

**SERVICE MANUAL**

**AND**

**PARTS LIST**

**FOR**

**CLAIRTONE**

**STEREOPHONIC**

**RADIO-PHONOGRAPH**

**Model S-250**

Printed in Canada

## ALIGNMENT PROCEDURE

F.M. DETECTOR CURVE

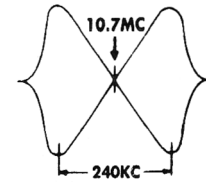


FIG. 1

F.M. I.F. PASSBAND

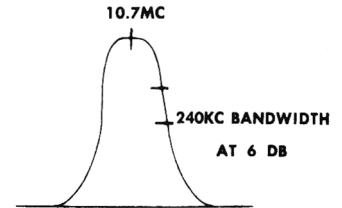


FIG. 2

### Preliminary:

Alignment is an exacting procedure and should be undertaken only when necessary. The following equipment is required:

1. Signal generator with a frequency range of at least from 455 kc to 1620 kc.
2. Signal generator with a frequency range covering 10.7 mc. for FM-I.F. alignment.
3. Vacuum tube voltmeter,  
OR
2. F.M. (sweep) signal generator usable at 10.7 mc
3. 10.7 Crystal or other accurate marker generator
4. Oscilloscope

**Notes:** Allow at least five minutes for the set to warm up before attempting alignment. An (8 ohm) speaker or dummy load (5-10 ohms) must be connected across the audio output transformer secondaries at all times.

### AM IF & RF ALIGNMENT

Step	Signal Generator Coupling	Signal Generator Frequency	Band Switch Position	Radio Dial Setting	Connect VTVM	Adjust	Remarks
1.	High Side to Pin 7 of V5 (6BE6) thru .001 MFD capacitor Low Side to Chassis.	455 KC	A.M.	Tuning Gang Fully Closed	High Side to Point 4, Low side to Chassis.	T7-T6	Short A.V.C. line to Chassis at Pt. 5 adjust top & bottom cores for maximum keep VTVM reading at less than 3 volts by reducing generator output as required. Repeat adjustments in same sequence (T-7 then T-6) until no further increase is noted.
2.	Loop (Radiated)	535 KC	A.M.	535 KC (A.M. Gang Fully Closed)	Same as in Step 1	T8	Remove A.V.C. short to Chassis and adjust for maximum reading.
3.	Same as in Step 2	1640 KC	A.M.	1640 KC (A.M. Gang Fully Open)	Same as in Step 1	A.M. Osc. Trimmer C14C	Adjust for maximum reading.
4.							Repeat steps 2 & 3 until no further increase is noted.
5.	Same as in Step 2	1400 KC	A.M.	1400 KC	Same as in Step 1	A.F.-R.F. Trimmer C14B	Adjust for maximum reading.

