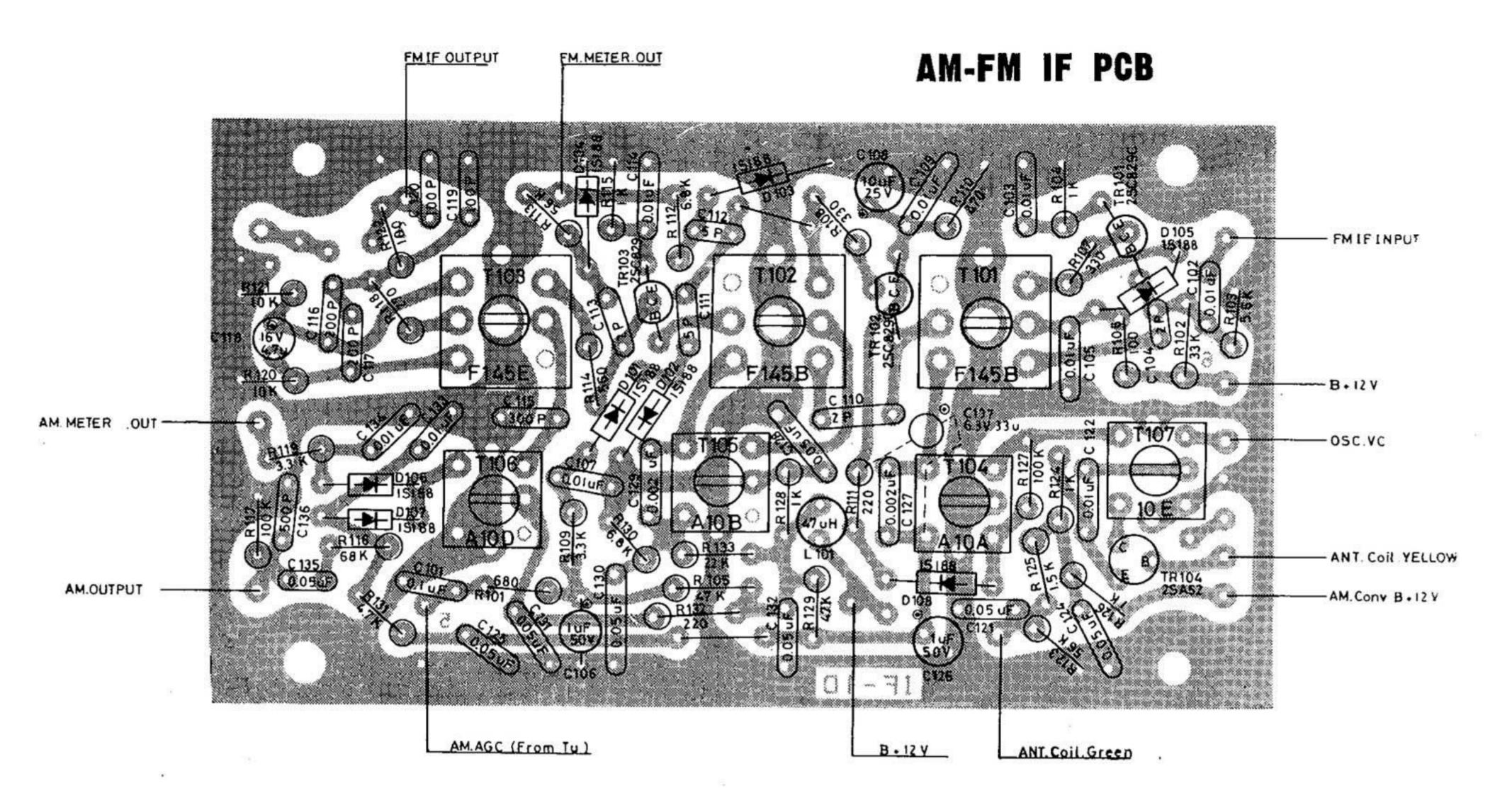
# SERVICE MANUAL

MODEL Two Thirty

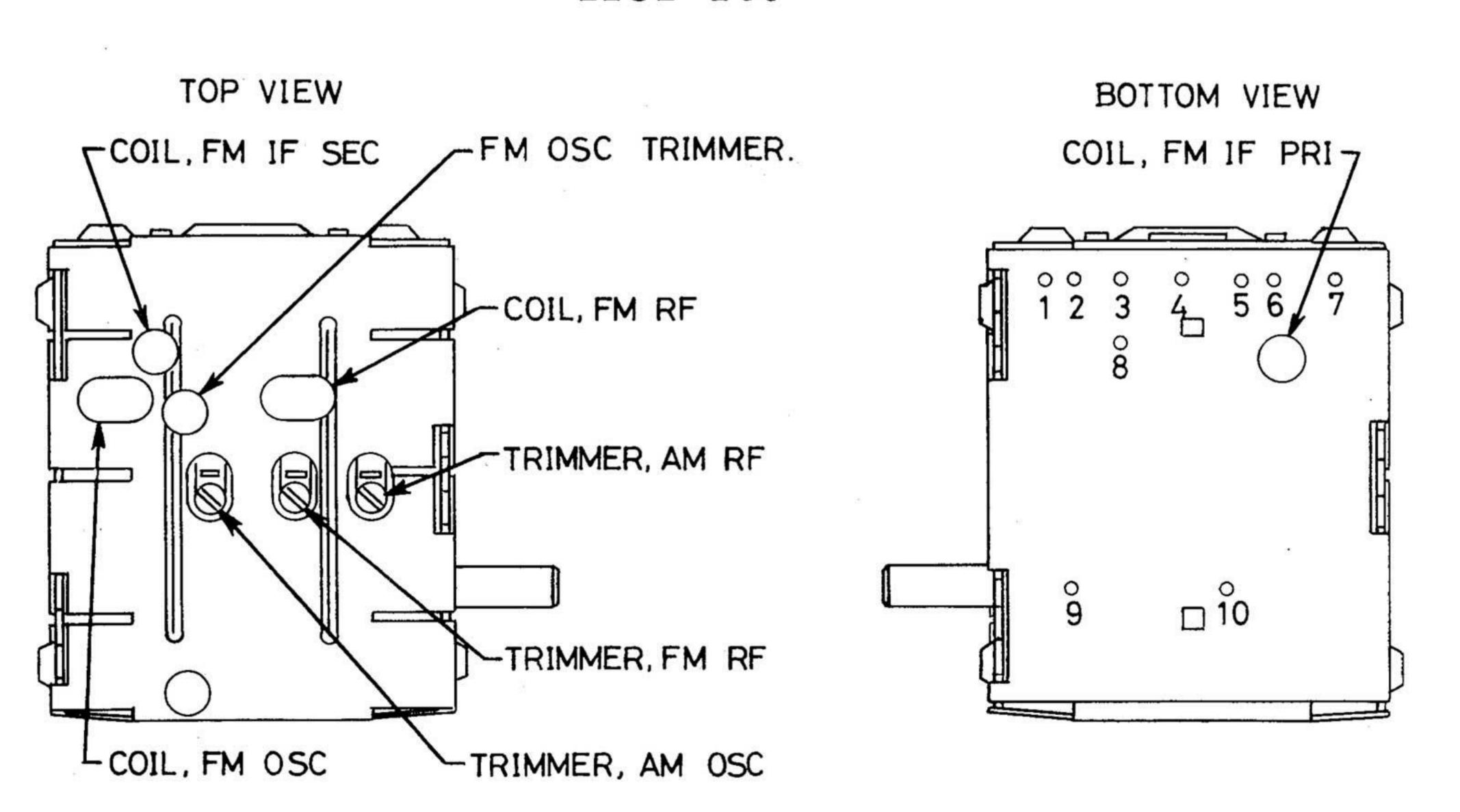
+ B4 · 27V (14V) R305 INPUT from IF p.c.b.(3) 5000 pF to selector sw OUTPUT +B5-18V (L) (R)

