

CFTBL Hologram V2.0 MOD Installation Guide

Warning:

Please remember that this is a “MOD.” We took great effort in designing and testing our system in order to produce a high quality product, but it is not a factory original or 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.

If you are not comfortable working on pinball machines, please have a professional install this MOD.

Step 1: Turn off your pinball machine. Don't attempt to install this MOD with the game powered up. Watch all 3 of the V1.0 installation videos on our YouTube channel. These videos can be found here:

<http://www.youtube.com/user/pinballmiked>

Now that you've watched all of the YouTube videos, we can proceed with the installation.

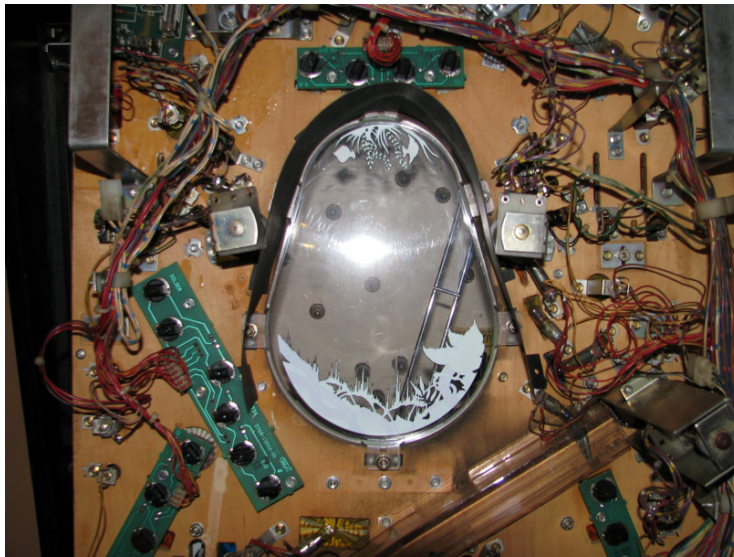
Step 2: Remove all of the original hologram hardware as outlined in the installation videos. The items shown below in Picture #1 should be removed before proceeding to *Step 3*.

Picture #1 – Original Hologram Hardware



Picture #2 illustrates what the bottom of the playfield should look like after the hologram has been removed. Referring to the installation videos, blue 3M painters tape can be used to cover the original hologram bracket screw holes; this is done to prevent wood dust from falling on to the TV screen during operation of the pinball machine. As an alternative to painters tape you can use screws to plug the holes (**WARNING – If you use the wrong size screws you may damage your playfield, if the screws are too long you'll puncture the top side of the playfield**). As shown in Picture #2, I removed the screws used to attach the paper shroud to the playfield near the subway. This was done to improve visibility of the TV screen during game play (this is optional).

Picture #2 – Playfield after Hologram is removed



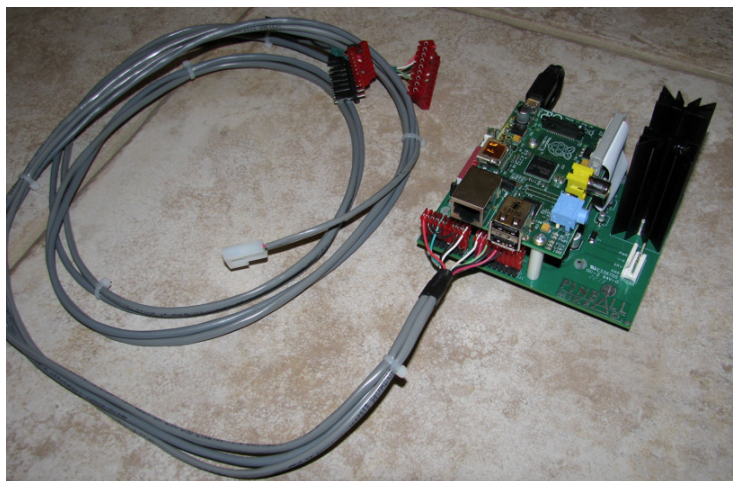
Picture #3 illustrates what the inside of the cabinet should look like after the mirror motor assembly has been removed.

Picture #3 – Cabinet after Hologram is removed



Step 3: Now it is time to install the interface board and MOD cabling (See Picture #4 below). In order to simplify the installation we have already connected the game interface cable to the interface board.

Picture #4 – MOD Hardware and Cabling



Originally we recommended installing the interface harness, as outlined in the installation videos, in the backbox and then routing the cabling down to the cabinet. However, now that we've already attached the harness to the interface board, we will do the exact opposite. We will now start with the installation of the interface board and work our way up to the backbox.

Let's get started.

