

TA-3650

UK Model
AEP Model



INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

GENERAL

Power Requirements: 110, 127, 220 or 240 V ac adjustable, 50/60 Hz

Power Consumption: 320 W (UK model)
540 W (AEP model)

Dimensions: Approx.
460 (w) x 170 (h) x 325 (d) mm
18 1/8 (w) x 6 5/8 (h) x 12 7/8 (d) inches
Including projecting parts and controls

Weight: Approx. 12.0 kg, 26 lb 8 oz (net)
Approx. 14.5 kg, 32 lb (with shipping carton)

POWER AMPLIFIER SECTION

Continuous RMS Power Output: Both channels driven simultaneously
(rated output)
(Less than 0.1 % harmonic distortion)
At 20 – 20,000 Hz
55 + 55 W (8 Ω)
At 1 kHz
60 + 60 W (8 Ω)
70 + 70 W (4 Ω) (AEP model)
According to DIN 45500
55 + 55 W (8 Ω)

Dynamic Power Output: 170 W (8 Ω)
(IHF constant power supply method)
200 W (4 Ω) (AEP model)

Power Bandwidth: 5 – 40,000 Hz, IHF

Damping Factor: 35 (8 Ω , at 1 kHz)

Harmonic Distortion: Less than 0.1 % at rated output
Less than 0.03 % at 1 W output

IM Distortion: Less than 0.1 % at rated output
(60 Hz : 7 kHz = 4 : 1)
Less than 0.03 % at 1 W output

Frequency Response: 3 – 100,000 Hz ± 0 dB
(at 1 W output)

S/N Ratio: Greater than 110 dB, short-circuited input

Residual Noise: Less than 0.008 μ W (8 Ω)

Inputs: POWER IN
Sensitivity 1.0V (for rated output)
Impedance 47 k Ω

Outputs: SPEAKER A, B
Accept speakers of 8 Ω or more.
(UK model)
Accept speakers of 4 – 16 Ω
(AEP model)

HEADPHONES
Accepts low and high impedance headphones

— continues to page 2 —

SONY®

SERVICE MANUAL

PREAMPLIFIER SECTION

Inputs:

	Sensitivity	Impedance	Maximum Input Capability (THD 0.1 %)	S/N (weighting network, input level)
PHONO 1, 2	2.5 mV (-50 dB)	50 k Ω	210 mV	70 dB (B. 2.5 mV)
TUNER AUX TAPE 1, 2 REC/PB	150 mV (-14.5 dB)	100 k Ω		90 dB (A. 150 mV)

Outputs:

	Output Level	Impedance
REC OUT 1, 2	150 mV	10 k Ω
REC/PB	17 mV	82 k Ω
PRE OUT	1.0 V	1.8 k Ω

Harmonic Distortion: Less than 0.05 % at rated output

IM Distortion: Less than 0.05 % at rated output
(60 Hz : 7 kHz = 4 : 1)

Frequency Response: PHONO 1, 2 RIAA equalization curve ± 0.5 dB

TUNER
AUX
TAPE 1, 2
REC/PB
(input) } 10 Hz — 100 kHz $\begin{smallmatrix} +0 \\ -2 \end{smallmatrix}$ dB

Tone Controls: BASS
 ± 10 dB at 50 Hz (TURNOVER FREQ 250 Hz)
 ± 10 dB at 100 Hz (TURNOVER FREQ 500 Hz)
TREBLE
 ± 10 dB at 10 kHz (TURNOVER FREQ 2.5 kHz)
 ± 10 dB at 20 kHz (TURNOVER FREQ 5 kHz)

Filters: LOW 6 dB/oct. below 30 Hz
HIGH 6 dB/oct. above 10 kHz

Loudness: +10 dB at 50 Hz, +3 dB at 10 kHz
(att. 30 dB)

Presence: +2.5 dB at 1 kHz
(att. 30 dB)

Residual Noise: Less than 0.15 μ V
(VOLUME minimum; TONE, FILTERS, LOUDNESS, and PRESENCE off)

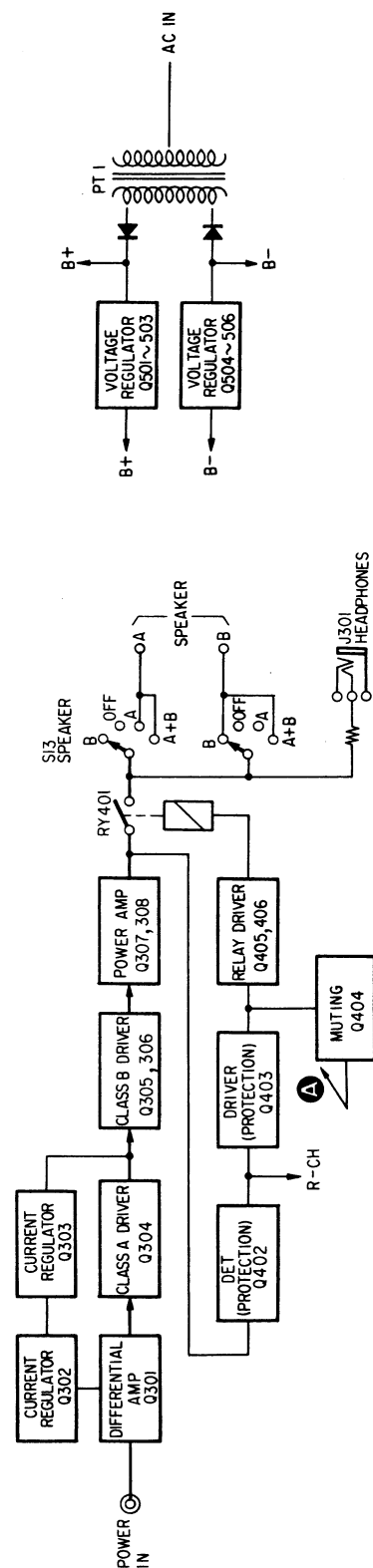
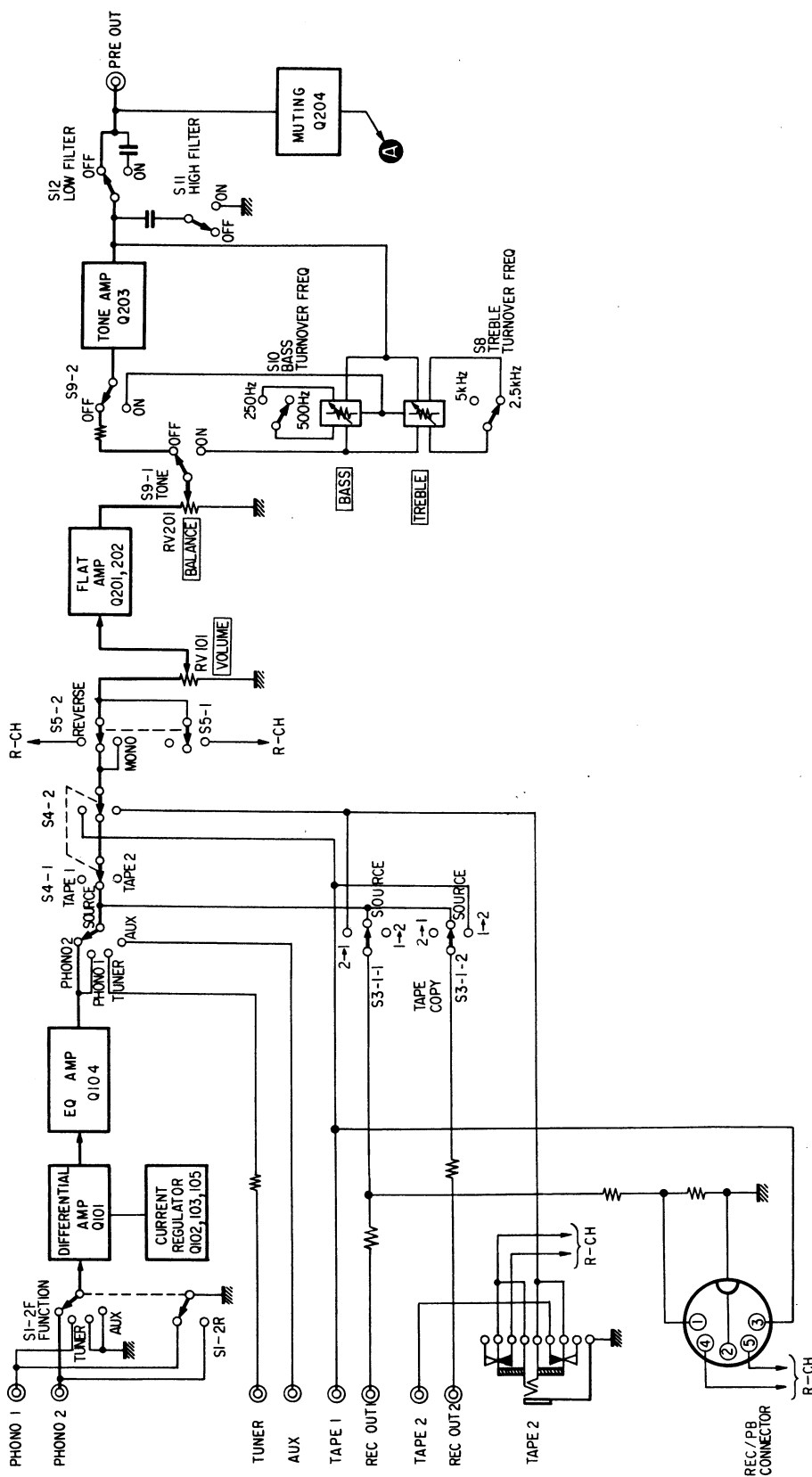
IDENTIFICATION OF SET

TA-3650 is classified by the specification label as shown below.

