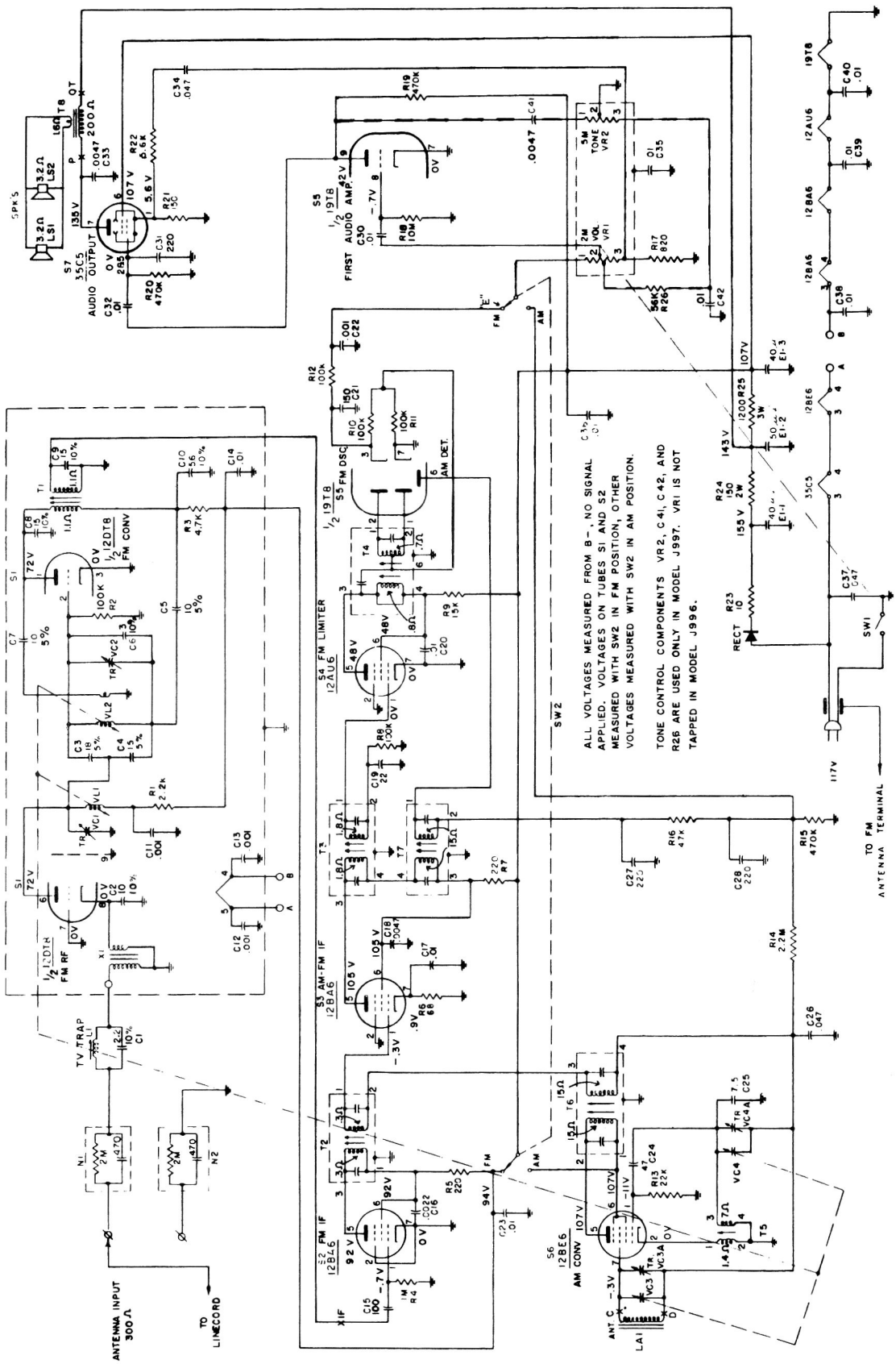


Figure 5. Models J-996, J-997, Schematic Diagram

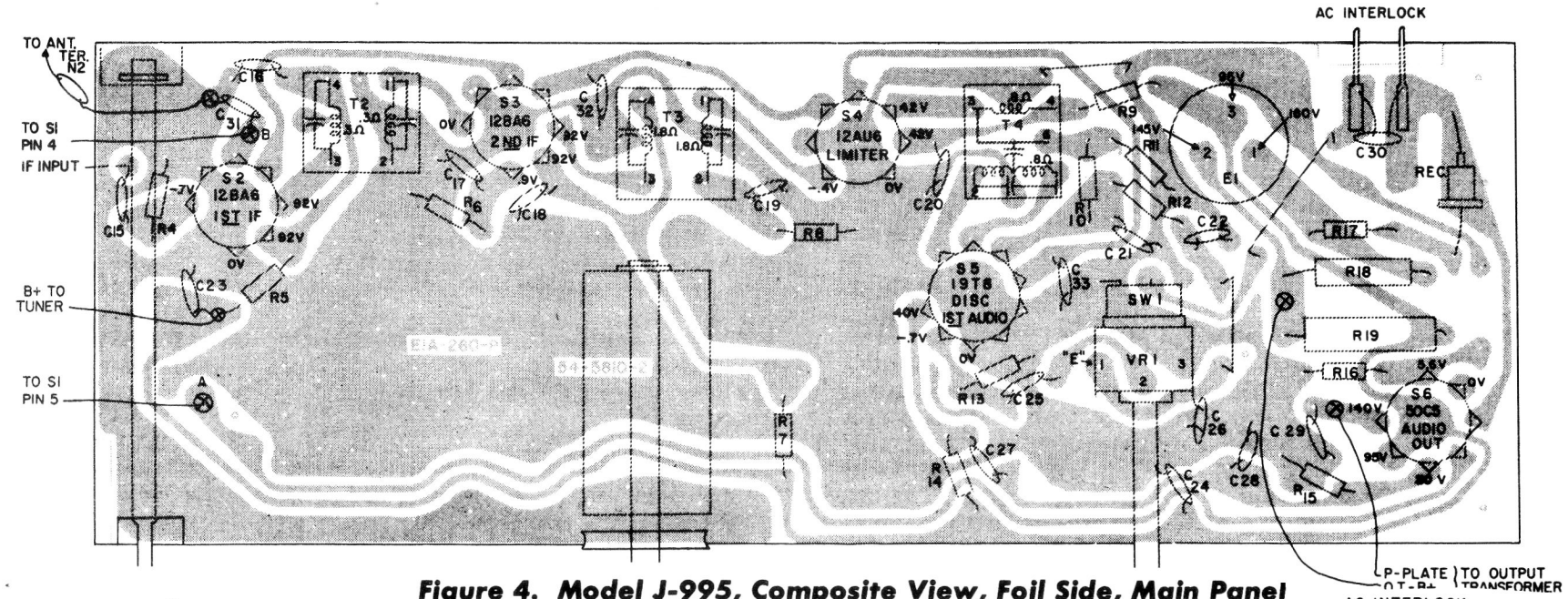


Figure 4. Model J-995, Composite View, Foil Side, Main Panel

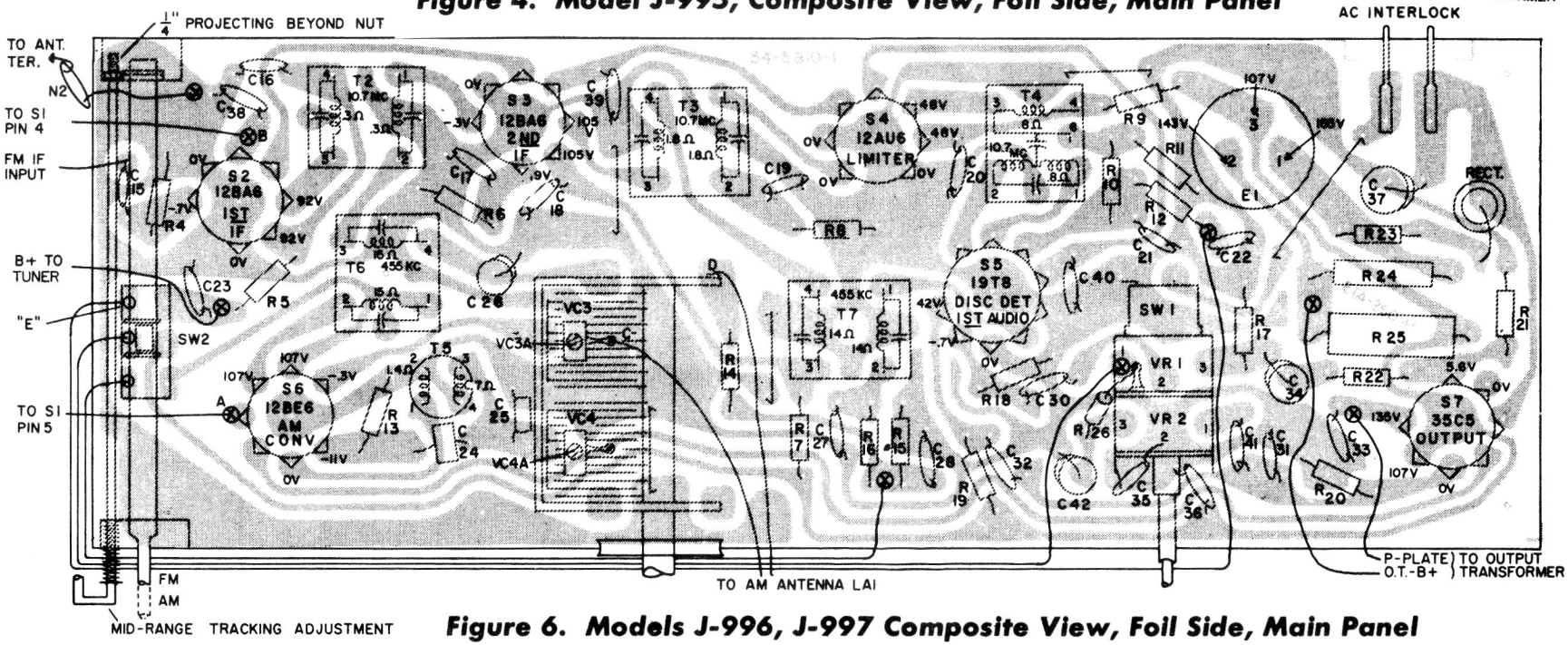


Figure 6. Models J-996, J-997 Composite View, Foil Side, Main Panel

ALIGNMENT PROCEDURE

General Instructions

1. Remove receiver from cabinet before beginning alignment.
2. Allow receiver and test equipment to warm up for fifteen minutes before alignment.
3. Remove slack from pulley cord before beginning alignment (see figure 8).
4. Use 30% modulation for AM alignment and 150KC deviation for FM sweep unless otherwise indicated.
5. Keep generator output as low as possible throughout alignment procedure.
6. During FM alignment match generator to 300 ohm unbalanced input by use of a suitable pad.

