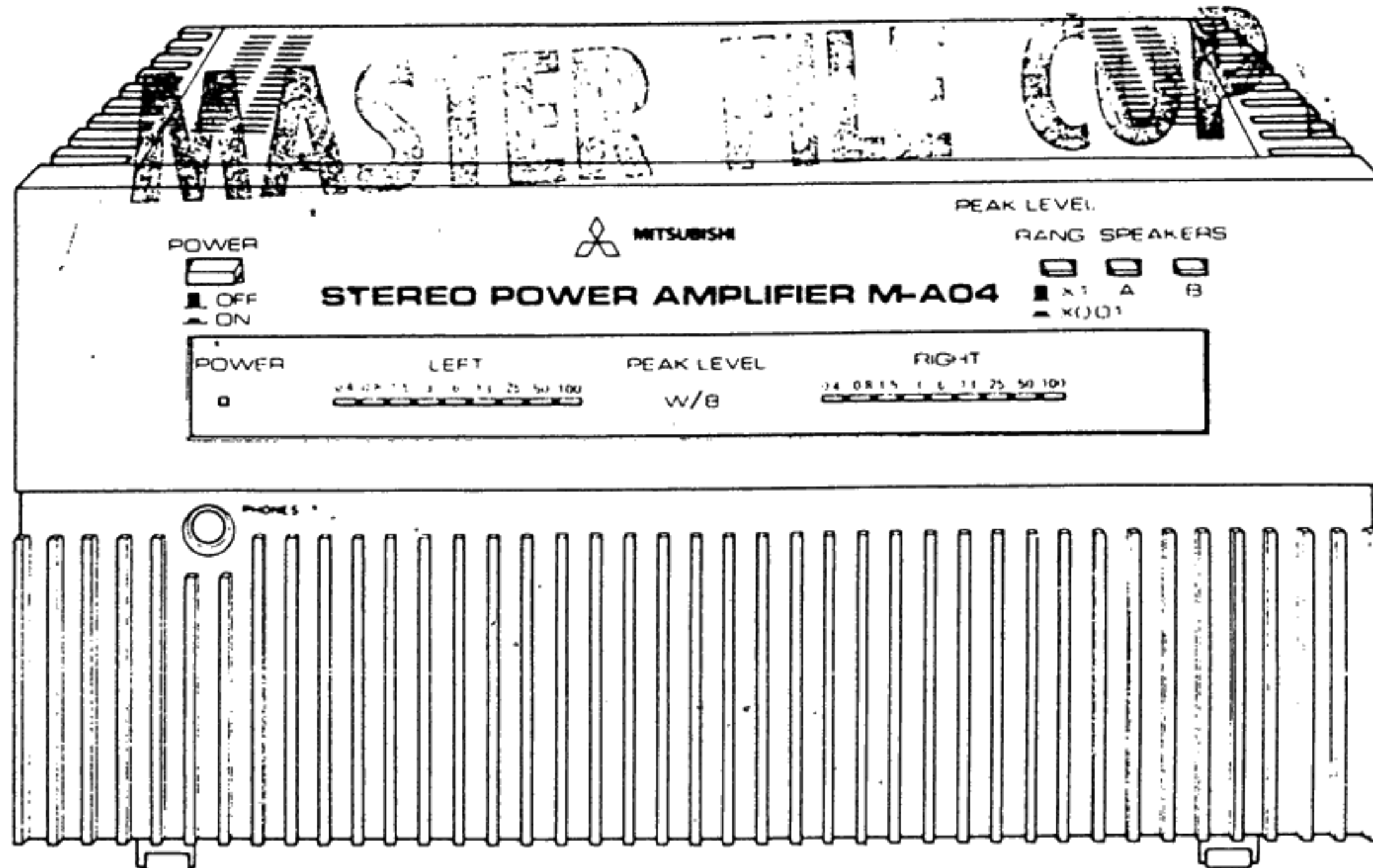




SERVICE MANUAL

STEREO POWER AMPLIFIER

MODEL M-A04



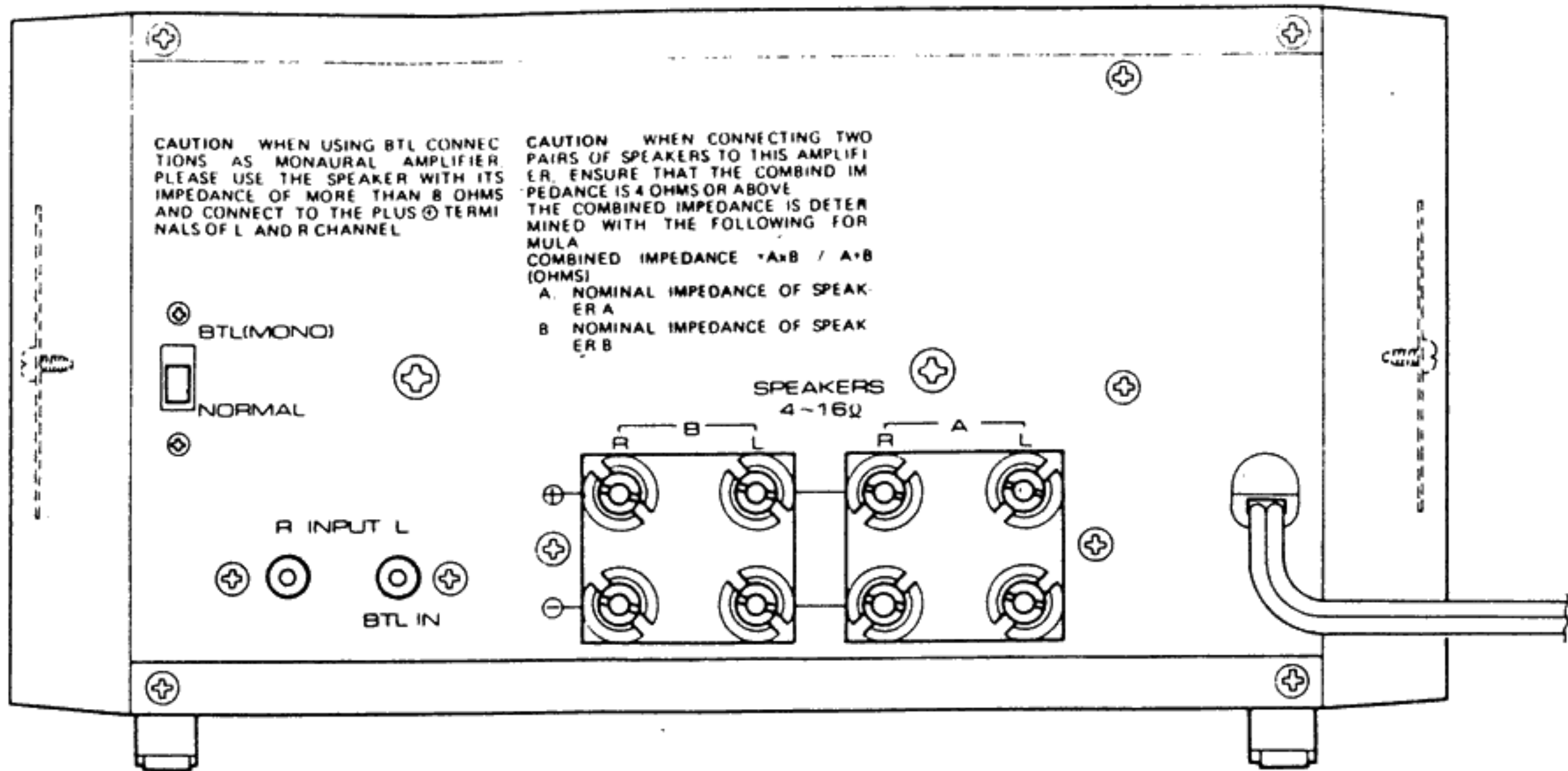
SPECIFICATIONS

Min. RMS power output
 50 watts per channel, min. RMS, at 8 ohms
 from 20 Hz to 20 KHz with no more than
 0.02% total harmonic distortion
 60 watts per channel, min. RMS, at 4 ohms
 from 20 Hz to 20 KHz with 0.02% total
 harmonic distortion
 100 watts with BTL connection at 8 ohms
 from 20 Hz to 20 KHz with 0.05% total
 harmonic distortion
Dynamic headroom
 1.0 dB
Power bandwidth (IHF, 0.1% THD)
 10 Hz ~ 100 KHz
Damping factor (20 Hz ~ 20 KHz)
 55
Slew rate
 120V/ μ sec
Total harmonic distortion
 0.008% at half output (25W)
 0.01% at 1W output
 0.03% at 50W with BTL connection

Intermodulation distortion
 0.003% at rated output (50W)
 0.006% at 1W output
Input sensitivity/impedance
 1V/50K ohms (stereo, BTL connection)
Frequency response
 -1 dB, DC ~ 250 KHz at 0.5W output
Signal to noise ratio
 118 dB (A-weighted, closed circuit)
 117 dB (new IHF, A-weighted)
Power consumption
 150W
Dimensions (W x H x D)
 270 x 140 x 243mm
 (10-5/8 x 5-1/2 x 9-5/8")
Weight
 7.2 Kg (16 lbs)

Design and specifications are subject to change
 without notice for improvement.

