



BLOODHOUND SSC

ENGINEERING ADVENTURE

BLOODHOUND SUPPORTERS

The BLOODHOUND Project **founder sponsors**:

- **Swansea University**
- **Serco Plc**
- **Engineering and Physical Sciences Research Council**
- **University of the West Of England**
- **STP**

The BLOODHOUND Project **product sponsors**:

- **Ashford Fabrications**
- **Airborne Systems**
- **Brixx Solutions**
- **Curventa Design Works**
- **Engineering Technology Board**
- **Falcon project**
- **Instrumentel**
- **The Mathworks**
- **Meynard Technologies**
- **Ministry of Defence**
- **National Physical Laboratory**
- **Parker Hannafin**
- **PDS Engineering**
- **Royal Academy of Engineering**
- **Siemens PLM Software**
- **IN2 Swansea University**
- **The Tourist Company**

STP

The BLOODHOUND Project has remarkable synergy with founder sponsor and premier engine fuel additive brand STP, whose major backing of World Land Speed Record holders in the barnstorming days of the '50s and 60s at Bonneville, USA, contributed to STP's heritage, fame and current pre-eminence worldwide.

Indeed, 2009 will mark the 50th anniversary of STP's first forays into World Land Speed Record sponsorships, when the likes of Athol Graham, and brothers Art and Walt Arfons, time and again ran the salt flats in their bid to grasp the title of the fastest man on earth.



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With that title now proudly resting with Britain's Andy Green, whose supersonic Land Speed Record soared to 763.035mph in October 1997, The BLOODHOUND Project provides the most exciting, compelling and enduring arena in which to once again showcase the STP product, to engage and educate consumers and future users on wider issues of engine efficiency, and to spearhead a major international STP brand campaign in 2009 and beyond.

Within the heart of BLOODHOUND SSC, STP fuel additives - the same as those available to motorists on the street - will once again be employed to optimise engine efficiency, as Richard Noble's team, with Andy Green again at the helm, bids for further all-conquering landmarks in the captivating history of the World Land Speed Record - the greatest sporting challenge on earth.

SERCO GROUP

Serco is an international services business with an annual turnover of around £3bn and over 40,000 employees worldwide. We work with governments to manage a wide range of public services.

These services touch almost everyone's life since we work across a very wide range of public services markets including defence, transport, health, education, civil government, technology and scientific research.

Our passion is about delivering the best quality and most efficient services. This means we cannot be complacent. We must always be looking for better ways to manage things, new technologies and ways to innovate. This is what excites us about BLOODHOUND SSC.

Not only has the National Physical Laboratory, which is one of Serco's businesses, been assisting The BLOODHOUND Team with its advanced technology development but we recognise the other social and economic opportunities that are an integral part of this programme.

Our own business currently employs 6000 scientists, mathematicians and engineers. In the future, we will require new, home grown scientific and engineering talent. Linked to that we currently have 48,000 children who are advancing through the educational system in Serco managed schools. We recognise a real need to inspire young people by showing them the tangible result of maths and science based courses.

The BLOODHOUND Project demonstrates what is possible when people bring together these skills to invent. It makes engineering, which has such an important role in our future economic and social development, exciting and attractive. Furthermore, we recognise that this is more than just a land speed record attempt.



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The knowledge gained from this innovative and exciting project has truly practical applications that will be carried forward into industry in future years.

SIEMENS PLM SOFTWARE

Siemens PLM Software is the exclusive product lifecycle management (PLM) software sponsor for The BLOODHOUND Project. Siemens PLM Software provides the capability for The BLOODHOUND Team to create, manage and share all design information associated with the car. The prime design and data management for the car is undertaken on Siemens' NX digital product development software. NX is a solution that transforms the entire product development process to reduce waste and increase design quality. More than a suite of integrated CAD, CAM and CAE applications, NX goes beyond individual and departmental productivity to improve efficiency in the overall process, and at each step in the car's development. A comprehensive solution, NX allows The BLOODHOUND Team access to the most advanced design technologies on the market.

Furthermore, as part of the Siemens PLM Software academic partnership program, we serve over 944,128 students yearly at 9,233 global institutions. Siemens PLM Software is unique in the PLM and CAD/CAM/CAE industries offering software to schools that can be used at every academic level – from middle schools to graduate engineering research programs. These tools are ideally suited for your engineering, engineering technology, manufacturing, industrial design and design and drafting programs. Siemens PLM Software offers all of its partner schools the same world-class product lifecycle management software and services for digital product design, simulation, analysis, manufacturing and product data management that are used by BLOODHOUND SSC.

SWANSEA UNIVERSITY

Swansea University's role in The BLOODHOUND Project is primarily contributing its expertise in CFD research.

Swansea University also provides Design Engineers to work on vehicle design and Engineering Management, in research for test sites for the record attempt, and in generating public awareness and engagement of the educational objectives.

