

TA-AX230 / AX235 / AX4060

SERVICE MANUAL



PHOTO : TA-AX230

TA-AX230:
AEP Model
G-AEP Model
UK Model
AUS Model

TA-AX235:
AEP Model
UK Model

TA-AX4060:
G-AEP Model

TA-AX235 is an integrated stereo amplifiers in SEN-200.

SPECIFICATIONS

Amplifier section
 Continuous RMS power output (both channels driven simultaneously) At 1 kHz, 5% THD
 40 + 40 watts (8 ohms)
 At 1 kHz, 0.08% THD
 35 + 35 watts (8 ohms)
 At 40 kHz - 20 kHz, 0.08% THD
 30 + 30 watts (8 ohms)

Peak music power output (Type 3)
 300 W (8 ohms, 5% THD)

Music power output (Type 3)
 150 W (8 ohms, 5% THD)

Power bandwidth (IHF)
 20 Hz - 30 kHz (8 ohms, 25 W)

Dynamic headroom
 1.2 dB ('78 IHF)

Harmonic distortion
 Less than 0.08% at rated output distortion

Intermodulation
 Less than 0.08% at rated output (IF) (60 Hz: 7 kHz = 4:1)

Frequency response
 PHONO: RIAA equalization curve ± 0.5 dB
 TUNER/CD/VIDEO/TAPE
 TA-AX230: 16 Hz - 70 kHz ± 3.0 dB
 TA-AX235/AX4060: 15 Hz - 70 kHz ± 3.0 dB

Residual noise
 Less than 100 µV (8 ohms, network A)

Damping factor
 36 (8 ohms, 1 kHz)

Input

	Sensitivity	Impedance
PHONO	2.0 mV	50 kohms
TUNER CD VIDEO TAPE	150 mV	50 kohms

Outputs

RECOUT
 Voltage 150 mV
 Impedance 470 ohms

SPEAKER
 Accepts speakers of 8 - 16 ohms

HEADPHONES
 Accepts low and high impedance headphones

-Continued on Page 2-

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND 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.

INTEGRATED STEREO AMPLIFIER
SONY



Graphic equalizer 100 Hz: ± 10 dB
 400 Hz: ± 10 dB
 1 kHz: ± 10 dB
 4 kHz: ± 10 dB
 12 kHz: ± 7 dB

General System

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

Power requirements

AEP G-AEP MODEL: 220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50/60 Hz
 UK, AUS MODEL: 240 V ac (or 220 V ac adjustable by authorized Sony personnel), 50/60 Hz

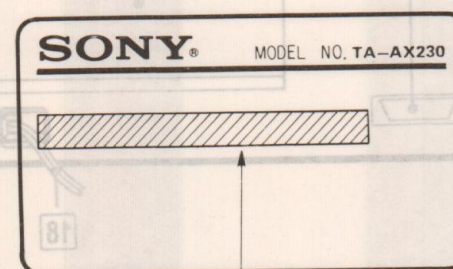
Power consumption

TA-AX230: AEP,G-AEP/AX-4060: 75W
 TA-AX230: UK, AUS: 175 W
 TA-AX235: AEP: 95 W
 TA-AX235: UK: 195 W
 TA-AX230/AX4060: 3 switched total 100 watts max.

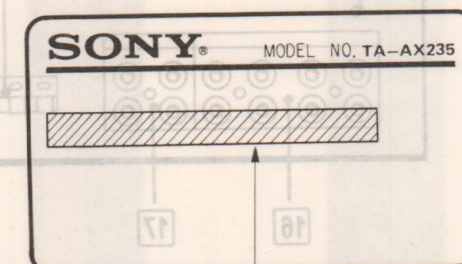
Dimensions
 TA-AX230: AEP ,G-AEP,UK/AX-4060:
 Approx. 430 x 105 x 255 mm
 (17 1/8 x 4 1/4 x 10 1/8 inches)
 TA-AX230: AUS/AX235:
 Approx. 430 x 105 x 250 mm
 (17 1/8 x 4 1/4 x 9 1/8 inches)

Weight
 TA-AX230/AX4060: Approx. 4.5 kg (9 lbs 15 oz) net
 TA-AX235: Approx. 5.0 kg(11 lb) net

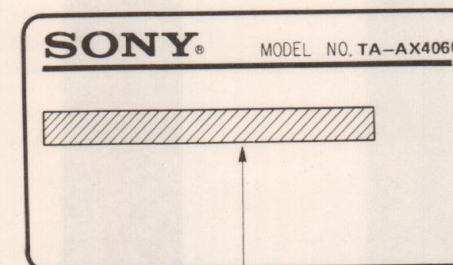
MODEL IDENTIFICATION - Specification Label -



TA-AX230:
 AEP model: AC 220V ~ 50/60Hz 75W
 UK model: AC 240V ~ 50/60Hz 175W
 G-AEP model: AC 220V ~ 50/60Hz 75W
 AUS model: AC 240V ~ 50/60Hz 175W



TA-AX235:
 AEP model: AC 220V ~ 50/60Hz 95W
 UK model: AC 240V ~ 50/60Hz 195W



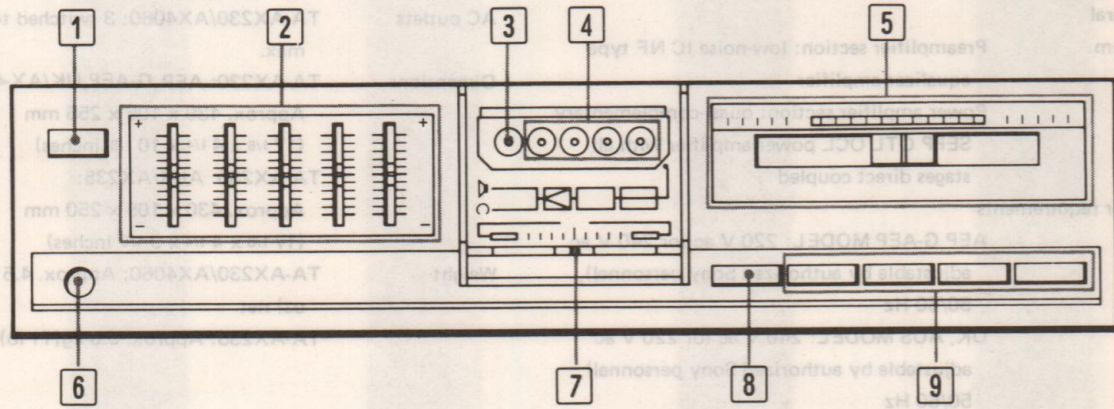
TA-AX4060:
 G-AEP model: AC 220V ~ 50/60Hz 75W



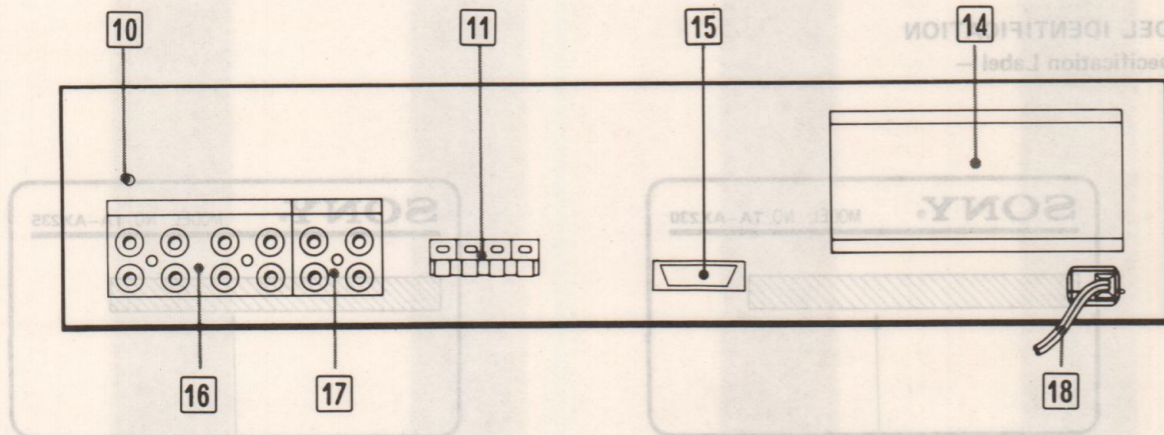
SECTION 1
OUTLINE

1-1. FUNCTION OF CONTROL

Front panel



Rear panel



FRONT PANEL

1 POWER switch

Turns the operating power on or off.

