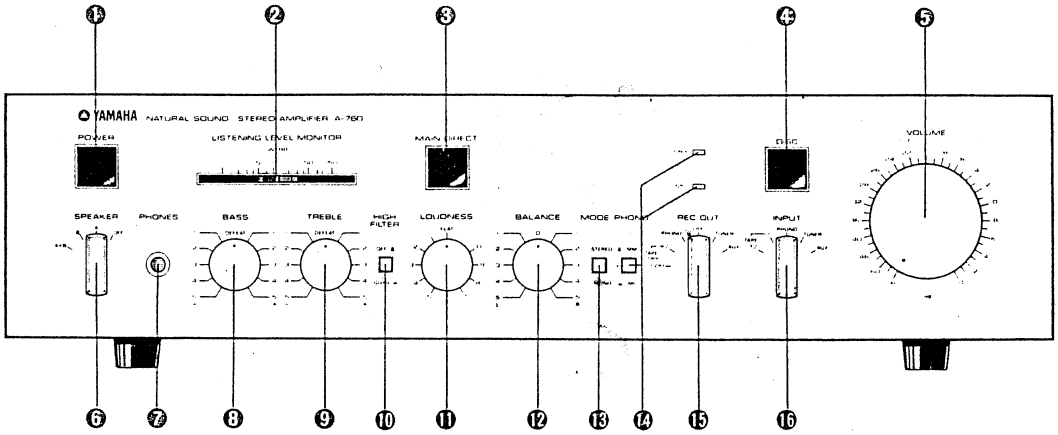
M. Henkemeier 04101/2090

A-760

SERVICE MANUAL

■ FRONT PANEL



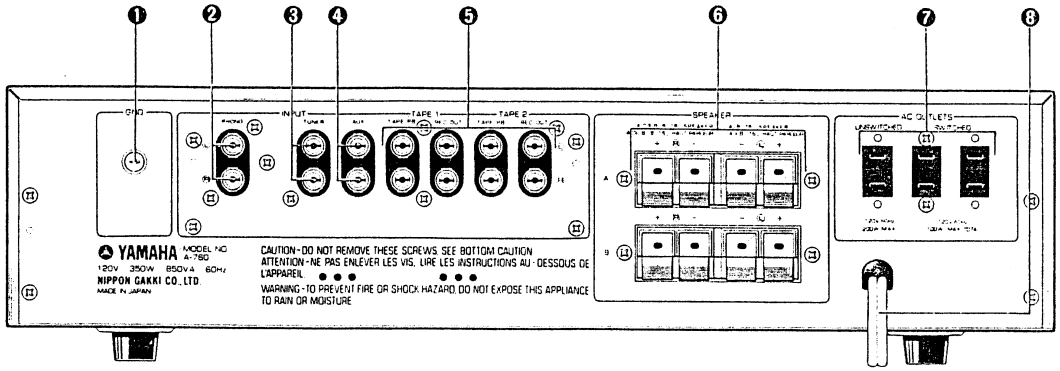
❶ POWER (power pushswitch)
❷ LISTENING LEVEL MONITOR (indicator)
❸ MAIN DIRECT (tone amp bypass pushwitch)
❹ DISC (phono disc selector pushswitch)
❺ VOLUME (volume control)
❻ SPEAKER (speaker selector switch)
❼ PHONES (headphone jack)
❽ BASS (bass control)
❾ TREBLE (treble control)
❿ HIGH FILTER (high filter in/out pushswitch)
⓫ LOUDNESS (loudness control)
⓬ BALANCE (balance control)
⓭ MODE (mode selector pushswitch)
⓮ PHONO (phono input selectors/indicators (MM/MC))
⓯ REC OUT (recording output selector switch)
⓰ INPUT (input selector)

■ CONTENTS

004417

SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN
'80.11. 2.42K. KT. Ⓟ Prited in Japan

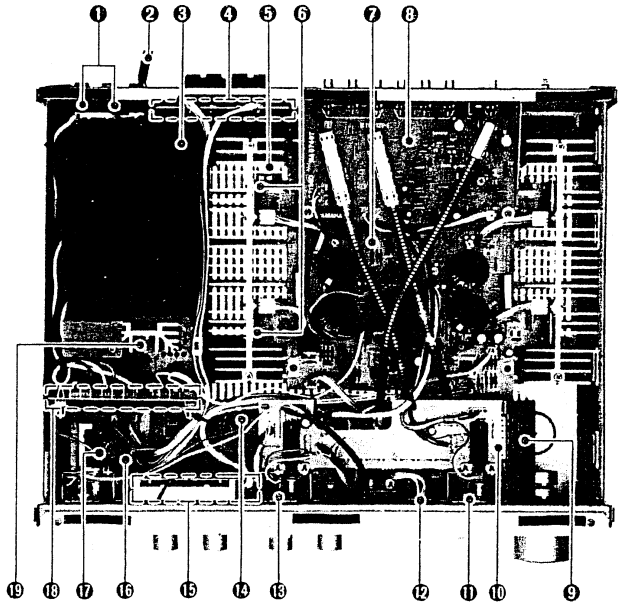
■ REAR PANEL



❶ GND (ground terminal)
❷ PHONO (phono input jacks)
❸ TUNER (tuner input jacks)
❹ AUX (auxiliary input jacks)
❺ TAPE 1/2 (Tape 1/2 record/playback jacks)
❻ SPEAKER (speaker terminals A/B)
❼ AC OUTLETS (switched and unswitched auxiliary outlets)
❽ Power cord

■ INTERNAL VIEW

Top View



❶ AC outlet
❷ Power cord
❸ Power transformer housing (power transformer: GA63580)
❹ Main C. board (3) NA07490-3
❺ Heat sink
❻ Power transistor(s)
❼ Main C. board (1) NA07490-1
❽ Function C. board NA07486
❾ Tone control C. board (3) NA07488-3
❿ Tone control C. board (2) NA07488-2
⓫ DISC switch
⓬ Phono indicator LED
⓭ MAIN DIRECT switch
⓮ Tone control C. board (1) NA07488-1
⓯ Main C. board (4) NA07490-4
⓰ Main C. board (2) NA07490-2
⓱ Power pushswitch
⓲ Control C. board (1) NA07495-1
⓳ Control C. board (2) NA07495-2

■ DISASSEMBLY

1. Top Cover Removal

Remove screws (1) and (2) in Photo 1 from the both sides of the unit. The top cover removed by sliding it toward of the arrow.

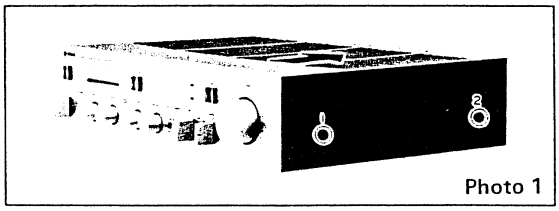


Photo 1

2. Bottom Cover Removal

Turn the unit to place it. Remove the nine bottm cover retaining screws (in Photo 2) and remove the bottom cover.

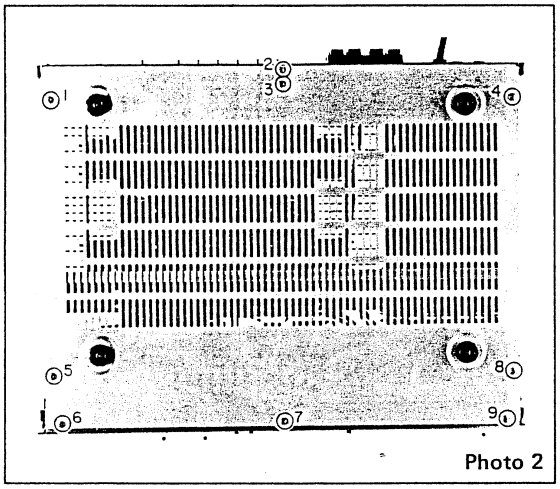


Photo 2

3. Front Panel Removal

a) Remove the top cover (step 1).
b) Remove the bottom cover (step 2).
c) Use an M 1.5 hexagon wrench to loosen the retaining screws. (SPEAKER, REC OUT, and INPUT switchs.) then pull out these knobs.
d) Pull out the illuminating lamps from the POWER, MAIN DIRECT, and DISC pushswitches' lamp holders, carefuly to avoid damaging the lamp leads.
e) Disconnect the MM and MC indicator lamps lead at the connectors.
f) Remove screws (1) and (2) shown in Photo 3. The front panel removed by slowly pulling it in the foreard direction.

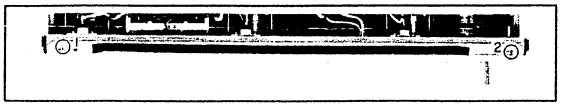


Photo 3

4. Rear Panel Removal

a) Remove the top cover (step 1).
b) Remove the bottom cover (step 2).
c) Disconnect the power cord at the AC OUTLETS. The rear panel removed by taking off screws (1) ~ (21) shown in Photo 4.

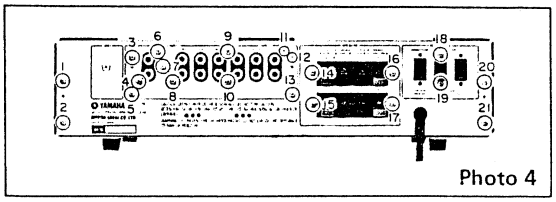


Photo 4

5. Function C. Board Removal

a) Remove the top cover (step 1).
b) Disconnect all leads and connectors from the function C. board, then remove the flexible wires from each on-board switch using a small standard screwdriver (Figure 1).
c) Remove screws (3) ~ (13) shown in Photo 4 to remove the function C. board.

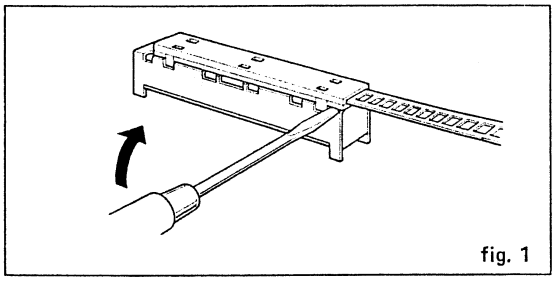


fig. 1

6. Tone Control C. Boards (1), (2), and (3), Main C. Boards (2) and (4), and Control C. Board (3) Removal

a) Remove the top and bottom covers and front panel from the unit (see steps 1, 2, and 3.).
b) Remove the BASS, TREBLE, LOUDNESS, BALANCE, and VOLUME control knobs located on the front panel.
c) Remove nut (A) and screws (1) ~ (4) in Photo 5 to remove tone control C. boards (2) and (3).
d) Remove screws (5) and (6) and nuts (B) ~ (E) in Photo 5 to remove tone control C. board (1).

