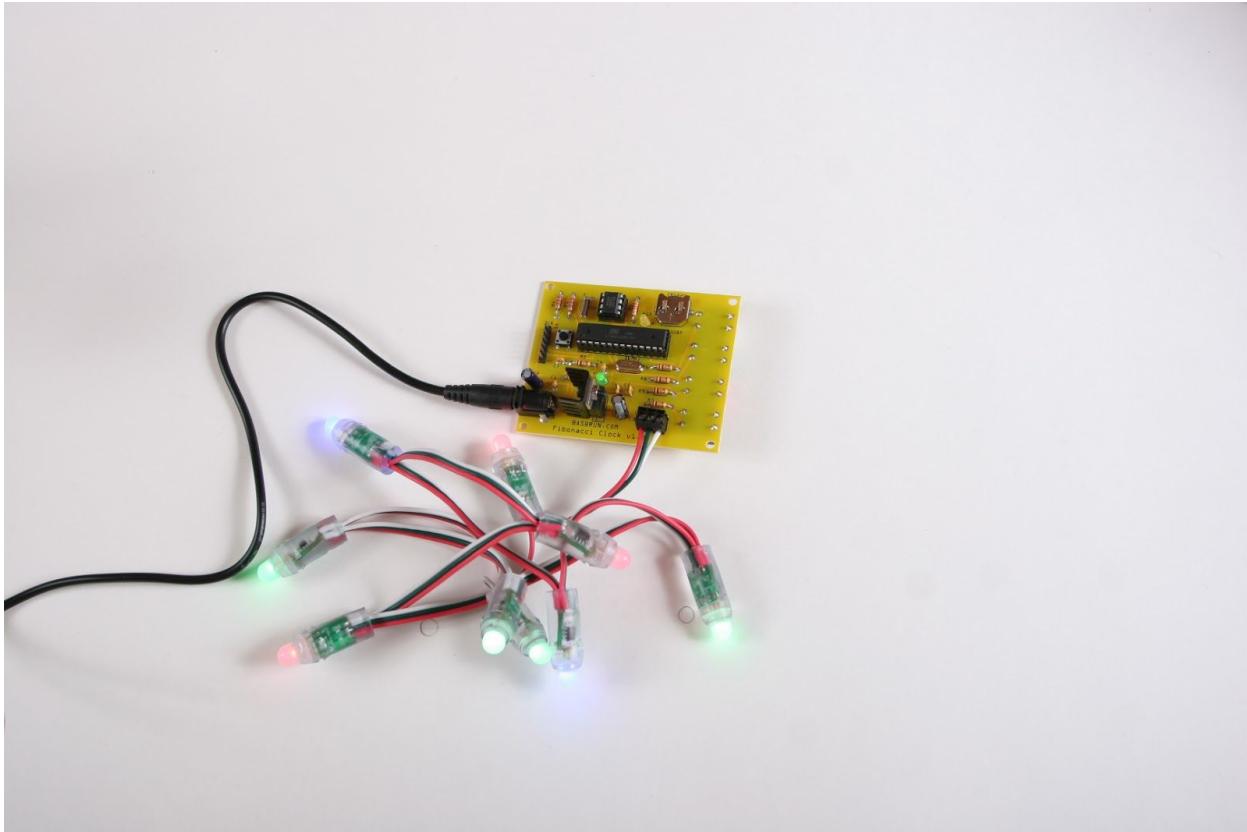


# Circuit Board Assembly Instructions

This document walk you through the assembly of the Base4 Clock v1.2 - v1.3 circuit boards.



**Important note for kit buyers** The color and appearance of the components may vary from one supplier to another and not match exactly the components illustrated in this document.

The kit provided for the Kickstarter backers matches the images here with the exception of the ceramic capacitors and one electrolytic capacitor. Some notes have been added to the “Parts” section when the appearance differ.

## Heat Sink

| Parts                             | Quantity | Image   |
|-----------------------------------|----------|---|
| HEAT SINK TO-220 .375"<br>COMPACT | 1        |  |
| IC REG LDO 5V 1.5A TO220          | 1        |  |

Screw the heat-sink to the 7805 voltage regulator.

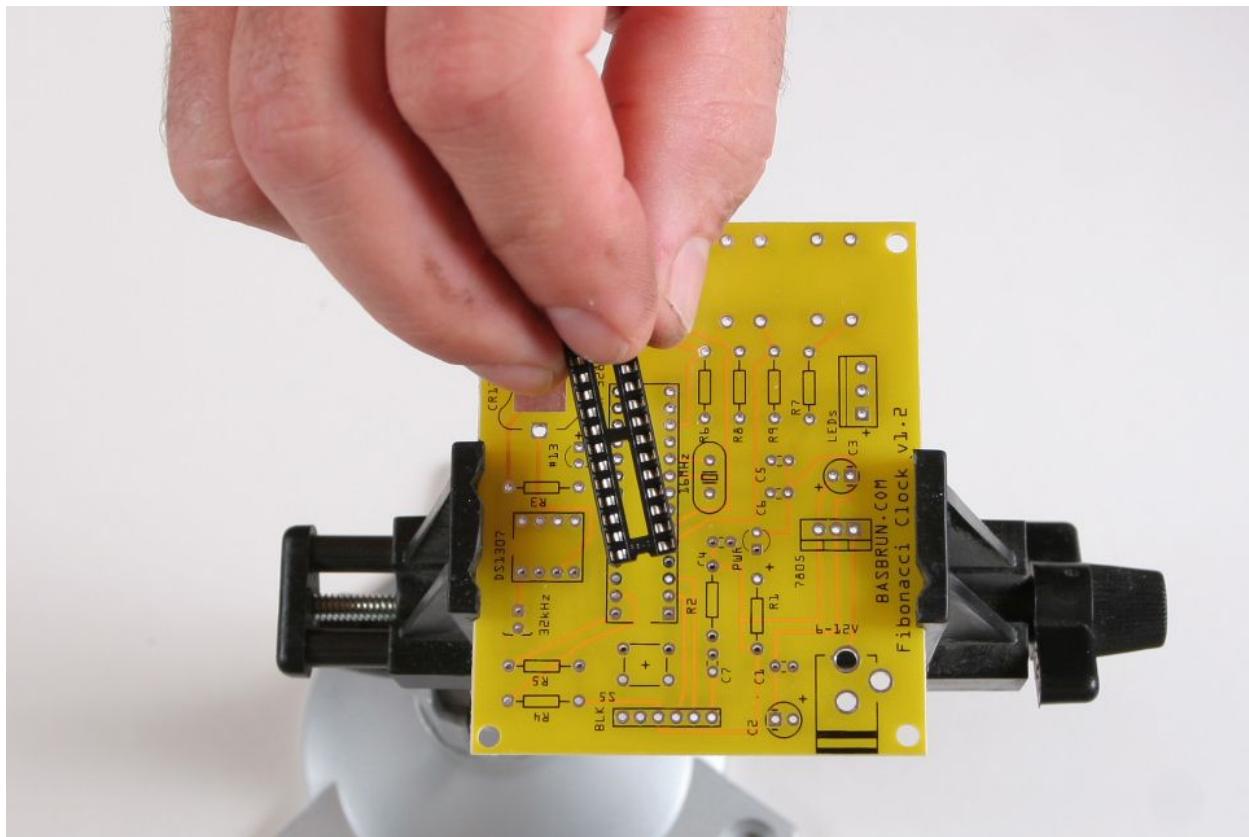


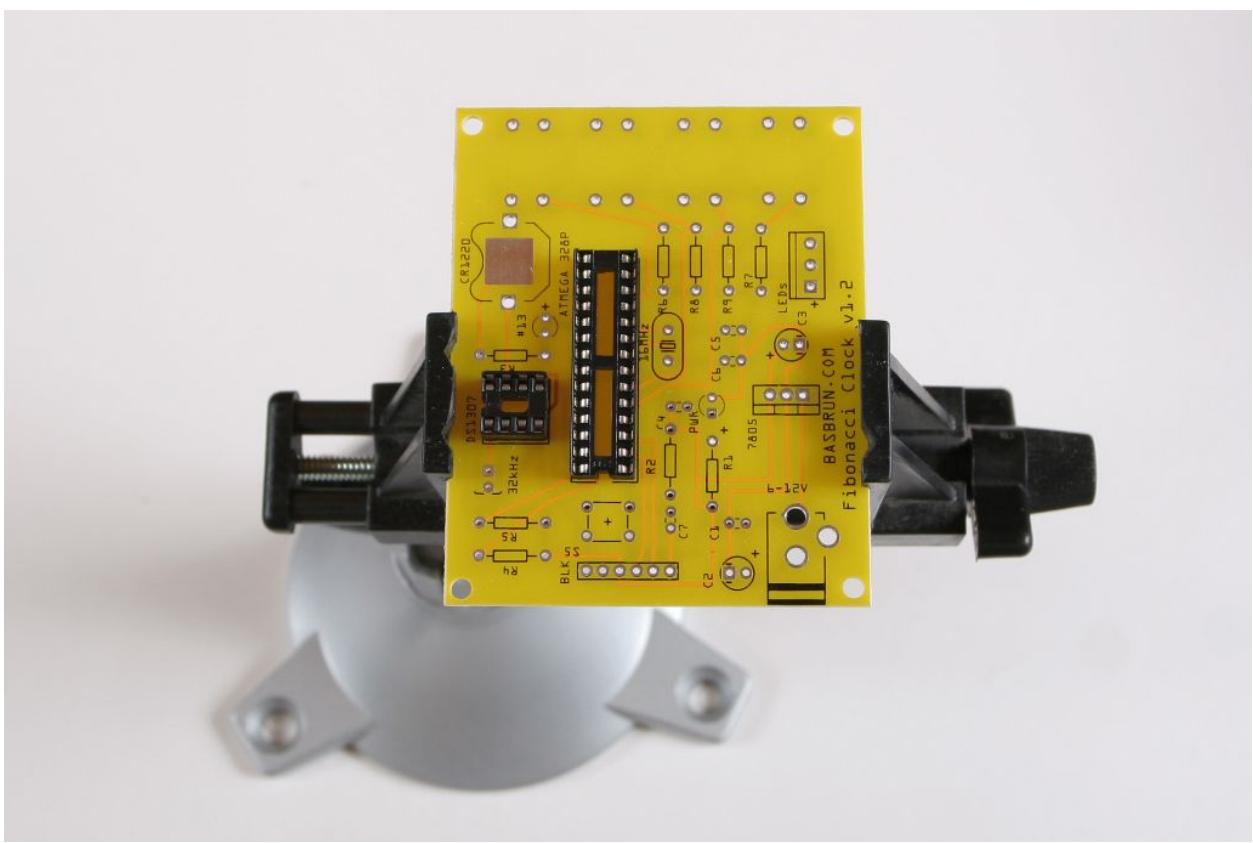
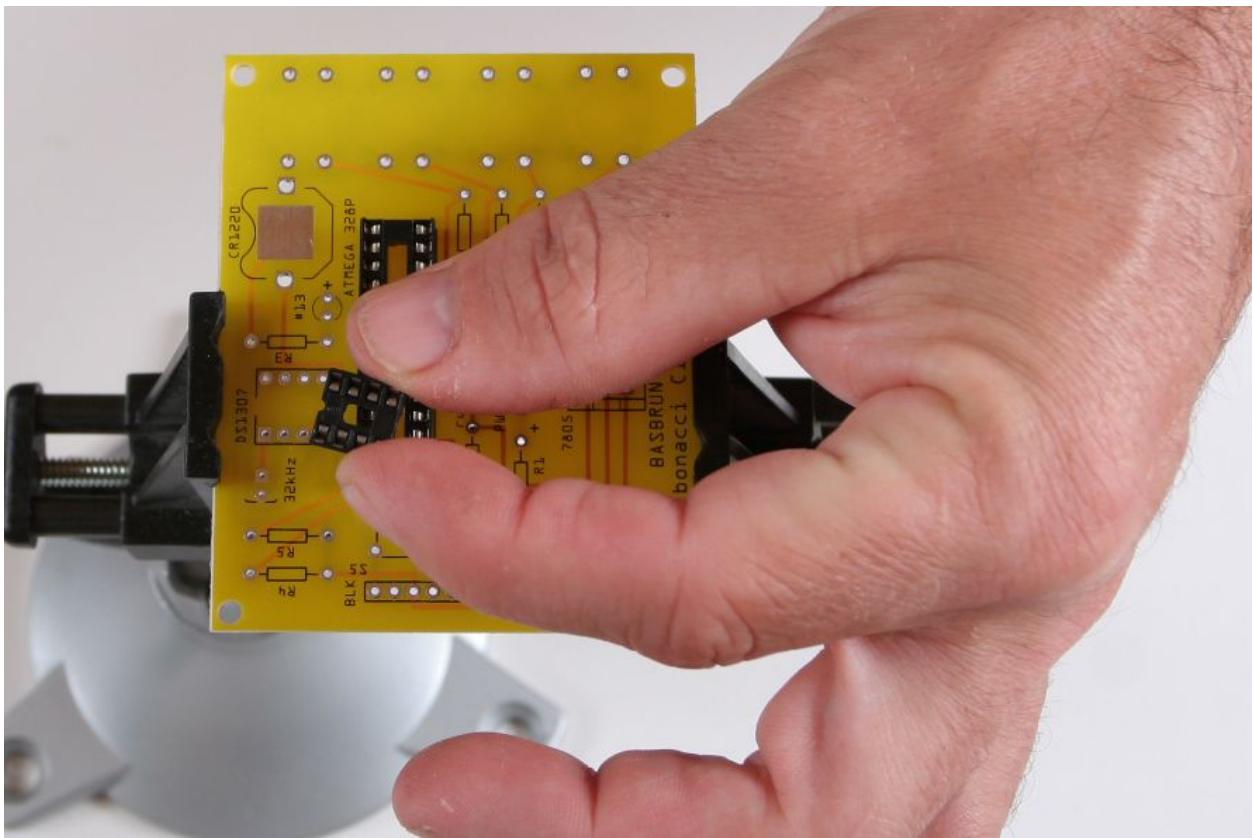


## DIP Sockets

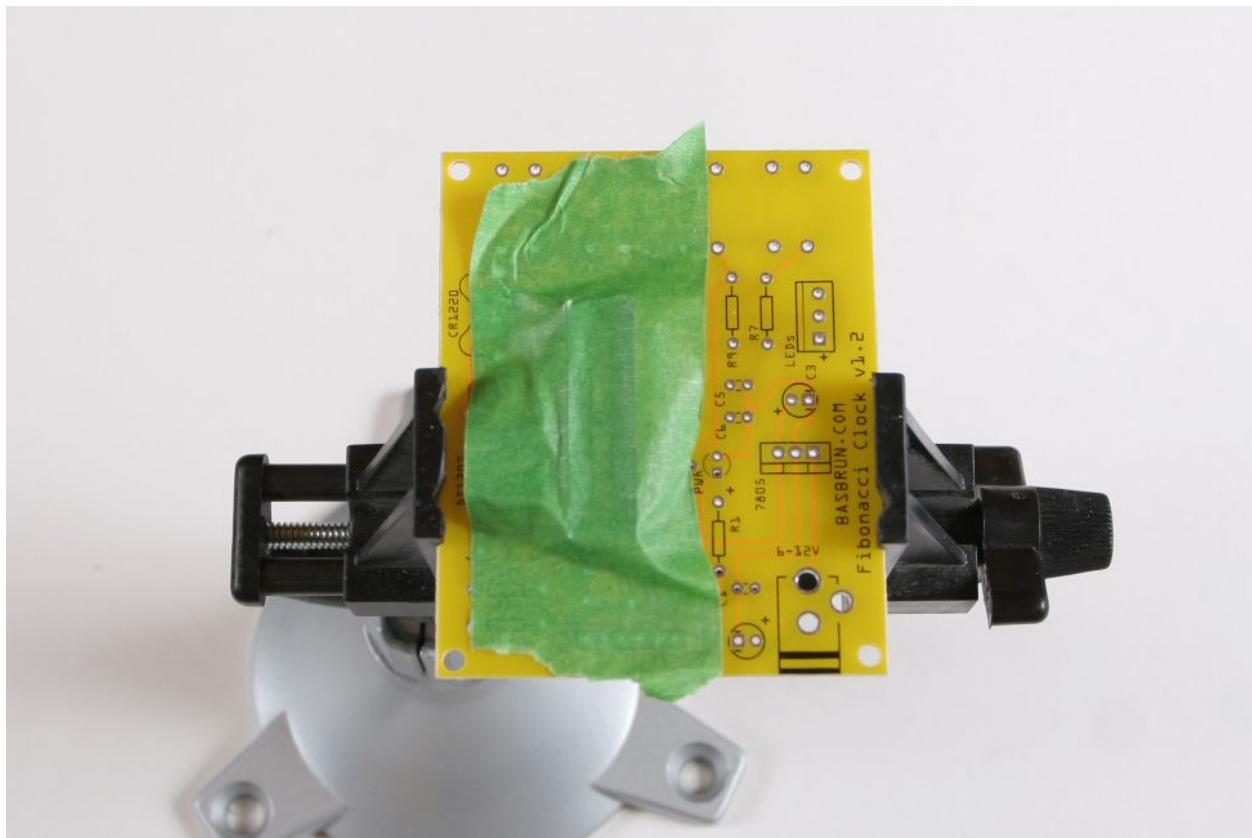
| Parts                        | Quantity | Image   |
|------------------------------|----------|---|
| CONN IC DIP SOCKET 28POS TIN | 1        |  |
| CONN IC DIP SOCKET 8POS TIN  | 1        |  |

Place the two DIP sockets in their locations.. The dent at the end of the DIP sockets should align with the dent on the circuit board drawings.

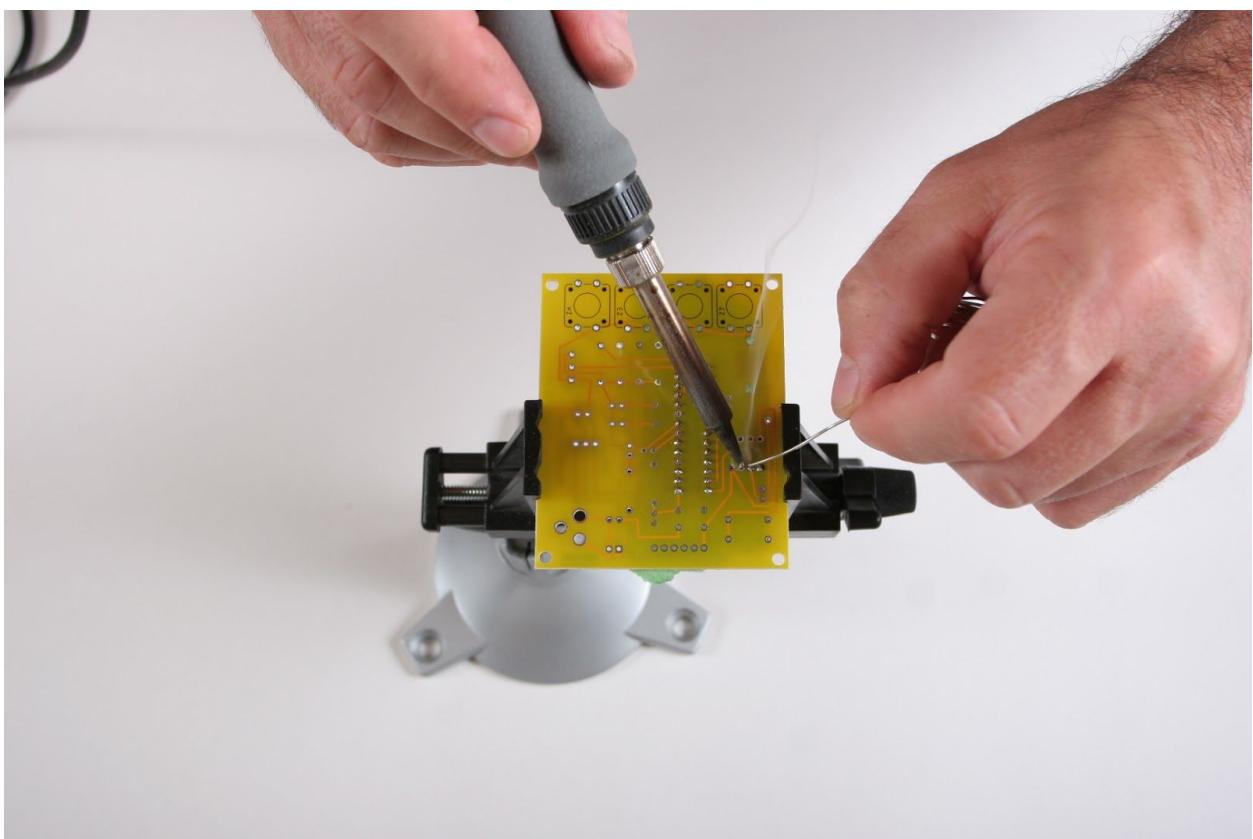
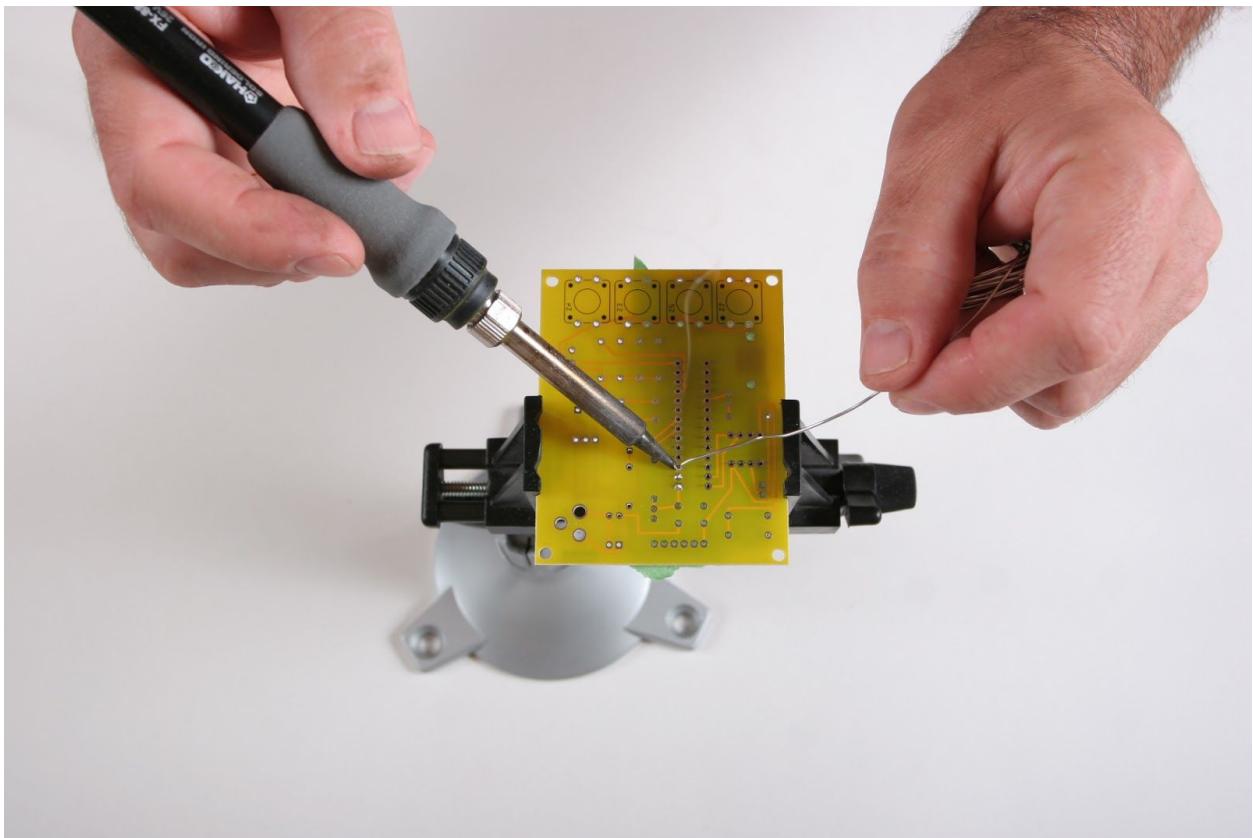




Secure with tape if necessary.



