LONGHORN RACING MONTHLY NEWSLETTER

APRIL 2022

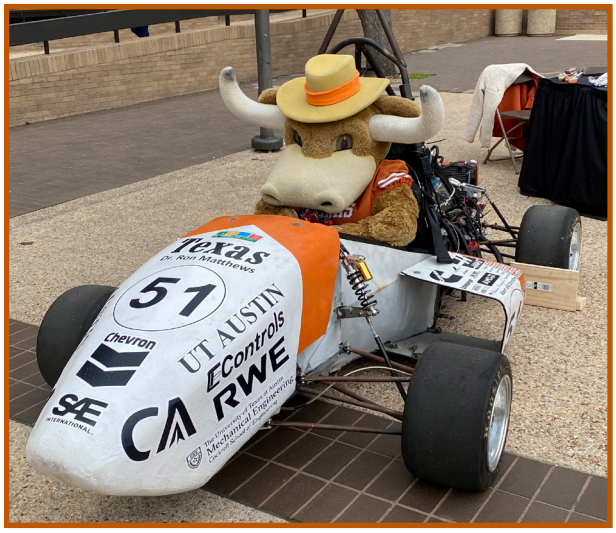
RECENT EVENTS

With Spring Break behind us, Longhorn Racing is looking toward an exciting few months up ahead. All three of our engineering teams worked incredibly hard over the break to get us even closer to having finished cars. With all three of our competition fast approaching, everything is getting geared up with LHR. On the design side, members on the Combustion team worked tirelessly over Spring Break to weld most of the frame in under a week which shows just how dedicated our members are to finishing our cars. The Electric team has also been just as busy working on numerous projects, including finalizing the battery case design that will power the car. Last but not least, our Solar team has been working on continued integration of the battery, solar panels, and battery protection system that keeps their car safe and powered.

Did I say last? Well, our Operation's team work certainly can't be ignored. All their members have been preparing for our biggest event of the year aside from our races: Unveiling. Longhorn Racing is pleased to announce our 40th Annual Unveiling will be held May 7th at the Engineering Education and Research Center at the University of Texas. This will be a massive event hosting previous alumni, current members, the partners who help make our cars possible, and a large number of campus staff and students. You won't want to miss this event so make sure to follow us on our social media accounts to get updated on general information as we reveal more information in the coming weeks as well as when tickets for Unveiling go live.

SPECIAL THANKS

Thank you to our bronze level partner, Axcel Motor Sports



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LONGHORN RACING COMBUSTION

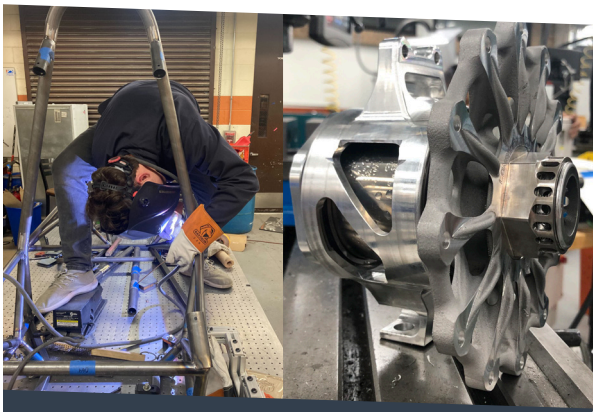
APRIL 2022

MONTHLY UPDATES

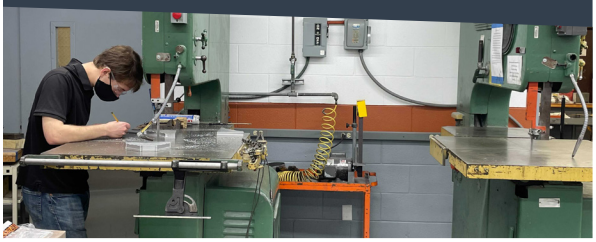
The IC team has made great progress in the month since the last newsletter. The week of spring break was incredibly productive for the team, and they're on track to hit their April 16th wheels down deadline.

For dynamics, this month was a huge success. Since the break, the control arms are completed. The team also assembled the wheel assemblies and pressed in bearings, and are looking forward to the first powered runs of the car in the next few weeks. Though there's still work to be done, dynamics is easily on track to finish on time.

Four members of the IC team after finishing the tacking of the frame



Left: Welding critcial points of the IC frame
Right: The new rear wheel assembly
Below: A member machining with the bandsaw



The body system had the most productive spring break, due in no small part to the frame's assembly. After months of supply issues, the team finally got mitered frame tubes, and all main frame components were welded in under a week. During this time, the composites team, joined by the aero team as their design officially concluded, was putting in hours to finish all the airfoil molds. Layups for the wings will be done shortly, and the nosecone and sidepod layups will follow. The ergonomics team worked closely with frame to coordinate driver positioning and controls.

The powertrain team spent most of the last month finalizing the dry sump, working on frame mounting, and doing part assemblies. During the break, the new engine arrived, and the team has been prepping it for installation in the frame. Also during the last month, calibration began to finalize a base tune for the new car this year. Exhaust fabrication is almost complete, and once the new engine is mounted in the frame, the car will be tuned for its new intake and exhaust setup as testing progresses.

