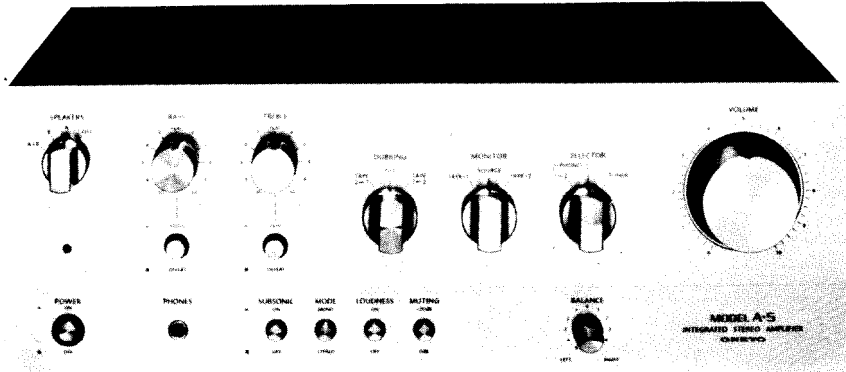


# ONKYO® SERVICE MANUAL

## INTEGRATED STEREO AMPLIFIER

### Model A-5



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# SPECIFICATIONS

## Power Amplifier Section

Continuous	60 watts per channel, min. RMS, at 4 ohms, both channels driven, 1kHz, 0.1% THD. 50 watts per channel, min. RMS, at 8 ohms, both channels driven, 1kHz 0.1% THD. 50 watts per channel, min. RMS, at 4 ohms, both channels driven, from 20Hz to 20kHz, 0.1% THD. 45 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20Hz to 20kHz, 0.1% THD.
Dynamic	250 watts total at 4 ohms 1% THD. (DIN) 160 watts total at 8 ohms 1% THD. (DIN) 220 watts total at 4 ohms 0.1% THD. 150 watts total at 8 ohms 0.1% THD.
Total Harmonic Distortion	0.1% at rated power 0.08% at 1 watt output
IM Distortion (70Hz:7kHz=4:1)	0.08% at 1 watt output
Frequency Response	2-70,000Hz ( $\pm 1$ dB)
Tilt of Square Wave	better than 5% at 50Hz
Signal to Noise Ratio	110dB (IHF A NETWORK)
Damping Factor	50 at 8 ohms
Input Impedance	25 k-ohms
Rated Input	1.5 volts
Load Impedance	4-16 ohms

## Preamplifier Section

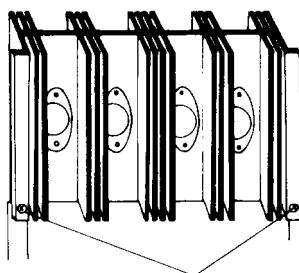
Input Sensitivity & Impedance	PHONO 1 & 2: 2.5mV, 50 k-ohms TUNER: 150mV, 50 k-ohms TAPE PLAY 1 & 2: 150mV, 50 k-ohms
Total Harmonic Distortion	0.08% at rated output
IM Distortion (70Hz:7kHz=4:1)	0.08% at rated output
Frequency Response	PHONO: $\pm 0.3$ dB at 30-15,000Hz TUNER: 15-40,000Hz (+0, -1dB)
Phono Overload	170mV RMS at 1kHz, 0.1% THD
Signal to Noise Ratio	PHONO: 75dB (IHF A NETWORK) TUNER: 90dB (IHF A NETWORK)
Tone Controls	
BASS	$\pm 10$ dB at 100Hz
TREBLE	$\pm 10$ dB at 10kHz
Output Voltage	1.5 volts
Output Impedance	2.2 k-ohms
Subsonic Filter	10Hz (6dB/oct.)
Muting	-20dB
Loudness (-40dB)	+5dB at 100Hz +5dB at 10kHz
<b>General</b>	
Power Supply	AC 110/120/220/240V, 50/60Hz. (Universal Model) AC 120V, 60Hz (U.S.A. Model)
Dimensions (W x H x D)	444 x 159 x 380mm (17½" x 6¼" x 15")
Net Weight	12.2kg (26.9 lbs.)

