

Audioklassik
Dossestrasse 14
10247 Berlin

TA-F5A

282

AEP Model
UK Model
US Model
E Model



(AEP, UK, E model)

INTEGRATED STEREO AMPLIFIER



SPECIFICATIONS

GENERAL

- Power Requirements:** 220 V ac (or 110 V ac by internal rewiring), 50/60 Hz (AEP model)
240 V ac (or 120 V ac by internal rewiring), 50/60 Hz (UK model)
120 V ac, 60 Hz (US model)
110 V, 220 V ac, 50/60 Hz (E1 model)
120 V, 240 V ac, 50/60 Hz (E2 model)
- Power Consumption:** 270 W (AEP, E model)
360 W (UK model)
125 W (US model)
- AC Outlets:** 2 switched 100 W (at max.)
(US model) 1 unswitched 50 W (at max.)
- Dimensions:** Approx. 410 (w) x 145 (h) x 370 (d) mm
16³/₈ (w) x 5³/₈ (h) x 14¹/₂ (d) inches
(AEP, UK, E model)
Approx. 435 (w) x 145 (h) x 370 (d) mm
17¹/₈ (w) x 5³/₈ (h) x 14¹/₂ (d) inches
(US model)
including projecting parts and controls
- Weight:** Approx. 7.2 kg (15 lb 14 oz), net
Approx. 9 kg (19 lb 14 oz), in
shipping carton (AEP, UK, E model)
Approx. 8.2 kg (18 lb 1 oz), net
Approx. 10 kg (22 lb 1 oz), in
shipping carton (US model)

AMPLIFIER SECTION

- Continuous RMS**
- Power Output:** Both channels driven simultaneously
(Less than 0.04 % total harmonic distortion)
At 20 – 20,000 Hz
70 + 70 W (8 Ω)
At 1 kHz
70 + 70 W (8 Ω)
According to DIN 45500 } (AEP, UK, E, model)
75 + 75 W (8 Ω)
- Power Bandwidth:** 5 – 35,000 Hz, 1HF
(AEP, UK, E model)
- Harmonic Distortion:** Less than 0.04 % at rated output
Less than 0.02 % at 10 W output
- IM Distortion:** Less than 0.01 % at rated output
(60 Hz : 7 kHz = 4 : 1) Less than 0.008 % at 10 W output

— Continued on next page —

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND  MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS 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.

SONY®

SERVICE MANUAL

282

TA-F5A

Frequency Response: PHONO RIAA equalization curve
± 0.2 dB

TUNER
AUX
TAPE 1
TAPE 2
REC/PB (AEP,
UK, E model)

3-70,000 Hz $\begin{matrix} +0 \\ -1 \end{matrix}$ dB

Tone Controls: BASS ± 10 dB at 60 Hz
(TURNOVER FREQ 300 Hz)
TREBLE ± 10 dB at 25 kHz
(TURNOVER FREQ 5 kHz)

Filters: LOW 6 dB/oct. below 15 Hz
HIGH 6 dB/oct. above 9 kHz

Damping Factor: 40 (8Ω, 1 kHz)
Residual Noise: Less than 50 μV (8 Ω, Network A)

Inputs:

	Sensitivity	Impedance	Maximum Input Level (0.1% distortion)	S/N (weighting network, input level)
PHONO	2.5 mV	50 kΩ	250 mV	85 dB (A, 2.5 mV)
TUNER AUX TAPE 1 TAPE 2 REC/PB (AEP, UK, E model)	150 mV	50 kΩ	—	100 dB (A, 150 mV)

Outputs:

	Output Level	Impedance
REC OUT 1 REC OUT 2 (US model)	150 mV	4.7 kΩ
REC/PB (AEP, UK, E model)	22 mV	82 kΩ
HEADPHONES	Accepts low and high impedance headphones *	
SPEAKER	Accepts speakers of 8-16 Ω (AEP, UK, E model) Accepts speakers of 4-16 Ω (US model)	

• MODEL IDENTIFICATION — Specification Label —

AEP model

SONY	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F5A AC 220 V ~ 50/60 Hz 270 W SERIAL NO. _____ MADE IN JAPAN
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UK model

SONY	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F5A AC 240 V ~ 50/60 Hz 360 W SERIAL NO. _____ MADE IN JAPAN
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US model

SONY	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F5A AC 120 V 60 Hz 125 W SERIAL NO. _____ MADE IN JAPAN
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E1 model

SONY	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F5A AC 110, 220 V ~ 50/60 Hz 270 W SERIAL NO. _____ MADE IN JAPAN
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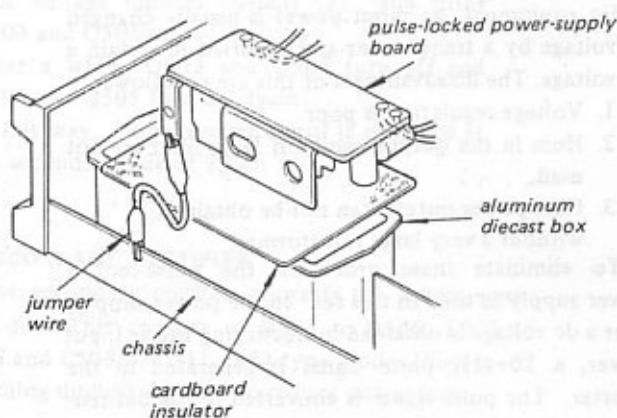
E2 model

SONY	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F5A AC 120, 240 V ~ 50/60 Hz 270 W SERIAL NO. _____ MADE IN JAPAN
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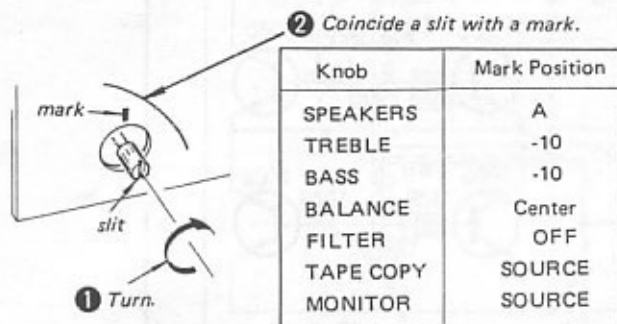
SERVICING NOTE

1. This set has a pulse-locked power-supply circuit which is quite different from a conventional power-supply circuit. The pulse-locked power supply directly rectifies and smooths the ac input power to produce the higher dc voltages required in the power supply circuit. When servicing this set, note the following.

