

## ClockIt

### Kit Information & Instructions



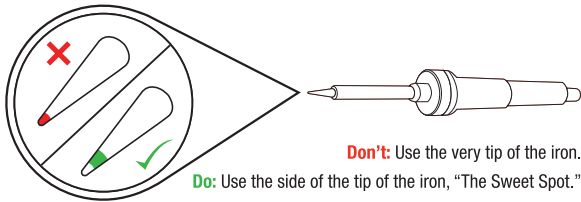
ClockIt is a clock with an alarm - short and sweet. For a beginner, expect to spend 20-30 minutes assembling the kit.

Based on the ATmega microcontroller, the code that runs ClockIt is available online. You can even reprogram ClockIt to be a count-down timer (for those bomb diffusing movie moments), a lovely egg timer, or any other device that requires a display, buzzer, and buttons (external programmer required).

#### Kit includes:

- 3/4" Female Standoff (quantity: 2)
- 22pF Cap (quantity: 2)
- 4 Digit Display
- ATmega microcontroller
- 5V Wall Wart
- Push Button (quantity: 3)
- 10 $\mu$ F Cap
- Resistor 10K Ohm
- Cap 0.1 $\mu$ F
- 1/4" Phillips Screw (quantity: 2)
- Mini Power Switch
- Buzzer
- Barrel Jack
- Crystal 16MHz

## ! SOLDERING TIPS



**Don't:** Use the very tip of the iron.

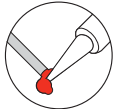
**Do:** Use the side of the tip of the iron, "The Sweet Spot."



**Do:** Touch the iron to the component leg and metal ring at the same time.



**Do:** While continuing to hold the iron in contact with the leg and metal ring, feed solder into the joint.



**Don't:** Glob the solder straight onto the iron and try to apply the solder with the iron.



**Do:** Use a sponge to clean your iron whenever black oxidization builds up on the tip.

## ! SOLDERING TIPS



**A** Solder flows around the leg and fills the hole - forming a volcano-shaped mound of solder.



**B** **Error:** Solder balls up on the leg, not connecting the leg to the metal ring.  
**Solution:** Add flux, then touch up with iron.



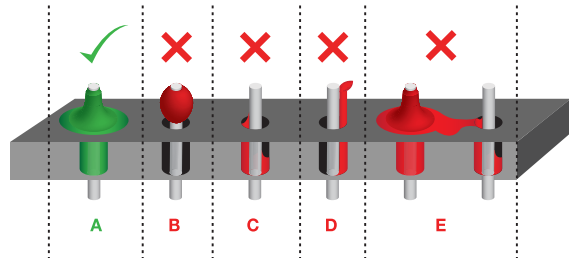
**C** **Error:** Bad Connection (i.e. it doesn't look like a volcano)  
**Solution:** Flux then add solder.



**D** **Error:** Bad Connection...and ugly...oh so ugly.  
**Solution:** Flux then add solder.



**E** **Error:** Too much solder connecting adjacent legs (aka a solder jumper).  
**Solution:** Wick off excess solder.



## QUICKSTART - YOUR FIRST COMPONENT

[STEPS 1 TO 11]

- ① Locate the **10K Resistor**.

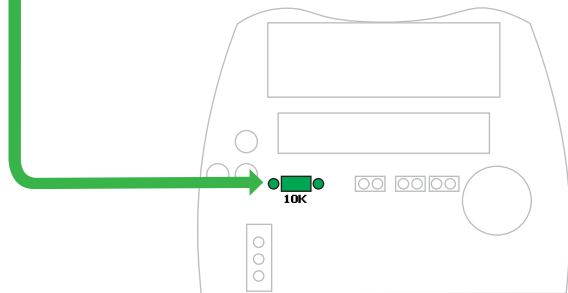


- ② Bend the legs downward.

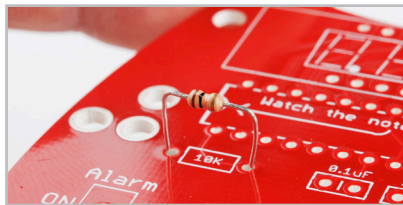


- ③ Locate the **10K Resistor** position on the board.

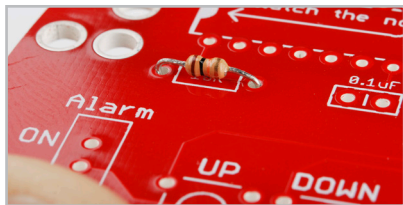
TOP



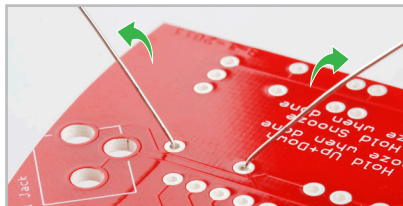
- ④ Insert the resistor into the PCB.



