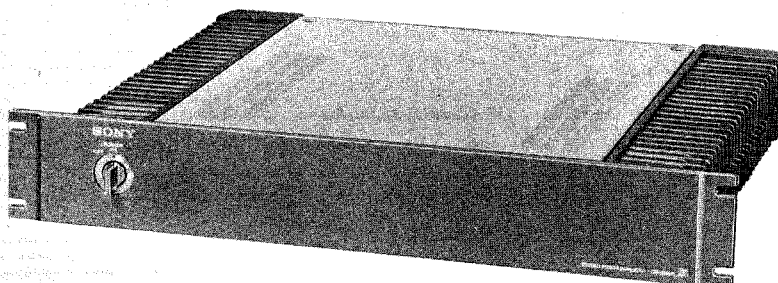


TA-N86B

US Model
Canadian Model
AEP Model
UK Model



STEREO POWER AMPLIFIER

SPECIFICATIONS

GENERAL

Power Requirements:	120 V ac, 60 Hz (US, Canadian model) 220 – 240 V ac, 50/60 Hz (AEP, UK model)
Power Consumption:	210 W (US model) 510 VA (Canadian model) 450 W (AEP, UK model)
Dimensions:	Approx. 480 (w) x 80 (h) x 380 (d) mm 18 ⁷ / ₈ (w) x 3 ¹ / ₈ (h) x 15 (d) inches Including projecting parts and controls
Weight:	Approx. 8.0 kg, 17 lb 10 oz (net) Approx. 8.6 kg, 18 lb 15 oz (in shipping carton)

POWER AMPLIFIER SECTION

Continuous RMS Power Output:
(US, Canadian model)

Class A and B Operation: with 8 Ω loads, both channels driven,
from 20–20,000 Hz, with no more
than 0.007 % total harmonic distortion

Mono Amp Operation: with 8 Ω loads, from 20–20,000 Hz,
with no more than 0.015 % THD

Class A	18 W + 18 W
Class B	80 W + 80 W (8 Ω) 90 W + 90 W (4 Ω)
Mono	180 W

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.

ATTENTION AU COMPOSANT AYANT RAPPORT
À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

— Continued on page 2 —

SONY[®]

SERVICE MANUAL

TA-N86B

(AEP, UK model)
 Less than 0.007 % THD, both channels driven simultaneously, 8 Ω
 (In mono amp operation: less than 0.015 %, 8 Ω)

	20 Hz – 20 kHz
Class A	18 W + 18 W
Class B	80 W + 80 W (8 Ω) 60 W + 60 W (4 Ω)
Mono	120 W

According to DIN 45500

Class A	18 W + 18 W
Class B	80 W + 80 W
Mono	120 W

Damping Factor: 70 (1 kHz, 8 Ω)

Harmonic Distortion:

		20 Hz–20 kHz	5 Hz–50 kHz
Rated output	Class A	0.007 %	0.02 %
	Class B	0.007 %	0.02 %
	Mono	0.015 %	0.07 %
½ rated output	Class A	0.0025 %	0.005 %
	Class B	0.0035 %	0.007 %
	Mono	0.008 %	0.03 %
1W output	Class A	0.001 %	0.006 %
	Class B	0.003 %	0.007 %
	Mono	0.008 %	0.025 %

Intermodulation (IM)

Distortion:

(60 Hz : 7 kHz = 4 : 1)

Rated output	Class A	0.004 %
	Class B	0.004 %
	Mono	0.005 %
½ rated output	Class A	0.002 %
	Class B	0.003 %
	Mono	0.004 %
1W output	Class A	0.002 %
	Class B	0.003 %
	Mono	0.004 %

Power Bandwidth (IHF): 5 Hz – 45 kHz (Class B, 8 Ω, 0.007 %)
 5 Hz – 60 kHz (Class A, 8 Ω, 0.007 %)
 5 Hz – 30 kHz (Mono, 8 Ω, 0.015 %)

Frequency Response: DC – 200 kHz $\begin{matrix} +0 \\ -1 \end{matrix}$ dB (DIRECT input)
 7 Hz – 200 kHz $\begin{matrix} +0 \\ -1 \end{matrix}$ dB (C COUPLED input)

S/N Ratio: Greater than 120 dB, short-circuited input

Residual Noise: 25 μV (8 Ω, network A)

Inputs:

	Gain			Impedance		
	Class A	Class B	Mono	Class A	Class B	Mono
DIRECT	27.4 dB	27.4 dB	33.4 dB	50 kΩ	50 kΩ	50 kΩ
C COUPLED (3 Hz cutoff frequency 6 dB/oct slope)						

Outputs: SPEAKER terminals
 Class B: Accept speakers of 4 – 16 Ω
 Class A and Mono amp: Accept speakers of 8 – 16 Ω

0 dB = 0.775 V

MODEL IDENTIFICATION

Specification Label

US model

SONY		
STEREO POWER AMPLIFIER		
MODEL NO.	TA-N86B	
SERIAL NO.		
AC 120 V	60 Hz	210 W
MADE IN JAPAN		

Canadian model

SONY		
STEREO POWER AMPLIFIER		
MODEL NO.	TA-N86B	
SERIAL NO.		
AC 120 V	60 Hz	510 VA
MADE IN JAPAN		

AEP, UK model

SONY	
STEREO POWER AMPLIFIER	
MODEL NO.	TA-N86B
SERIAL NO.	
220 ~ 240 V	
50/60 Hz 450 W	
MADE IN JAPAN	

SERVICING NOTES

1. REPLACEMENT OF THE TRANSFORMERS IN THE PULSE-LOCKED POWER-SUPPLY CIRCUIT

The lead wire arrangement for each of T601-603 in the inverter circuit are shown in Figs. 1 and 2.

As the repair parts, T603 is formed by an iron core and a coil winding, but T601 and T602 are only iron core. Thus, if the coils are defective, arrange a new transformers as shown in Fig. 1. Note that the lead lengths must be exact. Also wind the coil carefully.

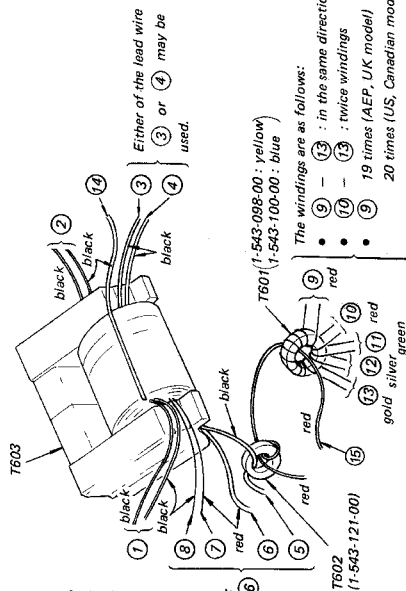


Fig. 1

2. PULSE-LOCKED POWER SUPPLY BOARD REPAIRING

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.

- 1) 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.
- 2) 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 as shown.

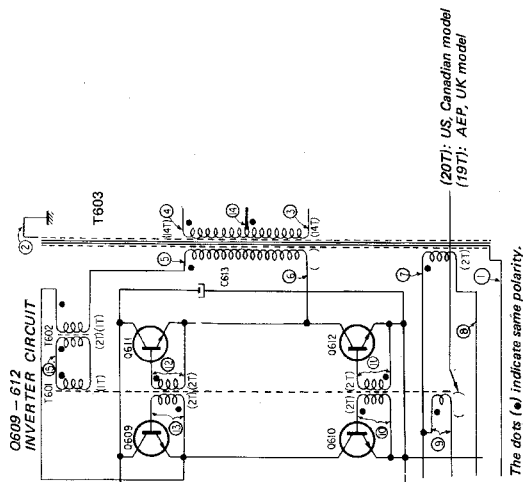


Fig. 2

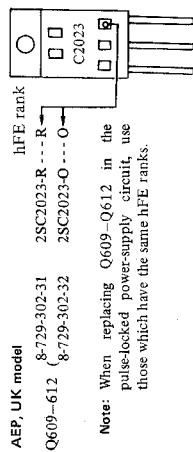
The dots (•) indicate same polarity.

3. INVERTER CIRCUIT TRANSISTOR REPLACEMENT (Q609-612)

- 1) Be sure that there are no bits of solder and wire ends on the places marked *2 in Fig. 3.
- 2) Proceed the following items surely when replacing the transistors (Q609 ~ 612).

* Apply thermal compound coat to the positions marked *1 and *2 in Fig. 3 before mounting the transistors.

† Lay the F-shaped plate flat to ensure uniform contact with all 4 transistors (see Fig. 4)



Note: When replacing Q609–Q612 in the pulse-locked power-supply circuit, use those which have the same hFE ranks.

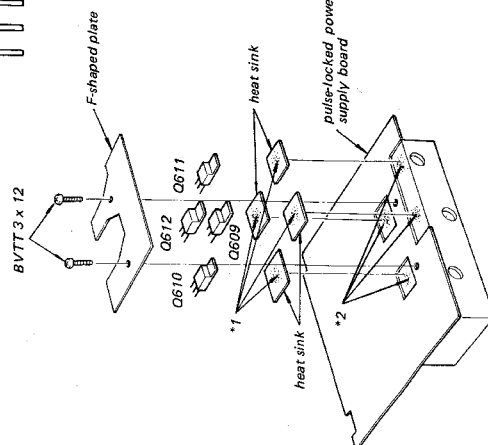
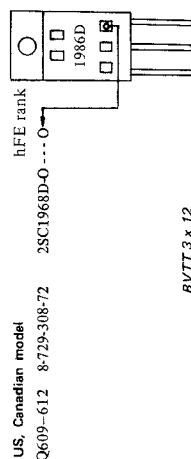


Fig. 3

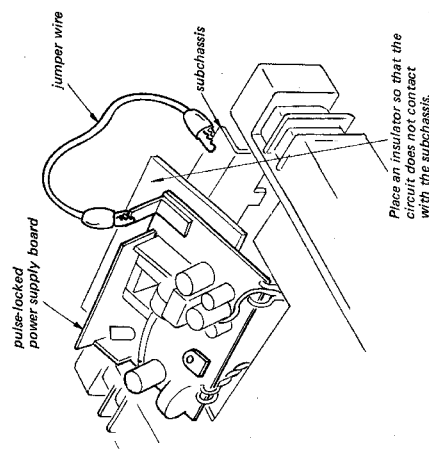


Fig. 4

SECTION 1 OUTLINE

1.1. CIRCUIT DESCRIPTION

[Switching of Class-A and Class-B Amplifiers]

The switching between the class-A and the class-B amplifiers is done by switching the bias voltage of the amplifier.

