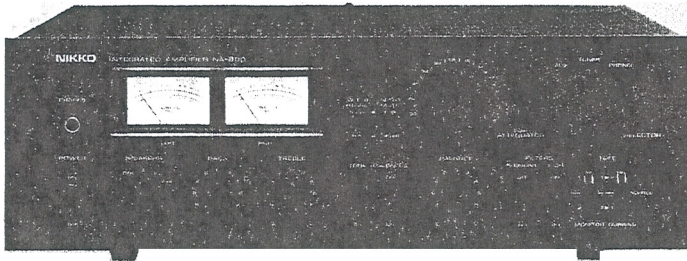


Nikko

AMPLIFIER

NA-890

INTEGRATED AMPLIFIER



TYPE AND VOLTAGE

W-TYPE UL and CSA type	120V AC
E-TYPE NK-STD type	220/240V AC
N-TYPE DEMKO and SEMKO type	
D-TYPE DIN type	

SERVICE MANUAL

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SPECIFICATIONS

W-TYPE, E-TYPE, N-TYPE

Continuous Power Output, 8 ohm loads:

20 Hz – 20 KHz, @ 0.04 % THD 70 Watts

1 KHz, @ 0.04 % THD 75 Watts

TH Distortion, 8 ohm loads:

@ Continuous Power Output < 0.04 %

@ 1 Watt Power Output < 0.04 %

IM Distortion, 8 ohm loads:

@ Continuous Power Output < 0.04 %

@ 1 Watt Power Output < 0.04 %

IHF Power Bandwidth:

@ 8 ohm loads 10 Hz – 30 KHz

Damping Factor, 8 ohm loads, @ 1 KHz 60

Frequency Response, 8 ohm loads:

PHONO → TAPE OUT
. < RIAA ± 1 dB @ 30 Hz – 15 KHz

TUNER, AUX, TAPE IN → SP. TER
. < ± 2 dB @ 10 Hz – 30 KHz

Input Sensitivity for 70 Watts Power Output, @ 1 KHz:

PHONO 2.3 mV ± 2 dB

TUNER, AUX, TAPE IN 140 mV ± 2 dB

Phono Overload, @ 1 KHz, @ 0.1 % THD . . 220 mV ± 2 dB

Output Level @ 2.3 mV Input, @ 1 KHz:

PHONO → TAPE OUT 140 mV ± 2 dB

Signal to Noise Ratio, IHF "A" Network:

PHONO < 80 dB

TUNER, AUX, TAPE IN < 90 dB

Tone Control

BASS @ 70 Hz ± 10 ± 2 dB

TREBLE @ 10 KHz ± 10 ± 2 dB

High Cut Filter, @ 7 KHz – 3 ± 2 dB

Low Cut Filter, @ 20 Hz – 3 ± 2 dB

Loudness Control, (VOLUME: –30 dB)

@ 70 Hz + 6 ± 2 dB

@ 10 KHz + 3 ± 2 dB

Audio Muting:

@ 0 dB (0.775 V) Power Output –20 ± 2 dB

Idling Current 20 ⁺²⁰/_{–10} mA

Midpoint Voltage 0 ± 50 mV

Mute Time 5 ± 3 Seconds

D-TYPE

Continuous Power Output, 4 ohm loads:

20 Hz – 20 KHz, @ 0.1 % THD 70 Watts

1 KHz, @ 1 % THD 80 Watts

TH Distortion, 4 ohm loads:

@ Continuous Power Output < 0.1 %

@ 1 Watt Power Output < 0.08 %

IM Distortion, 4 ohm loads:

@ Continuous Power Output < 0.1 %

@ 1 Watt Power Output < 0.08 %

Power Bandwidth, 4 ohm loads:

@ 0.1 % THD 10 Hz – 30 KHz

Damping Factor, 4 ohm loads, @ 1 KHz 45

Output Level @ 2.3 mV Input, @ 1 KHz:

PHONO → TAPE OUT 15 mV ± 2 dB

Signal to Noise Ratio, DIN Filter:

PHONO < 60 dB

TUNER, AUX, TAPE IN < 80 dB

Tone Control

BASS @ 70 Hz ± 10 ± 2 dB

TREBLE @ 10 KHz ± 10 ± 2 dB

High Cut Filter @ 7 KHz – 3 ± 2 dB

Low Cut Filter @ 20 Hz – 3 ± 2 dB

Loudness Control, (VOLUME: – 30 dB)

@ 70 Hz + 6 ± 2 dB

Frequency Response, 4 ohm loads:

PHOTO → TAPE OUT

..... < RIAA ± 1 dB 30 Hz – 15 KHz

TUNER, AUX, TAPE IN → SP. TER

..... < ± 2 dB @ 10 Hz – 30 KHz

Input Sensitivity for 80 Watts Power Output, @ 1 KHz:

PHONO 2.3 mV ± 2 dB

TUNER, AUX, TAPE IN 140 mV ± 2 dB

Phono Overload, @ 1 KHz, @ 0.1 % THD . 210 mV ± 2 dB

@ 10 KHz + 3 ± 2 dB

Audio Muting:

@ 0 dB (0.775 V) Power Output - 20 ± 2 dB

Idling Current 20 ⁺²⁰/₋₁₀ mA

Midpoint Voltage 0 ± 50 mV

Mute Time 5 ± 3 Seconds

Dimension

Width 16 - 1/2 in. (420 mm)

Height 5 - 3/8 in. (138 mm)

Depth 13 - 1/8 in. (335 mm)

Weight 24.2 lbs. (11 Kg)

Specifications subject to change without notice.

