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# ELECTRONICS SERVICE MANUAL

## A-04 Amplifier

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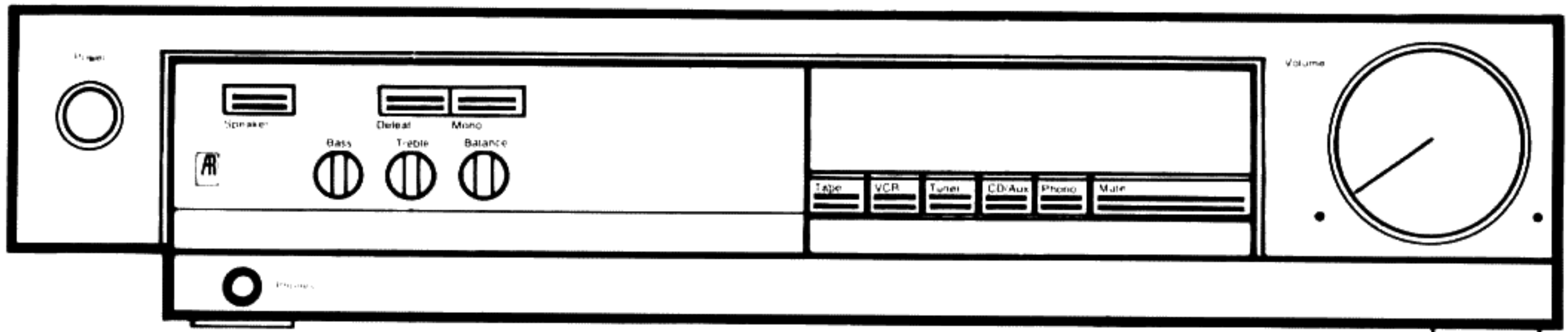
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## Bias Adjustment

