

# TA-F311

## SERVICE MANUAL

AEP Model



### SPECIFICATIONS

#### Amplifier

Continuous RMS power output (both channels driven simultaneously)

Model for Scandinavian countries, Spain and Portugal

DIN, 1 kHz	8 ohms	75 W + 75 W
20 Hz – 20 kHz	8 ohms	60 W + 60 W THD 0.03 %

Model for other European countries

DIN, 1 kHz	4 ohms	85 W + 85 W
	8 ohms	75 W + 75 W
20 Hz – 20 kHz	4 ohms	70 W + 70W THD 0.05 %
	8 ohms	60 W + 60W THD 0.03 %

Tone controls

	Response	Turnover frequency
BASS	±10 dB (100 Hz)	500 Hz
TREBLE	±10 dB (15 Hz)	3 kHz

#### Input

Input jack	Jack type	Sensitivity	Impedance	S/N (weighting network, input level)
PHONO (MM)	Phono	2.0 mV	50 kilohms	87 dB (A, 5 mV)
TUNER, CD, AUX, DAT/TAPE 1 TAPE 2	Phono	150 mV	50 kilohms	100 dB (150 mV)

#### Output

Output jack	Jack type	Voltage/impedance
REC OUT	Phono jack	Voltage 150 mV Impedance 1 kohm
SPEAKERS	—	<ul style="list-style-type: none"> <li>Model for Scandinavian countries, Spain and Portugal : Accepts speakers of 8 - 16 ohms</li> <li>Model for other countries: Accepts speakers of 4 - 16 ohms</li> </ul>
HEADPHONES	Stereophone jack	Accepts low and high impedance headphones

— Continued on page 2 —

INTEGRATED STEREO AMPLIFIER  
**SONY**®

Loudness (Attenuation 30 dB) +6 dB (100 Hz)/+3 dB (10 kHz)  
 Subsonic filter 6 dB/octave, attenuation below 15 Hz  
 Intermodulation (IM) distortion (60 Hz : 7 kHz = 4:1)  
 Frequency response PHONO: RIAA equalization curve  
 ±0.5 dB  
 TUNER, CD, AUX, TAPE 1, TAPE 2/  
 DAT: 7 Hz – 100 kHz ±3 dB  
 Residual noise Less than 170 µV (network A)  
 Damping factor 70 (8 ohms, 1 kHz)  
 Total harmonic distortion Less than 0.008 % at 10 W output  
 (8 ohms, 20 Hz – 20 kHz)

**General**

System Preamplifier: Low-noise, high-gain equalizer amplifier  
 Power amplifier: Pure-complementary SEPP OCL power amplifier with all stages directly coupled  
 Power requirements Models for Continental European countries : 220 V – 230 V AC, 50 Hz

**Power consumption**

Scandinavian countries, Spain and Portugal	140 W
Other countries	210 W

Dimensions Approx. 430 x 135 x 375 mm (w/h/d)  
 (17 x 5 3/8 x 14 7/8 inches)  
 Mass Approx. 9.2 kg (20 lb 5 oz)

Design and specifications are subject to change without notice.

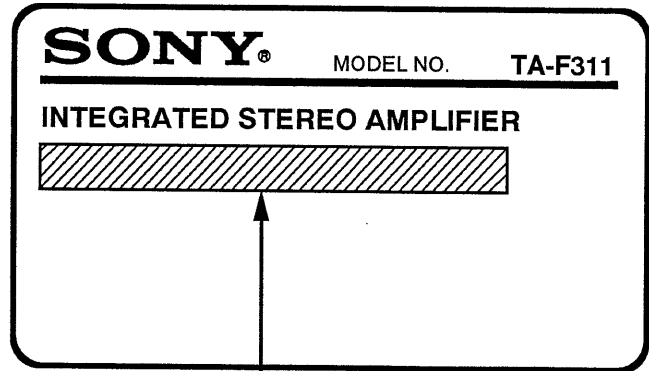
**Note**

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

**TABLE OF CONTENTS**

Section	Title	Page
Specifications		1
<b>1. GENERAL</b>		
1-1. Parts Identification		3
<b>2. DISASSEMBLY</b>		4
<b>3. ELECTRICAL ADJUSTMENTS</b>		5
<b>4. DIAGRAMS</b>		
4-1. Circuit Boards Location		6
4-2. Printed Wiring Boards		8
4-3. Schematic Diagram		13
<b>5. EXPLODED VIEWS</b>		
5-1. Front Panel Assembly		17
5-2. Chassis Assembly		18
<b>6. ELECTRICAL PARTS LIST</b>		19

**MODEL IDENTIFICATION**  
 (Specification Label)



AE1 model : AC 220-230V ~50 / 60Hz 210W  
 AE2 model : AC 220-230V ~50 / 60Hz 140W

AE2 : Model for Scandinavian countries, Spain and Portugal.  
 AE1 : Model for other European countries.

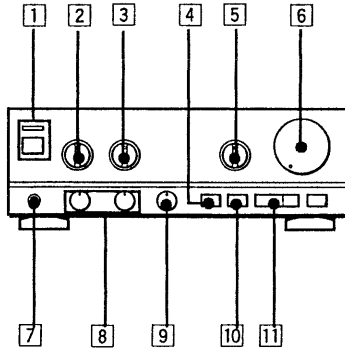
**SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY MARK OR DOTTED LINE WITH MARK ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

## SECTION 1 GENERAL

This section is extracted from instruction manual.

### 1-1. PARTS IDENTIFICATION



This section describes about each name of this amplifier and remote commander.

#### Front Panel

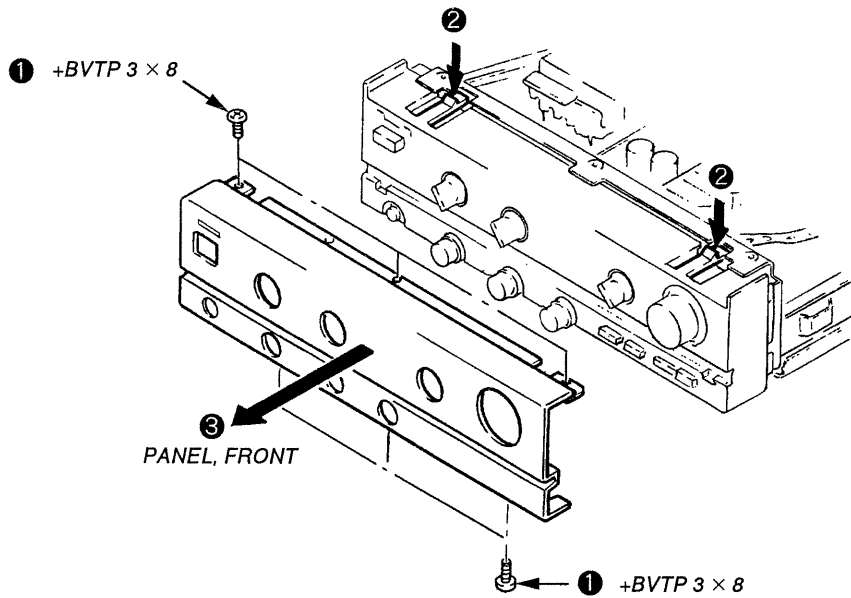
- 1 POWER switch and indicator\*
- 2 SPEAKERS selector
- 3 REC OUT SELECTOR
- 4 SUBSONIC  
Subsonic filter switch
- 5 INPUT SELECTOR
- 6 VOLUME control
- 7 HEADPHONES jack  
(stereo phone jack)
- 8 TONE controls
- 9 BALANCE control
- 10 LOUDNESS switch
- 11 SOURCE DIRECT switch and indicator

\* After the power is turned on, the POWER indicator lights in red and immediately changed to green. If it remains in red, turn off the power, check that speakers and other devices are properly connected, and turn on the power again.

