



Boglin MONSTER M4SK Mod

Created by Isaac Wellish



<https://learn.adafruit.com/boglin-monster-m4sk-mod>

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Overview



Hugely popular in the 1980s, the [Boglin](https://adafru.it/FXi) (<https://adafru.it/FXi>) was creepy enough to spook anyone who laid eyes upon one.



After some invasive but brief surgery, you can make this forgotten swamp creature even more spooky by giving it some eerie eyes with the [MONSTER M4SK](http://adafru.it/4343) (<http://adafru.it/4343>).



See, the M4SK and Boglin were meant to be, the board fits perfectly inside of the Boglin with minimal adjustment!

Parts



AdaBox013 - THE MONSTER M4SK

I was hacking in the lab quite late one night - soldering pins and debugging the bytes. When suddenly a bang exploded with sparks, and a figure emerged from the hazy dark!

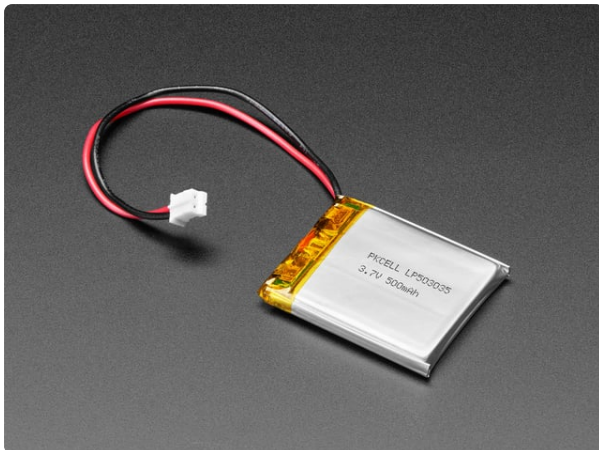
<https://www.adafruit.com/product/4281>



Adafruit MONSTER M4SK - DIY Electronic Eyes Mask

Peep dis! Have you always wanted to have another pair of eyes on the back of your head? Or outfit your costume with big beautiful orbs? The MONSTER M4SK

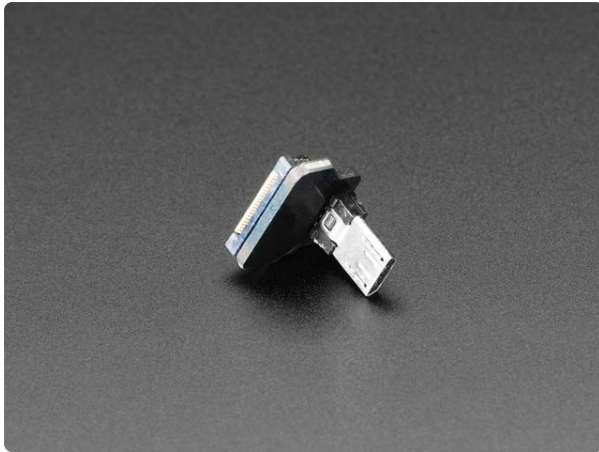
<https://www.adafruit.com/product/4343>



Lithium Ion Polymer Battery - 3.7v 500mAh

Lithium-ion polymer (also known as 'lipo' or 'lipoly') batteries are thin, light, and powerful. The output ranges from 4.2V when completely charged to 3.7V. This...

<https://www.adafruit.com/product/1578>



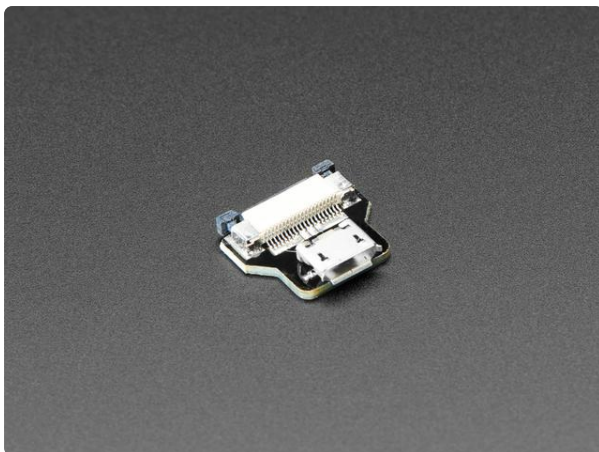
DIY USB Cable Parts - Right Angle Micro B Plug Down