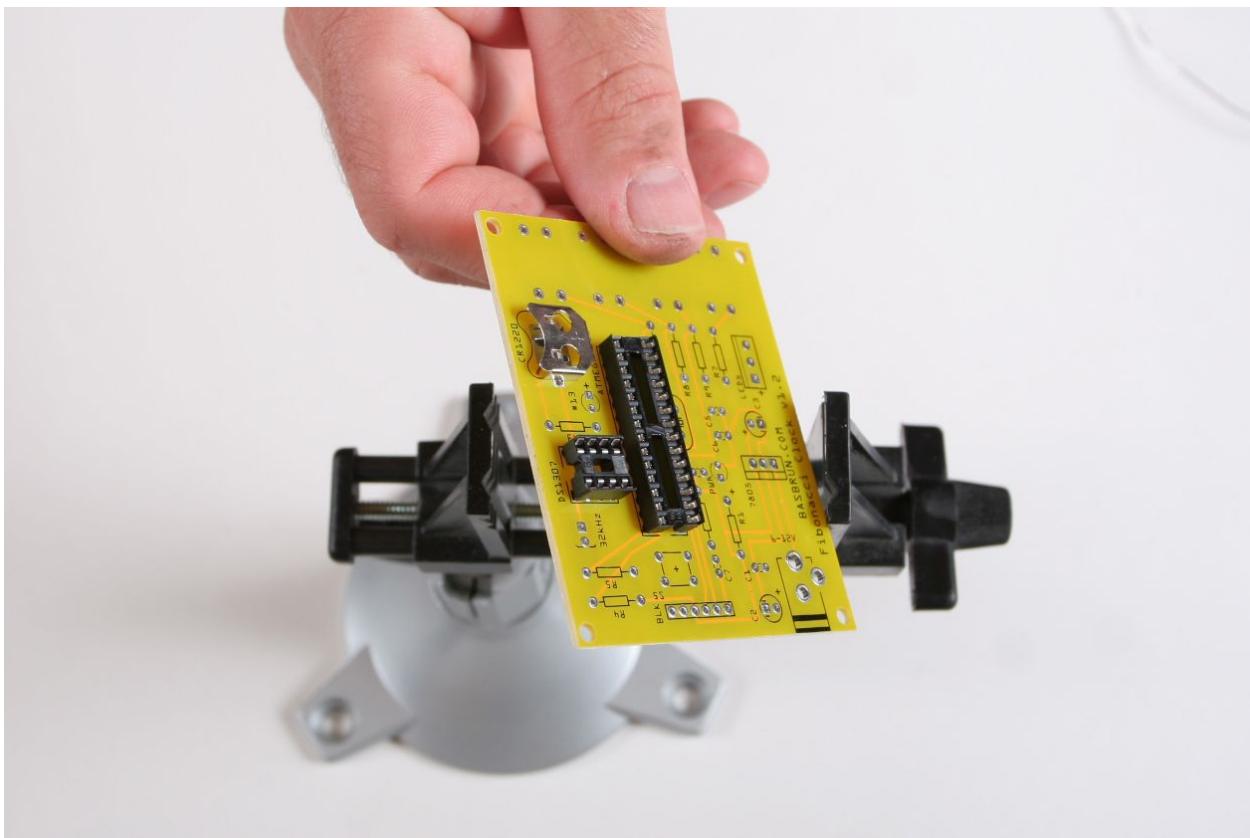
Solder



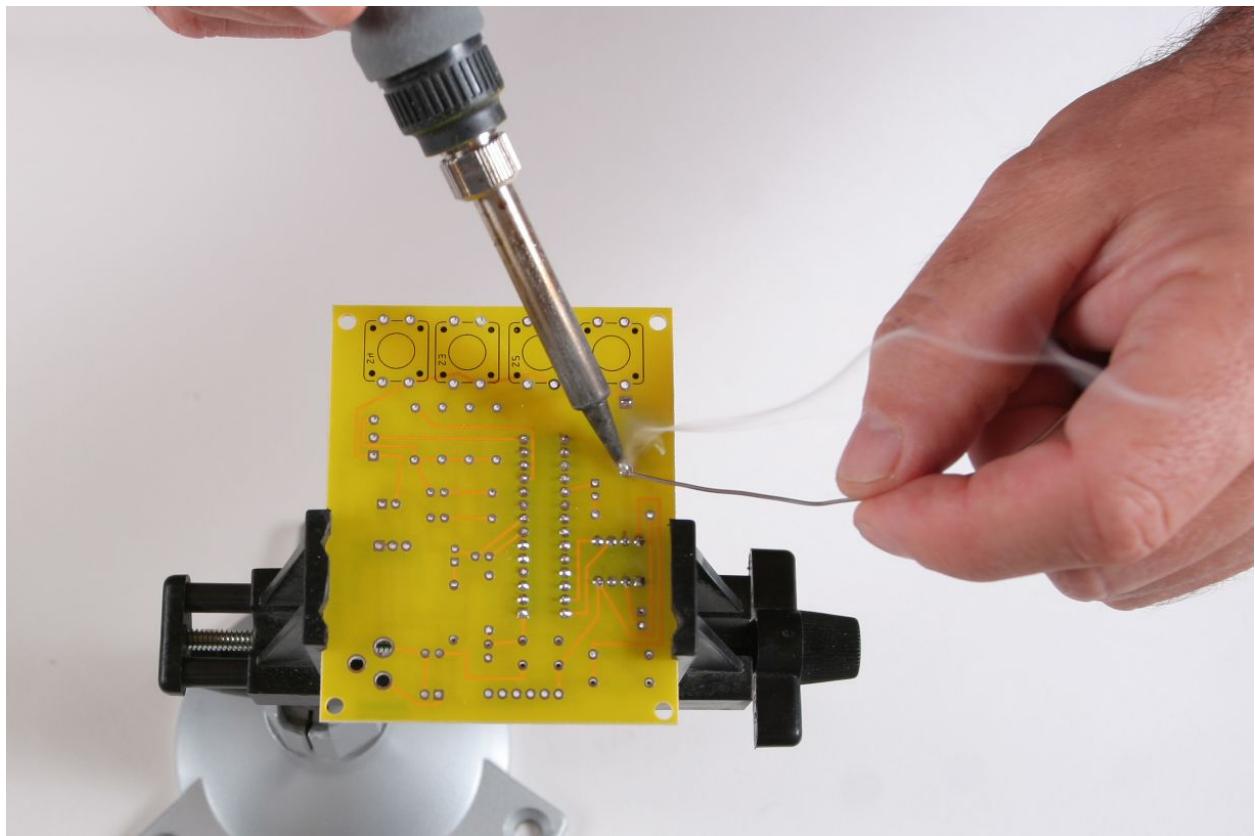
## Coin Battery Retainer

| Parts                        | Quantity | Image   |
|------------------------------|----------|---|
| RETAINER COIN 12MM W/PC PINS | 1        |  |

Snap the coin battery retainer into place. Make sure the opening is facing the edge of the board.



Solder

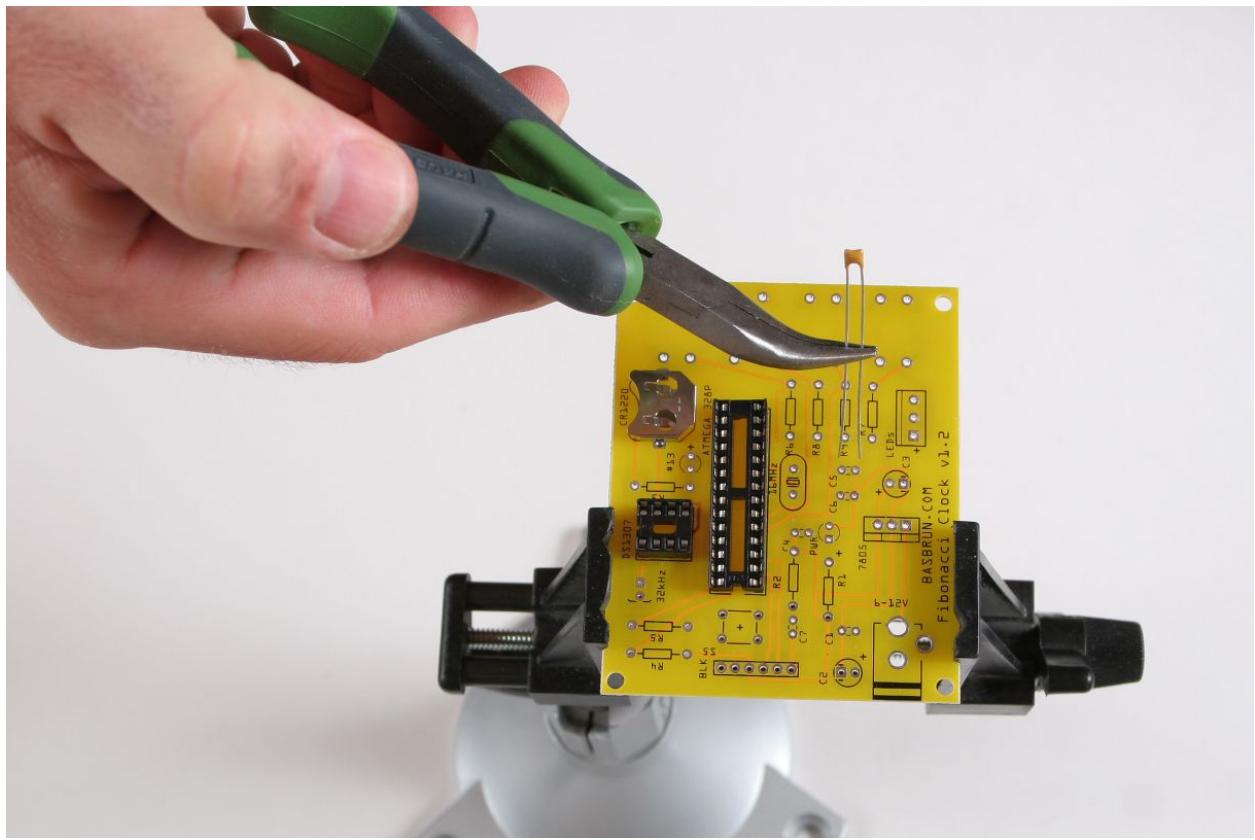


## Ceramic Capacitors

| Parts  | Quantity | Image   |
|--|----------|---|
| CAP CER 22PF 200V 10% RADIAL<br><i>May be short yellow in your kit</i> | 2        |  |
| CAP CER 0.1UF 50V 10% RADIAL<br><i>May be blue in your kit</i>         | 3        |  |

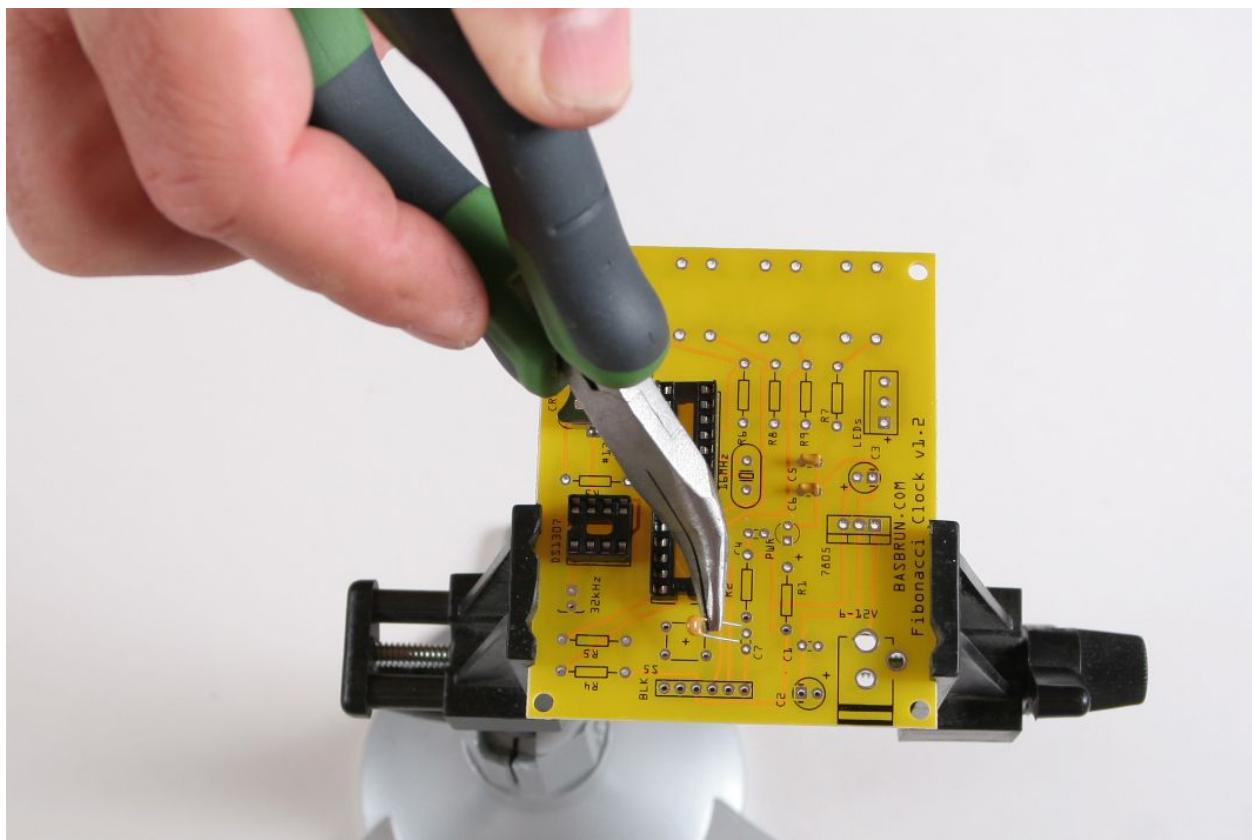
Place the two 22pF capacitors in C5 and C6.

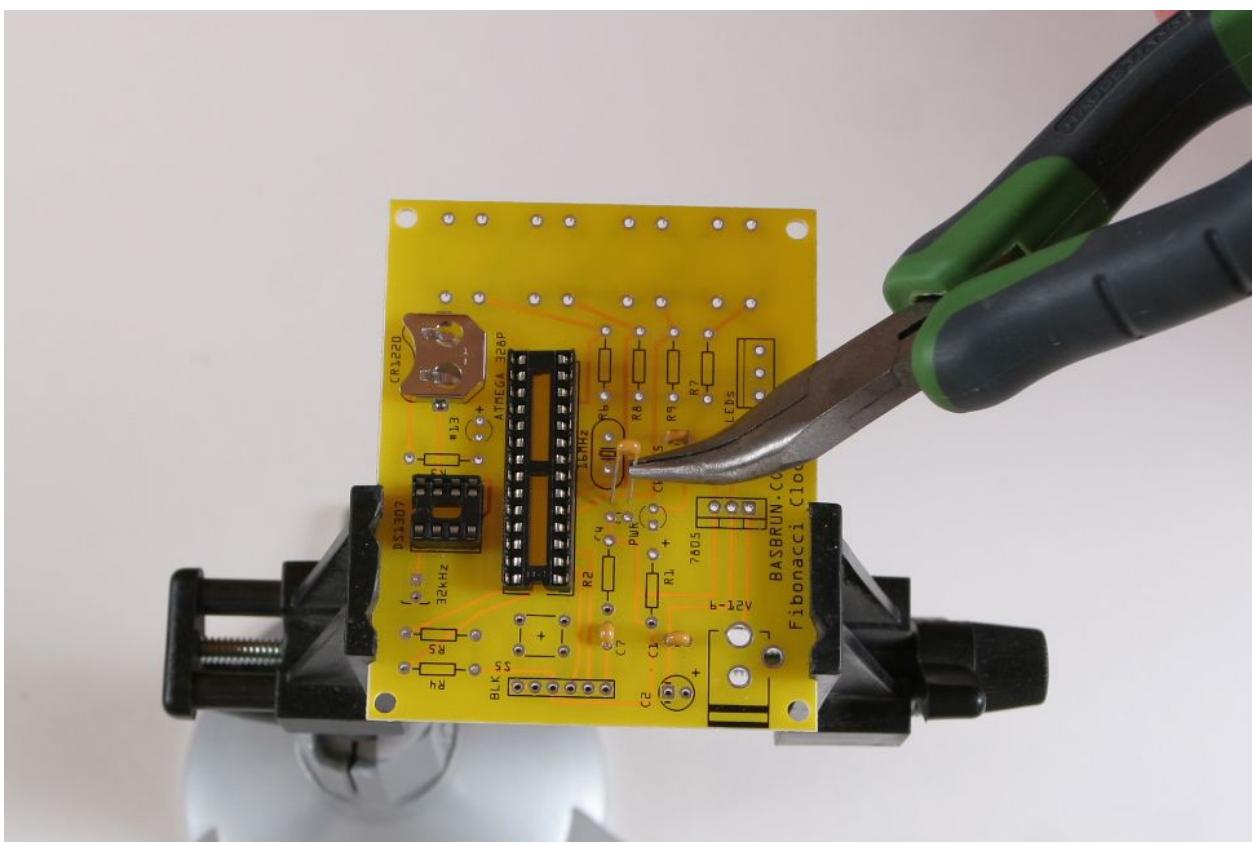
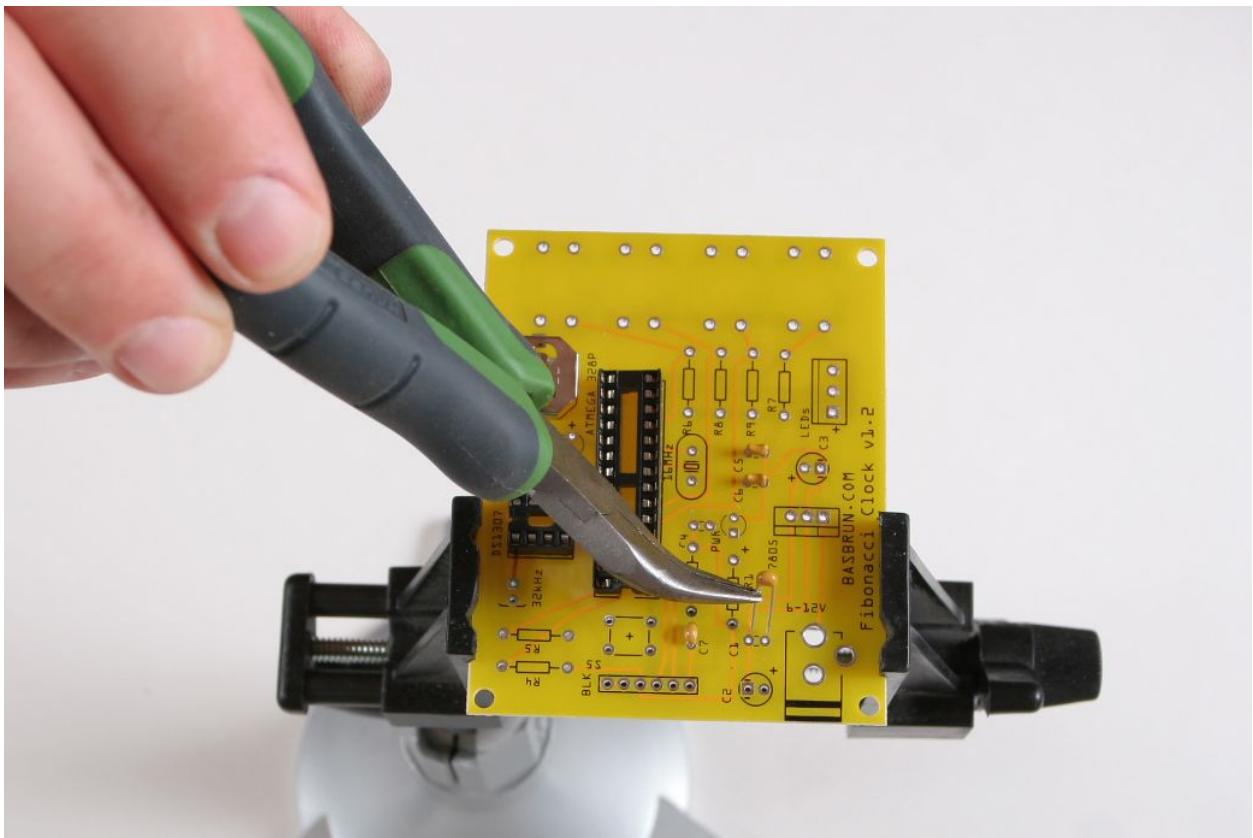
These capacitors are non-polarized and can be soldered in either way.

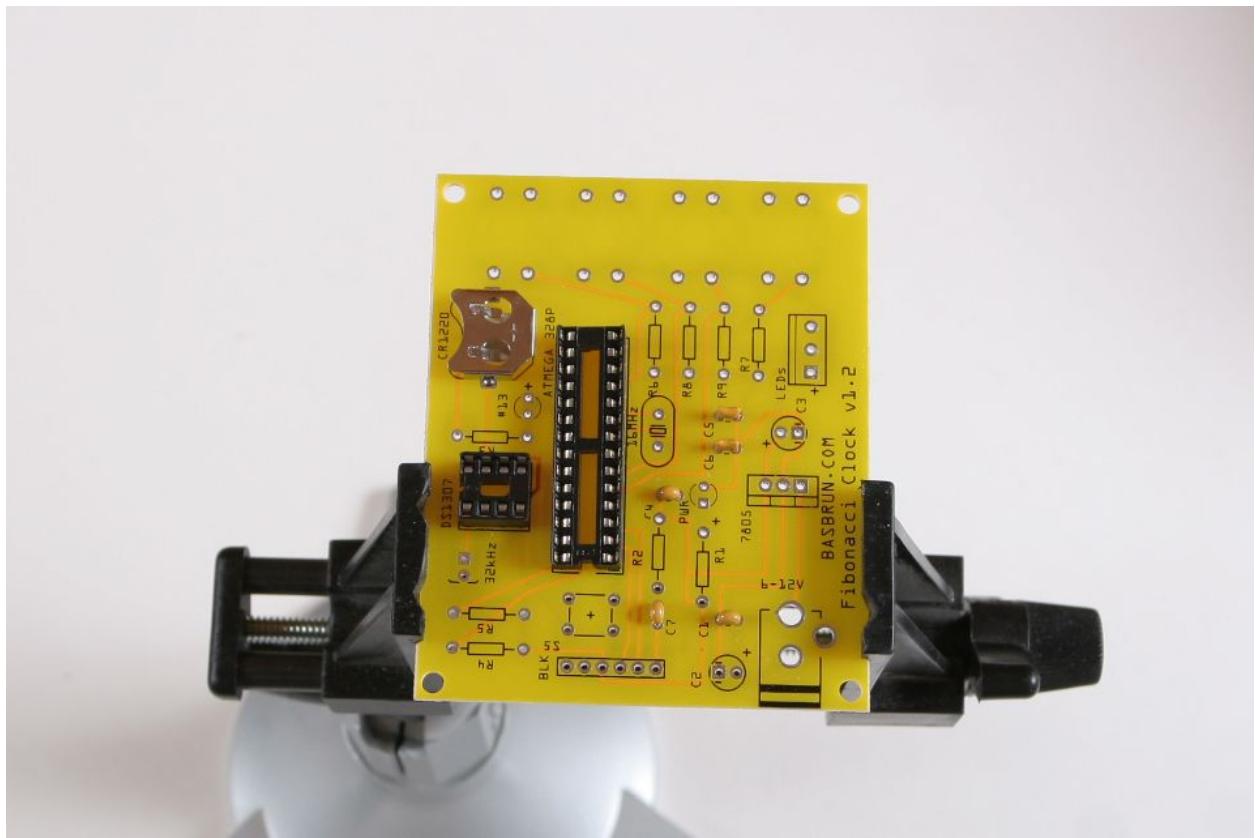


Place the three 0.1uF capacitors in C1, C4 and C7.

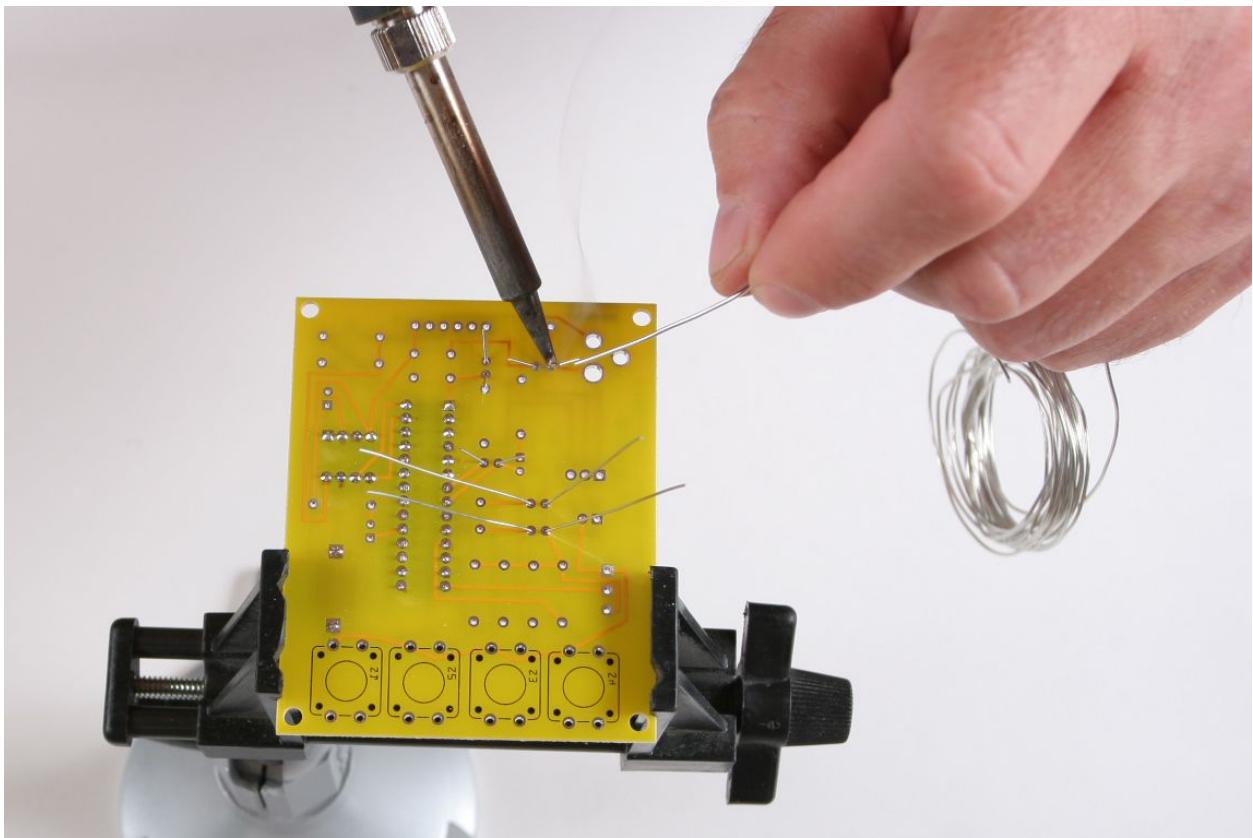
These capacitors are non-polarized and can be soldered in either way.