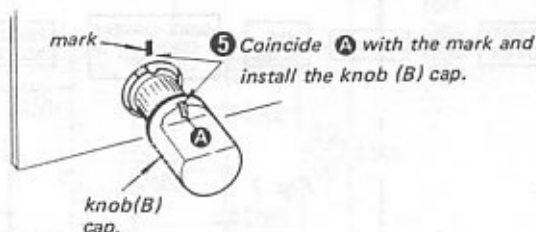
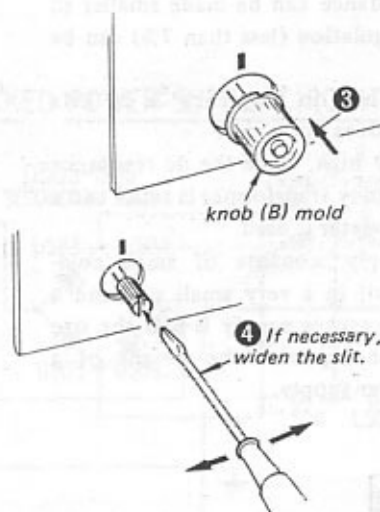
- To prevent unwanted radiation due to pulse signals in the pulse-locked power-supply circuit, the pulse-locked power-supply board is shielded by the aluminum diecast box.
- The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown on the right.



2. When replacing a knob (SPEAKERS/TREBLE/BASS / BALANCE / FILTER / TAPE COPY/ MONITOR), prepare a knob(B) cap (4-854-266-00) and a knob (B) mold (4-854-267-00). Installation of the knob is as follows.



Part No.	Description
X-4854-213-1	Knob Ass'y
including;	
4-854-266-00	Cap, knob (B)
4-854-267-00	Mold, knob (B)



3. CAUTION

When replacing Q503 - Q506 in the pulse-locked power-supply circuit, use those which have the same hFE values.

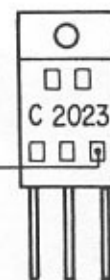
- AEP, UK, E model

Q503-506 8-729-302-31 2SC2023-R ... R
8-729-302-32 2SC2023-O ... O

- US model

Q503-506 8-729-308-62 2SC1986C-O ... O

Note: R or O indicates the hFE value.



SECTION 1

OUTLINE

1-1 CIRCUIT DESCRIPTION

In the power supply section of conventional audio equipment, ac input power is usually changed in voltage by a transformer and rectified to obtain a dc voltage. The disadvantages of this are as follows;

1. Voltage regulation is poor.
2. Hum in the output results if large filter are not used.
3. High-power output can not be obtained without a very large transformer.

To eliminate these problems, the pulse-locked power supply is used in this set. In the power supply, after a dc voltage is obtained by rectifying the ac input power, a 20 kHz pulse signal is generated in the inverter. The pulse signal is converted to the desired-voltage signal by a high-frequency transformer which has a small ferrite-core, and then rectified to produce dc voltages.

Fig. 1 shows the block diagram of the pulse-locked power supply. This power supply has the following advantages;

1. The source impedance can be made smaller so better voltage regulation (less than 7%) can be obtained.
2. Square waves as high in frequency as 20 kHz are used, so hum does not occur.
3. Efficiency is very high, since the dc resistance of the high-frequency transformer is small and a high-efficiency inverter is used.
4. This power supply consists of small components that result in a very small size and a light weight. This power supply is half the size and less than one quarter the weight of a conventional power supply.

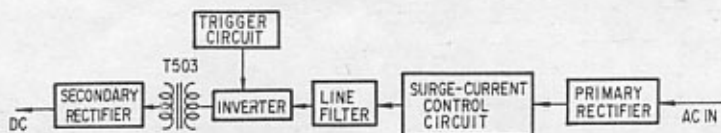


Fig. 1

1. SURGE-CURRENT CONTROL CIRCUIT (See Fig. 2)

Since the pulse-locked power supply directly rectifies ac power input, if S6 (POWER) is set to ON without a surge-current control circuit, a large surge-current charging C313 and C314 will flow and damage S6 (POWER).

To prevent this, the parallel combination of R601 to R603 are added in series with S6 (POWER) to control the rush-current. The resistors are shorted by RY601 after dc voltage appears in the secondary rectifier circuit.

2. LINE FILTER (See Fig. 2)

To eliminate the high-frequency ripple component produced in the inverter, a line filter is installed. The line filter consists of C501 to C503. L501 is a bifilar RF choke having a ferrite toroidal core.

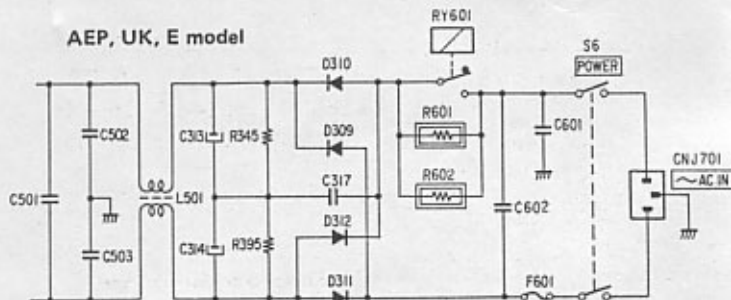


Fig. 2

3. INVERTER TRIGGER CIRCUIT (See Fig. 3.)

Setting S6 (POWER) to ON is not sufficient to start the inverter oscillating; a trigger signal is also required for inverter oscillation. The operation is as follows;

- 1) When S6 (POWER) is set to ON, current ① charges C506.
- 2) When the voltage between the base and emitter of Q502 becomes more than 0.6 V, Q502 and Q501 turn on.
- 3) C506 discharges and current ② flows, causing the inverter to start to oscillate.
- 4) After the start of the oscillation, the voltage appearing at the winding N2 of T503 is rectified by D501 and D502 and charges C505. As a result, Q502 and Q501 turn off so that the load on the N1 winding of T501 is reduced and the inverter operates normally, maintaining oscillation.

4. INVERTER CIRCUIT

The inverter consists of four transistors and generates a square-wave signal of about 20 kHz.

Fig. 4. shows the principle of the inverter. By turning S1 and S4, or S2 and S3 on and off, the square-wave signal shown in Fig. 5 is generated at the secondary side of T503. In short, dc current is changed to a square-wave signal by switching action.