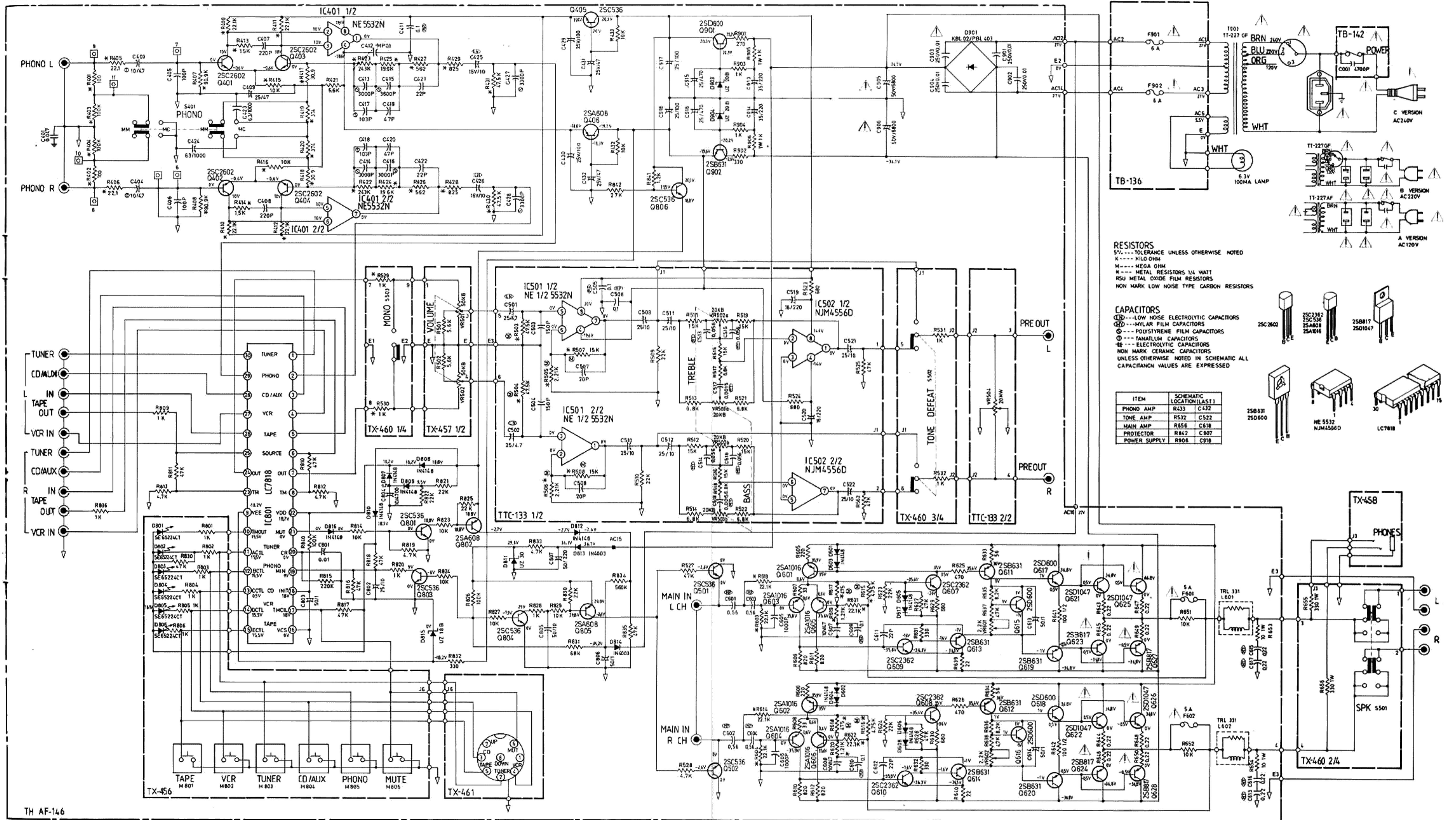
**Instruments:** DC milli-voltmeter

**Notes:** Prior to Bias Adjustment, run about 5 minutes with rated output (8 ohm) and warm up Power Transistor and Heat Sink.  
Set Volume Control to Minimum.

Step	Coupling		Adjust	Adjust for
	Plus Lead	Minus Lead		
1	TP3	TP1	VR601	DC milli-voltmeter reads 3.0mV
2	TP2	TP4	VR602	