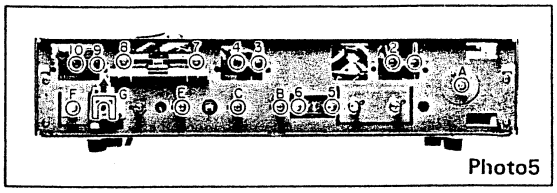


Photo5

e) Remove screws (7) and (8) in photo 5, then pull out the LISTENING LEVEL MONITOR knob to remove main C. board (4).
f) Remove screws (9) and (10) in Photo 5 to remove control C. board (3).
g) Remove nut (F) in Photo 5, then take off phone jack retention metal (G) in the arrow direction. Main C. board (2) can now be removed.

7. Main C. Board (1) and Heat Sink Removal

a) Remove the top and bottom covers (steps 1 and 2).
b) Remove the function C. board (step 5).
c) Remove the solder from all power transistors lead. (TR331~334)
d) Remove screws (1) ~ (4) in Photo 6 to remove main C. board (1).
e) Remove screws (5) ~ (8) in Photo 6 to remove the heat sink.
* Before reinstalling the main C. board, check that transistors TR317 and TR318 are thermally coupled.

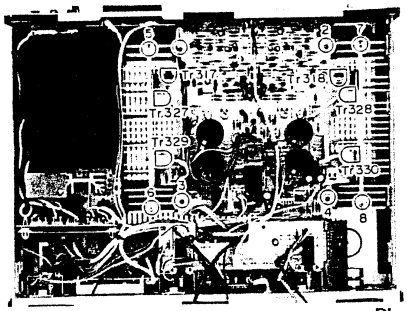


Photo 6

8. Power Transformer and Control C. Boards (1) and (2) Removal

a) Remove the top cover (step 1).
b) Disconnect all leads from the control C. board.
c) Remove screw (1) in Photo 7, then remove the control C. Board from board holders (A) and (B). Control boards (1) and (2) can now be removed.
d) Remove screws (2) ~ (5) in Photo 7 to remove the cover transformer.
e) Remove screws (1) ~ (4) in Photo 8 to remove the power transformer.

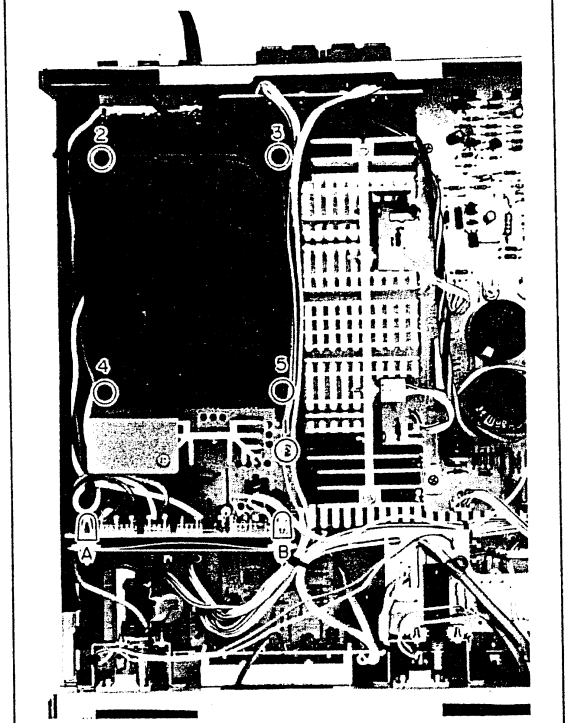


Photo 7

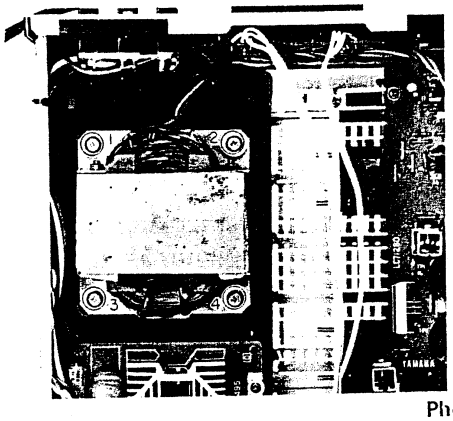


Photo 8

■ ADJUSTMENT

Power Supply voltage
U.S.A. and Canadian : AC 120V
General : AC 115V
North European : AC 220V
Australia and British : AC 240V

Prior To Adjustment

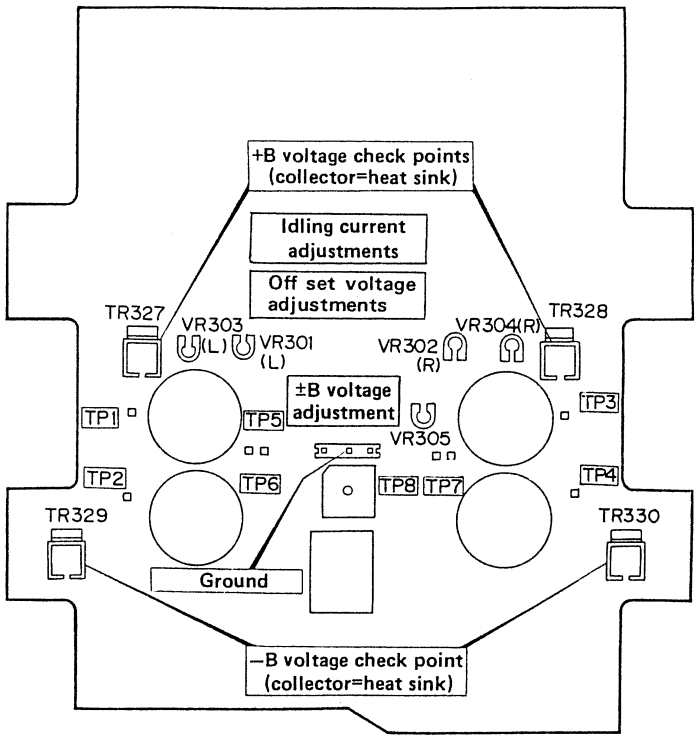
- Idle the unit for about 5 minutes before adjustment.

Step	Item	Condition	Adjustment	Test Point	Specification	Measuring Instrument
1	Idling current adjustment	VOLUME minimum position	Main board (1) VR303 (L-ch) VR304 (R-ch)	TP_1 – TP_2 (L) TP_3 – TP_4 (R)	10 ± 5mV	Digital voltmeter
2	Offset voltage adjustment	VOLUME minimum position	Main board (1) VR301 (L-ch) VR302 (R-ch)	TP_5 – TP_6 (L) TP_7 – TP_8 (R)	0 ± 10mV	Same as above
3	Main ± B voltage adjustment	Non-load	Main board (1) VR305	Control board P1 terminal – Chassis earth	***	Digital voltmeter
4	Photo-coupler current check	VOLUME minimum position; non-load	Across P_1 and TP_3 on the control board (If the voltage is outside the specification, adjust VR501 on the control board and VR305 on the main board alternately until the ± B voltage and the voltage across P_1 and TP_3 are within the specification.)		1.2V ± 0.2V	Same as above

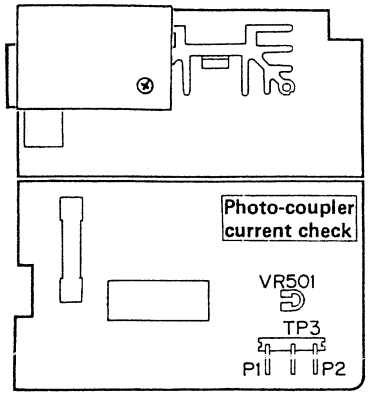
*** U.S.A. and Canadian, General 47.5V ± 0.3V
N. European, Australia, British 47.0V ± 0.3V

■ ADJUSTING POINTS

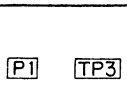
Main C.Board



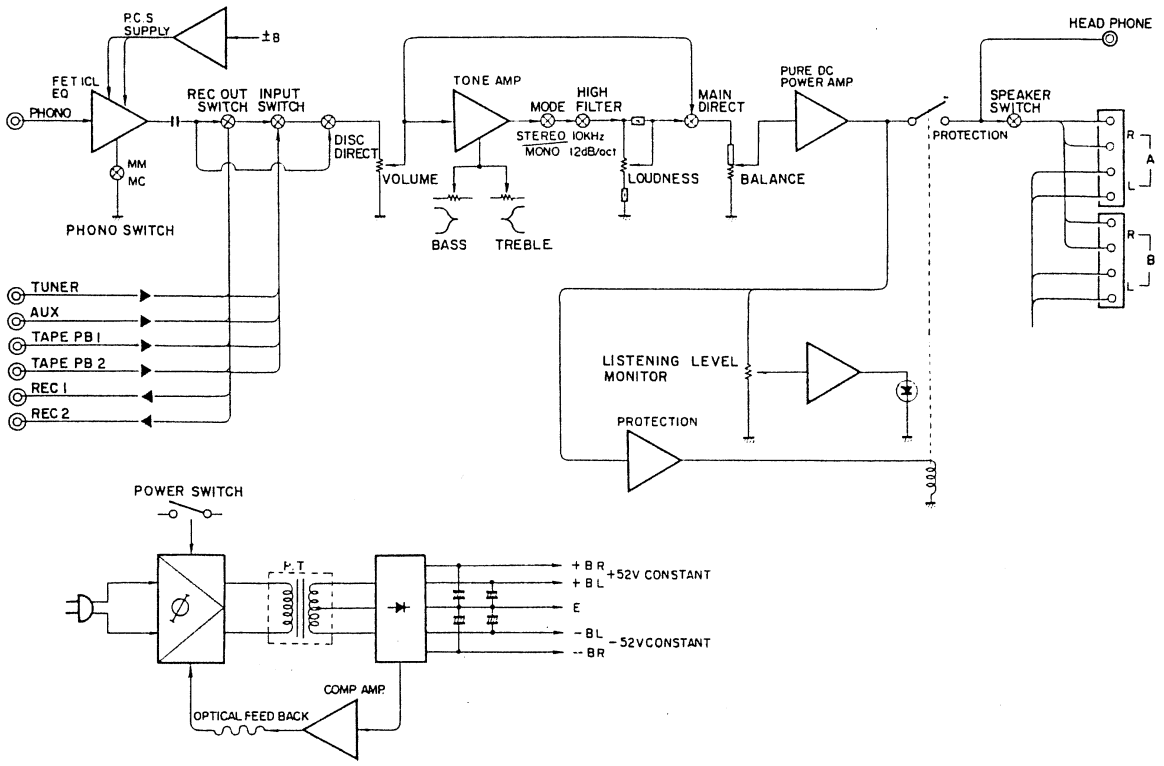
Control C. Board (1)



