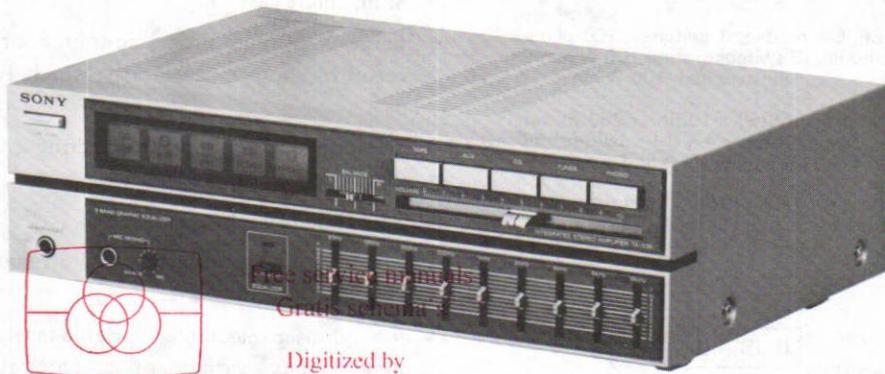


TA-V30

SERVICE MANUAL

AEP Model
UK Model
E ModelFree service manuals
Gratis schemata
Digitized bywww.freeservicemanuals.info

SPECIFICATIONS

Amplifier section

Continuous RMS Power Output:	At 1 kHz 38 + 38 watts (5% THD, 8 Ω) 33 + 33 watts (0.08% THD, 8 Ω)
	At 40 Hz – 20 kHz, 0.08% THD 28 + 28 watts (8 Ω)
	According to DIN 45500 28 + 28 watts (8 Ω)
Music Power:	140 W (5% THD) (E model)
Power Bandwidth (IHF):	10 Hz – 30 kHz (6 Ω, 15 W)
Dynamic Headroom:	1.8 dB ('78 IHF)
Harmonic Distortion:	Less than 0.08% at rated output
Intermodulation (IM) Distortion: (60 Hz : 7 kHz = 4 : 1)	Less than 0.08% at rated output
Frequency Response:	PHONO : RIAA equalization curve ±0.5 dB TUNER CD AUX TAPE } 15 Hz – 50 kHz +0 dB MIC MIXING 150 Hz – 10 kHz -4 dB
Residual Noise:	Less than 100 μV (8 Ω, network A)
Damping Factor:	30 (6 Ω, 1 kHz)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK \triangle 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.

Inputs:

	Sensitivity	Impedance	Maximum input capability (1 kHz)	S/N (weighting network, input level)
PHONO (MM)	2.5 mV	50 kΩ	120 mV (MM)	72 dB 75 dB* (A, 2.5 mV)
TUNER CD AUX TAPE	150 mV	50 kΩ	—	98 dB 80 dB* (A, 150 mV)
MIC MIXING	2.5 mV	50 kΩ	—	70 dB 70 dB* (A, 2.5 mV)

* '78 IHF

Outputs:	REC OUT Voltage 150 mV Impedance 4.7 kΩ SPEAKER Accepts speakers of 6 – 16 Ω HEADPHONES Accepts low and high impedance headphones. (12 mW/8Ω)
-----------------	---

Graphic Equalizer:	9 bands Center frequencies: 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz
---------------------------	--

General

System:	Preamplifier section: low-noise NF type equalizer amp Power amplifier section: quasi-complementary SEPP OTL OCL amplifier with all stages direct coupled
----------------	---

— Continued on page 2 —

INTEGRATED STEREO AMPLIFIER
SONY®



MICROFILM

AUD

Power Requirements: AEP model: 220 V ac (240 V ac adjustable by authorized Sony personnel), 50/60 Hz
 UK model: 240 V ac (220 V ac adjustable by authorized Sony personnel), 50/60 Hz
 E model: 120 or 240 V ac adjustable, 50/60 Hz

Power Consumption: 85 W

AC Outlets: AEP, UK model: 3 switched, 100 W max.
 E model: 2 switched, total 100 W max.
 1 unswitched, 100 W max.

Dimensions: Approx. 355(w) x 105(h) x 260(d) mm
 (14(w) x 4 $\frac{1}{4}$ (h) x 10 $\frac{1}{4}$ (d) inches)
 including projecting parts and controls

Weight: Approx. 4.5 kg (9 lbs 15 oz) net
 Approx. 5.3 kg (11 lbs 11 oz) in shipping carton

0 dB = 0.775 V

FEATURES

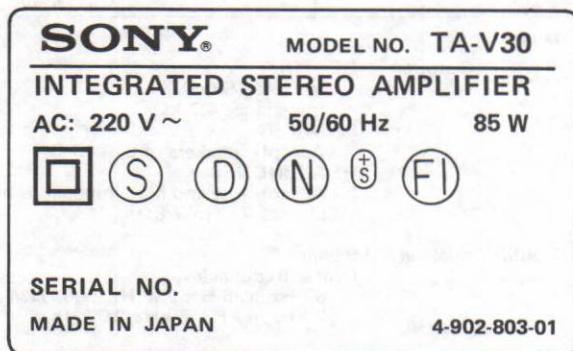
The Sony TA-V30 integrated stereo amplifier provides dynamic high-fidelity sound despite a remarkably compact cabinet.

- Slim, smart case.
- Large light-blue programme-source or mode indicator to show quite clearly which function is in use.
- Separate CD input for connecting a CD (compact disc) player.
- Soft-touch function switches.
- Cord clamp for ensuring tidy arrangement of the cords on the rear panel.
- 9-band user-selectable, variable-level equalizer to make many variations of graphic-oriented music sound.
- Power ON/OFF click-noise muting and amp/speaker protection circuits are equipped.
- Total of 3 AC outlets for wider user utility convenience.
- Front panel jack is provided for an external microphone to facilitate a microphone mixing pleasure.

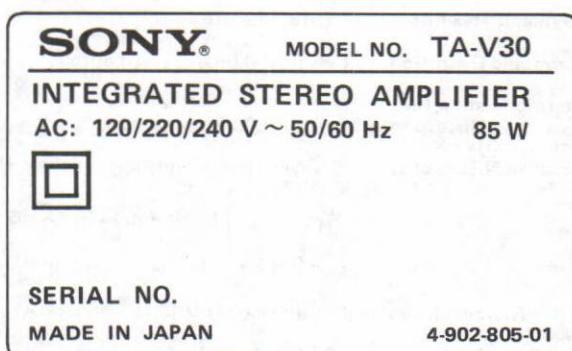
MODEL IDENTIFICATIONS

— Specification Label —

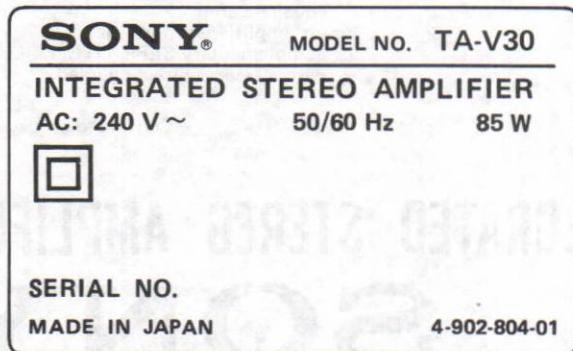
AEP model

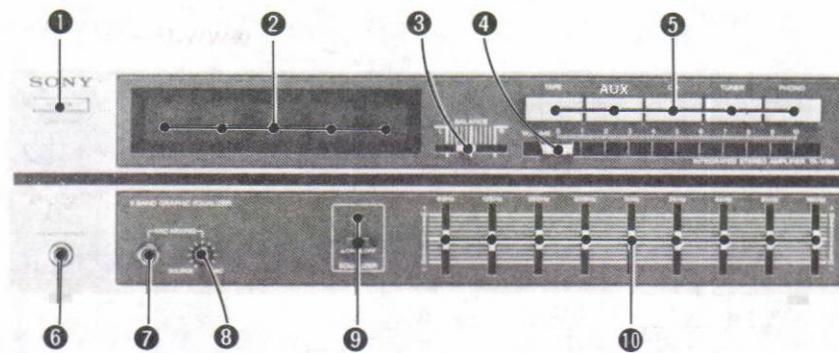


E model



UK model



CONTROLS AND SWITCHES**① POWER switch**

Turns the operating power on or off.

② Program source indicator

The programme in use is displayed here.

③ BALANCE control

Governs the amount of sound coming from each paired speaker to get optimum stereo effect.

④ VOLUME control

Regulates the overall sound level.

Sliding the lever towards 10 increases the volume and sliding it towards 0 decreases the volume. Be sure to lower the volume whenever you turn the amplifier on or off or make system connections.

⑤ Function switches

Depress one of these switches to select a desired programme source. The programme in use is displayed in the programme source indicator.

PHONO: For record programmes (connected to PHONO inputs)

TUNER: For off-the-air programmes (connected to TUNER inputs)

CD: For CD programmes (connected to CD inputs)

TAPE: For taped programmes (connected to TAPE inputs)

AUX: For other auxiliary programmes (connected to AUX inputs)

⑥ HEADPHONES jack (standard stereo)

Accepts any low or high impedance stereo headphones.

⑦ MIC MIXING jack

External microphone source connector to make a microphone mixing.

⑧ MIC MIXING control

External microphone mixing level is adjusted by turning this knob. When set at SOURCE position, source level becomes louder than microphone input, and vice versa. Usually set to SOURCE stop.

⑨ EQUALIZER switch/indicator

When equalization is needed, turn ON this switch. Then the indicator atop the switch goes on and graphic equalization is made possible.

When equalization is not needed, turn this switch OFF.

