	WIRE CLIP 43	7401340
★209a		1 – –	POWER TRANSFORMER T-1-295 120V	1102950
209b		– –	POWER TRANSFORMER T-1-316 100/120/220/240V	1103160
209c		– 1	POWER TRANSFORMER T-1-318 220/240V	1103180
210	†	4 4 4	BLTS 4 ϕx 8–screw	874408S
211		1 1 1	CHASSIS (R)	7324550
			(FRONT PLATE ASSEMBLY)	
212	1	6 6 6	PTS 3 ϕx 6–screw	814306S
(700)			**(TONE/MAIN AMP PCB ASS)**	
213	†	4 4 4	PMS 3 ϕx 5–screw	810305S
214	†	6 6 6	PTS 3 ϕx 8–screw	814308S
215	†	1 1 1	W 3 ϕ–washer	893203D
★216	†	1 1 1	SPCR 765–spacer	7152210
217	†	1 1 1	PCB ANGLE	893107S
218	†	6 6 6	PTS 3 ϕx 8–screw	814308S
			(BACK PLATE ASSEMBLY)	
219	†	8 8 8	PTS 3 ϕx 8–screw	814308S
220	†	6 6 6	BLTS 3 ϕx 8–screw	874308S
221	†	4 4 4	PTS 3 ϕx 10–screw	814310S
(600)			**(EQ/SW PCB ASS)**	
★222	†	1 1 1	SPCR 765–spacer	7152210
223	†	2 2 2	ANGLE	7226050
224	†	4 4 4	PTS 3 ϕx 8–screw	814308S
			FRONT PLATE ASSEMBLY	
★301		1 1 1	FRONT PLATE	7324560
(800)			**(METER CONTROL PCB ASS)**	
★302a	S9	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+ (W-type-u E-type-u N-type-d)	DESCRIPTION++	PART NO.
302b	S9	– 1 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	– 1 2	C–CAP 0.0047uF AC250V	239472E
305	†	– 1 2	C–CAP COVER (M) 23 ϕ	7400980
★306		2 2 2	METER	4582090
★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

BACK PLATE ASSEMBLY

★401a		1 – –	BACK PLATE W	7081910
401b		– 1 1	BACK PLATE E.N	7081900
★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 – –	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 3.15A–circuit breaker	4900690
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

PIN TERMINAL CIRCUIT BOARD

500		1 1 1	PIN TER PCB ASS–complete circuit board	9492350
501		1 1 1	PIN TER PCB	4630990
502		1 1 1	CB PIN TERMINAL 2P x 3	4446010
503		1 1 1	CB PIN TERMINAL 2P x 2	4444040
504		1 1 1	CB PIN TERMINAL 2P x 2D	4444050
★505		1 1 1	CONNECTOR 19PL	4582050
	R505	1 1 1	RES 100kohm 5% 1/4W	328104J
	R506	1 1 1	RES 100kohm 5% 1/4W	328104J
	R507	1 1 1	RES 330kohm 5% 1/4W	328334J
	R508	1 1 1	RES 330kohm 5% 1/4W	328334J