	Specification Label		
UK Model	<table><tr><td>SONY®</td><td>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 320W SERIAL NO. MADE IN JAPAN</td></tr></table>	SONY®	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 320W SERIAL NO. MADE IN JAPAN
SONY®	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 320W SERIAL NO. MADE IN JAPAN		
AEP Model	<table><tr><td>SONY®</td><td>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 540W SERIAL NO. MADE IN JAPAN</td></tr></table>	SONY®	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 540W SERIAL NO. MADE IN JAPAN
SONY®	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 540W SERIAL NO. MADE IN JAPAN		

SECTION 1 OUTLINE

BLOCK DIAGRAM

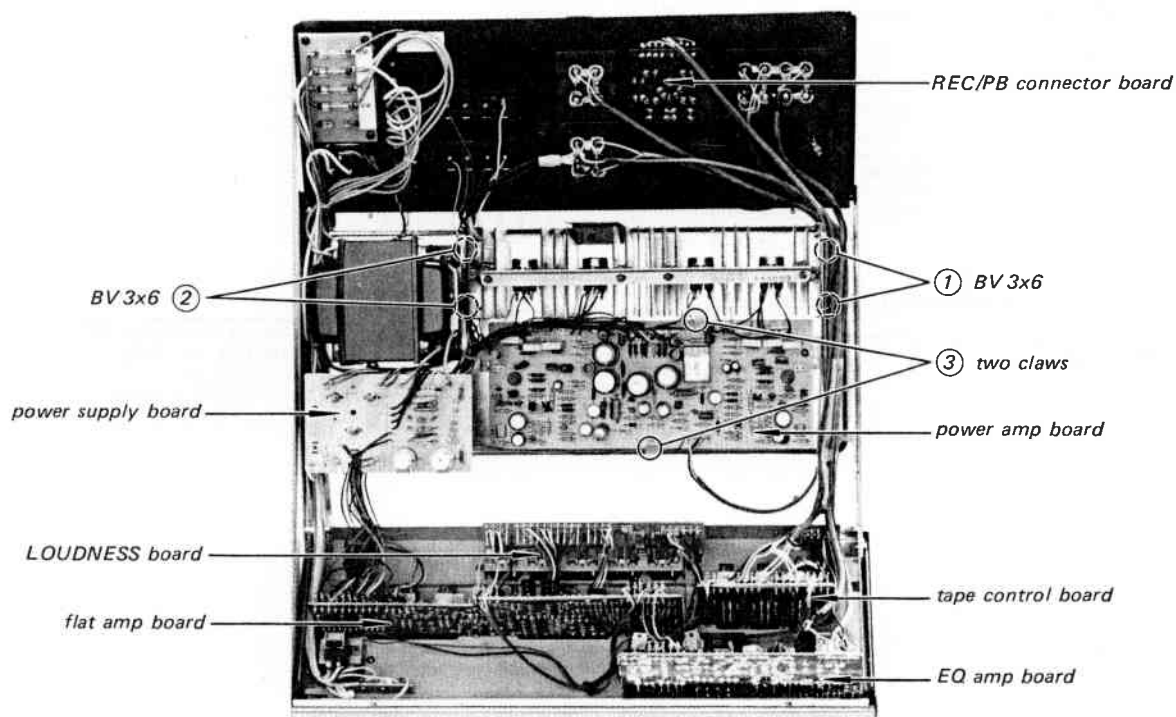


SECTION 2 DISASSEMBLY

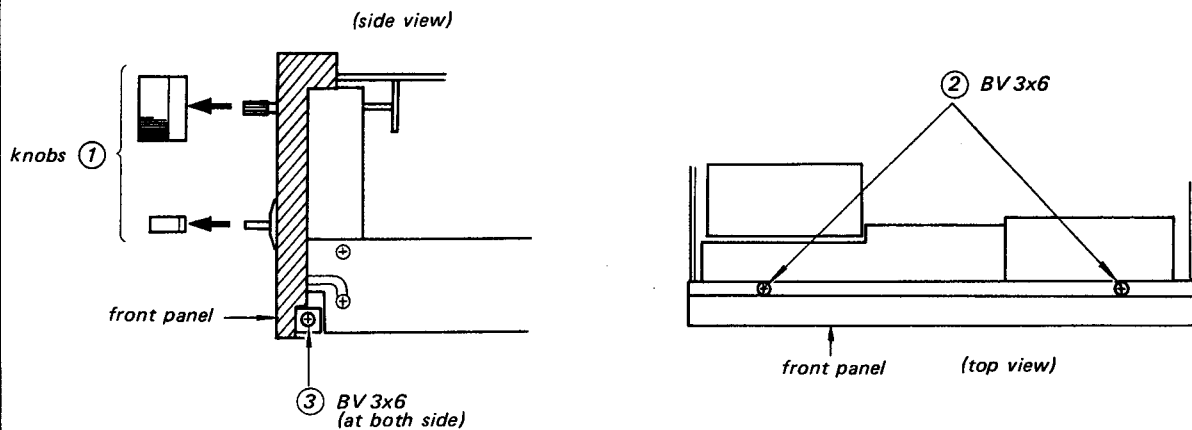
SIDE BOARD and TOP COVER REMOVAL



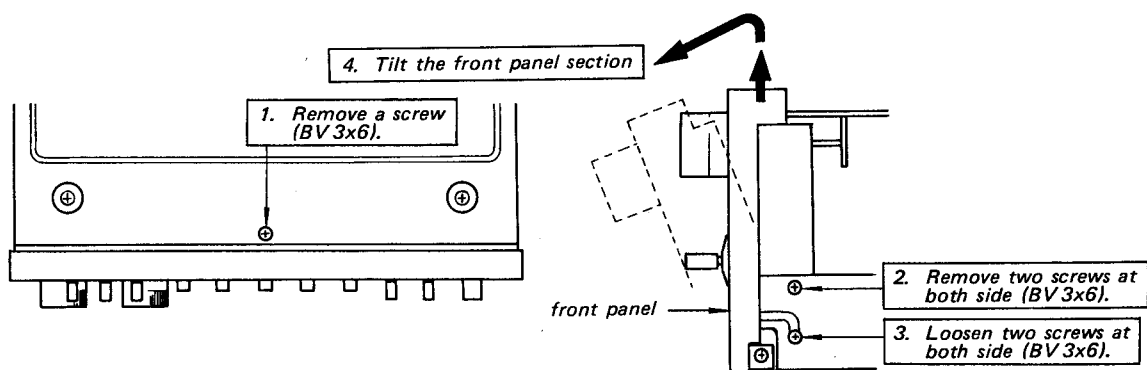
POWER AMP BOARD REMOVAL



FRONT PANEL REMOVAL

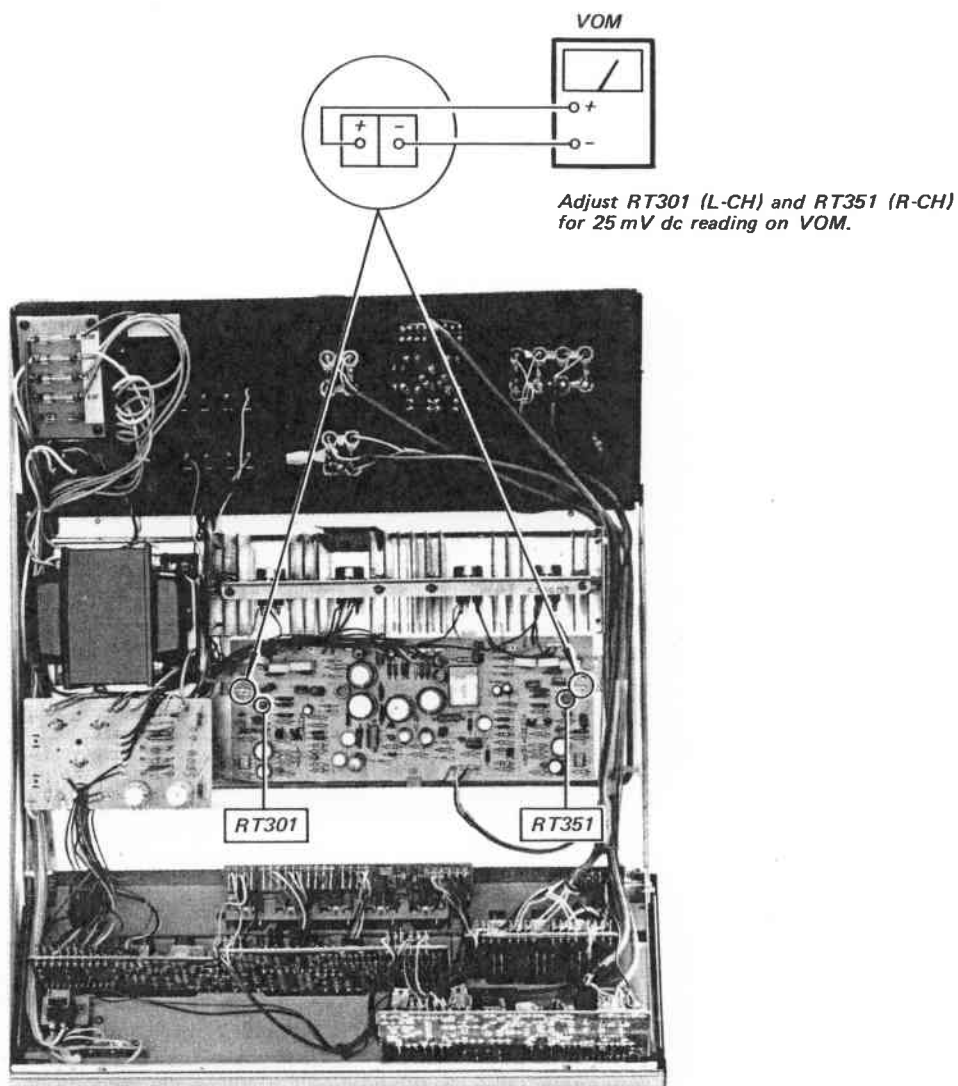


HOW TO RAISE THE CIRCUIT BOARDS (FLAT AMP, EQ AMP, TAPE CONTROL and LOUDNESS BOARDS)



