

QUASAR ELECTRONICS KIT No. 1086

CAR SOUND TO LIGHT MODULATOR

General Description

This is a very nice accessory found in the most expensive car stereo systems, that will add colour to your dashboard and increase your in-car entertainment especially when you drive in the dark. The circuit has a LED display that will follow the rhythm and the volume changes of the music in three different channels that correspond to the bass, middle and treble frequencies of the audible spectrum.

PLEASE NOTE: This product is NOT suitable for use with bridge (BTL) amplifier audio systems.

Technical Specifications - Characteristics

Working voltage: 12 V DC

Current: 200mA

How it Works

The circuit is very simple thanks to the use of a special IC which contains four op-amps, the LM324. The first of the amplifiers is used to raise the signal level sufficiently and its sensitivity is adjustable by means of P1. The output of the first amplifier drives three filters built around the other three op-amps in IC1. The signals from the filters drive the transistors Q1,2,3 which in turn drive the LED's. To each transistor there are connected six LED's which light in unison to enhance the effect. The circuit has been designed to work directly from the 12 VDC supply of the car and it is quite sensitive, so it will work with most car stereo systems.

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 project is a very easy one as there are no critical points in the circuit. Solder the IC socket first, the pins, the resistors and the capacitors and then carefully, to avoid damaging them solder the diodes and the transistors. Make also the little jumper connection next to Q1. The LED's should be inserted in such a way as to be at the same height from the p.c. board and to form straight lines with the other LED's. This is very important for the final appearance of the display. The p.c. board has a diagram on the component side which shows the correct orientation of the LED's, and you should make sure that you insert them correctly. It is needless to say that the LED's, being semiconductors should not be overheated during soldering.

When all the components have been mounted on the p.c. board make a careful visual inspection of the work done, clean the board with a solvent to remove all traces of flux that may still remain on it, insert the IC in its socket carefully and make the following

connections:

Points 1 (-) and 2 (+) to the power supply (12 VDC) or your car battery.

Points 3 (earth) and 4 (signal) to the output of your cassette player or radio.

Turn the power on and adjust the volume of the music at your usual listening level. Then turn the trimmer P1 till you get a pleasing light effect for this volume setting.

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.

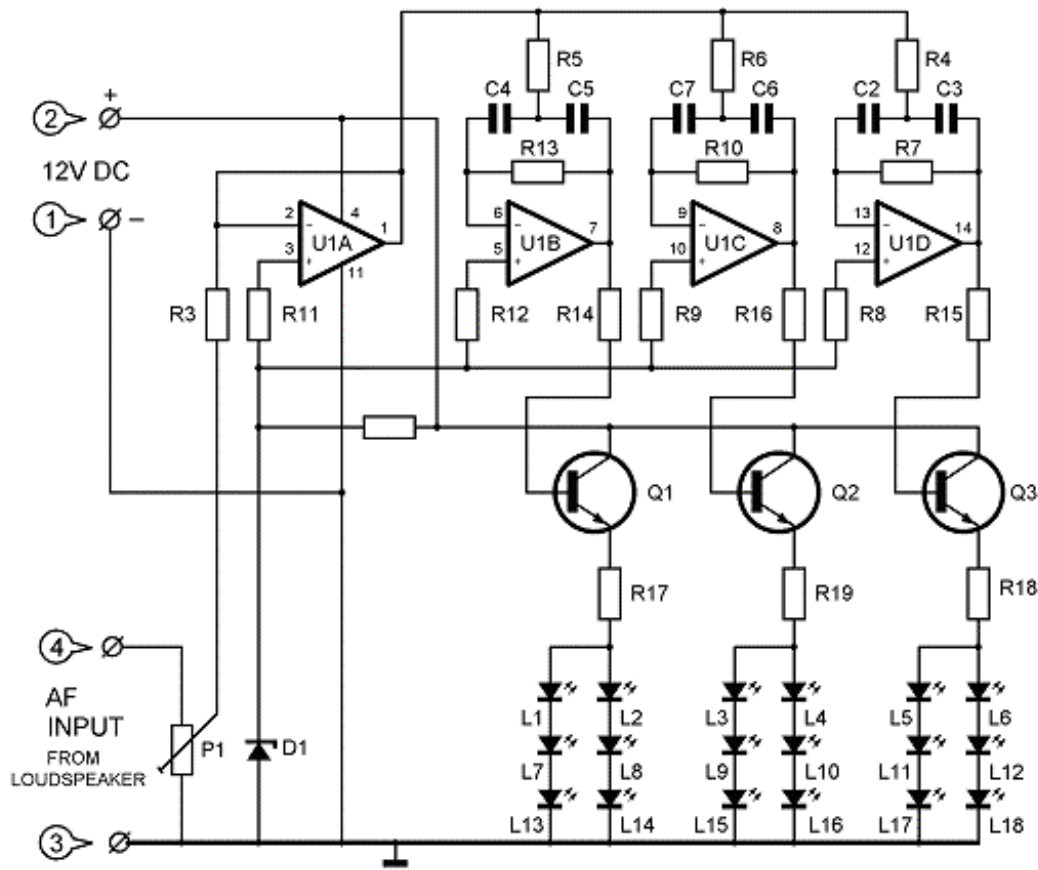
- Make sure that all the polarised components have been soldered the right way round. -

Make sure 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.

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/1086.htm>

For further info please contact us by e-mail:

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

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