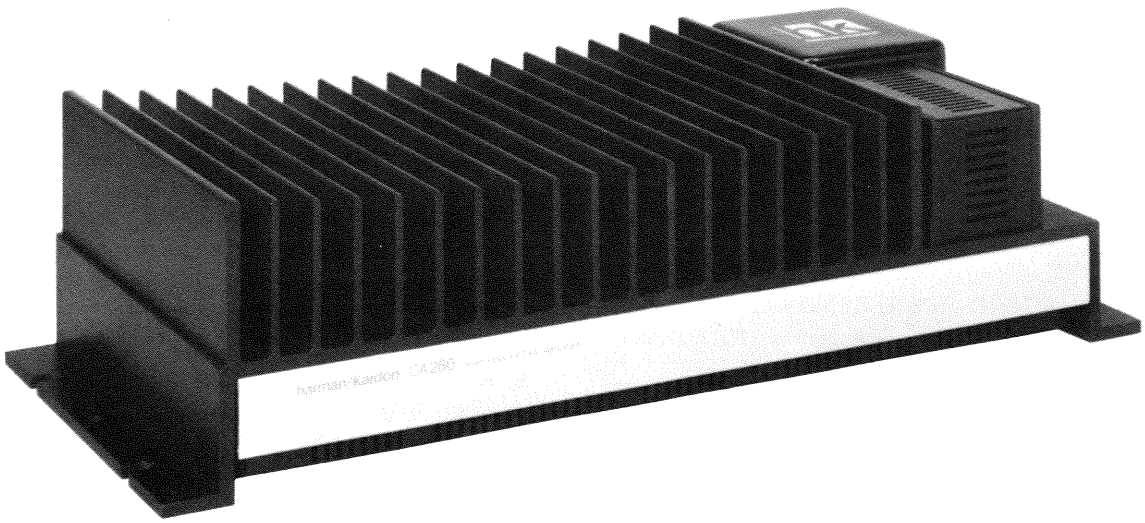
The Harman Kardon Model CA260

Manual No.74A

HIGH FIDELITY CAR AMPLIFIER

Technical Manual



harman/kardon
240 CROSSWAYS PARK WEST, WOODBURY, N.Y. 11797
1112-H15274A8 P-08846 1650 PRINTED IN JAPAN

SPECIFICATIONS

Power Output, RMS	: 60 watts per channel into 4 Ohms, 20 ~ 20,000Hz
	: 90 watts per channel into 2 Ohms, 20 ~ 20,000Hz
	: 180 watts bridged mono into 4 Ohms, 20 ~ 20,000Hz
HCC (High Instantaneous Current Capability)	: ± 30A
THD	: No more than 0.1%
Negative Feedback	: 25dB
Power Bandwidth	: 10Hz to 100,000Hz
Frequency Response	: 10Hz to 100,000Hz + 0, – 3dB
Signal-to-Noise Ratio	: 80dB
Input Sensitivity	
Line Level	: 0.25V/0.8V (switchable)
High Level	: 3V
Active Crossover Characteristics	
High Pass	: 200Hz, 12dB/Octave
Low Pass	: 200Hz, 6dB/Octave
Power Supply	: DC + 13.8V (11 ~ 16V usable), negative ground
Typical Input Current Requirements	
At Idle	: 2.5A
Full Power Music Signal	: 6.7A (4 Ohms/ch.)
	: 10A (2 Ohms/ch.)
Full Power Sine Wave	: 20A (4 Ohms/ch.)
	: 30A (2 Ohms/ch.)
Dimensions (W x H x D)	: 15-5/8"x3-7/8"x7-1/8" (396 x 98 x 180 mm)
Weight	: 10lbs. 2oz (4.6kg)

All specifications and features subject to change without notice.

DISASSEMBLY PROCEDURES (REFER TO PAGES 4 AND 10)

Note: When replacing parts, discharge by shorting between terminals of the capacitor (C51, C52) at the power source with 8Ω 100W resistor as it may have charge accumulated.

1 CABINET BOTTOM ASSEMBLY (101) REMOVAL

Remove 7 screws Ⓐ and remove the Cabinet Bottom Assembly (101).

2 MAIN P.C. BOARD (PCB-1) REMOVAL

1. Remove the Cabinet Bottom Assembly (101). (Refer to step 1 .)
2. Remove 9 screws Ⓑ and remove the Main P.C. Board (PCB-1) with Cabinet Back (142), Line Input P.C. Board (PCB-2), Bridged-Mono Switch P.C. Board (PCB-3) and terminals (TE1 and TE2).
3. Unsolder the lead wires from the Line Input P.C. Board (PCB-2) and Bridged-Mono Switch P.C. Board (PCB-3) and remove the terminals (TE1 and TE2) by unsoldering.
4. Remove 2 screws Ⓒ and remove the Cabinet Back (142) with the Line Input P.C. Board (PCB-2), Bridged-Mono Switch P.C. Board (PCB-3) and terminals (TE1 and TE2).

3 POWER SUPPLY P.C. BOARD (PCB-4) REMOVAL

1. Remove the Cabinet Bottom Assembly (101). (Refer to step 1 .)
2. Unsolder the lead wires from the Power Transformer (T1).
3. Remove 7 screws Ⓓ and remove the Power Supply P.C. Board (PCB-4) with the Cabinet Back (143), Fuse with Holder (F1), Insulator (186) and terminal (TE3).
4. Remove the terminal (TE3) by unsoldering.
5. Remove screw Ⓔ and remove the Cabinet Back (143) with Fuse with Holder (F1), Insulator (186) and terminal (TE3). At this time, disconnect the connector from Fuse with Holder (F1).

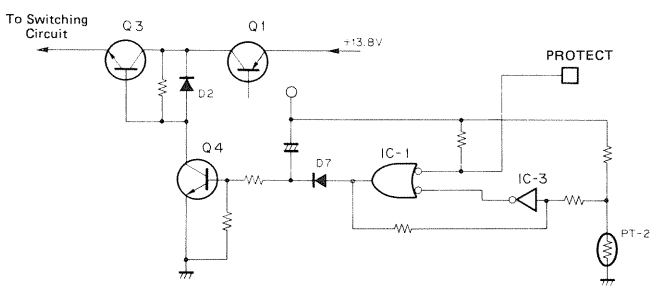
4 POWER TRANSFORMER (T1) REMOVAL

1. Remove the Power Supply P.C. Board (PCB-4). (Refer to step 3 .)
2. Remove 4 screws Ⓕ and remove the Power Transformer (T1).

PROTECTION CIRCUIT

If the temperature inside the CA260 rises above 80°C, the protection circuit comes into operation, decreasing output. At this time the protect indicator blinks. If the temperature comes back below 80°C by natural cooling, output returns as it was.

If the temperature rises above 100°C, the power supply circuit is shut off. Not only does the output stop, but also the protect indicator goes out. If this happens, it is possible that the CA260 is broken. However, even in this state, it cannot be always said that it is broken because the unit may operate when the temperature comes back below 80°C by natural cooling.



ALIGNMENT PROCEDURES (REFER TO PAGES 9 AND 10)

■ Idling current adjustment

Conditions:

- Connect the DC voltmeter between TP1 and TP2 and between TP3 and TP4.
- Connect a 13.8V power supply to the 12V Battery Power In terminal.
- After the power on, wait for 5 minutes before measuring to be sure of the most stable operation.

Inspection:

- Confirm that the idling current is 50mA ± 20mA (voltage: 33mV ± 13mV).
  If the current measured does not fall within the range specified, adjust it with the procedure below.

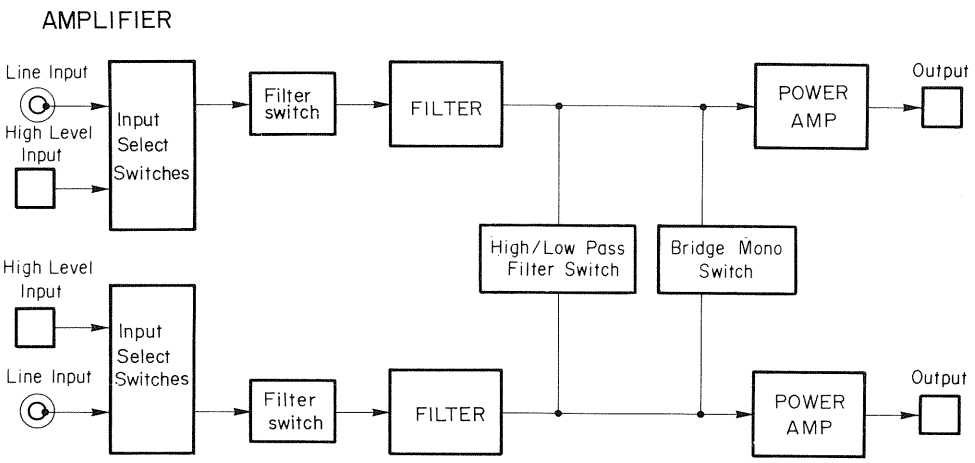
Adjustment

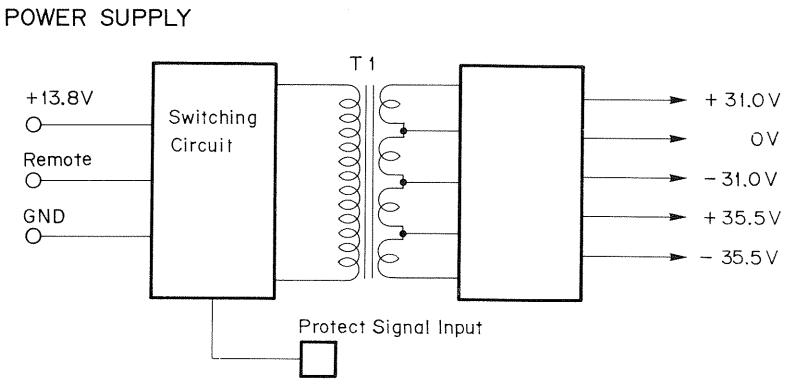
Note: When replacing or disconnecting a resistor, disconnect the power supply first.

Current	Voltage	Procedure
less than 29mA	less than 19mV	Add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
71mA ~ 100mA	46mV ~ 66mV	After cutting out R477 and R478, add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
101mA ~ 200mA	67mV ~ 132mV	After cutting out R479 and R480, add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
201mA ~ 250mA	133mV ~ 165mV	Cut out R477 and R478.
more than 251mA	more than 166mV	Cut out R479 and R480.