SECTION 3 ADJUSTMENT

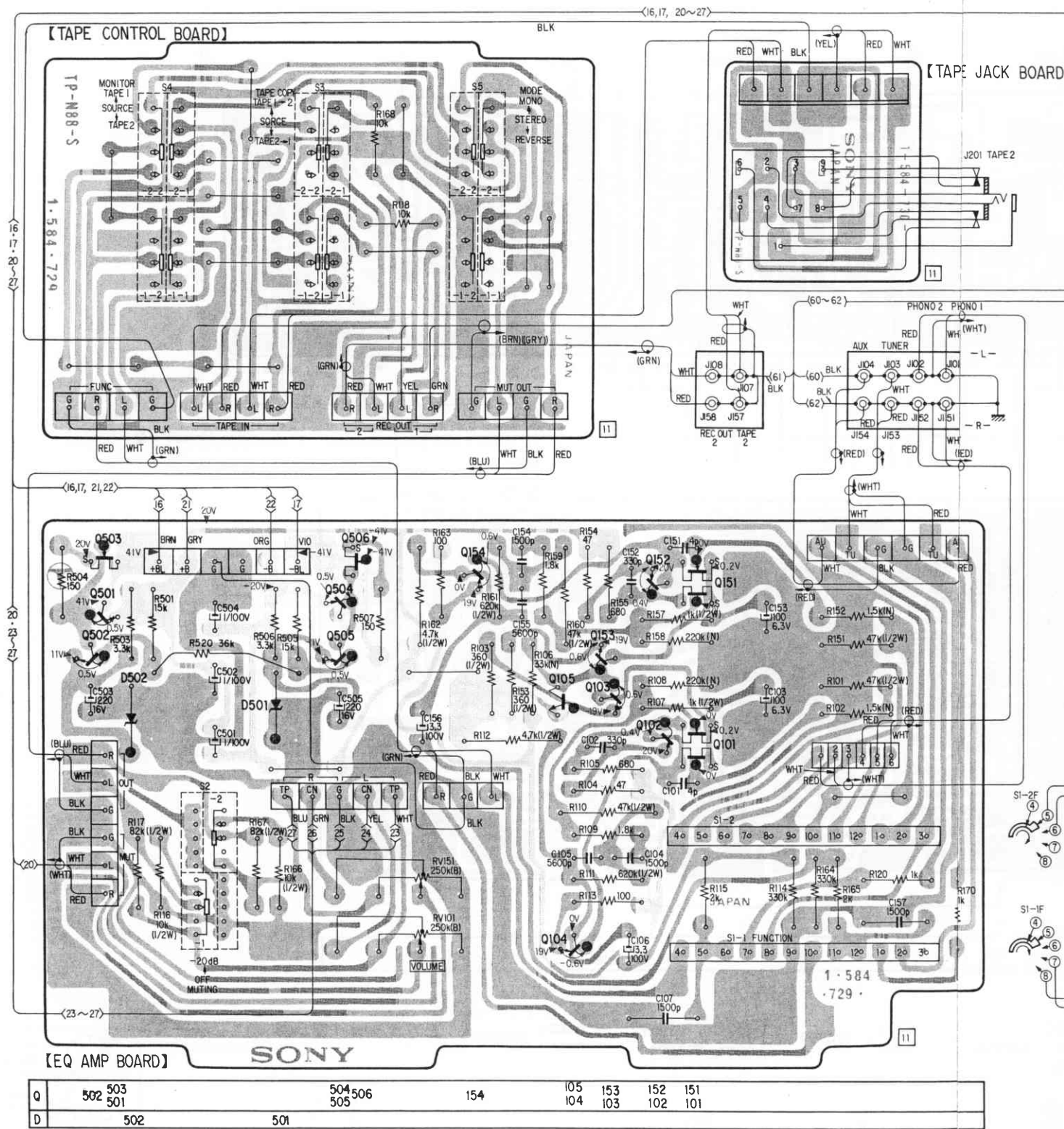
DC BIAS ADJUSTMENT



SECTION 4
DIAGRAMS

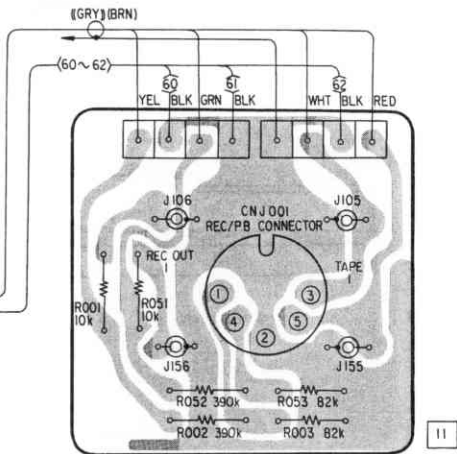
4-1. MOUNTING DIAGRAM - PREAMPLIFIER SECTION-

- Conductor Side -

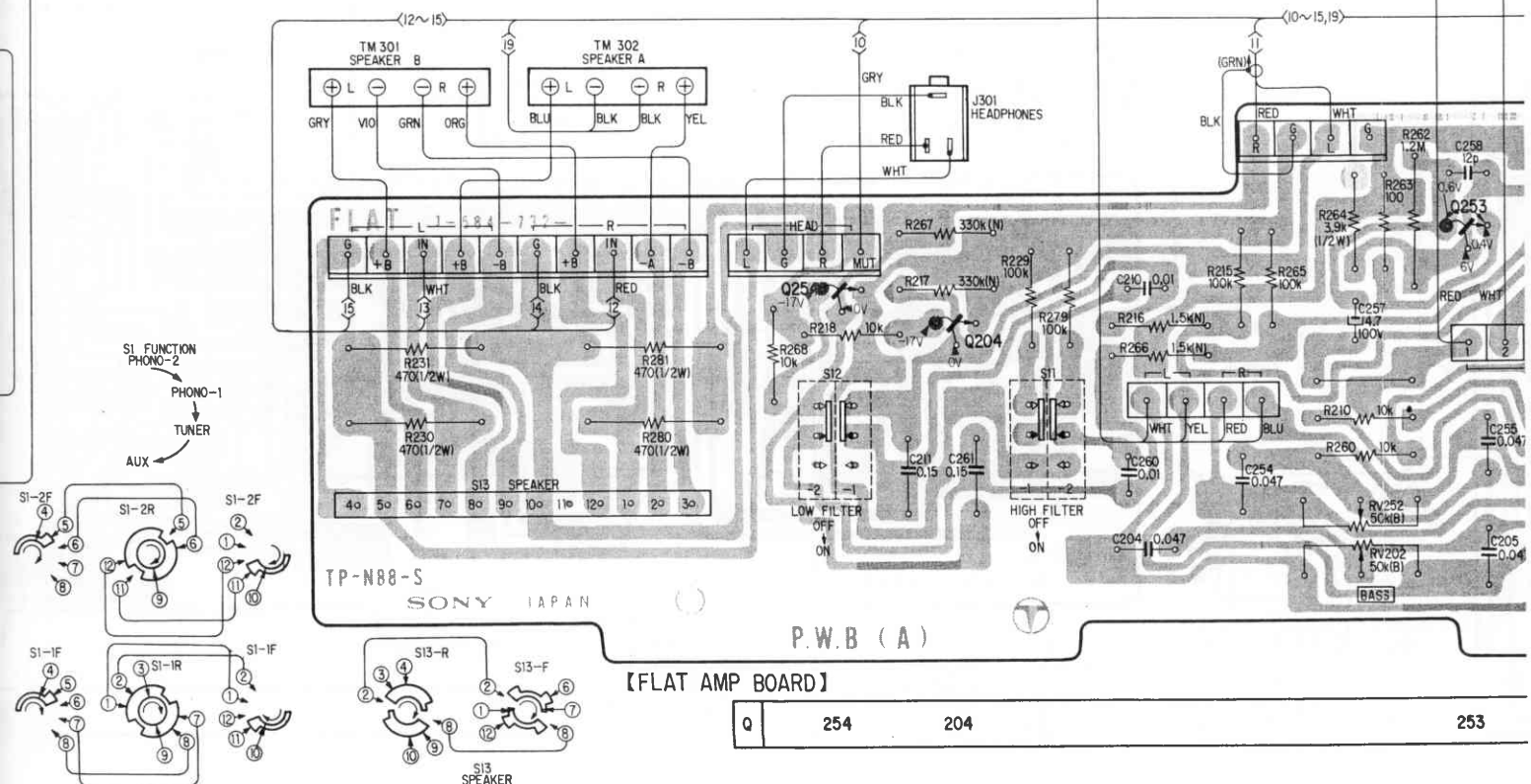
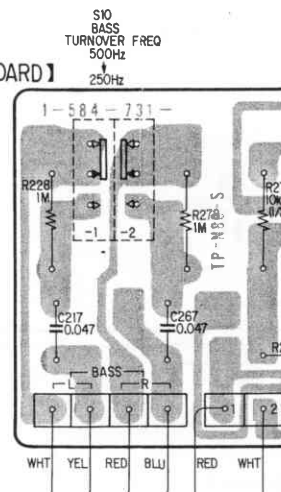


—〈16, 17, 20~27〉

【 REC/PB CONNECTOR BOARD 】



【LOUDNESS BOARD】



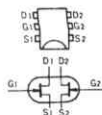
Q101 } : 2SK58
Q151 }

Q102, 104, 202 } : 2SA705
Q152, 154, 252 }

Q103, 105 } : 2SC1362
Q153, 201 }
Q251, 502 }

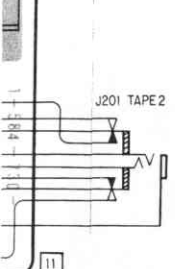
Q204 } : 2SC1636
Q254 }

Q505: **2SA678**

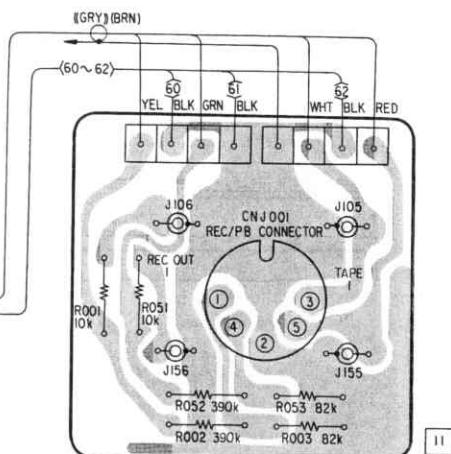


(16, 17, 20~27)

