SHARP **OPTONICA** **SERVICE MANUAL**

SM-1616H
SM-1616HB

STEREO AMPLIFIER

MODEL
SM-1616H
(Silver Panel)
SM-1616HB
(Black Panel)

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

SPECIFICATIONS

GENERAL DESCRIPTION

Power source:	AC 110/220/240V, 50/60Hz
Power consumption:	380W
Semiconductors:	2-IC (Integrated circuit) 24-Transistor 2-FET 17-Diode
Dimensions:	Width: 442 mm (17-7/16″) Height: 144 mm (5-11/16″) Depth: 253 mm (10′)
Weight:	7.8 kg (17.2 lbs.)

MAIN AMPLIFIER

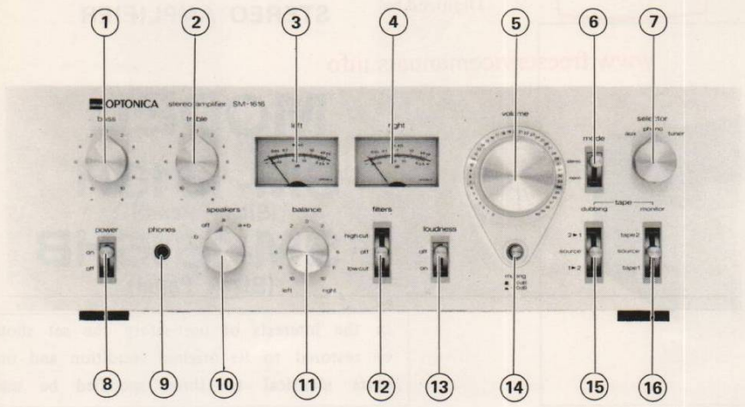
Circuit:	Differential amplifier, complimentary system, OCL (Output Capacitor Less)
Continuous power output (at 1kHz):	2 x 45W/4 ohms, Both channels driven, 0.15% distortion 2 x 40W/8 ohms, Both channels driven, 0.2% distortion
Continuous power output (20Hz ~ 20kHz):	2 x 38W/4 ohms, Both channels driven, 0.15% distortion 2 x 32W/8 ohms, Both channels driven, 0.2% distortion
Intermodulation distortion:	0.05% at 20W
Damping factor:	More than 40 (at 1kHz, 8 ohms)
Power bendwidth:	20Hz~40kHz
Frequency response:	15Hz~60kHz $^{+1dB}_{-3dB}$

PRE-AMPLIFIER

Circuit:	Direct coupled equalizer circuit, 'NF' type tone control
Input sensitivity and input impedance:	
PHONO:	2.5mV/50K ohms
AUX:	150mV/50K ohms
TUNER:	150mV/50K ohms
TAPE PB 1 and 2:	150mV/50K ohms
TAPE PB (DIN socket):	150mV/50K ohms
Output level and loaded impedance:	
REC 1 and 2:	150mV/50K ohms
REC (DIN socket):	30mV/80K ohms
Phone overload:	230mV (RMS, 1kHz, 0.1% THD)
RIAA curve deviation:	±0.4dB
Frequency response:	15Hz~60kHz $^{+1dB}_{-3dB}$ (TAPE, AUX, TAPE PB)
Tone control:	
Bass:	±9dB at 100Hz
Treble:	±9dB at 10kHz
Low filter:	−3dB at 30Hz, 6dB/oct
High filter:	−3dB at 7kHz, 6dB/oct

SHARP CORPORATION OSAKA, JAPAN

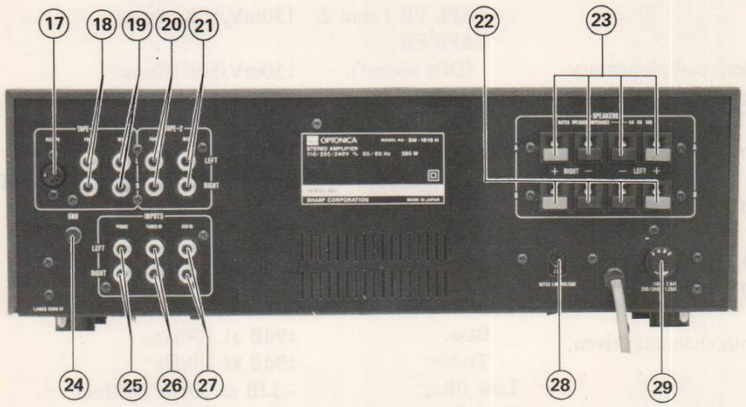
LAYOUT OF FRONT PARTS



① Bass Control
② Treble Control
③ Output Meter (Left)
④ Output Meter (Right)
⑤ Volume Control
⑥ Mode selector
⑦ Function Selector
⑧ Power Switch
⑨ Headphones Jack
⑩ Speakers Switch
⑪ Balance Control
⑫ Low and High Filter
⑬ Loudness Switch
⑭ Muting Switch
⑮ Tape-Dubbing Switch
⑯ Tape-Monitor Switch

Figure 1

LAYOUT OF REAR PARTS



⑰ REC/PB (DIN) Socket
⑱ Tape 1 (Playback) Jack
⑲ Tape 1 (Recording output) Jack
⑳ Tape 2 (Playback) Jack
㉑ Tape 2 (Recording output) Jack
㉒ Speakers Terminal B
㉓ Speakers Terminal A
㉔ GND Terminal
㉕ Input (Phono) Jacks
㉖ Input (Tuner) Jacks
㉗ Input (Auxiliary) Jacks
㉘ Mains Voltage Selector Socket
㉙ Fuse Holder

Figure 2

DISASSEMBLY (See Figure 3)

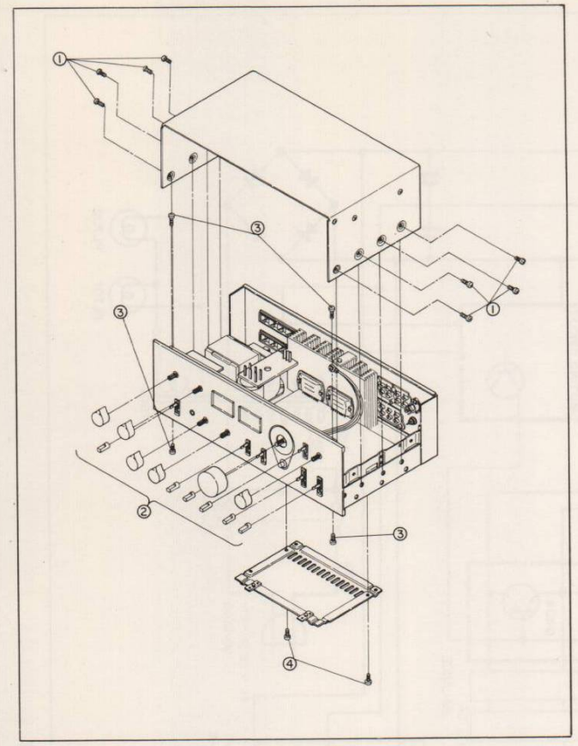


Figure 3

HOW TO REMOVE THE CABINET:
Remove the 8 screws ① retaining the cabinet (4 screws each for the both plates) and take out the cabinet.

HOW TO REMOVE THE FRONT PANEL:
Draw out the 12 knobs ② from the front panel and remove the 4 screws ③ retaining the front panel.
Then pull the front panel toward you to remove it.

HOW TO REMOVE THE BOTTOM PLATE:
Turn over the set, remove the 2 screws ④ retaining the bottom plate and lift up the bottom plate to remove it.

MAINS VOLTAGE SELECTION (See Figure 4)

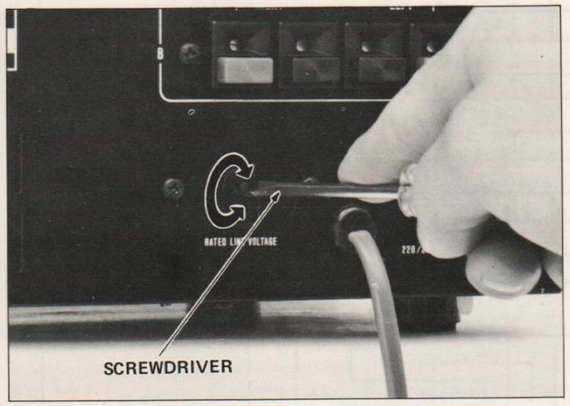


Figure 4

Check the preset voltage before connecting the mains plug to a mains outlet. If the setting is different from your local supply mains voltage, the selector must be reset as follows. Rotate the voltage selector by using a screwdriver so that your local voltage number can be seen.

