



Status Racing

Portfolio Award 2014

Status Racing Team – Collingwood Technology College

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History

The team was founded in 2010, by three technology teachers at Collingwood: Mr R. Winter, Mr D. Wicken and Miss S. Chudley. We received an offer from Surrey County Council, offering to pay half of the cost of a Greenpower kit car, to start our project. The remaining £1000 was paid by the school and we soon received our kit car. This included a 'build it yourself' chassis, batteries, a motor and all of the steering and electrical components. The next task was to find a team of students – an advert was placed in the newsletter telling any students interested to come to a meeting one lunch time; here the teachers discussed the application process.

After the applications had been sorted, 11 students were chosen from years 7 to 10. The team consisted of:

Dan Martin, Toby Roberts + Hannah Lang (yr7)

Dan Waite, Matt Russell (Yr8)

Tom Hall, Ollie Welzen-James, Hayley Butters, Chris Barton (Yr9)

Jack Roberts and Luke Baker-Smith (Y10)

In just three months, the kit car had been assembled and bodywork had been created and we were soon ready to start racing. We had only entered one Greenpower race that year (Greater London Regional Heat) and placed 32nd out of 52 teams. We had also entered the Surrey School Games motorsport competition and won that, beating the other Surrey based Greenpower teams.

In September 2011, Dan Martin was elected as team leader after Jack Roberts stood down from the role. We received our first sponsorship deal (of £200) from W. Godfreys and Sons nursery and soon after received £150 from David Martin Jewelers.

We had made the decision to improve the kit car – by adding a gearing system to the car. This was not as simple as it sounds and took us nearly five months to complete (after 3 failed attempts!) We also decided that in order for us to become a competitive team, we need to build our own car – from scratch! 2011 saw the first design phase for the MK2 car and in early 2012, we started construction of this new car – not knowing it wouldn't be completed until summer 2014.

A new season also saw some new team members for the team – with the arrival of year 7's: Ollie Redick, Livvy Retallack and Sam Fereday as well as the departures from Matt Russell and Chris Barton.

In spring – we gained our biggest sponsorship deal, with Autodesk. They sponsored the team £1500 as well as upgrading all of the inventor packages in the IT room.

The 2012 racing season was disastrous for us, losing our Surrey title and breaking down at both the Essex regional heat and Surrey School Games. The Greater London Regional Heat in 2012 was the wettest day of the year – with non-stop rain all day, which resulted in a bad electronics failure from our car and also the race to be cancelled half way through. Although it didn't seem it at the time, this was a big learning curve for the team and we knew we had to change a lot for us to be competitive in the 2013 season.

The first thing we did in 2013 was purchase a £500 speed controller, which would also allow us to monitor each driver in the races. We then had a big change of the structure of the team – making all of the team members re-apply for their position in the team as well as opening the applications to the rest of the school. The two 'core' team members, Dan Martin and Dan Waite remained on the team and with the help from Mr. Winter; we chose

the new team – which consisted of 15 students. We did re-recruit some of the original team member's back, but also gained many new team members. Here is what the team was like:

Matt Godfrey, Ben Wright, Alex Cooper, Jenson Brown and Fred Taylor (Yr7)

Livvy Retallack, Ollie Redick, Callum Sutton, Rebecca Kadwell, Arthur Holmes and Tom Vidler (Yr8)

Dan Martin, Charlie Ringrose and Will Harris (Yr9)

Dan Waite (Yr10)

We continued construction of the MK2 car and further improved the existing MK1 car by replacing sections of the bodywork and making the car lighter. Our overall aim this year was to qualify for the national final at Goodwood. This meant we needed to come in the top 75 of the overall mileage table in October or place in the top three in a regional heat.

Our first race was the Central South regional heat at Goodwood – this was our first time at this track as well as it being the first race experience for many of the team members. The team did not do too badly until a breakdown cost us a whole hour of the race! We then returned to the Surrey School Games competition with the aim to re-gain our title – something we successfully achieved by winning the race by 15 minutes! By winning this race, we won a tour of the McLaren production factory in Woking – an experience we will never forget.

Our next race was back at Essex – we really thought we could achieve a top three placing here. Once again, weather was not on our side with a track temperature of 36°C! This resulted in an over-heated motor and melted cable. Overall this meant that we came 6th out of 13 – meaning we still hadn't qualified for the final.

It was all down to the last regional heat, at Dunsfold. We needed to cover at least 80 miles in four hours to make it to the final. Sure enough, after four hours of fantastic racing – we covered 84 miles, meaning we had successfully qualified to the final the following month.

