

SERVICE MANUAL

FISHER

CA-228

FUNCTIONAL BLOCK DIAGRAM

Integrated
Stereo Amplifier
(EUROPE)

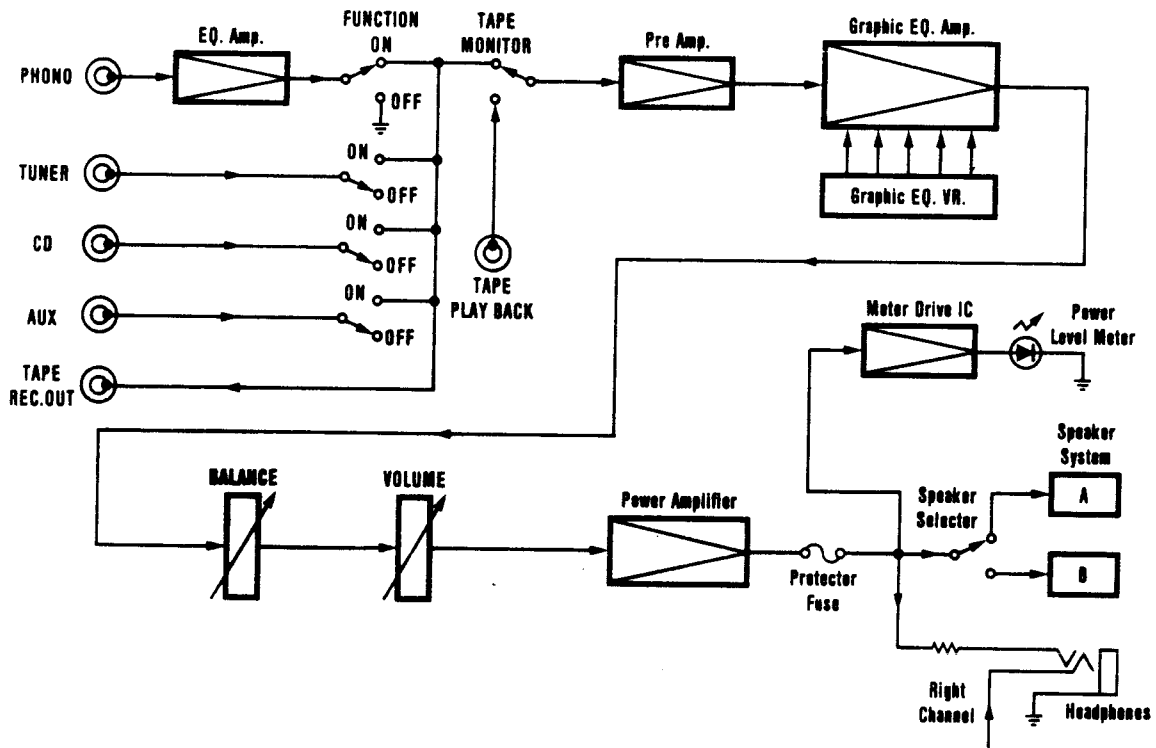


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FUNCTIONAL BLOCK DIAGRAM

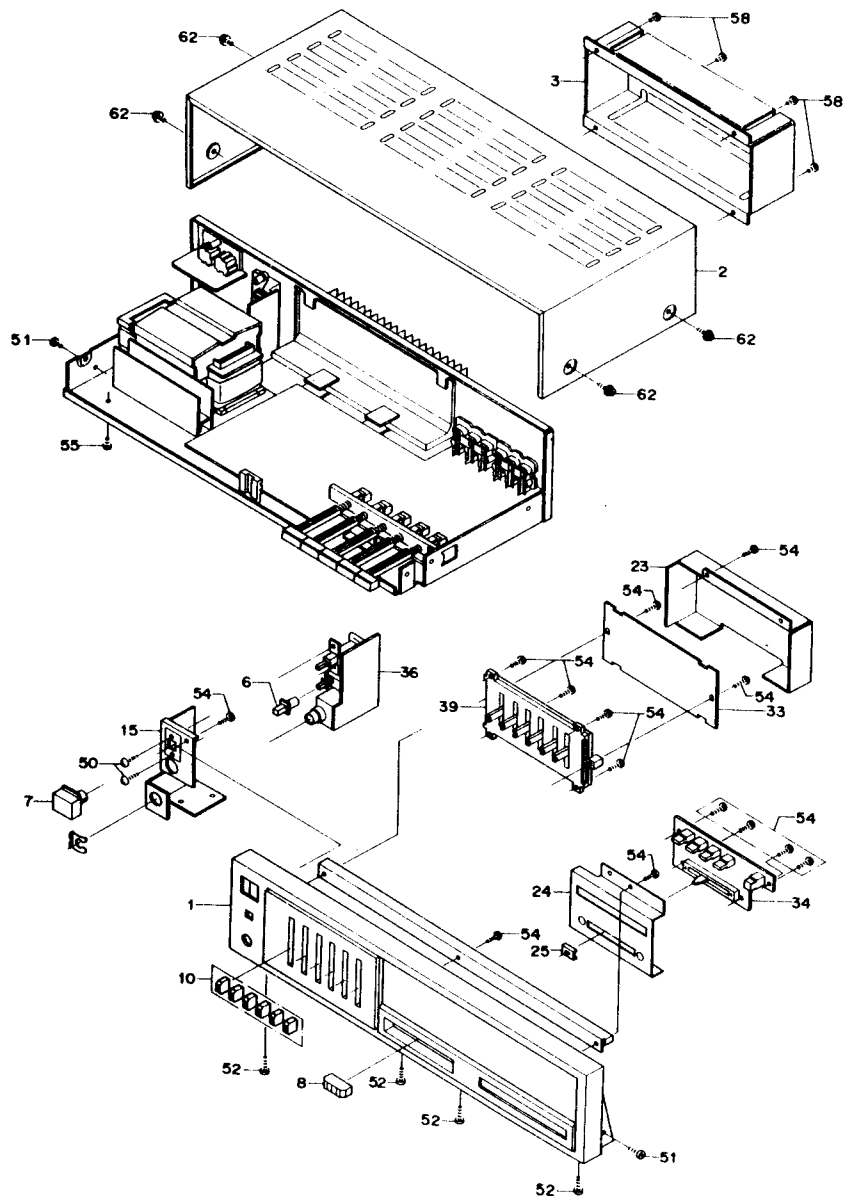


SPECIFICATIONS

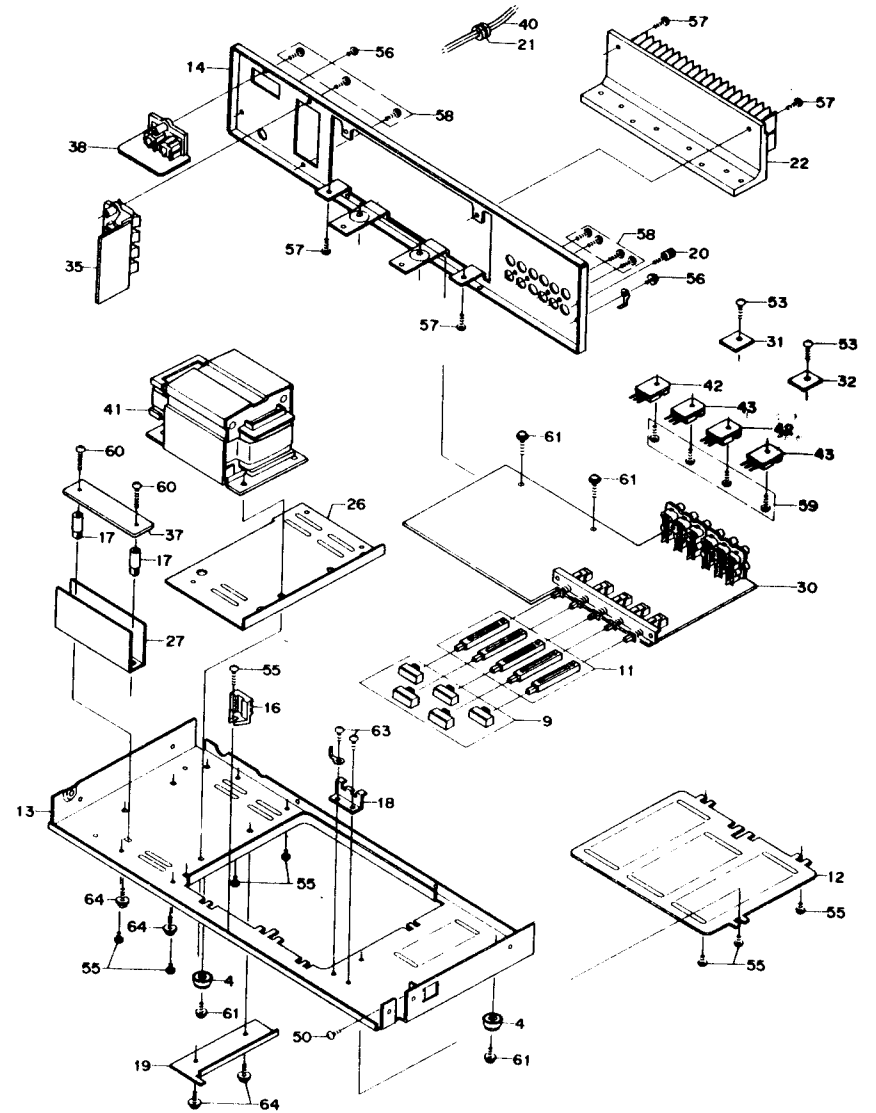
AMPLIFIER	CA-225
POWER AMPLIFIER SECTION	
Minimum RMS sine wave power per channel within stated bandwidth at no more than stated distortion and with 8-ohm load	70 Watts
Power Bandwidth	20 Hz – 20 kHz
Total Harmonic Distortion	0.5 %
I.M. Distortion	0.5 %
Speaker Damping	> 20
PREAMPLIFIER SECTION	
Frequency 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/TV/Video	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/TV/Video	85 dB
GENERAL	
Power Requirements (50 Hz)	110 / 220 V AC
Power Consumption	350 Watts
AC Outlets	2
Dimensions (W x H x D)	400 x 90 x 240 mm
Weight (approx.)	5.1 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.

CABINET & CHASSIS EXPLODED VIEW (1)



CABINET & CHASSIS EXPLODED VIEW (2)



CABINET & CHASSIS PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
PACKING PARTS LIST				ELECTRICAL PARTS LIST			
	3-9415-10300	Bag Polyethylene	1	30	141-0-1939-14153	Main Amp. P.C.B. Assy	1
	131-6-3009-36000	Pad (Right)	1	31	141-0-1939-14160	Transistor (Left) P.C.B. Assy	1
	131-6-3009-36010	Pad (Left)	1	32	141-0-1939-14170	Transistor (Right) P.C.B. Assy	1
	131-6-3069-16350	Patching Sheet	1	33	141-0-1939-14182	Graphic Equalizer P.C.B. Assy	1
	131-6-4559-11200	Serial No. Sheet	2	34	141-0-1939-14192	Power Meter P.C.B. Assy	1
	131-6-9459-00300	Rubber Band	1	35	141-0-1939-14202	Speaker Out P.C.B. Assy	1
	141-6-1189-17700	Box Corrugate-Exp.	1	36	141-0-1939-14213	Power Switch P.C.B. Assy	1
	141-6-2519-22390	Sheet Polyethylene	1	37	141-0-1939-14222	AC Fuse P.C.B. Assy	1
				38	141-0-1939-14232	Power Supply P.C.B. Assy	1
				39	4-2229-76200	Slide Volume (SW-250k Ω x6)	1
				40	Δ 4-2432-00501	Power Cord	1
				41	Δ 4-2512-30922	Power Trans	1
				42	4-2039-71830	Transistor, 2SA 1264 [Q115, Q215]	2
				43	4-2039-71820	Transistor, 2SC 3181 [Q116, Q216]	2
ACCESSORIES PARTS LIST				SCREW PARTS LIST			
	131-6-2719-10401	Bag Fan	1	50	101-3-1303-00611	Screw, Pan Hd., +M3.0x6	3
	142-6-4119-32971	Explanatory Booklet	1	51	143-3-1703-00811	Screw, Bind Hd. Tapping-B, +M3.0x8	2
