

**Stern - 2016  
Ghostbusters (GB)**

***Spook Central Mod v2***

The “Spook Central Mod” is hand crafted in Australia by a GB owner for GB owners around the world who love their game and want to transform the basic PKE reflective plastic to a Shandor Building with lighting linked to the top in-lanes. This mod is a relatively simple one to fit - no soldering, no complex tools and though you will need to lift the playfield vertical to connect the lighting - just follow the detailed instructions as follows to install.



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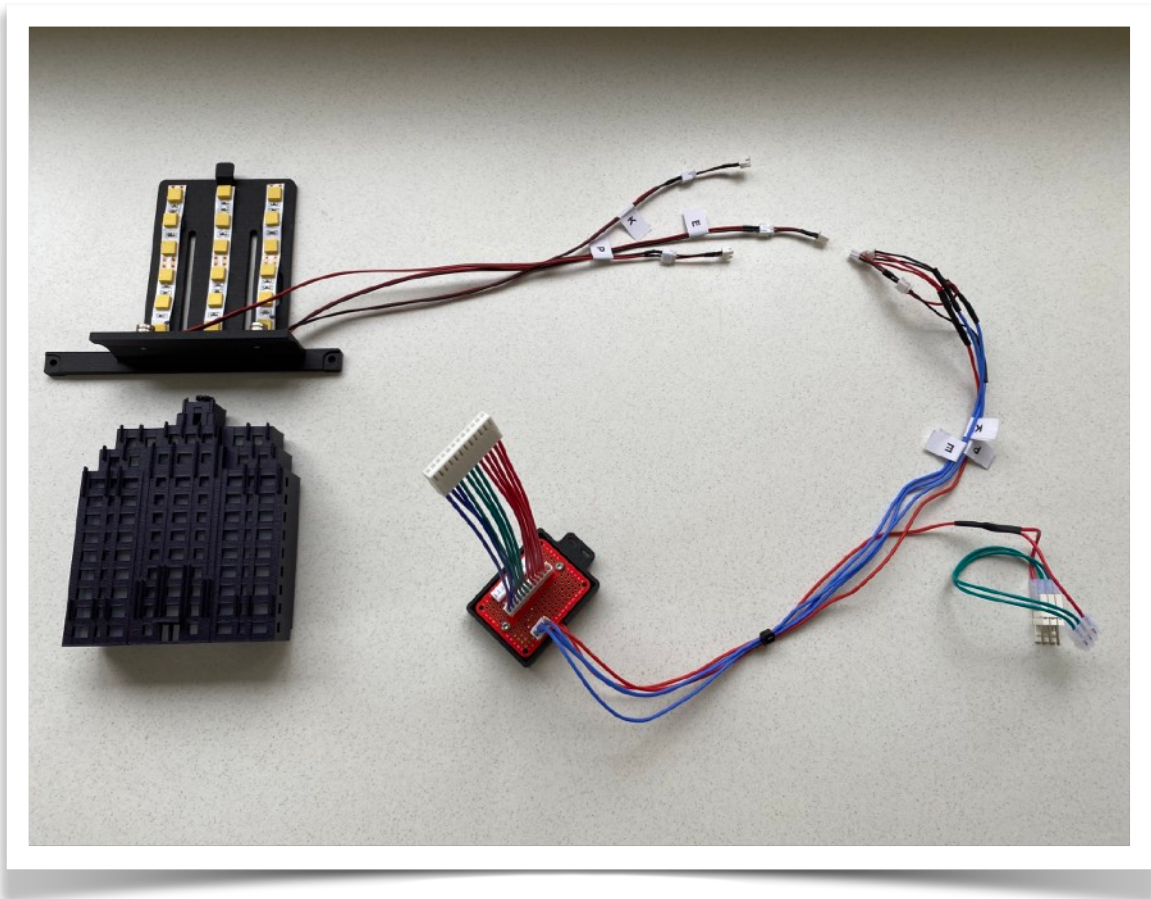
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## **1 - Mod Parts**

When you unpack your parcel, you will find the following components with the mod already pre-assembled (see photo below):

- 1 x **Spook Central Mod Kit (Backing Mount & Building)**
- 1 x **Light Wire Loom Kit**
- 1 x **2mm Allen / Hex Key**
- 1 x **2.5mm Allen / Hex Key**
- 1 x **spare Magnet (of the same polarity)**
- 6 x **Cable Ties**



## **2 - Tools and Safety Notes**

### **Tools necessary to install the mod**

- 1 x Phillips screwdriver (is not provided)
- 1 x 2mm metric Allen / Hex key (provided in the kit)
- 1 x 2.5mm metric Allen / Hex Key (provided in the kit)



- 1 x 90 Degree Phillips screwdriver (is not provided)

Note: it has been observed that some GB games have Philips head and others a Hex Head that secure the reflective plastic to the games backboard. These screws can be a little difficult to remove with a regular screwdriver. You will have to either remove a section of the ramp or purchase a cheap dedicated tool from a place like Amazon - unless you have something in your tool kit.

[https://www.amazon.com.au/dp/B0D1TGZ5G1?ref=ppx\\_yo2ov\\_dt\\_b\\_fed\\_asin\\_title](https://www.amazon.com.au/dp/B0D1TGZ5G1?ref=ppx_yo2ov_dt_b_fed_asin_title)



## **SAFETY NOTES:**

Make sure that your machine is powered off and the power cord running from your machine to the wall outlet has been turned off / disconnected to remove all risk of electrocution.

**Read through all these instructions carefully & completely before attempting the installation of this enhancement.** Although you may know your machine inside and out, there are a few things to consider and understand before proceeding.

