

Mounting the Smapler v0001r2 step by step

by [dcuartielles](#) on April 8, 2009

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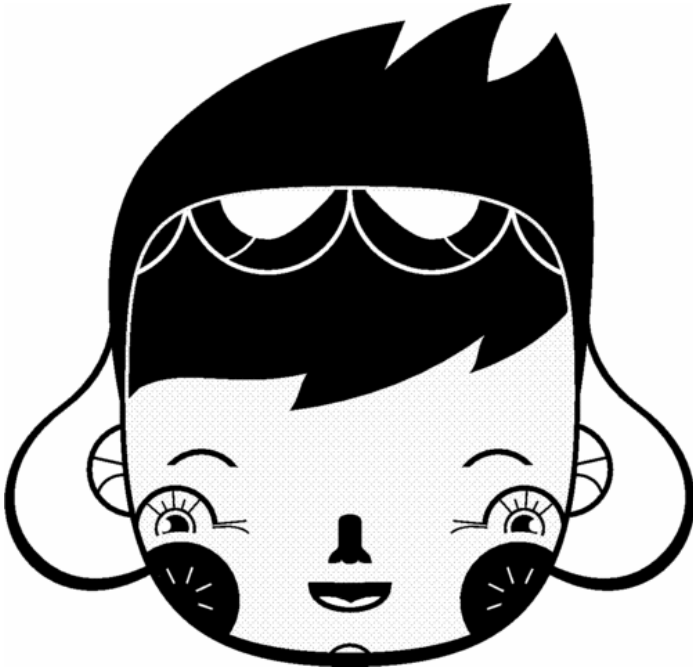
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intro: Mounting the Smapler v0001r2 step by step

This is a photographic guide for mounting the Smapler v0001r2. It is a standalone Arduino-compatible circuit with an on board SD card connector, a PS2 connector for mouse/keyboard, a sound amplifier and a bunch of I/O pins for sensors. With it you can make a music instrument, a simple media player, or a small computer.

This instructable is just showing the optimal process for mounting the board. There are examples of use at <http://blushingboy.net>. Anyways I plan publishing some extra articles on how to make a simple music instrument and in how to make a small computer in the following weeks. Stay tuned!

Note: the pictures and soldering work for this instructable is by T. Olsson from 1scale1.com, thanks for the great job!



step 1: The tools

The tools needed for mounting the Smapler v0001r2 are the same ones as for any other DIY kit: your soldering iron, some pliers, desoldering braid...



step 2: mounting the pcb

This is the photographic guide step by step. Just follow it in the same order and you will have guaranteed success with this kit!

