

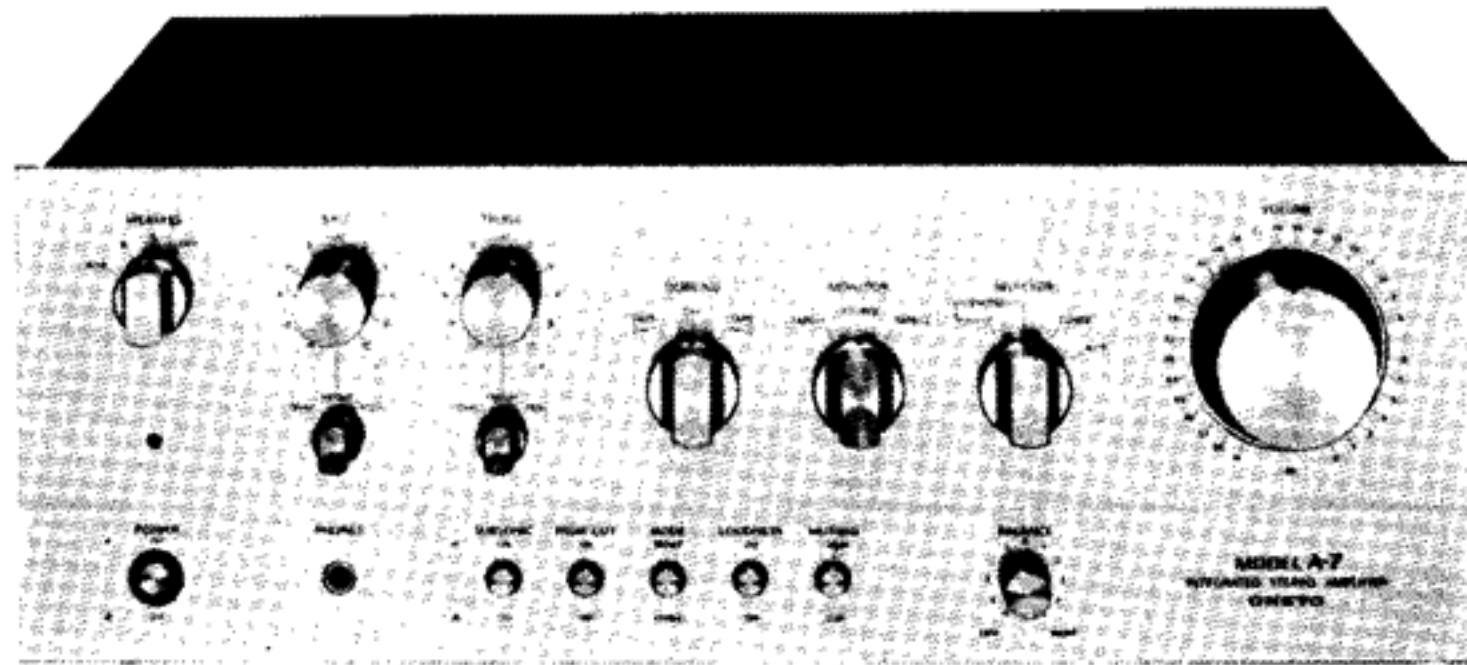
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# ONKYO SERVICE MANUAL

## INTEGRATED STEREO AMPLIFIER

### Model A-7



## SPECIFICATIONS

### Model A-7 Integrated Stereo Amplifier

Power Supply Rating	AC 120 Volts 60 Hz (USA Model) AC 110V/120V/220V/240V 50Hz/60Hz (Universal Model)	Total Harmonic Distortion (AUX)	0.1% at rated power	
Controls	POWER	IM Distortion (AUX)	0.08% at 1 watt output	
	SPEAKERS (OFF, A, B, A+B)	(70Hz : 7kHz = 4 : 1)	0.08% at 1 watt output	
	SELECTOR (PHONO 1, PHONO 2, TUNER, AUX)	Frequency Response	2-80,000 Hz ( $\pm 1$ dB)	
	TAPE MONITOR (TAPE 1, SOURCE, TAPE 2)	Tilt	better than 5% at 50 Hz	
	TAPE DUBBING (TAPE 2-1, OFF, TAPE 1-2)	Signal to Noise Ratio	110 dB (IHF A NETWORK)	
	VOLUME, BALANCE, BASS, TREBLE, TURN OVER SWITCH	Damping Factor	50 at 8 ohms	
	BASS (125Hz, DEFEAT, 400Hz)	Rated Input	1.5 volts	
	TREBLE (2kHz, DEFEAT, 8kHz)	Input Impedance	100 k-ohms	
	MUTING, LOUDNESS, MODE, HIGH FILTER, SUB-SONIC FILTER	Load Impedance	4-16 ohms	
	Outputs	SPEAKER A & B, PHONES TAPE REC 1 & 2, PRE OUT	<b>Preamplifier Section</b>	
Inputs	PHONO 1 & 2	Input Sensitivity & Impedance	PHONO 1 & 2: 2.5mV, 50 k-ohms TUNER: 150mV, 50 k-ohms AUX: 150mV, 50 k-ohms TAPE PLAY 1 & 2: 150mV, 50 k-ohms	
	TUNER AUX TAPE PLAY 1 & 2	Total Harmonic Distortion	0.05% at rated output	
Dimensions	MAIN IN	IM Distortion	0.08% at rated output	
	17½"(W) x 6¼"(H) x 15"(D) 444 x 159 x 380 mm	(70Hz : 7kHz = 4 : 1)		
Weight	29.7 lbs. 13.5 kg.	Frequency Response	PHONO: $\pm 0.2$ dB at 30-15,000 Hz AUX: +0, -1 dB at 10-50,000 Hz	
		Phono Overload	230mV RMS. at 1 kHz, 0.1% THD.	
<b>Power Amplifier Section</b>	Power Output (through AUX inputs)	Signal to Noise Ratio	PHONO: 80 dB (IHF A NETWORK) AUX: 90 dB (IHF A NETWORK)	
		Output Voltage	1.5 volts, max 15 volts	
		Output Impedance	2.7 k-ohms	
		Tone Control	<b>BASS</b> $\pm 10$ dB at 100 Hz (turnover at 400 Hz) <b>TREBLE</b> $\pm 10$ dB at 10 kHz (turnover at 2 kHz)	
		Turnover Frequency	<b>BASS</b> : 400 Hz, 125 Hz <b>TREBLE</b> : 2 kHz, 8 kHz	
		Filters	10 Hz (6 dB/oct.) 5 kHz (6 dB/oct.)	
		Muting	-20 dB	
		Loudness	+5 dB at 100 Hz +5 dB at 10 kHz	

Specifications are subject to change without notice.