Specifications and features are subject to change without notice.

# SERVICE PROCEDURES

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

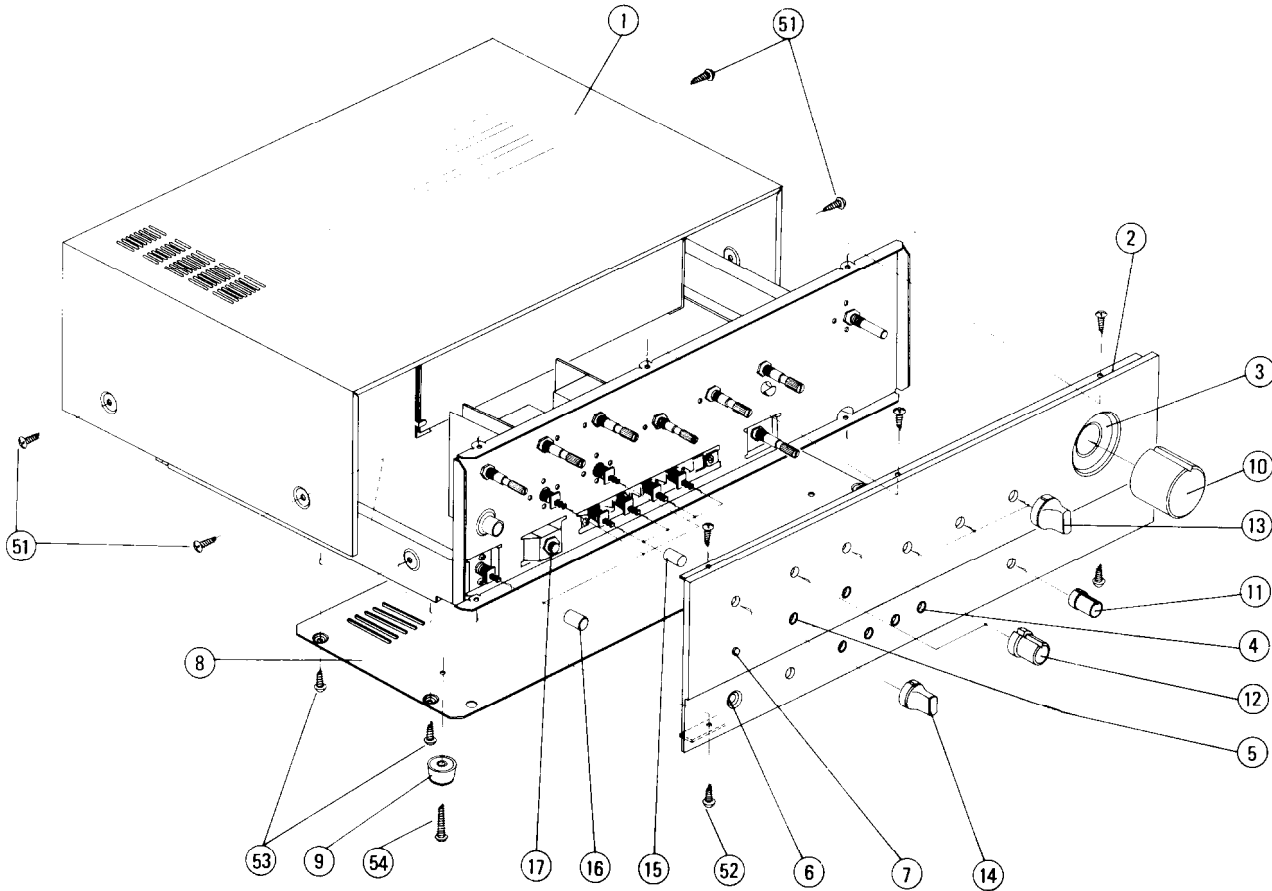
- 1) Remove two lower screws from the heat sink.
- 2) Remove two screws on the back of the heat sink.
- 3) Remove two heat-sensor transistors Q613 and Q614 from the heat sink. If they cannot be pulled out, remove two mounting screws from the transistor sockets.
- 4) The check can also be performed by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



