

## SERVICE MANUAL



US Model  
AEP Model  
UK Model  
E Model

## SPECIFICATIONS

## Audio power specifications

## POWER OUTPUT AND TOTAL HARMONIC DISTORTION:

With 8 ohm loads, both channels driven, from 20 - 20,000 Hz; rated 100 watts per channel minimum RMS power, with no more than 0.08% total harmonic distortion from 250 milliwatts to rated output

## Other specifications

Continuous RMS power output (both channels driven simultaneously) (US model) Stereo: 50 W + 50 W (6 ohms, 0.08%, 20 Hz - 20 kHz) Mono: 100 W (8 ohms, 0.08%, 20 Hz - 20 kHz) (Models for Except US) Stereo: 50 W + 50 W (6 ohms, 0.08%, 20 Hz - 20 kHz) Mono: 100 W (6 ohms, 0.08%, 20 Hz - 20 kHz)	Signal-to-noise ratio 105 dB (input shorted) Speaker output (US model) Stereo: 6 - 16 ohms Mono: 8 - 16 ohms (Models for Except US) Stereo/mono: 6 - 16 ohms
Dynamic power (US model) 75 W + 75 W (6 ohms) (Models for Except US) 85 W + 85 W (8 ohms)	General System Complementary Darlington SEPP power amplifier, with all stages direct coupled
Power bandwidth (IHF) 12 Hz - 40 kHz (6 ohms, THD 0.12%) (US model only)	Power requirements US model: 120V AC, 60Hz AEP, WG model: 220V - 50/60Hz UK model: 240V - 50/60Hz E model: 120, 220, 240V - 50/60Hz
Frequency response STEREO/FLAT: 5 Hz - 200 kHz, +0/-3 dB 3D: 5 Hz - 80 Hz, +0/-3 dB (12 dB/Oct.) STEREO: 180 mV (50 kohms) 3D: 110 mV (100 kohms) FLAT: 180 mV (100 kohms)	Power consumption US model: 110 watts Models for Except US: 140W
Input sensitivity STEREO: 180 mV (50 kohms) 3D: 110 mV (100 kohms) FLAT: 180 mV (100 kohms)	Dimensions US model: Approx. 470 x 120 x 265 mm (w/h/d) (17 x 4 3/4 x 10 1/2 inches) Models for Except US: Approx. 430 x 120 x 265 mm (w/h/d) (17 x 4 3/4 x 10 1/2 inches) including projecting parts and controls
	Weight US model: Approx. 5.9 kg (13 lb 1 oz), net Models for Except US: Approx. 5.3 kg (11 lb 11 oz), net

Design and specifications subject to change without notice.

STEREO POWER AMPLIFIER  
**SONY**

## 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.

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

## LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

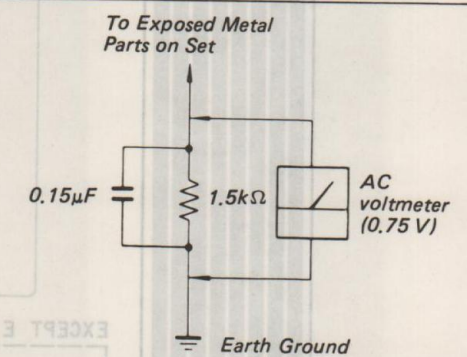
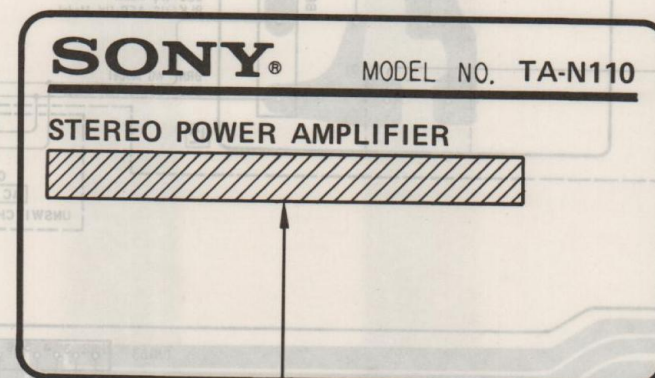


Fig. A. Using an AC voltmeter to check AC leakage.

## MODEL IDENTIFICATION

— Specification Label —

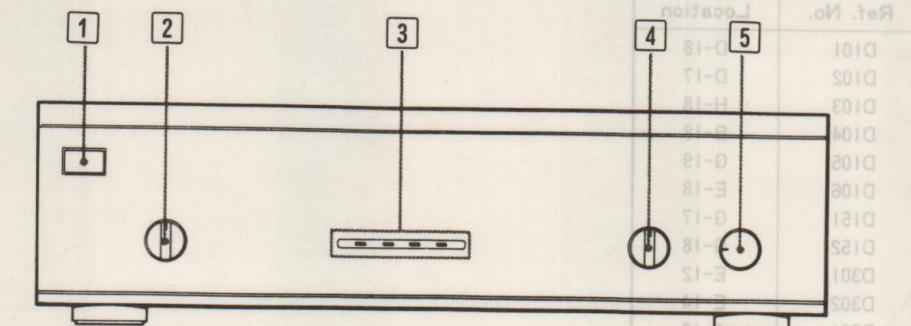


US model: AC: 120V 60Hz 110W  
AEP, WG model: AC: 220V~50/60Hz 140W  
UK model: AC: 240V~50/60Hz 140W  
E model: AC: 120, 220, 240V~50/60Hz 140W

(WG model: West Germany)

SECTION 1  
OUTLINE

## 1-1. LOCATION AND FUNCTION OF CONTROLS



(Side panels are attached to the US model.)

## 1 POWER switch

## 2 SPEAKERS selector

Selects speaker system to be used.

(When MONO is selected, the component connected to the MONO INPUT jack will be selected automatically as an input source.)

MONO: To select the speaker system connected to the MONO SPEAKER terminals (sub woofer or center speaker).