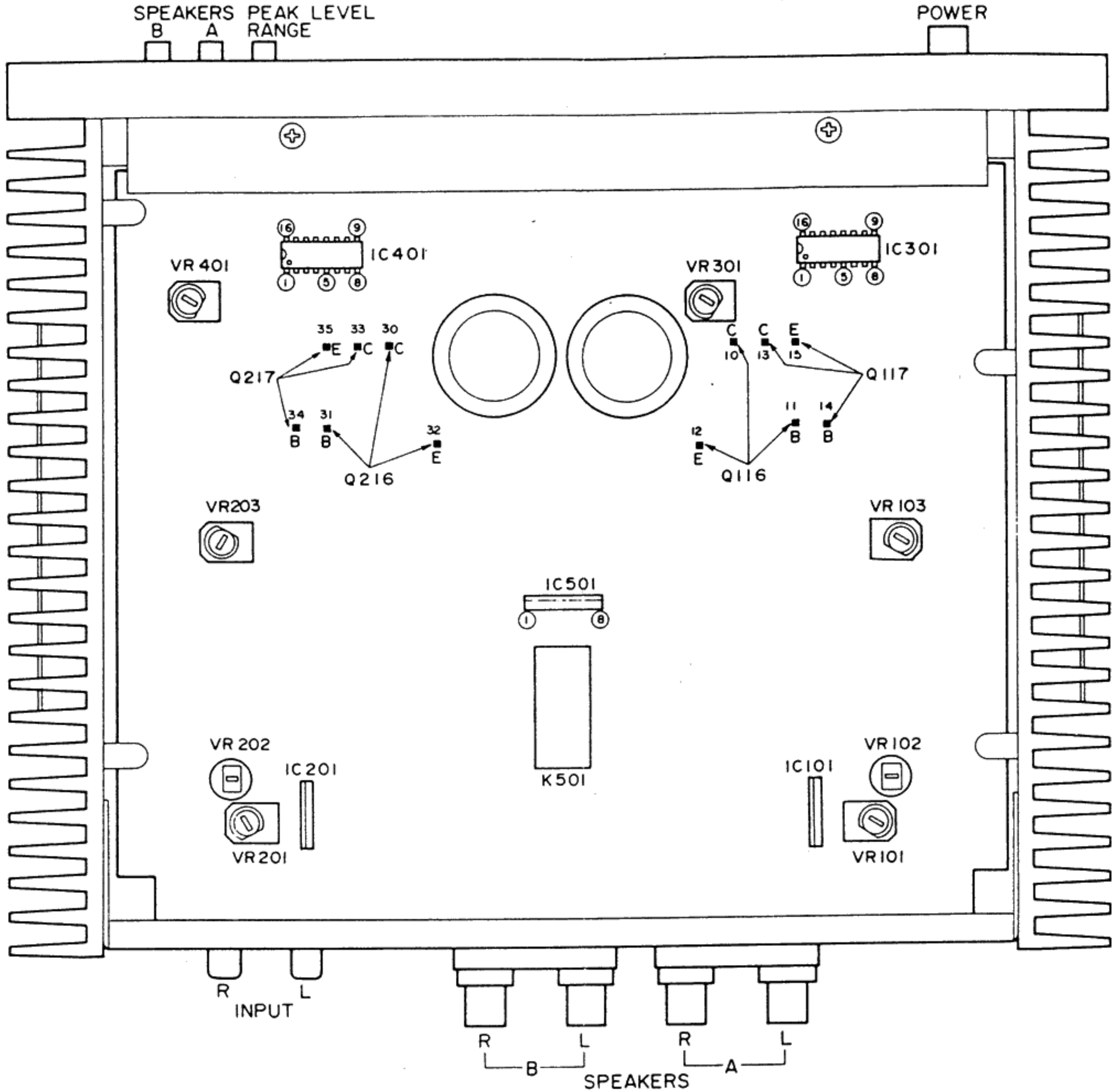
BACK PANEL



DISASSEMBLY INSTRUCTIONS

- 1. Remove upper and lower covers**
 - (1) Loosen two screws (black M3 x 6) fastening the upper cover and pull the cover backwards.
 - (2) Loosen two screws (black M3 x 6) fastening the lower cover from the rear side and three screws (black T1-3 x 20) fastening the cover from the lower side.
- 2. Remove the upper side of the front panel assembly.**
 - (1) Remove the upper cover according to 1, (1).
 - (2) Loosen two screws (black M3 x 10) each fastening the panel from the upper side right and left sides, respectively.
 - (3) Pull the entire panel forward from the rear of the upper side and both sides of the panel.
 - (4) To replace the panel, insert the tip of the left side knob about 2mm into the left side panel, and push the right side panel outward and at the same time, push the front panel in position.
- 3. Remove the front panel**
 - (1) Remove the upper side according to the step 2 above.
 - (2) Loosen four screws (flat head 3 x 6) fastening the panel from upper and lower sides.
- 4. Remove the lower side of the front panel.**
 - (1) Remove the lower cover according to the step 1, (2) above.
 - (2) Loosen the screw (T1-3 x 20) located at each of the upper side of right and left sides of the lower side of the panel.
- 5. Remove the left side panel or right side panel.**
 - (1) Remove the upper and lower cover according to step 1.
 - (2) Place the panel assembly with the side panel to be removed up.
 - (3) Loosen two screws (black T2-3 x 8), fastening the side panel from the rear of the base plate.
 - (4) Loosen three screws fastening the side panel from the front panel side.
 - (5) Remove two screws (black T2-3 x 8) fastening the decoration plate at the center of the side panel.
 - (6) Remove the decoration plate, and loosen one screw (black M4 x 8).

ADJUSTMENTS



1. Adjustment of the idling current with no load and no signal applied

- 1-1 Connect a DC voltmeter between the emitters of Q116 (12) and Q117 (15) or the emitters of Q216 (32) and Q217 (35).
- 1-2 Turn VR103 and VR203 fully in the direction opposite of the arrow mark. (Minimum voltage)
- 1-3 Adjust the voltage so that the voltmeter indicates $15\text{mV} \pm 5\text{mV}$.