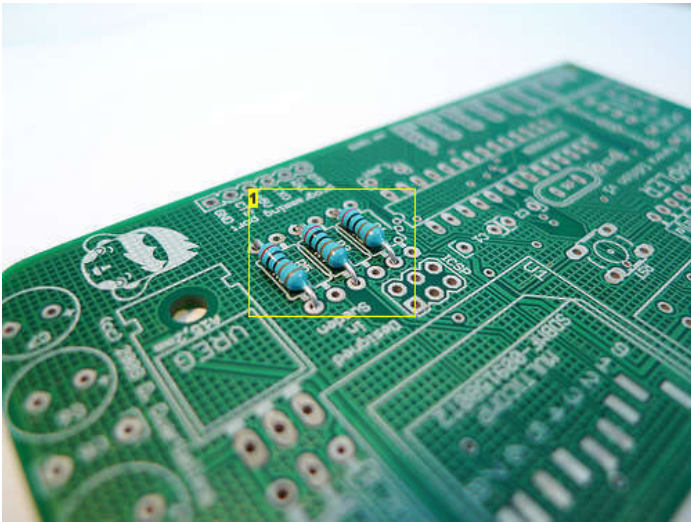


Image Notes

1. 1K resistors to interface the SD card from the processor

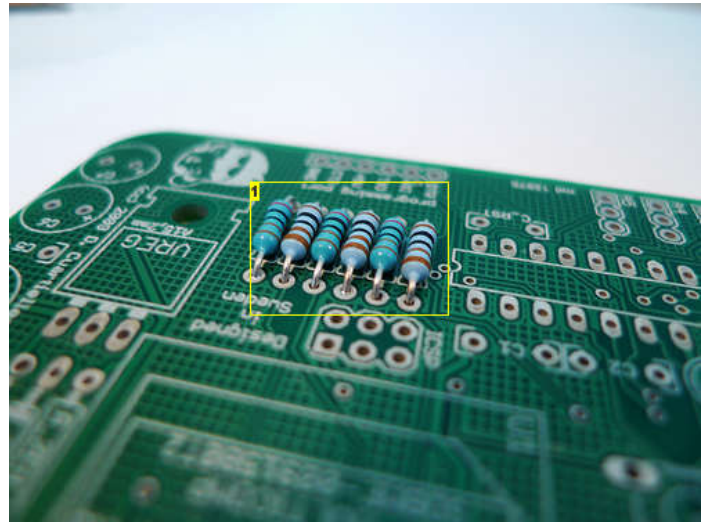


Image Notes

1. 2K resistors

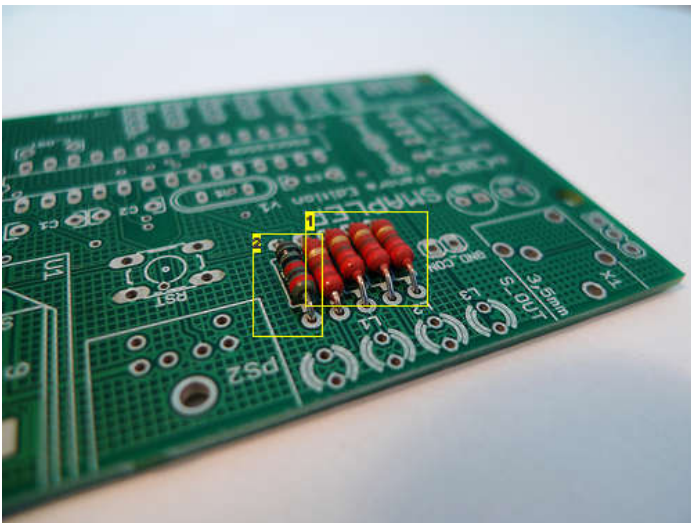


Image Notes

1. 220Ohm resistors for the 4 LEDs on board: - 1 power led to show if the board has power - 3 LEDs connected to PWM enabled pins
2. 10K resistor, this is the resistor for the reset button

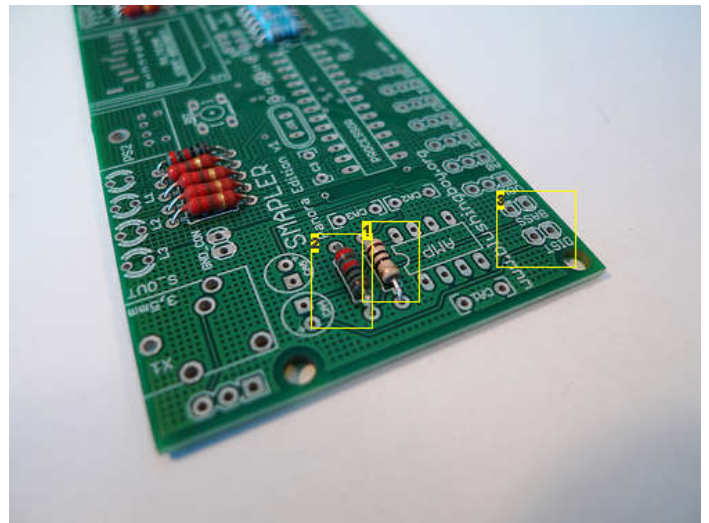


Image Notes

1. 10Ohm resistor for one of the loops in the power amplifier
2. 10K resistor for one of the loops in the amplifier
3. extra headers to activate bass boost or extra distortion