BLOCK DIAGRAM

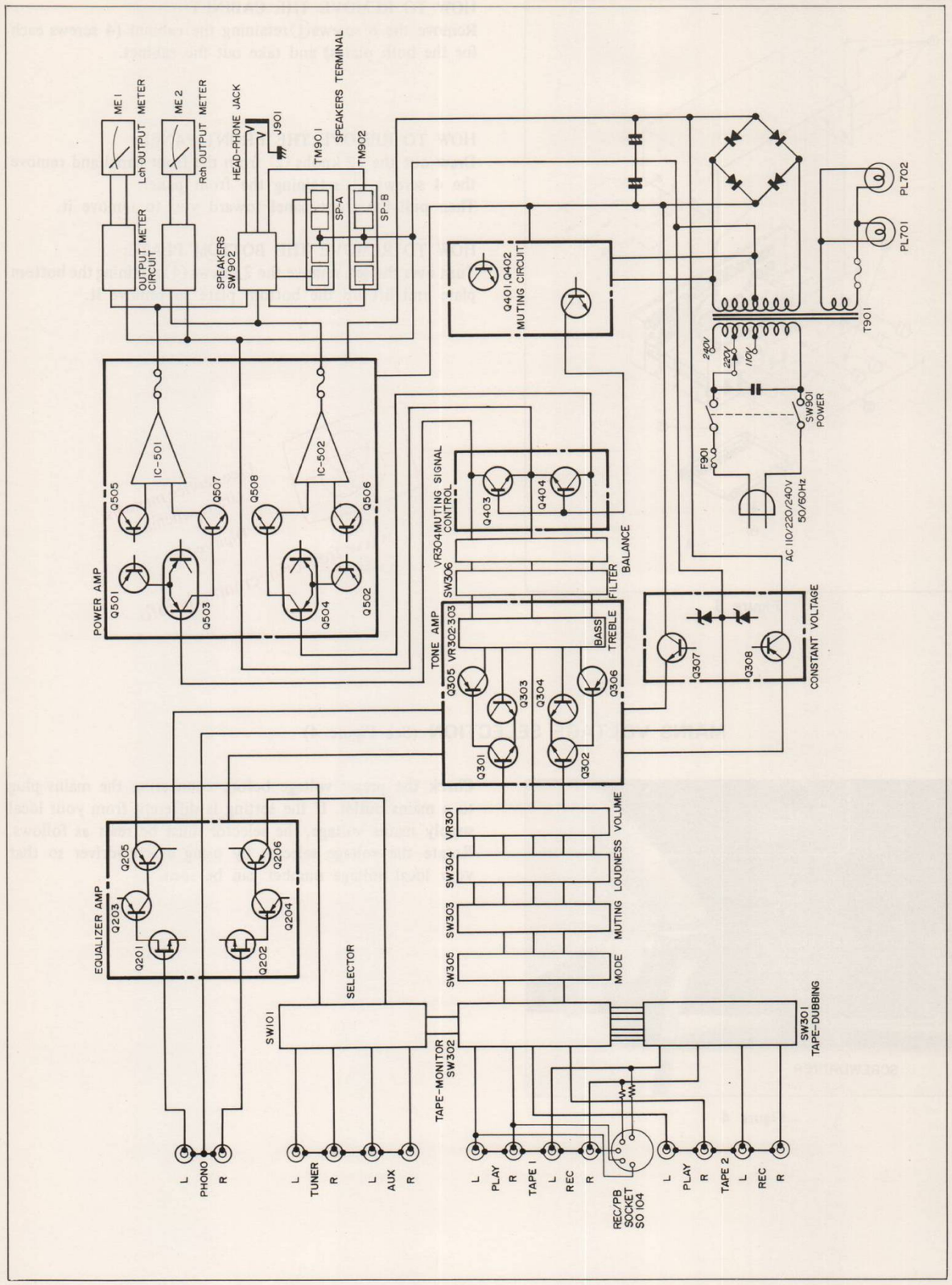


Figure 5

CIRCUIT DESCRIPTION

Note: Hereunder given are the explanations on the behavior of various circuits; main amplifier circuit, meter circuit, electronic muting circuit, meter circuit, electronic muting circuit and equalizer circuit.
In which, note that the following symbols will be used in the descriptions:
Q : Transistor R : Resistor C : Capacitor IC : Integrated circuit ME : Output meter
PTH : Positive characteristic thermistor

■MAIN AMPLIFIER CIRCUIT (See Figure 6)

This main amplifier is of a differential 1-stage pure complementary circuit and besides it incorporates Darlington power pack (made of IC501 and IC502) in which the drive stage and power stage are integrated into one unit. The bias circuit is incorporated in the Darlington pack and it assures a more stabilized and readjustment-free function of the amplifier. Moreover, this circuit scarcely is affected by the power voltage variations since it employs a current regulator circuit for the common emitter power source of the differential amplification stage.
The pre-drive transistors Q507 and Q508 are a current regulator circuit, which assures a higher gain and a lower distortion. To the bases of these transistors Q505 and Q506 are connected C511, C512, R513 and R514 and thus a rise time of Q505 and Q506 is delayed so that there will be no shock noises at the speaker.

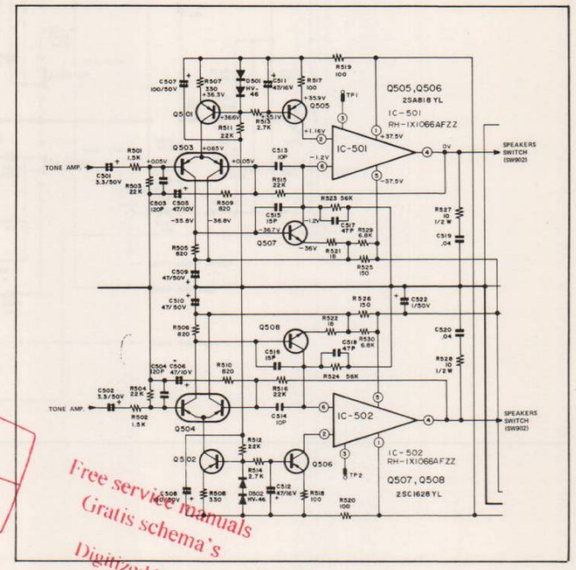


Figure 6

■METER CIRCUIT (See Figure 6 and 7)

With this meter circuit, output signals (from the pin ④ of IC501 and pin ④ of IC502) of the main amplifier are converted into DC signals to undergo logarithmic amplification and thus it becomes possible to drive the output meters ME1 and ME2.
The AC output signals of the main amplifier are supplied to D603 and D604 where their negative components are removed. Then the signals undergo logarithmic amplification through D605 and D606, thus driving the output meters. D601 and D602 are to prevent D603 and D604 from being reverse-biased. C601 and C602 are a speed-up capacitor to increase response speed of the output meters.

