THE WASP

A very stable BUG.
Can be carried and moved while in use.

Range: 100 to 200 metres.
Frequency: 85MHz to 110MHz - refer to article to set frequency.

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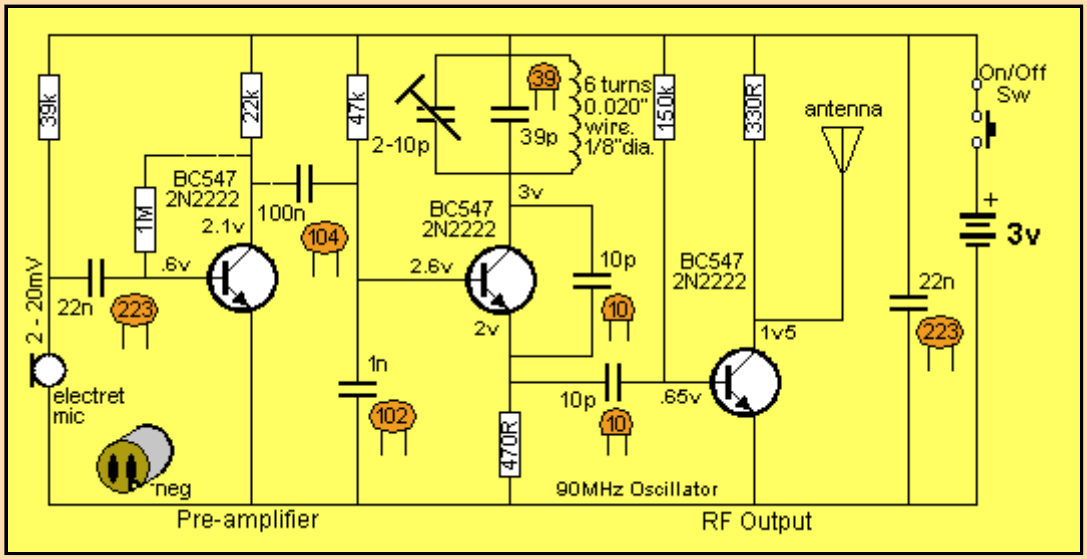
THE WASP

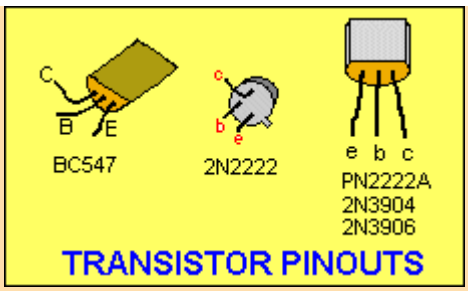
This is our first FM transmitter in a series. We will be specialising in showing how to design very efficient FM transmitters using a good layout and correctly-designed "**tank circuits**."

The Wasp is a 100 to 200 metre (100 to 200yds) device having a very stable performance. It can be used as a hand held microphone or left on a shelf to pick up the sounds in a room.
It has many interesting features. These will be fully described in the article. One of the most important features of this project is the use of standard components. This gives it universal appeal as the parts can be obtained from almost any electronics store.
It has been designed, not only for Australia, but for all other countries, as the web covers the world and nearly every locality has an FM allocation in the 88-108 band.

Since restrictions apply to FM transmitters in some countries, you will have to find out the laws in your locality before commencing construction.
Some countries require a licence, some do not allow transmission at all, while others have set aside FM bands specifically for amateur transmissions - the differing requirements reflect the maturity of the governing bodies and their understanding that the airwaves are community property and need to be controlled fairly.



The Wasp Circuit Diagram



The advantage of this design is it can be adjusted to transmit on any frequency from 85MHz to 110MHz, depending on the number of turns in the oscillator coil and the spacing of the turns. Final trimming of the frequency can be done with the air trimmer, included on the board. This will give about 5MHz range, so you can set the frequency to avoid other transmissions. The main advantage of the air trimmer is to set the frequency away from anything else, as it is pointless trying to transmit on top of another signal.

The Wasp completed, showing the placement of the components.

ALTERNATE TRANSISTORS

We have provided a list of alternate transistors that should have suitable characteristics. However I must point out we have not actually tried many of the types and the results you got will vary according to their capability at 100MHz. They may all be ok for the audio stage but when it comes to the oscillator section, the variations will be quite considerable.
From past experience I have found some batches of transistors work better than others, even when they have the same type number. If you intend to build this project from your own components, it is essential to investigate the gain of the transistor and its performance, before starting.
This is the advantage of buying a kit. The transistors have been pre-tested by building one of the kits to make sure everything is correct.