				52	143-3-1703-00818	Screw, Bind Hd. Tapping-B, +M3.0x8	4
				53	143-3-1903-01411	Screw, Brazier Hd. Tapping-B, +M3.0x14	2
				54	143-3-1902-60811	Screw, Brazier Hd. Tapping-B, +M2.6x8	14
				55	143-3-1903-00611	Screw, Brazier Hd. Tapping-B, +M3.0x6	9
				56	143-3-1903-00618	Screw, Brazier Hd. Tapping-B, +M3.0x6	2
				57	143-3-1903-00811	Screw, Brazier Hd. Tapping-B, +M3.0x8	4
				58	143-3-1903-00818	Screw, Brazier Hd. Tapping-B, +M3.0x8	11
				59	143-3-1903-01211	Screw, Brazier Hd. Tapping-B, +M3.0x12	4
				60	143-3-1903-02011	Screw, Brazier Hd. Tapping-B, +M3.0x20	2
				61	131-2-4201-25200	Screw, Brazier Hd. Tapping-B, +M3.0x6	4
				62	141-2-4219-33101	Screw, Bind Hd. Tapping-B, +M3.0x8	4
				63	131-2-4201-16906	Screw, Pan Hd. Tapping-C, +M3.0x4	2
				64	141-2-4219-43300	SCrew, Bind Hd. Tapping-C, +M4.0x10	4
CABINET & CHASSIS PARTS LIS				NOTES:			
	4-2379-21520	Terminal Lug	4	1. Parts order must contain Model Number, Part Number and Description.			
	131-6-4559-11200	Serial No. Sheet	1	2. Ordering quantity of screws and resistors must be multiple of 10 pcs.			
1	131-0-1016-45302	Cabinet Front Assy	1				
2	131-2-1110-39500	Plate Decorate (Equalizer)	1				
3	131-2-1110-39602	Plate Decorate	1				
4	131-2-1203-65800	Cabinet Front	1				
5	131-2-1801-16200	Leg	2				
6	131-2-1410-34400	Cover	1				
7	131-2-1410-34603	Cover Heat Sink	1				
8	131-2-1801-12900	Leg	2				
9	131-2-3604-16200	Metal Mount Cover	1				
10	131-2-1601-69601	Knob (Speaker Select)	1				
11	131-2-1601-86200	Knob (Power)	1				
12	131-2-1601-86504	Knob (Master Volume)	1				
13	131-2-1601-96700	Knob (Function)	5				
14	131-2-1601-96800	Knob (Equalizer)	6				
15	131-2-4219-20200	Shaft	5				
16	131-2-1410-34500	Cover (Bottom)	1				
17	131-2-3301-32200	Chassis	1				
18	131-2-3306-40702	Panel Rear	1				
19	131-2-3604-16000	Metal Mount Switch	1				
20	131-2-3614-17500	Mount P.C.B.	1				
21	131-2-3614-21800	Mount P.C.B.	2				
22	131-2-3614-28600	Mount P.C.B.	1				
23	131-2-3617-19200	Metal Mount Trans	1				
24	131-2-4201-17800	Screw Ground	1				
25	131-2-6111-14200	Bushing (Power Cord)	1				
26	131-2-6201-37400	Plate Heat Sink	1				
27	141-2-3229-59800	Plate Shield	1				
	141-2-3229-60000	Plate Shield	1				
	141-2-3229-60100	Plate Earth	1				
	131-2-3617-19300	Metal Mount Trans	1				
	131-2-6108-12500	Cover Sever	1				