Control C. Board (2)



BLOCK DIAGRAM



SPECIFICATIONS

Minimum RMS Output Power
8 ohms, 20 to 20,000Hz 0.01% THD . . . . . 80 W + 80 W
(DIN) . . . . . 100 W + 100 W

Total Harmonic Distortion
(20 to 20,000 Hz)
Phono MM to Rec Out (5 V output) 0.003%
Phono MC to Rec Out (5 V output) 0.006%
Aux/Tape/Tuner to Sp Out (40 W) 0.005%

IM Distortion Ratio (60 Hz : 7 kHz=4 : 1)
Aux/Tape/Tuner to Sp Out
8 ohms, 40 W 0.002%
8 ohms, 1 W 0.01%

Power Bandwidth
(8 ohms, 40 W, 0.02% THD) . . . . . 10 to 50,000 Hz

Damping Factor
(8 ohms, 1 kHz) . . . . . Better than 55

Frequency Response
(Aux/Tape/Tuner to Sp Out, 8 ohms) . . . . . 20 to 20,000 Hz ($\frac{+0}{-2}$ dB)

RIAA Deviation
Phono MM . . . . . ±0.2 dB
Phono MC . . . . . ±0.3 dB

Input Sensitivity/Impedance
Phono MM . . . . . 2.5 mV/47 k ohms
Phono MC . . . . . 250 μV/100 ohms
Aux/Tape/Tuner . . . . . 150 mV/47 kohms

Maximum Input Level (1 kHz)
Phono MM . . . . . 180 mV RMS
Phono MC . . . . . 18 mV RMS

Tone Control Characteristics
Bass . . . . . ±10 dB at 20 Hz
Treble . . . . . ±10 dB at 20 kHz
Turnover Frequencies Bass . . . . . 500 Hz
Treble . . . . . 3.5 kHz

Output Level/Impedance
Rec Out . . . . . 150 mV/550 ohms

Signal-to-Noise Ratio
(IHF A Network, Input Shorted)
Phono MM (10 mV) . . . . . 98 dB
Phono MC (500 μV) . . . . . 76 dB
Aux/Tape/Tuner (150 mV) . . . 103 dB

Residual Noise
(IHF A Network) . . . . . 165 μV

Filter Characteristics
High . . . . . 10 kHz, 12 dB/oct.

Channel Separation
(1 kHz, vol. −30 dB, Shorted)
Tuner to Sp Out . . . . . 70 dB
Phono MM to Sp Out . . . . . 70 dB
Phono MC to Sp Out . . . . . 70 dB

Continuous Loudness Control
(Level-Related Equalization)
Max. Attenuation . . . . . 20 dB at 1 kHz

Gain Tracking Error (0 to −60 dB) . . . . . 2 dB

Headphone Output . . . . . 6.5 mW (8 ohms, 0.01% THD)

Semiconductors . . . . . 47 Transistors, 4 ICs, 8 FETs, 54 Diodes, 3 LEDs

Power Supplies
U.S. and Canada . . . . . 120 V, 60 Hz
General . . . . . 110–120 V/220–240 V, 50/60 Hz
Northern Europe . . . . . 220 V, 50 Hz
Britain and Australia . . . . . 240 V, 50 Hz

Power Consumption
U.S. and Canada . . . . . 350 W/850 VA
General . . . . . 350 W
Britain, Australia and North European . . . . . 520 W

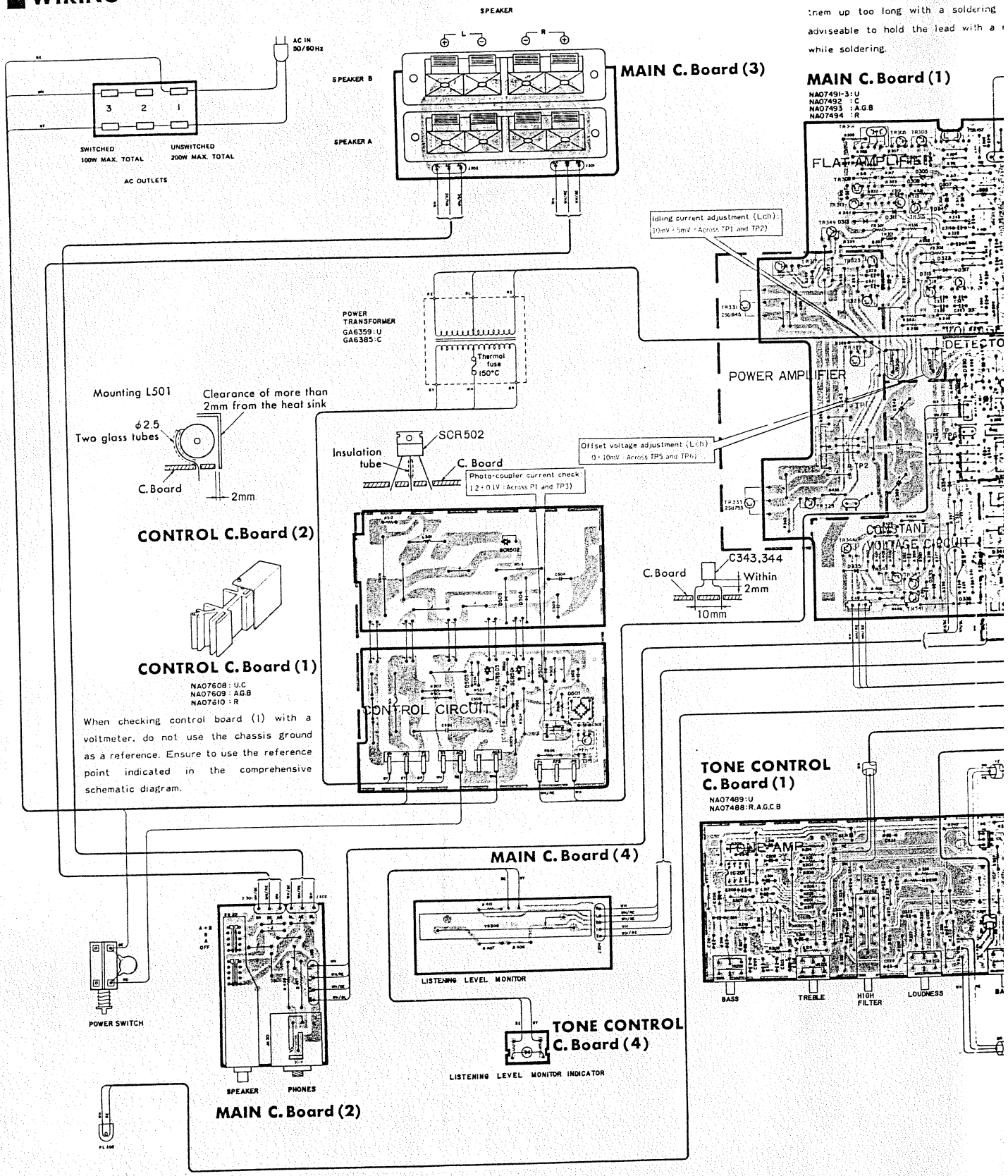
Dimensions (W x H x D) . . . . . 435 x 112 x 355 mm (17-1/8" x 4-7/16" x 14-3/8")

Weight . . . . . 9.1 kg (20 lbs., 7 oz.)

Specifications subject to change without notice.

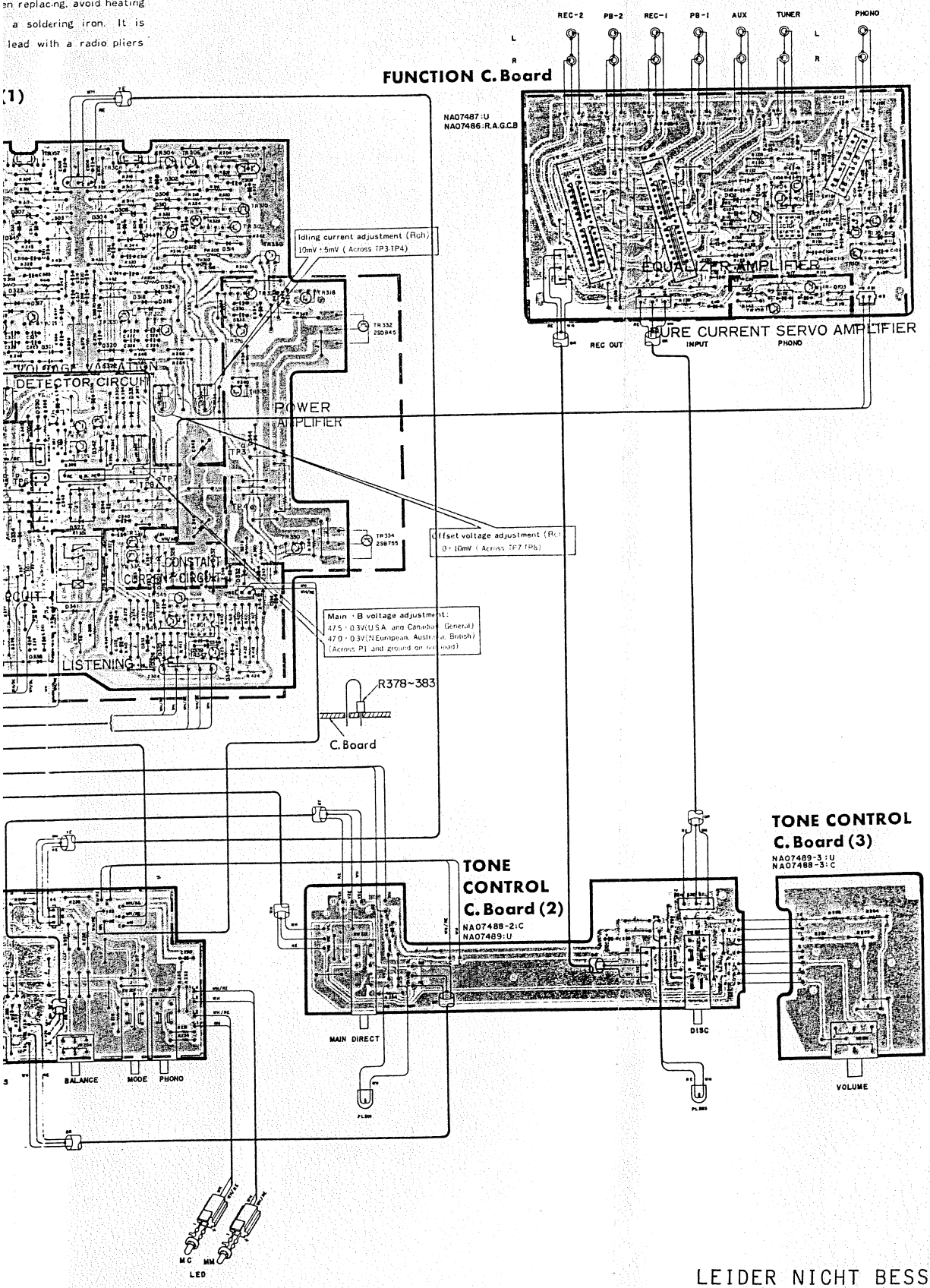
WIRING

TH 301 and 302 are thermistors (therm
variable resistors). When replacing, av
them up too long with a soldering
advisable to hold the lead with a
while soldering.



