Expressive Lights All-In-One Kit

Installation Guide

First, thank you for buying our mod. It is cool to know that we can help people keep their machines in great condition and looking their best! *Please read these instructions fully before installing the kit*. Reach out to us *before you start* if you have any questions.

Information:

This kit is designed to take the signal that drives the expression lights in your Stern game and replicate it to the speakers, backbox, and under the cabinet so they light up in the same colors and patterns as the expression lights, in perfect sync! We did our best to make this kit easy to install, and easy to remove, should you ever need to. As of this writing, this kit will work with Led Zeppelin, Rush, and Foo Fighters games with expression lighting installed, though it should also work with any future games that use expression lighting. All kits are fully bench tested right before they go into the box.

Tools you'll need include: P2 Philips screwdriver, 1/4" nut driver, 11/32" nut driver, either a 5/16" simple wrench or bent nose pliers, tape measure, 5/8 (16mm) drill bit (Forstner style recommended, but not required), drill, and a pencil or Sharpie. Also, having a second set of hands to help hold things while you work on the undercabinet lights will greatly simplify the installation since you'll be working against gravity the whole time.

Note that in these photos, we show the PinWoofer kit installed to begin with, but we'll address what you need to know for factory speakers as well.

**Power Supply Installation:**

Step 1:

TURN OFF THE POWER to the game and UNPLUG IT. This is crucial to avoid damaging the game and/or electrocuting yourself on the 120V AC power. Also, the node boards, expression lights, and our expressive lights are all VERY sensitive to power surges, so touch the side rails before touching anything in the game to discharge any built-up static.

Open the speaker panel and flip it down. DOUBLE CHECK that the AC power line in the back of the backbox is removed before proceeding. Remove the three bolts shown in yellow circles using the 11/32" nut driver. Gently remove the cover to expose the terminals on the power supply. Using the screwdriver, carefully pry off the two clear protective covers that are snapped onto the terminal blocks.

Step 2:

Now it's time to integrate the power supply. Using the four colored wires already attached to our power supply, connect them as shown in the picture: gray to V-, green to ground, red to N (the game will have a white wire here), and black to L. Use the Philips screwdriver to loosen up the terminal, slide the new fork in along with the existing fork, and tighten the terminal back down. Gently pull at the wires to ensure they're in tightly. Check that all of the forks are centered on their terminal and not accidentally spanning two terminals.
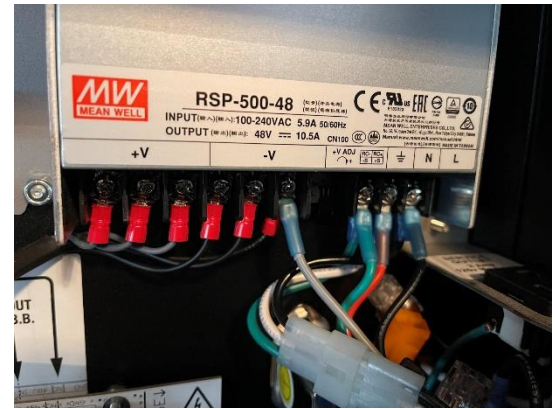
Step 3:

Reinstall the terminal covers by snapping them back into place, reinstall the power cover routing the new wires out to the left (as shown by the red arrow in the first pic), and reinstall the three nuts (note the nut on the left is the nylon nut). Don't yet stick the power supply down with the supplied foam tape, you'll want to move it around as you install other parts.

Step 4:

On the new power supply is a black cover that protects the terminals. It is held on by a screw on the side of the power supply and it snaps in on the other side. Remove the screw and remove the black cover. You'll reinstall this at the end.

