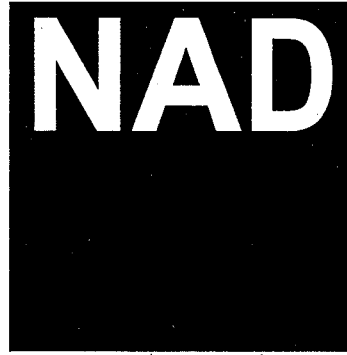


# SERVICE MANUAL



**319**

**INTEGRATED  
AMPLIFIER**

**319**

**INTEGRATED  
AMPLIFIER**

131

# SERVICE SAFETY PRECAUTIONS

## 1. Replacing the fuses

**CAUTION:** FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE REPLACE ONLY WITH SAME TYPE OF FUSE.

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
F501*AH	5120-0055-0	Fuse 10A 250V Non-Time Delay LBC (UL/CSA)
F501*C	5120-0017-0	Fuse 4A 250V Time Lag HBC (SEMKO/VDE)
*F502*AH	5120-0036-0	Fuse 100mA 250V Medium Time Lag LBC (UL/CSA)
F502*C	5120-0035-0	Fuse 100mA 250V Time Lag LBC (SEMKO/VDE)
F301-F304*AH	5120-0056-0	Fuse 10A 125V Semi-Time Delay LBC (UL/CSA)

**NOTE :**

- <\*AH> : USA, CANADIAN MODEL ONLY.
- <\*C> : EUROPEAN MODEL ONLY.

## 2. Safety-check out

(Only U.S.A. model)

Parts marked with the symbol  $\triangle$  are critical with regard to the risk of fire and electric shock. Replace only with parts recommended by the manufacturer.

Before returning the product to the customer, make leakage current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit.

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# SPECIFICATIONS

## POWER AMPLIFIER SECTION

CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (Min. power per channel, 20 Hz - 20 kHz, both channels driven, with no more than rated distortion)		<b>125 W (21 dBW)</b>
Rated Distortion * THD (20 Hz - 20 kHz)		<b>0.03%</b>
Clipping power at 8 ohms (Maximum continuous power per channel).		<b>150 W (21.8 dBW)</b>
IHF dynamic headroom at 8 ohms		<b>+1.3 dB</b>
IHF dynamic power (Maximum short term power per channel)		
	8 ohms:	<b>170 W (22.3 dBW)</b>
	4 ohms:	<b>280 W (24.5 dBW)</b>
	2 ohms:	<b>400 W (26.0 dBW)</b>
Slew rate		<b>&gt; 60 V / <math>\mu</math>sec</b>
Damping factor at 50 Hz	8 ohms:	<b>200</b>
Input Impedance		<b>60 kohms + 500 pF</b>
Input sensitivity (for rated output into 8 ohms)		<b>1.12 V</b>
Voltage gain		<b>x 28.3 (29 dB)</b>
Frequency response 20 Hz - 20 kHz		<b><math>\pm</math>0.2 dB - 3 dB at 2 Hz / 100 kHz</b>
Signal / Noise ratio, A-weighted		<b>96 dB ref. 1 W 117 dB ref. rated power</b>

## BRIDGED (MONOPHONIC) MODE

CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (Min. power per channel, with no more than rated distortion)		<b>400 W (26.0 dB)</b>
IHF dynamic headroom at 8 ohms		<b>+ 1.5 dB</b>
IHF dynamic power	8 ohms:	<b>560 W (27.5 dBW)</b>
	4 ohms:	<b>800 W (29.0 dBW)</b>
Input sensitivity (for rated output into 8 ohms)		<b>1000 mV</b>

## PREAMPLIFIER SECTION

### LINE LEVEL INPUTS

(CD, Video, Auxiliary, Tuner, Tape1, Tape2)

Input impedance (R and C)

20 kohms + 450 pF

Input sensitivity (ref. 0.5 V)

80 mV

Signal/ Noise ratio, A-weighted

85 dB ref. 1 W

Frequency response, 20 Hz - 20 kHz

±0.2 dB

Voltage gain

16 dB

THD + SMPTE + IHF I.M.

0.01%

### LINE LEVEL OUTPUTS

Preamp output impedance

220 ohms

Tape output impedance

Source Z + 2 kohms

Headphones output impedance

120 ohms

Maximum output level

preamp-out:

> 12 V

tape-out:

> 10 V

headphones-out:

> 8 V into 600 ohms

> 250 mV into 8 ohms

### CONTROLS

Treble

± 7 dB at 10 kHz

Bass

± 10 dB at 50 Hz

## DIMENSIONS AND WEIGHTS

Net Weight

14 kg (30.8 lb)

Shipping Weight

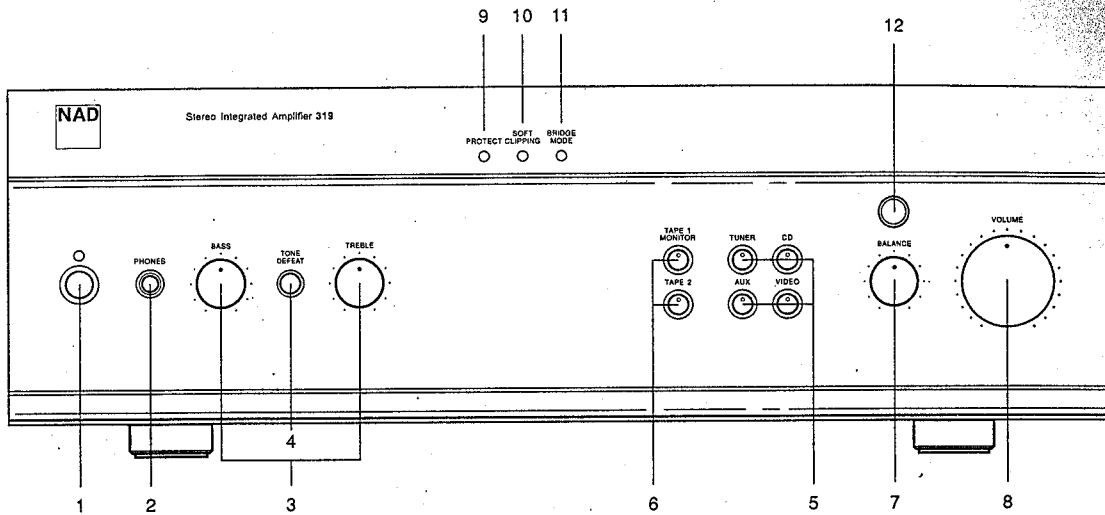
16 kg (35.2 lb)

Dimensions (Width x Height x Depth)


435mm x 145mm x 380mm

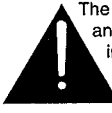
# REAR PANEL / FRONT PANEL VIEW

## FRONT PANEL

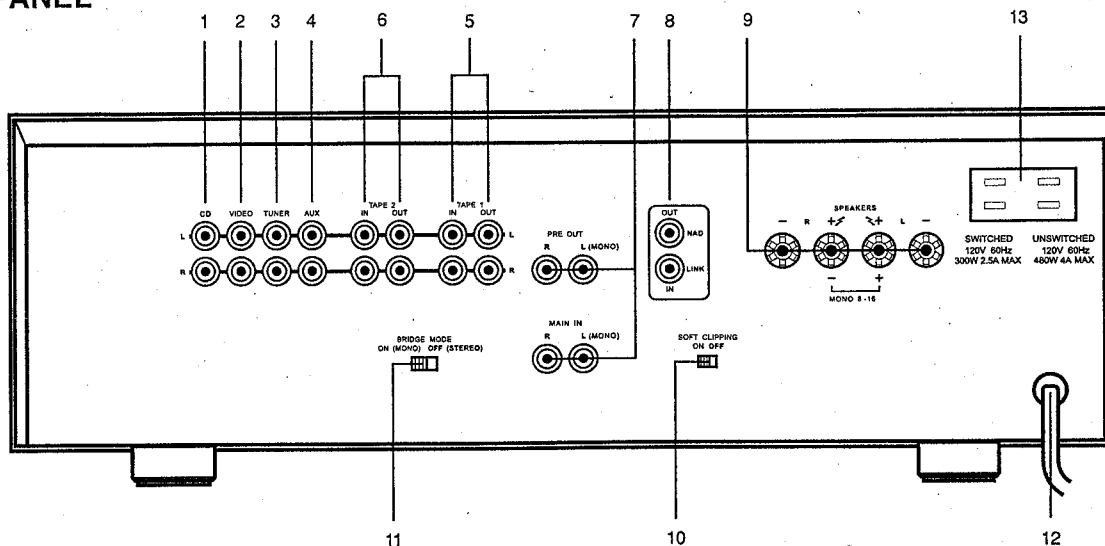


- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. POWER SWITCH</li> <li>2. HEADPHONE SOCKET</li> <li>3. BASS &amp; TREBLE CONTROLS</li> <li>4. TONE DEFEAT SWITCH</li> <li>5. INPUT SELECTORS</li> <li>6. TAPE 1 MONITOR/ TAPE 2</li> </ol> | <ol style="list-style-type: none"> <li>7. BALANCE CONTROL</li> <li>8. VOLUME CONTROL</li> <li>9. PROTECT INDICATOR</li> <li>10. SOFT CLIPPING INDICATOR</li> <li>11. BRIDGE MODE INDICATOR</li> <li>12. INFRA-RED SENSOR</li> </ol> |
|---|---|

 The graphic symbol of a lightning flash with an arrow point within a triangle signifies that there is dangerous voltage within the unit and it poses a hazard to anyone removing the cover to gain access to the interior of the unit. Only qualified service personnel should make any such attempt.

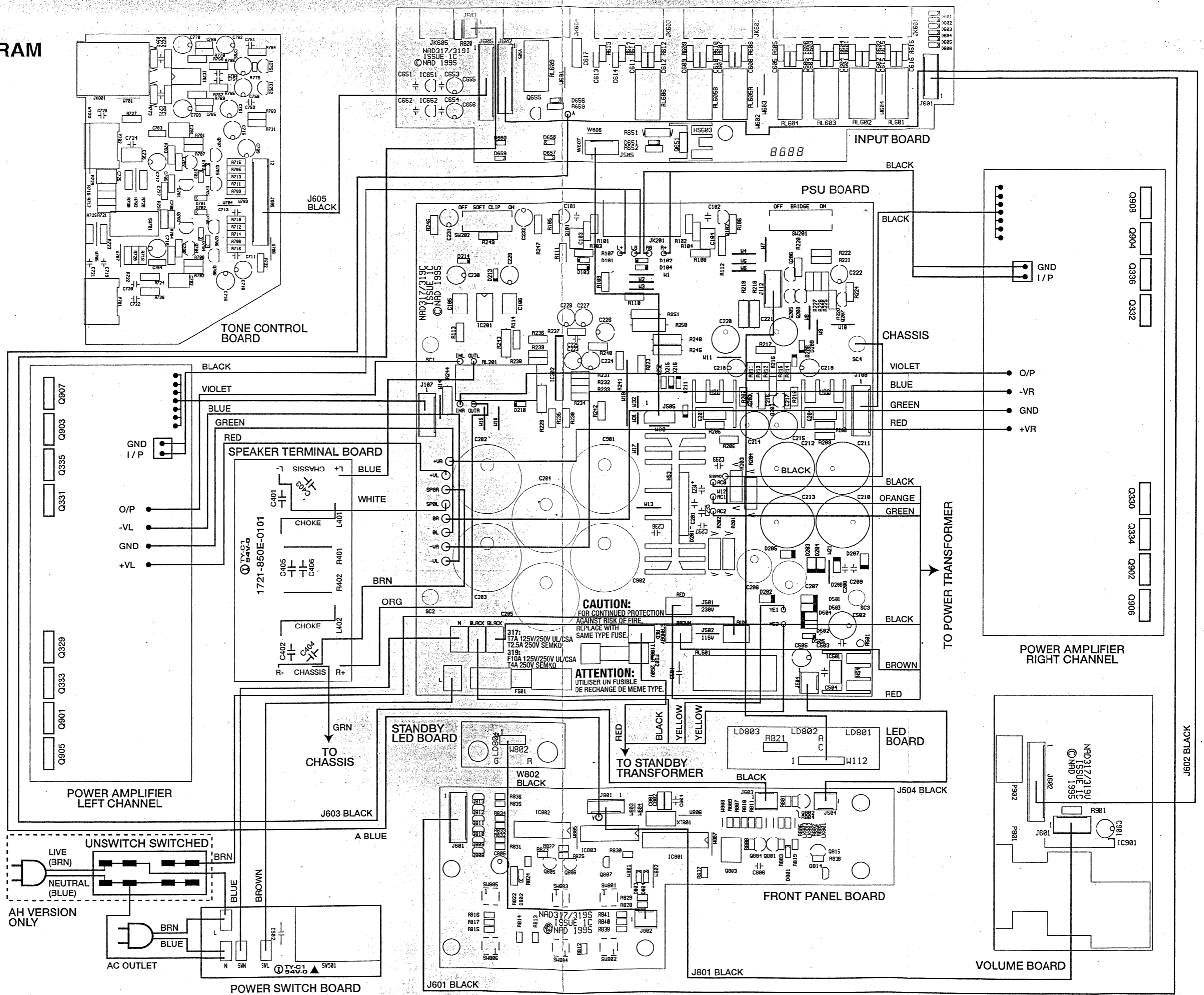
 The graphic symbol of an exclamation point within an equilateral triangle warns a user of the device that it is necessary to refer to the instruction manual and its warnings for proper operation of the unit.

