

## Making a Windows StepMania Cabinet from a DDR Cabinet

We wanted to run StepMania 5.09 on our DDR cabinet that we purchased. It had a 573 box running a CD with first mix (10 or so songs total!) which we wanted to replace with a laptop running SM with our library of thousands of songs. Here are the significant things we did.

We bought a PACdrive and JPAC from [www.ultimarc.com](http://www.ultimarc.com) in the UK. The JPAC plugs directly into the JAMMA connector normally plugged into the back of the 573 and provides INPUTS to the PC from the switches in the dance stage, as well as the select/start buttons, coin inputs, and test/service switches. The PACdrive can create digital signals that allow us to control the lights in the cabinet. Both connect to USB ports on the PC and do not need any special drivers installed.

The monitor in the cabinet was out of focus, super heavy, and took lots of power to run, so we replaced it in favor of a new 32" LED monitor from Best Buy. We also purchased a RAM setup with VESA 100mm plate for the back of the TV, a 'long' arm, and mounting plate, all for 1 ½" ball size. This makes it easy to move/adjust the TV's position to avoid glare as well as swing it out of the way as we worked on the cabinet. The TV weighs about 8 lbs, compared to probably 50-60 lbs for the old monitor.



Here is the RAM mount with the VESA plate connected to the back of the TV and the bottom of the arm. Note that the arm clamps the 1 ½" ball between its two halves, allowing you to position the TV at the angle you want it, then tighten the arm to lock it in place.



Here is a side view with the TV on left, moved away from the cabinet, on right. You can see the mounting plate connected to the cabinet at the top of the RAM mount arm.

We moved the marquee lights and speakers down to the cabinet's middle section which allows us to remove the top marquee for moving the whole cabinet as it is too tall for our trailer. We also replaced the speakers with some Yamaha outdoor speakers as one of the original speakers was shot.

The dance stage panels can run in two modes – test mode where the DDR software can see the 4 individual sensor inputs for each panel, or game mode where each panel provides an input regardless of which or how many panel sensor are triggered. To tell the dance stage control boards that we want to be in test mode, we have to short the white wire in each dance pad to the black ground wire. Most people do this by removing a steel panel on the dance pad to expose each of the control boards, and connect the white wire in pin 11 to the black wire in pin 13. If you are going to use a PACdrive, you can do this at another place in the wiring inside the cabinet, which we will discuss later. Note that you must make this connection to use the cabinet with a PC or the pads will not work. There is a Youtube video showing how to jumper the dance stage here: [www.youtube.com/watch?v=BD1zZncPI\\_0](http://www.youtube.com/watch?v=BD1zZncPI_0)

