

It is Spring 1993 and the UK is still learning to live with recession. There are nearly three million unemployed. Nevertheless we hear rally cries from parliament urging us to believe that Britain 'will be great again'. One of the keys, we are told, to long-term economic recovery and growth is the revitalisation of our manufacturing base. To do this we need to tap into a rich seam of young people with the vision, skills and talent to commit themselves to that base — to industry and namely to engineering.

Motor Magic

Sarah Watts

on behalf of the Young Engineers Club

Therein lies the first problem. Where is the glamour in engineering? Set it against the apparently better paid, higher profile and more exciting careers offered by the service industries and how can it compete? Moreover, how do schools with limited resources, already struggling to deliver the complete science and technology curriculum, find the facilities and expertise necessary for engineering?

■ Captivating nation-wide audience

One school in Bexhill-on-Sea thinks it has found a solution — a project so crammed full of drama, excitement, challenge, speed, tension, innovation and sheer hard work that it can't fail to captivate a nation-wide audience. If it succeeds, St Richards RC School will not

only be the proud possessor of a new world land speed record for electric vehicles, but also four teenagers and their teachers will have guaranteed themselves and their Young Engineering club a place in the history books forever.

Peter Fairhurst, the Design Technology teacher leading the two year period project comments, 'If this doesn't convince them that engineering in the twentieth century is now a million miles away from grubby overalls and steam engines, nothing ever will'.

Project Volta is St Richard's attempt at the World Land Speed Record for Electric Vehicles in the under 500kg category. It was Peter's own passion for car technology and construction that led to his pupils being encouraged to take up the biannual BP Buildcar Challenge. In 1990 their successive attempts finally paid off and St Richard's became outright winners. With the bit between his teeth, Peter began to develop a vision of a much more ambitious project.

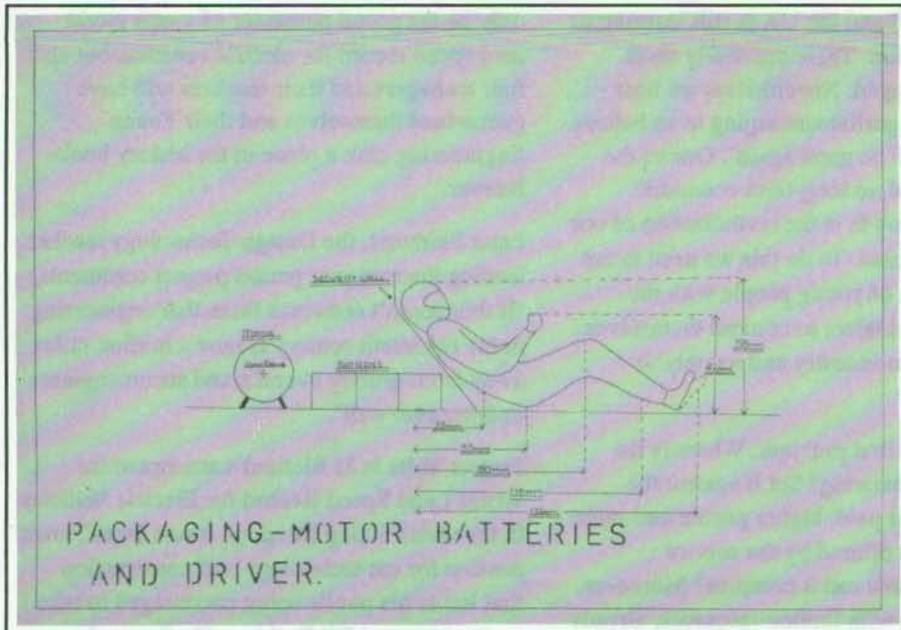
■ American inspiration

At the same time the school's Young Engineers club was born. Established in 1983 by the Standing Conference on Schools' Science and Technology, Young Engineers has been likened

Pictured from left: Bella Harrison, Chris Duncan, Vikki White and Ben Richardson.

The Young Engineers are pictured with the ultra-lightweight Kevlar body made for their car by Lotus at the company's headquarters in Norfolk.





The Project Volta

As with most educational schemes though it relies strongly on the personality drive and communication skills of the leader, in this case the teacher, to bring it alive to an audience which often carries some awkward misconceptions with it. The main problem lies in giving young people an accurate experience supported by up-to-date information and access to adequate, modern resources. In this way engineering is trying hard to build a new image for itself without misinterpreting the facts.