A: To select the speaker system connected to the SPEAKERS A terminals.

B: To select the speaker system connected to the SPEAKERS B terminals.

## 3 MONO/STEREO input indicators

MONO: Lights up when the SPEAKERS selector is set to MONO.

STEREO 1 to 3: Lights up to show the input component selected by the STEREO INPUT when the SPEAKERS selector is set to either A or B.

## 4 STEREO INPUT selector

Selects the component to be played among the components connected to the STEREO INPUT 1 to 3 jacks on the rear panel.

## 5 ATTENUATOR (volume) control

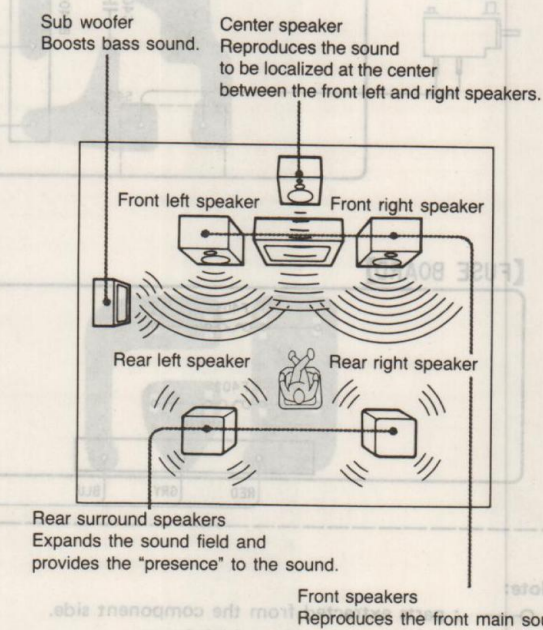
Adjusts the sound level of the speaker connected to TA-N110.

## 1-2. OVERVIEW

The TA-N110 is a power amplifier with selectable stereo/mono operation mode. It is suitable for use in a surround sound system. When the TA-N110 is connected to the surround processor, it can be used as follows.

- Stereo power amplifier for driving the rear surround speakers
- Stereo power amplifier for driving the front speakers
- Monaural power amplifier for driving the sub woofer.
- Monaural power amplifier for driving the center speaker.

As the TA-N110 is operable with an input voltage lower than normal power amplifier, it can be used also as an integrated amplifier or 3D system amplifier.

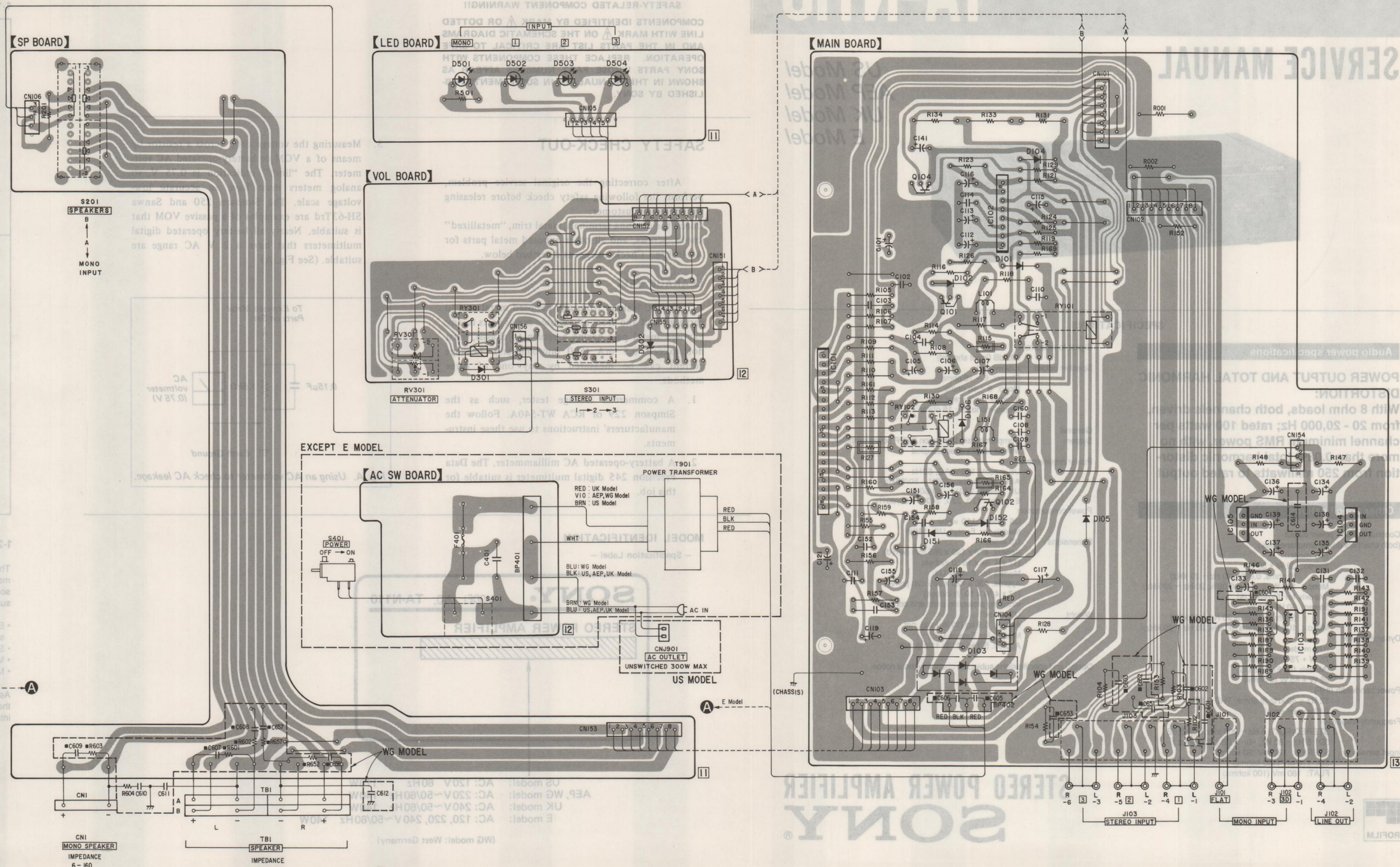




2-1. PRINTED WIRING BOARDS  
 ● See page 10 for Semiconductor Lead Layouts.

