

# TA-N80ES

## SERVICE MANUAL

*AEP Model  
E Model*



### SPECIFICATIONS

#### AUDIO POWER SPECIFICATIONS

##### POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 4 ohm loads, both channels driven, from 20 - 20,000 Hz; rated 270 watts per channel minimum RMS power, with no more than 0.006 % total harmonic distortion from 250 milliwatts to rated output.

With 8 ohm loads, both channels driven, from 20 - 20,000 Hz; rated 200 watts per channel minimum RMS power, with no more than 0.004 % total harmonic distortion from 250 milliwatts to rated output.

#### Other specifications

Item	Condition	Model except for North Europe	Model for North Europe
Continuous RMS power output (both channels driven simultaneously)	4 ohms 20 Hz - 20 kHz, THD 0.006 %	270 W + 270 W	—
	6 ohms 20 Hz - 20 kHz, THD 0.005 %	230 W + 230 W	190 W + 190 W
	8 ohms 20 Hz - 20 kHz, THD 0.004 %	200 W + 200 W	160 W + 160 W

Dynamic power	1 ohm	660 W	530 W
	2 ohms	800 W	640 W
	4 ohms	520 W	420 W
	6 ohms	370 W	300 W
	8 ohms	300 W	240 W
Power bandwidth (IHF)	4 ohms, 0.02 %	10 Hz - 100 kHz	—
	8 ohms, THD 0.02 %	10 Hz - 100kHz	
Dynamic headroom ('78 IHF)	4 ohms	2.8 dB	—
	8 ohms	1.8 dB	
Total harmonic distortion	4 ohms, at 10 watt output	0.004 %	—
	6 ohms, at 10 watt output	0.003 %	
	8 ohms, at 10 watt output	0.0018 %	

— Continued on page 2 —

STEREO POWER AMPLIFIER  
**SONY®**

Intermodulation (IM) distortion 60 Hz:7 kHz = 4:1	4 ohms, at rated output	0.006 %	—
	6 ohms, at rated output	0.005 %	
	8 ohms at rated output	0.004 %	
Damping factor	8 ohms, 1 kHz	100	
Slew rate	—	150 V/μsec 300 V/μsec (inside)	
Residual noise	network A	less than 35 μV	
Frequency response	—	1 Hz - 200 kHz $\pm 3$ dB	
Input sensitivity	—	UNBALANCED: 1 V, 30 kohms	
		BALANCED: 0.5 V, 600 ohms	
S/N (network) '78 IHF	FIXED VARIABLE	120 dB (A)	

**General**

**System** Super legato linear, purecomplementary SEPP power amplifier, powerful power supply

**Power requirements**  
Model for U.S.A. and Canada: 120 V AC, 60 Hz  
Model for other countries: 120, 220 or 240V AC adjustable, 50/60 Hz

**Power consumption**  
Model for U.S.A.: 380 watts  
Model for Canada: 950 VA  
Model for North European countries: 310 W  
Models for European countries and other countries: 510 W

**Dimensions** Approx. 470 x 185 x 440 mm (w/h/d) (18 <sup>5</sup>/<sub>8</sub> x 7 <sup>3</sup>/<sub>8</sub> x 17 <sup>3</sup>/<sub>8</sub> inches) including projecting parts and controls

**Weight** Model for European countries: Approx. 24 kg (52 lb 15 oz), net  
other models: Approx. 26.3 kg (58 lb)

**Supplied accessories**  
Power control cord (1)

Design and specifications subject to change without notice.

**SAFETY-RELATED COMPONENT WARNING!!**

COMPONENTS IDENTIFIED BY MARK  $\Delta$  OR DOTTED LINE WITH MARK  $\Delta$  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.

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**SECTION 1  
GENERAL**

English

**Precautions**

This section is extracted from instruction manual.

- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the plug out by the cord.
- Avoid installing or leaving the unit in a location:
  - near heat sources such as radiators, airducts or heaters
  - subject to direct sunlight
  - exposed to rain or moisture
  - where it is liable to come into contact with dust or dirt
  - that is unventilated, such as on a bookcase.
- Should any liquid or solid object fall into the unit, unplug the unit and have the unit checked by qualified personnel before operating it any further.
- AC power cord must be changed only at the qualified service shop.

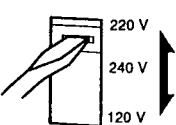
If you have any question or problem concerning your unit that is not covered in this manual, please consult your nearest Sony dealer.

**For the customers in the U.S.A.**

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

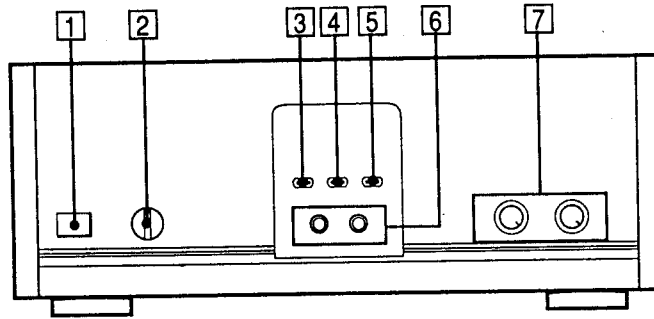
**Operating Voltage**

Before connecting the unit to an AC outlet, be sure that the operating voltage of your unit is identical with that of your local power supply.

U.S.A. and Canada	Operates on 120 V AC, 60 Hz.
European countries	Operates on 220 V AC, 50/60 Hz.
Other countries  	Operates on either 120 V, 220 V or 240 V AC, 50/60 Hz. The voltage selector is located on the rear panel. If the selector must be reset, disconnect the AC power cord and set the selector to the proper voltage of your local power supply.

## Function of Controls

## Fonction des commandes



**1 POWER switch**

**2 SPEAKERS selector**

Selects speaker system A, B or both (A+B). For headphone monitoring on the connected control amplifier, set the selector to OFF.

**3 PROTECTION indicator**

Lights up for approximately 7 seconds immediately after turning on the unit. This indicates that the built-in muting circuit is activated.

In normal operating conditions, this does not light. If it lights up (speaker sound is not heard) while operating, an abnormality has occurred. In this case, disconnect the AC power cord and check the connected components and speaker systems.

**4 STEREO indicator**

Lights up when OPERATION (STEREO/MONO) is set to STEREO.

**5 MONO indicator**

Lights up when OPERATION (STEREO/MONO) is set to MONO.

**6 INPUT selectors**

Select input source connected to the input jacks on the rear panel; FIXED or VARIABLE.

**7 RIGHT and LEFT (MONO) INPUT LEVEL controls**

Control input signal sound level from the control amplifier connected to the VARIABLE input jacks. Before turning ON the power, set these INPUT LEVEL controls to the "-20 dB" position.

**1 Interrupteur d'alimentation (POWER)**

**2 Sélecteur d'enceinte (SPEAKERS)**

Sélectionne le système d'enceintes A, B ou les deux (A+B). Pour écouter au casque sur l'amplificateur de contrôle raccordé, régler le sélecteur sur OFF.

**3 Témoin de protection (PROTECTION)**

S'allume pendant environ 7 secondes immédiatement après la mise sous tension de l'appareil. Ceci signifie que le circuit d'assourdissement incorporé est activé. En mode de fonctionnement normal, ce témoin ne s'allume pas.

S'il s'allume (le son de l'enceinte n'est plus perçu) pendant le fonctionnement, quelque chose d'anormal est arrivé. Dans ce cas, déconnecter le cordon d'alimentation secteur et les systèmes d'enceintes.

**4 Témoin de stéréo (STEREO)**

S'allume lorsque OPERATION (STEREO/MONO) est réglé sur STEREO.

**5 Témoin de monophonie (MONO)**

S'allume lorsque OPERATION (STEREO/MONO) est réglé sur MONO.

**6 Sélecteurs d'entrée (INPUT)**

Sélectionne la source d'entrée raccordée aux prises d'entrée sur le panneau arrière; FIXED ou VARIABLE.

**7 Réglage gauche et droit (RIGHT et LEFT (MONO) INPUT LEVEL)**

Règlent le niveau sonore du signal d'entrée depuis l'amplificateur de contrôle raccordé aux prises d'entrée VARIABLE. Avant de mettre l'appareil sous tension, régler ces commandes INPUT LEVEL sur la position "-20 dB".

## System Connections

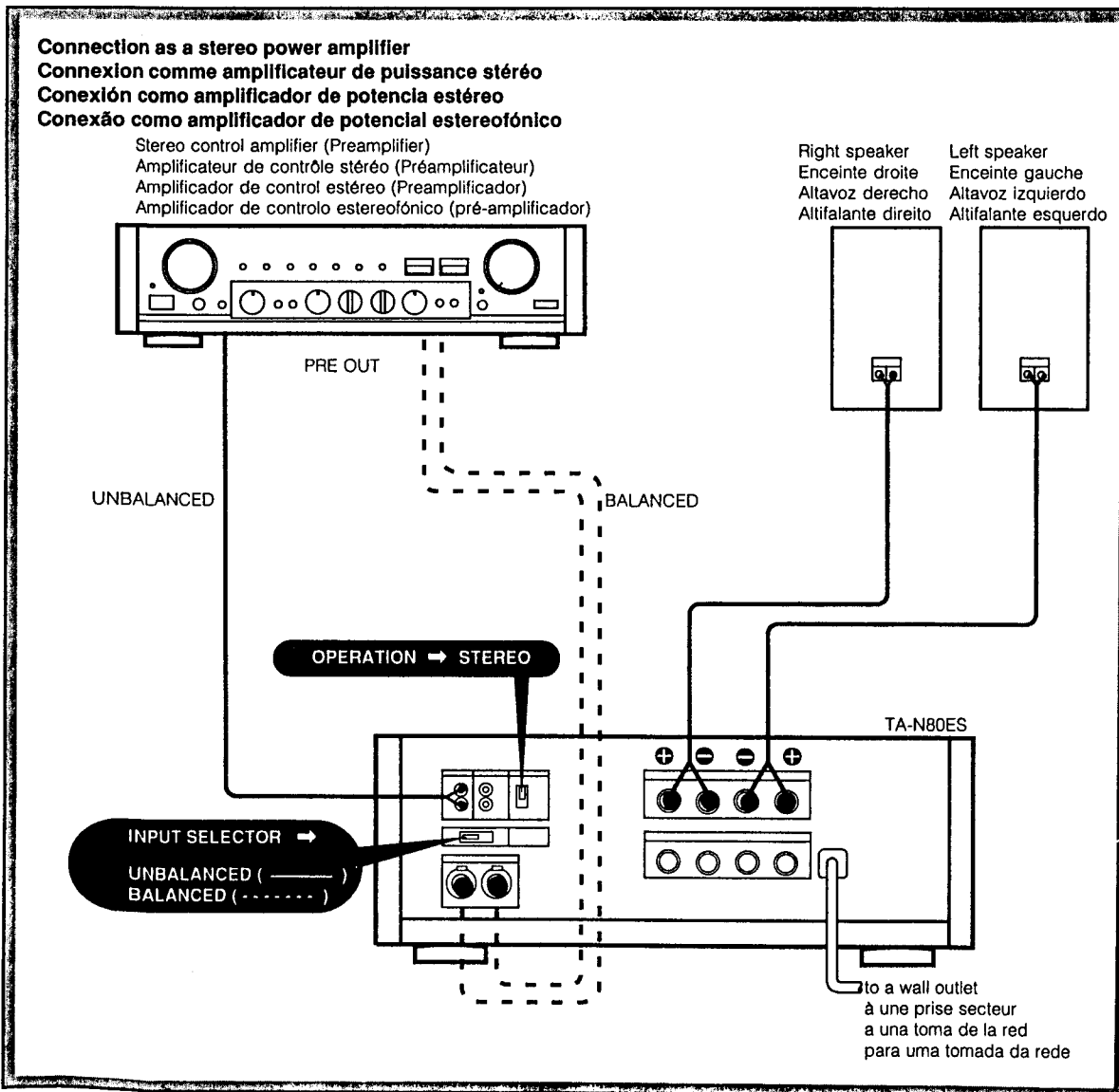
## Connexions du système

### Connection Notes

- The power cord should be connected last of all, first making sure that the POWER switch is turned off.
- Cable connectors should be fully inserted into the jacks.
- A loose connection may cause hum and noise.
- Cord plugs and jacks are color coded. Red plugs and jacks are for the right channel (R) and white ones are for the left channel (L).

