

TrapFX

HASLAB GHOST TRAP ELECTRONICS KIT

INSTALLATION GUIDE & USER MANUAL

v1.1

 ECTOLABS

INTRODUCTION

Thank you for purchasing the EctoLabs TrapFX(H) kit! This is a complete replacement set of electronics for your Hasbro Haslab Ghost Trap. This kit provides many improvements over the stock trap, including movie-specific capture sequences along with accurate sound effects, lighting and extra system modes. TrapFX also integrates with smoke kits and includes the ability to connect multicoloured NeoPixels for amazing enhanced lighting effects!

This installation guide takes you through the process with easy to follow step-by-step instructions, all fully illustrated with clear photos. A complete user guide is also included to get you up to speed with all the new features.

IMPORTANT BATTERY INFORMATION

In order to keep your newly upgraded Ghost Trap running at its best, it is essential that you use the correct type of batteries. We have pushed the limits of what is possible using as many of the existing components already pre-installed in your trap. Therefore, TrapFX requires the use of:

4x AA 1.5V Lithium-ion batteries

While a regular new set of standard Alkaline batteries may work initially, they are generally unable to provide enough consistent power to keep the system working properly for very long. This is because the voltage of alkaline batteries gradually drops as they begin to deplete. Once this voltage gets below a certain point, the components in your Ghost Trap will begin to misbehave or stop functioning completely.



Lithium-ion batteries, on the other hand, are able to maintain a steady voltage throughout the duration of their lifetime, so your Trap will continue to function correctly until the batteries are fully drained and ready to be replaced or recharged.

You may use either single use or rechargeable Lithium batteries, as long as they are rated at **1.5V** each. Be aware that some rechargeable lithium batteries only supply 1.2V which will not be enough to provide the full 6V that TrapFX requires.

Suitable batteries can be found for sale by most electronics retailers including Amazon and are exactly the same size as regular AAs so they can be installed inside your Ghost Trap's battery compartment without modification.

SAFETY & STATIC ELECTRICITY WARNING

As with any bare electronics, it is essential that you handle the circuitboards and accessories with care. We recommend holding the boards along their edges to avoid damaging any of the fragile components. Similarly, the thin wires involved in this installation can be easily broken if sufficient care and attention is not provided. Please note that EctoLabs cannot be held responsible for any damage caused by inappropriate handling of this kit.

We have also been made aware of reports of irreversible damage to Hasbro's stock electronics caused by exposure to static electricity. This is likely to be a result in storing the Trap in hard cases with unsuitable foam inserts. This foam may produce undetectable amounts of static that are then transferred to the internal circuitry via the exposed metal pedal connector. If you plan to store your Ghost Trap in such a case, it is essential that you use special anti-static foam or take measures to cover the exposed metal connector while not in use.

With this in mind, you should also keep all TrapFX circuit boards INSIDE their supplied anti-static bags until you are ready to install them in your trap.

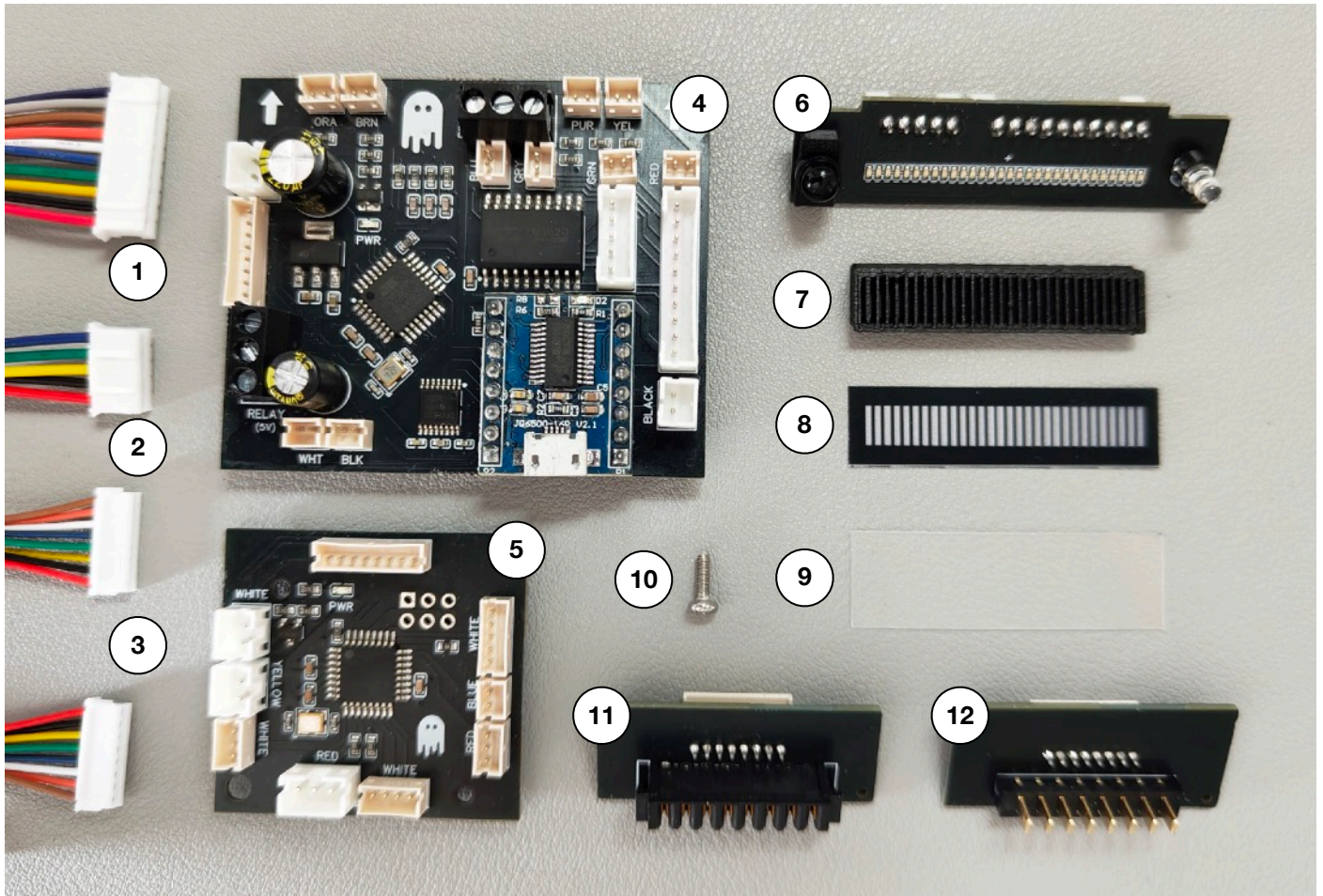
DISCLAIMER

While we have created this guide to help you complete this installation without issue, there is always the chance that things could go wrong if these instructions are not followed correctly. Therefore, please be aware that EctoLabs cannot be held responsible for any damage caused to your Haslab Ghost Trap by mishandling, accidental or otherwise.

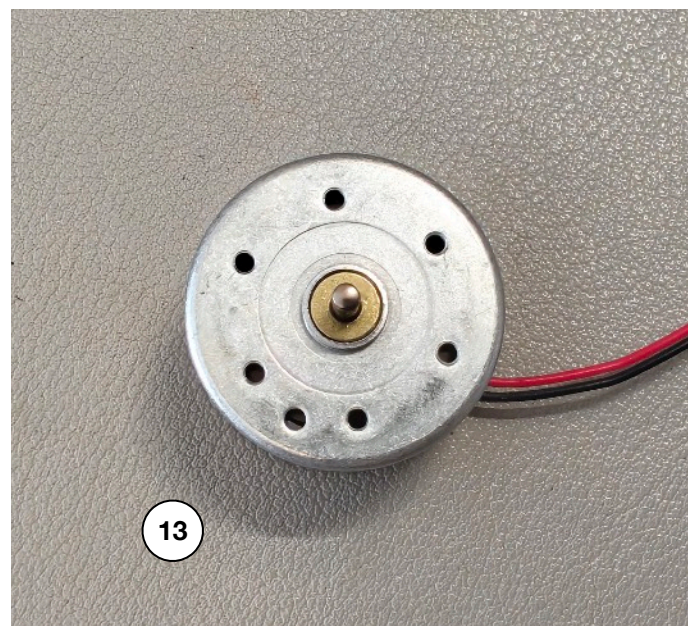
By proceeding with this installation, you agree to any risks involved and understand the information and warnings as set out in the above paragraphs of this guide.

INCLUDED IN YOUR KIT

Below are all the components included in your TrapFX(H) kit. Before beginning installation, we recommend checking all of the bags to make sure you have everything you need. Be sure to handle all parts carefully at all times.



1. 1x 10-pin bargraph cable
2. 1x 5-pin bargraph cable
3. 2x 8-pin connector cables
4. 1x Cartridge main board
5. 1x Chassis board
6. 1x Bargraph board
7. 1x 3D-printed bargraph insert
8. 1x Bargraph lens
9. 1x Bargraph window film
10. 1x Cap remover screw
11. 1x Cartridge connector board
12. 1x Chassis connector board
13. 1x Door motor



CARTRIDGE INSTALLATION

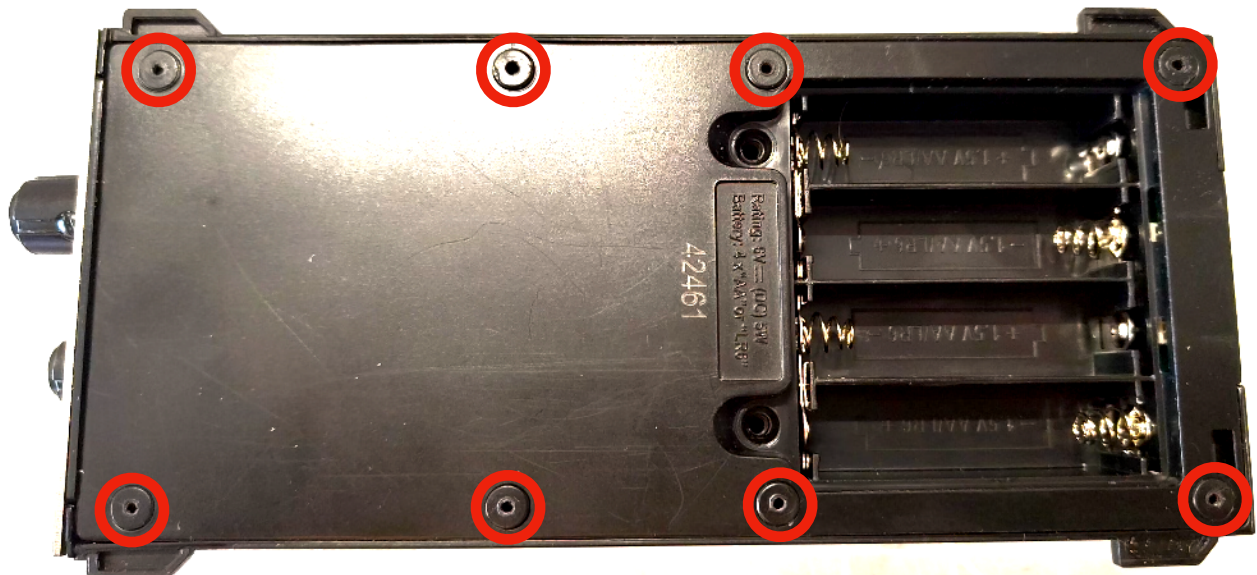


The inner removable section of the Haslab Ghost Trap (which we will refer to as the ‘Cartridge’) is the assembly that consists of the inner chamber, doors, bargraph, indicator light and front control dials. Inside the cartridge is where you will find Hasbro’s main circuit board that controls the door mechanism, chamber LEDs, bargraph LEDs and takes input from the front dial switches and the PKE IR sensor.

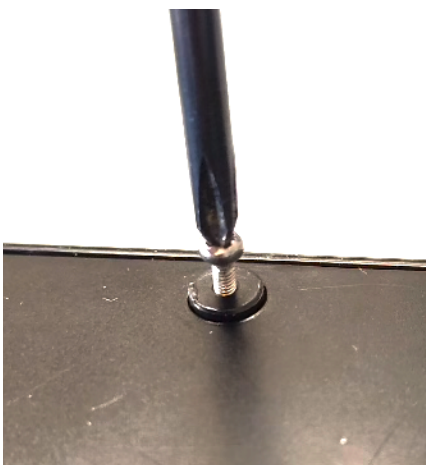
As you will see, there are many wires and cables inside the cartridge packed into a relatively small space. Although this may seem daunting at first, Hasbro were kind enough to make most components easy to disconnect as they use standard plugs and connectors. This means you can install your replacement TrapFX boards without any soldering or specialist equipment. However, as these wires are quite thin, it is essential that you take things slowly and carefully to avoid any accidental breakages. Although the cartridge is the fiddliest of the two sections to modify, the following step-by-step instructions and installation photos will guide you through every part of the process.

Tools required:

- Small phillips screwdriver
- Allen keys
- Pliers
- Flat file or craft knife

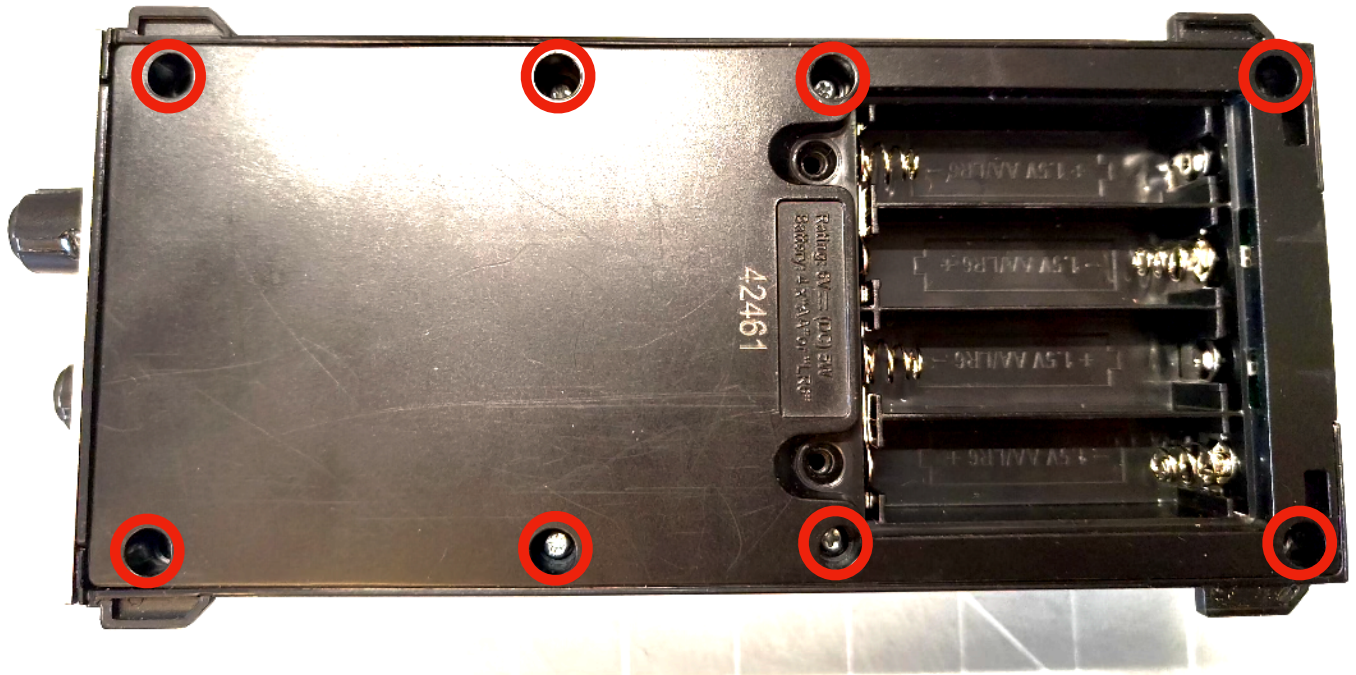


Let's begin by removing any batteries you already have installed. In order to get inside the cartridge, we must first remove the eight screw caps indicated by the **red circles** above. Be aware that these can be a little tricky to take out as they can be a tight fit. To help with this, we have included a small screw in the kit to help with pulling them out:

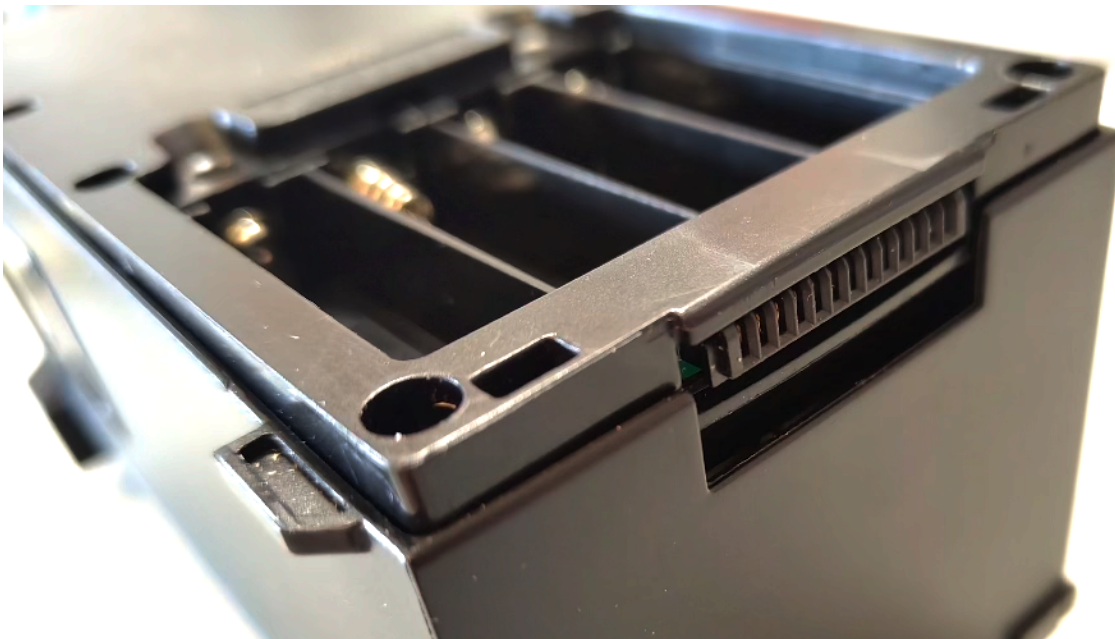


- Use a small phillips screwdriver to insert the screw into the small hole in the cap. Don't screw all the way in as we need something to grip onto.
- Use a pair of pliers to grip the screw and use force to pull the cap straight up until it releases from the hole.
- Repeat this process for the remaining seven screw caps.

If you are having trouble removing the caps with the included screw, you can try using a larger screw for better grip. Alternatively, you may be able to insert an extra small jeweller's screwdriver through the centre of the cap to reach the head of the screw which will force the cap out from underneath.

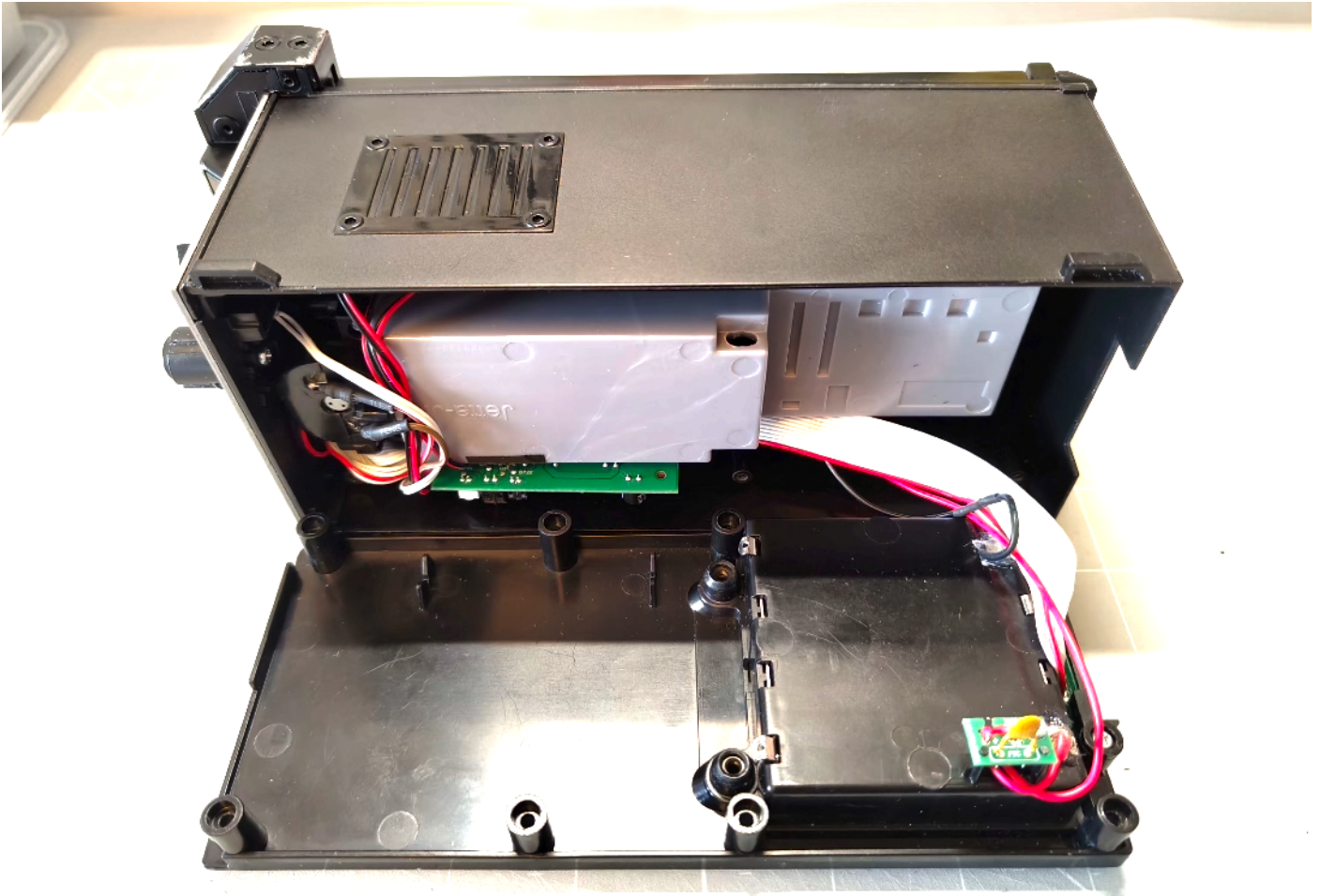


Now that we have removed the caps, use your screwdriver to remove the eight exposed screws as **indicated** above. Thankfully, Hasbro has used the same screw size and type for almost all of the trap's components which makes things very easy when putting the trap back together. Once removed, put the screws aside by placing them in a tray, bowl or container so they don't run off your table and get lost.

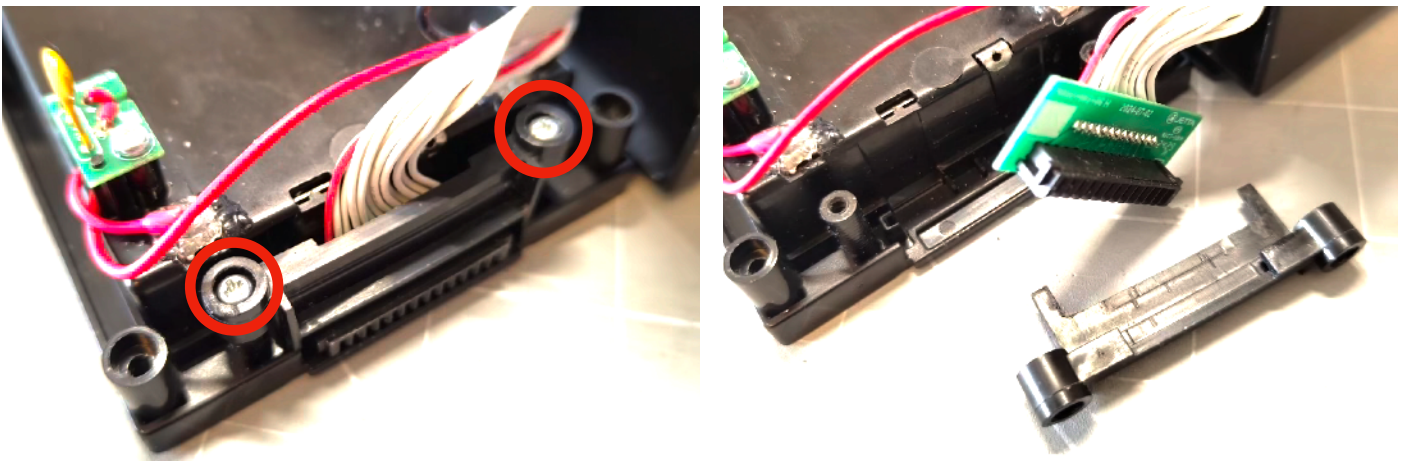


We can now gain access to the inside of the cartridge. Start by gently pushing up at the connector end until the bottom section releases as shown above.

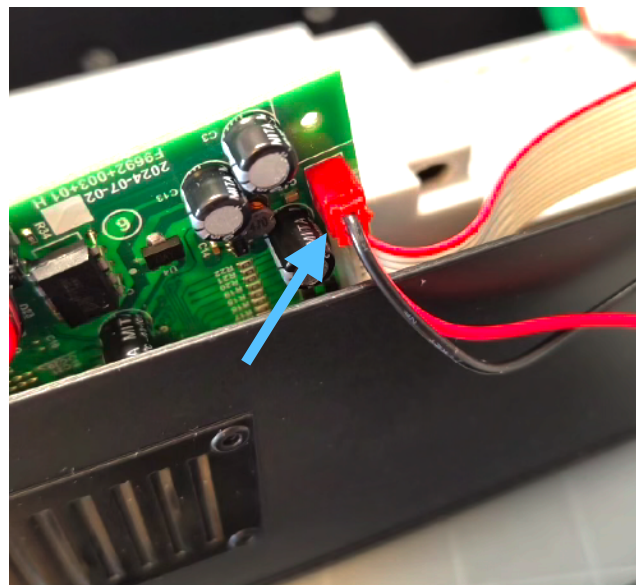
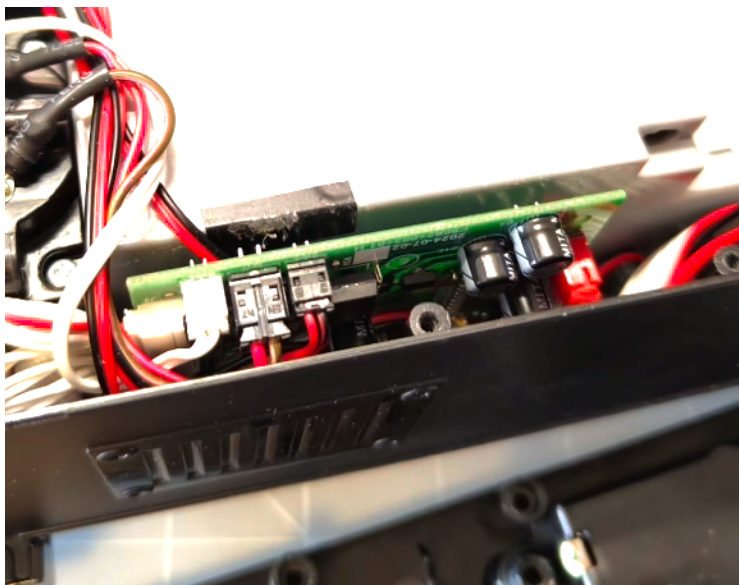
IMPORTANT - Do this slowly and do not pull up sharply as there are fragile cables still attached inside that can easily be broken.



Place the cartridge on its side and carefully release the entire bottom plate so that it sits flat on your table. Be aware of the wires that connect the battery box to the rest of the electronics and be very careful not to put any strain on them.

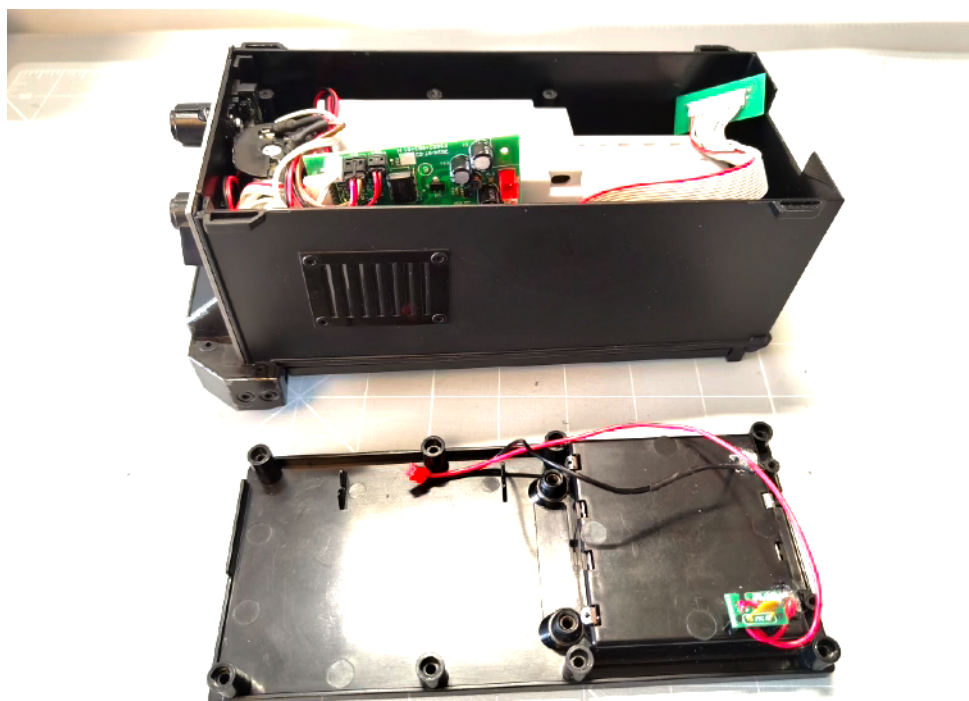


Now remove the two screws on the bottom plate as indicated by the **red circles** above. You will then be able to remove the plastic part that holds the green connector board place. Put the screws and the plastic holder safely aside.