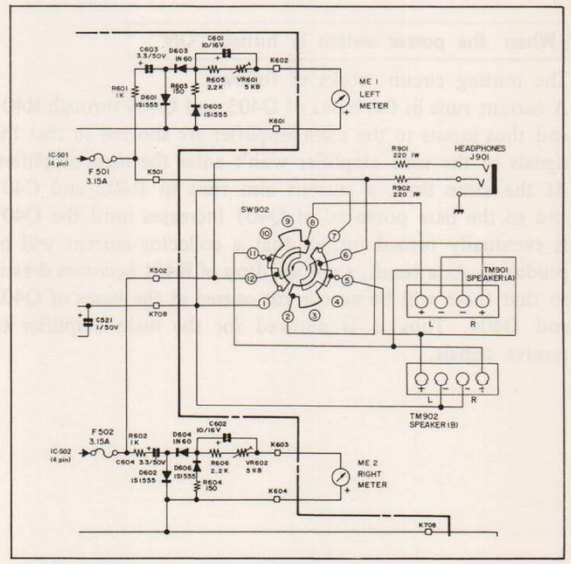


Figure 7

■MUTING CIRCUIT (See Figure 8)

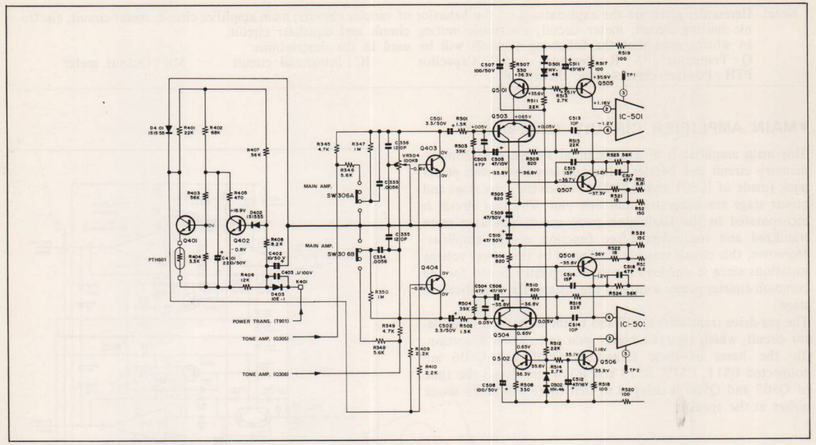


Figure 8

The electronic muting circuit is composed of transistors Q401 to Q404, diodes D401 to D403 and other resistors and capacitors and it works to prevent an occurrence of noises when the power switch SW901 is turned on or off, and to eliminate an abnormal thermal increase of the heat sink.

When the power switch is turned "ON"

The muting circuit works as follows;
A current runs in the bases of Q403 and Q404 through R401 and thus inputs to the main amplifier are shorted so that the signals of the tone amplifier won't enter the main amplifier. At the same time, a current also runs in R402 and C401 and so the base potential of Q401 increases until the Q401 is eventually turned on, so that a collector current will be produced. As a result, a voltage drop of R401 becomes drastic so that there will be no current caused at the bases of Q403 and Q404. Thus it is allowed for the main amplifier to receive signals.

When the power switch is turned "OFF"

The muting circuit works as follows;
The negative potential which has been charged in C402 becomes zeronized instantly and so the emitter potential of Q401 is increased to turn off the Q401. As a result, a current runs in the bases of Q403 and Q404 so that these transistors are turned on; this results in that no signal will enter the main amplifier.
Q402 is to discharge the C401 which has been once charged up when the power switch was turned off.

When temperature of the heat sink abnormally increases

The muting circuit works as follows;
If the heat sink of IC501 and IC502 are over-heated, the resistance of PTH601 is suddenly increased. As a result, the current of Q401 is reduced while its collector potential is increased so that the transistors Q403 and Q404 are turned on; this results in that no signals will enter the main amplifier so that an abnormal thermal increase of the heat sink can be eliminated.

■EQUALIZER CIRCUIT (See Figure 9)

The equalizer circuit is powered by the two-power-supply (+19.7V, −19.7V) system.
Q201 and Q202 in the first stage are high-amplification and low-noise type FET and input signals to these transistors are directly coupled with the second stage.
Q203 and Q204 in the second stage are low-noise transistor, in which almost all of the gains for the equalizer circuit are assured. The third stage is composed of Q205 and Q206 and it includes DC load resistor R213 and R214: the resistance of this resistor is limited to the minimum to assure signal inputs in a higher frequency range. C217 and C218 are boot strap capacitors which are to increase the gains of the second stage transistors Q203 and Q204 and to improve the linearity.

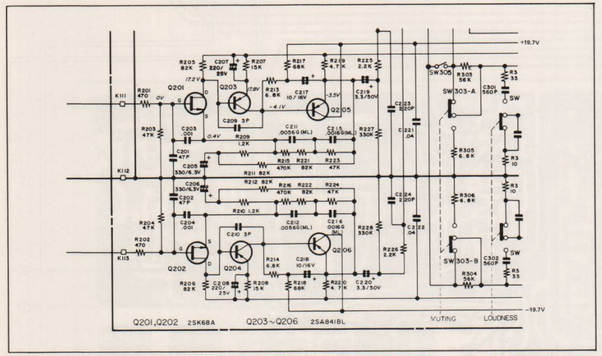


Figure 9

IC OUTPUT CIRCUIT (See Figure 10)

When replacing it, be sure to apply silicone grease on the surface of IC which is in contact with the heat sink, evenly and as sparingly as possible.

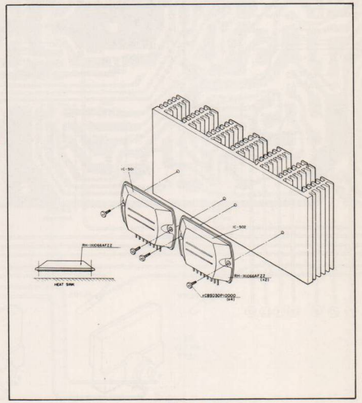


Figure 10

ADJUSTMENT OF MAIN AMP CIRCUIT (See Figure11 and 12)

1. Check the power supply voltage.
2. Set the power switch SW901 to "ON" position.
3. Set the volume control to "0" position.
4. • Check that the potential between the test point TP1 and K501 is 12mV to 60mV.
   • Check that the potential between the test point TP2 and K502 is 12mV to 60mV.
   • Check that the potential between K501 and earth is in the range of +50mV to −50mV
   • Check that the potential between K502 and earth is in the range of +50mV to −50mV.
   • Check that the potential between Q307 emitter and earth is +20V.
   • Check that the potential between Q308 emitter and earth is −20V.
   • Check that the potential between K706 and earth is +39V.
   • Check that the potential between K708 and earth is −39V.
5. By using a signal generator (1kHz, 300mV), apply signals to the terminal AUX located at the rear of the set and adjust the volume control and balance control so that the output signal of the speaker terminal (A or B) becomes 1W = 2.0V. (See Figure 11)
6. Adjust VR601 (and/or VR602) so that the left channel output meter (and/or the right channel output meter) will indicate 1W.

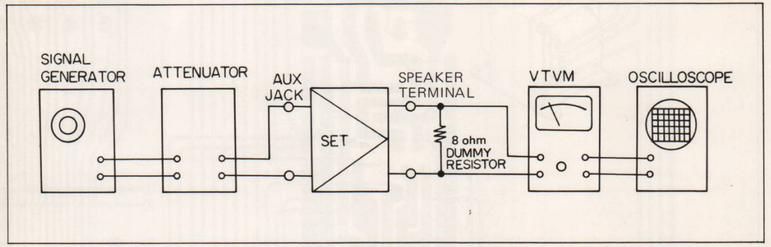


Figure 11

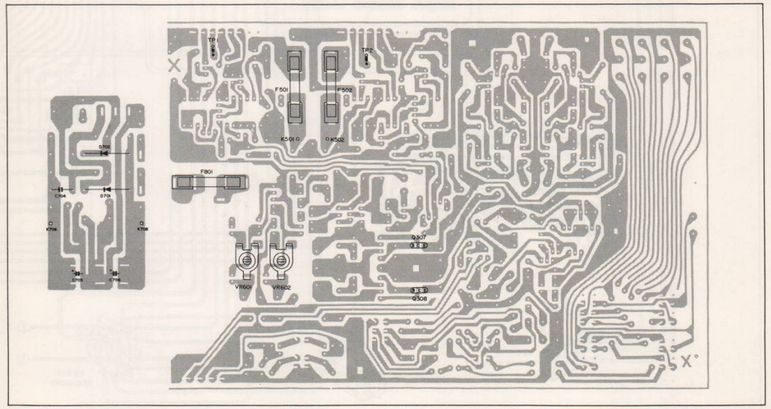


Figure 12

AC supply cord	Bushing		Connection A	Connection B
QACCL0001AFZZ	LBSHC0007AFZZ	SCA		
QACCV0001AGZZ	LBSHC0004AGZZ	SEEG	BLACK	BLUE
QACCZ0002TAOF	LBSHC0007AFZZ	EX		
QACCZ0053AF00	LBSHC0007AFZZ	EX		