EQUALIZER SWITCH CIRCUIT BOARD

★600		1 1 1	EQ/SW PCB ASS–complete circuit board	9441180
	C400	1 1 1	E–CAP 35R47uF	211425Q
	C401	1 1 1	E–CAP 35R47uF	211425Q
	C402	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C403	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C404	1 1 1	C–CAP 15pF 10% 50VSL	232150K
	C405	1 1 1	C–CAP 15pF 10% 50V SL	232150K
	C406	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C407	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C408	1 1 1	E–CAP 16R100uF	211230Q
	C409	1 1 1	E–CAP 16R100uF	211230Q
	C410	1 1 1	S–CAP 680pF 5% 50V	223681V
	C411	1 1 1	S–CAP 680pF 5% 50V	223681V
	C412	1 1 1	M–CAP 0.0018uF 5% 50V	222182J
	C413	1 1 1	M–CAP 0.0018uF 5% 50V	222182J
	C414	1 1 1	M–CAP 0.01uF 5% 50V	222103J
	C415	1 1 1	M–CAP 0.01uF 5% 50V	222103J
	C416	1 1 1	E–CAP 50R1uF	211510Q
	C417	1 1 1	E–CAP 50R1uF	211510Q
	C418	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C419	1 1 1	C–CAP 100pF 10% 50V SL	232101K
	C420	1 1 1	E–CAP 16R100uF	211230Q
	C421	1 1 1	E–CAP 16R100uF	211230Q
	C422	1 1 1	E–CAP 35R10uF	211420L
	C423	1 1 1	E–CAP 35R10uF	211420L
	C424	1 1 1	E–CAP 35R10uF	211420L
	C425	1 1 1	E–CAP 35R10uF	211420L
	C426	1 1 1	E–CAP 35R47uF	211425Q
	C427	1 1 1	E–CAP 35R47uF	211425Q
	C428	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C429	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	FET401	1 1 1	FET 2SK68A (L)	516023S
	FET402	1 1 1	FET 2SK68A (L)	516023S
	Q401	1 1 1	TR 2SA836 (E)	510050S
	Q402	1 1 1	TR 2SA836 (E)	510050S
	Q403	1 1 1	TR 2SA844 (D,E)	510051S
	Q404	1 1	TR 2SA844 (D,E)	510051S
	R401	1 1 1	RES 1kohm 5% 1/4W	328102J
	R402	1 1 1	RES 1kohm 5% 1/4W	328102J
	R403	1 1 1	RES 47kohm 5% 1/4W	328473J
	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

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+ (W-type-u E-type-u N-type-d)	DESCRIPTION++	PART NO.
	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
	R424	1 1 1	RES 150kohm 5% 1/4W	328154J
	R425	1 1 1	RES 6.8kohm 5% 1/4W	328682J
	R426	1 1 1	RES 6.8kohm 5% 1/4W	328682J
	R427	1 1 1	RES 390ohm 5% 1/4W	328391J
	R428	1 1 1	RES 390ohm 5% 1/4W	328391J
	R429	1 1 1	RES 270kohm 5% 1/4W	328274J
	R430	1 1 1	RES 270kohm 5% 1/4W	328274J
	R431	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	R432	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	R501	1 1 1	RES 10kohm 5% 1/4W	328103J
	R502	1 1 1	RES 10kohm 5% 1/4W	328103J
	R503	1 1 1	RES 10kohm 5% 1/4W	328103J
	R504	1 1 1	RES 10kohm 5% 1/4W	328103J
	R509	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	R510	1 1 1	RES 2.2kohm 5% 1/4W	328222J
★601	R511	1 1 1	VR V16L4(PH)N30KC5BM250K (C,C) 250kohm (balance)	4310510
★602	S1	1 1 1	ROTARY SLIDE SWITCH (selector)	4055120
★603	S2	1 1 1	ROTARY SLIDE SWITCH SRZ-V065N (tape)	4055060

TONE/MAIN AMP CIRCUIT BOARD

700a		1 1 –	TONE/MAIN AMP PCB ASS W,E —complete circuit board	9430620
700b		– – 1	TONE/MAIN AMP PCB ASS N —complete circuit board	9430630

(TONE AMP SECTION)