## SECTION 2 DISASSEMBLY

**Note :** Follow the disassembly procedure in the numerical order given.

1. Remove screws **1**  $\times$  6.
2. Push leaves **2** down to release 2 claws.
3. Pull front panel in the direction of arrow **3**



## SECTION 3 ELECTRICAL ADJUSTMENTS

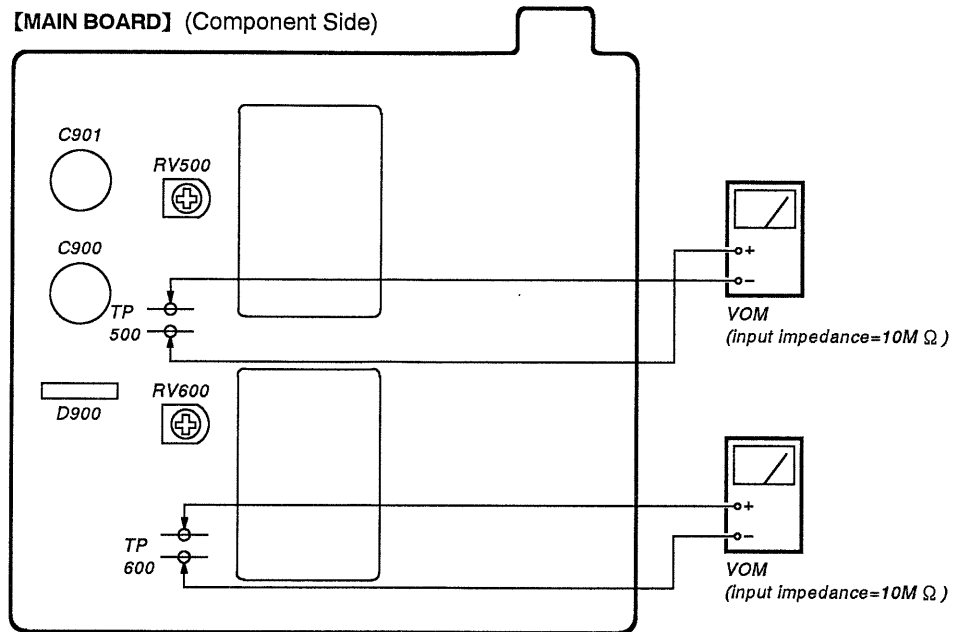
### Bias Current Adjustment

#### Procedure :

1. Set main volume to minimum.
2. Turn the power on and confirm that RY800 will turn on at about 12 seconds after power-on.
3. Adjust RV500 (L-ch) and RV600 (R-ch) so that the voltages across TP500 and TP600 become within the adjustment values.

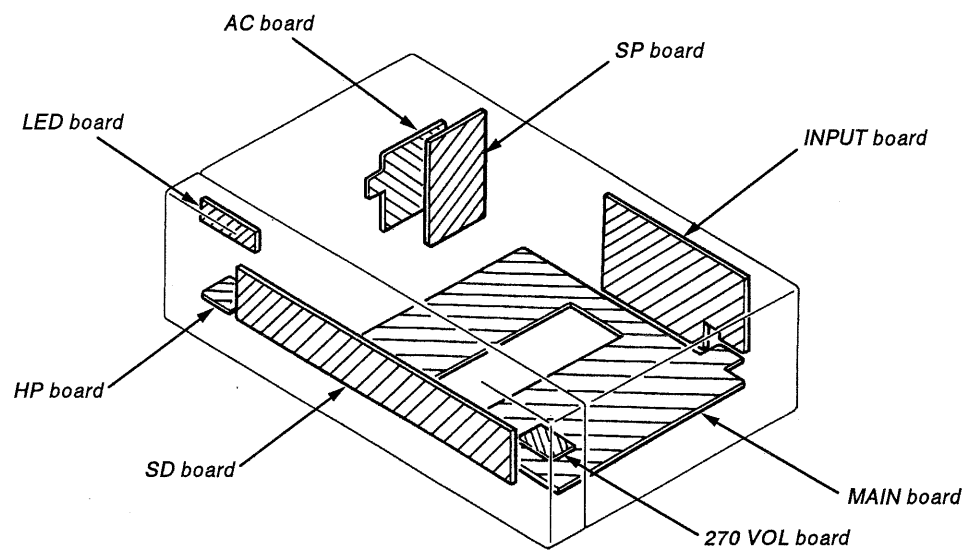
#### Adjustment Values :

