



The AXEme PICaxe Construction Set

Exactly what is it?

The AXEme Picaxe Construction kit is a self contained microprocessor development and prototyping system for the Picaxe 08-M microprocessor. The kit contains 9 volt and 5 volt power supplies, a solderless breadboard for prototyping, many fun sensors for interesting projects and an improved download circuit terminated in 2 types of connectors: a 3.5mm headphone jack for 'standard' PICaxe download cables and a 3 pin Molex connector for rolling your own download cable from old RS232 cables. All you need to supply is an appropriate wall adapter, delivering at least 12 volts DC, and an old serial cable for turning into a downloading cable.



Let's build!

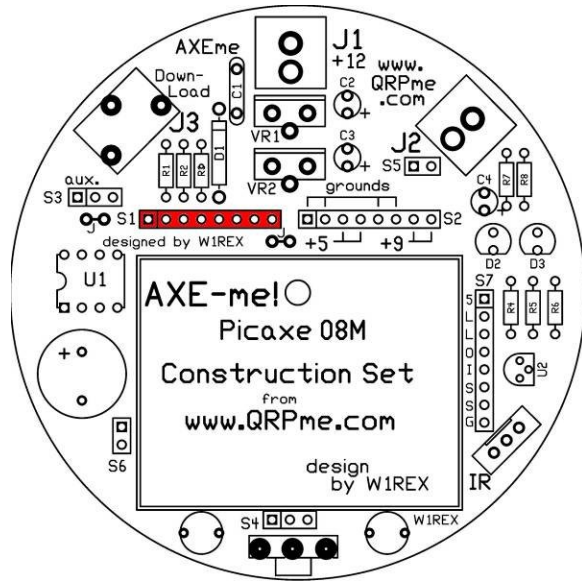
Zip off the easy open top and take out all the parts...

It is advisable to organize and inventory all the parts before you start building your kit! It is also advisable to read through this construction manual a couple of times to get a complete picture of the kit, construction steps and various parts **BEFORE** you begin soldering.



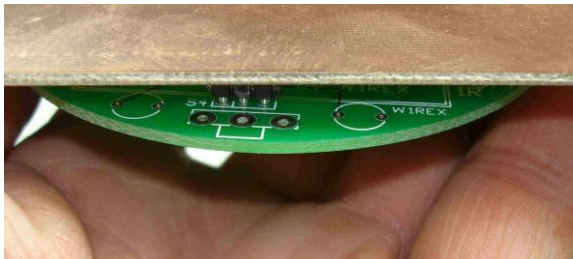
Parts List:

QTY	Designator(s)	Description
2	S1,S2,S4,S5, S6,S7,D2,D3	16 pin machined SIP socket (S1,S2,S7 8 pins each) cut into smaller sections (S4,S5,S6,D2,D3)
1	S3	3 position Molex SIP header
1	S3	3 position Molex female socket
3	S3	Molex socket terminal pins
2	J	2 position Molex SIP header
1	R1	180 ohm (Brown-Gray-Brown) resistor
3	R2, mods	10K ohm (Brown-Black-Orange) resistor
1	R3	22K ohm (Red-Red-Orange) resistor
3	R4,R5,R7	330 ohm (Orange-Orange-Brown) resistor
2	R6,R8	4.7K ohm (Yellow-Violet-Red) resistor
1	--	0 ohm (Black) jumper
1	C1	.1uF (104) capacitor
3	C2,C3,C4	4.7uF electrolytic capacitor
1	D1	1N6263 diode
1	D2	Green LED (this is the crystal clear LED)
1	D3	IR LED (this is the blue-ish LED)
1	U1	8 pin IC socket
1	U1	Picaxe 08-m microprocessor
1	U2	18B20 temperature sensor (looks like a transistor)
1	VR1	LM2937-9 9 volt regulator
1	VR2	L7805 5 volt regulator
2	--	tactile switches
2	J	Molex header shorting jumpers
1	--	piezo sounder
1	--	10K linear taper potentiometer
1	IR	38Khz IR decoder (looks like a black LED on stilts)
1	J8	stereo headphone jack
2	J1,J2	RCA connectors
1	--	170 tie point solderless breadboard
1	--	#6 nut
1	--	6-32 x flat head bolt
1	--	assortment of solderless breadboard jumpers
1	--	tuna can
1	--	printed circuit board



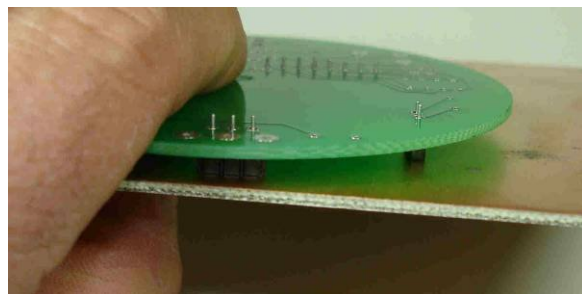
The first items to install are the SIP (single inline package) sockets. There are either 7 or 9 locations on the AXEme board where SIP sockets are installed. You can install the sockets 1 by 1 or all at once. I think it is actually easier to install them all at once using the following method.

