

Service Manual

FISHER

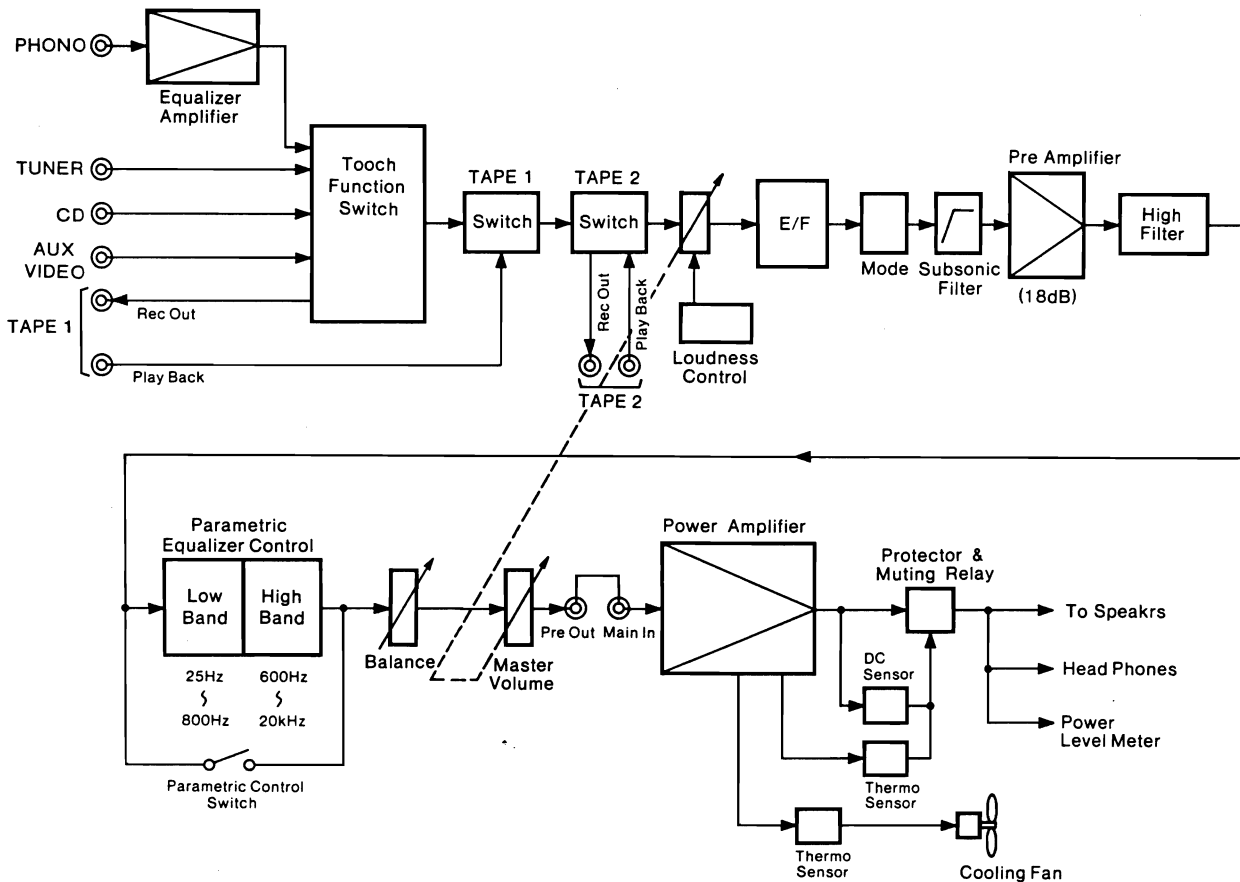
CA-276

INTEGRATED STEREO AMPLIFIER

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FUNCTIONAL BLOCK DIAGRAM



SPECIFICATIONS

AMPLIFIER	CA-276
POWER AMPLIFIER SECTION Minimum RMS sine wave power per channel within stated bandwidth at no more than stated distortion and with 8-ohm load	150 Watts
Power Bandwidth	20 Hz – 20 kHz
Total Harmonic Distortion	0.009 %
I.M. Distortion	0.009 %
Speaker Damping	> 20
PREAMPLIFIER SECTION Frequency Response	
Phono (RIAA)	±0.2 dB
Aux (20 Hz – 20 kHz)	±0.2 dB
Input Sensitivity and Impedance	
Phono	2.5 mV/50 kΩ
Tape Monitor 1, 2	150 mV/50 kΩ
Tuner	150 mV/50 kΩ
CD/Aux/Video	150 mV/50 kΩ
Phono Max. Input Capability	200 mV
Parametric Equalizer	
25 Hz – 800 Hz	±12 dB
600 Hz – 20 kHz	±12 dB
High Filter (Above 10 kHz)	–6 dB/Oct.
Subsonic Filter (Below 10 Hz)	–12 dB/Oct.
Loudness Contour (100 Hz/10 kHz)	+8 dB/+4 dB
Hum & Noise (IHF Short Circuit, A Network)	
Phono	75 dB
Tape Monitor 1, 2	100 dB
Tuner	100 dB
CD/Aux/Video	100 dB
GENERAL Power Requirements (50 Hz)	110 / 220 V AC
Power Consumption	850 Watts
Dimensions (W x D x H)	440 x 292 x 140 mm
Weight (approx.)	12.4 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.

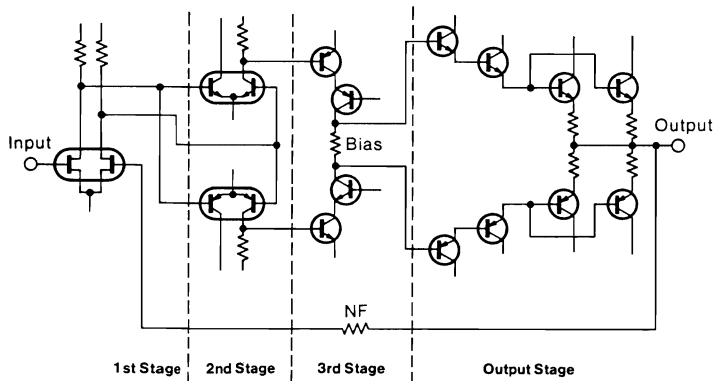
CIRCUIT DESCRIPTION

COMPOSITION OF POWER AMPLIFIER

The DC coupling of the input became possible with the differential FET amplifier used in the first stage and the distortion was reduced from the second stage to the final one in the complementary push-pull configuration.

The second stage is composed of the differential complementary push-pull, the third stage the cascade complementary push-pull, the output stage the triple Darlington push-pull, and the final stage is especially composed of the parabolic push to allow the output of 150W.

Power Amplifier Block Diagram



FTC Power 150W x 2 (Distortion 0.009%)

FORCED COOLING SYSTEM

The forced cooling system is adopted as a heat radiation system of the 150W amplifier and the AC motor having low noise is used as a fan motor. The fan does not rotate continuously. It starts rotating when the thermosensor, connected thermally at the vicinity of the output-stage transistor, detects the temperature 85°C – 90°C of the power transistor. When the temperature of the heat radiation plate drops below 85°C, the fan stops rotating.

If the temperature does not reach the detectable range due to small output, the fan does not start rotating.

PROTECTION CIRCUIT

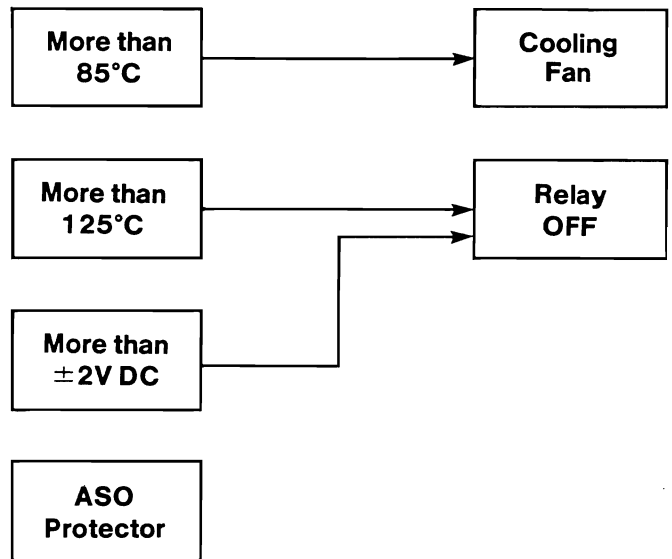
If the fan cooling system does not function by any possibility and the temperature of the power transistor rises to about 125°C, another thermosensor starts functioning, so that the relay in the output circuit is set off and the speakers are disconnected from the amplifier.

Therefore, this double protection system secures the power amplifier against damages.

When DC voltage of more than $\pm 2V$ is generated at the output terminal of the power amplifier, the power relay works to disconnect the speakers from the amplifier to protect them.

The ASO protector is also built in the unit to protect the ASO of the power transistor. This protector works very effectively to protect the transistor because it controls the current against the phase the rotation such as capacitance and inductance loads, etc., the overvoltage, and the loaded short-circuit current.

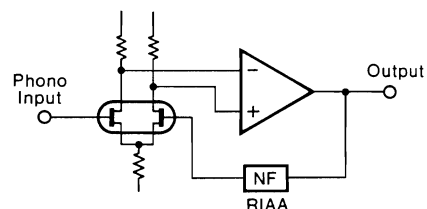
Protection System Block Diagram



PHONO EQUALIZER CIRCUIT

The differential FET amplifier having low noise is used in the first stage and it makes possible the DC coupling from the Player cartridge. It is also shown as an effect of the FET circuit that the amplifier has excellent capability to exclude the external power source.

Phono Equalizer Block Diagram



AUTO FUNCTION & SYNCHRO RECORDING

When the amplifier CA-276 is used in combination with the optionally available tuner FM-276, turntable MT-750, double cassette deck CR-W80 and compact disc player AD-844, the auto function and synchro (simultaneous) recording can be used to full advantage.

AUTO FUNCTION:

To operate . . .

- For radio reception:
Press the desired preset station button on tuner.

CIRCUIT DESCRIPTION (Continued)

- To listen to a record:
Press the START/REJECT button on the turntable.
- For tape playback:
Press the PLAY button on DECK 1 or DECK 2 of the double cassette deck.
- To listen to a compact disc:
Press the PLAY/PAUSE button on the compact disc player.

Any of the above mentioned actions automatically sets the amplifier's FUNCTION selector to the correct mode.

SYNCHRO RECORDING:

When music from a record or compact disc is being recorded, the PAUSE button on DECK 2 of the double cassette deck is automatically released or set to the depressed position in synchronization with the turntable's tonearm operation or the start or stop of the music on the disc.

- Synchro recording of records:
When the tonearm is lowered, the PAUSE button on DECK 2 is automatically released and the recording mode is established.
When the tonearm rises, a silent space of approximately 4 seconds is created, then the PAUSE button on DECK 2 is automatically set to the depressed position and the pause mode is established.
- Synchro recording of compact discs:
When the compact disc play begins, the PAUSE button on DECK 2 is automatically released and the recording mode is established.
When the compact disc play temporarily stops, a silent space of approximately 4 seconds is created, then the PAUSE button on DECK 2 is automatically set to the depressed position and the pause mode is established.

PARAMETRIC EQUALIZER CONTROLS

This unit is equipped with a sophisticated PARAMETRIC EQUALIZER that allows precision control over 3 audio parameters – center frequency, frequency band width and boost/cut level – while maintaining high sound quality. Use the PARAMETRIC EQUALIZER controls to compensate for adverse room acoustics, to reduce noise from noisy music sources, to create new sounds, or simply to adjust and maintain the ideal response of the entire playback system.

The center frequency is continuously variable from 25Hz to 800Hz for the LOW BAND, and from 600Hz to 20kHz for the HIGH BAND.

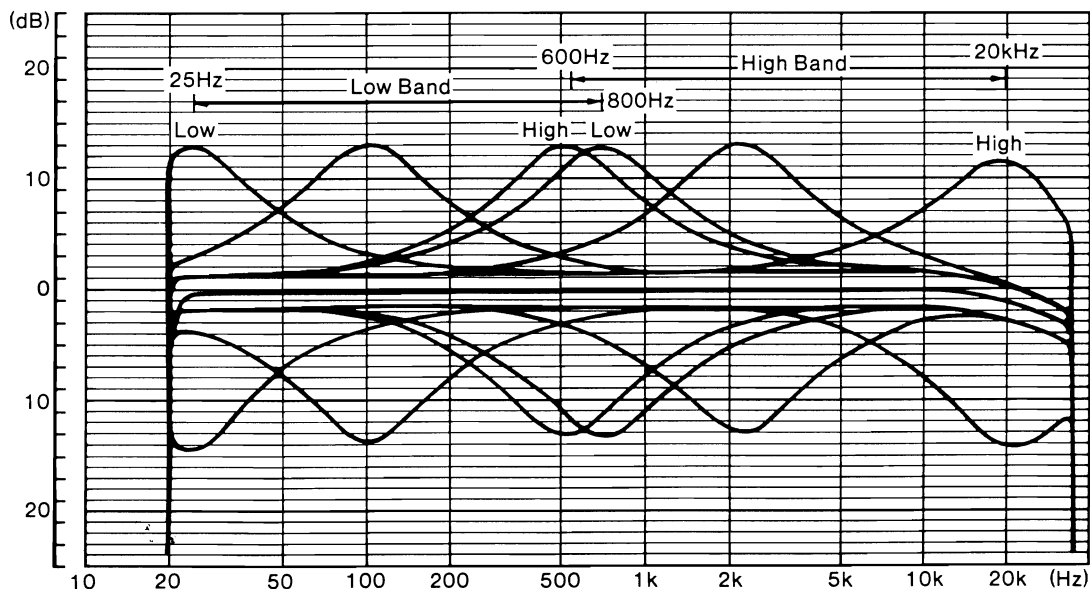
The frequency band width is adjustable from narrow to wide, while the boost/cut level can be adjusted up to ± 12 dB for both bands.

All 3 parameters are independently adjustable for even greater control over the system's frequency response.

Power Indication

The adoption of the wide display made indication of power more accurate than ever and the selection switch (200W/2W) made possible the visible indication of power at low sound intensity.

PARAMETRIC EQUALIZER CONTROLS RESPONSE



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:

- POWER switch to OFF
- SPEAKER switch to OFF
- PARAMETRIC EQUALIZER switch to DEFEAT
- METER RANGE switch to 200W position
- TAPE MONITOR switch to SOURCE
- FUNCTION switch to AUX
- HIGH FILTER switch to OFF
- SUBSONIC FILTER switch to OFF
- MODE switch to STEREO
- LOUDNESS switch to OFF
- 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 slowly to maximum.
- 4) Increase generator output for 150 Watts RMS (34.6 volts across the 8-ohm load). Harmonic Distortion Analyzer should measure 0.009 % 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 150 watts at Left and Right Channels (34.6 volts across the 8-ohm loads). Harmonic Distortion Analyzer should measure 0.009 % 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

This adjustment is very sensitive to changes in ambient temperature. Allow set to operate for 10 minutes before attempting this adjustment. and IDLING CURRENT ADJUSTMENT VR02 setting to mechanical center position.

CENTER VOLTAGE ADJUSTMENT

LEFT AMPLIFIER

1. Set the SPEAKERS switch to the OFF position.
2. Turn the MASTER VOLUME control to minimum.
3. Connect the DC VTVM between Pin No.21 on the FUSE P.C.Board. and Pin No.1 on the Power Amplifier P.C.Board.
4. Adjust the VR01 for an indication of 0V DC ($\pm 3mV$).

RIGHT AMPLIFIER

Repeat steps 3 and 4 for RIGHT channels.

