

 **sams**

transistor radio

TSM-148

for

Aiwa AR-162

Arvin 70R78-19

General Electric P2900A

Hitachi KH-1316W – J.C. Penney 1860 (850-0803) – Midland 10-568

Panasonic RF-1700, RF-1700C – Philco-Ford TSCP-81 – RCA RHM80EK

Realistic 14-916 – Realtone 2314 – Sears 250.21260200 – Sharp FX-184

Sony MR-9300WA – Soundesign 3430 – Toshiba RP-113F

Wards Airline GEN-1353A

\$3.25
\$4.10 IN CANADA
Cat. No. TSM-148



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Library of Congress Catalog Card Number 72-86315



transistor radio

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GENERAL SERVICING INFORMATION

The following information applies to all players in this volume, and should be followed before any adjustments are made or trouble diagnosis is attempted. Any exceptions or additions will be found in the detailed servicing procedures for each player.

POWER SOURCES

Many players require full supply voltage for proper operation. Be sure the supply voltage is maintained at the rated value under load while making adjustments.

CLEANING

Head faces should be cleaned with head cleaner to remove dust and accumulated oxide. (An applicator may be fashioned from absorbent cotton.) Do not use a screwdriver or any metallic object near the head faces.

CAUTION: Avoid getting head cleaner on any plastic surface.

Clean capstans, pressure rollers, and tape guides with alcohol using a soft lint-free cloth. Also use alcohol to remove oil and grease from drive belts and other driving surfaces.

LUBRICATING

Clean all surfaces before lubricating. Apply a few drops of #20 machine oil to all bearings and rotating bushings. Apply a thin film of light, nonhardening grease to all cam surfaces and pawls, if they have been factory lubricated. Always wipe excess oil or grease from parts that have been lubricated.

CAUTION: Oil and grease must be kept off all driving surfaces as well as any parts which may transfer oil or grease to them.

DEMAGNETIZING

Heads require demagnetizing at regular intervals to maintain high-frequency response, dynamic range, and low distortion. (Follow instructions included with the demagnetizing unit.) After demagnetizing the heads, keep all screwdrivers and other metallic objects away from the head faces. Tape guides may also require occasional demagnetizing.

IMPORTANT: Be sure to demagnetize the heads after making resistance measurements in the head circuits.

CARTRIDGES

Many problems associated with tape players result from defective cartridges. Always try a cartridge known to be good before attempting repairs.

ALIGNMENT INSTRUCTIONS

Check for specified source voltage. Set volume control at maximum.
 Fashion loop of several turns of wire and connect generator across loop.
 Use only enough generator output to obtain a suitable indication.

SELECTOR IN AM

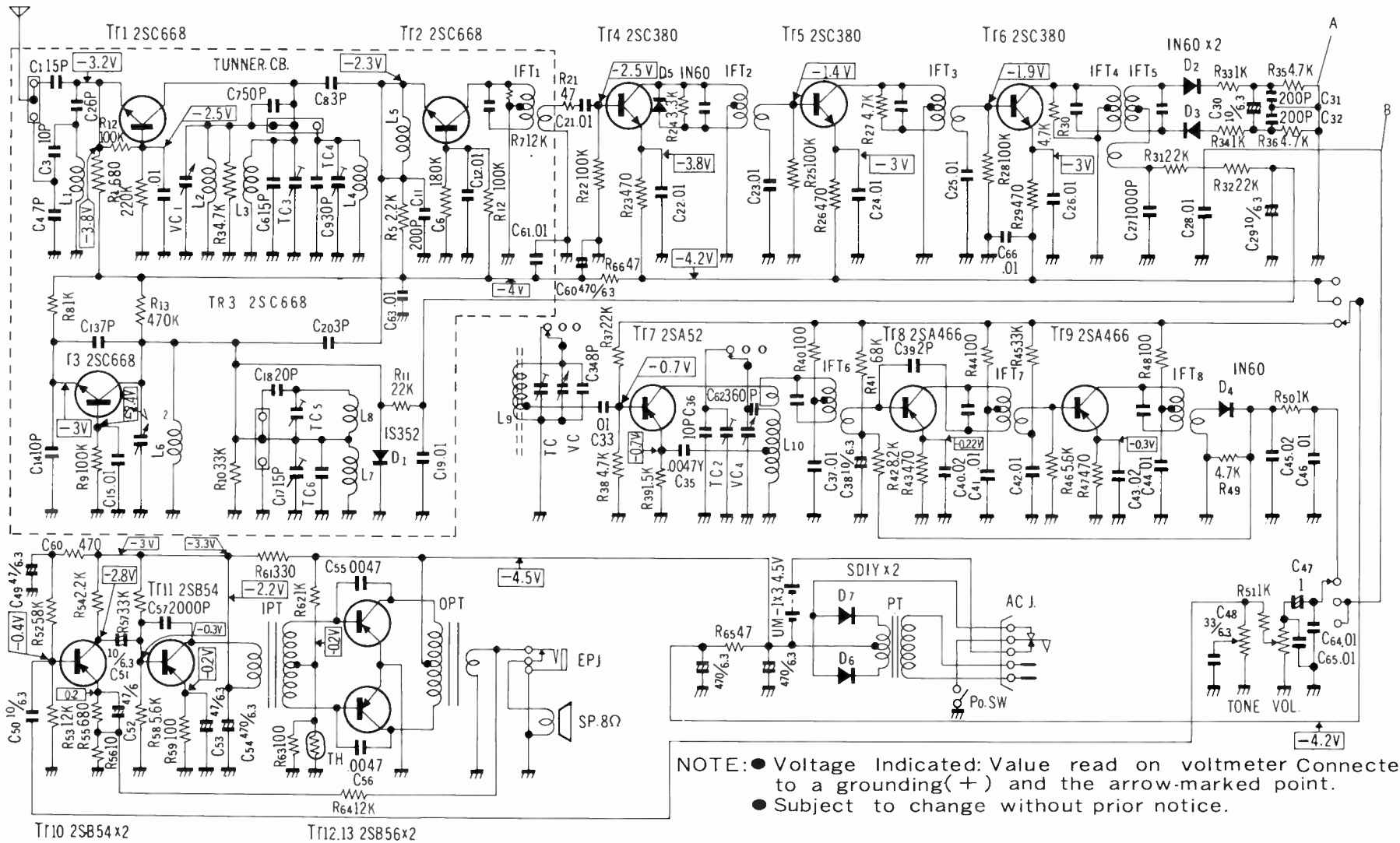
	GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	455KC 400 cycle modulation	Tuning gang fully open.	Output Meter across voice coil.	IFT8, IFT7, IFT6	Adjust for maximum. Repeat until no further improvement can be made.
2.	1650KC	"	"	TC2	Adjust for maximum.
3.	1400KC	Tune to signal	"	TC	"
4.	600KC	"	"	L10	Rock tuning gang and adjust for maximum. Repeat steps 2 thru 4 until no further improvement can be made.

SELECTOR IN FM

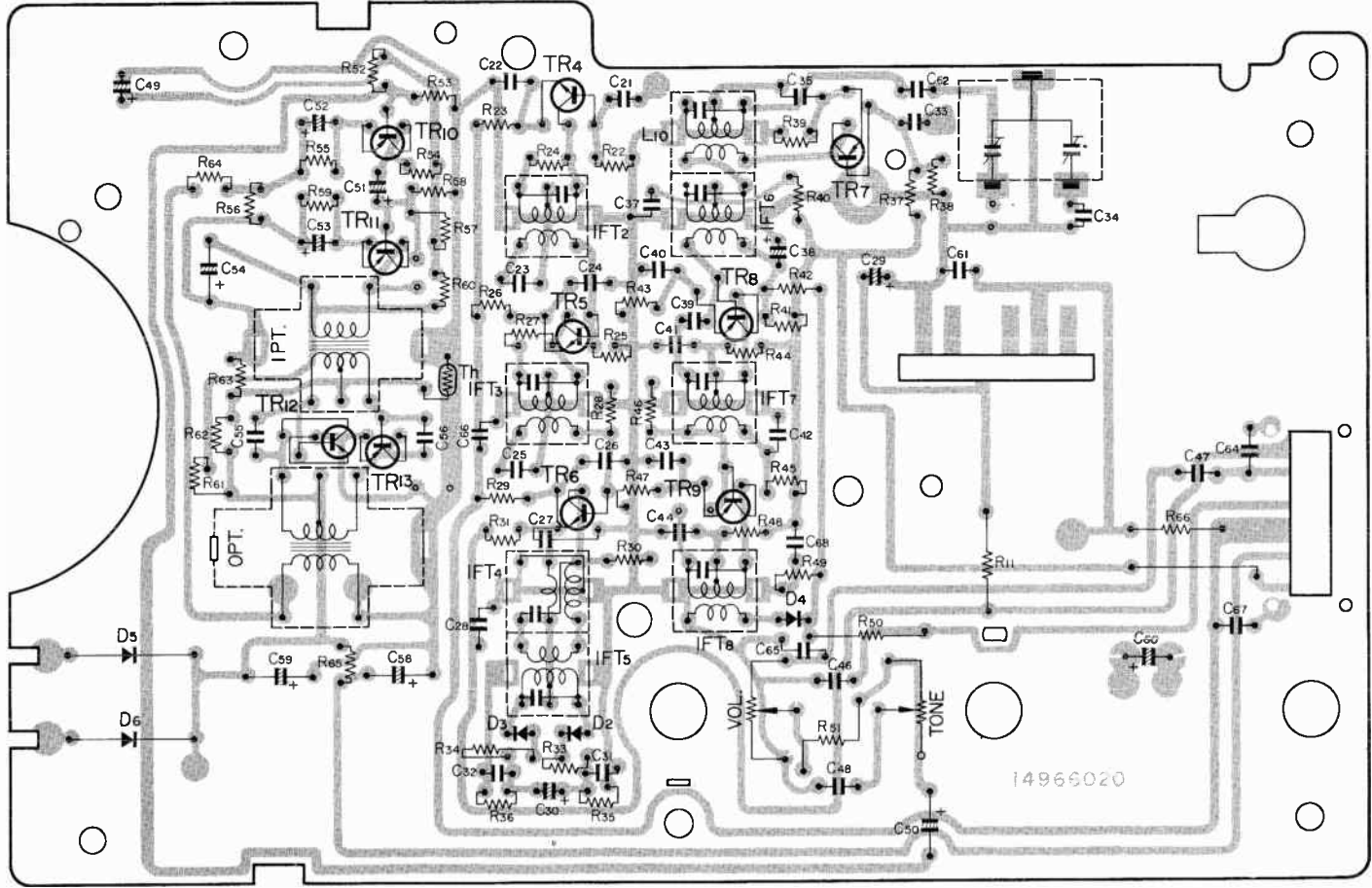
	GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
5.	10.7MC Unmodulated	Point of non-interference	DC probe of VTVM to point $\diamond A$, common to ground.	IFT4, IFT3, IFT2, IFT1	Adjust for maximum
6.	"	"	DC probe of VTVM to point $\diamond B$, common to ground.	IFT5	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.
7.	108MC	High freq. end.	DC probe of VTVM to point $\diamond A$, common to ground.	TC5, TC3	Adjust for maximum

SELECTOR IN POLICE BAND

	GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
8.	158MC	High freq. end.	DC probe of VTVM to point $\diamond A$, common to ground.	TC6, TC4	Adjust for maximum

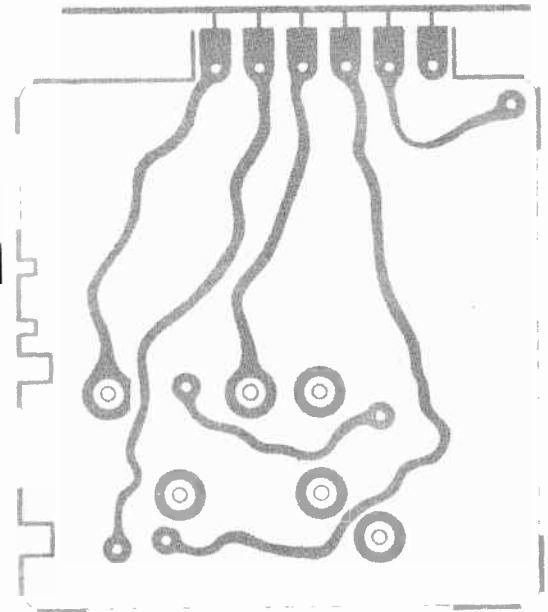
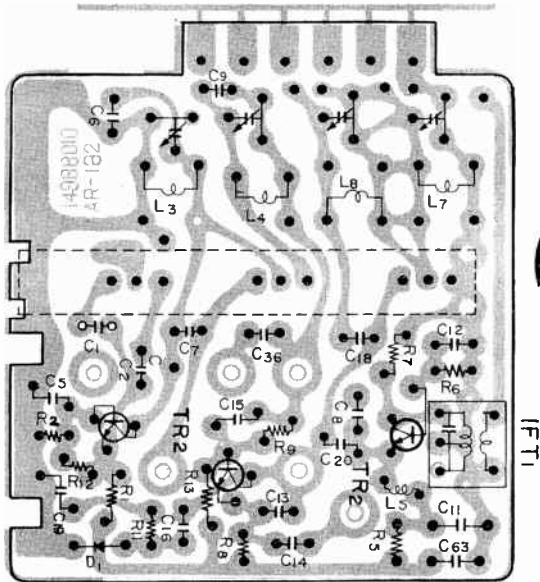


NOTE: ● Voltage Indicated: Value read on voltmeter Connected to a grounding(+) and the arrow-marked point.
 ● Subject to change without prior notice.



Aiwa AR-162

TUNER CIRCUIT BOARD, AR-162



SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	80523520	1S352
D2	80510600	1N60
D3	80510600	1N60
D4	80510600	1N60
D5	80510600	1N60
D6	70270050	SD-1Y
D7	70270050	SD-1Y
TR1	8036683	2SC668(C)
TR2	8036683	2SC668(C)
TR3	80366840	2SC668(D)
TR4	80338040	2SC380(Y)
TR5	80338030	2SC380(O)
TR6	80338030	2SC380(O)
TR7	80105200	2SA52
TR8	80146620	2SA466(2)
TR9	80146630	2SA466(3)
TR10	80205400	2SB54
TR11	80205400	2SB54
TR12	80205600	2SB56
TR13	80205600	2SB56

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C29	83321100	10mfd 6.3V
C30	83321100	10mfd 6.3V
C47		1mfd
C49	83325100	47mfd 6.3V
C51	83321100	10mfd 6.3V
C52	83325100	47mfd 6.3V
C53	83325100	47mfd 6.3V
C54	8332520	470mfd 6.3V
C60	8332520	470mfd 6.3V
TC1	11233740	Trimmer
TC2	11233740	Trimmer
TC3	12293070	Trimmer
TC4	12293070	Trimmer
TC5	12293070	Trimmer
TC6	12293070	Trimmer
VC	14966060	Tuning Gang

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
TH	80642610	Thermistor
Tone	70211720	Tone
Vol.	70211860	Volume

COILS/TRANSFORMERS

ITEM	PART NO.		
IFT1	14453070	L3	70060170
IFT2	1403340	L4	14966170
IFT3	1403340	L6	70040430
IFT4	70080780	L7	70060160
IFT5	70080840	L8	70060160
IFT6	13223060	L9	14966030
IFT7	13223070	L10	13836030
IFT8	70080630	OPT	70020250
IPT	70020240	PT	14966070
L2	70040430		

MISCELLANEOUS

ITEM	NAME	PART NO.
SP	Speaker	14966080
S1-3	Switch, Slide	14966040
	Switch, Rotary	14966050
	Antenna, Telescopic	14960361
	P.C. Board, Main	14966020
	P.C. Board, Tuner	14988010

CABINET PARTS

NAME	PART NO.
Cabinet	14960011
Escutcheon, Control	14960141
Dial Pointer	14962061
Handle	14960101
Knob, Volume	14960070
Knob, Tone	14960070
Knob, Selector	14960070
Knob, Tuning	14960040

TECHNICAL INFORMATION FOR SERVICEMEN

TUNING RANGE AM 530 - 1640 KHZ
FM 87.5 - 108.5 MHZ

IF FREQUENCY AM 455 KC
FM 10.7 MHZ

STANDARD OUTPUT TEST LEVEL: 50 M.W. (.63 VOLTS ACROSS 8 OHM, SPEAKER V.C.)

AM ALIGNMENT

OPERATION	GENERATOR CONNECTION	INPUT SIGNAL FREQUENCY	BAND	POSITION OF TUNING	METER	ADJUSTMENT	PURPOSE
1.	*TEST LOOP	455 KHZ	AM	HIGH FREQ. END OF DIAL	OUTPUT METER ACROSS SPKR	A1 A2	ALIGN IF
**2.	*TEST LOOP	1640 KHZ	AM	HIGH END	SAME	A4	SET OSC.
**3.	*TEST LOOP	530 KHZ	AM	LOW END	SAME	A6	SET OSC.
*4.	*TEST LOOP	1400 KHZ	AM	1400 KHZ	SAME	A5	ALIGN AM ANT. CIRCUIT
*5.	*TEST LOOP	600 KHZ	AM	600 KHZ	SAME	± A5A	ALIGN AM ANT. CIRCUIT

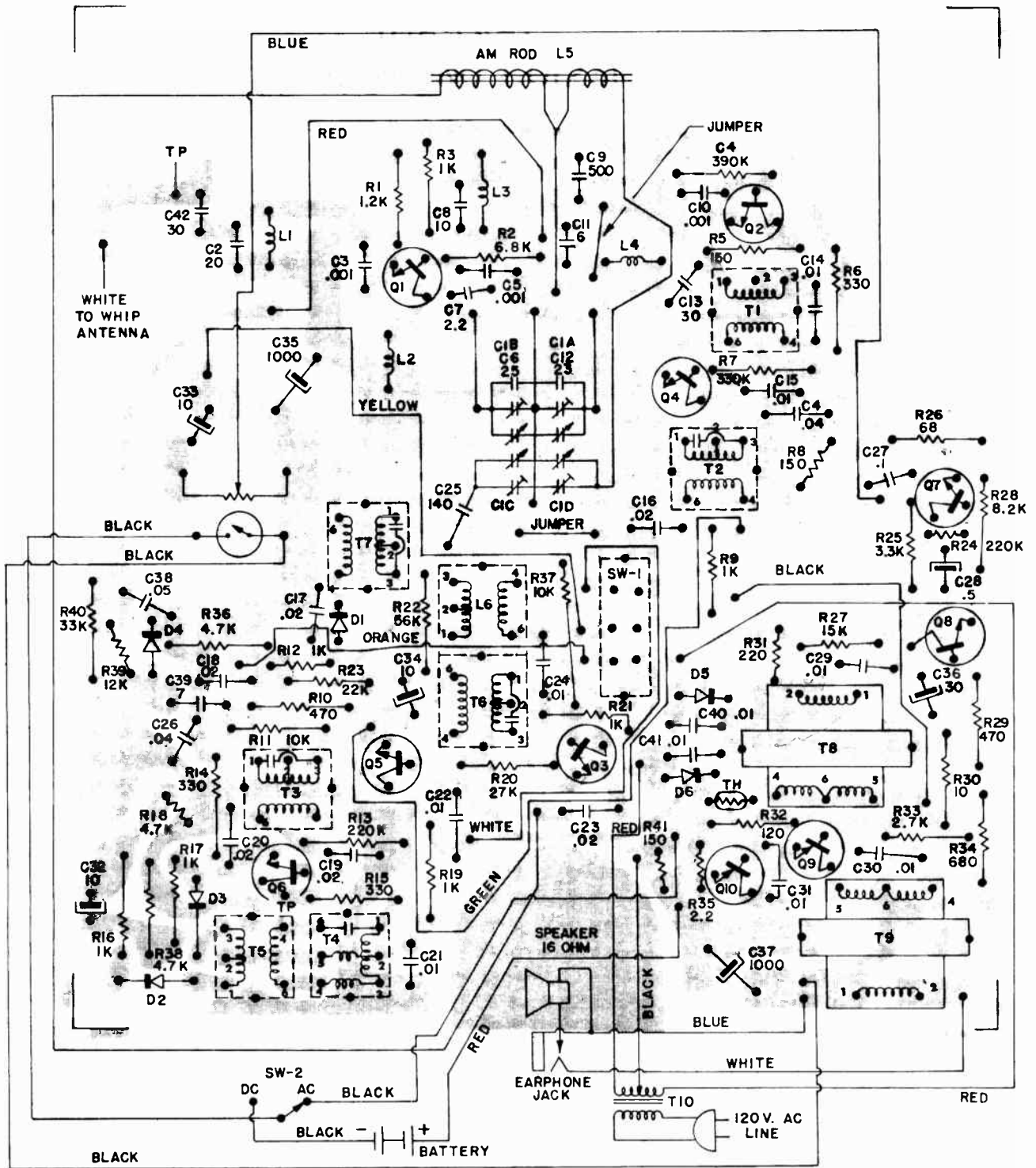
‡ FOR PROPER TRACKING OF THIS RADIO AN ANTENNA INDUCTANCE ADJUSTMENT HAS BEEN PROVIDED. THIS IS ACCOMPLISHED BY PLACING THE WINDING ON A COIL FORM WHICH CAN BE SLID ON THE ROD. THE COIL FORM IS SECURED TO THE ROD WITH WAX, AND SHOULD BE SECURED AGAIN AFTER ADJUSTMENT.

- * THREE (3) TURNS OF WIRE 6" IN DIAMETER PLACED ABOUT ONE FOOT FROM THE RECEIVER ANTENNA.
- ** REPEAT STEPS 2 AND 3 IN SEQUENCE UNTIL CORRECT COVERAGE IS OBTAINED.
- * REPEAT STEPS 4 AND 5 IN SEQUENCE UNTIL NO FURTHER CHANGE IS NOTED.

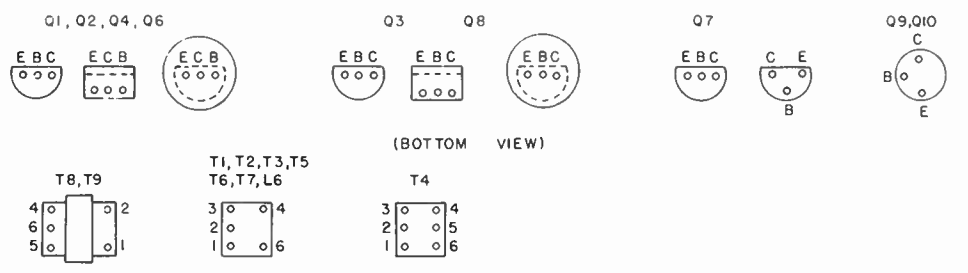
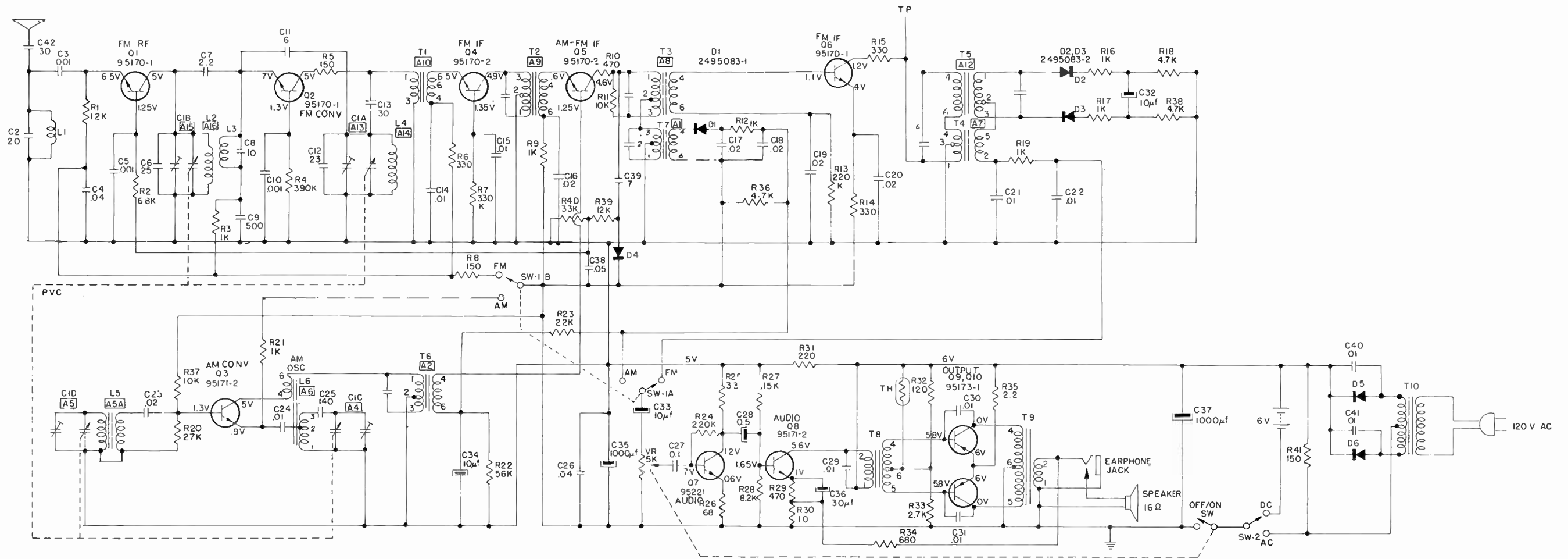
FM ALIGNMENT

OPERATION	GENERATOR CONNECTION	INPUT SIGNAL FREQ. 22.5 KHZ DEVIATION	BAND	POSITION OF TUNING	METER	ADJUSTMENT	PURPOSE
6.	FM ANTENNA	10.7 MHZ MODULATED. LOW SIGNAL LEVEL.	FM	MINIMUM INTERFERENCE POSITION	OUTPUT METER ACROSS SPKR	A7, A8, A10 A9	ALIGN FM IF FOR MAX. OUTPUT
7.	FM ANTENNA	10.7 MHZ MODULATED. INCREASE GENERATOR VOLTAGE TO OBTAIN LIMITING	FM	MINIMUM INTERFERENCE POSITION	CONNECT D.C. VTVM TO VOLUME CONTROL	A12	ADJUST ACCURATELY FOR ZERO D.C. VOLTS. THERE WILL BE A POSITIVE OR NEGATIVE VOLTAGE ON EITHER SIDE OF THE CORRECT SETTING.
**8.	FM ANTENNA	108.5 MHZ MODULATED	FM	HIGH END	OUTPUT METER ACROSS SPKR.	A13	SET OSC.
**9.	FM ANTENNA	87.5 MHZ MODULATED		LOW END	SAME	A14	SET OSC.
*10.	FM ANTENNA	106 MHZ MODULATED		TUNED TO 106 MHZ	SAME	A15	ALIGN RF FOR MAX. OUTPUT
*11.	FM ANTENNA	90 MHZ MODULATED		TUNED TO 90 MHZ	SAME	A16	ALIGN RF

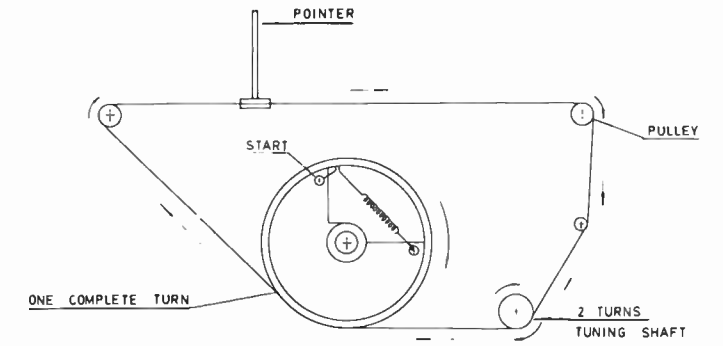
- ** REPEAT STEPS 8 & 9 IN SEQUENCE UNTIL PROPER COVERAGE IS OBTAINED.
- * REPEAT STEPS 10 & 11 IN SEQUENCE UNTIL NO FURTHER TRACK IMPROVEMENT IS OBTAINED.



CIRCUIT BOARD DIAGRAM
(Bottom View)



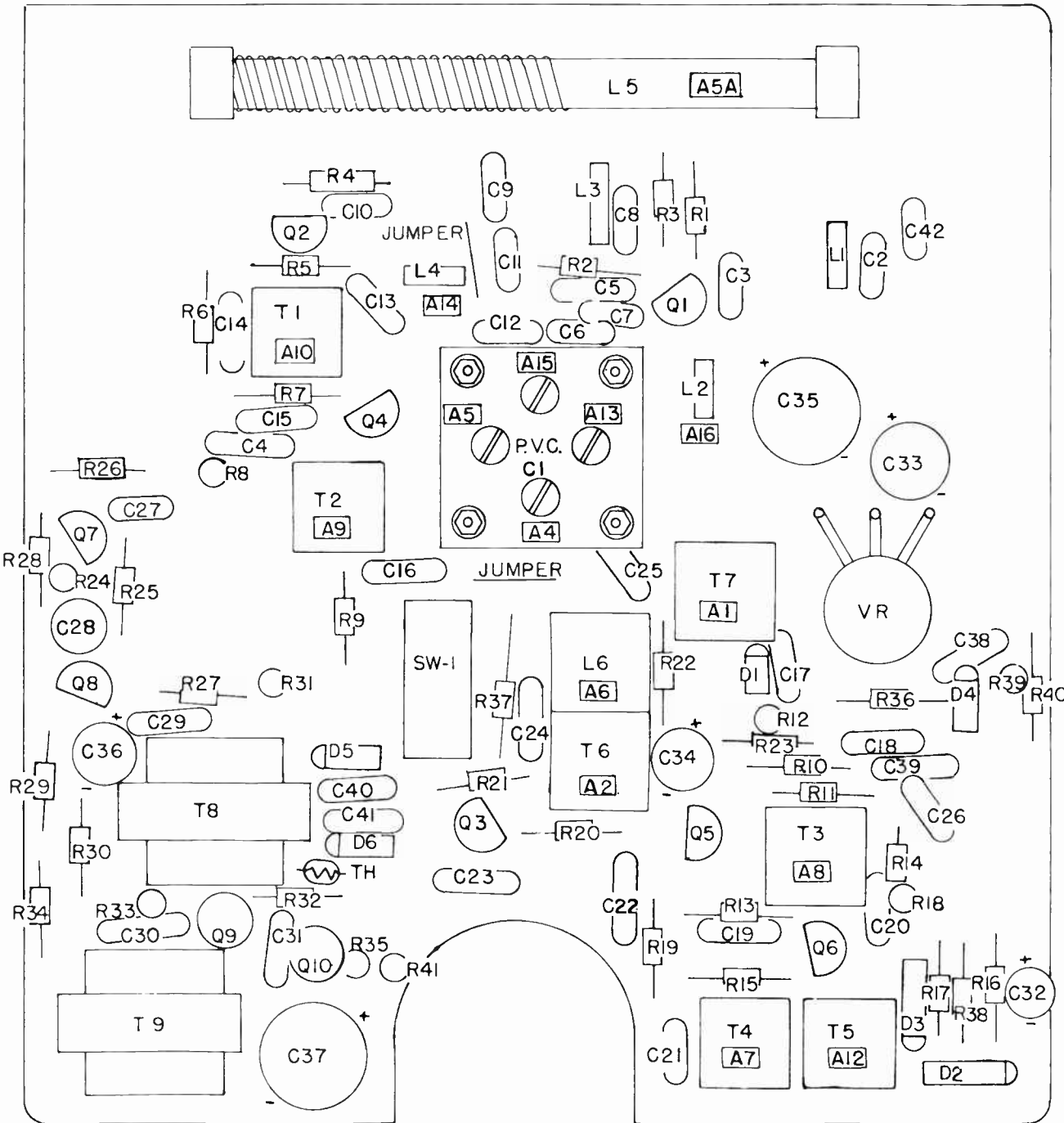
ALL VOLTAGES MEASURED WITH SW-1 IN FM POSITION SHOWN EXCEPT Q3 VOLTAGES, WHICH ARE MEASURED IN AM POSITION.
 RESISTANCE VALUES ARE IN OHMS K=1000.
 ALL VOLTAGES MEASURED WITH A V.T.V.M. WITH NO SIGNAL.
 ALL VOLTAGES MEASURED FROM B-.
 CAPACITANCE VALUES LISTED IN DECIMALS ARE IN MICROFARADS (μf) AND VALUES GREATER THAN 1.0 ARE IN PICOFARADS ($p f$), UNLESS OTHERWISE SPECIFIED.
 \perp = COMMON GROUND SYMBOL.



VARIABLE CONDENSER AT MAX. CAPACITY

STRINGING DIAGRAM

Arvin 70R78-19 (Ch. 1.01231)



LOCATION OF PARTS

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	2495083
D2	2495083-2
D3	2495083-2
D4	2495083
D5	47126-3
D6	47126-3
Q1	95170-2
Q2	95170-1
Q3	95171-2
Q4	95170-2
Q5	95170-2
Q6	95170-2
Q7	95221
Q8	95171-2
Q9	99203
Q10	99203

COILS/TRANSFORMERS

ITEM	PART NO.
L1	2475212
L2	2475212-1
L3	2498722
L4	2475212-2
L5	2495198-27
L6	2495909
T1	2495912
T2	2495913
T3	2495541-5
T4	2495955-2
T5	2495955-1
T6	2009724-11
T7	2009724-21
T8	2495039
T9	2496054
T10	2498343-2

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C1	2495065	Tuning Gang
C28	49385-24	.5mfd 10V
C32	49385-2	10mfd 10V
C33	49385-24	.5mfd 10V
C34	49385-2	10mfd 10V
C35	67012-36	1000mfd 10V
C37	67012-36	1000mfd 10V

MISCELLANEOUS

ITEM	NAME	PART NO.
SW1	Switch, Band	2495888-1
SW2	Switch, Slide	2498455-4
SPK	Speaker	2495641
	Antenna, Telescopic	2495726

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
TH	2495381	Thermistor (D22A)
VR	2496885	5000 ohms Volume

CABINET PARTS

NAME	PART NO.
Front Plate, Cabinet	2497791-4
Crystal	2010590-1
Dial Pointer	2010594
Knob, Tuning	2475283
Knob, Volume	2475283

I M P O R T A N T

- NOTES:
1. Set Bass and Treble controls to mid range.
 2. Set Volume Control to Max.
 3. With gang fully closed, dial scale pointer must always be set at LOG 0 position.
 4. Do not attempt to adjust or align the marine or shortwave bands if adequate Frequency Generator or Crystal controlled oscillator calibrated equipment is not available.
 5. SW whip antenna must be pushed down when connecting Signal Generator to Shortwave Antenna (Whip) Terminal, in series with a 5 pf capacitor.
 6. FM whip Ant. must be fully extended when connecting Signal Generator in series with a 220 ohm Resistor to External FM antenna terminals.

CHART 1 SWEEP FM ALIGNMENT

STEP	PUSH BUTTON	SWEEP GENERATOR	MARKER GENERATOR	TUNING GANG	SCOPE CONNECTION	ADJUSTMENTS	NOTES
1	FM	Set 10.7MC set sweep width to approx. 1MC connect output to emitter of TR15 thru a 1K Resistor.	10.7MC Unmodulated	Open	Series connection to collector of TR21. Connect a 1.5K Res. across R94.	T13, T14, T15, T16, T17 for Max. gain and symmetry (See Fig. 1).	Use Min. Output from Generator to achieve sweep response.
2	FM	SAME	SAME	Open	Series a 22K resistor to junction of R100 and C110 and ground. Disconnect 1.5K resistor across R94.	T19 for center cross over at 10.7MC (See Fig. 4).	Use Min. Signal. Attenuate sweep input and observe symmetry of response for balance at marker frequency.
3	FM	SAME	SAME	Open	SAME	T18 for Max. gain and symmetry at 10.7MC (See Fig. 4)	
4	RECHECK STEPS 1 THRU 3 AS NECESSARY						
5	FM	Set at 108.5MC Connect output to Ext. Antenna Terminals series a 220 ohm resistor (See note 6).	108.5MC Unmodulated	Open	Series a 22K Resistor to collector of TR21. Connect a 1.5K Res. across R94.	Oscillator coil L4 until marker is at peak of curve. (See Fig. 3). L1, L2 for Max. Amp.	Use Min. Sig. to achieve response. AFC switch to off.
6	FM	Set at 87.5MC (As Step 5).	87.5MC Unmodulated	Closed	SAME	Bend C1F Rotor blade until marker is at peak of curve. (Fig. 3) Bend C1C, C1A Rotor blade for Max. Amp.	SAME
7	RECHECK STEPS 5 AND 6						

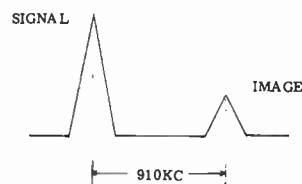


FIGURE 1

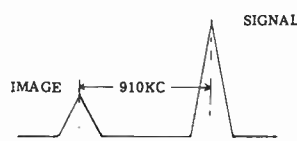


FIGURE 2

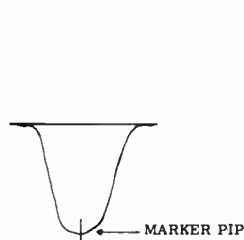


FIGURE 3

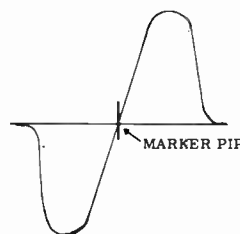


FIGURE 4

CHART 2 AM ALIGNMENT

STEP	PUSH BUTTON	SIGNAL GENERATOR	GENERATOR SETTING	TUNING GANG	CONNECT SCOPE OR OUTPUT METER	ADJUSTMENTS
1	BC	Radiate Output to L5.	455KC modulating 400 cycles at 30%	Open	Voice Coil	T9, T10, T11, T12 for Max. Amp.
2	REPEAT STEP 1 UNTIL NO FURTHER ADJUSTMENT IS REQUIRED.					
3	BC	Radiate Output to L5.	1630K	Open	Voice Coil	Oscillator Trimmer C42 for Max.
4	BC	SAME	580KC	580KC	SAME	AM Oscillator T6
5	BC	SAME	580KC	580KC	SAME	BC-RF, T4 for Max. while rocking gang.
6	BC	SAME	1400KC	1400KC	SAME	Peak C3 while rocking gang and C13 RF Trimmer.
7	REPEAT STEPS 1 THRU 6 AS NECESSARY					

CHART 3 LW ALIGNMENT

STEP	PUSH BUTTON	SIGNAL GENERATOR	GENERATOR SETTING	TUNING GANG	CONNECT SCOPE OR OUTPUT METER	ADJUSTMENTS
1	LW	Radiate Output to L5.	380KC	Open	Voice Coil	C44 for Max. Amp.
2	LW	SAME	380KC	380KC	SAME	C5, C18 for Max. Amp.
3	LW	SAME	167KC	167KC	SAME	T7, T5 for Max. Amp.
4	REPEAT ABOVE STEPS AS REQUIRED.					

CHART 4 MARINE AND SW ALIGNMENT

STEP	PUSH BUTTON	BAND SELECT	SIGNAL GENERATOR	GENERATOR SETTING	TUNING GANG	CONNECT SCOPE OR OUTPUT METER	ADJUSTMENTS	NOTES
1	MARINE	16M	Connect to SW Ant. Term. (See notes 3, 5)	17.06MF	Open	Voice Coil	Osc. 78 for Max. (Second peak down)	Adjust Sig. Gen. to 910KC below wanted Freq. to observe image Freq. response.
2	MARINE	16M	SAME	17.06MC	Open	SAME	T2, T3 for Max.	
3	MARINE	16M	SAME	17.06MC	Open	SAME	L15 for Max. 17.06MC Rejection	SAME
4	REPEAT AS REQUIRED							
5	MARINE	16M	Connect to SW Ant. Term. (See notes 3, 5)	5.1MC	5.1MC	Voice Coil	C40 for Max. Amp.	Adjust Sig. Gen. to 910KC above wanted Freq. to observe image Freq. response.
6	MARINE	16M	SAME	1.78 MC	1.78 MC	SAME	T1 for Max. Amp.	SAME
7	MARINE	16M	SAME	2.5MC	2.5MC	SAME	L14 for Max. Amp.	SAME
8	SW	16 M	SAME	18MC	Log 5.95 18MC	SAME	C56, L8 for Max. Amp.	SAME
9	SW	19M	SAME	15.2MC	Log 5.7 15.2MC	SAME	C54, L9 for Max. Amp.	SAME
10	SW	25M	SAME	11.9MC	Log 6.5 11.9MC	SAME	C52, L10 for Max. Amp.	SAME
11	SW	31M	SAME	9.75MC	Log 5.1 9.75MC	SAME	C50, L11 for Max. Amp.	SAME
12	SW	41M	SAME	7.2MC	Log 5.5 7.2MC	SAME	C48, L12 for Max. Amp.	SAME
13	SW	49M	SAME	6.2MC	Log 5.5 6.2 MC	SAME	C46, L13 for Max. Amp.	SAME
14	REPEAT ABOVE STEPS AS REQUIRED							

TRANSISTOR SUBSTITUTION CHART

<u>TR2, 9</u>	<u>TR3, 13</u>	<u>TR4</u>	<u>TR5, 12</u>	<u>TR6, 16</u>	<u>TR7, 8, 11</u>	<u>TR10, 17</u>	
RS7128	RS7129	RS7127	RS7216	RS7219	RS7217	RS7122	
<u>TR14</u>	<u>TR15</u>	<u>TR18</u>	<u>R73</u>	<u>TR19</u>	<u>R85</u>	<u>TR20</u>	<u>R90</u>
RS7215	RS7218	RS7123	68K	RS7122	47K	RS7123	68K
RS7210	RS7205	RS7124	68K	RS7123	56K	RS7124	82K
RS7211	RS7206	RS7125	82K	RS7124, 25	68K	RS7125	82K
<u>TR21</u>	<u>R95</u>	<u>TR23</u>	<u>GR.</u>	<u>TR25</u>	<u>R117</u>	<u>TR26, 27</u>	
RS7122	15K	RS7516, 7517	1	RS6843, 44	100	RS5788	
RS7123	15K		2	RS6843	100	RS5789	
RS7124	15K		3	RS6844	120	RS5789	
RS7125	18K	<u>TR24</u> <u>R112</u>	4	RS6843	82	RS5786	
		RS7515 180K	5	RS6844	100	RS5786	
<u>TR22</u>		RS7516 220K	6	RS6843	100	RS5787	
RS7514		RS7517 270K	7	RS6844	100	RS5787	

This chart will identify various groups used in production. For stock and replacement purposes, select any one group. EXAMPLE: Select any TR2 thru TR24, TR25 - RS5281, R117 - 100, TR26, 27 - RS5788.

For substituting transistors use chart as follows: (unit for repair contains EXAMPLE shown above) TR26-RS 88 is found defective and not available from stock, replace with TR26 & TR27 - RS5789 (GR2). If RS5788 or RS5789 (GR2) is not available for substitution, use one of the remaining groups and substitute components specified only on underlined groups.

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	RT1667
D2	RT1667
D3	RT1108
D4	RT2451
D5	RT2451
D6	RS6471
D7	RS6471
TR2-27	See Chart

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C1	RT2997	Tuning Gang
C3	RS6172	Trimmer
C5	RS6172	Trimmer
C6	RT1327	2mfd 15V
C13	RS6172	Trimmer
C18	RS6172	Trimmer
C31	RS2984	3mfd 12V
C38	RS3960	2mfd 12V
C40	RS6172	Trimmer
C42	RS6172	Trimmer
C44	RS6172	Trimmer
C46	RS6172	Trimmer
C48	RS6172	Trimmer
C50	RS6172	Trimmer
C52	RS6172	Trimmer
C54	RS6172	Trimmer
C56	RS6172	Trimmer
C89	RS2984	3mfd 12V
C115	RS4474	.5mfd 10V
C117	RS4474	.5mfd 10V
C120	RT3016	750mfd 10V
C121	RT3489	1mfd 12V
C126	RS6477	1000mfd 25V
C135	RS3967	50mfd 10V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R102a	RT3031	Bass
R102b		Treble
R105	RT3032	50K Volume

COILS/TRANSFORMERS

ITEM	PART NO.
L1	RT3024
L2	RT3025
L3	RS3796
L4	RS1510
L5	RT3026
L8	RT3027
L9	RT3028
L10	RT3029
L11	RT3030
L12	RT3023
L13	RT3022
L14	RT3021
L15	RT3020
L16	RT3019

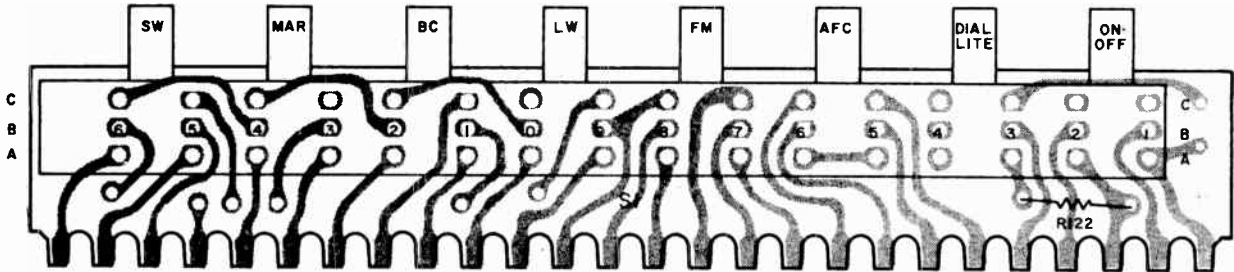
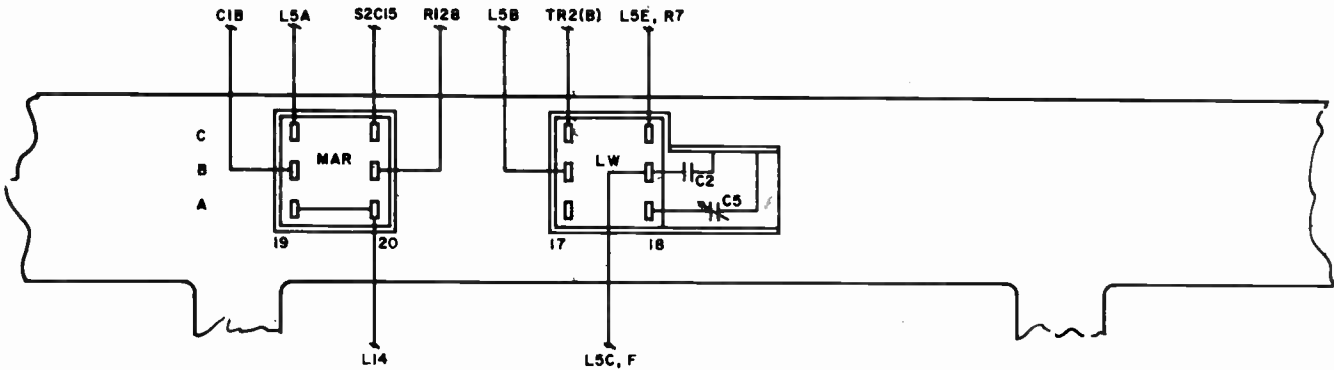
T1	RT3034
T2	RT3035
T3	RT3036
T4	RT3037
T5	RT3038
T6	RT3039
T7	RT3040
T8	RT3041
T9	RT3042
T10	RS2978
T11	RT3043
T12	RS2979
T13	RS6381
T14	RT1620
T15	RT1620
T16	RT1620
T17	RT1620
T18	RT1620
T19	RS3545
T20	RT3044
T21	RT3045
T22	RT3046

MISCELLANEOUS

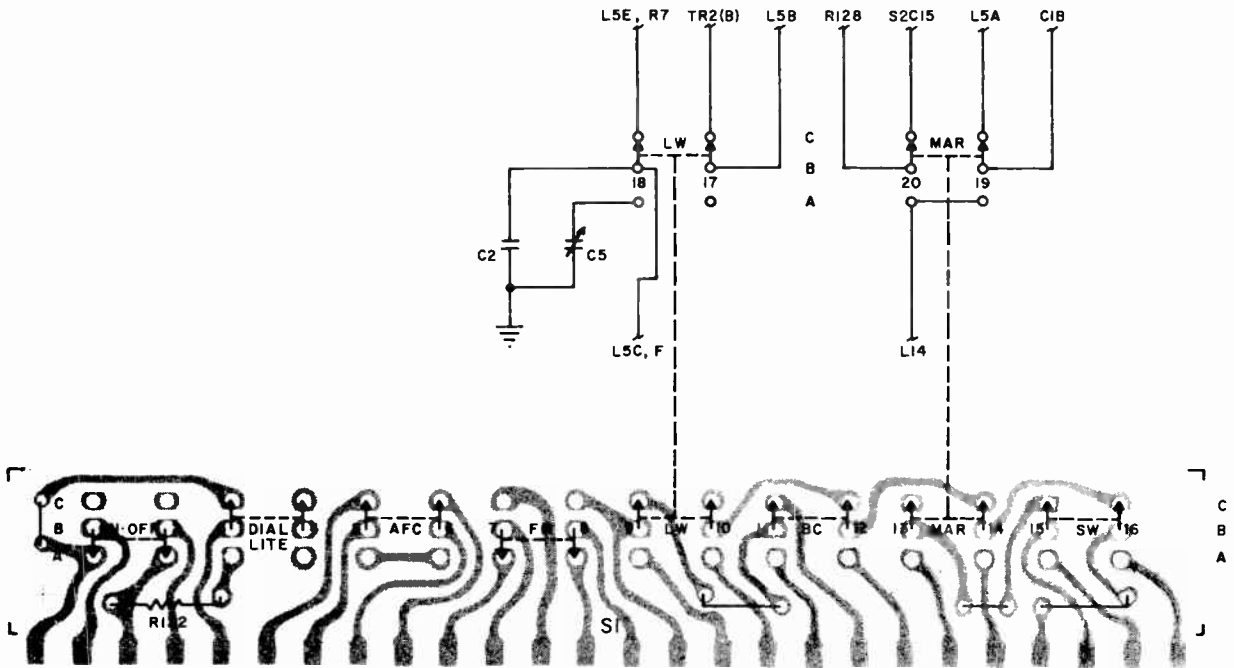
ITEM	NAME	PART NO.
M1	Meter, Tuning	RT2983
S1	Switch, Push	RT3048
S2	Switch, Rotor	RT3049
S3	Switch, AC-DC	RS6597
	Earphone (15 ohms)	RS4520
	FM Antenna, Telescopic	RT2992
	Sw Antenna, Telescopic	RT2993
	Speaker (5" x 7")	RB2241
	Headphone (11 ohms)	RT9251
	P.C. Board, Main	RT9471
	P.C. Board, Switch	RT9472

CABINET PARTS

NAME	PART NO.
Cabinet, Front	RB2237
Cabinet, Back	RB2238
Door, Left	RB2239
Door, Right	RB2240
Dial Crystal	RT2965
Battery Cover	RT2968
Dial Pointer	RT2971
Knob, Band	RT2973
Knob, Tone	RS6266
Knob, Volume	RS5942
Knob, Tuning	RS5943
Knob, Tone	RT2974
Knob, On-Off	RT2975
Knob, Lamp	RT2976
Knob, AFC	RT2977
Knob, FM	RT2978
Knob, LW	RT2979
Knob, BC	RT2980
Knob, Marine	RT2981
Knob, SW	RT2982

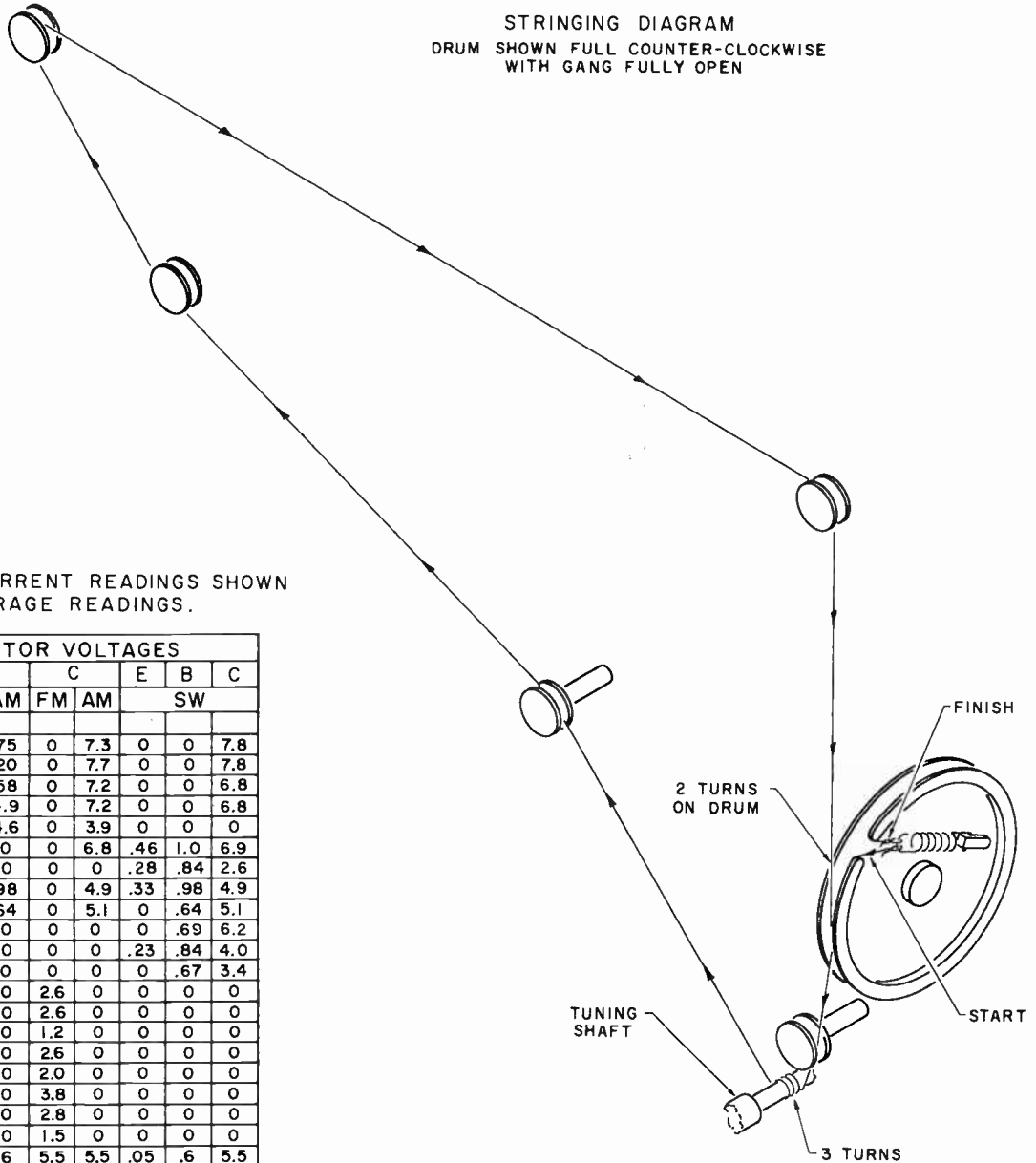


TOP VIEW OF FUNCTION SWITCH



BOTTOM VIEW OF FUNCTION SWITCH

STRINGING DIAGRAM
DRUM SHOWN FULL COUNTER-CLOCKWISE
WITH GANG FULLY OPEN



NOTE:
VOLTAGE AND CURRENT READINGS SHOWN
BELOW ARE AVERAGE READINGS.

