

SERVICE
MANUAL

SM-8

4822 725 50269

marantz®

Model SM-8

Stereo Power Amplifier

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.

Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified. 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 at the following addresses:

AUSTRIA
MARANTZ
Hietzinger Kai 137a
1130 Wien

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

DENMARK
MARANTZ
Horsvinget 5
2630 Tastrup

NORWAY
MARANTZ
Postboks 7034
Assiden
3007 Drammen

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

GERMANY
MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
Germany

THE NETHERLANDS
Elpro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

SWEDEN
MARANTZ
Box 1324
171 25 Solna

FINLAND
MARANTZ
Kuortanegatan 1
00520 Helsingfors 52

GREAT BRITAIN
MARANTZ HiFi U.K. Ltd
Kingsbridge House
Padbury oaks
575-583 Bath Road
Long ford
Middlesex UB7 0EH
Faxnr.: 0753 680 428

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocrates Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
Euroservice S.A.
Bernardo obrégón, 26
28012 Madrid
faxnr.: 3412 306 198

SWITZERLAND
MARANTZ
Technischer Service
Duenstrasse 3
3186 Dürdingen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

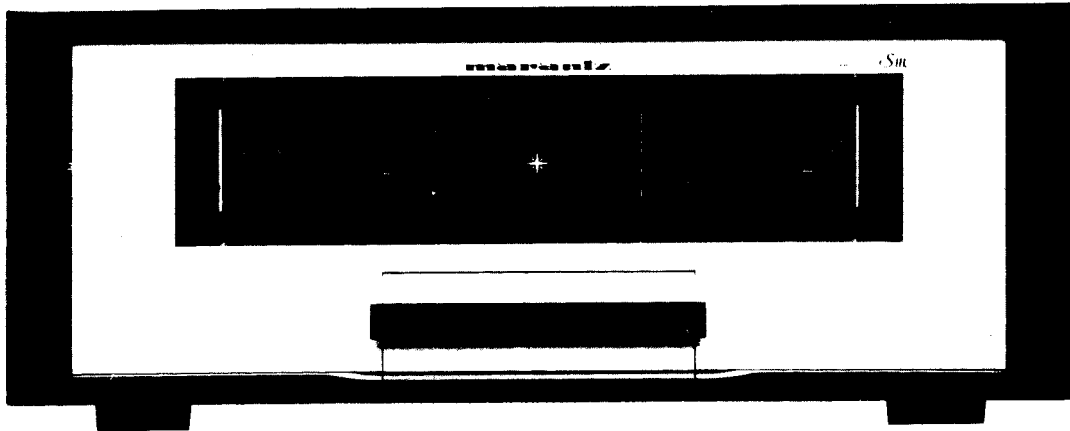
PORTUGAL
MARANTZ
Divisao philips S.A. service
Outurela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

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.

MARANTZ MODEL Sm-8 STEREO POWER AMPLIFIER



INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model Sm-8 Stereo Power Amplifier.

Service 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. SHOCK, FIRE HAZARD SERVICE TEST

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before return to user/customer.

Ref. UL Standard No. 1270. Para. 66. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

2. FEATURES

- **High power – 120W x 2 of dynamic "Marantz" sound**

From the line input, the audio signal passes to the dual FETs in the buffer amp and then to the first stage which is a differential amplifier using dual transistors. One side of this differential output is phase inverted, while the output of the buffer amp passes to a pure push-pull amplifier which drives the final output stage. The power amplifier stage uses newly developed super high f_T power transistors in parallel three-stage Darlington connection. This makes possible handling high currents with sufficient heat radiating capacity.

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- **Class A – Class AB automatic switching circuit**

Quarter A allows the main amplifier to operate as a pure class A amplifier for outputs of up to 30W, which is a quarter of the rated output 120W at 8Ω, at the switch to class AB for outputs larger than 30W. The transition from class A to class AB or vice versa is carried out by switching the bias current and the power supply voltage. The automatic switching circuit monitors the input voltage of the main amplifier and the output current of the speaker in order to detect output transitions. Note that the use of a phase correction circuit inside the detector prevents waveforms including those with a steep rising edge from being distorted. The automatic switching circuit can be easily used for amplifier configurations uniquely designed by Marantz by merely connecting the input of the detector to the signal system.

- **Large-sized peak power meter of the logarithmic compressed type**

Large-sized power meters that are suitable for high quality power amplifiers are available. This power meter can be used to check the output level and the balance between the right and left channels. It operates by detecting signal peaks, but it displays rms values which directly represent the outputs of the amplifier to an 8Ω load.

In addition, since a circuit generating logarithmic compressed displays is used, outputs of small to large quantities can be monitored without changing the range. This power meter can also be used as a peak holder by setting appropriate switches on the panel.

- **Protective circuit which does not degrade tone quality**

The overload protective circuit detects both overvoltage and overcurrent conditions, while in the area of safe operation (A.S.O.) does not degrade the operation of the drive transistors. The protective circuit has adaptable characteristics so that its operation does not interfere with the program and its operation is always constant.

- **Plus**

The power output circuit is equipped with high efficiency heat sinks to cool the power transistors, thus providing continuous high output power.

3. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Mode Sm-8 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 P60C
2. Voltage Amp. mounted on P.W. Board P70C
3. Test Point mounted on P.W. Board PJ0C
4. A-B Power Switch mounted on P.W. Board PK0C
5. A-B Detector mounted on P.W. Board PL0C
6. ASO Protector mounted on P.W. Board PN0C
7. Connection mounted on P.W. Board PPOC
8. Speaker &
Meter Switch mounted on P.W. Board PS0C
9. Output Network mounted on P.W. Board PW0C
10. Meter & Supply mounted on P.W. Board PX0C

4. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing the Model Sm-8 Stereo Power Amplifier.

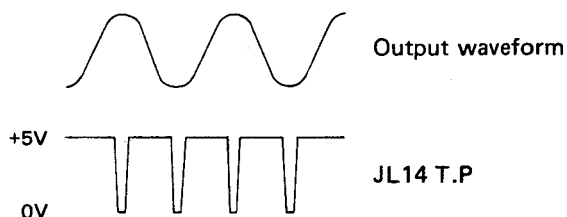
Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary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

5. ADJUSTMENT PROCEDURES

1. Class B idling adjustment

- Apply a sine wave signal of 1 to 2 VRMS to JL14 from an audio oscillator in order to forcibly make it operate as a class B amplifier.
- Adjust RL43 and RL44 so as to give DC voltage of 7 mV at the JJ01-02 and JJ03-04 test points.

NOTE: Carry out the adjustment one minute after the switch is turned on. After the set is stabilized, the voltage should be 27 mV (50 mA).



2. Class A idling adjustment

- Disconnect the input to JL14.
- Adjust RL39 and RL40 so as to give DC voltage of 440 mV at the JJ01-02 and JJ03-04 test points.

NOTE: Carry out the adjustment one minute after the input to JL14 is disconnected. The class B adjustment must be done first. After the unit is stabilized, the voltage should be 370 mV (655 mA).

3. Comparator balance adjustment

- Connect a trigger oscilloscope to JL14.
- Set the load of the device to OPEN, apply a signal with a frequency of 1 kHz and increase it gradually.
- While observing the output waveform of the unit and pulses at JL14, adjust RL31 so as to generate two pulses per output waveform period.

4. Switching level adjustment

- Connect a trigger oscilloscope to JL14.
- Set the load of the unit to OPEN and apply a signal having a frequency of 1 kHz to the L channel.
- With the output set to 15.5V, adjust RL09 so as to generate pulses at JL14.
- Apply a signal to the R channel and, similarly, adjust RL10.

5. Power meter adjustment

- Set the load of the unit to 8Ω , apply a signal having a frequency of 1 kHz and increase the input signal to 30.9V.
- Adjust the following so as to give a reading of 120W on the meter.
For the L channel, adjust RX05.
For the R channel, adjust RX06.

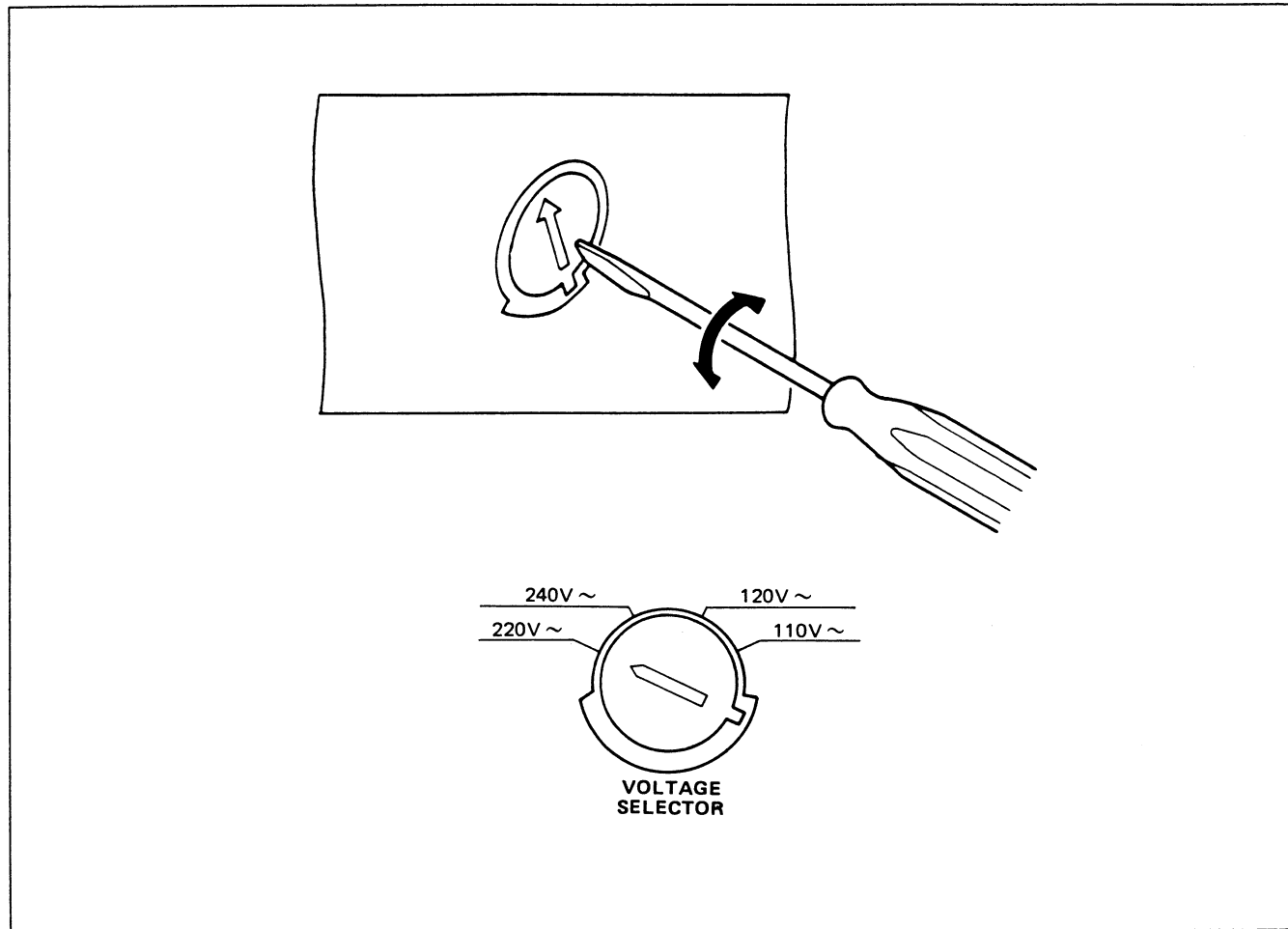
6. VOLTAGE CONVERSION

• EUROPEAN MODEL ONLY

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

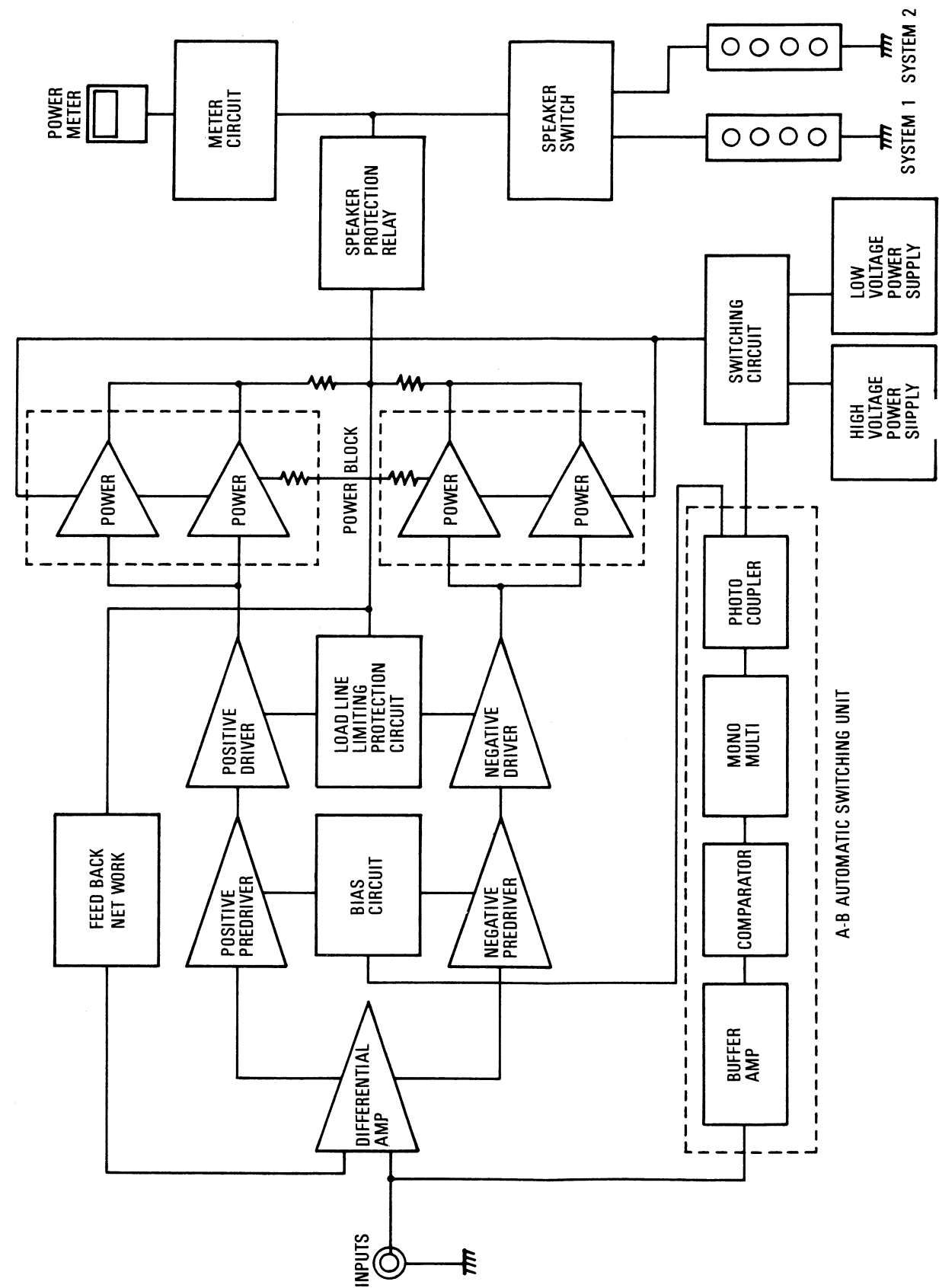
CAUTION
DISCONNECT POWER SUPPLY CORD FROM AC
OUTLET BEFORE CONVERTING VOLTAGE.