IDLING CURRENT ADJUSTMENT

LEFT AMPLIFIER

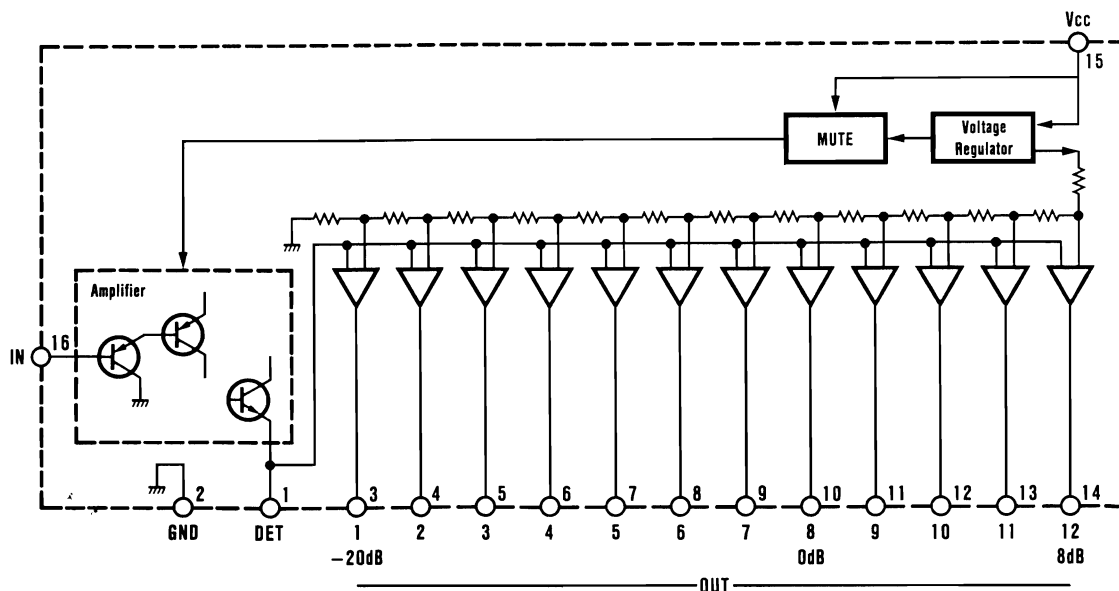
1. Set the SPEAKERS switch to the OFF position.
2. Turn the MASTER VOLUME control to minimum.
3. Connect the DC VTVM between Pins No.1 and No.3 on the Power Amplifier P.C.Board.
4. Adjust the VR02 for an indication of 3mV on the DC VTVM.

RIGHT AMPLIFIER

Repeat steps 3 and 4 for RIGHT Channels.

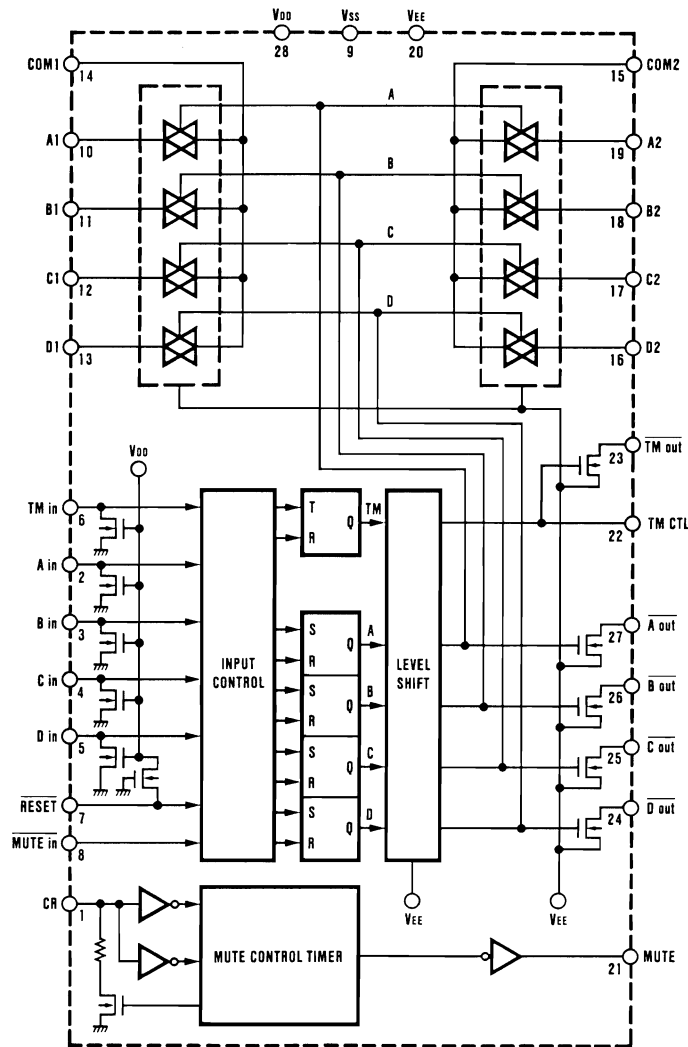
IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM

POWER LEVEL METER DRIVE IC BA 6146

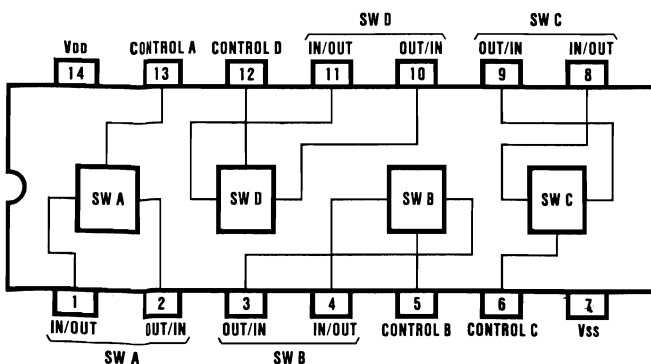


IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

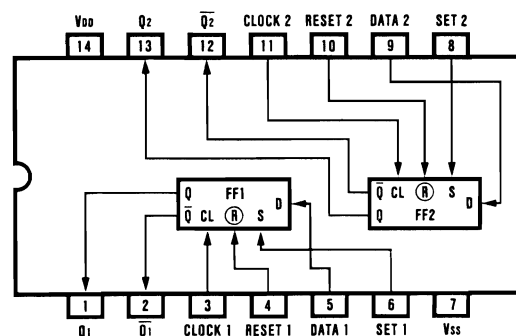
ANALOG FUNCTION SWITCH IC LC 7817



QUAD BILATERAL SWITCH IC LC 4966



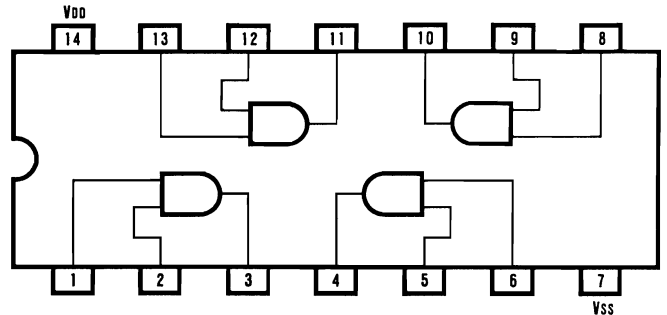
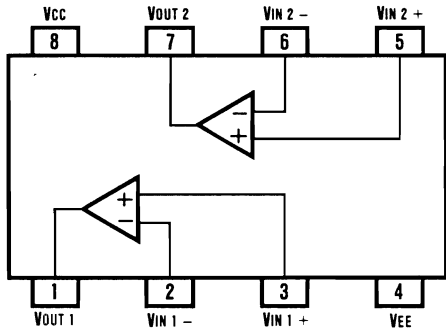
DUAL D - TYPE FLIP - FLOP IC LC 4013 B



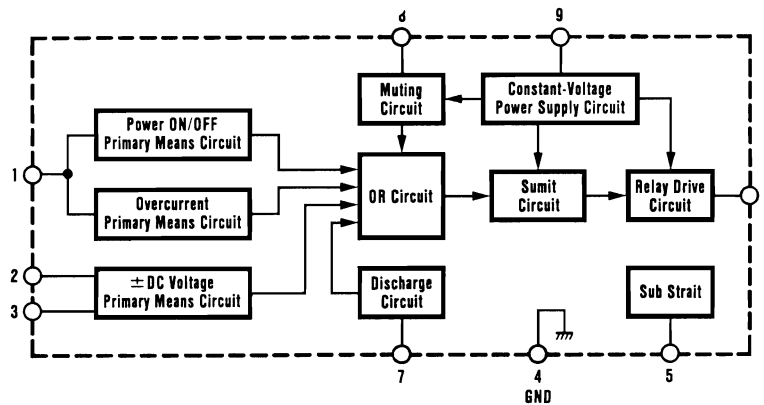
IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

PHONO EQUALIZER AMP IC NJM 4560 DX

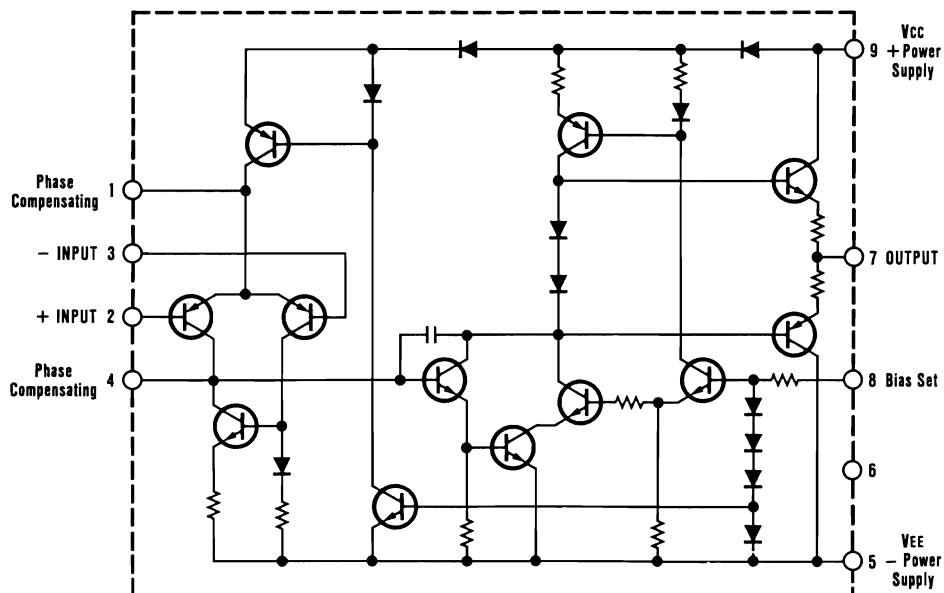
QUAD 2 - INPUT AND GATE IC LC 4081 B



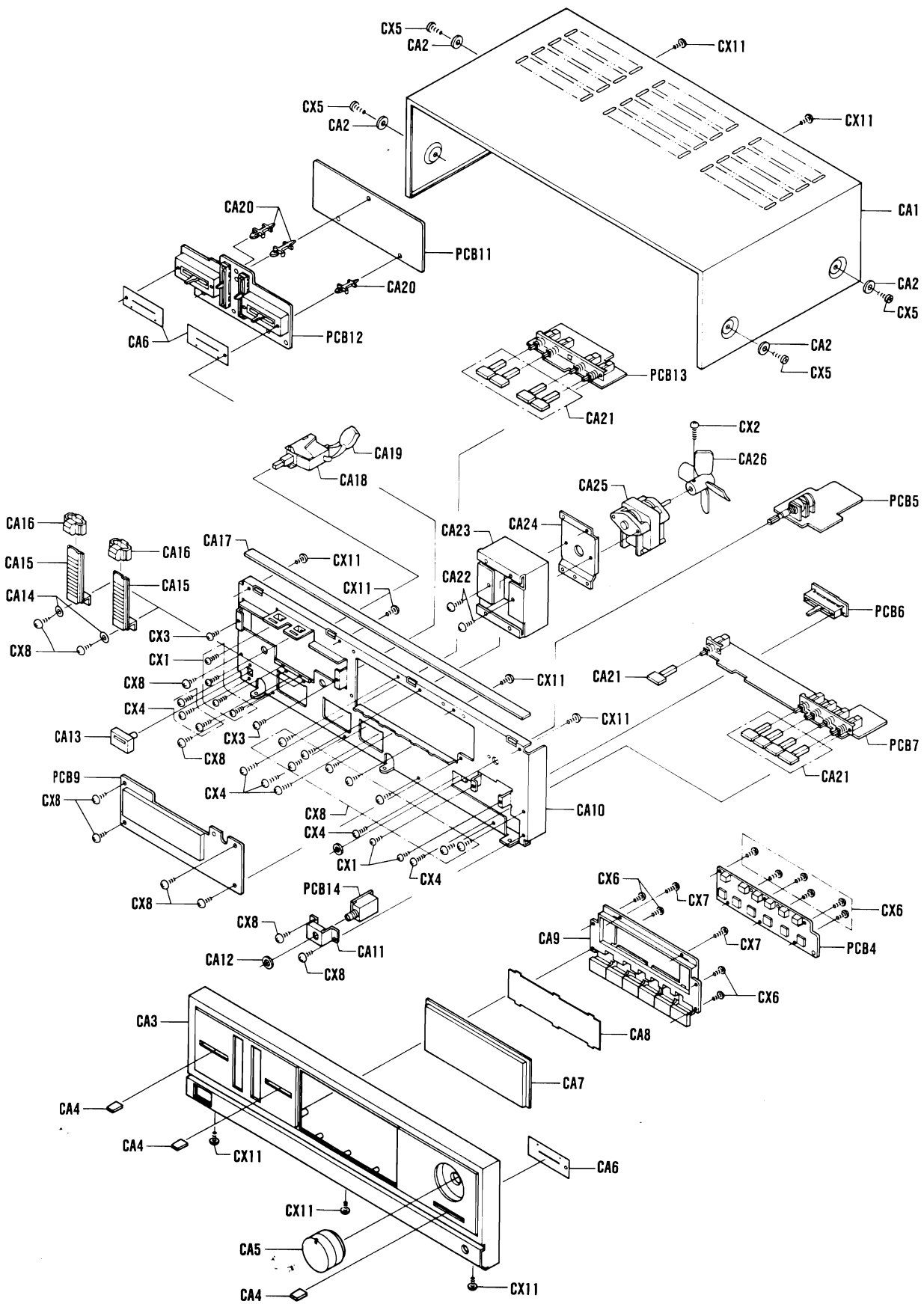
SPEAKER PROTECTOR IC TA 7317 P



PRE AMPLIFIER IC TA 7322 P



CABINET & CHASSIS EXPLODED VIEW (1)