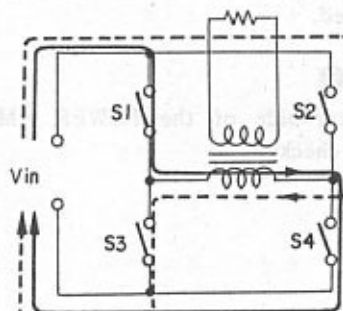


Fig. 4

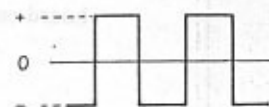
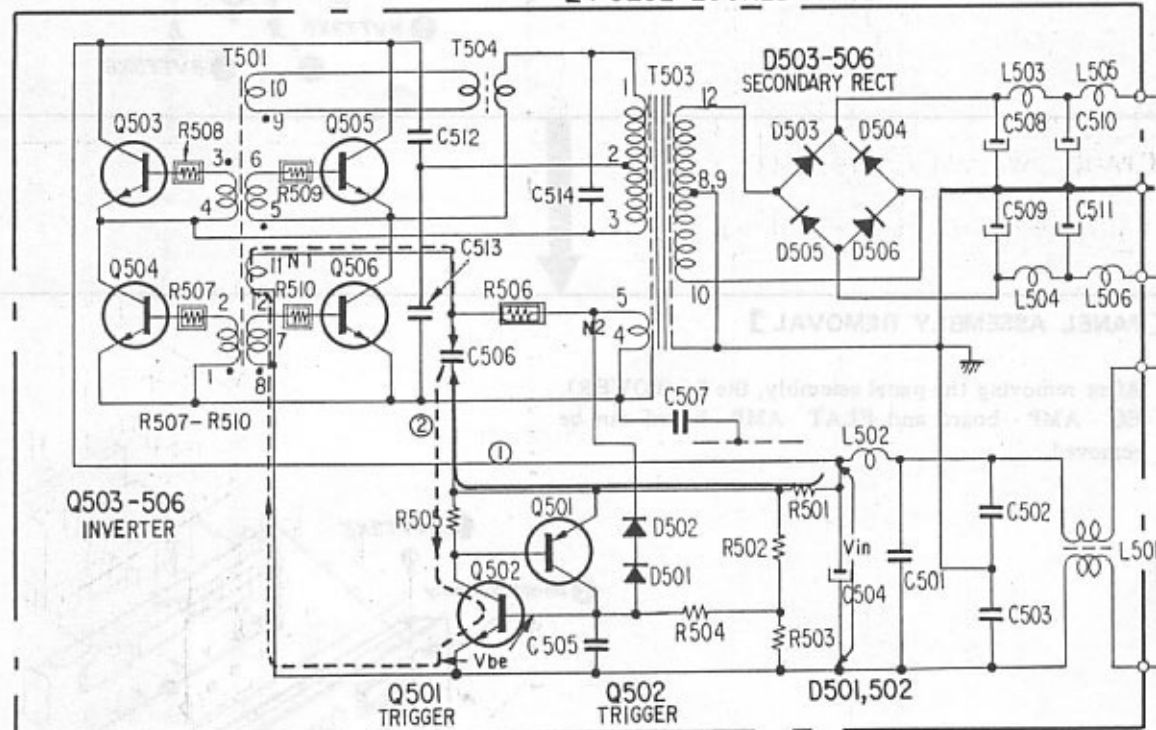


Fig. 5

【 PULSE-LOCKED POWER-SUPPLY CIRCUIT 】



N3 and N6 are wound in the same direction as N1.
N4, N5 and N9 are wound in the opposite direction of N1.

Fig. 3

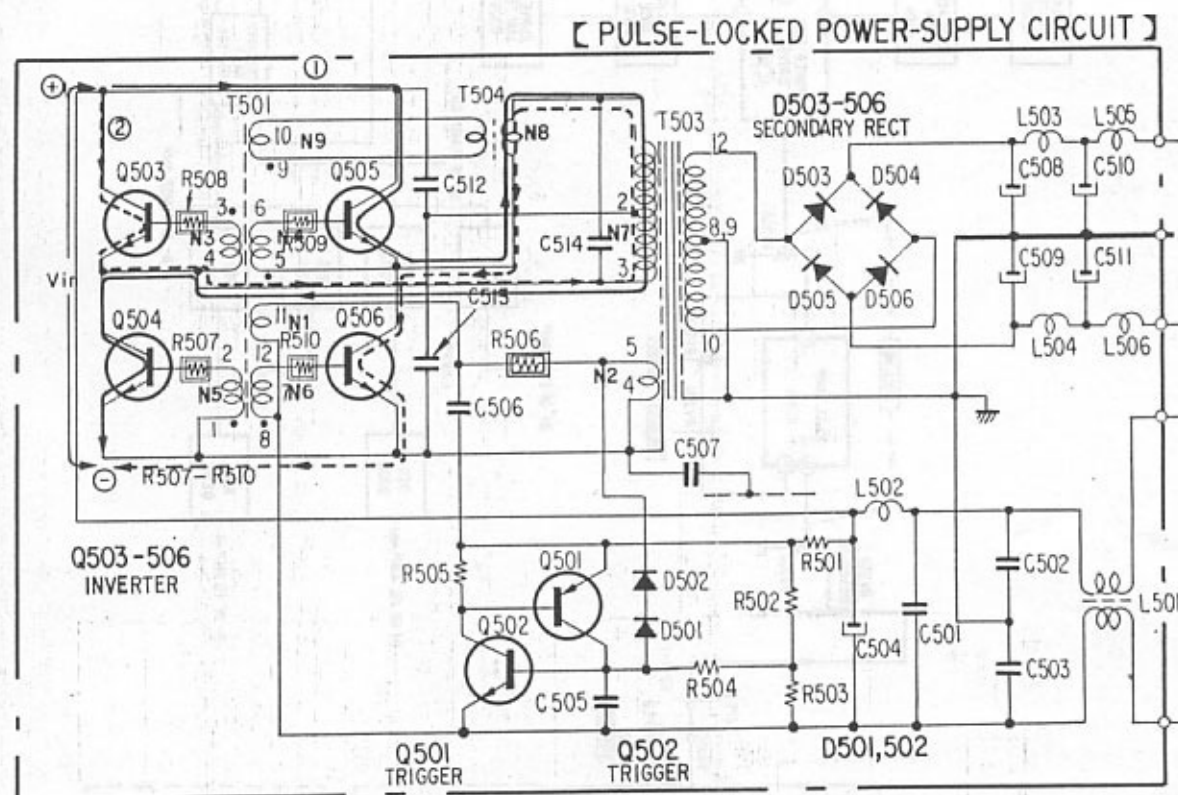
The details are as follows (See Fig. 6.);

- 1) A trigger signal is generated at winding N1 by the trigger circuit.
- 2) We assume that Q504 and Q505 are turned on by current ① which is induced by the trigger signal.
- 3) At this time, an induced current flows through winding N9 and generates voltages at windings N4 and N5. These voltages keep Q504 and Q505 on. This is a current feedback.
- 4) At the same time, an induced current flows through winding N2 of T503 and generates voltages at windings N4 and N5. These voltages also keep Q504 and Q505 on. This is a voltage feedback.
- 5) The current and voltage feedbacks keep Q504 and Q505 on and send power to T503. After a while, T501 becomes saturated and stops generating the voltages that keep Q504 and Q505 on.