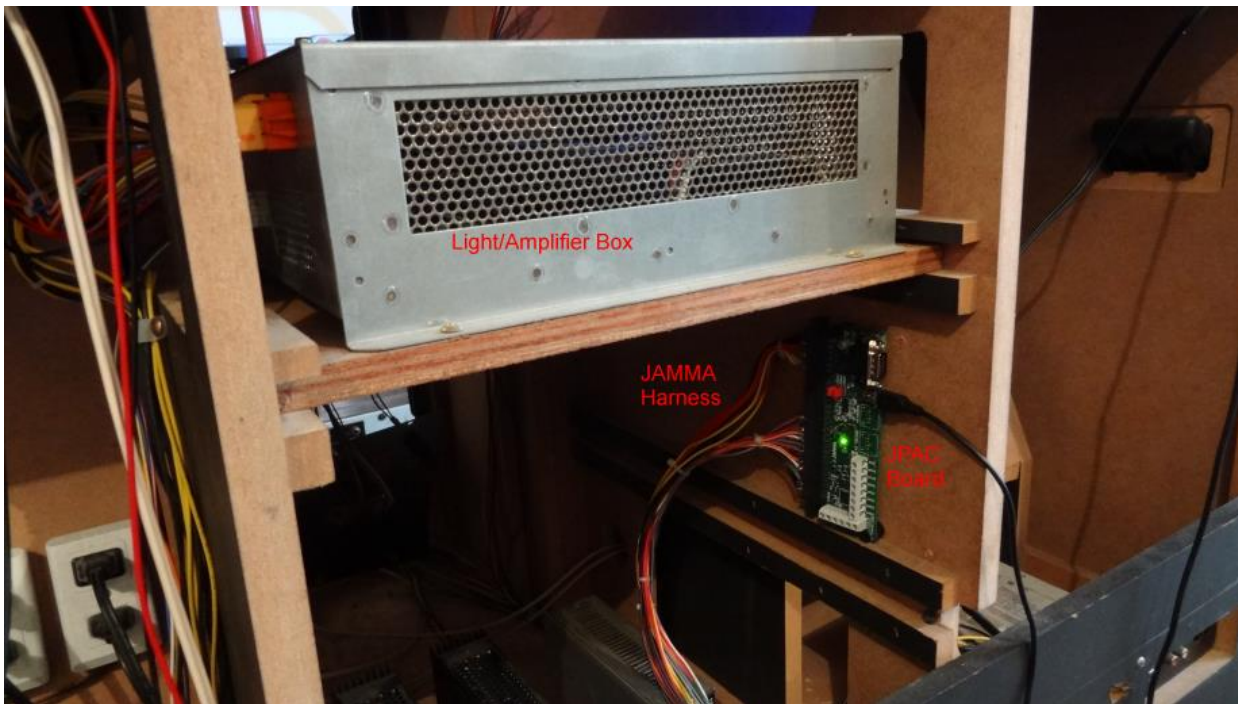


Here is one of the two dance stage boards where they have added the red jumper wire between the black and white wires by jamming the end of the wire down into the connector so it touches the metal connector pins. If you do this, you may want to tape or plastic tie the red wire to the others as there is a lot of vibration and the wire can become dislodged. There is a better way to do this with the wiring at the rear of the cabinet.

Once the JPAC was installed, we ran the WINIPAC utility we downloaded from [www.ultimarc.com](http://www.ultimarc.com). It reads the current set of switch configurations from the JPAC and lets you make changes to how the JPAC generates inputs over USB to your PC. So we configured the P1 and P2 inputs to keypresses, like WASZ for Up, Left, Right, Down stage panel presses. Write these down as you have to set StepMania to match. The WINIPAC saves the current settings to the JPAC automatically as you make changes.

We obtained a cable with red/white RCA jacks on one end, and a stereo headphone jack on the other. We plugged this into the Line 1 jacks of the Light/Amp box (which we will call the LAB from now on), and the other end into our laptop's headphone jack.





Viewed from the rear, the LAB is the metal box and the JPAC is mounted below, with the JAMMA harness plugged into it.

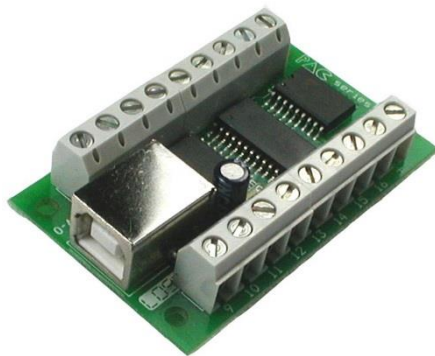
We installed StepMania 5.09, configured the inputs in the Options to match our JPAC settings and started playing. Every thing works and the cabinet is playable – except there are no lights.

There are 4 connectors plugged into the rear panel of the 573. These connectors are for P1 stage lights (white connector), P2 stage lights (orange connector), cabinet lights start/select buttons and 4 marquee side lights (red connector), and pink neon lights (6 pin white connector with 2 wires). After unplugging all of these connectors from the 573, remove the 573 from the cabinet and store for future use or ebay sales.