CABINET & CHASSIS PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty	
PACKING PARTS LIST				CA17	131 2 5205 32300	Cushion	1	
	3 9415 10300	Bag Polyethylene	1	CA18	△ 4 2319 77510	Power Switch	1	
131 6 1169 15701		Box Corrugate-Exp.	1	CA19	131 2 6114 01400	Cover Safety	1	
131 6 2119 02350		Bag Polyethylene-Exp.	1	CA20	131 2 3614 22200	Mount P.C.B. (Equalizer)	3	
131 6 3009 35460		Pad Rear	1	CA21	131 2 1601 70500	Knob (Speaker, Filter)	9	
131 6 3009 35470		Pad Front	1	CA22	131 2 4201 19900	Screw, +3.0x6 Sems	2	
131 6 3069 16350		Patching Sheet	1	CA23	131 2 6103 23900	Cover Shield (Motor)	1	
131 6 4559 10900		Manufacturing No.	2	CA24	131 2 3101 98600	Metal Mount Motor	1	
131 6 9459 00300		Rubber Band	1	CA25	4 5279 71441	Motor	1	
ACCESSORIES PARTS LIST				CA26	141 2 3799 04200	Fan (Cooling Fan Motor)	1	
131 6 2719 10801		Bag Fan	1	CA27	131 2 3301 31200	Chassis	1	
131 6 4519 15700		Guarantee Certificate	1	CA28	131 2 1801 13300	Leg	4	
131 6 4559 10900		Manufacturing No.	1	CA29	131 2 4203 84213	Washer, 4.2x13x1.0, Z1	4	
142 6 4119 32104		Explanatory Booklet	1	CA30	131 2 4201 23402	Screw, Brazier Hd. Tapping-C,	4	
CABINET & CHASSIS PARTS LIST				CA31	131 2 1105 31100	Plate Bottom	1	
CA1	131 2 1410 32700	Cover	1	CA32	131 2 3614 27600	Mount P.C.B. (Plate Bottom)	1	
CA2	131 2 4203 84231	Washer, 4.2x10x0.8 B	4	CA33	△ 4 2512 22920	Power Trans	1	
CA3	131 0 1016 44200	Panel Decorate Assy	1	CA34	131 2 4202 12904	Nut (Trans)	4	
	131 2 1203 62900	Panel Control Power	1	CA35	131 2 5205 22900	Cushion	1	
	131 2 1203 63000	Panel Control	1	CA36	131 2 6101 31000	Plate Shield (Equalizer)	1	
	131 2 1203 63100	Panel Control (Volume)	1	CA37	4 2039 72120	Transistor, 2SA 1301 (Q03,04) Left Channel	2	
	131 2 1203 63200	Panel Control (Equalizer)	1	CA37	4 2039 72120	Transistor, 2SA 1301 (Q03,04) Right Channel	2	
CA4	131 2 1601 71000	Knob (Equalizer, Balance)	3	CA38	4 2039 72110	Transistor, 2SC 3280 (Q01,02) Left Channel	2	
CA5	131 0 1001 63300	Knob (Main Volume)	1	CA38	4 2039 72110	Transistor, 2SC 3280 (Q01,02) Right Channel	2	
CA6	131 2 6113 51800	Shelter	3	CA39	131 2 6201 35300	Plate Heat Sink	2	
CA7	131 2 1205 28100	Decorate Plate Dial	1	CA40	4 2379 21520	Lug	1	
CA8	131 2 6308 23300	Filter	1	CA41	131 2 3101 98900	Metal Mount Heat Sink	4	
CA9	131 0 1001 63500	Knob (Function)	1	CA42	131 2 3101 98800	Metal Mount Auto Function	1	
	131 2 1604 48700	Decorate Knob Phono	1	CA43	131 2 6107 30900	Plate Sever	2	
	131 2 1604 48701	Decorate Knob Tuner	1	CA44	131 2 6101 31100	Plate Shield (Function)	1	
	131 2 1604 48702	Decorate Knob CD	1	CA45	131 2 5205 33100	Cushion	1	
	131 2 1604 48703	Decorate Knob Aux	1	CA46	131 2 3101 98700	Metal Mount Condenser	1	
	131 2 1604 48704	Decorate Knob Tape	1	CA47	131 2 3101 99500	Metal Mount Fuse	1	
	131 2 1604 48705	Decorate Knob Rec	1	CA48	131 2 4203 83224	Washer, 3.2x12x0.8T Z1	1	
131 2 6113 51300	Shelter Knob	1	CA49	131 2 3306 39801	Panel Rear	1		
CA10	131 2 3305 36100	Panel Front	1	CA50	131 2 5205 15300	Cushion	1	
CA11	131 2 3101 98500	Metal Mount Headphone Jack	1	CA51	131 2 4203 83223	Washer, 3.2x10x1 C2	1	
CA12	131 2 4202 13400	Nut (Headphones)	1	CA52	131 2 4201 17800	Screw Ground	1	
CA13	131 2 1601 90300	Knob (Power Switch)	1	CA53	4 2369 74040	Short Plug	2	
CA14	131 2 4203 83200	Washer, 3.2x8x0.5	2	CA54	△ 4 2312 01020	Switch Slide (Voltage Select)	1	
CA15	131 2 6113 51200	Shelter EQ	2	CA55	131 2 7104 00500	Plate Pad Switch	1	
CA16	131 0 1001 63400	Knob (Equalizer)	2	CA56	131 2 6111 14200	Bushing (Power Cord)	1	
	131 2 1601 90400	Knob (A)	1	CA57	△ 4 2432 00340	Power Cord	1	
	131 2 1601 90500	Knob (B)	1					
				C01	△ 4 2239 70970	Capacitor	0.01μF 400V	1
				C02	C12 2 3160 NG00R	Boundary	22000pF 16V ±30%	1
				C03	CC4 7 3500 ZG00C	Ceramic	0.047μF 50V +80,-2%	1

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol \triangle in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with \triangle , 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.

CABINET & CHASSIS PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
P.C.B. ASSY PARTS LIST			
PCB1	141 0 1939 07561	Power Supply Protect P.C.B. Assy	1
PCB2	141 0 1939 07411	EQ, Function P.C.B. Assy	1
PCB3	141 0 1939 07420	Auto Function P.C.B. Assy	1
PCB4	141 0 1939 07430	LED IND./Touch Switch P.C.B. Assy	1
PCB5	141 0 1939 07440	Volume P.C.B. Assy	1
PCB6	141 0 1939 07450	Balance Volume P.C.B. Assy	1
PCB7	141 0 1939 07460	Pre Amp. P.C.B. Assy	1
PCB8	141 0 1939 07470	Jack P.C.B. Assy	1
PCB9	141 0 1939 07480	Power Level Meter P.C.B. Assy	1
PCB10	141 0 1939 07491	Fuse P.C.B. Assy	1
PCB11	141 0 1939 07500	Parametric Tone P.C.B. Assy	1
PCB12	141 0 1939 07510	Parametric EQ. Volume P.C.B. Assy	1
PCB13	141 0 1939 07520	Switch P.C.B. Assy	1
PCB14	141 0 1939 07530	Headphone Jack P.C.B. Assy	1
PCB15	141 0 1939 07540	Power Amp. P.C.B. Assy (Left)	1
PCB16	141 0 1939 07550	Power Amp. P.C.B. Assy (Right)	1

SCREW PARTS LIST			
CX1	101 3 1302 00311	Screw, Pan Hd., +M2.0x3	6
CX2	101 3 1302 60811	Screw, Pan Hd., +M2.6x8	1
CX3	101 3 1303 00411	Screw, Pan Hd., +M3.0x4	2
CX4	101 3 1303 00611	Screw, Pan Hd., +M3.0x6	8
CX5	143 3 1704 00818	Screw, Bind Hd. Tapping-B, +M4.0x8	4
CX6	143 3 1902 60611	Screw, Brazier Hd. Tapping-B, +M2.6x6	10
CX7	143 3 1902 60811	Screw, Brazier Hd. Tapping-B, +M2.6x8	2
CX8	143 3 1903 00611	Screw, Brazier Hd. Tapping-B, +M3.0x6	43
CX9	143 3 1903 00618	Screw, Brazier Hd. Tapping-B, +M3.0x6	12
CX10	143 3 1903 00811	Screw, Brazier Hd. Tapping-B, +M3.0x8	2
CX11	143 3 1903 00818	Screw, Brazier Hd. Tapping-B, +M3.0x8	16
CX12	143 3 1903 01011	Screw, Brazier Hd. Tapping-B, +M3.0x10	8
CX13	143 3 1903 01211	Screw, Brazier Hd. Tapping-B, +M3.0x12	8
CX14	101 3 1303 00618	Screw, Pan Hd., +M3.0x6	2

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.

P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
POWER SUPPLY PROTECT P.C.B. ASSY							
PCB1	141 0 1939 07561	Power Supply Protect P.C.B. Assy	1	IC02	4 2069 73820	IC, NJM 78 M24	1
	4 2262 20920	Power Supply Protect P.C.B.	1	IC03	4 2069 73830	IC, NJM 79 M24	1
	4 2329 70280	Relay Lead	1	Q01	203 5 7252 27450	Transistor, 2SC 2274	1
	4 2329 70400	Relay	1	P01	4 2039 72050	Posistor, PTH487A-BB	1
	4 2329 70410	Relay	2	P02	4 2039 72050	Posistor, PTH487A-BB	1
	4 2369 73160	Connector 6P	1	P03	4 2039 72051	Posistor, PTH487A-BF	1
	4 2379 70920	4P Speaker Terminal (Speakers)	2	P04	4 2039 72051	Posistor, PTH487A-BF	1
	111 2 6220 11100	Wire Wrap Terminal	13	RESISTORS			
	131 2 3608 14100	Cramp Wire	1	R01	RD1 8 4251 JM000	Carbon 180kΩ 1/4W ±5%	1
	131 2 6201 21500	Plate Heat Sink	1	R02	RD4 7 3251 JM000	Carbon 47kΩ 1/4W ±5%	1
	131 2 6201 29800	Heat Sink	1	R03	RD6 8 2251 JM000	Carbon 6.8kΩ 1/4W ±5%	1
CA01	4 2359 76586	Connector 6P Assy	1	R04	RD3 9 2251 JM000	Carbon 3.9kΩ 1/4W ±5%	1
CA02	4 2359 76587	Connector 6P Assy	1	R05	RD1 0 3251 JM000	Carbon 10kΩ 1/4W ±5%	1
CA03	4 2359 77390	Connector 3P Assy	1	R06	RD1 0 4251 JM000	Carbon 100kΩ 1/4W ±5%	1
CA04	4 2359 77398	Connector 8P Assy	1	R07	RD1 5 3251 JM000	Carbon 15kΩ 1/4W ±5%	1
CAPACITORS				R08	RD5 6 3251 JM000	Carbon 56kΩ 1/4W ±5%	1
C01	CD4 7 7160 0001V	Electrolytic 470μF 16V	1	R09	RD3 3 2251 JM000	Carbon 33kΩ 1/4W ±5%	1
C02	CD4 7 7160 0001V	Electrolytic 470μF 16V	1	R10	RD6 8 2251 JM000	Carbon 6.8kΩ 1/4W ±5%	1
C03	4 2239 72110	Electrolytic 10000μF 80V	1	R11	RD1 5 4251 JM000	Carbon 150kΩ 1/4W ±5%	1
C04	4 2239 72110	Electrolytic 10000μF 80V	1	R12	RD1 5 4251 JM000	Carbon 150kΩ 1/4W ±5%	1
C05	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R13	RD1 5 3251 JM000	Carbon 15kΩ 1/4W ±5%	1
C06	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R14	RD5 6 3251 JM000	Carbon 56kΩ 1/4W ±5%	1
C07	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R15	RD5 6 3251 JM000	Carbon 56kΩ 1/4W ±5%	1
C08	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R16	RD4 7 3251 JM000	Carbon 47kΩ 1/4W ±5%	1
C09	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R17	RF1 0 0501 JZ000	Fuse 10Ω 1/2W ±5%	1
C10	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R18	RF1 0 0501 JZ000	Fuse 10Ω 1/2W ±5%	1
C11	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R19	RH4 7 1501 JZ000	Metal 470Ω 1/2W ±5%	1
C12	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R20	RH6 8 1202 JZ000	Metal 680Ω 2W ±5%	1
C13	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R21	RH6 8 1202 JZ000	Metal 680Ω 2W ±5%	1
C14	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R22	RH1 2 1102 KZ000	Metal 120Ω 1W ±10%	1
C15	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R23	RH1 2 1102 KZ000	Metal 120Ω 1W ±10%	1
C16	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	R24	RH2 7 1102 JZ000	Metal 270Ω 1W ±5%	1
C17	CB4 7 6500 0000V	None-polar 47μF 50V	1	EQ, FUNCTION P.C.B. ASSY			
C18	CD1 0 5500 0001V	Electrolytic 1μF 50V	1	PCB2	141 0 1939 07411	EQ, Function P.C.B. Assy	1
C19	CD1 0 6250 0001V	Electrolytic 10μF 25V	1		4 2262 20770	EQ, Function P.C.B.	1
C20	CD2 2 6100 0001V	Electrolytic 22μF 10V	1		4 2352 01700	Pin Jack 4P (Phono, Tuner)	1
C21	CD4 7 4500 0001V	Electrolytic 0.47μF 50V	1		4 2352 01700	Pin Jack 4P (CD, Aux/Video)	1
C22	CD4 7 6250 0001V	Electrolytic 47μF 25V	1		4 2352 01700	Pin Jack 4P (Tape 1)	1
C23	4 2239 72080	Electrolytic 470μF 40V	1		4 2352 01700	Pin Jack 4P (Tape 2)	1
C24	4 2239 72080	Electrolytic 470μF 40V	1	CN06	4 2369 73410	Connector 7P	1
C25	CD1 0 7250 0006V	Electrolytic 100μF 25V	1		141 2 3229 44600	Plate Shield	1
C26	CD1 0 7250 0006V	Electrolytic 100μF 25V	1		131 0 4006 31403	Cord Assy	1
C27	CK3 3 3401 M000V	Mylar 0.033μF 400V ±20%	1	J03	4 2359 77803	Connector 6P Assy	1
C28	CC1 0 3501 YEY0C	Ceramic 0.01μF 500V +100,-0%	1	CAPACITORS			
C31	CC1 0 2500 KE00R	Ceramic 1000pF 50V ±10%	1	C01	CC2 2 1500 KD00C	Ceramic 220pF 50V ±10%	1
C32	CC1 0 2500 KE00R	Ceramic 1000pF 50V ±10%	1	C02	CC2 2 1500 KD00C	Ceramic 220pF 50V ±10%	1
C33	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ±10%	1	C03	CM1 0 2500 K00SV	Mylar 0.001μF 50V ±10%	1
C34	CC1 0 2500 KE00C	Ceramic 0.001μF 50V ±10%	1	C04	CM1 0 2500 K00SV	Mylar 0.001μF 50V ±10%	1
SEMICONDUCTORS				C05	CM1 8 3500 K00SV	Mylar 0.018μF 50V ±10%	1
D01	202 5 2500 13541	Diode, DS 135	1	C06	CM1 8 3500 K00SV	Mylar 0.018μF 50V ±10%	1
D02	202 5 2500 13541	Diode, DS 135	1	C07	CM4 7 2500 K00SV	Mylar 0.0047μF 50V ±10%	1
D03	202 5 2500 13541	Diode, DS 135	1	C08	CM4 7 2500 K00SV	Mylar 0.0047μF 50V ±10%	1
D04	202 5 2500 13541	Diode, DS 135	1	C09	CD4 7 6100 0001V	Electrolytic 47μF 10V	1
D05	202 5 2500 13541	Diode, DS 135	1	C10	CD4 7 6100 0001V	Electrolytic 47μF 10V	1
D06	202 5 2500 13541	Diode, DS 135	1	C11	CD1 0 6160 0001V	Electrolytic 10μF 16V	1
D07	202 5 2500 13541	Diode, DS 135	1	C12	CD1 0 6160 0001V	Electrolytic 10μF 16V	1
D08	△ 202 5 3510 02010	Diode, S1RBA 20	1	C13	CM4 7 2500 K00SV	Mylar 0.0047μF 50V ±10%	1
D09	△ 202 5 3510 02010	Diode, S1RBA 20	1	C14	CM4 7 2500 K00SV	Mylar 0.0047μF 50V ±10%	1
D10	△ 202 5 2780 10015	Bridge Diode, DBA 100 C ³	1	C15	CD2 2 7250 0001V	Electrolytic 220μF 25V	1
DZ01	202 5 3210 15012	Zener Diode, GZA 15 Y	1	C16	CD2 2 7250 0001V	Electrolytic 220μF 25V	1
IC01	4 2069 73810	IC, TA 7317 P	1				