If you love DIY cable-rigging, then these USB adapters are right up your alley! Making custom USB cables has never been easier. Just grab one of our <https://www.adafruit.com/product/4105>



DIY USB or HDMI Cable Parts - 20 cm Ribbon Cable

If you're looking to make a custom cable with any two of our USB or HDMI adapters, then you'll need to have these flex cables handy! Making custom cables has never been... <https://www.adafruit.com/product/3561>



DIY USB Cable Parts - Straight Micro B Jack

If you love DIY cable-rigging, then these USB adapters are right up your alley! Making custom USB cables has never been easier. Just grab one of our <https://www.adafruit.com/product/4107>

Materials and Supplies

- Boglin (Unfortunately they are no longer made but can find some on [Ebay \(https://adafru.it/FXj\)](https://adafru.it/FXj) and other sites)
- Hobby knife
- Super glue ([Bob Smith Industries Maxi-Cure Extra Thick \(https://adafru.it/FXk\)](https://adafru.it/FXk) works great)
- Isopropyl alcohol for surface cleanup/prep
- Marker

- 8 x 2mm width zip ties

Optional

- Velcro hook and loop fastener with adhesive backing (optional - for securing battery)
- Panavise(s) for glue drying, not 100% necessary but helps make sure components are glued together securely



[Panavise Jr.](https://www.adafruit.com/product/151)

The best mini-vise for working on smaller PCBs (2.875" or less in one dimension)! The jaws are strong plastic that won't damage the PCB and doesn't mind if you hit it with the...

<https://www.adafruit.com/product/151>



[Panavise Multi-Purpose Work Center](https://www.adafruit.com/product/2452)

The Panavise Multi-Purpose Work Center is a versatile combination designed for holding larger, heavier objects. Very stable. An exceptional choice for any...

<https://www.adafruit.com/product/2452>

Eye Surgery

To prepare the Boglin for the MONSTER M4SK, we'll have to:

- remove the original plastic eyes to make room for the M4SK
- remove and replace the tail for easy USB access

Be cautious when using hobby knives and other sharp tools

Disconnect Upper Eyelids



First invert the Boglin inside out such that the back of the eyes are accessible.

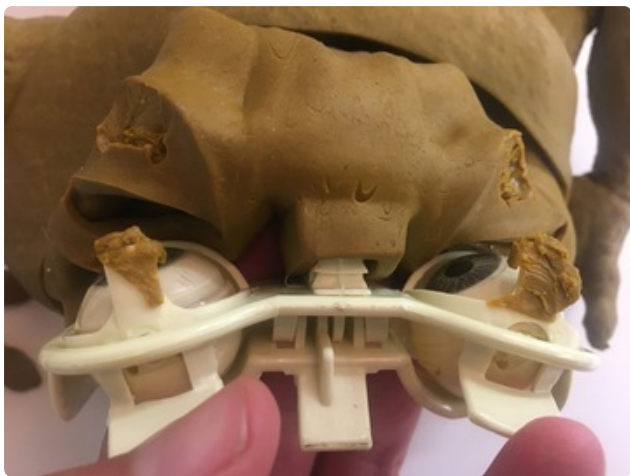
Pick one side of the eyelid's top to remove first.

Use your fingers to pull at the latex until you can see where the latex is attached to the plastic eyes.