- ⑤ Push the resistor in so it is nearly flush with the board.



- ⑥ Flip board over and slightly bend the legs outward to hold it in place.



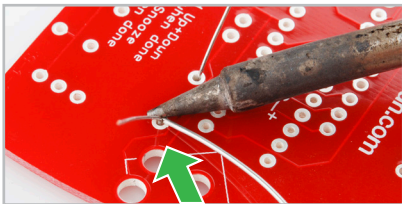
## QUICKSTART - YOUR FIRST COMPONENT

[STEPS 1 TO 11]

- ⑦ Flip the board over. Hold the soldering iron's "Sweet Spot" so it touches both the leg and the metal ring. Hold for 2 seconds.



- ⑧ Feed solder into the joint.



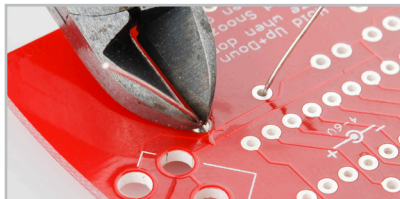
- ⑨ Pull solder away first.



- ⑩ Your solder joints should look like this - a tiny volcano.



- ⑪ Clip off any excess on the legs.





Now that you've successfully soldered in a resistor, use the same method to place and solder the rest of the components.

## ! EACH STEP HAS TWO PARTS

↑ START BY PLACING THE COMPONENT THROUGH THE **TOP SIDE OF THE BOARD.**

↓ TURN THE BOARD OVER TO SOLDER ON THE **BOTTOM SIDE OF THE BOARD.**



Steps highlighted with a yellow warning triangle represent a polarized component. Pay special attention to the component's markings indicating how to place it on the board.



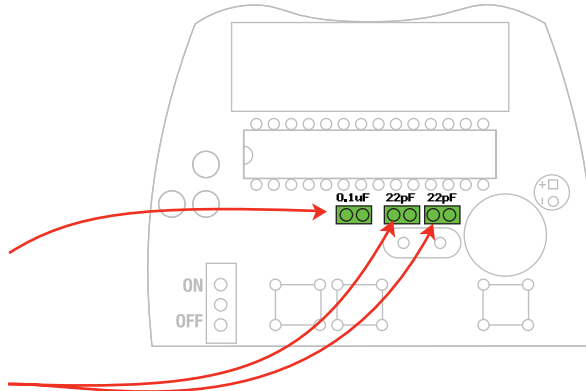
12 0.1µF Cap

**0.1µF Cap** (decoupling cap): Marked "104." Make sure you solder the one 0.1µF Cap. Do not confuse it with the 22pF caps!



13 22pF Caps

**22pF Caps** (crystal caps): Marked "220."





14 ATmega ⚠️

**ATmega (microcontroller):** Make sure the notch on the chip aligns with the notch on the board.



15 16MHz Crystal

**16MHz Crystal** (timing source)



16 Buttons x 3

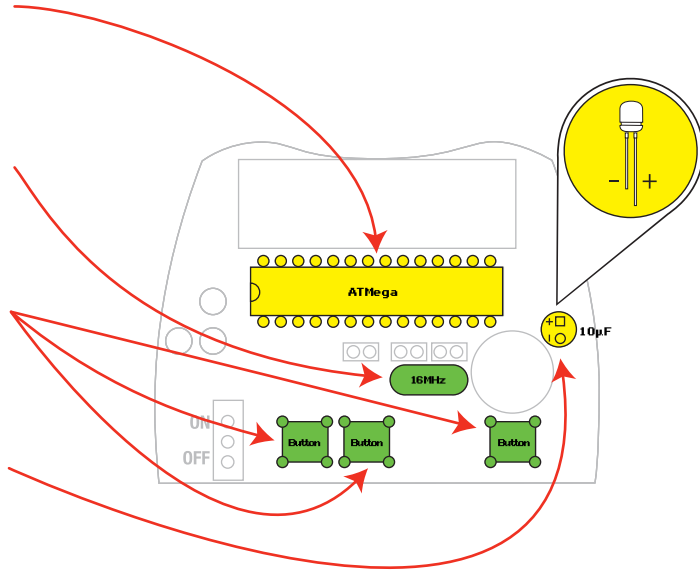
**Buttons** (time input) - Push into place and solder.



17 10µF Cap ⚠️

**10µF Cap** (decoupling cap): Typically the cap has a gold negative sign '-' on the side. This aligns with the black '-' on the board. The short lead is the ground.

## TOP OF BOARD



Remember highlighted components are polarized.



**Display** Match the dots on the display with the dots on the board. There is a decimal at the bottom of the board after each number.

