# BUILD LOG FOR THE MICKEY'S BIG TIMER

## Introduction and design parameters:

Our club, The Greater Detroit Soaring and Hiking Society has a good and varied membership that fly F3K, ALES, F5J and TALES. We run 4 events per year in each of the three disciplines (we lump ALES and F5J together for scheduling) and each discipline has its own CD. We also have a shed at our field that we keep equipment in year around but when the club decided to spend the money on the MBT we also decided that it could not be stored in the shed with its great temperature swings and critters that kind of like the place. It was apparent that the MBT had to be very transportable and self-contained as possible because each of the three CD's would be sharing and lugging the thing home and back to the field almost weekly.

As I naively volunteered to build the enclosure before I knew it had to be transportable it fell on me to do some head scratching (it hurts because of the lack of hair) and build an "everything-in-one-box" system. What I came up with is here in picture form and as few words as I can muster to make it clear.

We did opt for the pre-ship assembly by Mickey and that took a lot of work out of the process and I would advise anyone purchasing this unit to do the same. Mickey was more than gracious answering my questions and talking me through fixing my mistake when the MBT did not work on first try. I did not read the instructions he emailed me carefully enough so if you communicate with him, listen.

## Things I purchased or had laying around:

What I did not have in my shop I got on AMAZON or at the local hardware store and here is the list as best I remember.

- Bow and Arrow case: https://www.amazon.com/gp/product/B00AU6G64S/ref=ppx_yo_dt_b_asin_image_o03_s00?ie=UTF8&psc=1
- Hookup wire (100 feet): https://www.amazon.com/gp/product/B07RVMHSK4/ref=ppx_yo_dt_b_asin_image_o00_s00?ie=UTF8&psc=1
- Banana Plugs: https://www.amazon.com/gp/product/B007QUYQSY/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1 (I had 10 female sets on hand so did not purchase these but they are also on Amazon)
- Plastic Corner Molding: 2X8' lengths from Home Depot (the cheap semi-clear flexible plastic)
- 100 4MMX8MM machine screws from the local ACE HDWE store
- 16"X24"X 0.090" Clear Acrylic Plastic sheet from Home Depot
- 16 or so feet of 3/4"x3/4"x1/8" Aluminum Angle from the local ACE HWDE store
- 3M Automotive Trim Tape (large ½ wide roll) from the local Auto Zone

- 4- ¼" dia by 3 foot long fiberglass rods we "up-north fokes" use to mark the driveway for the snow removal guys.
- Goop (love this stuff) and some assorted wood screws.
- XT60 connectors
- Scrap plywood and hardwood I had laying around to make the temporary stand. (we have not decided how we are going to display the unit on the field as yet)
- Plastic box to house the "Contest Controller" (swiped from my wife's collection of stuff)

## The Build:

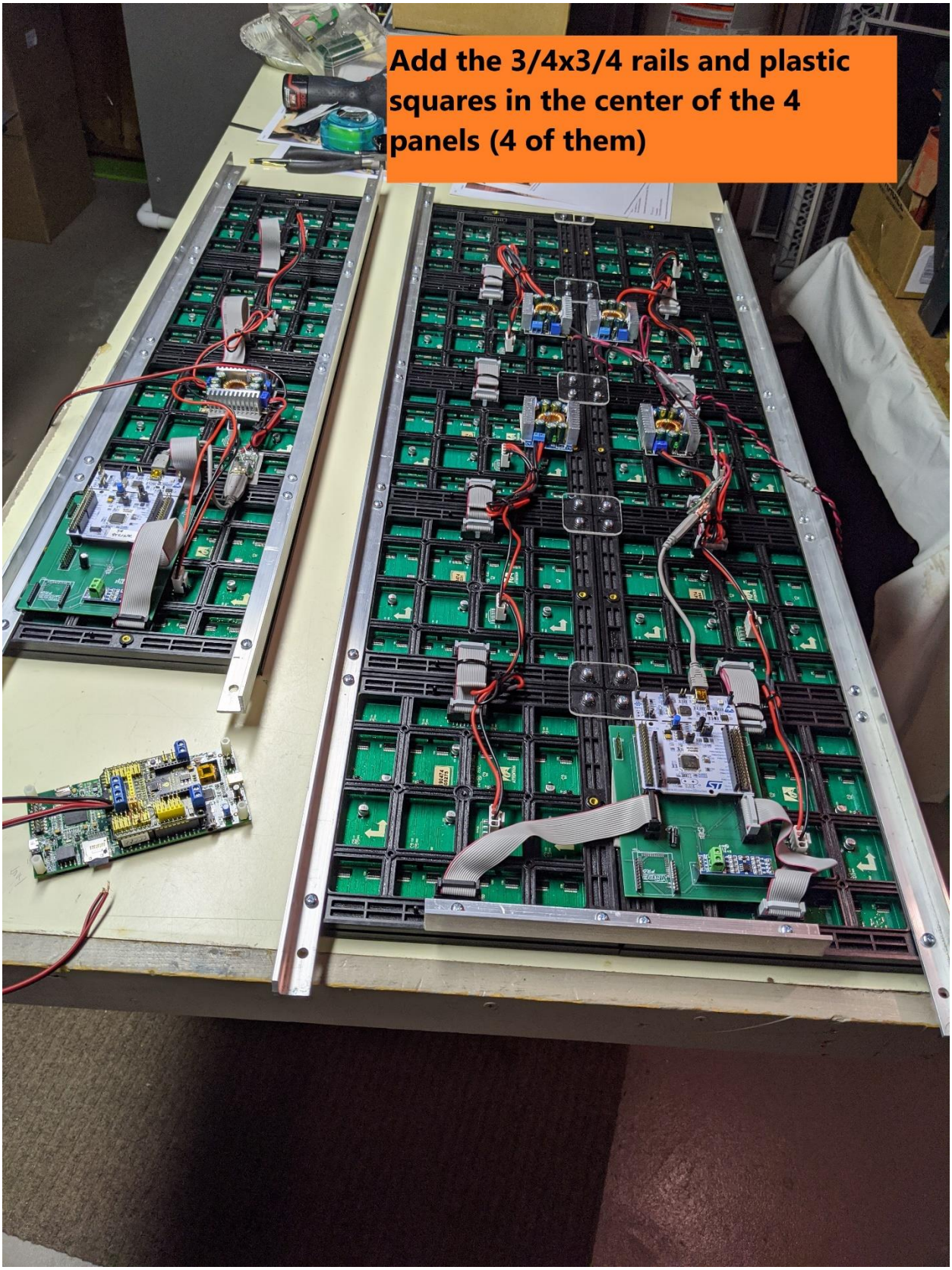
Most of the detail will be shown on the photos. It is not a step by step but I am sure you will get the idea and probably improve on it.