# Schematic Diagram

NOTE: PARTS AND CIRCUIT SUBJECT TO CHANGES FOR IMPROVEMENTS WITHOUT PRIOR NOTICE



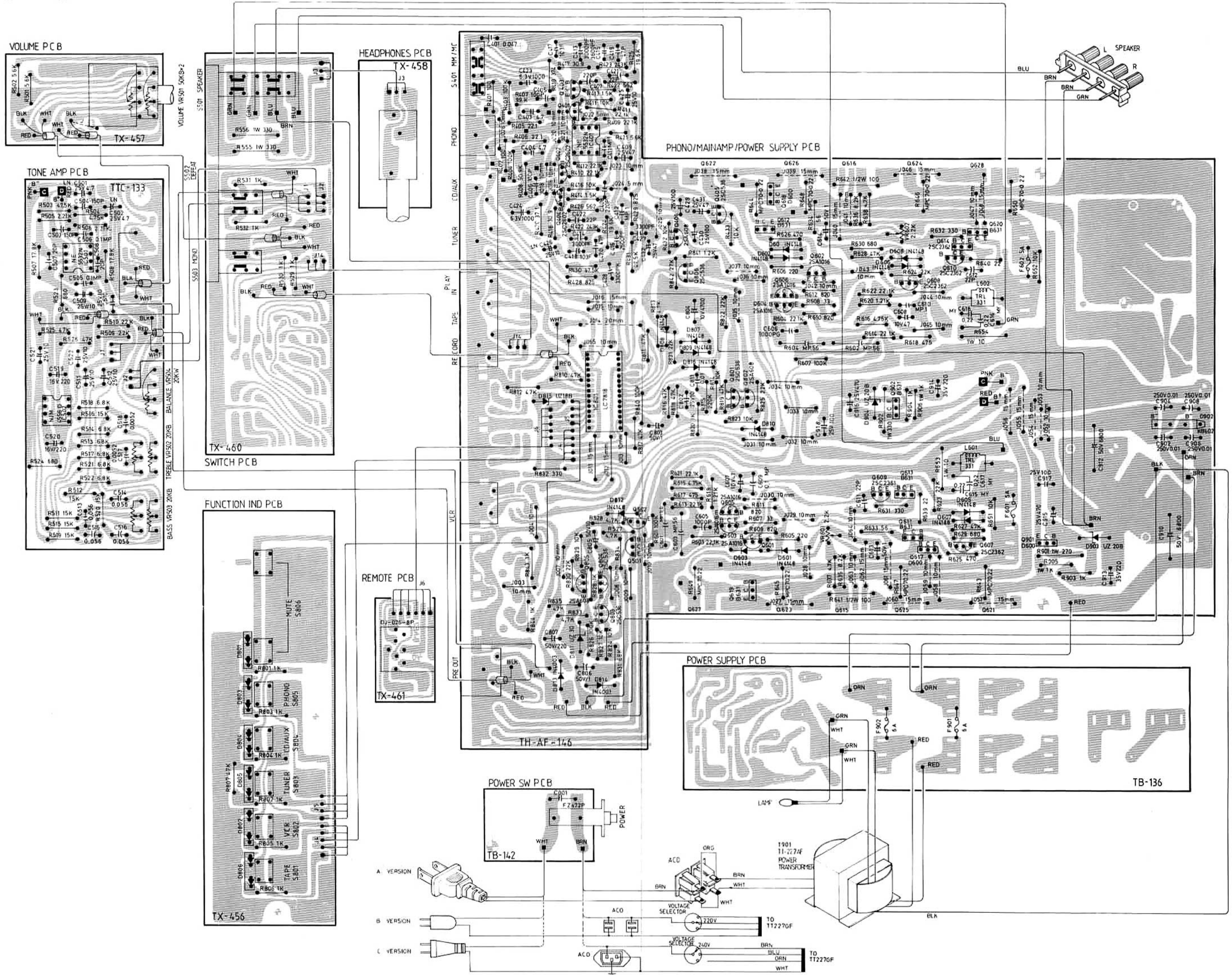
TH AF-146

**INSTRUCTIONS FOR SERVICE PERSONNEL**