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
C09	C11 0 3250 MF00R	Boundary	0.01μF 25V ±20%	1	R17	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
C11	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R18	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
C12	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R19	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
C13	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R20	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
C14	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R21	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
C15	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R22	RD1 2 2251 JM000 Carbon	1.2kΩ 1/4W ±5% 1
SEMICONDUCTORS					R23	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5% 1
D01	205 5 9040 44210	Diode, DS 442		1	R24	RD1 0 3161 JH000 Carbon	10kΩ 1/6W ±5% 1
D02	205 5 9040 44210	Diode, DS 442		1	R25	RD6 8 3251 JM000 Carbon	68kΩ 1/4W ±5% 1
D03	205 5 9040 44210	Diode, DS 442		1	R26	RD4 7 2251 JM000 Carbon	4.7kΩ 1/4W ±5% 1
D04	205 5 9040 44210	Diode, DS 442		1	R27	RD4 7 3161 JH000 Carbon	47kΩ 1/6W ±5% 1
D05	205 5 9040 44210	Diode, DS 442		1	R28	RD1 0 4161 JH000 Carbon	100kΩ 1/6W ±5% 1
D06	205 5 9040 44210	Diode, DS 442		1	R29	RD4 7 3161 JH000 Carbon	47kΩ 1/6W ±5% 1
D07	205 5 9040 44210	Diode, DS 442		1	R30	RD1 0 4161 JH000 Carbon	100kΩ 1/6W ±5% 1
D08	205 5 9040 44210	Diode, DS 442		1	R31	RD1 0 2251 JM000 Carbon	1kΩ 1/4W ±5% 1
D09	205 5 9040 44210	Diode, DS 442		1	R32	RD1 0 4251 JM000 Carbon	100kΩ 1/4W ±5% 1
D10	205 5 9040 44210	Diode, DS 442		1	R33	RD2 2 4161 JH000 Carbon	220kΩ 1/6W ±5% 1
D11	205 5 9040 44210	Diode, DS 442		1	R34	RD8 2 1251 JM000 Carbon	820Ω 1/4W ±5% 1
D12	205 5 9040 44210	Diode, DS 442		1	R35	RF1 2 1251 JK000 Fuse	120Ω 1/4W ±5% 1
D13	205 5 9040 44210	Diode, DS 442		1	LED IND./ TOUCH SWITCH P.C.B. ASSY		
D14	205 5 9040 44210	Diode, DS 442		1	PCB4	141 0 1939 07430 LED Ind./ Touch Switch P.C.B. Assy	1
D15	205 5 9040 44210	Diode, DS 442		1		4 2262 20790 LED Ind./ Touch Switch P.C.B. Assy	1
D16	205 5 9040 44210	Diode, DS 442		1	S01	4 2312 01880 Key Board Switch (Phono)	1
D17	205 5 9040 44210	Diode, DS 442		1	S02	4 2312 01880 Key Board Switch (Tuner)	1
D18	205 5 9040 44210	Diode, DS 442		1	S03	4 2312 01880 Key Board Switch (CD)	1
D19	205 5 9040 44210	Diode, DS 442		1	S04	4 2312 01880 Key Board Switch (Aux/Video)	1
D20	205 5 9040 44210	Diode, DS 442		1	S05	4 2312 01880 Key Board Switch (Tape 1)	1
D21	205 5 9040 44210	Diode, DS 442		1	S06	4 2312 01880 Key Board Switch (Synchro Rec)	1
D22	205 5 9040 44210	Diode, DS 442		1	J08	4 2359 77397 Connector 8P Assy	1
D23	205 5 9040 44210	Diode, DS 442		1	J09	4 2359 77396 Connector 7P Assy	1
D24	205 5 9040 44210	Diode, DS 442		1	SEMICONDUCTORS		
D25	205 5 9040 44210	Diode, DS 442		1	D01	4 2029 72590 L.E.D., SLF 202 B (Phono)	1
D26	202 5 3210 10012 Zener Diode, GZA 10 Y			1	D02	4 2029 72590 L.E.D., SLF 202 B (Tuner)	1
IC01	206 5 9464 01310 IC, LC 4013 B			1	D03	4 2029 72590 L.E.D., SLF 202 B (CD)	1
IC02	206 5 9494 08110 IC, LC 4081 B			1	D04	4 2029 72590 L.E.D., SLF 202 B (Aux/Video)	1
Q01	203 5 5000 53670 Transistor, 2SC 536			1	D05	4 2029 72600 L.E.D., SLF 102 B (Tape 1)	1
Q02	203 5 5000 53670 Transistor, 2SC 536			1	D06	4 2029 72600 L.E.D., SLF 102 B (Synchro Rec)	1
Q03	203 5 5000 53670 Transistor, 2SC 536			1	VOLUME P.C.B. ASSY		
Q04	203 5 5000 53670 Transistor, 2SC 536			1	PCB5	141 0 1939 07440 Volume P.C.B. Assy	1
Q05	203 5 5000 53670 Transistor, 2SC 536			1		4 2262 20800 Volume P.C.B.	1
Q06	203 5 5000 53670 Transistor, 2SC 536			1		4 2229 75271 VR 100kΩ-Bx2, 10kΩ-Cx2 (Volume)	1
Q07	203 5 5000 53670 Transistor, 2SC 536			1	CN04	4 2369 73130 Connector 3P	1
Q08	203 5 5000 53670 Transistor, 2SC 536			1	CN08	4 2369 73160 Connector 6P	1
Q09	203 5 5000 53670 Transistor, 2SC 536			1	CAPACITORS		
Q10	203 5 5000 53670 Transistor, 2SC 536			1	C01	CD4 7 5250 0001V Electrolytic	4.7μF 25V 1
Q11	203 5 5000 53670 Transistor, 2SC 536			1	C02	CD4 7 5250 0001V Electrolytic	4.7μF 25V 1
RESISTORS					C03	CC1 0 1500 KD00C Ceramic	100pF 50V ±10% 1
R01	RD6 8 3161 JH000 Carbon	68kΩ 1/6W ±5%	1	C04	CC1 0 1500 KD00C Ceramic	100pF 50V ±10% 1	
R02	RD6 8 3161 JH000 Carbon	68kΩ 1/6W ±5%	1	C05	CD4 7 5250 0001V Electrolytic	4.7μF 25V 1	
R03	RD6 8 3161 JH000 Carbon	68kΩ 1/6W ±5%	1	C06	CD4 7 5250 0001V Electrolytic	4.7μF 25V 1	
R04	RD6 8 3161 JH000 Carbon	68kΩ 1/6W ±5%	1	C07	CM1 0 3500 K00SV Mylar	0.01μF 50V ±10% 1	
R05	RD6 8 3161 JH000 Carbon	68kΩ 1/6W ±5%	1	SEMICONDUCTORS			
R06	RD2 2 4161 JH000 Carbon	220kΩ 1/6W ±5%	1	Q01	TTT - 2SC2 240-G Transistor, 2SC 2240	1	
R07	RD2 2 4161 JH000 Carbon	220kΩ 1/6W ±5%	1	Q02	TTT - 2SC2 240-G Transistor, 2SC 2240	1	
R08	RD2 2 4161 JH000 Carbon	220kΩ 1/6W ±5%	1	Q03	203 5 4921 01270 Transistor, 2SD 1012	1	
R09	RD2 2 4161 JH000 Carbon	220kΩ 1/6W ±5%	1	Q04	203 5 4921 01270 Transistor, 2SD 1012	1	
R10	RD3 9 3161 JH000 Carbon	39kΩ 1/6W ±5%	1	Q05	203 5 5000 53670 Transistor, 2SC 536	1	
R11	RD3 3 3251 JM000 Carbon	33kΩ 1/4W ±5%	1				
R12	RD3 3 3251 JM000 Carbon	33kΩ 1/4W ±5%	1				
R13	RD3 3 3251 JM000 Carbon	33kΩ 1/4W ±5%	1				
R14	RD3 3 3251 JM000 Carbon	33kΩ 1/4W ±5%	1				
R15	RD3 3 3251 JM000 Carbon	33kΩ 1/4W ±5%	1				
R16	RD1 0 3251 JM000 Carbon	10kΩ 1/4W ±5%	1				

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
Q06	203 5 7230 60870	Transistor, 2SA 608	1	SEMICONDUCTORS			
				IC01	ITT - TA73 22P-	IC, TA 7322 P	1
				IC02	ITT - TA73 22P-	IC, TA 7322 P	1
				RESISTORS			
R01	RD2 2 1161 JH000	Carbon	1	R01	RD3 3 2161 JH000	Carbon	1
R02	RD2 2 1161 JH000	Carbon	1	R02	RD3 3 2161 JH000	Carbon	1
R03	RD2 2 4161 JH000	Carbon	1	R03	RD4 7 1161 JH000	Carbon	1
R04	RD2 2 4161 JH000	Carbon	1	R04	RD4 7 1161 JH000	Carbon	1
R05	RD5 6 2161 JH000	Carbon	1	R05	RD1 5 4161 JH000	Carbon	1
R06	RD5 6 2161 JH000	Carbon	1	R06	RD1 5 4161 JH000	Carbon	1
R07	RD5 6 3161 JH000	Carbon	1	R07	RD5 6 3161 JH000	Carbon	1
R08	RD5 6 3161 JH000	Carbon	1	R08	RD5 6 3161 JH000	Carbon	1
R09	RD4 7 1161 JH000	Carbon	1	R09	RD6 8 2161 JH000	Carbon	1
R10	RD4 7 1161 JH000	Carbon	1	R10	RD6 8 2161 JH000	Carbon	1
R11	RD1 0 3161 JH000	Carbon	1	R11	RD5 6 3161 JH000	Carbon	1
R12	RD1 0 3161 JH000	Carbon	1	R12	RD5 6 3161 JH000	Carbon	1
R13	RD1 0 4251 JM000	Carbon	1	R13	RD3 3 1161 JH000	Carbon	1
R14	RD4 7 3161 JH000	Carbon	1	R14	RD3 3 1161 JH000	Carbon	1
R15	RD4 7 3161 JH000	Carbon	1	R15	RD8 2 1161 JH000	Carbon	1
R16	RD4 7 3161 JH000	Carbon	1	R16	RD8 2 1161 JH000	Carbon	1
				R17	RD8 2 3161 JH000	Carbon	1
				R18	RD8 2 3161 JH000	Carbon	1
				R19	RD1 0 4161 JH000	Carbon	1
				R20	RD1 0 4161 JH000	Carbon	1
				R21	RF1 5 1251 JK000	Fuse	1
				R22	RF1 5 1251 JK000	Fuse	1
				BALANCE VOLUME P.C.B. ASSY			
PCB6	141 0 1939 07450	Balance Volume P.C.B. Assy	1	JACK P.C.B. ASSY			
	4 2262 20810	Balance Volume P.C.B.	1	PCB8	141 0 1939 07470	Jack P.C.B. Assy	1
	4 2229 75261	Slide VR 10kΩ-Wx1 (Balance)	1		4 2262 20830	Jack P.C.B.	1
					4 2352 01650	Pin Jack 4P (Main In, Pre Out)	1
				J11	4 2359 77693	Connector 2P Assy	1
				J12	4 2359 77694	Connector 2P Assy	1
				PRE AMP. P.C.B. ASSY			
PCB7	141 0 1939 07460	Pre Amp. P.C.B. Assy	1	POWER LEVEL METER P.C.B. ASSY			
	4 2262 20820	Pre Amp. P.C.B.	1	PCB9	141 0 1939 07480	Power Level Meter P.C.B. Assy	1
S07	4 2319 77480	Switch Push 4 Key (Loudness, Mode, Subsonic, High Filter)	1		4 2262 20840	Power Level Meter P.C.B.	1
					4 2149 70020	Digitron	1
S08	4 2319 77500	Switch Push 1 Key (Tape 2)	1		131 2 5205 32800	Cushion	1
CN03	4 2369 73130	Connector 3P	1	J13	131 0 4006 31421	Cord Assy	1
CN07	4 2369 73130	Connector 3P	1	CAPACITORS			
J10	4 2359 77394	Connector 5P Assy	1	C01	CD1 0 6160 0001V	Electrolytic	10μF 16V
				C02	CD1 0 6160 0001V	Electrolytic	10μF 16V
				C03	CD2 2 6160 0001V	Electrolytic	22μF 16V
				C04	CD2 2 6160 0001V	Electrolytic	22μF 16V
				SEMICONDUCTORS			
				D01	205 5 9040 44210	Diode, DS 442	1
				D02	205 5 9040 44210	Diode, DS 442	1
				IC01	4 2069 73700	IC, BA 6146	1
				IC02	4 2069 73700	IC, BA 6146	1
				RESISTORS			
				R01	RD1 0 3251 JM000	Carbon	10kΩ 1/4W ±5% 1
				R02	RD1 0 3161 JH000	Carbon	10kΩ 1/6W ±5% 1
				R03	RD1 0 3161 JH000	Carbon	10kΩ 1/6W ±5% 1
				R04	RD1 0 3161 JH000	Carbon	10kΩ 1/6W ±5% 1
C01	CC4 7 1500 KD00C	Ceramic	1				
C02	CC4 7 1500 KD00C	Ceramic	1				
C03	CM2 2 4500 J00TV	Mylar	1				
C04	CM2 2 4500 J00TV	Mylar	1				
C05	CM1 0 4500 J00TV	Mylar	1				
C06	CM1 0 4500 J00TV	Mylar	1				
C07	CM1 0 4500 J00TV	Mylar	1				
C08	CM1 0 4500 J00TV	Mylar	1				
C09	CD1 0 5500 0001V	Electrolytic	1				
C10	CD1 0 5500 0001V	Electrolytic	1				
C11	CD1 0 6160 0001V	Electrolytic	1				
C12	CD1 0 6160 0001V	Electrolytic	1				
C13	CC1 5 0500 KD00C	Ceramic	1				
C14	CC1 5 0500 KD00C	Ceramic	1				
C15	CC3 3 1500 KD00C	Ceramic	1				
C16	CC3 3 1500 KD00C	Ceramic	1				
C17	CM4 7 2500 K00SV	Mylar	1				
C18	CM4 7 2500 K00SV	Mylar	1				
C19	CM3 3 3500 K00SV	Mylar	1				
C20	CM3 3 3500 K00SV	Mylar	1				
C21	CD1 0 6160 0001V	Electrolytic	1				
C22	CD1 0 6160 0001V	Electrolytic	1				
C23	CD2 2 7250 0001V	Electrolytic	1				
C24	CD2 2 7250 0001V	Electrolytic	1				

P.C.BOARD PARTS LIST (Continued)