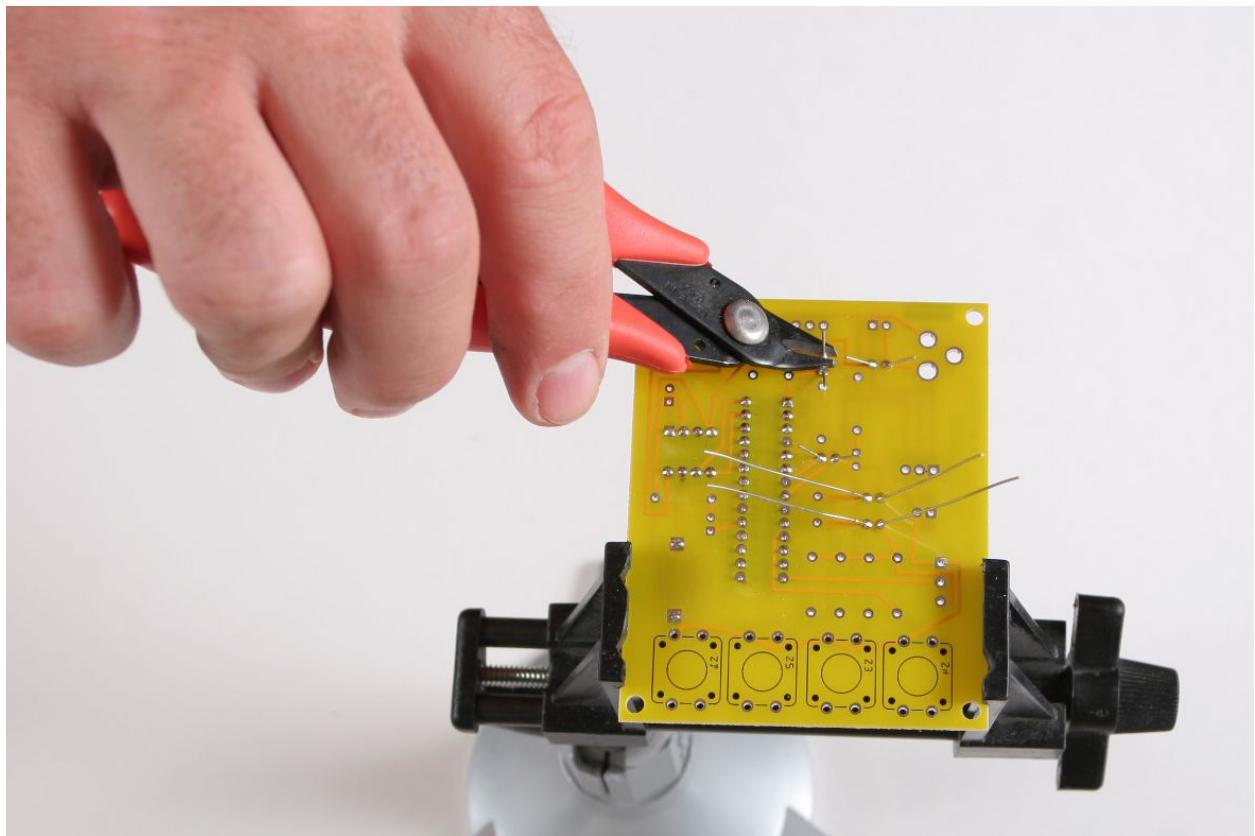




Solder



Cut the excess wires.

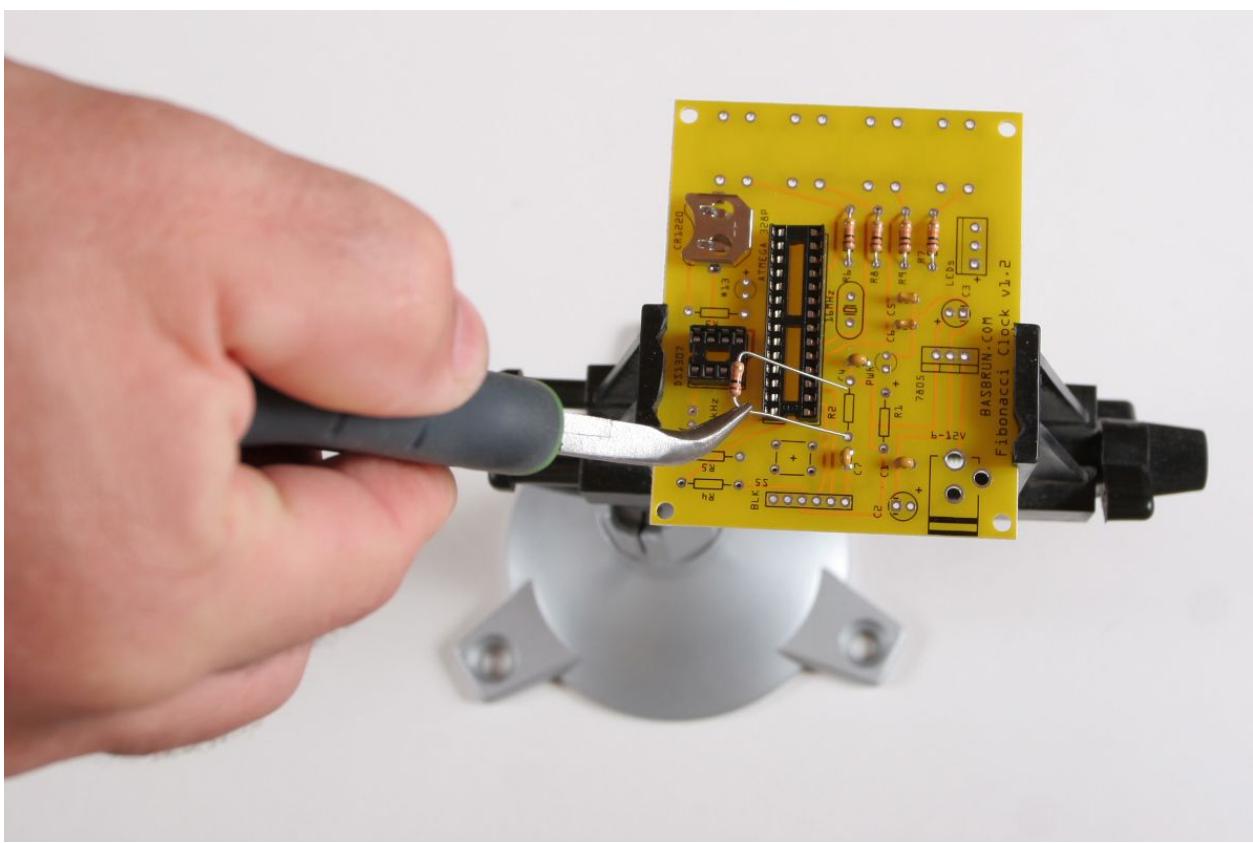
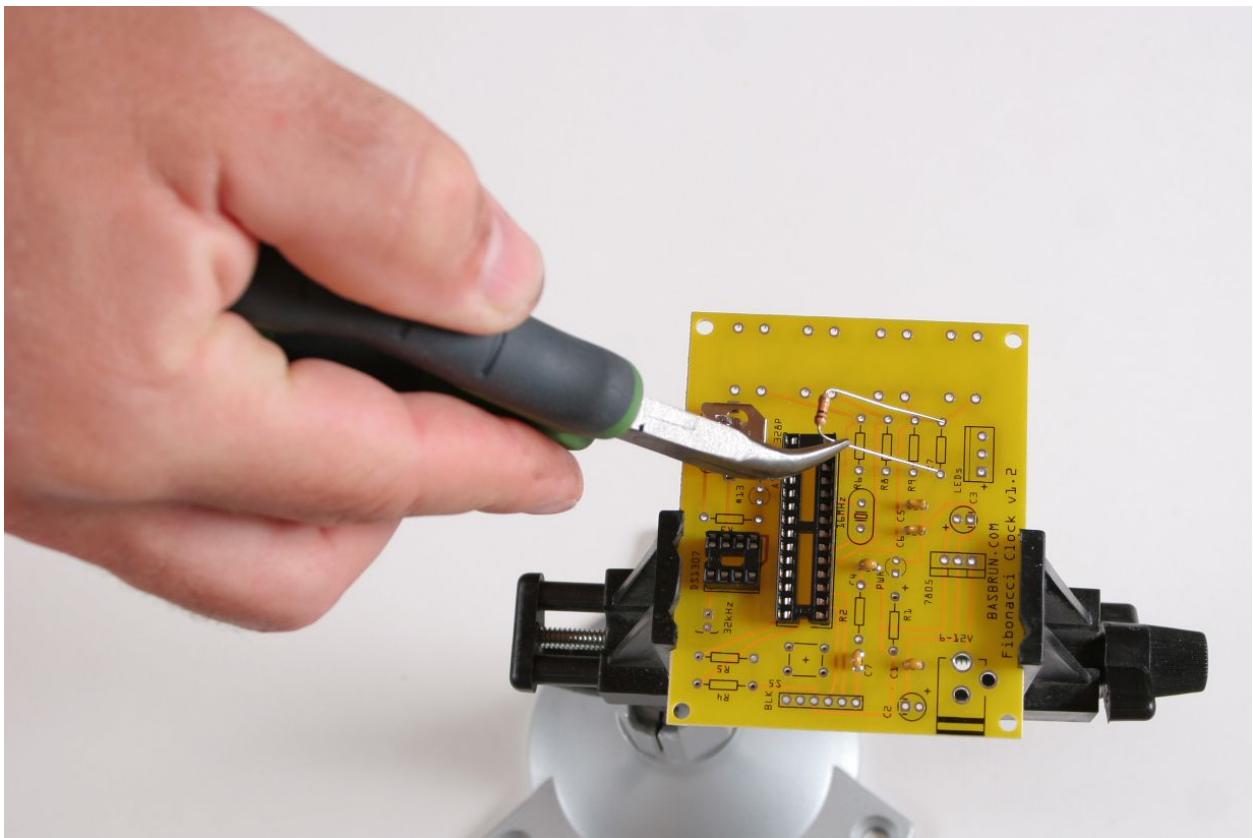


## Resistors

| Parts                            | Quantity | Image |
|----------------------------------|----------|-------|
| RES 10K OHM 1/4W 5% AXIAL        | 5        |       |
| RES 2.2K OHM 1/4W 5% CARBON FILM | 2        |       |
| RES 220 OHM 1/4W 5% AXIAL        | 2        |       |

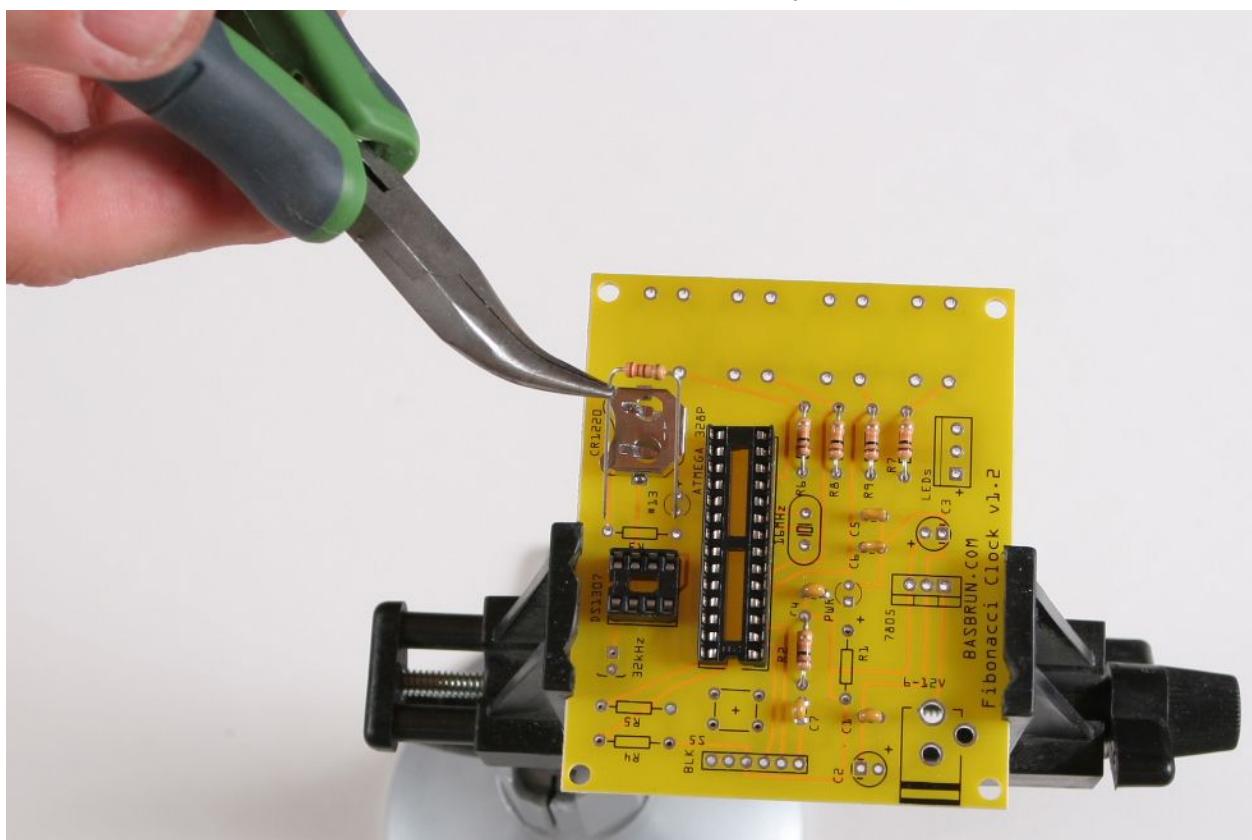
Place the five 10KH resistors in R2, R6, R7, R8 and R9.

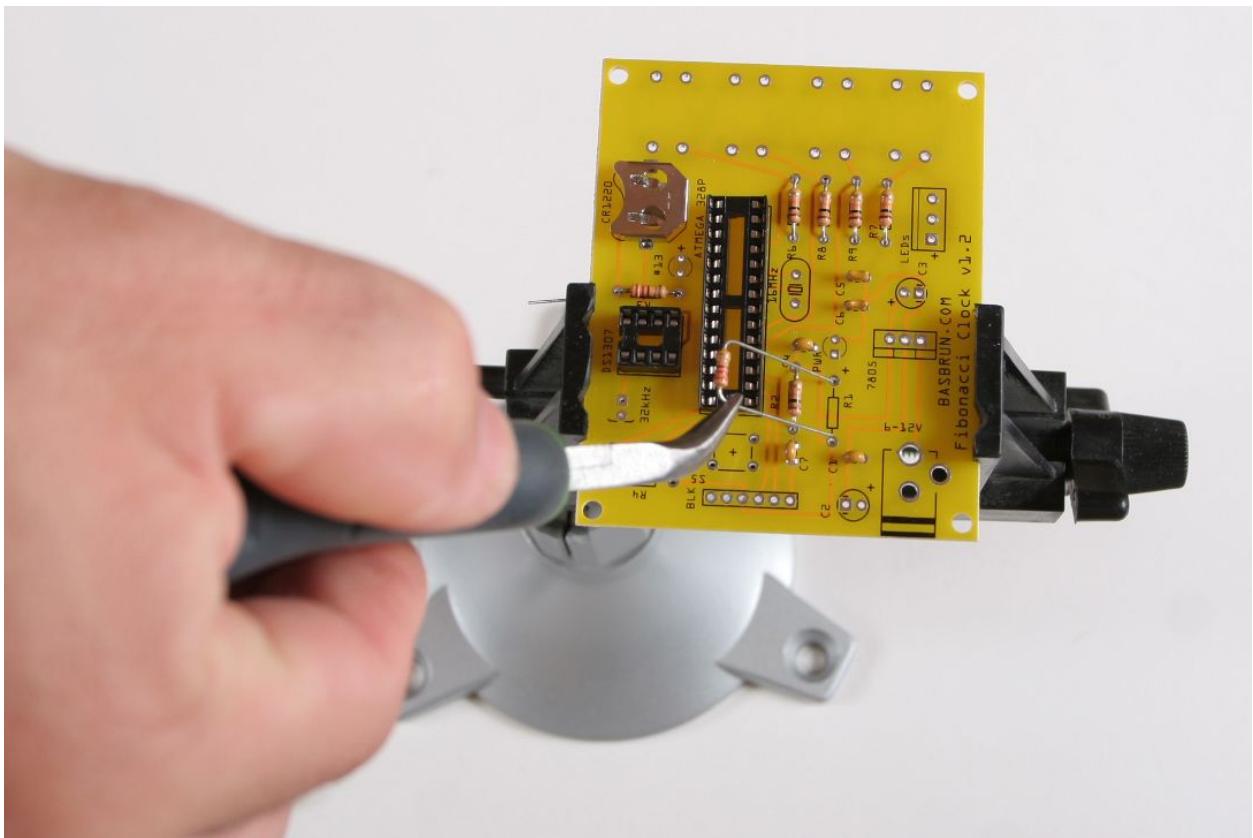
Resistors are non-polarized and can be soldered in either way.



Place the two 220H resistors in R1 and R3.

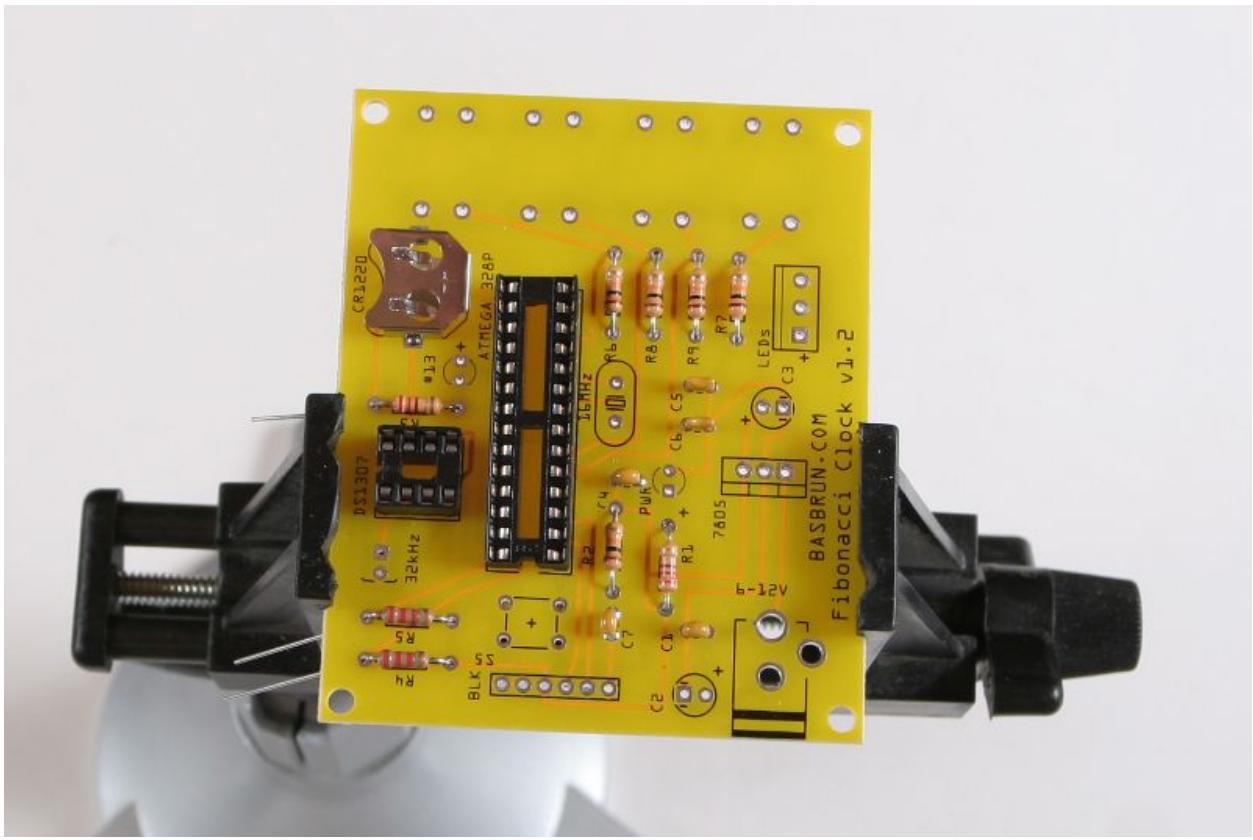
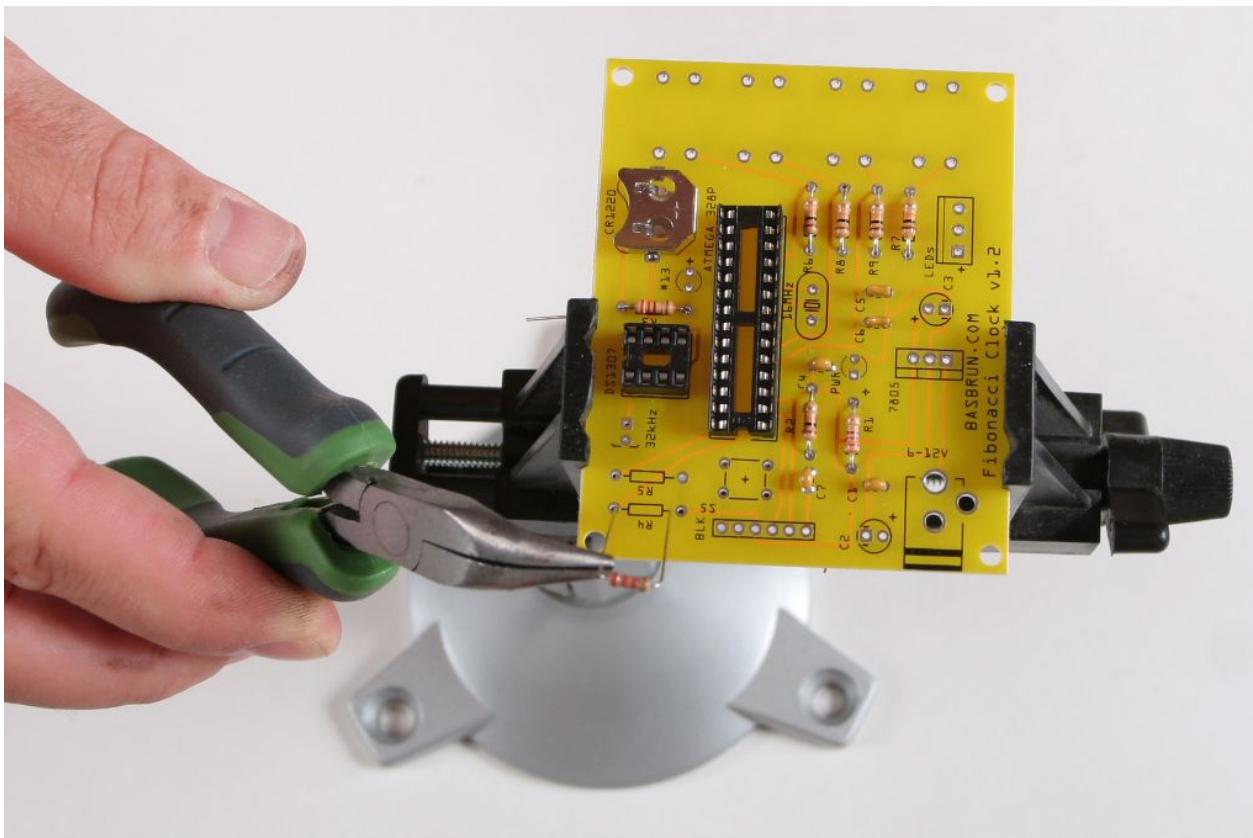
Resistors are non-polarized and can be soldered in either way



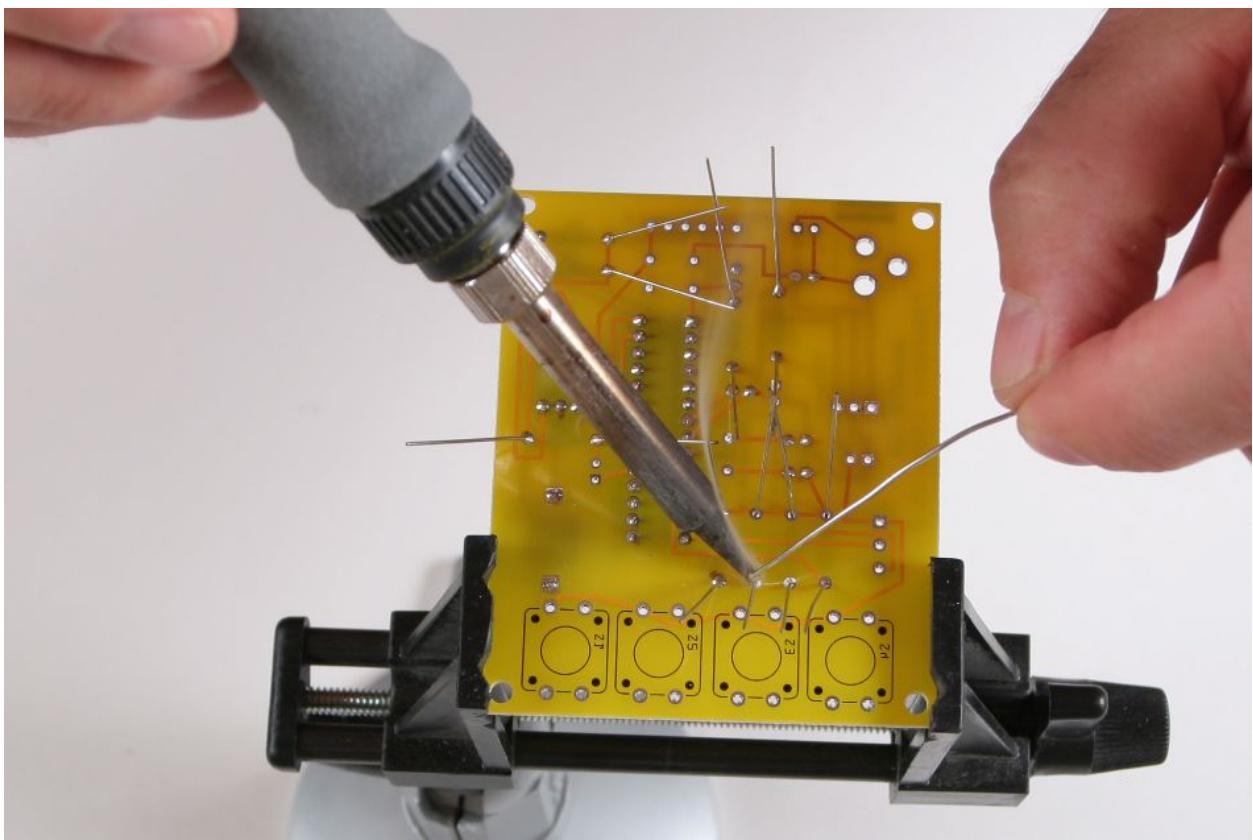


Place the two 2.2KH resistors in R4 and R5.