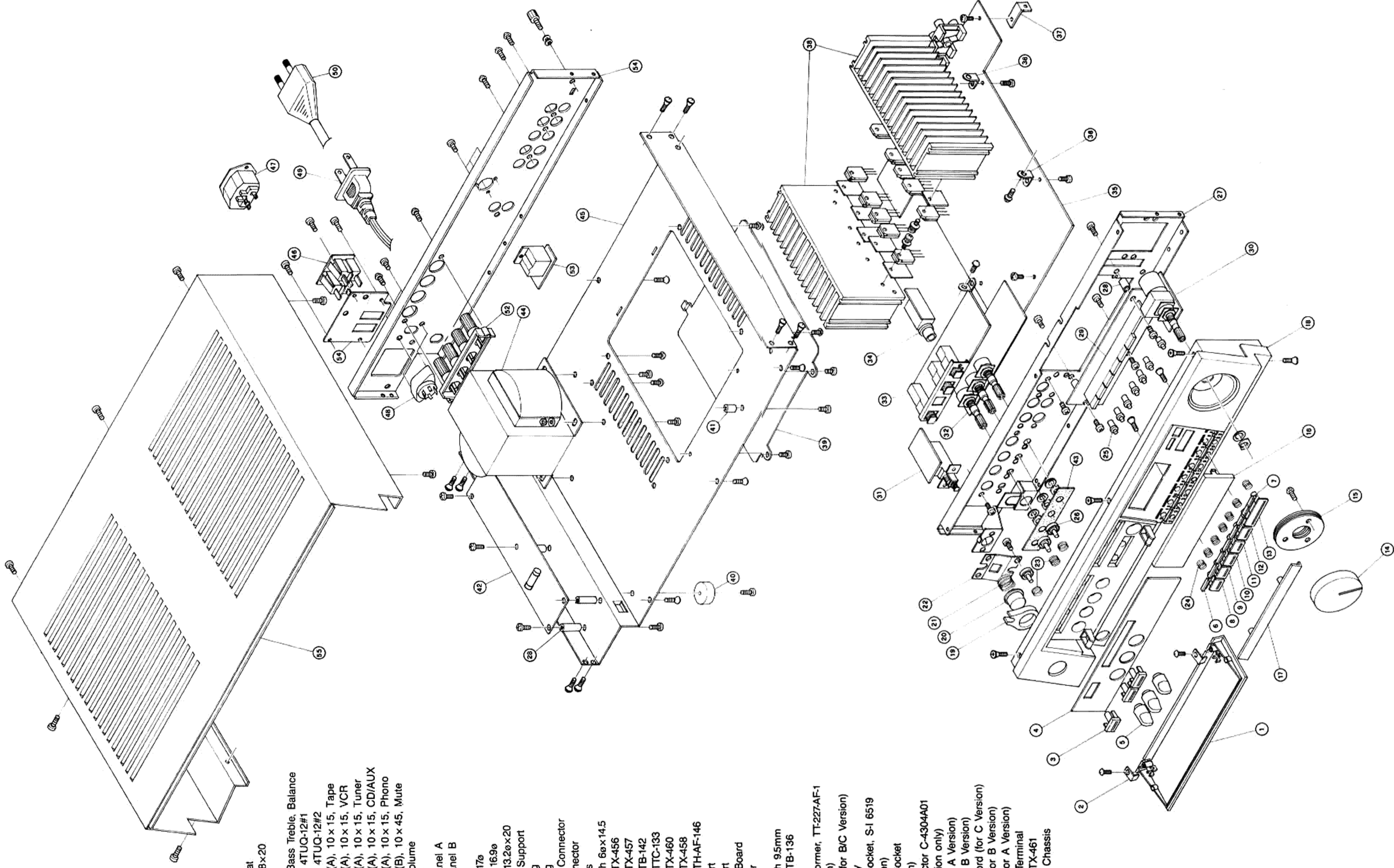
- 1) TO USE ONLY REPLACEMENT PARTS THAT HAVE THE CRITICAL CHARACTERISTICS RECOMMENDED BY MANUFACTURER.
- 2) TO MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

