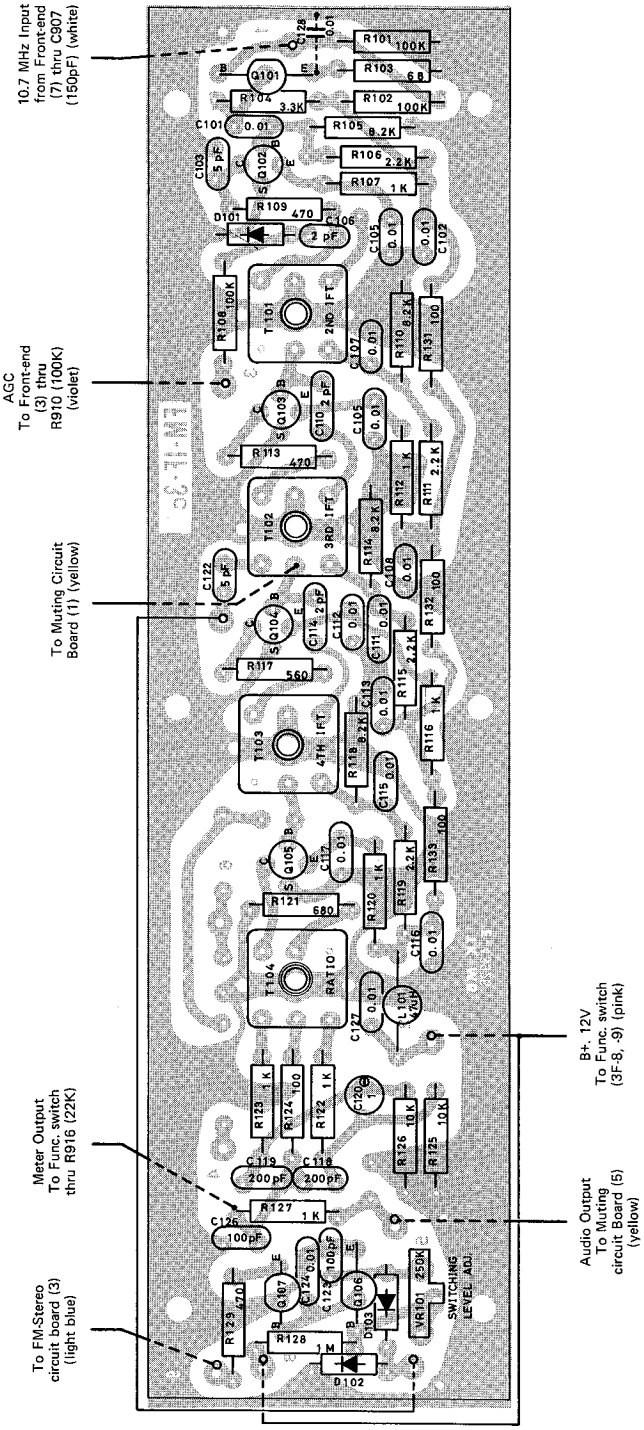
The Harman-Kardon Model 630

AM/FM/Stereo FM Solid State Receiver

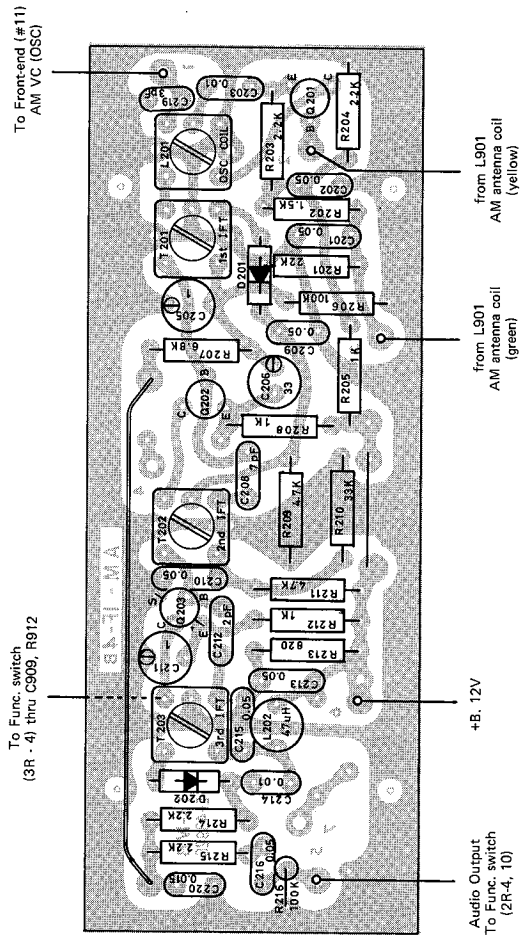
Technical Manual

harman/kardon

FM IF CIRCUIT BOARD

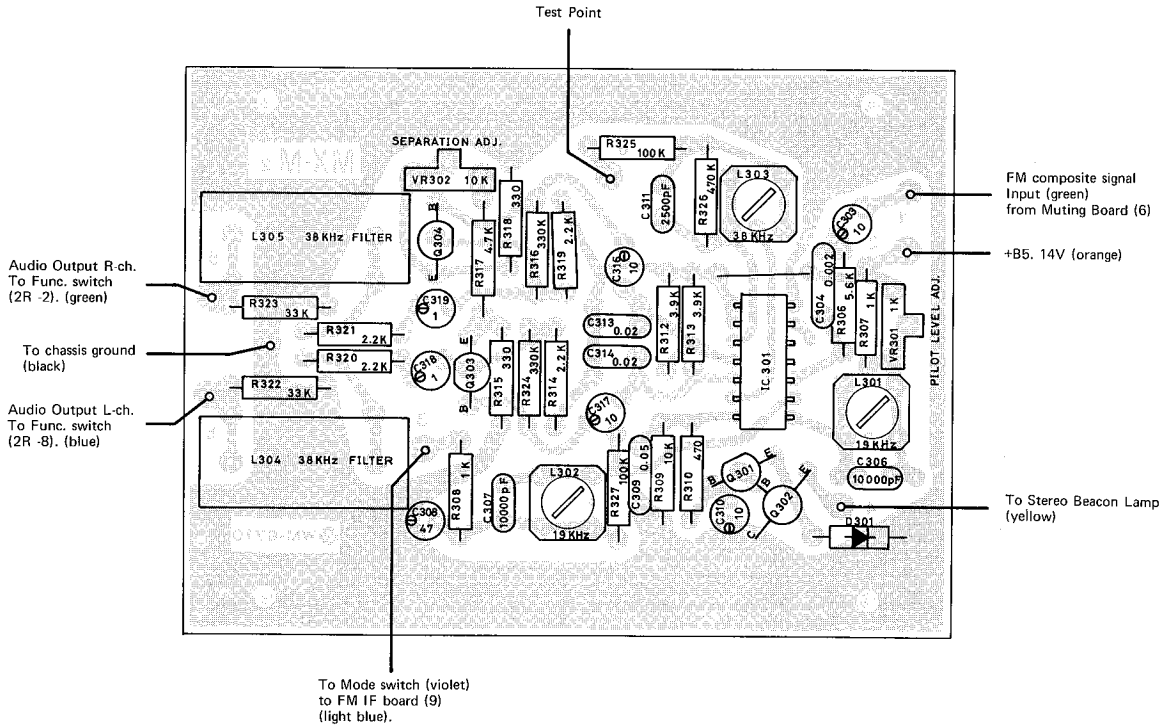


AM CIRCUIT BOARD

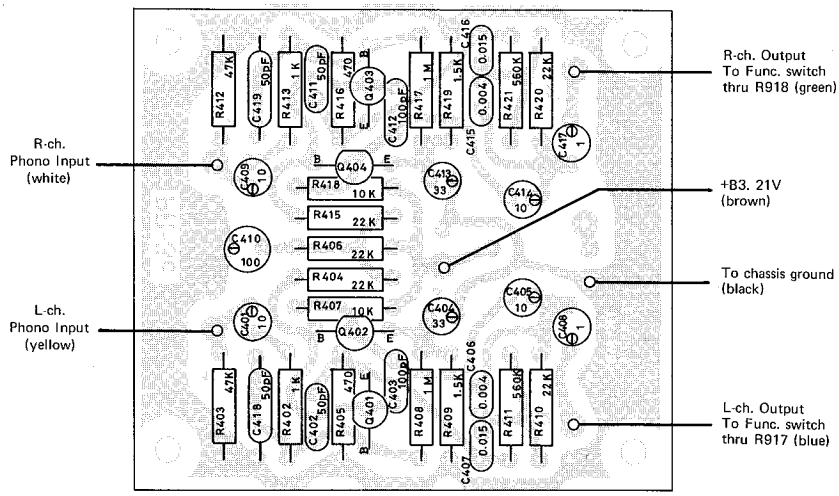


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD.
UNLESS OTHERWISE NOTED IN THIS DIAGRAM.

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).

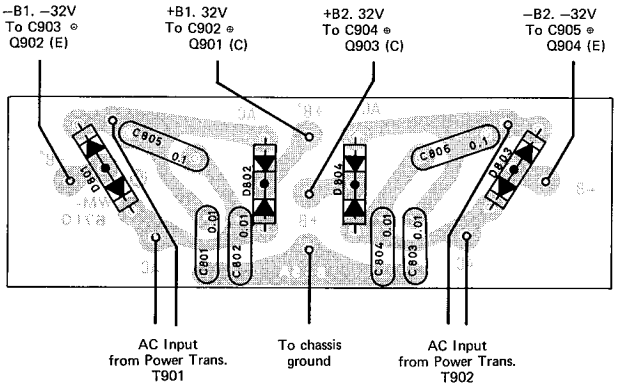