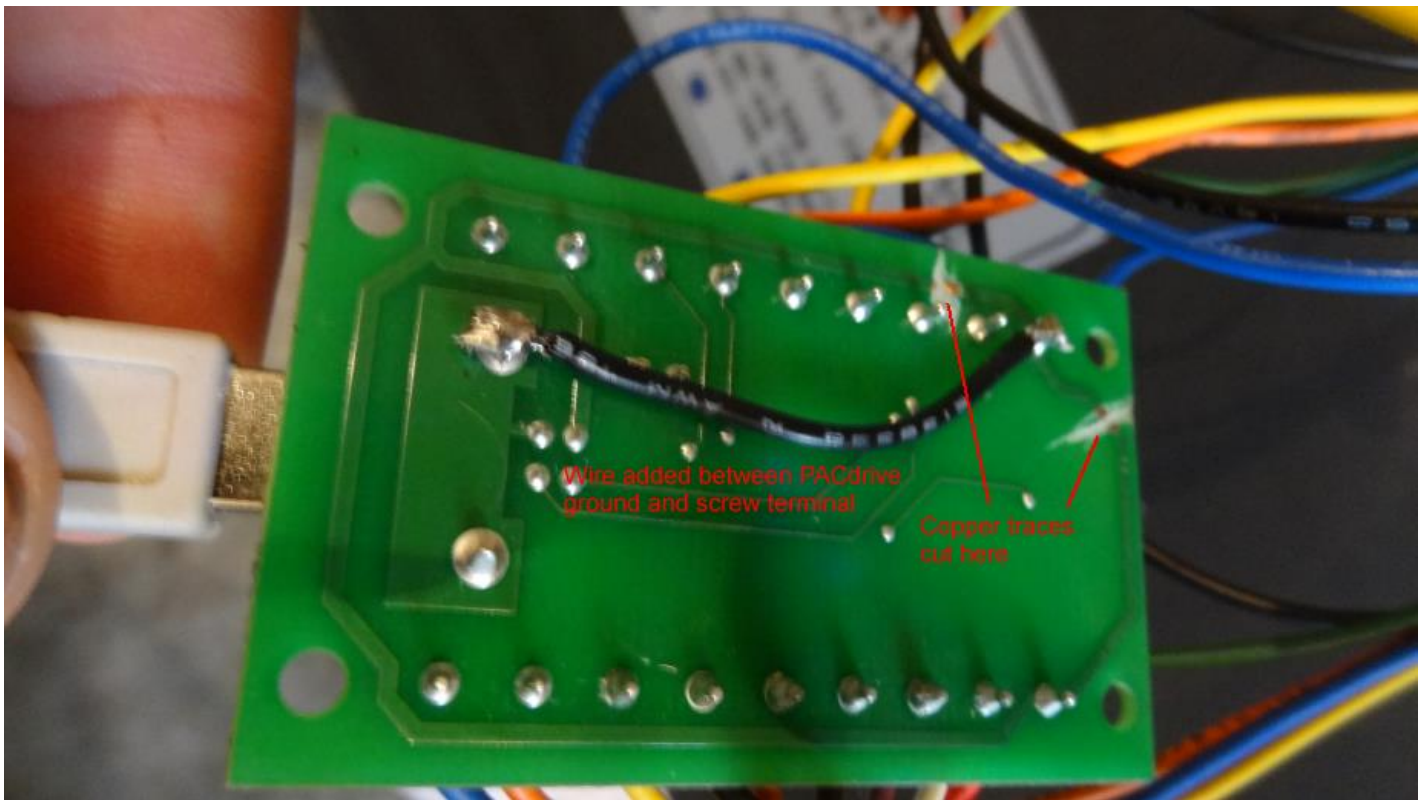
Here is the 573 controller, which uses custom Playstation hardware. Note the locations of the right and sound output connectors on the right and the large JAMMA connector on the left bottom, where the JAMMA connector is normally connected. You plug the JAMMA connector into the JPAC instead.

The LAB uses the wires in these connectors as signals from the 573 for which lights to turn on an off. In our setup, we wanted StepMania to create these signals, and need the PACdrive to be that interface device.