BLOCK DIAGRAM

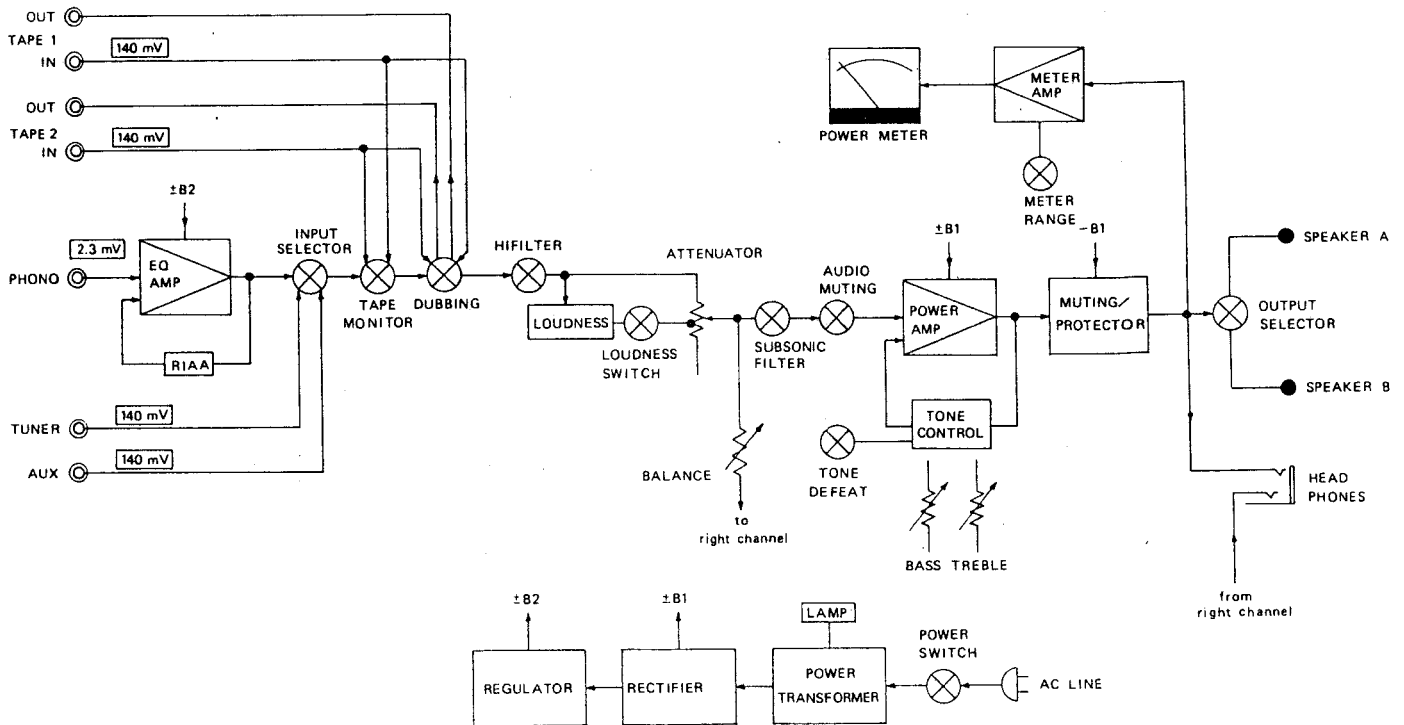


Figure 1

DISASSEMBLY

CABINET COVER REMOVAL

Remove three tapping screws from the top of the metal cover.
Remove six screws from both sides of the metal cover.

BOTTOM PLATE REMOVAL

Remove nine tapping screws (No. 3 ~ 11) (Photo 1) from the bottom of the unit.

FRONT PANEL REMOVAL

1. Using hexagonal wrench, remove two knobs (ATTENUATOR, SELECTOR) from the front of the unit.
2. Remove eleven knobs (POWER, SPEAKERS, BASS, TREBLE, TONE DEFEAT, LOUDNESS, BALANCE, SUBSONIC HI-FILTER, MONITOR, DUBBING) from the front of the unit by pulling them forward.
3. Remove four tapping screws (No. 1, 2) (Photo 1), (No. 1, 2) (Photo 2).
4. Lift the front panel away from the unit.

POWER TRANSFORMER REMOVAL

1. Disconnect all the power transformer cables.
2. Remove four screws (No. 3 ~ 6) (Photo 2) from the bottom plate.
3. Lift the power transformer away from the unit.