	C501	1 1 1	S–CAP 330pF 10% 50V	223331W
	C502	1 1 1	S–CAP 330pF 10% 50V	223331W
	C503	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C504	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C505	1 1 1	T–CAP 35D 0.47uF	252405M
	C506	1 1 1	T–CAP 35D 0.47uF	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
	C512	1 1 1	E–CAP 50R3.3uF LC	211513L
	C513	1 1 1	C–CAP 33pF 10% 50V SL	232330K
	C514	1 1 1	C–CAP 33pF 10% 50V SL	232330K
	C515	1 1 1	C–CAP 15pF 10% 50V SL	232150K
	C516	1 1 1	C–CAP 15pF 10% 50V SL	232150K
	C517	1 1 1	E–CAP 35R10uF LC	211420L
	C518	1 1 1	E–CAP 35R10uF LC	211420L
	C519	1 1 1	M–CAP 0.022uF 10% 50V	222223K
	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
	C602	1 1 1	M–CAP 0.01uF 10% 50V	222103K
	C603	1 1 1	M–CAP 0.15uF 10% 50V	222154K
	C604	1 1 1	M–CAP 0.15uF 10% 50V	222154K
	IC501	1 1 1	IC TA3176P	518045S
	IC502	1 1 1	IC TA3176P	518045S
	R512	1 1 1	RES 15kohm 5% 1/4W	328153J
	R513	1 1 1	RES 15kohm 5% 1/4W	328153J
	R514	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R515	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R516	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R517	1 1 1	RES 4.7kohm 5% 1/4W	328472J
★701	R518, R519	1 1 1	VR, V24L5G5PHN25KC15AL, 100kohmX2(41PC)(volume)	4320650
	R520	1 1 1	RES 1kohm 5% 1/4W	328102J
	R521	1 1 1	RES 1kohm 5% 1/4W	328102J
	R522	1 1 1	RES 330kohm 5% 1/4W	328334J
	R523	1 1 1	RES 330kohm 5% 1/4W	328334J
	R524	1 1 1	RES 1kohm 5% 1/4W	328102J
	R525	1 1 1	RES 1kohm 5% 1/4W	329102J
	R526	1 1 1	RES 10kohm 5% 1/4W	329103J
	R527	1 1 1	RES 10kohm 5% 1/4W	328103J
	R528	1 1 1	RES 470kohm 5% 1/4W	328474J
	R529	1 1 1	RES 470kohm 5% 1/4W	328474J
	R530	1 1 1	RES 12kohm 5% 1/4W	328123J
	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
	R536	1 1 1	RES 12kohm 5% 1/4W	328123J
	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
	R548	1 1 1	RES 220ohm 5% 1/4W	328221J
	R549	1 1 1	RES 220ohm 5% 1/4W	328221J
	R550	1 1 1	RES 220kohm 5% 1/4W	328224J
	R551	1 1 1	RES 220kohm 5% 1/4W	328224J
	R601	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	R602	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	R603	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R604	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R605	1 1 1	RES 390kohm 5% 1/4W	328394J
	R606	1 1 1	RES 390kohm 5% 1/4W	328394J
★704	S3–S6	1 1 1	TETRA PUSH SW SUE-43 (loudness, high-fil, tone, subsonic fil) — quadruple pushbutton switch	4040880
★705	S7,S8	1 1 1	TWIN PUSH SW (A speakers, B speakers) — double pushbutton switch	4040930

