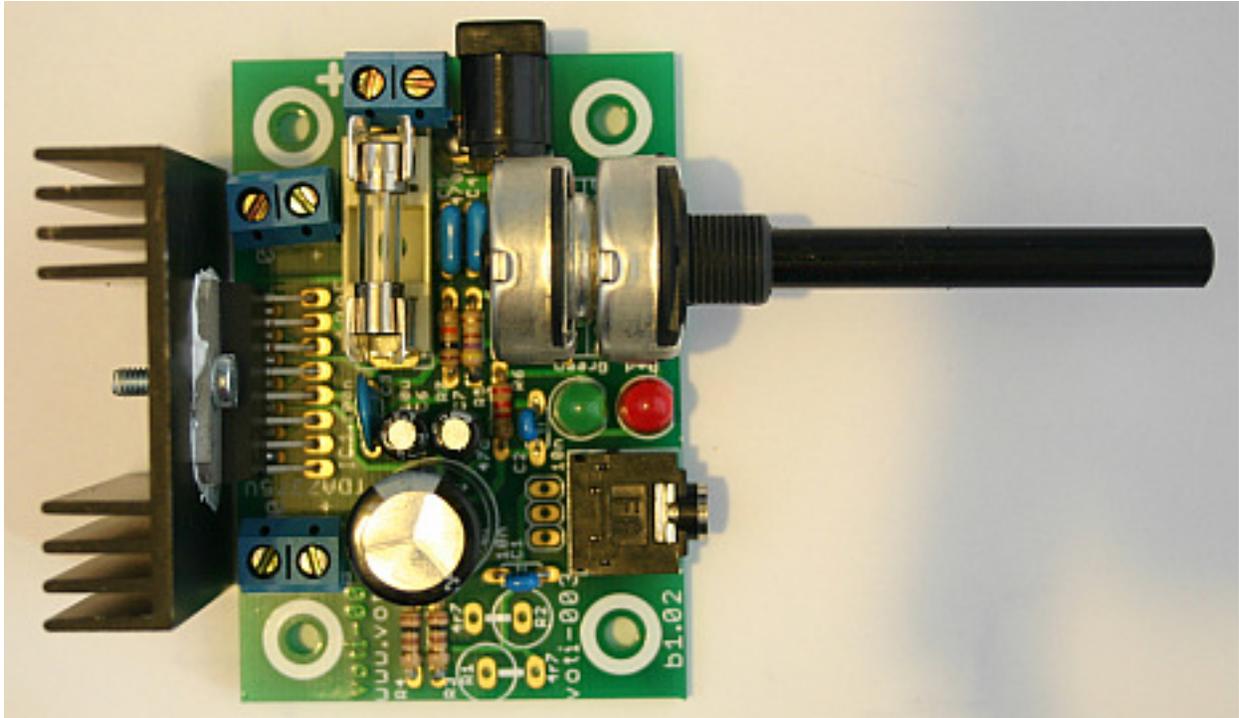


VOTI-003

2 x 20 W audio amplifier kit

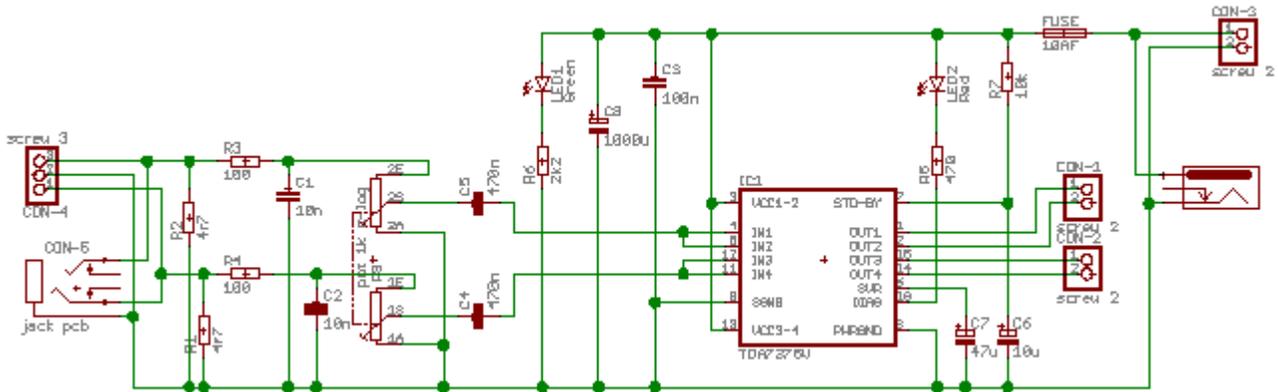
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version 1.00



Introduction

This document describes the VOTI-003 audio amplifier. This is a kit a 2 x 20W stereo bridge amplifier. This requires an 18 Volt supply, from a 14.4 Volt supply the maximum output power is around 2 x 10W. The kit contains the PCB and all components, including a stereo potentiometer for volume control. Loudspeakers and a power source are not included. A heat sink is included, which will be sufficient for normal use. For continuous full output power (a rare condition in normal use) a larger heat sink will be need (2 °C/W or better).