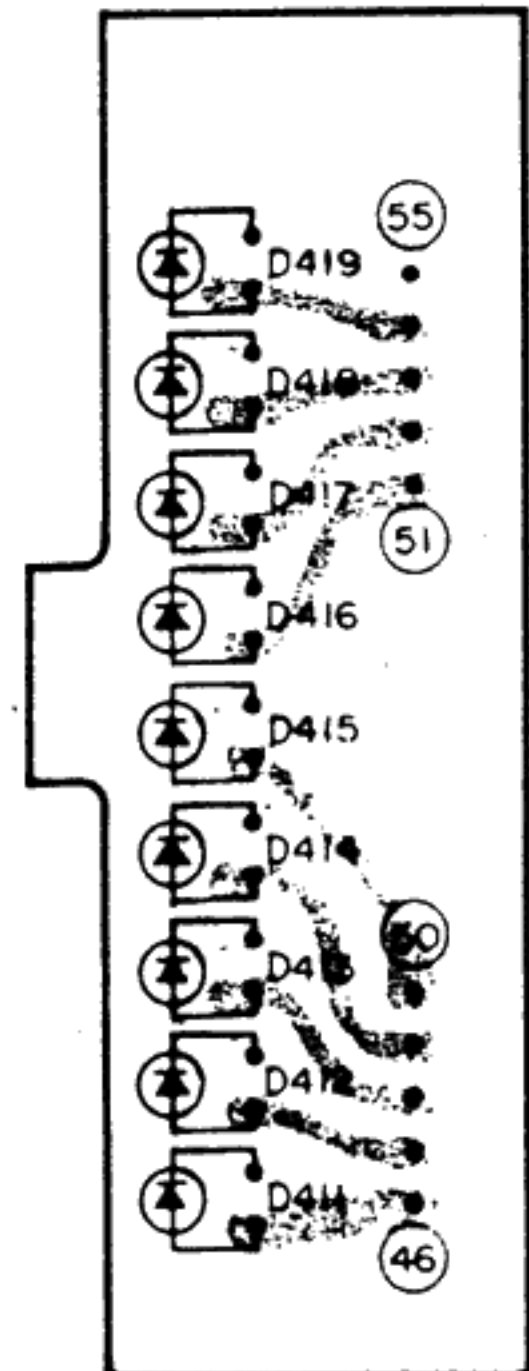
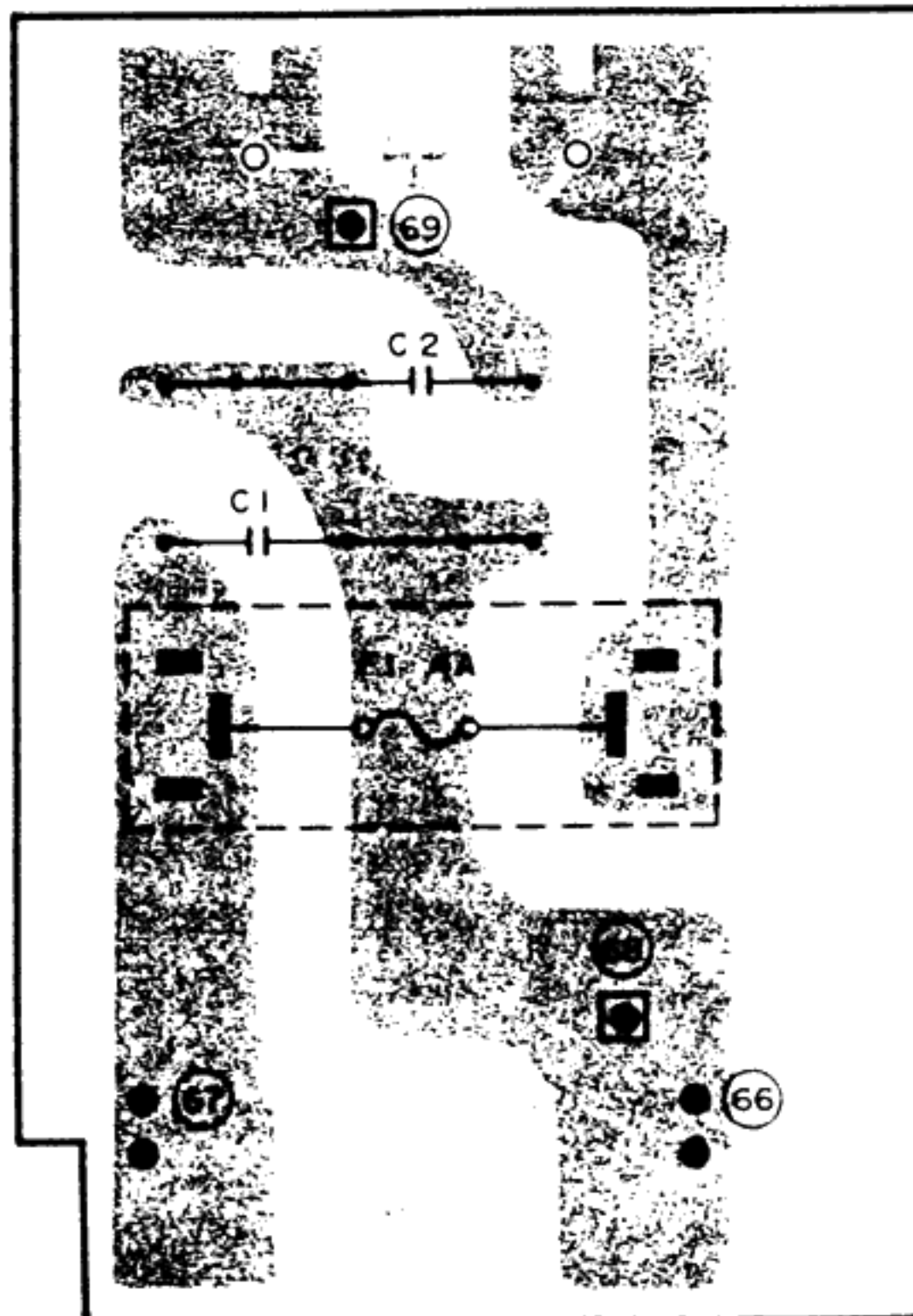
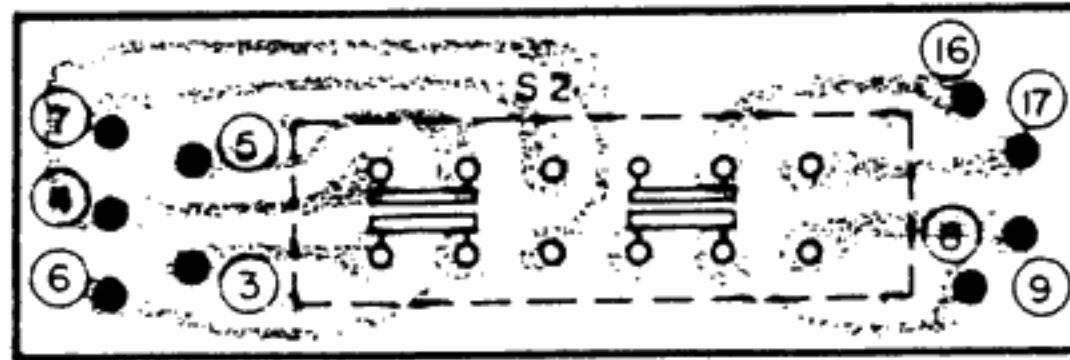