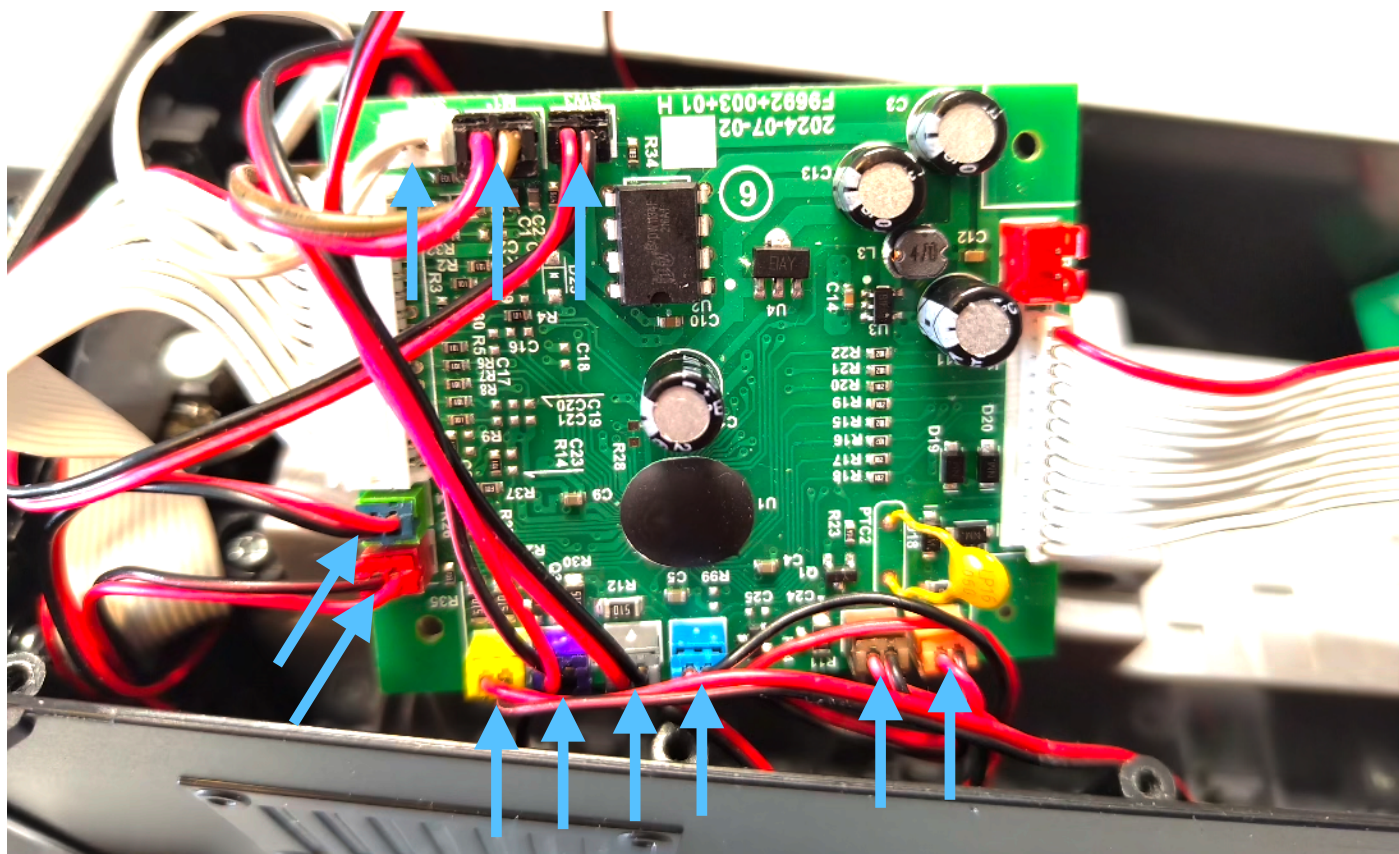


You will now be able to see the trap's main circuit board which sits in the gap between the grey inner chamber and the outer wall of the cartridge.

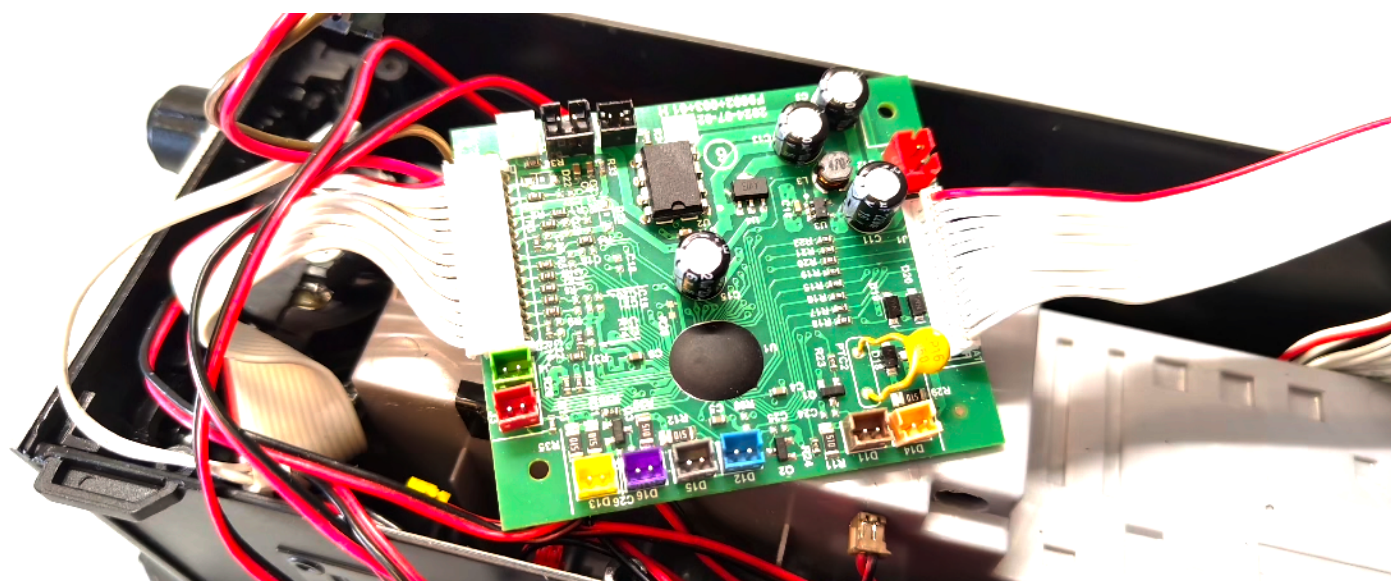
- Very gently lift up the right corner of the board until you have access to the red cable connector indicated above by the **blue arrow**.
- You now need to unplug this cable by carefully pulling it out of the connector. **Try to hold the cable as close to the connector as possible when you do this, as pulling the cable by the wires alone may break them. Take it slowly and try wiggling it a little as you pull if there is resistance.**



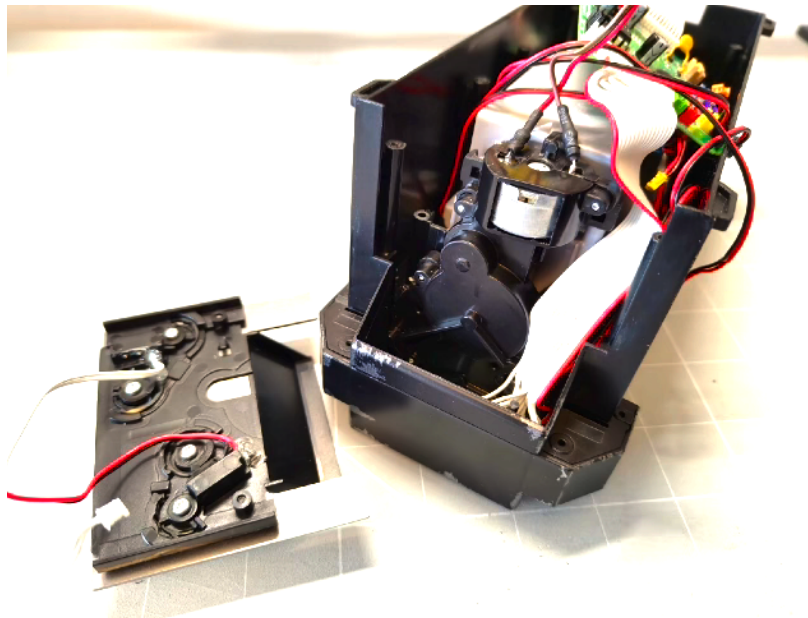
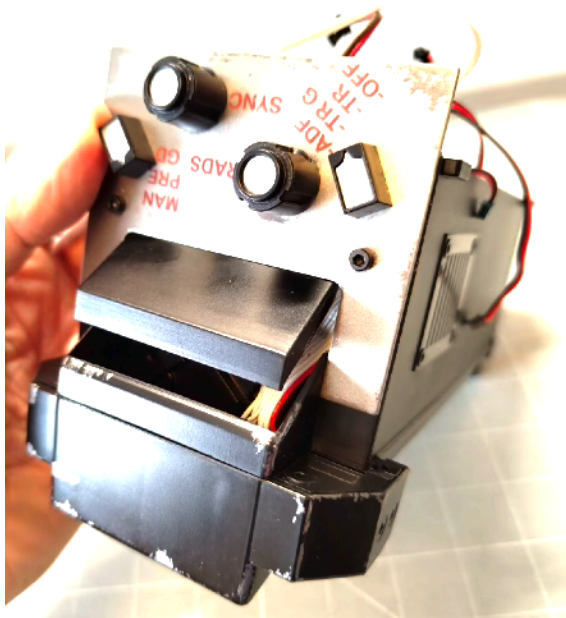
With this cable disconnected, you have freed the bottom plate from the rest of the cartridge. You are now safe to put this aside as we will not be needing this until reassembly.



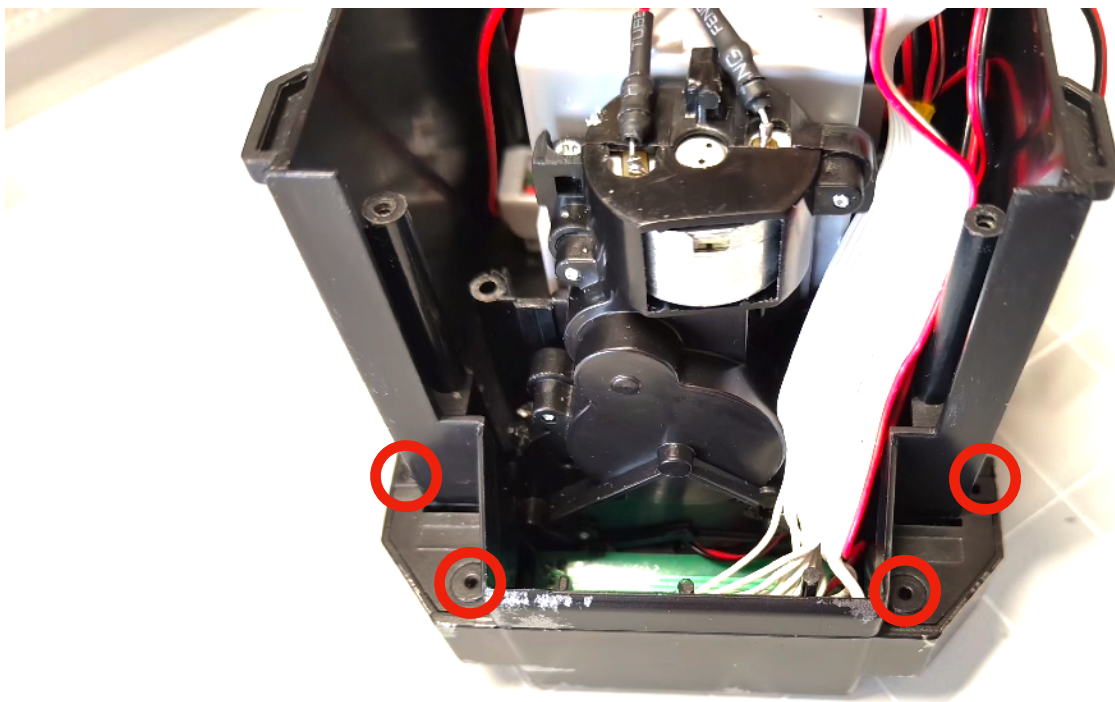
- Slide up the green main board further until you have access to all of the connectors. You will need to be very careful here as there are many fragile wires attached. As with everything in this installation, take things very slowly to avoid breaking any wires.
- Now disconnect the remaining eleven cables indicated by the **blue arrows** above, using the same method we used earlier. Note that you can leave the two white ribbon cables attached.



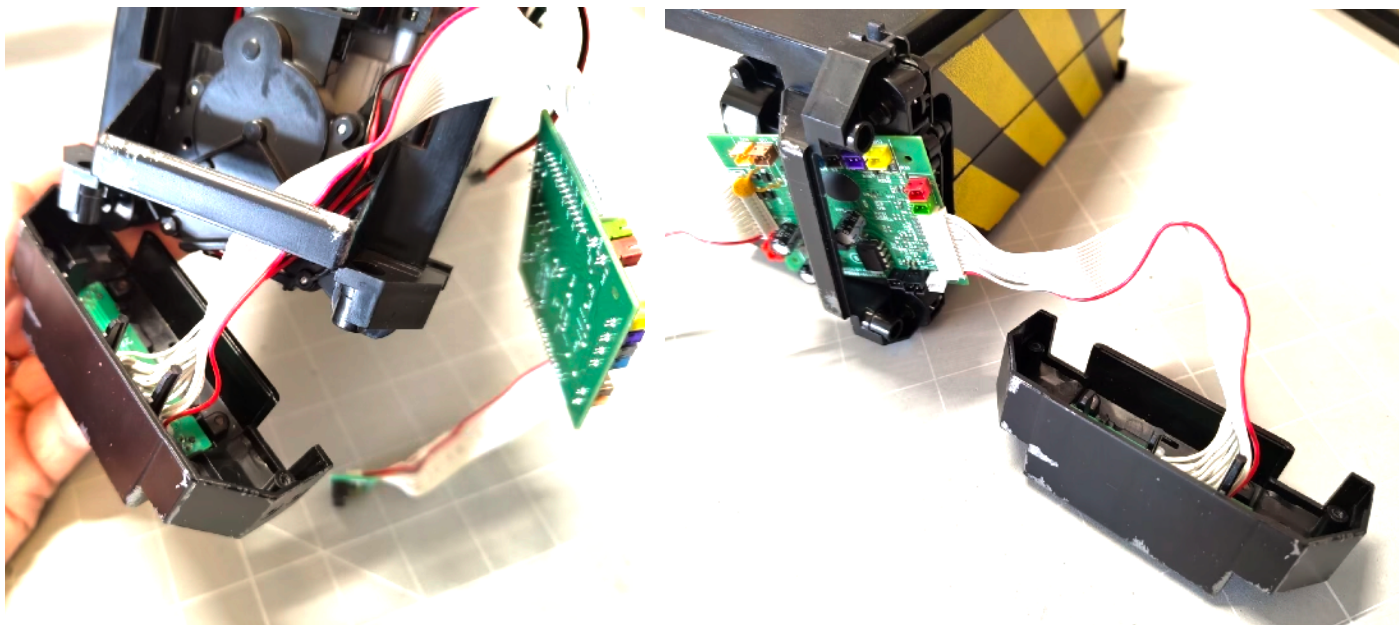
Leave the disconnected cables loose so that your main board appears as in the photo above.



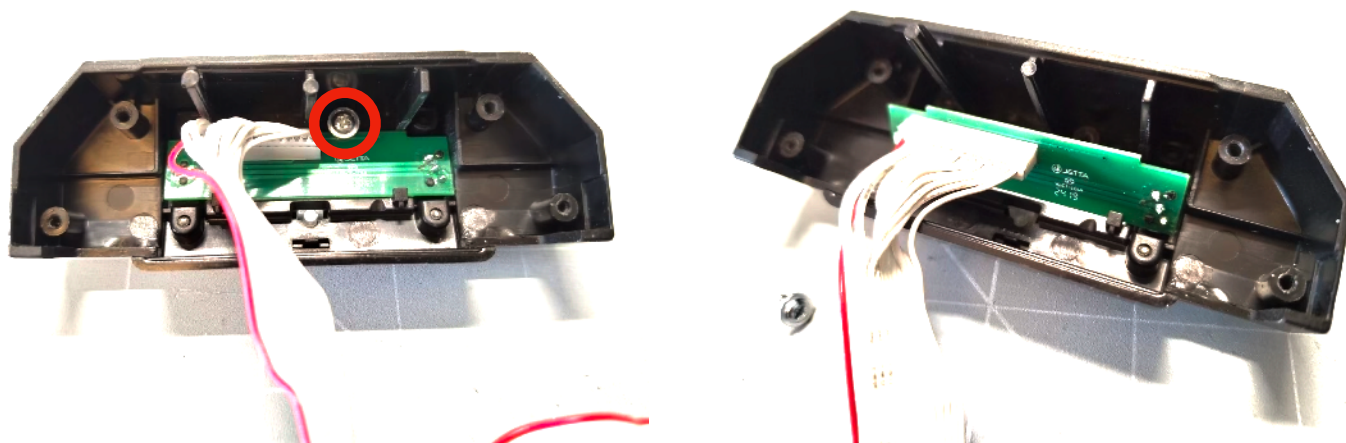
Now turn your attention to the front metal plate of the cartridge. You do **not** need to remove the two screws here. Instead, use your thumbs against two of the knobs and apply upwards pressure until the entire plate slides out. Be aware that there are two cables attached to the front plate, so be careful not to get these caught. Once the front plate has been separated, put this aside.



Using the methods we learnt in the first step, remove the caps and screws from the four positions indicated by the **red circles** above.

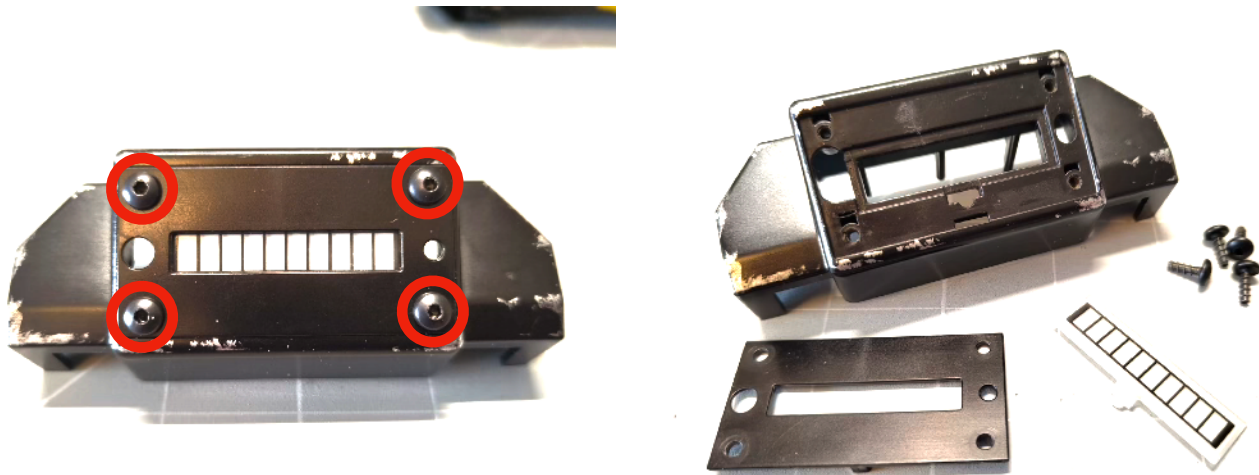


With the screws removed, you can now pull the bargraph section away. As you do so, pull the entire electronics assembly through the hole until it is separated completely from the cartridge.

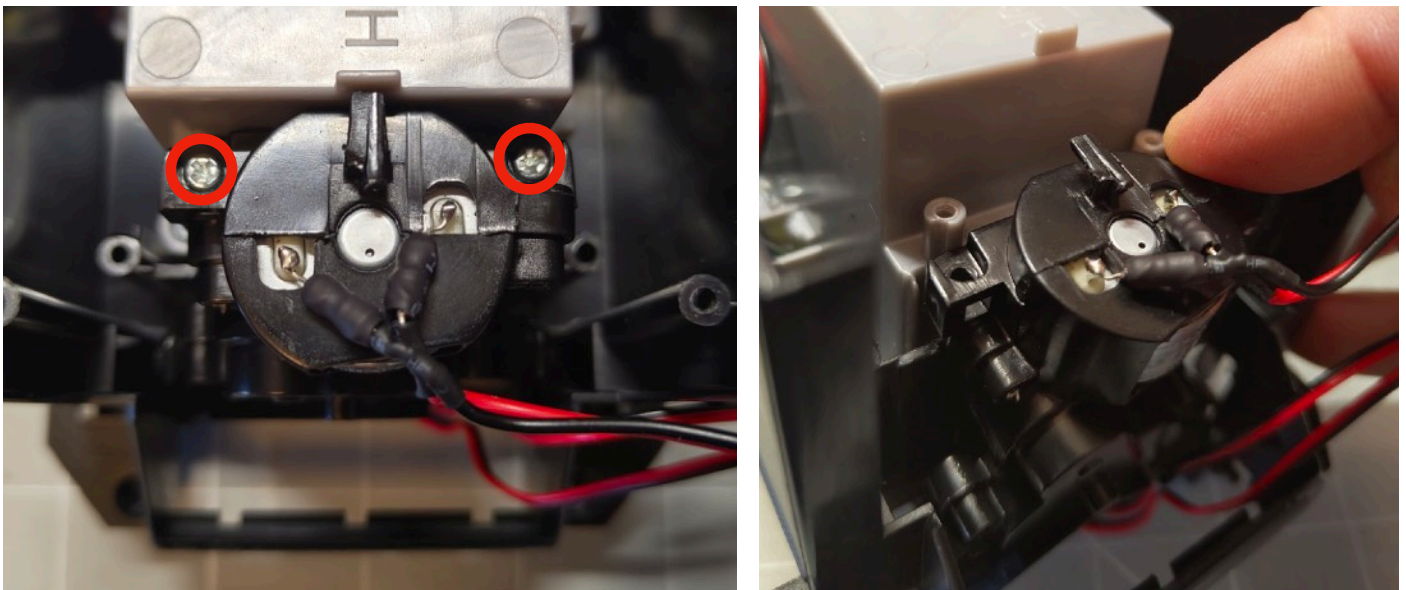


Remove the washer-head screw indicated by the **red circle** above. You can now take out the bargraph board by pulling up on its top edge. Be aware of the clips that hold the bottom edge of the board in place and be careful not to snap them.

You should now have successfully removed the main stock electronics from the cartridge. We recommend storing this away safely in an anti-static bag in case you ever need to restore your trap to stock in the future.

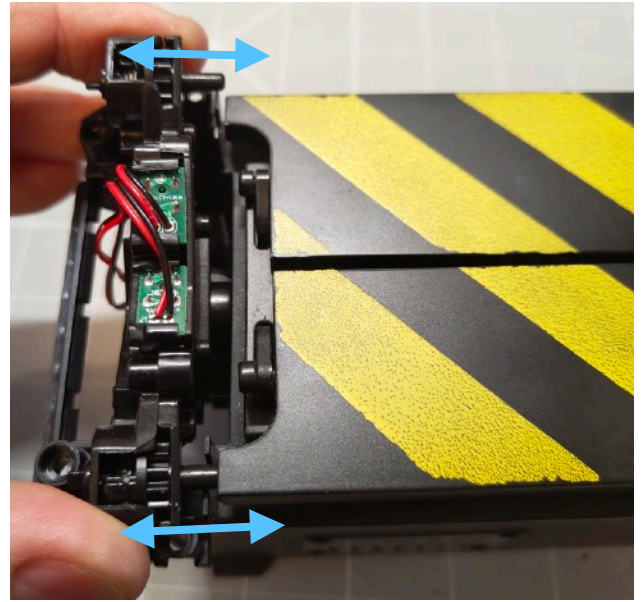
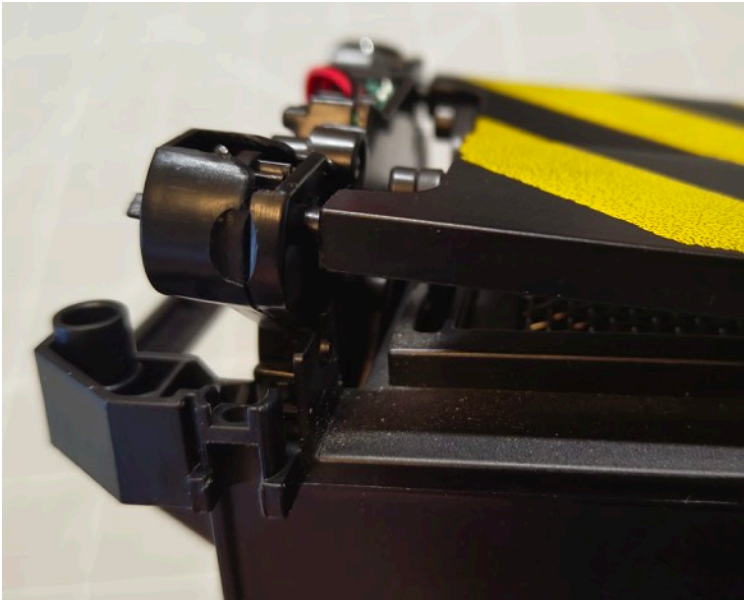


Use an allen key to remove the four button head screws from the face of the bargraph section as **indicated** above. You will find a light defuser inside which we will no longer require. Put the screws and the face plate aside for later.

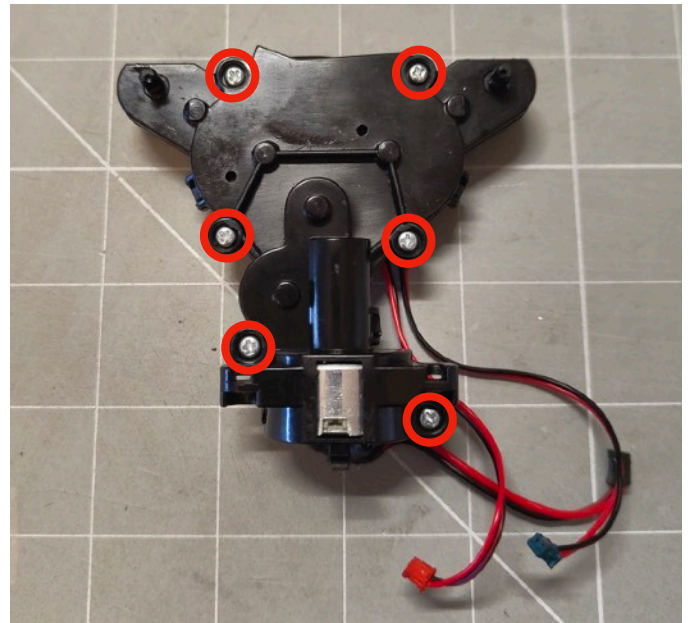
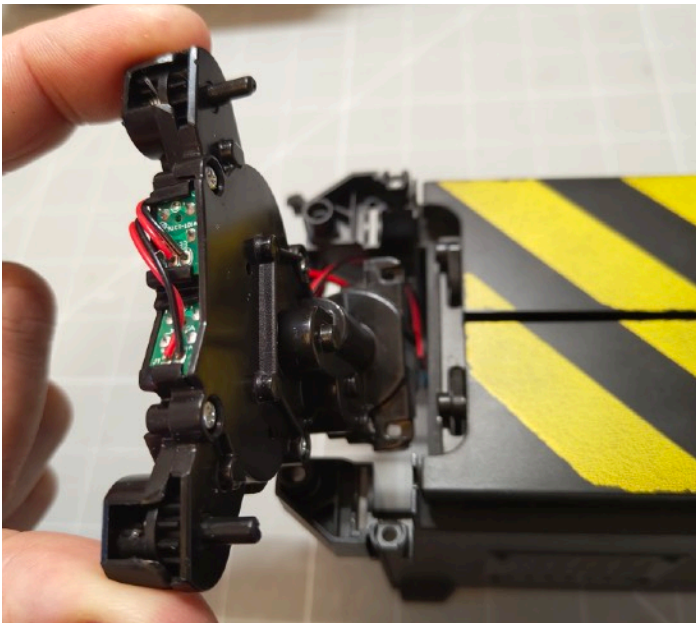


We now need to remove the door mechanism assembly so we can swap out the motor. Start by removing the two screws **indicated** above. Note that these screws are the longer type, so keep these separate from the others.

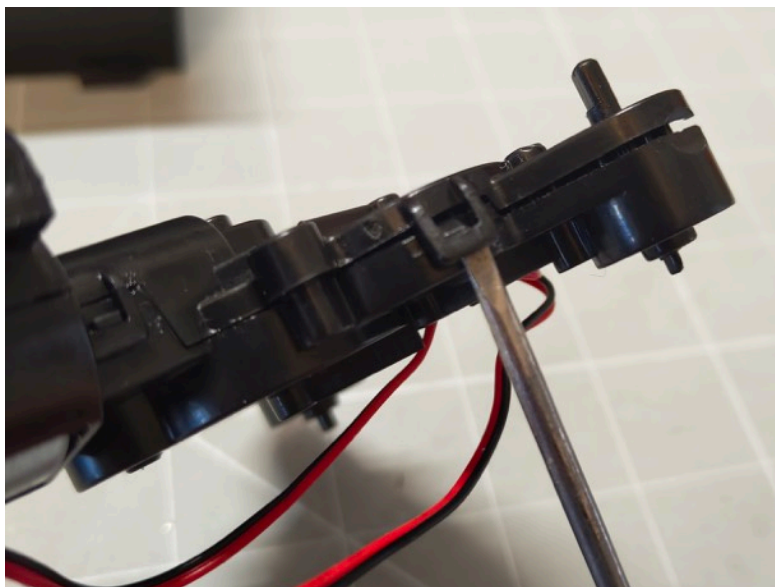
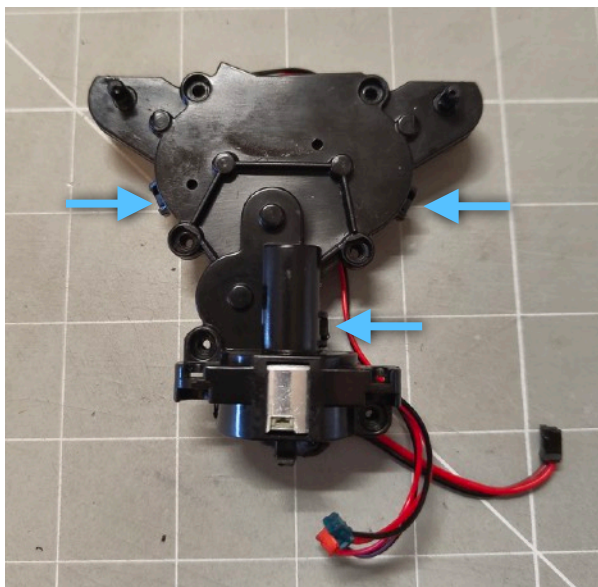
Once the screws are removed, gently pull the assembly away from the grey inner chamber until it is released from the screw posts it was attached to. Do not use too much force here as we want to avoid breakages.