mistors (thermo-sensitive
en replacing, avoid heating
a soldering iron. It is
lead with a radio pliers

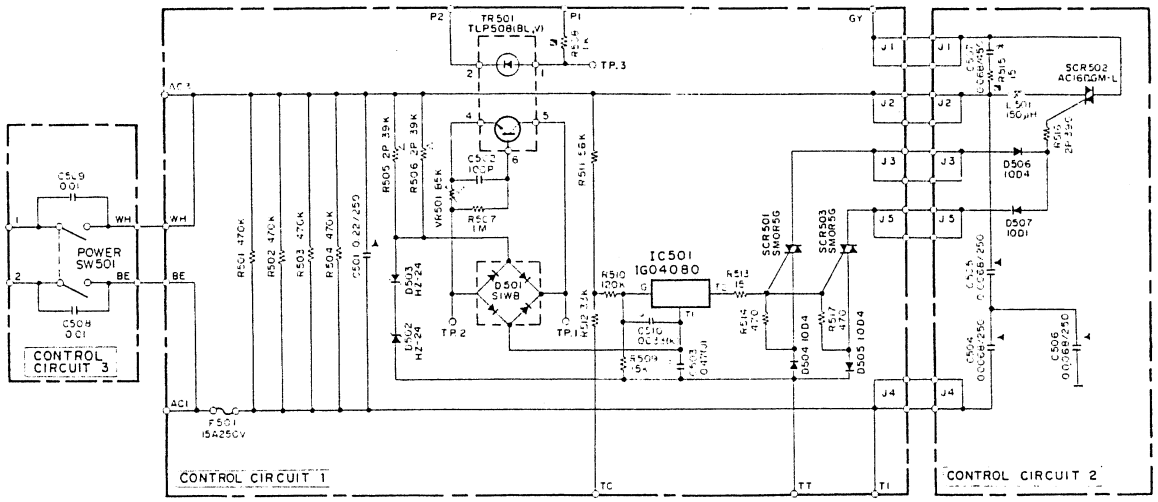
(1)



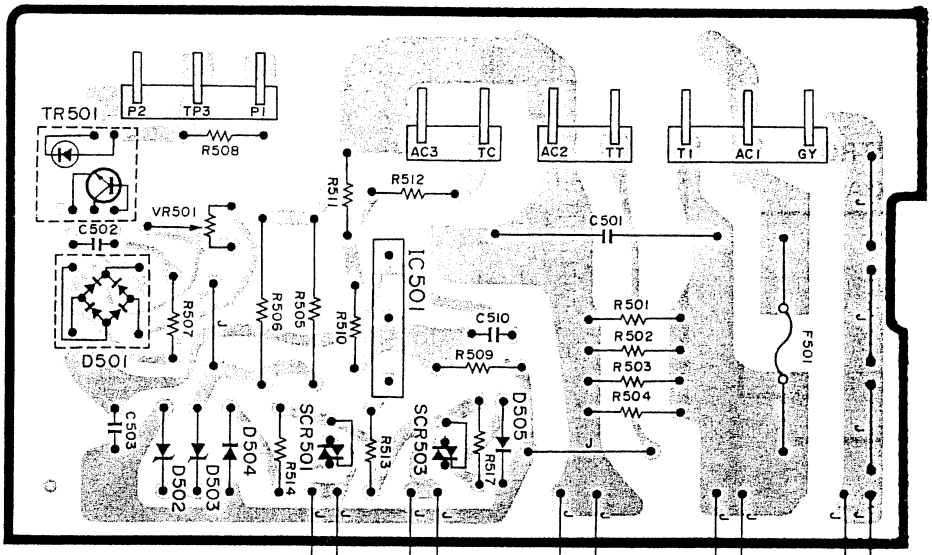
LEIDER NICHT BESSER MÖGLICH,

DA KOPIE VON KOPIE!

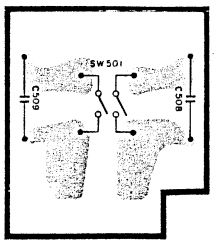
■ CONTROL C. BOARD / SCHEMATIC DIAGRAM (General model)