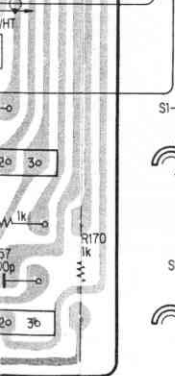
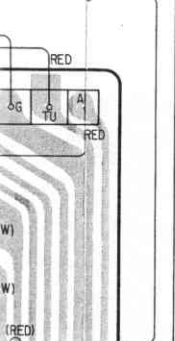
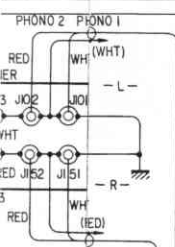
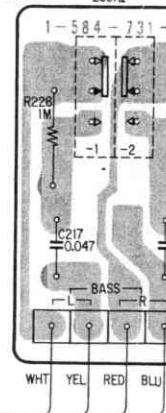
WHT
【TAPE JACK BOARD】



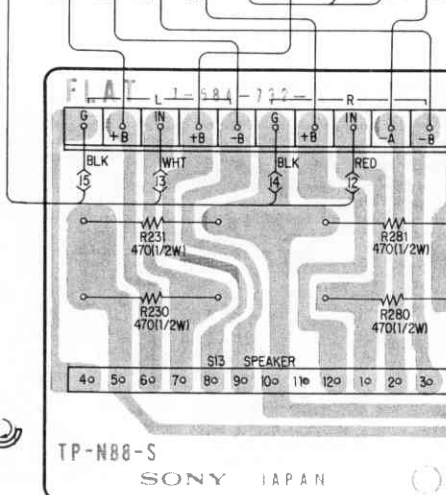
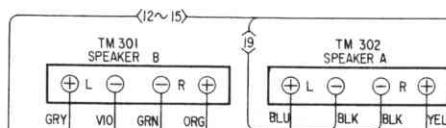
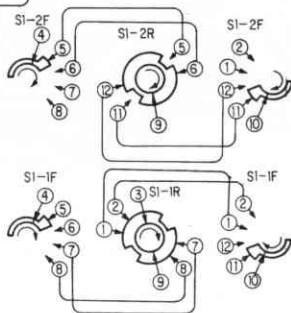
【REC/PB CONNECTOR BOARD】



【LOUDNESS BOARD】
S10
BASS
TURNOVER FREQ
500Hz
250Hz



S1 FUNCTION
PHONO-2
PHONO-1
TUNER
AUX



TP-N86-S
SONY JAPAN

P.W.B (A)

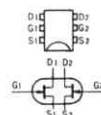
【FLAT AMP BOARD】

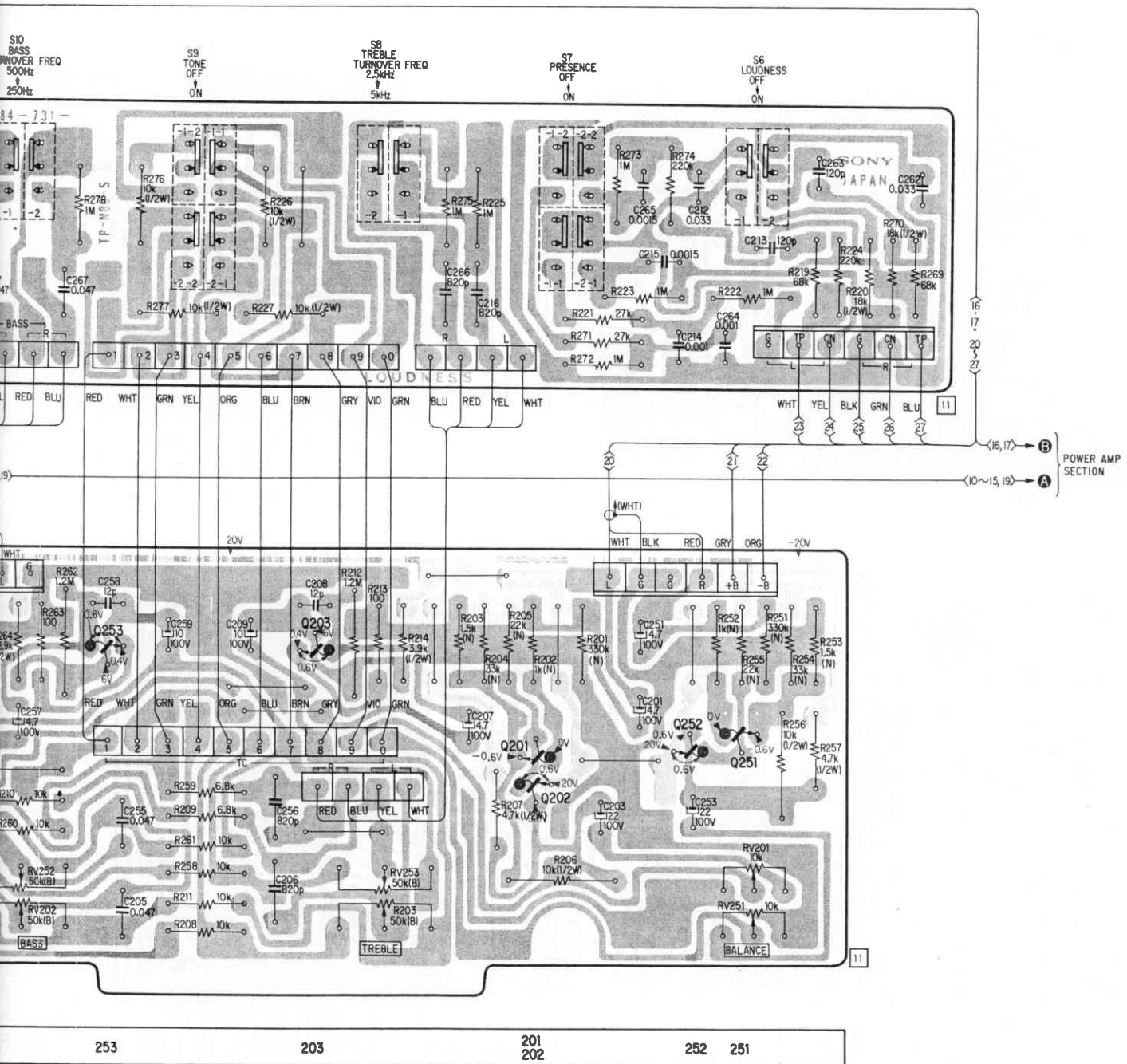
Q	254	204
---	-----	-----

Q101 : 2SK58
Q151 :

Q102, 104, 202 : 2SA705
Q152, 154, 252 :
Q204 : 2SC1636
Q505 : 2SA678

Q103, 105 : 2SA705
Q153, 201 : 2SA705
Q251, 502 :





3, 105
3, 201 } 2SC1362
1, 502

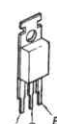
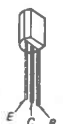
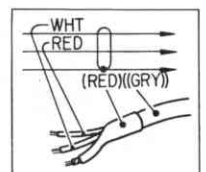
Q203 } 2SC900
Q253 }

