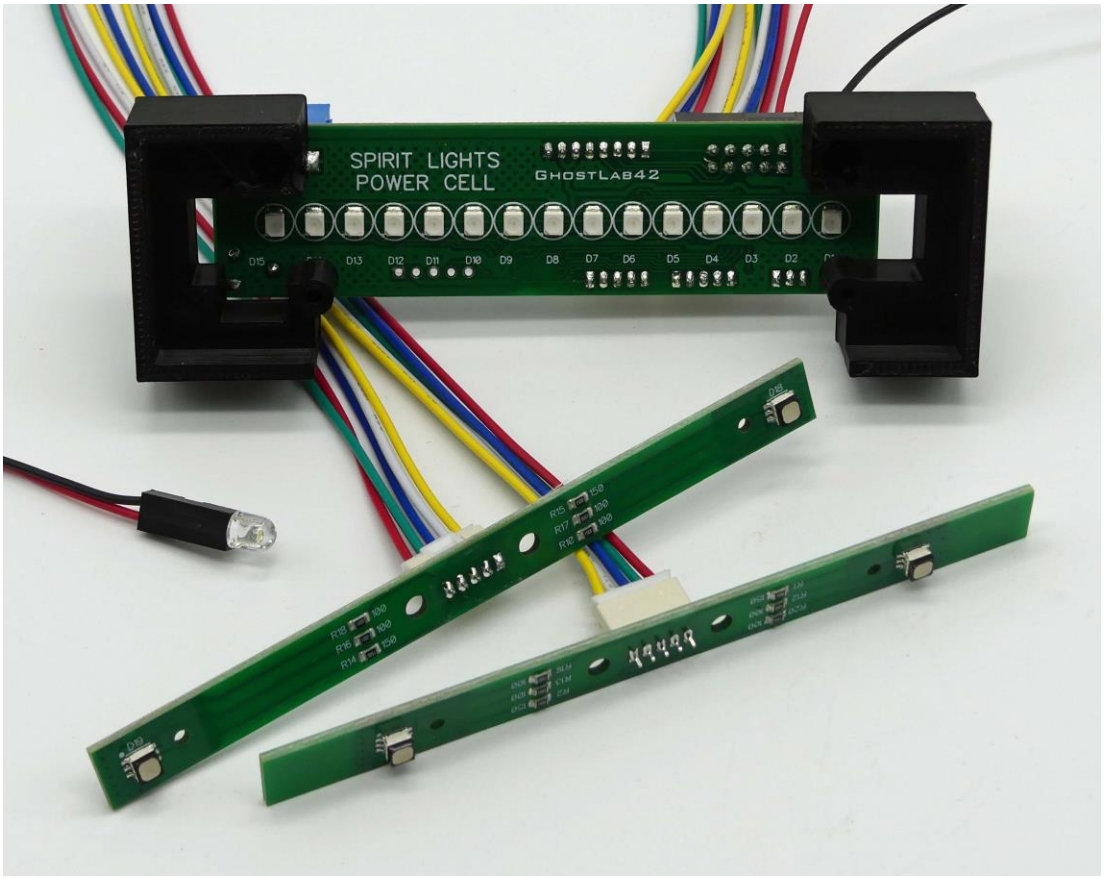
Congratulations on purchasing the Spirit Halloween Life-size PackLights Upgrade Kit that adds some serious lighting effects to your nuclear accelerator!

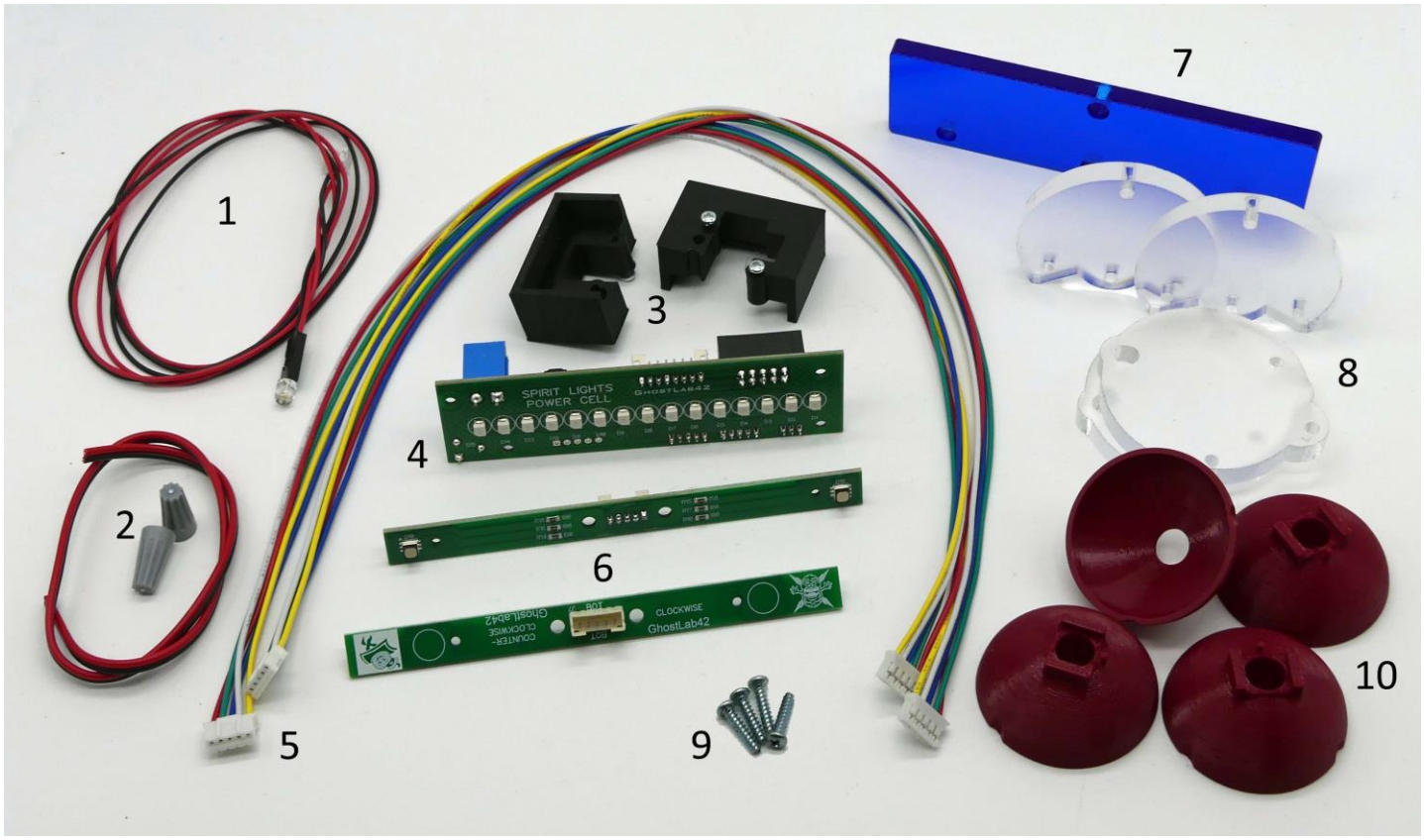
The PackLight Kit is designed to work in the Spirit Halloween Life Size Proton Pack and can be used with the existing Spirit electronics and battery pack or can be used with additional switch controls, the Spengler Sound board (and Spengler Link), the Matty Blaster board or the GBFans Sound Board. Selection of different operating modes and the speed of the normal lighting sequences can be adjusted by rotating the potentiometer. This PackLights Kit also receives commands from the Spengler Sound, Matty Blaster or the GBFans Sound Board, which adds other interesting effects like overheating, venting, and the video game modes.

Power Cell and Cyclotron Light Kit features:

- 15 wide-angle diffuse Blue LEDs on the main Power Cell circuit board
- 4 wide-angle Ultra Bright diffuse Red/Green/Blue LEDs for the cyclotron Lights
- 1 connection to support a Bright White LED or vent relay for venting affects
- Works with battery voltages from below 3V to 14V
- High efficiency switching power supply for longer battery life
- Easy wiring with a single cable connection for power with the Spirit electronics, or power and control from the Spengler Sound, Matty Blaster or GBFans Sound Board
- Easy wiring for stand-alone operation with a separate set of battery connection screw terminals (not used when connected to a Spengler Sound, Matty Blaster or GBFans Sound Board)
- Cables are keyed to only fit only in one orientation
- Capable of providing additional light sequences while powering up and down, firing, overheating, venting (Spengler Sound, Matty Blaster and GBFans Sound Board) and crossing the streams (Matty Blaster only).