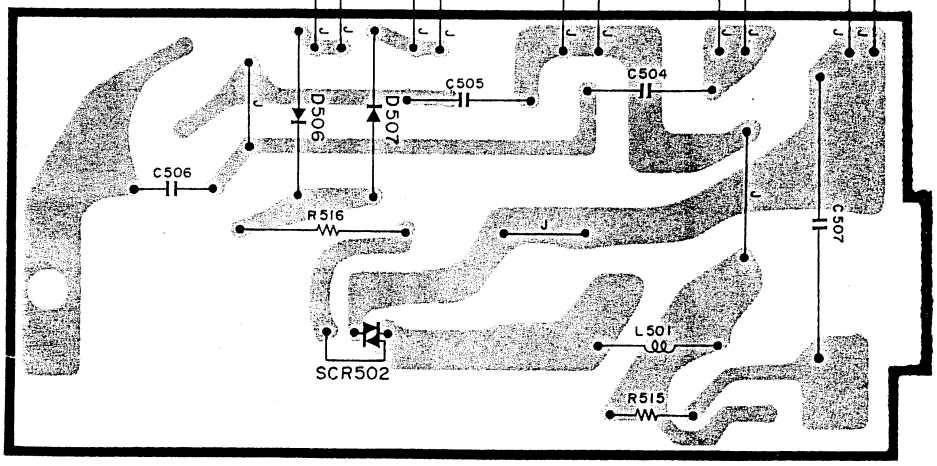
CONTROL C. BOARD 1



CONTROL
C. BOARD 3

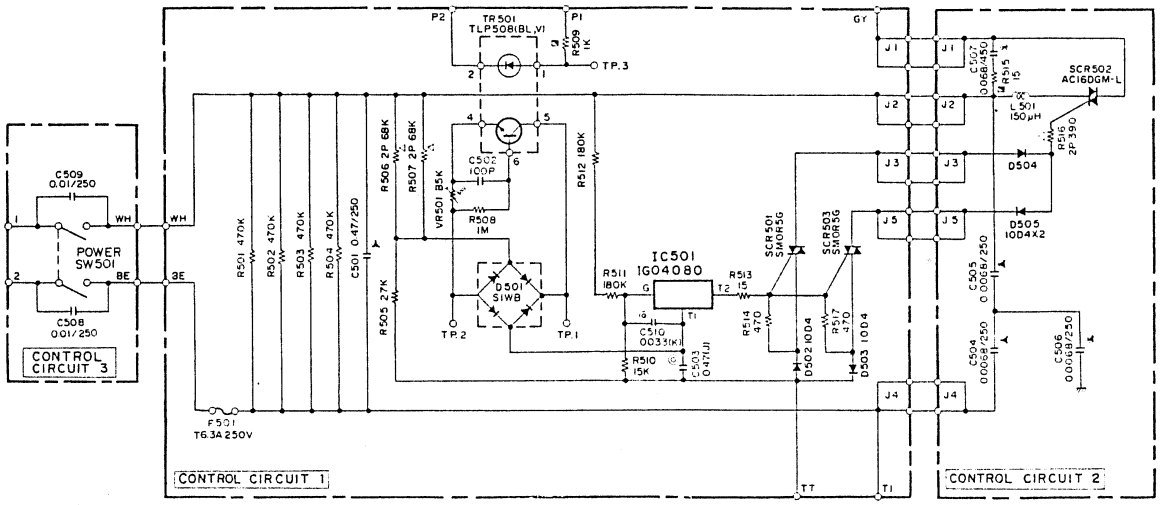


CONTROL C. BOARD 2

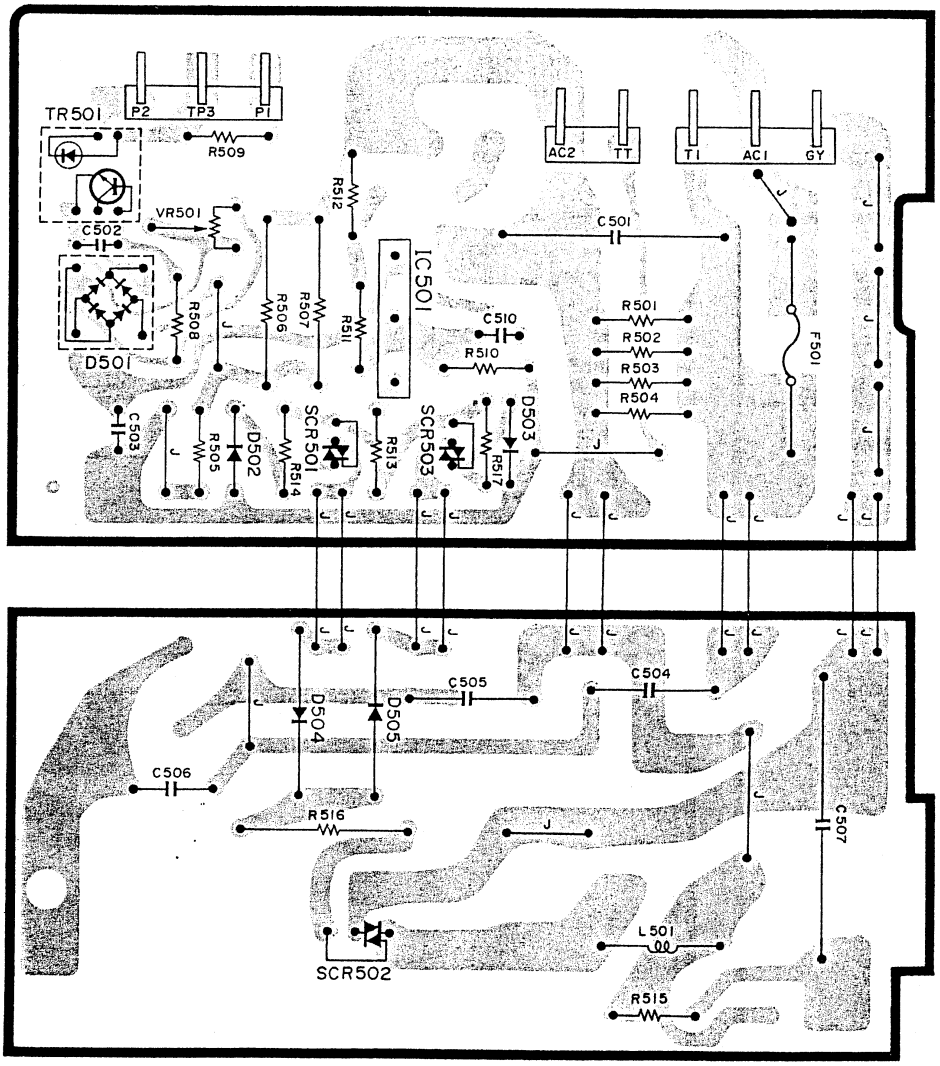


■ CONTROL C. BOARD / SCHEMATIC DIAGRAM

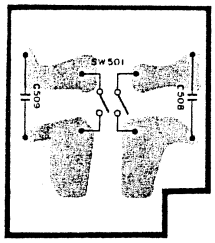
(British, Australian, North European models)