   Or Adjust idling current using a DC milli-volt meter across R617 resistor (on driver circuit board), rotate VR601 to obtain a 10mV reading on DC milli-volt meter = no signal input = (see Figure 2).
6. Repeat the same steps 3 thru 5 as above for Right channel.

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.

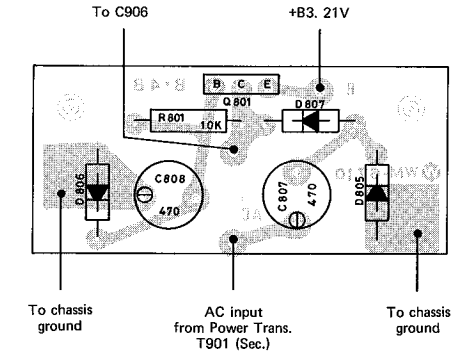
POWER SUPPLY CIRCUIT BOARD



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

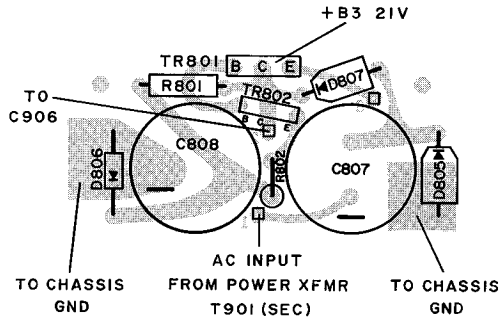
POWER SUPPLY (TUNER AND PREAMP)

VERSION 1

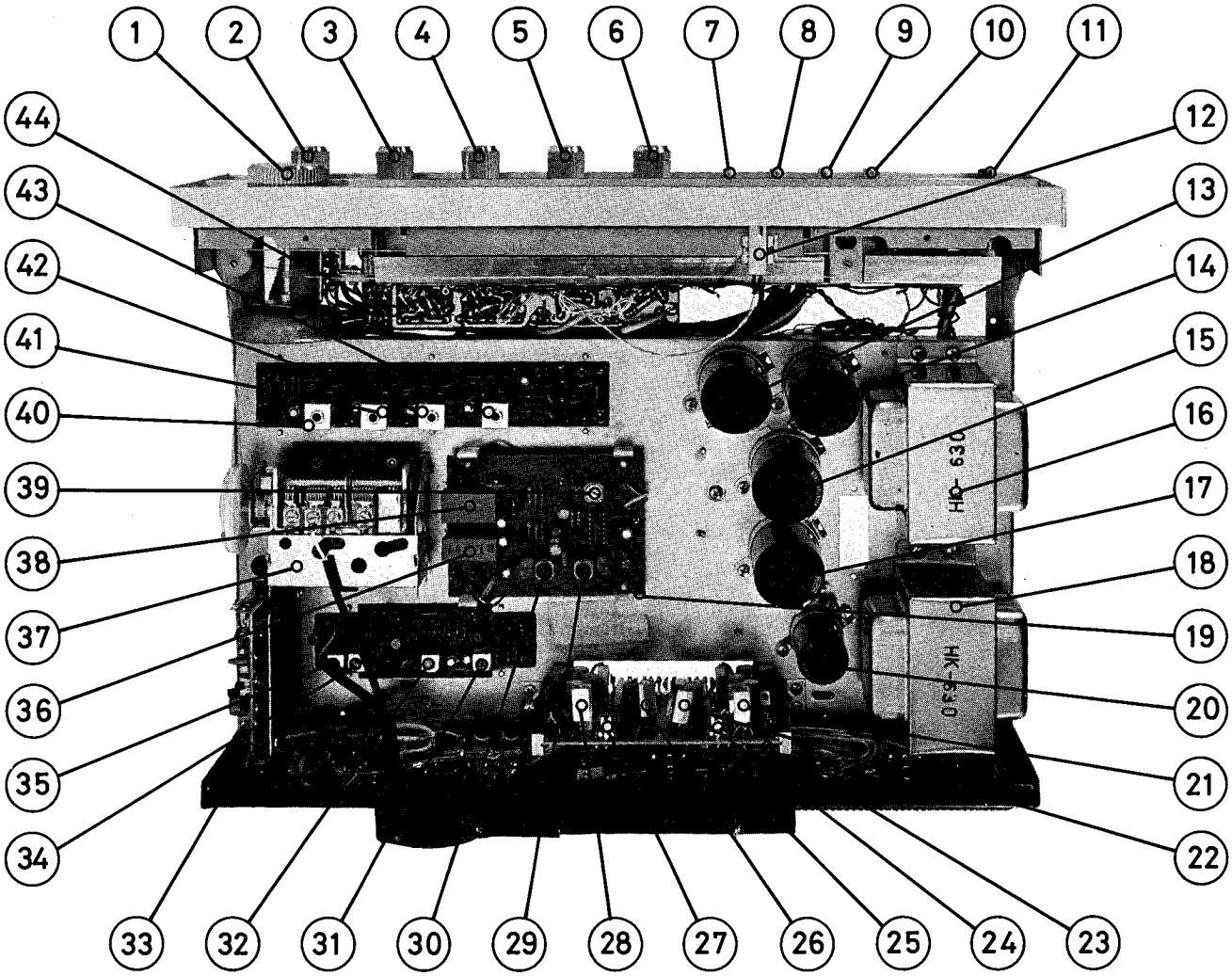


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD.