**ONKYO**<sup>®</sup>  
**AUDIO COMPONENTS**

# SERVICE PROCEDURES

## 1. Checking the operation of the protective circuit.

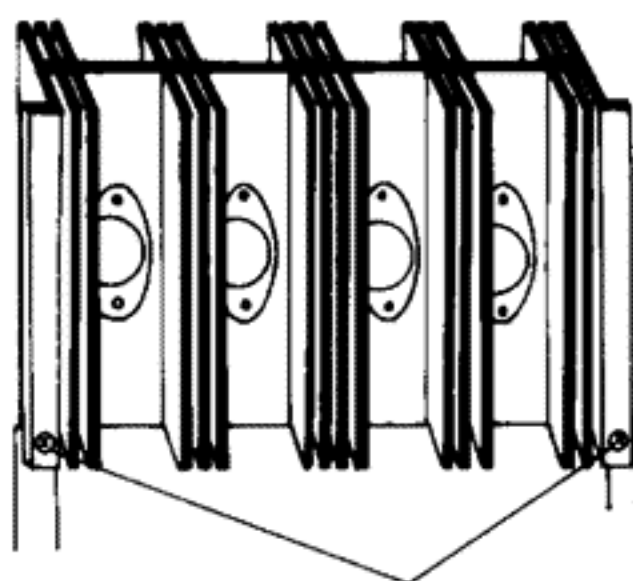
The protective circuit of the A-7 works in the following manner: A fuse burns out if speaker of too low impedance are connected, or if the speaker wires are accidentally shorted. A relay cuts-off output from the amplifier if due to malfunction DC current appears at the output terminals. The relays will also be actuated in the event of excessive output current. A check of the protective circuit is made by placing the unit in the following sequence of settings.

- 1) No load.
- 2) Set all controls at the levels set on the power amplifier (refer to power amplifier).
- 3) Set the SELECTOR switch to PHONO.
- 4) Apply a 5Hz, 1V (RMS) sine wave to the PHONO inputs.
- 5) Gradually increase the setting of the master volume control. The protective circuit relay should activate as a result of this.

**Note:** Operation of the protective circuit relay can also be checked by setting the center voltage at DC 4V and removing the fuses F701 and F702, and then applying a DC  $\pm 5V$  voltage to the output terminals. This should actuate the relay.

## 2. Checking the circuit board of the power amplifier.

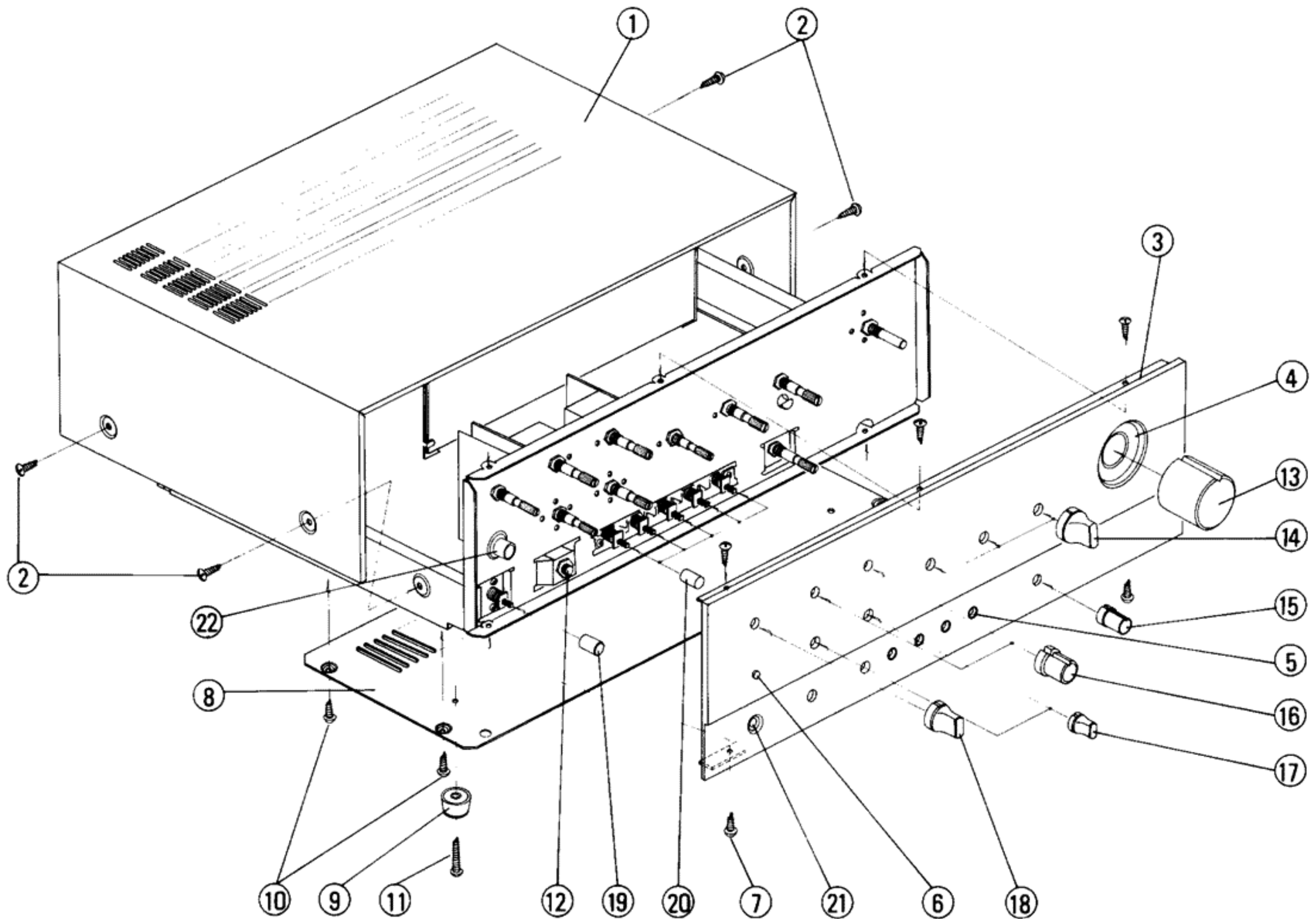
- 1) Remove two lower screws from the heat sink.
- 2) Remove two screws on the back of the heat sink.
- 3) Remove two heat-sensor transistors Q613 and Q614 from the heat sink. If they cannot be pulled out, remove two mounting screws from the transistor sockets.
- 4) The check can also be performed by fastening it as shown in Fig. 1 with screws that have been removed.