The build sequence I used was:

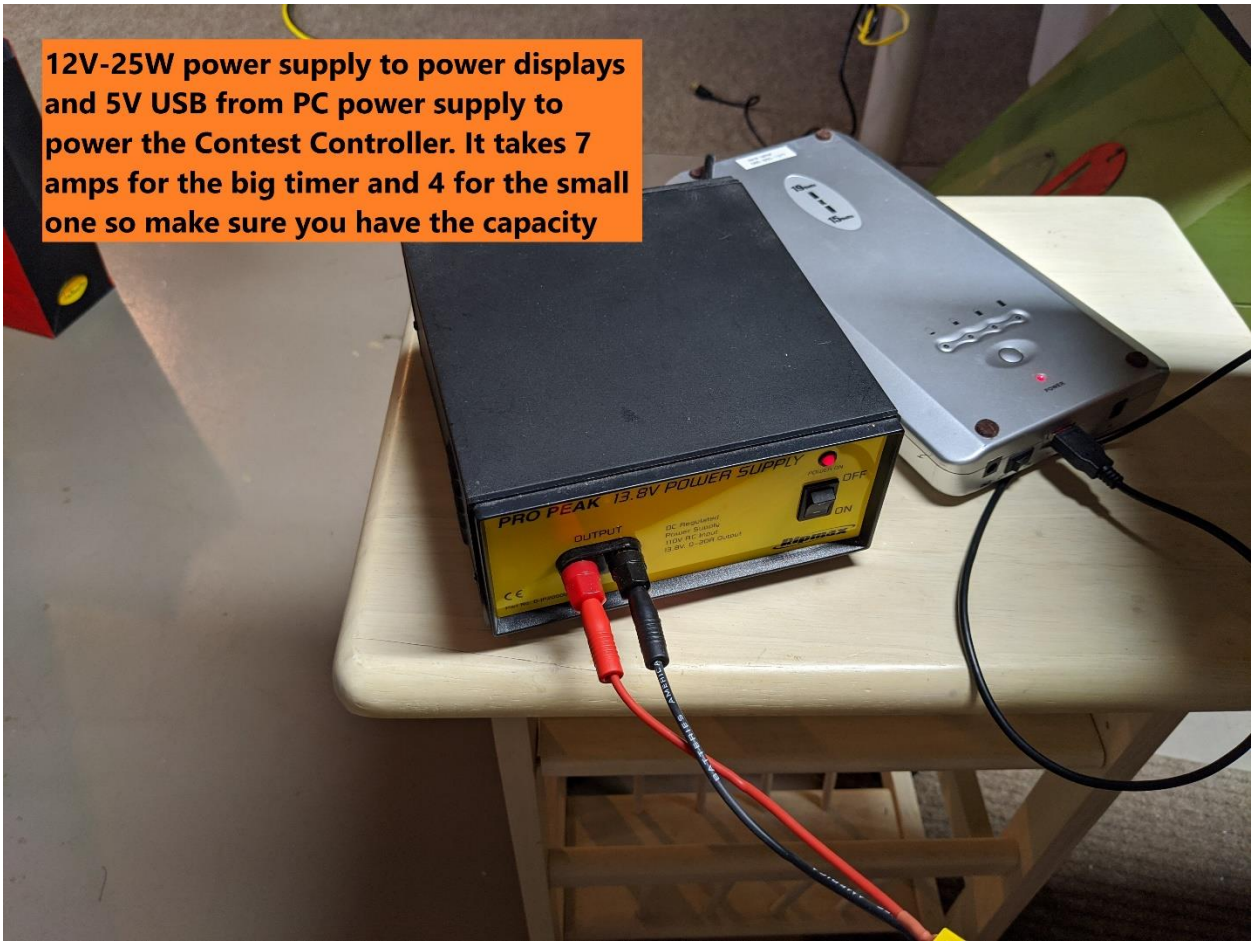
- Print out Mickey's instruction from the Dropbox files
- Lay out the parts and hook up all the wiring, it is almost idiot proof if you get the pre-assembled kit. Most of the wiring will 'kind of' all line up so it is just go along and plug stuff together.
- Measure everything and go to the Hardware and Amazon stores and get stuff.
- Assemble both displays with the aluminum angle plus little plastic squares on the big display.
- Update all the software from Mickey's Dropbox files and hook up the system to do an "It all works" test. Make sure you have enough power as the displays take a lot (11 amps total at 12V) and this is important… THE CONTEST CONTROLLER ONLY USES 5V FROM A USB OUTPUT. Be very careful to have all the pluses and minuses hooked up correctly. Some of the display controller interconnects are a little fussy and close together so make sure you have no shorts and they are clamped down well.
- Play with the Contest Controller (NOT HOOKED UP TO THE DISPLAY YET) until you figure out how to program a contest or trial contest (not hard but it is like getting a new phone or transmitter, you need to get familiar with it).
- Hook up the Contest controller to the Display Controllers then hook up the power.
- Block up the displays so you can see them, careful as the big display is not too stiff torsionally. Once in the case it is better but the case is plastic and flexible also so just do not twist it a lot by picking it up in the corners, always handle it from the center handle.
- Run the test, you may have to cycle the power once to get it to sync to the Contest Controller.
- Build the protection for the back of the small display using the flat aluminum strip and the corner molding with 3M automotive trim tape and the acrylic sheet. I did this because the back of the large display will always be protected in the case but the small one is going to be out in the open. I am guessing it will be hanging in the wind somewhere near the scoring tent. I am thinking the small display power supply will need to have some cooling on hot days so I made the cover two pieces so that the one over the power supply could be cracked open a little to allow in cooling air. Also the small display controller may have to be updated with firmware once in a while so it the plastic panel on that end can also be slid off to allow access.