- 6) Q504 and Q505 then turn off, and a voltage which is opposite in polarity to the former voltage appears at winding N2.
- 7) This voltage induces current ②, and turns Q503 and Q506 on.
- 8) After a while, Q503 and Q506 turn off and Q504 and Q505 turn on, again.
- 9) In this way, a square-wave signal is obtained at the secondary side of T503.

5. SECONDARY RECTIFIER

The secondary rectifier converts the square-wave into dc. This consists of D503 to D506, L503 to L506 and C508 to C511. S34-type diodes (high-speed switching diodes) are used to reduce power loss.

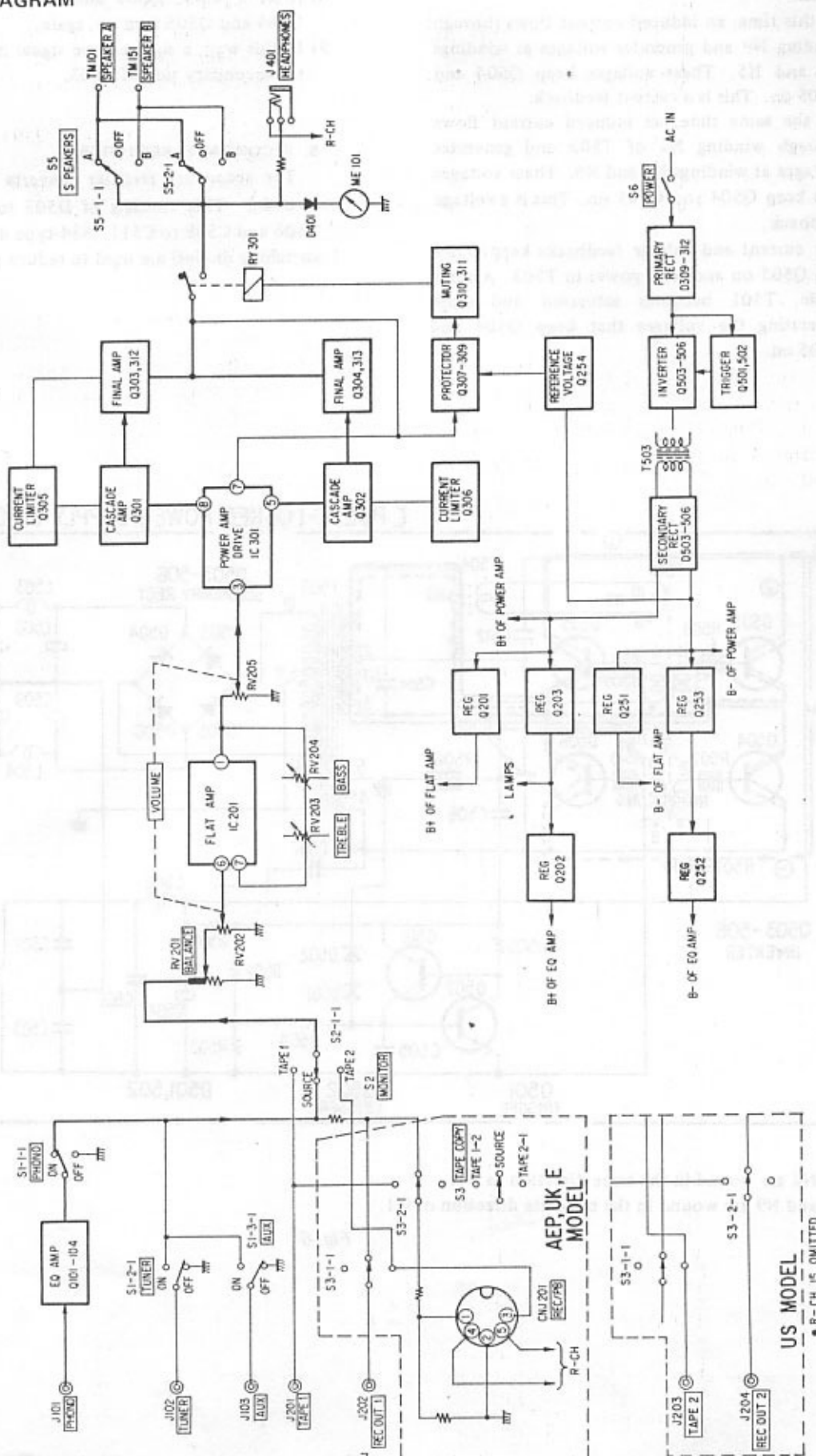


N3 and N6 are wound in the same direction as N1.

N4, N5 and N9 are wound in the opposite direction of N1.

Fig. 6

1-2. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

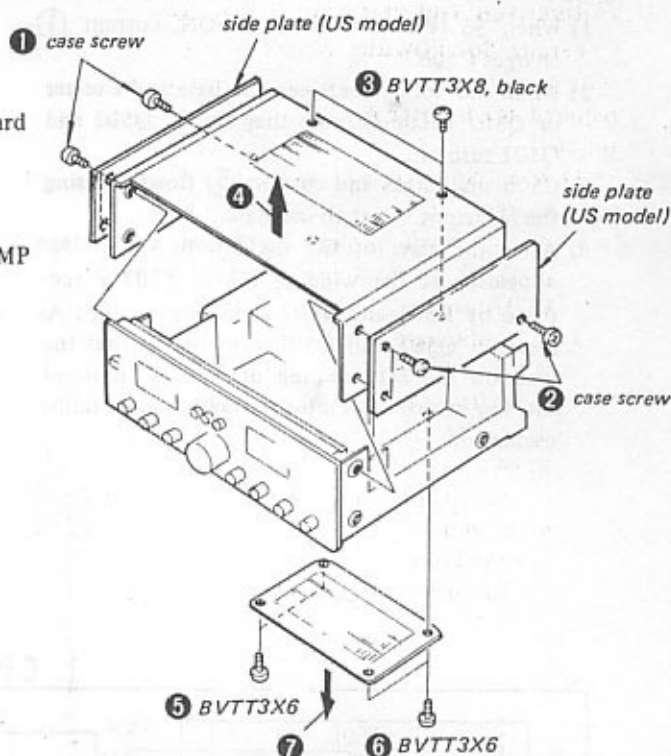
【CASE AND BOTTOM PLATE REMOVAL】

Case: ① to ④

The component side of the EQ AMP board can be checked.