Screw Fig. 1

3. The screws used to fasten the bus grounding strips and the terminals of the power supply electrolytic capacitor have can influence sound quality. They must be tightened securely.
4. When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of both channels have the same  $h_{FE}$  ratings.

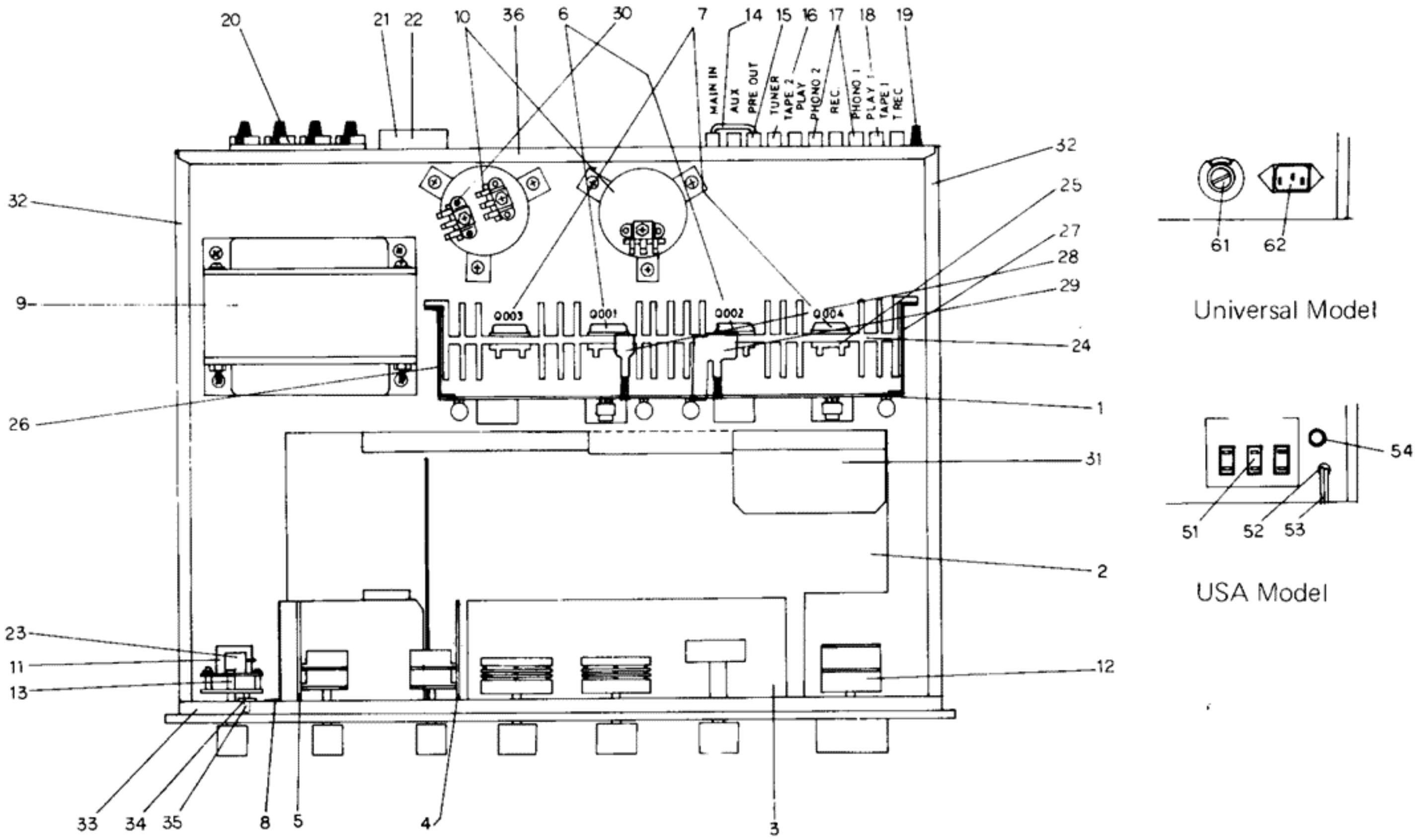
# COMPONENT LOCATION



## PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1	28184017A	Top Cover	12	250126	Headphone Jack 3P64M
2	838440109	Screw 4TTB+10C (BC)	13	28320155	Knob-Volume
	12829121	Front Panel Ass'y ( 3 ~ 7 )	14	28320158	Knob-Selector
3	27210069	Front Panel	15	28320157	Knob-Level
4	27265009A	Ring	16	28320161	Knob-Tone
5	27267014	Knob Guide	17	38320163	Knob-Shift
6	28198502	Facet	18	28320162	Knob-Push
7	27267015	Knob Guide	19	28320159	Knob-Power
8	27170019	Bottom Board	20	28320160	Knob-Push
9	280379	Leg	21	838130062	Tapping Screw 3STB+6BQ
10	831130082	Tapping Screw 3STW+8BQ	22	270611	Pilot Lamp Cover
11	832140122	Tapping Screw 4STR+12BQ			