VERSION 2

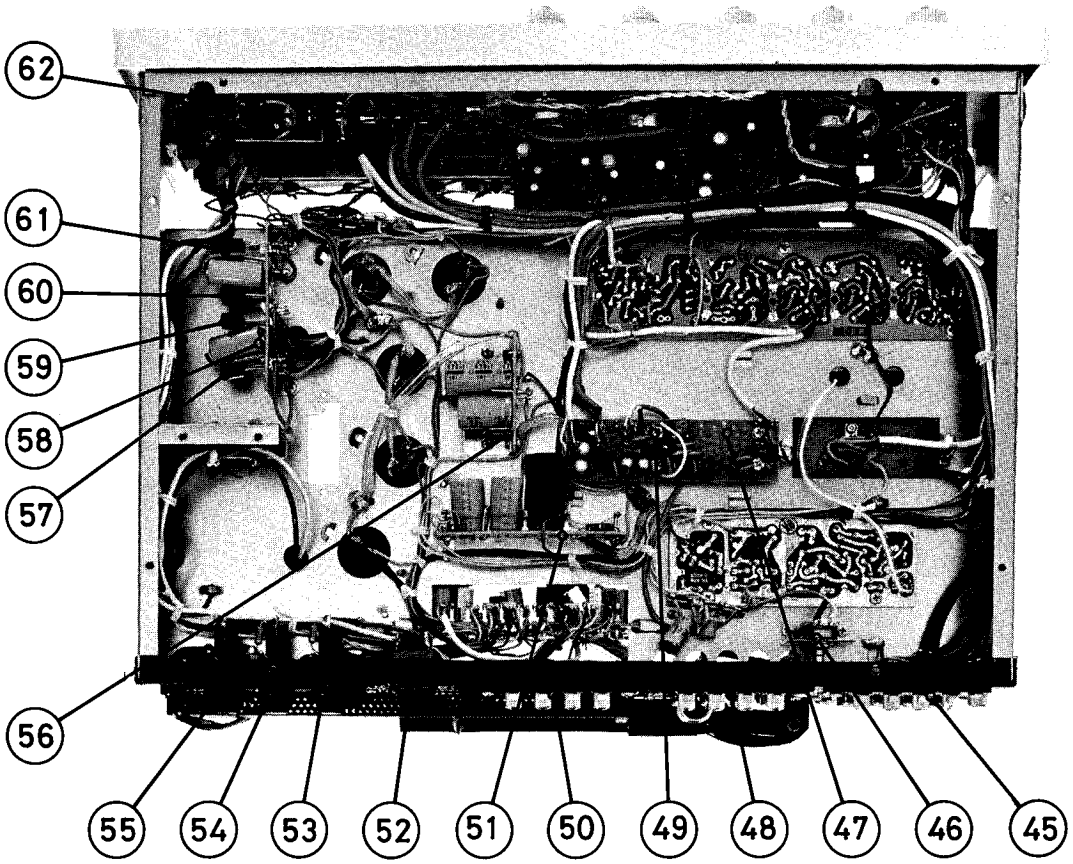


TOP VIEW



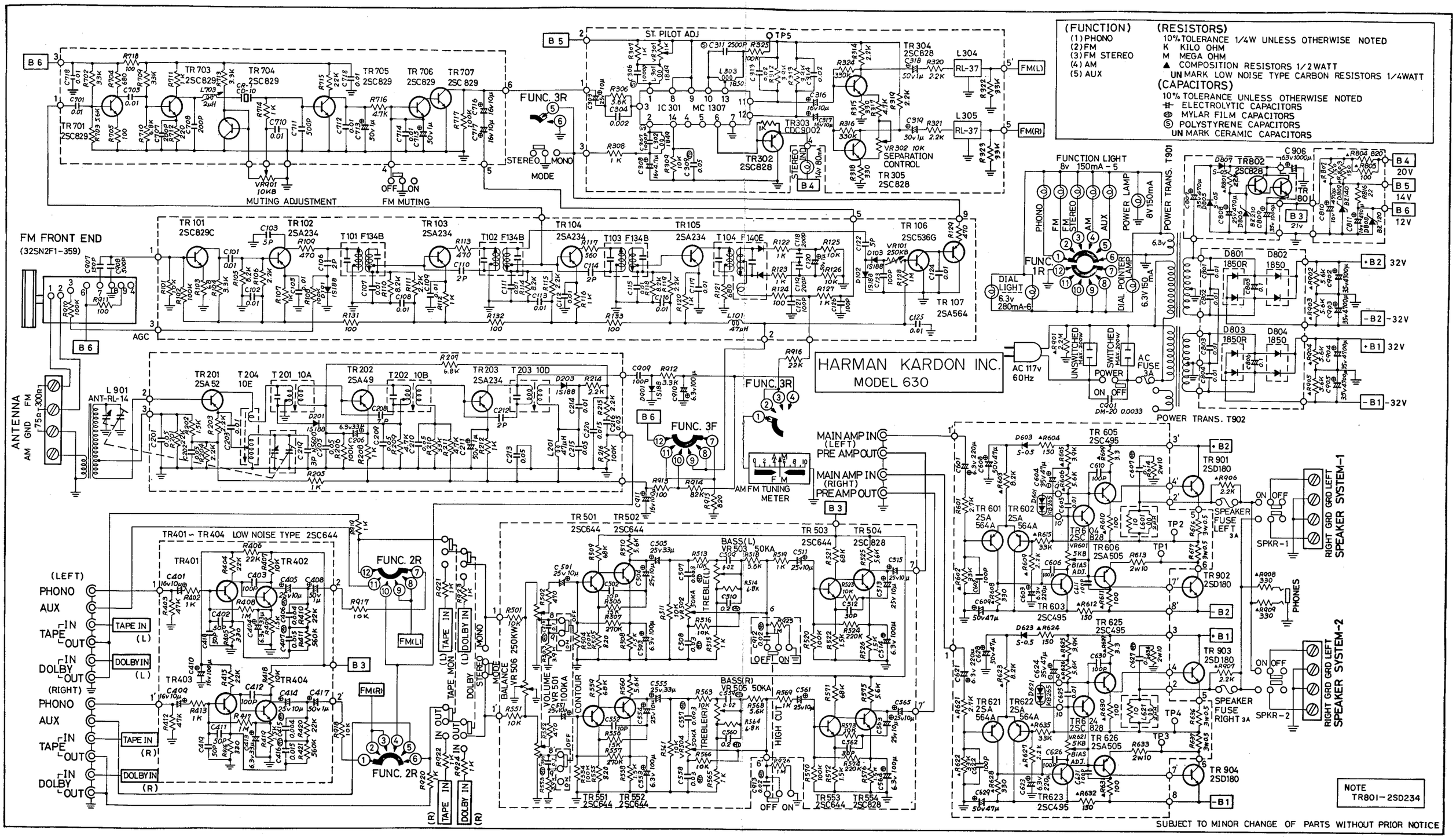
(1) TUNING KNOB
(2) FUNC. SELECTOR SWITCH
(3) VR502, VOLUME CONTROL
(4) VR501, BALANCE CONTROL
(5) VR503, TREBLE CONTROL
(6) VR504, BASS CONTROL
(7) CONTOUR SWITCH & FM MUTING SWITCH
(8) TAPE MON. SWITCH & MODE SWITCH
(9) HIGH-CUT SWITCH & DOLBY SWITCH
(10) SPEAKERS SWITCH
(11) POWER SWITCH
(12) DIAL 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