1. For the class-A amplifier, Q122 and Q123 (Q222 and Q223) are turned off by operating the read relay RY101 (RY201). Therefore, the bias voltage for the class-A amplifier is determined by RT103 (RT203). The

B voltage is switched by RY601 to that for the class-A amplifier.

2. For the class-B amplifier, the read relay RY101 (RY201) do not operate. RT103 (RT203) is short-circuited because Q122 and Q123 (Q222 and Q223) are turned on. As a result, the bias voltage for the class-B amplifier is determined by RT102 (RT202).

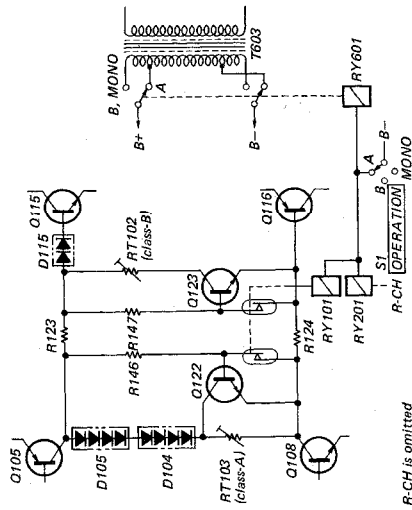


Fig. 1-1.

[MONO Operation]

The left and right channel amplifiers are connected and operated in series (BTL) as shown in Fig. 1-2.

Note that the output forms a balanced push-pull circuit, thus the output power becomes approximately double. The balanced output is obtained by using the original power amplifier input-output phase inversion and inserting a load in series between the each output hot side.

Thus, same but opposite phase signal is supplied to the left and right channel power amplifier inputs simultaneously. As a result, the power applied to the load is doubled.

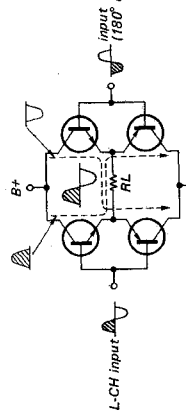


Fig. 1-2.

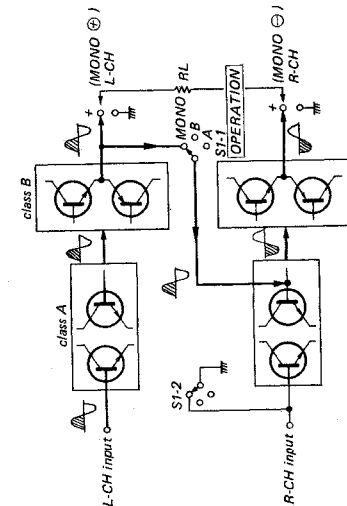
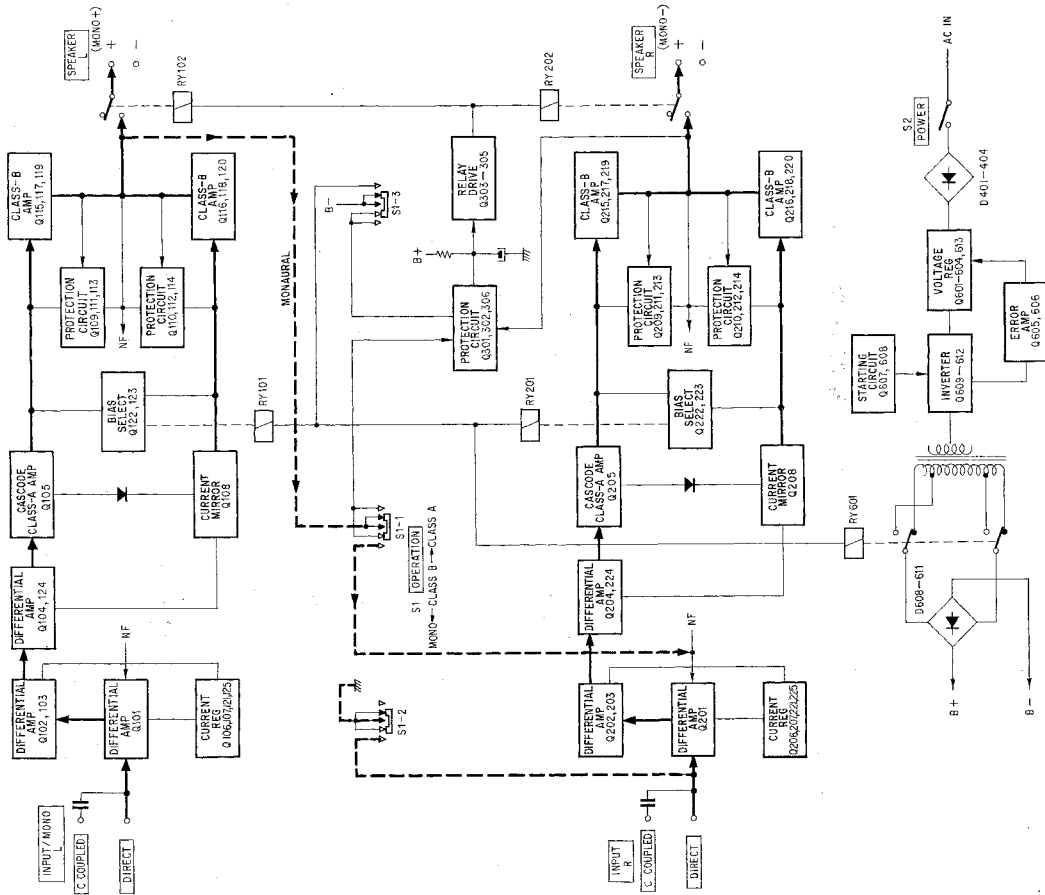


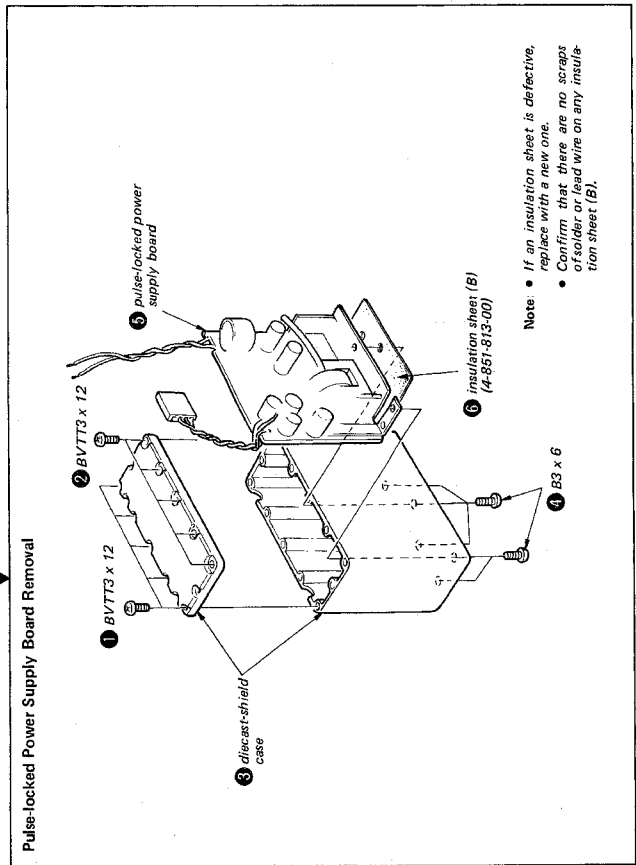
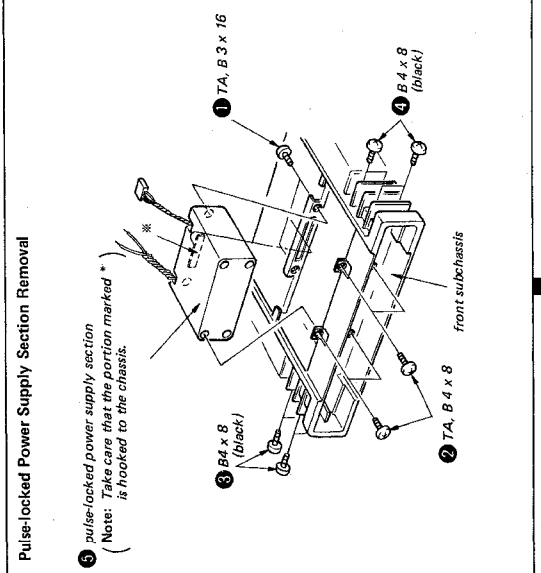
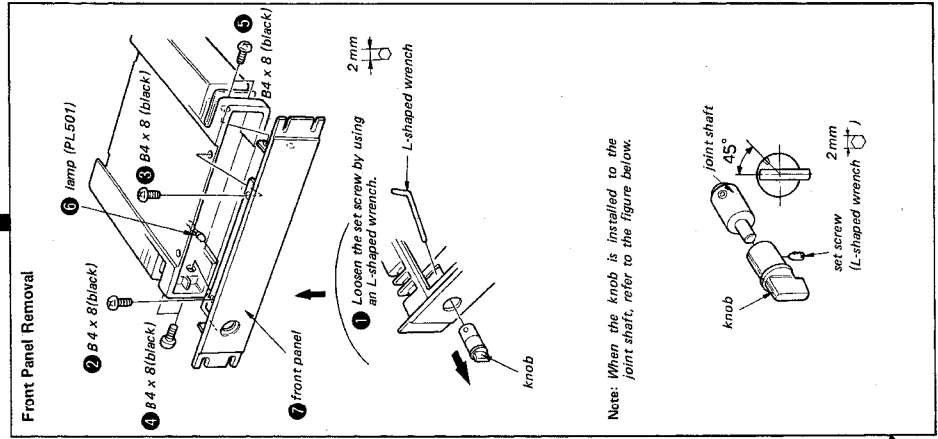
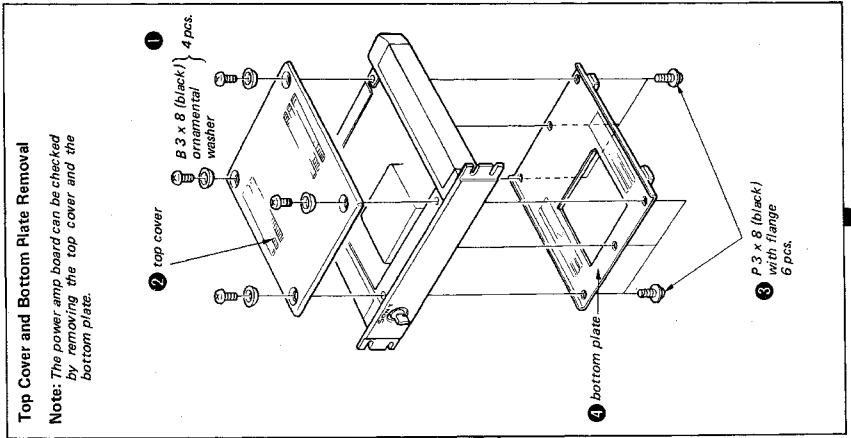
Fig. 1-3.

