

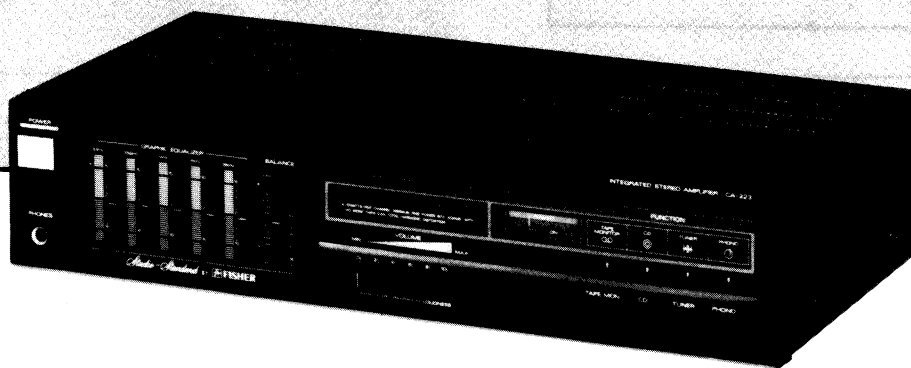
SERVICE MANUAL



FISHER

CA-223

**Integrated
Stereo Amplifier
(EUROPE)**



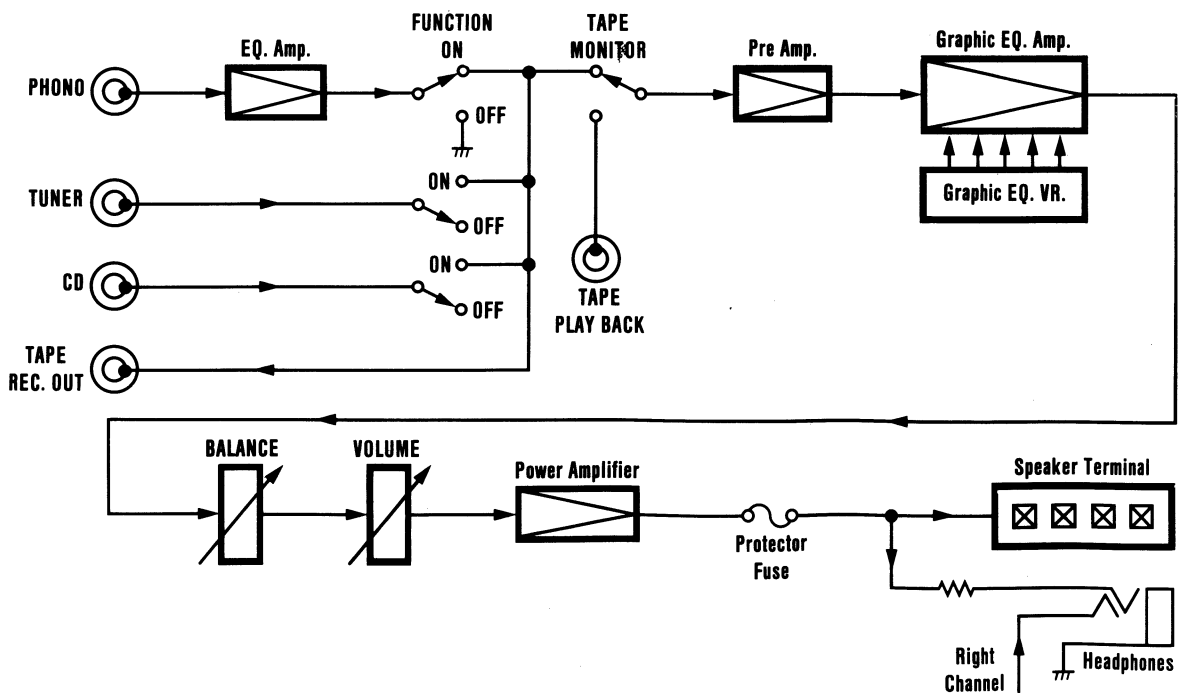
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WM-17170

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FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS

AMPLIFIER	CA-223
POWER AMPLIFIER SECTION	
Minimum RMS sine wave power per channel within stated bandwidth at no more than stated distortion and with 8-ohm load	20 Watts
Power Bandwidth	20 Hz – 20 kHz
Total Harmonic Distortion	0.5 %
I.M. Distortion	0.5 %
Speaker Damping	> 20
PREAMPLIFIER SECTION	
Frequency Response	
Phono (RIAA)	±1 dB
Aux (20 Hz – 20 kHz)	±1 dB
Input Sensitivity and Impedance	
Phono	2.5 mV/50 kΩ
Tape Monitor	150 mV/50 kΩ
Tuner/CD	150 mV/50 kΩ
Phono Max. Input Capability	150 mV
Graphic Equalizer	
63 Hz	±10 dB
250 Hz	±10 dB
1 kHz	±10 dB
4 kHz	±10 dB
16 kHz	±10 dB
Hum & Noise (IHF Short Circuit, A Network)	
Phono	68 dB
Tape Monitor	85 dB
Tuner/CD	85 dB
GENERAL	
Power Requirements (50 Hz)	220 V AC
Power Consumption	120 Watts
Dimensions (W x H x D)	400 x 91 x 202 mm
Weight (approx.)	3.8 kg

Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

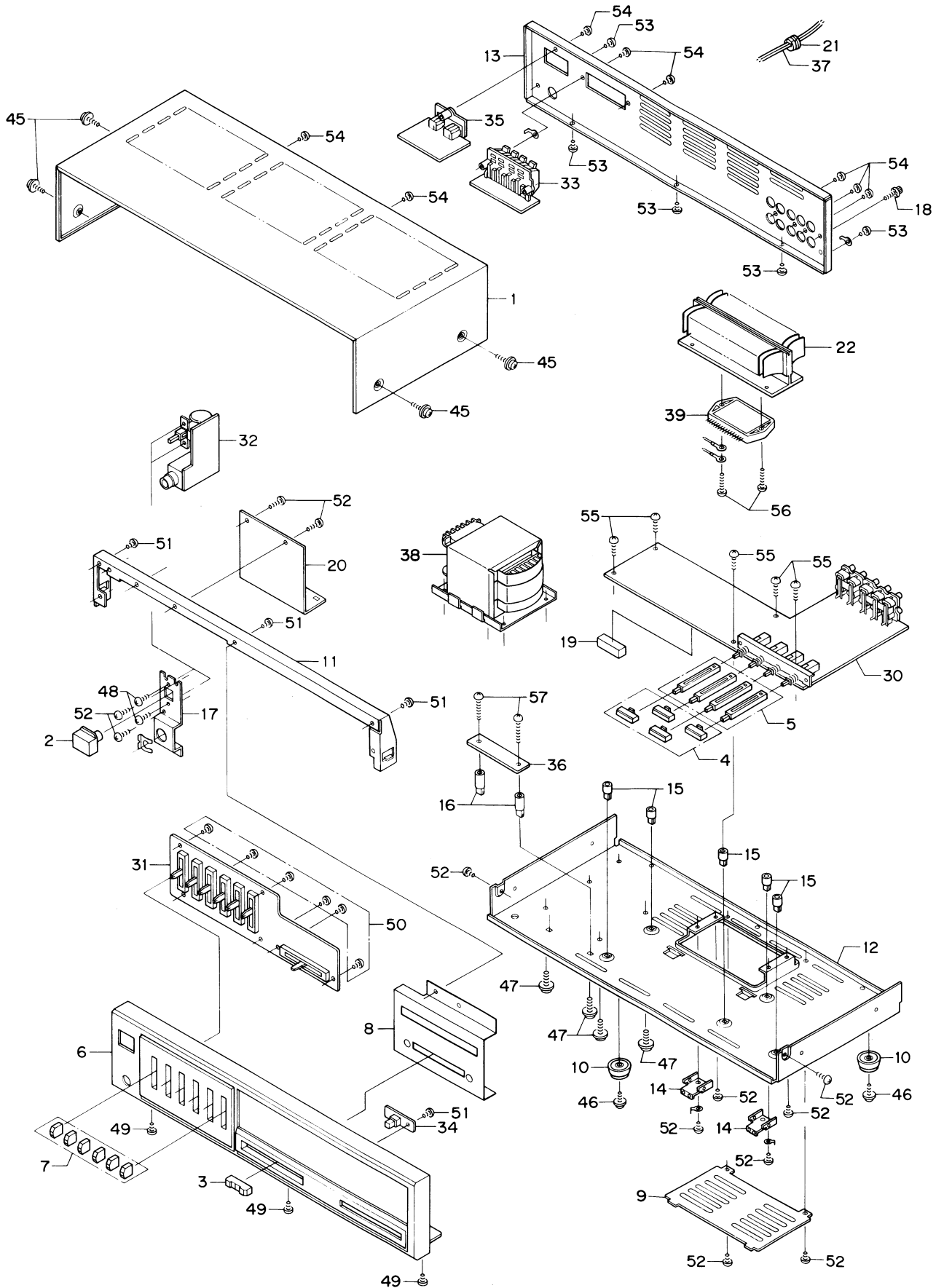
IMPORTANT NOTE

The amplifier has been Factory-adjusted for operation on 220V AC. The voltage can be changed for operation on 110V AC by making the following changes on the amplifier inside.

1. Remove the AC plug from the wall outlet.
2. Remove the screws securing the cover.
3. Disconnect Gray lead from AC Select P.C.Board Terminal No. 19, and then connect it to AC Select P.C.Board Terminal No. 16.
4. Disconnect Yellow lead from AC Select P.C.Board Terminal No. 19, and then connect it to AC Select P.C.Board Terminal No. 18.

The amplifier is now ready 110V operation. **DO NOT** attempt to operate the amplifier on 220V. Damage will result!

CABINET & CHASSIS EXPLODED VIEW



RECOMMENDED TEST EQUIPMENTS

The following test equipments are recommended to completely test and align the Amplifier:

- Line Voltage Isolation Transformer
- AC DC Multimeter
- Accurately Calibrated AC Voltmeter
- Oscilloscope (Flat to 100 kHz Minimum)
- Low-Distortion Audio Sine-Wave Generator
- Harmonic Distortion Analyzer
- Two (2) Load Resistors 8-ohms, 250 Watts (Minimum Rating)

HARMONIC DISTORTION TEST

CAUTION: Limit the following tests to no more than ten minutes each. Use 8-ohm resistors, with a minimum power rating of 250 watts when connecting a load across the SPEAKERS terminal.

CONTROL SETTINGS:

Unplug the AC power cord and set the front panel controls as follows:

- GRAPHIC EQUALIZER to center position.
- BALANCE control to center position.
- POWER switch to OFF
- FUNCTION switch to CD
- VOLUME control to MINIMUM position
- LEFT CHANNEL DRIVEN

ONE CHANNEL DRIVEN:

- 1) Connect a low distortion audio generator to LEFT CD IN jack. Set generator frequency to 1 kHz and output to minimum.
- 2) Connect an 8-ohm load resistor between SPEAKERS SYSTEM LEFT and COM terminals. Connect a Harmonic Distortion Analyzer and an AC VTVM in parallel across the 8-ohm load.
- 3) Connect the AC power cord. Turn VOLUME control to MAX.
- 4) Increase generator output for 20 Watts RMS (12.6 volts across the 8-ohm load). Harmonic Distortion Analyzer should measure 0.5 % distortion or less.
- 5) Repeat steps 1 through 4 for RIGHT CHANNEL.