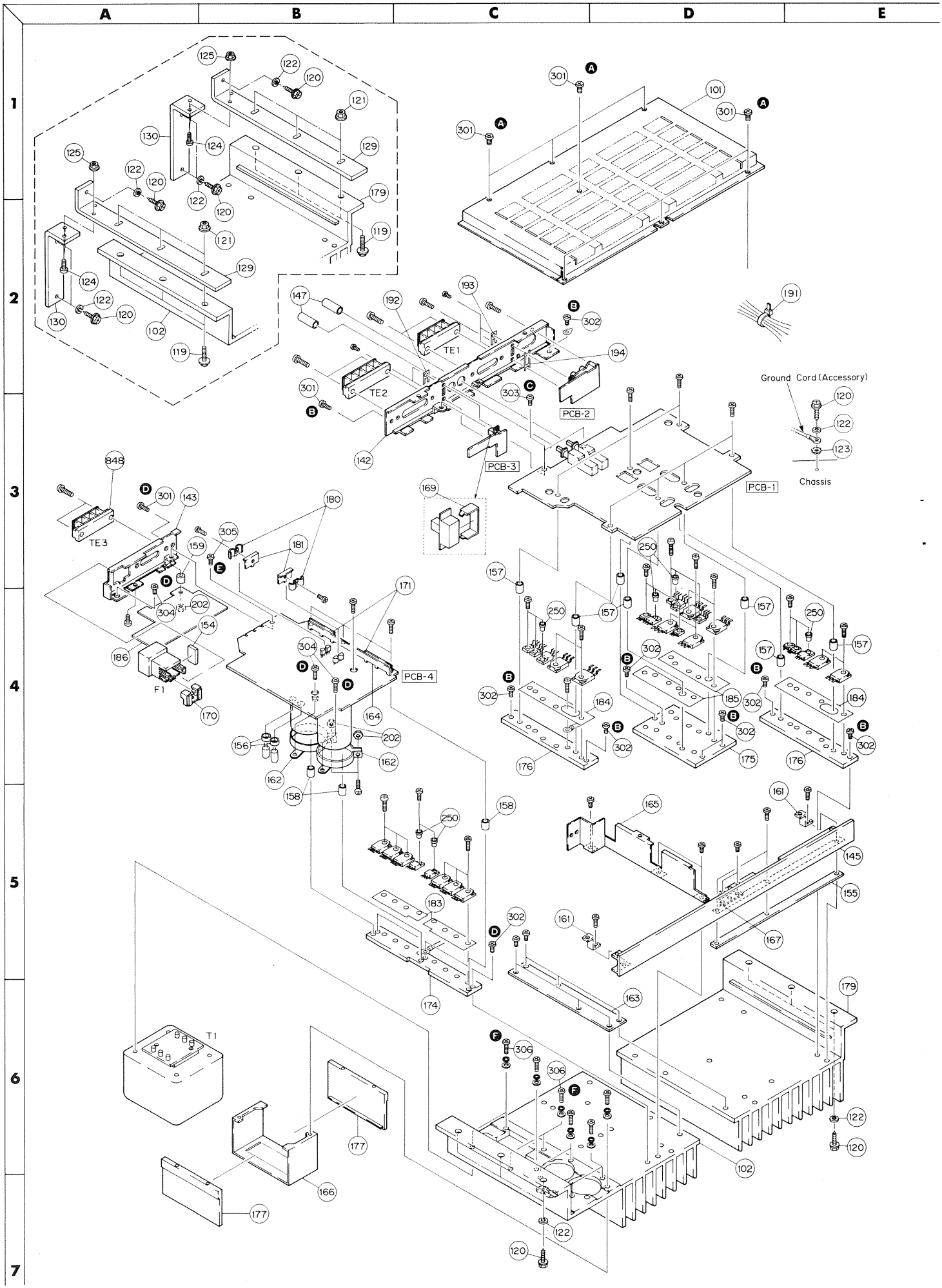
After the adjustment is complete, let the unit settle down for 10 minutes, than double-check that the idling current is set properly.

BLOCK DIAGRAM





GENERAL UNIT EXPLODED VIEW



GENERAL UNIT PARTS LIST

Ref. No.	Part No.	Description
101	A424-CA260A	Cabinet Bottom Assembly
102	B222-CA260A	Heat Sink Assembly, Right
119	2310-7028	Hexagon-Head Bolt
120	2346-501641	Hexagon-Head Tapping Screw
121	2440-7018	Hexagon Nut
122	2412-5042	Spring Washer
123	2414-504	Toothed Lock Washer
124	2557-401649	Bolt
125	2440-7019	Hexagon Nut
129	2218-7035	Bracket
130	2218-7036	Bracket
142	1424-12101	Cabinet Back
143	1424-12201	Cabinet Back
145	1443-07701	Front Panel
147	1662-05002	Push Button, Filter Switches
154	2112-11768	Sponge
155	2132-7118	Spacer
156	2132-7119	Spacer
157	2132-7120	Spacer
158	2132-7123	Spacer
159	2132-7124	Spacer
161	2219-7965	Bracket
162	2219-7966	Bracket
163	2219-7967	Bracket
164	2219-7968	Bracket
165	2219-7969	Bracket
166	2219-7971	Bracket
167	2219-7972	Bracket
169	2219-7994	Bracket
170	2219-7995	Bracket
171	2219-7998	Bracket
174	2222-7158	Heat Sink
175	2222-7159	Heat Sink
176	2222-7160	Heat Sink
177	2222-7161	Heat Sink
179	2222-7163	Heat Sink
180	2222-7106	Heat Sink
181	2222-7168	Heat Sink
183	2224-7092	Insulator
184	2224-7093	Insulator
185	2224-7094	Insulator
186	2224-7098	Insulator
191	2240-7120	Holder
192	2240-7220	Holder
193	2240-7224	Holder
194	2240-7225	Holder
202	2440-7016	Special Nut
250	2114-YC40B	Bushing
301	2347-3006K7	Self-Tapping Screw (+) (3 x 6mm)
302	2347-301026	Self-Tapping Screw (+) (3 x 10mm)
303	2347-300627	Self-Tapping Screw (+) (3 x 6mm)
304	2347-300626	Self-Tapping Screw (+) (3 x 6mm)
305	2347-301227	Self-Tapping Screw (+) (3 x 12mm)
306	2557-301229	Screw with Washer (+) (3 x 12mm)
	1111-J30179	Owner Guide (for U.S.A. model)
	1111-J30180	Owner Guide (for General & Canada models)
	1756-09901	Installation Template (Accessory)
	1221-717169	Packing Box
	1222-7267	Packing Cushion, Left
	1222-7268	Packing Cushion, Right

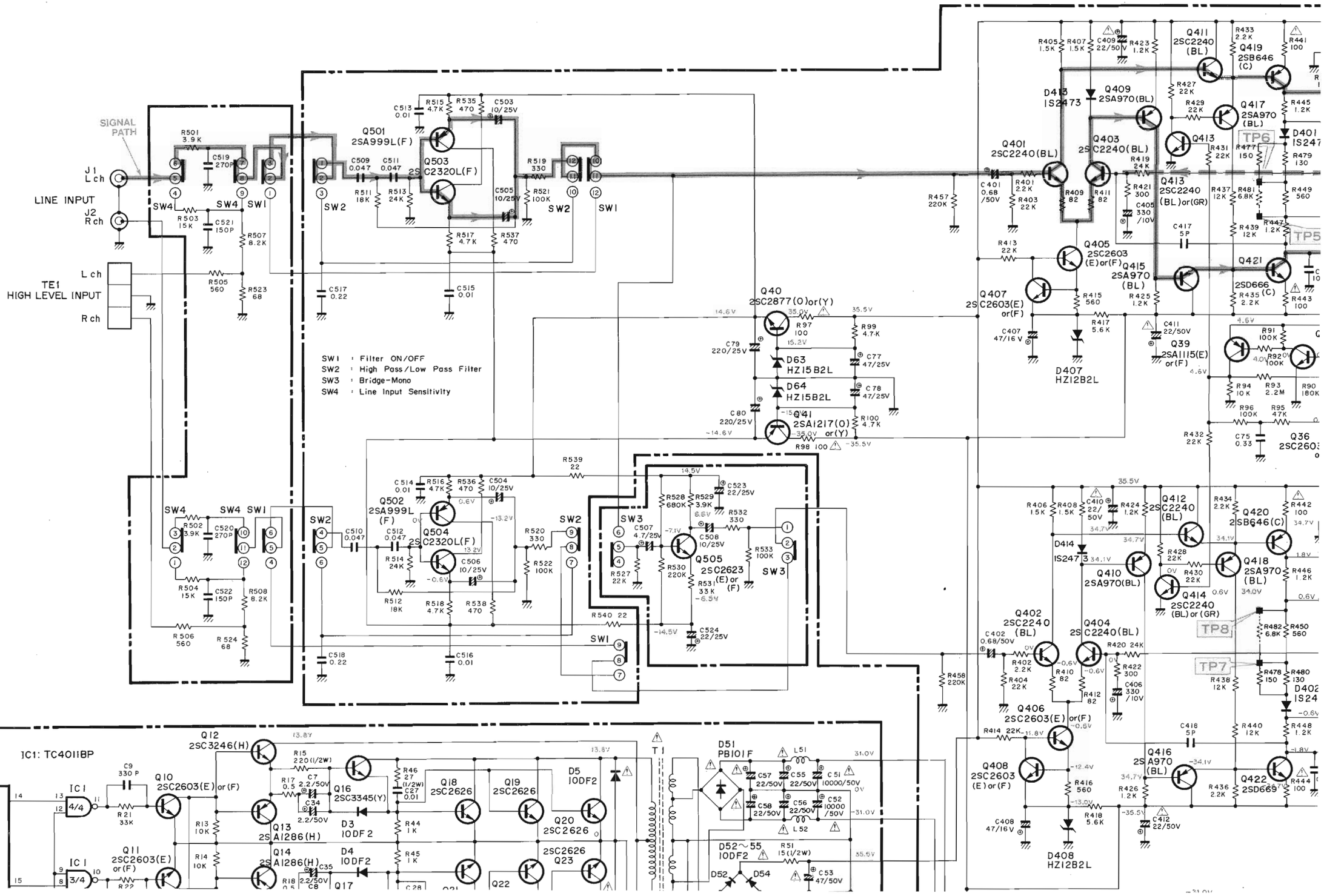
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	CHASSIS MISCELLANEOUS	
⚠T1	5584-701464	Power Transformer
C429	5369-104144	Capacitor, 0.1μF, ± 10%, 25V, Semiconductor
⚠F1	4472-7935	Fuse with Holder, 30A (Spare Fuse Inclusive)
PT1, 2	5192-090TS1	Posistor, ME2
TE1, 3	4214-148	Terminal, High Level Input, 12V Battery Power In
TE2	4214-147	Terminal, Speaker System
⚠J3	4163-701107	Connector with Lead Wire
LUG1	4211-4	Lug Terminal
	4162-726	Power Cord, Red (Accessory)
	4162-736	Ground Cord, Black (Accessory)
	4211-31	Spade Lug (w/Tube) (Accessory)
	PCB-1 MAIN P.C. BOARD	
	RESISTORS	
⚠R97, 98, 441, 442, 443, 444	5102-1014713	100Ω, ± 2%, 1/4W, Fuse
R417, 418	5174-562381	5.6kΩ, ± 1%, 1/4W, Metal
R419, 420	5174-243381	24kΩ, ± 1%, 1/4W, Metal
R421, 422	5174-301381	300Ω, ± 1%, 1/4W, Metal
R449, 450	5174-561381	560Ω, ± 1%, 1/4W, Metal
R459, 460	5174-470381	47Ω, ± 1%, 1/4W, Metal
R465A/B, 466A/B, 467A/B, 468A/B	5275-R33671	0.33Ω, ± 10%, 5W x 2, Cement
R469, 470, 471, 472	5171-220572	22Ω, ± 5%, 1W, Metal
R473, 474, 475, 476	5171-470572	47Ω, ± 5%, 1W, Metal
R477, 478	5174-151381	150Ω, ± 1%, 1/4W, Metal
R479, 480	5174-131381	130Ω, ± 1%, 1/4W, Metal
R483, 484, 485, 486	5174-100381	10Ω, ± 1%, 1/4W, Metal
R513, 514	5174-243381	24kΩ, ± 1%, 1/4W, Metal
	CAPACITORS	
C76	5345-226B041	22μF, ± 20%, 10V, Electrolytic
C77, 78	5345-476D041	47μF, ± 20%, 25V, Electrolytic
C79, 80	5345-227D041	220μF, ± 20%, 25V, Electrolytic
C81	5345-225F041	2.2μF, ± 20%, 50V, Electrolytic
C401, 402	5345-684F0951	0.68μF, ± 20%, 50V, Electrolytic
C405, 406	5345-337B0226	330μF, ± 20%, 10V, Electrolytic
C407, 408	5345-476C0952	47μF, ± 20%, 16V, Electrolytic
⚠C409, 410, 411, 412	5345-226F041	22μF, ± 20%, 50V, Electrolytic
C413, 414	5359-1015851	100pF, ± 5%, 100V, Polypropylene
C415, 416	5345-476C041	47μF, ± 20%, 16V, Electrolytic
C417, 418	5353-050934	5pF, ± 0.5pF, 500V, Mica
⚠C425, 426, 427, 428	5345-476F041	47μF, ± 20%, 50V, Electrolytic
C501, 502	5345-106C0952	10μF, ± 20%, 16V, Electrolytic
C503, 504, 505, 506	5345-106D0952	10μF, ± 20%, 25V, Electrolytic
C523, 524	5345-226D041	22μF, ± 20%, 25V, Electrolytic
	DIODES	
D61, 401, 402, 413, 414	5631-1S2473	1S2473
D62, 65	5641-MV104V	Varistor, MV104V
D63, 64	5635-HZ15-2L	Zener, HZ15-2L
D403, 404, 405, 406	5632-10DF2	10DF2
D407, 408	5635-HZ12B2L	Zener, HZ12B2L
D409, 410, 411, 412	5636-1S2471	1S2471