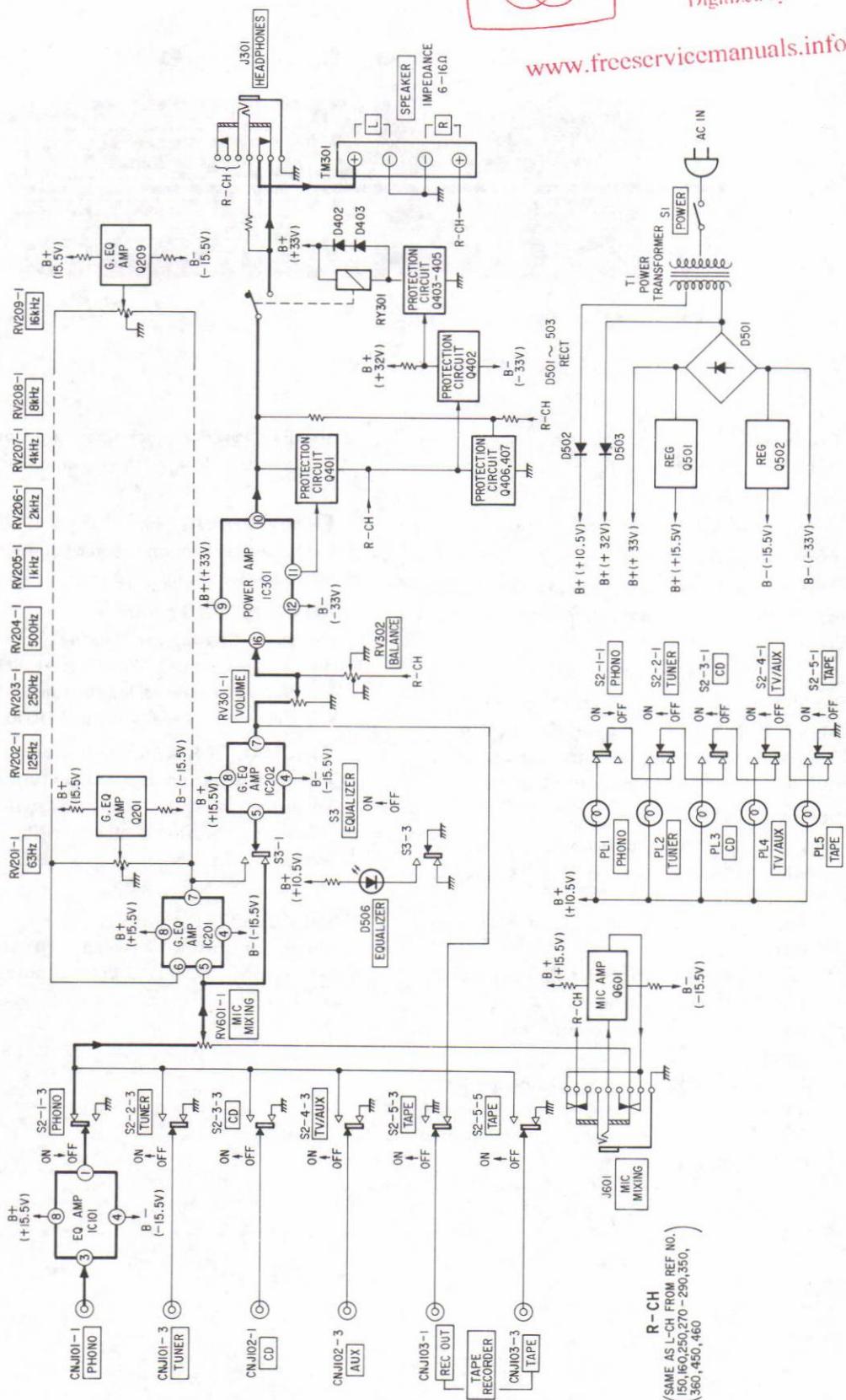
⑩ EQUALIZER controls

Those controls work when EQUALIZER switch is turned ON. When the knob is advanced to (+) side, emphasising equalization is made, and vice versa.

SECTION 1

OUTLINE

1-1. BLOCK DIAGRAM



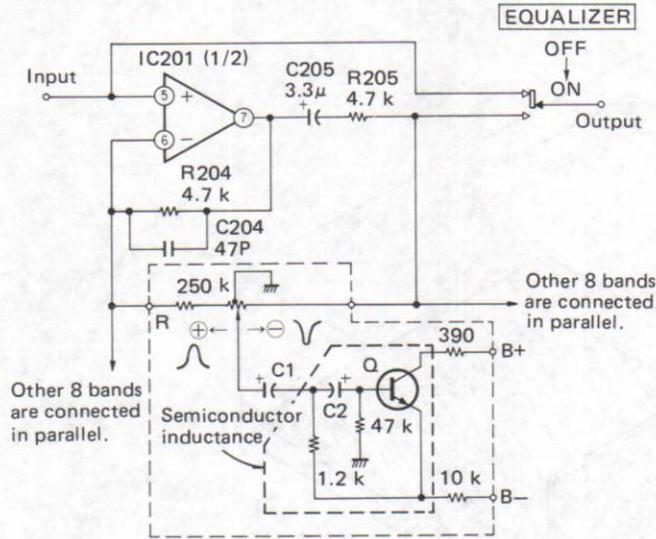
Free service manuals
Gratis schema's
Digitized by

www.freeservicemanuals.info

1-2. CIRCUIT DESCRIPTION

Graphic Equalizer

The graphic equalizer equipped on this amplifier unit is of the boost/filter type utilizing the conventional operational-amplifier configuration as shown in Fig. 1.



f	C1 (μF)	C2 (μF)	R (Ω)
63 Hz	1	0.1	0
125 Hz	0.47	0.056	0
250 Hz	0.22	0.033	0
500 Hz	0.1	0.018	0
1 kHz	0.068	0.0068	0
2 kHz	0.033	0.0033	0
4 kHz	0.015	0.0018	1.2 k
8 kHz	0.0082	0.00082	1.2 k
16 kHz	0.0033	0.00056	1.2 k

Fig. 1

Capacitor C2, resistors 1.2 kΩ and 47 kΩ and the equalizer-amplifier transistor 2SC2458 compose a semiconductor inductance network. Here $L = C2 \times 10^{-6} \times 1.2 \times 10^3 \times 47 \times 10^3$ henries. The center frequency is decided by the capacitor C1 and C2 as shown in the table.

The transistor 2SC2458 in the semiconductor inductance network is working in a unity-gain amplifier and the "Q" of the resonance circuit is about 2 (two).

Suppose that the 8 (eight) bands' controls are set to "0" positions and the required-band's equalizer control to the (+) side and a signal-boosting is resulted. In this case the circuit condition becomes in that shown in Fig. 2.

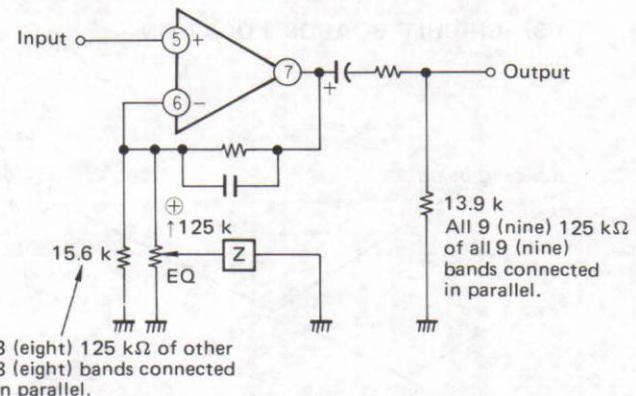


Fig. 2

And the circuit becomes in that shown in Fig. 3 in the mostly-boosted condition with the equalizer control set to +10. The resistors "R" 1.2 kΩ in the upper three frequencies 4 kHz, 8 kHz and 16 kHz in series with the respective equalizer control is provided to reduce the high peaks to protect any tweeters in the loud-speaker systems.

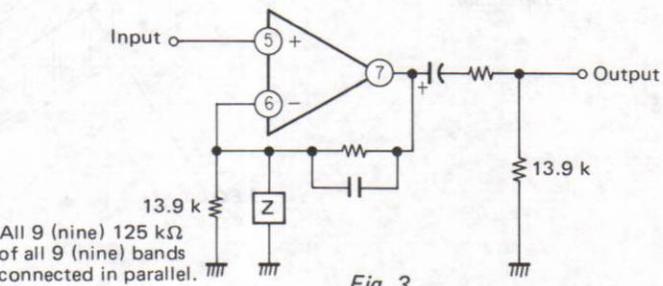


Fig. 3

When the required equalizer control is slid toward (-) on the contrary to enhance the filtering effects, the circuit results in that shown in Fig. 4. The output circuit becomes in that one shown in Fig. 5 in the maximum filtering condition with the equalizer control set to the -10 position.