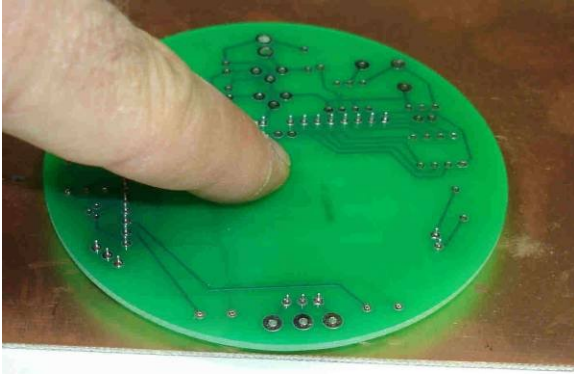
Insert all the SIP sockets in their proper locations. Note that there are 2 pin SIP sockets at the 2 LED locations D2 & D3. Using SIPs here allows the swapping of LEDs later when you are prototyping neat gizmos.



Lay a piece of bare pcb, glass, wood or anything smooth and flat over all the SIP sockets.

Pinch the 2 boards together, flip the whole sandwich over, and carefully place on the bench.



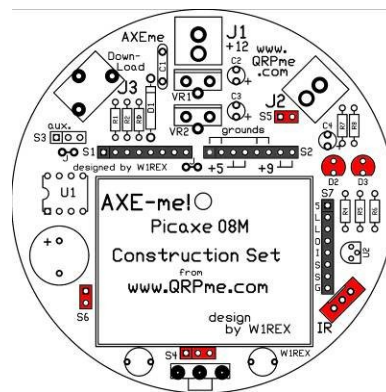
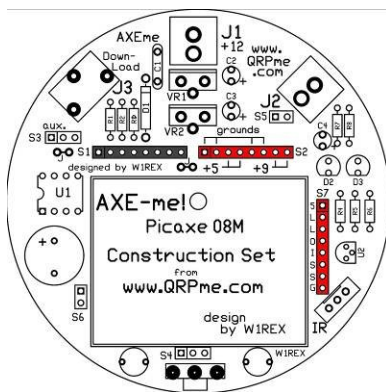


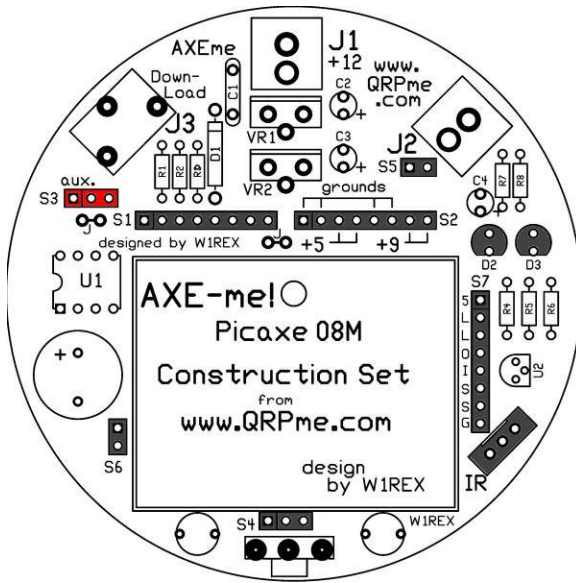
While still applying a little pressure, wiggle the pc board a little bit to help all the SIP sockets settle in and point their little legs straight up... Now you can solder ONE PIN ONLY of each SIP socket to hold it in place.

Now you can flip the pc board over and inspect all the SIP sockets in order to insure that they are all seated nice and vertical. If everything is OK, solder all the rest of the pins. If a socket has a problem, you should be able to hold the SIP with you finger (placed away from the pin you will be soldering) and reheat the soldered pin while attempting to orient the socket properly with your hopefully unburned finger.

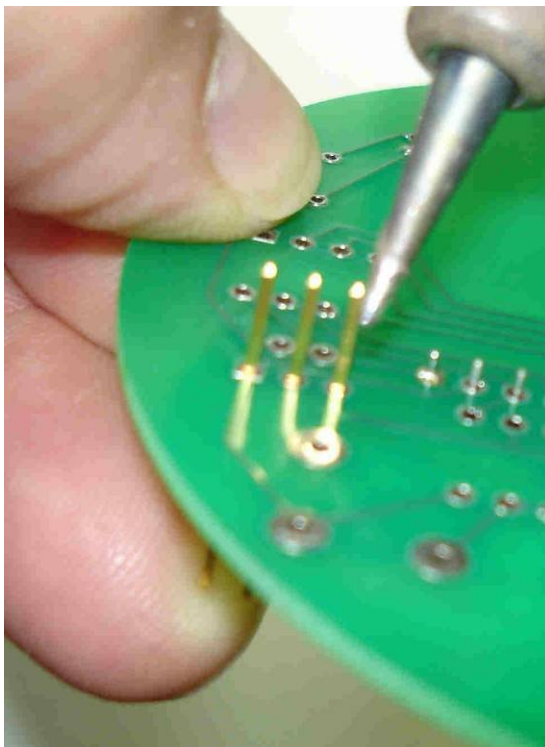
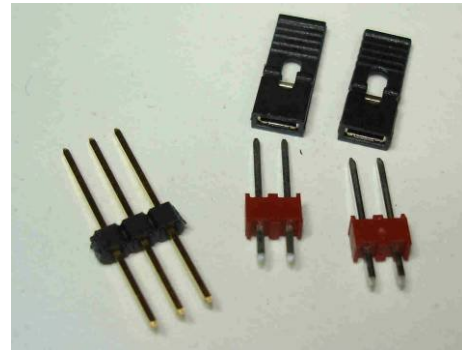


Here are the other SIP socket locations:





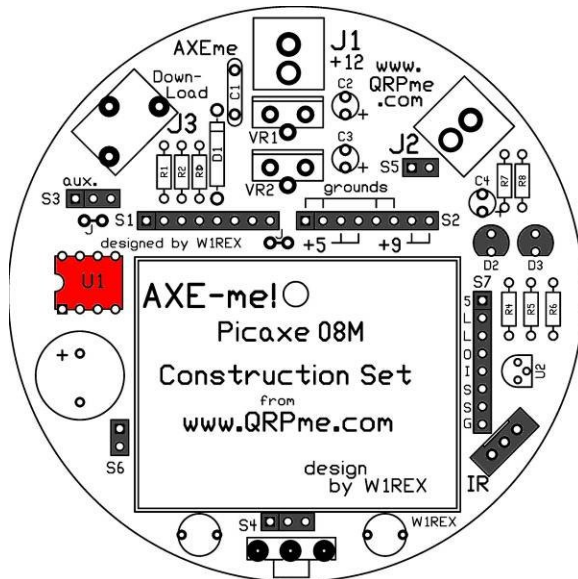
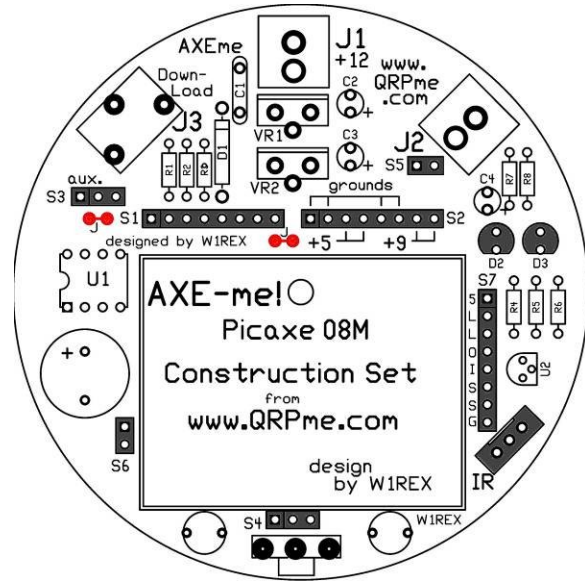
Now install a 3 pin Molex SIP header at S3. Here is a picture of a 3 pin SIP header, 2 2 pin SIP headers and shorting plugs.



Here is my solder technique for these little parts. I hold the board with my left hand (because I solder with my right) by holding 1 pin on the connector with one finger and apply pinching pressure with my thumb on the same hand. The soldering iron is held in my vice or laying on top of something holding it well off the bench top. A weight is used to keep the soldering iron in place. Now I can bring the board & part up and into the soldering iron and the now free second hand can bring in the solder.

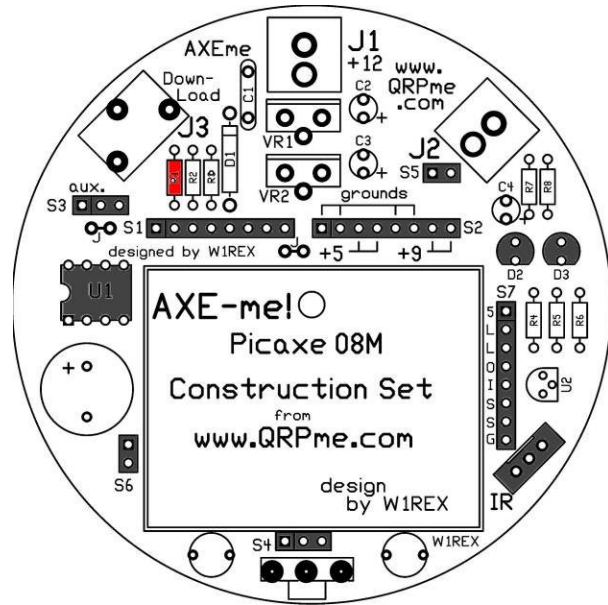
The two 2 pin Molex headers are soldered in at the 2 locations marked J. Watch out when soldering these parts with the technique above. If your finger slides over and touches the second pin....while you are soldering it, you will feel the heat....quickly!

I always tack the part in by soldering 1 pin and then check its orientation to make sure it is aligned properly and standing straight up.