Voltage Conversion Chart



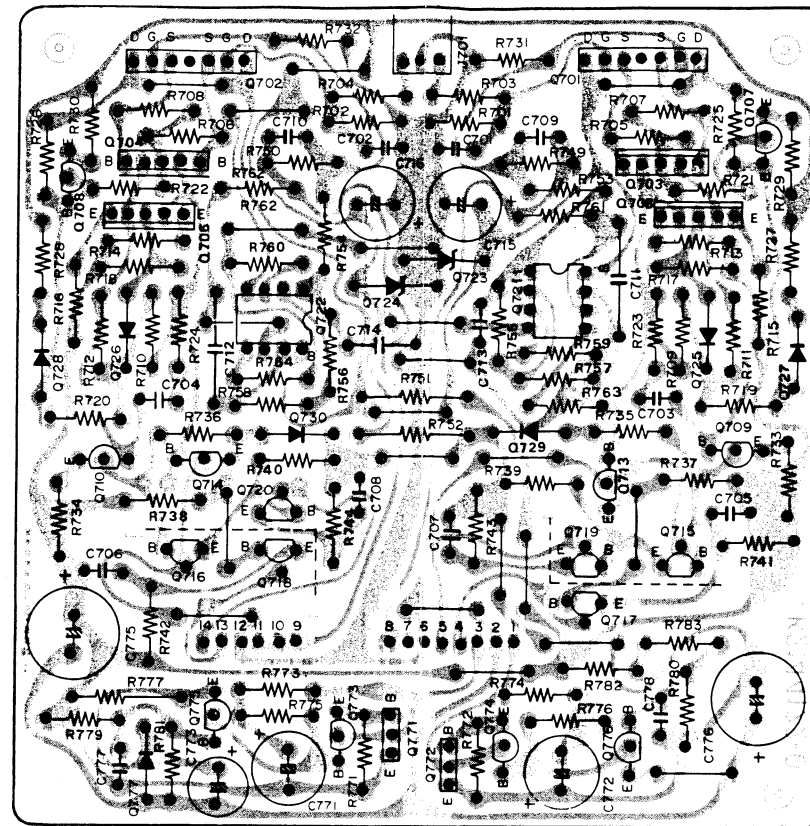
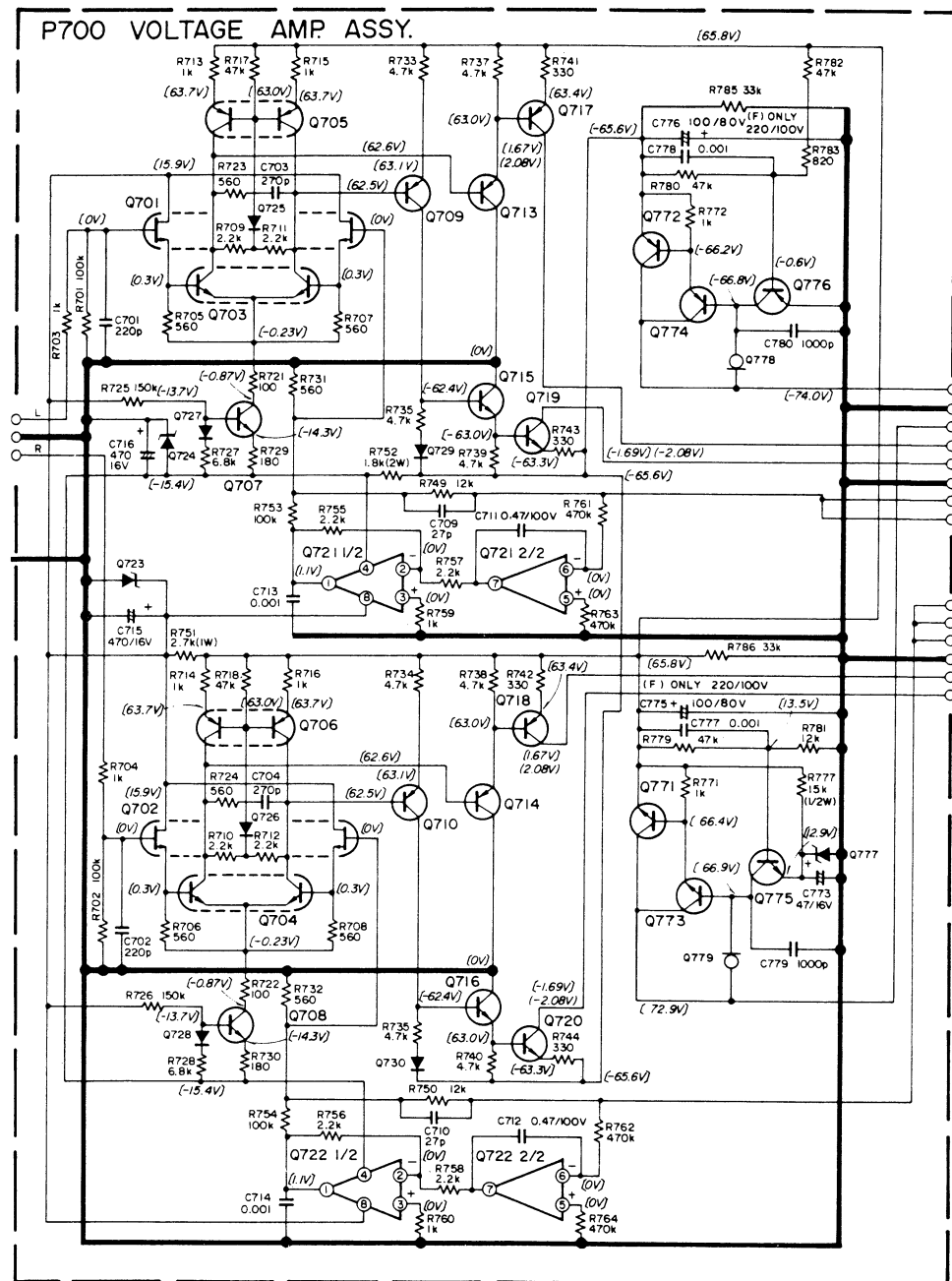
Note on safety: Symbol \triangle Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol \triangle . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

7. BLOCK DIAGRAM

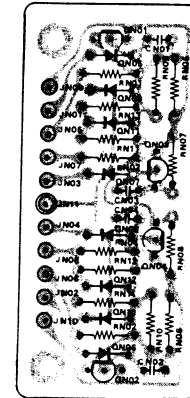
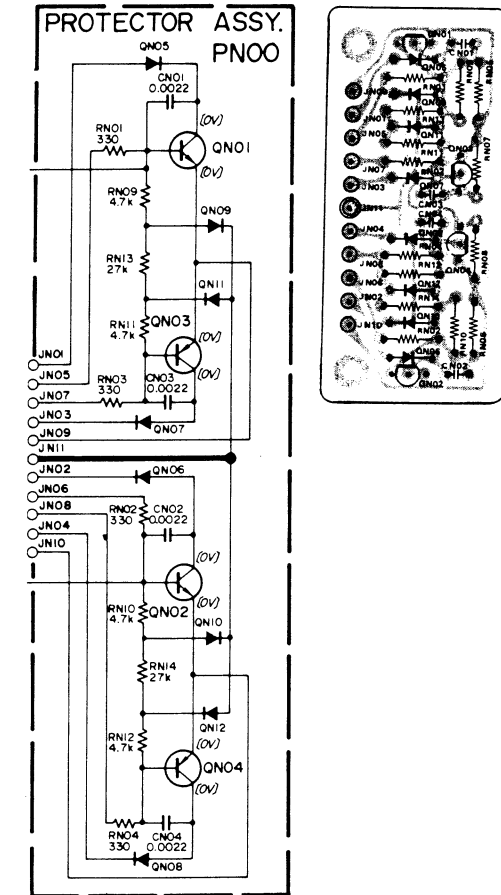


8. DIAGRAM AND COMPONENT LOCATIONS

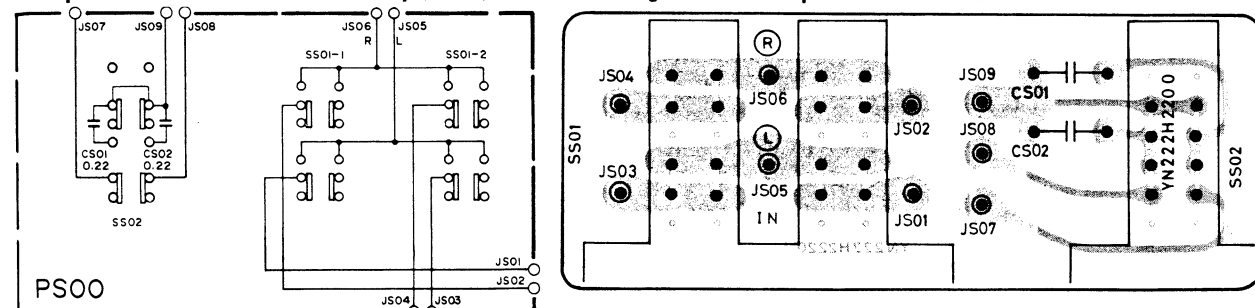
8.1 Voltage Amp. Assembly (P700) Schematic Diagram and Component Locations



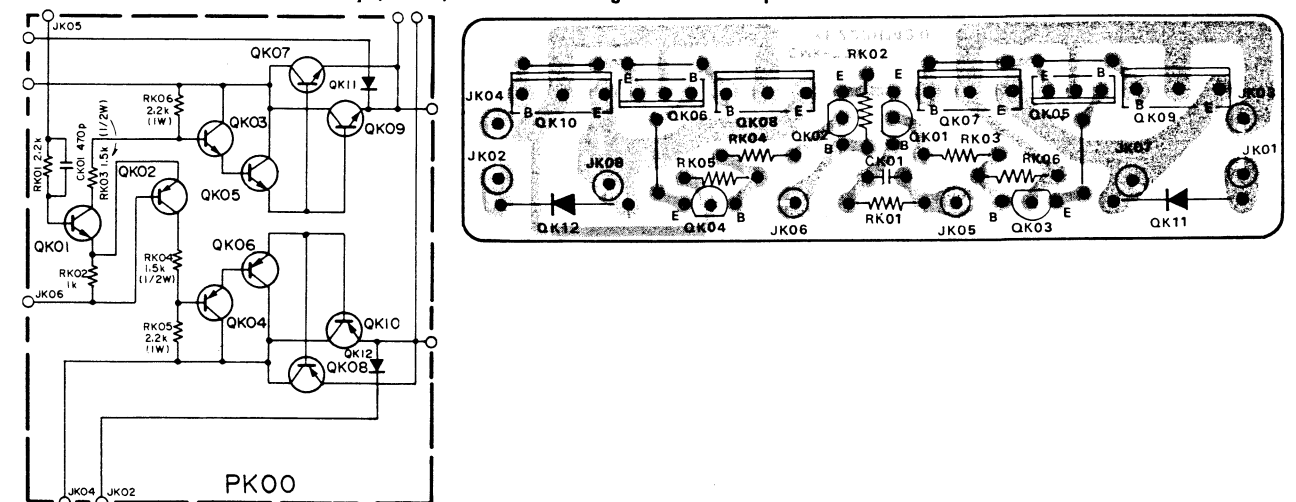
8.3 ASO Protector Assembly (PN00) Schematic Diagram and Component Locations



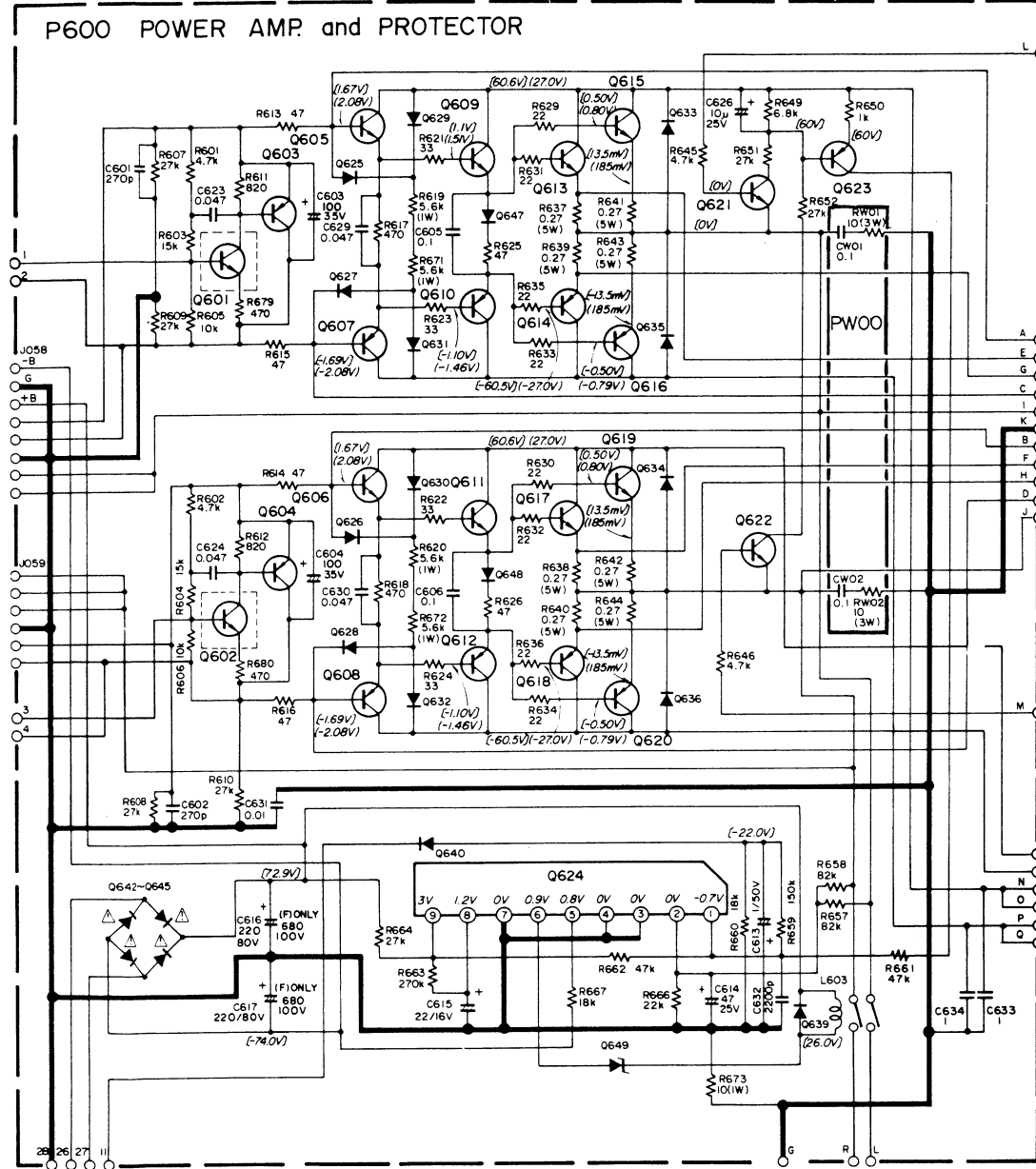
8.2 Speaker & Meter Switch Assembly (PS00) Schematic Diagram and Component Locations



