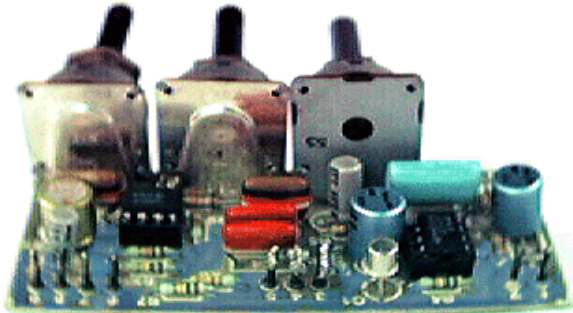

QUASAR ELECTRONICS KIT No. 1012 SPRING REVERBERATION



General Description

This is a reverberation unit which uses a spring line in order to create the sense of depth desired. It can be connected to any existing system between the preamplifier and final amplifier and the reverberation effect is adjustable. The circuit also features a set of tone controls which only affect the reverberating signal, but have no effect if the reverberation is turned off.

Technical Specifications - Characteristics

Working voltage: 12V DC
Max. current: 100 mA

How it Works

The circuit consists of two stages. The first is built around the CA741 IC which is an operational amplifier and the transistor Q1 (CV7644) and is an amplifier which raises the input signal to a certain level sufficiently high in order to drive the input of the reverberation line. (This requires a certain amount of power as the process is partly mechanical).

The reverberation unit is a metal box which contains two long springs taught between two transducers located in the far ends of the case. The springs are used to mechanically connect the input and output transducers and to transfer the signal between them. The amplified signal is fed to the input transducer and it makes it vibrate. These vibrations are then transferred to the springs and travel back and forth along the line till they are eventually converted back to electrical signals in the other end. This output signal is delayed with respect to the input and it also contains a certain amount of even more delayed repetitions which are the result of its travel back and forth along the spring lines. The effect of hearing the two signals together is similar to the reverberations which are formally produced in a very large hall or a cave.

Continuing the circuit's inspection we see the output stage which amplifies the output signals

up to a sufficiently high level in order to drive a mixer or an auxiliary input of an audio amplifier. This part of the circuit which is built around a TL082 operational amplifier IC incorporates a volume control (P1) which in effect controls the amount of reverberation, and a set of tone controls, (P2 treble and P3 bass).

These controls only affect the signal that passes from the spring line and are used to modify it in order to create different effects. In the output of the TL082 the original and the reverberating signals are mixed together and through the capacitor C7 are fed to the subsequent audio stages of the system.

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 and considerably 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 oxidized 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,

! are too thick to enter in the holes of the PCB. 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 PCB. 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 w hole operation should not take more than 5 seconds. Remove the iron and let the solder 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, specially 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.

If you follow the above outlines carefully you are not likely to have any problems with the construction of this project. Start building the circuit by placing and soldering the IC sockets and the pins first and continue with the resistors and the capacitors. Solder finally in place the electrolytic and the transistor taking care not to overheat them and making sure that you insert them the right way round.

Using shielded cables connect the potentiometers with the PCB. Using the same type of cable connect the input and the output of the reverberation line with the corresponding points of the circuit, which are as you can see from the circuit diagram. the points 3 (signal) and 4 (ground) the input and 5 (signal) the output.

The input of the circuit is across points 1 (common) and 2 (signal) and the output is 8 (signal) and 9 (common). The connections to and from these points should be done with shielded cable to avoid noise and interference.

The power supply which should be 12 VDC must be connected across points 6 (+) and 7 (-). In use you must insert the circuit between the preamplifier or the mixer and the final amplifier of your system and by means of the controls provided in the circuit you should be able to adjust the amount of reverberation and its sound quality

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

If your project still fails to work, please contact us for information about our Get-You-Going service.

For further info please contact us by e-mail:

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