# COMPONENT LOCATION



TOP VIEW

## PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1	12829576A	Main Amp. P.C.B. NAMA-376a	24	27160019	Heat sink
2	12829575A	Rectifier/Preamp P.C.B. NAAF-375a	25	250249	Power Transistor Socket M-1614
3	12838573	Switch P.C.B. NATM-373	26	27140122	Heatsink Bracket Left
4	128385741	Treble Control P.C.B. NATS-374 Part 1	27	27140123	Heatsink Bracket Right
5	128385742	Bass Control P.C.B. NATS- 374 Part 2	28	27140085A	Transistor Socket A
6	2200592 or 2200593	Power Amp. Transistor 2SD426 (R) or 2SD426 (O)	29	27140157	Transistor Socket B
7	2200582 or 2200583	Power Amp. Transistor 2SB556 (R) or 2SB556 (O)	30	25060025	7P Lug Plate
8	27150048	Shielded Plate	31	27150055	Shielded Plate
9	230187	Power Transformer NPT-608D	32	27115014A	Side Bracket
10	3504097	Elect. Capacitor 25000 $\mu$ F 55V	33	27110031	Front Bracket
11	25035050	Power Switch NPS-111-L15P	34	28140024	Cushion
12	5104041	Variable Resistor N35 DGR32C100KT30M, Volume Control	35	210015A	6.3V 50mA Power Indicator Lamp
13	25030073	Rotary Switch NRS-124-30Y, Speaker Selector	36	27120069	Back Panel
14	25055015	Connection Bar	51	25050015	AC Outlet NSCT-6P01
15	25045029	TAPE, PRE OUT, MAIN IN Terminal	52	270025	Strainrelief SR-3P-4
16	25045025	TUNER/AUX Input Terminal NPJ-4PRBL03	53	253072	AC Cord AS-UC
17	250170	Phono Terminal NTM-2WPBL-E1	54	250080	AC Fuse Holder S-N1301
18	25045022	Tape Terminal NPJ-6PRBL03	55	252049	AC Fuse 4A ST-6
19	25060008	Ground Terminal	The Universal type differs from the UDN type (USA model) at the following points.		
20	25060023	Speaker System Terminal NTM-4PRMN01	9	230188	Power Transformer NPT-608ADGQ
21	25050004	Fuse Holder with Cover	11	25035051	Power Switch NPS-121-L16P
22	252020	Speaker Fuse 5A-T	23	3500052	IS Capacitor PME271Y510CEE
23	3504012	UL Capacitor 0.01 $\mu$ F 125V	36	27120071	Back Panel
			51-55	none	
			61	250186	VS Socket S-I7205-7
			62	25050018	3P Inlet
			63	252003	Fuse 3A-T

# MAIN AMP. (NAMA-376a)

## MAIN AMP. ALIGNMENT

NOTES: 1. Set up A-7 as follows:  
 SELECTOR ... AUX TONE SHIFT ... DEFEAT  
 TONE & BALANCE ... Center  
 FILTER/LOUDNESS/DUBBING ... OFF  
 MODE ... STEREO T.MONITOR ... SOURCE  
 SPEAKERS ... OFF VOLUME ... Maximum (0dB)  
 2. Adjust after switching on for 3 minutes.

- IDLING CURRENT ADJUSTMENT**  
 Connect the DC Voltmeter between I<sub>ID</sub> and V<sub>CT</sub> terminals.  
 Adjust the Voltage to 17±2mV with R645. (Left channel)  
 Adjust the Voltage to 17±2mV with R646. (Right channel)
- CENTER VOLTAGE ADJUSTMENT**  
 Connect the DC Voltmeter between V<sub>CT</sub> and E terminals.  
 Adjust the Voltage to 0±5mV with R607. (Left channel)  
 Adjust the Voltage to 0±5mV with R608. (Right channel)

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Resistors</b>		
R663, R664	451630684	6.8 ohm 1W Metal
R667, R668	451731004	10 ohm 2W Metal
R671, R672	441521014	100 ohm 1/2W Metal Oxide Film
<b>Thermistors</b>		
TH601, TH602	4000003	D-22A

## SWITCH PC BOARD-PARTS LIST

S	Stock No.	Description	Notes
S101	25030069	NRS-144-30ZL	SELECTOR
S102	25030068	NRS-143-30A	DUBBING
S103	25030068	NRS-143-30A	MONITOR

# 5.30

## TONE CONTROL PC BOARD - PARTS LIST

C	Stock No.	Description
<b>Capacitors</b>		
C403, C404	374122044	0.2µF±5% 50V DE
C407, C408	374121144	0.11µF±5% 50V DE
C409, C410	390882207	22µF±50V SLD
C413, C414	372328214	820pF±5% 50V ST
<b>Rotary Variable Resistors</b>		
R401	5104042	GH30E-196K x 2 BASS
R413	5104043	GH30E-171K x 2 TREBLE
<b>Rotary Switches</b>		
S401, S402	25030072	NRS-143-30ZV FREQUENCY SHIFT

**Capacitor**  
 DE: Non-Inductive Polyester Film Capacitor.  
 LD, SLD: Low Leakage Current Type Electrolytic Capacitor.  
 ST: Polystyren Film Capacitor.  
 EL: Electrolytic Capacitor.