Life Size Spirit Pack Lights Kit Contents:



Basic Kit

- #1 White LED Vent Light cable assembly
- #2 Battery wire and wire nuts for use with Spirit 3xAA battery pack
- #3 Powercell mounting brackets with screws
- #4 Powercell boards with 15 Blue LEDs
- #5 2x Cyclotron connection cables
- #6 2x Cyclotron RGB LED boards

PowerCell Option:

- #7 Clear dark blue acrylic lens for powercell

Cyclotron Option:

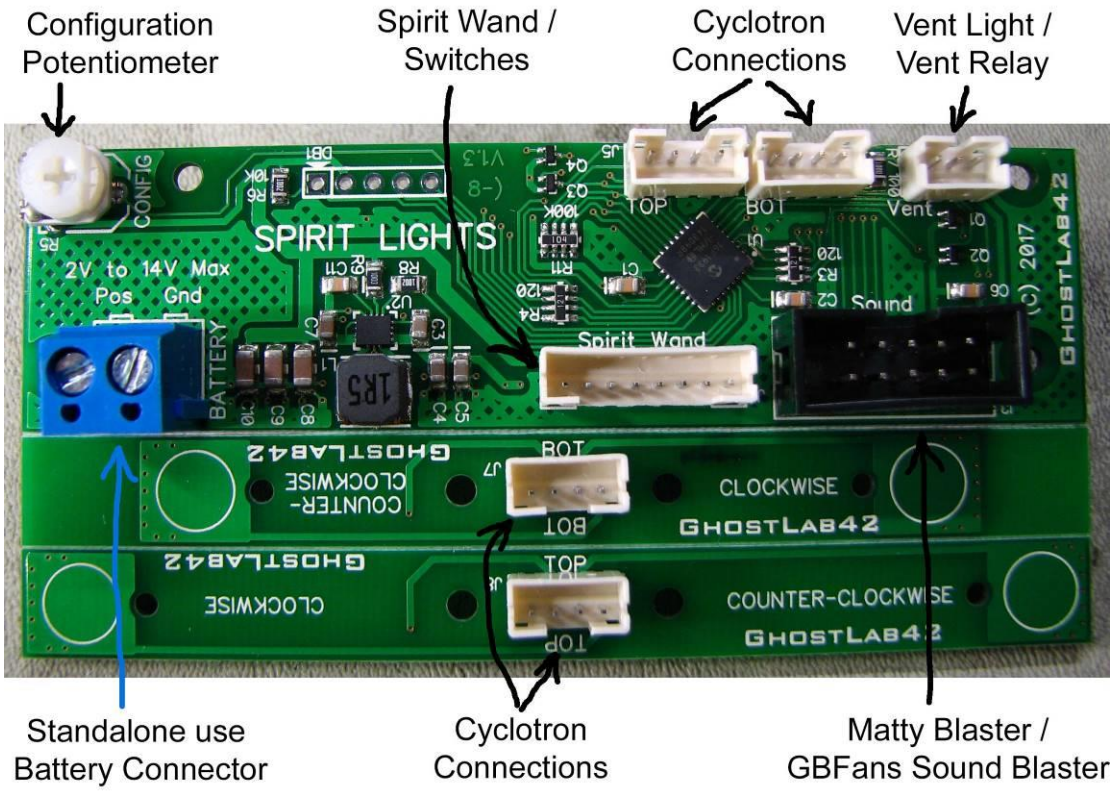
- #8 4x Frosted clear Cyclotron lenses
- #9 4x Mounting screws, 1 per cyclotron lens
- #10 4x Dark Red Cyclotron Reflectors

Specific Tools Needed:

Various tools:

Philips screw driver
Hot Glue gun (to hold the powercell mounting brackets in place)

Connections and Controls:



The Light Kit has a White configuration potentiometer on the back of the board to select between four main modes of operation:

1) Firmware Version Display and Cyclotron Test
   (Configuration potentiometer fully counterclockwise)
   a. The Power Cell LEDs will show the firmware version number
   b. The Cyclotron LEDs will show what is on the 4 digital inputs (all on in stand-alone mode) in Yellow lights (Red and Green both on)
   c. The White Vent LED (not supplied) will be turned on if connected to the vent cable.

2) Red Cyclotron Only Mode
   (Configuration potentiometer counterclockwise half of the range)
   a. No separate power-up sequence
   b. Each Cyclotron Light will snap on and fade off more quickly
   c. Rotate Counterclockwise for slower or Clockwise for faster sequencing
   d. Vent light or Vent relay supported

3) Red/Green/Blue/Orange Cyclotron Mode
   (Configuration potentiometer clockwise half of the range)
   a. Separate power-up sequence
   b. Cyclotron lights will snap on and fade off slowly like in the Video Game
   c. Rotate Counterclockwise for slower or Clockwise for faster sequencing
   d. No vent light or Vent relay supported in V1.2, supported starting with V2.0

4) Power Cell Test Mode
   (Configuration potentiometer fully clockwise)
   a. All Power Cell LEDs will be steadily on

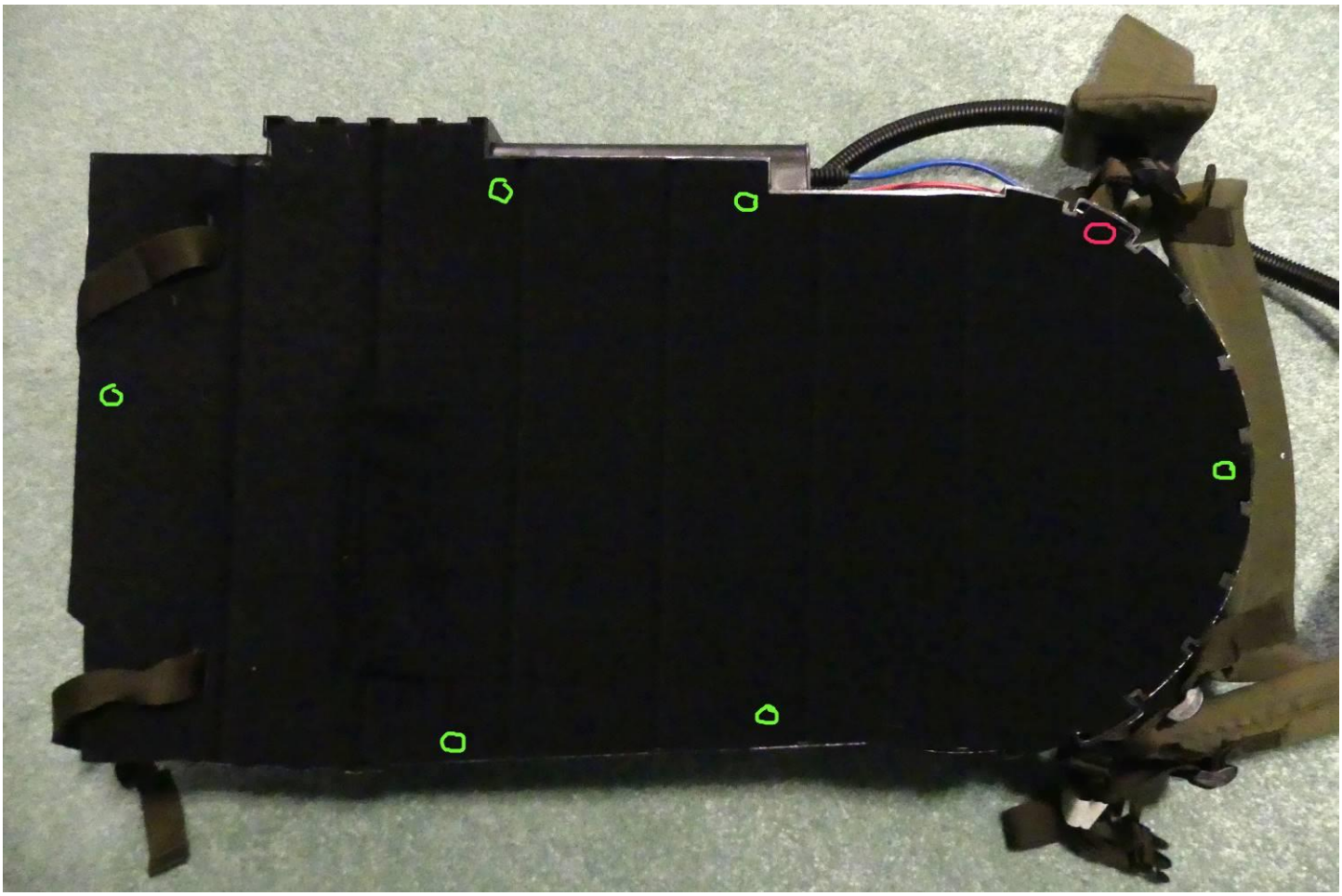
b. All Cyclotron and Vent LEDs are off
(Well, one cyclotron likes to flash – haven't tracked that down yet…)

Opening up the back of the pack:
Though there are multiple items that do not need access to the inside of the pack, let's get the back off the Spirit Pack first and not deal with this in the middle of the upgrade.

