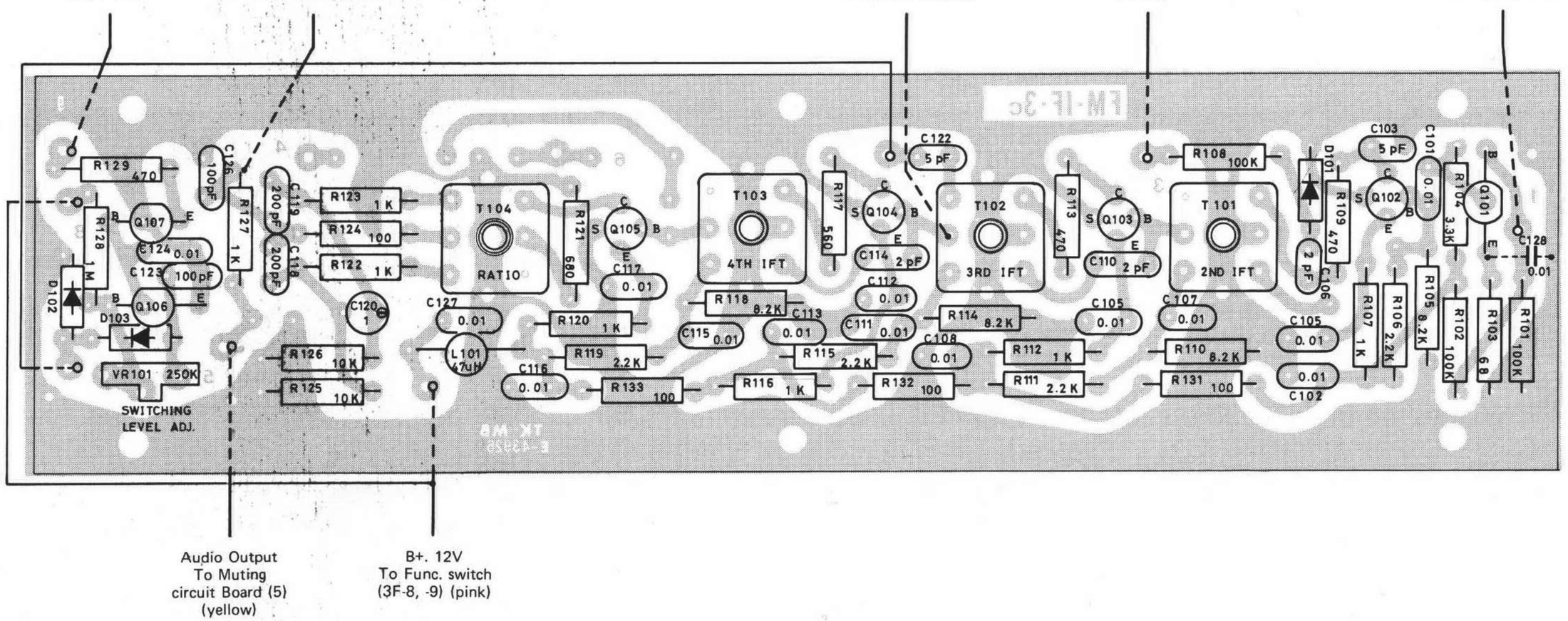
# The Harman-Kardon Model 630

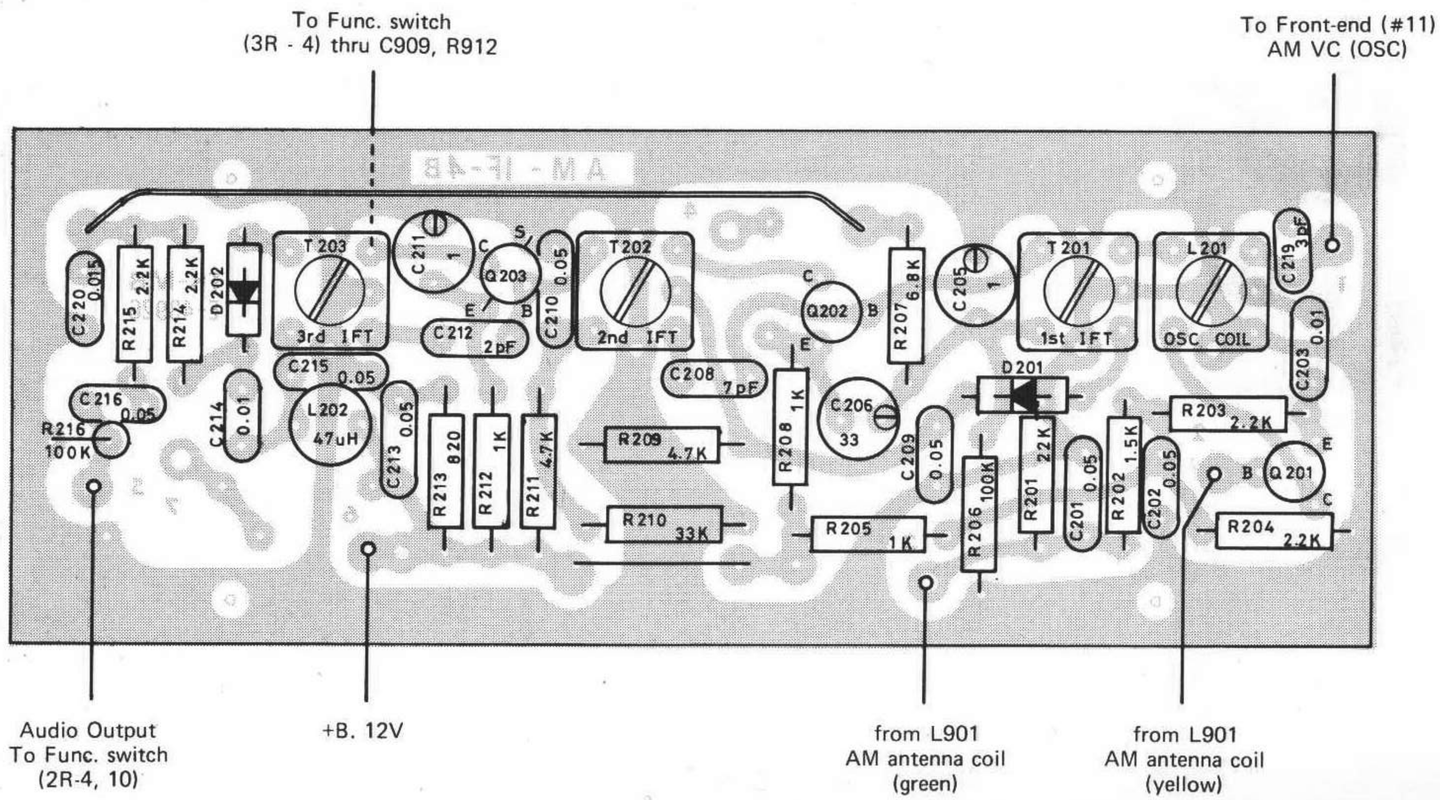
# AM/FM/Stereo FM Solid State Receiver

# Technical Manual

## FM IF CIRCUIT BOARD

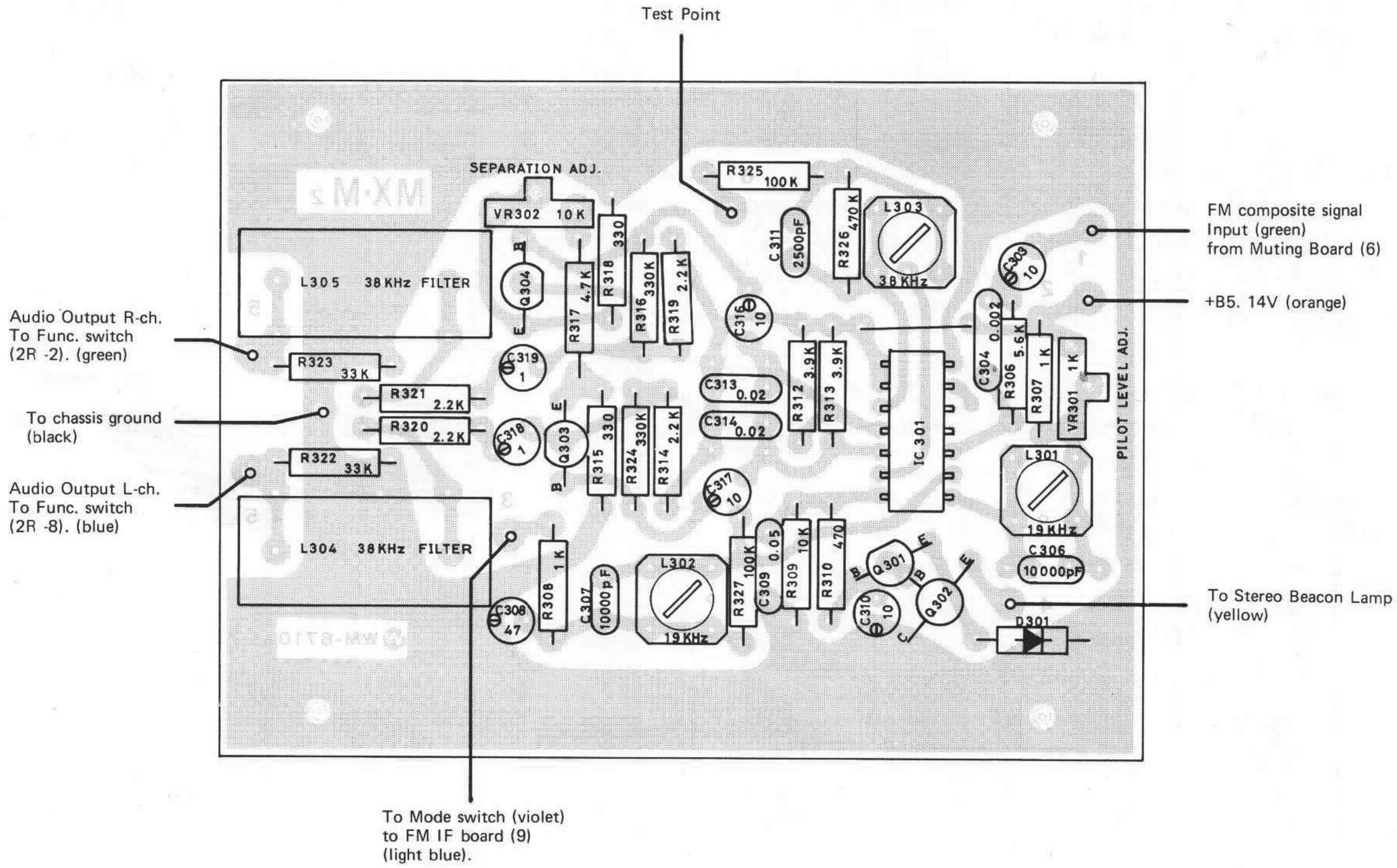



## AM CIRCUIT BOARD

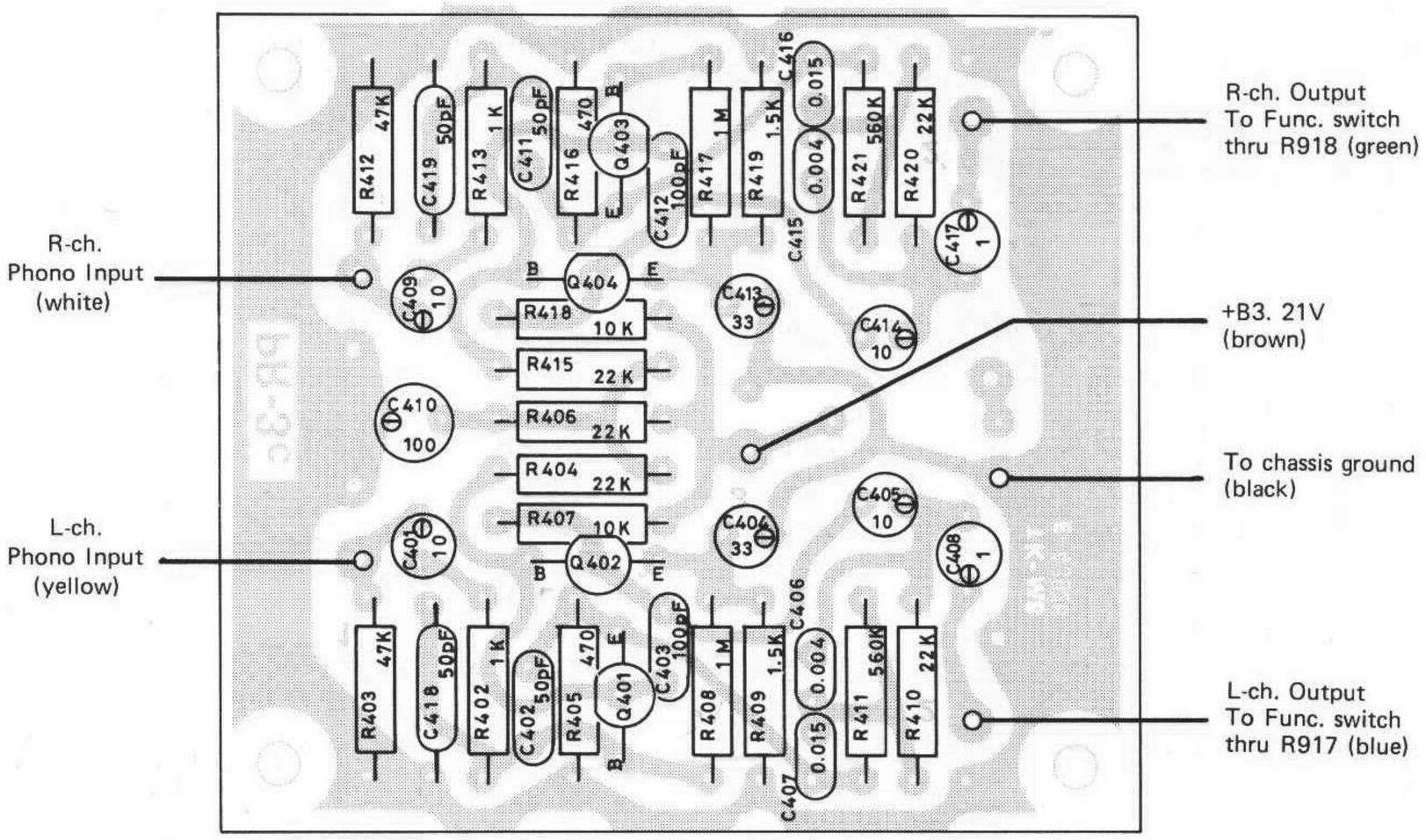



NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD, UNLESS OTHERWISE NOTED IN THIS DIAGRAM.

# 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 CONNECTED TO | ADJUST | ADJUST FOR |
|---|---|---|---|---|---|
| | MODULATION | RF DEVIATION | | | |
| 1 | 19KHz Pilot signal only | 2 – 5% | Oscilloscope to Test Point 5 (on MPX board) | L301, 302 and 303 | Maximum Amplitude on scope. |
| 2 | | 5% | * * * * * * * * * * | VR301 | Stereo Beacon Lamp just comes on. |
| 3 | Composite 1 KHz signal to Left channel only | Pilot 9% Signal 70% | Oscilloscope and VTVM to Left channel TAPE OUT jack. | L302 | Maximum and undistorted sine wave on scope. |
| 4 | | | Oscilloscope and VTVM to Right channel TAPE OUT jack. | | Minimum reading on VTVM. |
| 5 | Composite 1 KHz signal to Right channel only | | Same as in step 3. | | |
| 6 | Repeat steps 4 and 5 until no further improvement is possible. 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 INPUT LEVEL | OUTPUT INDICATOR CONNECTED TO | ADJUST | REMARKS |