● Semiconductor Location

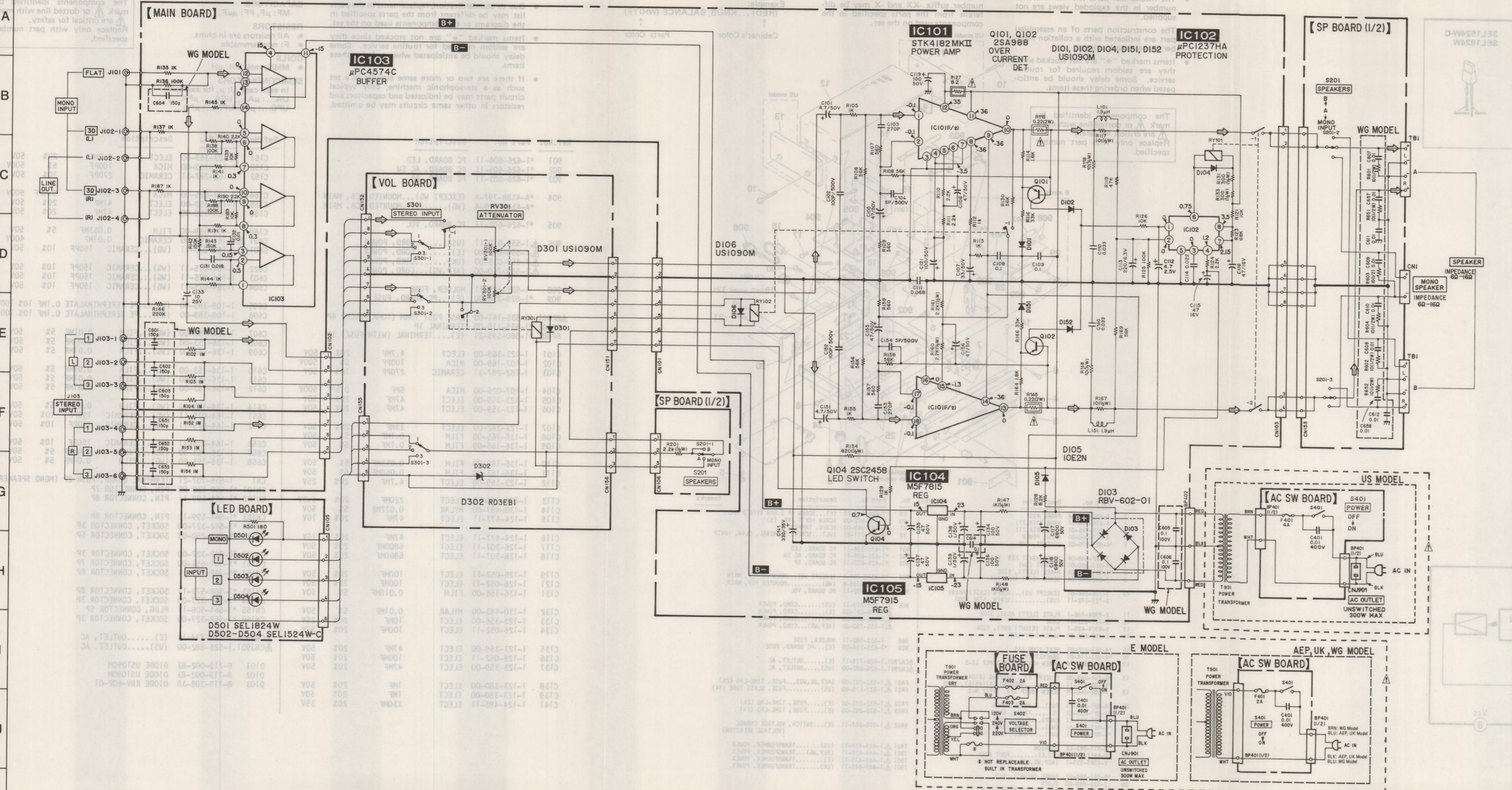
Ref. No.	Location
D101	D-18
D102	D-17
D103	H-18
D104	B-18
D105	G-19
D106	E-18
D151	G-17
D152	G-18
D301	E-12
D302	E-14
D501	A-12
D502	A-12
D503	A-13
D504	A-13
IC101	E-16
IC102	C-18
IC103	H-18
IC104	G-22
IC105	G-21
Q101	D-17
Q102	F-18
Q104	C-17



Note:  
 ● ○ : parts extracted from the component side.  
 ● : Pattern on the side which is seen.



2-2. SCHEMATIC DIAGRAM • See page 10 for IC block diagram.



