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# **The Harman-Kardon Model 630**

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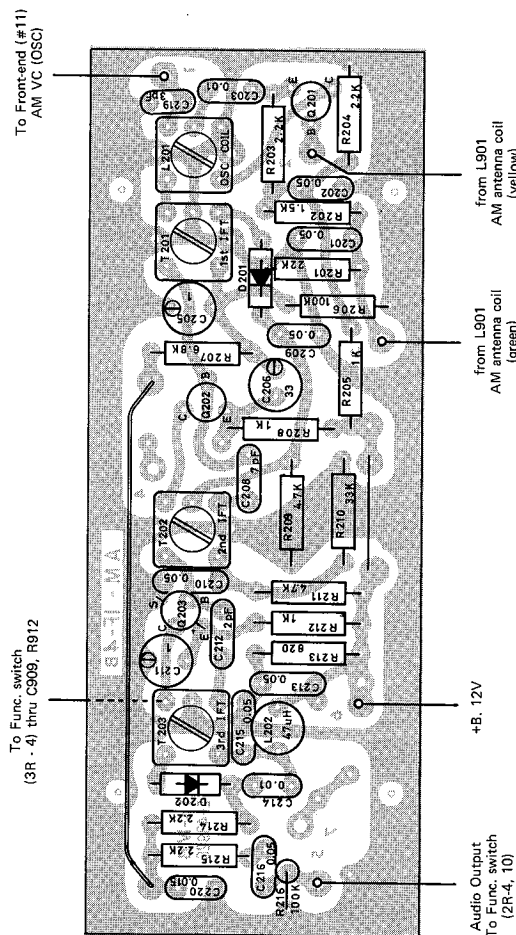
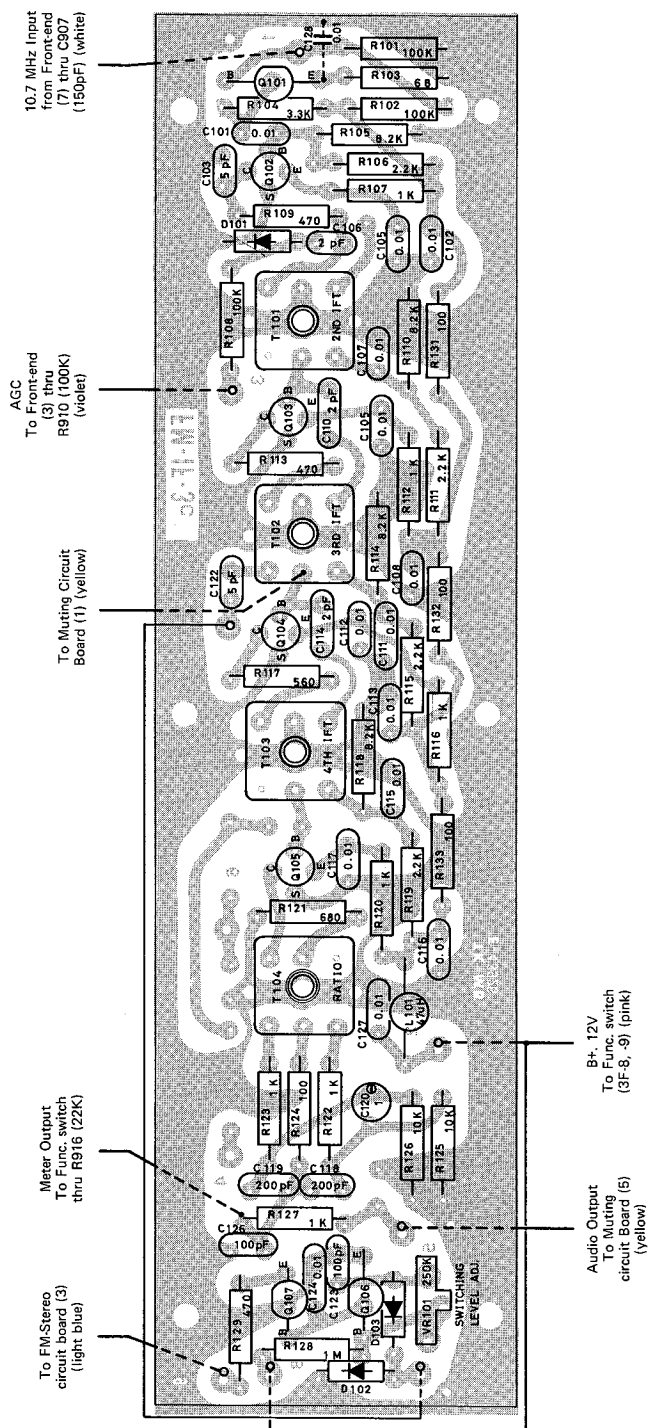
**AM/FM/Stereo FM  
Solid State Receiver**