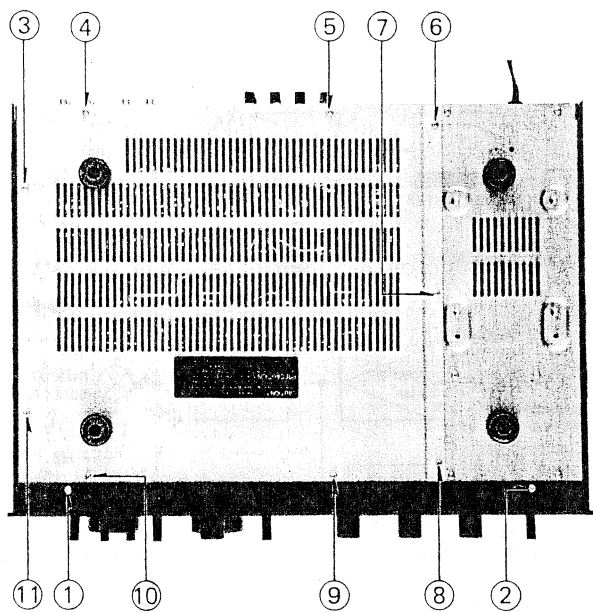


Photo 1

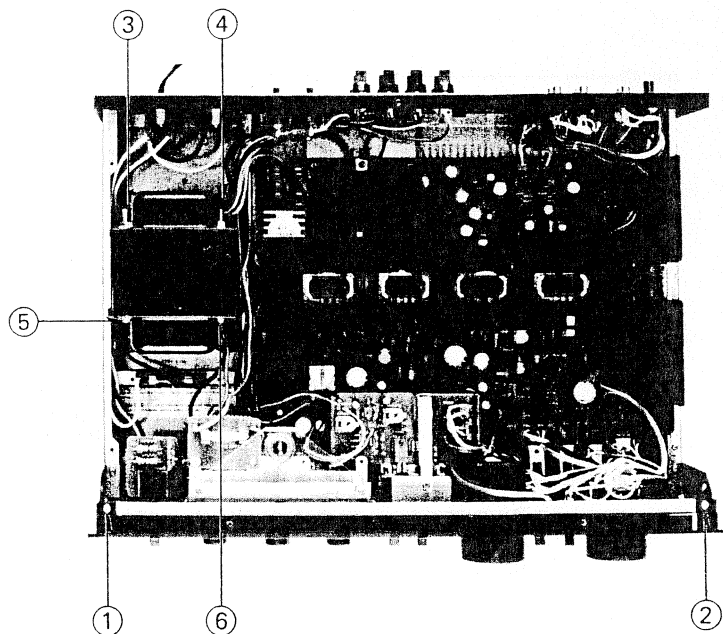


Photo 2

PARTS LOCATION

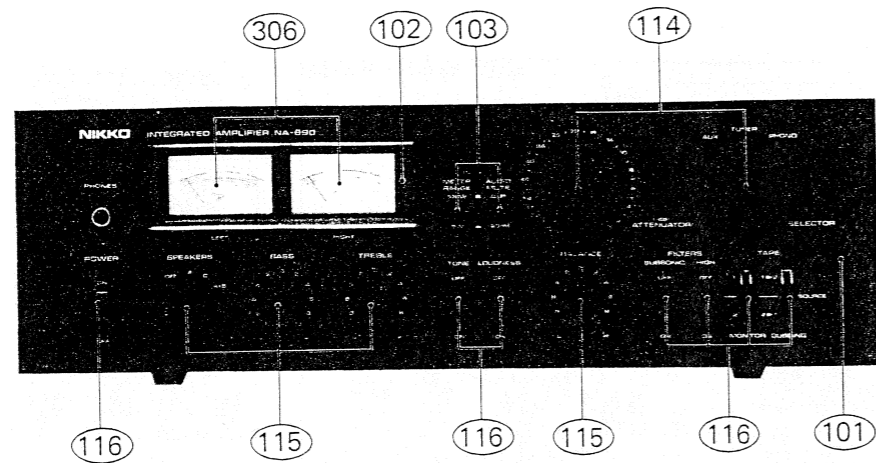


Photo 3

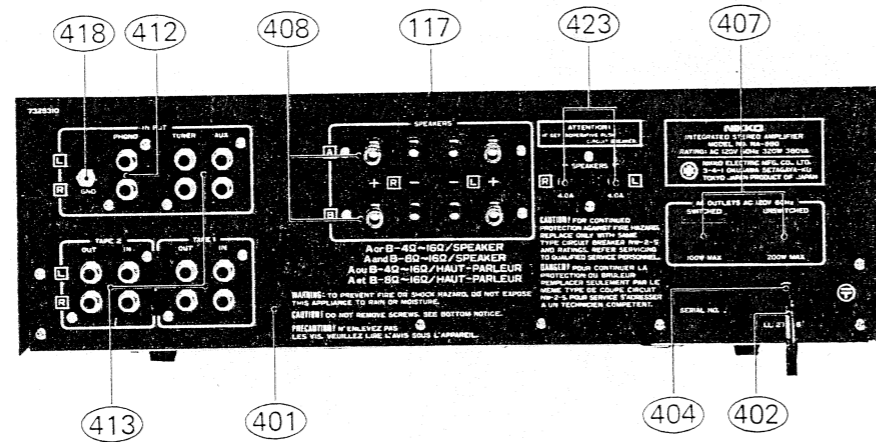


Photo 4

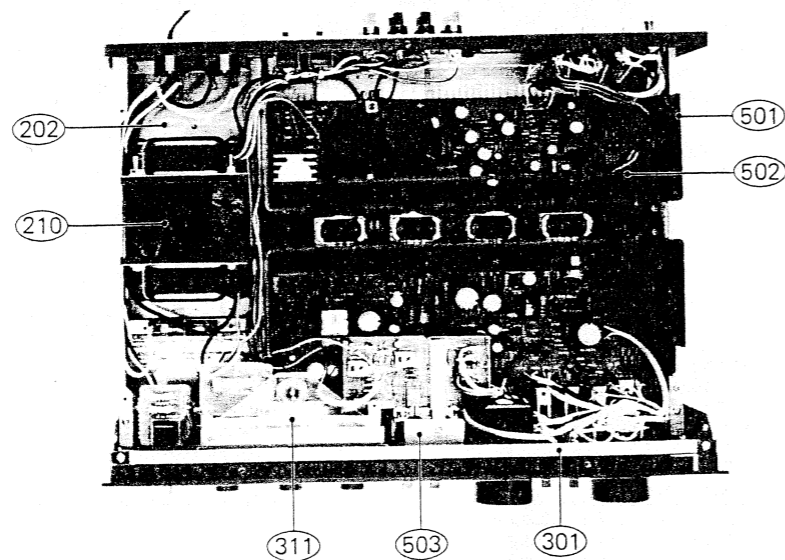


Photo 5

ALIGNMENT

TEST EQUIPMENT

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

IDLING CURRENT ADJUSTMENT

(See Amp PC Board and Fig. 2)

Idling current is obtained by measuring the voltage of the emitter resistor connected to the power transistor.

Left Channel:

1. Connect DC Voltmeter in accordance with Fig. 2.
2. Apply no signal to the amplifier.
3. Adjust potentiometer HVR701 so that the voltage drop across R751 is 6.6 (or 3.3 to 13.2) millivolts.

Right Channel:

Similarly, adjust potentiometer HVR702 so that the voltage drop across R752 is 6.6 (or 3.3 to 13.2) millivolts.

METER LEVEL ADJUSTMENT

(See Meter Control Circuit Board)

1. Set potentiometers HVR901 and HVR902 to mid-range.
2. Connect Generator to "AUX" of the amplifier.
3. Apply sine wave (1 kHz) to the amplifier.

Left Channel:

1. Push "METER RANGE" switch to "5W" position.
2. Set Generator and "ATTENUATOR" to obtain 5 watts (6.3 Volts into 8 ohms load).
3. Adjust potentiometer HVR901 so that the power meter reads 5 watts.

Right Channel:

Similarly, adjust potentiometer HVR902 so that the power meter reads 5 watts.

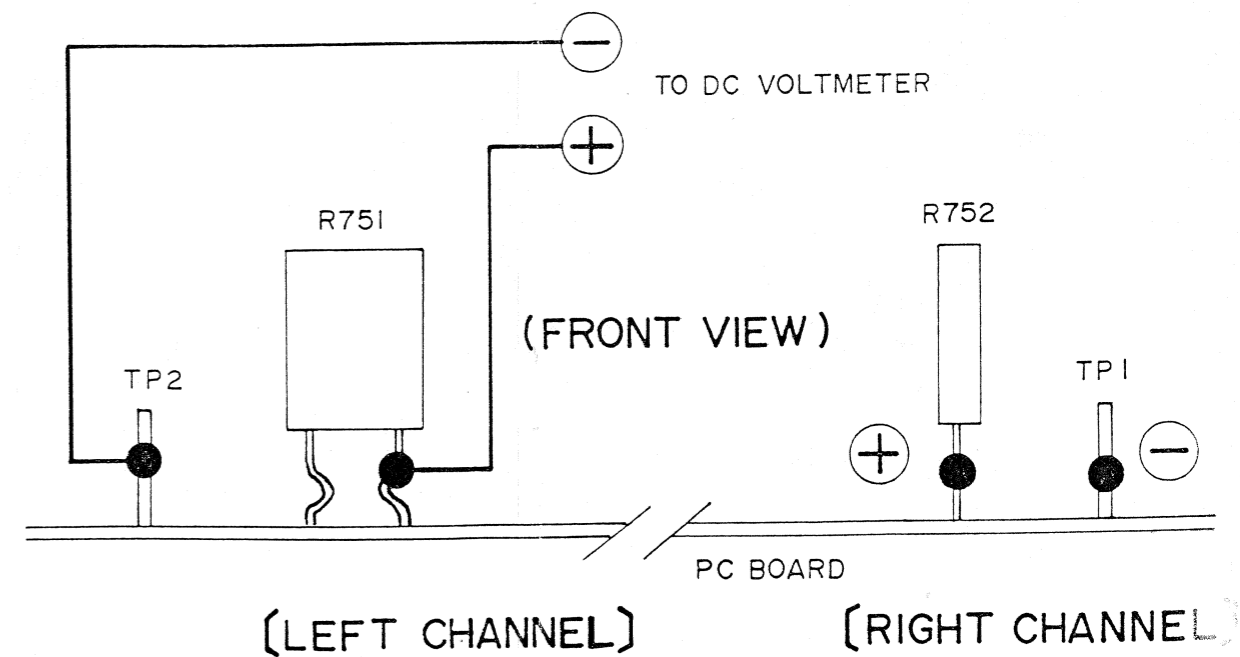


Figure 2

PC BOARD (BOTTOM VIEW)