MULTIPLEX PCB

haman kardon



AM FM FRONT-END "22S2-260"



### DESCRIPTION OF TERMINAL PINS

No.1, No.2: ANTENNA 300ohm BALANCED

No.3: A G C

No.4: + B 12 V

No.5: IF HOT

No.6: IF COLD

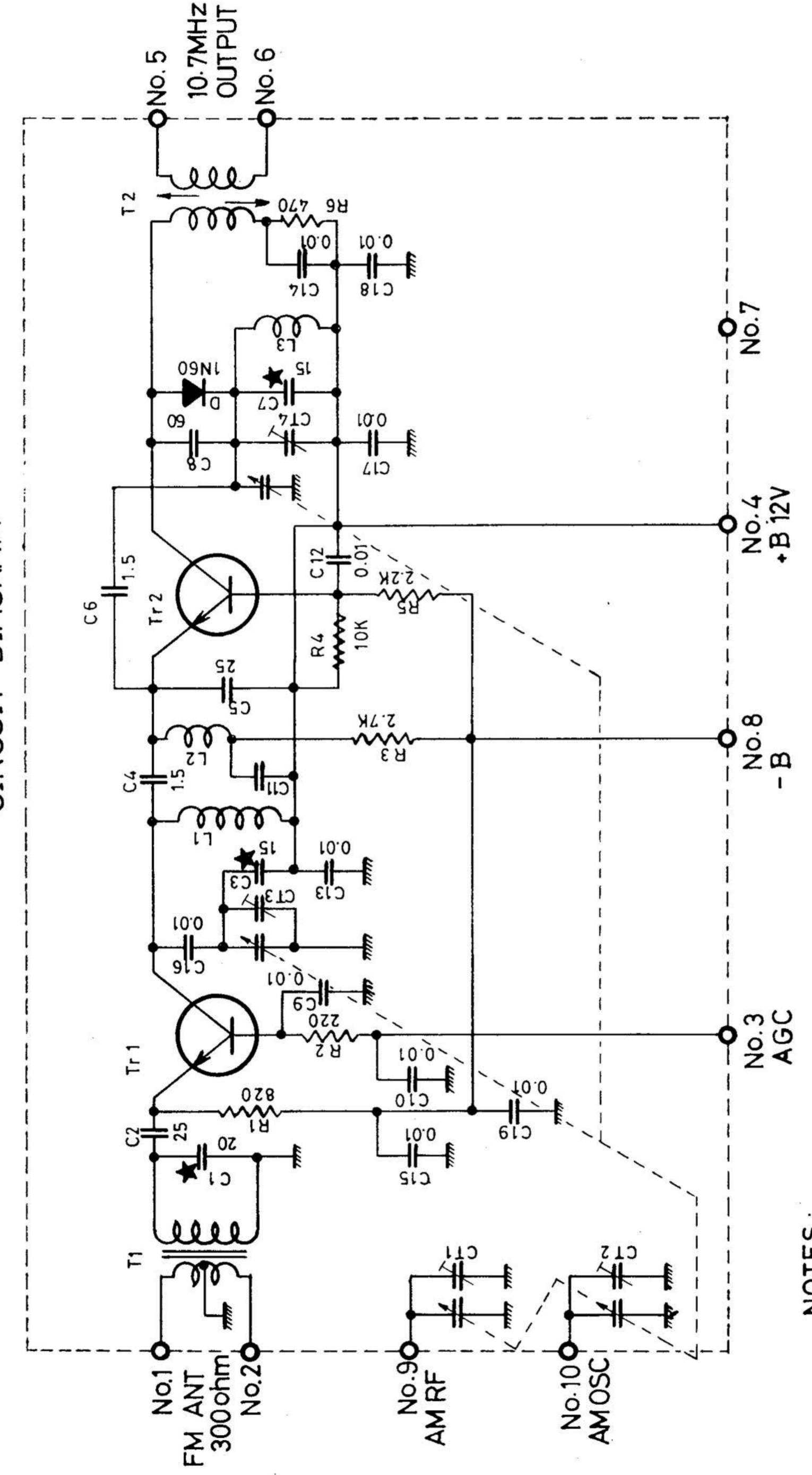
No.7:

No.8:-B GND

No.9: AM RF

No.10: AM OSC

# AM /FM FRONT-END "22S2-260" CIRCUIT DIAGRAM



DECIMAL VALUES IN CAPACITY VALUES IN UNF EXCEPT

- 2. ALL RESISTANCE VALUES IN OHMS.
- INPUT ZERO WHEN FOR -B VOLTAGE 1S 1.4V UPPER AGC
- . \* MARKS INDICATE ADJUSTABLE IN PRODUCTION.

