JVC

SERVICE MANUAL

STEREO INTEGRATED AMPLIFIER

MODEL A-X400/A-X400B

Model	Color Version
A-X400	Silver
A-X400B	Black

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This manual combines two single volumes; Service manual and Parts list.

No. 2739
Feb. 1984

Safety Precautions

1. The design of this product contains special hardware, many circuits and components specially for safety purposes.
   For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the product have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the parts list in Service manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list in Service manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and/or the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard.
   When service is required, the original lead routing and dress should be observed, and they should be confirmed to be returned to normal, after reassembling.
5. Leakage current check
   (Safety for electrical shock hazard)
   After reassembling the product, always perform an isolation check on the exposed metal parts of the Products (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5 mA AC (r.m.s.).
   - Alternate check method.
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1500Ω 10W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.).
     This corresponds to 0.5 mA AC (r.m.s.).

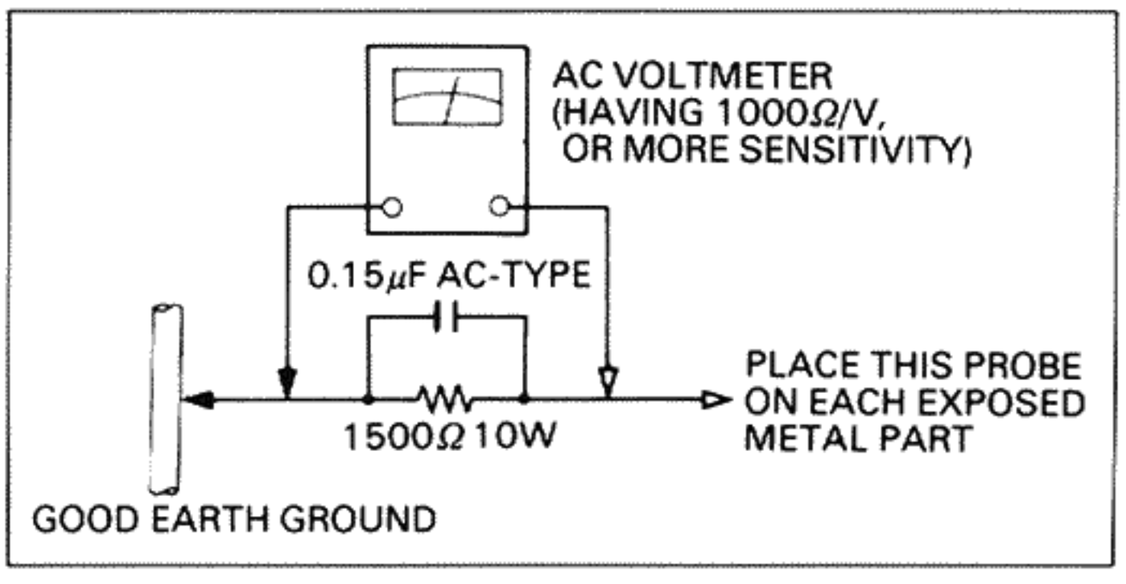


Fig. 1

Service Precautions

1. Before repairing, be sure to discharge the large electrolytic capacitors across a resistor of about 100 ohms/1 watt.

■ When disassembling

1. When replacing a power transistor or IC, be sure to apply silicone grease to the section of a new transistor or IC which is in close contact with the heatsink, then mount it.
2. When removing or stretching wires on the P. C. Board, be sure to restore them to their original routing as far as possible.
3. When connecting a remote switch, insert it from above as shown in Fig. 2. In this case, press it in sufficiently in order to prevent it from floating during operaiton.

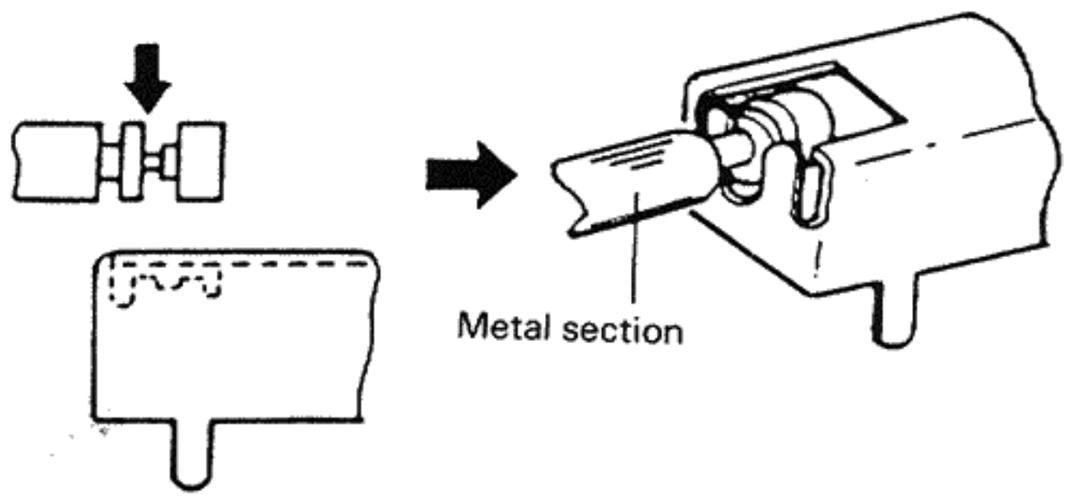


Fig. 2

Note: Set the switch to OFF, then mount or demount it holding the metal section shown above.

1. Specifications

CIRCUITRY : "Dynamic Super-A" power amplifier

ALLOVER CHARACTERISTICS

Output power (AUX IN SP. OUT)

1 kHz : 73 watts RMS per channel min. (8 ohms, 0.002% total harmonic distortion measured by JVC Audio Analyze System)
80 watts RMS per channel min. (8 ohms, 0.7% total harmonic distortion)

20 Hz – 20 kHz : 70 watts RMS per channel min. (both channels driven into 8 ohms from 20 Hz to 20 kHz, with no more than 0.007% total harmonic distortion.)