Speaker Kit Installation:

Step 1:

First you need to remove the speakers. Starting with either speaker, disconnect the speaker at the plug circled in red. Now remove all four nuts circled in yellow. Gently lift the speaker up off the posts and set it safely aside. For factory speakers, remove the four plastic spacers on the posts and the big foam surround, you will not use these at all when installing the new kit. For non-factory speakers, remove any rings or spacers that were provided. You should now see all posts with nothing on them all the way to the metal speaker grille plate (or colored speaker surround plate if your game had them). Repeat for the other speaker.
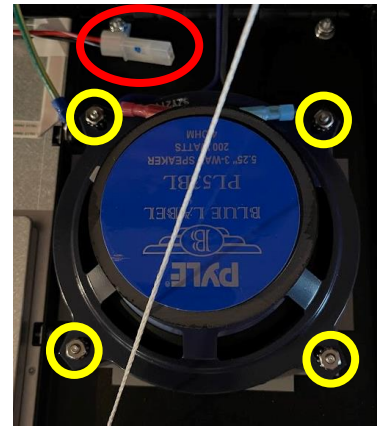
If you intend to install upgraded colored speaker surround plates, now is the time to do so.

Step 2:

Place your expressive speaker light rings onto the speaker posts as follows. When looking at the game from player position, the ring marked "L" will go on the speaker to your left, and the ring marked "R" will go on the speaker to your right. Another way to look at it is that the power supply is behind what we're calling the right speaker. This is very important because, if they are backwards, they'll mirror the wrong side of the expression lights. The side of the expressive light ring that is black and shows the letter will face up and away from the metal speaker grille plate. We recommend installing the ring with the wires at the top, as shown. This will make the bottom of the ring act as the "center" of the lights so they wrap up and around each side of the ring (like the letter C but turned on its side so the opening is at the top). Alternatively, you may choose to install it with the wires to the inside edge, causing the "center" of the lights to begin at the edge of the speaker panel and wrap around inwards toward the screen. Wires at the bottom works too. This is purely a matter of preference. The only position that will not work is with the wires to the outside; they will collide with the metal strips on the sides of the backbox that backstop the speaker panel. Once you have selected your orientation, it's time to install the speakers on to the ring lights.

Step 3:

To attach the speaker to the ring, first, place it on to the ring in the proper orientation and line up the tabs with the ring's tabs. Use four of the #8" Philips pan head screws to secure the speaker to the ring tabs. Make sure you support the tabs from underneath as you tighten so you don't accidentally push too hard and snap them off. Slowly snug each corner down in turns until the speaker is firmly held in place. Repeat for the other speaker. You can remove the light rings from the posts for this step if it helps.

Step 4:

Secure each ring light to the post using the supplied 5/16" lock nuts. To do this, slightly lift each corner of the ring until you can maneuver the nut into place, then only screw it about halfway down the post. Once all four nuts are in place, you can hand tighten them down the rest of the way. Use the 5/16" wrench or angle nose pliers to tighten all four nuts. Repeat for the other side. Be very careful in this step not to damage the lights with the tools. When you're done, it should look something like this (except you will have pan head Philips screws mounting the speaker, not hex screws as shown in our prototype here). The left speaker will look the same except it will have the extra orange wire coil hanging off it.


If you selected the low-profile kit, it may look slightly different than the photos here, but installation is the same.

Step 5:

Remove the twist ties from the long orange wire. Drop the orange wire down into the cabinet through the left hole in the neck. Once again, ensure that the power is turned off before proceeding. Connect the red wire fork to one of the V+ terminals on the new power supply you just installed. Connect the black wire fork to one of the V- terminals (being careful not to lose the gray wire connected there).