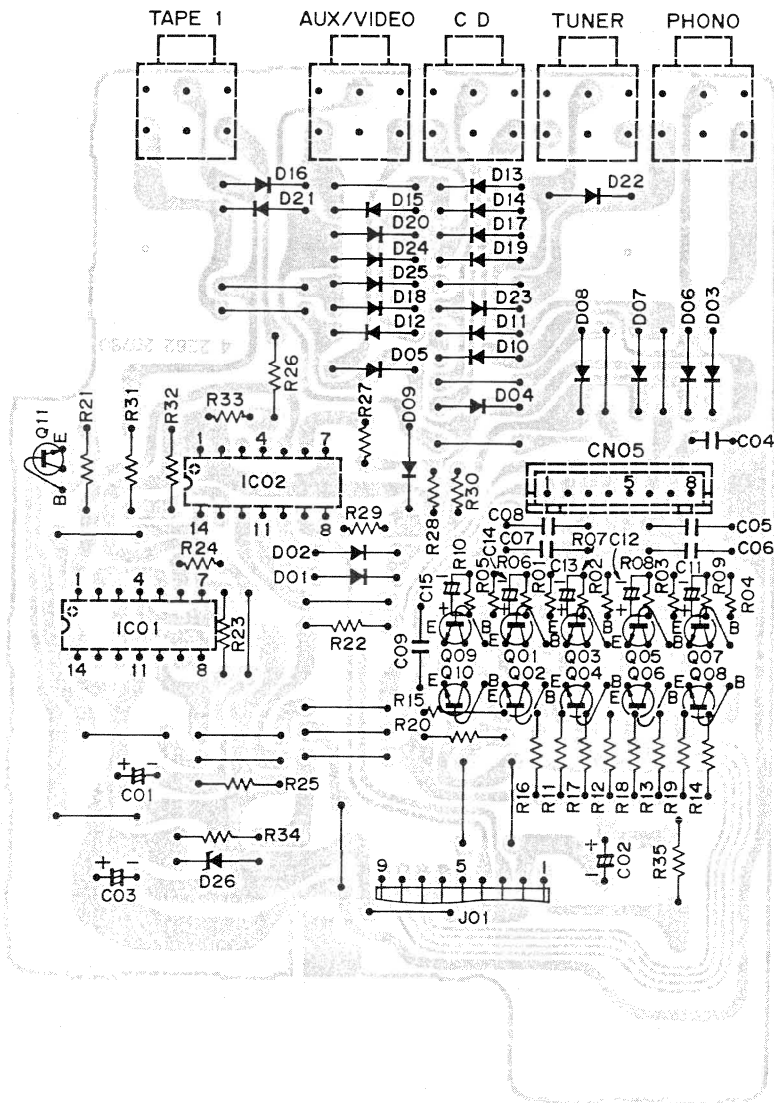
Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty		
FUSE P.C.B. ASSY				R13	RD3 3 2251 JM000	Carbon	3.3kΩ 1/4W ±5% 1		
PCB10	141 0 1939 07491	Fuse P.C.B. Assy	1	R14	RD3 3 2251 JM000	Carbon	3.3kΩ 1/4W ±5% 1		
	4 2262 20850	Fuse P.C.B.	1	R15	RD3 3 2251 JM000	Carbon	3.3kΩ 1/4W ±5% 1		
	△ 4 2349 20380	Fuse T 1.0A	4	R16	RD3 3 2251 JM000	Carbon	3.3kΩ 1/4W ±5% 1		
	△ 4 2349 21570	Fuse T 6.3A	2	R17	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
	4 2352 00200	Fuse Holder	12	R18	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
	111 2 6220 11100	Wire Wrap Terminal	22	R19	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
	4 2372 00830	EC Terminal 1P	2	R20	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
	131 2 7103 13418	Label	4	R21	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1		
	131 2 7103 40302	Label	2	R22	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1		
PARAMETRIC TONE P.C.B. ASSY				R23	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
PCB11	141 0 1939 07500	Parametric Tone P.C.B. Assy	1	R24	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
	4 2262 20860	Parametric Tone P.C.B.	1	R25	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1		
CN02	4 2369 73150	Connector 5P	1	R26	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1		
CAPACITORS				R27	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1		
C01	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	R28	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1	
C02	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	R29	RD5 6 2251 JM000	Carbon	5.6kΩ 1/4W ±5% 1	
C03	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R30	RD5 6 2251 JM000	Carbon	5.6kΩ 1/4W ±5% 1	
C04	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R31	RD1 2 2251 JM000	Carbon	1.2kΩ 1/4W ±5% 1	
C05	CC1 0 1500 KD00C	Ceramic	100pF 50V ±10%	1	R32	RD1 2 2251 JM000	Carbon	1.2kΩ 1/4W ±5% 1	
C06	CC1 0 1500 KD00C	Ceramic	100pF 50V ±10%	1	R33	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1	
C07	CM4 7 2500 K00SV	Mylar	0.0047μF 50V ±10%	1	R34	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1	
C08	CM4 7 2500 K00SV	Mylar	0.0047μF 50V ±10%	1	R35	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1	
C09	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R36	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5% 1	
C10	CD1 0 5500 0001V	Electrolytic	1μF 50V	1	R37	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1	
C11	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	R38	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1	
C12	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	R39	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1	
C13	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R40	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5% 1	
C14	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R41	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1	
C15	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R42	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1	
C16	CC1 0 1500 KD00R	Ceramic	100pF 50V ±10%	1	R43	RD5 6 1251 JM000	Carbon	560Ω 1/4W ±5% 1	
C17	CC1 8 1500 JD00R	Ceramic	180pF 50V ±5%	1	R44	RD5 6 1251 JM000	Carbon	560Ω 1/4W ±5% 1	
C18	CC1 8 1500 JD00R	Ceramic	180pF 50V ±5%	1	R45	RD4 7 3251 JM000	Carbon	47kΩ 1/4W ±5% 1	
C19	CM4 7 3500 K00SV	Mylar	0.047μF 50V ±10%	1	R46	RD4 7 3251 JM000	Carbon	47kΩ 1/4W ±5% 1	
C20	CM4 7 3500 K00SV	Mylar	0.047μF 50V ±10%	1	R47	RF1 2 1251 JK000	Fuse	120Ω 1/4W ±5% 1	
C21	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	R48	RF1 2 1251 JK000	Fuse	120Ω 1/4W ±5% 1	
C22	CD1 0 7100 0001V	Electrolytic	100μF 10V	1	PARAMETRIC EQ. VOLUME P.C.B. ASSY				
C23	CD2 2 7250 0001V	Electrolytic	220μF 25V	1	PCB12	141 0 1939 07510	Parametric EQ. Volume P.C.B. Assy	1	
C24	CD2 2 7250 0001V	Electrolytic	220μF 25V	1		4 2262 20870	Parametric EQ. Volume P.C.B.	1	
SEMICONDUCTORS						4 2229 75280	Slide VR 100kΩ -Ax4 (Low Band)	1	
IC01	IJJ - NJM4560DX	IC, NJM 4560 DX	1			4 2229 75280	Slide VR 100kΩ -Ax4 (High Band)	1	
IC02	IJJ - NJM4558DX	IC, NJM 4558 DX	1			4 2229 75290	Slide VR 50kΩ -Bx2 (EQ. Volume)	2	
IC03	IJJ - NJM4558DX	IC, NJM 4558 DX	1	SWITCH P.C.B. ASSY					
IC04	IJJ - NJM4560DX	IC, NJM 4560 DX	1	PCB13	141 0 1939 07520	Switch P.C.B. Assy	1		
IC05	IJJ - NJM4558DX	IC, NJM 4558 DX	1			4 2262 20880	Switch P.C.B.	1	
IC06	IJJ - NJM4558DX	IC, NJM 4558 DX	1	S09	4 2319 77490	Switch Push 4Key (Speakers Selector A/B, Parametric EQ Meter Range)	1		
RESISTORS				CN01	4 2362 00900	Plug 8P	1		
R01	RD2 2 1251 JM000	Carbon	220Ω 1/4W ±5%	1	J20	4 2359 77704	Connector 3P Assy	1	
R02	RD2 2 1251 JM000	Carbon	220Ω 1/4W ±5%	1	RESISTORS				
R03	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5%	1	R01	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1	
R04	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5%	1	R02	RD1 0 2251 JM000	Carbon	1kΩ 1/4W ±5% 1	
R05	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5%	1	HEADPHONE JACK P.C.B. ASSY				
R06	RD2 7 2251 JM000	Carbon	2.7kΩ 1/4W ±5%	1	PCB14	141 0 1939 07530	Headphone Jack P.C.B. Assy	1	
R07	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5%	1			4 2262 20890	Headphone Jack P.C.B.	1
R08	RD2 2 3251 JM000	Carbon	22kΩ 1/4W ±5%	1			4 2359 76380	Jack 3P 6.43 (Headphones)	1
R09	RD5 6 3251 JM000	Carbon	56kΩ 1/4W ±5%	1					
R10	RD5 6 3251 JM000	Carbon	56kΩ 1/4W ±5%	1					
R11	RD1 5 3251 JM000	Carbon	15kΩ 1/4W ±5%	1					
R12	RD1 5 3251 JM000	Carbon	15kΩ 1/4W ±5%	1					

P.C. BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
POWER AMP. P.C.B. ASSY (LEFT)				RESISTORS			
PCB15	141 0 1939 07540	Power Amp. P.C.B. Assy (Left)	1	R01	RD1 0 2251 JM000	Carbon 1kΩ 1/4W ±5%	1
	4 2262 20900	Power Amp. P.C.B. (Left)	1	R02	RD4 7 3251 JM000	Carbon 47kΩ 1/4W ±5%	1
	4 2369 73672	Plug 2P	1	R03	RD1 5 3251 JM000	Carbon 15kΩ 1/4W ±5%	1
	4 2369 74810	Plug 6P	1	R04	RD1 5 3251 JM000	Carbon 15kΩ 1/4W ±5%	1
111	2 6220 11100	Wire Wrap Terminal	3	R05	RD1 5 3251 JM000	Carbon 15kΩ 1/4W ±5%	1
131	2 3608 14100	Cramp Wire	1	R06	RD2 7 3251 JM000	Carbon 27kΩ 1/4W ±5%	1
131	2 6201 21500	Plate Heat Sink	2	R07	RD3 9 2251 JM000	Carbon 3.9kΩ 1/4W ±5%	1
L01	4 2532 00180	RF Filter (3 μH)	1	R08	RD3 9 2251 JM000	Carbon 3.9kΩ 1/4W ±5%	1
VR01	4 2229 75300	Semi Fixed 200Ω (Center Voltage Adjust)	1	R09	RD1 0 3251 JM000	Carbon 10kΩ 1/4W ±5%	1
VR02	4 2229 75310	Semi Fixed 300Ω (Idling Current Adjust)	1	R10	RD2 2 0251 JM000	Carbon 22Ω 1/4W ±5%	1
CAPACITORS				R11	RD2 2 0251 JM000	Carbon 22Ω 1/4W ±5%	1
C02	CC2 2 1500 KD00C	Ceramic 220pF 50V ±10%	1	R12	RH6 8 2102 JZ000	Metal 6.8kΩ 1W ±5%	1
C04	CC1 0 2500 KD00C	Ceramic 0.001μF 50V ±10%	1	R13	RH6 8 2102 JZ000	Metal 6.8kΩ 1W ±5%	1
C05	CD1 0 6250 0001V	Electrolytic 10μF 25V	1	R14	RD3 3 1251 JM000	Carbon 330Ω 1/4W ±5%	1
C06	CD1 0 6250 0001V	Electrolytic 10μF 25V	1	R15	RD3 3 1251 JM000	Carbon 330Ω 1/4W ±5%	1
C07	4 2239 72040	Ceramic 15pF 500V	1	R16	RD3 3 3251 JM000	Carbon 33kΩ 1/4W ±5%	1
C08	4 2239 72040	Ceramic 15pF 500V	1	R17	RD3 3 3251 JM000	Carbon 33kΩ 1/4W ±5%	1
C09A	CC8 0 A500 DD00C	Ceramic 8pF 50V ±0.5%	1	R18	RD1 0 2251 JM000	Carbon 1kΩ 1/4W ±5%	1
C09B	CC8 0 A500 DD00C	Ceramic 8pF 50V ±0.5%	1	R19	RD3 3 3251 JM000	Carbon 33kΩ 1/4W ±5%	1
C10	CD4 7 6101 0001V	Electrolytic 47μF 100V	1	R20	RD4 7 1251 JM000	Carbon 470Ω 1/4W ±5%	1
C11	CD4 7 6101 0001V	Electrolytic 47μF 100V	1	R21	RF1 0 1501 JZ000	Fuse 100Ω 1/2W ±5%	1
C12	CD4 7 6100 0001V	Electrolytic 47μF 10V	1	R22	RF1 0 1501 JZ000	Fuse 100Ω 1/2W ±5%	1
C13	CC4 7 1500 KD00C	Ceramic 470pF 50V ±10%	1	R23	RD1 5 1251 JM000	Carbon 150Ω 1/4W ±5%	1
C14	4 2239 72030	Ceramic 100pF 500V	1	R24	RD1 5 1251 JM000	Carbon 150Ω 1/4W ±5%	1
C15	4 2239 72030	Ceramic 100pF 500V	1	R25	RD4 7 1251 JM000	Carbon 470Ω 1/4W ±5%	1
C16	CM1 0 3500 K00SV	Mylar 0.01μF 50V ±10%	1	R26	RD6 8 1251 JM000	Carbon 680Ω 1/4W ±5%	1
C17	CM1 0 3500 K00SV	Mylar 0.01μF 50V ±10%	1	R27	RD6 8 1251 JM000	Carbon 680Ω 1/4W ±5%	1
C18	CM1 0 4500 J00TV	Mylar 0.1μF 50V ±5%	1	R28	RD2 2 1251 JM000	Carbon 220Ω 1/4W ±5%	1
C19	4 2239 72060	Electrolytic 4.7μF 100V	1	R29	RD2 2 1251 JM000	Carbon 220Ω 1/4W ±5%	1
C20	4 2239 72060	Electrolytic 4.7μF 100V	1	R30	RH8 2 2102 JZ000	Metal 8.2kΩ 1W ±5%	1
C21	CM1 0 4500 J00TV	Mylar 0.1μF 50V ±5%	1	R31	RH3 3 1202 JZ000	Metal 330Ω 2W ±5%	1
SEMICONDUCTORS				R32	RF5 6 A251 JH000	Fuse 5.6Ω 1/4W ±5%	1
D01	202 5 2810 44210	Diode, DS 442	1	R33	RF5 6 A251 JH000	Fuse 5.6Ω 1/4W ±5%	1
D02	202 5 2810 44210	Diode, DS 442	1	R34	RF5 6 A251 JH000	Fuse 5.6Ω 1/4W ±5%	1
D03	202 5 2810 44210	Diode, DS 442	1	R35	RF5 6 A251 JH000	Fuse 5.6Ω 1/4W ±5%	1
D04	202 5 2810 44210	Diode, DS 442	1	R36	4 2219 71250	Cement 0.47Ωx2 ±5%	1
D05	202 5 2810 44210	Diode, DS 442	1	R37	4 2219 71250	Cement 0.47Ωx2 ±5%	1
D06	202 5 2810 44210	Diode, DS 442	1	R38	RD5 6 A251 JM000	Carbon 5.6Ω 1/4W ±5%	1
D07	202 5 2810 44210	Diode, DS 442	1	R39	RH1 0 0202 JZ000	Metal 10Ω 2W ±5%	1
D08	202 5 2810 44210	Diode, DS 442	1	R40	RD4 7 3251 JM000	Carbon 47kΩ 1/4W ±5%	1
D09	DAA - STV- 3H-G	Diode, STV 3 H	1	R41	RD4 7 3251 JM000	Carbon 47kΩ 1/4W ±5%	1
DZ01	202 5 3210 22012	Zener Diode, GZA 22 Y	1	POWER AMP. P.C.B. ASSY (RIGHT)			
DZ02	202 5 3210 22012	Zener Diode, GZA 22 Y	1	PCB16	141 0 1939 07550	Power Amp. P.C.B. Assy (Right)	1
DZ03	202 5 3210 05112	Zener Diode, GZA 5.1 Y	1		4 2262 20910	Power Amp. P.C.B. (Right)	1
DZ04	202 5 3210 05112	Zener Diode, GZA 5.1 Y	1		4 2369 73672	Plug 2P	1
DZ05	202 5 3200 03085	Zener Diode, GZA 3.0 Y	1		4 2369 74810	Plug 6P	1
DZ06	202 5 3200 03085	Zener Diode, GZA 3.0 Y	1		111 2 6220 11100	Wire Wrap Terminal	3
DZ07	202 5 3200 02211	Zener Diode, GZA 2.2 X	1		131 2 3608 14100	Cramp Wire	1
Q01	4 2039 72040	FET, 2SK 389	1		131 2 6201 21500	Plate Heat Sink	2
Q02	203 5 5373 06760	Transistor, 2SC 3067	1	L01	4 2532 00180	RF Filter (3 μH)	1
Q03	203 5 5361 24060	Transistor, 2SA 1240	1	VR01	4 2229 75300	Semi Fixed 200Ω (Center Voltage Adjust)	1
Q04	203 5 7230 60860	Transistor, 2SA 608	1	VR02	4 2229 75310	Semi Fixed 300Ω (Idling Current Adjust)	1
Q05	203 5 6931 20985	Transistor, 2SA 1209	1	CAPACITORS			
Q06	203 5 5251 57160	Transistor, 2SC 1571	1	C02	CC2 2 1500 KD00C	Ceramic 220pF 50V ±10%	1
Q07	203 5 5632 91185	Transistor, 2SC 2911	1	C04	CC1 0 2500 KD00C	Ceramic 0.001μF 50V ±10%	1
Q08	203 5 6931 20985	Transistor, 2SA 1209	1	C05	CD1 0 6250 0001V	Electrolytic 10μF 25V	1
Q09	203 5 5632 91185	Transistor, 2SC 2911	1	C06	CD1 0 6250 0001V	Electrolytic 10μF 25V	1
Q10	203 5 8122 34440	Transistor, 2SC 2344	1	C07	4 2239 72040	Ceramic 15pF 500V	1
Q11	203 5 8631 01140	Transistor, 2SA 1011	1	C08	4 2239 72040	Ceramic 15pF 500V	1
Q12	203 5 6830 43850	Transistor, 2SD 438	1	C09A	CC8 0 A500 DD00C	Ceramic 8pF 50V ±0.5%	1
Q13	203 5 6840 56050	Transistor, 2SB 560	1				