## REAR PANEL



- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. CD INPUT</li> <li>2. VIDEO SOUND INPUT</li> <li>3. TUNER INPUT</li> <li>4. AUXILIARY INPUT</li> <li>5. TAPE 1 INPUT/OUTPUT</li> <li>6. TAPE 2 INPUT/OUTPUT</li> <li>7. PREAMP OUT, MAIN IN</li> </ol> | <ol style="list-style-type: none"> <li>8. NAD LINK INPUT/OUTPUT</li> <li>9. SPEAKER TERMINALS</li> <li>10. SOFT CLIPPING SWITCH</li> <li>11. BRIDGE MODE SWITCH</li> <li>12. AC LINE CORD</li> <li>13. AC OUTLETS (ONLY IN 120 V MODEL)</li> </ol> |
|---|--|

WIRING DIAGRAM



CAUTION:  
FOR CONTINUED PROTECTION  
AGAINST RISK OF FIRE,  
REPLACE WITH  
SAME TYPE FUSE.

ATTENTION:  
UTILISER UN FUSIBLE  
DE REMPLACEMENT DE MEME TYPE.

# DISASSEMBLY INSTRUCTIONS

AL

1. Remove machine screws M4.0 x 6.0 (① to ⑥) from the side panels. Remove tapping screw 3.0 x 8.0 (⑦ to ⑩) from the back panel. Refer to **Figure No. 1**.

A. A

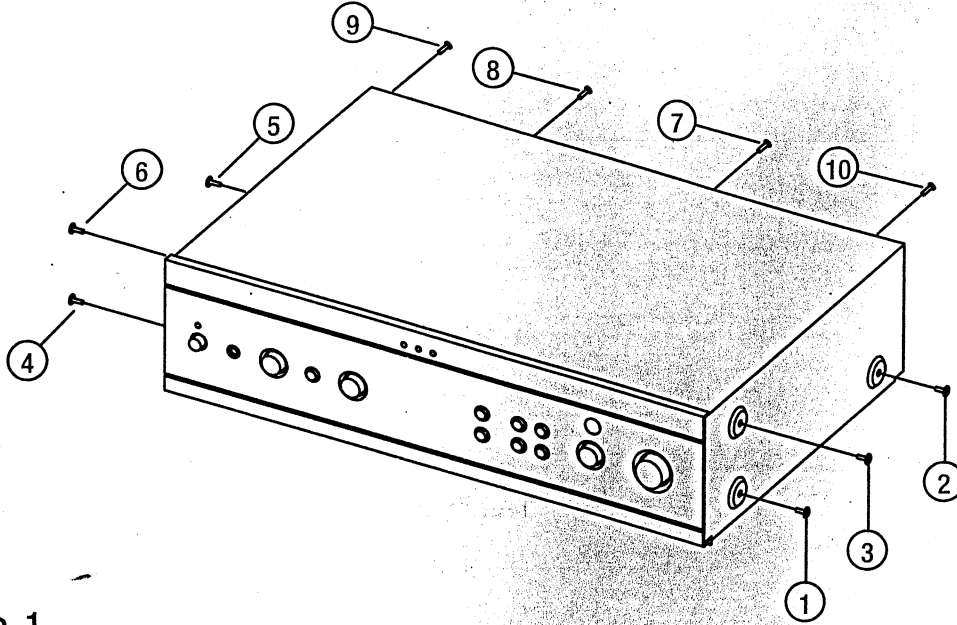


Figure No. 1.

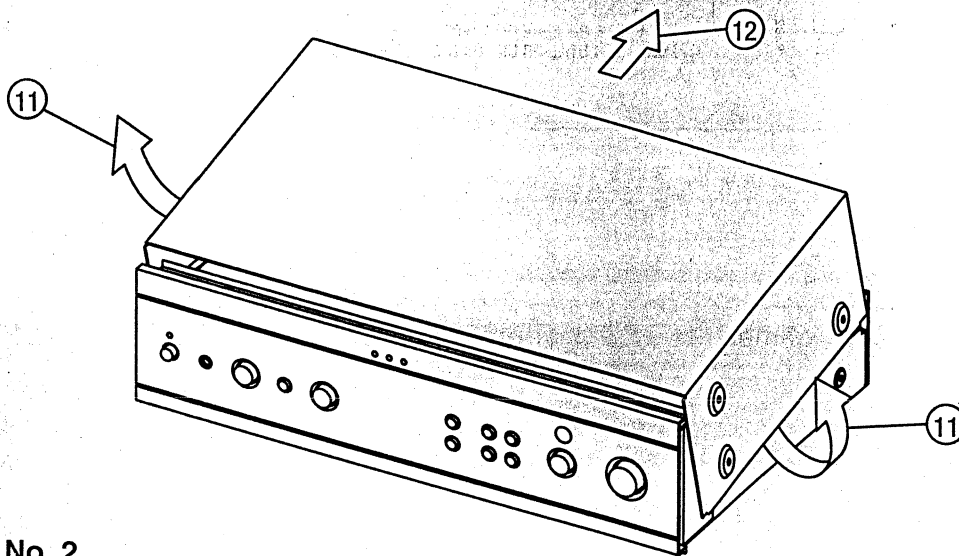
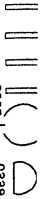


Figure No. 2.

2. Pull both sides of the TOP COVER slightly outwards (⑪), tilt approximately 35° and then move in the direction indicated by the arrow (⑫). Refer to **Figure No. 2**.

5850



THIS  
D3888

**NAD**  
317/319  
Stereo Power  
Amplifier

B. I

1.

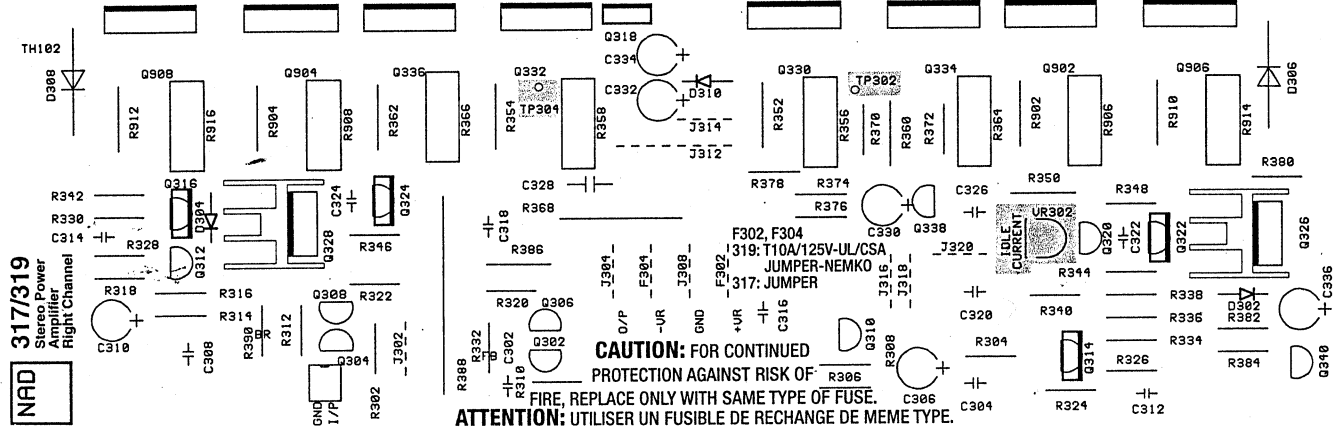
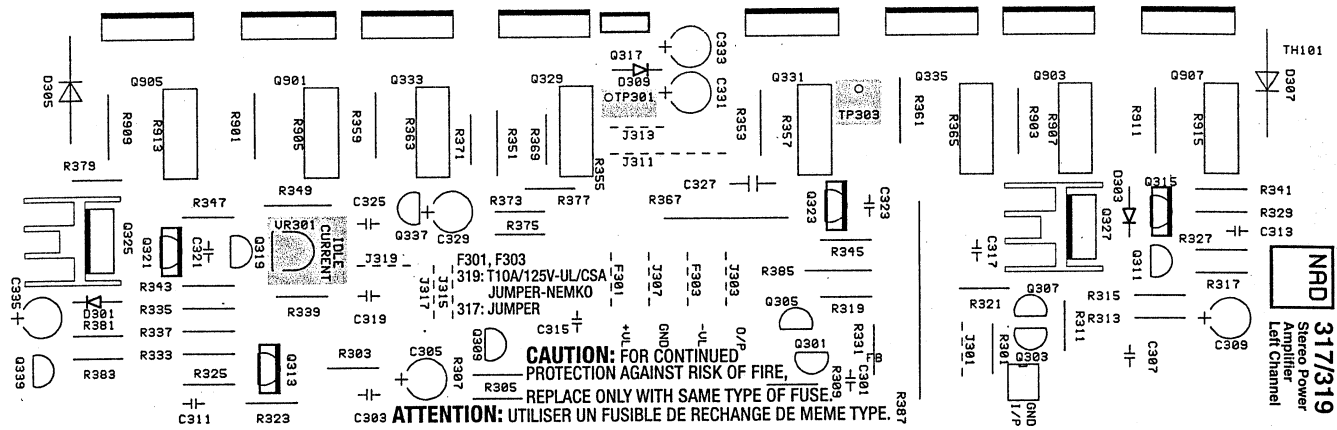
2.

3.



# ALIGNMENT POINTS DIAGRAM / PROCEDURES

## A. ALIGNMENT POINTS

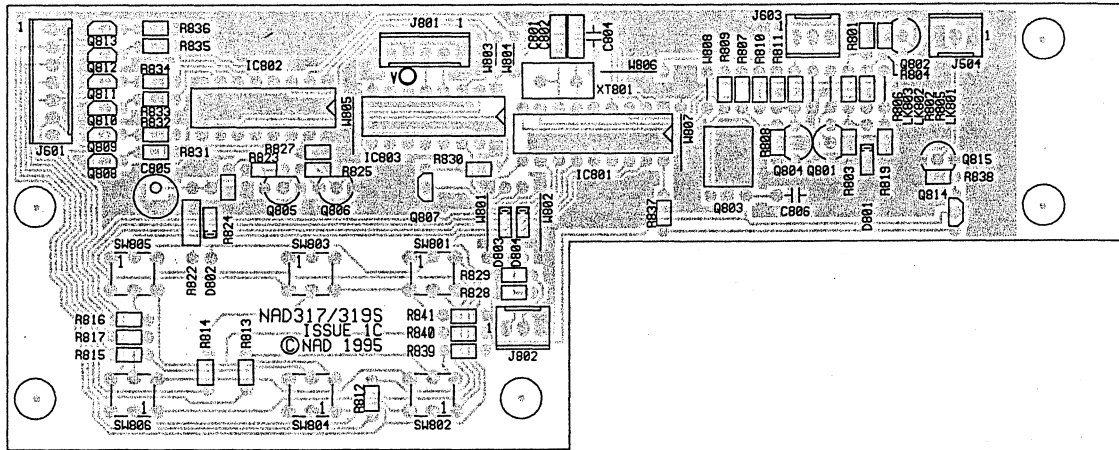


## B. IDLE CURRENT ALIGNMENT (NO SIGNAL, NO LOAD)

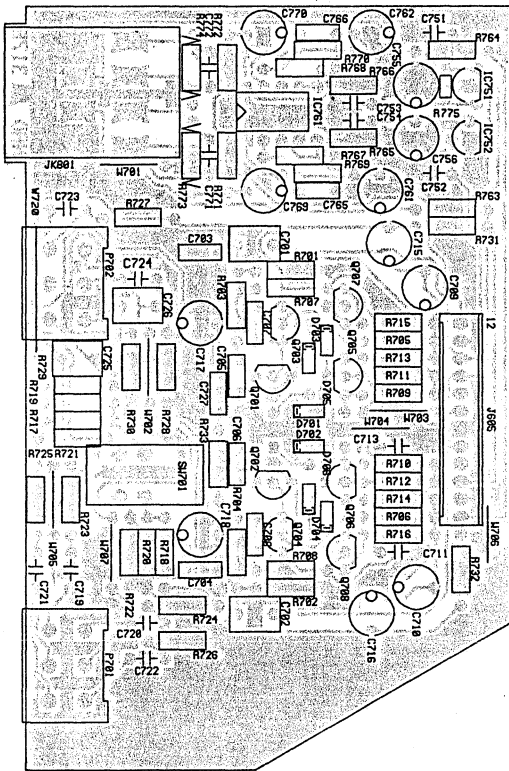
1. Connect a DC millivoltmeter to TP301 and TP303, and adjust VR301 for  $18 \pm 1.5$  mV reading on meter.
2. Connect a DC millivoltmeter to TP302 and TP304, and adjust VR302 for  $18 \pm 1.5$  mV reading on meter.
3. Leave power "on" for a minimum of 5 minutes, and check 1 and 2 for correct reading.