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.

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
- SPEAKERS switch to OFF
- FUNCTION switch to TV/VIDEO
- VOLUME control to MINIMUM position
- LEFT CHANNEL DRIVEN

ONE CHANNEL DRIVEN:

- 1) Connect a low distortion audio generator to LEFT AUX IN jack. Set generator frequency to 1 kHz and output to minimum.
- 2) Connect an 8-ohm load resistor between SPEAKERS SYSTEM-A 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 and set SPEAKERS switch to ON position. Turn VOLUME control to MAX.
- 4) Increase generator output for 70 Watts RMS (23.6 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-A terminals. Adjust generator output and "VOLUME" control for 70 watts at Left and Right Channels (23.6 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.

POWER AMPLIFIER ADJUSTMENT

BEFORE ADJUSTMENT

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

- Power switch to the **OFF** position.
- Set the **SPEAKERS** switch to the OFF position.
- Turn the **MASTER VOLUME** control to the position marked 0 (minimum).
- **IDLING CURRENT ADJUSTMENT** VR101/VR201 (on the Main P.C. Board) setting to mechanical center position.
- Connect the AC power cord and Power switch to the ON position.

IDLING CURRENT ADJUSTMENT

This adjustment is very sensitive to changes in ambient temperature. Allow set to operate for 5 minutes before attempting this adjustment.

LEFT CHANNEL AMPLIFIER

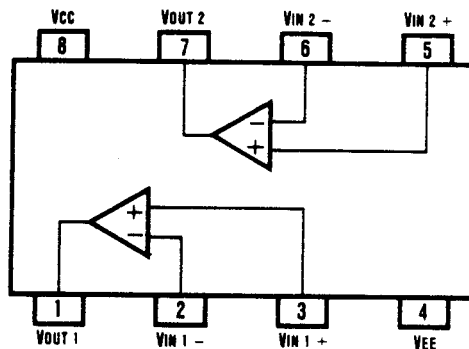
- 1) Connect the DC Voltmeter between R153 Left Leg and R152 Right Leg on the Main P.C. Board.
- 2) Adjust the VR101 for an indication of 6mV on the DC Voltmeter.

RIGHT CHANNEL AMPLIFIER

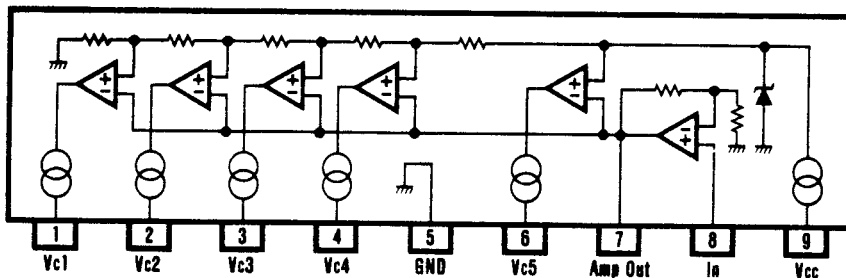
- 1) Connect the DC Voltmeter between R253 Left Leg and R252 Right Leg on the Main P.C. Board.
- 2) Adjust the VR201 for an indication of 6mV on the DC Voltmeter.