$5\text{mV} \pm 0.3\text{mV}$



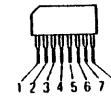
## SECTION 4 DIAGRAMS

### 4-1. CIRCUIT BOARDS LOCATION



### ● SEMICONDUCTOR LEAD LAYOUTS

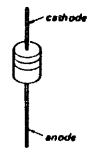
M5218AL  
uPC1237HA



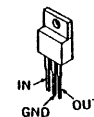
2SC945-P  
2SC1841-PAFAEA  
2SC2545



HZS6B1L  
HZS7C2L



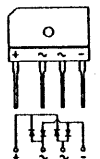
M5F7815



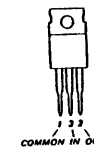
2SC2259-FG



RBV-602-01



M5F7915



2SC2603-EF



SEL2213C-C



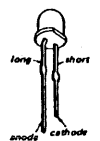
2SA949-OY-TPE6  
2SC2229-OY-TPE6



2SK246-GR



SEL2510C-D



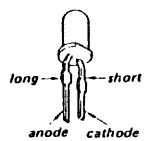
2SA988-PAFAEA



KSC1008



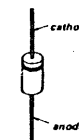
SEL2810A-C



2SA1175-HFE  
DTA124ES



10E2  
1N4148M  
1S1585

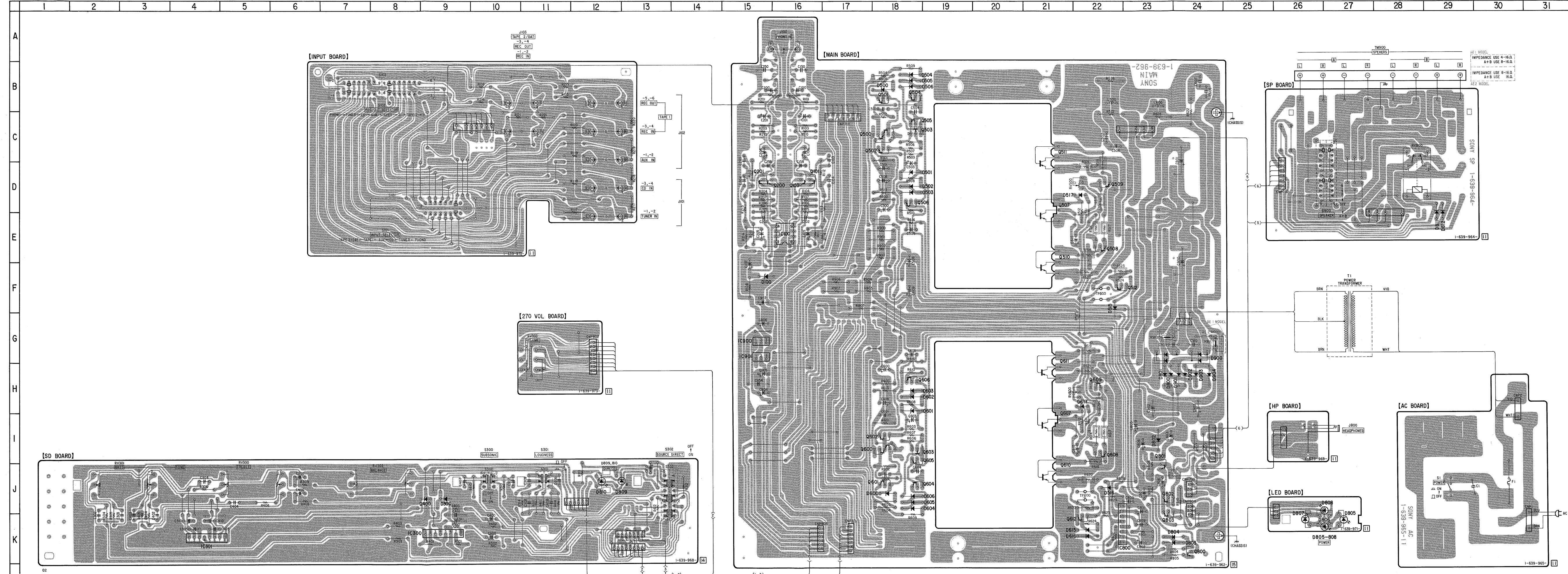


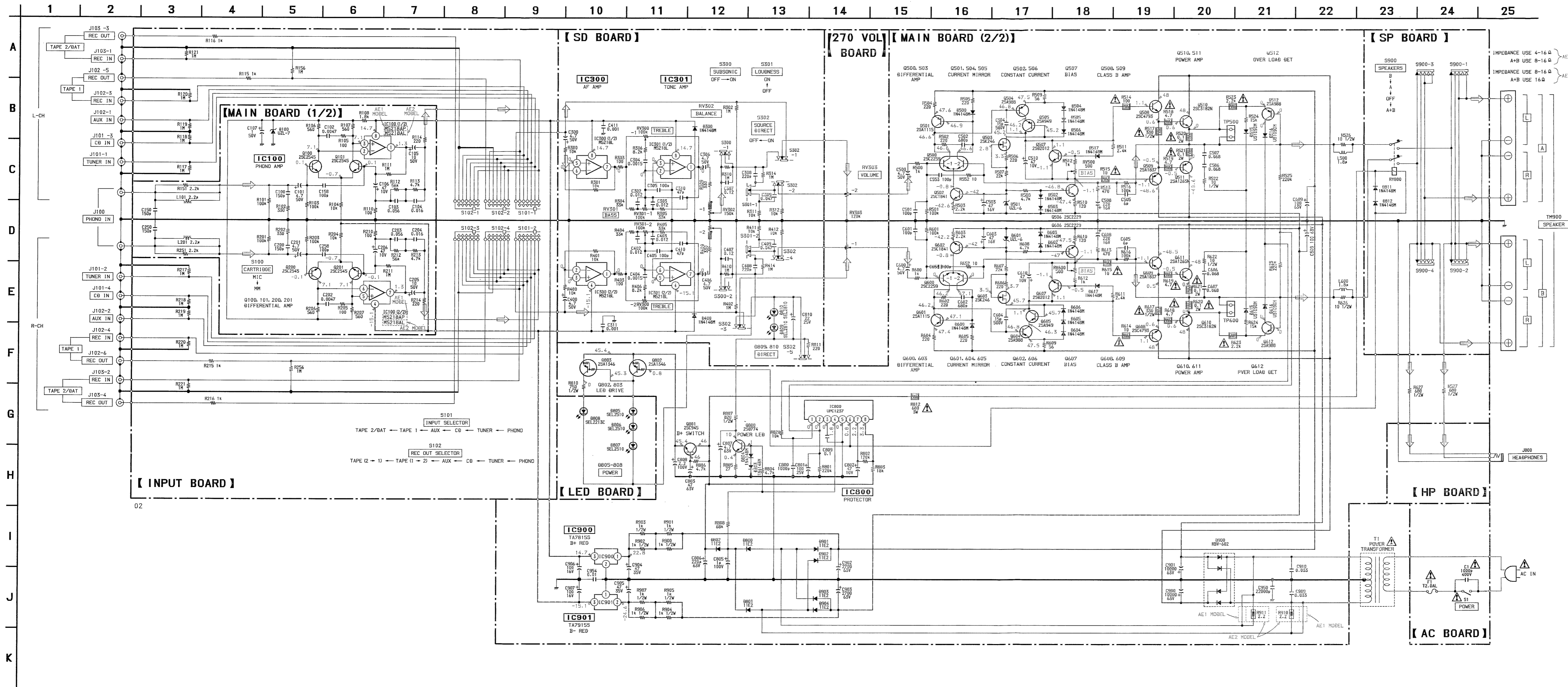
● SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
D100	F-15	IC100	E-16
D300	J-9	IC300	K-9
D400	J-9	IC301	K-4
D500	B-18	IC800	K-22
D501	D-18	IC900	G-15
D502	D-18	IC901	G-15
D503	D-18		
D504	B-18		
D505	B-18	Q100	D-16
D506	B-18	Q101	D-16
		Q200	D-15
		Q201	D-15
D515	F-22	Q500	C-18
D516	J-22		
D517	D-22		
D600	J-18	Q501	B-18
D601	H-18	Q502	C-18
		Q503	C-18
D602	H-18	Q504	B-18
D603	H-18	Q505	C-18
D604	J-18		
D605	J-18	Q506	D-18
D606	J-18	Q507	D-21
		Q508	E-22
		Q509	D-22
		Q510	F-21
D615	K-22		
D616	K-22		
D617	H-22		
D800	H-23	Q511	C-21
D801	H-23	Q512	F-22
		Q600	I-18
D802	I-23	Q601	J-18
D803	K-23	Q602	I-18
D804	K-23		
D805	K-27	Q603	I-18
D806	K-26	Q604	J-18
		Q605	I-18
D807	K-26	Q606	H-18
D808	J-26	Q607	I-21
D809	J-12		
D810	J-12	Q608	I-22
D811	E-29	Q609	H-22
		Q610	J-21
D812	E-29	Q611	H-21
D900	G-24	Q612	K-22
D901	H-24		
D902	H-24	Q800	K-24
D903	H-24	Q801	J-23
		Q802	J-23
D904	H-24	Q803	K-23

**Note:**

- : parts extracted from the component side.
- ⊙ : Pattern on the side which is seen.
- AE2: Model for Scandinavian countries, Spain and Portugal.
- AE1: Model for other European countries.

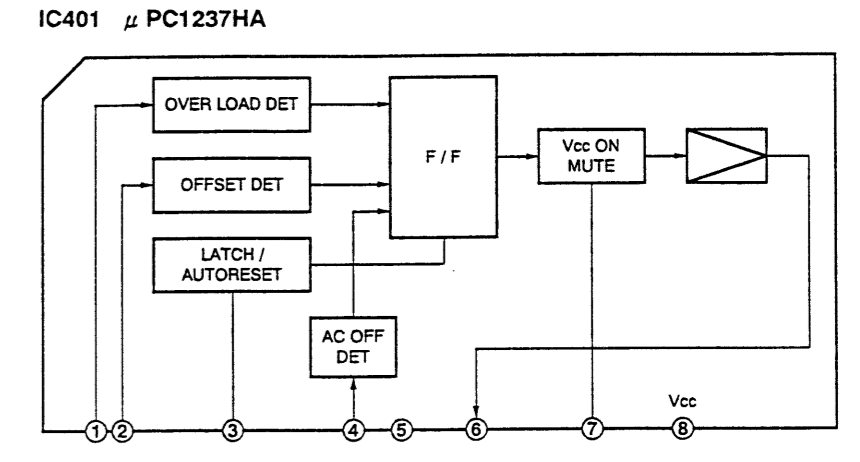




Note :

- All capacitors are in  $\mu F$  unless otherwise noted. pF:  $\mu F$  50V or less are not indicated except for electrolytics and tantalums.
  - All resistors are in  $\Omega$  and  $\frac{1}{4}W$  or less unless otherwise specified.
  - $\square$  : nonflammable resistor.
- Note : The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.
- $\square$  : B+ Line
  - $\square$  : B- Line
  - $\square$  : adjustment for repair.
  - Voltage and waveforms are d.c with respect to ground under no-signal conditions.
  - Voltages are taken with a VOM (input impedance 10M  $\Omega$ ). Voltage variations may be noted due to normal production tolerances.
  - Signal path.
  - $\rightarrow$  : PHONO
  - AE2 : Model for Scandinavian countries, Spain and Portugal.
  - AE1 : Model for other European countries.