### ALIGNMENT PROCEDURES

AM Alignment: "IF-1" "22S2-260"

Instruments: AM Signal Generator, AC V.T.V.M. Oscilloscope

STEP	DUMMY	SIGNAL GENERATOR COUPLING	S.G. FREQUENCY	SHLECTOR SWITCH	TUNING DIAL SETTING	INDICATING METER	ADJUST	ADJUST FOR
1	Direct	High side to AM ANT terminal Low side to chassis	455 KHz (400 Hz 30% AM)	AM	Any nonin- terfering setting	Tuning Indicator	T104, T105 & T106	Maximum Deflection
2	**. *** * *	Connect to short loop of wire, Radiate sig- nal into ferrite loop- stick ANT	600 KHz (400 Hz 30% AM)	AM.	600 KHz	Tuning	T107 & Bar ANT L701	Maximum Deflection
3	****	Same as step 2	1,400 KHz (400 Hz 30% AM)	AM.	1,400 KHz	Tuning	"22.52-260" CT2, CT1	Maximum Deflection

### ALIGNMENT PROCEDURES

FM Alignment: "IF-1" "2252-260"

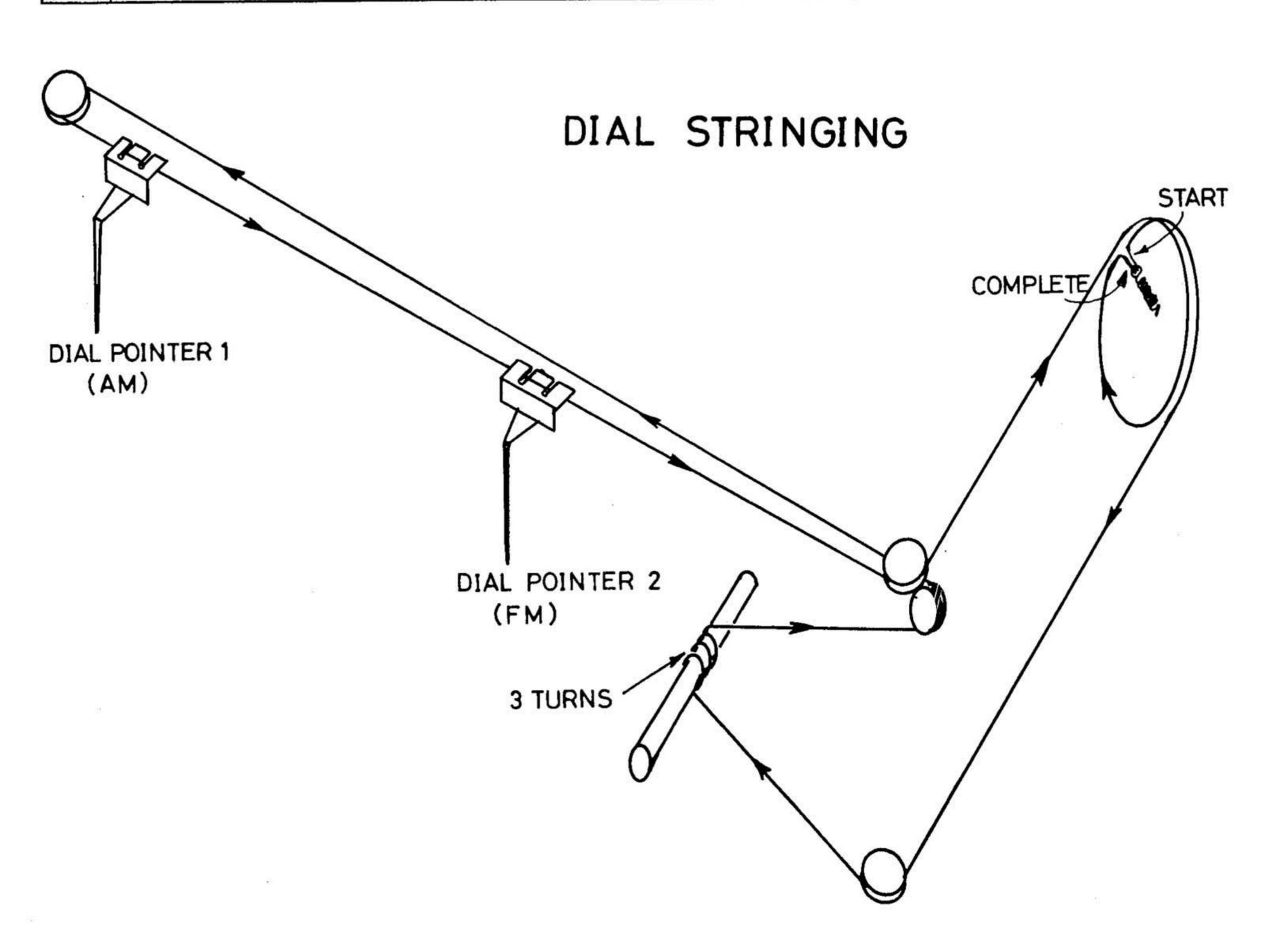
Instruments: FM Signal Generator, AC V.T.V.M. & Oscilloscope Note: Set Selector Switch to FM