Screw Fig. 1

2. 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.
3. When replacing differential amplifier or push-pull amplifier transistors, be sure that transistors of both channels have the the same  $h_{FE}$  ratings.

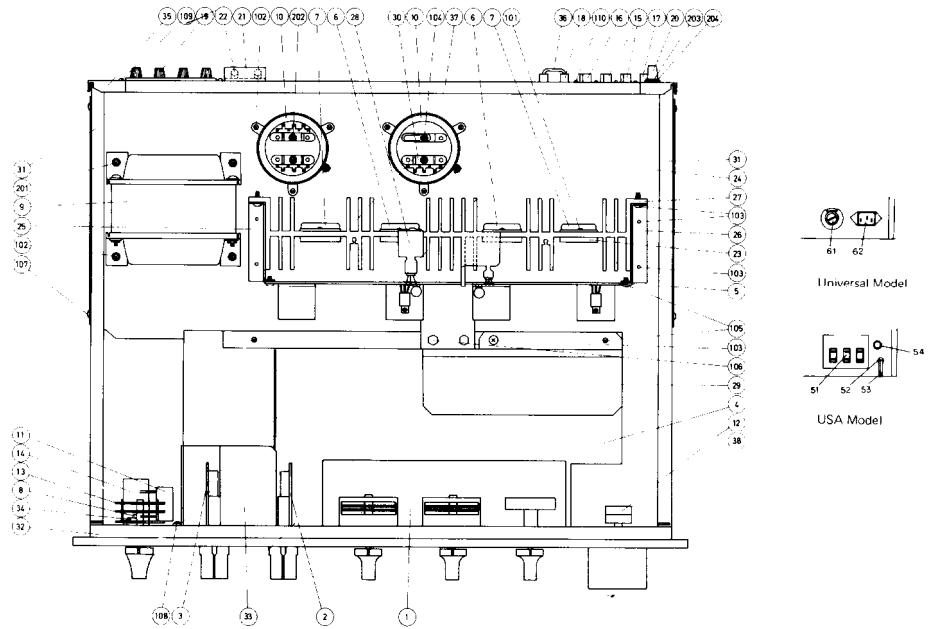
## COMPONENT LOCATION



## PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1.	28184017A	Top Cover	12.	28320161	TONE Knob
	12809121	Front Panel Ass'y (2-7)	13.	28320158	SELECTOR Knob
2.	2710070	Front Panel	14.	28320162	SPEAKER Knob
3.	27265009A	Ring	15.	28320160	PUSH Knob
4.	27267014	Knob Guide	16.	28320159	POWER Knob
5.	27266014	Shift Knob Guide	17.	250126	Stereo Headphone Jack
6.	27267015	Power Knob Guide			SCREWS
7.	28198502	Facet	51.	838440109	4TTB+10C BC
8.	27170019	Bottom Board	52.	838130062	3STB+6BQ Tapping
9.	280379	Leg	53.	831130082	3STW+8BQ Tapping
10.	28320155	VOLUME Knob	54.	832140122	4STR+12BQ Tapping
11.	28320157	LEVEL Knob			