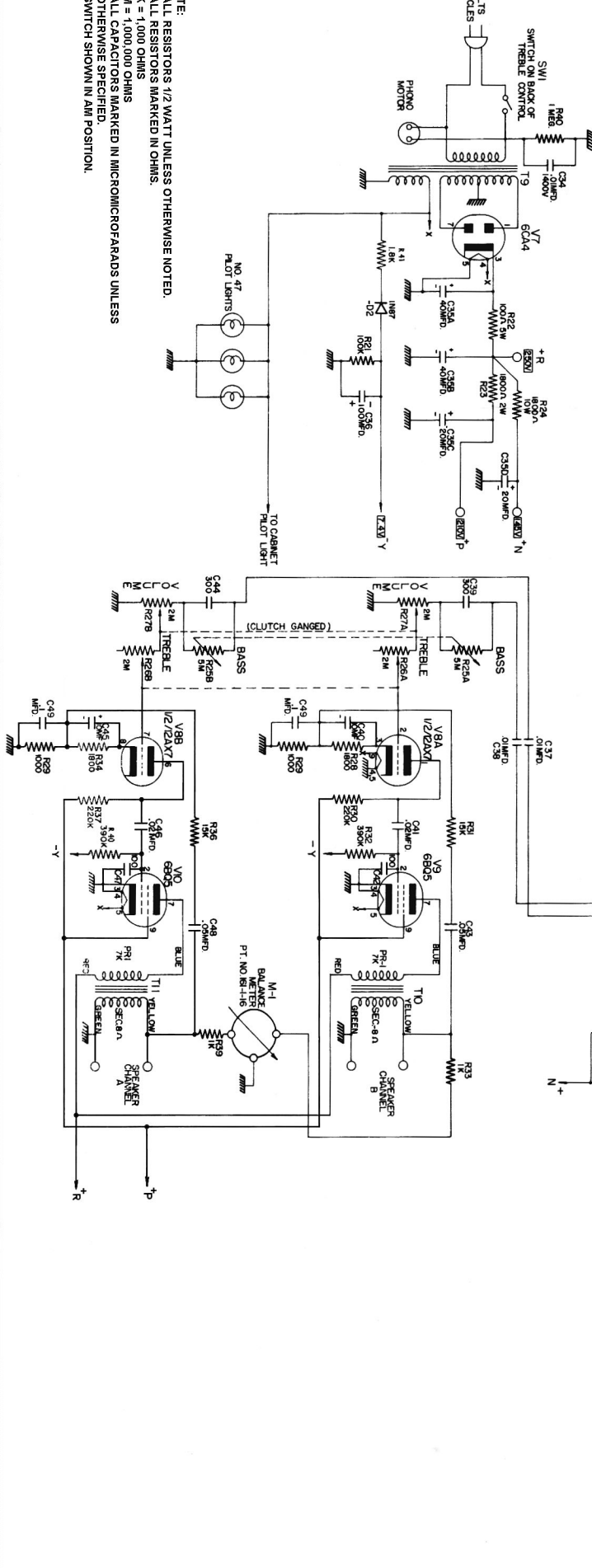
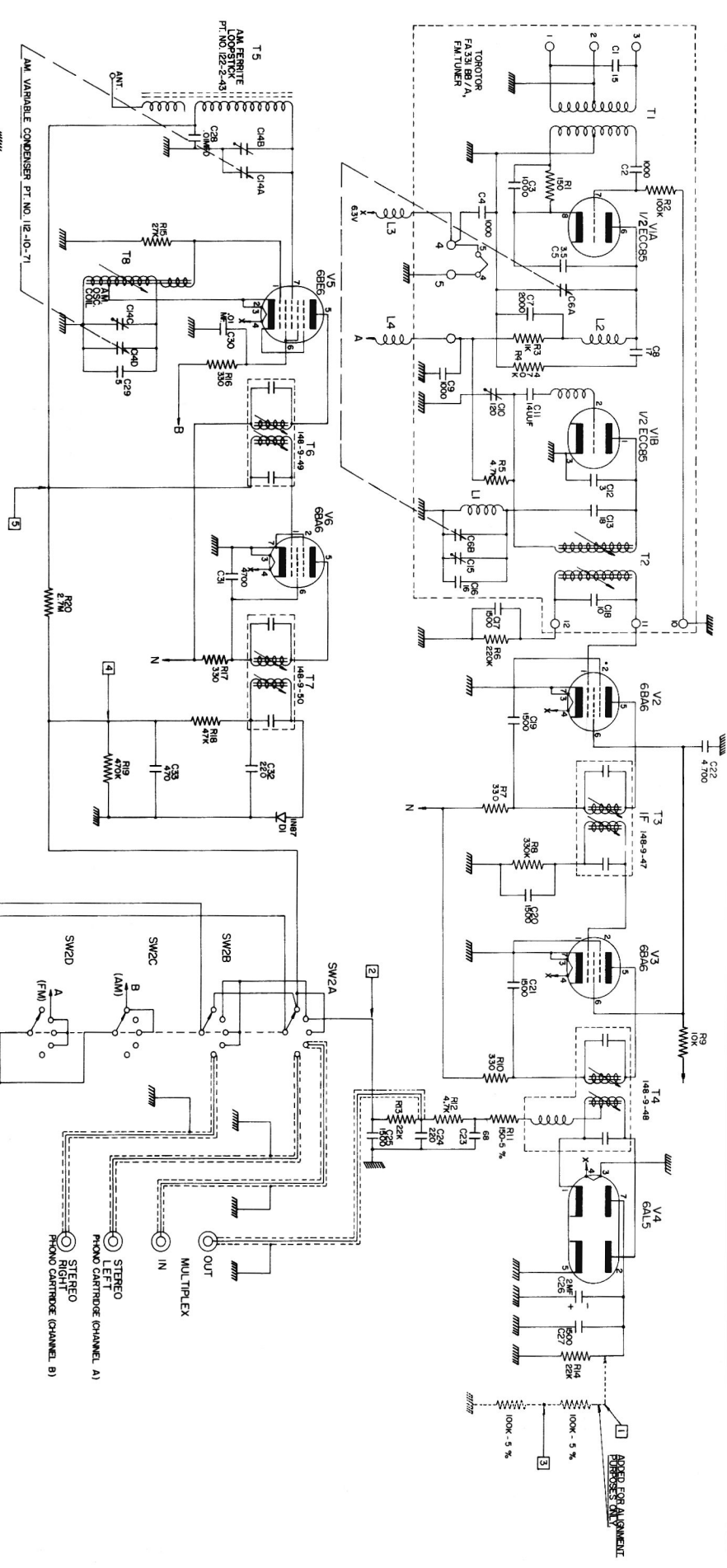
### F.M. - I.F. ALIGNMENT USING UNMODULATED SIGNAL GENERATOR AND VTVM