2 GRAPHIC EQUALIZER controls

To equalize the listening sound, slide each control upwards to increase the level of the frequency band, and downwards to decrease the level.

100 Hz: Use to boost or cut the bass.

400 Hz: Use to adjust the middle frequency range.

1 kHz: Use to provide more presence of vocals.

4 kHz: Use to adjust the brightness of sound.

12 kHz: This control effects general treble. Slide downwards to reduce high frequency noise, such as tape hiss.

To record or listen to the sound with the original tone quality, set all the controls at their center positions.

3 TAPE indicator

Lights up when the MONITOR TAPE button is depressed.

4 FUNCTION display

Shows the audio input source in use when the appropriate button is depressed.

5 VOLUME control and indicator

Adjusts the sound level.

6 HEADPHONES jack (stereo phone jack)

The headphone volume can be adjusted with the VOLUME control. sound from the speaker will be cut off when a plug is inserted to this jack.

7 BALANCE control

Adjusts the balance of the left and right channel output level.

8 MONITOR TAPE button

For listening to a taped program.

9 FUNCTION buttons

VIDEO: For listening to or recording the sound from the video equipment or an auxiliary programs (connected to VIDEO inputs).

CD: For listening to or recording the compact disc programs.

TUNER: For listening to or recording radio programs.

PHONO: For listening to or recording disc programs.

REAR PANEL

10 Ground terminal (⏏)

To prevent hum, be sure to connect the ground wire of the turntable system.

11 SPEAKER connector

14 AC OUTLETS (TA-AX230: AEP, G-AEP, UK/AX4060 only)

15 SYSTEM CONTROL connector (TA-AX235 only)

16 INPUT jacks (phono jack)

PHONO: Accept the outputs of a turntable system.

TUNER: Accept the outputs of a tuner.

CD: Accept the outputs of a CD player.

VIDEO: Accept the audio outputs of a video recorder.

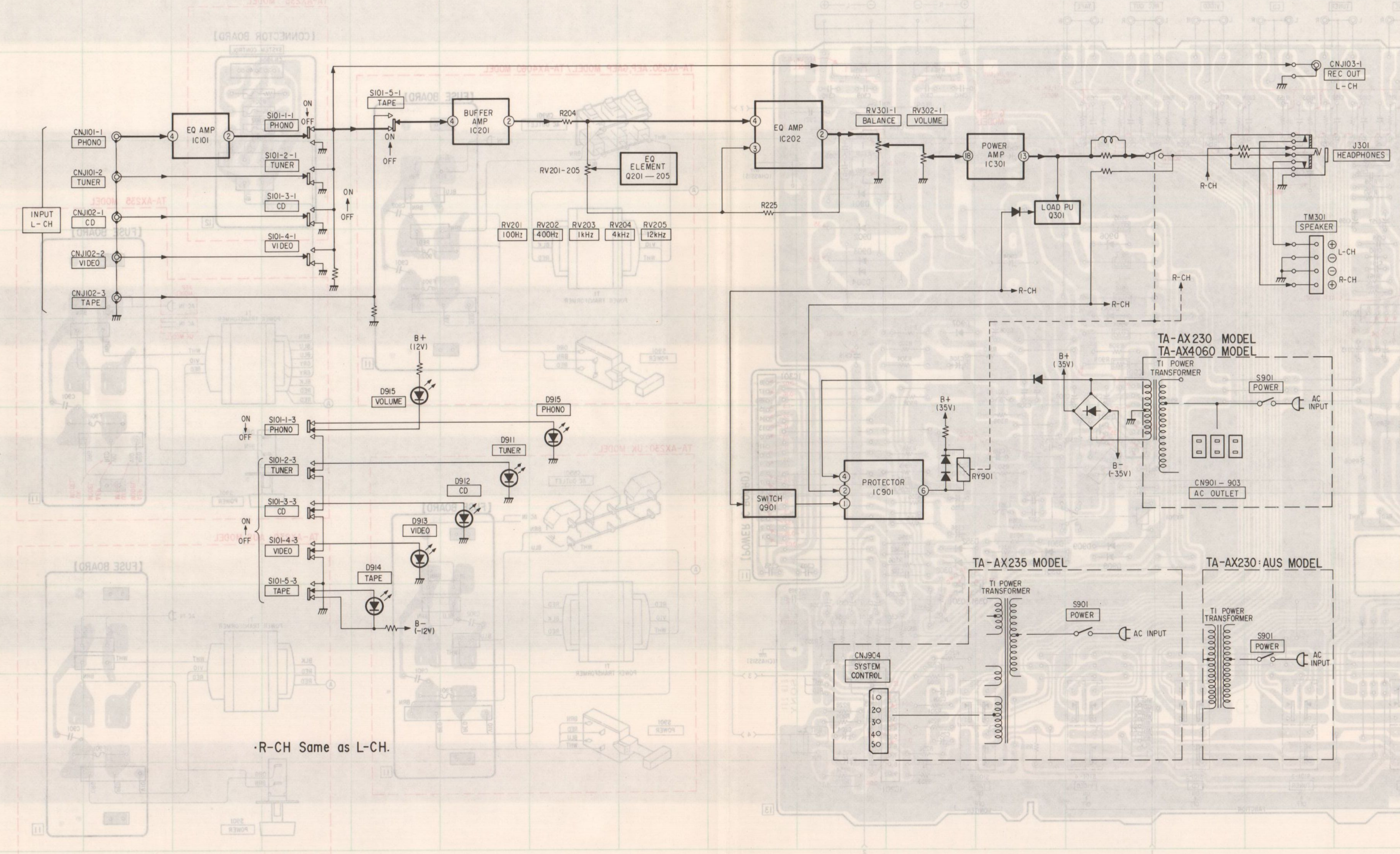
17 TAPE RECORDER jacks (phono jack)

REC OUT: For recording a program source connected to the amplifier.

TAPE: For monitoring a taped program.