SENSITIVITY OF THE ELECTRET MICROPHONE

The sensitivity of all our transmitters will amaze the first-time constructor. This is because the electret microphone we supply in the kit is very sensitive and the circuit has high gain.
Some electret inserts sold in electronics shops have medium to low sensitivity and will produce a very inferior output. You have to be careful when buying inserts as they are not identified in any way and you have no way of finding out the characteristics unless you put it in a circuit.
When we order microphones for the kits we specify high sensitivity, low-noise devices so that you get the best performance.

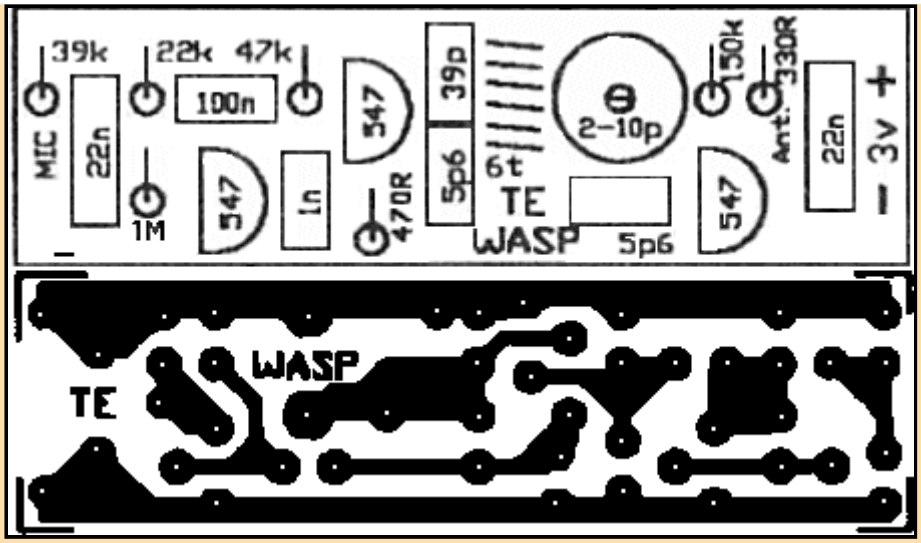
A close-up of the Wasp board showing the placement of the parts

GETTING STARTED

We classify this project as fairly simple as far as FM transmitters are concerned and is an ideal place to start.
Before starting, you should read through the entire article.
One of the features of this is project is the fact that the frequency is stable due to the resistor on the collector of the output transistor. This enables it to be carried around without drifting. The whole project is very compact and has a good range. It has been primarily designed for a portable application, such as a minister's microphone or for a lecturer, where the user must move around while talking.
It can be made even more compact by using button cells for the supply. We have opted for AAA cells for the kits as their size gives good battery life and the whole thing will fit inside a Tic Tac box.

You could just as easily use two button cells but it is not advisable to solder to these types of cells. Instead, you should bend up some paper clips to hold them in place. Some of the commercial lapel FM microphones are beautifully presented on the outside but their range is considerably less than you expect and we have been very disappointed. This project works much better than any of the types we have seen.
A brief outline of the ability of the WASP will help you compare it with our other designs.
The WASP will transmit up to about 100 to 200 metres under favourable conditions but when you carry it around, the range is reduced to 20 - 50 metres due to the fact that the body absorbs a large percentage of the signal. It transmits on the 88 - 108MHz band with the coil provided in the kit but this can be changed to above or below the commercial band by following our notes, later in the article. In all cases you must select an unused portion of the band so that the transmitter does not interfere with any other radio stations.
Frequency, range and fidelity are superb on FM and the reproduction is crystal clear. You can use this project for listening to wildlife, tracking animals, remote listening for security purposes, as an early warning alarm; for transferring TV sound from one room to another or listening for intruders at a remote part of your property. Its uses are limitless and it is especially useful for situations where it is required to be moved or carried, such as for stage-work.
We will leave the ideas up to you. Kits for the WASP are available by mail-order from Talking Electronics.

Without any more discussion, let's start.



The PC Board Artwork for The Wasp

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