AUTO FUNCTION P.C.BOARD

(BOTTOM VIEW)

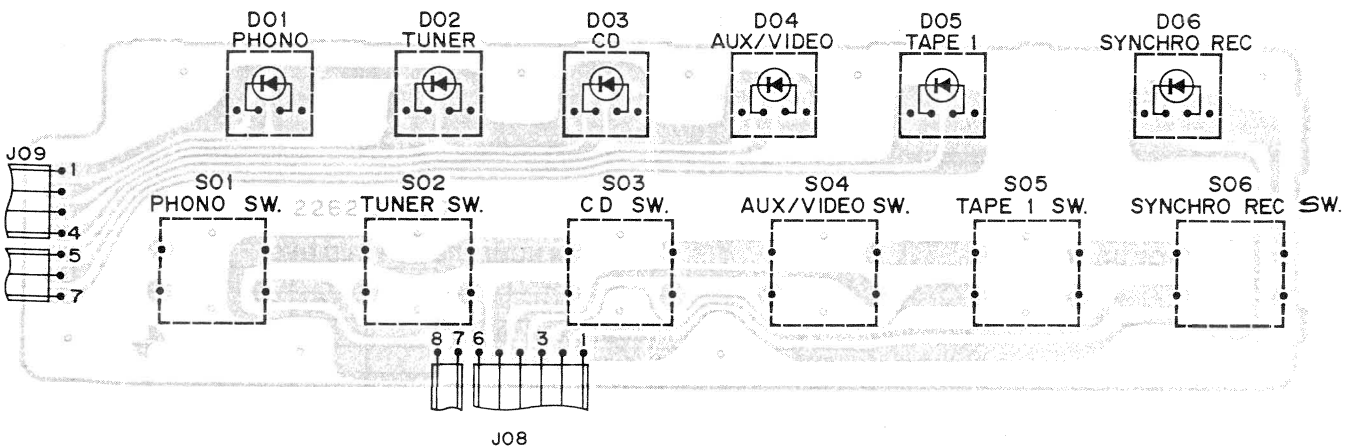


TRANSISTOR DC VOLTAGES							
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	
001	2SC 536	0V	0.7V	0V	007	2SC 536	
002	2SC 536	0.7V	0V	0V	008	2SC 536	
003	2SC 536	0V	0.7V	0V	009	2SC 536	
004	2SC 536	0.7V	0V	0V	010	2SC 536	
005	2SC 536	0V	0.7V	0V	011	2SC 536	
006	2SC 536	0.7V	0V	0V			
					B	C	E
					007	0.6V	0V
					008	0.7V	0V
					009	0.2V	0V
					010	0.7V	0V
					011	0.7V	0V

IC PIN NUMBERS DC VOLTAGES															
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC01	LC 4013 B	10.1V	0V	0V	0V	0V	0V	0V	10.3V	10.3V	0V	10.3V	0V	10.3V	10.3V
IC02	LC 4081 B	0V	0V	0V	0V	10.1V	0V	0V	0V	8.9V	0V	0V	-0.5V	0V	10.3V

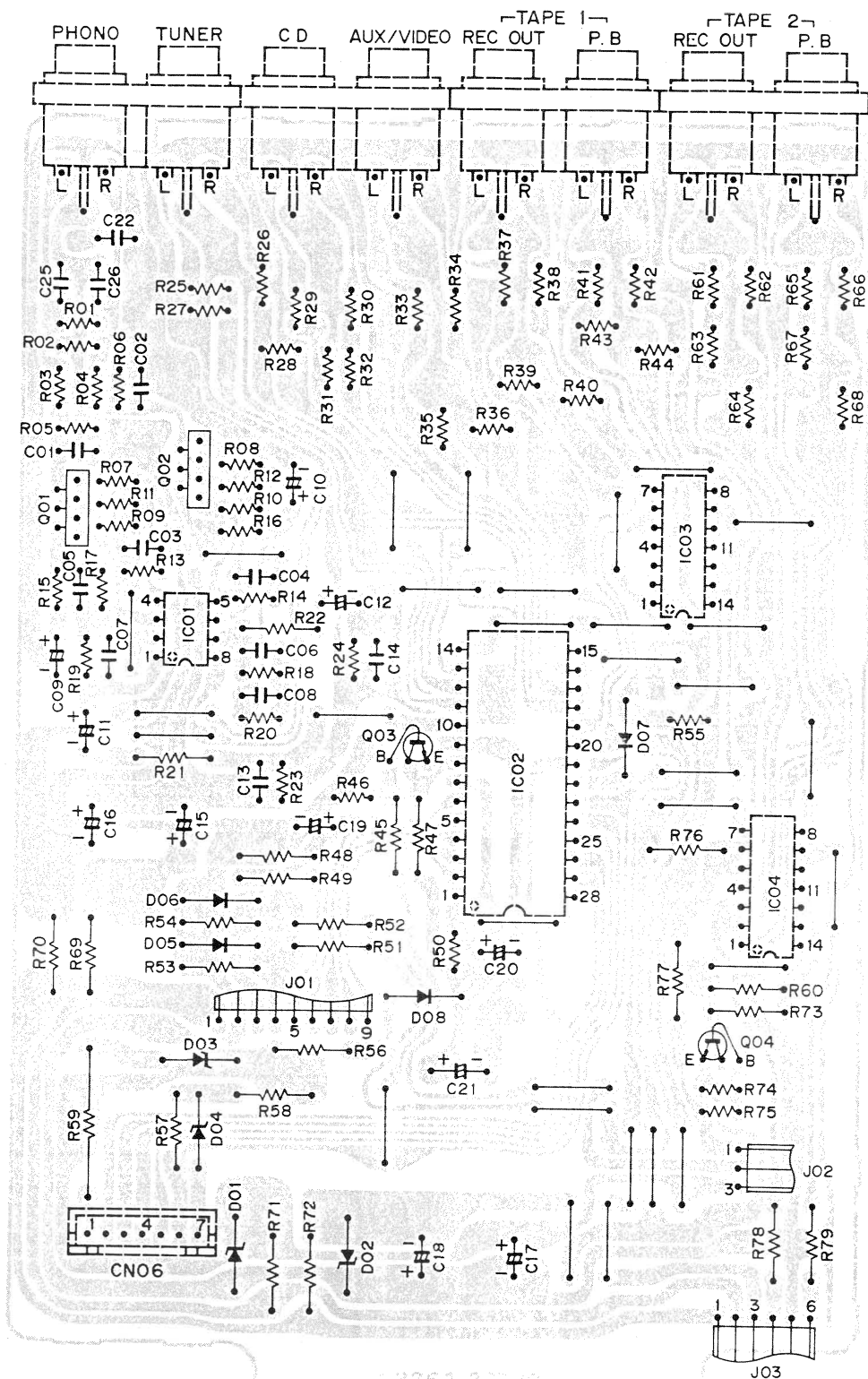
LED IND. / TOUCH SWITCH P.C.BOARD

(BOTTOM VIEW)



EQ, FUNCTION P.C. BOARD

(BOTTOM VIEW)



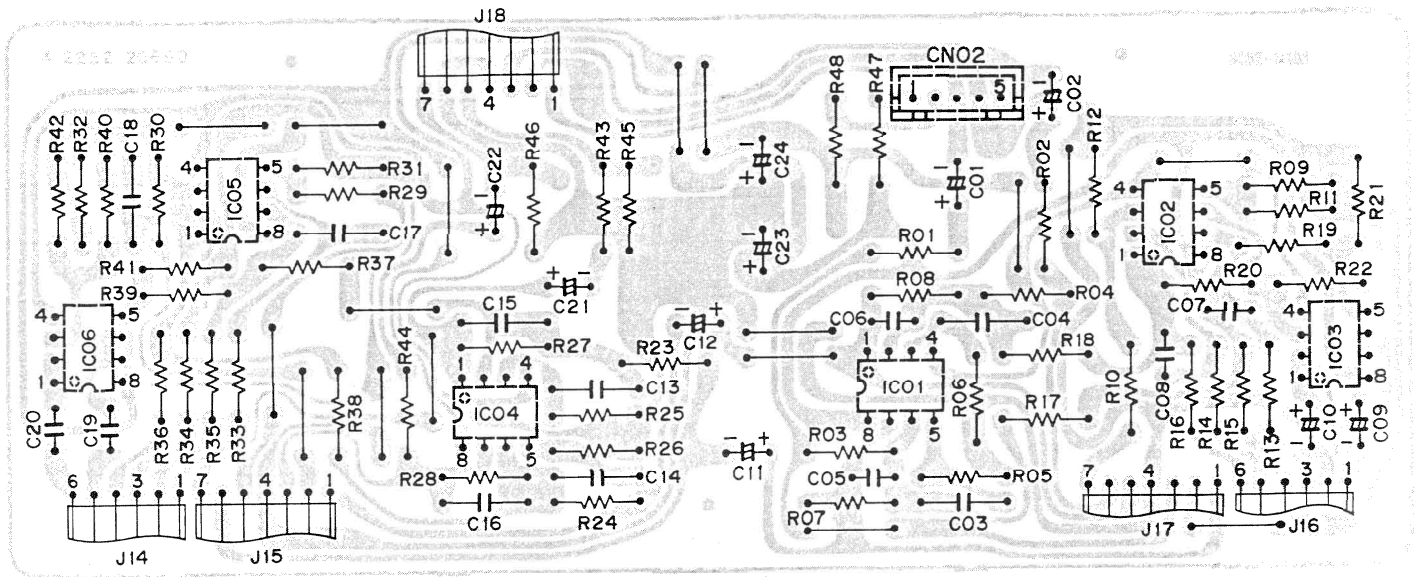
TRANSISTOR DC VOLTAGES

SYMBOL No.	DEVICE	B	C	E
001,02	2SK 389	0V	12.1V	0.2V
003	2SC 536	0V	19.2V	0V
004	2SC 536	-20V	-20.7V	-20V

IC PIN NUMBERS DC VOLTAGES

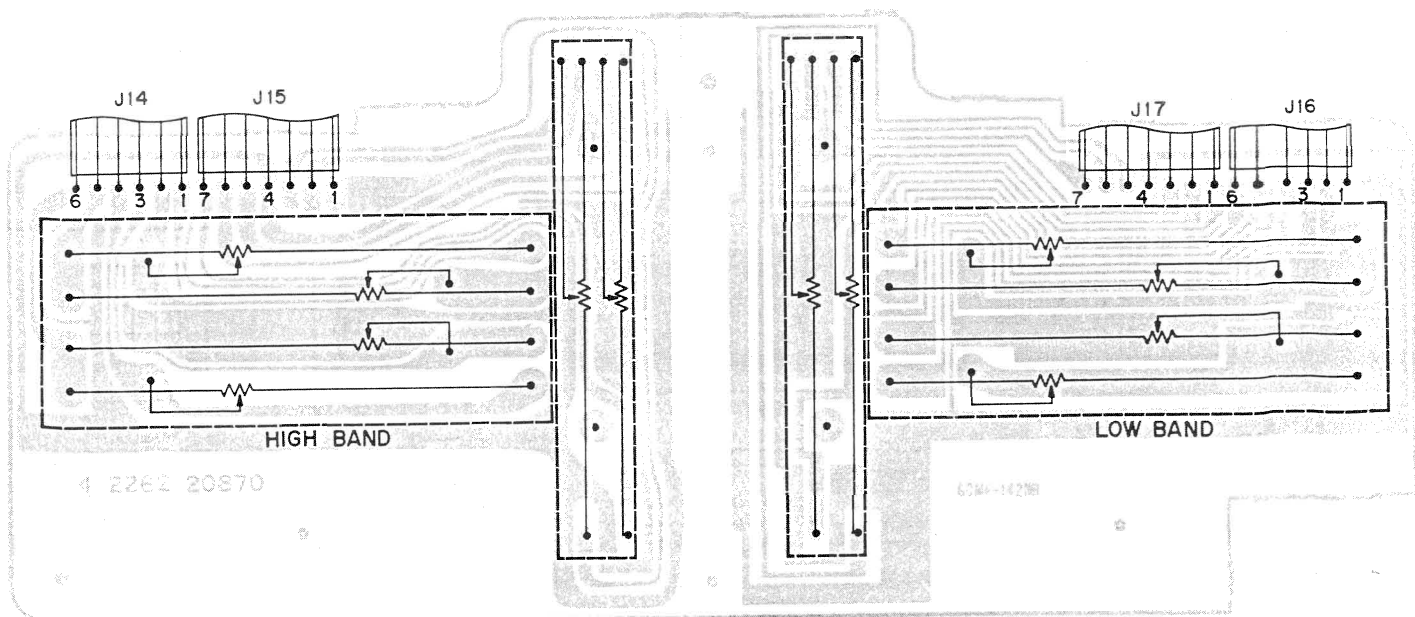
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
IC01	NJM 4560	0V	12.4V	12.4V	-22.8V	12.4V	0V	21.8V	0V	19.6V	19.6V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	-20.7V
IC02	LC 7817	19.2V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V
IC03	LC 4966	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V
IC04	LC 4966	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V

PARAMETRIC TONE P.C.BOARD (BOTTOM VIEW)



