



COMPETITION REVIEW

2018-2019

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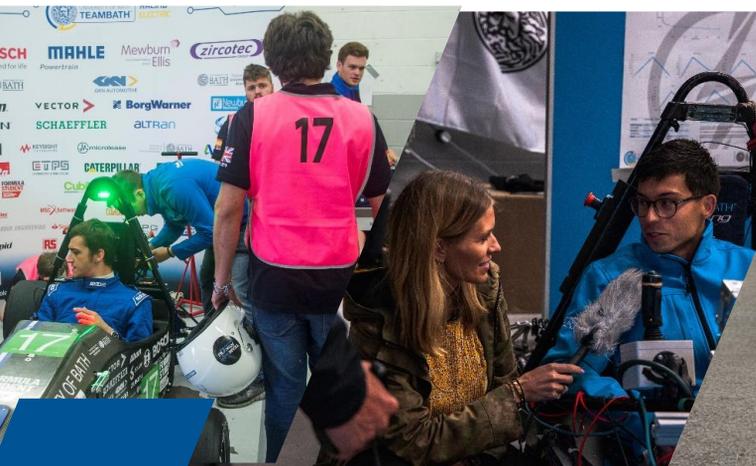
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Introduction

Our racing season for 2019 has come to a close, with Team Bath Racing electric (TBRe) having competed in Formula Student UK in July and (for the first time) Formula Student Spain in August. This review will focus on the recently completed Spain competition, with a summary of the UK competition, as well as a handover to next year's team and a farewell from this year's team. This year we entered our usual Class 1 and Class 2 entries for the competition, but also had an exciting debut from our new driverless team (TBRe AI).

Class 1 is the main competition where teams design and build a race-car to race in four dynamic events, with the design also being evaluated in three static events: Design, Cost & Manufacturing, and Business. The Class 2 competition follows the same static events but does not require a car to be built, thus eliminating the dynamic events. The AI team worked on converting our previous car (TBRe18) to a vehicle capable of driving without the need for a driver. The driverless competition is assessed based on Design, Business, Real-World AI and the dynamic events.



SILVERSTONE SUMMARY

Class 1

Having built up the car from scratch, the team faced numerous setbacks in scrutineering which ultimately led to failing the final step (the brake test) before being allowed to compete on the track. Despite this bump in the road, the team excelled in the Static events and left the event proud of the monumental achievement of building such an advanced car, some parts of which were described as “state-of-the-art” by scrutineers and judges.

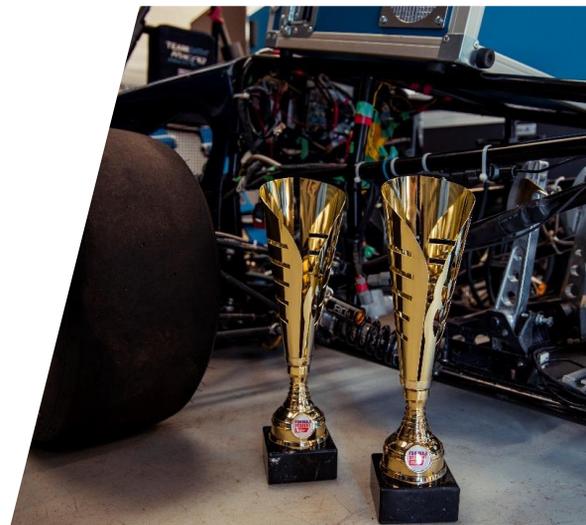


Class 2

Building on the designs of the 2019 car, the Class 2 team had competitive entries into all the static events, achieving 5th place overall. While the focus of next year's designs are to be the stabilization and optimisation of this year's radical changes, the designs also included some new features which were well-received by the competition judges, the main change being the introduction of an aerodynamics package.

Driverless/AI

The driverless team was formed at the start of the year with the aim of converting the 2018 TBRe entry to a fully autonomous vehicle. With the help of AB Dynamics, the team made great progress towards this milestone, achieving first place in both the Business Presentation as well as the Design Review. While the design implementation is still incomplete due to the immense complexity of this task, the team aims to have a running vehicle by next season.