WIRING GUIDE

- 5. (G25) From POWER TRANSFORMER (GRY.) To PILOT LAMP (BLK.)
- 6. From TERMINAL NO. 31 (YEL.) To PILOT LAMP (BLK.)
- 7. (G24) To POWER METERS (BLK.)
- 8. To CIRCUIT BREAKER R (VIO/WHT.)-W-TYPE only To TERMINAL NO. 33 (VIO/WHT.)-E, N, D-TYPE To TERMINAL NO. 36 (VIO/WHT.)
- 9. To CIRCUIT BREAKER L (VIO.)-W-TYPE only To TERMINAL NO. 35 (VIO.)-E, N, D-TYPE To TERMINAL NO. 39 (VIO.)
- 10. To VR501 (VOLUME) L (WHT.)
- 11. (G15) To VR502 (VOLUME) R (CLEAR)
- 12. To VR502 R (PINK)
- 13. From VR502 R (PINK)
- 14. (G11) From VR502 (CLEAR)
- 15. From VR501 L (WHT.)
- 16. From VR502 R (PINK)
- 17. From VR501 L (WHT.)
- 18. (G10) From VR501 (CLEAR)
- 19. (G8) To LUG (FRONT PLATE) (CLEAR)
- 20. (G7) To LUG (FRONT PLATE) (CLEAR)

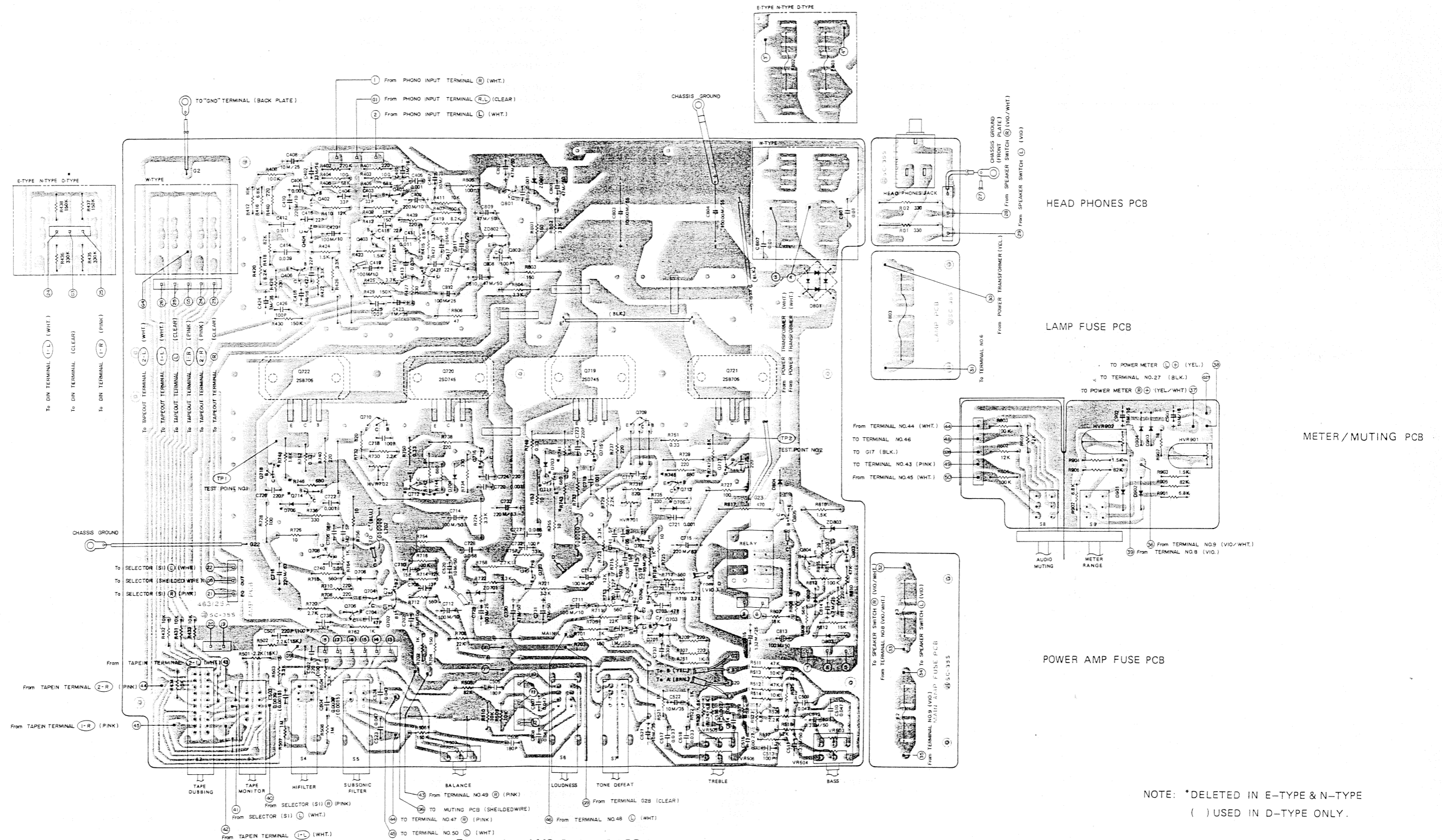


Figure 4 AMP P.C. BOARD

NOTE: *DELETED IN E-TYPE & N-TYPE () USED IN D-TYPE ONLY.

ARTS LIST

The KEY NUMBER (#) marked with a (*) on parts list relate to numbers of three digits with a (O). (Photo 3 - 5)

Numberals in file indicate the quantity of parts used in one type.

- TR : Transistor
- FET : Field effect transistor
- VR : Volume control (Variable resistor)
- RES : Carbon film fixed resistor
- MO-RES : Metal oxide film fixed resistor
- CE-RES : Cemented wirewound 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
- LC-CAP : Low leakage electrolytic capacitor

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

5. Parts ordering procedure:

- A. Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only)
 - B. 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.)

