Tuning Procedure For COX ICON FM Transmitter
Operating In the 72-73MHz Model Aircraft Frequency Band

The Transmitter

Please note that there are two specific areas of interest on the schematic titled COX HOBBIES ICON TRANSMITTER M45054064 having to do with the tuning of this transmitter.

1. The variable resistors VR2 and VR3 associated with transistor Q4 control the width of the frequency modulation for the oscillator Q3.
2. Tuned coils T2 through T5 are used to optimize and tune the transmitter to the specific operating frequency, while tuned coil T1 and its associated components form a harmonic trap.

After final assembly, the transmitter is prepared for tuning by temporarily placing a 'fake' plastic case back onto the unit, installing the antenna, and installing a battery holder with 8 fresh alkaline batteries. The 'fake' case back has holes drilled in it corresponding to the five tuned coils. This allows the technician tuning the transmitter to grasp it for hand capacitance while inserting a ceramic tuning wand through the holes to adjust the coils. The removable case back also allows access to the modulation circuitry during alignment. When the tuning procedure is complete the 'fake' case back is replaced with a non-drilled production piece and screwed in place.

The Alignment Equipment

The tuning procedure for this transmitter is carried out within a screen room. The alignment equipment includes the following;

1. Frequency Counter
2. Spectrum Analyzer
3. FM/AM Modulation Meter
4. FM/AM Signal Generator (reference if needed)
5. High Frequency Oscilloscope

Note that the frequency counter connected to the high frequency oscilloscope to observe all transmitter frequencies and frequency changes during alignment. Measurements are done by way of RF proximity link. The spectrum analyzer is set for split-screen operation to show the primary levels for the 72-73MHz frequencies, and the second 144-145MHz harmonic.

The Tuning and Alignment Procedure

Once the 'fake' case back and battery pack is installed in the transmitter, the telescoping antenna is fully extended, and the unit is switched on.

1. Grasping the transmitter with one hand, tune coils T5, T4, T3, and T2 for maximum RF level for the assigned frequency.
2. Coil T1 is then tuned for minimum second harmonic 144-145MHz power level.
3. Steps #1 and #2 are repeated three times in rapid succession.
4. Modulation control transistor Q4 is then shunted off.
5. The FM/AM modulation meter is then connected to the antenna.
6. Variable resistor VR3 is then adjusted for the primary 72-73MHz operation frequency.
7. Transistor Q4 is then shunted to the on position.
8. Variable resistor VR2 is then adjusted for a frequency shift from the primary operating frequency of –3KHz.
9. The shunt for transistor Q4 is then removed.
10. Normal frequency shift operation for the design from the encoder circuitry is then viewed on the modulation meter as the last tuning procedure.

11. The transmitter is removed from the alignment environment, the ‘fake’ case back, and the battery supply are removed. The correct production case back is then installed with four screws.