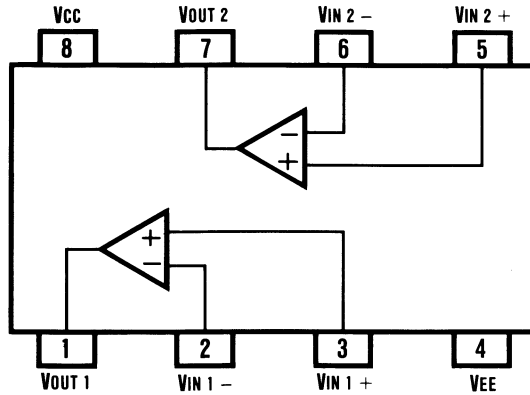
BOTH CHANNELS DRIVEN

Connect 8-ohm load resistors across LEFT and RIGHT SPEAKERS SYSTEM terminals. Adjust generator output and "VOLUME" control for 20 watts at Left and Right Channels (12.6 volts across the 8-ohm loads). Harmonic Distortion Analyzer should measure 0.5 % distortion or less at each channel.

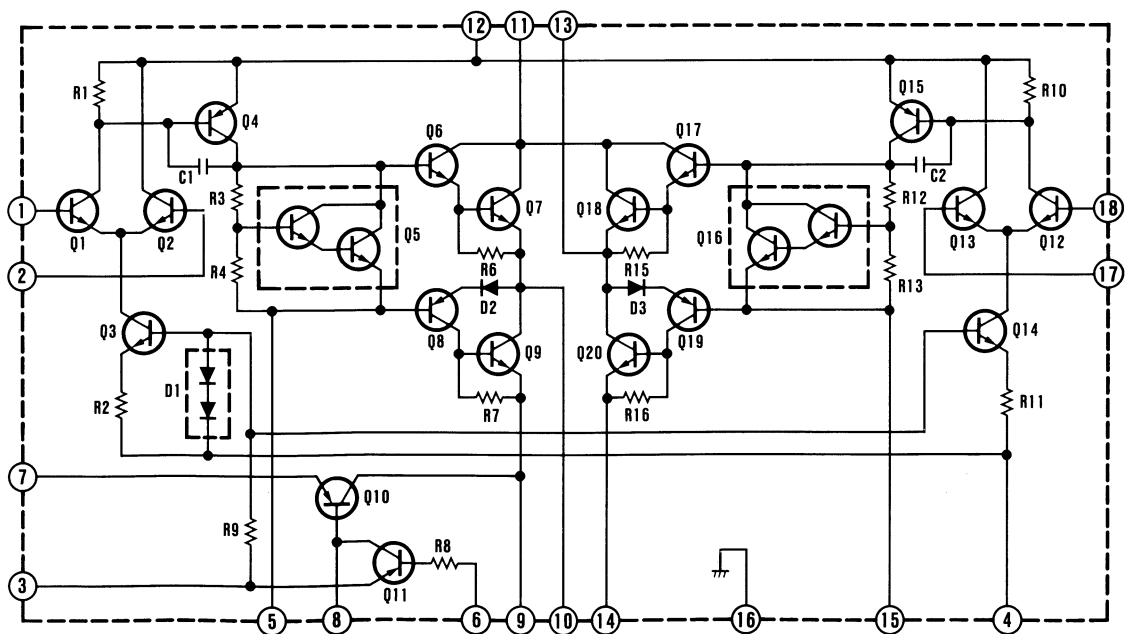
CAUTION: This precision high-fidelity instrument should be serviced only by qualified personnel, trained in the repair of transistor equipment and printed circuitry.