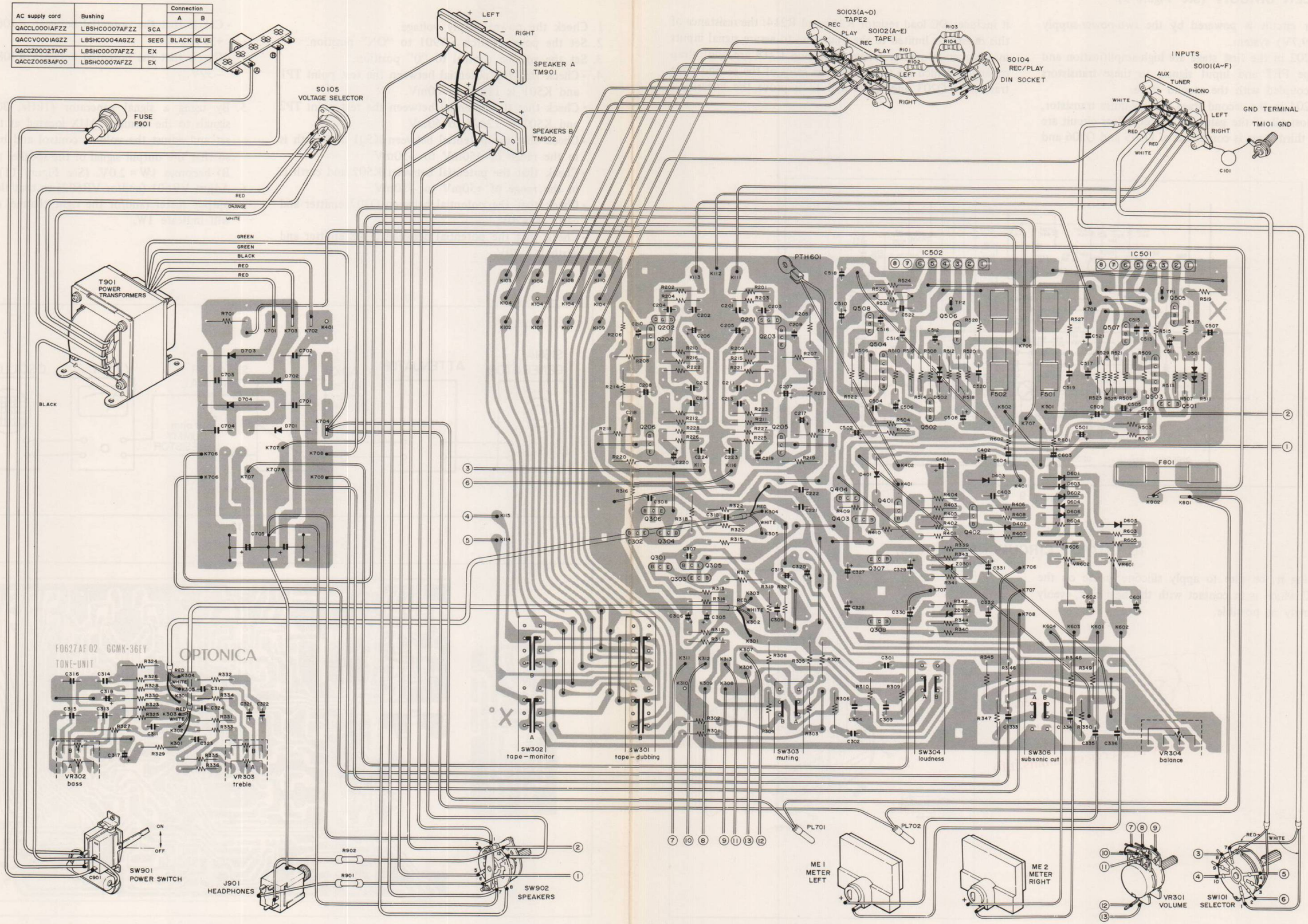
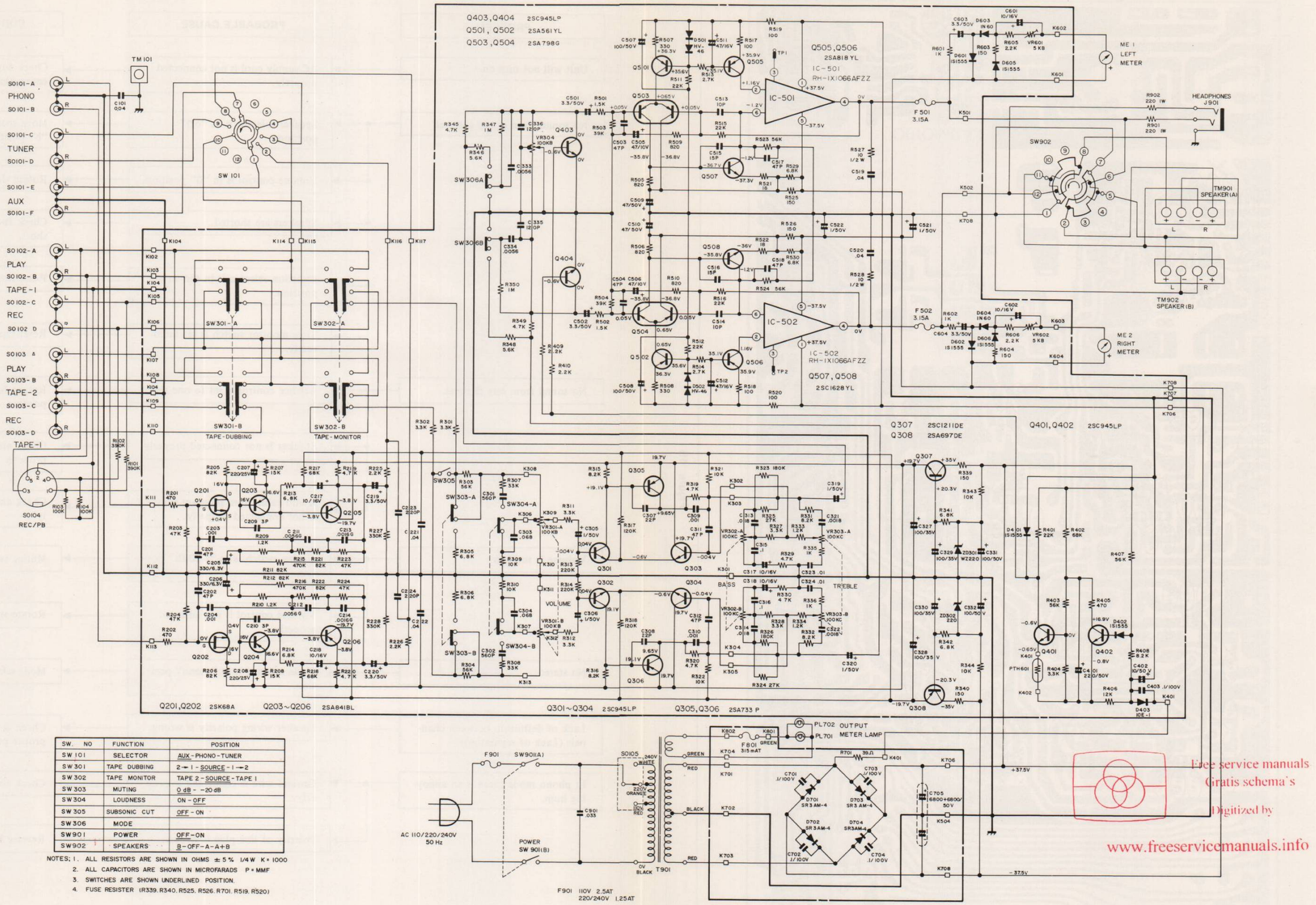


Figure 13 WIRING SIDE OF P.W. BOARD



SW. NO	FUNCTION	POSITION
SW 101	SELECTOR	AUX - PHONO - TUNER
SW 301	TAPE DUBBING	2 → 1 - SOURCE - 1 → 2
SW 302	TAPE MONITOR	TAPE 2 - SOURCE - TAPE 1
SW 303	MUTING	0 dB - -20 dB
SW 304	LOUDNESS	ON - OFF
SW 305	SUBSONIC CUT	OFF - ON
SW 306	MODE	
SW 901	POWER	OFF - ON
SW 902	SPEAKERS	B - OFF - A + B