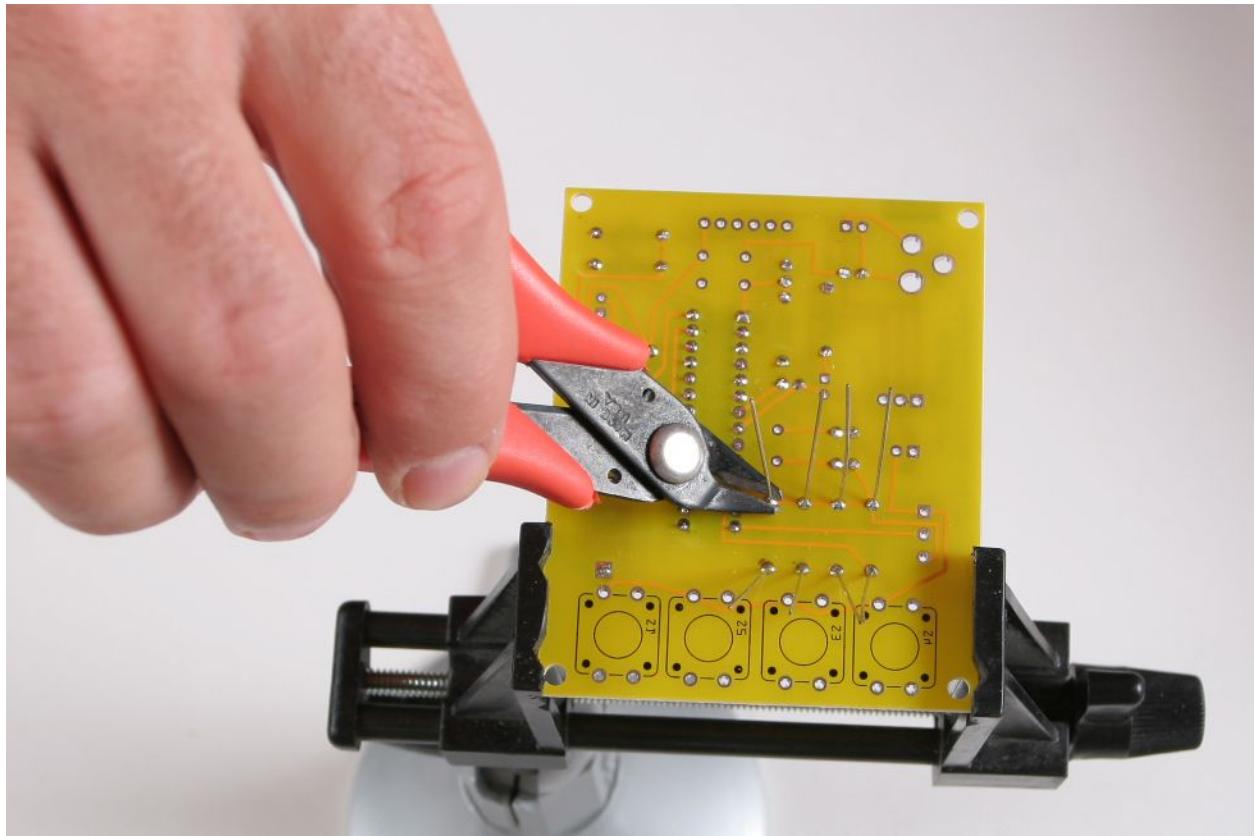
Resistors are non-polarized and can be soldered in either way



Solder



Cut the excess wires.



## Crystals

| Parts                         | Quantity | Image   |
|-------------------------------|----------|---|
| CRYSTAL 16.0000MHZ 18PF T/H   | 1        |  |
| CRYSTAL 32.7680KHZ 12.5PF T/H | 1        |  |

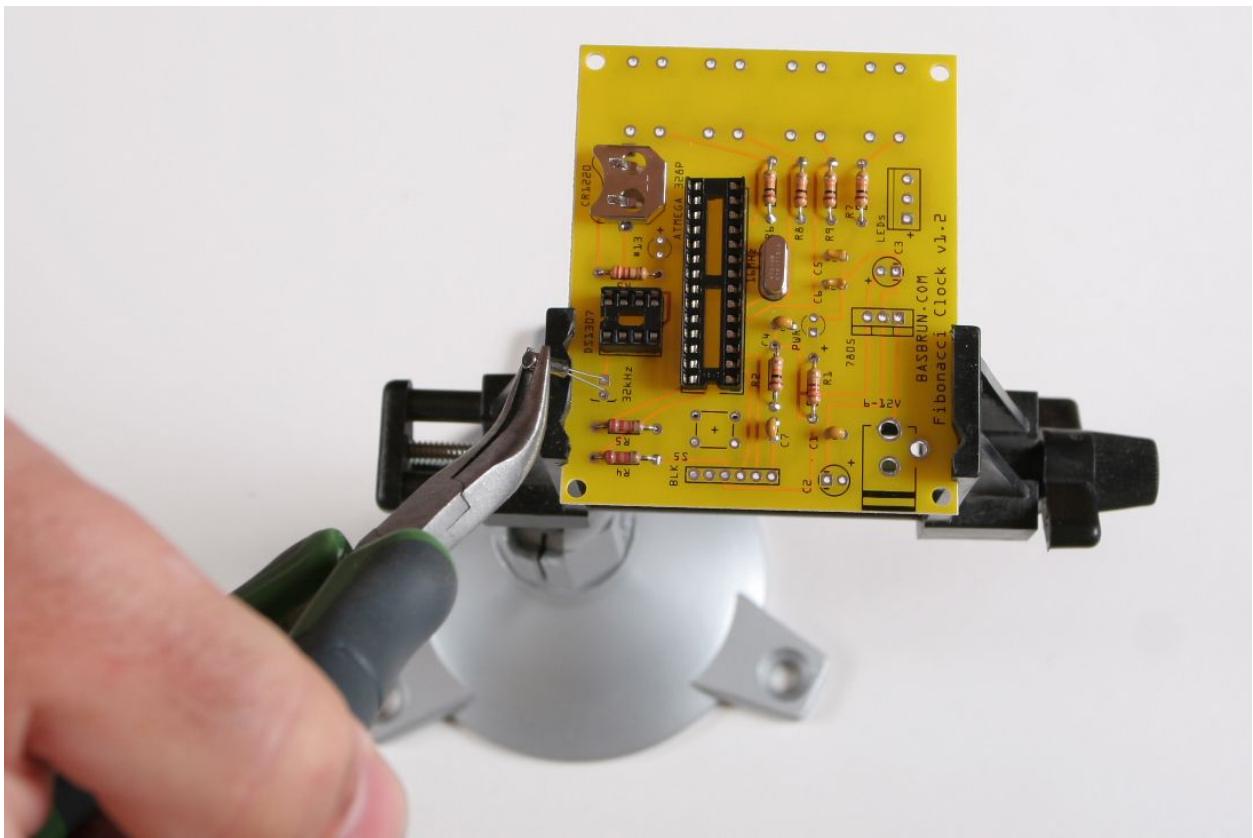
Place the 16MHz crystal in it's location next to the Atmega328P DIP socket.  
Crystals are non-polarized and can be placed in either way.



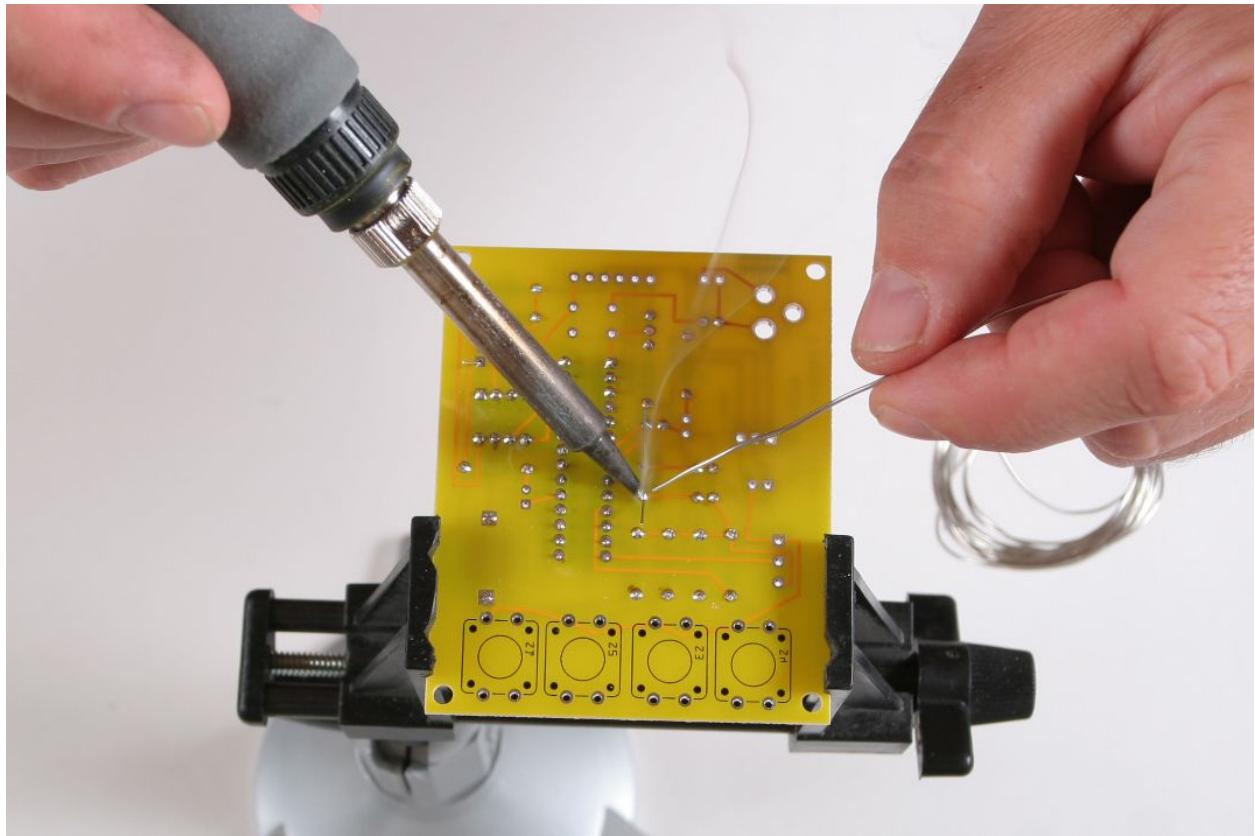
Place the 32KHz crystal in it's place next to the DS1307 DIP socket.

Crystals are non-polarized and can be placed in either way.

Secure the crystal with tape if necessary.



Solder

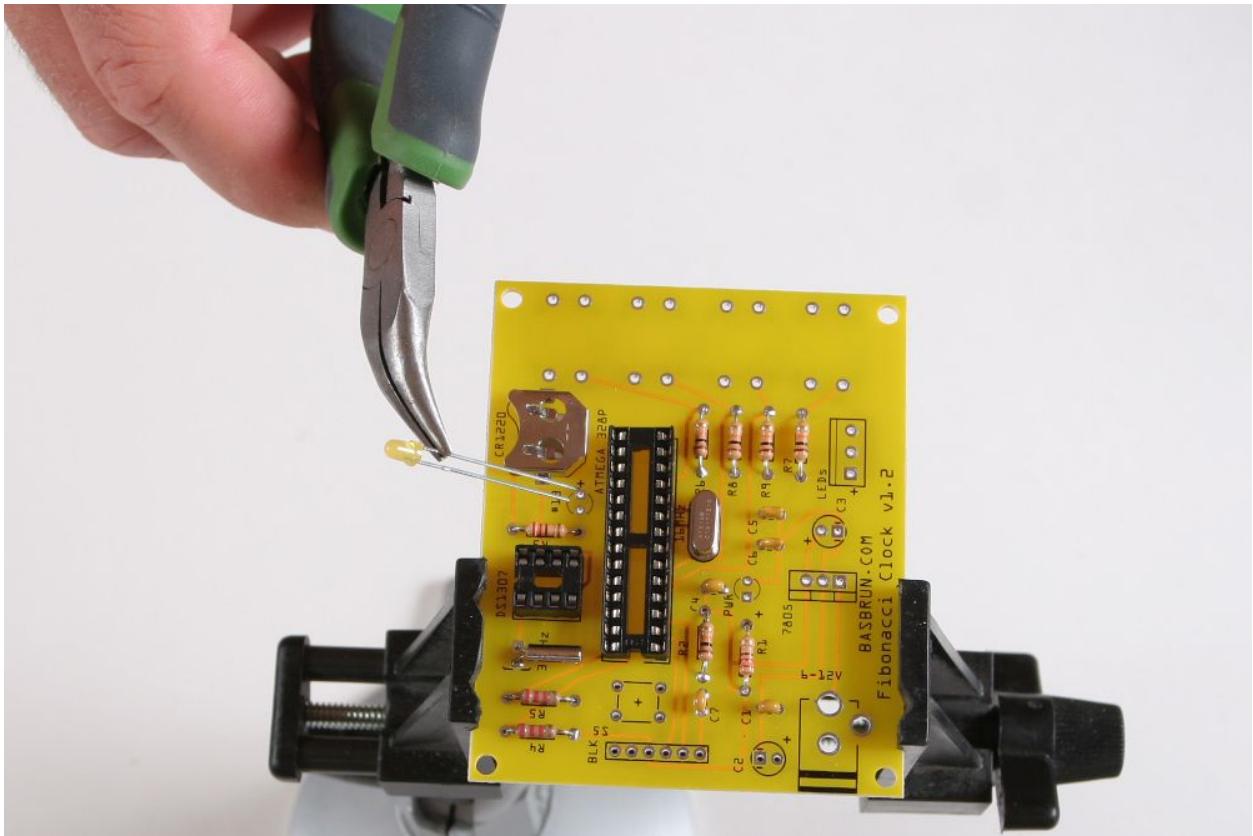


Cut the crystal excess wires.

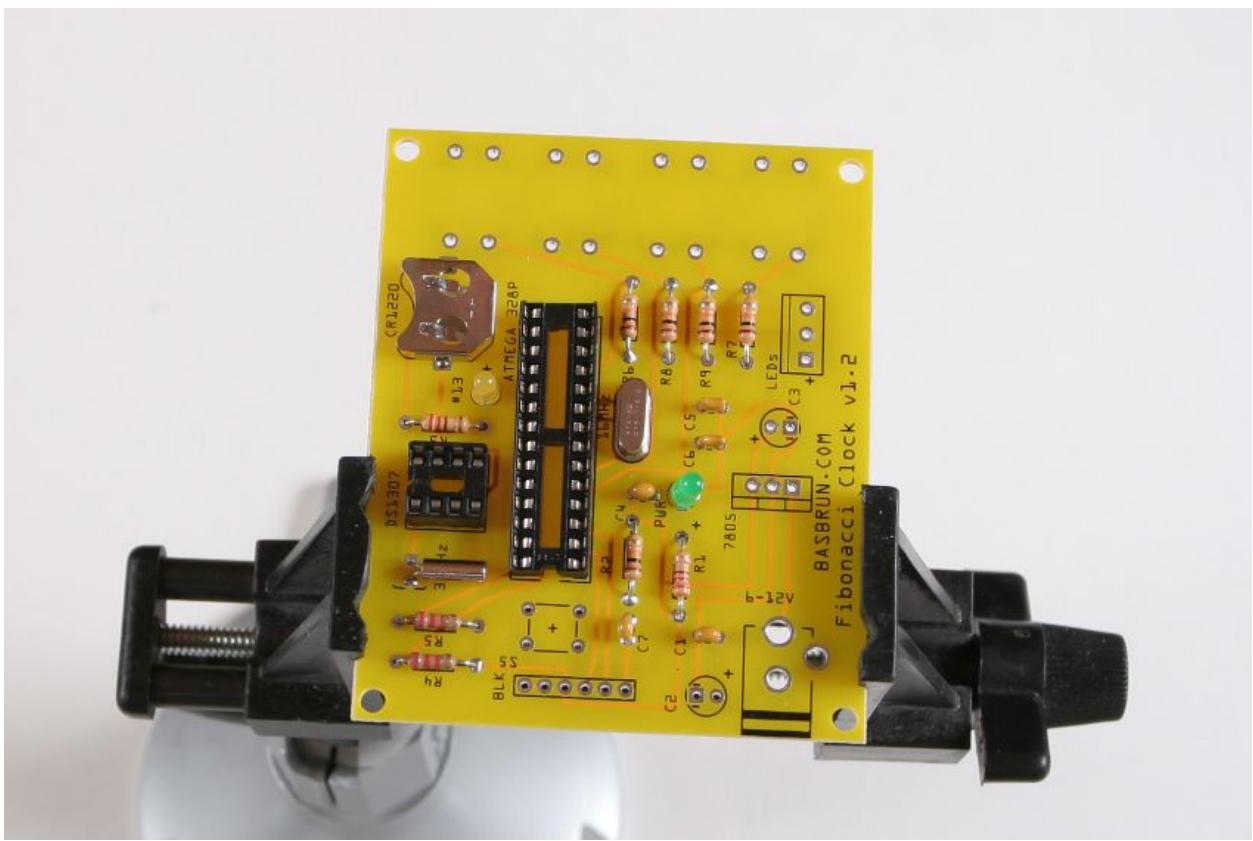
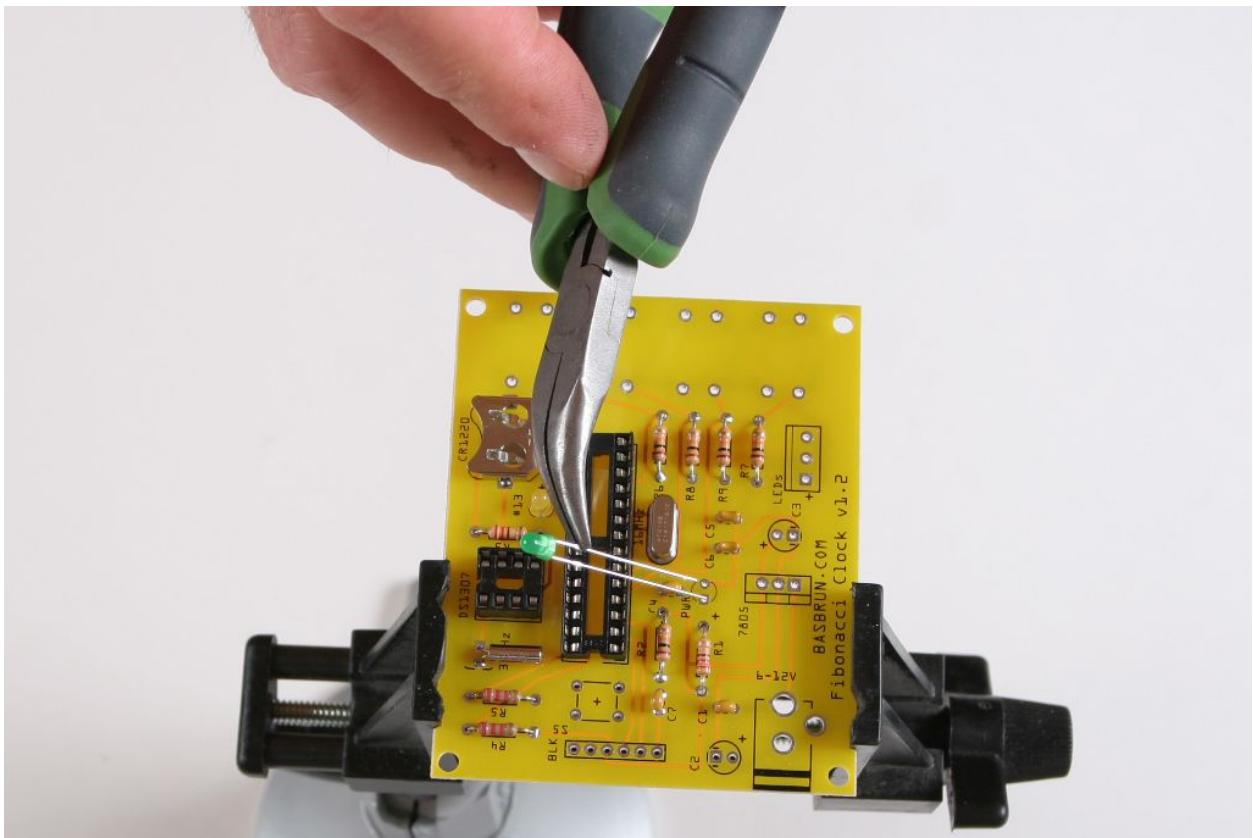
## LEDs

| Parts                            | Quantity | Image   |
|----------------------------------|----------|---|
| WL-TMRC THT LED ROUND COLOR DIFF | 1        |  |
| LED GRN 572NM DIFF 3MM RND       | 1        |  |

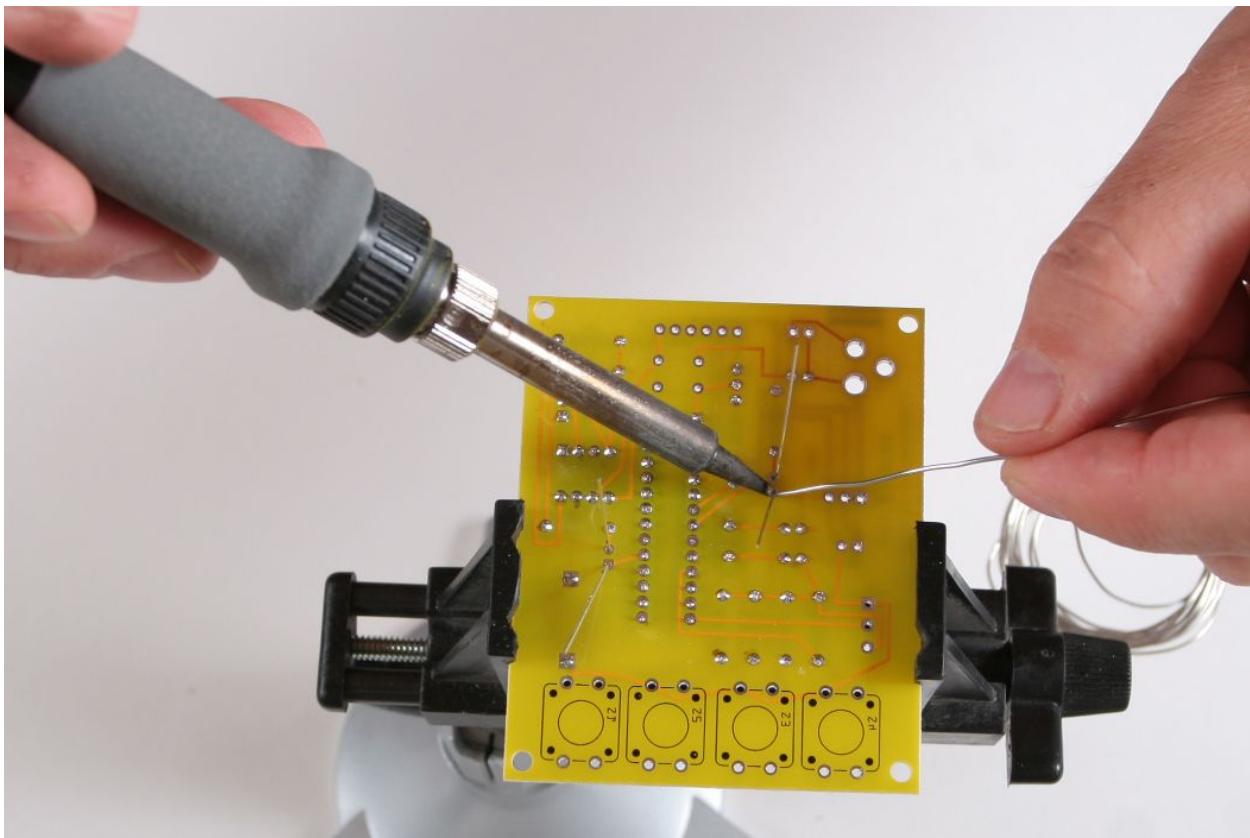
Place the yellow LED in its location close to the battery retainer. Make sure the long wire (anode) is in the hole next to the (+) sign.



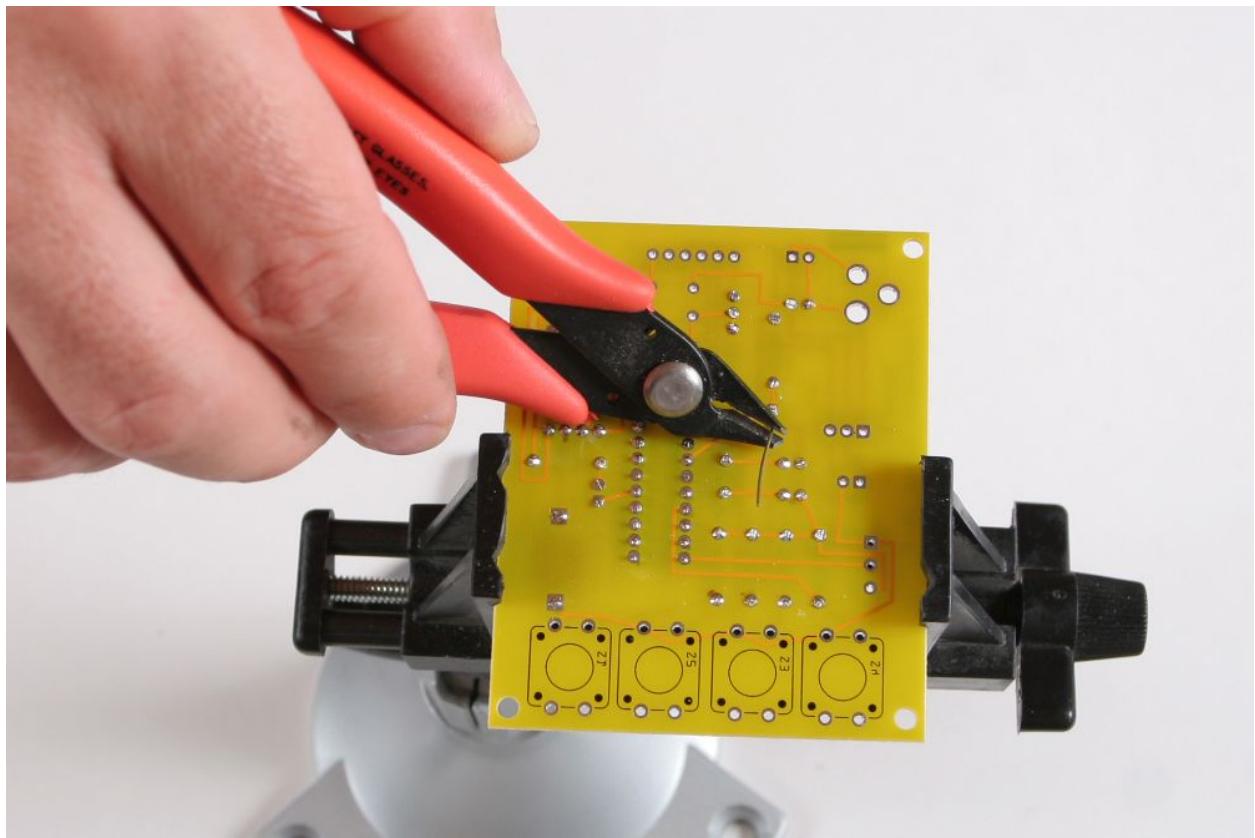
Place the green LED in its location in the center of the board. Make sure the long wire (anode) is in the hole next to the (+) sign.



