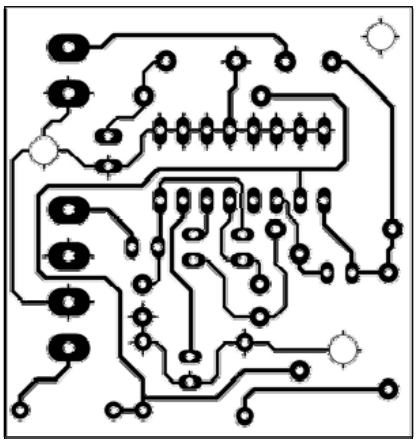
5W Mono Amplifier Kit

Kit Construction

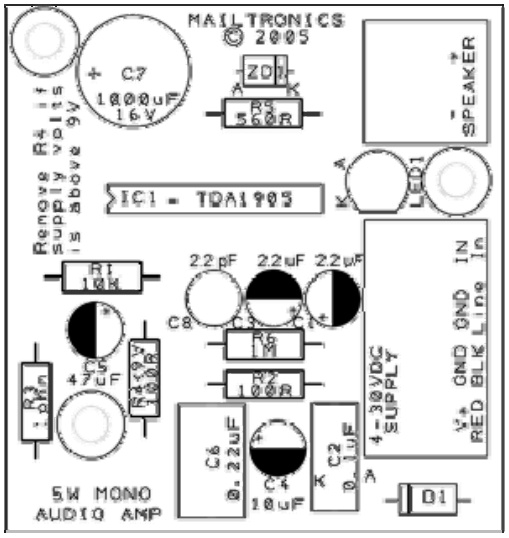
Before you start assembling your kit there are a couple of important things you must do. **FIRST** read through these instructions entirely **before you start construction** then follow the sequence below to ensure your kit is a success.

1. First you need to check the components against the parts list below to ensure you have all the components required. If all components are present then move on to step two. If you are missing any components then you will need to contact us for replacements.

IC1 – **TDA1905** amplifier IC
R1 – **10K** ohm resistor
R2 – **100** ohm resistor
R3 – **1** ohm resistor
R4 – **100** ohm resistor
R5 – **560** ohm resistor
R6 – **1M** ohm resistor
C1 – **2.2uF** electrolytic capacitor
C2 – **0.1uF** polyester capacitor
C3 – **2.2uF** electrolytic capacitor
C4 – **10uF** electrolytic capacitor
C5 – **47uF** electrolytic capacitor
C6 – **0.22uF** polyester capacitor
C7 – **1000uF** electrolytic capacitor
C8 – **2.2pF** ceramic capacitor
D1 – **1N4007** power diode
ZD1 – **4.3V** zener diode
LED1 – **5mm** multi-colour led



2. You now need to examine the PCB (printed circuit board) to ensure there are no shorted or broken tracks. It should be identical to the PCB Track picture to the right. If the PCB looks OK you may proceed to step 3. If you find any shorted tracks try to remove the short with a small scraper. If there are broken tracks you can repair them by soldering a small piece of wire across the break or contact us for a replacement PCB.



3. Lets start making the kit. Mount the components as shown on the Layout diagram to the right. When mounting the components, bend the leads with a small pair of long nose pliers where required, place component leads through PCB and slightly bend the leads over to hold the

components in place. This prevents the components falling out when you turn the PCB over to solder.

4. First mount and solder the resistors, these can be mounted hard against the PCB. Next mount the zener and the IN4007 diode, taking note of the polarity. Line the black or grey stripe end of the diode with the line on the component overlay on the PCB. Double check polarity before soldering in place.

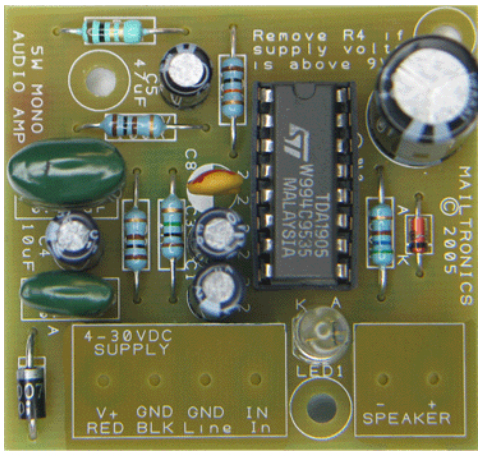
5. Now mount the IC socket, line the notch on the end of the socket up with the notch on the component overlay on the PCB. Double check polarity before soldering in place.

6. Mount the 2.2pF ceramic capacitor, note this is non polorised so may be installed either way.

7. Next mount the electrolytic capacitors taking note of the polarity. The long lead of the capacitor goes to the pad with the + next to it. The short lead (the one closest to the — — — marking on the side of the capacitor can) goes in the hole surrounded by the white PCB overlay.