### Remarques sur les connexions

- Le cordon d'alimentation doit être raccordé en dernier, en s'assurant au préalable que l'interrupteur POWER est sur OFF.
- Les câbles de connexions doivent être entièrement insérés dans les prises, une connexion relâchée pouvant être la cause de bruit et de ronflement.
- Les fiches et prises des cordons sont codés avec une couleur. Les fiches et prises rouges sont destinées au canal droit et les blanches au canal gauche.



## Conexiones del sistema

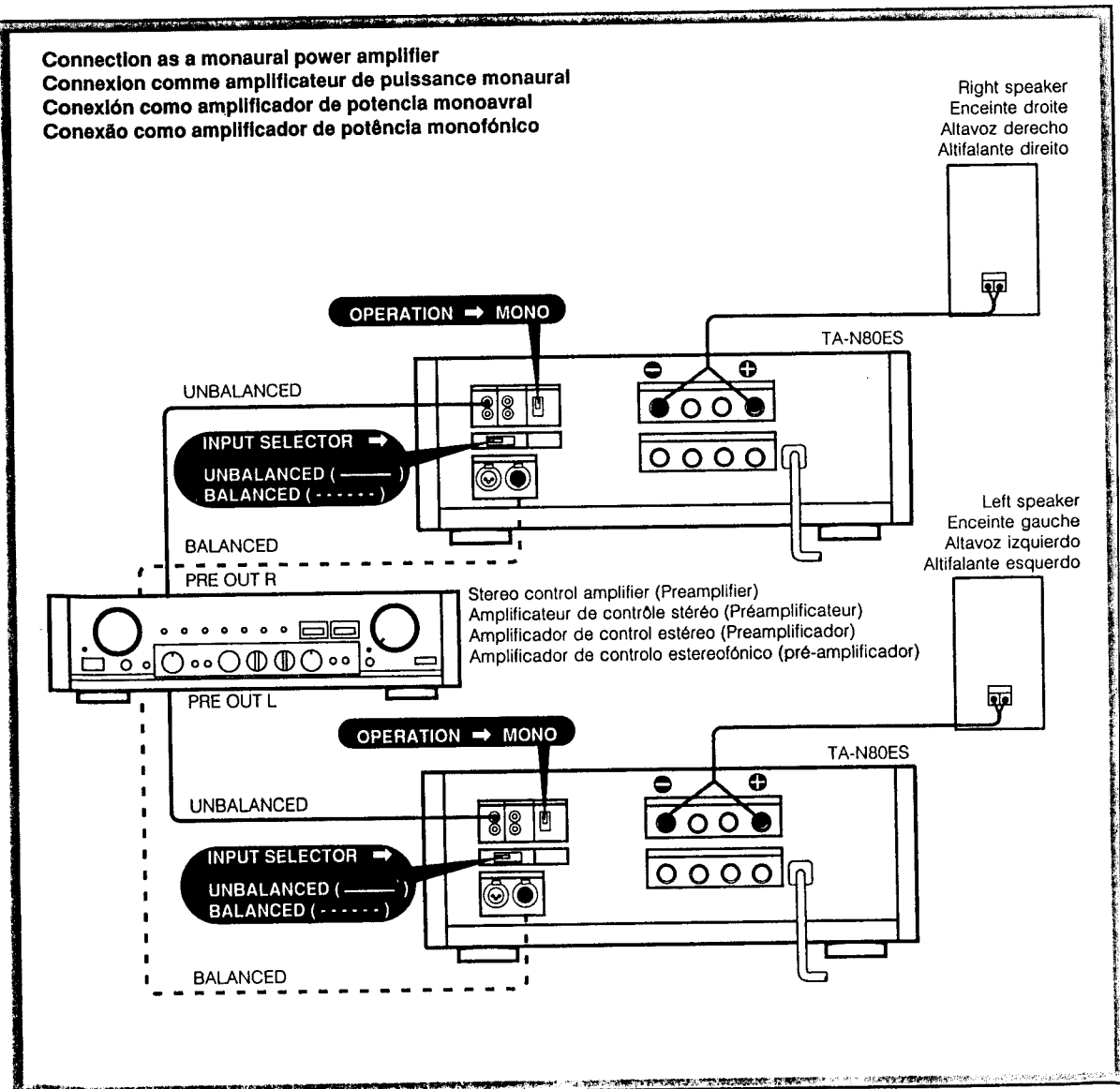
### Notas sobre las conexiones

- El cable de alimentación debe conectarse al final de todo, primero asegurándose de que el interruptor POWER esté en OFF.
- Las clavijas de cables deberán insertarse firmemente en las tomas. Una conexión floja puede causar zumbido y ruido.
- Las clavijas y tomas de los cables están codificadas en color. Las clavijas y las tomas rojas son para el canal derecho y las blancas para el izquierdo.

## Ligação do sistema

### Notas sobre as ligações

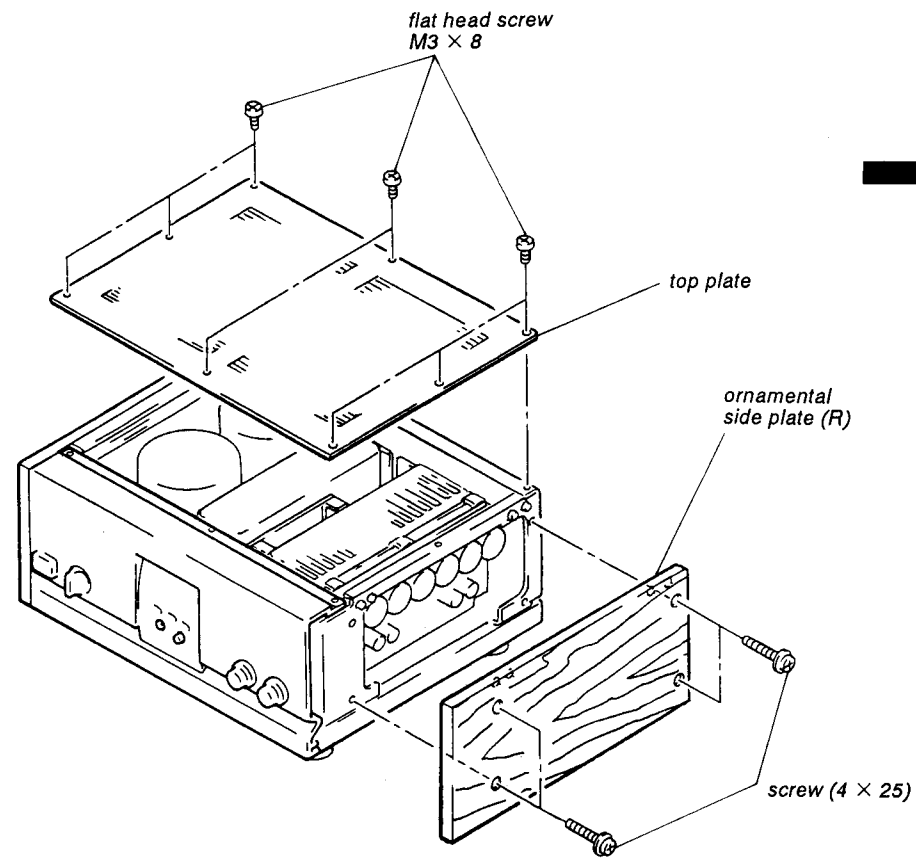
- O cabo de alimentação deve ser ligado por último. Primeiramente, assegure-se de que o interruptor de alimentação (POWER) está desligado.
- As fichas dos cabos devem estar firmemente inseridas nas suas respectivas tomadas. Ligações frouxas podem causar zumbidos e ruídos.
- As fichas estão codificadas por cores. As fichas e as tomadas vermelhas são para o canal da direita (R), e as brancas para o canal da esquerda (L).