DUMMY	SIGNAL GENERATOR		TUNING	INDICATING	AD IIIOM	AD HIGH BOD
A NT	COUPLING	FREQUENCY	SETTING	METER	ADJUST	ADJUST FOR
Direct	High side to."IF-1" input (1)	10.7 MHz (Un-Modula- ted)	Any non-in- terfering setting	Tuning	T101, T102,	Maximum Deflection
300 ohm carbon resistor	To FM ANT	98 MHz (400 Hz - 75 KHz) FM	Tune for maximum, using tuning indicator	V.T.V.M. & Osc- illoscope at L. output jack of Tape Rec.	T103, Top & Bottom, "2282-260" T2	Maximum  Deflection
Same as	Same as	90 MHz (400 Hz - 75 KHz) FM	90 MHz	Same as step 2	"22S2-260" CT4, CT3	Maximum Deflection
Same as	Same as	106 MHz (400 Hz - 75 KHz) FM	106 MHz	Same as step 2	"22S2-260" CT4, CT3	Maximum  Deflection
	ANT  Direct  300 ohm carbon resistor  Same as step 2  Same as	ANT COUPLING  Direct High side to."IF-1" input (1)  300 ohm carbon resistor terminals  Same as Same as step 2  Same as Same as	ANT COUPLING FREQUENCY  High side to."IF-1" (Un-Modula-ted)  300 ohm carbon resistor  To FM ANT 98 MHz (400 Hz - 75 KHz) FM  Same as Same as 90 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz)	DIAL SETTING  DIAL SETTING  DIAL SETTING  DIAL SETTING  DIAL SETTING  DIAL SETTING  Any non-interfering setting  300 ohm carbon resistor  To FM ANT 98 MHz (400 Hz - 75 KHz) FM  Terminals  Same as Same as 90 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz) 106 MHz	ANT COUPLING FREQUENCY SETTING METER  DIAL SETTING METER  DIAL SETTING METER  METER  Any non-in-terfering setting Indicator  Tuning Indicator  300 ohm carbon resistor  To FM ANT 98 MHz (400 Hz - 75 KHz) FM using tuning indicator  Same as Same as 90 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz) FM  Same as Same as 106 MHz (400 Hz - 75 KHz) Same as step 2	ANT  COUPLING FREQUENCY  SETTING  METER  ADJUST  ADJUST  ADJUST  DIAL SETTING  METER  ADJUST  ADJUST

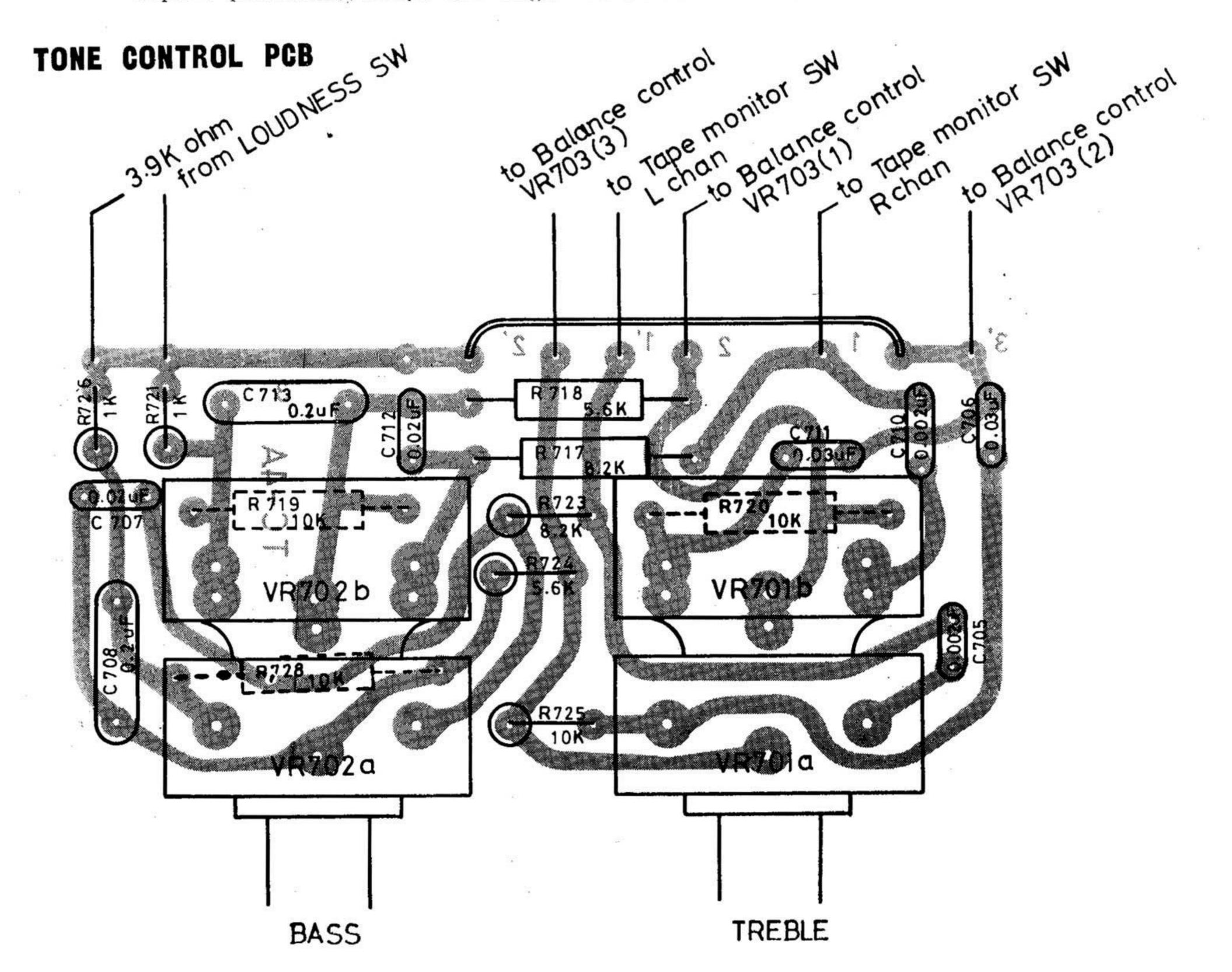
### MPX ALIGNMENT

INSRUMENTS: AUDIO GENERATOR, FM STEREO GENERATOR & OSCILLOSCOPE SET SELECTOR SWITCH TO "FM STEREO" SET VR 301, TO ITS CENTER POSITION