1.2. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

• Follow the disassembly procedure in the numerical order given.



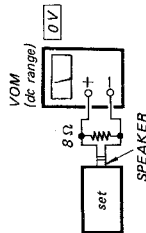
SECTION 3 ADJUSTMENTS

Note: 1. DC BIAS and DC BALANCE adjustments should be performed about several minutes later after the POWER switch (S10) is turned on.
2. Repeat DC BIAS and DC BALANCE adjustments two or three times.
3. After replacing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

DC Balance Adjustment

Procedure:

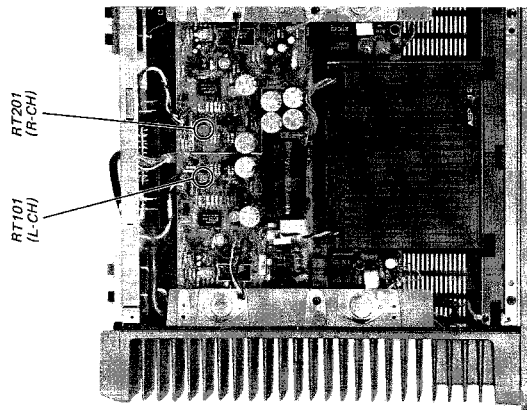
— Power Amp Board —



Adjust RT101 (L-CH) and RT201 (R-CH) for 0V reading on the VOM.

Adjustment Location

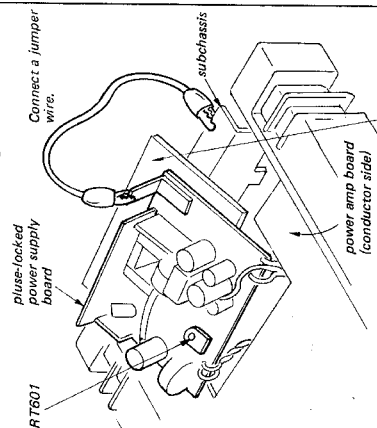
— Power Amp Board —



DC Voltage Adjustment

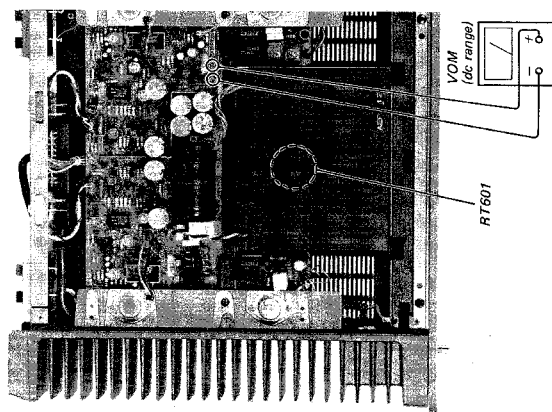
Procedure:

1. Connect a jumper wire.
2. Set the OPERATION switch (S1) to "CLASS B".
3. Adjust RT601 for 90 V reading on the VOM.



Adjustment Location

— Pulse-locked Power Supply Board —



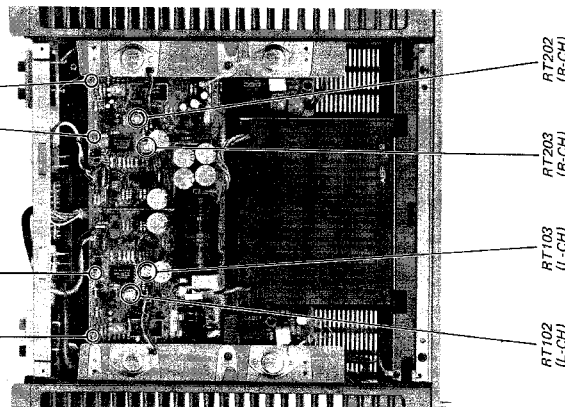
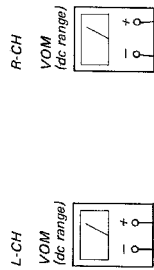
DC Bias Adjustment

Procedure:

1. Set the OPERATION switch (S1) to "CLASS A".
2. Adjust RT103 (L-CH) and RT203 (R-CH) for 350 mV dc on the VOM.
3. Set the OPERATION switch (S1) to "CLASS B".
4. Adjust RT102 (L-CH) and RT202 (R-CH) for 20 mV dc on the VOM.

Adjustment Location

— Power Amp Board —

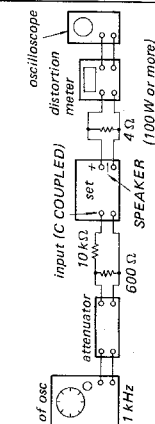


CLASS-B Amp Adjustments

Setting:

OPERATION switch (S1): CLASS-B

Procedure:

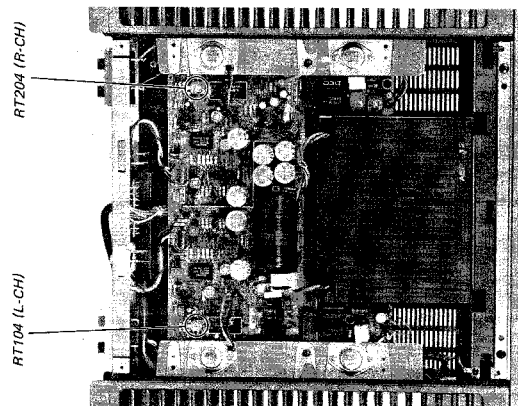


1. Adjust the attenuator for specified reading as shown below.
19 V US, Canadian model
15.5 V AEP, UK model

2. Adjust RT104 (L-CH) and RT204 (R-CH) for 0.007% or less on the distortion meter or for waveform with no clip on the oscilloscope.

Adjustment Location

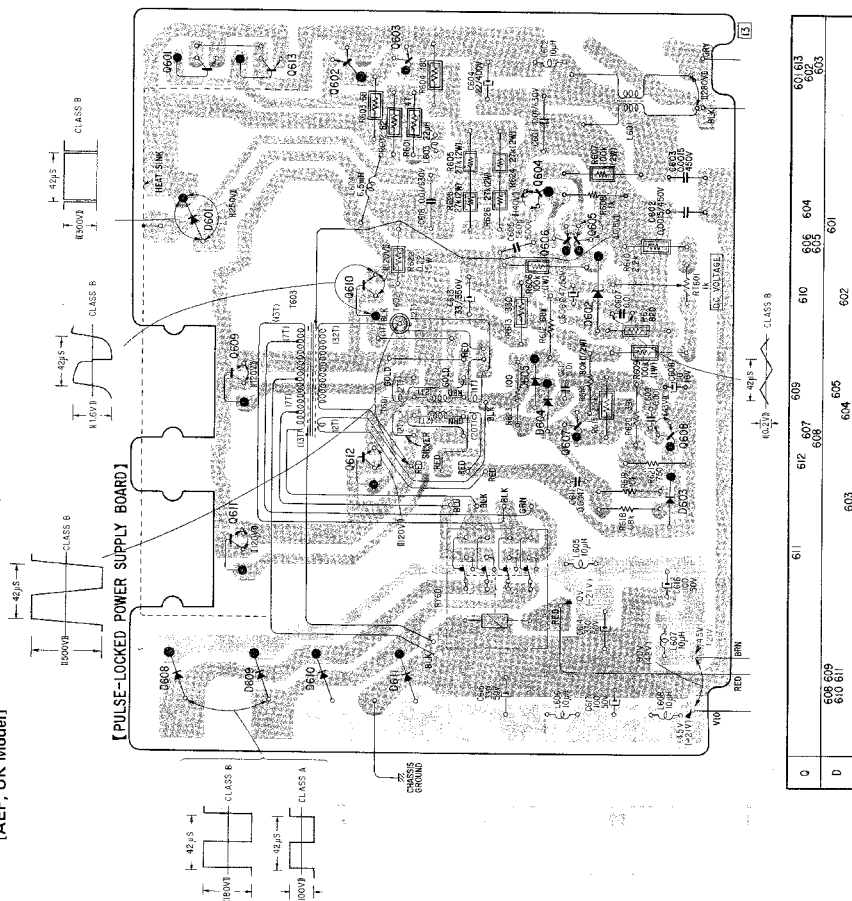
— Power Amp Board —



SECTION 4

DIAGRAMS

4-1. MOUNTING DIAGRAM – Pulse-locked Power Supply Board – [AEP, UK Model]



Replacement Semiconductors

see page 18.