18 Display 



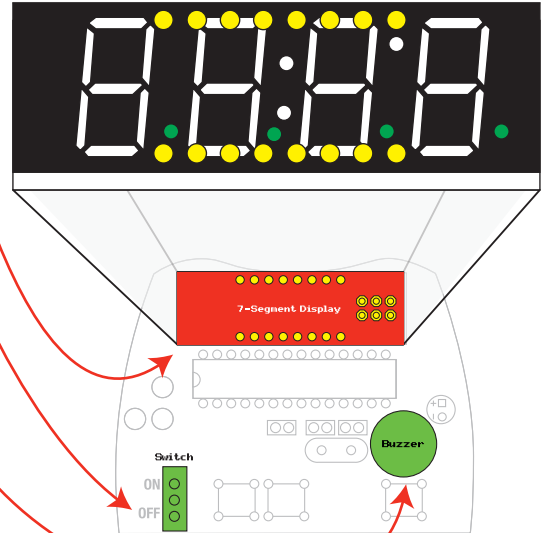
**Slide Switch** (alarm control): Keep iron tip away from top of switch! Plastic melts easily!

19 Slide Switch



**Buzzer** (alarm): Remove the sticker that might be covering the buzzer.

20 Buzzer



Remember highlighted components are polarized.

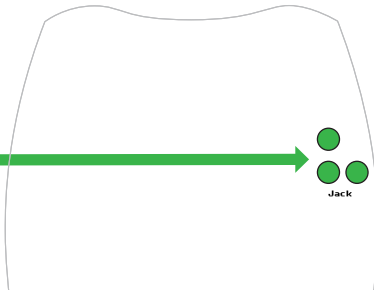
**! WORK ON THE BOTTOM SIDE FOR THIS STEP ONLY**



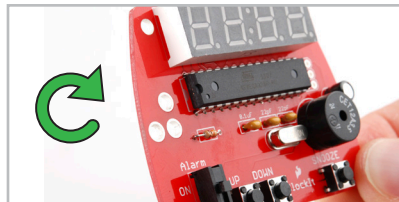
**21** Power Jack

**Power Jack** (power): Solder this part through the **bottom** of the board. Follow steps A to C for further details.

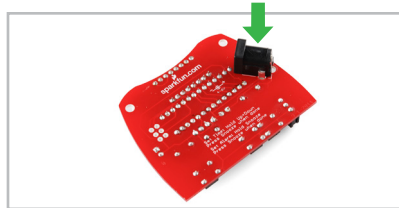
**BOTTOM**



**A** Take your board and flip it over to the bottom side.



**B** This is the bottom side. Place PowerJack in flush to board.



**C** Flip back to the top side of the board. Solder the Jack into place.





## ❗ TROUBLESHOOTING JUMPERS

Did you accidentally solder a jumper between two legs? Don't fret! Here is a simple process using solder wick to remove the excess solder.



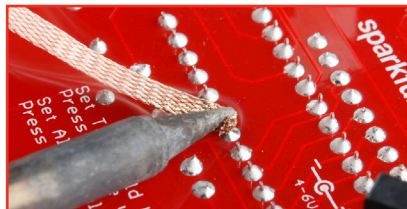
I Locate a piece of solder wick.



II Place solder wick on top of solder.



III Place iron on top of solder wick. Hold for 3-4 seconds.



IV Once the solder begins to flow into the wick, pull the wick and iron away at the same time.



## FINAL ASSEMBLY



No screwdriver necessary.  
Please only hand-tighten the screws and standoffs.



**Standoff & Phillips Screw** (mechanical): Attach 2 corner standoffs with 2 screws. Hold the screw in place and twist standoff onto screw.

22 Standoffs & Screws

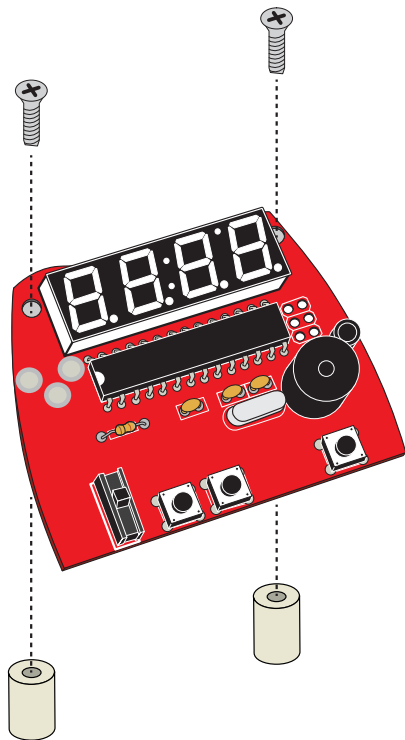


Plug in power and check to see if your blue display lights up.

23 Power Up!



22



## SETTING THE TIME

- 1 Hold Up and Down at the same time.

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- 2 Use the Up and Down buttons to adjust the time.

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- 3 Press Snooze when done.

## SETTING THE ALARM

- 1 Hold Snooze.

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- 2 Use the Up and Down buttons to adjust the time.

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- 3 Press Snooze when done.