

FM Micro Power Radio Guide

- (5) With the aid of a frequency meter, frequency counter, or a radio which tunes the required frequencies nearby, adjust C5 as close as possible to the desired frequency.
- (6) While watching the watt-meter slowly adjust C9 and C10 for maximum power.
- (7) Next adjust C11 and C12 for maximum output power.
- (8) Go back to C9 and C10 and readjust if necessary. You may have to jump back and forth between C11/C12 and C9/C10 several times to obtain maximum output. Proper adjustment not only yields maximum output but reduces harmonic content. You should be able to get between 3.5 and 5.5 watts output.
- (9) Fine tune to the desired frequency with R4. Check C9/C10, C11/C12 again.
- (10) Apply an audio signal at the level you'll normally be using to modulate the transmitter. Adjust R5 for proper modulation. Without a calibrated modulation monitor you have only one easy way to do this. Compare the loudness of your transmitter with that of another FM signal. Tune-in a local FM station and adjust your transmitter's modulation level so it is almost as loud as the test station. You may want to do this with several different test stations.

Now that you know your transmitter is functioning correctly, it is time to put it in a metal case. Not only will this make it an attractive easy to use device but it will improve the frequency stability. Once this is done, go through the tune up procedures again to make sure nothing has changed. Then enjoy your transmitter.

Helpful Hints

You will notice that these assembly instructions call for L2 to be 6 turns. In my prototype I could adjust the transmitter below the FM broadcast band fine. But when I approached the lower part of the band it would jump to above the FM broadcast band. I found that Q2 and its associated tank circuit wanted to resonate above the FM band, this caused the oscillator Q1 to want to jump and match Q2. Increasing L2 1 turn seemed to bring this back down so I could cover the FM broadcast band. Also I have L5 at 4 turns, this seems to provide a better match, thus transfers more power to the antenna. You could leave L5 at 4.5 turns and spread the coils apart to achieve the same results.

When mounting the transmitter in a case it is vary handy to have R4 accessible on the outside of the case so it is possible to fine tune the frequency during transmitting. A multi turn pot would be ideal and recommended, but a single turn pot would do. The reason is that it can take up to 15 minutes for the oscillator to heat stabilize, this causes a slight drift upwards in frequency. I have seen up to 500kHz of shift before the oscillator stabilize. This can be compensate for by giving the fine tune pot a little twist every couple of minutes at the beginning of the broadcast. Once the temperature has stabilize, drift is minimal. Never the less, I would still monitor the frequency with a frequency counter, or a very accurate digital tuner during any broadcast.