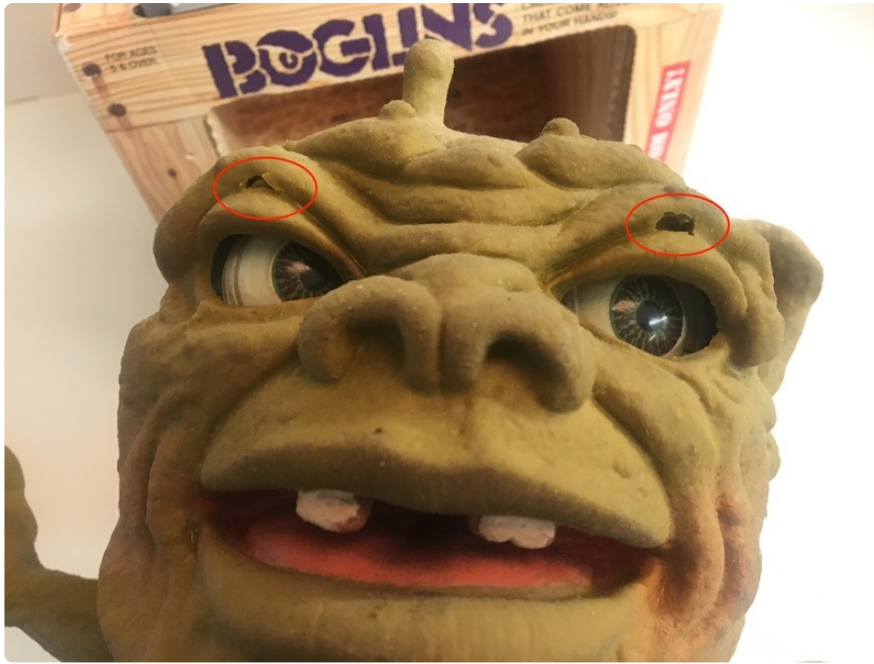
Take a hobby knife and carefully cut away at the latex all the way around the eyelid connection until the eyelid is free from the plastic.

Repeat with the opposite upper eyelid.

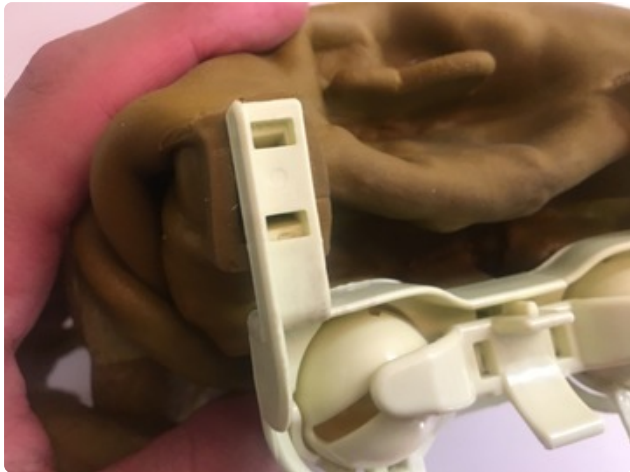
Try to remove as little latex material as possible to avoid eyelid holes. If you end up making unwanted holes in the lids, they can be fixed later.



Be careful when separating plastic eyes from eyelids. If you remove too much latex from eyelids, there will be visible holes in the eyelids. If necessary this can be fixed later.



Remove Eye-Cheek Connections



Next, find one cheek-to-eye connection to start removing.

Use the hobby knife to carefully separate the latex from the plastic all the way around until the connection is free.

Repeat with the other side.



Disconnect Lower Eyelids



Use the hobby knife to separate the latex from the plastic as before for the lower eye-lids.