Flip the cartridge over and push the mechanism assembly upwards so the end of the doors lift up slightly. Now separate the the mechanism by gently pulling the plastic rods out of the holes in the doors. These are fitted quite tightly so persevere until the mechanism is fully free.

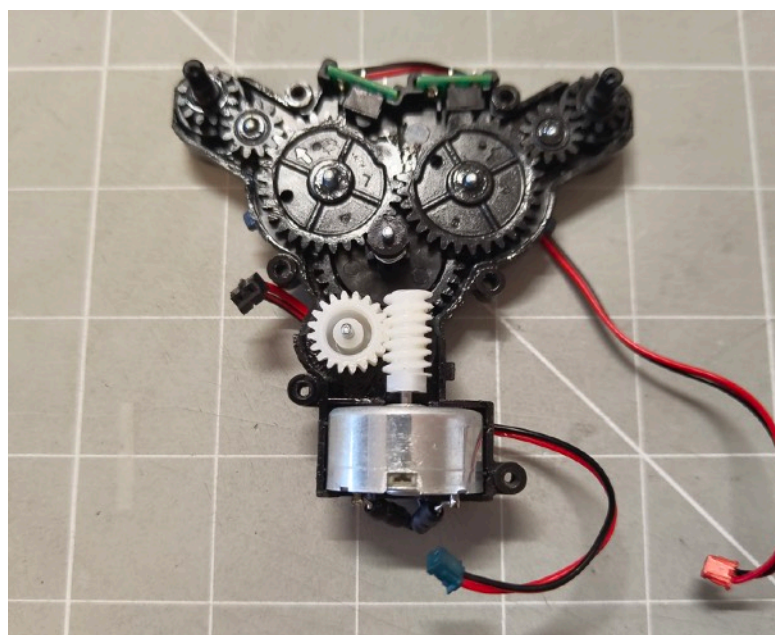
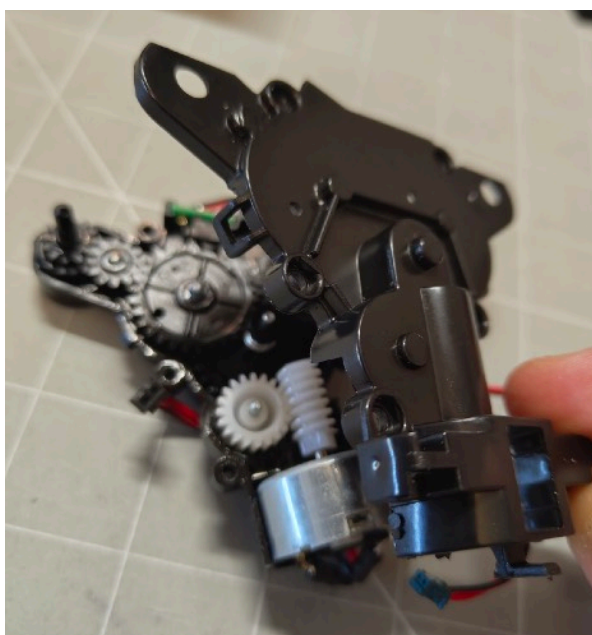


You will now be able to pull the entire mechanism out from the cartridge. Be careful not to pull on any of the attached wires as these can break easily. Once free, lay the mechanism flat on your bench and remove the six screws as **indicated** above.



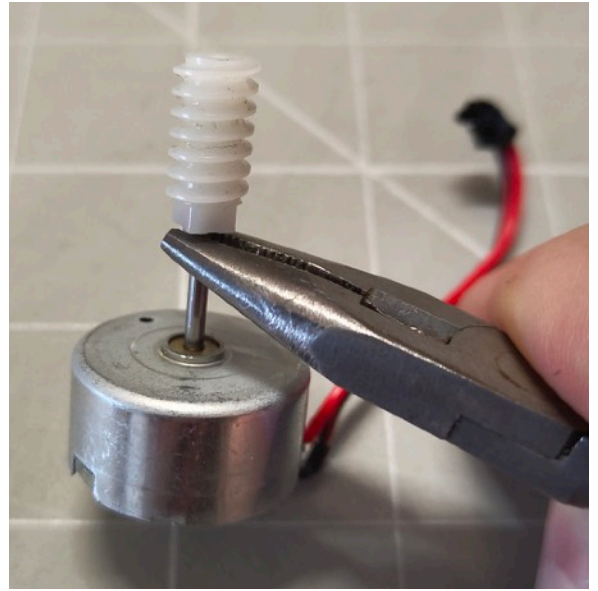
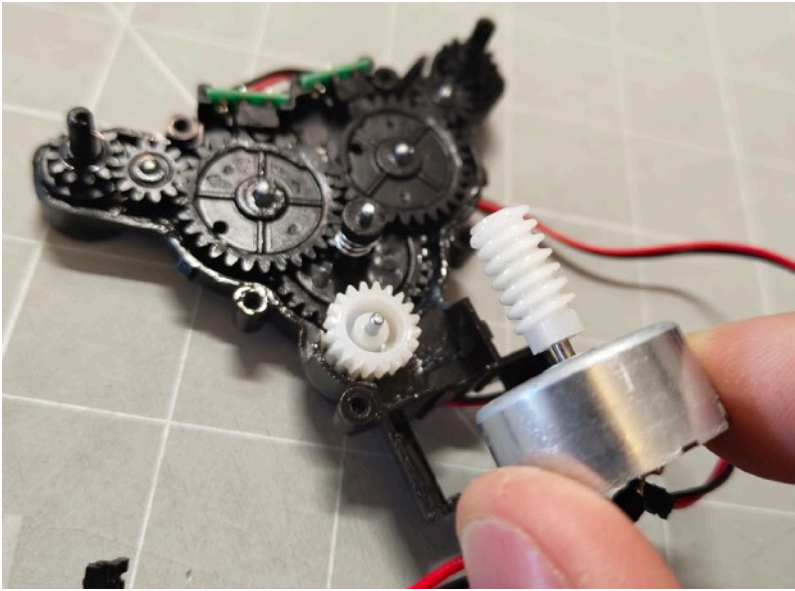
Before we can access the mechanism, we must first release the three clips along the side indicated by the **blue arrows** above. The easiest way to do this is to slide a small flat-headed screwdriver underneath and gently pry up until each clip releases.

Make sure you hold the mechanism in your hands securely as you do this, otherwise the top section may fly off and may cause the gears inside to fall out.



Lay the mechanism assembly flat on your bench once again and slowly remove the top plate. This will reveal the mechanism itself that includes eight plastic gears along with the motor that we will be replacing.

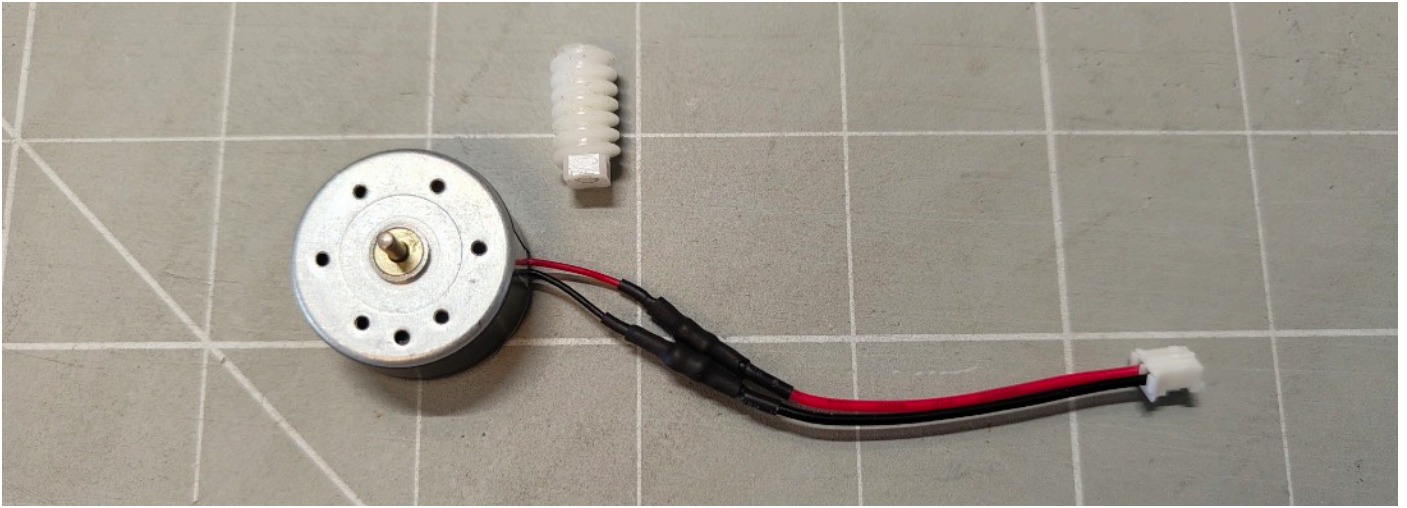
You must be very careful not to disturb the position of the gears or this may cause the doors to be misaligned when we reassemble the cartridge. We highly recommend taking a clear photo of this before continuing so you have a reference in the event of any gears becoming unseated. Pay attention to the position of the arrows on the largest gears as well as the position of the flat edges on the two protruding rods.



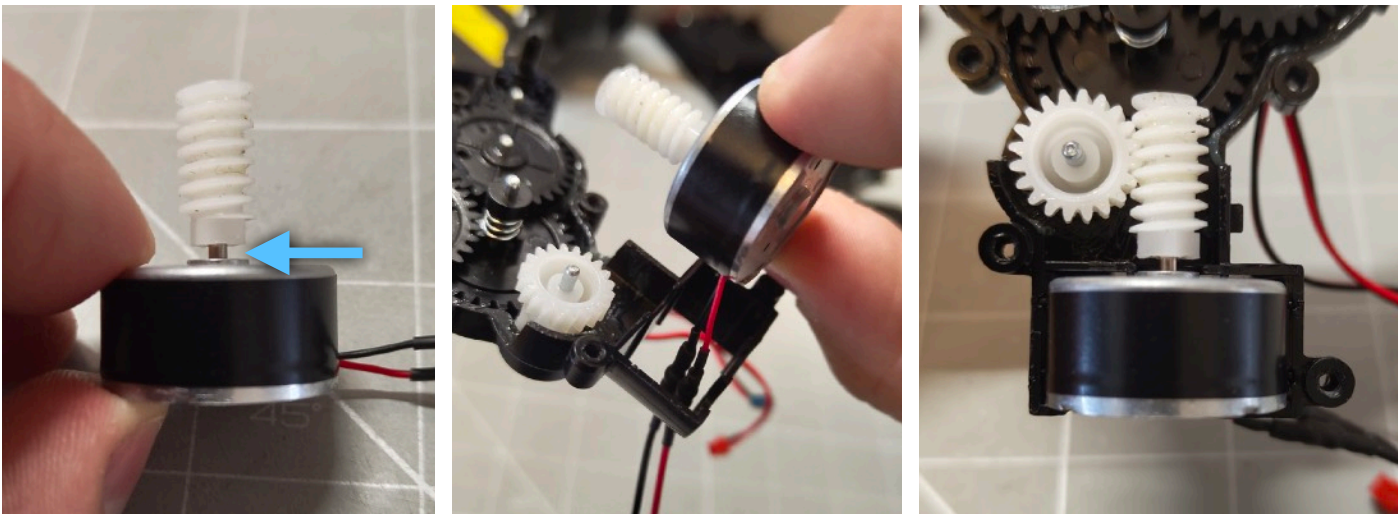
Now lift out the motor from the assembly and carefully place the rest of the mechanism to the side. Again, be careful to not disturb any of the gears as you do so.

With the motor separated, we need to remove the white plastic gear from the shaft of the motor. This will be fitted very tightly so you may need to use a pair of pliers at the base of the gear to carefully lever it upwards until it can be removed.

Congrats! You have successfully completed the cartridge disassembly. Now let's work in reverse and fit the new electronics...

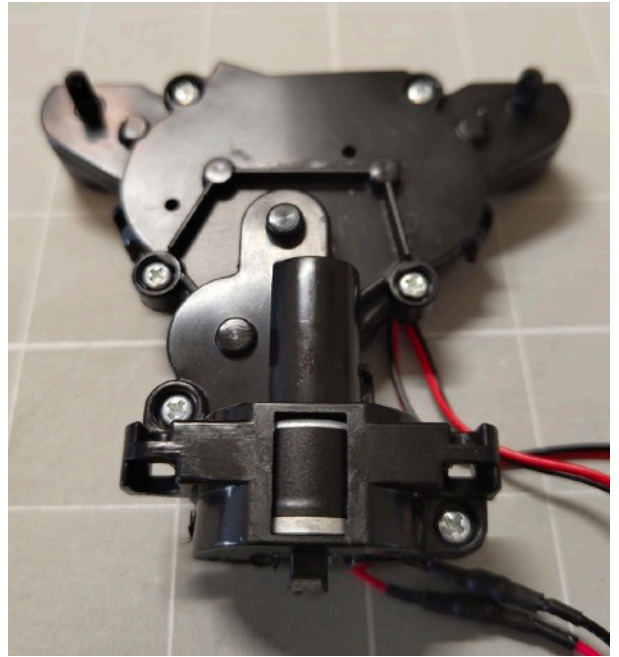


Let's begin the cartridge reassembly by fitting the replacement motor included with your kit...

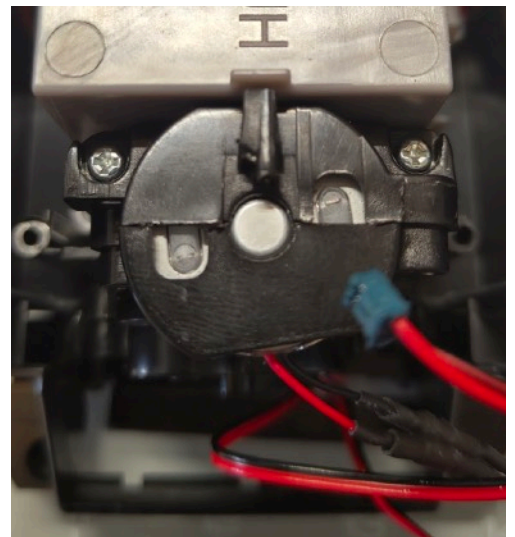
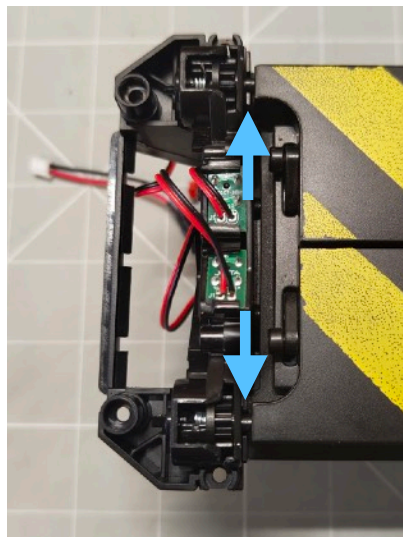
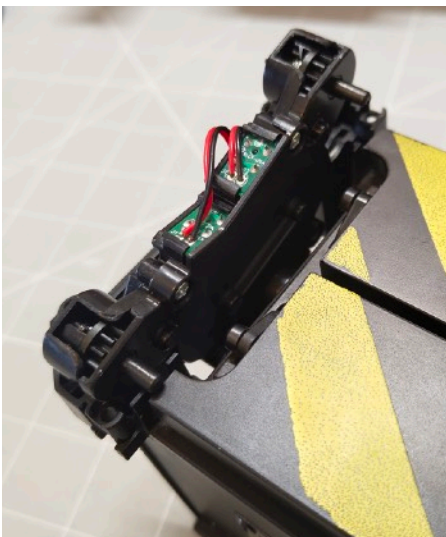


Push the white plastic gear we removed earlier on to the shaft of your new replacement motor. **Note that you must leave a gap between the bottom of the gear and the top of the motor as shown above** - this is to ensure there is no friction when the motor spins and prevent any unwanted noise when the trap's doors open and close.

Now feed the motor's wires through the hole in the mechanism enclosure and position the motor until it is seated and the two white plastic gears are fully engaged. We recommend using your finger to rotate the vertical gear slightly to make sure the mechanism is working correctly.



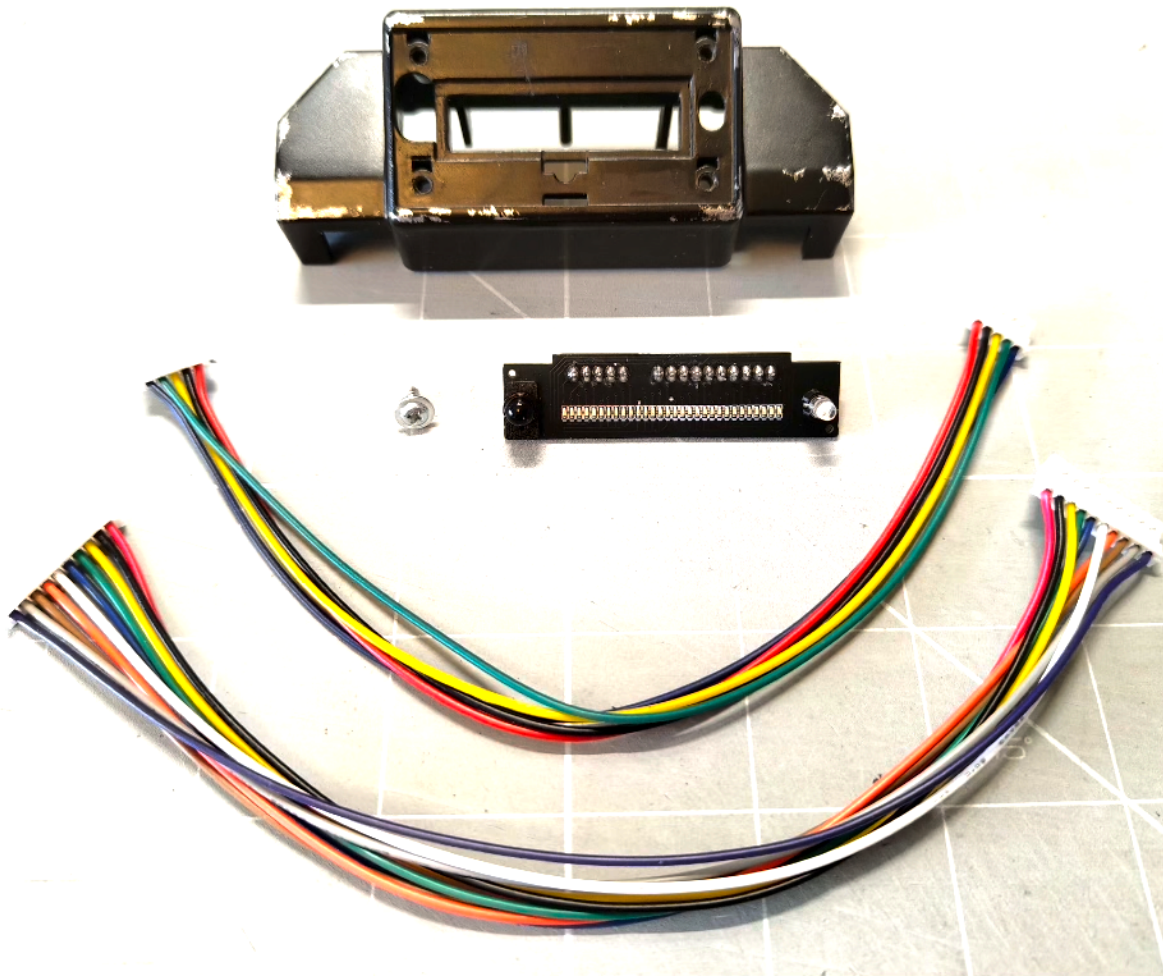
Once you are happy that the motor is correctly installed, replace the top plate of the mechanism assembly and press both parts together until the three clips snap shut. Finish off by replacing the six screws.



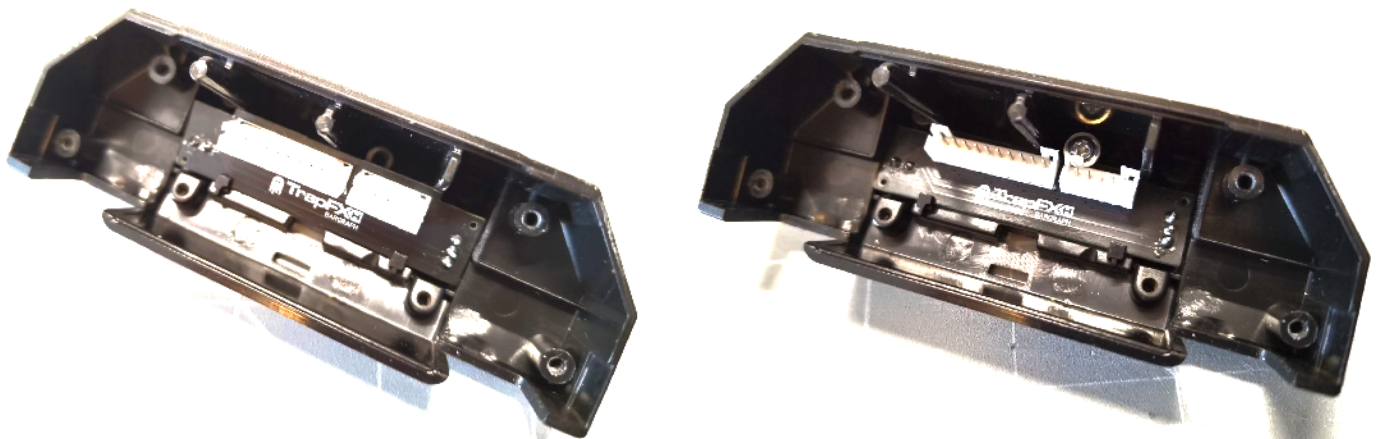
Loosely place the mechanism assembly through the hole in the cartridge until the two rods sit just above the doors. You can now reinsert the rods into the ends of the doors. Remember that each rod has a flat edge and the holes in the doors are keyed so the position must be correct before the rods can be fully inserted. This may take a little bit of awkward wiggling to get right, but once in place you will be able to push the entire assembly down until the doors sit flat.

Make sure there is a sufficient gap between the doors and the mechanism as shown by the blue arrows above. This will ensure that the doors are able to move freely when opening and closing.

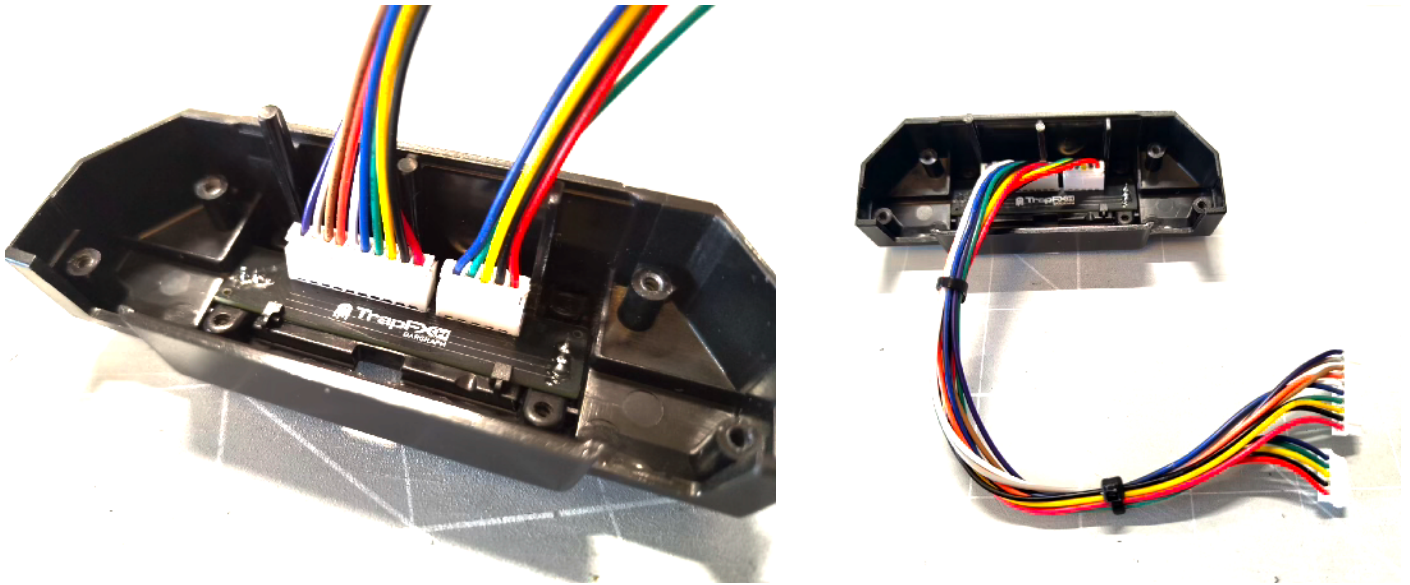
Finally, flip the cartridge over and replace the two longer screws to secure the mechanism to the inner chamber.



Start with the shell of the bargraph section and the washer-head screw, along with the bargraph board, the 10-wire cable and the 5-wire cable from your TrapFX kit.



Insert the new bargraph board by hooking the bottom edge underneath the two plastic clips, before pushing down on the board until it snaps into place. Secure the board by replacing the washer-head screw.



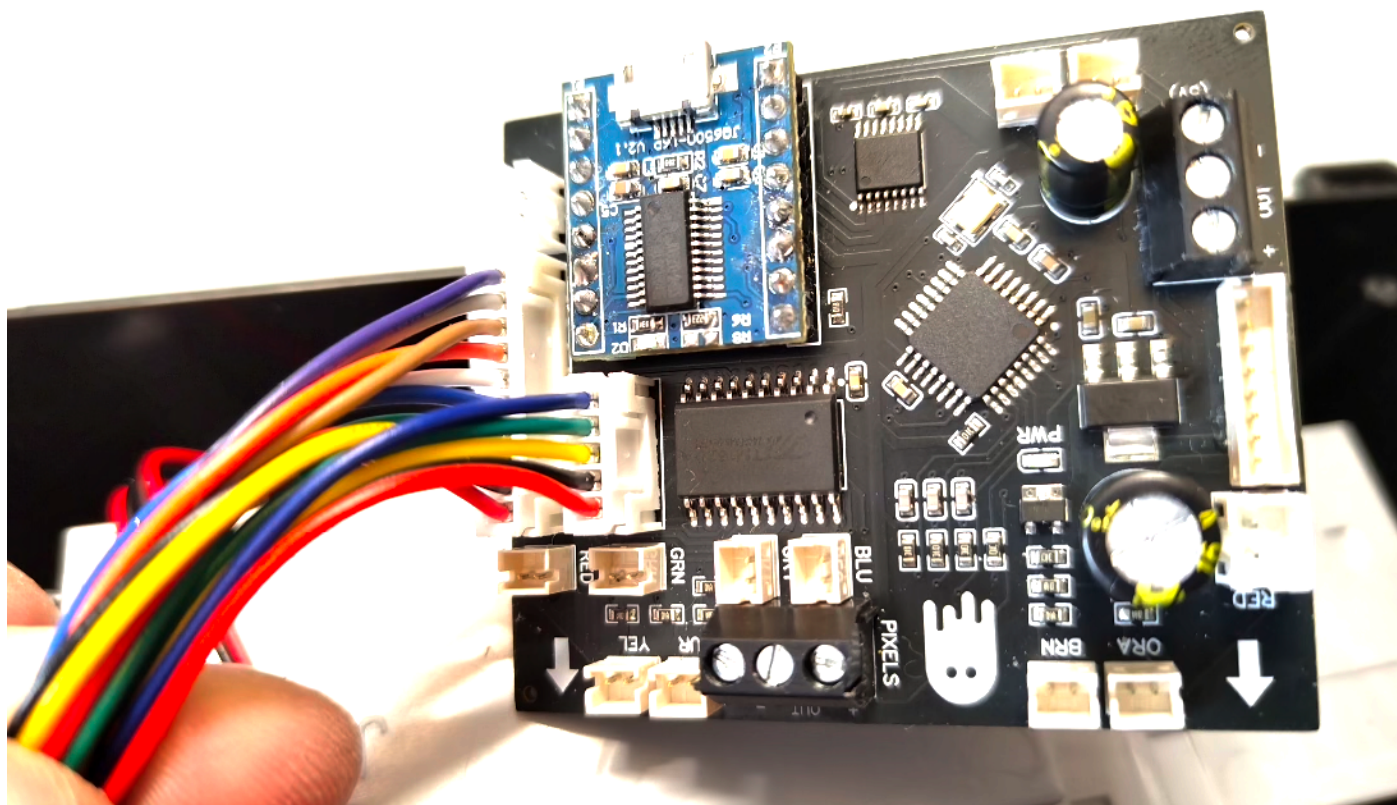
Connect the two cables to the bargraph board until they are both fully seated inside the connectors. Note that these can only be inserted one way, so make sure this is correct before pushing them down.

We recommend using a couple of cable ties or some pieces of electrical tape to tie the two cables together as shown above. This will keep things neater and make your cable management a little easier later on.

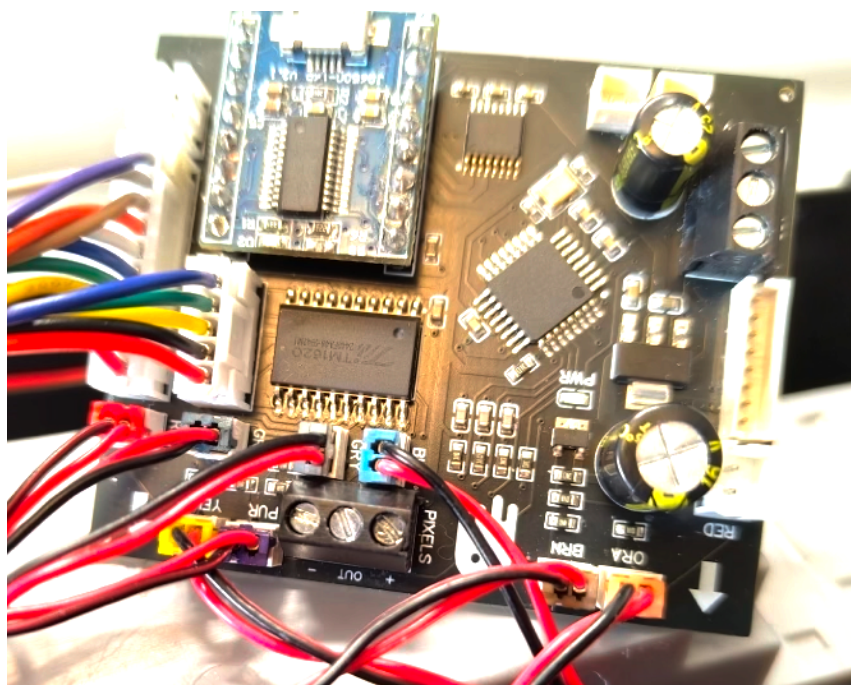
Note that we will not be fitting the bargraph diffuser lens and face plate just yet - we will do this later once all the electronics are installed in both the cartridge and chassis.