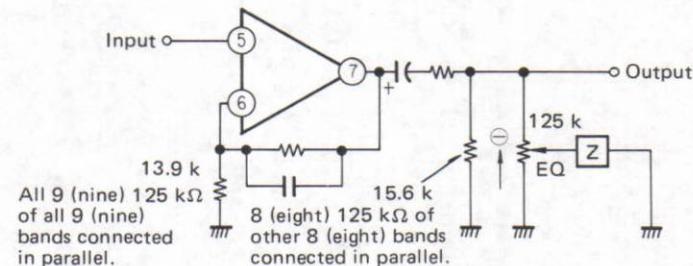


Fig. 4

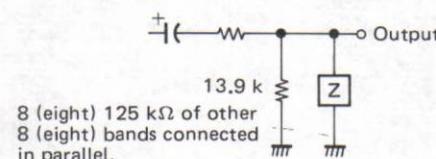
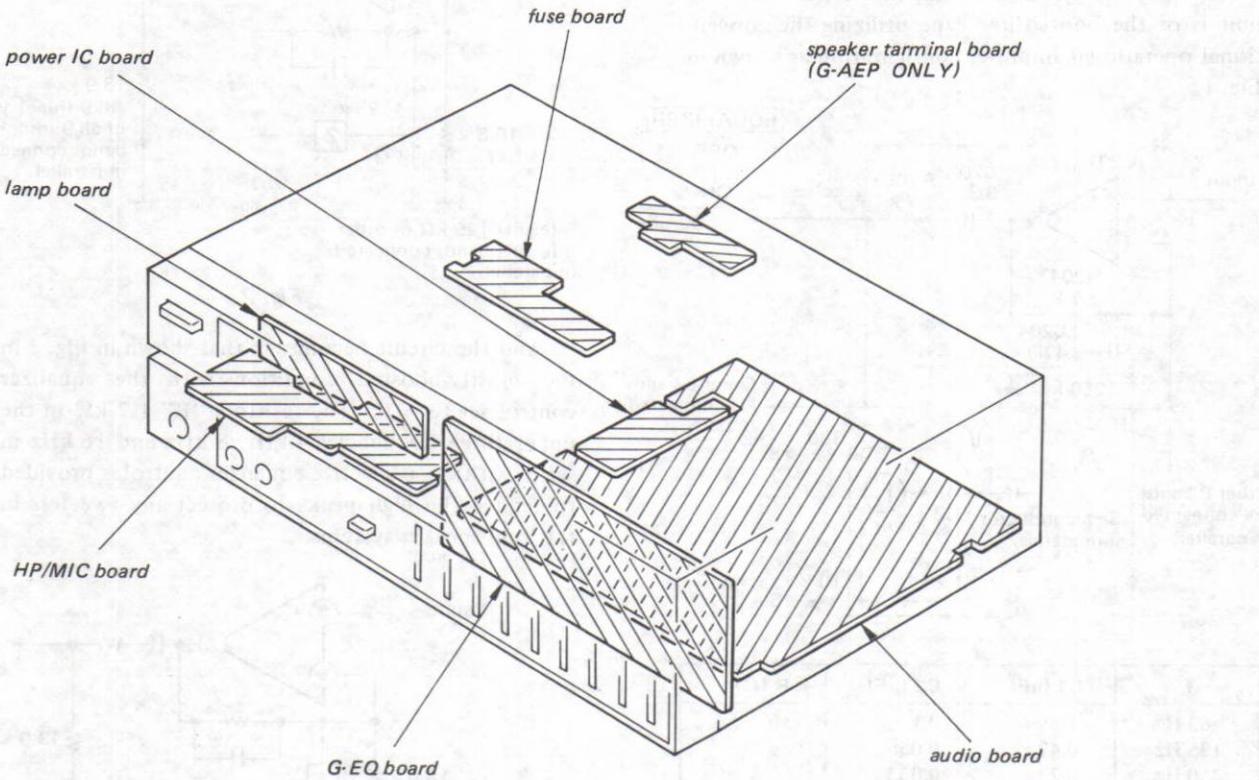


Fig. 5

1-3. CIRCUIT BOARDS LOCATION



1-4. NOTE ON ADJUSTMENT

This unit uses fixed value components throughout except the front-panel controls. Thus no internal adjustments are needed.