INTEGRATED CIRCUIT BLOCK DIAGRAM

PHONO / GRAPHIC EQUALIZER AMP IC NJM 072 DE / LA 6458 D



LED METER DRIVE AMP IC LB 1423



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							
30	141-0-1939-14153	Main Amp. P.C.B. Assy	1	C242	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
	4-2262-26060	Main Amp. P.C.B.	1	C243	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
	4-2349-20550	Fuse F4 0A	2	C244	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
	4-2349-20590	Fuse T4 0A	2	C245	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
VR101	4-2222-01280	Potentiometer (B-10011)	1	C246	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1
VR201	4-2222-01280	Potentiometer (B-10011)	1	C247	CC2-2-1500-KE00C	Ceramic 220pF 50V ±10%	1
S1	4-2319-78760	Push Switch 5Key (Tape Monitor/Function)	1	C302	CC1-0-3501-VEY0C	Ceramic 0.01μF 500V ±100.0%	1
L101	4-2532-00420	RF Filter (5μH)	1	C303	CC1-0-3501-VEY0C	Ceramic 0.01μF 500V ±100.0%	1
L201	4-2532-00420	RF Filter (5μH)	1	C304	CC1-0-3501-VEY0C	Ceramic 0.01μF 500V ±100.0%	1
	4-2352-01780	Pin Jack 6P (Phono, Tuner, CD)	1	C305	CC1-0-3501-VEY0C	Ceramic 0.01μF 500V ±100.0%	1
	4-2352-01780	Pin Jack 6P (TV/Video, Tape)	1	C306	4-2239-71180	Electrolytic 4700μF 55V	1
	4-2352-01940	Fuse Clip	1	C307	4-2239-71180	Electrolytic 4700μF 55V	1
	111-2-6220-11100	Wire Wrap Terminal	8	C308	CD1-0-5500-0001V	Electrolytic 1μF 50V	1
	131-2-6201-21500	Plate Heat Sink (for Q302)	1	C309	CD1-0-5500-0001V	Electrolytic 1μF 50V	1
CAPACITORS							
C101	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	C310	CD4-7-6250-0001V	Electrolytic 47μF 25V	1
C102	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1	C311	CD4-7-6250-0001V	Electrolytic 47μF 25V	1
C103	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	C312	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V ±80.20%	1
C104	CM1-8-3500-J00SV	Mylar 0.018μF 50V ±5%	1	C313	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V ±80.20%	1
C105	CM4-7-2500-J00SV	Mylar 0.0047μF 50V ±5%	1	C320	CD3-3-7250-0001V	Electrolytic 330μF 25V	1
C106	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	C321	CD4-7-6350-0001V	Electrolytic 47μF 35V	1
C107	CD4-7-663A-0001V	Electrolytic 47μF 6.3V	1	C325	CD2-2-7630-0001V	Electrolytic 220μF 63V	1
C108	CD1-0-5500-0001V	Electrolytic 1μF 50V	1	C501	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V ±80.20%	1
C109	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	SEMICONDUCTORS			
C128	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D101	205-5-9020-43010	Diode, DS 430	1
C129	CD1-0-6160-0001V	Electrolytic 10μF 16V	1	D102	202-5-3210-22012	Zener Diode, GZA 22 Y	1
C130	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D103	202-5-2810-44210	Diode, DS 442	1
C131	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D105	202-5-1410-00110	Diode, GMA 01	1
C132	CC4-7-0500-KD00C	Ceramic 47pF 50V ±10%	1	D106	202-5-1410-00110	Diode, GMA 01	1
C133	CD1-0-763A-0001V	Electrolytic 100μF 6.3V	1	D201	205-5-9020-43010	Diode, DS 430	1
C134	CD2-2-7630-0001V	Electrolytic 220μF 63V	1	D203	202-5-2810-44210	Diode, DS 442	1
C135	CD2-2-7630-0001V	Electrolytic 220μF 63V	1	D205	202-5-1410-00110	Diode, GMA 01	1
C136	CD1-0-5500-0001V	Electrolytic 1μF 50V	1	D206	202-5-1410-00110	Diode, GMA 01	1
C137	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V ±80.20%	1	D301	212-5-4550-02020	Diode, GMA 01	1
C140	CM1-0-4500-J00TV	Mylar 0.1μF 50V ±5%	1	D302	212-5-4550-02020	Diode, DSA 20 C	1
C141	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D303	212-5-4550-02020	Diode, DSA 20 C	1
C142	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D304	212-5-4550-02020	Diode, DSA 20 C	1
C143	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D305	202-5-3210-18012	Zener Diode, GZA 18 Y	1
C144	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D306	202-5-3210-18012	Zener Diode, GZA 18 Y	1
C145	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D307	202-5-9620-44621	Diode, DS 446	1
C146	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D308	202-5-2810-44210	Diode, DS 442	1
C147	CC2-2-1500-KE00C	Ceramic 220pF 50V ±10%	1	D311	212-5-4390-13510	Diode, DS 135 D	1
C201	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	D312	212-5-4390-13510	Diode, DS 135 D	1
C202	CD4-7-5250-0001V	Electrolytic 4.7μF 25V	1	IC1	IJJ--NJM0-72D-E	IC, NJM 072D E	1
C203	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O106	203-5-4921-01264	Transistor, 2SD 1012	1
C204	CM1-8-3500-J00SV	Mylar 0.018μF 50V ±5%	1	O107	203-5-5000-53661	Transistor, 2SC 536	1
C205	CM4-7-2500-J00SV	Mylar 0.0047μF 50V ±5%	1	O108	203-5-5000-53661	Transistor, 2SC 536	1
C206	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O109	203-5-7230-60860	Transistor, 2SA 608	1
C207	CD4-7-663A-0001V	Electrolytic 47μF 6.3V	1	O110	203-5-4561-01760	Transistor, 2SA 1017	1
C208	CD1-0-5500-0001V	Electrolytic 1μF 50V	1	O111	203-5-4542-36360	Transistor, 2SC 2363	1
C209	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O113	203-5-1711-35250	Transistor, 2SA 1352	1
C228	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O114	203-5-1743-41650	Transistor, 2SC 3416	1
C229	CD1-0-6160-0001V	Electrolytic 10μF 16V	1	O206	203-5-4921-01264	Transistor, 2SD 1012	1
C230	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O207	203-5-5000-53661	Transistor, 2SC 536	1
C231	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O208	203-5-5000-53661	Transistor, 2SC 536	1
C232	CC4-7-0500-KD00C	Ceramic 47pF 50V ±10%	1	O209	203-5-7230-60860	Transistor, 2SA 608	1
C233	CD1-0-763A-0001V	Electrolytic 100μF 6.3V	1	O210	203-5-4561-01760	Transistor, 2SA 1017	1
C234	CD2-2-7630-0001V	Electrolytic 220μF 63V	1	O211	203-5-4542-36360	Transistor, 2SC 2363	1
C235	CD2-2-7630-0001V	Electrolytic 220μF 63V	1	O213	203-5-1711-35250	Transistor, 2SA 1352	1
C237	CC4-7-3500-ZG00C	Ceramic 0.047μF 50V ±80.20%	1	O214	203-5-1743-41650	Transistor, 2SC 3416	1
C240	CM1-0-4500-J00TV	Mylar 0.1μF 50V ±5%	1	O301	203-5-7230-60860	Transistor, 2SA 608	1
C241	CC2-2-1500-KD00C	Ceramic 220pF 50V ±10%	1	O302	203-5-9620-32550	Transistor, 2SD 325	1
				O303	203-5-7230-60860	Transistor, 2SA 608	1