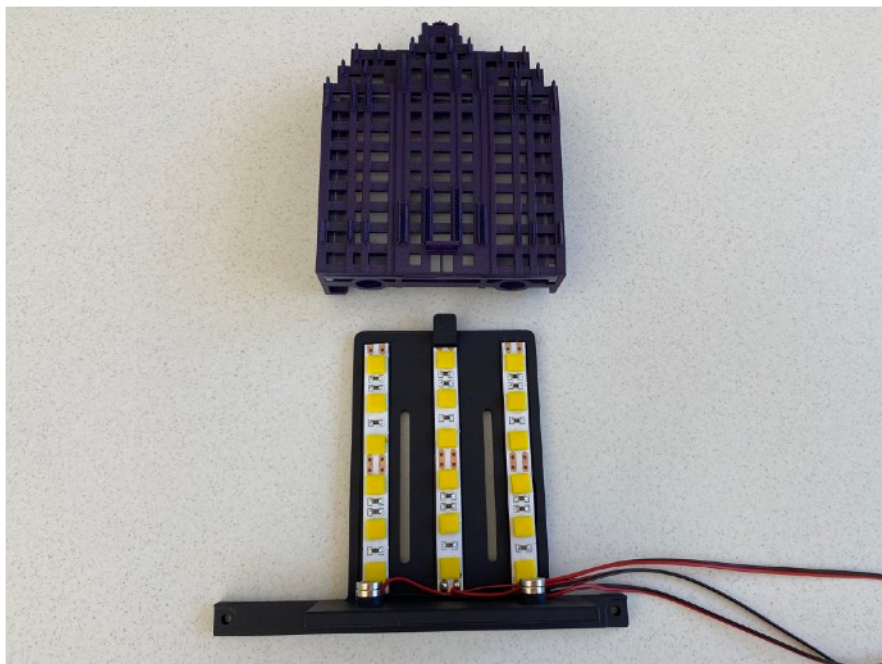
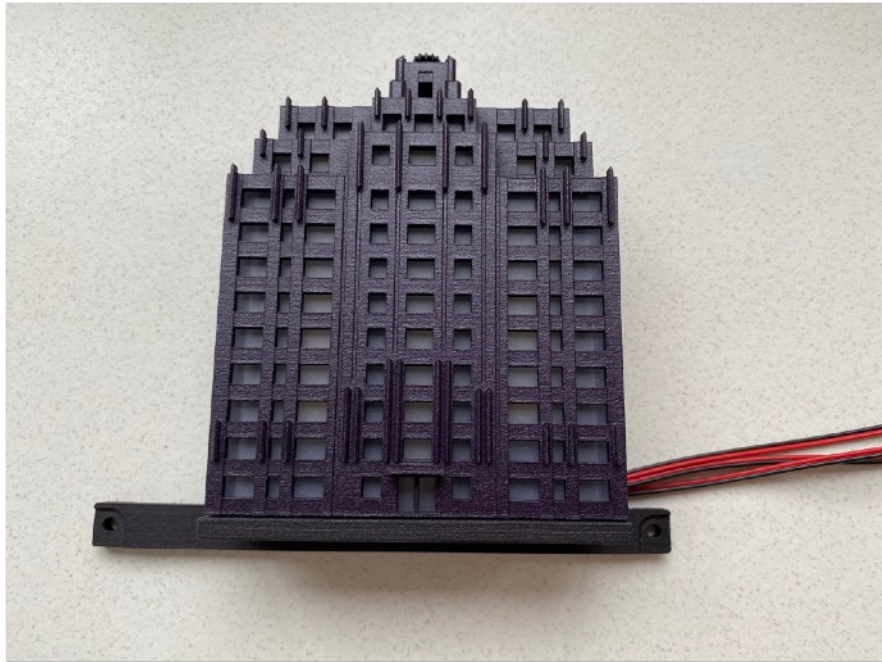
I did have the power on purely to aid for better photos but it was a risk that I was comfortable to carry out - I advise you to turn the machine off and only on when you need to test the mod's lighting do you turn on. If you chose not to power off you take responsibility of any issues caused from possible shorts etc.

### **3 - Mod Pre-assembly**

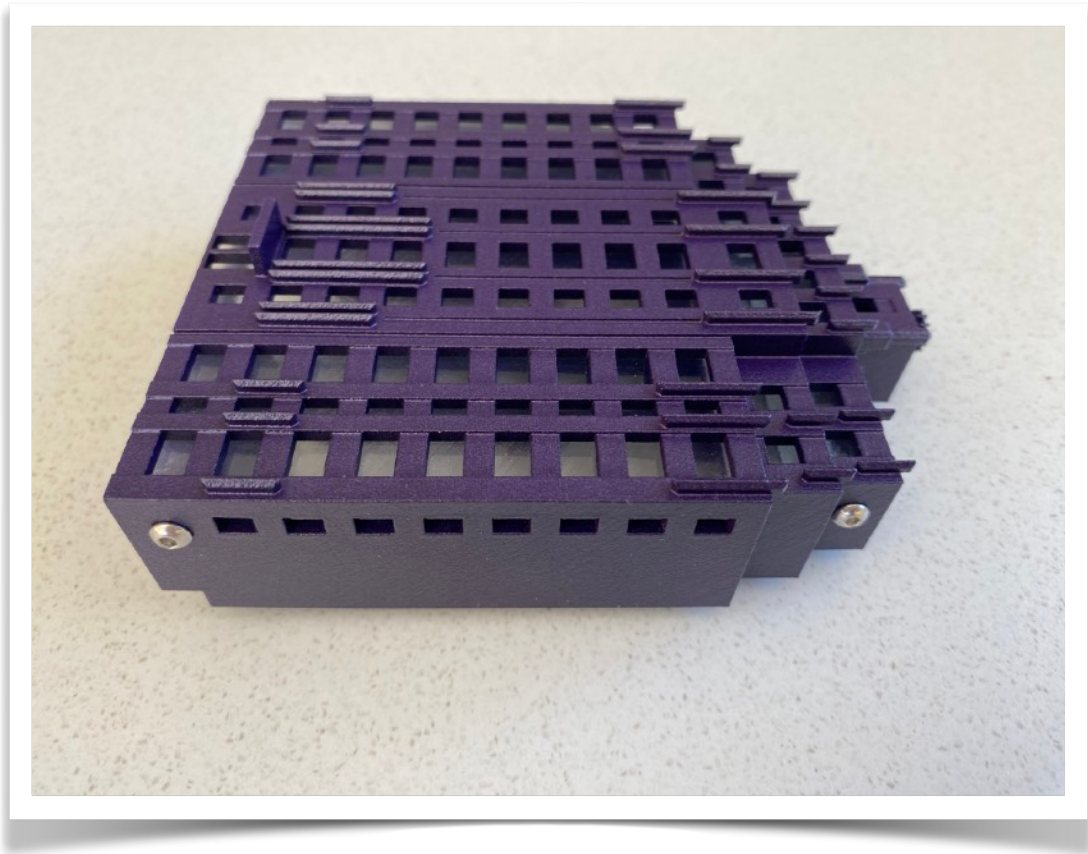
Your mod is supplied pre-assembled so read the following before unpacking.

Take care when unwrapping the mod parts as the building simply lifts up off the backing mount so take care not to drop anything - it simply slides up off a hook at the top and 2 magnet mounts at the bottom.

Lift the building off the backing mount as the building has no lighting installed in it and place on a microfibres cloth to the side ready for installation shortly.



There are 2 screws on one side of the building and these stop the resin windows from sliding out. A few people expressed taking the windows out to black out some of them to create the P / K / E letter lit windows. Personal I did not want to block out the windows but this does give you an option to do so, but the resin does not like thinners so if you make a mistake it will affect the finish of the resin windows.



Also with the run of v2 Spook Centrals the resin windows are a little more clearer than the prototypes. If you prefer to have a more of a cloudy look - you can get some fine grit sandpaper and lightly sand one face of the resin windows to cloud them up a little.

## 4 - Game Preparation

So remove the following:

- lockdown bar
- playfield glass
- pull playfield out on to it's pegs or playfield brackets
- remove all the balls in the game as you will need to lift the playfield up vertically to connect the mod lighting lead to a GI socket later in the assembly.



## **5 - Remove the PKE Reflective Plastic**

Using either a tool you have on hand or the recommended tool mentioned on page 4. Remove the PKE Reflective Plastic via the 2 plated screws at the bottom left and bottom right. Set these screws aside as you will be using these to fasten the Spook Central Mod Mount to the games graphic plastic back panel.