TRANSISTOR VOLTAGES									
TR. NO.	E		B		C		E	B	C
	FM	AM	FM	AM	FM	AM			
TR2	0	.20	0	.75	0	7.3	0	0	7.8
TR3	0	0	0	.20	0	7.7	0	0	7.8
TR4	0	.28	0	.58	0	7.2	0	0	6.8
TR5	0	5.0	0	4.9	0	7.2	0	0	6.8
TR6	0	3.9	0	4.6	0	3.9	0	0	0
TR7	0	0	0	0	0	6.8	.46	1.0	6.9
TR8	0	0	0	0	0	0	.28	.84	2.6
TR9	0	.35	0	.98	0	4.9	.33	.98	4.9
TR10	0	0	0	.64	0	5.1	0	.64	5.1
TR11	0	0	0	0	0	0	0	.69	6.2
TR12	0	0	0	0	0	0	.23	.84	4.0
TR13	0	0	0	0	0	0	0	.67	3.4
TR14	.25	0	.95	0	2.6	0	0	0	0
TR15	.24	0	.92	0	2.6	0	0	0	0
TR16	.115	0	.88	0	1.2	0	0	0	0
TR17	0	0	.70	0	2.6	0	0	0	0
TR18	0	0	.65	0	2.0	0	0	0	0
TR19	0	0	.60	0	3.8	0	0	0	0
TR20	0	0	.60	0	2.8	0	0	0	0
TR21	0	0	.68	0	1.5	0	0	0	0
TR22	.05	.05	.6	.6	5.5	5.5	.05	.6	5.5
TR23	0	0	.63	.63	4.3	4.3	0	.63	4.3
TR24	0	0	.65	.65	7.9	7.9	0	.65	7.9
TR25	9.0	9.0	8.4	8.4	8.4	8.4	9.0	8.4	8.4
TR26	8.8	8.8	8.6	8.6	.13	.13	8.8	8.6	.13
TR27	8.7	8.7	8.6	8.6	.16	.16	8.7	8.6	.16

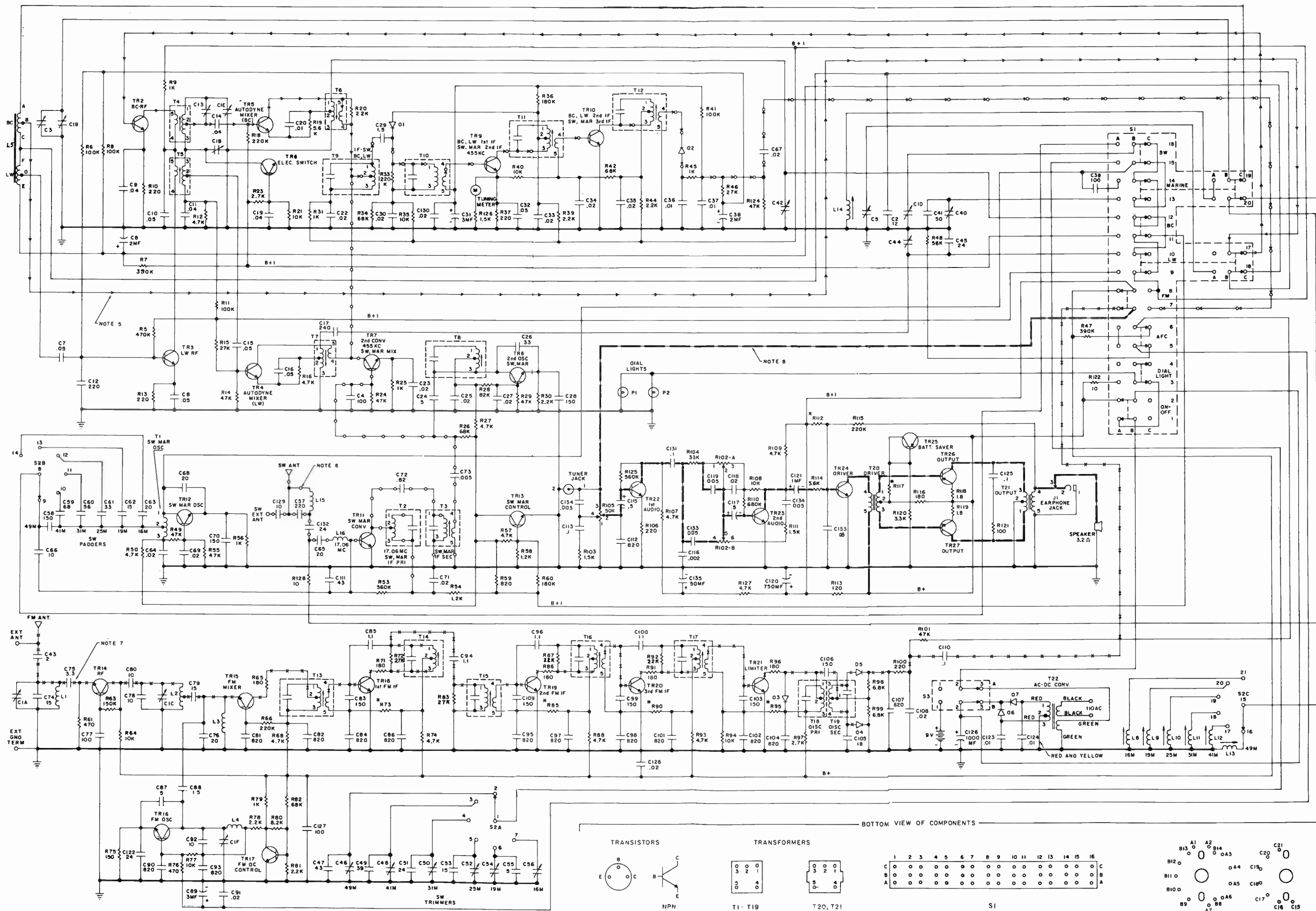
LINE VOLTAGE				
LINE	FM	AM	SW	LW
B+	9.0	9.0	9.0	9.0
B+1	7.6	8.4	7.8	8.4

TRANSISTOR VOLTAGE			
TR NO.	LW		
	E	B	C
TR3	.11	.66	7.8
TR4	4.6	5.0	7.3
TR6	0	0	.3

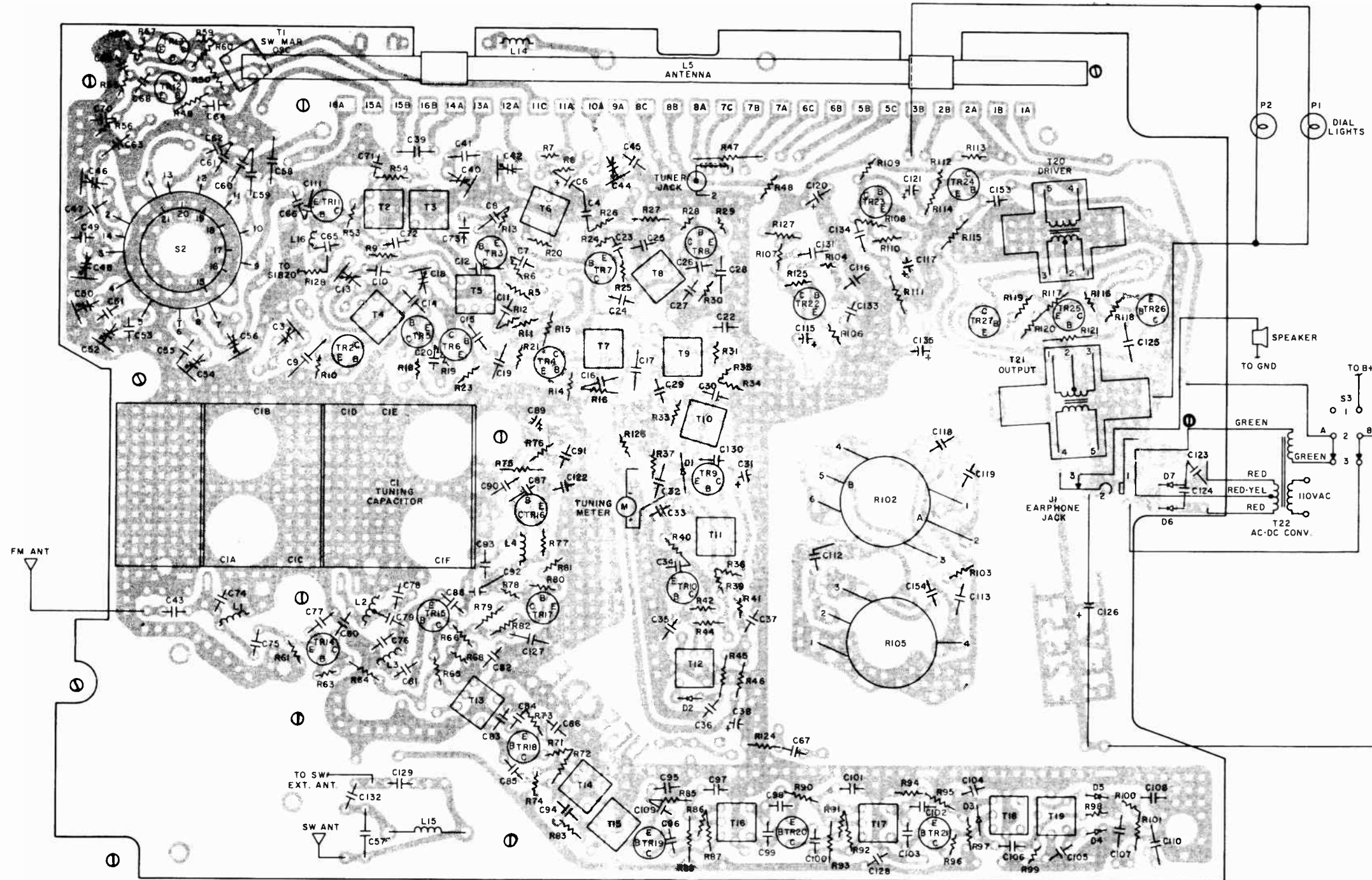
CURRENT DRAIN (NO SIGNAL - MA)			
FM	AM	SW	LW
27	26	26	25

NOTES

- UNLESS OTHERWISE NOTED CAPACITORS MORE THAN 1 = MMF CAPACITORS LESS THAN 1 = MF RESISTORS 1/2 WATT, K = 1000
- VOLTAGES ARE POSITIVE WITH RESPECT TO GROUND UNDER NO SIGNAL CONDITIONS AND VOLUME CONTROL MINIMUM.
- * REPLACE PARTS WITH TYPE SHOWN IN PARTS LIST OR TRANSISTOR SUBSTITUTION CHART.
- SI SHOWN IN FM POSITION.
- LINE SHOWN (→) IS BC SIGNAL PATH FROM BC ANTENNA TO SPEAKER.
- LINE SHOWN (⇌) IS SW SIGNAL PATH FROM SW ANTENNA TO SPEAKER.
- LINE SHOWN (✕) IS FM SIGNAL PATH FROM FM ANTENNA TO SPEAKER.
- LINE SHOWN (■) IS COMMON AUDIO PATH FROM SI TO SPEAKER



General Electric P2900A



COMPONENT LAYOUT (TOP VIEW), MODEL P2900A







ALIGNMENT INSTRUCTIONS

Check for specified source voltage. Set volume control at maximum.
 Fashion loop of several turns of wire and connect generator across loop.
 Use only enough generator output to obtain a suitable indication.

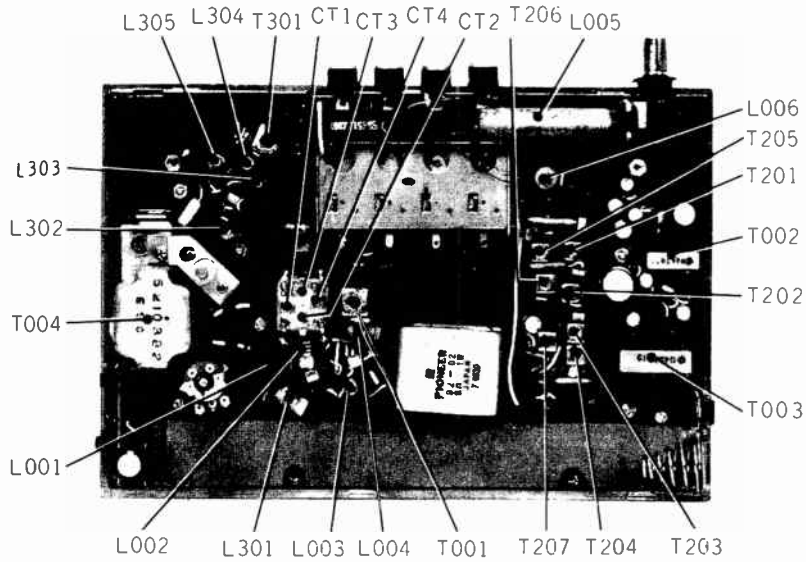
SELECTOR IN AM

	GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
1.	455KC 400 cycle modulation	Tuning gang fully open.	Output Meter across voice coil.	T207, T206, T205	Adjust for maximum. Repeat until no further improvement can be made.
2.	1605KC	"	"	CT4	Adjust for maximum.
3.	1400KC	Tune to signal	"	CT3	"
4.	600KC	"	"	L006	Rock tuning gang and adjust for maximum. Repeat steps 2 thru 4 until no further improvement can be made.

SELECTOR IN FM

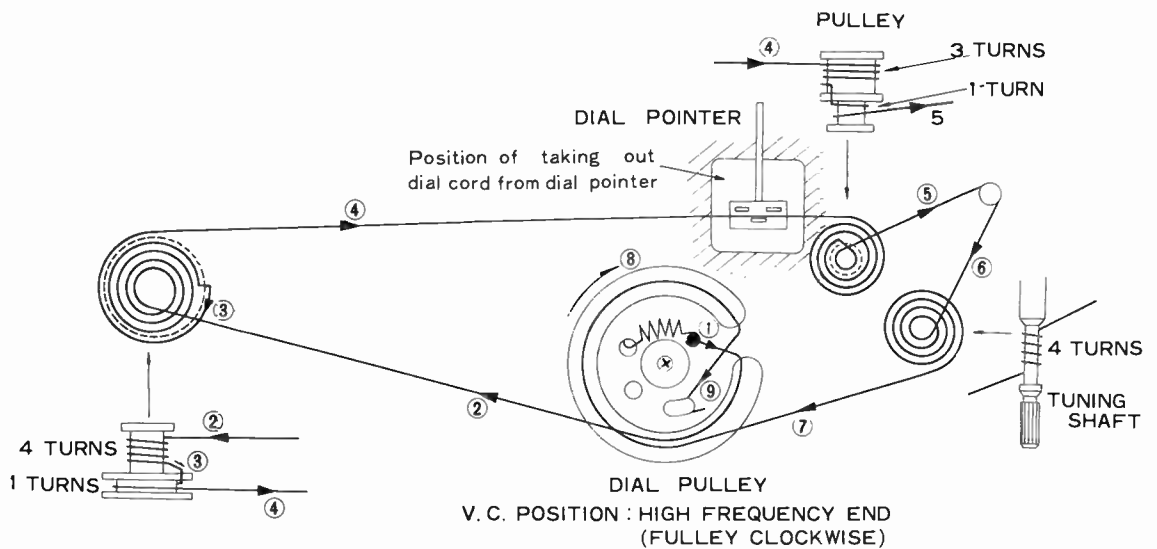
	GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUST	REMARKS
5.	10.7MC Unmodulated	Point of non-interference	DC probe of VTVM to point  , common to point  .	T203, T202, T201, T001	Adjust for maximum
6.	"	"	DC probe of VTVM to point  , common to point  .	T204	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.
7.	108MC	High freq. end.	DC probe of VTVM to point  , common to point  .	CT2, CT1	Adjust for maximum

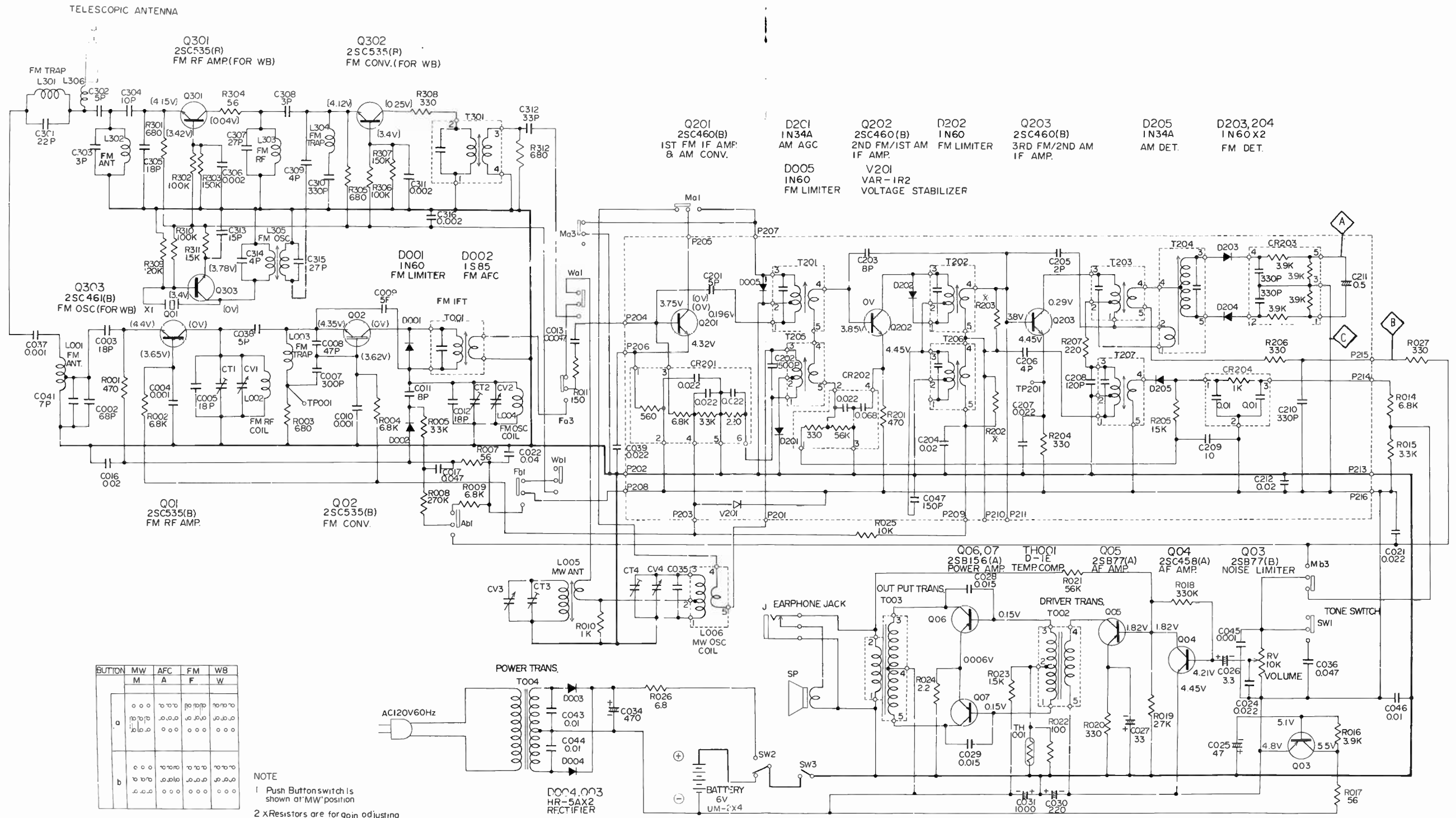
INTERNAL VIEW



DIAL CORD RESTRINGING

Referring to Fig. , loop the dial cord in the direction of arrows.

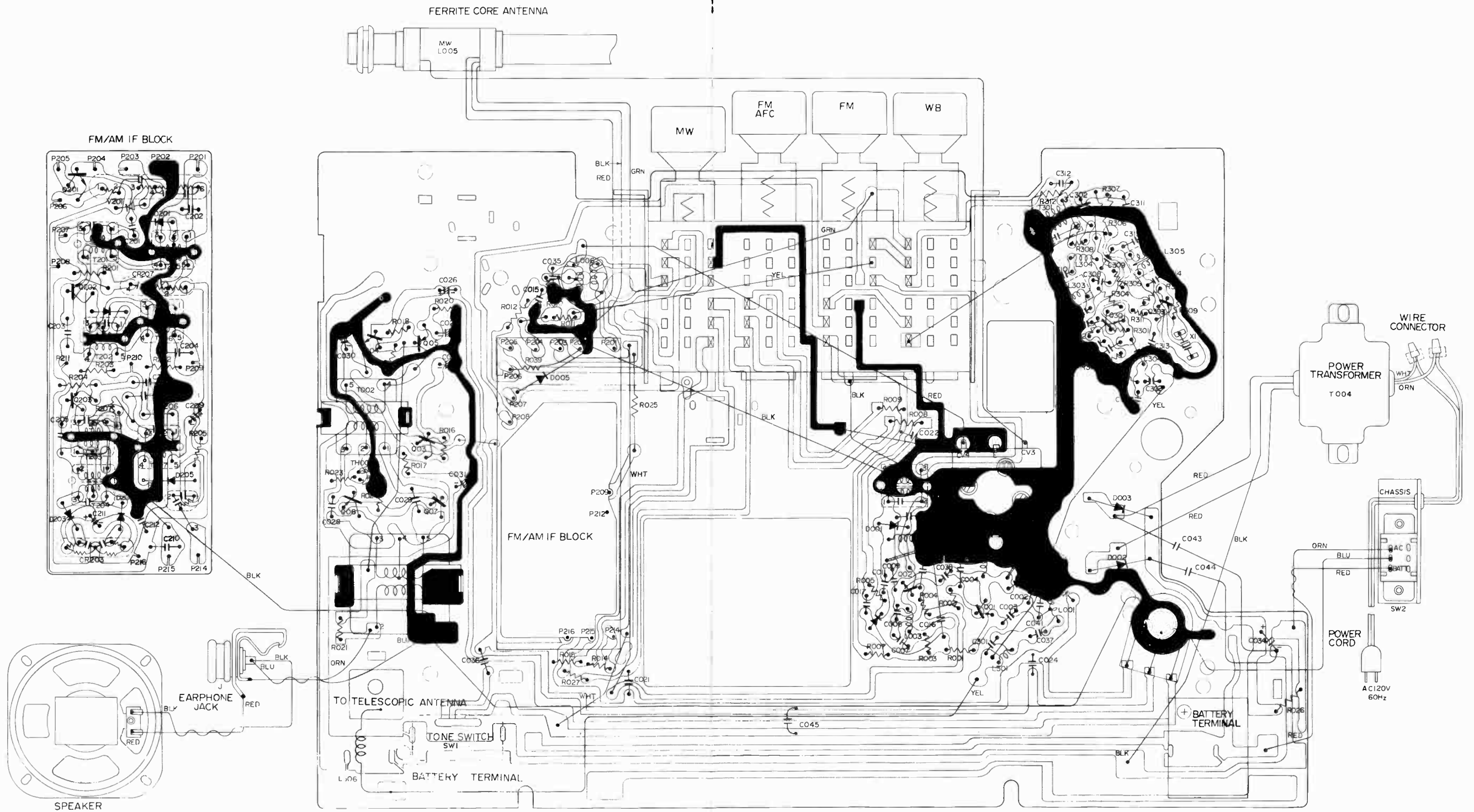




BUTTON	MW	AF	FM	WB
M	A	F	W	
a	o o	o o	o o	o o
b	o o	o o	o o	o o

- NOTE
- 1 Push Button switch is shown at MW position
 - 2 X Resistors are for gain adjusting.
 - 3 Voltage measured with voltmeter at 6V DC, + side earth base, Volume control at minimum and no signal. Voltage shown in () are in WB position Voltage shown in () are in FM position
 - 4 All resistance values in ohms K=1000
 - 5 All capacitance values in MF except "P" noted P=MMF=PF

Hitachi KH-1316W



SEMICONDUCTORS

ITEM	PART NO.	TYPE
D001	0575005	1N60
D002	0575024	1S85
D003	5330041	HR-5A
D004	5330041	HR-5A
D005	0575005	1N60
D201	0575001	1N34A
D202	0575005	1N60
D203	0575019	1N60(P)
D204	0575019	1N60(P)
D205	0575001	1N34A
Q01	0573510	2SC535(B)
Q02	0573510	2SC535(B)
Q03	0573114	2SB77(B)
Q04	0573479	2SC458(A)
Q05	0573103	2SB77(A)
Q06	0573011	2SB156(A)P
Q07	0573011	2SB156(A)P
Q201	0573486	2SC460(B)
Q202	0573486	2SC460(B)
Q203	0573486	2SC460(B)
Q301	0573510	2SC535(B)
Q302	0573510	2SC535(B)
Q303	0573507	2SC461(C)
V201	0170301	1R2

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C025	0252225	47mfd 6.3V
C026	0252513	3.3mfd 16V
C027	0252223	33mfd 6.3V
C030	0252232	220mfd 6.3V
C031	0252232	220mfd 6.3V
C034	0252335	470mfd 10V
C209	0252221	10mfd 6.3V
C211	0257040	.5mfd 15V
	0282563	Trimmer

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R012	0170753	3.3 ohms 10%
R026	0170757	6.8 ohms 10%
TH001	0576044	Thermistor, D-1E
VR	0151732	10K Volume/Switch

COILS/TRANSFORMERS

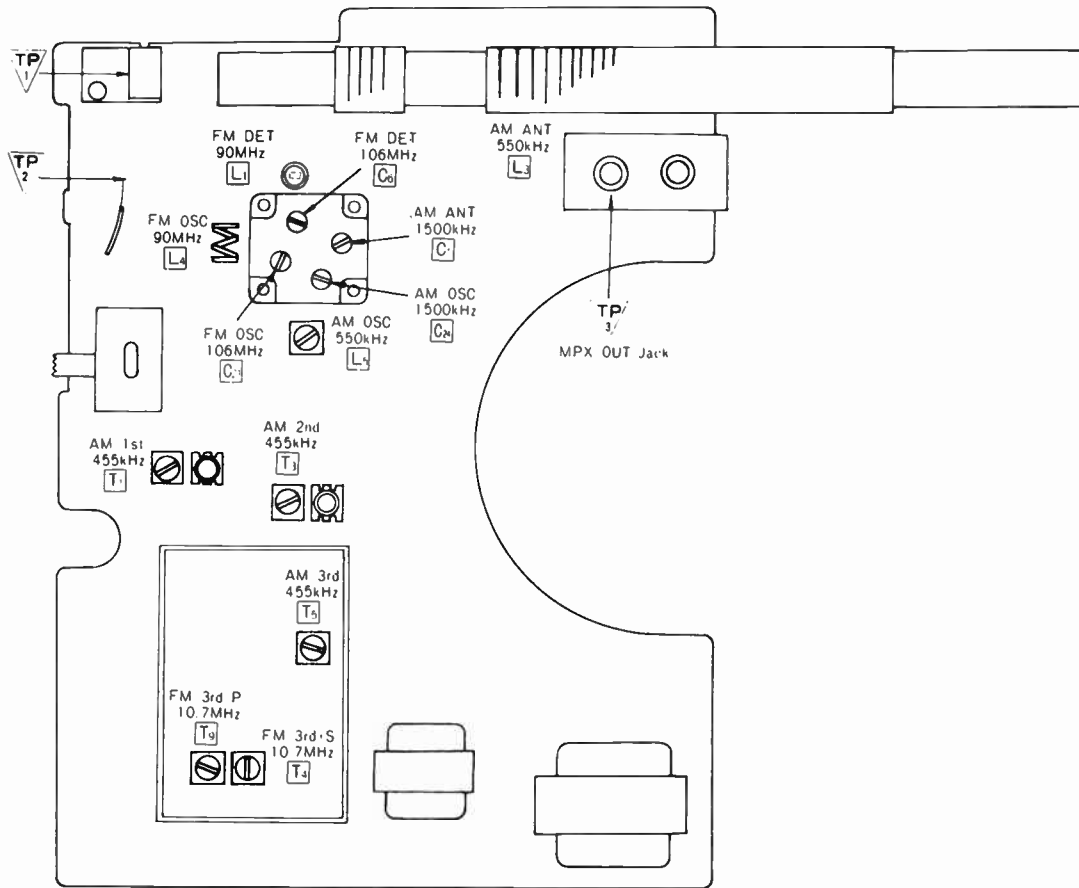
ITEM	PART NO.
L001	5126041
L002	0318523
L003	0324003
L004	0318524
L006	5126152
L301	0318537
L302	5126141
L303	5126034
L304	0324003
L305	5126035
T001	0322327
T002	0441077
T003	0452019
T201	0322339
T202	0322340
T203	5148011
T204	0326024
T205	0322144
T206	0322145
T207	0322130
T301	0322327
Power	5210382

MISCELLANEOUS

ITEM	NAME	PART NO.
CR201	Component Combination	0186360
CR202	Component Combination	0186361
CR203	Component Combination	0186352
CR204	Component Combination	0599723
X1	Crystal	5780051
	Antenna, Telescopic	5750096
	Earphone	0592052
	Socket, Crystal	0541354
	Speaker	5410411
	Switch, Push Button	5630413

CABINET PARTS

NAME	PART NO.
Assembly, Case	6115593
Grip, Handle	7176391
Arm, Handle	6330181
Knob, Tuning	6262881
Knob, Volume	6261961

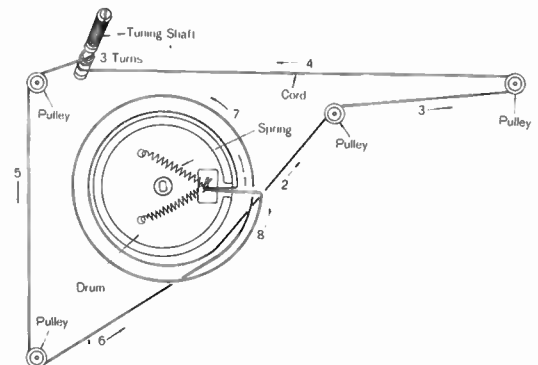


ALIGNMENT POINTS

DIAL CORD RESTRINGING INSTRUCTIONS

Notes:

1. Remove dial drum screw.
2. Remove two (2) P.C.B. screws,
3. Dial cord 47 $\frac{1}{4}$ inches long.
4. Drum is turned fully counter-clockwise.
5. Arrows (1-8) indicate correct order and direction of installation dial cord.
6. Cement dial cord ends.



ALIGNMENT INSTRUCTIONS

Notes:						
1. Set Volume control to maximum or minimum (FM-IF).		5. Set Band selector switch to AM or FM.		6. Set Power source switch to on.		
2. Set Tone control to high.		7. Set Power source voltage to 6 volts DC.		8. Output of signal generator should be no greater than necessary to obtain an output reading.		
3. Set AC-Battery selector switch to Battery.		4. Set Loudness selector switch to off.				
SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS	
CONNECTIONS	FREQUENCY					
AM ALIGNMENT						
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400 Hz.	Point of non-interference. (on/about 600 kHz)	Output meter across speaker voice coil.	T ₁ (1st IFT) T ₃ (2nd IFT) T ₅ (3rd IFT)	Adjust for maximum output.
2	Same as Step 1.	550 kHz	550 kHz	Same as Step 1.	L ₅ (OSC Coil) (*)L ₃ (ANT Coil)	Adjust for maximum output. Adjust L ₃ by moving coil bobbin along ferrite core.
3	Same as Step 1.	1500 kHz	1500 kHz	Same as Step 1.	C ₂₄ (OSC Trimmer) C ₁ (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
* Cement antenna bobbin with wax after completing alignment.						
FM-IF ALIGNMENT						
4	High side thru 0.001 mfd to TP ₂ (figure 6) and common to chassis.	10.7 MHz (400 kHz SWP.)	Point of non-interference. (on/about 100 MHz).	Connect vert. amp. of scope to TP ₃ (figure 6) and common to chassis.	T ₉ (3rd FM IFT) (Primary) T ₄ (3rd FM IFT) (Secondary)	1. Sink the core of T ₄ . 2. Adjust the T ₉ to maximum noise. 3. Adjust the T ₄ that the pattern of the oscilloscope will become large, as shown in figure 7.
FM-RF ALIGNMENT						
5	Connect to TP ₁ (figure 6) through FM Dummy antenna and common to chassis. (Refer to figure 8)	90 MHz	90 MHz	Output meter across speaker voice coil.	L ₄ (FM OSC Coil) L ₁ (FM DET Coil)	(*)Adjust for maximum output.
6	Same as Step 5.	106 MHz	106 MHz	Same as Step 5.	C ₂₁ (FM OSC Trimmer) C ₆ (FM DET Trimmer)	(*)Adjust for maximum output. Repeat steps (5) and (6).
* Three output responses will be present; tune to the center response.						

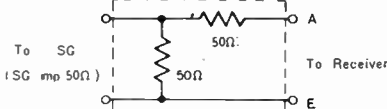


FIGURE 8. FM DUMMY ANTENNA

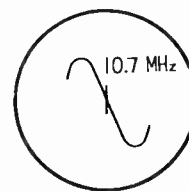


FIGURE 7. S-CURVE

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	1S351
D2	0A90
D3	0A90*
D4	0A90*
D5	0A90
IC	AN210
Se	RVD10DC1
TR1	2SC921
TR2	2SC920
TR3	2SC920
TR4	2SC945
TR5	2SC945
TR6	2SB324
TR7	2SB324

* Matched Pair.

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE		
C2 C5 C20 C23	PVC2LX20T3L	Tuning Gang		
C9			ECEA16V10	10mfd 16V
C39			ECEA50V1	1mfd 50V
C41			ECAG16ER1-Y	.1mfd 16V
C45	ECEA50V1	1mfd 50V		
C46	ECEA6V33	33mfd 6.3V		
C47	ECEA6V470	470mfd 6.3V		
C48	ECEA50V1	1mfd 50V		
C50	ECEA6V470	470mfd 6.3V		
C51	ECEA10V1000	1000mfd 10V		
C54	ECEA25V4R7	4.7mfd 25V		
C63	ECAG16ER47-Y	.47mfd 16V		

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R32	EVAQ3AB00A54	50K Tone
R33	EVAQ3AB00D54	50K Volume
Th	RRT800	Thermistor

COILS/TRANSFORMERS

ITEM	PART NO.
L1	RLD4N5

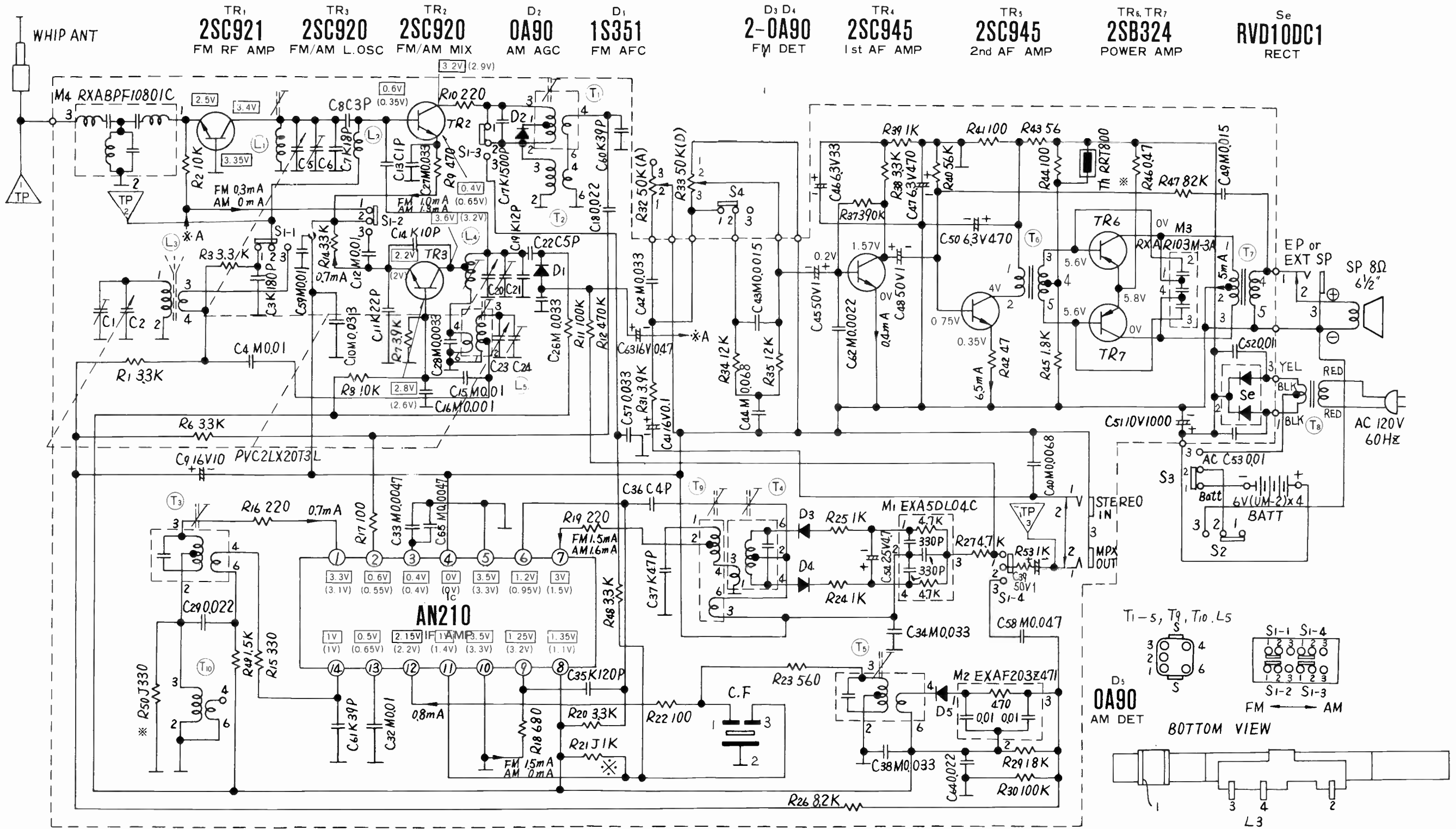
L2	RLQY15G5-0
L3	RLF2F38-0
L4	RL04Y53-0
L5	RL02B77-M
T1	RL12B124-M
T2	RL14L201
T3	RL12B257-M
T4	RL14B552
T5	RL12B450-M
T6	RLT3F33-W
T7	RLT2H23-W
T8	RLT5125-W
T9	RL14B551
T10	RL14L201

MISCELLANEOUS

ITEM	NAME	PART NO.
M1	Component Combination (330pf,330pf,47K,47K)	EXA5DL04C
M2	Component Combination (.01;.01,470 ohms)	EXAF203Z471
M3	Component Combination (.01,.01,.01)	RXAR103M-3A
M4	Component Combination	RXABPF10801C
S1	Switch, Band	RSS42A
S2	Switch, Power Source	RSS43D
S3	Switch, AC-Battery	RSS43F
S4	Switch, Loudness	RSS43F
	Antenna, Telescopic	XEARCR170FBS
	Earphone	EAE1FB
	Speaker (6-1/2")	EAS16P93SM

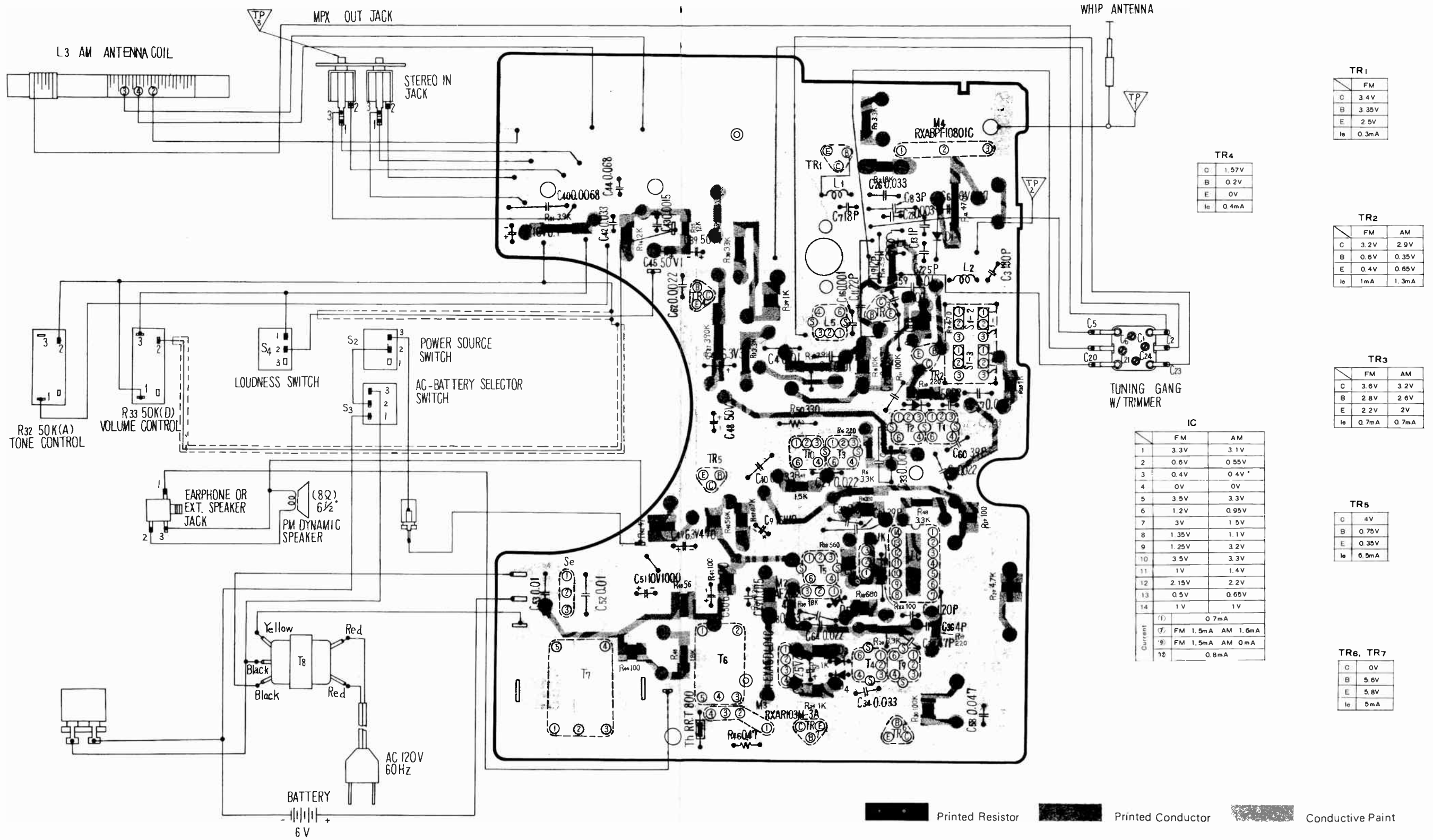
CABINET PARTS

NAME	PART NO.
Cabinet Complete, Black	RYARF814P
Cabinet Complete, White	RYARF814P8
Cabinet Only, Black	RKM98C
Cabinet Only, White	RKM98C8
Handle, Black	RKH42A
Handle, White	RKH42A8
Cover, Rear (Black)	RKF67C
Cover, Rear (White)	RKF67C8
Cover, Battery Compartment (Black)	RKK31B
Cover, Battery Compartment (White)	RKK31B8
Knob, Tuning	RBN70A
Knob, Volume	RBD31A
Dial Scale	RKD127C
Dial Pointer	RDP561A



C	1	2	9	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	19	18	60	41	42	43	44	45	46	62	47	48	50	51	49	52	53		
R	1	2	3	6	14	8	7	9	10	11	12	31	32	33	34	35	37	38	39	40	41	42	43	44	45	46	47	50	49	15	16	17	18	19	20	21	22	48	23	24	25	26	27	53	29	30

- Notes: 1. S1-1-S1-4: Band selector switch in FM position.
2. S2: Power source switch in OFF position.
3. S3: AC-Battery selector switch to Battery position.
4. S4: Loudness switch to ON position.
5. DC voltage measurements are taken with circuit tester 10KΩ/V from negative terminal of battery.
6. Battery current: No signal 47mA
Maximum output 390mA
7. Resistors are shown by * mark and printed resistance has no * mark.