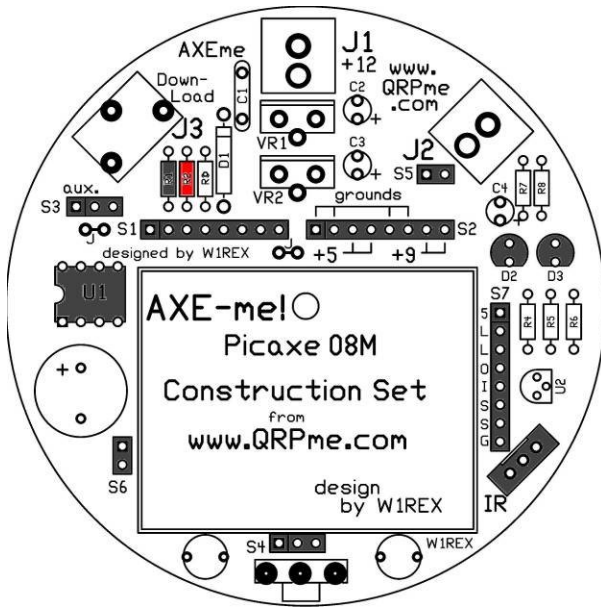


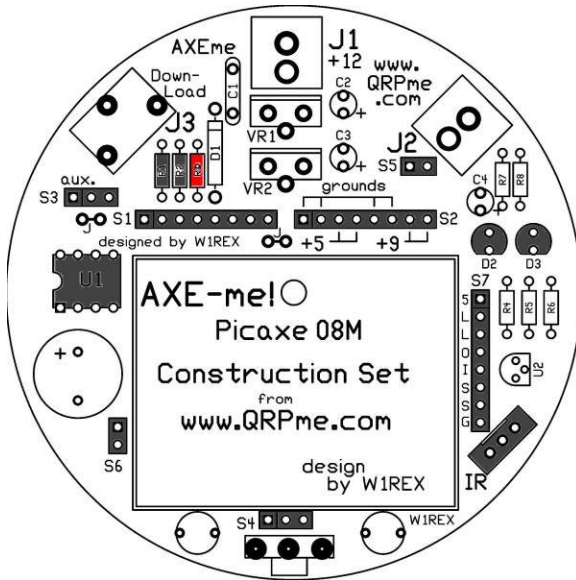
The 8 pin socket is soldered at location U1. Be sure to the socket such that the indentation on the socket matches the indentation on the silk screen. The PICaxe micro should be inserted in the socket AFTER you have finished the entire kit.

Now we will solder in the discreet resistors, capacitors and diode. The first resistor is a 180 ohm (Brown-Gray-Brown) resistor at R1. Insert the resistor. Spread the leads apart where they exit the hole to keep the resistor tight to the board when you flip it over to solder. Solder the leads on the back side of the board and clip off the excess leads.



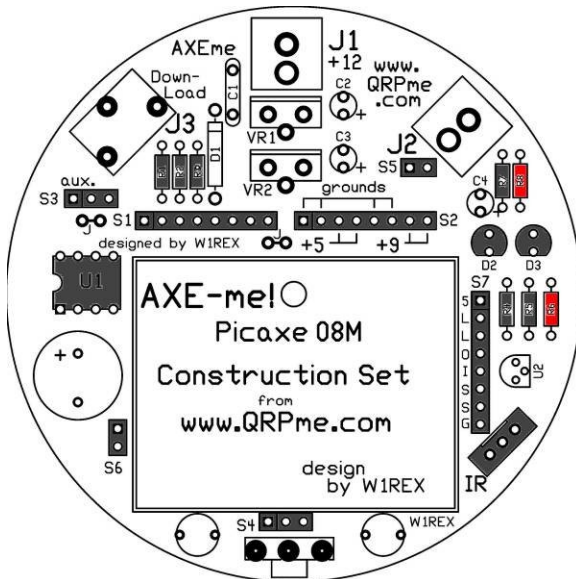
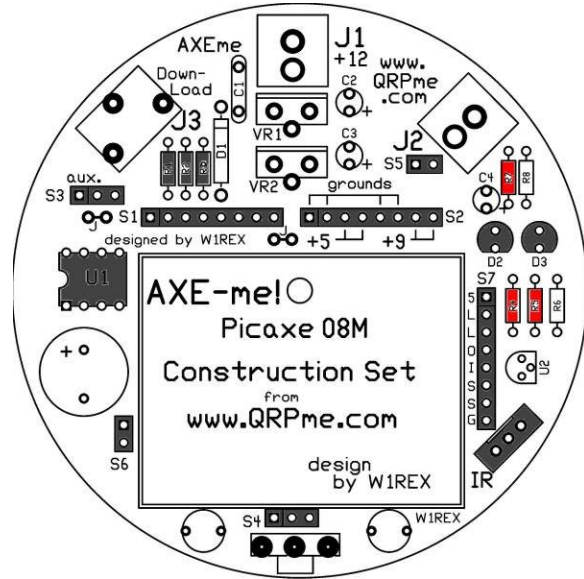
Next, install a 10K ohm (marked Brown-Black-Orange) at location R2.



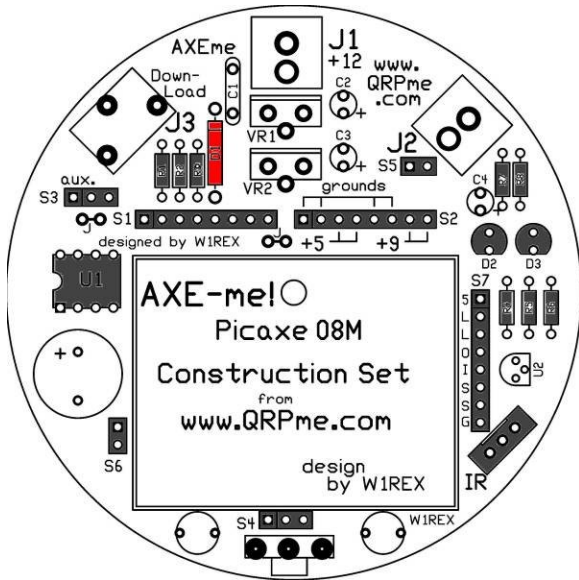


R3, a 22K ohm (Red-Red-Orange) is next.

Install 3 330 ohm resistors (Orange-Orange-Brown) at locations R4, R5 and R7.

