

FS2020 Virtual Dynamic Events



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Introduction

Following our decision to cancel the FS2020 live event, scheduled to take place in July at Silverstone, we have been working on options for delivering those elements of the traditional FS event format which could be continued with or offered as virtual or simulation events to provide the fullest possible educational benefit to competing teams whilst complying with the social distancing regulations in force around the world due to COVID-19.

This document provides an overview of our plans for Virtual Dynamic Events.

At time of launch, the Virtual Dynamic Events will be open to teams who registered as a Formula Student (formerly Class 1) team. You remain eligible if you have merged with your Concept Class team for the Static Events.

Purpose

- To respect social distancing regulations from the World Health Organisation and governments around the world in the fight against COVID-19 by removing the requirement for students and officials to physically meet in order to participate in the Formula Student competition
- To retain the traditional purpose of the dynamic events – education, competition and fun
- To provide an opportunity for engagement between the IMechE, FS officials and university teams
- To provide an opportunity to gain experience using LTS software
- To give teams a chance to learn about the influence of different setup parameters and the inherent compromises
- To emulate the experience of competing against other drivers in similar cars, with a limited amount of practice beforehand
- To provide a range of challenging driving experiences that require a high level of skill and adaptability to be quickest
- To gain an appreciation of how driving style and technique influences the dynamic behaviour of vehicles

Event Format

The precise details of the Event Format will be released later, at this time it is expected that the “Virtual Dynamic Events” will consist of two parts:

Lap-Time Simulation (LTS) of Acceleration and Skid-Pad using a Multi-Body Dynamics (MBD) Model

Online multiplayer competitive sim races using Assetto Corsa and an IMechE hosted private servers

Lap-Time Simulation Event

A proprietary software package, pre-configured with a generic Formula Student vehicle will be made available to all competing teams several weeks before the date of the competition.

Most of the vehicle parameters (mass, aero, tyre model, powertrain etc) will be locked. A range of suspension tuning parameters will be editable, within limits, and the performance of the vehicle evaluated over a restricted number of simulation iterations. The overall aim being to achieve the lowest event time.

The LTS event may also include Driver in The Loop (DIL) runs using the vehicle setup derived from your simulation iterations to assess their performance and stability when driven by a human rather than software code following a pre-determined run profile.

Sim Racing Event

There is a plethora of driving simulation packages commercially available, each with their own strengths and weaknesses. The organising committee has aimed to create event that has the lowest possible barrier to entry whilst providing a varied, competitive, and fun experience for the teams.

Assetto Corsa has been chosen due to its low cost, the extensive range of content available and the support from a broad and well established "modding" community.

The event will take place over at least two days, with all races hosted on a private IMechE server. It is anticipated there will be number of special events to allow more than one driver from each team to take part.

The first day will consist of a series of "qualifying" races, which will either be head to head or small grid, short duration races.

The results from qualifying will be used to set the grid(s) for a series of longer races with more cars on track at the same time on the final day.

Driving standards will be enforced as if this were a real race event, with time penalties or disqualifications depending on the severity of the incident.

Details of the cars and tracks to be used will be released ahead of the event to enable driver to familiarise themselves with both. It will be possible to do this both offline and online in practice sessions hosted on the IMechE server.

It is recommended that you try the online practice at least once before the competition, so you are familiar with the software interface and test the speed and stability of your internet connection.

Software Requirements and Recommendations

Assetto Corsa – here are several "flavours", the ultimate edition is the best value for all the DLC and ensures you will have Brands Hatch, which is highly likely to feature in our events

Content Manager – the excellent 3rd party launcher, the free version has all the functionality required to compete in our events and can be downloaded from here:

<https://assettocorsa.club/content-manager.html>

Steam Account – the server used to host the races will use your driver's Steam ID to ensure that only the registered drivers can access the races.

Other DLC – Details will be released closer to the event, any other DLC will be freeware and downloadable from Race Department or Assetto Corsa Club.

Hardware Requirements and Recommendations

The PC specs listed below are lifted straight from the Assetto Corsa website, it's also possible to check the relative strength of your PC against the minimum and recommended requirements on websites such as <https://www.game-debate.com/can-I-run/>

MINIMUM SYSTEM REQUIREMENTS:

OS: Windows Vista Sp1, 8, 8.1, 10

Processor: AMD Athlon X2 2.8 GHZ, Intel Core 2 Duo 2.4 GHZ

Memory: 2 GB RAM

Graphics: DirectX 10.1 (AMD Radeon HD 6450, Nvidia GeForce GT 460)

DirectX: Version 11

Network: Broadband Internet connection

Hard Drive: 15 GB available space

Sound Card: Integrated

RECOMMENDED SYSTEM REQUIREMENTS:

OS: Windows 7 Sp1 – 8 – 8.1 – 10

Processor: AMD Six-Core CPU, Intel Quad-Core CPU

Memory: 6 GB RAM

Graphics: DirectX 11 (AMD Radeon 290x, Nvidia GeForce GTX 970)

DirectX: Version 11

Network: Broadband Internet connection

Hard Drive: 30 GB available space

Sound Card: Integrated

It is possible to use a Gamepad, but a steering wheel and pedal set such as the Logitech G29 or Thrustmaster T300 are recommended. It is entirely possible to be competitive with these wheels, but you may already have some sim racers in your team who have more expensive hardware.

A good halfway house between the G29/T300 and the more expensive hardware are aftermarket "load cell brake pedal conversions" which give a more realistic brake feel and maybe save you a few tenths of lap time if the extra braking fidelity is exploited.

If you do not have a steering wheel and pedals already, they are often available second hand for reasonable prices.

The specification of your PC will determine what resolution, details settings and frame rate are achievable. While it's tempting to run at the highest resolution and detail settings, the most important item is to have a stable high frame rate. It is recommended that you aim for ≥ 60 frames per second when there are multiple cars on track. You can test this in offline races with AI cars.

Ideally your internet connection will have a “ping” below 20ms, anything up to 50ms should be acceptable. Above this the lag will likely be a detriment in any multiplayer events.

Registering for Participation

At time of launch the Virtual Dynamic Events are open to teams who registered as a Formula Student (formerly Class 1) team. This does include any FS teams who have merged with their Concept Class team for the Virtual Static Events.

To register for participation please email fs@imeche.org with **Virtual Dynamic Events** as the subject heading and include:

- University Name
- Team Name
- Car Number

The closing date for notifying us is Friday 22 May, 1700 UTC.

There are no entry fees payable to the IMechE associated with entry into the Virtual Dynamic Events although do consider that you may incur some costs in order to meet the hardware and software requirements set out above.