TR1

	FM
C	3.4V
B	3.35V
E	2.5V
Ie	0.3mA

TR4

C	1.57V
B	0.2V
E	0V
Ie	0.4mA

TR2

	FM	AM
C	3.2V	2.9V
B	0.6V	0.35V
E	0.4V	0.65V
Ie	1mA	1.3mA

TR3

	FM	AM
C	3.6V	3.2V
B	2.8V	2.6V
E	2.2V	2V
Ie	0.7mA	0.7mA

IC

	FM	AM
1	3.3V	3.1V
2	0.6V	0.55V
3	0.4V	0.4V
4	0V	0V
5	3.5V	3.3V
6	1.2V	0.95V
7	3V	1.5V
8	1.35V	1.1V
9	1.25V	3.2V
10	3.5V	3.3V
11	1V	1.4V
12	2.15V	2.2V
13	0.5V	0.65V
14	1V	1V
Current	0.7mA	
(7)	FM 1.5mA	AM 1.6mA
(9)	FM 1.5mA	AM 0mA
12	0.8mA	

TR5

C	4V
B	0.75V
E	0.35V
Ie	6.5mA

TR6, TR7

C	0V
B	5.6V
E	5.8V
Ie	5mA

Printed Resistor Printed Conductor Conductive Paint

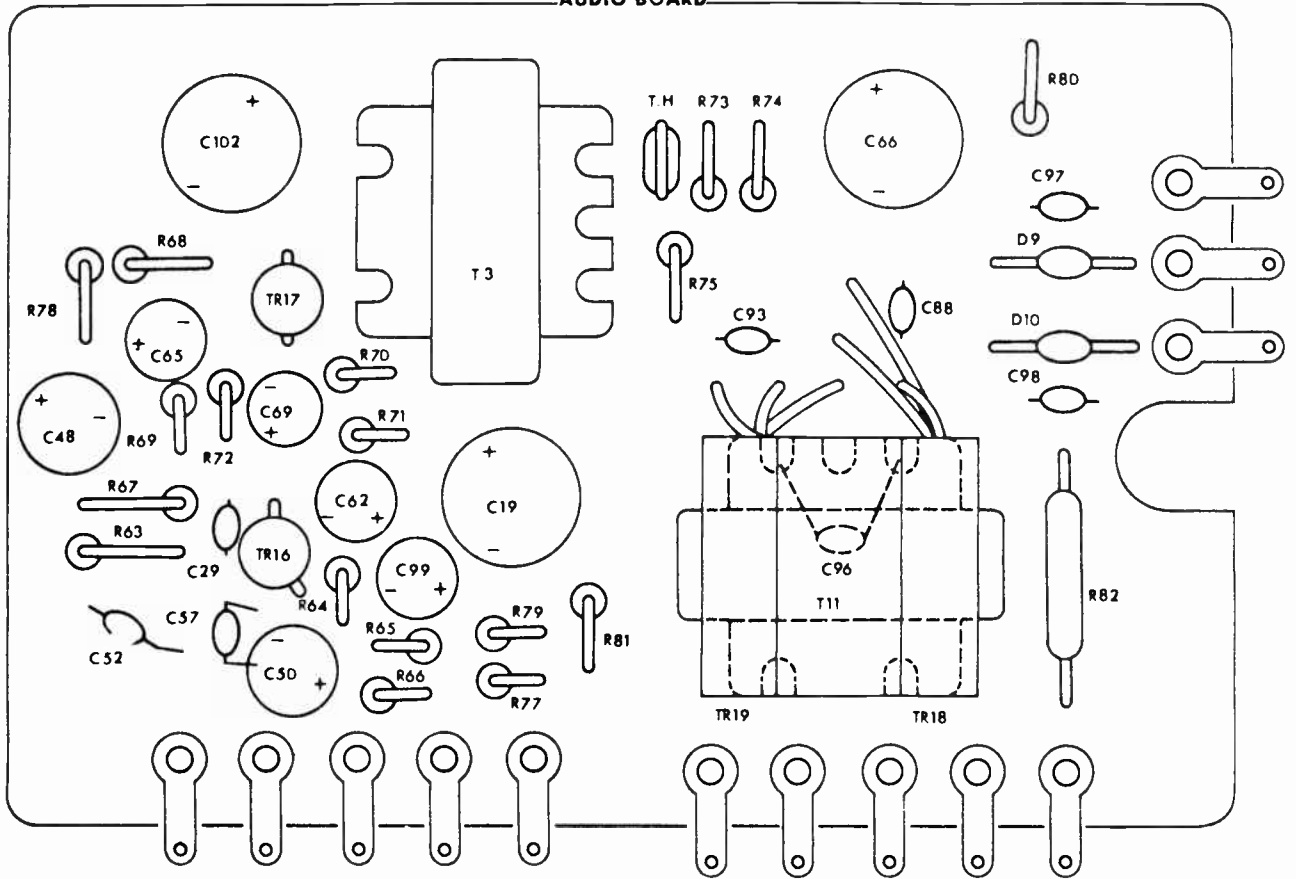
IC, TR, D		TR4	TR5	TR7	TR1	D5	D4	D3	TR3	TR6	D2	IC	D1	TR2
L, T	L3		T6	T7	L5	T5	T10	L1	T3	T4	T9	T2	T1	L2

ALIGNMENT INSTRUCTIONS

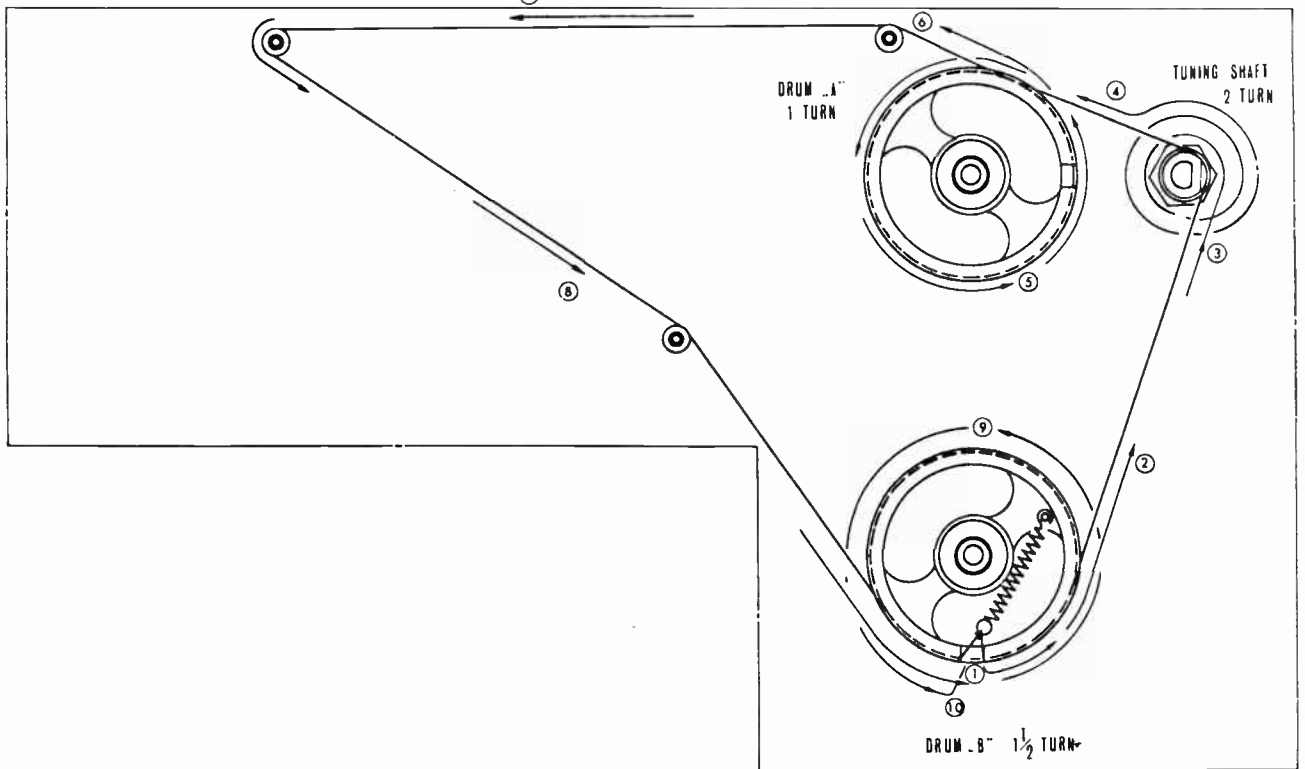
MODEL 10-568

STEP	SIGNAL SOURCE	OUTPUT INDICATOR	SET SIGNAL TO	SET RADIO DIAL TO	ADJUST	ADJUST FOR	
SET FUNCTION SWITCH ON AM							
1	SIG. GEN. - CONNECTED TO A LOOP OR SHORT PIECE OF WIRE PLACED NEAR AM ANT.	V.T.V.M. - CONNECTED ACROSS SPEAKER VOICE COIL.	455 KHz OR 465 KHz (MODULATED)	QUIET POINT ON BAND (VR-MAX.)	T4 1ST AMIF	MAXIMUM	
2							T8 2ND AMIF
3							T10 3RD AMIF
4			540 KHz	540 KHz	L10 AM CSC.		
5			1600 KHz	1600 KHz	TC10 AM OSC.		
6			600 KHz	600 KHz	L7 AM ANT.		
7			1400 KHz	1400 KHz	TC7 AM ANT.		
REPEAT STEP 1 THRU 7 AS NECESSARY TO OBTAIN MAXIMUM SENSITIVITY.							
SET FUNCTION SWITCH ON FM							
1	SWEEP GEN. - CONNECTED TO TP 1 THROUGH 10pF CAP.	OSILLO- SCOPE CONNECTED TO TP2 THROUGH NEDWORK	10.7 MHz WITH 3 POINT MARKERS	QUIET POINT ON BAND VR AT MIN.	T9 5TH FMIF	MAX. GAIN WITH SYMMETRICAL "S" CURVE CENTERED AT 10.7 MHz	
2					T9 4TH FMIF		
3					T7 3RD FMIF		
4					T6 2ND FMIF		
5					T2 1ST FMIF		
6	SIG. GEN. - COUPLED TO FM ANTENNA TERMINAL	V.T.V.M. - CONNECTED ACROSS SPEAKER VOICE COIL (VR-MAX.)	88 MHz (MODULATED)	88 MHz	L18 FM OSC.	MAXIMUM	
7			108 MHz	108 MHz	TC6 FM OSC		
8			90 MHz	90 MHz	L5 FM RF		
9			106 MHz	106 MHz	TC5 FM OSC		
REPEAT STEP 1 THRU 9 AS NECESSARY TO OBTAIN MAXIMUM (SYMMETRY) SENSITIVITY.							

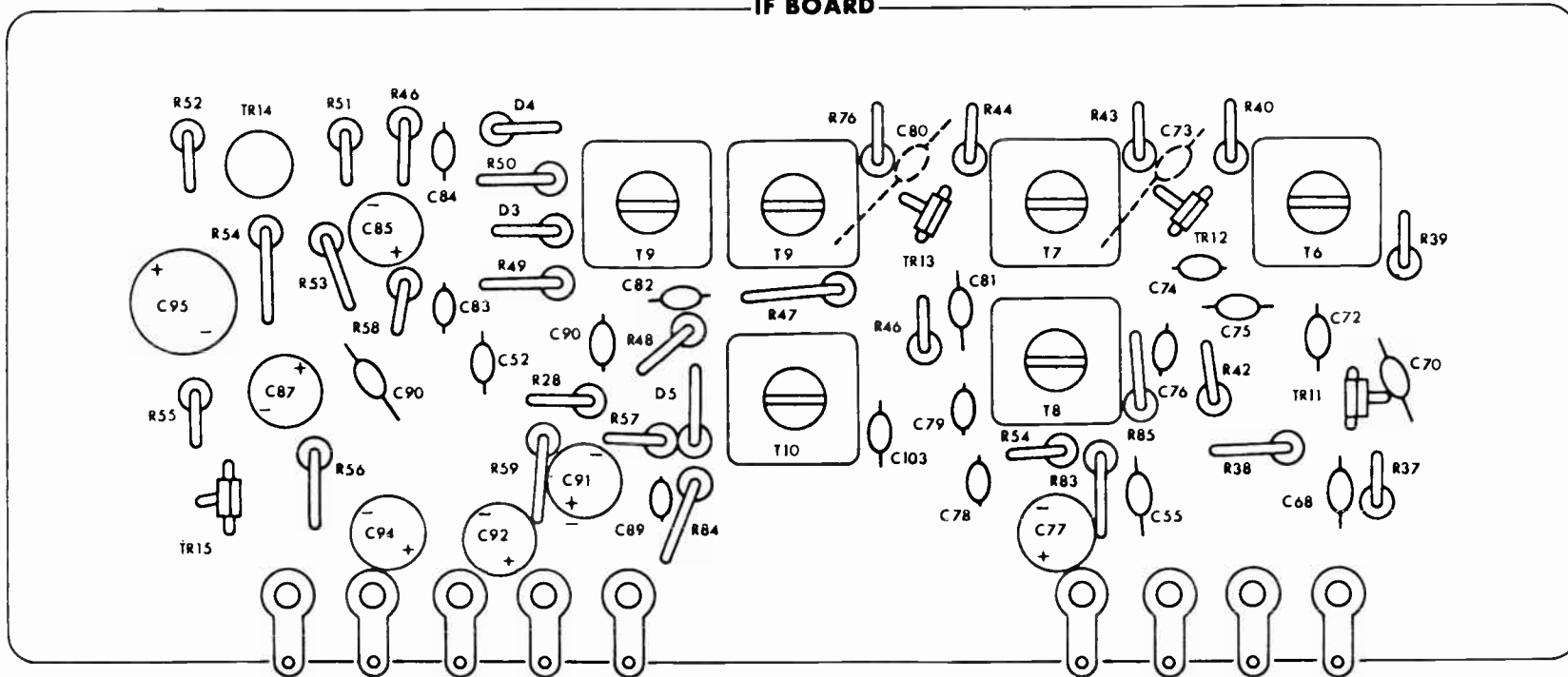
AUDIO BOARD



DIAL STRING DIAGRAM

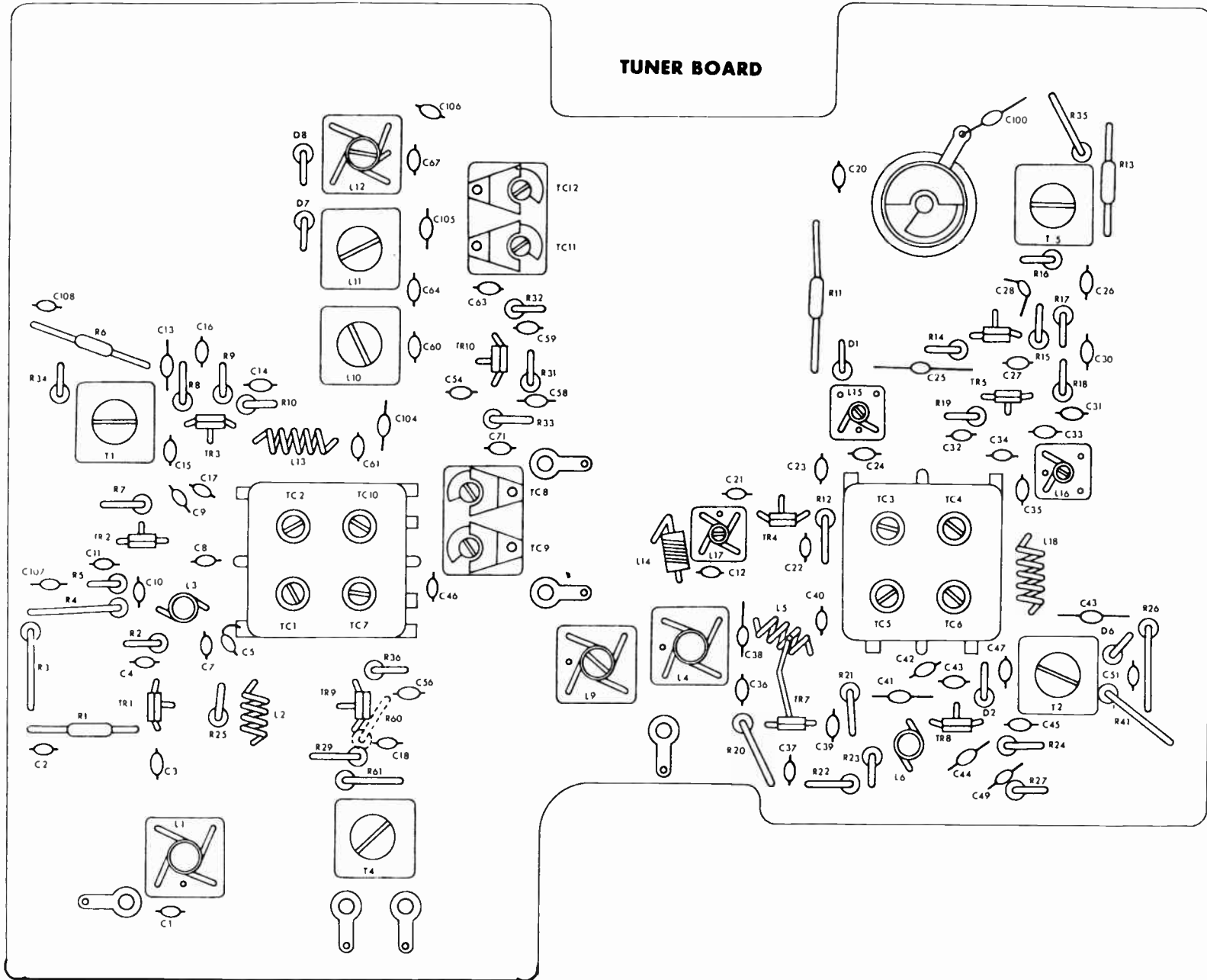


IF BOARD

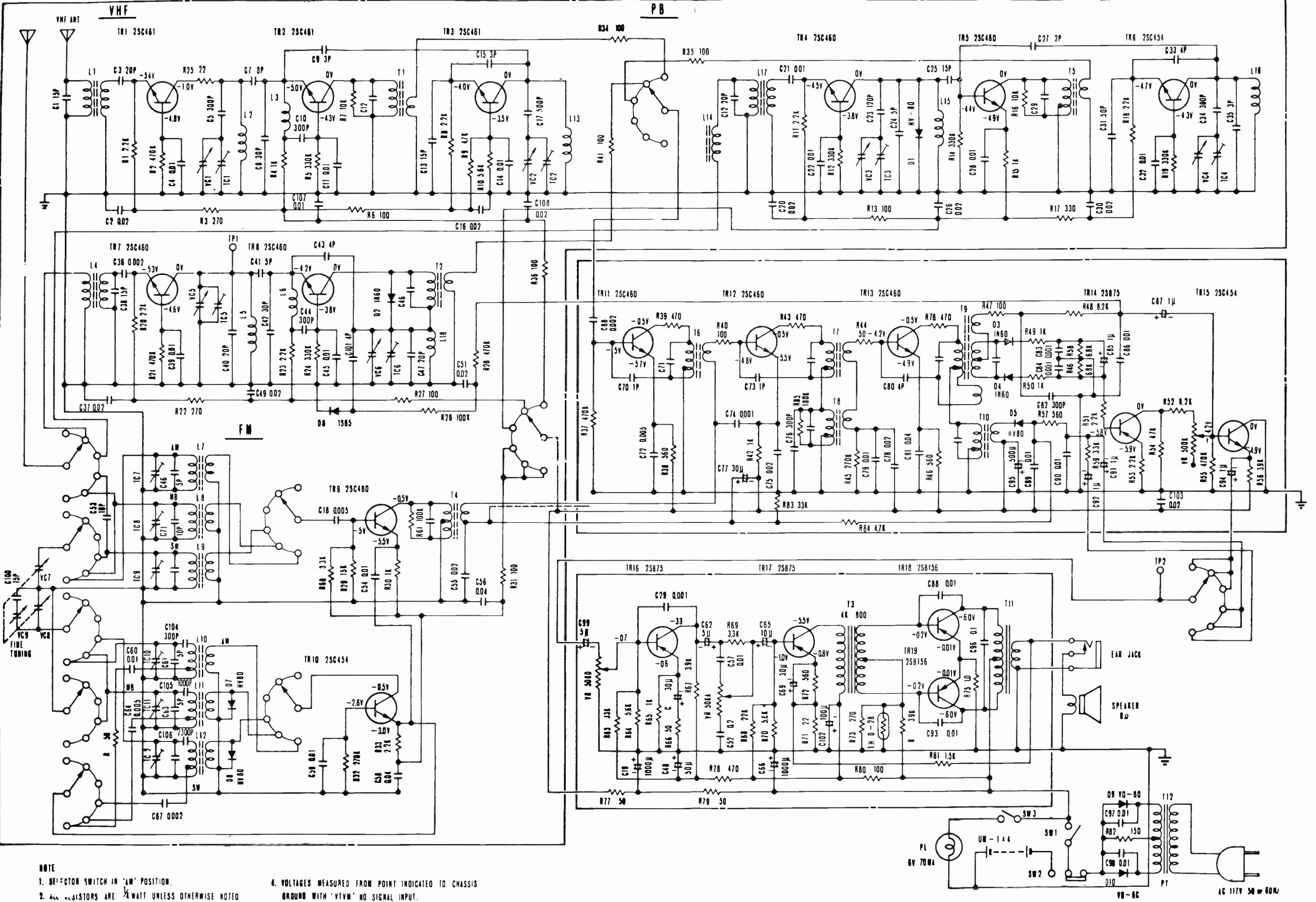


Midland 10-568

TUNER BOARD



SCHEMATIC DIAGRAM



NOTE
 1. BEFLECTION SWITCH IN 'AM' POSITION.
 2. ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE NOTED.
 3. ALL CAPACITORS ARE MFD UNLESS OTHERWISE NOTED.

4. VOLTAGES MEASURED FROM POINT INDICATED TO CHASSIS GROUND WITH 'VTVM' NO SIGNAL INPUT.

ALIGNMENT CONTD.

STEP	SIGNAL SOURCE	OUTPUT INDICATOR	SET SIGNAL TO	SET RADIO DIAL TO	ADJUST	ADJUST FOR
		SET FUNCTION	SWITCH ON MB			
1	SIG. GEN. - CONNECTED TO A LOOP OR SHORT PIECE OF WIRE PLACED NEAR MB ANT.	V.T.V.M. - CONNECTED ACROSS SPEAKER VOICE COIL.	1.5 MHz (MODULATED)	1.5 MHz	L11 MB OSC	MAXIMUM
2			4.0 MHz	4.0 MHz	TC11 MB OSC	
3			1.7 MHz	1.7 MHz	L3 ME ANT	
4			3.6 MHz	3.6 MHz	TC8 MB ANT	

REPEAT STEP 1 THRU 4 AS NECESSARY TO OBTAIN MAXIMUM SENSITIVITY.

SET FUNCTION SWITCH ON PB

1	SIG. GEN. - COUPLED TO PB ANTENNA TERMINAL	V.T.V.M. CONNECTED ACROSS VOICE COIL (VR-MIN.)	30MHz (MODULATION)	30 MHz	L16 PB OSC	MAXIMUM
2			50 MHz	50 MHz	TC4 PB OSC	
3			32 MHz	32 MHz	L15,T5 PB ANT	
4			48 MHz	48 MHz	TC3 FB ANT	

REPEAT STEP 1 THRU 4 AS NECESSARY TO OBTAIN MAXIMUM SENSITIVITY.

SET FUNCTION SWITCH ON SW1-2

1	SIG. GEN. - CONNECTED TO SW ANTENNA TERMINAL THRU DUMMY (30 OHM+8pF)	V.T.V.M. CONNECTED ACROSS SPEAKER VOICE COIL.	4.0MHz	4.0 MHz	L12 SW OSC	MAXIMUM
2			173 MHz	173 MHz	TC2 VHF OSC	
3			120 MHz	120 MHz	L2 T1 VHF OSC	
4			160 MHz	160 MHz	TC1 VHF ANT.	

REPEAT STEP 1 THRU 4 AS NECESSARY TO OBTAIN MAXIMUM SENSITIVITY.

SET FUNCTION SWITCH ON VHF 1-2

STEP	SIGNAL SOURCE	OUTPUT INDICATOR	SET SIGNAL TO	SET RADIO DIAL TO	ADJUST	ADJUST FOR
1	SIG. GEN. - COUPLED TO PB ANTENNA TERMINAL	V.T.V.M. CONNECTED ACROSS VOICE COIL	108 MHz (MODULATION)	108 MHz	L13 VHF OSC	MAXIMUM
2			173 MHz	173 MHz	TC2 VHF OSC	
3			120 MHz	120 MHz	L2,T1 VHF OSC	
4			160 MHz	160 MHz	TC1 VHF ANT	

REPEAT STEP 1 THRU 4 AS NECESSARY TO OBTAIN MAXIMUM SENSITIVITY.

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	09-306221	HV-80
D2	09-306019	1N60
D3	09-306019	1N60
D4	09-306019	1N60
D4	09-306019	1N60
D5	09-306221	HV-80
D6	09-306021	1S85
D7	09-306221	HV-80
D8	09-306221	HV-80
D9	09-306042	V0-6C
D10	09-306042	V0-6C
TR1	09-302005	2SC461
TR2	09-302005	2SC461
TR3	09-302005	2SC461
TR4	09-302004	2SC460
TR5	09-302004	2SC460
TR6	09-302017	2SC454
TR7	09-302004	2SC460
TR8	09-302004	2SC460
TR9	09-302004	2SC460
TR10	09-302017	2SC454
TR11	09-302004	2SC460
TR12	09-302004	2SC460
TR13	09-302004	2SC460
TR14	09-301005	2SB75
TR15	09-302017	2SC454
TR16	09-301005	2SB75
TR17	09-301005	2SB75
TR18	09-301056	2SB156

VR	10-163015	200K Squelch
VR	10-163014	50K Tone
VR	10-160075	5000 Ohms Volume

COILS/TRANSFORMERS

ITEM	PART NO.
L1	10-176093
L2	10-176094
L3	10-178019
L4	10-176095
L5	10-176094
L6	10-178019
L7	10-050091
L8	10-050091
L9	10-176096
L10	10-170185
L11	10-170186
L12	10-170187
L13	10-170188
L14	10-176097
L15	10-176098
L16	10-170189
L17	10-176099
T1	10-090277
T2	10-090277
T3	10-096077
T4	10-090278
T5	10-090279
T6	10-090279
T7	10-090279
T8	10-090280
T9	10-179009 (Pink)
	10-179010 (Blue)
T10	10-090281
T11	10-096078
T12	10-098023

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C19	77-336108	1000mfd 10V
C48	77-336506	50mfd 10V
C62	77-336505	5mfd 10V
C65	77-336106	10mfd 10V
C66	77-336108	1000mfd 10V
C69	77-336306	30mfd 10V
C77	77-336306	30mfd 10V
C85	77-336105	1mfd
C87	77-336105	1mfd
C91	77-336105	1mfd
C92	77-336105	1mfd
C94	77-336105	1mfd
C99	77-336505	5mfd 10V
C100	77-336306	30mfd 10V
C102	77-336108	1000mfd 10V
TC1	10-120068	Tuning Gang
TC2		
TC7		
TC10	10-120069	Tuning Gang
TC3		
TC4		
TC5	10-123025	Trimmer
TC6		
TC8 &		
TC9	10-123025	Trimmer
TC11 &		
TC12		
VC9	10-166003	Fine Tuning

MISCELLANEOUS

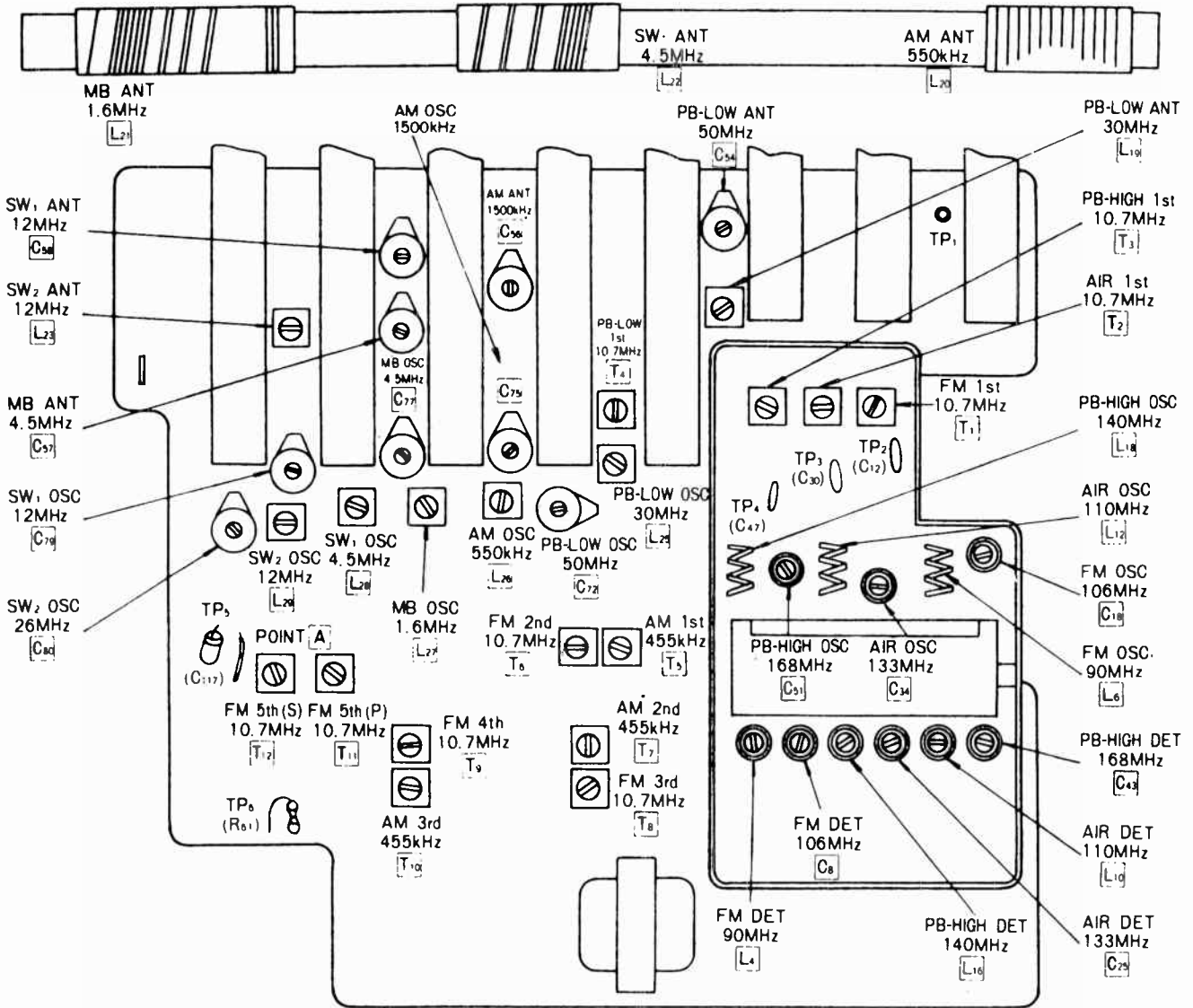
ITEM	NAME	PART NO.
S1	Switch, Power	10-183039
S2	Switch, AC-DC	10-183034
S3	Switch, Dial Lamp	10-186005
	Switch, Band	10-180021

CABINET PARTS

NAME	PART NO.
Cabinet, Leather	10-010134
Handle, Carrying	10-035045
Insert, Handle	10-035044
Knob, Tuning	10-113064
Knob, Fine Tuning	10-113065
Knob, Band Select	10-113066
Knob, Volume	10-110113
Knob, Tone	10-110113
Knob, Squelch	10-110113
Knob, Power	10-110114

CONTROLS/SPECIAL RESISTORS

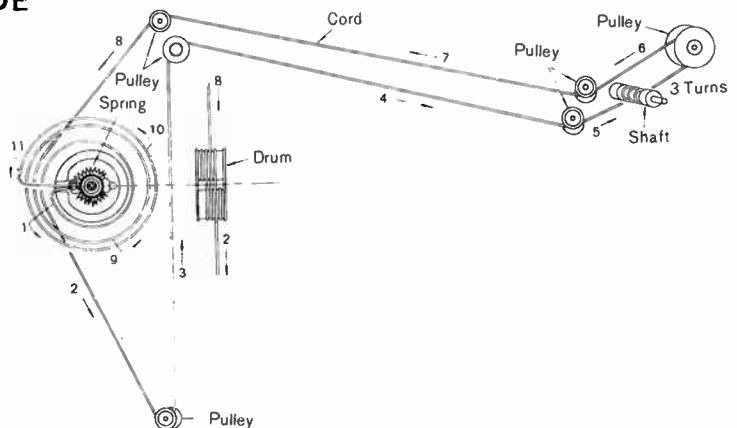
ITEM	PART NO.	DESCRIPTION
TH	09-307028	Thermistor (D-2B)



Alignment Points

■ DIAL CORD INSTALLATION GUIDE

1. Remove dial scale from chassis.
2. Dial cord length is 60".
3. Set tuning gang to minimum capacity.
4. Arrows (1~11) indicate correct order and direction of installation dial cord.
5. Cement dial cord ends.



■ TO MOUNT DIAL POINTER.

1. Set tuning gang to maximum capacity.
2. Set dial pointer to start point of dial scale.
3. Attach dial cord to dial pointer.

ALIGNMENT INSTRUCTIONS

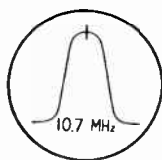


Fig. 1



Fig. 2

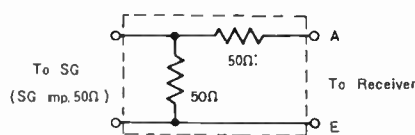


Fig. 3 FM Dummy Antenna

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum or minimum.
2. Set tone control to treble.
3. Set squelch control to OFF.
4. Set band selector switch to FM, AIR, PB-HIGH, PB-LOW, AM, MB, SW₁ or SW₂.
5. Set AFC switch to OFF (FM-IF & RF).
6. Set loudness switch to ON.
7. Set power source switch to ON.
8. Set AC-Battery selector switch to battery.
9. Set fine tuning gang to center.
10. Set power source voltage to 9 volts DC.
11. Output of signal generator should be no higher than necessary to obtain an output reading.

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS	
CONNECTIONS	FREQUENCY					
AM, MB, SW₁ & SW₂ IF ALIGNMENT						
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400 Hz.	Point of non-interference. (on/about 600 kHz)	Output meter across voice coil.	T ₅ (1st IFT) T ₇ (2nd IFT) T ₁₀ (3rd IFT)	Adjust for maximum output.
FM-IF ALIGNMENT						
2	High side thru. 0.001 mfd to point TP ₂ . Common to chassis.	10.7 MHz (400 kHz SWP.)	Point of non-interference. (on/about 90 MHz)	Connect vert. amp. of scope to point TP ₅ (*). Common to chassis.	T ₁ (1st FM IFT) T ₆ (2nd FM IFT) T ₈ (3rd FM IFT) T ₉ (4th FM IFT) T ₁₁ (5th FM IFT) (P)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to fig. 1)
AIR-IF ALIGNMENT						
3	High side thru. 0.001 mfd to point TP ₃ . Common to chassis.	"	Point of non-interference.	"	T ₂ (1st AIR IFT)	"
PB HIGH-IF ALIGNMENT						
4	High side thru. 0.001 mfd to point TP ₄ . Common to chassis.	"	"	"	T ₃ (1st PB-HIGH IFT)	"
PB LOW-IF ALIGNMENT						
5	High side thru. 0.001 mfd to point TP ₁ . Common to chassis.	"	"	"	T ₄ (1st PB-LOW IFT)	"
FM-DET ALIGNMENT						
6	High side thru. 0.001 mfd to point TP ₂ . Common to chassis.	"	"	Connect vert. amp. of scope to point TP ₇ . Common to chassis	T ₁₂ (5th FM IFT) (Secondary)	Adjust T ₁₂ so that 10.7 MHz marker appears at the center (Refer to fig. 2)
* Unsolder lead between test point TP ₅ and point A before alignment and resolder it after alignment.						

SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
FM-RF ALIGNMENT					
1	Connect to point TP ₁ through FM Dummy antenna. Common to chassis. (Refer to fig. 3)	90 MHz (1 1/2")	Output meter across voice coil.	L ₆ (FM OSC Coil) L ₄ (FM DET Ccoil)	Adjust for maximum output.
2	"	106 MHz (3 3/8")	"	C ₁₈ (FM OSC Trimmer) C ₈ (FM DET Trimmer)	Adjust for maximum output. Repeat steps (1) and (2).
AIR-RF ALIGNMENT					
3	"	110 MHz (1 3/8")	"	L ₁₂ (AIR OSC Coil) L ₁₀ (AIR DET Coil)	Adjust for maximum output.
4	"	133 MHz (3 3/2")	"	C ₃₄ (AIR OSC Trimmer) C ₂₅ (AIR DET Trimmer)	Adjust for maximum output. Repeat steps (3). and (4).
PB HIGH-RF ALIGNMENT					
5	"	140 MHz (1 7/8")	"	L ₁₈ (PB-HIGH OSC Coil) L ₁₆ (PB-HIGH DET Coil)	Adjust for maximum output.
6	"	168 MHz (3 3/2")	"	C ₅₁ (PB-HIGH OSC Trimmer) C ₄₃ (PB-HIGH DET Trimmer)	Adjust for maximum output. Repeat steps (5) and (6).
PB LOW-RF ALIGNMENT					
7	"	30 MHz (1")	"	L ₂₅ (PB-LOW OSC Coil) L ₁₉ (PB-LOW DET Coil)	Adjust for maximum output.
8	"	50 MHz (4 1/2")	"	C ₇₂ (PB-LOW OSC Trimmer) C ₅₄ (PB-LOW DET Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).
AM-RF ALIGNMENT					
9	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550 kHz (7 1/8")	"	L ₂₆ (AM OSC Coil) (*) L ₂₀ (AM ANT Coil)	Adjust for maximum output. Adjust L ₂₀ by moving coil bobbin along ferrite core.
10	"	1500 kHz (4 1/16")	"	C ₇₅ (AM OSC Trimmer) C ₅₆ (AM ANT Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).
MB-RF ALIGNMENT					
11	"	1.6 MHz (1 1/2")	"	L ₂₇ (MB OSC Coil) (*) L ₂₁ (MB ANT Coil)	Adjust for maximum output. Adjust L ₂₁ by moving coil bobbin along ferrite core.
12	"	4.5 MHz (4 3/8")	"	C ₇₇ (MB OSC Trimmer) C ₅₇ (MB ANT Trimmer)	Adjust for maximum output. Repeat steps (11) and (12).
SW1-RF ALIGNMENT					
13	Connect ceramic capacitor (10 mmf) between test point TP ₁ and chassis.	4.5 MHz (1 1/2")	"	L ₂₈ (SW ₁ OSC Coil) (*) L ₂₂ (SW ₁ ANT Coil)	Adjust for maximum output. Adjust L ₂₂ by moving coil bobbin along ferrite core.
14	"	12 MHz (4 3/8")	"	C ₇₉ (SW ₁ OSC Trimmer) C ₅₈ (SW ₁ ANT Trimmer)	Adjust for maximum output. Repeat steps (13) and (14).
SW2-RF ALIGNMENT					
15	Connect to test point TP ₁ through ceramic capacitor (10 mmf). Common to chassis	12 MHz (1 1/2")	"	L ₂₉ (SW ₂ OSC Coil) L ₂₃ (SW ₂ ANT Coil)	Adjust for maximum output.
16	"	26 MHz (4 3/8")	"	C ₈₀ (SW ₂ OSC Trimmer)	Adjust for maximum output. Repeat steps (15) and (16).

* Cement antenna bobbin with wax after completing alignment

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	1S351
D2	0A90
D3	0A90
D4	0A90
D5	0A90
D6	0A90
D7	0A90
D8	0A90
D9	0A90
D10	0A90
D11	RVD1S994
D12	1S1211
D13	1S1211
D14	1S1211
IC	AN210
SE	RVD10DC1R
TR1	2SC921
TR2	2SC920
TR3	2SC921
TR4	2SC920
TR5	2SC921
TR6	2SC921
TR7	2SC920
TR8	2SC920
TR9	2SB173
TR10	2SB175
TR11	2SB324
TR12	2SB324
TR13	2SC829
TR14	2SC829

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C8	ECVIZW10P32	Trimmer
C16	ECVIZW10P32	Trimmer
C25	ECVIZW10P32	Trimmer
C34	ECVIZW10P32	Trimmer
C43	ECVIZW10P32	Trimmer
C51	ECVIZW10P32	Trimmer
C54	RCVIT-16M	Trimmer
C56	RCVIT-16M	Trimmer
C57	RCVIT-16M	Trimmer
C58	RCVIT-16M	Trimmer
C72	RCVIT-16M	Trimmer
C75	RCVIT-16M	Trimmer
C77	RCVIT-16M	Trimmer
C79	RCVIT-16M	Trimmer
C80	RCVIT-16M	Trimmer
C88	ECEA6V100	100mfd 6.3V
C90	ECAG16ER1	.1mfd 16V
C98	ECEA6V100	100mfd 6.3V
C100	ECEA10V220	220mfd 10V
C104	ECEA16V10	10mfd 16V
C109	ECAG16ER1	.1mfd
C114	ECAG16ER47	.47mfd
C115	ECEA50V1	1mfd 50V
C117	ECEB25V4R7	4.7mfd 25V
C118	ECEA16V10	10mfd 16V
C119	ECAG16ER22	.22mfd 16V
C122	ECEA50V1	1mfd 50V
C123	ECEA16V10	10mfd 16V
C124	ECEA6V33	33mfd 6.3V
C125	ECEA16V10	10mfd 16V
C127	ECEA6V100	100mfd 6.3V
C128	ECEA10V220	220mfd 10V
C135	ECEA10V470	470mfd 10V
C136	ECEB16V1000	1000mfd 16V
C142	ECEA6V100	100mfd 6.3V
C150	ECEA10V220	220mfd 10V
C151	ECEA10V100	100mfd 10V
Tuning Gang (AM)	PVC22217AL	
Tuning Gang (FM)	ECV6EW02X50A	

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	VALUE
R64	EVCB0DL20B14	10K Squelch/Switch
R67	EVCB0AL20A14	10K Tone
R68	EVCB0AL20D54	50K Volume
Th2	RRT800	Thermistor
Th3	RRT800	Thermistor

COILS/TRANSFORMERS

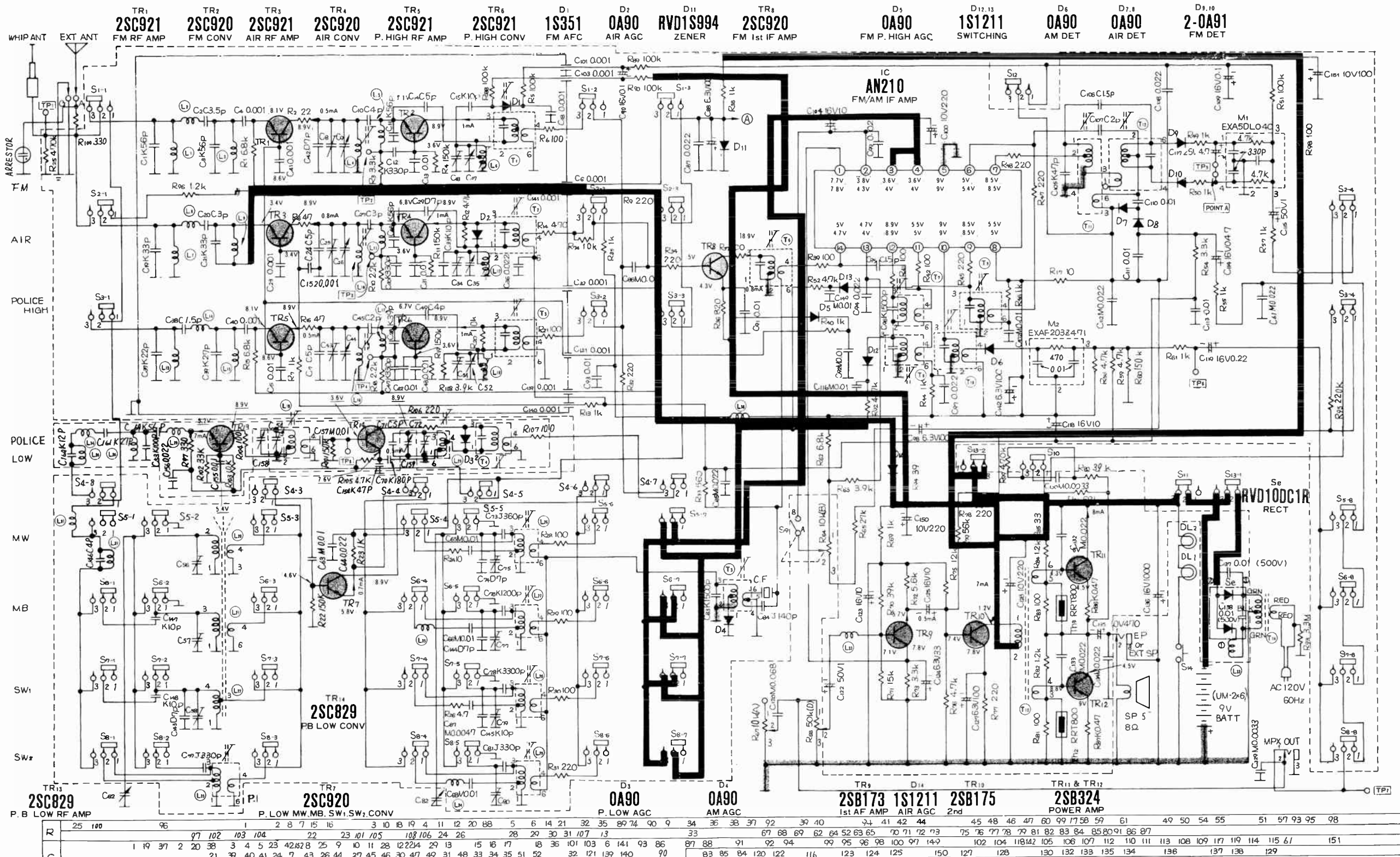
ITEM	PART NO.		
L1	RLQY10S-5	L28	RL03B37-M
L2	RLQY75S-5	L29	RL03B38-M
L3	RLQY10S-5	L30	RLQX121-1
L4	RLD4N15	L31	RLQY75S-5
L5	RLQY75S-5	L32	RLQX101-1-Q
L6	RLQ4Y54	L33	RLQY75S2-0
L7	RLQY10S-5	L34	RLQY50S-5
L8	RLQY50S-5	L35	RLQY25S-5
L9	RLQY10S-5	L36	RLQY50S-5
L10	RLD4N16	L37	RLQY75S-5
L11	RLQY75S-5	L38	RLQY25S-5
L12	RLQ4Y53	L39	RLQY50S-5
L13	RLQY05S-5	T1	RL14B152
L14	RLQY50S-5	T2	RL14B152
L15	RLQY05S-5	T3	RL14B152
L16	FLD4N23	T4	RL14B152
L17	RLQY75S-5	T5	RL12B126-M
L18	RLQ4Y54	T6	RL14B351
L19	RLA9B4-T	T7	RL12B152-M
L20	RLF9H16	T8	RL14B351
L21	RLF9H16	T9	RL14B351
L22	RLF9H16	T10	RL12B450-M
L23	RLA3B2B-T	T11	RL14B508
L24	RLQY25S-5	T12	RL14B552
L25	RLQ9B7-T	T13	RLT3G21-W
L26	RLQ2B73-M	T14	RLT5J101-W
L27	RLQ3B36-M		

MISCELLANEOUS

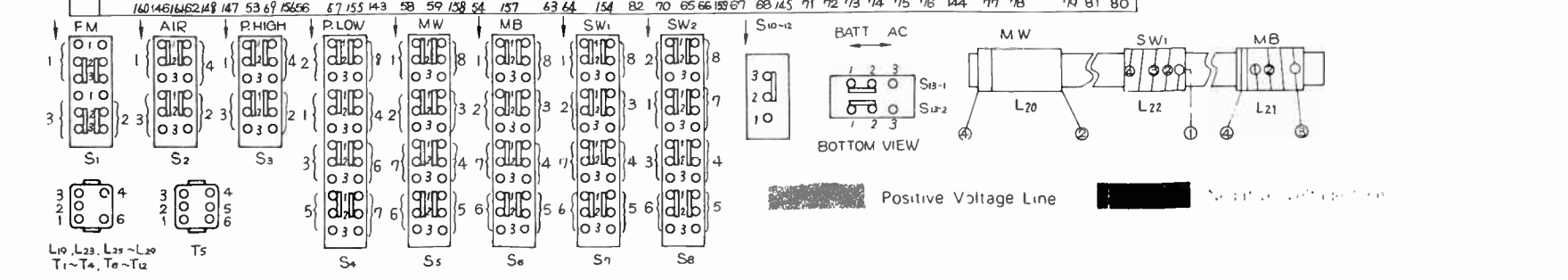
ITEM	NAME	PART NO.
CF	Ceramic Filter	EFGA455K21M
M1	Component Combination	EXA5DL04C
M2	Component Combination	EXAF203Z471
S1-8	Switch, Band	RSH801AS
S10	Switch, Loudness	RSH39A
S11	Switch, Power	RSH39A
S12	Switch, AFC	RSH39A
S13	Switch, AC-Battery	RSS153
S14	Switch, Dial Light	RSH40A
SP	Speaker (5", 8 ohms)	EAS12P70SG
	Antenna, Telescopic	XEARDT160GA
	Earphone	EAE1TB

CABINET PARTS

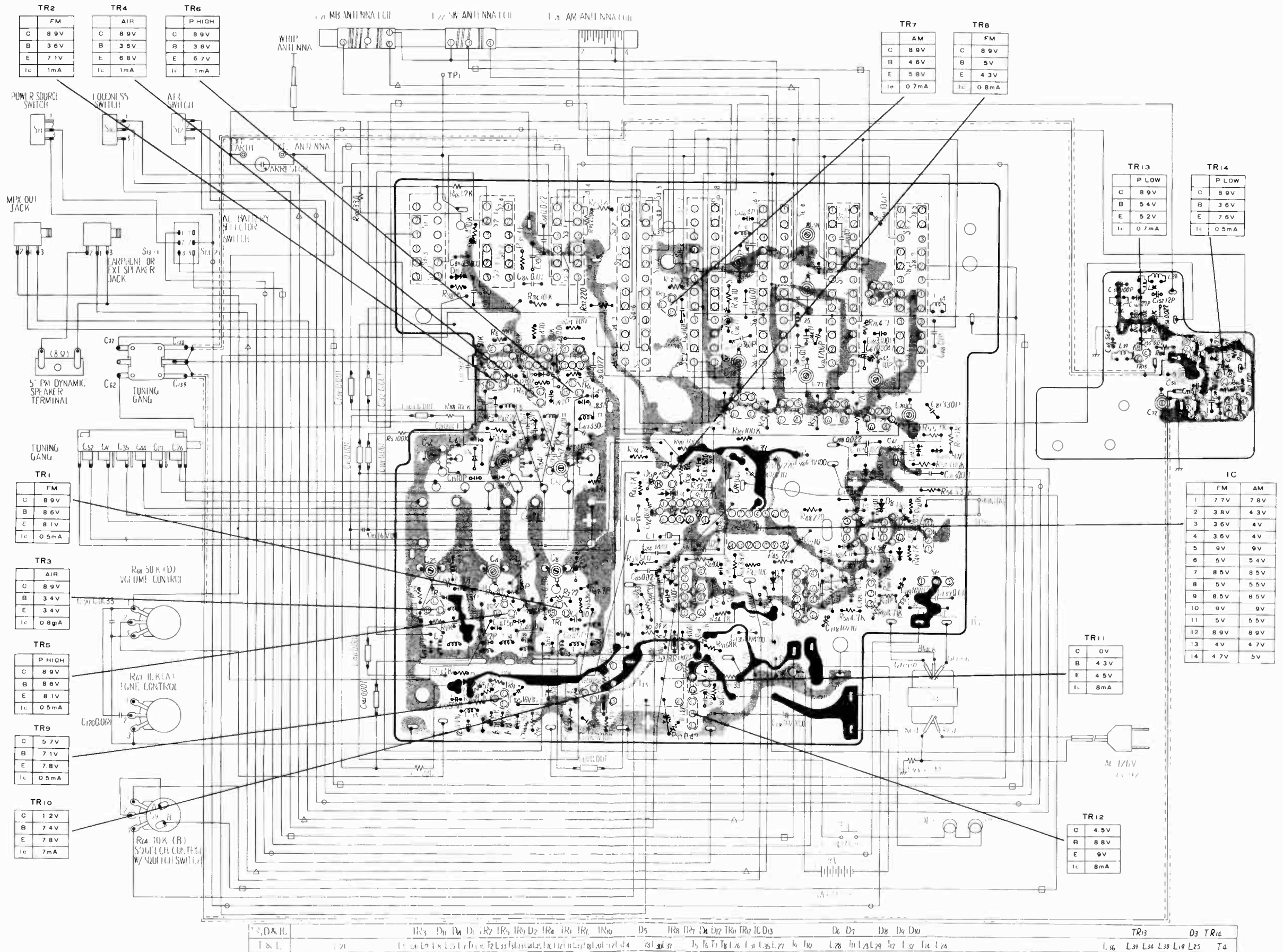
NAME	MODEL	PART NO.
Cabinet, Complete	RF-1700	RYARF1700M
Cabinet, Complete	RF-1700C	RYARF1700CM
Cabinet, Only	RF-1700/C	RKM156A
Cabinet Front, Complete	RF-1700/C	RYMRF1700M
Cabinet Back, Complete	RF-1700	RYFRF1700M
Cabinet Back, Complete	RF-1700C	RYFRF1700CM
Battery Compartment	RF-1700/C	RYNRF1700M
Cover, Complete		
Handle, Cabinet	RF-1700/C	RKH38AS
Knob, Fine Tuning	RF-1700/C	RBN108A
Knob, Tuning	RF-1700/C	RBN109A
Knob, Volume	RF-1700/C	RBN104A
Knob, Tone	RF-1700/C	RBN104A
Knob, Squelch	RF-1700/C	RBN104A



- Notes:**
- S1~S8: Band selector switch in "FM" position.
 - S9: Squelch switch in "OFF" position.
 - S10: Loudness switch in "OFF" position.
 - S11: Power source switch in "ON" position.
 - S12: FM AFC switch in "ON" position.
 - S13-1~S13-2: AC-Battery selector switch in "Battery" position.
 - S14: Dial light switch in "OFF" position.
 - DC voltage measurements are taken with circuit tester 10K Ω /V from negative terminal of battery.
 - P. Low position
 -FM position
 -AM position
 - <.....AIR position
 -P. High position
 - Battery current: No signal FM & AM 35mA
 AIR 40mA
 FM & AM 280mA
 AIR 290mA
- Maximum output.....