18 Power cord

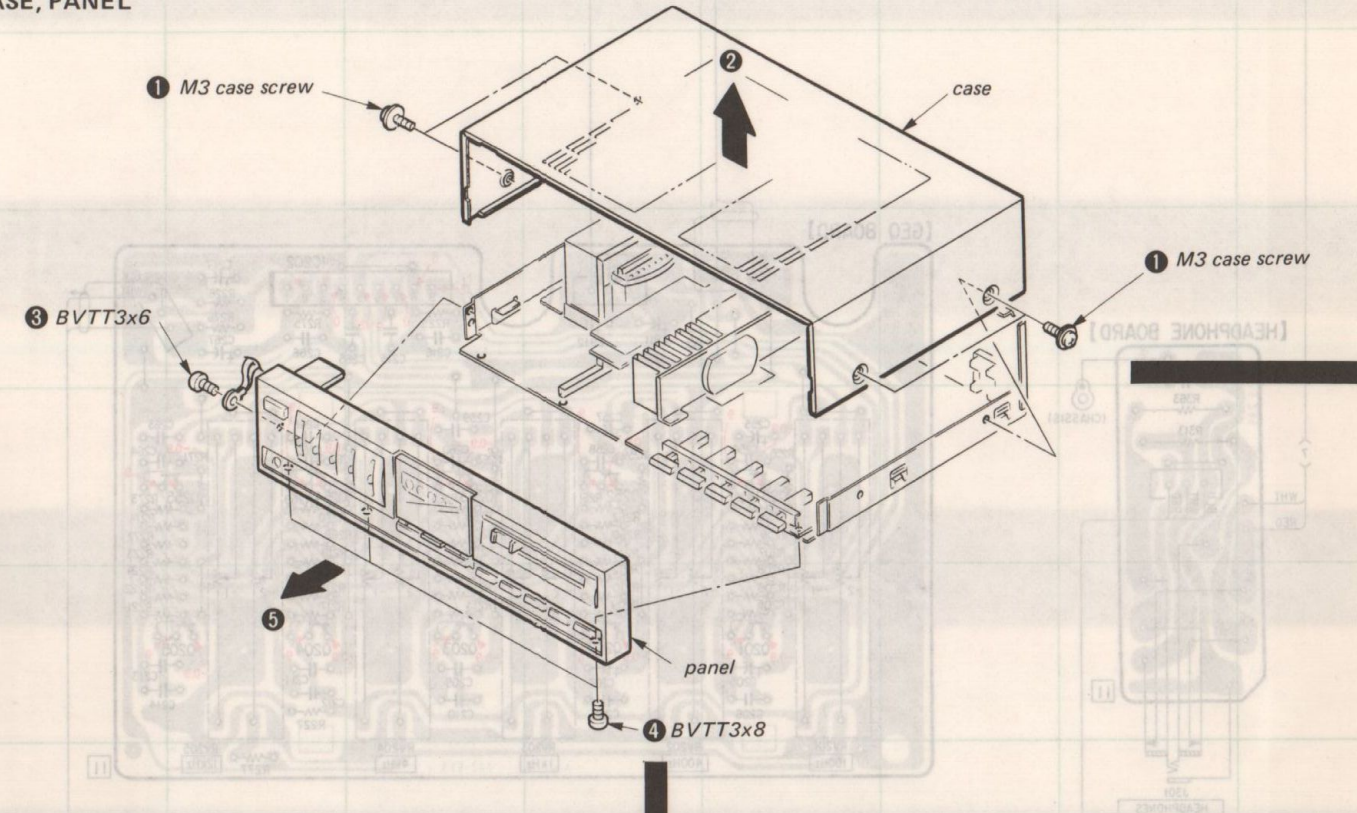
1-2. BLOCK DIAGRAM



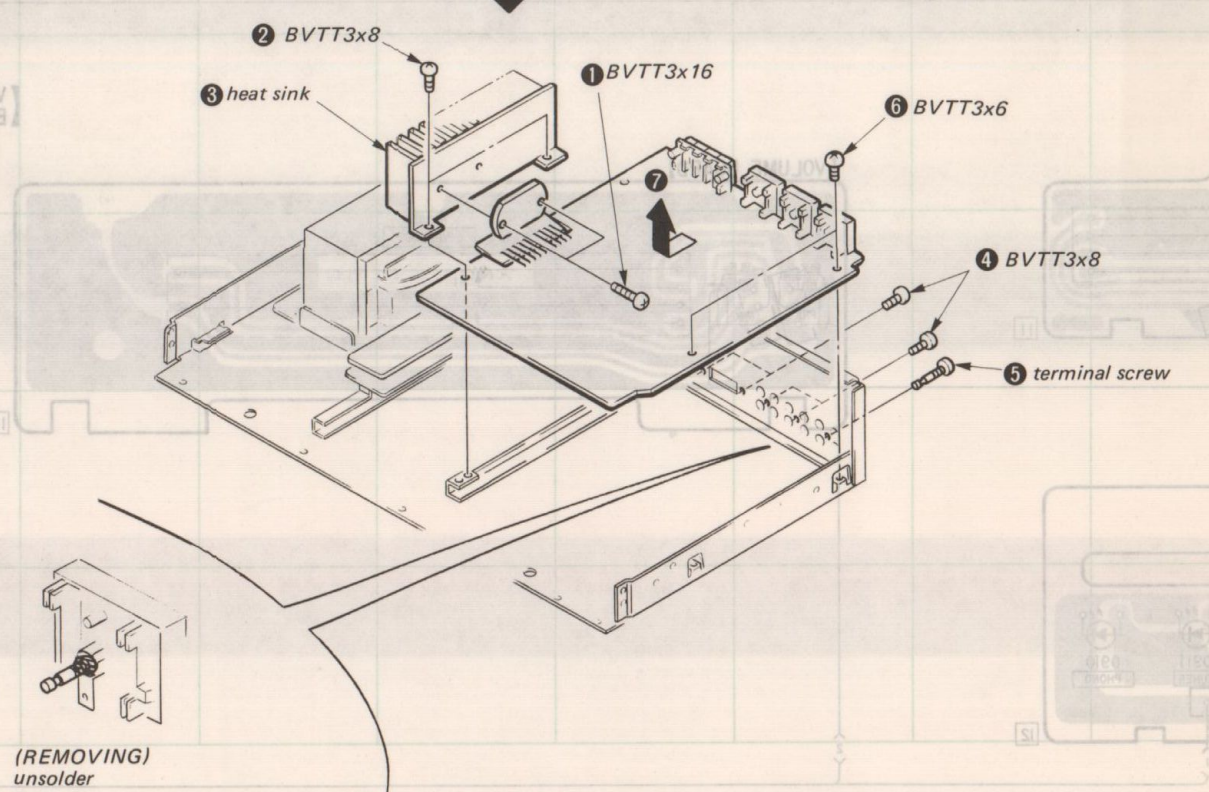
SECTION 2
DISASSEMBLY

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

CASE, PANEL



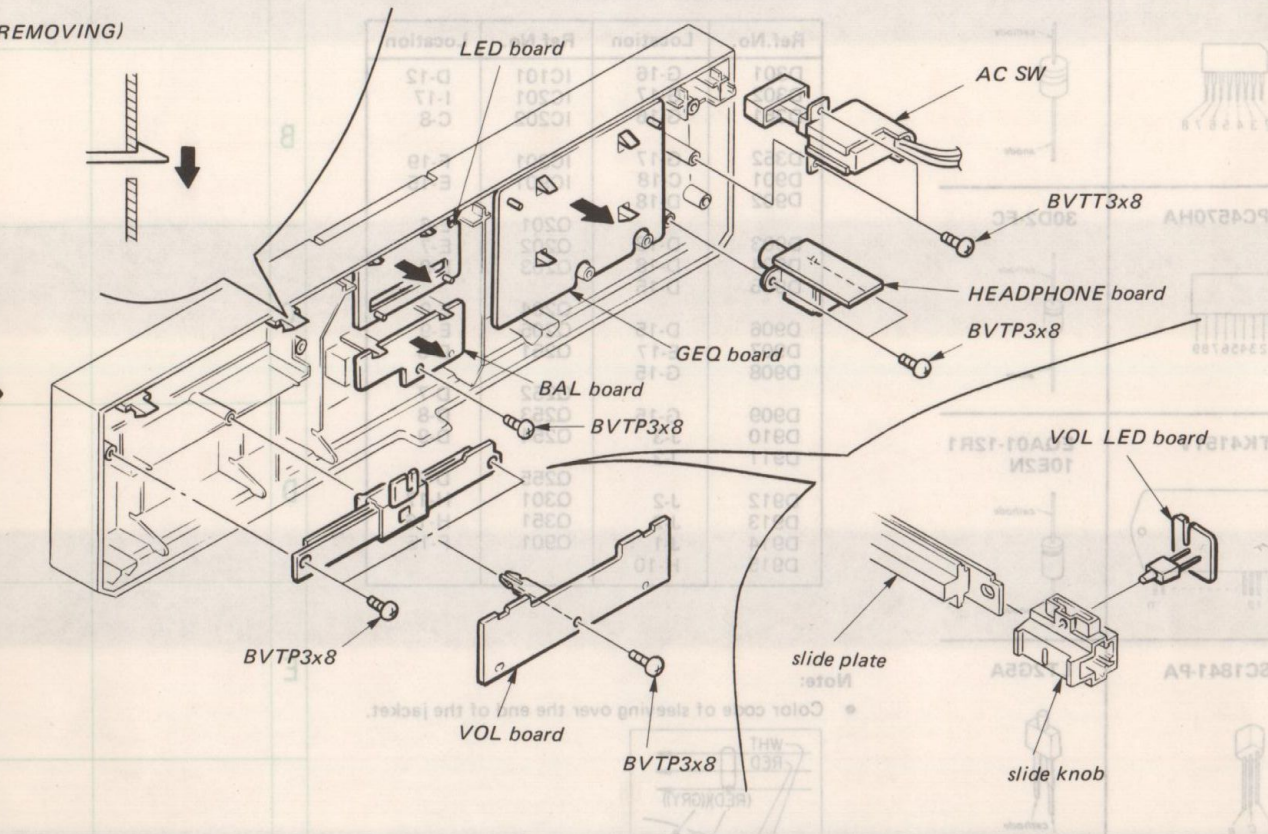
