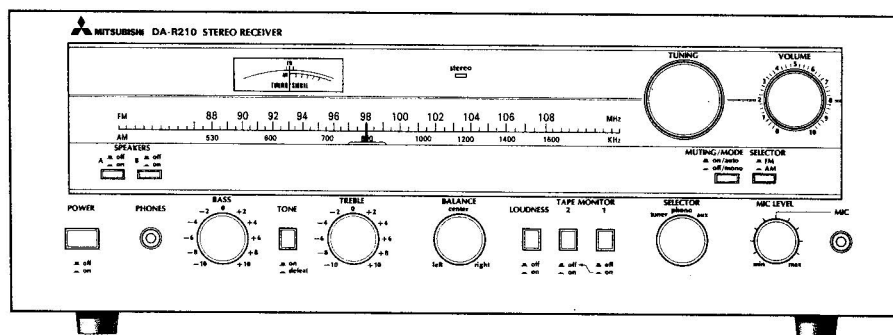




SERVICE MANUAL
STEREO RECEIVER
MODEL DA-R210



CONTENS

| | |
|----------------------------------|----|
| SPECIFICATIONS..... | 2 |
| PANEL OPERATIONS | 5 |
| HOW TO DISASSEMBLE..... | 7 |
| ADJUSTMENT | 8 |
| DIAL STRINGING DIAGRAM..... | 9 |
| CIRCUIT BOARD..... | 10 |
| SCHEMATIC DIAGRAM | 13 |
| WIRING..... | 15 |
| EQUIVALENT CIRCUIT DIAGRAM | 17 |
| PARTS LIST | 18 |

SPECIFICATIONS

1-(1) FM TUNER SECTION (IHF)

| | |
|--|------------------------------|
| Usable sensitivity | |
| MONO | 13.2dBf (2.5 μ V) |
| STEREO | 23.0dBf (7.8 μ V) |
| 50dB quieting sensitivity | |
| MONO | 20.0dBf (5.5 μ V) |
| STEREO | 40.0dBf (5.5 μ V) |
| Signal to noise ratio (at 98MHz, 1mV) | |
| MONO | 75dB |
| STEREO | 70dB |
| Frequency response | \pm 3dB from 40Hz to 15kHz |
| Total harmonic distortion (at 1kHz, 100% modulation) | |
| MONO | 0.2% |
| STEREO | 0.3% |
| Capture ratio | 1.0dB |
| Alternate channel selectivity (\pm 400kHz) | 55dB |
| Spurious response ratio (at 98MHz) | 70dB |
| Image response ratio (at 108MHz) | 60dB |
| IF response ratio (at 88MHz) | 80dB |
| AM suppression ratio | 50dB |
| Stereo separation | 40dB at 1kHz, 30dB at 10kHz |
| Subcarrier product ratio | 30dB |
| Tuning range | 87.5MHz to 108MHz |

1-(2) FM TUNER SECTION (DIN)

| | |
|---|------------------------------|
| Sensitivity (at 40kHz deviation) | |
| MONO (S/N 26dB) | 1.2 μ V |
| STEREO (S/N 46dB) | 32 μ V |
| Image frequency rejection (at 108MHz) | 60dB |
| IF rejection (at 88MHz) | 80dB |
| Spurious rejection (at 98MHz) | 70dB |
| AM rejection | 50dB |
| Selectivity (at 40kHz deviation, \pm 300kHz) | 50dB |
| Signal to noise ratio (at 40kHz deviation unweighted) | |
| MONO | 68dB |
| STEREO | 66dB |
| (at 40kHz deviation weighted) | |
| MONO | 70dB |
| STEREO | 68dB |
| Total harmonic distortion | |
| (at 1kHz, 40kHz deviation) | |
| MONO | 0.2% |
| STEREO | 0.4% |
| Stereo separation | |
| (at 1kHz, 40kHz deviation) | 40dB |
| Frequency response | \pm 3dB from 40Hz to 15kHz |

2-(1) AM TUNER SECTION (IHF)

| | |
|---|-------------------|
| Usable sensitivity (bar antenna at 30% modulation, S/N 26dB) | 40dB |
| Selectivity | 35dB |
| Total harmonic distortion (at 5m V/m, 30% modulation) | 0.8% |
| Image response ratio (at 1400kHz) | 40dB |
| IF response ratio (at 600kHz) | 60dB |
| Hum and noise (94 dB) | 50dB |
| Tuning range | 525kHz to 1605kHz |

2-(2) AM TUNER SECTION (DIN)

| | |
|---|------------------|
| Sensitivity (bar antenna, at 30% modulation, S/N 26dB) | 300 μ V/m |
| Signal to noise ratio (at 5mV/m, 30% modulation) | 50dB |
| Selectivity (at \pm 9kHz) | 30dB |
| Image frequency rejection (at 1400kHz) | 40dB |
| Total harmonic distortion (at 5mV/m, 30% modulation) | 1.0% |
| Tuning range | 525kHz ~ 1605kHz |

3. PREAMPLIFIER SECTION

| | |
|---|---|
| Input sensitivity/impedance (at continuous rated power output, 8 ohms, 1kHz) | |
| PHONO | 2.5mV/50k ohms |
| TUNER, AUX, PLAY 1, 2 (PIN) | 150mV/35k ohms |
| PLAY 1, 2 (DIN) | 150mV/35k ohms |
| MIC | 1mV/10k ohms |
| Phono overload level (at 1kHz, with 0.1% THD) | |
| PHONO | 200mV |
| Output level/impedance | |
| REC 1, 2 (PIN) | 150mV/600 ohms |
| REC 1, 2 (DIN) | 50mV/100k ohms |
| Frequency response | |
| PHONO | \pm 0.5dB from 20Hz to 20kHz (RIAA STD) |
| TUNER, AUX, PLAY 1, 2 | + 0.5dB, -1dB from 20Hz to 20kHz (in TONE DEFEAT switch ON position) |
| Tone control | |
| BASS | \pm 8dB at 100Hz |
| TREBLE | \pm 8dB at 10kHz |
| Loudness (Volume control set at -30dB position) | +7dB at 100Hz +5dB at 10kHz |
| Hum and noise (A network closed circuit) | |
| PHONO | 72dB |
| TUNER, AUX, PLAY 1, 2 | 95dB |
| Hum and noise (DIN, 50mW x 2) | |
| PHONO | 60dB |
| TUNER, AUX, PLAY 1, 2 | 62dB |

4. POWER AMPLIFIER SECTION

| | |
|--|--|
| Power output | 25W continuous power per channel, both channels driven into 8 ohms from 20Hz to 20kHz, with 0.1% THD 30W continuous power per channel, both channels driven into 4 ohms from 20Hz to 20kHz, with 0.3% THD |
| Total harmonic distortion | 0.03% at 12.5W per channel both channels driven into 8 ohms at 1kHz 0.03% at 1W per channel both channels driven into 8 ohms at 1kHz |
| Intermodulation distortion (70Hz and 7kHz, 4 : 1) | 0.2% at rated power per channel, 8 ohms 0.1% at 1W power per channel, 8 ohms |
| Power bandwidth (IHF) | 10Hz to 40kHz at 0.1% THD, 8 ohms |
| Damping factor | 25 from 20Hz to 20kHz, 8 ohms |

5. GENERAL

| | |
|------------------------|--|
| Power consumption | 140W (IEC nominal) |
| Dimensions (W x H x D) | 425 x 154 x 324 mm (16-3/4 x 6 x 12-3/4") |
| Weight | 8.5 kg (18-1/2 lb) |

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

PANEL OPERATIONS

FRONT PANEL

SPEAKERS (Speaker Selection Switches)

These switches control speaker selection.