Thread the cables through the front hole in the cartridge and reattach the bargraph section by replacing the four screws and caps we removed earlier.



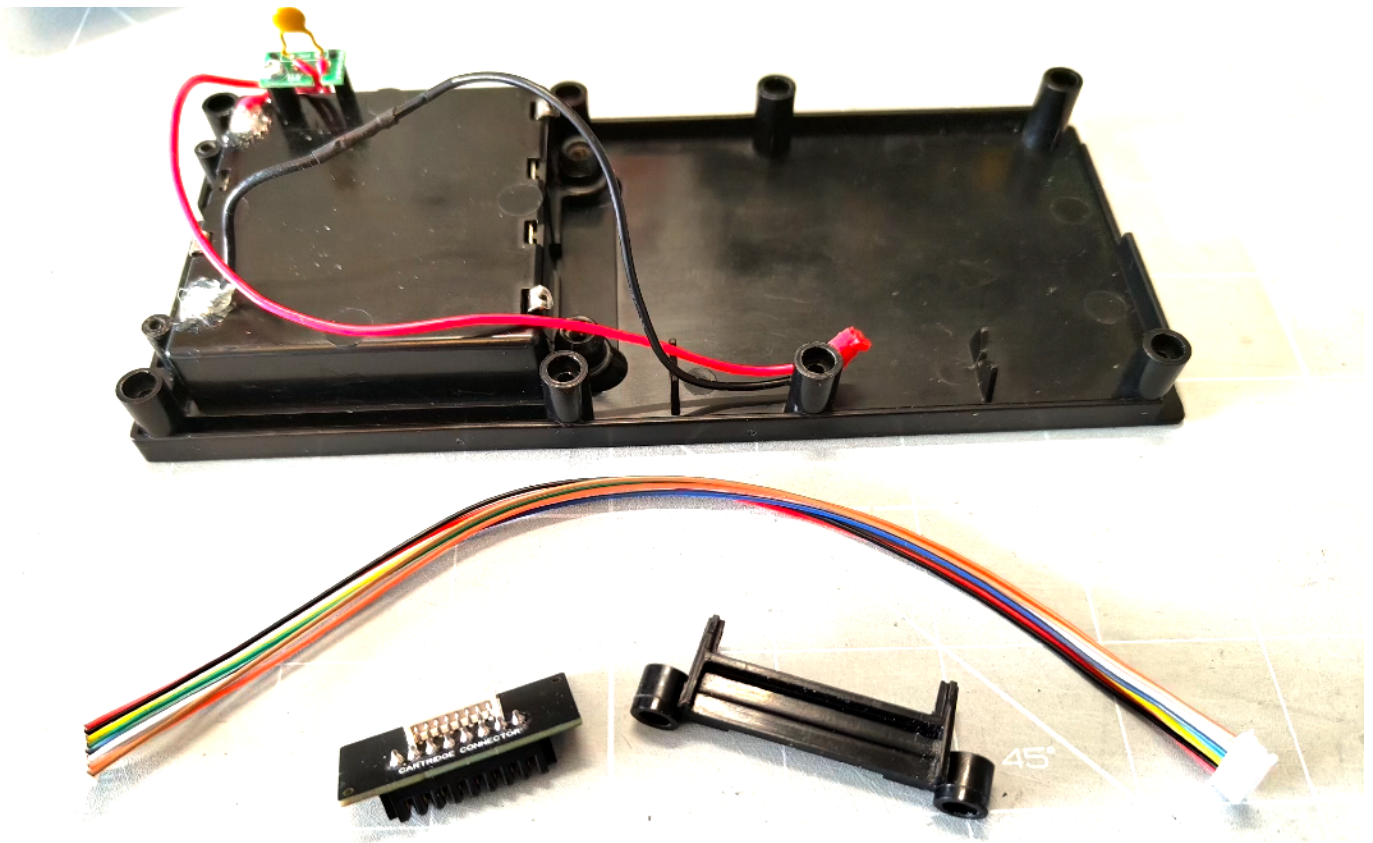
Find your new TrapFX main board and position it above the open cartridge with the two white arrows pointing downwards. Connect the two cables from the bargraph to the appropriate connectors on the board as shown above.



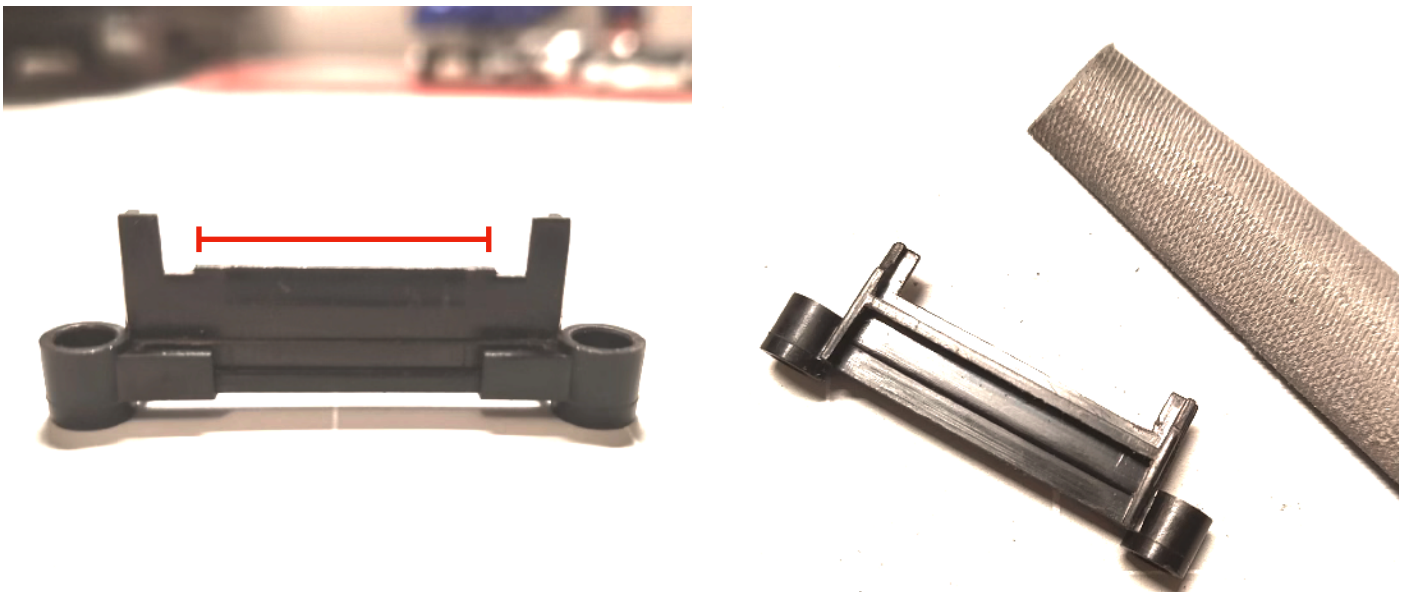
COLOUR CONNECTOR KEY:

RED	=	Red	(motor assembly)
GRN	=	Green	(motor assembly)
YEL	=	Yellow	(chamber LED 1)
PUR	=	Purple	(chamber LED 2)
GRY	=	Grey	(chamber LED 3)
BLU	=	Blue	(chamber LED 4)
BRN	=	Brown	(chamber LED 5)
ORA	=	Orange	(chamber LED 6)

Now connect the eight colour coded cables that are currently loose inside the cartridge. Unfortunately, we have been unable to include matching coloured connectors but we have labelled each one on the board itself. These should be self-explanatory but please check the connector key above as it is essential that these are attached to the correct connectors to prevent any damage to your trap electronics.

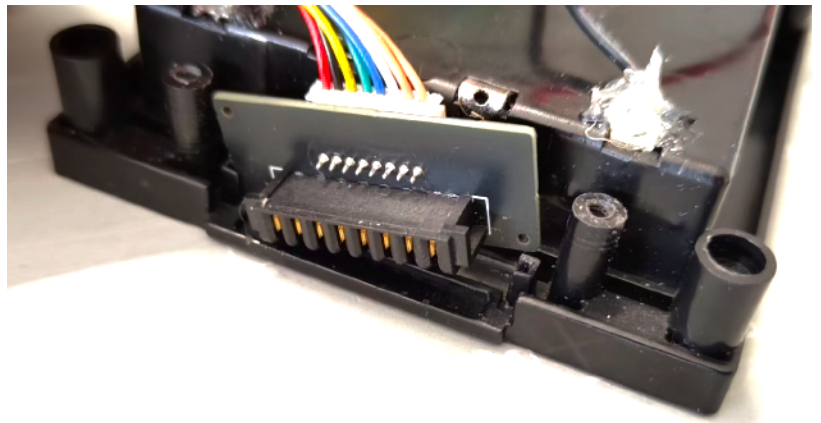
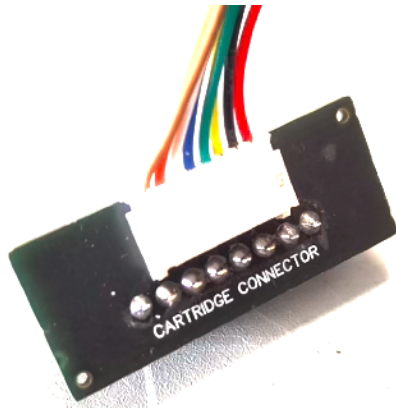


Retrieve the cartridge's bottom plate and find the new cartridge connector board along with the plastic holder and one 8-wire cable.

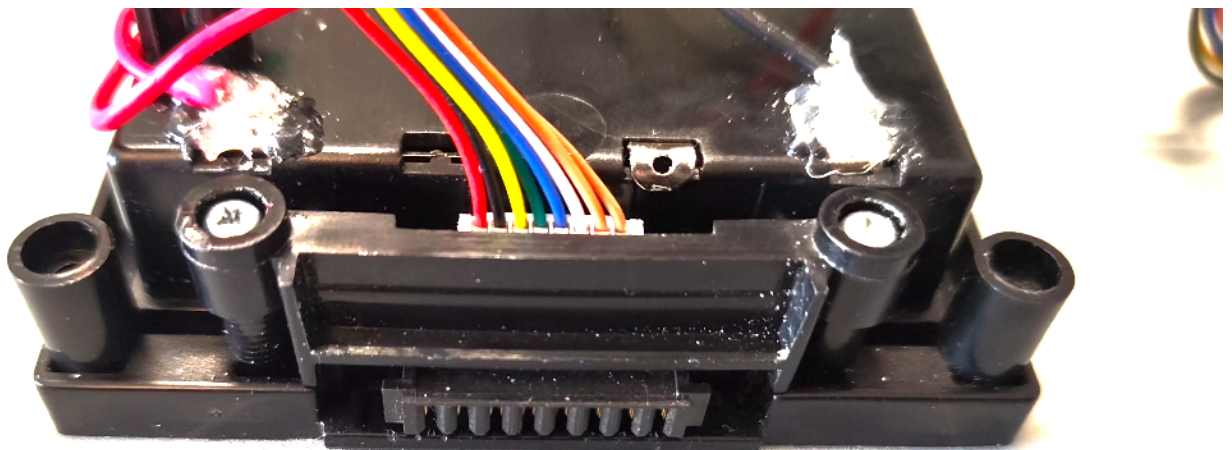


Before we can proceed, we need to do one very slight modification to the plastic holder. Take a look at the first photo above and you will see a raised lip in the centre. We need to remove this lip so that it has a flat edge - this is because the new pin connector is very slightly taller than the stock one used by Hasbro and will otherwise cause problems with closing the cartridge back up.

Use a flat file to remove the plastic so that the edge is flat as shown in the second photo above. If you do not have a file, you may use a sharp knife to cut this off. Don't worry though - this is the only physical modification we will need to make to your trap.

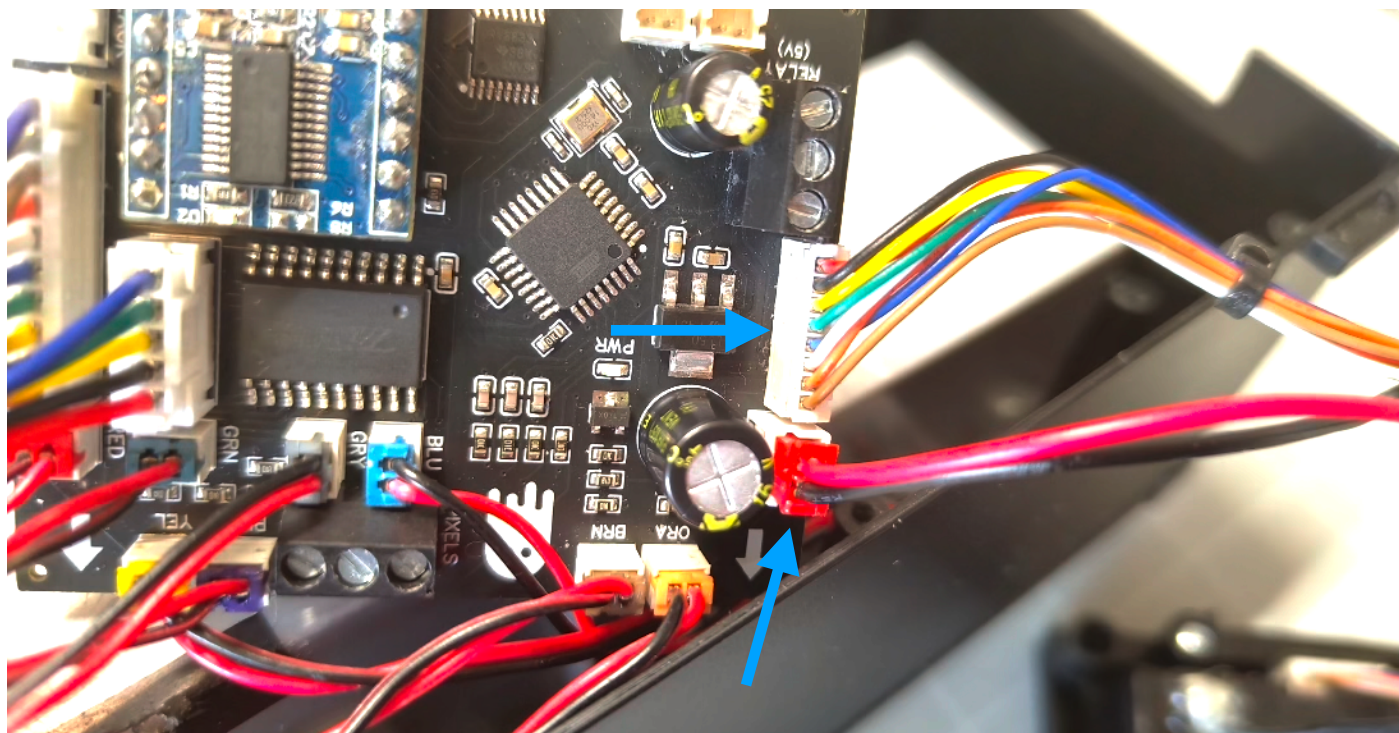


Connect the 8-wire cable to the connector board. Note that there are two similar looking connector boards included with your kit, so make sure you are using the one labelled **'CARTRIDGE CONNECTOR'**. Now insert the board into the slots on the bottom plate with the black pin connector facing outwards.

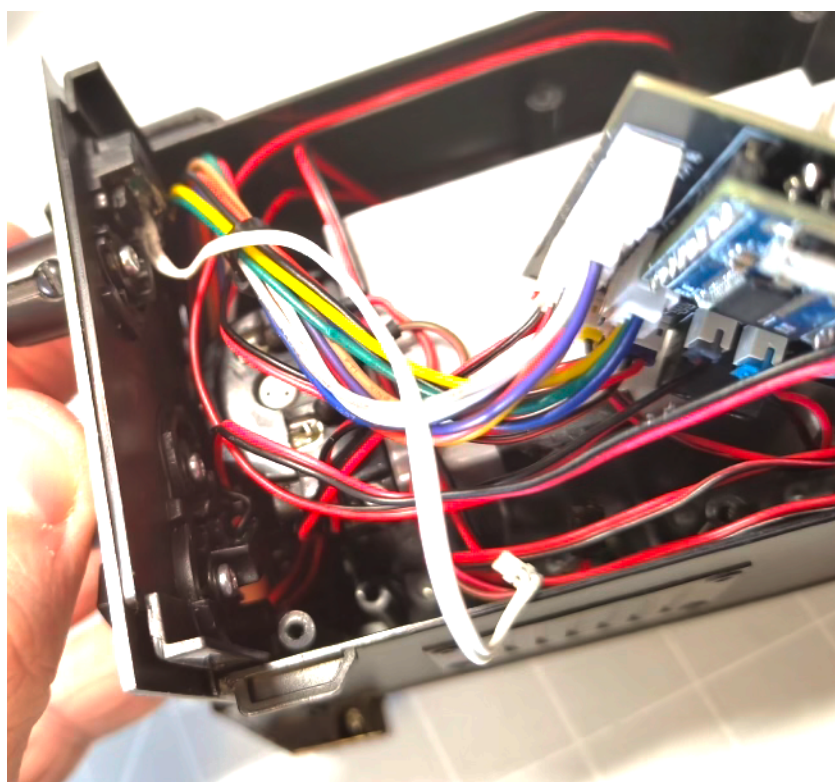
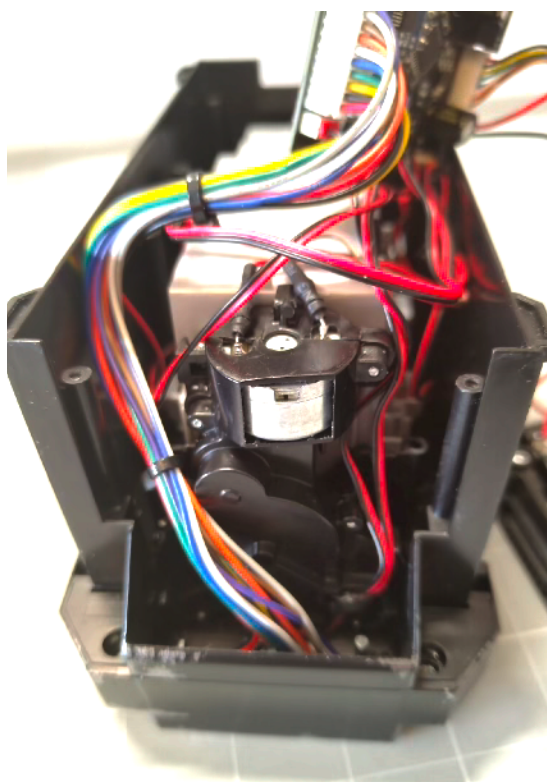


Now replace the newly modified plastic holder so it slots over the connector board and screw it back into place. This should sit flush against the board - if it is bulging when you screw it down, you may need to remove a little more plastic as per the modification instructions.

Again, we would recommend adding a couple of cable ties about the coloured wires to help with cable management later.

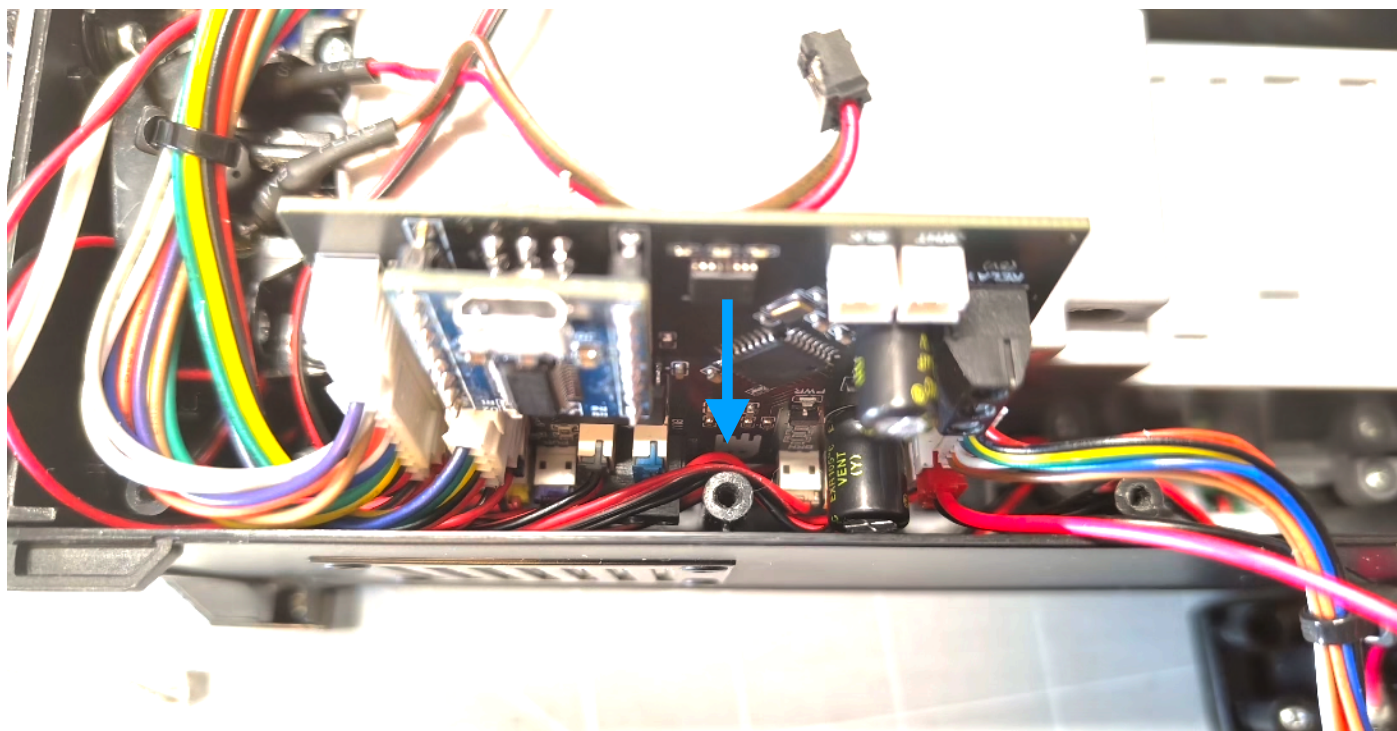


Return to the main circuit board and connect the 8-wire cable and the battery cable to the connector labeled **RED** as shown by the **blue arrows** above.



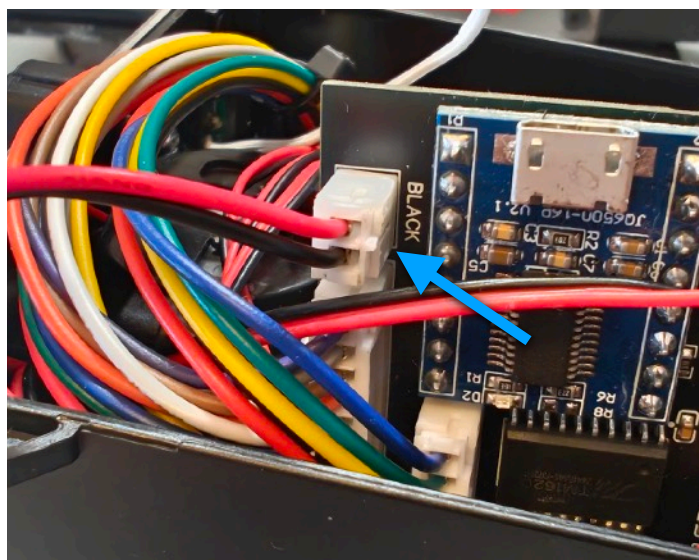
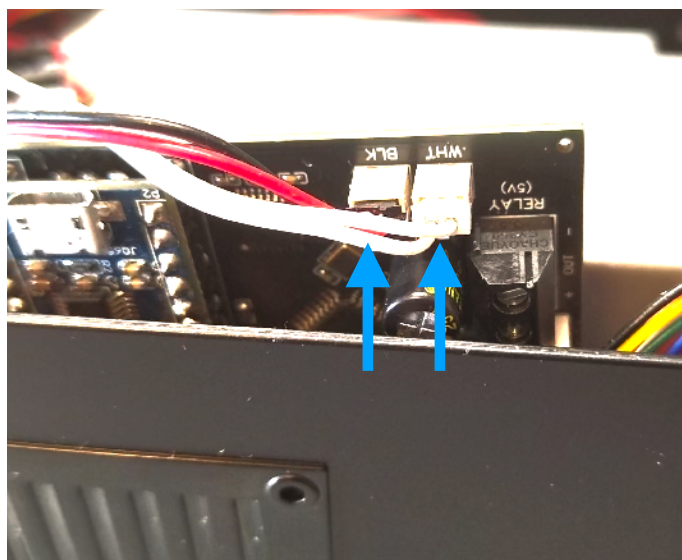
Now arrange the bargraph wires as shown above and slide the metal front plate back into place.

IMPORTANT - There are many delicate wires here so take your time and be careful not to pull or pinch any of them when replacing the front plate. Also make sure the cables attached to the front plate are accessible and not buried inside the cartridge once the plate has been replaced.



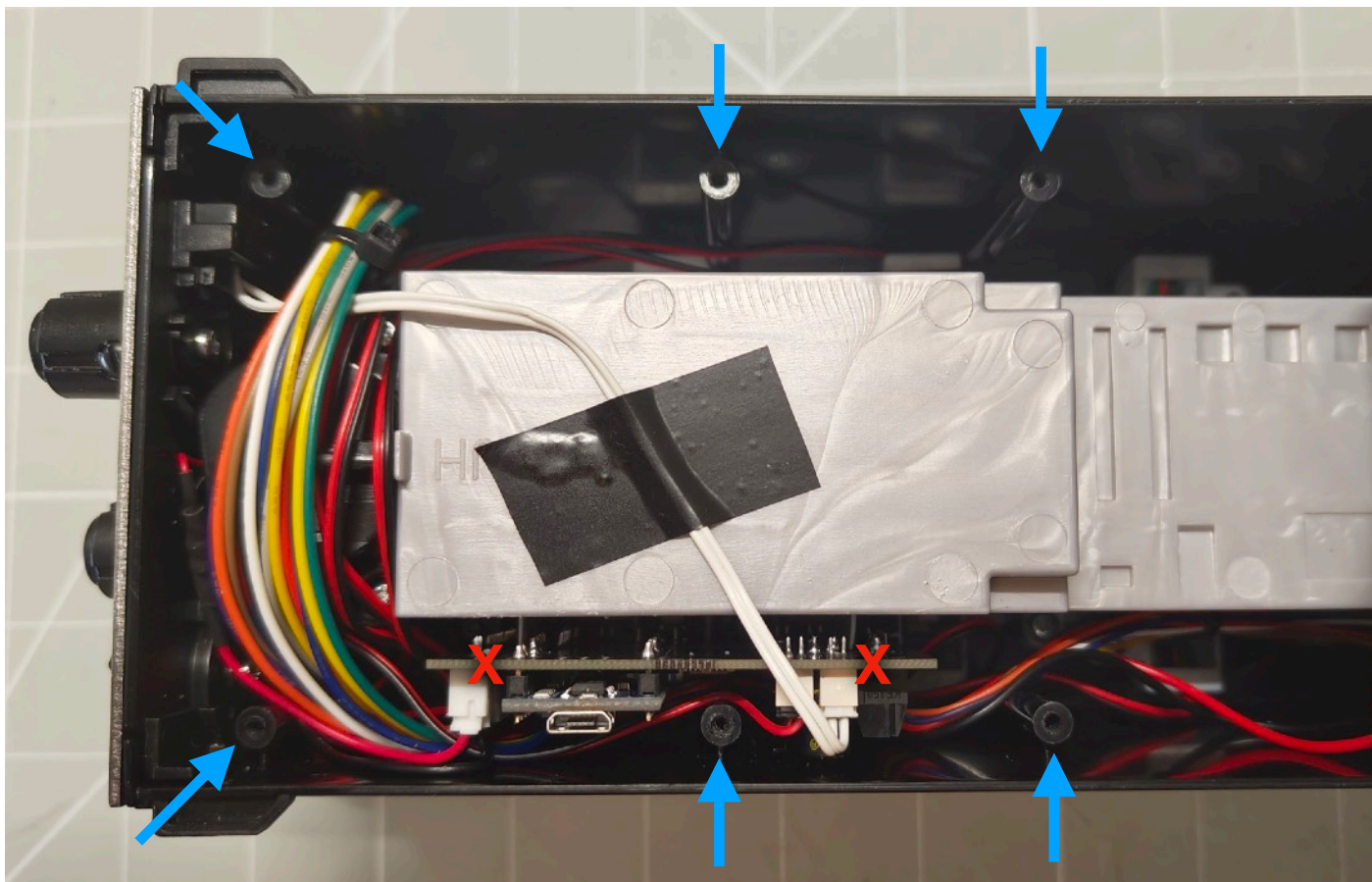
Now for the fiddly bit. We need to start inserting the main board into place. This can be a little tricky as there are so many wires in this area of the trap so, once again, take your time with this to avoid any accidental breakages.

The most important thing to make sure of it that the wires close to the round post are wrapped around it as shown in the photo above. If they are between the post and the outer wall of the cartridge, they will likely be badly pinched when we close it back up.



Leave the top half of the board sticking out as we still need to connect a few more cables... Connect the two cables from the metal front plate (white plug to **WHT** and black plug to **BLK**).

