

Transmitter Section:

1) RF module

The RF module consists of two VCOs operating at the frequency band 902 to 928MHz. The tuning elements of the VCOs are controlled by the varactor diodes VD201 and VD202. The RF channels are preselected from 911.4 to 918.4MHz. The VCO is phased locked to a crystal oscillator by the PLL chip U201. The accuracy of the transmission frequency is controlled by the reference 16MHz crystal X201. The output frequency of the transmission frequency is fine tuned by the trimmer capacitor VC201. The two VCO output are then buffered by two RF amplifiers. The amplified output are then combined before feeding to the antenna feed point.

2) Audio input

The Audio signal should be input from two RCA connectors on board, with signal level of around 500mVrms. Before feeding the audio signal to the RF module for FM modulation, this baseband signal will pass through the compander ICs U1 and U2 (KA8512) for better ultimate audio signal-to-noise ratio. The modulation depth will be controlled by two variable resistors VR1 and VR2. With 1kHz audio frequency of level 500mV rms, the RF carrier FM deviation should be 30kHz.

3) Operating Voltage

Two regulated DC voltage levels can be found within the TX PCB. Both DC 8V and 5V are regulated from the DC jack which is connected to a 12VDC adapter.

4) Channel selection

There is a channel selection switch used to tell the MCU which channel the user is going to select. By proper programming the PLL IC by the MCU, the RF carrier can be controlled.

5) Power indication

The build in LEDs of the transmitter indicate the status of operation and charging of battery pack. The red LED lights when the battery pack is under trickle charging which is controlled by transistor Q1. The other dual color LED indicates that the transmitter is under standby mode when it is green, or under transmission mode when it is amber.