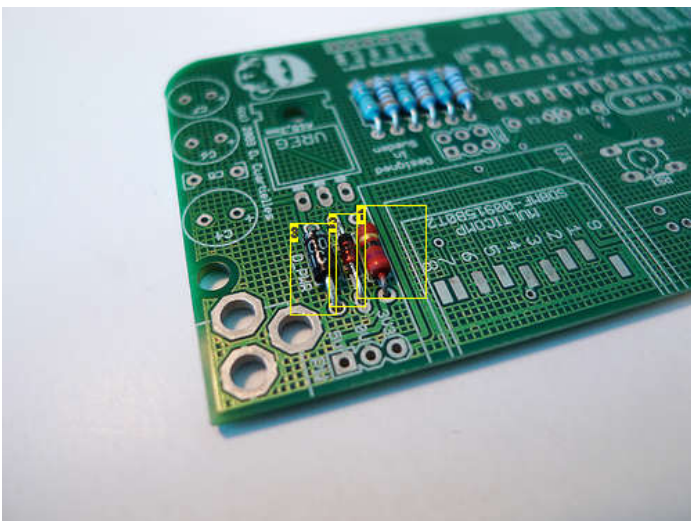


Image Notes

1. 270Ohm resistor
2. 3v3 Zener diode to power the SD card

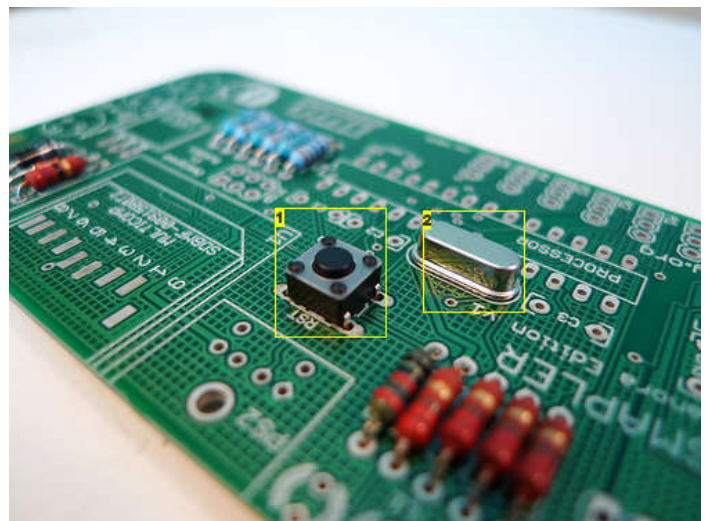


Image Notes

1. reset switch, however the board has automatic reset for reprogramming like any Arduino since the Decimila model

3. 1N4004 Power Diode to protect the circuit from inverse power connections

2. 16MHz crystal

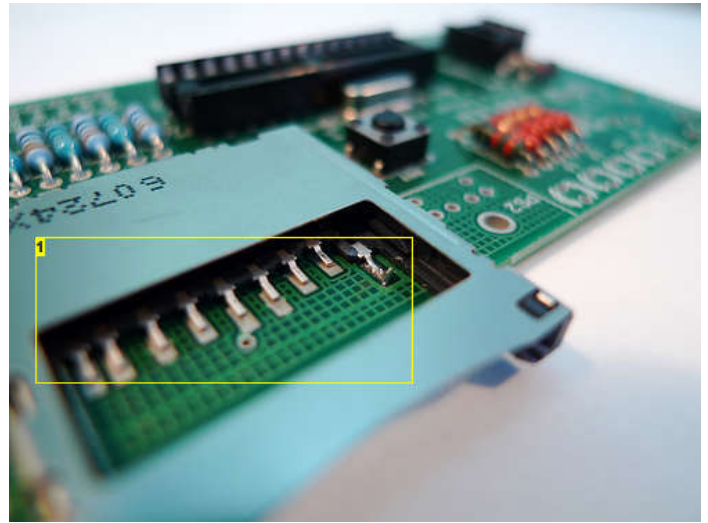
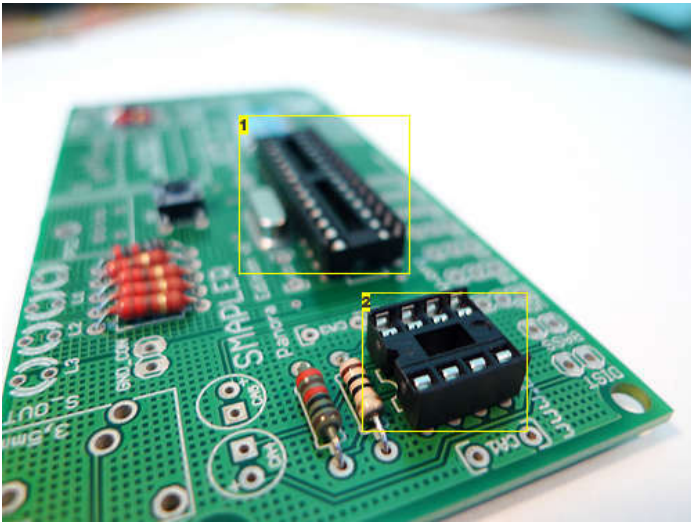


