

# QUASAR ELECTRONICS KIT No. 1057

## CASSETTE HEAD PREAMPLIFIER

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### General Description

This circuit is a classic cassette head preamplifier suit able for playback. It has been designed around a special integrated circuit, the TDA 1522 from PHILIPS, which includes all the necessary compensation circuits for the proper equalisation of the signal and has the following impressive technical specifications:

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### Technical Specifications – Characteristics

IC TYPE: ..... TDA 1522  
Working voltage: ..... 7 - 23 VDC stabilised  
Current drawn: ..... 5 mA typical  
Distortion T.H.D.: ..... 0.05 %  
Channel separation: ..... 45 dB minimum  
Input sensitivity: ..... 1.6  $\mu$ V (20 Hz - 20 KHz)  
Output voltage: ..... 760 mV  
Operating temperatures:... -30 - +85 °C degrees Centigrade

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### How it Works

There is not much to say about the workings of this circuit as everything seems that has been taken care of by the IC manufacturer. The circuit has been designed as a playback preamplifier, and the output signal is sufficiently high to drive any final power amplifier without any problems. The few discrete components are there to provide the necessary external bias voltages and frequency compensation to the IC. Because of the circuit's high sensitivity it is advisable to use a stabilised power supply if you wish to get the best performance out of the circuit. This preamplifier can be used to replace a low quality existing head preamplifier, when you wish to turn an old MONO cassette player to STEREO (you will have to change the head as well), or to replace a damaged preamplifier which is beyond repair. The circuit includes a MUTE facility which can be activated by connecting the pin 9 of the circuit to the earth.

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### 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 use of the integrated circuit has simplified this circuit very much and has also eliminated all the critical points that could possibly create problems to the inexperienced constructor. As it is now, building the circuit is just a matter of identifying the various components and soldering them in their places which have already been marked on the printed circuit board. Build the circuit by placing the pins first, then continue with the resistors and the capacitors, making sure that you insert the electrolytic the right way round - and finally solder in place the integrated circuit. The integrated circuit is in a special package called SIL (Single In Line) and is placed on the board vertically. The pins are

counted beginning from the notched side of the plastic shell, as you can see in the diagram drawn next to the main circuit diagram of the preamplifier. Take care not to overheat the device as you solder it because it can be damaged quite easily by excess heat. When you have finish soldering all the components on the P.C.B., clean it thoroughly and inspect it for dry joints or other mistakes. If it appears to be all right make the following connections:

- 5 (signal) and 6 (ground) R - IN
- 10 (signal) and 11 (ground) L - IN
- 2 (signal) and 1 (ground) R - OUT
- 8 (signal) and 7 (ground) L - OUT
- 9 and ground MUTING switch
- 4 (+) and 3 (-) 6 to 18 VDC power supply.

The inputs will be connected with the head and the output can be taken to any amplifier, preamplifier or mixer. Make all the signal connections TO and FROM the circuit using shielded cable to avoid interference and degraded performance.

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## Adjustments

This kit does not need any adjustments, if you follow the building instructions.

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## 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.

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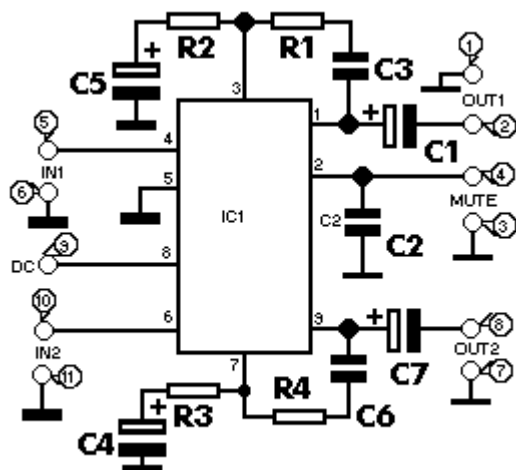
## If it does not work

- 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.

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## Schematic Diagram



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## Parts List

All components including printed circuit board, assembly instructions including schematics and detailed parts list are supplied when you purchase the kit.

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## Ordering

For pricing info and online ordering please visit:

<http://www.quasarelectronics.com/1057.htm>

For further info please contact us by e-mail:

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

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