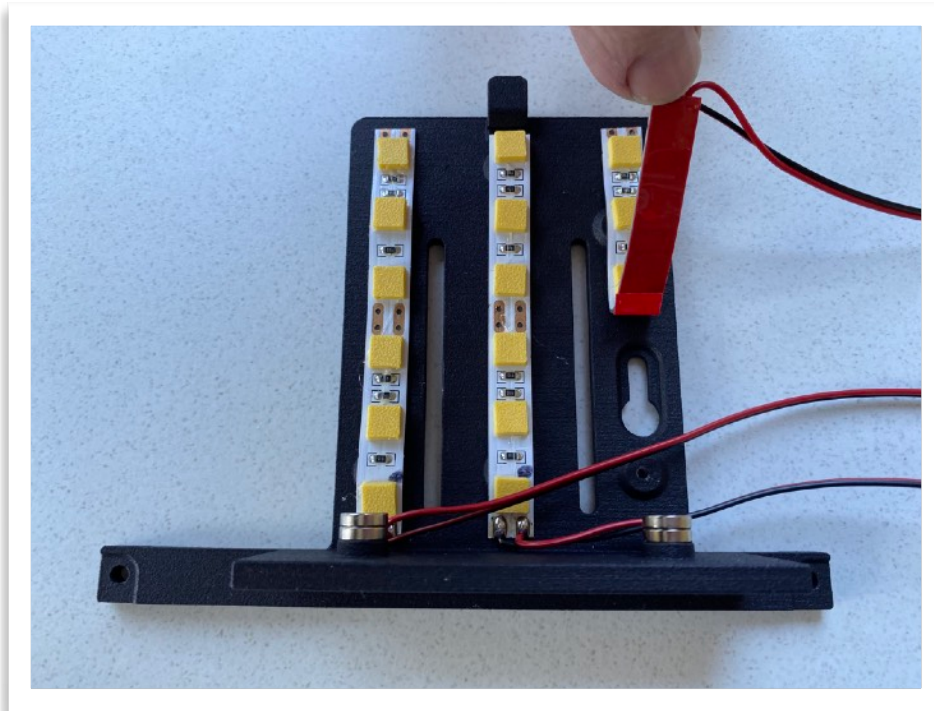
Some games have the Phillips screws and some have the hex head screw - if yours is a Phillips screw these will be a small challenge to remove. This is where the 90 degree ratchet screw driver helps OR you could remove the ramp to get better access.

There is also a screw on the backboard on the RHS on the backboard roughly inline with the E insert. Loosen this screw a few turns as the backing bracket is going to slide over this screw - you do not have to remove it fully.



## **6 - Installing the Spook Central Backing Mount to the Backboard**

The Mod's Backing Mount looks like the below photo. And you will notice the RHS led strip does not have all the self adhesive backing removed just yet.

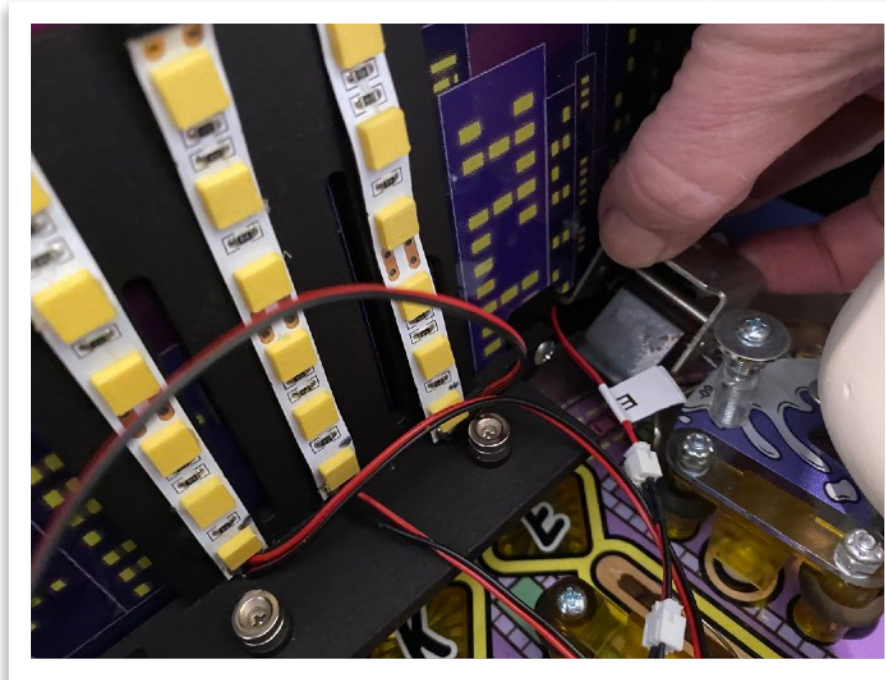


Now slide the Backing Mount over the screw that you previously unwound a few turns. Then take the 2 screws that you recently removed from the PKE Reflective Plastic and secure the Backing Mount at the bottom left and right corners of the mod mount and tighten up. Then wind in the screw that you only wound out a few turns and tighten up.

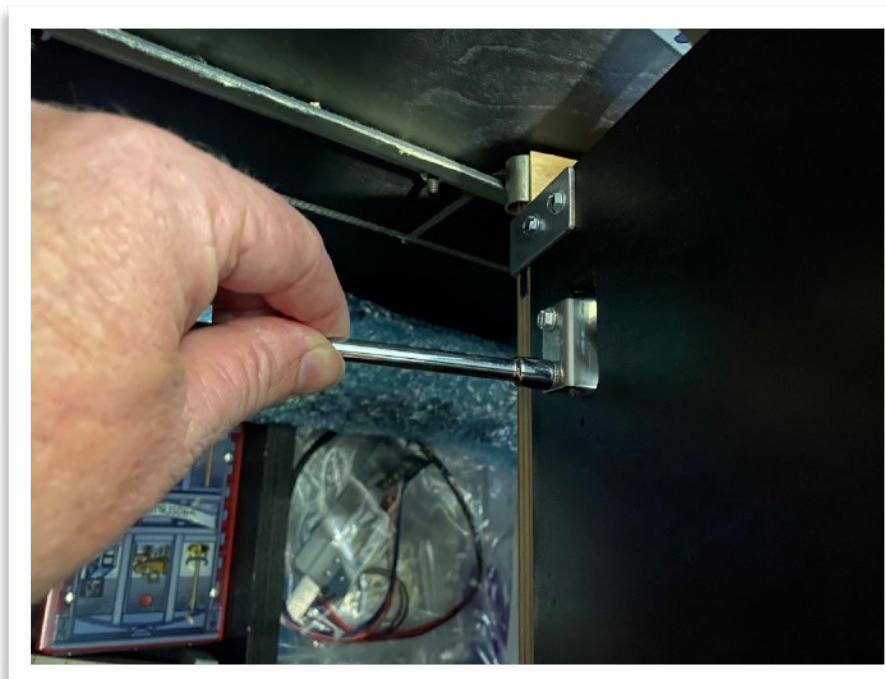


## **7 - Routing the Mod's Lighting Cables**

You will need to feed the 3 x lighting cables past the gate in the back right corner of the backboard.