Ref. No.	Part No.	Description
	TRANSISTORS	
Q31, 32, 33, 413, 414	5613-2240(BL)	2SC2240(BL) or 2SC2240(GR)
Q34, 409, 410, 415, 416, 417, 418	5611-970(BL)	2SA970(BL)
Q35, 36, 38, 405, 406, 407, 408	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q37, 39	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q40	5613-2877(O)	2SC2877(O) or 2SC2877(Y)
Q41	5611-1217(O)	2SA1217(O) or 2SC1217(Y)
Q401, 402, 403, 404	5613-1775(F)	2SC1775(F)
Q411, 412	5613-2240(BL)	2SC2240(BL)
Q419, 420	5612-646(C)	2SB646(C)
Q421, 422	5614-666(C)	2SD666(C)
Q423, 424	5614-669(B)	2SD669(B) or 2SD669(C)
Q425, 426	5612-649(B)	2SB649(B) or 2SB649(C)
Q427, 428	5614-669(C)	2SD669(C)
Q429, 430	5612-649(C)	2SB649(C)
Q431, 432	5613-2591(Q)	2SC2591(Q) or 2SC2591(R) or 2SC2591(S)
Q433, 434	5611-1111(Q)	2SA1111(Q) or 2SA1111(R) or 2SA1111(S)
Q435, 436, 437, 438	5613-3182(O)	2SC3182(O) or 2SC3182(R)
Q439, 440, 441, 442	5611-1265(O)	2SA1265(O) or 2SA1265(R)
Q501, 502	5611-999L(F)	2SA999L(F)
Q503, 504	5613-2320L(F)	2SC2320L(F)
	COILES	
L405, 406	5991-7165	
	MISCELLANEOUS	
SW1, 2	4431-A04727	Push Switch, Filter ON/OFF, High Pass/Low Pass Filter
	PCB-2 LINE INPUT P.C. BOARD	
	CAPACITORS	
C519, 520	5359-2715851	270pF, ± 5%, 100V, Polypropylene
C521, 522	5359-1515851	150pF, ± 5%, 100V, Polypropylene
	MISCELLANEOUS	
SW4	4421-0427126	Slide Switch, Line Input Sensitivity
J1, 2	4482-7117	2-Pin Jack, Line Input
	PCB-3 BRIDGED-MONO SWITCH P.C. BOARD	
	CAPACITORS	
C507	5345-475D0952	4.7μF, ± 20%, 25V, Electrolytic
C508	5345-106D0952	10μF, ± 20%, 25V, Electrolytic
	TRANSISTOR	
Q505	5613-2603(E)	2SC2603(E) or 2SC2603(F)
	MISCELLANEOUS	
SW3	4421-0227123	Slide Switch, Bridge Mono

Ref. No.	Part No.	Description
	PCB-4 POWER SUPPLY P.C. BOARD	
	RESISTOR	
R24	5174-184381	180kΩ, ± 10%, 1/4W, Metal
	CAPACITORS	
⚠C1, 29, 30, 31, 32, 33	5345-227D0921	220μF, ± 20%, 25V, Electrolytic
C2, 4, 5, 6	5345-107-25	100μF, ± 20%, 25V, Electrolytic
C3, 15	5345-227A041	220μF, ± 20%, 6.3V, Electrolytic
C7, 8, 34, 35	5345-225F041	2.2μF, ± 20%, 50V, Electrolytic
C9, 10	5359-3315851	330pF, ± 5%, 100V, Polypropylene
C12	5359-2015851	200pF, ± 5%, 100V, Polypropylene
C13	5345-106-16	10μF, ± 20%, 16V, Electrolytic
C18	5345-105-50	1μF, ± 20%, 50V, Electrolytic
⚠C51, 52	5341-109F0960	10000μF, ± 20%, 50V, Electrolytic
⚠C53, 54	5345-476F041	47μF, ± 20%, 50V, Electrolytic
⚠C55, 56, 57, 58	5345-226F041	22μF, ± 20%, 50V, Electrolytic
	INTEGRATED CIRCUITS	
IC1, 2	5654-MN4011B	MN4011B
IC3	5654-MN4069UB	MN4069UB
IC4	5654-MN4027B	MN4027B
IC5	5652-M5223P	M5223P
	TRANSISTORS	
Q1, 13, 14	5611-1286(H)	2SA1286(H)
Q2, 4, 6, 7, 8, 9, 10, 11	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3, 12, 15	5613-3246(H)	2SC3246(H)
Q16, 17	5613-3345(O)	2SC3345(O) or 2SC3345(Y)
Q18, 19, 20, 21, 22, 23	5613-2626	2SC2626
	DIODES	
D1	5632-ERC0102F	ERC0102F
D2, 7, 9, 10, 11, 13	5631-1S2473	1S2473
⚠D3, 4, 5, 6, 52, 53, 54, 55	5632-10DF2	10DF2
D8	5635-HZ6A-2L	Zener, HZ6A-2L
D12	5635-HZ9B-2L	Zener, HZ9B-2L
D14	5637-GL5HD10	L.E.D., GL5HD10, Power Indicator, Red
D15	5637-GL5HY10	L.E.D., GL5HY10, Protect Indicator, Amber
⚠D51	5685-PB101F	Bridge Silicon, PB101F
	COILS	
L51, 52	5991-7175	

SCHEMATIC DIAGRAM



D E F G H I J K

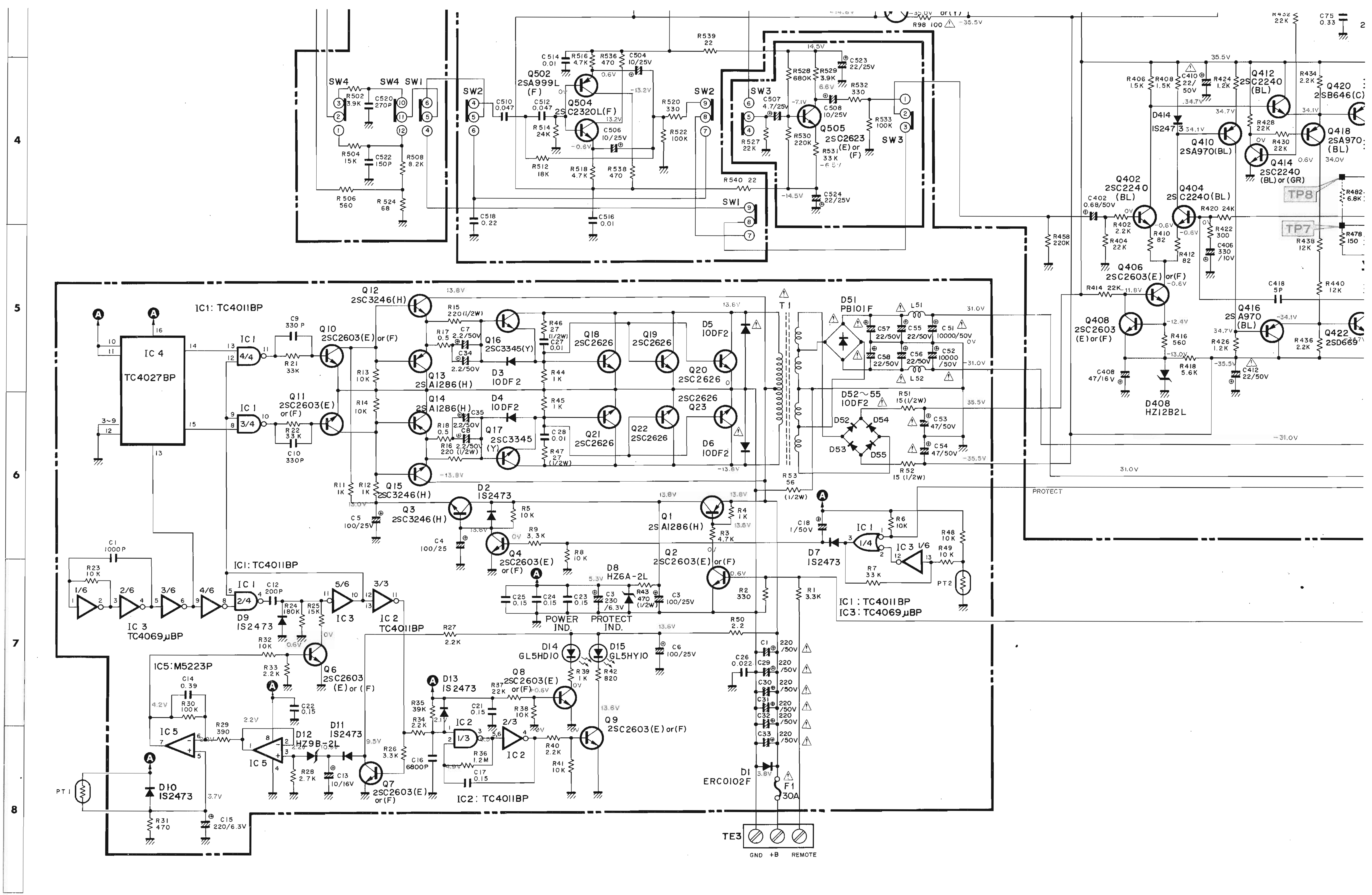
: Filter ON/OFF
: High Pass/Low Pass Filter
: Bridge-Mono
: Line Input Sensitivity