HEAT SINK, MAIN BOARD



SECTION 3
DIAGRAMS

HEADPHONE, GEO, LED, BAL, VOL, VOL LED BOARD AND AC SW

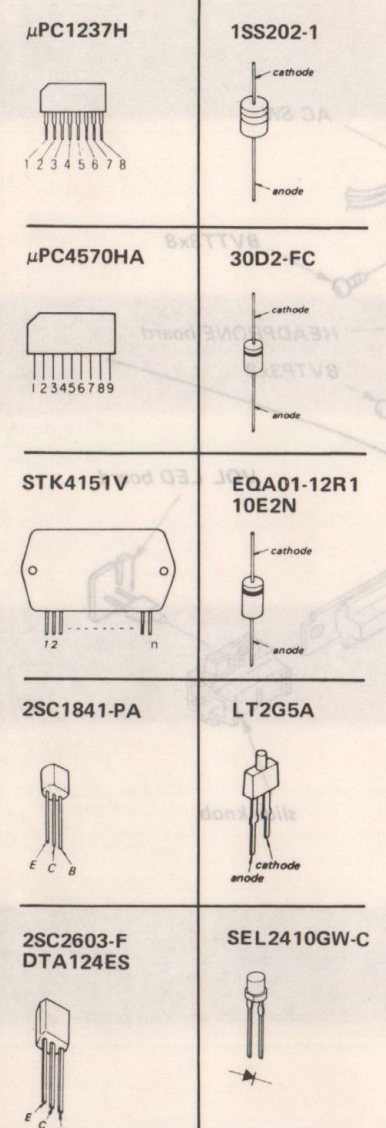
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SECTION 3 DIAGRAMS