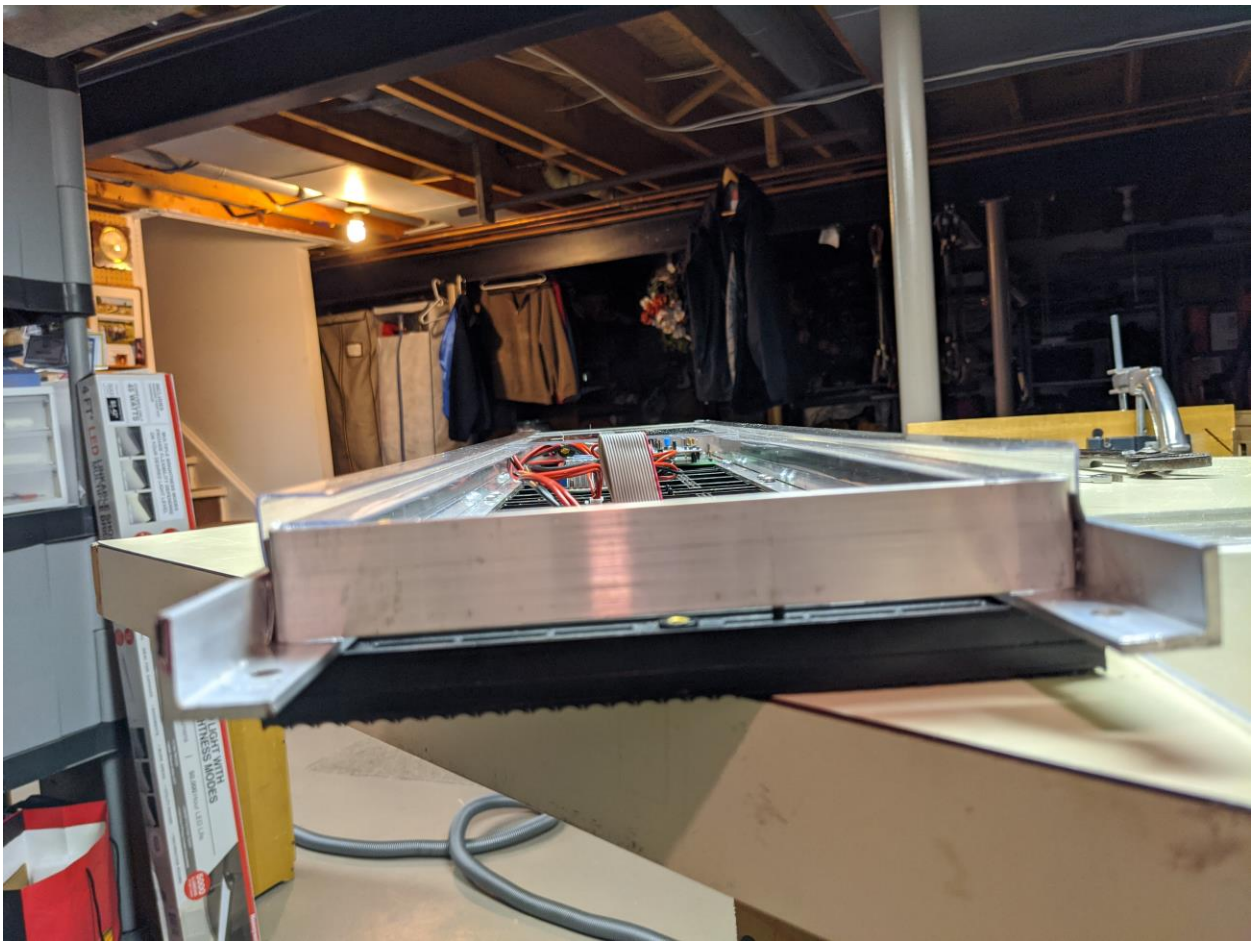
- Fab up the base of the bow case to accept the large display. I used 4 standoff blocks of plywood about 1” square along the top and bottom to align with the aluminum angle. Then I screwed some bellcranks on the aluminum angles that were extended about 1.5” past the display. These then cammed in under four more wooden blocks I screwed and Gooped to the side of case. Just rotating the cam 45 degrees allow the large display to be removed for the display controller updates.
- Using the yellow post hardware that came with the Plano Case I fabricated a couple of plastic disks and screwed them to the top of the short posts to hold the wiring.
- Then I fabricated the “stand up” base out of scrap plywood and made a couple of wood recievers for the quarter inch fiberglass rods used to hold the lid up and keep the case from falling over when in use.
- I used the arrow holders that came with the case to store the rods and just used padding for the storage of the take-apart stand.

## Photo Documentary


Add the 3/4x3/4 rails and plastic squares in the center of the 4 panels (4 of them)