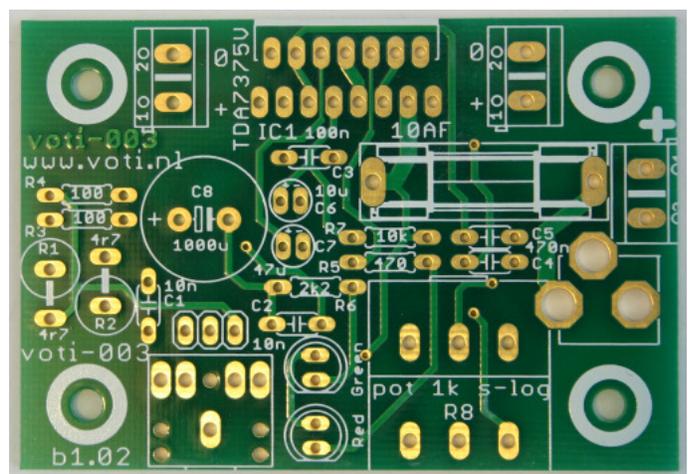
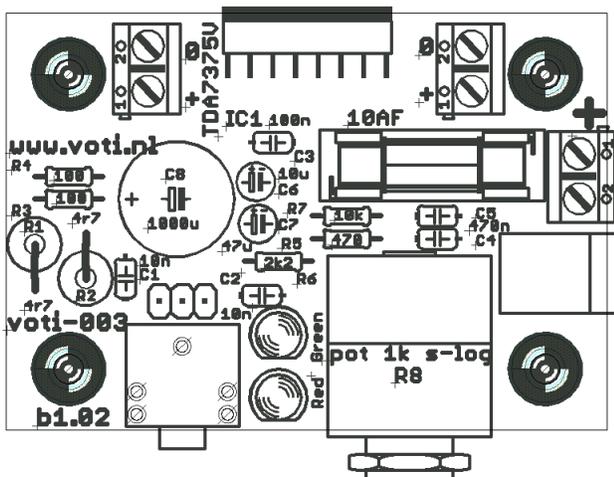
Circuit



The main part of the circuit is the TDA7375 amplifier chip. It contains four amplifiers, which are used in two pairs as bridge amplifiers to maximize the power for a given supply voltage. The input signal enters the PCB either through the jack connector CON-5 or (for a more permanent connection, or to accommodate a different connector) via the solder pads CON-4. Two optional resistors R1 and R2 provide a proper load when the signal is delivered by an amplifier which expects to drive 4 Ohm speakers. The resistors R3/R4 and capacitors C1/C2 provide a little filtering. Next are the stereo potentiometer R8 and the coupling capacitors C4/C5. Each signal is fed to two inputs of the TDA7375, appropriate for a bridge configuration. The outputs of the amplifier chip leave the PCB via two screw connectors. Power can be supplied via either a center-pin DC connector (as commonly found on small Wall-Warts) or via a third screw connector. The centre-pin connector is easy to use, but for better reliability the screw connector should be used. The DC power is filtered by the capacitors C8 and C9. The green LED D1 gives an indication that power is present. The red LED D2 will light up when the amplifier chip detects an error condition, like over-temperature or clipping.

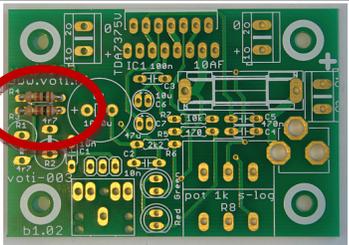
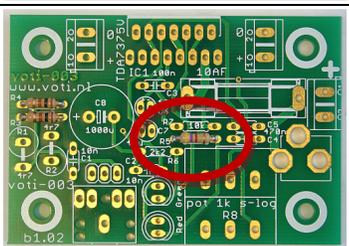
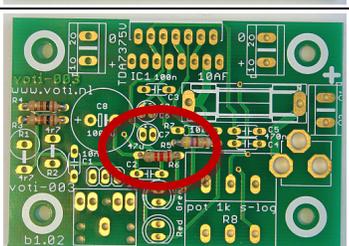
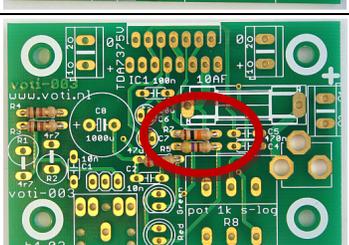
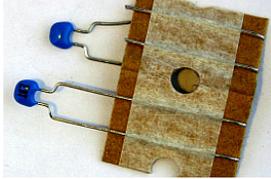
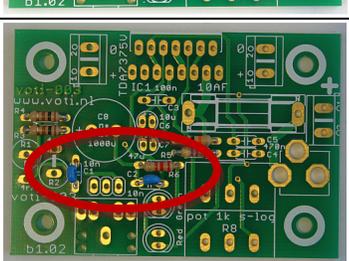
Component Placement