Q501: 2SC1061
Q504: 2SA671

Q503 } 2SK30A
Q506 }

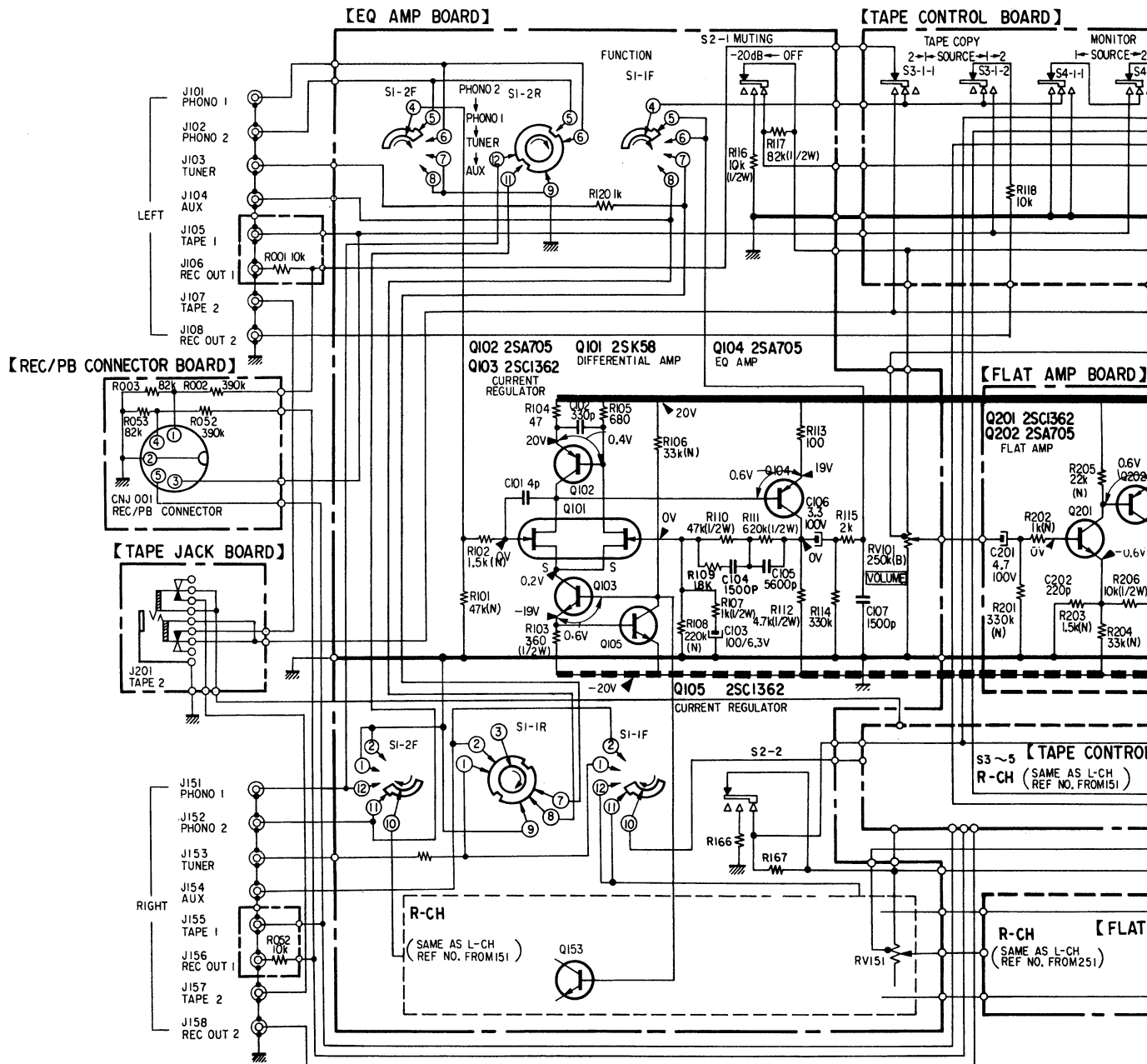
D501, 502: EQA01-11R

Note: •



- B+ pattern
- B- pattern

4-2. SCHEMATIC DIAGRAM – PREAMPLIFIER SECTION –

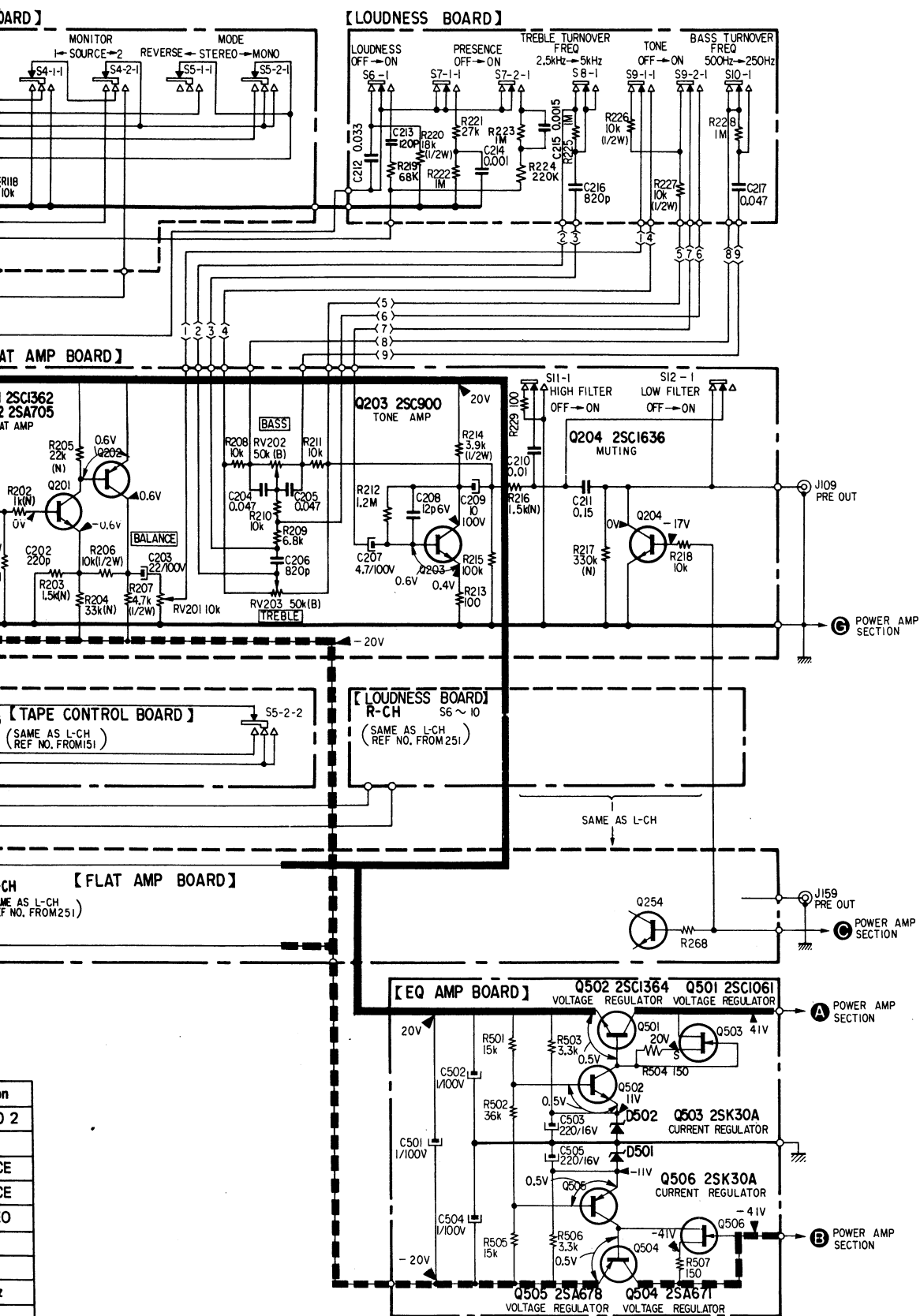


Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- --- indicates chassis ground.
- (N) indicates a low-noise resistor.
- --- indicates B+ circuit.
- --- indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20k Ω/V).
- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.

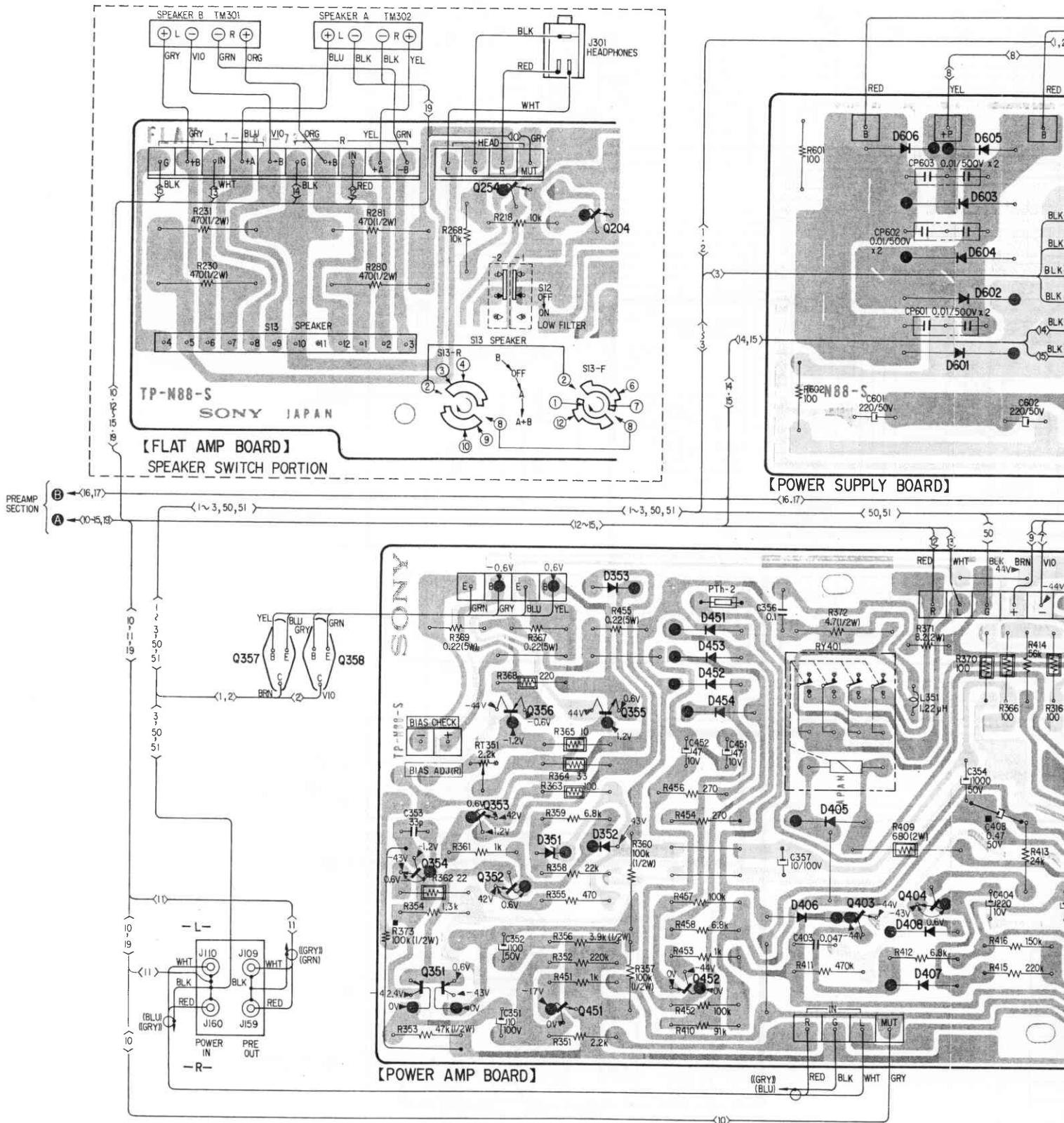
• Switch Mode:

Ref. No.	Switch	Position
S 1	FUNCTION	PHONO 2
S 2	MUTING	OFF
S 3	TAPE COPY	SOURCE
S 4	MONITOR	SOURCE
S 5	MODE	STEREO
S 6	LOUDNESS	OFF
S 7	PRESENCE	OFF
S 8	TREBLE TURNOVER FREQ	2.5 kHz
S 9	TONE	OFF
S10	BASS TURNOVER FREQ	500 Hz
S11	HIGH FILTER	OFF
S12	LOW FILTER	OFF