On 12th October 2013, we arrived at Goodwood for the day we'd been waiting for since 2011. We weren't overly ambitious with our expectations – we were hoping to be in the top 50. The race started well and we had climbed to 32nd place at one point. Unfortunately, electronic problems meant that we could not finish the race, but had to be towed across the line on the final lap! Overall, we finished a respectable 63rd out of 75.

After the final, the team had a discussion and decided to really focus on getting the MK2 car finished for the summer. In just a few months, we had a full rolling chassis!

In December, Brian Harris (a parent governor to the school) offered to take the existing steel kit car chassis and re-build it out of aluminum over Christmas - for free! This was excellent for the team however it did mean destroying the iconic bodywork!

Just a month later, we received the chassis back from Brian and after just a few adjustments, it was drivable! All we had left to do now was the bodywork on both cars and electronics in the MK2.

Our target for this year is for both cars to qualify for the final and for at least one to place in the top 30 in the country! Obviously this year will be very different for all of the Greenpower teams as the new race format has meant that instead of one 4hour race, there are now two 90 minute races. This also means we have to be more conservative with our batteries to make sure they last the entire race!

Stages of Production MK1 (Feb-May 2011)



First, we had to assemble the Greenpower kit car. This involved adding the wheels, steering and drive system.



We then wired all of the electronics into the car, and put in the tray for the batteries.



Next, a shell was created over the chassis by bending pieces of plastic to create the shell shape.



Cardboard was then stapled to the plastic shell before we covered the cardboard in bed sheets.



We then painted the bed sheets with a fibreglass resin which hardened the bed sheets, creating our bodywork.

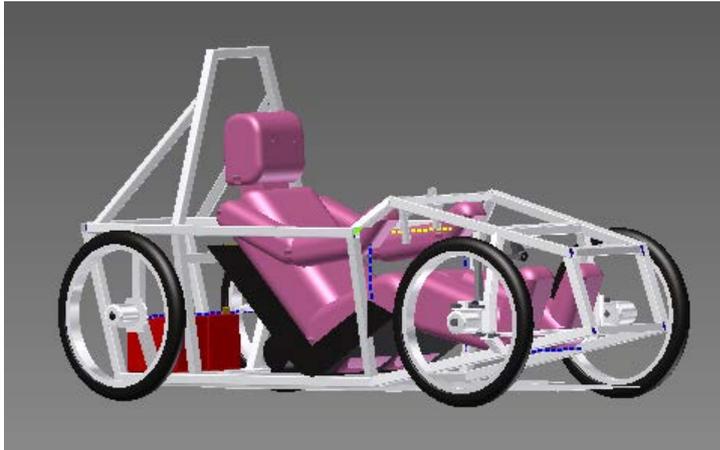


Finally, we painted the car blue – using the left-over paint from Mr Winter's Mini!

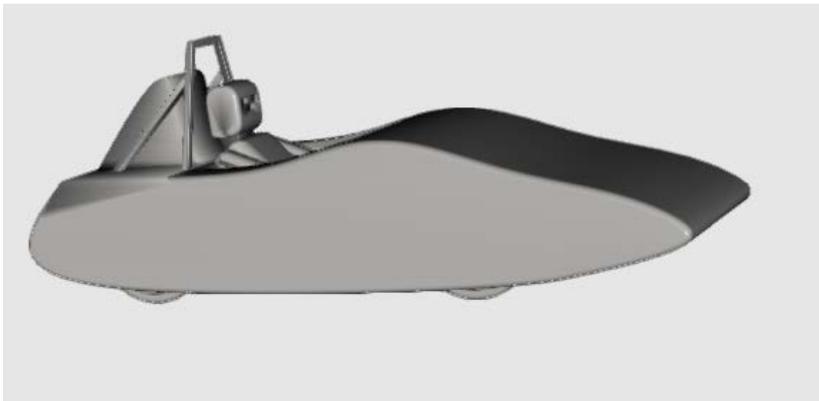
Design Work for Status MK2

Before the construction of the car, we spent a long time designing every aspect of the car. We tested the strength of the structure and the aerodynamics of the bodywork, all within our Autodesk software which we received for free as part of our sponsorship deal with them.

