



Copyright © SubDude Audio LLC, Idaho, USA. All Rights Reserved. Reproduction, transmission or redistribution of this document or its contents without written permission is prohibited.

Take your time, follow the instructions, relax, and enjoy yourself!

WARNINGS: Perform installation with your pinball machine turned off and unplugged from AC power.



PixlWav – Spike-3 Cabinet Lighting Kit Installation Instructions

**Note: You must have a functioning PixlWav Speaker Light Kit
Installed and Working Prior to Installation**

DANGER - SHOCK RISK:

The internal connection to AC Power Shown in this document is near exposed 110/220V AC connections that can easily be touched by human hand.

**IT IS NOT OK TO THINK YOU CAN LEAVE YOUR
MACHINE PLUGGED INTO WALL POWER
DURING INSTALLATION.**

**TURNING THE MACHINE OFF BY SWITCH IS
NOT ENOUGH.**

**YOU MUST UNPLUG YOUR MACHINE FROM
WALL POWER!**

Foreword

If your Spike-3 PixlWav *Speaker Light Kit* was purchased after 7/11/2026 you may skip the remaining foreword text below.

All Spike-3 PixlWav *Speaker Light Kits* shipped prior to 7/11/2026 included a Backbox Hub and CN23 Pickup Board that differs from what's shown in this document. We'll refer to these as "Legacy Boards".

The boards shown in the document are required. If you have Legacy Boards, we've identified you by name and have substituted new / current versions of the required boards, and they are included with your Cabinet Lighting Kit.

Please dispose of the old boards only after you have completed this installation and have confirmed everything is working, as they are no longer useful.

Your Speaker Lights will function as before.

Thank you for your consideration!

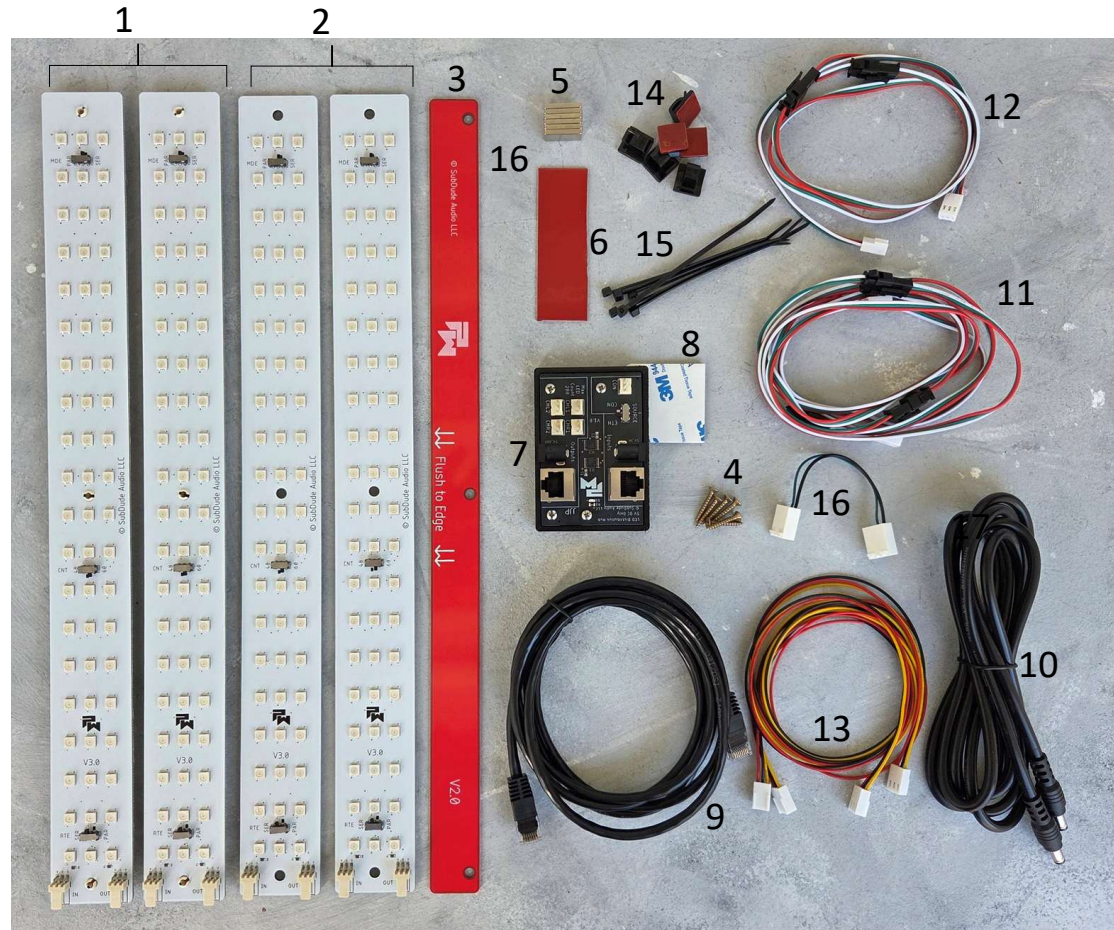


Kit Components and Preparation



Kit Components

1. Quantity two, LED Light Bars – Under Cab
2. Quantity two, LED Light Bars – Backbox
3. Drill Hole Registration Bar
4. Quantity six, m3x20mm Countersunk Screws
5. Quantity six, Rectangular Rare Earth Magnets
6. Double Sided High-Bond Adhesive Tape
7. PixlWav Extension Hub
8. Foam Adhesive Tape for 7 above
9. 2m Ethernet Cable
10. 2m Heavy Power Cable
11. Behind Backbox Cable Harness (Long)
12. Under Cabinet Cable Harness (Short)
13. Quantity two, 750mm Same Side Extension Cable
14. Quantity six, Cable Management Clips
15. Quantity six, 4in Cable Management Ties
16. CN10 to Pickup Boad Cable Harness

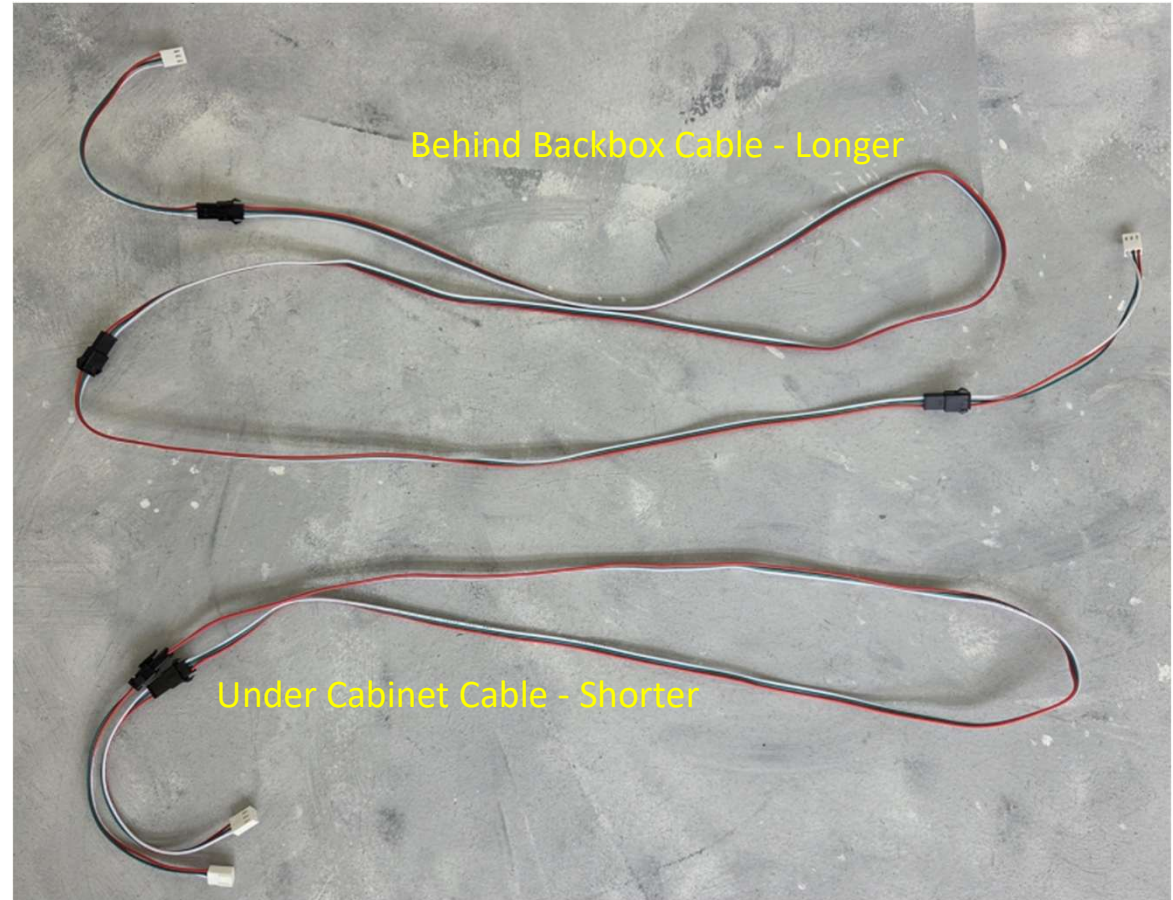


PIXLWAV

Pre-Connected Cables

There are two LED Cable Harnesses that have been pre-connected:

1. The Behind Backbox Cable is the longer of the two, measuring 72in (1.8m) length.
2. The Under Cabinet Cable is the shorter of the two, measuring 32in (0.8m) length.