INTEGRATED CIRCUIT BLOCK DIAGRAM

PHONO / GRAPHIC EQUALIZER AMP IC LA 6458 D



STK 4132 MK2 EQUIVALENT CIRCUIT



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
MAIN AMP. P.C.B. ASSY				C318	CB4-7-5500-0000V	None-polar 4.7μF 50V	1
30	141-0-1939-17760	Main Amp. P.C.B. Assy	1	C319	CD2-2-7250-0001V	Electrolytic 220μF 25V	1
	4-2262-29520	Main Amp. P.C.B.	1	C320	CD4-7-6350-0001V	Electrolytic 47μF 35V	1
S1	4-2319-79560	Push Switch 4Key (Function, Tape Monitor)	1	C401	CC4-7-3151-ZG00C	Ceramic 0.047μF 150V +80,-20%	1
L301	4-2532-00420	RF Filter (5μH)	1	C402	CC4-7-3151-ZG00C	Ceramic 0.047μF 150V +80,-20%	1
L302	4-2532-00420	RF Filter (5μH)	1	C403	CC4-7-3151-ZG00C	Ceramic 0.047μF 150V +80,-20%	1
	△ 4-2349-20250	Fuse T2.0A	2	C404	CC4-7-3151-ZG00C	Ceramic 0.047μF 150V +80,-20%	1
	△ 4-2349-20570	Fuse T2.5A	2	C405	CD2-2-8350-0005V	Electrolytic 2200μF 35V	1
	4-2352-01700	Pin Jack 4P (Tape)	1	C406	CD2-2-8350-0005V	Electrolytic 2200μF 35V	1
	4-2352-01780	Pin Jack 6P (Phono, Tuner, CD)	1	C407	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1
	4-2352-01940	Fuse Clip	8	C408	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1
	111-2-6220-11100	Wire Wrap Terminal	3	C703	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1
CAPACITORS				C704	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1
C101	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	C705	CC1-0-1500-KD00C	Ceramic 100pF 50V ±10%	1
C102	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	C706	CC1-0-1500-KD00C	Ceramic 100pF 50V ±10%	1
C103	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	C707	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C104	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	C708	CC1-0-3500-ZG00C	Ceramic 0.01μF 50V +80,-20%	1
C105	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1	SEMICONDUCTORS			
C106	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1	D101	202-5-1410-00110	Diode, GMA 01	1
C107	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	D102	202-5-1410-00110	Diode, GMA 01	1
C108	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	D201	202-5-9600-44610	Diode, DS 446	1
C109	CD4-7-6100-0001V	Electrolytic 47μF 10V	1	D301	202-5-9600-44610	Diode, DS 446	1
C110	CD4-7-6100-0001V	Electrolytic 47μF 10V	1	D302	205-5-9040-44210	Diode, DS 442	1
C111	CM1-8-3500-K00SV	Mylar 0.018μF 50V ±10%	1	D401	202-5-0220-01062	Diode, DSF 10C	1
C112	CM1-8-3500-K00SV	Mylar 0.018μF 50V ±10%	1	D402	202-5-0220-01062	Diode, DSF 10C	1
C113	CM4-7-2500-J00SV	Mylar 0.0047μF 50V ±5%	1	D403	202-5-0220-01062	Diode, DSF 10C	1
C114	CM4-7-2500-J00SV	Mylar 0.0047μF 50V ±5%	1	D404	202-5-0220-01062	Diode, DSF 10C	1
C115	CD1-0-5500-0001V	Electrolytic 1μF 50V	1	D405	202-5-3210-18012	Zener Diode, GZA 18Y	1
C116	CD1-0-5500-0001V	Electrolytic 1μF 50V	1	D406	202-5-3210-18012	Zener Diode, GZA 18Y	1
C117	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	D601	202-5-3210-27012	Zener Diode, GZA 27Y	1
C118	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	IC101	206-5-2726-45810	IC, LA 6458 DS	1
C119	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	Q301	203-5-5000-53670	Transistor, 2SC 536	1
C120	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	Q401	203-5-7252-27460	Transistor, 2SC 2274	1
C121	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	Q402	203-5-6820-98460	Transistor, 2SA 984	1
C122	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	RESISTORS			
C123	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	R101	401 025 7805	CARBON 2.2K JA 1/6W	1
C124	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	R102	401 025 7805	CARBON 2.2K JA 1/6W	1
C125	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	R103	401 024 7707	CARBON 100K JA 1/6W	1
C126	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	R104	401 024 7707	CARBON 100K JA 1/6W	1
C127	CD4-7-6160-0001V	Electrolytic 47μF 16V	1	R105	401 024 7707	CARBON 100K JA 1/6W	1
C128	CD4-7-6160-0001V	Electrolytic 47μF 16V	1	R106	401 024 7707	CARBON 100K JA 1/6W	1
C129	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1	R107	401 026 3905	CARBON 330 JA 1/6W	1
C130	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1	R108	401 026 3905	CARBON 330 JA 1/6W	1
C131	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	R109	401 025 8703	CARBON 220K JA 1/6W	1
C132	CC3-3-1500-KD00C	Ceramic 330pF 50V ±10%	1	R110	401 025 8703	CARBON 220K JA 1/6W	1
C140	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1	R111	401 025 1902	CARBON 15K JA 1/6W	1
C301	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R112	401 025 1902	CARBON 15K JA 1/6W	1
C302	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R113	401 024 7707	CARBON 100K JA 1/6W	1
C303	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R114	401 024 7707	CARBON 100K JA 1/6W	1
C304	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R115	401 012 5708	CARBON 1K JA 1/4W	1
C305	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R116	401 012 5708	CARBON 1K JA 1/4W	1
C306	CC2-2-1500-KE01R	Ceramic 220pF 50V ±10%	1	R117	401 012 5708	CARBON 1K JA 1/4W	1
C307	CD3-3-663A-0001V	Electrolytic 33μF 6.3V	1	R118	401 012 5708	CARBON 1K JA 1/4W	1
C308	CD3-3-663A-0001V	Electrolytic 33μF 6.3V	1	R119	401 012 5708	CARBON 1K JA 1/4W	1
C309	CD4-7-6350-0001V	Electrolytic 47μF 35V	1	R120	401 012 5708	CARBON 1K JA 1/4W	1
C310	CD4-7-6350-0001V	Electrolytic 47μF 35V	1	R121	401 012 5708	CARBON 1K JA 1/4W	1
C311	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1	R122	401 012 5708	CARBON 1K JA 1/4W	1
C312	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V +80,-20%	1	R123	401 012 5708	CARBON 1K JA 1/4W	1
C313	CD1-0-6350-0001V	Electrolytic 10μF 35V	1	R124	401 012 5708	CARBON 1K JA 1/4W	1
C314	CD1-0-6350-0001V	Electrolytic 10μF 35V	1	R125	401 016 2604	CARBON 220 JA 1/4W	1
C315	CD1-0-7350-0001V	Electrolytic 100μF 35V	1	R126	401 016 2604	CARBON 220 JA 1/4W	1
C316	CD1-0-7350-0001V	Electrolytic 100μF 35V	1	R255	401 016 2604	CARBON 220 JA 1/4W	1
C317	CD1-0-6350-0001V	Electrolytic 10μF 35V	1				