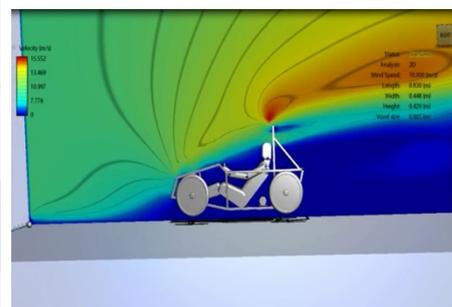
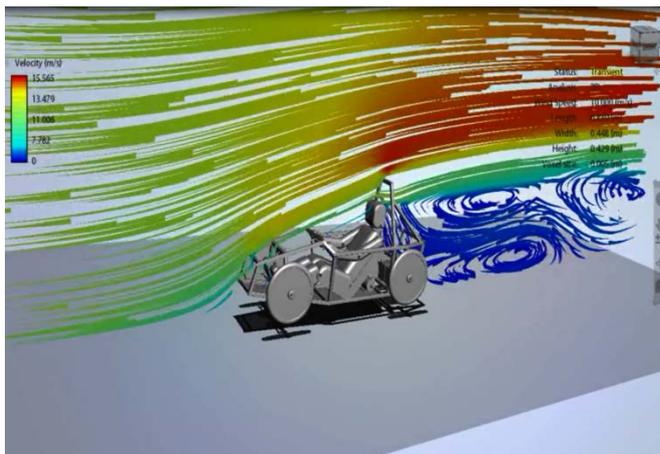
Chassis Design:



Body Design:



Wind tunnel Testing:



Stages of production MK2 (Sept 2011 – May 2014)

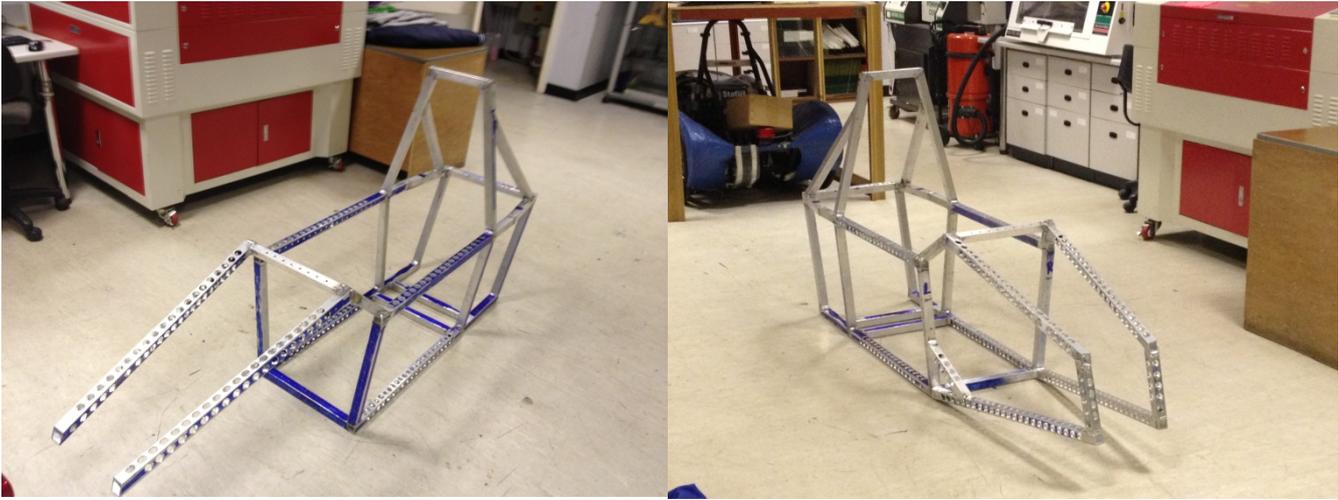


We started by creating the main roll – hoop and middle of the chassis. This was cut and welded in school by students and Mr Winter.