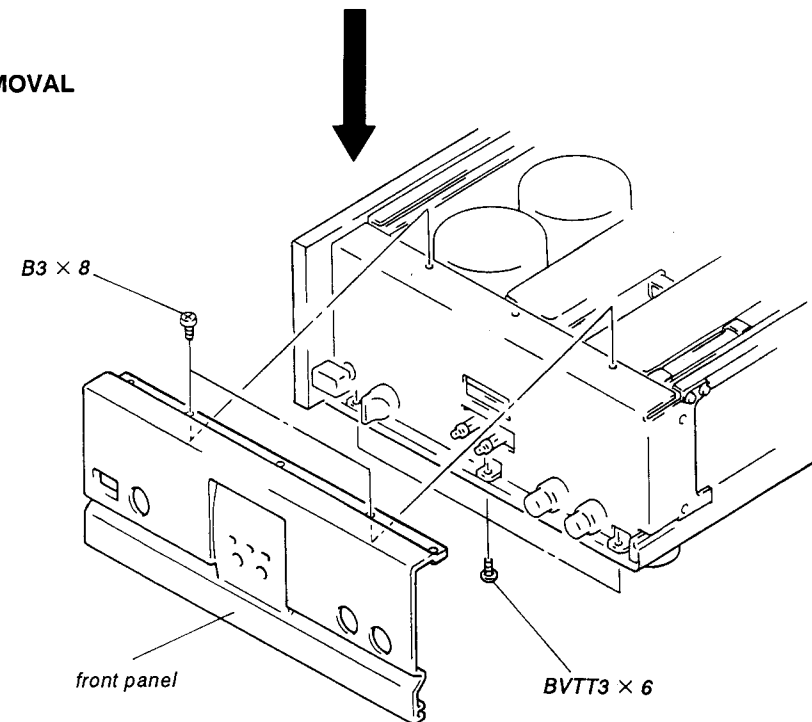
## SECTION 2 DISASSEMBLY

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

### TOP PLATE AND ORNAMENTAL SIDE PLATE (R) REMOVAL

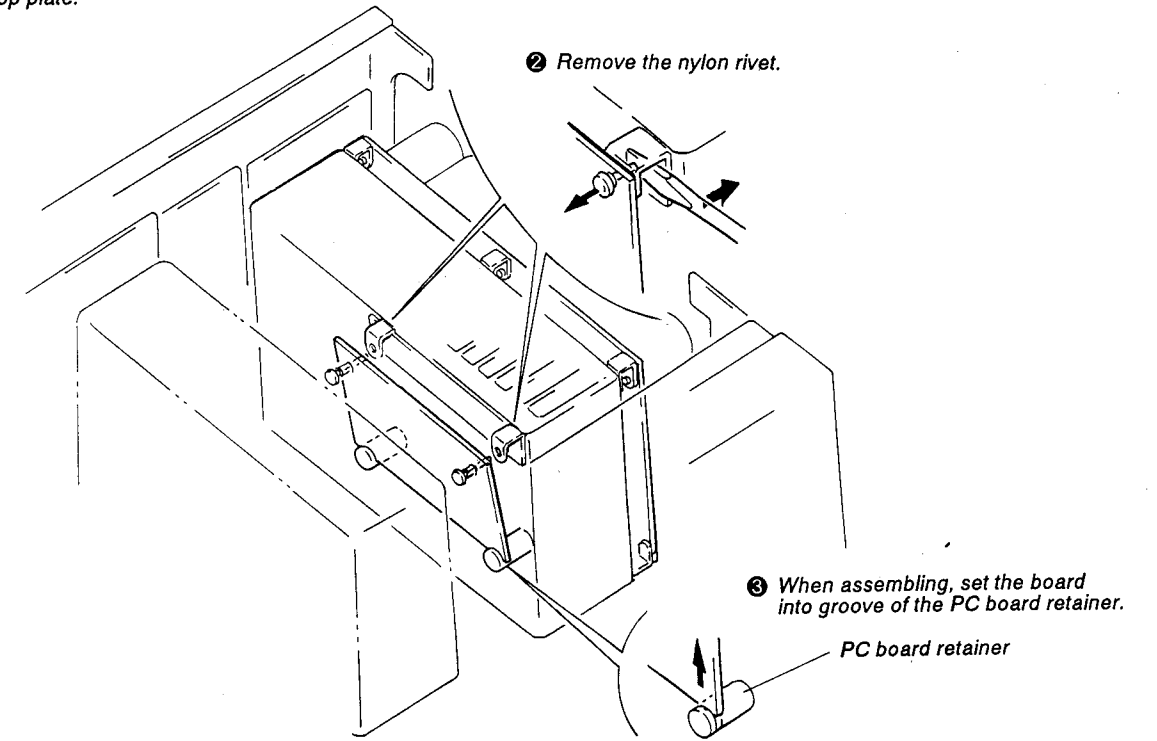


### FRONT PANEL REMOVAL



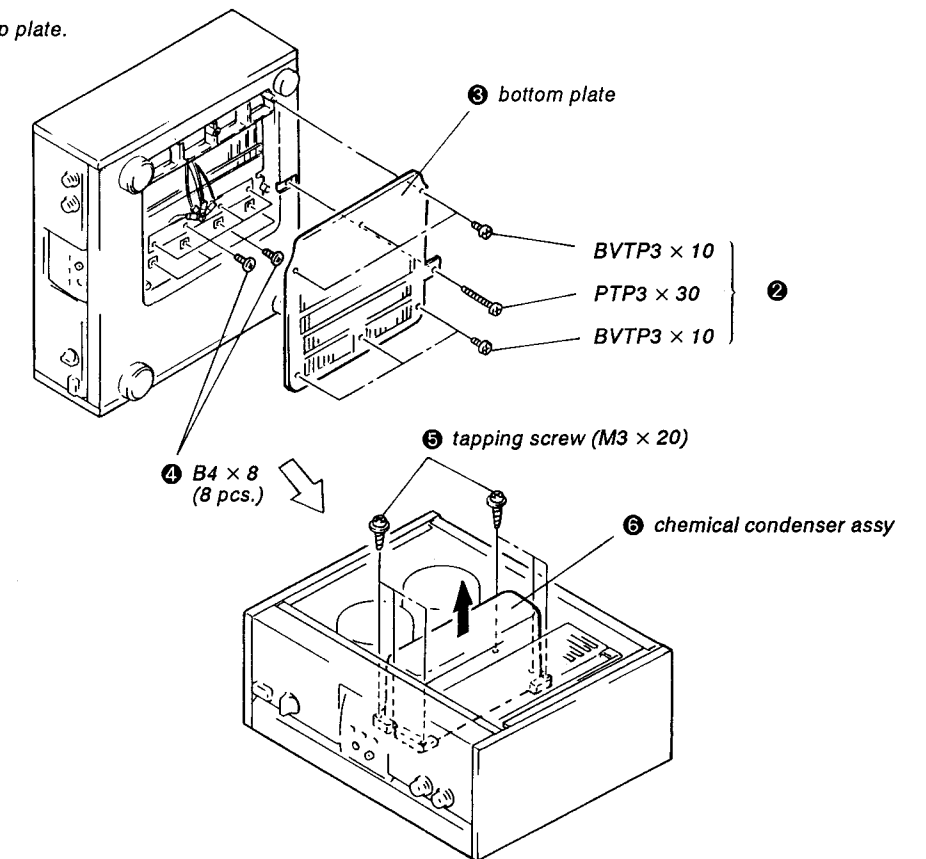
### PROTECTOR BOARD REMOVAL

1 Remove the top plate.



### CHEMICAL CONDENSER ASSY REMOVAL

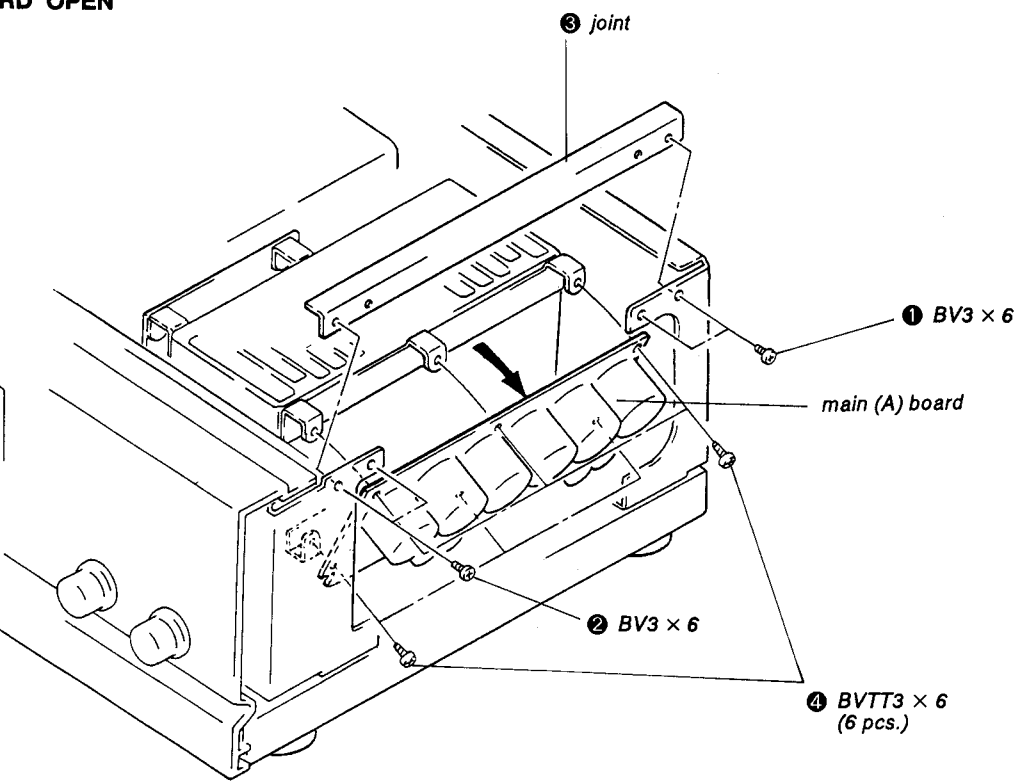
1 Remove the top plate.



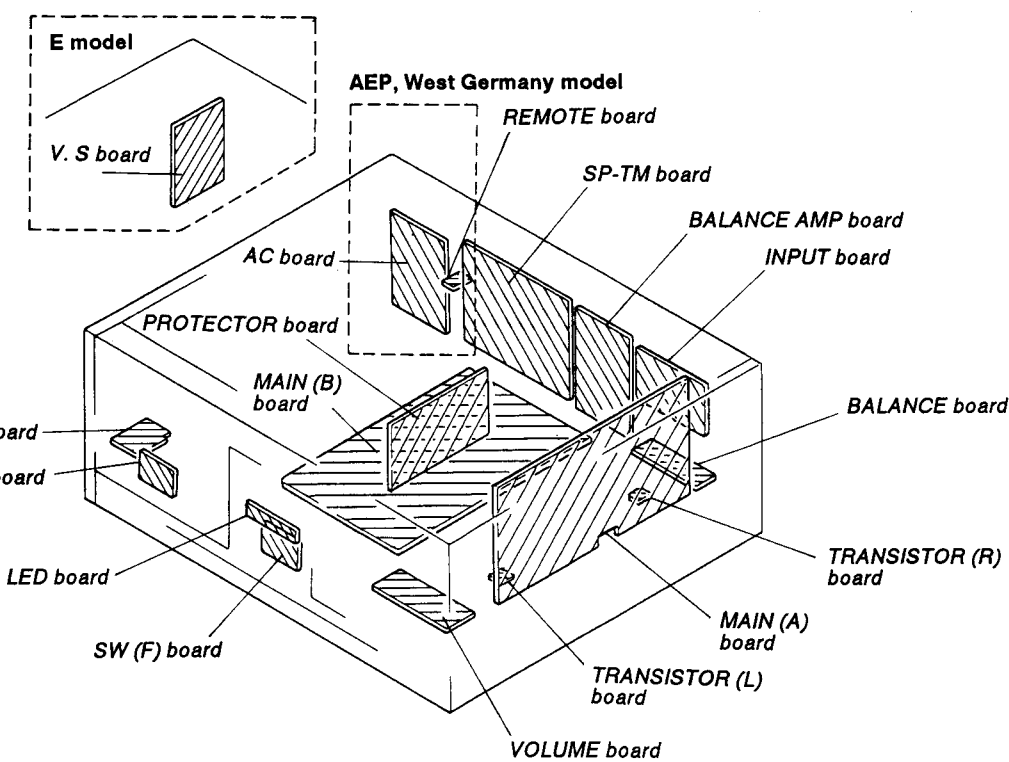
## SECTION 3 ELECTRICAL ADJUSTMENTS

## SECTION 4 DIAGRAMS

RD OPEN



RD'S LOCATION



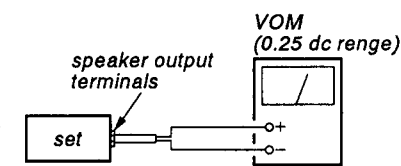
**Note:** Adjustment should be performed 5 minutes 5 minutes later, after the power switch is on.

### Offset Adjustment

**Setting:**

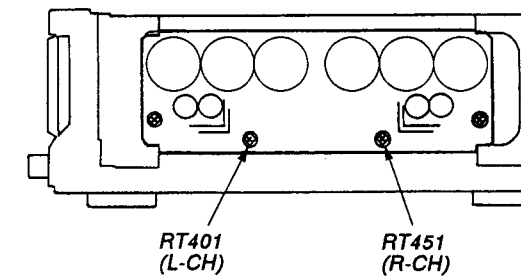
OPERATION switch: STEREO  
Input signal: No signal input

**Procedure:**



Adjust RT401 (L-CH) and RT-451 (R-CH) for 0 V reading on the VOM.

Adjustment Location: main (A) board



### Bias Current Adjustment

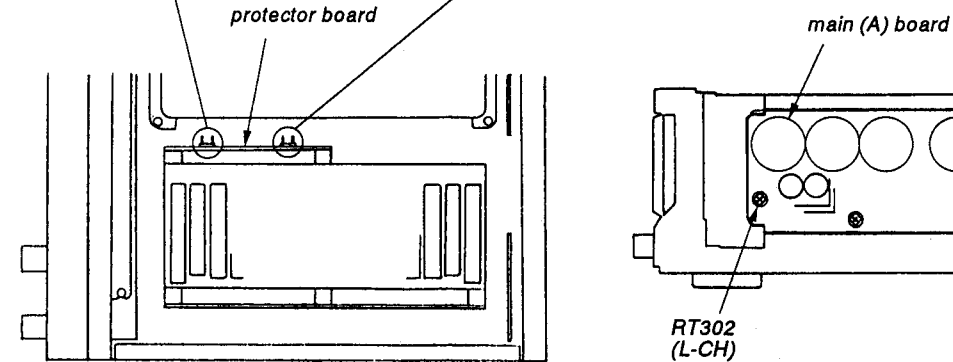
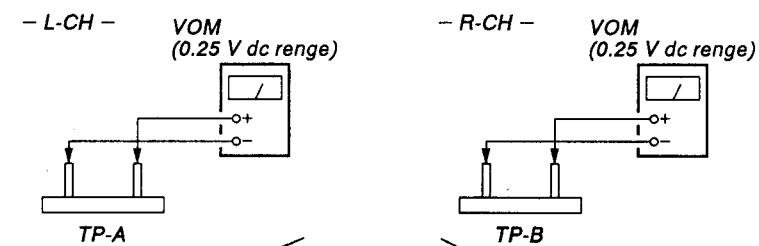
**Setting:**

OPERATION switch: STEREO  
Input signal: No signal input

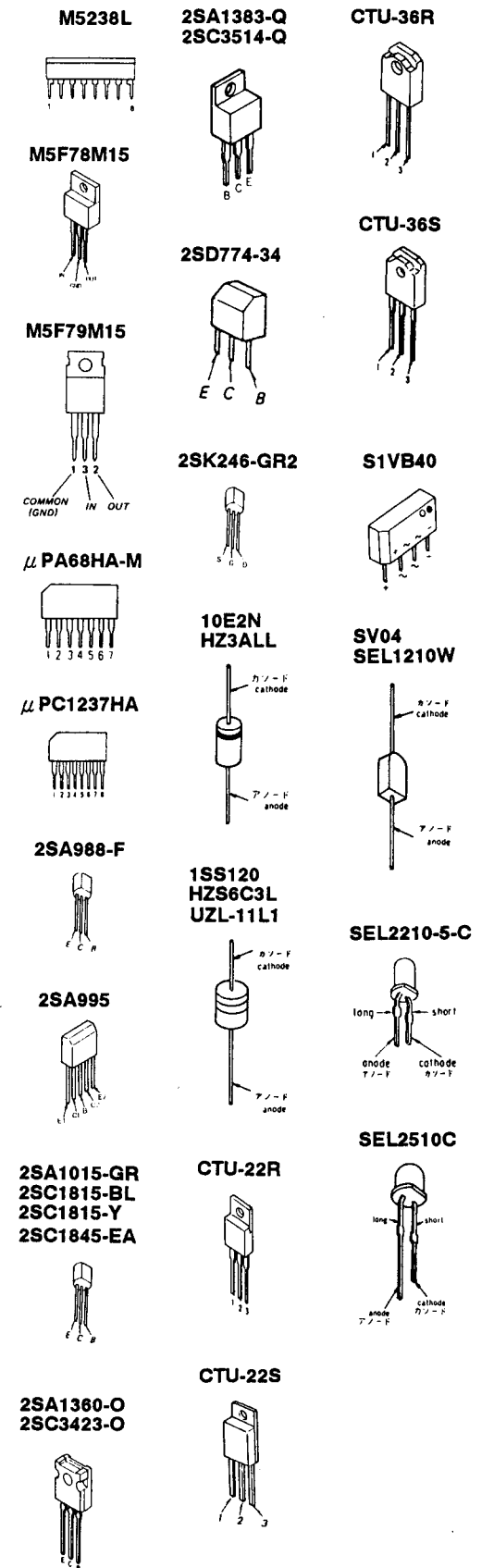
**Procedure:**

Adjust RT302 (L-CH) and RT352 (R-CH) so that VOM readings of TP-A (L-CH), TP-B (R-CH) become 15 mV.