Flip the pack over and remove the straps so we can completely remove the motherboard in a later step:



There are 7 screws that need to be removed and one of those (circled in RED) is tricky in that the post is not very strong and I did not realize how weak it was and broke it off on one of my packs.



Here is the problematic (at least for me) screw that is circled in red in the above photo:



The edge of the motherboard is sometimes hot glued to the pack itself. This may be random since the hot glue is used to attach the fabric to the motherboard, or it may be on purpose to both hold on the fabric and attach the motherboard to the pack.

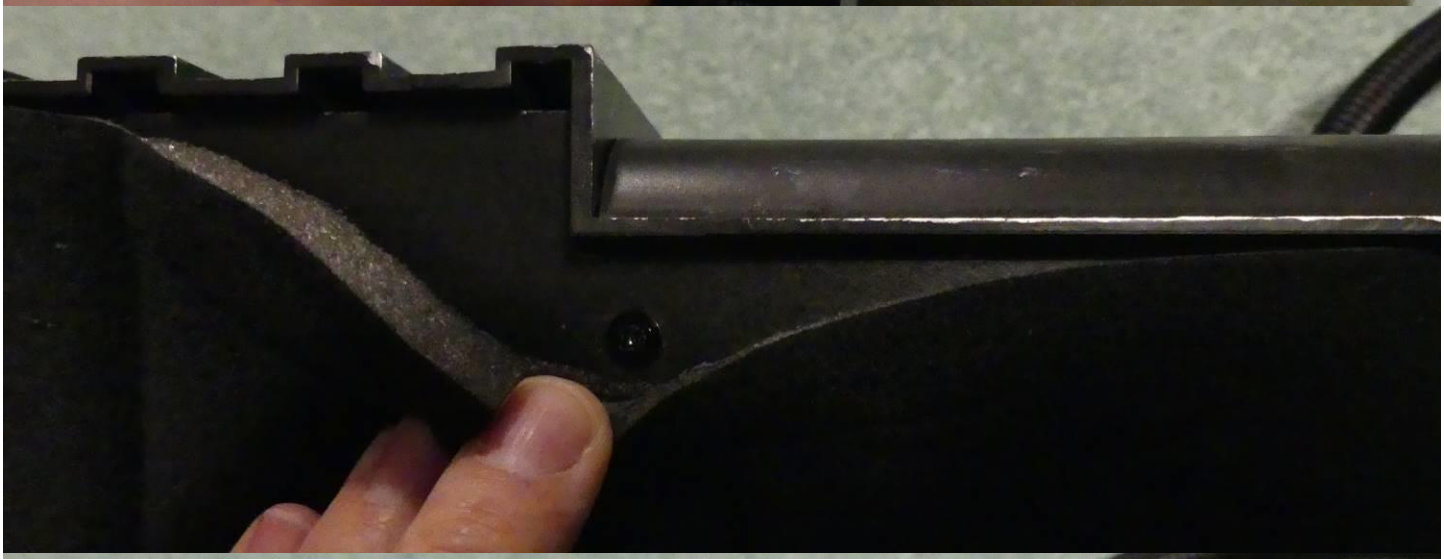
I used a small flat blade screwdriver and worked my way around the edge of the pack:



The motherboard can be damaged, so take great care and you may only need to do this in a few spots or possibly all around the entire edge.

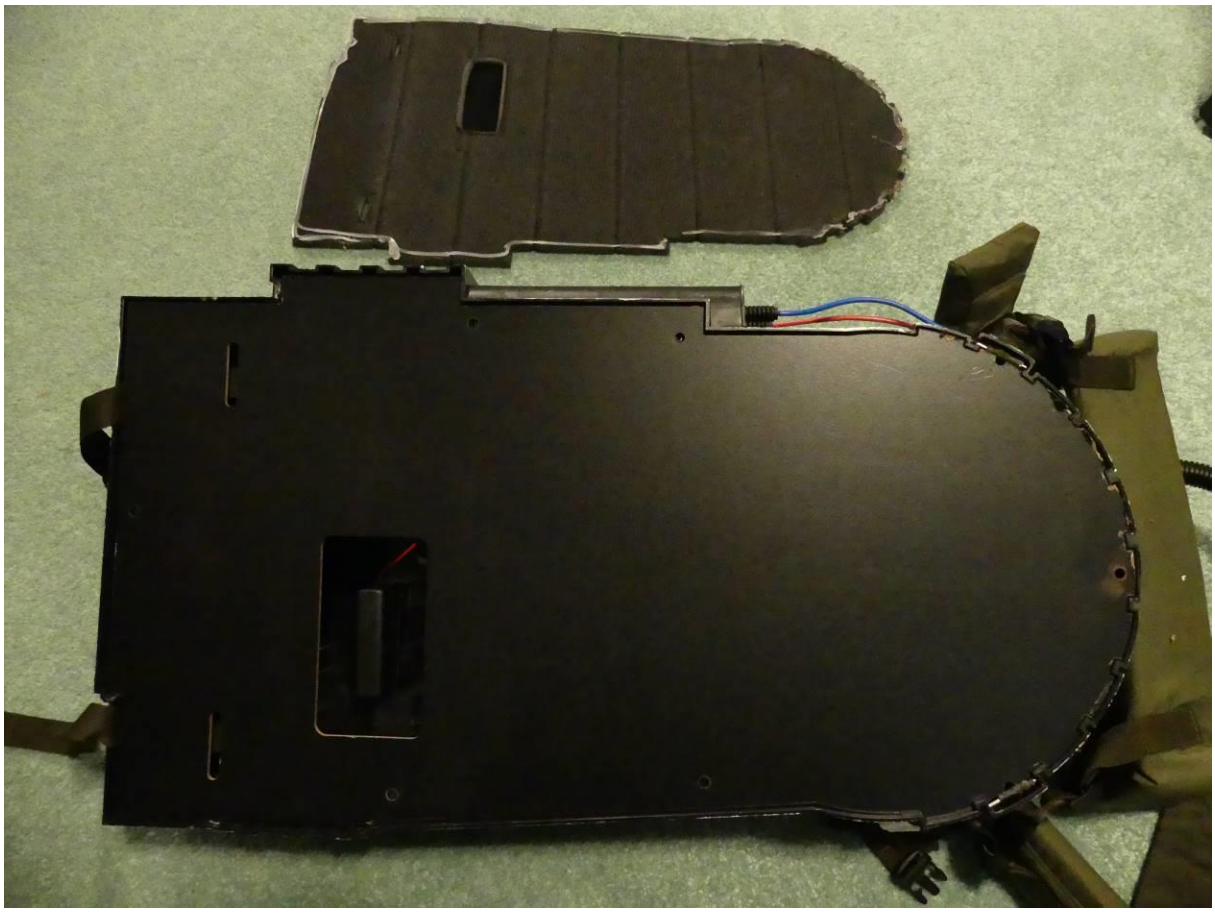
You may be able to just pry up a small section and expose the screws:







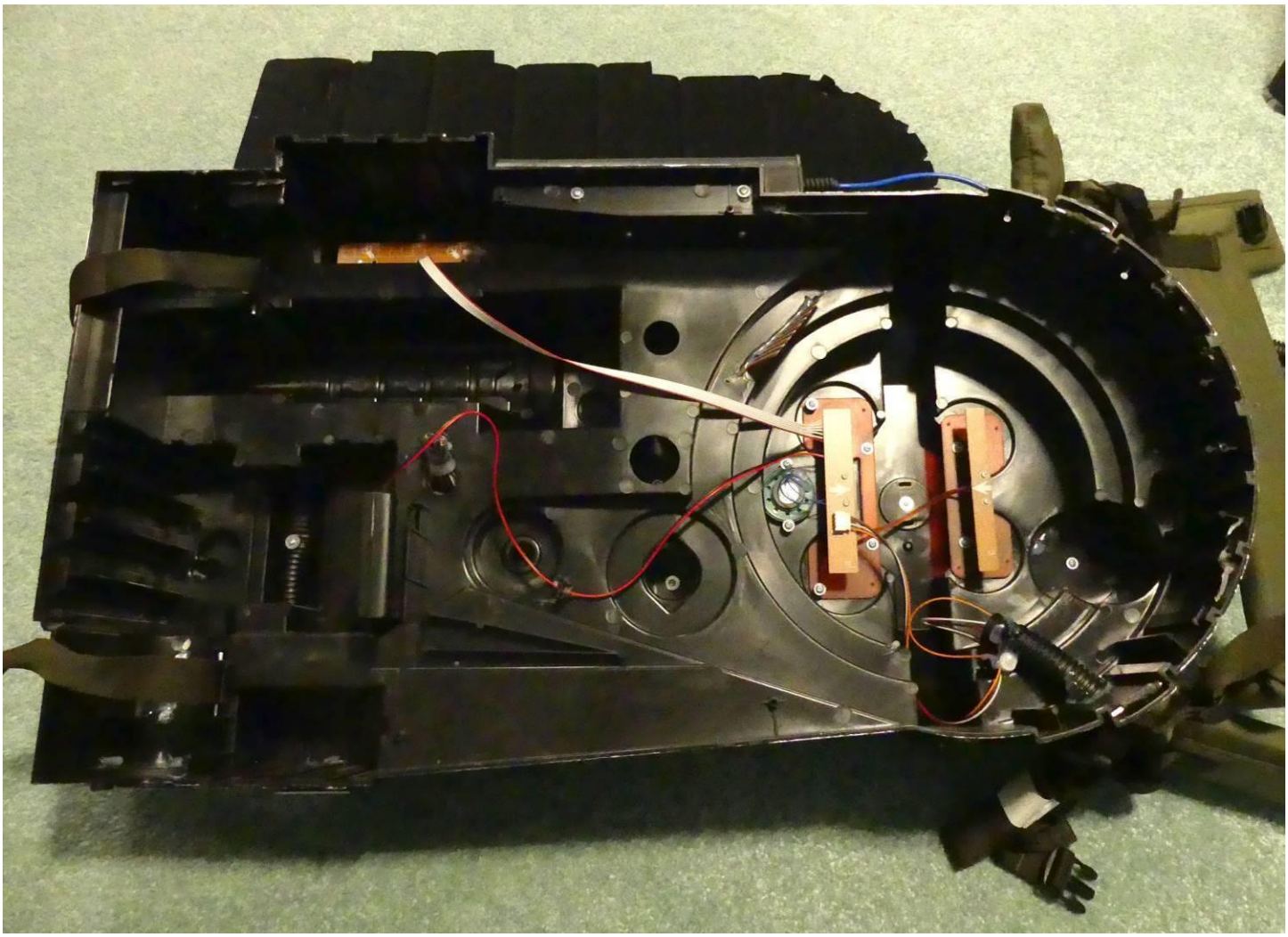
I eventually was able to remove all seven screws and the fabric was still somewhat attached then when I was moving it out of the way the entire piece of fabric just fell off, so not sure it was worth trying to leave it on!



You can use the open battery cover are to start lifting the mother board off and seeing where the glue still needs to be removed as you gently lift it up:



Once you get the back removed, here is the view inside the pack:

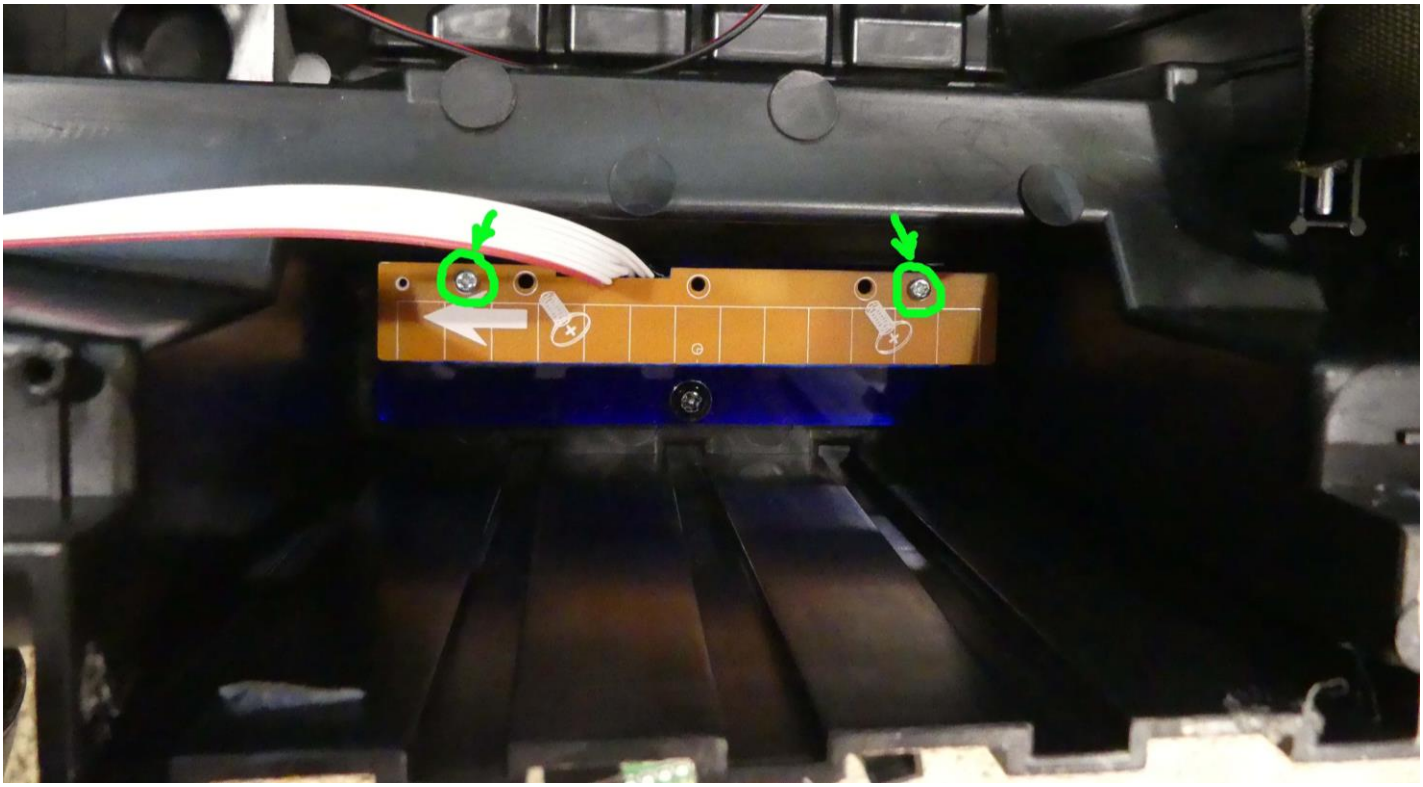


You either put the screws in a bag or put them in the posts they came from, so they don’t get lost.

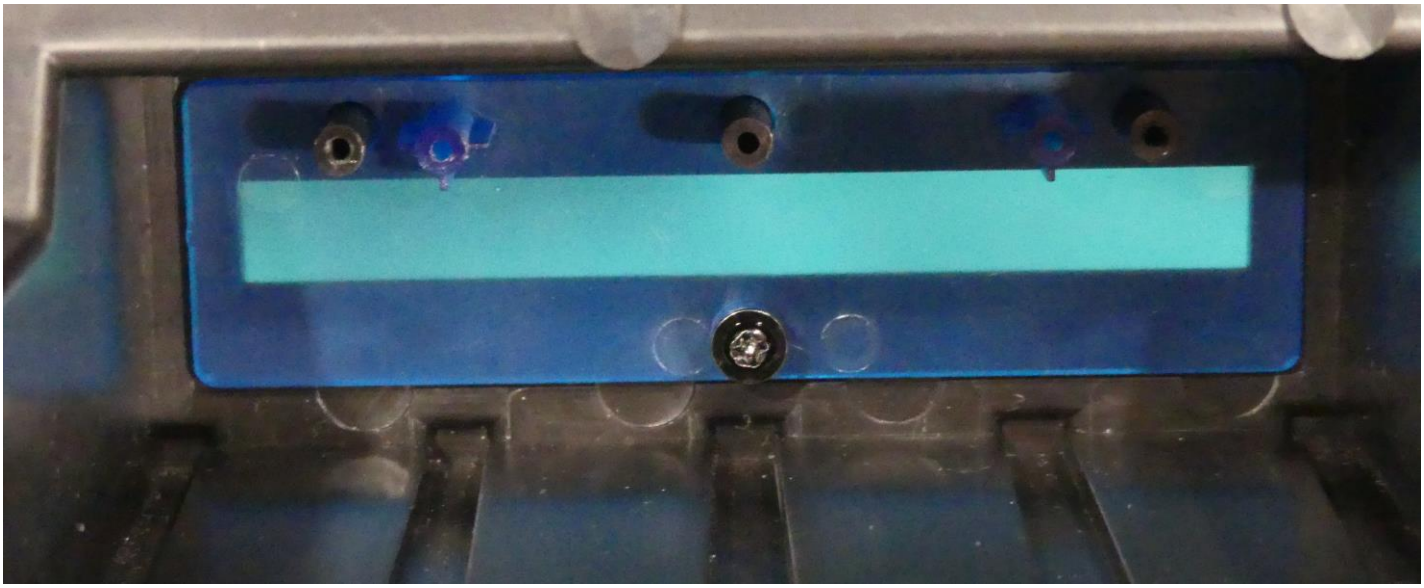
Order is not important, but this is the order that I like to install the mods.

