

Universal FM Transmitter

A truly universal FM transmitter that provides a sensitive microphone as well as a PC board mounted RCA jack for line input. It has two modes of operation selectable by an on-board jumper: "MICROPHONE" or "LINE". When set to "LINE" mode, it can be connected to any audio source to broadcast the audio signal. When set to "MICROPHONE" mode, it can be used as a wireless microphone transmitter.

1 Axial Resistor:

- R11 470Ω Yellow, Violet, Brown



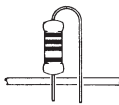
2 Ceramic Disc Capacitors:

- C1 104 / 0.1 μF / 100 nF
- C2 331 / 330 pF / n33
- C3, C11 8 pF
- C4 5 pF
- C5, C7 473 / 0.047 μF / 47n
- C6 47 pF
- C8, C9 102 / 0.001 μF / 1 nF
- C10 101 / 100 pF



3 Radial Resistors:

- R1 15 KΩ Brown, Green, Orange
- R2 5.6 KΩ Green, Blue, Red
- R3 10 KΩ Brown, Black, Orange
- R4 1 KΩ Brown, Black, Red
- R5 560Ω Green, Blue, Brown
- R6 100 KΩ Brown, Black, Yellow
- R7 27 KΩ Red, Violet, Orange
- R8 470Ω Yellow, Violet, Brown
- R9 43 KΩ Yellow, Orange, Orange
- R10 4.7Ω Yellow, Violet, Gold

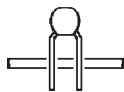


4 3-Pin Jumper Header:

- Install the 3-pin jumper header at locations marked "J1". Then place the small plastic jumper head on the leftmost two pins.

5 Inductor:

- Install the inductor at location marked "L2".



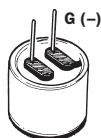
6 Transistors:

- Q1, Q2 CS9018
- * Do not overheat the pins of the transistor while soldering. Excess heat will damage these transistors.



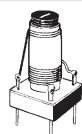
7 Electret Microphone:

- Install the microphone at location marked "MIC" by inserting the microphone pins into the PC board making sure that the outline of the PC board matches the orientation of the microphone (the microphone should be positioned entirely on the PC board).



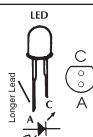
8 5-pin coil:

- Install the coil at location marked "L1".



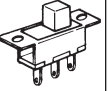
9 LED:

- Install the LED at location marked "LED". Please note that the longer pin is the anode.



10 Slide Switch:

- SW1 Single Pole Double Throw (SPDT) Switch



11 RCA Jack:

- Install the RCA jack at location marked "LINE".

12 Antenna:

- Connect the antenna wire included in the kit to the point marked "ANT".

Note: For optimum operation the length of the antenna should be 1/4 of the wave length of the frequency on which you are transmitting. For example, if you are transmitting on 90MHz the length of the antenna should be about 83 cm. You can use the following formula:

$$\lambda \text{ (wavelength in cm)} = v \text{ (speed of light)} / f \text{ (frequency)} =$$

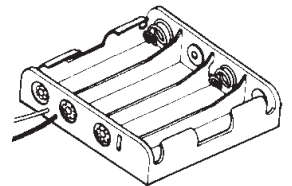
$$= 3 \times 10^{10} \text{ (cm/s)} / 90 \times 10^6 \text{ Hz} =$$

$$= 333 \text{ cm}$$

Therefore the antenna length should be $333 / 4 \approx 83 \text{ cm}$.

13 Battery Holder:

- Connect the battery holder wires to the points marked "+" and "-". Please note that the red wire must be connected to the point marked "+" and the black wire to the point marked "-".



Testing

Before testing the kit, It is highly recommended to inspect the PC board carefully as explained below:

- Check for proper placement of all components.
- Check for proper orientation of the transistors and the LED.
- Check for protruding pins which could touch other leads or adjacent pads.
- Check all solder connections for cold solder joints.
- Examine the PC board solder side to see that there are no solder bridges causing shorts between tracks.

Once you are satisfied that everything is correct, proceed to do the test as follows:

1. Place an FM receiver close to the kit and tune it to a frequency in which no other station is transmitting. Frequencies around 107 MHz are recommended.
2. Insert four new 1.5 V "AA" batteries in the battery holder and turn on the transmitter using switch "SW".
3. Turn the coil's ferrite bead using a screwdriver with a very fine tip until the transmitter's frequency is the same as the receiver's. You should be able to hear the broadcasted voice clearly when the frequencies match. (Normally, if the transmitter and the receiver are located too close to each other, you will hear a loud whistle sound due to audio feedback). Now increase the distance between the transmitter and the receiver and if necessary adjust the coil until the broadcasted signal is clear.
4. To use the transmitter in the "LINE" mode of operation, place the small plastic jumper head on the rightmost two pins of "J1", (the "L" position) to select the "LINE" mode of operation. Then connect an audio source such as the headphone output of a WalkMan or DiscMan to the RCA jack on the board using a cable with an RCA connector.

- ☞ The antenna should always be fully extended and should not be in contact with any metallic object.
- ☞ In order to increase the frequency of the transmitter, you have to turn the ferrite inside coil "L1" counter-clockwise.

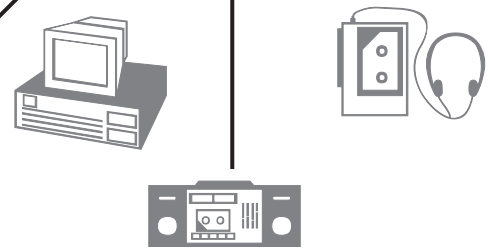
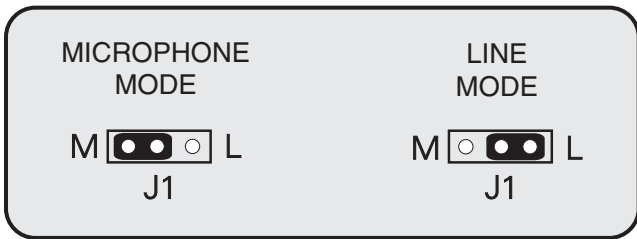
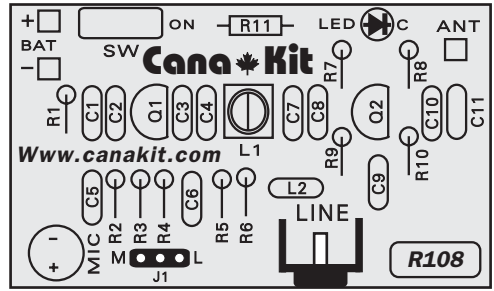
Important Notice

We urge all our customers to observe the regulations of their own national telecommunications authorities.

1. Build and adjust this kit according to this instruction manual and do not modify your kit in any way.

2. Check your intended operating frequency very carefully to ensure you will not cause interference to reception of licensed broadcasting.
3. If you receive any complaints about your transmissions interfering with broadcast reception, stop or change your operating frequency immediately.
4. Note that rules and regulations regarding FM transmitters and broadcasting differ widely from country to country or even state to state. The use of this transmitter for any purpose might be considered illegal in some countries. It is the responsibility of the kit user / builder to observe lawful use of the transmitter. We do not endorse any unlawful use of any of our products.

Wiring Diagram



Schematic Diagram

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