• IC BLOCK DIAGRAM





## SECTION 5 EXPLODED VIEWS

**NOTE :**

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts  
Example :  
KNOB, BALANCE (WHITE)...(RED)

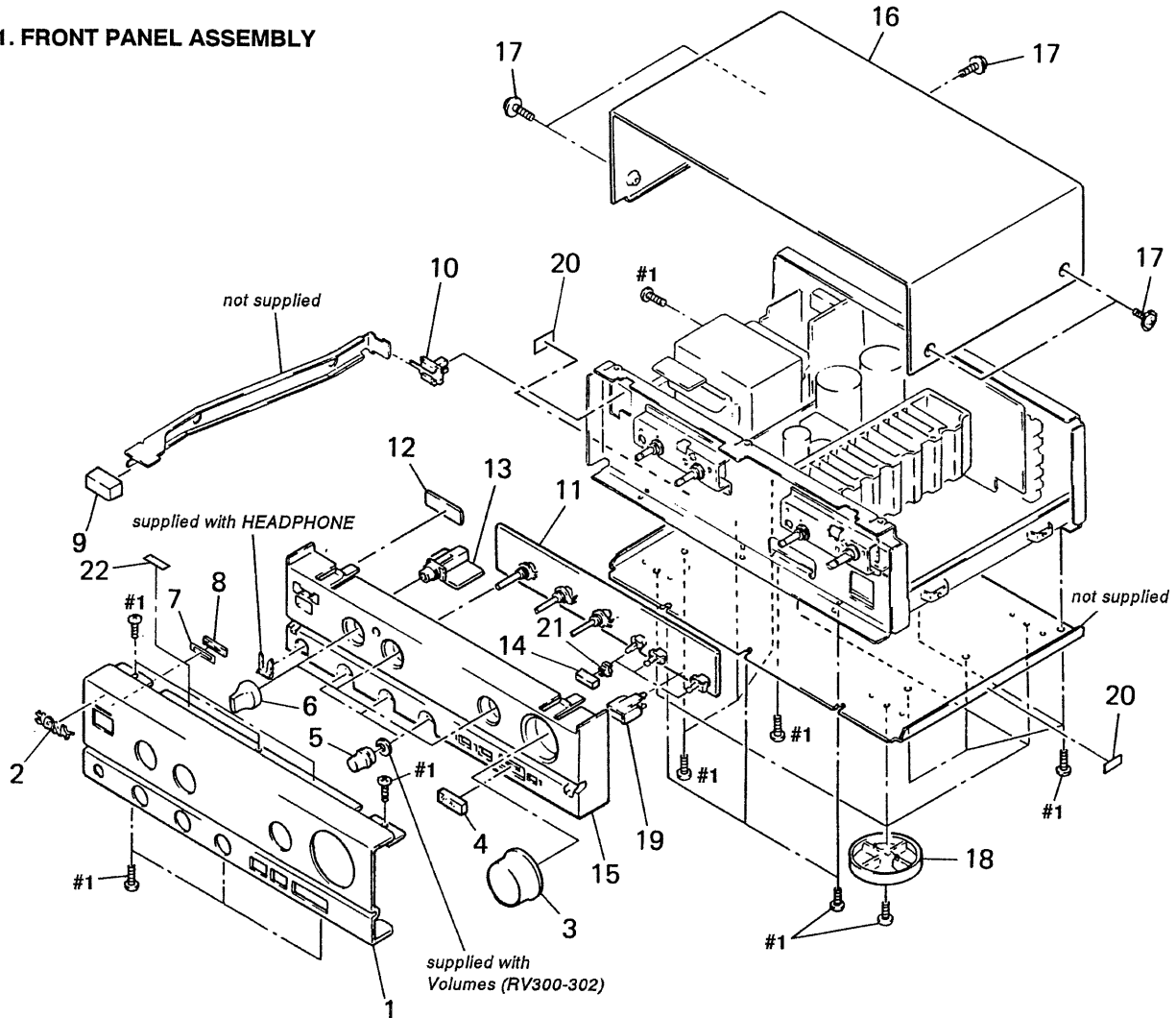
↑                      ↑  
Parts color      Cabinet's color

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware ( # mark) list is given in the last of this parts list.

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

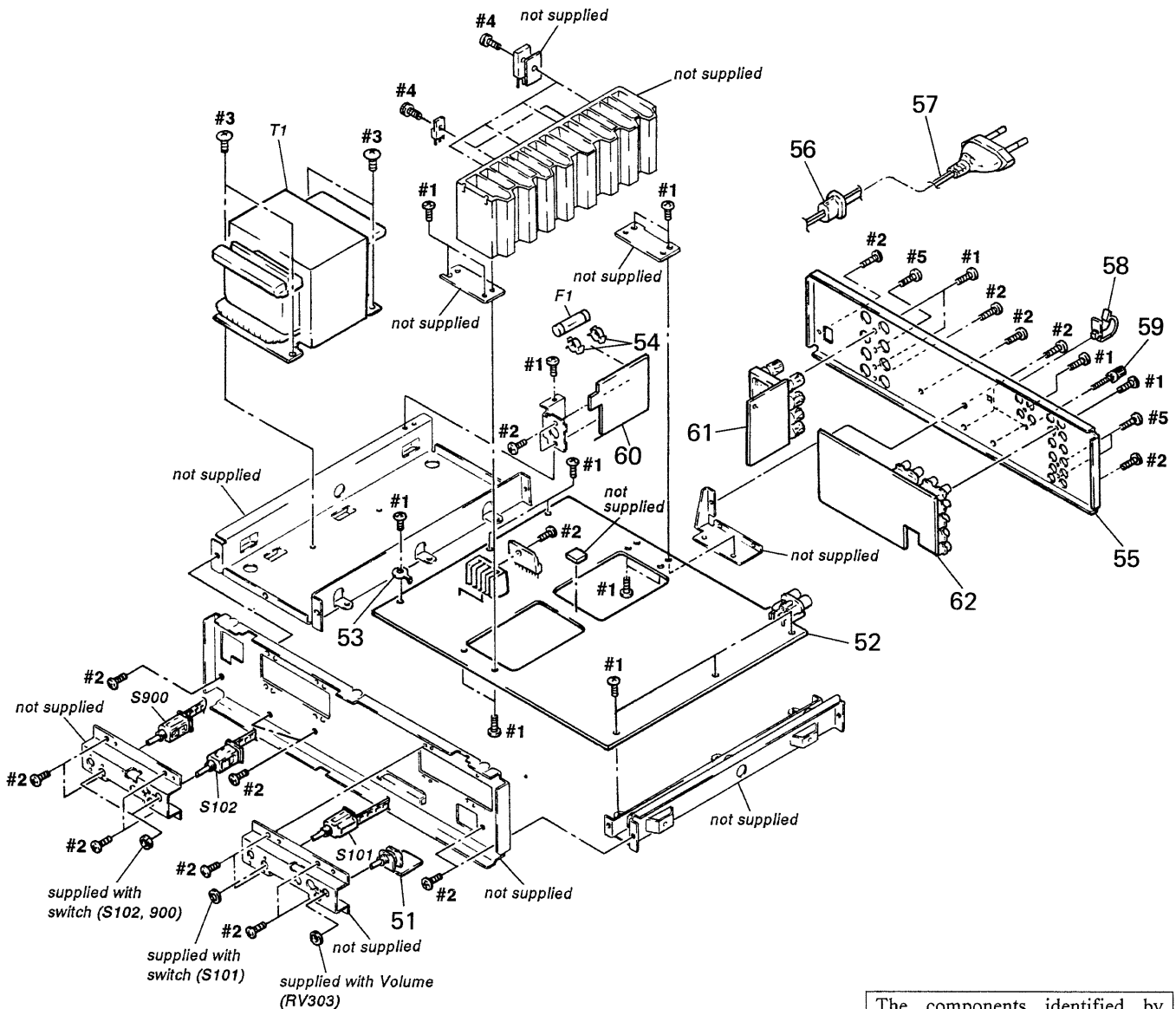
- AE2 : Model for Scandinavian countries, Spain and Portugal.
- AE1 : Model for other European countries.