Installing the powercell board:

Remove the two screws that are holding the existing powercell board:



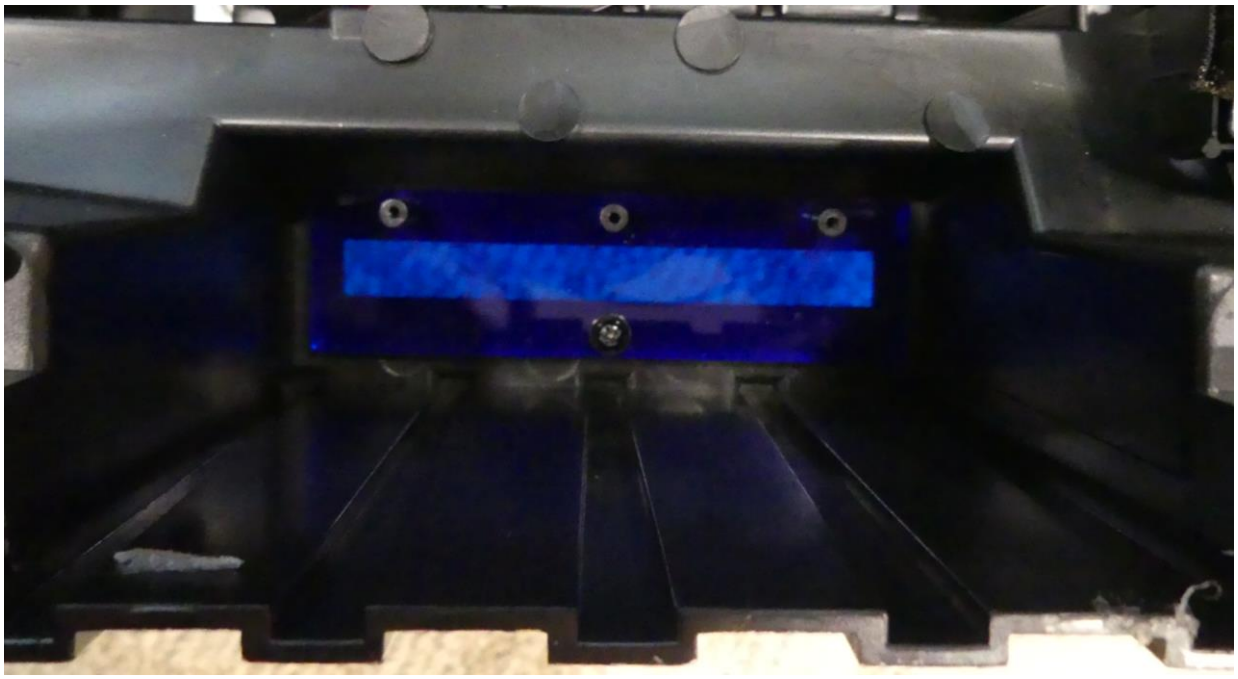
If you are replacing the light blue lens with the clear dark blue, remove the single screw that is holding in the light blue lens and remove the light blue lens:



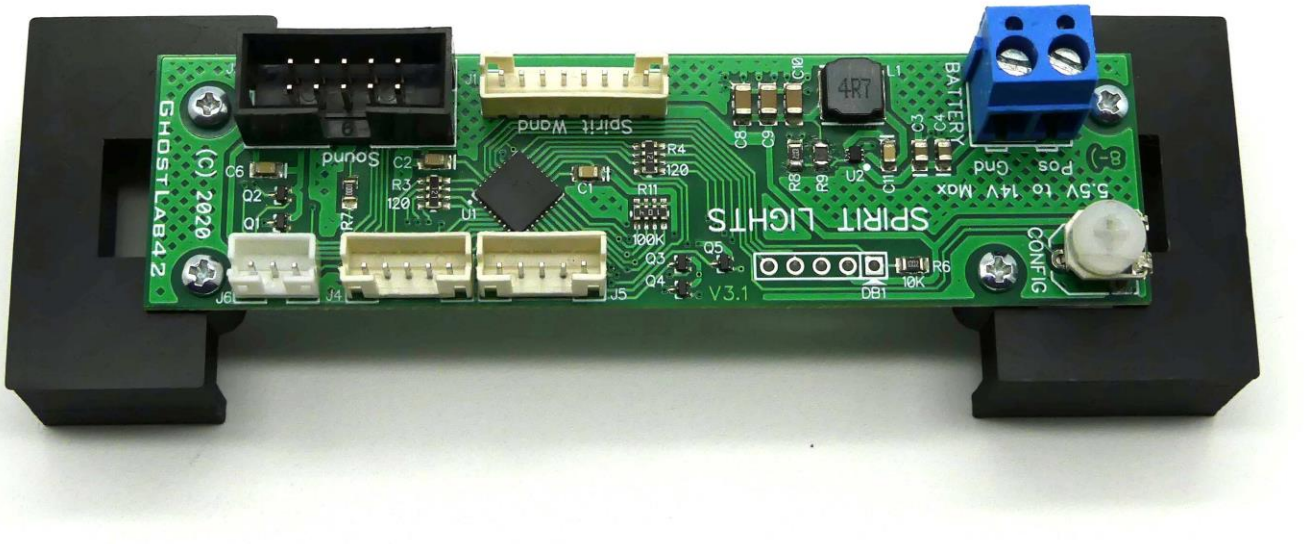
The screw will be used to hold in the clear dark blue lens, so keep track of it!

Remove the protective cover from both sides of the dark blue acrylic lens and place it over the posts. Be very careful not to leave fingerprints on either surface or you may be annoyed by that later after the pack is put back together.

Use the screw that was holding the light blue lens to secure this new dark blue lens:



Next unscrew the 4 short screws from the powercell mounting brackets #3 and place those screws in the mounting holes in the powercell board #4 and screw them back into the mounting brackets. THe powercell and mounting brackets will now look like this:

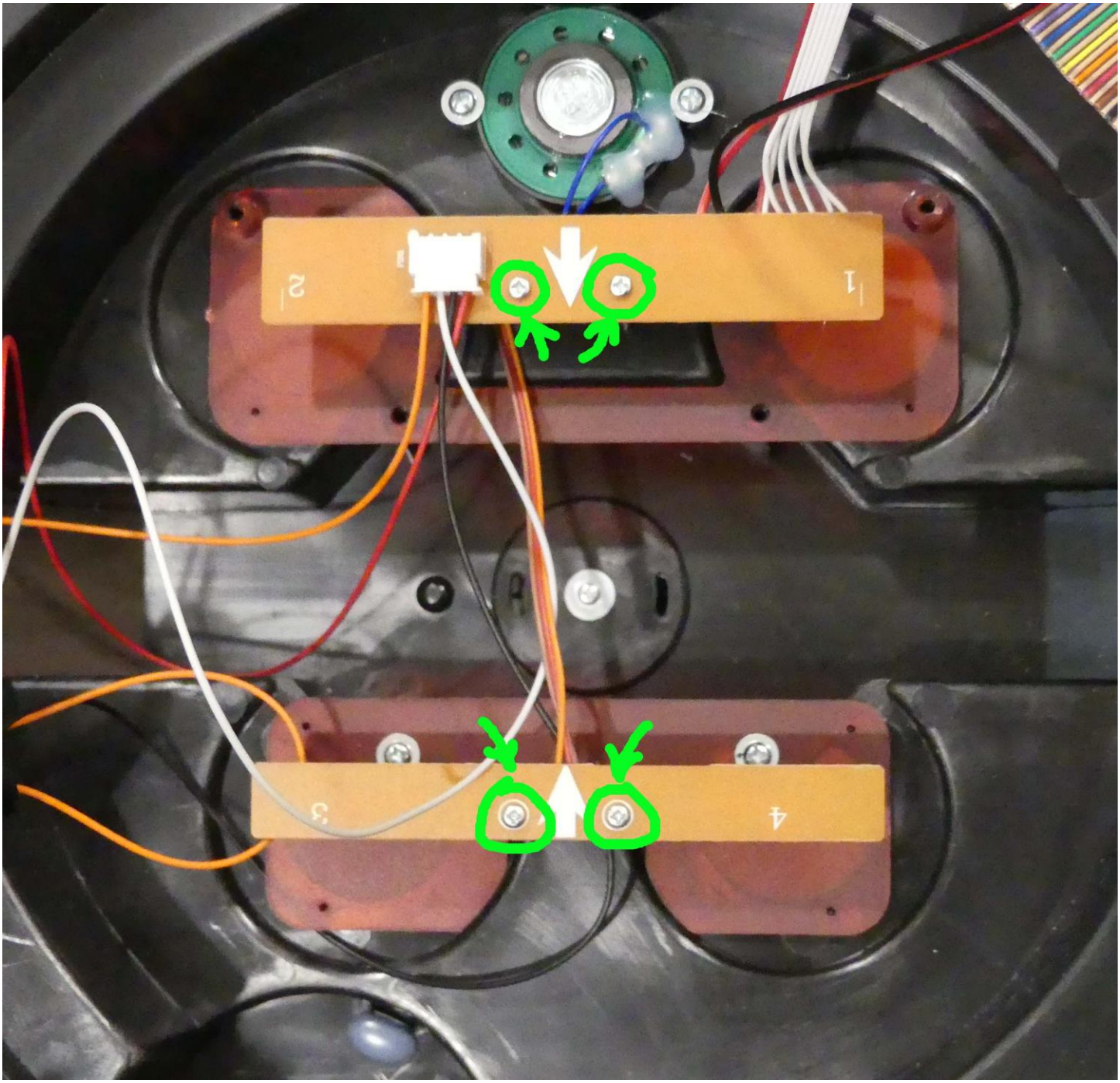


This just slides on top of the blue lens (either one) and can be secured in place with the hot glue gun at both ends of the brackets. There is no need to get any glue on the actual circuit board, glue is only needed on the brackets.

Mounting the Cyclotron Lights:

Remove the four screws (and keep them for the new cyclotron lights) and remove the 2 cyclotron boards.

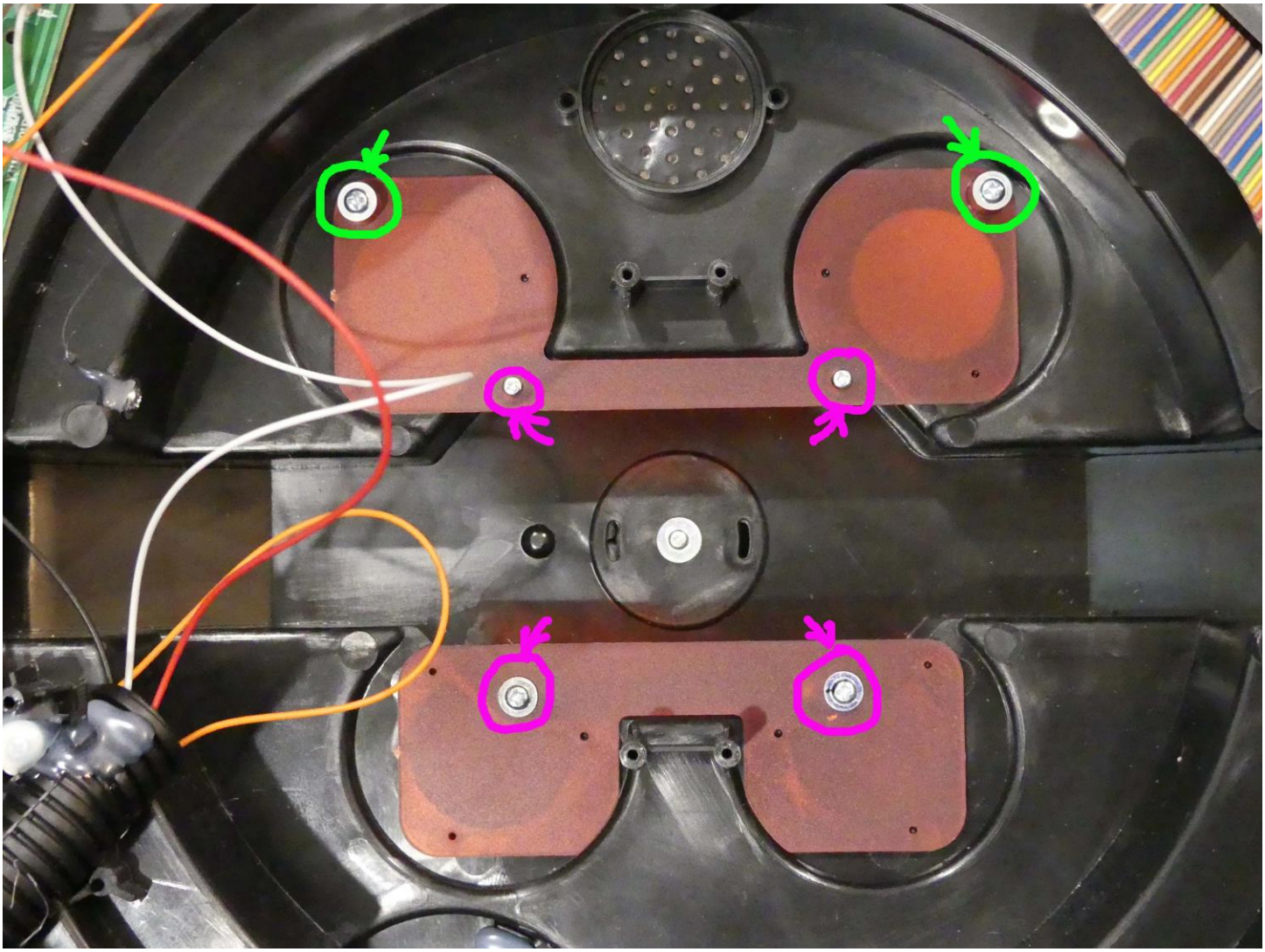
The top cyclotron board also makes the sounds, drives the speaker and looks at the switches in the wand. The wires that go to the speaker are very short and fragile, so be gentle when moving that board.



If you are also adding a new sound board, you can remove the original cyclotron boards and the speaker (if you want).

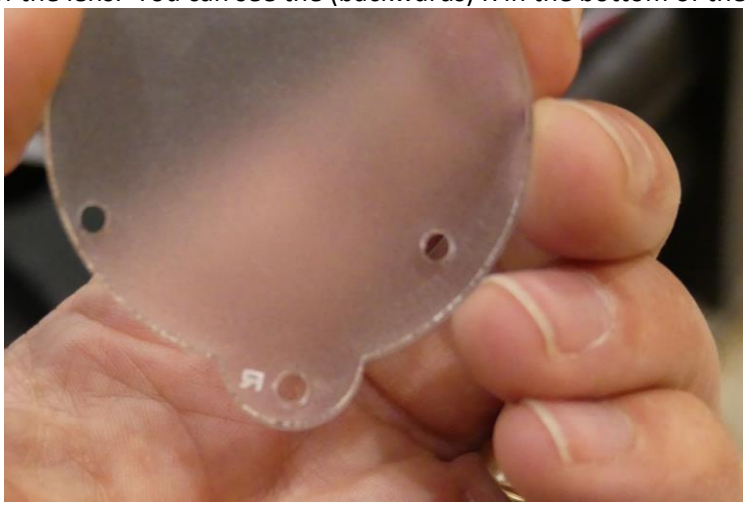
Once the cyclotron boards are moved aside, or completely removed, you have access to the red diffuse cyclotron lenses. The red lenses do not allow other colors to come through very well, so if you are planning on using the different color cyclotron lights (for Slime Blower, Meson Colider and Stasis Stream)

If you are replacing the cyclotron lenses with the clear frosted lenses #8, start by removing the 6 screws, 2 of which will be used to hold the new lenses (circled in Green) along with 4 new screws #9 since the clear diffuse cyclotron lenses are much thicker than the red plastic ones.