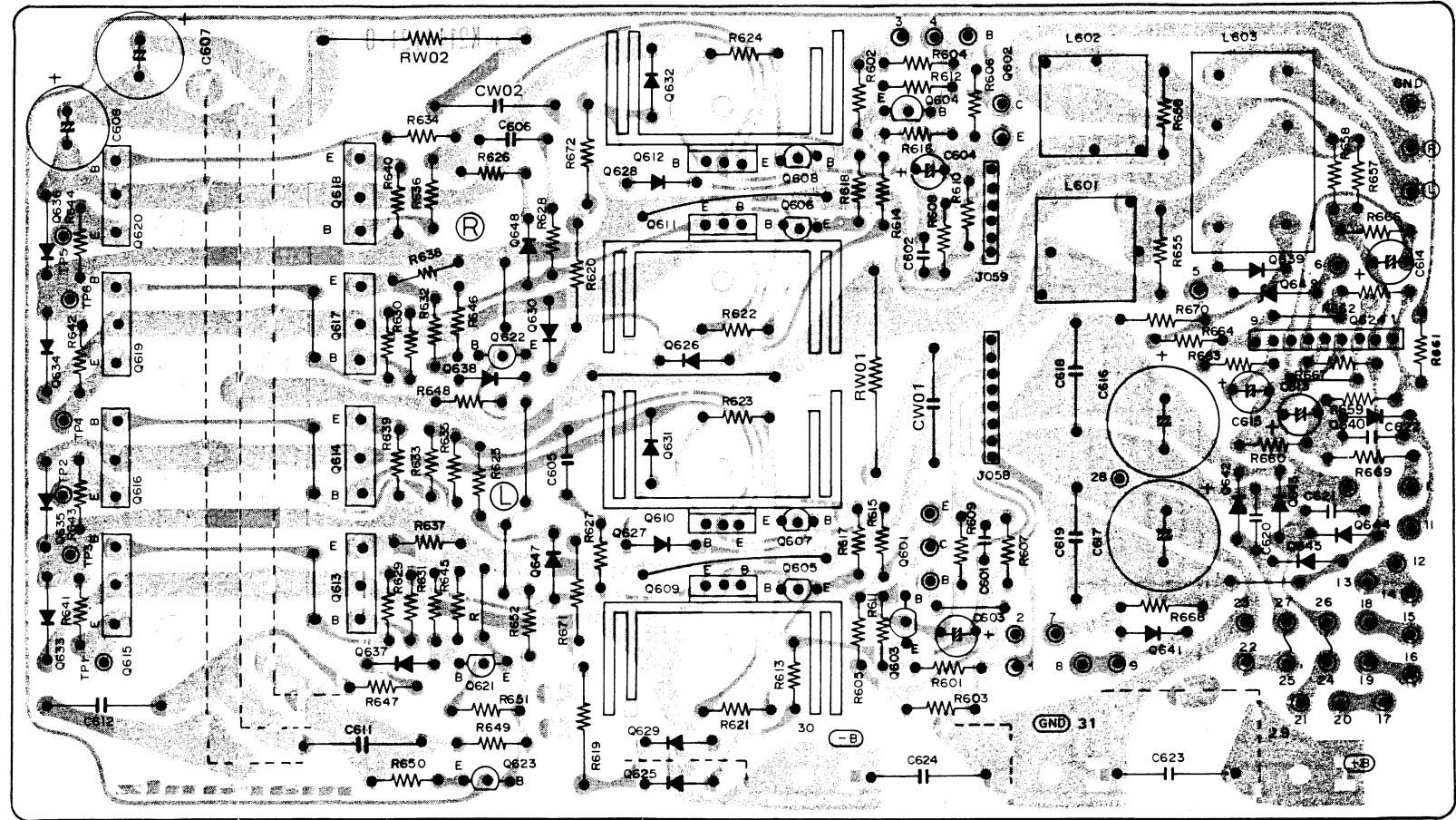
8.4 A-B Power Switch Assembly (PK00) Schematic Diagram and Component Locations



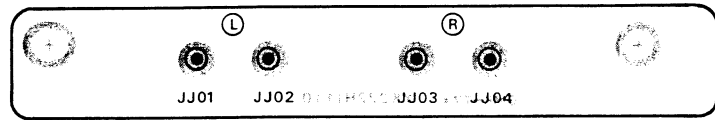
8.5 Power Amp. Assembly (P600) Schematic Diagram and Component Locations



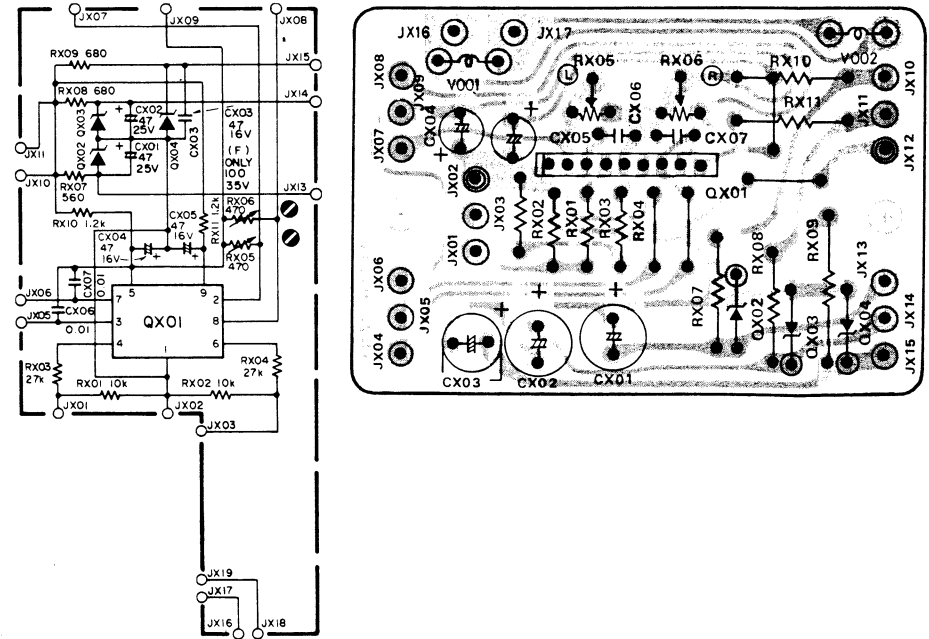
8.6 Output Network Assembly (PW00) Schematic Diagram and Component Locations



8.7 Test Point Assembly (PJ00) Schematic Diagram and Component Locations

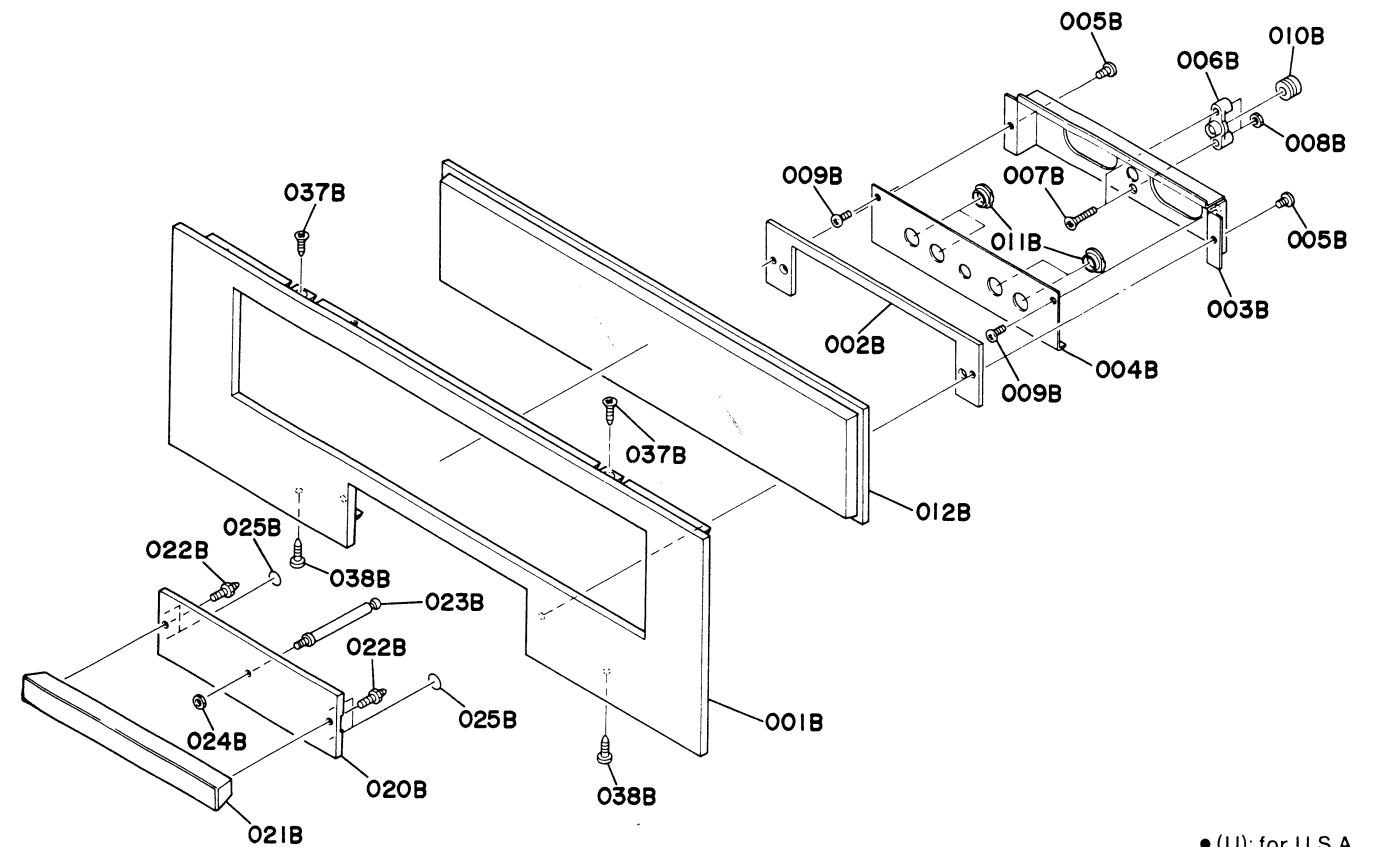


8.8 Meter & Supply Assembly (PX00) Schematic Diagram and Component Locations



9. EXPLODED VIEW AND PARTS LIST

• [C01-99] Front Panel

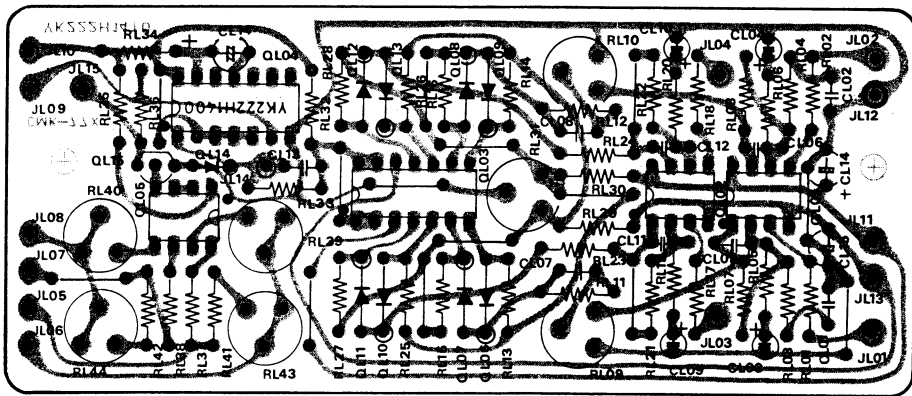
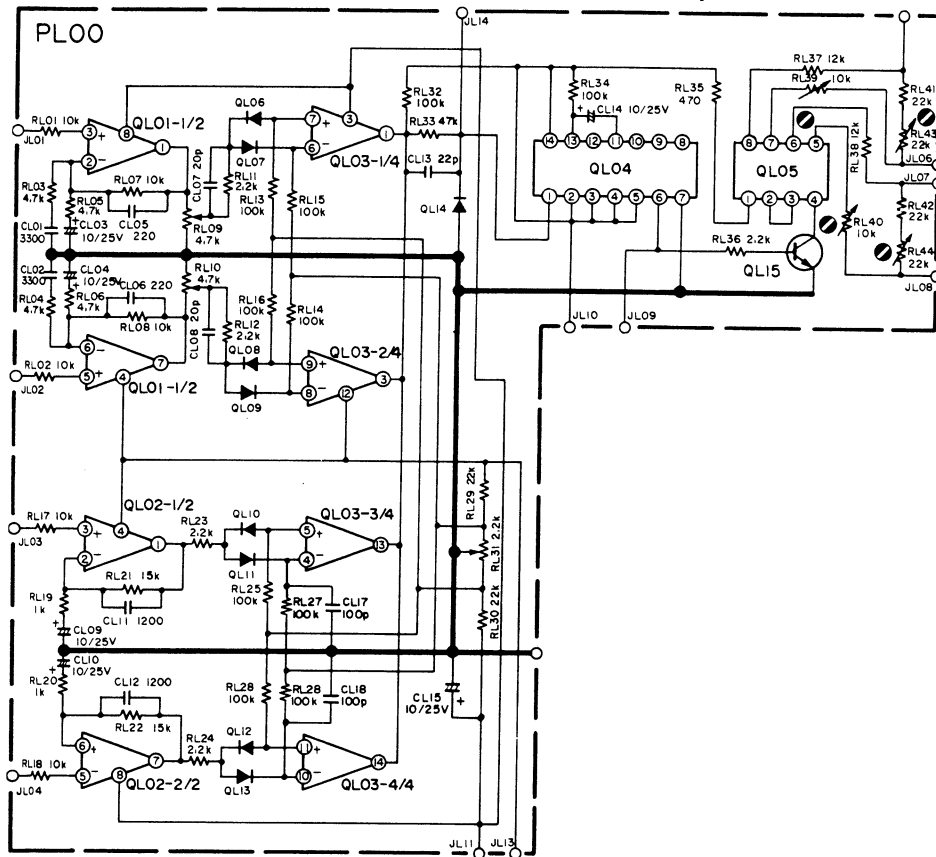


• (U): for U.S.A.
 • (E): for Europe
 • (F): for Japan

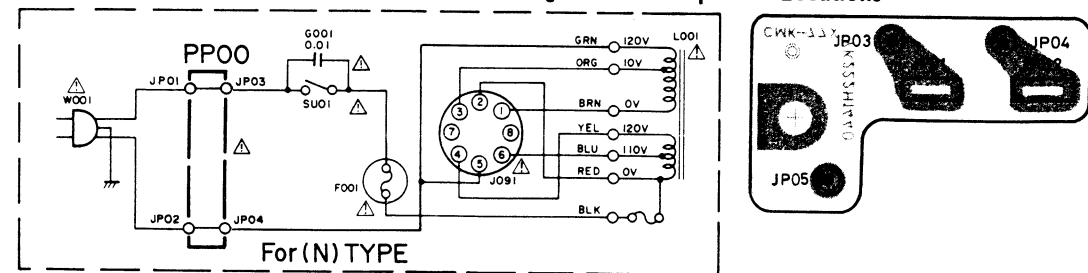
REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
A	1	1	1	222H063400	Front Panel Assembly
001B	1	1	1	222H063010	Escutcheon, Front Panel
002B	1	1	1	2461063030	Escutcheon, Pocket Frame
003B	1	1	1	2144160020	Bracket
004B	1	1	1	222H063020	Escutcheon, Pocket Panel
005B	2	2	2	51060305A9	P.H.M. Screw P3 x 5
006B	1	1	1	2461271010	Holder
007B	2	2	2	51042610A0	F.H.M. Screw F2.6 x 10
008B	2	2	2	53112603A0	Hexagon Nut M2.6
009B	2	2	2	51100204E0	B.H.M. Screw B2 x 4
010B	1	1	1	1143259010	Bushing, Pin Holder
011B	4	4	4	2978259110	Bushing, Push Switch
012B	1	1	1	201H158010	Window, Meter