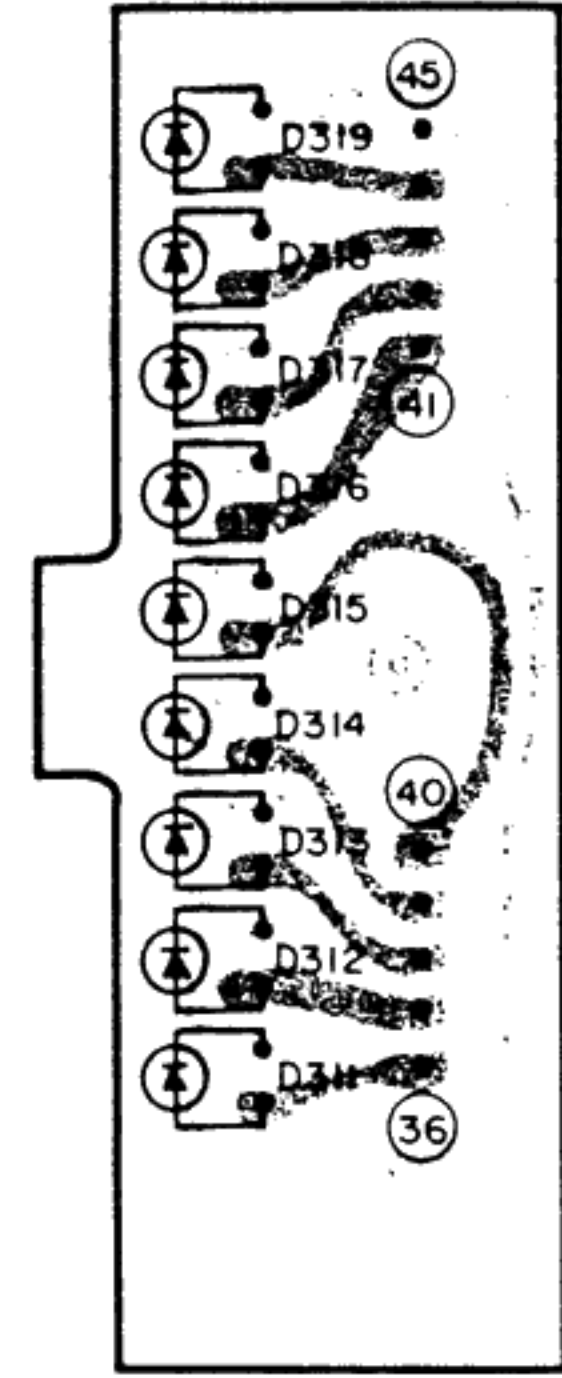
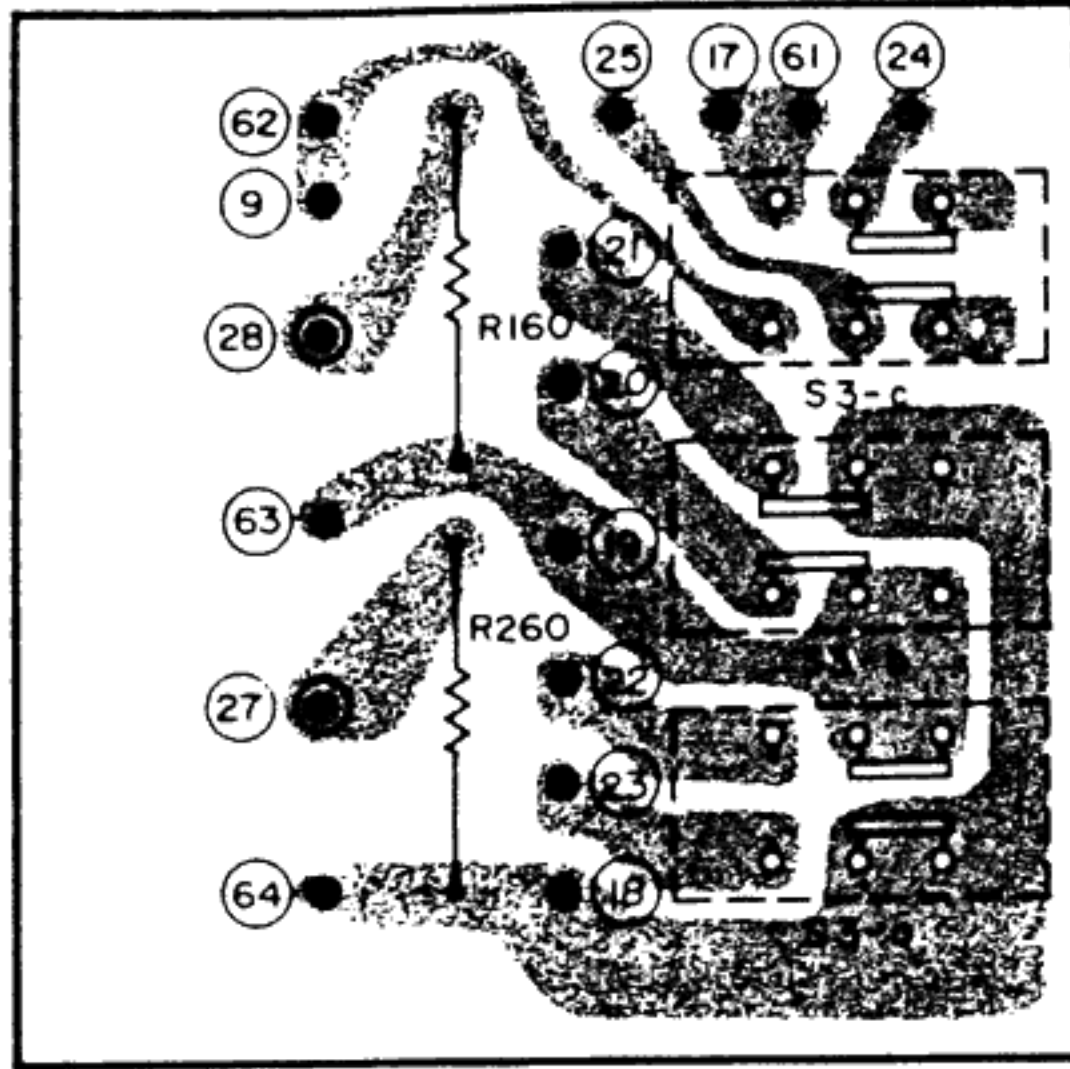
2. Adjustment of the midpoint potential