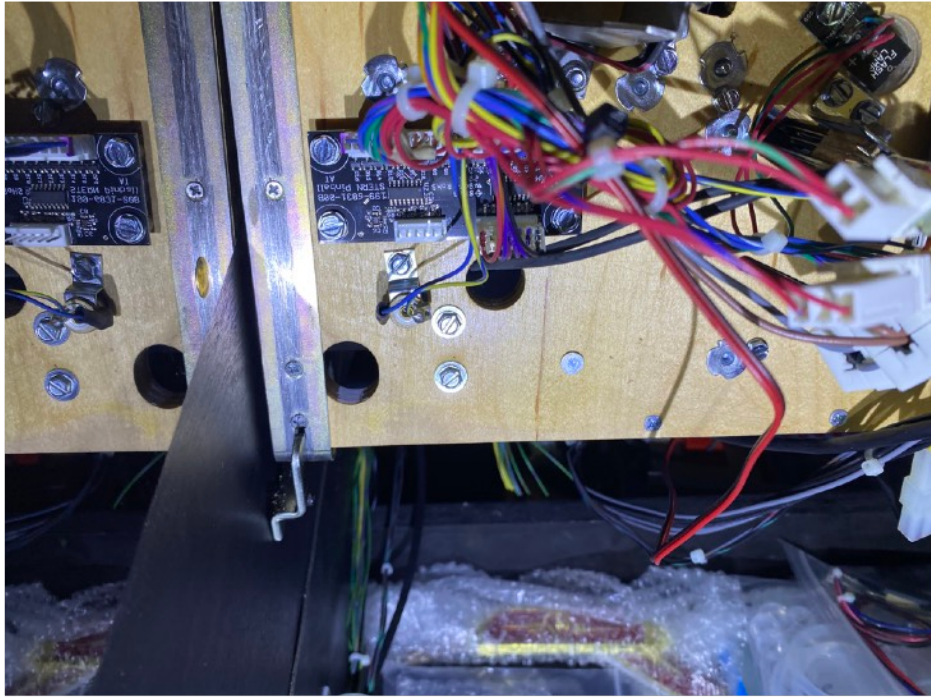
To make it easier, have a look at the back of the backboard and there are 2 x hex head bolts to remove, which allows you to move the gate assembly out of the way. Feed the cables through and then reassemble the gate assembly to the backboard. Then push the lighting wires into the corner of the mount and clean up so they will not foul with the building installation. Lastly secure the 3 wires with a cable tie at the back of the backboard.



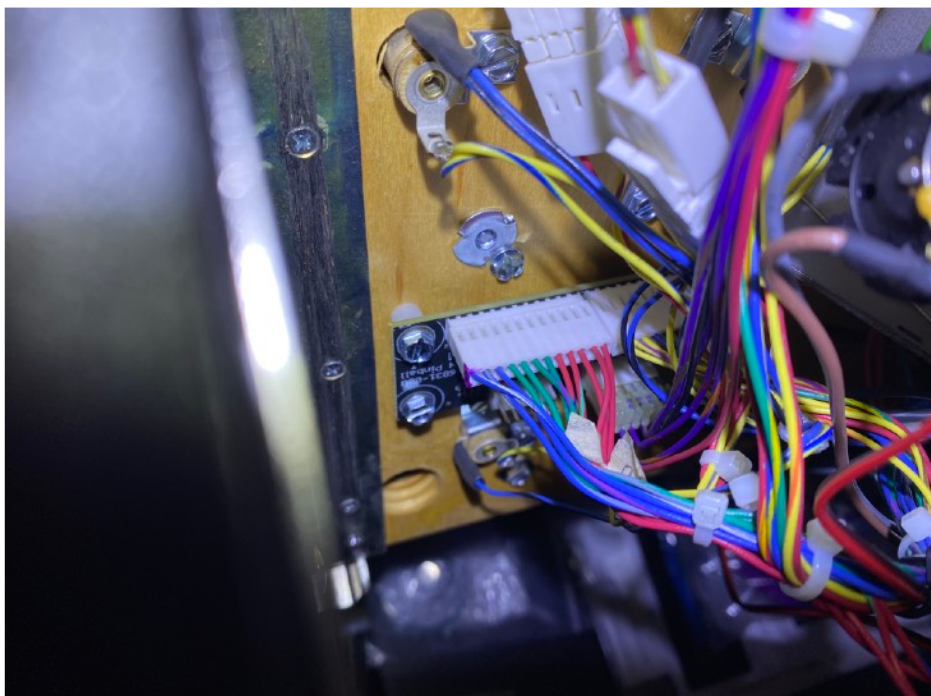
## **8 - Installing the Wiring For the Lighting**

While these next few pages may be a little daunting, please take your time and read through and follow the steps slowly.

Down at the bottom LHS of the playfield is the Stern PCB we need to connect to.



There is a 12 pin plug (with 3 x blues / 4 x greens / 5 x reds) - that you will need to remove but have your mod wiring kit ready for placing the Stern lead / plug directly on to.

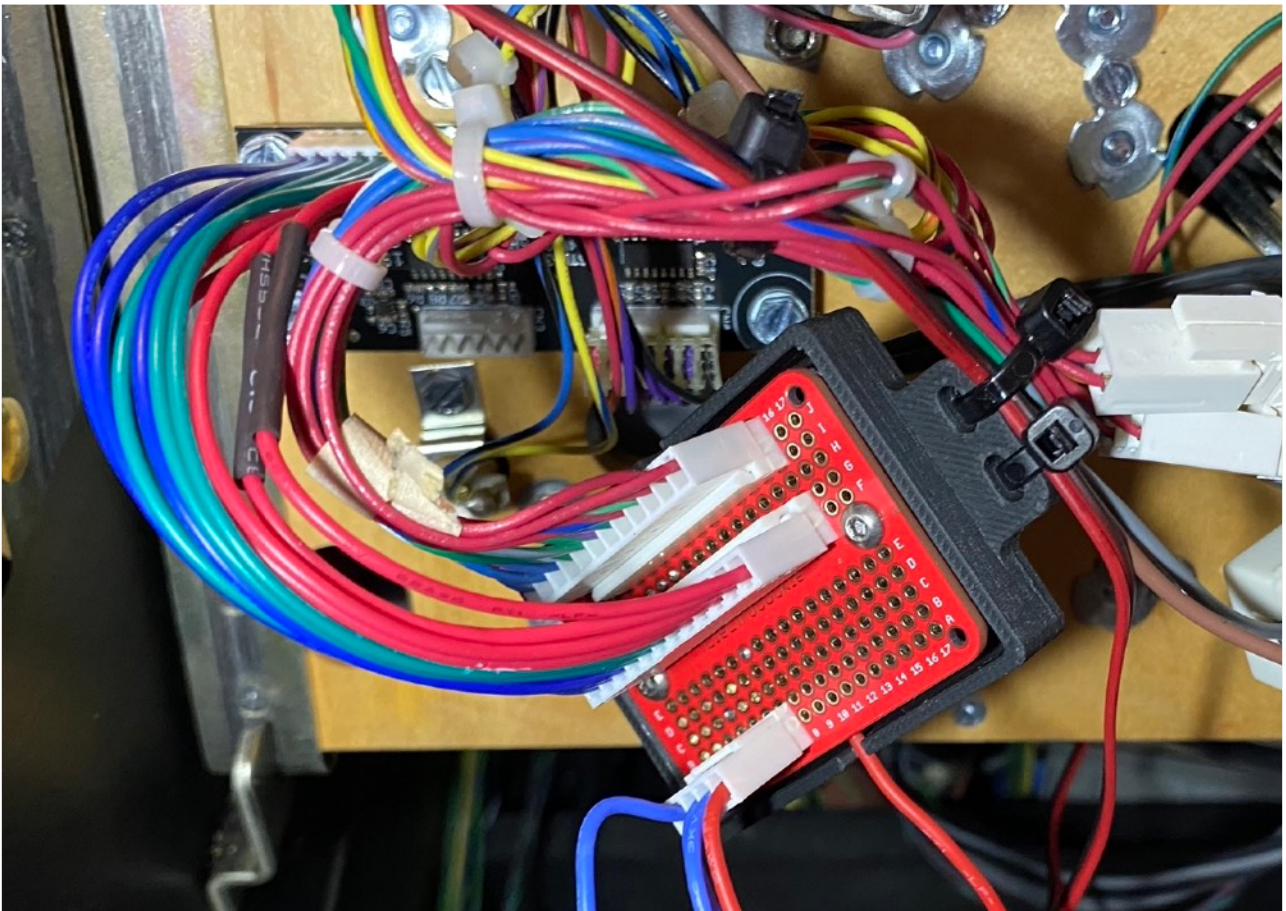


As soon as you remove the 12 pin plug from the Stern board install it as shown to the top row of the mod kit's board. The kit board will have a new lead already plugged into this board. Then take the other end of this new 12 pin lead and plug it into the same pins on the Stern board as the one you just removed.