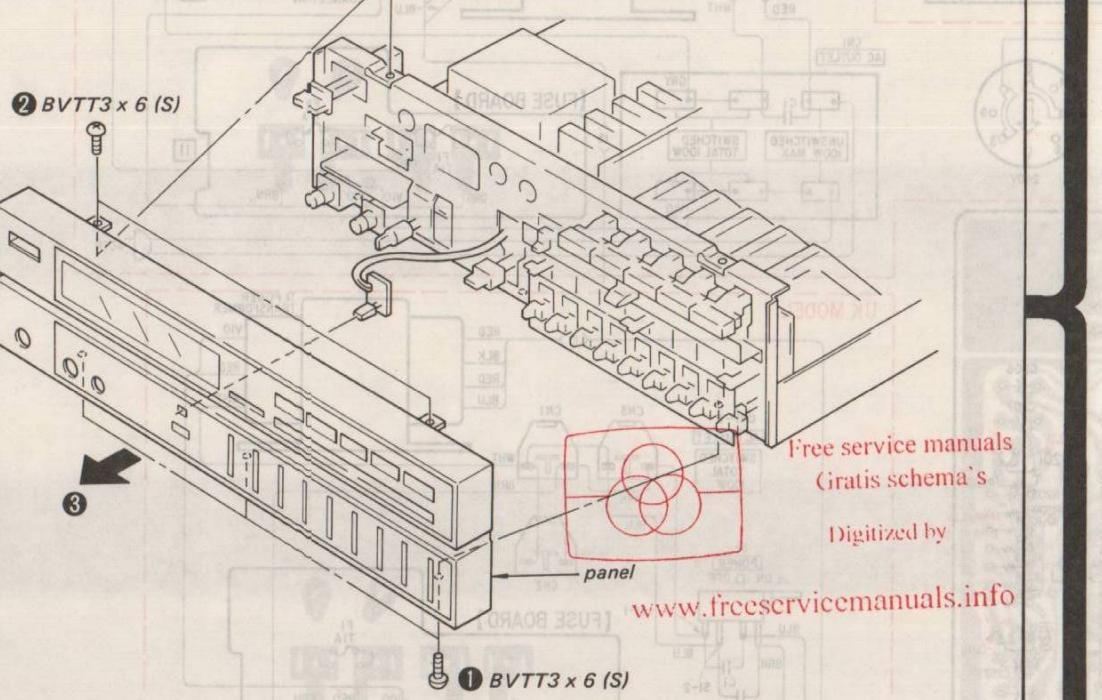
SECTION 2 DISASSEMBLY

CASE REMOVAL

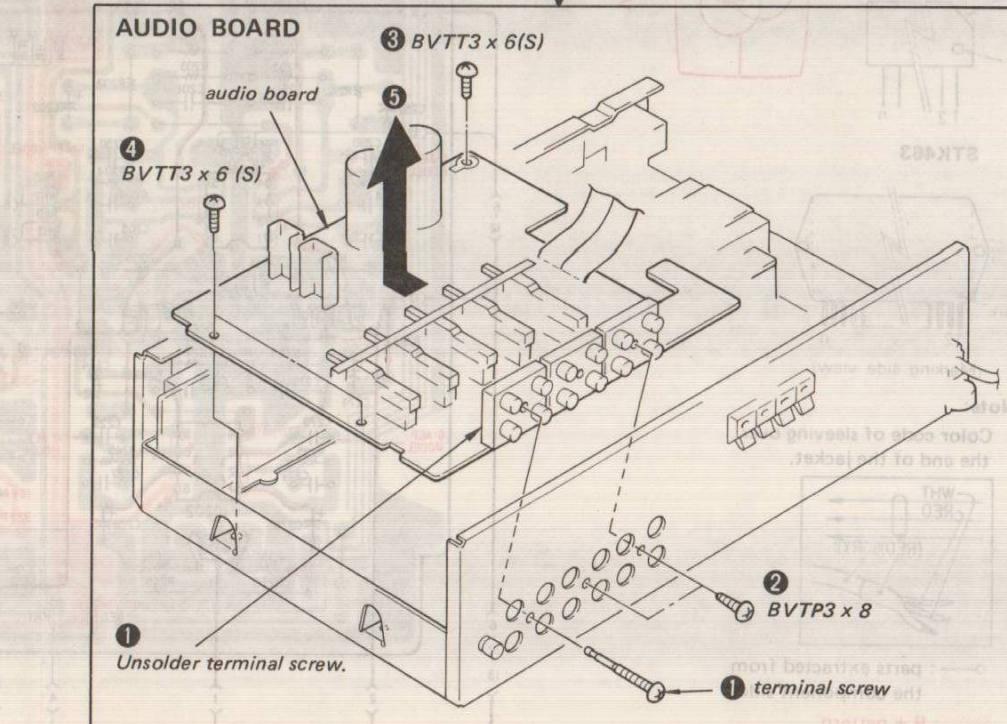
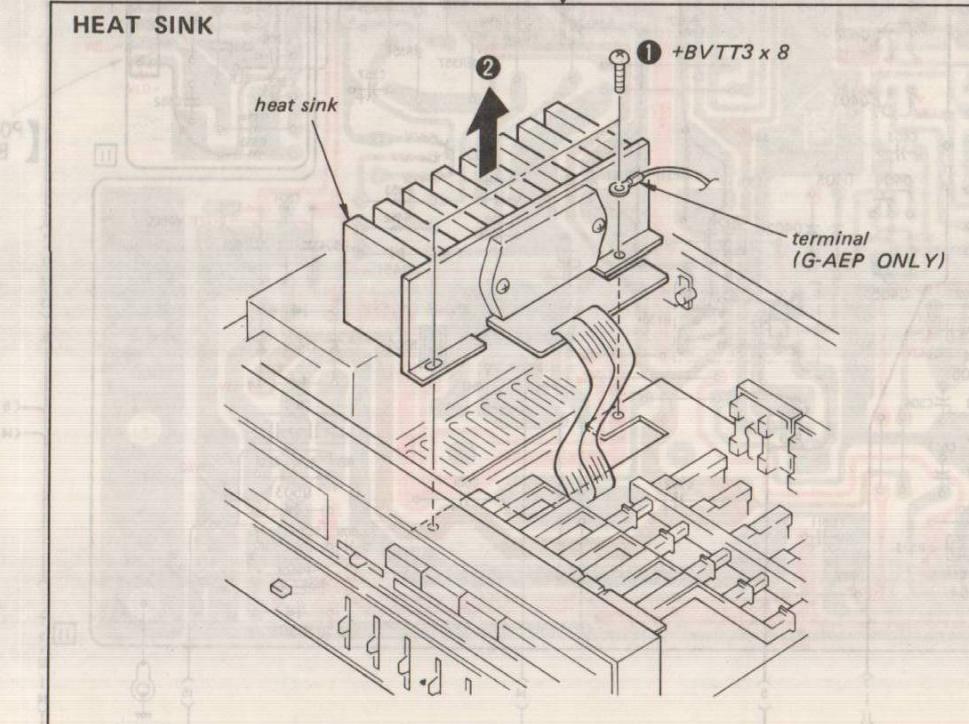
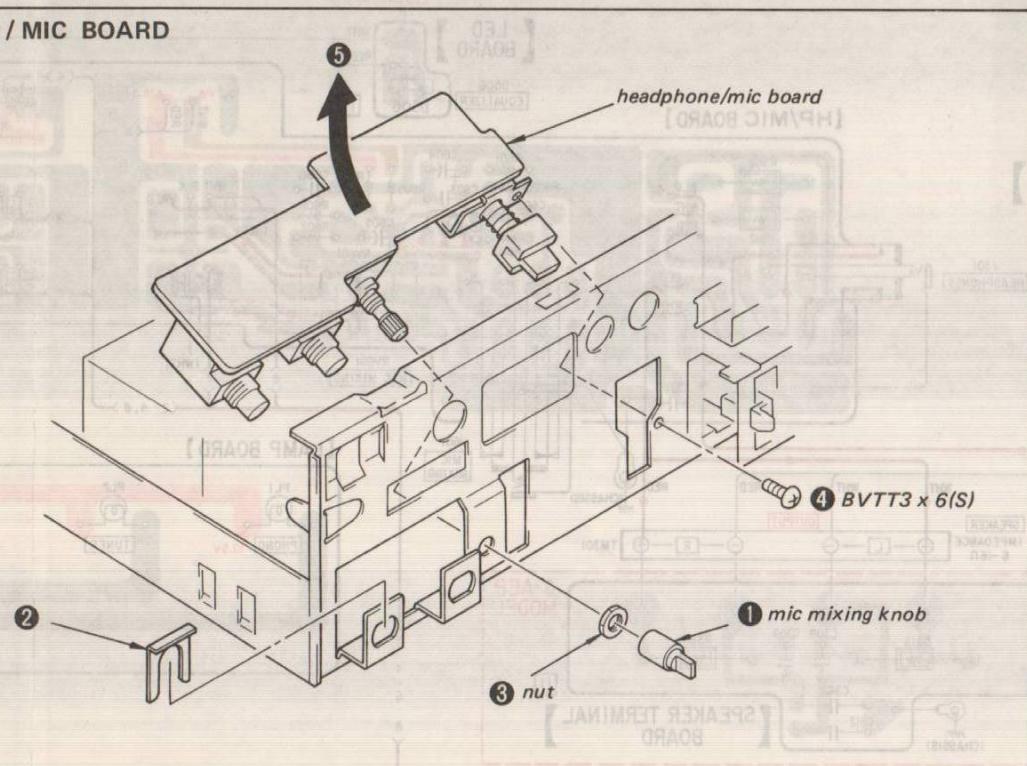
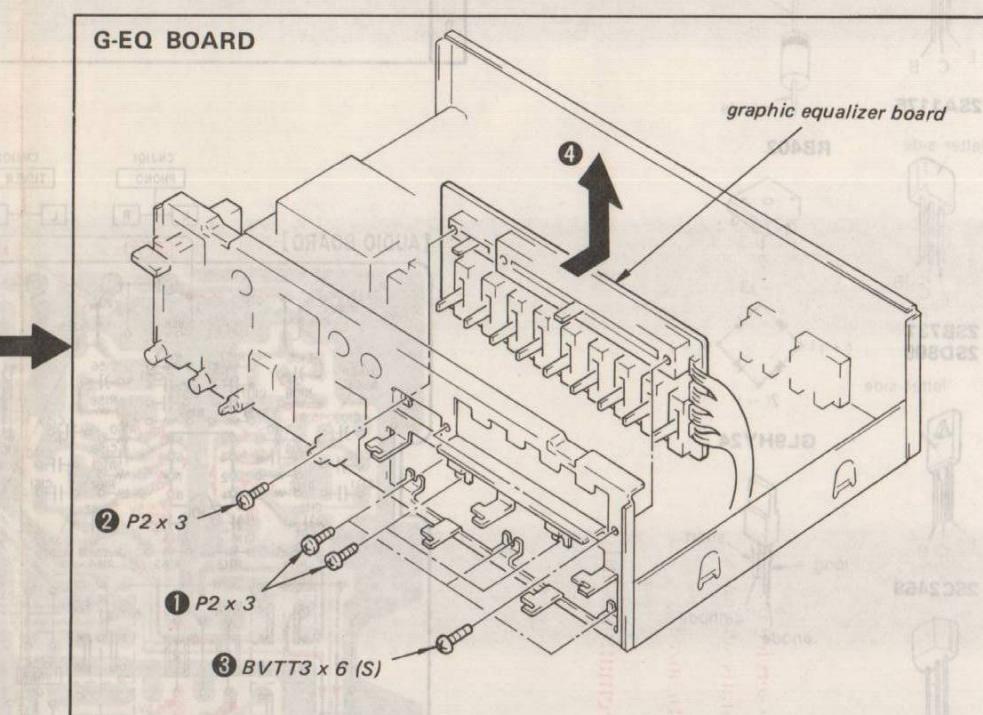
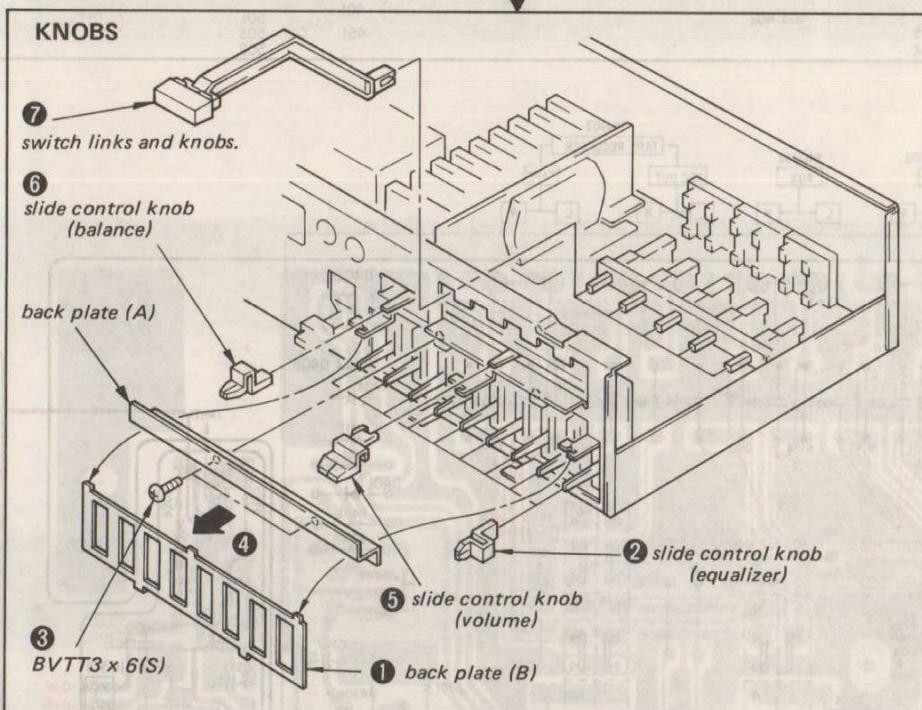
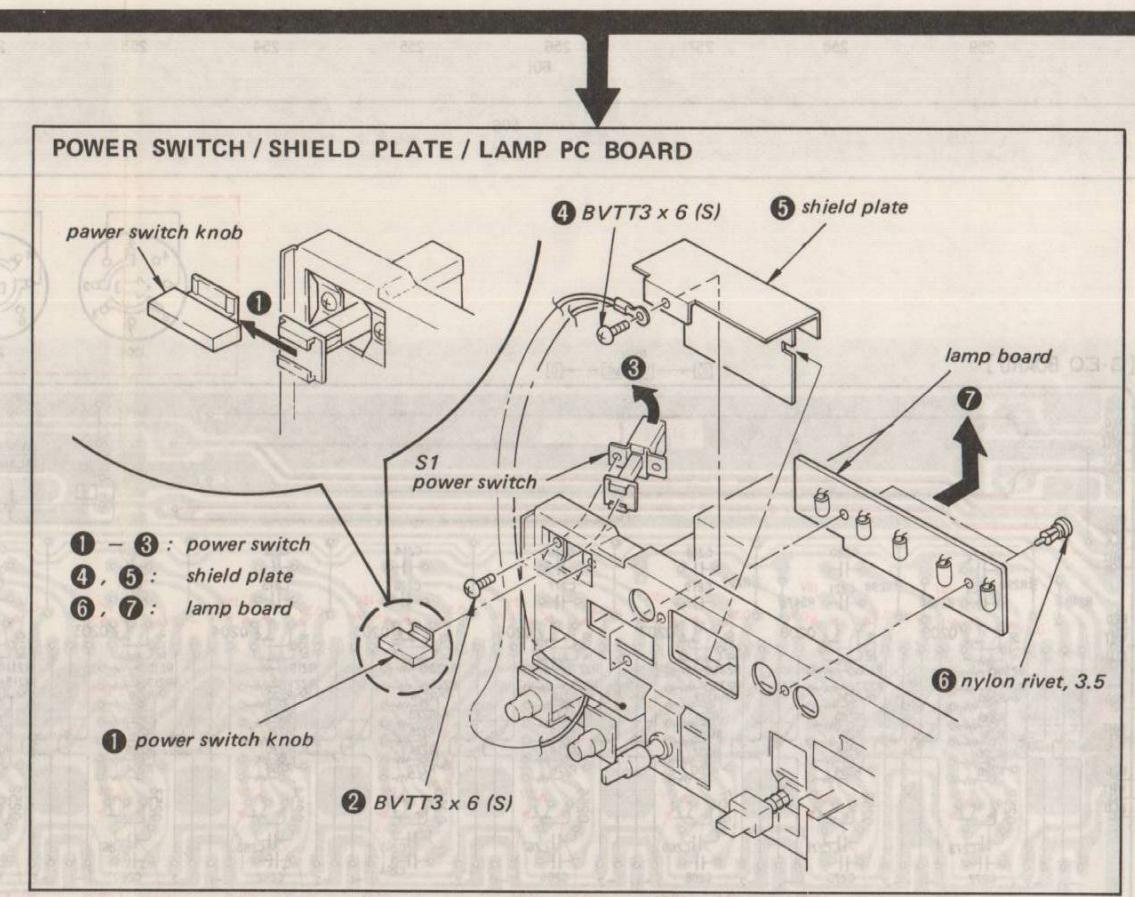
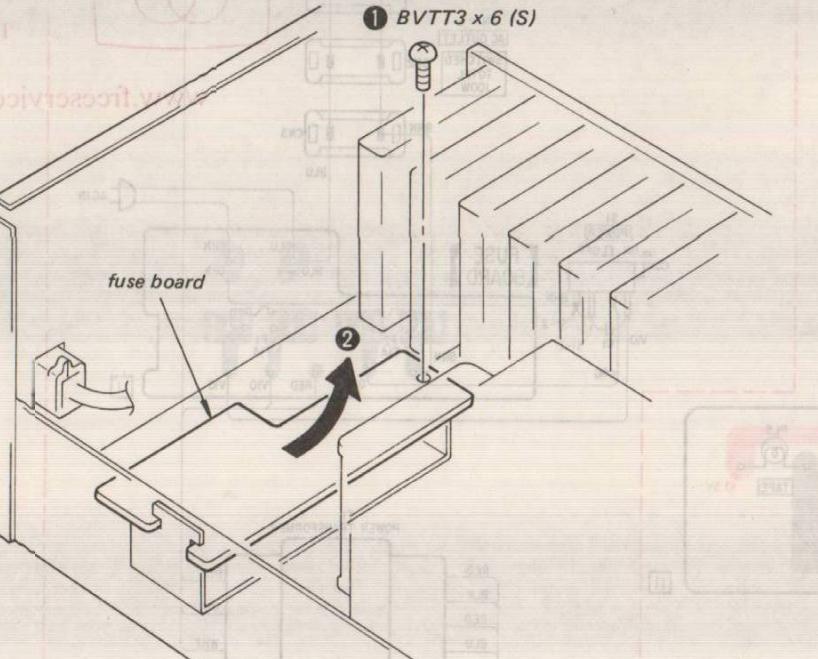
Remove case by taking out four screws securing case.