Solder



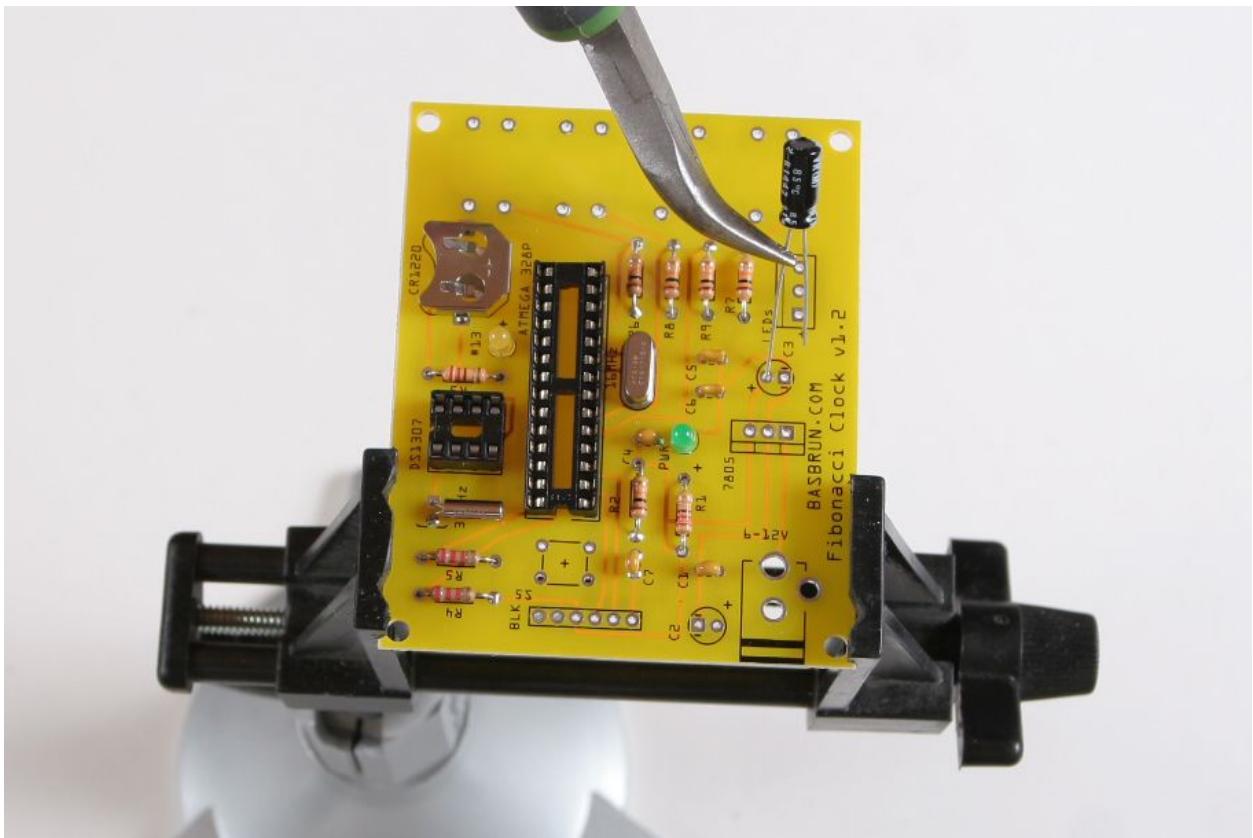
Cut the excess wires.



## Electrolytic Capacitors

| Parts  | Quantity | Image   |
|--|----------|---|
| CAP ALUM 100UF 20% 16V RADIAL                                  | 1        |  |
| CAP ALUM 10UF 20% 25V RADIAL<br><i>May be blue in your kit</i> | 1        |  |

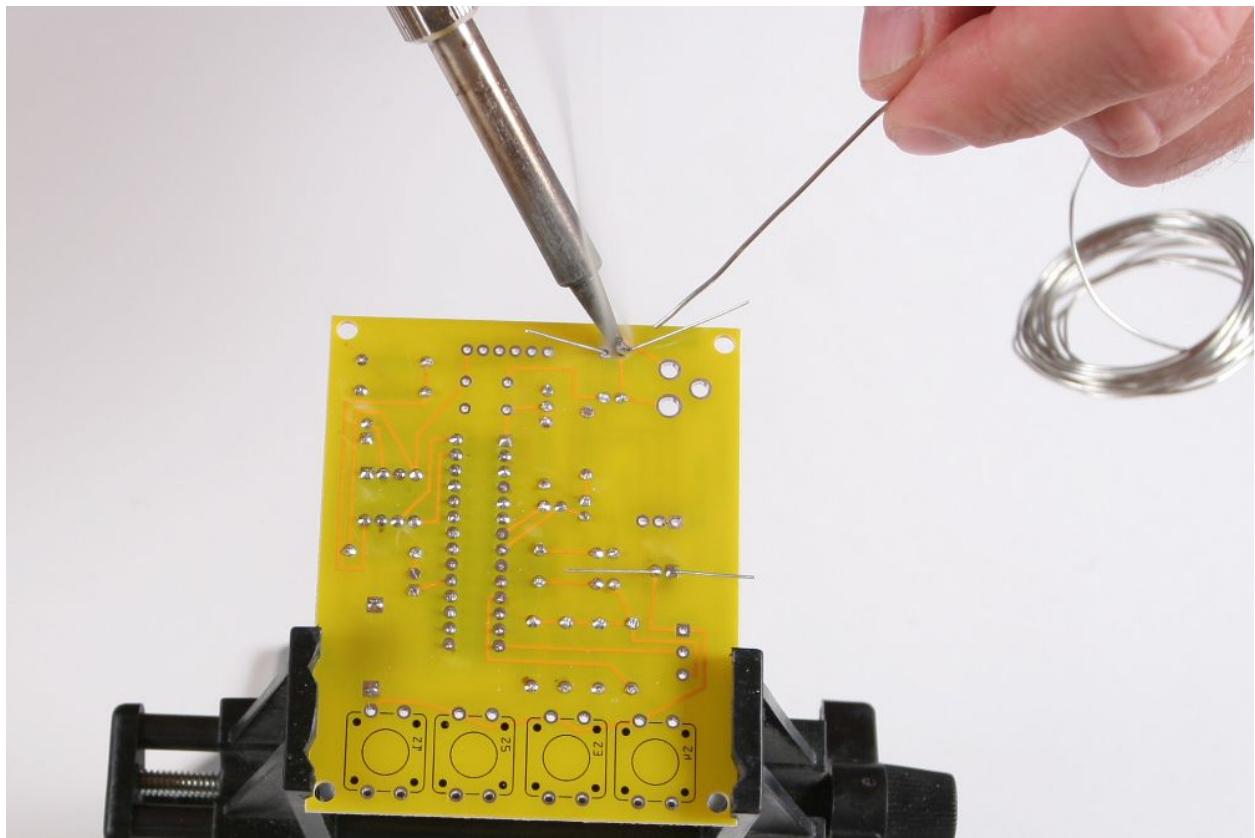
Place the 10uF electrolytic capacitors on C3. Electrolytic capacitors are polarized, make sure to insert the long wire into the round hole marked with a (+) sign.



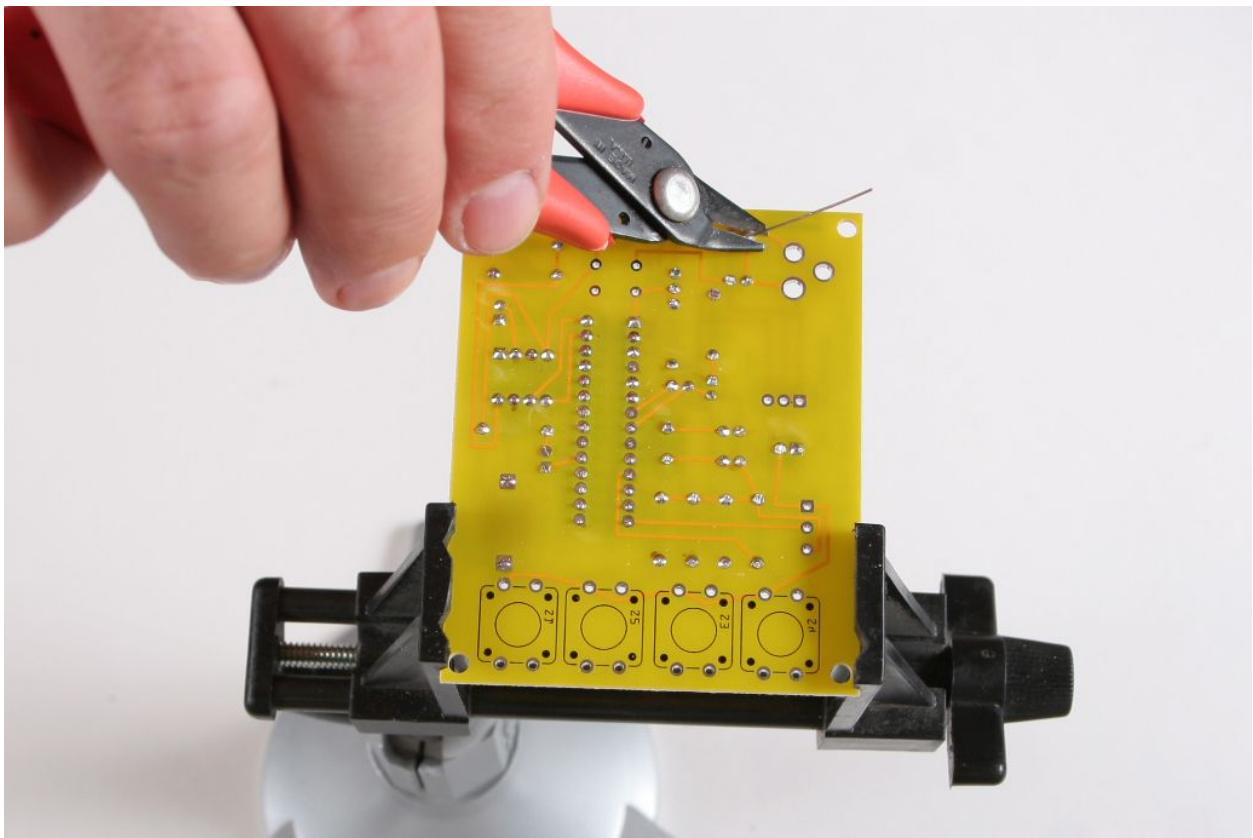
Place the 100uF electrolytic capacitors on C2. Electrolytic capacitors are polarized, make sure to insert the long wire into the round hole marked with a (+) sign.



Solder



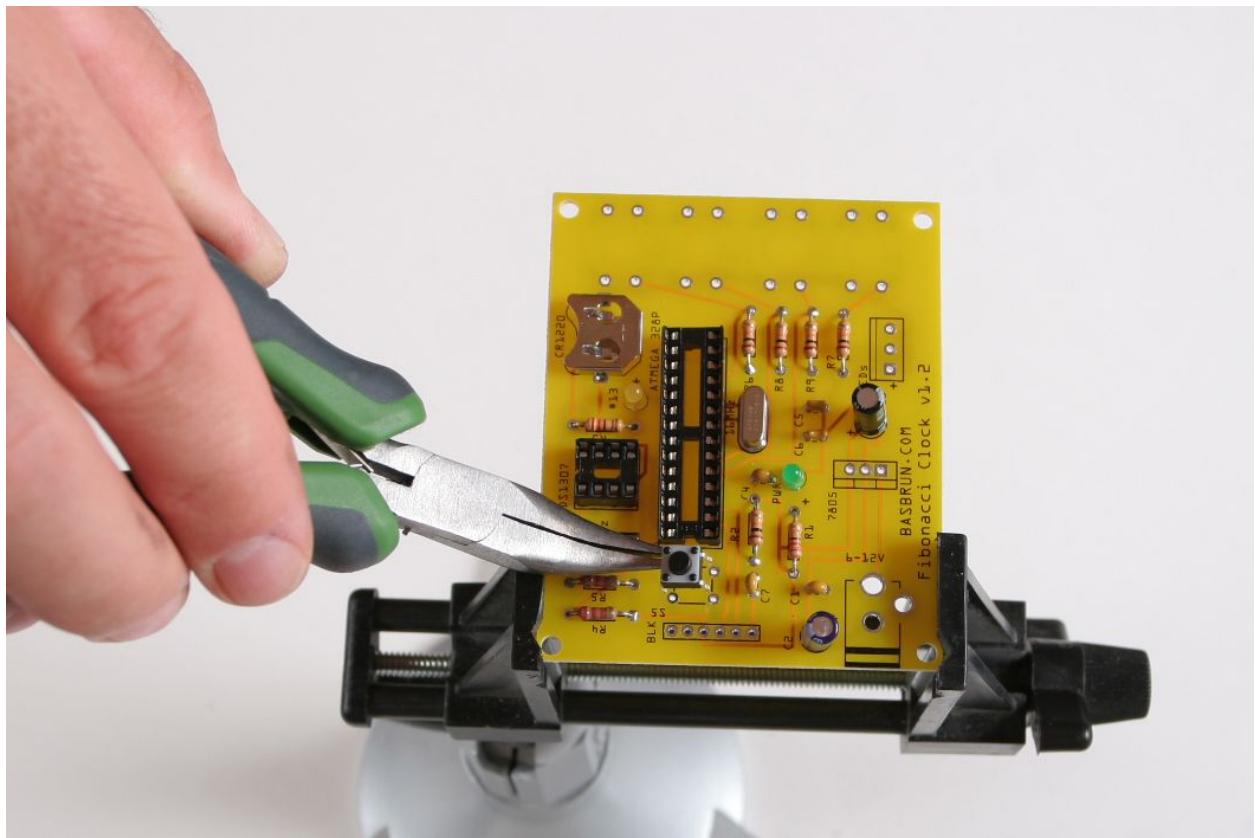
Cut the excess wires.



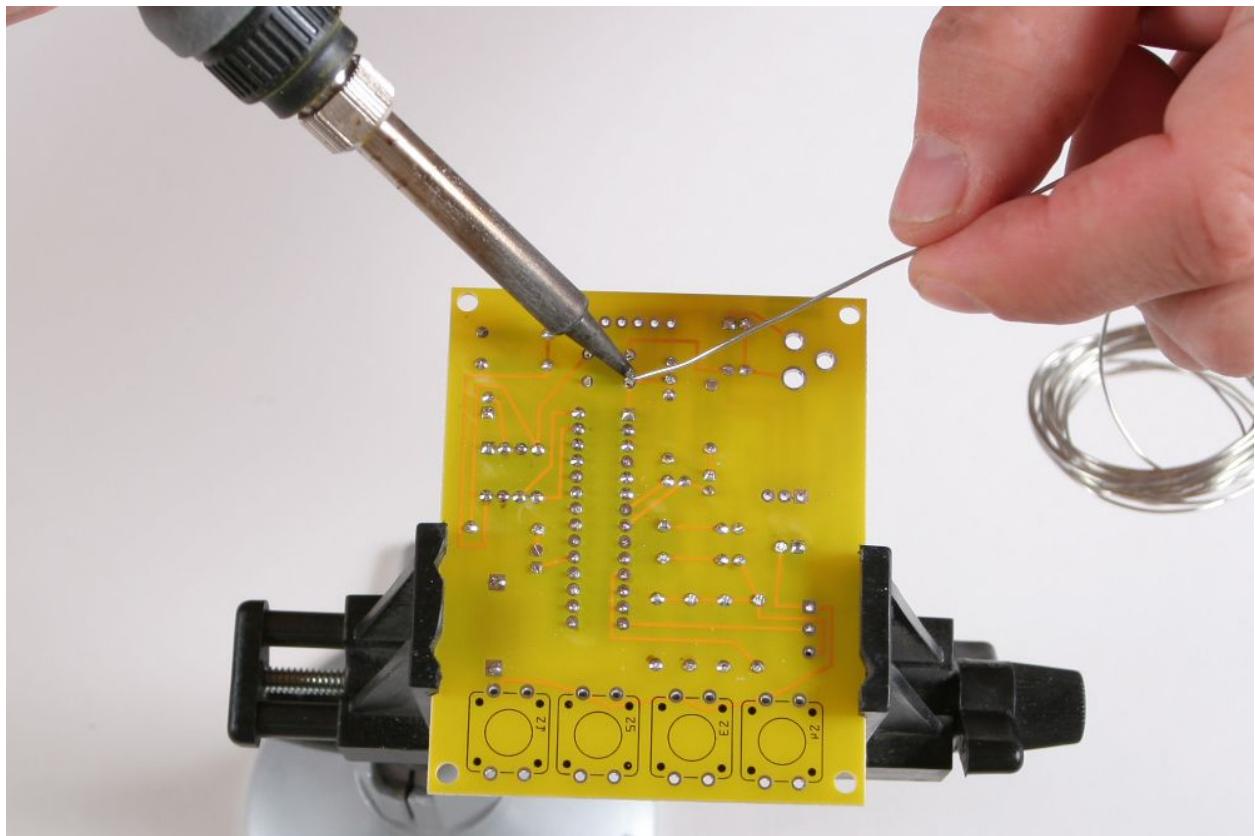
## Reset Switch

| Parts                               | Quantity | Image   |
|-------------------------------------|----------|---|
| SWITCH TACTILE SPST-NO 0.05A<br>24V | 1        |  |

Place the reset switch in its location between the Atmega328P DIP socket and the FTDI port. The pins of the switch must be facing the top and bottom sides of the board.



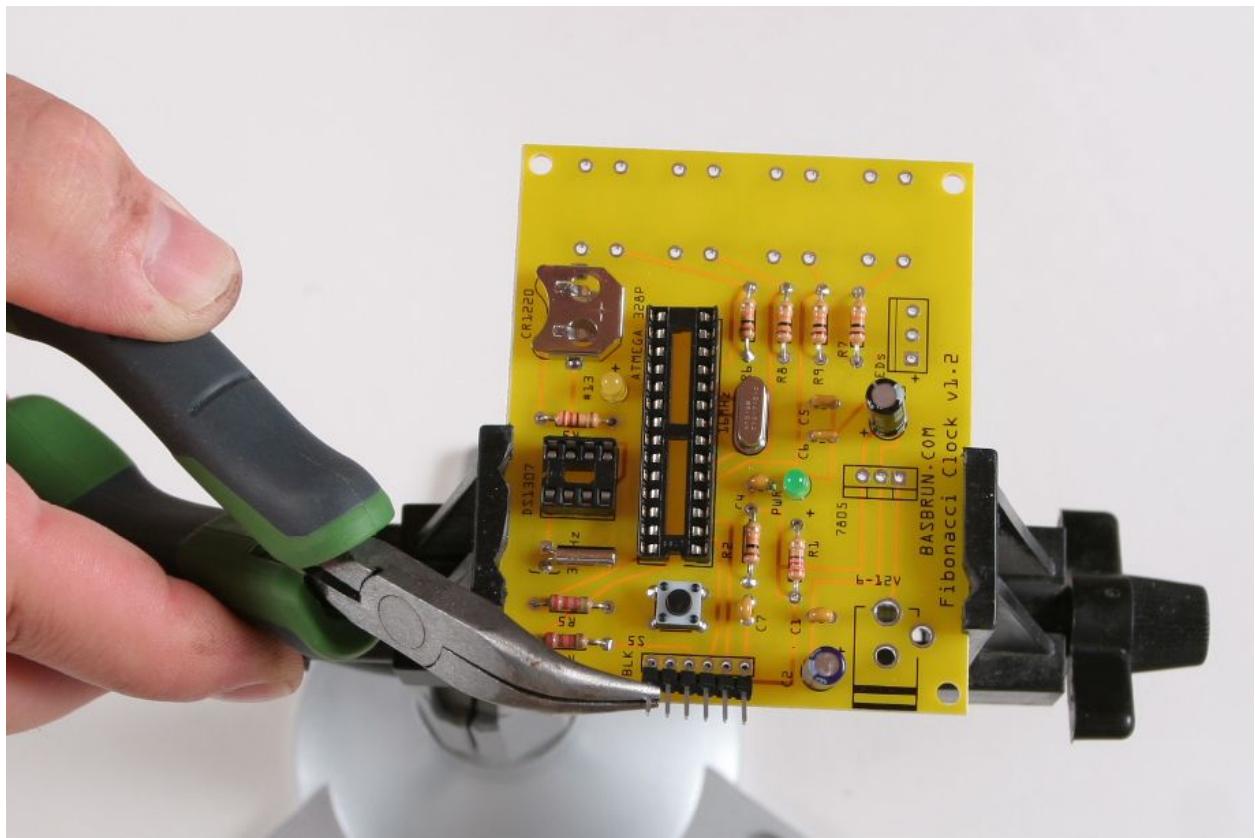
Solder



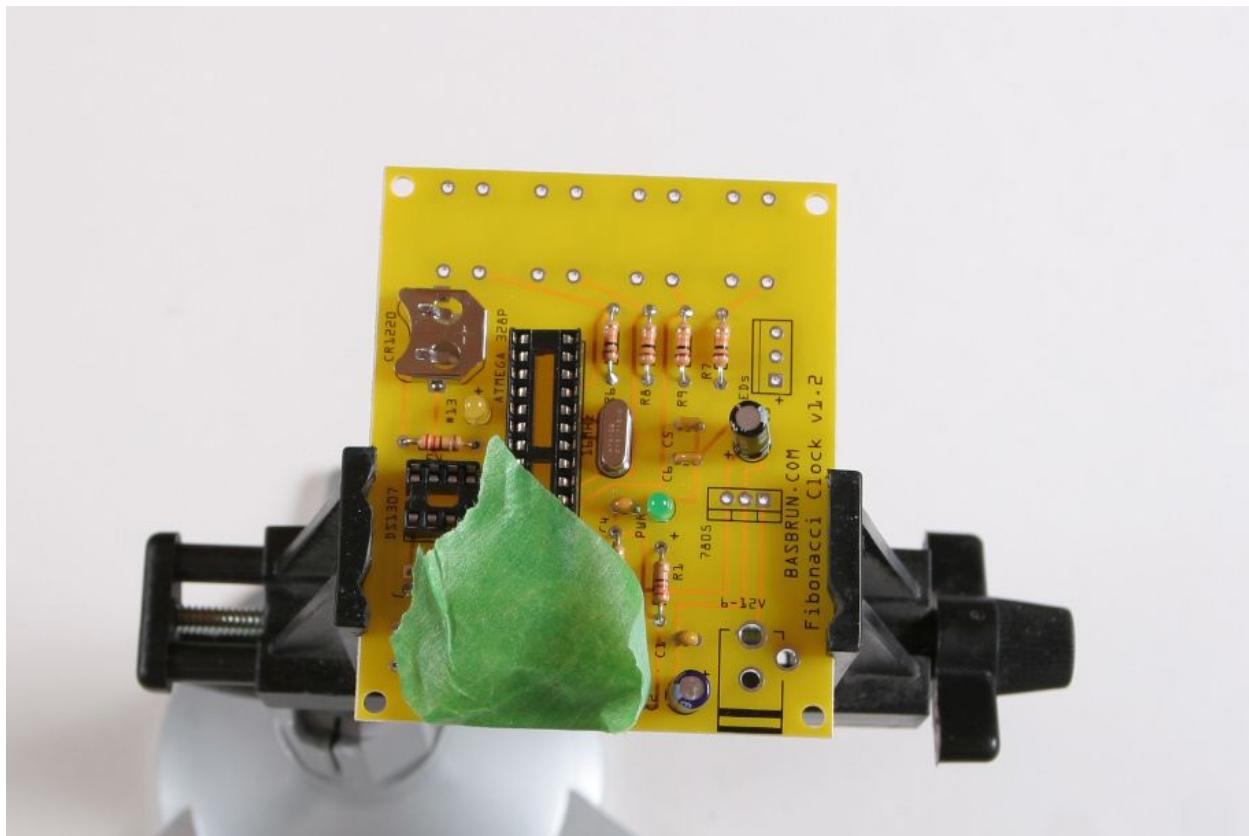
## FTDI Port

| Parts                         | Quantity | Image   |
|-------------------------------|----------|---|
| CONN HEADER 6POS .100 STR TIN | 1        |  |

Place the male header with the long pins facing up.



Secure with tape.



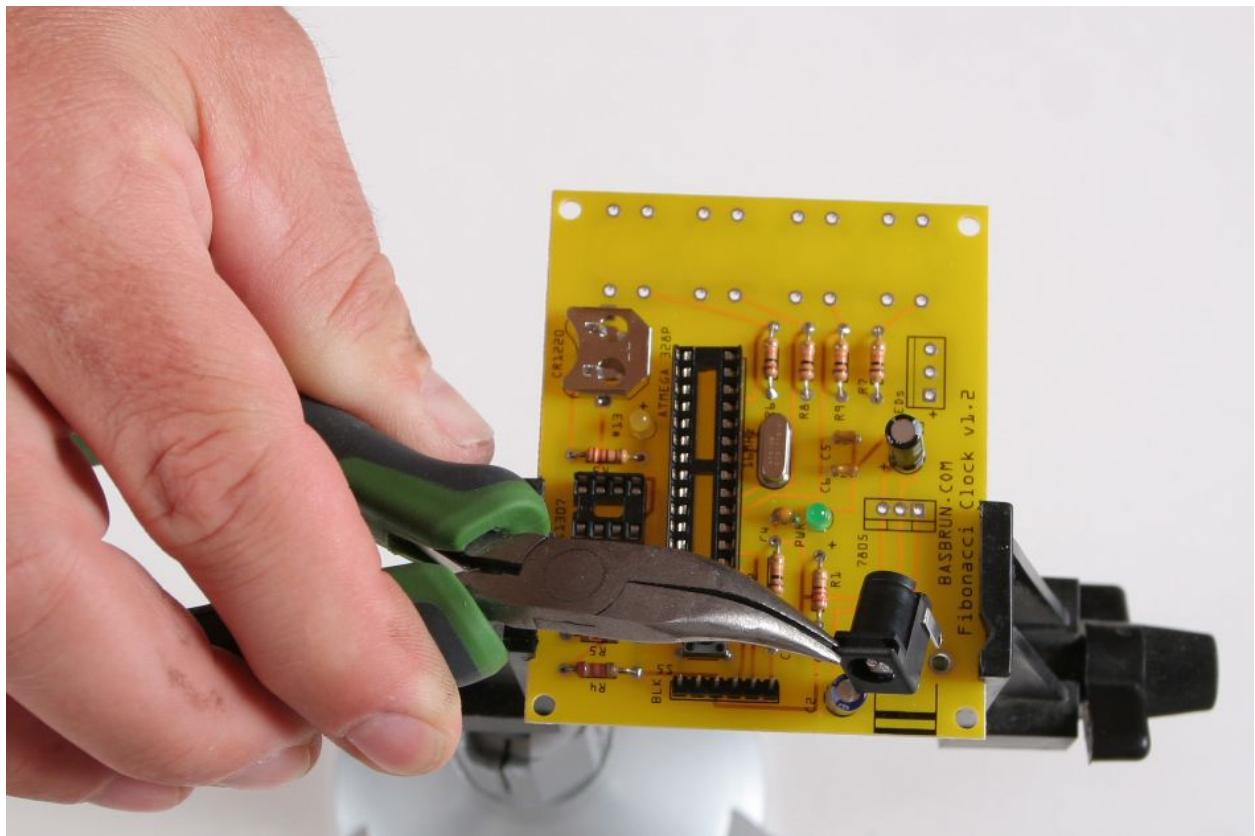
Solder the male header.