Total harmonic distortion
(AUX IN SP. OUT) : 0.007% (20 Hz – 20 kHz, 8 ohms) at 70 watts

Intermodulation distortion
(AUX IN SP. OUT) : 0.005% (60 Hz: 7 kHz = 4 : 1, 8 ohms) at 70 watts

Power band width
(AUX IN SP. OUT) : 5 Hz – 40 kHz (IHF, 0.05%, 8 ohms both channels driven)

Frequency characteristic : 5 Hz – 100 kHz +0, –3 dB (8 ohms)

Damping factor : 50 (1 kHz, 8 ohms)

Input terminals

Input sensitivity/impedance (1 kHz)

PHONO (MM) : 2.5 mV/47 kohms
PHONO (MC) : 200 μV/100Ω
DAD, TUNER, AUX, TAPE : 150 mV/40 kohms

Signal-to-noise ratio

PHONO (MM) : 87 dB
PHONO (MC) : 67 dB
DAD, TUNER, AUX, TAPE : 100 dB
('66 IHF)

PHONO (MM) : 85 dB ('78 IHF, Rec Out)
PHONO (MC) : 77 dB ('78 IHF, Rec Out)
DAD, TUNER, AUX, TAPE : 77 dB ('78 IHF, Speaker Out)

Tone controls : S.E.A.: center frequencies 63, 160, 400, 1k, 2.5k, 6.3k, 16k
S.E.A.: control range ± 12 dB

Loudness controls : 100 Hz: +6dB/10 kHz: +4 dB (at VOLUME –30 dB)

EQUALIZER

PHONO overload capacity (MM) : 100 mV (0.01 % THD)
(MC) : 8 mV (0.01 % THD)

PHONO RIAA deviation
(MM) : ± 0.3 dB (20 Hz – 20 kHz)
(MC) : ± 0.5 dB (20 Hz – 20 kHz)

GENERAL

Power source :

Areas	Line Voltage & Frequency	Power consumption
U.S.A. & Canada	AC 120V~, 60 Hz	290 watts 380 VA
Europe	AC 220V~, 50 Hz	160 watts
U.K. & Australia	AC 240V~, 50Hz	160 watts
U.S. Military Market & Other Countries	AC 110/120/220/ 240V~ Selectable	190 watts

Dimensions and Weight :

Dimensions (cm)			Weight (kg/lbs)
Height	Width	Depth	
11.7 (4-5/8")	43.5 (17-1/8")	34.7 (13-11/16")	7.8/17.2

Design and specifications subject to change without notice.

2. Removal and Reassembly Procedures

2-(1) Front panel section

1. Remove 6 metal cover screws (2 on each side of the cover and 2 on the rear), and remove the cover.
2. Remove 3 screws from the bottom plate of the front panel.

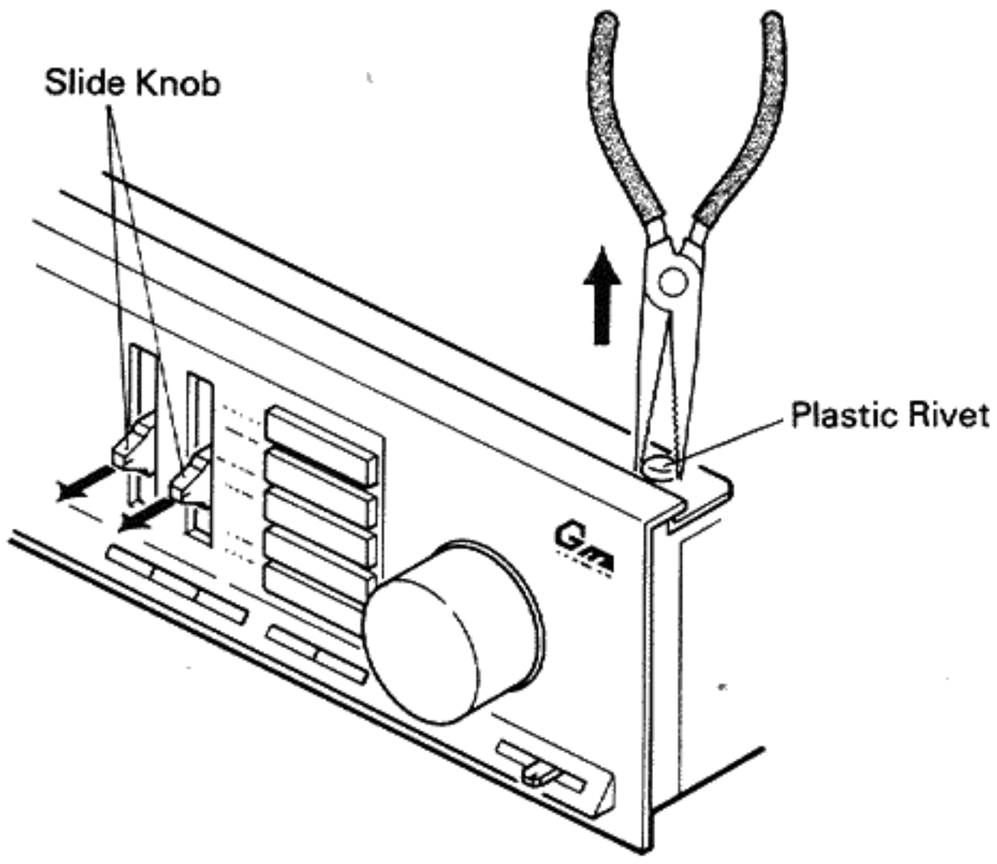


Fig. 3

2-(2) Power transistor section

1. Remove the metal cover (Refer to step 1. above.).
2. Remove 2 screws from each mains P. C. Board brackets.
3. Pull out the main P. C. Board in the direction of the arrow shown in Fig. 5, taking care that the board does not contact P. C. Board.

3. Pull out 3 plastic rivet bushes (2 on the both ends and 1 on the center) on the front panel by using the pinchers (Fig. 3).
4. Pull out 7 slide knobs and pull out the front panel (Fig. 3).
5. Remove the plastic rivet bushes from the P. C. Board and take out the P. C. Board (Fig. 4)