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+ (W-type-u E-type-u N-type-d)	DESCRIPTION++	PART NO.
			(POWER AMP SECTION)	
	C701	1 1 1	E–CAP 35R4.7uF LC	211415L
	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
	C706	1 1 1	E–CAP 50R100uF	211530Q
	C707	1 1 1	E–CAP 16R100uF	211230Q
	C708	1 1 1	E–CAP 16R100uF	211230Q
	C709	1 1 1	E–CAP 6.3R220uF	211032Q
	C710	1 1 1	E–CAP 6.3R220uF	211032Q
	C711	1 1 1	C–CAP 15pF 10% 50V SL	232150K
	C712	1 1 1	C–CAP 15pF 10% 50V SL	232150K
	C713	1 1 1	M–CAP 0.001uF 10% 50V	222102K
	C714	1 1 1	M–CAP 0.001uF 10% 50V	222102K
	C715	1 1 1	C–CAP 6pF ±0.5pF 50V SL	232609D
	C716	1 1 1	C–CAP 6pF ±0.5pF 50V SL	232609D
	C717	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C718	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C719	1 1 1	C–CAP 3pF ±0.5pF 50V SL	232309D
	C720	1 1 1	C–CAP 3pF ±0.5pF 50V SL	232309D
	D701	1 1 1	DIODE 1S2076	501019S
	D702	1 1 1	DIODE 1S2076	501019S
	D703	1 1 1	DIODE 1S2076	501019S
	D704	1 1 1	DIODE 1S2076	501019S
	D705	1 1 1	DIODE 1S2076	501019S
	D706	1 1 1	DIODE 1S2076	501019S
	D707	1 1 1	DIODE 1S2076	501019S
	D708	1 1 1	DIODE 1S2076	501019S
	F2	1 1 –	FUSE 5A 250V MGC	4700540
	F3	1 1–	FUSE 5A 250V MGC	4700540
		4 4 –	FUSE HOLDER	7050420
	F2	– – 1	MIDGET FUSE	
	F3	– – 1	MIDGET FUSE	
		– – 4	MIDGET FUSE HOLDER	7050430
	L1	1 1 1	CHOKE COIL	1210830
	L2	1 1 1	CHOKE COIL	1210830
	Q701	1 1 1	TR 2SA798 (F,G)	514086S
	Q702	1 1 1	TR 2SA798 (F,G)	514086S
	Q703	1 1 1	TR 2SB646A (C,D)	510052S
	Q704	1 1 1	TR 2SB646A (C,D)	510052S
	Q705	1 1 1	TR 2SC1345 (E)	511027S
	Q706	1 1 1	TR 2SC1345 (E)	511027S
	Q707	1 1 1	TR 2SD666A (C,D)	511025S
	Q708	1 1 1	TR 2SD666A (C,D)	511025S
	Q709	1 1 1	TR 2SC1345 (E)	511027S
	Q710	1 1 1	TR 2SC1345 (E)	511027S
	Q711	1 1 1	TR 2SA844 (D,E)	510051S
	Q712	1 1 1	TR 2SA844 (D,E)	510051S
	Q713	1 1 1	TR 2SD667A (C,D)	511026S
	Q714	1 1 1	TR 2SD667A (C,D)	511026S
	Q715	1 1 1	TR 2SB647A (C,D)	511053S
	Q716	1 1 1	TR 2SB647A (C,D)	511053S
	Q717	1 1 1	TR 2SD388 (R,S)	513041S
	Q718	1 1 1	TR 2SD388 (R,S)	513041S
	Q719	1 1 1	TR 2SB541 (R,S)	513053S
	Q720	1 1 1	TR 2SB541 (R,S)	513053S
	R701	1 1 1	RES 68kohm 5% 1/4W	328683J
	R702	1 1 1	RES 68kohm 5% 1/4W	328683J
	R703	1 1 1	RES 3.9kohm 5% 1/4W	328392J
	R704	1 1 1	RES 3.9kohm 5% 1/4W	328392J
	R705	1 1 1	RES 5.6kohm 5% 1/4W	328562J
	R706	1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R707	1 1 1	RES 18kohm 5% 1/4W	328183J
	R708	1 1 1	RES 18kohm 5% 1/4W	328183J
	R709	1 1 1	RES 1.8kohm 5% 1/4W	328182J