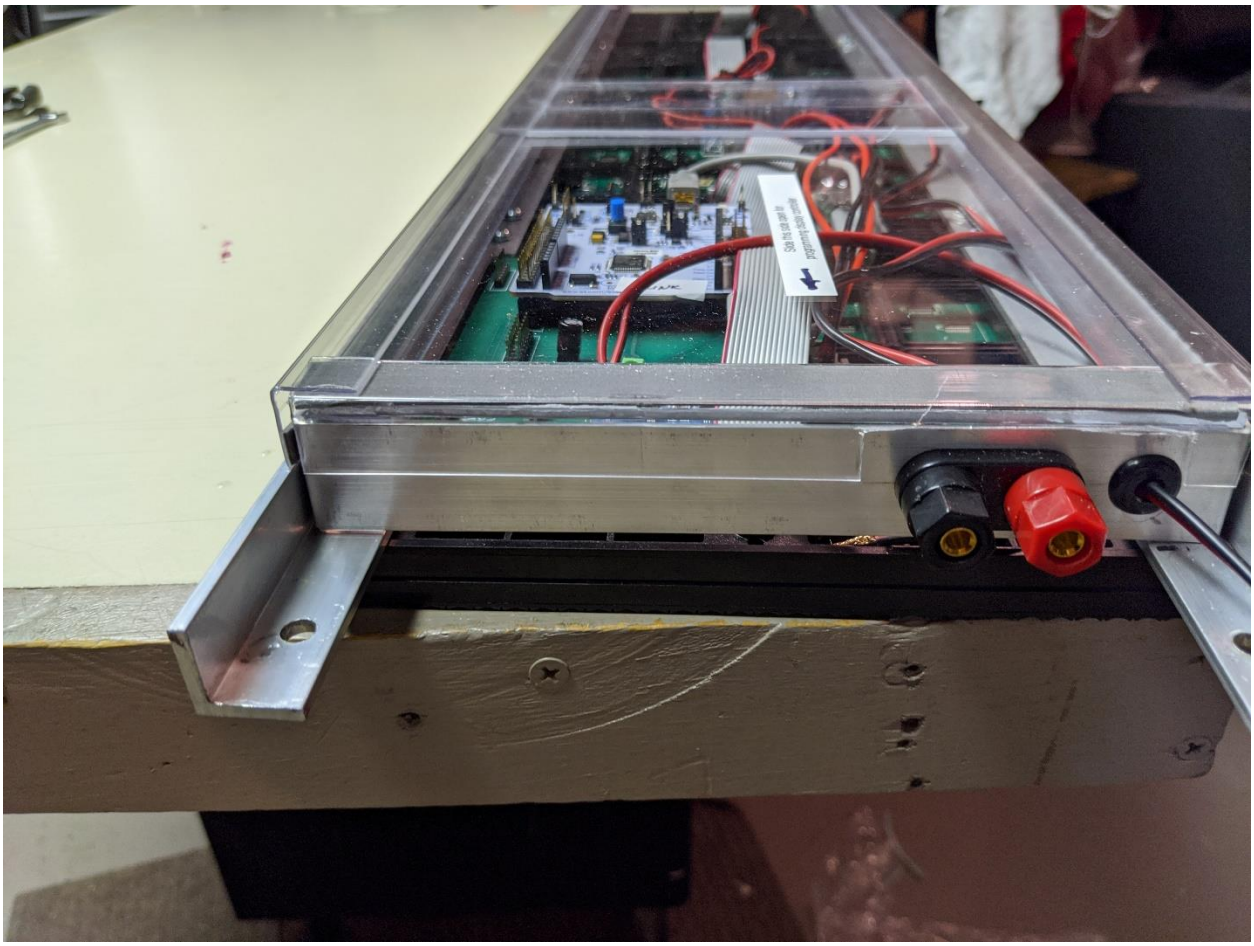

Had to machine a notch to clear display controller on small timer. Mickey knows and will make placement corrections on all future sales.
NUCLEO
-F446RE
MB1136
rev C
ST-LINK
ATTENTION


12V-25W power supply to power displays and 5V USB from PC power supply to power the Contest Controller. It takes 7 amps for the big timer and 4 for the small one so make sure you have the capacity
PRO PEAK 13.8V POWER SUPPLY
OFF
ON
OUTPUT

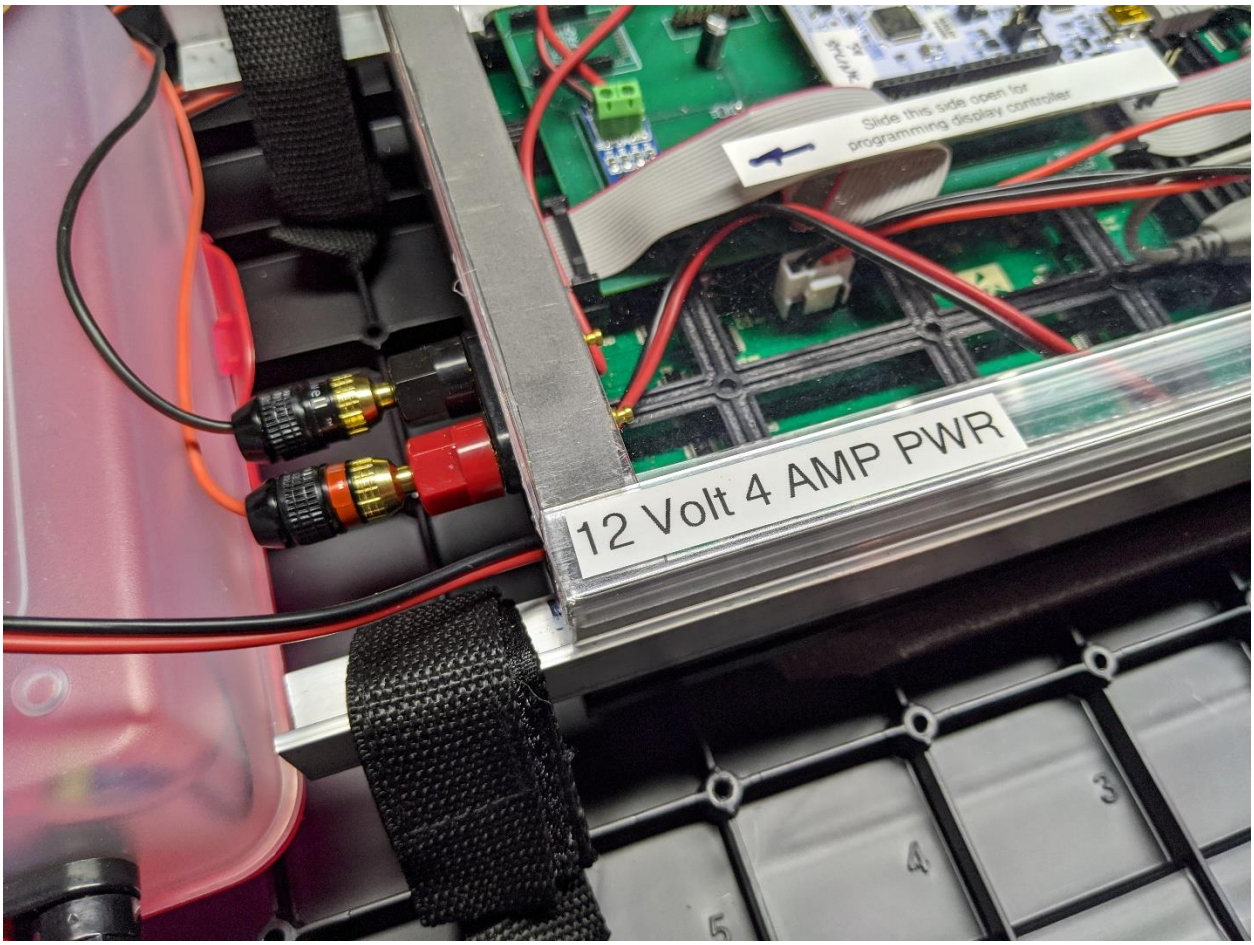


Framing the small display with the flat aluminum stock. It is held to the aluminum angle with the 3M trim tape. I made two U-shaped pieces that joined in about the center of the display.