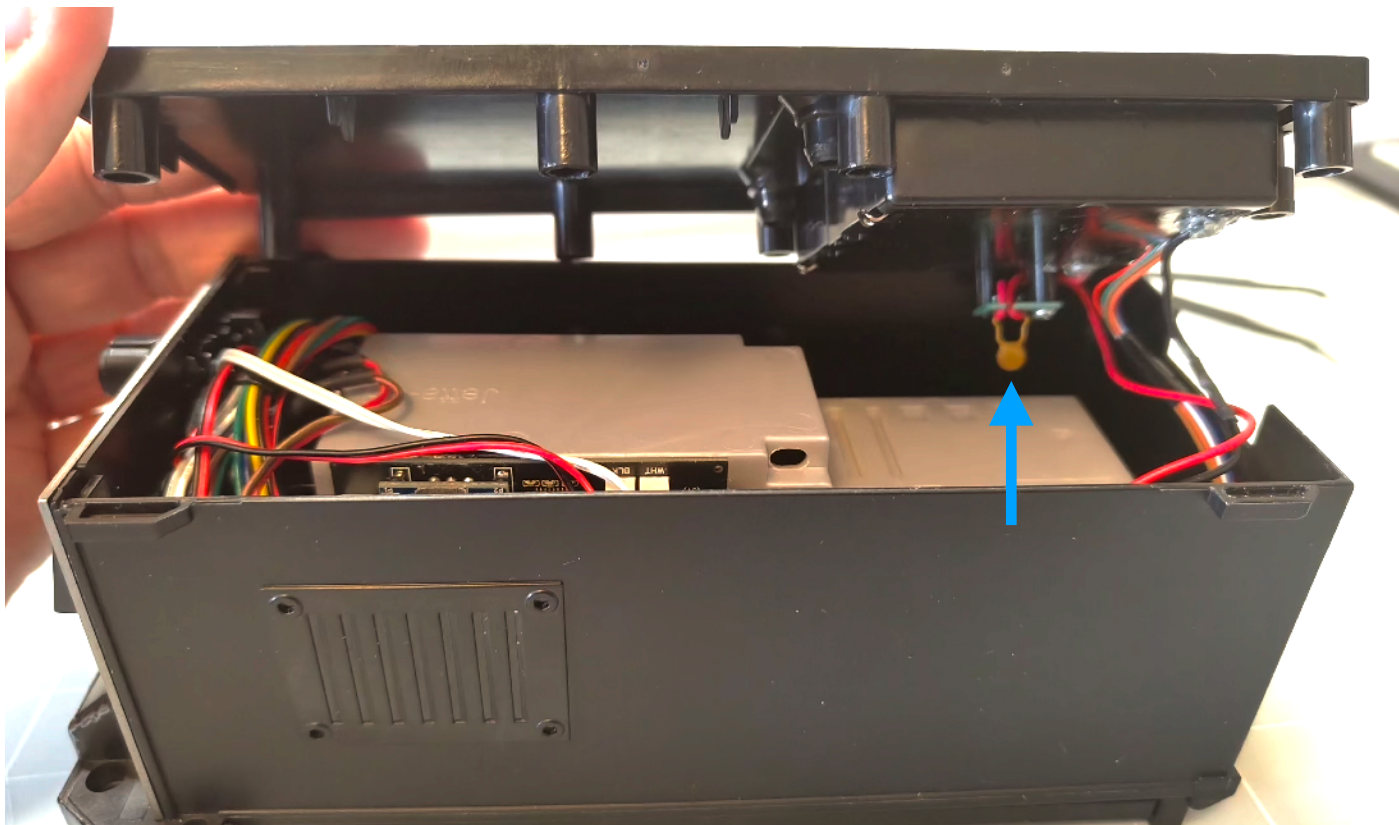
Finally, connect the cable from the installed replacement motor. This plug will be white in colour, but you will need to attach this to the connector labelled **BLACK**. This mislabeling is due to the last minute inclusion of a motor in the TrapFX kit and will be corrected for future runs.



Once you are happy that all connections are correct, lower the main board into place until the bottom edge sits flush in the slots inside the cartridge. This may take a some careful cable management as the rat's nest of wires can make this tricky. Pay close attention to the wires running deep inside the cartridge as these can become caught when lowering the board and prevent it from being seated correctly.

Again, make sure no wires are sitting behind the plastic posts indicated above by the **blue arrows**. They must be routed around so that the posts are not blocked and fully visible as shown. Failure to do this will cause damage to the wires when closing up the cartridge.

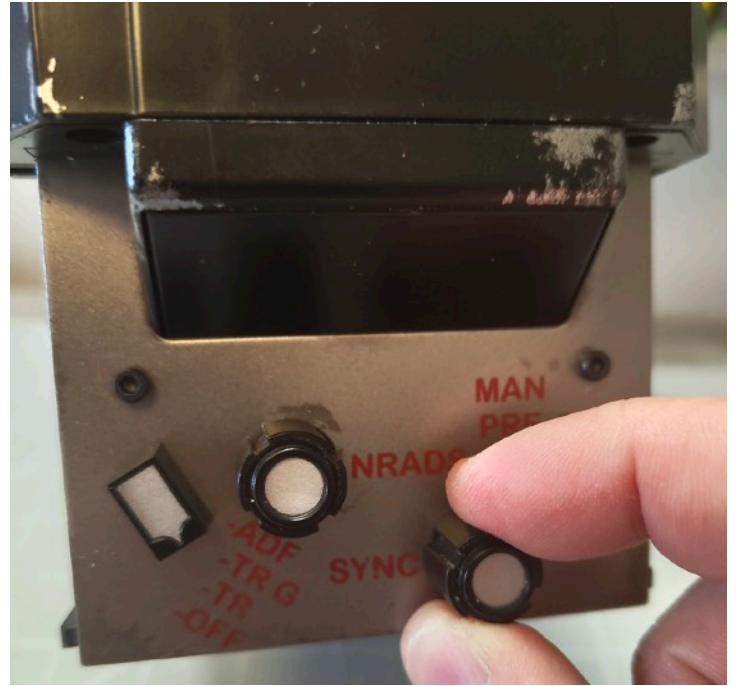
You should also avoid any wires trailing over the top of the TrapFX board in the areas marked by a red **X**, otherwise they will become badly pinched when replacing the bottom plate. If you need to route the white cable over the top, do so by securing with a piece of electrical tape as shown above.



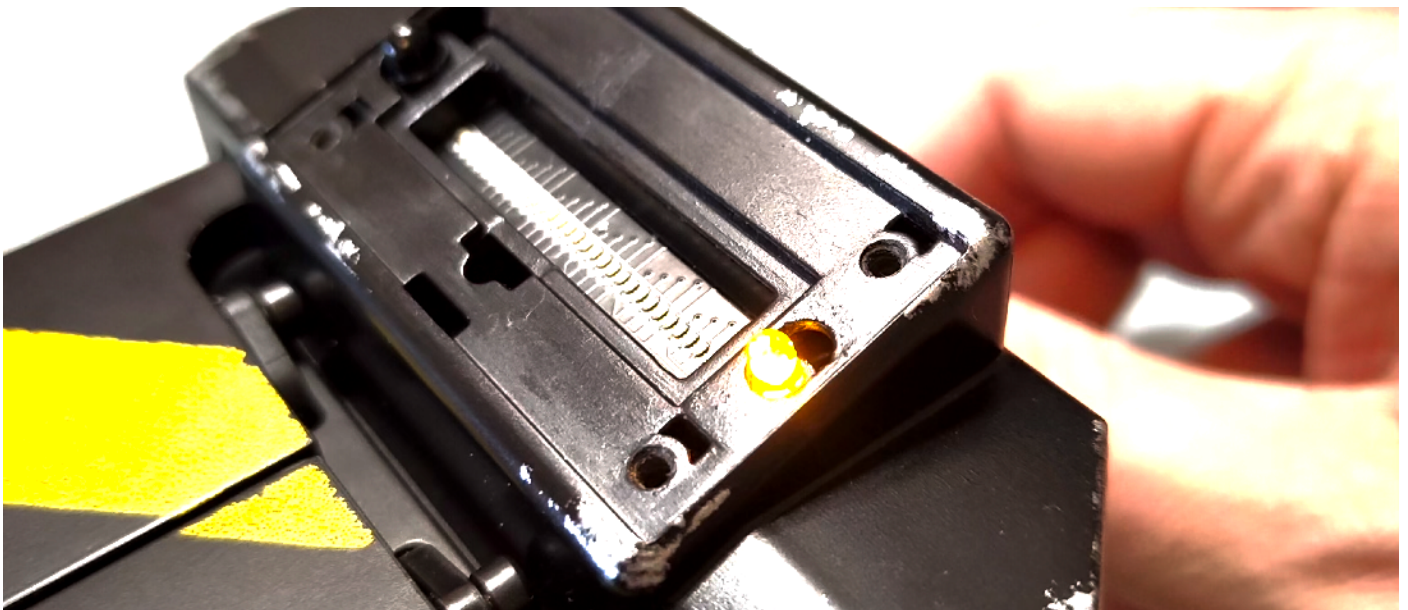
Okay, let's finish up by closing up the cartridge. Make sure the wires attached to the battery box and connector board do not obstruct the posts inside the cartridge. Also be wary of the yellow fuse component (indicted by the arrow above) - this should remain in a vertical position. If it has been bent over, carefully reposition before lowering the bottom plate.



The bottom plate should fit back into place easily and sit flush with the bottom edges of the cartridge. If there is any resistance, you may be pinching a wire. In this case, open up the cartridge again and check the position of your wires until the bottom plate sits correctly.



Before replacing the screws, let's do quick test of the electronics to make sure everything is as it should be. Insert your four AA 1.5V **Lithium-ion** batteries into the compartment, turn the cartridge over and rotate the front knob labelled '**SYNC**' clockwise.



Once the knob has been rotated, you should see the yellow indicator light next to the bargraph illuminate, followed by rapid flashing. If the light comes on, then you are done! Rotate the front knob anti-clockwise to turn off the cartridge. If no light illuminates then you may need to re-check your connections inside the cartridge and try again.

If you plan to install optional NeoPixel LEDs and/or a smoke kit inside the cartridge chamber, then leave the bottom plate unsecured and follow the next sections of the guide. Otherwise, you are safe to replace the screws to secure the bottom plate and battery door and proceed to the [Chassis Installation](#) section of the guide.

NEOPIXEL INSTALLATION (OPTIONAL)

With TrapFX, we have added the ability to drive up to eight individual NeoPixel LEDs for additional multicolour lighting effects during the capture sequences. These new lighting modes can be activated in the settings menu and work in conjunction with the six built-in white LEDs already found inside your trap.

What are NeoPixels?

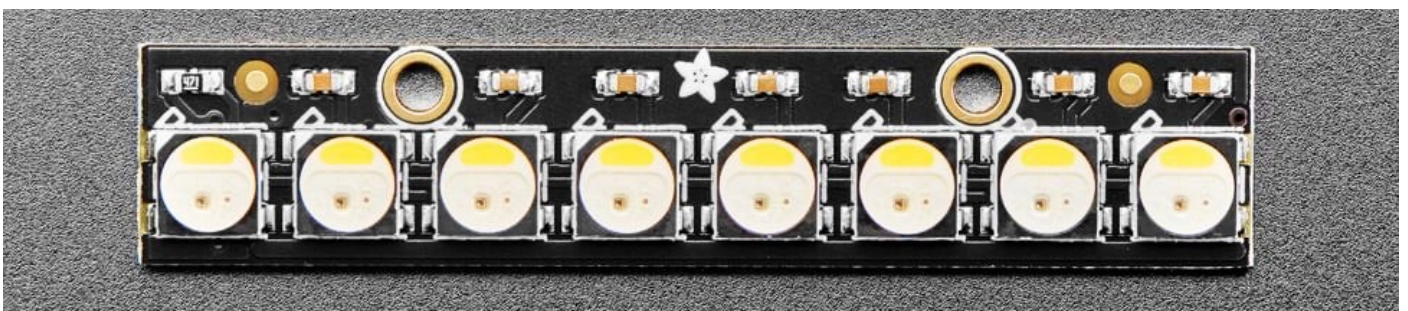
‘NeoPixel’ is a name coined by the electronics company Adafruit to describe their range of smart LED products. They are normally found in a small 5mm x 5mm square form factor and can be soldered together to create a chain of individually addressable lights. These are also available from other suppliers but tend to be referred to by their part name such as ‘WS2812B’ or ‘SK6812’.

How do they work?

Unlike traditional LEDs that are only able to display a single colour, each NeoPixel contains up to four tiny LEDs - red, green and blue (RGB), or red, green, blue and white (RGBW). This means that each pixel is able to display a full spectrum of colours that can be animated. This gives us the ability to create some amazing multicolour effects.

Which NeoPixel products are compatible with TrapFX?

There are a number of different options available. Which one is right for you depends on how you would like to arrange the lighting inside your Ghost Trap’s inner chamber and how comfortable you are with soldering. As mentioned, they can be found in either RGB or RGBW configurations. We highly recommend going for the RGBW (Cool White) variants as these include the brightest white LED that looks great during the ghost capture sequences. Here are two recommendations:



NeoPixel Stick (8 x RGBW LEDs) - Cool White

<https://www.adafruit.com/product/2869>

This is the simplest solution and easiest to work with. This is a small ready-made circuitboard that has eight NeoPixels already soldered into place, along with all the capacitors and resistors it needs to function correctly. You only need to solder three wires to the back of the board and it is ready to be connected to the TrapFX main board. The downside to this solution is that the individual pixels cannot be separated, so the lighting effects will be limited to a small area inside the trap chamber.



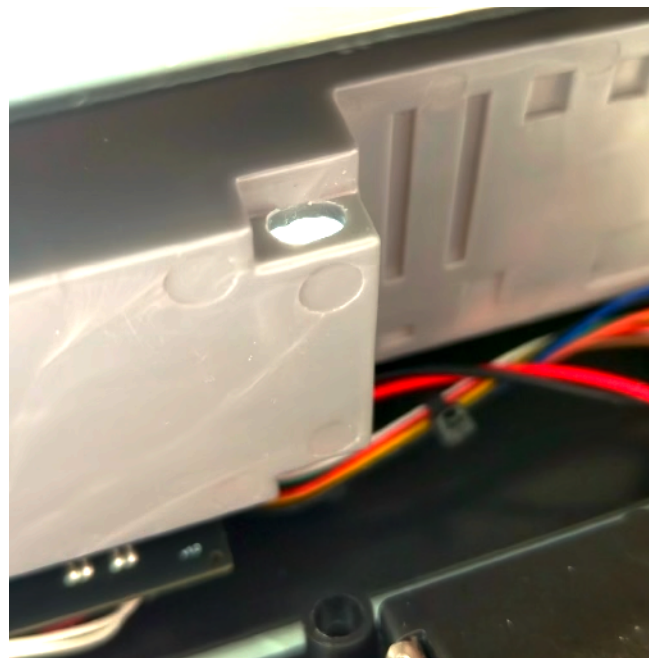
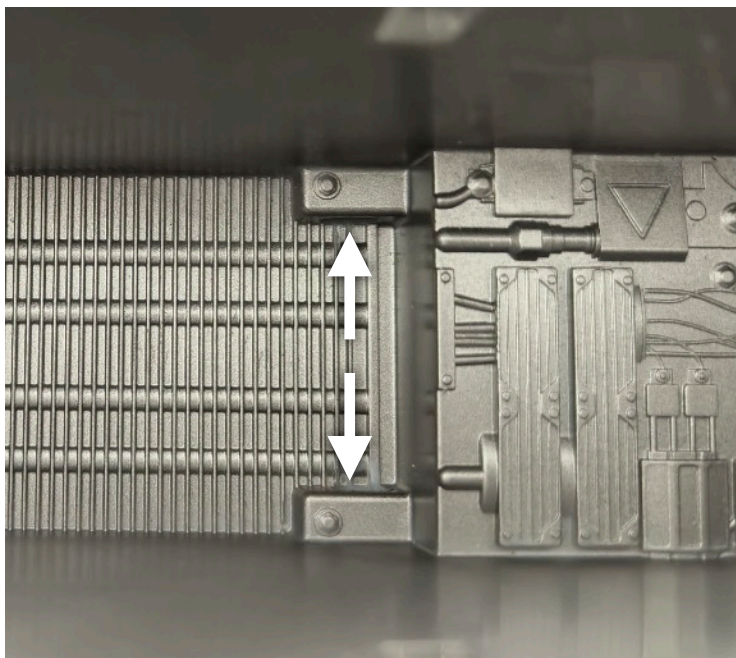
Individual NeoPixels (10 Pack) - RGBW Cool White

<https://www.adafruit.com/product/2762>

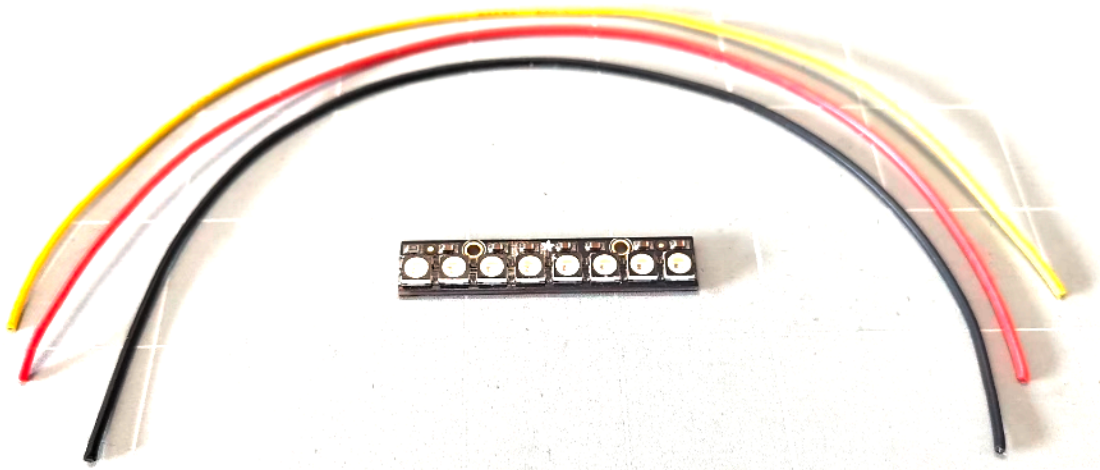
This pack of 10 individual NeoPixels enables you to create your own custom arrangement inside the trap chamber. However, some more intricate soldering is required and you will need additional capacitors and resistors to make these work. Also, bear in mind TrapFX only supports up to **eight** pixels, so you will have two spare with this 10 pack. However, if you are comfortable with electronics and soldering, these will allow you to place the pixels exactly where you want inside the trap and even integrate them into your own custom smoke system. Full information about working with these can be found on the Adafruit website.

How do I install the NeoPixels in my Ghost Trap?

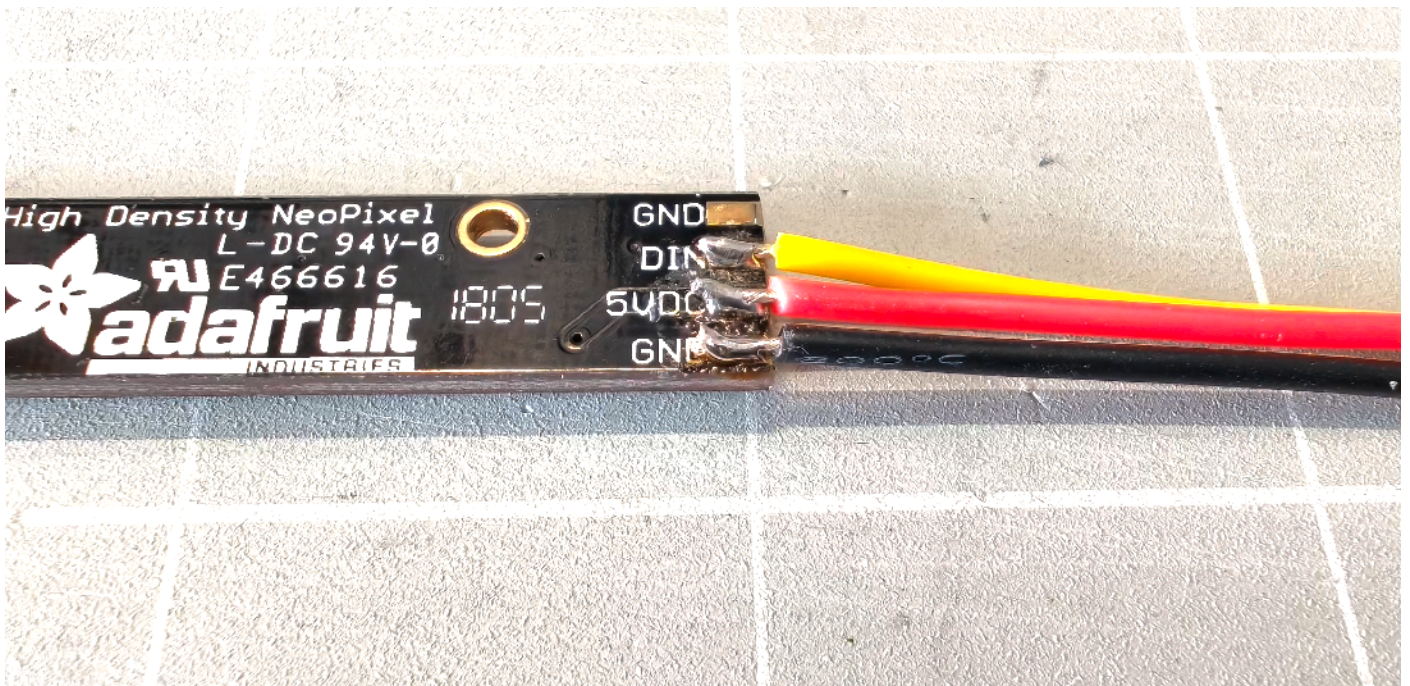
The following example uses the ready-made Adafruit NeoPixel Stick as linked to above:



In order for the NeoPixels to be connected to the TrapFX main board, we must create a small hole in the plastic inner chamber so we can feed the wires into the interior of the cartridge. The best location for this hole is through the side of one of the raised notches indicated by the arrows above. If you are also installing a smoke kit, you may want to create a hole on each side. You can use a Dremel to drill the hole from the inside of the cartridge as shown in the second photo above - make sure this is large enough for three wires to be fed through it.



Along with the NeoPixel Stick, you will need three wires. It's best to make these about 30cm in length to start with - you can always shorten them later if you find they are too long. We recommend using black, red, and yellow wires so they are easy to identify during installation.

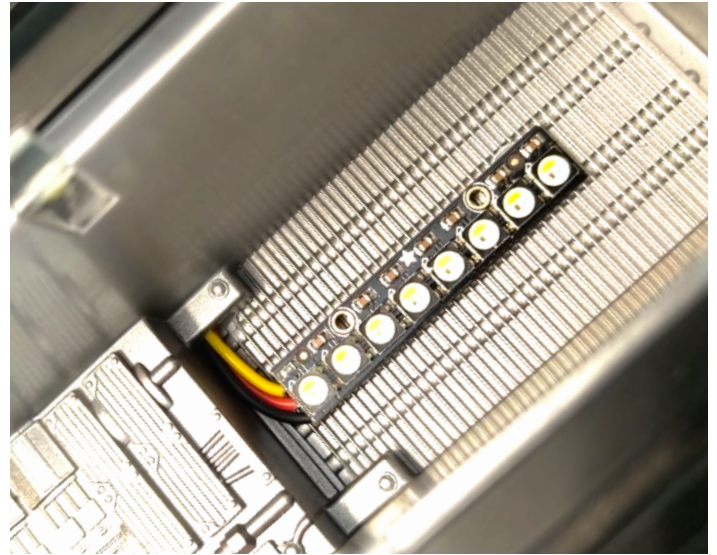
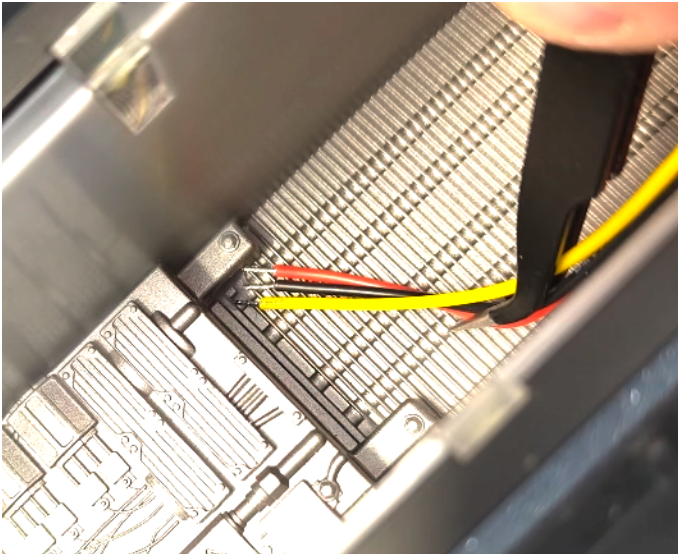


Trim the shielding from each end of the wires and solder them to the correct pads on the back of the NeoPixel stick as shown above:

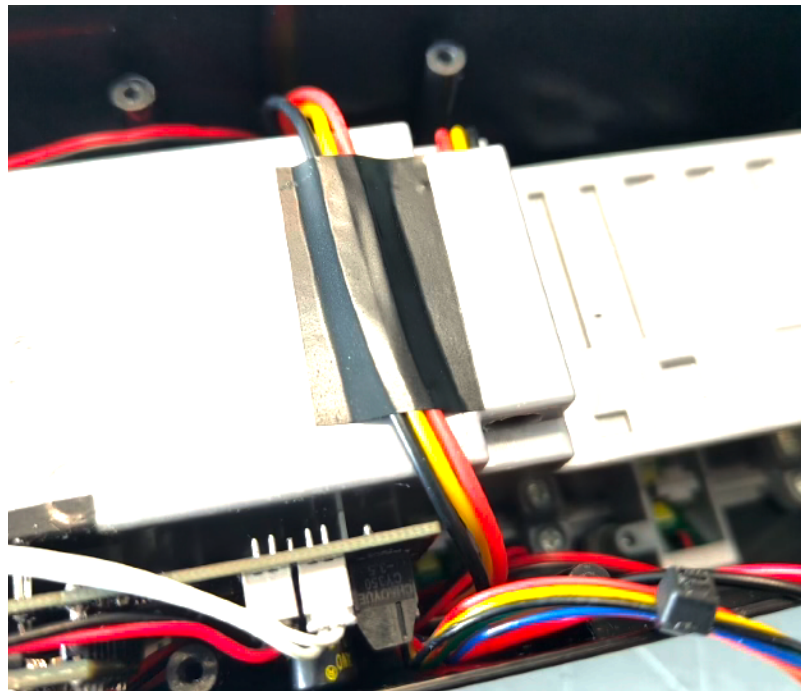
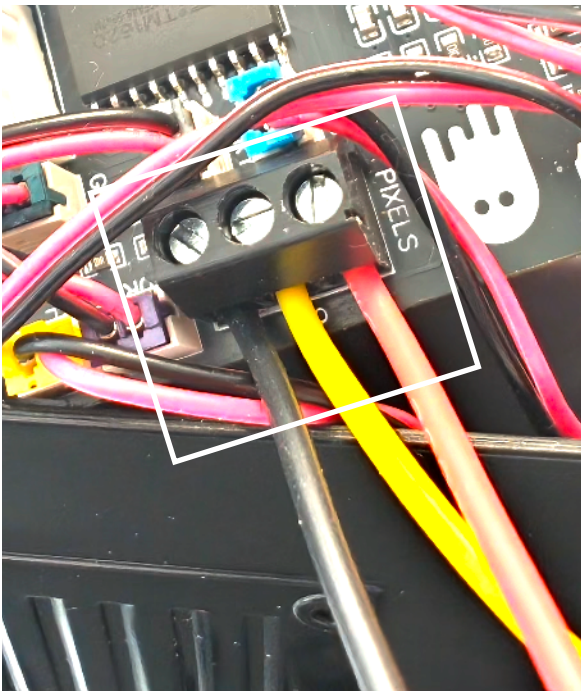
Yellow wire to DIN

Red wire to 5VDC

Black wire to GND



Use tweezers to feed all three wires through the hole from inside the chamber. You will then need to secure the NeoPixel stick with some strong mounting tape, hot glue or other adhesive of your choice.



Now connect the three wires to the screw terminal on the TrapFX main board labelled 'PIXELS'. Make sure the wires correspond to the correct terminal - **black** wire to '-', **yellow** wire to 'OUT' and **red** wire to '+'.

Finish up by securing the wires inside the cartridge. If you are routing longer wires around to the board, use some electrical tape on the flat surface of the chamber to keep them as flat as possible before closing up the cartridge. Be sure to check that all wires are clear of the plastic screw posts so they do not become pinched when replacing the bottom plate.

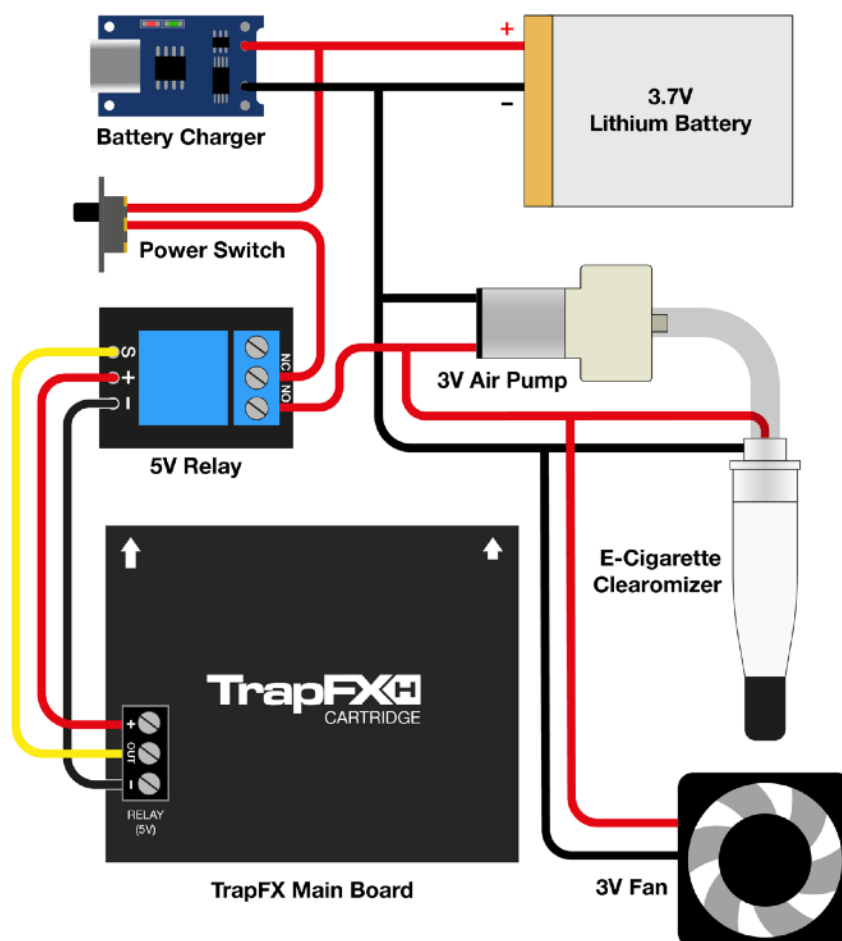
Full details on how to activate your NeoPixels during the ghost capture sequences are included in the operating instructions in this guide.

ADDING A SMOKE KIT (OPTIONAL)

TrapFX will work alongside existing remote controlled smoke kits designed for the Haslab Ghost Trap. However, we have included a special connector on the main board that opens the possibility for smoke kits to be triggered from the TrapFX system directly using a 5V relay. EctoLabs has been speaking with a number smoke kit makers in the hope that they will create versions of their kits designed to work with TrapFX.