## BOTTOM VIEW

### MAIN AMP. PC BOARD-PARTS LIST

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Transistors</b>		
Q601~Q604	2210754 or 2210755	2SC1775A(D) or 2SC1775A(E) Differential Amp.
Q605~Q608	2211084 or 2211085	2SA872A(D) or 2SA872A(E) Differential Amp.
Q609, Q610	2211032 or 2211033	2SA912(Q) or 2SA912(R) Driver Amp.
Q611, Q612	2211022 or 2211023	2SC1885(Q) or 2SC1885(R) Driver Amp.
Q613, Q614	2210743 or 2210744	2SC945(L) (P) or 2SC945(L) (Q) Bias Stabilization
Q615, Q616	2200364	2SD358(D) Complement
Q617, Q618	2200354	2SB528(D) Complement
<b>Diodes</b>		
D601~D604	223105	1S1555

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Coils</b>		
L601, L602	231001	S-1.3B
<b>Capacitors</b>		
C605, C606	390480477	4.7µF 50V LD
C619, C620	352744711	470µF 16V EL
C625, C626	374121045	0.1µF±10% 50V DE
C631, C632	374121044	0.1µF±5% 50V DE
C633~C636	352770331	3.3µF 63V EL
<b>Variable Resistors</b>		
R607, R608	5221008	R-HK4.7K.B3S CENTER VOLTAGE
R645, R646	5221007	R-HK2.2K.B3S IDLING CURRENT
<b>Resistors</b>		
R651, R652	451630274	2.7 ohm 1W Metal
R657, R658		
R659~R662	48114795	0.47 ohm 5W Cement

NOTES: When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of one channel have the same h<sub>FE</sub> ratings.

# BOARD VIEW

## EQUALIZER/TONE AMP. PC BOARD (NAAF-375a)

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Transistors</b>		
Q201-Q204	2210665 or 2210666	2SA841 (GR) or 2SA841 (BL) Differential Amp.
Q205, Q206	2210665 or 2210666	2SA841 (GR) or 2SA841 (BL) Equalizer Amp.
Q207, Q208	2210675 or 2210676	2SC1681 (GR) or 2SC1681 (BL) Equalizer Amp.
Q209, Q210	2211042 or 2211043	2SC1318 (Q) or 2SC1318 (R) Equalizer Amp.
Q211, Q212	2211052 or 2211053	2SA720 (Q) or 2SA720 (R) Equalizer Amp.
Q301-Q304	2210665, 2210666, 2210416 or 2210417	2SA841 (GR), 2SA841 (BL), 2SA726 (F) or 2SA726 (G) Differential Amp.
Q305, Q306	2210675 or 2210676	2SC1681 (GR) or 2SC1681 (BL) Tone Amp.
Q501	2200663 or 2200664	2SC1626 (O) or 2SC1626 (Y) Rectifier
Q502	2200673 or 2200674	2SA816 (O) or 2SA816 (Y) Rectifier
Q701~Q703	2211182, 2211183, 2210361 or 2210362	2SC1740 (Q), 2SC1740 (R), 2SC828A (Q) or 2SC828A (R) Protector
Q704	2210863	2SC1212AWT (C) Protector

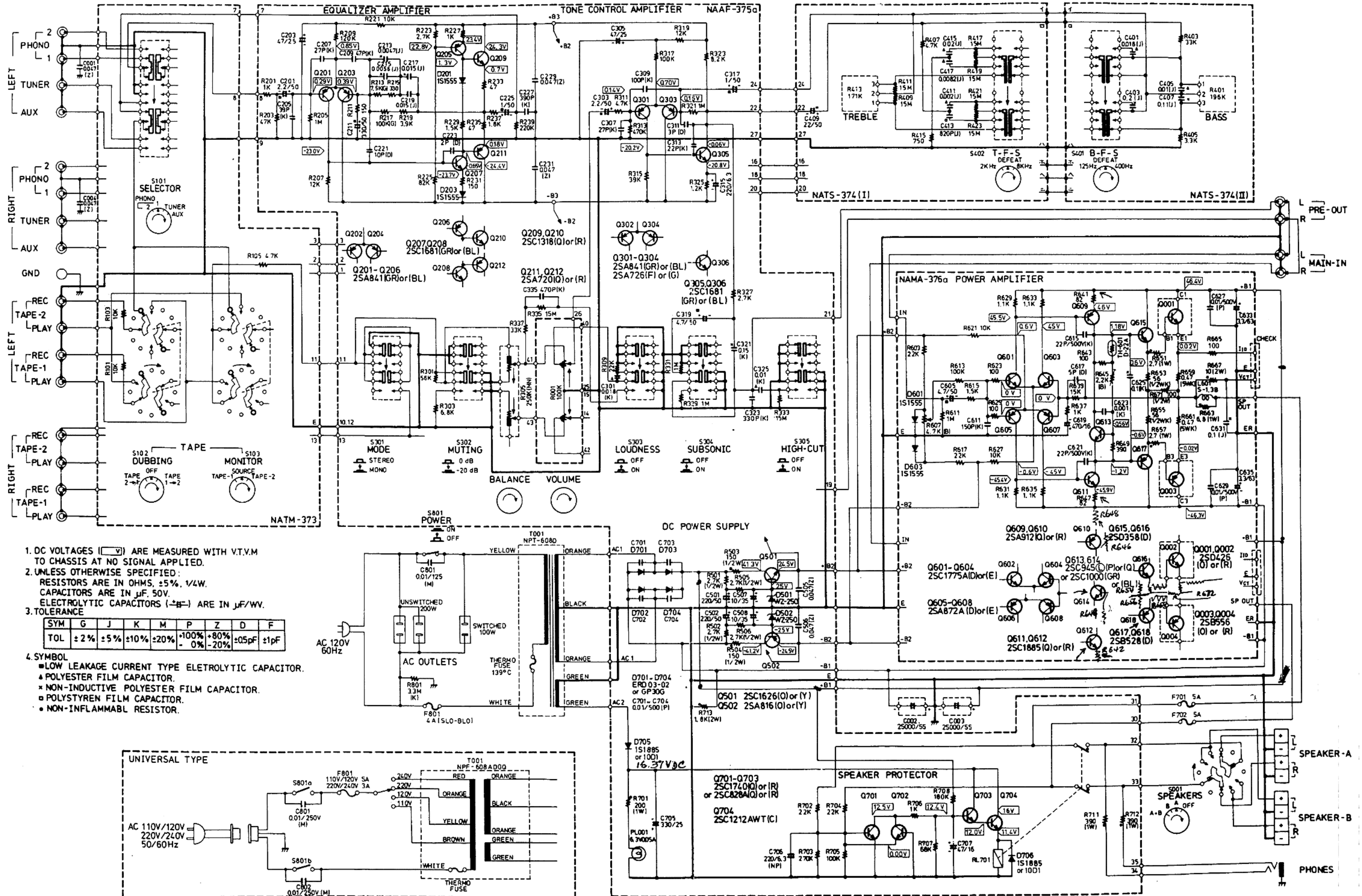
CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Diodes</b>		
D201-D204	223105	1S1555
D501, D502	224018	WZ-250
D701-D704	223832 or 223841	ERD03-02 or GP30G
D705, D706	223802 or 223801	1S1885 or 10D1
<b>Capacitors</b>		
C201, C202	390480227	2.2 $\mu$ F 50V LD
C303, C304		
C203, C204	352754701	47 $\mu$ F 25V EL
C305, C306		
C211, C212	390883317	330 $\mu$ F 50V SLD
C213, C214	374124724	4700pF $\pm$ 5% 50V DE
C215, C216	374125624	5600pF $\pm$ 5% 50V DE
C217, C218	374121534	0.015 $\mu$ F $\pm$ 5% 50V DE
C219, C220		
C225, C226	390480107	1 $\mu$ F 50V LD
C317, C318		
C315, C316	352722211	220 $\mu$ F 6.3V EL
C319, C320	390480477	4.7 $\mu$ F 50V LD
C321, C322	374121545	0.15 $\mu$ F $\pm$ 10% 50V DE