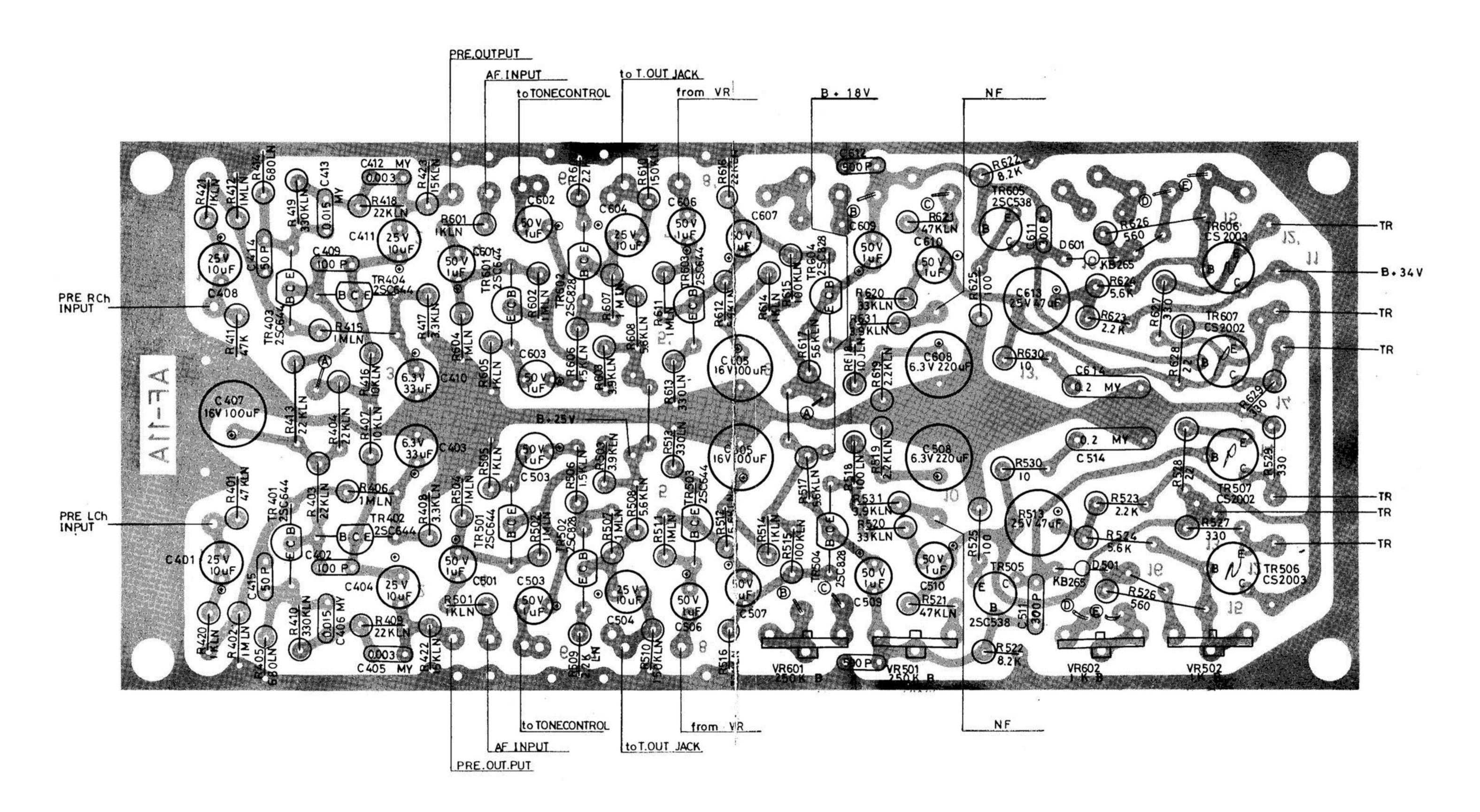
1 TOTAL 1722	19 KHz	SIGNAL GENERATOR	OUTPUT INDICATER		AD HIST FOR	
STEP	LEVEL SET	FREQ. SET TO	CONNECTED TO	ADJUST	ADJUST FOR	
1.		Audio Generator 67 KHz	Oscilloscope	L 302	Minimum	
2	72 KHz		TP-1	L 303		
3	1 - 2%	Stereo Generator 19 KHz	TP-2	L 301, T 301, T 302	Maximum	
4	8%	1,000 Hz Composite L or R chan	TP-1	L 301	Maximum and clean- est wave on scope	
5	5%	1,000 Hz Composite L or R chan	Detuning the dial, check the stereo beacon lamp just of		amp just comes on	
6		Composite 1,000 Hz	Cutput (6) 1-chan	Т 302	Maximum	
7	10%	L chan	Outout (5) R-chan	1m 201	Mi mimum	
8		Composite 1,000 Hz R chan	Output (6) L-chan	VR 301	Minimum	
9		Repeat steps 7 and 8 until	no further improvement is	possible.		