P.C. BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
RESISTORS							
R101	401 025 1605	CARBON 1.5K JA 1/6W	1	R305	401 012 5708	CARBON 1K JA 1/4W	1
R102	401 024 7707	CARBON 100K JA 1/6W	1	R306	401 022 1905	CARBON 680 JA 1/4W	1
R103	401 024 7707	CARBON 100K JA 1/6W	1	R307	401 022 1905	CARBON 680 JA 1/4W	1
R104	401 025 8703	CARBON 220K JA 1/6W	1	R312	401 060 8706	OXIDE-MT 2.7K JA 1W	1
R105	401 025 1902	CARBON 15K JA 1/6W	1	R314	401 027 9005	CARBON 82K JA 1/6W	1
R106	401 026 0607	CARBON 270 JA 1/6W	1	R315	401 024 7707	CARBON 100K JA 1/6W	1
R107	401 024 7707	CARBON 100K JA 1/6W	1	R316	401 020 2904	CARBON 47K JA 1/4W	1
R108	401 025 7805	CARBON 2.2K JA 1/6W	1	TRANSISTOR (LEFT) P.C.B. ASSY			
R135	401 024 7004	CARBON 1K JA 1/6W	1	31	141-0-1939-14160	Transistor (Left) P.C.B. Assy	1
R136	401 025 1902	CARBON 15K JA 1/6W	1		4-2262-26080	Transistor (Left) P.C.B.	1
R137	401 027 3003	CARBON 56K JA 1/6W	1	SEMICONDUCTORS			
R138	401 021 1906	CARBON 560 JA 1/4W	1	D104	202-5-2810-44210	Diode, DS 442	1
R139	401 021 1906	CARBON 560 JA 1/4W	1	O112	4-2039-72100	Transistor, 2SD 947	1
R140	402 015 5603	FUSIBLE RES 82 J- 1/4W	1	TRANSISTOR (RIGHT) P.C.B. ASSY			
R141	401 025 8208	CARBON 22K JA 1/6W	1	32	141-0-1939-14170	Transistor (Right) P.C.B. Assy	1
R142	401 027 3003	CARBON 56K JA 1/6W	1		4-2262-26080	Transistor (Right) P.C.B.	1
R143	401 026 0607	CARBON 270 JA 1/6W	1	SEMICONDUCTORS			
R144	401 027 8602	CARBON 8.2K JA 1/6W	1	D204	202-5-2810-44210	Diode, DS 442	1
R145	401 027 3003	CARBON 56K JA 1/6W	1	O212	4-2039-72100	Transistor, 2SD 947	1
R146	402 015 5603	FUSIBLE RES 82 J- 1/4W	1	GRAPHIC EQUALIZER P.C.B. ASSY			
R147	402 016 2601	FUSIBLE RES 33 J- 1/2W	1	33	141-0-1939-14182	Graphic Equalizer P.C.B. Assy	1
R148	402 016 2601	FUSIBLE RES 33 J- 1/2W	1		4-2262-26090	Graphic Equalizer P.C.B.	1
R149	402 015 3708	FUSIBLE RES 2.2 J- 1/4W	1		4-2359-78220	Socket Jumper 7P	1
R150	402 015 4408	FUSIBLE RES 330 J- 1/4W	1		4-2359-78800	Socket Jumper 5P	1
R151	402 015 3708	FUSIBLE RES 2.2 J- 1/4W	1	CAPACITORS			
R152	401 064 0300	OXIDE-MT 0.22 JB 2W	1	C110	CD1-0-5500-0001V	Electrolytic 1μF	1
R153	401 064 0300	OXIDE-MT 0.22 JB 2W	1	C111	CC1-0-1500-KD00C	Ceramic 100pF	1
R154	401 012 3407	CARBON 10 JA 1/4W	1	C112	CC6-8-0500-KD00C	Ceramic 68pF	1
R155	401 058 1207	OXIDE-MT 10 JB 1W	1	C113	CC1-0-0500-0D00C	Ceramic 10pF	1
R158	401 023 2802	CARBON 8.2K JA 1/4W	1	C114	CD2-2-6250-0001V	Electrolytic 22μF	1
R201	401 025 1605	CARBON 1.5K JA 1/6W	1	C115	CM1-8-3500-K00SV	Mylar 0.018μF	1
R202	401 024 7707	CARBON 100K JA 1/6W	1	C116	CD2-2-5500-0001V	Electrolytic 2.2μF	1
R203	401 024 7707	CARBON 100K JA 1/6W	1	C117	CM6-8-2500-K00SV	Mylar 0.0068μF	1
R204	401 025 8703	CARBON 220K JA 1/6W	1	C118	CD4-7-4500-0001V	Electrolytic 0.47μF	1
R205	401 025 1902	CARBON 15K JA 1/6W	1	C119	CM4-7-2500-K00SV	Mylar 0.0047μF	1
R206	401 026 0607	CARBON 270 JA 1/6W	1	C120	CM8-2-3500-J00TV	Mylar 0.082μF	1
R207	401 024 7707	CARBON 100K JA 1/6W	1	C121	CM1-5-2500-K00SV	Mylar 0.0015μF	1
R208	401 025 7805	CARBON 2.2K JA 1/6W	1	C122	CM2-2-3500-K00SV	Mylar 0.022μF	1
R235	401 024 7004	CARBON 1K JA 1/6W	1	C123	CC6-8-1500-KE00C	Ceramic 680pF	1
R236	401 014 5201	CARBON 15K JA 1/4W	1	C124	CM4-7-2500-K00SV	Mylar 0.0047μF	1
R237	401 021 4105	CARBON 56K JA 1/4W	1	C210	CD1-0-5500-0001V	Electrolytic 1μF	1
R238	401 021 1906	CARBON 560 JA 1/4W	1	C211	CC1-0-1500-KD00C	Ceramic 100pF	1
R239	401 021 1906	CARBON 560 JA 1/4W	1	C212	CC6-8-0500-KD00C	Ceramic 68pF	1
R240	402 015 5603	FUSIBLE RES 82 J- 1/4W	1	C213	CC1-0-0500-0D00C	Ceramic 10pF	1
R241	401 025 8208	CARBON 22K JA 1/6W	1	C214	CD2-2-6250-0001V	Electrolytic 22μF	1
R242	401 027 3003	CARBON 56K JA 1/6W	1				