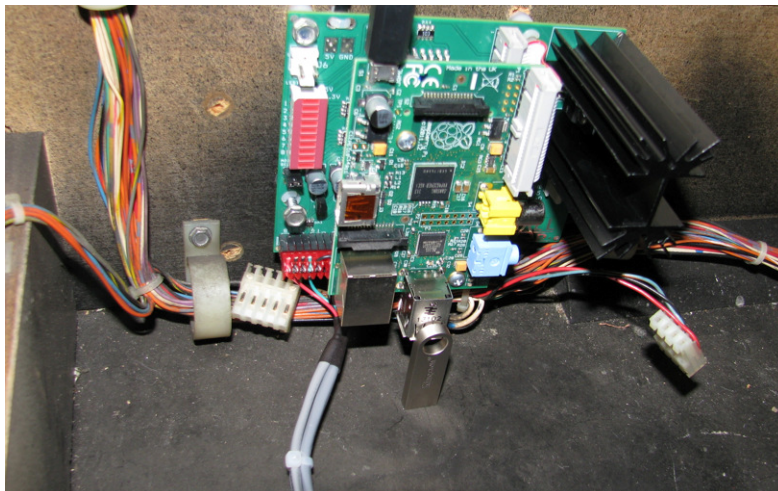
First, remove the #6 hex head screws used to mount the mirror motor triac board to the left cabinet wall. These will be reused to mount the MOD's interface board. (WARNING – As indicated in the installation videos, make sure the screws are not too long prior to installing the interface board. If the screws are not factory original they may be too long for use with our MOD).

Picture #5 – Original Triac Board Mounting Screws



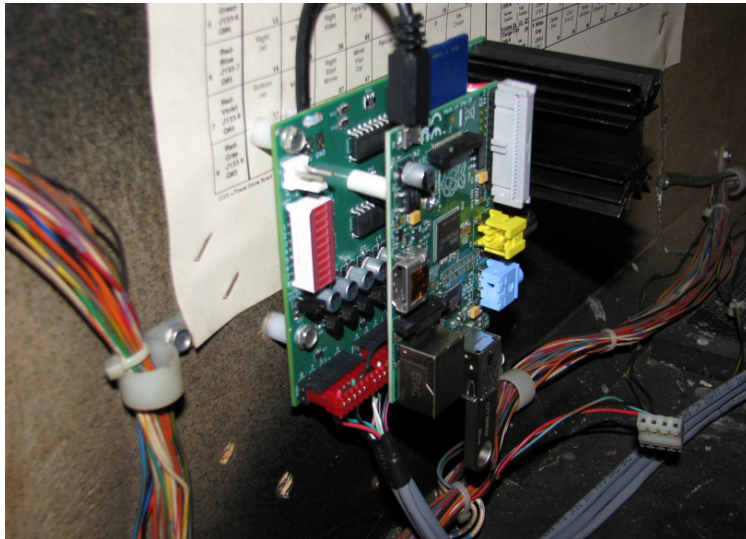
As indicated in the installation videos, not all CFTBL pinball machines are the same. The mirror motor triac board was not mounted in the exact same place on every machine. Our MOD was designed to use the existing triac board's mounting holes. However, if the triac board was mounted too low in the cabinet you may need to install our board at a higher location to accommodate the USB thumb drive (See Picture #6 & 7).

Picture #6 – MOD Interface Board Installed (Original Holes)



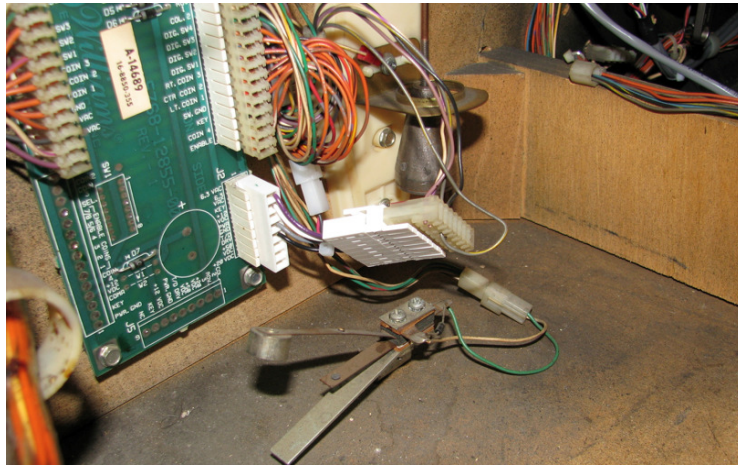
If your machine is like the one shown in Picture #6 you'll need to install the interface board as shown in Picture #7. Here we used the two upper triac board mounting holes for the two bottom mounting posts on the MOD's interface board. As you can see from Picture #6, this was necessary to accommodate the USB thumb drive. At this point you should install the SD card and USB drive as shown in Picture #7 below. Also, make sure to connect the 4 pin IDC connector (it plugs into the interface board directly below the heat sink) that was originally installed on the triac board; this is how the RPi (Raspberry Pi) computer is powered from the game. Also, make sure the micro USB cable is plugged into the RPi or the MOD will not work.