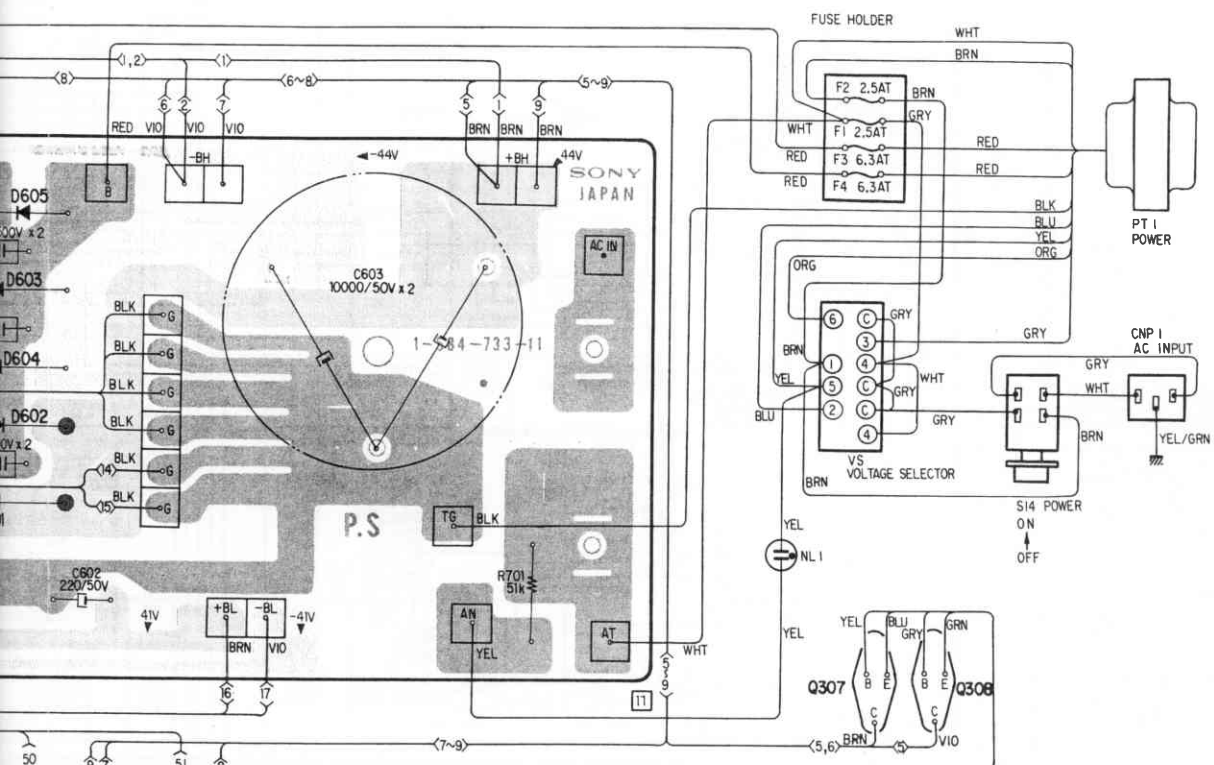
4-3. MOUNTING DIAGRAM – POWER AMPLIFIER SECTION –

– Conductor Side –

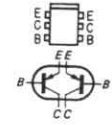


Q	357	358	354	351	353	356	451	355	452	403	404
D					351	353	352	451	452	406	405
								453	454	606	408
										601~604	605

TA-3650



Q301 : 2SA884
Q351 :



Q302 : 2SA639S
Q352 :
Q402 :
Q452 :

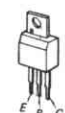
Q303 : 2SA896
Q353 :

Q404 : 2SC1811
Q304 :
Q354 :



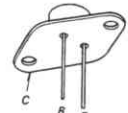
Q305 : 2SC1663
Q355 :

Q306 : 2SA835
Q356 :

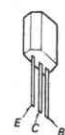


Q308 : 2SB519
Q358 :

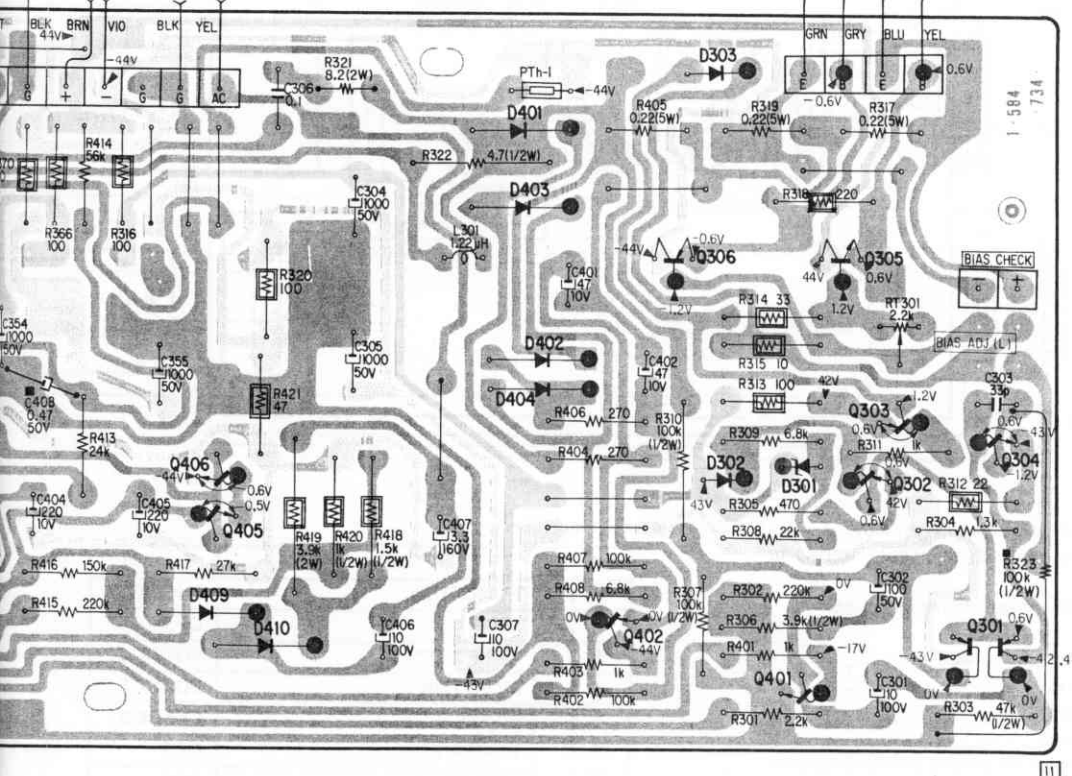
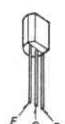
Q307 : 2SD533
Q357 :



Q401 : 2SC1636
Q451 :



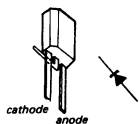
Q403 : 2SC1364
Q405 :
Q406 :



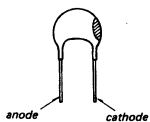
406	405	402	306	401	305	307	303	308	301	304
409	410	401	402	403	404	303	302	301		