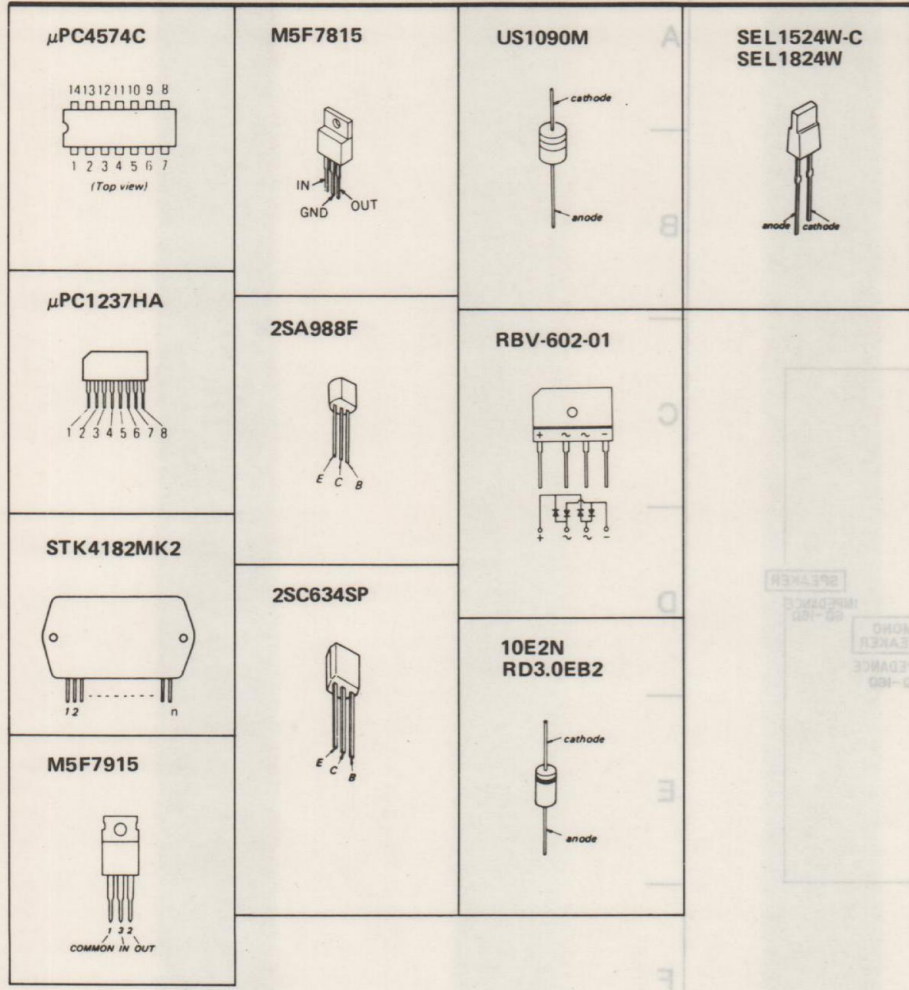
- Note:**
- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF;  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
  - All resistors are in  $\Omega$  and  $\frac{1}{4}\text{W}$  or less unless otherwise specified.
  - $\square$ : nonflammable resistor.
  - Voltage and waveforms are dc with respect to ground under no-signal conditions.
  - Voltages are taken with a VOM (50 k $\Omega$ /V). Voltage variations may be noted due to normal production tolerances.
  - Signal path.
  - $\rightleftarrows$ : SOUND
  - Switches

Ref. No.	Switch	Position
S201	SPEAKERS	A
S301	STEREO INPUT	1
S401	POWER	OFF

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



Semiconductor Lead Layouts



SECTION 3 EXPLODED VIEW

NOTE: The mechanical parts with no reference number in the exploded views are not supplied.

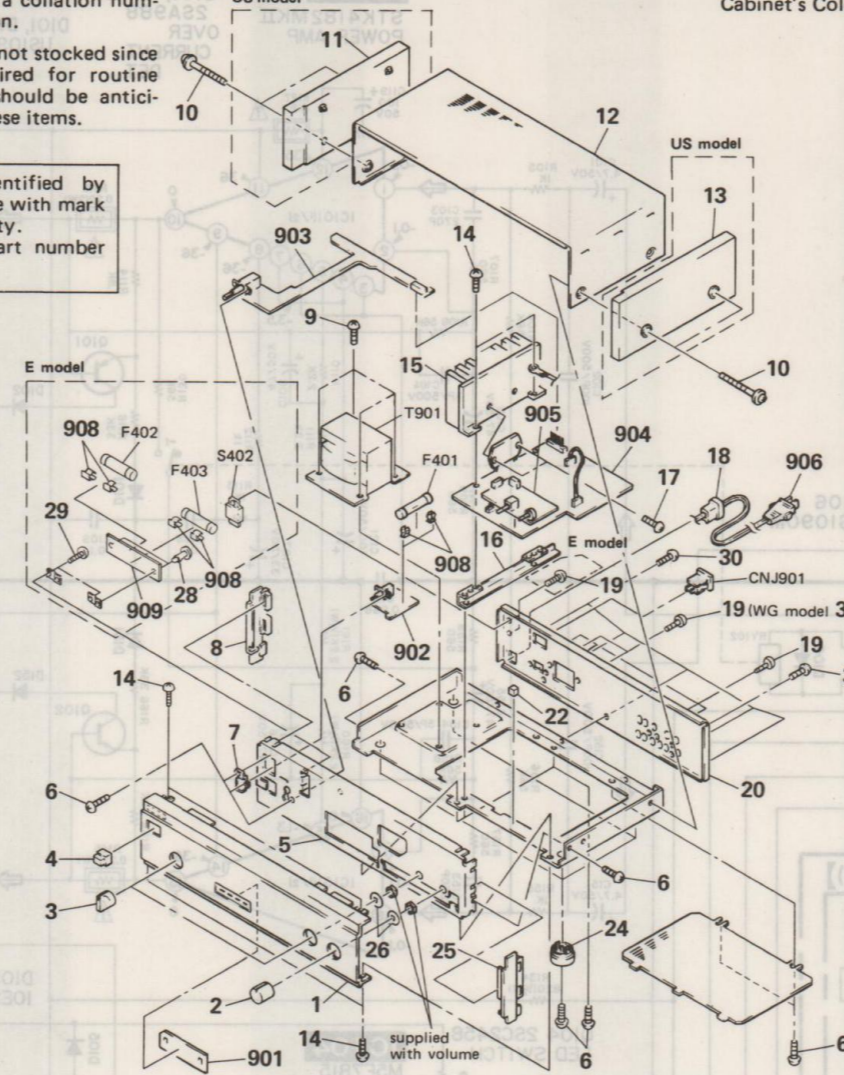
The construction parts of an assembled part are indicated with a collation number in the remark column.

Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

Color Indication of Appearance Parts Example: (RED)... KNOB, BALANCE (WHITE) Cabinet's Color Parts Color

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



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	A-4323-003-A	PANEL ASSY		29	7-685-134-19	(E)...SCREW #P 2.6X8 TYPE 2 N-S	
2	4-916-746-01	KNOB (DIA.21)		30	7-685-872-09	SCREW #BVTT 3X8 (S)	
3	4-916-745-01	KNOB (DIA.21)		31	7-621-849-00	SCREW, TAPPING	
4	4-917-460-01	KNOB, POWER		32	4-887-711-21	(WG)...SCREW, TERMINAL, CLAW, +BVTP	
5	*4-921-370-03	CHASSIS, SUB		901	*1-626-604-11	PC BOARD, LED	
6	7-682-548-04	SCREW +BVTT 3X8 (S)		902	*1-626-605-11	PC BOARD, AC SW	
7	*4-921-360-01	BRACKET (SW)		903	*1-626-603-11	PC BOARD, SP	
8	*4-921-365-01	PANEL (LEFT), SIDE		904	*A-4388-797-A	(EXCEPT WG)...MOUNTED PCB, MAIN	
9	7-682-560-04	SCREW +BVTT 4X6 (S)			*A-4388-799-A	(WG)...MOUNTED PCB, MAIN	
10	3-704-365-01	(EXCEPT US)...SCREW (CASE)(WXB8)		905	*1-626-602-11	PC BOARD, VOL	
	3-721-342-11	(US)...SCREW, SIDE WOOD		906	$\Delta$ 1-559-819-11	(US)...CORD, POWER	
11	X-4904-486-1	PLATE (LEFT) ASSY, SIDE			$\Delta$ 1-556-091-00	(E)...CORD, POWER	
12	*3-327-853-41	CASE			$\Delta$ 1-556-035-00	(UK)...CORD, POWER	
13	X-4904-485-1	PLATE (RIGHT) ASSY, SIDE			$\Delta$ 1-555-750-00	(AEP,WG)...CORD, POWER	
14	3-703-685-21	SCREW (+BV 3X8)		908	1-533-183-11	HOLDER, FUSE	
15	*4-921-322-01	HEAT SINK (A)		909	*1-628-354-00	(E)...PC BOARD, FUSE	
16	*4-921-314-01	BRACKET (P)		$\Delta$ CNJ901.1-526-774-11	(E)...OUTLET, AC		
17	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3		$\Delta$ CNJ901.1-526-882-00	(US)...OUTLET, AC		
18	*3-703-244-00	(EXCEPT E)...BUSHING (2104), CORD		F401	$\Delta$ 1-532-203-00	(AEP,UK,WG)...FUSE, TIME-LAG (2A)	
19	*3-703-571-11	(E)...BUSHING (S)(4516), CORD		F401	$\Delta$ 1-532-579-00	(US)...FUSE, GLASS TUBE (4A)	
20	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S		F402	$\Delta$ 1-532-203-00	(E)...FUSE, TIME-LAG (2A)	
21	*4-921-359-11	(US)...PANEL, BACK		F403	$\Delta$ 1-532-203-00	(E)...FUSE, TIME-LAG (2A)	
22	*4-921-359-21	(E)...PANEL, BACK		S402	$\Delta$ 1-570-307-11	(E)...SWITCH, VOLTAGE CHANGE (VOLTAGE SELECTOR)	
23	*4-921-359-31	(AEP)...PANEL, BACK		T901	$\Delta$ 1-449-434-11	(US)...TRANSFORMER, POWER	
24	*4-921-359-41	(WG)...PANEL, BACK			$\Delta$ 1-449-436-11	(AEP,WG)...TRANSFORMER, POWER	
25	*4-921-359-51	(UK)...PANEL, BACK			$\Delta$ 1-449-435-11	(E)...TRANSFORMER, POWER	
26	4-921-359-51	(UK)...PANEL, BACK			$\Delta$ 1-449-445-11	(UK)...TRANSFORMER, POWER	
27	9-911-843-XX	CUSHION					
28	X-4911-201-1	(US)...FOOT ASSY					
	X-4885-935-1	(AEP,WG,UK)...FOOT ASSY					
25	*4-921-364-01	PANEL (RIGHT), SIDE					
26	3-533-938-00	CLOTH					
27	4-812-134-00	(E)...RIVET NYLON, 3.5					

SECTION 4 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:  $\mu$ PF.

RESISTORS: All resistors are in ohms. F: nonflammable

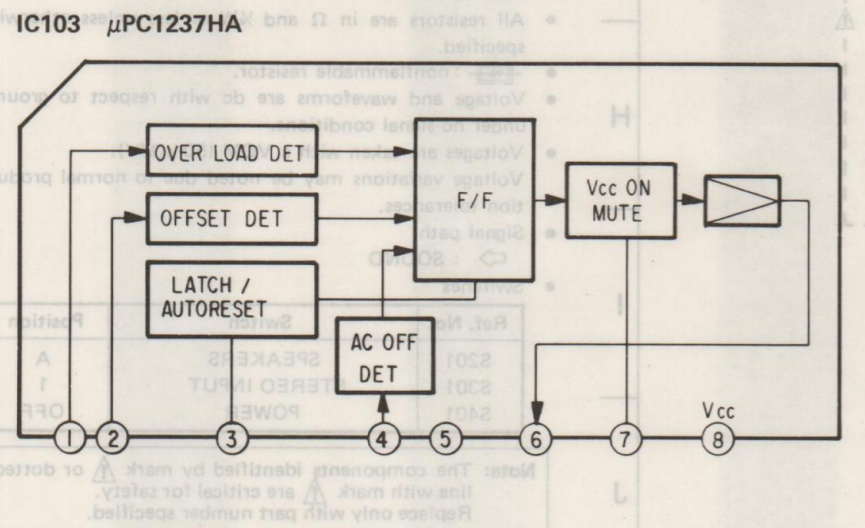
COILS: MMH: mH, UH:  $\mu$ H

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.