Panasonic RF-1700, RF-1700C



TR2

FM	
C	8.9V
B	3.6V
E	7.1V
Ic	1mA

TR4

AIR	
C	8.9V
B	3.6V
E	6.8V
Ic	1mA

TR6

P HIGH	
C	8.9V
B	3.6V
E	6.7V
Ic	1mA

TR7

AM	
C	8.9V
B	4.6V
E	5.8V
Ic	0.7mA

TR8

FM	
C	8.9V
B	5V
E	4.3V
Ic	0.8mA

TR13

P LOW	
C	8.9V
B	5.4V
E	5.2V
Ic	0.7mA

TR14

P LOW	
C	8.9V
B	3.6V
E	7.6V
Ic	0.5mA

TR1

FM	
C	8.9V
B	8.6V
E	8.1V
Ic	0.5mA

TR3

AIR	
C	8.9V
B	3.4V
E	3.4V
Ic	0.8mA

TR5

P HIGH	
C	8.9V
B	8.6V
E	8.1V
Ic	0.5mA

TR9

C	5.7V
B	7.1V
E	7.8V
Ic	0.5mA

TR10

C	1.2V
B	7.4V
E	7.8V
Ic	7mA

IC

	FM	AM
1	7.7V	7.8V
2	3.8V	4.3V
3	3.6V	4V
4	3.6V	4V
5	9V	9V
6	5V	5.4V
7	8.5V	8.5V
8	5V	5.5V
9	8.5V	8.5V
10	9V	9V
11	5V	5.5V
12	8.9V	8.9V
13	4V	4.7V
14	4.7V	5V

TR11

C	0V
B	4.3V
E	4.5V
Ic	8mA

TR12

C	4.5V
B	8.8V
E	9V
Ic	8mA

Positive Voltage Line Negative Voltage Line

- S, D & IC TR3 D1 D2 D3 TR2 TR5 TR4 D2 TR4 TR1 TR6 TR10 D5 TR8 TR4 D2 D12 TR1 TR12 IC D13 D6 D7 D8 D9 D10 TR13 D3 TR14 T & L C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43 C44 C45 C46 C47 C48 C49 C50 C51 C52 C53 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C64 C65 C66 C67 C68 C69 C70 C71 C72 C73 C74 C75 C76 C77 C78 C79 C80 C81 C82 C83 C84 C85 C86 C87 C88 C89 C90 C91 C92 C93 C94 C95 C96 C97 C98 C99 C100 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 R37 R38 R39 R40 R41 R42 R43 R44 R45 R46 R47 R48 R49 R50 R51 R52 R53 R54 R55 R56 R57 R58 R59 R60 R61 R62 R63 R64 R65 R66 R67 R68 R69 R70 R71 R72 R73 R74 R75 R76 R77 R78 R79 R80 R81 R82 R83 R84 R85 R86 R87 R88 R89 R90 R91 R92 R93 R94 R95 R96 R97 R98 R99 R100 L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21 L22 L23 L24 L25 L26 L27 L28 L29 L30 L31 L32 L33 L34 L35 L36 L37 L38 L39 L40 L41 L42 L43 L44 L45 L46 L47 L48 L49 L50 L51 L52 L53 L54 L55 L56 L57 L58 L59 L60 L61 L62 L63 L64 L65 L66 L67 L68 L69 L70 L71 L72 L73 L74 L75 L76 L77 L78 L79 L80 L81 L82 L83 L84 L85 L86 L87 L88 L89 L90 L91 L92 L93 L94 L95 L96 L97 L98 L99 L100 TP1

Cleaning, Lubrication, and Adjustments.

Due to dust, dirt, and magnetic oxide collecting on the playback head, the head should be cleaned at regular intervals. To clean, depress cartridge door, to expose playback head. Clean head with a cotton swab moistened with tape head cleaner fluid.

CAUTION: Under normal operation the mechanism should not require any lubrication for the life of this unit.

Should any lubrication be required a drop of light oil on moving surfaces will be sufficient.

ADJUSTMENTS:

Azimuth Alignment: Chassis removed from cabinet. Insert standard test cartridge into pocket. Set program selector to correct position to provide 8 KHZ alignment signal. Adjust azimuth alignment screw (see fig. # 4) for maximum output signal.

CROSSTALK: Head height adjustment can be made with chassis installed in cabinet by removing access plug indicated in fig. # 2 . Adjustment can also be made with chassis removed from cabinet.

Insert standard test cartridge into pocket. Select the proper program for crosstalk adjustment. Adjust crosstalk adjustment wheel shown in fig. # 4 for minimum output signal.

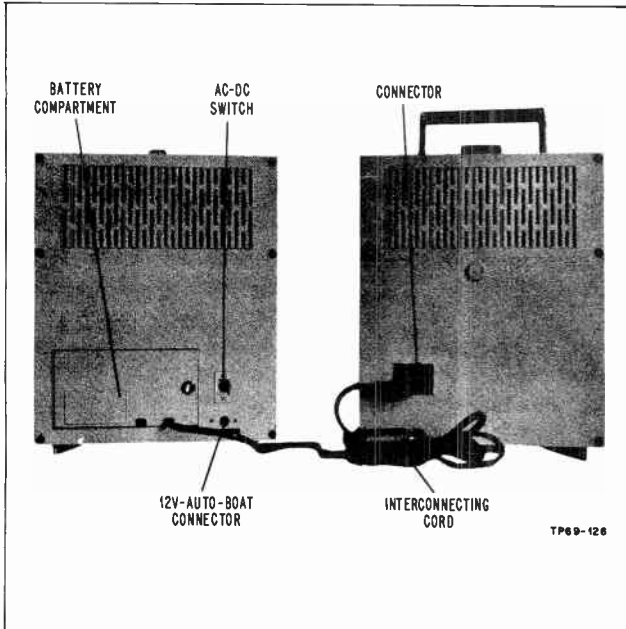


Figure 2. Cord Locations

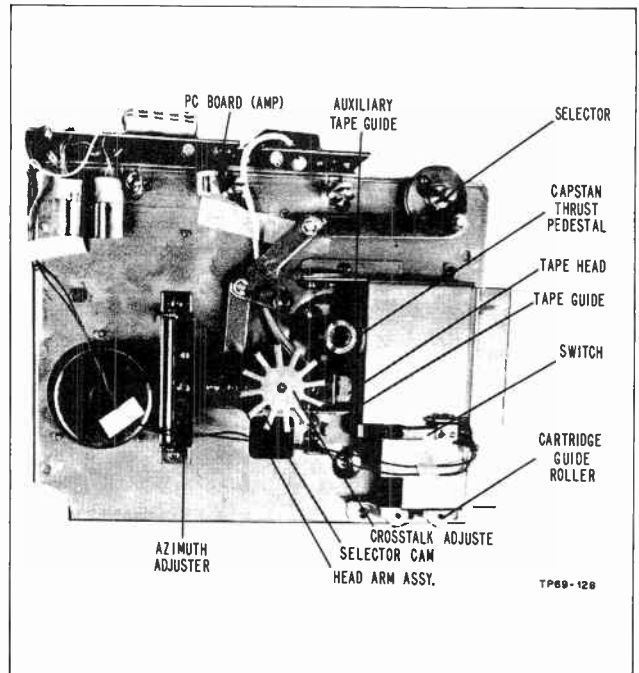
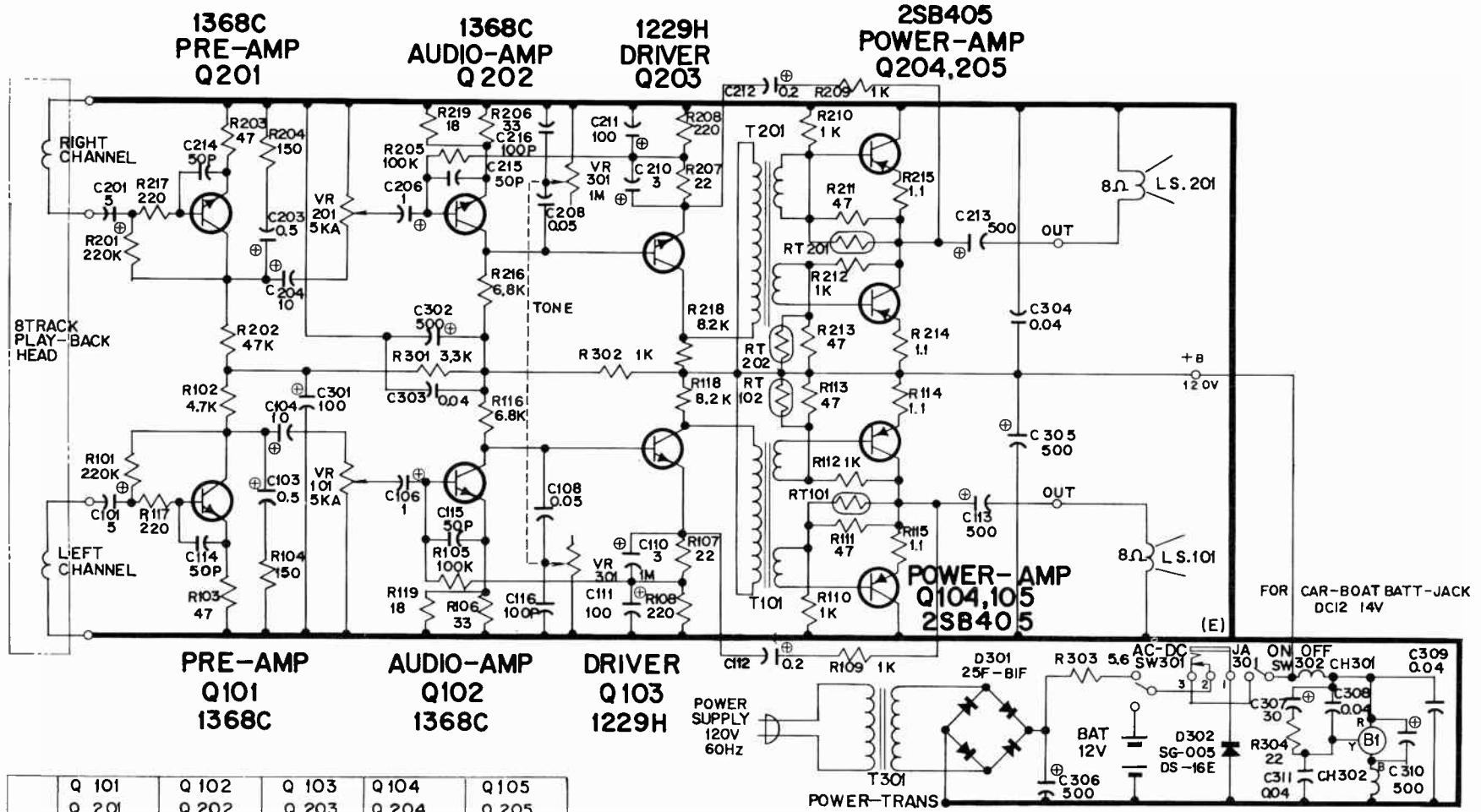


Figure 4. Azimuth Adjusting Screw



	Q 101	Q 102	Q 103	Q 104	Q 105	Q 201	Q 202	Q 203	Q 204	Q 205
	DC 12V	AC 120V	DC 12V	AC 120V	DC 12V	DC 12V	AC 120V	DC 12V	AC 120V	DC 12V
C	0.65	0.7	1.6	1.62	11.1	15	6.0	7.5	0	0
B	0.57	0.57	0.64	0.65	1.6	1.62	11.9	15.4	6	7.8
E	0.01	0.01	0.01	0.012	0.9	1.0	12	15.8	6	7.8

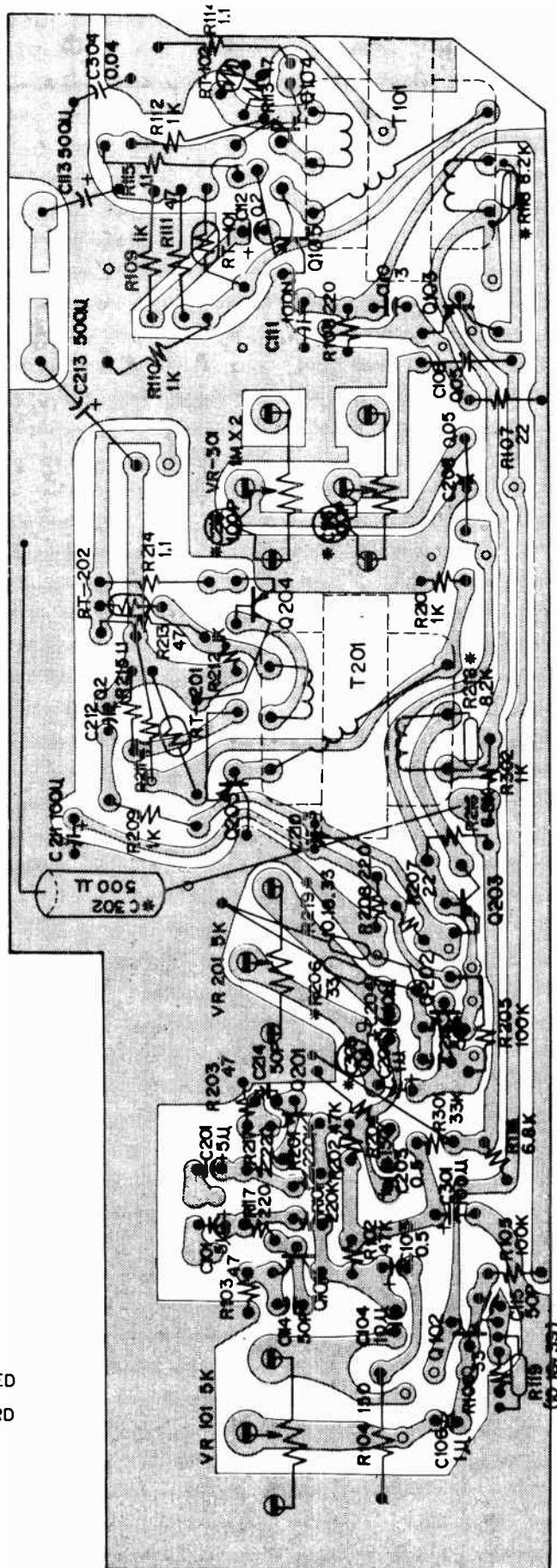
CURRENT DRAIN

	FULL SIG	NO SIG
	600 MA	200 MA

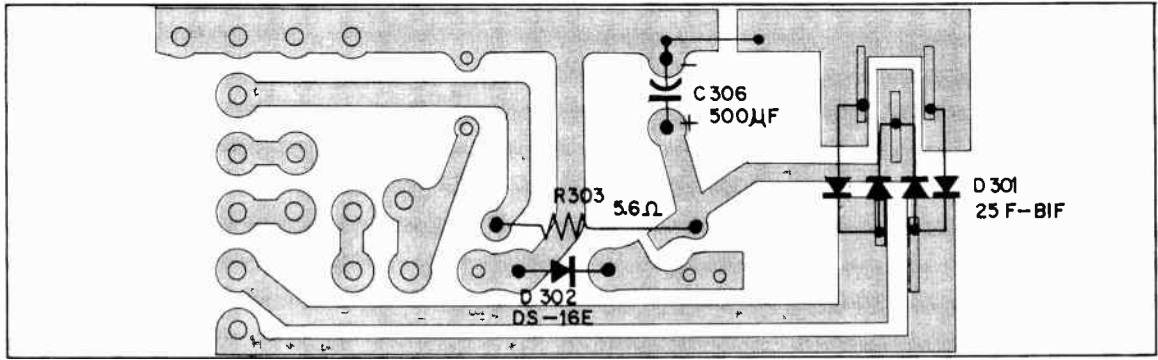
NOTES:
 ALL VOLTAGES TAKEN WITH B & K MODEL 175 VTVM
 NO SIGNAL APPLIED VOLUME AT MINIMUM.
 POWER SOURCE — 117V 60Hz AC
 CURRENT AT B+ POINT ON AMPLIFIER CHASSIS
 NO SIGNAL — 34MA.
 MAX SIGNAL — 350MA.



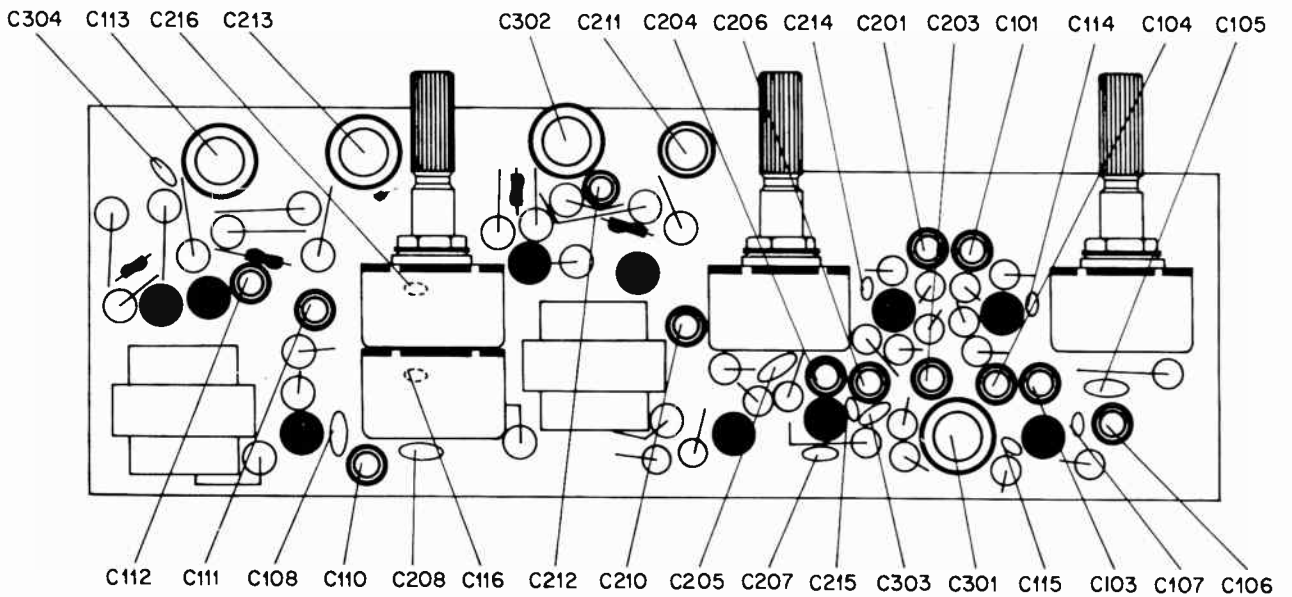
(Q101 TO Q105)
 (Q201 TO Q205)



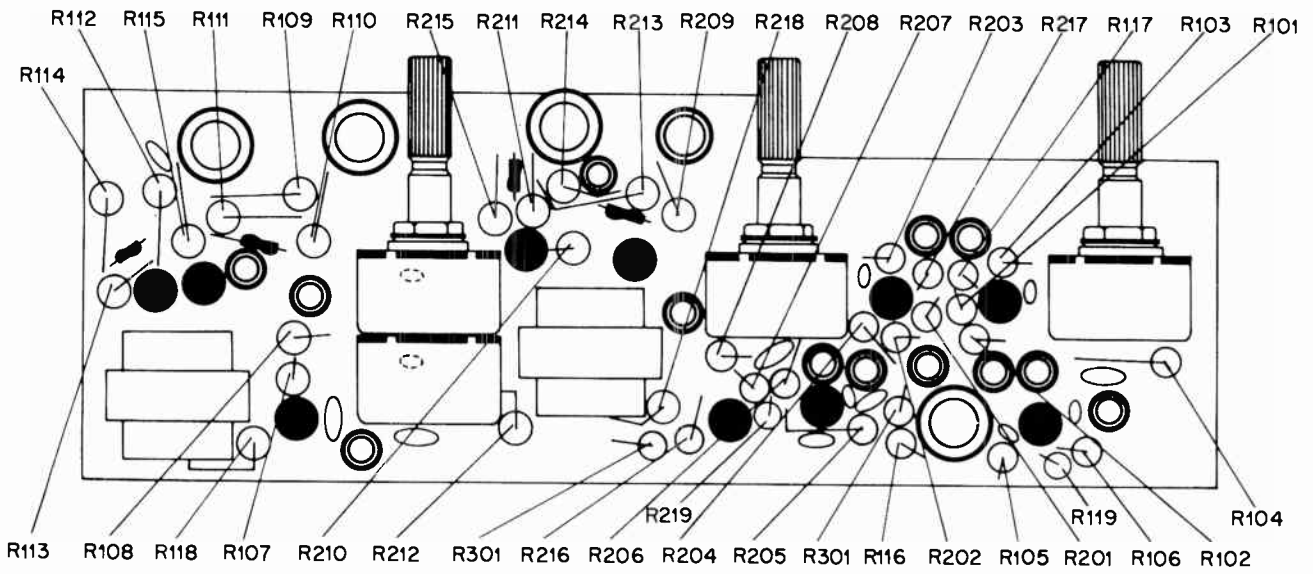
* COMPONENTS MOUNTED
ON BOTTOM OF BOARD



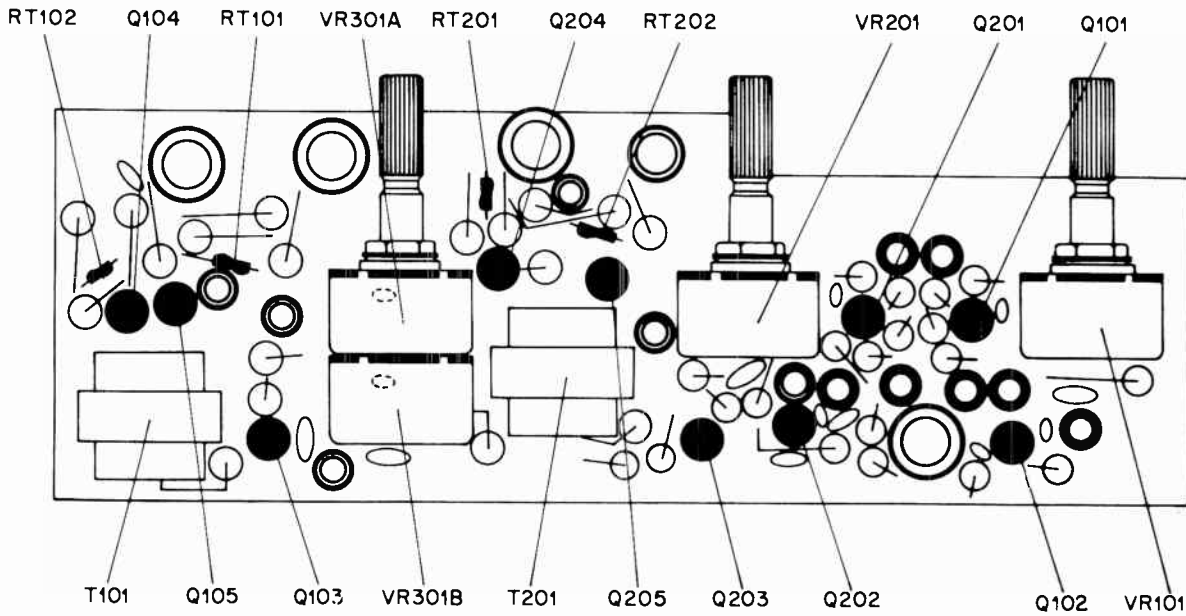
Bottom View Power Perma Circuit Panel



Top View PW Board Capacitor Location



Top View PW Board Resistor Location



Top View PW Board Transistor & Electrical Components

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D301	325-0081-109	25F-B1F
D302	325-0081-110	SG005
Q101	325-0081-100	1368C/D
Q102	325-0081-100	1368C/D
Q103	325-0081-101	1229H
Q104	325-0081-102	2SB405
Q105	325-0081-102	2SB405
Q201	325-0081-100	1368C/D
Q202	325-0081-100	1368C/D
Q203	325-0081-101	1229H
Q204	325-0081-102	2SB405
Q205	325-0081-102	2SB405

RT102	325-0081-103	Thermistor (14D46)
RT201	325-0081-103	Thermistor (14D46)
RT202	325-0081-103	Thermistor (14D46)
VR101	325-0081-106	5000 ohms Volume
VR201	325-0081-106	5000 ohms Volume
VR301	325-0081-107	1meg Tone (Dual)

COILS/TRANSFORMERS

ITEM	PART NO.
CH301	325-0081-111
CH302	325-0081-111
T101	325-0081-104
T202	325-0081-104
T301	325-0081-108

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C101	325-0042-317	5mfd
C103	325-0081-125	.5mfd
C104	325-0030-306	10mfd
C106	325-0031-328	1mfd
C110	325-0054-317	3mfd
C111	325-1375-18	100mfd
C112	325-0081-121	.2mfd
C113	325-0031-332	500mfd
C201	325-0042-317	5mfd
C203	325-0081-125	.5mfd
C204	325-0030-306	10mfd
C206	325-0031-328	1mfd
C210	325-0054-317	3mfd
C211	325-1375-18	100mfd
C212	325-0081-121	.2mfd
C213	325-0031-332	500mfd
C301	325-1375-18	100mfd
C302	325-0031-332	500mfd
C305	325-0031-332	500mfd
C306	325-0031-332	500mfd
C307	325-0042-322	30mfd
C310	325-0031-332	500mfd

MISCELLANEOUS

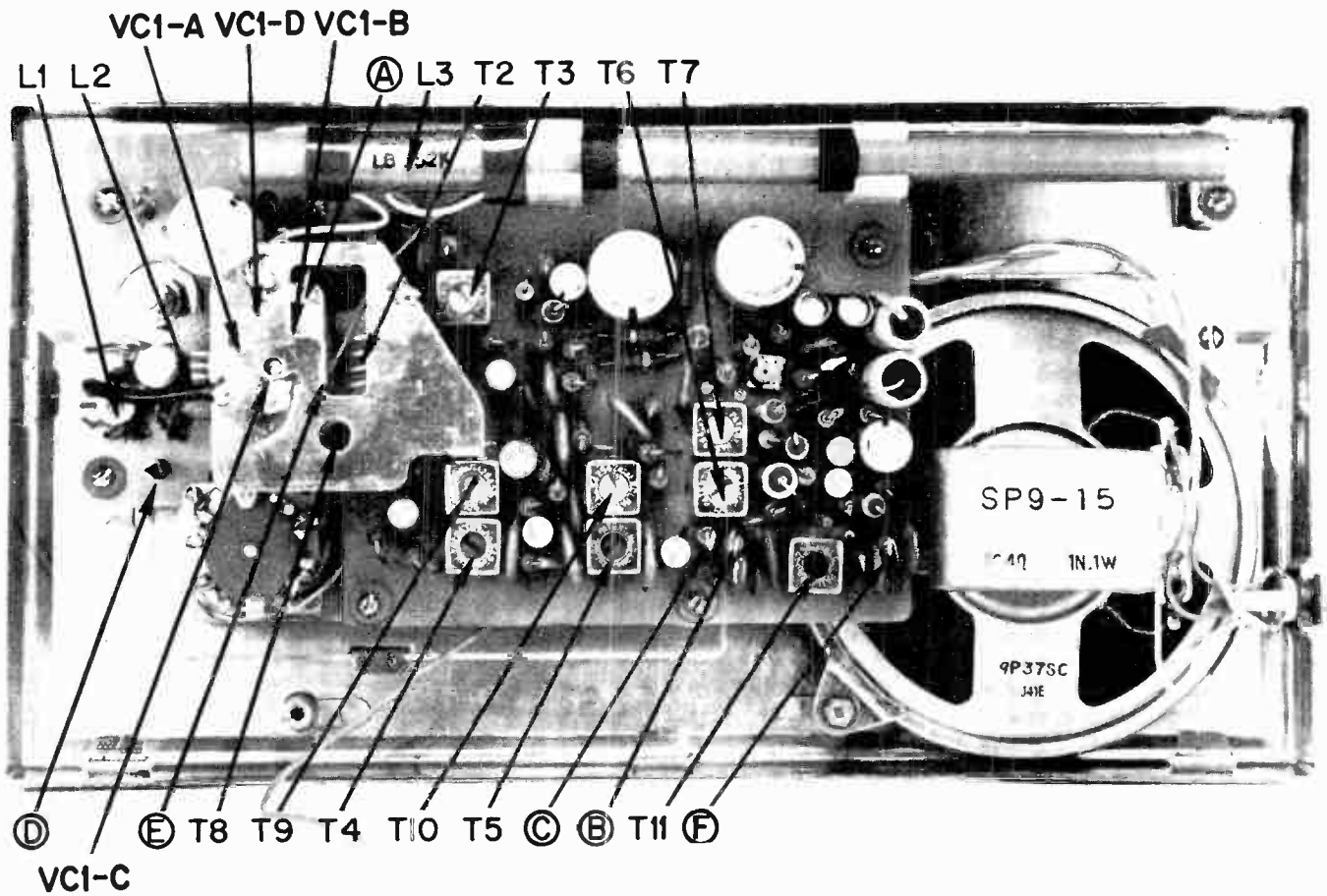
ITEM	NAME	PART NO.
LS101	Speaker (4" x 6")	325-0081-105
LS201	Speaker (4" x 6")	325-0081-105
SW301	Switch, AC-DC	325-0081-116
SW302	Switch, On-Off (Part of Cartridge Guide Assembly)	325-0081-200
	P.C. Board, Amp.	325-0081-118
	P.C. Board, Power	325-0081-119
	Head & Arm Ass'y	325-0081-203
	Motor	325-0081-211
	Belt	325-0081-216
	Flywheel Ass'y	325-0081-214
	Flywheel Bearing Ass'y	325-0081-215

CABINET PARTS

NAME	PART NO.
Front Panel, Main Unit	325-0081-1
Back Cover, Main Unit	325-0081-4
Front Panel, Speaker Unit	325-0081-2
Back Cover, Speaker Unit	325-0081-3
Door Ass'y, Battery	325-0081-24
Battery Case	325-0081-16
Handle	325-0081-11
Knob, Channel Select	325-0081-6
Knob, Volume (2 used)	325-0081-6
Knob, Tone	325-0081-6

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
RT101	325-0081-103	Thermistor (14D46)



ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

Signal Sources

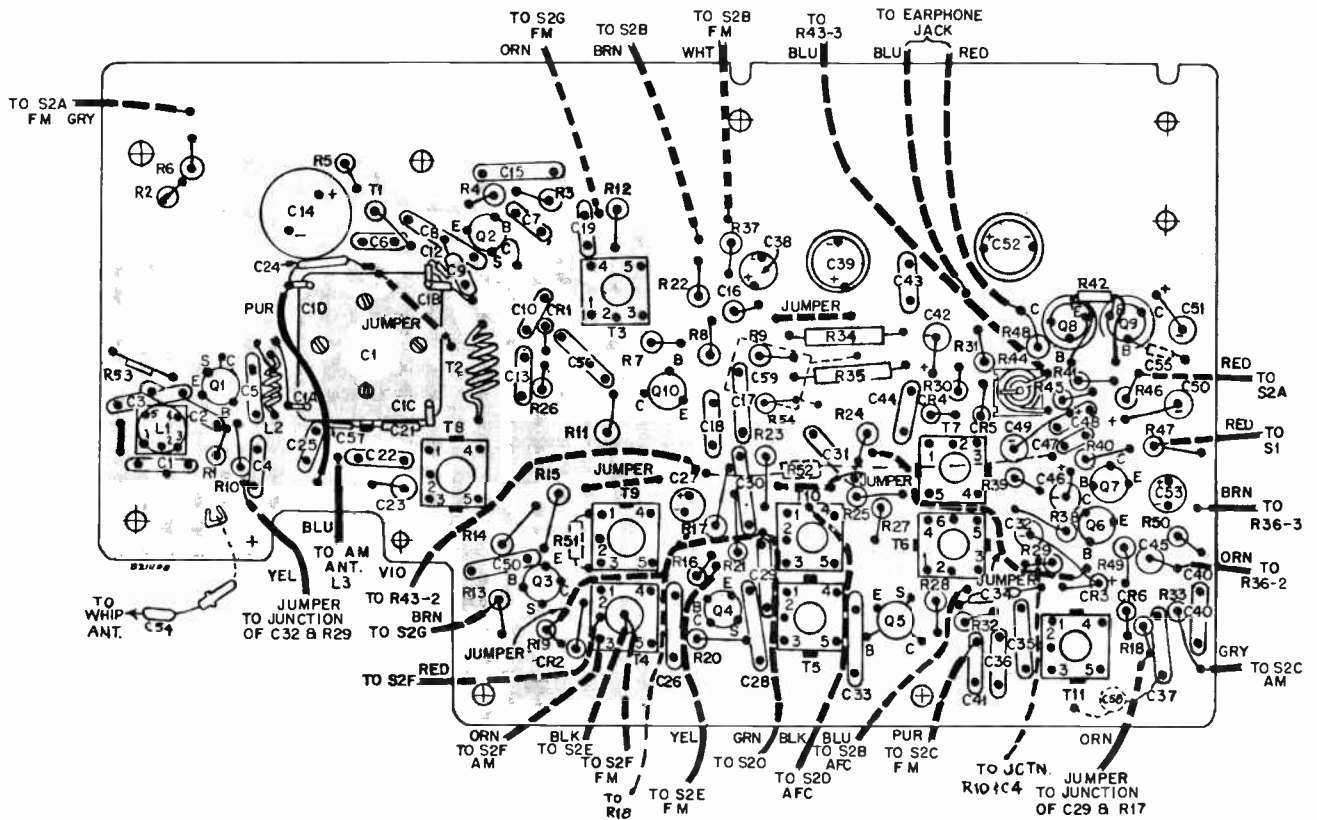
1. FM Sweep Generator (RCA WR-69A or equivalent)
2. Marker Generator (RCA WR-70A or equivalent)
3. RF Signal Generator (RCA WR-50A or equivalent)

Output Indicators

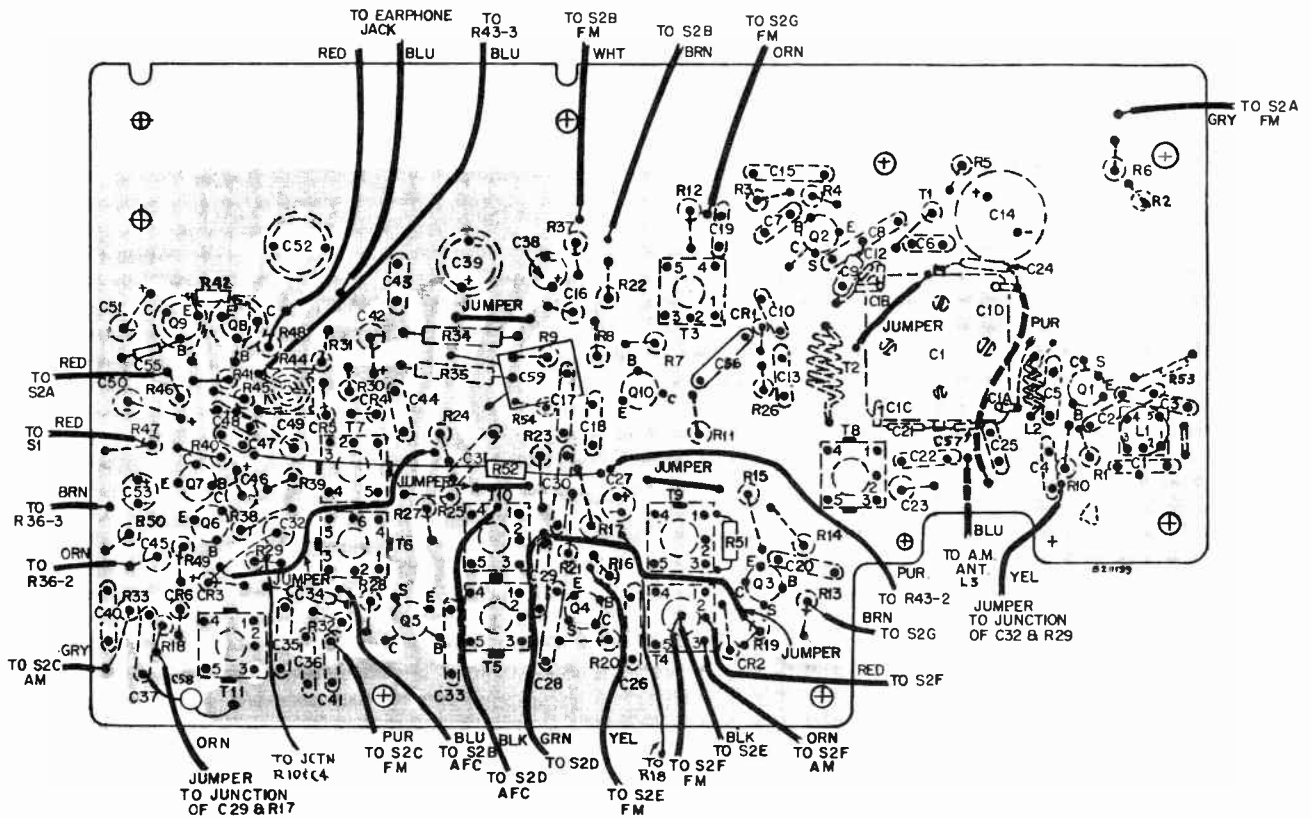
1. Oscilloscope (RCA WO-91A or equivalent)
2. Vacuum Tube Voltmeter (RCA WV-98C or equivalent)

GENERAL ALIGNMENT CONDITIONS

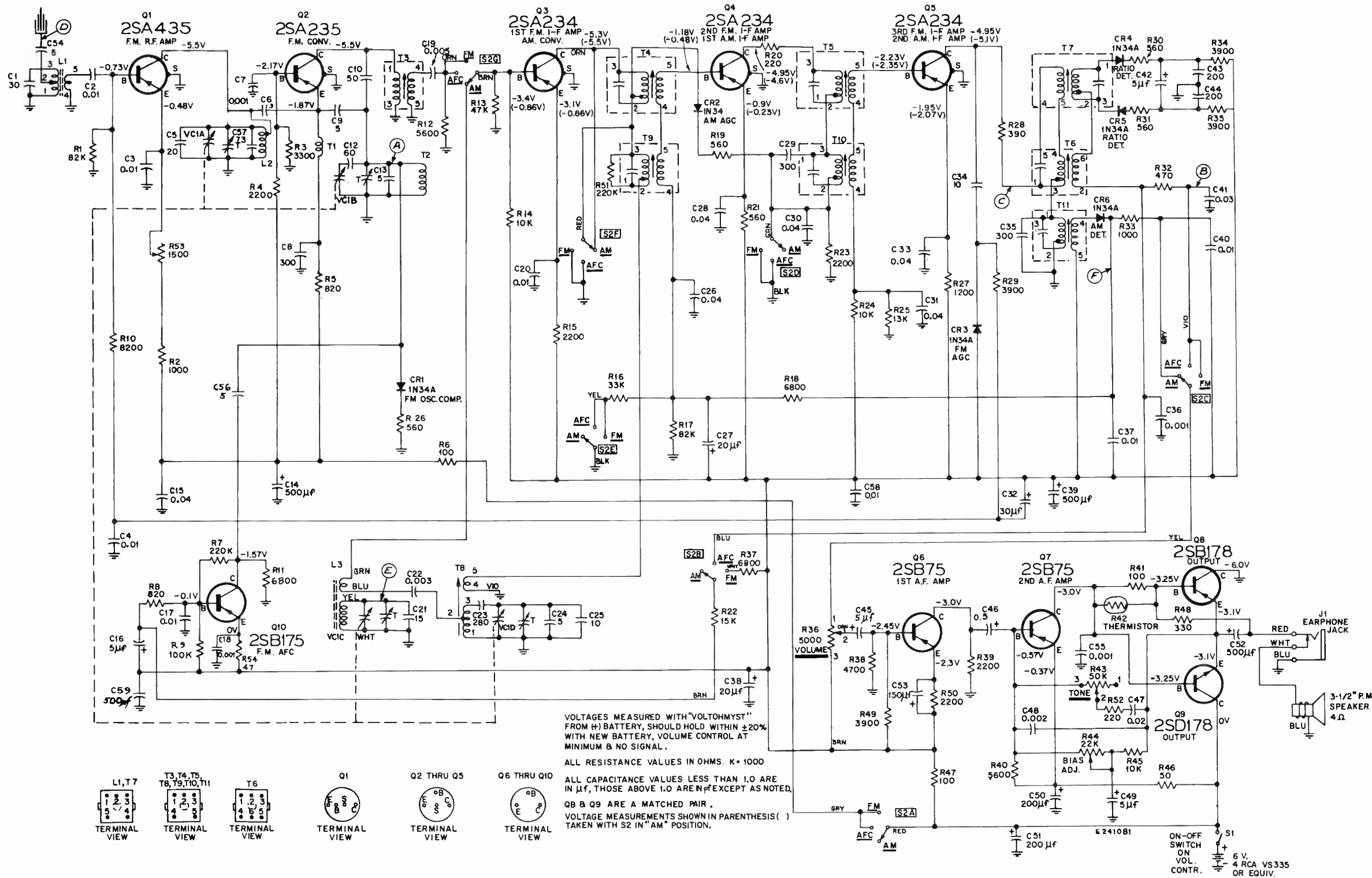
1. Signal input must be kept as low as possible to avoid AGC action and clipping. (Set output indicator to highest sensitivity.)
2. Signals and markers must be accurate (crystal controlled or calibrated.) The 10.7mc marker used in each step of the FM alignment must be the same.
3. Markers must not distort the oscilloscope trace.
4. Standard modulation is 400 cycles at 30% amplitude.
5. Control settings; Loudness — maximum, AFC-off.



Chassis Layout—Component Side



Chassis Layout—Wiring Side



Schematic Diagram

BATTERY REPLACEMENT

A "snap-out" panel in the back at the bottom covers the battery compartment. To insert or replace batteries:

- 1—Insert a coin in the small slot at the top of the panel and twist it to release the "snap-in" panel.
- 2—Insert cells, as shown, in the plastic battery tube.

3—Insert the tube into the compartment with the negative (-) (plain) end of the battery toward the spring.

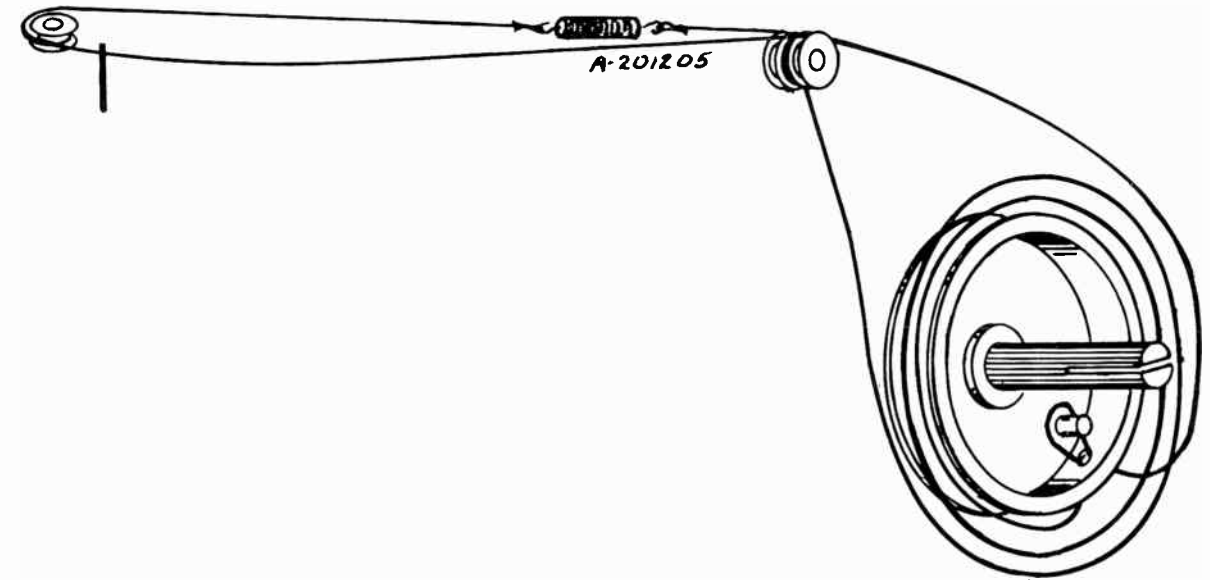
4—Place the cover panel in position with the three lugs matched with the three slots in the bottom and snap the top of the panel into place.

POWER OUTPUT vs. CURRENT CONSUMPTION

milliwatts	milliamps	milliwatts	milliamps
0	22	200	113
25	51	400	150
50	67	600	190
100	89	800	215

RCA RHM80EK

Step	Signal Source— Connect To—	Set Sig. To— Insert Markers	Output Indicator— Connect To—	Set Radio Dial To—	Adjust	Adjust for—	Step	
1	Set "Function" switch to FM						1	
2	Sweep Gen.— point "A" (VC1B)	10.7 mc (unmodulated) 10.6, 10.7 & 10.8 markers	Oscilloscope— point "B" thru a diode (S2C-FM)	Quiet point on band	T7 (Rat. Det.)	Straightness and symmetry of curve at 10.7 mc marker	2	
3			Oscilloscope— point "C" thru a diode (Q5c)		T3 (1st FM IF)		Maximum symmetrical response centered at 10.7 mc marker	3
4					T4 (2nd FM IF)			4
5					T5 (3rd FM IF)			5
6	T6 (4th FM IF)	6						
7	Marker Gen.— point "D" (FM antenna) thru a matching network	87 mc (modulated)	V.T.V.M.— across speaker voice coil	87 mc (gang closed)	T2 (FM Osc.)	Maximum	7	
8		109 mc (modulated)		109 mc (gang open)	VC1B-T (FM Osc.)		8	
9		90 mc (modulated)		90 mc	L2 (FM RF)		9	
10		105 mc (modulated)		105 mc	VC1A-T (FM RF)		10	
11		98 mc (modulated)		98 mc	L1 (FM Ant.)		11	
12	Check overall response curve and repeat above steps as necessary to obtain maximum sensitivity						12	
13	Set "Function" switch to AM						13	
14	Sweep Gen.— point "E" (VC1C)	455 kc 455 kc marker	Oscilloscope— point "F" (junct. CR6 and R33)	Quiet point on band	T9 (1st AM IF)	Maximum symmetrical response centered at 455 kc	14	
15					T10 (2nd AM IF)		15	
16					T11 (3rd AM IF)		16	
17	RF Gen.— a short piece or a loop of wire placed near AM antenna	1650 kc (modulated)	V.T.V.M.— across speaker voice coil	1650 kc (gang open)	VC1D-T (AM Osc.)	Maximum	17	
18		515 kc (modulated)		515 kc (gang closed)	T8 (AM Osc.)		18	
19		1400 kc (modulated)		1400 kc	VC1C-T (AM Ant.)		19	
20	Repeat steps 14 thru 19 as necessary to obtain maximum sensitivity						20	



Dial Cord Arrangement

SEMICONDUCTORS

ITEM	PART NO.	TYPE
CR1		1N34A
CR2		1N34A
CR3		1N34A
CR4		1N34A
CR5		1N34A
CR6		1N34A
Q1	119013	2SA435
Q2	116208	2SA235
Q3	116207	2SA234
Q4	116207	2SA234
Q5	116207	2SA234
Q6	116206	2SB75
Q7	116206	2SB75
Q8	116205	2SB178
Q9	116204	2SD178
Q10	116203	2SB175

R42	116286	Thermistor
R43	116291	50K Tone
R44	116290	22K Bias
R53	119010	1500 ohms Bias

COILS/TRANSFORMERS

ITEM	PART NO.
L1	116237
L3	116238
T1	116240
T3	116242
T4	116244
T5	116243
T6	116245
T7	116246
T8	116247
T9	116248
T10	116249
T11	116250

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C14	116233	500mfd 6V
C16	116228	5mfd 6V
C27	116229	20mfd 10V
C32	116230	30mfd 6V
C38	116229	20mfd 10V
C39	116233	500mfd 6V
C42	116228	5mfd 6V
C45	116228	5mfd 6V
C46	119012	.5mfd 10V
C49	116228	5mfd 6V
C50	116232	200mfd 6V
C51	116232	200mfd 6V
C52	116233	500mfd 6V
C53	116231	150mfd 6V
C59	116233	500mfd 6V
VC	116234	Tuning Gang

MISCELLANEOUS

ITEM	NAME	PART NO.
S1	Switch, On-Off	116288
S2	Switch, Function	116277
	Antenna, Telescopic	116256
	Earphone	116295
	Speaker (3-1/2", 4 ohms)	116264

CABINET PARTS

NAME	PART NO.
Cabinet Front	119011
Cabinet Back	Y7419
Cover, Battery Compartment	116253
Knob, Tuning	116260
Knob, Tone	116259
Knob, Volume	116258
Knob, Function	116261
Dial Pointer	116268

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R36	116288	5000 ohms Volume/Switch

EQUIPMENT NEEDED

1. AM Signal Generator
2. FM Signal Generator
3. IF Sweeper (AM, FM)
4. Marker generator
5. Output Meter (VTVM)
6. Dummy Load 8 ohm (2W more than)
7. FM Stereo Generator

IMPORTANT

1. For FM AM Alignment, apply 1KHz modulation on the signal generator and radiation signal.
2. Dummy Load must be 8 ohm.
3. Connect the Dummy Load instead of the speaker, and connect a VTVM or circuit tester to it.
4. You must not short the terminals of the speaker output.
5. If the Tape mechanism is aligned outside the cabinet, it will have to be re-aligned after re-insertion into the cabinet.
6. Use only non-metallic alignment tools to insure proper alignment at Radio section.

ALIGNMENT INSTRUCTION

AM Section

Control setting

Function switch ----- AM, Volume control ----- Max.

Circuit Alignment	Equipment connection	Step	Gen. Freq.	Dial Setting	Adjustment
IF	AM signal gen. Radiated signal Output meter. (VTVM) Connect across speaker voice coil. (See Fig.-1)	1	455 KHz (Mod.)	Tuning gang fully closed	AM IFT 1 (White) AM IFT 2 (White) AM IFT 3 (Black) Adjust for maximum output.
		2	"	"	Repeat until no further improvement can be made.
BAND	"	3	525 KHz (Mod.)	Tuning gang fully closed	L5 (AM OSC coil, Red) Adjust for maximum output.
		4	1650 KHz (Mod.)	Tuning gang fully opened.	Tc-4 (AM OSC Trimmer) Adjust for maximum output.
		5	"	"	Repeat steps 3 & 4.
TRACKING	"	6	600 KHz	Tune to signal.	L10 (AM antenna trimmer) Adjust for maximum output.
		7	1400 KHz	Tune to signal.	Tc-3 (AM antenna trimmer) Adjust for maximum output.
		8	"	"	Repeat steps 6 & 7.

ALIGNMENT INSTRUCTION

FM Section

Control setting

Function switch ----- FM Volume control ----- Max.