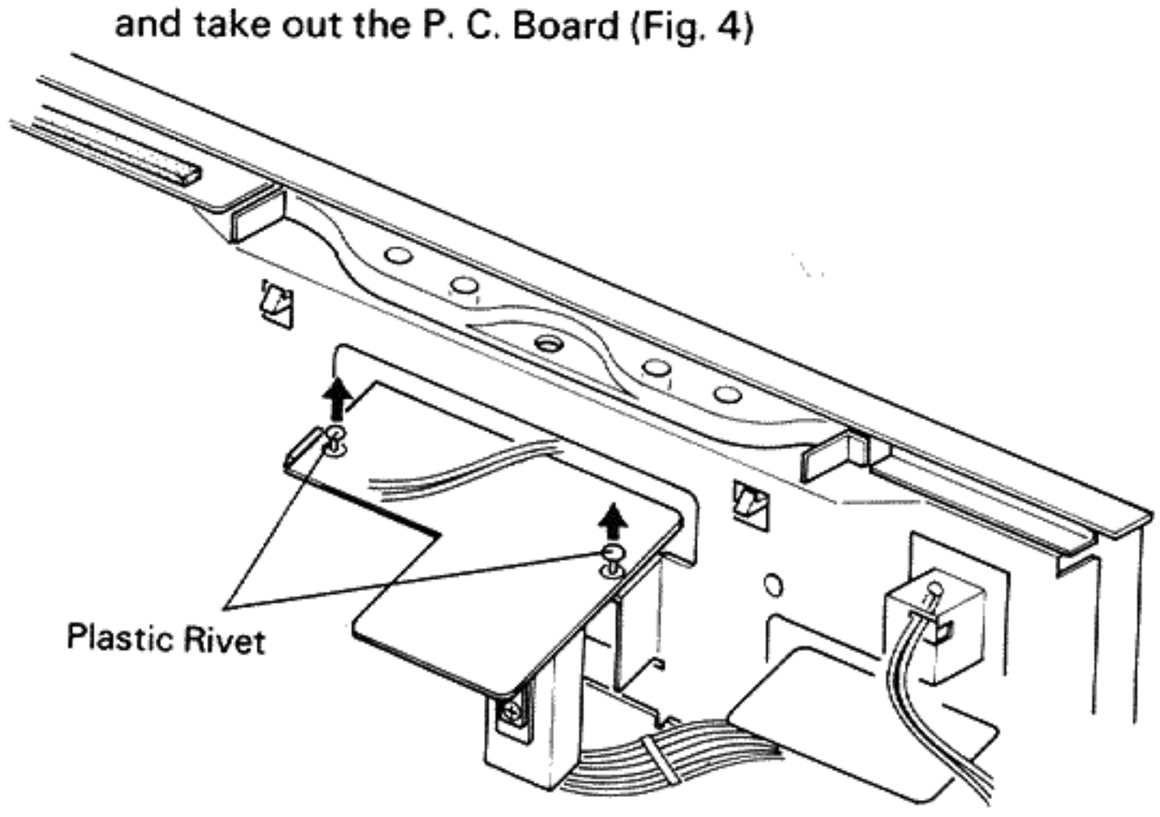


Fig. 4

2-(3) S. E. A. escutcheon section

1. Disengage the upper 3 claws from the front panel and remove the escutcheon from the upper side.

Note: If the claw is removed with excessive force, it may be broken.