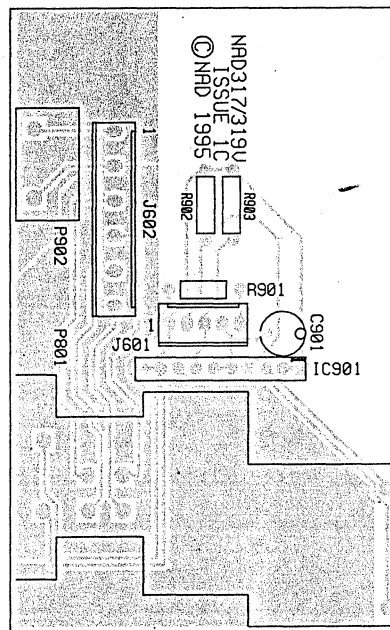
**FRONT PANEL PCB**



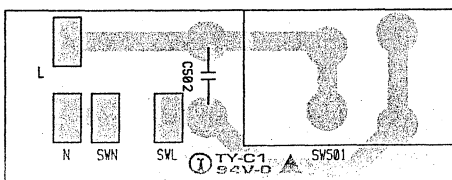
**TONE CONTROL PCB**



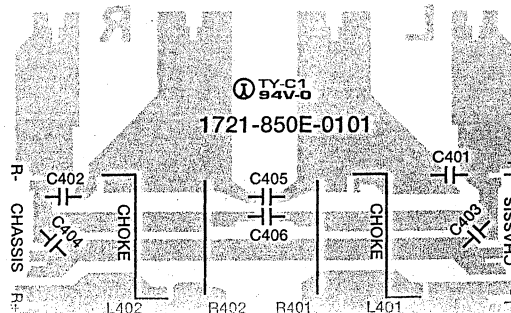
**VOLUME PCB**



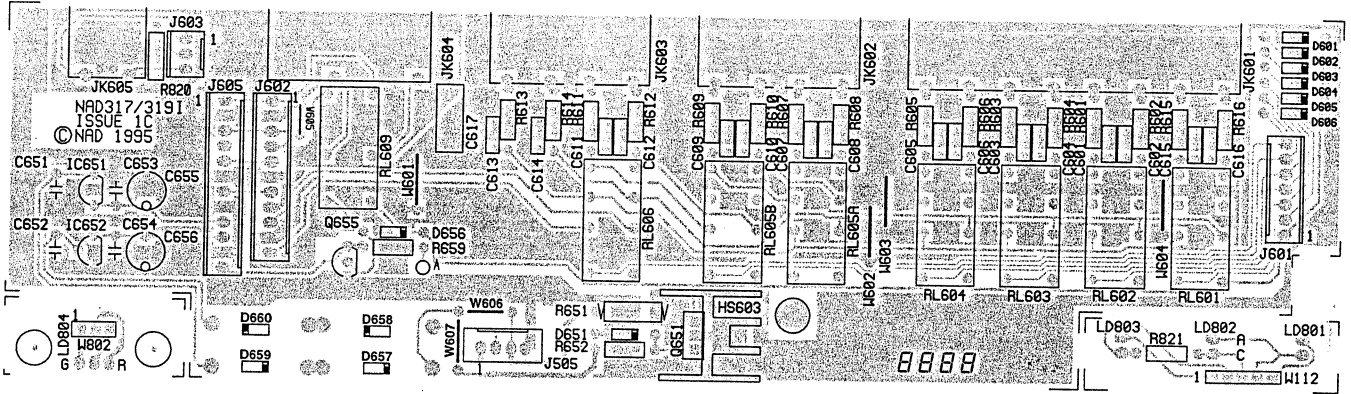
**POWER SWITCH PCB**



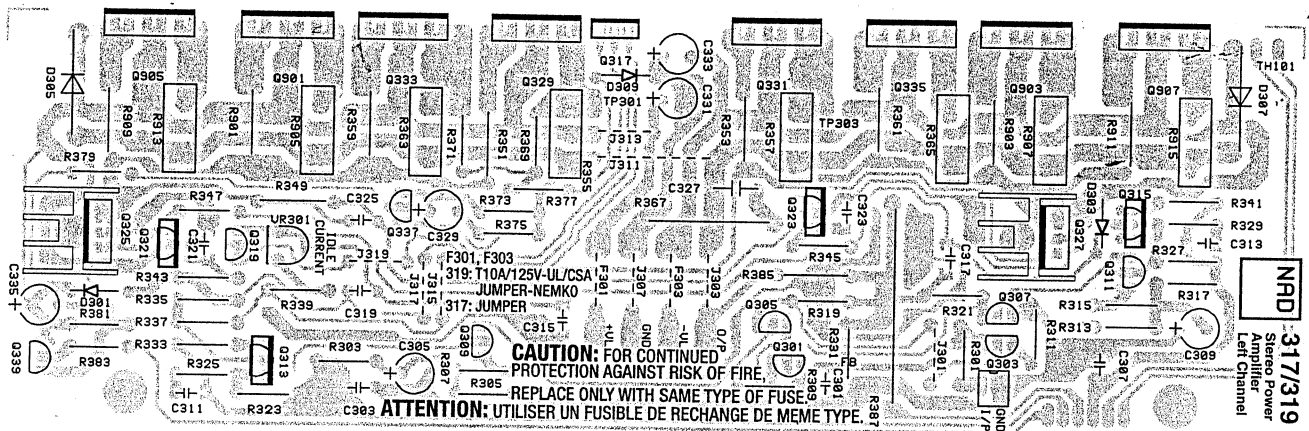
**SPEAKER TERMINAL PCB**



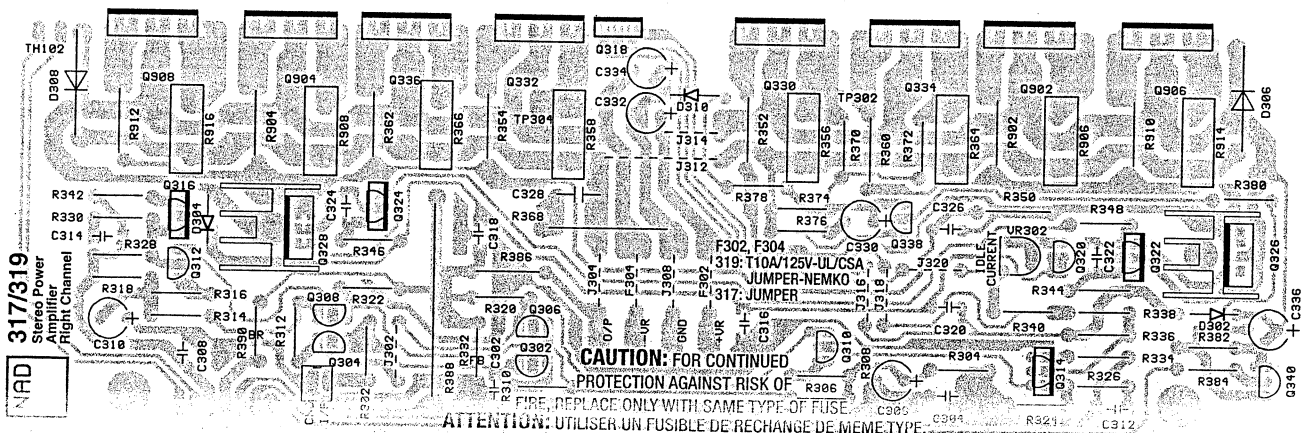
**INPUT, STANDBY LED & LED PCBs**



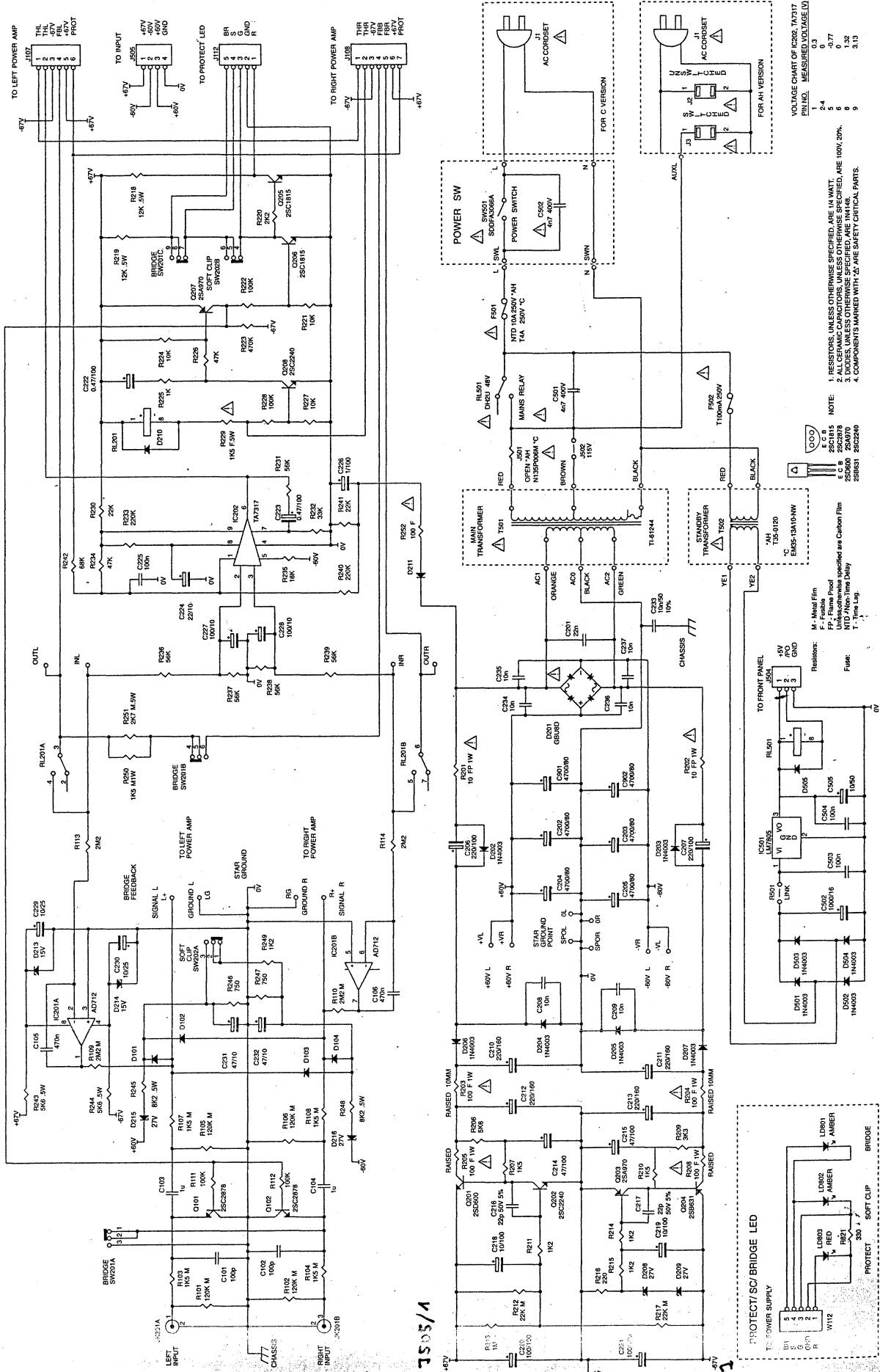
**POWER AMPLIFIER LEFT CHANNEL PCB**



**POWER AMPLIFIER RIGHT CHANNEL PCB**



# SCHEMATIC DIAGRAM PSU



14 3503/4

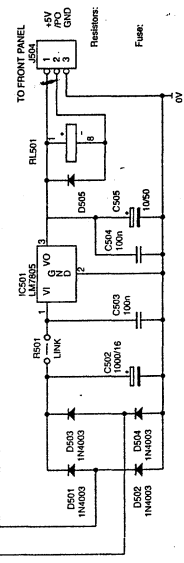
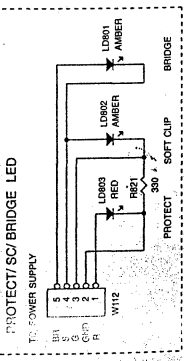
903/3