[NO IMAGE]

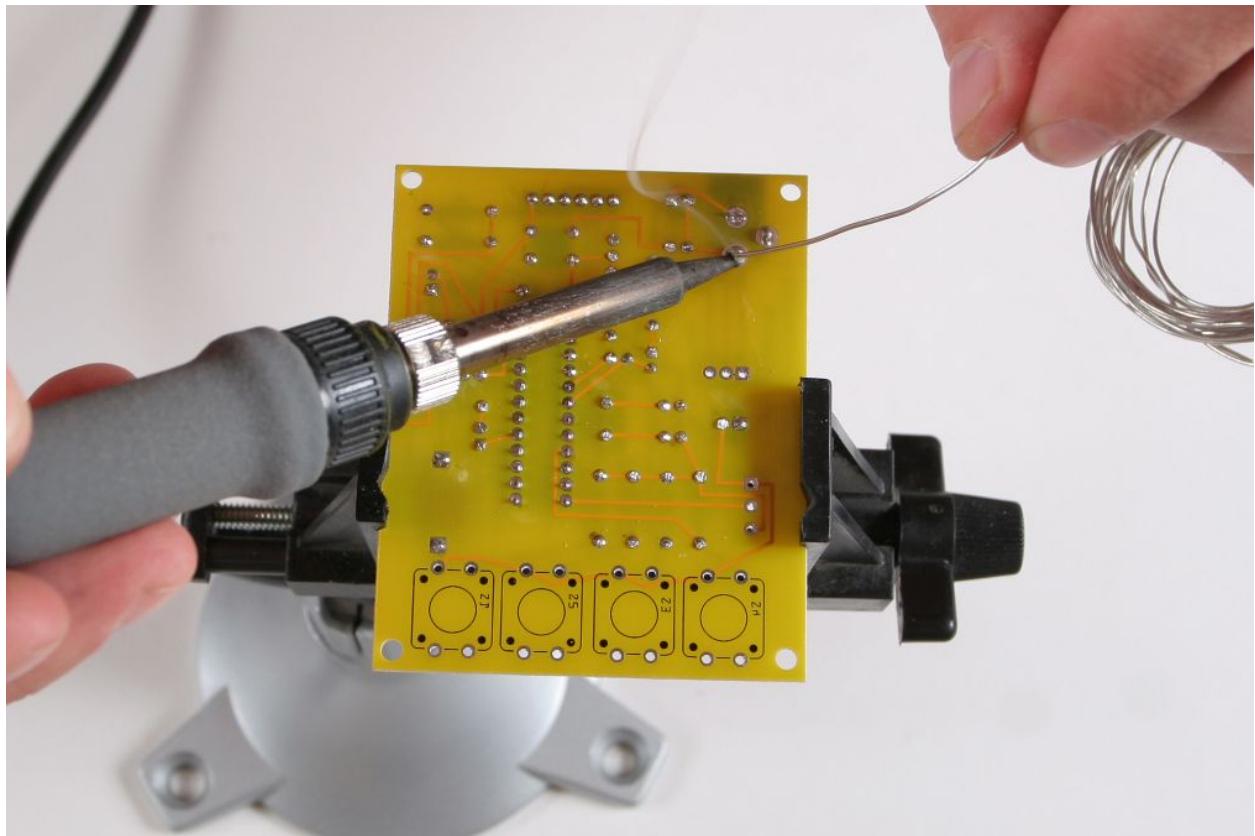
## Power Connector

| Parts                 | Quantity | Image |
|-----------------------|----------|-------|
| CONN POWER JACK 2.1MM | 1        |       |

Place the power connector in its location and secure with tape if necessary.



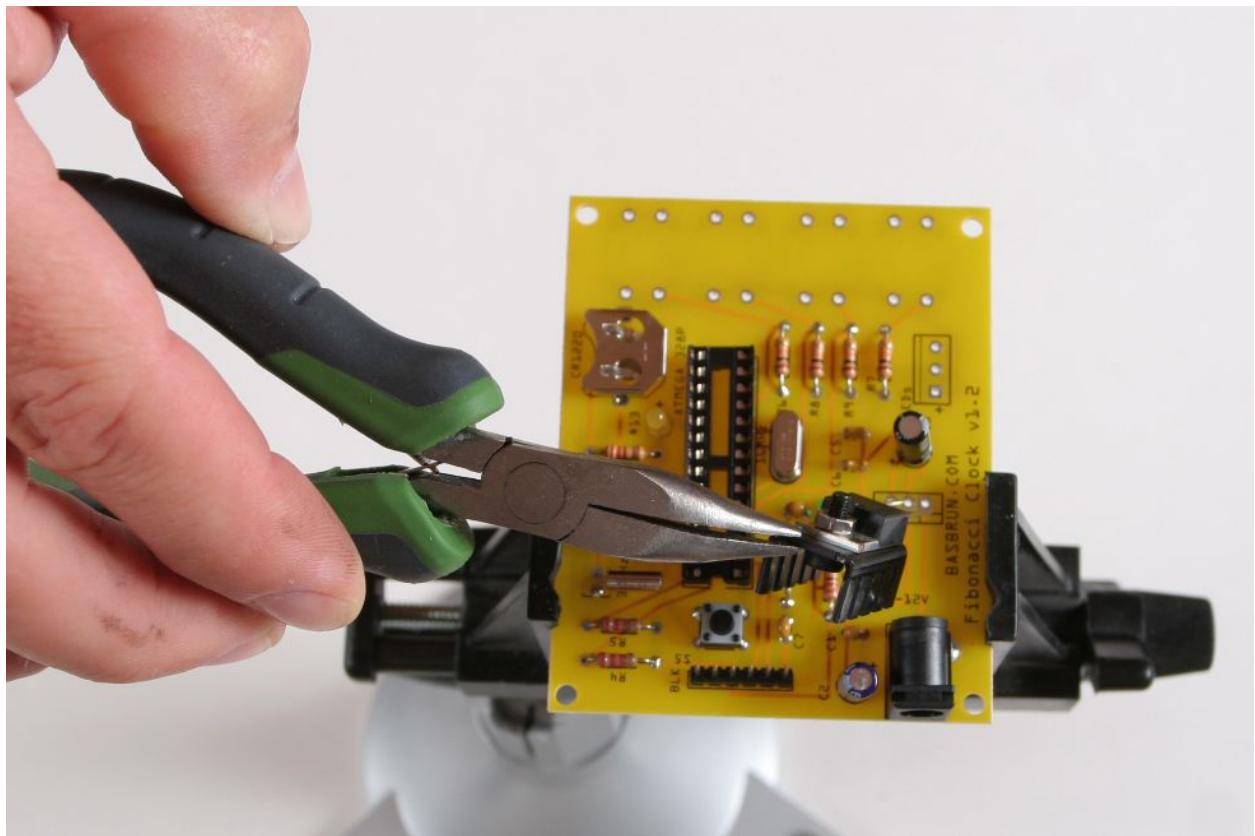
Solder



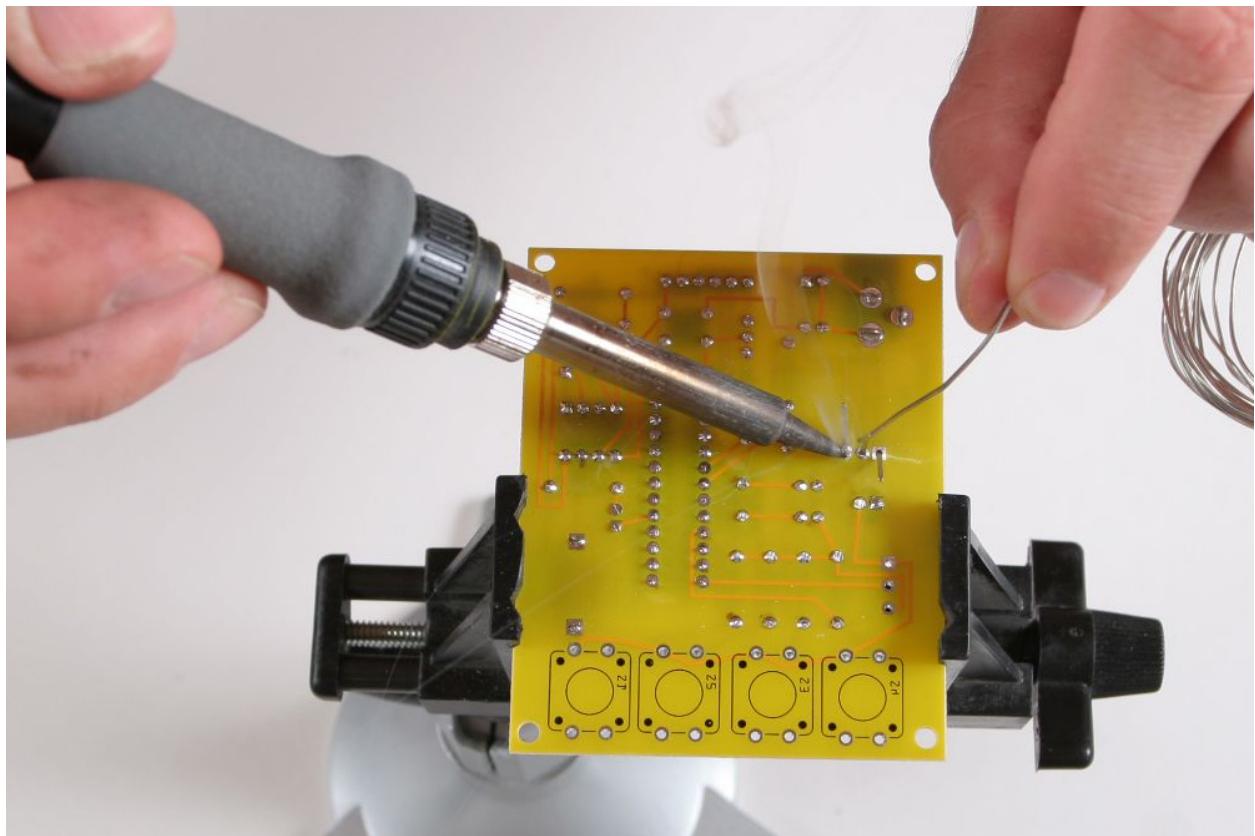
## Voltage Regulator

| Parts                          | Quantity | Image |
|--------------------------------|----------|-------|
| HEAT SINK TO-220 .375" COMPACT | 1        |       |
| IC REG LDO 5V 1.5A TO220       | 1        |       |

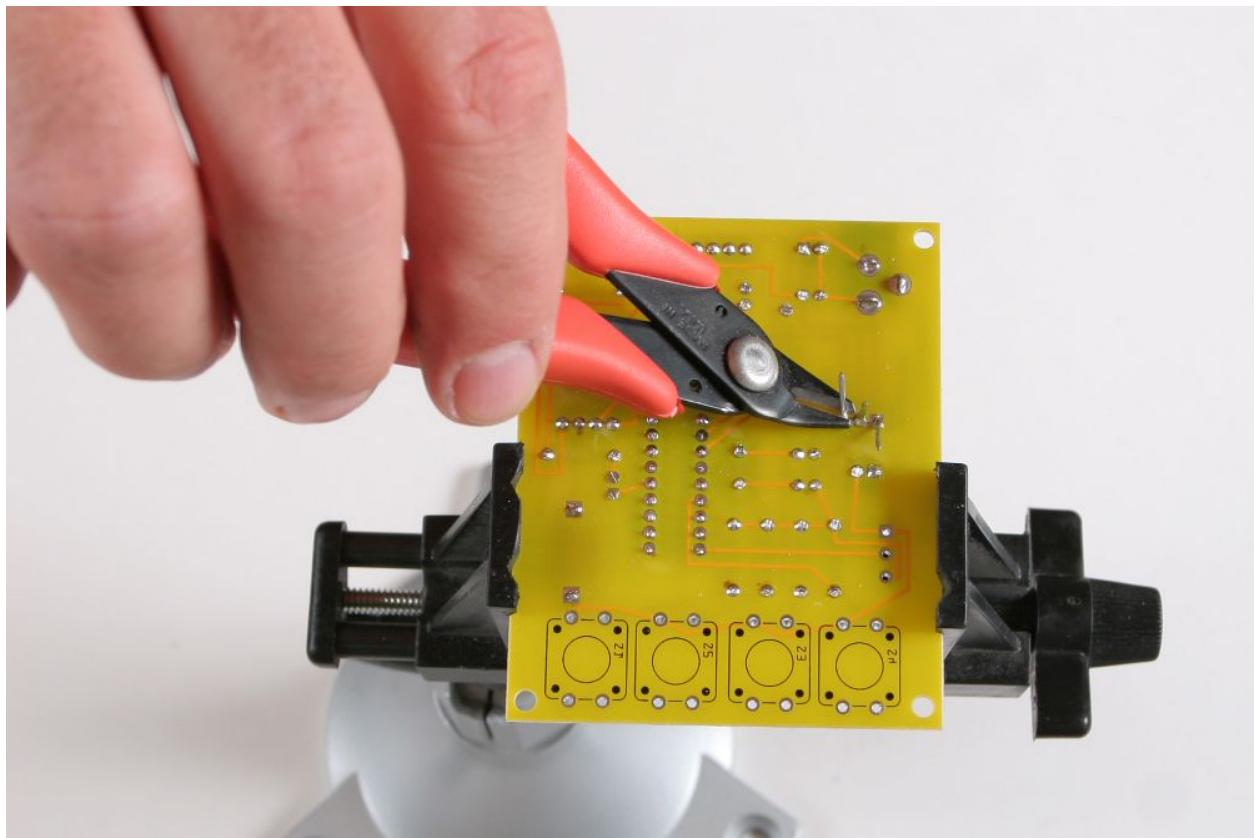
Place the voltage regulator and heat-sink assembly in the place marked 7805. The heat-sink should face the power connector.



Solder



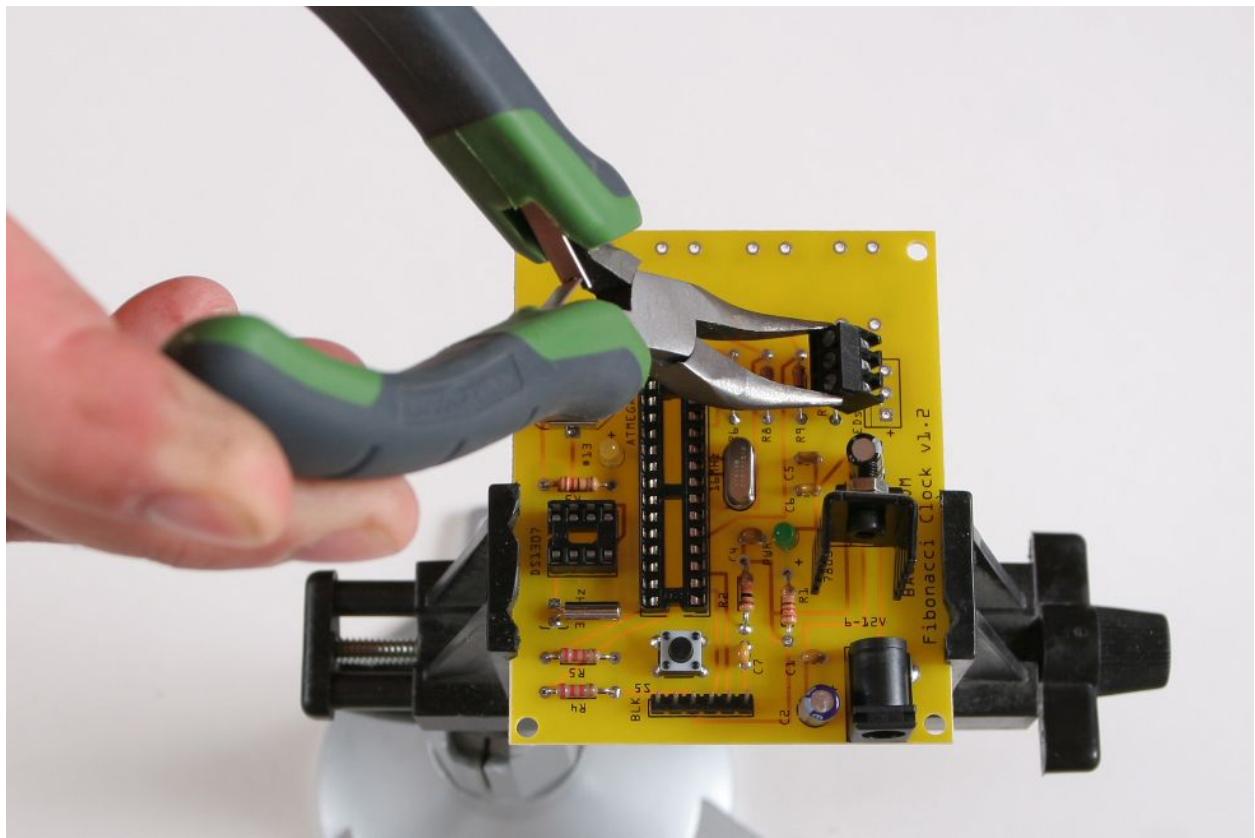
Cut the excess wires.



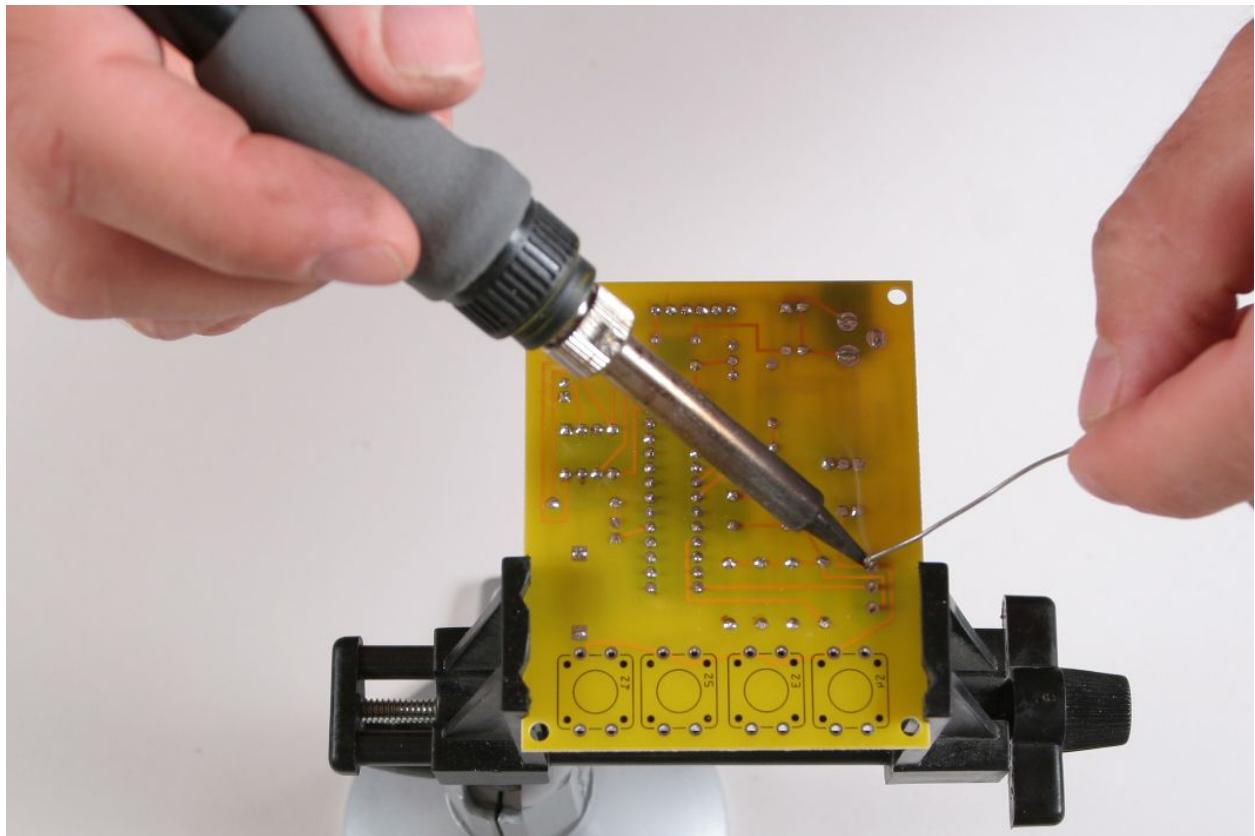
## Terminal Block

| Parts                            | Quantity | Image   |
|----------------------------------|----------|---|
| TERMINAL BLOCK 3.5MM 3POS<br>PCB | 1        |  |

Place the terminal block on the board with the beveled side facing the bottom edge of the board. Secure the part with tape if necessary.



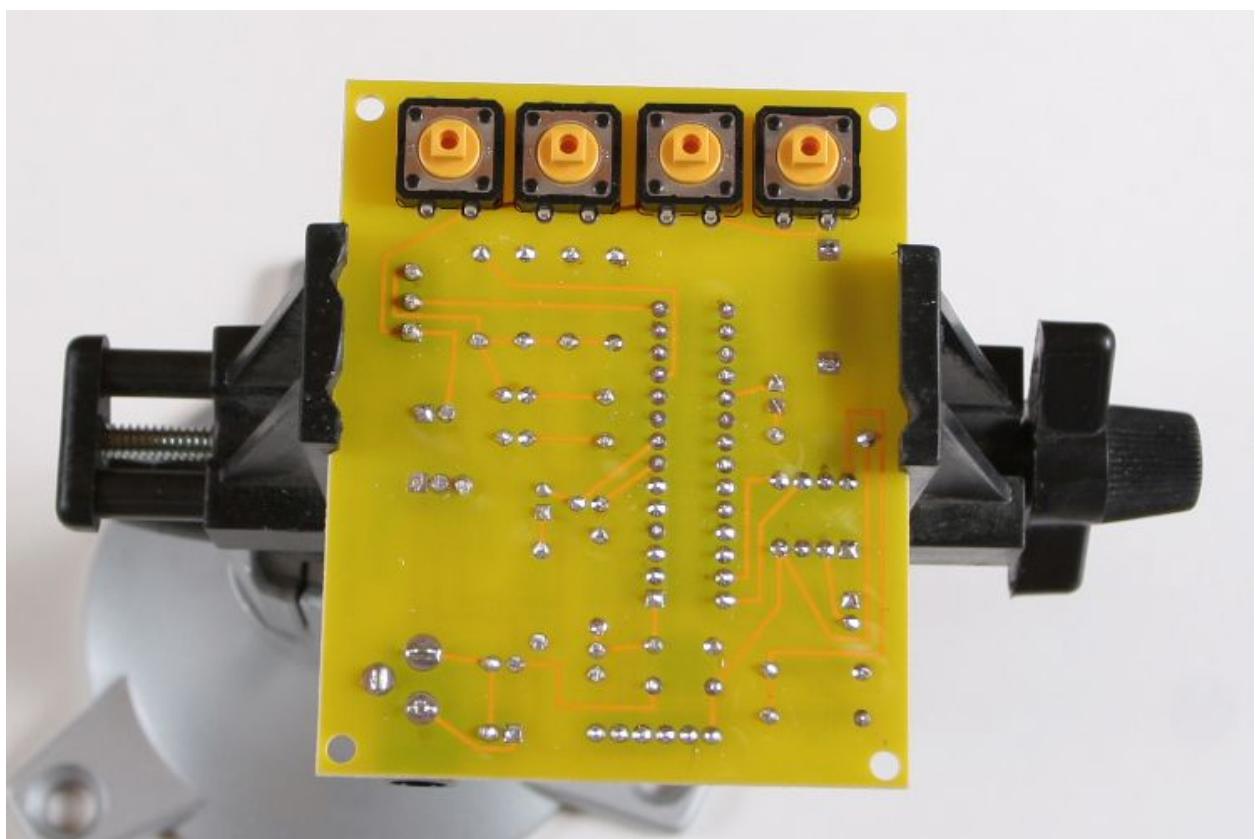
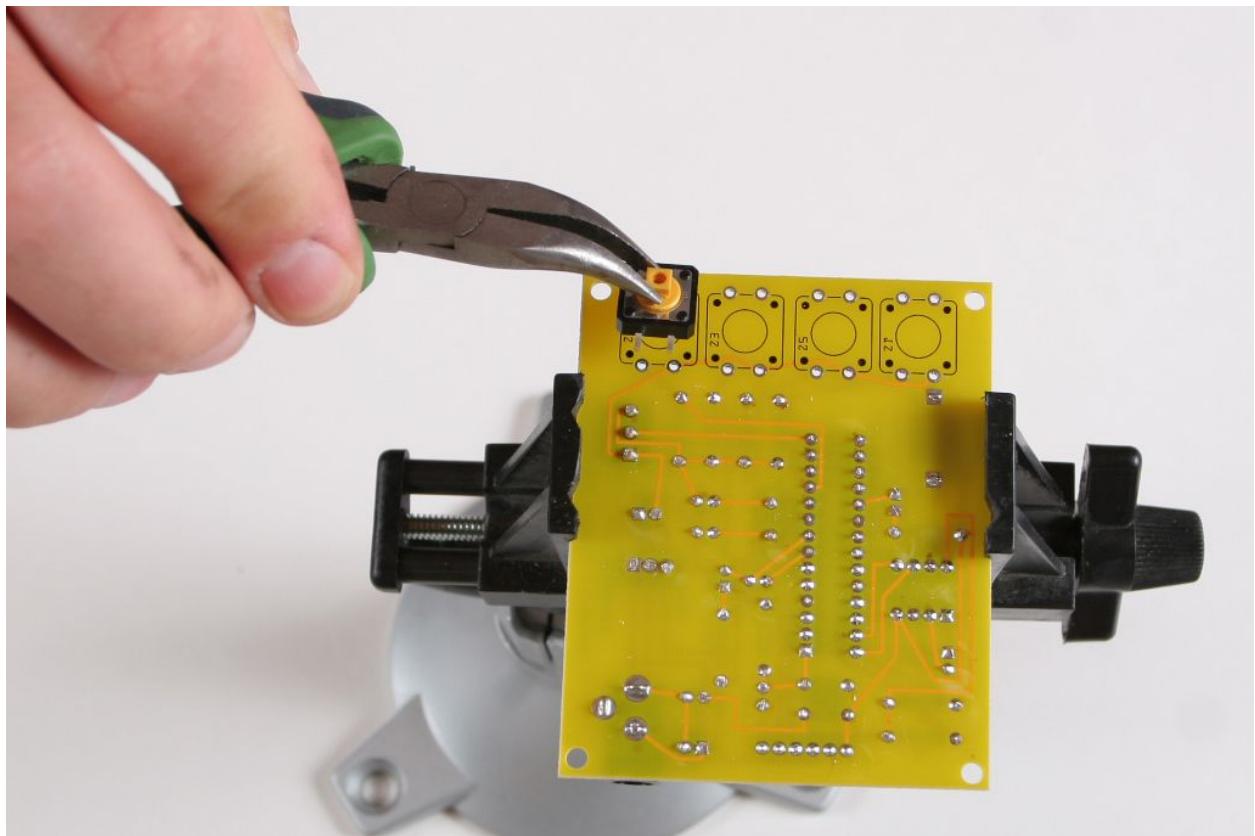
Solder