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

PANEL



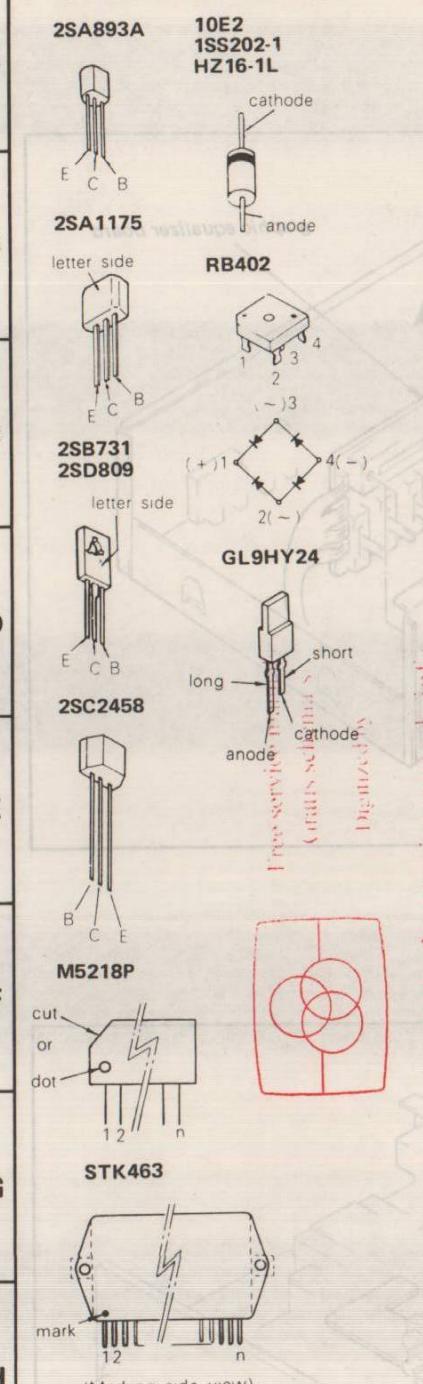
FUSE BOARD



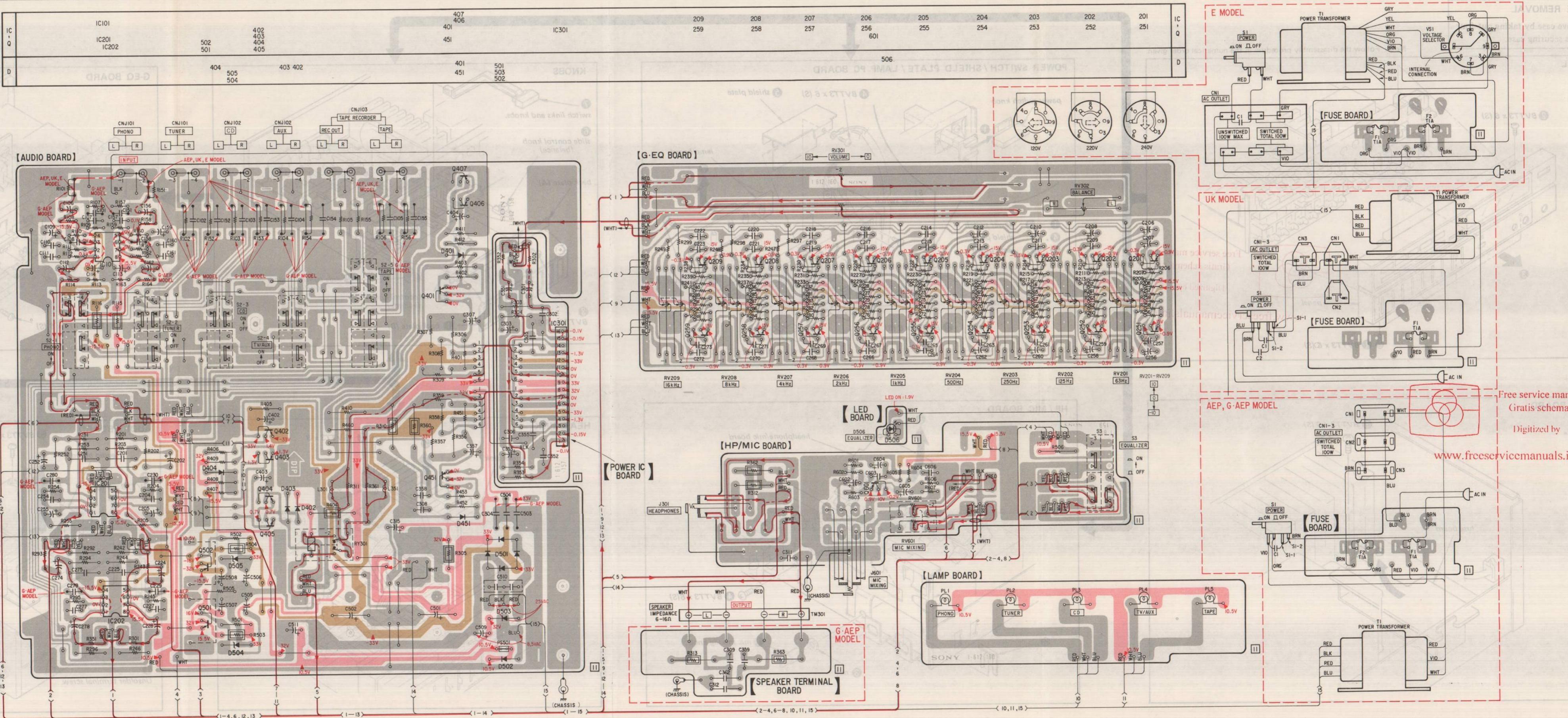
SECTION 3
DIAGRAMS

3-1. MOUNTING DIAGRAM

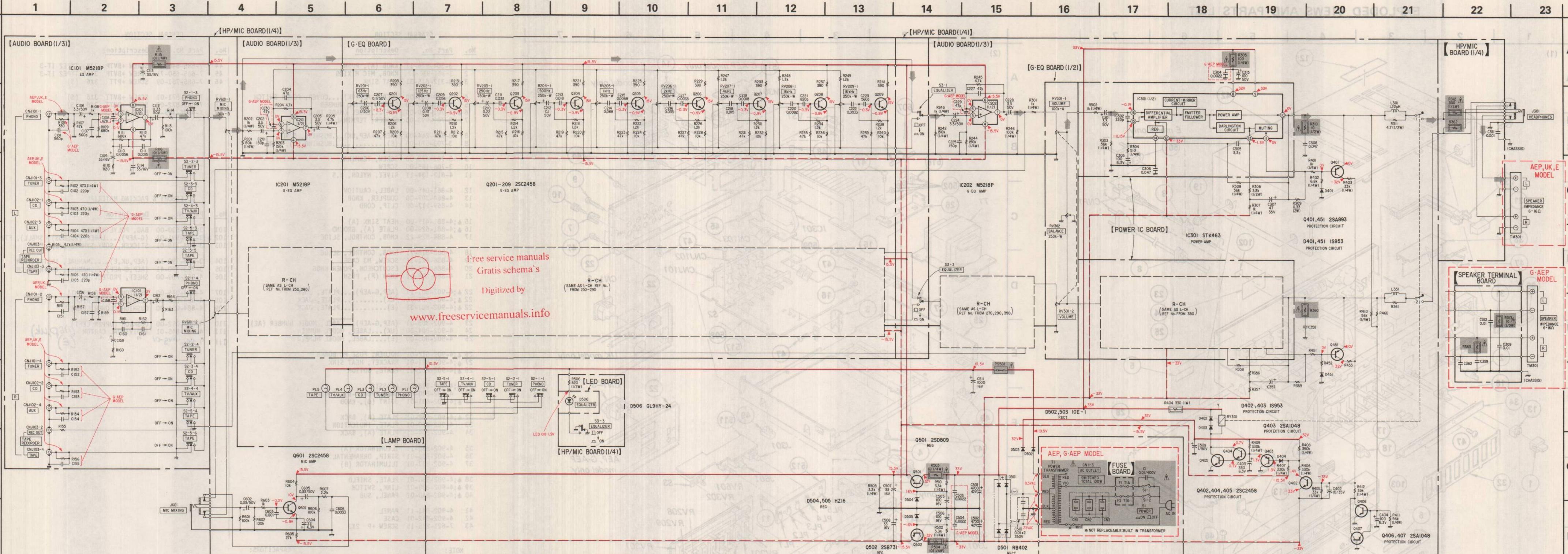
• Semiconductor Lead Layouts



- Note:**
- Color code of sleeving over the end of the jacket.
 - — : parts extracted from the component side.
 - ■ : B+ pattern
 - — : signal path
 - — : L-CH signal path
 - — : R-CH signal path