Step 6:

You're done with the backbox for the moment, so close the speaker panel. Now, remove the glass and pinballs from the machine and fully lift the playfield. Now you need to disconnect the Node 2 board from the expression light distribution board by removing the plug, as indicated by the red circle. These boards can be found on the left inside wall of the cabinet, approximately 1/3 of the way back. Be careful not to directly touch any boards through this process, as all are sensitive to static shocks.
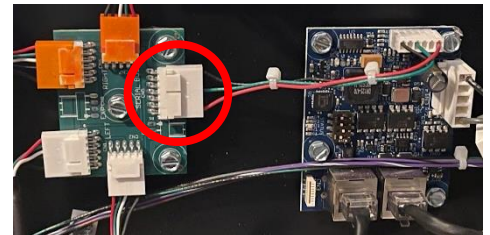
Step 7:

Now, take that same plug you just removed and plug it into the "NODE 2 BOARD" connector on the little green interface board included with our kit. Take the "E LIGHT BOARD" wire coming out of our interface board and plug it into the expression light distribution board where the Node 2 board was originally connected. Using the two hex head 3/4" screws included with the kit, find a place where the interface board sits, such that none of the wires are strained, and secure it to the cabinet with the 1/4" nut driver. Take the long orange wire you dropped down from the backbox and plug it into any one of the ACC connectors and secure the wire in the wire rings down the side of the cabinet. It should now look like this (except you won't have the other two orange wires connected just yet).
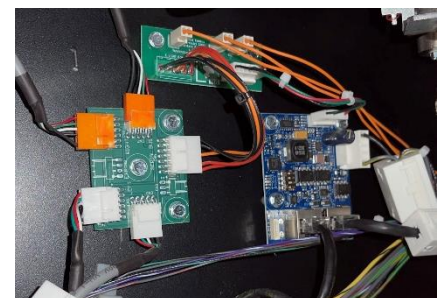
NOTE 1: We fully recommend you also look into the acrylic speaker light surrounds available from speakerlightkits.com. Gold is perfect for Rush, and light blue looks good with Led Zeppelin. They let a lot more light out and really let the expressive speaker light kits shine. You'll see them installed in our photos, because we

love them. Just bear in mind that they add a little depth. If you're using the factory Kenwood speakers, you shouldn't have any issue. But if you're using the PinWoofer speakers or similar, depth may be a problem and you're going to want to use our low profile mounting rings (contact us if you got the wrong kind and need to exchange).

NOTE 2: If you wish, you can remove the metal speaker surround plate entirely. This will let the speaker lights shine bright, and can give you a little extra mounting depth for deeper speakers.

Undercabinet Kit Installation:

Step 1:

Wipe away any dust on the bottom of the cabinet with a tack cloth or lightly dampened rag.

Step 2:

Time to mark and drill the through hole. To ensure proper orientation, this image shows what it would look like if you were on your back, under the machine, with your head towards the backbox, looking up at the bottom of the cabinet. Do not include the cabinet side/back walls when measuring and marking/drilling, only include the bare surface of the bottom plywood.

First, make a mark at 5" (130mm) down and 3" (80mm) in from the upper right corner. Carefully drill a 5/8" (16mm) hole at this location. Prior to drilling, take a look inside the cabinet and ensure that no wires or other parts have shifted and are in the drill zone. When the hole is done, insert the grommet with the protective flaps towards the ground, until it snaps in place.
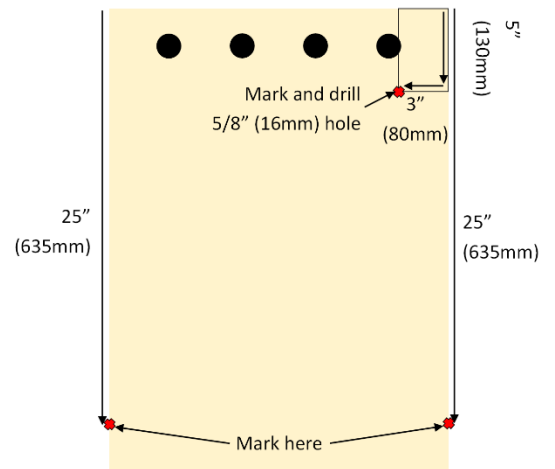
Second, measure and mark the point halfway down each side of the cabinet, about 25" (635mm).