NFB SIGNAL

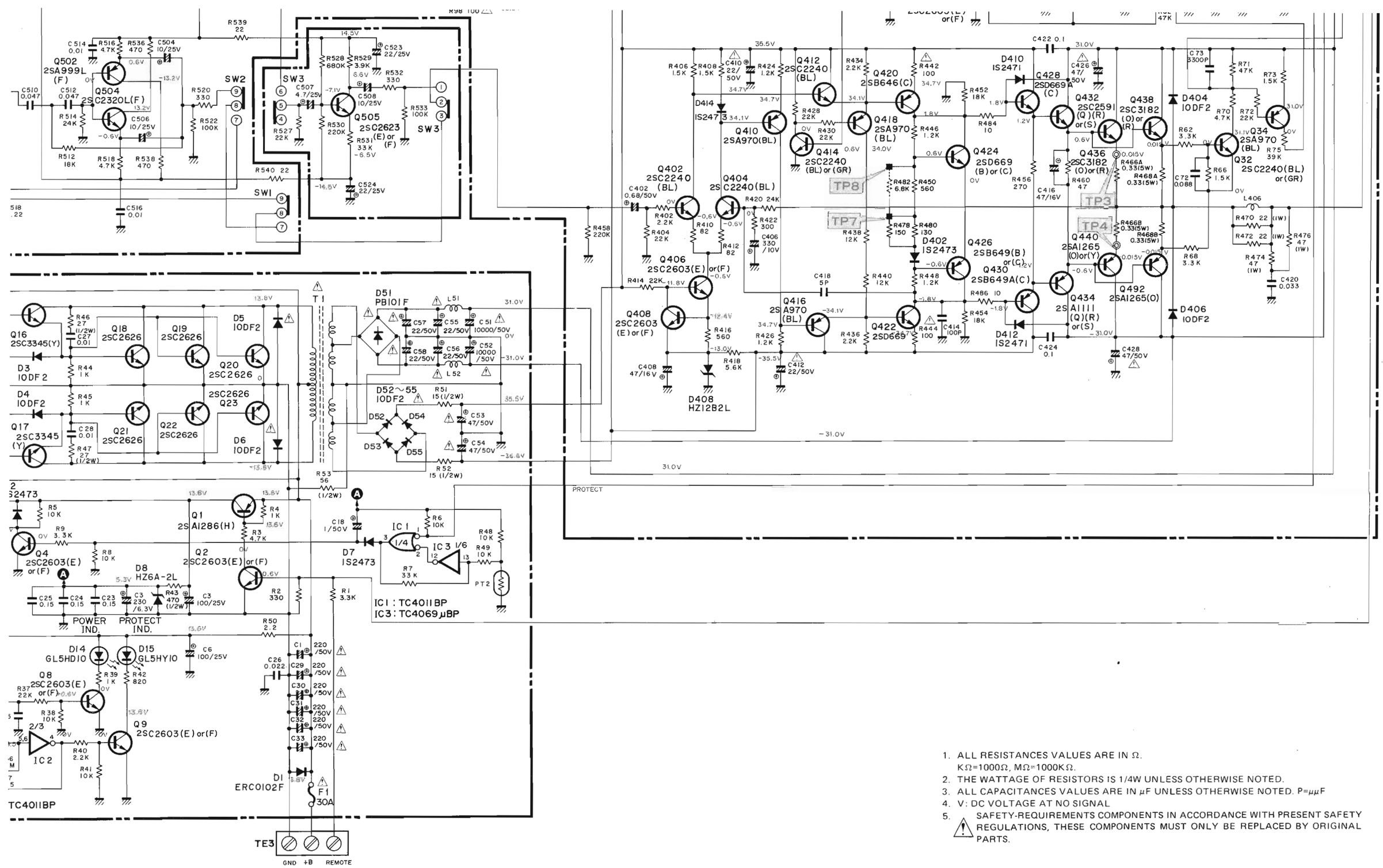
TE2
L
SPEAKER SYSTEM
R

SW1 SW2 SW3

TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8

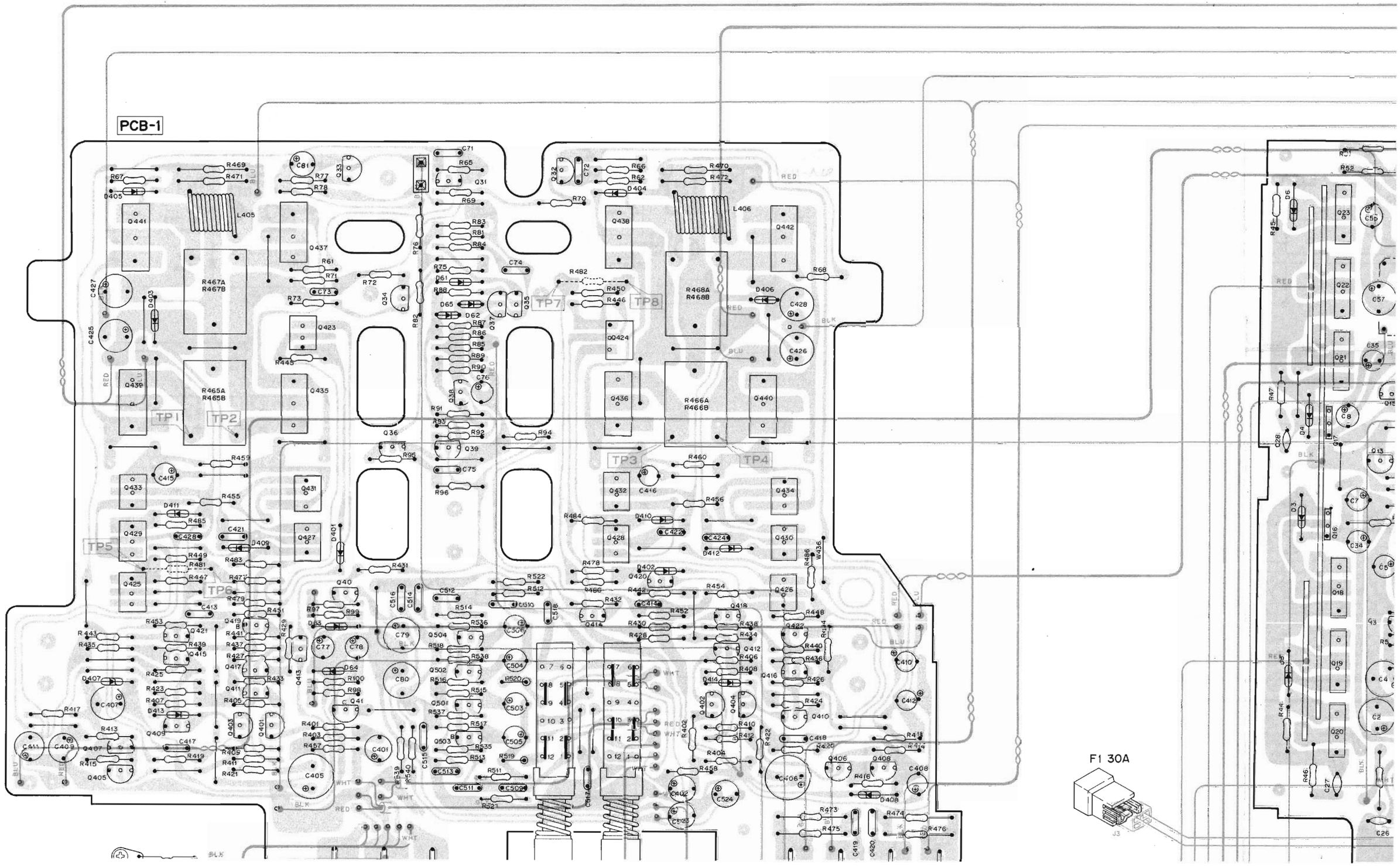


IC1: TC4011BP
IC 4
TC4027BP
IC 3
TC4069µBP
IC1: TC4011BP
IC 2
TC4011BP
IC5: M5223P
IC2: TC4011BP
IC1 : TC4011BP
IC3 : TC4069µBP
Q12
2SC3246(H)
Q10
2SC2603(E) or (F)
Q11
2SC2603(E) or (F)
Q13
2SA1286(H)
Q14
2SA1286(H)
Q15
2SC3246(H)
Q16
2SC3345(Y)
Q17
2SC3345 (Y)
Q18
2SC2626
Q19
2SC2626
Q20
2SC2626
Q21
2SC2626
Q22
2SC2626
2SC2626
Q23
D5
10DF2
D6
10DF2
D3
10DF 2
D4
10DF2
T1
D51
PB101F
D52~55
10DF2
D52
D53
D54
D55
Q3
2SC3246(H)
Q1
2SA1286(H)
Q2
2SC2603(E) or (F)
Q4
2SC2603(E) or (F)
D2
1S2473
D7
1S2473
D8
HZ6A-2L
POWER IND.
PROTECT IND.
D14
GL5HD10
D15
GL5HY10
Q6
2SC2603 (E) or (F)
Q7
2SC2603(E) or (F)
Q8
2SC2603(E) or (F)
Q9
2SC2603(E) or (F)
D9
1S2473
D10
1S2473
D11
1S2473
D12
HZ9B-2L
D13
1S2473
D1
ERC0102F
F1
30A
TE3
GND
+B
REMOTE
PT1
PT2
PROTECT
SW1
SW2
SW3
SW4
Q502
2SA999L (F)
Q504
2SC2320L(F)
Q505
2SC2623 (E) or (F)
Q402
2SC2240 (BL)
Q404
2SC2240(BL)
Q406
2SC2603(E) or(F)
Q408
2SC2603 (E) or (F)
Q410
2SA970(BL)
Q412
2SC2240 (BL)
Q414
2SC2240 (BL) or (GR)
Q416
2SA970 (BL)
Q418
2SA970 (BL)
Q420
2SB646(C)
Q422
2SD669
D408
HZ12B2L
D414
1S2473
TP7
TP8
4
5
6
7
8