LEDs

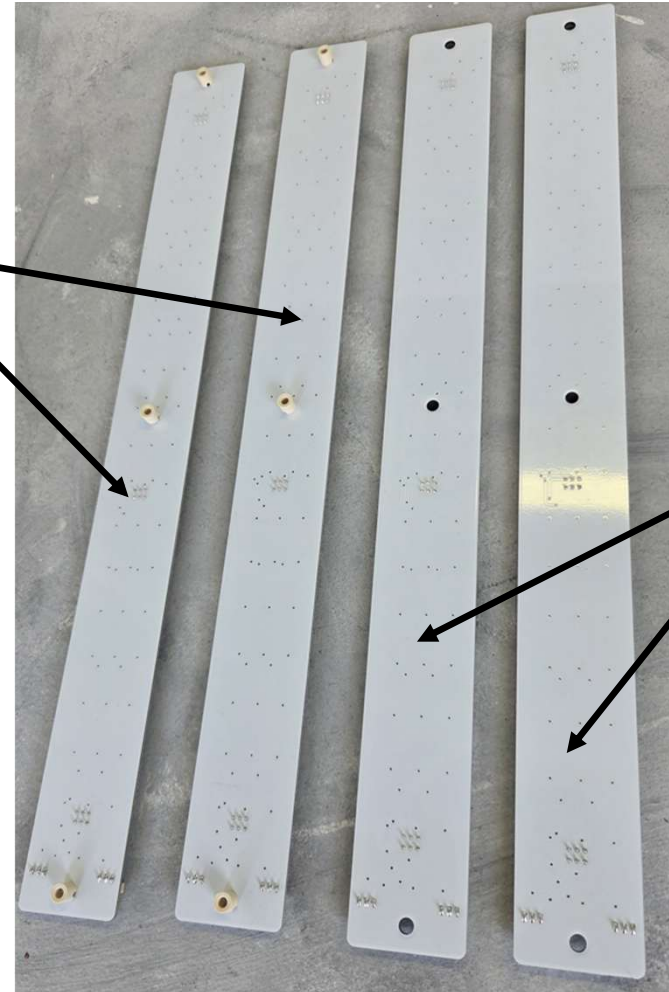
Shown to the right are:

1. Quantity two Under Cabinet LED Bars
2. Quantity two Behind Backbox LED Bars

Continue to next slide.

Under
Cabinet
Bars

Behind
Backbox
Bars

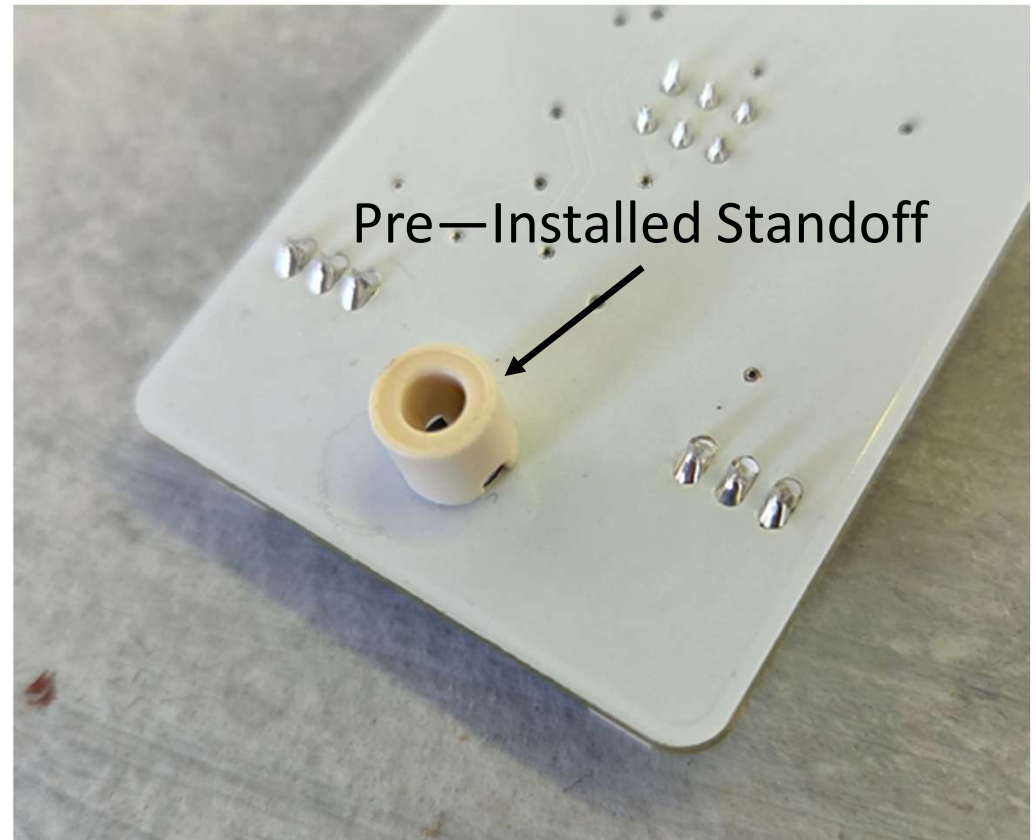


Under Cabinet LEDs

The Under Cabinet Bars have pre-installed standoffs as shown in the image to the right.

Each of the two Under Cabinet LED Bars has three Standoffs.

Continue to next slide.

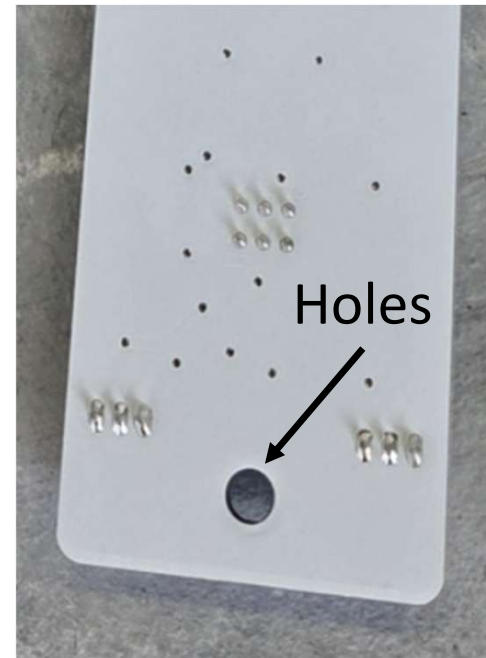


Behind Backbox LEDs

The Behind Backbox LED Bars have holes as shown.

Each of the two Behind Backbox LED Bars has three holes.

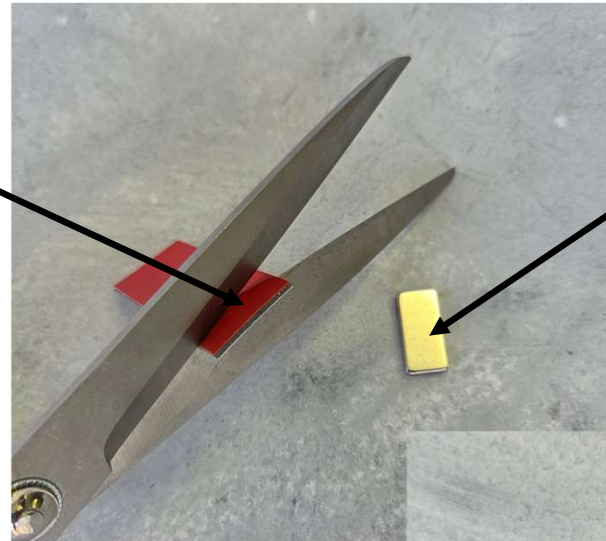
Continue to next slide.



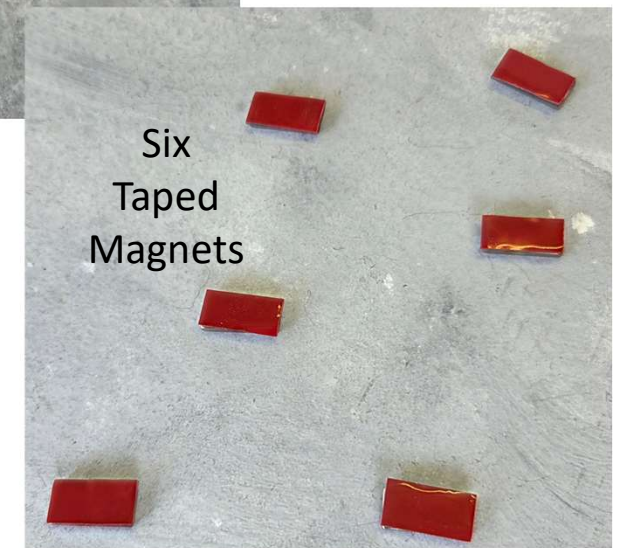
Magnet Tape

1. Cut the Double-Sided High-Bond Adhesive Tape into six segments, each sized for one magnet.
2. Place one tape segment onto each of the six magnets as shown.