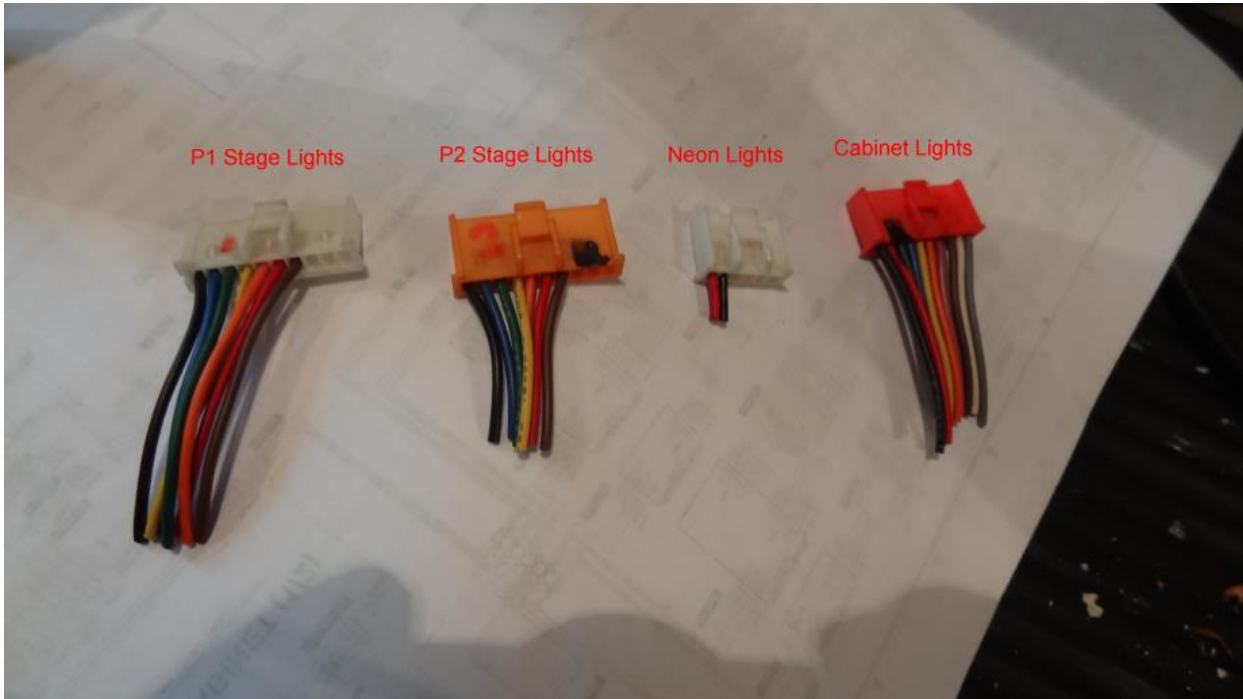


The PACdrive can control 16 outputs through its USB connection to the PC. It has screw terminals where you can place the end of a wire into a cavity, then tighten the screw to lock the wire in place and make a connection to it. There are 2 added screw terminals that are connected to the 5 Volt DC power supply provided by the PC through the USB cable. But the PACdrive is missing an important screw terminal that we need, which is a connection to ground. To remedy this it is necessary to add a ground wire from the PACdrive's ground. By soldering a wire to the metal shell around the USB connector, or to the bottom of the PACdrive, you can easily add a connection to the ground. When the

PACdrive energizes an output, it creates a connection between the screw terminal and the ground. This is exactly what we need to trigger the LAB and is the same signal that the 573 provided. Once I soldered the black wire to the ground plane on the bottom of my PACdrive, I used a metal file to cut the copper traces on both sides of one of the + terminals, then soldered the black wire to the bottom of that terminal. This was just for convenience, as it allowed me to connect my ground wires to this screw terminal.



Here is the PACdrive modified to provide a ground screw terminal.



Here are the 4 connectors that plugged into the 573. Note that the P1 and P2 connectors use the same color wires so make sure to label the wires. Some of these wires will not be needed.