Picture #7 – MOD Interface Board Installed (New Holes)



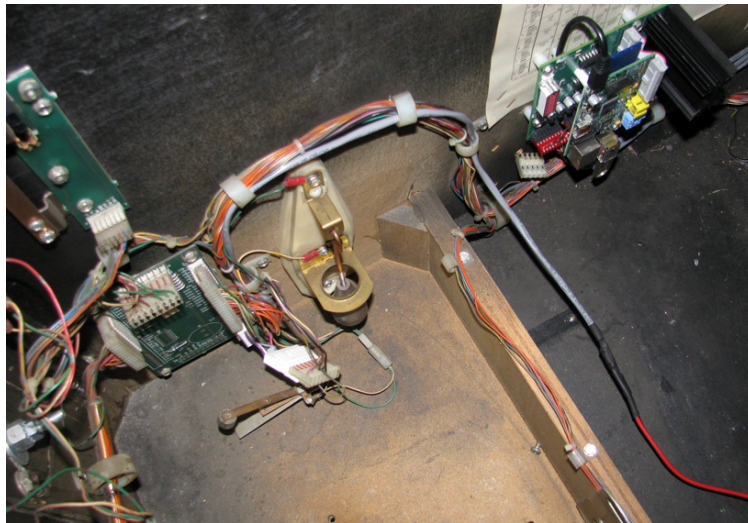
Step 4: Now it is time to install the TV power cable as outlined in the installation videos. First, remove the IDC connector plugged into J2 at the coin door interface board. Then plug the Molex connector on the MOD's TV harness (the one not connected to the z-connector) into J2 at the coin door interface board. Now plug the IDC connector you just disconnected from the coin door interface board into the z-connector on the TV power harness as shown in Picture #8.

Picture #8 – Connect TV Power Harness to J2



Now route the TV harness as shown in Picture #9 below.

Picture #9 – TV Power Harness Routing

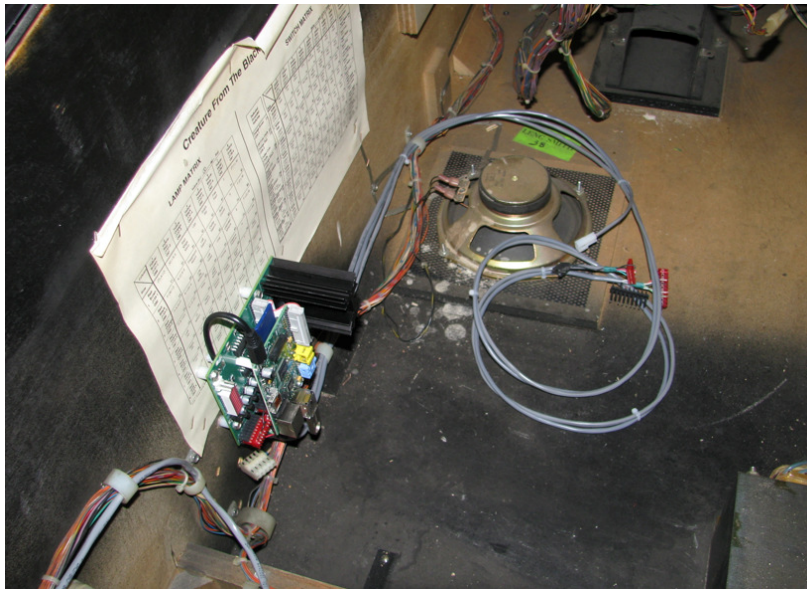


This is what your machine should look like at this point (See Picture #10).

Double check the following:

- (1) Make sure all cable connections on the interface board are properly seated.
- (2) Make sure the SD card is installed.
- (3) Make sure the USB drive is installed.
- (4) Decide what “Mode of Operation” you want. As indicated in the installation videos, removing the jumper pin located below the LED block will cause the MOD to boot up and run the “Hologram Emulation” mode.
- (5) Make sure the game 4 pin IDC connector (the one with the red, blue, and black wires) is plugged into the pin header on the interface board located below the heat sink.
- (6) Make sure the micro USB cable used to power the RPi is firmly seated.
- (7) Make sure all cable connections on the coin door interface board are firmly seated.

Picture #10 – Interface Board Installed Correctly



Step 5: Now it is time to route the game interface harness to the rear of the cabinet. Looking at the harness you will see a small 2 pin Molex connector. This connector is used to connect the MOD to the game's hologram lamp trigger as shown in Picture #11 below.