Adjustment Location: main (A) board and protector board



### 4-1. SEMICONDUCTOR LEAD LAYOUTS





4-2. PRINTED WIRING BOARDS

• See page 11 for Semiconductor Lead Layouts.

• See page 9 for Circuit Boards Location.

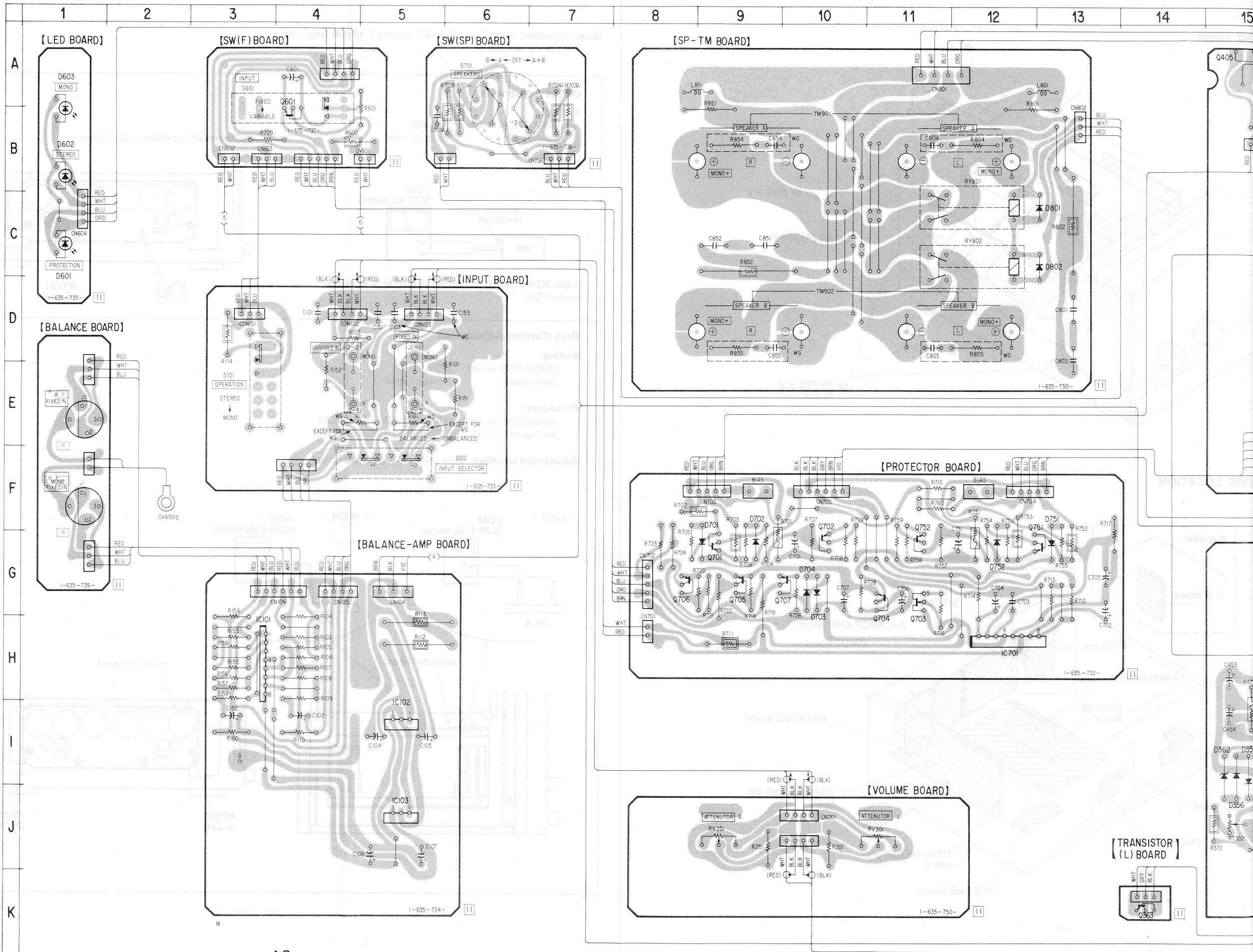
Note on Printed Wiring Board:

Note:

- : parts extracted from the component side.
- : Pattern on the side which is seen.
- WG : West Germany