VOLTAGE CHART OF IC202, TA3317

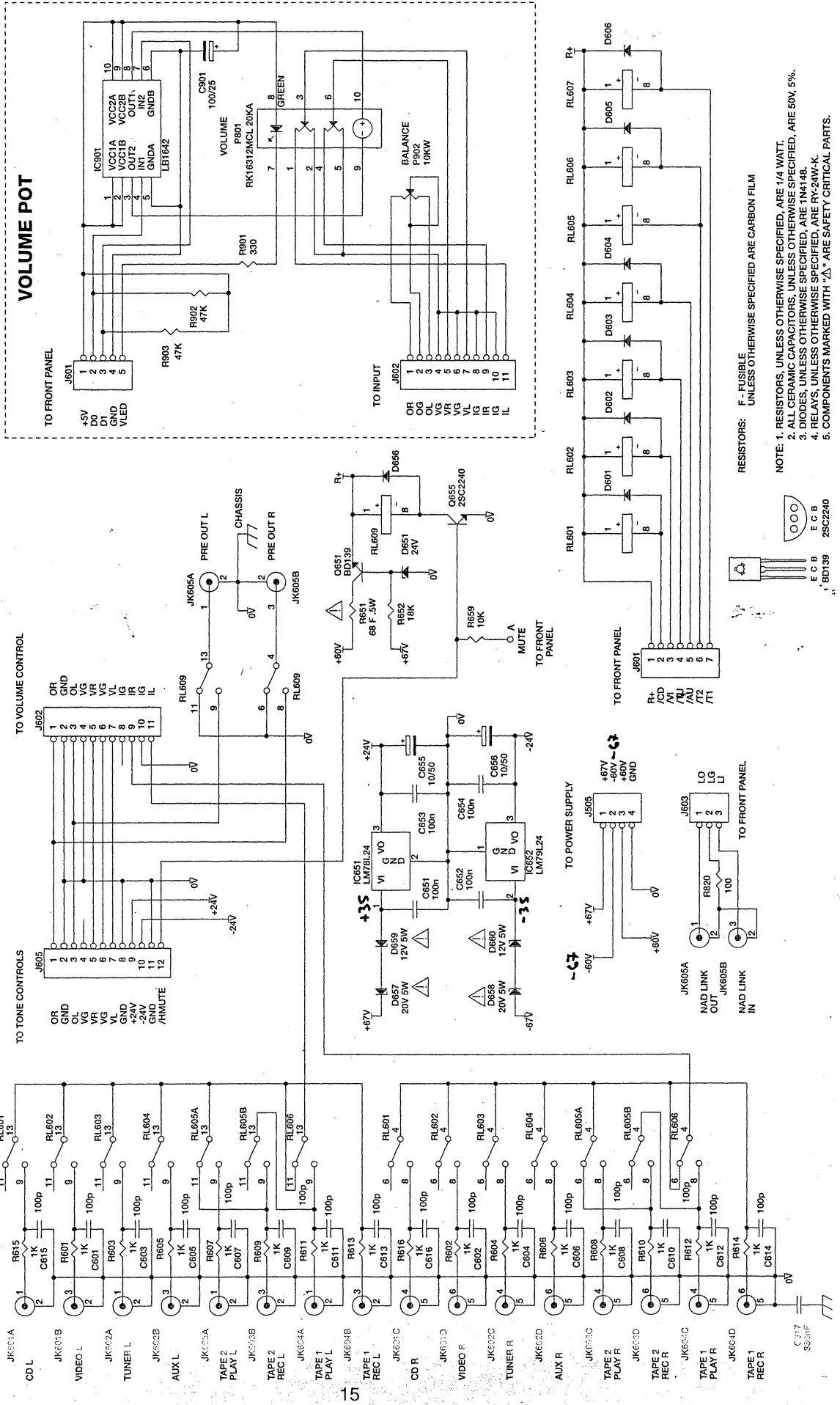
PIN NO.	MEASURED VOLTAGE (V)
1	0.9
2	0.9
3	0.9
4	0.77
5	0
6	0
7	0.25
8	0
9	3.15

- NOTE:
1. RESISTORS UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.
  2. ALL CERAMIC CAPACITORS UNLESS OTHERWISE SPECIFIED, ARE 100V, 20%.
  3. DIODES UNLESS OTHERWISE SPECIFIED, ARE 1N4001.
  4. COMPONENTS MARKED WITH Ⓢ ARE SAFETY CRITICAL PARTS.

RESISTORS:  
M - Metal Film  
FP - Flame Proof  
UNLESS OTHERWISE SPECIFIED ARE Carbon Film  
NTD - Non-Time Delay  
FUSE:  
1 - 1/4" Dia. Lug



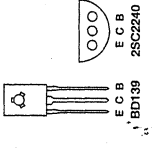
# INPUT & VOLUME POT



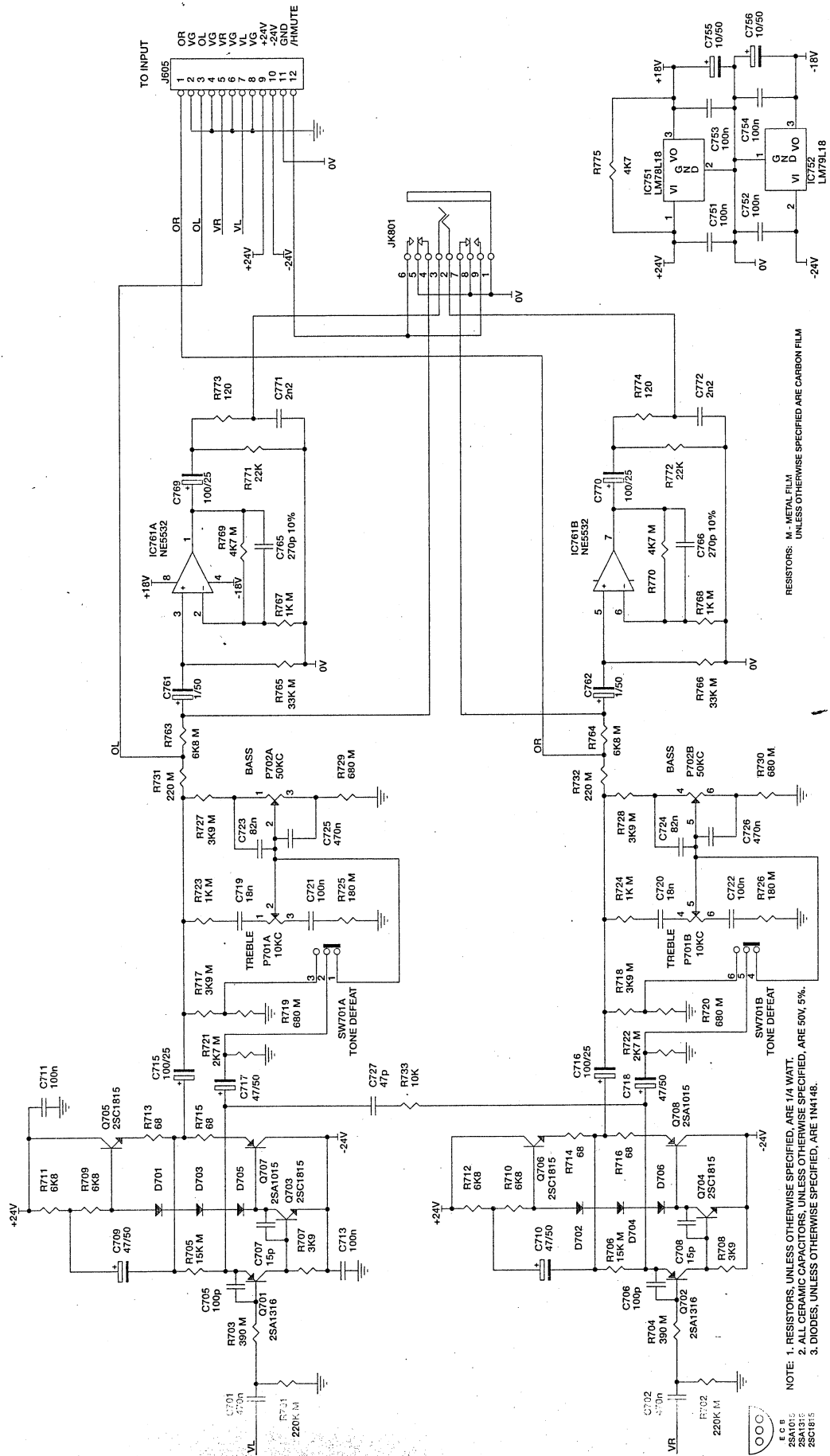
## VOLUME POT

RESISTORS: F - FUSIBLE  
 UNLESS OTHERWISE SPECIFIED ARE CARBON FILM

NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.  
 2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.  
 3. DIODES, UNLESS OTHERWISE SPECIFIED, ARE 1N4148.  
 4. RELAYS, UNLESS OTHERWISE SPECIFIED, ARE RT-24V-K.  
 5. COMPONENTS MARKED WITH "Z" ARE SAFETY CRITICAL PARTS.



# TONE CONTROL & HEADPHONE AMPLIFIER



RESISTORS: M. - METAL FILM  
UNLESS OTHERWISE SPECIFIED ARE CARBON FILM

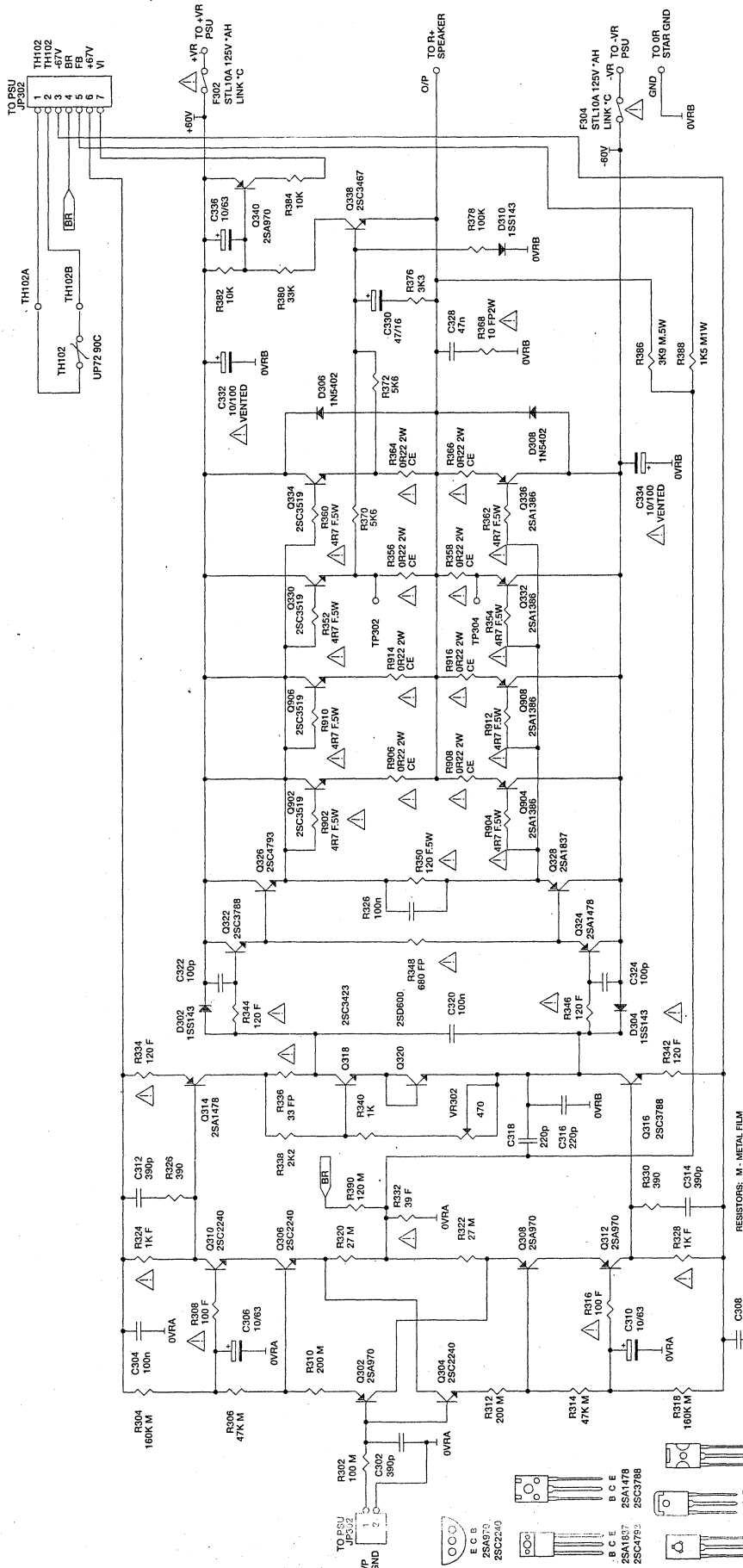
NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.  
2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.  
3. DIODES, UNLESS OTHERWISE SPECIFIED, ARE 1N4148.