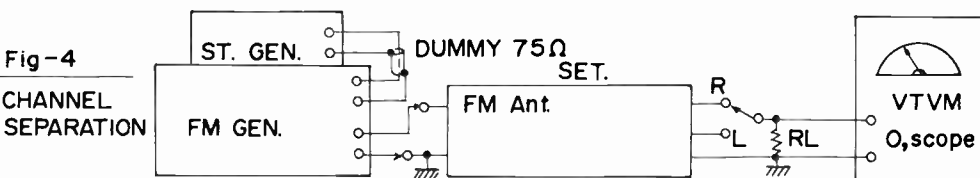
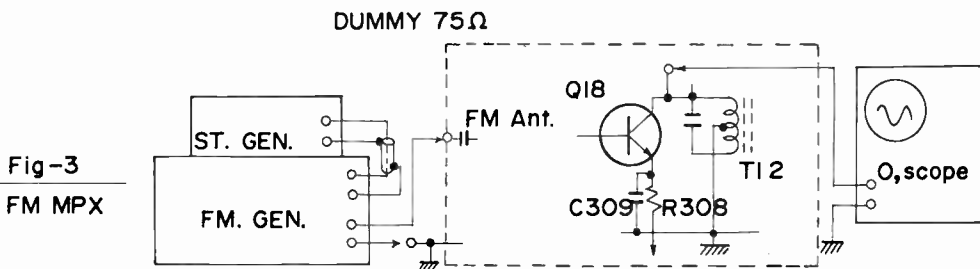
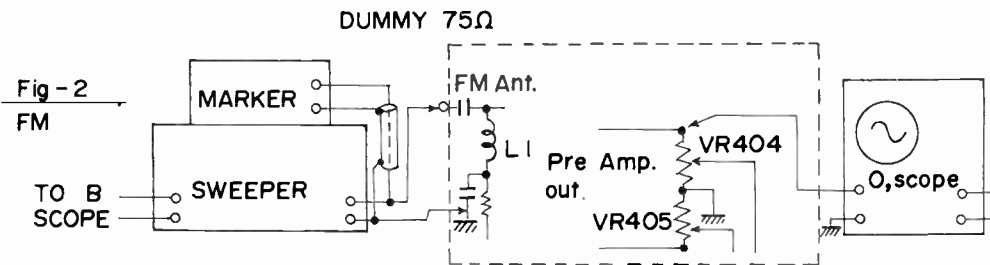
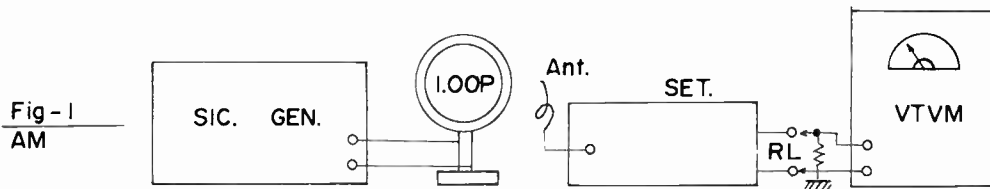
Circuit Alignment	Equipment connection	Step	Gen. Freq.	Dial Setting	Adjustment
IF	IF sweep gen. high & low side to FM antenna terminal. Marker gen. The same as sweep generator. Oscilloscope Across point VR404 (VR405) (Pre amp. out and GND.) (See Fig. 2)	1	10.7 MHz (100-200 KHz sweep)	Tuning gang fully closed.	T1 (Blue) T2 (Blue) T4 (Blue) T6D (Blue) Adjust for maximum symmetrical response. (10.7 MHz at the center point.)
		2	"	"	Repeat step 1.
Ratio Det.	"	3	10.7 MHz (Mod.)	Tuning gang fully closed.	T6E (Red) Adjust for suitable "S" curve.
		4	"	"	Repeat step 3.
BAND	FM signal gen. Output meter (VTVM). Across speaker voice coil. (See fig.4)	5	86 MHz (Mod.)	Tuning gang fully closed.	L4 (FM OSC Coil) Adjust for maximum output.
		6	110 MHz (Mod.)	Tuning gang fully closed.	Tc-2 (FM OSC trimmer) Adjust for maximum output.
		7	"	"	Repeat steps 5 & 6.
RF	"	8	90 MHz (Mod.)	Tune to signal.	L2 (FM RF Coil) Adjust for maximum output.
		9	106MHz (Mod.)	"	Tc-1 (FM RF trimmer) Adjust for maximum output.
		10	"	"	Repeat steps 8 & 9 to obtain suitable sensitivity at 90MHz & 106MHz.

FM MPX Section

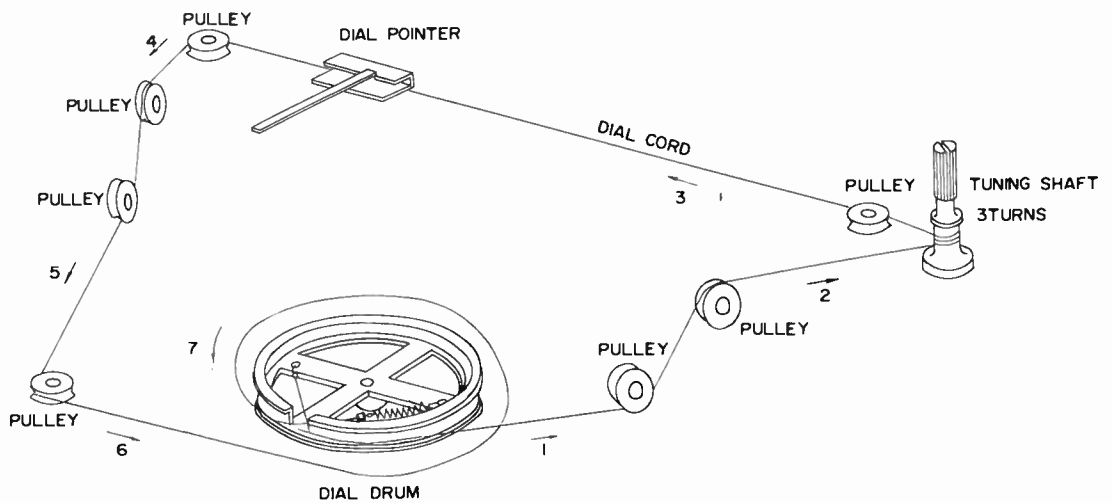
Control setting

Function switch ---- FM MPX, Volume control ---- Max.

T11, T12	FM Stereo Gen. Composite out connect to ext. mod. of FM Signal generator. FM signal gen. Ant. terminal. Oscilloscope (VTVM) Connect to TP1 (See Fig. 3)	1	98 MHz	Tune to signal.	First make sure section is properly aligned; Adjust T11, T12 to obtain suitable wave on oscilloscope.
	FM stereo gen. FM signal gen. Same as step 1 VTVM (O.Scope) (See Fig. 4)	2	"	"	Adjust VR301, T12 for minimum output from left (Right channel is modulated).



DIAL CORD STRINGING

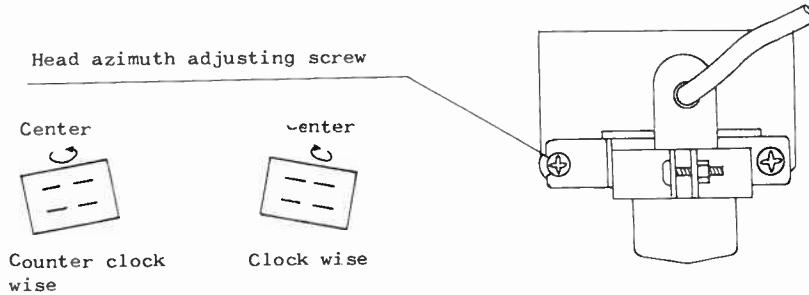


ADJUSTMENT OF HEAD AZIMUTH

The head azimuth, adjusting screw (+flat machine screw) is located at the real left of the automatic channel switch contact panel.

As in the case of the head height adjustment, counter clock wise rotation of the screw inclines the top of the head to the left, while clock wise rotation tilts it to the right.

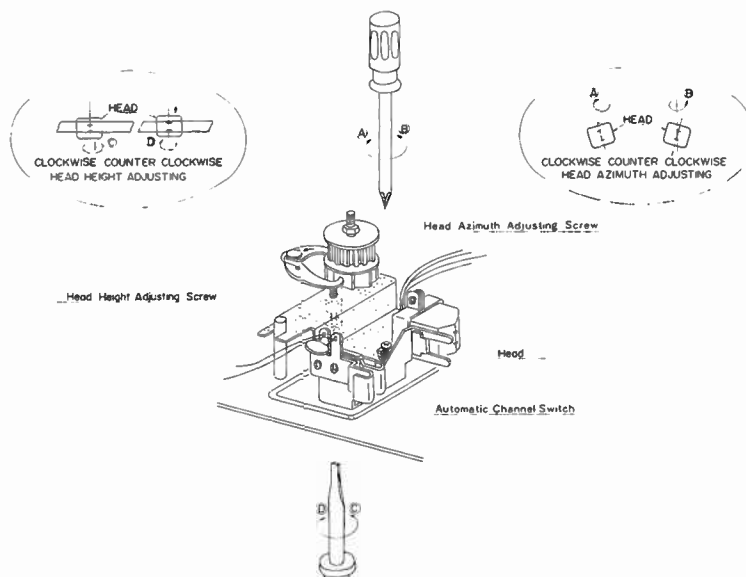
(Note) To adjust the head, repeat the height and azimuth adjustment.



HEAD AZIMUTH AND HEIGHT ADJUSTMENT BY RCA TEST CARTRIDGE 321

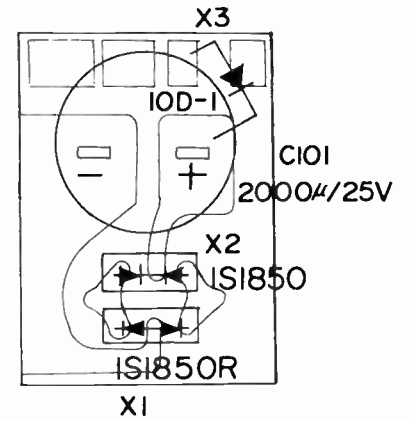
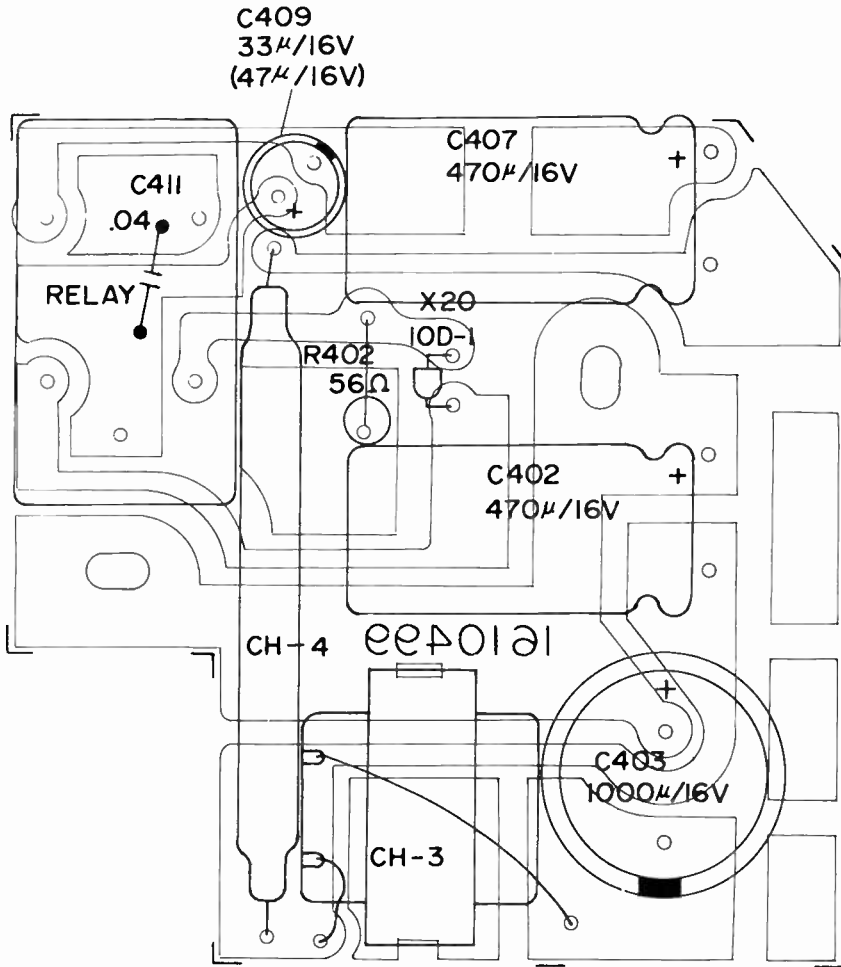
1. Connect the VTVM (or multimeter) to individual right and left output circuit of the stereo player.
2. Set to channel (on the head) by depressing the channel select button (Channels 2-6)
3. Turn the height adjustment screw back and forth to locate the position at which the meter connected to the left speaker shows minimum deflection.
4. After height adjustment has been completed, turn the azimuth adjusting screw to locate the position at which the meter connected to the right speaker shows maximum deflection.
5. Repeat these adjustments (Items 3 and 4) alternately, since the height may change by turning the azimuth adjusting screw.
6. After all adjustment have been completed, securely lock the azimuth and height adjusting screw.

Note : A 1000 Hz signal is recorded on each side above and below track 2 (left side) of the RCA test cartridge 321. Track 6 (right side) has an 8000Hz signal with slightly wider width than standard, and is used for azimuth adjustment.



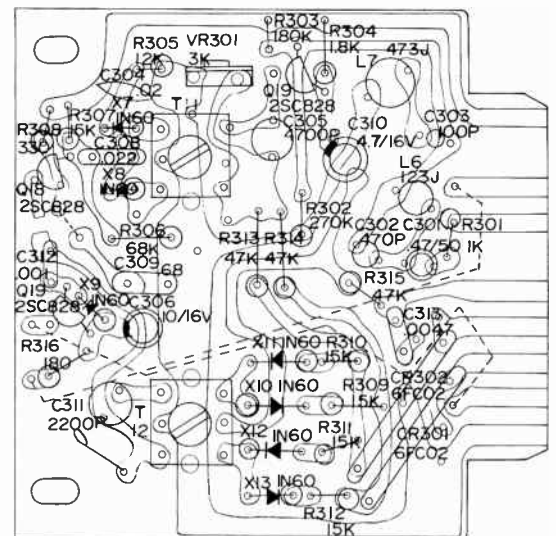
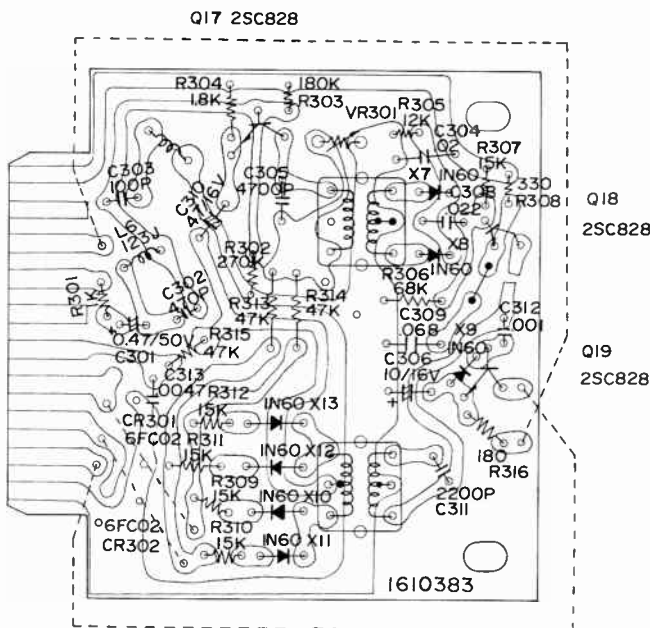
FILTER AND RELAY TOP VIEW

POWER SUPPLY

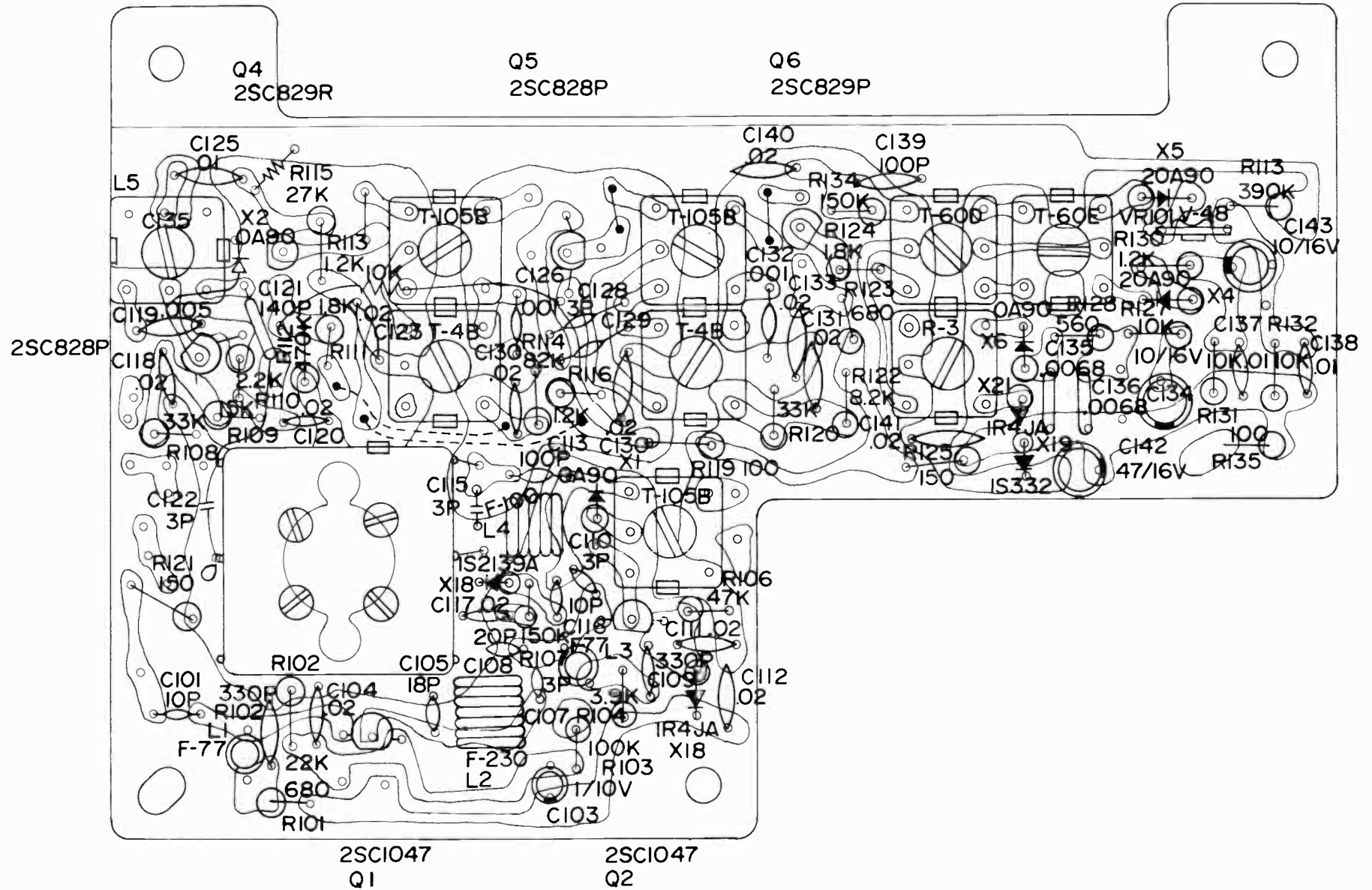


MPX BOTTOM VIEW

MPX TOP VIEW

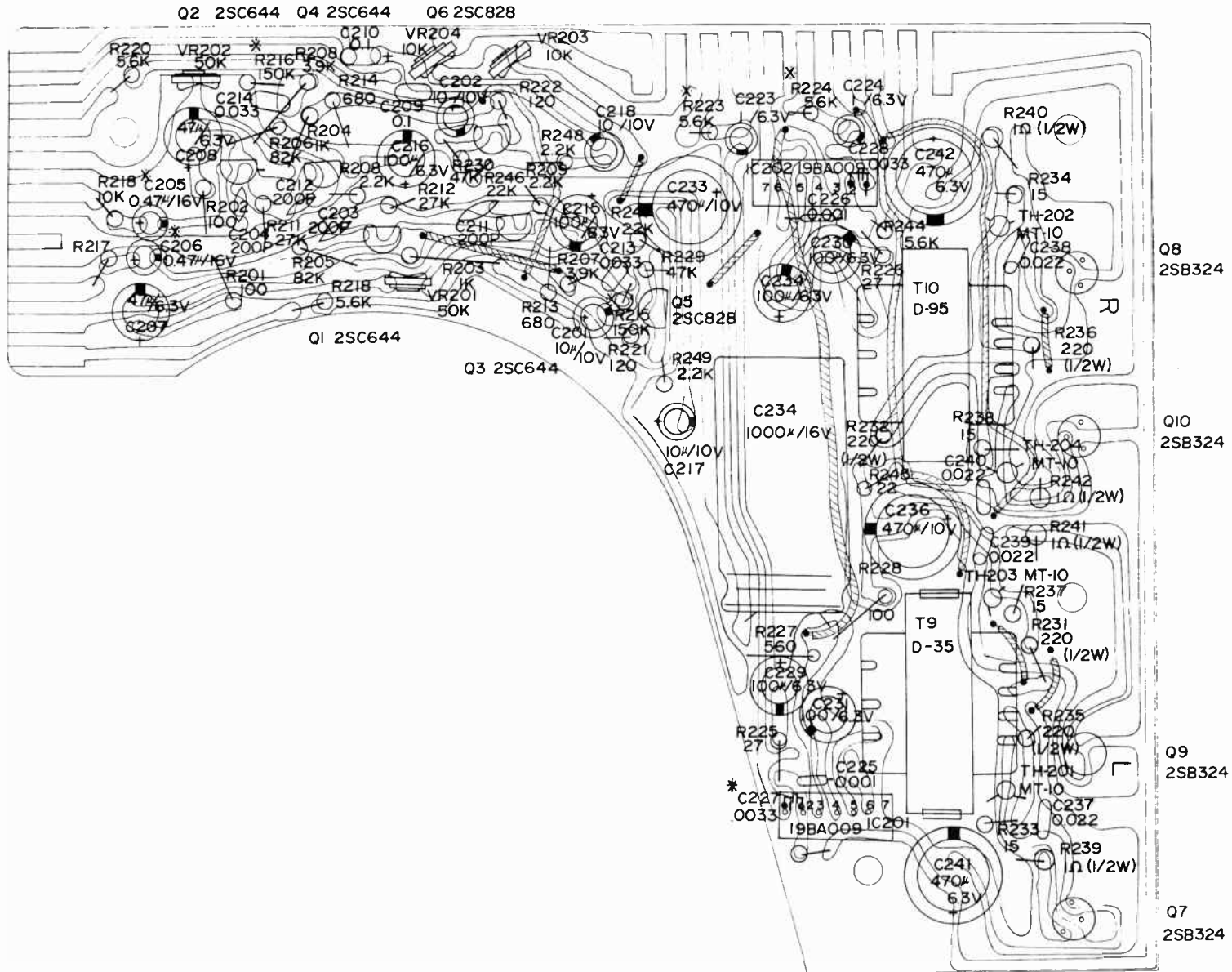


TUNER TOP VIEW

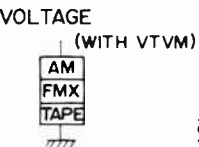
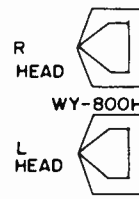
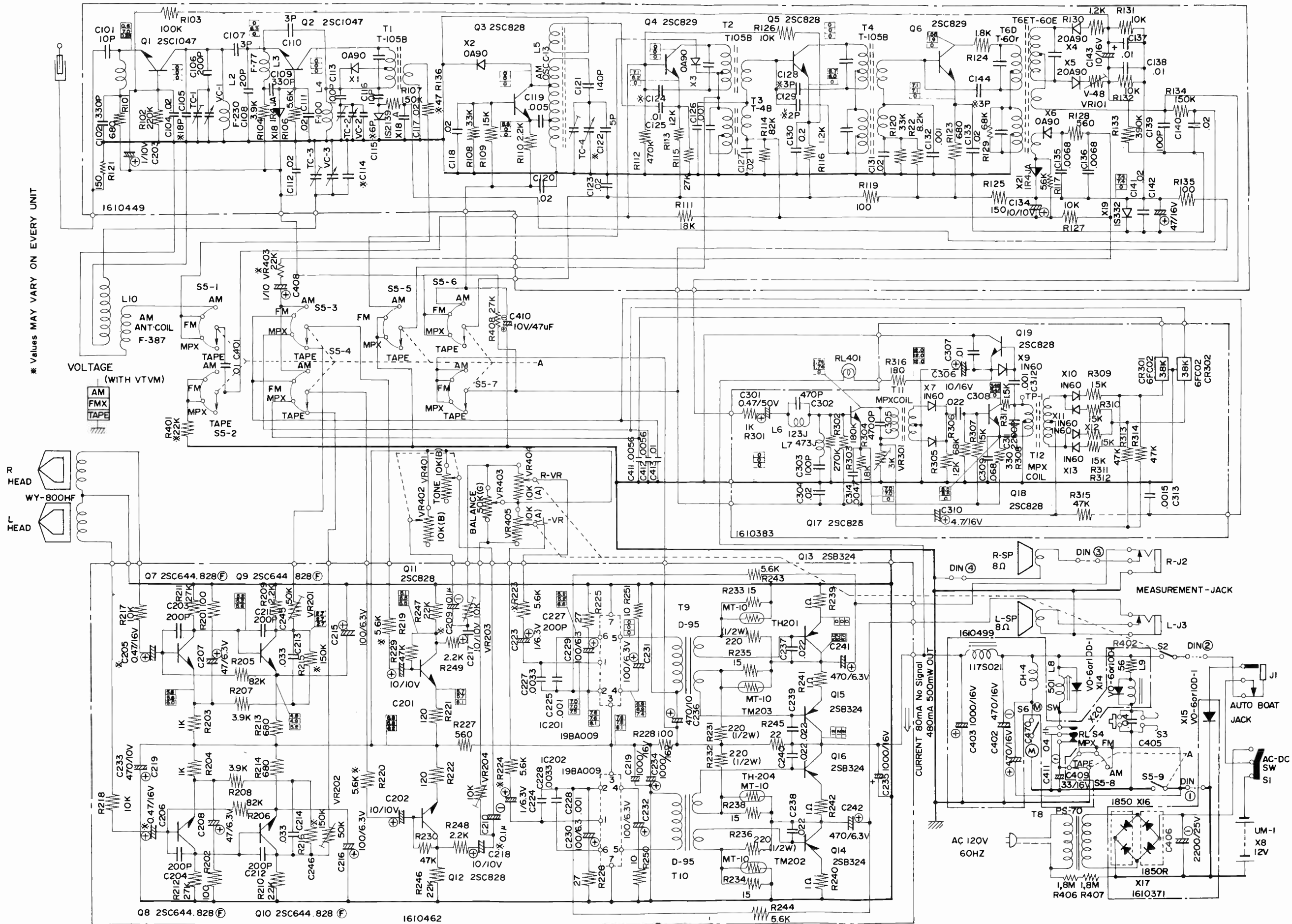


AMP TOP VIEW

※ Values may vary on every unit



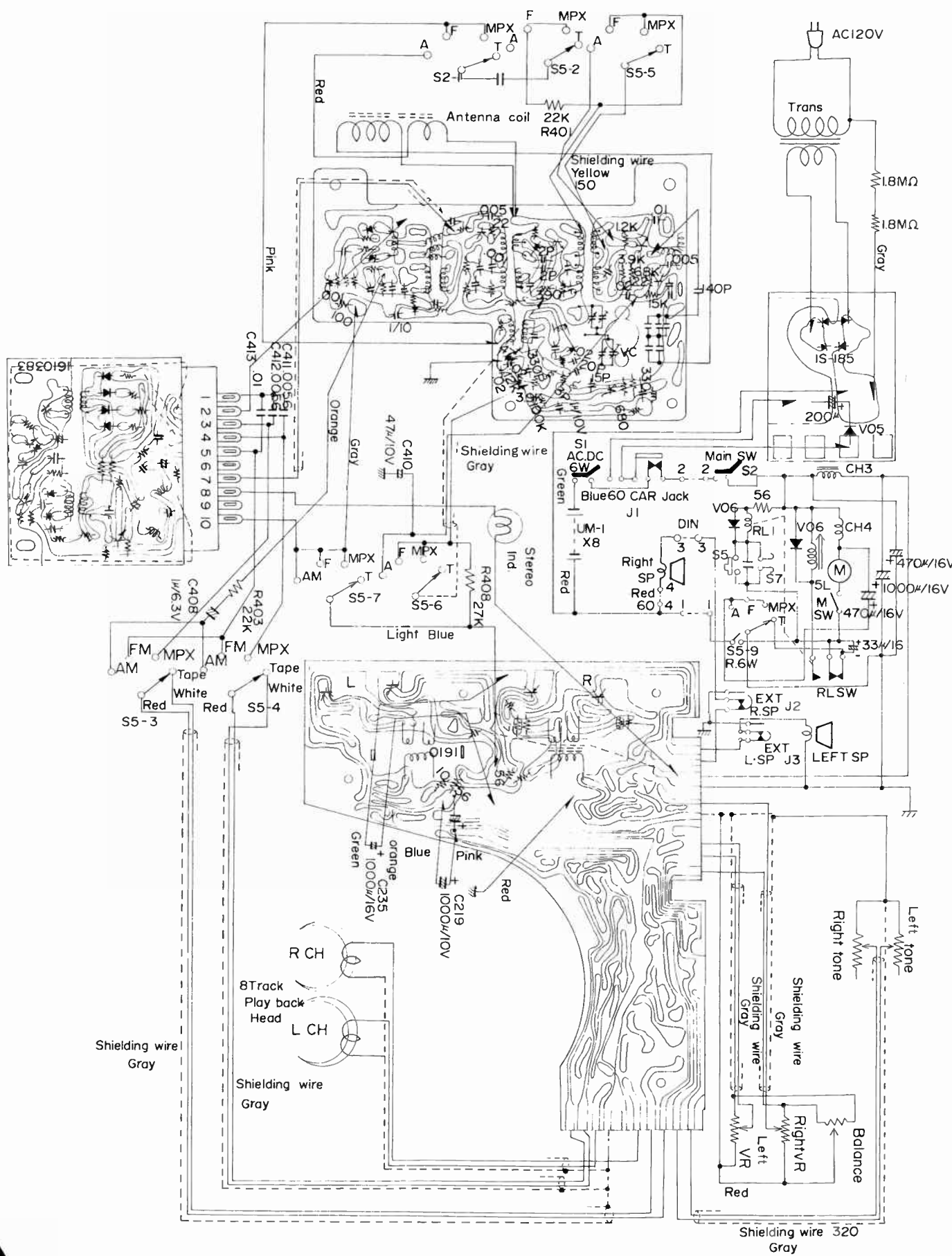
* Values MAY VARY ON EVERY UNIT



VOLTAGE (WITH VTVM)



Realistic 14-916



SEMICONDUCTORS

ITEM	PART NO.	TYPE
IC201	198A009	LAD010
IC202	198A009	LAD010
Q1	C1047	2SC1047
Q2	C1047	2SC1047
Q3	C828	2SC828
Q4	C829	2SC829
Q5	C828	2SC828
Q6	C829	2SC829
Q7	C644	2SC644 (2SC828F)
Q8	C644	2SC644 (2SC828F)
Q9	C644	2SC644 (2SC828F)
Q10	C644	2SC644 (2SC828F)
Q11	C828	2SC828
Q12	C828	2SC828
Q13	B324	2SB324
Q14	B324	2SB324
Q15	B324	2SB324
Q16	B324	2SB324
Q17	C828	2SC828
Q18	C828	2SC828
Q19	C828	2SC828
X1	R-7028	0A90
X2	R-7028	0A90
X3	R-7028	0A90
X4	R-7029	20A90
X5	R-7029	20A90
X6	R-7028	0A90
X7	1N60	1N60
X8	1N60	1N60
X9	1N60	1N60
X10	1N60	1N60
X11	1N60	1N60
X12	1N60	1N60
X13	1N60	1N60
X14	10D-1	10D-1
X15	10D-1	10D-1
X16	1S-1850	1S-1850
X17	1S-1850R	1S-1850R
X18	R-7032	VD-1RAJA
X19	R-7030	1S332
X20	10D-1	10D-1
X21	R-7032	VD-1RAJA
X22	R-7031	1S2139A

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	TYPE
C103	1201105	1mfd 6.3V
C124	1202476	47mfd 10V
C134	1203106	10mfd 16V
C143	1203106	10mfd 16V
C201	1203106	10mfd 16V
C202	1203106	10mfd 16V
C205	1203474	.47mfd 16V
C206	1203474	.47mfd 16V
C207	1201476	47mfd 6.3V
C208	1201476	47mfd 6.3V
C209	1211104	.1mfd 10V
C210	1211104	.1mfd 10V
C213	1202477	470mfd 10V
C215	1201107	100mfd 6.3V
C216	1201107	100mfd 6.3V
C217	1203106	10mfd 16V
C218	1203106	10mfd 16V
C219	1202108	1000mfd 10V
C223	1201105	1mfd 6.3V
C224	1201105	1mfd 6.3V
C229	1201107	100mfd 6.3V
C230	1201107	100mfd 6.3V
C231	1201107	100mfd 6.3V
C232	1201107	100mfd 6.3V
C234	1202108	1000mfd 10V
C235	1203108	1000mfd 16V
C236	1202477	470mfd 10V
C241	1201477	470mfd 6.3V
C242	1201477	470mfd 6.3V
C301	1201474	.47mfd 6.3V
C306	1203106	10mfd 16V
C310	1201475	4.7mfd 10V
C402	1203108	1000mfd 16V
C403	1203477	470mfd 16V

C406	1220045	2000mfd 25V
C407	1203477	470mfd 16V
C408	1201105	1mfd 6.3V
C409	1203306	30mfd 16V
C410	1202476	47mfd 10V
C411	1202227	220mfd 10V
VC1-4	C-4220	Tuning Gang

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
TH201	MT-10	Thermistor
TH202	MT-10	Thermistor
TH203	MT-10	Thermistor
TH204	MT-10	Thermistor
VR101	P-0269	Detector Balance
VR201	P-6019	50K Level
VR202	P-6019	50K Level
VR203	P-6018	10K
VR204	P-6018	10K
VR301	P-6022	3000 ohms Separation
VR401 &	P-1053	10K Tone
VR402		10K Tone
VR403	P-3012	50K Balance
VR404	P-2013	10K Volume
VR405	P-2013	10K Volume

COILS/TRANSFORMERS

ITEM	PART NO.		
CH-3	CB-2087	T3	CA-6716
CH-4	CA-2379	T4	CA-6300
L1	CA-2372	T5	CA-6716
L2	CA-4176	T6D	CA-6750
L3	CA-2372	T6E	CA-6796
L4	CA-4142	T7	CA-6912
L5	CA-4226	T8	TA-0242
L6	CA-2339	T9	TD-0015
L7	CB-2088	T10	TD-0015
L10	CA-2477	T11	CB-0069
T2	CA-6300	T12	CB-0070

MISCELLANEOUS

ITEM	NAME	PART NO.
CR301	38KC Filter	CB-0071
CR302	38KC Filter	CB-0071
S1	Switch, AC-DC	S-3004
S3	Switch, Shut-off	S-8026 & S-8027
S5	Switch, Rotary	S-1017
SP	Speaker (8 ohms)	S-4252
	Solenoid	S-9004
	Relay	R-8026
	Motor	M-4158
	Head, Play	H-4118
	P.C. Board, Amp	1610371
	P.C. Board, Tuner	1610449
	P.C. Board, MPX	1610383
	Antenna, Telescopic	A-0094
	Belt, Timing	B-6145
	Belt, Drive	B-6144
	Flywheel	RA-3082
	Main Bearing	RA-7105

CABINET PARTS

NAME	PART NO.
Cabinet Front, Left	Z-0098
Cabinet Front, Right	Z-0100
Cabinet Rear, Left	Z-0099
Cabinet Rear, Right	Z-0101
Battery Door	DB-0017
Cartridge Door	DA-0012
Uial Window	G-0071
Dial Pointer	D-1020
Handle	H-6008
Button, Channel Select	K-0761
Knob, Volume	K-0760
Knob, Tuning	K-0762

ALIGNMENT INSTRUCTION

AM (Radiate thru Loop)

Step	Frequency	Gang Setting	Scope and VTVM Probe on	Alignment Procedure
1.	455KC	MAX	Speaker	Peak T 6, T 7, T 8 for max. Output
2.	535KC	"	"	Adjust OSC Coil 50-67083-5 for max. Output
3.	1650KC	MIN	"	Adjust OSC Trimmer on top of PVC
				Repeat 2, 3, until Set is Properly tracked
4.	600KC	600KC	"	Adjust Ant Coil for max. Output
5.	1400KC	1400KC	"	Adjust Ant trimmer for max. Output
				Repeat 4, 5, until set is properly tracked

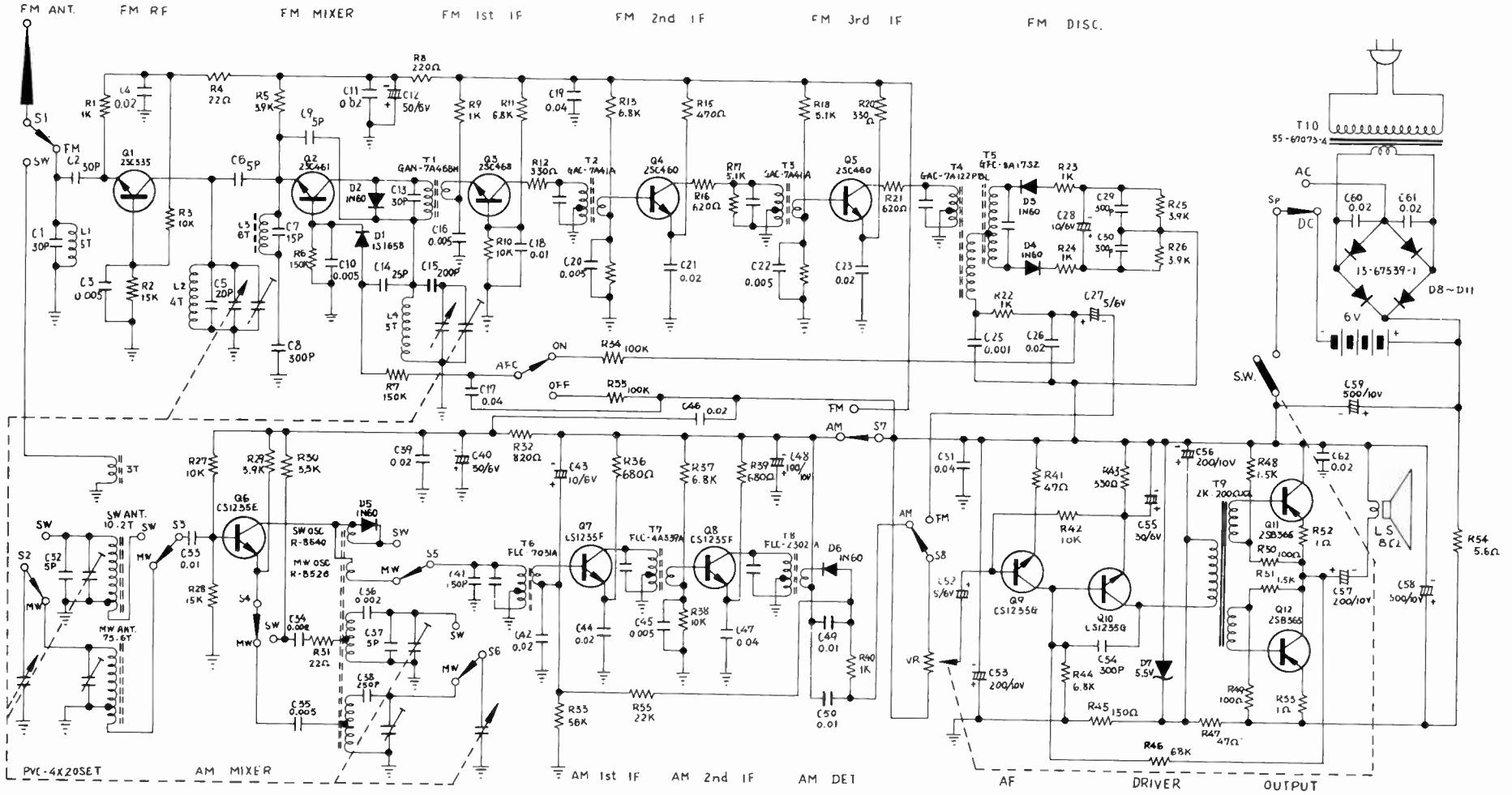
FM (Signal connect to Antenna terminal)

1.	10.7MC Sweep	MAX	Ratio detect Output C 27 R VR 5K	Adjust T 1, T 2, T 3, T 4 for max S curve and T 5 for center marker
2.	86.5MC	"	Speaker Output	Adjust L 4 for max Output
3.	109MC	"	" "	Adjust OSC trimmer on Top of PVC
				Repeat 2, 3, until set is properly tracked
4.	90MC	90MC	Speaker Output	Adjust RF Coil L 2 for max Output
5.	106MC	106MC	" "	Adjust RF Trimmer on Top of PVC for max. Output
				Repeat 4, 5, until set is properly tracked.

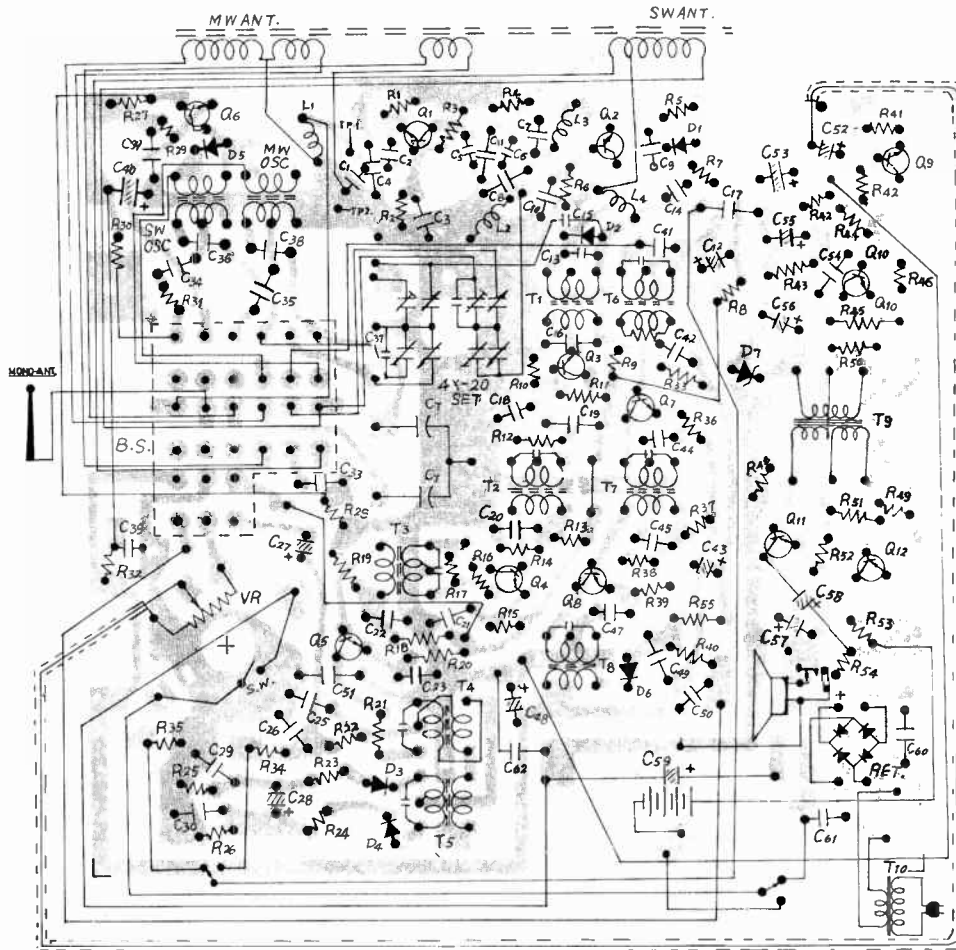
SW (Radiate thru Loop)

Step	Frequency	Gang Setting	Scope and VTVM Probe on	Alignment Procedure
1.	SW 3.8MC 12.5MC	MAX	Speaker	Peak T 6, T 7, T 8 for max. Output
2.	3.8MC	"	"	Adjust OSC Coil 50-670836 for max. Output
3.	12.5MC	MIN	"	Adjust OSC Trimmer on top of PVC
				Repeat 2, 3, until Set is Properly tracked
4.	4.2MC	4.2 MC	"	Adjust Ant Coil for max. Output
5.	9MC	9MC	"	Adjust Ant trimmer for max. Output
				Repeat 4, 5, until set is properly tracked.

SCHEMATIC DIAGRAM



PRINTED BOARD

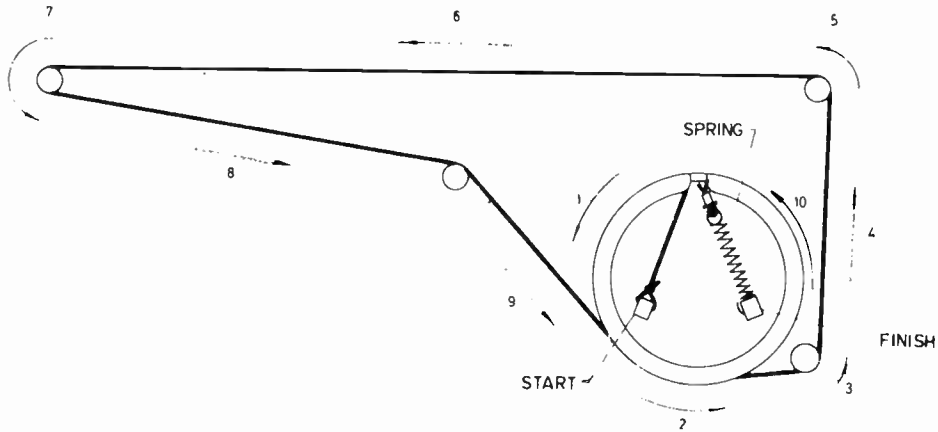


voltage table for Transistor

A TABLE (IN VOLTS)

SYMBOL	Vc	Vb	Ve
Q1	4.3V	1.8V	1.1V
Q2	4.3V	3V	2.4V
Q3	4V	1.7V	1.1V
Q4	2.7V	1.7V	1V
Q5	3V	1.3V	0.7V
Q6	5.1V	2.2V	1.7V
Q7	5.1V	1.1V	0.4V
Q8	5.1V	2V	1.3V
Q9	1.3V	0.6V	0.02V
Q10	5.6V	1.3V	0.7V
Q11	0	2.8V	3V
Q12	3V	5.8V	6V

DIAL CORD STRINGING



SEMICONDUCTORS

ITEM	PART NO./TYPE
AC Rect	13-67539-1/2314
D1	1S1658/2314
D2	1N60/2314
D3	1N60/2314
D4	1N60/2314
D5	1N60/2314
D6	1N60/2314
D7	M-758/2314
Q1	2SC535/2314
Q2	2SC461/2314
Q3	2SC460/2314
Q4	2SC460/2314
Q5	2SC460/2314
Q6	CS1235E/2314
Q7	CS1235F/2314
Q8	CS1235F/2314
Q9	CS1235G/2314
Q10	CS1235G/2314
Q11	2SB365/2314
Q12	2SB365/2314

COILS/TRANSFORMERS

ITEM	PART NO.
AMW	50-67561-2/2314
ASW	50-67561-3/2314
L1	ANA-5/2314
L2	INA-4/2314
L3	CNF-8/2314
L4	ONA/2314
T1	GAN-7A46BM/2314
T2	GAC-7A41A/2314
T3	GAC-7A41A/2314
T4	GAC-7A122PBL/2314
T5	GAC-8A17SZ
T6	FLC-7031A/2314
T7	FLC-4A339A/2314
T8	FLC-2302A/2314
T9	56-67225-4/2314
T10	55067073-4/2314

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C12	41-67050-8/2314	50mfd 6V
C27	41-67050-2/2314	5mfd 6V
C28	41-67050-4/2314	10mfd 6V
C40	41-67050-6/2314	30mfd 6V
C43	41-67050-4/2314	10mfd 6V
C48	41-67050-10/2314	100mfd 10V
C52	41-67050-2/2314	5mfd 6V
C53	41-67050-12/2314	200mfd 10V
C55	41-67050-6/2314	30mfd 6V
C56	41-67050-12/2314	200mfd 10V
C57	41-67050-12/2314	200mfd 10V
C58	41-67051-14/2314	500mfd 10V
C59	41-67051-14/2314	500mfd 10V
PVC	4X20BET/2314	Tuning Gang

MISCELLANEOUS

ITEM	NAME	PART NO.
S1-8	Switch, Band	33-67538-2/2314
SAFC	Switch, AFC	33-67549/2314
SP	Switch, AC-DC	33-67549/2314
LS	Speaker (3-1/2", 8 ohms)	12-67562-1/2314
	P.C. Board	10004567/2314
	Antenna, Telescopic	27-67110-5/2314

CONTROLS

ITEM	PART NO	DESCRIPTION
VR	37-67525/2314	Volume/Switch

CABINET PARTS

NAME	PART NO.
Cabinet	10-67423/2314
Leatherette, Cabinet	10-67319/2314
Dial Pointer	74-67779/2314
Button, Band Switch	74-67407/2314
Knob, Tuning	74-67192-1/2314
knob, Volume	74-67192-2/2314

HEAD ADJUSTMENTS

Sears test tape (68239) must be used for these adjustments. Connect load (8 ohm speaker or 8 ohm 1 watt resistor) to the earphone jack and set Tone control to treble (maximum clockwise rotation). Connect an AC VTVM across the load.

HEAD AZIMUTH ADJUSTMENT:

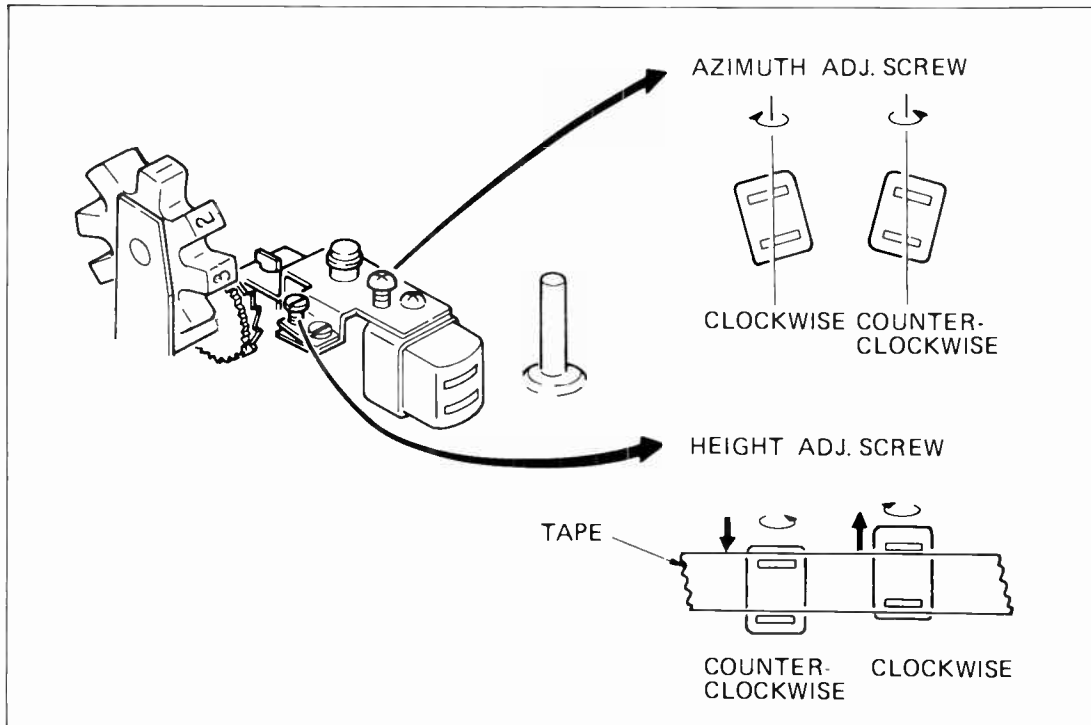
A high frequency signal (8 KHz) on the test tape is used for this adjustment. Adjust the Azimuth Adjusting screw for maximum output reading on VTVM.