Image Notes

- 1. 28DIP socket for the ATMEGA processor on board (328)
- 2. 8DIP socket for the operational amplifier (LM386)

Image Notes

- 1. Surface mounted SD card connector, this is the trickiest part of the circuit. First solder one pin to make sure it is aligned. Then go for the rest one by one

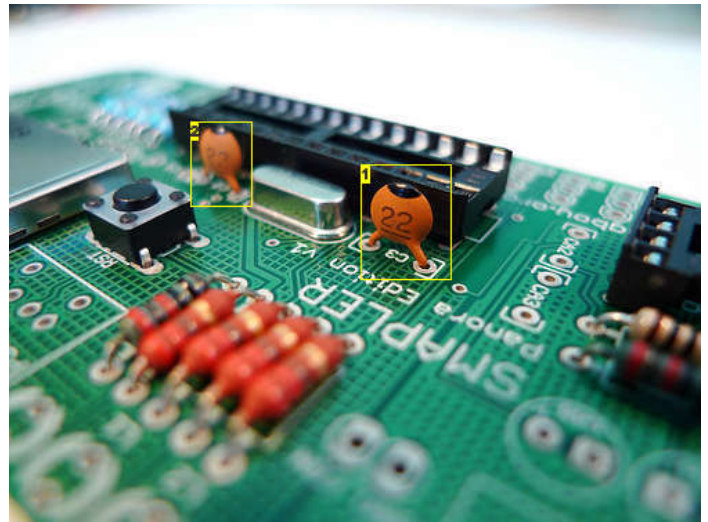
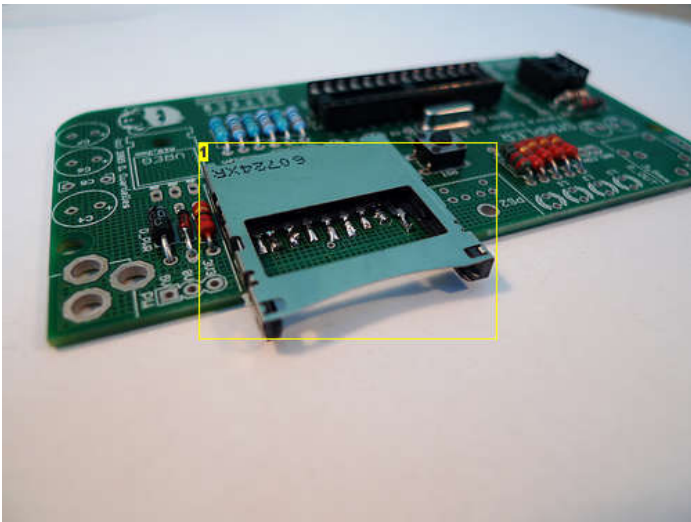


Image Notes

- 1. SD card connector after soldering

Image Notes

- 1. 22pF capacitor to filter out the noise generated by the 16MHz oscillator
- 2. 22pF capacitor to filter out the noise generated by the 16MHz oscillator