AM ALIGNMENT—MODELS J-996, J-997

1. Close (fully mesh) tuning gang. Lay a 6-inch ruler across face of dial so that edge of ruler touches top edge of the figure "4" in the number "54" and goes through the center of the capacitor shaft. Twist dial on shaft (keep shaft stationary) until edge of ruler is parallel to top of printed wiring panel. Do not readjust dial after this step.
2. I-F alignment. Set generator to 455KC. Connect output of generator through a .05 mfd capacitor to pin 7 of S6; low side of generator to B—. Connect VTVM across either speaker voice coil. Adjust top then bottom of T7 and T6 for maximum output. Repeat until there is no further increase in output.
3. Oscillator limits. Set generator, connected as in step 2, to 1630KC. Completely open tuning gang. Adjust VC4A for maximum output as indicated on VTVM connected across speaker as in step 2. Completely close tuning capacitor; set generator to 535KC. Adjust core in T5 for maximum output. Alternately adjust at 1630KC and 535KC until no further increase in output occurs.
4. R-F alignment. Connect generator to a radiating loop (5 or 6 turns, 5" dia.) placed at right angles to antenna. Set generator to 1500KC; tune receiver, as indicated on dial, to same frequency. Adjust VC3A for maximum output as indicated on meter connected across speaker voice coil. Remove radiating loop and tune receiver to a station in the vicinity of 600KC. If performance is satisfactory, proceed to FM alignment. If receiver lacks sensitivity, see the following note.

NOTE: In some cases low frequency sensitivity may be improved by making the following adjustments. Set generator, connected to loop (step 4), to 600KC, tune receiver, as indicated on dial, to 600KC. Carefully (avoid excessive heat) melt the wax holding the SMALL winding on antenna coil LA1. Slide the loosened winding along the antenna to the point at which maximum output occurs (meter connected across speaker voice coil). It will now be necessary to alternately adjust at 1500KC (step 4) and at 600KC until no further increase in output occurs. Refasten the loosened turns by again melting the wax.

FM ALIGNMENT—ALL MODELS

1. I-F alignment. Connect sweep and marker generators (see general instructions 4, 5, 6) to FM antenna terminals. Connect oscilloscope, through 100K isolating resistor, to junction to C19 and R8. Set generators to 10.7 mc and adjust top and bottom cores of T1, T2 and T3 for a symmetrical maximum amplitude curve with 10.7 mc marker at top.
2. Discriminator alignment. Change the scope connection, to point "E" on SW2 (Model J-997) or to VR1 (Model J-995). Connect an AM generator (30% modulation) set to 10.7 mc to pin 1 of S4. Adjust top of T4 for minimum amplitude between peaks. Inject 10.7 mc sweep signal and 10.7 mc marker at pin 1 of S4. Adjust bottom core of T4 for a symmetrical, maximum amplitude "S" curve centered at 10.7 mc and having a central linear portion of at least 200KC.
3. Mid-range tracking adjustment, Models J-996, J-997. Before tuner alignment, preset the mid-range tracking adjustment so that ¼" of shaft extends beyond the nut located at the rear of the tuning control bracket (see figure 6).
4. Tuner drive cord adjustment. With the pulley held in its most clockwise position, (viewed from front), rotate the fastener located on the pulley shaft clockwise until the tuner drive cord is slack (see figure 8). At this time, the movable core assembly in the tuner should be against the stop at its rear-most position; this may be determined by gently pulling, then releasing, the drive cord at the point at which it leaves the tuner housing. Holding the pulley in its most clockwise position rotate the fastener counterclockwise to the point at which all slack is removed from the drive cord but not far enough to cause the movable core assembly to move off its stop. It is of utmost importance that the tuner drive cord is wound smoothly on the pulley shaft without space between adjacent turns and without turns piled one on another.
5. Dial alignment—Model J-995 only. The dial will be positioned after the remaining tuner adjustments are completed.
6. FM tuning range adjustment. This adjustment is initially made at the factory and under normal conditions should not need readjustment. However, if tuner parts are replaced the tuning range may be set as follows:

   Connect generator, set to 108.5 mc (no deviation or modulation), to antenna terminals. Leave core assembly in its rear-most position as described in step 4. Connect VTVM to junction of C19 and R8 and adjust VC2 for maximum output. Rotate pulley 180° counterclockwise. The receiver should now be tuned to 87.3 mc if the low end oscillator adjusting loop (see figure 7) is correct. Check this 87.3 mc point with signal generator. If frequency is correct, proceed to step 7; if incorrect, adjust as follows:

   (a) If maximum output occurs when generator is set above 87.3 mc, squeeze adjacent sides of loop together slightly (see figure 7). (The loop is accessible through a hole in the tuner bottom shield and may be adjusted with a thin non-metallic rod.) Rotate pulley back 180° and readjust VC2 for maximum output at 108.5 mc. Rotate pulley counterclockwise 180° and check frequency of this point with signal generator. It should be closer to 87.3 mc than it was before the loop was squeezed together. If maximum output occurs with generator set below 87.3 mc the loop was squeezed too much and must be opened up. The above procedure may have to be repeated several times until the proper tuning range (108.5 mc to 87.3 mc ±100KC) is secured.

   (b) If maximum output occurs when generator is set below 87.3 mc the adjustment procedure is the same as in (a) excepting that the initial loop adjustment will be in the opposite direction (spread sides of loop apart).
7. RF alignment. Set generator to 105 mc (no deviation or modulation) and tune receiver to same frequency. Adjust VC1 for maximum output on VTVM connected to junction of C19 and R8.
8. Mid-range dial tracking adjustment—Models J-996, J-997. Set receiver dial to 100 mc, set generator connected to antenna terminals to 100 mc (no deviation or modulation). Connect VTVM to junction of C19 and R8. Turn nut on the rear of the mid-range tracking adjustment up to 3 turns in either direction to obtain maximum output. Due to the characteristics of the tuning unit, a small adjustment may be made at 100 mc without affecting the tuning adjustments made in step 6.
9. Dial alignment—Model J-995 only. Set signal generator (no deviation or modulation) to 100 mc and tune receiver to this frequency. Twist dial on shaft (hold shaft to prevent rotation) so that a 6-inch ruler, lying on the face of the dial, with its edge at the center of the pulley shaft and at the dot to the right of the figure "100" will be parallel to the top of the printed wiring panel.
10. TV trap adjustment. This trap, factory adjusted for maximum attenuation at 200 mc, will reduce interference from channel 9 through 13 television stations. If one of these channels causes severe interference, it may be minimized by tuning the trap to the offending channel. To do so, connect a VTVM to junction of C19 and R8, tune receiver to point of maximum interference and adjust L1 for minimum meter indication.