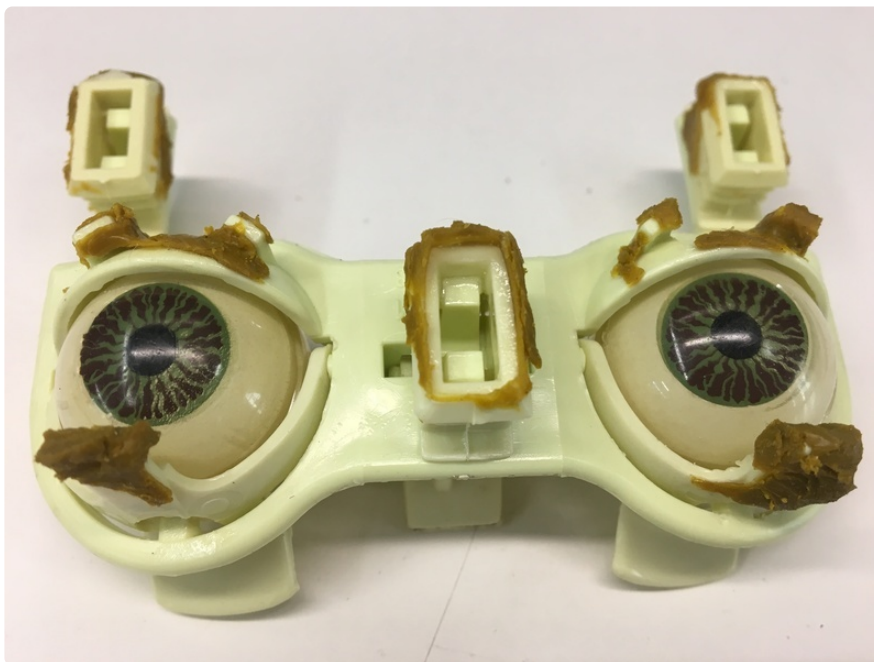


Remove Eye-Nose Connection



Use the hobby knife to separate the latex from the plastic from the nose connection. Eventually the set of plastic eyes will come free from the Boglin, yay we did it!





Fix the Eyelids (if Necessary)



First use some isopropyl alcohol to clean the surface where the eyelid holes are. Next apply some super glue around the eyelid hole area. Then carefully close the eyelid hole by pressing the eyelid skin above and below the hole together. Hold for at least 1 minute for glue to dry. Repeat on other side.





Tail Surgery

To access the MONSTER M4SK via usb to change the code or charge the battery, we're going to have extend the usb port and modify the Boglin so that the usb comes through its tail. To do this, we must remove some parts of the built-in tail contraption.

Remove the Tail



Start by flipping the tail inside out and look for the cylindrical plastic gold piece inside. Using one hand to hold the Boglin down and the other on the gold piece, pop off the gold piece.

Next disassemble the rest of the tail by taking out the clear plastic on the other side.





Reattach the Tail



Clean both sides of the tail attachment area with some isopropyl alcohol. Apply some super glue on one side. Reattach tail, making sure alignment is correct and hold in place for at least one minute. Next, if possible, use clamps or panavises to clamp tail together and wait approx. 30 min to dry.