At the time of writing, these products are yet to be confirmed, but we will update this guide with more details as soon as we get them.

If you wish to build your own custom smoke system, please see the following example circuit diagram which should give you an idea of how to connect all of the components together:



Be aware that your smoke system must have its **own power source**, as the four AA batteries inside the trap itself will not be able to supply the additional current required to drive an air pump and e-cigarette atomiser. Therefore, you will need to include a way of easily accessing the power switch and battery USB charger in your design.

You must also use a **5V relay** (in a 'normally open' configuration). This relay acts as a switch to turn the battery power on and off and is triggered directly from the TrapFX board during the ghost capture sequences. This means that there is no longer any need for external remote control fobs or RF transmitters.

CHASSIS INSTALLATION



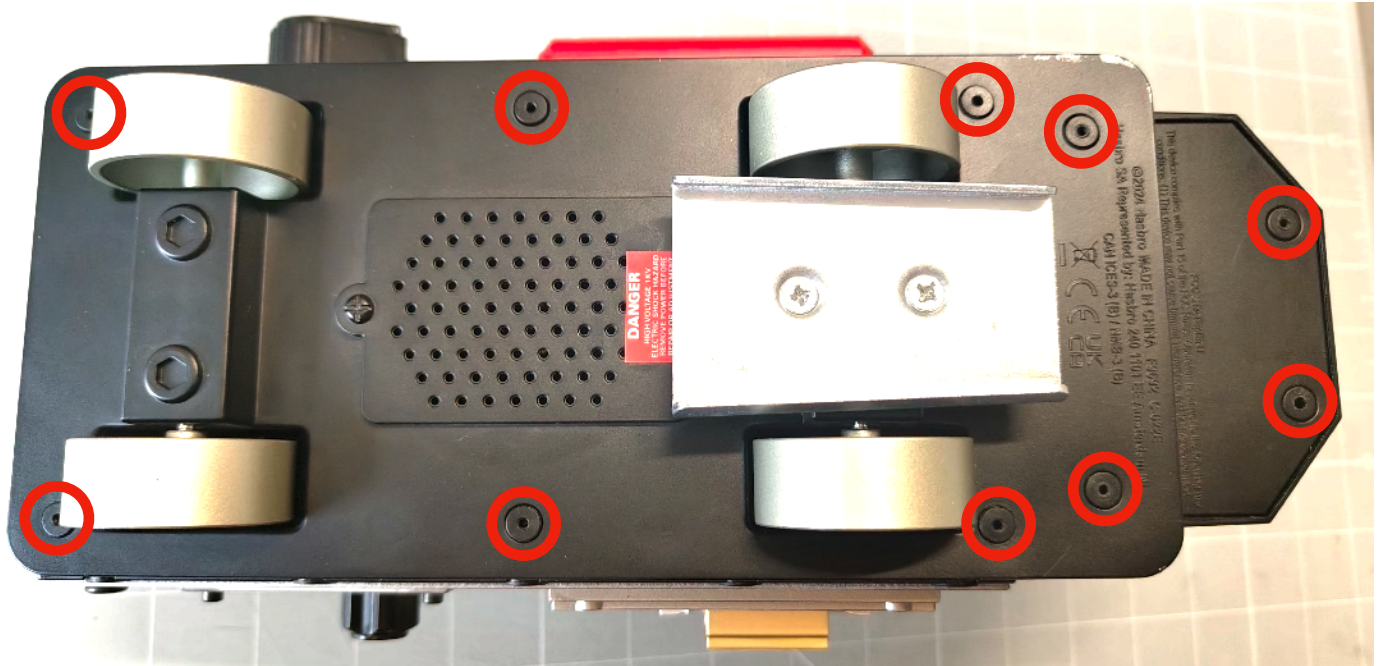
The body of the Ghost Trap (which we will refer to as the 'Chassis') is the assembly that consists of the outer shell, handle, side rods, rotary knobs, toggle switch, red indicator light and direct connection to the pedal. These components are attached to a second much smaller circuit board found inside which communicates with the mainboard in the cartridge. A speaker is housed in the bottom of the chassis for sound effect output.

Thankfully, the modifications we need to do to the chassis are much quicker and easier than those for the cartridge. Again, all components use standard plugs and connectors, so replacing the board is a relatively straightforward task. As ever, take it slowly as the wires inside can still be easily broken if you do not take appropriate care.

If you are planning on upgrading the trap's speaker to achieve better sound, we have including some additional instructions for doing this at the same time as installing your TrapFX kit.

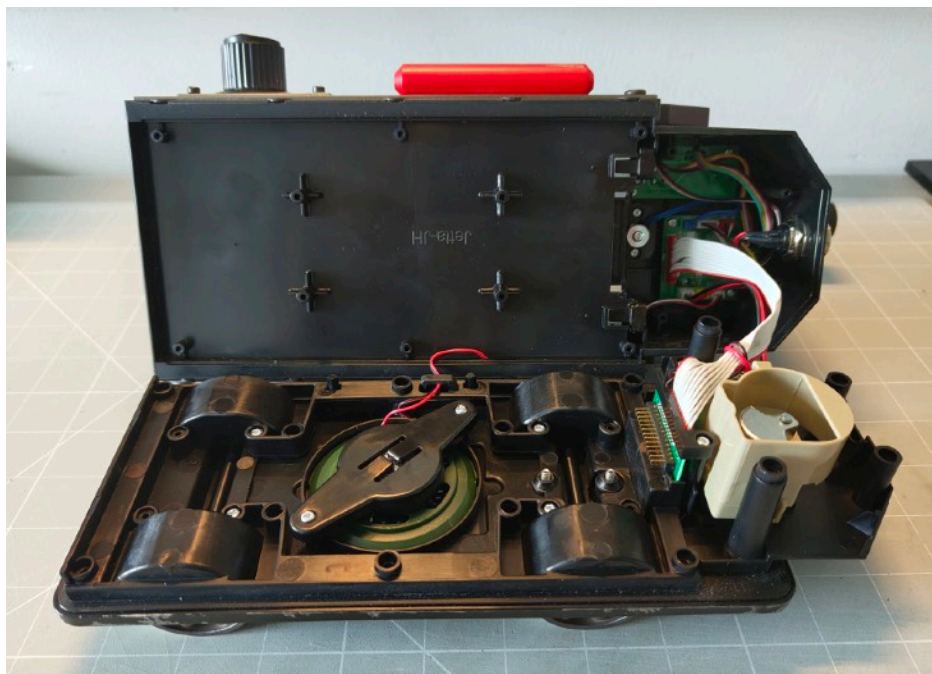
Tools required:

- Small phillips screwdriver
- Allen keys (if upgrading speaker)
- Pliers



Let's start off by removing the 10 screw caps indicated by the **red circles** above. Most of these caps are smaller than those found on the bottom of the cartridge, so these should be a little easier to remove. Once they are out, remove the screws and set them aside.

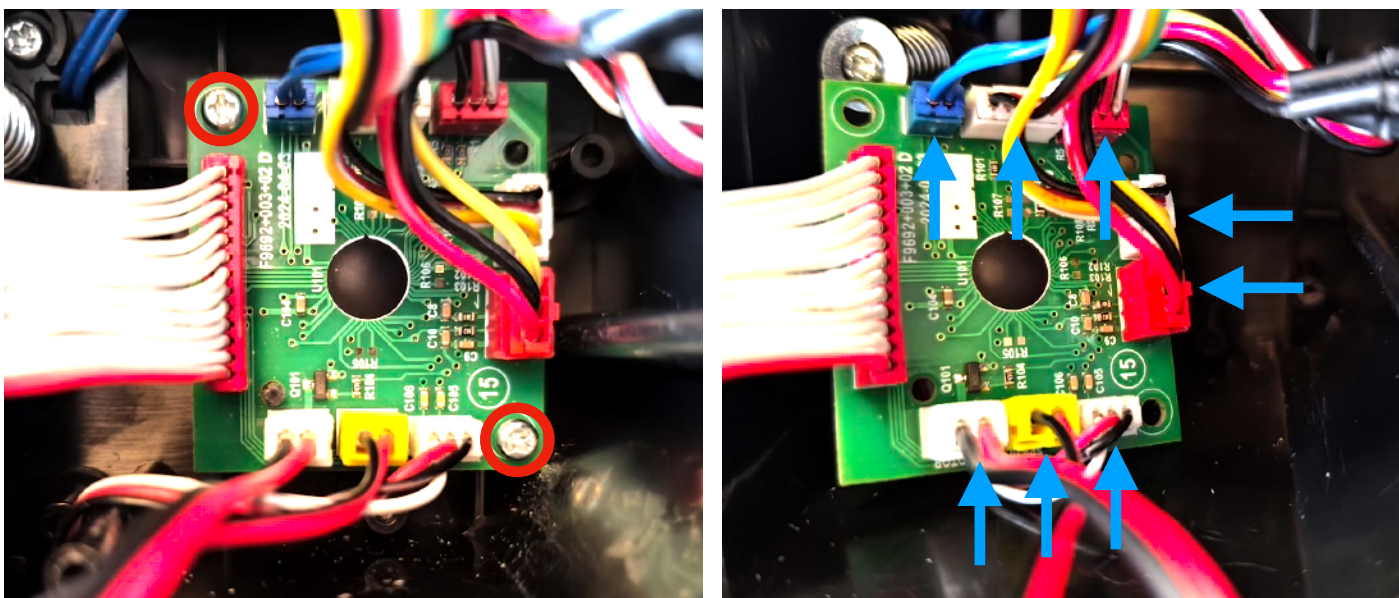
Note that although there appears to be screws by the speaker holes, these are actually fake dummy screws and simply part of the plastic moulding, so you can ignore these. You can also keep the metal V-Hook in place as this is attached to the base plate only and will not prevent you from opening the chassis.



Sit the trap on its side with the red/silver rods facing upwards, and carefully pull the base plate away from the chassis and place it down on your table. Be aware that there are two cables attached here, so do not pull the base away too sharply as the wires can easily be broken.

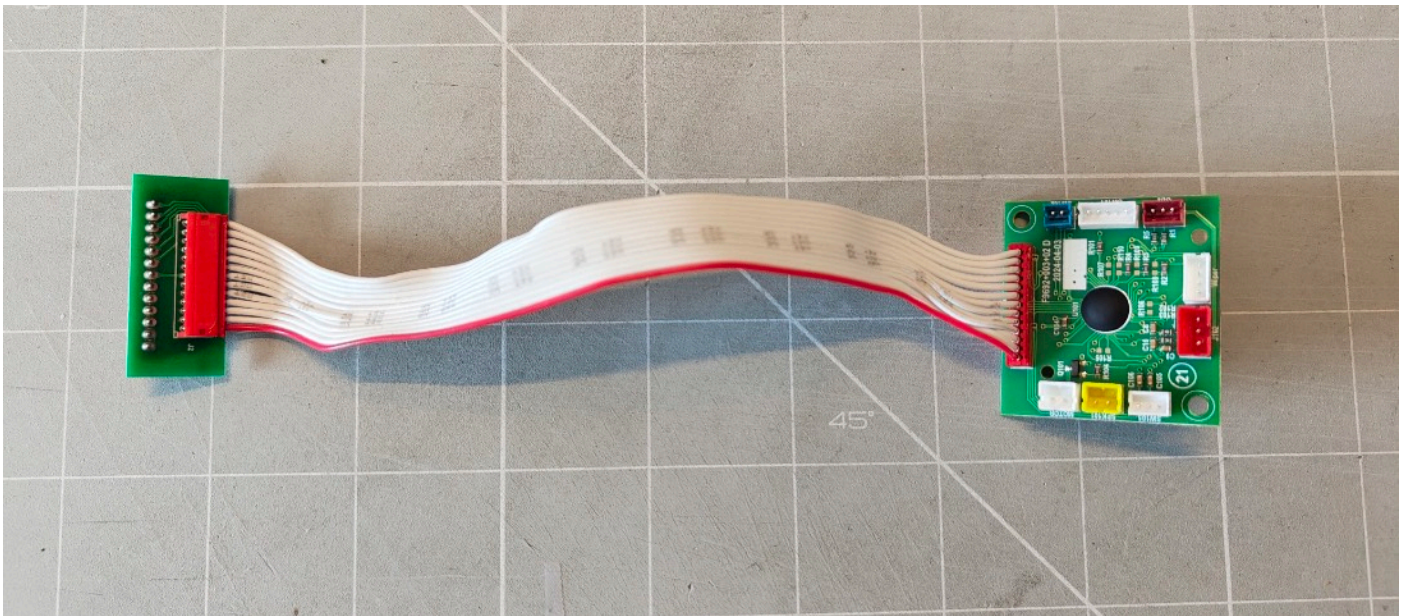


Turn your attention to the connector board which is recognisable by its 13 gold pins. As with the cartridge, this is secured in place by a plastic holder. Remove the two screws **circled** above take off the holder. Note that these screws are longer than the others, so keep these aside separately with the holder so they don't get mixed up. You can now lift out the connector board.



Looking inside the rear box of the chassis, you will see the small green board that connects the internal components. This held in place by two screws **circled** above. Remove these screws to release the board and pull it towards you as far as it will go. You will not be able to pull the board out very far as it is still tethered by multiple cables - just move it far enough so you can get better access to the connectors.

Now disconnect the eight cables from their connectors indicated by the **blue arrows** above. As with the cartridge, hold the cables as close to the connectors as possible and do not tug too hard by the wires alone. You can leave the white ribbon cable attached.



You should now be able to completely remove the green board with attached connector. We will no longer need these boards, so store them away safely in an anti-static bag with the rest of the stock electronics.

UPGRADING THE SPEAKER (OPTIONAL)

If you wish to improve the sound quality and overall volume of your Ghost Trap, we highly recommend installing a replacement speaker as suggested by Sean Charlesworth at [CharlesworthDynamics](https://www.charlesworthdynamics.com/). This is a 4 ohm 2.5W speaker which fits perfectly inside the Haslab Ghost Trap and is fully compatible with the TrapFX system. Note that basic soldering will be required.

You can purchase this speaker internationally from DigiKey:

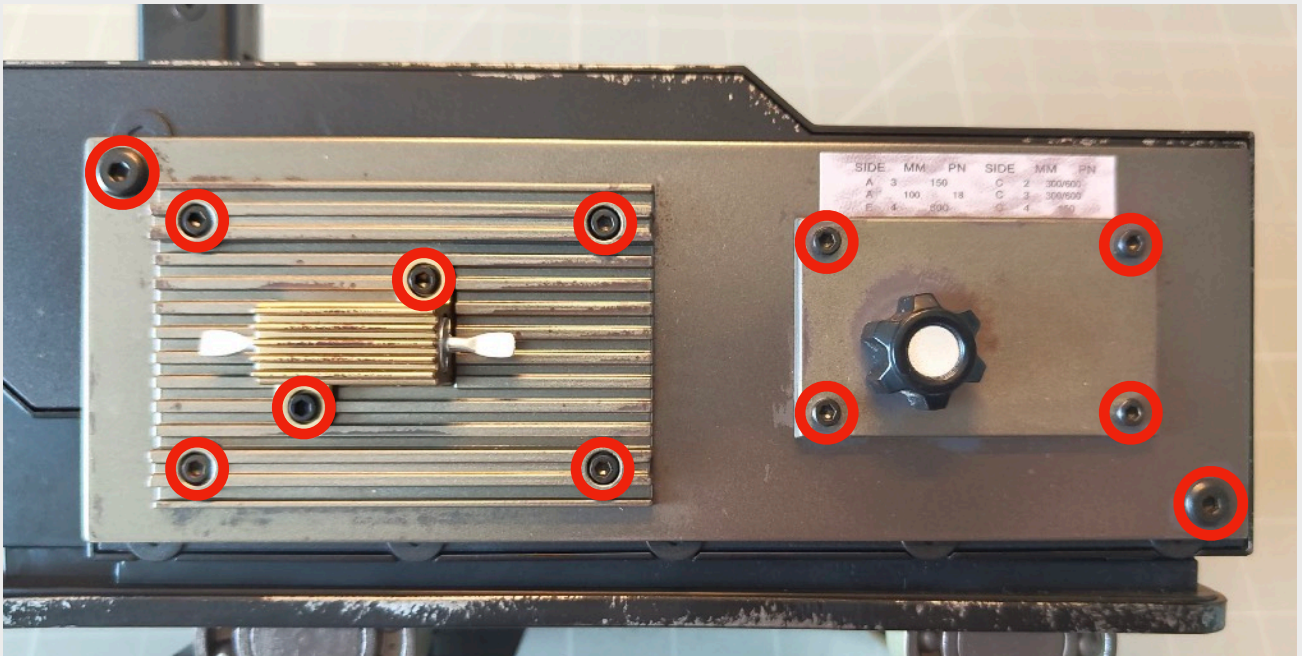


Manufacturer: Same Sky

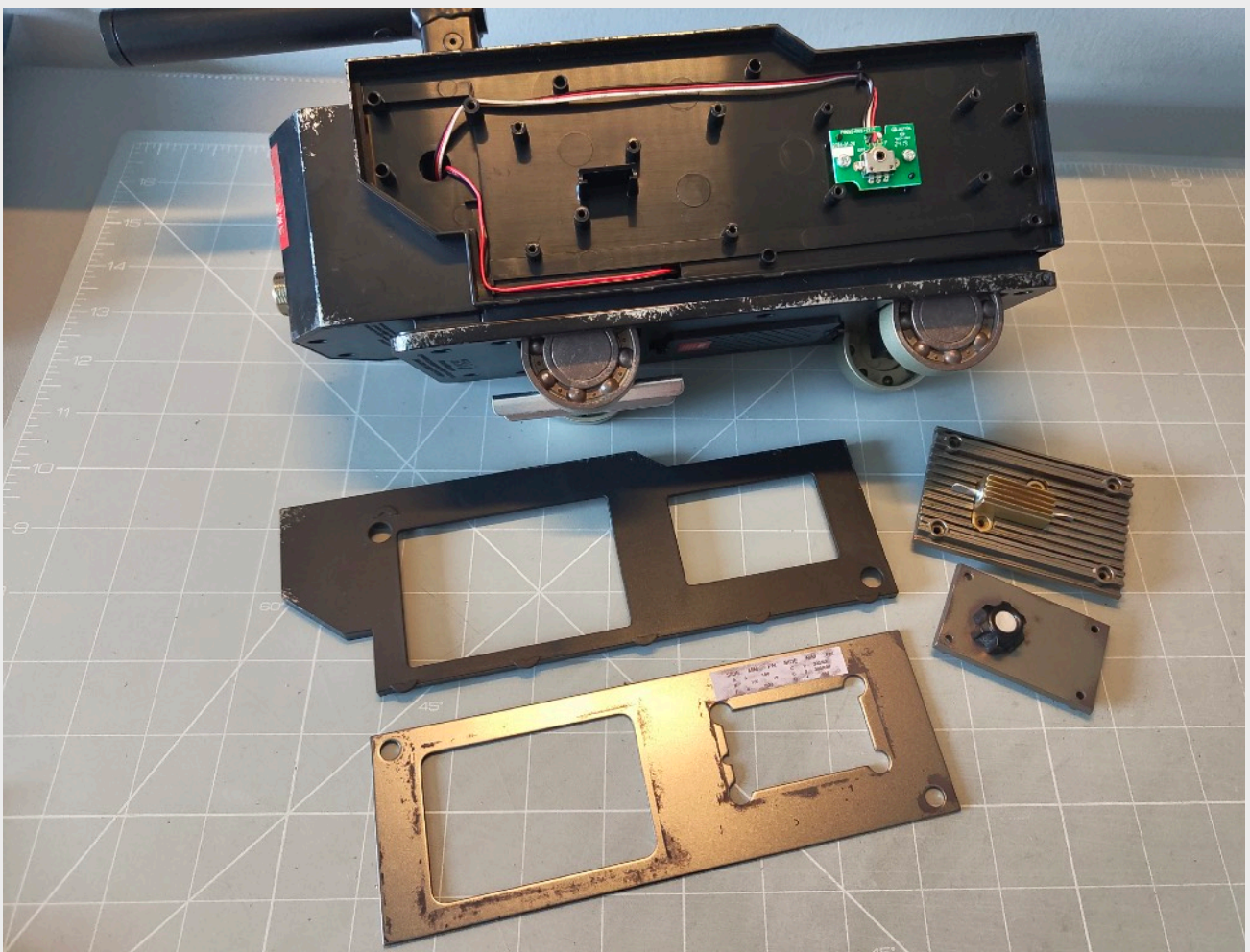
Part number: CDS-5709-254SP

Purchase link:

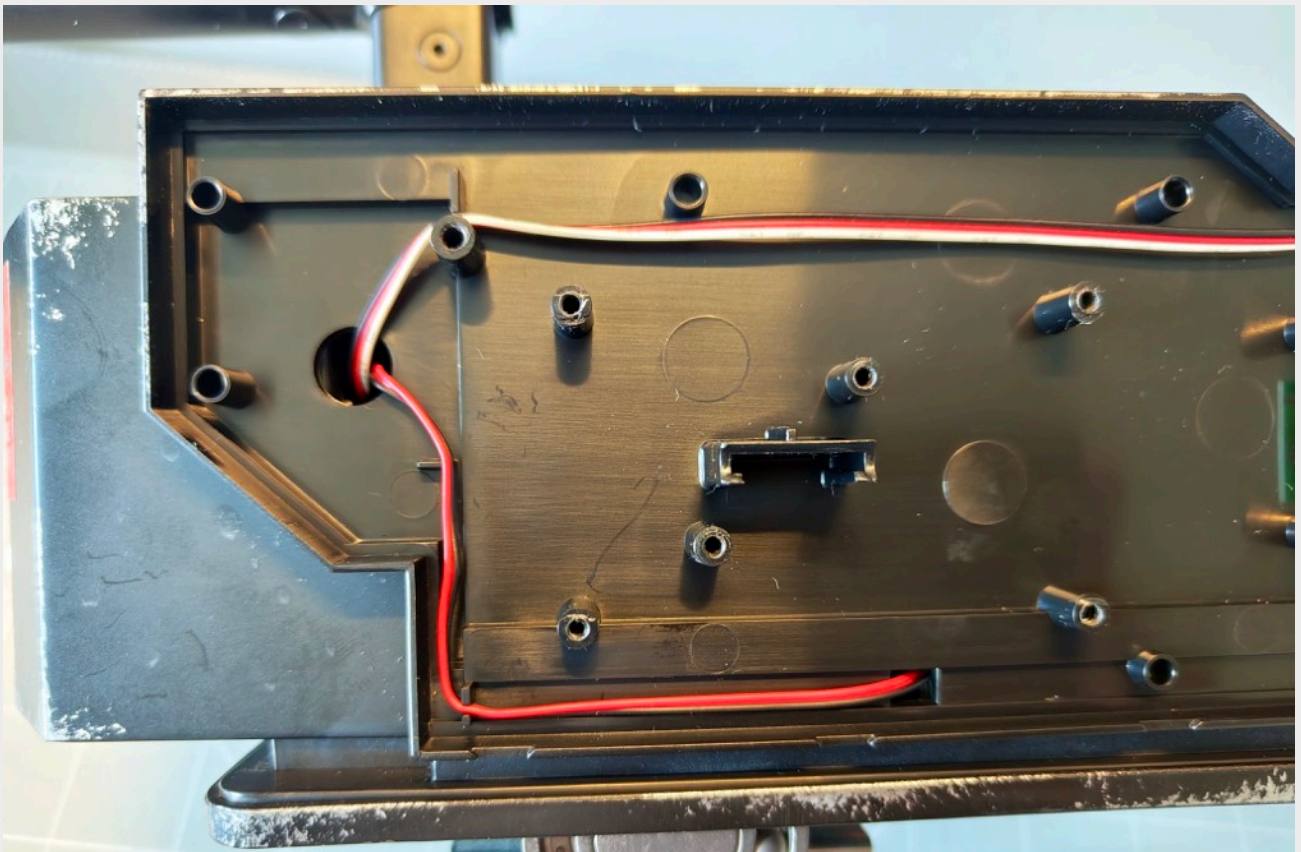
<https://www.digikey.com/en/products/detail/same-sky-formerly-cui-devices/CDS-5709-254SP/21284707>



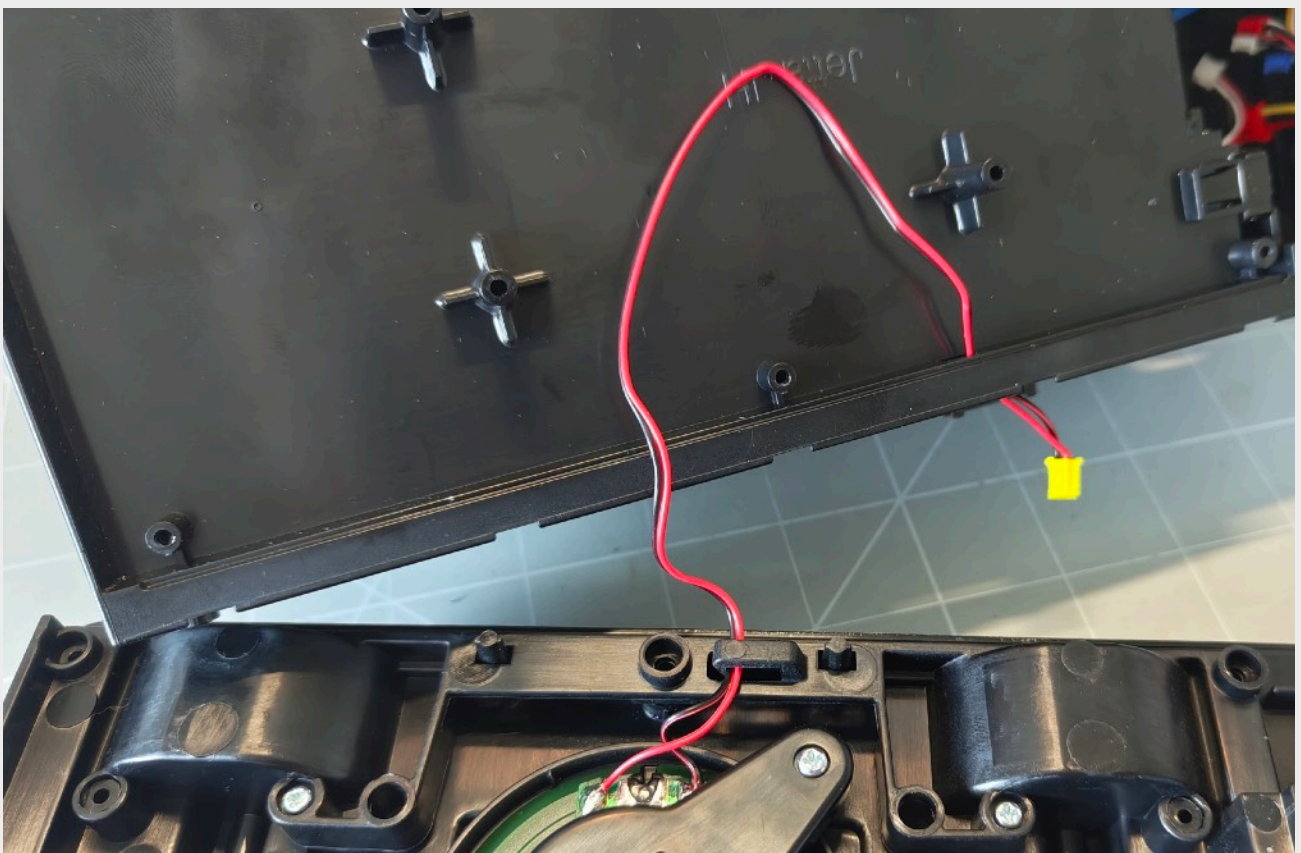
In order to swap out the speaker, we must first remove the chassis side plate that includes the resistor and rotary knob. Use allen keys to remove the twelve black bolts as **indicated** above.



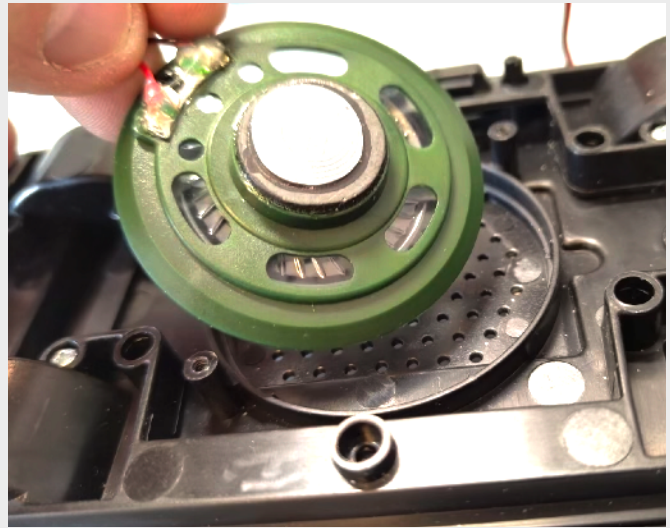
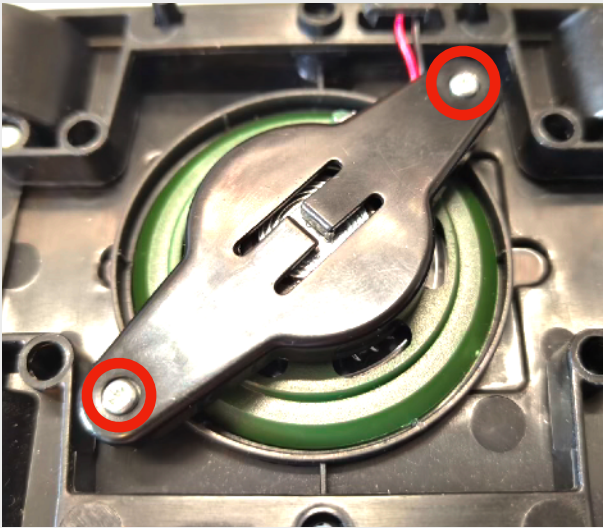
You can now pull off the two small plates with the resistor and rotary knob, the large metal side plate and the black plastic insert.