|---|---|---|---|---|---|
| 1 | Muting switch "OFF" | 10 uV | Oscilloscope to TAPE OUT | * * * * * * | Check output |
| 2 | Muting switch "ON" | | | Muting Level control VR 901 (on chassis) | Turn to Clockwise until the output just disappears. |
| 3 | | 1 mV | | Freq. Adju. L703 (on Muting circuit board) | Adjust L703 to obtain symmetrical output when detuned upper 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 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) 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 to FM antenna terminals Signal strength must be kept —3db of limitter satulation. | 98MHz (400Hz 100% mod.) | Tune for maximum output point. | Oscilloscope and AC VTVM to TAPE OUT jack | T2, Top & Bottom (on Front-end) 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 inter-fering 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).

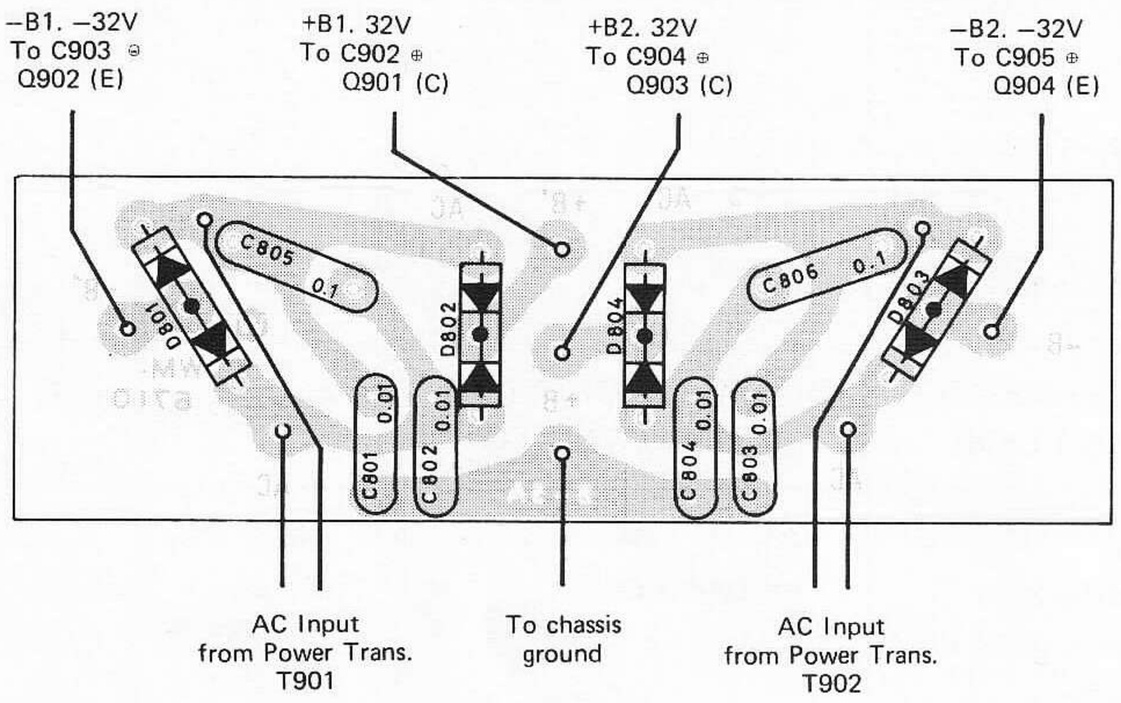
   Or Adjust idling current using a DC milli-volt meter across R617 resistor (on driver circuit board), rotate VR601 to obtain a 10mV reading on DC milli-volt meter = no signal input = (see Figure 2).
6. Repeat the same steps 3 thru 5 as above for Right channel.

