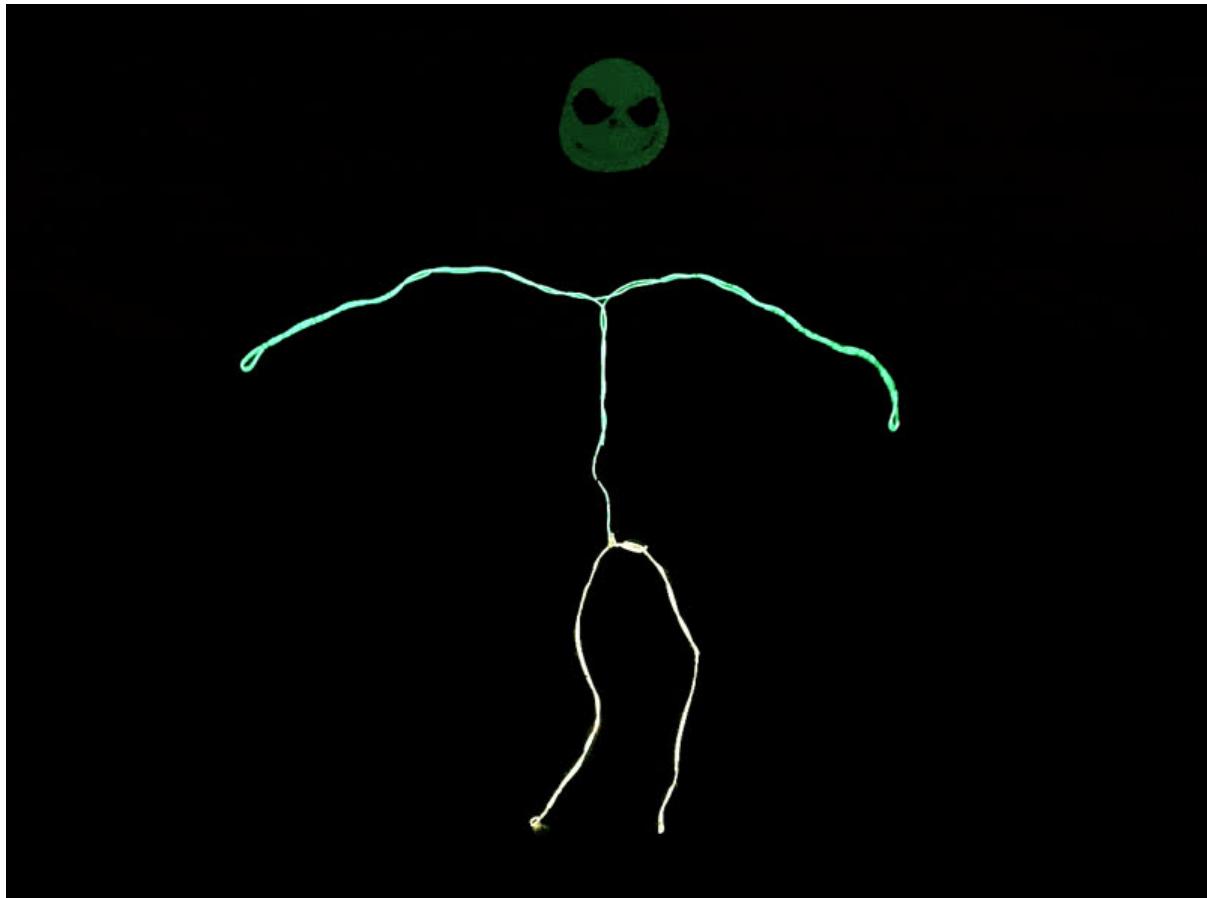




EL Stick Figure

Created by Ruiz Brothers



<https://learn.adafruit.com/el-stick-figure>

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Overview

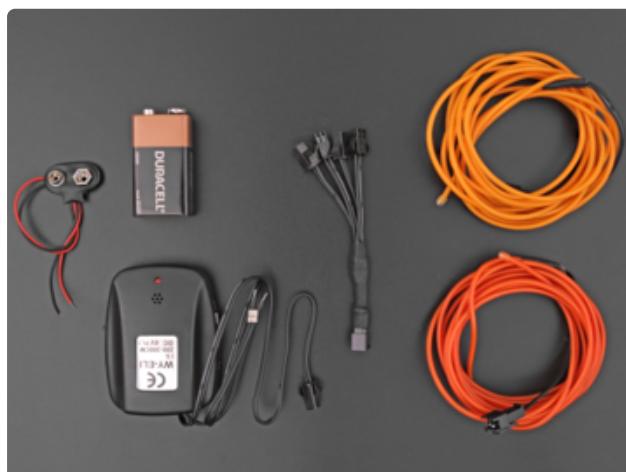
In this project we're making a light up stick figure costume!



We used EL wire to create a simple glowing skeleton. EL Wire is a flexible and comes in different colors!

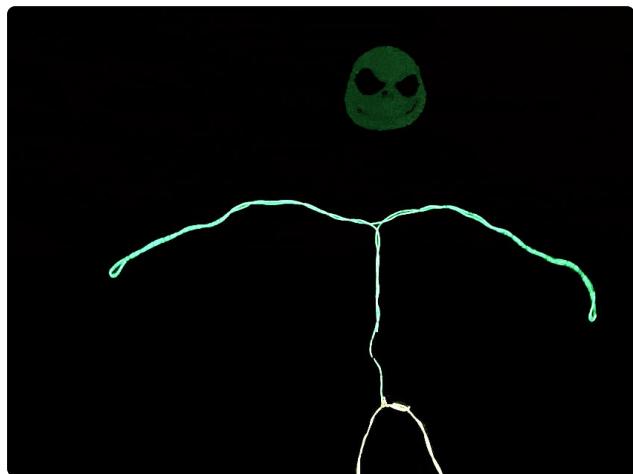
A creepy skull mask is cut from glow in the dark vinyl and felt to complete this easy but spooky costume!

Prerequisite Guides



If you're new to [Electroluminescent materials](https://adafru.it/CfW) (<https://adafru.it/CfW>) and [soldering](https://adafru.it/CjY) (<https://adafru.it/CjY>), take a moment to walk through the following guides to get you started.

Before you begin, check out our [introduction to electroluminescent materials including soldering to EL wire](https://adafru.it/CfW) (<https://adafru.it/CfW>)!



Parts List

A digestible list of parts used to build this project.

[EL Wire](http://adafru.it/406) (<http://adafru.it/406>)