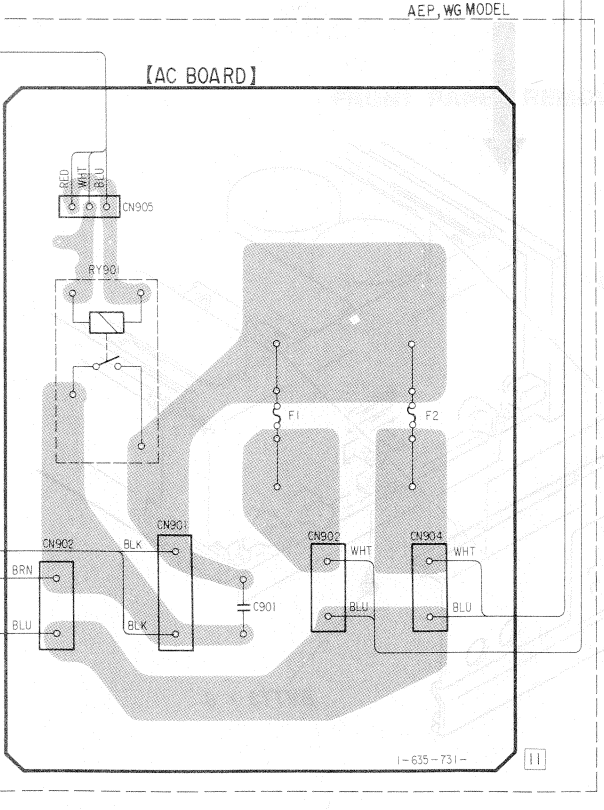
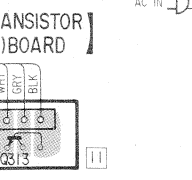
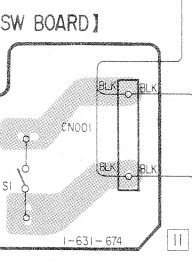
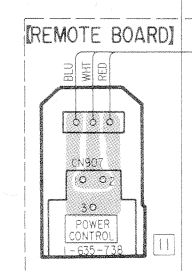
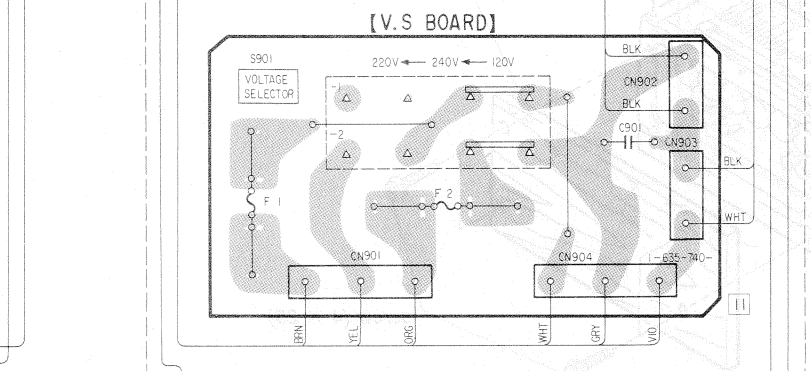
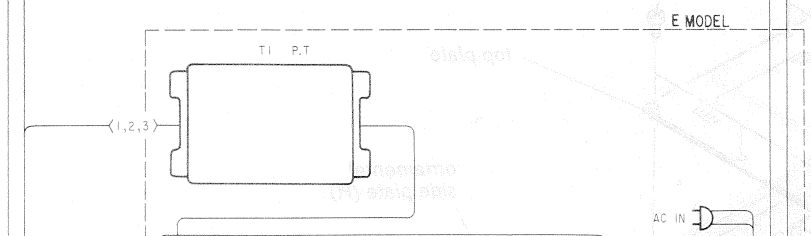
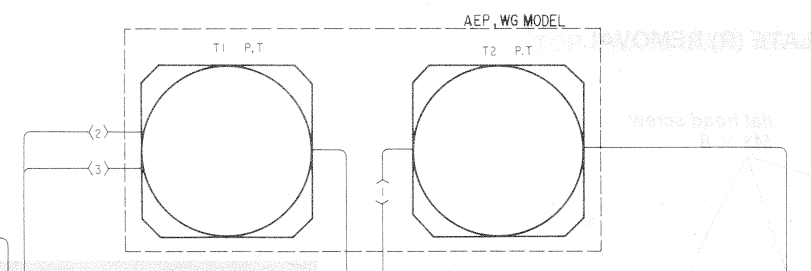
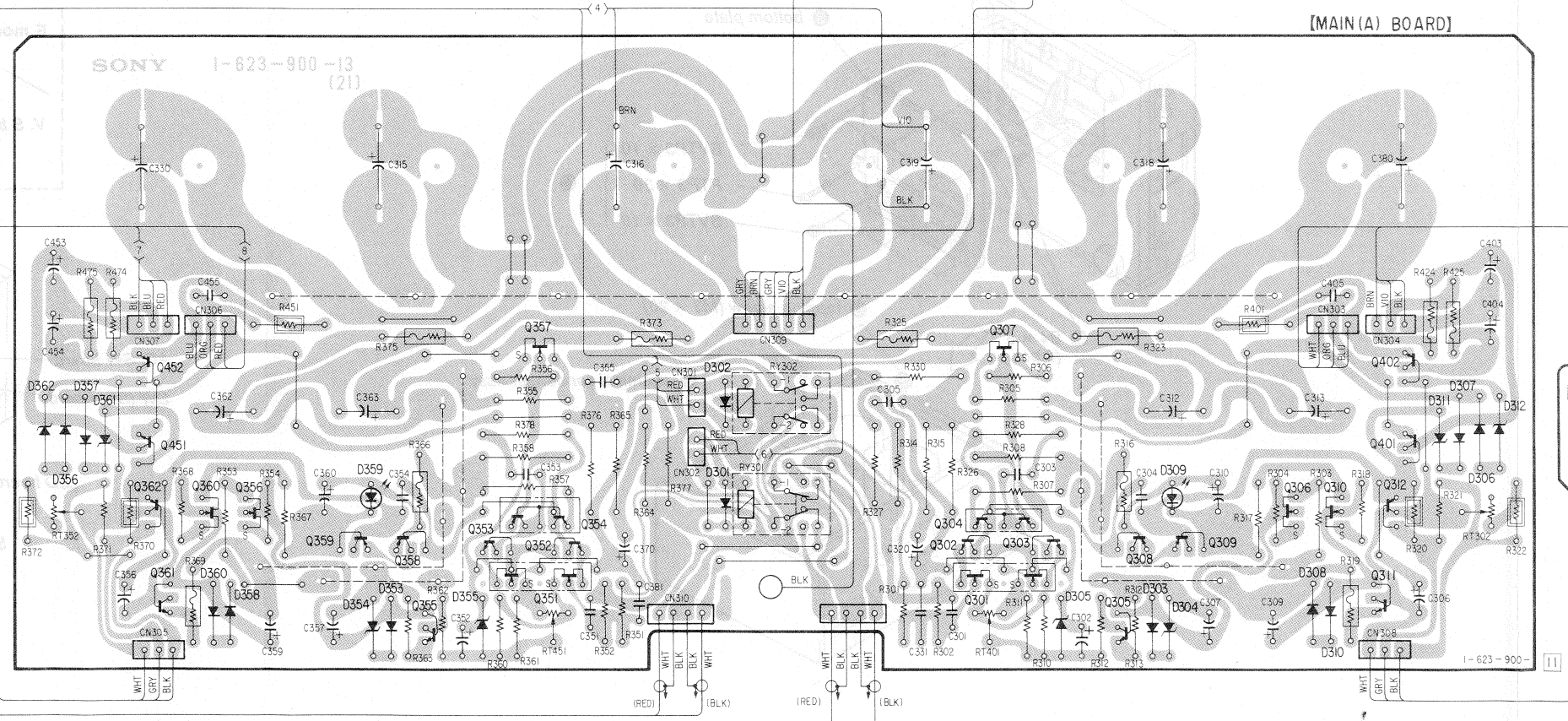
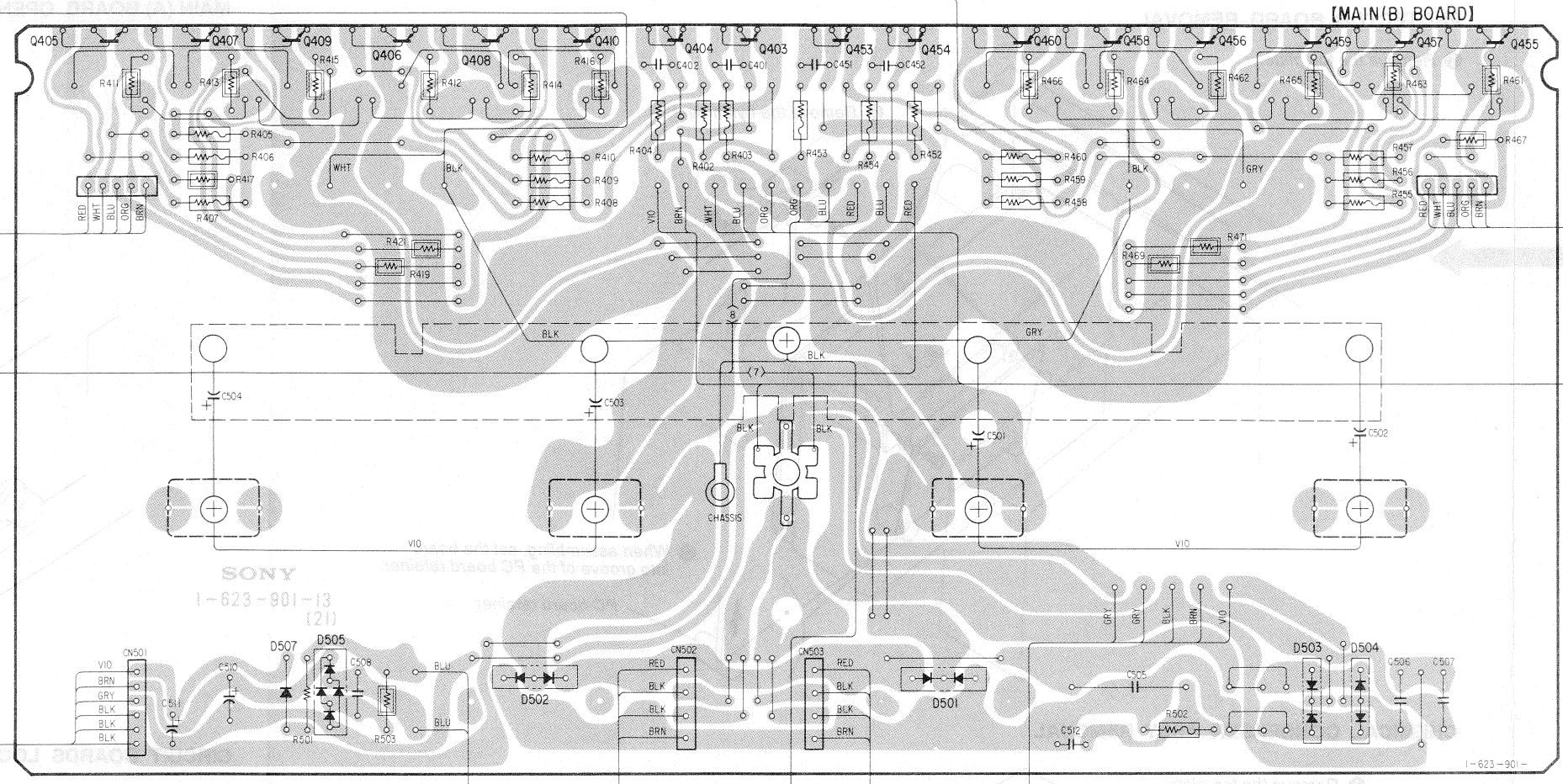
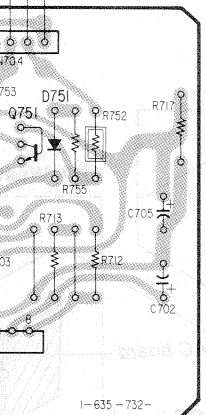
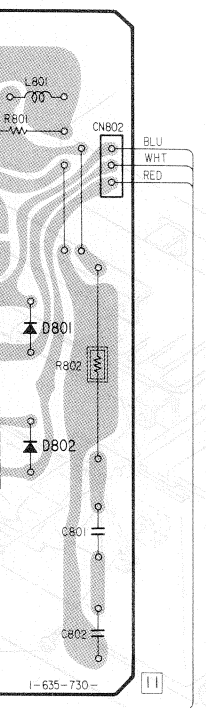
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D301	J-19	Q306	J-23
D302	I-19	Q307	I-21
D303	K-22	Q308	J-22
D304	K-23	Q309	J-23
D305	K-22	Q310	J-24
D306	I-25	Q311	K-24
D307	I-25	Q312	J-24
D308	K-24	Q313	K-26
D309	J-23	Q351	J-18
D310	K-24	Q352	J-18
D311	I-24	Q353	J-18
D312	I-25	Q354	J-18
D353	K-17	Q355	K-17
D354	K-17	Q356	J-16
D355	K-18	Q357	I-18
D356	I-15	Q358	J-17
D357	I-15	Q359	J-17
D358	K-16	Q360	J-16
D359	J-17	Q361	K-15
D360	K-16	Q362	J-15
D361	I-15	Q363	K-14
D362	I-15	Q401	J-24
D501	E-21	Q402	I-24
D502	E-18	Q403	A-20
D503	F-24	Q404	A-19
D504	F-24	Q405	A-15
D505	E-17	Q406	A-17
D507	E-16	Q407	A-16
D601	C-1	Q408	A-18
D602	B-1	Q409	A-16
D603	A-1	Q410	A-18
D701	G-9	Q451	J-15
D702	G-9	Q452	I-15
D703	G-10	Q453	A-20
D704	G-10	Q454	A-21
D751	G-13	Q455	A-25
D752	G-12	Q456	A-23
D801	C-13	Q457	A-24
D802	C-13	Q458	A-22
		Q459	A-24
IC101	H-3	Q460	A-22
IC102	I-5	Q601	B-4
IC103	J-5	Q701	G-9
IC152	J-5	Q702	G-10
IC701	H-12	Q703	G-11
		Q704	G-11
Q301	J-21	Q705	G-9
Q302	J-21	Q706	G-8
Q303	J-22	Q707	G-9
Q304	J-21	Q751	G-12
Q305	K-22	Q752	G-11