Note:
● ○ — : parts extracted from the component side.

● $\frac{500000}{500000} : B + \text{pattern}$

Readings are taken under no-signal conditions with a VOM (20 k Ω /V)

• Voltage values for pulse-locked power supply circuit
() class A

(()) with 220 V ac
< > with 120 V ac

• The waveforms are taken under class-B operation with 220 V ac unless otherwise noted.

red.

111

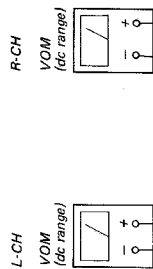
DC Bias Adjustment

Procedure:

1. Set the OPERATION switch (S1) to "CLASS A".
2. Adjust RT103 (L-CH) and RT203 (R-CH) for 350 mV dc on the VOM.
3. Set the OPERATION switch (S1) to "CLASS B".
4. Adjust RT102 (L-CH) and RT202 (R-CH) for 20 mV dc on the VOM.

Adjustment Location

- Power Amp Board -



Adjustment Location

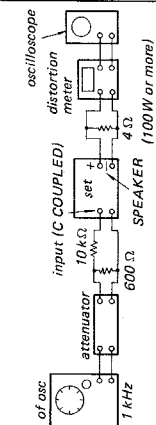
— Power Amp Board —

CLASS-B Amp Adjustments

Setting:

OPERATION switch (S1): CLASS-B

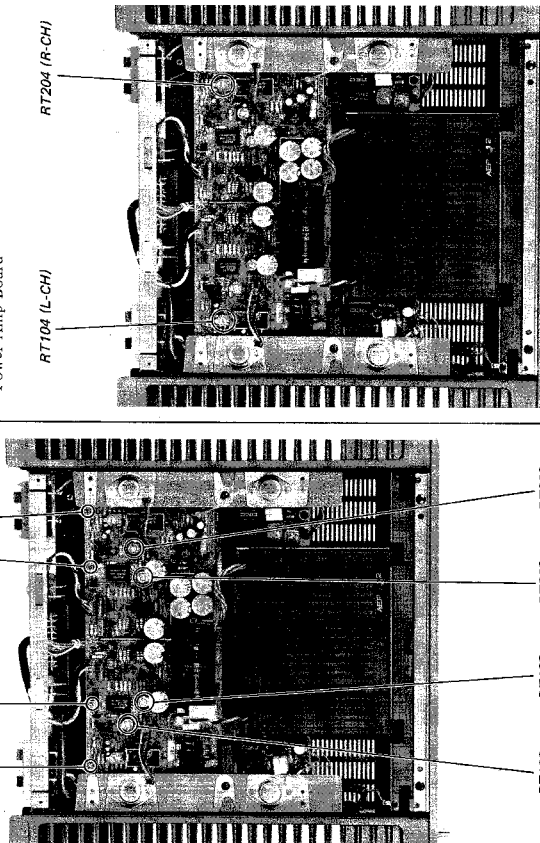
Procedure:



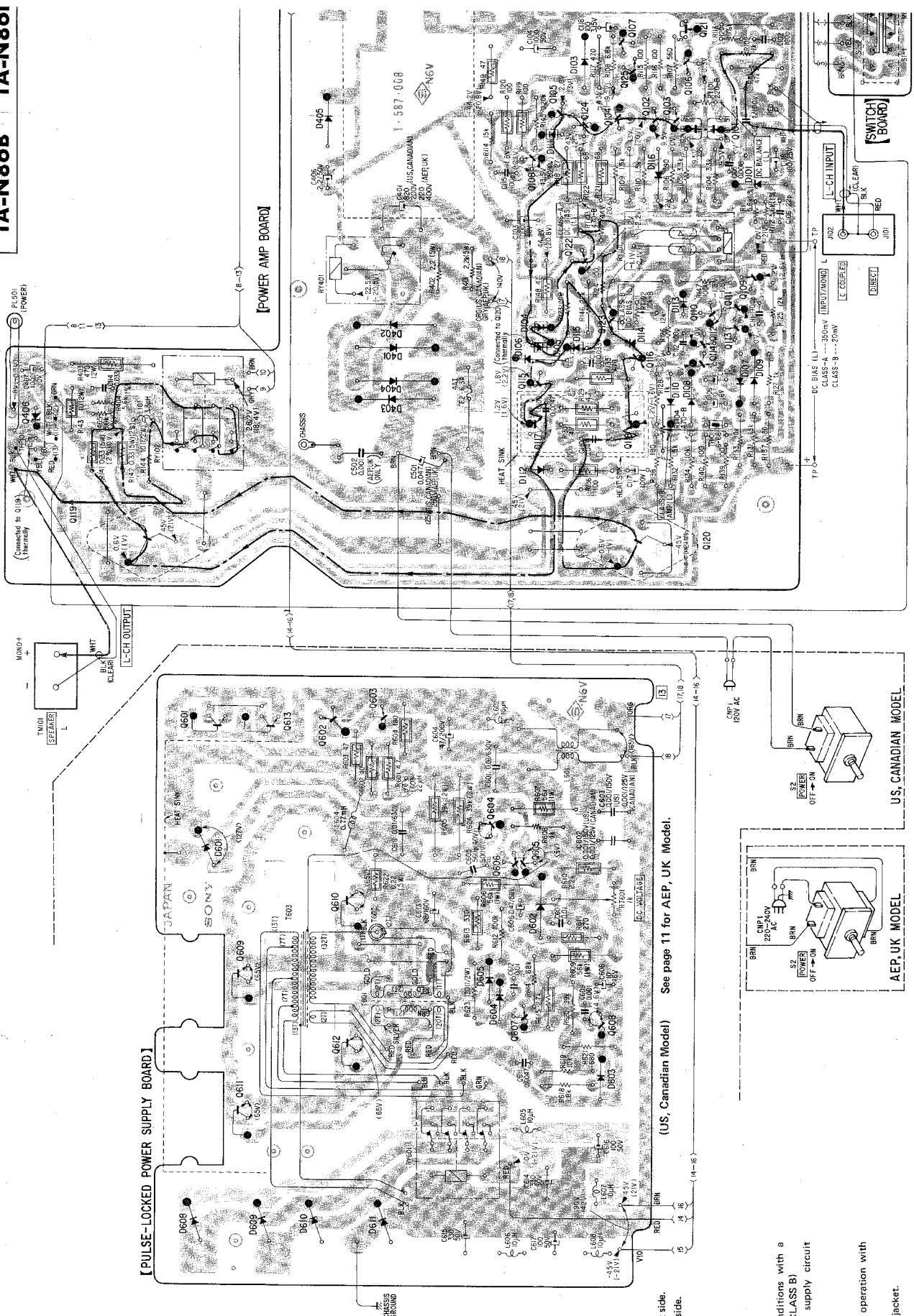
1. Adjust the attenuator for specified reading as shown below.
 19 V US, Canadian model
 15.5 V AEP, UK model
2. Adjust RT104 (L-CH) and RT204 (R-CH) for 0.007 % or less on the distortion meter or for waveform with no clip on the oscilloscope.

Adjustment Location

— Power Amp Board —



4-2. MOUNTING DIAGRAM



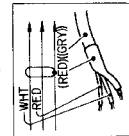
0	611	612	607	609	610	606	604	603	608	609	610	611	119	117	115	116	112	113	109	122	108	124	105	125	107
D	608	609	610	611	603	604	605	602	601	606	603	608	120	118	406	403	404	401	116	101	106	102	103	104	105