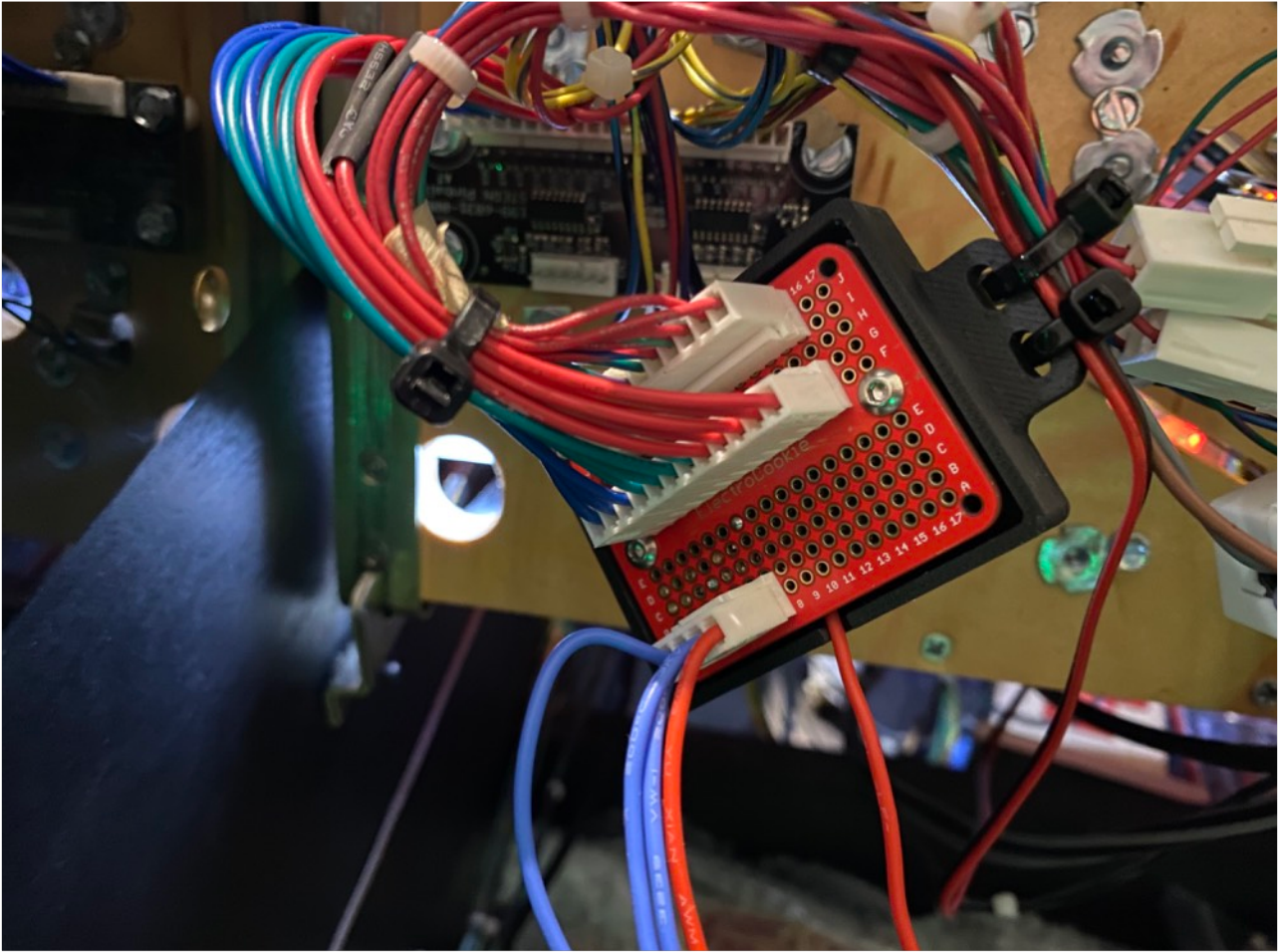
**PLEASE NOTE:** ensure to match the plug to the pins and ensure it is not over hanging on the left or the right. Doing it wrong could short or blow something - so take your time and double check yourself.

This (Red PCB though the PCB board will vary in colour) board acts like a Z connector to link your mods lighting to the PKE roll over insert lights. There is a 4 pin plug already fitted to the Red PCB and the other end has plugs that plug into the leads coming from the Mod Backing Mount Lighting Kit.

Lastly the Red PCB is secured to a small housing to ensure no shorts can occur and it also has 2 cable tie lugs, use the supplied cable ties to secure the housing to a local wiring harness as this will limit the risk of leads coming loose.



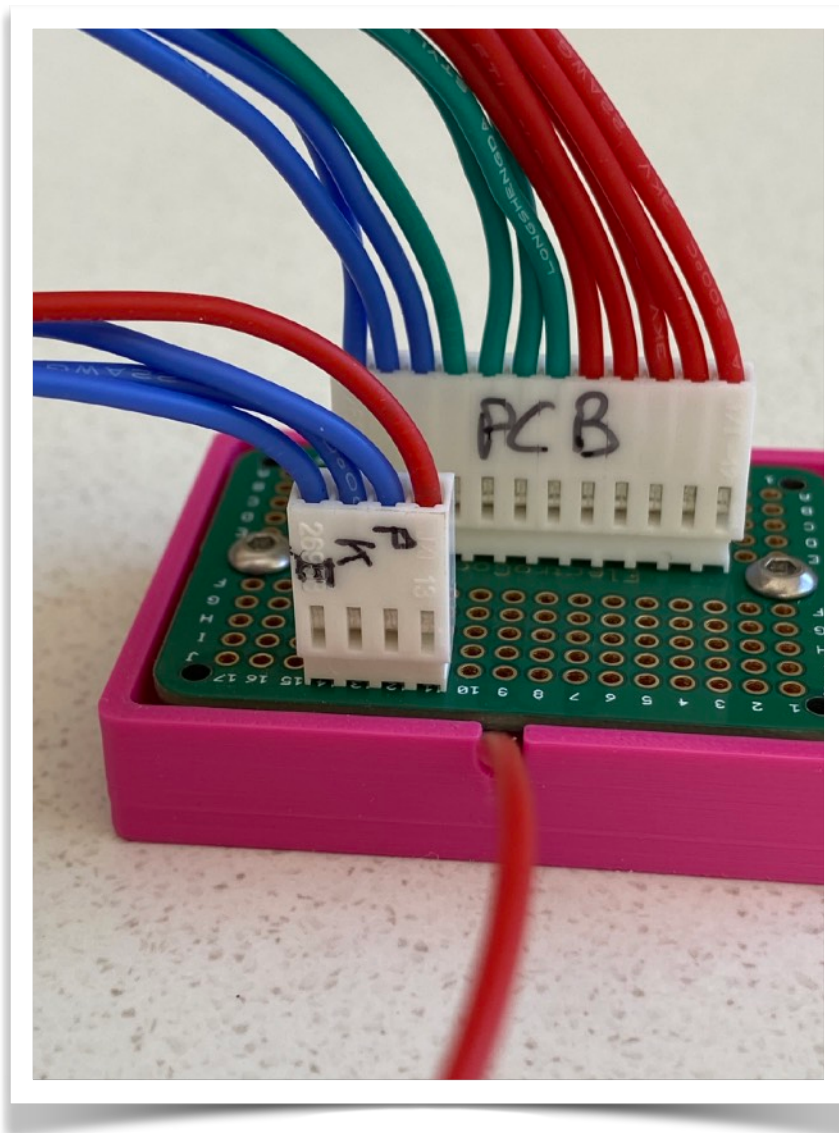
Lastly due to product availability the 12 pin plugs and 12 pin strip are of the same brand (unlike the protos) and they fit well. I recommend a cable tie around both 12 wire leads together (applies some tension) to ensure everything works nicely and leads can't flex and work loose.