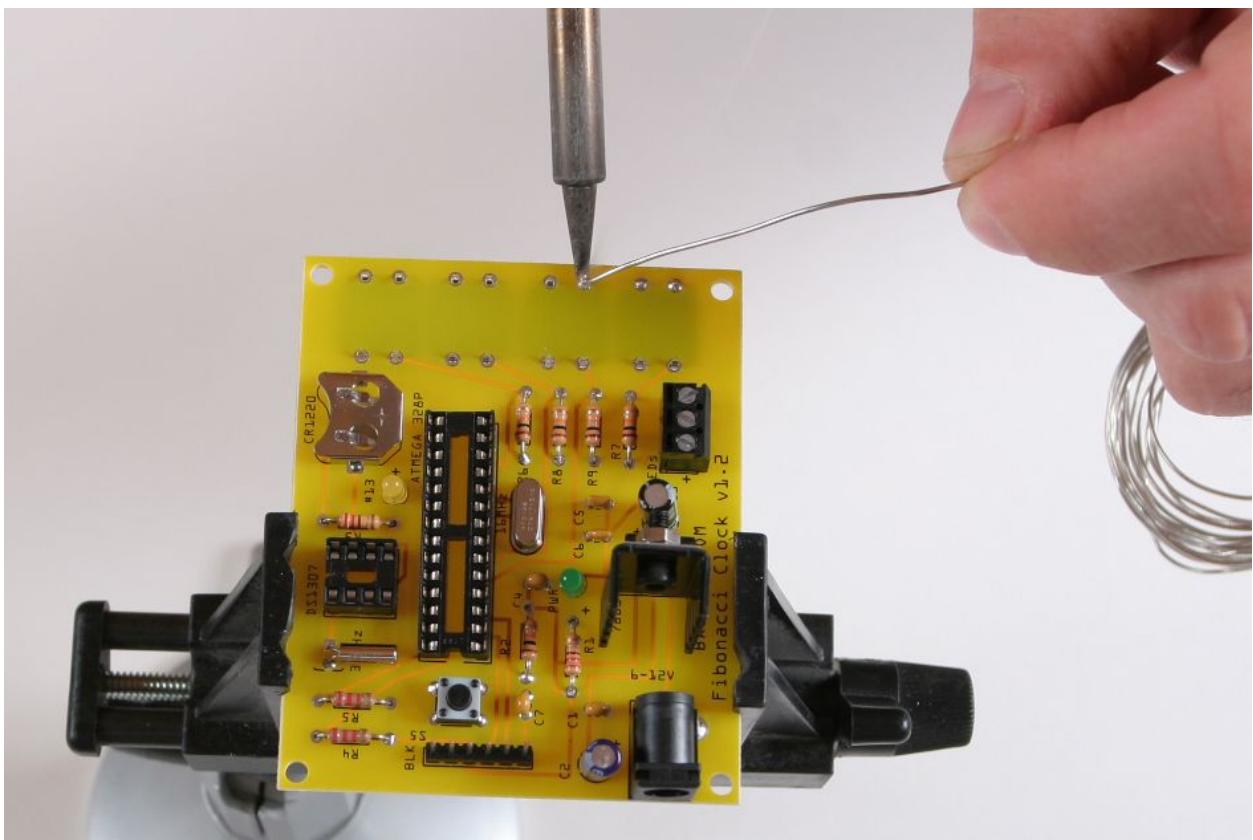
## Clock Buttons

| Parts  | Quantity | Image   |
|--|----------|---|
| SWITCH TACTILE SPST-NO 0.05A<br>24V<br><i>May be all black in your kit</i> | 4        |  |

Turn the board on the other side and place the four buttons in their location. They should snap in place.



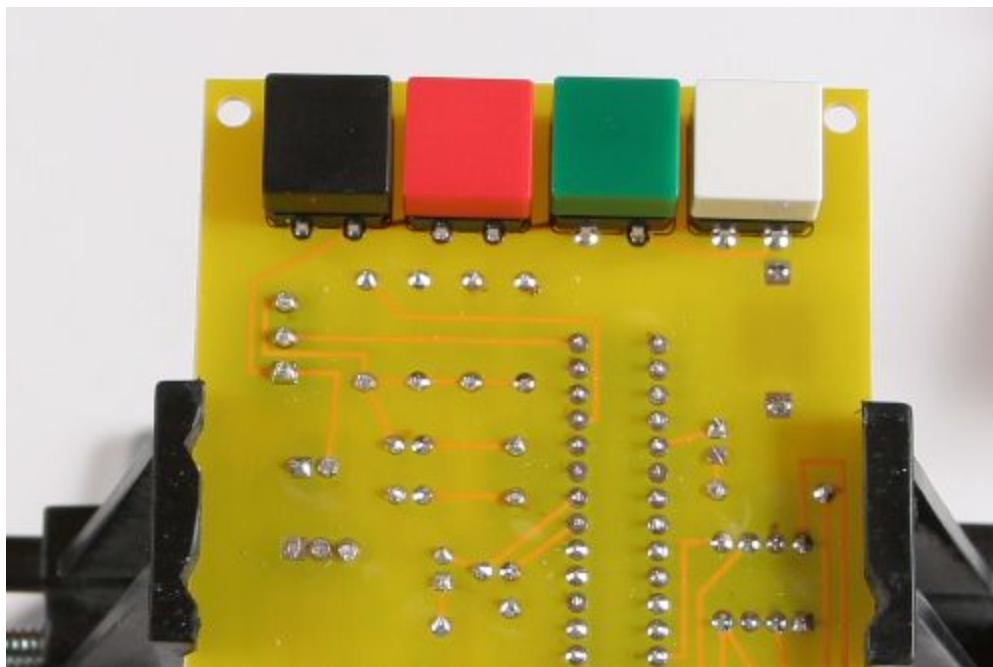
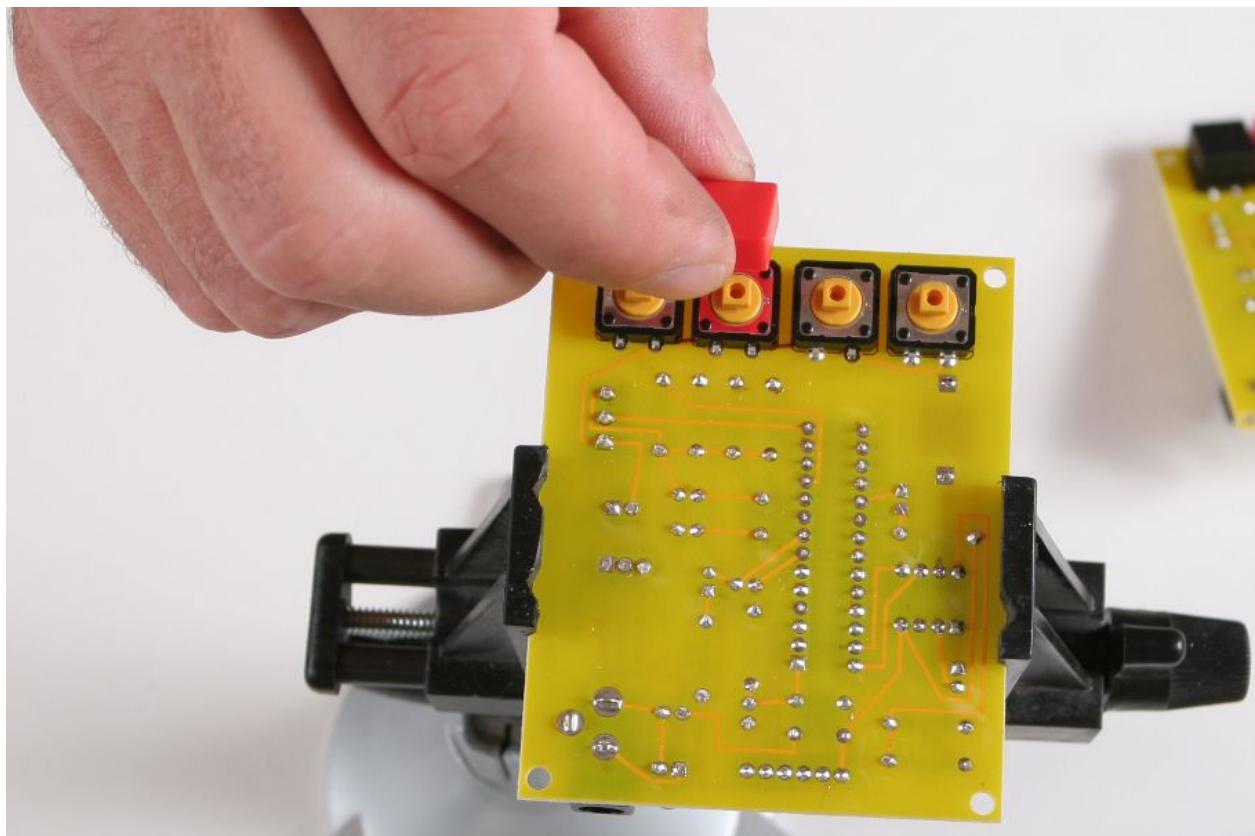
## Solder



## Buttons caps

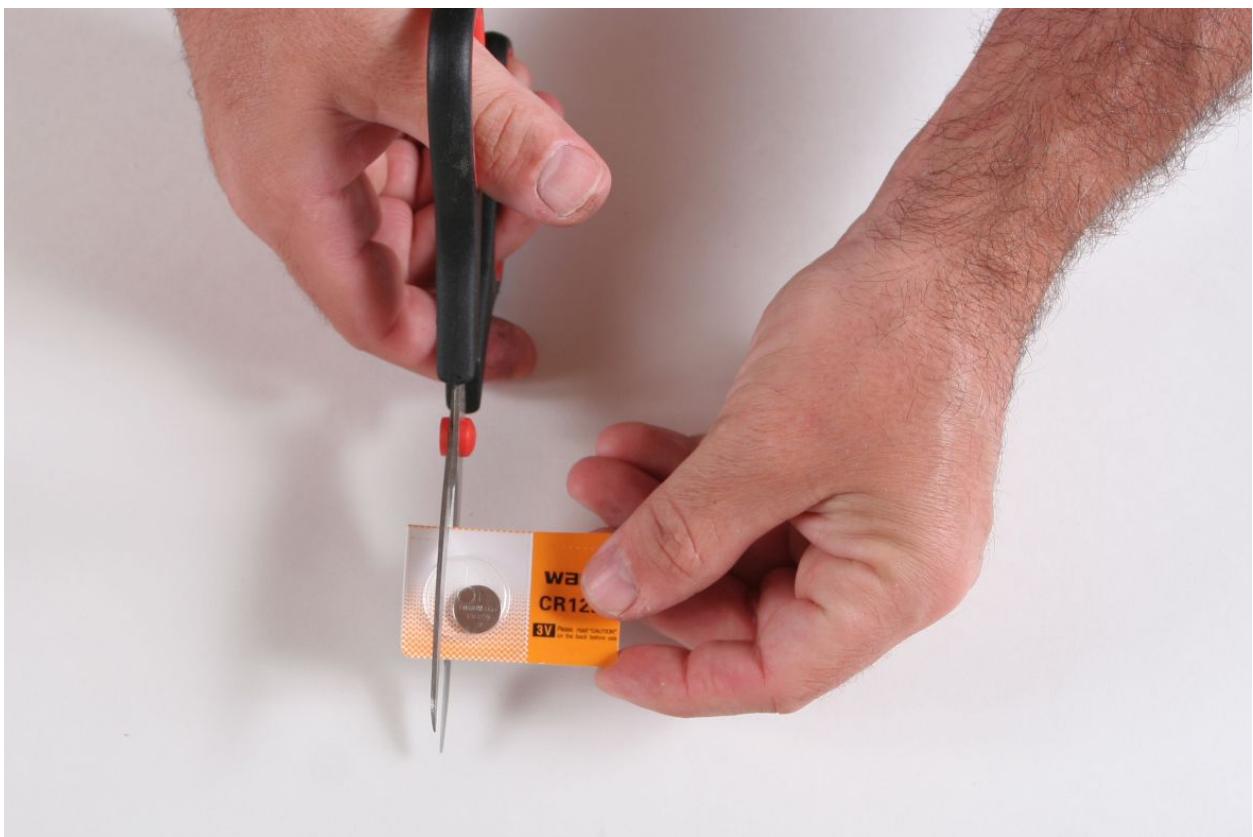
| Parts                    | Quantity | Image |
|--------------------------|----------|-------|
| CAP TACTILE SQUARE RED   | 1        |       |
| CAP TACTILE SQUARE WHITE | 1        |       |
| CAP TACTILE SQUARE GREEN | 1        |       |
| CAP TACTILE SQUARE BLACK | 1        |       |

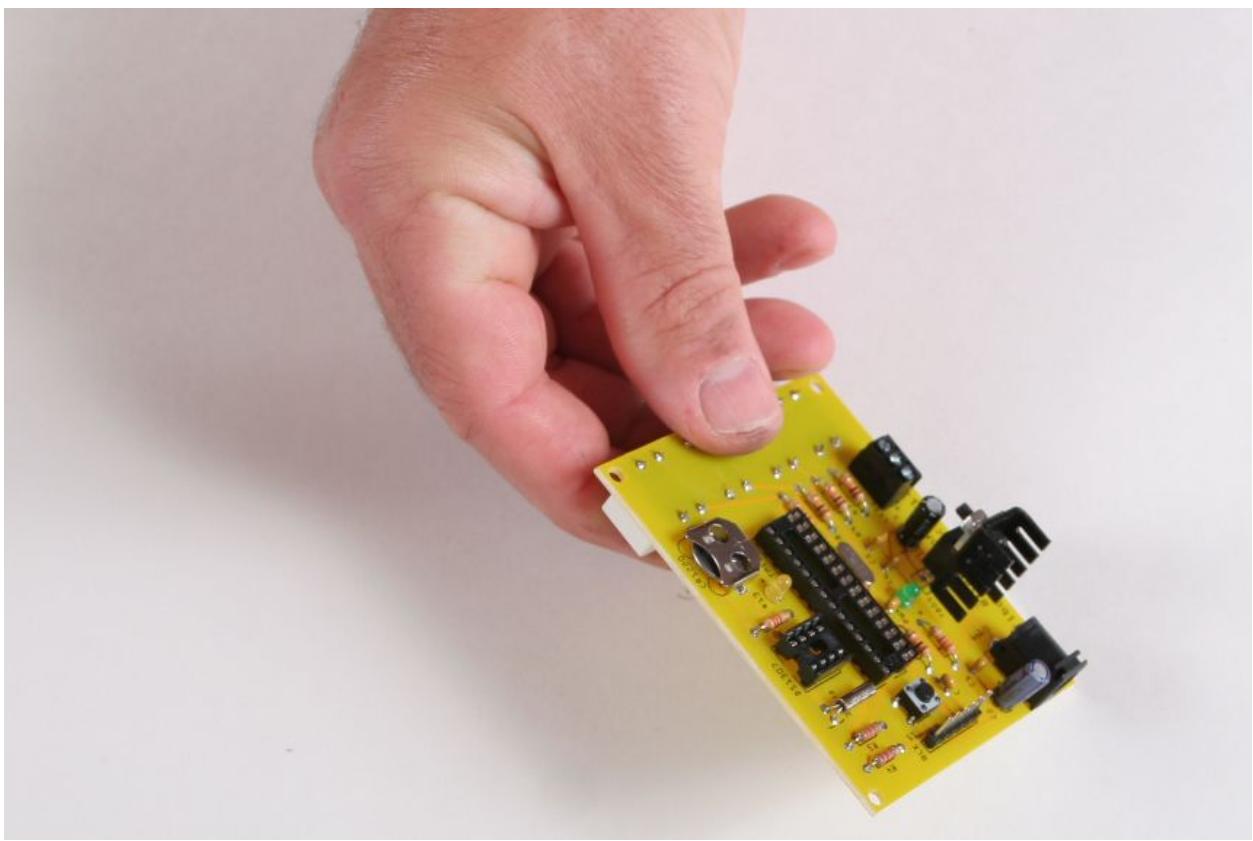
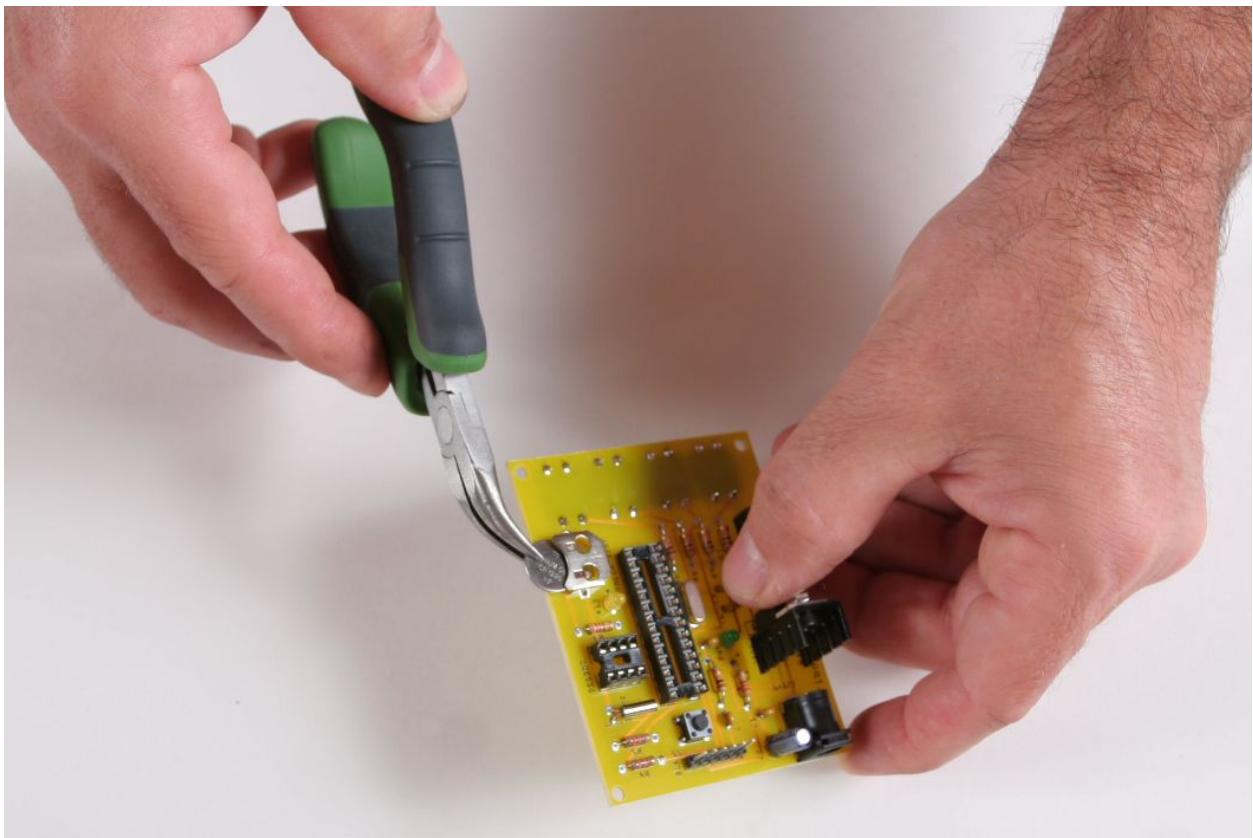
Place the button caps as displayed on the following picture. *Some kits come with button caps with a pin in the center of the socket. You may have to cut it if the button in your kit don't have a center hole.*



## Coin Battery

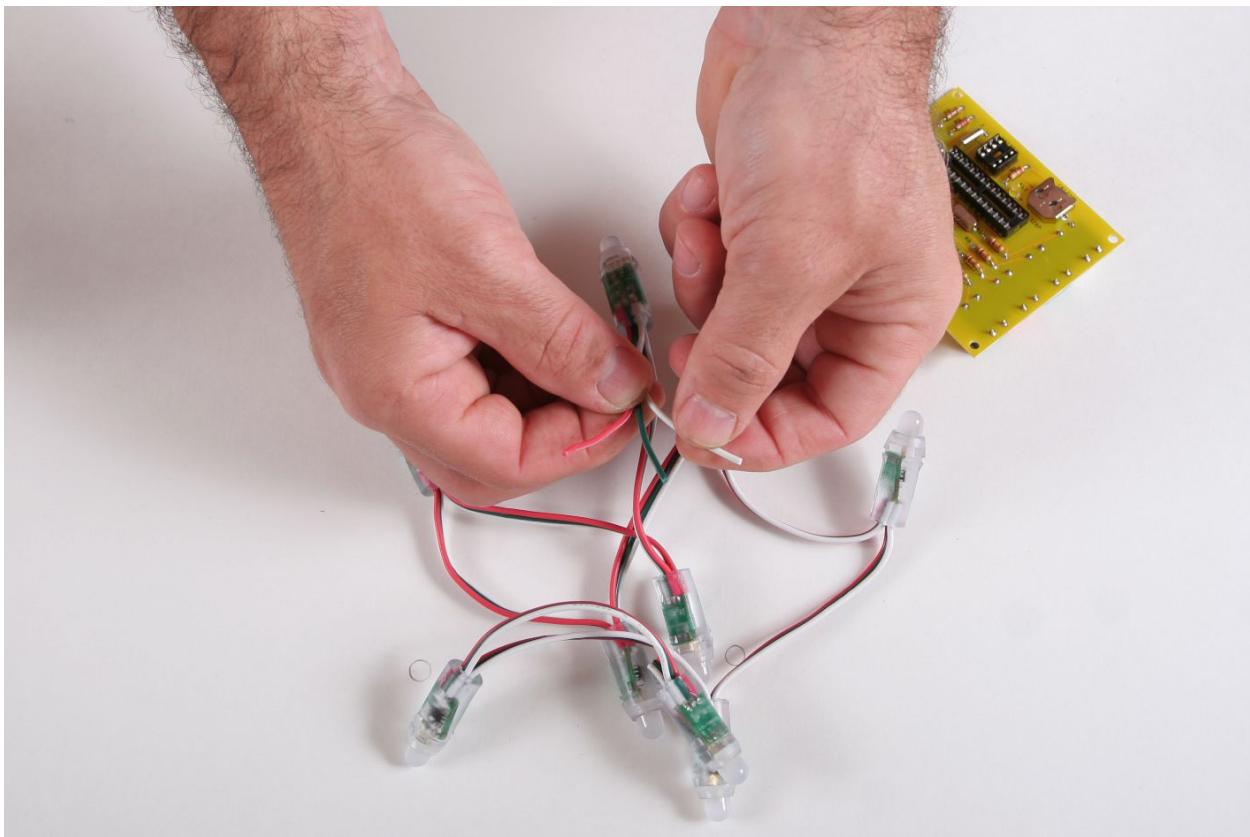
Insert the coin battery in the battery holder.





## LED Pixels

Separate the three wires of the LED strip.