Swansea University's School of Engineering is one of the leading Engineering Schools in the UK with 'excellent' rated teaching and 'five-star' rated multi-disciplinary research. The School's undergraduate and postgraduate courses are state-of-the-art and reflect the changing needs of the industry. The School has an



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international reputation for innovation and developing new technologies designed to make a real difference to people's lives.

Swansea University is a world-class, research-led university situated in stunning parkland overlooking Swansea Bay on the edge of the Gower peninsula, the UK's first Area of Outstanding Natural Beauty. Founded in 1920, the University now offers around 500 undergraduate courses and 150 postgraduate courses to more than 13,000 students.

NATIONAL PHYSICAL LABORATORY (NPL)

The world-class researchers at the UK's National Physical Laboratory (NPL) have worked with the Atomic Weapons Establishment (AWE) and Fluid Gravity Engineering (FGE) to advise The BLOODHOUND Team on two of the most high-risk aspects of the world record attempt – wheel and rocket designs.

The National Physical Laboratory (NPL) is one of the UK's leading science facilities and research centres. It is a world-leading centre of excellence in developing and applying the most accurate standards, science and technology available.

NPL occupies a unique position as the UK's National Measurement Institute and sits at the intersection between scientific discovery and real world application. Its expertise and original research have underpinned quality of life, innovation and competitiveness for UK citizens and business for more than a century:

- NPL provides companies with access to world leading support and technical expertise, inspiring the absolute confidence required to realise competitive advantage from new materials, techniques and technologies
- NPL expertise and services are crucial in a wide range of social applications - helping to save lives, protect the environment and enable citizens to feel safe and secure. Support in areas such as the development of advanced medical treatments and environmental monitoring helps secure a better quality of life for all
- NPL develops and maintains the nation's primary measurement standards, supporting an infrastructure of traceable measurement throughout the UK and the world, to ensure accuracy and consistency.

UNIVERSITY OF SOUTHAMPTON

The University of Southampton is a member of the BLOODHOUND Education Team, focussing on providing innovative ways for youngsters to engage in STEM, and helping to mould BLOODHOUND@University.



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Southampton is one of the UK's most active promoters of STEM in schools, and runs extensive outreach programmes in engineering, chemistry, physics, acoustics, electronics and computer science. The University of Southampton is a leading UK teaching and research institution with a global reputation for leading-edge research and scholarship across a wide range of subjects in engineering, science, social sciences, health and humanities.

With over 22,000 students, around 5,000 staff, and an annual turnover of over £350 million, the University of Southampton is acknowledged as one of the country's top institutions for engineering, computer science and medicine. We combine academic excellence with an innovative and entrepreneurial approach to research, supporting a culture that engages and challenges students and staff in their pursuit of learning.

The University of Southampton's School of Engineering Sciences offers expertise in engineering disciplines that underpin every aspect of 21st century life. Evolving from its traditional engineering roots, the School continues to expand into new, exciting research areas. From orthopaedic implant modelling and modern fuel cell technologies, to enhancing satellite broadcast technology and improving the aerodynamics of Formula One racing cars and hydrodynamics of America's Cup yachts, the School is always at the leading edge of engineering research.
www.southampton.ac.uk

ENGINEERING AND PHYSICAL SCIENCES RESEARCH COUNCIL (EPSRC)

EPSRC is the UK's main agency for funding research in engineering and the physical sciences. They invest around £800 million a year in research and postgraduate training, to help the nation handle the next generation of technological change.

Areas covered range from information technology to structural engineering, and mathematics to materials science. This research forms the basis for future economic development in the UK and improvements for everyone's health, lifestyle and culture. EPSRC promotes public engagement in science and engineering.

EPSRC have funded a team of researchers at Swansea University to carry out the research required in aerodynamics and computational fluid dynamics which is crucial to the development of the project and the design of the vehicle.

The research began in August 2007 and two of the researchers form part of the BLOODHOUND core research, design and build team.

EPSRC are working to bring the public engagement community into the project to organise a range of public activities over the next three years.

More information;



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- [EPSRC website \[www.epsrc.ac.uk\]](http://www.epsrc.ac.uk)
- Contact [Joanna Coleman \[joanna.coleman@epsrc.ac.uk\]](mailto:joanna.coleman@epsrc.ac.uk)

THE ROYAL ACADEMY OF ENGINEERING

Founded in 1976, The Royal Academy of Engineering promotes the engineering and technological welfare of the country. Our fellowship – comprising the UK's most eminent engineers – provides the leadership and expertise for our activities, which focus on the relationships between engineering, technology, and the quality of life. As a national academy, we provide independent and impartial advice to Government; work to secure the next generation of engineers; and provide a voice for Britain's engineering community.