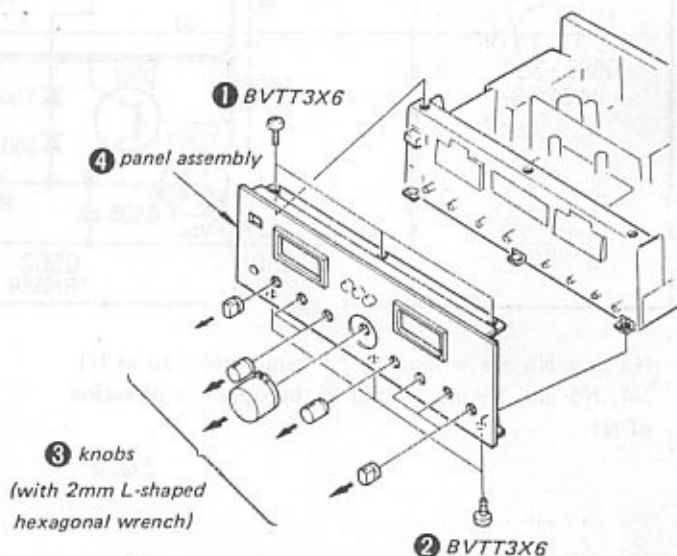
Bottom Plate: ⑤ to ⑦

The conductor side of the POWER AMP board can be checked.

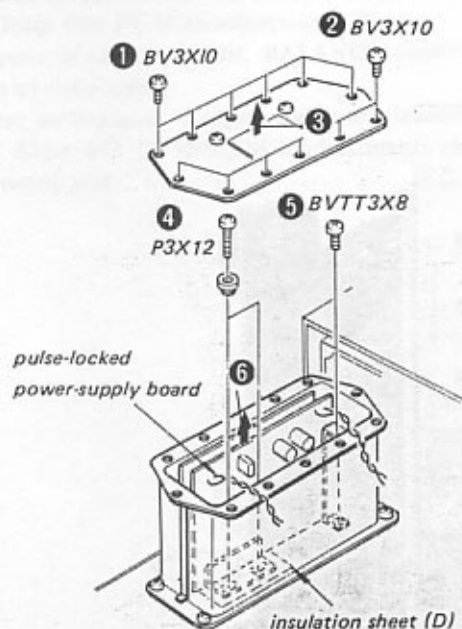


【PANEL ASSEMBLY REMOVAL】

After removing the panel assembly, the S6 (POWER), EQ AMP board and FLAT AMP board can be removed.

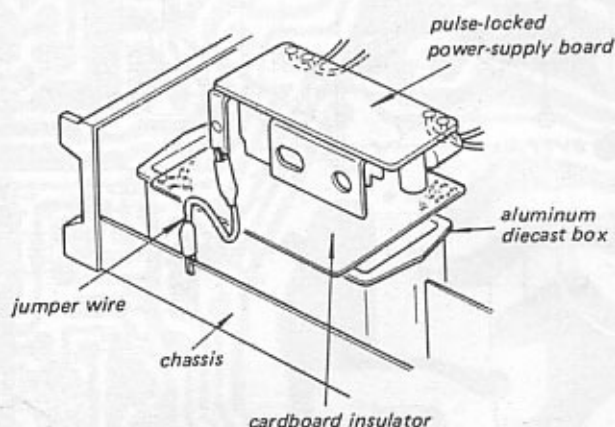


【PULSE-LOCKED POWER-SUPPLY BOARD REMOVAL】

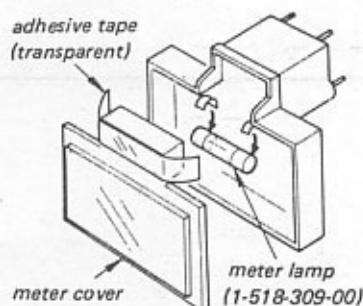


CAUTION

The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire and a cardboard insulator as shown below.



【METER LAMP REPLACEMENT】

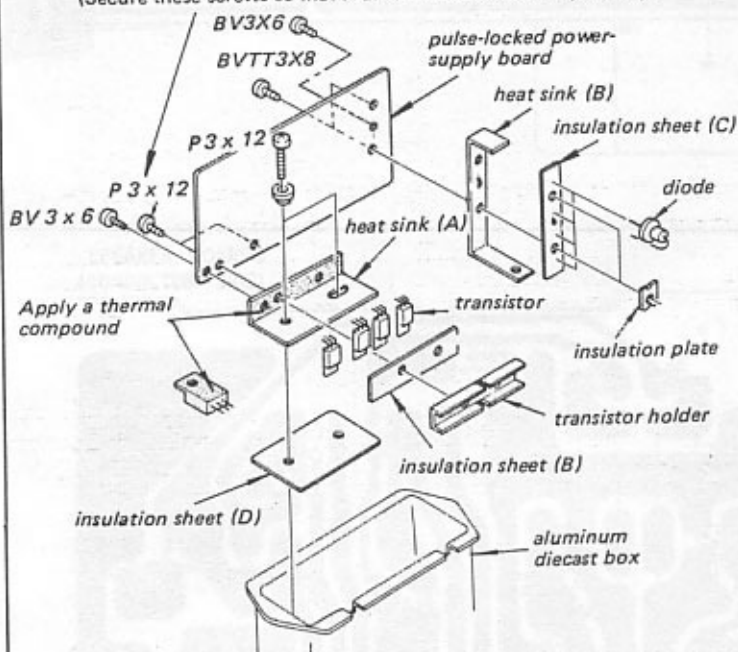


Note:

To obtain the same brightness of meter lamps, replace both lamps (L-CH and R-CH) together with new ones.

Exploded view (Refer this when installing the pulse-locked power-supply board.)

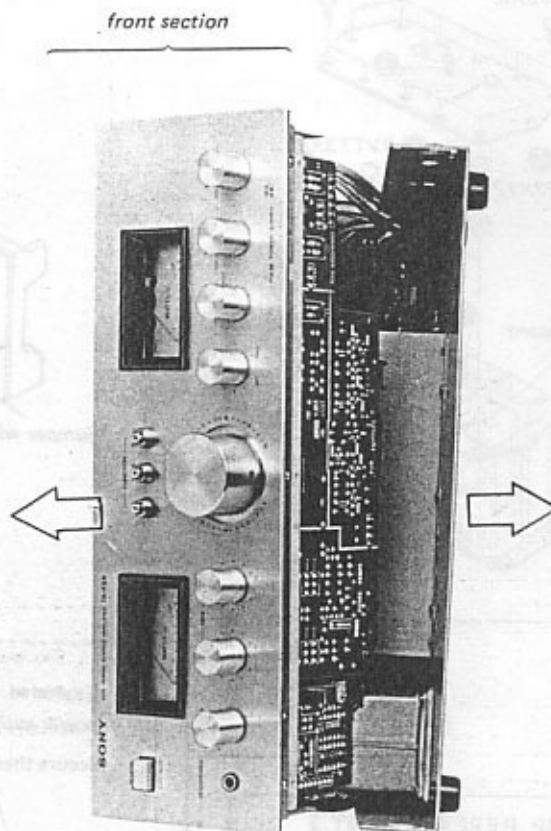
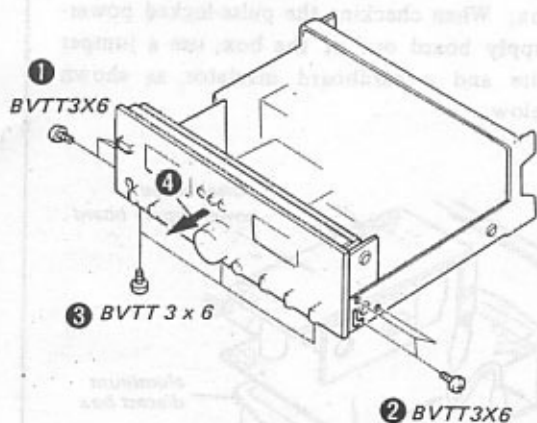
(Secure these screws so that four transistors are held properly.)