Step 3:

Do not install anything in this step, just examine the light strips and ensure you're properly oriented. On each side there are two strips of LEDs paired up in preinstalled mounting blocks. You'll notice one pair is close to the pigtail with the plug while the other pair are distanced by a much longer wire. From this point forward, each pair of strips will simply be referred to as if it was a singular strip. The side close to the pigtail will go on the left side of the game (your right side if you're still looking up at the underside of the cabinet), near the grommeted hole. This is shown here as the purple strip in the image and will be referred to as "the purple strip" from this point forward.

The more distanced side will go on the right side of the game (your left side if you're still under the cabinet), away from the grommeted hole. This is shown here as the blue strip in the image and will be referred to as "the blue strip". If done properly, the screw holes on the 8 mounting blocks will be facing the center of the game. The image to the right shows how it will all be installed, again from the underside looking up.
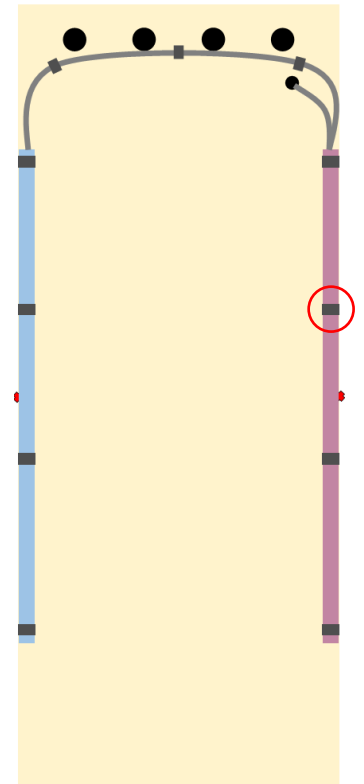
Step 4:

We'll install the purple strip first, beginning with the mounting block circled in red in the image. First, align the center of the strip's length (this will be a copper junction/cut point, not an LED) with the center mark you made back in Step 2. Have someone hold the strip firmly at this point. Count four LEDs from the center towards the grommeted hole. The bracket shown in the red circle will sit in between the fourth and fifth LED. It may have

shifted a bit, so double-check its position before continuing. Predrill the pilot hole (optional) then drive in one of the silver ¾" screws with the nut driver or slotted screwdriver to secure the mounting block.

Now count four LEDs in the other direction from the center. The next mounting block will sit between the fourth and fifth LED here as well. Mark the center of the hole but don't screw it in yet. Tear and peel the blue tape backing off the LED strips between the two mounting blocks. Carefully stick this section down, then secure the second mounting block with its screw.

Repeat this process for the last two blocks at the ends of the strip. Both will sit in between the last and second to last LEDs at each end of the strip. If there is any slack in the orange wires running between the pair of strips, you can snug it up by pulling the slack through the blocks until you're happy with it. You can optionally secure the wires at the mounting blocks with a small dab of hot glue or similar.

Repeat this entire process for the blue strip.

Step 5:

Push the plug through the grommeted hole (it's a tight fit, but it'll make it through) and feed it into the cabinet until the wire is snug. The grommet's fins will hold this firmly in place.

Secure the braid wrapped wire with the mounting clips and screws roughly as shown in the picture above, wherever you're happy with the placement.

Step 6:

Now we'll install the power/data supply. This is a five wire bundle with a six pin connector at one end, fork connectors at the other end of the red and black wires, and a separately coiled orange wire with a 2 pin connector at the end. Of the two of these cables included with your all-in-one kit, this will be the one with the shortest separate orange data wire. Lower the playfield and open the speaker panel. Drop the wire bundle down into the cabinet through the left hole in the neck. Once again, ensure that the power is turned off before proceeding. Connect the red wire fork to one of the V+ terminals on the new power supply you just installed. Connect the black wire fork to one of the V- terminals (being careful not to lose the gray wire connected there). These can share terminals with the other fork connectors.

Step 7:

Lift the playfield again and connect the power supply cable to the pigtail you pushed through the grommet back in step 6. Use existing wire loops to secure the power cable in the cabinet. Take the orange wire coming out of the plug (with the ferrite core on it) and run it towards the front of the cab, where the interface board was installed. Plug the orange wire into one of the ACC connectors on the interface board (any of them will work). Secure the orange wire using existing wire loops.