# CHASSIS LAYOUT



## PARTS LIST

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
1.	12835573A	NATM-373a Tape Monitor PCB. Complete	24.	27100017A	Main Chassis
2.	128355821	NATS-382 Part-1 Treble Unit PCB. Complete	25.	27140127	Heat Sink Bracket L
3.	128355822	NATS-382 Part-2 Bass Unit PCB. Complete	26.	27140128	Heat Sink Bracket R
4.	12809583A	NAAF-383a Preamp. PCB. Complete	27.	27160022	Heat Sink
5.	12809584A	NAMA-384a Main Amp. PCB. Complete	28.	27140085A	Transistor Socket
6.	2200373 or 2200372	2SD427 (O) or Power Amp. Transistor	29.	27150055A	Shielded Plate B
7.	2200383 or 2200382	2SB557 (O) or Power Amp. Transistor	30.	25060025	7P Terminal
8.	210015A	PL6.3V0 05AW-3UL RED Power Illumination Lamp	31.	27115014A	Side Bracket
9.	230192	NPT-611D Power Transformer	32.	27110034A	Front Bracket
10.	3504093	13,000µF 50V Elect. Capacitor	33.	27150048	Shielded Plate
11.	3504012	10000pF 125V UL. Capacitor	34.	270611	Lamp Cover
12.	5177018	N24RGR21C100KBT30M Variable Resistor, VOLUME	35.	27120072	Back Panel
13.	25030078	NRS-244-30Y Rotary Switch, SPEAKER SELECTOR	36.	25055015	Connection plug
14.	25035050	NPS-111-L15P Push Switch, Power	37.	28140024	Cushion
15.	250170	NTM-2WPBL-E1 Terminal	51.	25050015	NSCT-6P01 AC Outlet
16.	25045023	NPJ-2PRBL02 Terminal	52.	252049	4A ST-6 Main Fuse
17.	25045022	NPJ-6PRBL01 Terminal	53.	253072	AS-UC Power Supply Cord
18.	25045029	NPJ-6PRBL07 Terminal	54.	270025	SR-3P-4 Strainrelief
19.	25060023	NTM-4PRMN01 Terminal	101.	82113015	3P+15F-N Pan Head Screw
20.	25060008	GND. Terminal	102.	833140087	4TTP+8S Screw
21.	25050004	Fuse Holder with a cover	103.	834140102	4STS+10BQ Tapping Screw
22.	252014	4A-T Fuse, Speaker	104.	801150	LW4+8BS-Ni Hex Volt
23.	250249	M-1614 Transistor Socket	105.	831130082	3STW+8BQ Tapping Screw
			106.	84114010	B4 x 10 Hex Volt
			107.	831130082	3STW+8BQ Tapping Screw
			108.	834130062	3STS+6BQ Tapping Screw
			109.	834430102	3STS+10BQ BC Tapping Screw
			201.	87614012	W4 x 12F Washer
			202.	871440	SW-4BC Spring Washer
			203.	87613010	W3 x 10F Washer
			204.	87313006	M-3-B Toothed Lock Washer
			110.	82143006	3P+6F-N BC Pan Head Screw

The Universal type differs from the U.S.A. model at the following points.

REF. NO.	STOCK NO.	DESCRIPTION	REF. NO.	STOCK NO.	DESCRIPTION
9.	230195	NPT-611ADGQ Transformer-Power	51~54.	none	
11.	3500052	PME271Y510CEE IS Capacitor	56.	25050018	PA-125 3P Inlet
14.	25035051	NPS-121-L16P POWER Push Switch	57.	252003	3A-T Main Fuse
35.	27120073	Back Panel	58.	250186	S-I7205-7 VS Socket