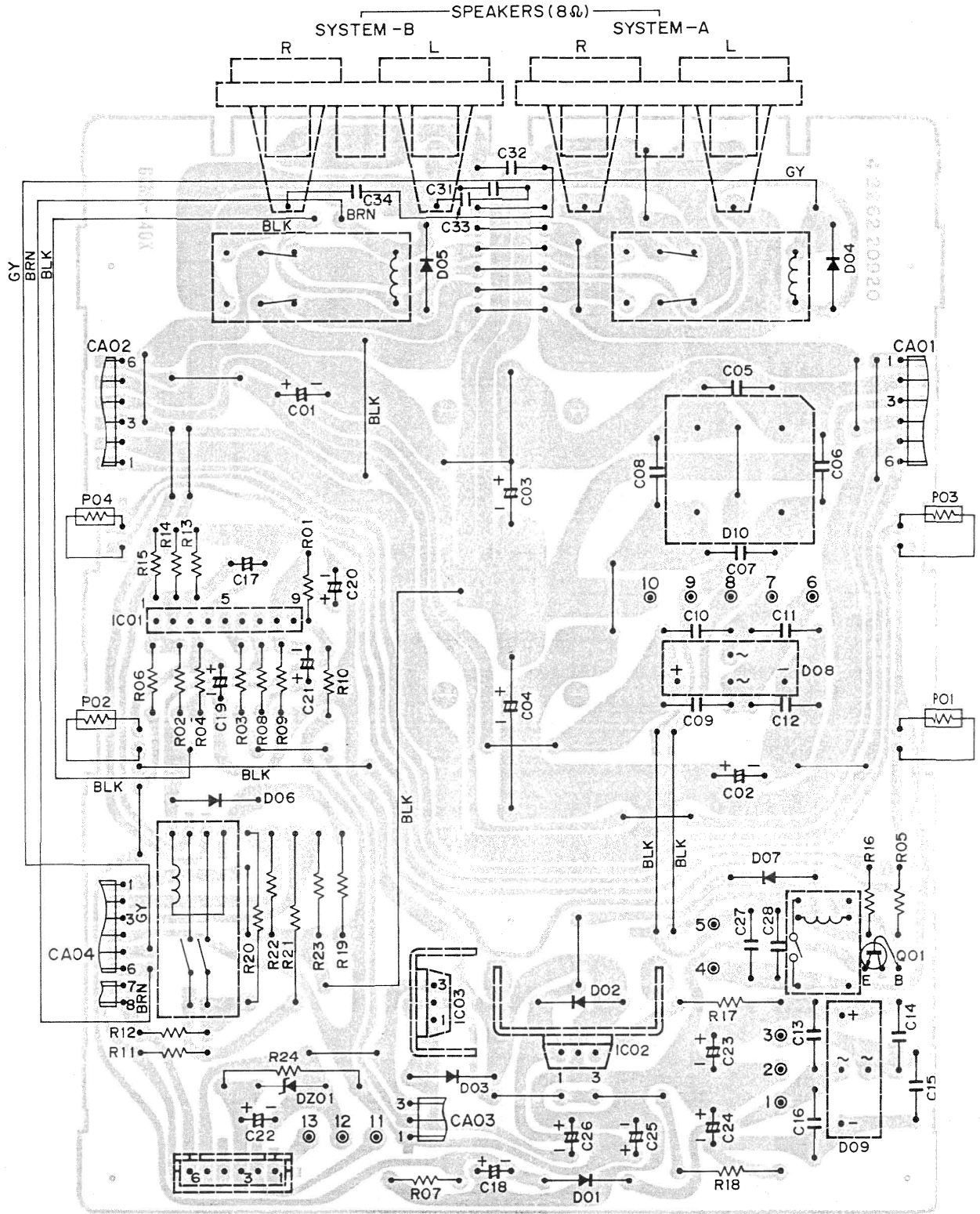
IC PIN NUMBERS DC VOLTAGES									
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8
IC01	NJM 4560 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V
IC02	NJM 4558 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V
IC03	NJM 4558 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V
IC04	NJM 4560 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V
IC05	NJM 4558 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V
IC06	NJM 4558 DX	0V	0V	0V	-21.3V	0V	0V	0V	20.2V

PARAMETRIC EQ. VOLUME P.C.BOARD (BOTTOM VIEW)



POWER SUPPLY PROTECT P.C.BOARD

(BOTTOM VIEW)

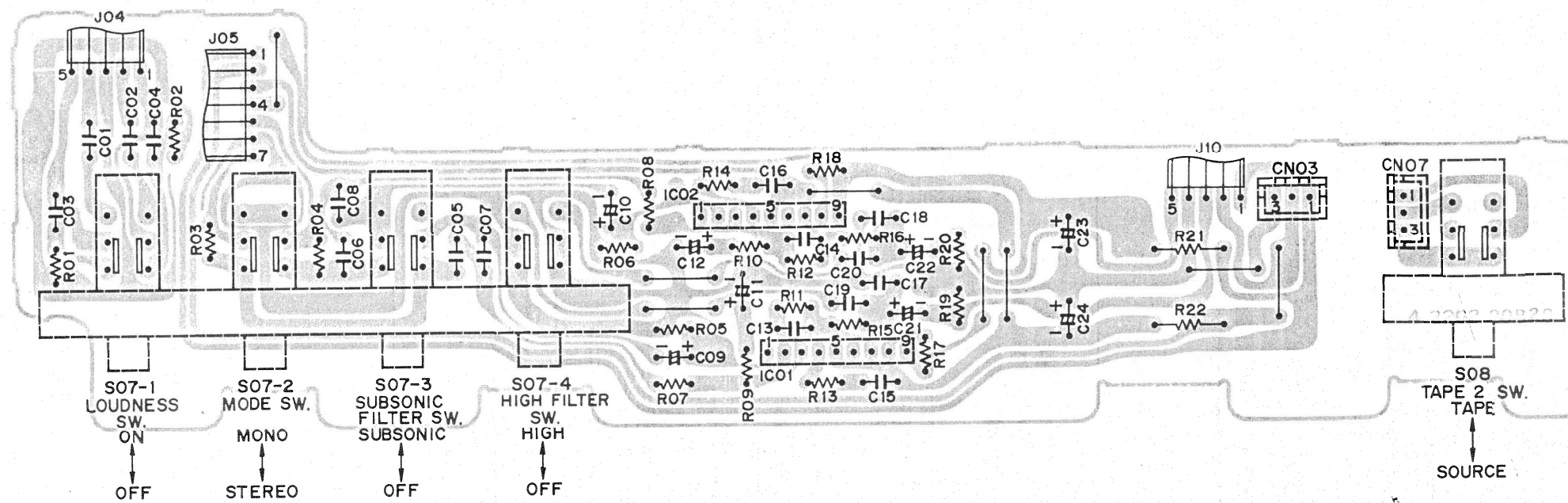


TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SC 2274	0.2V	23.5V	0V

IC PIN NUMBERS DC VOLTAGES										
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9
IC01	TA 9317 P	0.7V	0.1V	0.1V	0V	-0.8V	1.2V	0.2V	1.3V	3.0V
			INPUT	COM	OUTPUT					
IC02	NJM 78 M24	31.2V	0V	23.9V						
IC03	NJM 78 M24	-33.3V	0V	-24.9V						

PRE AMP. P.C. BOARD

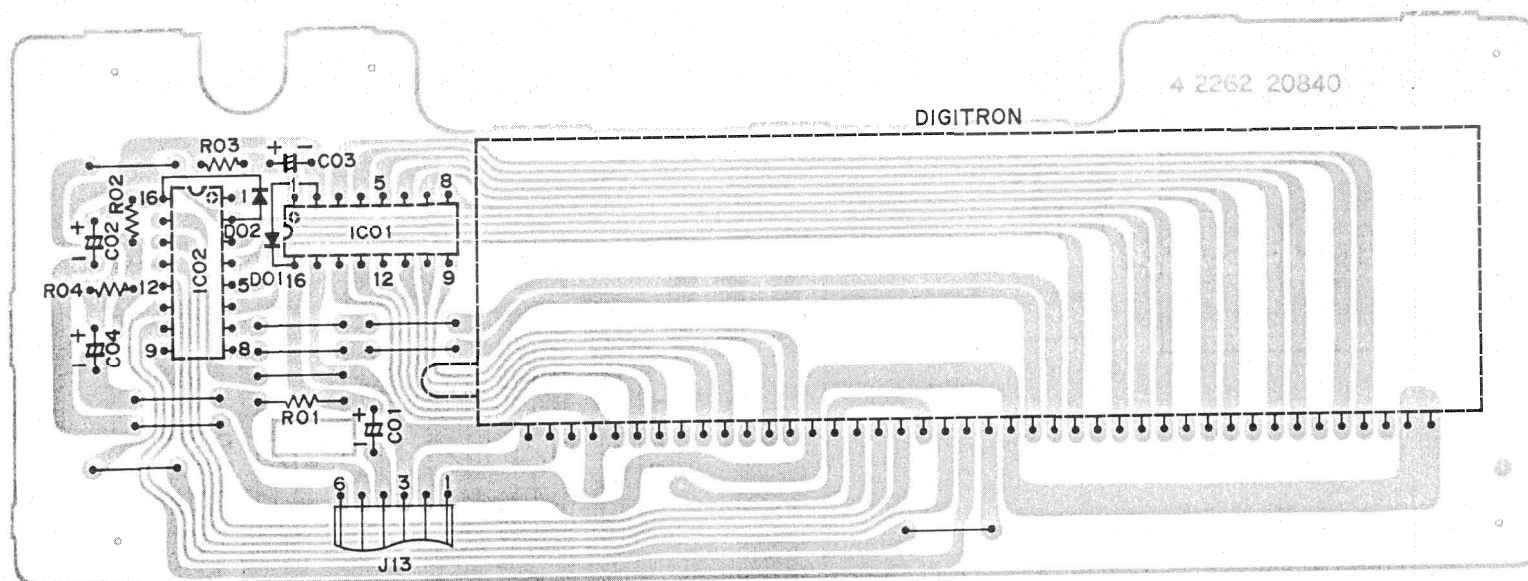
(BOTTOM VIEW)



IC PIN NUMBERS DC VOLTAGES										
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9
IC01,02	TA 7322 P	0.7V	0.2V	0.2V	-21.5V	-22.8V	0.2V	0.1V	-17V	21.7V

POWER LEVEL METER P.C. BOARD

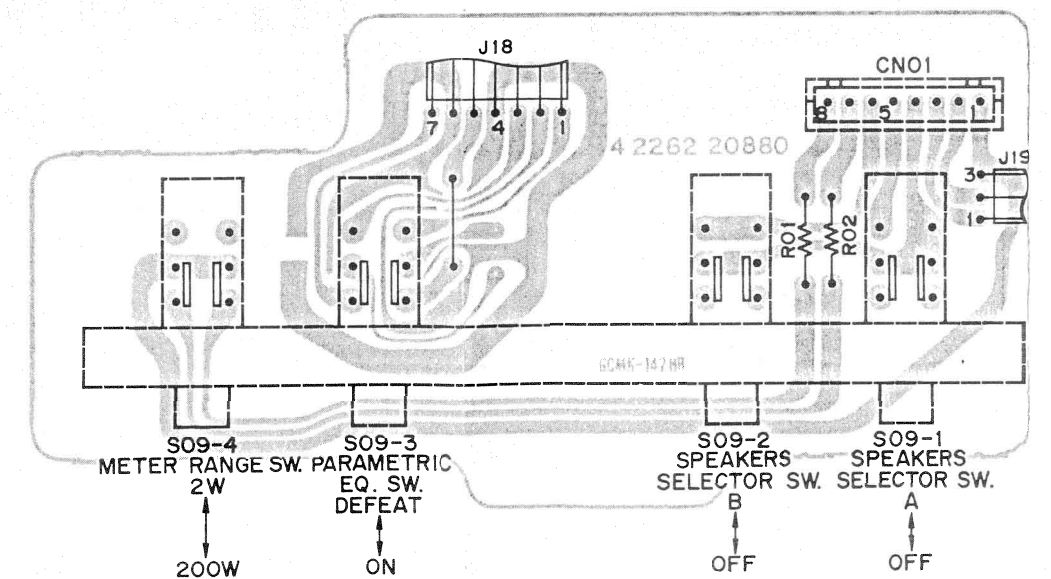
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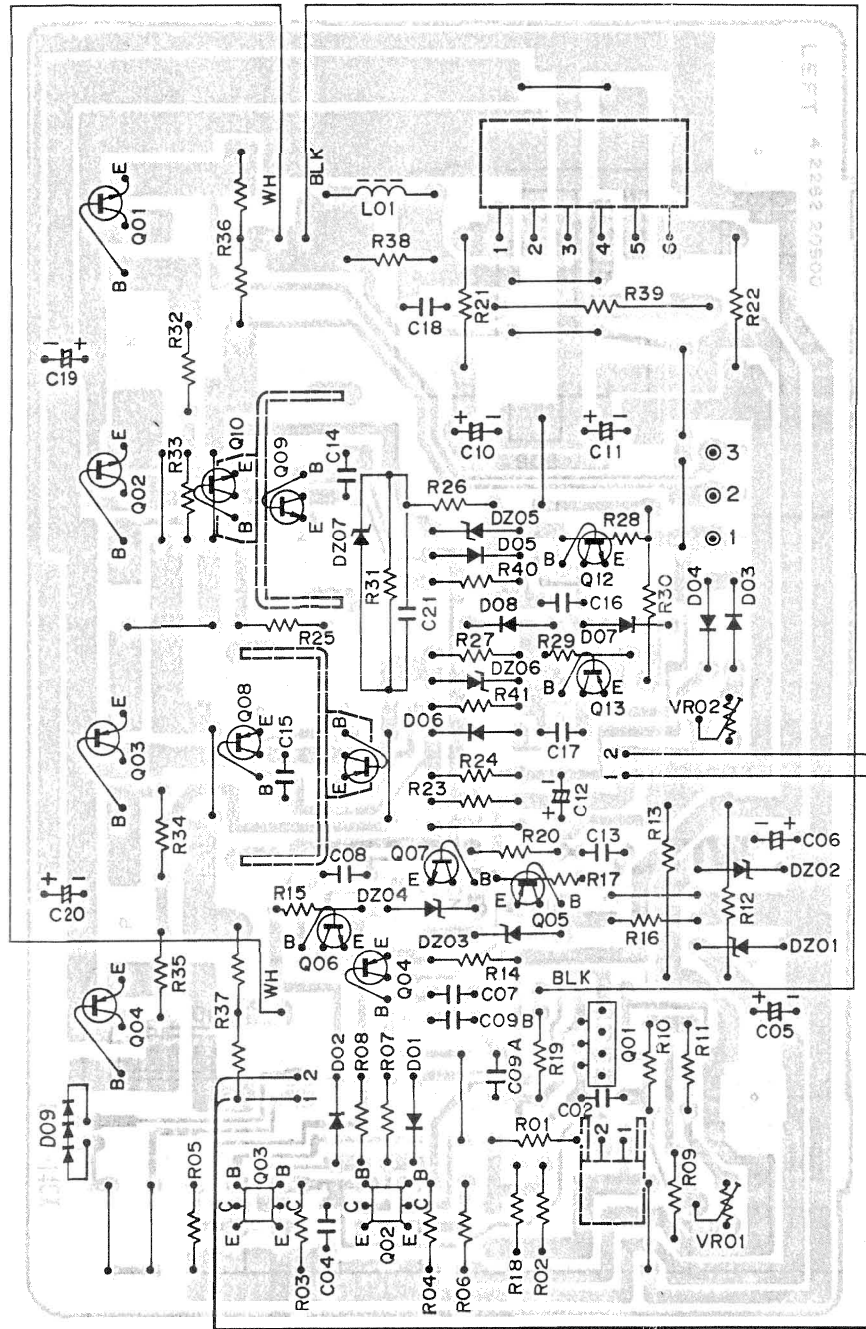
IC PIN NUMBERS DC VOLTAGES																	
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC01	BA 6146	0V	0V	-0.1V	-0.1V	-0.1V	0V	0.1V	0.2V	0.3V	0.2V	-0.1V	-0.1V	0V	-0.2V	15.1V	0V
IC02	BA 6146	0V	0V	-0.2V	-0.2V	-0.2V	-0.1V	-0.1V	0V	0V	0V	-0.1V	-0.1V	-0.2V	-0.1V	15.1V	0V

SWITCH P.C. BOARD

(BOTTOM VIEW)