**Technical Manual**

**harman/kardon**

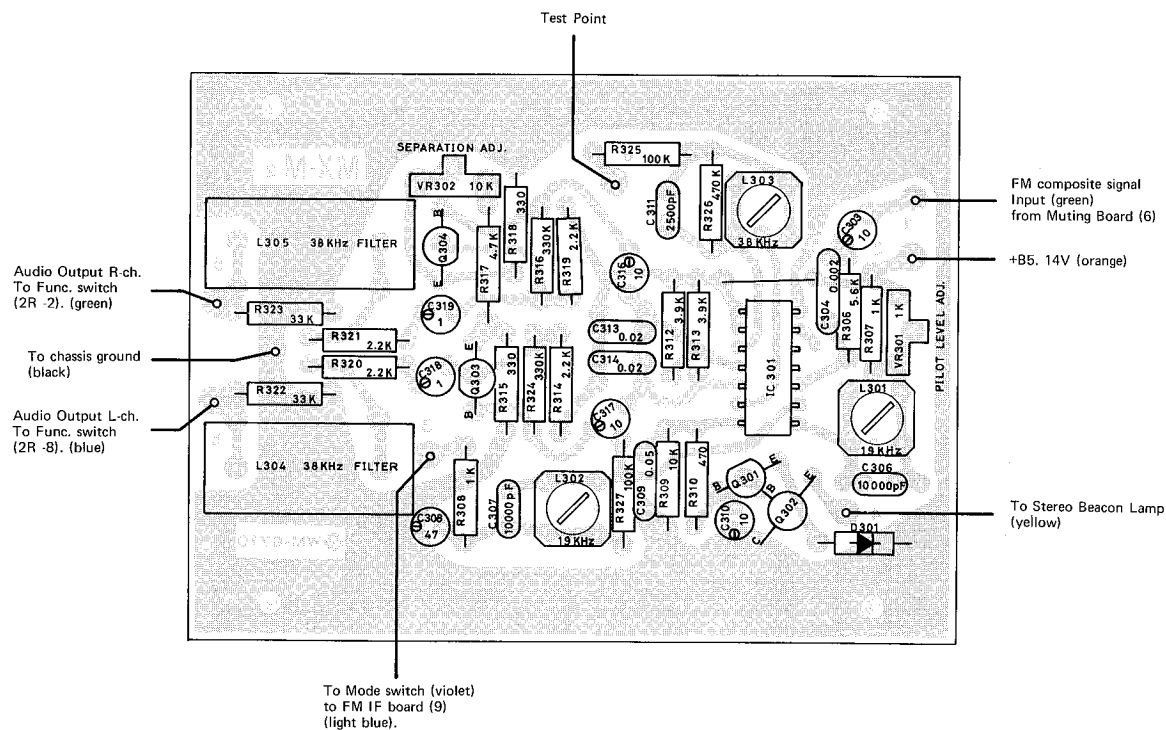
# FM IF CIRCUIT BOARD

# AM CIRCUIT BOARD

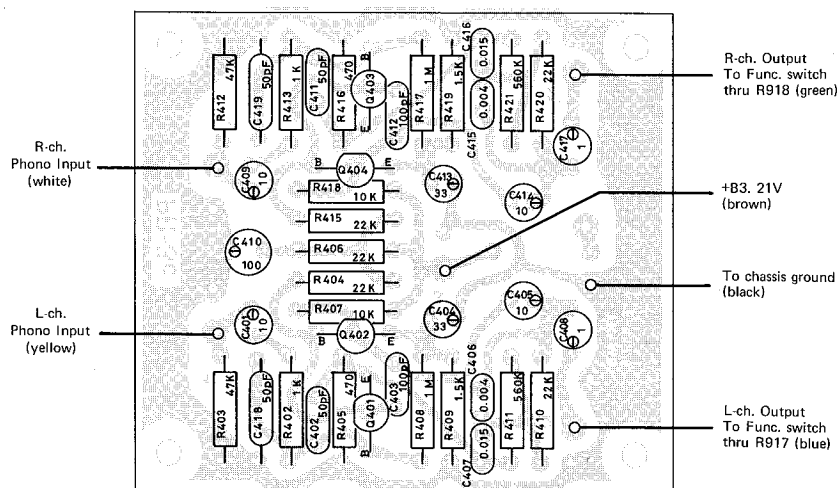


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.  
2. CAPACITANCE IS SHOWN IN PFD.  
UNLESS OTHERWISE NOTED IN THIS DIAGRAM.

## FM STEREO (MPX) CIRCUIT BOARD



## EQUALIZER AMPLIFIER CIRCUIT BOARD



# ALIGNMENT PROCEDURE

## FM STEREO ALIGNMENT PROCEDURE

### PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohm-meter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistors failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

**INSTRUMENTS:** FM Signal Generator, AC VTVM and Oscilloscope.

**NOTE:** The FM IF Amplifier must be completed before attempting this FM-Stereo Alignment. Poor IF alignment will result in poor Multiplex Adjustment.

Set Separation Adj. VR302 (on MPX board) to max-position before starting this procedure.

Set Selector switch to "FM STEREO".

Connect Stereo Generator to FM antenna terminals.

| STEPS | STEREO GENERATOR                                                                                                  |                        | OUTPUT INDICATOR<br>CONNECTED TO                            | ADJUST               | ADJUST FOR                                          |
|-------|-------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------|----------------------|-----------------------------------------------------|
|       | MODULATION                                                                                                        | RF DEVIATION           |                                                             |                      |                                                     |
| 1     | 19KHz Pilot<br>signal only                                                                                        | 2 – 5%                 | Oscilloscope to<br>Test Point 5<br>(on MPX board)           | L301, 302<br>and 303 | Maximum Amplitude<br>on scope.                      |
| 2     |                                                                                                                   | 5%                     | * * * * *                                                   | VR301                | Stereo Beacon Lamp<br>just comes on.                |
| 3     | Composite<br>1 KHz signal<br>to Left<br>channel only                                                              | Pilot 9%<br>Signal 70% | Oscilloscope and VTVM<br>to Left channel TAPE<br>OUT jack.  | L302                 | Maximum and undis-<br>torted sine wave on<br>scope. |
| 4     |                                                                                                                   |                        | Oscilloscope and VTVM<br>to Right channel TAPE<br>OUT jack. |                      | Minimum reading on<br>VTVM.                         |
| 5     | Composite<br>1 KHz signal<br>to Right<br>channel only                                                             |                        | Same as in step 3.                                          |                      |                                                     |
| 6     | Repeat steps 4 and 5 until no further improvement is possible.<br>And adjust Separation Adj. VR302, if necessary. |                        |                                                             |                      |                                                     |

### FM MUTING ADJUSTMENT

**INSTRUMENTS:** FM Signal Generator and Oscilloscope.

Set Selector switch to "FM" position.

| STEPS | CONDITION                 | ANTENNA<br>INPUT LEVEL | OUTPUT INDICATOR<br>CONNECTED TO | ADJUST                                           | REMARKS                                                                              |
|-------|---------------------------|------------------------|----------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|
| 1     | Muting<br>switch<br>"OFF" | 10 uV                  | Oscilloscope to<br>TAPE OUT      | * * * * *                                        | Check output                                                                         |
| 2     | Muting<br>switch<br>"ON"  |                        |                                  | Muting Level<br>control VR 901<br>(on chassis)   | Turn to Clockwise<br>until the output<br>just disappears.                            |
| 3     |                           | 1 mV                   |                                  | Freq. Adju. L703<br>(on Muting circuit<br>board) | Adjust L703 to obtain<br>symmetrical output<br>when detuned upper<br>and lower side. |
| 4     | Repeat step 2.            |                        |                                  |                                                  |                                                                                      |

## FM ALIGNMENT PROCEDURE

**Instruments:** FM Sweep Generator, FM Signal Generator, AC VTVM and Oscilloscope.

**NOTES:** Set Selector switch to "FM"

| STEPS | GENERATOR                                                                                                      |                          | TUNING DIAL SETTING            | OUTPUT INDICATOR CONNECTED TO                              | ADJUST                                                                        | ADJUST FOR                                  |
|-------|----------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------|
|       | CONNECTED TO                                                                                                   | FREQUENCY                |                                |                                                            |                                                                               |                                             |
| 1     | FM Sweep Generator<br><br>to junction of C907 & C908 (FM IF Input)                                             | 10.7 MHz                 | Quiet point on band            | Oscilloscope to junction of R127 and C126 (on FM IF board) | T104, 103, 102 & 101 (on FM IF board)<br>Top and Bottom                       | Maximum and Balanced S curve on scope.      |
| 2     | Disconnect FM Sweep Generator and connect FM Signal Generator to FM antenna terminals.                         |                          |                                |                                                            |                                                                               |                                             |
| 3     | FM Signal Generator<br><br>to FM antenna terminals<br>Signal strength must be kept -3db of limiter saturation. | 98MHz (400Hz 100% mod.)  | Tune for maximum output point. | Oscilloscope and AC VTVM to TAPE OUT jack                  | T2, Top & Bottom (on Front-end)<br>Touch up T101, 102 103 & 104 if necessary. | Maximum and undistorted amplitude on scope. |
| 4     |                                                                                                                | 90MHz (400 Hz 100% mod.) | 90MHz                          |                                                            | L2 (OSC), L1 (RF) & T1 (ANT) (on Front-end)                                   | Maximum reading on VTVM                     |
| 5     |                                                                                                                | 106MHz (400Hz 100% mod.) | 106MHz                         |                                                            | CT3 (OSC), CT2 (RF) & CT1 (ANT) (on Front-end)                                |                                             |
| 6.    | Repeat steps 4 and 5 until no further improvement is noticed.                                                  |                          |                                |                                                            |                                                                               |                                             |

## AM ALIGNMENT PROCEDURE

**Instruments:** AM Signal Generator and AC VTVM.

**NOTES:** Set Selector switch to AM.

Input signal must be kept as low as possible to avoid AVC action.

| STEPS | GENERATOR                                                                     |                            | TUNING DIAL SETTING                  | OUTPUT INDICATOR CONNECTED TO | ADJUST                                           | ADJUST FOR               |
|-------|-------------------------------------------------------------------------------|----------------------------|--------------------------------------|-------------------------------|--------------------------------------------------|--------------------------|
|       | COUPLING                                                                      | FREQUENCY                  |                                      |                               |                                                  |                          |
| 1     | Tr201 Base (on AM IF board) through a 0.1mfd capacitor                        | 455 KHz (400 Hz 30% mod.)  | Non interfering at low end of scale. | AC VTVM to TAPE OUT jack.     | T203, 202 and 201 (on AM IF board)               | Maximum reading on VTVM. |
| 2     | Connect to short loop of wire. Radiate signal into ferrite loopstick antenna. | 600 KHz (400 Hz 30% mod.)  | 600 KHz                              |                               | L201 (OSC) (on AM IF board) & L901 (ANT coil).   |                          |
| 3     |                                                                               | 1400 KHz (400 Hz 30% mod.) | 1400 KHz                             |                               | CT5 (OSC trim.) & CT4 (ANT trim.) (on Front-end) |                          |
| 4     | Repeat steps 2 and 3 until no further improvement is noticed.                 |                            |                                      |                               |                                                  |                          |

## PREDRIVER/DRIVER ADJUSTMENT

### PRE-DRIVER/DRIVER ADJUSTMENT

1. Set BALANCE, BASS and TREBLE controls to mid-position.
2. Set MODE switch to "STEREO", SPEAKER switch to "ON" and SELECTOR switch to "AUX" position.
3. Connect 8 ohm, 50 watts resistor across Left speaker terminals. Then, in parallel with the load resistor, connect a VTVM and the vertical input leads of an oscilloscope.
4. Connect an audio signal generator to Left channel, AUX input and apply 1,000 Hz (sine wave) signals.
5. Rotate Volume Control counterclockwise to get 0.9 volts RMS across 8 ohm (0.1 watt output) on VTVM. Adjust crossover distortion by turning Idling Adjust Control VR601 (on driver circuit board) until ideal response appears on scope (see Figure 1).