Y05A-7PABCDEFHJKLMNPOQRSTUVWXYZ

# Wiring Diagram



# Disassembly Diagram



Key No.	parts No.	Description
1.	CM00002054	Plastic Door
2.	SP-10004822	Door Lock Plat
3.	KB20001664	Push Button 8x20
4.	OM00002157	Door Plate
5.	KB10001333	Knob, 13 e, Bass Treble, Balance
6.	OM00002080	LED Diffusor, 4TUQ-12#1
7.	OM00002327	LED Diffusor, 4TUQ-12#2
8.	KB20001755	Tact Button (A), 10 x 15, Tape
9.	KB20001767	Tact Button (A), 10 x 15, VCR
10.	KB20001779	Tact Button (A), 10 x 15, Tuner
11.	KB20001780	Tact Button (A), 10 x 15, CD/AUX
12.	KB20001792	Tact Button (A), 10 x 15, Phono
13.	KB20001573	Tact Button (B), 10 x 45, Mute
14.	KB10001357	Knob, 50e, Volume
15.	SF00000780	Knob Spacer
16.	OM00002108	Sub Front Panel A
17.	OM00002110	Sub Front Panel B
18.	AA80000821	Front Panel
19.	BUJ0000724	Button Ring 17ø
20.	KB20001652	Push Button 16.9ø
21.	SN00000180	Button Ring 13.2øx20
22.	SP10004901	Push Button Support
23.	SN00000179	Button Spring
24.	SN00000192	Button Spring
25.	OM00002091	Push Button Connector
26.	OM00001943	Button Copnector
27.	AF80000299	Front Chassis
28.	BC00000337	Cylinder Bush 6øx14.5
29.		PC.B. Ass'y, TX-456
30.		PC.B. Ass'y, TX-457
31.		PC.B. Ass'y, TB-142
32.		PC.B. Ass'y, TTC-133
33.		PC.B. Ass'y, TX-460
34.		PC.B. Ass'y, TX-458
35.		PC.B. Ass'y, TH-AF-146
36.	SP10003258	PC.B. Support
37.	SP10003040	PC.B. Support
38.	AH20000370	Heat Sink Board
39.	AB00000158	Bottom Cover
40.	FT00000140	Rubber Foot
41.	BC00000258	Cylinder Bush 9.5mm
42.		PC.B. Ass'y, TB-136
43.	FE00000407	Felt.
44.	PT21004044	Power Transformer, TT-227-AF-1 (for A Version)
45.	PT21004093	TT-227-GF-1 (for B/C Version)
46.	AM00001318	Chassis Body
47.	SA00001450	AC Outlet Socket, S-I 6519 (for A/B Version)
48.	SA00001553	AC Outlet Socket (for C Version)
49.	VC00000048	Voltage Selector C-4304A01 (for B/C Version only)
50.	CD00000218	AC Cord (for A Version)
51.	CD00000097	AC Cord (for B Version)
52.	SP10005048	AC Power Cord (for C Version)
53.	SP10004755	ACO Mask (for B Version)
54.	TP20000249	ACO Mask (for A Version)
55.	AFB0000582	4P Speaker Terminal
	AUJ00000683	PC.B. Ass'y, TX-461
		Printed Rear Chassis
		Upper Cover

# Repair Parts List

Schematic Location	Parts No.	Description
<b>TRANSISTORS, DIODES AND IC'S</b>		
Q401 - 404	TR30000467	2SC2602(G), Phono Amp.
Q405	TR30000327	2SC536(G), Phono Stabilizer.
Q406	TR10000126	2SA608K, Phono Stabilizer
Q501, 502	TR30000327	2SC536(G), Tone Muting.
Q601 - 606	TR10000023	2SA1016(G,H), Constant Current/Differential Amp.
Q607 - 610	TR30000212	2SC2362(G,H), Muting/Pre-Driver.
Q611 - 614	TR10000047	2SB631K(E,F), Constant Current/Pre-Driver.
Q617 - 618	TR40000069	2SD600K(E,F), Driver
Q619, 620	TR10000047	2SB631K(E,F), Driver
Q621, 622	TR40000045	2SD1047(E,F), Power Amp.
Q623, 624	TR20000040	2SB817(D,E), Power Amp.
Q625, 626	TR40000045	2SD1047(E,F), Power Amp.
Q627, 628	TR20000040	2SB817(D,E), Power Amp.
Q801	TR30000327	2SC536(G), Protector
Q802	TR10000126	2SA608K, Protector
Q803, 804	TR30000327	2SC536(G), Protector
Q805	TR10000126	2SA608K, Protector
Q806	TR30000327	2SC536(G), Stabilizer
Q901	TR40000069	2SD600K(E,F), Stabilizer
Q902	TR10000047	2SB631K(E,F), Stabilizer
D601 - 608	DD10000100	IN4148, Bias Compensator
D801 - 806	DD40000812	SE65224DT-D, LED
Q807 - 810	DD10000100	IN4148, Diode
D811	DD20000030	UZ30, Zener Regulator
D812	DD10000100	IN4148, Diode se Prevention
D813, 814	DD10000068	IN4003, Diode
D815	DD20000041	UZ18B, Zener Regulator
D816	DD10000100	IN4148, Diode
D901,	DD10000020	KBL-02/PBL-403, Rectifier
D903, 904	DD20000028	UZ20B, Zener Regulator
IC401	IC00001279	NE5532N, Phono Amp.
IC501	IC00001279	NE5532N, Tone Amp.
IC502	IC00001474	NJM4556D, Tone Amp.
IC801	IC00001541	LC7818, Function