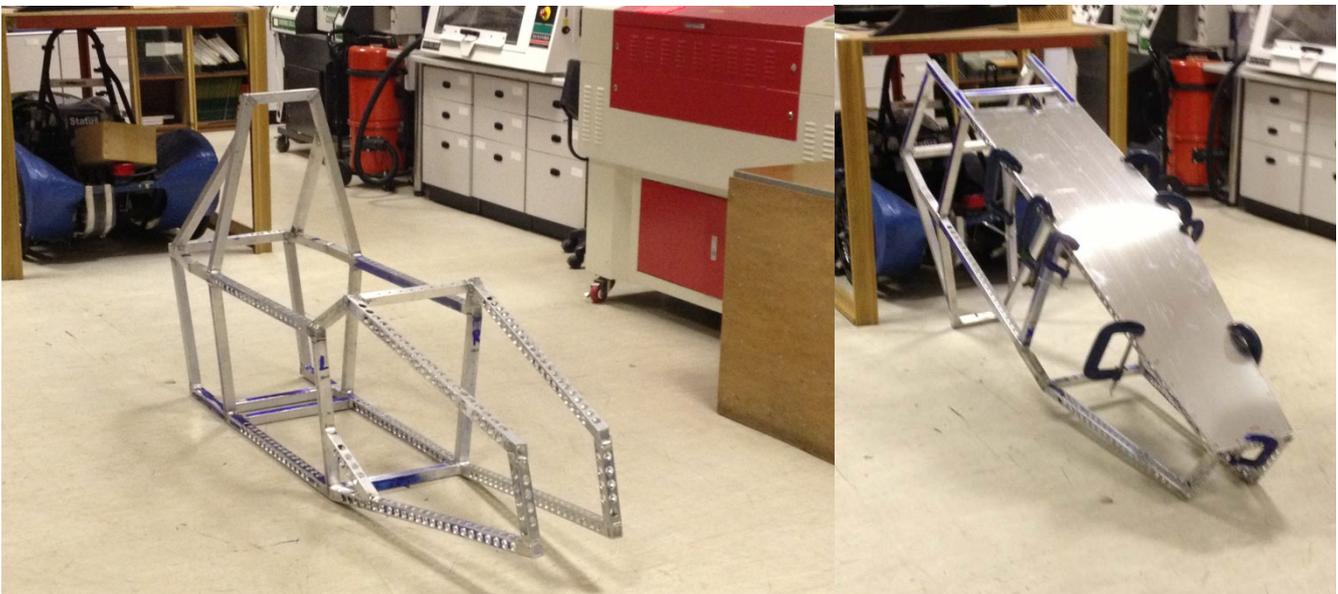


We then took the decision to drill holes in the chassis to save weight. These holes were all marked out and drilled by the team.

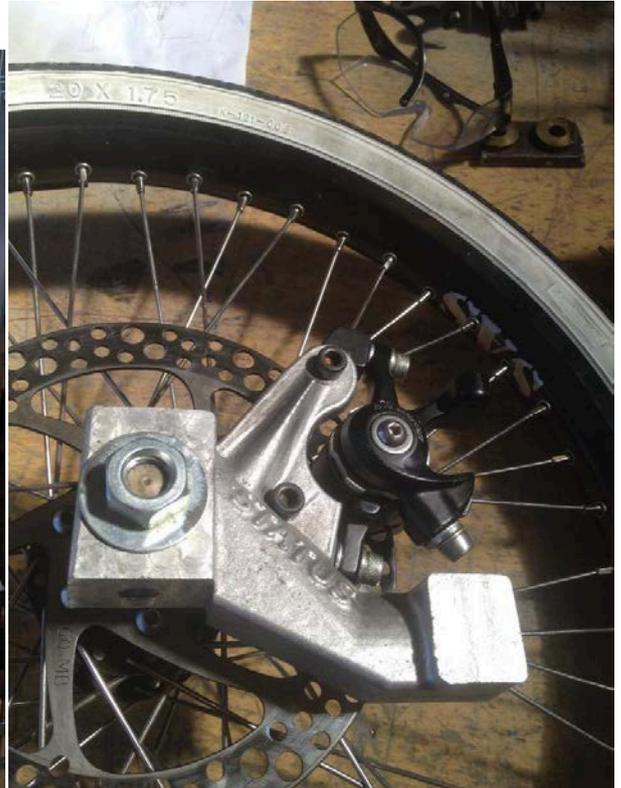
We calculated that the holes would remove 1/3 of the weight! - We did not drill the roll hoop or main structure as these are safety critical.



The next stage was to create the front part of the chassis and the front roll hoop. For an overall more aerodynamic shape, we decided to angle the floor up to create a point at the front.



The final stage of the chassis building was to attach the floor. We carefully cut the sheet aluminium using the guillotine and both riveted and welded the floor to the chassis for added strength.



The next stage of production was to cast wheel mounts for the car. We started by designing a 3D CAD model of the part, then 3D printing a template, which we pressed into the sand, before removing the template and pouring melted aluminium into the mould, creating the mounts.



We then added the individual axels for the two front wheels, as well as the main movement mechanism for the steering.



The wheels are then attached to the chassis, and adjusted to remove any camber.



The axel is then machined and the two rear wheels are attached.



The steering is then added. This involved machining a piece of steel bar for the connection to the wheel and adding the rose joints to the steering arms.