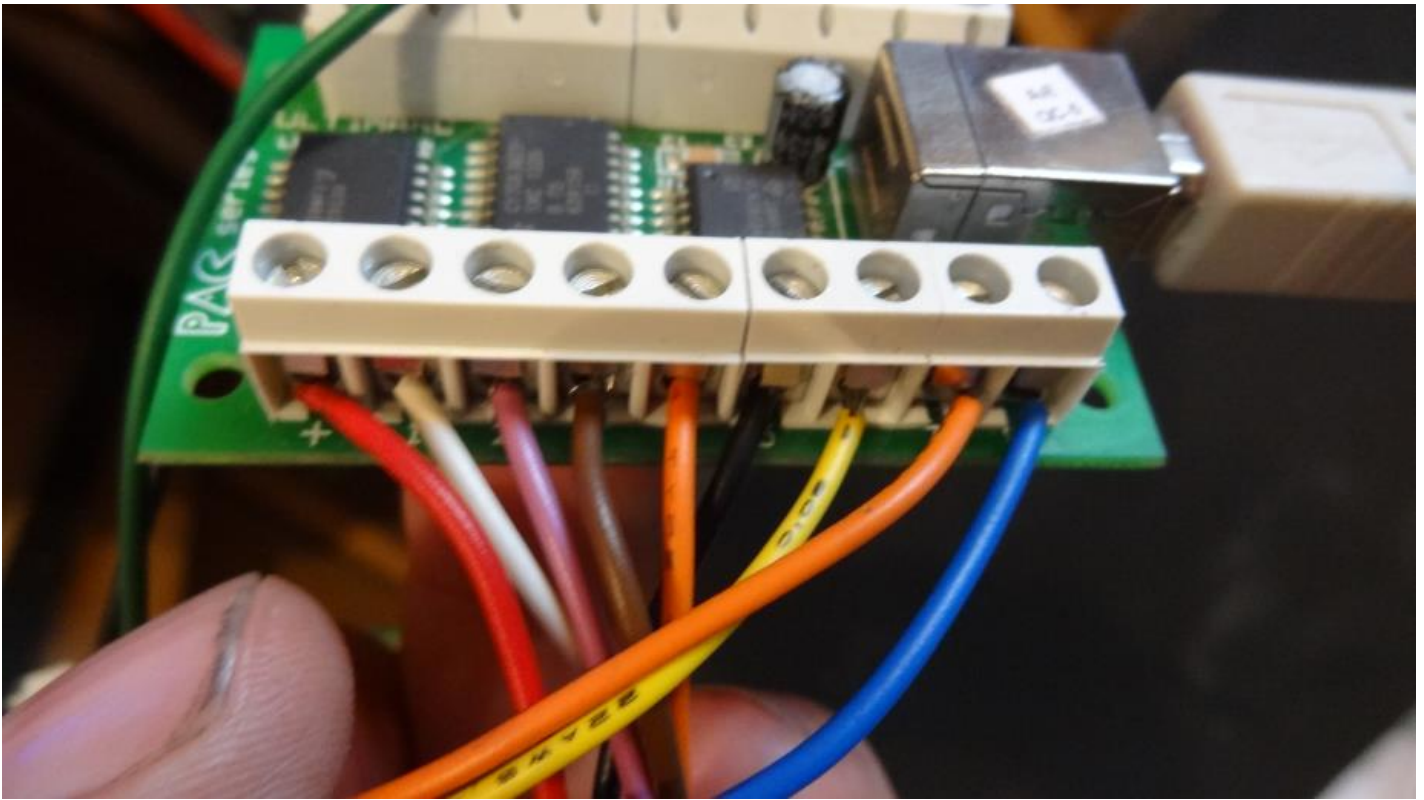
## Make sure to disconnect the PACdrive's USB connection from the PC while wiring it up.

So now we just had to connect the correct wires from the connectors above to the correct pins on the PACdrive to match up with the StepMania software. As I had to write the PACdrive driver for use with StepMania 5.09, I chose this order:

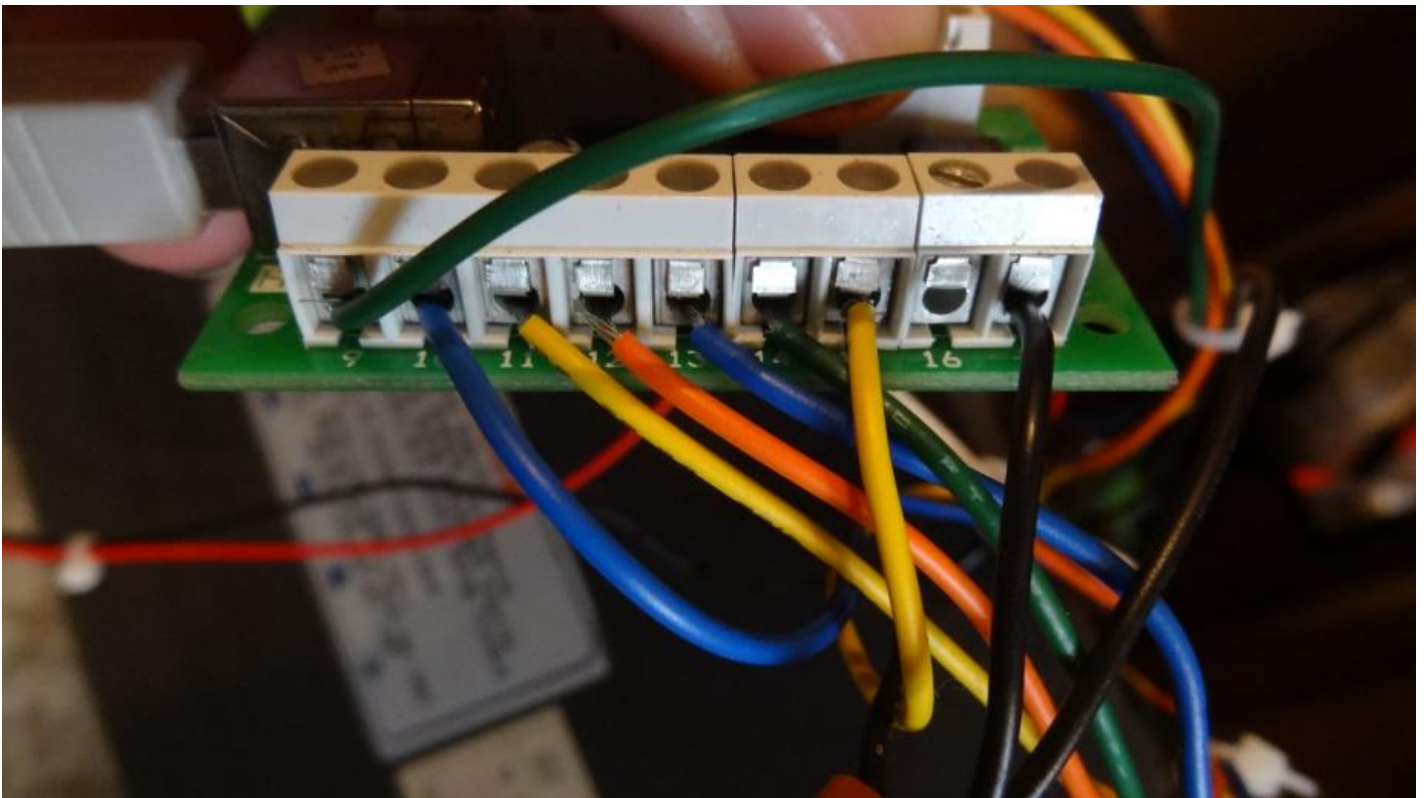
PACdrive Screw Terminal	Connected To	Connector	Wire Color
+	Neon	Neon	Red (goes directly to solid state relay +)
+ Modified to be ground	Grounds from P1,P2,Cabinet (3 wires)	P1,P2,Cabinet	Black
1	Marquee UL	Cabinet	White
2	Marquee UR	Cabinet	Purple
3	Marquee LL	Cabinet	Brown
4	Marquee LR	Cabinet	Orange
5	Bass lights (both sides Or'ed together)	Neon	Black (goes directly to solid state relay -)
6	Pad 1 L	P1	Yellow
7	Pad 1 R	P1	Orange
8	Pad 1 U	P1	Blue
9	Pad 1 D	P1	Green
10	Player 1 Start/Arrows	Cabinet	Blue
11	Pad 2 L	P2	Yellow
12	Pad 2 R	P2	Orange
13	Pad 2 U	P2	Blue
14	Pad 2 D	P2	Green
15	Player 2 Start/Arrows	Cabinet	Yellow
16	Spare		

You will notice that some of the wires in the connectors are unused. As mentioned earlier, there is a way to wire the stage to work in game mode rather than test mode. The red wires in the P1 and P2 harnesses can be connected to the ground wires for the connectors (these red wires connect to the white wires going to the stage control boards). You can twist them together with the black ground wires and use a wire nut to keep them all connected. See the orange wire nut in the 4<sup>th</sup> picture below for an example where to connect the 2 red wires. The brown wire in the P1 and P2 harness is not used.