[Pocket Inverter](http://adafru.it/564) (<http://adafru.it/564>) or
[Sound Inverter](http://adafru.it/831) (<http://adafru.it/831>) with
a [In-line wire 1-to-4 splitter](http://adafru.it/402) (<http://adafru.it/402>)

[9v clip](http://adafru.it/80) (<http://adafru.it/80>)

[9v Battery](http://adafru.it/1321) (<http://adafru.it/1321>)

Tools and Supplies

List of handy things to assist in any project.

[Wire Strippers](http://adafru.it/527) (<http://adafru.it/527>)

[Wire Cutters](http://adafru.it/152) (<http://adafru.it/152>)

[Soldering Iron](http://adafru.it/180) (<http://adafru.it/180>)

[Solder Wire](http://adafru.it/734) (<http://adafru.it/734>)

[Panavise Jr.](http://adafru.it/151) (<http://adafru.it/151>)

[Third Helping Hands](http://adafru.it/291) (<http://adafru.it/291>)

[Monoprice Inventor II](http://adafru.it/3897) (<http://adafru.it/3897>)



[Yellow Electroluminescent \(EL\) Wire - 2.5 meters](#)

EL Wire, also known as Electroluminescent wire is a stiff wire core coated with phosphor and then covered with a protective PVC sheath. When an AC signal is applied to it, it glows an...