Or Adjust idling current using a DC milli-volt meter across R617 resistor (on driver circuit board), rotate VR601 to obtain a 10mV reading on DC milli-volt meter = no signal input = (see Figure 2).

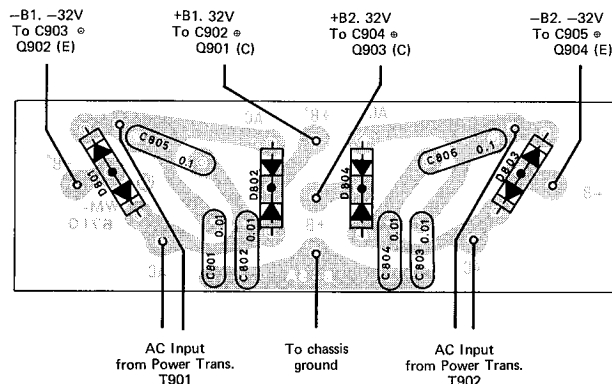
6. Repeat the same steps 3 thru 5 as above for Right channel.

## FM MONO-STEREO AUTOMATIC SWITCHING LEVEL

### ADJUSTMENT PROCEDURE

1. Connect a VTVM and Oscilloscope to the TAPE OUT jack (Left or Right).
2. Feed the FM signal with Stereo modulation into the FM ANT terminals.
3. Set the frequency at 98 MHz (when there are disrupting signal, choose another setting).
4. Set the MODE switch to STEREO and FUNCTION switch to FM MANUAL.
5. Turn CCW the MONO - STEREO Auto-switching Level Adj. VR101 (on FM IF board): this is a condition in which Auto-switching does not function.
6. Adjust the FM MPX so that the distortion and separation will be best.
7. Adjust the VR101 so that when the antenna input level is 30uV or more, Stereo will switch in and when the input is below the 30uV level, Mono will switch in.
8. After adjustment, check to make sure that, indeed, when the antenna input level exceeds 30uV, Stereo will switch in.

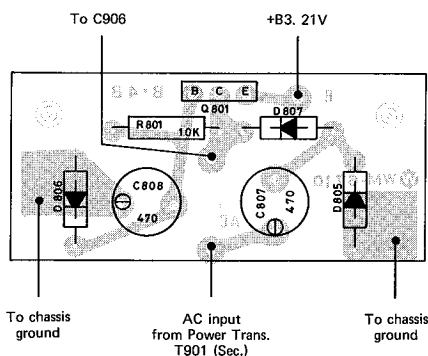
## POWER SUPPLY CIRCUIT BOARD



NOTES: 1. RESISTANCE IS SHOWN IN OHMS.  
2. CAPACITANCE IS SHOWN IN MFD.

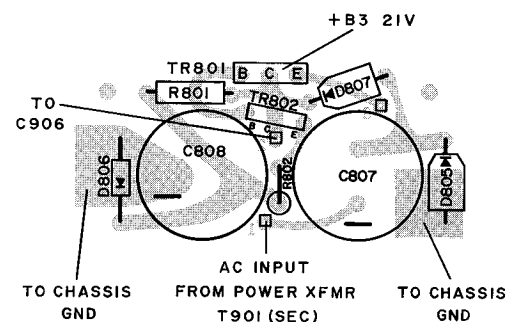
## POWER SUPPLY (TUNER AND PREAMP)

### VERSION 1

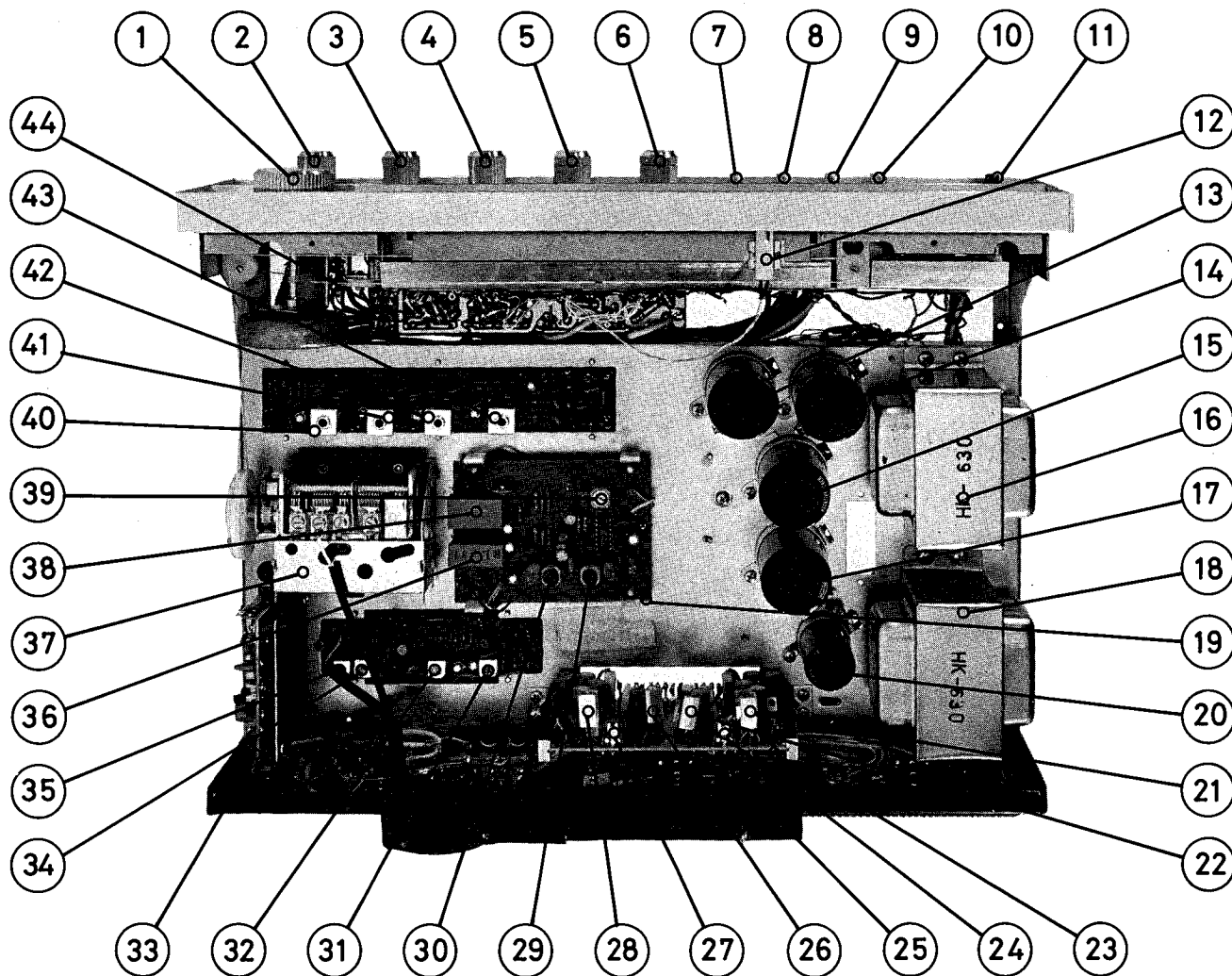


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.  
2. CAPACITANCE IS SHOWN IN MFD.