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Capacitors</b>		
C501, C502	352782211	220 $\mu$ F 50V EL
C507, C508	352761001	10 $\mu$ F 50V EL
C705	352753311	330 $\mu$ F 25V EL
C706	352322216	220 $\mu$ F 6.3V NP
C707	352744701	47 $\mu$ F 16V EL
<b>Resistors</b>		
R305	5148013 or 5148011	N16RGL250KMN30, Variable, BALANCE
R503, R504	441521514	150 ohm 1/2W Metal Oxide Film
R701	441622014	200 ohm 1W Metal Oxide Film
R711, R712	441623914	390 ohm 1W Metal Oxide Film
R713	441721824	1.8 kohm 2W Metal Oxide Film
<b>Switches</b>		
S301~S305	25035039	NPS-542-L04 Push
<b>Relay</b>		
RL701	250166	NRS2P5A-DC12
	27300059	Ground Plate
	27150049	Shielded Plate

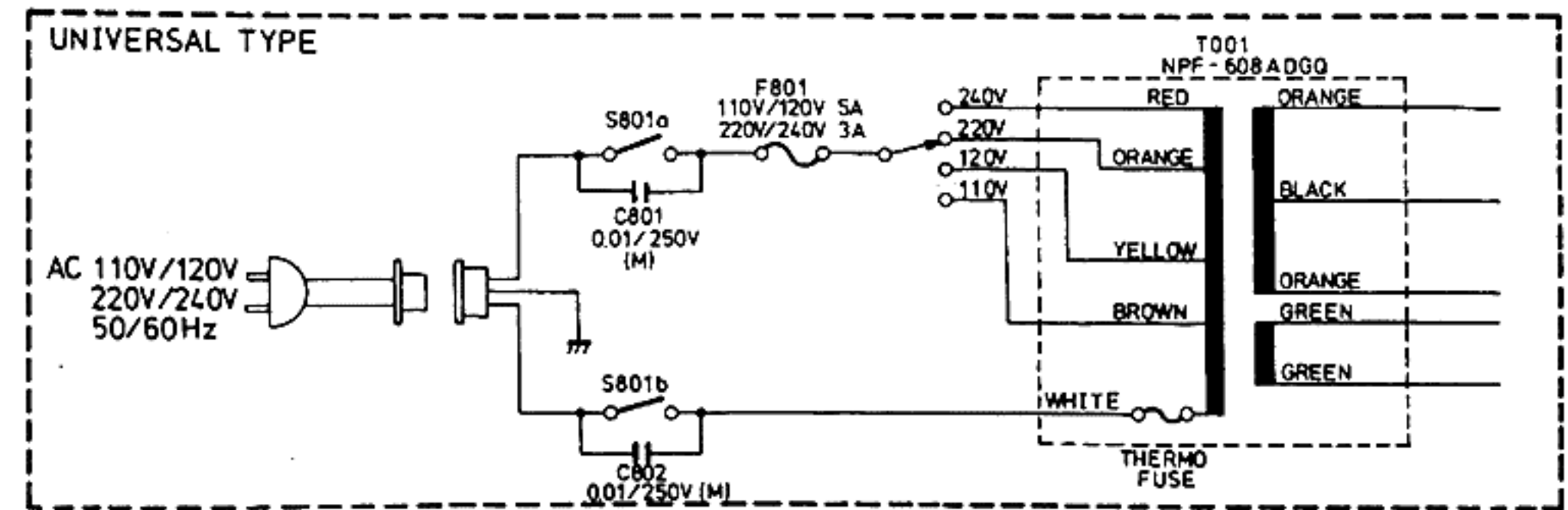
**NOTES:** When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of one channel have the same  $h_{FE}$  ratings.

**Capacitor**  
 DE: Non-Inductive Polyester Film Capacitor.  
 LD, SLD: Low Leakage Current Type Electrolytic Capacitor.  
 ST: Polystyren Film Capacitor.  
 EL: Electrolytic Capacitor.