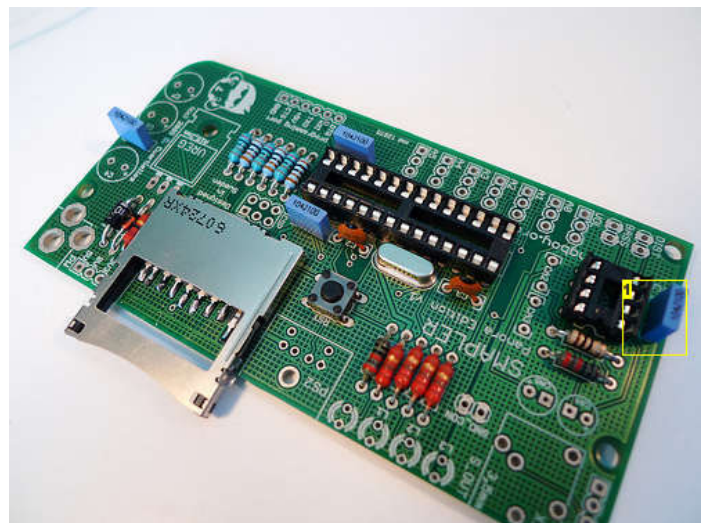
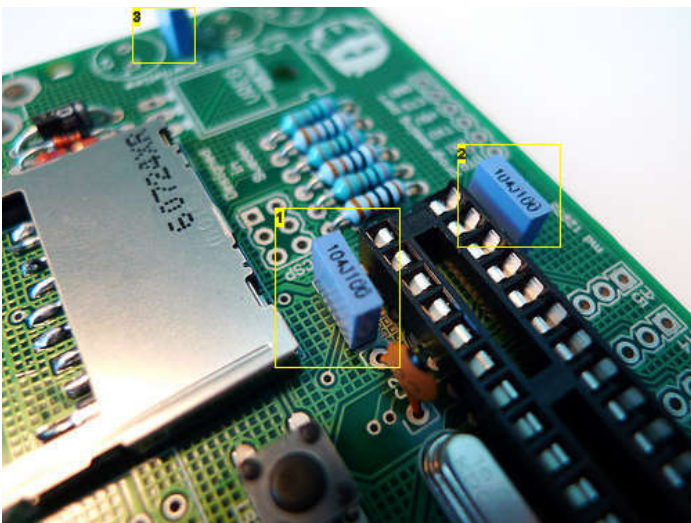


Image Notes

1. 100nF capacitor for decoupling the power at the processor
2. 100nF capacitor for the autoreset function
3. 100nF capacitor for filtering high-frequency noise at the voltage supply