	R710	1 1 1	RES 1.8kohm 5% 1/4W	328182J
	R711	1 1 1	RES 1.8kohm 5% 1/4W	328182J
	R712	1 1 1	RES 1.8kohm 5% 1/4W	328182J
	R713	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R714	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R715	1 1 1	RES 10kohm 5% 1/4W	328103J
	R716	1 1 1	RES 10kohm 5% 1/4W	328103J
	R717	1 1 1	RES 150ohm 5% 1/4W	328151J
	R718	1 1 1	RES 150ohm 5% 1/4W	328151J
	R719	1 1 1	RES 47ohm 5% 1/4W	328470J
	R720	1 1 1	RES 47ohm 5% 1/4W	328470J
	R721	1 1 1	FP-MO-RES 100ohm 5% 1/2W	360101L
	R722	1 1 1	FP-MO-RES 100ohm 5% 1/2W	360101L
	R723	1 1 1	RES 33kohm 5% 1/4W	328333J
	R724	1 1 1	RES 33kohm 5% 1/4W	328333J
	R725	1 1 1	RES 68kohm 5% 1/4W	328683J
	R726	1 1 1	RES 68kohm 5% 1/4W	328683J
	R727	1 1 1	RES 1kohm 5% 1/4W	328102J
	R728	1 1 1	RES 1kohm 5% 1/4W	328102J
	R729	1 1 1	HVR EVL-S6A-A00-B52 500ohm–potentiometer	4300700
	R730	1 1 1	HVR EVL-S6A-A00-B52 500ohm–potentiometer	4300700
	R731	1 1 1	RES 100ohm 5% 1/4W	328101J
	R732	1 1 1	RES 100ohm 5% 1/4W	328101J
	R733	1 1 1	RES 680ohm 5% 1/4W	328681J
	R734	1 1 1	RES 680ohm 5% 1/4W	328681J
	R735	1 1 1	RES 680ohm 5% 1/4W	328681J
	R736	1 1 1	RES 680ohm 5% 1/4W	328681J
	R737	1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
	R738	1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
	R739	1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
	R740	1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
	R741	1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
	R742	1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
	R743	1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
	R744	1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
	R745	1 1 1	CEM-RES 0.47ohm 5W	384479W
	R746	1 1 1	CEM-RES 0.47ohm 5W	394479W
	R747	1 1 1	CEM-RES 0.47ohm 5W	384479W
	R748	1 1 1	CEM-RES 0.47ohm 5W	384479W
	R749	1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	R750	1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	R751	1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	R752	1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	R753	1 1 1	FP-MO-RES 330ohm 5% 2W	362331L
	R754	1 1 1	FP-MO-RES 330ohm 5% 2W	362331L
	ZD701	1 1 1	ZENER DIODE HZ24	502040S
	ZD702	1 1 1	ZENER DIODE HZ24	502040S
		1 1 1	HEATSINK (EX)	7081840
		1 1 1	HEATSINK (B)	7081860
		1 1 1	HEATSINK (F)	7081960
		1 1 1	HEATSINK (S)	7081970
		8 8 8	PTS 3 ϕ x 8–screw	814308S
		8 8 8	PMS 3 ϕ x 14–screw	810314S
		8 8 8	TW(I) 3 ϕ–washer	893403U
		8 8 8	TW(I) 3 ϕ–washer	893403U
		8 8 8	IN 3 ϕ–nut	892013S