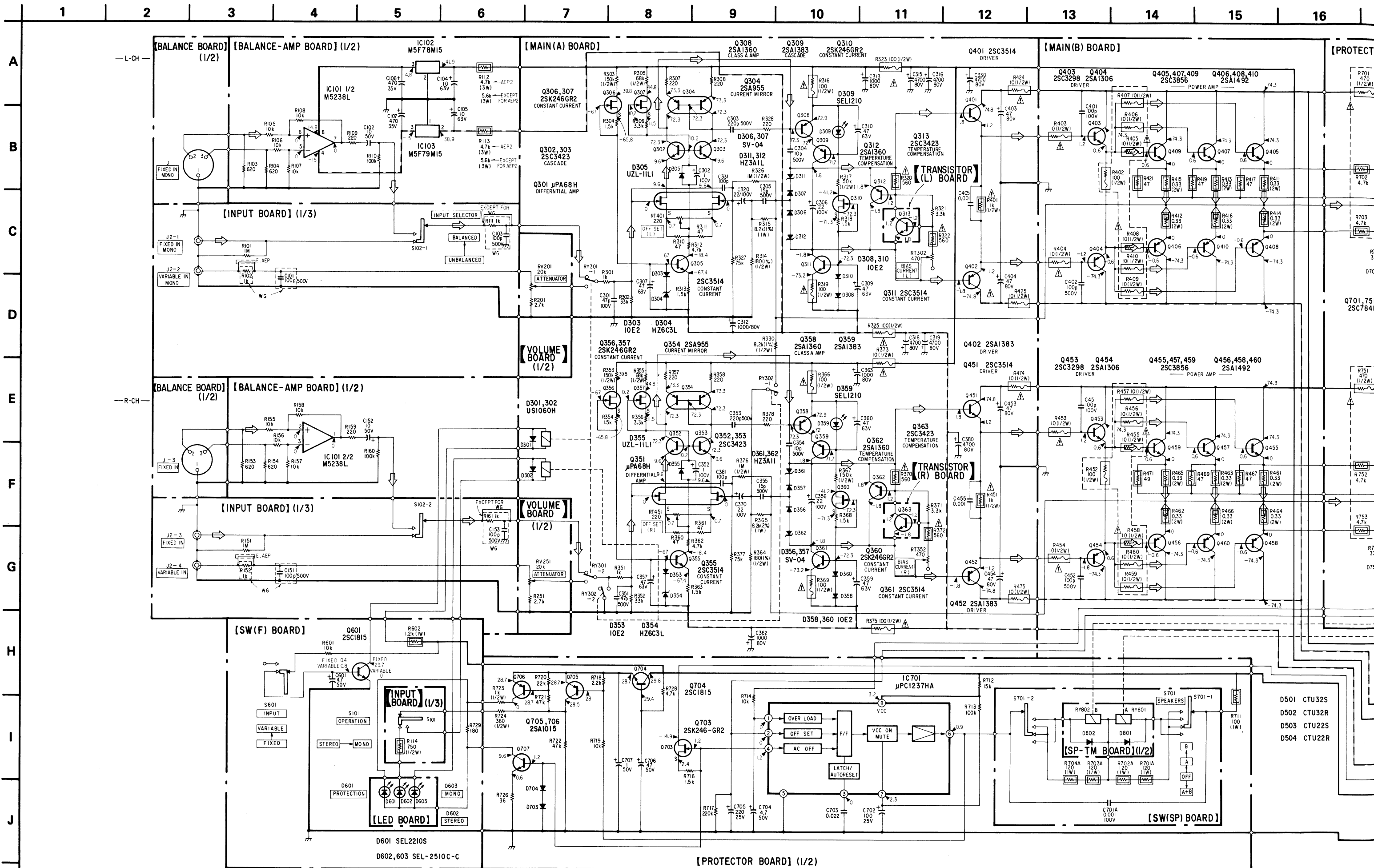


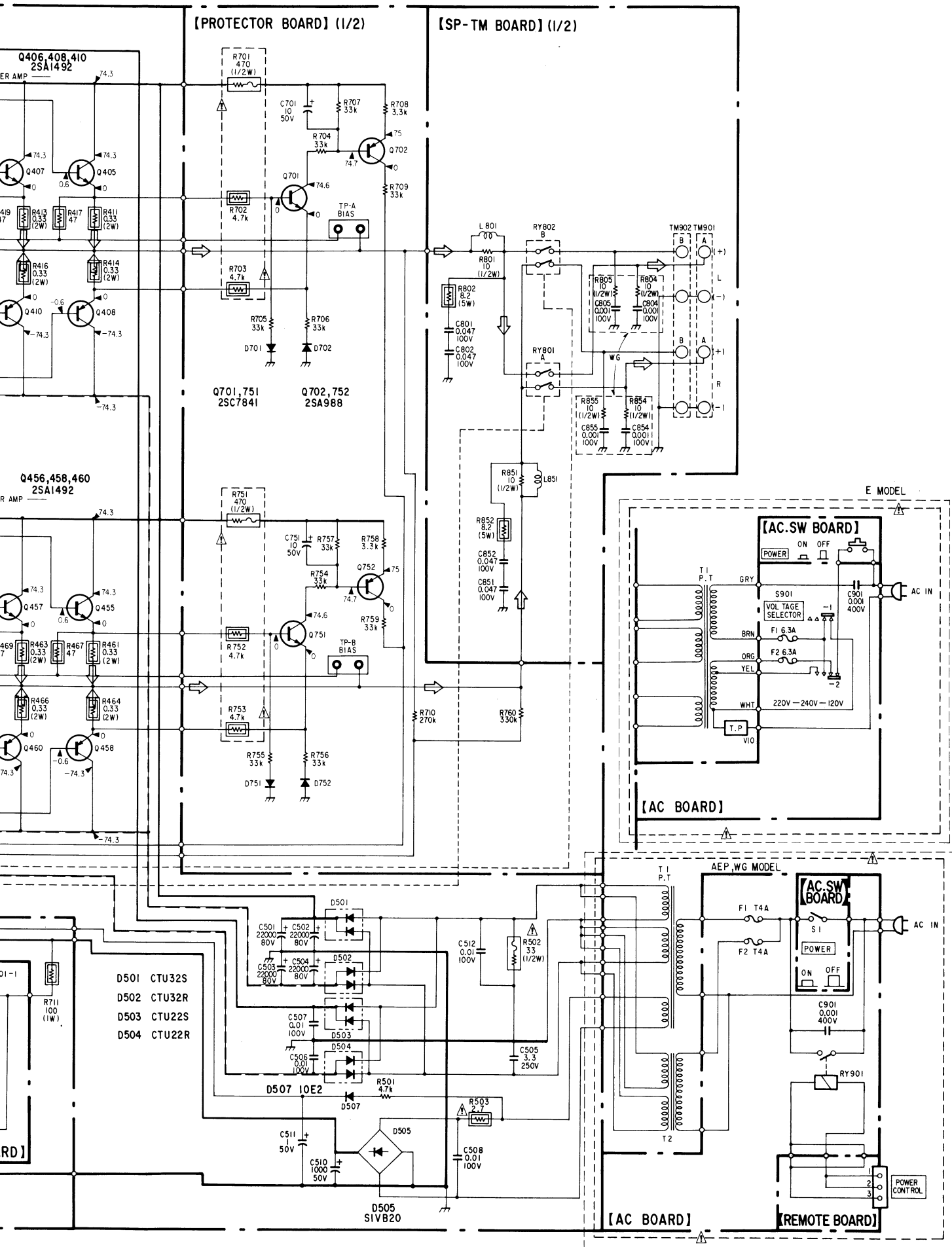


13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



4-3. SCHEMATIC DIAGRAM





**Note on Schematic Diagram:**

- Note:**
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{pF}$
  - 50 WV 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.
  - % : indicates tolerance.
  - : nonflammable resistor.
  - : fusible resistor.

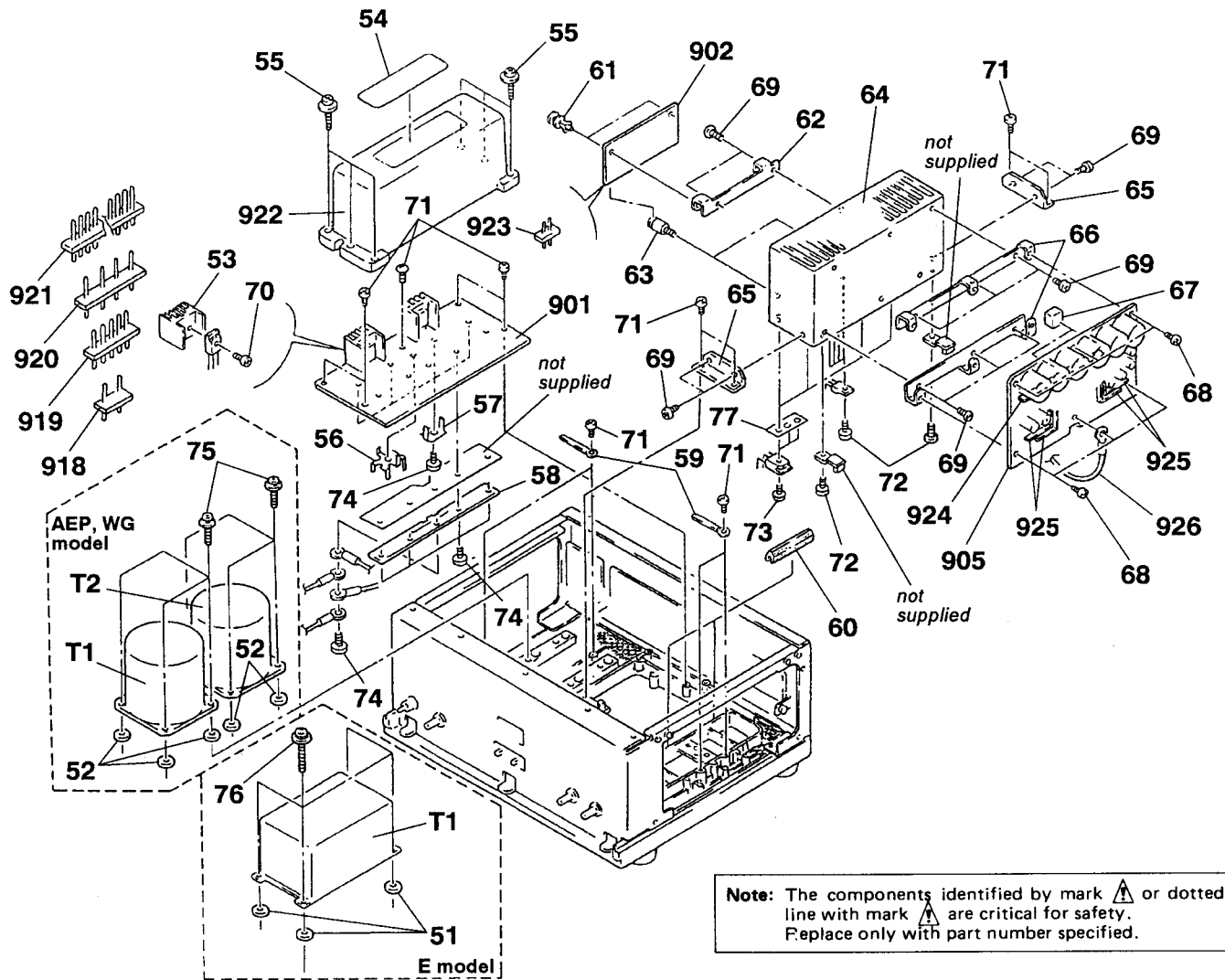
**Note:** The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

- : B + Line.
- : B - Line.
- : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (10 M $\Omega/V$ ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- : Signal path
- WG : West Germany



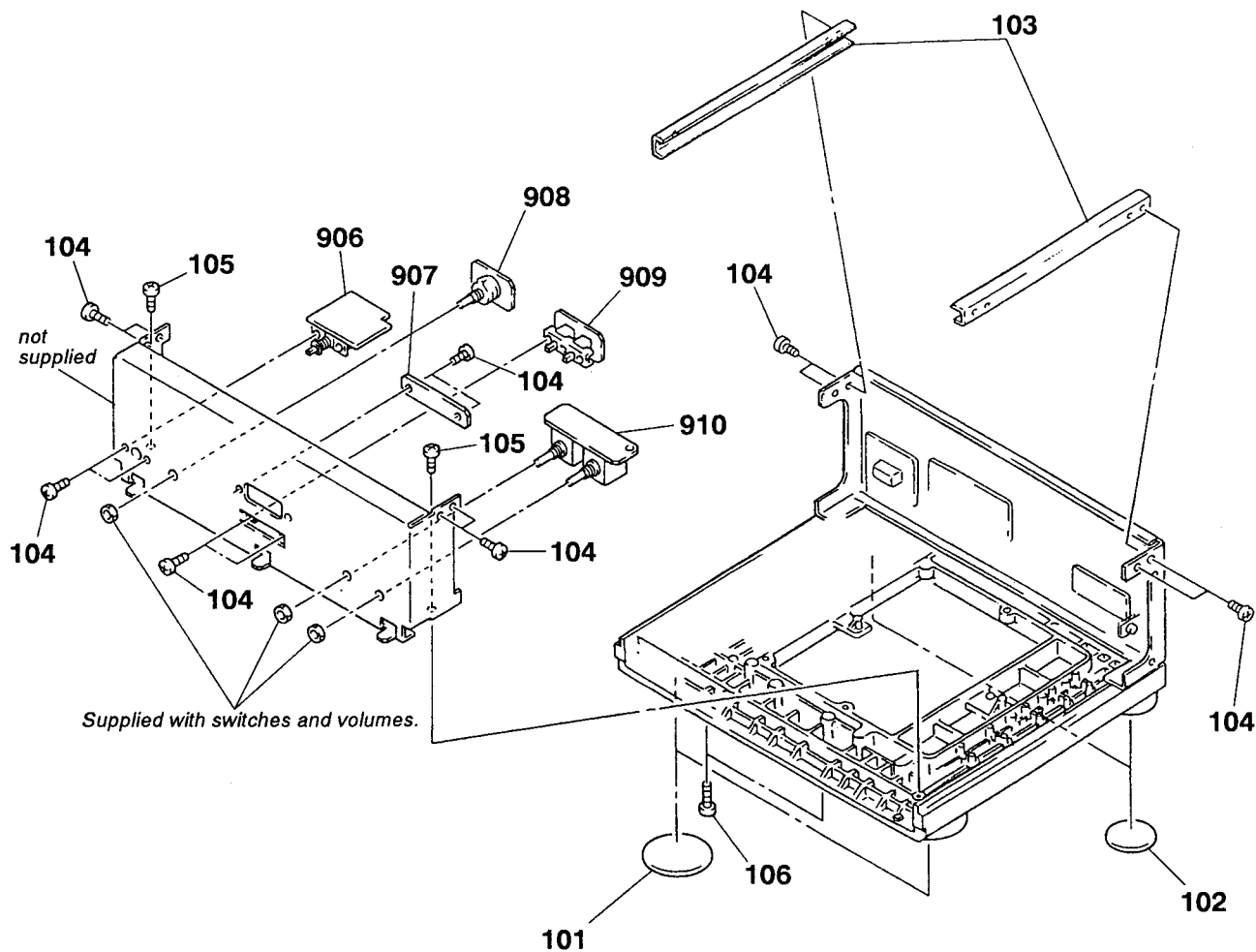


(2) MAIN CHASSIS SECTION



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	4-931-976-01	(E)...WASHER (BS)		76	7-682-669-09	(E)...SCREW +PSW 4X35	
52	4-916-751-01	(AEP)...WASHER		77	4-921-419-01	SHEET, INSULATING	
53	*4-921-402-01	HEAT SINK		901	*A-4341-090-A	(AEP1,E)...MOUNTED PCB, MAIN (B)	
54	*4-941-346-01	LABEL, CAPACITOR			*A-4341-101-A	(AEP2)...MOUNTED PCB, MAIN (B)	
55	4-921-437-01	SCREW (M3X20), TAPPING			*A-4341-108-A	(WG)...MOUNTED PCB, MAIN (B)	
56	*4-916-769-01	PLATE, GROUND, 4P		902	*A-4341-098-A	MOUNTED PCB, PROTECTOR	
57	*4-835-639-00	PLATE, GROUND		905	*A-4341-089-A	(AEP,E)...MOUNTED PCB, MAIN (A)	
58	*4-921-422-01	BAR, BUS			*A-4341-103-A	(WG)...MOUNTED PCB, MAIN (A)	
59	*4-908-882-01	CLAMP		918	1-535-135-11	BASE POST 14MM (10MM PITCH) 2P	
60	*4-921-413-01	RUBBER, DAMPING		919	*1-508-812-00	BASE POST (14MM) 5P	
61	4-812-134-00	RIVET NYLON, 3.5		920	*1-535-137-00	BASE POST 14MM (10MM PITCH)	
62	*4-921-424-21	BRACKET, PC BOARD		921	*1-508-817-00	14MM BASE POST	
63	*4-921-417-01	RETAINER, PC BOARD		922	⚠A-4323-662-A	CHEMICAL CONDENSER ASSY	
64	*4-921-430-01	HEAT SINK		923	*1-508-809-00	BASE POST (14MM) 2P	
65	*4-921-418-01	BRACKET, HEAT SINK		924	*3-311-617-01	REINFORCEMENT, PCB	
66	*4-921-424-01	BRACKET, PC BOARD		925	*1-560-242-21	BUS BAR 4P	
67	4-921-410-51	CUSHION		926	1-559-512-11	(AEP,WG)...CORD (WITH CONNECTOR)	
68	7-682-547-09	SCREW +BVTT 3X6 (S)		T1	⚠.1-450-177-11	(E).....TRANSFORMER, POWER	
69	7-685-645-79	SCREW +BVTP 3X6 TYPE2 SLIT		T1	⚠.1-450-179-11	(AEP1,WG)...TRANSFORMER, POWER	
70	7-682-549-09	SCREW +B 3X10		T1	⚠.1-450-181-11	(AEP2).....TRANSFORMER, POWER	
71	7-685-647-79	SCREW +BVTP 3X10 TYPE2 SLIT		T2	⚠.1-450-178-11	(AEP1,WG)...TRANSFORMER, POWER	
72	7-682-649-09	SCREW +PSW 3X10		T2	⚠.1-450-180-11	(AEP2).....TRANSFORMER, POWER	
73	7-682-650-09	SCREW +PSW 3X12					
74	7-682-561-10	SCREW +B 4X8					
75	4-847-802-01	(WG)...SCREW					
	7-682-962-01	(AEP)...SCREW +PSW 4X10					