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
B	1			2461063420	Pocket Cover Assembly
B1	1	1	1	2144063410	Pocket Cover Assembly
020B	1	1	1	2461063050	Escutcheon, Pocket Cover
021B	1			2461253010	Handle
021B	1	1	1	2461253210	Handle
022B	2	2	2	2461254010	Pin
023B	1	1	1	2461254020	Pin
024B	1	1	1	53110303E9	Hexagon Nut M3
025B	4	4	4	2461107020	Sheet
037B	2	2	2	51500308Z0	F.H. Tapped Screw F3 x 6
038B	2	2	2	51280308Z0	B.H. Tapped Screw B3 x 8

8.9 A-B Detector Assembly (PL00) Schematic Diagram and Component Locations

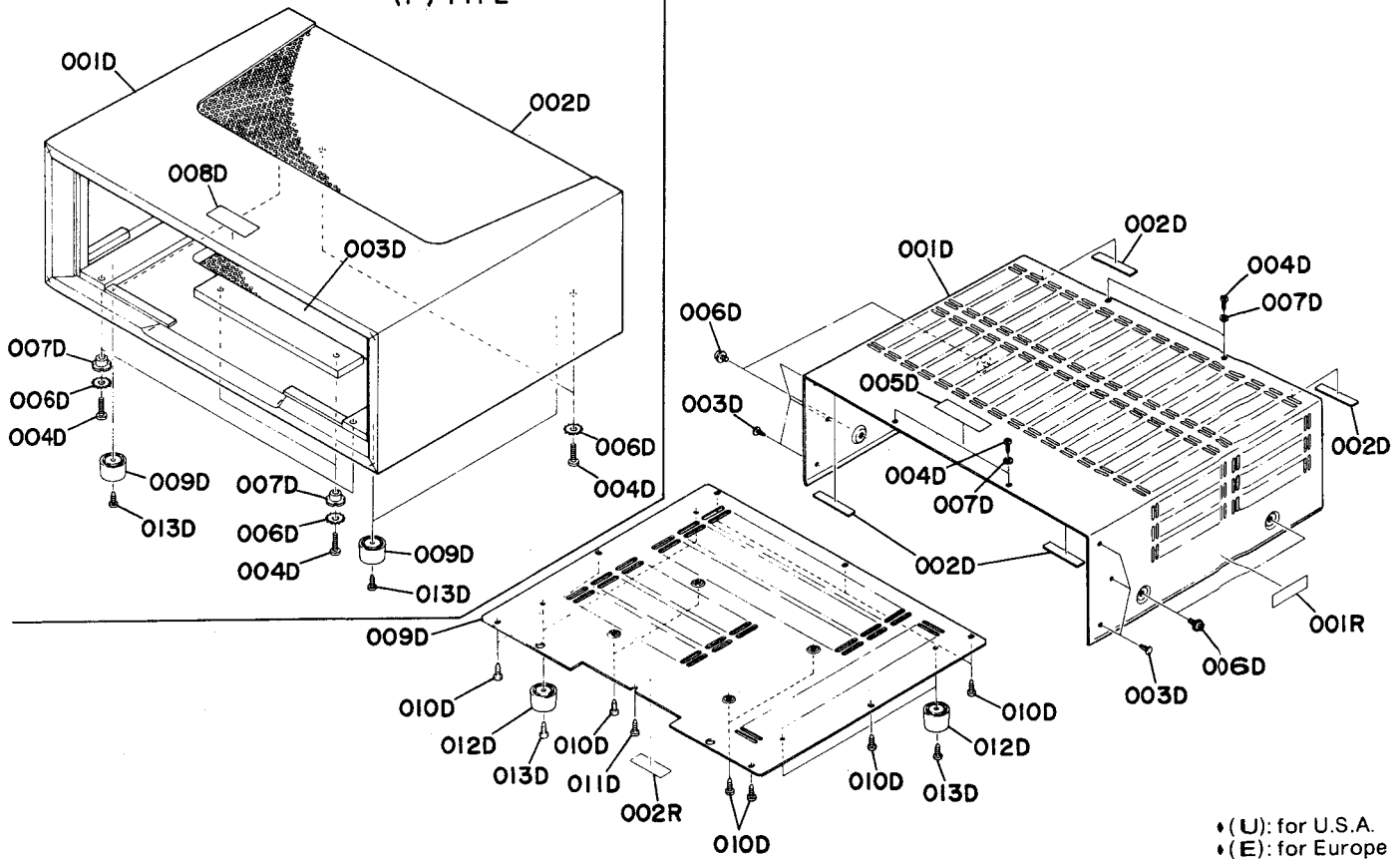


8.10 Connection Assembly (PP00) Schematic Diagram and Component Locations



• [C02-99] Top Cover

(F) TYPE

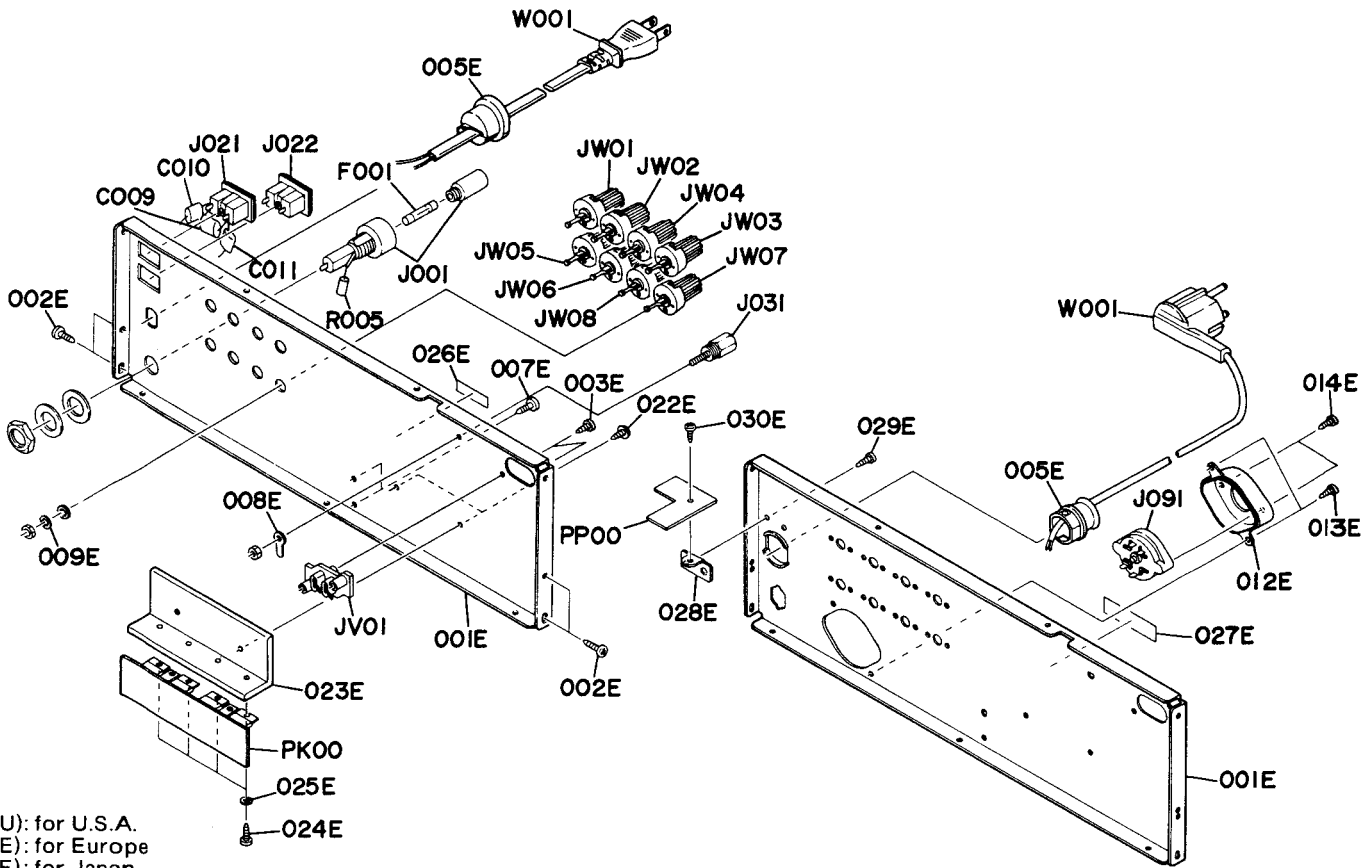


• (U): for U.S.A.
 • (E): for Europe
 • (F): for Japan

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
001D	1	1		2461257010	Lid, Top Cover
001D			1	222H064500	Case Wood
002D	4	4		2965118010	Spacer
002D			1	2996003010	Punched Plate
003D	6	6		2991259110	Bushing
003D			1	222H003010	Punched Plate
004D	4	4		51260308Z0	B.T. Screw B3 x 8
004D			6	51280430U0	B.H. Tapped Screw B4 x 30
005D	1	1		222H861020	Label
006D	4	4		51480406Z9	F.Washer Screw F4 x 6
006D			6	54080400R0	T.L Washer
007D	4	4		59030805S0	Washer
007D			4	53250503A0	Special Nut
008D			1	222H861010	Label
009D	1	1		2144257010	Lid, Bottom Cover
009D			4	2759057010	Leg
010D	11	11		51280410U0	B.H. Tapped Screw B4 x 10
011D	1	1		51280406U0	B.H. Tapped Screw B4 x 6
012D	4	4		2759057010	Leg
013D	4	4		51570410U0	P. Taptite Screw P4 x 10
013D			4	51524116A0	R.H. Wood Screw

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
001R	1	1		2911861140	Label
003R	1	1		2911861110	Label

● [C03-99] Rear Panel

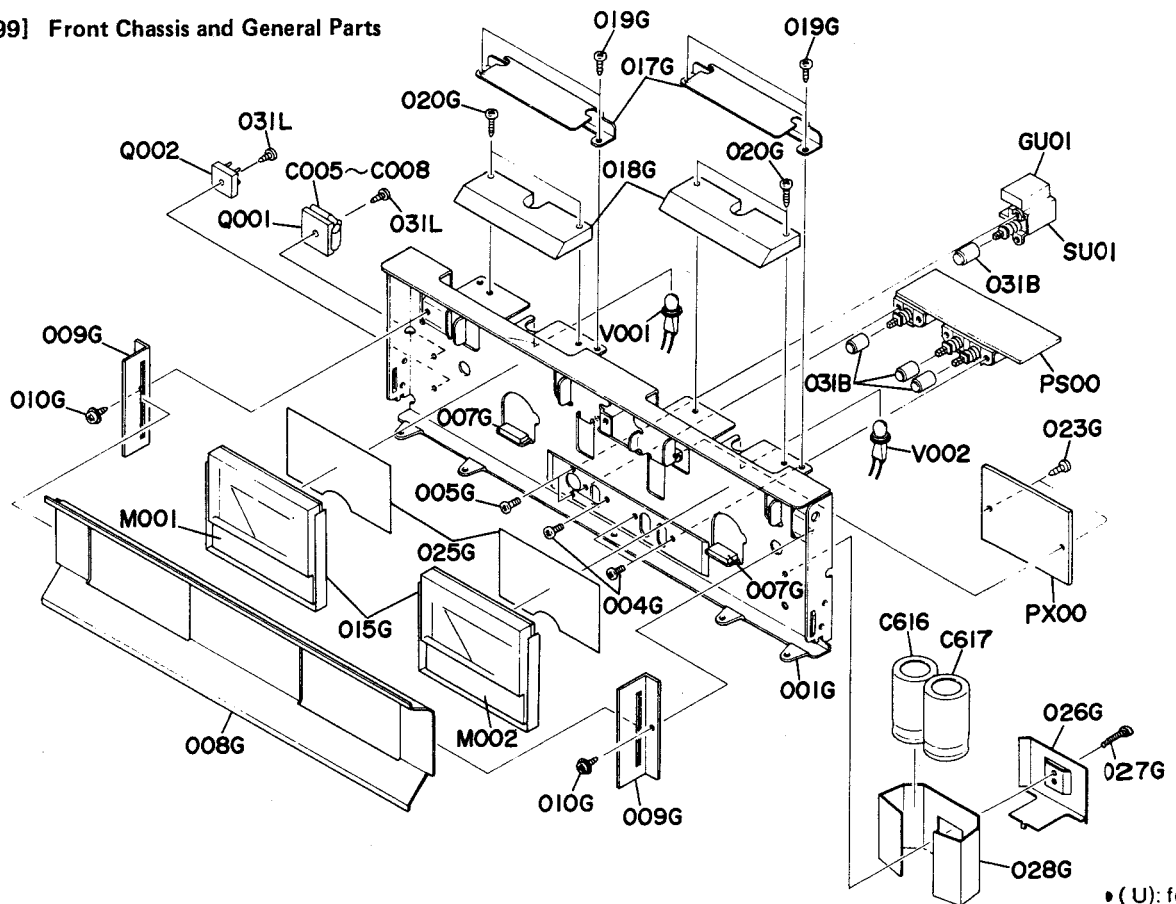


● (U): for U.S.A.
 ● (E): for Europe
 ● (F): for Japan

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
001E	1			222H160230	Bracket, Rear Panel
001E		1		222H160220	Bracket, Rear Panel
001E			1	222H160210	Bracket, Rear Panel
002E	4	4	4	51100308Z9	B.H.M. Screw B3 x 8
003E	2	2	2	51260308Z0	B.T. Screw B3 x 8
005E	1			1455259090	Bushing, AC Power Cord
005E		1		1455259050	Bushing, AC Power Cord
005E			1	1455259120	Bushing
007E	2	2	2	51260308Z0	B.T. Screw B3 x 8
008E	1	1	1	62040029W0	Lug, GND
009E	8	8	8	54040502A0	Spring Washer
012E	1			201H053030	Cover, Voltage Selector
013E		2		51280308U0	B.H. Tapped Screw B3 x 8
014E		2		51280308U0	B.H. Tapped Screw B3 x 8
022E	2	2	2	51260308Z0	B.T. Screw B3 x 8
023E	1	1	1	221H267010	Heatsink
024E	4	4	4	51780312Z0	B.T. Screw, Fin Neck B3 x 12
025E	4	4	4	54020301Z0	Flat Washsr, P
026E	1	1	1	2112265010	Indicator, Serial No.
027E		1		4581861010	Label
028E	1			404H160030	Bracket
029E	1			51260308Z0	B.T. Screw B3 x 8
030E	1			51260306Z0	B.T. Screw B3 x 6
△C009		1		DF76104120	Film Cap. 0.1μF ±10%
△C010		1		DF76332570	Film Cap. 3300pF ±10%
C011		1		DF76332570	Film Cap. 3300pF ±10%
△R005		1		RC10104120	Resistor 100KΩ ±10% 1/4W