# SCHEMATIC DIAGRAM



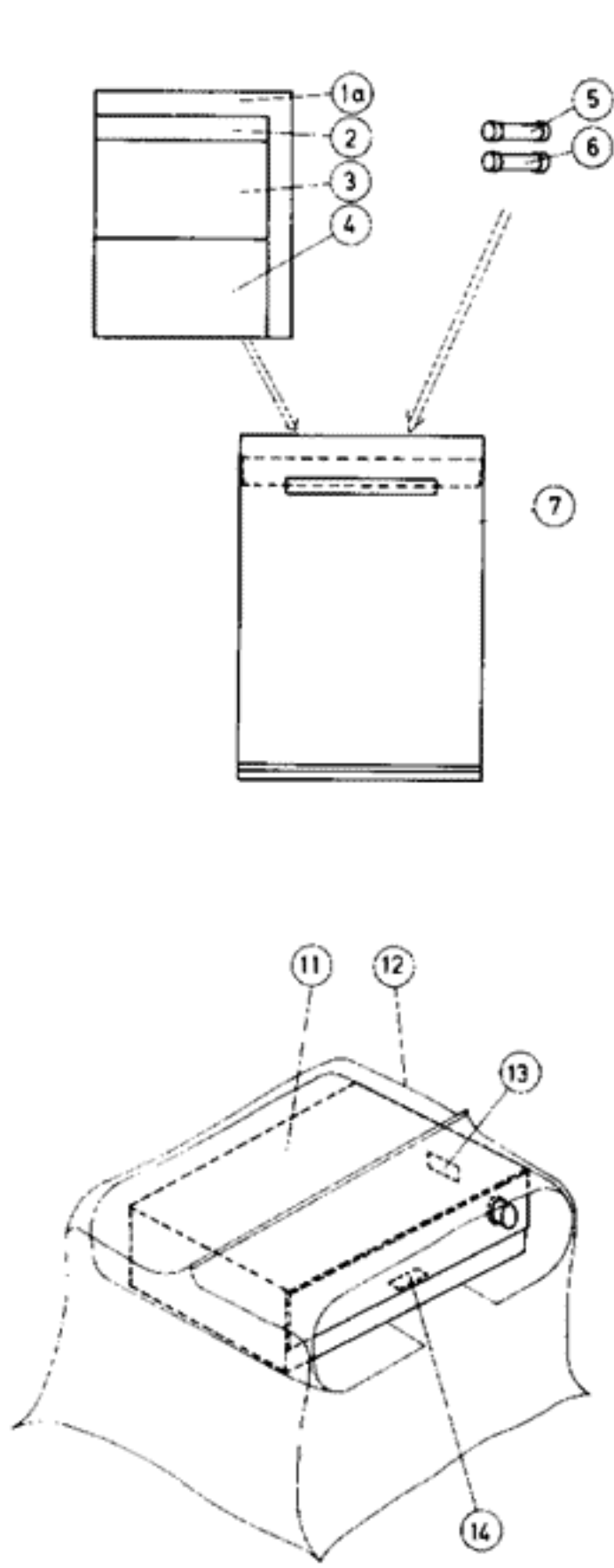
- DC VOLTAGES (  $\square$  ) ARE MEASURED WITH V.T.V.M TO CHASSIS AT NO SIGNAL APPLIED.
  - UNLESS OTHERWISE SPECIFIED:  
RESISTORS ARE IN OHMS,  $\pm 5\%$ , 1/4W.  
CAPACITORS ARE IN  $\mu F$ , 50V.  
ELECTROLYTIC CAPACITORS (  $\square$  ) ARE IN  $\mu F/WV$ .
  - TOLERANCE
- | SYM | G         | J         | K          | M          | P        | Z       | D           | F         |
|-----|-----------|-----------|------------|------------|----------|---------|-------------|-----------|
| TOL | $\pm 2\%$ | $\pm 5\%$ | $\pm 10\%$ | $\pm 20\%$ | $+100\%$ | $+80\%$ | $\pm 0.5pF$ | $\pm 1pF$ |
- SYMBOL
- LOW LEAKAGE CURRENT TYPE ELECTROLYTIC CAPACITOR.
  - POLYESTER FILM CAPACITOR.
  - NON-INDUCTIVE POLYESTER FILM CAPACITOR.
  - POLYSTYRENE FILM CAPACITOR.
  - NON-INFLAMMABLE RESISTOR.



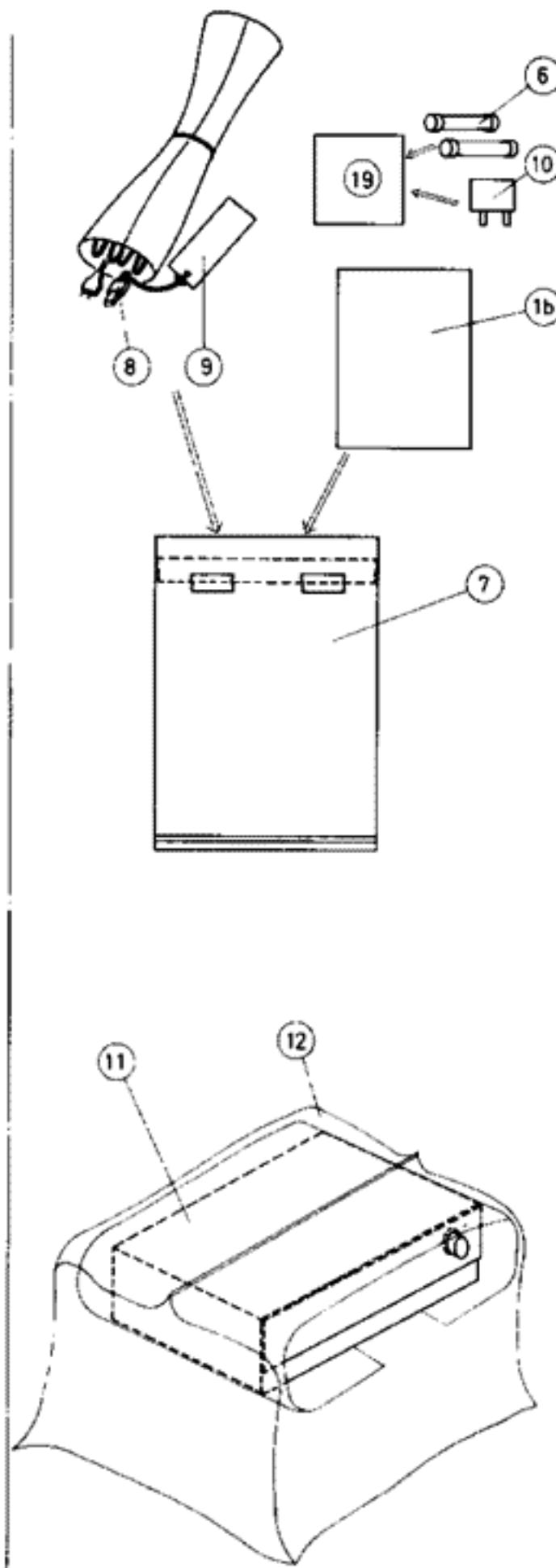
NOTICE: FOR SOME SPECIFIC REGIONS, THIS CIRCUIT IS CHANGED FOR THE REGIONAL VOLTAGE ONLY.