We then added the battery tray at the back of the car and mounted our motor!



And then added a seat, as well as a temporary wooden dashboard.

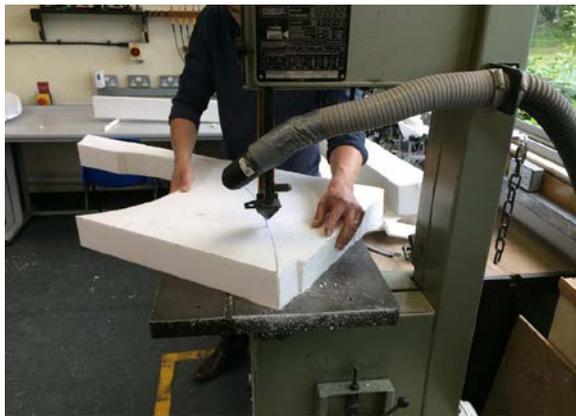


Once the rolling chassis was complete, it was time to drill more holes! This was all to save weight.

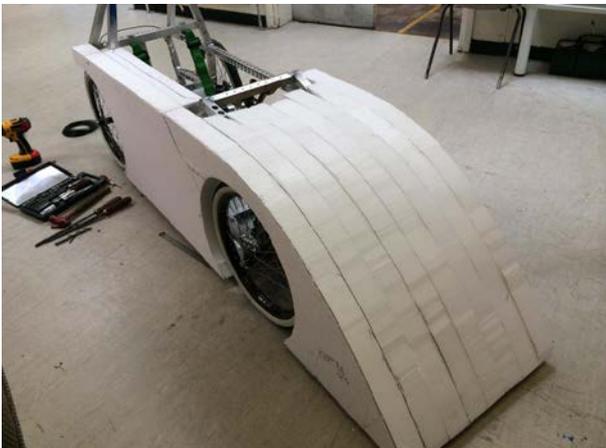


The next stage was to complete the bodywork. This was completed just two weeks before our first race of 2014 at Goodwood!

We started by creating the 'side pods' of the car by carving the shape out of big sheets of floor insulation polystyrene!



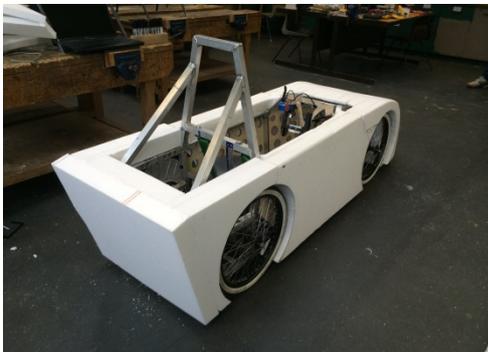
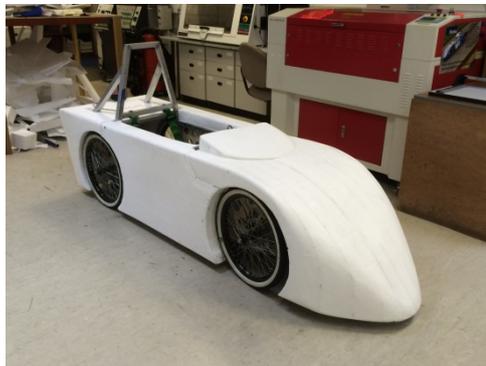
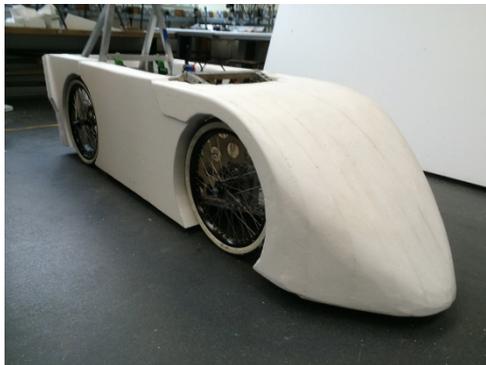
After the side pods were created, it was time for the front of the car. We created cross sections of the front and cut them all out, using a combination of the band saw, jig saw and an old hacksaw blade! After much staring, we managed to tessellate the shapes for the entire front of the car onto just one sheet of polystyrene!



A bulk order of grab adhesive from Screwfix was then required to glue together all of the cross sections to create the front of the car!



It then took a day of solid sanding (and a lot of mess!) for the final shape of the car to be created. We used a combination of sand paper and a belt sander to get our desired shape.



The finished shape.