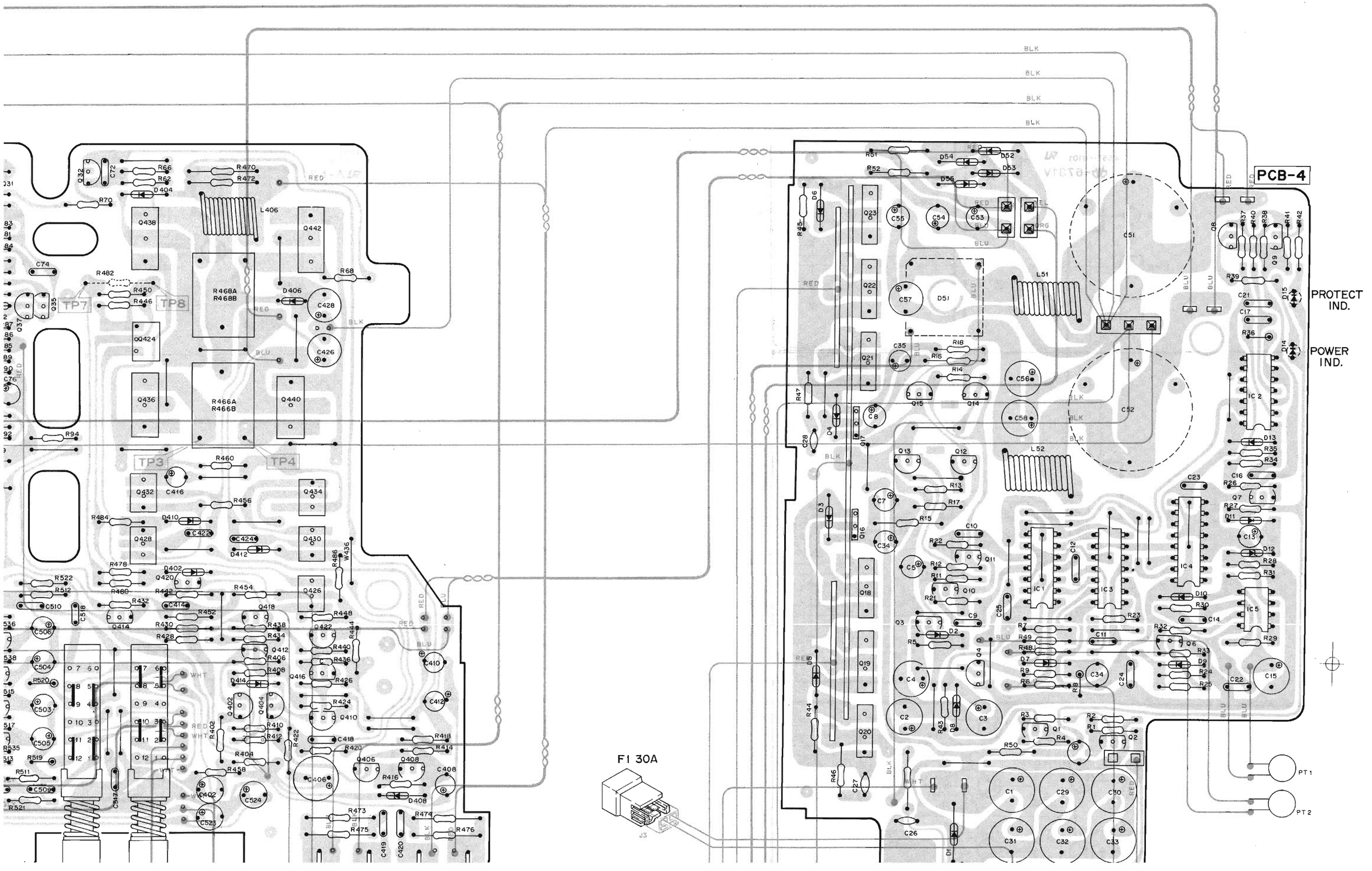


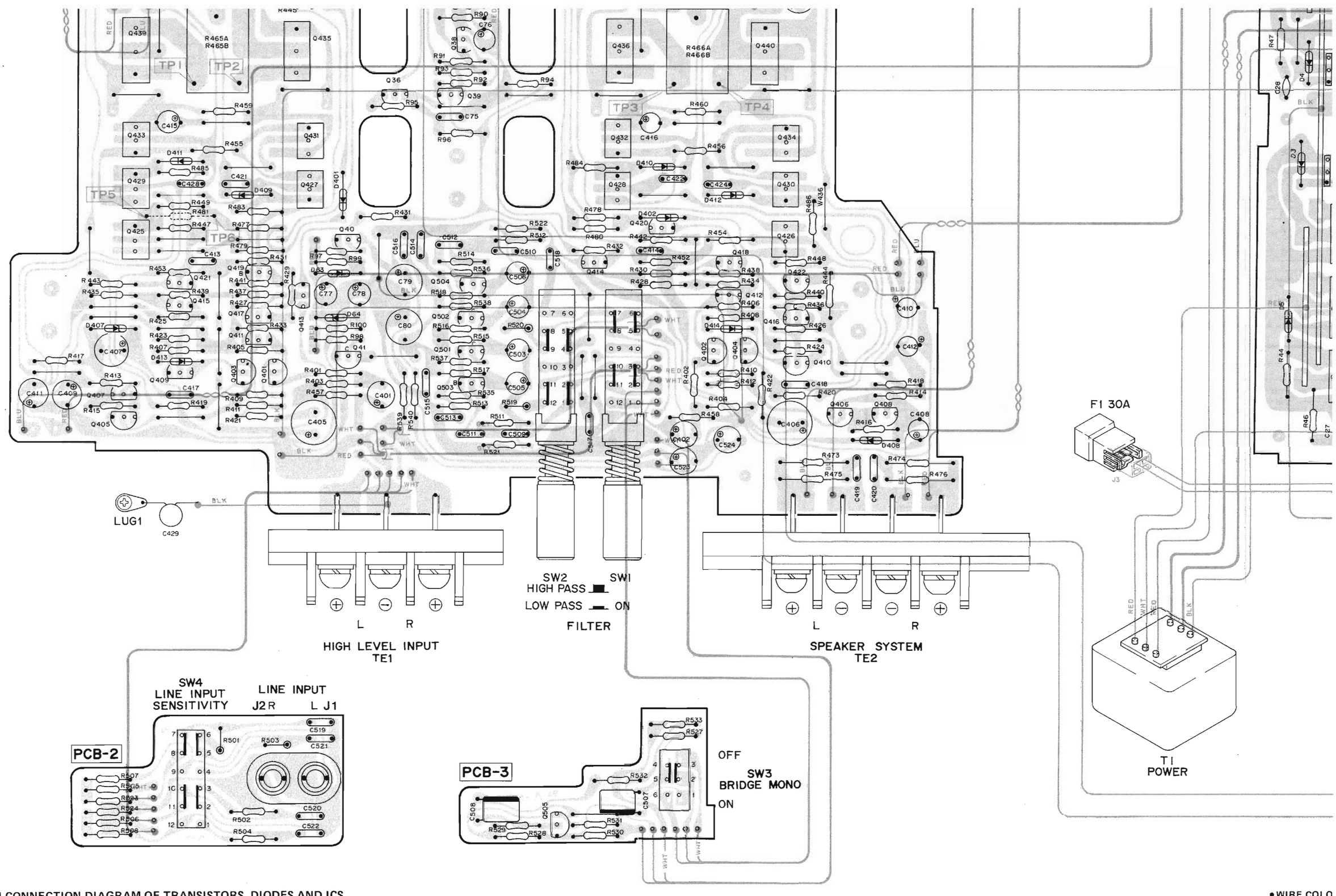
1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=μμF
4. V: DC VOLTAGE AT NO SIGNAL
5. ⚠ SAFETY-REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

WIRING DIAGRAM



D	E	F	G	H	I	J	K


PCB-4
PROTECT IND.
POWER IND.
F1 30A
J3
TP7
TP8
TP3
TP4
PT 1
PT 2
BLK
RED
BLU
WHT
ORG



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

2SC2240 2SA970 2SC1775 2SA999L 2SC2320L	2SC2603 2SA1115	2SC2877 2SA1217 2SD669 2SB649	2SB646 2SD666 2SA1286 2SC3246	2SC3345 2SC2591 2SA1111	2SC2626 2SC3182 2SA1265	1S2473 HZ15-2L 10DF2 HZ12B2L 1S2471 EROCO102F HZ6A-2L	HZ9B-2L	MV104V	GL5HD10 GL5HY10	PB101F	MN4011B MN4069UB	MN4027B	M5223P

• WIRE COLO

RED : Red
ORG : Oran
BLU : Blue
WHT : Whit
GRN : Gree
BLK : Blac
YEL : Yell
PUP : Purp
PIK : Pink

IND.

F1 30A

J3

SW2 HIGH PASS / LOW PASS — ON
FILTER

SW1

L R
SPEAKER SYSTEM
TE2

GND +B REMOTE
12V BATTERY POWER IN
TE3

T1
POWER

SW3
BRIDGE MONO
OFF
ON

B-3

2SC2626 2SC3182 2SA1265	1S2473 HZ15-2L 10DF2 HZ12B2L 1S2471 EROCO102F HZ6A-2L	HZ9B-2L	MV104V	GL5HD10 GL5HY10	PB101F	MN4011B MN4069UB	MN4027B	M5223P

- **WIRE COLOR ABBREVIATIONS**
  - RED : Red
  - ORG : Orange
  - BLU : Blue
  - WHT : White
  - GRN : Green
  - BLK : Black
  - YEL : Yellow
  - PUP : Purple
  - PIK : Pink

The Harman Kardon
Model CA260

Manual No. 74B

HIGH FIDELITY CAR AMPLIFIER

Technical Manual

ADDENDUM

harman/kardon
240 CROSSWAYS PARK WEST, WOODBURY, N.Y. 11797
1112-H1527488 P-088410 1650 PRINTED IN JAPAN

THIS CA260 TECHNICAL MANUAL ADDENDUM IS TO BE USED IN CONJUNCTION WITH CA260 TECHNICAL MANUAL NO.74A.

CONTENTS

CIRCUIT DESCRIPTION OF SWITCHING POWER SUPPLY

Principle Of Operation Of CA260 Power Supply (See Figure 1)

Oscillator circuit Ⓐ generates a 44kHz pulstrain. Divide circuit Ⓑ divides this 44kHz signal by a factor of 2. Therefore, divider Ⓑ produces a push-pull output signal of 22kHz with a precise 50% duty cycle. Under normal operating conditions the gate circuits Ⓒ and Ⓓ will pass this 50% duty cycle signal. The switching transistors Ⓔ are driven by the output signal of circuit Ⓓ .

Power transformer Ⓕ steps the switched DC power supply voltage of 13.5V up to plus and minus 30V.

Temperature Control Mode #1, And Over Voltage Protection Mode

When the temperature of the output transistors exceeds 80 degrees C (60 degrees C at temperature sensor Ⓗ) or the power supply voltage from the car battery exceeds 15V, the width of the pulses generated by the pulse width control circuit Ⓙ , Ⓘ and Ⓖ become narrower and the gate circuit Ⓒ will reduce the "ON" time of the switching transistors Ⓔ . See also figure 2 and 3.

As a result the output energy of the switching power transformer will be reduced and the plus and minus 30 volt power supply rail voltages will be reduced.

Due to this lower voltage the power dissipation in the output transistors will be reduced and the temperature of the output transistors will start to drop. When the temperature of the output transistors drops below 80 degrees or the voltage of the car battery drops below 15V the CA260 will again be capable of delivering full output power.

Temperature Control Mode #2 And Low Output Impedance Protection

When the temperature of the switching transistors Ⓔ exceeds 100°C, detector circuit Ⓛ and power supply gate circuit Ⓜ will be activated and driver circuit Ⓓ will be switched off.

The switching power supply circuit will now stop oscillating and no current will flow through the switching transistors.

When the impedance connected to the loudspeaker terminals drops below 1.3 ohms, protect and temperature detector circuit Ⓛ and power supply gate circuit Ⓜ will be activated and driver circuit Ⓓ will be switched off.

When the temperature of the switching transistors Ⓔ drops below 100°C or, the impedance connected to the loudspeaker terminals goes above 1.3 ohms, the switching power supply will be reactivated.

Protect Indicator Circuit

The protect indicator is driven by the protection indicator circuit Ⓝ .

Under normal conditions the indicator is OFF.

In temperature control mode #1 and the overvoltage protection mode, the indicator is flashing at a rate of about 3 flashes/second. In temperature control mode #2 and low output impedance protection mode the indicator and power indicator will be OFF.