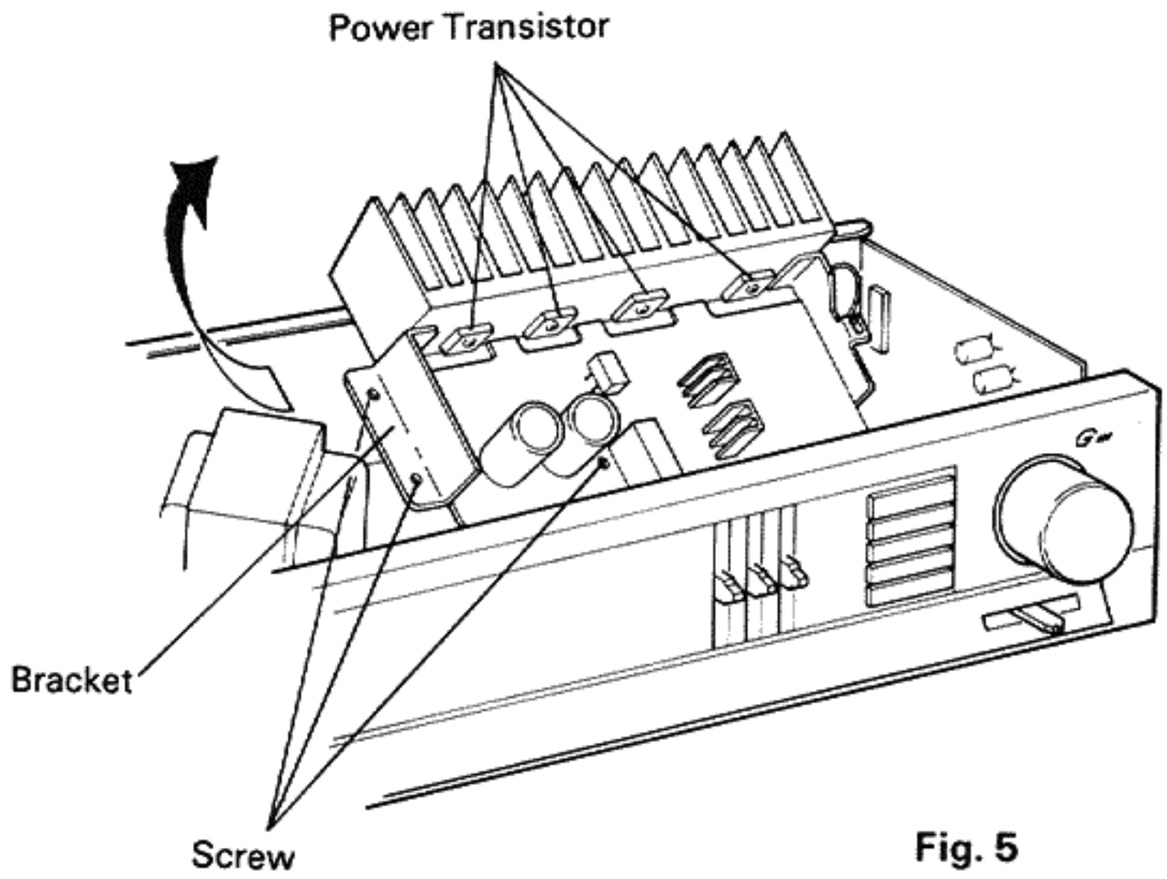


Fig. 5

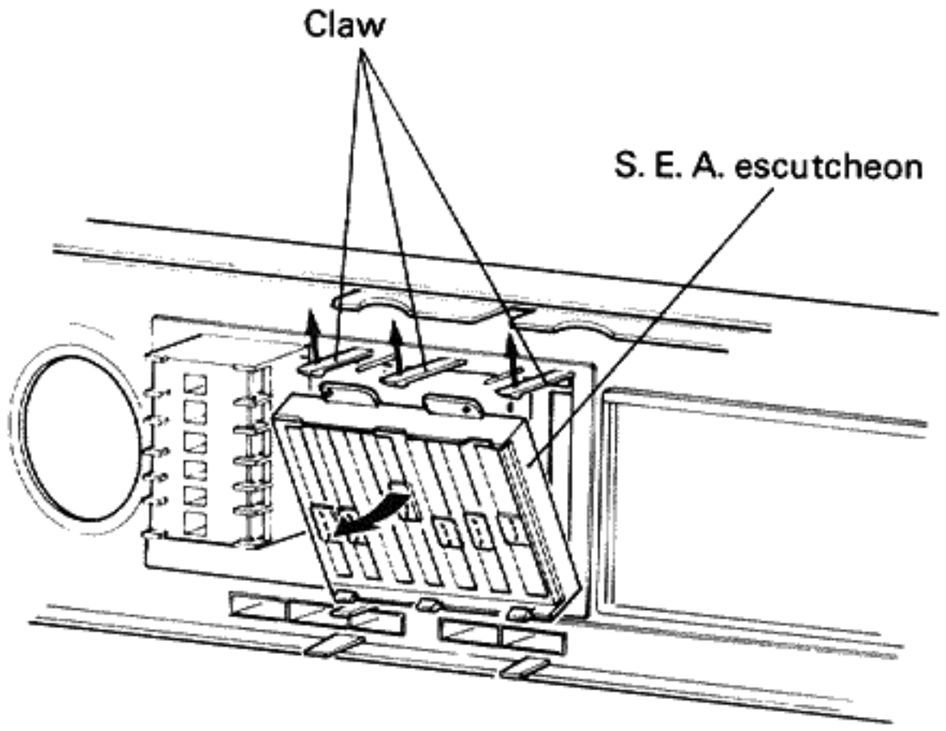


Fig. 6

Note: Reassemble in the reverse order to removal.

3. Adjustment Procedures

3-(1) Power Level Indicator Adjustment

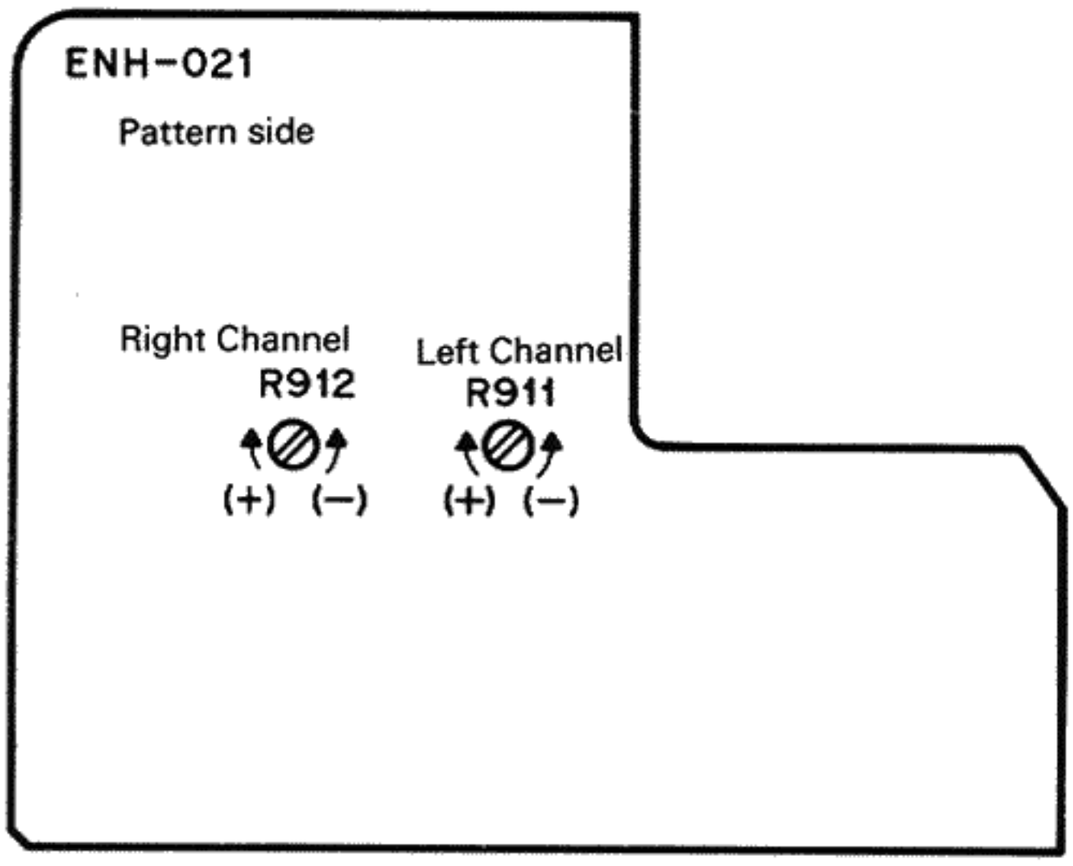


Fig. 7

Power Level Indicator Adjustment

1. Turn the semi-fixed resistors (R911, R912) counterclockwise fully, before switching the power ON.
2. With the output voltage at 14.1V 1 kHz, adjust the indicator so that its –3 dB point lights.
   Left channel : R911
   Right channel: R912