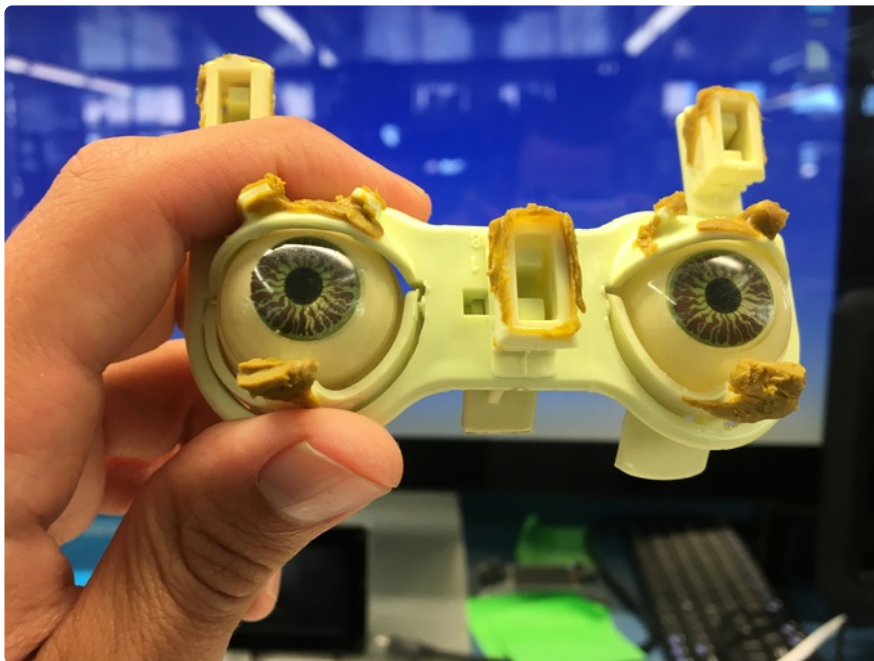
Add the M4SK

Add the Boglin eye graphics and **config.eye** file (linked in the green button below) to your MONSTER M4SK as [per the quickstart instructions](https://adafru.it/FDD) (<https://adafru.it/FDD>).

The Boglin eyes are made from the Hazel example in the quickstart instructions but with a white sclera to mimic the original Boglin eye.

[Download Boglin Eye Graphics](https://adafru.it/FXI)

<https://adafru.it/FXI>



See the config file below.

```
{  
  "boopThreshold" : 17500, // lower = more sensitive  
  "eyeRadius"      : 125,  
}
```

```
"eyelidIndex"      : "0x00", // From table: learn.adafruit.com/assets/61921
"pupilColor"       : [ 0, 0, 0 ],
"backColor"        : [ 140, 40, 20 ],
"irisTexture"      : "boglin/iris.bmp",
"scleraTexture"    : "boglin/graphic_tfts_sclera_adj_white.bmp",
"upperEyelid"     : "boglin/upper.bmp",
"lowerEyelid"     : "boglin/lower.bmp",
"left" : {
},
"right" : {
}
}
```

Be sure to place the **config.eye** file at the root level of the MONSTER M4SK and then press the reset button to see your changes.



Prepare the USB Cable

We will need to prepare a special usb cable with a down bend so that the usb port can be extended through the tail without damaging the cable's connection or causing a disruption to the Boglin facial structure.



Gather the micro B down plug, micro B straight jack, and usb ribbon cable.

Open both usb ports by carefully pulling out the black tabs slightly on each port.

Plug the usb ribbon cable into each port and close the black tabs to lock the ribbon cable in place.

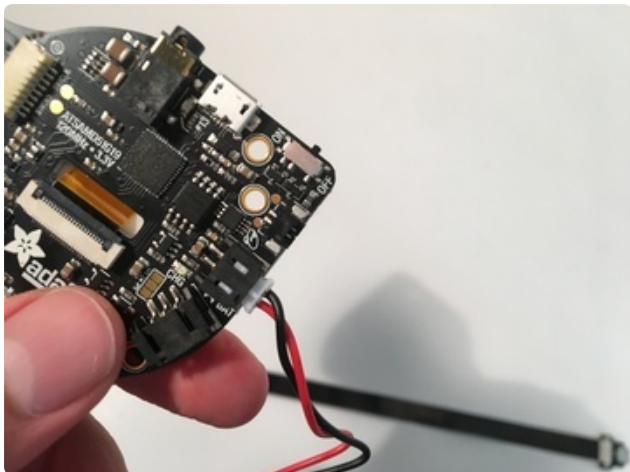
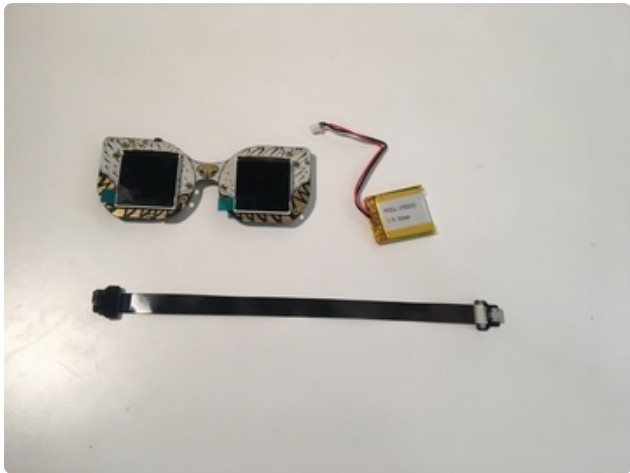
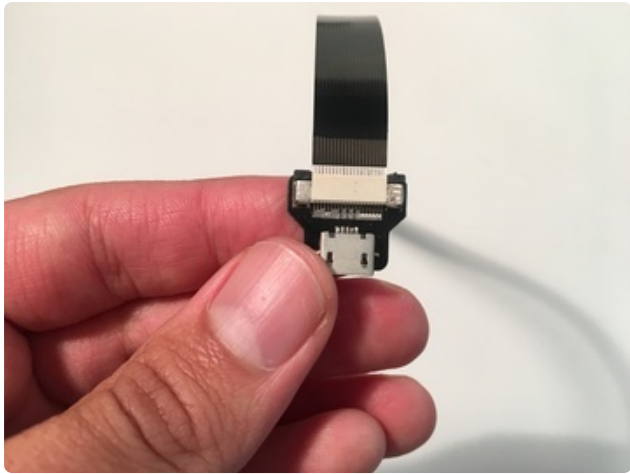
Plug the battery into the JST connection port on the board.