Tape
Segment



Magnet



Affix Magnets

1. Affix the magnets, three per Backbox LED Bar, over the holes, as shown.

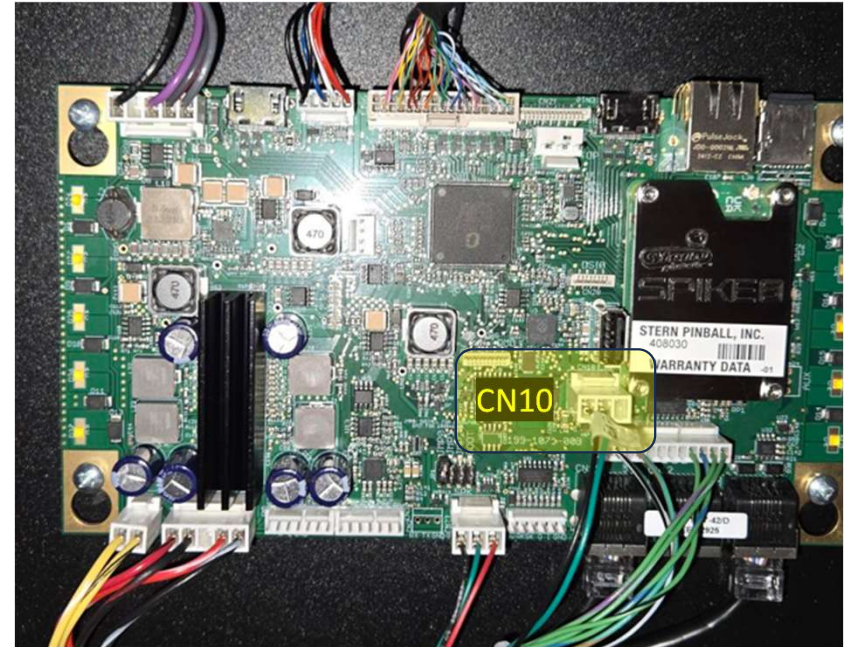


Backbox Installation – PixlWav Dynamic and Expression Speaker Lights



Spike-3 Node Board Headers

- Shown in the image at the upper-right is a key header location, CN10, which is the source of the Expression Light Side-Rail signal.
- The wire harness shown plugged to CN10 at the upper-right is present under two conditions:
 - You have a Limited-Edition trim, and this harness was present from the factory.
 - You have the pro or premium trim and have added the aftermarket Stern Expression Light Side-Rails.
- The Pickup Board shown at the lower-right is what your current PixlWav Speaker Light Kit already has plugged into CN23 unless you have the PixlWav Dynamic Speaker Light Kit. If you have the Dynamic Kit, a new Pickup Board is supplied with your Cabinet Light Kit so that the CN10 signal can be displayed on your new cabinet lighting kit.
- If you unplug a wire harness from CN10 during this installation, keep track of it since you'll need to re-plug it to the pickup board later to maintain functionality of the Expression Light Side-Rails.



Spike-3 Backbox Hub Overview

- Shown to the right is your existing PixlWav Backbox Speaker Light Hub.
- No action other than learning is required now.
- Refer to this slide as needed.
- Only key points are explained below.
- There are two power jacks labeled “5V IN” and “5V OUT”. They are interchangeable and each can be used for either power input or power output.
- Route Switch:
 - Selecting “CN23” routes the Spike-3 Expression Speaker Light Signal to the Source Switch.
 - Selecting “CN10” routes the Spike-3 Expression Side-Rail Signal to the Source Switch.
- Source Switch:
 - Selecting “ROUTE” pipes the signal selected by the Route Switch to the Speaker Light Headers.
 - Selecting “CON” routes the controller signal to the Speaker Lights. (I.e., the controller dongle signal that is plugged into the Controller Header).
- Backbox LED Headers - Plugging your Behind Backbox LED Cable Harness to one of these headers, routes the following signal to your Behind Backbox LEDs:
 - CON – Routes the Controller Header signal
 - SPK – Routes the CN23 Stern Speaker Light signal
 - EL – Routes the CN10 Expression Light Side-Rail signal

Input Ethernet Port

5V Power Jacks

Route Switch

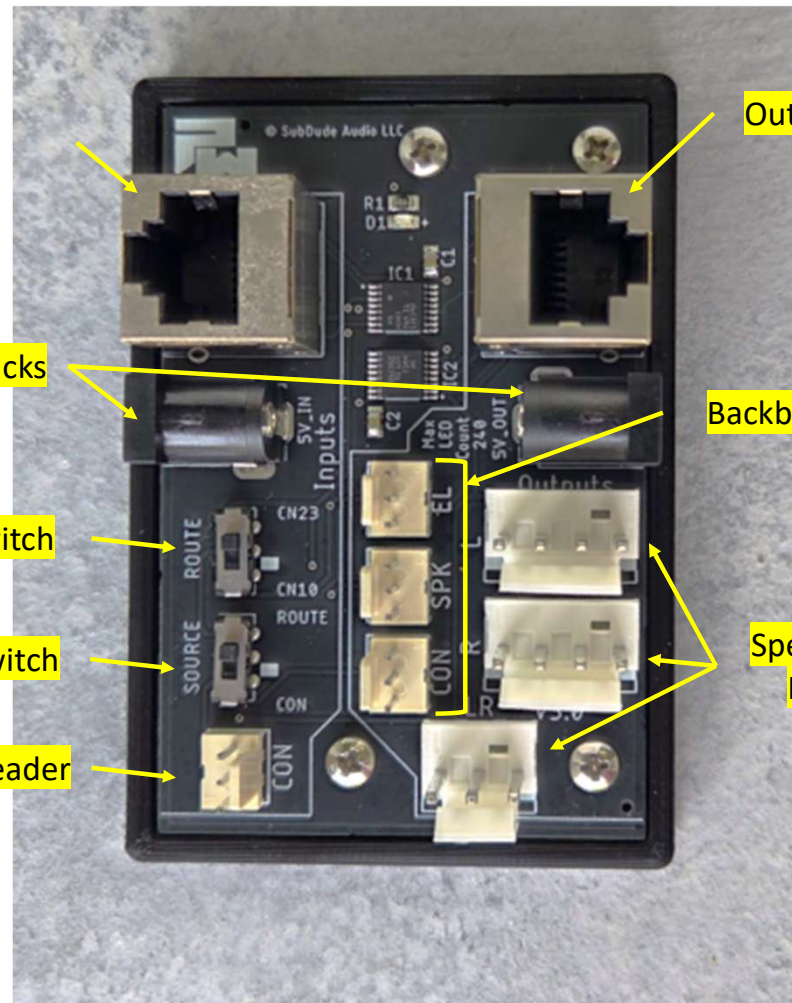
Source Switch

Controller Header

Output Ethernet Port

Backbox LED Headers

Speaker Light Headers



PIXLWAV

Spike-3 Pickup Board Overview

- Shown to the right is your PixlWav Pickup Board.
- No action other than learning is required now.
- Refer to this slide as needed.
- **Output Ethernet Port** routes to the Backbox Hub Input Ethernet Port.
- **NEVER plug anything to CN23 Out. Any Speaker Light connection should be done at the Backbox Hub.**
- **CN23 In** plugs to the CPU Note Board at CN23.
- **CN10 to CN10** jumpers to CN10 on the CPU Node Board.
- **CN10 Out** enables re-connection of your Stern OEM Expression Light Side-Rails, if you have this accessory.