Picture #11 – Hologram Lamp Connection



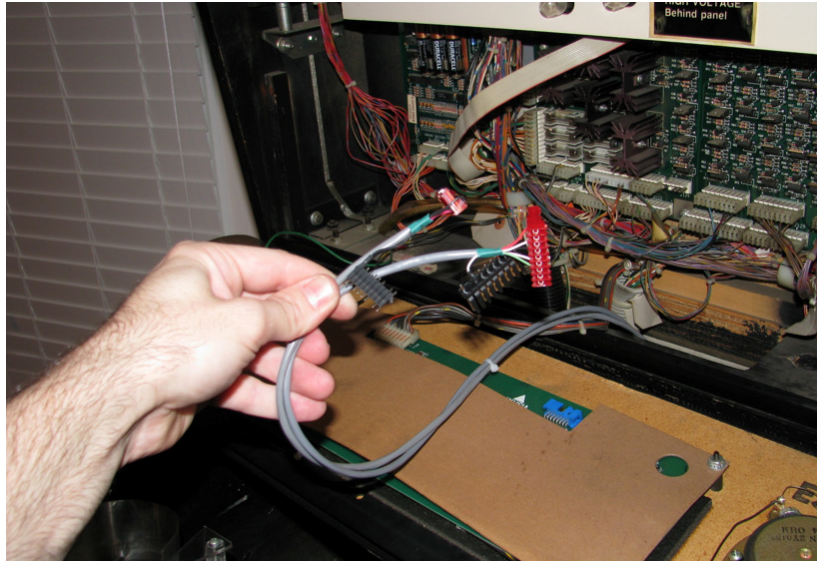
The remainder of the MOD's interface harness can now be routed into the backbox.

Picture #12 – Portion of MOD Harness that's Routed to Backbox



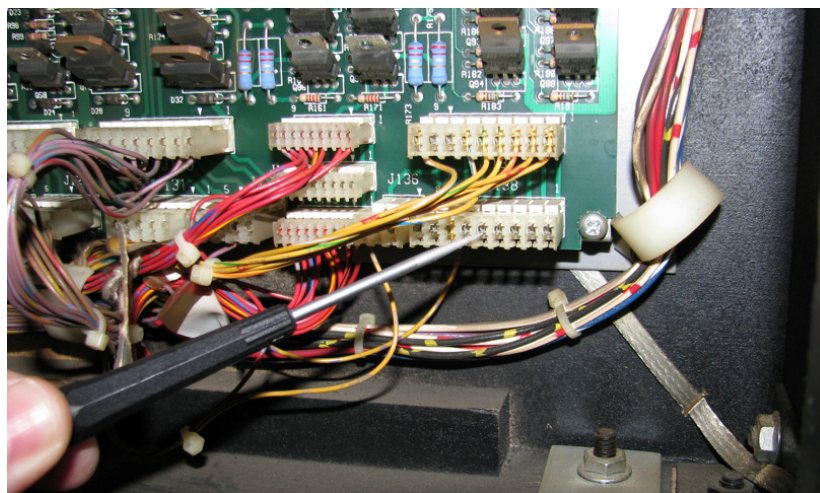
Step 6: Remove the translite and lower the speaker panel, gaining access to the machine's power driver board. Now fish the game interface harness up into the backbox as shown in Picture #13 below.

Picture #13 – Routing MOD's Harness into Backbox



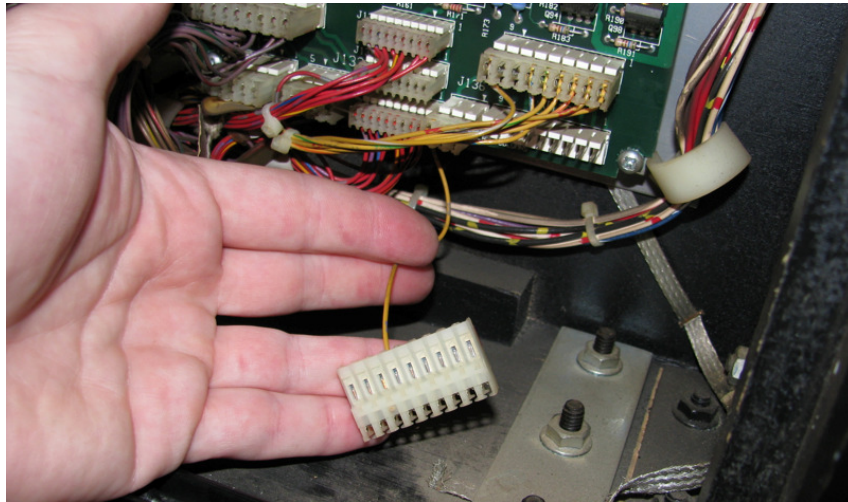
Remove the 9 pin IDC connector from the power driver board as shown in Picture #14. You are looking for the connector with a single yellow wire; this connector will either be connected to J137 or J138.

