

15.06.84.

SERVICE MANUAL MA-6



marantz®



model MA-6



Mono Power Amplifier



MARANTZ DESIGN AND SERVICE

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MARANTZ S.A.
EUROPEAN PARTS DEPARTMENT
2, Avenue Léopold III
B-7120 PERONNES-lez-BINCHE
BELGIUM
TWX: 57589 SEPLT B

The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING:

Parts may be ordered from the following addresses:

EUROPE

MARANTZ S.A.
European Parts Department
2, Avenue Léopold III
B-7120 Péronnes-lez-Binche
Belgium
Telex: 57589

MARANTZ DENMARK
Bregnerødvej 132b
3460 Birkerød
Denmark
Telex: 39137

MARANTZ BELGIUM
45 Rue Auguste Van Zande
1080 Brussels
Belgium

MARANTZ NEDERLAND B.V.
Wagenmakersweg 3
3449 HV Woerden
Netherlands

MARANTZ S.A.
326 Avenue Louise Bte 32
1050 Bruxelles
Belgium
Telex: 26602

MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

MARANTZ SVENSKA A.B.
Svartviksvägen 56
Träneberg Bromma
Sweden
Telex: 13449

MARANTZ ITALIANA S.p.A.
Via Monte Napoleone, 10
20121 Milano
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MARANTZ GERMANY G.M.B.H.
Max-Planckstrasse 22
6072 Dreieich 1
Germany
Telex: 4185316

MARANTZ AUDIO U.K. LTD.
Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 OLW
Great Britain
Telex: 935196

MARANTZ AUSTRIA Ge.M.B.H.
25 Franz Lisztgasse
2380 Perchtoldsdorf
Austria
Telex: 113583

AUSTRALIA

MARANTZ AUSTRALIA PTY., LTD.
19 Chard Road
Brookvale, NSW 2100
Australia
Telex: 24121

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

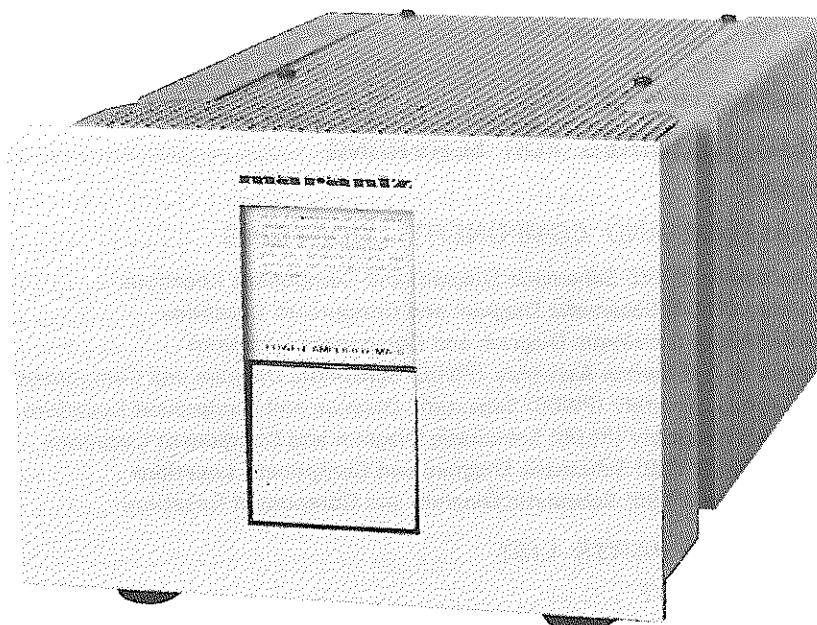
In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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MARANTZ MODEL MA-6 MONO POWER AMPLIFIER



INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model MA-6 Mono Power Amplifier.

Servicing information and voltage data included in this manual are intended for use by knowledgeable and experienced personnel only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of circuitry operation.

The parts list furnishes complete ordering information. Most replacement parts should be ordered from the Marantz Company. However, a simple description is included for parts which can be obtained locally.

1. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Model MA-6 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Power Amp. mounted on P.W. Board P700
2. V. Amp. mounted on P.W. Board P800
3. Power mounted on P.W. Board P850
4. AC Cord Terminal . . . mounted on P.W. Board PL00
5. Speaker Protector & A-B Switch
 A-B Switch mounted on P.W. Board PN00
6. Pilot Supply mounted on P.W. Board PT00
7. Input & B.T.L. Amp. . . mounted on P.W. Board PW00
8. Pilot Lamp mounted on P.W. Board PY00

2. ADJUSTMENT PROCEDURES

1. Input selector switch functions

The rear panel is equipped with an input selector switch, a pair of Normal Input connection terminals and a pair of BTL connection terminals. These function in the manner described below.

1.1 Mono amplifier

Use the Normal Input connection terminals. When the input selector switch is set to Normal, the output and input phase differential of the amplifier will be zero (0°). This is referred to as normal phase operation.

Next we again use the Normal Input connection terminals. When the input selector switch is set to Inverted, the output and input phase differential of the amplifier will be 180° . This is referred to as inverted phase operation.

(This means that the input signal has been connected to the inverted phase input terminal.)

The inverted phase function can be used in a number of ways. For example, depending on the room acoustics of your listening room, a multi-channel speaker system may give the best balance when the mid-range is 180° out of phase with the bass. Under these circumstances, the phase inverting function will prove to be highly useful.

1.2 BTL connecting two MA-6 units for increased power

A BTL connection couples the power output of two MA-6 units in series for a 3 – 3.5 times increase in the maximum power output. Connecting the power output in series means that one of the MA-6 units will be used as an inverted phase amplifier. The MA-6 has a built-in phase inversion amplifier that can supply another MA-6 unit with a phase inverted input signal. The phase inverted signal output from the BTL pin jacks of one MA-6 unit is supplied to the BTL pin jacks of the other MA-6 unit by means of a special connection cord. The BTL pin jacks can therefore serve as the phase inverting output terminals or the phase inverting input terminals. The BTL pin jacks function can be selected by using the input selector switch. Under these circumstances, the relation of the Normal Input pin jacks to the BTL pin jacks is as follows:

- a. When the BTL pin jacks are being used as the phase inverting output terminals, connect the output cord from the preamplifier to the Normal Input pin jacks, which are directly above the BTL pin jacks. Set the input selector switch to the + (plus) BTL position. Switch the BTL pin jacks of the other MA-6 unit to the phase inverting input terminal function. This can be done by setting the input selector switch of the other MA-6 unit to the – (minus) BTL position. There is no need to connect anything to the Normal Input pin jacks.

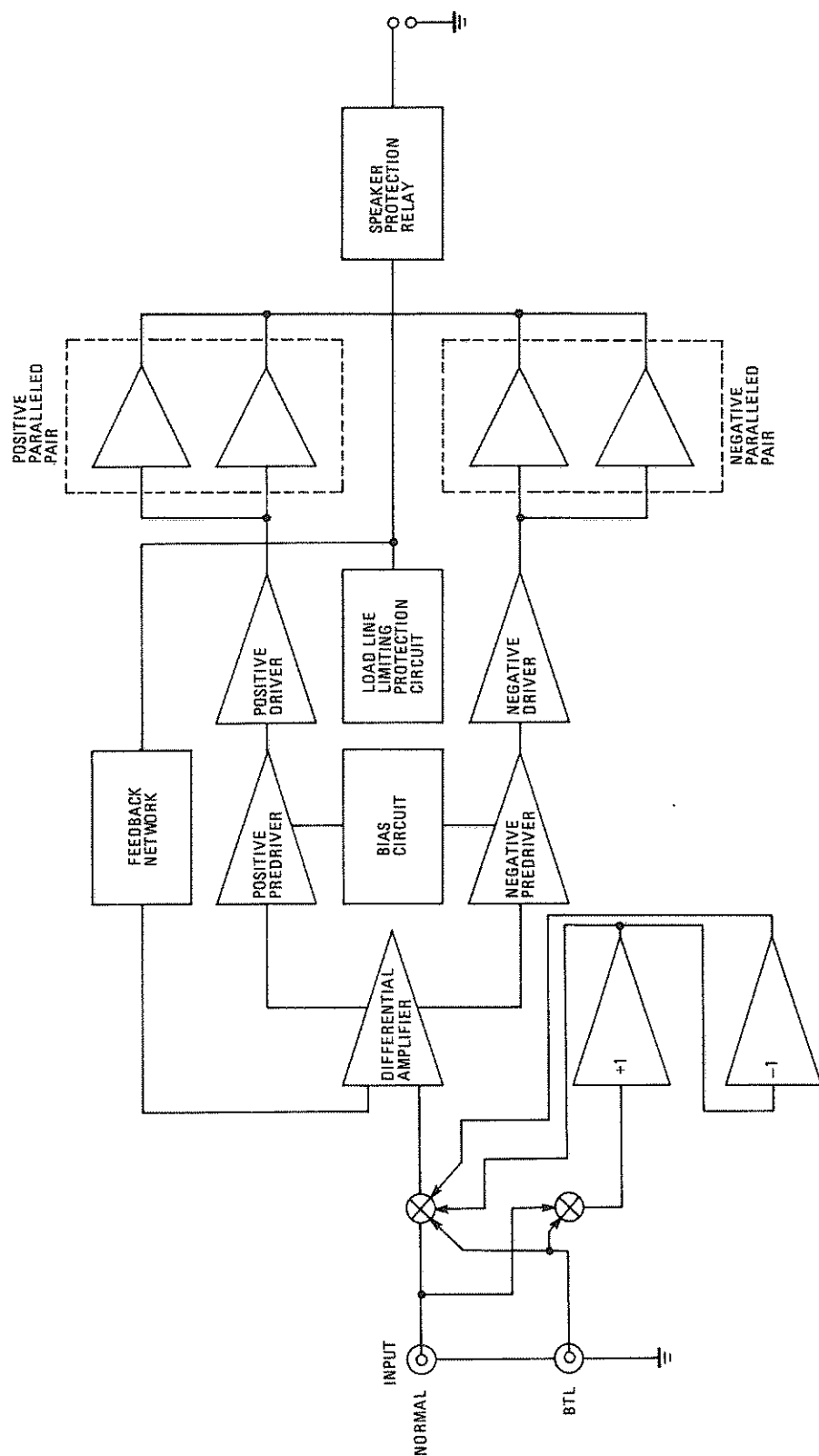
The red speaker terminal of the MA-6 unit whose BTL pin jacks are operating as the phase inverting output terminals (input selector switch set to + BTL position) will be the + (plus) speaker connection terminal. The red speaker terminal of the other MA-6 unit will be

the – (minus) speaker terminal.