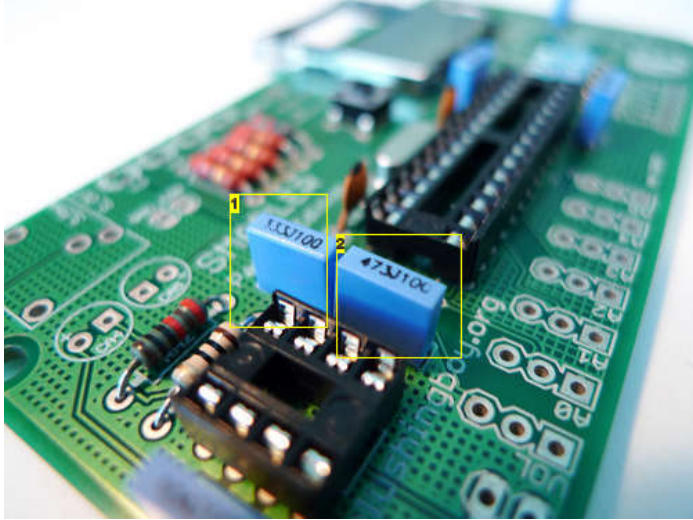


Image Notes

1. 33nF capacitor for the amplifier
2. 47nF capacitor for the amplifier

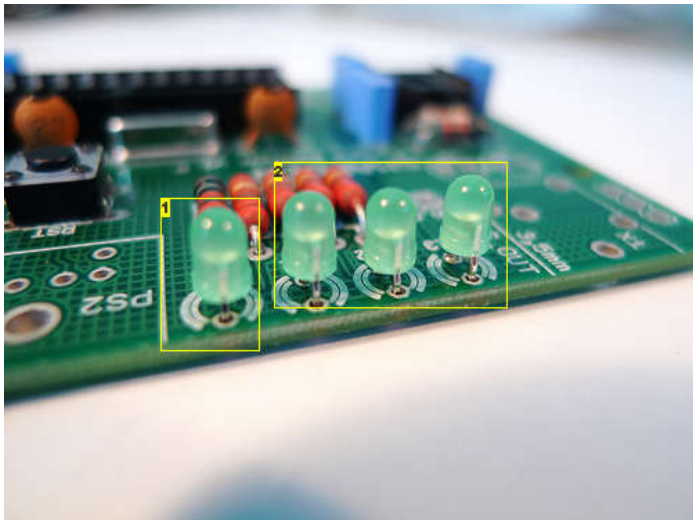


Image Notes

1. LED showing there is power connected to the board
2. LEDs connected to PWM enabled pins, for nicer light effects

Image Notes

1. 100nF capacitor for one of the feedback loops at the amplifier

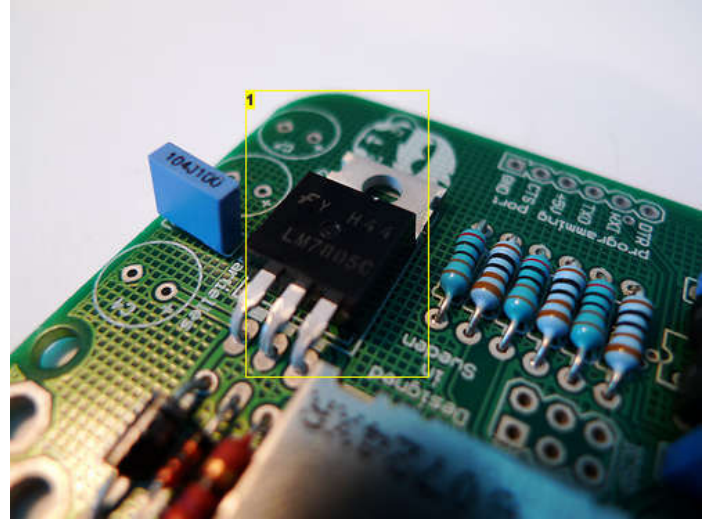


Image Notes

1. 7805 1,5Amp voltage regulator, supports up to 25VDC with no problem, can be exchanged by others with different current ranges