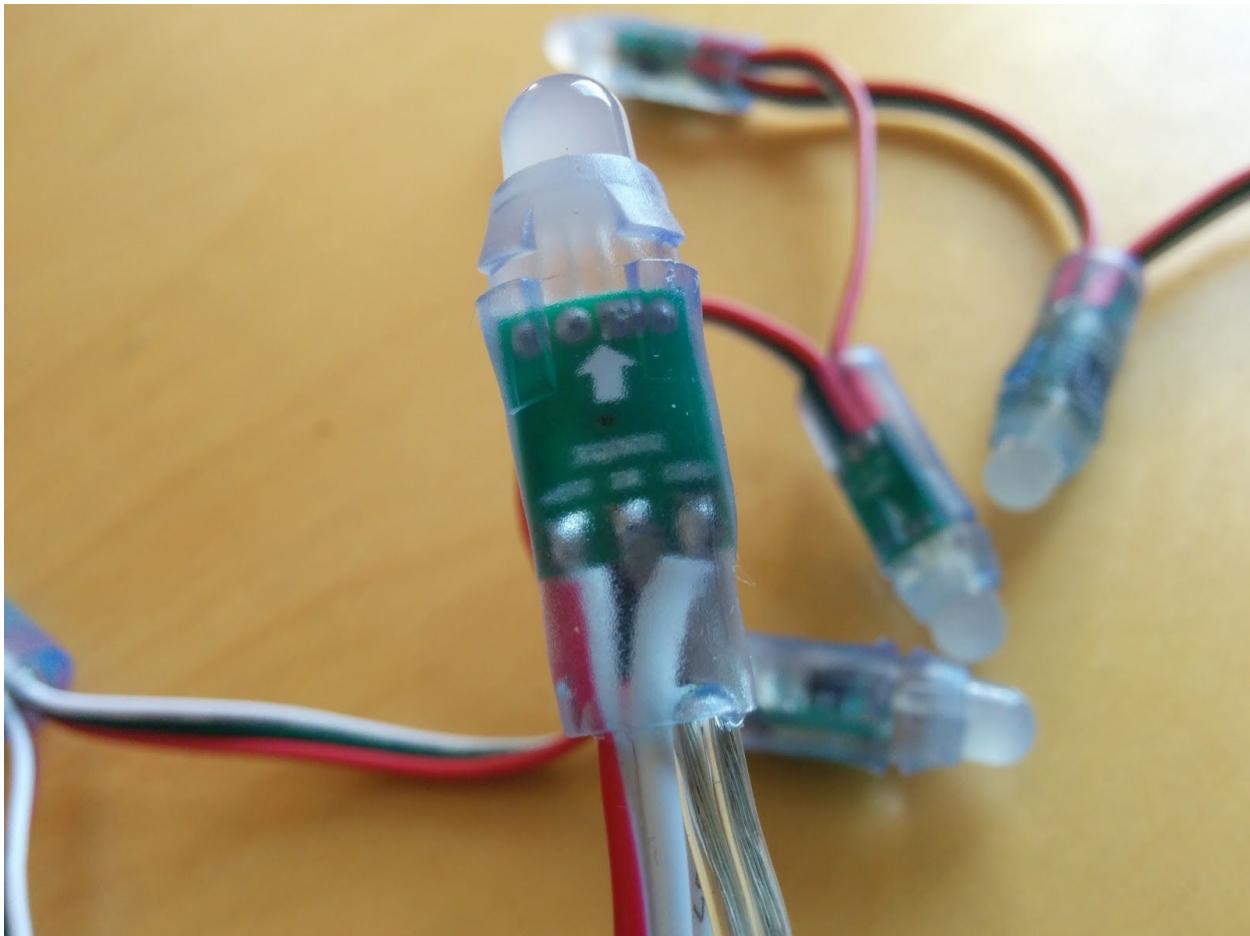
Strip the wires on approximately 5mm.

**Important note** Some kits will ship with a slightly different LED strip. The center green wire being replaced by two transparent wires or by a blue wire. One of the transparent wires replaces the green wire while the other is connected with the white wire on the ground.

You should use the transparent wire soldered to the center pin of the LED circuit board. If you are not sure what wire this is use a voltmeter to test connectivity between the transparent wires and the white wire. You should connect the one not connected to the ground (white).

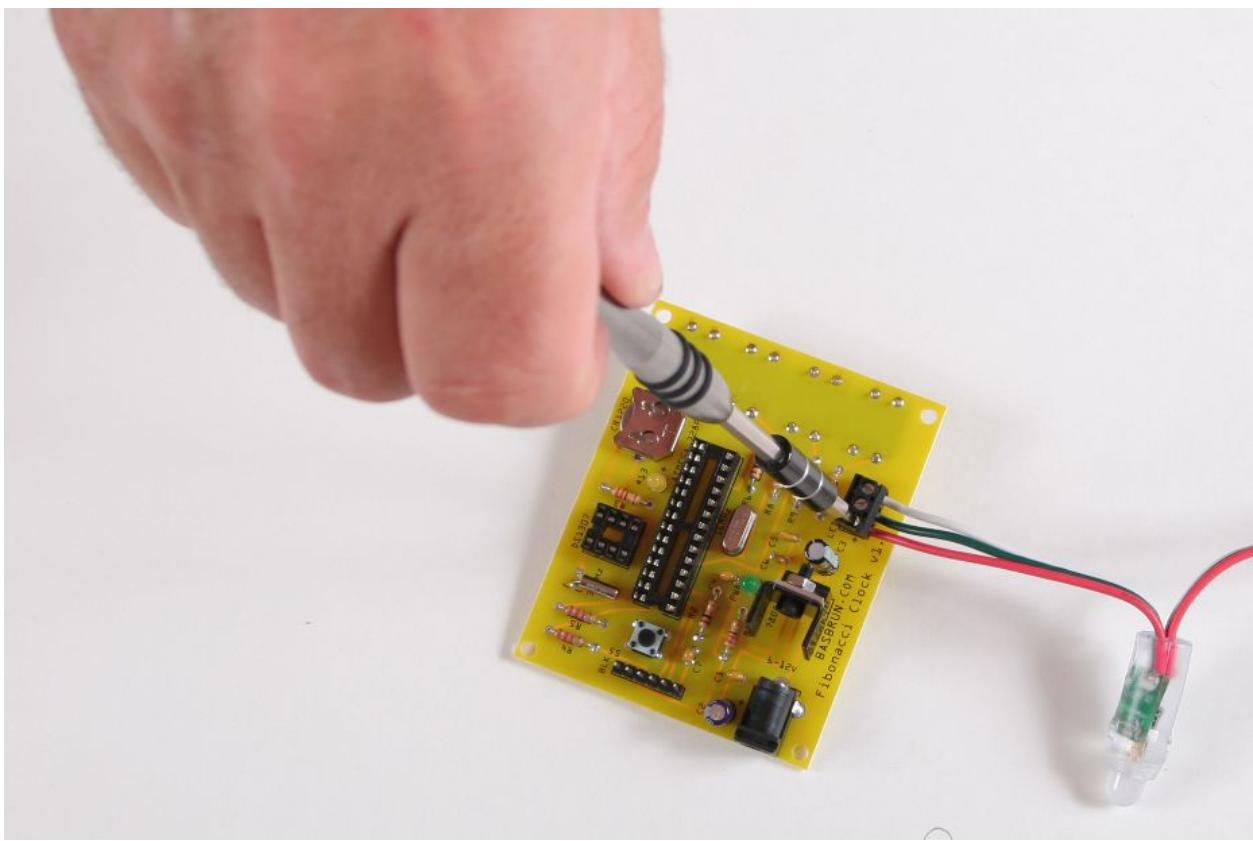
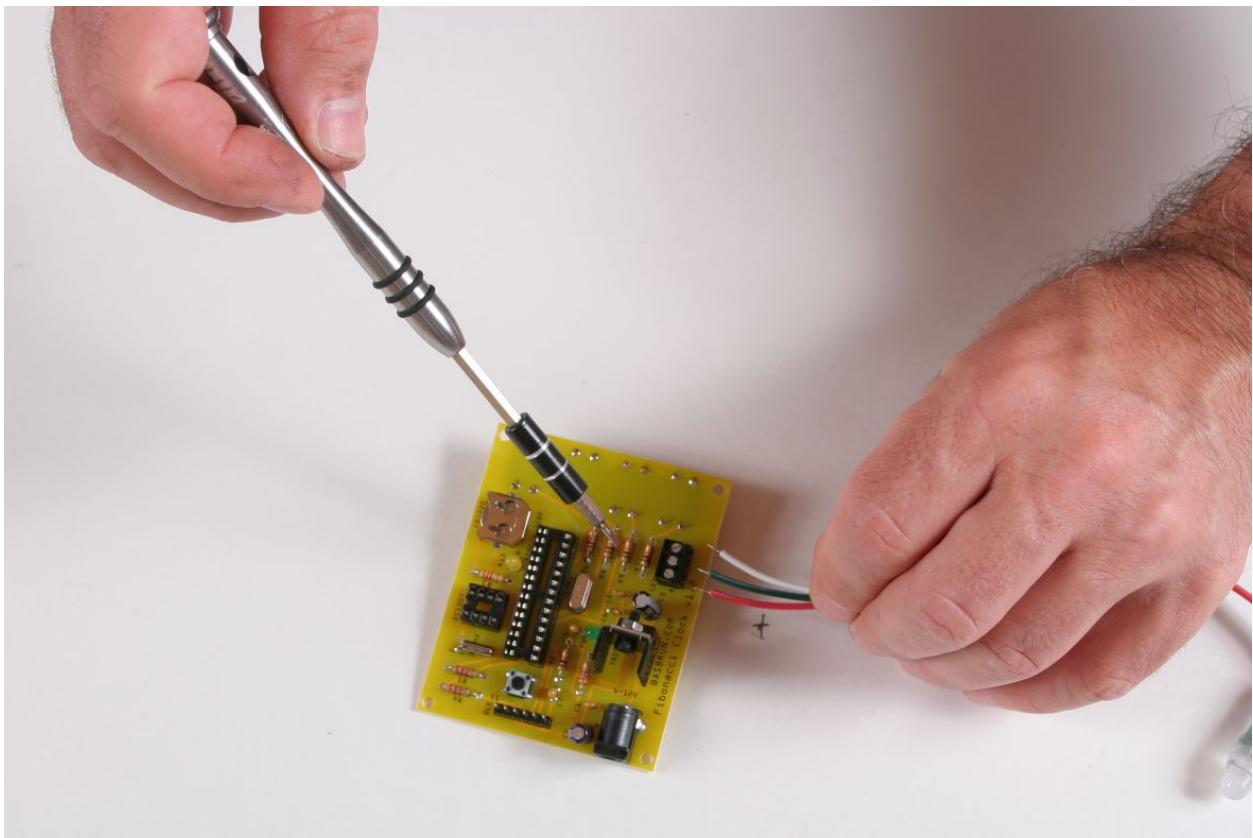
Other kits will ship with LED strips of different color. Red is the same but white is replaced by blue and the green center wire is replaced by white.

An LED strip with two transparent wires. Uses the one connected to the center pin of the circuit board (IN). The other is connected to the ground with the white wire and can be ignored.



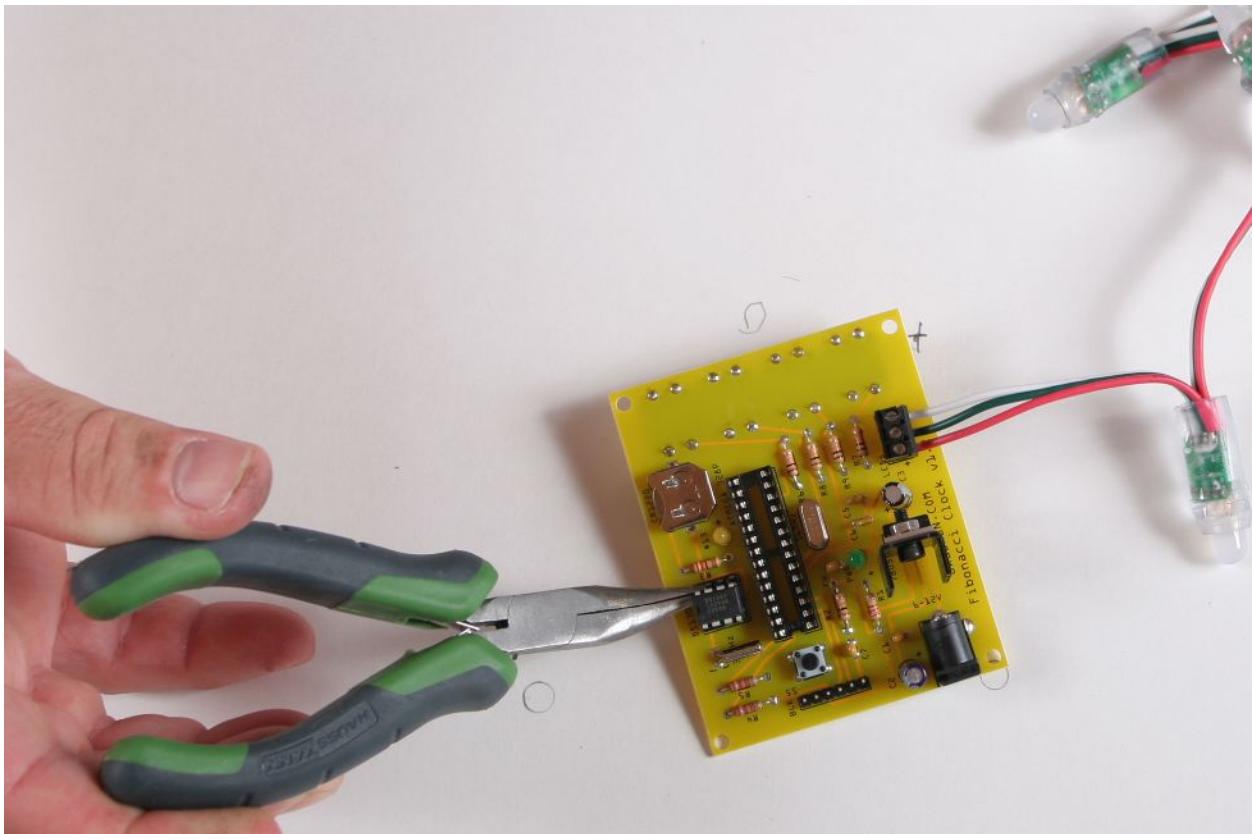


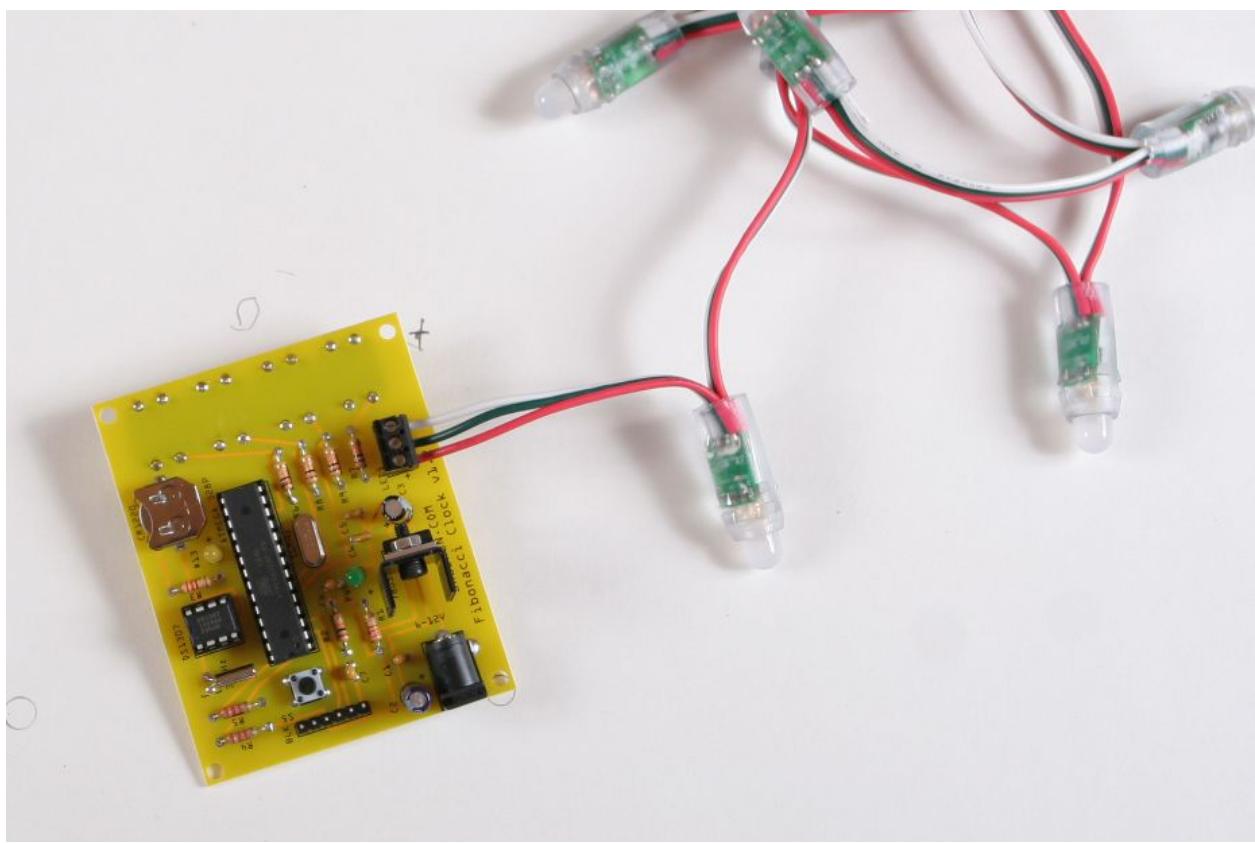
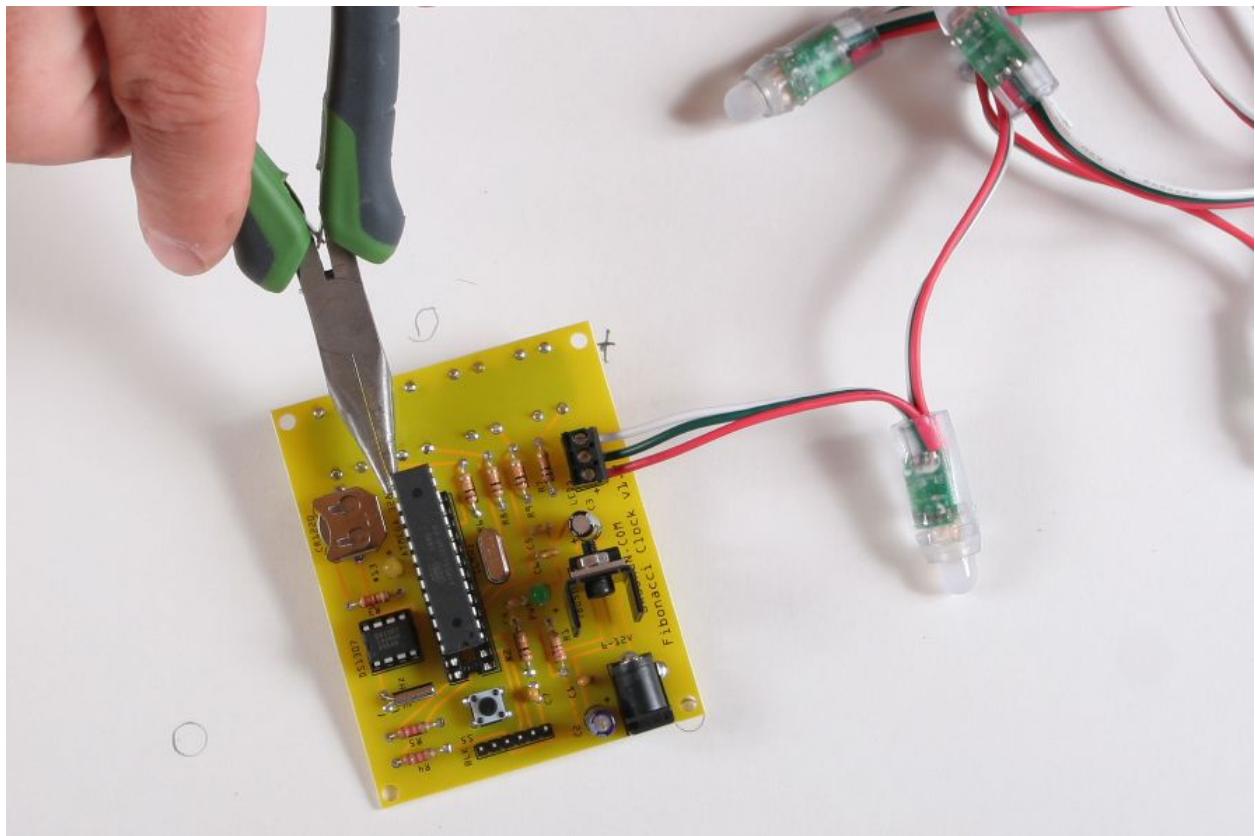
Screw the wires in the block terminal. Insert the red wire in the terminal marked with a (+) sign.



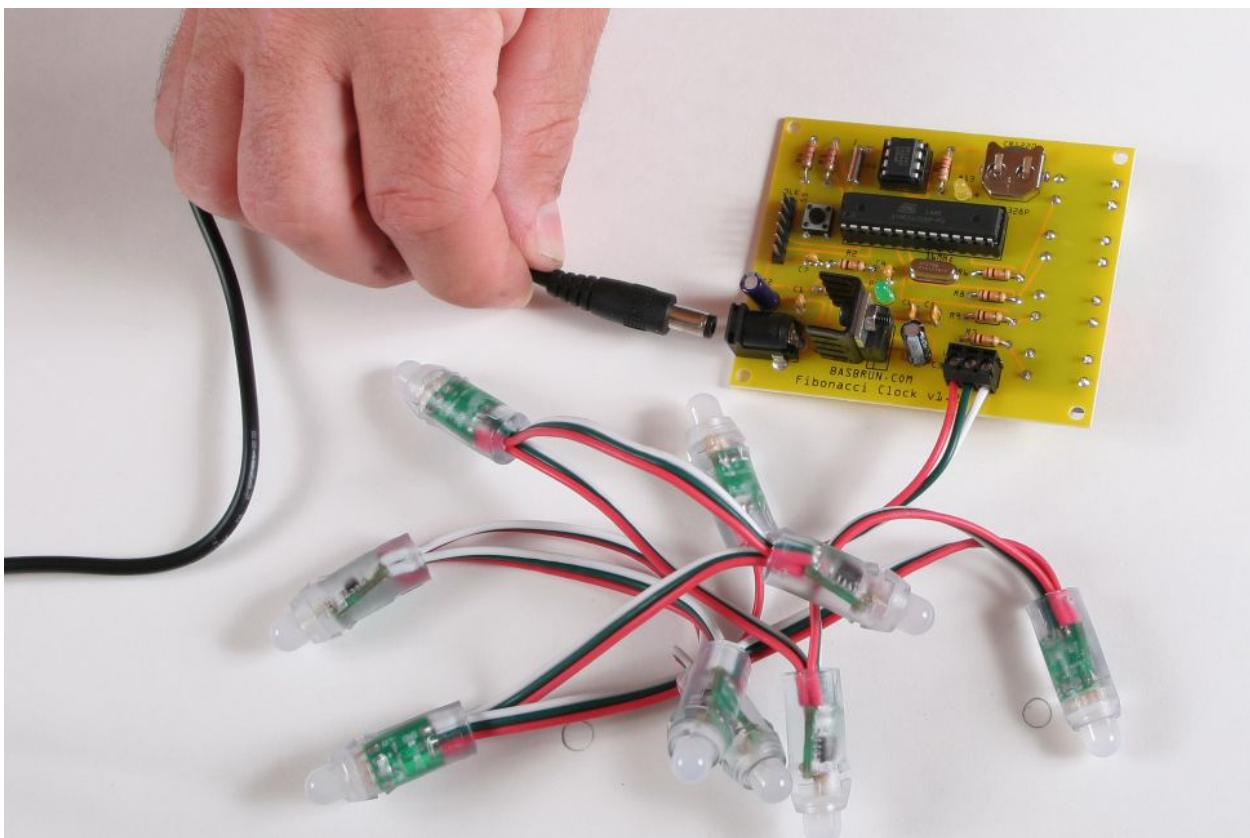
## ICs

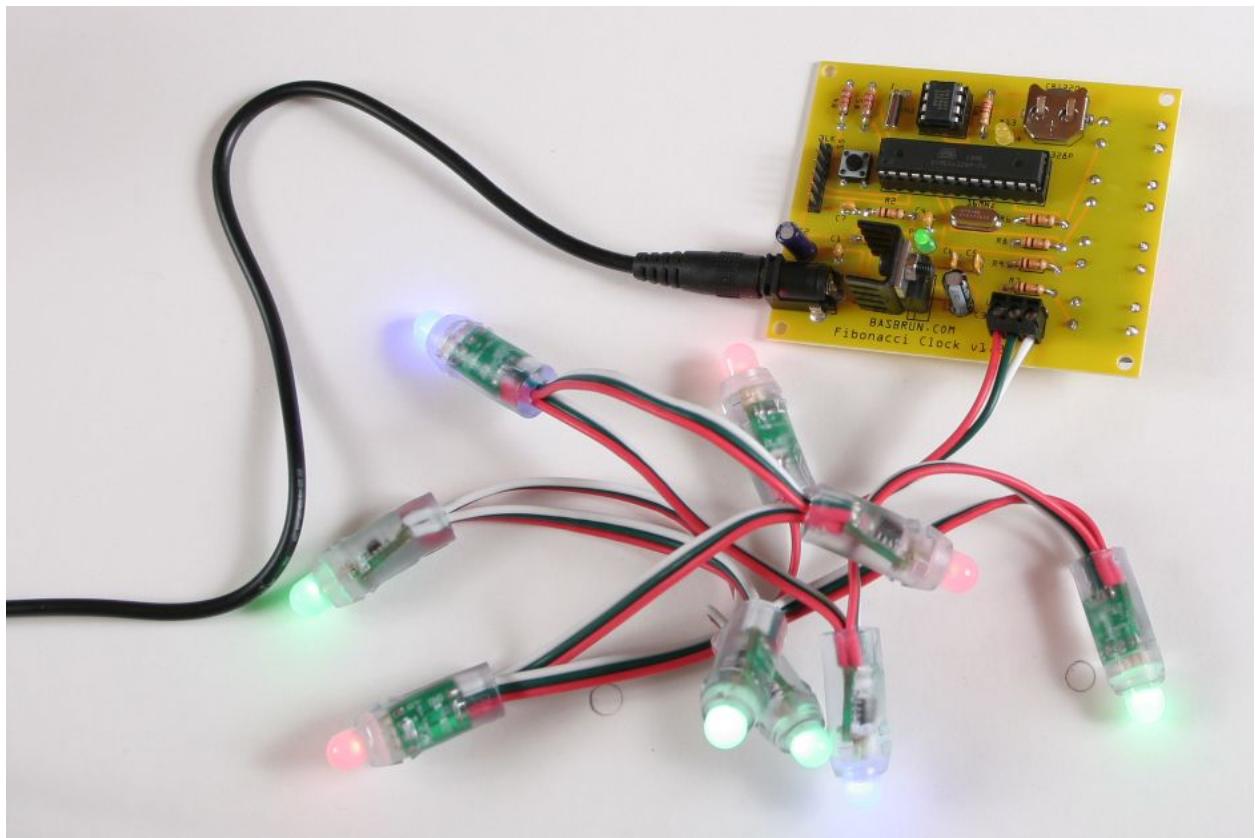
Insert the DS1307 real time clock IC and the Atmega328P microcontroller in the two DIP sockets. Make sure the dents at the end of the ICs are aligned with their equivalent on the DIP socket.





Connect the 6V power to test the circuit.





You're done.

Bravo!

#