- | A | B | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | For listening with headphones. The speakers are disconnected. |
| <input type="checkbox"/> | <input type="checkbox"/> | For listening to the speakers connected to terminals A. |
| <input type="checkbox"/> | <input type="checkbox"/> | For listening to the speakers connected to terminals B. |
| <input type="checkbox"/> | <input type="checkbox"/> | For listening to the speakers connected to terminals A and B. |

TUNING/SIGNAL (Tuning/Signal Meter)

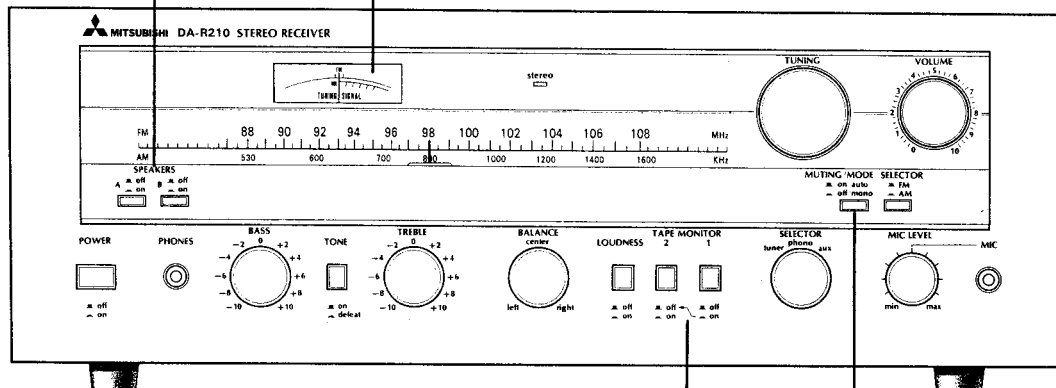
This meter shows the most distortion-free position for receiving the FM signal and the signal strength level of AM signal.

FOR FM BROADCAST RECEPTION

Tune it so that the indicator of the meter comes to the center.

FOR AM BROADCAST RECEPTION

Tune it so that the indicator of the meter swings to the extreme right.



TAPE MONITOR (Tape Monitor and Duplicate Switch)

These switches are used for monitoring either the program source being recorded or the playback from the tape deck, and duplicating from the tape to tape.

- | 2 | 1 | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | In this position, you can reproduce the program source set by the SELECTOR switch and record them with tape deck connected to REC1 and REC 2 outputs or TAPE 1 and TAPE 2 sockets. |
| <input type="checkbox"/> | <input type="checkbox"/> | For playing or record monitoring of the tape deck connected to PLAY 1 (TAPE 1) inputs, and duplicating from the tape deck connected to PLAY 1 (TAPE 1) inputs to the tape deck connected to REC 2 (TAPE 2) outputs. |
| <input type="checkbox"/> | <input type="checkbox"/> | For playing or record monitoring of the tape deck connected to PLAY 2 (TAPE 2) inputs. |

MUTING/MODE (Muting/Mode Selection Switch)

This switch is for selecting the mode of FM reception you desire.

ON/AUTO For receiving a FM stereo broadcast. In this position, the interstation noise is eliminated while tuning.

OFF/MONO For receiving a monaural FM broadcast. In this position, the interstation noise is not eliminated while tuning, enabling weaker FM broadcasts to be tuned in. Stereo broadcasts are also received monaurally.

REAR PANEL

ANTENNA (Antenna Terminals)
 These terminals are used for connecting FM and AM antennas. For more details, see page 8.

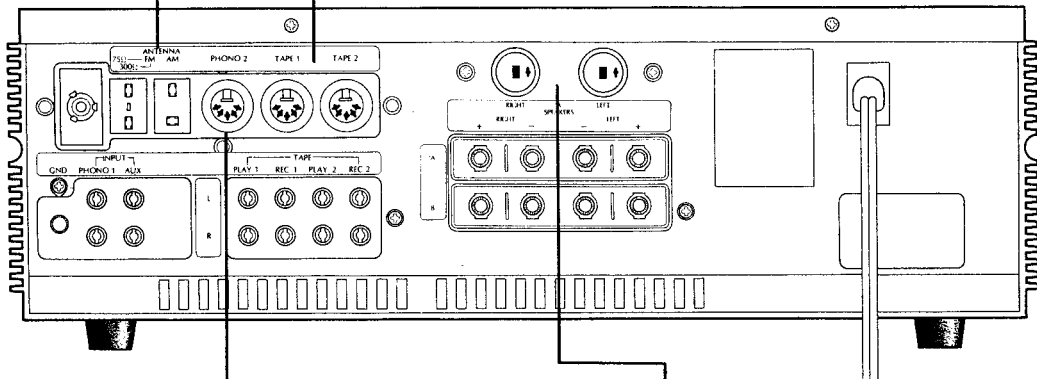
AM (AM and Ground External DIN Antenna Socket)
 Connect DIN antenna cords with ground wires to this socket for AM reception.

FM 300Ω (FM300 ohms DIN Antenna Socket)
 Connect 300 ohms DIN antenna cords to this socket for FM reception.

FM75Ω (FM75 ohms DIN Antenna Socket)
 Connect 75 ohms DIN antenna cords to this socket for FM reception.

GND (Ground Screw Terminal)
 Sometimes, hum or other noise may develop when a turntable is connected to this unit. In such a case, connect the ground wire of a turntable to this terminal.

TAPE 1, TAPE 2 (Tape Playback & Recording DIN Sockets)
 These sockets are for tape playback and recording. Connect the tape deck DIN plugs here.



PHONO (Phono PIN/DIN Inputs)
 The input impedance is 50 k ohms. The output leads from the turntable are connected here.

SPEAKERS (Speaker DIN Socket)
 Speakers A may be connected here. Do not use the Speakers A (screw terminals) at the same time.

HOW TO DISASSEMBLE COVER, PLATE & PANEL

1. Top Cover Removal

- 1) Remove the six screws on backside as shown in Fig. 1.
Remove the top cover by pulling it upwards.