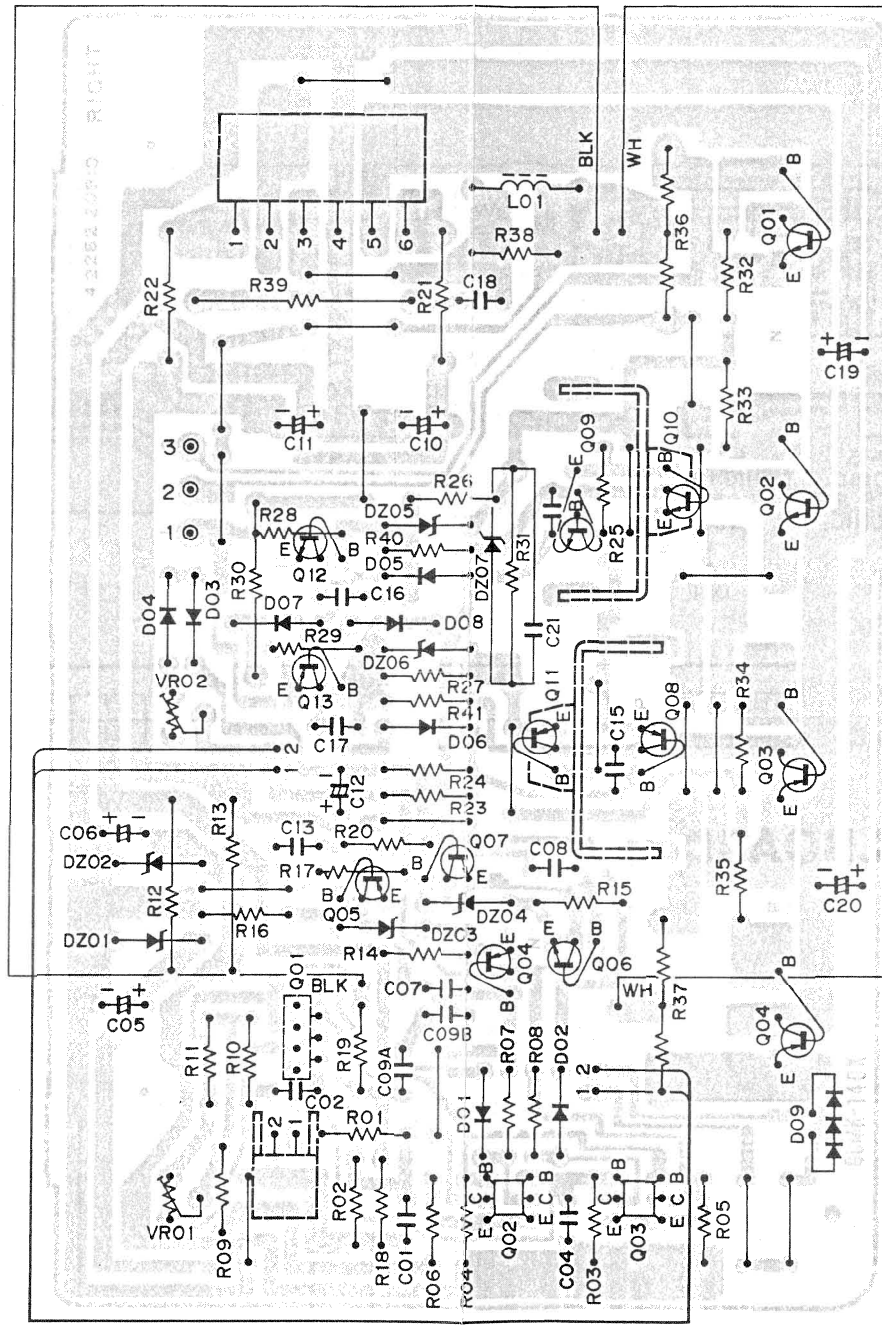
POWER AMP. (LEFT) P.C.BOARD (BOTTOM VIEW)



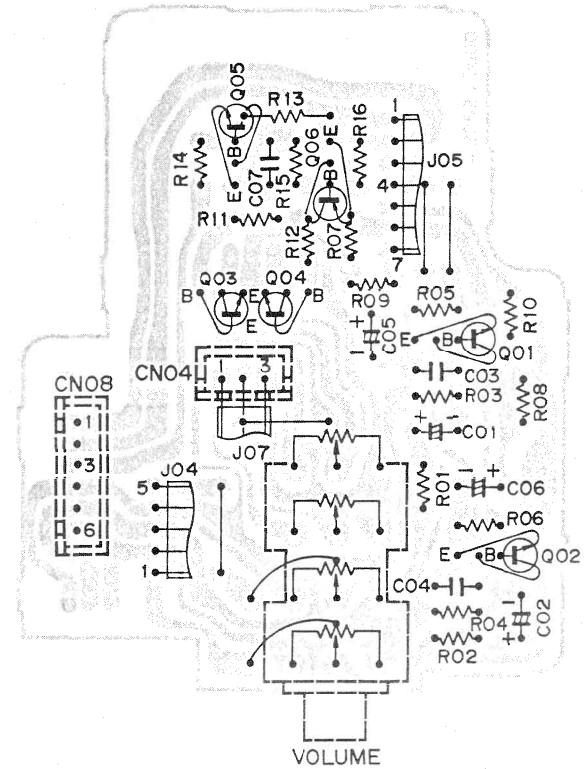
TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01	2SC 3281	0.6V	67.8V	0V
Q02	2SC 3281	0.6V	67.8V	0V
Q03	2SA 1302	-0.6V	-67.8V	0V
Q04	2SA 1302	-0.6V	-67.8V	0V

TRANSISTOR DC VOLTAGES														
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q01	2SK 389	0V	5.0V	0.5V	Q06	2SC 1571	-73V	-69.7V	-74V	Q11	2SA 1011	-1.1V	-68.3V	-0.6V
Q02	2SC 3067	5.0V	74.5V	4.4V	Q07	2SC 2911	-70.7V	-0.2V	-69.8V	Q12	2SD 438	0.4V	0.3V	0V
Q03	2SA 1240	5.0V	-75V	5.6V	Q08	2SA 1209	-1.1V	-68.6V	-1.7V	Q13	2SB 560	-0.4V	-1.4V	0V
Q04	2SA 608	73.4V	69.8V	74V	Q09	2SC 2911	1.1V	68V	1.6V					
Q05	2SA 1209	69.5V	1.7V	69V	Q10	2SC 2344	1.1V	68V	0.6V					

POWER AMP. (RIGHT) P.C.BOARD (BOTTOM VIEW)

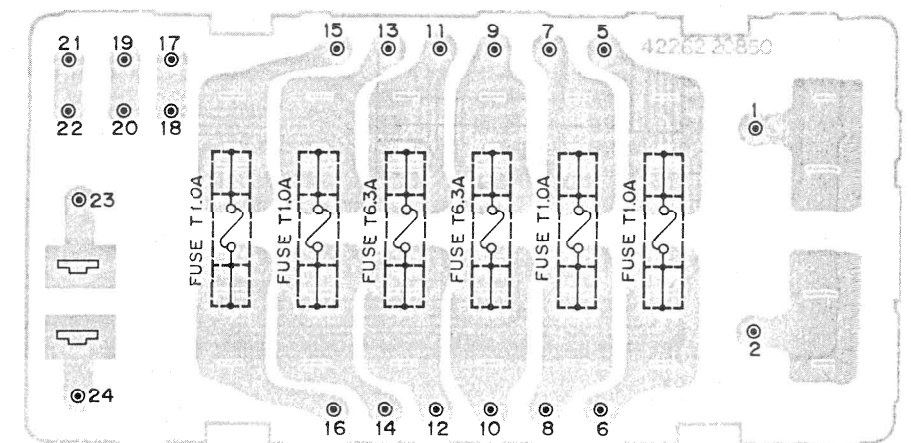


VOLUME P.C.BOARD (BOTTOM VIEW)

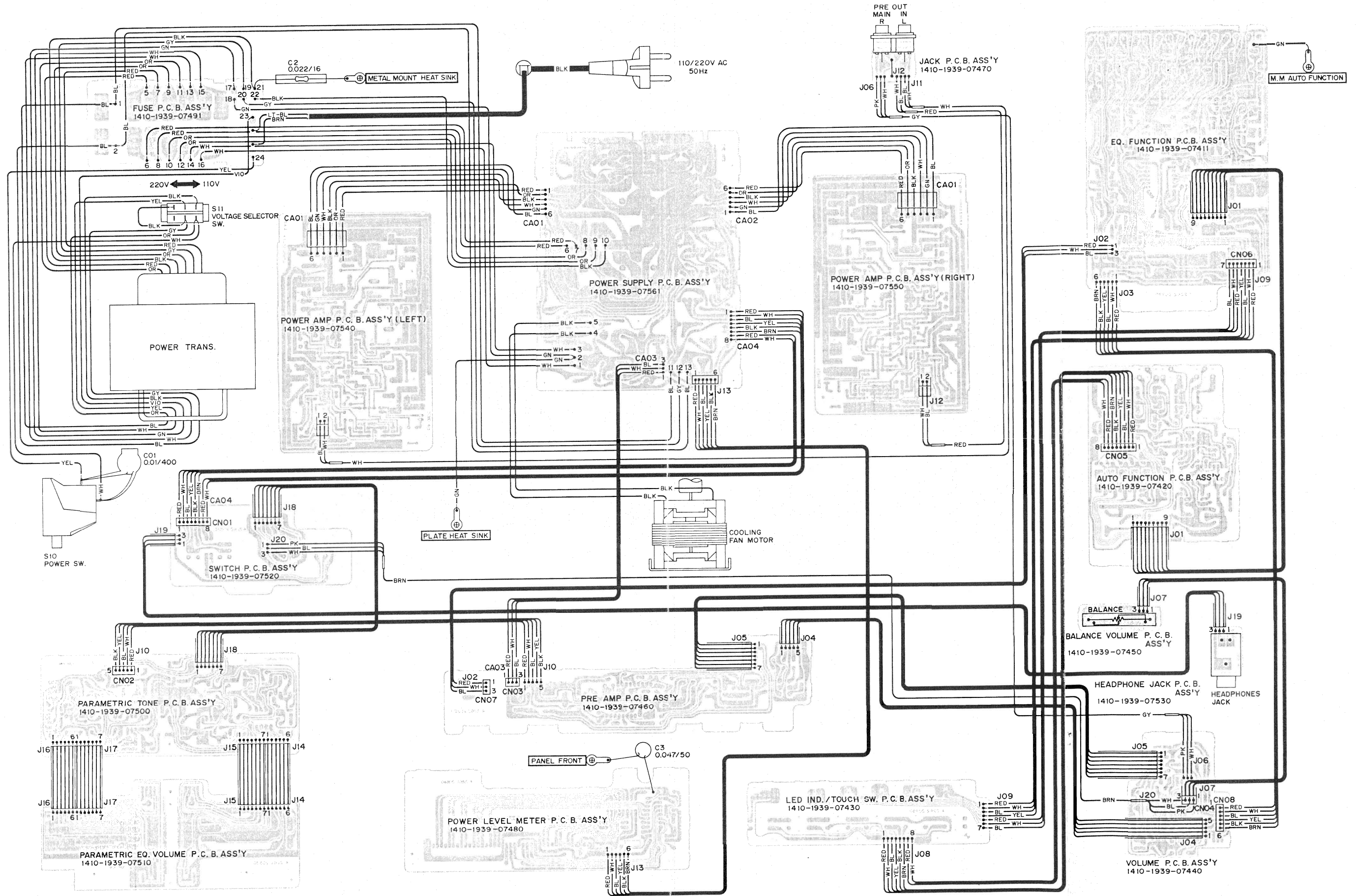


TRANSISTOR DC VOLTAGES				
SYMBOL No.	DEVICE	B	C	E
Q01,02	2SC 2240	-3.0V	21.7V	-3.6V
Q03,04	2SD 1012	-7.8V	0V	0V
Q05	2SC 536	0V	0V	0V
Q06	2SA 608	23.5V	-9.4V	23.8V

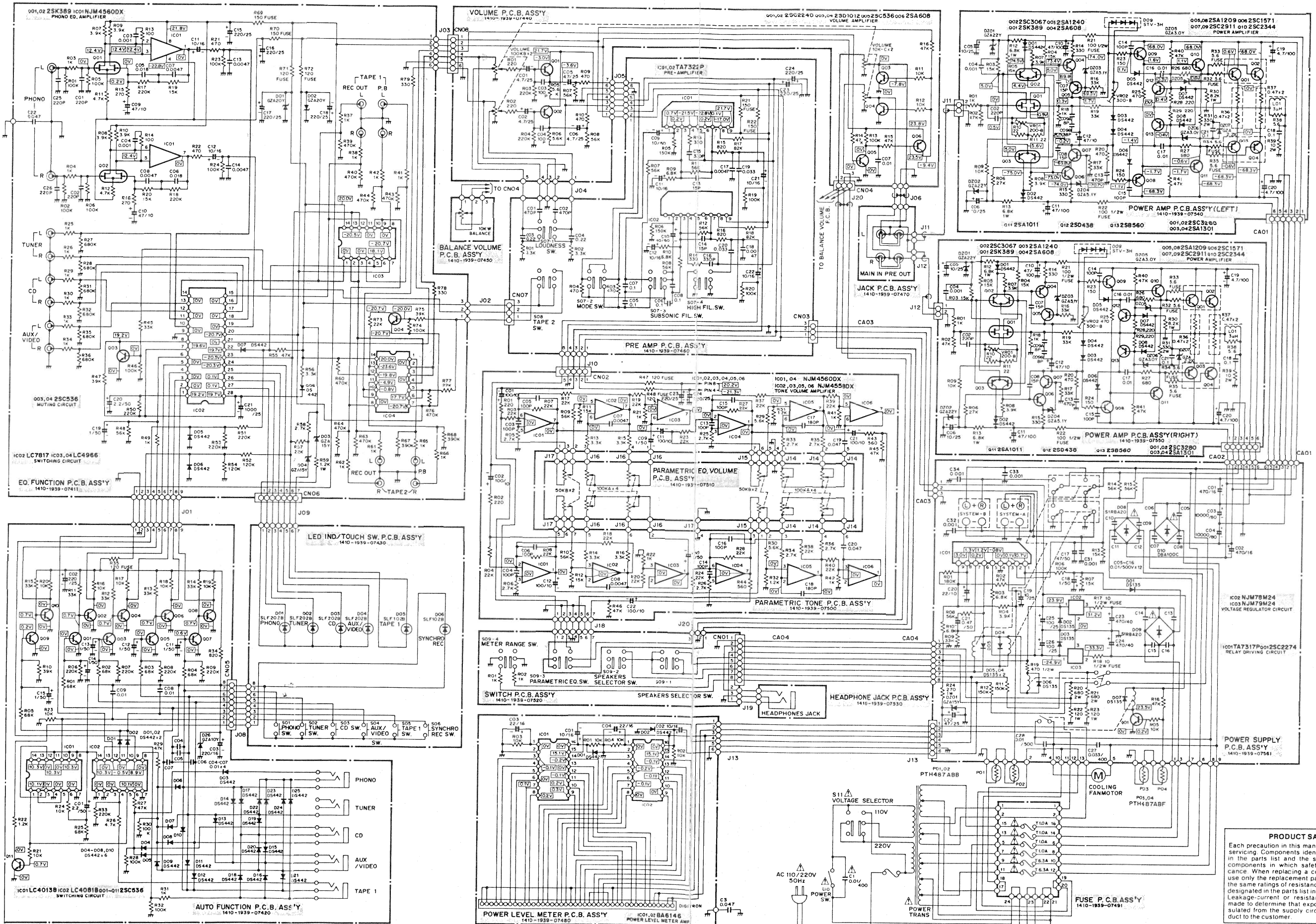
FUSE P.C.BOARD



POINT TO POINT WIRING DIAGRAM



SCHEMATIC DIAGRAM



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 signify components in which safety can be of special significance. When replacing a component identified with the IEC symbol, 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 adequately insulated from the supply circuit before returning the product to the customer.