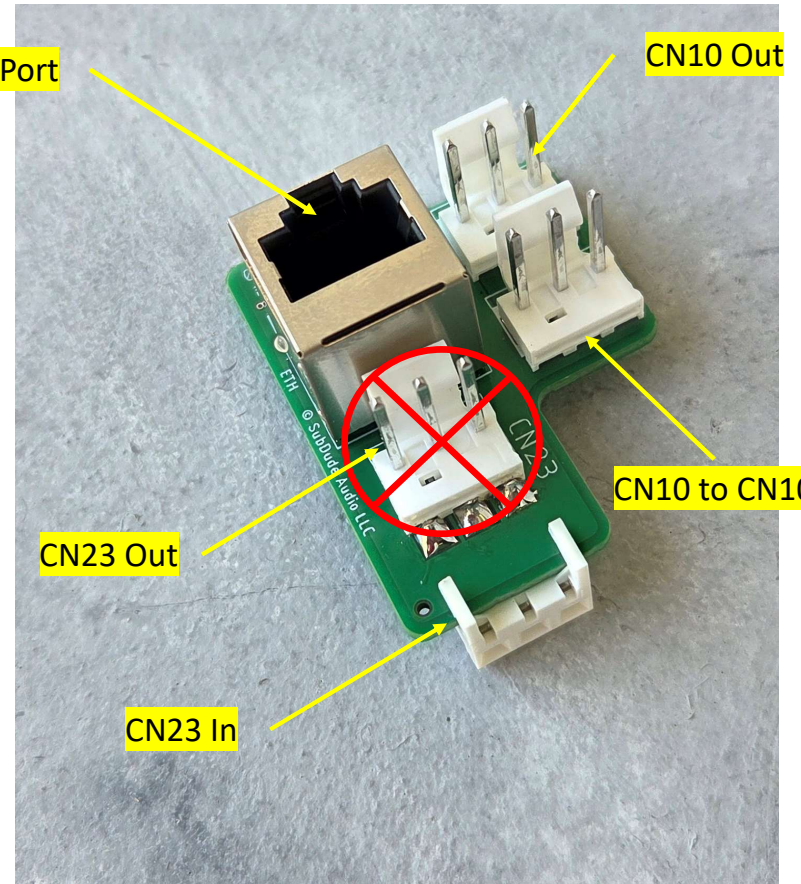
Output Ethernet Port

CN10 Out

CN10 to CN10

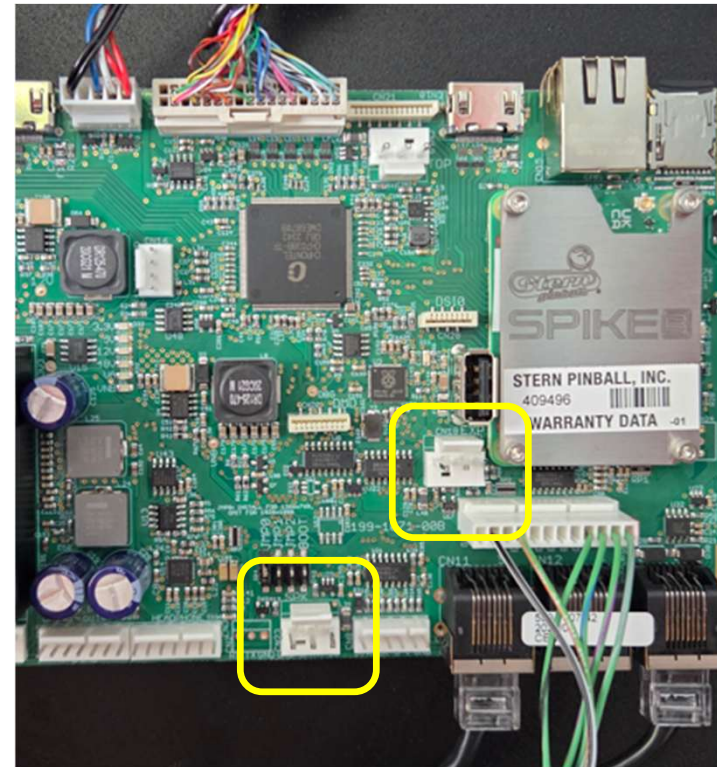
CN23 Out

CN23 In



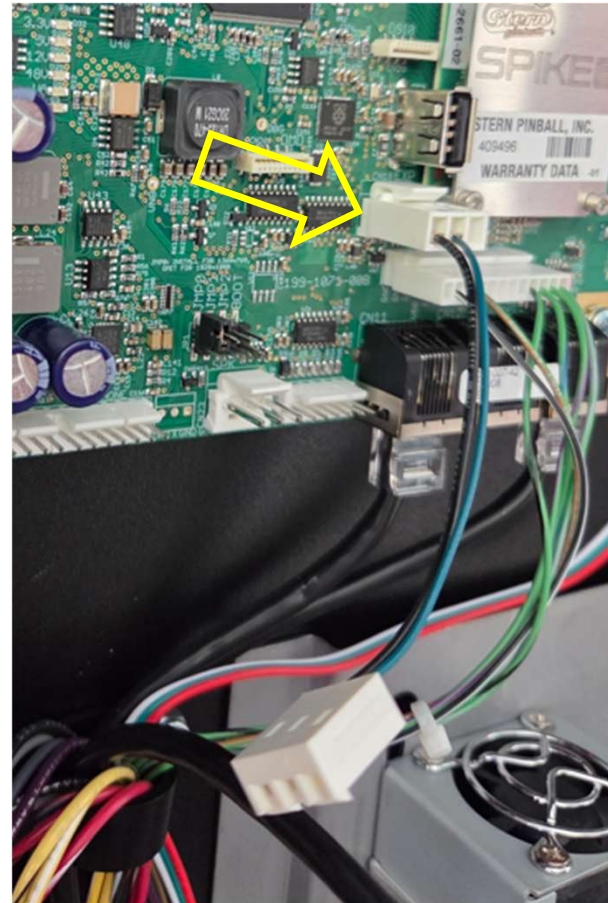
Pickup Board Connection - 1

1. Unplug any CN10 / CN23 harnesses or accessories now to expose the unpopulated headers as shown.



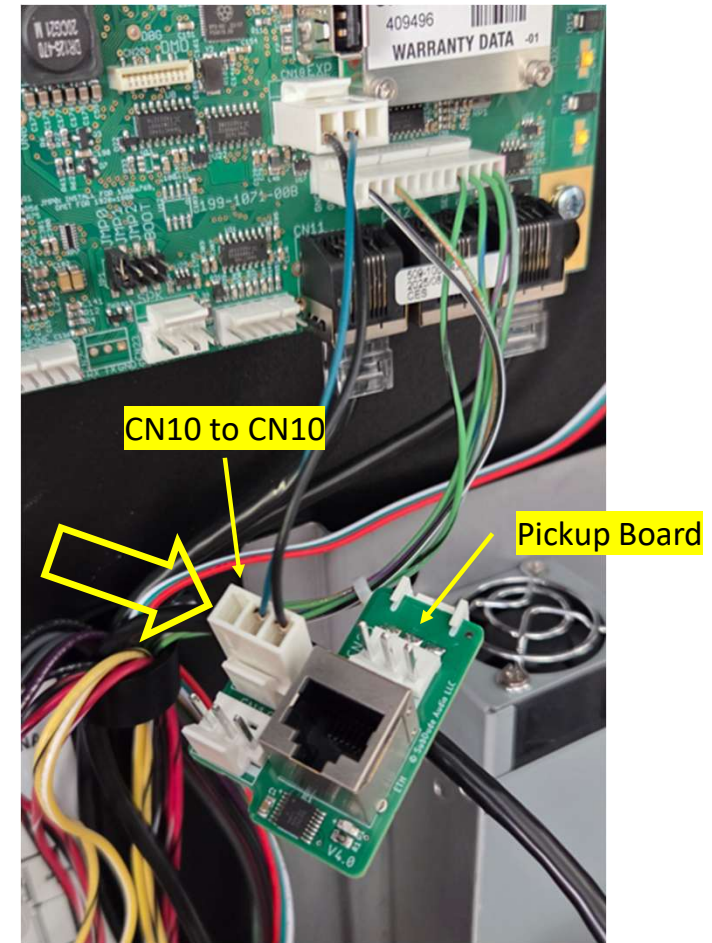
Pickup Board Connection - 2

1. Plug one end of the CN10 to Pickup Board Cable Harness at header CN10 as shown. (This is item 16 in the kit components slide).



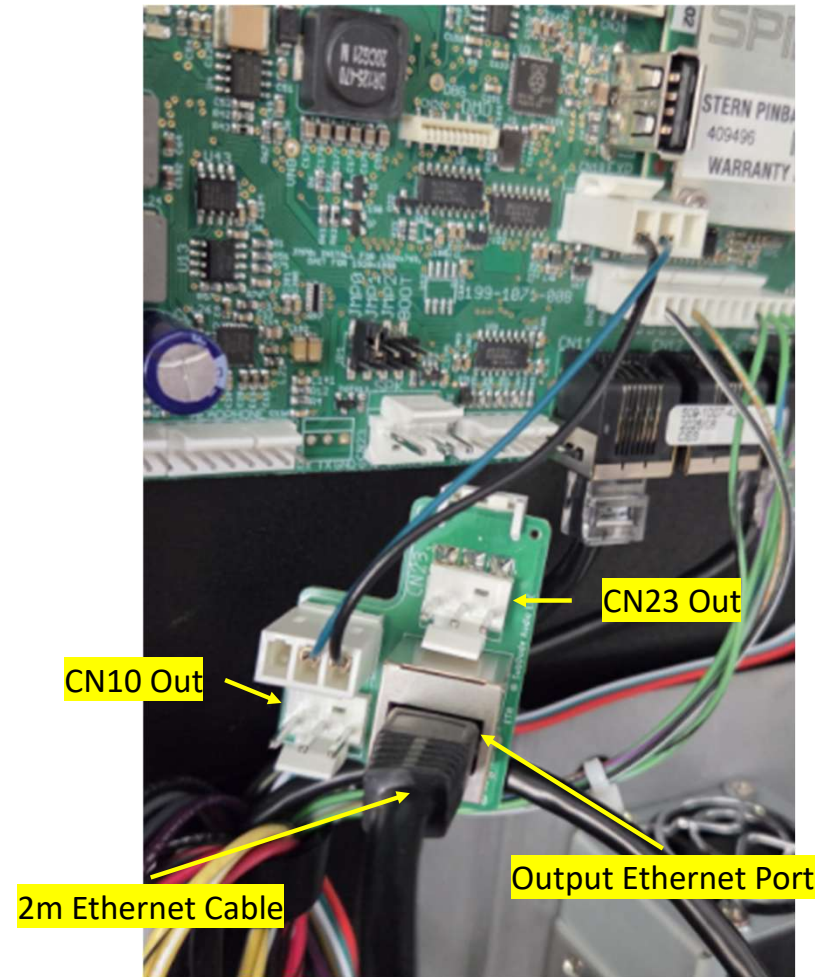
Pickup Board Connection - 3

1. Plug the other end of the CN10 to Pickup Board Cable Harness to the location shown on the Pickup Board. (Previously referred to as “CN10 to CN10”.)



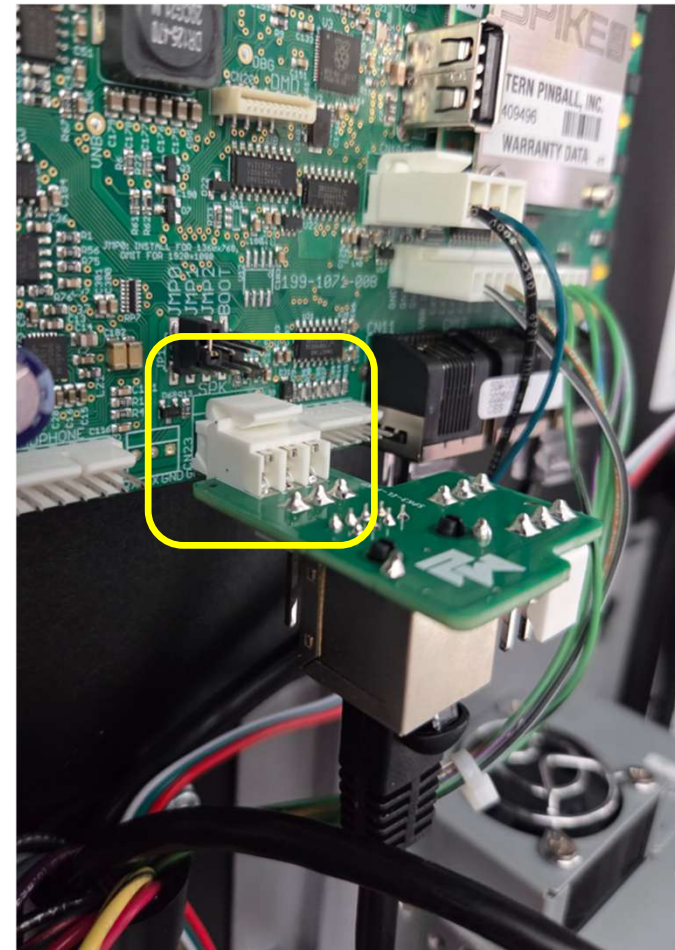
Pickup Board Connection

1. Plug one end of the **2m Ethernet Cable** to the **Output Ethernet Port** on the Pickup Board as shown.
2. Plug nothing to **CN23 Out**.
3. If you previously unplugged the Expression Side-Rail Harness from CN10, plug it to **CN10 Out** now.