It was now time to make the car look nice! We chose our design and colour scheme and painted a test piece to make sure it didn't dissolve our polystyrene!



It was now time to turn our designs into reality! We spent ages masking off the edges of and then painted the car. It took two coats to get a nice finish on the car.



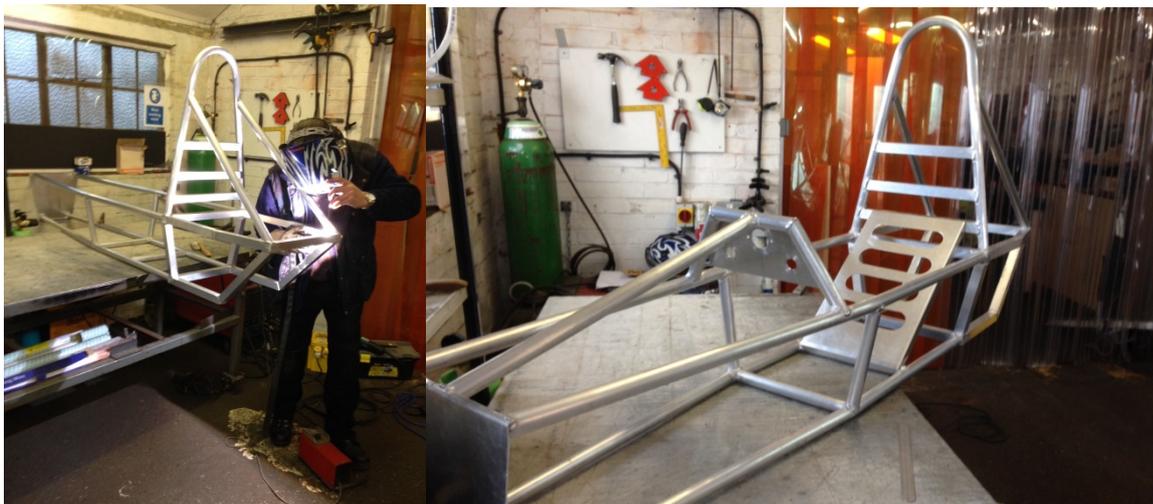
It was then time for the finishing touches. We designed and cut our sponsors logos and stuck them to the car. Unfortunately, we did have to do some of this on the morning of our first race at Goodwood!

Stages of production MK1 (2)

In December 2013, we received a very generous offer from a parent governor, to re-build our steel MK1 car, in aluminum for free! Here are the stages of production for our second MK1 car:



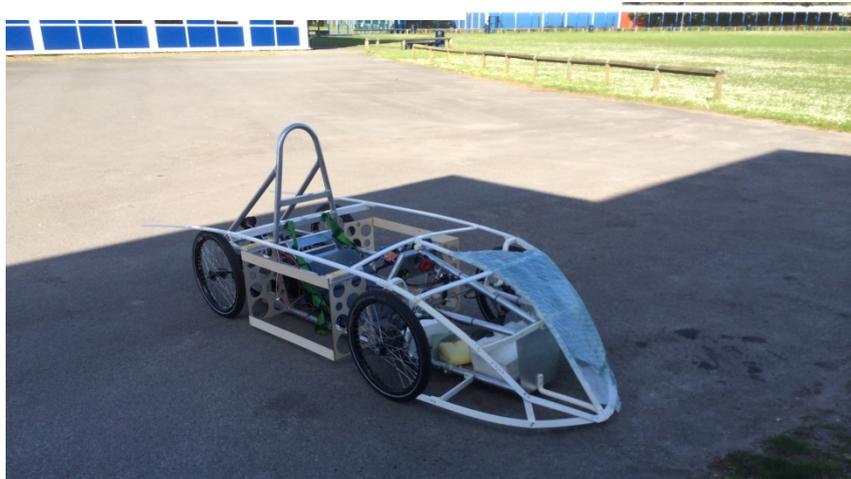
After the team had replicated the old chassis in 3D Autodesk CAD software, we sent it to Brian and within just a few weeks – the first part of the chassis was built.



Soon after, the roll cage and the seat had been welded to the chassis and the dashboard had been welded in.



In just three months, the car had been re – built! This included the steering and drives system!