<https://www.adafruit.com/product/406>



[EL Wire Sound Activated Pocket Inverter - 5V USB Power](#)

A small, portable inverter for EL wire with an audio input! This inverter has a little microphone and will light the connected EL according to the surrounding audio volume. Makes for...

<https://www.adafruit.com/product/831>



[In-line wire 1-to-4 splitter](#)

If you want to connect multiple EL wires/strips/panels up to one inverter, these splitters are quite useful. There is one male connector (goes to the inverter) and then 4 female...

<https://www.adafruit.com/product/402>



[9V battery clip with 5.5mm/2.1mm plug](#)

I found these high-quality battery clips. They're molded plastic so they won't tear like cheap clips, and they cover the battery terminals to prevent shorts. Comes with a...

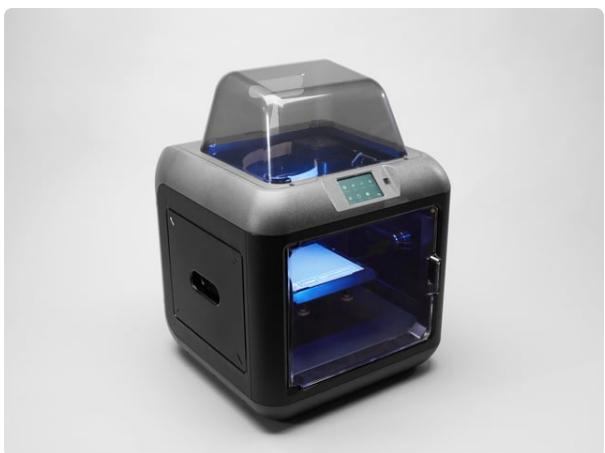
<https://www.adafruit.com/product/80>



Alkaline 9V Battery

Battery power for your portable project! These batteries are high quality at a good price and work fantastic with any of the kits or projects in the shop that use 9V. These...

<https://www.adafruit.com/product/1321>

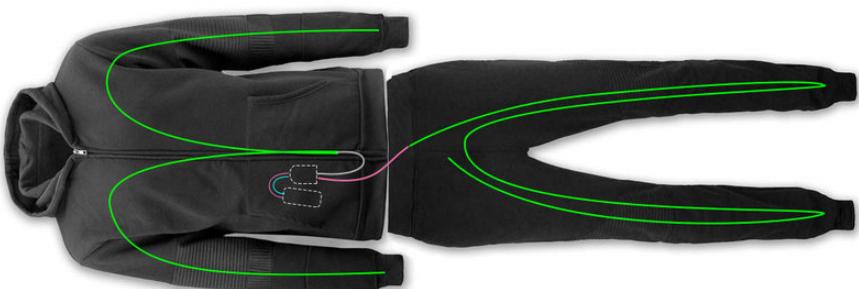


Monoprice Inventor II 3D Printer with Touchscreen and WiFi

The Monoprice Inventor II 3D Printer Touchscreen with WiFi is a perfect entry-level 3D printer with small footprint and reliable performance. It comes equipped with...

<https://www.adafruit.com/product/3897>

Circuit Diagram



EL Layout

This provides a visual reference for wiring of the components. They aren't true to scale, just meant to be used as reference.

Carefully fold the EL wire to outline both arms with the female connector near one of the jacket pockets. For the legs, we'll fold the EL wire by looping it around booth legs. Have the female connector end in the center, near the jackets pocket.

Connections



The Inverter connects to the In-line wire 1-to-4 splitter. Two 250 cm long pieces of EL wire connect to one of the 4 female connectors.

Battery

The striped wires are soldered to the 9v Battery Clip. The white striped wire goes to **+** (**positive**) and the plain black wire goes to **ground**.

3D Printing



What If I Don't Have A 3D Printer?