- 2-1 Connect a DC voltmeter between the speaker output terminal and ground.
 - 2-2 Turn VR101 and VR201 to their center positions.
 - 2-3 Adjust VR102, VR101*, VR202 and VR201* in this order so that the voltmeter indicates $0 \pm 5\text{mV}$.
- *VR101 and VR201 are for fine adjustment.

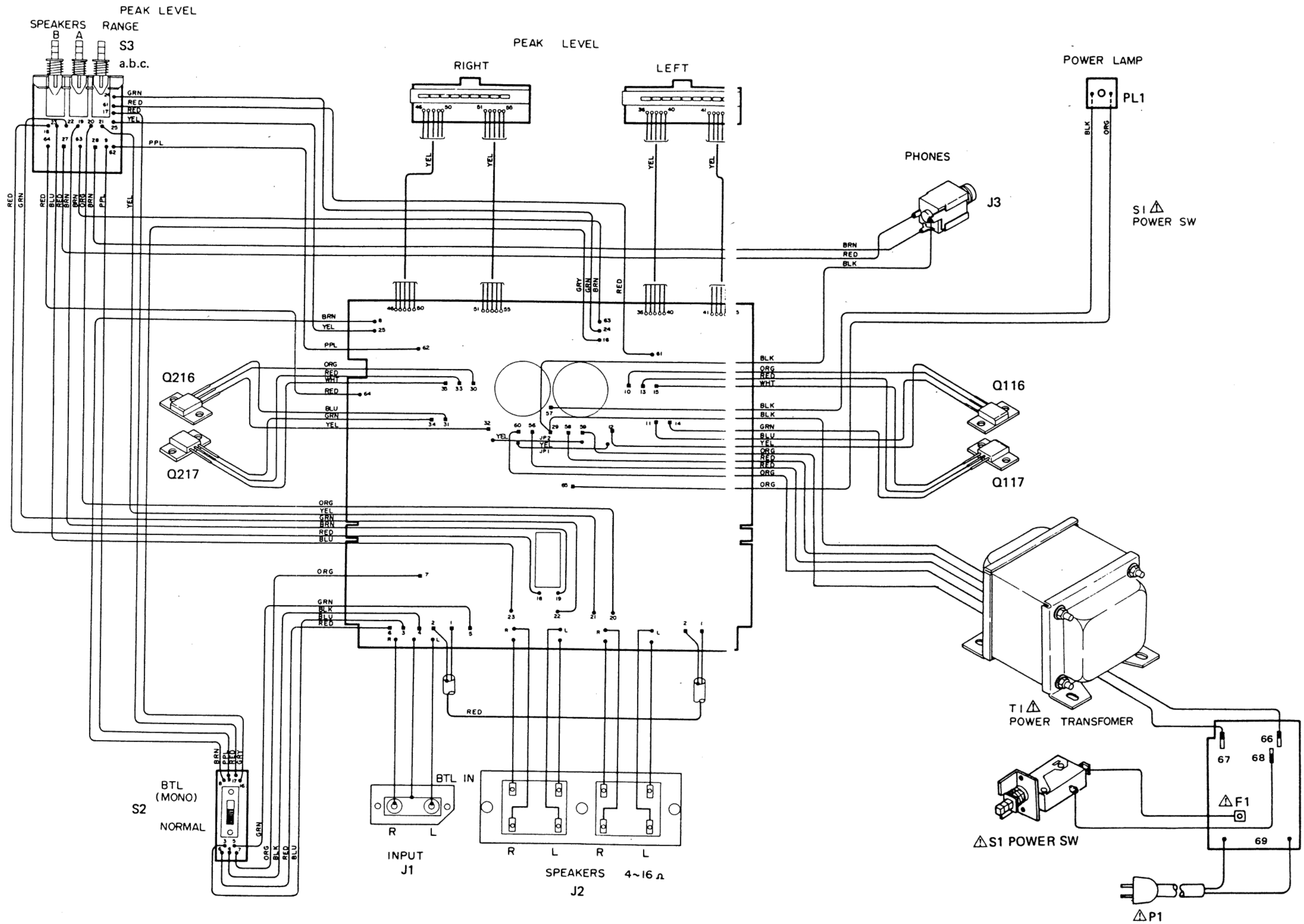
3. Adjustment of the peak indicator offset voltage (with no signal applied)

- 3-1 After adjusting the midpoint potential, connect a DC voltmeter between pin No. 5 of IC301 or IC401 and ground.
- 3-2 Adjust VR301 or VR401 for minimum voltage.