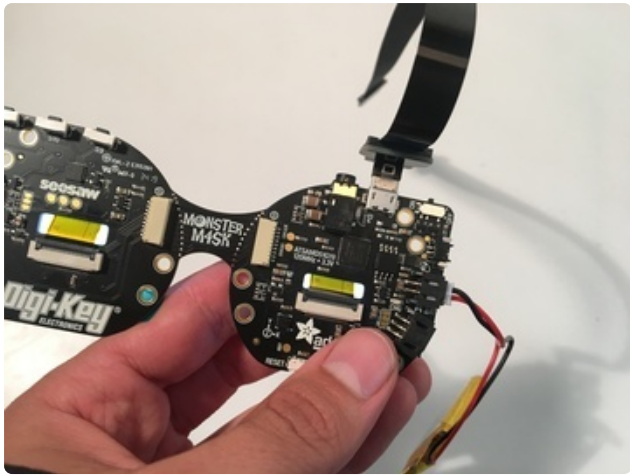
Plug the micro b down side of the cable in to the micro usb port on the board.

Lastly plug the other end of the cable into a computer to make sure the connection is good. The board should show up on your computer as a disk drive named

CIRCUITPY just like before. The board could also be showing up as **M4SKBOOT**.

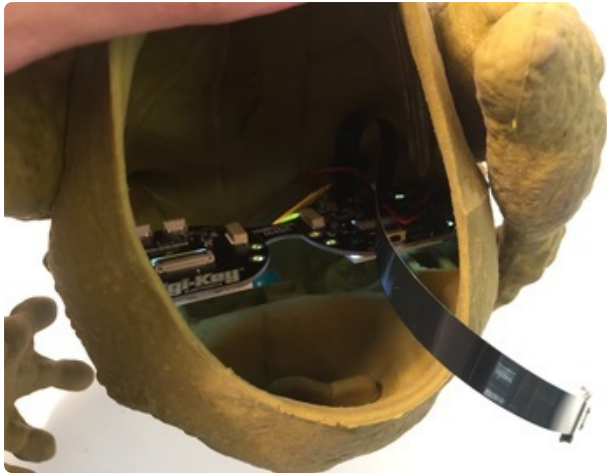
If the board is not showing up at all, double check all connections.