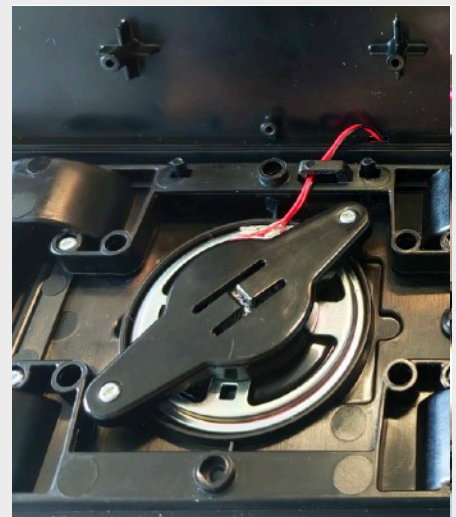
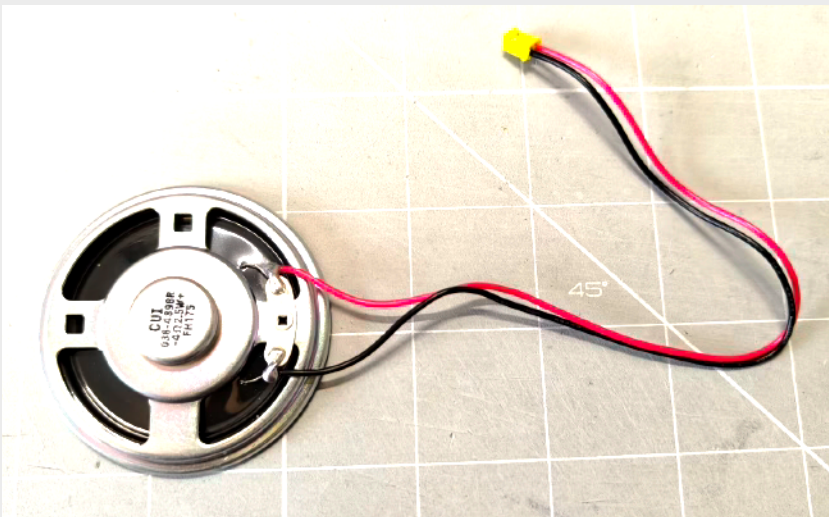
With the side plates removed, the cable routings are now exposed. The speaker is the 2-wire (red/black) cable running from the bottom of the chassis.



Pull the speaker cable (with yellow connector) through the two holes in the side of the chassis and unhook it from the clip on the base.



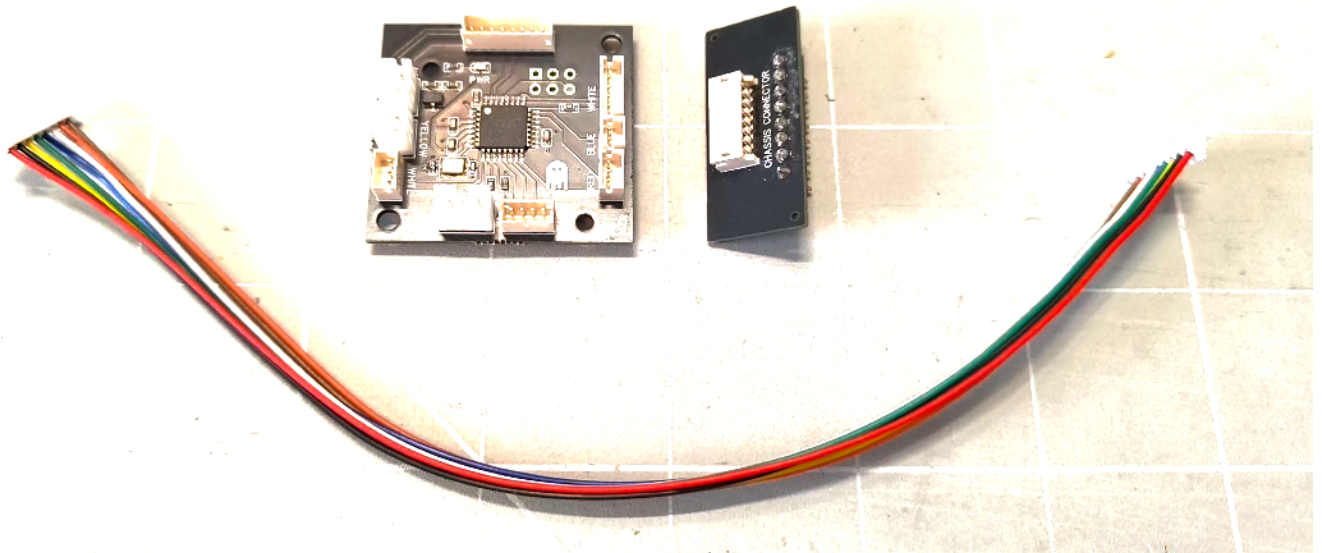
Remove the two screws **circled** above to release the plastic speaker holder. The pre-installed green speaker can then be lifted out.



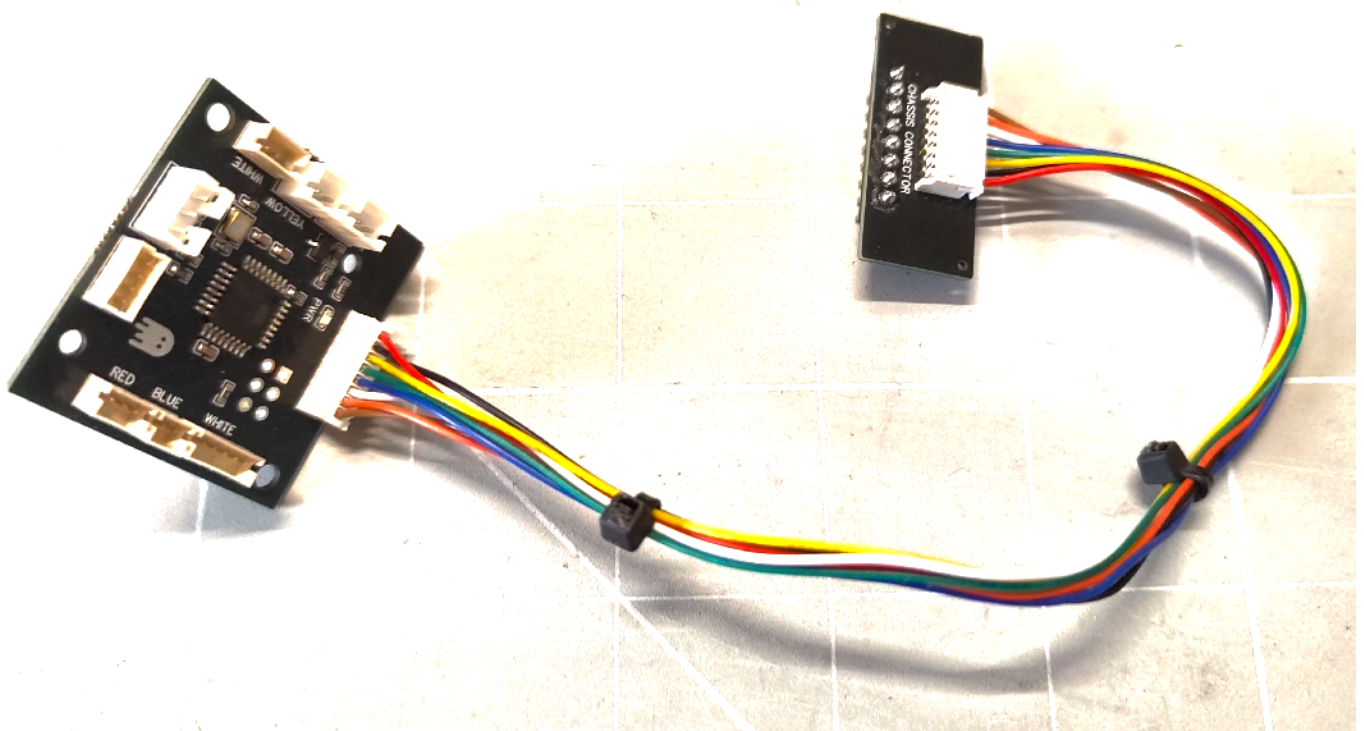
You will now need to desolder the cable attached to the old speaker and attach it to the new one. Solder the red wire to '+' and the black wire to '-'. You can now place the new speaker into the circular cutout in the chassis base plate. Note that you may need to trim a little bit of the plastic away from inside this cutout so that the speaker sits flat.

Replace the plastic holder and secure it with the two screws. Finally, thread the cable around the clip on the edge of the base plate as then back through the two holes in the side of the trap, making sure to route the cable exactly like the original. Finish up by replacing the side plates and the twelve black bolts you removed earlier.

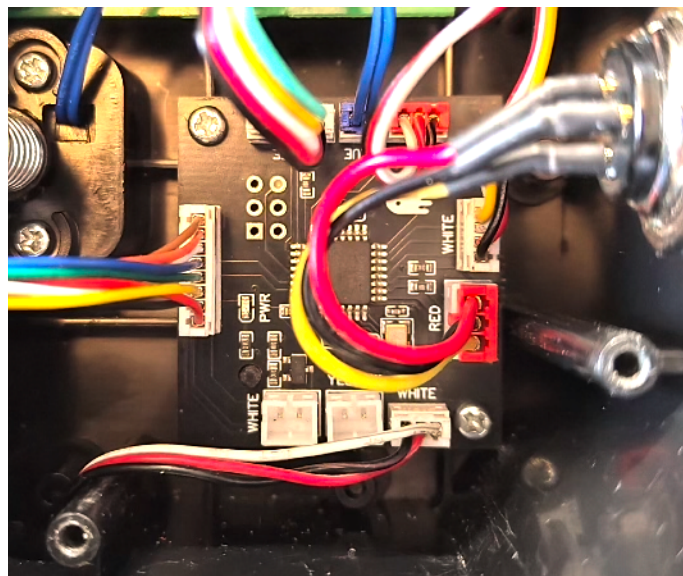
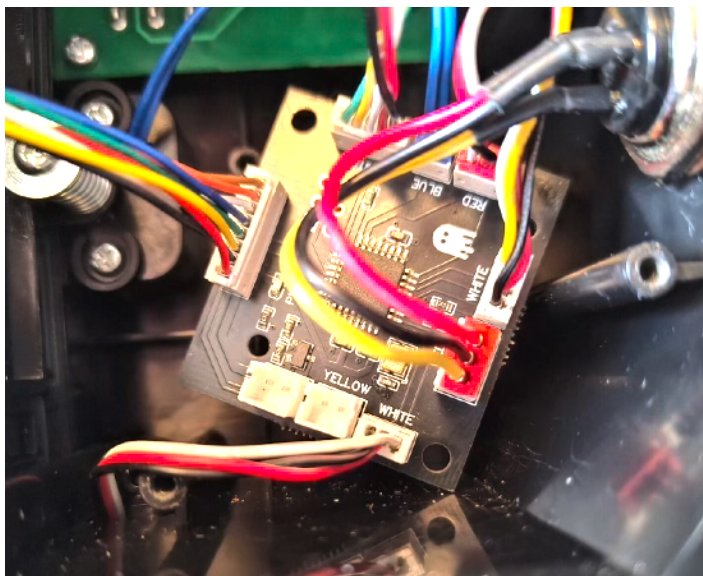
That's it! You're now all set for greatly improved sound quality and volume!



Time to install the rest of your TrapFX kit. For this you will need the small square board, the chassis connector board and the second 8-wire cable.

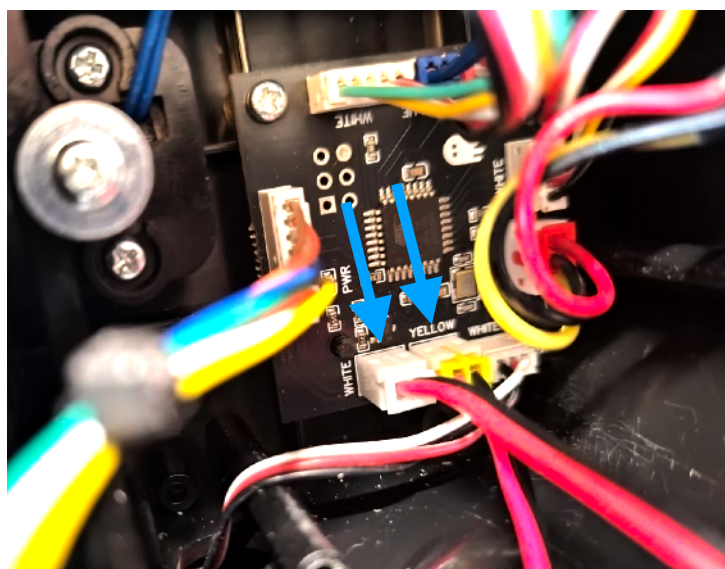
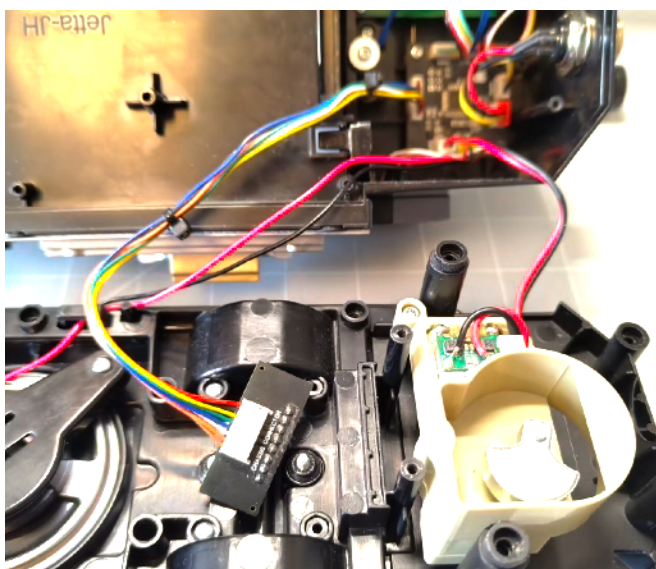


Connect the two boards together using the 8-wire cable. We recommend adding a couple of cable ties or electrical tape to help with cable management during installation.

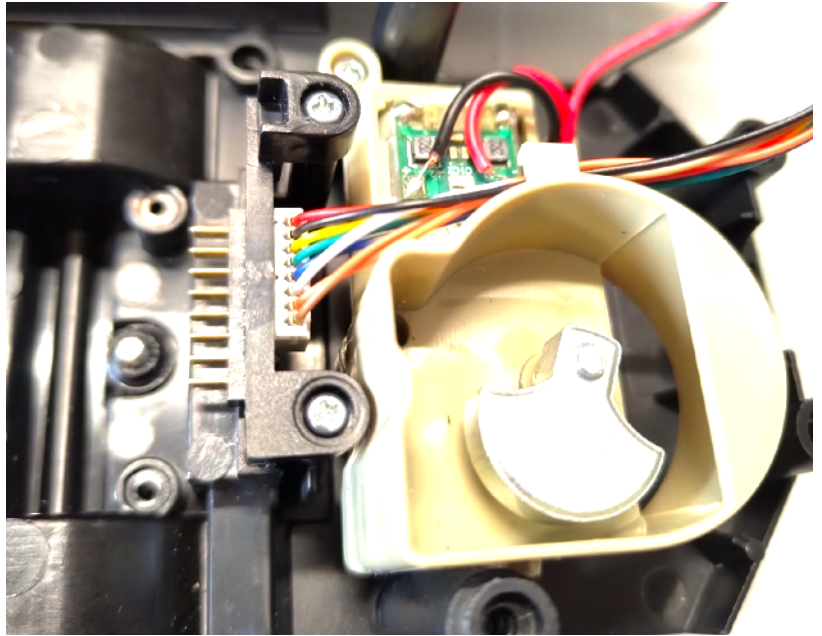
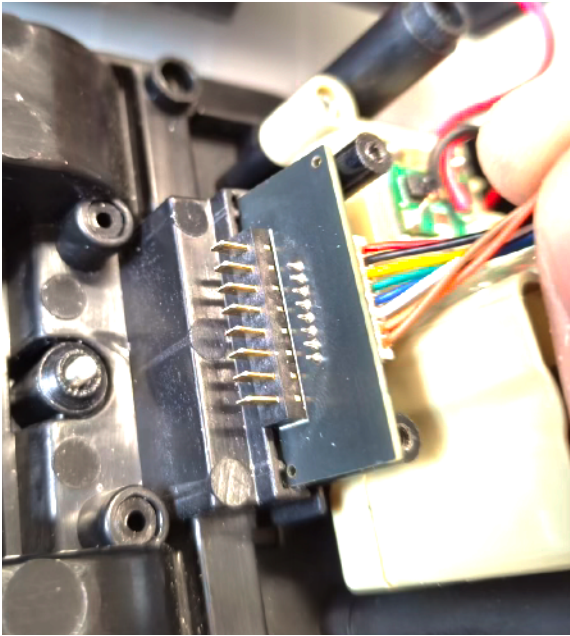


Position the square board behind the loose wires inside the chassis and connect each of the six cables to their respective connector. These are clearly printed on the board itself (small 5-pin **WHITE**, small 4-pin **WHITE**, small 3-pin **WHITE**, large 3-pin **RED**, small 3-pin **RED** and small 2-pin **BLUE**).

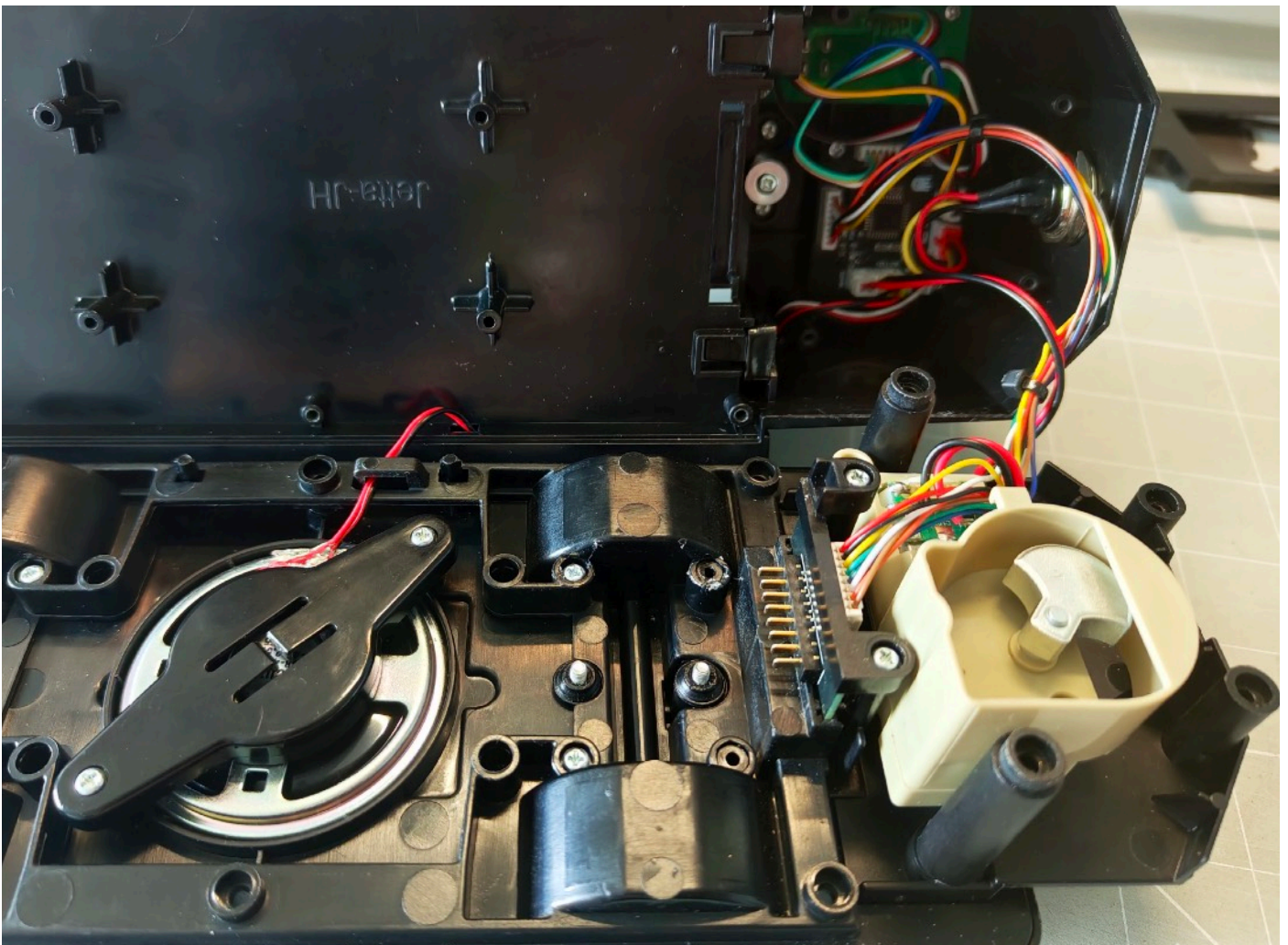
Once all the cables are connected, replace the screws to secure the board to the inside of the chassis. Note that there are two small plastic posts which slot into corresponding holes in the board, so make sure the board is fully seated before tightening the screws.



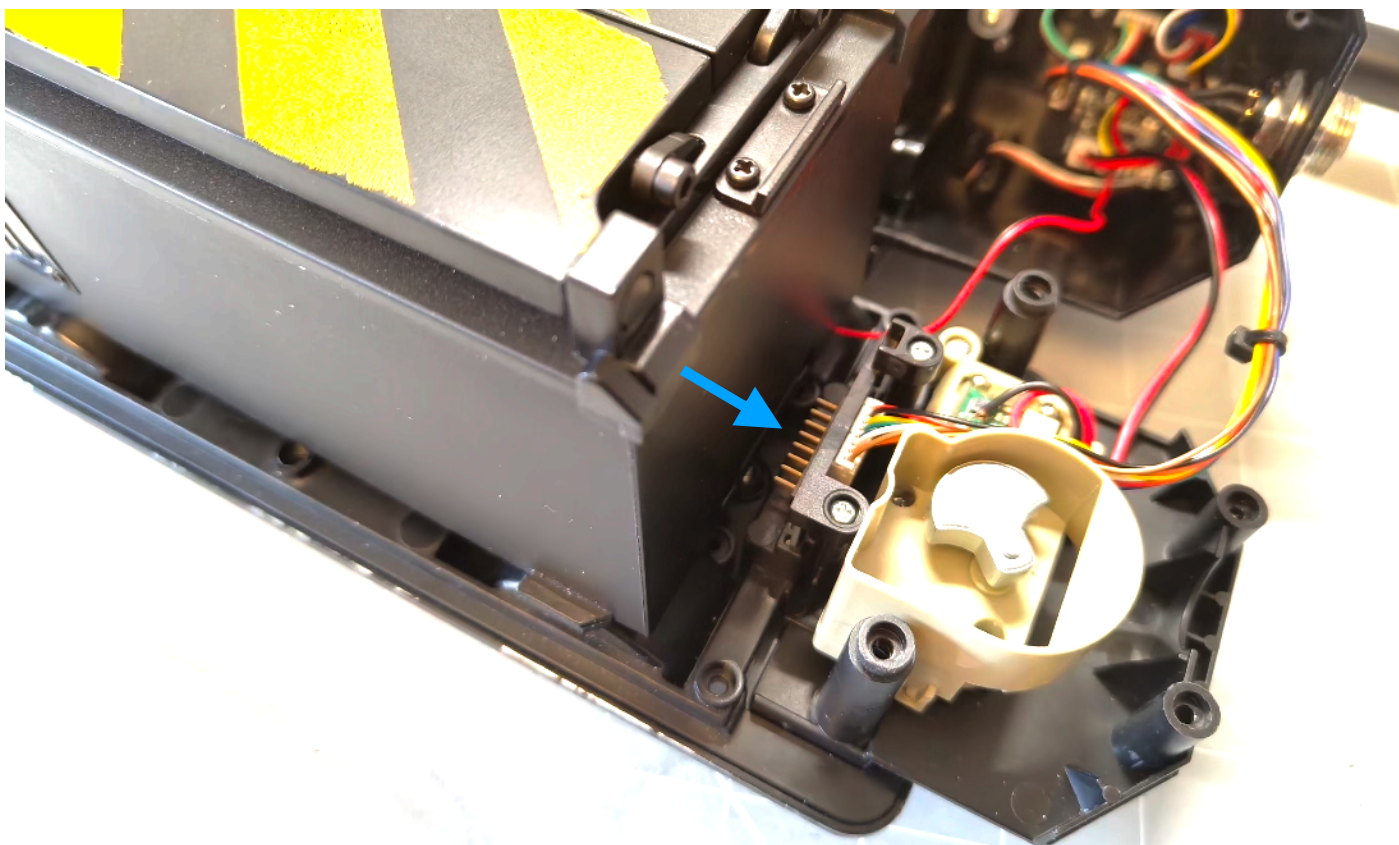
Bring back the base plate and connect the two remaining cables as shown above. If you have installed a new speaker and replaced the cable, this need to be attached to the connector labeled **'YELLOW'**.



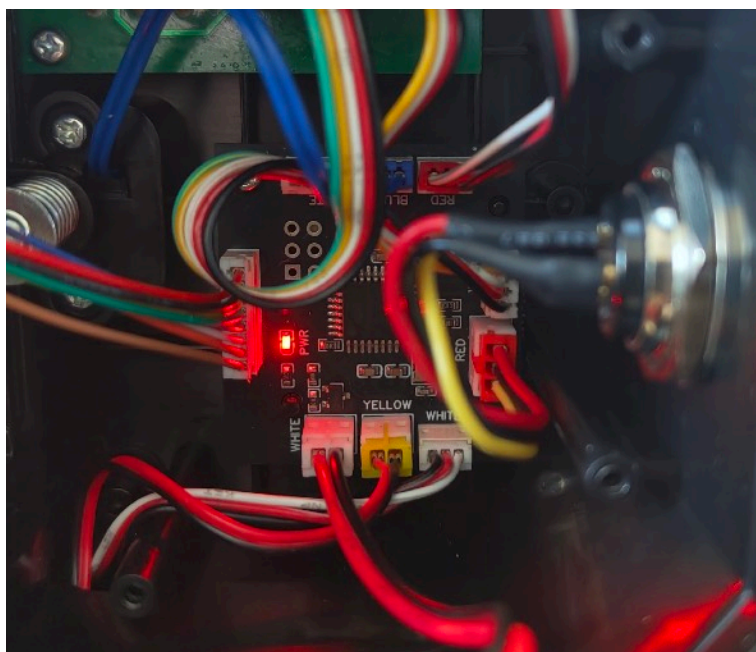
Now insert the connector board into the slot with the gold pins facing outwards. Replace the plastic holder and secure with its two longer screws. Tidy this up by routing the wires through the clips on the side of the beige rumble motor housing.



You should now have a cable arrangement similar to the photo above.

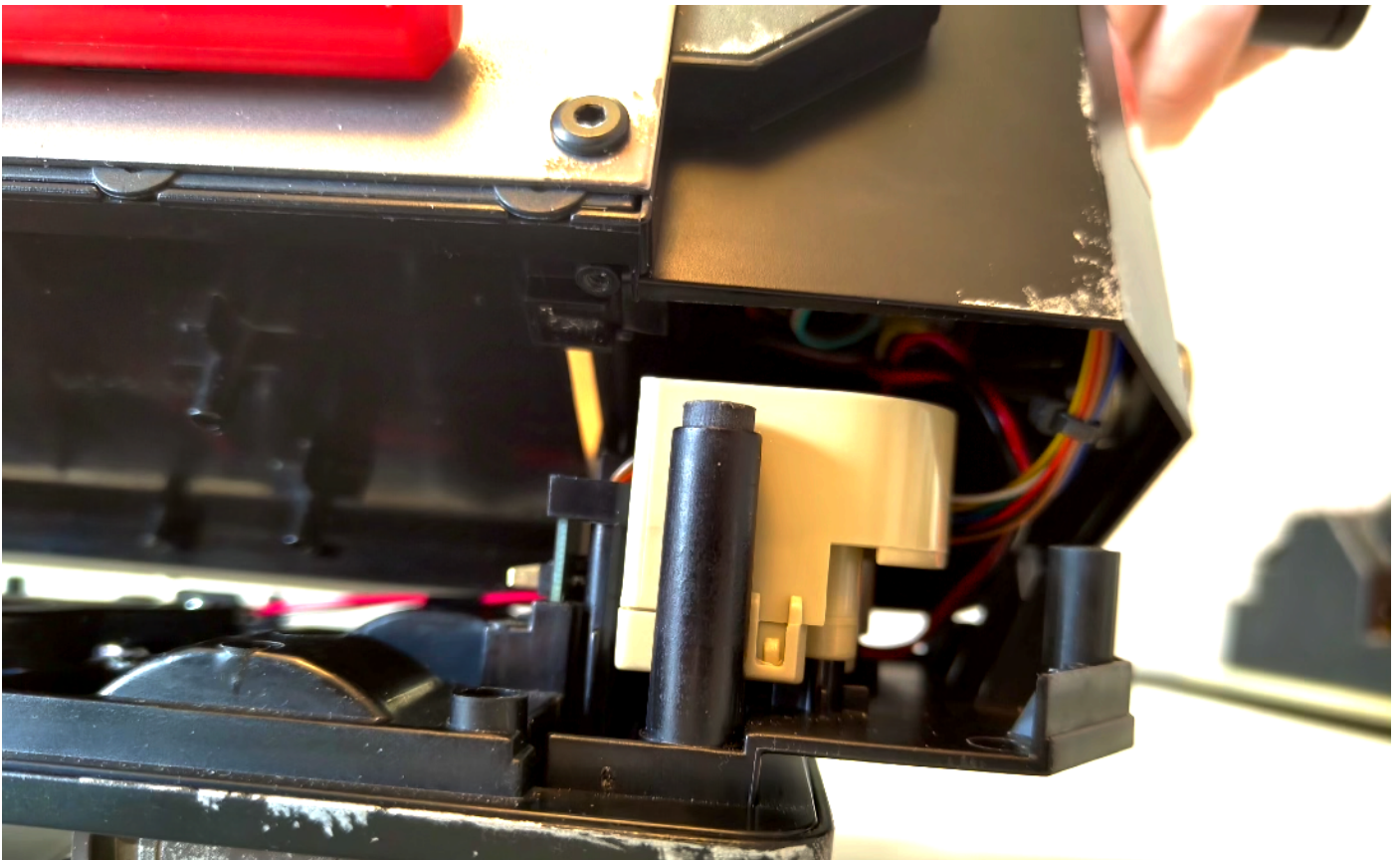


Before we close up the chassis, let's do a quick test of the electronics to make sure the second board is functional. Place the trap cartridge on top of the chassis base plate and insert the gold pins into the cartridge's connector as far as they will go.