1.	High Side to Tube Shield Fitted over V1 (ECC 85) Low Side to Chassis.	10.7 (Unmod.)	F.M.	Point of Non-Interference	D.C. Probe to Point 1. Common lead to Chassis.	T4 Primary only (bottom) T3 PRI & Sec. & T2 PRI & Sec	Adjust for maximum deflection.
2.	Same as in Step 1	10.7 (Unmod.)	F.M.	Same as in Step 1	D.C. Probe to Point 2. Common lead to Point 3 (Junction of added 100K 5% Resistors)	T4 Secondary (TOP)	Adjust for zero reading a positive and Negative reading will be obtained on either side of correct setting.

### F.M. - I.F. ALIGNMENT USING F.M. SIGNAL GENERATOR AND OSCILLOSCOPE

FREQUENCY MODULATE THE I.F. SIGNAL WITH 60 CYCLE SINE WAVE TO A TOTAL DEVIATION OF 450 KC. ADJUST THE SCOPE INTERNAL HORIZONTAL DEFLECTION VOLTAGE TO 120 CYCLES, AND SYNCHRONIZE IT WITH THE 60 CYCLE SINE WAVE.

1.	High Side to Pin. 1 of V3 (second 6BA6 F/M—I.F. Amplifier)	10.7 mc 450 KC Total Sweep Deviation	F.M.	Point of non-interference	Vert. Amp. Input to Point 1, Common to Chassis	T4 Primary only (bottom)	Disconnect 2 MFD. Stabilizing capacitor, adjust for curve of maximum amplitude & symmetry.
2.	Same as in step 1	Same	F.M.	Same as in Step 1	Vert. Amp. Input to Point 2, Common to Chassis	T4 Secondary only (top)	Re-connect 2 MFD. Stabilizing capacitor, adjust so that 10.7 mc. occurs at centre of cross-over lines, similar to Fig. 1. Slightly re-touch T4 Primary for maximum amplitude & straightness of cross-over lines.
3. Repeat Step No. 1							
4.	High Side to Pin 1 of V2 (first 6BA6 F/M—I.F. Amplifier)	Same	F.M.	Same as in Step 1	Vert. Amp. Input to point 1, Common to Chassis	T3 Primary & Secondary	With Stabilizing capacitor remaining disconnected (from step 3). Adjust T3 Top and Bottom for maximum amplitude and symmetry similar to Fig. 2.
5.	High Side to Tube Shield fitted over V1 (ECC 85), Low side to Chassis	Same	F.M.	Same as in Step 1	Same as in Step 4	T2 Primary & Secondary	Adjust for maximum amplitude and symmetry.
6.	Same as in Step 5	Same	F.M.	Same as in Step 1	Vert. Amp. Input to Point 2, Common to Chassis	T4 Secondary (Top)	Re-connect 2 MFD. Stabilizing Capacitor and Trim Secondary for maximum symmetry while maintaining 10.7 mc. at cross-over lines (Fig. 1).

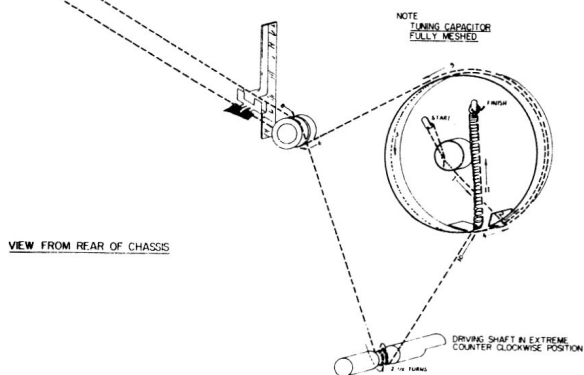


NOTE:  
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE NOTED.  
ALL RESISTORS MARKED IN OHMS.  
K = 1,000 OHMS  
M = 1,000,000 OHMS  
ALL CAPACITORS MARKED IN MICROMICROFARADS UNLESS OTHERWISE SPECIFIED.  
SWITCH SHOWN IN AM POSITION.

