QUASAR KIT No. 1019

CAR ALARM SYSTEM

General Description

This is a complete car alarm system that can be triggered by the vibrations caused by anyone trying to break into a car, or alter natively by the small voltage drop that will be caused by any courtesy light turning on when a door or the car's boot is opened, and also in direct mode that the alarm is triggered when a certain point of its circuit is grounded. There is an entry time of 8", an exit time of 20" and the duration of the alarm (if it is not turned manually off by the user) is 50". The alarm can control external devices (sirens, flashes, etc.) drawing a maxi mum current of 3 A. If you wish to control heavier loads then you should use a relay as the output device and control the loads through the relay.

Technical Specifications - Characteristics

Working voltage: 6-12V DC
Entry time: 8 sec
Exit time: 10 sec
Alarm time: 50 sec

How it Works

As it has already been mentioned the circuit provides the user with three time functions, namely entry, exit and alarm time and also direct and pulse triggered alarm. The entry time is controlled by the integrated circuit IC1 and the RC network R1-C2.
The transistor TR2 and its circuit which consists of C15, R16, R14, D2 & D5 is used as a pulse detector which triggers the alarm if there is a sudden fluctuation of the supply voltage which is an indication that the courtesy light - or some other light or apparatus - has been turned on. The exit time is controlled by TR4 and the associated components D6, R8, R9, C4, C6 & C7 and is 20 - 30 seconds. The alarm duration is again controlled by an IC, the second 555 timer of the circuit and it depends upon the values of R5 and C8. The output from IC2 is used to drive the output transistors TR1 and TR2 so that the circuit is capable to switch heavier loads. The pin number 5 on the p.c. board can be used as a direct trigger for the alarm as it will trigger the circuit immediately if it is connected to ground. Across point 5 and the negative supply rail is where you can connect a vibration sensitive switch that closes when it is moved, or push to brake switches that make contact when a door or the car's boot are opened. Please keep in mind that the maximum permissible current
through the output of the circuit is 3 A. If the devices that you want to control are likely to draw currents heavier than this, you should use the output from the alarm to control a relay and then switch the various loads by means of the relay contacts.

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 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 cannot 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 evenly the area around the hole 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 leave the solder to 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. After 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 construction of the alarm should present no difficulties thanks to the use of a well designed and clearly marked printed circuit board. All the components are marked on the component side of the board to help you place them correctly. Insert and solder first of all the pins and the IC sockets taking care to align them correctly. Identify the resistors by means of the colour bands on their bodies and solder them in their places, continue then with the capacitors making sure that the electrolytic are inserted the right way round and finally solder very carefully, so that you do not overheat them, the transistors and the diodes again making sure that you insert them correctly. When you solder the components in their places do not forget that this circuit is going to be used in the car and is likely to be subjected to a lot of vibrations, changes of temperature and other rough treatment. With this in mind make your joints as sound as possible because a lot of the circuit's reliability will depend on them. Use only multi-stranded wire for your connections as this is less likely to brake under continuous vibration and double check your soldered joints. If you are satisfied that everything is OK you can insert the IC's in their sockets making sure that you orient them properly and that you do not bend any pins as you insert them in their sockets. When everything is ready install the alarm in the car making the following connections:

Pins 1 (+) & 2 (-) supply.
Pins 3 (+) & 4 (-) load output.
Pin No. 5 instant trigger (when it is connected to ground)

Connect a switch in series with the supply rail so that you can disable the alarm and hide it somewhere in the car where it can be operated inconspicuously. A good idea is to use a key switch which can be placed anywhere even outside the car provided you conceal its wiring.

Adjustments

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

Warning

Quasar 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 your project still fails to work, please contact us for information about our Get-You-Going service.

Schematic Diagram
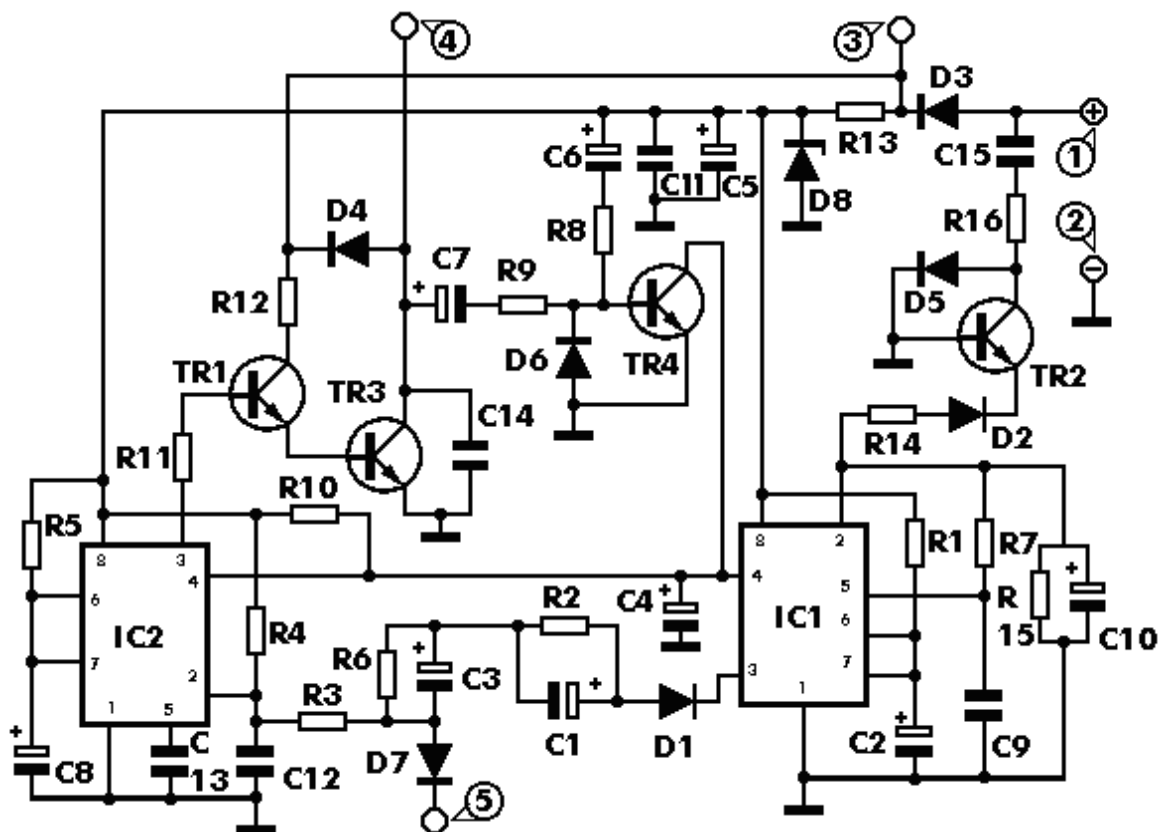
Parts List

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/1019.htm

For further info please contact us by e-mail:

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