**NAAF-383a PC BOARD VIEW**  
**Preamp., Rectifier and Transient Killer Bottom View**

**EQ./TONE AMP. AND TRANSIENT KILLER PC BOARD-PARTS LIST**

CIRCUIT NO.	STOCK NO.	DESCRIPTION	CIRCUIT NO.	STOCK NO.	DESCRIPTION	CIRCUIT NO.	STOCK NO.	DESCRIPTION
Q201, Q202	222422	TA-7136P(ONK)	Capacitors	390480227	2.2 $\mu$ F	50V	LD	
Q301, Q302	222423	TA-7136P	C209, C210	390882217	220 $\mu$ F	50V	SLD	
Q303, Q304	2210711 or 2210712	2SC1636(1) or 2SC1636(2)	C211, C212	374121824	1800pF $\pm$ 5%	50V	DE	
Q501	2211062 or 2211063	2SC1509(Q) or 2SC1509(R)	C213, C214	374121624	1600pF $\pm$ 5%	50V	DE	
Q502	2211072 or 2211073	2SA777(Q) or 2SA777(R)	C215, C216	374121224	1200pF $\pm$ 5%	50V	DE	
Q701	2210671	2SC1681(0-2)	C219, C210	390480107	1 $\mu$ F	50V	LD	
Q001, Q002	2200373 or 2200372	2SD427(O) or 2SD427(R)	C225, C226	352753311	330 $\mu$ F	25V	Elect.	
Q003, Q004	2200383 or 2200382	2SB557(O) or 2SB557(R)	C303, C304	390480227	2.2 $\mu$ F	50V	LD	
D501, D502	223920	WZ-177 Zener	C317, C318	390480107	1 $\mu$ F	50V	LD	
D701~D704	223815 or 223840	SR3AM-6B or CP-25G	C319, C320	390480477	4.7 $\mu$ F	50V	LD	
D705	223802	1S1885	C321, C322	390486897	0.68 $\mu$ F	50V	LD	
D706, D707	223829	1S1887	C501, C502	352762211	220 $\mu$ F	35V	Elect.	
D708, D709	223106	1S1554	C507, C508	352783301	33 $\mu$ F	50V	Elect.	
			C705, C707	352782211	220 $\mu$ F	50V	Elect.	
			C706	352783311	330 $\mu$ F	50V	Elect.	
			Resistors					
			R305	5148011	N16RGL250KMN30, Variable			
			R503, R504	441525114	510 $\Omega$ , 1/2W, Metal Oxide Film			
			R701	48195615	560 $\Omega$ , 3W, Cement			
			R702	441721224	1.2K $\Omega$ , 2W, Metal Oxide Film			
			R711, R712	441623914	390 $\Omega$ , 1W, Metal Oxide Film			

**CIRCUIT NO. STOCK NO. DESCRIPTION**

5301~S304 **Push Switches** 25035041 NFS-412-L06, Mode/Muting/Loudness/Subsonic  
**Ground Plate** 27300059 BUS-PRE.

**NOTES:**  
**Capacitors** Non-Inductive Polyester Film Capacitor  
**DE:** LD, SLD: Low Leakage Current Type Electrolytic Capacitor.

NAMA-384a PC BOARD VIEW  
Main Amp. Bottom View

MAIN AMP. PC BOARD-PARTS LIST

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Transistors</b>		
Q601, Q602	2210754	2SC1775A(D) or Differential Amp.
Q603, Q604	2210735	2SC1775A(E) or Differential Amp.
Q605, Q606	2211084	2SA872A(D) or Differential Amp.
Q607, Q608	2211085	2SA872A(E) or Differential Amp.
Q609, Q610	2211032	2SA912(Q) or Driver
	2211033	2SA912(R) or Driver
Q611, Q612	2211022	2SC1885(Q) or Driver
	2211023	2SC1885(R) or Driver
Q613, Q614	2210743	2SC945(D)(P) Bias Stabilization
Q615, Q616	2200364	2SD358(D) or Complement
	2200365	2SD358(E) or Complement
Q617, Q618	2200354	2SB528(D) or Complement
	2200355	2SB528(E) or Complement
<b>Coils</b>		
L601, L602	231001	S-1.3B Load Compensation
<b>Capacitors</b>		
C601, C602	390882207	22 $\mu$ F50V SLD
C605, C606	390883317	330 $\mu$ F50V SLD
C613, C614	374121045	0.1 $\mu$ F $\pm$ 10% 50V DE
C615, C616	374122245	0.22 $\mu$ F $\pm$ 10% 50V DE
C617, C618	352780331	3.3 $\mu$ F 50V Elect.
C619, C620		
<b>Thermistors</b>		
TH601, TH602	40000003	D22A
<b>Resistors</b>		
R633, R634	5221007	R-HK2.2KRB3S, Variable, Idling Current Adjust.
R639~R642	451630274	2.7 $\Omega$ 1W, Metal
R643~R646	48194795	0.47 $\Omega$ 3W, Cement
R647, R648	451730474	4.7 $\Omega$ 2W, Metal
R649, R650	451630684	6.8 $\Omega$ 1W, Metal
<b>Radiators</b>		
	270187-1	RAD-01
<b>Ground Plate</b>		
	27300062	BUS-MAIN