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
△F001	1			FS10800020	Fuse 8A 250V
△F001		1		FS10400900	Fuse 4A 250V
△F001			1	FS10800600	Fuse 8A 250V
△J001	1			YJ08000310	Jack, Fuse Holder
△J001		1		YJ08000290	Jack, Fuse Holder
△J001			1	YJ08000300	Jack, Fuse Holder
△J021	1	1		YJ04000910	Jack, AC Outlet
△J022	1	1		YJ04000910	Jack, AC Outlet
△J091	1	1		BY05080010	Voltage Selector
J031	1	1	1	YT01010050	Terminal, GND
JV01	1	1	1	YT02020170	Terminal, (2P) RCA Pin Jack
JW01	1	1	1	YT01010100	Terminal, SPK System 1; Red
JW02	1	1	1	YT01010110	Terminal, SPK System 1; Black
JW03	1	1	1	YT01010100	Terminal, SPK System 1; Red
JW04	1	1	1	YT01010110	Terminal, SPK System 1; Black
JW05	1	1	1	YT01010100	Terminal, SPK System 2; Red
JW06	1	1	1	YT01010110	Terminal, SPK System 2; Black
JW07	1	1	1	YT01010100	Terminal, SPK System 2; Red
JW08	1	1	1	YT01010110	Terminal, SPK System 2; Black
△W001	1			YC02000160	A.C. Power Cord
△W001		1		YC01900090	A.C. Power Cord
△W001			1	YC01800240	A.C. Power Cord

● [P01-99] Front Chassis and General Parts

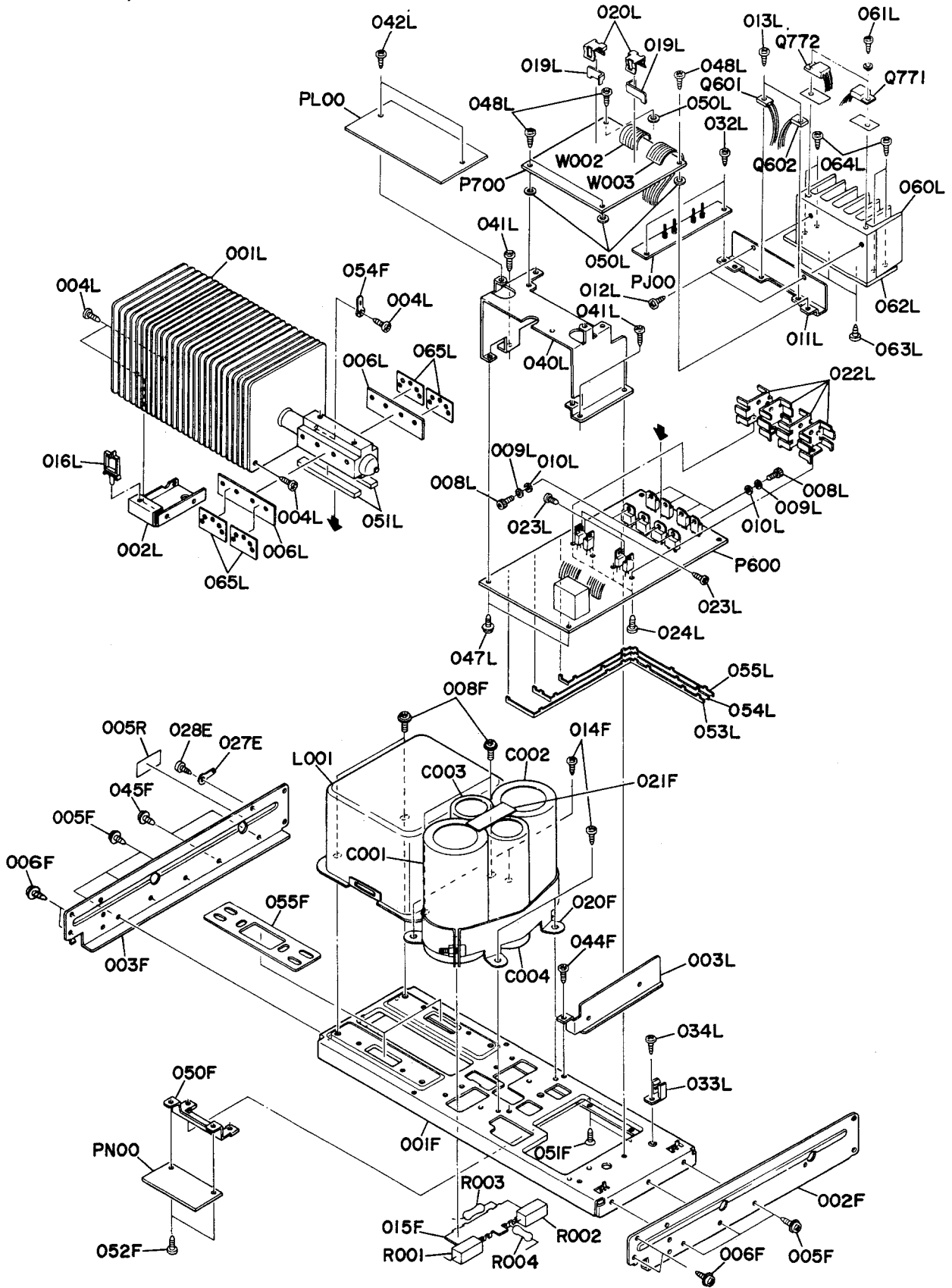


● (U): for U.S.A.
 ● (E): for Europe
 ● (F): for Japan

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
031B	4	4	4	2970154630	Knob, Push Switch
001G	1	1		201H160010	Bracket, Front Chassis
001G			1	201H160110	Bracket, Front Chassis
004G	4	4	4	51100306A9	B.H.M. Screw B3 x 6
005G	2	2	2	51100308Z9	B.H.M. Screw B3 x 8
007G	2	2	2	201H118010	Spacer
008G	1	1	1	222H063030	Escutcheon, Meter
009G	2	2	2	201H053120	Cover
010G	2	2	2	51260308Z0	B.T. Screw B3 x 8
015G	2	2	2	201H053010	Cover, Meter
017G	2	2	2	201H274010	Reflector, Meter
018G	2	2	2	201H274020	Reflector, Meter
019G	4	4	4	51260308Z0	B.T. Screw B3 x 8
020G	4	4	4	51280312Z0	B.H. Tapped Screw B3 x 12
023G	2	2	2	51260306Z0	B.T. Screw B3 x 6
025G	2	2	2	201H303010	Mask, Meter
026G			1	205H160110	Bracket
027G			1	51400335P0	B.H. Tapped Screw B3 x 35
028G			1	205H120010	Insulator

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
M001	1	1	1	IM11098020	D.C. Meter
M002	1	1	1	IM11098020	D.C. Meter
V001	1	1	1	IN10080540	Lamp, 8V 300mA
V002	1	1	1	IN10080540	Lamp, 8V 300mA
GU01	1			BF10400030	Cap. Comp. 0.1 μF + 120Ω
GU01		1		DK18103840	Ceramic 0.1 μF
GU01			1	DF16104510	Film Cap. 0.1 μF ±10%
ΔSU01	1			SP01010550	Push Switch, Power
ΔSU01		1		SP01010560	Push Switch, Power
ΔSU01			1	SP01010540	Push Switch, Power
031L	2	2	2	51280312Z0	B.H. Tapped Screw B3 x 12
C005	1	1	1	DF17104520	Film Cap. 0.1 μF ±20% 200V
C006	1	1	1	DF17104520	Film Cap. 0.1 μF ±20% 200V
C007	1	1	1	DF17104520	Film Cap. 0.1 μF ±20% 200V
C008	1	1	1	DF17104520	Film Cap. 0.1 μF ±20% 200V
C616			1	EC68710010	Elect. Cap. 680 μF 100V
C617			1	EC68710010	Elect. Cap. 680 μF 100V
ΔQ001	1	1	1	HD20004290	Diode S51B -20
ΔQ002	1	1	1	HD20022290	Diode S41B -20

• [P02-99] Main Amp. P.W. Board and Heatsink

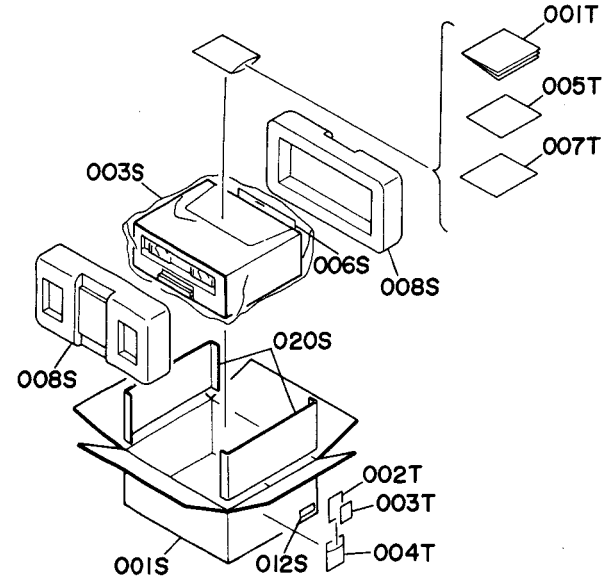


- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

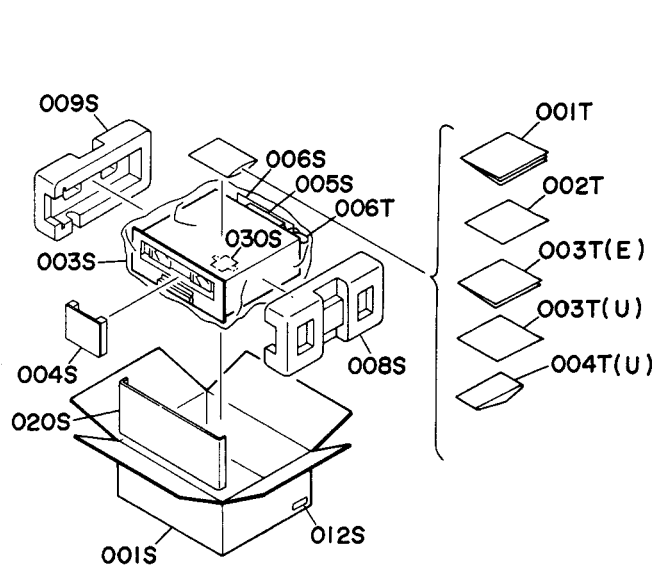
REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
001F	1	1		2144105010	Chassis, Center
001F			1	2144105110	Chassis, Center
002F	1	1		2979105220	Chassis, Side (R)
002F			1	2979105120	Chassis, Side (R)
003F	1	1		2979105230	Chassis, Side (L)
003F			1	2979105130	Chassis, Side (L)
005F	6	6	6	51260408Z0	B.T. Screw B4 x 8
006F	4	4	4	51260308Z0	B.T. Screw B3 x 8
008F	4	4	4	51480406Z9	F. Washer Screw F4 x 6
014F	4	4	4	51260308Z0	B.T. Screw B3 x 8
015F	1	1	1	221H123010	Contacto
020F	1	1	1	221H160010	Bracket
021F	1	1	1	221H067010	Cap
044F	1	1	1	51260308Z0	B.T. Screw B3 x 8
045F	2	2	2	51260308Z0	B.T. Screw B3 x 8
050F	1	1		2144160090	Bracket
050F			1	2144160190	Bracket
051F	2	2	2	51500308Z0	F.H. Tapped Screw F3 x 8
052F	2	2	2	51280306Z0	B.H. Tapped Screw B3 x 6
054F	1	1	1	62030049W0	Lug
055F			2	222H0530Z0	Cover
901F			1	62030039W0	Lug
902F			1	51280308B0	B.H. Tapped Screw B3 x 8
001L	1	1	1	222H2670Z0	Heatsink
002L	1	1		2144160040	Bracket
002L			1	2144160140	Bracket
003L	1	1		2144160050	Bracket
003L			1	2144160150	Bracket
004L	4	4	4	51260306Z0	B.T. Screw B3 x 6
006L	2	2	2	201H120010	Insulator
008L	8	8	8	52730310Z9	H.S. Heat Bolt H3 x 10
009L	8	8	8	54020301E0	Flat Washer, P.
010L	8	8	8	54040302N0	Spring Washer
011L	1	1		222H160030	Bracket
011L			1	222H160130	Bracket
012L	2	2	2	51260308Z0	B.T. Screw B3 x 8
013L	2	2	2	51260308Z0	B.T. Screw B3 x 8
016L	1	1	1	28860050Z0	Clamper
019L	2	2	2	2990267080	Heatsink
020L	2	2	2	201H115010	Spring
022L	4	4	4	22122670Z0	Heatsink
023L	4	4	4	51260308Z0	B.T. Screw B3 x 8
024L	4	4	4	51280308Z0	B.H. Tapped Screw B3 x 8
032L	2	2	2	51260308Z0	B.T. Screw B3 x 8
033L	1	1	1	2887005110	Clamper
034L	1	1	1	51280308Z0	B.H. Tapped Screw B3 x 8
040L	1	1	1	2144160160	Bracket
041L	3	3	3	51260308Z0	B.T. Screw B3 x 8
042L	2	2	2	51260308Z0	B.T. Screw B3 x 8
047L	2	2	2	51260306Z0	B.T. Screw B3 x 6
048L	4	4	4	51260306Z0	B. Tapped Screw B3 x 6
050L	4	4	4	59030808P0	Washer
051L	2	2	2	2144118010	Spacer

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
053L	1	1	1	2144123040	Contacto
054L	1	1	1	2144123050	Contacto
055L	1	1	1	2144123060	Contacto
060L	1	1	1	222H267030	Heatsink (1)
061L	2	2	2	51100308Z9	B.H.M. Screw B3 x 8
062L	1	1	1	222H267040	Heatsink (2)
063L	3	3	3	51280312Z0	B.H. Tapped Screw B3 x 12
064L	4	4	4	51280312Z0	B.H. Tapped Screw B3 x 12
065L			4	222H053010	Cover
027E			1	62030039W0	Lug
028E			1	51280308Z0	B.H. Tapped Screw B3 x 8
005R			1	28828610Z0	Label
C001	1	1	1	EC229075Z0	Elect Cap. 22000µF 75V
C002	1	1	1	EC229075Z0	Elect Cap. 22000µF 75V
C003	1	1	1	EC20903510	Elect Cap. 20000µF 35V
C004	1	1	1	EC20903510	Elect Cap. 20000µF 35V
△L001	1			TS60508080	Power Transformer
△L001			1	TS60508070	Power Transformer
△L001			1	TS60508060	Power Transformer
R001	1	1	1	GS10222030	Resistor 2.2KΩ ±10% 3W
R002	1	1	1	GS10222030	Resistor 2.2KΩ ±10% 3W
△R003	1	1	1	GJ053320Z0	Resistor 3.3KΩ ±10% 2W
△R004	1	1	1	GJ051320Z0	Resistor 1.3KΩ ±10% 2W
W002	1	1	1	YU08200260	Jumper Lead, (8P) 200mm
W003	1	1	1	YU06200260	Jumper Lead, (6P) 200mm
Q601	1	1	1	HT315681S0	Transistor 2SC1681(S)
Q602	1	1	1	HT315681S0	Transistor 2SC1681(S)
Q771	1	1	1	HT322382E0	Transistor 2SC2238(O or Y)
Q772	1	1	1	HT109682E0	Transistor 2SC168(O or Y)