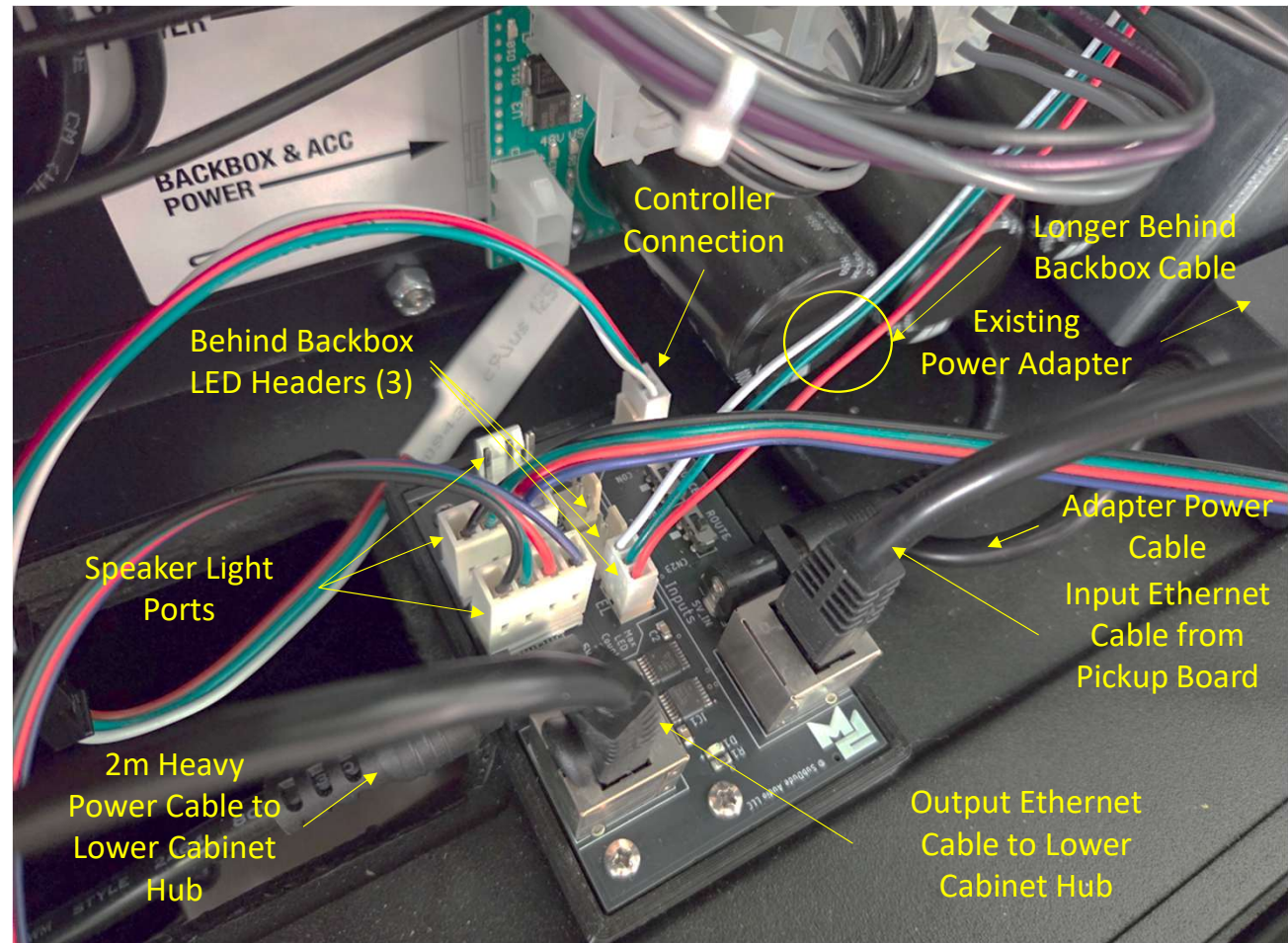
Pickup Board Connection

1. Plug the Pickup Board to CN23 as shown.



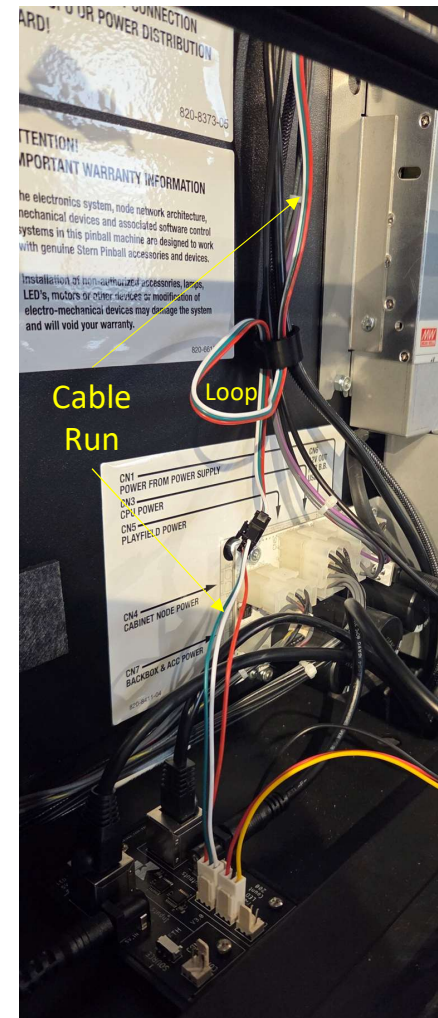
Backbox Wiring - 1

- Shown to the right is your existing PixlWav Backbox Speaker Light Hub.
 - Your existing speaker lights are plugged into one or two of the three available Speaker Light Ports. In this case, there are two port occupied by the speaker lights.
1. Using the Longer Behind Backbox Cable, plug the end with the corresponding colors Red Green White as shown, to the desired signal header. (What's shown will convey the CN10 EL Signal to the Behind Backbox LEDs.)
 2. Plug one end of the 2m Heavy Power Cable as shown, to one of the 5V Jacks. (The 5V_IN and 5V_OUT Jacks on the Hub are inter-changeable.) Fish this cable down into the lower cabinet for connection later.
 3. Plug one end of the 2m Ethernet Cable to the Output Ethernet Port as shown. Fish this cable down into the lower cabinet for connection later.



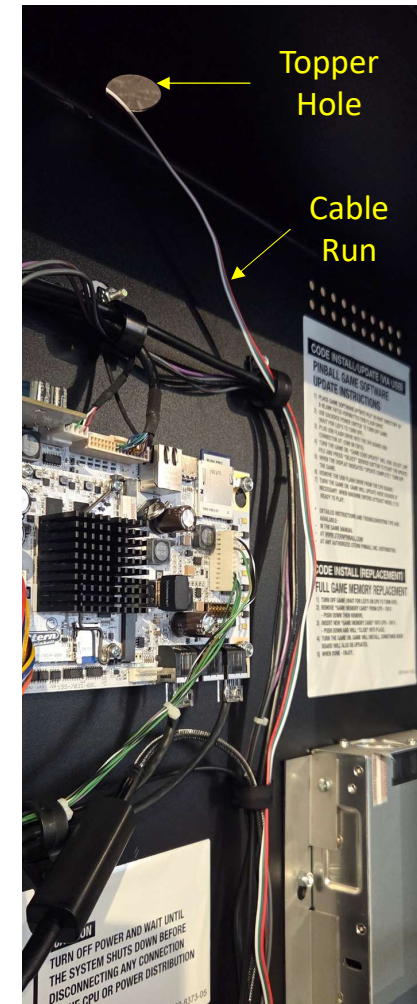
Backbox Wiring - 2

- The image to the right is simplified.
- Route the long backbox cable to the lower right Wire Loom.
- Note that after you complete the backbox wiring run in a later step, you may want to take up any excess slack in the cable, inside of the backbox. To do this, create a Loop as shown. If no slack remains, that is OK.