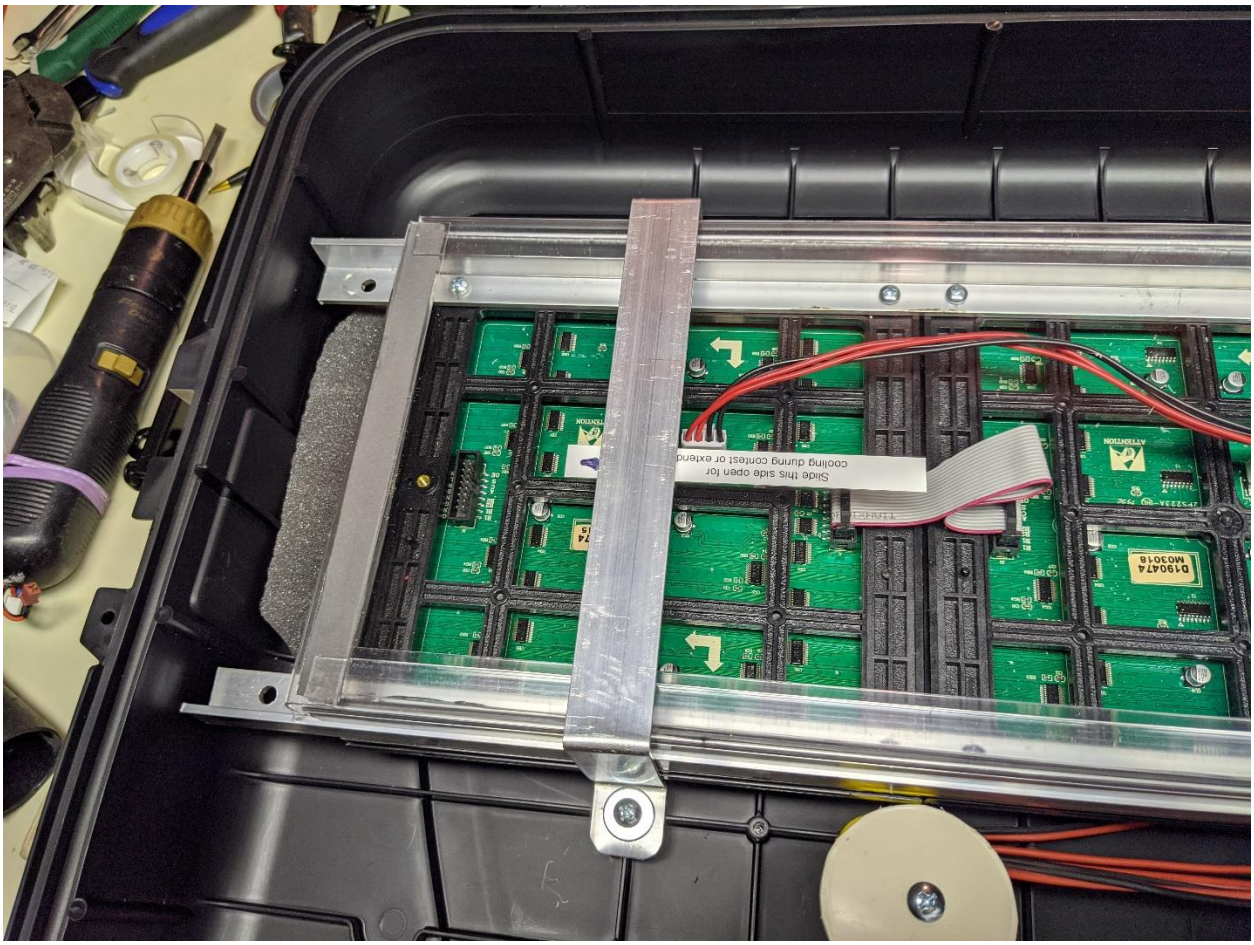
Here you see the large plastic slide out panel (small panel is on the display) and its end treatment. Corner molding was 3M taped the ends to seal off against the aluminum flat stock ends. The sheet slides into the two L-shaped corner moldings that are taped together to form a letter “F”. One is trapped to the outside of the flat stock and the other to the inside of the flat stock.



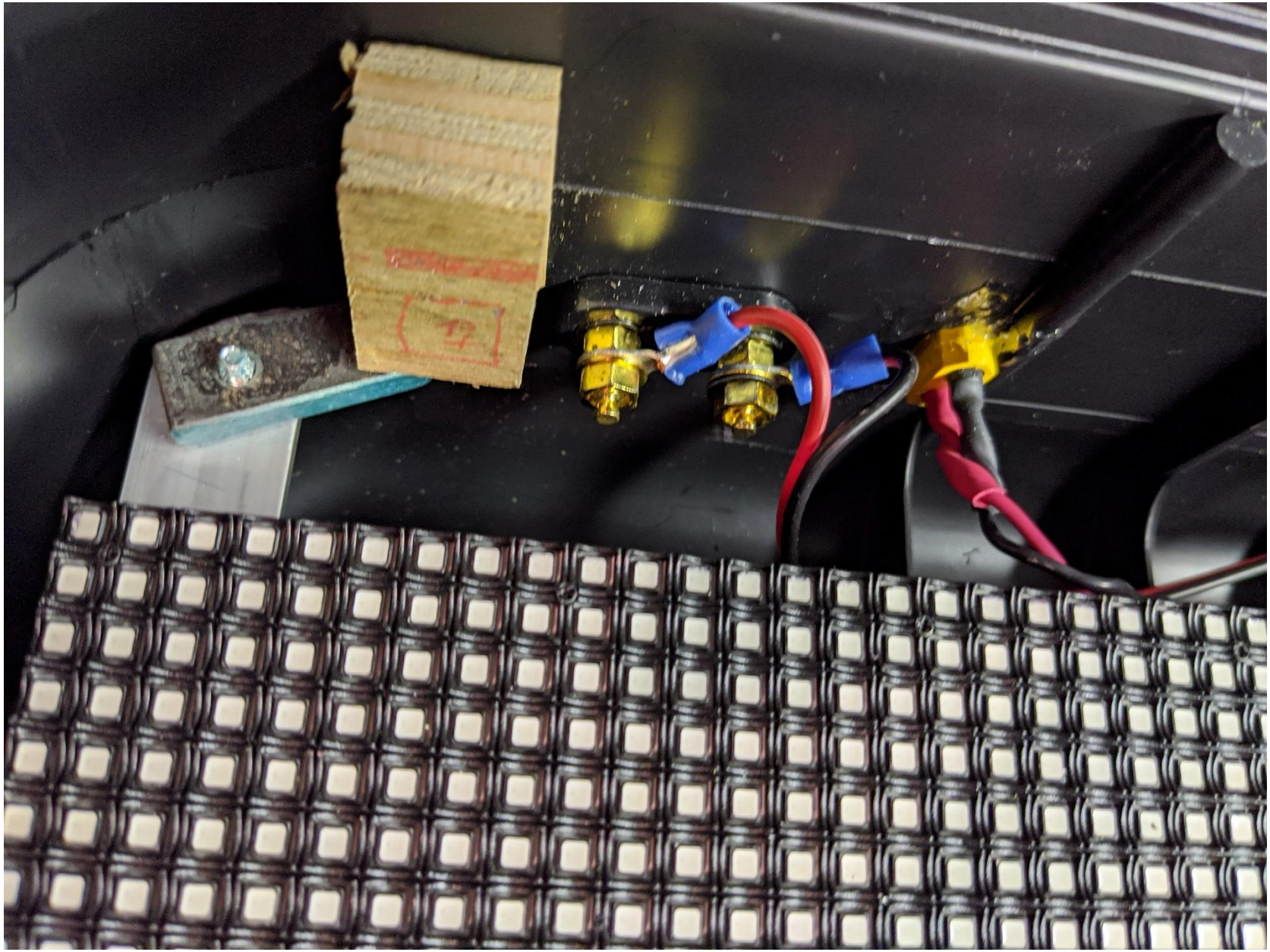
The rails extend about 1.5” on both displays and have holes to hang or lock them in place. The end aluminum strip has the red and black connectors for the signal and the wire coming out for the power with the XT60 connector on the end (not shown).