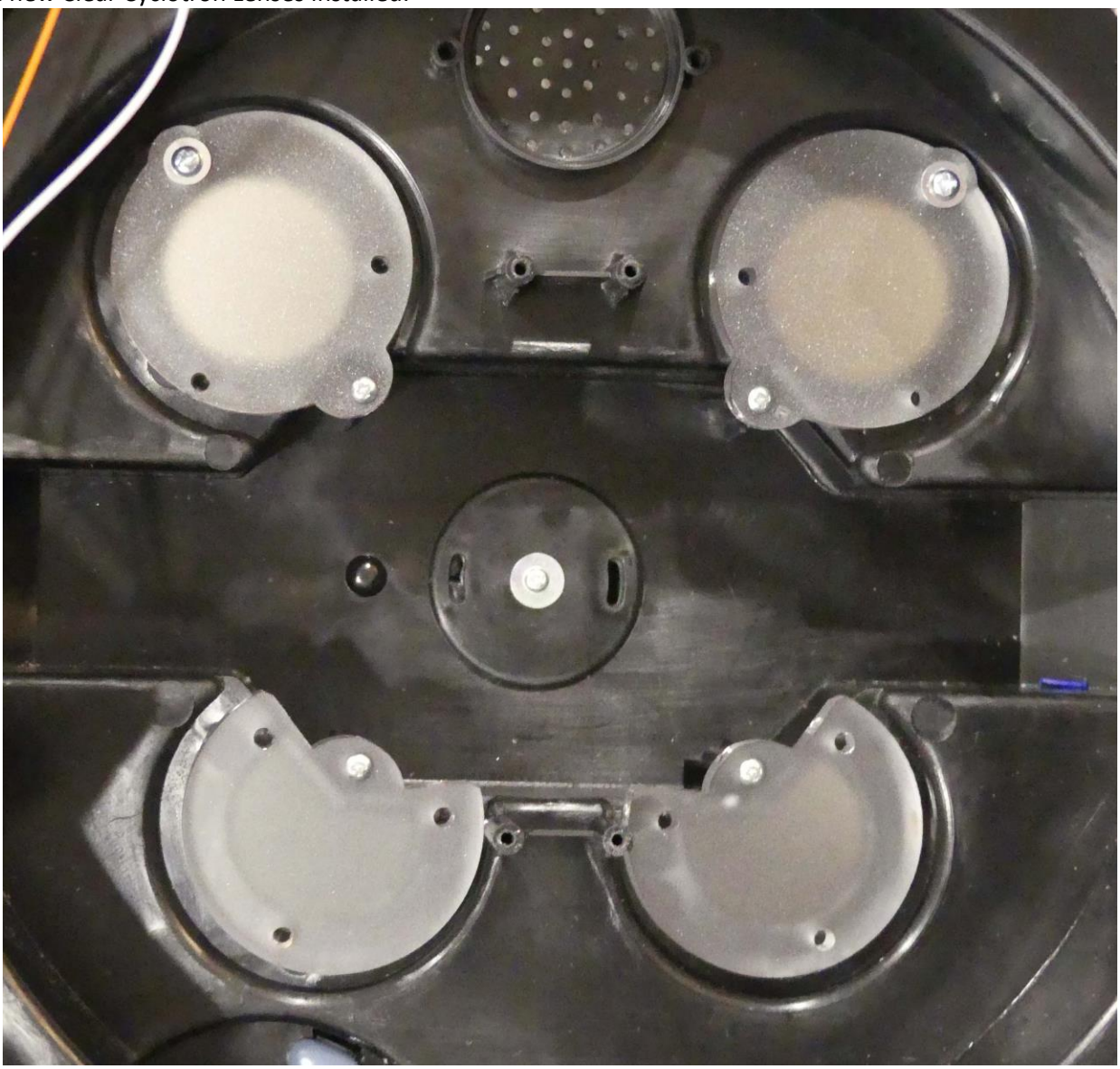


Remove the protective paper on both sides of each lens and be careful not to leave fingerprints on the shiny side that faces out. The frosted side faces the inside of the pack.

The top two full circles only go in one way and are labeled L and R, though the letters are easiest to see when looking through the clear front side of the lens. You can see the (backwards) R in the bottom of the lens in this image:



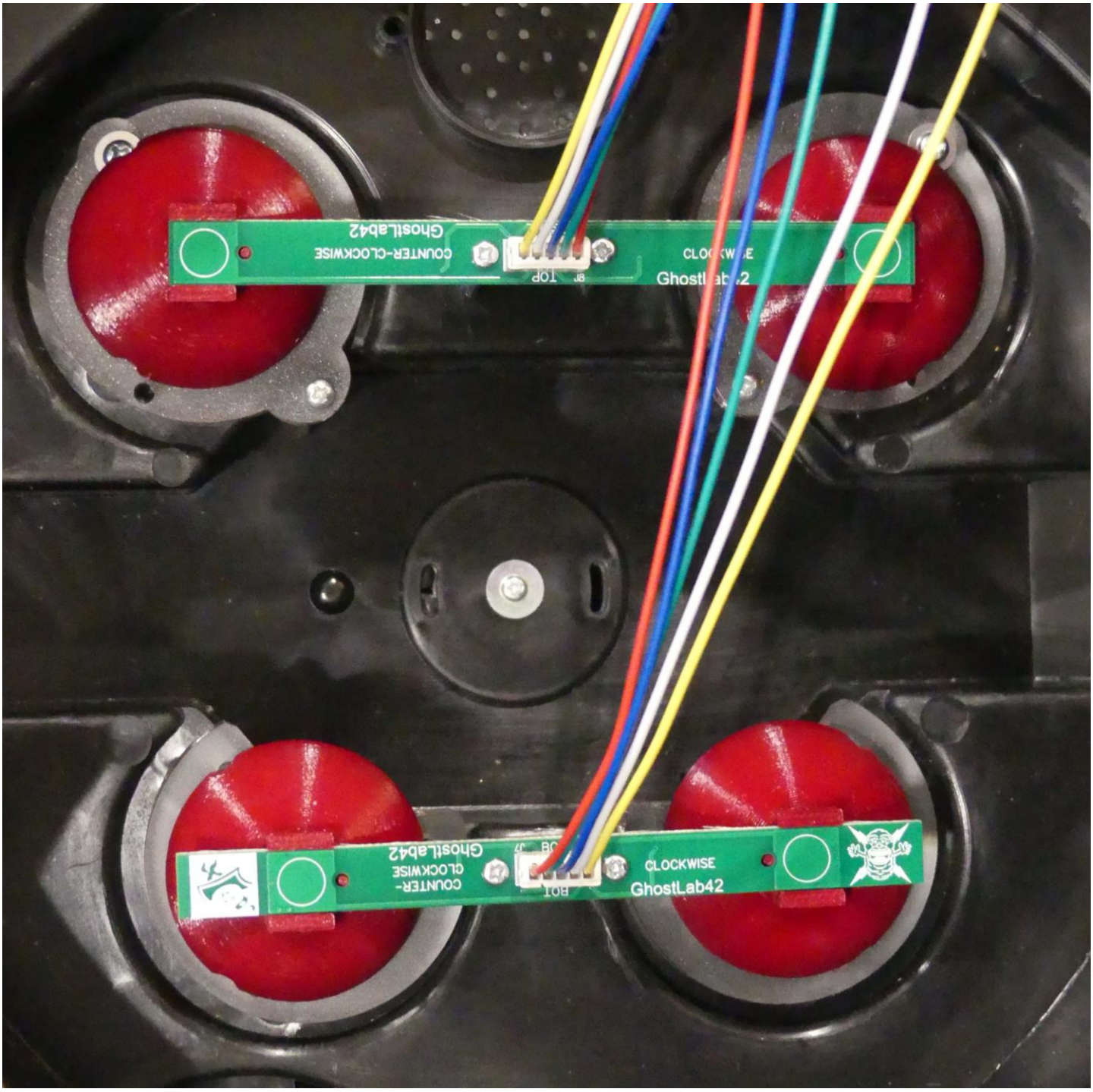
With the new Clear Cyclotron Lenses installed:



If you are using the spirit pack's red lenses, then the two cyclotron circuit boards can be installed on the posts that held the original cyclotron circuit boards. Use the same screws as were used with the other cyclotron boards.

If you are using the clear frosted cyclotron lenses, then just start the screws, but do not secure the board down snuggly. This is so there is room to add the reflectors #10 between the cyclotron circuit boards and the clear frosted lenses.

The red lenses have a post that aligns with a hole in the circuit board. Normally this is a tight fit and the reflectors will stay attached to the boards, but there was a problem with the manufacturing of the boards so the reflectors do not hold on very well to the boards. This is why it is easier to start mounting the cyclotron boards first and then sliding the reflectors under each cyclotron RGB LED.



The cyclotron boards are shown mounted in the “Clockwise” (seen from outside the pack) position since the word “clockwise” is right side up. If you mount the boards such that the words “COUNTER-CLOCKWISE) are right side up, the cyclotron sequence will progress in a counter clockwise direction.

Just plug the cables #2 between each cyclotron board and the powercell board. They are keyed so should only go in the correct directions.

The vent light cable assembly #1 can also be plugged into the powercell board. Where is the light to be mounted???? That is up to you and you can be creative. Some have mounted it in the N-filter and some the Booster frame. The powercell vent connector can also be used to plug in a vent relay (not included) that can control an e-cig smoke kit (not included).