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
R227	401 026 6609	CARBON 390 JA 1/6W	1				
R228	401 026 6609	CARBON 390 JA 1/6W	1				
R229	401 025 1902	CARBON 15K JA 1/6W	1				
R230	401 025 1902	CARBON 15K JA 1/6W	1				
R231	401 026 7408	CARBON 39K JA 1/6W	1				
R232	401 026 7408	CARBON 39K JA 1/6W	1				
R233	401 025 1605	CARBON 1.5K JA 1/6W	1				
R234	401 025 1605	CARBON 1.5K JA 1/6W	1				
R235	401 026 6609	CARBON 390 JA 1/6W	1				
R236	401 026 6609	CARBON 390 JA 1/6W	1				
R237	401 025 1902	CARBON 15K JA 1/6W	1				
R238	401 025 1902	CARBON 15K JA 1/6W	1				
R239	401 026 4605	CARBON 33K JA 1/6W	1				
R240	401 026 4605	CARBON 33K JA 1/6W	1				
R241	401 025 1605	CARBON 1.5K JA 1/6W	1				
R242	401 025 1605	CARBON 1.5K JA 1/6W	1				
R243	401 026 6609	CARBON 390 JA 1/6W	1				
R244	401 026 6609	CARBON 390 JA 1/6W	1				
R245	401 025 1902	CARBON 15K JA 1/6W	1				
R246	401 025 1902	CARBON 15K JA 1/6W	1				
R247	401 025 8208	CARBON 22K JA 1/6W	1				
R248	401 025 8208	CARBON 22K JA 1/6W	1				
R249	401 025 1605	CARBON 1.5K JA 1/6W	1				
R250	401 025 1605	CARBON 1.5K JA 1/6W	1				
R251	401 027 5502	CARBON 6.8K JA 1/6W	1				
R252	401 027 5502	CARBON 6.8K JA 1/6W	1				
R253	401 024 7004	CARBON 1K JA 1/6W	1				
R254	401 024 7004	CARBON 1K JA 1/6W	1				
R257	401 024 7707	CARBON 100K JA 1/6W	1				
R258	401 024 7707	CARBON 100K JA 1/6W	1				
POWER SWITCH P.C.B. ASSY							
32	141-0-1939-17780	Power Switch P.C.B. Assy	1				
	4-2262-29540	Power Switch P.C.B.	1				
S2	△ 4-2312-05710	Switch Push Power (Power)	1				
	4-2352-01170	Jack 7P 6.45 (Headphones)	1				
	111-2-6220-11100	Wire Wrap Terminal	2				
	131-2-6114-01400	Cover Safty	1				
CAPACITOR							
C801	△ 4-2239-70970	Capacitor	0.01 μ F	400V			1
RESISTORS							
R501	401 055 7004	OXIDE-MT 270 JB 1/2W	1				
R502	401 055 7004	OXIDE-MT 270 JB 1/2W	1				
R503	401 014 2903	CARBON 150 JA 1/4W	1				
R504	401 014 2903	CARBON 150 JA 1/4W	1				
SPEAKER OUT P.C.B. ASSY							
33	141-0-1939-17790	Speaker Out P.C.B. Assy	1				
	4-2262-29550	Speaker Out P.C.B.	1				
	4-2379-70820	4P Push Terminal (Speaker)	1				
CAPACITORS							
C501	CC1-0-2500-KE00R	Ceramic	0.001 μ F	50V \pm 10%			1
C502	CC1-0-2500-KE00R	Ceramic	0.001 μ F	50V \pm 10%			1
POWER IND. P.C.B. ASSY							
34	141-0-1939-17800	Power Ind. P.C.B. Assy	1				
	4-2262-29560	Power Ind. P.C.B.	1				
	131-2-4208-41300	Spacer (Led)	1				

SEMICONDUCTOR

D602 4-2029-72101 L.E.D., GL 9 PR 54 (Power) 1

SOCKET 2P P.C.B. ASSY

35 141-0-1939-17810 Socket 2P P.C.B. Assy 1
 4-2262-29570 Socket 2P P.C.B. 1
 △ 4-2349-20380 Fuse T1.0A 2
 4-2352-01940 Fuse Clip 4
 △ 4-2359-79090 Socket 2P-2 (Power Supply) 1
 111-2-6220-11100 Wire Wrap Terminal 4

AC SELECT P.C.B. ASSY

36 141-0-1939-17820 AC Select P.C.B. Assy 1
 4-2262-29580 AC Select P.C.B. 1
 4-2372-00830 EC Terminal 1P 2
 111-2-6220-11100 Wire Wrap Terminal 4

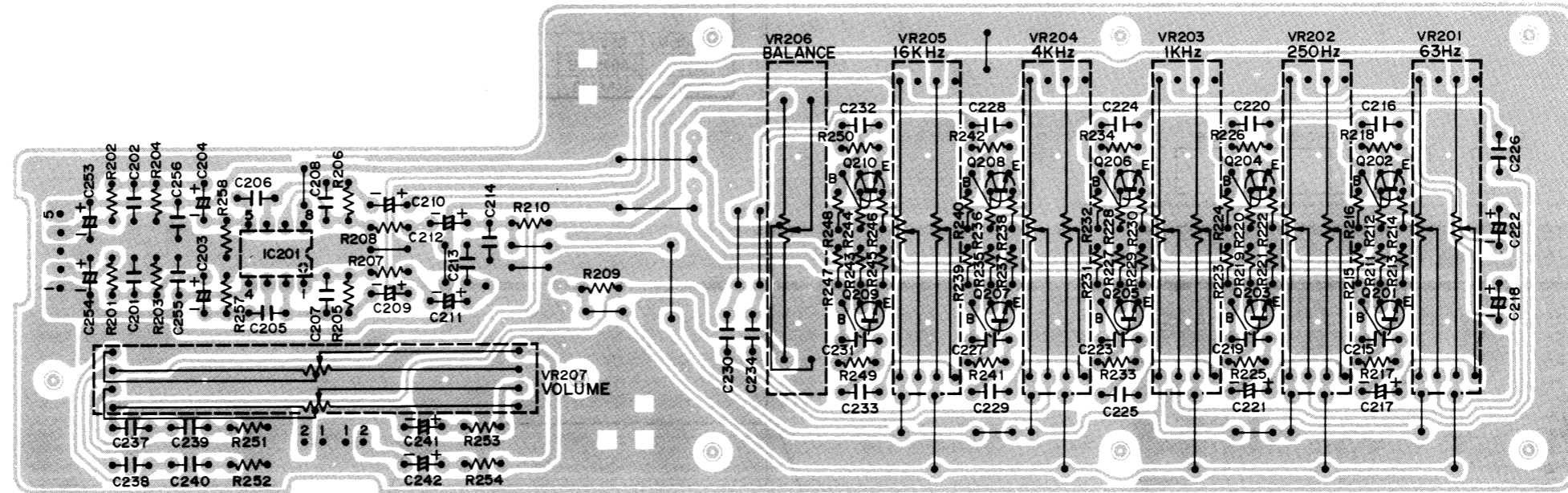
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol △ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with △, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