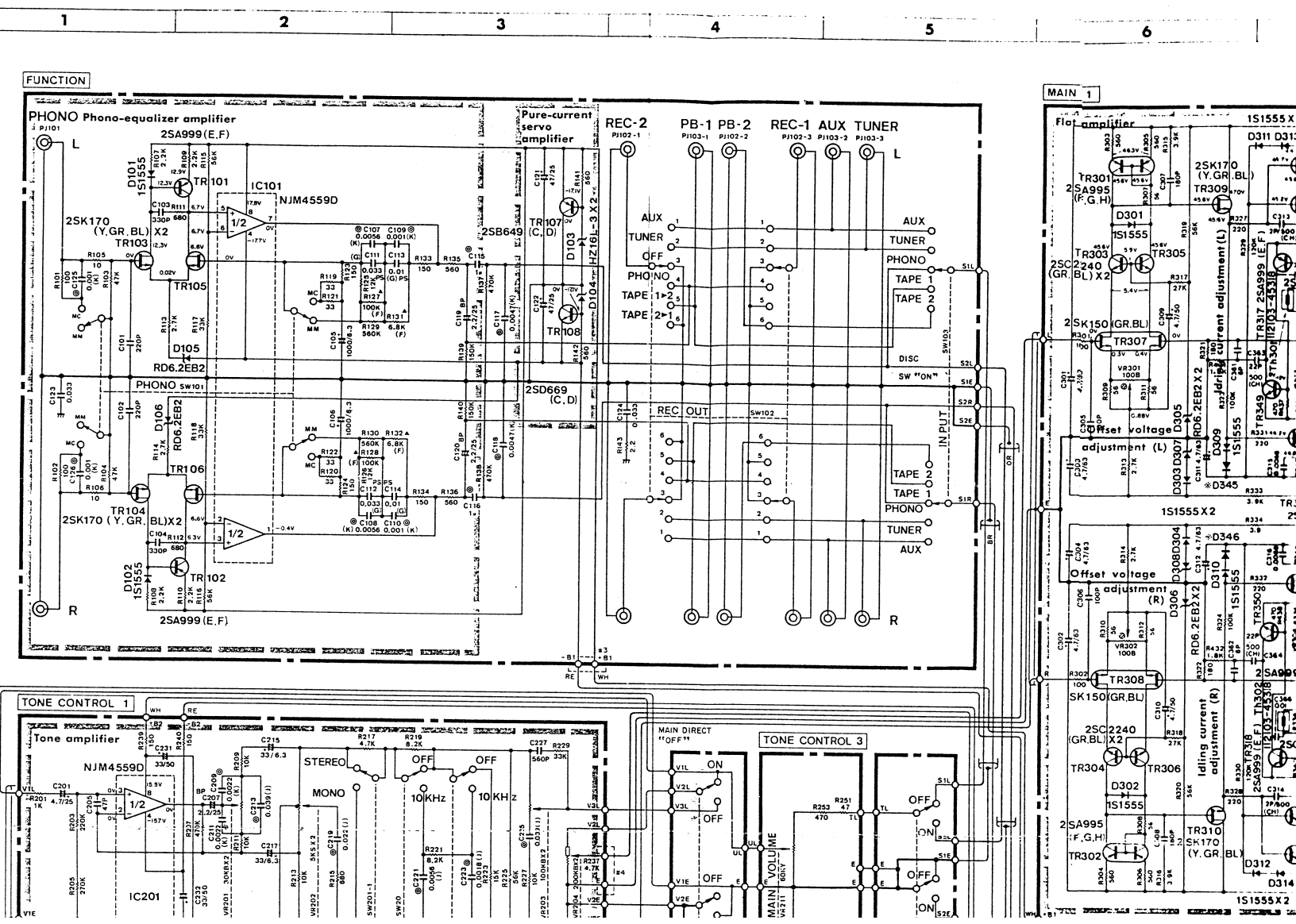


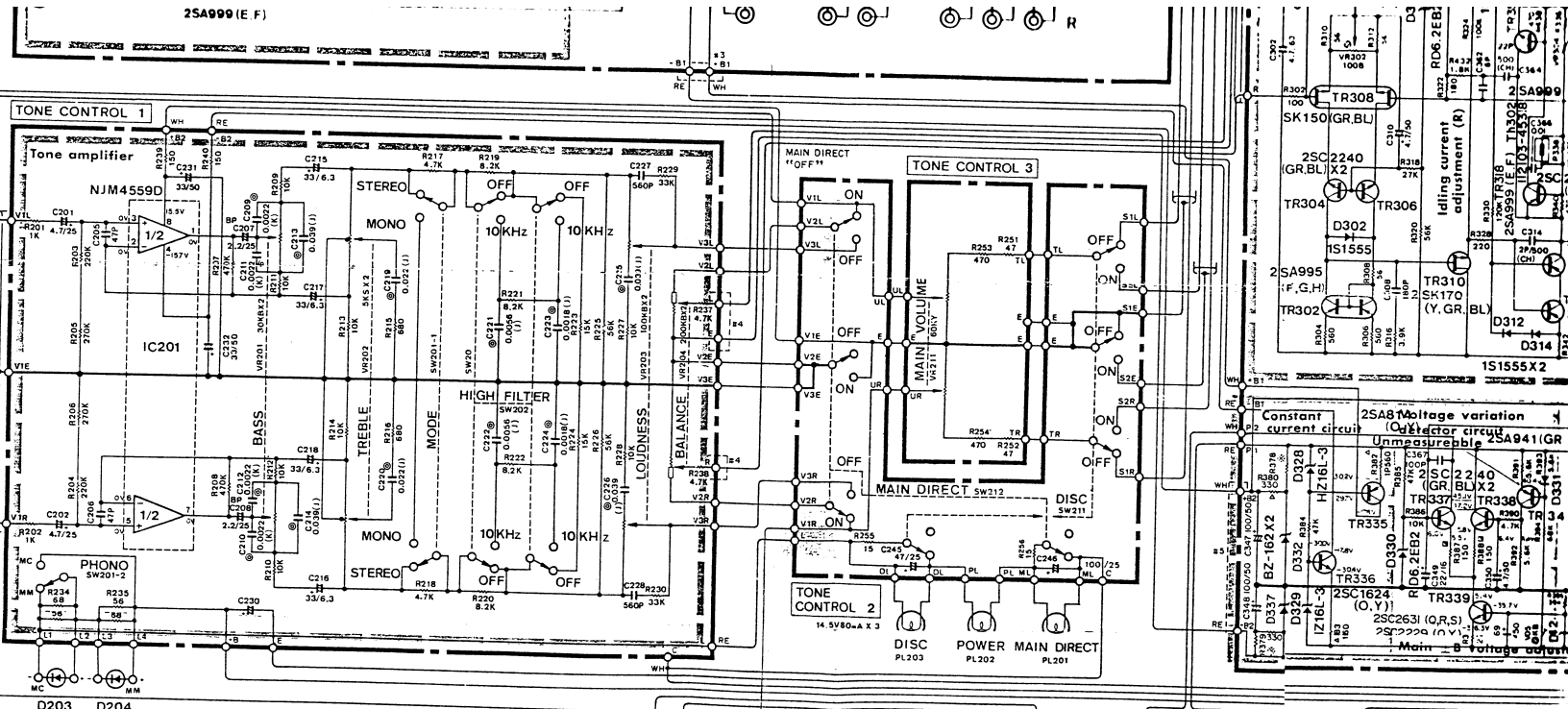
CONTROL C. BOARD 1



CONTROL C. BOARD 3







al model

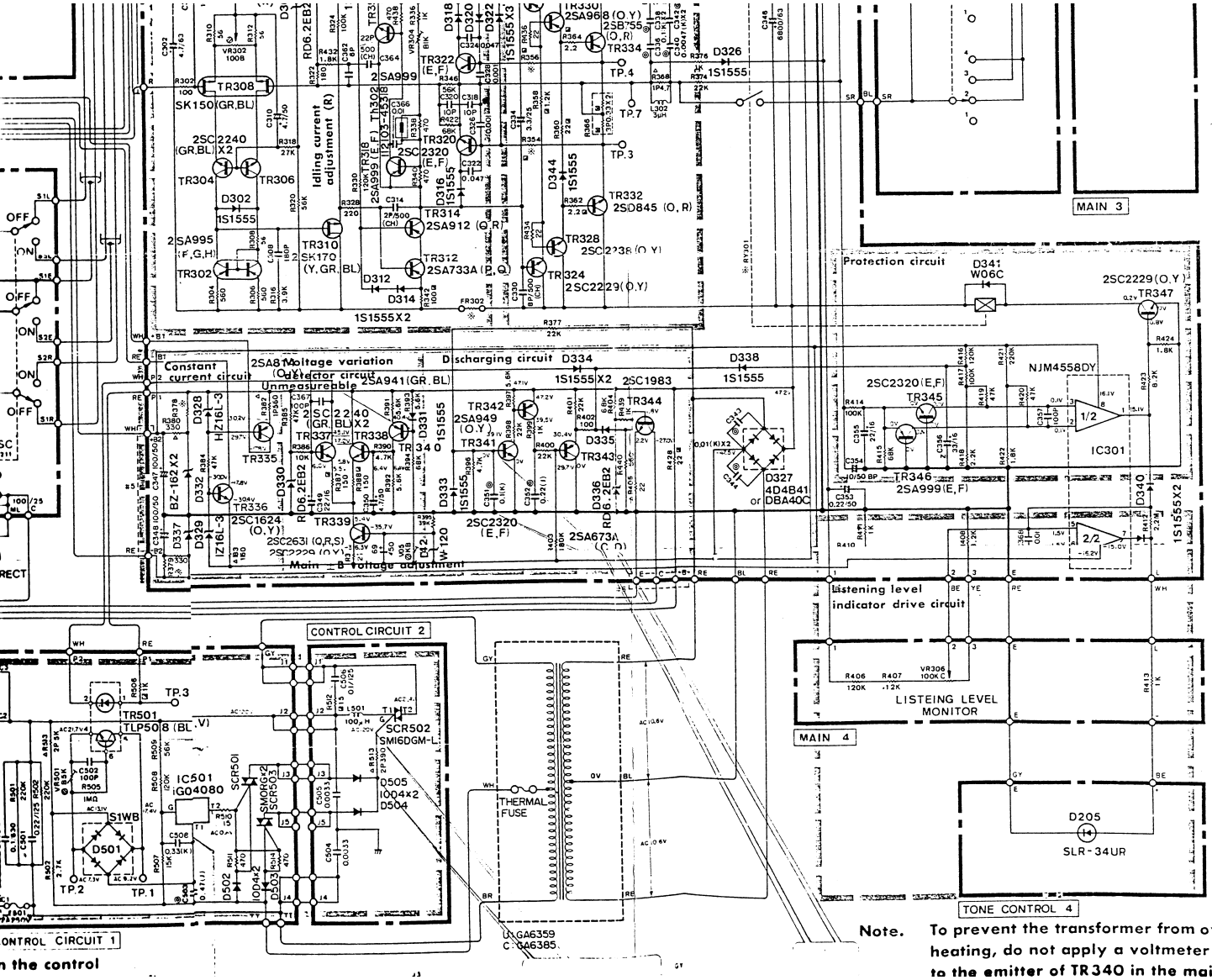
lian, North European and British models

ard

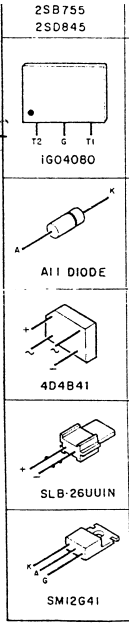
nges made according to destination.

Note 1. When observing signal waveforms on the control circuit boards, avoid physical

Note 2. Ensure to check voltages on the control circuit with reference to the reference



2SB755
2SD845

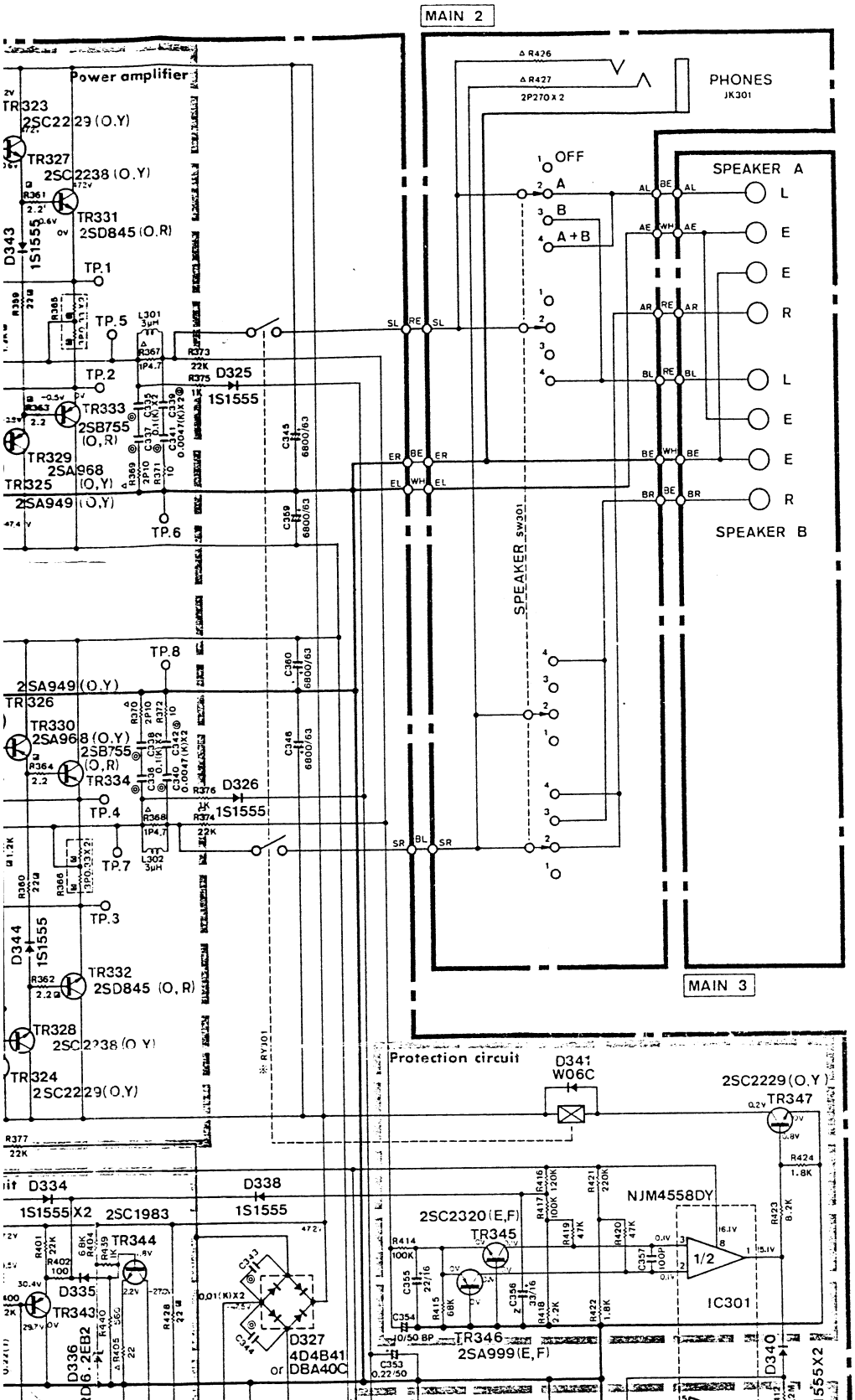


RESIST R

REMARKS	PA
NO MARK	CARBON RES
△	METAL OXIDE
▲	METALIZED
⊠	METAL PLAT
⊡	FIRE PROOF
⊘	SEMI VARIA
□	CEMENT MOLD

CAPACITOR

REMARKS	PA
NO MARK	CERAMIC CA
◎	MYLAR CAP
○	POLYSTYRENE
*	PAPER CAP
PS	P.S. CAPACIT



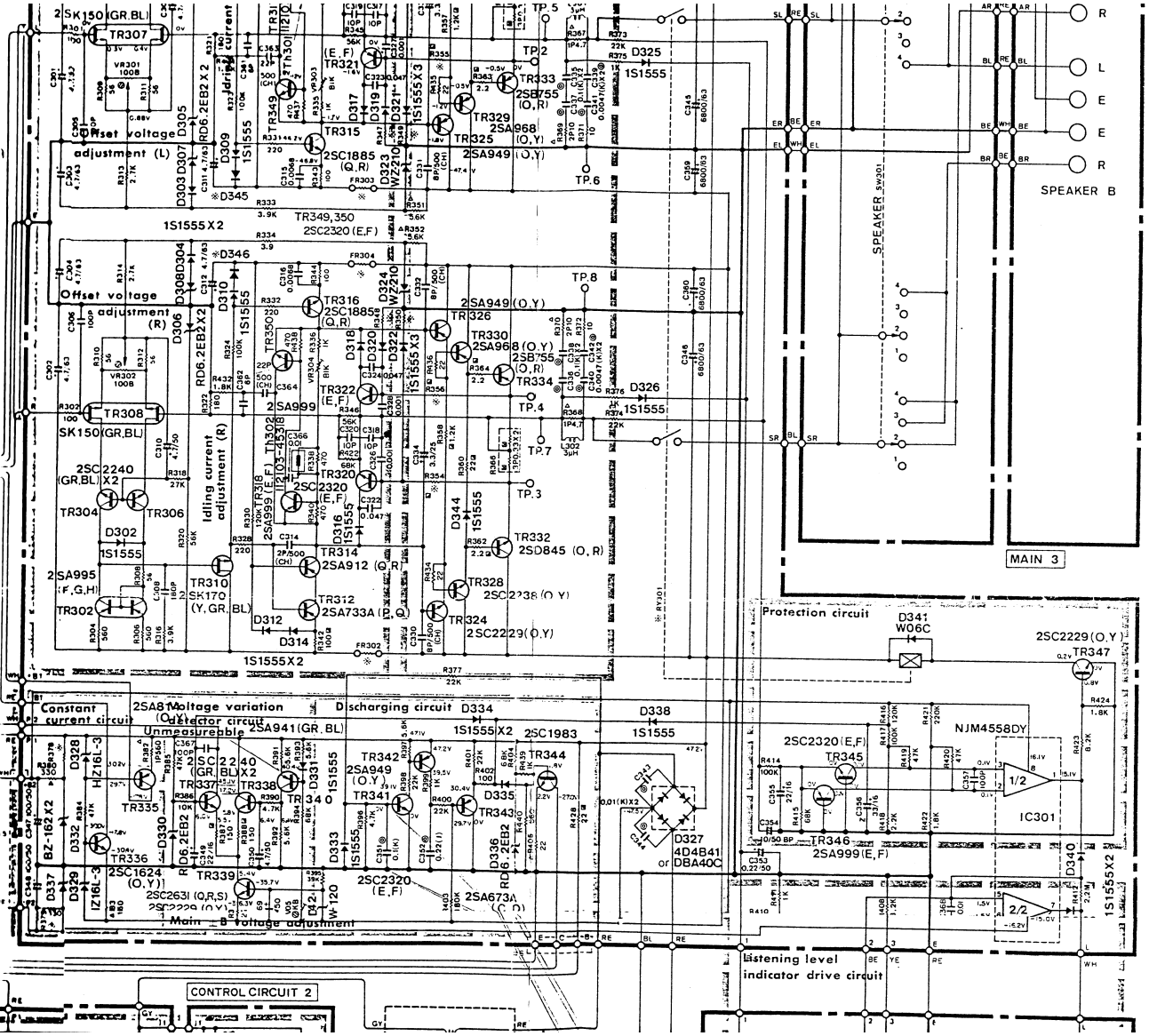
2SA733A 2SA912 2SA941 2SA949 2SA999 2SC458 2SC1885 2SC2229 2SC2240 2SC2320	2SK170
2SA673	2SA814 2SC1624 2SC1983
2SA968 2SC2238	2SB649 2SD669
2SA995	2SK150
2SB755 2SD845	NJM4558DY NJM4559D
IG04080	TLP508
A11 DIODE	S1WB
4D4B41	SLR-34UR
SLB-26UUIN	
SMI2G41	MOR5G