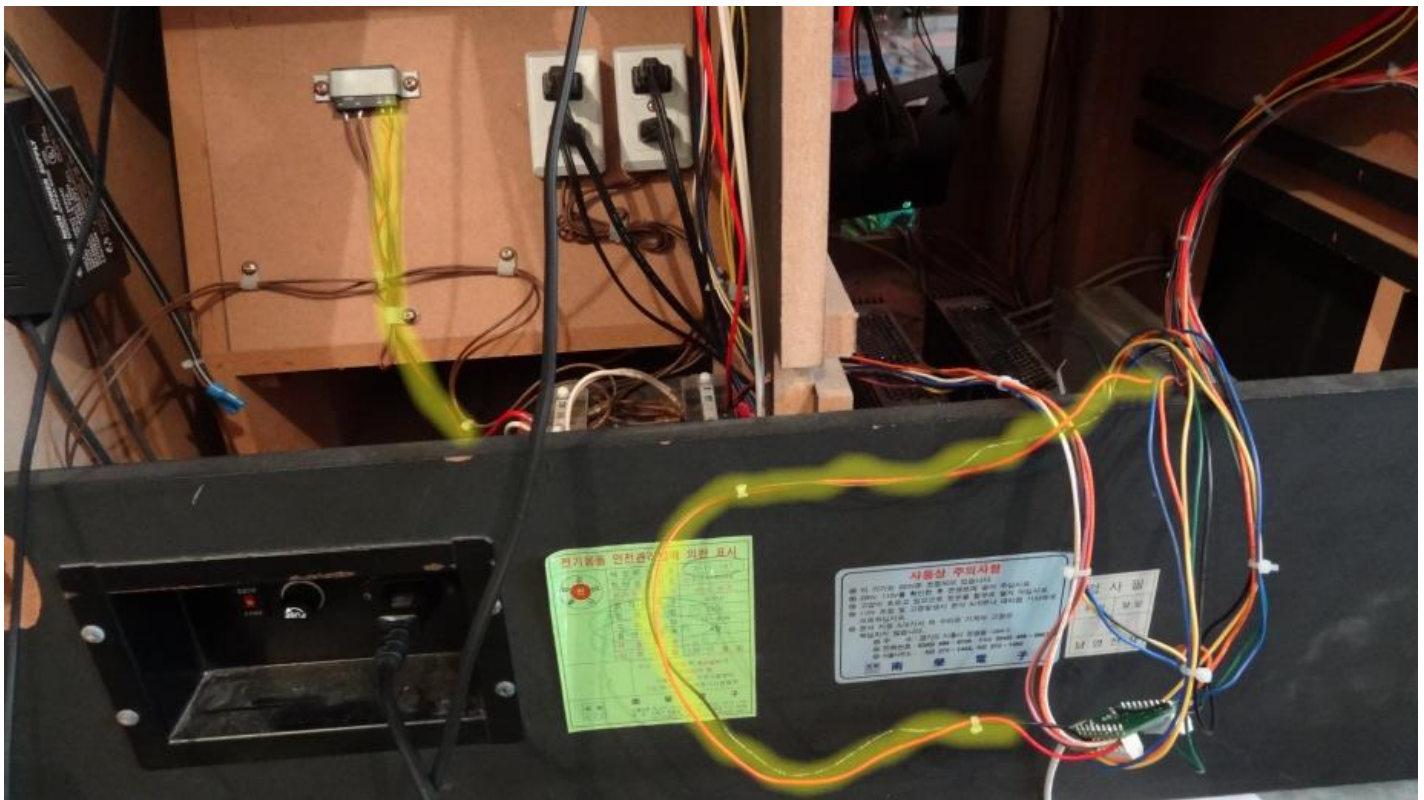


PACdrive screw terminals (1-8)



PACdrive screw terminals (9-16). The rightmost screw terminal is the one with the modified ground.





Yellow glow around red/black wires going between PACdrive and neon solid state relay. You will need to change the wiring by removing the red wire from the JAMMA connector and connecting it to the PACdrive + terminal.



Here is the completely wired PACdrive. Note that the 3 ground wires plus a short black wire have their ends twisted together under the orange wire nut. The other end of the short black wire goes to the modified + terminal that is connected to ground.

To test your wiring download the LEDBlinky apps from <http://www.ledblinkynet/Download.htm>

After installing, run the SimpleLEDTest.exe. You should see each light light up as you energize each output in the software.

If all works, the wiring is complete. Now you just have to get a StepMania build that includes the PACdrive driver and configure StepMania's Preferences.ini file to use that driver. Run the stepmania.exe program once so it create its folders and Preferences.ini file, which we will then modify.

We have written a PACdrive driver and added to the most recent StepMania 5.09 build obtained from github on 9/6/2015. Once StepMania runs, it creates some files in the C:\Users\(\login user name)\AppData\Roaming\StepMania 5 folder. AppData may be hidden on your system, or may be located elsewhere. Inside the StepMania 5 folder, look in the Save folder and edit the file Preferences.ini using Notepad. Change the LightsDriver= line to:

LightsDriver=PacDrive

And save the file. Now with the PACdriver connected to the PC, run stepmania.exe. It should run and all of the lights will start working as expected. You are done.

You can download a zip of the StepMania 5.09 build with PacDrive support that we are using at:

<http://www.peeweepower.com/stepmania/stepmania5.09PacDrive.zip>

There is a video of our machine running at:

<http://youtu.be/6BlxgnHo3LY>