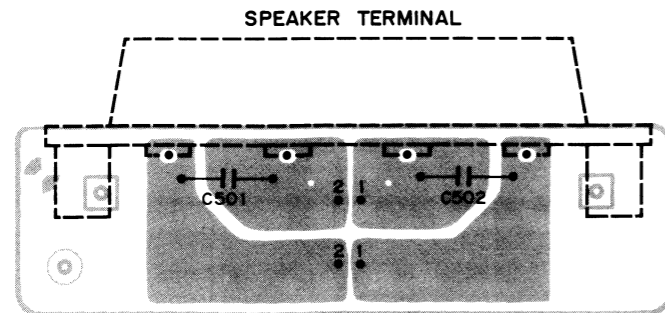
CONTROL AMPLIFIER P.C. BOARD (BOTTOM VIEW)



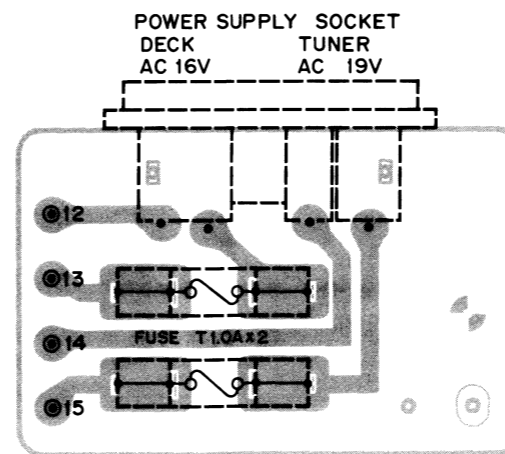
IC PIN NUMBERS DC VOLTAGES									
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8
IC201	LA6458DS	0V	0V	0V	-16.5V	0V	0V	0V	16.5V

TRANSISTOR DC VOLTAGES									
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q201,202	2SC536	-0.4V	15.9V	-1.0V	Q207,208	2SC536	-0.1V	15.9V	-0.7V
Q203,204	2SC536	-0.3V	15.9V	-0.9V	Q209,210	2SC536	-0.1V	15.9V	-0.7V
Q205,206	2SC536	-0.1V	15.9V	-0.7V					

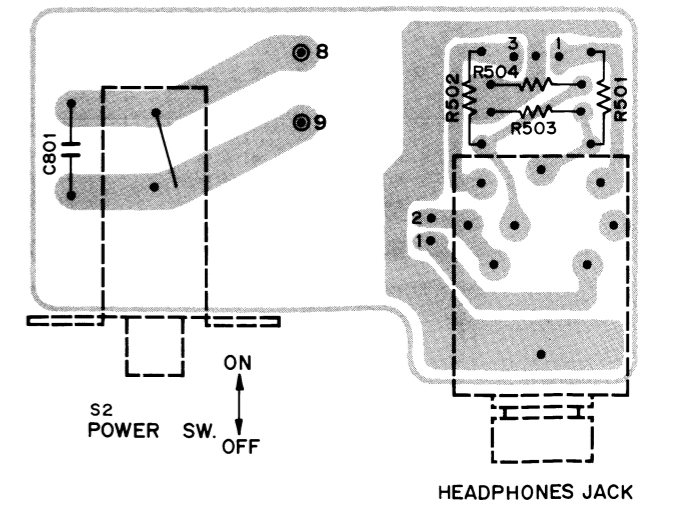
SPEAKER OUT P.C. BOARD (BOTTOM VIEW)



SOCKET 2P P.C. BOARD (BOTTOM VIEW)



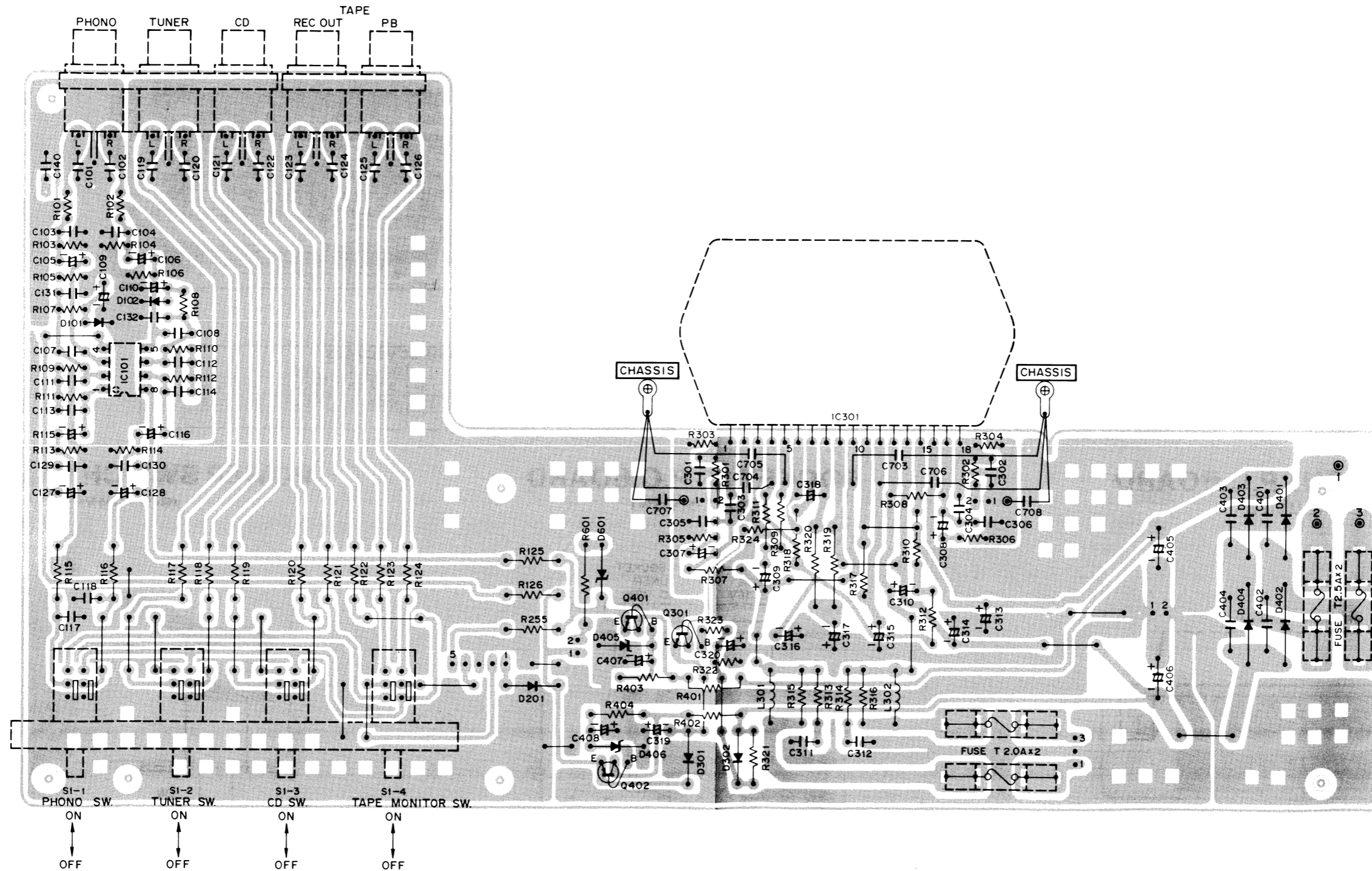
POWER SWITCH P.C. BOARD (BOTTOM VIEW)