— 12 —

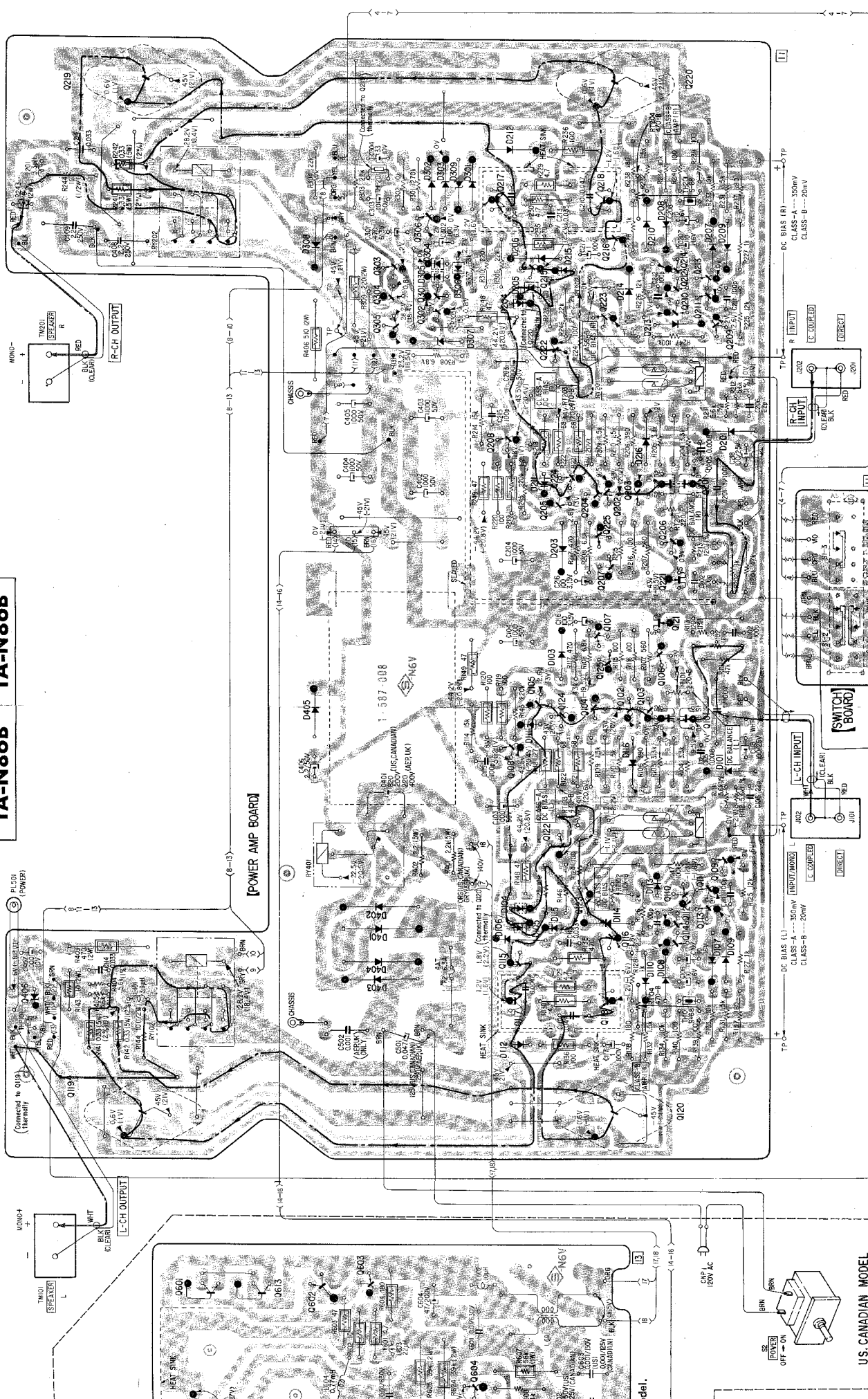
Replace Semiconductors
see page 18.

- Note:
- : parts extracted from the component side.
 - : parts extracted from the conductor side.
 - ⬤ : B + pattern

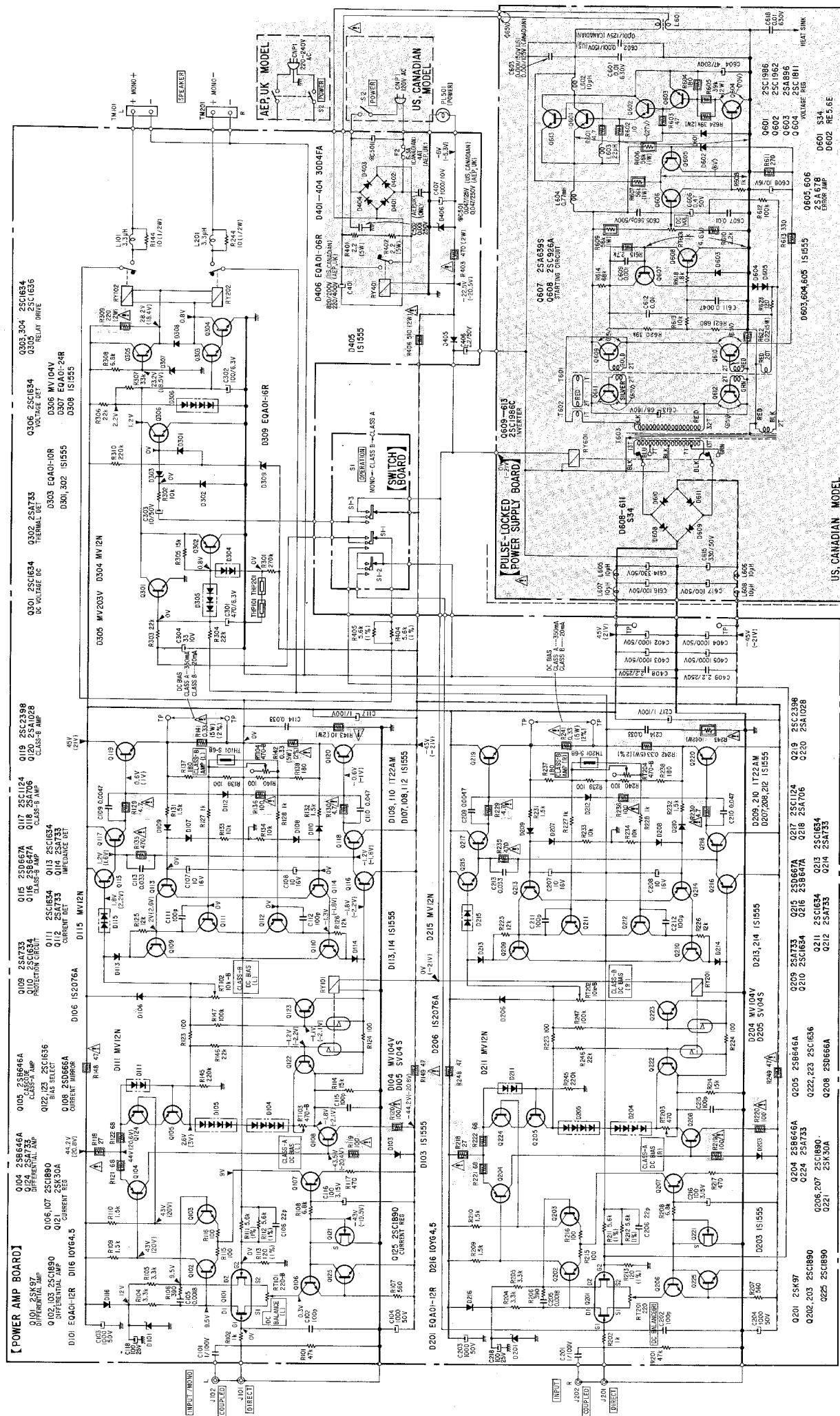
- Signal Path
- : L-CH
- : R-CH
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V) (OPERATION switch: CLASS B)
- Voltage values for pulse-locked power supply circuit
- () class A
- () with 220 V ac
- < > with 120 V ac
- The waveforms are taken under class-B operation with 220 V ac unless otherwise noted.
- Color code of sleeving over the end of the jacket.



TA-N86B TA-N86B



601	602	603	604	119	117	115	116	123	122	108	124,105	125	107	207	225	205,204	224	208	305,302	304	303	217	
605	606	114	112	110	118	114	112	110	109	104	104	106	121	208	221	206	203,201	216	209	303	301	306	218
609										101,102,103													
																	</						