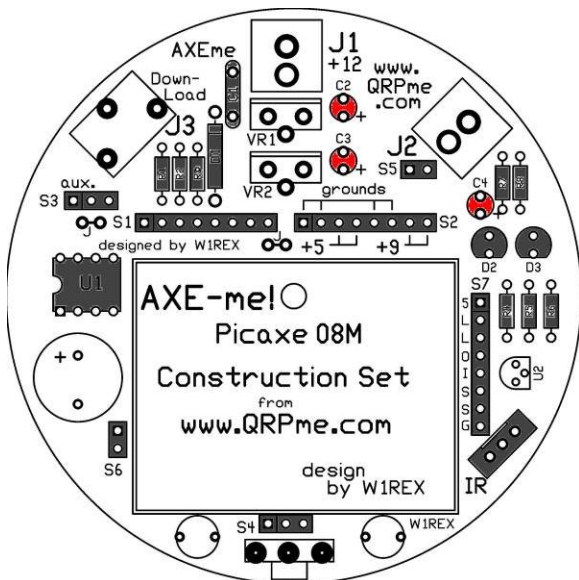
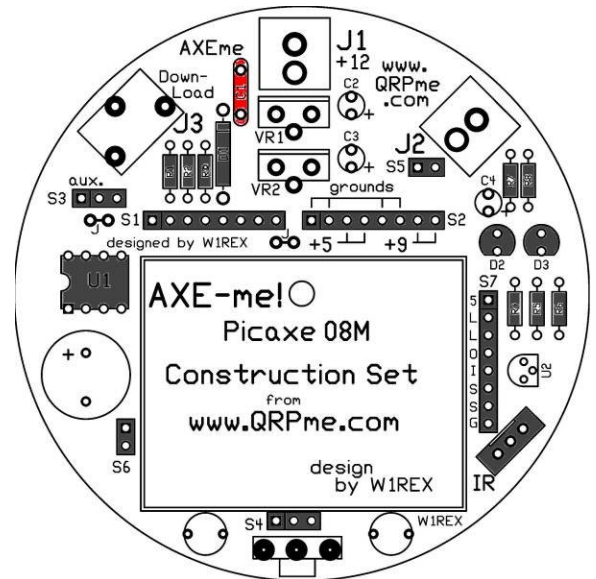


Install 2 4.7K ohm resistors (Yellow-Violet-Red) at locations R6 and R8.

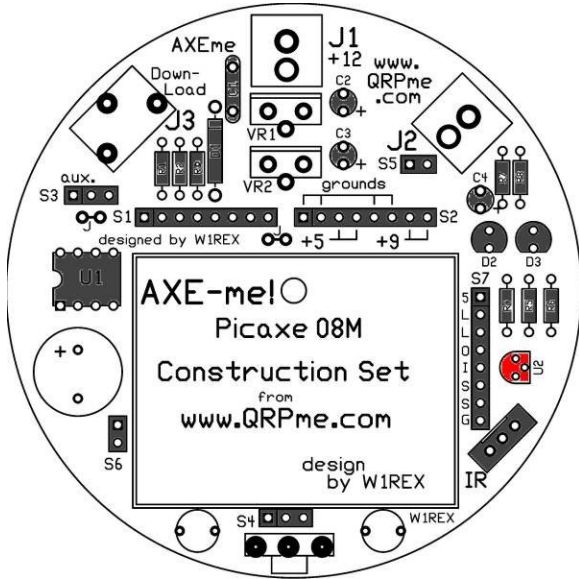


A 1N6263 is installed at location D1. Pay attention to the polarity of the diode. Orient the diode so that the stripe on the diode aligns with the stripe on the silk screen.

A .1uF (marked 104) is installed at location C1.

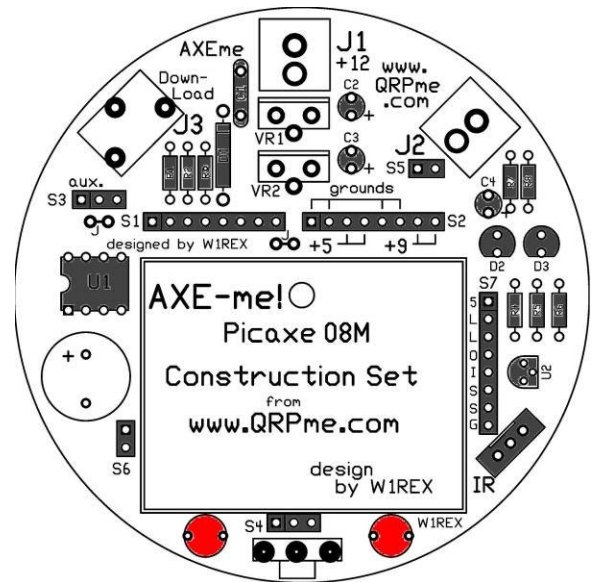


Now install 3 4.7 uF electrolytic capacitors at locations C2, C3 and C4. Make sure that the + lead on the capacitor is inserted in the + hole marked on the silk screen.