The speaker output polarity will be – (minus) if the BTL pin jacks are switched from their function as the phase inverting output terminals. Carry out the above instruction for the opposite unit when switching under these circumstances.

- b. The above explanation dealt mainly with the connection of the input terminals. The following explanation will cover the connection of the speaker terminals. Connect the supplied black cord to the speaker terminals marked with – (minus). This is the special cord used for BTL connections. Insert the cord into the holes of the terminals and then tighten the terminals firmly. Rechecking and retightening the terminals periodically is also a secret of good sound. The speakers will not have to be reconnected, regardless of the switching of the input terminals as explained in section a.

4. BLOCK DIAGRAM



2. DC Offset Voltage Adjustment

Adjustment point R715 (22 kohm)
Input selector switch position Normal (Fig. 1)



Fig. 1

Input terminal Open
Output Open
Measurement point Speaker terminals
Connect the output to a millivoltmeter, and adjust R715 so that the reading is 0 mV.

3. Bias Current Adjustment

3.1 CLASS AB (Set the CLASS AB, CLASS A selector switch on the rear panel to CLASS AB. Fig. 2)

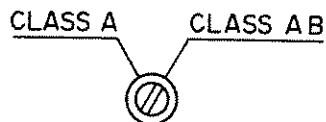


Fig. 2

Adjustment point RN01 (1 kohm)
Input selector switch position Normal (Fig. 1)
Output No load
Measurement point J707 (Between pin 1 - 3)
Connect a millivoltmeter to J705 and adjust the terminal voltage to 27 mV. Wait for one minute after adjusting the terminal voltage, and then readjust the terminal voltage to 27 mV.

3.2 CLASS A (Set the CLASS AB, CLASS A selector switch on the rear panel to CLASS A. Fig. 3)

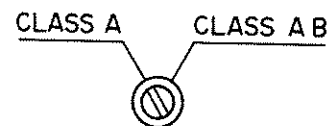


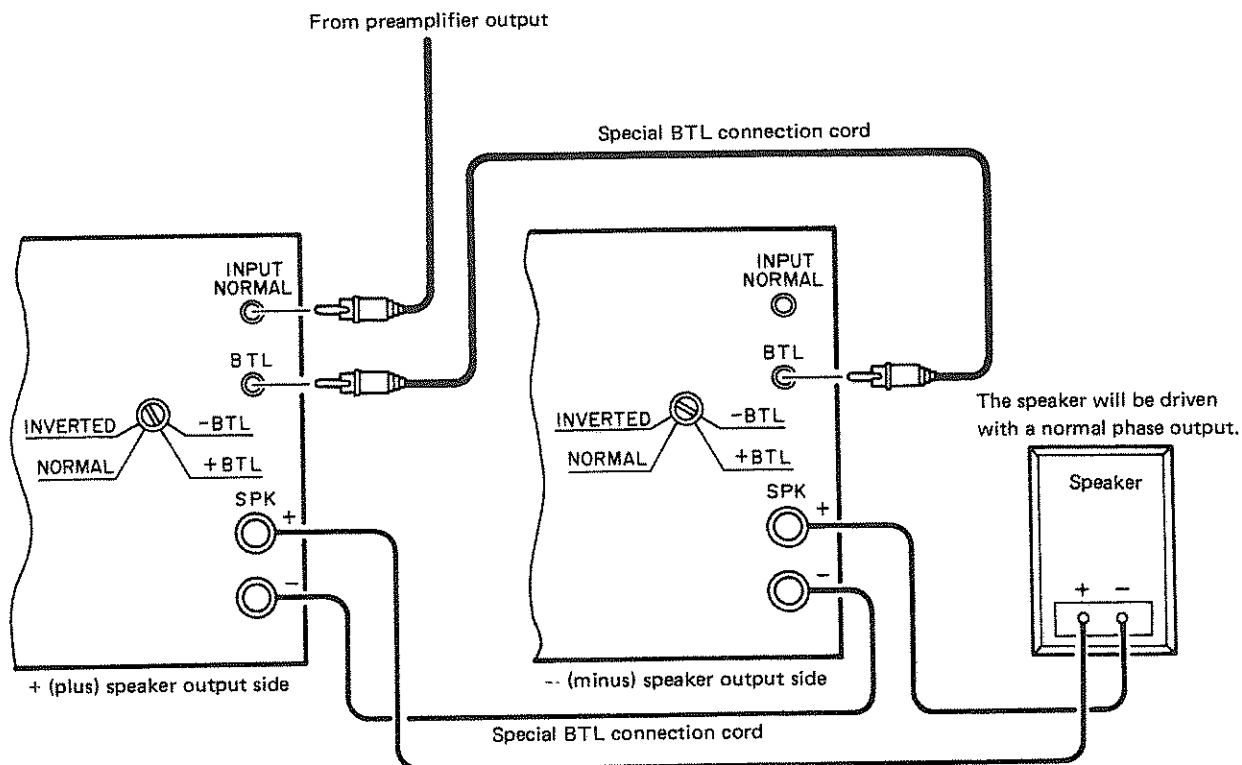
Fig. 3

Adjustment point RN02 (4.7 kohm)
Input selector switch position Normal (Fig. 1)
Input Zero
Output No load
Measurement point J707 (Between pin 1 - 3)
Connect a millivoltmeter to J705 and adjust the terminal voltage to 220 mV. Wait for one minute after adjusting the terminal voltage, and then readjust the terminal voltage to 220 mV.

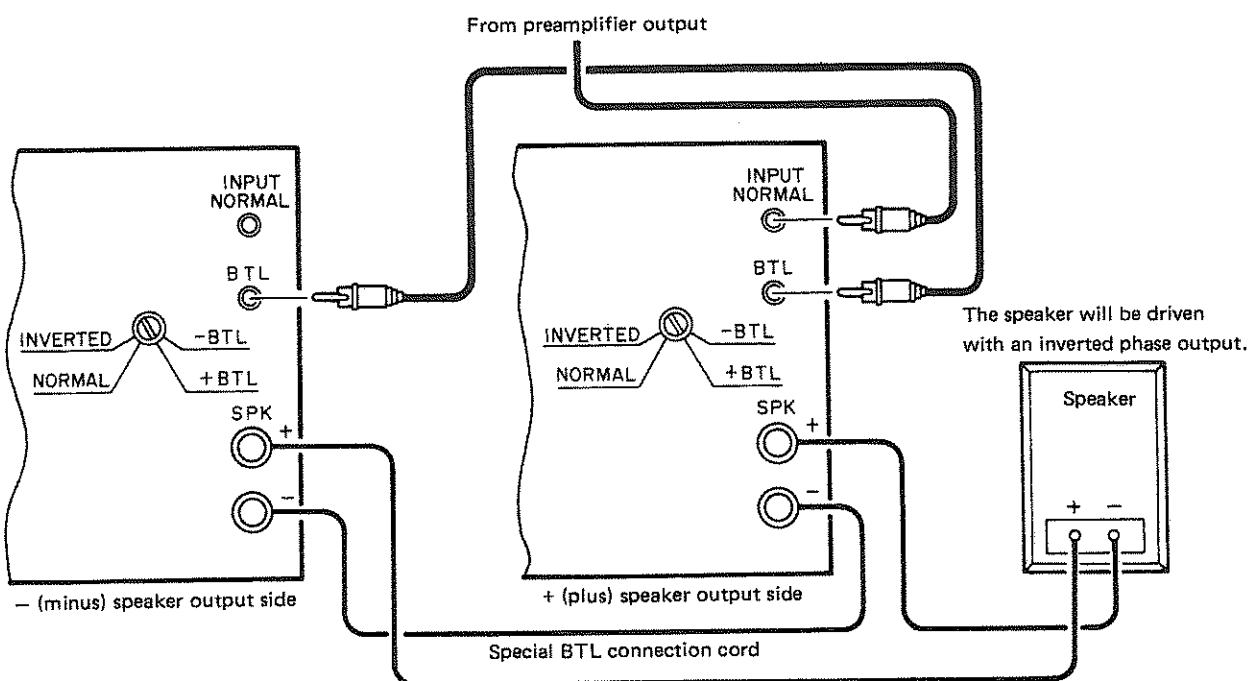
3. TEST EQUIPMENT REQUIRED FOR SERVICING

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer (0 ~ 140V AC, 10A)	Adjust level of primery power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

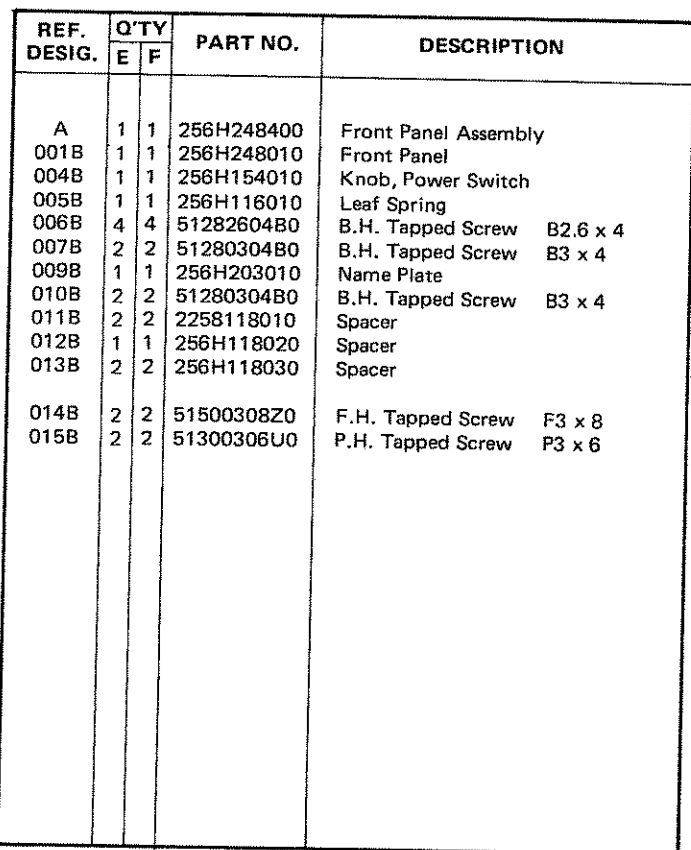
BTL connection (I)