### 5-1. FRONT PANEL ASSEMBLY



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
1	4-957-473-01	PANEL, FRONT		* 12	1-639-971-11	LED BOARD	
2	4-942-568-01	EMBLEM (NO. 5), SONY		* 13	1-639-969-11	HP BOARD	
3	X-4941-616-1	KNOB (R53) ASSY		14	4-947-011-01	BUTTON (F)	
4	4-945-622-01	PLATE (S/D), INDICATION		* 15	4-957-474-01	BASE, PANEL	
5	4-949-932-01	KNOB (DIA. 25)		* 16	4-924-920-71	CASE	
6	4-949-931-01	KNOB (DIA. 21)		17	3-704-366-01	SCREW (CASE) (M3X8)	
7	4-945-175-01	INDICATOR (PSW)		18	4-956-885-11	FOOT (F58175S2W)	
8	X-4942-660-1	INDICATOR ASSY		19	4-945-177-01	HOUSE, LIGHTING	
9	4-949-281-01	BUTTON		20	4-952-154-01	CUSHION (PE)	
10	4-875-466-11	JOINT (F2), KNOB		21	4-864-307-00	RING	
* 11	A-4345-196-A	SD BOARD, COMPLETE		22	9-911-830-XX	SHEET, HB	

## 5-2. CHASSIS ASSEMBLY



The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 51	1-639-973-11	270 VOL BOARD		59	4-947-010-01	SCREW, FEEDER FIXED	
* 52	A-4360-480-A	MAIN BOARD, COMPLETE (AE1)		* 60	1-639-965-11	AC BOARD	
* 52	A-4360-481-A	MAIN BOARD, COMPLETE (AE2)		* 61	1-639-964-11	SP BOARD	
* 53	4-870-539-00	PLATE, GROUND		* 62	1-639-972-11	INPUT BOARD	
54	1-533-225-11	HOLDER, FUSE		$\triangle$ F1	1-532-203-00	FUSE (T2A)	
* 55	4-957-475-01	PANEL, BACK (AE1)		S101	1-572-796-11	SWITCH, ROTARY SLIDE (INPUT SELECTOR)	
* 55	4-957-475-11	PANEL, BACK (AE2)		S102	1-572-795-11	SWITCH, ROTARY SLIDE (REC OUT SELECTOR)	
* 56	3-703-244-00	BUSHING (2104), CORD		S900	1-572-794-11	SWITCH, ROTARY SLIDE (SPEAKERS)	
$\triangle$ 57	1-575-651-11	CORD, POWER		$\triangle$ T1	1-423-598-11	TRANSFORMER, POWER	
* 58	4-949-235-01	HOOK					

## SECTION 6 ELECTRICAL PARTS LIST

270 VOL

AC

HP

INPUT

LED

**NOTE :**

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS  
All resistors are in ohms  
METAL : Metal-film resistor  
METAL OXIDE : Metal oxide-film resistor  
F : nonflammable

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS  
In each case, u :  $\mu$ , for example :  
uA.... :  $\mu$  A.... , uPA.... :  $\mu$  PA....  
uPB.... :  $\mu$  PB.... , uPC.... :  $\mu$  PC....  
uPD.... :  $\mu$  PD....
- CAPACITORS  
uF :  $\mu$  F
- COILS  
uH :  $\mu$  H

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

- AE2 : Model for Scandinavian countries, Spain and Portugal.
- AE1 : Model for other European countries.

Ref. No.	Part No.	Description	Remark
* 1-639-973-11	270 VOL BOARD	*****	
		< CONNECTOR >	
* CNP802	1-564-342-11	PIN, CONNECTOR 8P	
		< VARIABLE RESISTOR >	
RV303	1-241-557-11	RES, VAR, CARBON 120K/120K (VOLUME)	
*****			
* 1-639-965-11	AC BOARD	*****	
	1-533-225-11	HOLDER, FUSE	
* 1-533-293-11	FUSE HOLDER		
		< CAPACITOR >	
$\Delta$ C1	1-161-741-00	CERAMIC 0.001uF 10% 400V	
		< CONNECTOR >	
* CNP1	1-568-226-11	PIN, CONNECTOR 2P	
CNP2	1-564-321-00	PIN, CONNECTOR 2P	
		< FUSE >	
$\Delta$ F1	1-532-203-00	FUSE (T2A)	
		< SWITCH >	
$\Delta$ S1	1-554-920-11	SWITCH, PUSH (AC POWER) (1 KEY)	
*****			
* 1-639-969-11	HP BOARD	*****	
		< JACK >	
J800	1-507-796-71	JACK	

Ref. No.	Part No.	Description	Remark
* 1-639-972-11	INPUT BOARD	*****	
* J101	1-573-142-11	JACK, PIN 4P (CD IN/TUNER IN)	
J102	1-568-978-11	JACK 6P (TAPE 1/AUX IN)	
* J103	1-573-142-21	JACK, PIN 4P (TAPE 2/DAT)	
		< RESISTOR >	
R115	1-247-713-11	CARBON 1K 5% 1/4W	
R116	1-247-713-11	CARBON 1K 5% 1/4W	
R117	1-246-545-00	CARBON 1.0M 5% 1/4W	
R118	1-246-545-00	CARBON 1.0M 5% 1/4W	
R119	1-246-545-00	CARBON 1.0M 5% 1/4W	
R120	1-246-545-00	CARBON 1.0M 5% 1/4W	
R121	1-246-545-00	CARBON 1.0M 5% 1/4W	
R215	1-247-713-11	CARBON 1K 5% 1/4W	
R216	1-247-713-11	CARBON 1K 5% 1/4W	
R217	1-246-545-00	CARBON 1.0M 5% 1/4W	
R218	1-246-545-00	CARBON 1.0M 5% 1/4W	
R219	1-246-545-00	CARBON 1.0M 5% 1/4W	
R220	1-246-545-00	CARBON 1.0M 5% 1/4W	
R221	1-246-545-00	CARBON 1.0M 5% 1/4W	
		< SWITCH >	
S101	1-571-669-11	SWITCH, SLIDE (REC OUT SELECTOR)	
S102	1-571-115-11	SWITCH, SLIDE (INPUT SELECTOR)	
*****			
* 1-639-971-11	LED BOARD	*****	
		< DIODE >	
D805	8-719-303-02	DIODE SEL2510C-D (POWER(GREEN))	
D806	8-719-303-02	DIODE SEL2510C-D (POWER(GREEN))	
D807	8-719-303-02	DIODE SEL2510C-D (POWER(GREEN))	
D808	8-719-302-23	DIODE SEL2213C-C (POWER(RED))	