● [H01-99] Packing Materials



(F) TYPE



(U,E) TYPE

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
001S	1			222H801020	Packing Case
001S		1		222H801010	Packing Case
001S			1	222H801030	Packing Case
003S	1	1		9090808030	Polyethylene Sheet
003S			1	9091111030	Polyethylene Sheet
004S	1	1		2144809020	Cushion
004S			1	204H053010	Cover
005S			1	2864804010	Sleeve
006S	1	1		2864804010	Sheet
008S	1	1		2139809010	Cushion, (R)
008S			2	205H809010	Cushion
009S	1	1		2139809020	Cushion, (L)
012S	2			9526019010	Serial No. Card
012S		2		9526019060	Serial No. Card
012S			2	9526019040	Serial No. Card
020S	1	1		2144807010	Reinforcing
020S			2	205H807010	Reinforcing
030S			1	2731821010	Silicagel

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
001T	1			222H851010	Instructions
001T		1		222H851310	Instructions
001T			1	222H851110	Instructions
002T	1			222H851020	Instruction, Spec
002T			1	222H851320	Instruction, Spec
002T			1	9631000130	Guarantee Card
003T	1			103H854010	Guarantee Card
003T			1	222H856010	Circuit Diagram
004T	1			2225813010	Envelope
004T			1	128T854010	Guarantee Card
006T	1			9560000100	Hang Tag
007T			1	9611000030	User's Card

10. ELECTRICAL PARTS LIST

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
P600	1	1	1	YK222H1310 ZZ222H8310	P600-POWER AMP. CIRCUIT BOARD P.W. Board, Power Amp. P.W. Board Assembly
P600-CAPACITORS					
C601	1	1	1	DF55271510	Film 270pF ±5%
C602	1	1	1	DF55271510	Film 270pF ±5%
C603	1	1	1	EA10703560	Elect 100μF 35V
C604	1	1	1	EA10703560	Elect 100μF 35V
C605	1	1	1	DF16104350	Film 0.1μF ±10%
C606	1	1	1	DF16104350	Film 0.1μF ±10%
C613	1	1	1	EA10505030	Elect 1μF 50V
C614	1	1	1	EA47602530	Elect 47μF 25V
C615	1	1	1	EA22601630	Elect 22μF 16V
C616	1	1	1	EA22710030	Elect 220μF 10V
C617	1	1	1	EA22710030	Elect 220μF 10V
C623	1	1	1	DF16473350	Film 0.047μF ±10%
C624	1	1	1	DF16473350	Film 0.047μF ±10%
C626	1	1	1	EA10602530	Elect 10μF 25V
C629	1	1	1	DF16473350	Film 0.047μF ±10%
C630	1	1	1	DF16473350	Film 0.047μF ±10%
C632	1	1	1	DF16222350	Film 2200pF ±10%
C633	1	1	1	DF16105540	Film 1μF ±10%
C634	1	1	1	DF16105540	Film 1μF ±10%
P600-RESISTORS (All Resistors are ±5% and ¼W)					
R601	1	1	1	GD05472140	4.7KΩ
R602	1	1	1	GD05472140	4.7KΩ
R603	1	1	1	GD05153140	15KΩ
R604	1	1	1	GD05153140	15KΩ
R605	1	1	1	GD05103140	10KΩ
R606	1	1	1	GD05103140	10KΩ
R607	1	1	1	GD05273140	27KΩ
R608	1	1	1	GD05273140	27KΩ
R609	1	1	1	GD05273140	27KΩ
R610	1	1	1	GD05273140	27KΩ
R611	1	1	1	GD05821140	820Ω
R612	1	1	1	GD05821140	820Ω
R613	1	1	1	GG05470140	47Ω
R614	1	1	1	GG05470140	47Ω
R615	1	1	1	GG05470140	47Ω
R616	1	1	1	GG05470140	47Ω
R617	1	1	1	GG05471140	470Ω
R618	1	1	1	GG05471140	470Ω
R619	1	1	1	GA05562010	5.6KΩ
R620	1	1	1	GA05562010	5.6KΩ
R621	1	1	1	GG05330140	33Ω
R622	1	1	1	GG05330140	33Ω
R623	1	1	1	GG05330140	33Ω
R624	1	1	1	GG05330140	33Ω
R625	1	1	1	GG05470140	47Ω
R626	1	1	1	GG05470140	47Ω
R627	1	1	1	75061001P0	Jumper
R628	1	1	1	75061001P0	Jumper
R629	1	1	1	GG05220140	22Ω
R630	1	1	1	GG05220140	22Ω

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
R631	1	1	1	GG05220140	22Ω
R632	1	1	1	GG05220140	22Ω
R633	1	1	1	GG05220140	22Ω
R634	1	1	1	GG05220140	22Ω
R635	1	1	1	GG05220140	22Ω
R636	1	1	1	GG05220140	22Ω
R637	1	1	1	GO10272050	0.27Ω ±10% 5W
R638	1	1	1	GO10272050	0.27Ω ±10% 5W
R639	1	1	1	GO10272050	0.27Ω ±10% 5W
R640	1	1	1	GO19272050	0.27Ω ±10% 5W
R641	1	1	1	GO10272050	0.27Ω ±10% 5W
R642	1	1	1	GO10272050	0.27Ω ±10% 5W
R643	1	1	1	GO10272050	0.27Ω ±10% 5W
R644	1	1	1	GO10272050	0.27Ω ±10% 5W
R645	1	1	1	GD05472140	4.7KΩ
R646	1	1	1	GD05472140	4.7KΩ
R649	1	1	1	GD05682140	6.8KΩ
R650	1	1	1	GD05102140	1KΩ
R651	1	1	1	GD05273140	27KΩ
R652	1	1	1	GD05273140	27KΩ
R657	1	1	1	GD05823140	82KΩ
R658	1	1	1	GD05823140	82KΩ
R659	1	1	1	GD05154140	150KΩ
R660	1	1	1	GD05183140	18KΩ
R661	1	1	1	GD05473140	47KΩ
R662	1	1	1	GD05473140	47KΩ
R663	1	1	1	GD05474140	470KΩ
R664	1	1	1	GD05273140	27KΩ
R666	1	1	1	GD05223140	22KΩ
R667	1	1	1	GG05183120	18KΩ ¼W
R671	1	1	1	GA05562010	5.6KΩ 1W
R672	1	1	1	GA05562010	5.6KΩ 1W
R673	1	1	1	GJ05100010	10Ω 1W
R679	1	1	1	GD05471140	470Ω
R680	1	1	1	GD05471140	470Ω
P600-SEMICONDUCTORS					
Q601	1	1	1	HT315681S0	Transistor 2S(1568(S)
Q602	1	1	1	HT315681S0	Transistor 2S(1568(S)
Q603	1	1	1	HT110152A0	Transistor 2S(1015(O or Y)
Q604	1	1	1	HT110152A0	Transistor 2S(1015(O or Y)
Q605	1	1	1	HT326322R0	Transistor 2S(2632(R or S)
Q606	1	1	1	HT326322R0	Transistor 2S(2632(R or S)
Q607	1	1	1	HT111242R0	Transistor 2S(1124(R or S)
Q608	1	1	1	HT111242R0	Transistor 2S(1124(R or S)
Q609	1	1	1	HT325912B0	Transistor 2S(2591(Q or R)
Q610	1	1	1	HT111112B0	Transistor 2S(1111(Q or R)

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
Q611	1	1	1	HT325912B0	Transistor 2SC2591(Q or R)
Q612	1	1	1	HT111112B0	Transistor 2SA1111(Q or R)
Q613	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
Q614	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
Q615	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
Q616	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
Q617	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
Q618	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
Q619	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
Q620	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
Q621	1	1	1	HT318152A0	Transistor 2SC1815(O or Y)
Q622	1	1	1	HT318152A0	Transistor 2SC1815(O or Y)
Q623	1	1	1	HT110152A0	Transistor 2SA1015(O or Y)
Q624	1	1	1	HC10042050	IC TA7317P
Q625	1	1	1	HD20014010	Diode 1S2471G
Q626	1	1	1	HD20014010	Diode 1S2471G
Q627	1	1	1	HD20014010	Diode 1S2471G
Q628	1	1	1	HD20014010	Diode 1S2471G
Q629	1	1	1	HD20022030	Diode DSF-10C-BT
Q630	1	1	1	HD20022030	Diode DSF-10C-BT
Q631	1	1	1	HD20022030	Diode DSF-10C-BT
Q632	1	1	1	HD20022030	Diode DSF-10C-BT
Q633	1	1	1	HD20011010	Diode W06C
Q634	1	1	1	HD20011010	Diode W06C
Q635	1	1	1	HD20011010	Diode W06C
Q636	1	1	1	HD20011010	Diode W06C
Q639	1	1	1	HD20011050	Diode 1S1555
Q640	1	1	1	HD20025100	Diode 10DF-2
△Q642	1	1	1	HD20011010	Diode W06C
△Q643	1	1	1	HD20011010	Diode W06C
△Q644	1	1	1	HD20011010	Diode W06C
△Q645	1	1	1	HD20011010	Diode W06C
Q647	1	1	1	HD20011050	Diode 1S1555
Q648	1	1	1	HD20011050	Diode 1S1555
Q649	1	1	1	HD30064090	Zener BZ-240
L603	1	1	1	LY20480060	P600-MISCELLANEOUS Relay, 48V DC AR3423
P700	1	1	1	YK222H1320	P700-VOLTAGE AMP. CIRCUIT BOARD P.W. Board, Voltage Amp.
	1	1		ZZ222H8320	P.W. Board Assembly
C701	1	1	1	DF55221520	Film 220pF ±5%
C702	1	1	1	DF55221520	Film 220pF ±5%
C703	1	1	1	DF55271520	Film 270pF ±5%
C704	1	1	1	DF55271520	Film 270pF ±5%
C709	1	1	1	DF35270520	Mica 27pF ±10%
C710	1	1	1	DF35270520	Mica 27pF ±10%
C711	1	1	1	DF16474520	Film 0.47μF ±10%
C712	1	1	1	DF16474520	Film 0.47μF ±10%
C713	1	1	1	DF16102350	Film 0.001μF ±10%
C714	1	1	1	DF16102350	Film 0.001μF ±10%

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
C715	1	1	1	EA47701630	Elect 470μF 16V
C716	1	1	1	EA47701630	Elect 470μF 16V
C773	1	1	1	EA47601630	Elect 47μF 16V
C775	1	1	1	EA10710030	Elect 100μF 100V
C775	1	1	1	EA22710060	Elect 220μF 100V
C776	1	1	1	EA10710030	Elect 100μF 100V
C776	1	1	1	EA22710060	Elect 220μF 100V
C777	1	1	1	DF16102510	Film 1000pF ±10%
C778	1	1	1	DF16102510	Film 1000pF ±10%
C779	1	1	1	DF16102510	Film 1000pF ±10%
C780	1	1	1	DF16102510	Film 1000pF ±10%
					P700-RESISTOR (All Resistor are ±5% and ¼W)
R701	1	1	1	GD05473140	47KΩ
R702	1	1	1	GD05473140	47KΩ
R703	1	1	1	GM21410010	1KΩ
R704	1	1	1	GM21410010	1KΩ
R705	1	1	1	GD05561140	560Ω
R706	1	1	1	GD05561140	560Ω
R707	1	1	1	GD05561140	560Ω
R708	1	1	1	GD05561140	560Ω
R709	1	1	1	GD05222140	2.2KΩ
R710	1	1	1	GD05222140	2.2KΩ
R711	1	1	1	GD05222140	2.2KΩ
R712	1	1	1	GD05222140	2.2KΩ
R713	1	1	1	GD05102140	1KΩ
R714	1	1	1	GD05102140	1KΩ
R715	1	1	1	GD05102140	1KΩ
R716	1	1	1	GD05102140	1KΩ
R717	1	1	1	GD05473140	47KΩ
R718	1	1	1	GD05473140	47KΩ
R721	1	1	1	GD05101140	100Ω
R722	1	1	1	GD05101140	100Ω
R723	1	1	1	GD05561140	560Ω
R724	1	1	1	GD05561140	560Ω
R725	1	1	1	GD05154140	150KΩ
R726	1	1	1	GD05154140	150KΩ
R727	1	1	1	GD05682140	6.8KΩ
R728	1	1	1	GD05682140	6.8KΩ
R729	1	1	1	GD05181140	180Ω
R730	1	1	1	GD05181140	180Ω
R731	1	1	1	GD05561140	560Ω
R732	1	1	1	GD05561140	560Ω
R733	1	1	1	GD05472140	4.7KΩ
R734	1	1	1	GD05472140	4.7KΩ
R735	1	1	1	GD05472140	4.7KΩ
R736	1	1	1	GD05472140	4.7KΩ
R737	1	1	1	GD05472140	4.7KΩ
R738	1	1	1	GD05472140	4.7KΩ
R739	1	1	1	GD05472140	4.7KΩ
R740	1	1	1	GD05472140	4.7KΩ
R741	1	1	1	GG05331140	330Ω
R742	1	1	1	GG05331140	330Ω

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
R743	1	1	1	GG05331140	330Ω
R744	1	1	1	GG05331140	330Ω
R749	1	1	1	GD05123140	12KΩ
R750	1	1	1	GD05123140	12KΩ
R751	1	1	1	GA05272020	2.7KΩ 2W
R752	1	1	1	GA05182020	1.8KΩ 2W
R753	1	1	1	GD05473140	47KΩ
R754	1	1	1	GD05473140	47KΩ
R755	1	1	1	GD05222140	2.2KΩ
R756	1	1	1	GD05222140	2.2KΩ
R757	1	1	1	GD05222140	2.2KΩ
R758	1	1	1	GD05222140	2.2KΩ
R759	1	1	1	GD05102140	1KΩ
R760	1	1	1	GD05102140	1KΩ
R761	1	1	1	GD05474140	470KΩ
R762	1	1	1	GD05474140	470KΩ
R763	1	1	1	GD05474140	470KΩ
R764	1	1	1	GD05474140	470KΩ
R771	1	1	1	GD05102140	1KΩ
R772	1	1	1	GD05102140	1KΩ
R777	1	1	1	GA05153010	15KΩ 1W
R779	1	1	1	GD05123140	12KΩ
R780	1	1	1	GD05473140	47KΩ
R781	1	1	1	GD05332140	3.3KΩ
R782	1	1	1	GD05473140	47KΩ
R783	1	1	1	GD05821140	820Ω
R785	1	1	1	GD05333140	33KΩ
R786	1	1	1	GD05333140	33KΩ
P700-SEMICONDUCTORS					
Q701	1	1	1	HC10042060	IC μPA68H
Q702	1	1	1	HC10042060	IC μPA68H
Q703	1	1	1	HT322592F0	Transistor 2SC2259(F or G)
Q704	1	1	1	HT322592F0	Transistor 2SC2259(F or G)
Q705	1	1	1	HT108722B0	Transistor 2SA872(D or E) x 2
Q706	1	1	1	HT108722B0	Transistor 2SA872(D or E) x 2
Q707	1	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q708	1	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q709	1	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q710	1	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q713	1	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q714	1	1	1	HT109702A0	Transistor 2SA970(GR or BL)
Q715	1	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q716	1	1	1	HT322402A0	Transistor 2SC2240(GR or BL)
Q717	1	1	1	HT111242R0	Transistor 2SA1124(R or S)
Q718	1	1	1	HT111242R0	Transistor 2SA1124(R or S)
Q719	1	1	1	HT326322R0	Transistor 2SC2632(R or S)
Q720	1	1	1	HT326322R0	Transistor 2SC2632(R or S)
Q721	1	1	1	HC10019020	IC AN6552
Q722	1	1	1	HC10019020	IC AN6552