PART ORDERING PROCEDURE ----- Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) 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 ⁺	DESCRIPTION ⁺⁺	PART NO.
PACKING MATERIALS & ACCESSORIES				
301	1 1 1	1	Carton box	9825450
302	2 2 2	2	Pad	9840770
303	1 1 1	1	Sack, polyethylen cloth	9640550
304	1 1 1	1	Cloth, polishing	9690040
305	1 1 1	1	Sack, polyethylen cloth - # 13	9640320
305a	1 ---	1	Manual, instruction - E	960252E
305b	- 1 -	1	Manual, instruction - K	960253K
305c	--- 1	1	Manual, instruction - G	960254G
307	--- 1	1	Envelope - G	9690170
307a	1 ---	1	Service station list	9690180
307b	1 ---	1	Card, warranty	967007A
307c	1 1 1	1	Drier - Silica gel	9690010
CABINET ASSEMBLY				
101a	1 1 1	1	Panel, front - SILVER	7884210
101b	1 1 1	1	Panel, front - BLACK	7884220
101	1 1 1	1	Window, meter	7802360
102	2 2 2	2	Button, push - meter range/muting	7401550
104	2 2 2	2	Guide, for push button	7401560
105	2 2 2	2	Stopper, for push button	7401460
106	2 2 2	2	Spring - (V)	7440400
107	1 1 1	1	Guide - 2S, for lever switch	7401610
108	2 2 2	2	Guide - 2T, for lever switch	7401590
109	1 1 1	1	Guide - 3T, for lever switch	7401600
110	4 4 4	4	Screw - PTS 3φx8	814308S
111	7 7 7	7	Dust cover, for lever switch	7002000
112	1 1 1	1	Blind plate - FL	7002010
113	1 1 1	1	Blind plate - FU	7002020
113a	2 2 2	2	Knob - 19SL-42DA - attenuator/selector, SILVER	7841290
113b	4 4 4	4	Knob - 19SL-19DR - bass/treble/balance/speaker selector, SILVER	7841250
113c	7 7 7	7	Knob - 19SL-8LS, for lever switches, SILVER	7841190
114a	2 2 2	2	Knob - 19BK-42D - attenuator/selector, BLACK	7841160
115b	4 4 4	4	Knob - 19BK-19D - bass/treble/balance/speaker selector, BLACK	7841140
115b	7 7 7	7	Knob - 19BK-8LS, for lever switches, BLACK	7841200
117	1 1 1	1	Cover, metal	7820890
118	6 6 6	6	Screw - TFS 4φx10	887410W
119	6 6 6	6	Washer - 4φ	893104W
120	3 3 3	3	Screw - PTS 3φx6	814306W
121	1 1 1	1	Plate, bottom	7325260
122	9 9 9	9	Screw - PTS 3φx6	814306S
123	4 4 4	4	Foot - 23φx12	7401800

KEY NO.	SYMBOL NO.	TYPE ⁺	DESCRIPTION ⁺⁺	PART NO.
124	4 4 4	4	Screw - PTS 3φx10	814310S
CHASSIS ASSEMBLY				
*201	1 1 1	1	Angle, right side	7226710
*202	1 1 1	1	Chassis, for power transformer	7325280
203	1 1 1	1	(FRONT PLATE ASSEMBLY)	
	9 9 9	9	Screw - PTS 3φx6	814306S
204	1 1 1	1	(BACK PLATE ASSEMBLY)	
	7 7 7	7	Screw - PTS 3φx6	814306S
205	--- 1	1	Washer - TW (1) 3φ	893403U
206	1 1 1	1	(AMP PCB ASSEMBLY)	
	4 4 4	4	Screw - PTS 3φx10	814310S
207	3 3 3	3	Screw - PTS 3φx8	814308S
208	1 1 1	1	Washer - TW (1) 3φ	893403U
209	1 1 1	1	Lug, ground - 4P	4400080
*210a	1 ---	1	Transformer, power - T-1-332 - 120 V only	1103320
*210b	- 1 -	1	Transformer, power - T-1-333 - 220/240 V class II	1103330
211	4 4 4	4	Screw, tap title - 4φx6	7121110
212	1 1 1	1	Bracket, power transformer	7032080
213	4 4 4	4	Screw - PTS 3φx6	814306S
214	- 1 -	1	(POWER AMP FUSE PCB ASSEMBLY)	
	- 2 -	2	Screw - PTS 3φx6	814306S
215	1 1 1	1	Lug, GND	4400000
216	1 1 1	1	Screw - PTS 3φx6	814306S
217	1 1 1	1	Washer - TW (1) 3φ	893403U
218a	1 ---	1	Fuse holder - 1P	4581840
218b	- 1 -	1	Fuse holder, midget fuse - 1P	4581430
219	1 ---	1	Screw - PTS 3φx8	814308S
220	- 1 -	1	Screw - PMS 3φx8	810308S
221	- 1 -	1	Washer - IN 3φ	892013S
222	- 1 -	1	Washer - TW (1) 3φ	893403U
223a	F 1	1	Fuse - 5A 250V MGC	4700540
223b	F 1	1	Midget fuse - (S) 3.15 A 250 V	4720390
FRONT PLATE ASSEMBLY				
*301	1 1 1	1	Plate, front	7325270
302a	S11	1	Switch, lever - SDA1L TV-5 - power, spst	4025370
302b	S11	- 1 -	Switch, lever - SDE3L class II - power, dpst	4025380
303	2 2 2	2	Screw - PMS 3φx6	810306S
				4050990