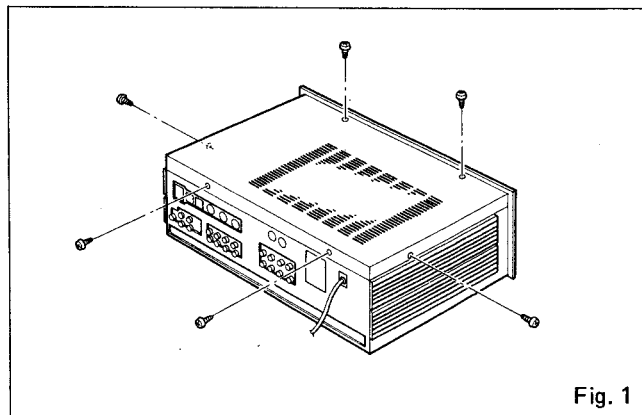


Fig. 1

2. Bottom Plate Removal

- If the five screws (A) shown in Fig. 2 are removed, the bottom plate can be taken out.

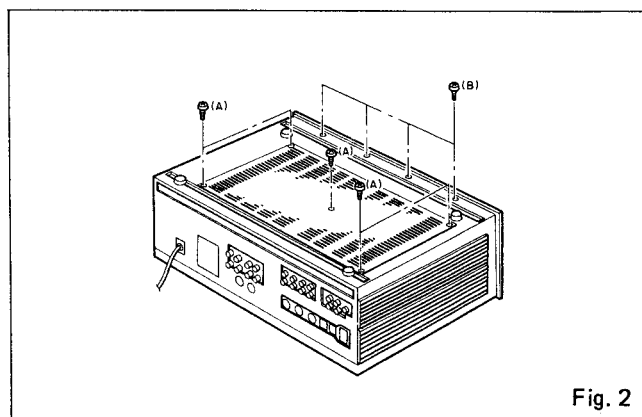


Fig. 2

3. Front Panel Removal

- 1) Remove the top cover (See Removal Procedure 1).
- 2) Remove the four screws (B) shown in Fig. 2.
- 3) Remove the two screws shown in Fig. 3.
- 4) Pull out the knob as shown in Fig. 4 and remove the mounting nut. To remove the front panel in this state, pull it towards you.

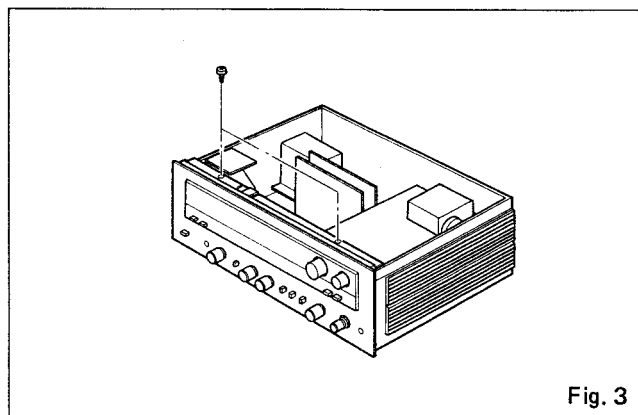


Fig. 3

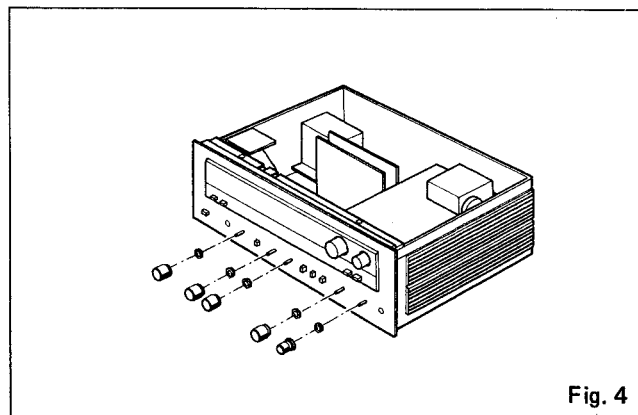


Fig. 4

ADJUSTMENT

AM Adjustment

- 1) Set BAND SELECTOR switch to AM position.
- 2) Connect output from SG (SIGNAL GENERATOR) to LOOP ANTENNA.
- 3) The output from the stereo receiver set is taken from the terminal (8) or (9) of the printed circuit board of the tuner to be connected to the AC voltmeter.
- 4) Adjust SG frequency to 525 KHz.
- 5) Set the dial to the lowest frequency, and adjust T201 to receive 525 KHz from SG.
- 6) Adjust SG frequency to 1605 KHz then.
- 7) Set the dial to the highest frequency and adjust C211 trimmer capacitor to receive 1605 KHz from SG.
- 8) Adjust SG frequency to 600 KHz.
- 9) Tune the dial to 600 KHz and adjust L201 (bar antenna) to obtain the maximum sensitivity.
Note: As antenna coil bobbins are fixed by wax, melt them using a soldering iron.
- 10) Adjust SG frequency to 1400 KHz.
- 11) Tune the dial to 1400 KHz and adjust C202 (the trimmer on the variable capacitor) to obtain the maximum sensitivity.
- 12) Repeat the same procedures mentioned in Items 8 to 11 to obtain the maximum sensitivity at 600 KHz and 1400 KHz.
- 13) Adjust SG frequency to 1000 KHz.
- 14) Tune the dial to 1000 KHz and adjust T202 to obtain the maximum sensitivity.

FM Adjustment

1. FM Front End Adjustment

- 1) Set the BAND SELECTOR switch to FM position.
- 2) Connect the output of SG to the terminal of FM antenna.
- 3) The output from the stereo receiver set is taken from the terminal (8) or (9) of the printed circuit board of the tuner to be connected to the AC voltmeter.
- 4) Adjust SG frequency to 87.4 MHz.
- 5) Set the dial to the highest frequency and adjust L103 to receive 87.4 MHz from SG.
- 6) Adjust SG frequency to 109 MHz.
- 7) Set the dial to the highest frequency and adjust C116 trimmer capacitor to receive of 109 MHz from SG.
- 8) Adjust SG frequency to 87.4 MHz.
- 9) Set the dial to the lowest frequency to receive 87.4 MHz from SG. Adjust L101, L102 and T101 to obtain the maximum sensitivity.
- 10) Adjust SG frequency to 109 MHz.
- 11) Set the dial to the highest frequency to receive 109 MHz from SG. Adjust C102 and C107 trimmers to obtain the maximum sensitivity.
- 12) Repeat the same procedures mentioned in the Items 8 to 11 to obtain the maximum sensitivity at 87.4 MHz and 109 MHz.

2. FM Discriminate Transformer Adjustment

- 1) Set MUTING switch to OFF position.
- 2) Turn the dial to any position in which no signal is received. Adjust T102 to make the indicator of the center meter come in the center.
- 3) Set the SG to 98 MHz and modulate 1 KHz 100%/mono.
- 4) Connect distortion meter to the terminal (8) or (9) of the tuner printed circuit board.
- 5) Set MODE switch to FM MONO position.
- 6) Tune the dial to 98 MHz and adjust T103 to obtain the minimum distortion factor.