## 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.

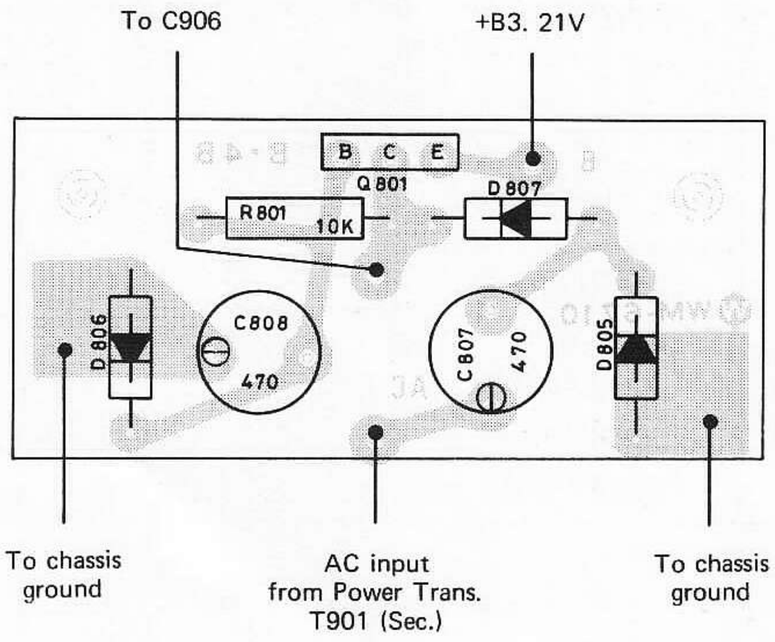
## POWER SUPPLY CIRCUIT BOARD




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

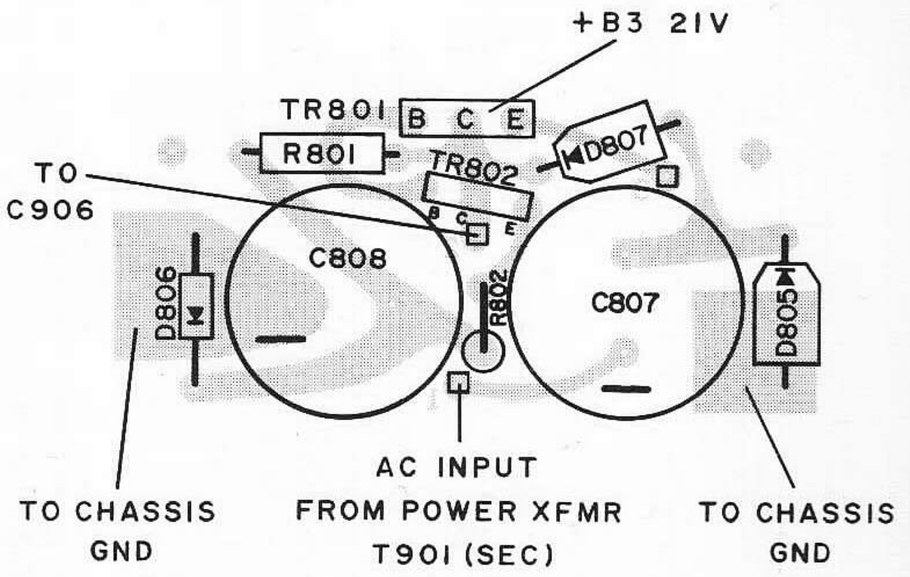
## POWER SUPPLY (TUNER AND PREAMP)

### VERSION 1

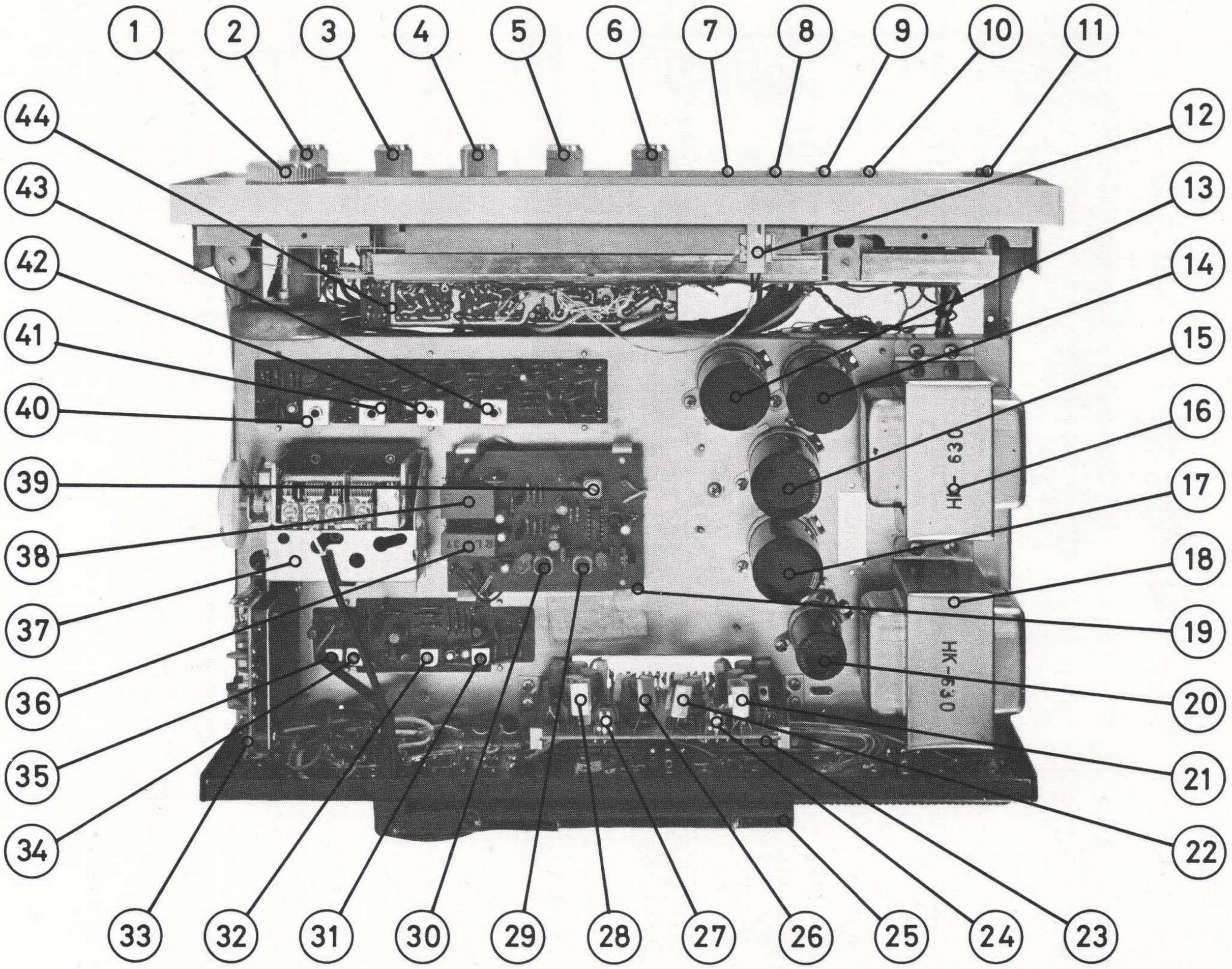



NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD.

### VERSION 2



## TOP VIEW




(1) TUNING KNOB

(2) FUNC. SELECTOR SWITCH

(3) VR502, VOLUME CONTROL

(4) VR501, BALANCE CONTROL

(5) VR503, TREBLE CONTROL

(6) VR504, BASS CONTROL

(7) CONTOUR SWITCH & FM MUTING SWITCH

(8) TAPE MON. SWITCH & MODE SWITCH

(9) HIGH-CUT SWITCH & DOLBY SWITCH

(10) SPEAKERS SWITCH

(11) POWER SWITCH

(12) DIAL POINTER

(13) C903, RIPPLE FILTER

(14) C902, RIPPLE FILTER

(15) C904, RIPPLE FILTER

(16) T901, POWER TRANSFORMER (R-CH)

(17) C905, RIPPLE FILTER

(18) T902, POWER TRANSFORMER (L-CH)

(19) MPX CIRCUIT BOARD

(20) C906, RIPPLE FILTER

(21) Q626, DRIVER TRANSISTOR (R-CH)

(22) Q625, DRIVER TRANSISTOR (R-CH)

(23) PREDRIVER/DRIVER CIRCUIT BOARD

(24) VR621, IDLING CURRENT ADJ. (R-CH)

(25) L901, AM LOOPSTICK ANTENNA

(26) Q605, DRIVER TRANSISTOR (L-CH)

(27) VR601, IDLING CURRENT ADJ. (L-CH)

(28) Q606, DRIVER TRANSISTOR

(29) L301, MPX COIL, 19KHz TUNE

(30) L302, MPX COIL, 19KHz TUNE

(31) T203, AM IFT (3rd)

(32) T202, AM IFT (2nd)

(33) EQUALIZER AMP CIRCUIT BOARD

(34) T201, AM IFT (1st)

(35) L201, AM LOCAL OSCILLATOR COIL

(36) L304, MPX 38KHz FILTER

(37) AM/FM FRONT END

(38) L305, MPX 38KHz FILTER

(39) L303, MPX COIL, 38KHz TUNE

(40) T101, FM IFT (1st)