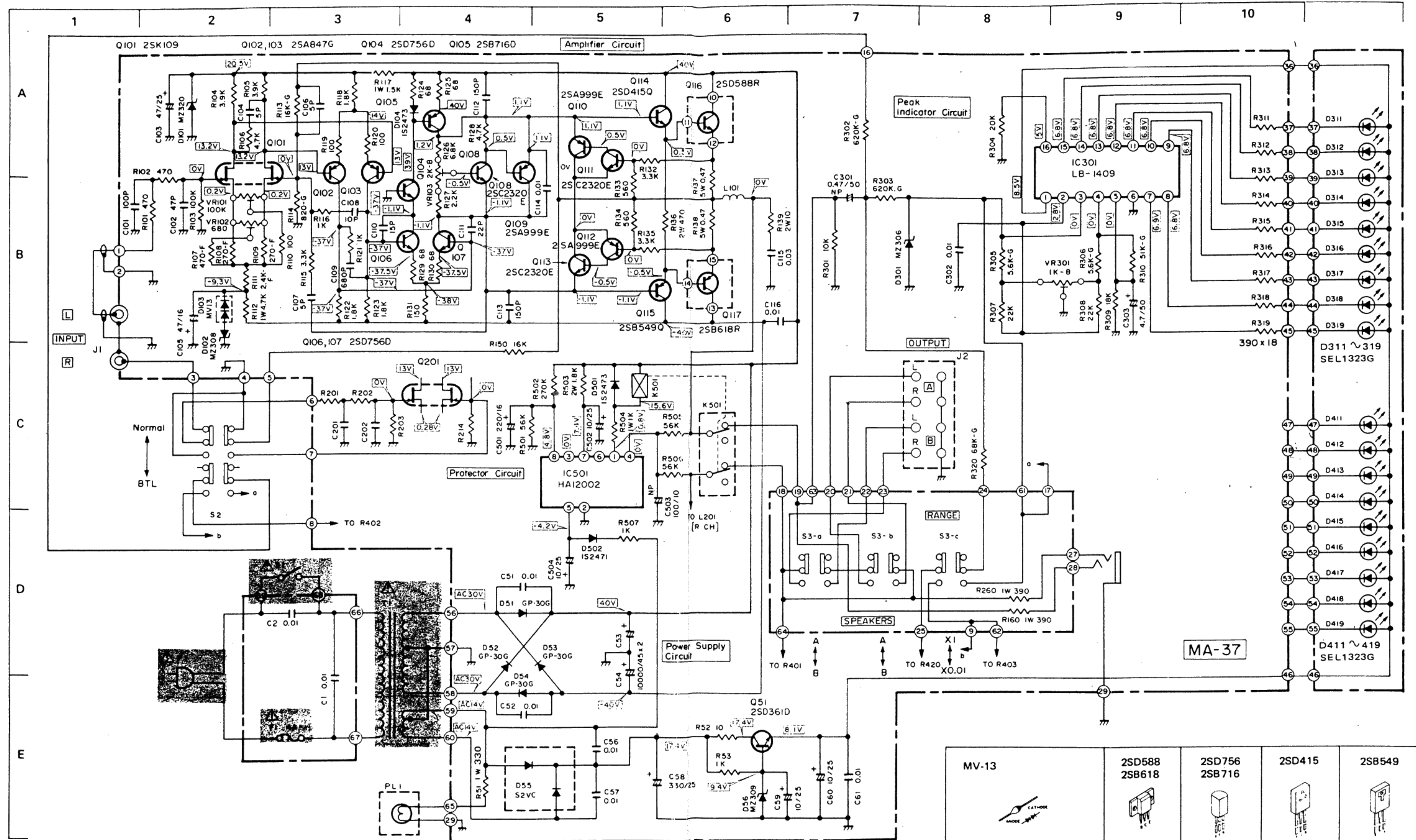
PRINTED CIRCUIT BOARDS



WIRING DIAGRAM



SCHEMATIC DIAGRAM



NOTE

1. Capacitor and resistor units
 C...no-symbol: μ F
 P symbol: pF
 R no-symbol: Ω
 K symbol: K Ω
2. All the resistors are carbon 1/4 W units unless otherwise specified.
3. The voltages are the values measured with a DC voltmeter on 100V range, no signal applied.

4. The right channel is omitted from the circuit below.
 Right channel circuit Specifications are 200 series
 Peak indicator circuit. Specifications are 400 series
 5. and marks components that are critical for continued safety and performance of this unit. Replace only with components of exact type as specified.
- *Specifications of this unit are subject to change without notice for improvement.

| | | | | |
|------------|----------------------|-----------------------|------------|-------------|
| MV-13 | 2SD588 2SB618 | 2SD756 2SB716 | 2SD415 | 2SB549 |
| 2SD361 | SEL1323G | 2SC2320 2SA999 | 2SA847 | 2SK 109 |

PARTS LIST

NOTE: Δ and ~~XXXX~~ marked components on the parts list have special characteristics to maintain the safety performance of this unit. When replacing any of these parts, be sure to use only the specified parts.