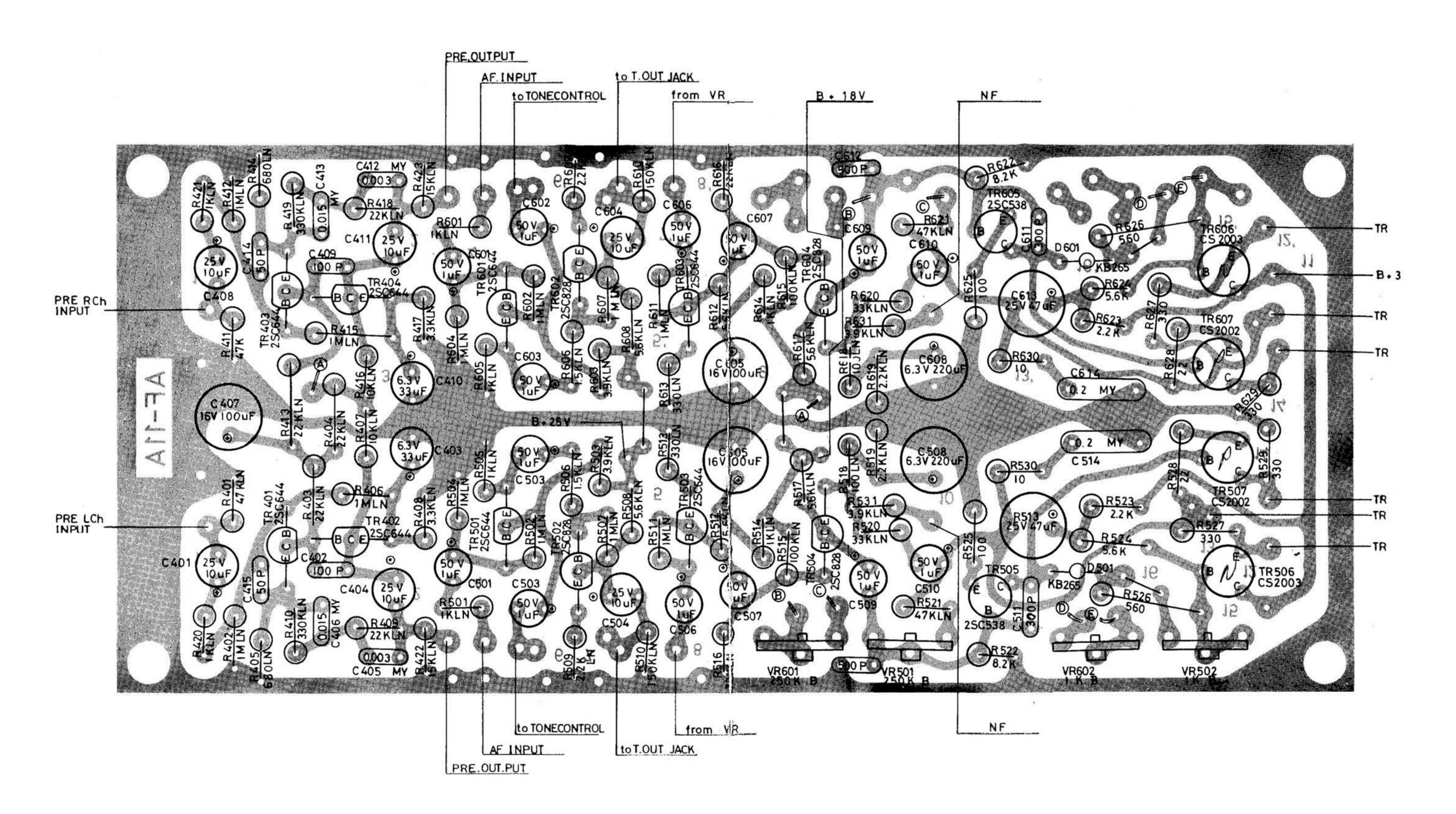
- \* Set Balance, Bass and Treble controls to their center position.
- \* Set Mode switch to "STEREO", Speaker switch to "SPKR-1" and Selector switch to "AUX".
- \* Connect 8 ohm (50W) resistor across L speaker terminals, and in parallel with the load resistor, connect the vertical input leads of the oscilloscope.
- \* Connect an audio generator, set for 1,000 Hz (Sine Wave), to L AUX input.
- \* Connect AC power cord and rotate volume control to clockwise position full volume. Increase generator output until sine wave on scope just starts clipping. Adjust DC balance VR501 for equal clipping on the positive and negative half cycles of the signal.
- \* Adjust crossover distortion, adjust VR502 until the crossover is extinguished (rotate volume control to counter clockwise position to get 0.1 watt (0.9V RMS) output). Or adjust idling current, using a DC mA-meter, rotate VR502 to obtain a 12 mA reading on a DC mA-meter (no signal input)
- \* Repeat preceding steps for right channel.