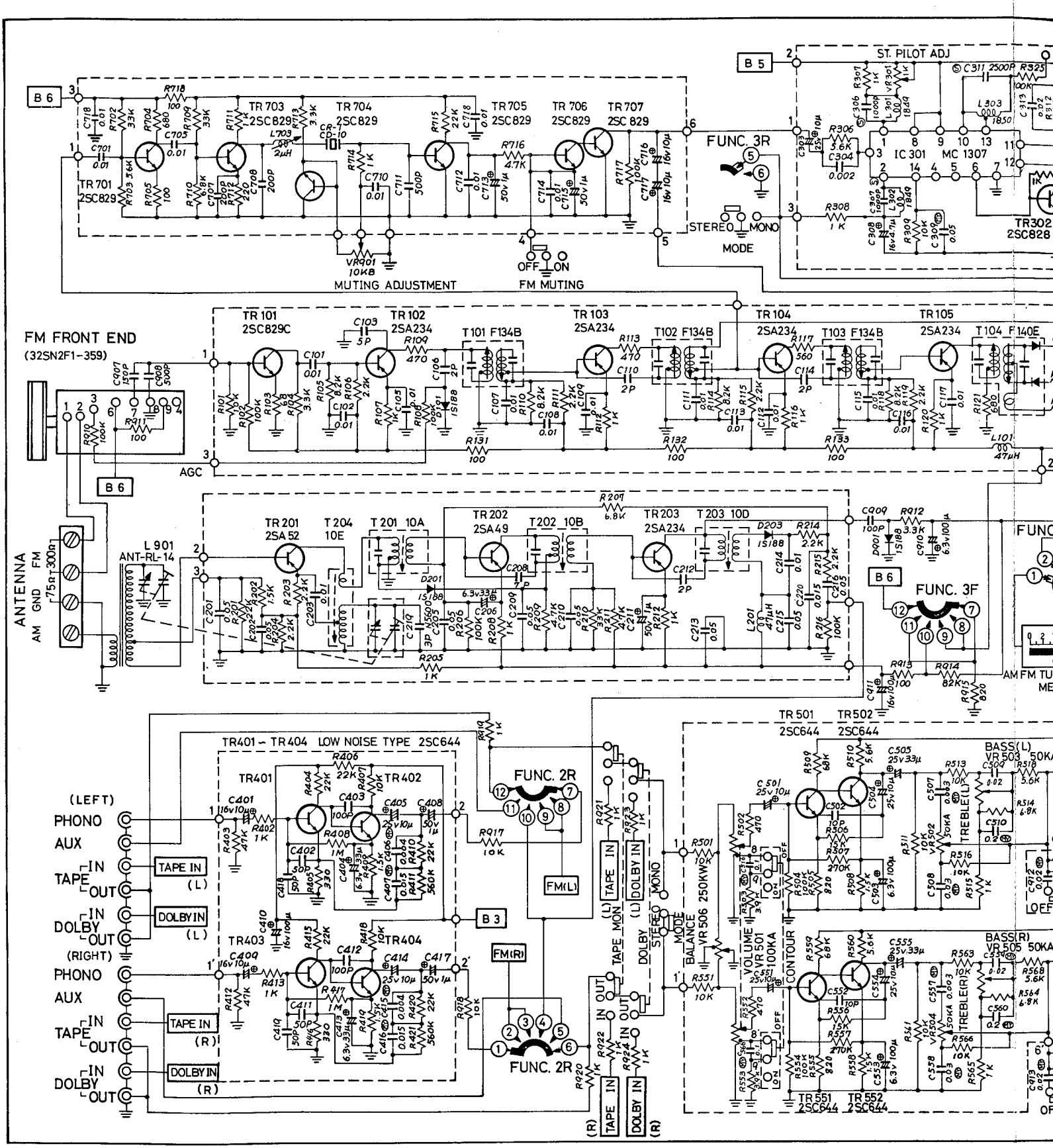


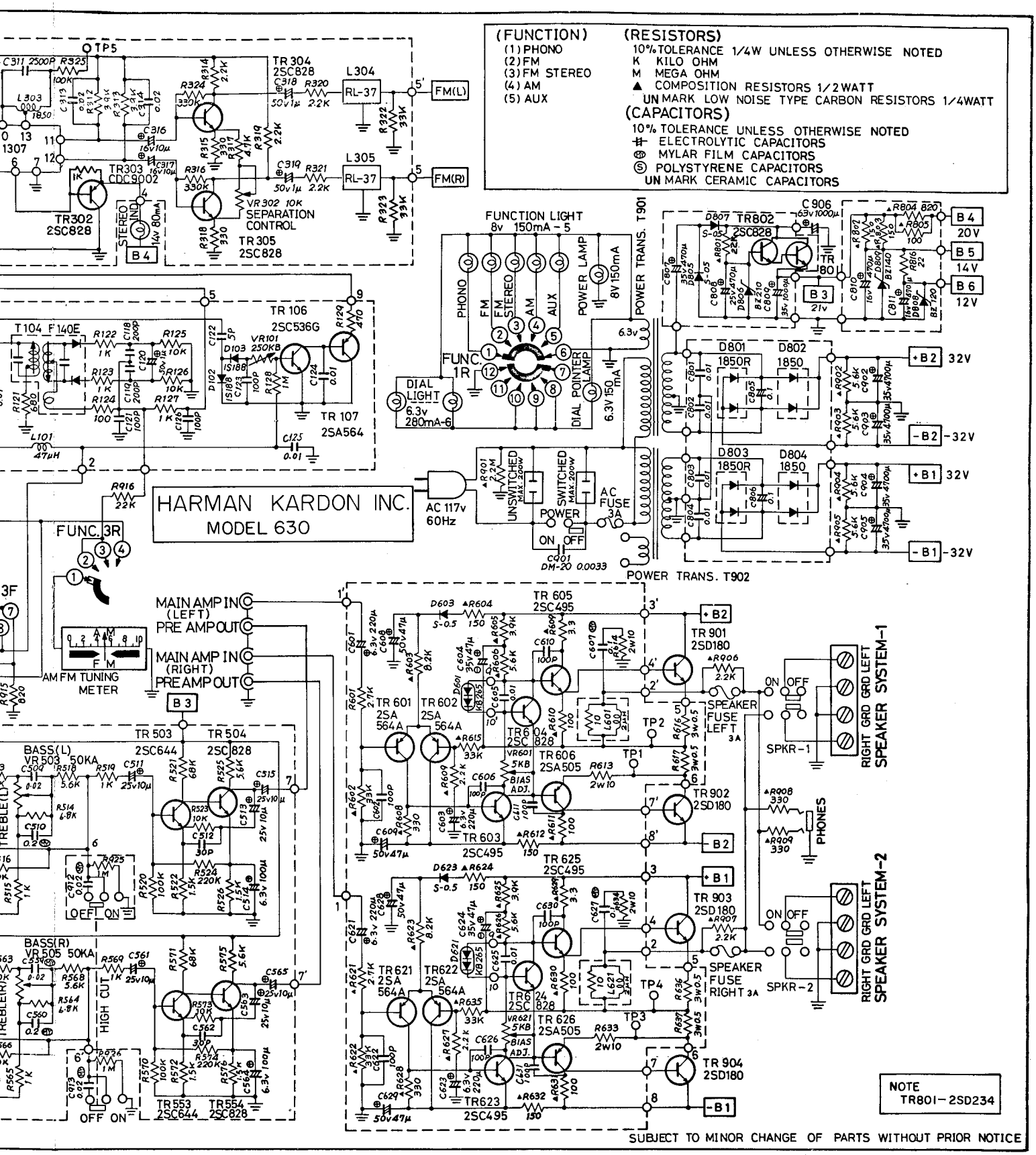
(45) ANTENNA TERMINAL STRIP
(46) VR901, FM MUTING LEVEL ADJ.
(47) FM MUTING CIRCUIT BOARD
(48) SPEAKER SYSTEM –1 TERMINAL STRIP
(49) L703, MUTING COIL
(50) SPEAKER SYSTEM –2 TERMINAL STRIP
(51) REGULATOR CIRCUIT BOARD
(52) AC OUTLET
(53) SPEAKER FUSE, L-CH
(54) SPEAKER FUSE, R-CH
(55) AC FUSE
(56) POWER 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