# MAIN

Ref. No.	Part No.	Description	Remark	
*	A-4360-480-A	MAIN BOARD, COMPLETE (AE1) *****		
*	A-4360-481-A	MAIN BOARD, COMPLETE (AE2) *****		
*	4-870-539-00	PLATE, GROUND		
	7-682-547-09	SCREW +BVTT 3X6 (S)		
< CAPACITOR >				
C100	1-164-075-11	CERAMIC	150PF	10% 50V
C101	1-126-163-11	ELECT	4.7uF	20% 50V
C102	1-161-377-00	CERAMIC	0.0047uF	30% 50V
C103	1-130-492-11	MYLAR	0.056uF	5% 50V
C104	1-137-471-11	FILM	0.016uF	5% 50V
C105	1-126-059-11	ELECT	10uF	20% 50V
C106	1-126-022-11	ELECT	47uF	20% 10V
C107	1-126-044-11	ELECT	1uF	20% 50V
C150	1-162-284-31	CERAMIC	150PF	10% 50V
C158	1-164-073-11	CERAMIC	100PF	10% 50V
C200	1-164-075-11	CERAMIC	150PF	10% 50V
C201	1-126-163-11	ELECT	4.7uF	20% 50V
C202	1-161-377-00	CERAMIC	0.0047uF	30% 50V
C203	1-130-492-11	MYLAR	0.056uF	5% 50V
C204	1-137-471-11	FILM	0.016uF	5% 50V
C205	1-126-059-11	ELECT	10uF	20% 50V
C206	1-126-022-11	ELECT	47uF	20% 10V
C250	1-162-284-31	CERAMIC	150PF	10% 50V
C258	1-164-073-11	CERAMIC	100PF	10% 50V
C500	1-126-163-11	ELECT	4.7uF	20% 50V
C501	1-164-073-11	CERAMIC	100PF	10% 50V
C502	1-164-083-11	CERAMIC	680PF	10% 50V
C503	1-124-477-11	ELECT	47uF	20% 25V
C504	1-102-316-00	CERAMIC	15PF	5% 500V
C505	1-102-943-00	CERAMIC	6.0PF	+-.0.5PF 50V
C506	1-136-163-00	FILM	0.068uF	5% 50V
C507	1-136-163-00	FILM	0.068uF	5% 50V
C508	1-124-995-11	ELECT	220uF	20% 10V
C509	1-126-063-11	ELECT	100uF	20% 63V
C510	1-126-022-11	ELECT	47uF	20% 10V
C600	1-126-163-11	ELECT	4.7uF	20% 50V
C601	1-164-073-11	CERAMIC	100PF	10% 50V
C602	1-164-083-11	CERAMIC	680PF	10% 50V
C603	1-124-477-11	ELECT	47uF	20% 25V
C604	1-102-316-00	CERAMIC	15PF	5% 500V
C605	1-102-943-00	CERAMIC	6.0PF	+-.0.5PF 50V
C606	1-136-163-00	FILM	0.068uF	5% 50V
C607	1-136-163-00	FILM	0.068uF	5% 50V
C608	1-124-995-11	ELECT	220uF	20% 10V
C609	1-126-063-11	ELECT	100uF	20% 63V

Ref. No.	Part No.	Description	Remark	
C610	1-126-022-11	ELECT	47uF	20% 10V
C800	1-164-085-11	CERAMIC	0.001uF	10% 50V
C801	1-124-478-11	ELECT	100uF	20% 25V
C802	1-124-126-00	ELECT	47uF	20% 10V
C803	1-124-918-11	ELECT	47uF	20% 63V
C805	1-124-791-11	ELECT	1.0uF	20% 100V
C806	1-124-919-11	ELECT	220uF	20% 63V
C807	1-124-927-11	ELECT	4.7uF	20% 100V
C808	1-124-925-11	ELECT	2.2uF	20% 100V
C809	1-136-165-00	FILM	0.1uF	5% 50V
C900	1-107-415-11	ELECT	10000uF	20% 63V
C901	1-107-415-11	ELECT	10000uF	20% 63V
C902	1-128-358-51	ELECT	2700uF	20% 56V
C903	1-128-358-51	ELECT	2700uF	20% 56V
C904	1-126-051-11	ELECT	47uF	20% 35V
C905	1-126-051-11	ELECT	47uF	20% 35V
C906	1-126-023-11	ELECT	100uF	20% 16V
C907	1-126-023-11	ELECT	100uF	20% 16V
C909	1-106-379-12	MYLAR	0.033uF	5% 200V
C910	1-106-379-12	MYLAR	0.033uF	5% 200V
C954	1-162-306-11	CERAMIC	0.01uF	20% 16V
< CONNECTOR >				
* CNP700	1-564-506-11	PLUG, CONNECTOR 3P		
CNP701	1-564-510-11	PLUG, CONNECTOR 7P		
* CNP801	1-564-341-11	PIN, CONNECTOR 7P		
* CNP803	1-564-340-00	PIN, CONNECTOR 6P		
* CNP804	1-564-337-00	PIN, CONNECTOR 3P		
< DIODE >				
D100	8-719-933-50	DIODE	HZS7C2L	
D500	8-719-987-63	DIODE	1N4148M	
D501	8-719-933-36	DIODE	HZS6B1L	
D502	8-719-987-63	DIODE	1N4148M	
D503	8-719-987-63	DIODE	1N4148M	
D504	8-719-987-63	DIODE	1N4148M	
D505	8-719-987-63	DIODE	1N4148M	
D506	8-719-987-63	DIODE	1N4148M	
D515	8-719-815-85	DIODE	1S1585	
D516	8-719-815-85	DIODE	1S1585	
D517	8-719-987-63	DIODE	1N4148M	
D600	8-719-987-63	DIODE	1N4148M	
D601	8-719-933-36	DIODE	HZS6B1L	
D602	8-719-987-63	DIODE	1N4148M	
D603	8-719-987-63	DIODE	1N4148M	
D604	8-719-987-63	DIODE	1N4148M	
D605	8-719-987-63	DIODE	1N4148M	
D606	8-719-987-63	DIODE	1N4148M	
D615	8-719-815-85	DIODE	1S1585	

Ref. No.	Part No.	Description	Remark
D616	8-719-815-85	DIODE 1S1585	
D617	8-719-987-63	DIODE 1N4148M	
D800	8-719-200-02	DIODE 10E2	
D801	8-719-200-02	DIODE 10E2	
D802	8-719-200-02	DIODE 10E2	
D803	8-719-987-63	DIODE 1N4148M	
D804	8-719-987-63	DIODE 1N4148M	
D900	8-719-302-38	DIODE RBV-602-01	
D901	8-719-200-02	DIODE 10E2	
D902	8-719-200-02	DIODE 10E2	
D903	8-719-200-02	DIODE 10E2	
D904	8-719-200-02	DIODE 10E2	
< IC >			
IC100	8-759-634-51	IC M5218AP (AE1)	
IC100	8-759-634-50	IC M5218AL (AE2)	
IC800	8-759-111-68	IC uPC1237HA	
IC900	8-759-231-59	IC M5F7815	
IC901	8-759-245-87	IC M5F7915	
< JACK >			
* J100	1-573-140-11	JACK, PIN 2P (PHONO IN)	
< COIL >			
L500	1-428-133-11	COIL, AIR-CORE	
L600	1-428-133-11	COIL, AIR-CORE	
< TRANSISTOR >			
Q100	8-729-354-52	TRANSISTOR 2SC2545	
Q101	8-729-354-52	TRANSISTOR 2SC2545	
Q200	8-729-354-52	TRANSISTOR 2SC2545	
Q201	8-729-354-52	TRANSISTOR 2SC2545	
Q500	8-729-620-17	TRANSISTOR 2SC2259-FG	
Q501	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q502	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	
Q503	8-729-224-62	TRANSISTOR 2SK246-GR	
Q504	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q505	8-729-021-74	TRANSISTOR 2SA949-OY-TPE6	
Q506	8-729-021-73	TRANSISTOR 2SC2229-OY-TPE6	
Q507	8-729-209-15	TRANSISTOR 2SD2012	
Q508	8-729-017-06	TRANSISTOR 2SC4793	
Q509	8-729-017-05	TRANSISTOR 2SA1837	
Q510	8-729-020-88	TRANSISTOR 2SC3182N-M-RO	
Q511	8-729-020-89	TRANSISTOR 2SA1265N-M-RO	
Q512	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q600	8-729-620-17	TRANSISTOR 2SC2259-FG	
Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q602	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	