Electronics spent most of the break and beyond finalizing their main projects for the year. The wiring harness is coming close to completion as everything is laid out in the frame, and the team has put great effort into making installation, removal, and diagnostics easier through clever planning and documentation. The team now has their hands on their BSPD PCBs and have begun testing them to ensure rules compliance. The next few weeks for electronics will include powertrain wiring integration as well as dashboard finalization.

The combustion team is working hard to meet its wheels down deadline, and we appreciate the continuous support of all those who read our newsletter blurbs and cheer us on. Please remember to come see the culmination of all our hard work at our unveiling on May 7th!

LONGHORN RACING ELECTRIC

APRIL 2022

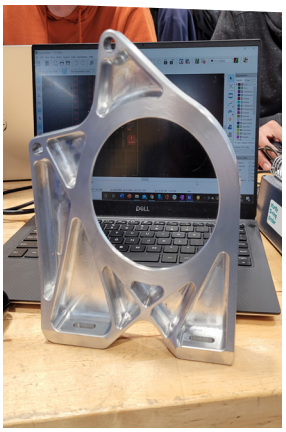
MONTHLY UPDATES

The electric team has been working hard this month to work toward their Powered Run deadline of April 15th.

The Aerodynamics system has been making consistent progress on the manufacturing of the wing assemblies, nosecone, and undertray. They have finished making all the endplates and are currently working on the front and rear wing element layups. As soon as that is done, they will be working on prepping the nosecone and undertray molds.

The Driver Controls system has been focusing on seat and pedals. They have finished both the seat support layups, cut them to size and will soon be ready to weld the tabs onto the frame. Pedal assembly manufacturing has begun with the pedal faces and pins done, while the rest will be completed in the next few weeks.

Left: One electric member welds the car's frame with a new welder
Bottom Left: One of the electric team's recently CNCed dif mount
Bottom: During a drive day, a few small modifications are made to the kart

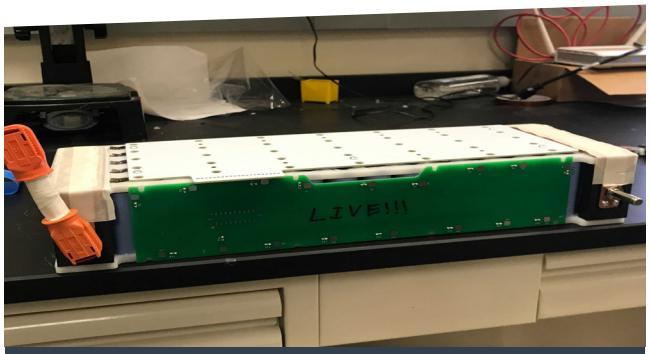


The Dynamics system has made a lot of progress as well. The frame is almost completely welded and ready to place tabs, thanks to the hard work put in. They also finished manufacturing the uprights and the rear hubs, as well as almost all suspension and steering part manufacturing. With only a few more parts left, the dynamics system is looking forward to assembling the wheels.

The Electronics system has been working on the validation of the various PCBs, namely the high voltage PCB (HVPCB) and the tractive system control unit (TSCU). They have also been assembling the brake system plausibility device, preparing for wire harnessing, and sourcing key electrical components.

The Powertrain system has also been closely working with Electronics on harnessing, battery, and battery management. They are also finalizing their battery cooling intakes to be additively manufactured.

The electric team is very excited to show off all our hard work at Unveiling on May 7th and we hope to see you there!



Above: Recently assembled battery case to test battery and electronics interface

LONGHORN RACING SOLAR

APRIL 2022

MONTHLY UPDATES

The Solar team has been pushing hard and making progress towards our race as lots of our systems are nearing completion,

Body has finished all composite shell layups besides our canopy. Our battery box panels are also nearing completion and are about to be cut by the waterjet which is needed before electrical/mechanical integration.

Dynamics has spent lots of time machining all their components, and should be complete by mid-April. We'll then be able to test fit with our frame and send the frame off for heat treating.

The BPS system has integrated our battery pack and spent the month of March primarily fixing small bugs and testing the integration. During our last workday, our BPS system was able to run for over 4 hours continuously while monitoring temperature, voltage, and current of the battery.

Photo of the setup for the 4 hour BPS, battery and solar panel test

Controls has been finishing their firmware and is about to start testing their logic with the motor test bench. After making lots of changes to the system to improve quality and reliability, we're very excited to see it in action. They were also able to connect properly to the lighting board on the dashboard and control the signal indicators properly.

Data Acquisition has been working on the data capturing and visualization system on our Raspberry Pi systems. They are preparing to start testing with our newly developed on-board Telemetry board.

Power Systems has been working on integration this month with the battery pack to ensure safety while we test with the array and BPS. They've also begun manufacturing the wire harness and electronics enclosure.

Left: A Solar member writes code for the car's control system

Power Generation has been the focus of the integration for this month since we have integrated the solar array with our battery and BPS. They have been focusing on testing not only the array, but also the custom RTD boards for measuring temperature of the array. They hope to begin testing the custom MPPT with the array this coming weekend.

Overall, our team is making lots of good progress and we are pushing hard to make all of our deadlines for competition. We are very excited for this coming month and are expecting do a lot before unveiling our car in May!

The body system working on the battery box layup

You are codially invited to

LonghornRacing's

40th Anniversary

Unveiling

Cars, Food, Alumni, and More

Save the Date:

May 7th