- Note:
- If a insulation sheet is injured or torn, change it.
 - Confirm that there are no scraps of solder or lead wire on any insulation sheet.

【 FLAT AMP BOARD CHECKING AND SERVICING 】

The FLAT AMP board and EQ AMP board on the front section can be separated from the chassis.



SECTION 3

ELECTRICAL ADJUSTMENTS

Note:

1. DC BIAS and DC BALANCE adjustments should be performed several minutes after the set becomes stable (S6: POWER is set to ON.).
2. Perform first DC BIAS adjustment.
3. Repeat DC BIAS and DC BALANCE adjustments two or three times.
4. After servicing or changing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

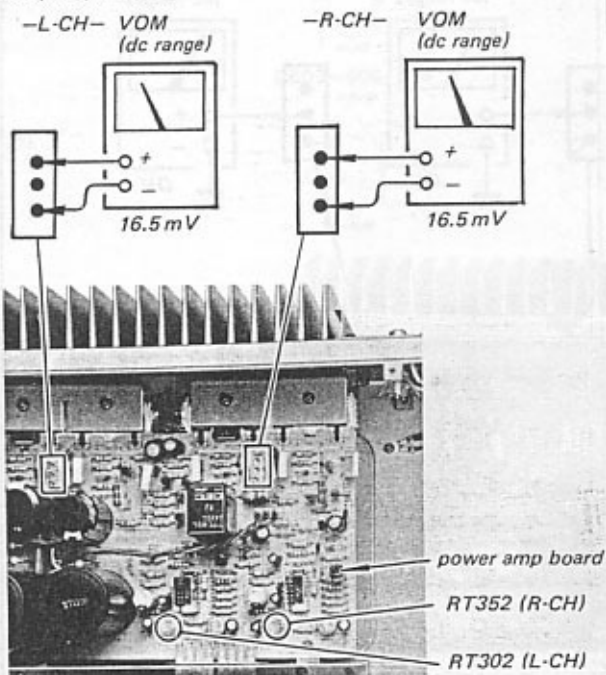
DC Bias Adjustment

Procedure:

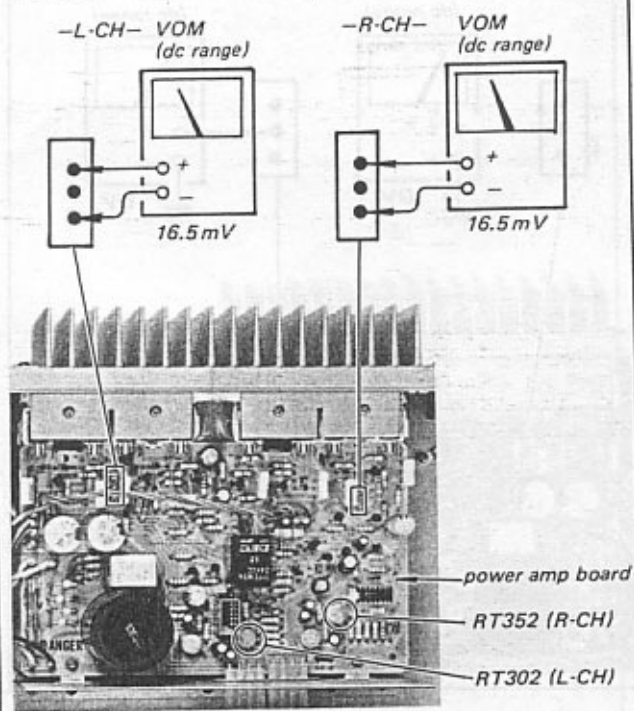
Adjust RT302 (L-CH) and RT352 (R-CH) for 16.5 mV readings.

Adjustment Location:

AEP, UK, E model



US model



Audioklassik
 Dossestrasse 14
 10247 Berlin

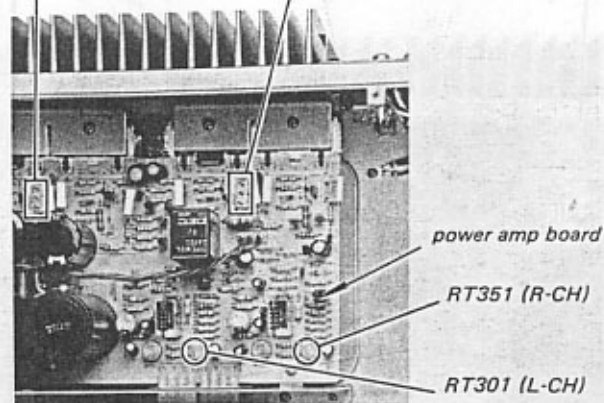
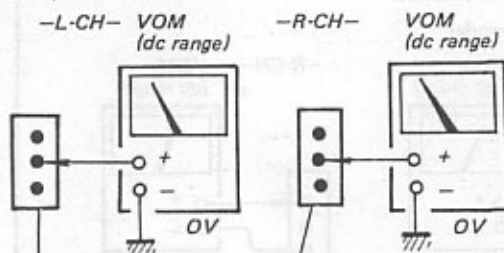
DC Balance Adjustment

Procedure:

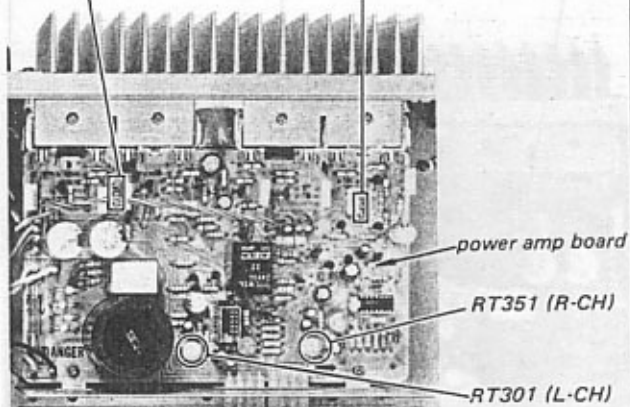
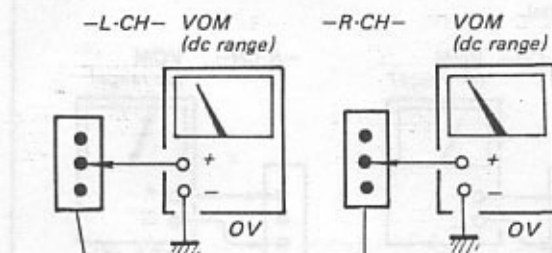
Adjust RT301 (L-CH) and RT351 (R-CH) for 0V readings.