3-(2) Power Amplifier Idling Current Adjustment

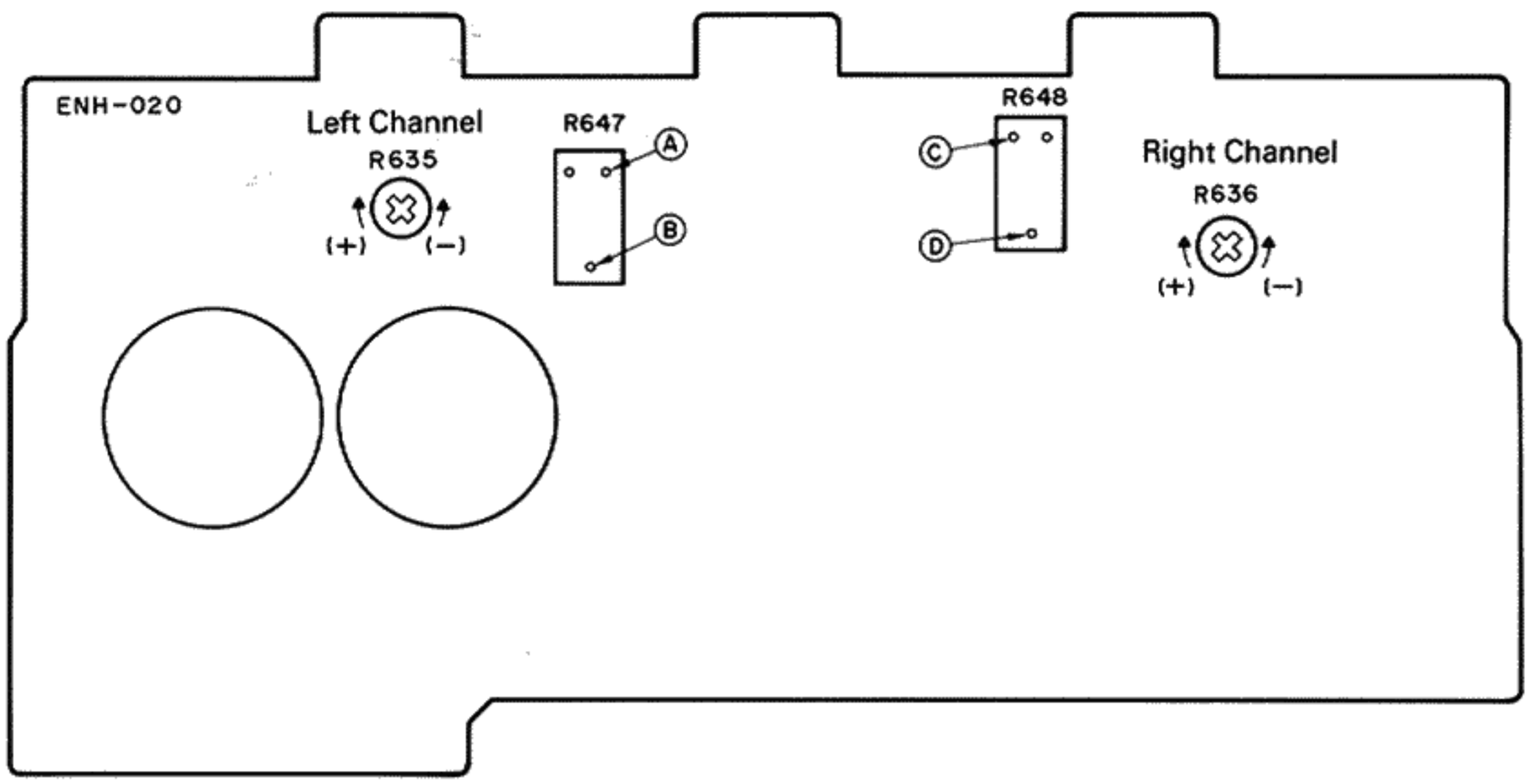


Fig. 8

1. Before turning on the power, turn the semi-fixed resistors (R635 for L channel and R636 for R channel) of the power amplifier circuit board fully counterclockwise.
2. Adjust the semi-fixed resistors (R635 and R636) so that the voltage at the following test points of the power amplifier circuit board is within a range of 5 mV – 6 mV after the power is turned on.
   L channel: Measure the voltage between test point Ⓐ (emitter of Q617) and output at the test point Ⓑ.