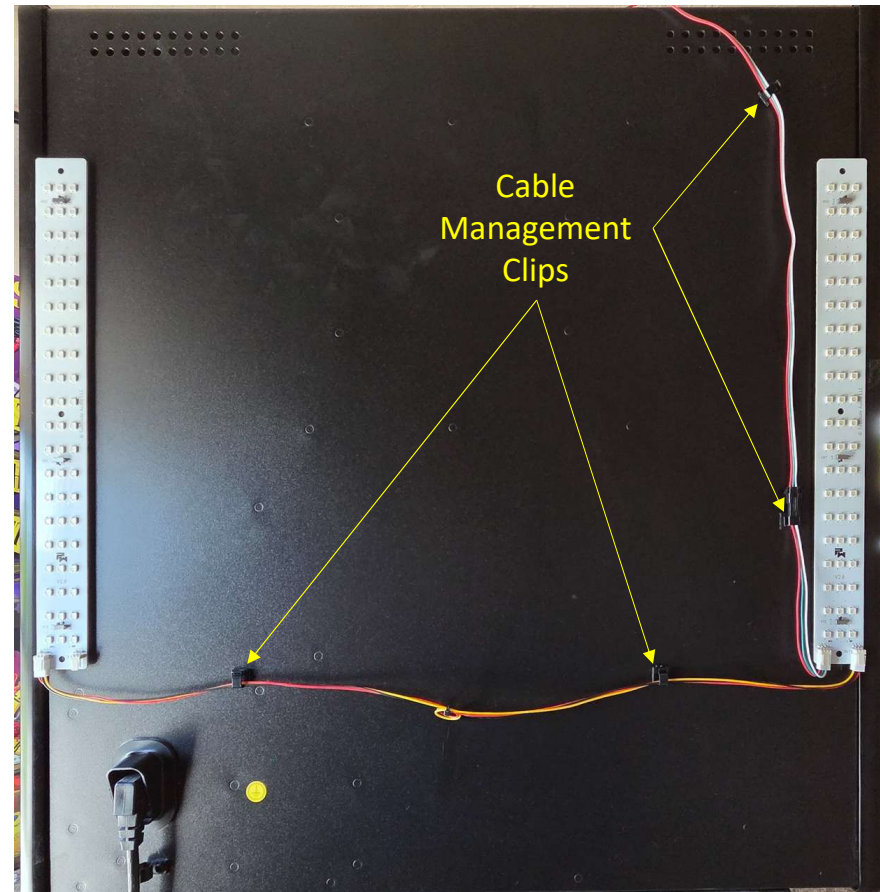
Backbox Wiring - 3

1. Route the backbox cable up and through the Topper Hole as shown.
2. Utilize any Wire Looms as shown.



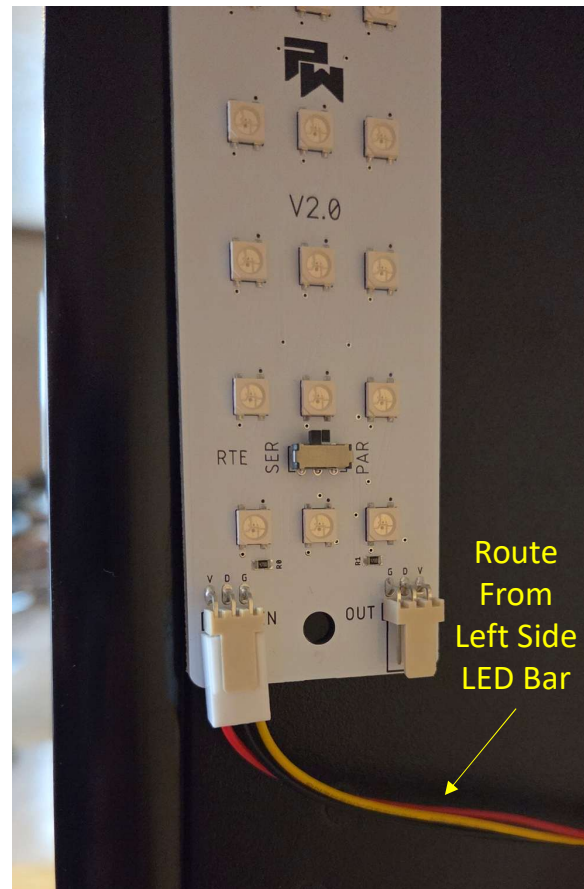
Backbox Wiring - 4

1. The left and right light bars are interchangeable.
2. Attach one on bar on the left and one bar on the right as shown, roughly 4in (100mm) from the top of the backbox.
3. Attach four Cable Management Clips as shown.
4. Continue to the next slide for header connections.

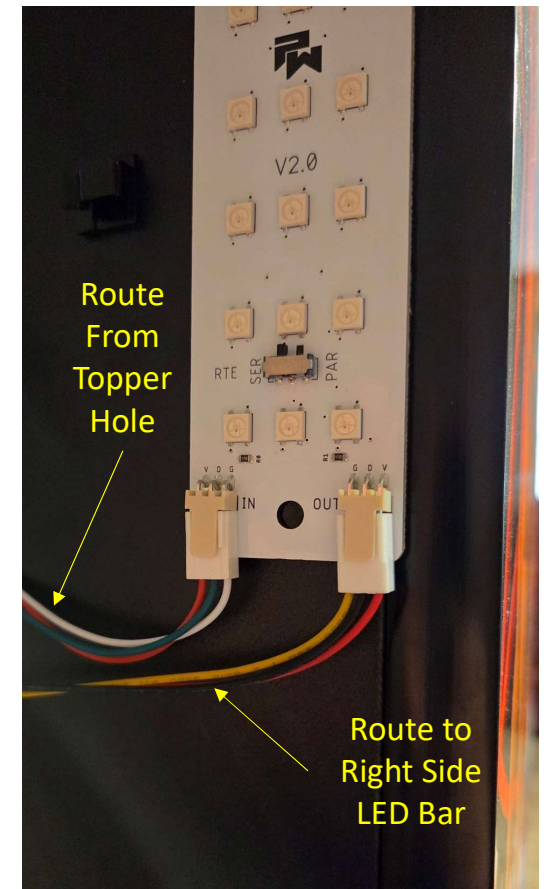


Backbox Wiring - 5

1. The left-side and right-side connections referenced in the images are from the player position (i.e., the side the player sees when playing the game).
2. Make your connections as shown.
3. The backbox LEDs are complete.



Right Side Backbox Connection



Left Side Backbox Connection

Lower Cabinet Installation



Drill Bit and Drill

1. Locate a drill and a 1/16" drill bit. A small hand-held, rechargeable cordless drill is recommended.
2. You will need to drill a total of six small holes to a limited depth. The holes will make mounting the Under Cabinet LED Bars effortless.
3. To avoid drilling through the floor of the lower Pinball Machine Cabinet, wrap a small piece of tape around the drill bit, 1/4" from the tip as shown.
4. Electrical tape is recommended.
5. The tape will spin as the bit rotates, and it will serve as a depth gauge as you drill.
6. When drilling, do not allow the drill bit to enter the wood more than the limit imposed by the tape.



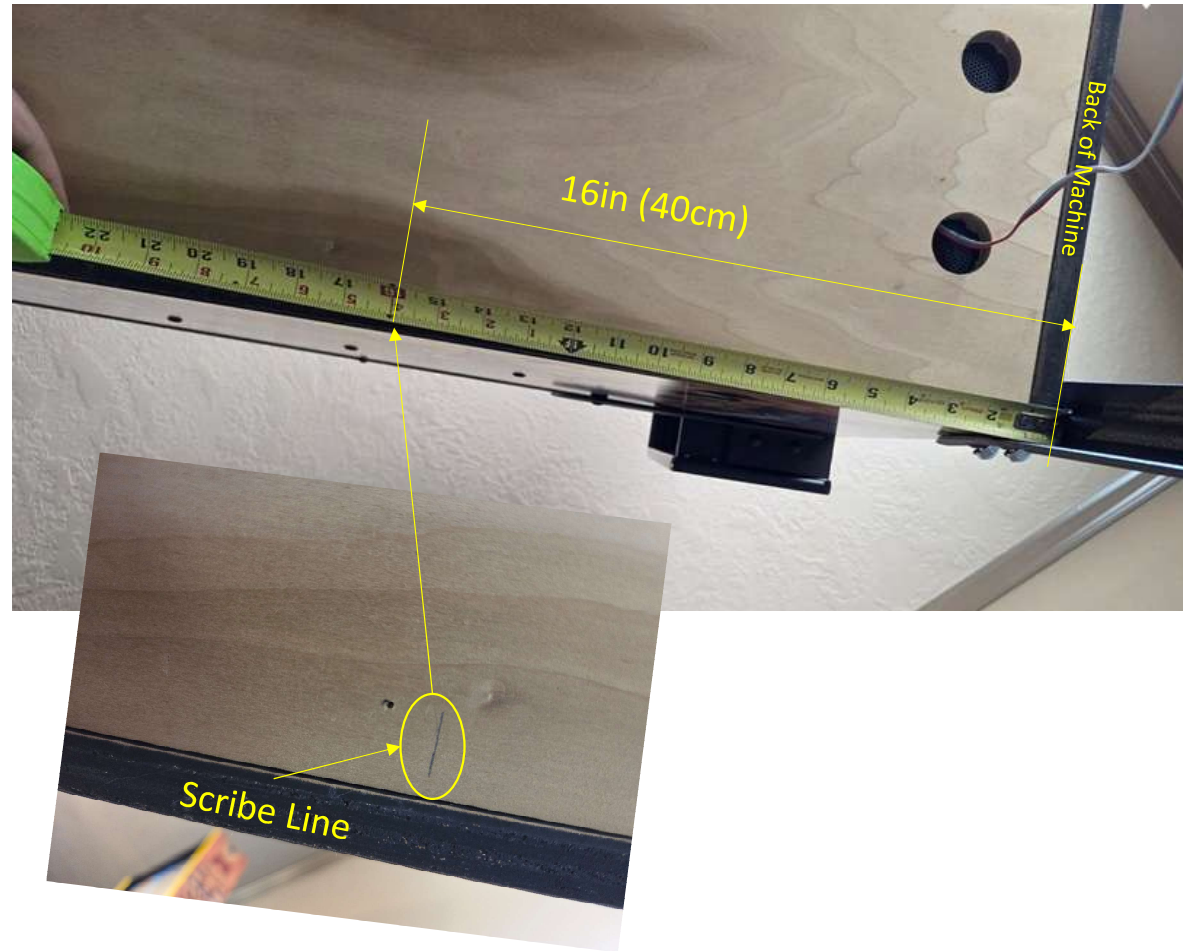
Preparing Lower Cabinet for Drilling - 1

1. It is faster to install the Lower Cabinet LEDs while lying on your back, leaving the machine in place provided you are capable.
2. Get a helper if necessary.
3. From the back of the machine, and on the underside of the lower cabinet, you will measure 16in (40cm) in the next step.
4. Continue to the next slide.