3. FM MPX Adjustment

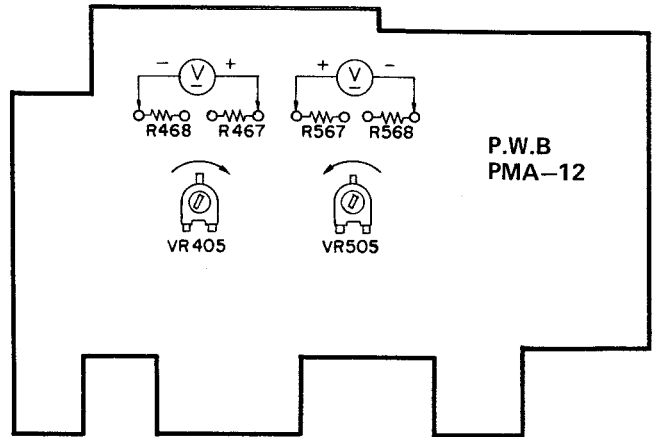
Connect the frequency counter between the terminal (14) (TP2) of the tuner printed circuit board and the ground to adjust VR101 to 19 KHz.

AUDIO FREQUENCY PRINTED CIRCUIT BOARD ADJUSTMENT

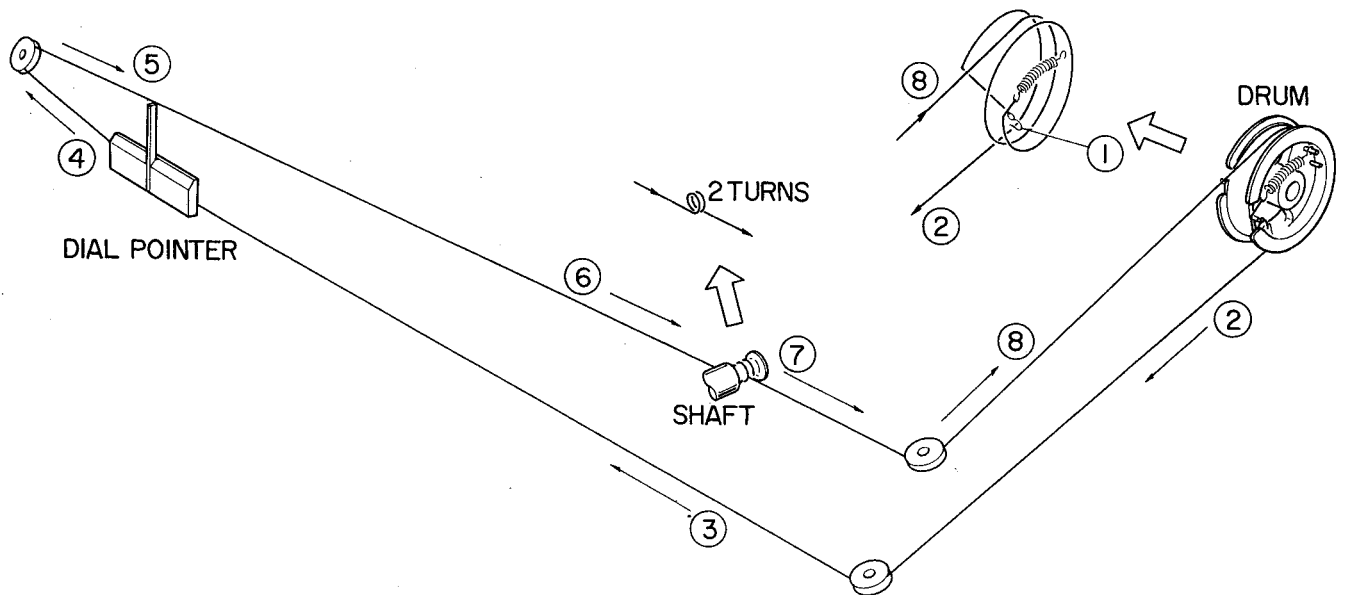
How to Adjust Idling Current

- 1) Turn VR405 and VR505 thoroughly in the opposite direction of the arrow.
- 2) Turn on power switch.
- 3) Turn VR405 and VR505 in the direction of the arrow so that voltage at either end of R467 – R468 and R567 – R568 become 27 ± 5 mV.

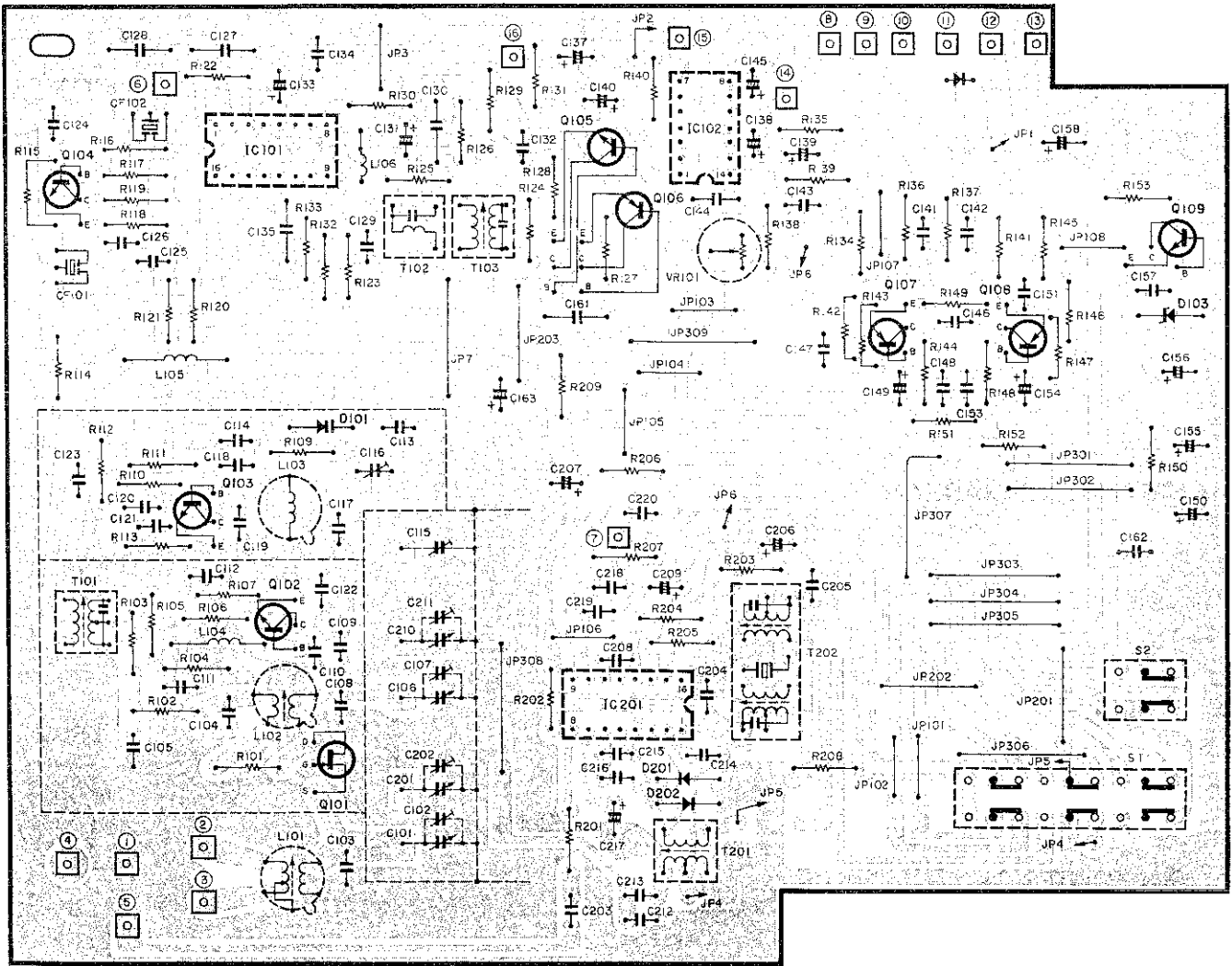
PRINTED WIRING BOARD (PARTS SIDE)