# RIGHT POWER AMPLIFIER

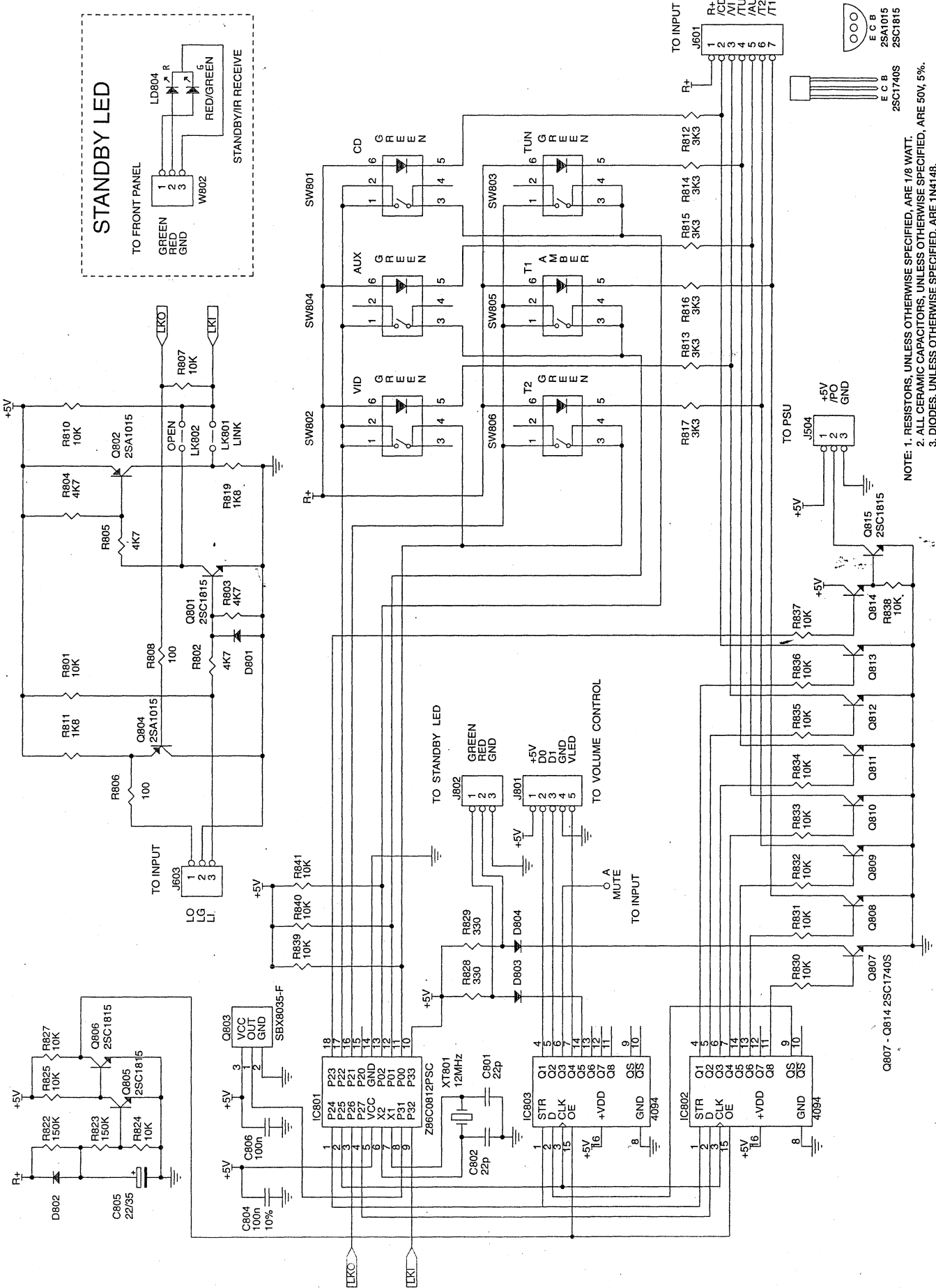


NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/4 WATT.  
 2. COMPONENTS MARKED WITH  $\Delta$  ARE SAFETY CRITICAL PARTS.

RESISTORS: M - METAL FILM  
 F - FUSIBLE  
 FP - FLAME PROOF  
 CE - CERAMIC CASE  
 STL - SEMI-TIME LAG

RESISTORS: M - METAL FILM  
 F - FUSIBLE  
 FP - FLAME PROOF  
 CE - CERAMIC CASE  
 STL - SEMI-TIME LAG

# FRONT PANEL

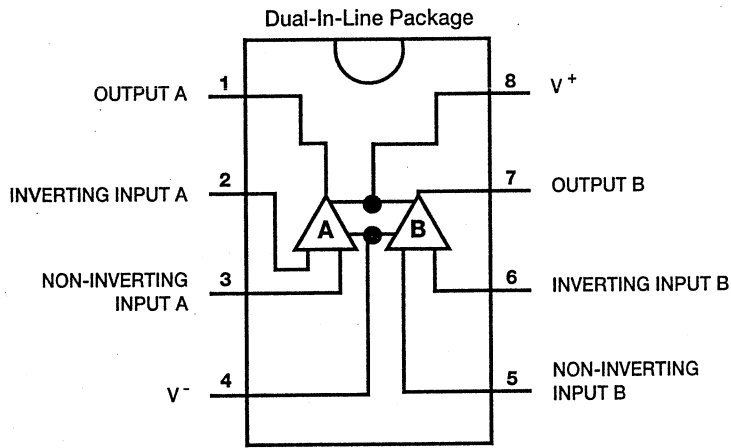


NOTE: 1. RESISTORS, UNLESS OTHERWISE SPECIFIED, ARE 1/8 WATT.  
 2. ALL CERAMIC CAPACITORS, UNLESS OTHERWISE SPECIFIED, ARE 50V, 5%.  
 3. DIODES, UNLESS OTHERWISE SPECIFIED, ARE 1N4148.