8. Now mount the two polyester capacitors (green caps). These are non polorised so may be installed either way.

9. The last component to solder in is the LED. This can be mounted at any height above the PCB that you desire. You may like to mount it high enough to poke through a front panel of your amplifier enclosure. Ensure that the long lead on the LED is in the terminal marked "A", this is the anode or positive lead on the LED. It will not work if installed the wrong way.



10. Now you can mount IC1 the amplifier, simply press it into the IC Socket making sure the notch on the IC lines up with the sockets mark.

11. The next step is to solder the battery holder wires on. Follow the correct polarity as marked red for + black for –.

12. Solder the SPEAKER on to the terminals marked SPEAKER + and - .

13. Last of all you will need to supply the amplifier with a audio source, such as a portable disc player, mp3 player , radio or some other audio source. Since this is only a mono amplifier you will only need to connect either the left or right channel of the source device. Connect the either channel to the LINE IN + and – terminals. The amplifier works best when connected directly to the headphone output of your audio source. This also allows you to use the volume control on your audio source.

14. Once you have finished soldering all the components it is time to do a final check before you connect your battery or power supply and test the kit.
First check your PCB against the Layout drawing to confirm all components are in the correct positions and have been orientated the correct way. If any

components are incorrect you will need to rectify this before you can continue.
Now take a look at your soldering. Check for any shorts between tracks caused by solder splatters or bridging. Finally double check that you have connected the battery clip or power supply the correct way around, black to negative and red to positive. If all looks good then insert the batteries, turn it on and see what happens.

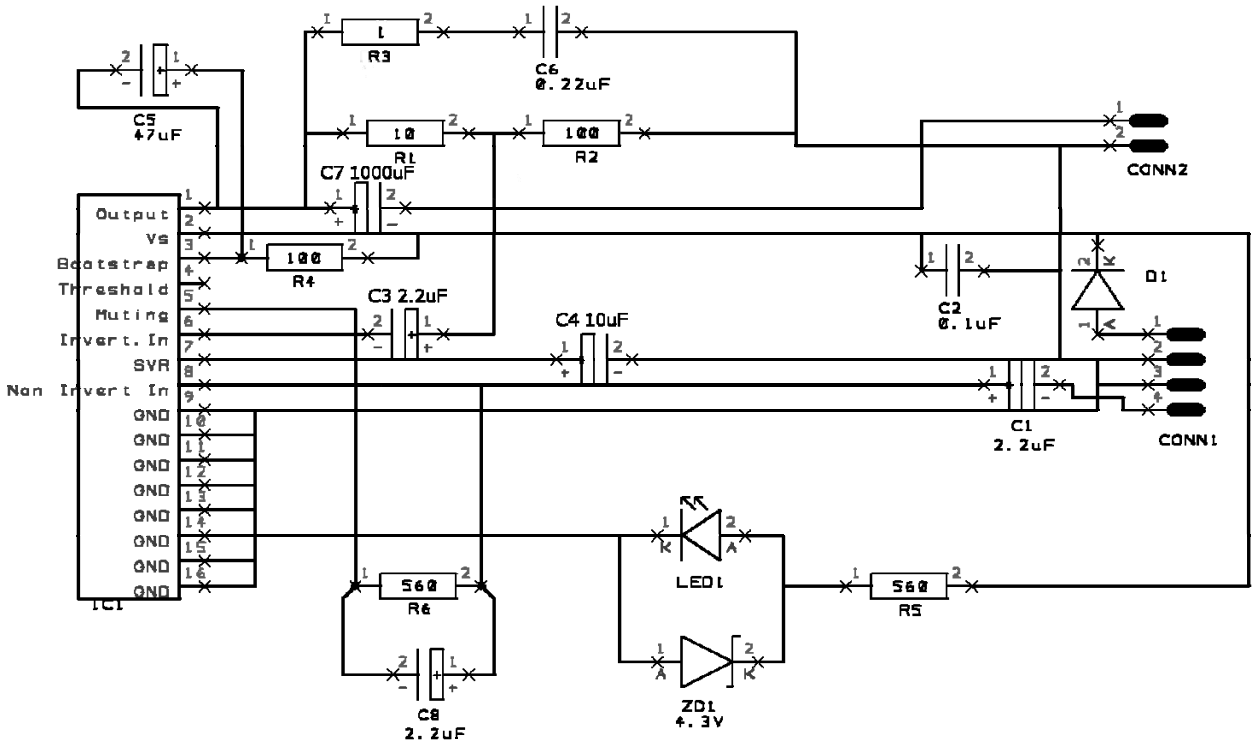
If you have installed and soldered all the components correctly you should see the LED start to pulse. If it is then at least you have the power connected correctly. Now turn on you audio source device and see if your amplifier works. With any luck all should be working and sound should be pumping out of you speaker.