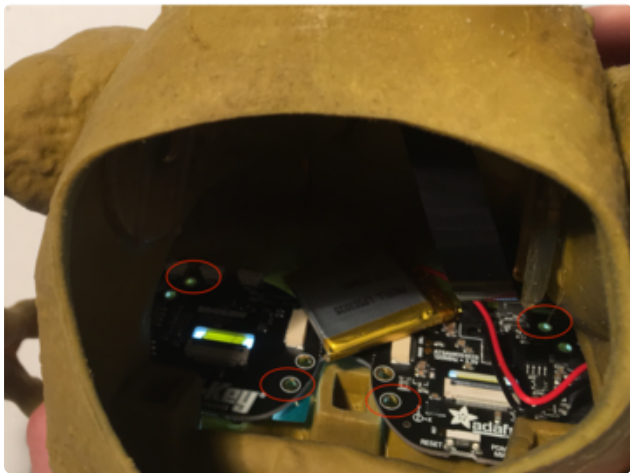
Position the Board

Now we'll mount the board inside of the Boglin. To do this, we will use [John Park's zip tie method](https://adafru.it/FXm) (<https://adafru.it/FXm>). First we'll have to position the board so we have the desired orientation.



After turning it on, stick the board inside of the Boglin and position such that eyes are visible and adjust until placement is desirable.

Carefully flip the Boglin over, keeping the position of the board in place. Use a sharpie to mark just above and below the holes shown here to know where to place the zip ties next.



Place the Zip Ties



Now remove the board from the Boglin, and flip the Boglin inside out.

Clean the areas below and above the marks we just made with some isopropyl alcohol.

Place some super glue just below one of the marks of the top part of where the board will go. Place a zip tie, perpendicular to the Boglin skin and hold in place for one minute.

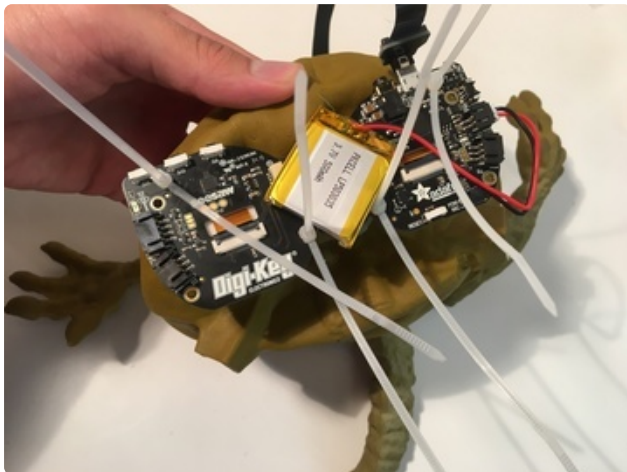
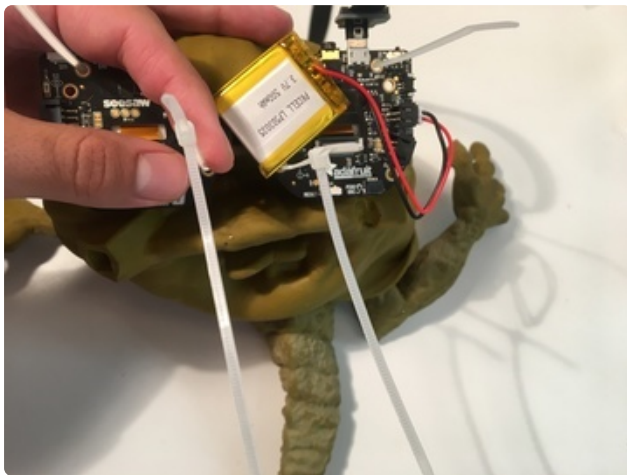
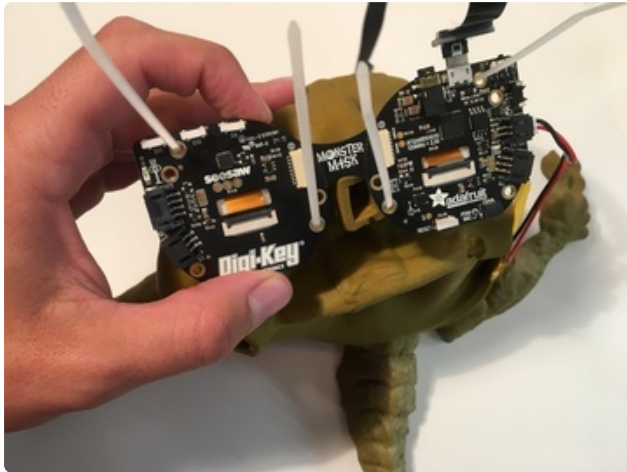
Repeat with three other marks and zip ties. Let the zip ties sit for at least 30 minutes to dry in place.