■ Question of motivation

With more than 22 years' teaching experience Peter Fairhurst knows what to do to motivate young people. Through the Young Engineers club he invited just four students to take part in Project Volta, two boys and two girls. He explains his reasons,

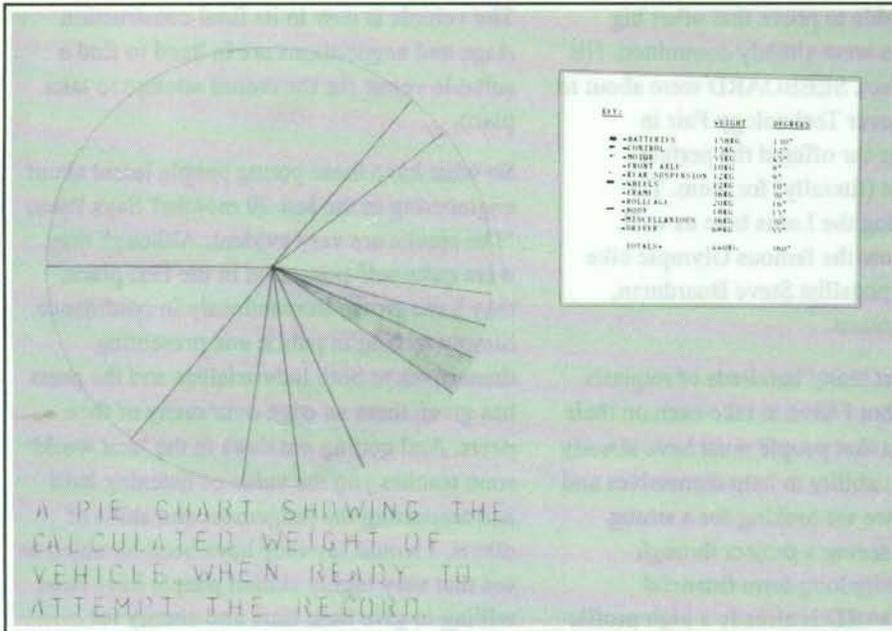
'Boys tend to think they know it all. They've fixed their bicycle wheels at home or mended the lawnmower because Dad's asked them to, so they approach most design and make tasks with a 'been there done that' attitude. Girls, on the other hand, do not generally prejudge or make assumptions. They tend to make much better problem-solvers'.

Bella Harrison, Vikki White, Ben Richardson and Chris Duncan, all D&T students now in Year 11 thus became the project engineers 20 months ago. At this point luck played its part. Bella's brother, Matthew, an ex-pupil at St Richard's was then working as a Research Engineer with the world-renowned car design manufacturing company, Lotus. Within weeks Matthew, who has a doctorate in Computational Fluid Dynamics from Southampton University, was working alongside Peter and his students to establish a starting point for the design of the Volta car. Not unnaturally he turned to his employers for help.

to a technological equivalent of the scouts. The movement was the brainchild of David Bloomfield, now Chief Executive of the SCSST, who was struck, during a visit to the United States, by the success of JETS, Junior Engineering and Technology Societies. These high school societies were run by the students themselves and encouraged industrial visits and student-driven project work with the support of a local engineer. Clubs existed for just about every other pursuit — swimming, stamp collecting, bird-watching — but where was a youngster with an above average interest in design and engineering to go?

In both educational and economic terms, the Young Engineers vision is an important one and the organisation is by no means alone in addressing the issue of promoting engineering in schools. Above all, Young Engineers is a hard and fast investment in marketing engineering to young people. The movement is backed by four national sponsors, Lloyd's Register, Biwater Ltd, BT and BAA, who, between them, have invested millions of pounds over the last decade in what they hope will be their future workforce.

Its insistence on extra-curricular, club-based activity built on a close relationship between local company, engineering and school, ensures that it attracts students with a strong interest in innovation — design and make — and in acquiring engineering skills and knowledge. Equally, it makes no divide between different intellectual abilities. Clubs all operate as mixed age and mixed ability groups.



■ Proven success

Already a Staffordshire based company, DETA Batteries, had pledged their support by providing the special batteries for the car. DETA had historical connections with St Richard's going back to BP Buildcar days, but this time their contribution was to be a lot more complex and potentially a lot more costly. As Phillip Tart of DETA explains, 'Magnanimity alone was not the key issue. Project Volta exhibited all the promise of a commercial opportunity to further develop our specialist range of products. DETA together with St Richard's School had already proved they could form a successful partnership when they took first prize with the 'Richelle' car in the 1990 BP Buildcar competition.'