Backbox Kit Installation:

Step 1:

Wipe away any dust on the back of the backbox with a tack cloth or lightly dampened rag.

Step 2:

Remove the backglass and set it aside. On the top panel of the backbox, to the rear of the backbox, you will find a circular plug sealing a 1" hole. Remove that plug by squeezing the two retaining tabs and pushing it upward. Replace it with the included rubber grommet, positioning it so that the side with the tabs/flaps is facing up.

Step 3:

Using the magnetic mounting blocks, attach the light strips to the back of the backbox. The strip with two orange wires running down its length will go on the left (when facing the back of the backbox), and the strip with one orange wire will go on the right. For now, just roughly position them, you'll adjust them later. Push the plug through the grommet, into the backbox.

Step 4:

Now we'll install the power/data supply. This is a five wire bundle with a six pin connector at one end, fork connectors at the other end of the red and black wires, and a separately coiled orange wire with a 2 pin connector at the end. Of the two of these cables included with your all-in-one kit, this will be the one with the much longer separate orange data wire. Connect the red wire fork to one of the V+ terminals on the new power supply you just installed. Connect the black wire fork to one of the V- terminals (being careful not to lose the gray wire connected there). These can share terminals with the other fork connectors.

Step 5:

From the new power supply block, route the wires towards the top of the backbox, using the clips in the backbox to secure them. You'll first route the bundle of red and black power wires up the right side of the mainboard (when looking at it from the front of the game), then to the top center clip. Connect the 6-pin plugs together at the top. Next, route the orange wire (with the ferrite core on it) down the left side of the mainboard, and drop it down the bottom left opening of the backbox and into the cabinet. Lift the playfield and continue to route the orange wire down the left side of the cabinet.

Step 6:

Plug the orange wire into one of the ACC connectors on the interface board (any one will work). Pull any remaining slack in the orange wire towards the back of the cabinet; this will put the slack where it needs to be should you ever need to lower the backbox for transportation.

Step 7:

Return to the back of the backbox. Now you can adjust the light strips into their final positions. We recommend about 2-3 inches in from each side and roughly centered, top to bottom. Once you have them where you like them, you can tear off the blue backing from the strips and stick them down so they won't slide down over time.

Final Review

The hard part is done! Now we're just going to double-check a few things.

Ensure the four colored wires are connected to the new power supply the same way you connected them to the game's power supply – especially ensure the gray wire is still connected to one of the V- terminals, otherwise the new expressive light kits will behave erratically.

Ensure all red wires have been connected to V+ terminals on the new power supply, and that black wires are connected to V- terminals. Also check that all of the forks are centered on their terminal and not accidentally spanning two terminals. At this point, you may reinstall the black protective cover you took off at the beginning.

Ensure all orange data wires have been connected to an ACC connector on the interface board. Ensure these wires are snugged to the back of the game and are secured with wire loops.

Ensure that the two 6 pin connectors for the undercabinet and backbox light kits are securely connected.

Once you're satisfied that everything is as it should be, you can secure the new power supply to the bottom center of the backbox with the preinstalled foam tape.

Congratulations! You're all done! Lower the playfield, close the speaker panel, reinstall the pinballs and glass, and you're ready to plug it in and turn the game on. The lights will power on with the game and you should see the test cycle run through both the expression lights and your new expressive light kits.

If you don't see the lights come on, check if you have the coin door open as that will disable lights. Take a moment to ensure that the correct side of each kit lights up with the matching expression light sides… if not, you installed one of them backwards and will need to go back and fix it.

Now sit back and watch the show when the attract mode starts! ENJOY!!

Contact:

If anything goes wrong feel free to reach out to @OutpostKodelia on Pinside (preferred for fastest response), or support@ninjacamp.com. I will respond as quickly as possible.