Picture #14 – Remove 9 Pin Connector with Single Yellow Wire



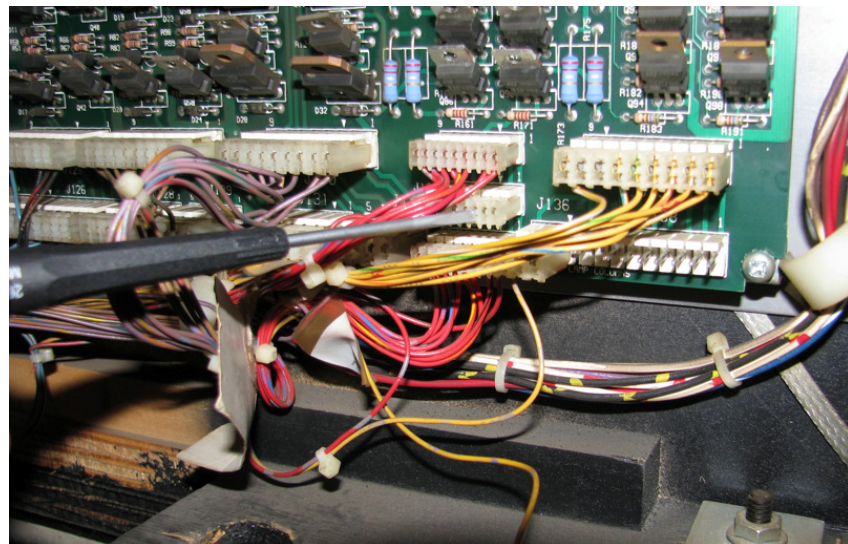
Here's a closer look at the connector you are looking for (See Picture #15 below).

Picture #15 – .156" Pitch 9 Pin Connector Disconnected



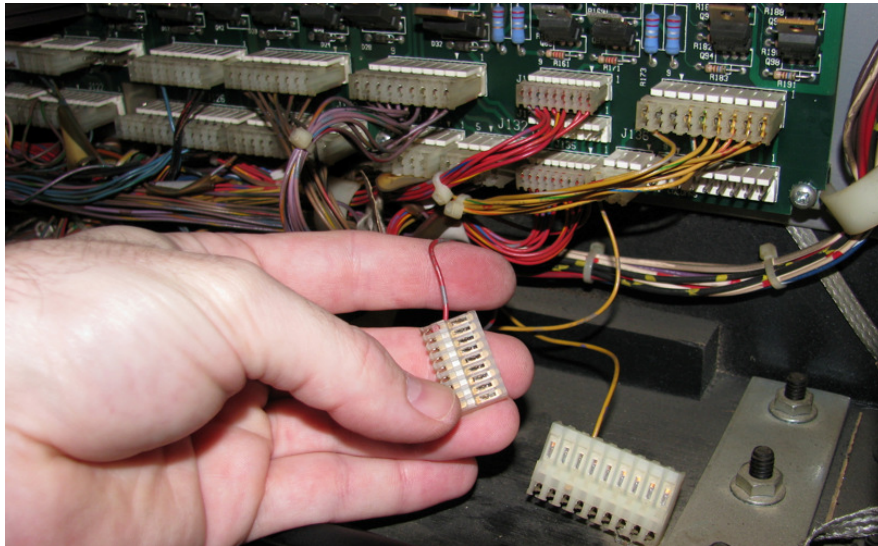
Now, remove the 9 pin IDC connector from the power driver board as shown in Picture #16. You are looking for the connector with a single red wire; this connector will either be connected to J133, J134, or J135.

Picture #16 – Remove 9 Pin Connector with Single Red Wire



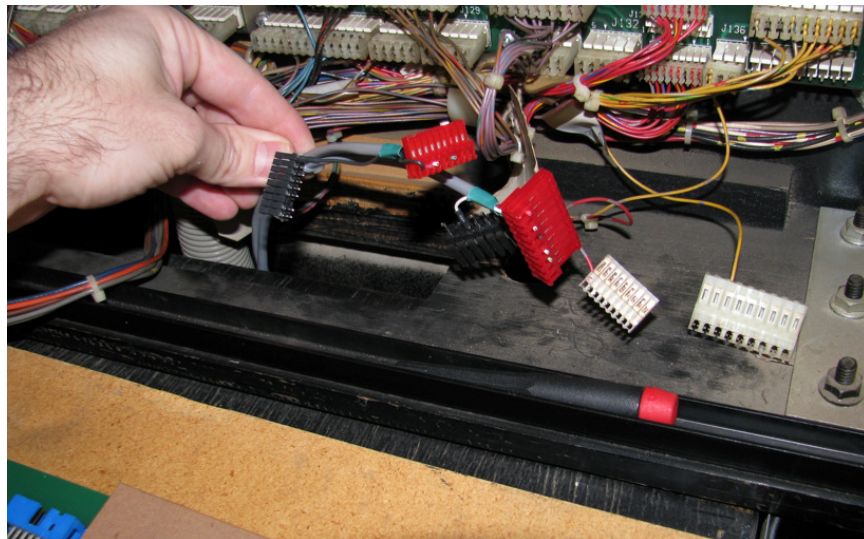
Here's a closer look at the connector you are looking for (See Picture #17 below).