3-1. MOUNTING DIAGRAM

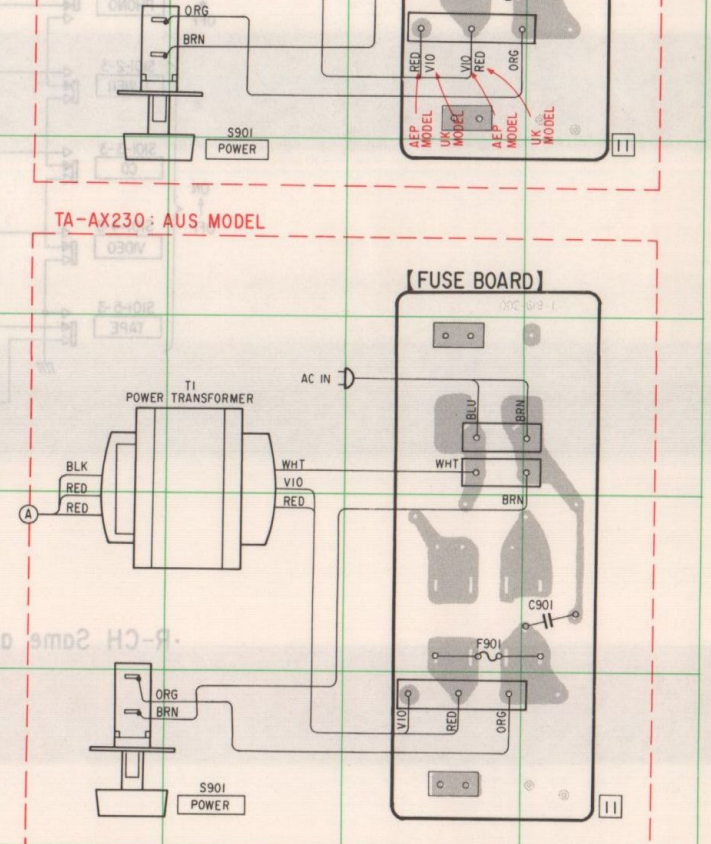
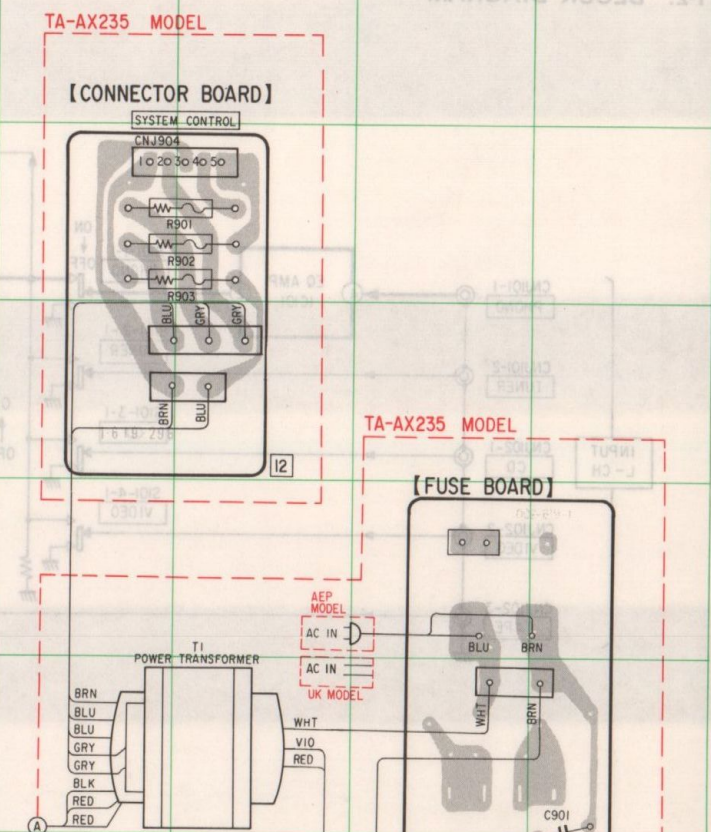
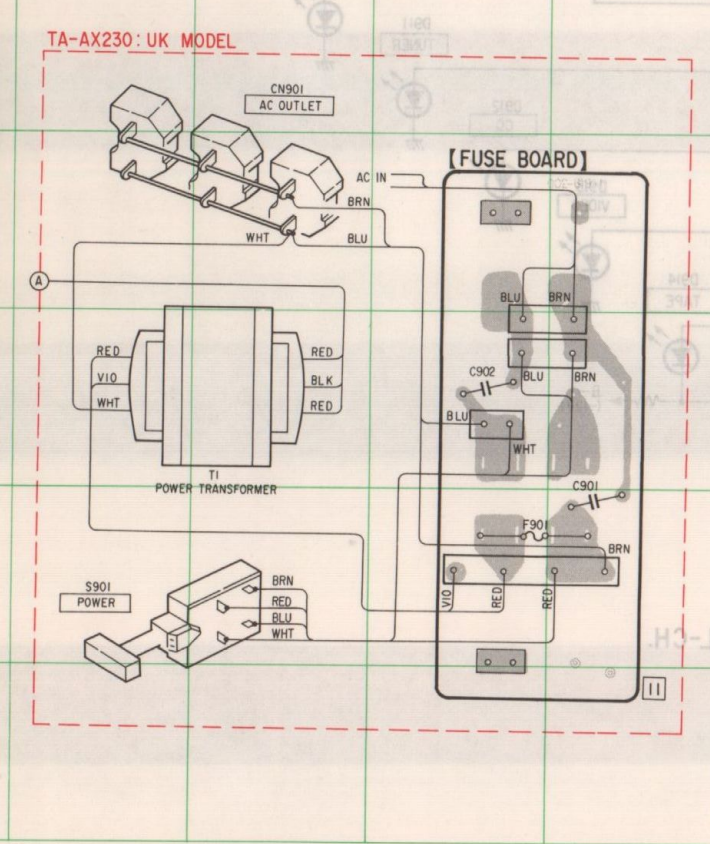
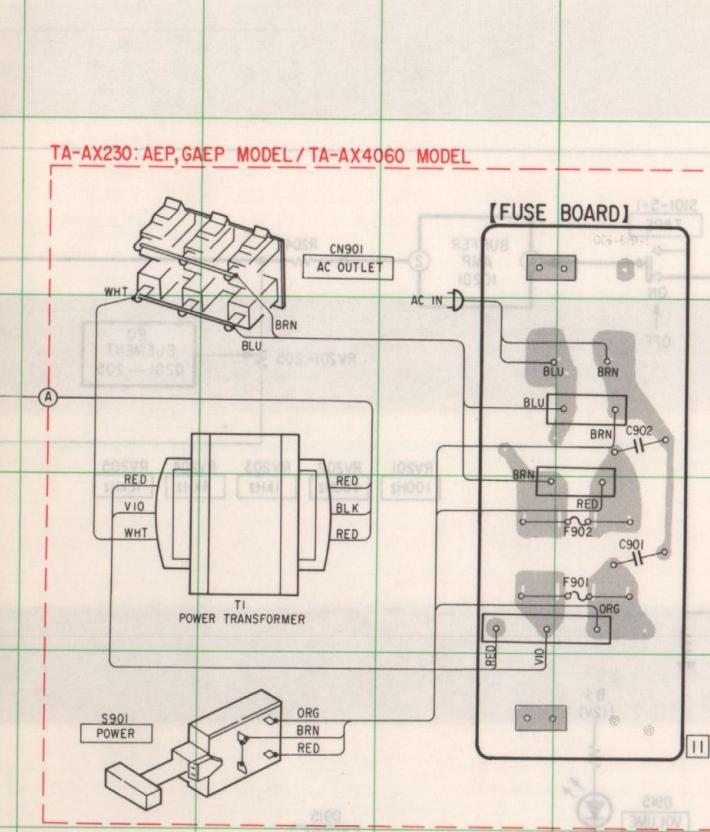
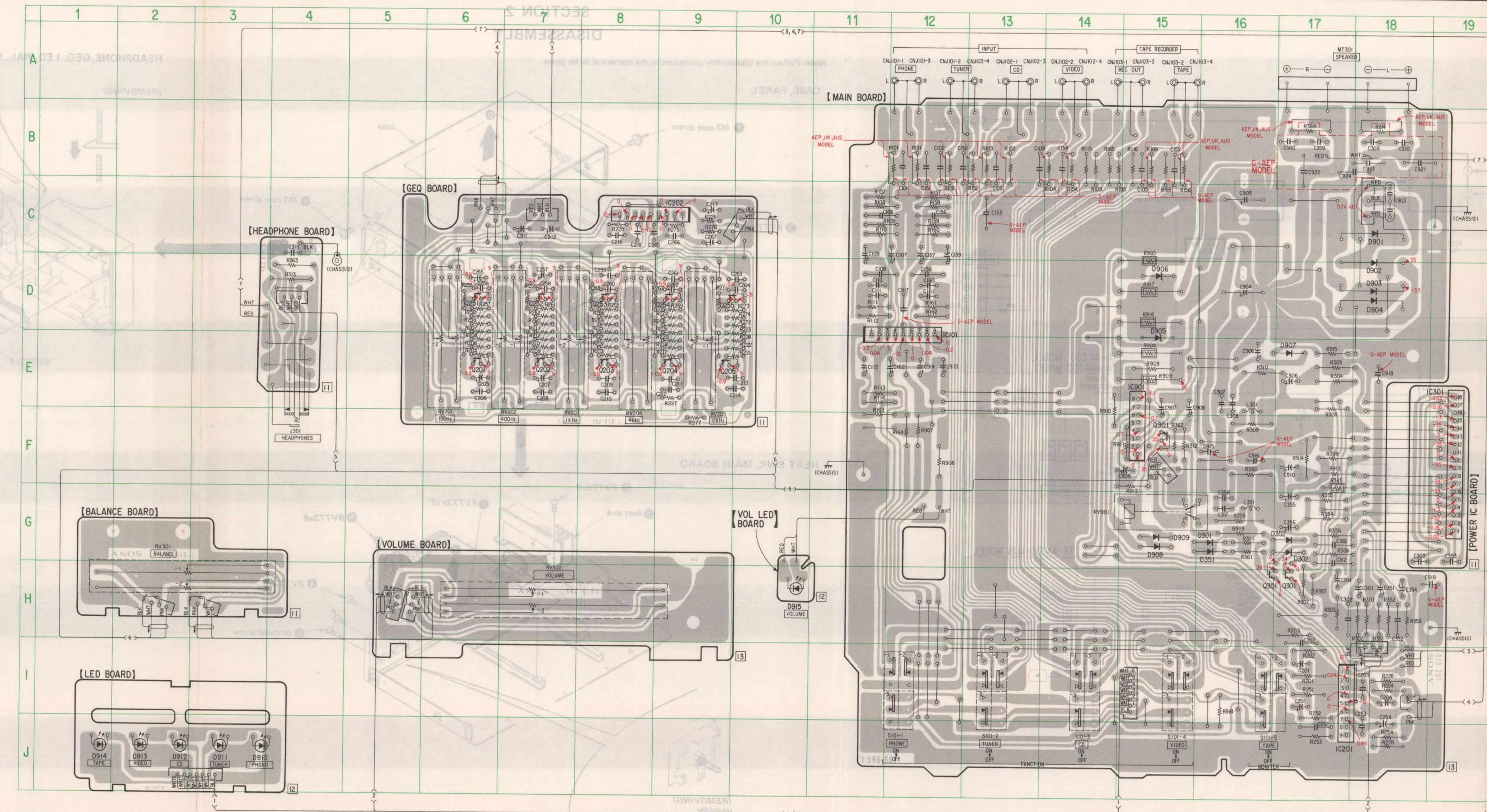
• Semiconductor Lead Layouts