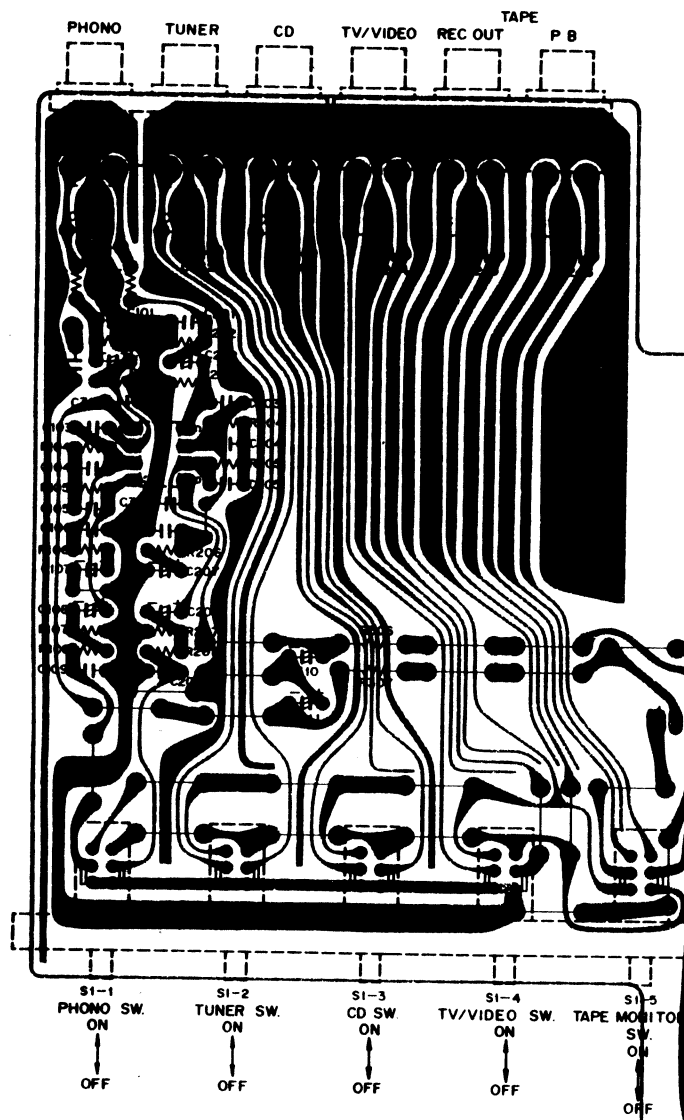
P.C. BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
C314	CD4-7-6250-0001V	Electrolytic	47µF 25V	1			
C315	CD4-7-6250-0001V	Electrolytic	47µF 25V	1			
SEMICONDUCTORS							
IC2	206-5-2726-45810	IC, LA 6458 DS		1			
Q101	203-5-5000-53660	Transistor, 2SC 536		1			
Q102	203-5-5000-53660	Transistor, 2SC 536		1			
Q103	203-5-5000-53660	Transistor, 2SC 536		1			
Q104	203-5-5000-53660	Transistor, 2SC 536		1			
Q105	203-5-5000-53660	Transistor, 2SC 536		1			
Q201	203-5-5000-53660	Transistor, 2SC 536		1			
Q202	203-5-5000-53660	Transistor, 2SC 536		1			
Q203	203-5-5000-53660	Transistor, 2SC 536		1			
Q204	203-5-5000-53660	Transistor, 2SC 536		1			
Q205	203-5-5000-53660	Transistor, 2SC 536		1			
RESISTORS							
R109	401 025 1605	CARBON 1.5K JA 1/6W		1			
R110	401 027 3003	CARBON 56K JA 1/6W		1			
R111	401 026 9907	CARBON 4.7K JA 1/6W		1			
R112	401 027 2600	CARBON 5.6K JA 1/6W		1			
R113	401 024 9305	CARBON 1.2K JA 1/6W		1			
R114	401 025 2305	CARBON 150K JA 1/6W		1			
R115	401 026 6609	CARBON 390 JA 1/6W		1			
R116	401 025 1902	CARBON 1.5K JA 1/6W		1			
R117	401 024 9305	CARBON 1.2K JA 1/6W		1			
R118	401 024 7707	CARBON 100K JA 1/6W		1			
R119	401 026 6609	CARBON 390 JA 1/6W		1			
R120	401 025 1902	CARBON 1.5K JA 1/6W		1			
R121	401 025 1605	CARBON 1.5K JA 1/6W		1			
R122	401 026 7408	CARBON 39K JA 1/6W		1			
R123	401 026 6609	CARBON 390 JA 1/6W		1			
R124	401 025 1902	CARBON 1.5K JA 1/6W		1			
R125	401 025 1605	CARBON 1.5K JA 1/6W		1			
R126	401 026 4605	CARBON 33K JA 1/6W		1			
R127	401 026 6609	CARBON 390 JA 1/6W		1			
R128	401 025 1902	CARBON 1.5K JA 1/6W		1			
R129	401 025 1605	CARBON 1.5K JA 1/6W		1			
R130	401 025 1605	CARBON 22K JA 1/6W		1			
R131	401 026 6609	CARBON 390 JA 1/6W		1			
R132	401 025 1902	CARBON 1.5K JA 1/6W		1			
R133	401 020 2003	CARBON 4.7K JA 1/4W		1			
R209	401 025 1605	CARBON 1.5K JA 1/6W		1			
R210	401 027 3003	CARBON 56K JA 1/6W		1			
R211	401 026 9907	CARBON 4.7K JA 1/6W		1			
R212	401 021 3009	CARBON 5.6K JA 1/4W		1			
R213	401 024 9305	CARBON 1.2K JA 1/6W		1			
R214	401 025 2305	CARBON 150K JA 1/6W		1			
R215	401 026 6609	CARBON 390 JA 1/6W		1			
R216	401 025 1902	CARBON 1.5K JA 1/6W		1			
R217	401 024 9305	CARBON 1.2K JA 1/6W		1			
R218	401 024 7707	CARBON 100K JA 1/6W		1			
R219	401 026 6609	CARBON 390 JA 1/6W		1			
R220	401 025 1902	CARBON 1.5K JA 1/6W		1			
R221	401 025 1605	CARBON 1.5K JA 1/6W		1			
R222	401 026 7408	CARBON 39K JA 1/6W		1			
R223	401 026 6609	CARBON 390 JA 1/6W		1			
R224	401 025 1902	CARBON 1.5K JA 1/6W		1			
R225	401 025 1605	CARBON 1.5K JA 1/6W		1			
R226	401 026 4605	CARBON 33K JA 1/6W		1			
R227	401 026 6609	CARBON 390 JA 1/6W		1			
R228	401 025 1902	CARBON 1.5K JA 1/6W		1			
R229	401 025 1605	CARBON 1.5K JA 1/6W		1			
R230	401 025 8208	CARBON 22K JA 1/6W		1			
R231	401 026 6609	CARBON 390 JA 1/6W		1			
R232	401 025 1902	CARBON 1.5K JA 1/6W		1			
R233	401 026 9907	CARBON 4.7K JA 1/6W		1			
R308	401 012 4503	CARBON 100 JA 1/4W		1			
R309	401 012 4503	CARBON 100 JA 1/4W		1			
POWER METER P.C.B. ASSY							
34	141-0-1939-14192	Power Meter P.C.B. Assy		1			
	4-2262-26100	Power Meter P.C.B.		1			
VR501	4-2229-76210	Slide Volume (A-100kΩx2, Volume)		1			
	131-2-4208-49100	Spacer LED		5			
	131-2-4208-49200	Spacer LED		1			
CAPACITORS							
C125	CC3-3-1500-KD00C	Ceramic	330pF 50V ±10%	1			
C126	CM4-7-3500-K00SV	Mylar	0.047µF 50V ±10%	1			
C225	CC3-3-1500-KD00C	Ceramic	330pF 50V ±10%	1			
C226	CM4-7-3500-K00SV	Mylar	0.047µF 50V ±10%	1			
C318	CD4-7-6250-0001V	Electrolytic	47µF 25V	1			
C319	CD1-0-5500-0001V	Electrolytic	1µF 50V	1			
C401	CD1-0-6250-0001V	Electrolytic	10µF 25V	1			
SEMICONDUCTORS							
D309	4-2029-72101	L.E.D. GL 9 PR 54 (Power)		1			
D310	202-5-3210-08212	Zener Diode, GZA 8.2 V		1			
D401	000--SLP-173B-	L.E.D. SLP 173 B (Power Level Meter)		1			
D402	000--SLP-173B-	L.E.D. SLP 173 B (Power Level Meter)		1			
D403	000--SLP-173B-	L.E.D. SLP 173 B (Power Level Meter)		1			
D404	000--SLP-173B-	L.E.D. SLP 173 B (Power Level Meter)		1			
D405	000--SLP-173B-	L.E.D. SLP 173 B (Power Level Meter)		1			
D406	202-5-2810-44210	Diode, DS 442		1			
D407	202-5-2810-44210	Diode, DS 442		1			
IC3	206-5-2291-42310	IC, LB 1423		1			
RESISTORS							
R134	401 026 9907	CARBON 4.7K JA 1/6W		1			
R234	401 026 9907	CARBON 4.7K JA 1/6W		1			
R310	401 012 4503	CARBON 100 JA 1/4W		1			
R311	401 027 2303	CARBON 560 JA 1/6W		1			
R313	401 020 0801	CARBON 470 JA 1/4W		1			
R401	401 014 2903	CARBON 150 JA 1/4W		1			
R402	401 012 7009	CARBON 10K JA 1/4W		1			
R403	401 015 2704	CARBON 1.8K JA 1/4W		1			
R404	401 012 7009	CARBON 10K JA 1/4W		1			
SPEAKER OUT P.C.B. ASSY							
35	141-0-1939-14202	Speaker Out P.C.B. Assy		1			
	4-2262-26110	Speaker Out P.C.B.		1			
	4-2379-71080	8P Push Terminal (Speakers)		1			
CAPACITORS							
C138	CC1-0-2500-KE00R	Ceramic	1000pF 50V ±10%	1			
C139	CC1-0-2500-KE00R	Ceramic	1000pF 50V ±10%	1			
C238	CC1-0-2500-KE00R	Ceramic	1000pF 50V ±10%	1			
C239	CC1-0-2500-KE00R	Ceramic	1000pF 50V ±10%	1			
POWER SWITCH P.C.B. ASSY							
36	141-0-1939-14213	Power Switch P.C.B. Assy		1			
	4-2262-26120	Power Switch P.C.B.		1			
S2	4-2312-05820	Switch Push 1 Key (Speakers)		1			
S3	4-2312-05710	Switch Push Power (Power)		1			

P.C. BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
	4-2352-01170	Jack 7P 6 45 (Headphones)	1
	111-2-6220-11100	Wire Wrap Terminal	2
	131-2-6114-01400	Cover Safety	1
CAPACITOR			
C301	4-2239-70970	Capacitor 0.01µF 400V ±100%	1
RESISTORS			
R156	401 061 6503	OXIDE-MT 390 JB 1W	1
R157	401 013 4205	CARBON 120 JA 1/4W	1
R256	401 061 6503	OXIDE-MT 390 JB 1W	1
R257	401 013 4205	CARBON 120 JA 1/4W	1
AC FUSE P.C.B. ASSY			
37	141-0-1939-14222	AC Fuse P.C.B. Assy	1
	4-2262-26130	AC Fuse P.C.B.	1
	4-2372-00830	EC Terminal 1P	2
	111-2-6220-11100	Wire Wrap Terminal	4
POWER SUPPLY P.C.B. ASSY			
38	141-0-1939-14232	Power Supply P.C.B. Assy	1
	4-2262-26140	Power Supply 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 Socket)	1
	111-2-6220-11100	Wire Wrap Terminal	4
	131-2-7103-52604	Label Fuse T1 0Ax2	1
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 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.			