When placing zip ties with super glue, be careful not to press zip tie too firmly into Boglin skin or the zip tie may pierce through the latex skin (due to the glue's effect on latex)

Mount the Board



Place a zip tie on each other existing zip tie and push down to mount the board in place.

Once the connections are nice and snug, check that the eyes look like they are positioned the way you want them to be. Cut the excess ends of the zip ties off.

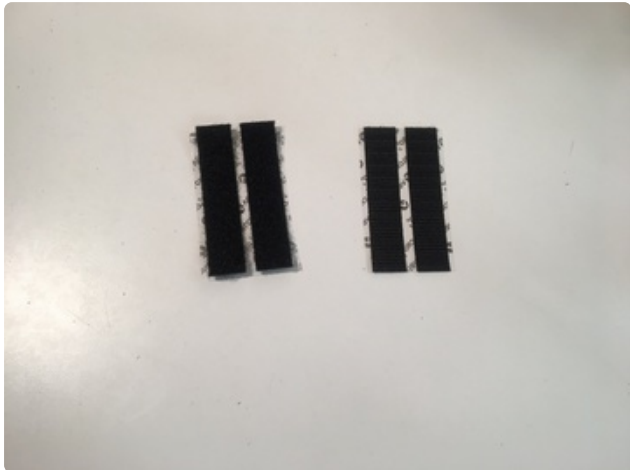


Easy USB Access



Pull the usb cable through the hole in the tail of the Boglin for easy usb access.

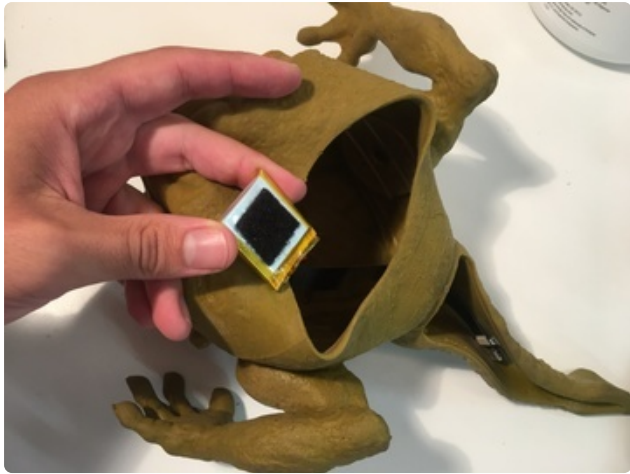
Secure the Battery Inside of the Boglin (optional)



Clean off one side of the battery and place a square a velcro hook and loop fastener material on it.

Clean the plastic circular arm piece (the side closer to where the battery is connected to the board) and place a couple pieces of the opposite velcro hook and loop material on it.

Connect the battery to the plastic piece via the velcro.





Switch Access



To turn the board on and off, you can use the switch above and to the left of the left eye.



If you can't find the switch by feeling through the skin, you can always access the switch by going through the back of the Boglin.

And that's it! Enjoy your wonderful and delightfully creepy Boglin mod!



Going Further

Make this project even heebie-jeebier by trying out some of these ideas:

- Use a photo editor to make the eyes even more like the original Boglin eyes.
- Add a speaker to the Boglin to make it speak when it senses motion.
- Make the Boglin a BORGlin by making it move with some servo motors!