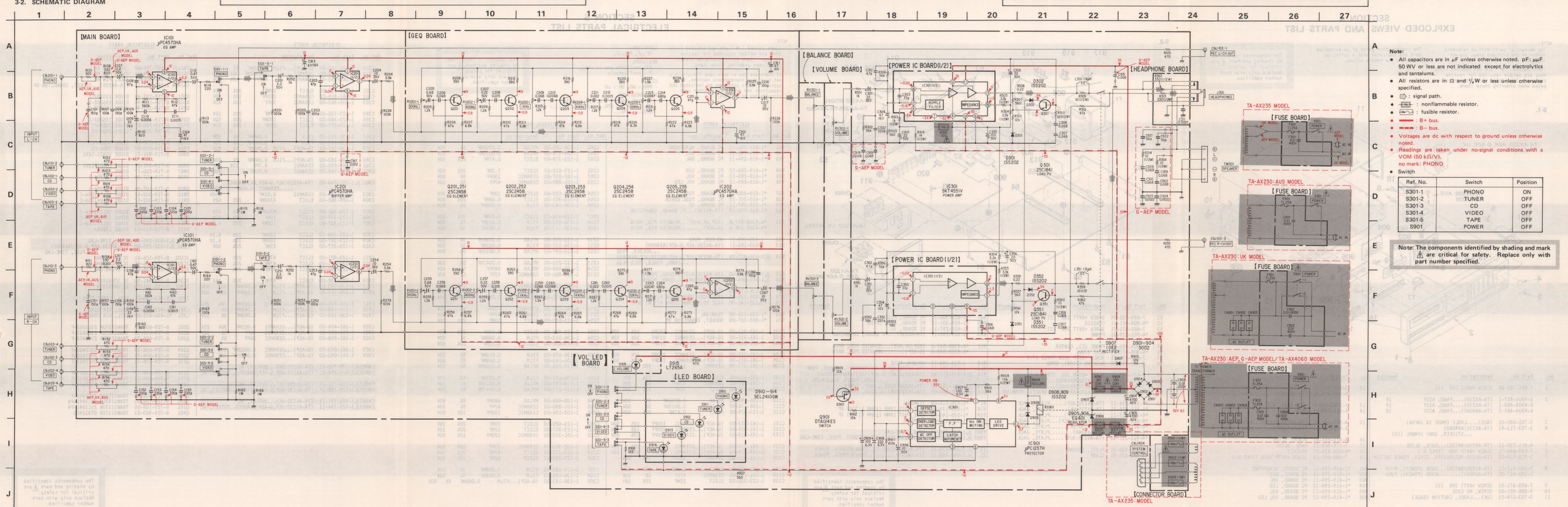


• Semiconductor Location

Ref.No.	Location	Ref.No.	Location
D301	G-16	IC101	D-12
D302	G-17	IC201	I-17
D351	G-16	IC202	C-8
D352	G-17	IC301	F-19
D901	C-18	IC901	E-15
D902	D-18		
D903	D-18	Q201	E-6
D904	D-18	Q202	E-7
D905	D-15	Q203	E-8
D906	D-15	Q204	E-9
D907	E-17	Q205	E-9
D908	G-15	Q251	D-6
D909	G-15	Q252	D-7
D910	J-3	Q253	D-8
D911	J-3	Q254	D-9
D912	J-2	Q255	D-9
D913	J-2	Q301	H-17
D914	J-1	Q351	H-16
D915	H-10	Q901	F-15

Note:
 • Color code of sleeving over the end of the jacket.
 (WHT, RED, GRN, (REDXIGRY))
 • ○ : parts extracted from the component side.





- Note:**
- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$. 50 WV or less are not indicated, except for electrolytics and tantalums.
 - All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
 - Signal path.
 - Nonflammable resistor.
 - Fusible resistor.
 - B+ bus.
 - B- bus.
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under no-signal conditions with a VOM (50 $\text{k}\Omega/\text{V}$). no mark: PHONO.
 - Switch.

Ref. No.	Switch	Position
S301-1	PHONO	ON
S301-2	TUNER	OFF
S301-3	CD	OFF
S301-4	VIDEO	OFF
S301-5	TAPE	OFF
S901	POWER	OFF

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

SECTION 4 EXPLODED VIEWS AND PARTS LIST

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.

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

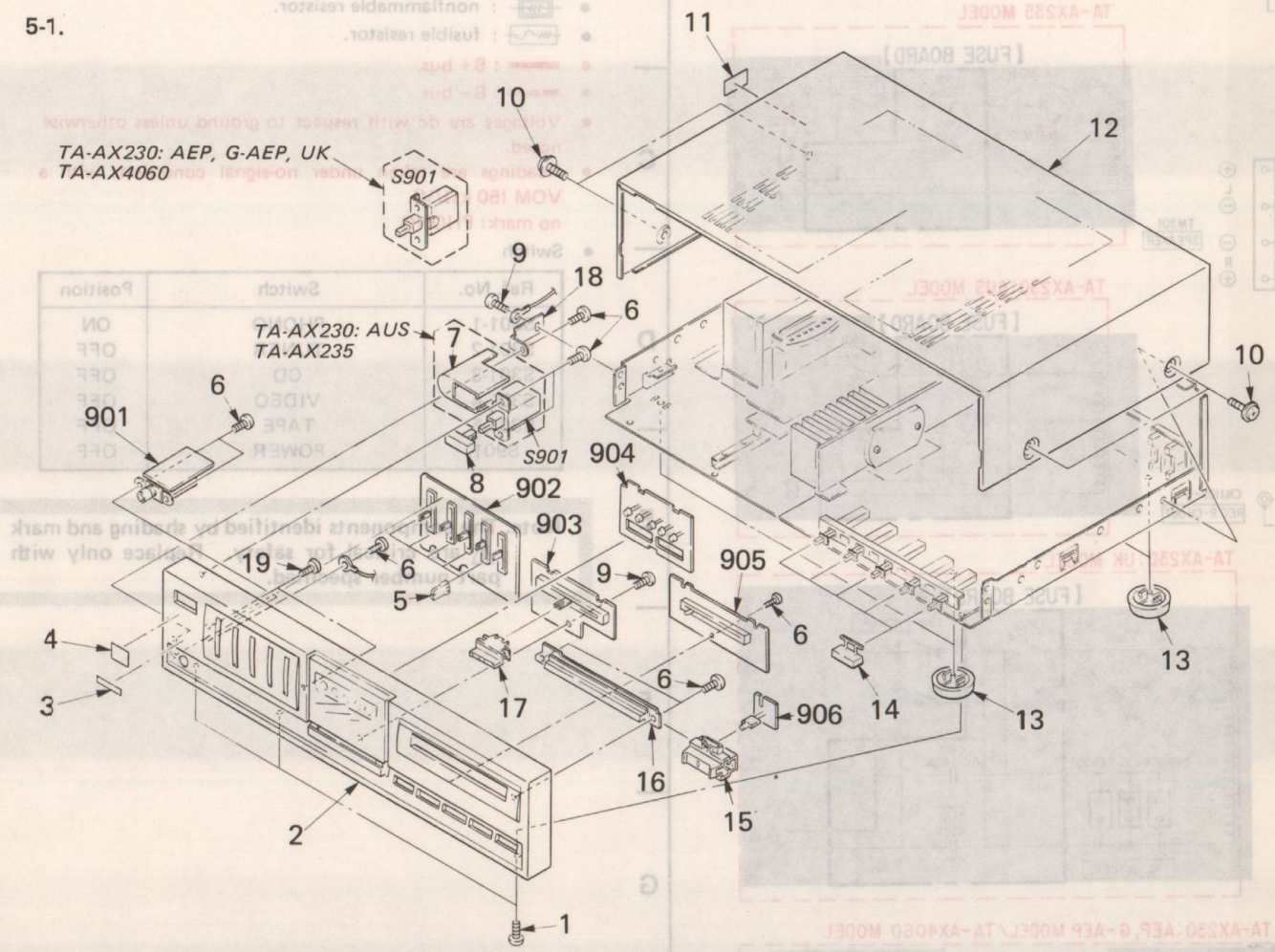


Table with 4 columns: No., Part No., Description, Remarks. Lists parts 1 through 11 with their respective part numbers and descriptions.

5-2.