# IC BLOCK DIAGRAM

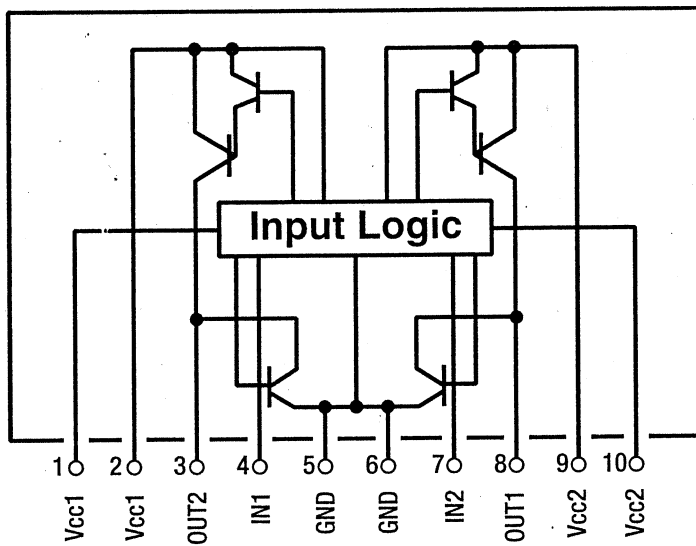
TONE BOARD, PSU & MAIN BOARD

IC761: NE5532, IC201: AD712



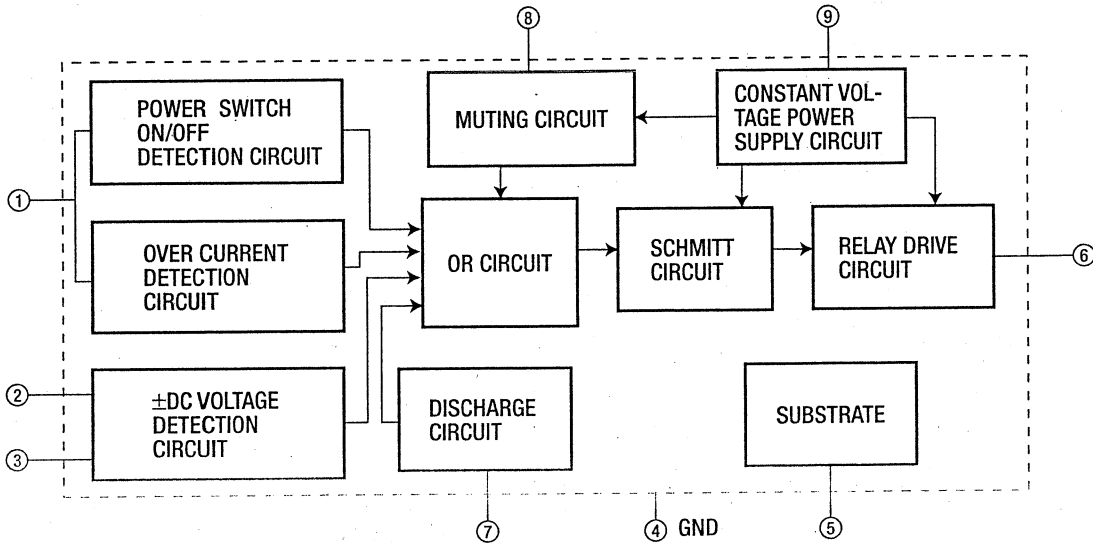
# VOLUME BOARD

IC901: LB1642

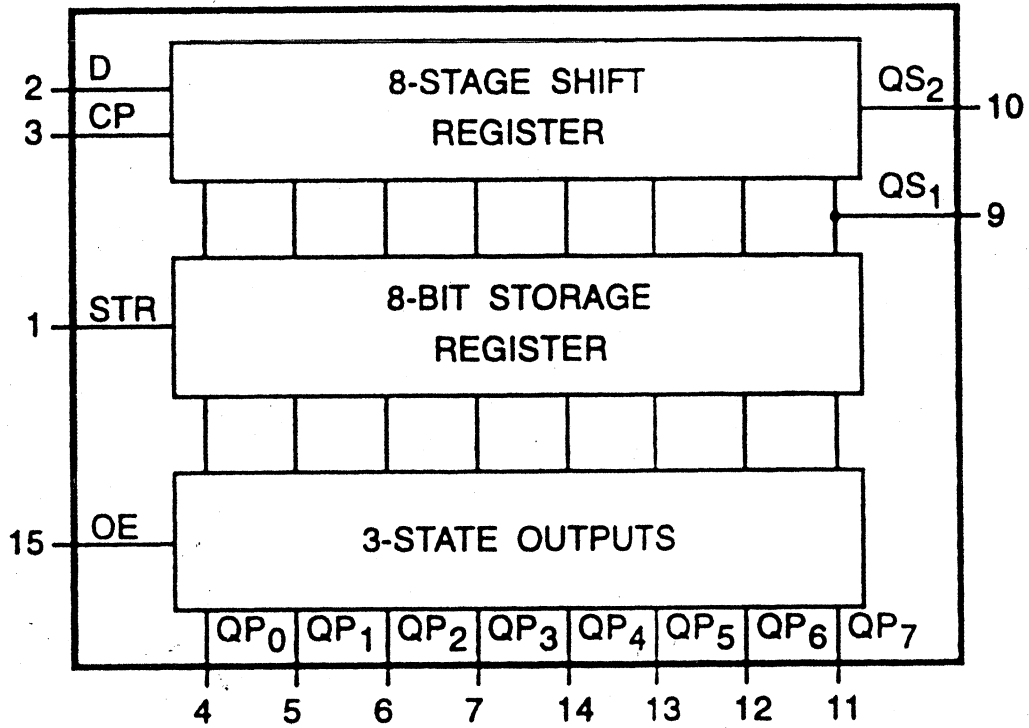


# PSU BOARD

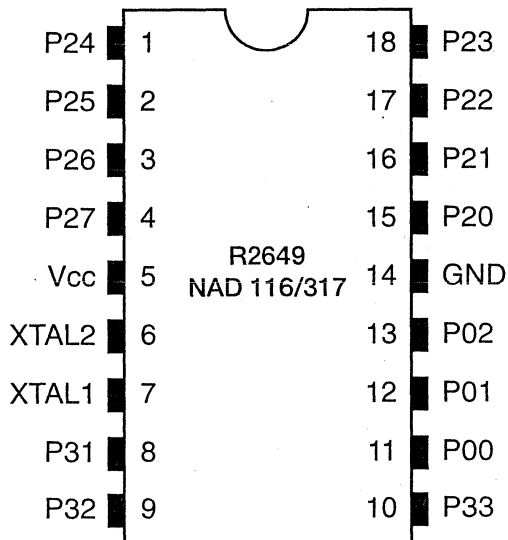
IC202: TA7317P



FRONT PANEL BOARD  
 IC802, IC803: MC14094BCP

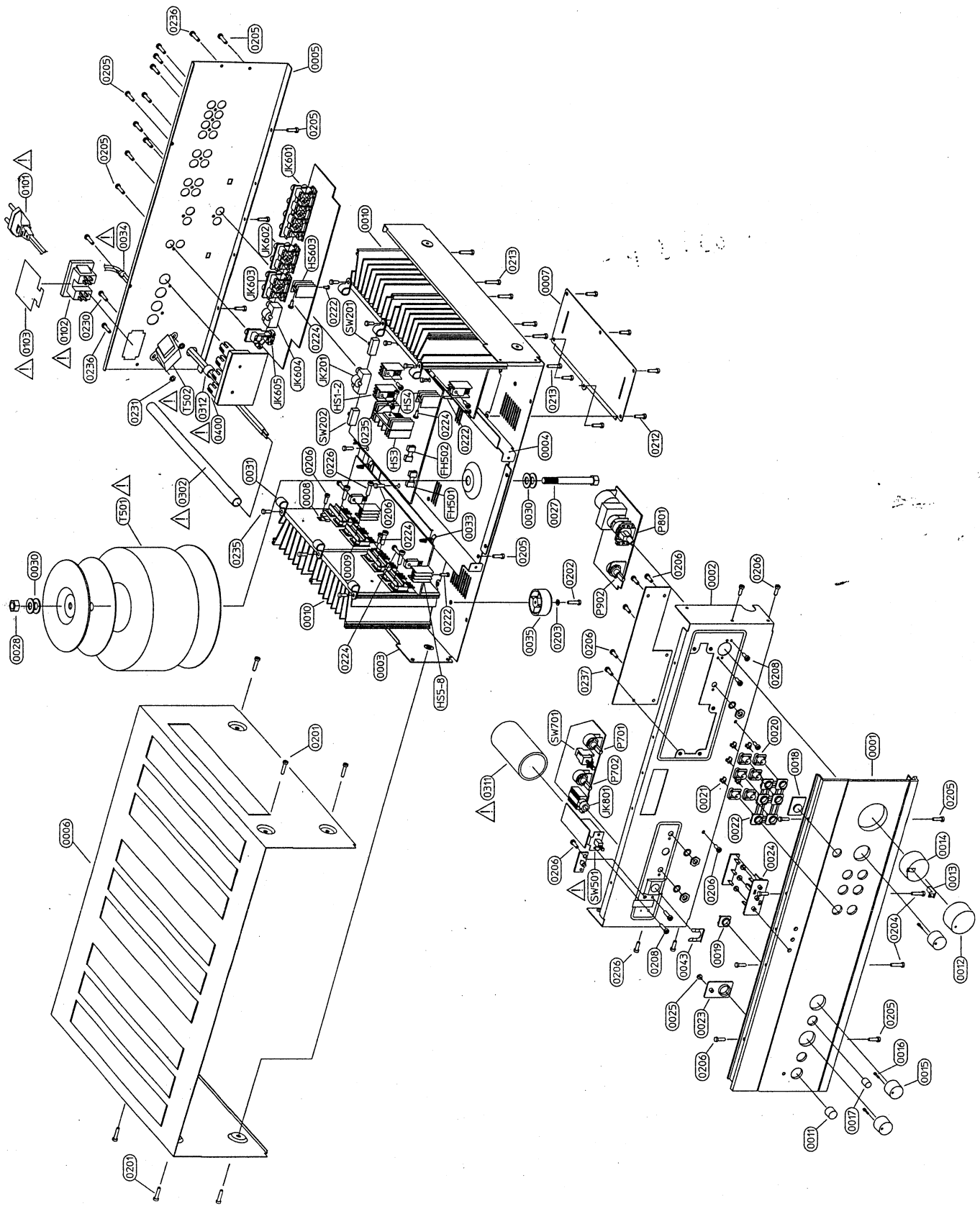


IC801: R2649 NAD 116/317



PIN IDENTIFICATION			
Z86E/08	STANDARD		
PIN #	SYMBOL	FUNCTION	DIRECTION
1-4	P24-P27	Port 2, Pins 4, 5, 6, 7	In/Output
5	Vcc	Power Supply	
6	XTAL2	Crystal Osc. Clock	Output
7	XTAL1	Crystal Osc. Clock	Input
8	P31	Port 3, Pin 1	Input
9	P32	Port 3, Pin 2	Input
10	P33	Port 3, Pin 3	Input
11-13	P00-P02	Port 0, Pins 0, 1, 2	In/Output
14	GND	Ground	
15-18	P20-P23	Port 2, Pins 0, 1, 2, 3	In/Output

# EXPLODED VIEW



# EXPLODED VIEW PARTS LIST

Item	Part No	Description	Qty
0001	1462-0602-2	FASCIA W/SS	1
0002	1402-6610-0	SUBFASCIA	1
0003	1402-3270-1	BASE PLATE	1
0004	1402-3290-2	CHANNEL	1
0005*AH	1402-3361-1	REAR PANEL W/SS	1
0005*C	1402-3372-2	REAR PANEL W/SS	1
0006	1402-3380-0	TOP COVER	1
0007	1402-3300-0	ACCESS COVER	2
0008	4132-1661-0	THERMAL MOUNTING CLIP	2
0009	4132-1671-0	TRANSISTOR CLAMP	8
0010	5400-0871-0	MAIN HEATSINK	2
0011	2437-640B-0	POWER BUTTON	1
0012	1402-3460-0	35MM KNOB SKIN	1
0013	2437-7706-0	35MM KNOB LENS	1
0014	2437-7601-0	35MM KNOB CORE	1
0015	2437-5701-1	18.5MM KNOB (BASS,TREBLE,BALANCE)	3
0016	4152-0041-0	POINTER	3
0017	2437-6001-0	8.0MM LONG BUTTON	1
0018	3714-910B-1	IRS WINDOW LENS	1
0019	4152-1871-0	BEZEL CLUSTER	1
0020	2439-9701-0	SINGLE LENS BUTTON	6
0021	3714-9206-1	BUTTON LENS	6
0022	4152-1871-0	BEZEL CLUSTER	1
0023	4152-1881-0	POWER BEZEL	1
0024	4152-1891-0	LED BEZEL	1
0025	4152-0011-0	LED LENS	4
0027	4132-1891-2	BOLT M8X1.25P HEX HD (WHT.ZN)	1
0028	2640-8062-1282	NUT M8X1.25P 6.2T (WHT.ZN)	1
0030	2600-8012-2202	FLAT WASHER M8X1.2X22(WHT.ZN)	4
0031	4152-1911-0	CABLE CLAMP	6
0033	4151-9951-2	PCB SUPPORT AIS-4L 6.4MM HIGH	4
0034	△ 4151-9461-0	STRAIN RELIEF BUSHING	1
0035	4151-9371-1	RUBBER FOOT 14.8MM HIGH	4
0043	4132-4121-0	6.4MM PHONE JACK CLIP	1
0101*AH	△ 7009-3100-1	AC CORD 18AWGX2 SPT-2 (UL/CSA)	1
0101*C	△ 7009-3110-0	AC CORD (SEMKO)	1
0102*AH	△ 2103-7701-2	AC OUTLET	1
0103*AH	△ 4151-9941-0	AC OUTLET COVER PLATE	1
0201	2900-4006-3010	M4X0.5PX6MM W/FLAT WASHER	6
0202	2904-3008-3000	SCREW M3X8 (BLK.ZN)	4
0203	2842-3367-0	METAL WASHER ID=3.3 OD=6.7	4
0204	2954-3010-3000	TAPPING 3X10MM B-TITE (BLK.ZN)	6
0205	2954-3008-3000	TAPPING 3X8MM B-TITE (BLK.ZN)	26
0206	2954-3006-0000	TAPPING 3X6MM B-TITE (YEL.ZN)	21
0208	2904-3006-0000	SCREW M3X6 (YEL.ZN)	4

Item	Part No	Description	Qty
0212	2950-3508-3000	TAPPING 3.5X8MM B-TITE (BLK.ZN)	10
0213	2954-3510-3000	TAPPING 3.5X10MM B-TITE (BLK.ZN)	12
0222	2954-2606-0000	TAPPING 2.6X6MM B-TITE (YEL.ZN)	10
0224	2954-3008-0000	TAPPING 3X8MM B-TITE (YEL.ZN)	10
0226	2908-4012-3400	HEXAGON SOCKET HEAD	8
0230	2904-3008-3000	SCREW M3X8 (BLK.ZN)	2
0231	2836-3005-0	M3X0.5P HEX CAP NUT	2
0235	2954-3510-0000	TAPPING 3.5X10MM B-TITE (YEL.ZN)	7
0236	2950-3008-3000	TAPPING 3X8MM (BLK.ZN)	2
0237	2950-3006-0000	TAPPING 3X6MM (YEL.ZN)	1
0302    △	1660-0710-0	GLASS-FIBRE SLEEVE TUBE	1
0311    △	1660-0630-0	SHINKAGE TUBE (ID=14MM)	1
0312*C   △	1808-0130-0	FERRITE CORE D19XT10	1
0400*AH	2103-8104-0	SPEAKER TERMINAL W/O PLUG	1
0400*C	2113-1133-0	SPEAKER TERMINAL W/PLUG	1
FH501*C	4131-9131-0	FUSE HOLDER 5X20MM	2
FH501*AH	4132-1821-0	FUSE HOLDER 1/4"X1 1/4"	2
FH502	4132-9131-0	FUSE HOLDER 5X20MM	2
HS1-2,HS603	5400-0851-0	HEATSINK	3
HS3	5400-0901-0	HEATSINK	1
HS4-8	5400-0831-0	HEATSINK	5
JK201,JK604	2103-7902-0	TWIN RAC JACK YKC21-3539	2
JK601	2113-1101-0	8P RCA JACK R/W AU HSP-248V	1
JK602,JK603	2113-0104-0	4P RCA R/W AU	2
JK605	2113-1121-0	2P RCA JACK Y/Y AU HSP-242V-22	1
JK801	2113-1081-1	PHONE-JACK 6.5MM GOLD	1
P701	4750-3646-0	VR-TRE 2X10KC W/WASHER & NUT	1
P702	4750-3676-0	VR-BASS 2X50KC W/WASHER & NUT	1
P801	4750-4476-0	MOTORIZED POTENTIOMETER 2X20KA	1
P902	4750-3656-0	VR-BAL 1X10KW W/WASHER & NUT	1
SW201	5200-3161-0-01	4PDT SLIDE SW.SK-42F28-G6TS	1
SW202	5200-3171-0-01	DPDT SLIDE SW.SK-22F28-G9TS	1
SW501   △	5200-3181-0-01	POWER SWITCH SDDFA3066A	1
SW701	5200-3121-0-01	2P2T ALPS SPUN W/O FRAME	1
T501    △	1806-2160-1	POWER TRANSFORMER	1
T502*AH   △	1806-2147-0	TRANS AC 120V DC9V 350MA EI-35	1
T502*C   △	1806-2148-0	TRANS AC 230V DC9V 350MA EI-35	1

NOTE : - The components identified by △ mark are critical for risk of fire and electrical shock.  
Replace only with part number specified.  
- <\*AH > : USA, Canadian model only.  
<\*C > : European model only.

# ELECTRICAL PARTS LIST

Reference No	Part Number	Description
<b>PSU ASSEMBLY</b>		
<b>PC BOARD</b>		
*AH	PCB-N0780C-PSU	PSU ASSEMBLY
*C	PCB-N0781C-PSU	PSU ASSEMBLY
<b>CAPACITORS</b>		
C101-C102	158R-101J-5-IQ	CP 250V 100pF 5%
C103-C104	153I-105K-9-NL	CM 63V 1 $\mu$ F 10%
C105-C106	153I-474K-9-NL	CM 63V 0.47 $\mu$ F 10%
C202-C205	8910-0062-0	CE 80V 4700 $\mu$ F 20%
C206-C207	157H-227M-5-X&	CE 100V 220 $\mu$ F 20%
C208-C209	153R-103M-9-NL	CM 250V 0.01 $\mu$ F 20%
C210-C213	8910-0056-0	CE 160V 220 $\mu$ F 20%
C214-C215	157H-476M-5-S5	CE 100V 47 $\mu$ F 20%
C216-C217	15CG-220J-7-IJ	CC 50V 22pF 5% NPO
C218-C219	157H-106M-5-LU	CE 100V 10 $\mu$ F 20%
C220-C221	157H-107M-5-X9	CE 100V 100 $\mu$ F 20%
C222-C223	157H-474M-5-IU	CE 100V 0.47 $\mu$ F 20%
C224	157C-226M-5-IU	CE 10V 22 $\mu$ F 20%
C225	153H-104M-9-NL	CM 100V 0.1 $\mu$ F 20%
C226	157H-105M-5-IU	CE 100V 1 $\mu$ F 20%
C227-C228	157C-107M-5-IU	CE 10V 100 $\mu$ F 20%
C229-C230	157E-106M-5-IU	CE 25V 10 $\mu$ F 20%
C231-C232	157C-476M-5-IU	CE 10V 47 $\mu$ F 20%
C501	8910-0049-0	CAP400V 4700pF DE7150F472MVA1KC
C502	157D-108M-5-S9	CE 16V 1000 $\mu$ F 20%
C503-C504	153H-104M-9-NL	CM 100V 0.1 $\mu$ F 20%
C505	157F-106M-5-IU	CE 50V 10 $\mu$ F 20%
C901-C902	8910-0062-0	CE 80V 4700 $\mu$ F 20%
<b>DIODES</b>		
D101-D104	4804-1480-2	DIODE 1N4148
D201	4840-0610-0	BRIDGE DIODE GBU8D
D202-D207	4804-0030-2	DIODE 1N4003
D208-D209	4837-33V0-2	DZ 1/2W 33V (32.2-33.6)
D210-D211	4804-1480-2	DIODE 1N4148
D213-D214	4840-0510-0	ZD 1/2W 15V HZ 15-3
D215-D216	4837-27V0-2	DZ 1/2W 27V(26.2-27.6)
D501-D504	4804-0030-2	DIODE 1N4003
D505	4804-1480-2	DIODE 1N4148
<b>FUSES</b>		
F501*AH	5100-0055-0	FUSE 10A 250V NON-TIME DELAY LBC UL/CSA
F501*C	5120-0017-0	FUSE 4A 250V TIME LAG HBC SEMKO/VDE
F502*AH	5120-0036-0	FUSE 100mA 250V MEDIUM TIME LAG LBC UL/CSA
F502*C	5120-0035-0	FUSE 100mA 250V TIME LAG HBC SEMKO/VDE