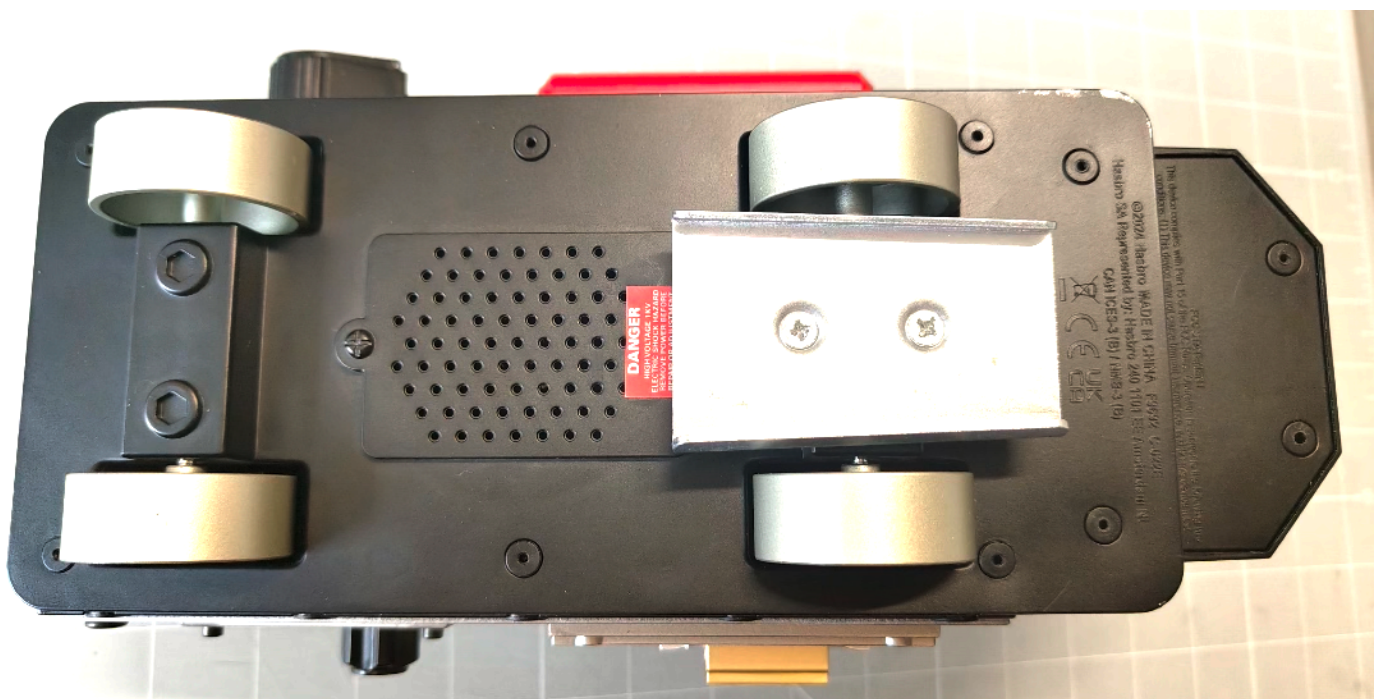


As we did earlier, rotate the SYNC dial on the front of the cartridge clockwise to turn on the power. The yellow indicator next to the bargraph should briefly illuminate and then turn off. Look inside the chassis and you should now see a power light illuminated on the board (this is normally red but may vary in colour). As long as there is a light on, you're good to go!

Rotate the SYNC dial anti-clockwise to turn off the power and disconnect the cartridge.



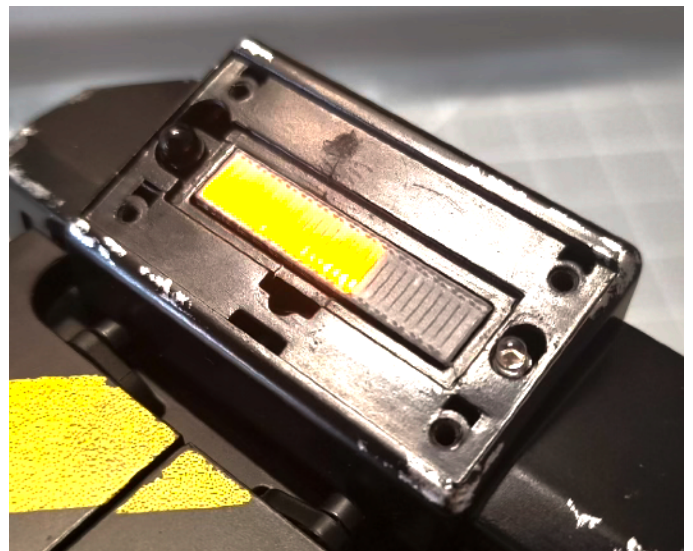
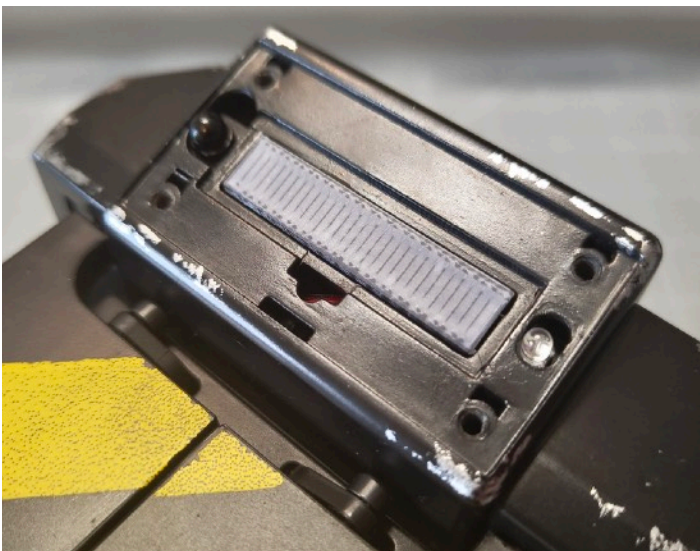
Now let's close up the chassis by inserting the base plate back into the body of the trap. As we learnt with the cartridge, it is very important to make sure no wires are caught around the plastic screw posts.



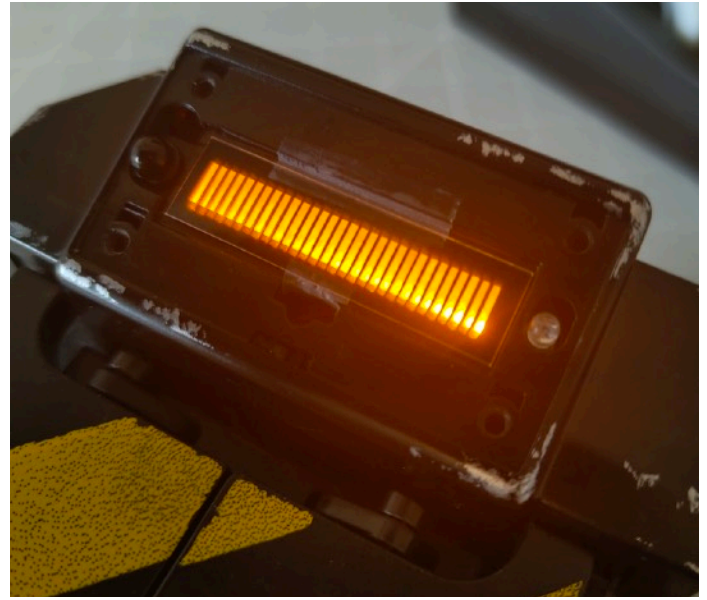
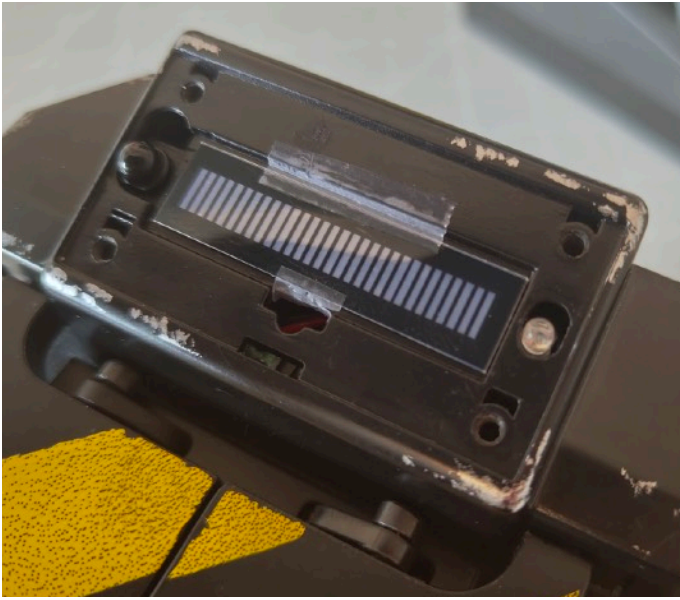
The base plate should sit back flush - if you can feel some resistance when pushing the base plate back in fully, reopen the chassis and rearrange the cables inside until it fits together correctly. This may take a few attempts to get just right, so take your time otherwise you may risk pinching some of the fragile wires. Once this is done, replace the 10 screws and caps.



Great! That's all the new electronics installed, but we still need to get that bargraph looking good. Slide the cartridge into the chassis until it clicks into place and turn on the power by rotating the SYNC dial clockwise on the front of the trap. Now rotate the side knob in both directions - you should see the bargraph LEDs filling up and emptying as you do so.

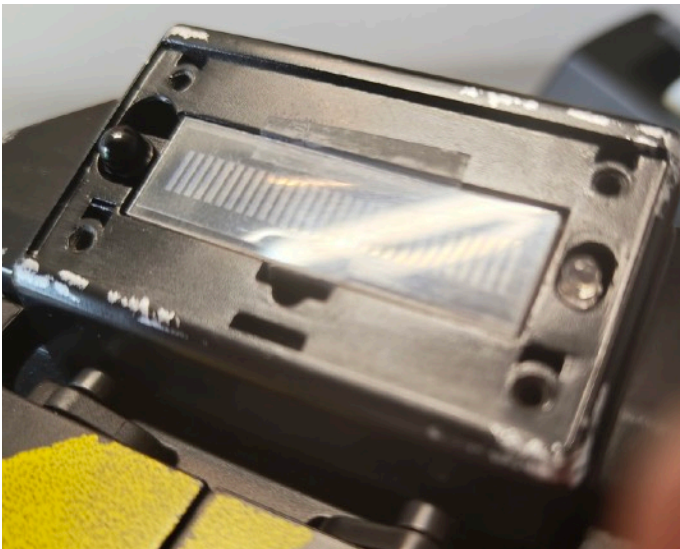


Find the included bargraph insert and place this above the bargraph LEDs. Make sure the side with the diffuser tape applied is facing upwards. Now rotate the side knob again and you will see each segment appear as 30 individual bars.



Next, place bargraph lens over the top with the darker printed side facing upwards. You will need to line up the segments as closely as possible, so rotate the side knob as you do this to illuminate the LEDs until you are happy with the lens position. Be aware that the printed lens can pick up your fingerprints easily, so handle with care or use tweezers to assist with this.

Apply a small section of tape to the top and bottom to keep it in place but be careful not to place this too close to the segments otherwise the tape will be visible when you attach the face plate.

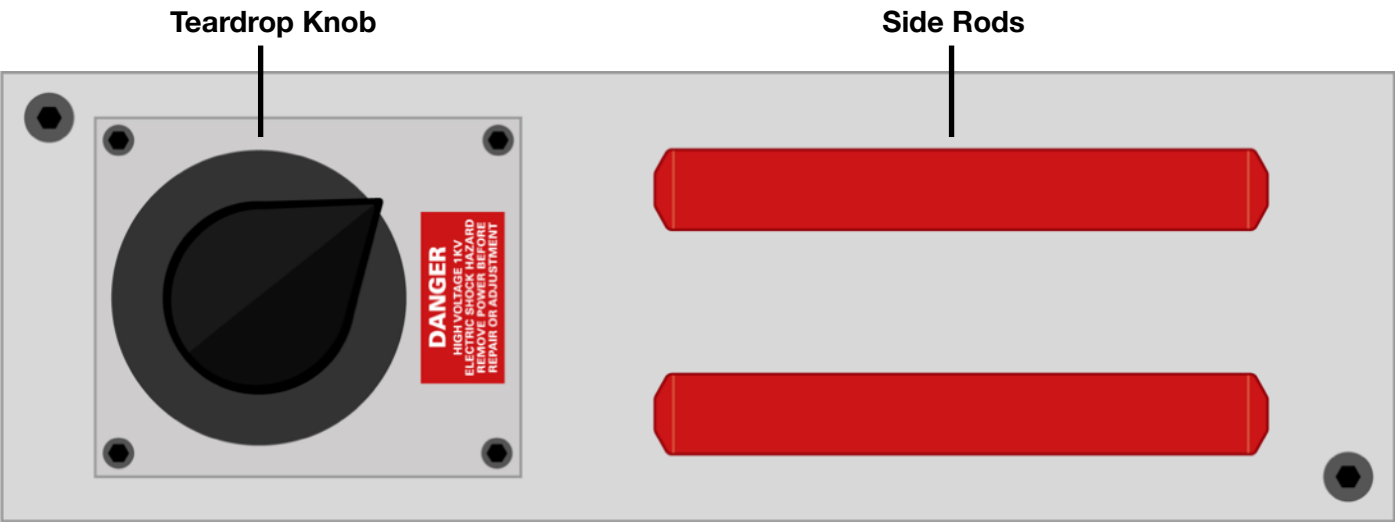
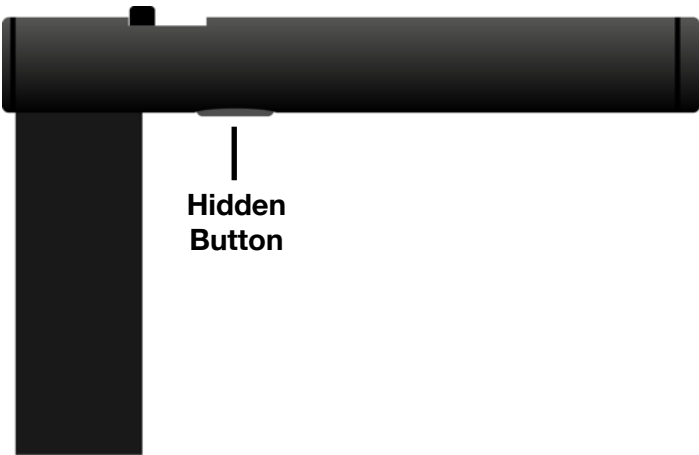
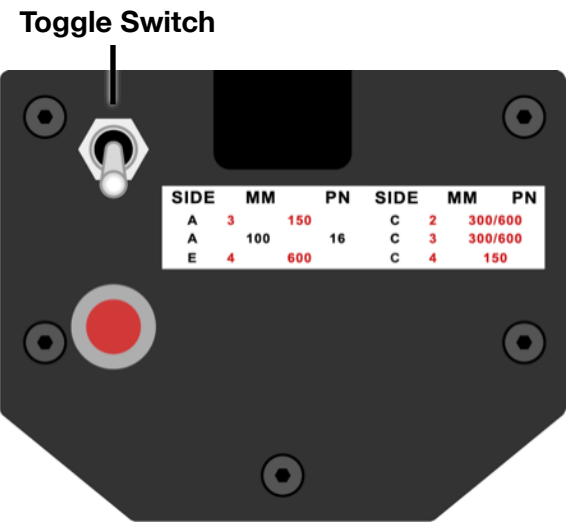
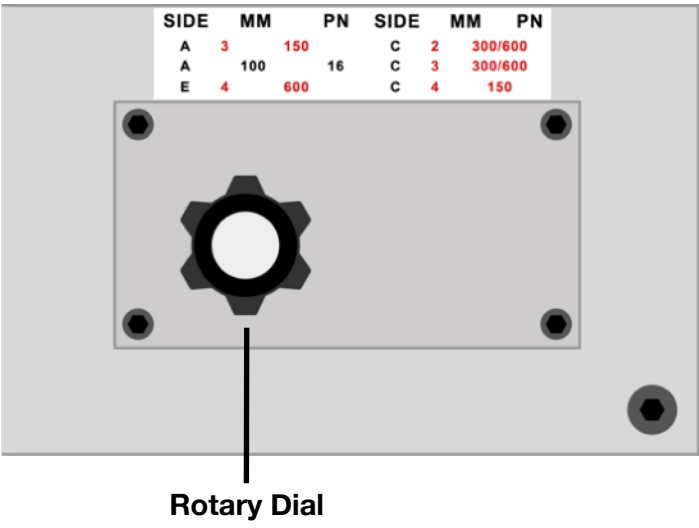
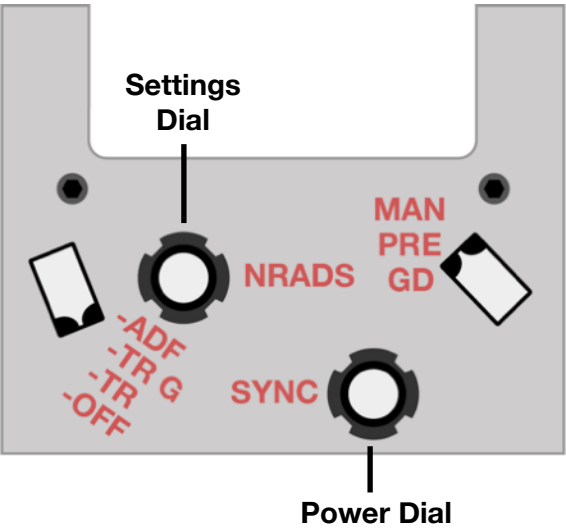


Now place the glossy window film over the top of the lens - you may want to give this a wipe with a clean soft cloth to remove any dust and fingerprints. Finally, reattach the face plate using the four button head screws we removed earlier. Et voilà! You now have a beautiful 30-segment bargraph display!

And that's it... Your TrapFX installation is complete! It's definitely Miller Time, so go grab yourself a cold one and, when you're ready, continue to the next section for the full TrapFX operating instructions.

USER OPERATION MANUAL

Now that you have installed your TrapFX kit, it's time to get familiar with its new capabilities. As TrapFX does things differently compared to the stock electronics, you find some of the controls function slightly differently. The diagrams below show all of the available switches, buttons and dials along with the names that we use to refer to them:



TURNING YOUR GHOST TRAP ON AND OFF

Unlike the stock electronics, TrapFX uses a **Power Dial** on the front of the trap to turn your trap on and off. This is different to Hasbro's 'standby' system and will not automatically shut down after a set time. This means TrapFX is always ready to go - just remember to power off your trap fully once you are finished using it, otherwise your battery will continue to drain.

↻ **Clockwise turn = Power ON**

Provides power to the trap so it is ready for use. The yellow bargraph indicator will briefly illuminate before turning off. In 'Idle Mode', this indicator will flash intermittently to remind you that the trap is still powered on.

↺ **Anti-clockwise turn = Power OFF**

Power is completely disconnected from the system so your trap will no longer drain the battery when not in use.

SELECTING THE OPERATION MODE

Once you have powered on your trap, use the **Toggle Switch** to switch between operation modes:

↑ **Forward position = Active Mode (no rumble)**

Puts the trap into an active state without any physical vibrations and triggers the bargraph startup sequence and sound effect. The trap is now ready for ghost capture.

• **Centre position = Idle Mode**

Shuts down the capture operations and puts the trap into an idle state. From this mode, you are able to open the doors to gain access to the inner chamber and adjust the system settings.

↓ **Backward position = Active Mode (with rumble)**

Puts the trap into an active state as above with additional rumble effects during ghost capture. A brief vibration will be felt to confirm the rumble motor is now active.

SWITCHING MOVIE MODES

TrapFX includes movie-specific capture sequences designed to mimic the way the different ghost traps operated in *Ghostbusters (1984)* and *Ghostbusters II (1989)*. You can switch between these modes by attaching the correctly coloured **Side Rods** supplied with your Haslab Ghost Trap.

Attach both **red rods** for effects from the original *Ghostbusters* movie, or the **silver rods** for *Ghostbusters II*. If you attach one of each colour, or do not attach any rods at all, the trap will backfire and ghost capture will not be possible! Each movie mode has its own set of unique sound effects and lighting sequences.

SPECIAL GHOST EFFECTS

You can choose specific ghost sound effects to play during and after capture or choose to not have any ghost sounds at all. This can be selected by turning the **Teardrop Knob** on the side of the trap. As you rotate the knob, you will hear a sound effect for each option in the following order:

- | | |
|--------------------------------|--------------------------------|
| 1. Slimer (GB1) | 4. Library Ghost |
| 2. The Scoleri Brothers | 5. Mini Pufts |
| 3. Terror Dog | 6. Cartoon Slimer (RGB) |

We have also adapted Hasbro's original ghost sounds to feel a little more dynamic. Captured ghosts will sound more muffled as if they are 'inside' the trap. Ghosts that are being sucked in or released from the trap will sound clearer, louder and 'outside' the trap.

If you wish to turn off ghost sounds completely, rotate the knob until you hear **electrical sparks**. With this setting, the capture sequences will play through with only the trap's standard effects.

CAPTURING A GHOST

With the trap in Active Mode, press down on the **Pedal** to begin the capture sequence. You can also mimic a pedal press with a quick double-press of the **Hidden Button** underneath the trap's handle. How the trap behaves, depends on your configuration of the **Side Rods**:

Ghostbusters (1984) sequence:

Designed to mimic the behaviour from the original movie's Sedgewick Hotel scene and involves two pedal presses. The first press opens the trap doors and illuminates the lights inside which remain steady on. When you are ready to capture, hit the pedal again and the trap will begin to suck in the ghost before closing the doors. The bargraph will fill from left to right, the yellow indicator will illuminate and the red lamps on the trap and pedal will flash.

Ghostbusters II (1989) sequence:

This is a faster sequence performed with a single pedal press as seen in the courtroom scene from the second movie. Hit the pedal to activate the sequence - the doors will open and interior lights will immediately begin to react. Once the ghost has been captured, the doors will quickly close, the bargraph will fill and the yellow indicator will blink twice. You may keep your foot on the pedal during capture and release as soon as the doors close to mimic Egon's use of the trap in this scene.

You will also hear additional effects during capture if you have selected the Slimer (GB1) sounds while in 1984 mode, or The Scoleri Brothers while in 1989 mode. After the capture sequence is complete, you will hear your selected ghost inside the trap. Be careful not to press the pedal again, otherwise the doors will fly open and your ghost will escape!!

ADJUSTING SOUND EFFECT VOLUME

You can change the overall volume of the sound effects at any time by simply turning the **Rotary Dial** on the side of the trap. Turn the dial clockwise to increase the volume and anti-clockwise to decrease it. The bargraph will react to your rotations and display the current volume level. If you want to mute all sound effects for silent operation, simply turn the dial anti-clockwise until the bargraph is empty.

SERVICE MODE

This enables you to open the doors and access the inner chamber without having to run a capture sequence. First, put the trap into Idle Mode by moving the **Toggle Switch** to the centre position. Now perform a 'double-click' by quickly pressing the **Hidden Button** twice. To close the doors, double-press the button in the same way.

SPOOKY MODE

An enhanced version of Hasbro's 'Spooky Mode' has been included in TrapFX which activates an infinite loop of randomised ghost sounds and effects. To enter this mode, make sure your trap is active by flicking the **Toggle Switch** to its forward or backwards position, then triple-press the **Hidden Button**. To leave Spooky Mode, flick the **Toggle Switch** back to the centre position.

HASLAB PKE METER FUNCTION

Just like the stock electronics, TrapFX will react to your Haslab PKE Meter using the infrared receiver next to the bargraph. To use this function, put your trap into Active mode and point your PKE at the trap. When the meter's arms are fully extended, you will hear a random ghost sound or effect. You can repeat this by retracting and re-extending the arms to hear another sound. However, due to Hasbro's IR implementation, the signals transmitted by the PKE Meter can be inconsistent. Therefore, you may find that a ghost sound is not heard every single time.

TRIGGERING A SMOKE KIT

If you have installed a TrapFX compatible smoke kit that connects directly to the cartridge's main board, you can adjust the settings to automatically trigger smoke effects either during the capture sequence (before the doors close), or after the capture sequence has completed (once the doors have closed). Alternatively, you can turn this functionality off completely if you wish to only trigger smoke manually. Please see the 'Settings Mode' section of this guide on how to adjust this.

To trigger smoke effects manually, rotate the **Settings Dial** clockwise to unlock this function. Now hold down the **Hidden Button** to activate your smoke kit. Smoke will stop when you release the button or after a period of ten seconds, whichever is soonest. Rotate the **Settings Dial** anti-clockwise to re-lock if you need to prevent accidental button presses.

SETTINGS MODE

TrapFX introduces a special voice-guided mode that allows for a range of different system settings to be adjusted. In this mode you can change the way your Ghost Trap behaves during the capture sequences including lighting effects, bargraph animations, smoke kit activation and NeoPixel customisation.

To enter Settings Mode, put the trap into Idle Mode by moving the **Toggle Switch** to the centre position. Now perform a ‘triple-click’ by quickly pressing the **Hidden Button** three times. You will then hear the TrapFX voice guide say: “*System settings*”.

Navigating the settings menu is achieved by using the **Hidden Button** and the **Settings Dial** on the front of the trap. To begin cycling through the settings, rotate the **Settings Dial**. You should now hear the voice speak the first setting “*Default Volume*”. To proceed to the next setting, turn the dial in the opposite direction. Continue to rotate the dial back and forth to cycle through all available settings.

Once you hear the setting you want to adjust, single-press the **Hidden Button** to hear the first option for that setting. Press the button again to hear the second option, and so on. There is no need to confirm anything, so simply stop pressing the button as soon as you have heard the option you want to keep.

To change a different setting, continue to rotate the **Settings Dial** until you hear the setting you wish to adjust and repeat the above process.

When you are happy with your new settings, triple-press the **Hidden Button**. You will then hear the voice say “*Configuration saved*”. Note that the settings are saved to the on-board memory so the system will remember your configuration, even after the trap has been powered off.

Please see the following page for a full list of all available settings and options...

SETTINGS MODE CHEAT SHEET

SETTINGS (Settings Dial)	OPTIONS (Hidden Button)	DESCRIPTION
"Default volume"	"Maximum" "High" "Medium" "Low" "Off"	Sets the volume of all sound effects when the trap is powered on.
"LED capture animation"	"1" = Strobe "2" = Flicker "3" = Pulse "4" = Steady on "5" = Off	Changes the animation of the built-in chamber LEDs during ghost capture.
"Bargraph capture animation"	"1" = Centre out "2" = Fill and empty "3" = Interference "4" = Steady on "5" = Off	Changes the animation of the bargraph segments during ghost capture.
⚠ USE THESE SETTINGS WITH CAUTION!! Please read the 'Door Position Calibration' section of this guide before adjusting.		
"Open door position"	"1" ... "6"	Calibrates the opened door position.
"Closed door position"	"1" ... "6"	Calibrates the closed door position.
"Smoke activation"	"During capture" "After capture" "Off"	If you have installed TrapFX compatible smoke kit, this defines the point at which smoke effects are triggered. See the 'Triggering a Smoke Kit' section of this guide for more info.
"NeoPixel count"	"1" ... "8"	Defines the number of individual NeoPixels you have installed in the chamber, up to a maximum of 8. If you are using a pre-built NeoPixel board from Adafruit, you should set this to the total number of pixels it contains. If you have not installed any NeoPixels, you can ignore these settings.
"NeoPixel color"	"White" "Custom colour"	If you are using RGBW NeoPixels, setting this to 'White' will utilise the separate bright white LED only. 'Custom colour' allows you to set any colour of your choice. With this option selected, turn the side Rotary Dial in either direction to cycle through the entire colour spectrum.
"NeoPixel capture animation"	"1" = Strobe "2" = Flicker "3" = Pulse "4" = Steady on "5" = Off	Changes the animation of the installed NeoPixels during ghost capture.

DOOR POSITION CALIBRATION

With TrapFX installed, it is possible that you are noticing that the doors on your Ghost Trap are not opening or closing in the way that they did when using Hasbro's stock electronics. In some cases, the doors may not open all the way to their vertical position or not close enough so that they sit flat.

To remedy this, we have added calibration options in Settings Mode. This works by adjusting the time it takes for the motor to fully stop after the doors begin to open or close.

CAUTION! There is a physical limit to how far the doors can move. If these settings are set too high, the door mechanism will reach a hard stop and begin skipping. When this occurs, the motor can be badly strained which, if allowed to happen too frequently, can lead to permanent damage and malfunction.

To calibrate your door positions, navigate to the relevant setting in Settings Mode and cycle through the options using the **Hidden Button** as previously described. With each press of the button, the doors will move from open to closed, or closed to open. You must stop with the button presses as soon as the doors are fully vertical (in the open position) or fully flat (in the closed position).

For the reasons mentioned above, **DO NOT GO TOO FAR WITH THIS**, otherwise you risk damaging the motor. If you do hear the mechanism begin to skip, immediately exit Settings Mode by triple-pressing the **Hidden Button**. You can then re-enter Settings Mode and recalibrate the doors, being careful to stop at a lower setting.

TROUBLESHOOTING

We hope that this guide makes installation of your TrapFX kit as easy as possible. Your kit has been fully tested before being shipped to you, however if you do experience any problems there are some things you can try:

EFFECT SEQUENCES OUT OF SYNC

If you find that the light and sound sequences are not quite running correctly, or the doors are opening when they should be closing (or visa versa), the simplest solution is to turn off the power by rotating the **Power Dial** anti-clockwise. The sequences and timings will be reset when you next turn on your trap.

DOORS NOT OPENING OR MOVING SLOWLY

This is usually the first sign that your batteries need replacing. On occasion, you may find that one of your four AA batteries loses charge quicker than the others - in this case, the system will not have enough voltage to run all components correctly, so be sure to insert a fresh or fully recharged set of batteries to keep your Ghost Trap running. Remember that you should always use a set of 4x Lithium-ion AA batteries instead of alkaline to be sure everything runs correctly.

WEAK VIBRATIONS WITH RUMBLE MOTOR

As with movement issues with the doors, vibrations that are hard to feel are normally down to low batteries. Make sure to use a set of 4x Lithium-ion AA batteries to keep your trap running as intended. Bear in mind, due to Hasbro's placement of the rumble motor and the weight of the trap itself, it is very limited in its ability to create a shaking motion. Therefore, it is better to consider this motor as a way of providing haptic feedback and enhanced mechanical effects.

NEOPIXEL DISPLAYING INCORRECT COLOURS

If you have installed NeoPixels in your trap and notice that they do not display as expected, it may be that you are using unsupported pixels. For best results, be sure to follow our recommendations in the installation guide and use **RBGW** NeoPixel branded products from Adafruit.

SYSTEM NOT POWERING ON

If your Ghost Trap is not responding when you turn it on, first verify that you are using fresh or fully charged batteries. If you know this is the case, double check the cable connections you made during installation. If any of these connections are incorrect, this can cause the TrapFX boards to not function or not power on at all. Therefore, refer to the installation guide and the printed labels on each circuitboard to make sure all components are connected correctly.