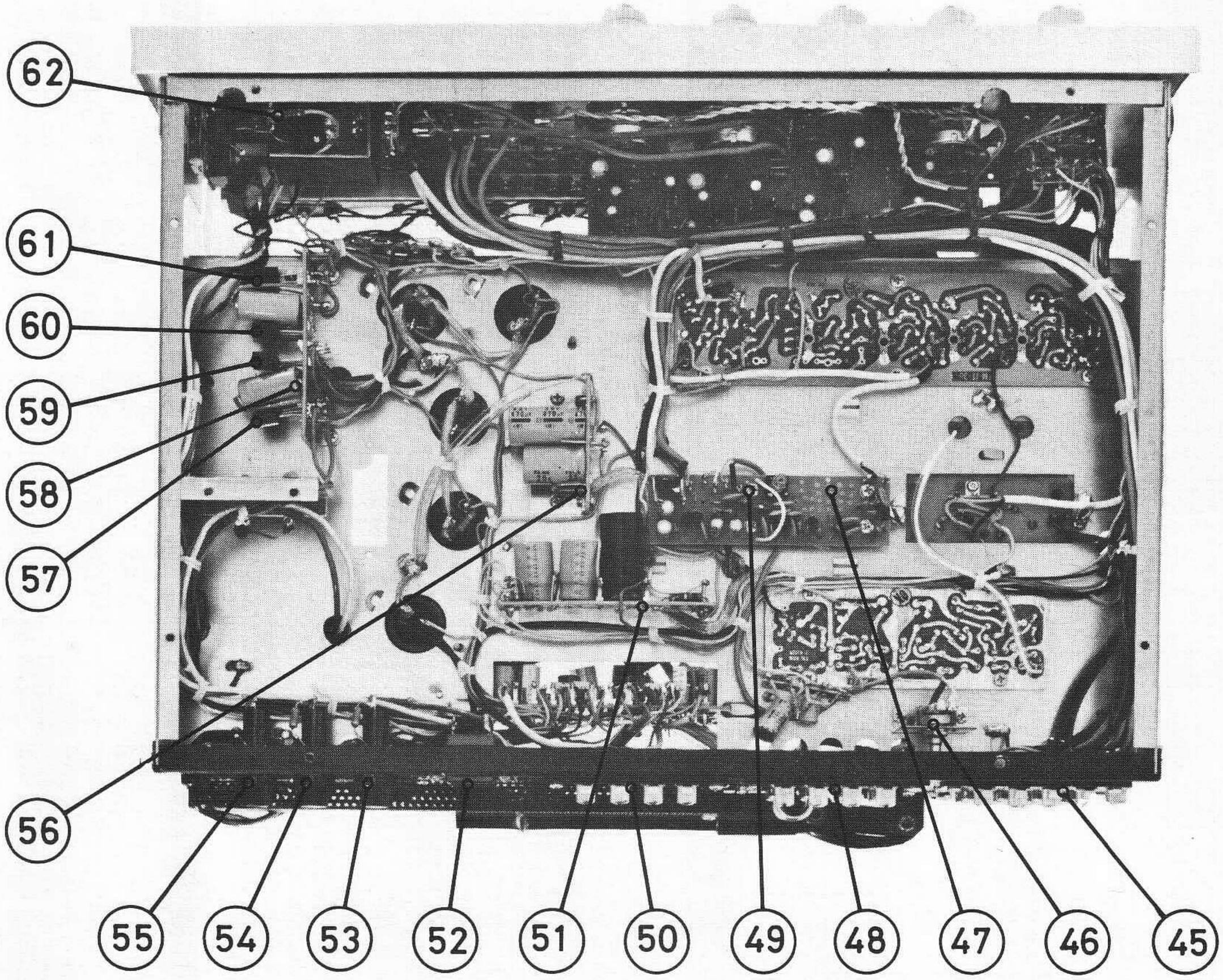
(41) T102, FM IFT (2nd)

(42) T103, FM IFT (3rd)

(43) T104, FM IFT (RATIO)

(44) TONE AMP CIRCUIT BOARD

# BOTTOM VIEW




45 ANTENNA TERMINAL STRIP

46 VR901, FM MUTING LEVEL ADJ.

47 FM MUTING CIRCUIT BOARD

48 SPEAKER SYSTEM –1 TERMINAL STRIP

49 L703, MUTING COIL

50 SPEAKER SYSTEM –2 TERMINAL STRIP

51 REGULATOR CIRCUIT BOARD

52 AC OUTLET

53 SPEAKER FUSE, L-CH

54 SPEAKER FUSE, R-CH

55 AC FUSE

56 POWER SUPPLY CIRCUIT BOARD FOR TUNER & PREAMP.

57 D803, RECTIFIER

58 POWER SUPPLY CIRCUIT BOARD FOR POWER AMP.

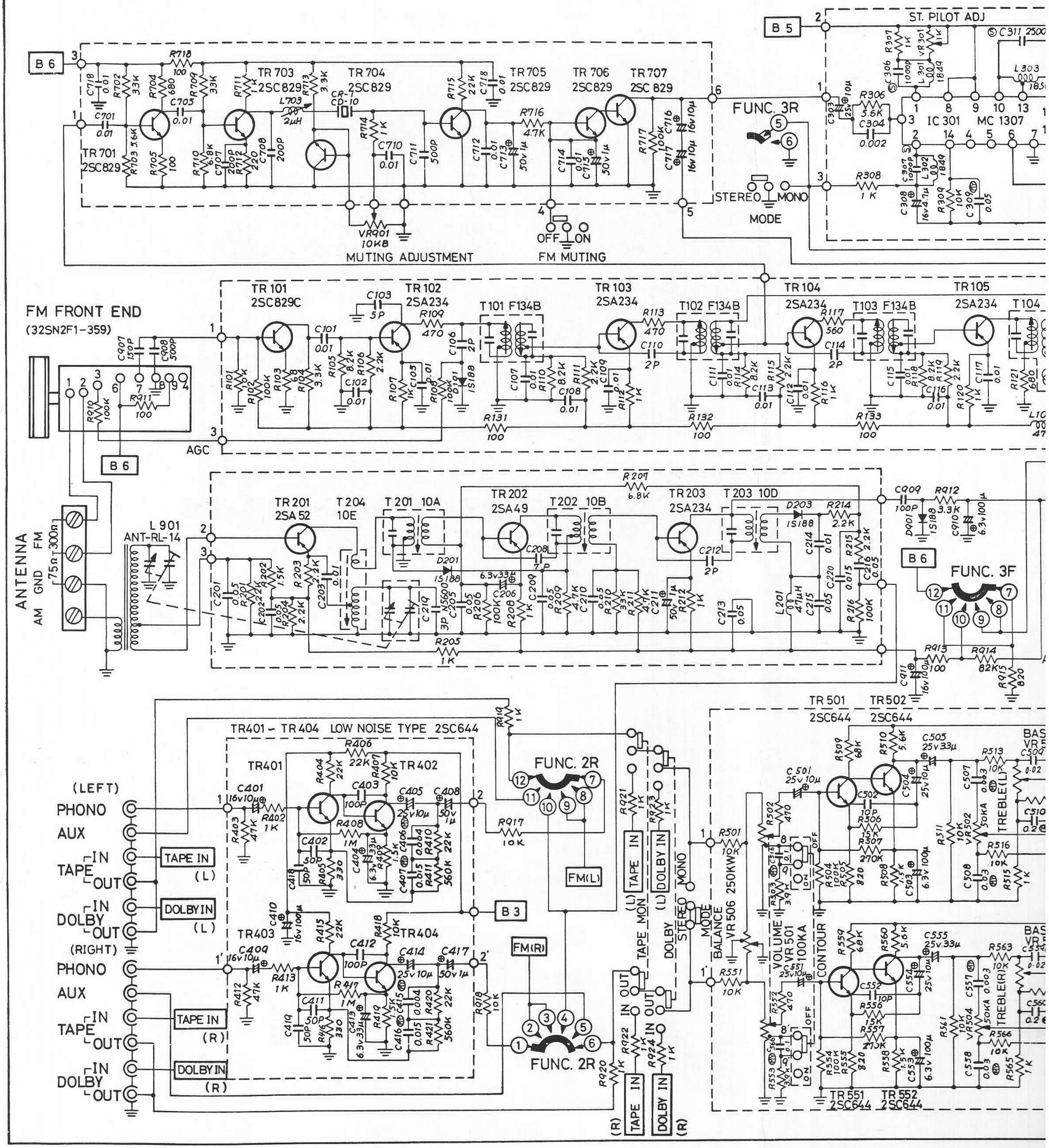
59 D804, RECTIFIER

60 D802, RECTIFIER

61 D801, RECTIFIER

62 HEADPHONE RECEPTACLE

# SCHEMATIC DIAGRAM - MODEL 630



# HARMAN KARDON INC.
## MODEL 630

**(FUNCTION)**
(1) PHONO
(2) FM
(3) FM STEREO
(4) AM
(5) AUX

**(RESISTORS)**
10% TOLERANCE 1/4W UNLESS OTHERWISE NOTED
K KILO OHM
M MEGA OHM
▲ COMPOSITION RESISTORS 1/2 WATT
UN MARK LOW NOISE TYPE CARBON RESISTORS 1/4WATT

**(CAPACITORS)**
10% TOLERANCE UNLESS OTHERWISE NOTED
# ELECTROLYTIC CAPACITORS
Ⓜ MYLAR FILM CAPACITORS
Ⓢ POLYSTYRENE CAPACITORS
UN MARK CERAMIC CAPACITORS

