Blake

- Implemented Bluetooth OTA
    - Added Reset both in hardware and software to keep the bluetooth module off during normal operation
    - Added control software to initialize OTA flashing
    - Tested with the ESS code base successfully
    - Created an additional bluetooth module with a weatherproof antenna attachment
- Redid the majority of the cable connectors (includes all of the cables above the funnel/top plate assembly and all of the connectors within the funnel/top plate assembly except for the big amphenol connector)
    - Added silicone waterproofing and heat shrink tension relief to these cables
    - Redid the crimps for the majority of the pins/sockets within the connectors
- Installed the final AZ homing sensor, funnel, funnel spacer, and funnel top plate parts
    - Used two-part epoxy to bond the AZ homing sensor mount to the shaft of the funnel because there was not enough clearance to mount using nuts and bolts
- Performed signal integrity tests with the Spectracyber and the LNA with Kerry
    - Determined the signal was good but had issues with the LNA which we sent to Carl to investigate
- Modified some of the cover pieces to properly fit onto the elevation frame. This included filing, sanding, flex-seal, and painting
- Painted the elevation top plate (2 coats primer, 2 coats protective enamel)
- Added an Earth ground connection from the PEP and through the slip ring
- Added LNA power lines from the PEP through the slip ring
- Installed the through-connectors for both the top plate and the ESS box (silicone waterproof included)
- Troubleshooted and fixed the AZ absolute encoder pausing issue
- Need to dos:
    - Attach the Earth ground cable somewhere within the elevation frame (this cable is labeled)
    - 3D print a small box for the limit switch breakout board such that it can be properly waterproofed
    - Perform long term sensor data collection testing
        - Eric and I ran into an issue with the control room software lagging behind while collecting the data. This issue was observed once all 3 accelerometers were being sampled so we believe this to be the cause
    - Perform appointment testing
- Concerns
    - Damage to the slip ring during transportation
    - LNA not working properly
        - We identified the LNA as an issue during signal integrity testing, yet when Carl took a look at it he determined that the LNA was functioning properly. I'm not as familiar with the signal processing as Kerry would be, so maybe everything is okay, but I would ask Kerry what the plan is

Eric

- Implemented Rev 7 PCB, have three and a half boards ready
    - One board is labeled “Test Board” - this one has faulty hardware
    - All three boards have ethernet implemented directly on the board (RJ45 connector). Previously, this wasn’t the case.
- Final ESS cables ready (save for two motor temperature sensor internal cables)
- Azimuth absolute encoder takes the median of the readings it has taken since the last time the ESS sent the encoder information to CR
- Painted elevation cover pieces on that cover thin slots
- Elevation absolute encoder uses a running average of the last 100 samples.
    - I believe this is too much; if the elevation shaft is moving too fast, then the encoder readings “lag behind”. This is especially prevalent when the user stops rotating the shaft and the readings are still updating.
    - Proposed solution would be to reduce the number of readings we are averaging. This will be less of an issue during “normal” operation, as when the RT takes readings, movement will be significantly slower.
- Elevation absolute encoder is not accurate; for every 90 degrees, the measurement is off by around 2.5 degrees.
    - Two things changed since the measurements changed
        - Implementation of a shunt capacitor on the elevation absolute encoder power lines
        - Fabrication of the aluminum elevation absolute encoder plate
            - This is FOR SURE off by a few millimeters. An error occurred when it was being drilled, so the mounting holes are different from the planned design.
    - Proposed solution would be to multiply the elevation absolute encoder raw angle readings by a constant to match the relative encoder.
- Azimuth encoder is off by 10.03 degrees
    - Proposed solution would be to remove the constant that is applied in the control room software.
- Need to fabricate cables for extra motor temperature sensors. Will need to remove three wires from motor temperature Molex connectors on PCB to implement new internal ESS temperature sensor cables.
- Control room software sensor information unpacks information extremely slowly, and will eventually crawl to a stop. A similar issue has been seen before, Tyler Franks would have an idea on how to fix it
- PLC software change - PLC currently cuts power after 10 seconds of not communicating to the CR. Needs to change so it powers motors indefinitely.

Josh

- ESS box manufacturing
- ESS Box mounting hardware
    - L brackets and paracord
- Designed and printed counterbalance End caps

Jarrett

- Ordered an array of nuts bolts and washers
- Ordered and modified hardstops for counterbalance and elevation mount
- Helped with redesigning the ESS box
- Worked on all panel cover modifications and remakes
- Drilled and tapped holes for the cover in the elevation mount

Task that remain:

1. Remake top motor mount cover section out of the ⅛” aluminum plate that we have in the workspace
2. Adjust so that it aligns properly with the already drilled and tapped holes
    a. I recommend using a file as it should go somewhat quickly and work well, the holes need to be at least ¼” to allow screw clearance.
    b. Screws are ¼-20
3. Adjust holes on the skirt section of the cover (section that goes over the azimuth ring and rests on the bolts on the bottom of the elevation mount
    a. Consult Prof. Hake about size of holes, wether to make them clear the bolt heads or the washers
    b. Likely going to need to use a large holecutting drill bit, make sure to align it with the center as best as you can
    c. Don't rush the process and be careful as the strength of the plastic isn’t fantastic. Maybe look into other means if you feel it is necessary
4. Elevation mount hardstops may need to be shortened to fit between the elevation mount and flat bottom section of the counterbalance
    a. I recommend removing from the top section of the hardstop
5. Order square drive screws for the cover, DO NOT USE THE SLOT HEAD SCREWS
    a. If square drive are not found, then look for hex key, then philips head
    b. Tapped holes are for ¼-20, find a size that matches, if confused I recommend consulting prof. Keifer.

Lance

- ESS box – Josh drilled initial holes in one side of the box. I finished those holes and drilled/milled out the other side. As well as found a way to remove the bracket on the inside of the box in order to actually fit the connectors inside the box.
- Funnel - I redesigned the funnel and got it printed by Evan (from Lehr Labs) in less than a month. I also machined the top plate for the funnel. I worked with Blake with testing of the funnel and with the connector sizes and lengths in order to create more space for the ESS box to fit above the funnel. If I had not lowered the funnel, the box would not have fit where it currently is above the funnel.
- PCB mount - I remade the final PCB mount inside the ESS box and implemented this, worked with Eric and Blake on making sure the fitment was correct and PCB had ample space inside.

- Accelerometer and temp mounts - Reprinted nylon accelerometer casings and lids. Also fixed the temperature sensor issue, both sensors can now hold two temperature probes.
- Painting - I painted the Azimuth ring and started painting the top plate of the elevation frame, Blake then finished painting the top plate of the Elevation frame.

To do: Know how these clamps work - Fenner drives b121050
Unsure if side to counterbalance matters but fenner drive to metal flange does. They are currently taped together with the cover.