3-2. SCHEMATIC DIAGRAM



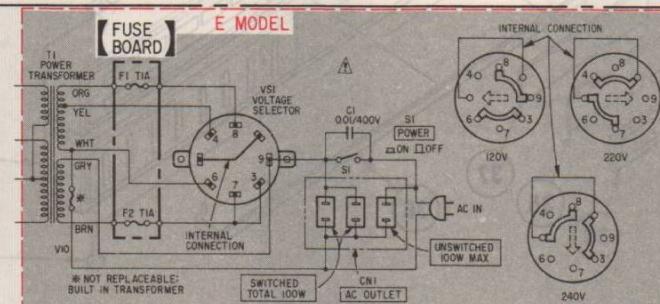
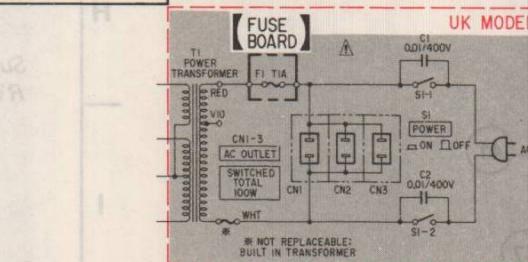
- Note:**
- Components for right channel have same values as for left channel. Reference numbers are coded from 251 (50 up).
 - All capacitors are in μF unless otherwise noted. pF: μpF 50V or less are not indicated except for electrolytics and tantalums.
 - All resistors are in ohms, $1/8\text{W}$ unless otherwise noted. k Ω : 1000 Ω , M Ω : 1000 k Ω .
 - WW- : nonflammable resistor.
 - ADJUSTMENT FOR REPAIR- : adjustment for repair.
 - B+ bus- : B+ bus.
 - B- bus- : B- bus.
 - signal path- : signal path.

- Readings are taken under no-signal conditions with a VOM (50 k Ω /V).
- Switch

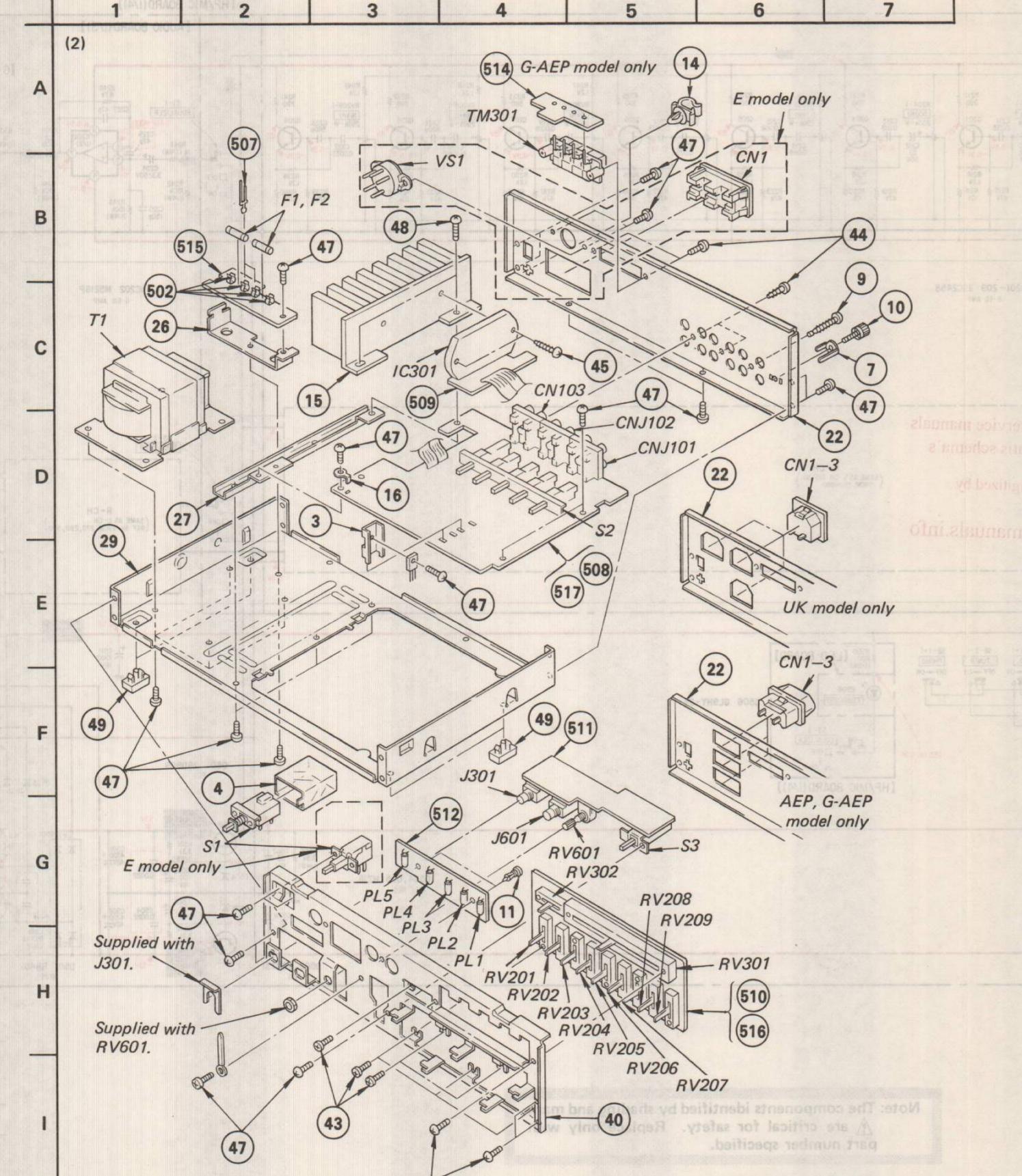
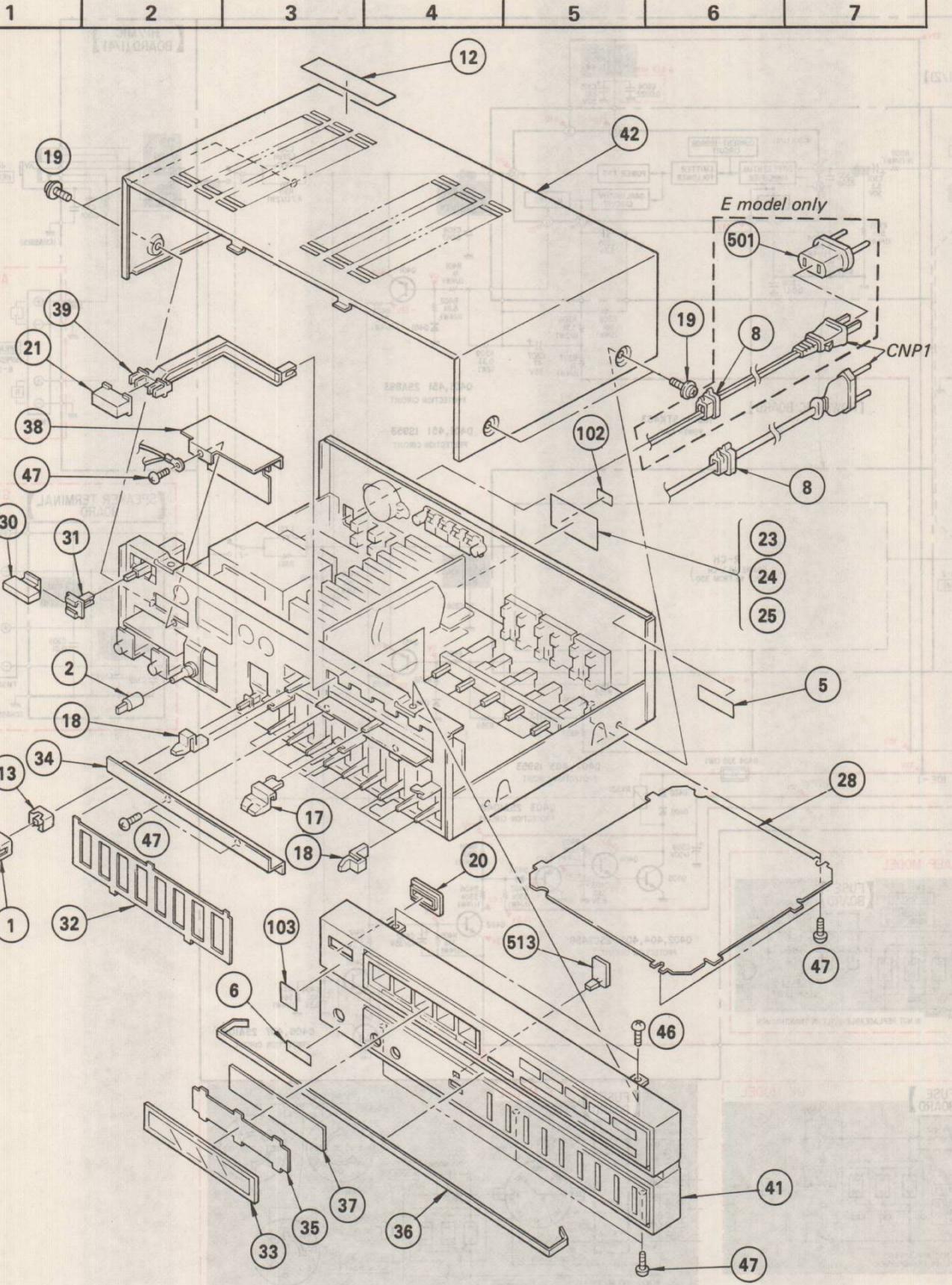
Ref. No.	Switch	Position
S1	POWER	OFF
S2-1	PHONO	ON
S2-2	TUNER	OFF
S2-3	CD	OFF
S2-4	TV/AUX	OFF
S2-5	TAPE	OFF
S3	EQUALIZER	OFF

Note: The components identified by shading and mark \triangle are critical for safety. Replace only with part number specified.