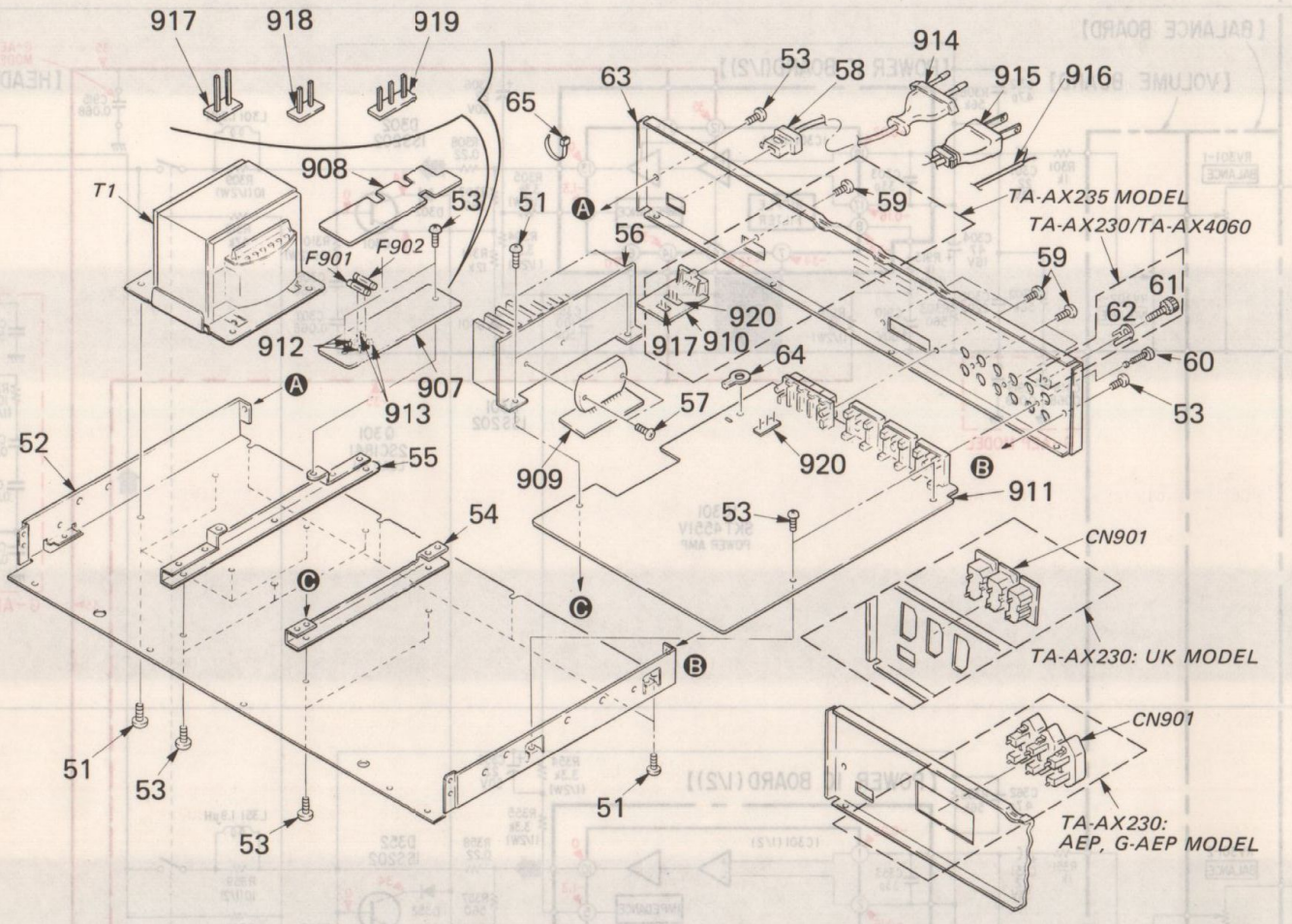


Table with 4 columns: No., Part No., Description, Remarks. Lists parts 51 through 917 with their respective part numbers and descriptions.

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

SECTION 5 ELECTRICAL PARTS LIST

NOTE: 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.

RESISTORS: All resistors are in ohms. F: nonflammable. CAPACITORS: MF:µF, PF:µµF. COILS: MMH: mH, UH: µH. SEMICONDUCTORS: In each case, U: u, for example: UA...:µA..., UPA...:µPA..., UPC...:µPC, UPD...:µPD...

Table with 3 columns: Ref.No., Part No., Description. Lists electrical parts 901 through 917 with their respective part numbers and descriptions.

Table with 3 columns: Ref.No., Part No., Description. Lists electrical parts C160 through C309 with their respective part numbers and descriptions.

SECTION 5 ELECTRICAL PARTS LIST

Table with 3 columns: Ref.No., Part No., Description. Lists electrical parts C310 through C359 with their respective part numbers and descriptions.

Table with 3 columns: Ref.No., Part No., Description. Lists electrical parts CNJ101 through D915 with their respective part numbers and descriptions.

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

ELECTRICAL PARTS

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R101	1-247-712-11	(G-AEP)...CARBON	820	5%	1/4W
R102	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R103	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R104	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R105	1-247-708-11	CARBON	470	5%	1/4W
R106	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R107	1-249-469-11	CARBON	100K	5%	1/4W
R108	1-249-461-85	(AEP,UK,AUS)...CARBON	330	5%	1/4W
R108	1-247-712-11	(G-AEP).....CARBON	820	5%	1/4W
R109	1-249-469-11	CARBON	100K	5%	1/4W
R110	1-247-712-11	CARBON	820	5%	1/4W
R111	1-246-539-00	CARBON	560K	5%	1/4W
R112	1-249-465-11	CARBON	47K	5%	1/4W
R113	1-249-469-11	CARBON	100K	5%	1/4W
R114	1-247-704-11	CARBON	220	5%	1/4W
R115	1-246-545-00	CARBON	1M	5%	1/4W
R116	1-246-545-00	CARBON	1M	5%	1/4W
R151	1-247-712-11	(G-AEP)...CARBON	820	5%	1/4W
R152	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R153	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R154	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R155	1-247-708-11	CARBON	470	5%	1/4W
R156	1-247-708-11	(G-AEP)...CARBON	470	5%	1/4W
R157	1-249-469-11	CARBON	100K	5%	1/4W
R158	1-249-461-85	(AEP,UK,AUS)...CARBON	330	5%	1/4W
R158	1-247-712-11	(G-AEP).....CARBON	820	5%	1/4W
R159	1-249-469-11	CARBON	100K	5%	1/4W
R160	1-247-712-11	CARBON	820	5%	1/4W
R161	1-246-539-00	CARBON	560K	5%	1/4W
R162	1-249-465-11	CARBON	47K	5%	1/4W
R163	1-249-469-11	CARBON	100K	5%	1/4W
R164	1-247-704-11	CARBON	220	5%	1/4W
R165	1-246-545-00	CARBON	1M	5%	1/4W
R166	1-246-545-00	CARBON	1M	5%	1/4W
R201	1-249-469-11	CARBON	100K	5%	1/4W
R202	1-247-713-11	CARBON	1K	5%	1/4W
R203	1-249-469-11	CARBON	100K	5%	1/4W
R204	1-247-145-00	CARBON	3.9K	5%	1/4W
R205	1-247-833-00	CARBON	1.2K	5%	1/6W
R206	1-249-437-11	CARBON	47K	5%	1/6W
R207	1-247-851-00	CARBON	6.8K	5%	1/6W
R208	1-247-821-00	CARBON	390	5%	1/6W
R209	1-247-833-00	CARBON	1.2K	5%	1/6W
R210	1-249-437-11	CARBON	47K	5%	1/6W
R211	1-247-851-00	CARBON	6.8K	5%	1/6W
R212	1-247-821-00	CARBON	390	5%	1/6W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R213	1-247-833-00	CARBON	1.2K	5%	1/6W
R214	1-249-437-11	CARBON	47K	5%	1/6W
R215	1-247-851-00	CARBON	6.8K	5%	1/6W
R216	1-247-821-00	CARBON	390	5%	1/6W
R217	1-247-833-00	CARBON	1.2K	5%	1/6W
R218	1-249-437-11	CARBON	47K	5%	1/6W
R219	1-247-851-00	CARBON	6.8K	5%	1/6W
R220	1-247-821-00	CARBON	390	5%	1/6W
R221	1-247-833-00	CARBON	1.2K	5%	1/6W
R222	1-249-437-11	CARBON	47K	5%	1/6W
R223	1-247-851-00	CARBON	6.8K	5%	1/6W
R224	1-247-821-00	CARBON	390	5%	1/6W
R225	1-247-845-00	CARBON	3.9K	5%	1/6W
R226	1-249-441-11	CARBON	100K	5%	1/6W
R227	1-249-419-11	CARBON	1.5K	5%	1/6W
R228	1-249-469-11	CARBON	100K	5%	1/4W
R251	1-249-469-11	CARBON	100K	5%	1/4W
R252	1-247-713-11	CARBON	1K	5%	1/4W
R253	1-249-469-11	CARBON	100K	5%	1/4W
R254	1-247-145-00	CARBON	3.9K	5%	1/4W
R255	1-247-833-00	CARBON	1.2K	5%	1/6W
R256	1-249-437-11	CARBON	47K	5%	1/6W
R257	1-247-851-00	CARBON	6.8K	5%	1/6W
R258	1-247-821-00	CARBON	390	5%	1/6W
R259	1-247-833-00	CARBON	1.2K	5%	1/6W
R260	1-249-437-11	CARBON	47K	5%	1/6W
R261	1-247-851-00	CARBON	6.8K	5%	1/6W
R262	1-247-821-00	CARBON	390	5%	1/6W
R263	1-247-833-00	CARBON	1.2K	5%	1/6W
R264	1-249-437-11	CARBON	47K	5%	1/6W
R265	1-247-851-00	CARBON	6.8K	5%	1/6W
R266	1-247-821-00	CARBON	390	5%	1/6W
R267	1-247-833-00	CARBON	1.2K	5%	1/6W
R268	1-249-437-11	CARBON	47K	5%	1/6W
R269	1-247-851-00	CARBON	6.8K	5%	1/6W
R270	1-247-821-00	CARBON	390	5%	1/6W
R271	1-247-833-00	CARBON	1.2K	5%	1/6W
R272	1-249-437-11	CARBON	47K	5%	1/6W
R273	1-247-851-00	CARBON	6.8K	5%	1/6W
R274	1-247-821-00	CARBON	390	5%	1/6W
R275	1-247-845-00	CARBON	3.9K	5%	1/6W
R276	1-249-441-11	CARBON	100K	5%	1/6W
R277	1-249-419-11	CARBON	1.5K	5%	1/6W
R278	1-249-469-11	CARBON	100K	5%	1/4W
R301	1-247-713-11	CARBON	1K	5%	1/4W