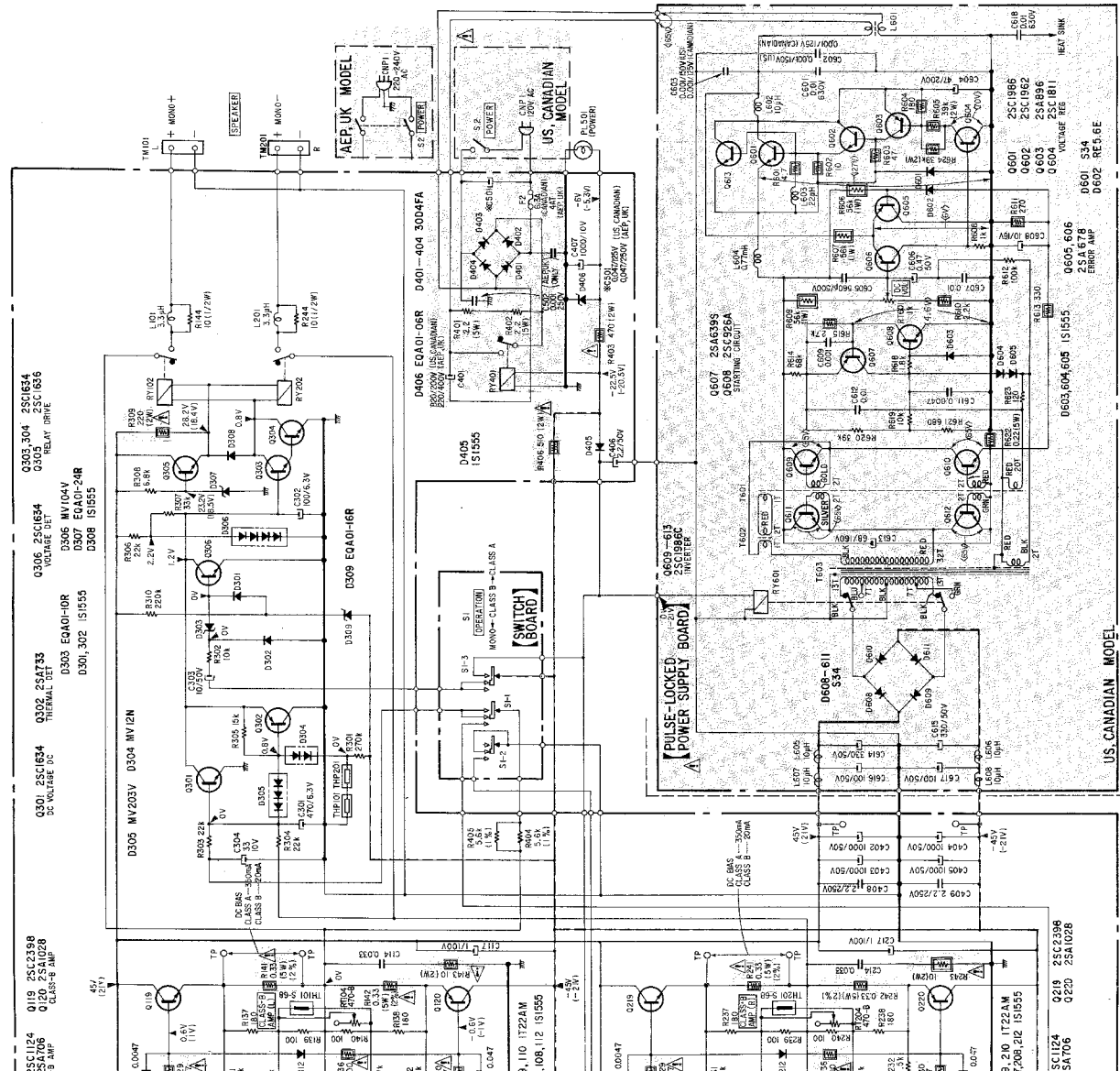


- Note:
- All capacitors are in μF unless otherwise noted $\text{pF} = \mu\text{F}$ 50 WV or less are not indicated except for electrolytics.
 - All resistors are in ohms, $\frac{1}{2}$ W unless otherwise noted.
 - K3: 1000 Ω ; M2 = 1000 k Ω
 - Voltages are dc with respect to ground unless otherwise noted.
 - All adjustable resistors have characteristic curve B, unless otherwise noted.
 - $\square$: nonflammable resistor.
 - 1% indicates component tolerance.
 - $\square$: panel designation.
 - $\square$: adjustment for repair.
 - Readings are taken under no-signal conditions with a VOM (20 k Ω /V) (OPERATION switch: CLASS B)
 - Voltage values for pulse-locked power supply circuit () class A
 - () with 220 V ac
 - < > with 120 V ac
 - The waveforms are taken under class-B operation with 220 V ac unless otherwise noted.
 - ---: B+ bus.
 - ---: B- bus.
 - Switch

Ref. No.	Switch	Position
S1	OPERATION	CLASS B
S2	POWER	OFF

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

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.



SECTION 5

EXPLODED VIEWS

Replacement Semiconductors

For replacement, use semiconductors except in ().

Q107, 207: 25K97

Q118, 218: 25A706

Q120, 220: 25A1028

Q121, 221: 25K30A

Q122, 222: 25C1636

Q123, 223: 25C1636

Q124, 224: 25C1636

Q125, 225: 25C1636

Q126, 226: 25C1636

Q127, 227: 25C1636

Q128, 228: 25C1636

Q129, 229: 25C1636

Q130, 230: 25C1636

Q131, 231: 25C1636

Q132, 232: 25C1636

Q133, 233: 25C1636

Q134, 234: 25C1636

Q135, 235: 25C1636

Q136, 236: 25C1636

Q137, 237: 25C1636

Q138, 238: 25C1636

Q139, 239: 25C1636

Q140, 240: 25C1636

Q141, 241: 25C1636

Q142, 242: 25C1636

Q143, 243: 25C1636

Q144, 244: 25C1636

Q145, 245: 25C1636

Q146, 246: 25C1636

Q147, 247: 25C1636

Q148, 248: 25C1636

Q149, 249: 25C1636

Q150, 250: 25C1636

Q151, 251: 25C1636

Q152, 252: 25C1636

Q153, 253: 25C1636

Q154, 254: 25C1636

Q155, 255: 25C1636

Q156, 256: 25C1636

Q157, 257: 25C1636

Q158, 258: 25C1636

Q159, 259: 25C1636

Q160, 260: 25C1636

Q161, 261: 25C1636

Q162, 262: 25C1636

Q163, 263: 25C1636

Q164, 264: 25C1636

Q165, 265: 25C1636

Q166, 266: 25C1636

Q167, 267: 25C1636

Q168, 268: 25C1636

Q169, 269: 25C1636

Q170, 270: 25C1636

Q171, 271: 25C1636

Q172, 272: 25C1636

Q173, 273: 25C1636

Q174, 274: 25C1636

Q175, 275: 25C1636

Q176, 276: 25C1636

Q177, 277: 25C1636

Q178, 278: 25C1636

Q179, 279: 25C1636

Q180, 280: 25C1636

Q181, 281: 25C1636

Q182, 282: 25C1636

Q183, 283: 25C1636

Replacement Semiconductors

For replacement, use semiconductors except in ().

Q107, 207: 25K97

Q118, 218: 25A706

Q120, 220: 25A1028

Q121, 221: 25K30A

Q122, 222: 25C1636

Q123, 223: 25C1636

Q124, 224: 25C1636

Q125, 225: 25C1636

Q126, 226: 25C1636

Q127, 227: 25C1636

Q128, 228: 25C1636

Q129, 229: 25C1636

Q130, 230: 25C1636

Q131, 231: 25C1636

Q132, 232: 25C1636

Q133, 233: 25C1636

Q134, 234: 25C1636

Q135, 235: 25C1636

Q136, 236: 25C1636

Q137, 237: 25C1636

Q138, 238: 25C1636

Q139, 239: 25C1636

Q140, 240: 25C1636

Q141, 241: 25C1636

Q142, 242: 25C1636

Q143, 243: 25C1636

Q144, 244: 25C1636

Q145, 245: 25C1636

Q146, 246: 25C1636

Q147, 247: 25C1636

Q148, 248: 25C1636

Q149, 249: 25C1636

Q150, 250: 25C1636

Q151, 251: 25C1636

Q152, 252: 25C1636

Q153, 253: 25C1636

Q154, 254: 25C1636

Q155, 255: 25C1636

Q156, 256: 25C1636

Q157, 257: 25C1636

Q158, 258: 25C1636

Q159, 259: 25C1636

Q160, 260: 25C1636

Q161, 261: 25C1636

Q162, 262: 25C1636

Q163, 263: 25C1636

Q164, 264: 25C1636

Q165, 265: 25C1636

Q166, 266: 25C1636

Q167, 267: 25C1636

Q168, 268: 25C1636

Q169, 269: 25C1636

Q170, 270: 25C1636

Q171, 271: 25C1636

Q172, 272: 25C1636

Q173, 273: 25C1636

Q174, 274: 25C1636

Q175, 275: 25C1636

Q176, 276: 25C1636

Q177, 277: 25C1636

Q178, 278: 25C1636

Q179, 279: 25C1636

Q180, 280: 25C1636

Q181, 281: 25C1636

Q182, 282: 25C1636

Q183, 283: 25C1636

Pulse-Locked Power Supply Board (AEP, UK model)

Replacement Semiconductors

For replacement, use semiconductors except in ().

Q107, 207: 25K97

Q118, 218: 25A706

Q120, 220: 25A1028

Q121, 221: 25K30A

Q122, 222: 25C1636

Q123, 223: 25C1636

Q124, 224: 25C1636

Q125, 225: 25C1636

Q126, 226: 25C1636

Q127, 227: 25C1636

Q128, 228: 25C1636

Q129, 229: 25C1636

Q130, 230: 25C1636

Q131, 231: 25C1636

Q132, 232: 25C1636

Q133, 233: 25C1636

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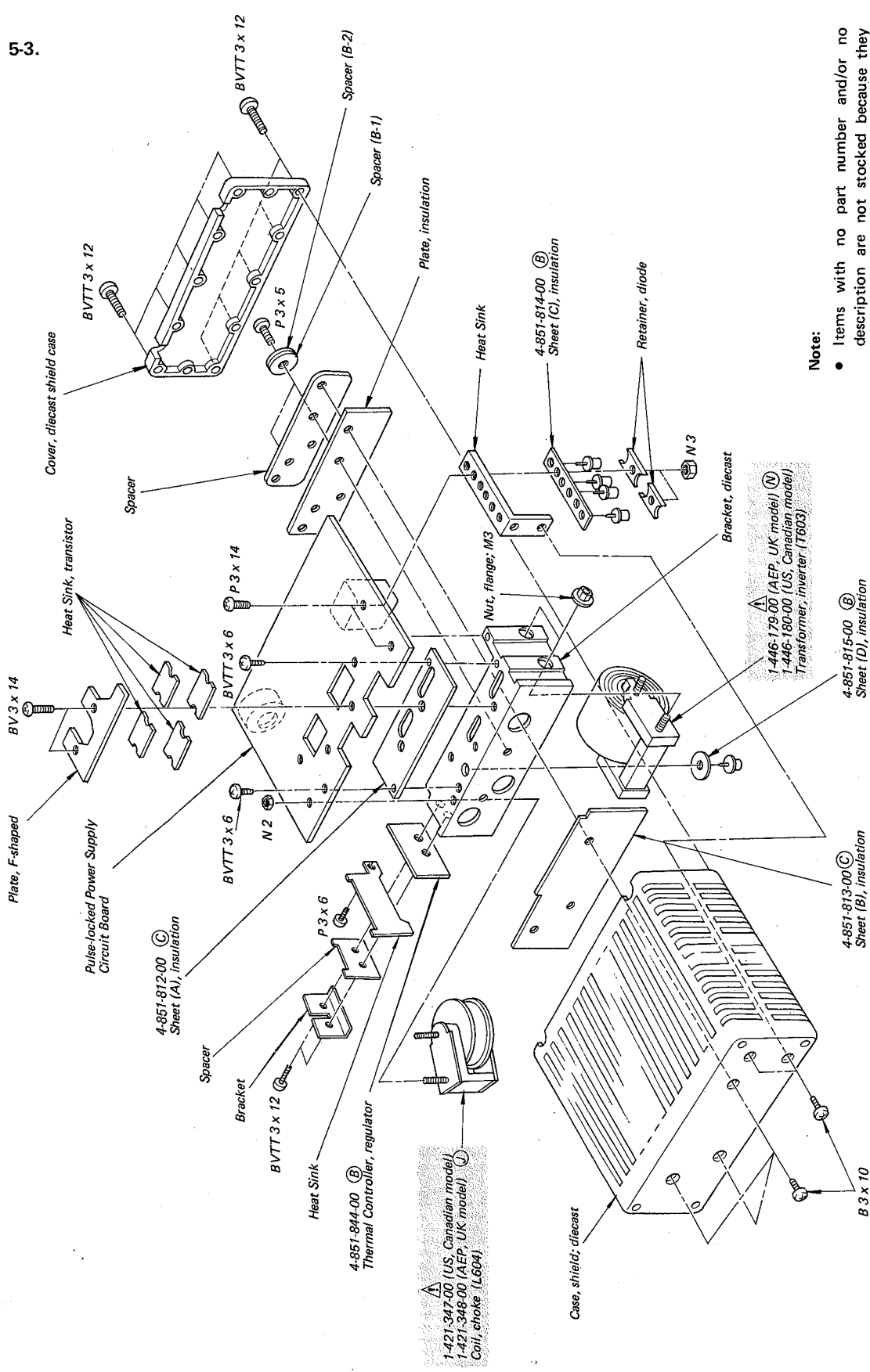