### VERSION 2

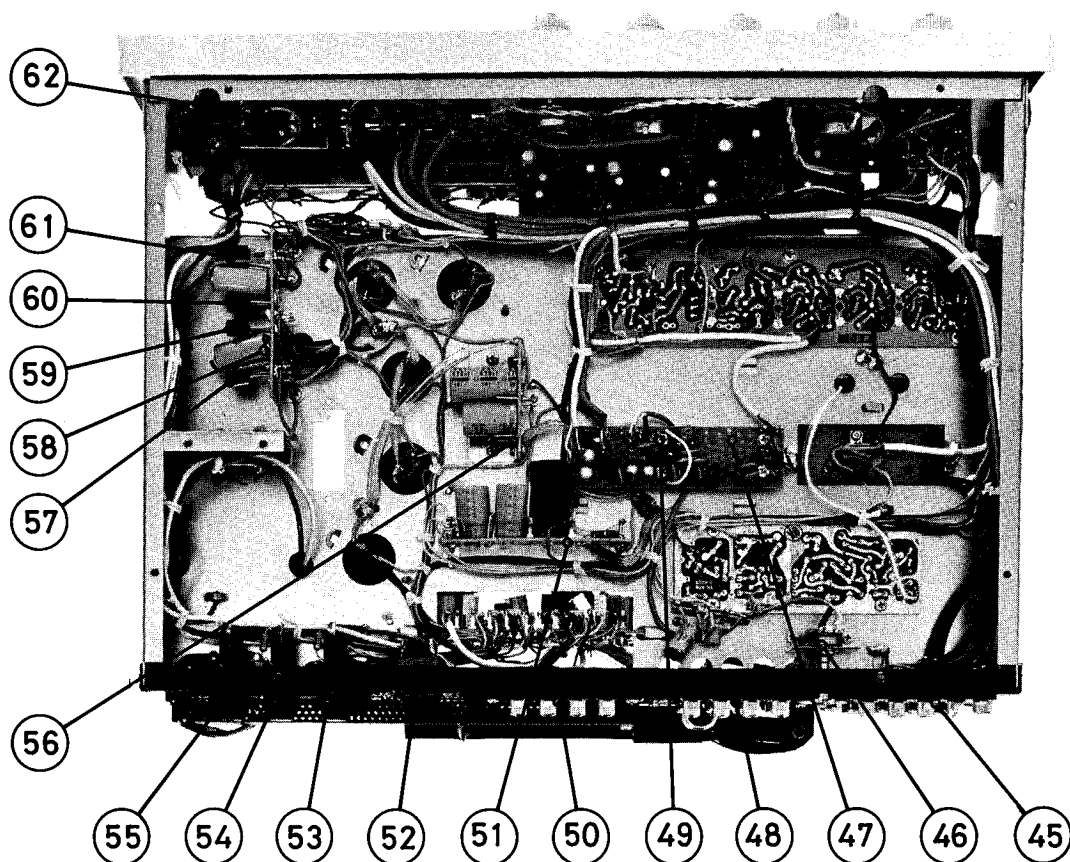


### TOP VIEW

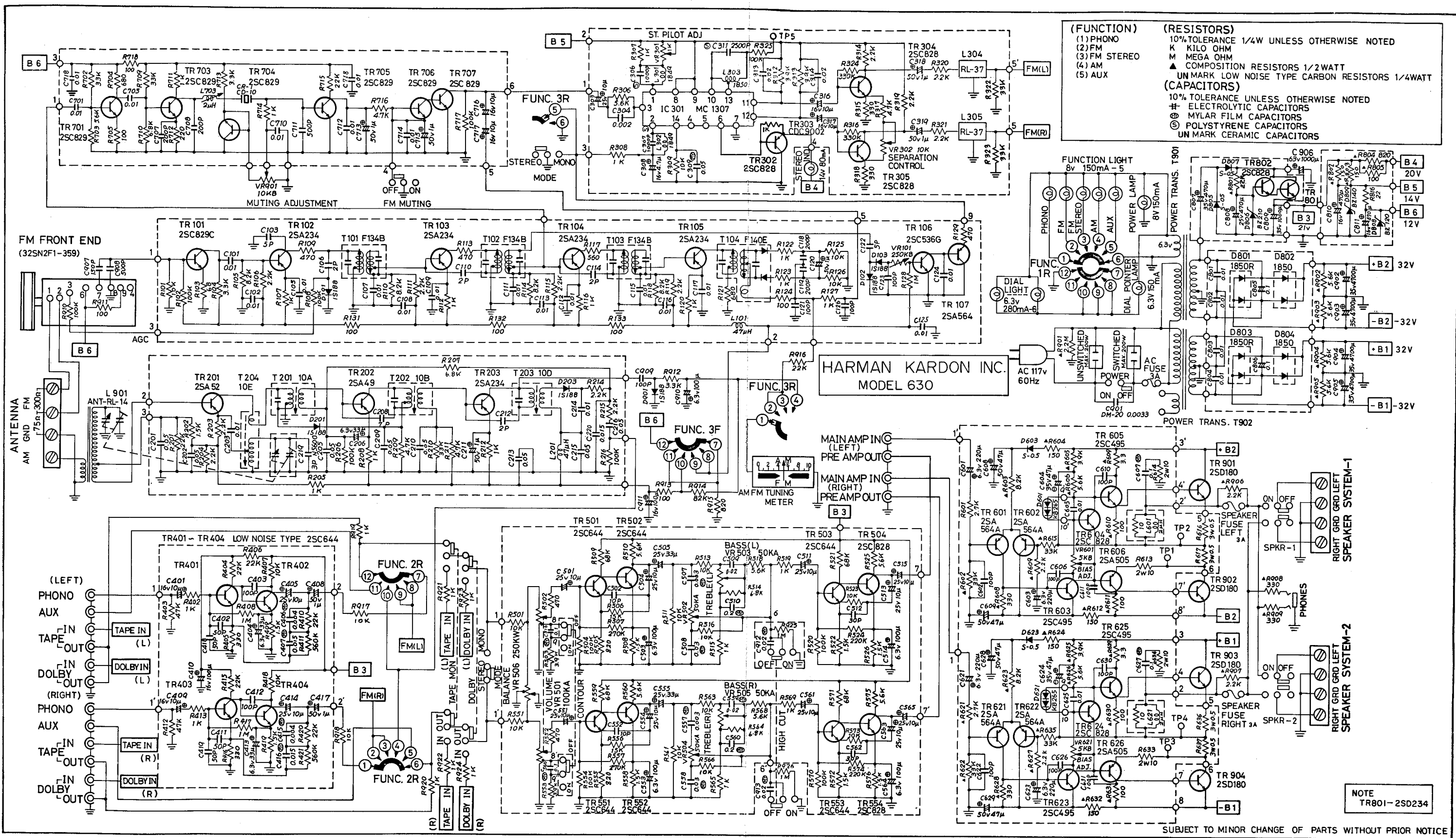


- |                                            |                                             |                                          |
|--------------------------------------------|---------------------------------------------|------------------------------------------|
| <b>1</b> TUNING KNOB                       | <b>16</b> T901, POWER TRANSFORMER (R-CH)    | <b>31</b> T203, AM IFT (3rd)             |
| <b>2</b> FUNC. SELECTOR SWITCH             | <b>17</b> C905, RIPPLE FILTER               | <b>32</b> T202, AM IFT (2nd)             |
| <b>3</b> VR502, VOLUME CONTROL             | <b>18</b> T902, POWER TRANSFORMER (L-CH)    | <b>33</b> EQUALIZER AMP CIRCUIT BOARD    |
| <b>4</b> VR501, BALANCE CONTROL            | <b>19</b> MPX CIRCUIT BOARD                 | <b>34</b> T201, AM IFT (1st)             |
| <b>5</b> VR503, TREBLE CONTROL             | <b>20</b> C906, RIPPLE FILTER               | <b>35</b> L201, AM LOCAL OSCILLATOR COIL |
| <b>6</b> VR504, BASS CONTROL               | <b>21</b> Q626, DRIVER TRANSISTOR (R-CH)    | <b>36</b> L304, MPX 38KHz FILTER         |
| <b>7</b> CONTOUR SWITCH & FM MUTING SWITCH | <b>22</b> Q625, DRIVER TRANSISTOR (R-CH)    | <b>37</b> AM/FM FRONT END                |
| <b>8</b> TAPE MON. SWITCH & MODE SWITCH    | <b>23</b> PREDRIVER/DRIVER CIRCUIT BOARD    | <b>38</b> L305, MPX 38KHz FILTER         |
| <b>9</b> HIGH-CUT SWITCH & DOLBY SWITCH    | <b>24</b> VR621, IDLING CURRENT ADJ. (R-CH) | <b>39</b> L303, MPX COIL, 38KHz TUNE     |
| <b>10</b> SPEAKERS SWITCH                  | <b>25</b> L901, AM LOOPSTICK ANTENNA        | <b>40</b> T101, FM IFT (1st)             |
| <b>11</b> POWER SWITCH                     | <b>26</b> Q605, DRIVER TRANSISTOR (L-CH)    | <b>41</b> T102, FM IFT (2nd)             |