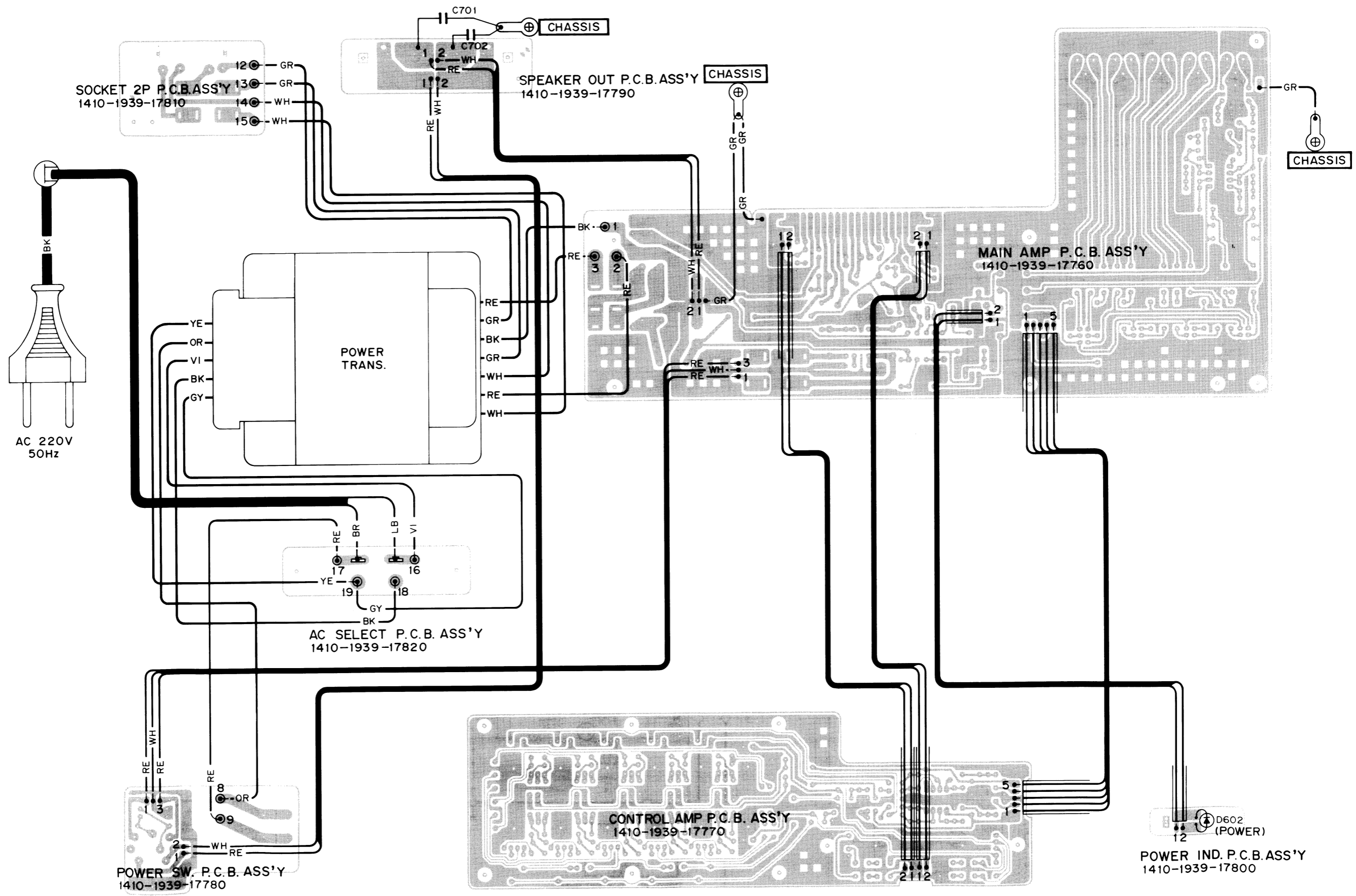
MAIN PRINTED CIRCUIT BOARD

TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q301	2SC536	-16.6V	0.5V	-17.3V
Q401	2SC2274	18.3V	27.0V	17.7V
Q402	2SA984	-18.5V	-27.0V	-17.8V

