

QUASAR ELECTRONICS KIT No. 1122

TELEPHONE CALL RELAY

General Description

The telephone has become one of the indispensable devices in everyday life. Its use has lifted the barriers of communication and brings people together instantly regardless of the physical distance between them.

In many cases the telephone is placed in workshops, open spaces or far away from the person who must hear the ringing and take the call. In these cases if no one hears the ringing the call is not answered and the advantage of using the telephone is lost.

A solution to this problem is offered by the simple circuit you are about to build which is a relay that becomes activated every time the telephone rings. It is then very easy to connect another device that will give a signal that the telephone is ringing to advise you. As the relay's contacts are completely isolated from the telephone lines you can safely use a 220 V lamp which will turn on and off with the telephone's ringing, a large electric bell that can be heard over a distance or above the ambient noise or any other device that you see fit for the purpose.

Technical Specifications – Characteristics

- Working voltage: Supplied by the telephone line.
- Current drawn: Supplied by the telephone line.
- Relay ratings: 220 V/3 A maximum.
- Small size.
- Simple construction and operation.
- Can be left permanently on the telephone line.
- Does not affect normal telephone operation.

How it Works

The circuit is connected in parallel with the telephone line.

When the telephone rings the capacitors C1,2,3 & C4 become charged. These capacitors are connected in parallel for greater capacity, and they block DC voltages from the rest of the circuit while they let the AC which produces the ringing to pass through them.

This AC voltage is rectified by the rectifier bridge and filtered by the capacitor C2. It is then applied to the relay which is activated closing the contacts between the points 1 and 2 of the circuit. (The relay is a change over type and while it is at rest there is a closed circuit between points 2 and 3. When it is energised this contact is broken and the circuit between points 1 and 2 is closed). Using the appropriate set of contacts you can connect almost any device, in any configuration, to be operated by the ringing of the telephone.

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 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.
- 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 components of the telephone call relay are very few and you should have no difficulty in building the circuit. Solder the pins, capacitors, relay and finally the diodes. Make a careful inspection of the board, clean off any solder flux residues and your circuit is ready. The only thing that you should be careful about during the circuit's construction is the correct orientation of the electrolytic and the diodes.

To use the circuit connect in parallel with the telephone line across points 4 and 5 and use the relay contacts as a switch for the bell, lamp, or siren that you want to activate by means of the circuit. (For more details see the practical diagram showing how to connect the device with the telephone line and the external bell). If when you connect the relay across the line you find that your telephone appears to be engaged then simply reverse the connections at points 4 and 5 on the circuit board and the problem will be solved.

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.

The telephone exchange belongs to the state or some public utility monopoly and in order to ensure its smooth operation there are certain limitations regarding what you can connect to your telephone line. Please enquire locally to make certain that you are not breaking any regulations before using this device. Quasar Electronics Kit shall not be held responsible for any illicit use of any devices supplied.

If it does not work

Check your work for possible dry joints, bridges across adjacent tracks or soldering flux residues that usually cause problems.

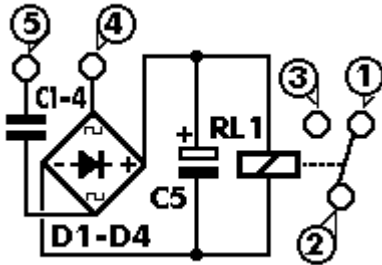
Check again all the external connections to and from the circuit to see if there is a mistake there.

- 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 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

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/1122.htm>

For further info please contact us by e-mail:

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

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