Ref.No.	Part No.	Description				
901	*1-626-604-11	PC BOARD, LED				
902	*1-626-605-11	PC BOARD, AC SW				
903	*1-626-603-11	PC BOARD, SP				
904	*A-4388-797-A	(EXCEPT WG)...MOUNTED PCB, MAIN				
	*A-4388-799-A	(WG)...MOUNTED PCB, MAIN				
905	*1-626-602-11	PC BOARD, VOL				
906	$\Delta$ 1-559-819-11	(US)...CORD, POWER				
	$\Delta$ 1-556-091-00	(E)...CORD, POWER				
	$\Delta$ 1-556-035-00	(UK)...CORD, POWER				
	$\Delta$ 1-555-750-00	(AEP,WG)...CORD, POWER				
908	1-533-183-11	HOLDER, FUSE				
909	*1-628-354-00	(E)...PC BOARD, FUSE				
$\Delta$ BP401	*1-535-141-00	BASE POST 19MM (10MM PITCH) 4P				
BP402	*1-535-116-00	TERMINAL 3P				
BP403	*1-560-595-21	(E)...TERMINAL (WITH FUSE) 3P				
C101	1-123-369-00	ELECT	4.7MF	20%	50V	
C102	1-107-169-00	MICA	100PF	5%	500V	
C103	1-162-287-31	CERAMIC	270PF	10%	50V	
C104	1-107-026-00	MICA	5PF	0.5PF	500V	
C105	1-123-359-00	ELECT	47MF	20%	50V	
C106	1-123-359-00	ELECT	47MF	20%	50V	
C107	1-123-382-00	ELECT	33MF	20%	50V	
C108	1-136-165-00	FILM	0.1MF	5%	50V	
C109	1-136-165-00	FILM	0.1MF	5%	50V	
C110	1-136-159-00	FILM	0.033MF	5%	50V	
C111	1-136-163-00	FILM	0.068MF	5%	50V	
C112	1-123-369-00	ELECT	4.7MF	20%	25V	
C113	1-126-176-11	ELECT	220MF	20%	6.3V	
C114	1-130-487-00	MYLAR	0.022MF	5%	50V	
C115	1-124-477-11	ELECT	47MF	20%	16V	
C116	1-124-477-11	ELECT	47MF	20%	16V	
C117	1-126-307-11	ELECT	6800MF	20%	50V	
C118	1-126-307-11	ELECT	6800MF	20%	50V	
C119	1-126-052-11	ELECT	100MF	20%	50V	
C121	1-126-052-11	ELECT	100MF	20%	50V	
C131	1-136-156-00	FILM	0.018MF	5%	50V	
C132	1-130-483-00	MYLAR	0.01MF	5%	50V	
C133	1-123-356-00	ELECT	10MF	20%	25V	
C134	1-126-052-11	ELECT	100MF	20%	50V	
C135	1-123-359-00	ELECT	47MF	20%	50V	
C136	1-126-052-11	ELECT	100MF	20%	50V	
C137	1-123-359-00	ELECT	47MF	20%	50V	
C138	1-123-380-00	ELECT	1MF	20%	50V	
C139	1-123-380-00	ELECT	1MF	20%	50V	
C141	1-124-485-11	ELECT	330MF	20%	35V	
C151	1-123-369-00	ELECT	4.7MF	20%	50V	
C152	1-107-169-00	MICA	100PF	5%	500V	
C153	1-162-287-31	CERAMIC	270PF	10%	50V	
C154	1-107-026-00	MICA	5PF	0.5PF	500V	
C155	1-123-359-00	ELECT	47MF	20%	50V	
C156	1-123-359-00	ELECT	47MF	20%	50V	
C160	1-136-159-00	FILM	0.033MF	5%	50V	
C401	$\Delta$ 1-161-744-00	CERAMIC	0.01MF		400V	
C601	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C622	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C603	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C604	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C605	1-108-389-00	(WG)...PE TEREPHTHALATE	0.1MF	10%	100V	
C606	1-108-389-00	(WG)...PE TEREPHTHALATE	0.1MF	10%	100V	
C607	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C608	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C609	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C610	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C611	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C612	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C614	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C651	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C652	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C653	1-164-075-11	(WG)...CERAMIC	150PF	10%	50V	
C657	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
C658	1-136-153-00	(WG)...FILM	0.01MF	5%	50V	
CN1	1-536-707-21	TERMINAL BOARD, PUSH 2P (MONO SPEAKER)				
CN101	*1-560-532-00	PIN, CONNECTOR 7P				
CN102	*1-564-599-11	PIN, CONNECTOR 8P				
CN103	*1-564-599-11	PIN, CONNECTOR 8P				
CN104	*1-562-327-00	SOCKET, CONNECTOR 3P				
CN105	*1-562-250-00	SOCKET, CONNECTOR 5P				
CN106	*1-562-327-00	SOCKET, CONNECTOR 3P				
CN151	*1-561-651-00	SOCKET, CONNECTOR 7P				
CN152	*1-562-573-11	SOCKET, CONNECTOR 8P				
CN153	*1-562-573-11	SOCKET, CONNECTOR 8P				
CN154	*1-562-327-00	SOCKET, CONNECTOR 3P				
CN155	*1-564-508-11	PLUG, CONNECTOR 5P				
CN156	*1-562-327-00	SOCKET, CONNECTOR 3P				
$\Delta$ CNJ901.1-526-774-11	(E)...OUTLET, AC					
$\Delta$ CNJ901.1-526-882-00	(US)...OUTLET, AC					
D101	8-719-002-83	DIODE US1090M				
D102	8-719-002-83	DIODE US1090M				
D103	8-719-302-38	DIODE RBV-602-01				