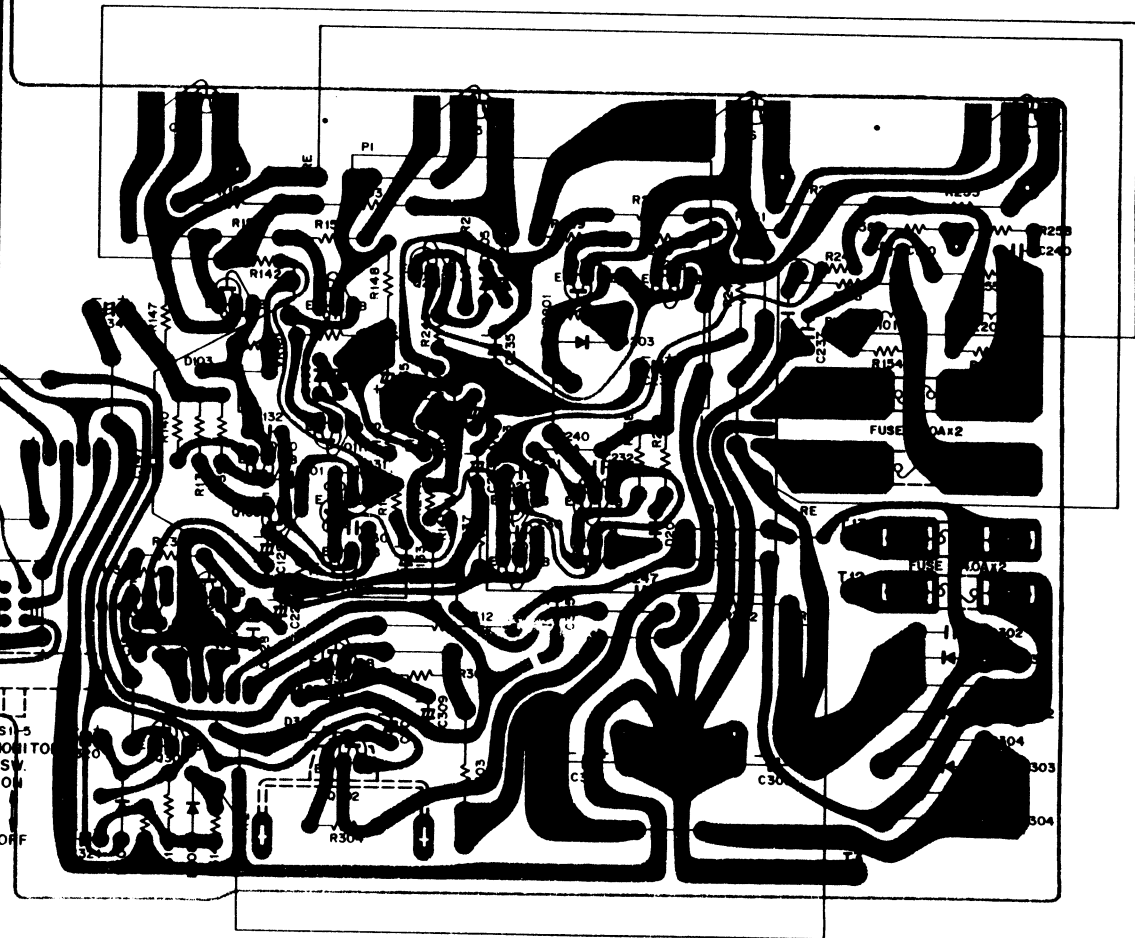
MAIN PRINTED CIRCUIT BOARD



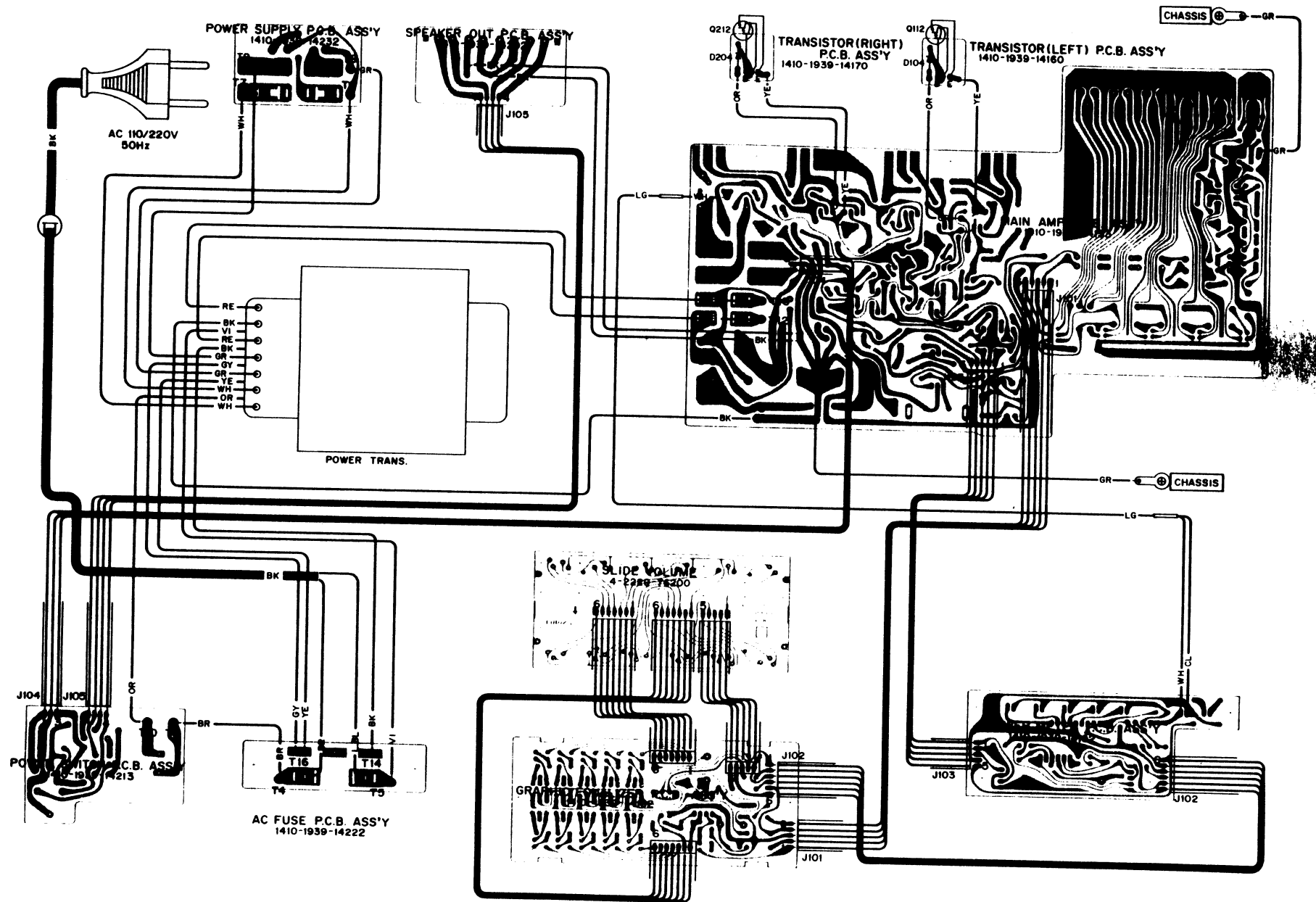
TRANSISTOR DC VOLTAGES									
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q106,206	2SD1012	0.3V	0V	0V	Q110,210	2SA1017	51.2V	1.1V	52.2V
Q107,207	2SC536	0V	51.2V	-0.6V	Q111,211	2SC2363	-51.4V	-1.1V	-52.0V
Q108,208	2SC536	0V	52.2V	-0.6V	Q113,213	2SA1352	-1.1V	-52.0V	-0.6V
Q109,209	2SA608	52.2V	51.2V	52.7V	Q114,214	2SC3416	1.1V	52.0V	0.5V