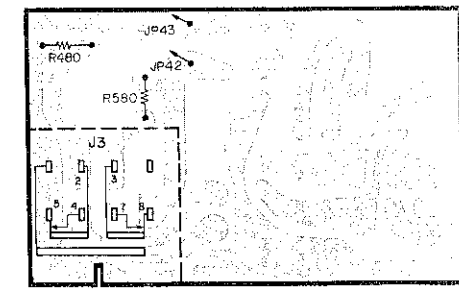
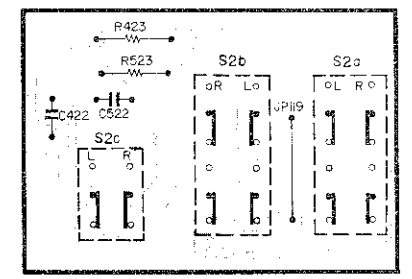
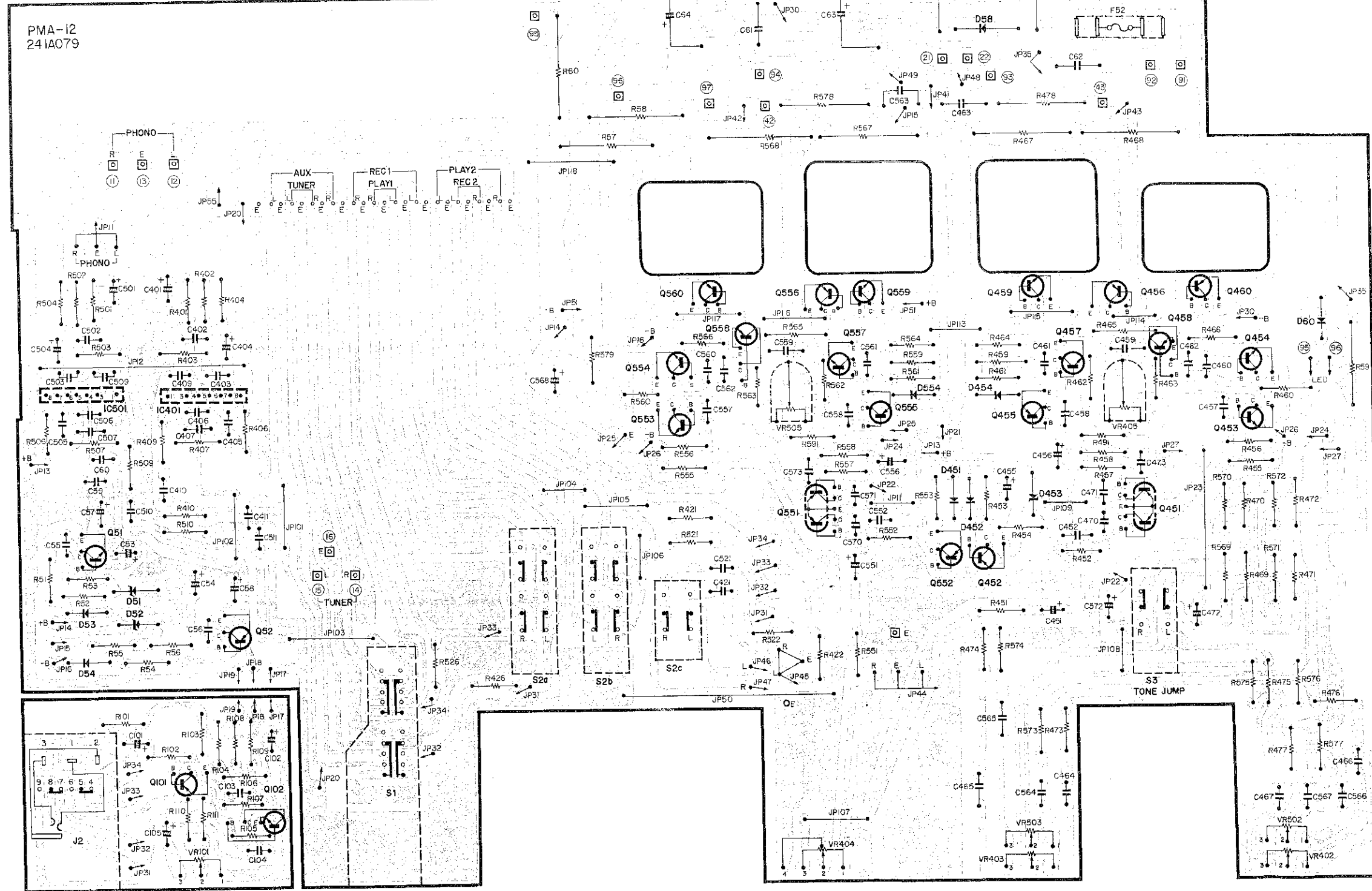
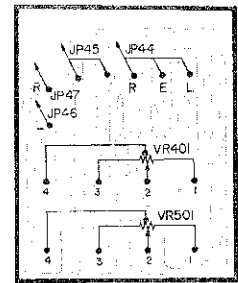
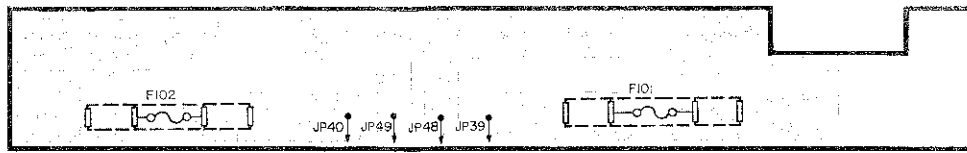
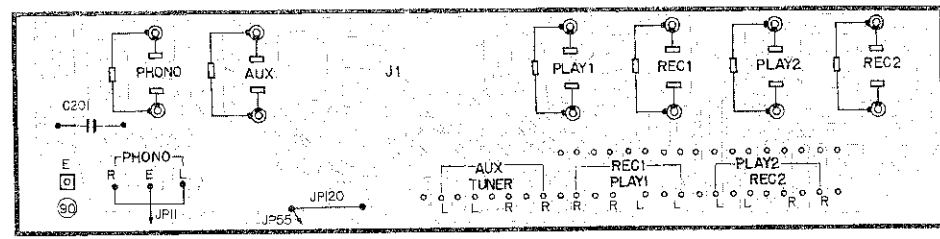