RESIST R

REMARKS	PART NAME
NO MARK	CARBON RESISTOR
△	METAL OXIDE FILM RESISTOR
▲	METALIZED FILM RESISTOR
⊠	METAL PLATE RESISTOR
◪	FIRE PROOF CARBON RESISTOR
⊘	SEMI VARIABLE RESISTOR
□	CEMENT MOLDED RESISTOR

CAPACITOR

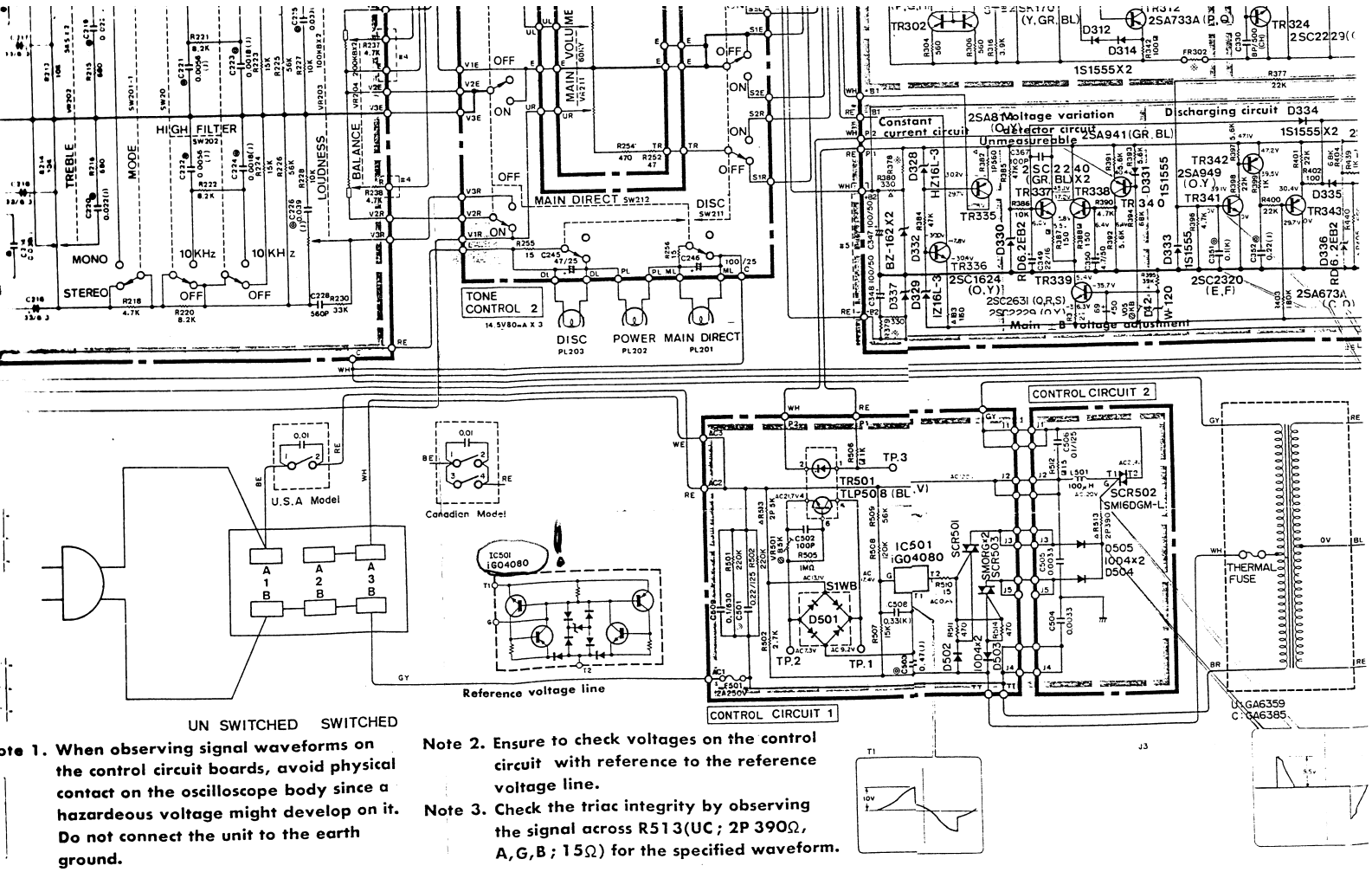
REMARKS	PART NAME



2SA673	
2SA968 2SC2238	2SB649 2SD669
2SA995	2SK150
2SB755 2SD845	NJM4558DY NJM4559D
IG04080	TLP508
All DIODE	S1WB
4D4B41	SLR-34UR
SLB-26UUIN	
SMI2G41	MOR5G

RESIST R

REMARKS	PART NAME
NO MARK	CARBON RESISTOR
△	METAL OXIDE FILM RESISTOR
▲	METALIZED FILM RESISTOR
⊠	METAL PLATE RESISTOR
⊡	FIRE PROOF CARBON RESISTOR



Note 1. When observing signal waveforms on the control circuit boards, avoid physical contact on the oscilloscope body since a hazardeous voltage might develop on it. Do not connect the unit to the earth ground.

Note 2. Ensure to check voltages on the control circuit with reference to the reference voltage line.

Note 3. Check the triac integrity by observing the signal across R513(UC ; 2P 390Ω, A,G,B ; 15Ω) for the specified waveform.

PARTS LIST

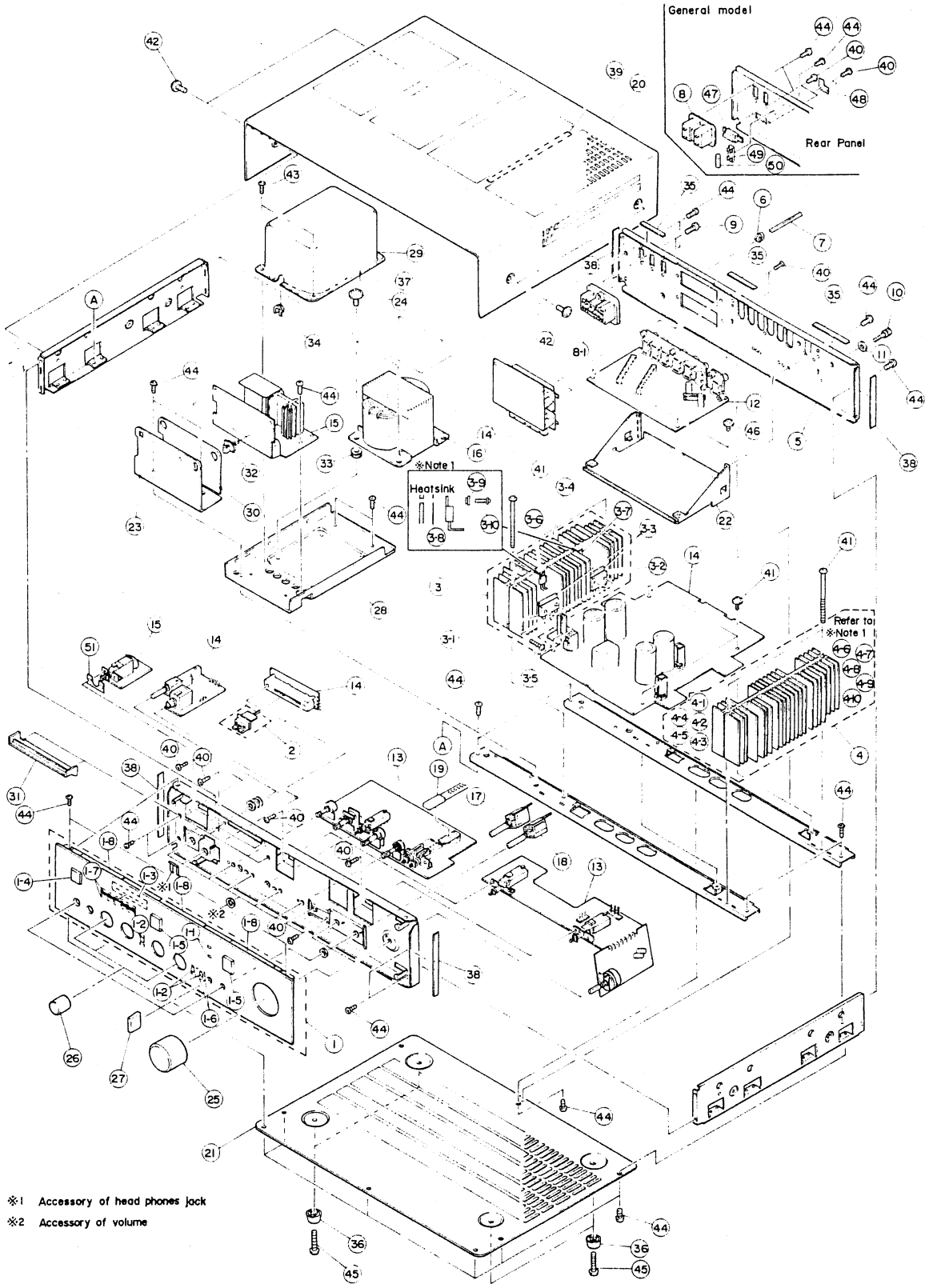
A-760

■ CONTENTS

SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

004417

■ EXPLODED VIEW



■ PARTS LIST (Mechanism)

	Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model	Markets
※	1	32 00 00 NB 09 88 90	Panel Unit	パネルユニット			
	1-1	42 00 00 iF 00 12 40	LED (Orange) SLB-26UU1N	LED角形(オレンジ)			
	1-2	32 00 00 NB 09 39 20	Push Button Ass'y #9392	プッシュボタンAss'y		CR-440	
※	1-3	32 00 00 CB 09 97 50	Frame. Slit #9975	スリット枠			
	1-4	32 00 00 NB 09 14 30	Push Button Ass'y #9143	プッシュボタンAss'y		A-550	
	1-5	32 00 00 NB 09 14 50	〃 #9145	〃		〃	
	1-6	42 00 00 CB 07 41 90	Adhesive Tape 5×30	ダブルタックテープ			
	1-7	42 00 00 CB 07 41 90	〃 5×80	〃			
	1-8	42 00 00 CB 08 50 50	Tape (Anti-vibration) 3×7×50	防振テープ			
※	2	32 00 00 NB 09 79 40	LED Knob Ass'y	LEDツマミAss'y			R,A,G,C,B
※	〃	32 00 00 NB 09 89 00	〃	〃			U
※	3	32 00 00 NB 09 89 10	Radiator (L) Unit	ラジエター(L)ユニット			
※	3-1	42 00 00 iB 07 55 00	Transistor 2SB755 (R,O)	ペアトランジスタ	TR333		
※	3-2	42 00 00 iD 08 45 00	〃 2SD845 (R,O)	〃	TR331		
	3-3	42 00 00 iL 00 05 10	Mica Base AC-243	マイカベース			
※	3-4	32 00 00 BA 07 94 50	Heat Sink	放熱板			
	3-5	42 00 00 EK 09 50 50	Bind Head Tap Tight Screw 3×12 (ZMC2-Y)	鉄バインドタップタイトネジ	(B-tyte)		
	3-6 (4-6)	42 00 00 iA 09 68 00	Transistor 2SA968 (O,Y)	ペアトランジスタ	TR329(TR330)		
	3-7 (4-7)	42 00 00 iC 22 38 00	〃 2SC2238 (O,Y)	〃	TR327(TR328)		Radiator (R)
	3-8 (4-8)	42 00 00 iL 00 02 70	Mica Base AC-229	マイカベース			〃 (L)
	3-9 (4-9)	32 00 00 CB 07 28 80	Bush	絶縁ブッシュ			Unit
	3-10 (4-10)	42 00 00 EK 03 00 30	B.W Head Tapping Screw 2.6×12 (ZMC2-Y)	鉄BWヘッドタッピンネジ			
※	4	32 00 00 NB 09 89 20	Radiator (R) Unit	ラジエター(R)ユニット			
※	4-1	42 00 00 iB 07 55 00	Transistor 2SB755 (R,O)	ペアトランジスタ	TR334		
※	4-2	42 00 00 iD 08 45 00	〃 2SD845 (R,O)	〃	TR332		
	4-3	42 00 00 iL 00 05 10	Mica Base AC-243	マイカーベース			
※	4-4	32 00 00 BA 07 94 50	Heat Sink #7945	放熱板			
	4-5	42 00 00 EK 09 50 50	Bind Head Tap Tight Screw 3×12 (ZMC2-Y)	鉄バインドタップタイトネジ			
※	5	32 00 00 AA 60 35 90	Rear Panel	リアパネル			U,C
※	〃	32 00 00 AA 60 35 80	〃	〃			R
※	〃	32 00 00 AA 60 36 00	〃	〃			A,B
※	〃	32 00 00 AA 60 36 10	〃	〃			G
	6	42 00 00 CB 07 27 50	Cord Stopper SR-4N-4	コードストッパー			
	7	42 00 00 MG 00 08 90	Power Cord (Black) 2m 13A 125V	電源コード			U,C
	〃	42 00 00 MG 00 07 80	〃 〃 6A 250V	〃			R
	〃	42 00 00 MG 00 09 10	〃 〃 〃	〃			G
	〃	42 00 00 MG 00 09 20	〃 (Gray) 2.5m 7.5A 250V	〃			A
	〃	42 00 00 MG 00 10 00	〃 (Black) 2m 6A 300/500V	〃			B
	8	42 00 00 LB 40 06 50	AC Outlet M7013-A	ACアウトレット			R
	8-1	42 00 00 LB 60 29 80	〃 M7017-A	〃		CR-640	U,C
	9	42 00 00 EN 03 00 20	Bind Head Tapping Screw 3×8 (ZMC2-Y)	鉄バインドタッピングネジ	Type-2		
	10	42 00 00 EZ 00 14 00	Screw (for Earth Teminal) 3×13.5 (MFNi-II)	アース端子ネジ			
	11	42 00 00 EW 40 36 50	Sems Flat Washer φ3.6×φ10×t0.8 (FNM3-38)	鉄セムス平座金			
※	12	32 00 00 NA 07 48 70	Function Circuit Board	ファンクションシート			U
※	〃	32 00 00 NA 07 48 60	〃	〃			R,A,G,C,B
※	13	32 00 00 NA 07 48 90	Tone Control Circuit Board	トーンコントロールシート			U
※	〃	32 00 00 NA 07 48 80	〃	〃			R,A,G,C,B
※	14	32 00 00 NA 07 49 10	Main Circuit Board	メインシート			U
※	〃	32 00 00 NA 07 49 20	〃	〃			C
※	〃	32 00 00 NA 07 49 30	〃	〃			A,G,B
※	〃	32 00 00 NA 07 49 40	〃	〃			R

※ : New Part (新部品)

	Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model	Markets
※	15	32 00 00 NA 07 60 80	Control Circuit Board	制御シート			U,C
※	〃	32 00 00 NA 07 60 90	〃	〃			A,G,B
※	〃	32 00 00 NA 07 61 00	〃	〃			R
※	16	42 00 00 GA 63 59 00	Power Transformer	電源トランス			U
※	〃	42 00 00 GA 63 60 00	〃	〃			G
※	〃	42 00 00 GA 63 61 00	〃	〃			A,B
※	〃	42 00 00 GA 63 62 00	〃	〃			R
※	〃	42 00 00 GA 63 85 10	〃	〃			C
※	17	42 00 00 KA 90 16 40	Remote Rotary Switch	リモートロータリーSW	Control + Wire		
※	18	42 00 00 KA 90 16 50	〃	〃	〃		
※	19	42 00 00 KA 90 16 70	Remote Push Switch	リモートプッシュSW	Wire		
※	20	32 00 00 AA 60 38 70	Top Cover	トップカバー			
※	21	32 00 00 AA 60 36 20	Bottom Cover	ボトムカバー			
※	22	32 00 00 AA 60 36 50	Holder, P.C Board	シートホルダー			
※	23	32 00 00 AA 60 41 90	Holder, CS	C.Sホルダー			
※	24	32 00 00 AA 60 38 50	Tight Screw (with Steps)	段付ネジ			
※	25	32 00 00 BA 07 33 80	VOL Knob	VOLツマミ			
	26	32 00 00 BA 07 72 80	T.C Knob	T.Cツマミ		CR-240	
※	27	32 00 00 BA 07 94 60	Knob SW	SWツマミ			
※	28	32 00 00 BA 07 96 40	Holder, Power Transformer	トランスホルダー			
※	29	32 00 00 BA 07 95 70	Cover, Transformer	トランスカバー			
※	30	42 00 00 CA 07 05 80	Isolation Plate	絶縁板			
※	31	32 00 00 CB 09 97 40	Cover, Slit	スリットカバー			
※	32	32 00 00 CB 09 98 30	Support, P.C	P.Cサポート			
※	33	32 00 00 CB 09 99 10	Rubber, Antivibration	防振ゴム			
※	34	32 00 00 CB 60 05 70	Bush	リードブッシュ			
※	35	42 00 00 CB 09 98 10	Rubber, Antivibration	防振ゴム			
	36	42 00 00 CB 09 86 00	Leg	脚			
※	37	42 00 00 CB 60 05 60	Packing Cover	カバーパッキン			
※	38	42 00 00 CB 60 06 40	Damper	ダンパー			
※	39	42 00 00 CB 60 05 80	Tape Antivibration 1.52×10×110	防振テープ			
	40	42 00 00 ED 03 00 80	Bind Head Screw 3×6 (ZMC2-Y)	鉄バインド小ネジ			
※	41	42 00 00 ED 04 07 50	〃 4×75 (〃)	〃			
	42	42 00 00 EK 13 00 20	B.W Head Screw 4×8 φ9 (FNM3-3g)	鉄プレザーワッシャーヘッド小ネジ			
	43	42 00 00 EN 33 00 10	Bind Head Tapping Screw 3×8 (ZMC2-BI)	鉄バインドタッピンネジ	Type-2		
	44	42 00 00 EN 03 00 20	〃 3×8 (ZMC2-Y)	〃	〃		
	45	42 00 00 EN 02 00 40	〃 3×12 (〃)	〃	〃		
	46	42 00 00 EK 93 00 10	B.W Head Tapping Screw 3×8 φ10 (ZMC2-Y)	鉄B.Wヘッドタッピンネジ	〃		
	47	42 00 00 KA 40 07 40	Slide Switch (Voltage Selector)	スライドSW			R
	48	32 00 00 CB 60 14 40	Switch Guard	VSストッパー			R
	49	42 00 00 LB 20 13 00	Fuse Holder	ヒューズホルダー			R
	50	42 00 00 KB 00 13 00	Fuse T7A 250V	ヒューズタイラッシュ			R
※	51	42 00 00 CB 60 29 20	Spacer, Switch	SWスペーサー			
※		32 00 00 MZ 07 90 30	Connector (Tone,C,Board) Ass'y	トーンコントロールコネクターAss'y			
		42 00 00 BB 00 44 30	Connect Pin 2.5Pitch (SHF-001T-08CS)	2.5ピッチコンタクトピン			
		42 00 00 LB 20 13 80	Housing 2.5 Pitch (H2P-SHF)	2.5ピッチハウジング	Connector		
		42 00 00 LB 30 07 20	〃 2.5 〃 (H3P-SHF)	〃	Tone Control		
		42 00 00 CB 07 21 70	Shield Cap	シールドキャップ			
		42 00 00 CB 07 78 60	〃 344325	〃			
		42 00 00 CB 07 78 70	〃 324332	〃			
※		32 00 00 MZ 07 93 70	Connector (Main C,Board) Ass'y	メインコネクターAss'y			
		32 00 00 NB 07 62 40	Accessories Assembly	付属品Ass'y		CA-410	
		42 00 00 TX 90 07 80	Hexagonal Wrench	六角レンチ1.5φ			

※ : New Part (新部品)