Not to worry! You can use a 3D printing service such as [3DHubs](https://adafru.it/jNb) (<https://adafru.it/jNb>) or [MakeXYZ](https://adafru.it/veh) (<https://adafru.it/veh>) to have a local 3D printer operator 3D print and ship you parts to you. This is a great way to get your parts 3D printed by local makers. You could also try checking out your local Library or search for a Maker Space.

Fusion 360 files

Below are links to modify the design of the 9v pocket and sewing tabs to fine tune them to adjust to your printer tolerances.

[Edit 9v Pocket in Fusion 360](#)

<https://adafru.it/CQE>

Design Source Files

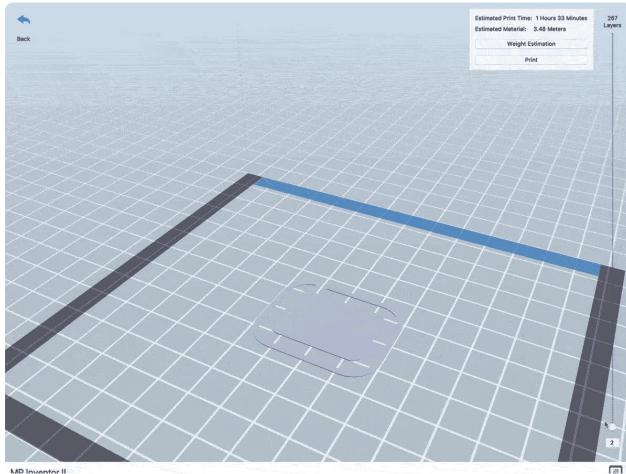
The enclosure assembly was designed in Fusion 360. This can be downloaded in different formats like STEP, SAT and more. Electronic components like the board, displays, connectors and more can be downloaded from our [Fusion 360 CAD parts github repo](#) (<https://adafru.it/AW8>).

[Adafruit Part CAD files](#)

<https://adafru.it/AW8>

Slice Settings

These settings are for NinjaFlex 85A with a 0.4mm nozzle profiles using [FlashPrint \(<https://adafru.it/CFc>\)](https://adafru.it/CFc) Optimized for the [Flashforge Inventor 2 \(<http://adafru.it/3897>\)](http://adafru.it/3897).



Nozzle .4mm

Layer Height .2mm

Line Width .38

Print Speed 40mm/s

Retraction 0mm

Build plate adhesion type – skirt

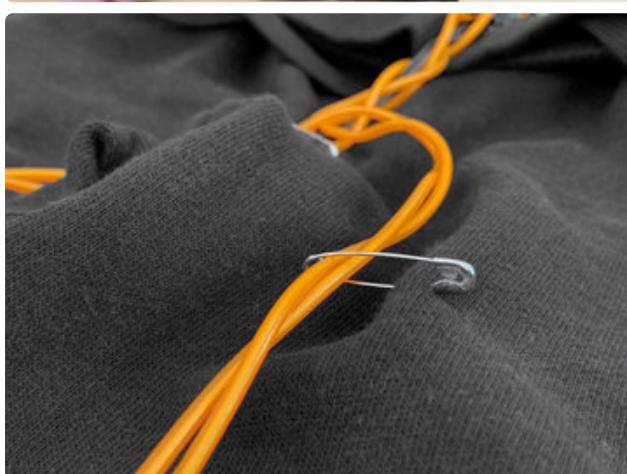
Bed Oc Blue Tape

Assembly

Layout wire



First we'll use safety pins to layout our EL wire across a fitted jacket. Make sure to choose a jacket with front pockets. We'll use the pockets to store the battery and inverter.