REF. DESIG.	QTY			PART NO.	DESCRIPTION
	U	E	F		
Q723	1	1	1	HD30025090	Zener WZ150
Q724	1	1	1	HD30025090	Zener WZ150
Q725	1	1	1	HD20011050	Diode 1S1555
Q726	1	1	1	HD20011050	Diode 1S1555
Q727	1	1	1	HD20011050	Diode 1S1555
Q728	1	1	1	HD20011050	Diode 1S1555
Q729	1	1	1	HD20011050	Diode 1S1555
Q730	1	1	1	HD20011050	Diode 1S1555
Q771	1	1	1	HT322382E0	Transistor 2SC2238(O or Y)
Q772	1	1	1	HT109682E0	Transistor 2SC968(O or Y)
Q773	1	1	1	HT317752D0	Transistor 2SC1775A(D or E)
Q774	1	1	1	HT108722D0	Transistor 2SA872A(D or E)
Q775	1	1	1	HT317752D0	Transistor 2SC1775A(D or E)
Q776	1	1	1	HT108722D0	Transistor 2SA872A(D or E)
Q777	1	1	1	HD30009010	Zener HZ12B2L
Q778	1	1	1	HD60002100	C.R Diode
Q779	1	1	1	HD60002100	C.R Diode
PJ00-TEST POINT CIRCUIT BOARD					
PJ00	1	1	1	YK222H1430	P.W. Board, Test Point
PK00-A-B POWER SWITCH CIRCUIT BOARD					
PK00	1	1	1	YK222H1420	P.W. Board, A-B Power Switch
	1	1		ZZ222H8420	P.W. Board Assembly
PK00-CAPACITOR					
CK01	1	1	1	DD15220370	Ceramic 22pF ±5%
PK00-RESISTORS (All Resistors are ±5% and ¼W)					
RK01	1	1	1	GD05222140	2.2KΩ
RK02	1	1	1	GD05102140	1KΩ
RK03	1	1	1	GD05152140	1.5KΩ
RK04	1	1	1	GD05152140	1.5KΩ
RK05	1	1	1	GD05222140	2.2KΩ
RK06	1	1	1	GD05222140	2.2KΩ
PK00-MISCELLANEOUS					
QK01	1	1	1	HT317752D0	Transistor 2SC1775A(D or E)
QK02	1	1	1	HT108722D0	Transistor 2SA872(D or E)
QK03	1	1	1	HT309452B0	Transistor 2SC945(P or Q)
QK04	1	1	1	HT107332A0	Transistor 2SA733(P or Q)
QK05	1	1	1	HT322382E0	Transistor 2SC2228(O or Y)
QK06	1	1	1	HT109682E0	Transistor 2SA968(O or Y)
QK07	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
QK08	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
QK09	1	1	1	HT328372A0	Transistor 2SC2837(R or O)
QK10	1	1	1	HT111862A0	Transistor 2SA1186(R or O)
QK11	1	1	1	HD20027100	Diode 30DF-2
QK12	1	1	1	HD20027100	Diode 30DF-2

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
PL00	1	1	1	YK222H1410 ZZ222H8410	PL00-A-B DETECTOR CIRCUIT BOARD P.W. Board, A-B Detector P.W. Board Assembly
PL00-CAPACITORS					
CL01	1	1	1	DF15471550	Film 470pF ±5%
CL02	1	1	1	DF15471550	Film 470pF ±5%
CL03	1	1	1	EA10601630	Elect 10μF 16V
CL04	1	1	1	EA10601630	Elect 10μF 16V
CL05	1	1	1	DK16221300	Ceramic 220pF ±10%
CL06	1	1	1	DK16221300	Ceramic 220pF ±10%
CL07	1	1	1	DD15220370	Ceramic 22pF ±5%
CL08	1	1	1	DD15220370	Ceramic 22pF ±5%
CL09	1	1	1	EA10701030	Elect 100μF 16V
CL10	1	1	1	EA10701030	Elect 100μF 16V
CL11	1	1	1	DF16182300	Film 1800pF ±10%
CL12	1	1	1	DF16182300	Film 1800pF ±10%
CL13	1	1	1	DD15220370	Ceramic 22pF ±5%
CL14	1	1	1	EA10601630	Elect 10μF 16V
CL15	1	1	1	EA10602530	Elect 10μF 25V
CL16	1	1	1	EA10602530	Elect 10μF 25V
CL17	1	1	1	DD15101370	Ceramic 100pF ±5%
CL18	1	1	1	DD15101370	Ceramic 100pF ±5%
PL00-RESISTORS (All Resistors are ±5% and ¼W)					
RL01	1	1	1	GD05103140	10KΩ
RL02	1	1	1	GD05103140	10KΩ
RL03	1	1	1	GD05472140	4.7KΩ
RL04	1	1	1	GD05472140	4.7KΩ
RL05	1	1	1	GD05472140	4.7KΩ
RL06	1	1	1	GD05472140	4.7KΩ
RL07	1	1	1	GD05103140	10KΩ
RL08	1	1	1	GD05103140	10KΩ
RL09	1	1	1	RA05020130	4.7KΩ, Trimming
RL10	1	1	1	RA05020130	4.7KΩ, Trimming
RL11	1	1	1	GD05222140	2.2KΩ
RL12	1	1	1	GD05222140	2.2KΩ
RL13	1	1	1	GD05104140	100KΩ
RL14	1	1	1	GD05104140	100KΩ
RL15	1	1	1	GD05104140	100KΩ
RL16	1	1	1	GD05104140	100KΩ
RL17	1	1	1	GD05103140	10KΩ
RL18	1	1	1	GD05103140	10KΩ
RL19	1	1	1	GD05102140	1KΩ
RL20	1	1	1	GD05102140	1KΩ
RL21	1	1	1	GD05153140	15KΩ
RL22	1	1	1	GD05153140	15KΩ
RL23	1	1	1	GD05222140	2.2KΩ
RL24	1	1	1	GD05222140	2.2KΩ
RL25	1	1	1	GD05104140	100KΩ
RL26	1	1	1	GD05104140	100KΩ
RL27	1	1	1	GD05104140	100KΩ
RL28	1	1	1	GD05104140	100KΩ
RL29	1	1	1	GD05223140	22KΩ
RL30	1	1	1	GD05223140	22KΩ

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
RL31	1	1	1	RA02220100	2.2KΩ, Trimming
RL32	1	1	1	GD05104140	100KΩ
RL33	1	1	1	GD05473140	47KΩ
RL34	1	1	1	GD05104140	100KΩ
RL35	1	1	1	GD05471140	470Ω
RL36	1	1	1	GD05222140	2.2KΩ
RL37	1	1	1	GD05123140	12KΩ
RL38	1	1	1	GD05123140	12KΩ
RL39	1	1	1	RA01030070	10KΩ, Trimming
RL40	1	1	1	RA01030070	10KΩ, Trimming
RL41	1	1	1	GD05223140	22KΩ
RL42	1	1	1	GD05223140	22KΩ
RL43	1	1	1	RA02230040	22KΩ, Trimming
RL44	1	1	1	RA02230040	22KΩ, Trimming
PL00-SEMICONDUCTORS					
QL01	1	1	1	HC10007090	IC 4560
QL02	1	1	1	HC10013370	IC TL4558
QL03	1	1	1	HC10009090	IC NJM2901
QL04	1	1	1	HC712200A0	IC HD74LS122
QL05	1	1	1	HW10001320	Photo Unit PC627
QL06	1	1	1	HD20001210	Diode 1S2473
QL07	1	1	1	HD20001210	Diode 1S2473
QL08	1	1	1	HD20001210	Diode 1S2473
QL09	1	1	1	HD20001210	Diode 1S2473
QL10	1	1	1	HD20001210	Diode 1S2473
QL11	1	1	1	HD20001210	Diode 1S2473
QL12	1	1	1	HD20001210	Diode 1S2473
QL13	1	1	1	HD20001210	Diode 1S2473
QL14	1	1	1	HD20001210	Diode 1S2473
QL15	1	1	1	HT309452B0	Transistor 2SC945(P on Q)

- (U): for U.S.A.
- (E): for Europe
- (F): for Japan

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
PS00	1	1	1	YN222H2220	PS00-SPEAKER & METER SWITCH CIRCUIT BOARD P.W. Board, Speaker & Meter Switch
	1	1		ZZ222H8220	P.W. Board Assembly
CS01	1	1	1	DF16224300	Film Cap. 0.22 μ F \pm 10%
CS02	1	1	1	DF16224300	Film Cap. 0.22 μ F \pm 10%
SS01	1	1	1	SP04020200	Push Switch, System 1-2
SS02	1	1	1	SP04010270	Push Switch, Meter
PN00	1	1	1	YH22870210	PN00-ASO PROTECTOR CIRCUIT BOARD P.W. Board, ASO Protector
	1	1		ZZ22878210	P.W. Board Assembly
CN01	1	1	1	DF16222350	PN00-CAPACITORS Film 2200pF \pm 10%
	1	1	1	DF16222350	Film 2200pF \pm 10%
	1	1	1	DF16222350	Film 2200pF \pm 10%
	1	1	1	DF16222350	Film 2200pF \pm 10%
RN01	1	1	1	GD05331140	PN00-RESISTORS (All Resistors are \pm 5% and $\frac{1}{4}$ W) 330 Ω
	1	1	1	GD05331140	330 Ω
	1	1	1	GD05331140	330 Ω
	1	1	1	GD05331140	330 Ω
	1	1	1	GD05472140	4.7K Ω
	1	1	1	GD05472140	4.7K Ω
	1	1	1	GD05472140	4.7K Ω
	1	1	1	GD05472140	4.7K Ω
	1	1	1	GD05472140	4.7K Ω
	1	1	1	GD05273140	27K Ω
	1	1	1	GD05273140	27K Ω
	1	1	1	GD05273140	27K Ω
	1	1	1	GD05273140	27K Ω
	1	1	1	GD05273140	27K Ω
QN01	1	1	1	HT309452C0	PN00-SEMICONDUCTORS Transistor 2SC945(P or K)
	1	1	1	HT309452C0	Transistor 2SC945(P or K)
	1	1	1	HT107332C0	Transistor 2SA733(P or K)
	1	1	1	HT107332C0	Transistor 2SA733(P or K)
	1	1	1	HD20011050	Diode 1S1555
	1	1	1	HD20011050	Diode 1S1555
	1	1	1	HD20011050	Diode 1S1555
	1	1	1	HD20011050	Diode 1S1555
	1	1	1	HD20002210	Diode 1S2472
	1	1	1	HD20002210	Diode 1S2472
	1	1	1	HD20002210	Diode 1S2472
	1	1	1	HD20002210	Diode 1S2472
PP00	1			YK222H1440	PP00-CONNECTION CIRCUIT BOARD P.W. Board, Connection
	1			ZZ222H8440	P.W. Board Assembly
Δ JP01	1			YL01010040	Plug
Δ JP02	1			YL01010040	Plug

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	E	F		
PX00	1	1	1	YN222H2210	PX00-METER & SUPPLY CIRCUIT BOARD P.W. Board, Meter & Supply
	1	1		ZZ222H8210	P.W. Board Assembly
CX01	1	1	1	EA47602530	PX00-CAPACITORS Elect 47 μ F 25V
	1	1	1	EA47602530	Elect 47 μ F 25V
	1	1	1	EA10703540	Elect 100 μ F 35V
	1	1	1	EA47601630	Elect 47 μ F 16V
	1	1	1	EA47601630	Elect 47 μ F 16V
	1	1	1	DF16103300	Film 0.01 μ F \pm 10%
	1	1	1	DF16103300	Film 0.01 μ F \pm 10%
RX01	1	1	1	GD05103140	PX00-RESISTORS 10K Ω \pm 5% $\frac{1}{4}$ W
	1	1	1	GD05103140	10K Ω \pm 5% $\frac{1}{4}$ W
	1	1	1	GD05273140	27K Ω \pm 5% $\frac{1}{4}$ W
	1	1	1	GD05273140	27K Ω \pm 5% $\frac{1}{4}$ W
	1	1	1	RA04710040	470 Ω (B), Trimming
	1	1	1	RA04710040	470 Ω (B), Trimming
	1	1	1	GA05561010	560 Ω \pm 5% 1W
	1	1	1	GA05681010	680 Ω \pm 5% 1W
	1	1	1	GA05681020	680 Ω \pm 5% 2W
	1	1	1	GA05152010	1.5K Ω \pm 5% 1W
	1	1	1	GA05152010	1.5K Ω \pm 5% 1W
QX01	1	1	1	HC10041050	PX00-SEMICONDUCTORS IC TA7318P-2
	1	1	1	HD30013010	Zener HZ-15-2L
	1	1	1	HD30013010	Zener HZ-15-2L
	1	1	1	HD30033090	Zener WZ-052
Q003			1	HD20015030	Diode DS135D
			1	HD20015030	Diode DS135D
PW00	1	1	1	YK222H1330	PW00-OUTPUT NETWORK CIRCUIT BOARD P.W. Board Output Network
	1	1		ZZ222H8330	P.W. Board Assembly
CW01	1	1	1	DF17104520	Film 0.1 μ F \pm 20%
CW02	1	1	1	DF17104520	Film 0.1 μ F \pm 20%
RW01	1	1	1	GJ05100030	10 Ω 0.25W
RW02	1	1	1	GJ05100030	10 Ω 0.25W

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

NOTE ON SAFETY :