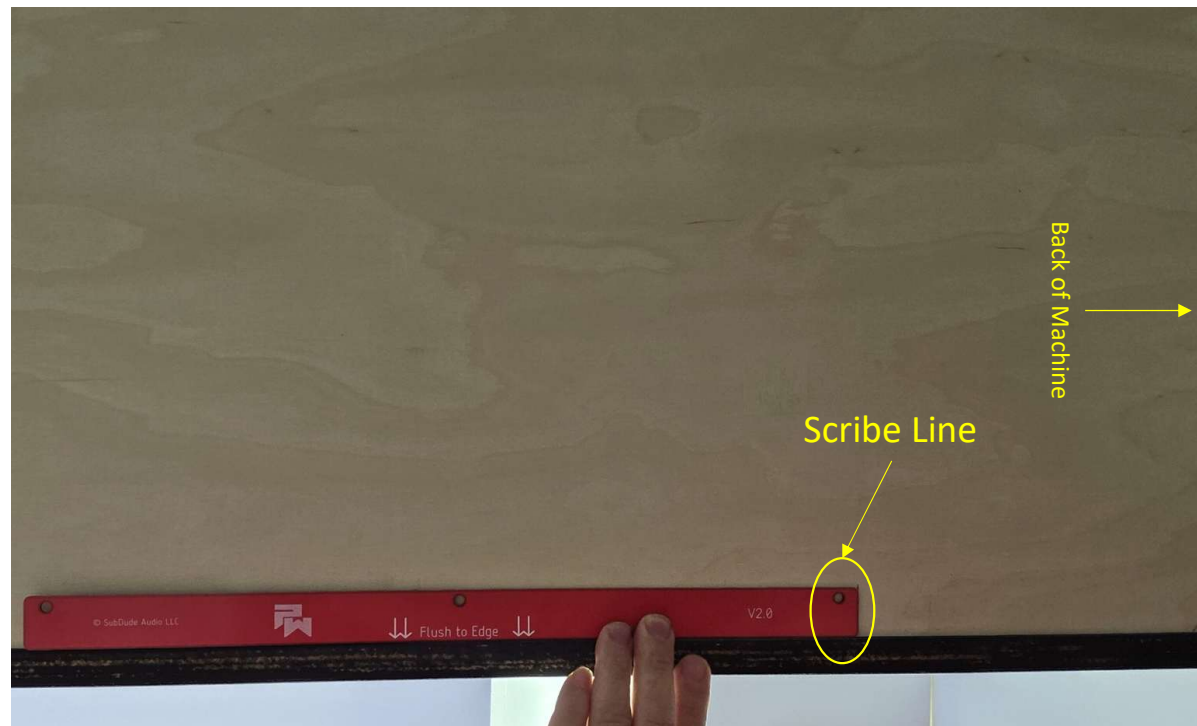
Preparing Lower Cabinet for Drilling - 2

1. Measuring 16in (40cm) from the back of the machine, scribe a line in pencil as shown to the right, next to the edge panel of the machine.
2. Repeat for the other side.
3. Each line represents the rear edge of the corresponding LED Bar after installation.



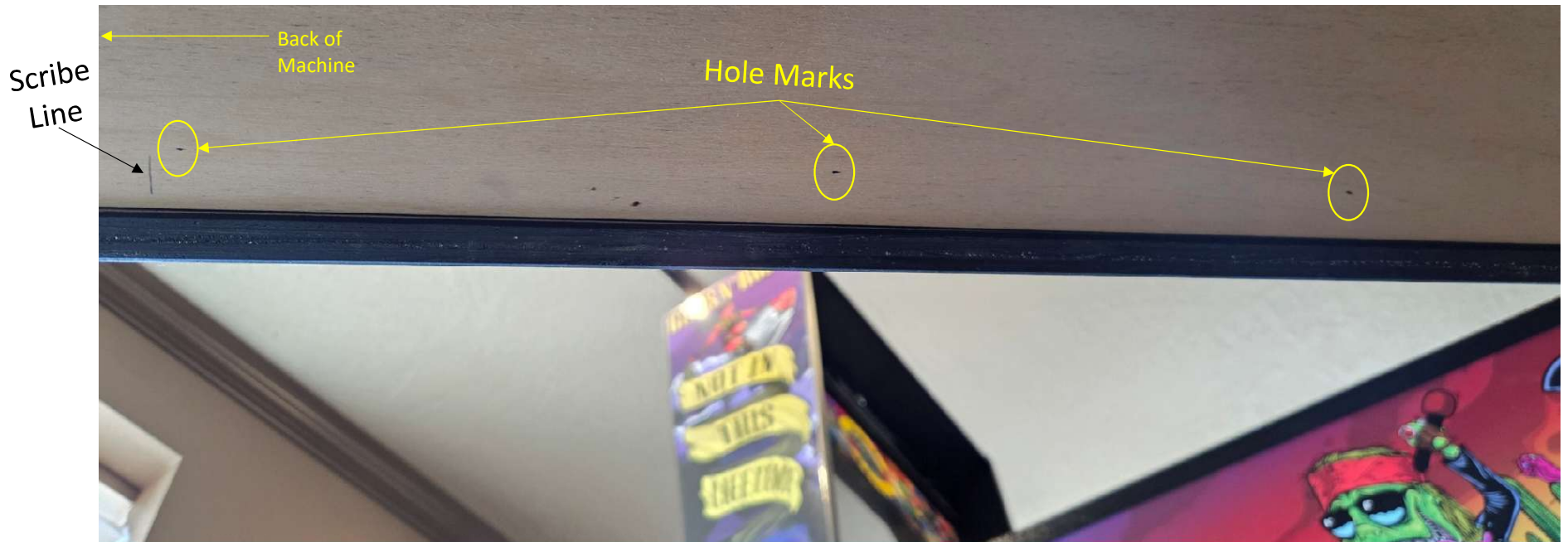
Preparing Lower Cabinet for Drilling - 3

1. Using the provided Red Registration Template, align two edges as follows:
 - I. Align one end of the Template to the scribe line.
 - II. Align the “Flush to Edge” side along the edge wall of the cabinet.
2. Using a pencil, a pen, or Sharpie, mark each of the three holes to serve as drill locations in a later step.
3. Repeat the above on the other side of the machine.



Lower Cabinet for Drilling - 4

1. Your drill marks should look like below.
2. Drill your holes after reviewing the next slide.



Preparing Lower Cabinet for Drilling - 5

1. Shown to the right is what your drill bit will look like when you've reached the correct depth.
2. **As you drill to the correct depth, make certain your head is out of the way of falling debris that might fall into your eyes, ears, etc.**
3. Proceed to the next slide.



Mount Lower Cabinet LEDs

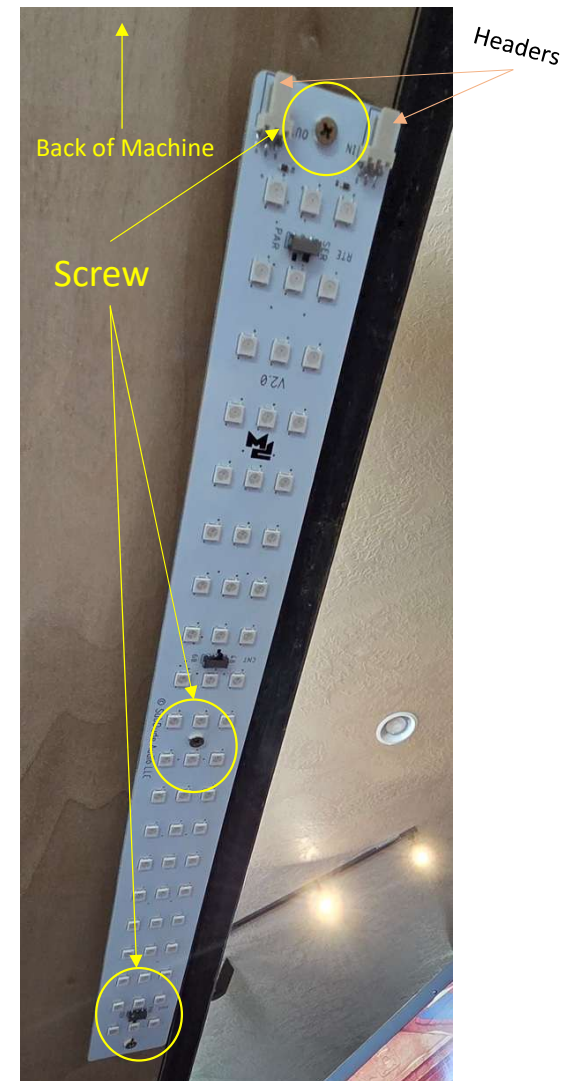
1. The image to the right shows the final position of the LED Bars.
2. Note the orientation of the PCB electrical headers. These headers point towards the back of the machine.
3. **Don't forget about your LEDs in the future when moving your machine because they can be damaged. If necessary, it is an easy matter to remove the LED Bars. When moving a machine, one lowers the headfirst. Removing the backbox LEDs (which are held in place with magnets and easily removed) will be a reminder to remove the under-cabinet LEDs.**