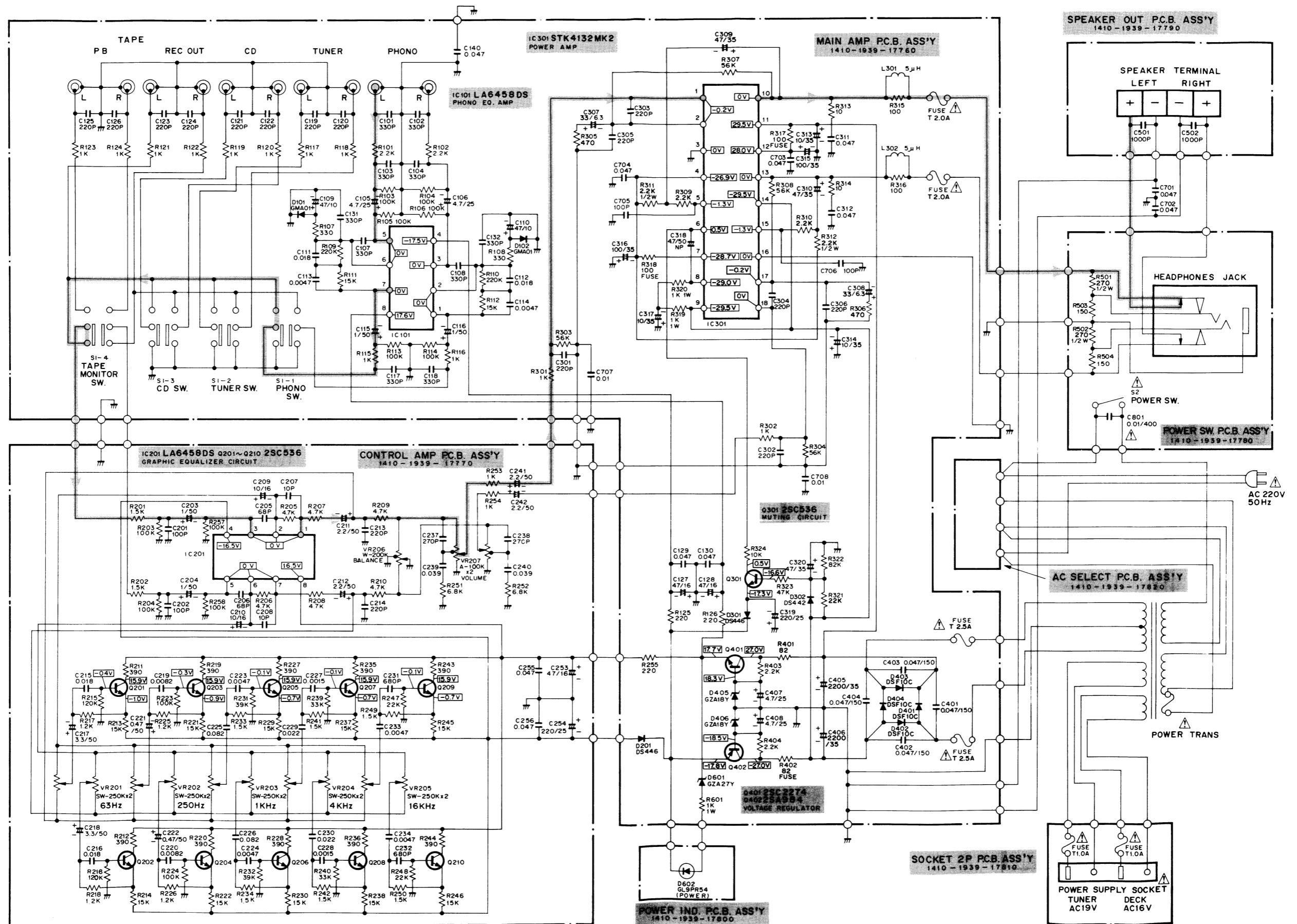
IC PIN NUMBERS DC VOLTAGES																			
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
IC101	LA6458DS	0V	0V	0V	-17.5V	0V	0V	0V	17.6V										
IC301	STK4132	-0.2V	-0.2V	0V	-26.9V	-1.3V	0.5V	-28.7V	-29.0V	-29.5V	0V	29.5V	28.0V	0V	-29.5V	-1.3V	0V	-0.2V	0V




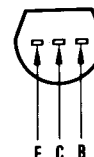
POINT TO POINT WIRING DIAGRAM



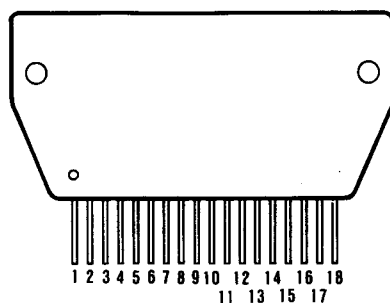
SCHEMATIC DIAGRAM



SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA 984 2SC 536 2SC 2274		
TERMINAL NAME		
B → BASE C → COLLECTOR E → EMITTER		

STK 4132 MK2 BOTTOM VIEW



LA 6458 BOTTOM VIEW



SWITCH POSITION TABLE

No.	Name	Position	No.	Name	Position
S1-1	PHONO Switch	OFF	S1-4	TAPE MONITOR Switch	OFF
S1-2	TUNER Switch	OFF	S2	POWER Switch	OFF
S1-3	CD Switch	OFF			

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with Δ , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.

Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

NOTES:

1. All resistors values are indicated in "ohm" ($K=10^3$, $M=10^6$).
2. All capacitors values are indicated in " μF " ($P=10^{-12}$).
3. All voltages indicated on the schematics are measured under the following conditions.
 - a. Use a V.T.V.M.

- b. All voltages $\pm 10\%$ with respect to chassis ground
- c. No signals at input terminals
- d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.



FISHER

FISHER Hi-Fi Europa Vertriebs GmbH

Stahlgruberring 4 8000 München 82	Tel: 089/420 45-0 Tlx: 524033
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Bitte geben Sie unbedingt die Ersatzteil-Nummer und die Modellbezeichnung an.

Sie sparen so wertvolle Zeit. Vielen Dank.

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