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A B C D E

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Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (—) = slotted head
- Circled letters (A) to (Z) are applicable to European models only.

Note: Les composants identifiés par un trame et une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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

SECTION 6

ELECTRICAL PARTS LIST

Note: Circled letters (A to Z) are applicable to European models only.

Ref. No. Part No. Description

SEMICONDUCTORS

Transistors

Q101, 201	8-765-342-10	(F) 2SK97
⇒ Q102, 202	8-720-950-03	(C) 2SC926A
⇒ Q103, 203		
Q104, 204	8-729-304-62	(B) 2SB646A
Q105, 205		
⇒ Q106, 206	8-720-950-03	(C) 2SC926A
⇒ Q107, 207		
⇒ Q108, 208	8-765-012-20	(C) 2SC1811
⇒ Q109, 209	8-729-612-77	(B) 2SA1027R
⇒ Q110, 210	8-729-663-47	(C) 2SC1364
⇒ Q111, 211		
⇒ Q112, 212	8-729-612-77	(B) 2SA1027R
⇒ Q113, 213	8-729-663-47	(C) 2SC1364
⇒ Q114, 214	8-729-612-77	(B) 2SA1027R
Q115, 215	8-729-306-72	(B) 2SD667A
Q116, 216	8-729-300-72	(B) 2SB647A
Q117, 217	8-725-412-00	(C) 2SC1124
Q118, 218	8-727-632-00	(C) 2SA706
Q119, 219	8-765-471-20	(I) 2SC2398
Q120, 220	8-765-481-20	(K) 2SA1028
Q121, 221	8-729-203-04	(B) 2SK30A
Q122, 222		
Q123, 223	8-761-622-00	(B) 2SC1636
⇒ Q124, 224	8-729-612-77	(B) 2SA1027R
⇒ Q125, 225	8-720-950-03	(C) 2SC926A
⇒ Q301	8-729-663-47	(C) 2SC1364
⇒ Q302	8-729-612-77	(B) 2SA1027R
⇒ Q303, 304	8-729-663-47	(C) 2SC1364
Q305	8-761-622-00	(B) 2SC1636
⇒ Q306	8-729-663-47	(C) 2SC1364
⇒ Q601	△8-729-302-31	(D) 2SC2023-R (AEP, UK model)
⇒ Q601	△8-729-302-32	(D) 2SC2023-O (AEP, UK model)
⇒ Q601	△8-729-308-72	2SC1986D (US, Canadian model)
⇒ Q602	△8-729-372-30	(C) 2SC1723 (AEP, UK model)
Q602	△8-765-170-01	2SC1962 (US, Canadian model)
Q603	△8-765-082-20	2SA896 (US, Canadian model)

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

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

Ref. No. Part No. Description

Q603	△8-765-141-00	(J) 2SA911 (AEP, UK model)
⇒ Q604	△8-729-372-30	(C) 2SC1723 (AEP, UK model)
Q604	△8-765-012-20	2SC1811 (US, Canadian model)
⇒ Q605, 606	△8-729-612-77	(B) 2SA1027R
Q607	△8-729-163-04	(C) 2SA639S
Q608	△8-720-950-03	(C) 2SC926A
⇒ Q609-613	△8-729-302-31	(D) 2SC2023-R (AEP, UK model)
⇒ Q609-613	△8-729-302-32	(D) 2SC2023-O (AEP, UK model)
⇒ Q609-613	△8-729-308-72	2SC1986D-O (US, Canadian model)

Diodes

⇒ D101, 201	8-719-930-12	(B) EQB01-12Z
D103, 203	8-719-815-55	(B) 1S1555
D104, 204	8-719-910-40	(B) MV104V
D105, 205	8-719-300-11	(B) SV04S
D106, 206	8-719-923-76	(B) 1S2076A
D107, 207		
D108, 208	8-719-815-55	(B) 1S1555
D109, 209		
D110, 210	8-719-422-21	(B) 1T22AM
D111, 211	8-719-912-00	(B) MV12N
D112-114	8-719-815-55	(B) 1S1555
D212-214		
D115, 215	8-719-912-00	(B) MV12N
D116, 216	8-719-210-45	(C) 10YG4.5
D301, 302	8-719-815-55	(B) 1S1555
⇒ D303	8-719-931-10	(B) EQB01-10
D304	8-719-912-00	(B) MV12N
D305	8-719-920-30	(B) MV203V
D306	8-719-910-40	(B) MV104V
⇒ D307	8-719-931-24	(B) EQB01-24
D308	8-719-815-55	(B) 1S1555
⇒ D309	8-719-931-16	(B) EQB01-16
⇒ D401-404	△8-719-911-55	(B) U05G
D405	8-719-815-55	(B) 1S1555
⇒ D406	8-719-931-16	(B) EQB01-16
D601	△8-719-303-41	(C) S34
D602	△8-719-156-08	(B) RD5.6E
D603-605	△8-719-815-55	(B) 1S1555
D608-611	△8-719-303-41	(C) S34

Note: Les composants identifiés par un tramé et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (A to Z) are applicable to European models only.

Ref. No. Part No. Description

Thermistors

TH101, 201 1-800-193-00 (A) Thermistor, S-68
THP101, 201 1-800-427-00 (B) Thermistor, positive

COILS

L601 (A) 1-421-259-00 Line filter (US, Canadian model)
L601 (A) 1-421-349-00 (F) Line filter (AEP, UK model)
L602 (A) 1-421-329-00 (B) 10 μ H, choke
L603 (A) 1-407-161-XX (A) 22 μ H, microinductor
L604 (A) 1-421-347-00 0.77 mH, choke
(US, Canadian model)

L604 (A) 1-421-348-00 (J) 6.5 mH, choke (AEP, UK model)
L605-608 (A) 1-421-329-00 (B) 10 μ H, choke

TRANSFORMERS

T601 (A) 1-543-098-00 Core (US, Canadian model)
T601 (A) 1-543-100-00 (B) Core (AEP, UK model)
T602 (A) 1-543-121-00 (B) Core
T603 (A) 1-446-179-00 (M) Inverter (AEP, UK model)
T603 (A) 1-446-180-00 Inverter (US, Canadian model)

CAPACITORS

All capacitors are in μ F and electrolytic unless otherwise noted.
50 WV or less are not indicated except for electrolytics.
p : μ F, elect : electrolytic

C101, 201 1-130-083-00 (C) 1 100 V polyethylene
C102, 202 1-102-975-00 (A) 100 p ceramic
C103, 203 1-123-061-00 (C) 1000 50 V
C104, 204
C105, 205 1-108-561-00 (A) 0.0018 mylar
C106, 206 1-107-069-00 (A) 22 p mica
C107, 207 1-121-651-00 (A) 10 16 V
C108, 208
C109, 209 1-108-234-00 (A) 0.0047 mylar
C110, 210 1-108-246-00 (A) 0.047 mylar
C111, 211 1-102-975-00 (A) 100 p ceramic
C112, 212
C113, 213 1-108-244-00 (A) 0.033 mylar
C114, 214

Ref. No. Part No. Description

C115, 215 1-107-085-00 (A) 100 p mica
C116, 216 1-131-177-00 (C) 100 3.15 V tantalum
C117, 217 1-123-249-00 (A) 1 100 V
C118, 218 1-121-417-00 (B) 100 25 V

C301 1-121-424-00 (B) 470 6.3 V
C302 1-121-414-00 (A) 100 6.3 V
C303 1-121-738-00 (A) 10 50 V
C304 1-121-402-00 (A) 33 10 V

C401 (A) 1-123-407-00 (I) 220 400 V (AEP, UK model)
C401 (A) 1-123-408-00 820 200 V (US, Canadian model)
C402-405 1-123-061-00 (C) 1000 50 V
C406 1-121-450-00 (A) 2.2 50 V
C407 1-121-736-00 (B) 1000 10 V
C408, 409 1-108-972-00 (G) 2.2 250 V mylar

C501 (A) 1-108-749-00 0.047 125 V mylar
(US model)
C501 (A) 1-130-159-00 (C) 0.047 250 V film
(AEP, UK model)
C501 (A) 1-130-197-00 0.047 125 V polyethylene
(Canadian model)
C502 (A) 1-102-222-00 (B) 0.001 250 V ceramic
(AEP, UK model)

C601 (A) 1-130-141-00 (A) 0.01 630 V polyethylene
C602, 603 (A) 1-115-149-00 (C) 0.0015 450 V paper
(AEP, UK model)
C602, 603 (A) 1-161-502-00 0.001 150 V ceramic
(US model)
C602, 603 (A) 1-161-516-00 0.001 125 V ceramic
(Canadian model)
C604 (A) 1-123-401-00 47 200 V (US, Canadian model)

C604 (A) 1-123-402-00 (C) 22 400 V (AEP, UK model)
C605 (A) 1-161-438-00 (A) 560 p 500 V ceramic
C606 (A) 1-121-726-00 (A) 0.47 50 V
C607 (A) 1-108-239-00 (A) 0.01 mylar
C608 (A) 1-121-651-00 (A) 10 16 V

C609 (A) 1-108-227-00 (A) 0.001 mylar
C611 (A) 1-108-234-00 (A) 0.0047 mylar
C612 (A) 1-108-239-51 (A) 0.01 mylar
C613 (A) 1-123-277-00 68 160 V (US, Canadian model)

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

Note: Les composants identifiés par un trame et une marque (A) sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (**A** to **Z**) are applicable to European models only.