Ref. No.	Part No.	Description	Remark
Q603	8-729-224-62	TRANSISTOR 2SK246-GR	
Q604	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q605	8-729-021-74	TRANSISTOR 2SA949-OY-TPE6	
Q606	8-729-021-73	TRANSISTOR 2SC2229-OY-TPE6	
Q607	8-729-209-15	TRANSISTOR 2SD2012	
Q608	8-729-017-06	TRANSISTOR 2SC4793	
Q609	8-729-017-05	TRANSISTOR 2SA1837	
Q610	8-729-020-88	TRANSISTOR 2SC3182N-M-RO	
Q611	8-729-020-89	TRANSISTOR 2SA1265N-M-RO	
Q612	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q800	8-729-140-96	TRANSISTOR KSC1008	
Q801	8-729-194-57	TRANSISTOR 2SC945-P	
Q802	8-729-900-63	TRANSISTOR DTA124ES	
Q803	8-729-900-63	TRANSISTOR DTA124ES	
< RESISTOR >			
R101	1-249-469-11	CARBON 100K 5% 1/4W	
R102	1-247-706-11	CARBON 330 5% 1/4W	
R103	1-249-469-11	CARBON 100K 5% 1/4W	
R104	1-247-725-11	CARBON 10K 5% 1/4W	
R105	1-247-700-11	CARBON 100 5% 1/4W	
R106	1-247-710-11	CARBON 560 5% 1/4W	
R107	1-247-710-11	CARBON 560 5% 1/4W	
R108	1-247-716-11	CARBON 1.8K 5% 1/4W	
R110	1-247-700-11	CARBON 100 5% 1/4W	
R111	1-246-545-00	CARBON 1.0M 5% 1/4W	
R112	1-249-844-11	CARBON 56K 1% 1/2W	
R113	1-249-818-11	CARBON 4.7K 1% 1/2W	
R114	1-247-704-11	CARBON 220 5% 1/4W	
R201	1-249-469-11	CARBON 100K 5% 1/4W	
R202	1-247-706-11	CARBON 330 5% 1/4W	
R203	1-249-469-11	CARBON 100K 5% 1/4W	
R204	1-247-725-11	CARBON 10K 5% 1/4W	
R205	1-247-700-11	CARBON 100 5% 1/4W	
R206	1-247-710-11	CARBON 560 5% 1/4W	
R207	1-247-710-11	CARBON 560 5% 1/4W	
R210	1-247-700-11	CARBON 100 5% 1/4W	
R211	1-246-545-00	CARBON 1.0M 5% 1/4W	
R212	1-249-844-11	CARBON 56K 1% 1/2W	
R213	1-249-818-11	CARBON 4.7K 1% 1/2W	
R214	1-247-704-11	CARBON 220 5% 1/4W	
R500	1-247-713-11	CARBON 1K 5% 1/4W	
R501	1-249-469-11	CARBON 100K 5% 1/4W	
R502	1-247-704-11	CARBON 220 5% 1/4W	
R503	1-247-717-11	CARBON 2.2K 5% 1/4W	
R504	1-247-704-11	CARBON 220 5% 1/4W	
R505	1-247-704-11	CARBON 220 5% 1/4W	
R506	1-247-704-11	CARBON 220 5% 1/4W	
R507	1-249-462-11	CARBON 22K 5% 1/4W	

**MAIN SD**

Ref. No.	Part No.	Description	Remark
R508	1-247-721-11	CARBON	4.7K 5% 1/4W
R509	1-249-522-11	CARBON	56 5% 1/4W
R510	1-247-701-11	CARBON	120 5% 1/4W
R511	1-249-561-11	CARBON	2.4K 5% 1/4W
R512	1-247-713-11	CARBON	1K 5% 1/4W
R513	1-249-915-11	CARBON	470 1% 1/4W
R514	1-247-688-11	CARBON	10 5% 1/4W
R515	1-247-688-11	CARBON	10 5% 1/4W
R516	1-249-469-11	CARBON	100K 5% 1/4W
R517	1-247-745-11	CARBON	330 5% 1/2W
R518	1-249-455-11	CARBON	4.7 5% 1/4W
R519	1-249-455-11	CARBON	4.7 5% 1/4W
△R520	1-217-611-00	RES, METAL PLATE	0.1
△R521	1-217-611-00	RES, METAL PLATE	0.1
R522	1-247-727-11	CARBON	10 5% 1/2W
△R523	1-247-717-11	CARBON	2.2K 5% 1/4W F
R524	1-249-460-11	CARBON	15K 5% 1/4W
R525	1-247-887-00	CARBON	220K 5% 1/4W
R526	1-247-727-11	CARBON	10 5% 1/2W
R527	1-247-750-11	CARBON	680 5% 1/2W
R600	1-247-713-11	CARBON	1K 5% 1/4W
R601	1-249-469-11	CARBON	100K 5% 1/4W
R602	1-247-704-11	CARBON	220 5% 1/4W
R603	1-247-717-11	CARBON	2.2K 5% 1/4W
R604	1-247-704-11	CARBON	220 5% 1/4W
R605	1-247-704-11	CARBON	220 5% 1/4W
R606	1-247-704-11	CARBON	220 5% 1/4W
R607	1-249-462-11	CARBON	22K 5% 1/4W
R608	1-247-721-11	CARBON	4.7K 5% 1/4W
R609	1-249-522-11	CARBON	56 5% 1/4W
R610	1-247-701-11	CARBON	120 5% 1/4W
R611	1-249-561-11	CARBON	2.4K 5% 1/4W
R612	1-247-713-11	CARBON	1K 5% 1/4W
R613	1-249-915-11	CARBON	470 1% 1/4W
R614	1-247-688-11	CARBON	10 5% 1/4W
R615	1-247-688-11	CARBON	10 5% 1/4W
R616	1-249-469-11	CARBON	100K 5% 1/4W
R617	1-247-745-11	CARBON	330 5% 1/2W
R618	1-249-455-11	CARBON	4.7 5% 1/4W
R619	1-249-455-11	CARBON	4.7 5% 1/4W
△R620	1-217-611-00	RES, METAL PLATE	0.1
△R621	1-217-611-00	RES, METAL PLATE	0.1
R622	1-247-727-11	CARBON	10 5% 1/2W
△R623	1-247-717-11	CARBON	2.2K 5% 1/4W F
R624	1-249-460-11	CARBON	15K 5% 1/4W
R625	1-247-887-00	CARBON	220K 5% 1/4W
R626	1-247-727-11	CARBON	10 5% 1/2W
R627	1-247-750-11	CARBON	680 5% 1/2W
R801	1-247-887-00	CARBON	220K 5% 1/4W