### **Helpful Information**

The 3 x Blue wires coming from 4 pin plug are passing signals from the insert lighting to the building lighting - which is achieved by bridging wires under the circuit board so the 12 pin cabling needs to be all connected as well. Ref to this photo to show which wire is which in case you need to track down a non-working cable.

The Blue wires are marked on the plug what they are linked to - P / K / E to aid in any possible tracking of an issue.

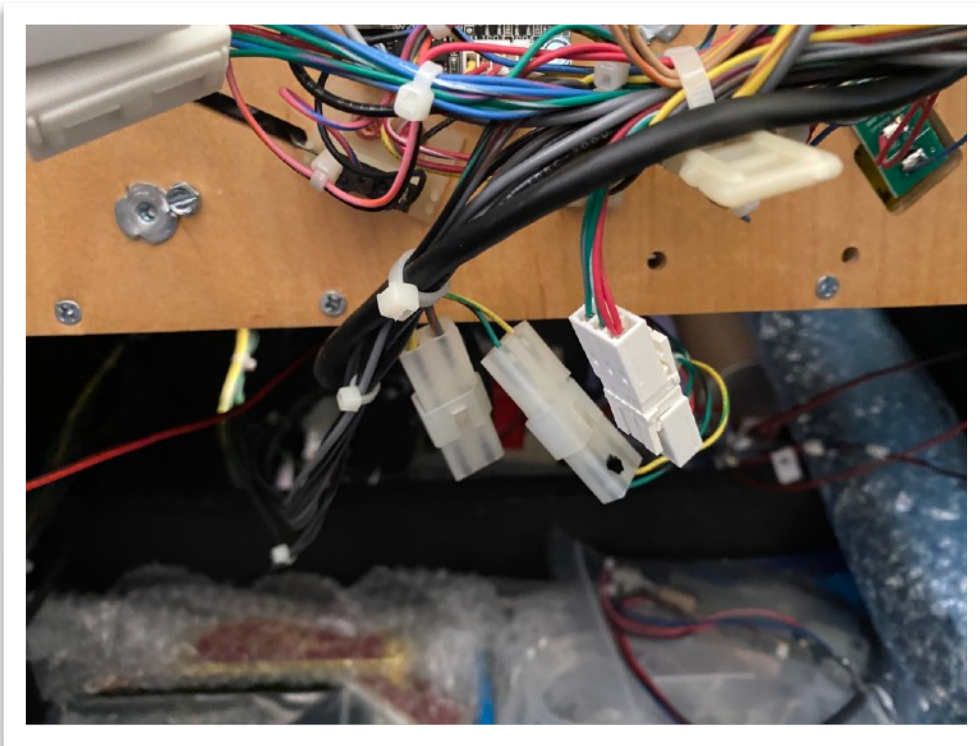


The 1 x Red wire coming from the 4 pin plug is the power for the building lighting.

The 1 x Red wire coming from under Red PCB is the power wire coming from another plug which is part of the supplied wiring loom.

The 12 pin plug does not have a power wire to get power from hence getting power from a different lead. The green and red wires of the 12 pin plug are just passing their own signals through - we only need communication from the blue wires.

There is an existing Stern plug closer to the PKE Inserts which is a 3 pin plug (green / green / red) on a existing Z connector. We will be tapping into this plug for the power for the mod's lighting.