Ref. No.	Part No.	Description
C613	A 1-123-280-00 C 33	350 V (AEP, UK model)
C614, 615	A 1-121-656-00 B 330	50 V
C616, 617	A 1-121-417-00 B 100	50 V
C618	A 1-130-141-00 A 0.01	630 V polyethylene

RESISTORS

All resistors are in ohms. Common ¼ W carbon resistors are omitted. Refer to the list on page 27 for their part numbers. All adjustable resistors have characteristic curve B, unless otherwise noted. kΩ : 1000 Ω

R111, 211 R112, 212	1-214-150-11 A 5.6 k	¼ W(1 %) metal oxide
R113, 213	1-214-110-00 A 120	¼ W(1 %) metal oxide
R118, 218	A 1-211-508-00 A 27	¼ W carbon (nonflammable)
R119, 219 R120, 220	A 1-211-522-00 A 100	¼ W carbon (nonflammable)
R121, 221 R122, 222	A 1-211-518-00 A 68	¼ W carbon (nonflammable)
R129, 229 R130, 230	A 1-211-490-00 A 4.7	¼ W carbon (nonflammable)
R135, 235	A 1-211-538-00 A 470	¼ W carbon (nonflammable)
R136, 236	A 1-211-522-00 A 100	¼ W carbon (nonflammable)
R141, 241 R142, 242	A 1-217-573-00 0.33	5 W(2 %) wirewound (nonflammable)
R143, 243	A 1-206-463-00 A 10	2 W metal oxide (nonflammable)
R144, 244	A 1-244-825-00 10	½ W carbon
R148, 248 R149, 249	A 1-211-514-00 A 47	¼ W carbon (nonflammable)
R309	A 1-206-648-00 A 220	2 W metal oxide (nonflammable)
R401, 402	A 1-217-570-00 2.2	5 W metal plate
R403	A 1-206-656-00 A 470	2 W metal oxide (nonflammable)
R404, 405	1-214-150-00 5.6 k	¼ W(1 %) metal oxide
R406	A 1-206-657-00 A 510	2 W metal oxide (nonflammable)

R601	A 1-211-490-00 4.7	¼ W carbon (nonflammable) (US, Canadian model)
R601	A 1-211-514-00 A 47	¼ W carbon (nonflammable) (AEP, UK model)
R602	A 1-211-498-00 10	¼ W carbon (nonflammable) (US, Canadian model)
R602	A 1-211-520-00 A 82	¼ W carbon (nonflammable) (AEP, UK model)
R603	A 1-211-514-00 47	¼ W carbon (nonflammable) (US, Canadian model)
R603	A 1-211-518-00 A 68	¼ W carbon (nonflammable) (AEP, UK model)
R604	A 1-211-528-00 A 180	¼ W carbon (nonflammable)
R605	A 1-214-596-00 39 k	2 W metal oxide (nonflammable) (US, Canadian model)
R605	A 1-206-698-00 A 27 k	2 W metal oxide (nonflammable) (AEP, UK model)
R606	A 1-214-598-00 56 k	1 W metal oxide (nonflammable) (US, Canadian model)
R606	A 1-214-595-00 A 100 k	1 W metal oxide (nonflammable) (AEP, UK model)
R607	A 1-214-598-00 56 k	1 W metal oxide (nonflammable) (US, Canadian model)
R607	A 1-214-597-00 A 100 k	2 W metal oxide (nonflammable) (AEP, UK model)
R608	A 1-246-470-00 A 1 k	¼ W carbon
R609	A 1-214-598-00 56 k	1 W metal oxide (nonflammable) (US, Canadian model)
R609	A 1-214-595-00 A 100 k	1 W metal oxide (nonflammable) (AEP, UK model)

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

Note: Les composants identifiés par un trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (A) to (Z) are applicable to European models only.

Ref. No.	Part No.	Description
R610	△1-211-945-00 (A) 2.2 k	¼ W carbon (nonflammable)
R611	△1-211-532-00 270	¼ W carbon (nonflammable) (US, Canadian model)
R611	△1-211-544-00 (A) 820	¼ W carbon (nonflammable) (AEP, UK model)
R612	△1-246-517-00 (A) 68 k	¼ W carbon (AEP, UK model)
R612	△1-246-521-00 100 k	¼ W carbon (US, Canadian model)
R614	△1-244-927-00 (A) 180 k	½ W carbon (AEP, UK model)
R614	△1-246-517-00 68 k	¼ W carbon (US, Canadian model)
R615	△1-211-553-00 (A) 2.7 k	¼ W carbon (nonflammable)
R618	△1-246-479-00 (A) 1.8 k	¼ W carbon
R619	△1-246-497-00 (A) 10 k	¼ W carbon
R620	△1-246-511-00 (A) 39 k	¼ W carbon
R621	△1-246-469-00 680	¼ W carbon (US, Canadian model)
R621	△1-246-470-00 (A) 750	¼ W carbon (AEP, UK model)
R622	△1-217-156-00 (B) 0.22	5 W wirewound
R623	△1-246-449-00 (A) 100	¼ W carbon (AEP, UK model)
R623	△1-246-451-00 120	¼ W carbon (US, Canadian model)
R624	△1-214-596-00 39 k	2 W (US, Canadian model)
R624-626	△1-206-698-00 (A) 27 k	2 W metal oxide (AEP, UK model)
RT101, 201	1-224-550-21 (B) 220	adjustable; dc balance
RT102, 202	1-224-252-XX (B) 10 k	adjustable; class-B dc bias
RT103, 203	1-224-248-XX (B) 470	adjustable; class-A dc bias
RT104, 204	1-224-641-XX (B) 470	adjustable; class-B amp
RT601	△1-224-642-XX (B) 1 k	adjustable; dc voltage

SWITCHES

S1	1-516-580-00 (C) Slide	OPERATION
S2	△1-552-689-00 Rotary	POWER (US, Canadian model)
S2	△1-552-690-00 (F) Rotary	POWER (AEP, UK model)

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

Ref. No.	Part No.	Description
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MISCELLANEOUS

CNP1	△1-551-238-00 (I) Cord	power (AEP model)
CNP1	△1-551-421-00 Cord	power (US, Canadian model)
CNP1	△1-534-820-XX (F) Cord	power (UK model)
F2	△1-532-350-00 (B) Fuse	4AT (AEP, UK model)
F2	△1-532-509-00 Fuse	6.3A (US, Canadian model)
J101, 201 J102, 202	1-507-378-XX (B) Jack	2 p; DIRECT, C COUPLED
PL501	1-518-299-91 (B) Lamp	6 V 35 mA; POWER
RY101, 201	1-515-294-00 (F) Relay	
RY102, 202	1-515-302-00 (F) Relay	
RY401	△1-515-278-00 Relay	(US, Canadian model)
RY401	△1-515-278-00 (F) Relay	(AEP, UK model)
RY601	△1-515-127-XX (I) Relay	
TM101	1-535-195-21 (F) Terminal Strip	2 p; SPEAKER (white)
TM201	1-535-195-31 (F) Terminal Strip	2 p; SPEAKER (red)
	1-517-072-00 Holder	lamp (US, Canadian model)
	1-525-186-00 (B) Socket	transistor
	1-533-131-00 (A) Holder	fuse

Note: Les composants identifiés par un tramé et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (**A** to **Z**) are applicable to European models only.

ACCESSORIES AND PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
3-701-202-00	(A) Bag, check sheet
3-770-353-11	(F) Manual, instruction (AEP, UK model)
3-770-353-21	Manual, instruction (US, Canadian model)
3-794-233-21	Sheet (US model)
3-794-301-31	Sheet, instruction (Canadian model)
4-809-251-00	(A) Bag, plastic
4-854-019-00	(C) Cushion
4-854-024-00	(F) Carton (AEP, UK model)
4-854-025-00	(B) Sub-cushion (AEP, UK model)
4-854-026-00	Carton (US, Canadian model)

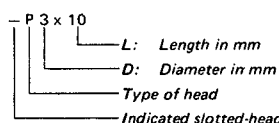
1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

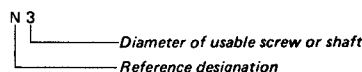
HARDWARE NOMENCLATURE

Screw:



Unless otherwise indicated, it means cross-recessed head (Phillips type).

Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	