CHAM Limited

Pioneering CFD Software for Education & Industry

CHAM Case Study – F1 VWT module applied to F1 in Schools Challenge.

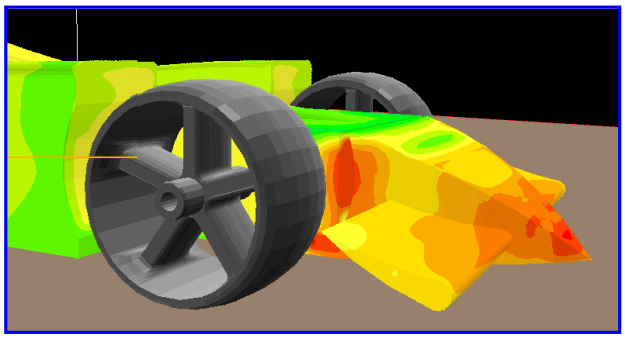
Pulse – World Record Holders for the 3rd time!

F1 in Schools (www.f1inschools.co.uk) is a competition that challenges secondary-school students to *design*, *model*, *construct*, *test* and *race*, a CO2-powered model F1-Car. The participating students are encouraged to emulate the same basic design and production procedures as their adult counterparts within the motorsport industry.

Students create several design alternatives using a CAD package such as Pro Desktop, and investigate their relative aerodynamic performance using the CHAM F1 VWT (Virtual Wind Tunnel) to select their favourite proto-type.

Once designed, the car is manufactured on a CNC (Computer Numerical Control) machine, such as the Denford MicroRouter, before physical testing in a mini-wind tunnel. See www.cham.co.uk/DOCS/f1_VWT_Flyer.pdf for background.

The challenge also requires pupils to produce a portfolio and presentation to show the technical processes they complete during their project. At that point they are ready to compete in the various regional, national and international competitions organised by the F1-in-Schools organisation. Believe me – this is a serious business, the technical standards are high and the competition is fierce.



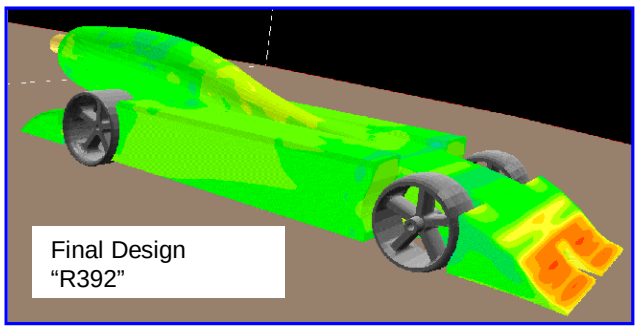
Pressure contours over nose cone – early design

Pulse – Devonport High School for Boys

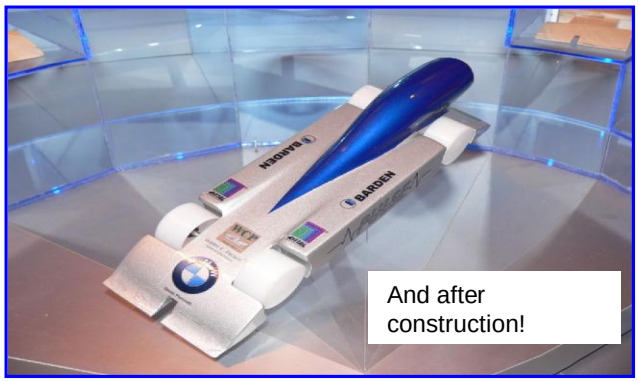
CHAM has been following the fortunes of one UK team, “Pulse”, consisting of four students from Devonport High School for Boys, Plymouth.

This season, Pulse designed an R-Type dragster, which is more technical than their early D-type projects, and more closely resembles a real Formula-1 car. In order to produce this more technical design, Pulse has made extensive use of CHAM’s F1 VWT software.

Close to 30 alternative designs were created using CAD software, with each one of these designs being brought into the Virtual Wind Tunnel to obtain an integrated drag co-efficient, with the best being 0.1838. The VR-Viewer enabled the team to produce some excellent images showing the forces acting on the car. The most encouraging designs are then cut out using the Micro Router and tested on a 20m track, with the best achieving a time of 1.108 seconds.



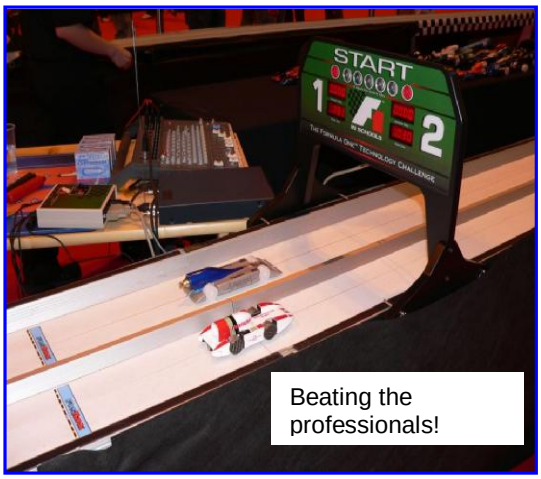
Final Design "R392"



And after construction!

The team beat the world record in December 2006, previously held by Malaysia. They set a time of 1.069 seconds for firing the car made from balsa wood down a 20-metre track at the F1-in-Schools competition held at Exeter University.

The success resulted in their becoming South West Regional Champions, and they represented the region at the National Finals, held at the Autosport Show in Birmingham during January 2007. Here they raced their car four times, setting another world record with a time of 1.056 seconds. Pulse also raced against the Honda team *[the real Honda Team*] and beat their car with a time of 1.030 seconds. Unfortunately, it does not count as a new world record.



Beating the professionals!

The boys, aged between 15 and 16 came away with four prizes: Fastest R-Type Car, Best in Age Group, Best Presentation and the Innovative Thinking Award. Pulse will now represent England at the 2008 International Finals, held in either America or Malaysia.

John Ware, Team Manager said "*It is an absolutely fantastic achievement to beat the world record for the third time, and I am relieved that all our work over the past year has paid off. It has been an honour to represent the South-West at such a high level, and we look forward to representing England next year*."

The competition also involves gaining sponsorship, and the team is now beginning to raise funds to reach the International Finals. For further information please visit the team's website at www.pulsef1.co.uk

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