POWER SUPPLY BLOCK DIAGRAM

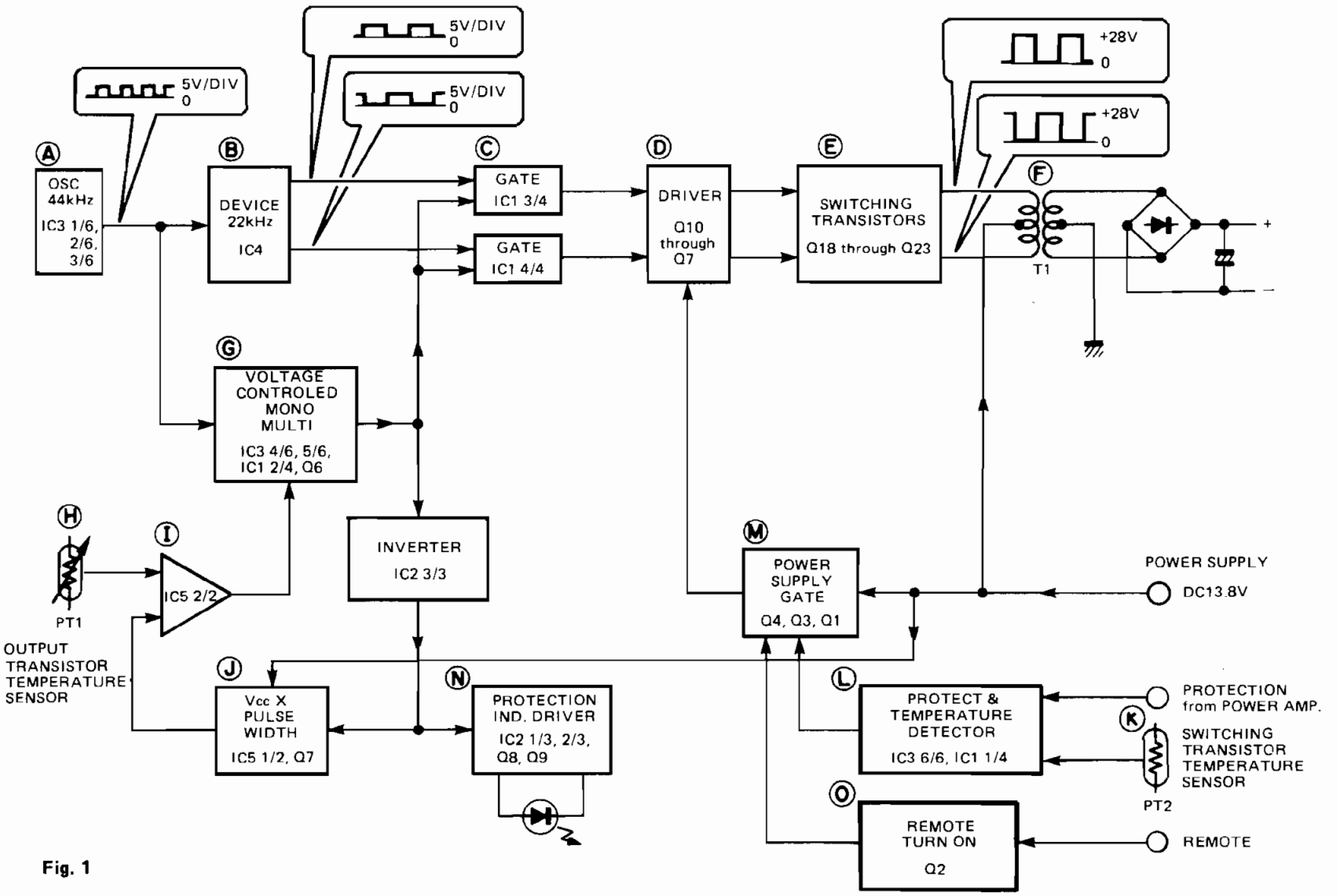
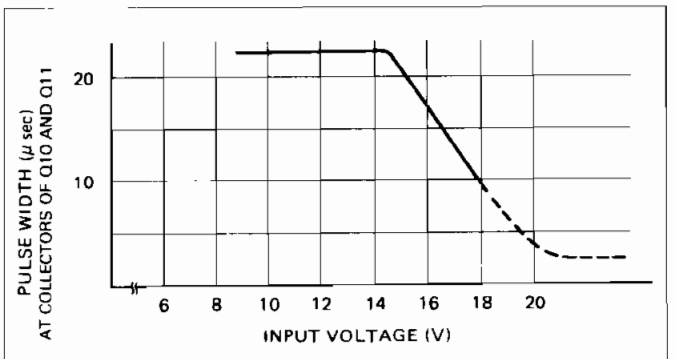
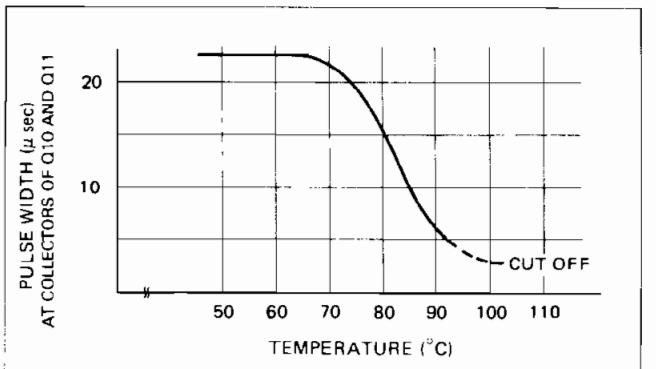


Fig. 1



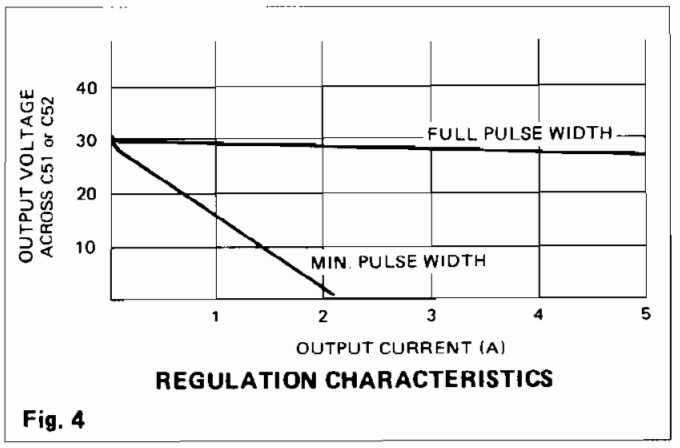
PULSE WIDTH VS INPUT VOLTAGE

Fig. 2



PULSE WIDTH VS TEMPERATURE AT SENSOR

Fig. 3



REGULATION CHARACTERISTICS

Fig. 4

ALIGNMENT PROCEDURES

■Idling current adjustment

Conditions:

- Connect the DC voltmeter between TP1 and TP2 and between TP3 and TP4.
- Connect a 13.8V power supply to the 12V Battery Power In terminal.
- After the power on, wait for 5 minutes before measuring to be sure of the most stable operation.

Inspection:

- Confirm that the idling current is 50mA ± 20mA (voltage: 33mV ± 13mV).
  If the current measured does not fall within the range specified, adjust it with the procedure below.

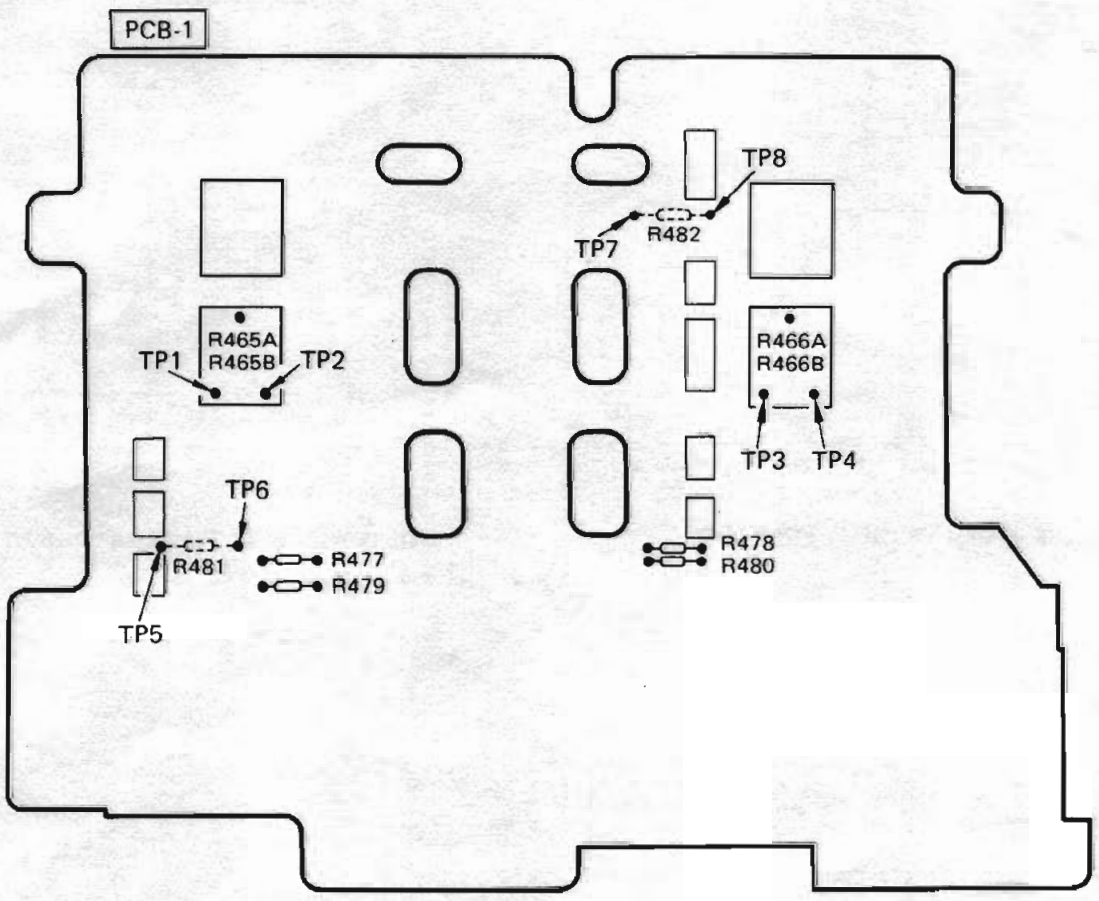
Adjustment

Note: When replacing or disconnecting a resistor, disconnect the power supply first.

Current	Voltage	Procedure
less than 29mA	less than 19mV	Add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
71mA ~ 100mA	46mV ~ 66mV	After cutting out R477 and R478, add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
101mA ~ 200mA	67mV ~ 132mV	After cutting out R479 and R480, add R481 and R482 between TP5 and TP6 and between TP7 and TP8.
201mA ~ 250mA	133mV ~ 165mV	Cut out R477 and R478.
more than 251mA	more than 166mV	Cut out R479 and R480.

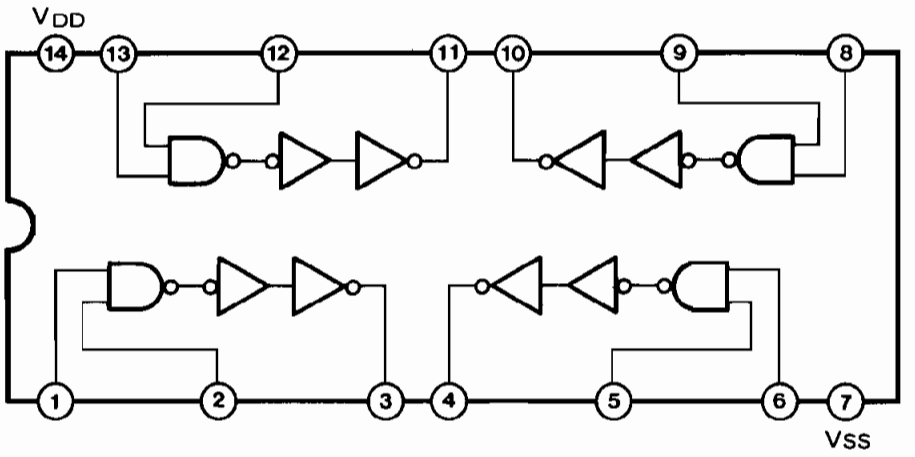
After the adjustment is complete, let the unit settle down for 10 minutes, than double-check that the idling current is set properly.