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KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d)	DESCRIPTION++	PART NO.
★706		1 1 1	EAR JACK HLJ 0190	4550220
			(POWER SUPPLY SECTION)	
	C801	1 1 1	C–CAP 0.01uF 100,–0% 500V	238103P
	C802	1 1 1	C–CAP 0.01uF 100,–0% 500V	238103P
	C803	1 1 1	C–CAP 0.01uF 100,–0% 500V	238103P
	C804	1 1 1	C–CAP 0.01uF 100,–0% 500V	238103P
	C805	1 1 1	E–CAP 50L3300uF	212543P
	C806	1 1 1	E–CAP 50L3300uF	212543P
	C807	1 1 1	E–CAP 50L3300uF	212543P
	C808	1 1 1	E–CAP 50L3300uF	212543P
	C809	1 1 1	E–CAP 50L3300uF	212543P
	C810	1 1 1	E–CAP 50L3300uF	212543P
	C811	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C812	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C813	1 1 1	E–CAP 35R330uF	211433Q
	C814	1 1 1	E–CAP 35R330uF	211433Q
	C815	1 1 1	E–CAP 35R47uF	211425Q
	C816	1 1 1	E–CAP 35R47uF	211425Q
	C817	1 1 1	E–CAP 35R47uF	211425Q
	C818	1 1 1	E–CAP 35R47uF	211425Q
	C819	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	C820	1 1 1	M–CAP 0.1uF 10% 50V	222104K
	D801	1 1 1	DIODE S5VB10	560041S
	↑	1 1 1	HEATSINK (D)	7081950
	↑	1 1 1	PTS 3 ϕ x 12–screw	814312S
	Q801	1 1 1	TR 2SD571 (L,M)	511012S
	Q802	1 1 1	TR 2SB605 (L,M)	510041S
	F1	1 1 –	FUSE 2A AC125V	4700660
		2 2 –	FUSE HOLDER	7050420
	F1	– – 1	MIDGET FUSE 2A	
		– – 2	MIDGET FUSE HOLDER	7050430
	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
	R804	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R805	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R806	1 1 1	FP-MO-RES 100ohm 5% 1W	361101L
	R807	1 1 1	RES 100ohm 5% 1/4W	328101J
	R808	1 1 1	RES 100ohm 5% 1/4W	328101J
	R809	1 1 1	RES 47ohm 5% 1/4W	328470J
	R810	1 1 1	RES 47ohm 5% 1/4W	328470J
	R811	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L
	R812	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L
	ZD801	1 1 1	ZENER DIODE HZ33	502039S
	ZD802	1 1 1	ZENER DIODE HZ33	502039S
			(PROTECTOR SECTION)	
	C821	1 1 1	E–CAP 16R220uF	211232Q
	C822	1 1 1	E–CAP 16R220uF	211232Q
	C823	1 1 1	E–CAP 35R4.7uF	211415Q
	C824	1 1 1	E–CAP 35R220uF	211432Q
	D802	1 1 1	DIODE 1S1885	560032S
	D803	1 1 1	DIODE 1S2076A	501020S
	Q803	1 1 1	TR 2SA844 (D,E)	510051S
	Q804	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	Q805	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	Q806	1 1 1	TR 2SC1627 (O,Y)	511017S
	R813	1 1 1	RES 22kohm 5% 1/4W	328223J
	R814	1 1 1	RES 22kohm 5% 1/4W	328223J
	R815	1 1 1	RES 18kohm 5% 1/4W	328183J
	R816	1 1 1	RES 18kohm 5% 1/4W	328183J
	R817	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	R818	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	R819	1 1 1	RES 220kohm 5% 1/4W	328224J
	R820	1 1 1	RES 12kohm 5% 1/4W	328123J
	R821	1 1 1	RES 100kohm 5% 1/4W	328104J
	R822	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
	R823	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
		1 1 1	RELAY MAT4B-211R(DC24V)	1700210