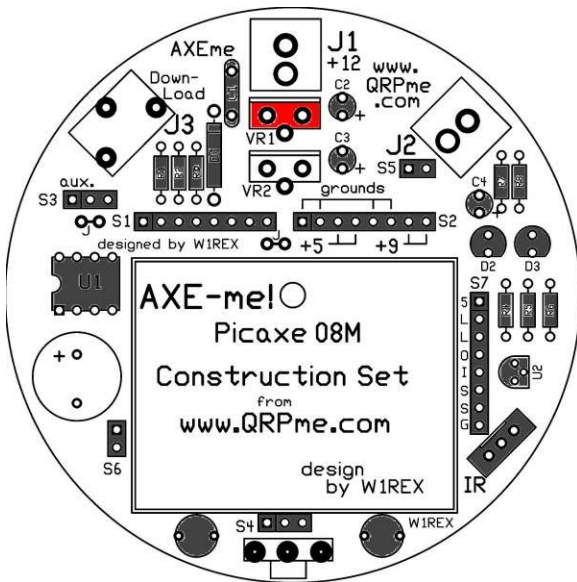


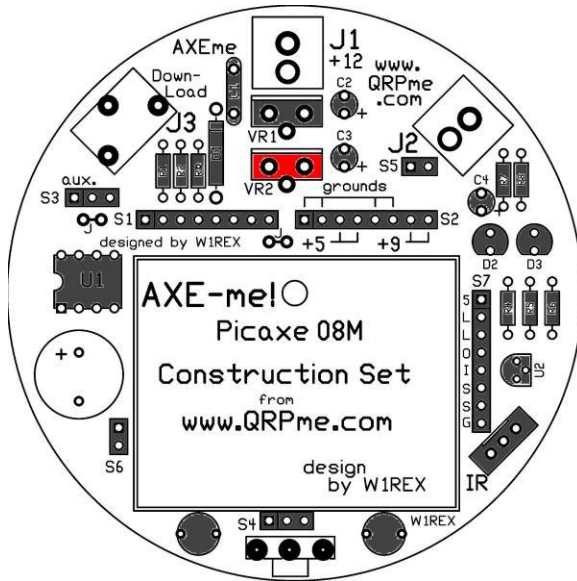
The DS18B20 temperature sensor is installed at location U2. The temperature looks like a TO-92 plastic transistor.

Install the 2 momentary switches at locations on either side of S4.



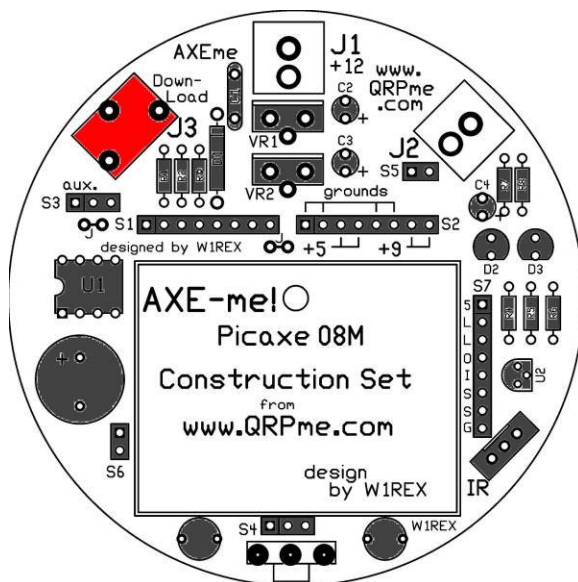
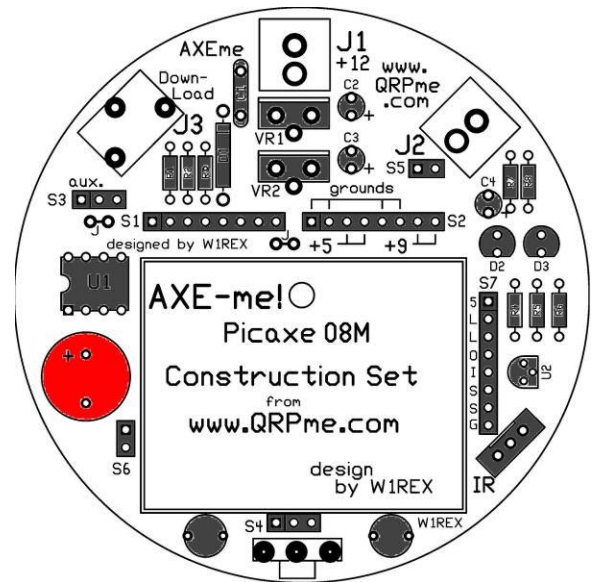
The LM2937-9 voltage regulator can now be installed at location VR1. Note that the heat tab side of the regulator is marked on the silk screen.



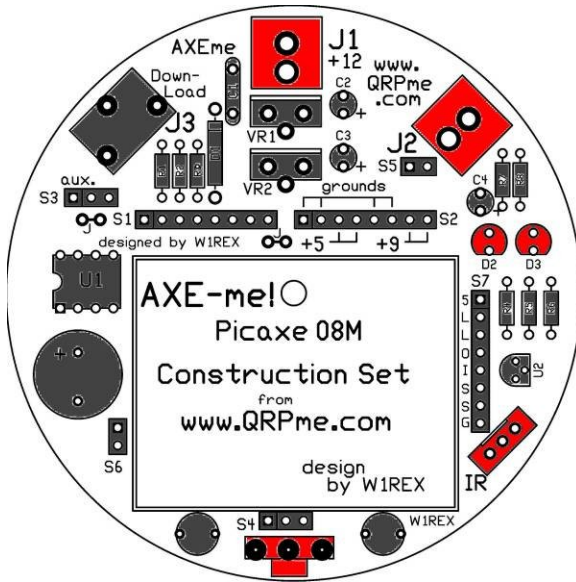


Then install VR2, an L7805 voltage regulator.

The piezo sounder is now soldered into the location just above connector S6. Pay attention to the polarity marking on the sounder and the silk screen.