Note: Voltages are measured with a VOM (50k Ω /V).



SECTION 4
EXPLODED VIEWS AND PARTS LIST



GENERAL SECTION			GENERAL SECTION		
No.	Part No.	Description	No.	Part No.	Description
1	3-304-926-11	KNOB (A), PUSH	44	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3
2	3-304-930-12	KNOB, MIC MIXING	45	7-685-650-71	SCREW +BVTP 3X16 TYPE2 IT-3
3	3-312-615-31	HEAT SINK	46	7-685-751-09	SCREW +PTT 3X6 (S)
4	3-559-001-00	(AEP,G-AEP,UK)...COVER, POWER SWITCH	47	7-685-871-01	SCREW +BVTT 3X6 (S)
5	3-701-030-00	LABEL, SERIAL NUMBER (UK)...LABEL (MADE IN JAPAN)	48	7-685-872-09	SCREW +BVTT 3X8 (S)
6	3-701-690-00	SPACER, TERMINAL	49	X-4886-405-1	FOOT ASSY
7	3-701-993-00				
8	3-703-244-00	(AEP,G-AEP,UK)...BUSHING, CORD (E).....BUSHING (S), CORD			
8	3-703-571-00				
9	3-703-473-00	SCREW, TERMINAL			
10	3-706-165-00	SCREW			
11	4-812-134-11	RIVET, NYLON, 3.5			
12	4-861-045-00	LABEL, CAUTION			
13	4-864-307-00	COUPLER, KNOB			
14	4-869-217-00	CLIP, CORD			
15	4-881-415-00	HEAT SINK (A)			
16	4-881-629-00	PLATE (A), GROUND			
17	4-884-829-22	KNOB, CONTROL, SLIDE			
18	4-886-818-71	KNOB, CONTROL, SLIDE			
19	4-886-821-11	SCREW, M3 CASE			
20	4-886-976-00	ESCUTCHEON, POWER KNOB			
21	4-888-208-11	KNOB (F), PUSH			
22	4-902-801-11	(AEP,G-AEP)...PLATE, JACK (UK).....PLATE, JACK (E).....PLATE, JACK			
22	4-902-801-21				
22	4-902-801-31				
23	4-902-803-01	(AEP,G-AEP)...LABEL, MODEL NUMBER (AE)			
24	4-902-804-00	(UK)...LABEL, MODEL NUMBER			
25	4-902-805-00	(E)...LABEL, MODEL NUMBER			
26	4-902-812-01	HOLDER, FUSE PC BOARD			
27	4-902-821-01	BRACKET, HEAT SINK			
28	4-902-822-01	PLATE, BOTTOM			
29	4-902-828-01	CHASSIS			
30	4-902-830-01	KNOB (POWER-S), T TYPE			
31	4-902-831-01	JOINT (G), KNOB			
32	4-902-832-01	PLATE (B), BACK			
33	4-902-833-01	PLATE, INDICATION			
34	4-902-834-01	PLATE (A), BACK			
35	4-902-835-11	ILLUMINATOR (A)			
36	4-902-836-01	STRIP, ORNAMENTAL			
37	4-902-837-01	ILLUMINATOR (B)			
38	4-902-838-01	PLATE, SHIELD			
39	4-902-839-01	LINK, SWITCH			
40	4-902-840-01	PANEL, SUB			
41	4-902-841-11	PANEL			
42	4-902-842-01	CASE			
43	7-621-255-15	SCREW +P 2X3			

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- 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 numbers ($\Delta-\Delta\Delta-\Delta\Delta-\Delta\Delta-X$ or $\Delta-\Delta\Delta\Delta-\Delta\Delta-\Delta\Delta-X$) may be different from those used in the set.
- 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: μ F, PF: μ F.

RESISTORS:

• All resistors are in ohms.

• F : nonflammable

COILS

• MMH : mH, UH : μ H

SEMICONDUCATORS

In each case, U : μ , for example:UA : μ A, UPAs : μ PA..., UPC : μ PC,UPD : μ PD...

ELECTRICAL PARTS

Ref. No.	Part No.	Description	Q'ty	Vol.	Ref. No.	Part No.	Description	Q'ty	Vol.
501	Δ.1-526-565-00	(E)...AC PLUG ADAPTOR	1	230V	C209	1-130-629-00	FILM	0.056MF	5%
502	1-533-131-00	HOLDER, FUSE	1	230V	C210	1-123-608-00	ELECT	0.22MF	20%
503	Δ;1-535-115-00	TERMINAL	1	230V	C211	1-130-626-00	FILM	0.033MF	5%
504	Δ;1-535-116-00	TERMINAL	1	230V	C212	1-123-607-00	ELECT	0.1MF	20%
505	Δ;1-535-139-00	(AEP,G-AEP,E)...BASE POST 22MM (10MM PITCH) 2P	1	230V	C213	1-130-623-00	FILM	0.018MF	5%
506	Δ;1-535-140-00	BASE POST 22MM (10MM PITCH) 3P	1	230V	C214	1-130-630-00	FILM	0.068MF	5%
507	1-535-416-00	(AEP,G-AEP)...TERMINAL	1	230V	C215	1-108-575-00	MYLAR	0.0068MF	5%
508	Δ;1-612-156-11	PC BOARD, AUDIO	1	230V	C216	1-130-626-00	FILM	0.033MF	5%
509	Δ;1-612-157-11	PC BOARD, POWER IC	1	230V	C217	1-108-567-00	MYLAR	0.0033MF	5%
510	Δ;1-612-158-11	PC BOARD, G.EQ	1	230V	C218	1-130-622-00	FILM	0.015MF	5%
511	Δ;1-612-159-11	PC BOARD, HP/MIC	1	230V	C219	1-108-561-00	MYLAR	0.0018MF	5%
512	Δ;1-612-160-11	PC BOARD, LAMP	1	230V	C220	1-108-577-00	MYLAR	0.0082MF	5%
513	Δ;1-612-161-11	PC BOARD, LED	1	230V	C221	1-102-117-00	CERAMIC	820PF	10%
514	Δ;1-612-162-11	(G-AEP)...PC BOARD, SPEAKER TERMINAL	1	230V	C222	1-108-567-00	MYLAR	0.0033MF	5%
515	Δ;1-612-163-11	PC BOARD, FUSE	1	230V	C223	1-102-115-00	CERAMIC	560PF	10%
516	Δ;A-4375-189-A	MOUNTED PCB, G.EQ	1	230V	C224	1-123-382-00	ELECT	3.3MF	20%
517	Δ;A-4388-384-A	(AEP,UK,E)...MOUNTED PCB, AUDIO	1	230V	C225	1-161-313-00	CERAMIC	150PF	10%
517	Δ;A-4388-385-A	(G-AEP)...MOUNTED PCB, AUDIO	1	230V	C227	1-101-880-00	CERAMIC	47PF	5%
C1	Δ 1-161-744-00	(AEP,G-AEP,UK)...CAP, CERAMIC	1	230V	C228	1-123-382-00	ELECT	3.3MF	20%
		0.01MF FZ 400V			C229	1-101-880-00	CERAMIC	47PF	5%
C1	Δ 1-161-937-00	(E)...CAP, CERAMIC	1	230V	C230	1-101-880-00	CERAMIC	47PF	5%
C2	Δ 1-161-744-00	(AEP,G-AEP,UK)...CAP, CERAMIC	1	230V	C301	1-123-382-00	ELECT	3.3MF	20%
C2	Δ 1-161-937-00	(E)...CAP,CERAMIC	1	230V	C302	1-102-978-00	CERAMIC	220PF	5%
		0.01MF FZ 400V		C303	1-123-295-00	ELECT	100MF	20%	
		0.01MF 250V		C304	1-161-326-00	(G-AEP)...CERAMIC	0.0022MF	30%	
C101	1-102-115-00	CERAMIC	560PF	10%	C305	1-161-253-00	CERAMIC	3.3PF	10%
C102	1-161-315-00	(G-AEP)...CERAMIC	220PF	10%	C306	1-108-246-00	MYLAR	0.047MF	10%
C103	1-161-315-00	(G-AEP)...CERAMIC	220PF	10%	C307	1-123-359-00	ELECT	47MF	20%
C104	1-161-315-00	(G-AEP)...CERAMIC	220PF	10%	C308	1-108-246-00	MYLAR	0.047MF	10%
C105	1-161-315-00	(G-AEP)...CERAMIC	220PF	10%	C309	1-108-579-00	(G-AEP)...MYLAR	0.01MF	5%
C106	1-123-382-00	ELECT	3.3MF	20%	C311	1-102-074-00	CERAMIC	0.001MF	10%
C107	1-102-115-00	CERAMIC	560PF	10%	C312	1-108-239-00	(G-AEP)...MYLAR	0.01MF	10%
C108	1-101-880-00	CERAMIC	47PF	5%	C315	1-123-513-00	ELECT	100MF	20%
C109	1-123-318-00	ELECT	33MF	20%	C402	1-123-341-00	ELECT	10MF	20%
C110	1-108-573-00	MYLAR	0.0056MF	5%	C403	1-123-309-00	ELECT	330MF	20%
C111	1-108-559-00	MYLAR	0.0015MF	5%	C404	1-123-307-00	ELECT	100MF	20%
C112	1-123-609-00	ELECT	0.33MF	20%	C501	1-124-362-00	ELECT	4700MF	20%
C113	1-123-318-00	ELECT	33MF	20%	C502	1-124-362-00	ELECT	4700MF	20%
C114	1-123-318-00	ELECT	33MF	20%	C503	1-161-326-00	(G-AEP)...CERAMIC	0.0022MF	30%
C201	1-161-313-00	CERAMIC	150PF	10%	C504	1-161-326-00	(G-AEP)...CERAMIC	0.0022MF	30%
C202	1-123-382-00	ELECT	3.3MF	20%	C505	1-123-333-00	ELECT	100MF	20%
C204	1-101-880-00	CERAMIC	47PF	5%	C506	1-123-333-00	ELECT	100MF	20%
C205	1-123-382-00	ELECT	3.3MF	20%	C507	1-123-318-00	ELECT	33MF	20%
C206	1-123-611-00	ELECT	1MF	20%	C508	1-123-318-00	ELECT	33MF	20%
C207	1-123-607-00	ELECT	0.1MF	20%	C509	1-123-380-00	ELECT	1MF	20%
C208	1-123-610-00	ELECT	0.47MF	20%	C509	1-123-380-00	ELECT	1MF	20%

NOTE:
 The mechanical parts with no reference number in the exploded views are not supplied.
 Items marked "Δ" 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 numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.
 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.