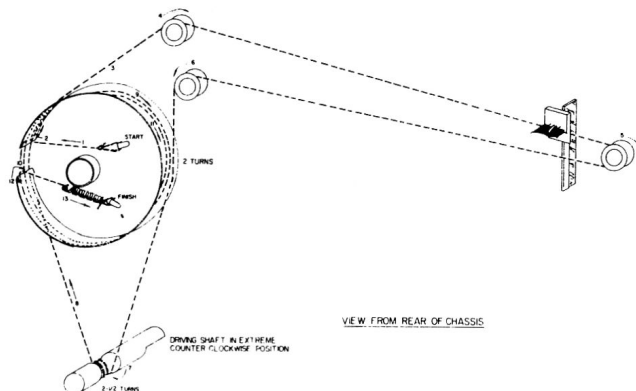
# PARTS LIST

Schematic Location	Part Number	Description	Schematic Location	Part Number	Description
<b>CAPACITORS</b>					
C1 to C13		Included in Torotor FA-331 BB Tuner	R26 (A & B)	134-5-75	2 meg, dual treble control with ON-OFF switch on rear
C15, C16, C18			R27 (A & B)	134-5-74	2 meg, dual volume control
C14			R28-R34-R41		1800 ohms, ½ W., 10%
(A-B-C-D) 112-10-71	2 gang, 102 mmfd-217 mmfd., Complete with 3/1 ratio gears and 1½" drum, Variable Capacitor		R29-R33-R35-R39		1000 ohms, ½ W., 10%
C17-C19-C20-C21-C25-C27		1500 mmfd., 500 V, GMV, ceramic disc	R31-R36		15K, ½ W., 10%
C22-C31		4700 mmfd., 500 V, GMV, ceramic disc	R32-R40		390K, ½ W., 20%
C23	112-10-77	68 mmfd., 500 V., ±10%, ceramic disc	<b>TRANSFORMERS AND COILS</b>		
C24-C32		220 mmfd., 500 V, GMV, ceramic disc	L3	122-2-46	Choke, fil. voltage, for FM tuner
C26	112-10-63	2 mfd., 50 Volts, electrolytic	L4	122-2-45	Choke, plate voltage, for FM tuner
C28-C30-C37-C38		.01 mfd., 500 V, GMV, ceramic disc	T3	148-9-47	FM/IF transformer
C29	112-10-72	5 mmfd., 500 V, temp. comp. ceramic disc	T4	148-9-48	FM/IF ratio detector transformer
C33		470 mmfd., 500 V, GMV, ceramic disc	T5	122-2-43	Loopstick antenna, complete with mounting board
C34	112-10-70	.01 mfd., 1400 V, GMV, ceramic disc	T6	148-9-49	AM/IF input transformer
C35			T7	148-9-50	AM/IF output transformer
(A-B-C-D) 112-10-62	40-40-20-20 mfd., 350V, electrolytic		T8	122-2-44	Adjustable oscillator coil
C36	112-10-60	100 mfd., 12 volts, electrolytic	T9	148-9-46	Power transformer
C39-C44		300 mmfd., 500 V, GMV, ceramic disc	T10-T11	148-9-45	Output transformer
C40-C45	112-10-64	10 mfd., 10 volts, electrolytic	<b>MISCELLANEOUS PARTS</b>		
C41-C46		.02 mfd., 500 V, GMV, ceramic disc	D1-D2	138-2-8	IN87 Diode
C42-C47		100 mmfd., 500 V, GMV, ceramic disc		140-2-32	Phono power receptacle
C43-C48		.05 mfd., 200 V, paper tubular	SW-2	144-9-71	Rotary switch, 2 sections, 5 positions, 4 poles
C49-C50		.1 mfd., 400 V, paper tubular		146-2-13	Dial cord tension spring
<b>RESISTORS</b>			M-1	161-1-16	Stereo balance meter
R1-R5		Included in Torotor FM Tuner		166-1-1	Tuner, FM, Torotor No. FA331 BB/A, complete with tube ECC85
R6-R30-R37		220K, ½ W., 10%	<b>CABINET PARTS</b>		
R7-R10-R16-R17		330 ohms, ½ W., 20%	Part Number	Description	
R8		330K, ½ W., 20%	12-21073-641	Garrard RC 210 Changer with ACOS 73-3AD/S or 73-2AD/S Cartridge	
R9		10K, 1W., 10%	14-106-4	C100-106CC E.M.I. Woofer 10 x 6	
R11		150 ohms, ½ W., 5%	14-212-41	TW 34/2 E.M.I. Tweeter 2½"	
R12		4.7K, ½ W., 10%	20-148-41	Dial Plate	
R13-R14		22K, ½ W., 20%	21-133	Dial Glass	
R15		27K, ½ W., 10%	22-11-3	Knob, Treble, Bass, Function, Loudness	
R18		47K, ½ W., 20%	22-11-5	Knob, AM, FM Tuning	
R19		470K, ½ W., 20%	24-1	1 MFD 20 VAC TCC Capacitor	
R20		2.7 meg, ½ W., 10%	32-1	Speaker Jack	
R21		100K, ½ W., 10%	35-1-234	Lens for pilot light	
R22		100 ohms, 5W., 10% wire wound	26-3-4	Grille Cloth Mellotone PR9532	
R23		1800 ohms, 2W., 10%			
R24		1800 ohms, 10W., 10% wire wound			
R25 (A & B) 134-5-76	5 meg, dual bass control				