<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
<b>ICs</b>		
IC201	3130-3830-0	IC AD712 (JN) ANALOG DEVICES
IC202	3130-3550-0	IC TA7317P
IC501	3130-2020-3	IC 7805 REGULATOR
<b>TRANSISTORS</b>		
Q101-Q102	4860-0770-5	TR 2SC2878 (A,B)
Q201	4860-0740-5	TR 2SD600K (E,F)
Q202	4852-40GR-5	TR 2SC2240GR
Q203	4860-0650-5	TR 2SA970GR
Q204	4860-0870-5	TR 2SB631K (E,F)
Q205-Q206	4851-815Y-5	TR 2SC1815-Y HFE 120-240
Q207	4860-0650-5	TR 2SA970GR
Q208	4852-40GR-5	TR 2SC2240GR
<b>RESISTORS</b>		
R101-R102	4715-124A-2	RMF 120k Ohm 1/4W 1%
R103-R104	4715-152A-2	RMF 1.5k Ohm 1/4W 1%
R105-R106	4715-124A-2	RMF 120k Ohm 1/4W 1%
R107-R108	4715-152A-2	RMF 1.5k Ohm 1/4W 1%
R109-R110	4715-225A-2	RMF 2.2M Ohm 1/4W 1%
R201-R202	4718-100J-L-P	RFP 10 Ohm 1W 5%
R203-R205,R208	4715-101J-1-F	RFU 100 Ohm 1W 5%
R212,R217	4715-223A-2	RMF 22k Ohm 1/4W 1%
R229	4717-152J-2-F	RFU 1.5k Ohm 1/2W 5%
R250	4718-152A-1	RMF 1.5k Ohm 1W 1%
R251	4717-272A-2	RMF 2.7k Ohm 1/2W 1%
R252	4715-101J-2-F	RFU 100 Ohm 1/4W 5%
<b>RELAYS</b>		
RL201	4500-0130-0	RELAY DEC DH48D2-0
RL501	4500-0230-0	RELAY VS-5MB TV-8
<b>THERMISTOR</b>		
J501°C	8910-0101-0	NTC THERMISTOR N135P005M
<b>INPUT ASSEMBLY</b>		
<b>PC BOARD</b>		
	PCB-N0780C-JACK	INPUT ASSEMBLY
<b>CAPACITORS</b>		
C617	153F-334J-5-MIB	CM 50V 0.33µF 5%
C651-C654	153I-104K-9-NL	CM 63V 0.1µF 10%
C655-C656	157F-106M-5-IU	CE 50V 10µF 20%
<b>DIODES</b>		
D601-D606	4804-1480-2	DIODE 1N4148
D651	4840-0620-0	ZD 1/2W 24V (23.6-24.7)
D656	4804-1480-2	DIODE 1N4148
D657-D658	4840-1450-0	ZD 20V 5W (1N5357B)
D659-D660	4840-1440-0	ZD 12V 5W

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
<b>ICs</b>		
IC651	3130-4810-0	IC LM78L24 REGULATOR
IC652	3130-4820-0	IC LM79L24 REGULATOR
<b>TRANSISTORS</b>		
Q651	485D-1390-5	TR BD139-10 HFE 63-160
Q655	4852-40GR-5	TR 2SC2240GR
<b>RESISTORS</b>		
R651 <span style="float: right;">△</span>	4717-680J-2-F	RFU 68 Ohm 1/2W 5%
<b>RELAYS</b>		
RL601-RL604	4500-0210-0	RELAY RY-24W-K
RL605A,RL605B	4500-0210-0	RELAY RY-24W-K
RL606,RL609	4500-0210-0	RELAY RY-24W-K
<b><u>LEFT POWER AMPLIFIER ASSEMBLY</u></b>		
<b><u>PC BOARD</u></b>		
*AH	PCB-N0780C-AMPL	LEFT POWER AMPLIFIER ASSEMBLY
*C	PCB-N0781C-AMPL	LEFT POWER AMPLIFIER ASSEMBLY
<b>CAPACITORS</b>		
C301	158F-391J-5-IQ	CP 50V 390pF 5%
C303	153H-104M-9-NL	CM 100V 0.1μF 20%
C305	157I-106M-5-IU	CE 63V 10μF 20%
C307	153H-104M-9-NL	CM 100V 0.1μF 20%
C309	157I-106M-5-IU	CE 63V 10μF 20%
C311,C313	158F-391J-5-IQ	CP 50V 390pF 5%
C315,C317	158K-221J-5-IQ	CP 150V 220pF 5%
C319	153H-104M-9-NL	CM 100V 0.1μF 20%
C321,C323	158R-101J-5-IQ	CP 250V 100pF 5%
C325	153H-104M-9-NL	CM 100V 0.1μF 20%
C327	153H-473K-9-SW	CM 100V 0.047μF 10%
C329	157D-476M-5-IU	CE 16V 47μF 20%
C331,C333 <span style="float: right;">△</span>	157H-106M-5-WV	CE 100V 10μF 20% VENTED
C335	157I-106M-5-IU	CE 63V 10μF 20%
<b>DIODES</b>		
D301,D303	4840-0590-0	DIODE 1SS143
D305,D307	4805-4020-L	DIODE 1N5402
D309	4840-0590-0	DIODE 1SS143
<b>TRANSISTORS</b>		
Q301	4860-0650-5	TR 2SA970GR
Q303,Q305	4852-40GR-5	TR 2SC2240GR
Q307	4860-0650-5	TR 2SA970GR
Q309	4852-40GR-5	TR 2SC2240GR
Q311	4860-0650-5	TR 2SA970GR
Q313	4860-0810-5	TR 2SA1478(E)
Q315	4860-0820-5	TR 2SC3788(E)
Q317	4860-0790-5	TR 2SC3423 (Y)
Q319	4860-0740-5	TR 2SD600K (E,F)
Q321	4860-0820-5	TR 2SC3788(E)

Reference No	Part Number	Description
Q323	4860-0810-5	TR 2SA1478(E)
Q325	4860-1060-5	TR 2SC4793 100-320
Q327	4860-1050-5	TR 2SA1837 100-320
Q329	4860-0730-5	TR 2SC3519 (0,P,Y)
Q331	4860-0690-5	TR 2SA1386 (0,P,Y)
Q333	4860-0730-5	TR 2SC3519 (0,P,Y)
Q335	4860-0690-5	TR 2SA1386 (0,P,Y)
Q337	4860-0720-5	TR 2SC3467 (E)
Q339	4860-0650-5	TR 2SA970GR
Q901	4860-0730-5	TR 2SC3519 (0,P,Y)
Q903	4860-0690-5	TR 2SA1386 (0,P,Y)
Q905	4860-0730-5	TR 2SC3519 (0,P,Y)
Q907	4860-0690-5	TR 2SA1386 (0,P,Y)
<b>RESISTORS</b>		
R301	4715-101A-2	RMF 100 Ohm 1/4W 1%
R303	4715-164A-2	RMF 160k Ohm 1/4W 1%
R305	4715-473A-2	RMF 47k Ohm 1/4W 1%
R307	4715-101J-2-F	RFU 100 Ohm 1/4W 5%
R309,R311	4715-201A-2	RMF 200 Ohm 1/4W 1%
R313	4715-473A-2	RMF 47k Ohm 1/4W 1%
R315	4715-101J-2-F	RFU 100 Ohm 1/4W 5%
R317	4715-164A-2	RMF 160k Ohm 1/4W 1%
R319,R321	4715-270A-2	RMF 27 Ohm 1/4W 1%
R323	4715-102J-2-F	RFU 1k Ohm 1/4W 5%
R327	4715-102J-2-F	RFU 1k Ohm 1/4W 5%
R331	4715-390J-2-F	RFU 39 Ohm 1/4W 5%
R333	4715-121J-2-F	RFU 120 Ohm 1/4W 5%
R335	4715-330J-2-P	RFP 33 Ohm 1/4W 5%
R341,R343,R345	4715-121J-2-F	RFU 120 Ohm 1/4W 5%
R347	4715-681J-2-P	RFP 680 Ohm 1/4W 5%
R349	4717-121J-2-F	RFU 120 Ohm 1/2W 5%
R351,R353	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R355,R357	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R359,R361	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R363,R365	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R367	4719-100J-1-P	RFP 10 Ohm 2W 5%
R385	4717-392A-2	RMF 3.9k Ohm 1/2W 1%
R387	4718-152A-1	RMF 1.5k Ohm 1W 1%
R901,R903	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R905,R907	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R909,R911	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R913,R915	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
<b>FUSES</b>		
F301*AH,F303*AH	5120-0056-0	FUSE 10A 125V SEMI-TIME LAG LBC UL/CSA
F301*C,F303*C	635N-0001-0	JUMPER #23 TYPE & WHEEL
<b>THERMAL BREAKER</b>		
TH101	8910-0055-0	THERMAL BREAKER 90C
<b>VARIABLE RESISTOR</b>		
VR301	4756-4716-3-06	SVR 470 H3 7X7.6

Reference No	Part Number	Description
<b>RIGHT POWER AMPLIFIER ASSEMBLY</b> <b>PC BOARD</b> *AH *C	PCB-N0780C-AMPR PCB-N0781C-AMPR	RIGHT POWER AMPLIFIER ASSEMBLY RIGHT POWER AMPLIFIER ASSEMBLY
<b>CAPACITORS</b> C302 C304 C306 C308 C310 C312,C314 C316,C318 C320 C322,C324 C326 C328 C330 C332,C334 C336	158F-391J-5-IQ 153H-104M-9-NL 157I-106M-5-IU 153H-104M-9-NL 157I-106M-5-IU 158F-391J-5-IQ 158K-221J-5-IQ 153H-104M-9-NL 158R-101J-5-IQ 153H-104M-9-NL 153H-473K-9-SW 157D-476M-5-IU 157H-106M-5-WV 157I-106M-5-IU	CP 50V 390pF 5% CM 100V 0.1μF 20% CE 63V 10μF 20% CM 100V 0.1μF 20% CE 63V 10μF 20% CP 50V 390pF 5% CP 150V 220pF 5% CM 100V 0.1μF 20% CP 250V 100pF 5% CM 100V 0.1μF 20% CM 100V 0.047μF 10% CE 16V 47μF 20% CE 100V 10μF 20% VENTED CE 63V 10μF 20%
<b>DIODES</b> D302,D304 D306,D308 D310	4840-0590-0 4805-4020-L 4840-0590-0	DIODE 1SS143 DIODE 1N5402 DIODE 1SS143
<b>TRANSISTORS</b> Q302 Q304,Q306 Q308 Q310 Q312 Q314 Q316 Q318 Q320 Q322 Q324 Q326 Q328 Q330 Q332 Q334 Q336 Q338 Q340 Q902 Q904 Q906 Q908	4860-0650-5 4852-40GR-5 4860-0650-5 4852-40GR-5 4860-0650-5 4860-0810-5 4860-0820-5 4860-0790-5 4860-0740-5 4860-0820-5 4860-0810-5 4860-1060-5 4860-1050-5 4860-0730-5 4860-0690-5 4860-0730-5 4860-0690-5 4860-0720-5 4860-0650-5 4860-0730-5 4860-0690-5 4860-0730-5 4860-0690-5	TR 2SA970GR TR 2SC2240GR TR 2SA970GR TR 2SC2240GR TR 2SA970GR TR 2SA1478(E) TR 2SC3788(E) TR 2SC3423 (Y) TR 2SD600K (E,F) TR 2SC3788(E) TR 2SA1478(E) TR 2SC4793 100-320 TR 2SA1837 100-320 TR 2SC3519 (0,P,Y) TR 2SA1386 (0,P,Y) TR 2SC3519 (0,P,Y) TR 2SA1386 (0,P,Y) TR 2SC3467 (E) TR 2SA970GR TR 2SC3519 (0,P,Y) TR 2SA1386 (0,P,Y) TR 2SC3519 (0,P,Y) TR 2SA1386 (0,P,Y)
<b>RESISTORS</b> R302 R304	4715-101A-2 4715-164A-2	RMF 100 Ohm 1/4W 1% RMF 160k Ohm 1/4W 1%