TAPE MONITOR PC BOARD-PARTS LIST

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Rotary Switches</b>		
S101	25030071	NRS-143-30ZL Tape Selector
S102	25030068	NRS-143-30A Tape Dubbing
S103	25030068	NRS-143-30A Tape Monitor
<b>TREBLE CONTROL PC BOARD-PARTS LIST</b>		
CIRCUIT NO. <td>STOCK NO. <td>DESCRIPTION</td> </td>	STOCK NO. <td>DESCRIPTION</td>	DESCRIPTION
<b>Capacitors</b>		
C401, C402	390882207	22 $\mu$ F 50V SLD
C400, C410	374121244	0.12 $\mu$ F 5% 50V DE
R401	5148010	Variable Resistor
		N16RGM11C200KRD30
		Treble Control
<b>Push Switch</b>		
S402	25035042	NPS-142L07

BASS CONTROL PC BOARD-PARTS LIST

CIRCUIT NO.	STOCK NO.	DESCRIPTION
<b>Capacitors</b>		
C409, C410	374121244	0.12 $\mu$ F 5% 50V DE
<b>Variable Resistor</b>		
R423	5148010	N16RGM11C200KRD30, Bass Control
<b>Push Switches</b>		
S403	25035042	NPS-142L07

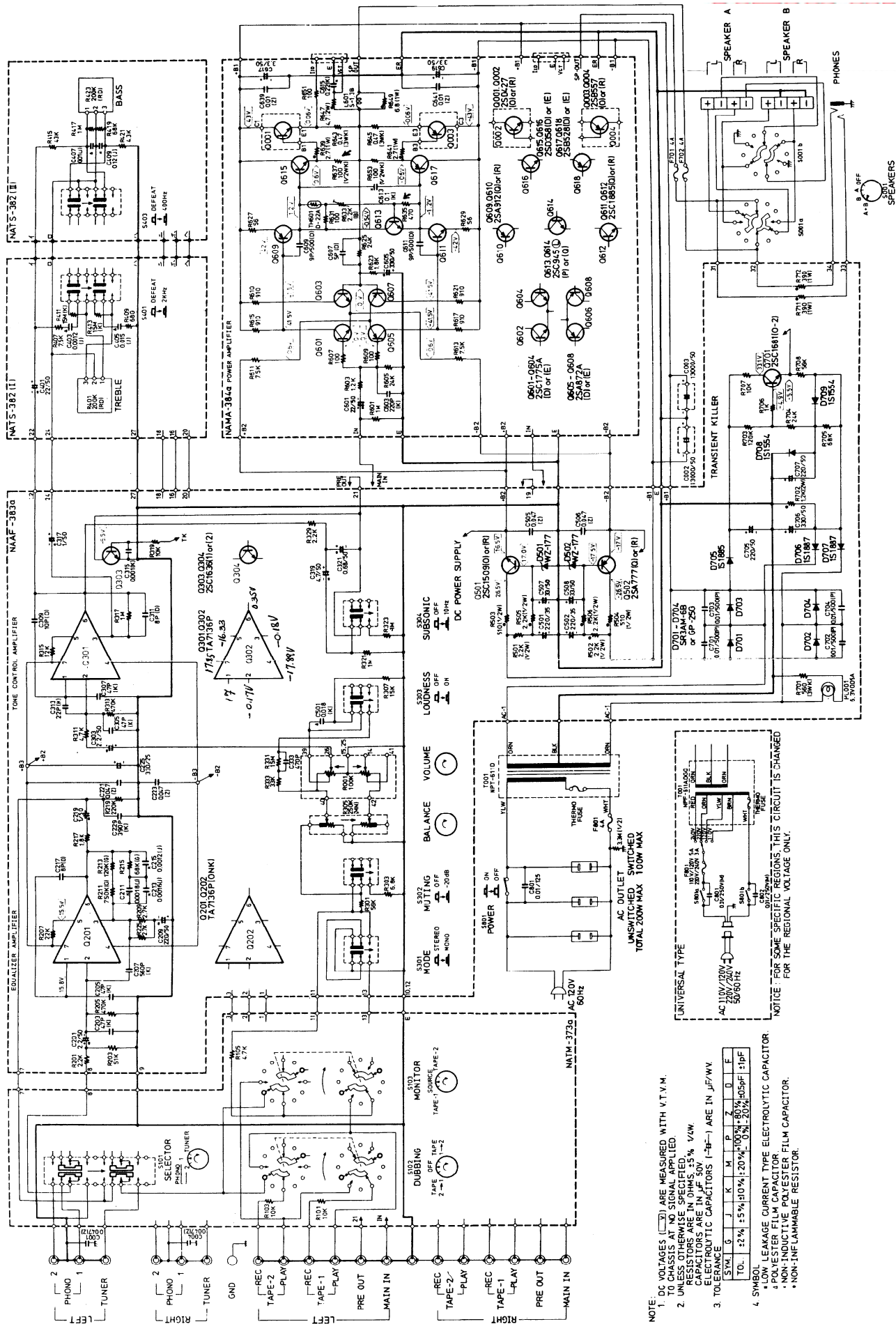
MAIN AMP. ALIGNMENT

NOTES:  
 1. Set up A-5 as follows:  
 SELECTOR ..... TUNER  
 TONE SHIFT ..... DEFEBT  
 TONE & BALANCE ..... Center  
 FILTER/LOUDNESS/DUBBING ..... OFF  
 MODE ..... STEREO  
 T. MONITOR ..... SOURCE  
 SPEAKER ..... OFF  
 VOLUME ..... Maximum  
 2. Adjust after switching on for 3 minutes.  
 1. Idling current adjustment  
 Connect the DC Voltmeter between Id and VCT terminals  
 Adjust the Voltage to 16.5 $\pm$ 2mV with R639. (Left channel)  
 Adjust the Voltage to 16.5 $\pm$ 2mV with R634. (Right channel)

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.

Capacitors: Non-Inductive Polyester Film Capacitor  
 DE: Low Leakage Current Type Electrolytic Capacitor  
 ID, SLD:

# SCHEMATIC DIAGRAM

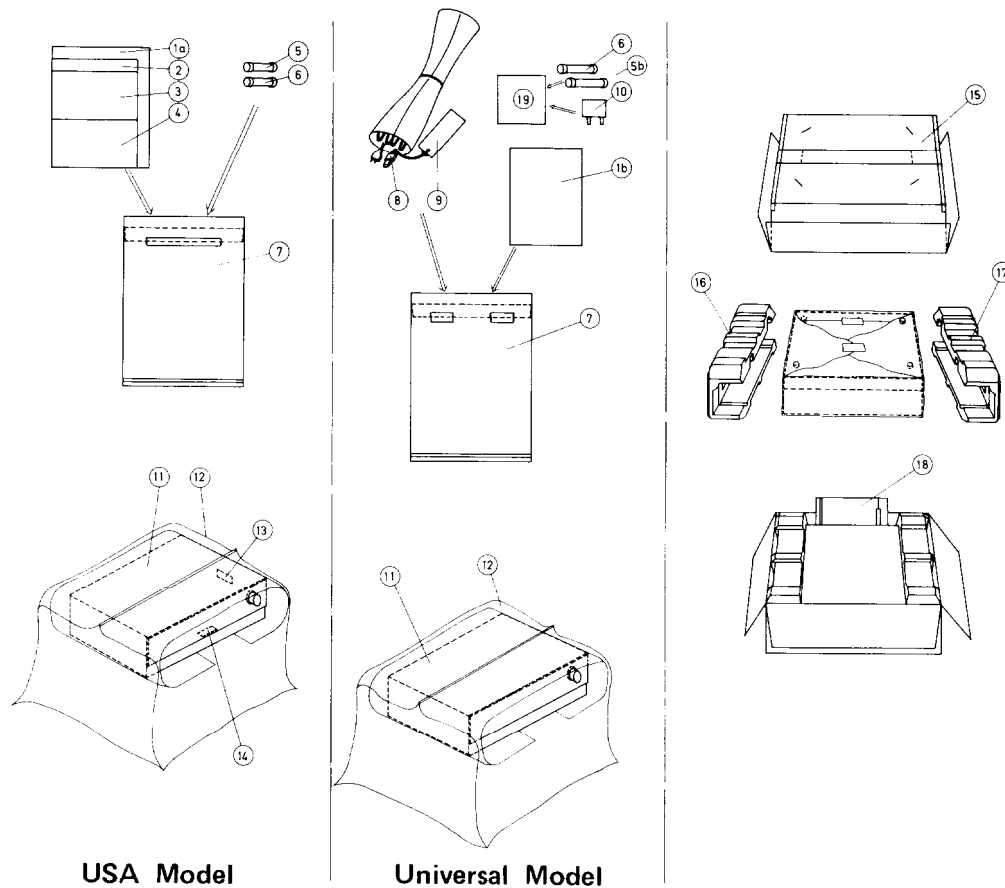


- NOTE:
- DC VOLTAGES ( ) ARE MEASURED WITH V.T.M. TO CHASSIS AT NO SIGNAL APPLIED, UNLESS OTHERWISE SPECIFIED.
  - RESISTORS ARE IN OHMS, ±5% 1/4W. CAPACITORS ARE IN μF, 50V. ELECTROLYTIC CAPACITORS (E) ARE IN μF/WV. FILM CAPACITORS (F) ARE IN pF/WV.
  - TOLERANCE:
 

TOL.	±2%	±5%	±10%	±20%	±50%	±100%	±200%
	S	V	K	M	P	Z	D
  - SYMBOL:
    - LOW LEAKAGE CURRENT TYPE ELECTROLYTIC CAPACITOR.
    - NON-INDUCTIVE POLYESTER FILM CAPACITOR.
    - NON-FLAMMABLE RESISTOR.

UNIVERSAL TYPE  
AC 110V/220V/240V/250V/260V/50/60 Hz  
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	29340199	Instruction Manual	10	25055018	CV-K-1, Conversion Plug
1b	29340201	Instruction Manual	11	290008	500 x 1000 (m/m), Sheet
2	29358001	Service Station List	12	29100027	850 x 650 (m/m), PolyBag
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	29050113	Carton Box
5b	252020	5A-T, Fuse	16	29090178	Pad, Left
6	252014	4A-T, Fuse	17	29090179	Pad, Right
7	29100006A	250 x 350 (m/m), Poly Bag	19	29100002	150 x 80 (m/m), Poly Bag
8	253083	Power Supply Cord		250153	Shorting Pin
9	293268	Tag, Voltage		29380025	Tag, Cabinet Composite