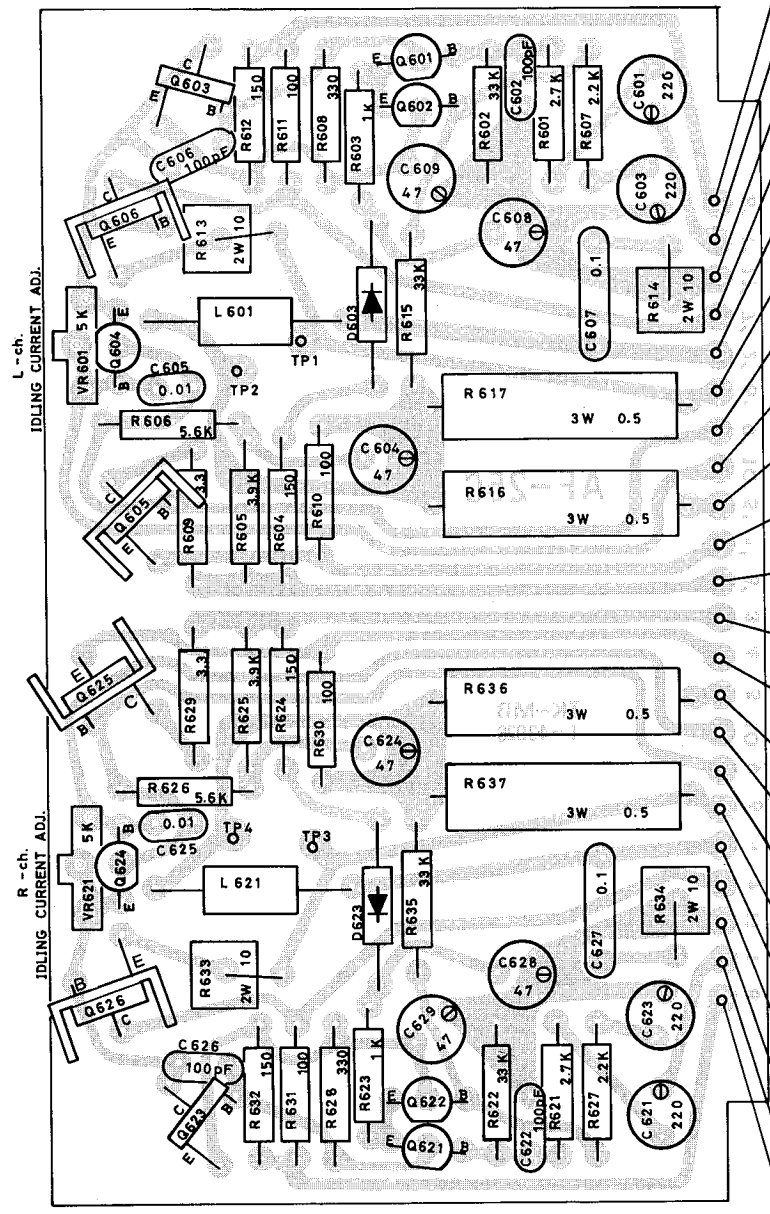
SCHEMATIC DIAGRAM - MODEL 630




(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 1/2WATT
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
FUNCTION LIGHT
8v 150mA - 5
POWER TRANS. T901
POWER TRANS. T902
TR 304
2SC828
TR303
CDC9002
TR302
2SC828
TR 305
2SC828
TR 106
2SC536G
TR 107
2SA564
TR 605
2SC495
TR 601
2SA 564A
TR 602
2SA 564A
TR 604
2SC 828
TR 606
2SA505
TR 603
2SC495
TR 625
2SC495
TR621
2SA 564A
TR622
2SA 564A
TR624
2SC 828
TR 626
2SA505
TR623
2SC495
TR 901
2SD180
TR 902
2SD180
TR 903
2SD180
TR 904
2SD180
TR 503
2SC644
TR 504
2SC 828
TR553
2SC644
TR554
2SC828
TR802
2SC828
TR 80
MAIN AMP IN (LEFT)
PRE AMP OUT
MAIN AMP IN (RIGHT)
PRE AMP OUT
AM FM TUNING METER
FUNC. 1R
FUNC. 3R
DIAL LIGHT
6.3v 280mA-6
DIAL POINTER LAMP
6.3v 150mA
POWER LAMP
8V 150mA
AC 117v 60Hz
UNSWITCHED MAX. 200W
SWITCHED MAX. 200W
AC FUSE 3A
POWER
ON OFF
SPEAKER FUSE LEFT 3A
SPEAKER FUSE RIGHT 3A
SPKR-1
SPKR-2
PHONES
RIGHT GRD GRD LEFT
SPEAKER SYSTEM-1
SPEAKER SYSTEM-2
BASS(L) VR503 50KA
BASS(R) VR505 50KA
TREBLE(L)
TREBLE(R)
HIGH CUT
OFF ON
STEREO IND.
VR302 10K SEPARATION CONTROL
VR101 250KB
VR601 5KB BIAS ADJ.
VR621 5KB BIAS ADJ.
D801 1850R
D802 1850
D803 1850R
D804 1850
+B4 20V
+B2 32V
-B2 -32V
+B1 32V
-B1 -32V
B4
B5 14V
B6 12V
B3 21V
NOTE
TR801-2SD234
SUBJECT TO MINOR CHANGE OF PARTS WITHOUT PRIOR NOTICE

PREDRIVER/DRIVER CIRCUIT BOARD

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).