HEAD HEIGHT ADJUSTMENT:

Height adjustment is a means of moving the tape head up or down so that the head is positioned exactly in line with the pre-recorded program on the tape.

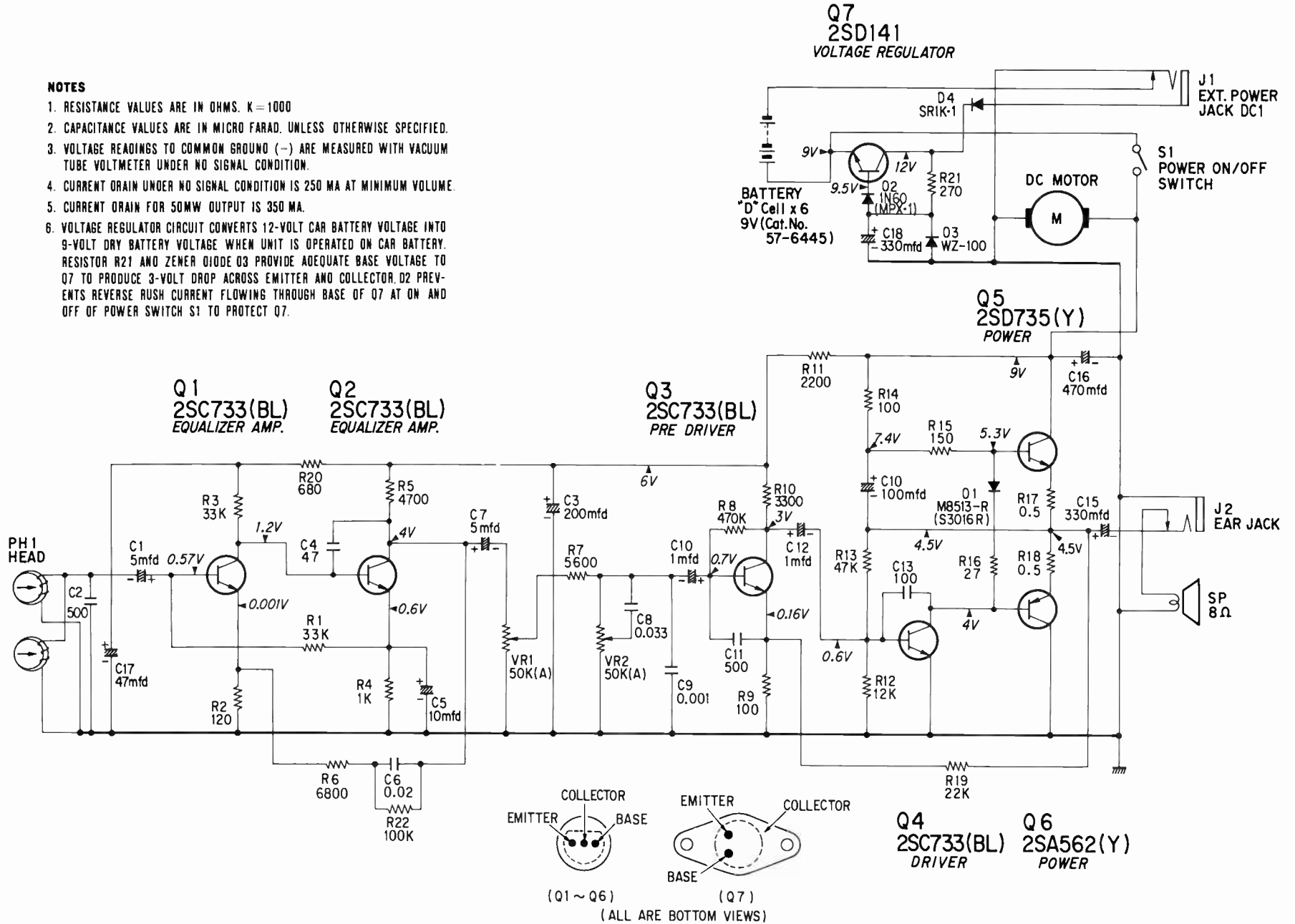
Misadjustment of this screw will result in crosstalk and poor separation.

Use the test tape and playback No. 2 channel, and adjust the Height Adjusting screw for minimum output on VTVM.

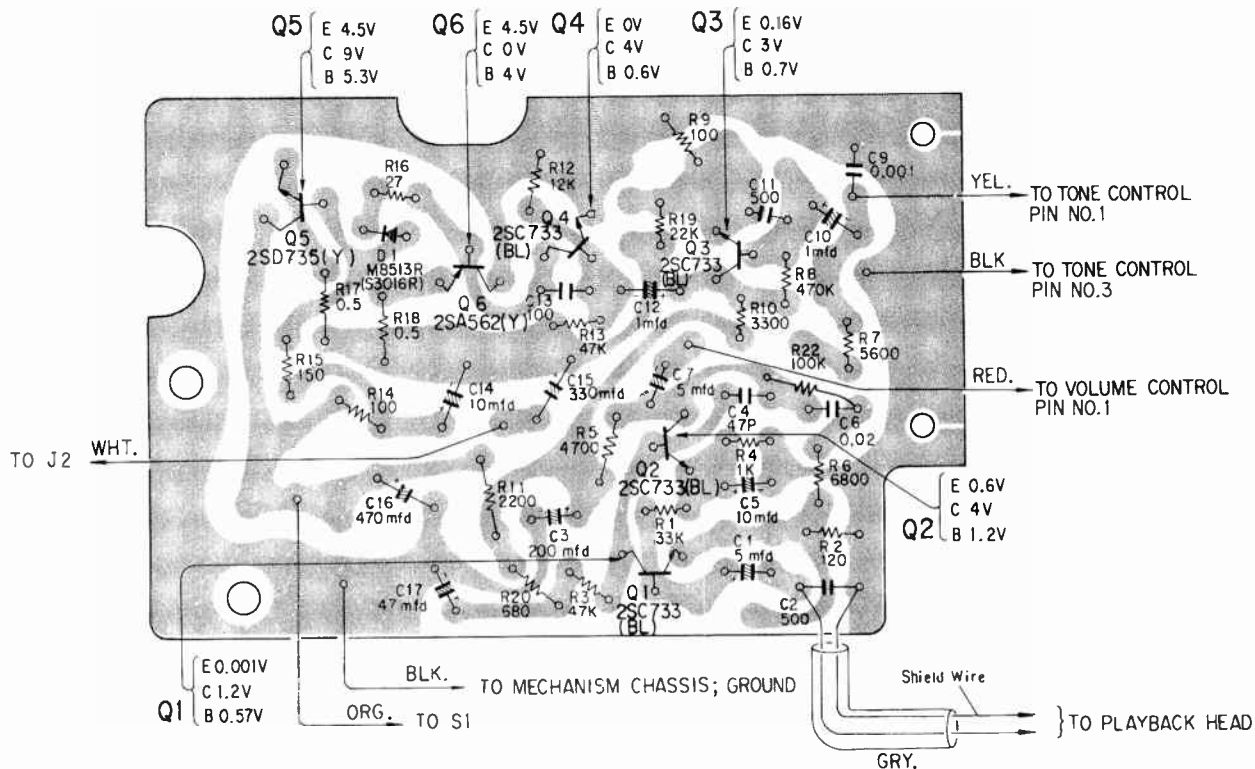


NOTES

1. RESISTANCE VALUES ARE IN OHMS. K = 1000
2. CAPACITANCE VALUES ARE IN MICRO FARAD. UNLESS OTHERWISE SPECIFIED.
3. VOLTAGE READINGS TO COMMON GROUND (-) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITION.
4. CURRENT DRAIN UNDER NO SIGNAL CONDITION IS 250 MA AT MINIMUM VOLUME.
5. CURRENT DRAIN FOR 50MW OUTPUT IS 350 MA.
6. VOLTAGE REGULATOR CIRCUIT CONVERTS 12-VOLT CAR BATTERY VOLTAGE INTO 9-VOLT DRY BATTERY VOLTAGE WHEN UNIT IS OPERATED ON CAR BATTERY. RESISTOR R21 AND ZENER DIODE Q3 PROVIDE ADEQUATE BASE VOLTAGE TO Q7 TO PRODUCE 3-VOLT DROP ACROSS EMITTER AND COLLECTOR. Q2 PREVENTS REVERSE RUSH CURRENT FLOWING THROUGH BASE OF Q7 AT ON AND OFF OF POWER SWITCH S1 TO PROTECT Q7.



AMPLIFIER CIRCUIT BOARD DIAGRAM (BOTTOM VIEW)



- NOTES:
1. RESISTANCE VALUES ARE IN OHMS. k = 1000
 2. CAPACITANCE VALUES LESS THAN 1.0 ARE IN MICROFARADS (mfd) AND VALUES GREATER THAN 1.0 ARE IN PICOFARADS (pfd) EXCEPT WHERE NOTED.
 3. VOLTAGE READINGS TO COMMON GROUND (—) ARE MEASURED WITH VACUUM TUBE VOLTMETER UNDER NO SIGNAL CONDITION.

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	46-86431-3	M8513-R
D2	86-10-1	1N60
D3	46-86432-3	WZ-100
D4	46-86433-3	SR1K-1
Q1	46-86419-3	2SC733(BL)
Q2	46-86419-3	2SC733(BL)
Q3	46-86419-3	2SC733(BL)
Q4	46-86419-3	2SC733(BL)
Q5	46-86192-3	2SD735(Y)
Q6	46-86293-3	2SA562(Y)
Q7	46-86360-3	2SD141

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C1	46-184-3	5mfd 10V
C3	46-18232-3	200mfd 6V
C5	18-434-5	10mfd 10V
C7	46-184-3	5mfd 10V
C10	18-275-5	1mfd 10V
C12	18-275-5	1mfd 10V
C14	46-18201-3	100mfd 10V
C15	46-18259-3	330mfd 6V
C16	46-18205-3	470mfd 12V
C17	18-435-5	47mfd 6V
C18	46-18297-3	330mfd 10V

CONTROLS

ITEM	PART NO.	DESCRIPTION
VR1	46-24460-3	50K Volume
VR2	46-24460-3	50K Tone

MISCELLANEOUS

ITEM	NAME	PART NO.
M	Motor w/Pulley	46-5936-3
PH1	Head, Playback	46-33123-3
S1	Switch, On-Off	46-69152-3
SP	Speaker (8 ohms ,4")	46-3374-3
	AC Adapter	Model #57-2139
	Belt, Drive	46-39331-3
	Flywheel	46-39375-3
	Bearing, Capstan	46-2661-3

CABINET PARTS

NAME	PART NO.
Cabinet Front	46-42197-3
Cabinet Back	46-21362-3
Lid, Battery Compartment	46-21356-3
Knob, Volume	46-52441-3
Knob, Tone	46-52441-3
Knob, Program Selector	46-52395-3

TROUBLE CHART

Symptom		Main Cause
No operation at all (Measure current across on-off switch).	No current	<ol style="list-style-type: none"> 1. Battery exhausted 2. Defective on-off switch (SW-5)
	Excessive current	Parts touch.
	Weak current	<ol style="list-style-type: none"> 1. Battery exhausted 2. Primary winding coil of output trans. (T9)
No click is heard when a circuit tester probe is put to the volume control (R).		<ol style="list-style-type: none"> 1. Defective earphone jack (J1) 2. Defective speaker (SP1) 3. Defective output transformer (T9) 4. Defective input transformer (T8)
Click is heard when a circuit tester probe is put to the volume control. (R1)	Neither AM nor FM operates.	<ol style="list-style-type: none"> 1. Defective band selector 2. Defective transistor (Q2, Q4, Q5) 3. Defective capacitor (C40)
	AM does not operate.	<ol style="list-style-type: none"> 1. Defective detector (D2) 2. Defective capacitor (M2) 3. Defective antenna coil (L5) 4. Defective oscillator coil (L6) 5. Defective IF transformer (T5, T6, T7)
	FM does not operate.	<ol style="list-style-type: none"> 1. Defective transistor (Q1, Q2) 2. Defective FM RF coil (L2) 3. Defective oscillation coil (L4) 4. Defective IF transformer (T1, T2, T3, T4)
Insufficient sensitivity	AM reception	<ol style="list-style-type: none"> 1. Insufficient adjustment of IF transformer (T5, T6, T7) 2. Insufficient adjustment of antenna coil (L5) 3. Insufficient adjustment of antenna trimmer (C7). <p style="text-align: center;">As for adjustment, refer to AM ALIGNMENT PROCEDURE</p>
	FM reception	<ol style="list-style-type: none"> 1. Insufficient adjustment of IF transformer (T1, T2, T3, T4) 2. Insufficient adjustment of FM RF coil (L2) 3. Insufficient adjustment of antenna trimmer (C5) <p style="text-align: center;">As for adjustment, refer to FM ALIGNMENT PROCEDURE</p>
Sound distortion		<ol style="list-style-type: none"> 1. Battery exhausted 2. Defective speaker (SP1)
	Output transistor voltage is abnormal.	<ol style="list-style-type: none"> 1. Defective bias circuit 2. Defective transistor (Q8, Q9) 3. Defective output transformer (T9) 4. Defective input transformer (T8)
	FM reception	Insufficient adjustment of IF transformer (T3, T4)

ALIGNMENT INSTRUCTIONS

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

- 1) Connect an output meter across the speaker voice coil lugs.
- 2) Set the volume control for maximum.
- 3) Attenuate the signals from the generator enough to swing the most sensitive range of the output meter.
- 4) Use a non-metallic alignment tool.
- 5) Repeat adjustments to insure good results.

AM ALIGNMENT PROCEDURE

Step	Test Stage	Signal Generator		Dial Setting	Indicator	Adjustment	Remarks
		Connection	Frequency				
1	IF	Radiated as small as possible.	455 kHz modulated	Tuning gang fully closed.	Output meter (VTVM) across voice coil.	T5 (Yellow) T6 (White) T7 (Black)	Adjust for maximum output.
		Repeat until no further improvement can be made.					
2	Band Coverage	Radiated as small as possible.	520 kHz modulated	Tuning gang fully closed.	Same as step 1	Oscillator coil L6 (Red)	Same as step 1
		Same as above	1680 kHz modulated	Tuning gang fully open.	Same as step 1	Oscillator trimmer C8	Same as step 1
		Repeat until no further improvement can be made.					
3	Tracking	Radiated as small as possible.	600 kHz modulated	Tune to signal.	Same as step 1	Antenna coil L5	Same as step 1 (See NOTE A)
		Same as above	1400 kHz modulated	Same as above	Same as step 1	Antenna trimmer C3	Same as above
		Repeat until no further improvement can be made.					

AM ALIGNMENT BY USING BROADCASTING STATION

(If generator is not available)

Step	Test Stage	Dial Pointer Setting	Indicator	Adjustment	Remarks
1	IF	Tune to maximum broadcasting signal around 1500kHz. Then rotate set slightly away from the maximum signal direction.	Output meter (VTVM) across voice coil.	T5 (Yellow) T6 (White) T7 (Black)	Adjust for maximum output.
		Repeat until no further improvement can be made.			
2	Tracking	Tune to maximum broadcasting signal around 600kHz. Then rotate set slightly away from the maximum signal direction.	Same as step 1	Antenna coil L5	Slide and adjust antenna winding for maximum output, (See NOTE A)
		Tune to maximum broadcasting signal around 1400kHz. Then rotate set slightly away from the maximum signal direction.	Same as step 1	Antenna trimmer C3	Same as step 1 (See NOTE A)
		Repeat until no further improvement can be made.			

NOTE A

Check the alignment of the receiver antenna coil by bringing a piece of ferrite (such as coil slug) near the antenna loop stick, then a piece of brass. If ferrite increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inductance.

FM ALIGNMENT PROCEDURE

Step	Test Stage	Signal Generator		Dial Setting	Indicator	Adjustment	Remarks
		Connection	Frequency				
1	IF	Through 5 PF capacitor to TP1 and ground.	10.7MHz AM modulated	Tuning gang fully closed.	DC probe of VTVM to point TP7 and ground.	T1 (Orange) T2 (Violet)	Adjust for maximum indication.
		Repeat until no further improvement can be made.					
2	Ratio Detector	Same as step 1	Same as step 1	Same as step 1	DC probe of VTVM to TP4 and ground.	T3 (Pink) T4 (Blue)	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.
		Repeat until no further improvement can be made.					
3	Band Coverage	Through 75 ohm matching pad to rod antenna.	87.5MHz modulated	Tuning gang fully closed.	Output meter (VTVM) across voice coil.	Oscillator coil L4	Adjust for maximum output.
		Same as above	109MHz modulated	Tuning gang fully open.	Same as above	Oscillator trimmer C6	Same as above
		Repeat until no further improvement can be made.					
4	Tracking	Same as step 3	88MHz modulated	Tune to signal.	Same as step 3	RF coil L2	Same as step 3
		Same as step 3	108MHz modulated	Same as above	Same as step 3	RF trimmer C5	Same as step 3
		Repeat until no further improvement can be made.					

FM IF ALIGNMENT BY USING BROADCASTING STATION
(If generator is not available)

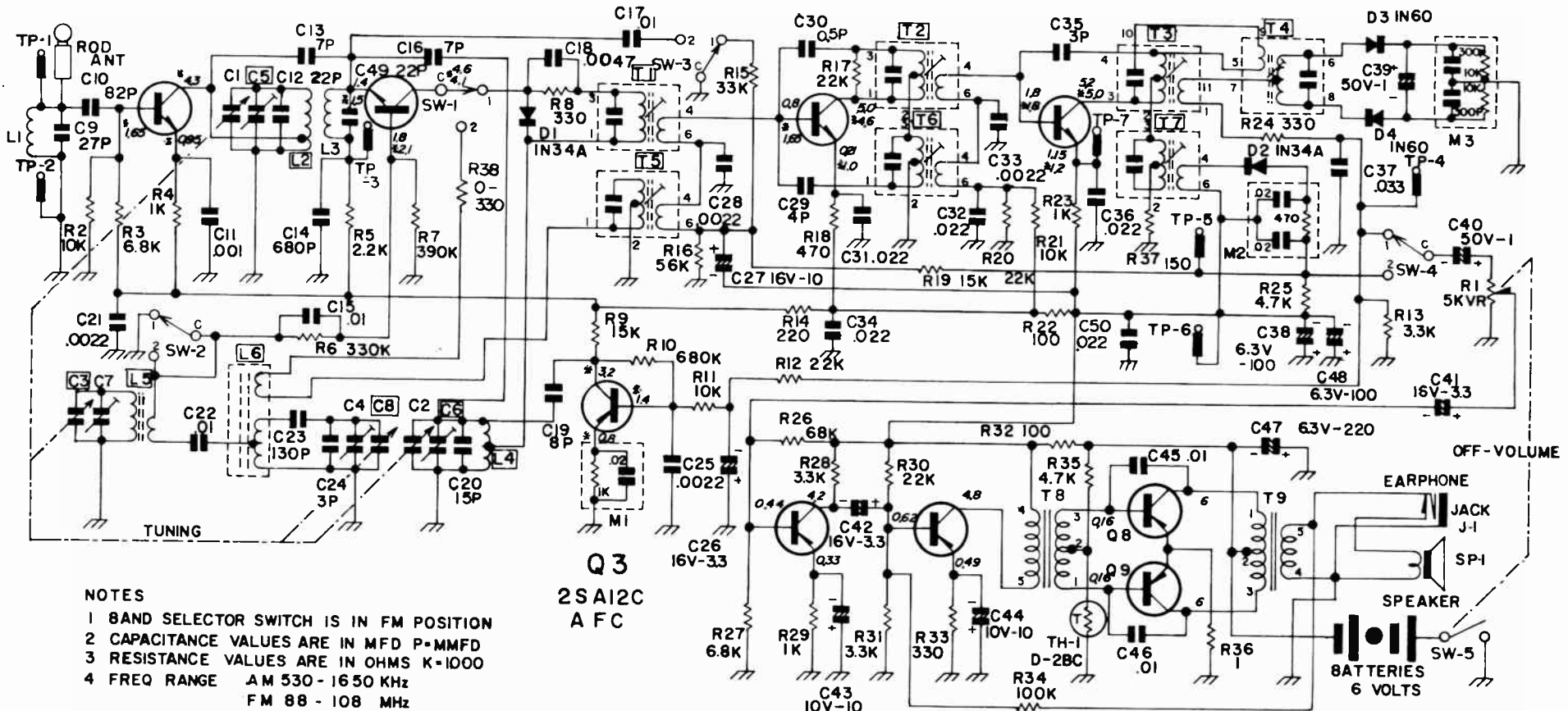
Step	Test Stage	Dial Pointer Setting	Indicator	Adjustment	Remarks
1	IF	Tune to maximum any broadcasting signal.	Connect VTVM to point TP7 and ground. Adjust antenna for the weakest signal as possible, while still retaining a positive indication on VTVM.	T1 (Orange) T2 (Violet)	Adjust for maximum indication.
		Repeat until no further improvement can be made.			
2	Ratio Detector	Tune to maximum any broadcasting signal.	Output meter across voice coil	T3 (Pink) T4 (Blue)	Adjust for maximum output.
		Set the pointer to low end of dial.	Output meter across voice coil	T3 (Pink) T4 (Blue)	Adjust for minimum rushing noise.
		Repeat until no further improvement of maximum output and minimum rushing noise can be made.			

Q1
2SC535A
FM RF AMP

Q2
2SC461B
CONV

Q4
2SC460C
1st IF AMP

Q5
2SC460C
2nd IF AMP



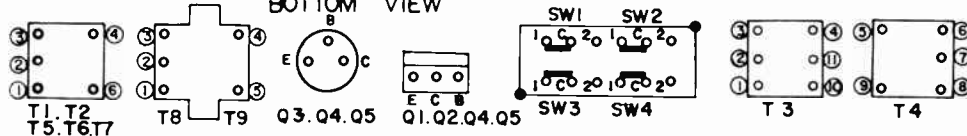
NOTES

- 1 BAND SELECTOR SWITCH IS IN FM POSITION
- 2 CAPACITANCE VALUES ARE IN MFD P-MMFD
- 3 RESISTANCE VALUES ARE IN OHMS K-1000
- 4 FREQ RANGE AM 530 - 1650 KHz
FM 88 - 108 MHz

IF AM 455KHz FM 10.7MHz

- 5 Q1,Q2,Q4,Q5 VOLTAGE READINGS TO COMMON -B ARE MEASURED BY VTVM UNDER NO SIGNAL CONDITION
- 6 Q3 Q6 Q7 Q8 Q9 VOLTAGE READINGS TO COMMON GROUND(+) ARE MEASURED BY VTVM UNDER NO SIGNAL CONDITION
- 7 VOLTAGE MARKED WITH * ARE MEASURED IN FM POSITION

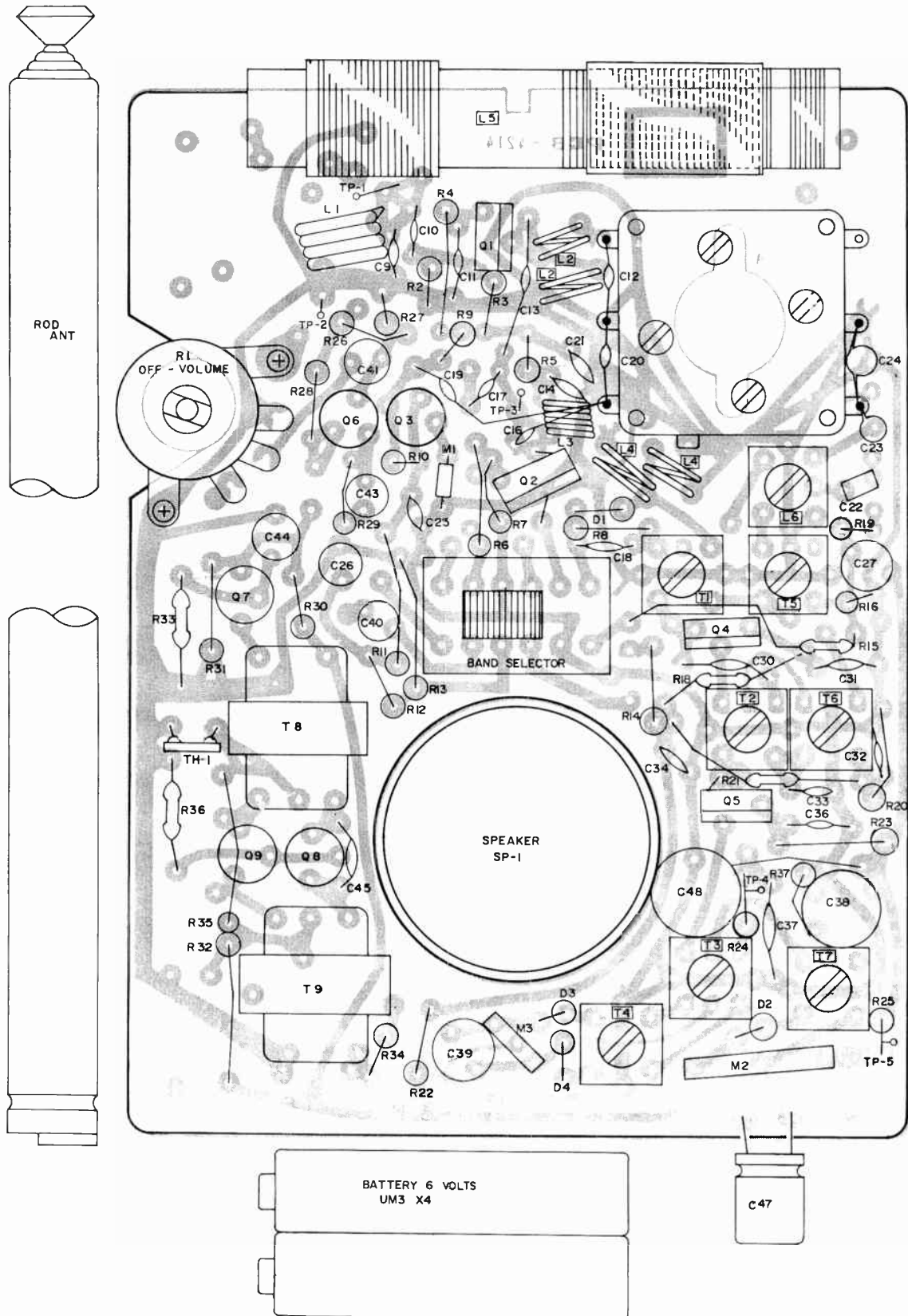
BOTTOM VIEW

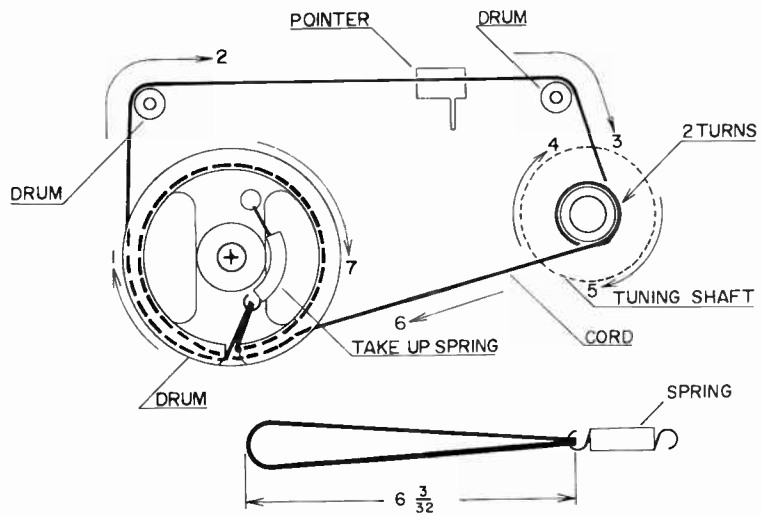


Q6
2SB75B
AUDIO AMP

Q7
2SB75B
AUDIO DRIVE

Q8, Q9
2SB77B
OUTPUT





Dial Cord Stringing

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	1N34A
D2	1N34A
D3	1N60
D4	1N60
Q1	2SC535
Q2	2SC461
Q3	2SA12
Q4	2SC460
Q5	2SC460
Q6	2SB75
Q7	2SB75
Q8	2SB77

L3	7L-954B
L4	7L-598C
L5	8L-237A
L6	8L-329B
T1	71F-878
T2	71F-887
T3	71F-888
T4	71F-879
T5	71F-877
T6	71F-885
T7	71F-886
T8	6T-809
T9	7T-839

VARIABLE CAPS

ITEM	PART NO.	VALUE
C1-4	VC-417	Tuning Gang

MISCELLANEOUS

ITEM	NAME	PART NO.
M1	Component, Combination	PRC-332
M2	Component, Combination	PRC-332
M3	Component, Combination	PRC-332
SP1	Speaker	6P-81H
SW1-4	Switch, Band	34S-26
	Antenna, Telescopic	705319
	Earphone	3MR-402

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R1	8V-809	5000 ohms Volume/Switch
TH1	D-2B	Thermistor

CABINET PARTS

NAME	PART NO.
Cabinet Front, Complete	3CAB-4214A
Cabinet Back	3CAB-4214B
Cover, Battery Compartment	100319
Dial Pointer	212319
Dial	101319
Knob, Tuning	9K-241
Knob, Volume	9K-242

COILS/TRANSFORMERS

ITEM	PART NO.
L1	7L-597C
L2	7L-623C

CIRCUIT ADJUSTMENTS

3-1. AM IF ALIGNMENT

Test Equipments/Tools Required:

- * Rf signal generator (for a-m)
- * VTVM
- * Loop antenna
- * Screwdriver for alignment

Preparation:

1. Band Selector : AM
2. TONE : HIGH
3. VOL : MAX
4. Tuning Knob : Fully clockwise

Rf Signal Generator Coupling	Rf Signal Generator Frequency	VTVM Connection	Adjust
Loop antenna (See Fig. 3-2)	455 kHz (1 kHz 30% a-m)	On af circuit board (See Fig. 3-1)	CFT (Adjust for maximum meter reading.)

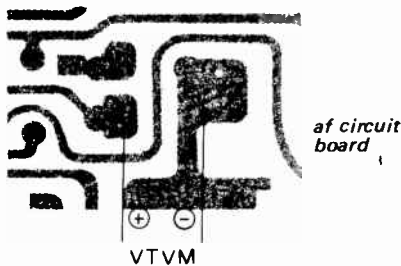


Fig. 3-1. VTVM connection

Preparation:

1. Sweep/Marker Generator Connection : Across the tuning capacitor as shown in Fig. 3-3
2. Oscilloscope Connection : Check pins P207 and P209 as shown in Fig. 3-4
3. Sweep Generator Center Frequency : 10.7 MHz
4. Marker Generator Frequency : 10.7 MHz
5. Band Selector : FM
6. AFC Switch : OFF
7. TONE : HIGH

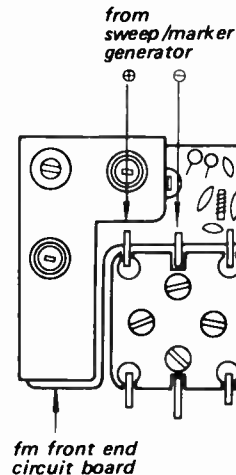


Fig. 3-3. Sweep/marker generator connection

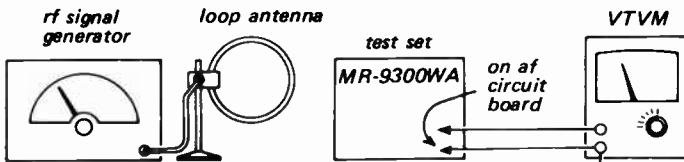


Fig. 3-2. Am i-f alignment setup

3-2. FM IF ALIGNMENT

Test Equipments/Tools Required:

- * 10.7 MHz sweep generator with 10.7 MHz marker generator
- * Oscilloscope
- * Screwdriver for alignment

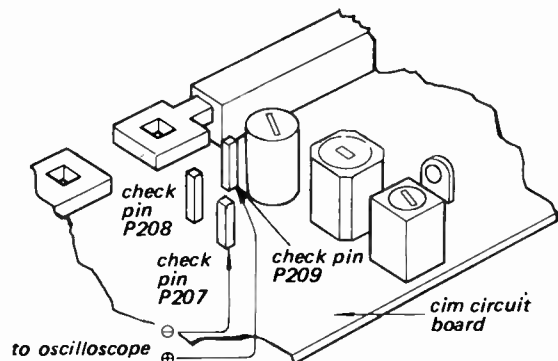


Fig. 3-4. Oscilloscope connection

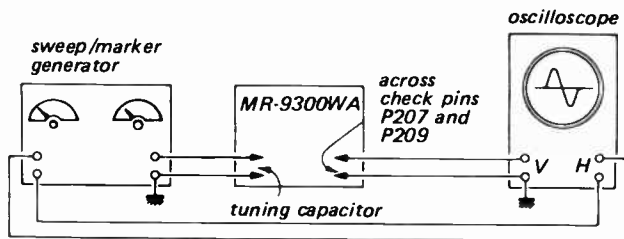


Fig. 3-5. Fm i-f alignment setup

Procedure:

1. Turn the core of discriminator transformer (IFT F204) fully counterclockwise.
2. Turn the core of fm i-f transformer (IFT F101, F201, F202) and discriminator transformer (IFT F203) to obtain the maximum amplitude response curve shown in Fig. 3-6.
3. Turn the core of discriminator transformer (IFT F204) to obtain the "S" curve response shown in Fig. 3-7.

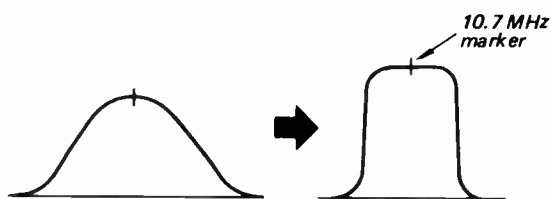


Fig. 3-6.

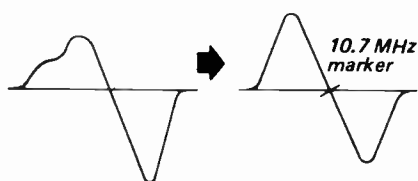


Fig. 3-7.

Sweep/Marker Generator	Oscilloscope Connection	Adjust
<p>Coupling: Direct connection across fm tuning capacitor (osc section). See Fig. 3-3.</p> <p>Frequency: 10.7 MHz</p>	<p>Across check pins P207 and P209 shown in Fig. 3-4.</p>	<p>IFT F101 F201 F202 F203 F204</p>

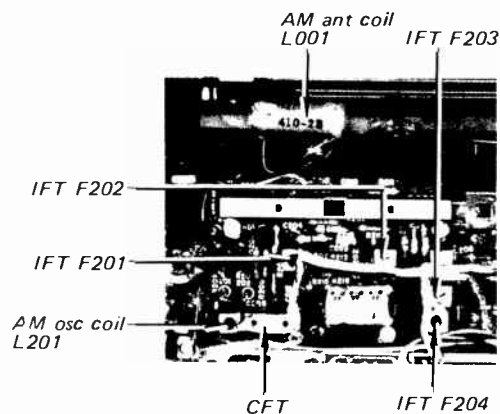


Fig. 3-8. Adjusting parts location

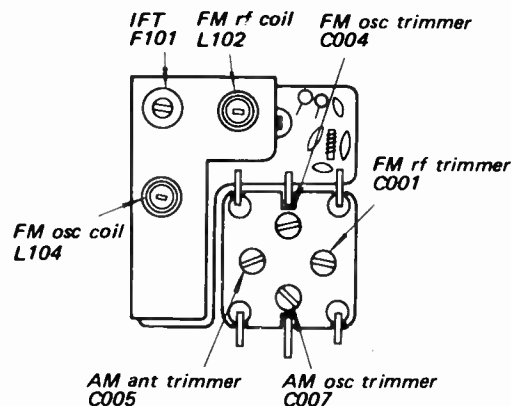


Fig. 3-9. Adjusting parts location

3-3. FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Test Equipments/Tools Required:

- * Rf signal generator (for fm and a-m)
- * Loop antenna
- * VTVM
- * Screwdriver for alignment

Preparation:

1. VTVM
Connection : On af circuit board
(See Fig. 3-10)
2. Modulation : FM... 400Hz, ± 22.5 kHz frequency modulated signal.
AM... 1 kHz 30%-amplitude modulated signal.
3. AFC Switch: OFF
4. TONE : HIGH
5. VOL : MAX

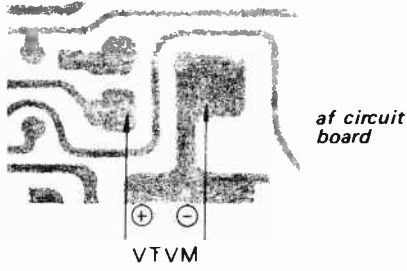


Fig. 3-10. VTVM connection

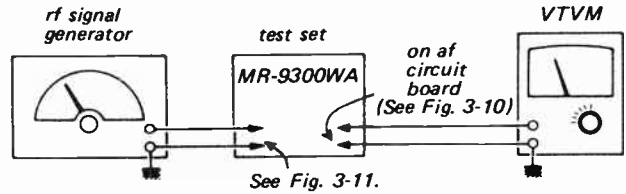


Fig. 3-12. Fm frequency coverage and tracking adjustment setup

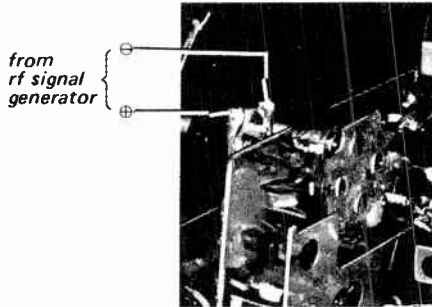


Fig. 3-11. Rf signal generator connection (fm)

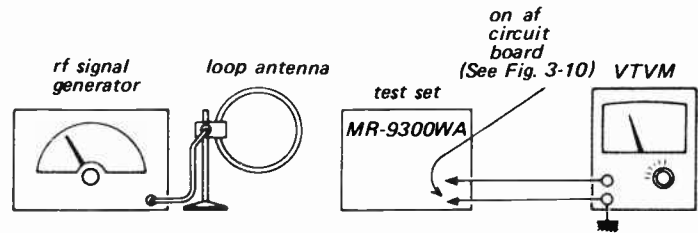


Fig. 3-13. A-m frequency coverage and tracking adjustment setup

Adjustment	Rf Signal Generator Coupling	Rf Signal Generator Frequency	Receiver Dial Setting	Adjust	Remarks
FM Frequency Coverage	Direct connection to terminals on fm front end circuit board. (See Fig. 3-11.)	85.5 MHz	Fully left	FM osc coil L104	Band selector: FM-MONO Adjust for maximum meter reading.
		109.5 MHz	Fully right	FM osc trimmer C004	
FM Tracking		85.5 MHz	Tune to 85.5-MHz signal	FM rf coil L102	
		109.5 MHz	Tune to 109.5-MHz signal	FM rf trimmer C001	
AM Frequency Coverage	Loop antenna (See Fig. 3-13.)	520 kHz	Fully left	AM osc coil L201	Band selector: AM Adjust for maximum meter reading.
		1,680 kHz	Fully right	AM osc trimmer C007	
AM Tracking		620 kHz	Tune to 620-kHz signal	AM ant coil L001	
		1,400 kHz	Tune to 1,400-kHz signal	AM ant trimmer C005	

3-4. MPX CIRCUIT ADJUSTMENT

Test Equipments/Tools Required:

- * Rf Signal Generator (for fm)
- * Stereo Signal Generator
- * Audio Signal Generator
- * VTVM
- * Screwdriver for adjustment
- * 8Ω resistor
- * 4Ω resistor

A. 67 kHz TRAP COIL (L209), 64 kHz TRAP COIL (L213) AND SUB CHANNEL FILTER COIL (L212) ADJUSTMENT

This adjustment has a influence on the stereo separation and the tone quality. Adjust L209, L212,

and L213 exactly with the test equipment after adjusting the front end and i-f section.

Preparation:

1. Rf Signal Generator (for fm)
 - Frequency : 98 MHz
 - Output Level : 45 ~ 80 dB
2. Band Selector : FM-ST
3. AFC Switch : ON
4. VOL : Fully counterclockwise
5. Tuning Knob : Tune to 98 MHz signal
6. Rf Signal Generator Connection :
 - Terminal of FM EXT ANT as shown in Fig. 3-14.
7. Audio Signal Modulation :
 - ±22.5 kHz (30%) fm modulation

Stereo Signal Generator	Audio Signal Generator Frequency	VTVM Connection	Adjust	Remarks
Main Channel: On Sub Channel: Off Pilot Signal: Off	67 kHz	Ⓐ shown in Fig. 3-15	L209 (See Fig. 3-18)	Adjust for minimum meter reading.
	64 kHz	Ⓑ shown in Fig. 3-15	L213 (See Fig. 3-18)	
Main Channel: On Sub Channel: On Pilot Signal: On	400 Hz	Ⓑ shown in Fig. 3-15	L212 (See Fig. 3-18)	Adjust for minimum meter reading.

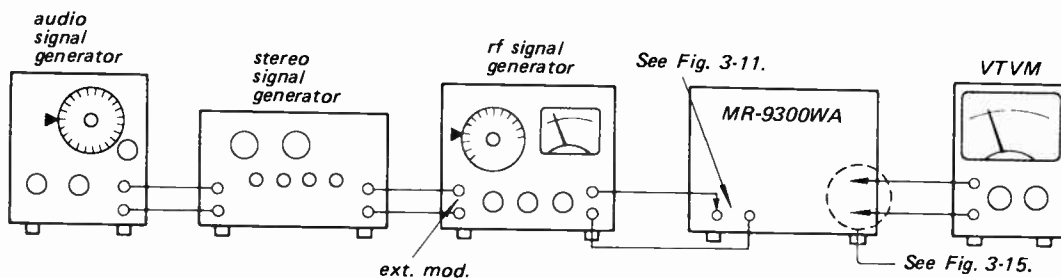


Fig. 3-14. Trap coil adjustment setup

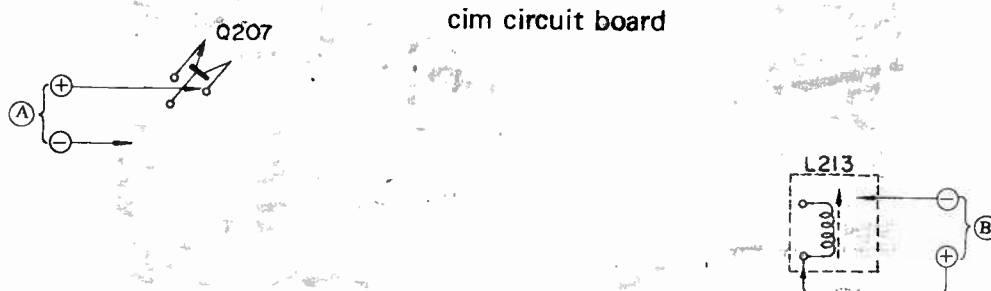


Fig. 3-15. VTVM connection

B. MS RATIO ADJUSTMENT

MS ratio adjustment is that of channel separation and has a great influence on the spread of stereophonic sound. Make this adjustment with proper equipments, only after adjusting trap coils.

Preparation:

1. Band Selector : FM-ST
2. VOL : MAX
3. TONE : HIGH
4. AFC Switch : ON

5. Tuning Knob : Tune to 98 MHz signal
6. Solder 4Ω-resistor and 8Ω-resistor as shown in Fig. 3-17.

Procedure:

1. Tune to 98 MHz signal for maximum VTVM ① reading.
2. Turn the VOLUME control knob so that the VTVM ① reading is 0.25 V.
3. Adjust the semi-fixed resistor R266 so that the VTVM ② reading is 0.45 V.

Audio Signal Generator	Stereo Signal Generator	Rf Signal Generator	VTVM Connection	Adjust
400 Hz	Main Channel: On Sub Channel: On Pilot Signal: On Pre-emphasis: On	Frequency: 98 MHz Output Level: 54 dB Connection: Terminals on fm front end circuit board as shown in Fig. 3-11.	VTVM 1: ① shown in Fig. 3-17. VTVM 2: ② shown in Fig. 3-17.	R266 (See Fig. 3-18)

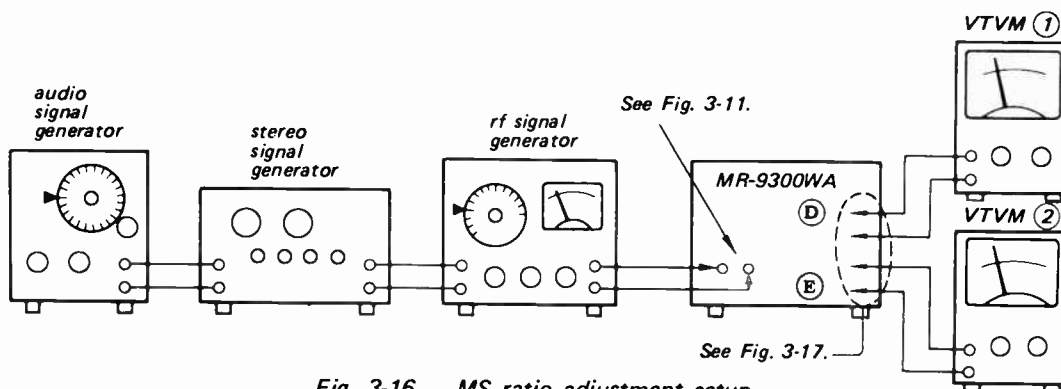


Fig. 3-16. MS ratio adjustment setup

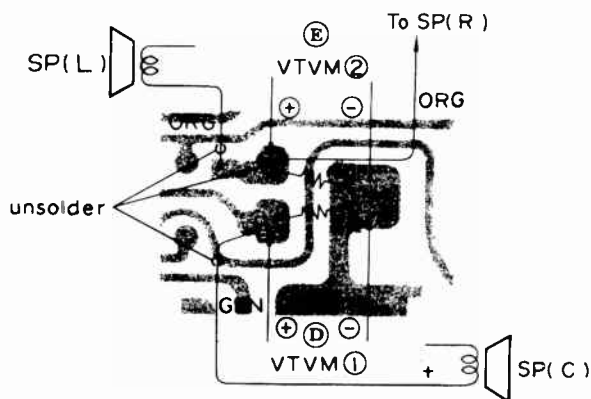


Fig. 3-17. VTVM connection

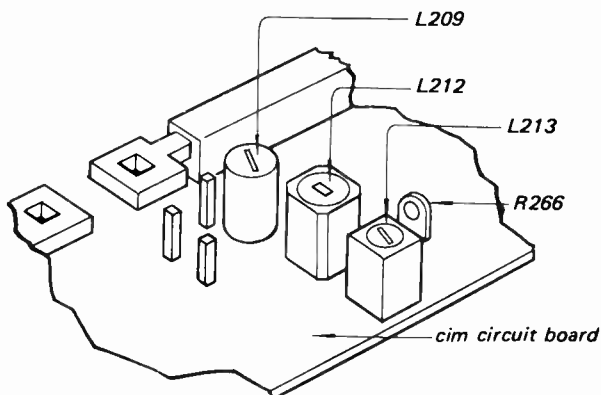


Fig. 3-18. Adjusting parts location

3-5. BIAS ADJUSTMENT

A. Agc (Automatic Gain Control) Adjustment

Preparation:

1. Connect a $0.2\mu\text{F}$ ceramic capacitor across emitter and collector of transistor Q201 as shown in Fig. 3-19.
2. Set the band selector to AM.

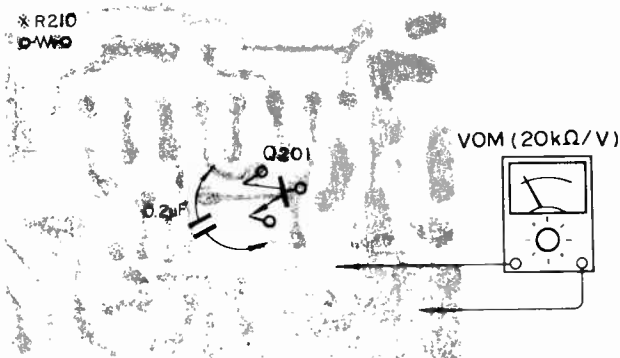


Fig. 3-19.

Adjustment:

1. Select the value of R210 so that the emitter voltage of Q201 is $0.3\sim 0.35$ volts with a VOM ($20\text{k}\Omega/\text{V}$).

Ref. No.	Part No.	Description
R210 (See Fig. 3-19)	1-244-710	$36\text{ k}\Omega$ $\frac{1}{4}\text{W}$ carbon
	1-244-711	$39\text{ k}\Omega$ $\frac{1}{4}\text{W}$ carbon
	1-244-712	$43\text{ k}\Omega$ $\frac{1}{4}\text{W}$ carbon
	1-244-713	$47\text{ k}\Omega$ $\frac{1}{4}\text{W}$ carbon
	1-244-714	$51\text{ k}\Omega$ $\frac{1}{4}\text{W}$ carbon

2. After adjusting R210, remove the $0.2\mu\text{F}$ ceramic capacitor.

B. Stereo Range Adjustment

Select the value of R303 and R304 so that the emitter voltage of Q301 and Q302 is 0.025V with a VTVM.

R303	1-244-717	$68\text{ k}\Omega$
	1-244-725	$150\text{ k}\Omega$
R304	1-244-729	$220\text{ k}\Omega$
	1-244-732	$300\text{ k}\Omega$

2-6. DIAL CORD STRINGING

1. Cut the dial cord (0.3 mm dia.) by the length of about 1 m.
2. Rotate the dial drum fully clockwise.
3. Set the dial cord in numerical order as shown in Fig. 2-8.
4. Hook the spring on the drum and fix the cord with the eyelet by stretching the spring.

5. Fix the both knots of the dial cord with a contact cement.

Pointer Setting

After stringing, set the pointer as follows.

1. Rotate the drum fully counterclockwise.
2. Set the pointer on the pointer setting position.
3. Fix the pointer with a contact cement.