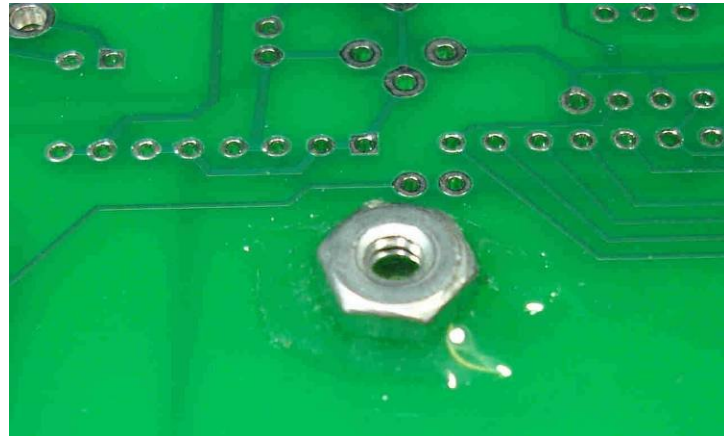


Solder in the headphone type jack at location J3.



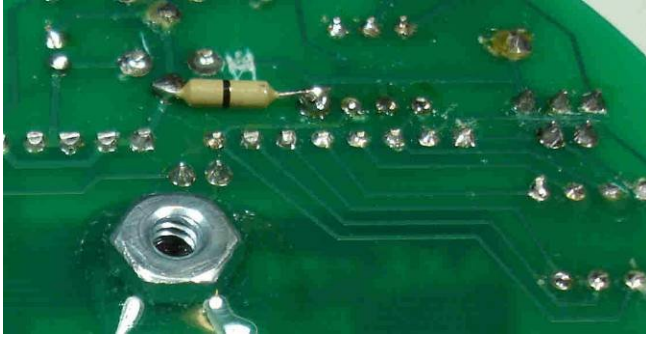
The final 3 parts to be soldered on the board are the 2 RCA jacks at J1 and J2 and the 10K pot at the lower edge of the board. The green LED (clear) can now be inserted into the SIP socket at D2 and the IRLED (blue-ish) at SIP location D3. Likewise, the IR detector can be installed in the SIP connector marked IR with the little black lens pointing out. Pay attention to match up the 'flats' on the LED and the 'flats' on the silk screen.

Epoxy the nut so that it is centered over the hole in the center of the board. Be careful here....Don't let any epoxy get into the hole or onto the threads of the nut. You might try roughing up the board and nut for maximum adhesion...



Here come the mods.....

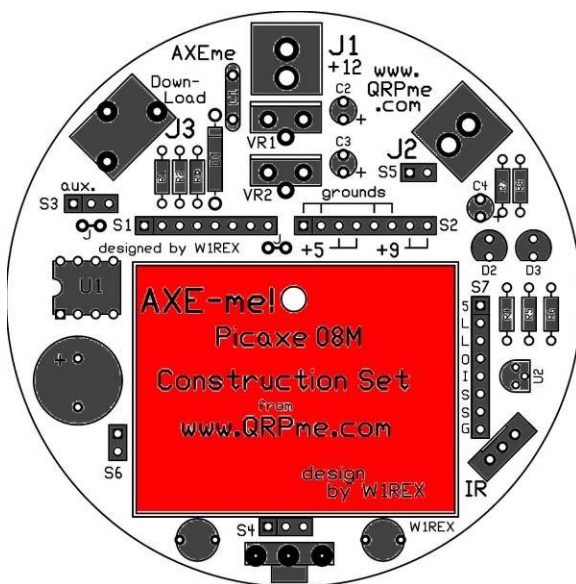
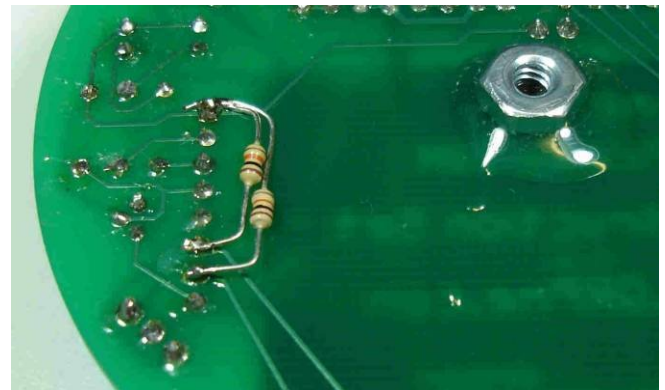
Here come the mods.....



Solder a zero ohm jumper (Black) between the center pin of the L7805 5 volt regulator at VR2 to the bottom pad of diode D1 approximately .4 inches to the right. The trace cut above this mod should already be made.