The pictures below show the placement of the components on the PCB.

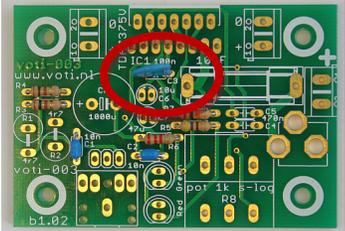
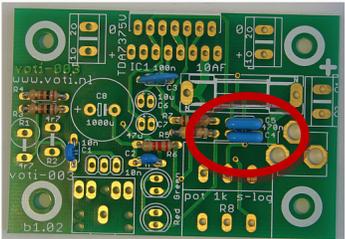
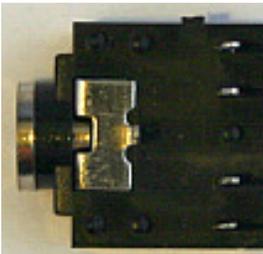
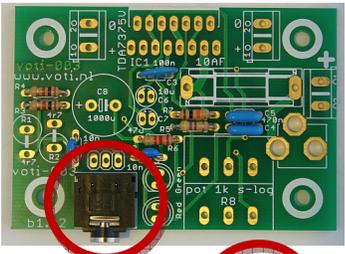
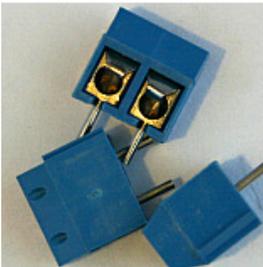
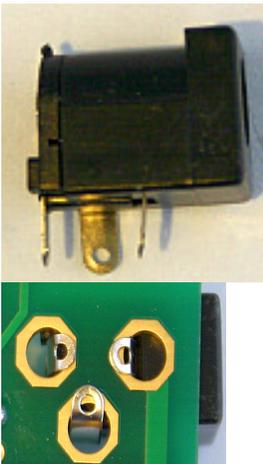


Assembly

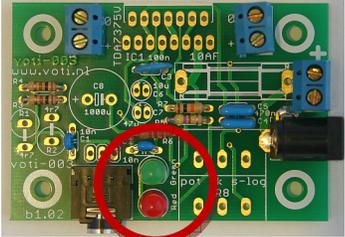
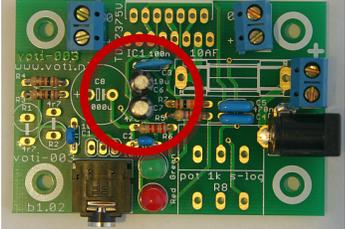
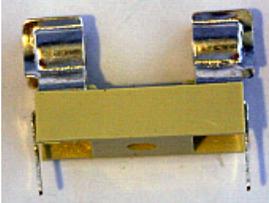
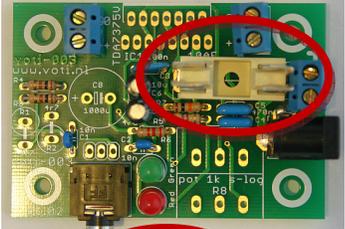
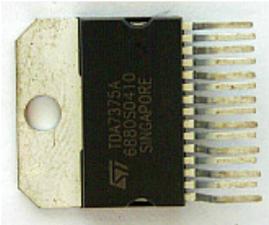
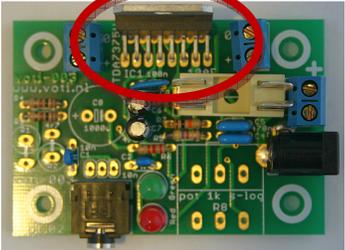
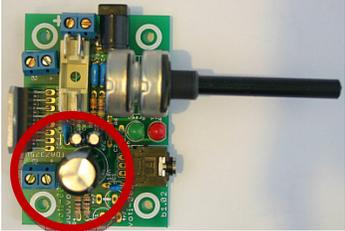
The kit contains the PCB and all components as shown in the circuit diagram. Assembling the kit is not difficult, no fine-pitched or SMD components are used. Just follow the instructions below carefully. Some soldering experience is recommended. Orient the PCB as shown on the pictures and in the previous paragraph. The silkscreen (component side) text should be readable.