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

11. TECHNICAL SPECIFICATIONS

AUDIO SECTION

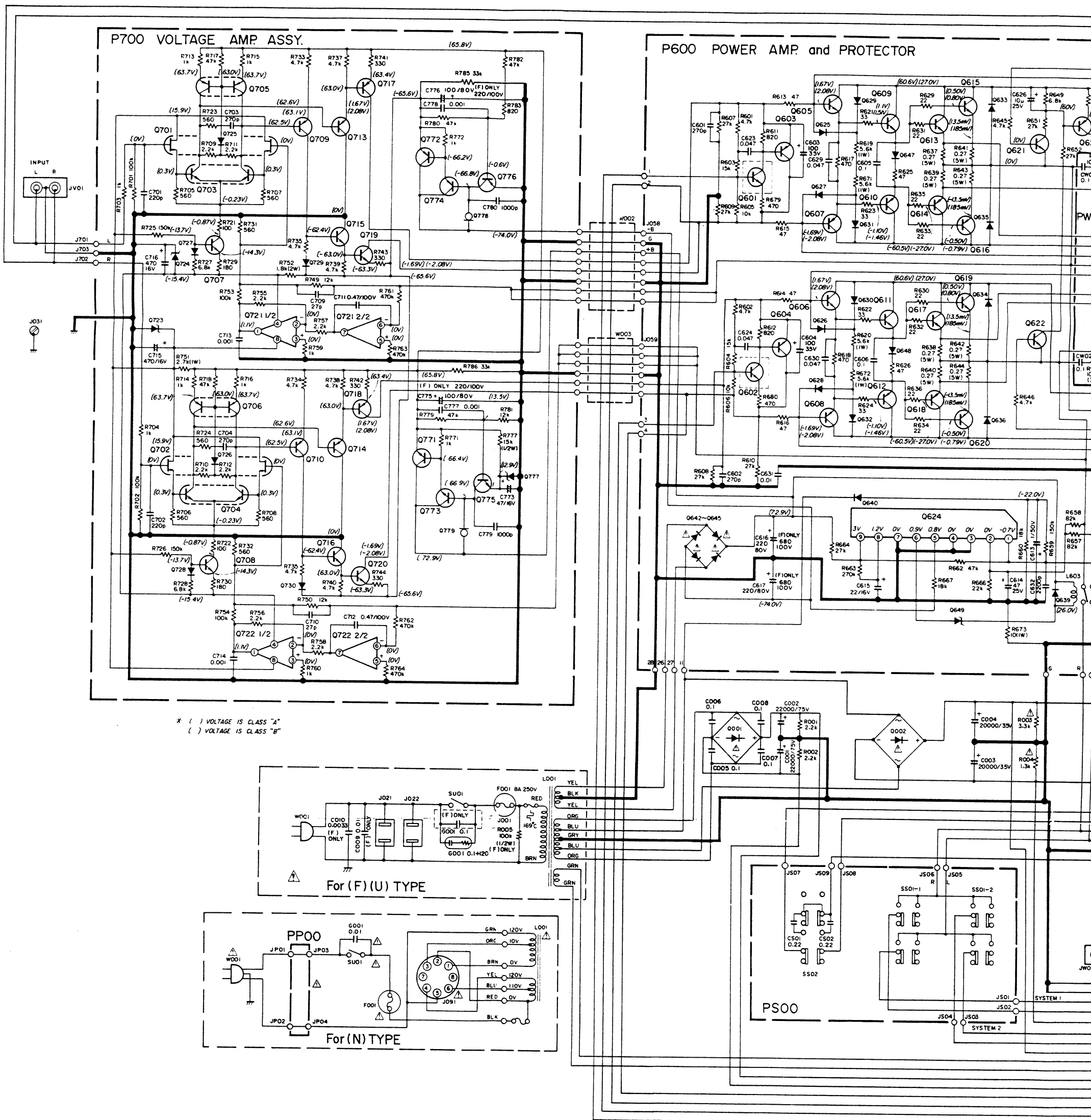
POWER OUTPUT RATING CHANNEL	
4 OHMS RMS (20 Hz – 20 kHz)	140 W
8 OHMS RMS (20 MHz – 20 kHz, Class AB)	120 W
TOTAL HARMONIC DISTORTION AT RMS 8 OHMS	0.015 %
I.M DISTORTION	0.015 %
DAMPING FACTOR 8 OHMS (1 kHz)	100
MAIN IN Sensitivity for Rated Output	1.5 V
MAIN IN Impedance	47 k ohms
Frequency Responce (+0, -1 dB)	5 Hz – 85 kHz
MAIN IN Signal-to-Noise Ratio ("A" Weighted)	110 dB

GENERAL

Power Requirements	110/120/220/240 V AC, 50/60 Hz
	(Voltage selection can be done by external voltage selector.)
Power Consumption (at Rated Output, Both Channels Operating)	450 W
Dimensions	
Panel Width	473.5 mm
Panel Height	172.5 mm
Depth	345 mm
Weight	
Unit alone	16.5 kg

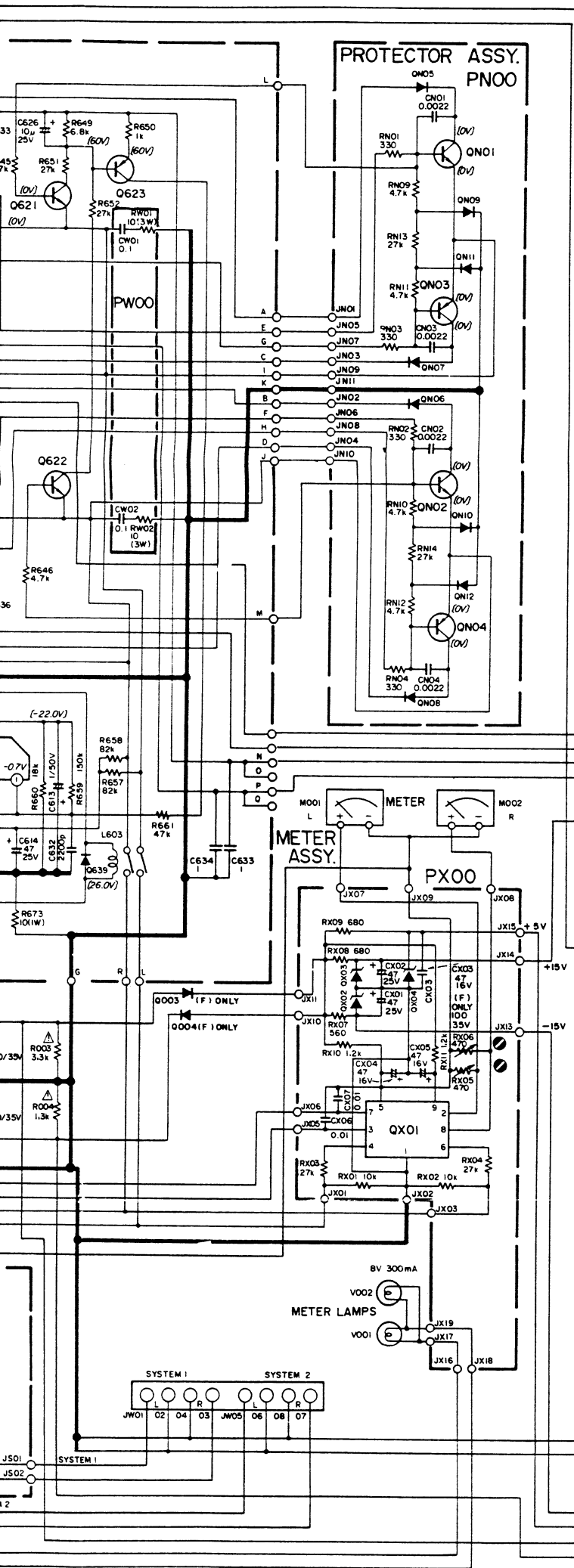
Specifications and appearance are subject to change for modification without notice.

12. SCHEMATIC DIAGRAM

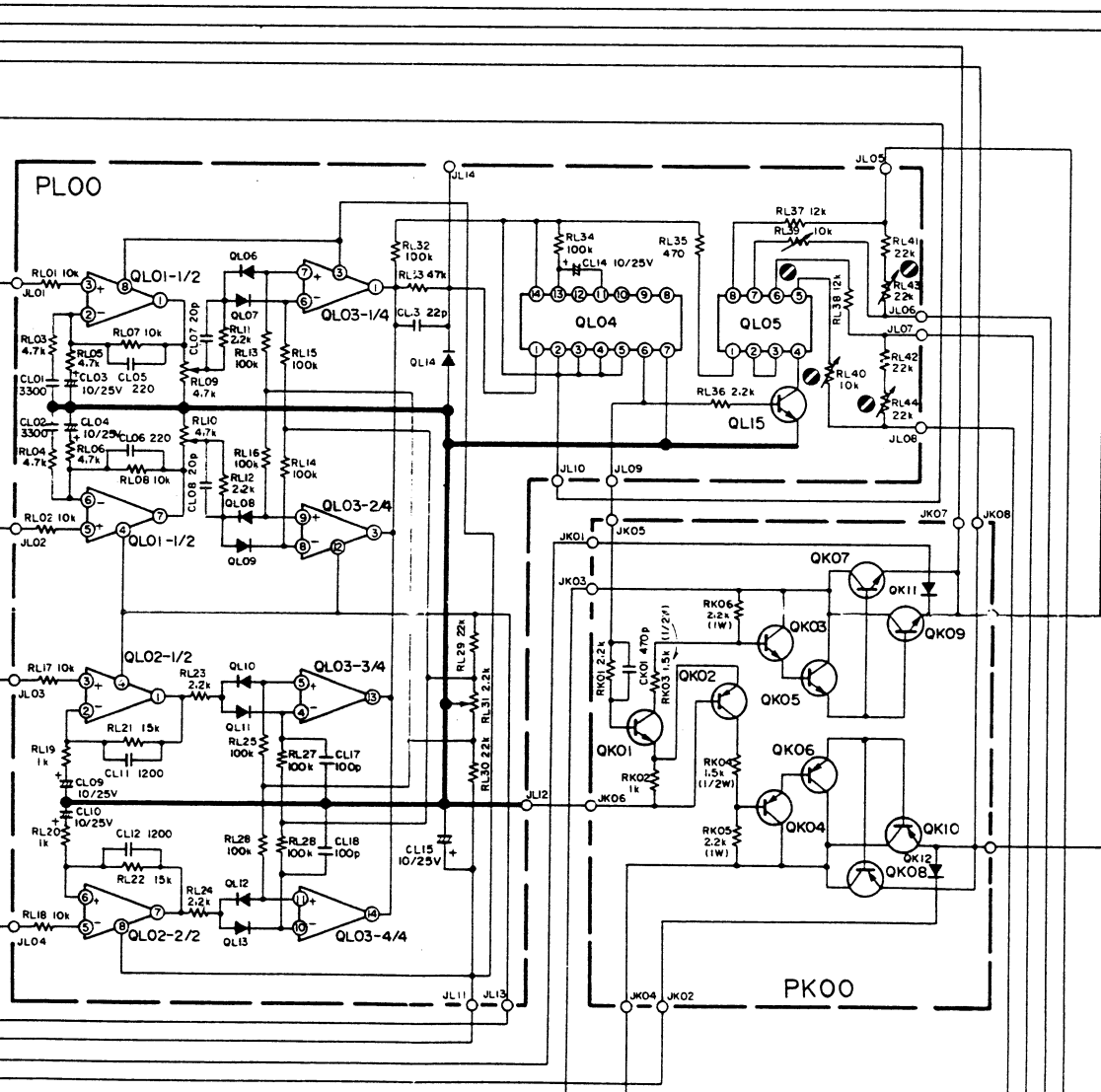
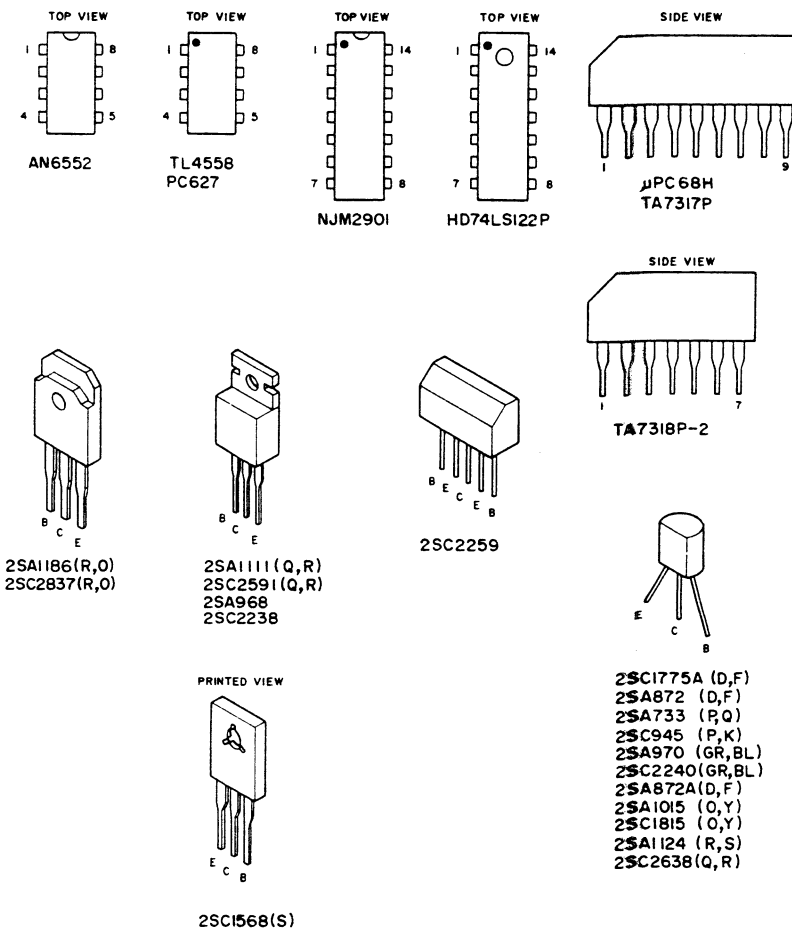


NOTE ON SAFETY :
 Symbol Δ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol Δ . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Model Sm-8



Q601, Q602 2SC1568(S)	Q701, Q702 μPC68H	Q773, Q775 2SC1775A(D,E)	Q002 S4VB-20
Q603, Q604 2SA1015(O,Y)	Q703, Q704 2SC2259(F,G)	Q774, Q776 2SA872A(D,E)	Q003, Q004 DS135D
Q605, Q606 2SC2632(R,S)	Q705, Q706 2SA872(D,E)	Q777 HZI2B2L	QL01, QL02 TL4558
Q607, Q608 2SA1124(R,S)	Q707, Q708 Q715, Q716 2SC2240(GR,BL)	QX0: TA7318P-2	QL03 NJM2901
Q609, Q611 2SC2591(Q,R)	Q709, Q710 Q713, Q714 2SA970(GR,BL)	QX02, QX03 HZI5-2L	QL04 HD74LS122
Q610, Q612 2SA1111(Q,R)	Q717, Q718 2SA1124(R,S)	QX04 WZ-052	QL05 PC627
Q613, Q615 Q617, Q619 2SC2837(R,O)	Q719, Q720 2SC2632(R,S)	QZ01 SLP132B	QL15 2SC945(P,Q)
Q614, Q616 Q618, Q620 2SA1186(R,O)	Q721, Q722 AN6552	QK01 2SC1775A(D,F)	(F) ONLY QK13, QK14 30DF-2
Q621, Q622 2SC1815(O,Y)	Q723, Q724 WZ-150	QK02 2SA872(D,F)	
Q623 2SA1015(O,Y)	Q725 ~ Q730 1S1555	QK03 2SC945(P,Q)	
Q624 TA7317P	QN01, QN02 2SC945(P,K)	QK04 2SA733(P,Q)	
Q625 ~ Q628 1S2471(G)	QN03, QN04 2SA733(P,K)	QK05 2SC2238	
Q629 ~ Q632 DS135D	QN05 ~ QN08 1S1555	QK06 2SA968	
Q642, Q645 Q633 ~ Q636 W06C	QN09 ~ QN12 1S2472	QK07, QK09 2SC2837(R,O)	
Q637 ~ Q639 Q641, Q647, Q648 1S1555	Q771 2SC2238	QK0E, QK10 2SA1186(R,O)	
Q640 10DF-2	Q772 2SA968	QK11, QK12 30DF-2	
Q649 BZ-240	Q773, Q775 10DY1.3	QL06 ~ QL14 1S2473	
		Q001 S5VB-20	



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



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