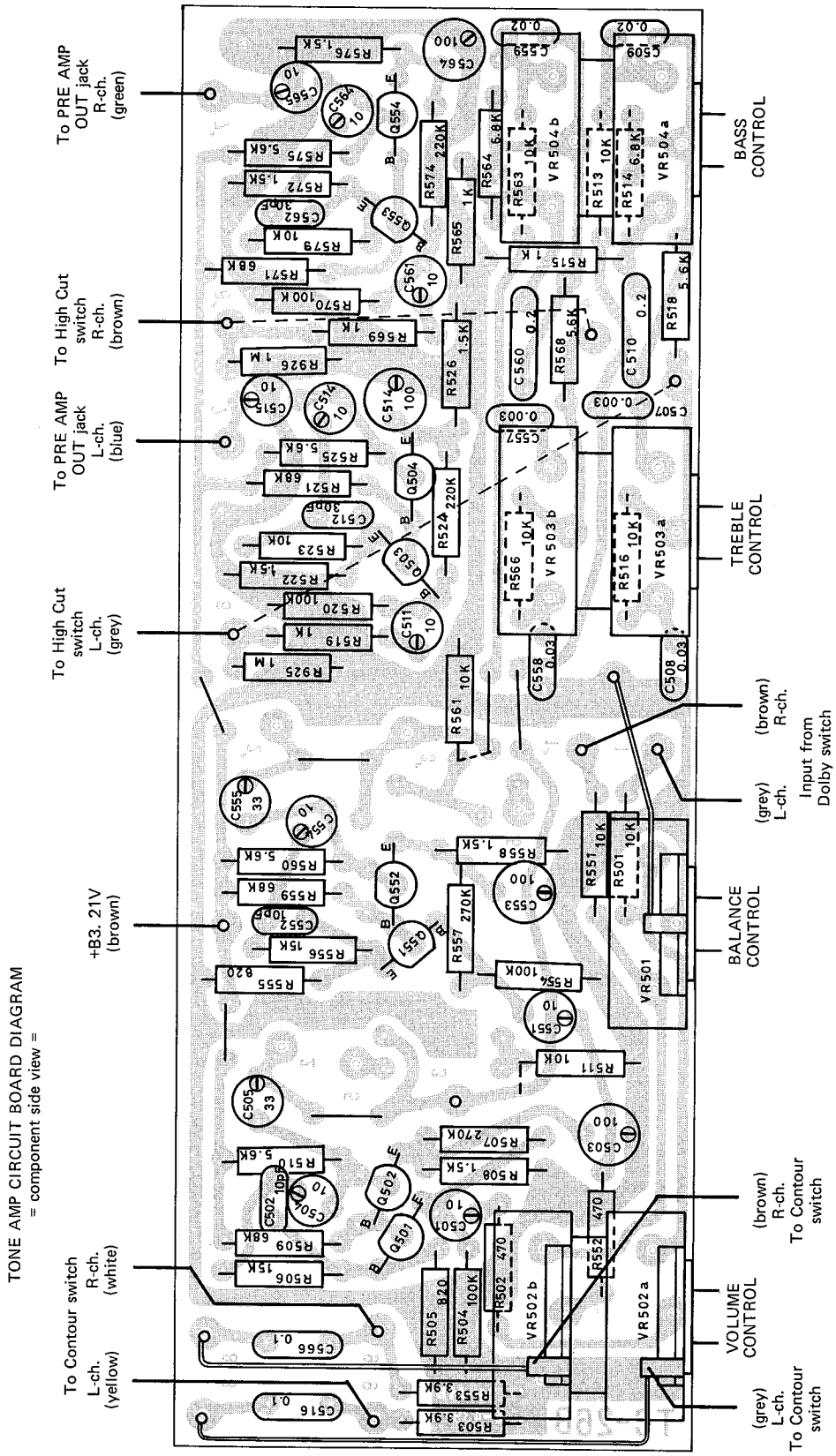
Audio Input (white).

