



This FM transmitter (FM TX) is about the simplest and most basic FM TX it is possible to build and have a useful Transmitting range. It is surprisingly powerful despite its small component count and 3V operating voltage. It will Easily penetrate over three floors of an apartment building and go over 300 meters in the open air. The circuit We use is based on a proven Australian design. It may be tuned anywhere in the FM band. Or it may be tuned Outside the commercial M band for greater privacy.(Of course this means you must modify your FM radio to Be able to receive the transmission or have a broad-band FM receiver.)The output power of this FM TX is below The legal limits of many countries (e.g., USA and Australia).However, some countries may ban ALL wireless transmissions Without a license. It is the responsibility of the builder to check the legal requirements for the operation of this circuit And to obey them.

CIRCUIT DESCRIPTION:

The circuit is basically a radio frequency (RF) oscillator that operates around 100 MHz. Audio picked up and Amplified by the electrets microphone is fed into the audio amplifier stage built around the first transistor. Output From the collector is fed into the base of the second transistor where it modulates the resonant frequency of The tank circuit (the 5 turn coil and the trim cap) by varying the junction capacitance of the transistor. Junction Capacitance is a function of the potential difference applied to the base of the transistor. The tank circuit is Connected in a Colpitts oscillator circuit.

CIRCUIT CALIBRATION:Place the transmitter about 10 feet from a FM radio. Set the radio to somewhere about 89 - 90 MHz. Walk back to the Fm Tx and turn it on. Spread the winding of the coil apart by approximately 1mm from each other. No coil winding should be touching another winding. Use a small screw driver to tune the trim cap. Remove the screwdriver from the trim screw after every adjustment so the LC circuit is not affected by stray capacitance. Or use a plastic screwdriver. If you have difficulty finding the transmitting frequency then have a second person tune up and down the FM dial after every adjustment.One full turn of the trim cap will cover its full range of capacitance from 6pF to 45pF. The normal FM band tunes in over about one tenth of the full range of the tuning cap. So it is best to adjust it in steps of 5 to 10 degrees at each turn. So tuning takes a little patience but is not difficult.The reason that there must be at least 10 ft. separation between the radio and the Tx is that the Tx emits harmonics; it does not only emit on one frequency but on several different frequencies close to each other.

NOTE:You may experiment with using 6V or 9V with the circuit to see how this increases the range of the transmitter. The sensitivity may be increased by lowering the 22K resistor to 10K. Try it and see.