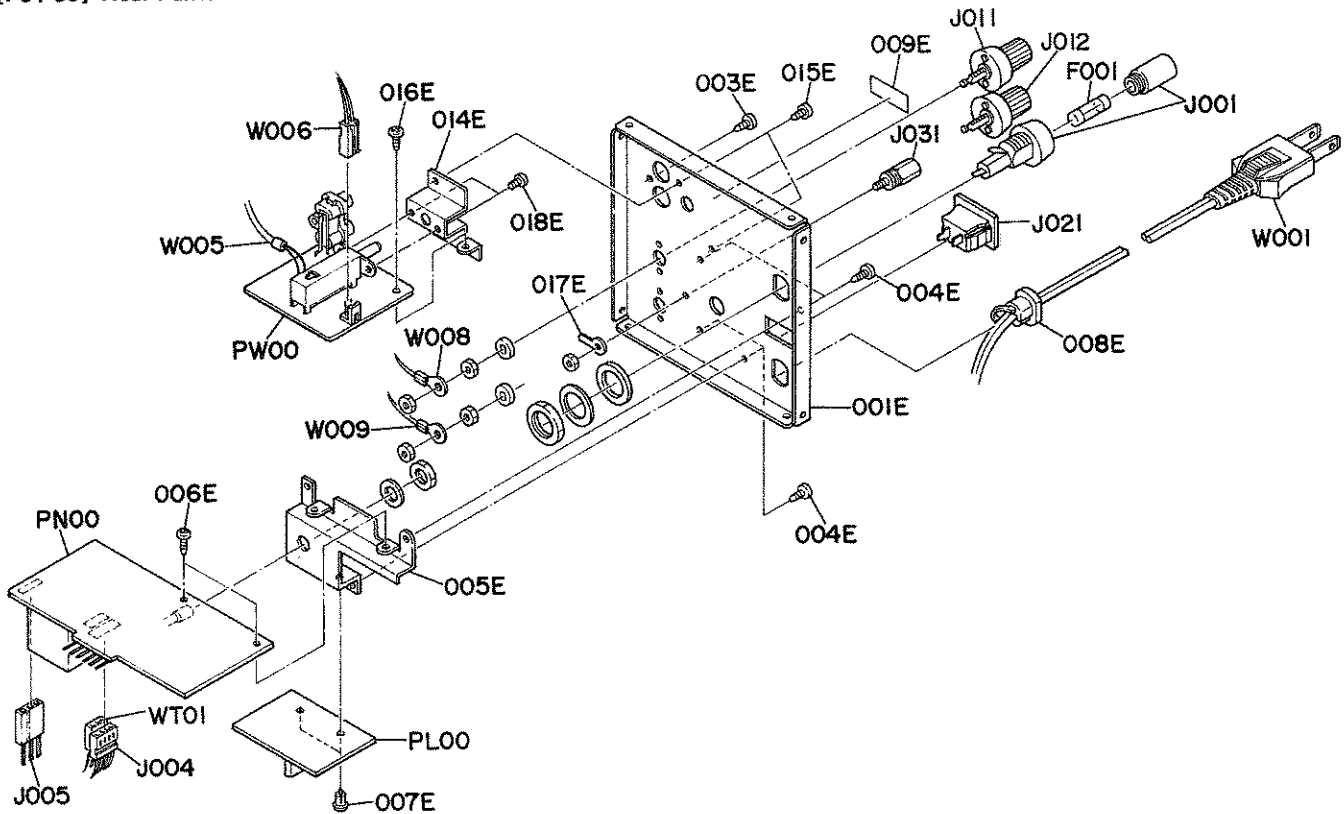
BTL connection (II)



● [C01-99] Front Panel & Front Chassis

10

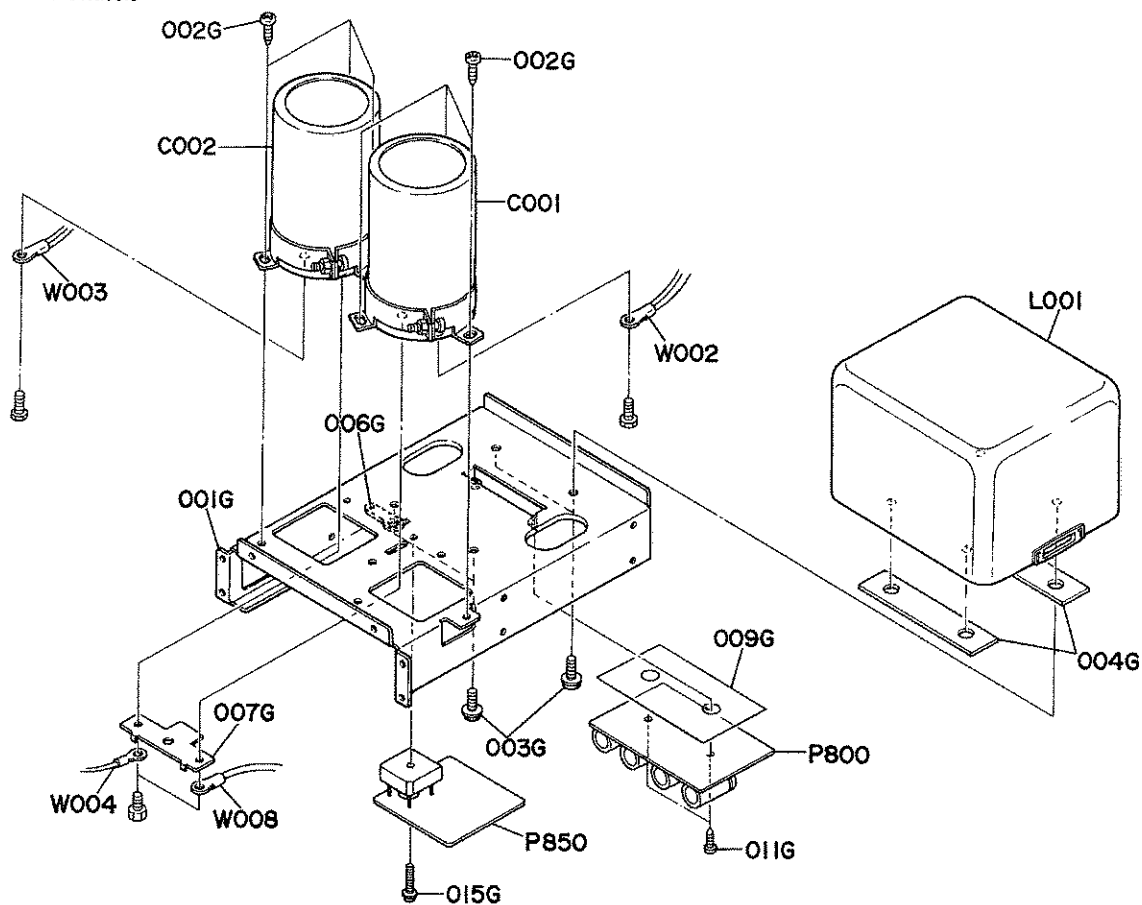
● [P01-99] Rear Panel



REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
001E	1		256H250220	Bracket, Rear Panel
001E		1	256H250210	Bracket, Rear Panel
003E	1	1	51280308Z0	B.H. Tapped Screw B3 x 8
004E	4	4	51280308Z0	B.H. Tapped Screw B3 x 8
005E	1	1	2142160050	Bracket
006E	2	2	51280308Z0	B.H. Tapped Screw B3 x 8
007E	2	2	2276005050	Clamper
008E	1		1455259040	Bushing, AC Cord
008E		1	1455259090	Bushing, AC Cord
009E	1	1	2112265010	Indicator, Serial No.
012E	2		51280308Z0	B.H. Tapped Screw B3 x 8
014E	1	1	256H104010	Retainer, Switch Bracket
015E	2	2	51280308Z0	B.H. Tapped Screw B3 x 8
016E	1	1	51280308Z0	B.H. Tapped Screw B3 x 8
017E	1	1	54050400R0	T.L. Washer
018E	2	2	51100306Z9	B.H.M. Screw B3 x 6

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
△ F001	1		FS10200800	Fuse, 2A
△ F001	1		FS10400600	Fuse, 4A 250V
△ J001	1		YJ08000290	Jack, Fuse Holder
△ J001	1		YJ08000300	Jack, Fuse Holder
J004	1	1	YJ06001040	Jack, (3P)
J005	1	1	YJ06001040	Jack, (3P)
J011	1	1	YT01010100	Terminal, Speaker (+)
J012	1	1	YT01010110	Terminal, Speaker (-)
△ J021	1	1	YJ04001110	Jack, AC Outlet
J031	1	1	YT01010050	Terminal, GND
△ J091	1		BY05030040	Volt, Selector
△ W001	1		YC01900090	A.C. Power Cord
△ W001	1	1	YC01800200	A.C. Power Cord
W005	1	1	YB00120120	Connective Cord, (2P)
W006	1	1	YB00180180	Connective Cord, (2P)
W008	1	1	YB00300760	Connective Cord, SPK. GND
W009	1	1	YB00110110	Connective Cord, SPK. HOT
WT01	1	1	YB00500350	Connective Cord, (3P)
PL00	1	1	YK256H1870	P.W. Board, AC Cord Terminate
PN00	1	1	YK256H1830	P.W. Board, SPK. Protector/A-B SW.
PW00	1	1	YK256H1840	P.W. Board, Input/BTL Amp