Schematic Location	Parts No.	Description
<b>COILS, VARIABLE RESISTORS, SWITCHES AND OTHERS</b>		
L601, 602	LC23310002	TRL-331, Anti-Parasitic Coil
VR501	RV10001073	051 C-4170A08, 50KB x 2, Volume Control
VR502, 503	RV10000433	4TR-1742, 20KB x 2, Treble, Bass Control
VR504	RV10000378	4TR-1572, 20KW, Balance Control
VR601, 602	RV40000022	VM6CKPV-1S-B 2.2KB, Bias Adj.
S501 - 503	SH14000160	4TR-2279, 4 Key Push Switch, Speaker/Defeat/Mono
S801 - 808	SH60000239	4TR-2301, Key Board Switch, Tape/VCR/Tuner/CD/Phono/Mute
	SH40000155	C-4176A01, Power
S401	SH20000319	SSY342, Slide Switch Phono
T001	PT21004044	TT-227-AF-1, Power Transformer (for A Version)
	PT21004093	TT-227-GF-1 Power Transformer (for B, C Version)
F601,602	FU12000106	Fuse, 250V 5A (UL)
	FU23000074	Fuse, 250V 5A (Mini)
F901,902	FU12000136	Fuse, 250V 6A (UL)
	FU23000086	Fuse 250V 6.3A (Mini)

# Specifications

<b>Continuous Power Output</b> .....	40 watts* per channel, min RMS both channels driven into 8 ohms from 20 to 20,000 Hz with no more than 0.03% total harmonic distortion
<b>DIN Power Output</b> .....	58 watts per channel (1kHz, 4 ohms, 1% THD) (D)
<b>Music Power</b> .....	200 watts total (100 w/ch)
<b>Continuous Rated Power Output</b> .....	total harmonic distortion (20 to 20,000 Hz) no more than 0.03% inter modulation distortion (60Hz:7kHz = 4:1) no more than 0.03%
<b>Continuous 1/2 Rated Power Output</b> ...	total harmonic distortion (20 to 20,000 Hz) no more than 0.02% inter modulation distortion (60Hz:7kHz = 4:1)
<b>1 Watt/ch Power Output, 8 ohms</b> .....	total harmonic distortion (20 to 20,000 Hz) no more than 0.03% inter modulation distortion (60Hz:7kHz = 4:1) no more than 0.03%
<b>Output</b>	
<b>Speaker</b> .....	8 ohm nominal
<b>Headphone</b> .....	8 ohm nominal
<b>Damping Factor</b> .....	120 (1 kHz, 8 ohms)
<b>Input Sensitivity/Impedance</b>	
<b>Phono (MM)</b> .....	2.5mV/47 Kohms
<b>Phono (MC)</b> .....	200 $\mu$ V/100 ohms
<b>CD</b> .....	150mV/20 Kohms
<b>Tuner, Tape Monitor</b> .....	150mV/20 Kohms
<b>Overload Level (THD 0.5% 1 kHz)</b>	
<b>Phono (MM)</b> .....	180mV
<b>Phono (MC)</b> .....	15mV
<b>CD, Tuner, Tape Monitor</b> .....	5V
<b>Frequency Response</b>	
<b>Phono</b> .....	20 to 20,000Hz $\pm$ 0.2dB (RIAA STD)
<b>CD, Tuner, Tape Monitor</b> .....	20 to 20,000Hz + 0.5dB - 0.3dB
<b>Signal to Noise Ratio (IHF A Network)</b>	
<b>Phono (MM)</b> .....	80 dB
<b>Phono (MC)</b> .....	70 dB
<b>CD, Tuner, Tape Monitor</b> .....	90 dB
<b>Power Consumption</b> .....	200 watts
<b>Dimensions (Overall)</b> .....	430(W) $\times$ 88(H) $\times$ 356(D) 16 <sup>15/16</sup> " $\times$ 3 <sup>15/32</sup> " $\times$ 14 <sup>1/16</sup> "
<b>Weight (net)</b> .....	7.6 kgs/16.72 lbs

- Specifications and design subject to possible modification without notice.
- \*Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only).