4-4. SCHEMATIC DIAGRAM – POWER AMPLIFIER SECTION –

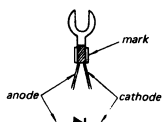
D301 } 1T243
D351 }



D302 } VD1221
D352 }



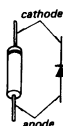
D303 } SV04F
D353 }



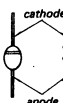
D401, 402 } 1T22A
D451, 452 }

D403~405 } 1S1555
D453, 454 }

D605, 606: 10E2

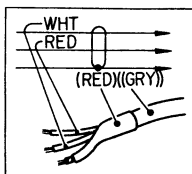


D601~604: U05E

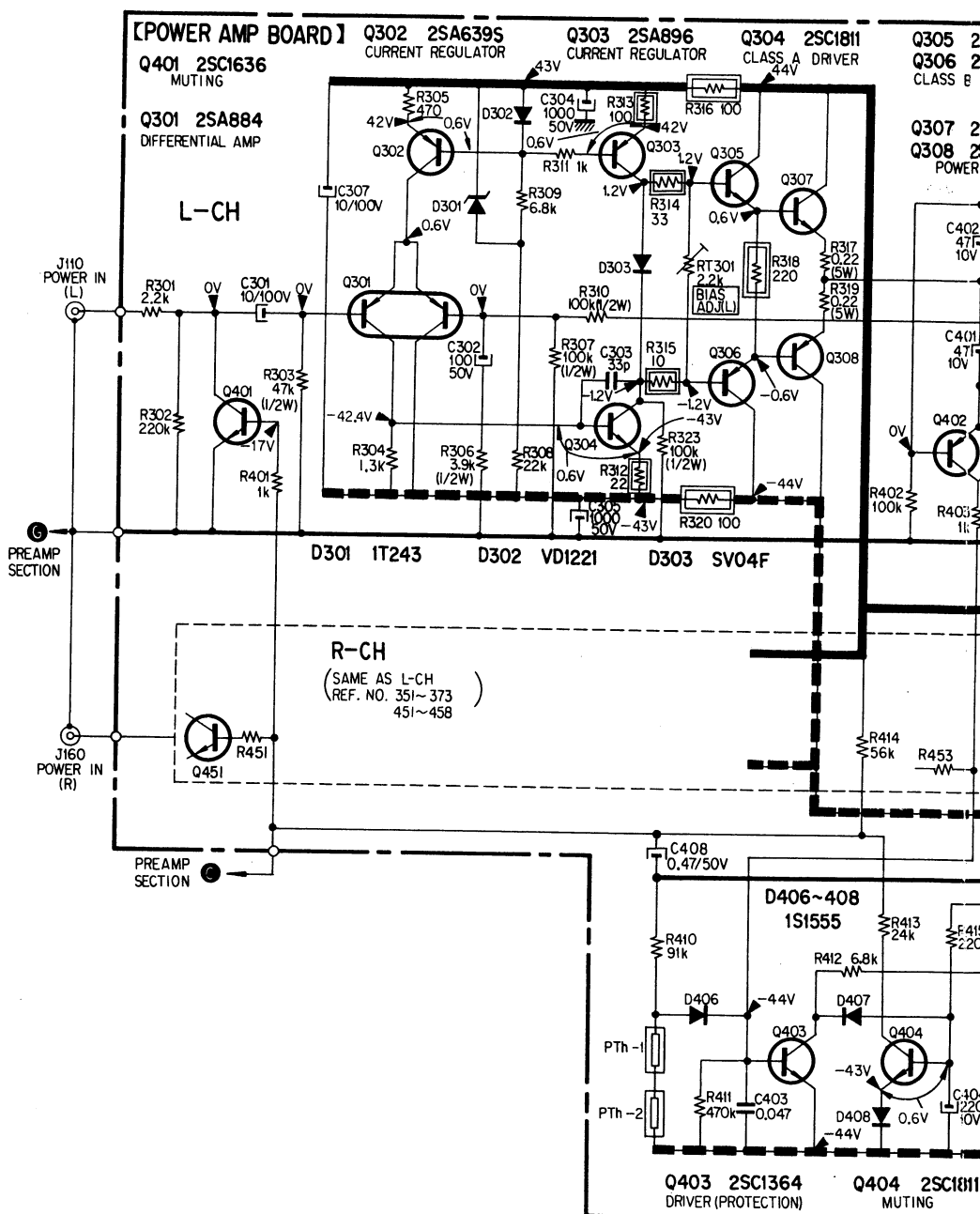


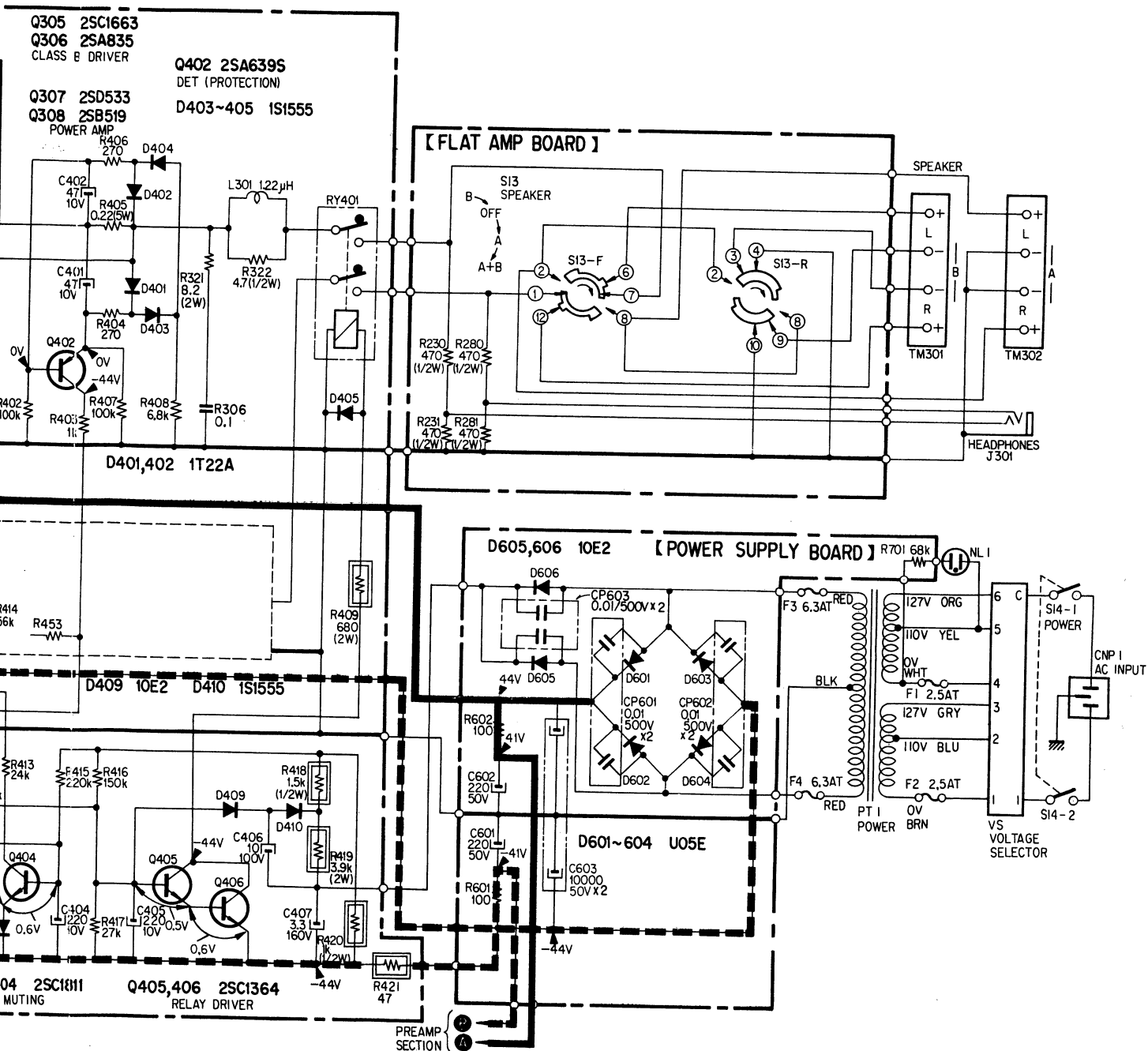
Note:

- ■ indicates parts on the conductor side.
- — indicates lead wire connection on the conductor side.
- ○ indicates lead wire connection through the component side.



- B+ pattern
- B- pattern





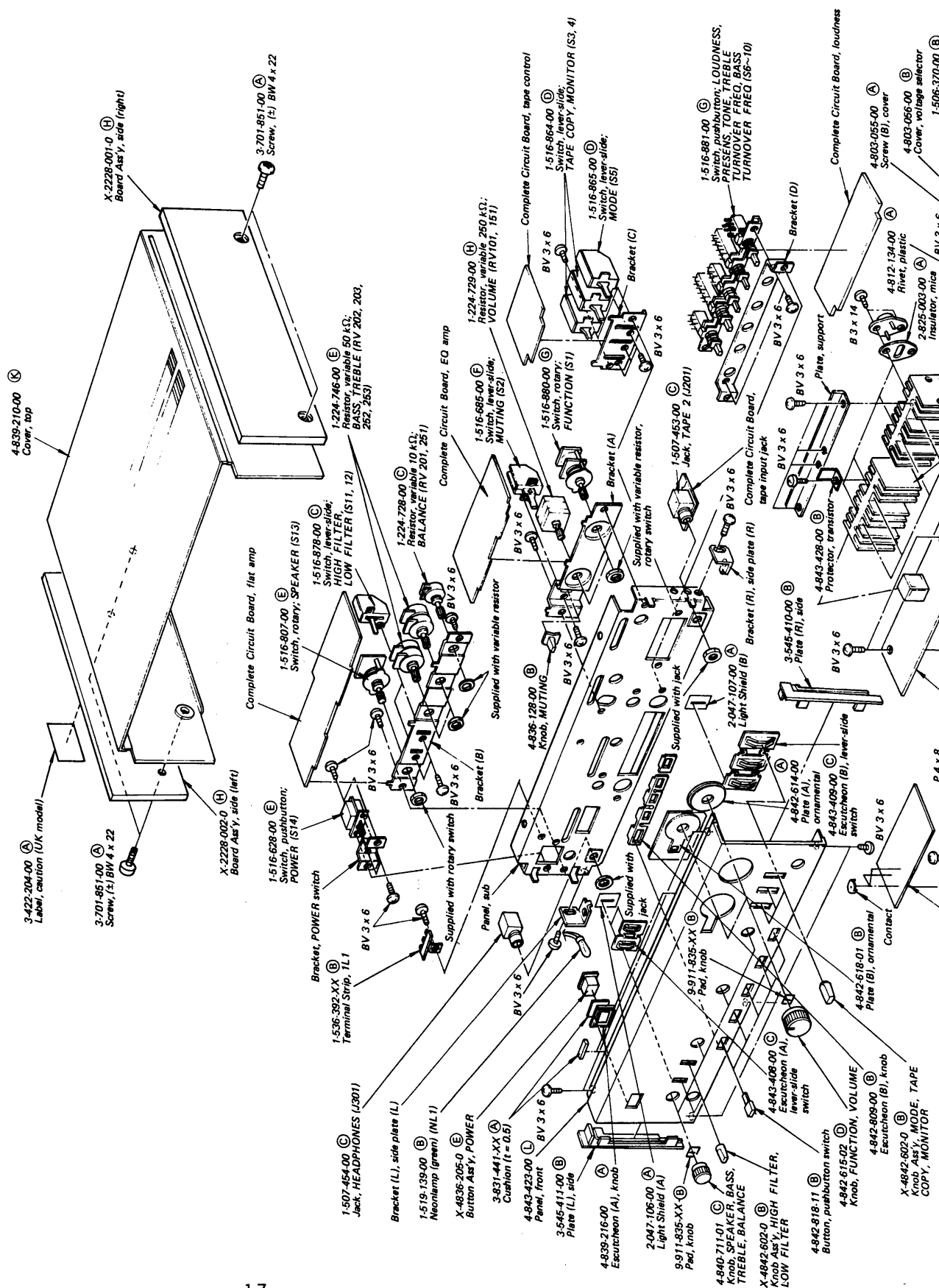
Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- --- indicates chassis ground.
- (N) indicates a low-noise resistor.
- --- indicates B+ circuit.
- --- indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 $k\Omega/V$).

- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.
- Switch Mode:

Ref. No.	Switch	Position
S13	SPEAKER	B
S14	POWER	OFF

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- 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
- (□□□) shows the number of coils in spring.