DIAL STRINGING DIAGRAM

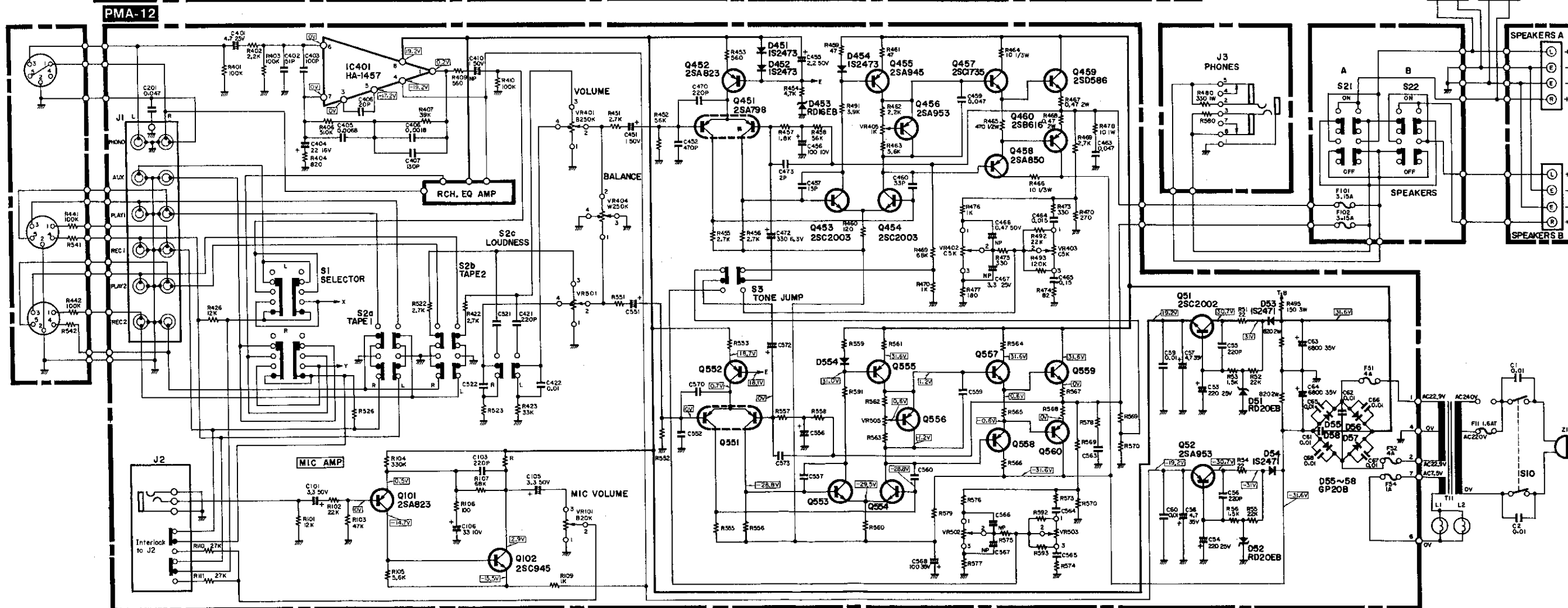
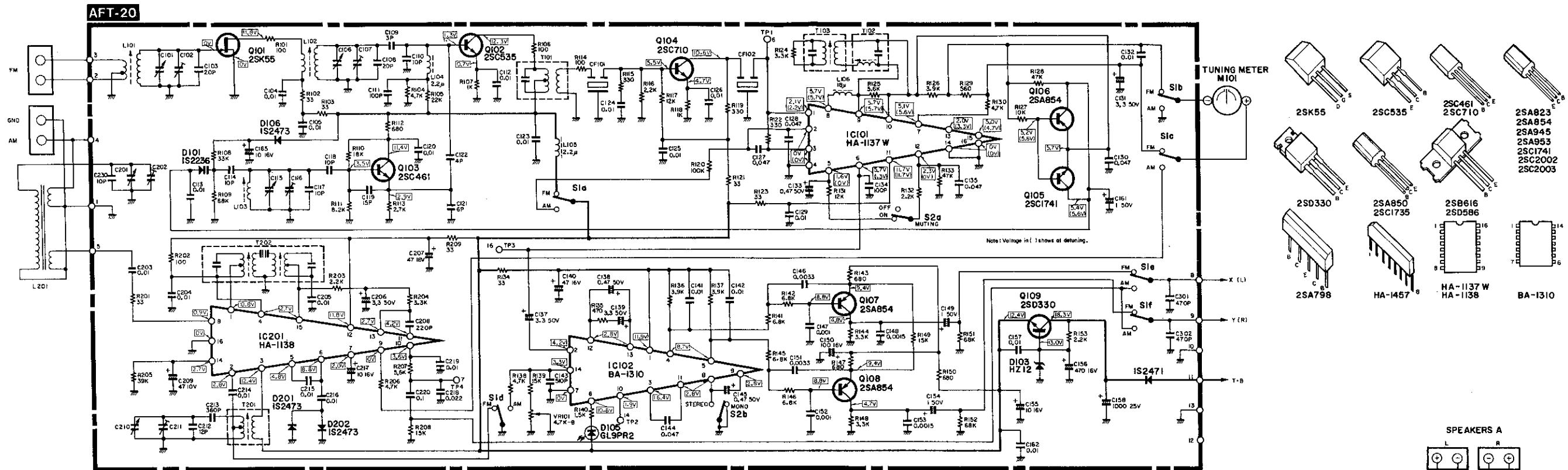