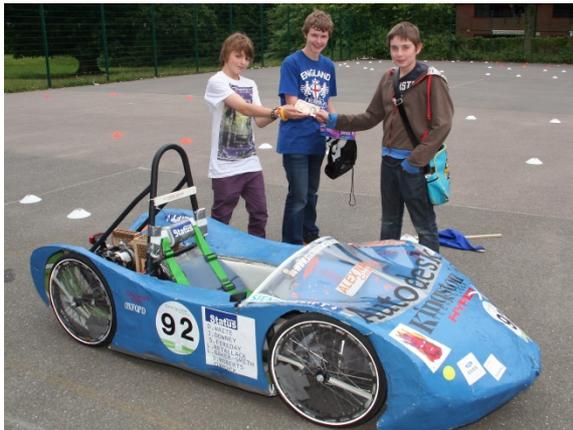
We are now working on the bodywork of the car. We are planning to have a fibreglass body, similar to the one on the original MK1 car.

This car will be racing for the first time competitively in Bedford in September!

Publicity & Fundraising

This year we have hosted a lot of presentations and stalls to show off, promote and raise money for the Status Racing team.

COLLINGWOOD COLLEGE FUN DAY – 2011-2014



Each year the college has a fun day where each form has a stall and all students have time off lessons. We decided to create a small track on the netball courts and charge people £1 to drive 2 laps of the course, one a practice lap and one a timed lap. Throughout the afternoon students laps were timed and the fastest lap time at the end of the day won £10! From this we raised £35.

COLLINGWOOD COLLEGE OPEN EVENING



Each year in September, parents take their year 6 children to look around the school to see if it is right for their son/daughter to spend their secondary life at. We set up a stall just outside the principals meeting. We had a big board filled with pictures and it was set in the year 9 playground, the perfect place to demonstrate the car in action. As expected we had large crowds of people all watching the car whizz around the playground and half way through the event we brought over the school photography team with a camera, laptop and printer and gave year 6 students the opportunity to have their picture taken in the car and to buy it for £3.50. We also had a donation pot at the stall where we encouraged parents to throw in loose change. Dan Martin (the team leader) was handing out sponsorship letters to the parents and encouraging them to give the letters to people they knew in the hope that we would get some sponsorship. At the end of the evening we raised £34.67 from the photos and the donation pot and gave out over 200 sponsorship letters. The letters paid off as later that week we received £50 from Talbot Construction.

SURREY SCHOOL GAMES LAUNCH 2012



We were asked by the organisers to represent the Motorsport category of the Surrey school Games launch event in Cobham. We set up a stall with our car taking pride of place on a small stage behind and we stood talking through how we made the car and giving out business cards with our website on and email address. Dan Martin and Toby Roberts were even lucky enough to hold the Olympic torch from 1948!

SURREY OLYMPIC OFFICIALS MEETING



We were asked to attend a meeting and give a presentation to 30 of Surrey's biggest Olympic representatives and athletes about our team progress over the year. We gave out a business card to each person and even got interviewed and photographed by Radio Jackie!

COLLINGWOOD COLLEGE WORLD RECORD ATTEMPT LARGEST HUMAN LONDON 2012 LOGO



Before the world record event started a presentation was held in the College's new sports hall with the Mayor and 100 other people including Olympic trampolinist Amanda Parker and the Surrey Judo team and of course, the Collingwood senior staff! We gave our presentation lead by Dan Martin and we had an overwhelming crowd around our area!

Sunday Times Festival of Education 2013



Last year, we were asked to represent and advertise Greenpower at the Sunday Times festival of Education – held at Wellington College.

We displayed for two days and attracted large amounts of people who were interested in both the Greenpower project, and the work that we do.

We even saw celebrities such as Katie Price and Education Secretary, Michael Gove!

Lightwater Village Fete 2013 & 2014

2013



As part of our on-going fundraising campaign, we decided to try and get a space at our local summer village fete. They accepted and despite the terrible weather that day, managed to raise £80 and give out over 200 flyers advertising our website and Facebook page.



For a second year, the team decided to display at the Lightwater Village Fete. We decided to not only display the car, but also to hold a scaletrix lap time competition, which ties in with the electric racing theme! As with last year, the weather was awful. Despite this, we managed to raise £120!

Camberley Car Show 2014



This year, we contacted the organisers of the highly popular Camberley Car Show to ask to display at their event in August. The organisers loved the project and have given us a prime spot for the show in August alongside some great classic cars!

Collingwood End of year awards



Our school are incredibly proud of the work that we do with the Greenpower project. In 2013, our Principal awarded team leader Dan Martin and deputy team leader Dan Waite a special achievement award, for our outstanding dedication and achievement with the Greenpower project over the last 4 years. We then displayed the car after the event to many parents and stakeholders of the school and once again had an overwhelming response to what we do.