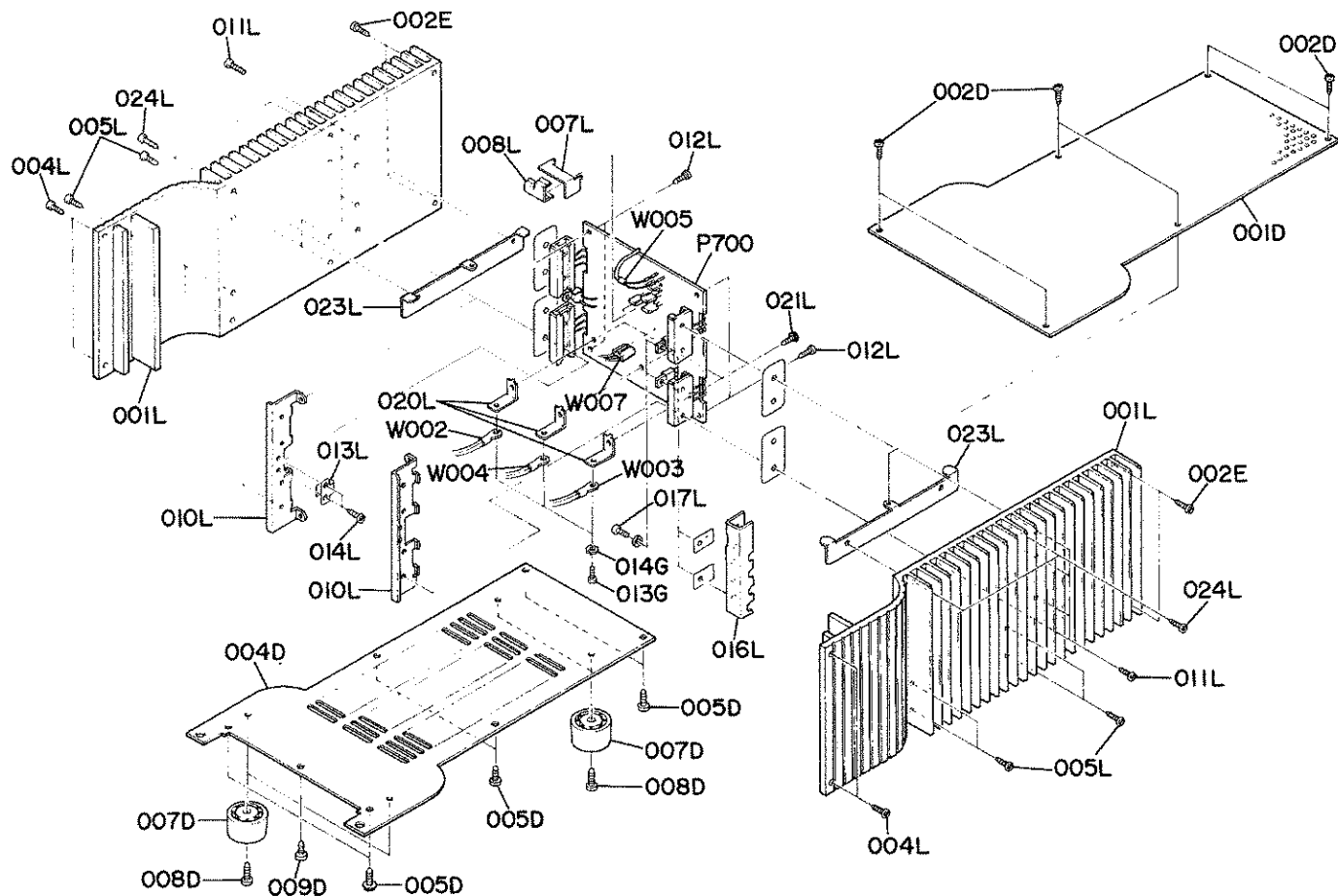
• [P02-99] Main Chassis



REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
001G	1	1	2142105010	Chassis, Main
002G	6	6	51280406Z0	B.H. Tapped Screw B4 x 6
003G	4	4	51706009Z0	Spec. Set Screw
004G	2	2	256H118010	Spacer
006G	1	1	62041760W0	Lug
007G	1	1	2142123020	Contactor
009G	1	1	256H120010	Insulator
011G	2	2	51280308Z0	B.H. Tapped Screw B3 x 8
015G	1	1	51280312Z0	B.H. Tapped Screw B3 x 12

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
△ C001	1	1	EC22907530	Elect Cap. 22000μF 75V
△ C002	1	1	EC22907530	Elect Cap. 22000μF 75V
△ L001	1		TS19611040	Power Transformer
△ L001		1	TS19611030	Power Transformer
W002	1	1	YB00260100	Connective Cord, (+B)
W003	1	1	YB00260110	Connective Cord, (-B)
W004	1	1	YB00190050	Connective Cord, GND
W008	1	1	YB00300760	Connective Cord, SPK. GND
P800	1	1	YK256H1820	P.W. Board, Power Supply-1
P850	1	1	YK256H1880	P.W. Board, Power Supply-2

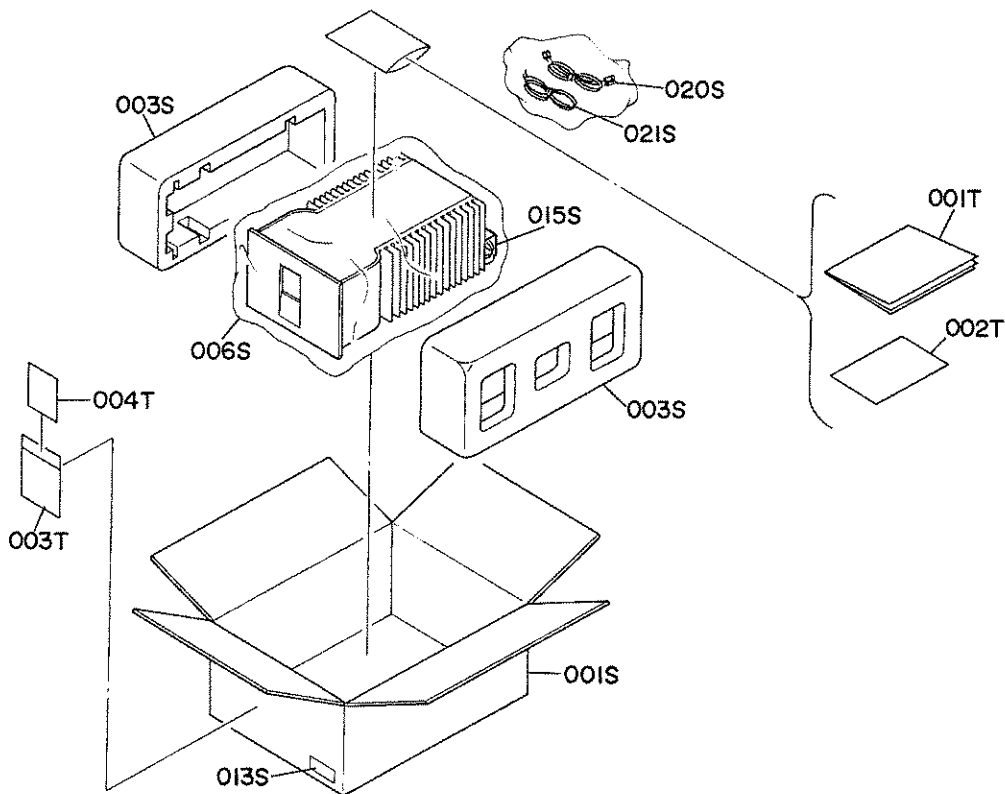
• [P03-99] Top Cover & Heatsink



REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
001D	1	1	2142053010	Cover, Top
002D	6	6	51280306Z0	B.H. Tapped Screw B3 x 6
004D	1	1	2142257010	Lid, Bottom Cover
005D	6	6	51280410U0	B.H. Tapped Screw B4 x 10
007D	4	4	2142057010	Leg
008D	4	4	51570420B0	P. Taptite Screw P4 x 20
009D	1	1	51280406U0	B.H. Tapped Screw B4 x 6
002E	4	4	51300310Z0	P.H. Tapped Screw P3 x 10
013G	3	3	51280306Z0	B.H. Tapped Screw B3 x 6
014G	3	3	54050400R0	T.L. Washer OR
001L	1	1	2142267240	Heatsink, Main (R)
002L	1	1	2142267250	Heatsink, Main (L)
004L	4	4	51280310Z0	B.H. Tapped Screw B3 x 10
005L	8	8	51300310Z0	P.H. Tapped Screw P3 x 10
007L	1	1	2990267080	Heatsink
008L	1	1	2990115020	Spring
010L	2	2	2142160030	Bracket, Power Transistor
011L	8	8	51060315Z9	P.H.M. Screw P3 x 15
012L	4	4	51280308Z0	B.H. Tapped Screw B3 x 8
013L	1	1	2142115010	Spring
014L	2	2	51280305Z0	B.H. Tapped Screw B3 x 5

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
016L	1	1	2142267030	Heatsink
017L	2	2	51280308Z0	B.H. Tapped Screw B3 x 8
020L	3	3	2142123030	Contactor
021L	3	3	51290306B0	B.T. Screw B3 x 6
023L	2	2	2142160090	Bracket, Top Cover
024L	4	4	51300310Z0	P.H. Tapped Screw P3 x 10
W002	1	1	YB00260100	Connective Cord, (+B)
W003	1	1	YB00260110	Connective Cord, (-B)
W004	1	1	YB00190050	Connective Cord, GND
W005	1	1	YB00120120	Connective Cord
W007	1	1	YB00380090	Connective Cord
P700	1	1	YK256H1810	P.W. Board, Main Amp

- [H01-99] Packing Materials



REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
001S	1	1	256H801010	Packing Case
003S	2	2	2142809010	Cushion
006S	1	1	9090808030	Polyethylene Sheet
013S	4		9526019060	Serial No. Card
013S		4	9526019040	Serial No. Card
015S	1	1	2864804010	Sleeve
020S	1	1	ZD00400020	Connective Cord
021S	1	1	YB00500340	Connective Cord

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
001T	1		256H851310	User Manual
001T		1	256H851110	User Manual
002T		1	9631000130	Warranty Card
003T		1	128T854010	Warranty Card
004T		1	9611000030	User's Card
005T	1		256H851320	User Manual, Spec.
006T	1		256H856010	Circuit Diagram