IC PIN NUMBERS DC VOLTAGES									
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8
IC01	NJM072	0V	0V	0V	-15.1V	0V	0V	0V	15.6V

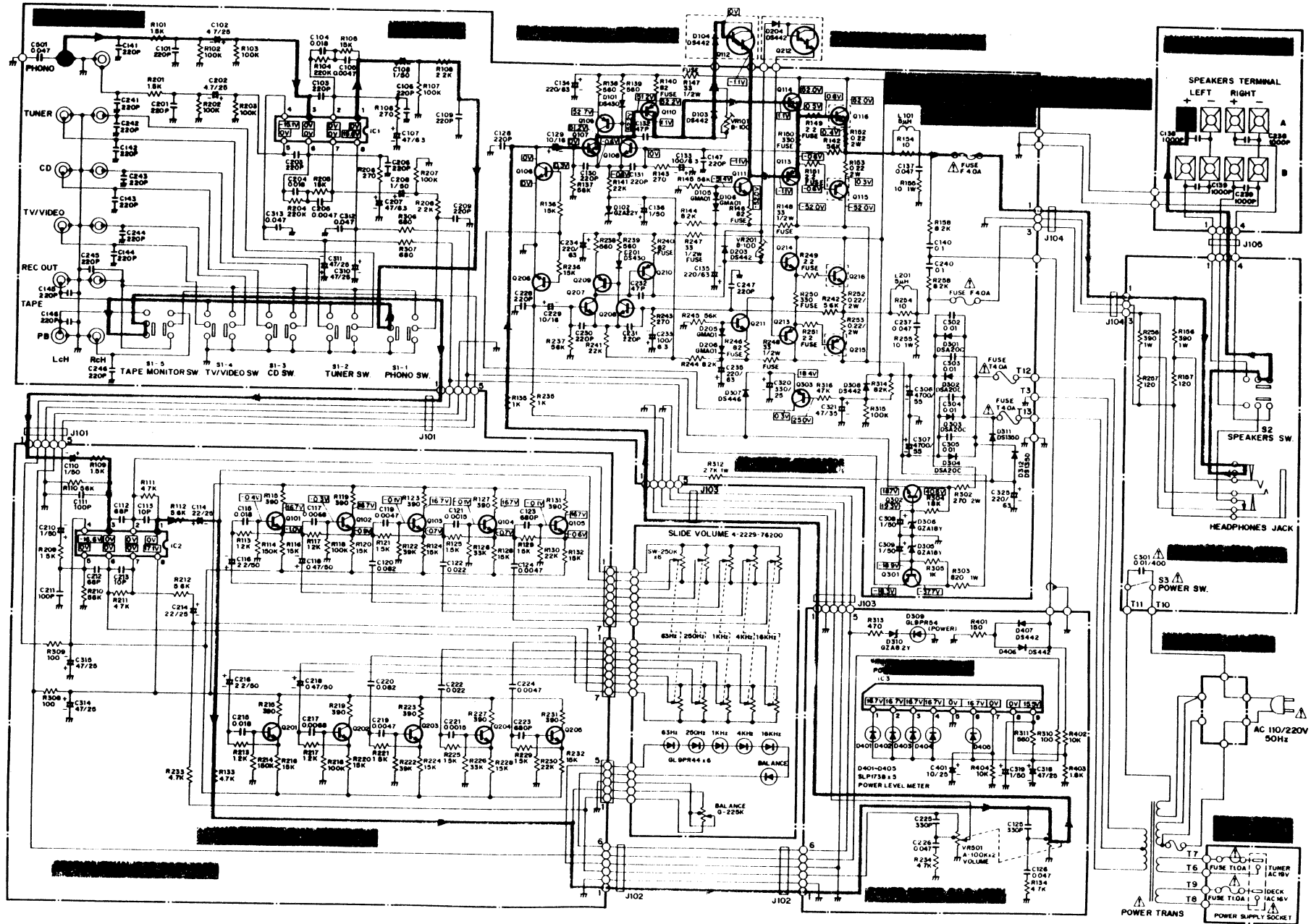
TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q301	2SA608	-18.9V	-37.7V	-18.3V
Q302	2SD325	19.3V	40.6V	18.7V
Q303	2SA608	25.0V	0.3V	18.4V



POINT TO POINT WIRING DIAGRAM



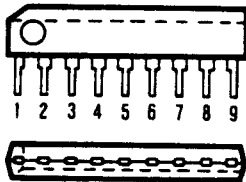
SCHEMATIC DIAGRAM



SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW	TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SC 536 2SA 608 2SA 1017 2SC 2363			2SA 1265 2SC 3182		
2SD 325			2SA 1352 2SC 3416 2SD 947		
2SD 1012			TERMINAL NAME		
			B → BASE C → COLLECTOR E → EMITTER		

LB 1423 FRONT/BOTTOM VIEWS



NJM 072 / LA 6458 BOTTOM VIEW



SWITCH NAME & POSITION

No.	Name	Position	No.	Name	Position
S1-1	PHONO Switch	OFF	S1-5	TAPE MONITOR Switch	OFF
S1-2	TUNER Switch	OFF	S2	SPEAKERS Switch	A
S1-3	CD Switch	OFF	S3	POWER Switch	OFF
S1-4	TV/VIDEO Switch	OFF			

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NOTES:

- All resistors values are indicated in "ohm" (K=10³, M=10⁶).
- All capacitors values are indicated in "μF" (P=10⁻¹²).
- All voltages indicated on the schematics are measured under the following conditions.
 - Use a V.T.V.M.

- All voltages ± 10 % with respect to chassis ground
 - No signals at input terminals
 - 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.