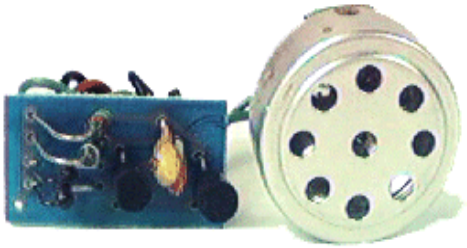
QUASAR ELECTRONICS KIT No. 1015
ELECTRONIC MOSQUITO REPELLER



General Description

This simple circuit can prove itself worth many times its value (which is very reasonable anyway) in getting rid of mosquitoes without having to use potentially harmful chemical repellents. It is a simple multivibrator which oscillates at a frequency of approximately 5 KHz. It uses a common piezoelectric microphone as a transducer and runs off a small 1.5 V battery, which because of the very low consumption of the device, will last very long even with continuous use.

Technical Specifications - Characteristics

Working voltage: 1,5V DC
Max. current: 1 mA
Working frequency: 5KHz

How it Works

The principle upon which this little device is based is very simple really. It is well known that only female mosquitoes bite. Research has proven that the sound produced by male mosquitoes makes females go away (except when they are in the mating period of course). This sound is what our little device produces and thus it keeps mosquitoes away from you. As you can see from the circuit diagram the circuit is a simple multivibrator built around two transistors. The frequency of oscillation is determined by the two capacitors C1-C2 and the resistors R2-R3. The output is taken from the collectors of the transistors and is used to drive a small piezoelectric element (a small crystal microphone in fact) which produces a barely audible but nevertheless effective 5 KHz tone.

Construction

First of all let us consider a few basics in building electronic circuits on a printed circuit board. The board is made of a thin insulating material clad with a thin layer of conductive copper that is shaped in such a way as to form the necessary conductors between the various components of the circuit. The use of a properly designed printed circuit board is very desirable as it speeds construction up considerably and reduces the possibility of making errors. Quasar Electronics Kit boards also come pre-drilled and with the outline of the components and their identification printed on the component side to make construction easier. To protect the board during storage from oxidation and assure it gets to you in perfect condition the copper is tinned during manufacturing and covered with a special varnish that protects it from getting oxidised and also makes soldering easier. Soldering the components to the board is the only way to build your circuit and from the way you do it depends greatly your success or failure. This work is not very difficult and if you stick to a few rules you should have no problems. The soldering iron that you use must be light and its power should not exceed the 25 Watts. The tip should be fine and must be kept clean at all times. For this purpose come very handy specially made sponges that are kept wet and from time to time you can wipe the hot tip on them to remove all the residues that tend to accumulate on it. DO NOT file or sandpaper a dirty or worn out tip. If the tip can not be cleaned, replace it. There are many different types of solder in the market and you should choose a good quality one that contains the necessary flux in its core, to assure a perfect joint every time. DO NOT use soldering flux apart from that which is already included in your solder. Too much flux can cause many problems and is one of the main causes of circuit malfunction. If nevertheless you have to use extra flux, as it is the case when you have to tin copper wires, clean it very thoroughly after you finish your work. In order to solder a component correctly you should do the following:

Clean the component leads with a small piece of emery paper. - Bend them at the correct distance from the component's body and insert the component in its place on the board.

You may find sometimes a component with heavier gauge leads than usual, that are too thick to enter in the holes of the p.c. board. In this case use a mini drill to enlarge the holes slightly. Do not make the holes too large as this is going to make soldering difficult afterwards.

Take the hot iron and place its tip on the component lead while holding the end of the solder wire at the point where the lead emerges from the board. The iron tip must touch the lead slightly above the p.c. board.

When the solder starts to melt and flow wait till it covers the area around the hole evenly and the flux boils and gets out from underneath the solder. The whole operation should not take more than 5 seconds. Remove the iron and let the solder cool naturally without blowing on it or moving the component. If everything was done properly the surface of the joint must have a bright metallic finish and its edges should be smoothly ended on the component lead and the board track. If the solder looks dull, cracked, or has the shape of a blob then you have made a dry joint and you should remove the solder (with a pump, or a solder wick) and redo it.

Take care not to overheat the tracks as it is very easy to lift them from the board and break them.

When you are soldering a sensitive component it is good practice to hold the lead from the component side of the board with a pair of long-nose pliers to divert any heat that could possibly damage the component.

Make sure that you do not use more solder than it is necessary as you are running the risk of

short-circuiting adjacent tracks on the board, especially if they are very close together.
When you finish your work, cut off the excess of the component leads and clean the board thoroughly with a suitable solvent to remove all flux residues that may still remain on it.

The very small size of the printed circuit board which is used for this project made impractical the printing of the component layout on the component side of the PCB. Instead, a component layout is included in the instructions which accompany the kit. It is shown from the component side and it is 3 times larger than the original PCB in order to make things easier for you. Following the practical diagram place the resistors first in their places and solder them, do the same with the capacitors and finally solder the transistors very carefully because if they are overheated they can be damaged. Use two short pieces of wire to connect the piezoelectric microphone with the PCB at the points shown in the diagram. Connect the battery across the circuit as it is shown and you should be able to hear a high pitched tone from the microphone. This tone is approximately 5000 Hz and that is what repels the mosquitoes and guarantees you an unmolested sleep!

Adjustments

This kit does not need any adjustments, if you follow the building instructions.

Warning

Quasar Electronics kits are sold as stand alone training kits.
If they are used as part of a larger assembly and any damage is caused, our company bears no responsibility.

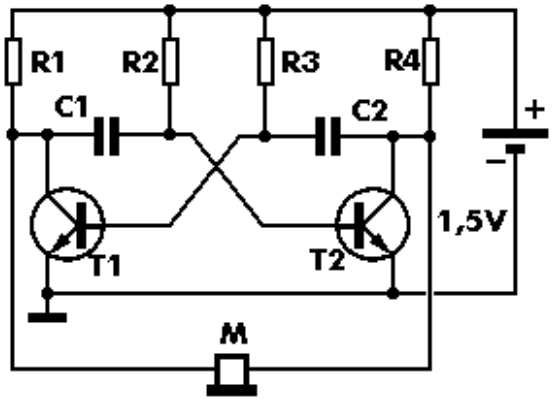
While using electrical parts, handle power supply and equipment with great care, following safety standards as described by international specs and regulations.

If it does not work

Check your work for possible dry joints, bridges across adjacent tracks or soldering flux residues that usually cause problems.
Check again all the external connections to and from the circuit to see if there is a mistake there.
See that there are no components missing or inserted in the wrong places.
Make sure that all the polarised components have been soldered the right way round.
Make sure that the supply has the correct voltage and is connected the right way round to your circuit.
Check your project for faulty or damaged components.

If everything checks out and your project still fails to work, please contact us for information on our Get-You-Going service.

Electronic Diagram



Parts List

This is supplied when you purchase the kit.

For further info please contact us by e-mail:

Parts List

All components including printed circuit board, assembly instructions including schematics and detailed parts list are supplied when you purchase the kit.

Ordering

For pricing info and online ordering please visit:

http://www.quasarelectronics.com/1015.htm

For further info please contact us by e-mail:

mailto: sales@QuasarElectronics.com