7. ELECTRICAL PARTS LIST

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
P700	1	1	YK256H1810 ZZ256H8810	P700-MAIN AMP CIRCUIT BOARD P.W. Board, Main Amp P.W. Board Assembly
				P700-CAPACITORS
C701	1	1	DF31100520	Mica 10pF $\pm 0.5\text{pF}$
C702	1	1	DF55182520	Film 1800pF $\pm 5\%$
C703	1	1	DF55182520	Film 1800pF $\pm 5\%$
C704	1	1	DF35470520	Mica 47pF $\pm 5\%$
C707	1	1	EA10702560	Elect 100 μ F 25V
C708	1	1	DF55102520	Film 1000pF $\pm 5\%$
C709	1	1	DF55102520	Film 1000pF $\pm 5\%$
C710	1	1	OA33505010	Elect 3.3 μ F 50V
C711	1	1	OA33505010	Elect 3.3 μ F 50V
C712	1	1	DF16104510	Film 0.1 μ F $\pm 10\%$
C713	1	1	DF35220520	Mica 22pF $\pm 5\%$
C714	1	1	EA47701660	Elect 470 μ F 16V
C715	1	1	EA47701660	Elect 470 μ F 16V
				P700-RESISTORS (All Resistors are $\pm 2\%$ & $\frac{1}{4}\text{W}$)
R701	1	1	GM21456200	562 Ω
R702	1	1	GM21456220	56.2K Ω
R703	1	1	GM21456200	562 Ω
R704	1	1	GM21456200	562 Ω
R705	1	1	GM21410010	1K Ω
R706	1	1	GM21417820	17.8K Ω
R707	1	1	GM21410010	1K Ω
R708	1	1	GM21417800	178 Ω
R709	1	1	GM21412110	1.21K Ω
R710	1	1	GM21410030	100K Ω
R711	1	1	GM21446410	4.64K Ω
R712	1	1	GM21427410	2.74K Ω
R713	1	1	GM21482510	8.25K Ω
R714	1	1	GM21427410	2.74K Ω
R715	1	1	RA02230050	22K Ω (B), Trimming
R716	1	1	GA05100030	10 Ω $\pm 5\%$ 3W
R717	1	1	GM214100G0	10 Ω
R718	1	1	GM214100G0	10 Ω
R719	1	1	GM21422610	2.26K Ω
R720	1	1	GM21422610	2.26K Ω
R721	1	1	GM214464G0	46.4 Ω
R722	1	1	GM214464G0	46.4 Ω
R723	1	1	GM21421510	2.15K Ω
R724	1	1	GM21421510	2.15K Ω
R725	1	1	GM21456220	56.2K Ω
R726	1	1	GM21456220	56.2K Ω
R727	1	1	GM21421510	2.15K Ω
R728	1	1	GM21421510	2.15K Ω
Δ R729	1	1	GG05561140	560 Ω $\pm 5\%$
Δ R730	1	1	GG05561140	560 Ω $\pm 5\%$

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
R731	1	1	GM21433210	3.32K Ω
R732	1	1	GM21414720	14.7K Ω
R733	1	1	GM21416210	1.62K Ω
R734	1	1	GM21482500	825 Ω
Δ R735	1	1	GG05330140	33 Ω $\pm 5\%$
Δ R736	1	1	GG05330140	33 Ω $\pm 5\%$
R737	1	1	GM21468110	6.81K Ω
R738	1	1	GM21468110	6.81K Ω
R740	1	1	GM21433200	332 Ω
R741	1	1	GM21433200	332 Ω
R742	1	1	GM21410010	1K Ω
R743	1	1	GM21410010	1K Ω
R744	1	1	GM21410010	1K Ω
R745	1	1	GM21410010	1K Ω
Δ R746	1	1	GG05331120	330 Ω $\pm 5\%$ $\frac{1}{4}\text{W}$
Δ R747	1	1	GG05270140	27 Ω $\pm 5\%$
Δ R748	1	1	GG05100140	10 Ω $\pm 5\%$
Δ R749	1	1	GG05100140	10 Ω $\pm 5\%$
Δ R750	1	1	GG05100140	10 Ω $\pm 5\%$
Δ R751	1	1	GG05100140	10 Ω $\pm 5\%$
Δ R752	1	1	GG05047140	4.7 Ω $\pm 5\%$
Δ R753	1	1	GG05047140	4.7 Ω $\pm 5\%$
Δ R754	1	1	GG05047140	4.7 Ω $\pm 5\%$
Δ R755	1	1	GG05047140	4.7 Ω $\pm 5\%$
R756	1	1	GO10272050	0.27 Ω $\pm 10\%$ 5W
R757	1	1	GO10272050	0.27 Ω $\pm 10\%$ 5W
R758	1	1	GO10272050	0.27 Ω $\pm 10\%$ 5W
R759	1	1	GO10272050	0.27 Ω $\pm 10\%$ 5W
R760	1	1	GM21423720	23.7K Ω
Δ R761	1	1	GG05561140	560 Ω $\pm 5\%$
Δ R762	1	1	GG05561140	560 Ω $\pm 5\%$
R763	1	1	GD05047140	4.7 Ω $\pm 5\%$
R764	1	1	GD05047140	4.7 Ω $\pm 5\%$
R765	1	1	GM21414720	14.7K Ω
				P700-SEMICONDUCTORS
Q701	1	1	HC10042060	IC μ PA68H
Q702	1	1	HT322592F0	Transistor 2SC2259
Q703	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q704	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q705	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q706	1	1	HT109701A0	Transistor 2SA970(GR)
Q707	1	1	HT322401A0	Transistor 2SC2240(GR)
Q708	1	1	HT111451O0	Transistor 2SA1145(Y)
Q709	1	1	HT327051O0	Transistor 2SC2705(Y)
Q710	1	1	HT318151C0	Transistor 2SC1815(GR)
Q711	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q712	1	1	HT318152A0	Transistor 2SC1815(O or Y)
Q713	1	1	HT110152A0	Transistor 2SA1015(O or Y)
Q714	1	1	HT327051O0	Transistor 2SC2705(Y)
Q715	1	1	HT111451O0	Transistor 2SA1145(Y)
Q716	1	1	HT332981O0	Transistor 2SC3298(O)
Q717	1	1	HT113061O0	Transistor 2SA1306(O)
Q718	1	1	HT325642A0	Transistor 2SC2564(R or Y)
Q719	1	1	HT110942A0	Transistor 2SA1094(R or Y)
Q720	1	1	HT325642A0	Transistor 2SC2564(R or Y)

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION	
	E	F			
Q721	1	1	HT110942A0	Transistor	2SA1094(Ror Y)
Q722	1	1	HD30028010	Zener	HZ11LA-3
Q723	1	1	HD30010310	Zener	HZ15L-2
Q724	1	1	HD20011050	Diode	1S1555
Q725	1	1	HD20011050	Diode	1S1555
Q726	1	1	HD20011050	Diode	1S1555
Q727	1	1	HD20011050	Diode	1S1555
Q728	1	1	HT32705100	Transistor	2SC2705(O)
Q729	1	1	HT11145100	Transistor	2SA1145(O)
Q730	1	1	HV00003080	Varistor	SV-02
Q731	1	1	HD20011050	Diode	1S1555
Q732	1	1	HD20011050	Diode	1S1555
Q733	1	1	HD20011050	Diode	1S1555
Q734	1	1	HD20011050	Diode	1S1555
Q735	1	1	HD20014010	Diode	1SS81
Q736	1	1	HD20014010	Diode	1SS81
Q737	1	1	HD20011050	Diode	1S1555
Q738	1	1	HD20011050	Diode	1S1555
Q739	1	1	HD20028080	Diode	EP01Z
Q740	1	1	HD20028080	Diode	EP01Z
△ Q741	1	1	HP00004230	Posistor	PTH487A(BE)
Q742	1	1	HD20011050	Diode	1S1555
Q743	1	1	HD20028080	Diode	EP01Z
Q744	1	1	HD20028080	Diode	EP01Z
Q745	1	1	HD20014010	Diode	1SS81
Q746	1	1	HD20014010	Diode	1SS81
Q747	1	1	HD60007100	C.R. Diode	10YD4.5C
Q748	1	1	HD60007100	C.R. Diode	10YD4.5C
Q749	1	1	HD60007100	C.R. Diode	10YD4.5C
J701	1	1	YL09010210	Terminal	
J702	1	1	YL09010210	Terminal	
J703	1	1	YJ06000360	Jack, 6P	
J704	1	1	YP10001990	Jack, 3P	
J705	1	1	YP06001040	Plug, 3P	
L701	1	1	LJ31115080	Coil, 0.5μH	
P800	1	1	YK256H1820	P.W. Board, Power Supply-1	
	1		ZZ256H8820	P.W. Board Assembly	
△ C801	1	1	DF17223540	Film	0.022μF ±20%
△ C802	1	1	DF17223540	Film	0.022μF ±20%
△ C803	1	1	OA33710010	Elect	330μF 100V
△ C804	1	1	OA33710010	Elect	330μF 100V
△ C805	1	1	OA33710010	Elect	330μF 100V
△ C806	1	1	OA33710010	Elect	330μF 100V
△ C807	1	1	OA22606310	Elect	22μF 63V
△ C808	1	1	OA22606310	Elect	22μF 63V
△ R803	1	1	GA05332010	3.3KΩ	±5% 1W
△ R804	1	1	GA05332010	3.3KΩ	±5% 1W

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION	
	E	F			
△ Q801	1	1	HD20028080	Diode	EP01Z
△ Q802	1	1	HD20028080	Diode	EP01Z
△ Q803	1	1	HD20028080	Diode	EP01Z
△ Q804	1	1	HD20028080	Diode	EP01Z
J801	1	1	YP06001040	Plug, 3P	
P850	1	1	YK256H1880	P.W. Board, Power Supply-2	
	1		ZZ256H8880	P.W. Board Assembly	
△ C851	1	1	DF17223540	Film	0.022μF ±20%
△ C852	1	1	DF17223540	Film	0.022μF ±20%
△ C853	1	1	OA47603510	Elect	4.7μF 35V
△ C854	1	1	OA47603510	Elect	4.7μF 35V
△ C855	1	1	OA10505010	Elect	1μF 50V
△ D851	1	1	HE20011100	Diode	PB102F
△ D852	1	1	HD20028080	Diode	EP01Z
△ D853	1	1	HD20028080	Diode	EP01Z
△ D854	1	1	HD20028080	Diode	EP01Z
△ D855	1	1	HD20028080	Diode	EP01Z
W851	1	1	YB00350170	Connective Cord	
W852	1	1	YB00130140	Connective Cord	
PL00	1	1	YK256H1870	P.W. Board, AC Cord Terminate	
	1		ZZ256H8870	P.W. Board Assembly	
△ G001	1	1	BF10400060	Cap. Comp. 0.1μF+120Ω	350V
PN00	1	1	YK256H1830	P.W. Board, SPK Protect & A-B SW	
	1		ZZ256H8830	P.W. Board Assembly	
CN01	1	1	OA10703510	Elect	100μF 35V
CN02	1	1	OA10703510	Elect	100μF 35V
CN04	1	1	OA10701010	Elect	100μF 10V
CN05	1	1	OA22601610	Elect	22μF 16V
CN06	1	1	OF15182010	Film	1800pF ±5%
CN07	1	1	OA33603510	Elect	33μF 35V
CN08	1	1	OF15182010	Film	1800pF ±5%
CN09	1	1	EA33708050	Elect	330μF 80V
CN10	1	1	EA33708050	Elect	330μF 80V
RN01	1	1	RA01020150	1KΩ(B), Trimming	
RN02	1	1	RA05020130	4.7KΩ(B), Trimming	
RN03	1	1	GM21410010	1KΩ	±2%
RN04	1	1	GD05820140	82Ω	
RN05	1	1	GM21417820	17.8KΩ	±2%
RN06	1	1	GD05103140	10KΩ	
RN07	1	1	GD05223140	22KΩ	
RN08	1	1	GD05823140	82KΩ	
RN09	1	1	GD05103140	10KΩ	
RN10	1	1	GD05473140	47KΩ	