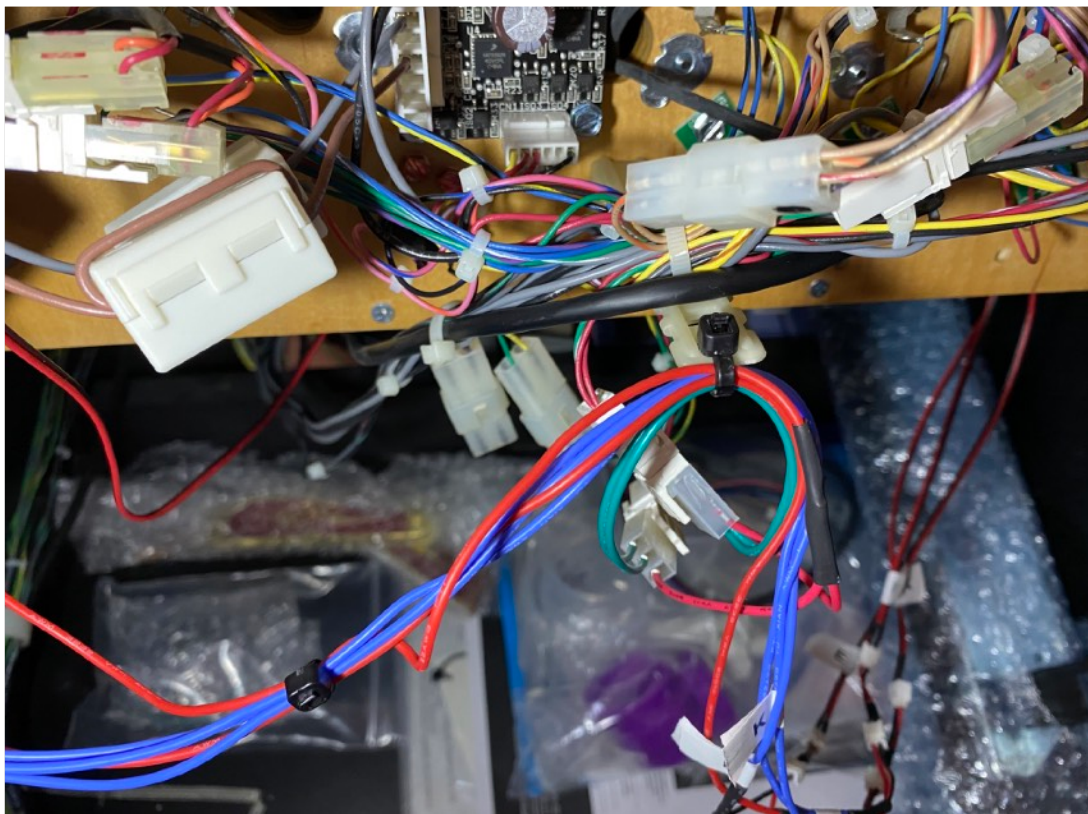
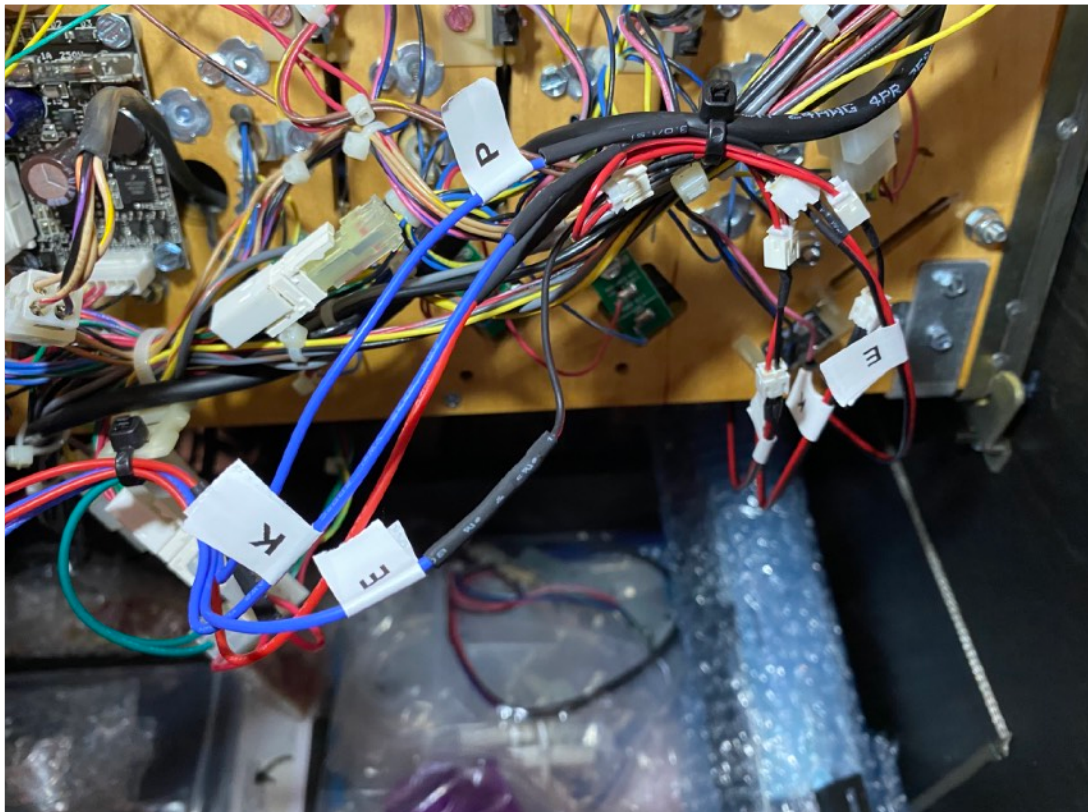
Disconnect the above plug and then take the attached mod lead and connect as shown to both ends of the stern plug that you just disconnected - ensuring colours are matching - Green for Green and Red for Red.



Now take the lead from the 4 pin plug and feed to the RHS and locate the 3 leads coming from the Mod Backing Plate. Both sets of leads will have labelling P / K and E on them. Simply match the leads with the same letter tags.



Now you just need to secure the loose leads to existing Stern wiring to ensure nothing catches on anything or vibrates loose. Secure the leads approximately as shown.



## **9 - Testing the Mod Wiring**

Before lowering the playfield into the cabinet, you can test the mod lighting. You do not need the balls in the game to test as the attract mod will light up the PKE top in-lanes and also the Mod Lighting. Do not touch any wiring / coils under the playfield while the game is live.

1. Turn the game's power on.
2. Wait for boot up and attract mode and then the PKE inlanes will cycle through with the lighting effect.
3. Have a look around the vertical playfield and check to see that the mod lighting is cycling left to right.
4. Turn the game off immediately if things are not working as it should and follow the below steps for a particular issue.

### **Issues and Solutions**

Firstly if things are not working as they should, turn the game off and check all the plugs and connections and alignment. The following is identification of possible issues that you could be experiencing.

- if the PKE insert lighting and mod is not coming on there is a connection issue at the 12 pin plug / lead - check the pin / plug alignment, pressed on correctly with the cable wiring being correct and that the cable tie is in place to hold the 2 x 12 pin cables in tension.
- If the PKE insert lighting is working but the mods lighting is not coming on - the power is not getting through to the building - check the plugs and that the pins in the lighting cables are pushed in correctly and fully - the Comet plug pins can push out fairly easily as they are a friction hold.
- if the building lighting is not synced up with the PKE insert lighting - swap the leads at the back RHS where the mods wiring meets the mod PCB wiring where the cables are labelled and swap around - take care to pull the plugs apart - do not tug / pull on the wires as they may pull out - seperate at the plugs.
- If the mods lighting is not coming on, it could also be the polarity of the wires and power going to the LED strips. Comet Polarity wires were installed in-line - simply remove one and reconnect the wires with polarity swap wire (is about a 1 inch / 2.5cm long) short lead removed. If it now works after a test it means the game has reversed polarity.

If you are still having issues, disconnect the wiring loom or turn the game off and please contact me and we can do a check - send photos through and we will problem solve - I will reply quickly so you are not down for too long.

Swinks - on Pinside

Email - [swinks.pinball@gmail.com](mailto:swinks.pinball@gmail.com)

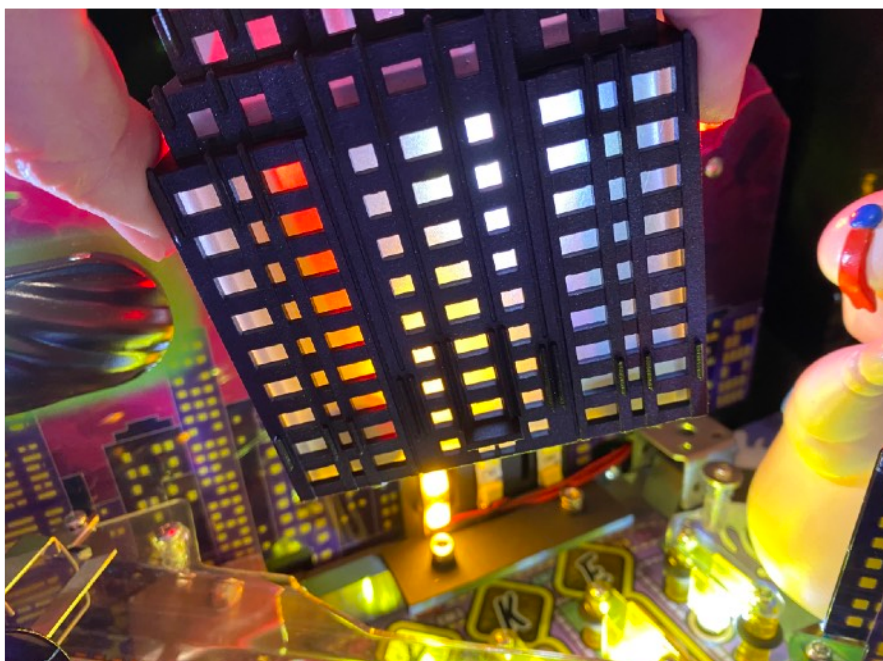
## **10 - Finish the Mod Assembly**

If you have reached here, your mod lights up as it should and you are almost at the point of enjoying your mod.