Ref. No.	Part No.	Description	Remark
R802	1-247-881-00	CARBON	120K 5% 1/4W
R803	1-249-461-11	CARBON	18K 5% 1/4W
R804	1-247-721-11	CARBON	4.7K 5% 1/4W
R805	1-247-693-11	CARBON	27 5% 1/4W
R806	1-247-721-11	CARBON	4.7K 5% 1/4W
R807	1-247-751-11	CARBON	820 5% 1/2W
R808	1-249-467-11	CARBON	68K 5% 1/4W
R810	1-247-237-00	CARBON	750 5% 1/2W
△R812	1-215-916-00	METAL OXIDE	680 5% 3W F
R820	1-247-725-11	CARBON	10K 5% 1/4W
R900	1-247-752-11	CARBON	1K 5% 1/2W
R901	1-247-752-11	CARBON	1K 5% 1/2W
R902	1-247-752-11	CARBON	1K 5% 1/2W
R903	1-247-752-11	CARBON	1K 5% 1/2W
R904	1-247-752-11	CARBON	1K 5% 1/2W
R905	1-247-752-11	CARBON	1K 5% 1/2W
R906	1-247-752-11	CARBON	1K 5% 1/2W
R907	1-247-752-11	CARBON	1K 5% 1/2W
R910	1-806-882-11	THERMISTOR, POSITIVE	2.2 (AE2)
R911	1-806-882-11	THERMISTOR, POSITIVE	2.2 (AE2)
< VARIABLE RESISTOR >			
RV500	1-237-455-11	RES, ADJ, CARBON 500 (BIAS CURRENT L)	
RV600	1-237-455-11	RES, ADJ, CARBON 500 (BIAS CURRENT R)	
*****			
*	A-4345-196-A	SD BOARD, COMPLETE	
*****			
< CAPACITOR >			
C300	1-126-163-11	ELECT	4.7uF 20% 50V
C302	1-136-154-00	FILM	0.012uF 5% 50V
C303	1-136-154-00	FILM	0.012uF 5% 50V
C304	1-130-473-00	MYLAR	0.0015uF 5% 50V
C305	1-164-073-11	CERAMIC	100PF 10% 50V
C306	1-126-163-11	ELECT	4.7uF 20% 50V
C307	1-136-166-00	FILM	0.12uF 5% 50V
C308	1-162-286-31	CERAMIC	220PF 10% 50V
C309	1-136-161-00	FILM	0.047uF 5% 50V
C310	1-164-062-11	CERAMIC	47PF 5% 50V
C400	1-126-163-11	ELECT	4.7uF 20% 50V
C402	1-136-154-00	FILM	0.012uF 5% 50V
C403	1-136-154-00	FILM	0.012uF 5% 50V
C404	1-130-473-00	MYLAR	0.0015uF 5% 50V
C405	1-164-073-11	CERAMIC	100PF 10% 50V
C406	1-126-163-11	ELECT	4.7uF 20% 50V
C407	1-136-166-00	FILM	0.12uF 5% 50V
C408	1-162-286-31	CERAMIC	220PF 10% 50V
C409	1-136-161-00	FILM	0.047uF 5% 50V
C410	1-164-062-11	CERAMIC	47PF 5% 50V

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
C810	1-124-916-11	ELECT 22uF	20% 63V
		< DIODE >	
D300	8-719-987-63	DIODE 1N4148M	
D400	8-719-987-63	DIODE 1N4148M	
D809	8-719-301-52	LED SEL2810A-C (DIRECT)	
D810	8-719-301-52	LED SEL2810A-C (DIRECT)	
		< IC >	
IC300	8-759-634-50	IC M5218AL	
IC301	8-759-634-50	IC M5218AL	
		< RESISTOR >	
R300	1-247-725-11	CARBON 10K 5%	1/4W
R301	1-247-725-11	CARBON 10K 5%	1/4W
R302	1-246-545-00	CARBON 1.0M 5%	1/4W
R303	1-247-700-11	CARBON 100 5%	1/4W
R304	1-247-726-11	CARBON 33K 5%	1/4W
R305	1-247-726-11	CARBON 33K 5%	1/4W
R306	1-247-724-11	CARBON 8.2K 5%	1/4W
R309	1-247-706-11	CARBON 330 5%	1/4W
R310	1-246-545-00	CARBON 1.0M 5%	1/4W
R311	1-247-725-11	CARBON 10K 5%	1/4W
R312	1-247-725-11	CARBON 10K 5%	1/4W
R314	1-246-545-00	CARBON 1.0M 5%	1/4W
R400	1-247-725-11	CARBON 10K 5%	1/4W
R401	1-247-725-11	CARBON 10K 5%	1/4W
R402	1-246-545-00	CARBON 1.0M 5%	1/4W
R403	1-247-700-11	CARBON 100 5%	1/4W
R404	1-247-726-11	CARBON 33K 5%	1/4W
R405	1-247-726-11	CARBON 33K 5%	1/4W
R406	1-247-724-11	CARBON 8.2K 5%	1/4W
R409	1-247-706-11	CARBON 330 5%	1/4W
R410	1-246-545-00	CARBON 1.0M 5%	1/4W
R411	1-247-725-11	CARBON 10K 5%	1/4W
R412	1-247-725-11	CARBON 10K 5%	1/4W
R414	1-246-545-00	CARBON 1.0M 5%	1/4W
R811	1-247-704-11	CARBON 220 5%	1/4W
		< VARIABLE RESISTOR >	
RV300	1-241-056-11	RES, VAR, CARBON 100K/100K	(TREBLE)
RV301	1-241-056-11	RES, VAR, CARBON 100K/100K	(BASS)
RV302	1-238-513-11	RES, VAR, CARBON 150K/150K	(BALANCE)
		< SWITCH >	
S300	1-571-112-21	SWITCH, PUSH (1 KEY)	(SUBSONIC)
S301	1-571-112-21	SWITCH, PUSH (1 KEY)	(LOUDNESS)
S302	1-572-642-11	SWITCH, PUSH (1 KEY)	(SOURCE DIRECT)

Ref. No.	Part No.	Description	Remark
*	1-639-964-11	SP BOARD	*****
		< CONNECTOR >	
* CNP702	1-564-509-11	PLUG, CONNECTOR 6P	
		< DIODE >	
D811	8-719-987-63	DIODE 1N4148M	
D812	8-719-987-63	DIODE 1N4148M	
		< RELAY >	
RY800	1-515-501-00	RELAY	
		< SWITCH >	
S900	1-570-897-11	SWITCH, SLIDE (REMOTE)	(SPEAKERS)
		< TERMINAL >	
TM900	1-537-228-11	TERMINAL BOARD (SP)	(AE1)
TM900	1-537-227-11	TERMINAL BOARD (SP)	(SPEAKERS) (AE2)
		*****	
		MISCELLANEOUS	*****
△57	1-575-651-11	CORD, POWER	
S101	1-572-796-11	SWITCH, ROTARY SLIDE	(INPUT SELECTOR)
S102	1-572-795-11	SWITCH, ROTARY SLIDE	(REC OUT SELECTOR)
S900	1-572-794-11	SWITCH, ROTARY SLIDE	(SPEAKERS)
△T1	1-423-598-11	TRANSFORMER, POWER	
		*****	
		ACCESSORIES & PACKING MATERIALS	*****
	3-756-898-11	MANUAL, INSTRUCTION	(ENGLISH, FRENCH, SPANISH, PORTUGUESE, ITALIAN)
	3-756-898-41	MANUAL, INSTRUCTION	(GERMAN, DUTCH, SWEDISH, DANISH, FINNISH)
*	4-931-985-01	CUSHION	
*	4-958-308-01	INDIVIDUAL CARTON	
		*****	
		HARDWARE LIST	*****
#1	7-685-646-79	SCREW +BVTP 3X8	TYPE2 N-S
#2	7-682-547-09	SCREW +BVTT 3X6	(S)
#3	7-682-560-04	SCREW +BVTT 4X6	(S)
#4	7-685-648-79	SCREW +BVTP 3X12	TYPE2 IT-3
#5	7-621-849-00	SCREW (BV/RING)	

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