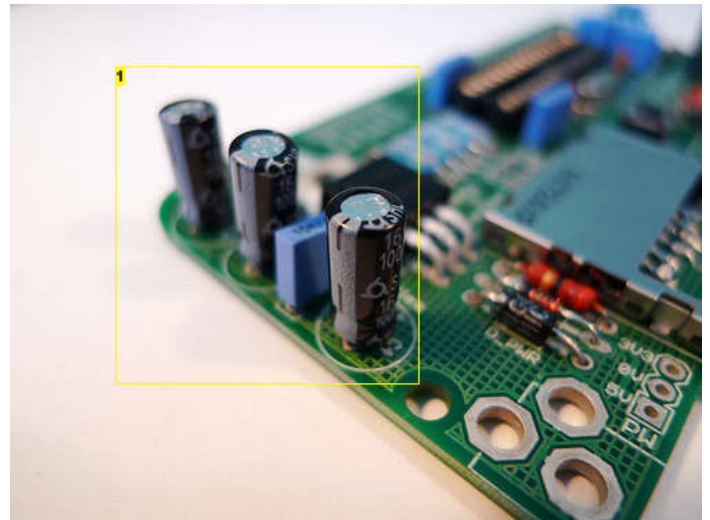


Image Notes

1. rest of the capacitors at the power supply

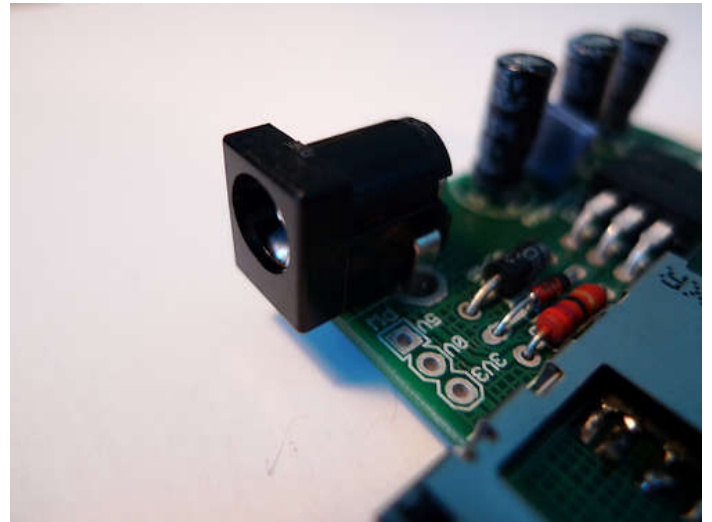
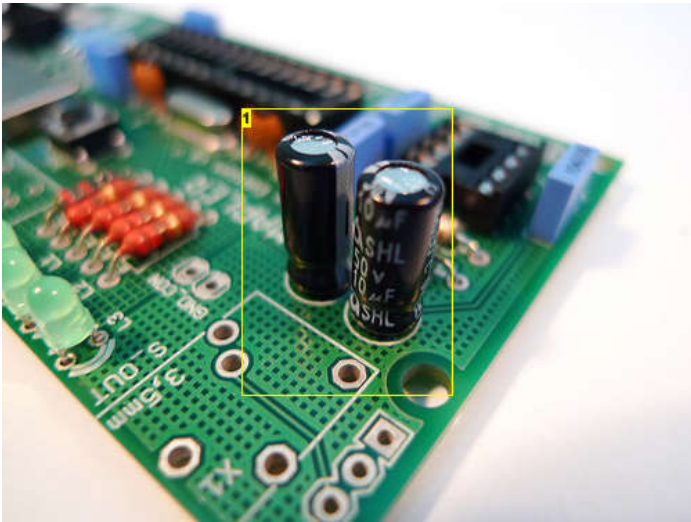


Image Notes

1. electrolytic capacitors for the opamp: for decoupling the sound and adding the distortion loop. The bigger the value of the biggest one, the more distortion it will generate

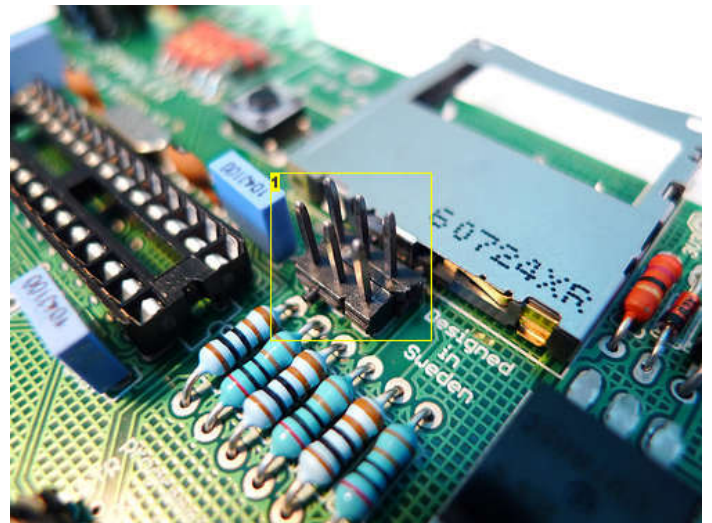
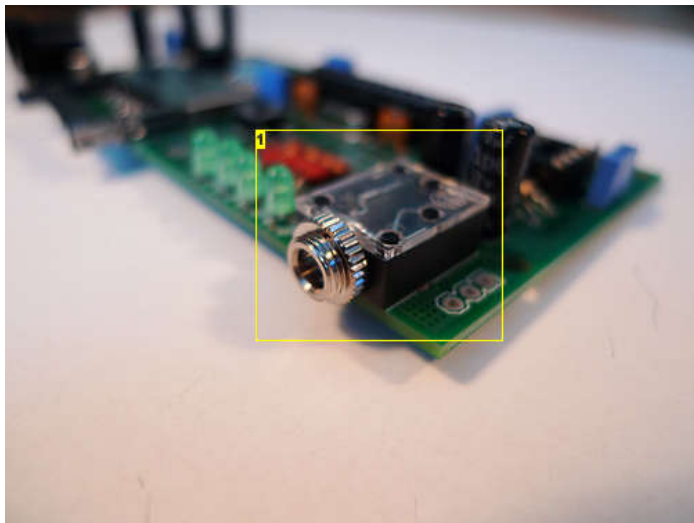


Image Notes

1. soundjack (stereo with mono output)