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
R306	4715-473A-2	RMF 47k Ohm 1/4W 1%
R308	4715-101J-2-F	RFU 100 Ohm 1/4W 5%
R310,R312	4715-201A-2	RMF 200 Ohm 1/4W 1%
R314	4715-473A-2	RMF 47k Ohm 1/4W 1%
R316	4715-101J-2-F	RFU 100 Ohm 1/4W 5%
R318	4715-164A-2	RMF 160k Ohm 1/4W 1%
R320,R322	4715-270A-2	RMF 27 Ohm 1/4W 1%
R324	4715-102J-2-F	RFU 1k Ohm 1/4W 5%
R328	4715-102J-2-F	RFU 1k Ohm 1/4W 5%
R332	4715-390J-2-F	RFU 39 Ohm 1/4W 5%
R334	4715-121J-2-F	RFU 120 Ohm 1/4W 5%
R336	4715-330J-2-P	RFP 33 Ohm 1/4W 5%
R342,R344,R346	4715-121J-2-F	RFU 120 Ohm 1/4W 5%
R348	4715-681J-2-P	RFP 680 Ohm 1/4W 5%
R350	4717-121J-2-F	RFU 120 Ohm 1/2W 5%
R352,R354	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R356,R358	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R360,R362	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R364,R366	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R368	4719-100J-1-P	RFP 10 Ohm 2W 5%
R386	4717-392A-2	RMF 3.9k Ohm 1/2W 1%
R388	4718-152A-1	RMF 1.5k Ohm 1W 1%
R390	4715-121A-2	RMF 120 Ohm 1/4W 1%
R902,R904	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R906,R908	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
R910,R912	4717-4R7J-2-F	RFU 4.7 Ohm 1/2W 5%
R914,R916	4719-022K-5-N	RCE 0.22 Ohm 2W 10%
<b>FUSES</b>		
F302*AH,F304*AH	5120-0056-0	FUSE 10A 125V SEMI-TIME LAG LBC UL/CSA
F302*C,F304*C	635N-0001-0	JUMPER #23 TAPE & WHEEL
<b>THERMAL BREAKER</b>		
TH102	8910-0055-0	THERMAL BREAKER 90C
<b>VARIABLE RESISTOR</b>		
VR302	4756-4716-3-06	SVR 470 H3 7X7.6
<b><u>TONE ASSEMBLY</u></b>		
<b>PC BOARD</b>		
	PCB-N0780C-BASS	TONE ASSEMBLY
<b>CAPACITORS</b>		
C701-C702	153I-474J-9-NO	CM 63V 0.47 $\mu$ F 5%
C709-C710	157F-476M-5-LU	CE 50V 47 $\mu$ F 20%
C711,C713	153I-104K-9-NL	CM 63V 0.1 $\mu$ F 10%
C715-C716	157F-107M-5-OW	CE 50V 100 $\mu$ F 20%
C717-C718	157F-476M-5-LU	CE 50V 47 $\mu$ F 20%
C719-C720	153I-183K-9-NL	CM 63V 0.018 $\mu$ F 10%
C721-C722	153I-104K-9-NL	CM 63V 0.1 $\mu$ F 10%
C723-C724	153I-823K-9-NL	CM 63V 0.082 $\mu$ F 10%
C725-C726	153I-474J-9-NO	CM 63V 0.47 $\mu$ F 5%

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
C751-C754	153I-104K-9-NL	CM 63V 0.1 $\mu$ F 10%
C755-C756	157F-106M-5-IU	CE 50V 10 $\mu$ F 20%
C761-C762	157F-105M-5-IU	CE 50V 1 $\mu$ F 20%
C769-C770	157F-107M-5-OW	CE 50V 100 $\mu$ F 20%
C771-C772	153I-222K-9-NL	CM 63V 2200pF 10%
<b>DIODES</b>		
D701-D706	4804-1480-2	DIODE 1N4148
<b>*ICs</b>		
IC751	3130-4830-0	IC LM78L18 REGULATOR
IC752	3130-4840-0	IC LM79L18 REGULATOR
IC761	3130-2430-0	IC NE5532 OP AMP
<b>TRANSISTORS</b>		
Q701-Q702	4860-0670-5	TR 2SA1316BL
Q703-Q706	4851-815Y-5	TR 2SC1815-Y HFE 120-240
Q707-Q708	4860-0660-5	TR 2SA1015GR
<b>RESISTORS</b>		
R701-R702	4715-224C-2	RMF 220k Ohm 1/4W 2%
R703-R704	4715-391C-2	RMF 390 Ohm 1/4W 2%
R705-R706	4715-153C-2	RMF 15k Ohm 1/4W 2%
R717-R718	4715-392C-2	RMF 3.9k Ohm 1/4W 2%
R719-R720	4715-681C-2	RMF 680 Ohm 1/4W 2%
R721-R722	4715-272C-2	RMF 2.7k Ohm 1/4W 2%
R723-R724	4715-102C-2	RMF 1k Ohm 1/4W 2%
R725-R726	4715-181C-2	RMF 180 Ohm 1/4W 2%
R727-R728	4715-392C-2	RMF 3.9k Ohm 1/4W 2%
R729-R730	4715-681C-2	RMF 680 Ohm 1/4W 2%
R731-R732	4715-221C-2	RMF 220 Ohm 1/4W 2%
R763-R764	4715-682C-2	RMF 6.8k Ohm 1/4W 2%
R765-R766	4715-333C-2	RMF 33k Ohm 1/4W 2%
R767-R768	4715-102C-2	RMF 1k Ohm 1/4W 2%
R769-R770	4715-472C-2	RMF 4.7k Ohm 1/4W 2%
<b>FRONT PANEL ASSEMBLY</b>		
<b>PC BOARD</b>		
	PCB-N0780C-KEY	FRONT PANEL ASSEMBLY
<b>CAPACITORS</b>		
C805	157Q-226M-5-OW	CE 35V 22 $\mu$ F 20%
C806	153H-104M-9-NL	CM 100V 0.1 $\mu$ F 20%
<b>DIODES</b>		
D801-D804	4804-1480-2	DIODE 1N4148
<b>ICs</b>		
IC801	3130-4740-1	UPZ86C0812PSCR2649 MASKED
IC802	3130-3600-0	MC14094BCP 8-BIT SIPO SR 3S

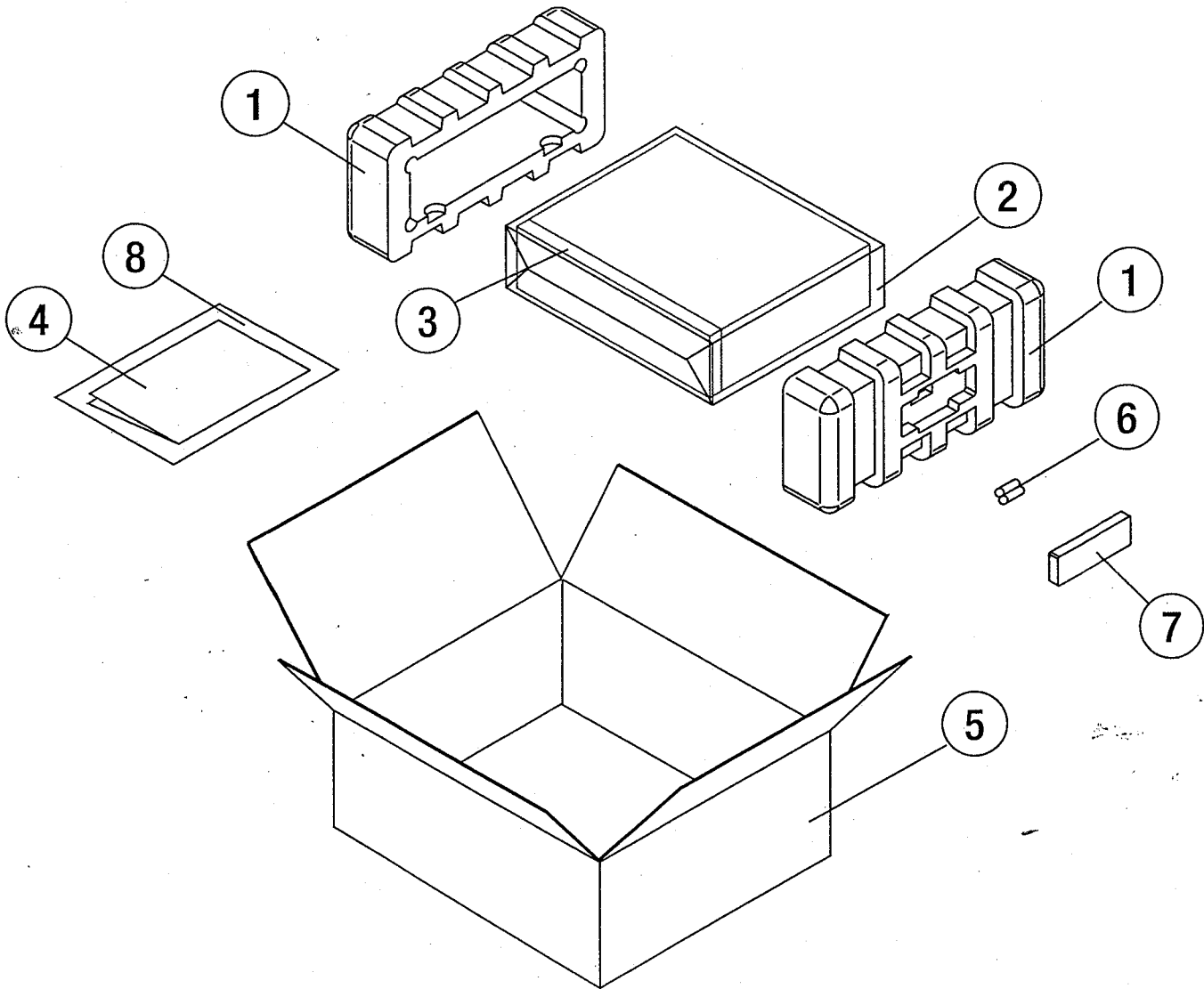
<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
<b>TRANSISTORS</b>		
Q801	4860-0700-5	TR 2SC1815GR
Q802	4860-0660-5	TR 2SA1015GR
Q803	481X-8035-3	IR SENSOR SBX8035-F
Q804	4860-0660-5	TR 2SA1015GR
Q805-Q806	4860-0700-5	TR 2SC1815GR
Q807-Q814	4860-1590-5	TR 2SC1740S (R) HFE180-390
Q815	4860-0700-5	TR 2SC1815GR
<b>* SWITCHES</b>		
SW801-SW804,SW806	5200-3201-0-01	TACT LED GREEN SKWQFG
SW805	5200-3231-0-01	TACT LED AMBER SKHQFH
<b>RESONATOR</b>		
XT801	2703-0190-0	CR RESONATOR CSA 12MHZ
<b>LED ASSEMBLY PC BOARD</b>		
	PCB-N0780C-LED1	LED ASSEMBLY
<b>LEDS</b>		
LD801-LD802	3700-3513-Y	LED AMBER (L-424YDT)3MM
LD803	3700-2522-R	LED RED 3MM
<b>STANDBY LED ASSEMBLY PC BOARD</b>		
	PCB-N0780C-LED2	STANDBY-LED ASSEMBLY
<b>LED</b>		
LD804	3700-3517-RG	LED RED/GREEN (L-469HGW)
<b>SPEAKER ASSEMBLY PC BOARD</b>		
*AH	PCB-N0780C-SPK	SPEAKER ASSEMBLY
*C	PCB-N0781C-SPK	SPEAKER ASSEMBLY
<b>CAPACITORS</b>		
C401-C402	153R-103M-9-NL	CM 250V 0.01 $\mu$ F 20%
<b>COILS</b>		
L401-L402	1804-0490-0	SPRING COIL 1 $\mu$ H 1/9/16.5
<b>RESISTORS</b>		
R401-R402 $\triangle$	4718-3R3J-2-P	RFP 3.3 Ohm 1W 5%
<b>POWER SWITCH ASSEMBLY PC BOARD</b>		
	PCB-N0780C-SW	POWER-SW ASSEMBLY
<b>CAPACITOR</b>		
C502 $\triangle$	8910-0049-0	CAP400V 4700pF DE7150F472MVA1KC

<u>Reference No</u>	<u>Part Number</u>	<u>Description</u>
<b><u>VOLUME ASSEMBLY</u></b> <b><u>PC BOARD</u></b>	PCB-N0780C-VOL	VOLUME ASSEMBLY
<b><u>CAPACITOR</u></b> C901	157E-107M-5-KW	CE 25V 100µF 20%
<b><u>IC</u></b> IC901	3130-3410-0	IC LB1642 SANYO MOTOR DRIVER

- NOTE :** – The components identified by  $\triangle$  mark are critical for risk of fire and electrical shock.  
 Replace only with part number specified.
- <\*AH > : USA, Canadian model only.
  - <\*C > : European model only.
  - Capacitors : CP-Polystyrere, CM-Mylar, CE-Electrolytic, CC-Ceramic.
  - Resistors : RMF-Metal Film, RFU-Fusible, RFP-Flame Proof, RCE-Ceramic Case.



## PACKING DIAGRAM



## PACKING LIST

<u>Item</u>	<u>Part No</u>	<u>Description</u>	<u>Qty</u>
1	1490-2793-0	POLYFOAM END CAP	2
2	1497-1072-3	UNIT POLYBAG	1
3	1497-1162-0	FASCIA COVER	1
4	4301-3818-0	INSTRUCTION MANUAL	1
5	1477-1501-0	CARTON BOX	1
6	4060-0580-0	BATTERIES	2
7	8900-1070-0	REMOTE CONTROL	1
8	1497-1062-0	MANUAL POLYBAG	1

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