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
RN11	1	1	GD05562140	5.6K Ω
RN12	1	1	GD05820140	82 Ω
RN13	1	1	GD05103140	10K Ω
RN14	1	1	GM21410030	100K Ω $\pm 2\%$
RN15	1	1	GD05564140	560K Ω
RN16	1	1	GD05820140	82 Ω
PN00-SEMICONDUCTORS				
QN01	1	1	HC10042050	IC TA7317P
QN02	1	1	HD20028080	Diode EP01Z
QN03	1	1	HD20028080	Diode EP01Z
PN00-MISCELLANEOUS				
JN01	1	1	YP06001040	Plug, 3P
JN02	1	1	YP06000360	Plug, 6P
JN03	1	1	YP10001990	Plug, 3P
JN04	1	1	YP10002000	Plug, 4P
JN06	1	1	YP06001040	Plug, 3P
LN01	1	1	LY20240150	Relay, JC2A-DC24V
SN01	1	1	SR03020010	Rotary Switch
PT00-SUB TRANSFORMER CIRCUIT BOARD				
PT00	1	1	YK256H1850	P.W. Board, Sub Transformer
			ZZ256H8850	P.W. Board Assembly
LT01	1		TS13514030	Power Transformer
LT01		1	TS13514020	Power Transformer
WT01	1	1	YB00500350	Connective Cord
PW00-INPUT & BTL AMP CIRCUIT BOARD				
PW00	1	1	YK256H1840	P.W. Board, Input & BTL Amp
		1	ZZ256H8840	P.W. Board Assembly
PW00-CAPACITORS				
CW01	1	1	DF35221520	Mica 220pF $\pm 5\%$
CW02	1	1	OA22701610	Elect 220 μ F 16V
CW03	1	1	OA22701610	Elect 220 μ F 16V
CW04	1	1	OA47503550	Elect 4.7 μ F 35V
CW05	1	1	OA47503550	Elect 4.7 μ F 35V
CW06	1	1	OF15103010	Film 0.01 μ F $\pm 5\%$
PW00-RESISTORS (All Resistors are $\pm 2\%$ & $\frac{1}{4}W$)				
RW01	1	1	GM21456200	562 Ω
RW02	1	1	GM21456220	56.2K Ω
RW03	1	1	GM214464G0	46.4 Ω
RW04	1	1	GM21446410	4.64K Ω
RW05	1	1	GM21446410	4.64K Ω
RW06	1	1	GM214464G0	46.4 Ω
RW07	1	1	GM21422610	2.26K Ω
RW08	1	1	GM21456220	56.2K Ω
RW09	1	1	GM21446400	464 Ω
RW10	1	1	GM21446400	464 Ω

REF. DESIG.	Q'TY		PART NO.	DESCRIPTION
	E	F		
				PW00-SEMICONDUCTORS
QW01	1	1	HC10023090	IC NJM5532D
QW02	1	1	HD30013010	Zener HZ15L
QW03	1	1	HD30013010	Zener HZ15L
				PW00-MISCELLANEOUS
JW01	1	1	YT02020290	Terminal
JW02	1	1	YP10001980	Plug, 2P
SW01	1	1	SR04040280	Rotary Switch
				PY00-PILOT LAMP CIRCUIT BOARD
PY00	1	1	YK256H1860	P.W. Board, Pilot Lamp
		1	ZZ256H8860	P.W. Board Assembly
VY01	1	1	IN10080580	Lamp (RED)
VY02	1	1	IN10080590	Lamp (BLUE)
VY03	1	1	IN10080590	Lamp (BLUE)

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

NOTE ON SAFETY:

Symbol $\triangle$ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol $\triangle$. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

8. TECHNICAL SPECIFICATIONS

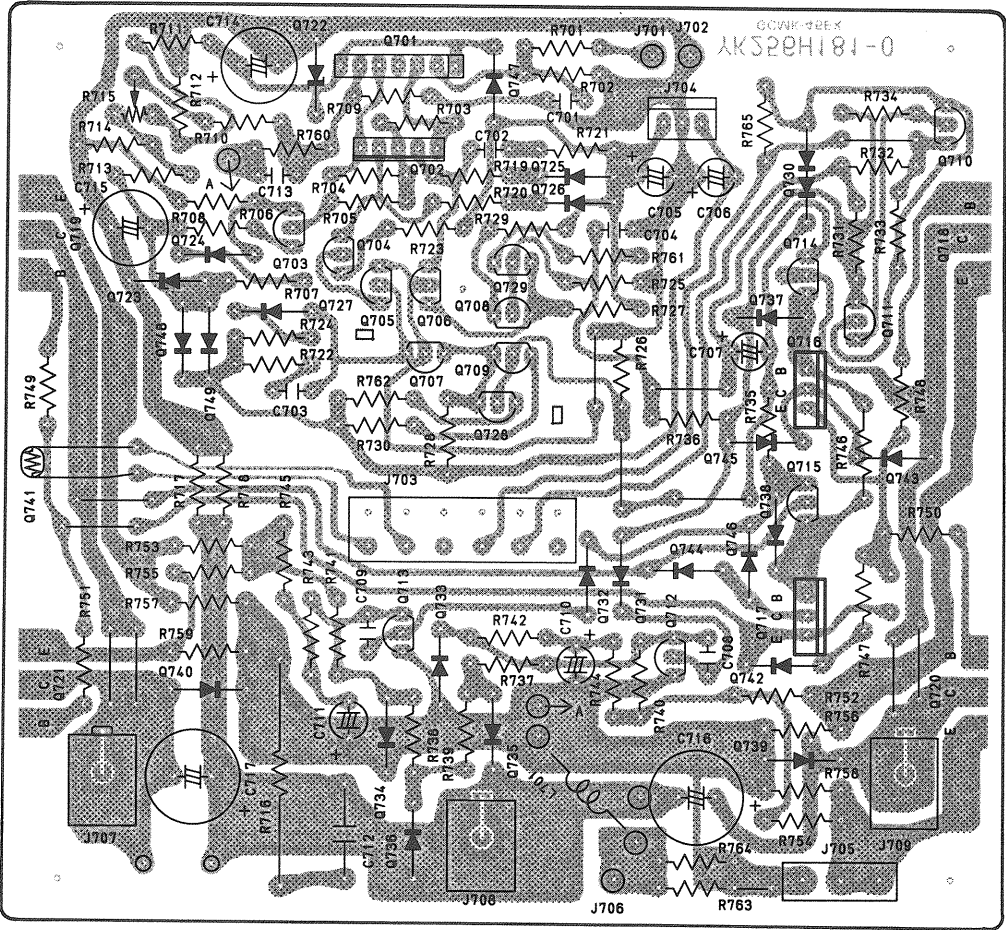
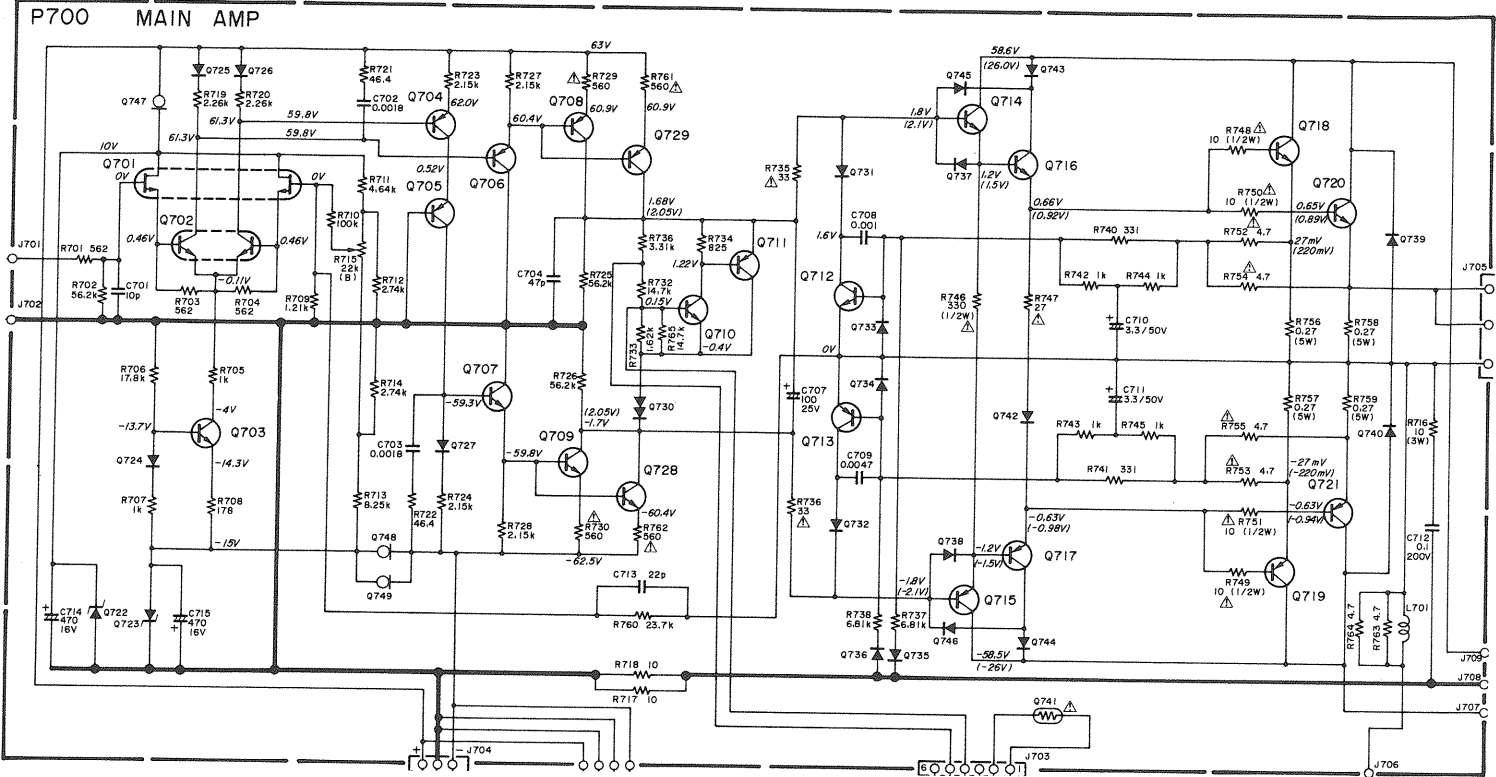
Rated Power Output (20 — 20 kHz)	
CLASS B Operation	120 W (8 ohms) 150 W (4 ohms)
CLASS A Operation	30 W (8 ohms)
Total Harmonic Distortion (20 — 20 kHz, 8 ohms load)	Less than 0.008%
Intermodulation Distortion	Less than 0.008%
Frequency Response (20 — 20 kHz)	+0, -0.2 dB
(1 — 100 kHz)	+0, -1 dB
Input Sensitivity/Impedance	1.5 V/56 kohms
Damping Factor (1 kHz, 8 ohms load)	Better than 250
Residual Noise (IHF-A Curve)	68 μ V
Power Requirements	AC 100 V 50/60 Hz
Power Consumption	150 W
Dimensions	
Panel Width	208 mm
Panel Height	146 mm
Depth	334 mm
Weight	10 kg