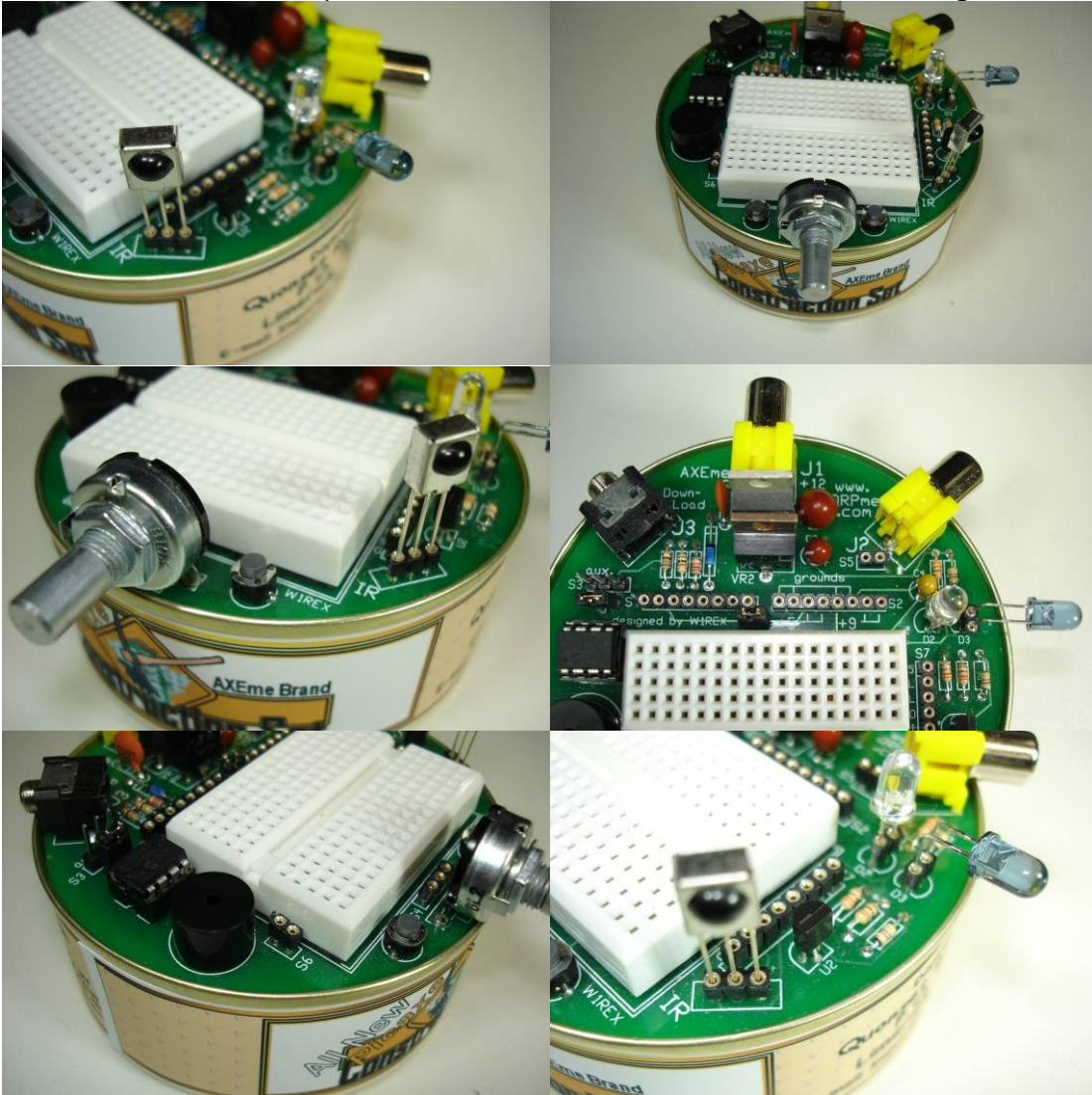
This next mod is optional.

Solder 2 10K ohm (Brown-Black-Orange) resistors in at the 2 pins on socket S7 where the 2 momentary switch contacts are terminated (2nd and 3rd pin from the bottom). Both the resistors are then soldered to the top pin (+5volts) on the same connector. This mod eliminates the need to always add a pull-up resistor on the solderless breadboard when connecting the switches to inputs on the PICaxe micro.



Now you can attach the solderless breadboard to the circuit board. You should 'dry fit' the board to the can to make sure the board mounts to the can properly BEFORE attaching the self stick breadboard and covering the mounting hole. Insert the screw up into the can from the bottom, install the board on the lip on the can opening and attach the two together. Don't overtighten.

Here are some pictures of the AXEme kit from several angles...



You will have some left over parts when you finish building your kit. Don't worry! Be Happy! You will find uses for these parts when you read through the User's Guide.....

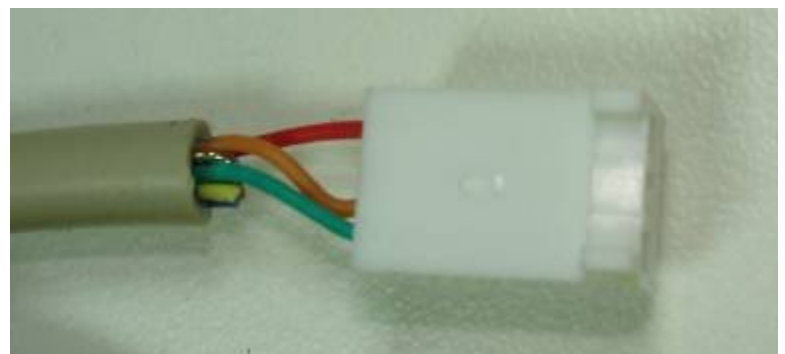


Your AXEme Picaxe Construction kit is now finished and ready for experimentation. Now you need to find a wall adapter, build (or acquire) a download cable and install the programming system. The Picaxe program development package is available as a free download from: www.rev-ed.co.uk/picaxe If you do not have a high speed internet connection, it is advisable to purchase a starter package which includes a downloading cable and the programming software on a CDrom.

The downloading cable can be made using an 'old' DB9F serial cable like the one pictured. Below. One end is cut off and 3 Molex pins are inserted on the Txd, Rxd and Ground (2,3 and 5) pins. Complete details for making both Serial and USB downloading cables can be found at the Picaxe site:

<< http://www.rev-.co.uk/docs/picaxe_manual3.pdf >>

Use the link to the manual and go to Page 42 for cable info...





**A homebrew
download cable
ready to go...**

Check into the QRPme website:

www.QRPme.com

**Projects and programs using the
Picaxe Construction Set
will be posted there as they are developed.**

**Thank you for your purchase!
W1REX**