NOTES; 1. ALL RESISTORS ARE SHOWN IN OHMS ± 5 % 1/4 W K = 1000
2. ALL CAPACITORS ARE SHOWN IN MICROFARADS P = MMF
3. SWITCHES ARE SHOWN UNDERLINED POSITION.
4. FUSE RESISTER (R339. R340. R525. R526. R701. R519. R520)

(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 14 SCHEMATIC DIAGRAM

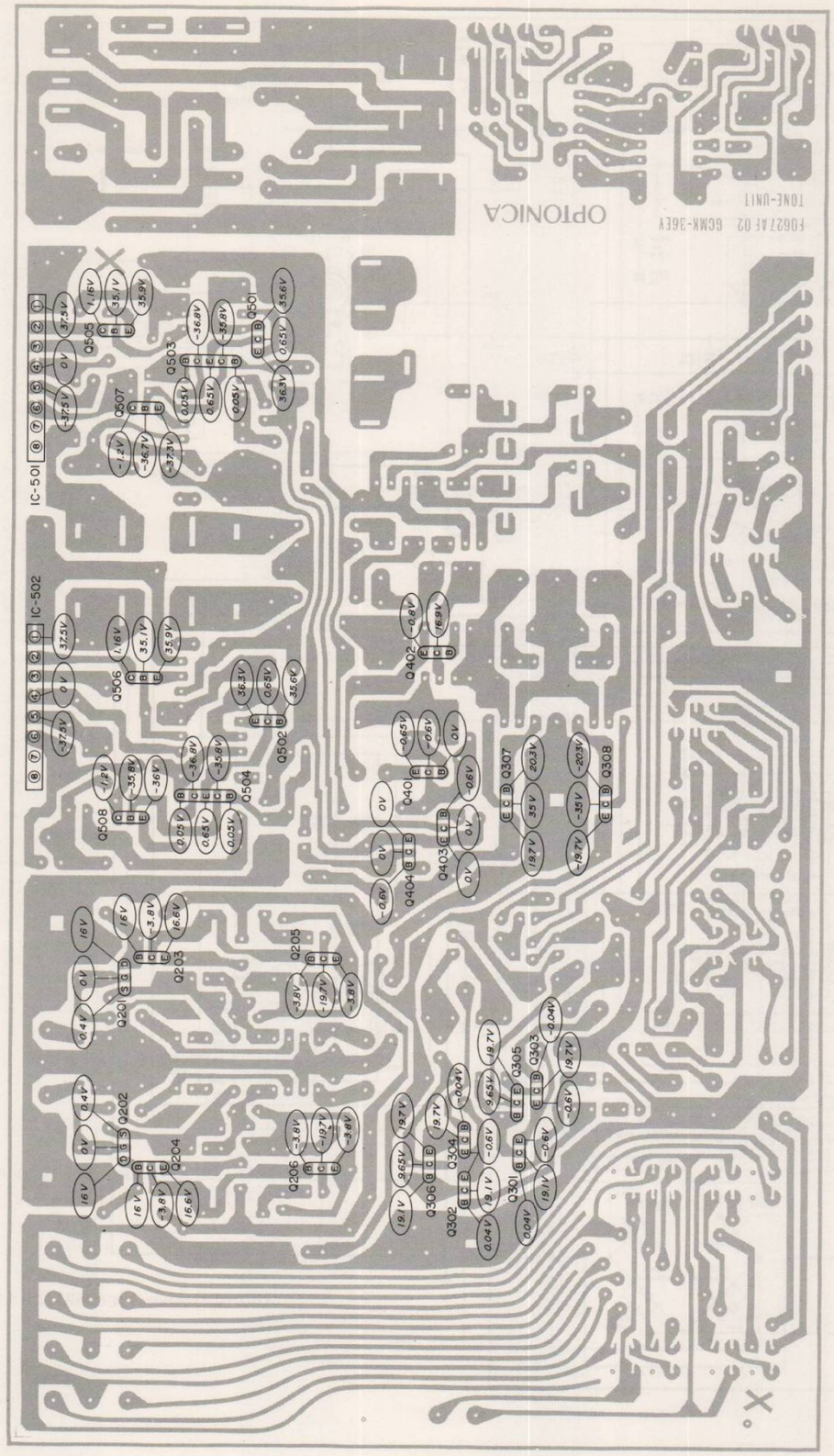


Figure 15

TROUBLE SHOOTING CHART

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Unit will not turn on.	AC supply cord is not connected properly.	Check supply cord plug for positive connection at the outlet.
No sound from either channel.	Speaker selector is in "off" position.	Move speaker selector to "a" or "b" position.
	Volume control is in "0" position.	Rotate the volume control.
	Speakers are shorted.	Check speaker wiring to remove short.
	Function selector is in the wrong position.	Reset the function selector.
	Tape monitor switch is set incorrectly.	Reset tape monitor switch.
No sound from one channel.	Balance control is set to one side.	Return balance control to center position.
	Speaker is not connected properly.	Check and reconnect speaker properly.
	Audio cable from program source is not connected properly.	Check and reconnect cables properly.
Volume is too low.	Muting switch is in "−20dB" position.	Muting switch to "0dB" position.
	Volume control is not adjusted properly.	Rotate volume control.
No stereo.	Mode selector is in "mono" position.	Mode selector to "stereo" position.
Lack of definition between channels (Lack of separation)	Speaker wiring polarity is wrong.	Check & reconnect wires with proper polarity.
In phono mode there is an annoying hum.	Ground wire is connected improperly.	Check and reconnect ground wire.
	Polarity of line plug is wrong.	Reverse the line cord plug.

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
		INTEGRATED CIRCUITS	
IC501, IC502	RH-IX1066AFZZ	Power	BA
		TRANSISTORS	
Q201, Q202	VS2SK68A///1F	1st Equalizer Amp (2SK68A)	AF
Q203, Q204	VS2SA841-B/-1	2nd Equalizer Amp (2SA841BL)	AE
Q205, Q206	VS2SA841-B/-1	3rd Equalizer Amp (2SA841BL)	AE
Q301, Q302	VS2SC945LP/-1	Differential Amp (2SC945LP)	AC
Q303, Q304	VS2SC945LP/-1	Differential Amp (2SC945LP)	AC
Q305, Q306	VS2SA733-P/-1	Tone Amp (2SA733P)	AD
Q307	VS2SC1211-D-1	Constant Voltage (Positive Voltage) (2SC1211DE)	AE
Q308	VS2SA697-D/-1	Constant Voltage (Negative Voltage) (2SA697DE)	AE
Q401	VS2SC945LP/-1	Muting Control (2SC945LP)	AC
Q402	VS2SC945LP/-1	Muting Discharge (2SC945LP)	AC
Q403, Q404	VS2SC945LP/-1	Muting Signal Control (2SC945LP)	AC
Q501, Q502	VS2SA561-Y/-1	Constant Current (2SA561YL)	AG
Q503, Q504	VS2SA798-G/-1	Differential Amp (2SA798G)	AF
Q505, Q506	VS2SA818-Y/-1	Pre Driver/Constant Current (2SA818YL)	AH
Q507, Q508	VS2SC1628-Y-1	Pre Driver (2SC1628YL)	AH
		DIODES	
D401	VHD1S1555V/1G	Protection, Q403, Q404 (1S1555)	AB
D402	VHD1S1555V/1G	Protection, Q402 (1S1555)	AB
D403	VHD10E1////-F	Power Rectifier (10E-1)	AC
D501, D502	VHVHV46-G//-1	Constant Current (HV-46)	AD
D601, D602	VHD1S1555V/1G	Protection, D603, D604 (1S1555)	AB
D603, D604	VHD1N60////-1	Rectifier (1N60)	AB
D605, D606	VHD1S1555V/1G	Logarithmic Compressor (1S1555)	AB
D701, D702, D703, D704	VHDSR3AM-4/-1	Power Rectifier	AF
ZD301, ZD302	VHEWZ220///-1	Constant Voltage (WZ220)	AD
		CONTROLS	
VR301, (A, B)	RVR-B0145AFZZ	100K(B) ohm, Volume Control	AN
VR302, (A, B)	RVR-C0055AFZZ	100K(C) ohm, Bass Control	AK
VR303, (A, B)	RVR-C0055AFZZ	100K(C) ohm, Treble Control	AK
VR304, (A, B)	RVR-B0144AFZZ	100K(B) ohm, Balance Control	AF
VR601, VR602	RVR-M0126AFZZ	5K(B) ohm, Output Meter Adjustment	AC
		TRANSFORMER	
T901	RTRNP0553AFZZ	Power	BH
		RESISTORS (Unless otherwise specified are 1/4W, ±5%, Carbon type)	
R101, R102	VRD-ST2EE394J	390K ohm	AA
R103, R104	VRD-ST2EE104J	100K ohm	AA
R201, R202	VRD-ST2EE471J	470 ohm	AA
R203, R204	VRD-ST2EE473J	47K ohm	AA
R205, R206	VRD-ST2EE823J	82K ohm	AA
R207, R208	VRD-ST2EE153J	15K ohm	AA
R209, R210	VRD-ST2EE122J	1.2K ohm	AA
R211, R212	VRD-ST2EE823J	82K ohm	AA
R213, R214	VRD-ST2EE682J	6.8K ohm	AA
R215, R216	VRD-ST2EE474J	470K ohm	AA
R217, R218	VRD-ST2EE683J	68K ohm	AA
R219, R220	VRD-ST2EE472J	4.7K ohm	AA
R221, R222	VRD-ST2EE823J	82K ohm	AA
R223, R224	VRD-ST2EE473J	47K ohm	AA
R225, R226	VRD-ST2EE222J	2.2K ohm	AA
R227, R228	VRD-ST2EE334J	330K ohm	AA