(3) FRONT CHASSIS SECTION



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
101	4-916-704-11	FOOT		906	*1-636-674-11	PC BOARD, AC.SW	
102	4-916-704-01	FOOT		907	*1-635-735-11	PC BOARD, LED	
103	*4-921-421-01	JOINT		908	*1-635-736-11	PC BOARD, SW (SP)	
104	7-682-547-09	SCREW +BVTT 3X6 (S)		909	*1-635-737-11	PC BOARD, SW (F)	
105	7-685-647-79	SCREW +BVTP 3X10 TYPE2 SLIT		910	*1-635-750-11	PC BOARD, VOLUME	
106	7-685-650-79	SCREW +BVTP 3X16 TYPE2 SLIT					





## SECTION 6 ELECTRICAL PARTS LIST

**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.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

**CAPACITORS:**

MF:  $\mu$ F, PF:  $\mu$ MF.

**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

**COILS**

• MMH: mH, UH:  $\mu$ H

**SEMICONDUCTORS**

In each case, U:  $\mu$ , for example:

UA....:  $\mu$ A...., UPA....:  $\mu$ PA....,  
UPC....:  $\mu$ PC, UPD....:  $\mu$ PD....

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

- WG: West Germany

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description			
901	*A-4341-090-A	(AEP1,E)...MOUNTED PCB, MAIN (B)	C303	1-109-621-00	MICA	220PF	5%	500V
	*A-4341-101-A	(AEP2)....MOUNTED PCB, MAIN (B)	C304	1-107-202-00	MICA	10PF	0.5PF	500V
	*A-4341-108-A	(WG).....MOUNTED PCB, MAIN (B)	C305	1-107-206-00	MICA	15PF	5%	500V
902	*A-4341-098-A	MOUNTED PCB, PROTECTOR	C306	1-124-748-11	ELECT	22MF	20%	100V
903	$\Delta$ 1-533-183-11	HOLDER, FUSE	C307	1-124-918-11	ELECT	47MF	20%	63V
			C309	1-124-918-11	ELECT	47MF	20%	63V
904	$\Delta$ 1-559-297-31	(E).....CORD, POWER	C310	1-124-918-11	ELECT	47MF	20%	63V
	$\Delta$ 1-575-953-11	(AEP,WG)...CORD, POWER	C312	1-126-370-11	ELECT	1000MF	20%	80V
905	*A-4341-089-A	(AEP,E)...MOUNTED PCB, MAIN (A)	C313	1-126-370-11	ELECT	1000MF	20%	80V
	*A-4341-103-A	(WG).....MOUNTED PCB, MAIN (A)	C315	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
906	*1-636-674-11	PC BOARD, AC.SW	C316	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
907	*1-635-735-11	PC BOARD, LED	C318	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
908	*1-635-736-11	PC BOARD, SW (SP)	C319	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
909	*1-635-737-11	PC BOARD, SW (F)	C320	1-124-748-11	ELECT	22MF	20%	100V
910	*1-635-750-11	PC BOARD, VOLUME	C330	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
911	*1-635-731-11	(AEP,WG)...PC BOARD, AC	C331	1-162-282-11	(WG)...CERAMIC	100PF	10%	50V
912	*1-635-740-11	(E)...PC BOARD, V.S	C351	1-107-163-00	MICA	47PF	5%	500V
913	*1-635-738-11	(AEP,WG)...PC BOARD, REMOTE	C352	1-123-380-00	ELECT	1MF	20%	100V
914	*1-635-730-11	PC BOARD, SP-TM	C353	1-109-621-00	MICA	220PF	5%	500V
915	*1-635-734-11	PC BOARD, BALANCE-AMP	C354	1-107-202-00	MICA	10PF	0.5PF	500V
916	*1-635-733-11	PC BOARD, INPUT	C355	1-107-206-00	MICA	15PF	5%	500V
917	*1-635-739-11	PC BOARD, BALANCE	C356	1-124-748-11	ELECT	22MF	20%	100V
918	1-535-135-11	BASE POST 14MM (10MM PITCH) 2P	C357	1-124-918-11	ELECT	47MF	20%	63V
919	*1-508-812-00	BASE POST (14MM) 5P	C359	1-124-918-11	ELECT	47MF	20%	63V
920	*1-535-137-00	BASE POST 14MM (10MM PITCH)	C360	1-124-918-11	ELECT	47MF	20%	63V
921	*1-508-817-00	14MM BASE POST	C362	1-126-370-11	ELECT	1000MF	20%	80V
922	$\Delta$ A-4323-662-A	CHEMICAL CONDENSER ASSY	C363	1-126-370-11	ELECT	1000MF	20%	80V
923	*1-508-809-00	BASE POST (14MM) 2P	C370	1-124-748-11	ELECT	22MF	20%	100V
924	*3-311-617-01	REINFORCEMENT, PCB	C380	1-125-488-11	ELECT(BLOCK)	4700MF	20%	80V
925	*1-560-242-21	BUS BAR 4P	C381	1-162-282-11	(WG)...CERAMIC	100PF	10%	50V
926	1-559-512-11	(AEP,WG)...CORD (WITH CONNECTOR)	C401	1-107-169-00	MICA	100PF	5%	500V
927	$\Delta$ 1-569-007-11	(E3)...ADAPTOR, CONVERSION 2P	C402	1-107-169-00	MICA	100PF	5%	500V
C101	1-107-169-00	(WG)...MICA	C403	1-126-359-11	ELECT	47MF	20%	80V
C102	1-126-059-11	ELECT	C404	1-126-359-11	ELECT	47MF	20%	80V
C103	1-107-169-00	(WG)...MICA	C405	1-130-471-00	MYLAR	0.001MF	5%	50V
C104	1-124-915-11	ELECT	C451	1-107-169-00	MICA	100PF	5%	500V
C105	1-124-915-11	ELECT	C452	1-107-169-00	MICA	100PF	5%	500V
C106	1-124-713-11	ELECT	C453	1-126-359-11	ELECT	47MF	20%	80V
C107	1-124-713-11	ELECT	C454	1-126-359-11	ELECT	47MF	20%	80V
C151	1-107-169-00	(WG)...MICA	C455	1-130-471-00	MYLAR	0.001MF	5%	50V
C152	1-126-059-11	ELECT	C505	1-130-801-11	FILM	3.3MF	10%	250V
C153	1-107-169-00	(WG)...MICA	C506	1-130-955-00	FILM	0.01MF	10%	100V
C301	1-107-163-00	MICA	C507	1-130-955-00	FILM	0.01MF	10%	100V
C302	1-123-380-00	ELECT	C508	1-130-955-00	FILM	0.01MF	10%	100V
			C510	1-124-637-11	ELECT	1000MF	20%	50V

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



Ref.No.	Part No.	Description
Q301	8-759-108-01	TRANSISTOR UPA68HA-M
Q302	8-729-203-45	TRANSISTOR 2SC3423-0
Q303	8-729-203-45	TRANSISTOR 2SC3423-0
Q304	8-729-699-51	TRANSISTOR 2SA995
Q305	8-729-104-18	TRANSISTOR 2SC3514-Q
Q306	8-729-201-56	TRANSISTOR 2SK246-GR2
Q307	8-729-201-56	TRANSISTOR 2SK246-GR2
Q308	8-729-209-17	TRANSISTOR 2SA1360-0
Q309	8-729-104-91	TRANSISTOR 2SA1383-Q
Q310	8-729-201-56	TRANSISTOR 2SK246-GR2
Q311	8-729-104-18	TRANSISTOR 2SC3514-Q
Q312	8-729-209-17	TRANSISTOR 2SA1360-0
Q313	8-729-203-45	TRANSISTOR 2SC3423-0
Q351	8-759-108-01	TRANSISTOR UPA68HA-M
Q352	8-729-203-45	TRANSISTOR 2SC3423-0
Q353	8-729-203-45	TRANSISTOR 2SC3423-0
Q354	8-729-699-51	TRANSISTOR 2SA995
Q355	8-729-104-18	TRANSISTOR 2SC3514-Q
Q356	8-729-201-56	TRANSISTOR 2SK246-GR2
Q357	8-729-201-56	TRANSISTOR 2SK246-GR2
Q358	8-729-209-17	TRANSISTOR 2SA1360-0
Q359	8-729-104-91	TRANSISTOR 2SA1383-Q
Q360	8-729-201-56	TRANSISTOR 2SK246-GR2
Q361	8-729-104-18	TRANSISTOR 2SC3514-Q
Q362	8-729-209-17	TRANSISTOR 2SA1360-0
Q363	8-729-203-45	TRANSISTOR 2SC3423-0
Q401	8-729-104-18	TRANSISTOR 2SC3514-Q
Q402	8-729-104-91	TRANSISTOR 2SA1383-Q
Q403	8-729-208-72	TRANSISTOR 2SC3298B-Y
Q404	8-729-208-38	TRANSISTOR 2SA1306A-0
Q405	8-729-303-89	TRANSISTOR 2SC3856-Y
Q406	8-729-303-86	TRANSISTOR 2SA1492-Y
Q407	8-729-303-89	TRANSISTOR 2SC3856-Y
Q408	8-729-303-86	TRANSISTOR 2SA1492-Y
Q409	8-729-303-89	TRANSISTOR 2SC3856-Y
Q410	8-729-303-86	TRANSISTOR 2SA1492-Y
Q451	8-729-104-18	TRANSISTOR 2SC3514-Q
Q452	8-729-104-91	TRANSISTOR 2SA1383-Q
Q453	8-729-208-72	TRANSISTOR 2SC3298B-Y
Q454	8-729-208-38	TRANSISTOR 2SA1306A-0
Q455	8-729-303-89	TRANSISTOR 2SC3856-Y
Q456	8-729-303-86	TRANSISTOR 2SA1492-Y
Q457	8-729-303-89	TRANSISTOR 2SC3856-Y
Q458	8-729-303-86	TRANSISTOR 2SA1492-Y
Q459	8-729-303-89	TRANSISTOR 2SC3856-Y
Q460	8-729-303-86	TRANSISTOR 2SA1492-Y
Q601	8-729-281-54	TRANSISTOR 2SC1815-BL
Q701	8-729-184-53	TRANSISTOR 2SC1845-EA
Q702	8-729-108-14	TRANSISTOR 2SA988-F
Q703	8-729-201-56	TRANSISTOR 2SK246-GR2
Q704	8-729-281-52	TRANSISTOR 2SC1815-Y
Q705	8-729-201-53	TRANSISTOR 2SA1015GR
Q706	8-729-201-53	TRANSISTOR 2SA1015GR
Q707	8-729-140-96	TRANSISTOR 2SD774-34
Q751	8-729-184-53	TRANSISTOR 2SC1845-EA
Q752	8-729-108-14	TRANSISTOR 2SA988-F

