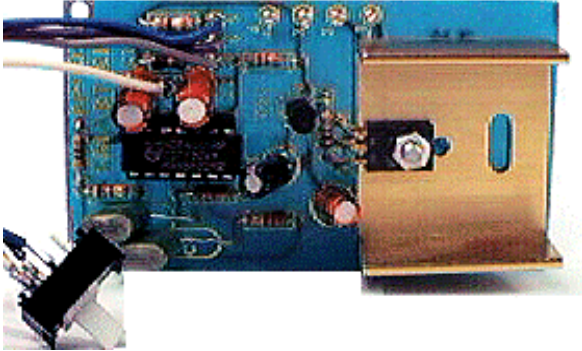


## QUASAR ELECTRONICS KIT No. 1029

### 4-SOUND ELECTRONIC SIREN



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#### General Description

A siren capable of producing four different sounds one of which is a simple tone and the others are more complex sounds similar to the sirens used by the police, ambulance cars and the FBI.

It has an output power of 6 Watts and works from a 12 VDC power supply.

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#### Technical Specifications - Characteristics

Working voltage: 9-15V DC

Max. current: 1 A

Max. output power: 8 Watts

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#### How it Works

The circuit is based on the CMOS IC, CD 4001, which consists of four NOR gates connected as inverters in this case. The IC works as an oscillator and produces the sounds which are amplified by the power amplifier stage. Depending on the position of the selector switch the output signal varies from a pure single tone to more complex combinations of sounds that are produced by the modulation of one tone by another of lower frequency.

The signal from the pin 3 of the CD 4001 is used to drive an amplifier that consists of two transistors a BC558 as a driver and a BD135 that is the output power transistor. The amplifier's power output is 6 W maximum and depends on the supply used and the impedance of the speaker that is connected to its output. (The circuit will work well with speakers having impedance from 8 to 25 ohms.)

If you want different sounds from your siren you can change the values of the resistors R1,2,3 or use more resistors and a switch having more positions to create your own effects.

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## 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 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.
- Bent them at the correct distance from the component 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 allow 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.
- 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 still remain on it.

The circuit is quite simple and if you follow the circuit diagram and the indications on the p.c. board carefully you should have no problems. Start by soldering the pins on the board first, continue with the IC socket, the resistors, the capacitors taking care not to insert any electrolytic the wrong way round and finish your work with the transistors. The output transistor should be mounted on a heatsink as it gets quite hot during its operation especially if it works for long periods of time continuously.

When all the soldering has been finished you can insert the IC in its socket. The IC is of the CMOS type and should be handled with care as it can be damaged very easily from static discharges and even touching it with the fingers can damage it sometimes. Insert the IC in its socket carefully taking care to align it properly. Make the connections to the power supply and the speaker and turn the power ON. The siren should be heard loudly from the speaker and changing the position of the selector switch should change the output sound.

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## **Adjustments**

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

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## **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.

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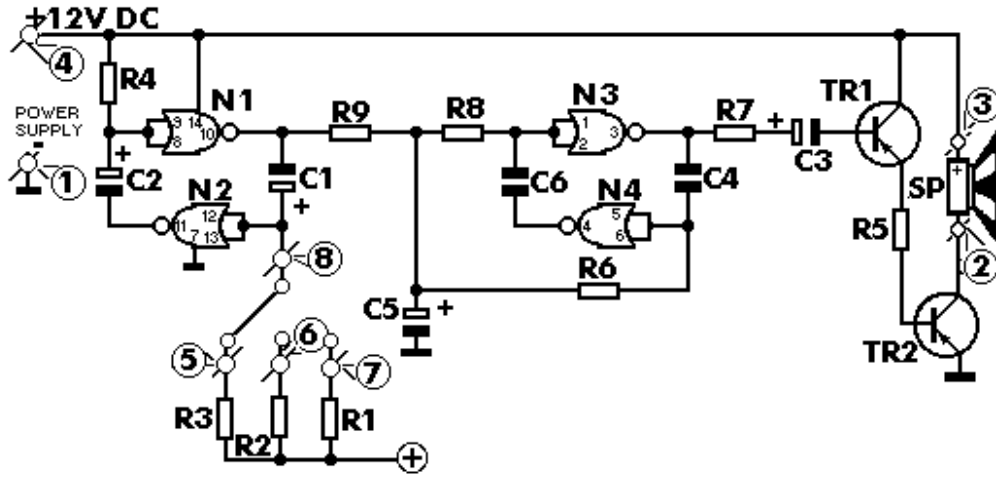
## **If it does not work**

- 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 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.

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## 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/1029.htm>

For further info please contact us by e-mail:

**[mailto: sales@QuasarElectronics.com](mailto:sales@QuasarElectronics.com)**

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