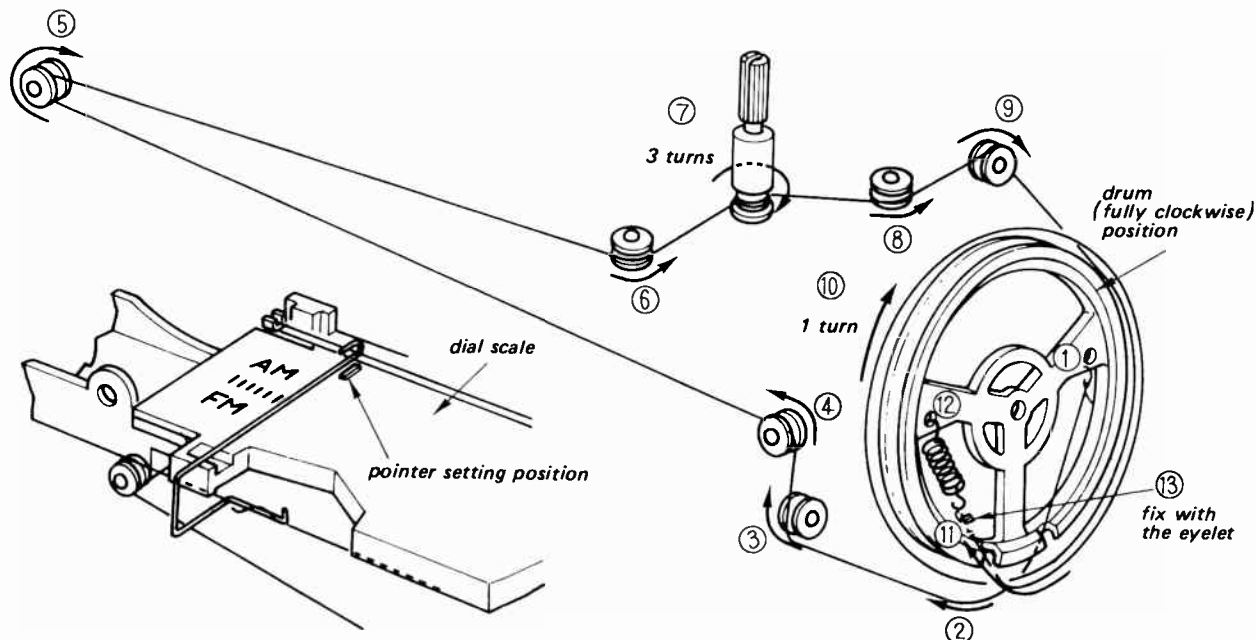


Fig. 2-8

SEMICONDUCTORS

ITEM	PART NO./TYPE
D101	1S351M
D201	1T-261
D202	1T-261
D203	1T-23
D204	1T-262
D205	1T-262
D206	1T-22
D207	1T-22
D301	CD-2
Q101	2SC710
Q102	2SC710
Q103	2SC930
Q201	2SC710
Q202	2SC710
Q203	2SC710
Q204	2SC870
Q205	2SB136
Q206	2SC870
Q207	2SC633A
Q208	2SC633A
Q301	2SC870
Q302	2SC870
Q303	2SB495
Q304	2SB495
Q305	2SB495
Q306	2SB495

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C001-8	1-151-215	Tuning Gang
C123	1-121-391	1mf 50V
C213	1-121-391	1mf 50V
C224	1-121-425	470mf 10V
C227	1-121-469	10mf 10V
C232	1-121-469	10mf 10V
C234	1-127-019	.1mf 10V
C236	1-121-469	10mf 10V
C237	1-127-019	.1mf 10V
C245	1-121-469	10mf 10V
C248	1-121-391	1mf 50V
C251	1-121-391	1mf 50V
C252	1-121-420	220mf 10V
C253	1-127-021	.33mf 10V
C254	1-127-019	.1mf 10V
C255	1-121-391	1mf 50V
C256	1-127-020	.22mf 10V
C302	1-121-391	1mf 50V
C303	1-121-469	10mf 10V
C304	1-121-736	1000mf 10V
C305	1-121-392	3.3mf 25V
C306	1-127-023	1mf 10V
C313	1-121-736	1000mf 10V
C314	1-121-736	1000mf 10V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R001 & R002	1-222-357	10K Tone
		10K Tone

R003 & R004	1-222-360-22	50K Volume
		50K Volume
R266	1-221-635	5000 ohms Separation
TH301	8-691-002-01	Thermistor (CS-47)
TH302	8-691-002-01	Thermistor (CS-47)

COILS/TRANSFORMERS

ITEM	PART NO.
L001	1-401-410-23
L002	1-407-182
L003	1-407-178
L101	1-425-449
L102	1-425-632
L103	1-403-242
L104	1-405-463
L105	1-407-182
L106	1-407-182
L201	1-405-417
L202	1-403-244-31
L205	1-403-244-31
L206	1-403-272-31
L207	1-403-273-31
L208	1-403-137-11
L209	1-409-201
L210	1-425-633
L211	1-425-633
L212	1-425-635
L213	1-425-634
PT	1-441-641
T301	1-423-156
T302	1-423-156
T303	1-427-256
T304	1-427-285

MISCELLANEOUS

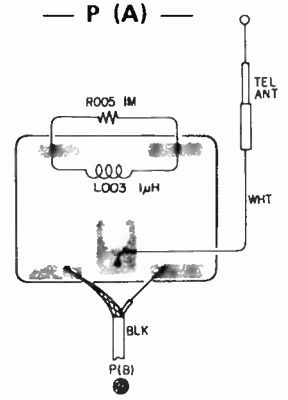
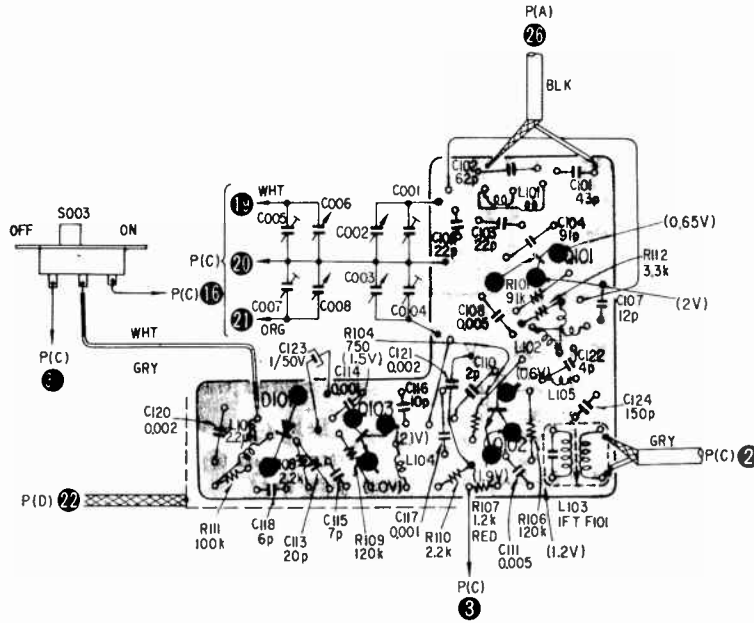
ITEM	NAME	PART NO.
CF	Ceramic Filter (Red)	1-527-501-11
	Ceramic Filter (Blue)	1-527-501-12
	Ceramic Filter (Org)	1-527-501-13
CFT	Ceramic Filter	1-403-144
S003	Switch, AFC	1-514-304
S201-206	Switch, Band	1-514-741
S211-216	Switch, Band	1-514-741
SP	Speaker	1-502-266-11
	Antenna, Telescopic	1-501-072-20
	FM Front End, Complete	8-981-392-10
	P.C. Board, FM Front End	1-539-615-14
	P.C. Board, CIM	1-539-906-11
		1-539-625-12
	P.C. Board, AF	1-539-655-14
	P.C. Board, Antenna	1-581-102-12

CABINET PARTS

NAME	PART NO.
Cabinet Front, Ass'y.	X-38399-13
Cabinet Rear, Ass'y.	X-38399-12
Handle, Carrying	3-837-220
Knob, Tuning	X-38312-81
Knob, Volume/Power	X-38372-83
Knob, Tone	X-38372-83

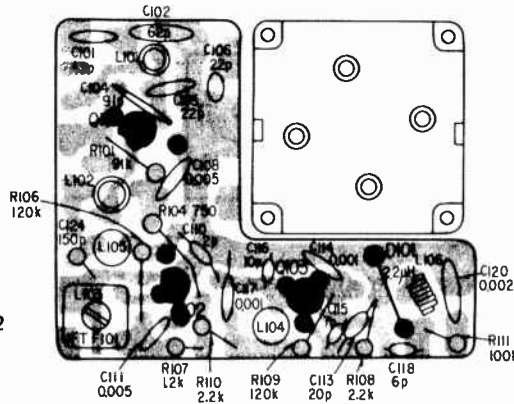
FM FRONT END CIRCUIT BOARD — P (B) —

— Conductor Side —



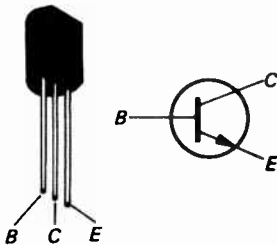
— Component Side —

C107, C112, C123, R112
conductor side parts.

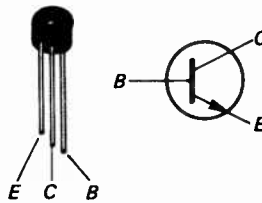


Printed circuit board,
Part No. 1-539-615-14

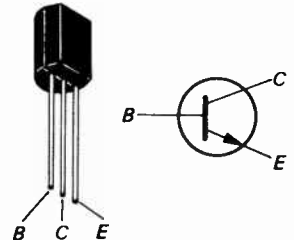
Q101, Q102: 2SC710

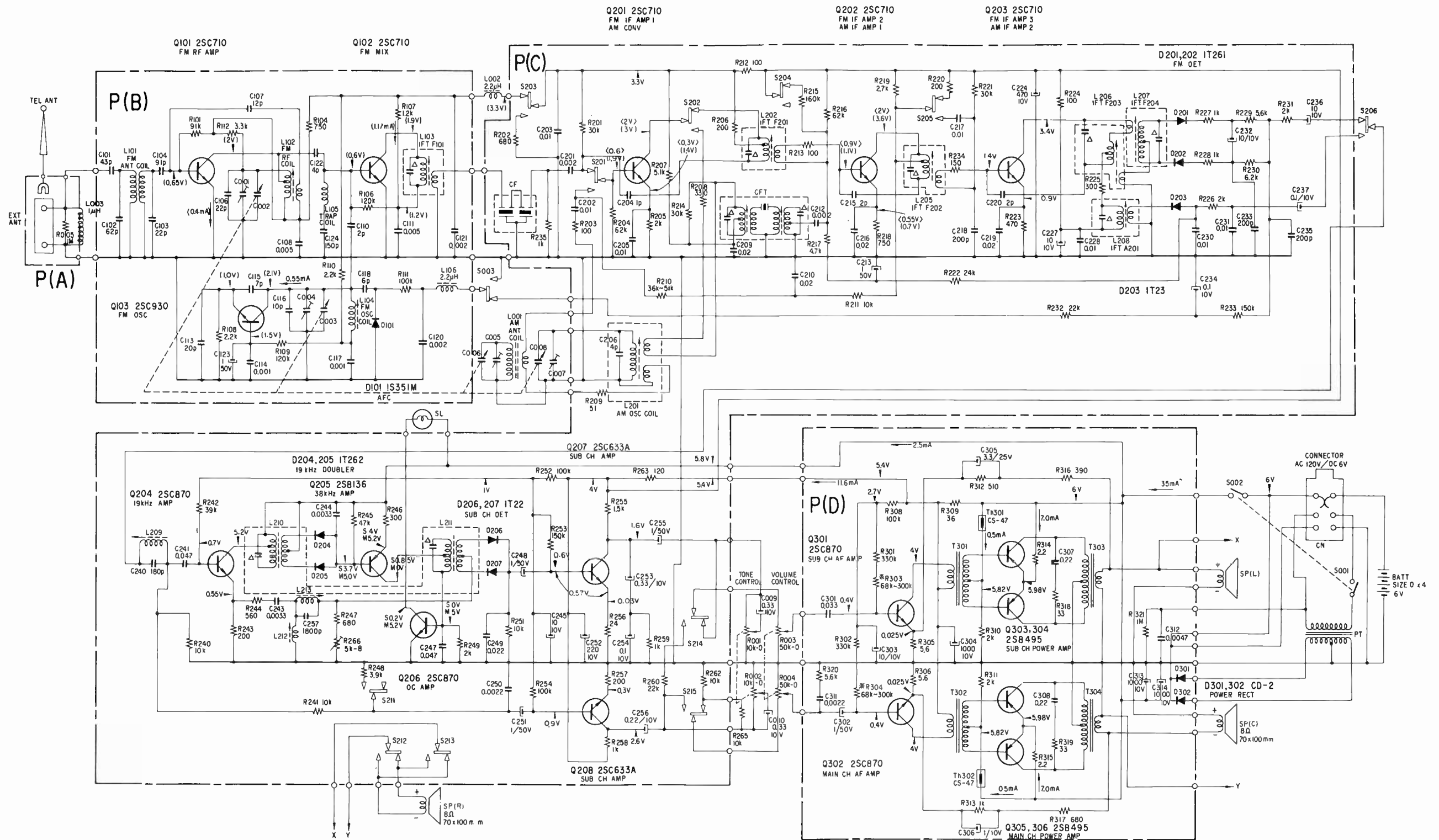


Q103: 2SC930



Q201 ~ Q203: 2SC710
Q204, Q206 : 2SC870





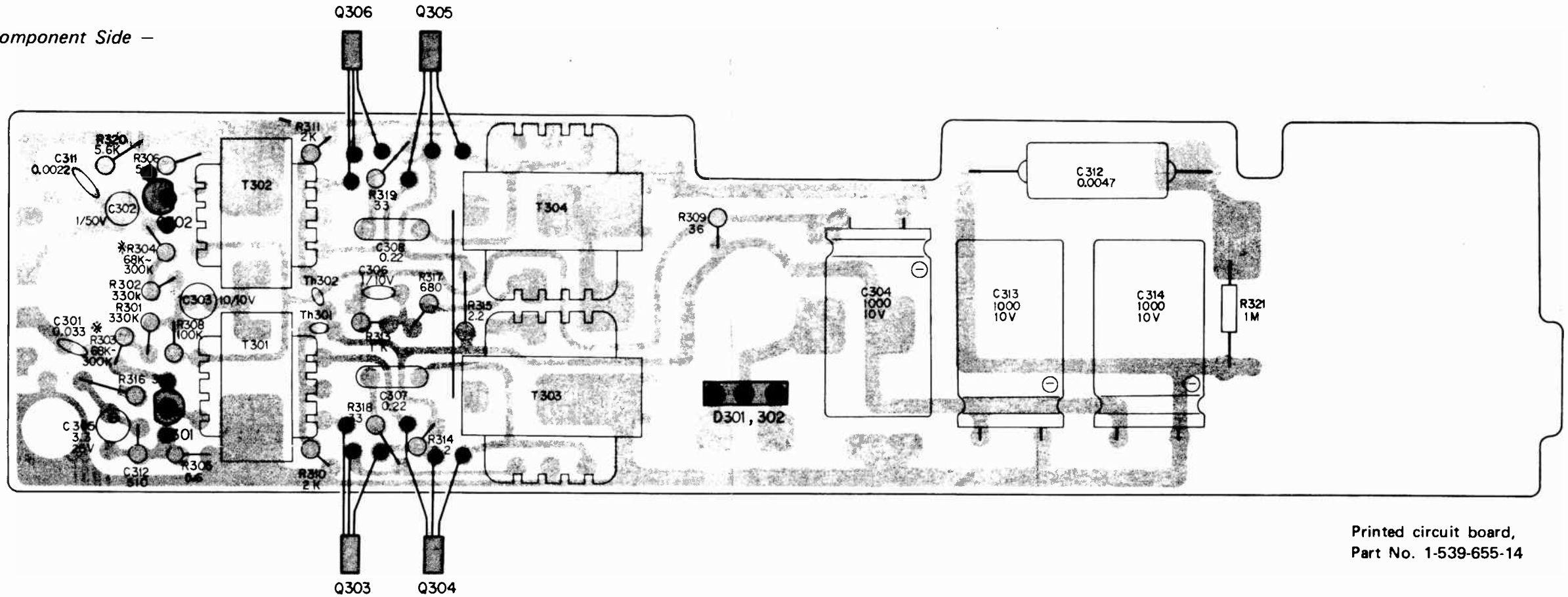
Note:

1. All resistors and capacitors are in Ω and μF unless otherwise specified.
2. Capacitors marked Δ are built-in i-f transformers.
3. The symbol * indicates a component whose value is selected to yield normal operating condition.
4. Voltage values are measured from point indicated to ground circuit with a dc voltmeter (VTVM) and current values are measured with a dc ammeter. Voltage and current are measured with no radio signal received. Variations may be noted due to normal production tolerances. The values in $\langle \rangle$ are measured with band selector AM and in $()$ with FM. The symbol M shows the value with FM(MONO) and S with FM-ST(STEREO).

5. S201 - S206: band selector (position FM)
S211 - S216: FM-FMST selector (position FMST)
S003: AFC switch (position ON)
 6. CF: When replacing ceramic filter, use one whose identification color is the same as the used one.
- | Part No. | Identification Color (Color of Component) |
|--------------|---|
| 1-527-501-11 | red |
| 1-527-501-12 | blue |
| 1-527-501-13 | orange |

Sony MR-9300WA

— Component Side —



Printed circuit board,
Part No. 1-539-655-14

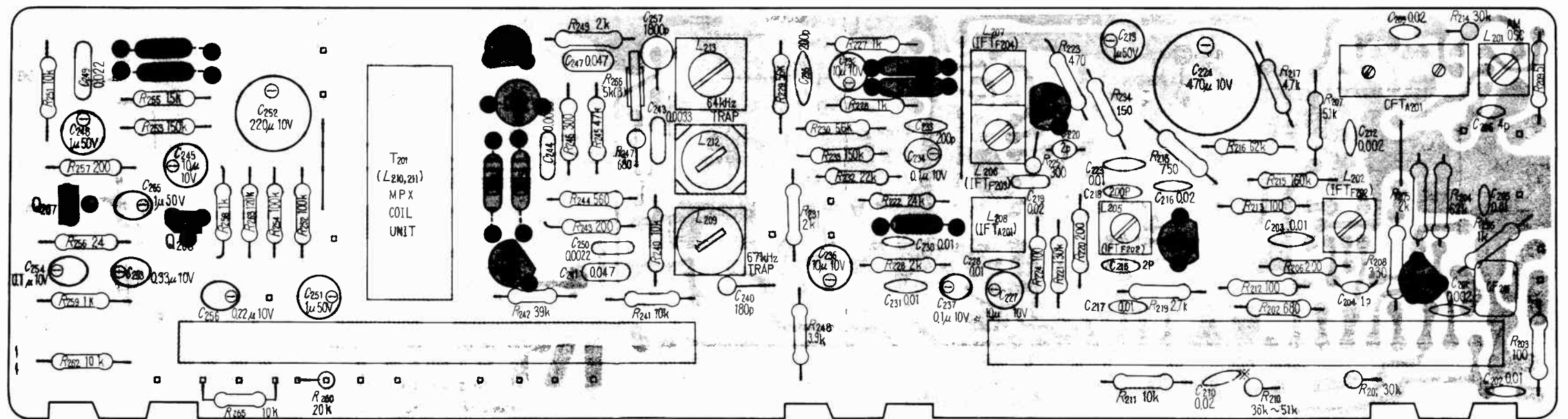
— Component Side —

Note:

1. S201 – S206 is band selector;
FM AM

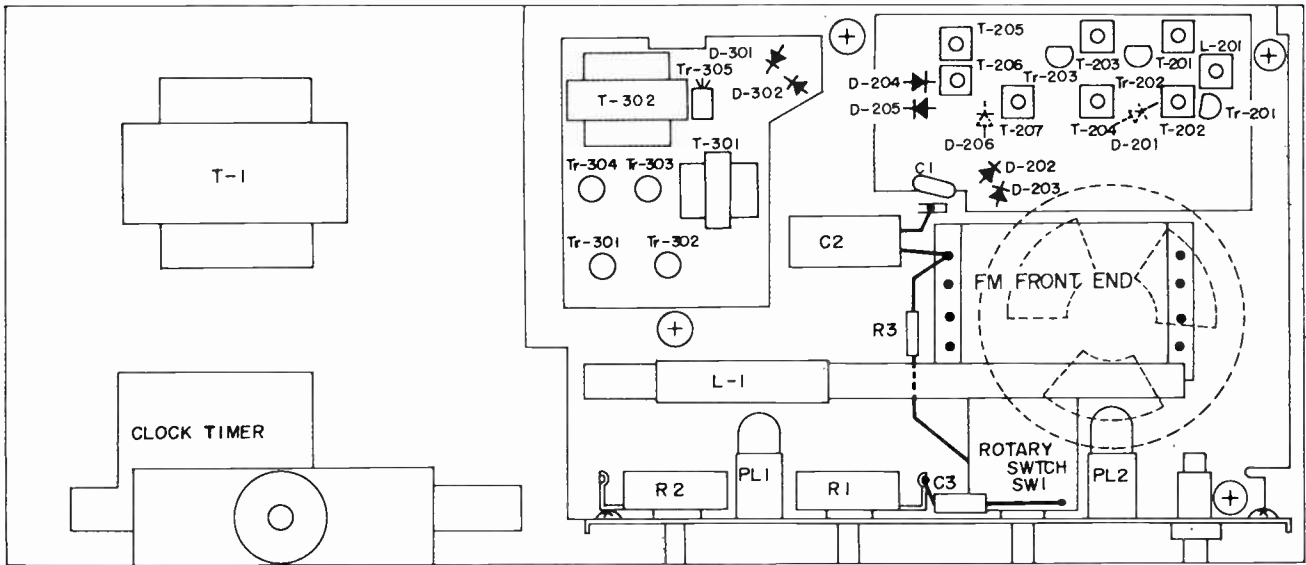
S211 – S216 is FM - FM ST
selector; STEREO MONO

2. C253, C254 and R259 have
a great influence on the stereo
separation and the tone quali-
ty. Make sure the value of
parts when you change these
parts.

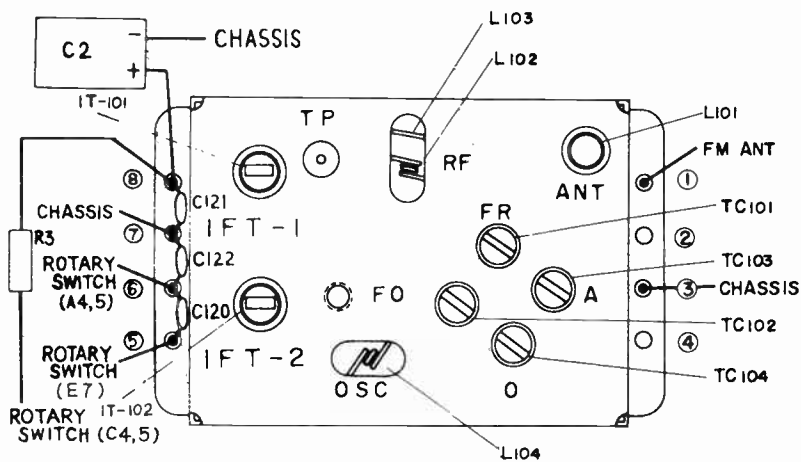


Printed circuit board,
Part No. 1-539-906-11

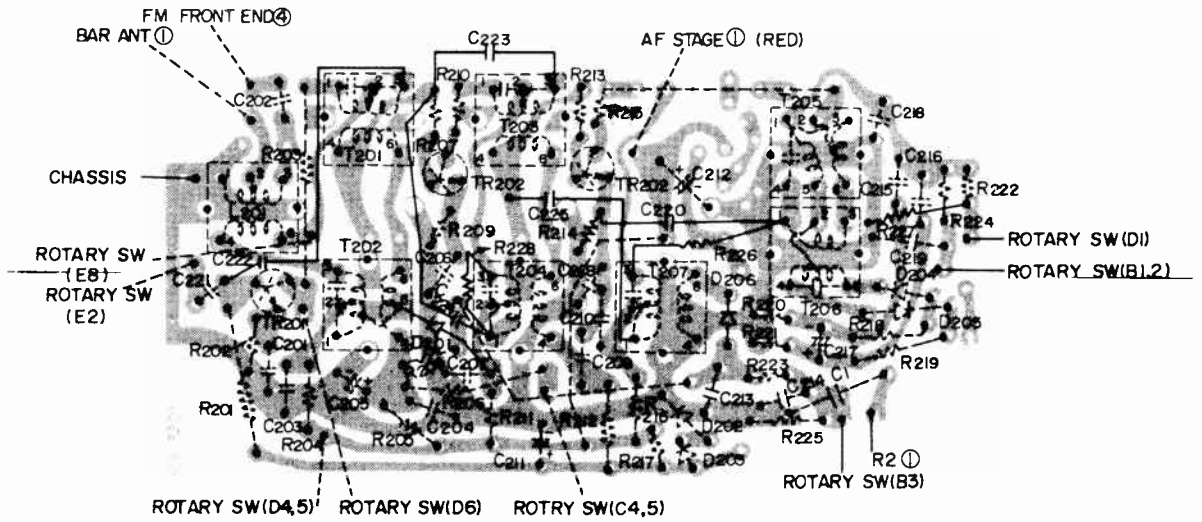
TOP VIEW



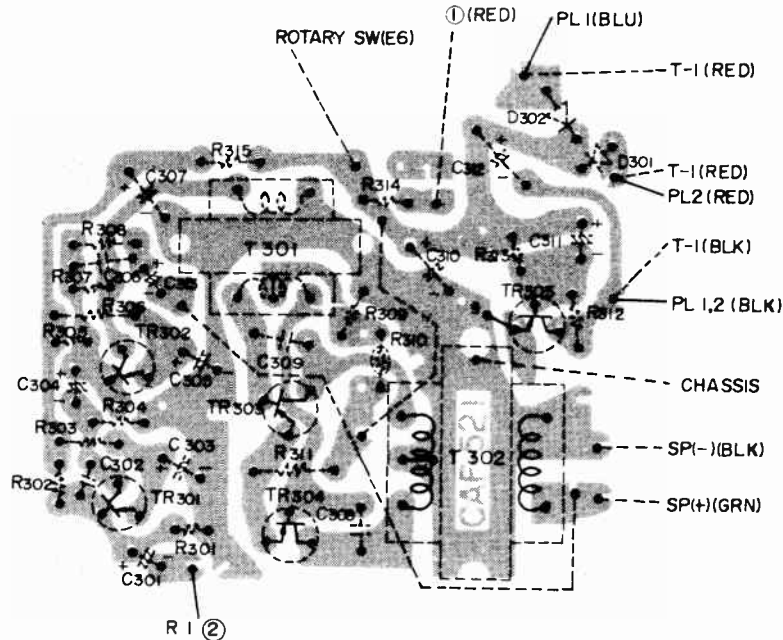
FM FRONT END (TOP VIEW)



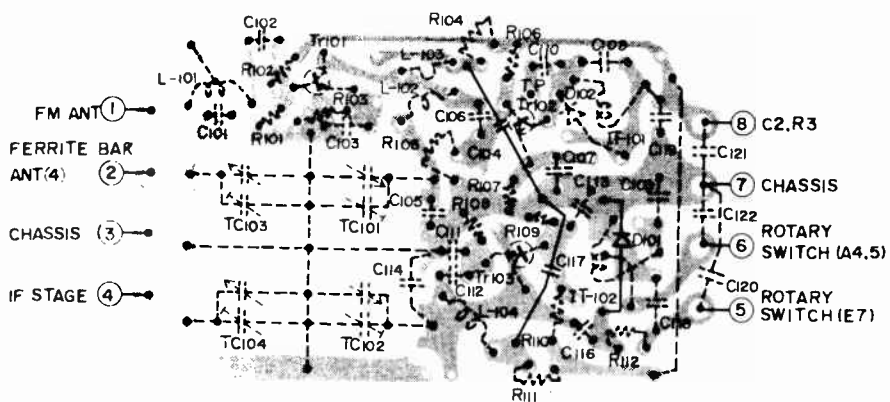
IF STAGE (BOTTOM VIEW)

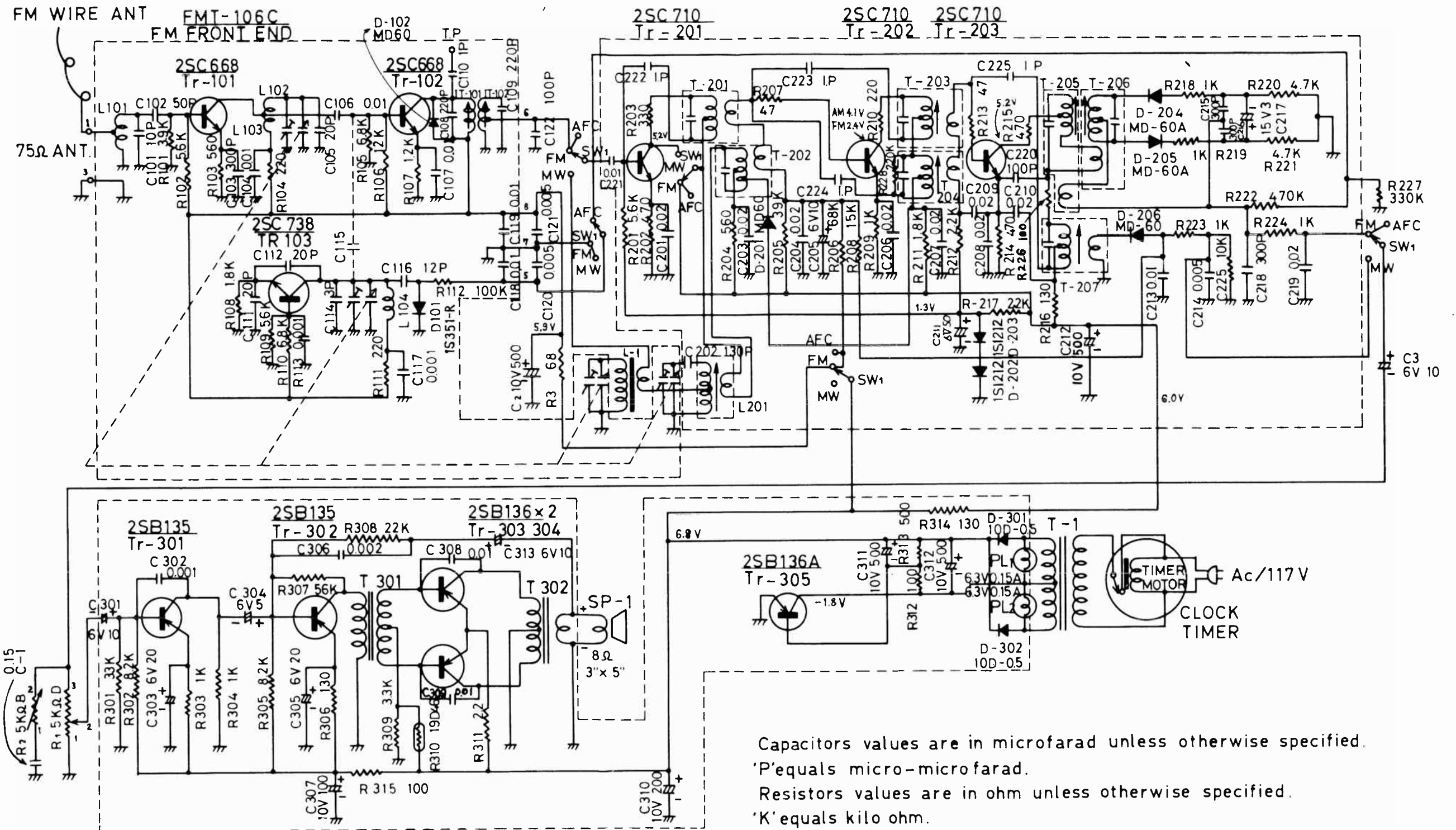


AF STAGE (BOTTOM VIEW)



FM FRONT END (BOTTOM VIEW)





Capacitors values are in microfarad unless otherwise specified.
 'P' equals micro-microfarad.
 Resistors values are in ohm unless otherwise specified.
 'K' equals kilo ohm.

ALIGNMENT INSTRUCTIONS

Use only enough generator output to provide a usable indication
Use an insulated screwdriver for adjustment

AM Alignment Set Band Switch (SW1) in AM Position.

Set Volume Control to maximum position
Set Signal Generator for 400% modulation

STEP	Signal Generator Coupling	Signal Generator Frequency	Radio Dial Setting	Indicator	Adjust	Remarks	STEP
1	Fashion loop of several turns of wire and radiate signal into loop of receiver	455KC (400%Mod)	Turning gang fully open.	Connect output meter across speaker voice coil.	T-202 T-204 T-207	Adjust for maximum output	1
2	"	515KC	Lower end	"	L201	"	2
3	"	1680KC	Upper end	"	TC-104	Adjust for maximum output Repeat steps 2 and 3	3
4	"	600KC	600KC	"	L-1	Adjust for maximum output by moving Ant. Coil (L-1) along ferrite core.	4
5	"	1400KC	1400KC	"	TC-103	Adjust for maximum output. Repeat steps 4 and 5.	5

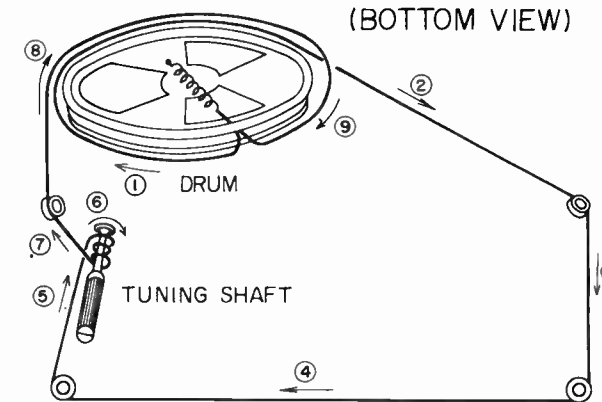
FM IF Alignment. Using Sweep Generator and Oscilloscope. Set Band Switch (SW1) in FM Position

STEP	Signal Generator Coupling	Sweep Generator Frequency	Radio Dial Setting	Indicator	Adjust	Remarks	STEP
6	High side to FM FRONT END (TP) Low side to chassis	10.7MC (10.7MC Marker)	Point of non-interference.	Vert. amp to R1 ③ Low side to chassis	IT-101 IT-102 T-201 T-203 T-205	Turning ferrite core of T-206 anticlockwise fully. Adjust for maximum gain and symmetry of response similar to Fig. A	6
7	"	"	"	"	T-206	Adjust to place marker at center of S_2 curve as shown in Fig. B, for maximum amplitude and symmetry of response curve. Repeat steps 6 and 7 for more accurate alignment.	7

FM RF Alignment. Using FM Signal Generator.

STEP	Signal Generator Coupling	Signal Generator Frequency	Radio Dial Setting	Indicator	Adjust	Remarks	STEP
8	High side to FM FRONT END ① Low side to chassis	86.5MC	Lower end	Connect output meter across speaker voice coil	L104	adjust for maximum	8
9	"	109.5MC	Upper end	"	TC102	Adjust for maximum. Repeat steps 8 and 9	9
10	"	90MC	90MC	"	L102 L103	Adjust for maximum.	10
11	"	106MC	106MC	"	TC-101	Adjust for maximum. Repeat steps 10 and 11	11

DIAL CORD STRINGING (BOTTOM VIEW)



SEMICONDUCTORS

ITEM	PART NO./TYPE
D201	MD60/3430
D202	1S1212/3430
D203	1S1212/3430
D204	MD60A/3430
D205	MD60A/3430
D206	MD60/3430
D301	10D0.5/3430
D302	10D0.5/3430
TR201	2SC710/3430
TR202	2SC710/3430
TR203	2SC710/3430
TR301	2SB135/3430
TR302	2SB135/3430
TR303	2SB136/3430
TR304	2SB136/3430
TR305	2SB136A/3430

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R1	24R5KD40/3430	5000 ohms
R2	24R5KB40/3430	5000 ohms
R310	19D46/3430	Thermistor

COILS/TRANSFORMERS

ITEM	PART NO.
L1	MA-2328/3430
L201	MO-1310/3430
T1	PT-93C/3430
T201	IT-0234R/3430
T202	IT-0234X/3430
T203	IT-0234R/3430
T204	IT-0234Y/3430
T205	IT-0234S/3430
T206	IT-0234T/3430
T207	IT-0234Z/3430
T301	DT-1910/3430
T302	MT-2511/3430

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C2	EC10V500S/3430	500mfd 10V
C3	EC6V10B/3430	10mfd 6V
C205	EC6V10S/3430	10mfd 6V
C211	EC6V50S/3430	50mfd 6V
C217	EC15V3S/3430	3mfd 15V
C301	EC6V10S/3430	10mfd 6V
C303	EC6V20S/3430	20mfd 6V
C307	EC10V100S/3430	100mfd 10V
C310	EC10V200S/3430	200mfd 10V
C311	EC10V500S/3430	500mfd 10V
C312	EC10V500S/3430	500mfd 10V
C313	EC6V10S/3430	10mfd 6V

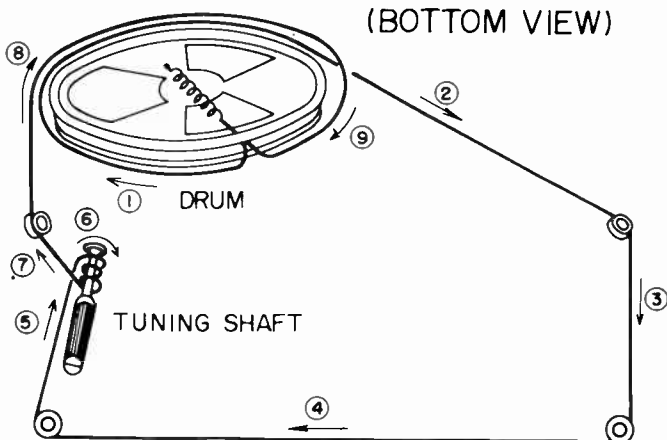
MISCELLANEOUS

ITEM	NAME	PART NO.
SP1	Speaker (3" x 5")	EP-120826C/3430
SW1	Switch, Band	RS-283-40S/3430
	FM Front End	FMT-106C/3430
	P.C. Board, IF	CIF-520U/3430
	P.P. Board, AF	CAF-521U/3430

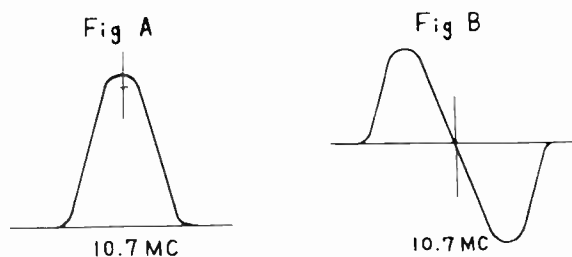
CABINET PARTS

Note: Order from Manufacturer by color and description.

DIAL CORD STRINGING (BOTTOM VIEW)



FM IF CHARACTER



ALIGNMENT PROCEDURE

The following equipments are required for alignment:

1. AM signal generator.
2. FM signal generator.
3. Vacuum tube volt meter.
4. Sweep signal generator (10.7MHz ±300kHz) with 10.7MHz marker signal (Ext. marker may be used).
5. Oscilloscope.
6. Test loop, a coil of any size wire, one turn or more.

NOTE:

During alignment keep the signal generator output at the lowest level that will maintain a usable output from the set.

- Generator modulation (FM) (Other than IF alignment) 30%, 400Hz
- Generator modulation (AM) 30%, 400Hz
- Ground connection of signal generator chassis ground

MW ALIGNMENT

Step	Generator Connection	Generator Frequency	Band	Position of Tuning Gang	Meter Connection	Adjustment	Remarks
1	Test Loop	455kHz	MW	Fully clockwise.	Across voice coil of speaker.	IT6, IT7, IT8	Adjust for maximum.
2		525kHz		Fully counter-clockwise.		L6	Same as step 1
3		1605kHz		Fully clockwise.		CT1-4	Same as step 1.
4	Repeat step 2 and 3 until maximum is attained on both ends.						
5	Test Loop	600kHz	MW	Turn tuner for Maximum signal.	Across voice coil of speaker.	L5	Same as step 1.
6		1400kHz				CT1-3	Same as step 1.
7	Repeat step 5 and 6 until maximum is attained on both ends.						

FM IF ALIGNMENT

Generator Connection	Generator Frequency	Band	Position of Tuning Gang	Oscilloscope Connection	Adjustment	Remarks
Connect sweep Generator through 10PF to TP-2 Figure 4, 5 and schematic diagram	10.7MHz Center Freq. with 10.7MHz Marker.	FM	Fully clockwise.	Connect to TP-3. Figure 4, 5 and schematic diagram.	IT1, IT2, IT3, IT4, IT5	Adjust for ratio detector "S" Curve as shown figure 4.

FM RF ALIGNMENT

Step	Generator Connection	Generator Frequency	Band	Position of Tuning Gang	Meter Connection	Adjustment	Remarks
1	FM Generator to TP-1 directly	87.4MHz	FM	Fully counter-clockwise	Across voice coil of speaker.	L4	Adjust for maximum.
2	Same as step 1.	109MHz		Fully clockwise.		CT1-2	
3	Repeat step 1 and 2 until maximum is attained on both ends.						
4	Same as step 1.	90MHz	FM	Turn tuner for maximum signal.	Across voice coil of speaker.	L2	Adjust for maximum.
5		106MHz				CT1-1	
6	Repeat step 4 and 5 until maximum is attained on both ends.						

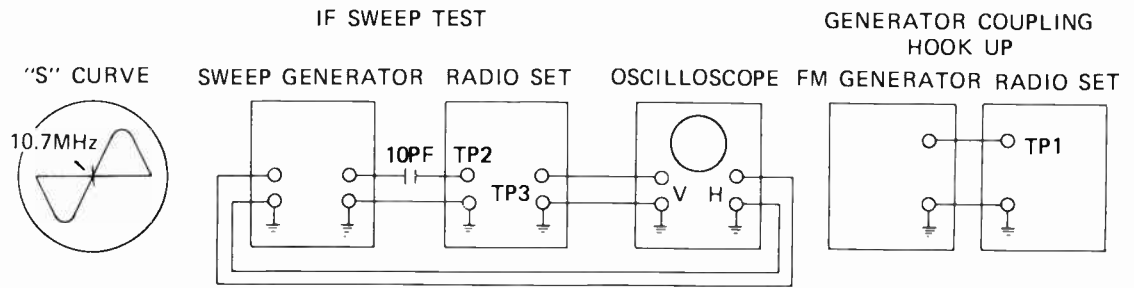
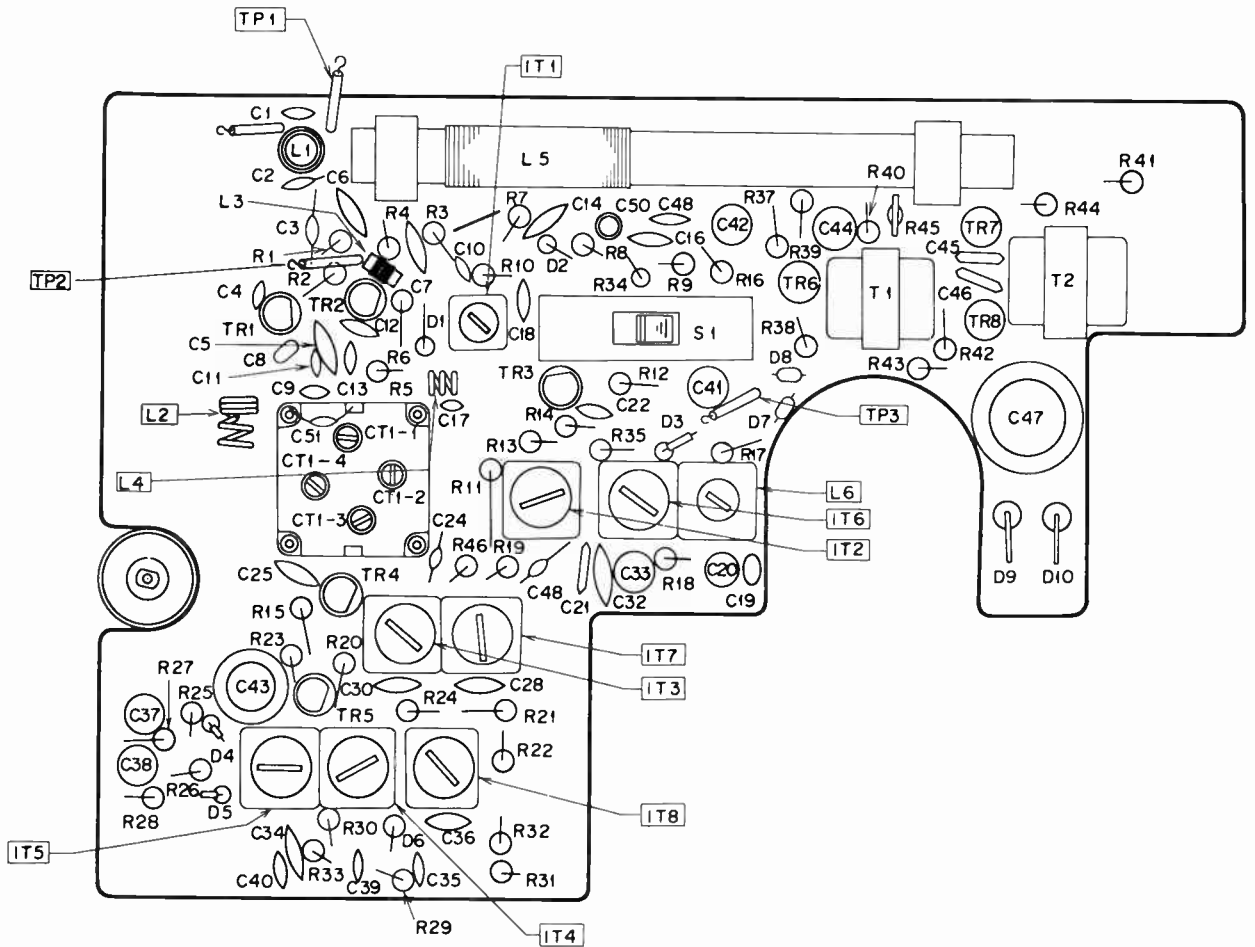
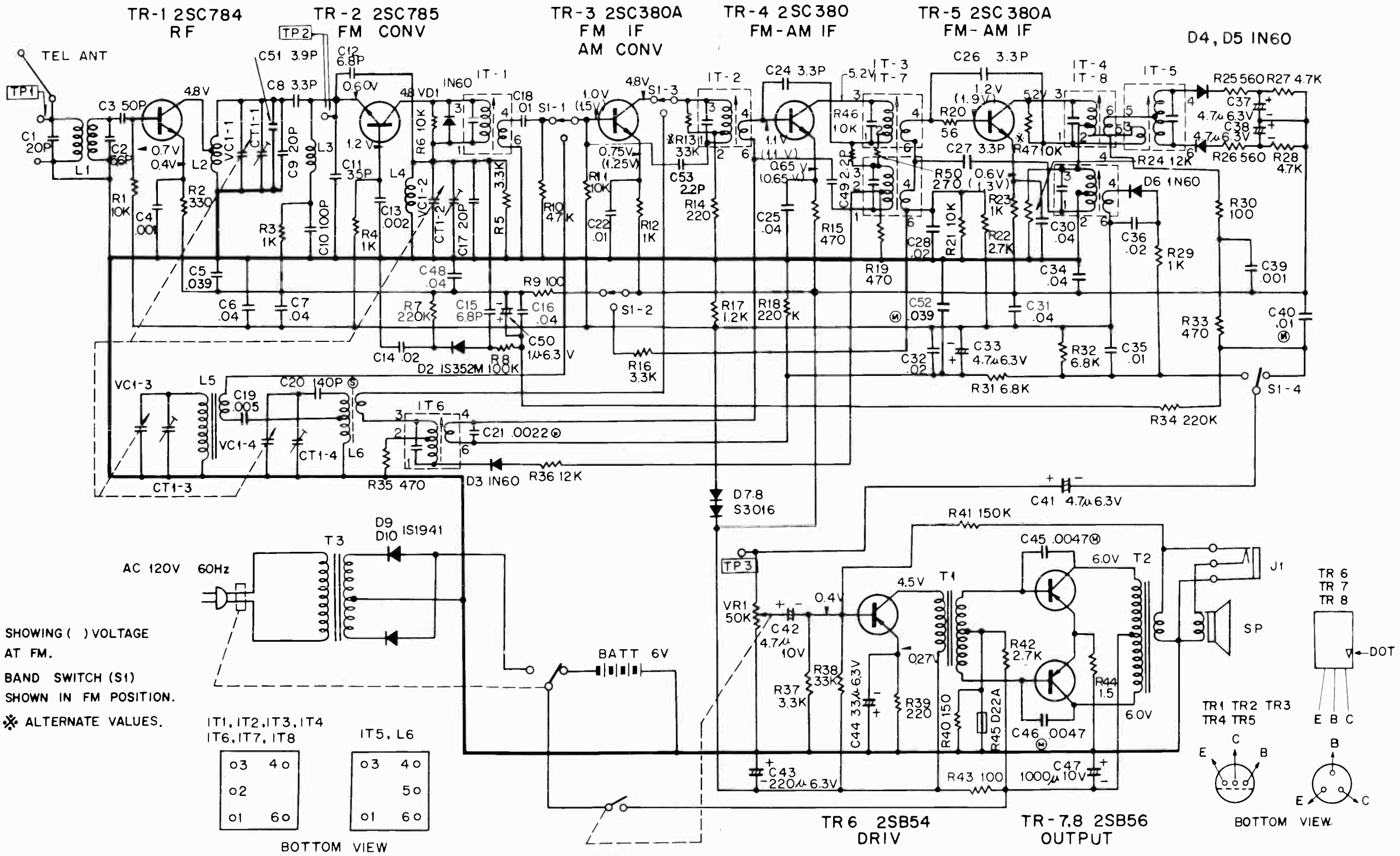


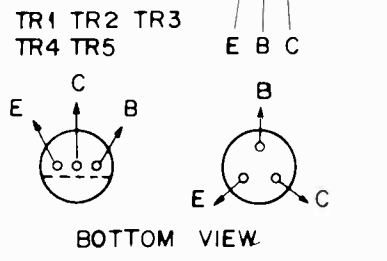
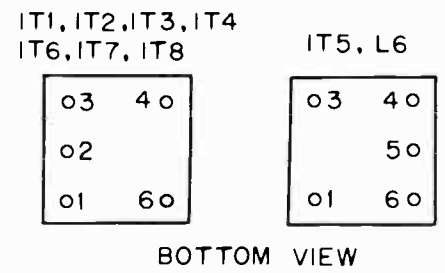
FIGURE 4. FM IF AND RF TEST SET-UP

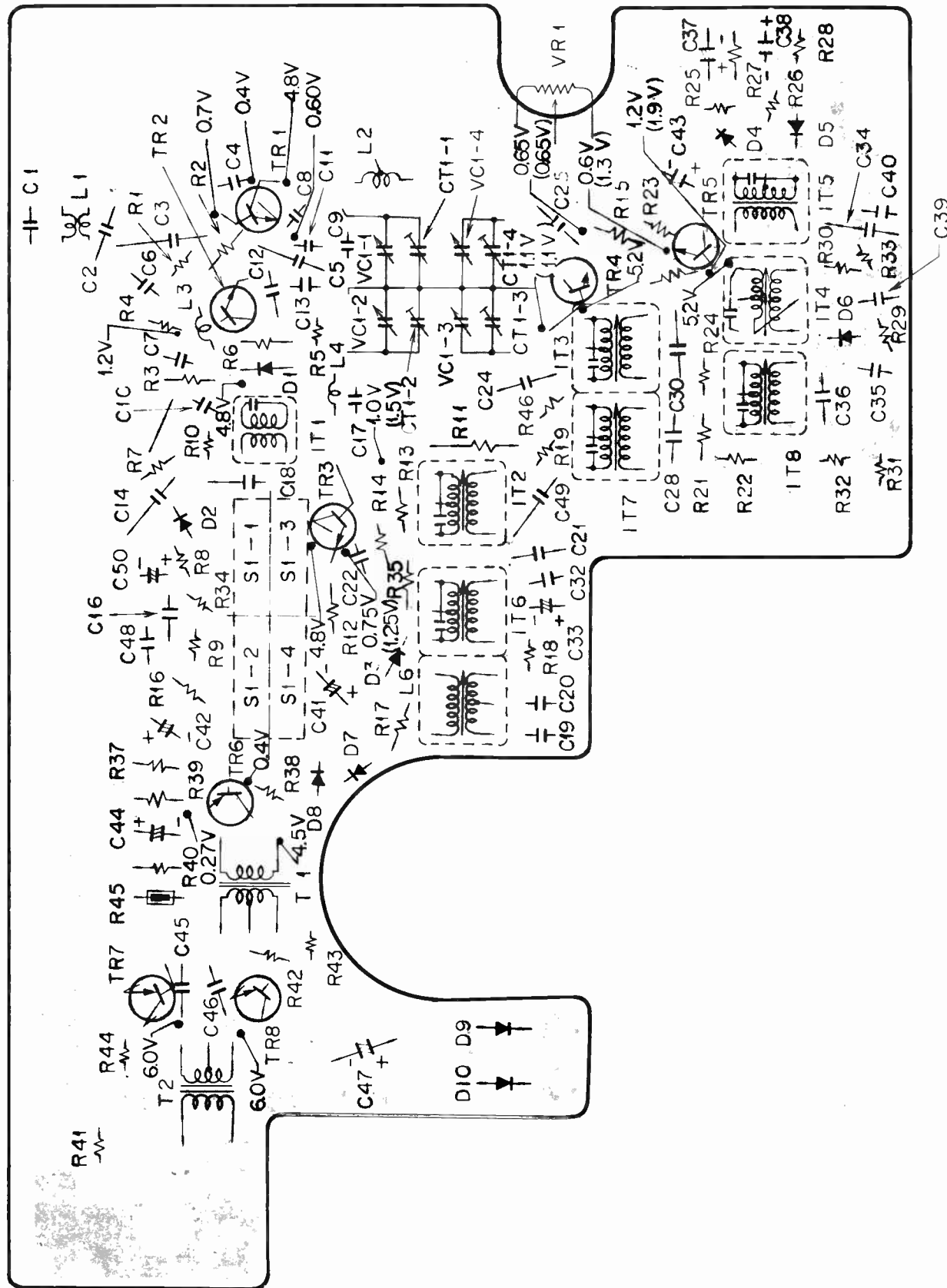


TOP VIEW OF CHASSIS



SHOWING () VOLTAGE AT FM.
 BAND SWITCH (S1) SHOWN IN FM POSITION.
 * ALTERNATE VALUES.





