

## **QUASAR KIT No. 1209: $\pm 40V$ , 8A Dual Polarity Power Supply**

### **GENERAL DESCRIPTION**

This is a simple and easy to build yet powerful and very useful power supply that can give an output of up to 8 Amperes at  $\pm 40$  VDC which can be used to drive power amplifiers having an output power of up to 100 Watts (like 1077 kit) per channel.

### **HOW IT WORKS**

The circuit of the power supply is very simple as it only has 12 components. Because of the high currents involved the rectifier bridge is formed by 4 discrete diodes of the P600B type which can take the maximum current for which the supply is rated.

There are also four smoothing electrolytic capacitors two for each supply rail and two 100 nF ceramic decoupling capacitors connected in parallel with the electrolytics.

There are also two fuses placed in series with each supply rail to protect the supply and the devices which are connected to it.

As you see from the circuit diagram the transformer must have a symmetrical secondary winding the central tap of which must be connected to ground (pin 3 of PCB) and the two remaining ends will then be connected to the two AC inputs of the rectifier bridge (pins 1 and 2 of the PCB). The output is then taken from pins 4 (-), 5 (0), and 6 (+) of the PCB.

### **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 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, 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 only thing to watch in this project is the polarity of the diodes and the electrolytic capacitors which is marked clearly on the component side of the PCB. Make sure that all the soldering is done properly as it is essential for the good operation of the circuit because of the high currents involved in the circuit.

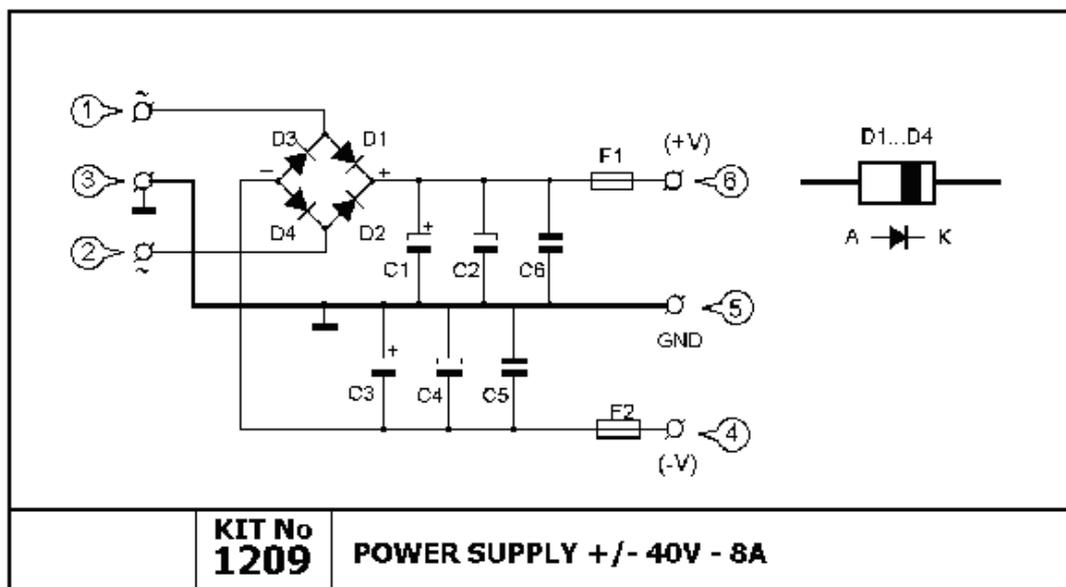
Check thoroughly every single connection and only if you are completely satisfied with your work connect the circuit to the transformer in the way described above. Keep in mind that the transformer's output voltage should not exceed the 70 % of the desired DC output voltage, and that all the wires

used to connect the supply to the transformer and the device that is going to be used with it must be very heavy gauge to avoid any losses and even burning of the cables because of overheating.

### IF IT DOESN'T 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 polarized components have been soldered the right way round.
- Make sure that the transformer has the correct secondary voltage and is connected correctly.
- Check your project for faulty or damaged components. If everything checks and your project still fails to work, please contact your retailer and the Quasar Kit Service will repair it for you.

### SCHEMATIC DIAGRAM



The circuit diagram of the power supply.

### PARTS LIST

All components shown on the schematic diagram including printed circuit board, assembly instructions including schematics and detailed parts list are supplied when you purchase the kit. The mains transformer is not supplied.

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### Ordering

For pricing info and online ordering please visit:

<http://www.quasarelectronics.com/1209.htm>

For further info please contact us by e-mail:

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

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