Piggyaxe 14M2 Motherboard Kit

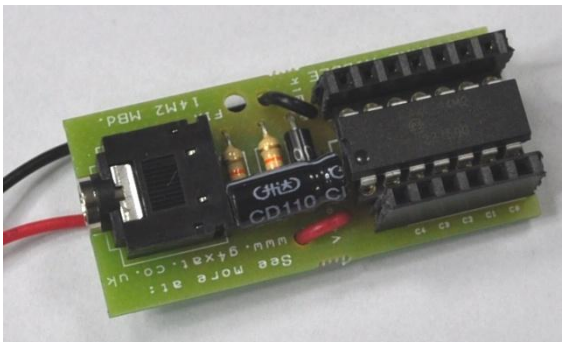
Electronics is FUN – so let's build a PIGGYAXE 14M2 Motherboard!

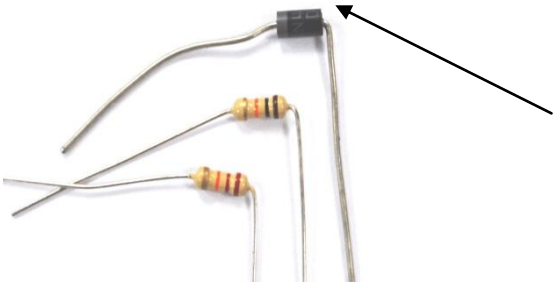
Start by collecting the following parts: (Available as a Rapid Electronics kit, order code 70-1063):

Picaxe 14M2 microcontroller, R1: 10kΩ resistor (brown-black-orange-gold), R2: 22kΩ resistor (red-red-orange-gold), D1 protective diode: 1N4001, PP3 battery snap, PCB, C1: 100uF 10 volt miniature radial electrolytic capacitor (black cylinder with short wire - and long wire +), 3.5mm stereo download socket, optional 14-pin DIL chip socket, header pins or SIL socket strip as required.

You will also need: a soldering iron with a stand and a wet sponge, a PCB holder of some sort, some solder and a pair of side cutters. Remember: soldering irons can burn you. You should always wash your hands after handling solder.

Take great care to fit the components exactly where they are supposed to go, otherwise your circuit may not work as expected. Use the photograph below to help you place the components correctly.





Above, a completed motherboard with a socketed chip and SIL sockets.

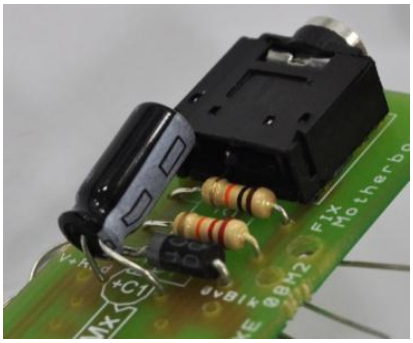
Start assembly by bending the legs on the two resistors and the diode as shown above right. Make the bend on the diode OPPOSITE the Silver band as shown by the arrow. ❑ For the resistors, bending either end is fine. ❑

Fit them to the board as shown, this makes it easier to tuck in the capacitor.

This is important especially if you fit the 14M2 without a socket.

Put a tick ✓ in each box as you solder in each part or if you prefer, get someone to check your placement before you solder it. **CHECK TWICE – SOLDER ONCE!**

Fit R1 ❑, R2 ❑, and D1 ❑ as close to the bottom of the PCB as possible (photo above). Then add the download socket , making sure that ALL 5 of its LEGS are actually through the PCB and are soldered. ❑



The next component to fit is the electrolytic capacitor C1. Take care to fit the short '–' lead into the hole opposite the '+'. Tuck it in carefully between the back of the download socket and to the right of R1, R2 and D1.

C1 ❑

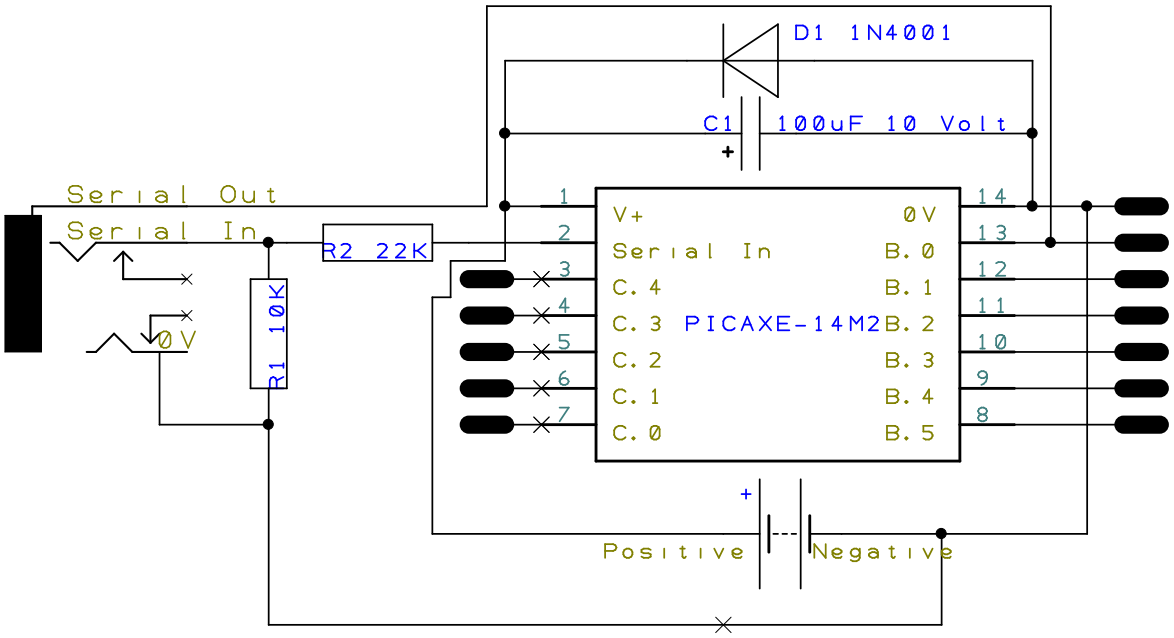
Now fit the 14-pin DIL chip socket (or the 14M2 direct if you wish) taking care to match the notch at one end with the outline ❑

Finally fit the RED and BLACK wires from the battery snap up though the stress relief holes then down into the PCB and solder ❑

Always carefully check your soldering for errors (missed joints, bridges between parts that should NOT be connected or solder splashes) and if it looks OK, proceed to the next stage.

TIP! Once you have fitted the micro-controller you can test your motherboard by seeing if you can download a blank programme. That should prove that it's working. You can then add either the SIL socket strip or solder it to a matching daughter-board using straight or 90 degree header pins.

WARNING! DO NOT USE MORE than 6 VOLTS to power your Picaxe chip.



In terms of the number of components this is a fairly straightforward circuit. Access to all the I/O and +ve and –ve is provided on the two rows. Capable of 4 channels of hardware PWM and 8 bit port 'emulation' it's a handy little chip.