Note the a 9 volt battery will run low within about an hour if used on a high volume setting. You may like to use a 12V 450mA plugpack to run your amplifier if you are going to use it for extended periods. If you use a power supply above 9V then R4 should be removed from the PCB.

When using speakers, mount them in a box to improve the sound quality. It makes a huge difference. Even if it is just a cardboard box.

Well we hope you enjoyed making the Amplifier kitset and hope you get many hours of fun from using it. Why not make another and build a STEREO amplifier.

Schematic Drawing Of 5W Mono Amplifier



SOLDERING – A Quick Lesson

How important is soldering?

Among the foremost of reasons an electronic project frequently fails to work properly is due to "poor" soldering practices. This is usually caused by "dry joints" when soldering. Here I discuss the correct procedures for soldering electronic projects.

Dry joints when soldering

At first glance many solder joints appear to be quite "O.K." but on closer examination many are in fact defective. The insidious problem with dry joints in soldering is that the circuit frequently performs alright for a period of time, even years before failure.

This problem even occurs with manufactured equipment. Ask any TV / Video repair technician who has torn a lot of hair out over an elusive fault ultimately traced back to a dry joint.

Good soldering practices for your electronic project

The cause of dry joints in soldering is mostly the improper application of heat. Both the component leg and the PCB need to be both heated simultaneously to the correct temperature to allow the solder to flow freely between BOTH surfaces. Obviously this requires practice and most newcomers inevitably get it wrong.

Improper heating while soldering and its consequences can be seen below.

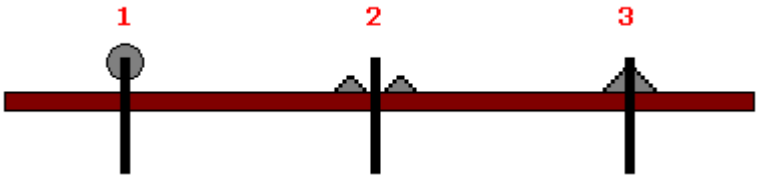


Figure 1 - correct soldering procedures to avoid dry joints

Here in figure 1 entitled "correct soldering procedures to avoid dry joints" we have three examples of soldering depicted. The first example indicates the component lead was heated while the PCB wasn't heated. As a consequence the solder only flowed onto the component lead.

In the second example of soldering in figure 1 we find the PCB was correctly heated while little or inadequate heat was applied to the component lead. This is the most treacherous example because although I have made it very obvious in the diagram, in practice it is not always particularly obvious. Often this type of dry joint "just" allows the solder to "touch" the component lead while not actually being ***"soldered"*** to the lead. Of course it might work for a period of time depending upon environmental conditions of heat and cold.

In the final example of "correct soldering procedures to avoid dry joints" I have depicted the solder bridging both the PCB and the component lead. In this case the PCB and the component lead were both heated ***"simultaneously"*** AND the solder was applied to either the component lead or the PCB to "flow" freely from one to

the other to provide a good “electrical” joint. Such a joint is always “bright and shiny”, dull looking joints are often suspect.

You never apply the solder to the soldering iron “tip”. Solder is always applied to the “job”, never the soldering iron. Allow the solder to “set” and cool before proceeding to the next joint.

Other cases of soldering

We have discussed soldering components to a PCB yet this is not the only case of soldering. Often we need to connect wires to switches and other components. A common misconception is that soldering is designed to provide a good mechanical joint. - It isn’t!

Any connection should have it’s own mechanical strength perhaps by twisting wires together or twisting the wire around a binding post or through a hole provided for the purpose. The solder is only intended for a good “electrical” connection. Never provide a connection which can’t stand mechanically on it’s own merits.

What’s soldering flux?

Modern quality electronics solders contain a “flux” resin within the solder. This flux is designed to flow over the job and prevent contact with the atmosphere. Metals, particularly copper when heated tend to “oxidise” and prevent the alloying or good electrical bond between the copper and the solder.

Good solder containing the resin will have resin flowing over the leads and prevent this oxidisation process and as the solder flows the resin is displaced allowing the solder to form an “atomic” bonding with the items being soldered together. A good resin helps to keep the surfaces clean.

Rules for good soldering

Of course some of these rules might seem very obvious but are worth repeating.

- Use a reasonable quality iron of the correct wattage for the job.
- Only use “electronic” resin cored solder of fine gauge.
- Make sure all surfaces to be soldered are “bright, shiny” and thoroughly clean.
- If a mechanical joint, make sure it can “stand alone” before soldering.
- Make sure the solder tip is clean, shiny and properly “wetted”.
- Apply the resin cored solder to the heated “job”, not to the soldering iron tip.
- Remember to visually inspect ALL of your soldered joints, preferably with magnifying glasses.
- Consider using your multimeter to provide an “electrical continuity” check between various parts of the circuit.