Adjustment Location:

AEP, UK, E model



US model

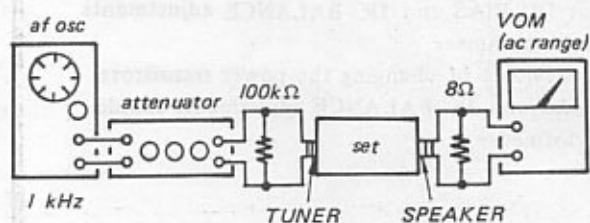


Meter Level Adjustment

Setting:

FUNCTION switch: TUNER

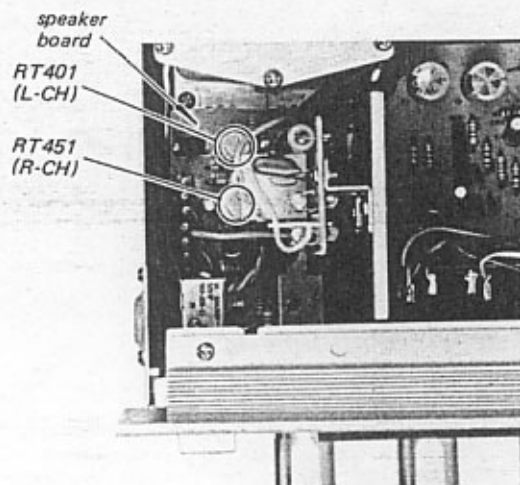
Procedure:



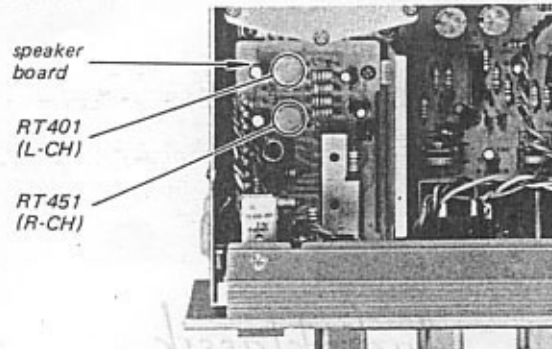
1. Turn the VOLUME control fully clockwise.
2. Adjust the TUNER input level for a 2.83 V reading.
3. Adjust RT401 (L-CH) and RT451 (R-CH) so that the power meters indicate 1 W.

Adjustment Location:

AEP, UK, E model



US model



SECTION 4

DIAGRAMS

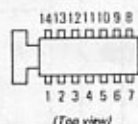
4-1. MOUNTING DIAGRAM (AEP, UK, E Model)

— Power Amplifier Section —

• Replacement Semiconductors

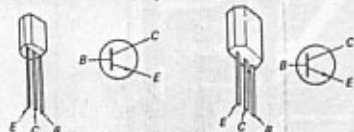
For replacement, use semiconductors except in ().

IC301, 351: CX171



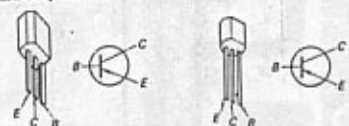
Q301, 351
Q306, 356
Q307, 357
Q308, 310, 311
Q502

: 2SC1364 (2SC634A)



Q302, 352
Q305, 355
Q309, 501

: 2SA678 (2SA733)



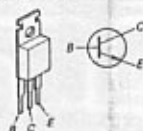
Q303, 353
Q312, 362

: 2SA771

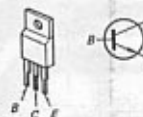


Q304, 354
Q313, 363

: 2SC 1986C (2SC 1986)



Q503—506: 2SC2023 -R (2SC2023)



D301, 351
D302, 352

: MV12N



D303, 353
D304, 354

: 1S2076A

D305, 355
D401, 451
D402, 452

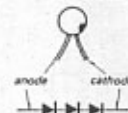
: 1T22AM (1T22)

D306, 356, 308
D313, 363
D501, 502

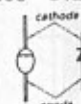
: 1S1555



D307: MV203V



D309—312: U05G (U05E)

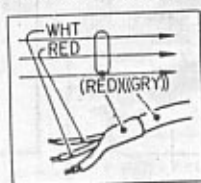


D503—506: S34



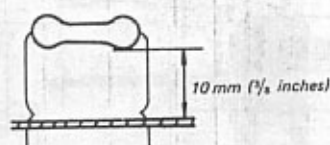
Note:

- Color code of sleeving over the end of the jacket.



- — : parts extracted from the component side.
- — : B + pattern
- — : B - pattern
- Signal Path
 - : L-CH
 - : R-CH
 - : Common

All resistors and diodes indicated by • are mounted as shown below.

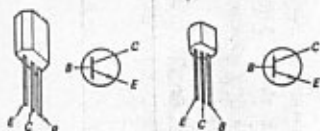


4-2. MOUNTING DIAGRAM (AEP, UK, E Model) — Preamplifier Section —

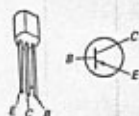
• Replacement Semiconductors

For replacement, use semiconductors except in ().

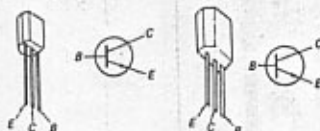
Q101, 151: 2SC1637-0 (2SC2129)



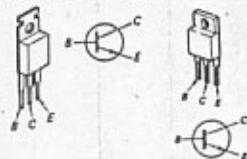
Q102, 152: 2SA872D (2SA872)
Q103, 153: 2SA896 (2SB646)



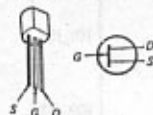
Q104, 154: 2SC1364 (2SC1634)
Q201, 202: 2SC1364 (2SC634A)



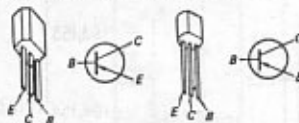
Q203: 2SD476A (2SC1826)



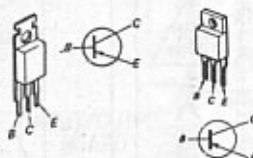
Q204, 254: 2SK30A



Q251, 252: 2SA678 (2SA733)



Q253: 2SB566A (2SA768)



IC201, 251 : HA1457



D101, 151: MV12N



D102 : EQB01-06 (EQA01-06R)
D201 : EQB01-30 (EQA01-30R)
D202, 251: EQB01-25 (EQA01-25R)
D252 : EQB01-28 (EQA01-28R)

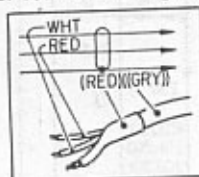


D253: 10E2



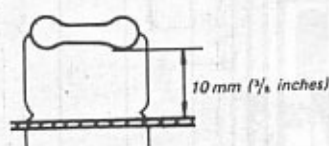
Note:

- Color code of sleeving over the end of the jacket.