Lower the playfield from its vertical position onto the cabinet on to its pegs / service brackets.

The RHS LED strip will need the remaining piece of backing tape removed and stick down the LED strip to the backing plate over the screw head.

Take your mod building and take note of the 2 holes in a round section in the bottom which have a bolt in each - the bolt heads magnetise to the magnets on the bottom of the backing mount. Also in the very top section of the building is an enclosed section - this hooks over a locating hook on the backing mount. Slide on to the backing mount ensuring the wires coming out of the RHS are pushed to the back edge so not to hold the building up a few millimetres - it should sit flush onto the bottom of the backing mount. It might take one or two goes to adjust right.



## **11 - Set Up your Game**

Once the building is installed you are now ready to lower you playfield into the cabinet, and re-install the games balls and power up once again. Check that the building lights up in attract mode matching the PKE lighting sequence.

Now when:

- the P insert is lit the Left side of the Building lights up
- the K insert is lit the Middle of the Building Lights up
- the E insert is lit the Right side of the Building Lights up

**ENJOY**

In the Photo below the K Insert is lit



**IMPORTANT NOTE: in the future if you need to lift you playfield vertical - I advise to lift the Spook Central Building out and placing it in a safe place to avoid it dropping out.**

## **12 - Customise your Spook Central Mod Windows**

Some other modders designed their PKE mods to show P / K / E in the windows by blanking out some of the windows. I chose not to replicate what others have done - rather light up a section of the building BUT I did design the resin windows to slide out easily.

You can slide out the window panel and place some masking tape on it and reinstall into the mod and then pencil mark the windows you want to keep lit. Then slide the window panel out and carefully cut around those windows to keep clear and leave the tape in place (for windows you want light to travel out) and remove the major part of the tape. Be careful not to cut where there is another window as then the resin will be damaged.

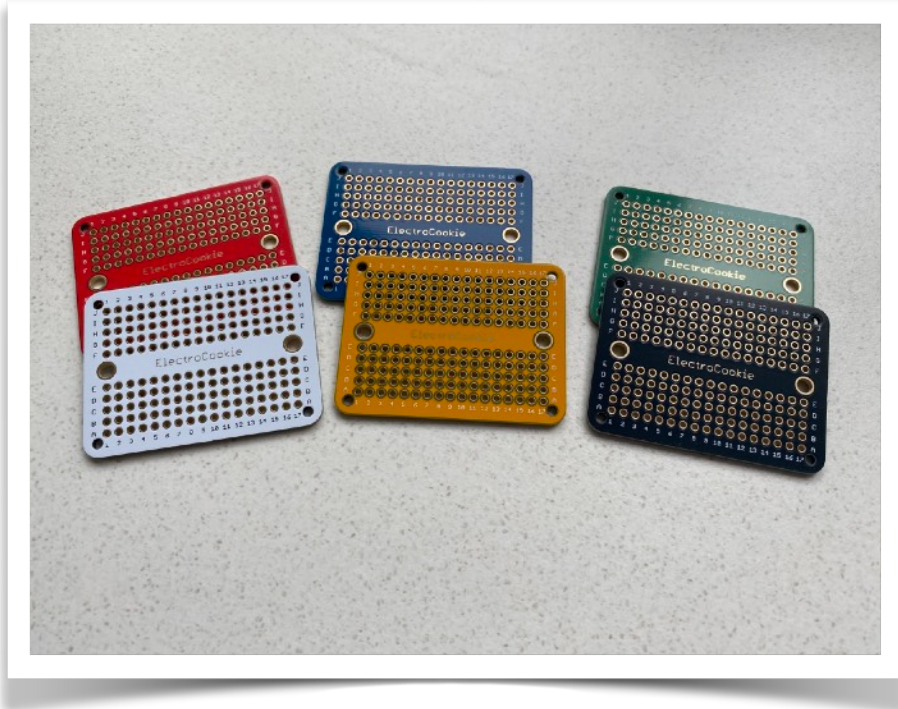
You can then do a quick coat of paint / airbrush over the areas where you do not want light to shine through.

**Please note: the resin windows does not like thinners so avoid harsh chemicals as it will damage them - it will make it cloudy and sticky.**

*Personally I like the classic building look and would not mess with the resin windows, but each to their own and perform at your own risk.*

### **13 - Spare Parts**

- The 12 pin strips and plugs are 0.100 Molex 2510 fittings
- The 4 pin plug are 0.156 Molex fittings
- The PCB's are ElectroCookie mini PCB's - which are purchased in packets of 6 and come in 6 different colours so each persons mod will have a different colour board.



- The LED strips are 6vdc warm white strips from Pinball Haus but you could use 5vdc strips as well.
- I will provide the file for the LED covers on Makerworld so you can print your own and swap out to a different colour or a different shade of yellow - <https://makerworld.com/en/@swinks/upload>
- I will provide the file for the PCB Holder on Makerworld so you can print your own and swap out to a different colour or replace if damaged - <https://makerworld.com/en/@swinks/upload>
- The wires used are from Aliexpress for the 0.100 and 0.156 Molex but Amazon have kits as well but more expensive.
- The twin red/black wires are from Comet Pinball.

#### **RETURN POLICY:**

*Please contact us as we will be proactive to try and quickly resolve any problems from abroad reducing the need to send your purchased parts back for repair. Approval from Swinks Pinball must be received before any items can be returned for repair or replacement. All parts, cables, etc. must be included when the product is returned. We will repair or replace/exchange components based on our analysis of the problem. Swinks Pinball reserves the right to deny any return or exchange. Refunds are not given. Freight will be covered by Swinks Pinball on the return trip back to you **only**.*

*In stating that, we want everyone to love and enjoy their Spook Central Mod - so if you have any issues at all, please, please reach out via the well known Pinside forum or via email and I will promptly help you out.*

*Email: [swinks.pinball@gmail.com](mailto:swinks.pinball@gmail.com)*

#### **PRODUCT DISCLAIMER:**

*Please remember that this is a "MOD." We took great effort in designing and testing our product in order to produce a high quality product, but it is not a Stern factory original nor an approved part for your pinball machine. There is the risk of unwanted side effects with any modification to a factory game and there are many factors that can cause undesirable side effects after installation of such a modification. As such, we cannot assume responsibility for game malfunction, damage to the game or surroundings, unwanted electrical emissions, personal injury, or other adverse effects caused by the installation of our MOD as we did not install it.*

#### **PRODUCT QUALITY DISCLAIMER:**

*All parts are made to the highest quality possible. The Mod's parts are professionally 3D printed by Zelta3D using MJF & SLS nylon & Resin processes which may have some minor print lines, colour variances (which follows through the dye and some paint process) or clouding (on the resin parts) - which are all part of the process and treated to the best of our ability to make the parts look nice and professional. In addition the purple dye process and paint process will be unique to each mod and is meant to be directional to create shadowing to simulate a night atmosphere. Once the mod is installed into the game with game lighting these minor effects will not be clearly visible from the players perspective and the mod will give your machine that cool night time city feeling.*