Specifications and apperance are subject to change for modification without notice.

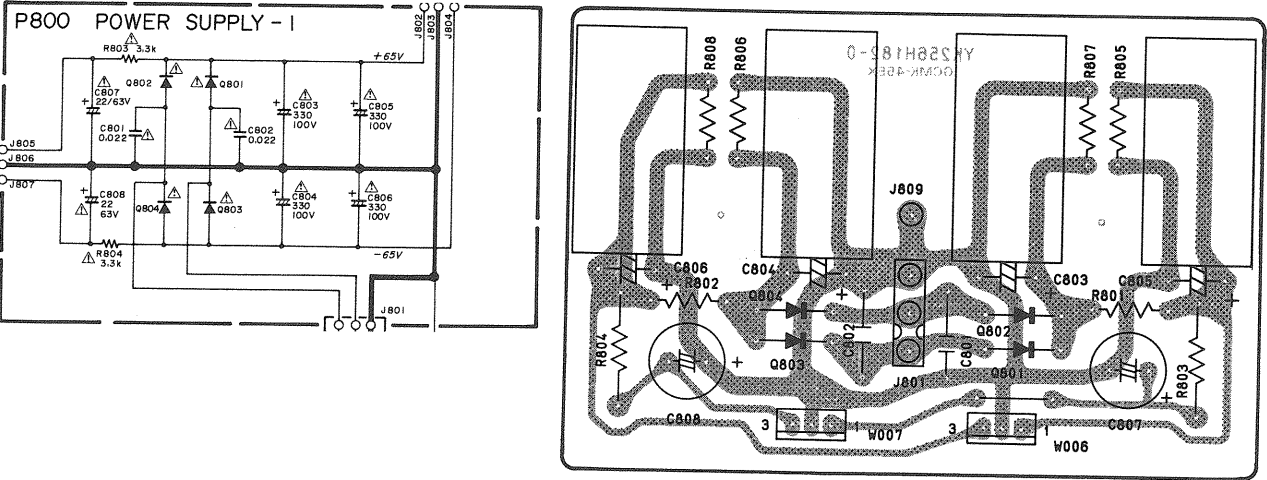
MEMORANDUM

5. SCHEMATIC DIAGRAM AND COMPONENT LOCATIONS

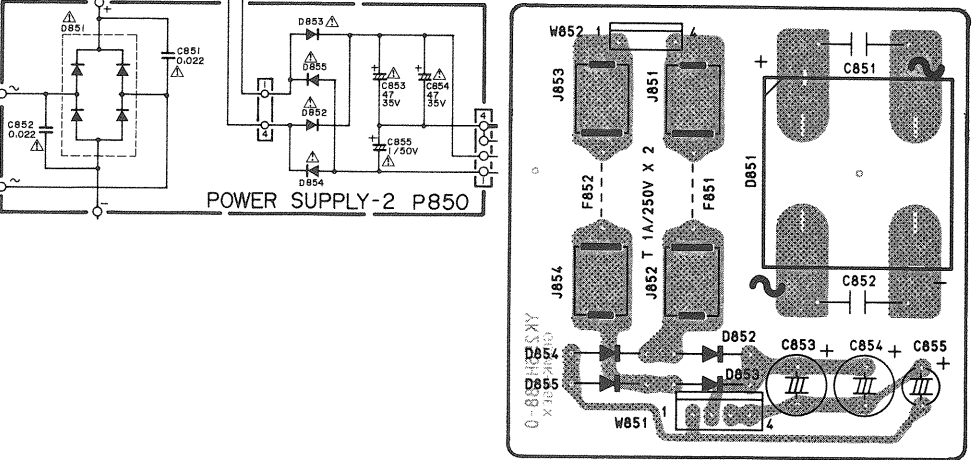
5.1 Power Amp. Assembly (P700) Schematic Diagram and Component Locations



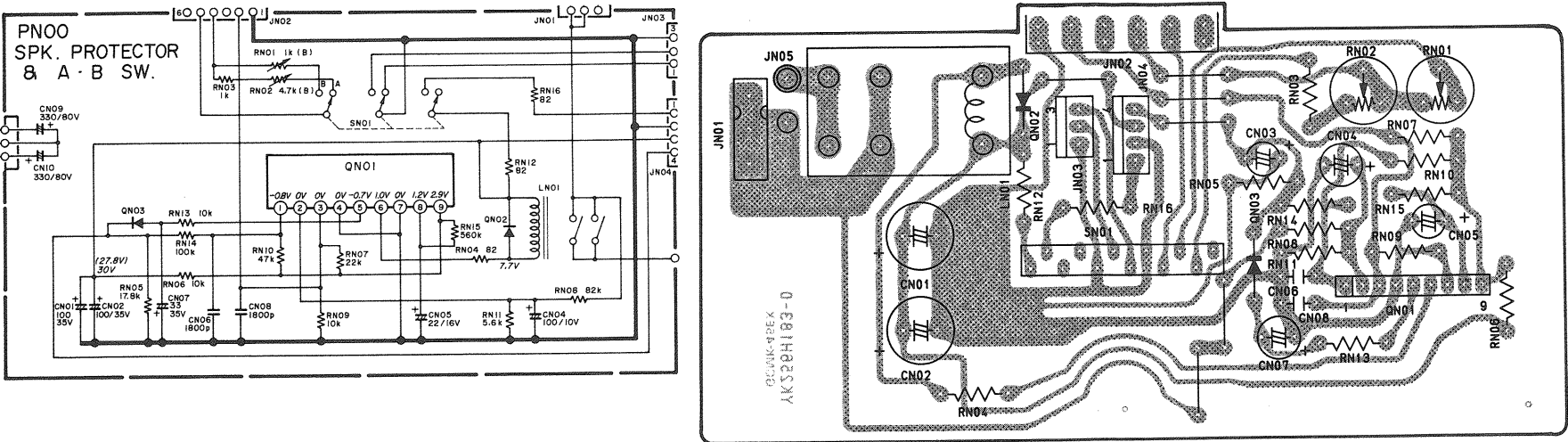
5.2 V. Amp. Assembly (P800) Schematic Diagram and Component Locations



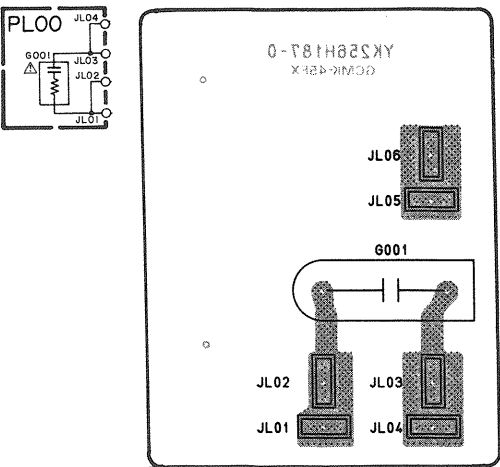
5.3 Power Assembly (P850) Schematic Diagram and Component Locations



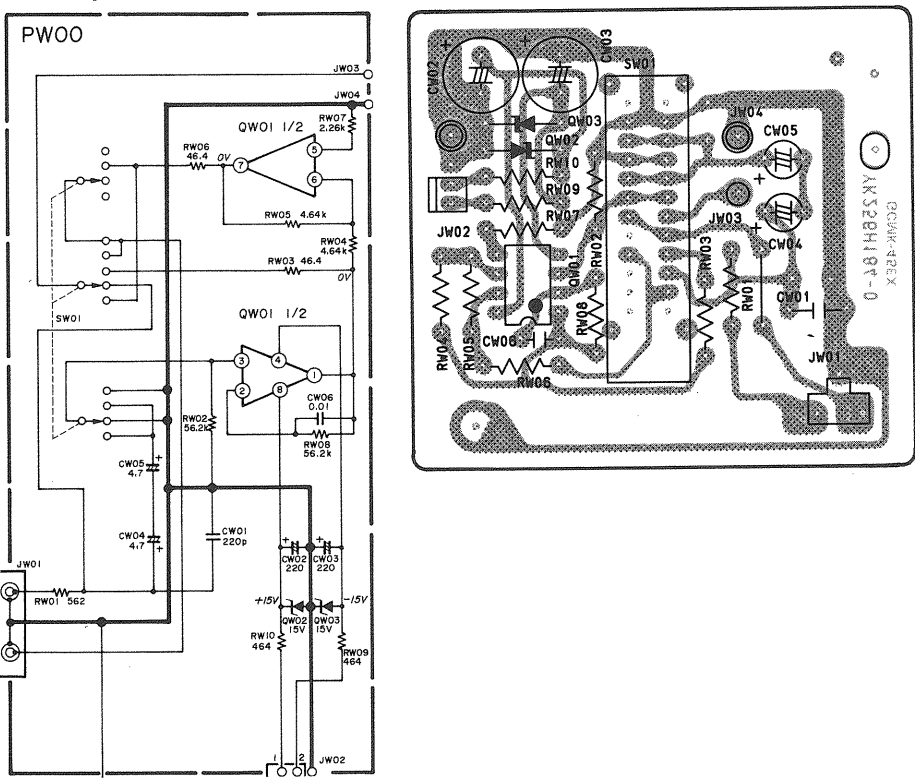
5.4 Speaker Protector & A-B Switch Assembly (PN00) Schematic Diagram and Component Locations