KEY NO.	SYMBOL NO.	TYPE ⁺	DESCRIPTION ⁺⁺	PART NO.
304a	S10	1 ---	Switch, rotary - SRY 1-2-4 25KC - speaker selector	4050990
304b	S10	- 1 -	Switch, rotary - SRY 1-4-4 25KC - speaker selector	4051200
305	S1	1 1 1	Switch, rotary - SRY 1-3-3 25R - input selector	4051220
	VR501	1 1 1	VR - WKHG11 250kohm Bx2	
	~ 502	1 1 1	25R - attenuator	4390150
*306	2 2 2	2	Meter, power - 8ohm	4582470
307	1 1 1	1	Holder, meter	7032190
308	2 2 2	2	Screw - PTS 3φx6	814306S
309	1 1 1	1	(LAMP FUSE PCB ASSEMBLY)	
310	1 1 1	1	Screw - PTS 3φx8	814308S
				814306S
*311	1 1 1	1	Reflex plate, meter	7401580
312	2 2 2	2	Screw - PTS 3φx10	814310S
313	1 1 1	1	Lamp - 8V 0.3 A	5808120
314	1 1 1	1	Angle, reflex	7032460
315	1 1 1	1	Panel, meter	7884280
316	1 1 1	1	(METER/MUTING PCB ASSEMBLY)	
				7032070
317	2 2 2	2	Screw - PMS 3φx6	810306S
318	3 3 3	3	Screw - PTS 3φx6	814306S
319	1 1 1	1	Washer - TW (1) 3φ	893403U
320	1 1 1	1	Lug - 1L3P(L)	441131L
321	1 1 1	1	Screw - PTS 3φx6	814306S
322	1 1 1	1	Washer - TW (1) 3φ	893403U
323	1 1 1	1	(HEAD PHONES PCB ASSEMBLY)	
				810306S
324	1 1 1	1	Lug, ground	4400000
325	1 1 1	1	Washer - TW (1) 3φ	893403U
	C3	1	C-CAP 0.0047uf AC125 V	239472C
	C3,C4	- 2 -	C-CAP 0.0047uf AC250 V VDE	239472E
326	- 2 -	2	Cover, C-CAP 23φ	7400980
BACK PLATE ASSEMBLY				
*401a	1 ---	1	Plate, back - W	7325310
*401b	- 1 -	1	Plate, back - E	7325330
*402a	1 ---	1	Plug/Cord - DP-70	606007A
*402b	- 1 -	1	Plug/Cord - CEE-2T	600506J
*402c	--- 1	1	Plug/Cord CEE-2T	600510A
	--- 1	1	Lug, ground	4400000
*404a	1 ---	1	Stopper, cord - SR-3P-4	7400620
*404b	- 1 -	1	Stopper, cord - SR-4N-4	7400690
*404c	--- 1	1	Stopper, cord - SR-6W-1	7400740
405	- 1 -	1	Bracket, cord - EH	7029800
406	- 2 -	2	Screw - PTS 3φx6	814306S
*407	2 ---	2	Socket, AC outlet	4500150
*408	2 2 2	2	Terminal, speaker - screw type - NK	4450480
409	4 4 4	4	Screw - PTS 3φx8	814308S
410	1 1 1	1	Holder, PCB	7032210
411	2 2 2	2	Screw - PTS 3φx6	814306S
*412	1 1 1	1	Terminal, RCA type pin jack - WP 1Px2	4442020
*413	3 3 3	3	Terminal, RCA type pin jack - WP 2Px2	4444020
414	2 2 2	2	Screw - PMS 3φx6	810306S
415	6 6 6	6	Screw - PTS 3φx8	814308S

KEY NO.	SYMBOL NO.	TYPE ⁺	DESCRIPTION ⁺⁺	PART NO.
416	- 1 -	1	Connector, DIN type 5P	4530220
417	- 2 -	2	Screw - PTS 3φx6	814306S
	C1,C2	2 2 2	C-CAP 0.01uf 80, -20 % 50V YG	231103Z
		1 1 1	Lug, ground	4400000
*418	1 1 1	1	Nut, GND terminal	7152060
419	1 1 1	1	Shaft, GND terminal	7152050
420	1 1 1	1	Washer - 1N 3φ	892013S
421	1 1 1	1	Washer - TW (1) 3φ	893403U
422	1 1 1	1	Washer - 3φ	893203D
*423	2 ---	2	Circuit breaker - NW-2S 4.0 A	4900880
424	1 ---	1	Bracket, circuit breaker - 2P	7030140
425	2 ---	2	Screw - PTS 3φx6	814306S
AMP PC BOARD ASSEMBLY				
(EQ AMP SECTION)				
	Q401,402	2 2 2	TR 2SA991 (E or F)	510104S
	Q403,404	2 2 2	TR 2SC1844 (E or F)	512106S
	Q405,406	2 2 2	TR 2SC1815 (Y or GR)	512107S
	C401,402	2 2 2	T-CAP 16D3.3uf	252213M
	C403,404	2 2 2	C-CAP 33pf 10 % 50V SL	232330K
	C405,406	2 2 2	C-CAP 0.001uf 80, -20 % 50V YG	231102Z
	C407,408	2 2 2	E-CAP 25R10uf	211320Q
	C409,410	2 2 2	E-CAP 10R220uf	211132Q
	C411,412	2 2 2	M-CAP 0.011uf 2% 50V	228113G
	C413,414	2 2 2	M-CAP 0.039uf 2% 50V	228393G
	C415,416	2 2 2	C-CAP 22pf 10% 50V SL	232220K
	C417,418	2 2 2	E-CAP 16R10	211220Q
	C419,420	2 2 2	E-CAP 10R100uf	211130Q
	C421,422	2 2 2	C-CAP 22pf 10% 50V SL	232220K
	C423,424	2 2 2	T-CAP 35D1uf	252410M
	C425,426	2 2 2	C-CAP 100pf 10% 50V SL	232101K
	R401,402	2 2 2	RES 220kohm 5% 1/4W	328224J
	R403,404	2 2 2	RES 100ohm 5% 1/4W	328101J
	R405,406	2 2 2	RES 68kohm 5% 1/4W	328683J
	R407,408	2 2 2	RES 100kohm 5% 1/4W	328104J
	R409,410	2 2 2	RES 12kohm 5% 1/4W	328123J
	R411,412	2 2 2	RES 10kohm 5% 1/4W	328103J
	R413,414	2 2 2	RES 150ohm 5% 1/4W	328151J
	R415,416	2 2 2	RES, metal film 6.8kohm 2% 1/4W	304682G
	R417,418	2 2 2	RES, metal film 82kohm 2% 1/4W	304823G
	R419,420	2 2 2	RES 8.2kohm 5% 1/4W	328822J
	R421,422	2 2 2	RES 3.3kohm 5% 1/4W	328332J
	R423,424	2 2 2	RES 1.5 kohm 5% 1/4W	328152J
	R425,426	2 2 2	RES 3.3kohm 5% 1/4W	329332J
	R427,428	2 2 2	RES 330ohm 5% 1/4W	328331J
	R429,430	2 2 2	RES 150kohm 5% 1/4W	328154J
	R431,432	2 2 2	RES 10kohm 5% 1/4W	328103J
	R433,434	2 2 2	RES 10kohm 5% 1/4W	328103J
	R435,436	2 2 2	RES 330kohm 5% 1/4W	328334J
	R437,438	2 2 2	RES 100kohm 5% 1/4W	328104J
	R439,440	2 2 2	RES 220ohm 5% 1/4W	328221J
(TONE AMP SECTION)				
	VR503	1 1 1	VR VM10E126C - 250kohm - balance	4310550
	~ VR506	2 2 2	VR GM70E644C - 100kohm C x 2 - bass/treble	4320860