| <b>12</b> DIAL POINTER                     | <b>27</b> VR601, IDLING CURRENT ADJ. (L-CH) | <b>42</b> T103, FM IFT (3rd)             |
| <b>13</b> C903, RIPPLE FILTER              | <b>28</b> Q606, DRIVER TRANSISTOR           | <b>43</b> T104, FM IFT (RATIO)           |
| <b>14</b> C902, RIPPLE FILTER              | <b>29</b> L301, MPX COIL, 19KHz TUNE        | <b>44</b> TONE AMP CIRCUIT BOARD         |
| <b>15</b> C904, RIPPLE FILTER              | <b>30</b> L302, MPX COIL, 19KHz TUNE        |                                          |

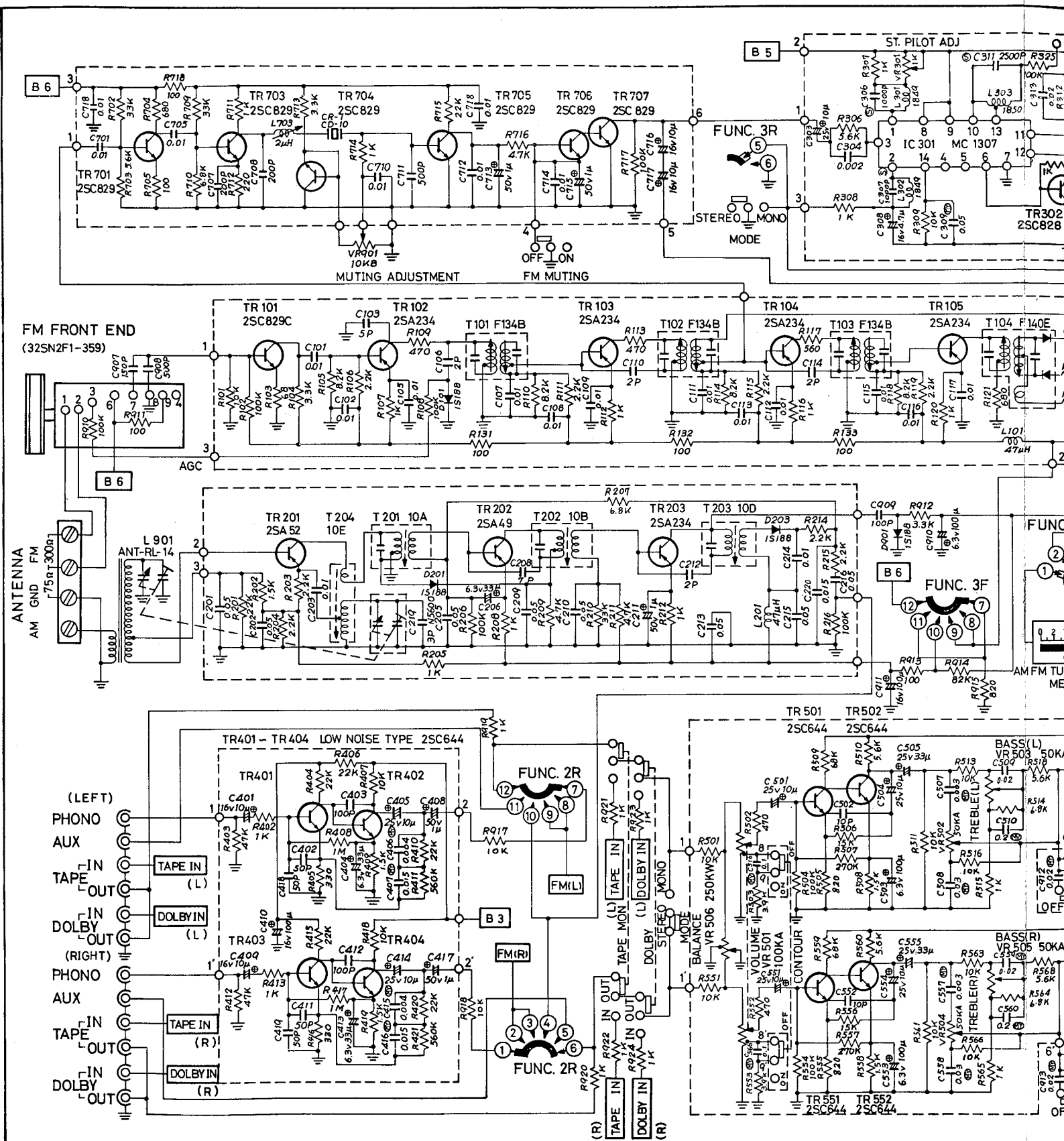
## BOTTOM VIEW



- |                                       |                                                        |
|---------------------------------------|--------------------------------------------------------|
| (45) ANTENNA TERMINAL STRIP           | (55) AC FUSE                                           |
| (46) VR901, FM MUTING LEVEL ADJ.      | (56) POWER SUPPLY CIRCUIT BOARD<br>FOR TUNER & PREAMP. |
| (47) FM MUTING CIRCUIT BOARD          | (57) D803, RECTIFIER                                   |
| (48) SPEAKER SYSTEM -1 TERMINAL STRIP | (58) POWER SUPPLY CIRCUIT BOARD<br>FOR POWER AMP.      |
| (49) L703, MUTING COIL                | (59) D804, RECTIFIER                                   |
| (50) SPEAKER SYSTEM -2 TERMINAL STRIP | (60) D802, RECTIFIER                                   |
| (51) REGULATOR CIRCUIT BOARD          | (61) D801, RECTIFIER                                   |
| (52) AC OUTLET                        | (62) HEADPHONE RECEPTACLE                              |
| (53) SPEAKER FUSE, L-CH               |                                                        |
| (54) SPEAKER FUSE, R-CH               |                                                        |