Image Notes

1. the bootloader programming (ICSP) connector. Allows reprogramming the bootloader in your processor

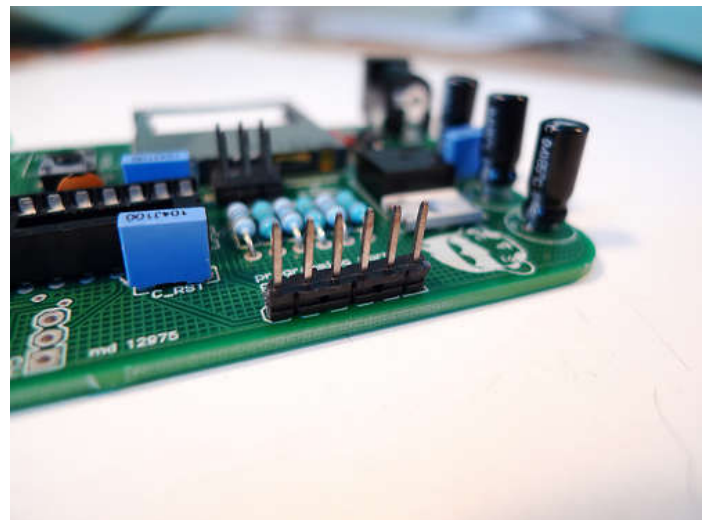
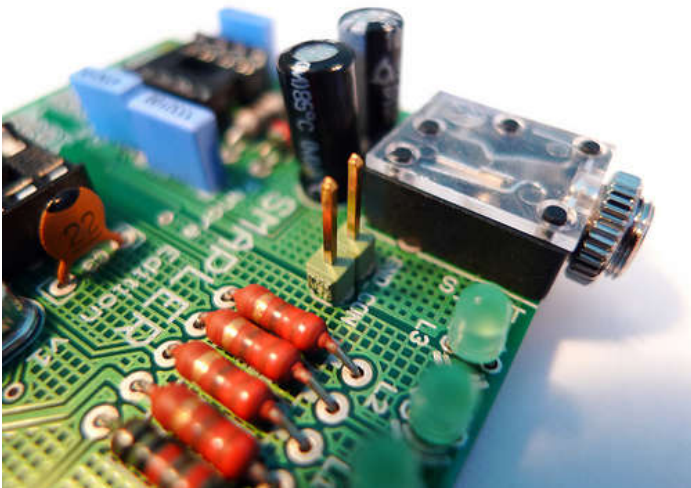


Image Notes

1. programming pins to send programs through an FTDI compatible

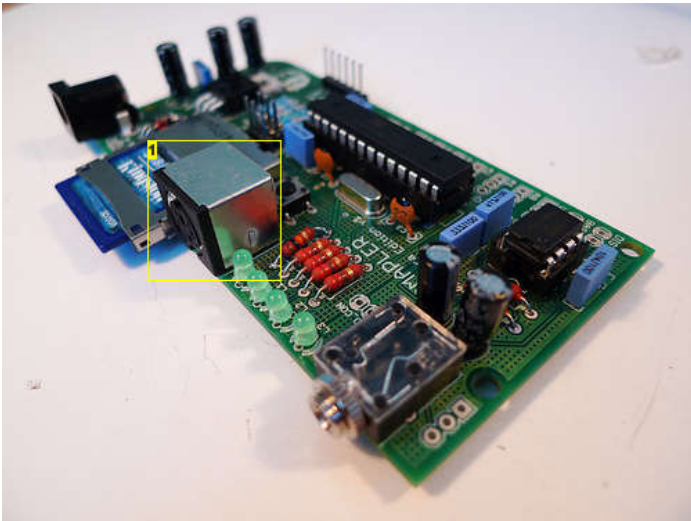


Image Notes

1. PS2 connector for your old keyboards or computer mice to act as interface to the smapler

step 3: Where to find documentation

You can experiment with the SDplayWAV library I wrote for this design:

<http://blushingboy.net/p/SDplayWAV/>

It will play whatever 8bit, 8KHz sound files you have in the SD card one by one.

You could also try out the work made for Smapler v0002, but taking into account that the Smapler v0001 is only mono:

<http://blushingboy.net/p/SNDlib/>



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