LONGHORN RACING MONTHLY NEWSLETTER

RECENT EVENTS

Another month has come and gone and Longhorn Racing continues to produce excellent results. Our Solar team has been hard at work and have successfully integrated their battery protection system and the battery and made large strides in building the carbon fiber body of their car. Meanwhile, Combustion's manufacturing has proceeded nearly flawless this month with the frame being ordered, new members trained on the machines, and wire harnessing beginning on the electronics side. With our Electric team, we have had many positive developments including machining most of the drivetrain and dynamics parts as well as beginning validation of the PCB's for the high voltage systems of their car.

But aside from the design side, Longhorn Racing has also been successful with our operations team. In the month of February alone, we participated in Girl Day, the E-Week celebration at UT, and are currently preparing to take part in LEAD Texas and host our first general meeting of the semester. Another big achievement of our operations team was acquiring two new welders for the team. With these on board, our ability to assemble the frames should be greatly increased.

With big events like Unveiling and our races in the not too distant future, everyone in Longhorn Racing is working as hard as they can to make sure the 2022 season is our best one yet. To make sure you don't miss all the amazing updates, follow us on Instagram @longhornracing to view the day-to-day progress of our cars.

SPECIAL THANKS



UPCOMING EVENTS

Bowling Social -7-8pm General Meeting -7-8pm *More information on Slack









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LONGHORN RACING COMBUSTION

MARCH 2022

MONTHLY UPDATES

The Combustion team has been hard at work since the last newsletter. Even though most of our members are struggling through midterms, each system has been working to complete their parts. As the wheels-down testing goal of spring break is still in place, we're focusing all our efforts on finishing things up as quickly as possible.

The aerodynamics team finalized most of the car's bodywork and aero package. The composites team is working on making their designs into reality. With a few layups done, they are finalizing mold designs to finish the rest by the end of March. The ergonomics group is making final adjustments to cockpit controls before manufacturing them, and are coordinating with our electronics system to make sure the driver will have all needed information within reach. The frame system finalized jig design, and is mostly done with its manufacturing. They are eagerly awaiting cut and mitered frame tubes from a partner in San Antonio.



Combustion member uses the CNC during a combustion workday



The dynamics system's focus this past month has been on new member training and manufacturing its final remaining parts. The leads have been teaching the new members as much as possible about making the parts they designed last semseter Also, they has been finding new ways to solve old manufacturing challenges and pave the way to make parts quicker.

The powertrain system has spent the month working on their dry sump system and testing the new intake. The dry sump system initially had several leaks due to a complex flowpath, but the team has been working on simplifying the routing to prevent leaks from forming under harsh driving conditions. They have also been testing the new intake and quantifying the improvements they made over last year's design in preparation for competition presentations this summer.

Left: Welding together a part for the test exhaust part

The electronics system has been spending their time optimizing the telemetry server they launched last month and streamlining the wiring harness creation process. They have been debugging the telemetry server and adding new channels users can choose from when looking to compare testing and race day data. Also, the wiring harness has been fully laid out in CAD and will be the main focus of the team starting next week.

All in all, the combustion team is very busy as we wrap up production on the 2022 car. Look forward to our announcements in the following newsletters for wheels-down testing updates and competition plans. IC member works on rerouting piping for the test engine





LONGHORN RACING ELECTRIC

MONTHLY UPDATES

The Electric team has been working almost everyday to continue to make progress towards our Powered Run deadline. Here is a glimpse into what each system has done specifically:

Aerodynamics has been up at the J.J. Pickle Research Campus working on layups for the nosecone, front and rear wing, and undertray. New members on the aero team have showed their dedication by eagerly showing up to help on non-workdays and driving to San Antonio and Dallas to pickup the foam molds for layups. Also, they have been hard at work preparing initial sketches for the car's livery.

Driver Controls just onboarded a few new members, and they have begun splitting off into handling brake line component ordering, assembly research, and writing foam seat assembly procedures as they continue to familiarize themselves with the rest of the system. They have also finished one of two of the layups used as a seat support and will soon be manufacturing the pedal assembly.

Dynamics and Structures finished manufacturing the uprights and has begun on the hubs. Now that the frame and welder have arrived, Frame is ready to start welding. Our new welders have been practicing every chance they got in preperation of the frame, so we are excited for them to use their skills!

Electronics has ordered most of their boards and begun assembling and testing them. The HVPCB (High Voltage PCB) is almost ready and the TCSU (Tractive System Control Unit) is right behind it. They've also been working with Powertrain to do wire harnessing preparation for the wire bundles on the car. Our goal for this year is to be more deliberate about our harnessing.



Above: Finalizing CAM before CNCing Dissasembling the 2021 Below: Testing fuses drivechain



Powertrain has been making some good progress as well. Drivetrain does not have any more parts to machine

other than the output shaft which was sent out to be manufactured. Battery has been working hard to complete nickel fuse testing and start an ELC test segment to tune compatibility with the Orion BMS.

Last but not least, our Race Logistics and Testing system has been working to assemble a moment of inertia jig to be ready to validate the car once it has been assembled. They have also tuned a lap timer to be used at the next drive day.

Overall, a lot has been done, but a lot is still yet to do. We are super proud of all of our hard-working members!



LONGHORN RACING SOLAR



MONTHLY UPDATES

The Solar team made great progress with integration and manufacturing since our last newsletter. As we work towards our July competition, we are finishing up mechanical modifications and electrical integration.

The body system has been working on the last of our carbon fiber layups for the outer shell components while our bottom hull and tail components are nearing completion. The last layup they have to complete is the canopy, which they are manufacturing the mold for now. They have also been finalizing edits to our frame, which they will be completing soon. The dynamics system has been working hard in the machine shop to manufacture the last of our components and train their new members to use the CNC and weld. It's great to see all of them learning so guickly!

The BPS system has had a great month getting started with our electrical integration! They were first involved with integration with our Lilon battery pack. They were able to properly, read, monitor, and communicate the voltage, current, and temperature information from our battery pack. Our BPS system has been working on this custom system for a very long time, and it's incredibly exciting to see it all functioning properly.



The body system in front of the car's carbon fiber body

The battery and BPS powering lightbulbs

Working on testing a PCB and code for the BPS

The Controls group has been rearchitecting their software stack to be more reliable and readable. In the next few weeks, they will be implementing these changes to ensure that this system runs smoothly for the race. The Data Acquisition system has focused mainly on onboard-ing new members. The group has grown quite a bit since the beginning of the semester, and as we look to the future, the team will be focusing on our data visualization system and working towards building a race strategy simulation.

The Power Generation group had their first big integration milestone this month. The array was connected to our battery and BPS, and we were able to safely charge our battery using nothing but the energy from the sun. It was an amazing experience to see our systems functioning using solar power. Power Systems has also been very involved with the integration this month. As they are responsible for power distribution, wiring, and hardware, they have been putting all the other systems together properly.

Overall, the Solar team has been making great progress, and we are excited to continue with our development as we push towards July!