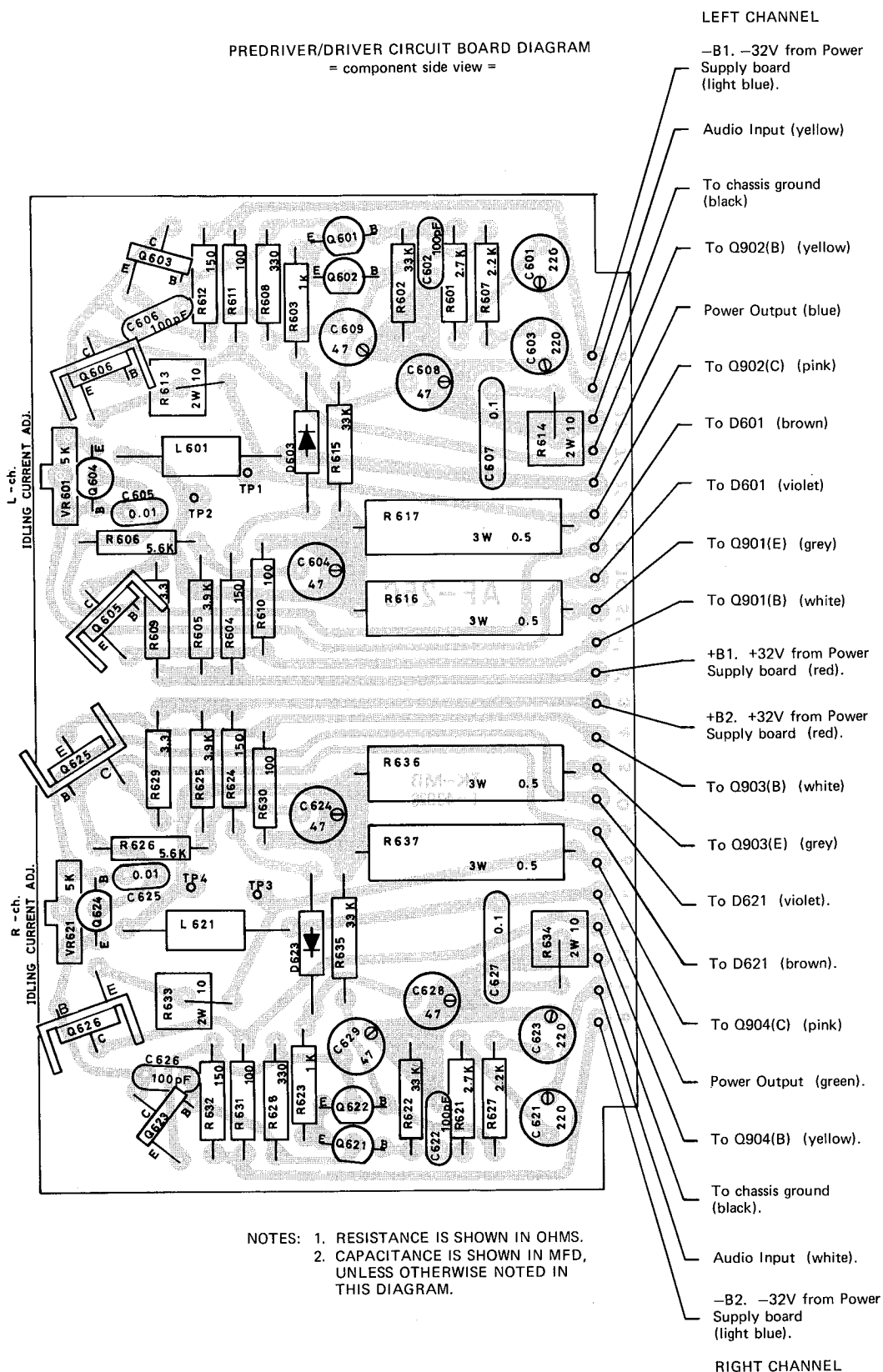
## SCHEMATIC DIAGRAM - MODEL 630



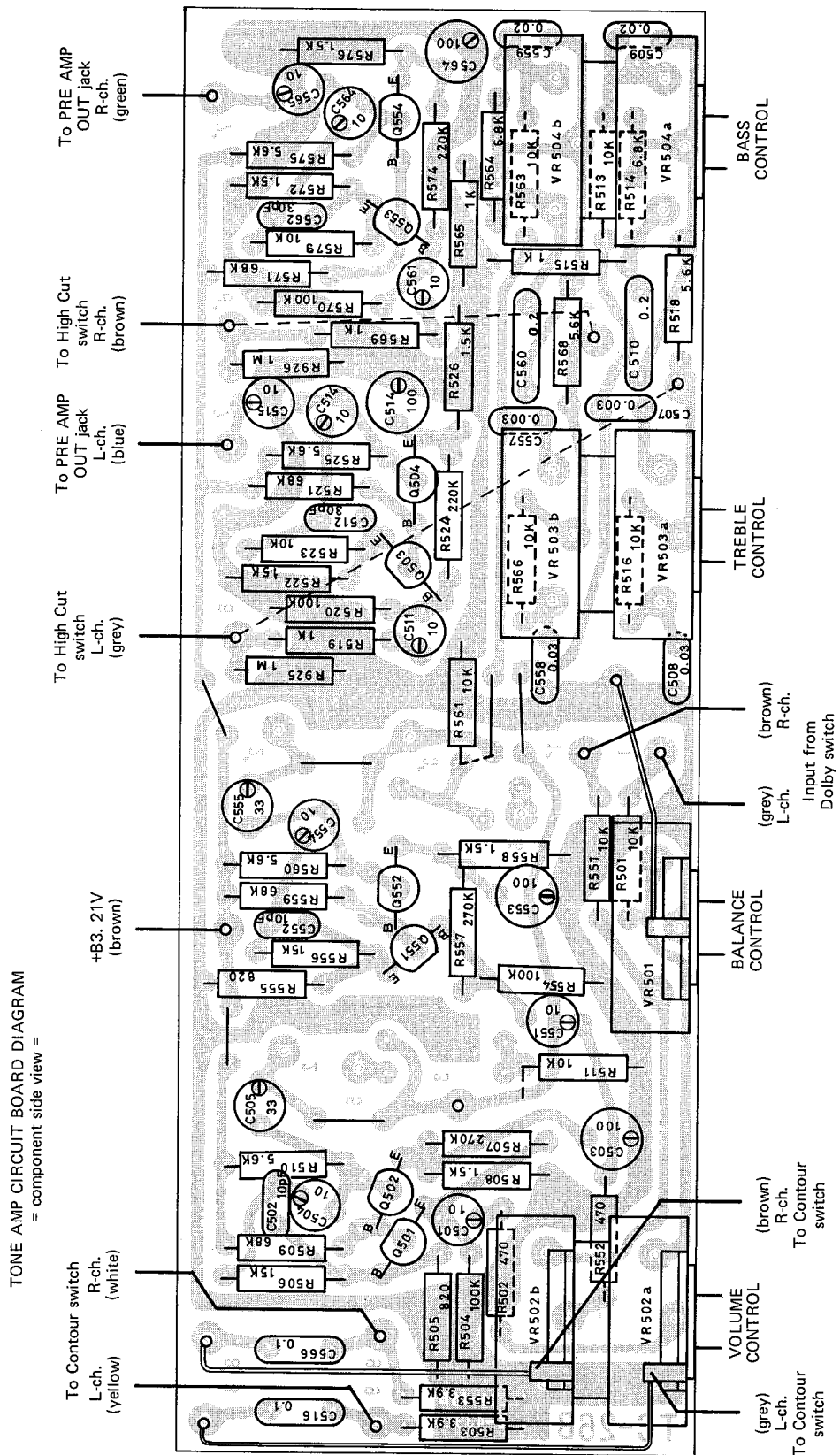


# PREDRIVER/DRIVER CIRCUIT BOARD

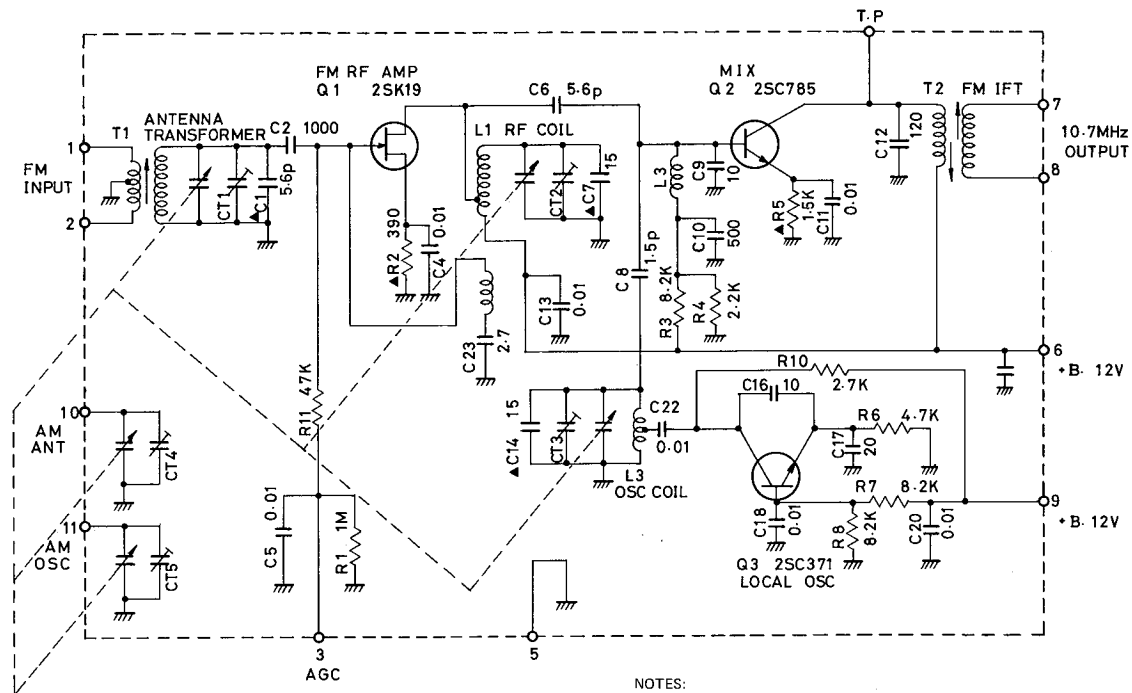
PREDRIVER/DRIVER CIRCUIT BOARD DIAGRAM  
= component side view =



# TONE AMP CIRCUIT BOARD



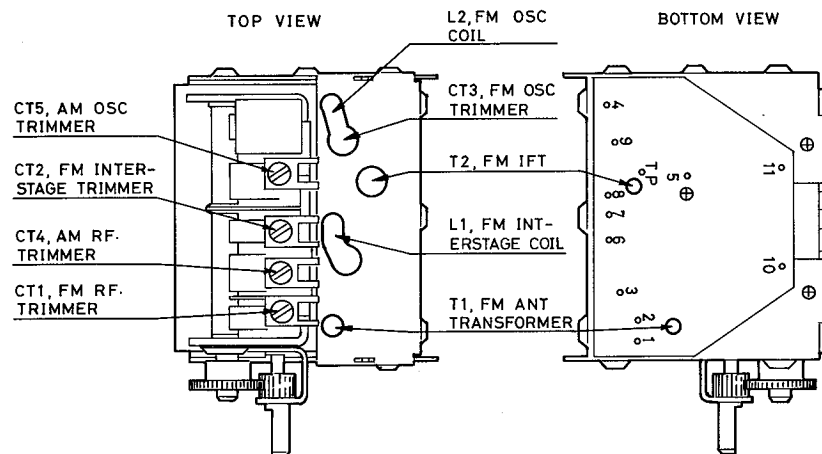