TP5
TR 304 2SC828
TR303 CDC9002
TR 305 2SC828
L304 RL-37
L305 RL-37
FM(L)
FM(R)
VR302 10K SEPARATION CONTROL
STEREO IND. 14V 80mA
B4
TR 106 2SC536G
TR 107 2SA564
VR101 250KB
FUNCTION LIGHT 8v 150mA – 5
PHONO
FM
FM STEREO
AM
AUX
FUNC. 1R
DIAL LIGHT 6.3v 280mA-6
POWER LAMP 8V 150mA
DIAL POINTER LAMP 6.3V 150mA
POWER TRANS. T901
TR802 2SC828
TR 80
B3 21v
B4 20V
B5 14V
B6 12V
D801 1850R
D802 1850
D803 1850R
D804 1850
+B2 32V
-B2 -32V
+B1 32V
-B1 -32V
AC 117v 60Hz
UNSWITCHED MAX. 200W
SWITCHED MAX. 200W
POWER
AC FUSE 3A
ON OFF
POWER TRANS. T902
MAIN AMP IN (LEFT)
PRE AMP OUT
MAIN AMP IN (RIGHT)
PRE AMP OUT
TR 503 2SC644
TR 504 2SC828
TR553 2SC644
TR554 2SC828
TR 601 2SA 564A
TR 602 2SA 564A
TR 603 2SC495
TR 604 2SC 828
TR 605 2SC495
TR 606 2SA505
TR 901 2SD180
TR 902 2SD180
TR 903 2SD180
TR 904 2SD180
TR621 2SA 564A
TR622 2SA 564A
TR623 2SC495
TR624 2SC 828
TR625 2SC495
TR626 2SA505
TP1
TP2
TP3
TP4
SPEAKER FUSE LEFT 3A
SPEAKER FUSE RIGHT 3A
SPKR-1
SPKR-2
PHONES
RIGHT GRD GRD LEFT SPEAKER SYSTEM-1
RIGHT GRD GRD LEFT SPEAKER SYSTEM-2

NOTE
TR801–2SD234

SUBJECT TO MINOR CHANGE OF PARTS WITHOUT PRIOR NOTICE

(FUNCTION)
(1) PHONO
(2) FM
(3) FM STEREO
(4) AM
(5) AUX

(RESISTORS)
10% TOLERANCE 1/4W UNLESS OTHERWISE NOTED
K KILO OHM
M MEGA OHM
▲ COMPOSITION RESISTORS 1/2WATT
UN MARK LOW NOISE TYPE CARBON RESISTORS 1/4WATT

(CAPACITORS)
10% TOLERANCE UNLESS OTHERWISE NOTED
⊣⊢ ELECTROLYTIC CAPACITORS
Ⓜ MYLAR FILM CAPACITORS
Ⓢ POLYSTYRENE CAPACITORS
UN MARK CERAMIC CAPACITORS

# HARMAN KARDON INC.
## MODEL 630

TP5
TR 304 2SC828
L304 RL-37
L305 RL-37
TR303 CDC9002
TR302 2SC828
TR 305 2SC828
VR302 10K SEPARATION CONTROL
STEREO IND 14v 80mA
FM(L)
FM(R)
B4

FUNCTION LIGHT 8v 150mA - 5
POWER LAMP 8V 150mA
POWER TRANS. T901
DIAL LIGHT 6.3v 280mA-6
FUNC. 1R
PHONO
FM
FM STEREO
AM
AUX
DIAL POINTER LAMP
6.3v 150mA

TR802 2SC828
B3 21v
B4 20V
B5 14V
B6 12V

D801 1850R
D802 1850
D803 1850R
D804 1850
+B2 32V
-B2 -32V
+B1 32V
-B1 -32V

AC 117v 60Hz
UNSWITCHED MAX.200W
SWITCHED MAX.200W
POWER
AC FUSE 3A
ON OFF
CQ01 DM-20 0.0033
POWER TRANS. T902

TR 106 2SC536G
TR 107 2SA564
VR101 250KB
FUNC. 3R
TR 503 2SC644
TR 504 2SC828
TR553 2SC644
TR554 2SC828
HIGH CUT
OFF ON

MAIN AMP IN (LEFT)
PRE AMP OUT
MAIN AMP IN (RIGHT)
PRE AMP OUT
FM TUNING METER

TR 601 2SA 564A
TR 602 2SA 564A
TR 603 2SC495
TR 604 2SC828
TR 605 2SC495
TR 606 2SA505
VR601 5KB BIAS ADJ.
TR 901 2SD180
TR 902 2SD180
TR 903 2SD180
TR 904 2SD180
SPEAKER FUSE LEFT 3A
SPEAKER FUSE RIGHT 3A
ON OFF
SPKR-1
SPKR-2
PHONES
RIGHT GRD GRD LEFT SPEAKER SYSTEM-1
RIGHT GRD GRD LEFT SPEAKER SYSTEM-2

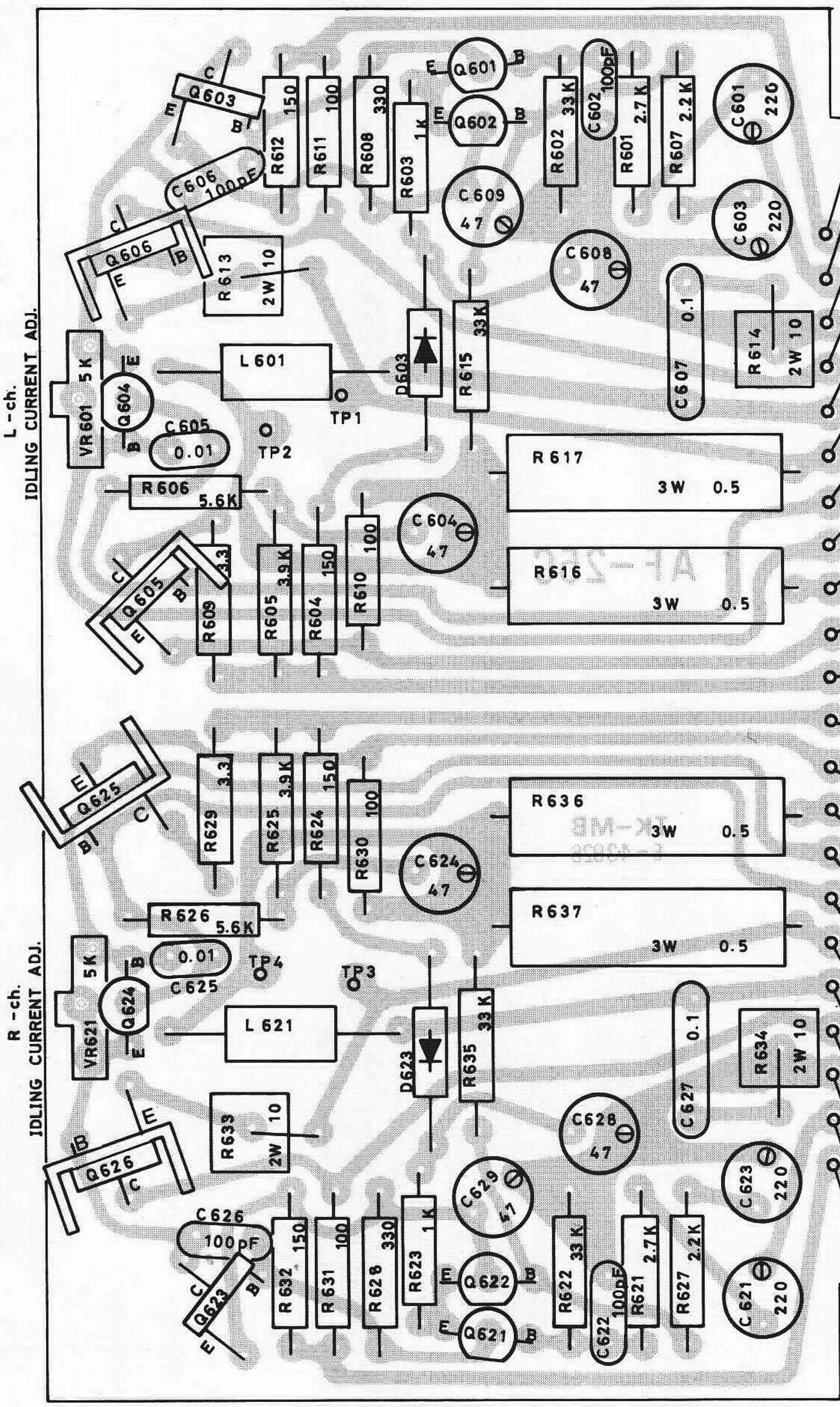
TR621 2SA 564A
TR622 2SA 564A
TR623 2SC495
TR624 2SC828
TR625 2SC495
TR626 2SA505
VR621 5KB BIAS ADJ.
TR 903 2SD180
TR 904 2SD180

NOTE
TR801-2SD234

SUBJECT TO MINOR CHANGE OF PARTS WITHOUT PRIOR NOTICE

# PREDRIVER/DRIVER CIRCUIT BOARD DIAGRAM

= component side view =




LEFT CHANNEL

–B1. –32V from Power Supply board (light blue).

Audio Input (yellow)

To chassis ground (black)

To Q902(B) (yellow)

Power Output (blue)

To Q902(C) (pink)

To D601 (brown)

To D601 (violet)

To Q901(E) (grey)

To Q901(B) (white)

+B1. +32V from Power Supply board (red).

+B2. +32V from Power Supply board (red).

To Q903(B) (white)

To Q903(E) (grey)

To D621 (violet).

To D621 (brown).

To Q904(C) (pink)

Power Output (green).