PART ORDERING PROCEDURE ----- Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) 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 ⁺ wwww xxxx TTTT ΣwzD	DESCRIPTION ⁺⁺	PART NO.
S2	1 1 1 1		Switch, lever SLR 5-4-3 - tape dubbing	4025310
S3	1 1 1 1		Switch, lever SLR 523 - tape monitor	4025360
S4~S7	4 4 4 4		Switch, lever SLR 522 - tone defeat/ loudness/subsonic/hi-filter	4025350
C501,502	2 2 2 -		C-CAP 220pf 10% 50V SL	232221K
C501,502	---2		C-CAP 100pf 10% 50V SL	232101K
C503,504	2 2 2 -		M-CAP 0.0039uf 10% 50V	222392K
C503,504	---2		M-CAP 0.0015uf 10% 50V	222152K
C505,506	2 2 2 2		C-CAP 56pf 10% 50V SL	232560K
C507,508	2 2 2 2		M-CAP 0.082uf 10% 50V	222823K
C509,510	2 2 2 2		M-CAP 0.047uf 10% 50V	222473K
C511,512	2 2 2 2		LC-CAP 50R0.33uf 20%	211503L
C513,514	2 2 2 2		C-CAP 100pf 10% 50V SL	232101K
C515,516	2 2 2 2		M-CAP 0.0027uf 10% 50V	222272K
C517,518	2 2 2 2		M-CAP 0.033uf 10% 50V	222333K
C519,520	2 2 2 2		E-CAP 50R10uf	211520Q
C521,522	2 2 2 2		E-CAP 35R10uf	211420Q
C523,524	2 2 2 2		M-CAP 0.047uf 10% 50V	222473K
R501,502	2 2 2 -		RES 2.2kohm 5% 1/4W	328222J
R501,502	---2		RES 15kohm 5% 1/4W	328153J
R503,504	2 2 2 2		RES 3.3kohm 5% 1/4W	328332J
R505,506	2 2 2 2		RES 150kohm 5% 1/4W	328154J
R507,508	2 2 2 2		RES 1megohm 5% 1/4W	328105J
R509,510	2 2 2 2		RES 10kohm 5% 1/4W	328103J
R511,512	2 2 2 2		RES 47kohm 5% 1/4W	328473J
R513,514	2 2 2 2		RES 10kohm 5% 1/4W	328103J
R517,518	2 2 2 2		RES 1.2kohm 5% 1/4W	328122J
R519,520	2 2 2 2		RES 5.6kohm 5% 1/4W	328562J
R521,522	2 2 2 2		RES 1kohm 5% 1/4W	328102J
(POWER AMP SECTION)				
*501	1 1 1 1		Heat sink	7082090
*502	2 2 2 2		Heat sink, SUB	7082100
503	8 8 8 8		Screw - PTS 3φx8	814308S
504	2 2 2 2		Screw - PTS 3φx6	814306S
Q701,702	2 2 2 2		TR 2SA798 (G or H)	514086S
Q703,704	2 2 2 2		TR 2SC1815 (Y or GR)	512107S
Q705,706	2 2 2 2		TR 2SC1815 (Y or GR)	512107S
Q707,708	2 2 2 2		TR 2SC2229 (Y)	512108S
Q709,710	2 2 2 2		TR 2SC945L (P or Q)	515077S
Q711,712	2 ---2		TR 2SC1815 (Y or GR)	512107S
Q713,714	2 ---2		TR 2SA1015 (Y)	510102S
Q715,716	2 2 2 2		TR 2SD669 (B or C)	513104S
Q717,718	2 2 2 2		TR 2SB649 (B or C)	511104S
Q719,720	2 2 2 2		TR 2SD745 (Q or R)	513103S
Q721,722	2 2 2 2		TR 2SB705 (Q or R)	511103S
Q723	1 1 1 1		TR 2SC1815 (Y or GR)	512107S
D701				
~D706	6 2 2 6		Diode 1S1555	501021S
ZD701	1 1 1 1		Zener Diode HZ24V-2	502053S
L701,702	2 2 2 2		Coil, choke - 15T 2.2uh	1210940
C701,702	2 2 2 2		M-CAP 1uf 10% 100V	282105K
C703,704	2 2 2 2		C-CAP 47pf 10% 50V SL	232470K
C705,706	2 2 2 2		C-CAP 68pf 10% 50V SL	232680K
C707,708	2 2 2 2		C-CAP 12pf 10% 50V SL	232120K
C709,710	2 2 2 2		C-CAP 15pf 10% 50V SL	232150K
C711,712	2 2 2 2		E-CAP 10R100uf	211130K
C713,714	2 2 2 2		E-CAP 50R100uf	211530Q
C715,716	2 2 2 2		E-CAP 63R220uf	
C717,718	2 2 2 2		C-CAP 100pf 10% 50V SL	232101K
C719,720	2 2 2 2		M-CAP 0.001uf 10% 50V	222102K
C721,722	2 2 2 2		M-CAP 0.001uf 10% 50V	222102K
C723,724	2 2 2 2		C-CAP 220pf 10% 50V SL	232221K
C725,726	2 2 2 2		C-CAP 220pf 10% 50V SL	232221K
C727,728	2 2 2 2		M-CAP 0.068uf 10% 50V SL	222683K
C729	1 1 1 1		E-CAP 25R100uf	211330Q
C730,731	2 2 2 2		E-CAP 63R47uf	211625Q