Picture #17 – .1" Pitch 9 Pin Connector Disconnected



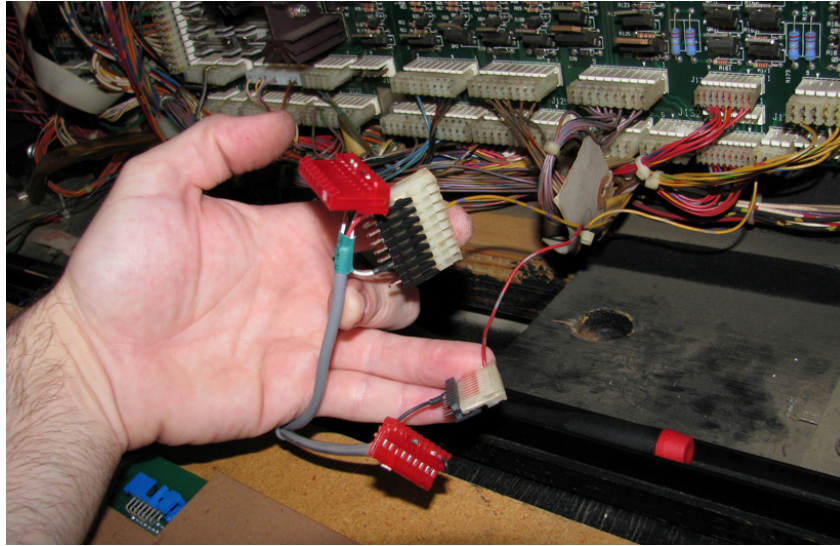
Now we can connect the game's IDC connectors to the black headerpins on the interface harness.

Picture #18 – MOD Harness



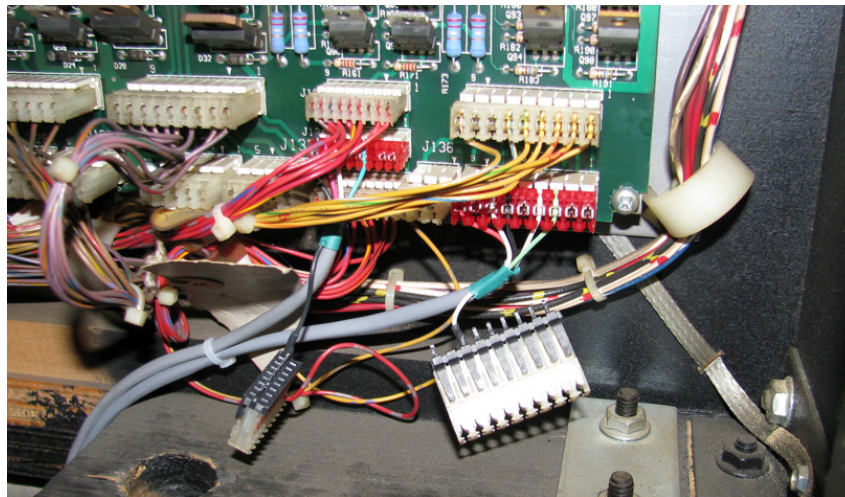
Step 7: Connect the game's IDC connectors to the MOD's game interface harness as shown in Picture #19 below. The larger 9 pin IDC connector (the one with the single yellow wire) will connect to the black header pins with the .156" pin pitch. The smaller 9 pin connector (the one with the single red wire) will connect to the black header pins with the .1" pin pitch. The game's IDC connectors are keyed, so they can only be connected to the MOD's harness one way.

Picture #19 – Game's IDC Connectors Plugged into MOD Harness



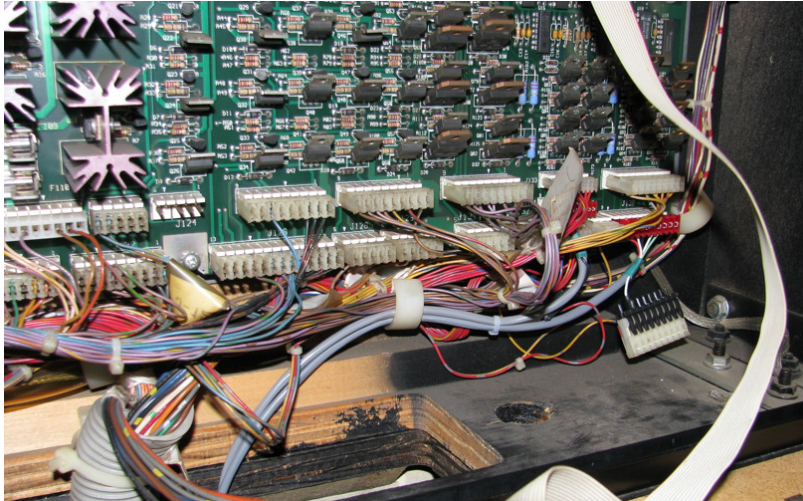
Now you can plug the red IDC connectors on the MOD harness into the power driver board as shown in Picture #20 below. The harness connectors will plug directly in at the locations where the game's connectors were originally seated (so, the .156" pin pitch connector will plug into either J137 or J138 and the .1" pin pitch connector will plug into either J133, J134, or J135).