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

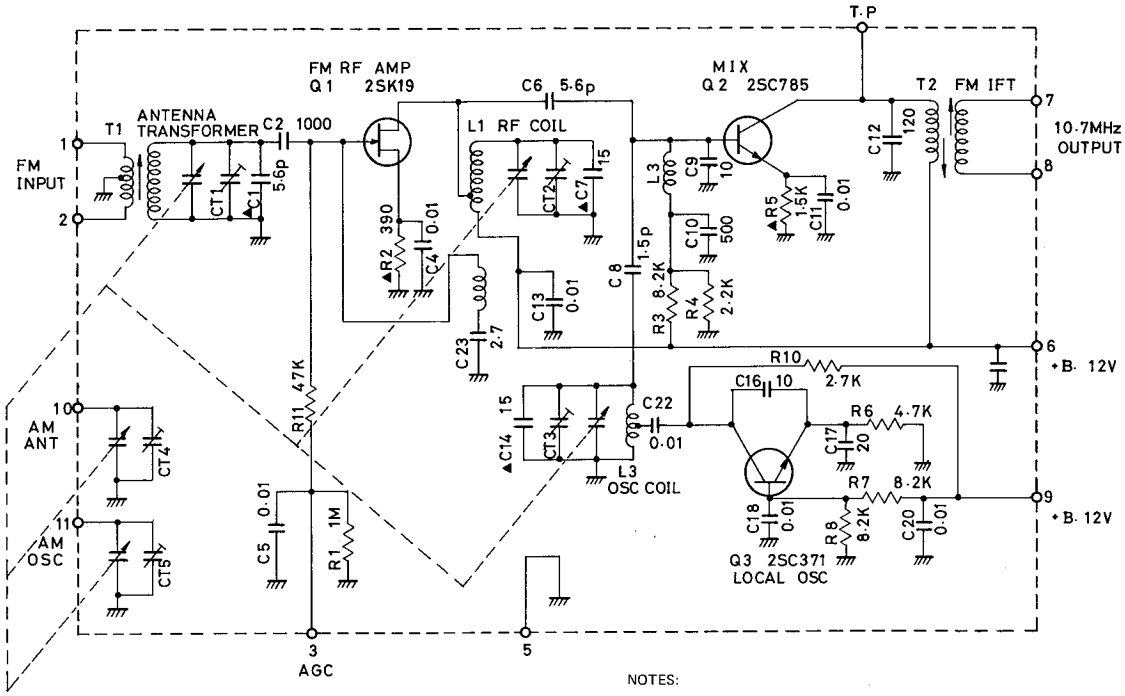
RIGHT CHANNEL

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

TONE AMP CIRCUIT BOARD



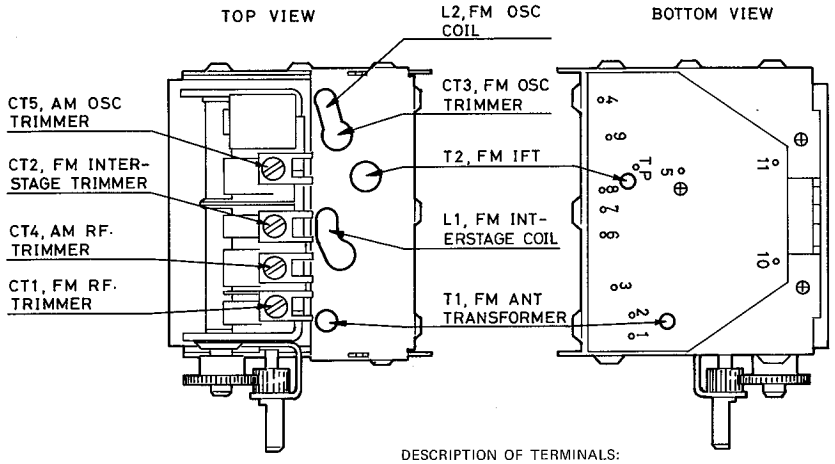
AM/FM FRONT END SCHEMATIC



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.

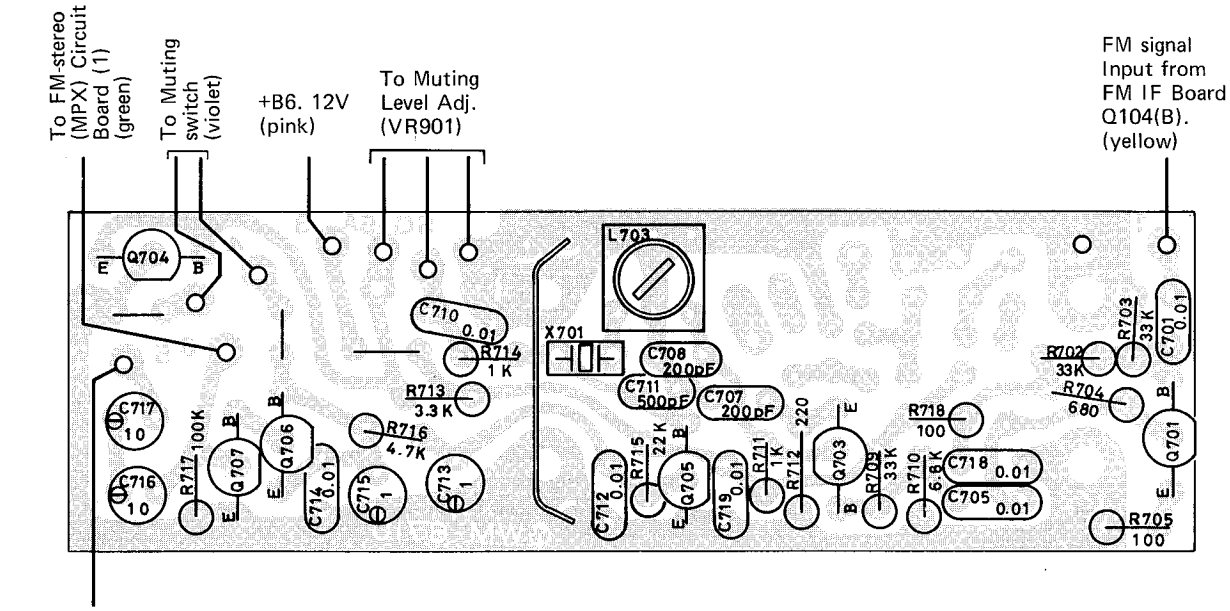
AM/FM FRONT END LAYOUT (32SNF1-359)



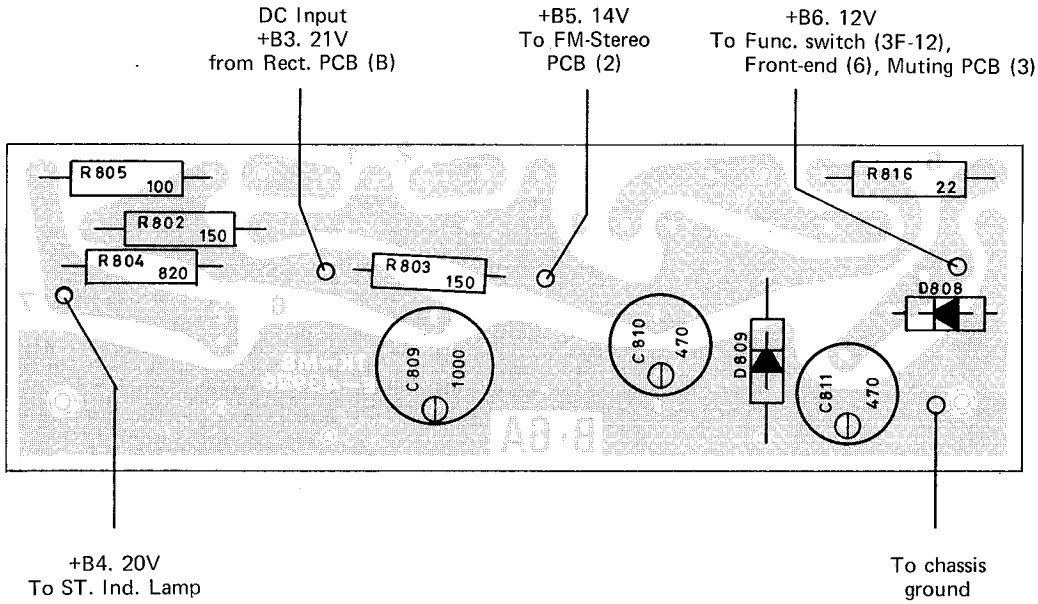
DESCRIPTION OF TERMINALS:

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

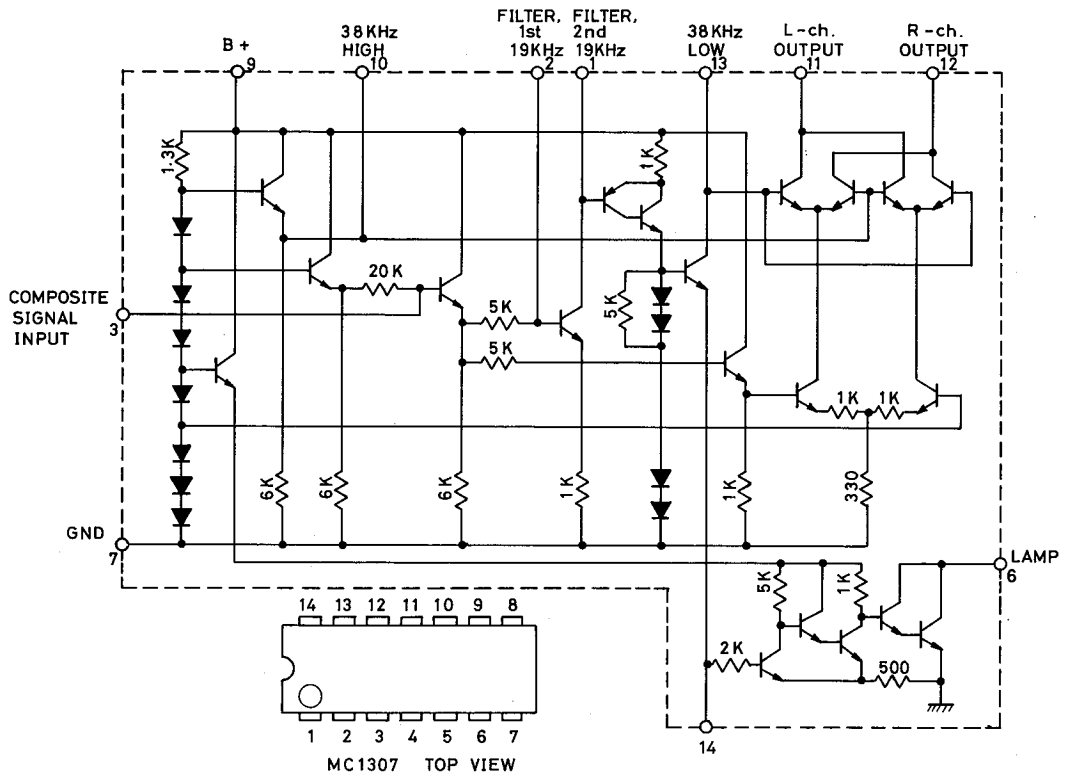


REGULATOR CIRCUIT BOARD

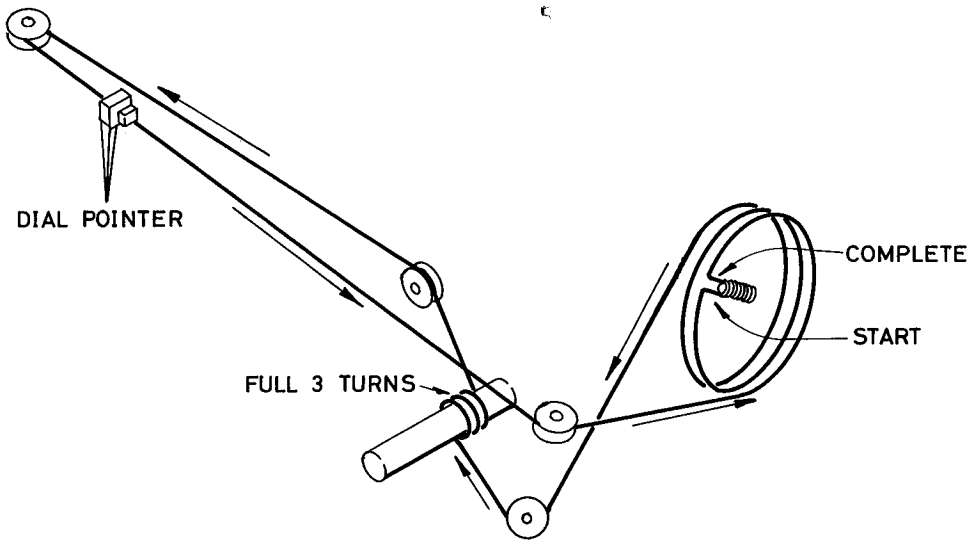


NOTES: 1. RESISTANCE IS SHOWN IN OHMS.
2. CAPACITANCE IS SHOWN IN MFD.

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 PART NO.	REF. NO.	DESCRIPTION
TRANSFORMERS & COILS		
12026545		Ceramic Filter, CD10
10128136	T901/2	Power Transformer
12028103	L301/2	Coil, MPX 19KHZ
12024858	L303	Coil, MPX 38KHZ
12028137	L901	Coil, AM Antenna Assy. W/Holder
12028102	L304/5	Coil, Filter RL-37
12028141	L703	Coil, Muting Frequency Adj.
12028166	L601/21	Damped Inductor
12027934	L201	Coil, AM Osc.
12028138	L101/202	Coil, RFC 47uH
11024846	T101/2/3	IFT, FM (1st, 2nd, 3rd)
11028263	T104	IFT, FM Ratio
11024829	T201	IFT, AM (1st)
11024830	T202	IFT, AM (2nd)
11024831	T203	IFT, AM (3rd)
DIODES		
41027991	D802/4	Diode, 1S1850
41028109	D801/3	Diode, 1S1850R
41028139	D301/603/23/805/7	Diode, SE-05
*42028108	D806	Diode, Zener, BZ-210 (21V)
*42028107	D808	Diode, Zener, BZ-120 (12V)
*42028106	D809	Diode, Zener, BZ-140 (14V)
42025628	D101/2/3/201/2/901	Diode, 1S188, AM DET
CONTROLS		
23528127	VR301	VR, MPX Pilot Level Adj., 1K
23528129	VR302	VR, MPX Separation Adj., 10K
23528125	VR601/21	VR, Idling Current Adj., 5K
23528126	VR101	VR, FM Auto-Switching Adj.,250K
23528165	VR901	VR, FM Muting Level Adj., 10K
22028135	VR502/3/4/5	Variable Resistor, Bass & Treble
22028162	VR501	VR, Volume 100K
22028163	VR506	VR, Balance 250K
TRANSISTORS		
*43025624	Q901/2/3/4	Transistors, Power Output, 2SD180
*43026932	Q801	Transistors, 2SD234
43028214	Q603/23/605/25	Transistors, 2SC496
43028215	Q606/26	Transistors, 2SA496
43025972	Q401/2/3/4/501/2/3/51/52/53	Transistors, 2SC644
*43027722	Q302	Transistors, CDC9002-1
43025336	Q201	Transistors, 2SA52
43025336	Q202	Transistors, 2SA49
43025613	Q107/601/2/21/22	Transistors, 2SA 564A
43025972	Q301/3/4/504/54/604/24	Transistors, 2SC828
*43025972	Q101/701/3/4/5/6/7	Transistors, 2SC829
43025972	Q106	Transistors, 2SA536G
43025336	Q102/3/4/5/203	Transistors, 2SA341
38128120	D601/21	Varistor, KB265
MISCELLANEOUS		
63028130		Escutcheon Assy.
61628131		Top Plexiglas, Dial
60728084		Dial Pointer Assy. w/bulb
12528132		Tuning Meter
63228087		Knob, Single (Function, Volume, Bal.)
63228088		Knob, Dual, Front (Bass & Treble)
63228089		Knob, Dual, Back (Bass & Treble)
63228090		Knob, Tuning
63228091		Knob, Round Pushbutton
63228092		Knob, Power
24028134		Switch, Function Selector
63228110		Switch, 2-gang Push
25027921		Switch, Power
60428094	C644	Tuning Shaft w/Flywheel
65424895		Fuse Holder
65424896		AC Outlet
65424917		Headphone Jack
*46527892		Bulb, Stereo Indicator, 14V 80MA
*46527254		Bulb, Func. Ind., Dial Pointer Power Pilot, 8V 0.15A
*46524956		Bulb, Dial Scale, 6.3V 280MA
62018160		Plastic Foot
00228161	2SN2FI-359	AM/FM Front End Tuner

NOTE TO WARRANTY STATIONS: Items marked by asterisk (*) are recommended spare parts stock. Printed circuit board assembly numbers are shown for reference only. Harman/Kardon does not normally supply assembled printed circuit boards.