KEY NO.	SYMBOL NO.	TYPE ⁺ wwww xxxx TTTT ΣwzD	DESCRIPTION ⁺⁺	PART NO.
C732	1 1 1 1		C-CAP 100pf 10% 50V SL	232101K
C733	1 1 1 1		E-CAP 63R220uf	211632Q
HVR701,				
HVR702	2 2 2 2		Potentiometer - HVR B500ohm	4300830
R701,702	2 2 2 2		RES 1kohm 5% 1/4W	328102J
R703,704	2 2 2 2		RES 150kohm 5% 1/4W	328154J
R705,706	2 2 2 2		RES 22kohm 5% 1/4W	328223J
R707,708	2 2 2 2		RES 220ohm 5% 1/4W	328221J
R709,710	2 2 2 2		RES 220ohm 5% 1/4W	328221J
R711,712	2 2 2 2		RES 560 ohm 5% 1/4W	328561J
R713,714	2 2 2 2		RES 15kohm 5% 1/4W	328153J
R715,716	2 2 2 2		RES 100kohm 5% 1/4W	328104J
R717,718	2 2 2 2		RES 560 ohm 5% 1/4W	328561J
R719,720	2 2 2 2		RES 2.7kohm 5% 1/4W	328272J
R721,722	2 2 2 2		MO-RES 3.3kohm 5% 1W	361332B
R723,724	2 2 2 2		MO-RES 3.3kohm 5% 1W	361332B
R725,726	2 2 2 2		MO-RES 10ohm 5% 1W	361100B
R727,728	2 2 2 2		FP-MO-RES 100ohm 5% 1W	361101L
R729,730	2 2 2 2		RES 2.2kohm 5% 1/4W	328222J
R731,732	2 2 2 2		RES 820ohm 5% 1/4W	328821J
R733,734	2 2 2 2		MO-RES 330ohm 5% 1W	361331B
R735,736	2 2 2 2		MO-RES 330ohm 5% 1W	361331B
R737,738	2 2 2 2		FP-MO-RES 220ohm 5% 1W	361221L
R739,740	2 2 2 2		FP-MO-RES 220ohm 5% 1W	361221L
R741,742	2 ---2		MO-RES 1.8kohm 5% 1W	361182B
R743,744	2 ---2		RES 680ohm 5% 1/4W	328681J
R743,744	---2		RES 680ohm 5% 1/4W	328681J
R745,746	2 ---2		RES 680ohm 5% 1/4W	328681J
R745,746	---2		RES 680ohm 5% 1/4W	328681J
R747,748	2 2 2 2		MO-RES 1.8kohm 5% 1W	361182B
R749,750	2 2 2 2		CEM-RES 0.33ohm 5% 5W	384339W
R751,752	2 2 2 2		CEM-RES 0.33ohm 5% 5W	384339W
R753,754	2 2 2 2		FP-MO-RES 10ohm 5% 2W	362100L
R755,756	2 2 2 2		FP-MO-RES 10ohm 5% 2W	362100L
R757	1 1 1 1		RES 33kohm 5% 1/4W	328333J
R758	1 1 1 1		MO-RES 3.3kohm 5% 1W	361332J
R759,760	1 1 1 1		RES 820ohm 5% 1/4W	328821J
R761,762	2 2 2 2		RES 1kohm 5% 1/4W	328102J
R763,764	2 2 2 2		RES 1kohm 5% 1/4W	328102J
(REGULATOR SECTION)				
Q801	1 1 1 1		TR 2SC1627A (O or Y)	512101S
Q802	1 1 1 1		TR 2SA817A (O or Y)	510101S
Q803,804	2 2 2 2		TR 2SC1815 (Y or GR)	512107S
Q805	1 1 1 1		TR 2SC1627 (O or Y)	511017S
D801	1 1 1 1		Diode M4C-41-13	560052S
D802	1 1 1 1		Diode 1S1555	501021S
D803,804	2 2 2 2		Diode S5277B	560046S
ZD801~				
ZD802	2 2 2 2		Zener Diode HZ24V-2	502053S
ZD803	1 1 1 1		Zener Diode HZ30V-1	502054S
	1 1 1 1		Relay FRL-264 DC24V	1700230
C801,802	2 2 2 2		C-CAP 0.01uf 100, -0 % 500V	238103P
C803,804	2 2 2 2		E-CAP 55T10000uf	212150P
C805	1 1 1 1		C-CAP 100pf 10% 50V SL	232101K
C806,807	2 2 2 2		E-CAP 50R47uf	211525Q
C808	1 1 1 1		C-CAP 100pf 10% 50V SL	232101K
C809,810	2 2 2 2		E-CAP 50R47uf	211525Q
C811,812	2 2 2 2		E-CAP 25R100uf	211330Q
C813	1 1 1 1		BP-CAP 25R100uf	215330N
C814	1 1 1 1		E-CAP 35R4.7uf	211415Q
C815	1 1 1 1		E-CAP 25R100uf	211330Q
R801	1 1 1 1		FP-MO-RES 150ohm 5% 2W	362151L
R802	1 1 1 1		MO-RES 3.3kohm 5% 1W	361332B
R803	1 1 1 1		FP-MO-RES 150ohm 5% 2W	362151L

PART ORDERING PROCEDURE ----- Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) 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 ⁺ wwwww ooooo >>>> TTTTT ~wzO	DESCRIPTION ⁺⁺	PART NO.
R804	1111	MO-RES	3.3kohm 5% 1W	361332B
R805	1111	FP-MO-RES	100ohm 5% 1W	361101L
R806	1111	FP-MO-RES	47ohm 5% 1W	361470L
R807,808	2222	RES	18kohm 5% 1/4W	328183J
R809	1111	RES	56kohm 5% 1/4W	328563J
R810	1111	RES	47kohm 5% 1/4W	328473J
R811	1111	RES	220kohm 5% 1/4W	328224J
R812	1111	RES	15kohm 5% 1/4W	328153J
R813	1111	RES	100kohm 5% 1/4W	328104J
R814	1111	RES	330kohm 5% 1/4W	328334J
R815	1111	RES	39kohm 5% 1/4W	328393J
R816	1111	MO-RES	2.2kohm 5% 2W	362222B
R817	1111	FP-MO-RES	470ohm 5% 2W	362471L
F801,802	-222	Midget fuse - (S) 5AT 250 V		4720410
	-444	Holder, midget fuse		7050430
METER/MUTING PCB ASSEMBLY				
*505	S8,S9	1111	Switch, twin push - SUF24	4041050
		1111	Shield plate	7032170
	D901			
	~D904	4444	Diode 1N60P	500001G
	C901,902	2222	E-CAP 16R10uf	211220Q
	HVR901,			
	HVR902	2222	Potentiometer - HVR EVA-S6A 1kohm	4301120

KEY NO.	SYMBOL NO.	TYPE ⁺ wwwww ooooo >>>> TTTTT ~wzO	DESCRIPTION ⁺⁺	PART NO.
R601,602	2222	RES	12kohm 5% 1/4W	328123J
R603,604	2222	RES	100kohm 5% 1/4W	328104J
R901,902	2222	RES	6.8kohm 5% 1/4W	328682J
R903,904	2222	RES	1.5kohm 5% 1/4W	328152J
R905,906	2222	RES	82kohm 5% 1/4W	328823J
R907,908	2222	RES	18ohm 5% 1/4W	328180J
HEAD PHONES PCB ASSEMBLY				
	1111	Jack, head phones - JL3A		4550260
R01,R02	2222	MO-RES	330ohm 5% 2W	362331B
LAMP FUSE PCB ASSEMBLY				
F803	1---	Fuse - 0.5A 250 V MGC		4700560
F803	-111	Midget fuse - (S) 500mAT 250 V		4720310
	2---	Fuse holder		7050420
	-222	Fuse holder, midget fuse		7050430
POWER AMP FUSE ASSEMBLY				
F2,F3	-222	Midget fuse - (S) 5AT 250 V		4720410
	-444	Fuse holder, midget fuse		7050430