Picture #20 – Plug MOD Harness into Power Driver Board



Now you can cleanly route the cabling through the nylon wire hoops in the backbox as shown in Picture #21 below.

Picture #21 – Wire Routing in Backbox



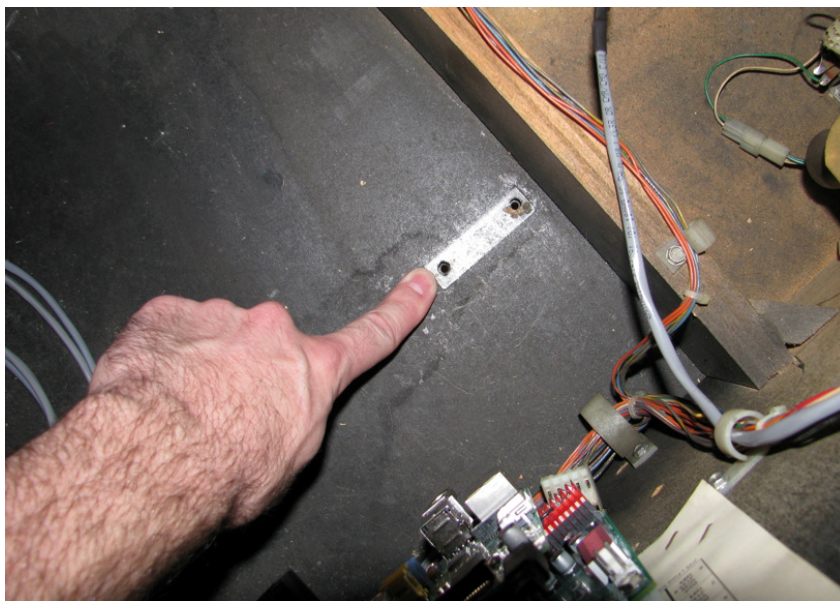
You should have plenty of slack in the MOD harness to accommodate lifting the playfield.

Picture #22 – Slack in Wire Harness



Step 8: Now it's time to install the TV. As indicated in the installation videos, you'll want to attach the stand to the TV first. The TV stand will mount to the cabinet floor where the mirror motor assembly was originally installed as shown in Picture 23.

Picture #23 – TV Stand Mounts Here



One of the modifications we've made for CFTBL V2.0 is the newly designed TV stand. We replaced the 3 holes (as seen in the installation videos) in the base plate with a single continuous slot. This allows more adjustability when positioning the TV inside the cabinet. Obviously, not everyone is the same height, so the slot in the TV stand's base plate gives you the ability to position the TV in the optimum viewing position you like. **(WARNING – Make sure you follow the instructions detailed in the installation videos regarding which playfield harness support posts should be removed. The further you move the TV stand towards the rear of the cabinet the more important this step is).**

Picture #24 – TV Stand Base Plate Mounting Slot



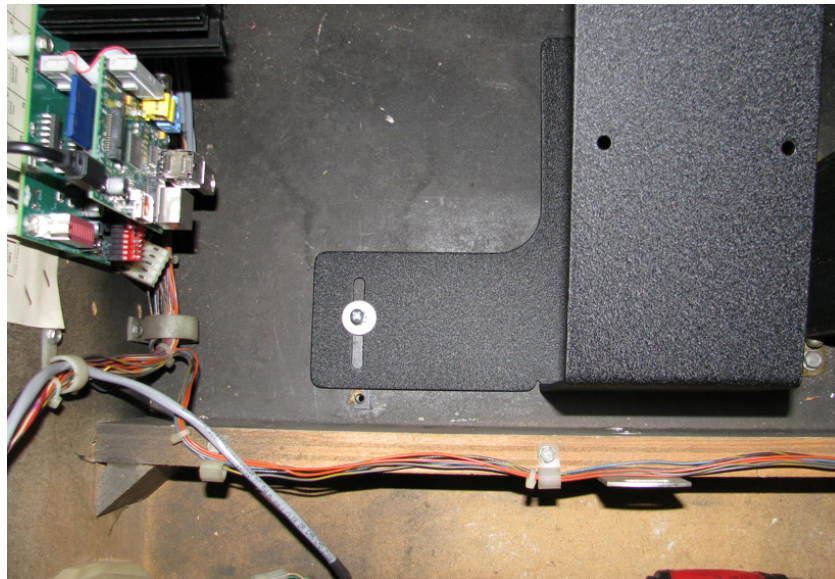
Included with your MOD are two 8-32 bolts and lock/flat washer as shown in Picture #25.

Picture #25 – TV Stand Mounting Bolts



To illustrate how the TV stand is attached to the cabinet floor, refer to Picture #26 below. As indicated in the installation videos, we recommend that you start off with the TV stand positioned as close to the coin door as possible. Again, the installation of the TV stand is covered in great detail in the installation videos. **(WARNING – Make sure the TV is position 3.5” from the left cabinet wall as discussed in the installation videos. If the TV is positioned too close to the right cabinet wall the ball up-kicker located at the “M” FILM letter shot will hit the TV when lowering the playfield.)**

Picture #26 – TV Stand Mounting Location



Now you can install the HDMI cable (connecting the RPi to the TV) and plug the TV power harness into the TV.