   R channel: Measure the voltage between test point Ⓒ (emitter of Q618) and output at the test point Ⓓ.
3. Readjust resistors R635 and R636 about 5 minutes after the power is turned on (the heatsink temperature must be sufficiently high) so that the voltage at the test point becomes 11 mV.
   Confirm that the voltage does not vary when the heatsink temperature increases further.

Note: Be sure to perform the measurement with the probes and cabinet of the measuring equipment separated from the grounding terminals of A-X400 or other measuring equipment.

4. Block Diagram

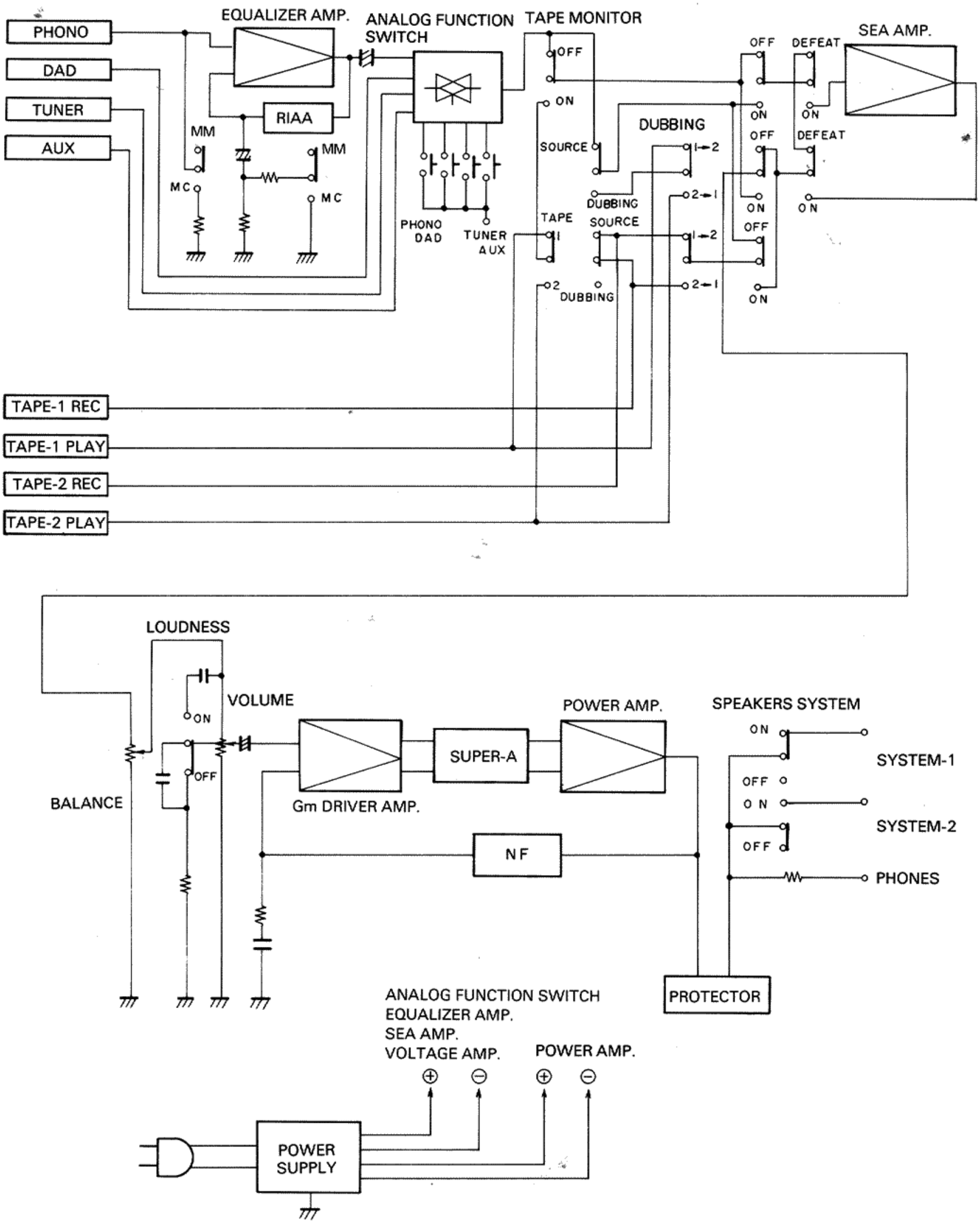
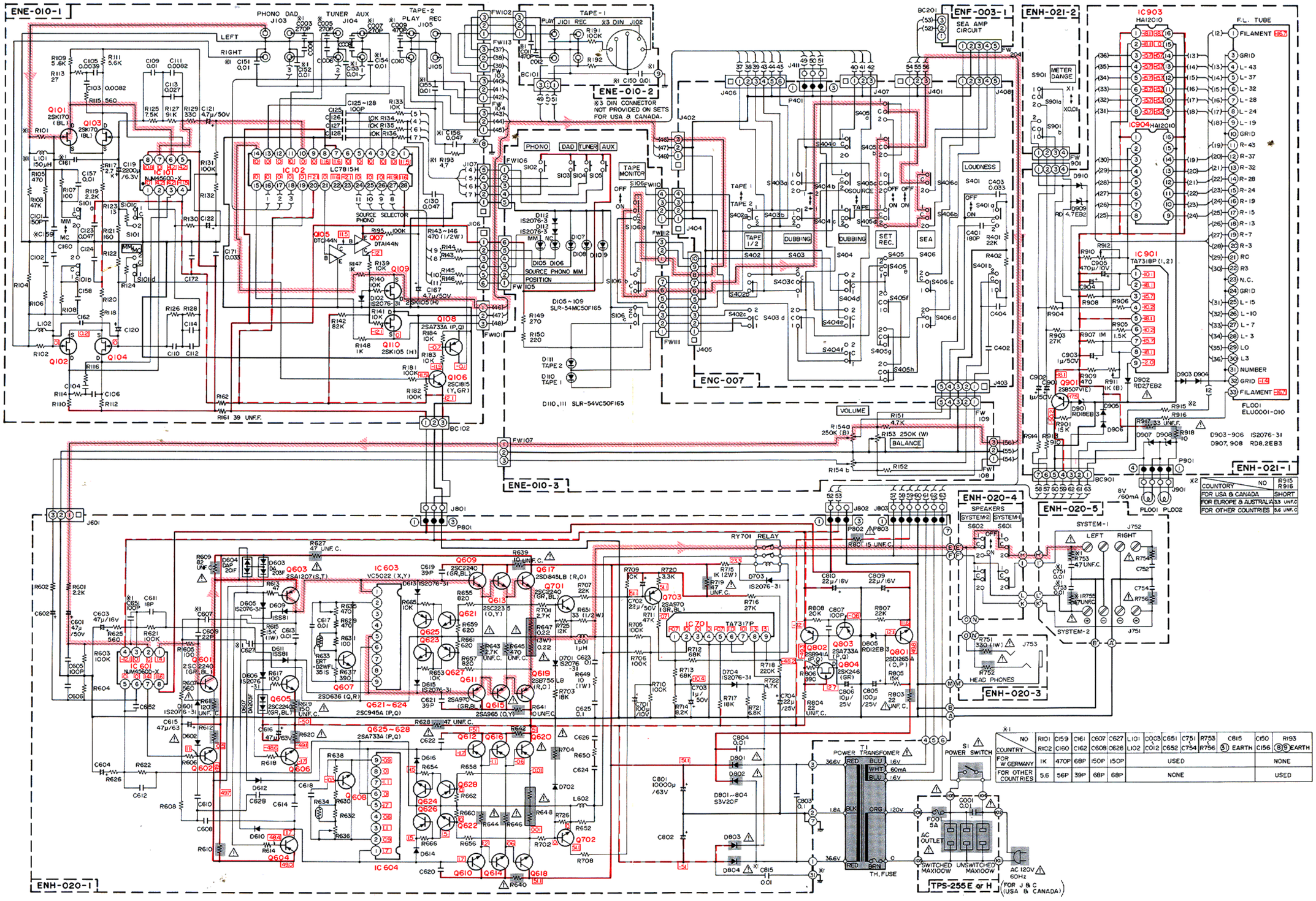