BOTTOM VIEW OF CHASSIS WIRING

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	1N60
D2	1S352M
D3	1N60
D4	1N60(P)
D5	1N60(P)
D6	1N60
D7	S3016
D8	S3016
D9	1S1941
D10	1S1941
TR1	2SC784
TR2	2SC785
TR3	2SC380A
TR4	2SC380
TR5	2SC380A
TR6	2SB54
TR7	2SB56
TR8	2SB56

COILS/TRANSFORMERS

ITEM	PART NO.
IT1	2226534000
IT2	2226516600
IT3	2226516600
IT4	2226714500
IT5	2226717600
IT6	2226416700
IT7	2226416700
IT8	2226614900
L1	2229201500
L2	2229416000 (2229421000)
L3	2229100900
L4	2229421100
L5	2224233000
L6	2229519300
T1	2221423700
T2	2221619200
T3	2221356200

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C33	2244249700	4.7mfd 6.3V
C37	2244249700	4.7mfd 6.3V
C38	2244249700	4.7mfd 6.3V
C41	2244249700	4.7mfd 6.3V
C42	2244249700	4.7mfd 6.3V
C43	2244222100	220mfd 6.3V
C44	2244233000	33mfd 6.3V
C47	2244310200	1000mfd 10V
C50	2244210900	1mfd 6.3V
VC	2230825500	Tuning Gang

MISCELLANEOUS

ITEM	NAME	PART NO.
S1	Switch, Selector	2214521900
SP	Speaker	2215125700
	Antenna, Telescopic	2212418200
	Earphone	2215205000

CABINET PARTS

NAME	PART NO.
Assembly, Cabinet Front	2282168100
Assembly, Cabinet Rear	2282252700
Assembly, Battery Cover	2282252800
Assembly, Handle	2282851300
Bracket, Handle	2275457200
Knob, Volume	2283529300
Knob, Tuning	2283529400
Knob, Selector	2283453900
Pointer, Dial	2274155400

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R44	2254415900	1.5 ohm 10%
R45	2269100100	Thermistor, D22A
VR	2262602100	50K Volume

ALIGNMENT

Equipment Required

1. RF Signal Generator
2. Electronic Voltmeter
A.C.V.T.V.M.

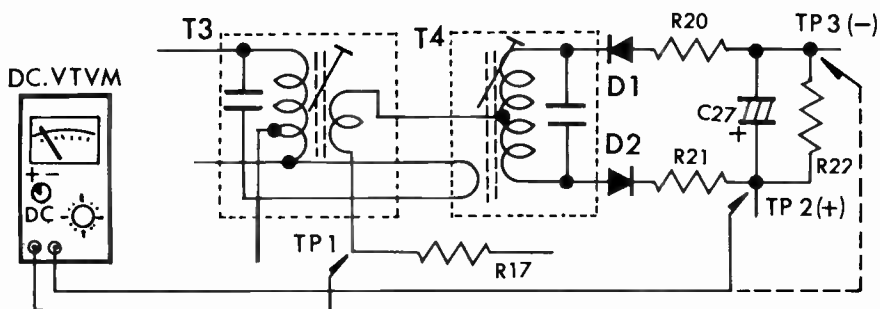
General

1. Signal input must be as low as possible to avoid overload and clipping.
(Use highest sensitivity of output indicator)
2. Volume control at maximum.
3. Standard modulation is 400 Hz at 30%.
4. Connect 8 ohm dummy load across voice coil.

Step	Connect Signal Source To-	Connect Output Indicator To-	Set Signal Generator To-	Set Radio Dial To-	Adjust -	Adjust For -	Step
Set Function Switch to AM							
1	Loop of several turns of wire connected across gen leads. Place loop close to the AM antenna.	A.C.V.T.V.M. across voice coil	455 KHz (AM Mod.)	Tuning gang closed	T5 T6	Maximum output on V.T.V.M.	1
2			515 KHz (AM Mod.)	Tuning gang closed	L7		2
3			1680 KHz (AM Mod.)	Tuning gang open	TC4		3
4	Repeat Steps 2 and 3 for optimum sensitivity						4
5	Same as above	A.C.V.T.V.M. across voice coil	600 KHz (AM Mod.)	Tune for signal	L6	Maximum output	5
6			1400 KHz (AM Mod.)		TC3		6
7	Repeat Steps 5 and 6 for optimum sensitivity						7

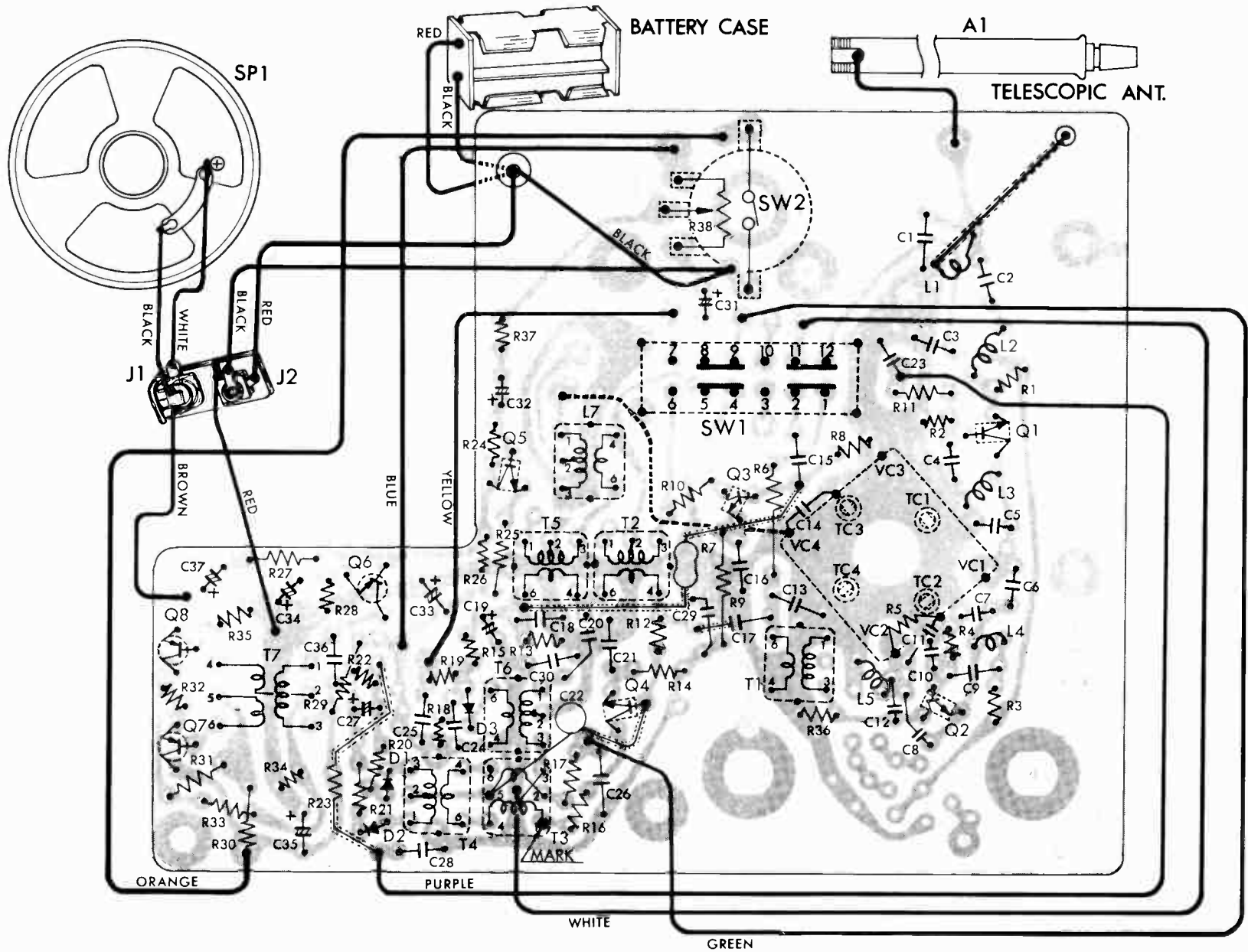
Set Function Switch to FM							
1	Place gen. leads across FM ant. terminals	A.C.V.T.V.M. across voice coil	10.7 MHz (FM Mod.)	Tuning gang closed	T1 T2 T3	Maximum output on V.T.V.M.	1
2		D.C.V.T.V.M. across TP ₁ : TP ₂ , TP ₃ (See note)	10.7 MHz (FM Unmod.)		T4	Adjust T4 so that voltage read between TP2 and TP1 is equal in amplitude but opposite in polarity to voltage read between TP3 and TP1. (See Diagram below.)	2
3	Repeat Steps 1 and 2 for optimum sensitivity						3
4	Same as above	A.C.V.T.V.M. across voice coil	87.0 MHz (FM Mod.)	Tuning gang closed	L5	Maximum output on V.T.V.M.	4
5			109.5 MHz (FM Mod.)	Tuning gang open	TC2		5
6	Repeat Steps 4 and 5 for optimum sensitivity						6
7	Same as above	A.C.V.T.V.M. across voice coil	88 MHz (FM Mod.)	Turn for signal	L3	Maximum output on V.T.V.M.	7
8			108 MHz (FM Mod.)		TC1		8
9	Repeat Steps 7 and 8 for optimum sensitivity						9

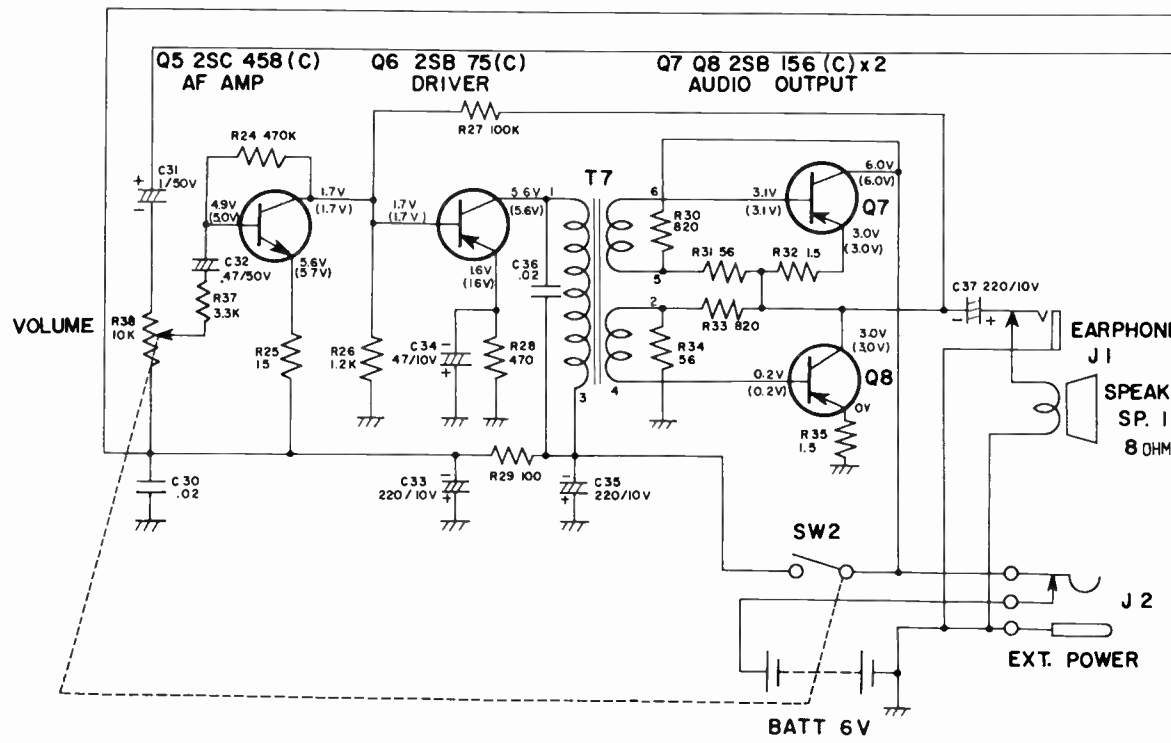
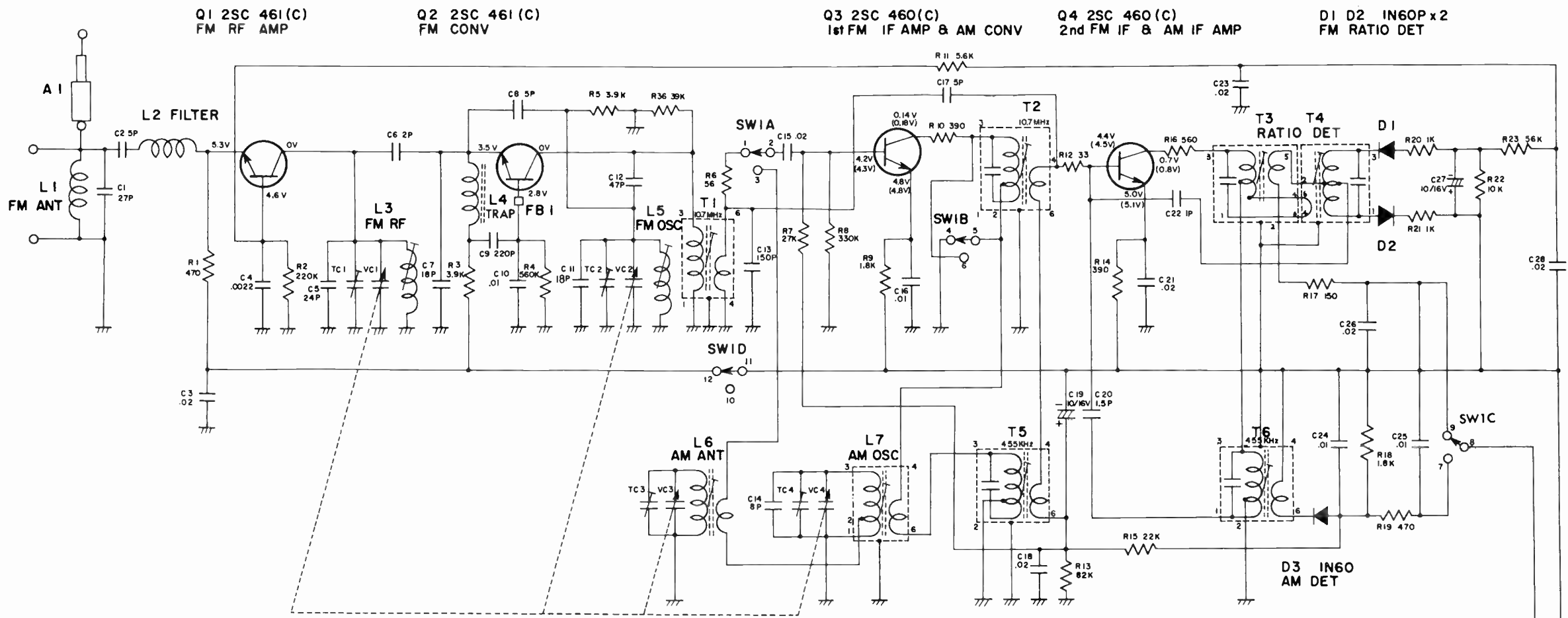
NOTE



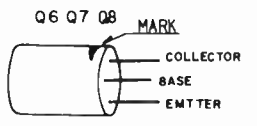
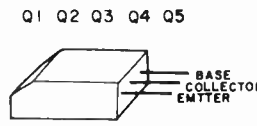
FM IF ALIGNMENT TEST POINTS

BOTTOM VIEW OF PC BOARD

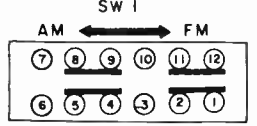




TRANSISTOR CONNECTION

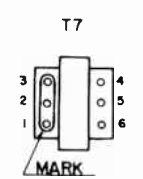
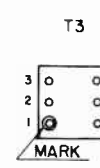
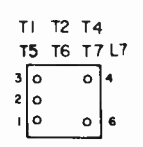


BOTTOM VIEW SW 1

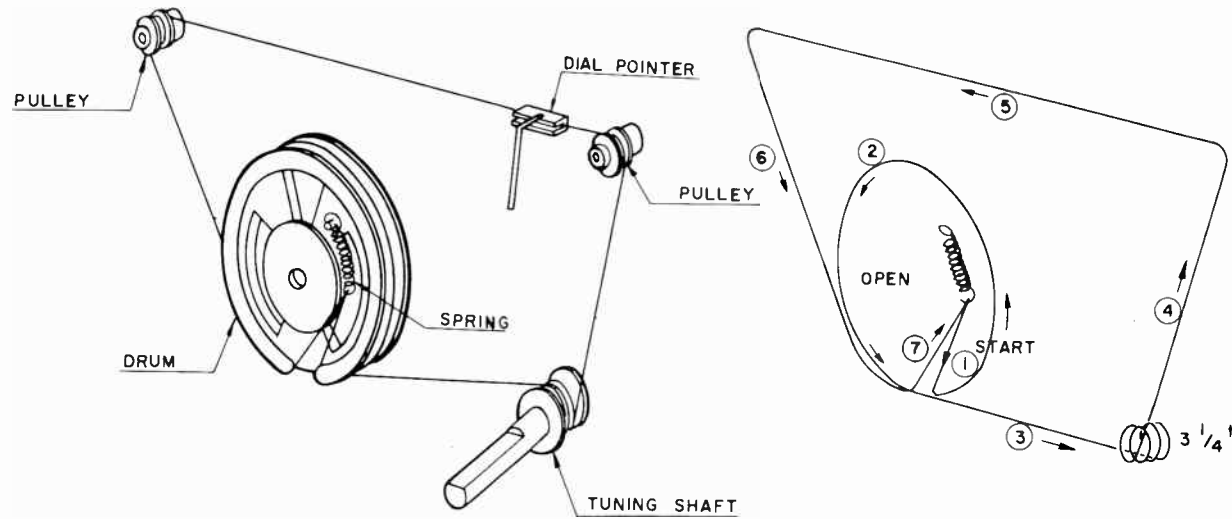


NOTES.

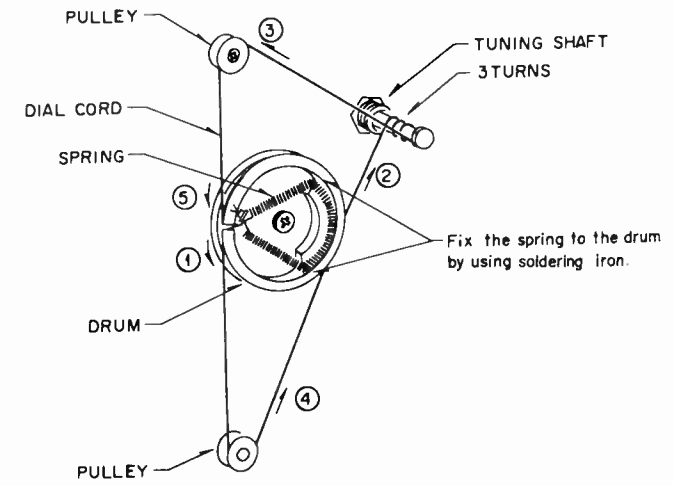
1. BAND SELECTOR SWITCH SW1 IS IN FM POSITION.
2. ALL RESISTANCES ARE ± 5%, 1/4W, UNLESS NOTED OTHERWISE, VALUES ARE IN OHMS. K=1000, M=1000K
3. ALL CAPACITANCE VALUES ARE IN MF UNLESS OTHERWISE SPECIFIED.(EXCEPT ELECTROLYTICS) P= MMF
4. VOLTAGE READING TO COMMON GROUND (+) ARE MESURED WITH VTVM UNDER NO SIGNAL.
5. VOLTAGE MARKED WITH () ARE MESURED IN AM POSITION.



DIAL CORD STRINGING



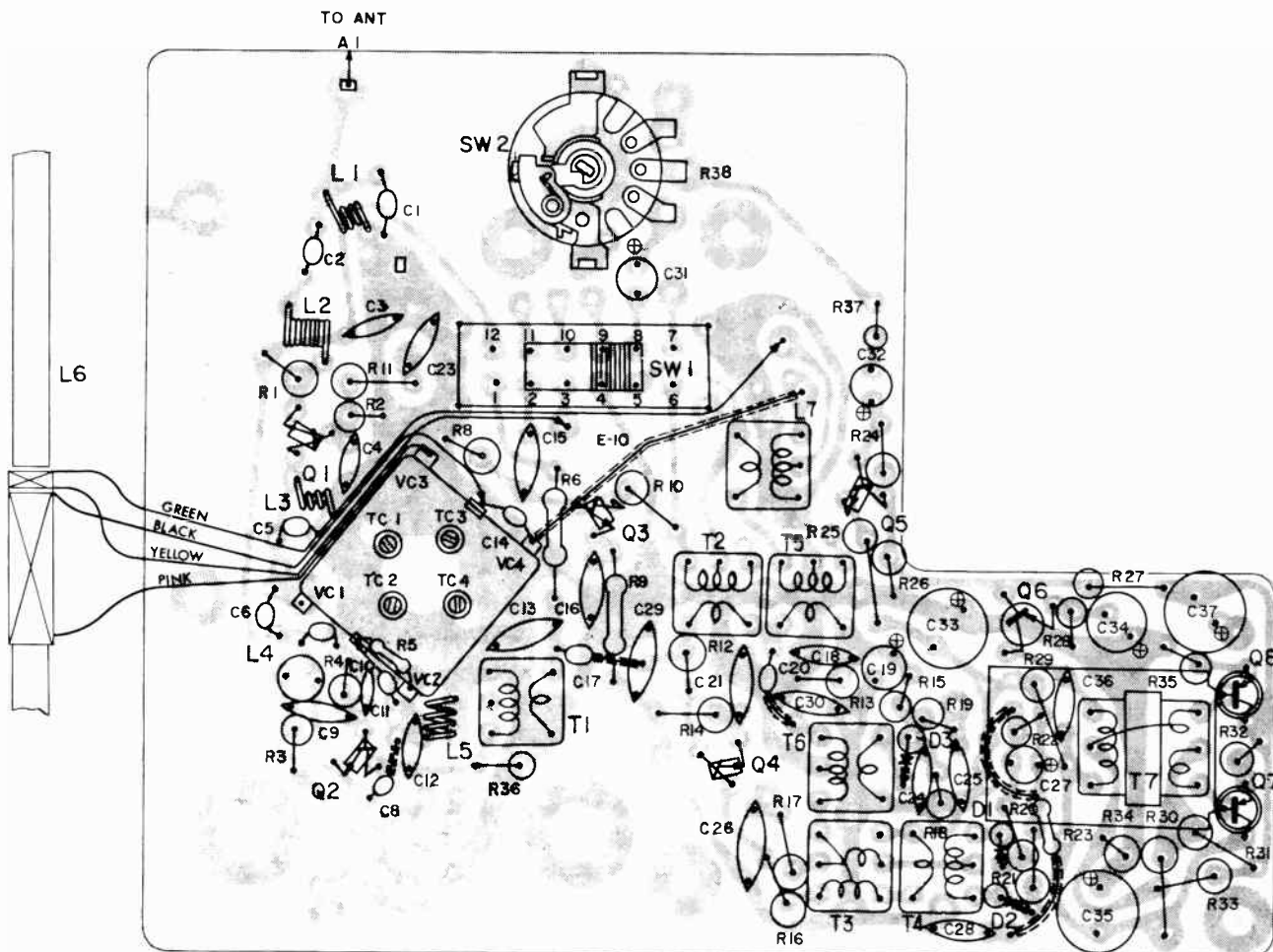
Overall length of dial cord is approximately 18 1/8 inches.
Start stringing with Gang in open position.



DIAL CORD STRINGING

1. Set the tuning capacitor to the maximum capacitance (fully counterclockwise).
2. Wind the dial cord in the numerical sequence indicated

TOP VIEW OF PC BOARD



SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	24MW820	1N60(P)
D2	24MW820	1N60(P)
D3		1N60
Q1	24MW1081	2SC461C
Q2	24MW1081	2SC461C
Q3	24MW1082	2SC460C
Q4	24MW1082	2SC460C
Q5	24MW458	2SC458C
Q6	24MW1083	2SB75C
Q7 & Q8	24MW1084	2SB156C*

* Matched Pair

COILS/TRANSFORMERS

ITEM	PART NO.
L1	61MW993
L2	61MW789
L3	61MW758
L4	61MW759
L5	61MW991
L6	61MW248
L7	61MW992
T1	62MW571
T2	62MW692
T3	62MW693
T4	62MW664
T5	62MW694
T6	62MW695
T7	11MW375

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C19	32MW909	10mfd 16V
C27	32MW909	10mfd 16V
C31	32MW910	1mfd 50V
C32	32MW911	.47mfd 50V
C33	32MW912	220mfd 10V
C34	32MW913	47mfd 10V
C35	32MW912	220mfd 10V
C37	32MW912	220mfd 10V
VC	35MW406	Tuning Gang

MISCELLANEOUS

ITEM	NAME	PART NO.
SW1	Switch, Band	12MW378
	Antenna, Telescopic	60MW249
	Earphone	63MW221
	Speaker (3-1/2", 8 ohms)	10MW141

CONTROLS

ITEM	PART NO.	DESCRIPTION
R38	25MW535	10K Volume

CABINET PARTS

NAME	PART NO.
Cabinet Front, Ass'y	98MW696
Cabinet Back, Ass'y	98MW697
Cover, Battery	18MW430
Handle, Ass'y	70MW502
Dial Pointer	45MW106
Knob, Volume	50MW752
Knob, Tuning	50MW752

INDEX

THIS INDEX LISTS ALL TRANSISTOR RADIOS APPEARING IN "SERVICING TRANSISTOR RADIOS",
"PHOTOFACT TRANSISTOR RADIO SERIES", AND "SAMS TRANSISTOR RADIO" VOLUMES.

KEY → (EP) Early Productions		(LP) Late Productions		(SN) Serial Number		(REV) Revised					
ACME	VOL.	ADMIRAL (CONT.)	VOL.	AIRCADLE	VOL.	ALLIED (CONT.)	VOL.	ARVIN (CONT.)	VOL.	ARVIN (CONT.)	VOL.
CH-610	16	PRF131	118	AF-1408	116	24SC075	56	65R79	59	1.50401	120
CH-620	16	PRF157	115	AF-1506	117	24SC080	52	65R98	45	1.50501	114
ADMIRAL		PRF771	140	PV-456	113	24U0265	81	66R29	66	1.54201	113
CHASSIS		PRMS81	143	RP-1027	127	1053	51	66R39	68	1.54301	114
		STPF841	138	TEN-1505	96	1908	81	66R58	67	1.54501	115
		TP360	122	TR-1204	102	2436	93	66R69	70	1.55401	125
4P2	1	Y741R	103	TR-1300	83	2540	96	66R78	73	1.56401	117
5E5/A/B	8	Y793/797/798	8	TR-1500	95	2671	95	67R09	69	1.57501	126
5F5	6	Y811R/13R	97	TR-1500N	109	2680(10-4113S)	104	67R19	82	1.61601	18
5J4	122	Y821	8	TR-1504	114	2684	110	67R29	81	1.61701	17
5W4	4	Y822	8	TR-1504N	117	2684 (Rev.)	118	68R05	89	1.62201	19
6M3A	20	Y831R	111	TRS-25/-27	129			68R89	87	1.62402	21
6M3N/NA	28	Y847R	113	GGF736	96	ALPHA		70R13-17/-18/		1.66101/02	22
6M3N (L.P.)	46	Y851R	110	18J15	119	-19	114			1.66401	24
6S2	3	Y907R	113	136F1	93	Q-62	16	70R22-17	123	1.66402	27
6T2	5	Y909A/B	41	136-F6	126			70R22-29	126	1.66502	26
6V3	25	Y1009A	74	162-F1	133	AMBASSADOR		70R24-19	146	1.66601	24
7A2	11	Y2009/11/12/13/		100S-J-200	98	A-155/-884	50	70R55-19	115	1.66801/.69401	25
7B2/B	12	23/27/28	1D	1505H	92	A-1064	52	70R76-19	136	1.73401	27
7B2C/D	24	Y2061/63/67/68	11	1505-V	96	FM-10	54	70R78-19	148	1.75001/101	31
7D2	46	Y2081/82/83	12	9675-12	96	MBE-12	85	70R85-12	147	1.80601	34
7K1	29	Y2081A/82A/83A	24	AIR CHIEF		MBE-14	86	77R19	75	1.80602	41
7L1, 7M1	1	Y2091/93/98	13	3-V-80	25	PAF29	139	77R29	79	1.80602 (L.P.)	73
7P1	7	Y2101/02/08	12	4-C-55	40	PMB70	140	78R09	89	1.81601	36
7Q1	6	Y2119	46	4-C-66/-69	30	TPR-561/-564	53	78R39	99	1.82001/.83101/	
7V1/A/8	10	Y2127/37	16	4-C-82/-83	64	1065	67	78R88/R89	104	201	48
8A2	13	Y2137C	38	4-C-88	62	1565	68	80R23-17	116	1.84701	44
8A4	72	Y2212/23/26/29	20	4-C-89	63	6065, 8065	67	80R35-19	116	1.85301	41
8A4 (Rev.)	83	Y2252/53/56	24	4-C-90	62	9065	69	80R44-19	109	1.85401	45
8B3N	48	Y2271/72/73,		4-C-92	75	AMC		80R45-19	114	1.88101	52
8B4	72	Y2301GPN/03GPN/		4-C-96/-97	63	AMCTF125	64	80R47-19	117	1.88401	58
8C2	16	07GPN	28	4-C-100	62	TP-148	117	80R55-18	120	1.88501	59
8C2C	38	Y2311/12/19	29	4-C-101/-102	63	87R16/52	30	80R65-19	112	1.90001	57
8C3N	50	Y2321/23/27	28	AIRLINE		700	125	80R77-18	110	1.90101	70
8C4	74	Y2332/33/38	25	(See Wards)		87R59	81	86R19	79	1.90801	66
8D2	16	Y2351/2371	29	AIWA		87R79	79	86R29	68	1.90901	67
8F2	28	Y2411GP/13GP/		AR-102	38	90R33-13	107	87R59	81	1.92701	60
8F3	62	21GP/23GP	36	AR-111	39	2598	7	87R79	79	1.93301	70
8G2	29	Y2451N/61N	40	AR-112	79	3588	4	90R33-13	107	1.94101	73
8H1N	51	Y2531GP/37GP/		AR-113	39	7595	6	2598	7	1.96101	68
8K1	4	39GP	50	AR-115	37	8576	2	3588	4	1.96901	79
8K2-1N/-2N/-3N	36	Y2542/43/49	46	AR-116	55	8584	3	7595	6	1.97001	68
8L1	4	Y2557	48	AR-117	39	9562	2	8576	2	1.97701	69
8L5	138	Y2577	50	AR-122/-123/-125	56	9574P	1	9562	2	1.99701	75
8M1	6	Y2587	51	AR-126	59	9577	1	9574P	1	1.99801	79
8S1/A	5	YD101GP/07GP/		AR-128	79	9594	8	9577	1	1.99901	81
8S1C	9	09GP	60	AR-142/II	142	9594	8	9594	8	1.99902	116
8T1/A	8	YD102GP/GPA/		AR-162	148	9598	6	9598	6	ASTROTONE	
8V1	7	202GP/GPA	66	AR-165	143	9598	6			99-3513L	59
9G1	10	YD242/243	62	AR-232	60	ARVIN					
9G1A/B/C	41	YD257	65	AR-666	75	15R75,55R47/48	48				
9M1	60	YG171	72	AR-670	37	28R29	105				
9Y1, 9Y1A	136	YH301GP/02GP/		AR-751	54	30R86-19	121				
10A3	84	312/13	72	AR-752	77	53Y25-16	125				
10B2	73	YH321/331GP	73	AR-852	37	60R23-15/-16/-19	113				
10B3	85	YH347	74	AR-853	38	60R23/28/29	10				
10C2	74	YH351/361	75	AR-854	39	60R33/35/38/47/49/					
10C2A/C3	88	YH371/GP	74	AKKORD		58	11				
10F1N	40	YK201GP	83	Penguin U60	13	60R63/69/73/79	12				
10F3	87	YK211GP/12GP	84	ALADDIN		60R75-19	101				
10G1N	50	YK221GP/23GP	85	AL65	17	61R13/16/19/23,					
10G2	116	YK237	88	AL80	19	61R26/29	17				
10G3	97	YK301GP/07GP	87	ALARON		61R35/39	18				
10H3	112	YK311	88	B-666	31	61R48/49	19				
10J1	65	YK327	89	EC3280	38	61R58	21				
10J3	111	YK331	87	FAK-113	35	61R61/64/65/69/					
10T1	103	YK341	89	TR-709	33	79/95/99	22				
11W1	29	YK351	91	TRN-DX	52	62R09	24				
11H1/J1	75	YK361A	137	TRN-1210	54	62R13/16/19/23/					
12E2	89	YK367	95	UR-300	35	26/29	26				
12H1	72	YK367A	137	UR-701	43	62R35/39	25				
12J2	113	4P21/22/24/28,		ALLIED		62R48/49	24				
13B1	87	7L12/14/16/18,		TR-1053	40	62R48/49	27				
13C1	89	7M12/14/18	1	10A4034S	85	62R65/69	22				
13D1	91	221/37	4	10B4362X	95	62R98	25				
13E4	110	521/28	5	10B4370S	96	63R38/58	31				
13C1	74	531/37	4	10B4516S	93	63R88	36				
13H1	113	561/66	5	24SC062	40	63R98	37				
13K1	118	581/82	4			64K03	41				
15B4 (EP)	95	691/92	8			64R29	44				
15B4 (LP)	137	703/08	7			64R38	36				
15J4	143	711/17	8			64R78	34				
17B4	115	739/42/43	6			64R78	41				
17E4	140	751/57	7			64R78 (L.P.)	73				
Models		801/02/08	6			65R03	57				
		811	5			65R03-1	70				
		811B	9			65R29	52				
PRF111	136	816	5			65R58	60				
PRF121	116	816B	9			65R69	58				
		909	10								

BRADFORD (CONT.) VOL.	CHANNEL MASTER (CONT.) VOL.	CONTINENTAL (CONT.) VOL.	DELMONICO (CONT.) VOL.	EMERSON (CONT.) VOL.	GENERAL ELECTRIC (CONT.) VOL.
2053030	6238	TR-100	TR-7C	988 Rambler	P755A/60A/61A
(WTC-60939)	6246	TR-182	TRS-6	991	P765A,66A/B
2067C10	6247	TR-200	7TA-2	999	P770A/71A/76A
2604C31	6252A	TR-208	7TH-1		P780A/B
(WTC-53652)	6459	TR-215	7YR707	Chassis	P780H
2953D42	6466	TR-300	8TR8, 9FM190	120309/14/28	P784A
	6468	TR-613	10FM-190	120350	P785A/86A/87A
BRENTWOOD	6469	TR-630	10TR10	120374	P790A/91A/B
	6474	TR-632	DEWALO	120374	P795C
MB-800	6475	TR-660/-661/-668/-680	K-544/-701A/02B	120416	P7950/96C/0
MB-1500	6476	TR-682	L-414	120457	P797C
	6477	TR-683	L-546	120472/85	P797D
BULOVA	6479	TR-716	L-703	120486	P798C
	6500	TR-716 (Rev.)	DUMONT	120510	P7980
C430/32	6501/02	TR-751	RA-902	120528	P800A
132/34/36/37	6502 (Rev.)	TR-801	900	120598	P805/06
260/70 Series	6503/04	TR-814	Chassis	120655	P807B/07E
662/63/72/73/75/76	6505	TR-823	120486	120664/L	P807G/07H
681/82/83/85	6506	TR-862/63/69/75	EICO	120713	P807J
715/18	6507	TR-884	RA-6		P807S/T
742/43/45/46	6508 (Rev.)	TR-1066	ELECTRO-BRANO	EVER-PLAY	P808B/E
782/85/86	6509	TR-1067	1255	100	P808G/H
792/93/95	6510	TR-1085	1466	1836A	P808J
810/12	6511 (Rev.)	150	ELECTRONICS GUILD	2836A	P808S/T
832/33/36	6512	160	E-1000		P809E
840 Series	6512-2	CORONADO	ELECTROPHONIC (See Morse/Electrophonic)		P810A/11A
850/52/55/56	6514	RA44-9914A	ELGIN	CPR-7	P815A/16A
860 Series	6515	RA44-9915A	R-800	FAIRCREST	P820A
870/72/73/75/76	6516	RA48-9898A	R-1000/A	1094	P820C
880 Series	6517	RA48-9899A	R-1000B/C	1670	P821A
890 Series, 892/93/95	6518	RA48-9903A	R-1100	1982	P821C/22C
1002/03/06	6519	RA48-9905A	R-1200	2091	P830A
1010/12/13	6520	RA50-9900A	R-1300		P830E
1022/23/25/26	6521	RA50-9902A	R-1400		P831A
1042/52/53/56/62/63/66, 1102/03	6522	RA50-9908A/-9909A	R-1500		P831E/32E
1110 Series	6523	RA60-5232A	R-1550		P840A
1150/52/53	6524/26	RA60-9879A/85A	R-1600		P845A
1170/72/73/76	6527/28/31	RA60-9889A	R-1650		P850B/C
1180/82/88	6560	RA60-9891A	R-1700		P8500
1200	6561	RA60-9917A	R-1750		P850E
1209	6562	RA60-9922A	R-1800		P851C
1270/72	6562-2	RA60-9925A/30A	R-1850		P851D
1430/32/33	6562	RA60-9930B	R-1900		P855A
1460/62/63/64	6562	RA60-9940A	R-2100		P860A/B/D
1470/72/73/76	6562	RA60-9941A	R-2200		P860E/F
1480/82/88	6562	RA60-9943A	R-2500		P865A
1490/92	6562	RA60-9945A	R-3100		P870A
1550/52/58	6562	RA70-9948A	R-3300		P871A
1570/72/73/76/80/82/88	6562	RA70-9949A			P875A
1610, 1612	6562	RA75-5235A			P880A/B/81A/B
1640, 1642	6562	RA75-5249A			P885B
1660	6562	RA75-5249A			P891A
1662, 1663	6562	RA75-5249A			P895A1/A2/B1/B2/C1/C2/O1/D2/E1/E2/E3/E4/H/K
1670/72/73	6562	RA80-5250A			P895F/G/J/L/M
1681/82/83/85	6562	RA80-5259A			P905A
1690/92/98	6562	(43-5259)			P910A1/A2/B1/B2/C1/C2/D1/D2/E1/E2/E3/E4/H/K
7822/55/66	6562	2011			P910AA
8200 Series	6562	2318			P910F/G/J/L/M
					P911AA
CALRAD	CLAIRTONE-BRAUN	CORVAIR	EMERSON	FALCON	P911F/G/J/L/M/12F/G/J/L/M/13F/G/J/L/M
60A183	T-4	9T-641	31P50	6THK, 8THK	P914AA
CAMEO	T22C	10PL62, 10SK93	31P53	TRB-611	P914AA
64N09-3	T-23		31P54	TRS-701	P915A/B
64N09-3	T523		31P55		P915C/D
CANDLE	TR-605		31P56	FUTURA	P915E/16E/17E
PTR-60S	46-050		31P57/58	111, 222	P916A/B
VM-1210	46-070		31P60	250	P916C/D
CAPEHART	46-090		31P61	366	P917A/B
T6-202	46-300		31P62	1051	P917C/O
T6-203			31P63		P920A
T7-S200			31P64		P925A/B/30A
T8-201			31P67		P940A
CARAVELLE	CLARICON		31P68		P940C
5002/03	TR-605		31P71		P943A/B
CARTAPE	46-050		31P75		P943C
PT-8	46-070		31P77		P945A
CHANNEL MASTER	46-090		31P78		P945B/46B
6201	46-300		31P79S		P955A
6202			555		P955C
6205			555V		P955E
6208			707		P965A
6232			842		P968A
6233			844/47/55		P970A
6237			868/69		P970F
			888		P975A
			888 Atlas, 888		P975B/C
			Explo'er		P975D
			888 Galaxy		P975E
			888 Titan		P977A, P977B
			888 Transimer/II/Vanguard		P977E
			899		P990A
			911		P995A/96A
			977		P1700A
					P1710A/11A

GENERAL ELECTRIC VOL. (CONT.)	GOLDEN SHIELD VOL.	HITACHI (CONT.) VOL.	ISCO VOL.	LAFAYETTE (CONT.) VOL.	LLOYD'S (CONT.) VOL.															
P1715A/16A/30A/ 31A, P1715A-1/ 17A-1 80 P1720A/B/C, 21A/ B/C, 25C, 85 91 P1730B/31B 85 P1760A/61A 89 P1770A/71A 92 P1785 147 P1790, P1791 141 P1800A/01A/02A 59 P1805A 65 P1805B/C/07A 88 P1810A 65 P1811C 99 P1815A 59 P1819A 85 P1820A 59 P1820K 85 P1820M 136 P1821K 85 P1821M 136 P1830A 64 P1835A/B 79 P1840A 82 P1843A/B 107 P1847A 140 P1851A/58A 98 P1861B/64A 110 P1870A/71A 83 P1905A 82 P1905B 84 P1905C 92 P1910A 83 P1910B 78 P1910C 93 P1920A 96 P1930A/31A 107 P1940A 143 P1950A 87 P1970A 90 P1983A 93 P1985A/86A 118 P2760A/B 122 P2807A 117 P2810A 112 P2812A 121 P2820A 121 P2835A 130 P2840B 124 P2860A 123 P2870A 127 P2880A 124 P2900A 148 P2930A 115 P2940A 142 P2950B 132 P2970A 125 P2975A 95 P4700A 127 P4700B 138 P4710A 123 P4810A 145 P4830A 138 P4920A 134 P4940A 146 P4980A 133 P7401A 48 P8501B/C/11C 17 P9001A/11A 22 P9051A 28 P9151A/B 34 P9151C/D 48 P9151E/61E/71E 79 P9161A/B 31 P9161C/D 48 P9171A/B 31 P9171C/D 48 R310A/15A 30 R475h 123 R476g 123 R577g 125 T145A/46A 47 T285A 57 T295A 55 T1205A/06A 57 T1205B/C/06B/C 60 675, 676 2 T4840A 133	2300/06/09, 2500, 2601/02/05/09, 2700/01, 2714 11 3500, 3608/09 13 7058 17	KH-970H 71 KH-1000H 52 KH-1005 25 KH-1005, KH-1005C (Serial No. 5600001 and later) 138 KH-1007M 83 KH-1021M 139 KH-1038 145 KH-1090H 107 KH-1108M 136 KH-1316W 148 KH-1326, KH-1326A 137 KS-1700H 137 KS-1710H 139 KS-1720H 141 KS-1810H 140 T-728 24 TH-600 43 TH-610 57 TH-620 69 TH-621 10 TH-627R 4 TH-640 33 TH-650 26 TH-660 19 TH-667 16 TH-680 56 TH-759 21 TH-812 33 TH-815 83 TH-841 34 TH-848 43 TH-862R 8 TH-890 52 TH-900 84 TPQ-201 119 WH-761M 15 WH-761SB 16 WH-817 20 WH-822 8 WH-822H 35 WH-829 25 WH-829M 19 WH-888R/-999 57 WH-1160 96 XH-1500 14	MSS 69 9F-220C 70 11F-314MB 77 12F-245 74	ITT 600 22 615 28 628 29 721 25 731, 871 23 881-S 24 1000 32 1005 30 1011 25 6406/08/09-A/ 09-F 38 6509 46 6521-FX 48	JEFFERSON TRAVIS JT-D210 13 JT-E212 12 JT-F211 10 JT-G104 11 JT-G200 14 JT-G204 12 JT-H105/S 15 JT-H204 13	JEWELL 10 49	JULIETTE AFS-160 100 APB-11H 101 APR-1400 101 AT-60H 64 AT-65/-85 62 AT-105 63 AT-125 64 CTP-2010 120 CTP-2076 119 DTF-150 63 FM-175 65 FPR-1240 104 FPR-1250 105 NA-1114 100 NA-1818 102 NA-1840 108 NA-5018 96 ST-1212 67 TK-1228 101 8TP-525 118	KENT TR-605 61	KNIGHT KN-2400 41 24SU2290 41	KOWA KT-31 8 KT-62A 12 KT-63 13 KT-66 12 KT-67 13 KT-81 15 KT-91 17 KTF-1/KTS-1B 14	KOYO KTR-834 49 KTR-1031 61	KROY T-880/-910 78	LAFAYETTE FS-91 12 FS-93 17 FS-112 5 FS-129 28 FS-200 8 FS-204 11 FS-223 16 FS-225 17 FS-235 22 FS-238 46	FS-243 29 FS-244 28 FS-245 29 FS-248 30 FS-251 30 FS-252/-253 32 FS-258 38 FS-278L 39 FS-279L/-280L/ -281 37 FS-284L 38 FS-305 49 Hi-Fi Deluxe 97 TR-1645 51 TR-1660 37 TR-1948 39 TR-2051 37 TR-3047 37 12KC1 77 17G0104 52 17C6905L 52 17-0101/02 62 17-4202L 77 99-3515L 72 99-3523L 94 99-3524 100 99-3526WX 105 99-3528 107 99-3530L 98 99-3534L 99	LINCOLN L640 24 TR-970 32 TR-1055 51 TR-1844/-194c 33 TR-3047 34 TR-3422 32 TR-4016 26 TR-4250 51 23SC204 24 24SC003/13 26 24SC040R/41R 33 24SC051 26 24SC052R 26 24SC053R 33 24SC054/58/79 52 4597 69	LINMARK T-40 10 T-60/-61 5 T-62 6 T-63 9 T-80 11	LLOYD'S R-84/L 39 TF-57L 38 TF-58 36 TF-96 69 TF-97 61 TF-106 57 TF-109 70 TF-110 39 TF-111 71 TF-129L 39 TF-130AC 71 TF-159 73 TF-311 57 TF-312 75 TF-911 38 TF-912 56 TF-914 57 TF-990L 51 TR-6KA 45 TR-6KB 50 TR-6L 38 TR-6P 56 TR-6T 40 TR-8KA 44 TR-8KB 54 TR-8L 38 TR-10G 69 TR-10K 57 TR-10L 38 TR-10N 54 TR-12K/L 72 TR-62 42 TR-82 70 TR-86L 58 TR-98L 39 TR-100 42 TR-103MB 45 TR-108MB 41 TRA-10 53	IN27-127A 136 2V83-138A 137 4K34 72 SK04 70 SK05 71 SK07 69 SK10 72 SN65 71 SR01 69 SR02 71 SR06 70 SR08 75 6K87B/D/J 75 6K88A/B/C 76 6K89B/D/N 79 6K98A/B/D 77 6N45B 77 6N48B 80 7N41E 103 7N45B 77 7S41A/B/H 78 8N50 138 8N53-94C 107 8N56-94A 108 8R35B-94C 105 8R-202A 44 8S74B 102 9F02-39A 142 9N11-120A 139 9N24-37A 143 9N57-37A 141 9N59-37A 140 9R36 101 10R-200A3 45 10R-303A 47	MACO AB-100 8 AB-175M 21 T-16 7	MAGNAVOX AM-22 11 AM-23 9 AM-60 15 AM-61 58 AM-62 25 AM-64 24 AM-80 16 AM-81 58 AM-82/-83 35 AM-85 24 AM-89 57 AM-801/-802 70 AM-803 71 AM-804 81 AM-811 82 AT-61 16 AW-24 10 AW-88 35 AW-90 21 FM-91 61 FM-92 59 FM-95/-96 22 FM-97 26 FM-100/-101 59 FM-104 81 FM-806 72 FM-807 82 FM-808 95 MA-86, SA-87 35 1P2505 126 1P2506 126 1R1001 104 1R1005 107 1R1200 103 1R1201 97 1R1202 98 1R1203 111 1R1204 118 1R1205 120 1R1208 111 1R1212 114 1R1213 116 1R1214 137 1R1221 139 1R1226 124 1R1231 140 1R1253 142 1R1264 144 1R1286 145 1V9032 126 2AM-70 35 2R1200 (Runs 1 & 2) 109

MAGNAVOX (CONT.) VOL.	MIDLAND (CONT.) VOL.	MOTOROLA (CONT.) VOL.	MOTOROLA (CONT.) VOL.	NORELCO (CONT.) VOL.	PANASONIC (CONT.) VOL.
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