IC BLOCK DIAGRAMS





Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
D104	8-719-002-83	DIODE US1090M	R136	1-249-469-11	CARBON 100K 5% 1/4W
D105	8-719-200-77	DIODE 10E2N	R137	1-247-713-11	CARBON 1K 5% 1/4W
D106	8-719-002-83	DIODE US1090M	R138	1-249-469-11	CARBON 100K 5% 1/4W
D151	8-719-002-83	DIODE US1090M	R139	1-247-725-11	CARBON 10K 5% 1/4W
D152	8-719-002-83	DIODE US1090M	R140	1-247-717-11	CARBON 2.2K 5% 1/4W
D301	8-719-002-83	DIODE US1090M	R141	1-247-713-11	CARBON 1K 5% 1/4W
D302	8-719-100-15	DIODE RD3.0EB2	R142	1-249-604-11	CARBON 150K 5% 1/4W
D501	8-719-310-83	DIODE SEL1824W	R143	1-249-604-11	CARBON 150K 5% 1/4W
D502	8-719-310-75	DIODE SEL1524W-C	R144	1-247-713-11	CARBON 1K 5% 1/4W
D503	8-719-310-75	DIODE SEL1524W-C	R145	1-247-713-11	CARBON 1K 5% 1/4W
D504	8-719-310-75	DIODE SEL1524W-C	R146	1-247-887-00	CARBON 220K 5% 1/4W
F401	△.1-532-203-00	(AEP,UK,WG)...FUSE, TIME-LAG (2A)	R147	1-247-752-11	CARBON 1K 5% 1/2W
F401	△.1-532-579-00	(US).....FUSE, GLASS TUBE (4A)	R148	1-247-752-11	CARBON 1K 5% 1/2W
F402	△.1-532-203-00	(E)...FUSE, TIME-LAG (2A)	R152	1-246-545-00	CARBON 1M 5% 1/4W
F403	△.1-532-203-00	(E)...FUSE, TIME-LAG (2A)	R153	1-246-545-00	CARBON 1M 5% 1/4W
IC101	8-749-900-34	IC STK4182MK2	R154	1-246-545-00	CARBON 1M 5% 1/4W
IC102	8-759-111-68	IC UPC1237HA	R155	1-247-713-11	CARBON 1K 5% 1/4W
IC103	8-759-113-18	IC UPC4574C	R156	1-249-466-11	CARBON 56K 5% 1/4W
IC104	8-759-604-34	IC M5F7815	R157	1-247-710-11	CARBON 560 5% 1/4W
IC105	8-759-604-52	IC M5F7915	R158	1-249-466-11	CARBON 56K 5% 1/4W
J101	1-565-406-21	JACK, PIN 1P (MONO INPUT FLAT)	R159	1-247-710-11	CARBON 560 5% 1/4W
J102	1-565-258-21	JACK, PIN 4P (MONO INPUT 3D/LINE OUT)	R160	1-247-756-11	CARBON 2.2K 5% 1/2W
J103	1-565-320-11	JACK, PIN 6P (STEREO INPUT)	R161	1-247-756-11	CARBON 2.2K 5% 1/2W
L101	*1-420-872-00	COIL, AIR CORE 1.9UH	R164	1-247-716-11	CARBON 1.8K 5% 1/4W
L151	*1-420-872-00	COIL, AIR CORE 1.9UH	R165	△.1-217-151-00	RES, METAL PLATE 0.22 2W
Q101	8-729-108-14	TRANSISTOR 2SA988F	R166	1-247-726-11	CARBON 33K 5% 1/4W
Q102	8-729-108-14	TRANSISTOR 2SA988F	R167	1-247-727-11	CARBON 10 5% 1/2W
Q104	8-729-600-27	TRANSISTOR 2SC6345P	R168	1-247-727-11	CARBON 10 5% 1/2W
R001	1-249-496-11	CARBON 100K 5% 1/2W	R169	1-249-466-11	CARBON 56K 5% 1/4W
R002	1-249-496-11	CARBON 100K 5% 1/2W	R187	1-247-713-11	CARBON 1K 5% 1/4W
R102	1-246-545-00	CARBON 1M 5% 1/4W	R188	1-249-469-11	CARBON 100K 5% 1/4W
R103	1-246-545-00	CARBON 1M 5% 1/4W	R189	1-247-725-11	CARBON 10K 5% 1/4W
R104	1-246-545-00	CARBON 1M 5% 1/4W	R190	1-247-717-11	CARBON 2.2K 5% 1/4W
R105	1-247-713-11	CARBON 1K 5% 1/4W	R191	1-247-713-11	CARBON 1K 5% 1/4W
R106	1-249-466-11	CARBON 56K 5% 1/4W	R201	1-247-756-11	CARBON 2.2K 5% 1/2W
R107	1-247-710-11	CARBON 560 5% 1/4W	R501	1-247-703-11	CARBON 180 5% 1/4W
R108	1-249-466-11	CARBON 56K 5% 1/4W	R601	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R109	1-247-710-11	CARBON 560 5% 1/4W	R602	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R110	1-247-717-11	CARBON 2.2K 5% 1/4W	R603	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R111	1-247-756-11	CARBON 2.2K 5% 1/2W	R604	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R112	1-247-713-11	CARBON 1K 5% 1/4W	R651	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R113	1-247-713-11	CARBON 1K 5% 1/4W	R652	1-247-727-11	(WG)...CARBON 10 5% 1/2W
R114	1-247-716-11	CARBON 1.8K 5% 1/4W	RV301	1-238-176-11	RES, VAR, CARBON 100K/100K (ATTENUATOR)
R115	△.1-217-151-00	RES, METAL PLATE 0.22 2W	RY101	1-515-533-11	RELAY
R116	1-247-726-11	CARBON 33K 5% 1/4W	RY102	1-515-614-11	RELAY
R117	1-247-727-11	CARBON 10 5% 1/2W	RY301	1-515-614-11	RELAY
R118	1-247-727-11	CARBON 10 5% 1/2W	S201	1-571-545-11	SWITCH, ROTARY (SPEAKERS)
R119	1-249-465-11	CARBON 47K 5% 1/4W	S301	1-571-546-11	SWITCH, ROTARY (STEREO INPUT)
R121	1-247-725-11	CARBON 10K 5% 1/4W	S401	△.1-554-920-11	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)
R123	1-249-467-11	CARBON 68K 5% 1/4W	S402	△.1-570-307-11	(E)...SWITCH, VOLTAGE SELECTOR (VOLTAGE SELECTOR)
R124	1-247-717-11	CARBON 2.2K 5% 1/4W	T901	△.1-449-434-11	(US).....TRANSFORMER, POWER
R125	1-249-469-11	CARBON 100K 5% 1/4W	T901	△.1-449-436-11	(AEP,WG)...TRANSFORMER, POWER
R126	1-247-725-11	CARBON 10K 5% 1/4W	T901	△.1-449-435-11	(E).....TRANSFORMER, POWER
R127	△.1-249-458-11	CARBON 8.2 5% 1/4W	T901	△.1-449-445-11	(UK).....TRANSFORMER, POWER
R128	1-247-724-11	CARBON 8.2K 5% 1/4W	TBI	1-536-706-00	TERMINAL BOARD (SPEAKER)
R129	1-247-713-11	CARBON 1K 5% 1/4W			
R130	1-249-466-11	CARBON 56K 5% 1/4W			
R131	1-244-860-11	CARBON 300 5% 1/2W			
R133	1-244-860-11	CARBON 300 5% 1/2W			
R134	1-247-751-11	CARBON 820 5% 1/2W			
R135	1-247-713-11	CARBON 1K 5% 1/4W			