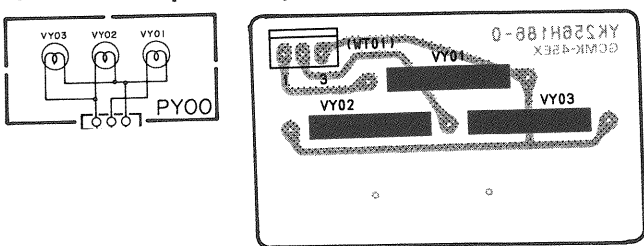
5.6 AC Cord Terminale Assembly (PL00) Schematic Diagram and Component Locations



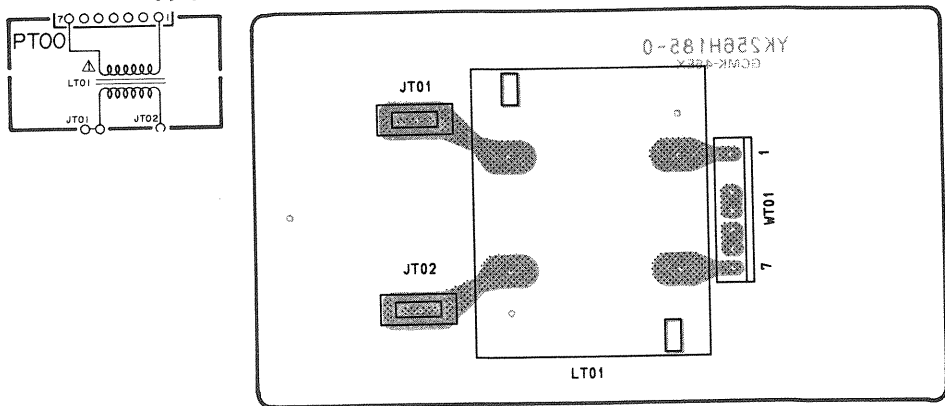
5.5 Input & B.T.L. Amp. Assembly (PW00) Schematic Diagram and Component Locations



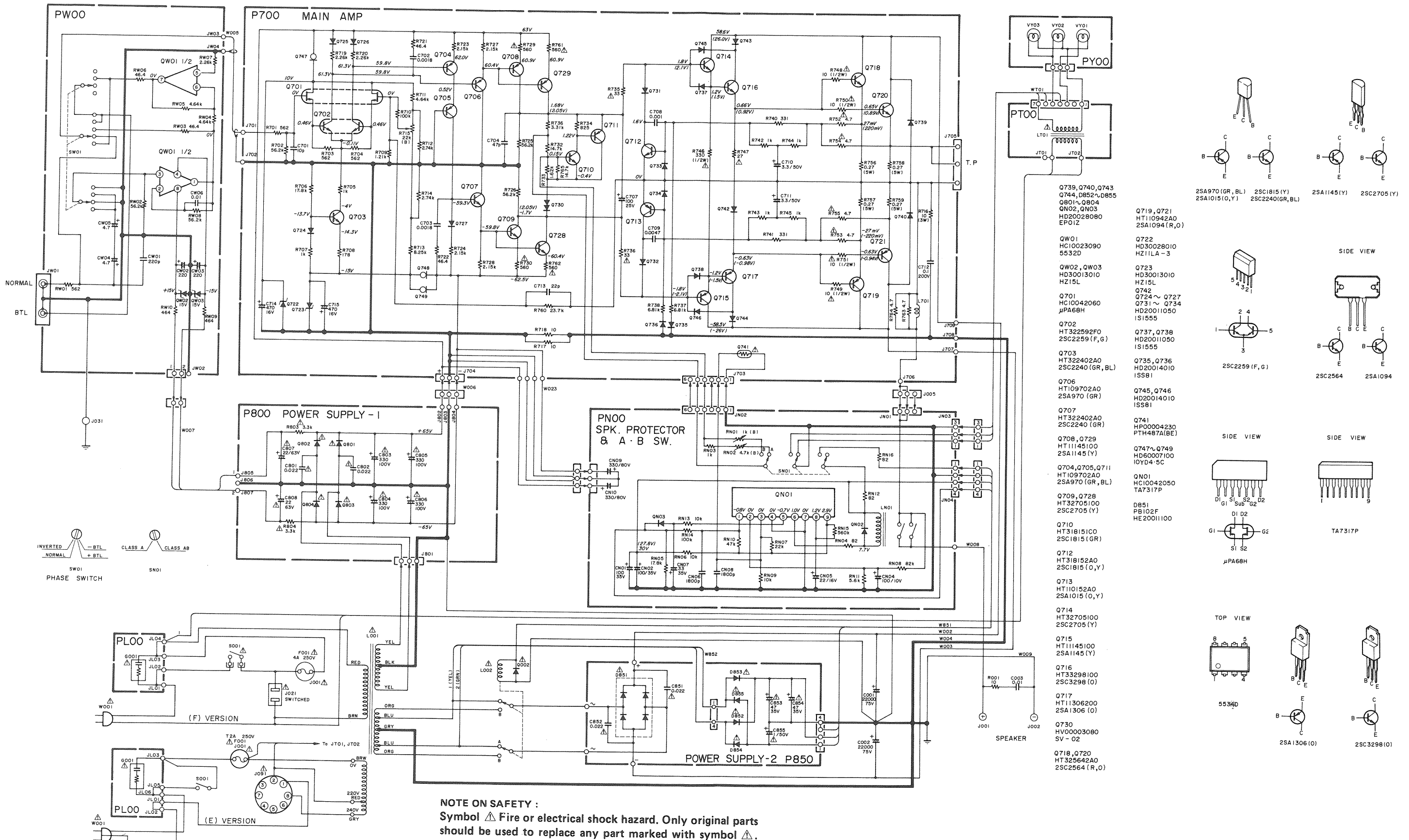
5.7 Pilot Lamp Assembly (PY00) Schematic Diagram and Component Locations



5.8 Pilot Supply Assembly (PT00) Schematic Diagram and Component Locations



9. SCHEMATIC DIAGRAM

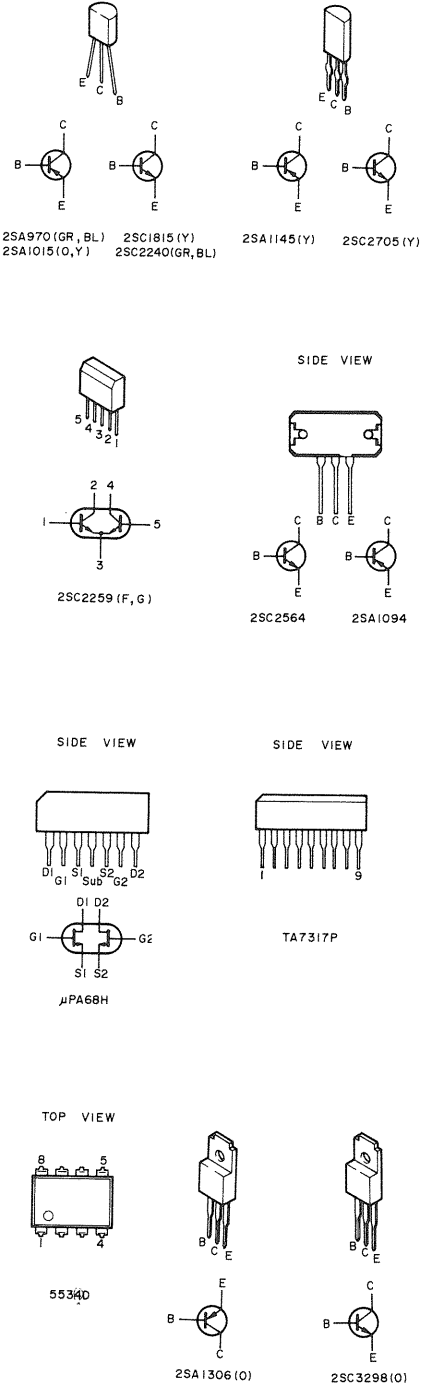


NOTE ON SAFETY :
Symbol  Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Components and wiring are subject to change for modification without notice.

- Q739, Q740, Q743
Q744, D852~D855
Q801~Q804
Q802, Q803
HD20028080
EP01Z
- QW01
HC10023090
5532D
- QW02, QW03
HD30013010
HZ15L
- Q701
HC10042060
μPA68H
- Q702
HT322592F0
2SC2259 (F, G)
- Q703
HT322402A0
2SC2240 (GR, BL)
- Q706
HT109702A0
2SA970 (GR)
- Q707
HT322402A0
2SC2240 (GR)
- Q708, Q729
HT11145100
2SA1145 (Y)
- Q704, Q705, Q711
HT109702A0
2SA970 (GR, BL)
- Q709, Q728
HT32705100
2SC2705 (Y)
- Q710
HT318151C0
2SC1815 (GR)
- Q712
HT318152A0
2SC1815 (O, Y)
- Q713
HT110152A0
2SA1015 (O, Y)
- Q714
HT32705100
2SC2705 (Y)
- Q715
HT11145100
2SA1145 (Y)
- Q716
HT32398100
2SC3298 (O)
- Q717
HT11306200
2SA1306 (O)
- Q730
HV00003080
SV - 02
- Q718, Q720
HT325642A0
2SC2564 (R, O)

- Q719, Q721
HT110942A0
2SA1094 (R, O)
- Q722
HD30028010
HZ11LA - 3
- Q723
HD30013010
HZ15L
- Q742
Q724 ~ Q727
Q731 ~ Q734
HD20011050
IS1555
- Q737, Q738
HD20011050
IS1555
- Q735, Q736
HD20014010
IS581
- Q745, Q746
HD20014010
IS581
- Q741
HP00004230
PTH487A(BE)
- Q747~Q749
HD60007100
10YD4-5C
- Q801
HC10042050
TA7317P
- D851
PB102F
HE2001100





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