CIRCUIT BOARD

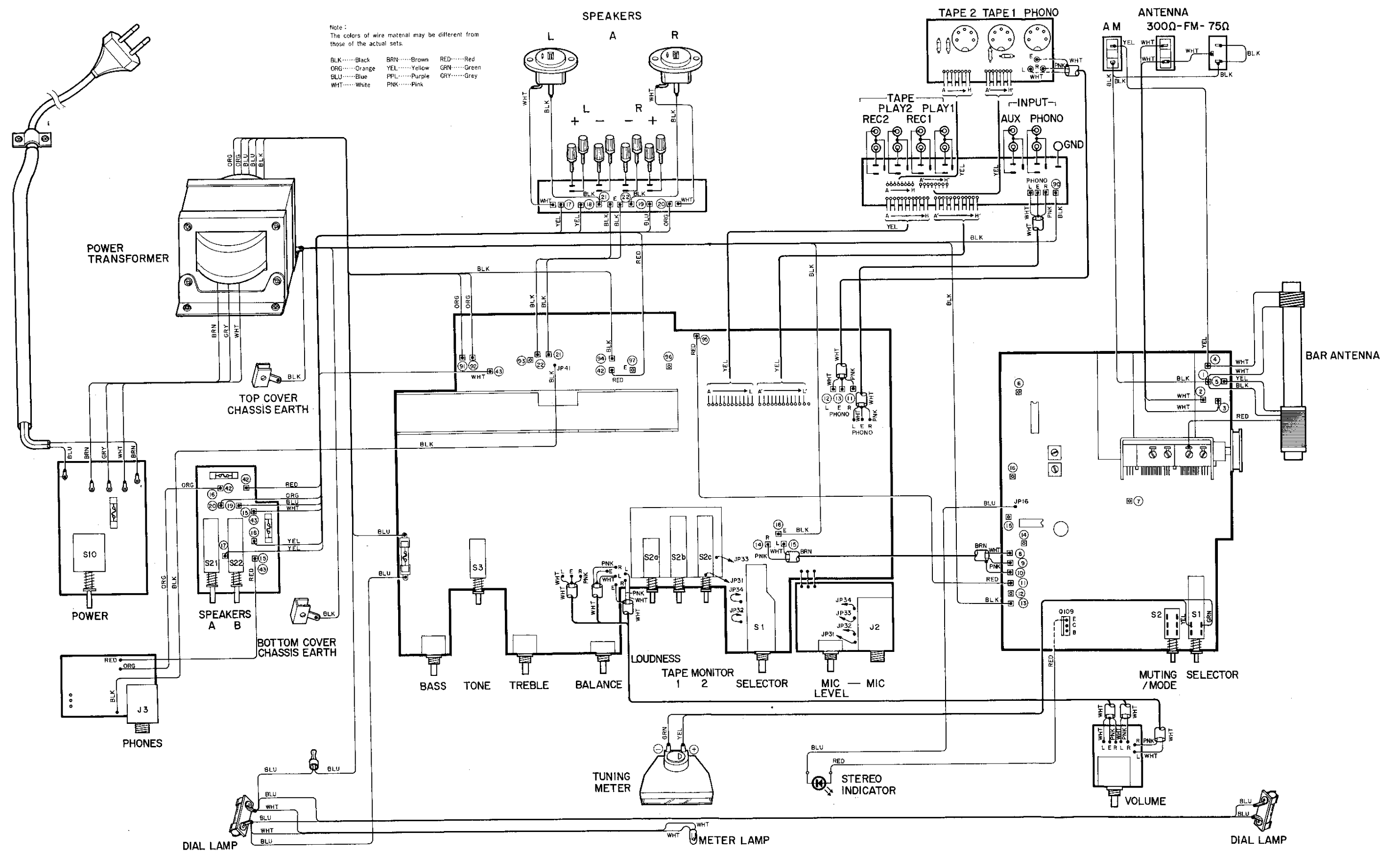




SCHEMATIC DIAGRAM

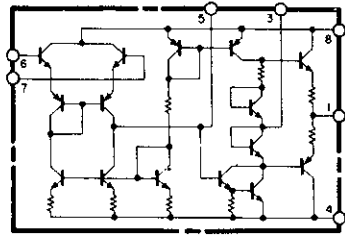


WIRING

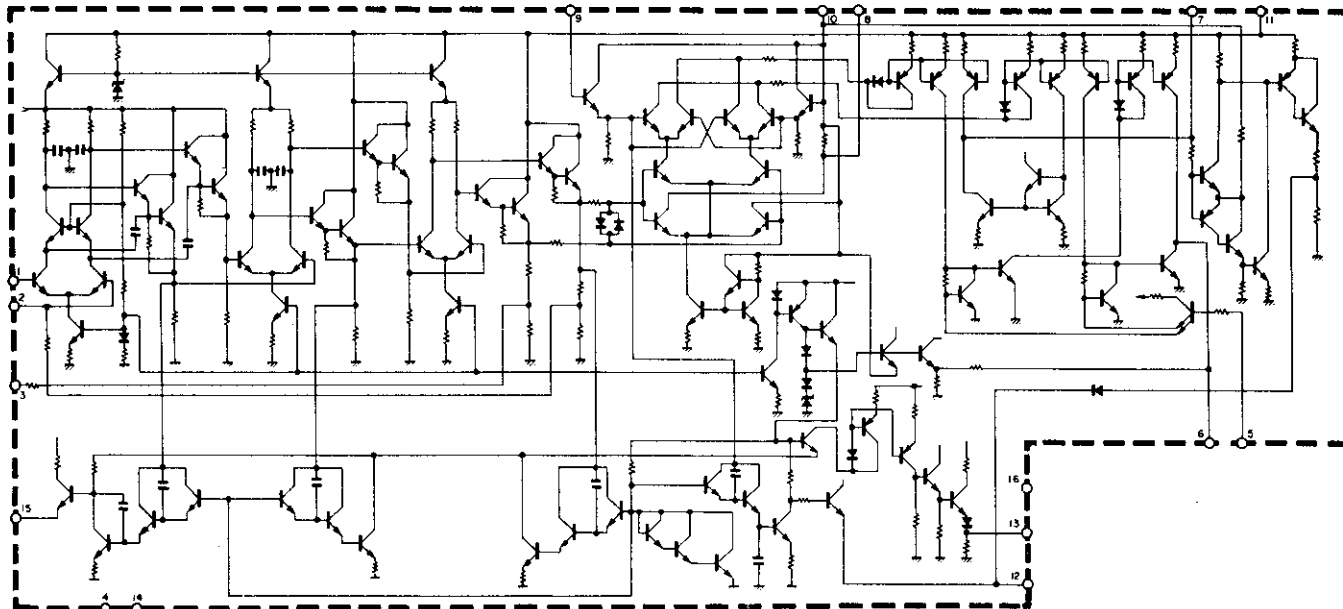


EQUIVALENT CIRCUIT DIAGRAM

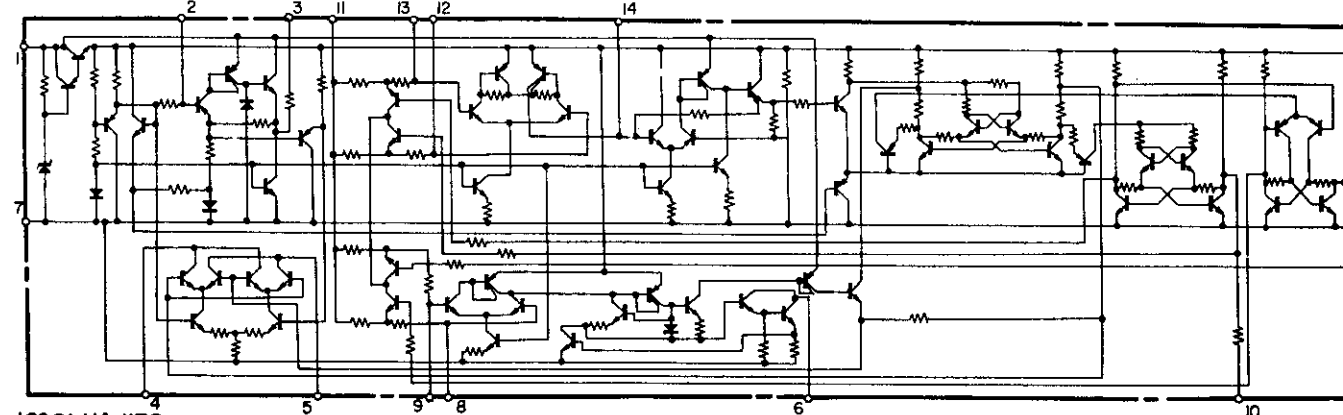
IC401, IC501 HA-1457



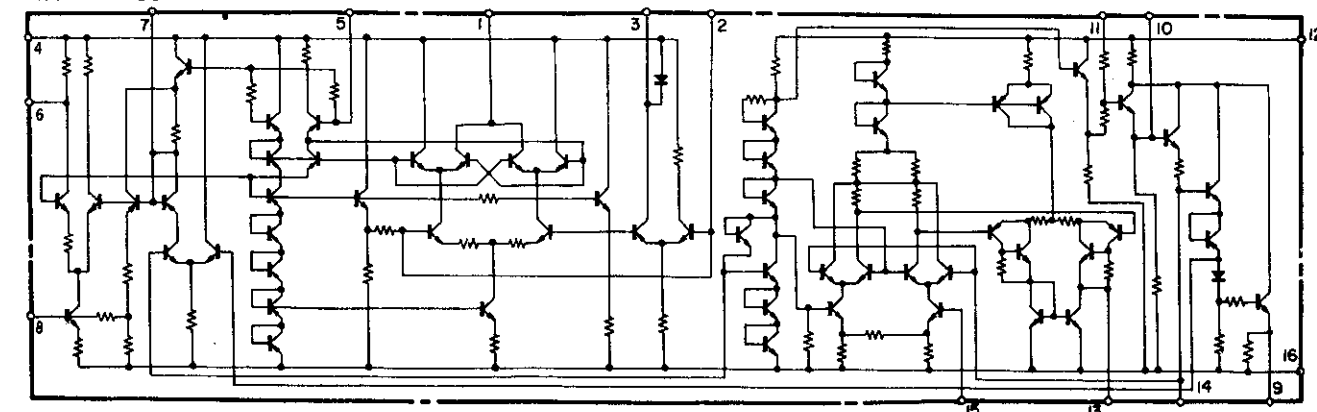
IC101 HA-1137W



IC102 BA-1310



IC201 HA-1138



PARTS LIST

| SYMBOL NO. | PART NO. | DESCRIPTION |
|--------------------|-----------|------------------|
| DIODES | | |
| D51 | M07229320 | RD-20EB |
| D52 | M07229320 | RD-20EB |
| D53 | M07113321 | 1S2471 |
| D54 | M07113321 | 1S2471 |
| D55 | M07229323 | GP20B |
| D56 | M07229323 | GP20B |
| D57 | M07229323 | GP20B |
| D58 | M07229323 | GP20B |
| D101 | M07085320 | 1S2236 |
| D103 | M04137320 | HZ-12 |
| D105 | M05142322 | GL-9PR2 |
| D106 | M07060320 | 1S2473 |
| D201 | M07060320 | 1S2473 |
| D202 | M07060320 | 1S2473 |
| D451 | M07060320 | 1S2473 |
| D452 | M07060320 | 1S2473 |
| D453 | M07229321 | RD16EB |
| D454 | M07060320 | 1S2473 |
| D551 | M07060320 | 1S2473 |
| D552 | M07060320 | 1S2473 |
| D553 | M07229321 | RD16EB |
| D554 | M07060320 | 1S2473 |
| TRANSISTORS | | |
| Q51 | M07229305 | 2SC2002 |
| Q52 | M07229303 | 2SA953 |
| Q101 | M05104312 | 2SA823 (MIC AMP) |
| Q101 | M07152303 | 2SK55 |
| Q102 | M07229304 | 2SC945 (MIC AMP) |
| Q102 | M04070303 | 2SC535 |
| Q103 | M04066313 | 2SC461 |
| Q104 | M04070304 | 2SC710 |
| Q105 | M07137307 | 2SC1741 |
| Q106 | M07137308 | 2SA854 |
| Q107 | M07137308 | 2SA854 |
| Q108 | M07137308 | 2SA854 |
| Q109 | M07061304 | 2SD330 |
| Q451 | M07133303 | 2SA798 |
| Q452 | M05104312 | 2SA823 |
| Q453 | M07229306 | 2SC2003 |
| Q454 | M07229306 | 2SC2003 |
| Q455 | M07229307 | 2SA954 |
| Q456 | M07229303 | 2SA953 |
| Q457 | M07128303 | 2SC1735 |
| Q458 | M07133304 | 2SA850 |