Stowage of the signal wires and tie downs of the one end of the small display using the Velcro straps supplied with the bow case. Use a washer and screw (supplied) to attach the strap. Some labeling to make sure users of the system at least have an idea of what is going on.




The other end of the small display in stowage mode showing the aluminum strap screwed in. Foam that came with the case is cut to provide spring tension to the hold downs as well as protect the face if the display.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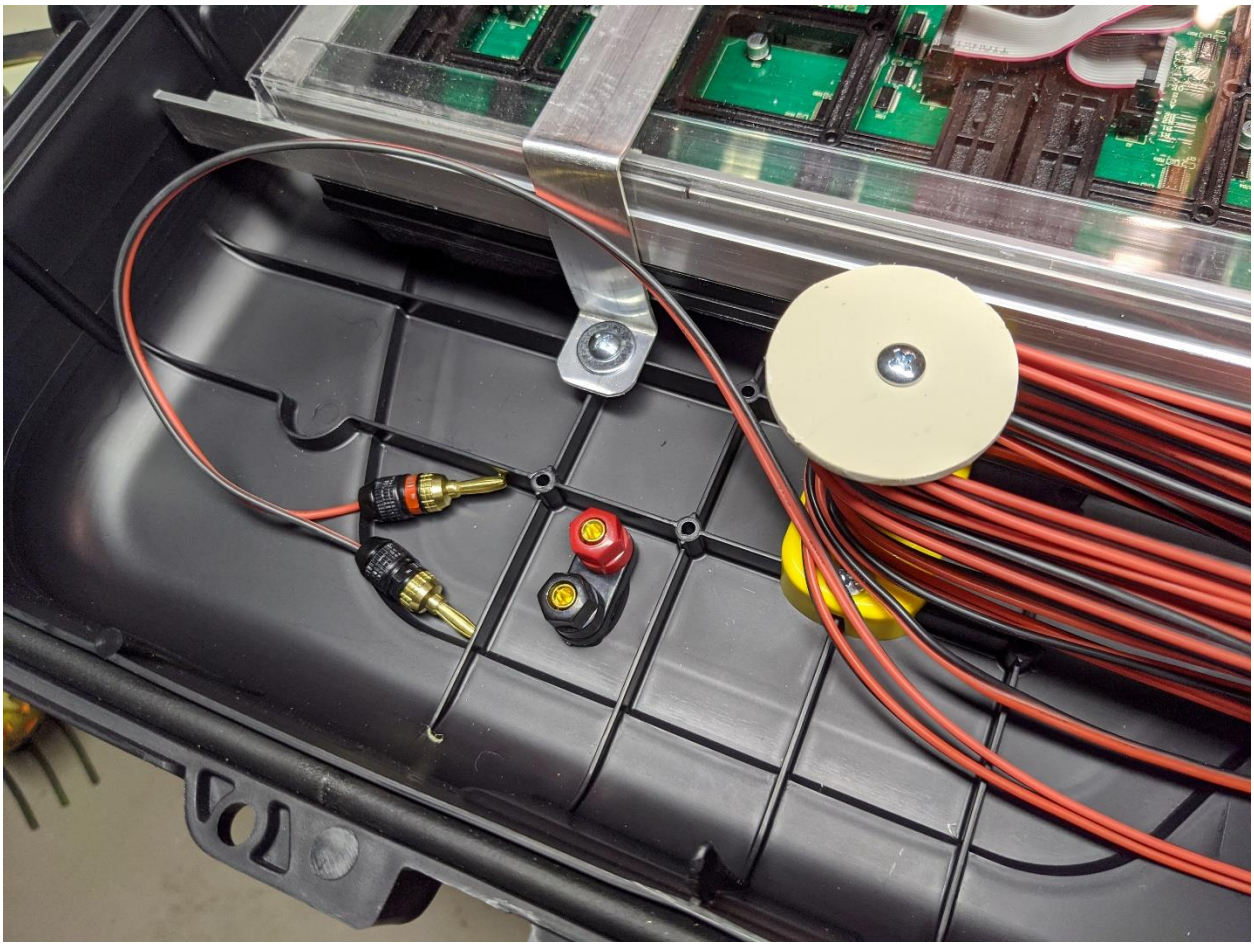
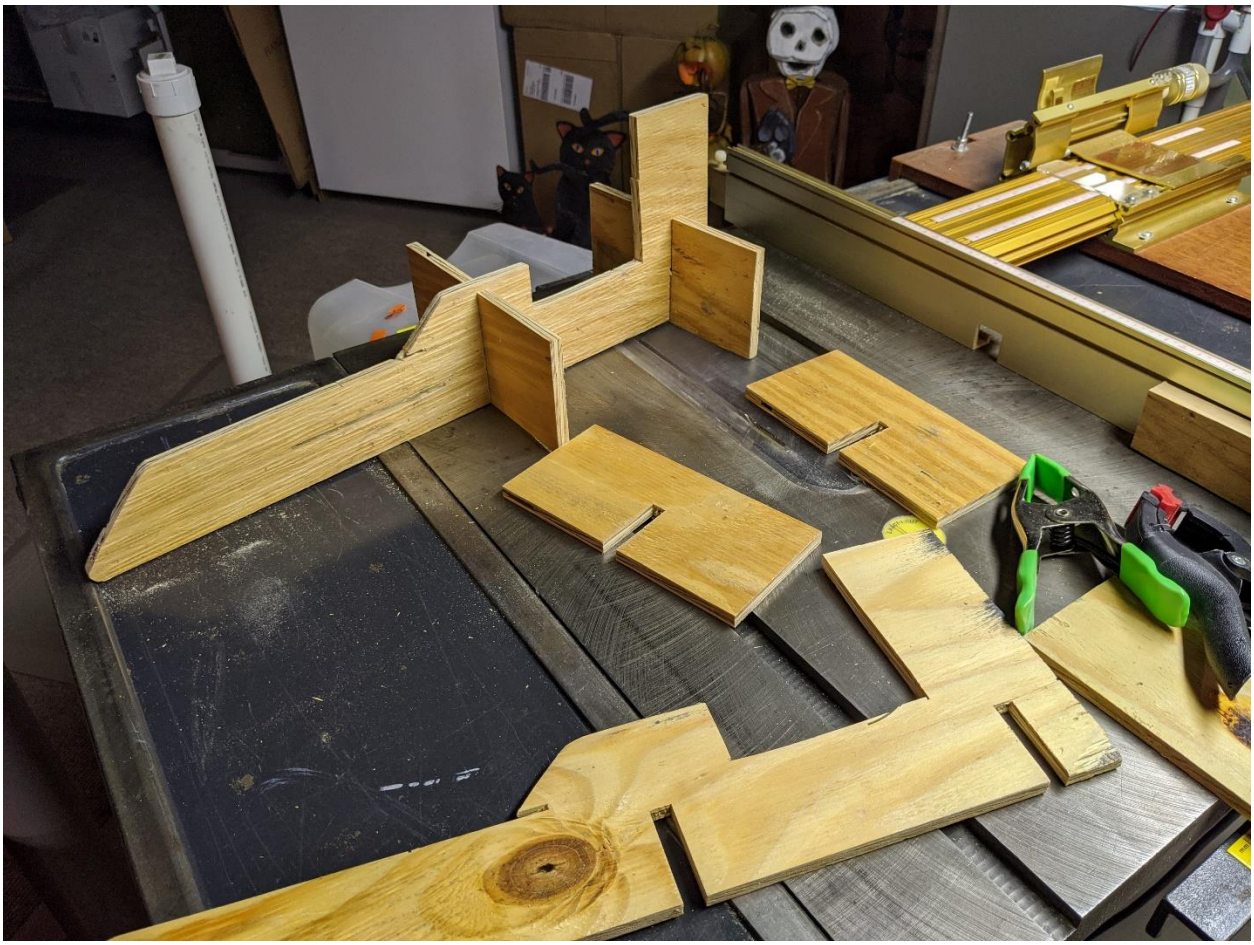
Hold downs on the four corners cam out of the way to allow the display to be removed or turned over to reprogram the controller. Make sure you have enough excess wire to stand the display up or turn over to get to the controller. The extra wire is stored under the display.