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

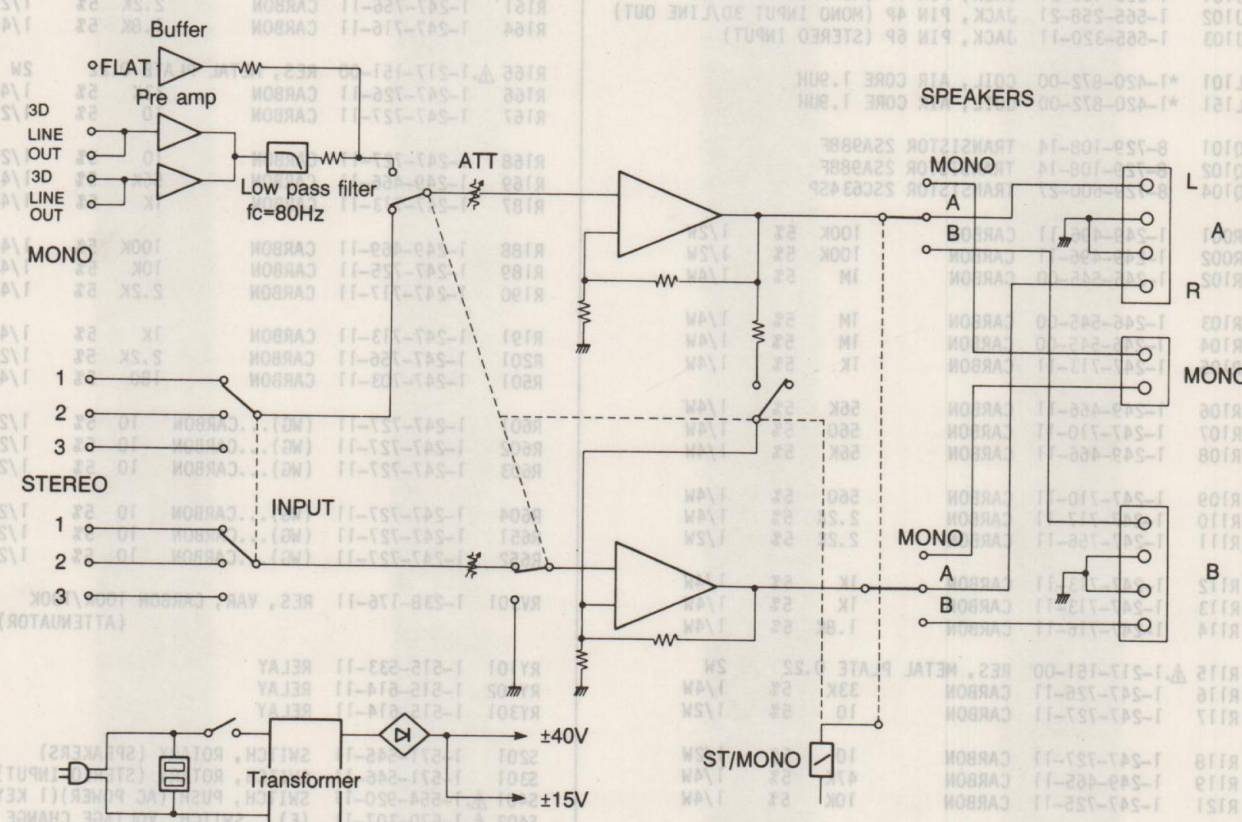


ACCESSORY & PACKING MATERIAL

△1-526-565-00	(E)...AC PLUG ADAPTOR
*3-701-948-17	(EXCEPT US)...LABEL, FUSE
*3-701-030-00	LABEL, SERIAL NUMBER
3-703-450-01	INSTRUCTION SHEET (STANDARD), PROTECTION MANUAL, INSTRUCTION
*3-346-378-01	(EXCEPT US)...INDIVIDUAL CARTON
*4-921-373-11	(US).....INDIVIDUAL CARTON
*4-921-311-01	(EXCEPT US)...CUSHION
*4-921-371-01	(US).....CUSHION

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

Block Diagram



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