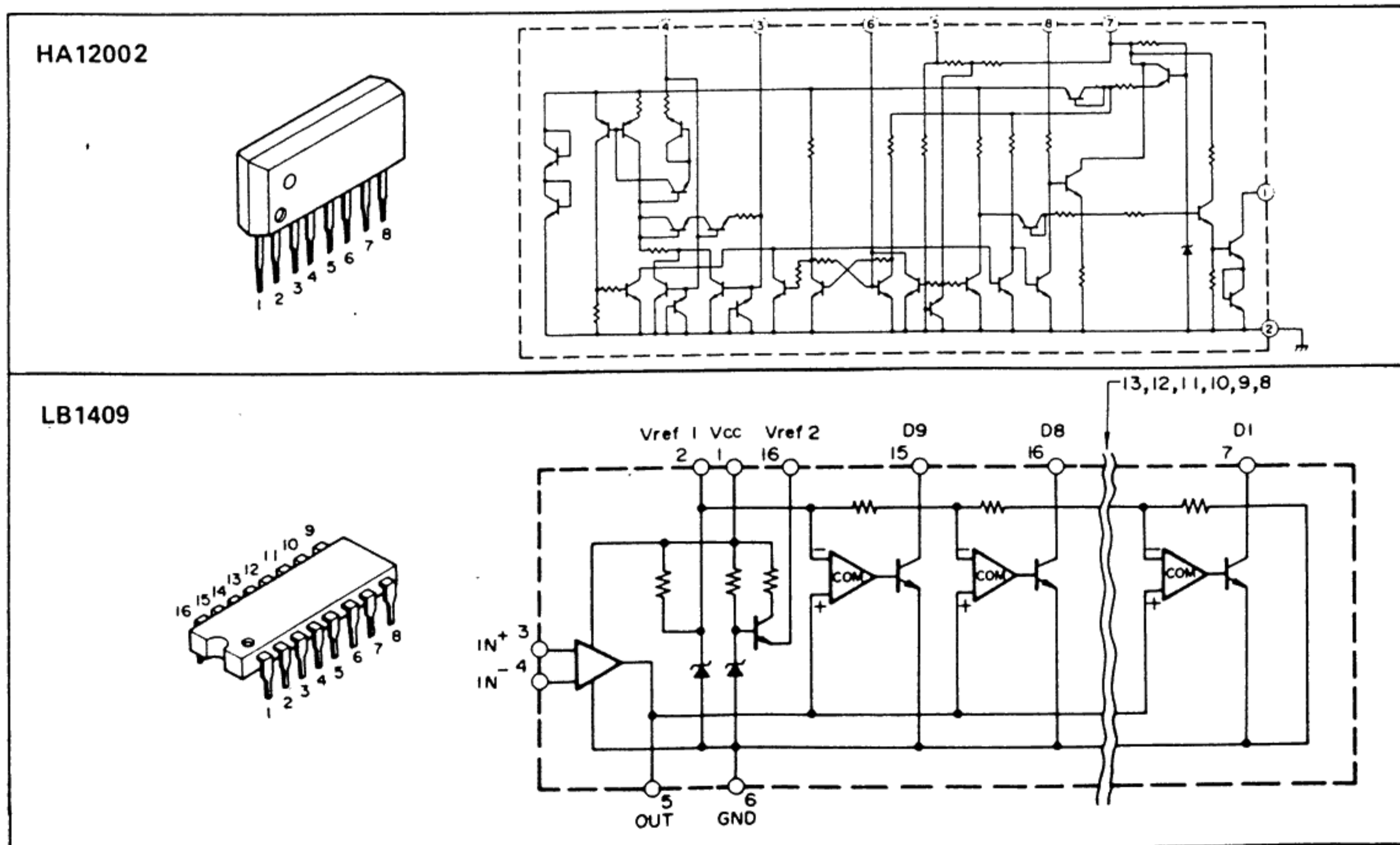
| Symbol No. | Parts No. | Description |
|--------------------|-----------|-----------------------|
| Diodes | | |
| D51 | M07447321 | GP30D |
| D52 | M07447321 | GP30D |
| D53 | M07447321 | GP30D |
| D54 | M07447321 | GP30D |
| D55 | M05163321 | S2VC10 |
| D56 | M07447322 | MZ309 |
| D101 | M07493320 | MZ320 |
| D102 | M07493321 | MZ308 |
| D103 | M04091331 | MV13 |
| D104 | M05200320 | 1S2473 |
| D201 | M07493320 | MZ320 |
| D202 | M07493321 | MZ308 |
| D203 | M04091331 | MV13 |
| D204 | M05200320 | 1S2473 |
| D301 | M07492320 | MZ306 |
| D311 | M07447320 | SEL1323G (Peak Level) |
| D312 | M07447320 | SEL1323G (Peak Level) |
| D313 | M07447320 | SEL1323G (Peak Level) |
| D314 | M07447320 | SEL1323G (Peak Level) |
| D315 | M07447320 | SEL1323G (Peak Level) |
| D316 | M07447320 | SEL1323G (Peak Level) |
| D317 | M07447320 | SEL1323G (Peak Level) |
| D318 | M07447320 | SEL1323G (Peak Level) |
| D319 | M07447320 | SEL1323G (Peak Level) |
| D401 | M07492320 | MZ306 |
| D411 | M07447320 | SEL1323G (Peak Level) |
| D412 | M07447320 | SEL1323G (Peak Level) |
| D413 | M07447320 | SEL1323G (Peak Level) |
| D414 | M07447320 | SEL1323G (Peak Level) |
| D415 | M07447320 | SEL1323G (Peak Level) |
| D416 | M07447320 | SEL1323G (Peak Level) |
| D417 | M07447320 | SEL1323G (Peak Level) |
| D418 | M07447320 | SEL1323G (Peak Level) |
| D419 | M07447320 | SEL1323G (Peak Level) |
| D501 | M05200320 | 1S2473 |
| D502 | M07492321 | 1S2471 |
| Transistors | | |
| Q51 | M07506303 | 2SD361 |
| Q101 | M07213303 | 2SK109 |
| Q102 | M07140303 | 2SA847 |
| Q103 | M07140303 | 2SA847 |
| Q104 | M07370305 | 2SD756 |
| Q105 | M07370306 | 2SB716 |
| Q106 | M07370305 | 2SD756 |
| Q107 | M07370305 | 2SD756 |
| Q108 | M07390303 | 2SC2320 |
| Q109 | M07390304 | 2SA999 |

| Symbol No. | Parts No. | Description |
|---------------------------------|-----------|--------------------------------------|
| Q110 | M07390304 | 2SA999 |
| Q111 | M07390303 | 2SC2320 |
| Q112 | M07390304 | 2SA999 |
| Q113 | M07390303 | 2SC2320 |
| Q114 | M07230306 | 2SD415 |
| Q115 | M07230307 | 2SB549 |
| Q116 | M07230308 | 2SD588 |
| Q117 | M07230309 | 2SB618 |
| Q201 | M07213303 | 2SK109 |
| Q202 | M07140303 | 2SA847 |
| Q203 | M07140303 | 2SA847 |
| Q204 | M07370305 | 2SD756 |
| Q205 | M07370306 | 2SB716 |
| Q206 | M07370305 | 2SD756 |
| Q207 | M07370305 | 2SD756 |
| Q208 | M07390303 | 2SC2320 |
| Q209 | M07390304 | 2SA999 |
| Q210 | M07390304 | 2SA999 |
| Q211 | M07390303 | 2SC2320 |
| Q212 | M07390304 | 2SA999 |
| Q213 | M07390303 | 2SC2320 |
| Q214 | M07230306 | 2SD415 |
| Q215 | M07230307 | 2SB549 |
| Q216 | M07230308 | 2SD588 |
| Q217 | M07230309 | 2SB618 |
| IC's | | |
| IC301 | M07447344 | LB1409 |
| IC401 | M07447344 | LB1409 |
| IC501 | M07447343 | HA12002 |
| Electrical Parts | | |
| C53, 54 | M07461360 | C-Electrolytic-45V 10000 |
| C116, 216 | M07492360 | C-Ceramic-500V 103M |
| M07514490 For SA-311 | | |
| J1 | M07447475 | Pin Jack |
| J2 | M07440575 | Terminal Board |
| J3 | M05104441 | Jack (Phones) |
| K501 | M07447465 | Relay |
| L101, 201 | M07072530 | Coil |
| M07234300 | | |
| PL-1 | M07370250 | Lamp |
| M07234300 | | |
| S2 | M07447450 | SW-Slide |
| S3-a ~ c | M07389450 | SW-Push (Peak level range, Speakers) |
| M07234300 | | |