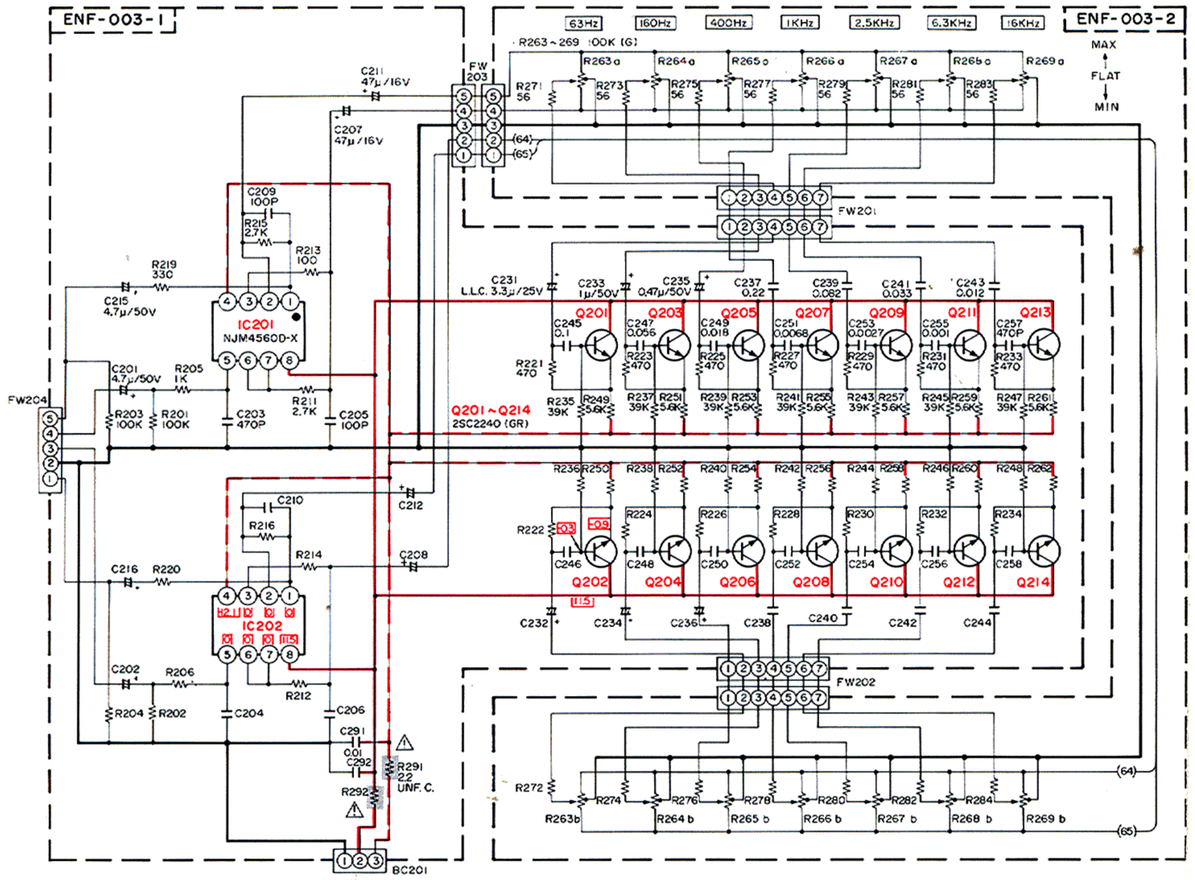
Fig. 9

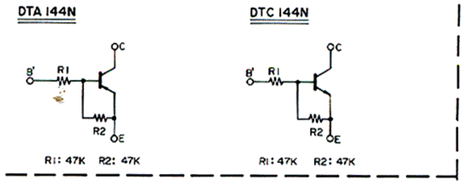
5. A-X400 Schematic Diagram

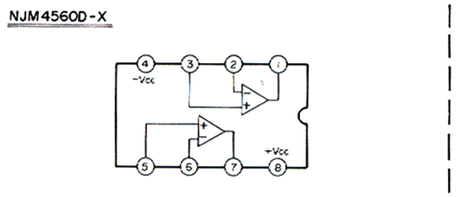


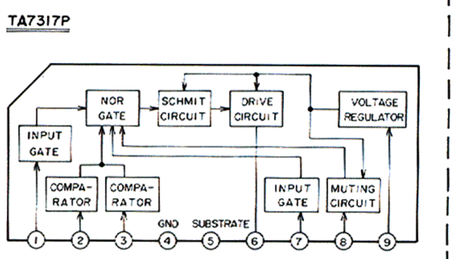
Notes:

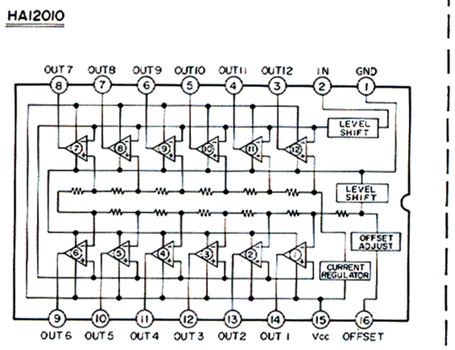
1. ——— indicates positive B power supply.
2. - - - - - indicates negative B power supply.
3. ▨ indicates signal path.
4. When replacing the parts in the darkned area (▨) and those marked with ⚠, be sure to use the designated parts to ensure safety.
5. This is the standard circuit diagram. The design and contents are subject to change without notice.

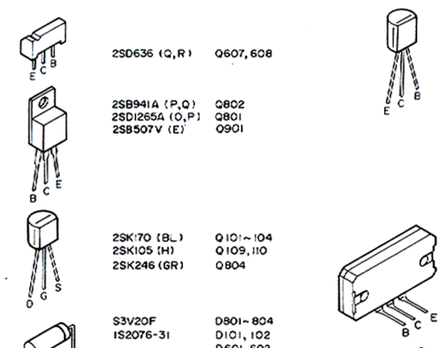






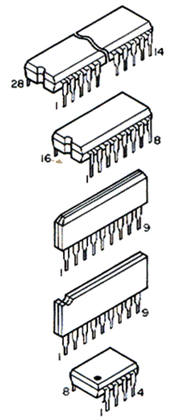






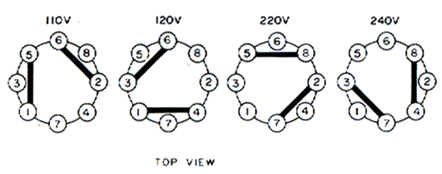
2SD636 (Q,R)	Q607, 608	
2SB941A (P,Q)	Q802	
2SD1265A (O,P)	Q801	
2SB507V (E)	Q901	
2SK170 (BL)	Q101~104	
2SK105 (H)	Q109, 110	
2SK246 (GR)	Q804	
S3V20F	D801~804	
IS2076-31	D101, 102	
	D601, 602	
	D613, 614	
	D701~704	
	D605, 606	
IS58I	D609~612	
RD2.7EB2	D902	
RD4.7EB2	D909, 910	
RD82EB3	D907, 908	
RD12EB3	D805	
RD18EB3	D901	

DTC144N	Q105
DTA144N	Q107
2SC2240 (GR)	Q201~214
2SC2240 (GR,BL)	Q601, 602
	Q605, 606
	Q609, 610
	Q701, 702
2SA970 (GR,BL)	Q611, 612
	Q703
2SA733A (P, Q)	Q108
	Q625~628
	Q803
2SC1815 (Y, GR)	Q106
2SC945A (P,Q)	Q621~624
2SA1207 (S,T)	Q603, 604
2SA965 (O,Y)	Q615, 616
2SC2235 (O,Y)	Q613, 614
2SB755LB (R,O)	Q619, 620
2SD845LB (R,O)	Q617, 618
DA203F	D603, 607
DAP201F	D604
SLR-54MC50FI65	D905~909
SLR-54VC50FI65	D110, 111

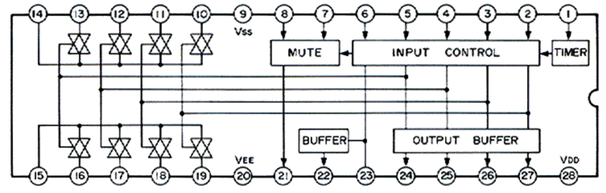


LC7815H	IC102	
HAI2010	IC903, 904	
TA7317P	IC701	
TA7318P (1,2)	IC901	
VC5022 (X,Y)	IC603, 604	
NJM4560D-X	IC201, 202	
	IC101, 601	