Here's what the MOD should look like when you are done (See picture #27):

Picture #27 – CFTBL MOD Installed



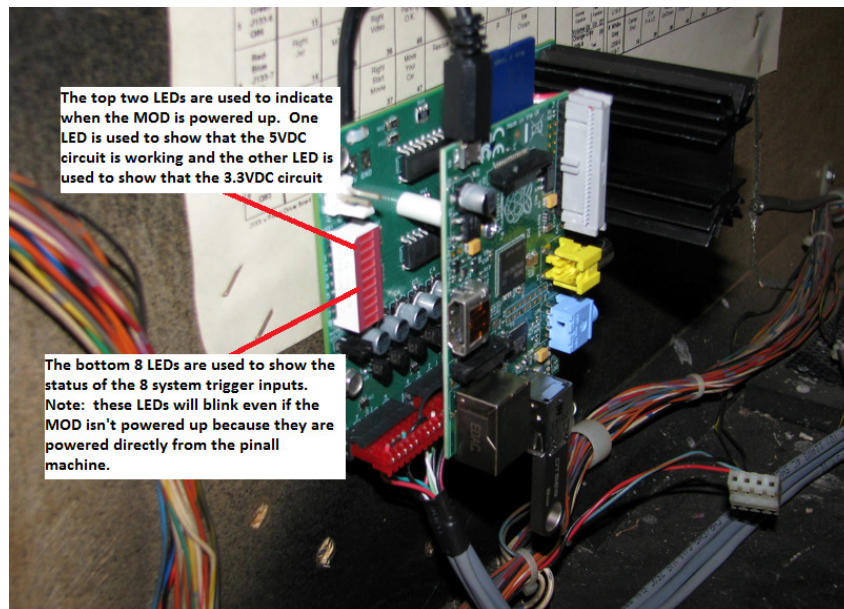
Remember, it is important to watch the installation videos for additional details not presented in this manual. This document is a good reference guide, but the videos are much more detailed and will ensure you correctly install the MOD as designed.

Trouble Shooting Tips:

- (1) The TV screen is black and the game is powered up – what do I do? Remember the MOD uses a computer (Raspberry Pi) to display graphics on the TV screen. The RPi does take about 90 seconds to boot into our program, so make sure you've given the system enough time to startup correctly.
- (2) Ok, the TV screen is still black and I've waited a few minutes – now what? First, make sure the TV is turned on. Use the TV's remote control unit and make sure the TV is powered on. If the TV is powered on, then make sure the TV "input source" is set to the correct HDMI port (the one you connected the RPi to). Double check and make sure the HDMI cable is plugged into the RPi and the TV. If the TV doesn't turn on then make sure the power cable is connected to the TV and at J2 on the coin door interface board.

Now when you turn the game on/off the TV will turn on/off as well.

- (3) Ok, I did steps 1 and 2 and nothing is being displayed on the TV screen – now what? First, make sure the SD card and USB thumb drive are installed in the RPi. WARNING - never remove or install the SD card (or USB drive) when the pinball machine is powered up, this will corrupt or erase the programming on the SD card.
- (4) Ok, both the SD card and USB thumb drive are installed – now what? Verify the MOD is actually powered up. You can tell if the MOD is powered up by looking at the red LED block on the interface board. The top two LEDs are used to indicate when the 5VDC and 3.3VDC circuits are powered up. If either of these LEDs is not illuminated make sure the 4 pin IDC connector (the one originally used to power the mirror motor triac board) is plugged into the interface board below the heat sink. Also, make sure the micro USB cable is connected to the RPi.



- (5) Ok, everything looks good in steps 1 – 4 above, now what? Double check all of the cable connections, making sure everything is properly connected and seated. Now turn the game off for 15 seconds and then turn it back on. Remember, the RPi is a computer and it could lock up, might just need to be rebooted (this is very rare though).

If the TV screen is still black 2 minutes after rebooting then I'd assume the SD card is probably corrupted. You can reimage your card, but **PLEASE** contact me before you attempt this. I've included "Win32 disk Imager", a windows utility used to reimage SD cards, on your USB drive as well as a clone of the original SD card. Again, get in touch with me and I'll walk you through this directly.

- (6) The MOD seems to be working but I'm not seeing the specific video for "fill in the blank" – what do I do? Alright, you probably have a bad connection either in the back box, at the

hologram lamp, or at the interface board (either J1 or J2). Double check your connectors. Note, when the game is in attract mode you should see the bottom 6 LEDs on the interface board's red LED block blinking. To check LEDs 3 and 4 (these correspond to the hologram mirror motor and hologram lamp trigger inputs) put the game in hologram test.