METER CONTROL CIRCUIT BOARD

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d)	DESCRIPTION++	PART NO.
★800		1 1 1	METER CONTROL PCB ASS– complete circuit board	9492350
	D901	1 1 1	DIODE 1N60P	500001G
	D902	1 1 1	DIODE 1N60P	500001G
	D903	1 1 1	DIODE 1S2076	501019S
	D904	1 1 1	DIODE 1S2076	501019S
	D905	1 1 1	DIODE 1S2076	501019S
	D906	1 1 1	DIODE 1S2076	501019S
★801	R913, R914	1 1 1	VR,V16L4G3-1PHN25KC, B5kohmX2(meter level)	4320670
	R915	1 1 1	HVR, EVL-S6A-A00-B14, B10kohm –potentiometer	4300650
	R916	1 1 1	HVR, EVL-S6A-A00-V14,B10kohm –potentiometer	4300650
	R917	1 1 1	RES 680ohm 5% 1/4W	328681J
	R918	1 1 1	RES 680ohm 5% 1/4W	328681J
	R919	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm –potentiometer	4300700
	R920	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm –potemtiometer	4300700

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 ± 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 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 1.5 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 60 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 1.5 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 60 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

TRANSISTORS

+ NOTES

Ge : Germanium
Si : Sillicon

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

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C, unless otherwise specified)					ELECTRICAL CHARACTERISTICS Tipical Values: (TA = 25° C unless otherwise specified)													MANUFUCTURE
			Collector-to-Base Voltage VCBO (V)	Emitter-to-Base Voltage VEBO (V)	Collector Current IC (mA)	Collector Dissipation PC (mW)	Junction Temperature Tj (C)	Collector Cutoff Current ICBO (uA)	VCB (V)	Static Forward-Current Transfer Ratio hFE	VCE (V)	IC (mA)	Collector-Emitter Saturation Voltage VCE(sat) (V)	IC (mA)	IB (mA)	Gain-Bandwidth Product fT fαb* (MHz)	VCE VCB* (V)	IE IC* (mA)	Base Spreading Resistance γbb' hie(real)* (Ω)	VCE VCB* (V)	IE (mA)	Output Capacitance Cob (pF)	
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
2SB646A(C,D)	AF,Pridriver	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	–0.1 max	–60	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	135 400	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	0.5 max	18	400 800	12	2	0.5 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	70 240	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	40 120	5	1A	2max	5	1	9	10	–200				190	NEC
2SD571(L,M)	AF,Driver	NPN Si–E	60	5	700	800	150	0.1 max	60	90 270	1	100	0.6 max	500	50	110	6	–10					NEC
2SD666A(C,D)	AF,Pridriver	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 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 Tipical Values: (TA = 25°C unless otherwise specified)															MANUFACTURE
			Gate-to-Drain Voltage VGDO (V)	Gate-to-Source Voltage BGSO (V)	Gate Current IG (mA)	Drain Current ID (mA)	Total Power Dissipation Tj (mW)	Junction Temperature Tj (°C)	Date Leak Current Test Conditions	IGSS (nA)	Gate to Drain Breakdown Voltage Test Conditions	V(BR) GDO (V)	Drain Current Test Conditions	IDSS (mA)	Gate to Source Cutoff Voltage Test Conditions	VGS (V)	Forward Transfer Admittance Test Conditions	|yfs|	Feed back Capacitance Test Conditions	CRSS (pF)	Power Gain (Common source) Test Conditions	GPS (dB)	Noise Figure Test Conditions	NF (dB)	
2SK68A (L,M)	AF, Low noise	N-channel Junction FET	–50	–50	10	20	250	125	VGS= –20V VDS= 0	–1.0 max			VDS= 10V VGS= 0	0.5 min 3.0 typ 12 max	VDS= 10V ID= 10uA	–0.5	VDS= 10V ID= 0.5mA f=1KHz	5.2	VDS= 10V VGS= 0 f=1MHz	2.6			VDS= 10V VGS= 0 RG= 1Kohm	10 max (10Hz) 1.5 max (1KHz)	NEC

DIODES, LEDS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25° C unless otherwise specified)									ELECTRICAL CHARACTERISTICS Tipical Values: (TA = 25° C unless otherwise specified)							MANUFACTURE
			Reverse Surge Voltage VR surge (V)	Peak Reverse Voltage VRM (V)	Reverse Voltage VR (V)	Peak Forward Voltage VFM (V)	Peak Forward Current IFM (mA)	Average Rectified Current I (mA)	Forward Surge Current IF surge (A)	Junction Temperature Tj (C)	Total Power Dissipation PD (mW)	Forward Current IF min (mA)	Test Condition VF (V)	Forward Voltage VF (V)	Test Condition IF (mA)	Reverse Current IR max (uA)	Test Condition VR (V)		
S5VB10	Rectifier			–100				6A	200 (Tc=25 C)	150				1.05	3A	10			SHINDENGEN
1N60P	FM detector	Ge–P		–35	–25	500	150	IF = 50	0.5 (1 sec)	70		4	1			75	–10		HITACHI
1S1885	Rectifier	Si–A		–100		70		1A (Ta=65 C)	60					1.2	1.5A	10	–100		TOSHIBA
1S2076	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