ALIGNMENT POINT LOCATION

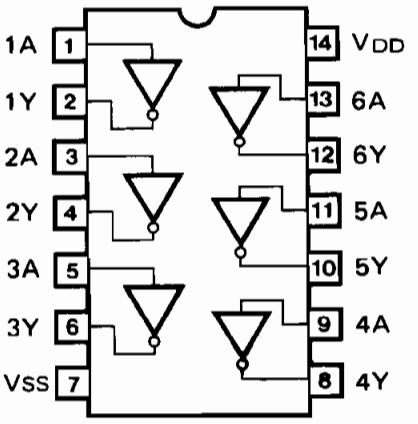


INTEGRATED CIRCUIT FUNCTIONAL DIAGRAMS

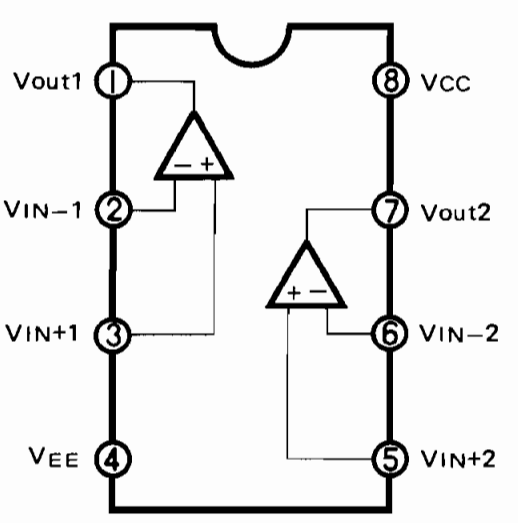
IC1, 2: MN4011B



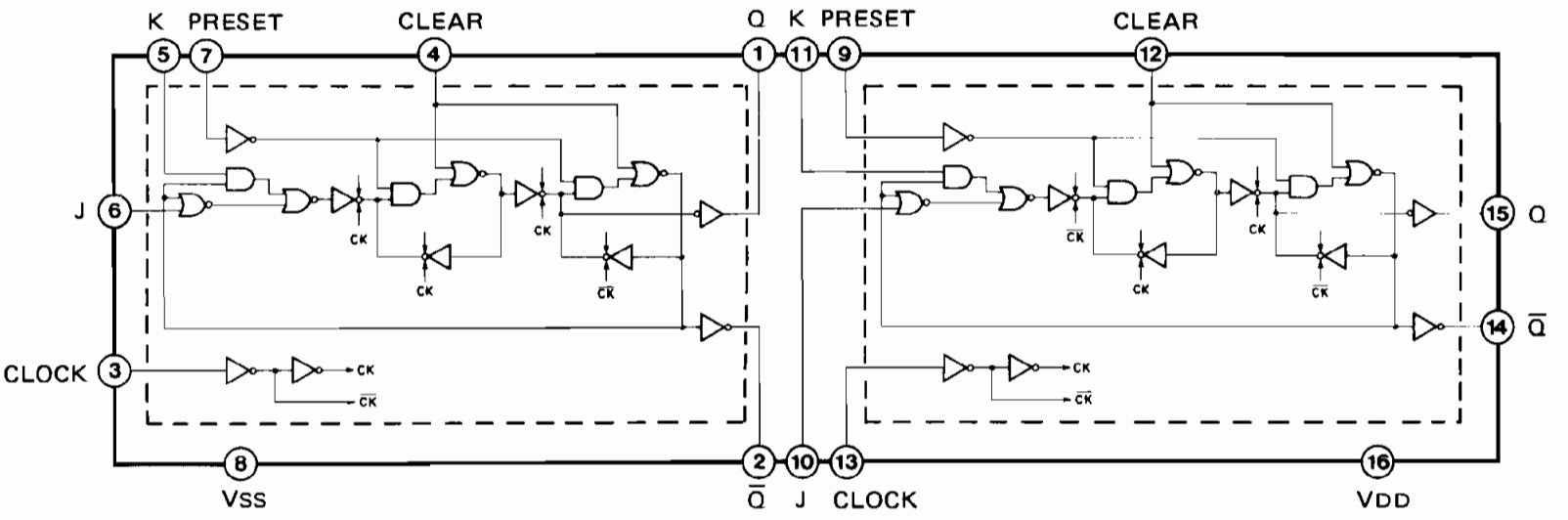
IC3: MN4069UB



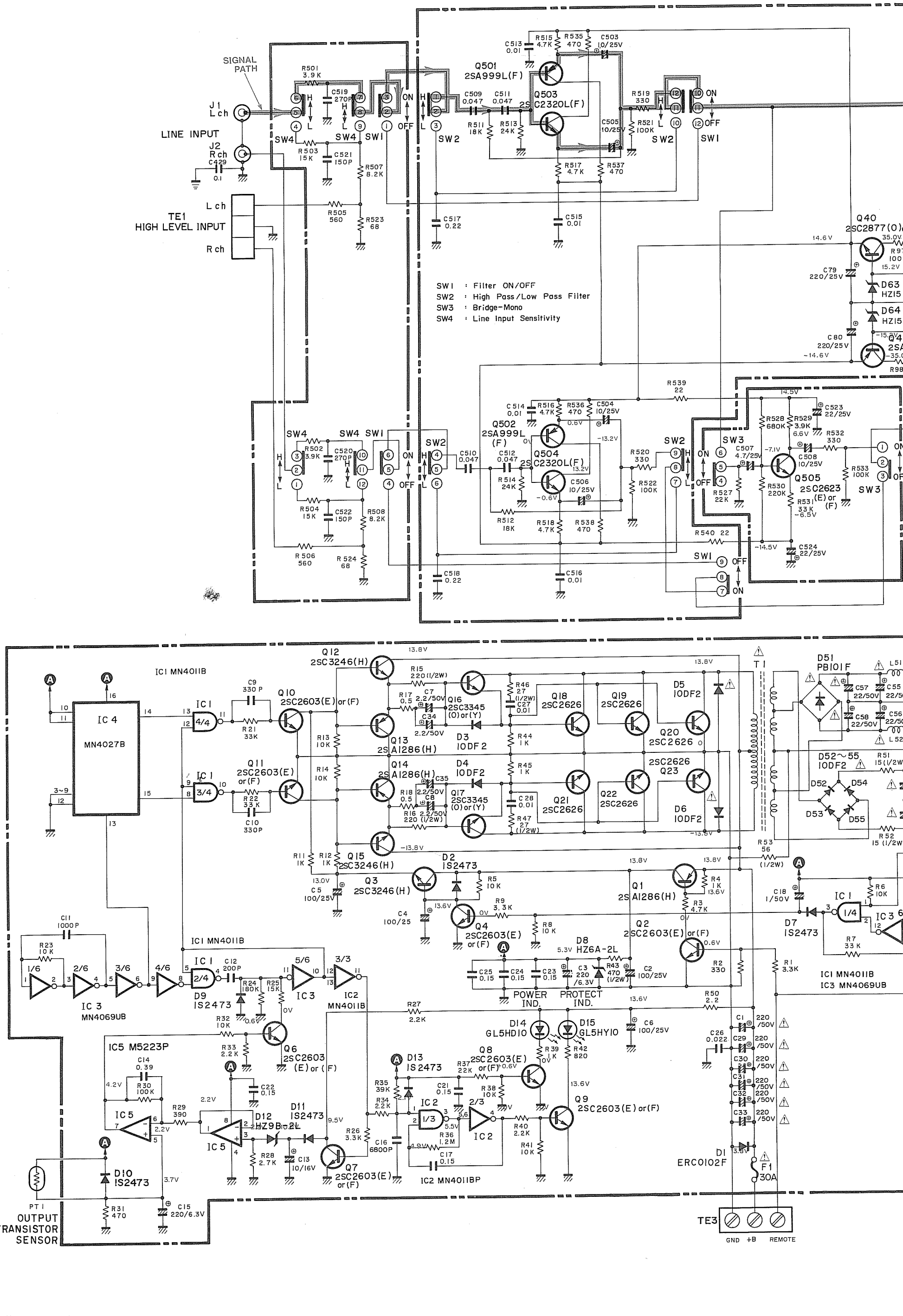
IC5: M5223P

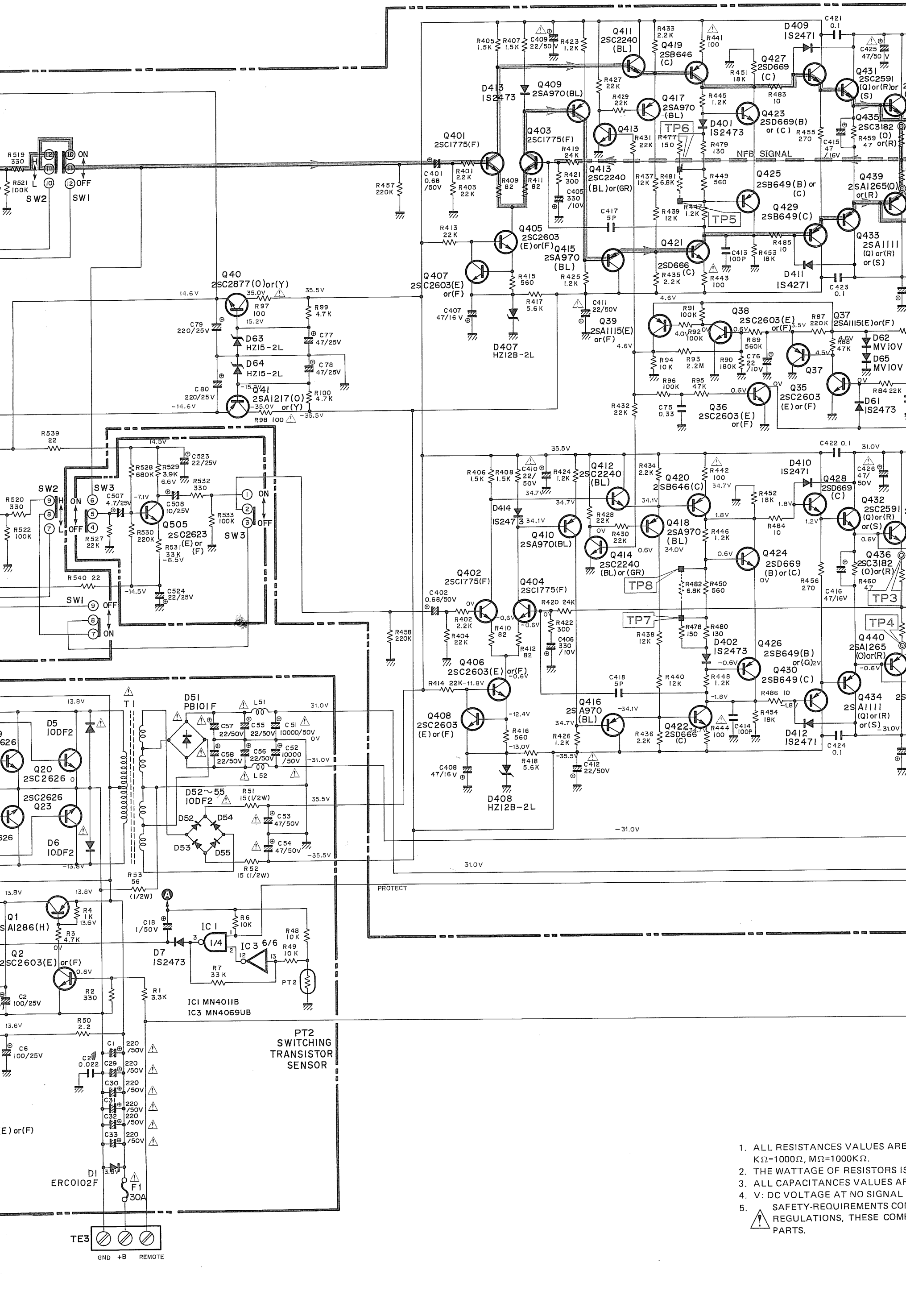


IC4: MN4027B

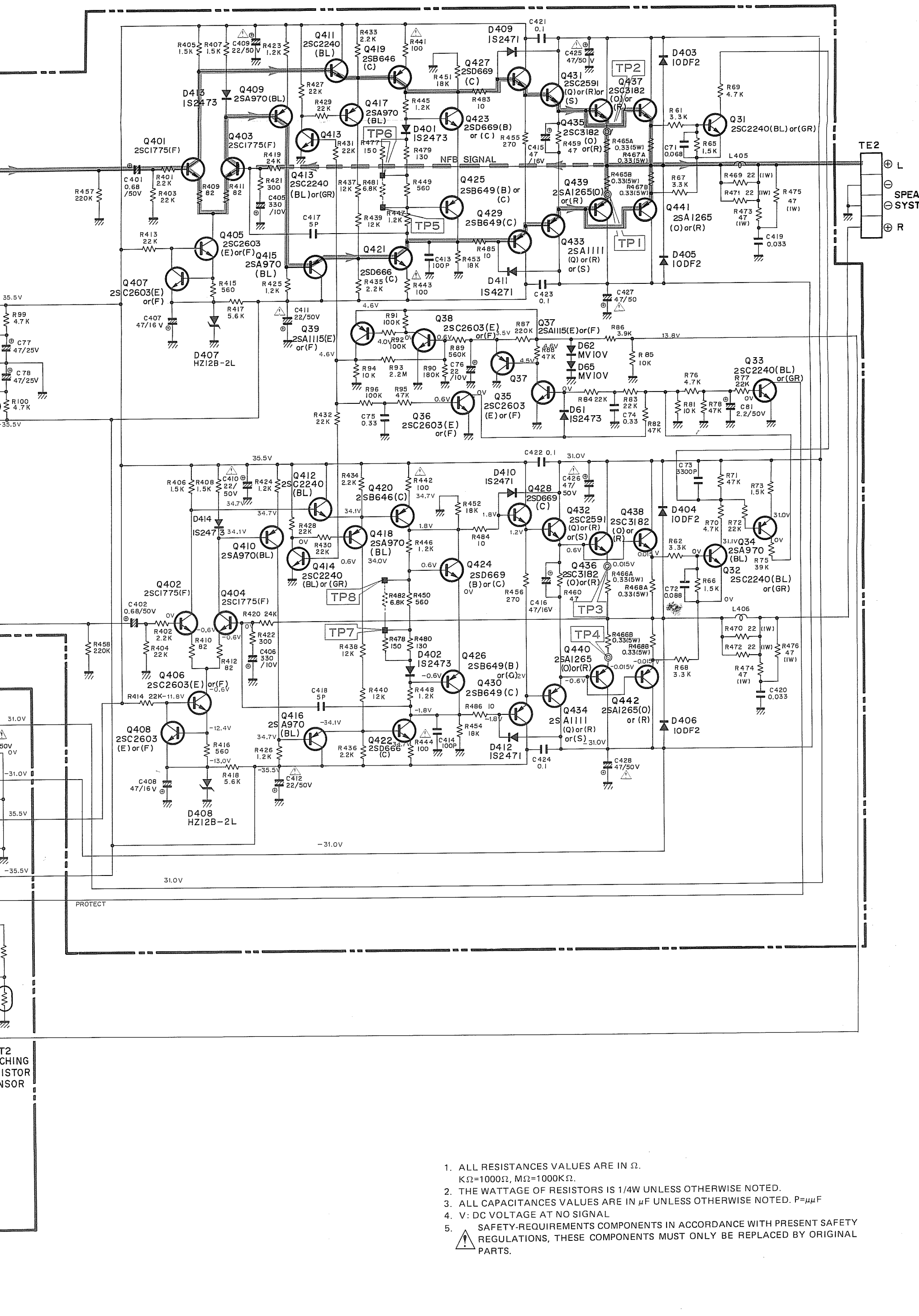


SCHEMATIC DIAGRAM





1. ALL RESISTANCES VALUES ARE
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS
3. ALL CAPACITANCES VALUES AR
4. V: DC VOLTAGE AT NO SIGNAL
5. ⚠ SAFETY-REQUIREMENTS CO
   REGULATIONS, THESE COM
   PARTS.



1. ALL RESISTANCES VALUES ARE IN Ω.
   KΩ=1000Ω, MΩ=1000KΩ.
2. THE WATTAGE OF RESISTORS IS 1/4W UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. P=μμF
4. V: DC VOLTAGE AT NO SIGNAL
5. ⚠ SAFETY-REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

The Harman Kardon Model CA260

Manual 74C

HIGH FIDELITY CAR AMPLIFIER

SUPPLEMENTARY MANUAL

MODIFICATIONS WERE MADE AT SERIAL NUMBER 9008201 TO IMPROVE PERFORMANCE. EXCEPT FOR THE CHANGES AS NOTED IN THIS SUPPLEMENT, REFER TO MANUAL 74A AND 74B FOR ALL OTHER PARTS AND SERVICE INFORMATION.

SPECIFICATIONS

Power Output, RMS : 60 watts per channel into 4 Ohms, 20 ~ 20,000Hz
: 90 watts per channel into 2 Ohms, 20 ~ 20,000Hz
: 180 watts bridged mono into 4 Ohms, 20 ~ 20,000Hz

HCC (High Instantaneous Current Capability) : ±30A

THD (4 Ohms/2 Ohms) : No more than 0.1%/0.2%

Negative Feedback : 25dB