| Q459 | M07229308 | 2SD586 |
| Q460 | M07229309 | 2SB616 |
| Q551 | M07133303 | 2SA798 |
| Q552 | M05104312 | 2SA823 |
| Q553 | M07229306 | 2SC2003 |
| Q554 | M07229306 | 2SC2003 |
| Q556 | M07229303 | 2SA953 |
| Q557 | M07128303 | 2SC1735 |
| Q558 | M07133304 | 2SA850 |
| Q559 | M07229308 | 2SD586 |
| Q560 | M07229309 | 2SB616 |

| SYMBOL NO. | PART NO. | DESCRIPTION |
|-------------------|-----------|------------------------|
| ICs | | |
| IC101 | M07132343 | HA1137W |
| IC102 | M07115344 | BA1310 |
| IC201 | M07115345 | HA1138 |
| IC401 | M07229343 | HA1457 |
| IC501 | M07229343 | HA1457 |
| VOLUME | | |
| VR101 | M07229400 | STD-A20K20 (MIC LEVEL) |
| VR401 | M07373400 | W-B250K35 |
| VR402 | M07229403 | W-C5K20 (BASS) |
| VR403 | M07229403 | W-C5K20 (TREBLE) |
| VR404 | M07229401 | STD-W250K20 (BALANCE) |
| VR501 | M07373400 | W-B250K35 |
| VR502 | M07229403 | W-C5K20 (BASS) |
| VR503 | M07229403 | W-C5K20 (TREBLE) |
| SWITCHES | | |
| S1 | M07229450 | ROTARY (AM-FM BAND) |
| S2 | M07229451 | PUSH FM-MODE, MUTING |
| S3 | M07229452 | PUSH |
| S10 | M05113430 | PUSH (POWER) |
| S21 | M07219450 | PUSH |
| ELECTRICAL | | |
| T11 | M07362549 | TRANS POWER |
| L1 | M07115250 | LAMP |
| L2 | M07373250 | LAMP |
| L201 | M07152540 | COIL-ANT |
| M101 | M07373260 | METER |
| F11 | M07362492 | FUSE-1.6A-SEMKO |
| F51 | M07362490 | FUSE-4A-SEMKO |
| F52 | M07362490 | FUSE-4A-SEMKO |
| F54 | M05110472 | FUSE-1A-SEMKO |
| F101 | M07362491 | FUSE-3.15A-SEMKO |
| F102 | M07362491 | FUSE-3.15A-SEMKO |
| J2 | M07229475 | JACK (MIC) |
| J3 | M07229476 | JACK (HEAD PHONE) |
| CABINET | | |
| | M07373210 | KNOB METAL |
| | M07373211 | KNOB METAL |
| | M07229212 | KNOB METAL |
| | M07229211 | KNOB METAL |
| | M07373212 | KNOB |
| | M07373213 | KNOB |
| | M07215195 | LEG |