### PREAMP AND AUDIO AMPLIFIER PCB



## PREAMP AND AUDIO AMPLIFIER PCB





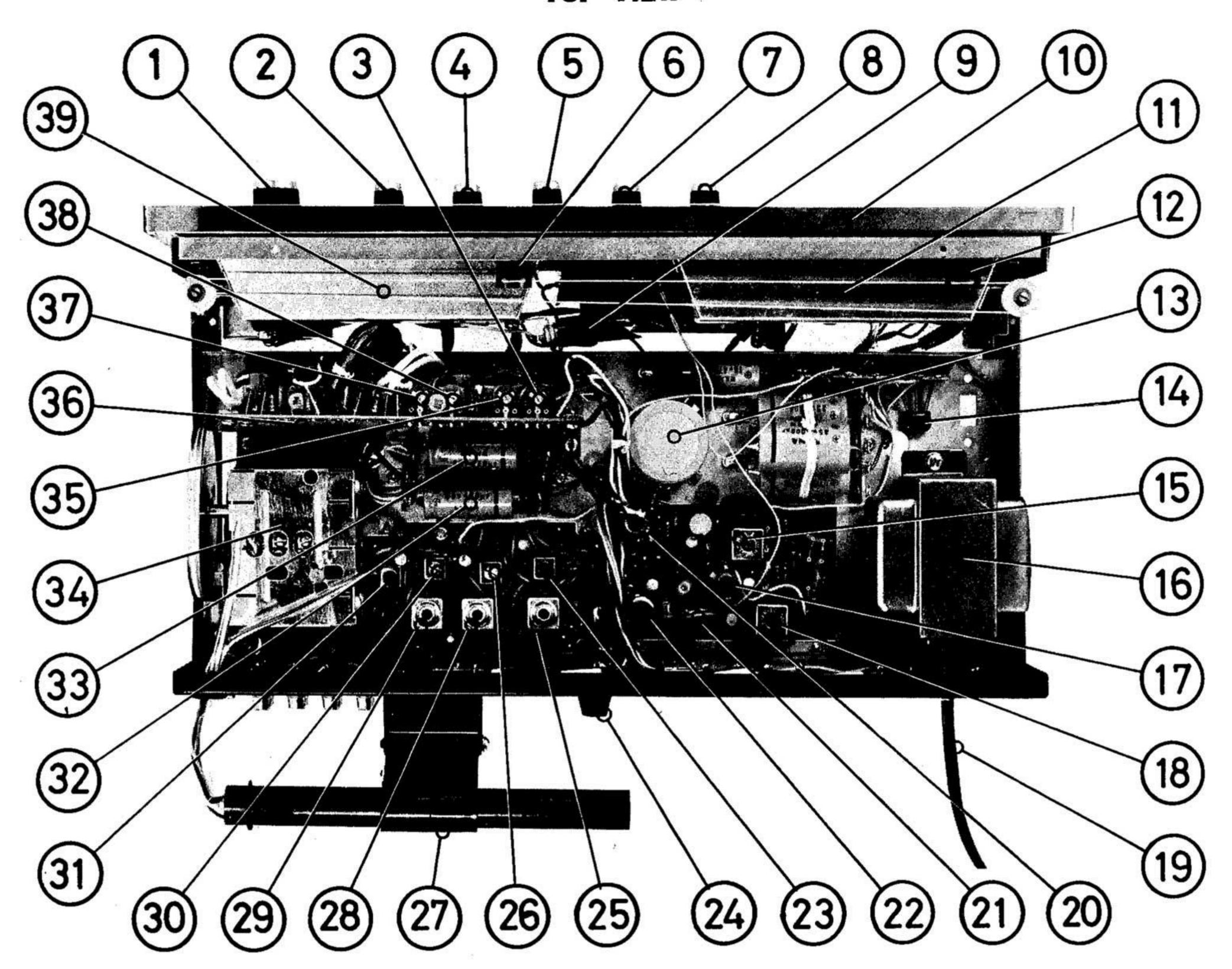


# REPLACEMENT PARTS LIST

HK Part No.	Source No.	Description
36625081	#3	Resistor, 0.5 A, 2W
22025671	R31-3062	Resistor, Variable, Loudness
22025672	R30-8072	Resistor, Variable, Balance
22025122	R31-1060	Resistor, Variable, Treble & Bass
23525118	R10-206	Resistor, Variable, MPX Separation, Threshold
23525676	R10-002	Resistor, Variable, AF Bias
23527233	R10-007	Resistor, Variable, AF DC Balance
31527234	1010-001	Capacitor, Lytic 2200UF, 50V
31525665		Capacitor, Lytic 1000UF, 35V
31525670		Capacitor, Lytic 470UF, 16V
31527235		Capacitor, Lytic 470UF, 25V
12027236	L01-0001	Coil, RF, 47UH (L101)
- 12024832	L05-0007	Coil, MPX, RL-7 (L301)
12024857	L05-0011	Coil, MPX, RL-17 (L302)
12024856	L05-0010	Coil, MPX, RL-16 (L303)
12027237	LM02-0008	Coil, AM Antenna (L701)
11027238	L04-0014	Transformer, FM-IF, F145B (T101, T102)
11027239	L04-0015	Transformer, FM-IF, F145E (T103)
11024829	L03-0010	Transformer, AM-IF, A-10A (T104)
11024830	L03-0011	Transformer, AM-IF, A-10B (T105)
11024831	L03-0013	Transformer, AM-IF, A-10D (T106)
11027240	L02-0004	Transformer, AM OSC., A-10E (T107)
11024855	L05-0009	Transformer, MPX, RL-10 (T301, T302)
11027241	L40-1099	Transformer, Power
43025620	2SC829	Transistor, AM/FM IF Amp (TR101, TR102, TR103)
43024833	2SA52	Transistor, AM Convertor (TR104)
43024834	2SA49	Transistor, MPX (TR301, TR302, TR303)
43024859	2SC828	Transistor, MPX, AF (TR304, TR502, TR504,
43025619	2SC644	TR602, TR604) Transistor, AF Preamp, AF Main (TR401,
43023017	250044	TR402, TR403, TR404, TR501, TR503,
•	18	TR601, TR603)
43027242	2SC538A	Transistor, AF Predriver (TR505, TR605)
43027243	CS2003HE	Transistor, Driver (TR506, TR606)
43027244	CS2002HE	Transistor, Driver (TR507, TR607)
43027245	2SC931	Transistor, Power Amp (TR701, TR702, TR703,
13021213	200751	TR704)
41027246	KB265B	Varistor
41025628	IS188	Diode, Signal
4027247	IS1850	Diode, Power
24027248	S-1030	Switch, Function
24525642	S-1005	Switch, Rocker (Control, Monitor, Mode, Speaker)
25527249	S-1035	Switch, Power (UEH12BP)
65427250	E-4003	Headphone Jack
65424896	S-2041	AC Convenience Receptacle
65424895	5-2032	Fuse Holder
65427251	E-2009	Input Jack
65425635	E-3005	Terminal Strip, Speaker
65427252	E-3003	Terminal Strip, Antenna
46524955	M-5001	Lamp, Meter (0.25A, 6.3V)
46527253	M-5006 ·	Lamp, Stereo Ind. (30mA, 6.0V)
46527254	M-5007	Lamp, Pilot (0.15A, 8.0V)
53027268		Line Cord
00327255	UA-0010	AM/FM Front End (2282-260)
12524913	I-1014	Tuning Meter
45024897	M-5011	Fuse, 1.5A
60424912	M-2101	Flywheel
65427256	M-8002	Stereo Lamp Holder
60727257	D31-1002	Dial Pointer Diarialess Insert Upper
61627258		Plexiglass Insert, Upper
61627259	==	Plexiglass Insert, Lower
61627260		Diffuser, Light (White)
61627261	TO 1 1 1000	Diffuser, Light (Red)
63027262	B11-1035	Escutcheon Top Cover
60127263	B21-1012	Top Cover Knob, Tuning
63227264		Knob (Selector, Volume, Balance, Bass, Treble)
63227265		Pushbutton, Power, Red
63227266	4PC 12'A	Tuning Shaft
60427267	4BG-12A	Owner Manual
90726448		Technical Manual
90726668		

speed handling of your order be sure to include both the model and serial numbers which appear at the back, in addition to the quantity, part number and part description of the items ordered. Orders from independindependent servicemen, and retail customers will be shipped on a C.O.D. basis. Harman-Kardon reserves the titute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman-nview, L.I., N.Y., Att: Parts Department. All prices are subject to change without notice.

