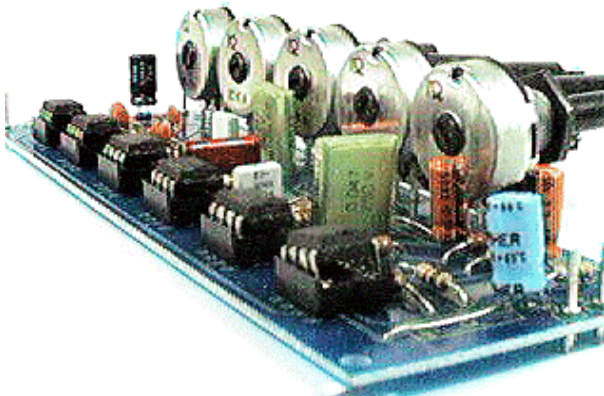


QUASAR ELECTRONICS KIT No. 1044 GRAPHIC EQUALISER



General Description

Equalisers are a «must» in good hi-fi systems and no hi-fi amateur should be without one. They are very useful in adapting the response of the system to the particular room, or in recordings to improve deficiencies of the equipment or the original recording. A good equaliser, used with skill can perform miracles in improving the quality of your hi-fi.

Technical Specifications - Characteristics

Working voltage: 12V DC

Current: 50 mA

Frequency response: 20Hz-20KHz

How it Works

This equaliser has five bands which cover all the audible frequencies, centred at 60, 250, 1,000, 4,000 and 16,000 Hz. The spacing between peak frequencies is two octaves which is quite adequate for most domestic applications. The circuit is for one channel and if you want to use it for STEREO you should build two, one for each channel of your system. The circuit consists of 6 IC's, the well known LM741 op-amps five of which are used as active filters while the sixth is a mixer amplifier which returns the processed acoustic signal to the power amplifier. The circuit has been designed so that when the potentiometers are in the middle of their travel the signal is not affected at all. Turning a potentiometer in either direction will affect the corresponding frequency range accordingly. The maximum output voltage without distortion is 1 Vpp. The equaliser operates from a 12 VDC power supply which makes it suitable for use in the car as well.

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 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 may still remain on it.

The construction of the equaliser is very easy if you follow the diagrams and our advice carefully. The only really sensitive components are the IC's and the diodes and if you handle them with a little care you shouldn't have any problem. Start building the circuit by soldering the pins and the IC sockets in their places on the p.c. board. Solder then the resistors, the capacitors, making sure that the electrolytic are inserted the right way round before soldering them, and finally the potentiometers and the diodes. The diodes are sensitive to heat and should not be overheated during soldering. Depending on the size and the shape of the case you are going to use for the project you can either solder the potentiometers on the p.c. board directly or use short pieces of shielded audio cable to connect them with the rest of the circuit. When you have finished soldering the components on the board check everything for possible mistakes, clean the board with a solvent to remove all traces of soldering flux and insert the IC's in their sockets. Make sure that you align them properly and that you do not bend their pins during insertion. Make then the following connections using shielded cable for the input and output and preferably twisted twin cable for the power supply.

- The supply (12 VDC) must be connected at points 1 (+) and 2 (-) of the board.
- The input is at points 5 (signal) and 4 (earth).
- The output is at points 3 (signal) and 4 (earth).

If you turn the power on, and the potentiometers of the equaliser are in their middle position there shouldn't be any notice able difference to the music if the equaliser is inserted or not in the signal path. However turning the potentiometers should produce a noticeable effect to the reproduction.

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.

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/1044.htm>

For further info please contact us by e-mail:

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

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