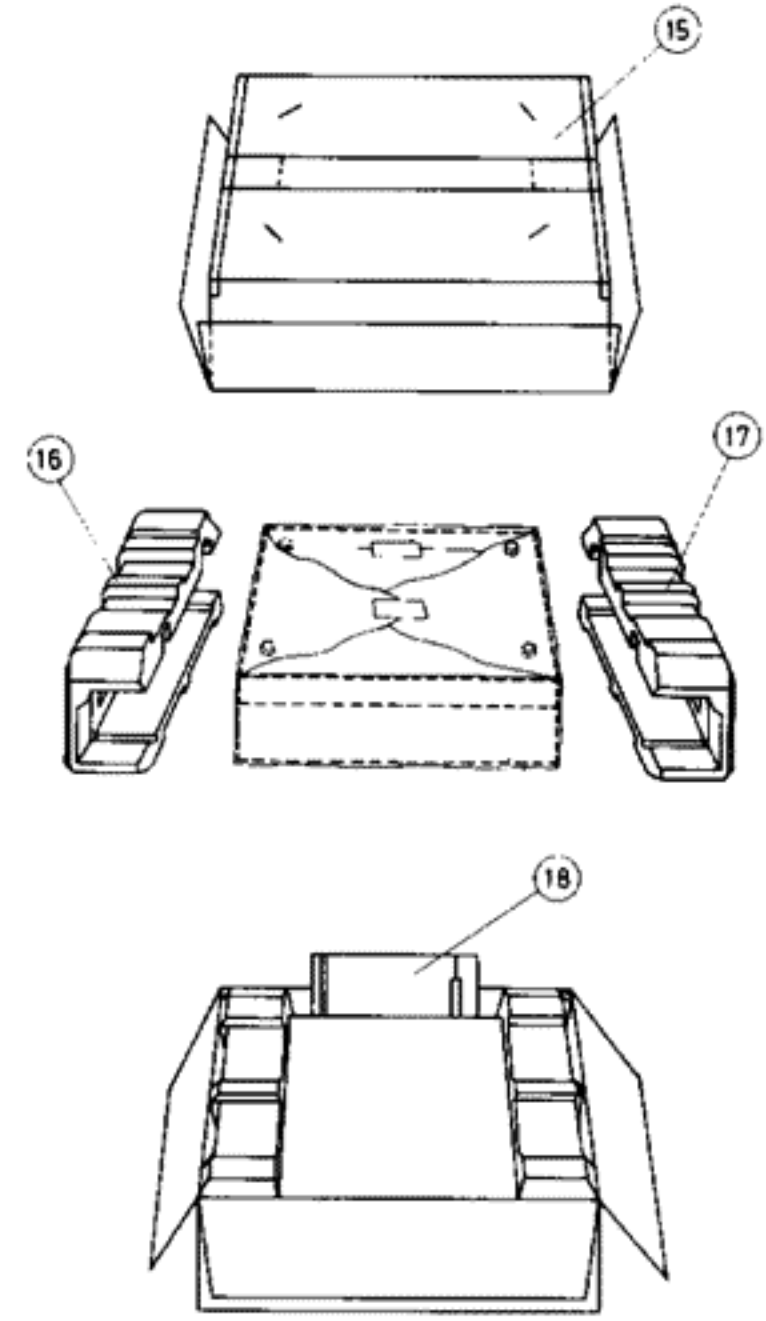
# PACKING PROCEDURES



**USA Model**



**Universal Model**



## USA Model

- All printed materials and accessory items are placed in a poly bag and taped.
- The AC power cord is wrapped in paper and wound with a rubber band.
- A tag describing the composition of the cabinet is attached to the speaker switch.
- Four shorting pins are inserted in the phono terminals.

## Universal Model

- The AC power cord is wrapped in paper and wound with a rubber band.
- There is a voltage tag to which the unit is set attached to the AC power cord.
- All printed materials and accessory items are placed in a poly bag and taped.
- Four shorting pins are inserted in the phono terminals.

# PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1a	29340193	Instruction Manual	10	25055018	CV-K-1, Conversion Plug
1b	29340195	Instruction Manual	11	290008	500 x 1000 (m/m), Sheet
2	29358001	Service Station List	12	29100027	850 x 650 (m/m), Poly Bag
3	29355046	Caution Card for Warranty Card	13	282969	Caution Label A
4	29365003	Warranty Card	14	293041	Caution Label
5	252049	4A, ST-6, Fuse	15	29050112	Carton Box
6	252020	5A-T, Fuse	16	29090178	Pad, Left
7	29100006A	250 x 350 (m/m), Poly Bag	17	29090179	Pad, Right
8	253083	Power Supply Cord		250153	Shorting Pin
9	293268	Tag, Voltage		29380025	Tag, Cabinet Composite
			19	29100002	150 x 80(m/m), Poly Bag