Mount Lower Cabinet LEDs

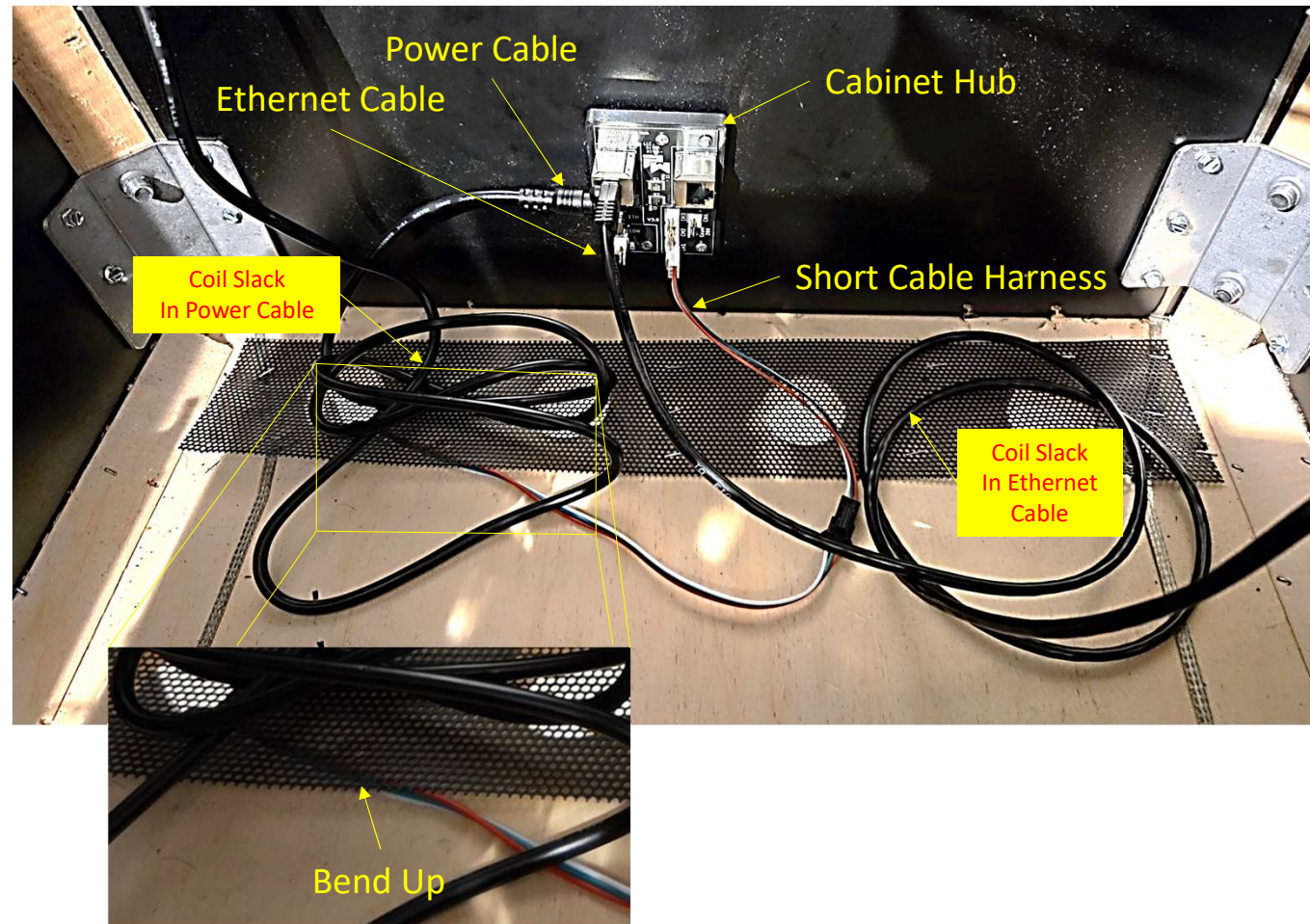
1. Have an appropriately sized Phillips Screwdriver, all six counter sunk screws, and the two Under Cabinet LED Bars within reach before you start this step.
2. Pick a side to start on. The image to the right is the left side of the machine while at player position for reference.
3. One at a time, insert a counter sunk screw into the standoff and into the corresponding drill hole.
4. Start each screw by hand tightening until it becomes difficult to turn the screw. A few threads will temporarily support the LED bar while you start the remaining screws provided you support the bar with your free hand.
5. Using your Phillips Screwdriver, tighten each screw until the head is seated and turning provides resistance sufficient to indicate you have fully tightened the screw.
6. **Do not allow your screwdriver to fly away and damage the circuit board. Be measured and deliberate while tightening the screws.**
7. **Do no overtighten the screws. Tighten enough to observe that the light bar is secure.**
8. Install the other LED bar now.

FIXLWNV



Cabinet Hub Wiring

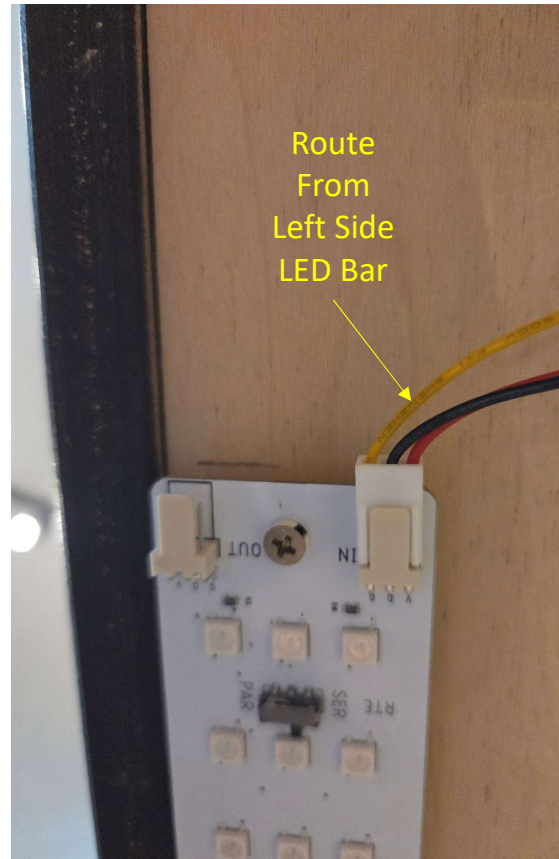
- Shown to the upper-right is the completed installation.
- Secure the hub with the provided double-sided tape square.
- Connect the Ethernet Cable to the input port.
- Connect the Power Cable to either the 5V_IN or 5V_OUT port.
- Ensure the SOURCE switch is set to "ETH".
- The four ventilation holes shown have a metal or plastic covering grate, secured with screws. Loosen or remove one or more screws to make room for the Short Cable Harness.
- As shown in the zoom, gently bend up the grate to allow space to fish the Short Wire down and outside of the cabinet floor. Fish the wire now.
- Connect the Short Cable Harness to one of the below:
 - CHL1/2: to project the Stern Expression Light Side-Rail signal to the Under Cabinet LED Bars.
 - CHR1/2: to project the currently selected speaker light signal to the Under Cabinet LED Bars.
- Leave most of the slack in the over-length power and ethernet cables as shown to allow for lowering the head without tension, later.



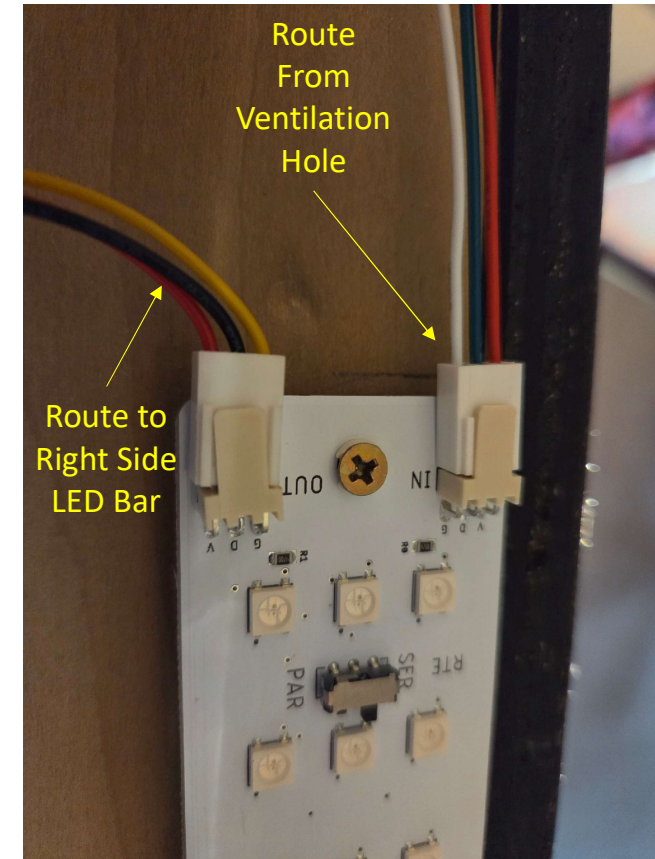
PIXLWNV

Under Cabinet Wiring

1. The left-side and right-side connections referenced in the images are from the player position (i.e., the side the player sees when playing the game).
2. Make your connections as shown.
3. The Cabinet LEDs are complete.



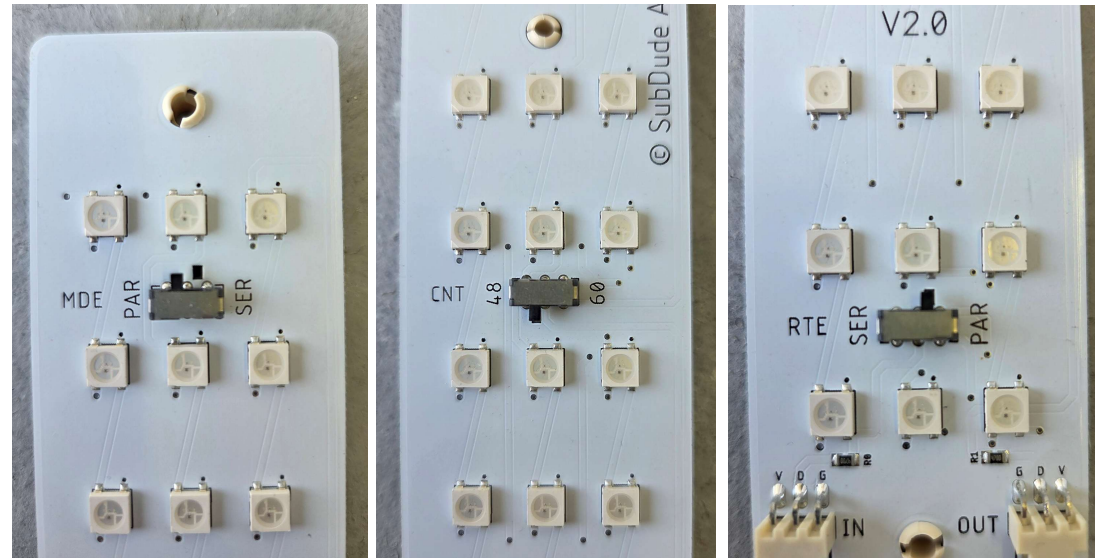
Right Side Cabinet Connection



Left Side Cabinet Connection

Configure LED Bar Switches

1. There are three switches per LED Bar as shown to the right.
2. They are labeled “MDE”, “CNT”, and “RTE”.
3. The switch settings for each pair of LED Bars must be set to the same values (A pair being i) the behind backbox pair, or ii) the under-cabinet pair.) The backbox pair can differ from the under-cabinet LED Pair.
4. Follow the table below to determine the switch and projection settings for each pair.
5. Configure your switches now:



Type	MDE	CNT	RTE
Spike-3 Stern OEM Speaker Light Signal from CN23	PAR	60	SER
PixlWav Controller-Based Dynamic Speaker Light Signal	SER	60	SER
Spike-3 Expression Speaker Light Signal from CN10	SER	48	SER



You Have Installed your LED Cabinet Lights