MF:μF, PF:μμF.

RESISTORS

All resistors are in ohms.
 F : nonflammable

COILS

MH : mH, UH : μH

SEMICONDUCTORS

In each case, U : μ, for example:
 UA...: uA..., UPA...: uPA..., UPC...: uPC,
 UPD...: uPD...

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref. No.	Part No.	Description	Value	Tolerance	Power
R101	1-247-819-00	(G-AEP) ... CARBON	330	5%	1/6W
R102	1-247-123-00	CARBON	470	5%	1/4W
R103	1-247-123-00	CARBON	470	5%	1/4W
R104	1-247-123-00	CARBON	47K	5%	1/6W
R105	1-247-147-00	CARBON	4.7K	5%	1/4W
R106	1-247-123-00	CARBON	470	5%	1/4W
R107	1-247-871-00	CARBON	47K	5%	1/6W
R108	1-247-831-00	CARBON	1K	5%	1/6W
R109	1-247-899-00	CARBON	680K	5%	1/6W
R110	1-247-829-00	CARBON	820	5%	1/6W
R111	1-247-899-00	CARBON	680K	5%	1/6W
R112	1-247-871-00	CARBON	47K	5%	1/6W
R113	1-247-879-00	CARBON	100K	5%	1/6W
R114	1-247-831-00	CARBON	1K	5%	1/6W
R115	△.1-247-083-00	CARBON	10	5%	1/4W F
R116	△.1-247-083-00	CARBON	10	5%	1/4W F
R201	1-246-525-00	CARBON	150K	5%	1/4W
R202	1-247-131-00	CARBON	1K	5%	1/4W
R203	1-246-525-00	CARBON	150K	5%	1/4W
R204	1-247-847-00	CARBON	4.7K	5%	1/6W
R205	1-247-147-00	CARBON	4.7K	5%	1/4W
R206	1-247-833-00	CARBON	1.2K	5%	1/6W
R207	1-247-871-00	CARBON	47K	5%	1/6W
R208	1-247-855-00	CARBON	10K	5%	1/6W
R209	1-247-821-00	CARBON	390	5%	1/6W
R210	1-247-833-00	CARBON	1.2K	5%	1/6W
R211	1-247-871-00	CARBON	47K	5%	1/6W
R212	1-247-855-00	CARBON	10K	5%	1/6W
R213	1-247-821-00	CARBON	390	5%	1/6W
R214	1-247-833-00	CARBON	1.2K	5%	1/6W
R215	1-247-871-00	CARBON	47K	5%	1/6W
R216	1-247-855-00	CARBON	10K	5%	1/6W
R217	1-247-821-00	CARBON	390	5%	1/6W
R218	1-247-833-00	CARBON	1.2K	5%	1/6W
R219	1-247-871-00	CARBON	47K	5%	1/6W
R220	1-247-855-00	CARBON	10K	5%	1/6W
R221	1-247-821-00	CARBON	390	5%	1/6W
R222	1-247-833-00	CARBON	1.2K	5%	1/6W
R223	1-247-871-00	CARBON	47K	5%	1/6W
R224	1-247-855-00	CARBON	10K	5%	1/6W
R225	1-247-821-00	CARBON	390	5%	1/6W
R226	1-247-833-00	CARBON	1.2K	5%	1/6W
R227	1-247-871-00	CARBON	47K	5%	1/6W
R228	1-247-855-00	CARBON	10K	5%	1/6W
R229	1-247-821-00	CARBON	390	5%	1/6W

ELECTRICAL PARTS

Ref. No.	Part No.	Description	Value	Tolerance	Power
R230	1-247-833-00	CARBON	1.2K	5%	1/6W
R231	1-247-871-00	CARBON	47K	5%	1/6W
R232	1-247-855-00	CARBON	10K	5%	1/6W
R233	1-247-821-00	CARBON	390	5%	1/6W
R234	1-247-833-00	CARBON	1.2K	5%	1/6W
R235	1-247-871-00	CARBON	47K	5%	1/6W
R236	1-247-855-00	CARBON	10K	5%	1/6W
R237	1-247-821-00	CARBON	390	5%	1/6W
R238	1-247-833-00	CARBON	1.2K	5%	1/6W
R239	1-247-871-00	CARBON	47K	5%	1/6W
R240	1-247-855-00	CARBON	10K	5%	1/6W
R241	1-247-821-00	CARBON	390	5%	1/6W
R242	1-246-525-00	CARBON	150K	5%	1/4W
R243	1-247-131-00	CARBON	1K	5%	1/4W
R244	1-246-525-00	CARBON	150K	5%	1/4W
R245	1-247-847-00	CARBON	4.7K	5%	1/6W
R246	1-247-179-00	CARBON	100K	5%	1/4W
R247	1-247-833-00	CARBON	1.2K	5%	1/6W
R248	1-247-833-00	CARBON	1.2K	5%	1/6W
R249	1-247-833-00	CERAMIC	1.2K	5%	1/6W
R301	1-247-131-00	CARBON	1K	5%	1/4W
R302	1-247-131-00	CARBON	1K	5%	1/4W
R303	1-247-173-00	CARBON	56K	5%	1/4W
R304	1-246-466-00	CARBON	510	5%	1/4W
R305	△.1-247-107-00	CARBON	100	5%	1/4W F
R306	1-244-885-00	CARBON	3.3K	5%	1/2W
R307	1-247-131-00	CARBON	1K	5%	1/4W
R308	1-247-173-00	CARBON	56K	5%	1/4W
R309	1-207-615-00	RES, METAL PLATE	0.33	2W	
R310	△.1-247-192-00	(G-AEP) ... CARBON	10	5%	1/2W F
R311	1-244-817-00	CARBON	4.7	5%	1/2W
R312	△.1-247-228-00	CARBON	330	5%	1/2W F
R313	△.1-247-192-00	(G-AEP) ... CARBON	10	5%	1/2W F
R360	△.1-247-192-00	CARBON	10	5%	1/2W F
R362	△.1-247-228-00	CARBON	330	5%	1/2W F
R363	△.1-247-192-00	CARBON	10	5%	1/2W F
R401	1-247-131-00	CARBON	1K	5%	1/4W
R402	1-247-151-00	CARBON	6.8K	5%	1/4W
R403	1-247-167-00	CARBON	33K	5%	1/4W
R404	1-213-137-00	METAL OXIDE	330	5%	1W F
R405	1-247-167-00	CARBON	33K	5%	1/4W
R406	1-246-533-00	CARBON	330K	5%	1/4W
R407	1-246-533-00	CARBON	330K	5%	1/4W
R408	1-246-535-00	CARBON	390K	5%	1/4W
R409	1-246-533-00	CARBON	330K	5%	1/4W

ELECTRICAL PARTS

Ref. No.	Part No.	Description	Value	Tolerance	Power
R410	1-247-173-00	CARBON	56K	5%	1/4W
R411	1-247-173-00	CARBON	56K	5%	1/4W
R412	1-247-167-00	CARBON	33K	5%	1/4W
R460	1-247-173-00	CARBON	56K	5%	1/4W
R501	1-246-485-00	CARBON	3.3K	5%	1/4W
R502	1-246-485-00	CARBON	3.3K	5%	1/4W
R503	△.1-247-083-00	CARBON	10	5%	1/4W F
R504	△.1-247-083-00	CARBON	10	5%	1/4W F
R505	1-246-485-00	CARBON	3.3K	5%	1/4W
R506	1-244-871-00	CARBON	820	5%	1/2W
R601	1-247-879-00	CARBON	100K	5%	1/6W
R602	1-247-879-00	CARBON	100K	5%	1/6W
R603	1-247-831-00	CARBON	1K	5%	1/6W
R604	1-247-855-00	CARBON	10K	5%	1/6W
R605	1-247-865-00	CARBON	27K	5%	1/6W
R606	1-247-879-00	CARBON	100K	5%	1/6W
R607	1-247-839-00	CARBON	2.2K	5%	1/6W
V201	1-153-385-00	EFFECT	100	5%	1/6W
V202	1-153-385-00	EFFECT	100	5%	1/6W
V203	1-153-385-00	EFFECT	100	5%	1/6W
V204	1-153-385-00	EFFECT	100	5%	1/6W
V205	1-153-385-00	EFFECT	100	5%	1/6W
V206	1-153-385-00	EFFECT	100	5%	1/6W
V207	1-153-385-00	EFFECT	100	5%	1/6W
V208	1-153-385-00	EFFECT	100	5%	1/6W
V209	1-153-385-00	EFFECT	100	5%	1/6W