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R301, R302	VRD-ST2EE332J	3.3K ohm	AA
R303, R304	VRD-ST2EE563J	56K ohm	AA
R305, R306	VRD-ST2EE682J	6.8K ohm	AA
R307, R308	VRD-ST2EE333J	33K ohm	AA
R309, R310	VRD-ST2EE103J	10K ohm	AA
R311, R312	VRD-ST2EE332J	3.3K ohm	AA
R313, R314	VRD-ST2EE224J	220K ohm	AA
R315, R316	VRD-ST2EE822J	8.2K ohm	AA
R317, R318	VRD-ST2EE124J	120K ohm	AA
R319, R320	VRD-ST2EE472J	4.7K ohm	AA
R321, R322	VRD-ST2EE103J	10K ohm	AA
R323	VRD-ST2EE184J	180K ohm	AA
R324	VRD-ST2EE273J	27K ohm	AA
R325	VRD-ST2EE273J	27K ohm	AA
R326	VRD-ST2EE184J	180K ohm	AA
R327, R328	VRD-ST2EE332J	3.3K ohm	AA
R329, R330	VRD-ST2EE472J	4.7K ohm	AA
R331, R332	VRD-ST2EE822J	8.2K ohm	AA
R333, R334	VRD-ST2EE122J	1.2K ohm	AA
R335, R336	VRD-ST2EE102J	1K ohm	AA
R339, R340	VRG-ST2EA151J	150 ohm, 1/4W, ±5%, Fusible	AB
R341, R342	VRD-ST2EE682J	6.8K ohm	AA
R343, R344	VRD-ST2EE103J	10K ohm	AA
R345	VRD-ST2EE472J	4.7K ohm	AA
R346	VRD-ST2EE562J	5.6K ohm	AA
R347	VRD-ST2EE105J	1 Meg ohm	AA
R348	VRD-ST2EE562J	5.6K ohm	AA
R349	VRD-ST2EE472J	4.7K ohm	AA
R350	VRD-ST2EE105J	1 Meg ohm	AA
R401	VRD-ST2EE223J	22K ohm	AA
R402	VRD-ST2EE683J	68K ohm	AA
R403	VRD-ST2EE563J	56K ohm	AA
R404	VRD-ST2EE332J	3.3K ohm	AA
R405	VRD-ST2EE471J	470 ohm	AA
R406	VRD-ST2EE123J	12K ohm	AA
R407	VRD-ST2EE563J	56K ohm	AA
R408	VRD-ST2EE822K	8.2K ohm	AA
R409	VRD-ST2EE222J	2.2K ohm	AA
R410	VRD-ST2EE222J	2.2K ohm	AA
R501, R502	VRD-ST2EE152J	1.5K ohm	AA
R503, R504	VRD-ST2EE393J	39K ohm	AA
R505, R506	VRD-ST2EE821J	820 ohm	AA
R507, R508	VRD-ST2EE331J	330 ohm	AA
R509, R510	VRD-ST2EE821J	820 ohm	AA
R511, R512	VRD-ST2EE223J	22K ohm	AA
R513, R514	VRD-ST2EE272J	2.7K ohm	AA
R515, R516	VRD-ST2EE223J	22K ohm	AA
R517, R518	VRD-ST2EE101J	100 ohm	AA
R519, R520	VRG-ST2EA101J	100 ohm, 1/4W, ±5%, Fusible	AB
R521, R522	VRD-ST2EE180J	18 ohm	AA
R523, R524	VRD-ST2EE563J	56K ohm	AA
R525, R526	VRG-ST2EA151J	150 ohm, 1/4W, ±5%, Fusible	AB
R527, R528	VRG-ST2HA100J	10 ohm, 1/2W, ± 5% , Fusible	AB
R529, R530	VRD-ST2EE682J	6.8K ohm	AA
R601, R602	VRD-ST2EE102J	1K ohm	AA
R603, R604	VRD-ST2EE151J	150 ohm	AA
R605, R606	VRD-ST2EE222J	2.2K ohm	AA
R701	VRG-ST2EA390J	39 ohm, 1/4W, ±5%, Fusible	AB
R901, R902	VRS-PT3AB221K	220 ohm, 1W, ±10%, Oxide Film	AB
		CAPACITORS	
C101	VCKZPU1HF403Z	.04MFD, 50V, +80 −20%, Ceramic	AA
C201, C202	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic	AA
C203, C204	VCKZPU1HF102Z	.001MFD, 50V, +80 −20%, Ceramic	AA
C205, C206	VCEAAU0JW337Y	330MFD, 6.3V, +50 −10%, Electrolytic	AC
C207, C208	VCEAAU1EW227Y	220MFD, 25V, +50 −10%, Electrolytic	AC
C209, C210	VCCSPU1HL3R0C	3PF, 50V, ±.25PF, Ceramic	AA
C211, C212	VCQYKU2AM562G	.0056MFD, 100V, +50 −10%, Mylar	AD
C213, C214	VCQYKU2AM162G	.0016MFD, 100V, +50 −10%, Mylar	AD
C217, C218	VCEAAU1CW106Y	10MFD, 16V, +50 −10%, Electrolytic	AB
C219, C220	VCEAAU1HW335A	3.3MFD, 50V, +75 −10%, Electrolytic	AB
C221, C222	VCKZPU1HF403Z	.04MFD, 50V, +80 −20%, Ceramic	AA
C223, C224	VCCSPU1HL221K	220PF, 50V, ±10%, Ceramic	AA
C301, C302	VCCSPU1HL561K	560PF, 50V, ±10%, Ceramic	AA
C303, C304	VCQYKU1HM683K	.068MFD, 50V, ±10%, Mylar	AC
C305, C306	VCEAAU1HW105A	1MFD, 50V, +75 −10%, Electrolytic	AB