To Q904(B) (yellow).

To chassis ground (black).

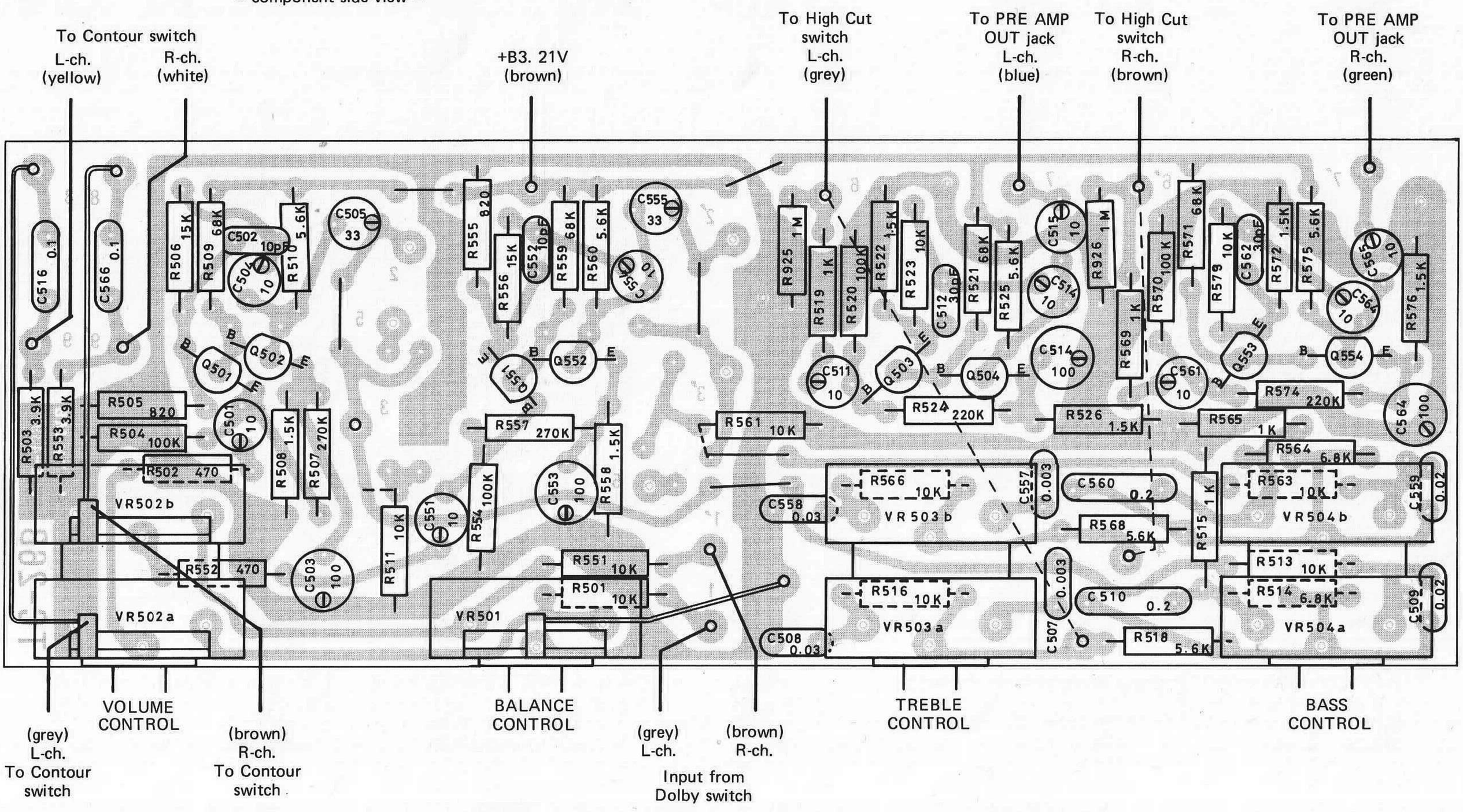
Audio Input (white).

–B2. –32V from Power Supply board (light blue).