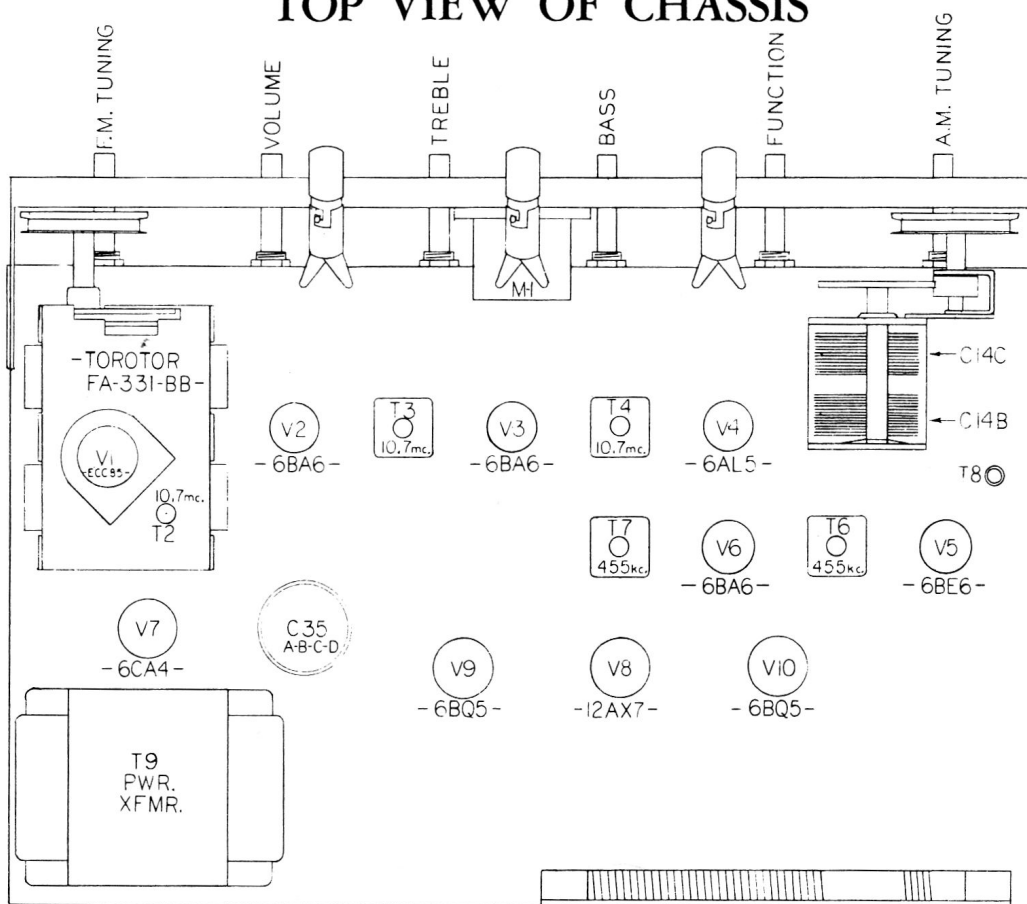
## A. M. DIAL STRINGING



## F. M. DIAL STRINGING



## TOP VIEW OF CHASSIS



## BACK VIEW OF CHASSIS