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C307, C308	VCCSPU1HL220K	22PF, 50V, ±10%, Ceramic	AA
C309, C310	VCKZPU1HF102Z	.001MFD, 50V, +80 −20%, Ceramic	AA
C311, C312	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic	AA
C313, C314	VCQYKU1HM183J	.018MFD, 50V, ±5%, Mylar	AC
C315, C316	VCQYKU1HM104J	.1MFD, 50V, ±5%, Mylar	AD
C317, C318	VCEAAU1CW106Y	10MFD, 16V, +50 −10%, Electrolytic	AB
C319, C320	VCEALU1HW105M	1MFD, 50V, ±20%, Electrolytic	AD
C321, C322	VCQYKU1HM182J	.0018MFD, 50V, ±5%, Mylar	AC
C323, C324	VCQYKU1HM103J	.01MFD, 50V, ±5%, Mylar	AB
C327, C328	VCEAAU1VW107Y	100MFD, 35V, +50 −10%, Electrolytic	AD
C329, C330	VCEAAU1VW107Y	100MFD, 35V, +50 −10%, Electrolytic	AD
C331, C332	VCEAAU1HW107Y	100MFD, 50V, +50 −10%, Electrolytic	AD
C333, C334	VCQYKU1HM562J	.0056MFD, 50V, ±5%, Mylar	AC
C335, C336	VCCSPU1HL121K	120PF, 50V, ±10%, Ceramic	AA
C401	VCEAAU1HW227Y	220MFD, 50V, +50 −10%, Electrolytic	AD
C402	VCEAAU1HW106Y	10MFD, 50V, +50 −10%, Electrolytic	AC
C403	VCQYKU2AM104M	.1MFD, 100V, ±20%, Mylar	AD
C501, C502	VCEAAU1HW335A	3.3MFD, 50V, +75 −10%, Electrolytic	AB
C503, C504	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic	AA
C505, C506	VCEAAU1AW476Y	47MFD, 10V, +50 −10%, Electrolytic	AB
C507, C508	VCEAAU1HW107Y	100MFD, 50V, +50 −10%, Electrolytic	AD
C509, C510	VCEAAU1HW476Y	47MFD, 50V, +50 −10%, Electrolytic	AC
C511, C512	VCEAAU1CW476Y	47MFD, 16V, +50 −10%, Electrolytic	AC
C513, C514	VCCSPU1HL100C	10PF, 50V, ±.25PF, Ceramic	AA
C515, C516	VCCSPU1HL150K	15PF, 50V, ±10%, Ceramic	AA
C517, C518	VCCSPU1HL470K	47PF, 50V, ±10%, Ceramic	AA
C519, C520	VCKZPU1HF403Z	.04MFD, 50V, +80 −20%, Ceramic	AA
C521, C522	VCEAAU1HW105A	1MFD, 50V, +75 −10%, Electrolytic	AB
C601, C602	VCEAAU1CW106Y	10MFD, 16V, +50 −10%, Electrolytic	AB
C603, C604	VCEAAU1HW335A	3.3MFD, 50V, +75 −10%, Electrolytic	AB
C701, C702, C703, C704	VCQYKU2AM104M	.1MFD, 100V, ±20%, Mylar	AD
C705	RC-EZ1005AFZZ	6800MFD x 2, 50V, Electrolytic	BA
C901	RC-PZ062CAFZZ	.033MFD, 450V (AC)	AG

MISCELLANEOUS

GCOVA1075AFSC	Cover, Tape-Dubbing/Tape-Monitor (SM-1616H)	AC
GCOVA1075AFSB	Cover, Tape-Dubbing/Tape-Monitor (SM-1616HB)	AC
GCOVA1076AFSC	Cover, Power/Low Cut/Loudness (SM-1616H)	AC
GCOVA1076AFSB	Cover, Power/Low Cut/Loudness (SM-1616HB)	AC
HPNLC3325AFSA	Front Panel (SM-1616H)	**
NPNLC3325AFSB	Front Panel (SM-1616HB)	**
PSPAS0008SGSA	Spacer, Muting Knob (SM-1616H)	AB
PSPAS0008SGSB	Spacer, Muting Knob (SM-1616HB)	AB
LANGQ0510AFZZ	Bracket, Main Voltage Selector	AB
LANGQ0589AFSA	Bracket, Terminal (SM-1616H)	**
LANGQ0592AFSA	Bracket, Terminal (SM-1616HB)	**
QFSHP1001AGZZ	Fuse Holder (Terminal Bracket)	AH
QLUGL0451AFZZ	Lug Terminal, 4 Pin	AD
GLEGP0059AF00	Leg	AB
LHLDW1060AFZZ	Wire Holder	AA
LX-NZ3030SEFN	Nut, Headphone Jack	AA
PFLT-0340AF00	Cushion, Cabinet Top	−
PCUSS0076AFZZ	Cushion, Output Meter	AA
LANGF0392AFZZ	Bracket, Heat Sink Settle	AB
LHLDW9003CEZZ	Wire Holder	AA
LHLDW1053AFZZ	Wire Holder	AB
LHLDW1068AFZZ	Wire Holder	AA
GCAB-3053AFSA	Cabinet, Top	**
GFTAU3064AFZZ	Cabinet, Bottom	AD
QPWBF0627AFZZ	Printed Wiring Board	−
JKNBM0136AFSE	Knob, Muting (SM-1616H)	AC
JKNBM0136AFSD	Knob, Muting (SM-1616HB)	AC
JKNBN0316AFSA	Knob, Volume (SM-1616H)	AK
JKNBN0316AFSC	Knob, Volume (SM-1616HB)	AK
JKNBN0330AFSA	Knob, Bass/Treble/Speakers/Balance/Selector (SM-1616H)	AH
JKNBN0330AFSB	Knob, Bass/Treble/Speakers/Balance/Selector (SM-1616HB)	AH
JKBNP0070AFSA	Knob, Power/Low Cut/Loudness/Tape-Dubbing/Tape-Monitor (SM-1616H)	AH
JKNBP0070AFSC	Knob, Power/Low Cut/Loudness/Tape-Dubbing/Tape-Monitor (SM-1616HB)	AG
PSHEF0110AFZZ	Sheet, Light Cut off	AA
QPLGS0102AGZZ	Short Type Plug	AD
LX-WZ5065AGFE	Washer, Fuse Holder	AB
QLUGP0104AGZZ	Terminal Strip, Wire	AA
QTANN0150AFZZ	GND Terminal	AD
LANGT0705AFZZ	Bracket	**
PRDAR0141AFFW	Heat Sink	AY
PCUSG0069AF00	Cushion	AB
QACCL0001AFZZ	AC Supply Cord	AR
LBSHC0007AFZZ	Bushing, AC Cord	AB
QACCV0001AGZZ	AC Supply Cord	AP
LBSHC0004AGZZ	Bushing, AC Cord	AC
QACCZ0002TA00	AC Supply Cord	AK
LCHSM0260AFZZ	Chassis	−

REF. NO.	PART NO.	DESCRIPTION	CODE
	PCOVU8110AFZZ	Cover, Output Meter Lamp	AB
PTH1	RH-QX1002AFZZ	Positive Characteristic Thermistor	AG
SO104	QSOCD2553AFZZ	Socket, REC/PB (DIN)	AD
SO105	QSOCE0410AGZZ	Switch, Mains Voltage Selector	AH
SO102	QSOCJ2459AFZZ	Socket, Tape 1 (REC/PB)	AE
SO103	QSOCJ2459AFZZ	Socket, Tape 2 (REC/PB)	AE
SW901	QSW-B9073AFZZ	Switch, Power	AM
SW304	QSW-B0051AFZZ	Switch, Loudness	AK
SW306	QSW-B0073AFZZ	Switch, Filters	AM
SW301, SW302	QSW-B0054AFZZ	Switch, Tape-Dubbing/Tape Monitor	AL
SW305	QSW-B0090AFZZ	Switch, Mode	AG
SW303	QSW-P0139AFZZ	Switch, Muting	AG
SW101	QSW-R0106AFZZ	Switch, Selector	AK
SW902	QSW-R0142AFZZ	Switch, Speakers	AN
TM901, TM902	QTANZ0455AFZZ	Speakers Terminal	AG
TM101	LX-WZ0019AFFW	Lug, GND Terminal	AA
	QFSHD1001AGZZ	Fuse Holder	AB
F901	QFS-C122CAGNI	Fuse, 1.25AT	AE
F801	QFS-C321CAGNI	Fuse, 315mAT	AE
F501, F502	QFS-C322CAGNI	Fuse, 3.15AT	AE
	QFS-C252CAGNI	Fuse, 2.5AT	AE
J901	QJAKJ0001SGZZ	Jack, Headphones	AG
PL701, PL702	RLMPM0062AFZZ	Output Meter Lamp	AE
ME1, ME2	RMTRL0136AFSA	Output Meter	AU
SO101	QSOCJ2660AFZZ	Socket, Input (PHONO/TUNER/AUX)	AG
	QACCZ0053AF00	AC Supply Cord	AK
	SPAKA0514AFZZ	Packing Add.	**
	SPAKC1133AFZZ	Packing Case (SM-1616H)	**
	SPAKC1143AFZZ	Packing Case (SM-1616HB)	**
	SSAKA0007SEZZ	Polyethylene Bag	AA
	SSAKH0015SEZZ	Polyethylene Bag	AB