SPAIN DAY 1: ARRIVAL

The team arrived at the Circuit De Barcelona after a very long drive from Bath on Tuesday and immediately set up camp in the site. After this the team set up the pits which would be the home of the car for the next five days then attended the welcome event before heading off for an early night of rest in preparation of the long days ahead.





SPAIN DAY 2: SCRUTINEERING

The team got into the pits early in the morning and managed to pass the pre-scrutineering checks as soon as they got in. After this the drivers headed off to complete their checks and all five managed to pass as well as complete the egress test by exiting the car full-strapped within five seconds. This got them the wristbands certifying that they were now allowed to drive the car.

Following the driver tests, the team began the hardest part of Formula Student: accumulator and mechanical scrutineering. Unfortunately, they were not completed by the end of the day and the team had to return to the campsite when the pits were due to close for the night.

SPAIN DAY 3: STATICS

With another early start, the team managed to pass mechanical scrutineering and sorted out most of the issues faced during electrical scrutineering, putting them in a good place for the coming days and events. The progress allowed the team to be on track for competing in the dynamic events in the coming days.

The team also had the business plan presentation on this day, in which the team came 6th place, just after the finalists. The judges were impressed by the creativity of the business plan, which revolved around an idea they had never seen before in the competition involving a partnership with Nintendo. This secured over 70 points for the overall score.

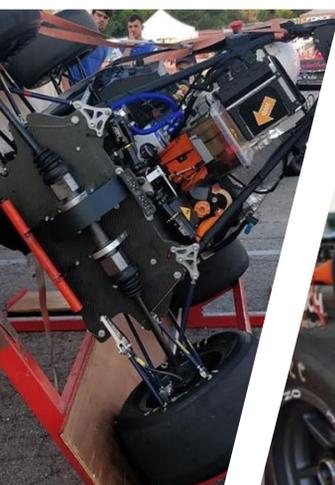




SPAIN DAY 4: DYNAMICS

The team finished off the static events on Friday through the Cost & Manufacturing event and the Engineering Design event. The accumulator and chassis designs were especially lauded for the quality of design and production in the design event.

After sorting out an electrical issue, the electrical inspection was passed. This left the tilt, rain and brake tests between the team and the dynamic events. Unfortunately, the skid pad event had closed before the scrutineering was completed, but the car blitzed through these tests in an hour, just in time to go out for the acceleration event on the main straight in the evening.



SPAIN DAY 5: AUTOCROSS



With scrutineering out of the way and some time to spare before the upcoming autocross race, the team took to the practice area to familiarize the drivers with the car feel and road conditions. Final tweaks were also made to the car to optimize its performance.



When the time for the autocross had come, the team had tuned the car to a level everyone was happy with and the drivers felt comfortable taking on the track. The autocross was completed with no issues and the team went back to the camp site ecstatic with the car's performance, which set everyone's mind at ease in time for the biggest event: the endurance race.

SPAIN DAY 6: ENDURANCE

The final day of the event had come, bringing with it the most anticipated race. Successfully completing the endurance race is a daunting task, but the team was confident with the car's capabilities, and the race results proved those capabilities. The team finished the race in 11th place, with an efficiency score of 87.2%.



The team then took the photo which has now become a tradition at the end of every event, packed up the pits and attended the closing ceremony to wrap up the competition and the 2018/19 season. The team then headed back to Bath to pack the car away for the incoming team to face the new year.

HIGHLIGHTS & ACHIEVEMENTS



Top UK Electric and AI-ADS Team
1st UK Electric Team to Compete In Europe

Formula Student UK

TBRe

6th Place Class 1 Design (out of 81 teams)
5th Place Class 2 Overall (out of 35 teams)
3rd Place Class 2 Cost & Manufacturing
5th Place Class 2 Business Presentation

TBRe AI

1st Place Business Presentation
1st Place Design Review

Formula Student Spain

15th Place Overall
6th Place Business Presentation
11th Place Endurance
87.2% Efficiency Score
One out of 26 electric cars to pass scrutineering
One out of 16 electric cars to complete Endurance

OUTGOING TEAM MESSAGE



Project Manager 2019 – Kieran Shopland

It was my absolute pleasure to lead Team Bath Racing Electric 2019 through what was a momentous year. With many ups and downs along the way, the team ended with a car full of technological advances that was able to challenge many of the top teams in the world. This was testament to the incredible passion and determination demonstrated by the 2019 team.