Ref.No.	Part No.	Description
R101	1-246-545-00	CARBON 1M 5% 1/4W
R102	1-247-713-11	(WG)...CARBON 1K 5% 1/4W
R103	1-249-547-11	CARBON 620 5% 1/4W
R104	1-249-547-11	CARBON 620 5% 1/4W
R105	1-247-725-11	CARBON 10K 5% 1/4W
R106	1-247-725-11	CARBON 10K 5% 1/4W
R107	1-247-725-11	CARBON 10K 5% 1/4W
R108	1-247-725-11	CARBON 10K 5% 1/4W
R109	1-247-704-11	CARBON 220 5% 1/4W
R110	1-249-469-11	CARBON 100K 5% 1/4W
R111	1-247-713-11	(WG)...CARBON 1K 5% 1/4W
R112	1-215-921-51	(AEP2)...METAL OXIDE 4.7K 5% 3W F
R112	1-216-485-11	(EXCEPT AEP2) ...METAL OXIDE 5.6K 5% 3W F
R113	1-215-921-51	(AEP2)...METAL OXIDE 4.7K 5% 3W F
R113	1-216-485-11	(EXCEPT AEP2) ...METAL OXIDE 5.6K 5% 3W F
R114	1-247-237-00	CARBON 750 5% 1/2W F
R151	1-246-545-00	CARBON 1M 5% 1/4W
R152	1-247-713-11	(WG)...CARBON 1K 5% 1/4W
R153	1-249-547-11	CARBON 620 5% 1/4W
R154	1-249-547-11	CARBON 620 5% 1/4W
R155	1-247-725-11	CARBON 10K 5% 1/4W
R156	1-247-725-11	CARBON 10K 5% 1/4W
R157	1-247-725-11	CARBON 10K 5% 1/4W
R158	1-247-725-11	CARBON 10K 5% 1/4W
R159	1-247-704-11	CARBON 220 5% 1/4W
R160	1-249-469-11	CARBON 100K 5% 1/4W
R161	1-247-713-11	(WG)...CARBON 1K 5% 1/4W
R201	1-247-718-11	CARBON 2.7K 5% 1/4W
R251	1-247-718-11	CARBON 2.7K 5% 1/4W
R301	1-247-713-11	CARBON 1K 5% 1/4W
R302	1-249-497-11	CARBON 33K 5% 1/4W
R303	1-249-725-11	CARBON 150K 5% 1/2W
R304	1-249-556-11	CARBON 1.5K 5% 1/4W
R305	1-249-717-11	CARBON 68K 5% 1/2W
R306	1-247-719-11	CARBON 3.3K 5% 1/4W
R307	1-247-704-11	CARBON 220 5% 1/4W
R308	1-247-704-11	CARBON 220 5% 1/4W
R310	1-249-520-11	CARBON 47 5% 1/4W
R311	1-249-520-11	CARBON 47 5% 1/4W
R312	1-247-721-11	CARBON 4.7K 5% 1/4W
R313	1-249-556-11	CARBON 1.5K 5% 1/4W
R314	1-249-784-11	CARBON 180 1% 1/2W
R315	1-259-698-11	CARBON 8.2K 2% 1W
R316	△1-219-022-11	FUSIBLE 100 5% 1/2W F
R317	1-249-725-11	CARBON 150K 5% 1/2W
R318	1-249-556-11	CARBON 1.5K 5% 1/4W
R319	△1-219-022-11	FUSIBLE 100 5% 1/2W F
R320	△1-247-710-11	CARBON 560 5% 1/4W F
R321	1-247-719-11	CARBON 3.3K 5% 1/4W
R322	△1-247-710-11	CARBON 560 5% 1/4W F
R323	△1-219-022-11	FUSIBLE 100 5% 1/2W F
R325	△1-219-022-11	FUSIBLE 100 5% 1/2W F
R326	1-214-937-00	CARBON 1M 5% 1/2W
R327	1-249-597-11	CARBON 75K 5% 1/4W

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

# TA-N80ES

Ref.No.	Part No.	Description			
R328	1-247-704-11	CARBON	220	5%	1/4W
R330	1-249-824-11	CARBON	8.2K	1%	1/2W
R351	1-247-713-11	CARBON	1K	5%	1/4W
R352	1-249-497-11	CARBON	33K	5%	1/4W
R353	1-249-725-11	CARBON	150K	5%	1/2W
R354	1-249-556-11	CARBON	1.5K	5%	1/4W
R355	1-249-717-11	CARBON	68K	5%	1/2W
R356	1-247-719-11	CARBON	3.3K	5%	1/4W
R357	1-247-704-11	CARBON	220	5%	1/4W
R358	1-247-704-11	CARBON	220	5%	1/4W
R360	1-249-520-11	CARBON	47	5%	1/4W
R361	1-249-520-11	CARBON	47	5%	1/4W
R362	1-247-721-11	CARBON	4.7K	5%	1/4W
R363	1-249-556-11	CARBON	1.5K	5%	1/4W
R364	1-249-784-11	CARBON	180	1%	1/2W
R365	1-259-698-11	CARBON	8.2K	2%	1W
R366	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R367	1-249-725-11	CARBON	150K	5%	1/2W
R368	1-249-556-11	CARBON	1.5K	5%	1/4W
R369	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R370	△1-247-710-11	CARBON	560	5%	1/4W F
R371	1-247-719-11	CARBON	3.3K	5%	1/4W
R372	△1-247-710-11	CARBON	560	5%	1/4W F
R373	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R375	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R376	1-214-937-00	CARBON	1M	5%	1/2W
R377	1-249-597-11	CARBON	75K	5%	1/4W
R378	1-247-704-11	CARBON	220	5%	1/4W
R401	△1-247-240-51	CARBON	1K	5%	1/2W F
R402	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R403	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R404	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R405	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R406	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R407	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R408	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R409	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R410	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R411	1-217-152-00	RES, METAL PLATE	0.33		
R412	1-217-152-00	RES, METAL PLATE	0.33		
R413	1-217-152-00	RES, METAL PLATE	0.33		
R414	1-217-152-00	RES, METAL PLATE	0.33		
R415	1-217-152-00	RES, METAL PLATE	0.33		
R416	1-217-152-00	RES, METAL PLATE	0.33		
R417	1-247-696-11	CARBON	47	5%	1/4W F
R419	1-247-696-11	CARBON	47	5%	1/4W F
R421	1-247-696-11	CARBON	47	5%	1/4W F
R424	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R425	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R451	△1-247-240-51	CARBON	1K	5%	1/2W F
R452	△1-219-022-11	FUSIBLE	100	5%	1/2W F
R453	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R454	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R455	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R456	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R457	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R458	△1-217-997-11	FUSIBLE	10	5%	1/2W F

Ref.No.	Part No.	Description			
R459	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R460	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R461	1-217-152-00	RES, METAL PLATE	0.33		
R462	1-217-152-00	RES, METAL PLATE	0.33		
R463	1-217-152-00	RES, METAL PLATE	0.33		
R464	1-217-152-00	RES, METAL PLATE	0.33		
R465	1-217-152-00	RES, METAL PLATE	0.33		
R466	1-217-152-00	RES, METAL PLATE	0.33		
R467	1-247-696-11	CARBON	47	5%	1/4W F
R469	1-247-696-11	CARBON	47	5%	1/4W F
R471	1-247-696-11	CARBON	47	5%	1/4W F
R474	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R475	△1-217-997-11	FUSIBLE	10	5%	1/2W F
R501	1-247-721-11	CARBON	4.7K	5%	1/4W
R502	△1-219-010-11	FUSIBLE	33	5%	1/2W F
R503	△1-249-452-11	CARBON	2.7	5%	1/4W F
R601	1-247-725-11	CARBON	10K	5%	1/4W
R602	1-216-433-00	METAL OXIDE	1.2K	5%	1W F
R701	△1-212-998-00	FUSIBLE	470	5%	1/2W F
R701A	1-216-427-00	METAL OXIDE	120	5%	1W F
R702	△1-247-721-11	CARBON	4.7K	5%	1/4W F
R702A	1-216-427-00	METAL OXIDE	120	5%	1W F
R703	△1-247-721-11	CARBON	4.7K	5%	1/4W F
R703A	1-216-427-00	METAL OXIDE	120	5%	1W F
R704	1-249-497-11	CARBON	33K	5%	1/4W
R704A	1-216-427-00	METAL OXIDE	120	5%	1W F
R705	1-249-497-11	CARBON	33K	5%	1/4W
R706	1-249-497-11	CARBON	33K	5%	1/4W
R707	1-249-497-11	CARBON	33K	5%	1/4W
R708	1-247-719-11	CARBON	3.3K	5%	1/4W
R709	1-249-497-11	CARBON	33K	5%	1/4W
R710	1-246-531-00	CARBON	270K	5%	1/4W
R711	1-215-863-11	METAL OXIDE	100	5%	1W F
R712	1-249-460-11	CARBON	15K	5%	1/4W
R713	1-249-469-11	CARBON	100K	5%	1/4W
R714	1-247-725-11	CARBON	10K	5%	1/4W
R716	1-249-556-11	CARBON	1.5K	5%	1/4W
R717	1-247-887-00	CARBON	220K	5%	1/4W
R718	1-247-717-11	CARBON	2.2K	5%	1/4W
R719	1-247-725-11	CARBON	10K	5%	1/4W
R720	1-249-462-11	CARBON	22K	5%	1/4W
R721	1-249-465-11	CARBON	47K	5%	1/4W
R722	1-249-465-11	CARBON	47K	5%	1/4W
R723	1-249-673-11	CARBON	1K	5%	1/2W
R724	1-249-662-11	CARBON	360	5%	1/2W
R726	1-249-517-11	CARBON	36	5%	1/4W
R728	1-247-721-11	CARBON	4.7K	5%	1/4W
R729	1-247-703-11	CARBON	180	5%	1/4W
R751	△1-212-998-00	FUSIBLE	470	5%	1/2W F
R752	△1-247-721-11	CARBON	4.7K	5%	1/4W F
R753	△1-247-721-11	CARBON	4.7K	5%	1/4W F
R754	1-249-497-11	CARBON	33K	5%	1/4W
R755	1-249-497-11	CARBON	33K	5%	1/4W
R756	1-249-497-11	CARBON	33K	5%	1/4W
R757	1-249-497-11	CARBON	33K	5%	1/4W
R758	1-247-719-11	CARBON	3.3K	5%	1/4W

**Note:** 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
R759	1-249-497-11	CARBON 33K 5% 1/4W
R760	1-247-891-00	CARBON 330K 5% 1/4W
R801	1-247-727-11	CARBON 10 5% 1/2W
R802	1-216-420-11	METAL OXIDE 8.2 5% 5W F
R804	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R805	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R851	1-247-727-11	CARBON 10 5% 1/2W
R852	1-216-420-11	METAL OXIDE 8.2 5% 5W F
R854	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R855	1-247-727-11	(WG)...CARBON 10 5% 1/2W
RT302	1-224-248-XX	RES, ADJ, SOLID 470
RT352	1-224-248-XX	RES, ADJ, SOLID 470
RT401	1-224-550-21	RES, ADJ, SOLID 220
RT451	1-224-550-21	RES, ADJ, SOLID 220
RV201	1-237-849-11	RES, VAR, CARBON 20K (ATTENUATOR L)
RV251	1-237-849-11	RES, VAR, CARBON 20K (ATTENUATOR R)
RY801	1-515-703-11	RELAY
RY802	1-515-703-11	RELAY
RY901	△,1-515-617-11	(EXCEPT E)...RELAY
S1	△,1-554-538-00	SWITCH, PUSH (AC POWER)(1 KEY)
S101	1-516-785-XX	SLIDE SWITCH (OPERATION)
S102	1-516-785-XX	SLIDE SWITCH (INPUT SELECTOR)
S601	1-572-424-11	SWITCH, PUSH (2 KEY)(INPUT)
S701	1-572-425-11	SWITCH, ROTARY (SPEAKERS)
S901	1-572-009-11	(E)...SELECTOR, VOLTAGE
T1	△,1-450-177-11	(E).....TRANSFORMER, POWER
T1	△,1-450-179-11	(AEP1,WG)...TRANSFORMER, POWER
T1	△,1-450-181-11	(AEP2).....TRANSFORMER, POWER
T2	△,1-450-178-11	(AEP1,WG)...TRANSFORMER, POWER
T2	△,1-450-180-11	(AEP2).....TRANSFORMER, POWER
TM901	1-537-102-11	TERMINAL BOARD (SP)
TM902	1-537-102-11	TERMINAL BOARD (SP)

#### ACCESSORY & PACKING MATERIAL

1-575-952-11	(AEP,WG)...CABLE (WITH CONNECTOR)
3-752-341-11	(AEP,E)...MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)
3-752-341-41	(AEP,WG)...MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN)
4-921-404-01	CUSHION
*4-941-754-01	INDIVIDUAL CARTON

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