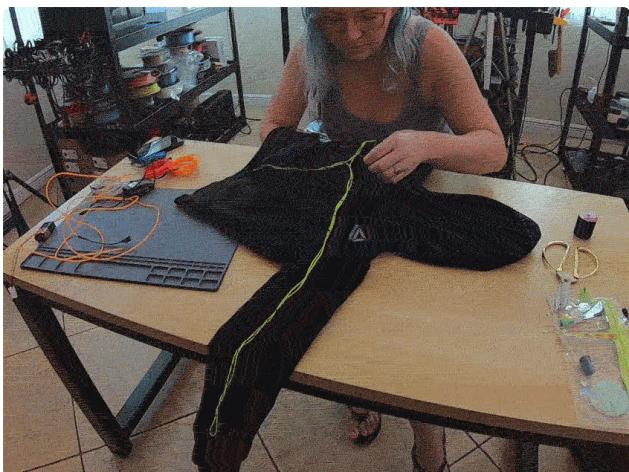


Loop the EL wire

Start with the EL wire connector close to the pocket as shown in the picture. Form an equal "T" shape so its as long as the piece of EL wire.

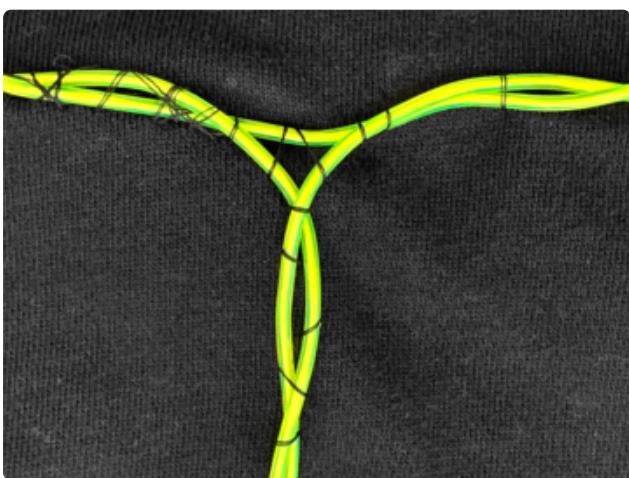
Legs

Next on to the legs. We'll bend the EL wire into an upside down "Y" shape. Start with the female connector at the top center and loop the wire to outline both legs as shown in the Circuit Diagram page.



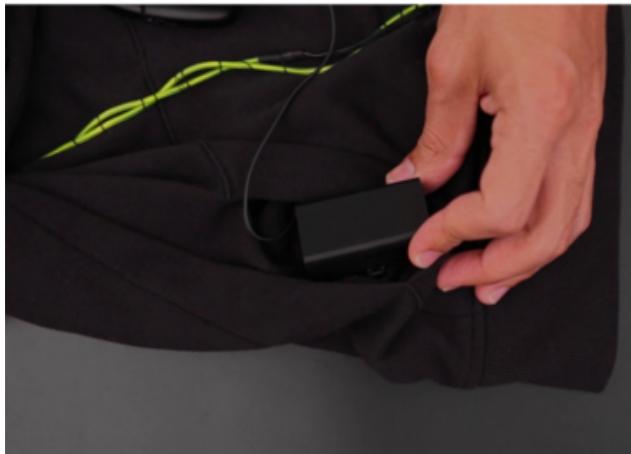
Sew Wire

Once we finish making any adjustments to the layout, we can start stitching the EL wire.

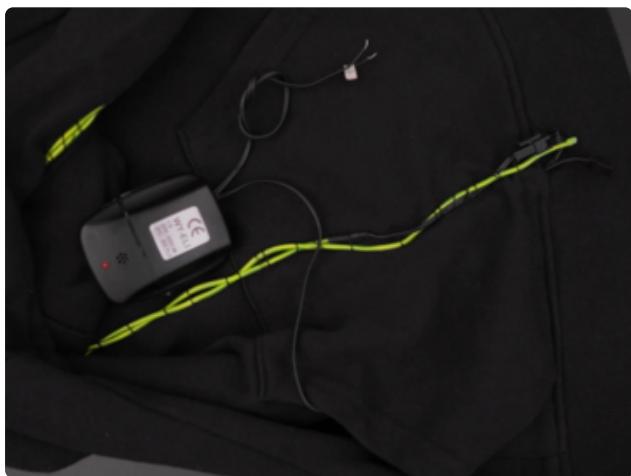


We used a [whip stitch \(<https://adafru.it/19ya>\)](https://adafru.it/19ya) to hold the EL wire to the jacket. We recommend using clear nylon to avoid blocking the wire.