One of the Academy's strategic priorities is to inspire young people in schools and colleges to become the next generation of engineers and we therefore fully support the aims of The BLOODHOUND education experience. A number of the education initiatives involved with The BLOODHOUND Project are also part of the Academy's Best Programme and have been working successfully with young people for many years. These include Young Engineers, The Smallpeice Trust and the Engineering Development Trust with their Go4SET, Headstart, Engineering Education Scheme and Year in Industry programmes.

The opportunity to see these and other interventions feature at the Filton centre is also an exciting development as this area of the southwest has such a prevalence of high technology companies and a rich engineering heritage.

Given the great shortage of young people considering science, maths and engineering related careers, the Academy believes that The BLOODHOUND Project can become an iconic engineering adventure that inspires a generation of young people to become the engineers and scientists that will answer the global challenges we face in the future.

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UNIVERSITY OF THE WEST OF ENGLAND (UWE)

UWE Bristol (University of the West of England) is a university that believes in partnership to the benefit of the student and staff experience. It sees The BLOODHOUND Project as an ideal way of creating opportunities for its staff and students as well as being an inspirational engineering project.



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UWE became involved with The BLOODHOUND Project very early on when Dr John Lanham, Head of Department of Design & Engineering assisted John Piper, The BLOODHOUND Project's Chief Engineer, establish a base at UWE for the early design work and access to UWE resources. Subsequently UWE has produced the scale model of the car for the launch.

The early construction of the initial full sized mock up of BLOODHOUND SSC will also take place on UWE's Frenchay Campus in one of the department's laboratories.

UWE has set up and is leading a Higher Education programme, BLOODHOUND@University, which will provide academics and students with access to The BLOODHOUND Project and it expects its own 5,000 Faculty of Environment and Technology students to benefit directly from having BLOODHOUND SSC on the premises and easy access to the project and its data. BLOODHOUND@University will develop a suite of case studies and other activities drawing upon the project. Additionally UWE aims to research how new learning methodologies can exploit such an open and inspiring project, with all its challenges in terms of sustainability and engineering excellence.

UWE is also involved as follows:

- James Burch a lecturer in architecture has produced the designs and drawings for the Education Centre
- Professor Jim Longhurst, from UWE's Institute of Sustainability Health and Environment is providing advice and guidance on the sustainability issues and opportunities arising from the project
- UWE has used its strong partnerships to provide openings for the project, including the relationship with BAe and Regional and Local authorities
- UWE has advised on the Education aspects of the project through its school of education and sees The BLOODHOUND Project providing a breathtaking experience for schools and colleges in the region

As an engaged, enterprising and accessible university, UWE shares the values of this iconic engineering adventure

ENGINEERING AND TECHNOLOGY BOARD (ETB)

The ETB is an independent organisation that promotes the vital contribution that engineers, engineering and technology make to our society. We welcome and support The BLOODHOUND Project as an exciting new opportunity to inspire young



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people to pursue engineering, technology and related careers. The BLOODHOUND Project is a high profile engineering adventure which will capture the public's imagination and stimulate widespread interest and debate, encouraging young people to think about the challenges and opportunities of engineering in a whole new way.

The ETB has been involved in The BLOODHOUND Project from the beginning and our contribution has specifically focused on the development and hosting of the website, support to the education activities and facilitation of links to business and industry. We view innovative and challenging programmes like The BLOODHOUND Project as a great way to kindle young people's interest in engineering and technology on a completely new level. To that effect we are also working with BLOODHOUND Engineering Team members in our Visiting Lecturers initiative, whereby impressive engineering presenters will provide master classes in public speaking and conduct student lecture tours to encourage more inspiring teaching of students, as part of our national 'Engineers Make it Happen' campaign.'

Dr John Morton, Chief Executive, The Engineering and Technology Board, ETB

INSTRUMENTEL

Instrumentel Ltd., specialise in the design and development of electronics destined for harsh or difficult to access environments. The company is a "spin out" from Leeds University to commercialise the research of its founder, Dr Greg Horler.

The Company has developed an 'enhanced' RFID technology that is able to operate in harsh environments. The cornerstone of the technology is the XT01 transponder; a rugged battery-less silicon chip which integrates RFID near-field and far-field communications capable of operating over the temperature -40 to +225 Celsius. In order to support this device, Instrumentel have developed considerable expertise in "extreme environment instrumentation"; this expertise was used to design and deploy the BLOODHOUND SSC electronic control unit (ECU) a device used to both control and sample data from the rig used to test the BLOODHOUND SSC Rocket Pump.

It is anticipated that Instrumentel's enhanced RFID technology would be used to sample data from the highly stressed components comprising BLOODHOUND SSC, such as the wheels, brakes and other reciprocating or rotating parts; the data being sampled for security, research and development purposes.

DCSF



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