Says Phillip, 'We have a policy of employing and training young people where possible rather than recruiting older, more experienced personnel, so a liaison with St Richard's made a lot of sense. In marketing terms, the experience and success with the Richelle car project enabled DETA to widen its customer base and provide increased awareness of our light motive power batteries in sectors we had found difficult to reach before, such as solar power, standby power and vehicle auxiliary systems. With Project Volta we have stretched our own technology and skills. The challenge has been to design and build a battery which is capable of discharging its power within two minutes, in contrast to a conventional starter battery which is required to support a number of ancillary operations as well as starting the engine. We therefore turned to our German

plant, where they produce batteries for well-known vehicle manufacturers such as BMW, Mercedes Benz and VW/Audi. This battery has been specially commissioned under the technical supervision of DETA's Chief Development Officer, Jurgen Gorg. It will not go into production in this form, but will add further weight and credibility to our world-wide engineering pedigree.'

Back at Lotus in Norfolk, Matthew was often to be seen with a scale model of the Volta car under his arm. In a short time his department head, ex-teacher, Malcolm Macdonald, began to take a keener interest in the project. This was no coincidence for the soon-to-be-famous Lotus Olympic bike was in the offing. Between them both the bike and the Young Engineers car might become world record breakers and the company could secure its place in the headlines for all the best reasons. At the same time, Lotus test driver and international racing driver, Rudi Thomann, declared his personal desire to drive the car when it came to making the record attempt.

Lotus offered to build the ultra-lightweight Kevlar body for the car. The team in Bexhill built a fibreglass covered polyurethane 'plug' on the frame, from which the moulds could be taken. Lotus contacted each of their suppliers asking them to provide materials free of charge, leaving Lotus to underwrite the labour cost of the £5000-£6000 body.

■ Motor solution

One of the other things that the students have come to learn through Project Volta is that everyone likes to be associated with a success story. Not having found a sponsor for the motor at this stage, Peter started knocking on more doors. When he went to see Chris English, Publicity Manager at SEEBOARD, the project already had a high profile locally and, of

course, he was able to prove that other big name companies were already committed. His timing was perfect. SEEBOARD were about to launch the first ever Technology Fair in Brighton and the car offered the perfect publicity vehicle (literally) for them. The prospect of having the Lotus bike as well, which was by now the famous Olympic bike ridden by gold medallist Steve Boardman, added further interest.

Says Chris, 'I get many hundreds of requests asking for help but I have to take each on their merits. We insist that people must have already demonstrated an ability to help themselves and emphasise that we are looking for a strong commitment to seeing a project through without necessarily long-term financial support. SEEBOARD is already a high profile organisation so publicity is not an overriding factor. On all these counts, Project Volta has been quite superb'.

So, SEEBOARD were finally on board and Project Volta had its motor at a cost of over £4000. Chris English's vision rewarded with widespread press coverage in both the local and the national papers.

■ Final days

In November 1992 negotiations with MIRA (Motor Industries Research Association) began in order to put the car through its first paces. Once again, the financial clock was ticking. This time the cost facing the St Richard's students for one day's testing alone was £45000. But again, the 'carrot' of publicity saved the day. If the Young Engineers could secure some specified television coverage, they could have the testing they required at no cost. Weeks later, after much anguish and many telephone calls, both Blue Peter and an independent film crew were secured for the day and Tomorrow's World had already made their interest very clear having tracked the project's progress from the beginning.

By Christmas 1992 the students and Peter were working hard to alter the 'plug' body shape in accordance with the advice given by the aerodynamics experts following the MIRA windtunnel test findings. For six days running they put in early starts. Early this year the vehicle was finally taken to Norfolk for the body to be built.

The vehicle is now in its final construction stage and negotiations are in hand to find a suitable venue for the record attempt to take place.

So what have these young people learnt about engineering in the last 20 months? Says Peter, 'The results are very evident. Although they were quite self-possessed in the first place, they have grown tremendously in confidence. Simply talking in public and presenting themselves to both industrialists and the press has given them an edge over many of their peers. And getting out there in the 'real world' soon teaches you the value of listening hard and respecting the judgement and skills of others. I would say they have been humbled to see that very highly skilled people have been willing to give their time and energy for nothing'.

Gordon Cockburn, National Director for Young Engineers, agrees: 'I do not think that the projects' commercial edge has spoilt it for the students. On the contrary, having to account for every hour worked, every decision made and every penny spent is yet another 'real world' experience — a privilege that many other students cannot claim at such a young age and one that gives them unparalleled credentials when they face their future employers'.

'Above all, an experience like Project Volta and Young Engineers has given them staying power', continues Peter. 'They have been with this project for nearly 20 months now and are determined to see it through. When Bella, who wants to be a dancer, went for a ballet school audition, the panel was impressed by her commitment to this project — it shows character, stamina and ability to work well in a team they said and she'll need plenty of that if she's to survive in professional ballet. For Chris and Ben, Project Volta has confirmed what they knew all along — it's the engineering life for them.'

For further information contact Gordon Cockburn, Tel: 0483 509349.