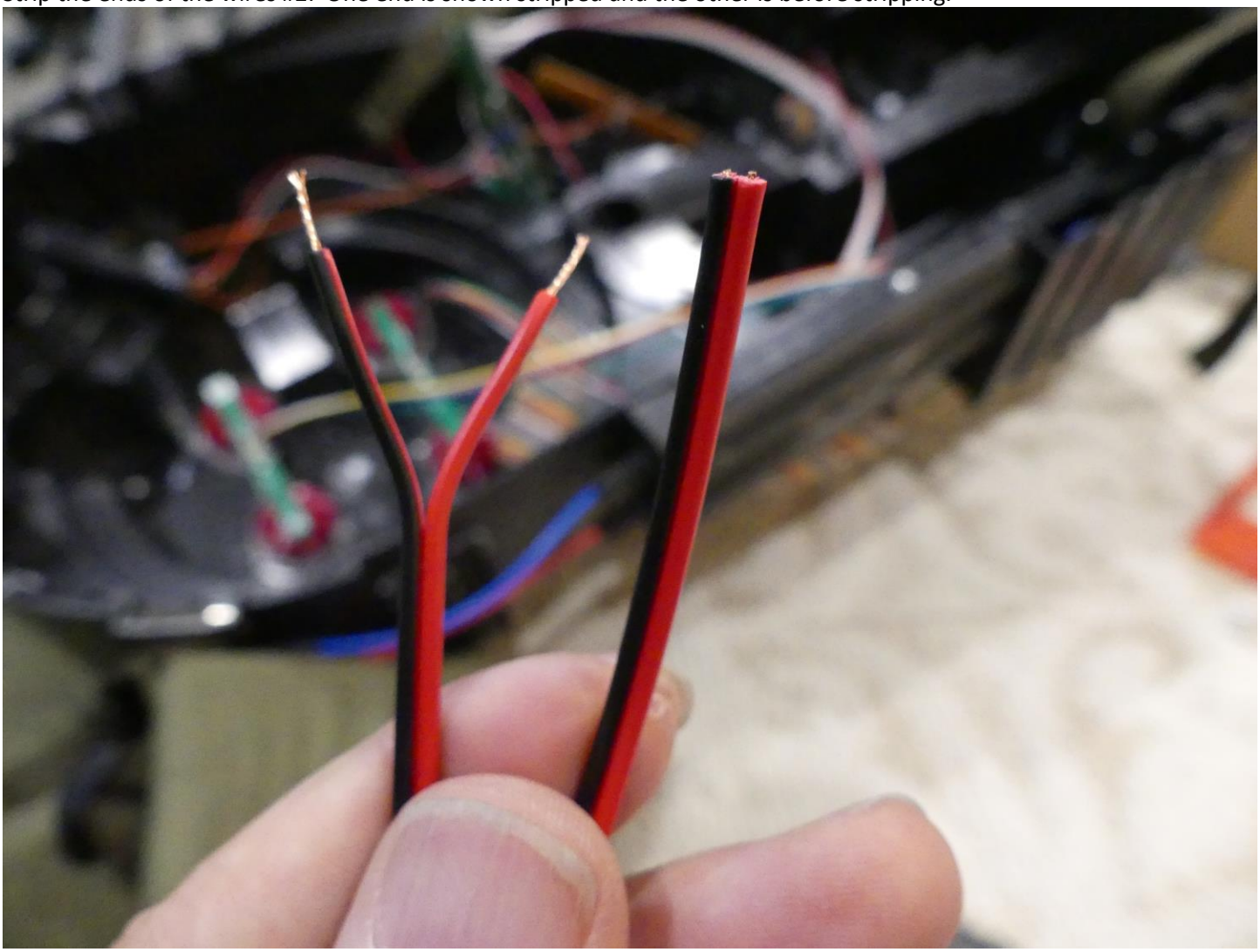
With the darker red reflectors and the frosted clear cyclotron lenses, the pack still has the look of a red lens, but will work great with the different color cyclotron illuminations.



Connecting power:

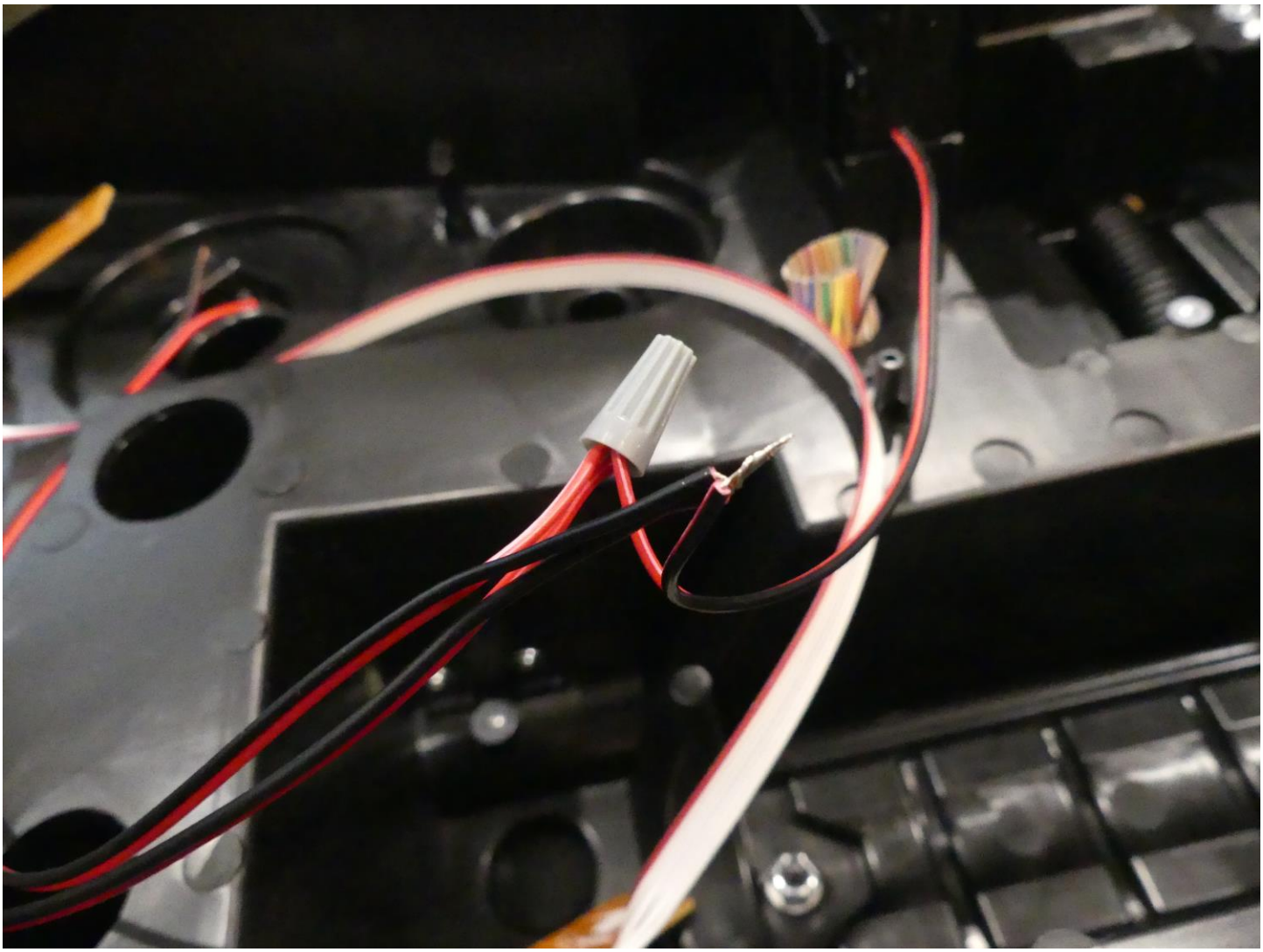
If you are going to add a new sound board, then the original 3xAA battery pack and all of the original electronics can be removed. If you want to just add new pack lights and want to keep the other electronics and the new pack lights you will want to share the 3xAA battery pack.

Strip the ends of the wires #2. One end is shown stripped and the other is before stripping.



Next cut the pair of wires between the battery and the top powercell board. Cut it approximately halfway between the two. And then strip both of the cut ends. Be very careful with the battery wires that are attached to the cyclotron board as they can be easily broken off of the cyclotron board and you would have to reattach them with a soldering iron.

Connect the three red wire stripped ends together and use the wire nut #2 screwed on top of those ends so that they stay together. Do the same thing for the three black wire stripped ends.



This connects the 3xAA battery pack to both the original electronics and the new powercell board. The New powercell and cyclotron lights will start operating as soon as the battery is turned on. I covered the LEDs of the original boards with electrical tape so the original LEDs would not distract from the new ones. I also used tape to hold the original cyclotron and powercell boards in place in the pack. Nothing too fancy!

Reassemble the pack:

After testing the pack to make sure everything is working, time to put the back panel (motherboard) back on with the screws you saved and also re-attach the straps if they were removed.

Now go out and enjoy bustin some ghosts!