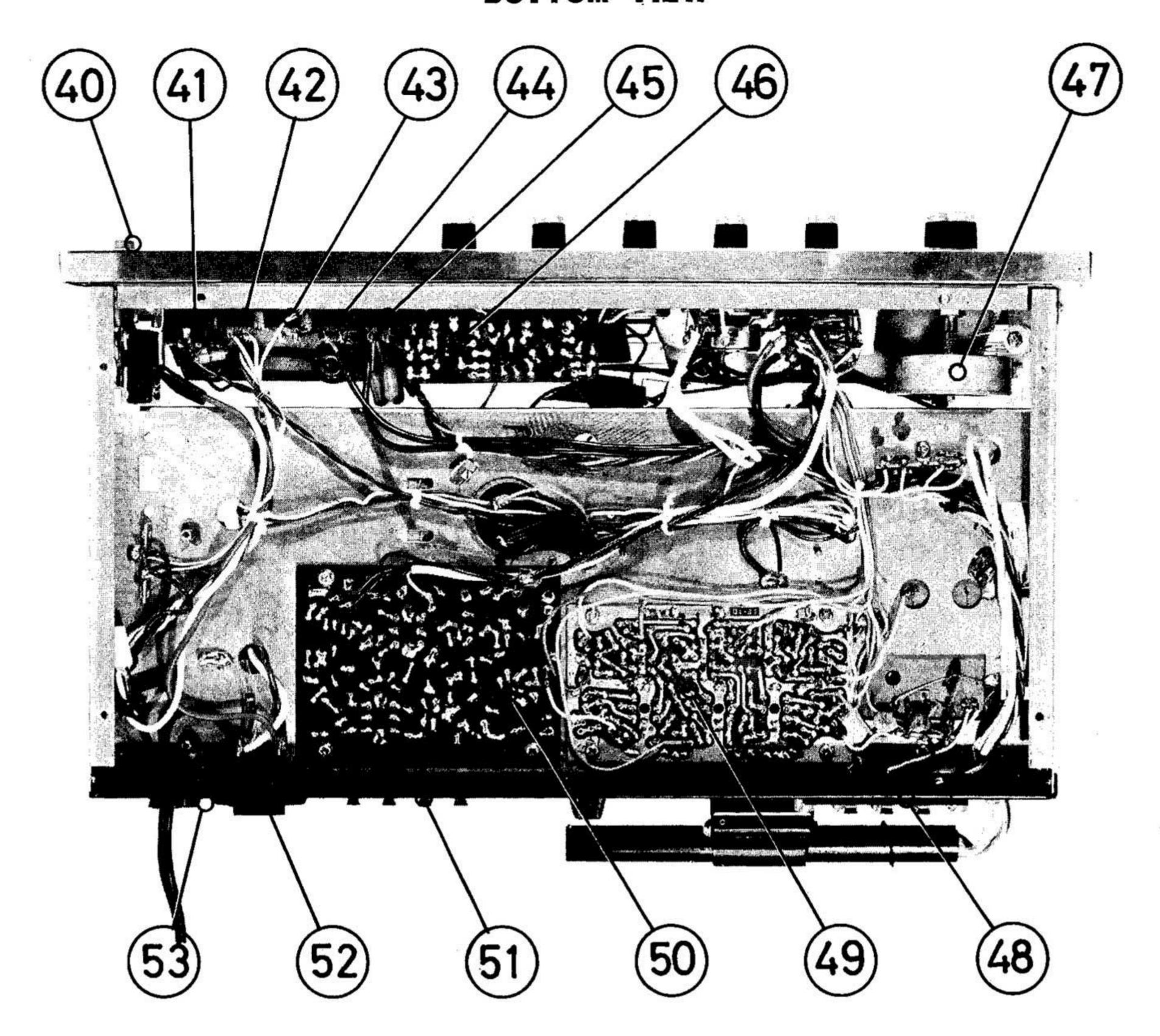
## TOP VIEW



- 1 TUNING SHAFT
- 2 FUNCTION SWITCH
- 3 IDLING ADJ L-chan (VR502)
- 4 VOLUME CONTROL
- 5 BALANCE CONTROL
- 6 FM DIAL POINTER
  - 7 TREBLE CONTROL
  - 8 BASS CONTROL
  - 9 METER LAMP
- 10 FRONT PANEL
- 11 AM DIAL LAMP HOUSE
- 12 AM DIAL POINTER
  - 13 C719 RIPPLE FILTER

- 14 RECTIFIER
- 15 T301
- 16 POWER TRANSFORMER
- 17 L302
- 18 T302
- 19 AC LINE CORD
- 20 L303
- 21 SEPARATION CONTROL (VR301)
- 22 L301
- 23 T106 AM IFT
- 24 DC FUSE
- 25 T103 FM IFT
- 26 T105 AM IFT

# **BOTTOM VIEW**



- 27 AM LOOPSTICK ANT L701
- 28 T102 FM IFT
- 29 T101 FM IFT
- 30 T104 AM IFT
- 31 T107 AM OSC
- 32 C716 (R-chan)
- 33 C715 (L-chan)
- 34 AM/FM FRONT-END
- 35 IDLING ADJ R-chan (VR602)
- 36 AF P.C.B.
- 37 DC BALANCE ADJ R-chan (VR-601)
- 38 DC BALANCE ADJ L-chan (VR501)
- 39 FM DIAL LAMP HOUSE
- 40 POWER SWITCH

- 41 HEAD PHONE JACK
- 42 SPEAKER SWITCH
- 43 MODE SWITCH
- 44 MONITOR SWITCH
- 45 LOUDNESS SWITCH
- 46 TONE CONTROL P.C.B.
- 47 FLY WHEEL
- 48 ANT TERMINAL STRIP
- 49 AM/FM IF P.C.B.
- 50 MPX P.C.B.
- 51 SPKR SYSTEM-1 TERMINAL STRIP
- 52 AC OUTLET SOCKET
- 53 SPKR SYSTEM-2 TERMINAL STRIP