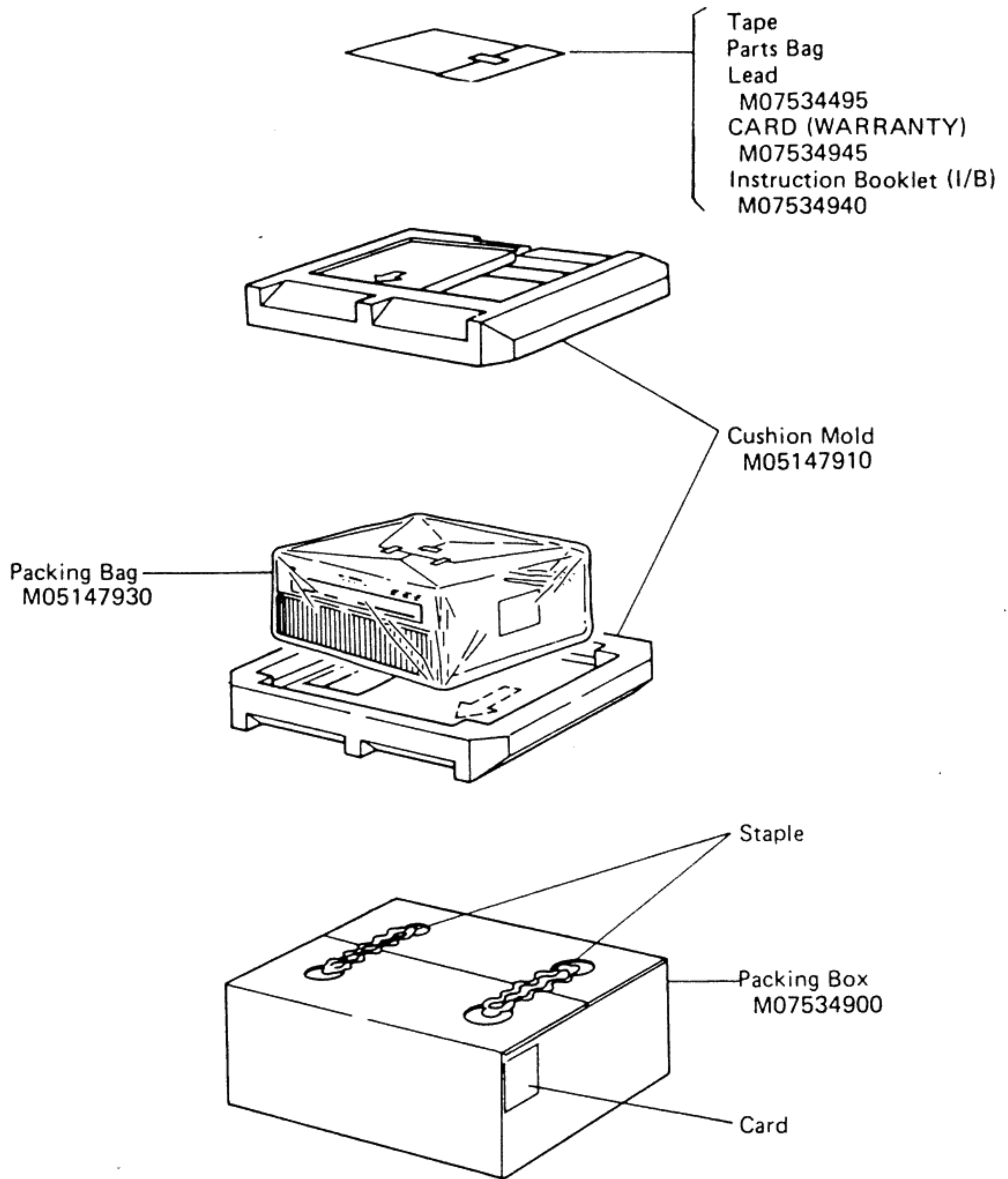
| Symbol No. | Parts No. | Description |
|---------------|-----------|--------------------|
| VR101, 201 | M05175362 | VR-SEMI-B100K |
| VR102, 202 | M07213436 | VR-SEMI-B680 |
| VR103, 203 | M07440437 | VR-SEMI-B2K |
| VR301, 401 | M07440435 | VR-SEMI-B1K |
| Cabinet Parts | | |
| 1 | M07357211 | Knob (Peak, SP) |
| 2 | M05147120 | Knob (Power) |
| 3 | | Screw-F M3 x 6 |
| 4 | | T-Screw 1-3 x 20 |
| 5 | | Screw-B M3 x 6 |
| 6 | | Holder |
| 7 | | Holder |
| 8 | | Screw-B 2-3 x 8 |
| 9 | | T-Screw 2-3 x 8 |
| 10 | | T-Screw 1-3 x 12 |
| 11 | | Screw-B M3 x 10 |
| 12 | | Shade (Lamp) |
| 13 | | T-Screw 2-3 x 10 |
| 14 | | Cover (Side Plate) |
| 15 | | Washer 3 |
| 16 | | T-Screw M3 x 10 |
| 17 | | Screw-B M2.6 x 4 |
| 18 | | Holder |
| 19 | M07534113 | Radiator-Ass'y (L) |
| 20 | M07534114 | Radiator-Ass'y (R) |

| Symbol No. | Parts No. | Description |
|------------|-----------|---------------------------|
| 21 | | Sheet |
| 22 | | Screw-B M3 x 16 |
| 23 | | Holder-Z |
| 24 | | Panel-Front (Sub) |
| 27 | | P.C.B. Assy |
| 28 | | T-Screw 2-3 x 8 |
| 29 | | Cushion-PL |
| 30 | | Bush Mold |
| 31 | M07534102 | Panel Back |
| 32 | M07510060 | Clamper(for Panel Back) |
| 33 | | P.C.B |
| 34 | | P.C.B |
| 35 | | P.C.B |
| 36 | | Clamper (P.C.B) |
| 37 | | Holder-Z |
| 38 | M07534100 | Panel-Ass'y (Front) |
| 39 | M07534225 | Ornament-Ass'y (J3) |
| 40 | M07534104 | Cover Assy (Top) |
| 41 | M07534106 | Cover-Assy (Bottom) |
| 42 | M07534190 | Leg-Assy |
| 43 | | Ornament-Assy (Indicator) |
| 44 | | Indicator (Power) |
| 45 | | P.C.B |
| 46 | | P.C.B |
| 47 | | Holder-U |

INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS



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