## AM/FM FRONT END SCHEMATIC



### NOTES:

1. ALL CAPACITANCE VALUES ARE EXPRESSED IN MMF, EXCEPT DECIMAL VALUES IN MF.
2. ALL RESISTANCE VALUES ARE SHOWN IN OHMS.
3. Δ VALUES SHOWN ARE FACTORY AVERAGE VALUE.

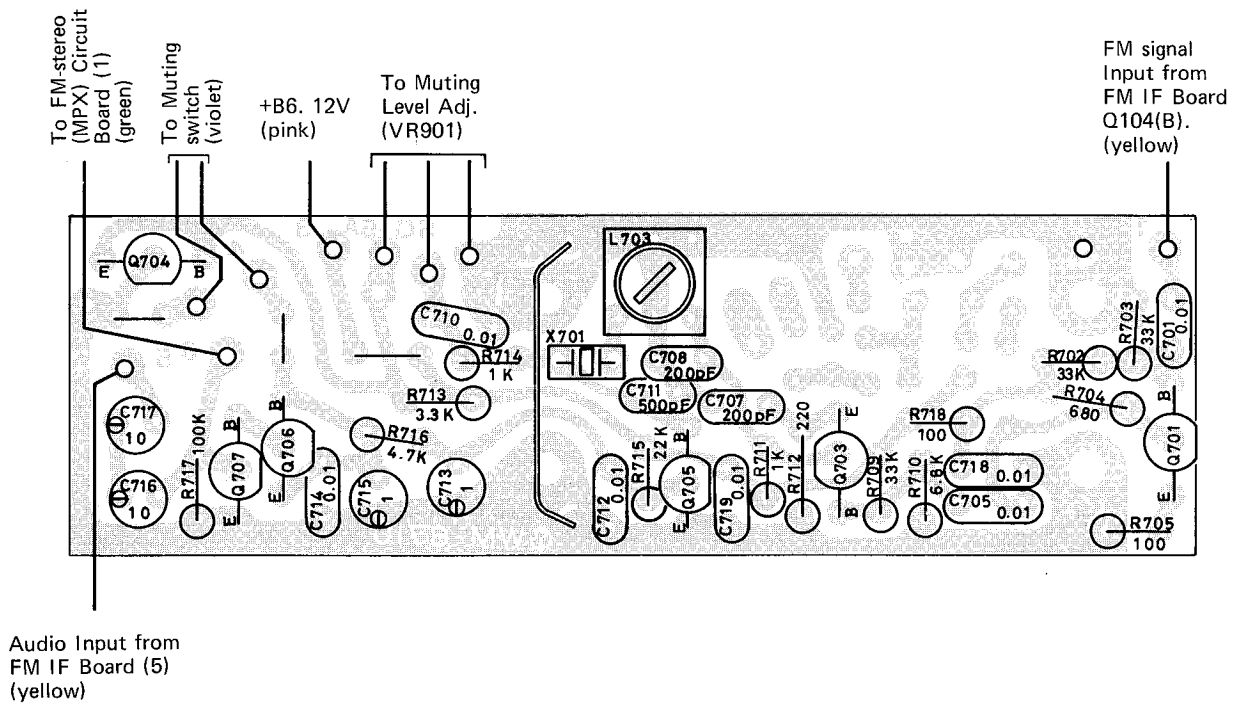
## AM/FM FRONT END LAYOUT (32SNF1-359)



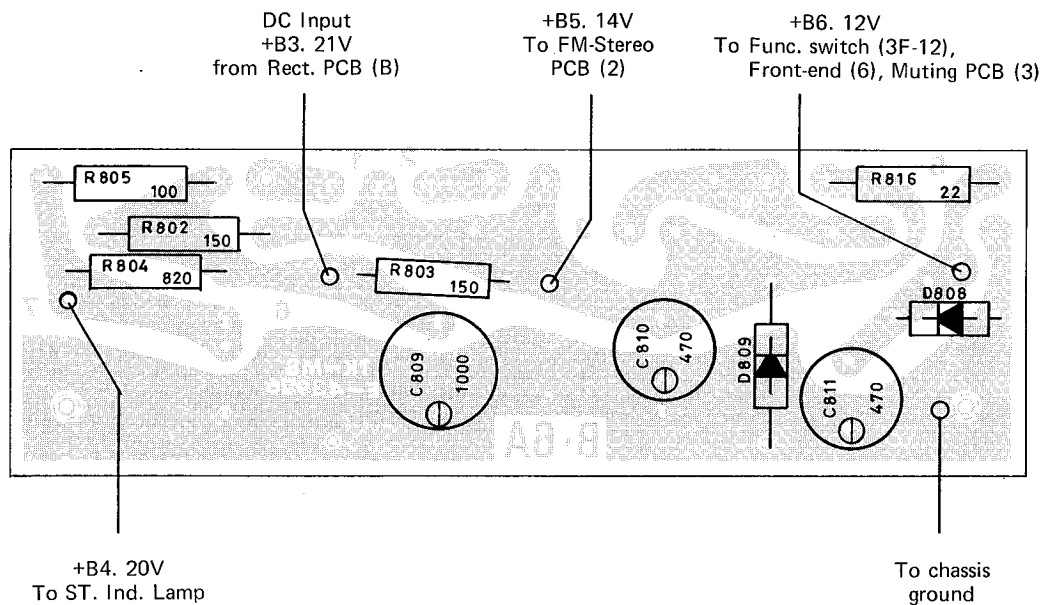
### DESCRIPTION OF TERMINALS:

- No. 1, 2. ANTENNA, 300 ohm BALANCED
3. AGC
4. NC
5. GND
6. B+, RF and MIX.
7. IF, HOT
8. IF, COLD
9. B+, OSC
10. AM RF VC
11. AM OSC VC

## MUTING CIRCUIT BOARD

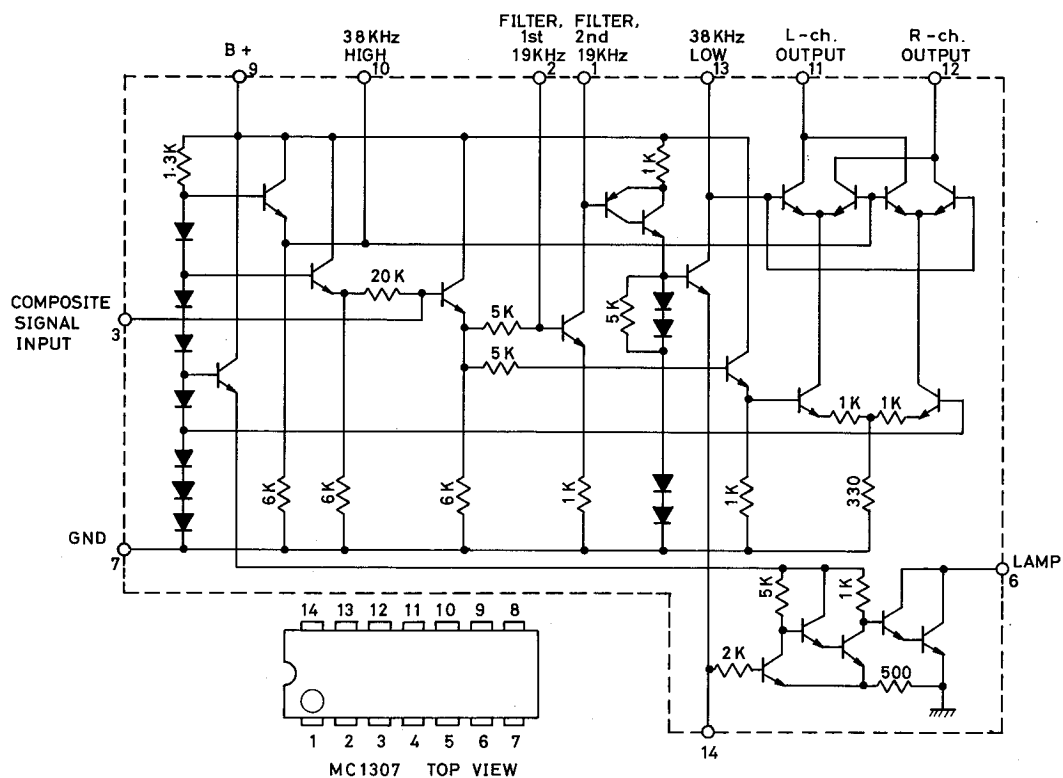


## REGULATOR CIRCUIT BOARD

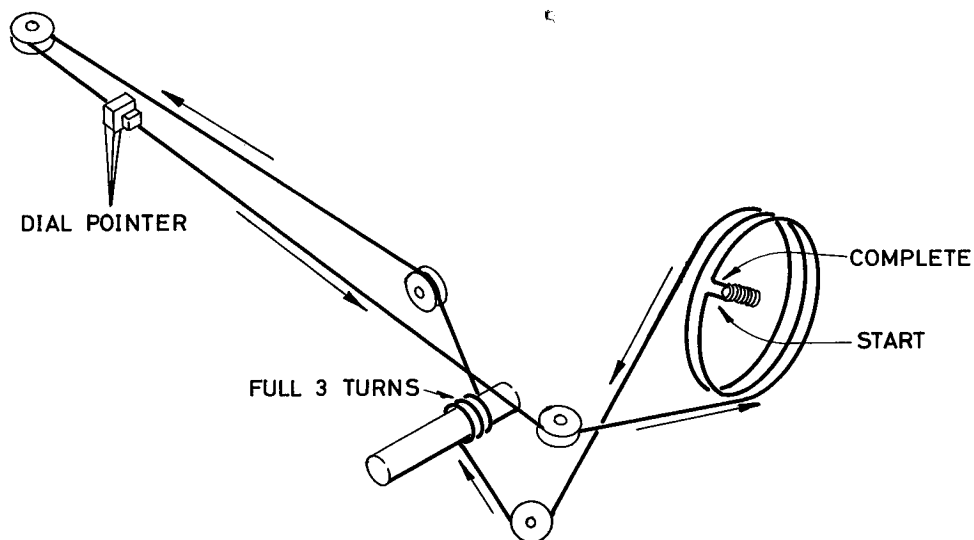


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.  
2. CAPACITANCE IS SHOWN IN MFD.

## FM MULTIPLEX STEREO DEMODULATOR SCHEMATIC



## DIAL STRINGING DIAGRAM



NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803, Att: Parts Department.

# REPLACEMENT PARTS LIST

| H-K                             | H-K                         | H-K         | H-K         |
|---------------------------------|-----------------------------|-------------|-------------|
| PART NO.                        | REF. NO.                    | PART NO.    | REF. NO.    |
| DESCRIPTION                     | DESCRIPTION                 | DESCRIPTION | DESCRIPTION |
| <b>TRANSFORMERS &amp; COILS</b> |                             |             |             |
| 12026545                        |                             |             |             |
| 10128136                        | T901/2                      |             |             |
| 12028103                        | L301/2                      |             |             |
| 12024858                        | L303                        |             |             |
| 12028137                        | L901                        |             |             |
| 12028102                        | L304/5                      |             |             |
| 12028141                        | L703                        |             |             |
| 12028166                        | L601/21                     |             |             |
| 12027934                        | L201                        |             |             |
| 12028138                        | L101/202                    |             |             |
| 11024846                        | T101/2/3                    |             |             |
| 11028263                        | T104                        |             |             |
| 11024829                        | T201                        |             |             |
| 11024830                        | T202                        |             |             |
| 11024831                        | T203                        |             |             |
| <b>DIODES</b>                   |                             |             |             |
| 41027991                        | D802/4                      |             |             |
| 41028109                        | D801/3                      |             |             |
| 41028139                        | D301/603/23/805/7           |             |             |
| *42028108                       | D806                        |             |             |
| *42028107                       | D808                        |             |             |
| *42028106                       | D809                        |             |             |
| 42025628                        | D101/2/3/201/2/901          |             |             |
| <b>CONTROLS</b>                 |                             |             |             |
| 23528127                        | VR301                       |             |             |
| 23528129                        | VR302                       |             |             |
| 23528125                        | VR601/21                    |             |             |
| 23528126                        | VR101                       |             |             |
| 23528165                        | VR901                       |             |             |
| 22028135                        | VR502/3/4/5                 |             |             |
| 22028162                        | VR501                       |             |             |
| 22028163                        | VR506                       |             |             |
| <b>TRANSISTORS</b>              |                             |             |             |
| *43025624                       | Q901/2/3/4                  |             |             |
| *43026932                       | Q801                        |             |             |
| 43028214                        | Q603/23/605/25              |             |             |
| 43028215                        | Q606/26                     |             |             |
| 43025972                        | Q401/2/3/4/501/2/3/51/52/53 |             |             |
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