SECTION 6 ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
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PRINTED CIRCUIT BOARD

1-583-850-00	(B)	REC/PB Connector
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SEMICONDUCTORS

Transistors

Q101(151)	(F)	2SK58
Q102(152)	(B)	2SA705
Q103(153)	(B)	2SC1362
Q104(154)	(B)	2SA705
Q105	(B)	2SC1362

Q201(251)	(B)	2SC1362
Q202(252)	(B)	2SA705
Q203(253)	(B)	2SC900
Q204(254)	(B)	2SC1636

Q301(351)	(D)	2SA884
Q302(352)	(C)	2SA639S
Q303(353)	(C)	2SA896
Q304(354)	(C)	2SC1811
Q305(355)	(D)	2SC1663

Q306(356)	(E)	2SA835
Q307(357)	(H)	2SD533
Q308(358)	(L)	2SB519

Q401(451)	(B)	2SC1636
Q402(452)	(C)	2SA639S
Q403	(B)	2SC1364
Q404	(C)	2SC1811
Q405,406	(B)	2SC1364

Q501	(D)	2SC1061
Q502	(B)	2SC1364
Q503	(B)	2SK30A
Q504	(E)	2SA671
Q505	(C)	2SA678
Q506	(B)	2SK30A

Diodes

D301(351)	(B)	1T243
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• The mark of (A) to (Z): for European model.

Ref. No.	Part No.	Description
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D302(352)	(B)	VD1221
D303(353)	(B)	SV04F

D401(451)	(B)	1T22A
D402(452)		
D403~405	(B)	1S1555
(D453~455)		
D406~408	(B)	1S1555

D409	(B)	10E2
D410	(B)	1S1555

D501,502	(C)	EQA01-11R
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D601~604	(C)	U05E
D605,606	(B)	10E2

PTh1,2	1-800-427-21	(R)	Thermistor (positive), PTh487B
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Transformer

PT1	1-442-624-00	(R)	Power (w/voltage selector)
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CAPACITORS

All capacitors are in μF and of electrolytic type unless otherwise noted. ($p = \mu\mu$)
50 or less working volts are omitted except for electrolytic type.

C101(151)	1-102-941-11	(A)	4p	ceramic
C102(152)	1-102-820-11	(A)	330p	ceramic
C103(153)	1-131-295-11	(C)	100	6.3V tantalum
C104(154)	1-130-061-11	(B)	1500p	630V polypropylene film
C105(155)	1-130-062-11	(B)	5600p	630V polypropylene film

C106(156)	1-121-995-11	(B)	3.3	100V
C107(157)	1-130-061-11	(B)	1500p	630V polypropylene film

C201(251)	1-121-918-11	(A)	4.7	100V
C203(253)	1-121-996-11	(A)	22	100V
C204(254)				
C205(255)	1-108-845-12	(A)	0.047	mylar
C206(256)	1-103-773-11	(A)	820p	polystyrol
C207(257)	1-121-918-11	(A)	4.7	100V

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>		
C208(258)	1-102-949-11	(A) 12p	ceramic	
C209(259)	1-121-126-11	(A) 10	100V	
C210(260)	1-108-837-12	(A) 0.01	mylar	
C211(261)	1-108-851-12	(A) 0.15	mylar	
C212(262)	1-108-843-12	(A) 0.033	mylar	
C213(263)	1-102-816-11	(A) 120p	ceramic	
C214(264)	1-108-825-12	(A) 0.001	mylar	
C215(265)	1-108-827-12	(A) 0.0015	mylar	
C216(266)	1-103-773-11	(A) 820p	polystyrol	
C217(267)	1-108-845-12	(A) 0.047	mylar	
G301(351)	1-121-126-11	(A) 10	100V	
C302(352)	1-131-295-11	(C) 100	6.3V tantalum	
C303(353)	1-102-963-11	(A) 33p	ceramic	
C304(354)	1-123-061-11	(C) 1000	50V	
C305(355)				
C306(356)	1-108-849-12	(A) 0.1	mylar	
C307(357)	1-123-080-11	(B) 10	100V	
C401(451)	1-121-352-11	(A) 47	10V	
C402(452)				
C403	1-108-845-12	(A) 0.047	mylar	
C404,405	1-123-072-11	(B) 220	10V	
C406	1-123-080-11	(B) 10	100V	
C407	1-123-109-11	(B) 3.3	160V	
C501,502	1-121-148-11	(A) 1	100V	
C503	1-121-421-11	(B) 220	16V	
C504	1-121-148-11	(A) 1	100V	
C505	1-121-421-11	(B) 220	16V	
C601,602	1-121-937-11	(B) 220	50V	
C603	1-125-134-11	(K) 10000+10000	50V	

RESISTORS

All resistors are in Ω . $\frac{1}{2}W$, $\pm 5\%$, carbon resistors (except special type) are omitted. Check schematic diagram for the resistance values. (k = 1,000, M = 1,000 k)

R101(151)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R103(153)	1-244-862-11	(A) 360	$\frac{1}{2}W$	carbon
R107(157)	1-244-873-11	(A) 1 k	$\frac{1}{2}W$	carbon
R110(160)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon

• The mark of (A) to (Z) : for European model.

R111(161)	1-244-940-11	(A) 620 k	$\frac{1}{2}W$	carbon
R112(162)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R116(166)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R117(167)	1-244-919-11	(A) 82 k	$\frac{1}{2}W$	carbon
R206(256)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R207(257)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R214(264)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R220(270)	1-244-903-11	(A) 18 k	$\frac{1}{2}W$	carbon
R226(276)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R227(277)				
R230(280)	1-244-865-11	(A) 470	$\frac{1}{2}W$	carbon
R231(281)				
R303(353)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R306(356)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R307(357)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R310(360)				
R312(362)	1-211-506-11	(A) 22	$\frac{1}{4}W$	nonflammable
R313(363)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R314(364)	1-211-510-11	(A) 33	$\frac{1}{4}W$	nonflammable
R315(365)	1-211-498-11	(A) 10	$\frac{1}{4}W$	nonflammable
R316(366)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R317(367)	1-217-156-11	(A) 0.22	5W	wire-wound
R318(368)	1-211-530-11	(A) 220	$\frac{1}{4}W$	nonflammable
R319(369)	1-217-156-11	(A) 0.22	5W	wire-wound
R320(370)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R321(371)	1-258-223-11	(A) 8.2	2W	carbon
R322(372)	1-244-817-11	(A) 4.7	$\frac{1}{2}W$	carbon
R323(373)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R405(455)	1-217-156-11	(A) 0.22	5W	wire-wound
R409	1-206-660-11	(A) 680	2W	metal oxide
R418	1-211-642-11	(A) 1.5 k	$\frac{1}{2}W$	nonflammable
R419	1-206-678-11	(A) 3.9 k	2W	metal oxide
R420	1-211-638-11	(A) 1 k	$\frac{1}{2}W$	nonflammable
R421	1-211-514-11	(A) 47	$\frac{1}{4}W$	nonflammable
R501	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
R502	1-244-910-11	(A) 36 k	$\frac{1}{2}W$	carbon
R503	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
RT301(351)	1-224-250-XX	(C) 2.2 k	adjustable	
RV101(151)	1-224-729-00	(H) 250 k	variable; VOLUME	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RV201(251)	1-224-728-00	Ⓒ 10 k, variable; BALANCE
RV202(252)	1-224-746-00	Ⓔ 50 k, variable; BASS, TREBLE
RV203(253)		

SWITCHES

S1	1-516-880-00	Ⓖ Rotary, FUNCTION
S2	1-516-685-00	Ⓕ Lever-slide, MUTING
S3,4	1-516-864-00	Ⓓ Lever-slide, TAPE COPY, MONITOR
S5	1-516-865-00	Ⓓ Lever-slide, MODE
S6~10	1-516-881-00	Ⓖ Pushbutton, LOUDNESS, PRESENCE, TONE, TURNOVER FREQ (BASS, TREBLE)
S11,12	1-516-878-00	Ⓒ Lever-slide, HIGH FILTER, LOW FILTER
S13	1-516-807-00	Ⓔ Rotary, SPEAKER
S14	1-516-628-00	Ⓔ Pushbutton, POWER

JACKS

J101~104 (J151~154)	1-507-429-XX	Ⓓ Phono, 8-P
J105,106 (J155,156)	1-507-471-00	Ⓒ Phono, 4-P
J107~110 (J157~160)	1-507-470-00	Ⓒ Phono, 4-P
J201	1-507-453-00	Ⓒ TAPE 2
J301	1-507-454-00	Ⓒ HEADPHONES

• The mark of Ⓐ to Ⓔ : for European model.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
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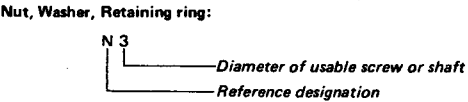
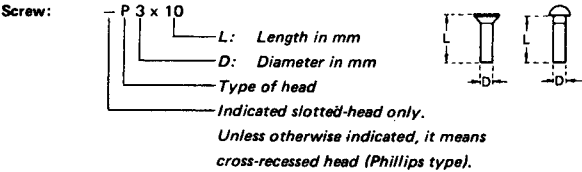
MISCELLANEOUS

CNJ1	1-509-549-00	Ⓑ Connector, REC/PB
CNP1	1-509-546-00	Ⓒ Connector, 3-P; ac input
CP601~603	1-102-355-11	Ⓑ Encapsulated Component
F1,2	1-532-286-00	Ⓑ Fuse, 2.5AT
F3,4	1-532-325-00	Ⓑ Fuse, 6.3AT
NL1	1-519-139-00	Ⓑ Neon lamp (green)
RY401	1-515-257-00	Ⓗ Relay
TM301,302	1-535-057-00	Ⓔ Terminal Strip, 4-P; SPEAKER
	1-506-370-00	Ⓑ Plug, jumper
	1-508-690-00	Ⓒ Plug, voltage selector
	1-509-863-00	Ⓑ Socket, transistor
	1-536-392-XX	Ⓑ Terminal Strip, 1L1

ACCESSORIES

1-506-113-00	Ⓑ Plug, shorting
1-534-819-00	Ⓖ Cord, power
3-780-852-11	Ⓑ Manual, instruction

HARDWARE NOMENCLATURE



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		braizer-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	