Power Bandwidth : 10Hz to 100,000Hz

Frequency Response : 10Hz to 100,000Hz +0, −3dB

Signal-to-Noise Ratio : 80dB

Input Sensitivity

Line Level : 0.1V/0.5V (switchable)

High Level : 1V

Active Crossover Characteristics

High Pass : 200Hz, 12dB/Octave

Low Pass : 200Hz, 6dB/Octave

Power Supply : DC +13.8V (11 ~ 16V usable), negative ground

Typical Input Current Requirements

At Idle : 2.5A

Full Power Music Signal : 6.7A (4 Ohms/ch.)
: 10A (2 Ohms/ch.)

Full Power Sine Wave : 20A (4 Ohms/ch.)
: 30A (2 Ohms/ch.)

Dimensions (W x H x D) : 15-5/8'' x 3-7/8'' x 7-1/8'' (396 x 98 x 180 mm)

Weight : 10lbs. 2oz. (4.6kg)

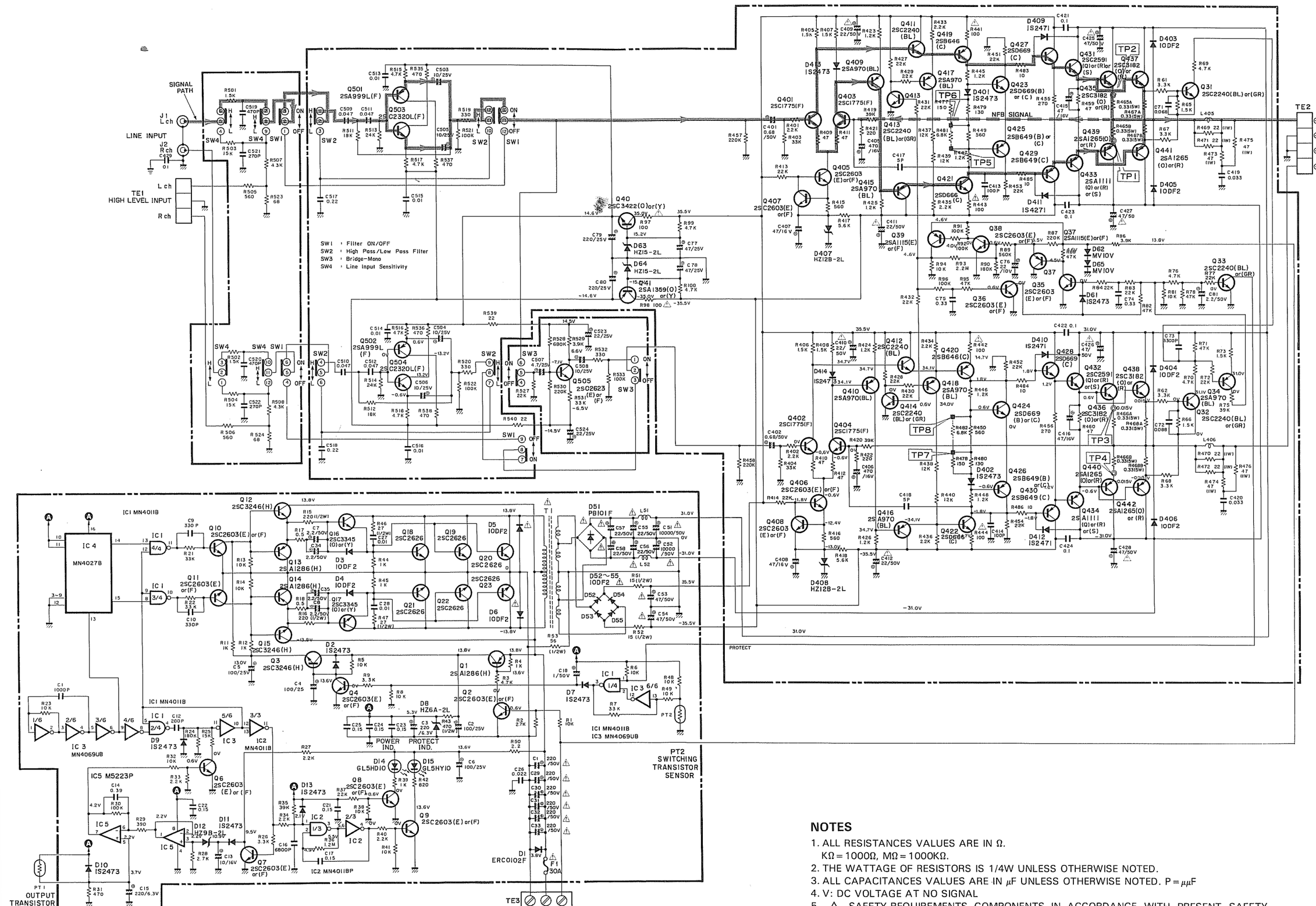
Specifications and components subject to change without notice.
Overall performance will be maintained or improved.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	PCB-1 MAIN P. C. BOARD	
	RESISTORS	
R419, 420	5174-393381	39kΩ, ±1%, 1/4W, Metal
R421, 422	5174-221381	220Ω, ±1%, 1/4W, Metal
	CAPACITORS	
C405, 406	5345-477C0952	470μF, ±20%, 16V, Electrolytic
	TRANSISTORS	
Q40	5613-3422(O)	2SC3422(O) or 2SC3422(Y)
Q41	5611-1359(O)	2SA1359(O) or 2SA1359(Y)
	PCB-2 LINE INPUT P. C. BOARD	
	CAPACITORS	
C519, 520	5359-4715851	470pF, ±5%, 100V, Polypropylene
C521, 522	5359-2715851	270pF, ±5%, 100V, Polypropylene

harman/kardon
240 Crossways Park West, Woodbury, N.Y. 11797
1112-H15274C P-088511 1650 Printed in Japan

SCHEMATIC DIAGRAM



NOTES

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