Without doubt, the highlight of the year was placing 11th in the endurance event at Formula Student Spain. The ability to pass scrutineering was challenge enough, but to then go on and outperform some of the worlds best teams with more established pasts was an amazing achievement. A massive thank you has to go out to all of our sponsors for enabling us to achieve this.

Tom Coxon will now take over my role and is well placed to do so having had significant interaction in all areas of the 2019 team. I am confident he, and the 2020 team will take the TBRe onto even greater successes. For such a young team, the development TBRe has shown to date is extraordinary and with your continued support the future prospects are extremely exciting.

OUTGOING TEAM MESSAGE



Technical Manager 2019 – Ben Carretta

Team Bath Racing Electric saw a major step change in performance during the 2018/19 racing season. The implementation of composite manufacture and additive manufacturing allowed for a mass reduction of 60kg from the previous vehicle while retaining the same amount of available power and energy capacity, a saving of nearly 25%. This, coupled with the marked improvement to the handling and suspension systems catapulted the team into a position where we were able to compete with some of the best teams in the world on an international stage, despite running without an aerodynamic package.

The progress this year, and over previous years, has been truly phenomenal and I am immensely proud to have been a part of it. Placing 16th at one of the most competitive events of the Formula Student calendar, despite relatively major setbacks both on and off the track, is a huge statement as to the trajectory of the team, and the passion fuelling it. I am eagerly awaiting the 2020 competition, and cannot wait to see what the future holds for the team

OUTGOING TEAM MESSAGE



Business Manager 2019 – Afkar Ansar

Being the Business Manager for TBRe19 has been a wonderful experience. It has been a pleasure working with a talented team, with great sponsors and a supportive group of University staff. As a team, we have been extremely fortunate to get the level of support we have received from our sponsors, and once again this year the level of sponsorship has increased, enabling us to push for further innovation on the car.

I would like to take this opportunity to thank the University of Bath, the Alumni fund and the Department of Engineering. Their continued support has made my experience and job a lot easier.

My tenure as the Business Manager has come to an end, and I am glad to handover my duties to a very capable Bassel Ghazali. Bassel has been part of the team since his first year, and has shown great dedication by supporting the various previous teams in both technical and commercial tasks. I know he will do a great job and help the TBRe brand grow even further, I wish him and the TBRe20 team the best of luck!

INCOMING TEAM MESSAGE

Project Manager 2020 – Thomas Coxon

After the difficulties experienced at Silverstone, Formula Student Spain was a fantastic opportunity to faithfully showcase the passion, commitment and dedication of TBR_e19. Placing only 4 positions behind the current world champions, our performance in Spain highlighted the quality of the team's work and proved that we can bring a real challenge to the best teams in the world.

I am looking forward to the start of the new season and am proud to be project manager for TBR_e20. With your help and support we hope to further develop on the enormous efforts of our predecessors and continue to improve our performance.



Technical Manager 2020 – Sam Griffin

TBR_e19 was a showcase of parallel innovation, with Silverstone demonstrating the dedication of the team to deliver, made possible by the valuable support of all our sponsors. Pushing the boundaries to the next level naturally comes with risk, but experiencing the resulting set-backs throughout the competition weekend will prove invaluable as I move into the role of Technical Manager.

I look forward to introducing independent car-wide innovations as we stabilise the strong platform the retiring members have worked so hard to achieve - there's now a lot of lower-risk potential to unlock, exploiting it the key to our aim to win FSUK

Business Manager 2020 – Bassel Ghazali

I'm filled with excitement as I enter my fourth year with TBR_e. Seeing the car grow from a mere concept to a competition-winning achievement of engineering and working with the talent and dedication which has gone into creating that transformation has given me invaluable experience which I hope to use to further elevate the team.

As the incoming Business Manager I look forward to building and maintaining our sponsor relations and media presence, and we will strive to deliver a result worthy of all the wonderful support we have received. A huge thank you to all our sponsors, the University of Bath, and our supervisors Prof. Peter Wilson, Dr. Ben Metcalfe, and Dr. Joe Flynn, all of whom this experience would never have been possible without.





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