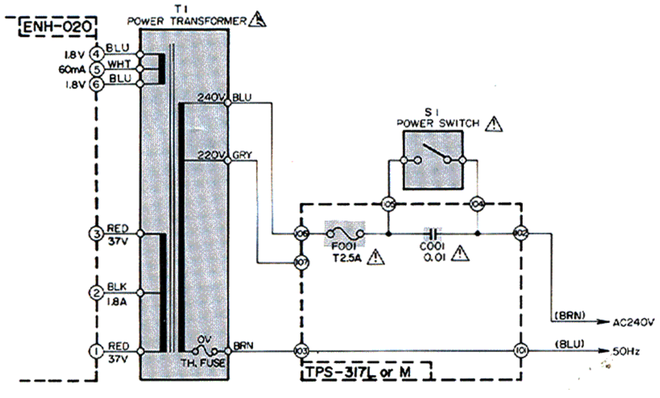
VOLTAGE SELECTOR CONNECTION



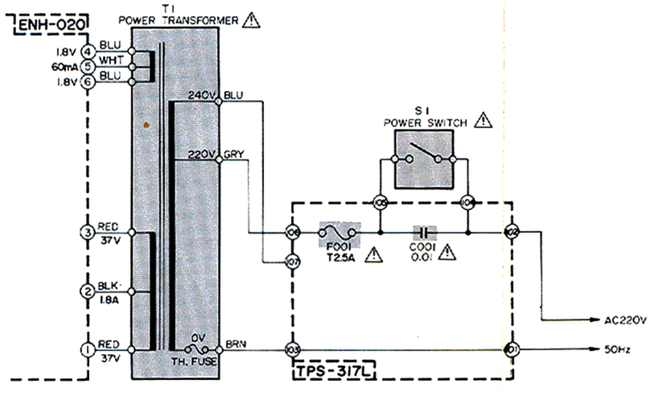
LC7815H



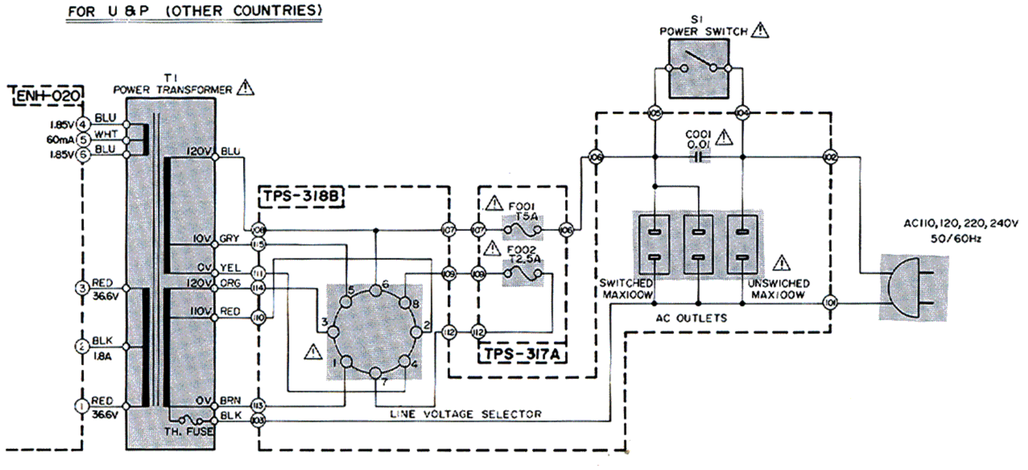
FOR BS & A (U.K & AUSTRALIA)



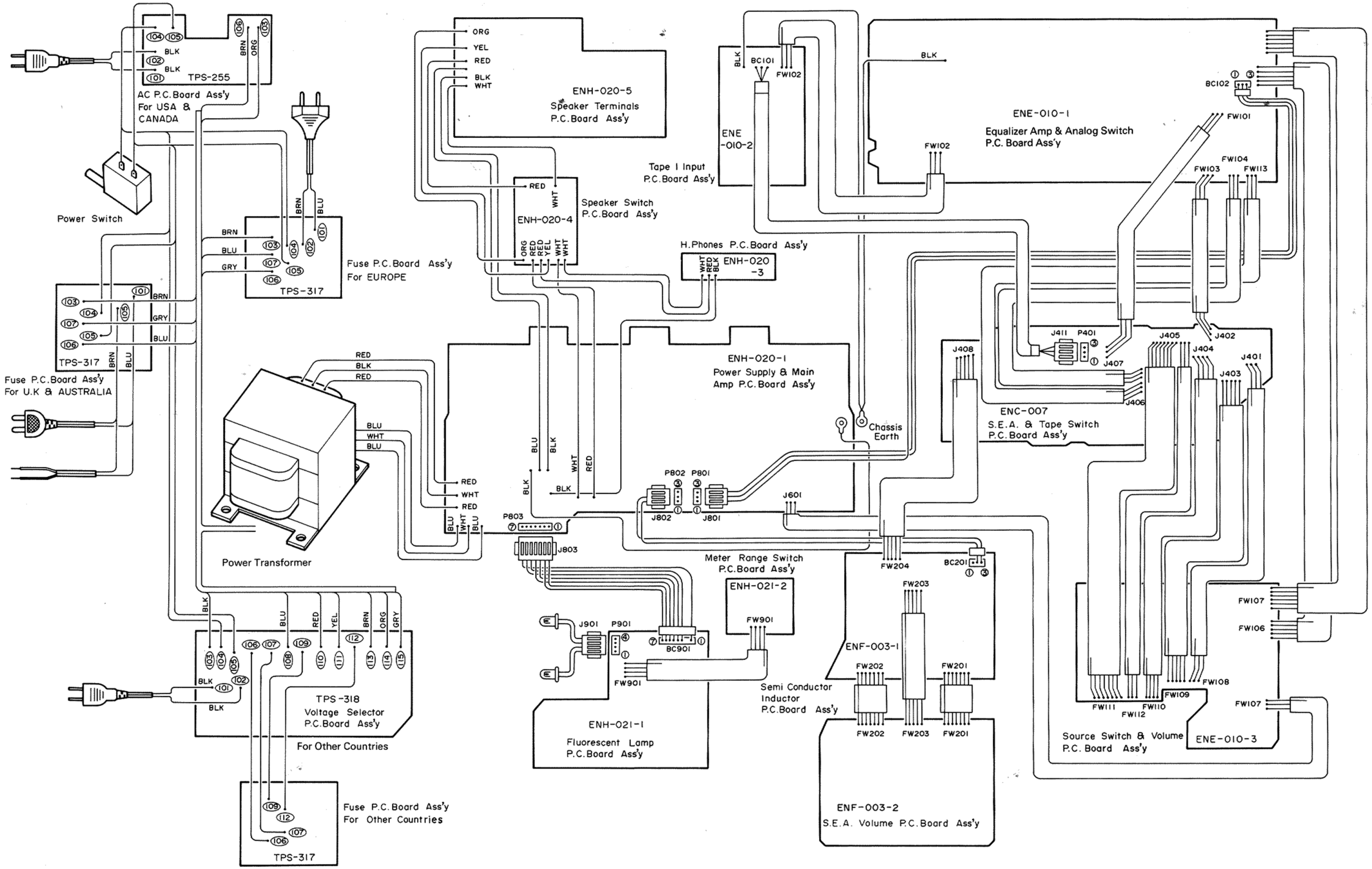
FOR E & G (EUROPE & WEST GERMANY)



FOR U & P (OTHER COUNTRIES)



6. Wiring Diagram



MEMO

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