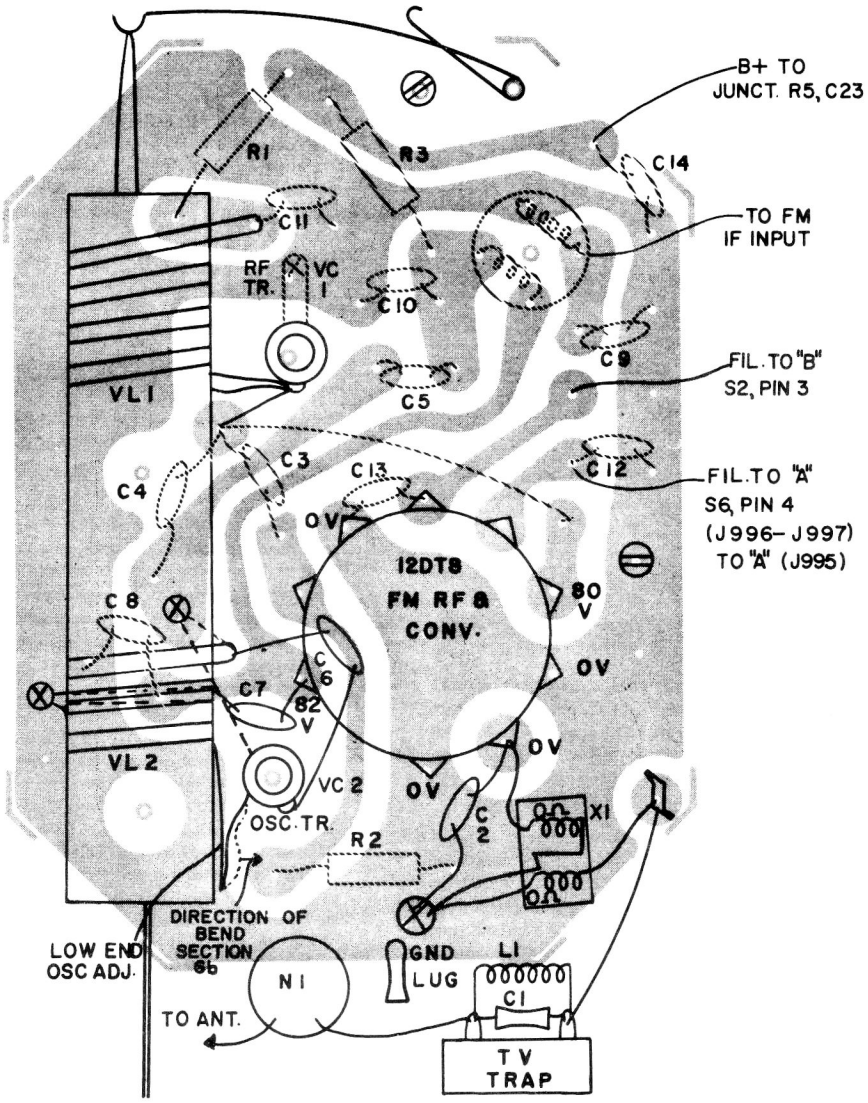
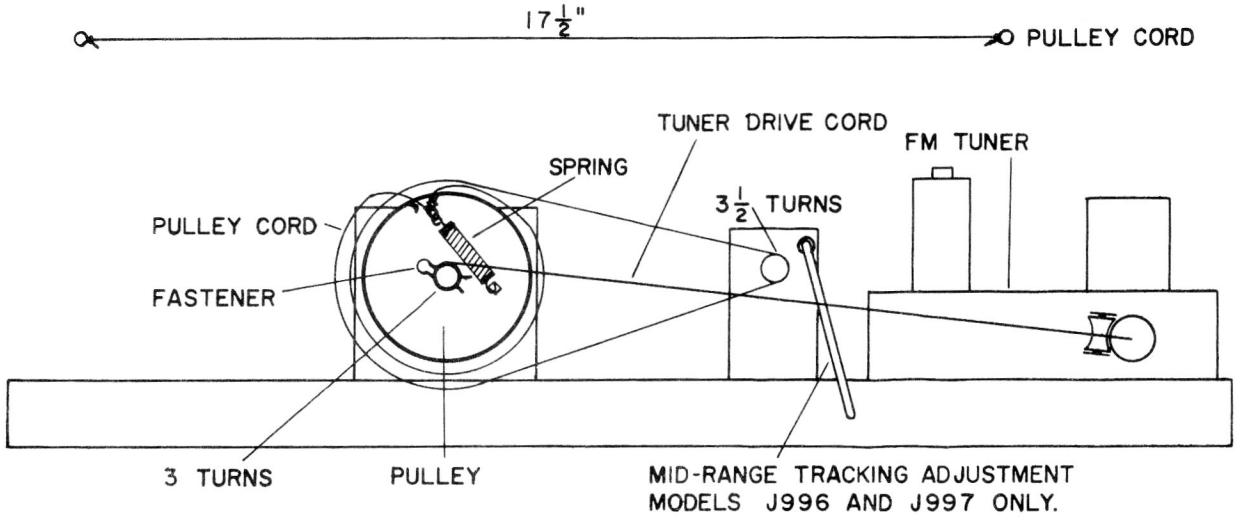


Figure 7. All Models, Composite View, Foil Side, FM Tuner Panel



All Models, Dial and Tuner Cords—Cord Lifted Off Pulley; Pulley in Counterclockwise Position