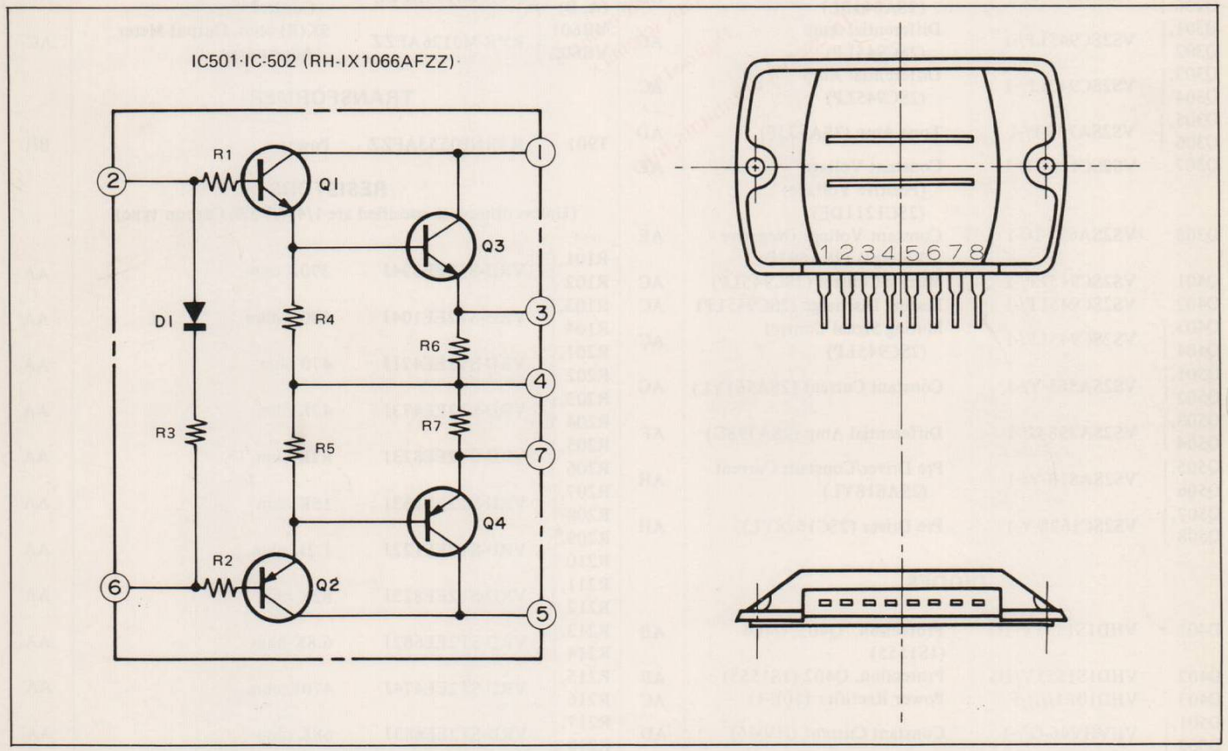


Figure 16 EQUIVALENT OF INTEGRATED CIRCUIT

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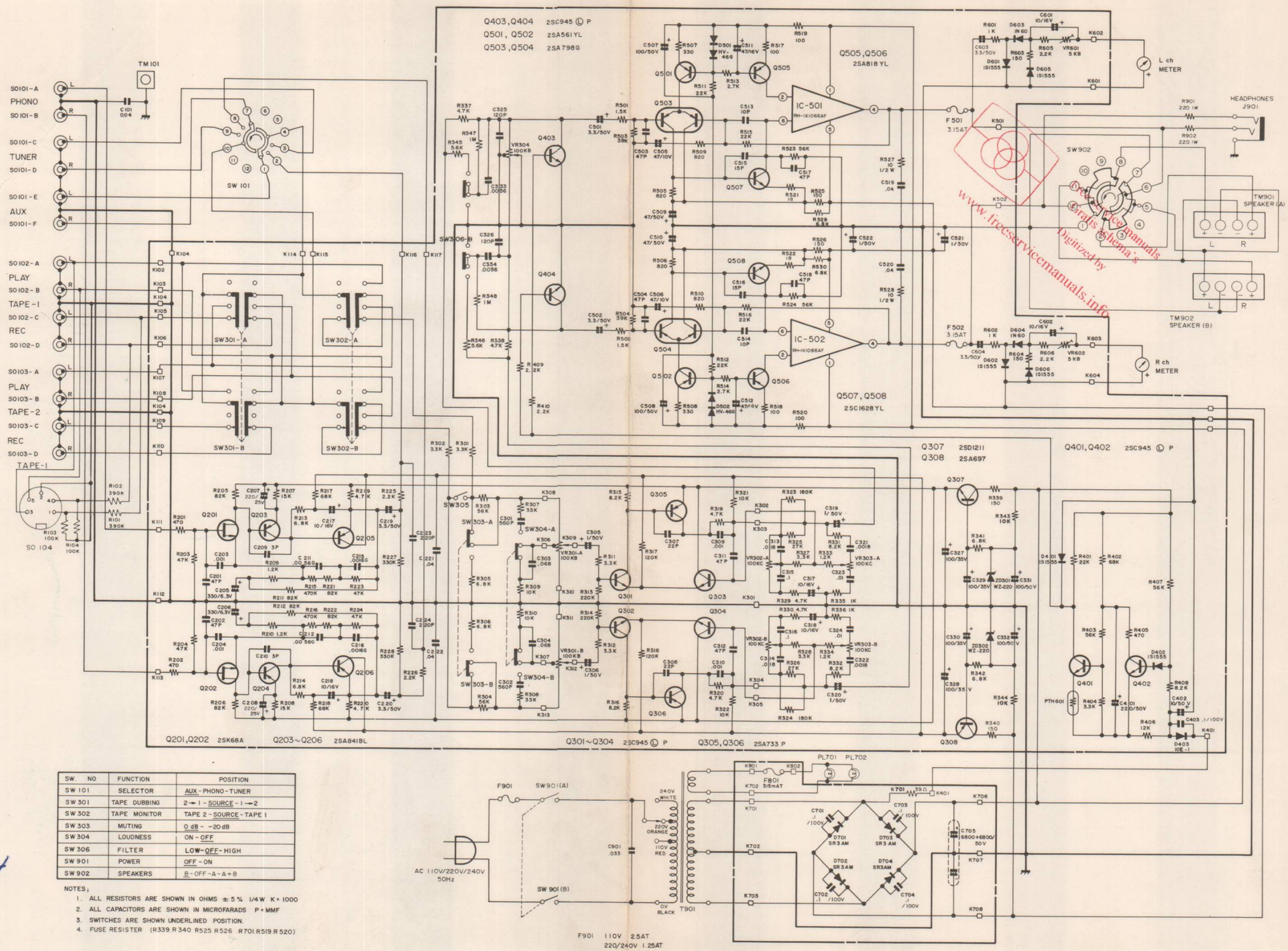

SW. NO	FUNCTION	POSITION
SW 101	SELECTOR	AUX - PHONO - TUNER
SW 301	TAPE DUBBING	2→1 - SOURCE - 1→2
SW 302	TAPE MONITOR	TAPE 2 - SOURCE - TAPE 1
SW 303	MUTING	0 dB - -20 dB
SW 304	LOUDNESS	ON - OFF
SW 306	FILTER	LOW - OFF - HIGH
SW 901	POWER	OFF - ON
SW 902	SPEAKERS	B - OFF - A - A+B

NOTES,
1. ALL RESISTORS ARE SHOWN IN OHMS ±5% 1/4W K=1000
2. ALL CAPACITORS ARE SHOWN IN MICROFARADS P=MMF
3. SWITCHES ARE SHOWN UNDERLINED POSITION.
4. FUSE RESISTER (R339 R340 R525 R526 R701 R519 R520)

SM 1616H

● Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.