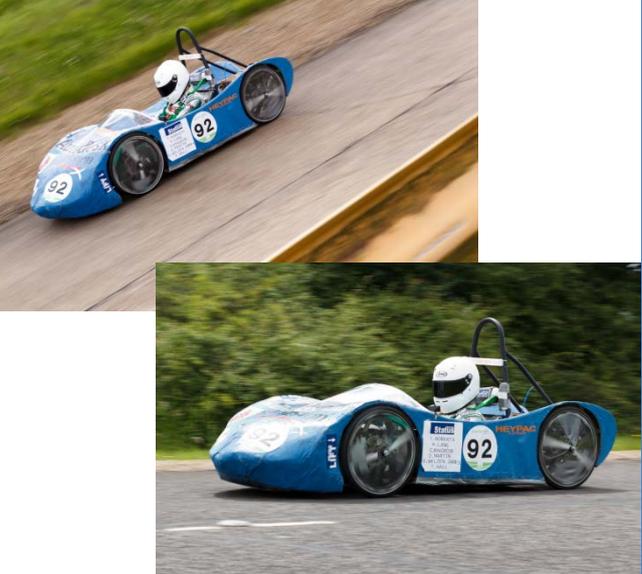
Testing

Before the races, we test the car in a mock up 'practice' 90 minute race. For this, we go to Bracknell Athletics track, where we have full use of the new 400m running track. We record data through our advanced speed controller, as well as time race laps – to work out what we need to do for our races.



Our races:

Since we started in 2010, we have raced in 11 races around the county at iconic race tracks such as Goodwood, Dunsfold (Top Gear Test Track), Rockingham, Ford Dunton in Essex and Bedford.

<p>Greater London Regional Heat 2011 at Dunsfold Park.</p>	<p>22nd</p>	
<p>Surrey School Games 2011 at Dunsfold Park.</p>	<p>1st</p>	
<p>Essex Regional Heat 2012 at Ford Dunton Tech Center.</p>	<p>5th</p>	

<p>Surrey School Games 2012 at Sandown Park.</p>	<p>4th</p>	
<p>Greater London Regional Heat 2012 at Dunsfold Park.</p>	<p>36th (race cancelled half way through)</p>	
<p>Central South Regional Heat 2013 at Goodwood.</p>	<p>37th</p>	
<p>Surrey Grand Prix 2013 at Dunsfold Park.</p>	<p>1st</p>	

<p>Essex Regional Heat 2013 at Ford Dunton Tech Center.</p>	<p>4th</p>	 
<p>Greater London Regional Heat 2013 at Dunsfold Park.</p>	<p>14th (Qualified for the final!)</p>	 
<p>2013 F24 National Final at Goodwood.</p>	<p>63rd</p>	  
<p>Central South Regional Heat 2014 at Goodwood.</p>	<p>22nd</p>	  

Our Sponsors

Our team has worked very hard to gain sponsorship from companies both big and small. We have always said that sponsorship is one of the most important things for a Greenpower team – as without any money, there will be no car!

Here are all of our sponsors since we started in 2010:

Autodesk -	£1,500
Collingwood College -	£1,000
David Martin Jewellers of Lightwater -	£800
Kingston Technology -	£500
Fab IT Welding -	Re-build of the MK1 car
Alex Naughton Coaches -	£300
Heypac -	£300
Talbot Construction -	£150
Oxford International College -	£100
Charismatic Cars -	£100
W.Godfrey and Sons-	£150
Surrey County Council -	Half the cost of the initial Kit Car.



Our website and social media:



Our website has been created by team members Dan Waite and Dan Martin and contains lots of information about the car, races and pictures. We have a lot of traffic on our site; with visitors from all around the world (we've had visitors from Belgium, America, New Zealand and China!)

www.statusracingteam.co.uk

We use our Facebook page as our main blog and how we document all of our progress. We have nearly 150 likes and have posted over 200 statuses.

www.facebook.com/statusracingteam



We have recently set up an Instagram and twitter account to show all of our pictures from build progress, testing and races. It is early days and hope to have many followers!

@status_racing

(for Instagram and twitter)



We would like to thank everyone that has supported our team over the last four years. I would also like to take the opportunity to thank Mr Winter and all of the Technology staff at Collingwood College for their dedication and hard work. Also, I would like to thank Brian Harris and Ed Beale for the re-construction of the MK1 kit car in aluminum.

Finally, we would like to thank Greenpower for organizing all of the fantastic events which we enter every year.



www.statusracingteam.co.uk