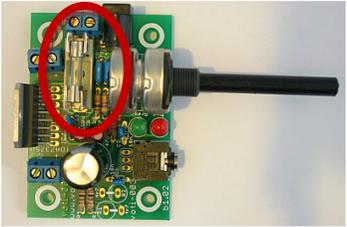
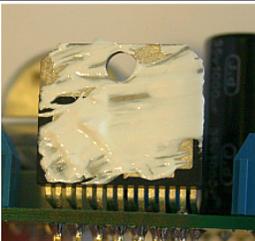
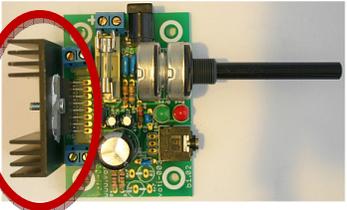
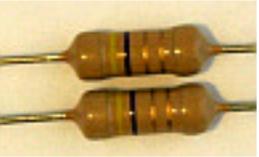
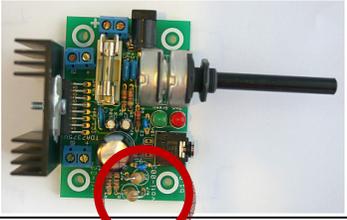
	<p>Place and solder the two 100 Ohm resistors (brown-black-brown). Cut the wires (I won't mention this again for other components).</p>	
	<p>Place and solder the 470 Ohm resistor (yellow-purple-brown).</p>	
	<p>Place and solder the 2k2 resistor (red-red-red).</p>	
	<p>Place and solder the 10k Ohm resistor (brown-black-orange).</p>	
	<p>Place and solder the two 10 nF capacitors (marked 103 or 10k).</p>	

2 x 20 W audio amplifier kit

	<p>Place and solder the the 100 nF capacitor (marked 104 or 100k).</p>	
	<p>Place and solder the two 470 nF capacitors (marked 474 or 470k).</p>	
	<p>Place and solder the jack connector.</p>	
	<p>Place and solder the three two-pole screw connectors. Make sure the wire entry points are towards the edges of the PCB, otherwise it will be very difficult to make the wire connections lateron!</p>	
	<p>Place the centre-pin power connector. I prefer to bend the eyes towards another with a screwdriver before soldering. Solder the eyes, using ample solder.</p>	

2 x 20 W audio amplifier kit

	<p>Place and solder the two LEDs. Note that the red LED is nearest to the PCB edge. Also note that the flat side of the LEDs must be towards the (lower) edge of the PCB (as shown on the silkscreen).</p>	
	<p>Place and solder the 10 uF and 47 uF electrolytic capacitors. The 47 uF capacitor must be placed nearest to the LEDs. The white stripe on the capacitors (negative pole) must be at the right side (towards the two registers nearby and the black power connector at the edge).</p>	
	<p>Place and solder the fuse holder.</p>	
	<p>Place the amplifier chip. Take care that all leads are in their correct hole. Solder the leads.</p>	
	<p>Place and solder the stereo potentiometer.</p>	
	<p>Place and solder the big electrolytic capacitor. The white stripe at its side must be oriented identical to the smaller capacitors: to the right side, towards the fuse holder.</p>	

	<p>Place the fuse in the fuse holder.</p>	
	<p>Smear <u>a little</u> heat conducting paste on the back side of the amplifier chip. The picture shows far too much paste!</p>	
	<p>Fasten the heat sink to the amplifier chip.</p>	
	<p>When needed, the two optional 4.7 Ohm resistors can be placed. They are mounted vertically.</p>	

Use

To use the amplifier you must connect

- The power source, 12 – 18V DC, 1A is sufficient for low-power use, 6A for continuous full power use. The black 2.5mm-centre-pin connector is easy to use, but for a permanent connection and/or higher currents the use of the screw connector is recommended. The silk screen printing clearly shows where the positive lead should go.
- Two loudspeakers, 4 Ohm, 20W. Note that loudspeakers have a polarity, for best music quality the speakers should be connected as indicated on the silk screen.
- An audio source. Using the 3.5mm jack connector is the easy option. For a more permanent connection the solder pads at the back of the connector can be used, the middle pad is the ground.

Change notes

the latest version of this document can be downloaded from <http://www.voti.nl/docs/VOTI-003.pdf>

version	date	notes
1.0	2003-11-04	first version