QUASAR KIT No. 1052

3-INPUT MONO MIXER

General Description

This is an easy to build, inexpensive but nevertheless fully featured MONO mixer. It will prove itself very useful in amateur FM transmitters, for mixing the output of musical instruments, in Disco's etc. The circuit allows for individual setting of the input sensitivity of each input and also has separate BASS and TREBLE controls.

Technical Specifications - Characteristics

- 3 inputs having separate sensitivity settings each.
- Input sensitivity 150-300 mV pp.
- Maximum input signal before distortion 1 V pp.
- Output signal level 2.5 V pp
- Maximum output level before distortion 15 V pp
- Separate BASS and TREBLE controls.
- Supply voltage 18 VDC.

How it Works

The circuit is very simple. The three inputs are voltage amplifiers built around the transistors Q1,2,3 and having adjust able input sensitivities by means of the potentiometers P1,2,3.
The collectors of the three transistors are connected together and the signals are then fed to the base of Q4 which mixes the three signals. The output signal from Q4 is taken to the tone control which is a classic Baxandall tone control circuit and finally enters the output stage which consists of two transistors Q5 and Q6. The output is taken from the emitter of Q6 through the coupling capacitor C13.

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 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 circuit of the mixer is a very simple one, and this together with the use of a printed circuit board with all the components marked on it makes construction very easy. Start building the circuit by soldering the pins, continue with the resistors and the capacitors taking care to insert the electrolytic correctly and finally solder the transistors and the zener diode in their places making sure that they are not over heated during soldering. The potentiometers can be soldered directly on the p.c. board or alternatively can be connected to it using short pieces of shielded audio cable. This is up to you and it will depend on the layout of the case that you are going to use to house your project. The inputs are across points 1-2, 3-4, 5-6 and the output is taken from points 9 and 10. Points 1,3,5 are common and you should connect the shielding of the cables there while the input

signals should be applied at points 2, 4, and 6. Similarly point 10 of the output is common (earth) and point 9 is where the output signal will be taken from. The power supply will be connected at points 7 (+) and 8 (-). The power supply must be regulated and its output well filtered to avoid introducing unwanted noise and hum from the mains to the system. The three potentiometers P1,2,3 will be used to adjust the sensitivity of the three inputs separately and P4,5 control the bass and treble respectively. If the mixer is going to be used for the modulation of an FM transmitter the output from the preamplifier of each source, (microphone, cassette, Pick-Up) will be connected to a different input of the mixer, and the mixer's output will be used to modulate directly the transmitter. For use with musical instruments, and provided they have a minimum output of 150 mV, the output of each instrument will be connected directly to an input of the circuit and the mixer's output will be connected to the power amplifier's input.

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.

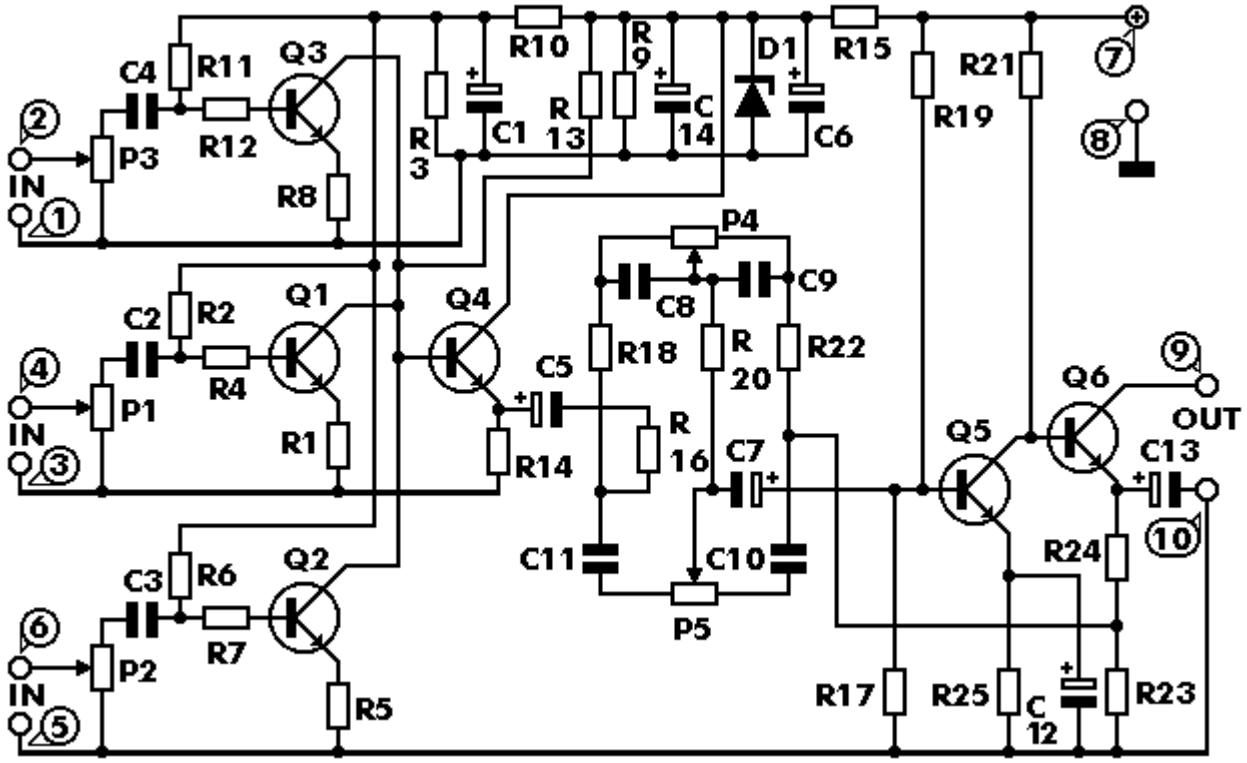
While using electrical parts, handle power supply and equipment with great care, following safety standards as described by international specs and regulations.

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/1052.htm

For further info please contact us by e-mail:

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