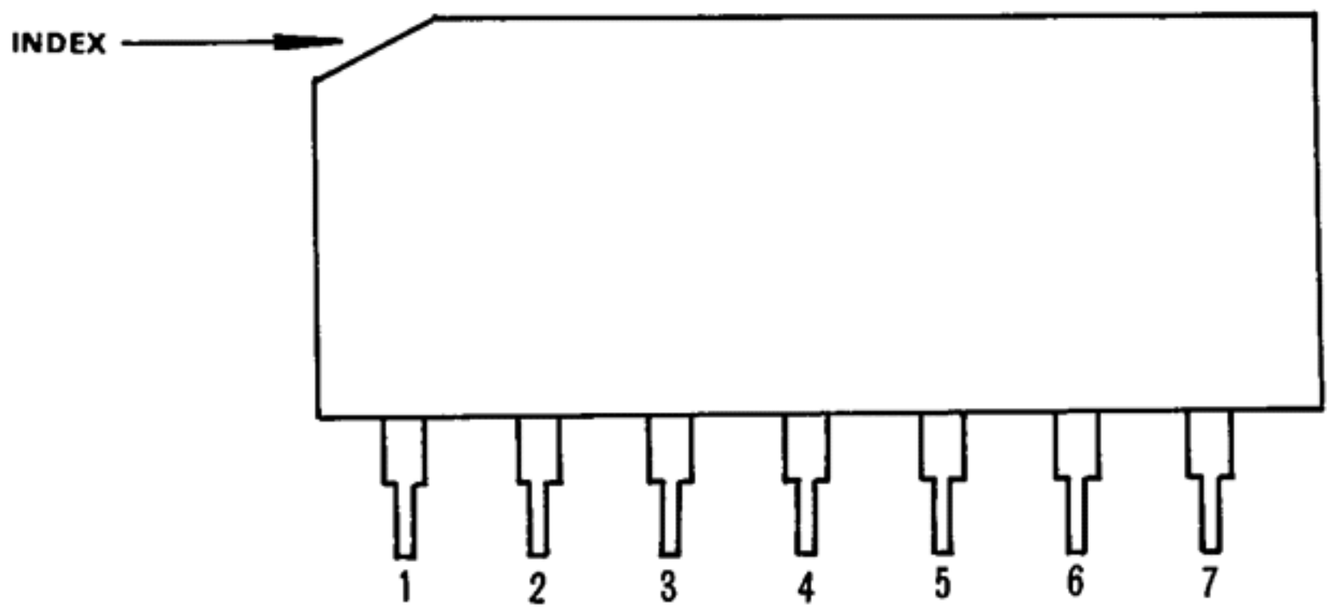
ZENER DIODES

DEVICE TYPE	APPLICATIONS	STRUCTURE+	MAXIMUM RATINGS Absolute –Maximum Values: (TA = 25° C unless otherwise specified)			ELECTRICAL CHARACTERISTICS Tipical Values: (TA = 25° C unless otherwise specified)														MANUFUCTURE
			Total Power Dissipation PD (mW)	Zener Current IZ (A)	Junction Temperature Tj Tj (C)	Zener Voltage VZ MIN (V)	VZ TYP (V)	VZ MAX (V)	Test Condition IZ (mA)	Differential Resistance rd TYP (Ω)	rd MAX (Ω)	Test Condition IZ (mA)	Temperature Coefficient γZ TYP (%/ C)	γZ MAX (%/ C)	Test Condition IZ (mA)	Reverse Current IR MAX (uA)	Test Condition VR (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 mB/ C	–2	1	–25		HITACHI

INTEGRATED CIRCUIT (TA7136P)

DEVICE TYPE	APPLICATION	ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)				ELECTRICAL CHARACTERISTICS(T_A=25°C) Tipical 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 (Vrms)	Equivalent Input Noise Voltage (μVrms)	
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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