- ○ : parts extracted from the component side.
- ■ : B + pattern
- ■ : B - pattern
- Signal Path
 - : L-CH
 - - - : R-CH
 - : Common
- ▲ : nonflammable resistor.

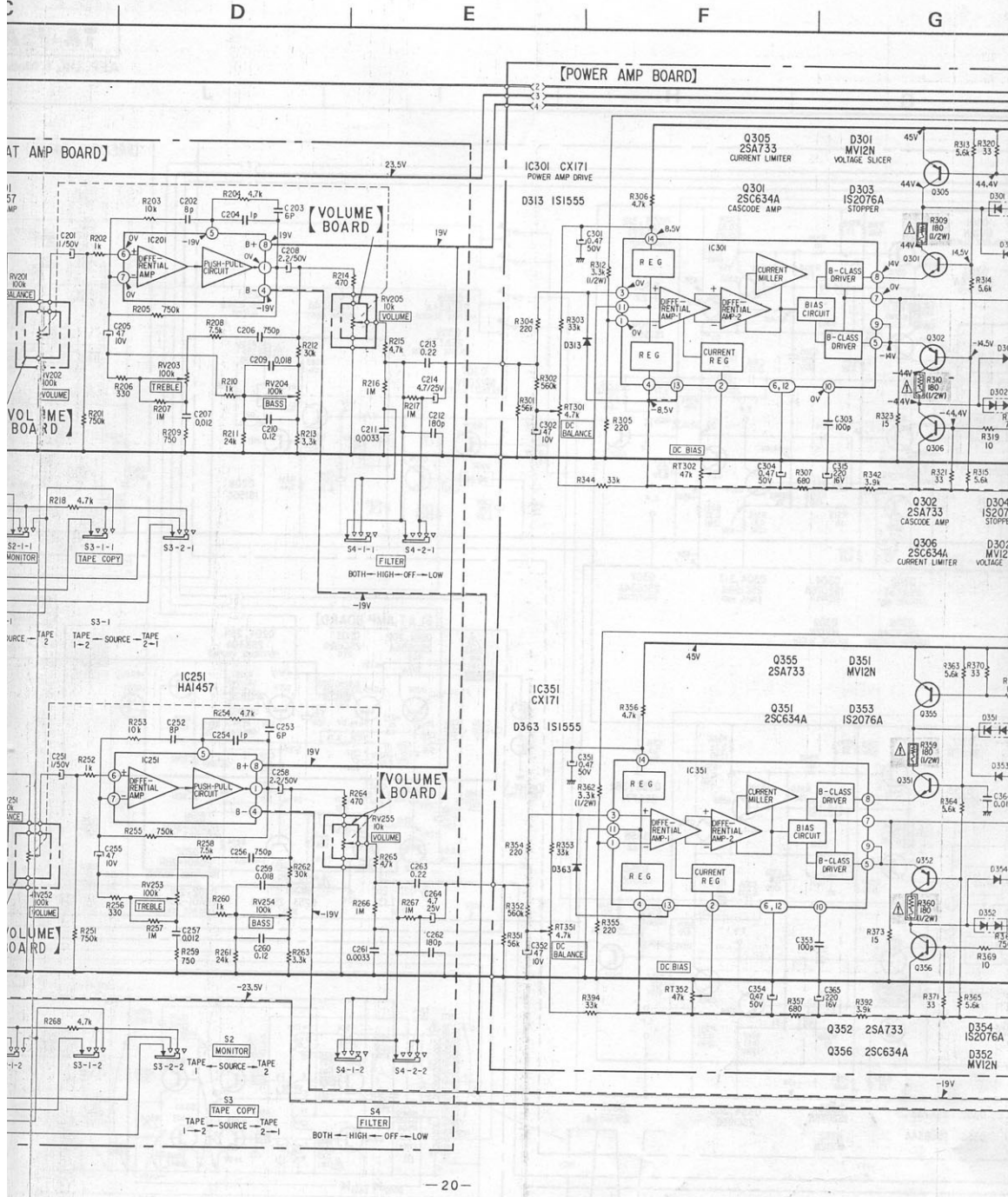
All resistors and diodes indicated by ● are mounted as shown below.



AEP,



A TA-F5A Model AEP, UK, E Model





TA-F5A

AEP, UK, E Model

L



- 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.
- All resistors are in ohms $\frac{1}{2}\text{W}$ unless otherwise noted. $\text{k}\Omega = 1000 \Omega$, $\text{M}\Omega = 1000 \text{k}\Omega$.
-  : nonflammable resistor
-  : B + bus.
-  : panel designation
-  : adjustment for repair.
-  : B - bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions with a VOM (20 $\text{k}\Omega/\text{V}$) when 220 V ac is applied to the set.
- Voltage variations may be noted due to normal production tolerances
- Switch

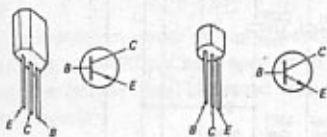
Ref. No.	Switch	Position
S1	FUNCTION	PHONO
S2	MONITOR	SOURCE
S3	TAPE COPY	SOURCE
S4	FILTER	OFF
S5	SPEAKERS	OFF
S6	POWER	OFF
S701	VOLTAGE SELECTOR	OFF

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

• Replacement Semiconductors

For replacement, use semiconductors except in ().

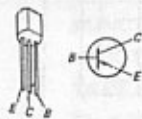
Q101, 151: 2SC1637-0 (2SC2129)



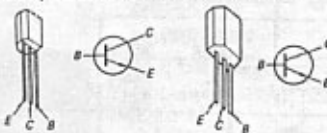
D102: EQB01-06 (EQA01-06R)



Q102, 152: 2SA872D (2SA872)
Q103, 153: 2SA896 (2SB646)



Q104, 154: 2SC1364 (2SC1634)

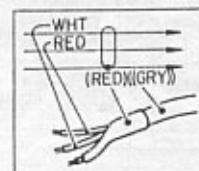


D101, 151: MV12N



Note:

- Color code of sleeving over the end of the jacket.



- ○ : parts extracted from the component side.
- ■ : B + pattern
- ■ : B - pattern

All resistors and diodes indicated by ● are mounted as shown below.