Battery pocket



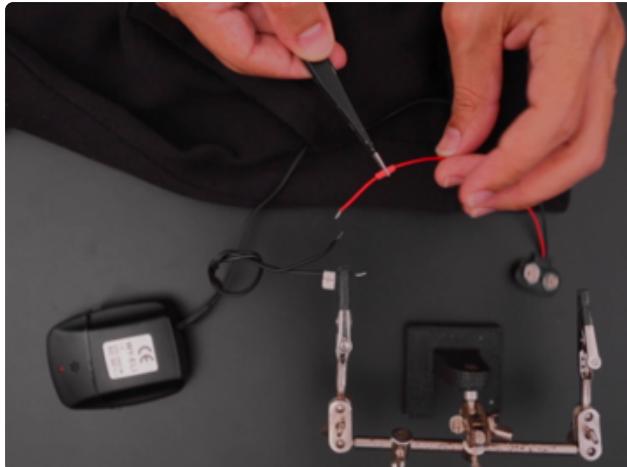
Position the Inverter inside the pocket. We'll create a small hole on the inside part of the pocket and use it to pass the male connectors to our Inverter.



Place the Inverter inside the pocket to so there is enough room for the **9v 3D Printed Battery Holder**. Place the battery holder inside the pocket. Note the placement of the two sewing tabs on the sides of the battery holder.

Sew Battery Pocket

Make sure theres enough room for both the battery and inverter to lay comfortably. Now we'll go ahead and sew both tabs to the inside of the pocket.



Solder Connections

The sounder Inverters will require us to solder on our 9v battery clip.



We'll use a third helping hand to help hold the wires while we remove the barrel jack on the 9v Clip.

To protect the connections, we'll need to add two small pieces of heat shrink to each wire and then strip, tin and solder each connection.



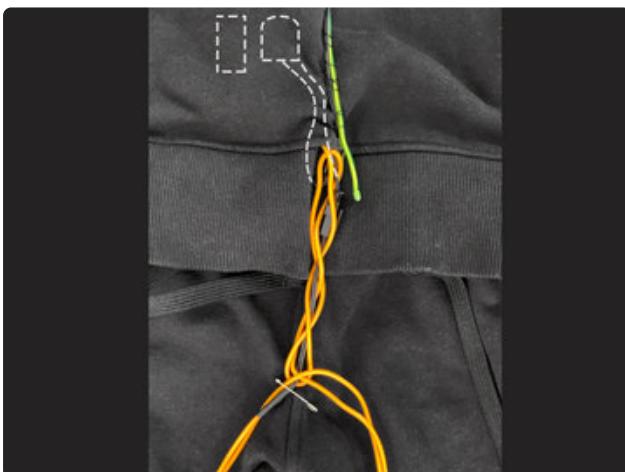
Arrange in pocket

Next, we'll move on to mounting our battery into its pocket holder.



Position the battery so the battery clip inserts into the holder first, with the wires positioned against the battery as shown in the picture.

Arrange the parts in the pocket so they rest flat against your waist while wearing.



Connect pants

Next we'll connect the Elm wire on the pants to the Inverter. We can connect our EL wires to any two of the four JST SM connectors.

Any excess El wire can easily hide inside the pocket.



Face Mask

And finally to finish off our costume, we cut out a skull shape out of felt. We then cut the shape out of glow in the dark vinyl. You can glue it to the felt or use heat press material to attach it to the felt.



To wear, measure a piece of elastic band around your head and then sew or glue the ends to the mask!