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

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Part No.	Description	Part No.	Description
R302	1-247-173-00	CARBON	56K	5%	1/4W	
R303	1-247-125-00	CARBON	560	5%	1/4W	
R304	1-247-252-00	CARBON	3.3K	5%	1/2W	
R305	1-247-252-00	CARBON	3.3K	5%	1/2W	
R306	1-247-173-00	CARBON	56K	5%	1/4W	
R307	1-247-125-00	CARBON	560	5%	1/4W	
R308	1-217-151-00	RES, METAL PLATE	0.22			
R309	1-247-192-00	CARBON	10	5%	1/2W	
R310	1-247-192-00	CARBON	10	5%	1/2W	
R311	1-249-459-11	CARBON	12K	5%	1/4W	
R312	1-249-465-11	CARBON	47K	5%	1/4W	
R313	1-247-745-11	CARBON	330	5%	1/2W	
R314	1-247-192-00	(G-AEP)...CARBON	10	5%	1/2W	
R351	1-247-713-11	CARBON	1K	5%	1/4W	
R352	1-247-173-00	CARBON	56K	5%	1/4W	
R353	1-247-125-00	CARBON	560	5%	1/4W	
R354	1-247-252-00	CARBON	3.3K	5%	1/2W	
R355	1-247-252-00	CARBON	3.3K	5%	1/2W	
R356	1-247-173-00	CARBON	56K	5%	1/4W	
R357	1-247-125-00	CARBON	560	5%	1/4W	
R358	1-217-151-00	RES, METAL PLATE	0.22			
R359	1-247-192-00	CARBON	10	5%	1/2W	
R360	1-247-192-00	CARBON	10	5%	1/2W	
R361	1-249-459-11	CARBON	12K	5%	1/4W	
R362	1-249-465-11	CARBON	47K	5%	1/4W	
R363	1-247-745-11	CARBON	330	5%	1/2W	
R364	1-247-192-00	(G-AEP)...CARBON	10	5%	1/2W	
R365	△1-247-700-11	CARBON	100	5%	1/4W	F
R901	△1-217-469-00	(TA-AX235)...FUSE	1	5%	1W	F
R902	△1-217-469-00	(TA-AX235)...FUSE	1	5%	1W	F
R903	△1-217-469-00	(TA-AX235)...FUSE	1	5%	1W	F
R904	△1-206-644-00	METAL OXIDE	150	5%	2W	F
R905	△1-206-646-11	METAL OXIDE	180	5%	2W	F
R906	1-247-708-11	CARBON	470	5%	1/4W	
R907	1-247-125-00	CARBON	560	5%	1/4W	
R908	1-247-264-00	CARBON	10K	5%	1/2W	
R909	△1-206-658-00	METAL OXIDE	560	5%	2W	F
R910	1-247-173-00	CARBON	56K	5%	1/4W	
R911	1-249-469-11	CARBON	100K	5%	1/4W	
R912	1-247-725-11	CARBON	10K	5%	1/4W	
R913	1-247-240-00	CARBON	1K	5%	1/2W	
R914	1-247-240-00	CARBON	1K	5%	1/2W	
R915	1-249-459-11	CARBON	12K	5%	1/4W	
R916	△1-206-646-11	METAL OXIDE	180	5%	2W	F
R917	△1-206-644-00	METAL OXIDE	150	5%	2W	F

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Part No.	Description	Part No.	Description
R918	1-247-109-00	CARBON	120	5%	1/4W	
R919	1-247-725-11	CARBON	10K	5%	1/4W	
RV201	1-237-172-11	RES, VAR, SLIDE	250K/250K		(100Hz)	
RV202	1-237-172-11	RES, VAR, SLIDE	250K/250K		(400Hz)	
RV203	1-237-172-11	RES, VAR, SLIDE	250K/250K		(1kHz)	
RV204	1-237-172-11	RES, VAR, SLIDE	250K/250K		(4kHz)	
RV205	1-237-172-11	RES, VAR, SLIDE	250K/250K		(12kHz)	
RV301	1-237-203-11	RES, VAR, SLIDE	250K/250K		(BALANCE)	
RV302	1-237-202-11	RES, VAR, SLIDE	100K/100K		(VOLUME)	
RY901	1-515-533-11	RELAY				
S101	1-570-626-11	SWITCH, PUSH (5 KEY)			(PHONO/TUNER/CD/VIDIO/TAPE)	
S901	△1-553-318-51	(TA-AX230:AUS/AX235)			...SWITCH, PUSH (AC POWER)(1 KEY)	
S901	△1-554-685-11	(TA-AX230:AEP,G-AEP,UK/AX4060)			...SWITCH, PUSH (AC POWER)(1 KEY)	
T1	△1-448-479-11	(TA-AX230/AX4060)...TRANSFORMER, POWER				
T1	△1-448-480-11	(TA-AX235).....TRANSFORMER, POWER				
TM301	1-536-705-00	TERMINAL BOARD (SP)				
ACCESSORY & PACKING MATERIAL						
	Part No.	Description				
	3-701-630-00	BAG, POLYETHYLENE				
	3-703-713-41	STICKER, SONY SYMBOL (10)				
	3-765-306-11	(TA-AX230:AEP,AUX,UK)...MANUAL, INSTRUCTION				
	3-765-306-41	(TA-AX230:AEP,G-AEP)...MANUAL, INSTRUCTION				
	3-765-412-61	(TA-AX4060).....MANUAL, INSTRUCTION				
	4-876-352-00	SHEET, PROTECTION				
	4-904-442-01	CUSHION (LEFT), LOWER				
	4-904-443-01	CUSHION (RIGHT), LOWER				
	4-904-444-01	CUSHION (LEFT), UPPER				
	4-904-445-01	CUSHION (RIGHT), UPPER				

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