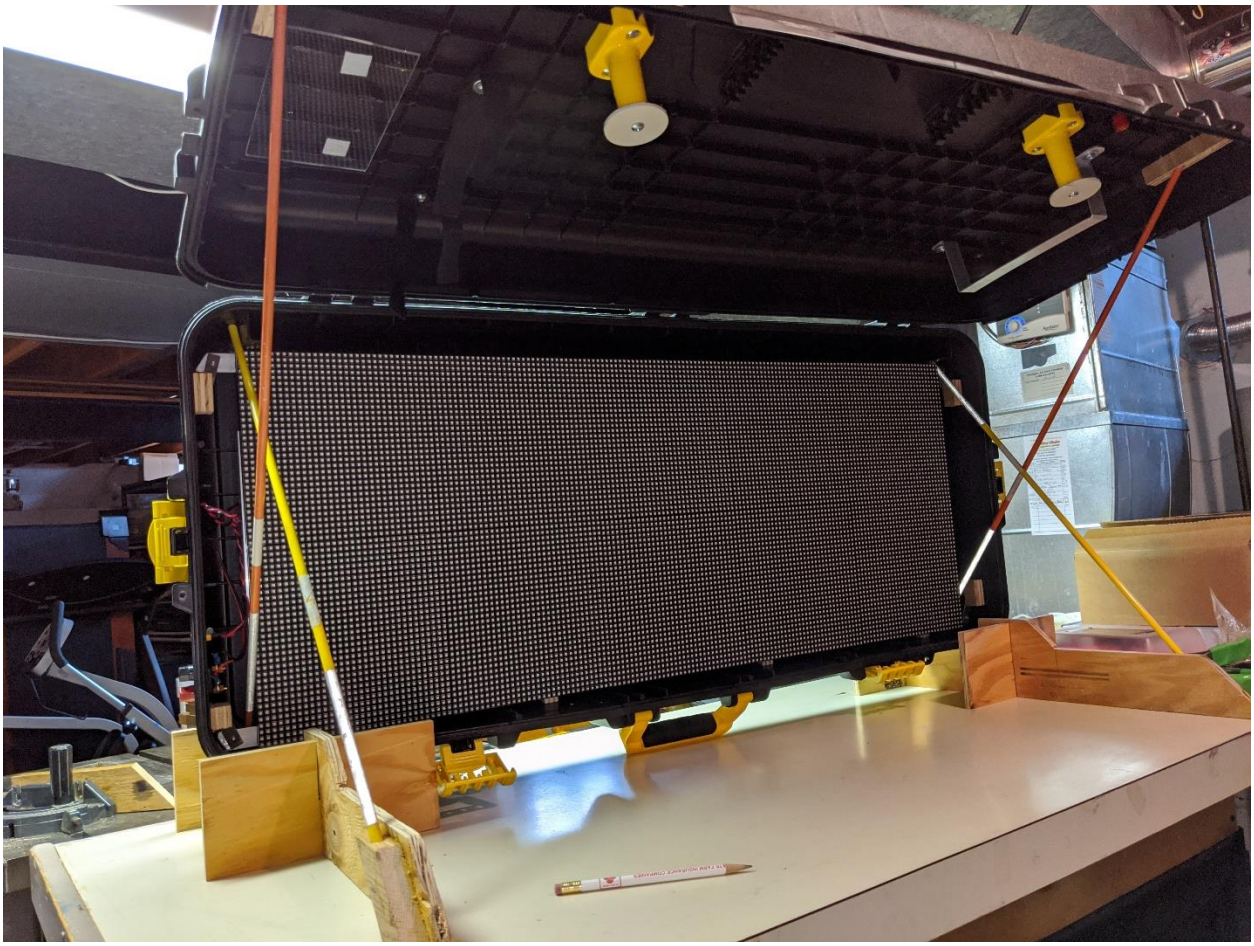


The red and black female connector is made by cutting off the studs on the back and Goop it to the case. This allows stowage of the loose ends that go to the big display so they do not flop around. All the other ends have a place to stay when not in use.



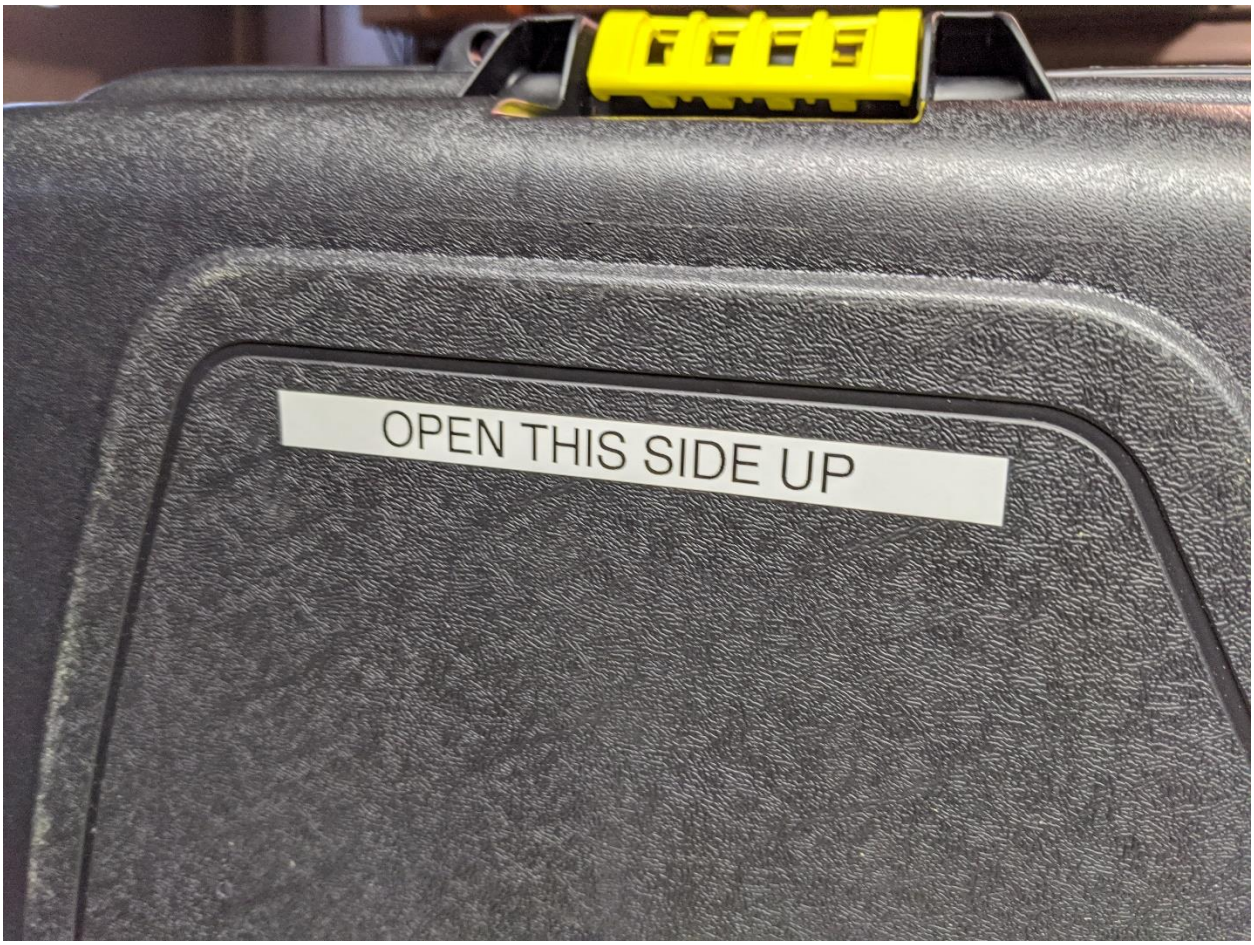
The fabricated stand that can lay flat in the carrying case on top of the big display. I made this only for the purpose of doing a demo of the unit to the club as the CD's may want to use other methods of holding the case upright once we get to the field and try it out. The rod receiving blocks are not glued to

the bottom stands as yet.



Shown in the “as used” position with the rods keeping everything steady. The open lid serves as the sun shield but the unit is not water proof. You can see the rod receiving blocks, the tops of the yellow rods just wedge into the case and display aluminum angle. The “lid” has rod receiving blocks Gooped and screwed while the bottom of the orange rods just wedge on the bottom like the yellow ones do on the top. You can see the plastic sheet Gooped the lid with the two Velcro pads to accept the Contest Controller. Notice that all the stuff in the lid has been removed to use the unit on the field.

Power and signal to the Big Display. The small display has similar connectors, it does not matter what signal set goes to what display as long as you keep the plus and minus straight on each one. 12V Power go to the XT60’s on both displays. The two screws are for the big display hold-downs.




Several labels were used to keep thing in order when in use.

I used a Bluetooth transmitter and speaker to test out the audio and it worked fine. The transmitter plugs into the jack on Contest Controller board. We will use an amp and speaker system at the field that we already have and use.


OK all done, if you have questions email me at jiafret at gmail dot com.