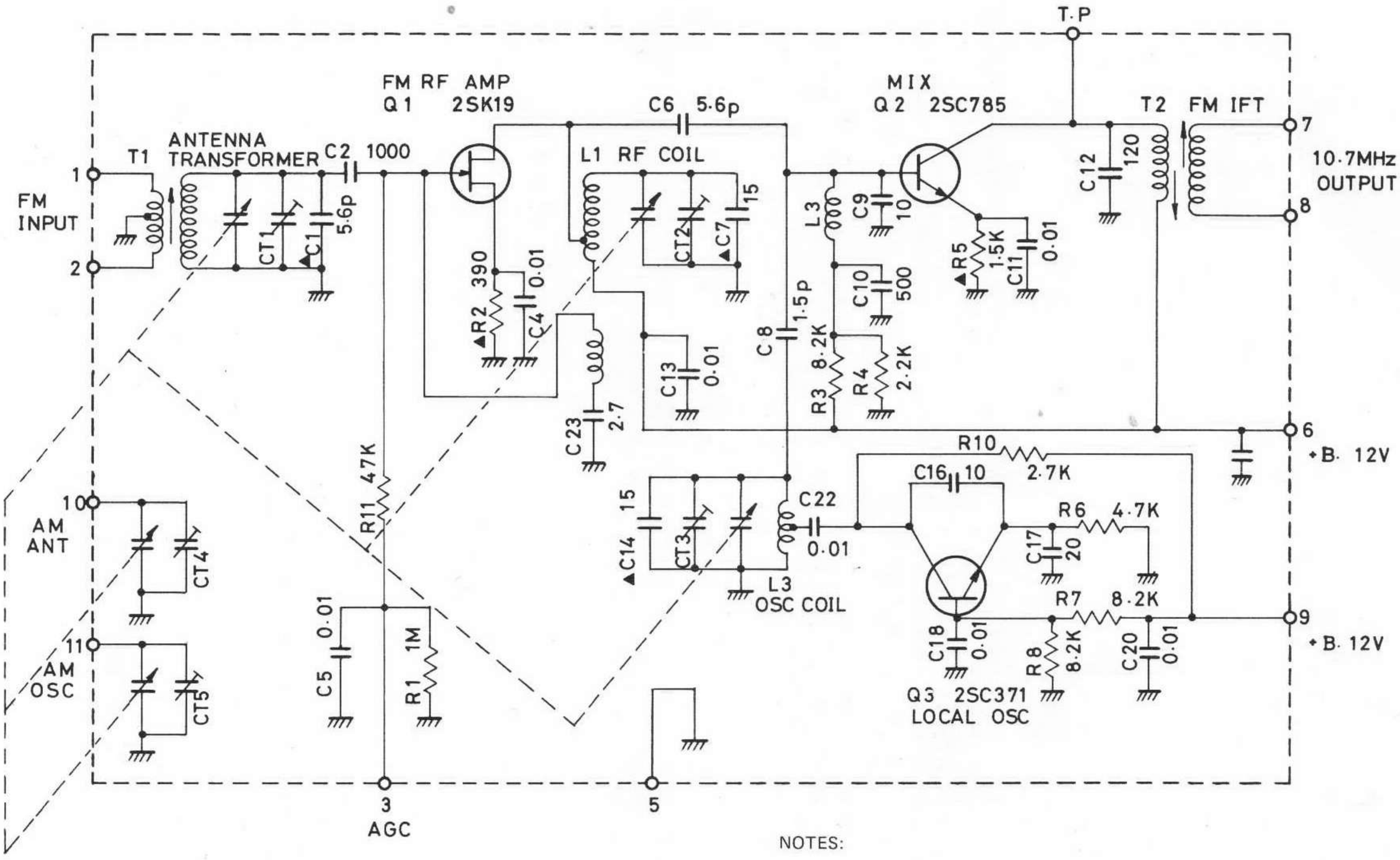
RIGHT CHANNEL

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

TONE AMP CIRCUIT BOARD DIAGRAM
= component side view =



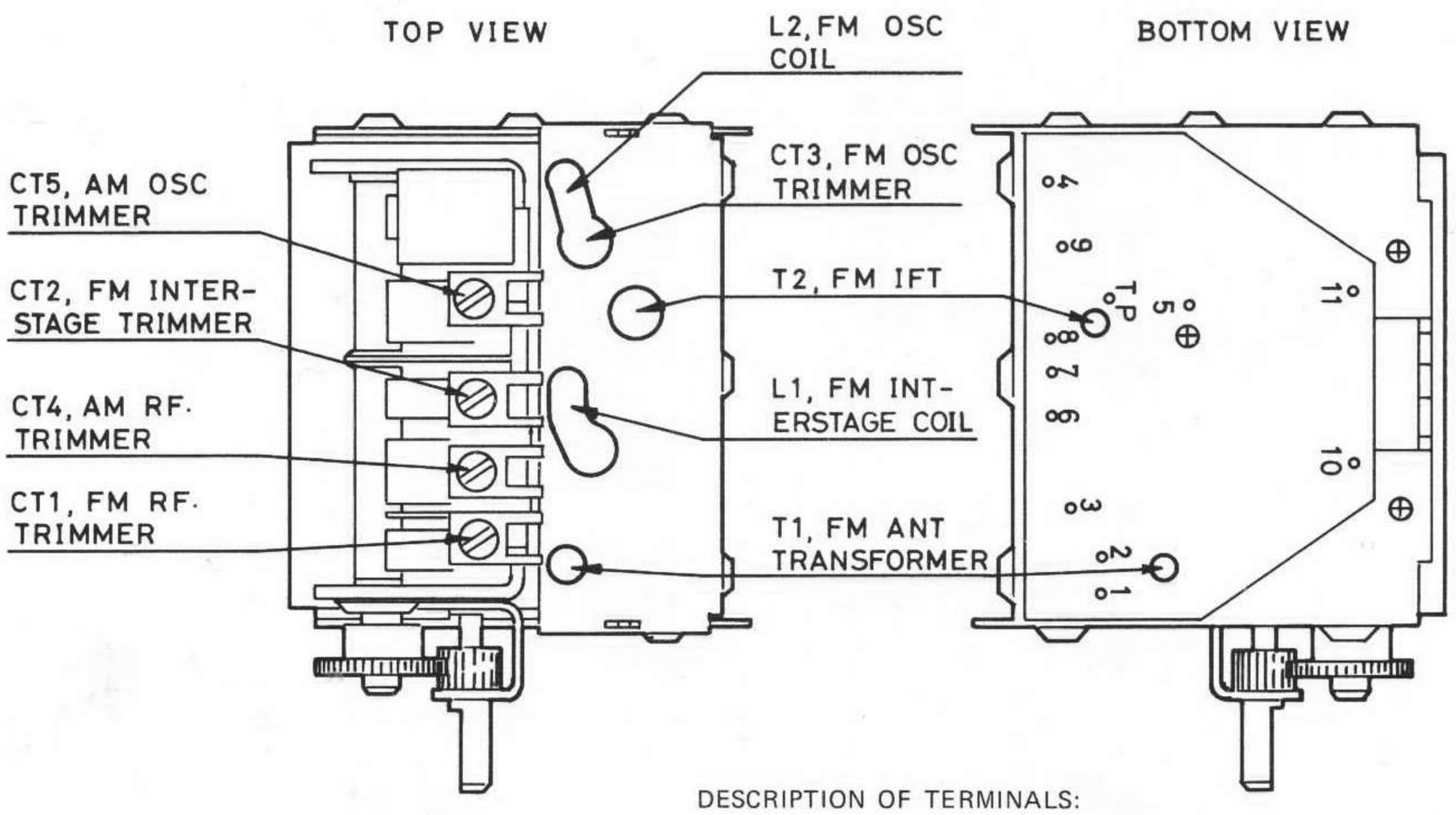
# AM/FM FRONT END SCHEMATIC




NOTES:

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

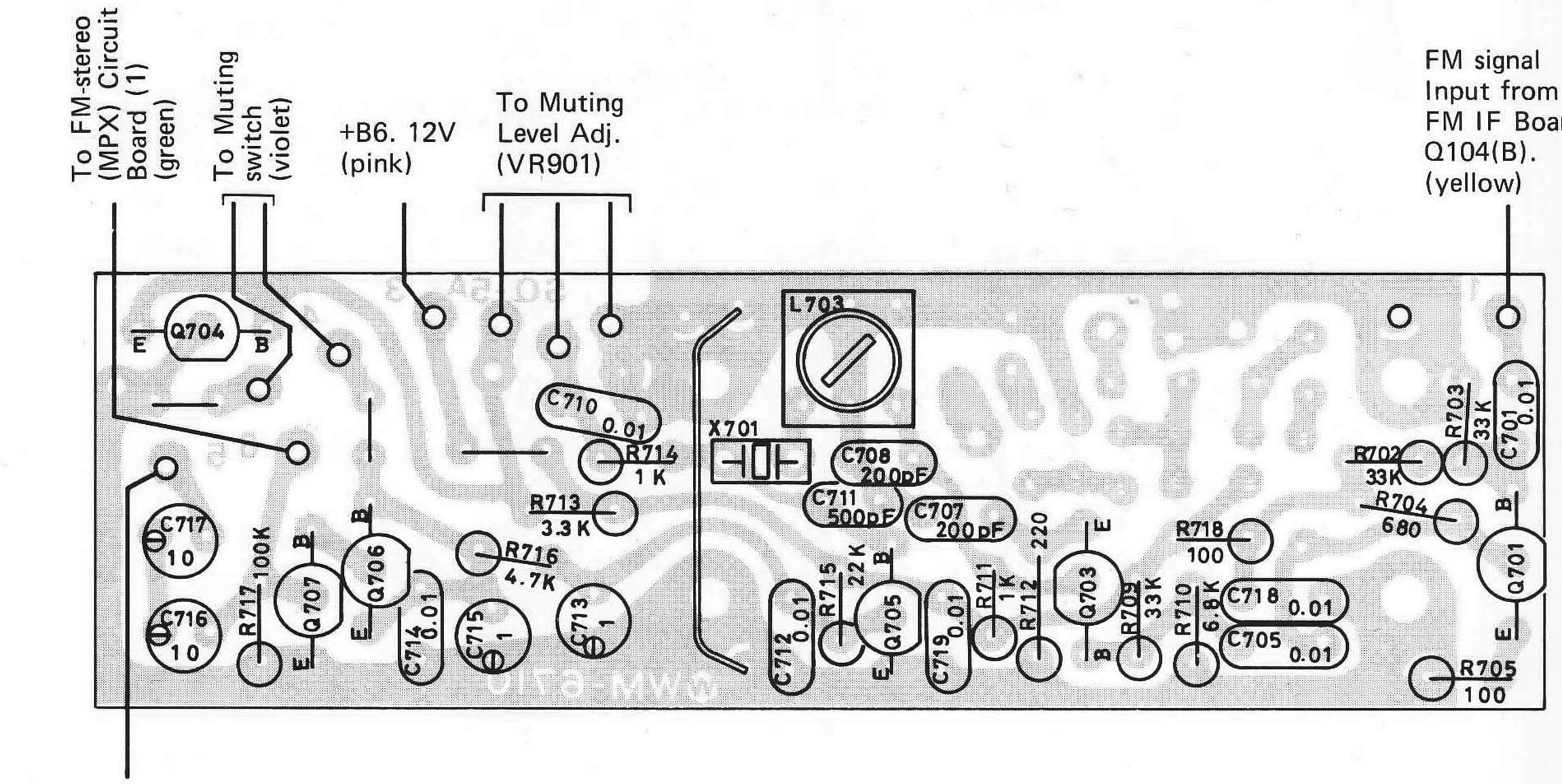
# AM/FM FRONT END LAYOUT (32SNF1-359)



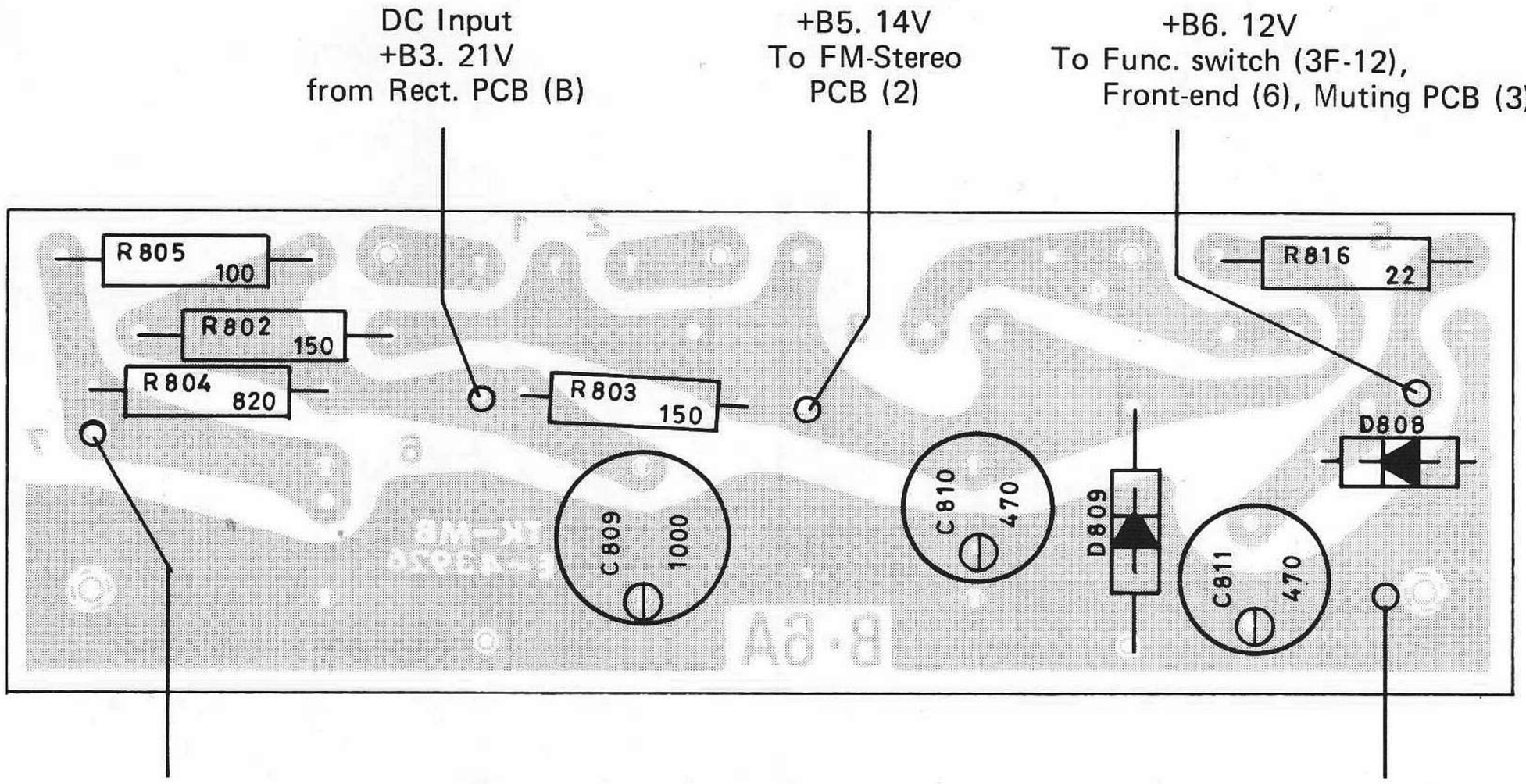

DESCRIPTION OF TERMINALS:

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

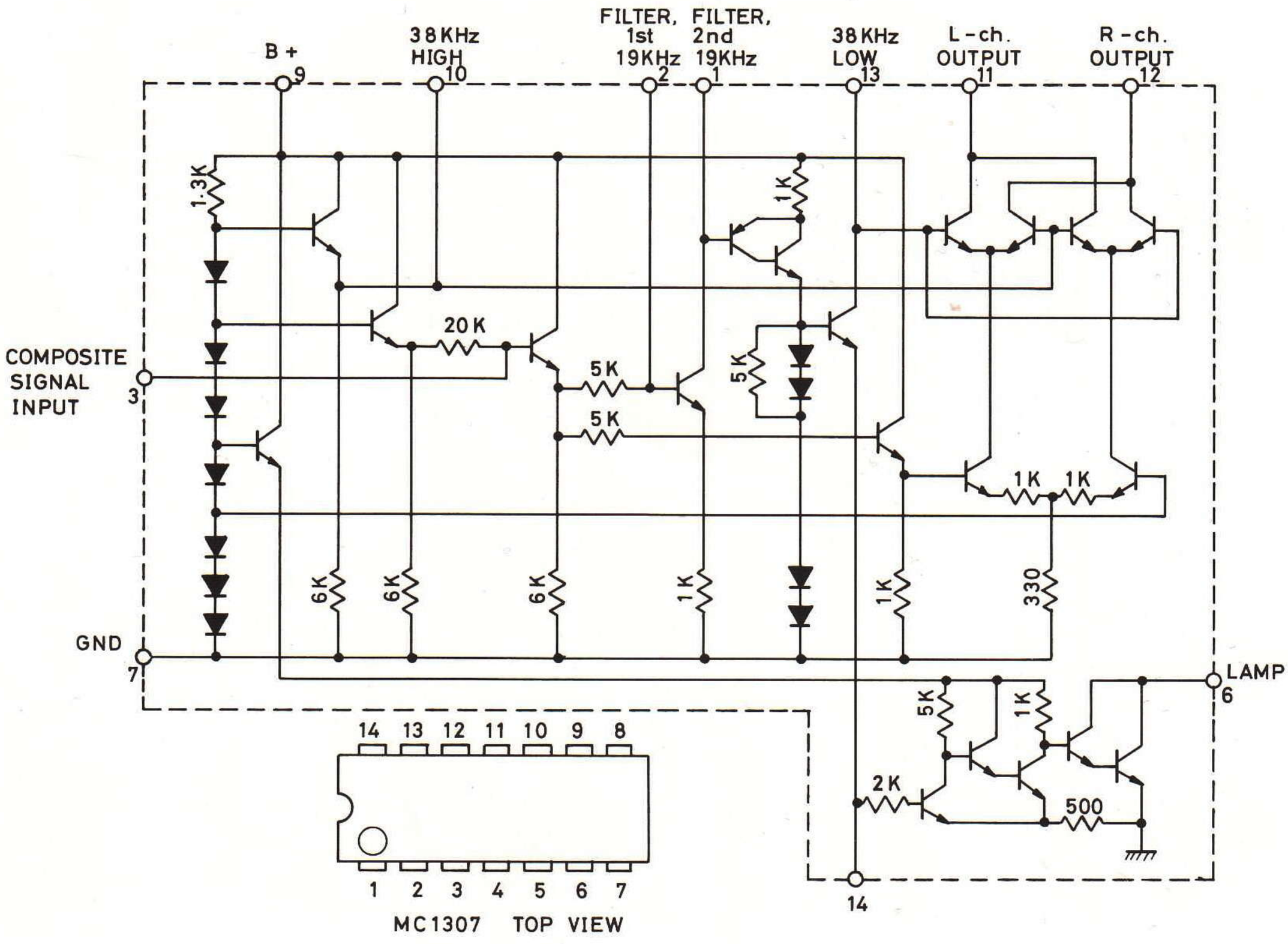



## REGULATOR CIRCUIT BOARD

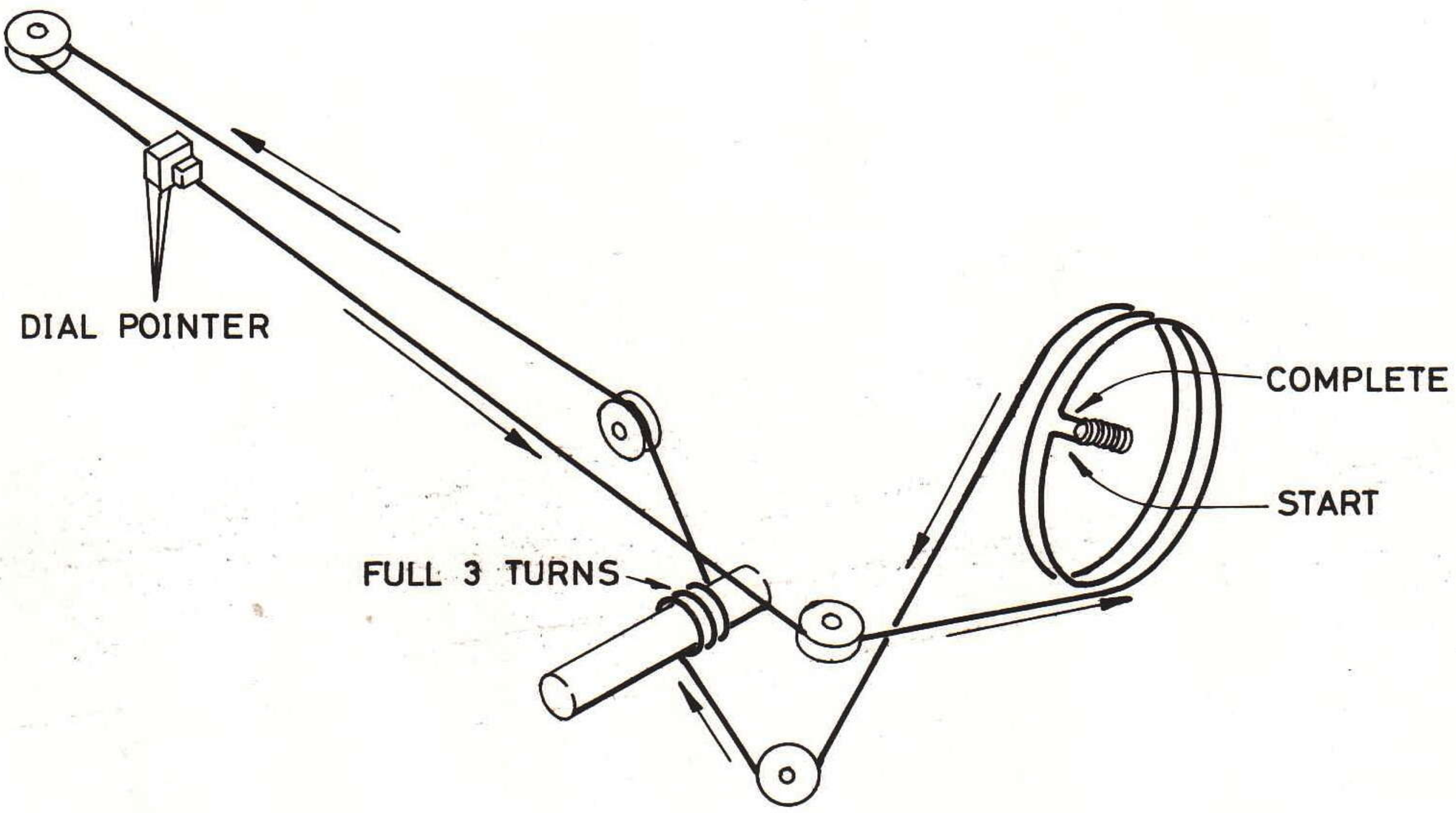



NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD.

# 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.

# TECHNICAL INFORMATION BULLETIN

SERVICE BULLETIN #105

AUGUST 1974

TO: ALL AUTHORIZED WARRANTY STATIONS

FROM: LEN GAYNOR, NATIONAL SERVICE MANAGER

SUBJECT: MODIFICATION OF MODEL 630 REGULATOR STAGE

There have been a number of previous Service Bulletins on this subject, namely Service Bulletin #117 and #130. Although both previous bulletins were valid, we have come up with a circuit modification which will OBSOLETE both previous bulletins. This modification should be applicable to ALL production runs of the Model 630, and should be performed after ALL normal repairs are made.

1. Locate and remove completely from the circuit the "Braided Ground Wire" connected from D-805 on the "Power Supply Tuner-Preamp Board" to the chassis ground lug adjacent to C-906.

2. Disconnect both ends of the AC input lead (orange) which was connected from the negative side of C-807 on the "Power Supply Tuner-Preamp Board" and the AC input point on the "Power Supply Circuit Board".

3. Remove and discard the 5.6K ohm resistor connected between the positive (+) and negative (-) terminals of C-904 (4700 mfd/35 volt).

4. Re-connect orange wire (removed in paragraph 2 above) from the collector of TR-801 (Q801) on the "Power Supply Tuner-Preamp Board" to the positive (+) side of C-904 (4700 mfd/35 volt).

This now completes the modification.

Sincerely,

L. Gaynor
National Service Manager