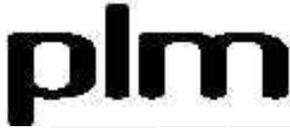


## Newsletter - May Edition

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Composites Institute

It has been another fantastic month for the Monash Motorsport. After an incredible effort by the team, major progress has been made in all areas of the project.

Design of the new car's major sub-systems has been effectively completed, including front and rear suspension, hubs and uprights, chassis, aerodynamics and driveline. All that remains is for detail design (as discussed later) to be completed.

Construction is also moving rapidly with the front chassis structure including suspension mounting points complete. The new wing profiles have been hot wire cut from foam (by our friends at Austuf) and extensive work has performed in preparing moulds for the final product. While overall completed components are minimal, nearly all sub-systems are underway. Expect a bumper issue next month featuring an extensive summary of newly completed components.

Quite possibly the best news is on the sponsorship front. As can be seen from the sponsor montage on the left, a number of new partners have joined with the team. Mercedes Benz, Huntsman Composites, J + R Aerospace, Bosch, John Hart Technology, NSK and Engineers Australia have committed various contributions to the team over the last month. Coupled with renewed commitments from long-time supporters Shell, Davies Craig, Route 66 and Austuf it has been a rewarding month. We hope this is evidence of the teams commitment to providing value and excitement to all our sponsors.

If this wasn't enough, the team has also purchased a MoTeC Data Acquisition system. Due to our rapid progress the new 2003 car it will be used as the test bed for the new logger while our 2002 vehicle will be utilised for driver training. The dynamic data from the MoTeC will allow on track and static tuning of vehicle kinematics and lead to quicker lap times at the competition.



## *Construction Progress*



Having developed the cockpit section of the car late March, April was spent completing the front chassis and beginning manufacture of the remainder of the vehicle.

Constructed on a perfectly level jigging table rigged by the team, the emphasis was on ensuring the suspension hard points were located as accurately as possible. Precision jigging apparatus were constructed, including the specially designed three-legged, counter-weighted, reinforced, all-thread device for locating bell cranks. This close attention to detail will ensure the suspension performs exactly as it was designed to.



A wholesale redesign of all mounting methods, coupled with extensive chassis optimisation has led to the front chassis weighing in at around 5kgs lighter than last year.

With suspension points located, work has begun on manufacturing the components for the suspension wishbones, which thanks to J & R Aerospace will be manufactured from Chrome-Moly Steel. This higher strength alloy steel will allow further weight to be removed from the suspension, helping reduce unsprung weight as well.



Engine development is also progressing with close attention being paid to the exhaust specification. Using an adjustable exhaust tuning kit the team will be able to optimise our primary and secondary lengths in order to maximise power. Further work is also planned on the intake and engine mapping to ensure the engine runs as efficiently as possible.

Finally the new 2003 wing profiles have been hot-wire foam cut as can be seen below. Featuring integral lips to allow moulds to be easily constructed, these blue foam plugs are undergoing the first stages of surface preparation prior to moulding. The final product will be manufactured using carbon fibre laid up inside the moulds. This will result in both a lighter structure and better surface finish.



## *Design Update*

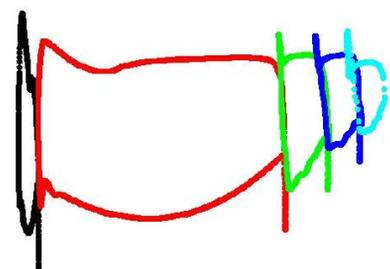
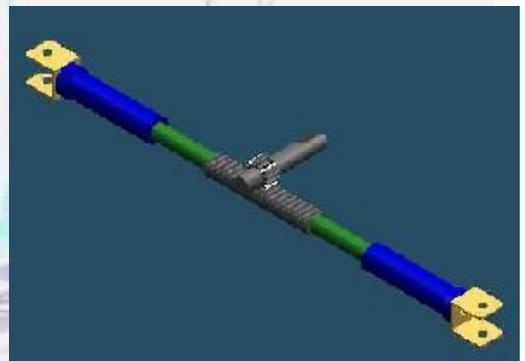
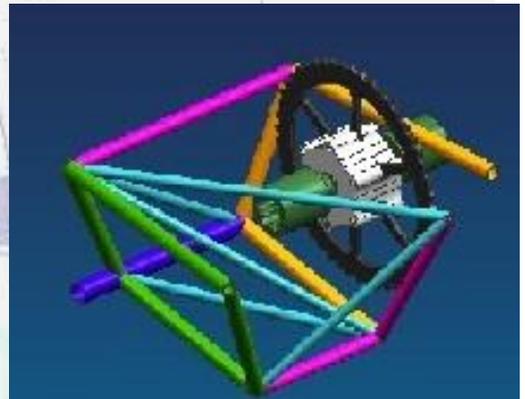
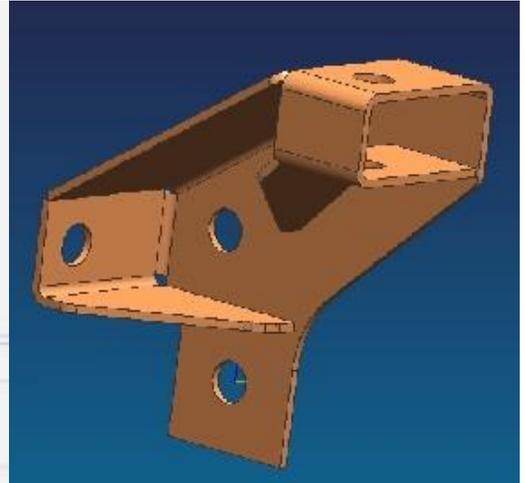
Design work is nearing completion, with details the primary focus at this stage. Extensive work this year has been directed at packaging and mounting of components. As can be seen from the pictures opposite, detailed 3D modelling has allowed packaging tolerances to be minimised and parts to be designed with multiple functions in mind. This all forms a part of the 2003 design philosophy to tighten up last years proven package. Simply put, emphasis is placed on integration and reducing weight.

Examples of clever integration include the new rear bell crank arrangement which doubles as a rear wing mount (keeping the downforce unsprung) and the new engine mounts. As can be seen in the top picture the folded steel mount performs three functions. To be laser cut from mild steel, it is a wishbone mount, engine mount and the rear bell crank mount combined.

Also displayed is the 2003 rear chassis and combined differential/sprocket. The close attention to packaging has allowed the rear chassis structure to benefit from improved structural efficiency without inheriting the problems associated with chain clearances in 2002.

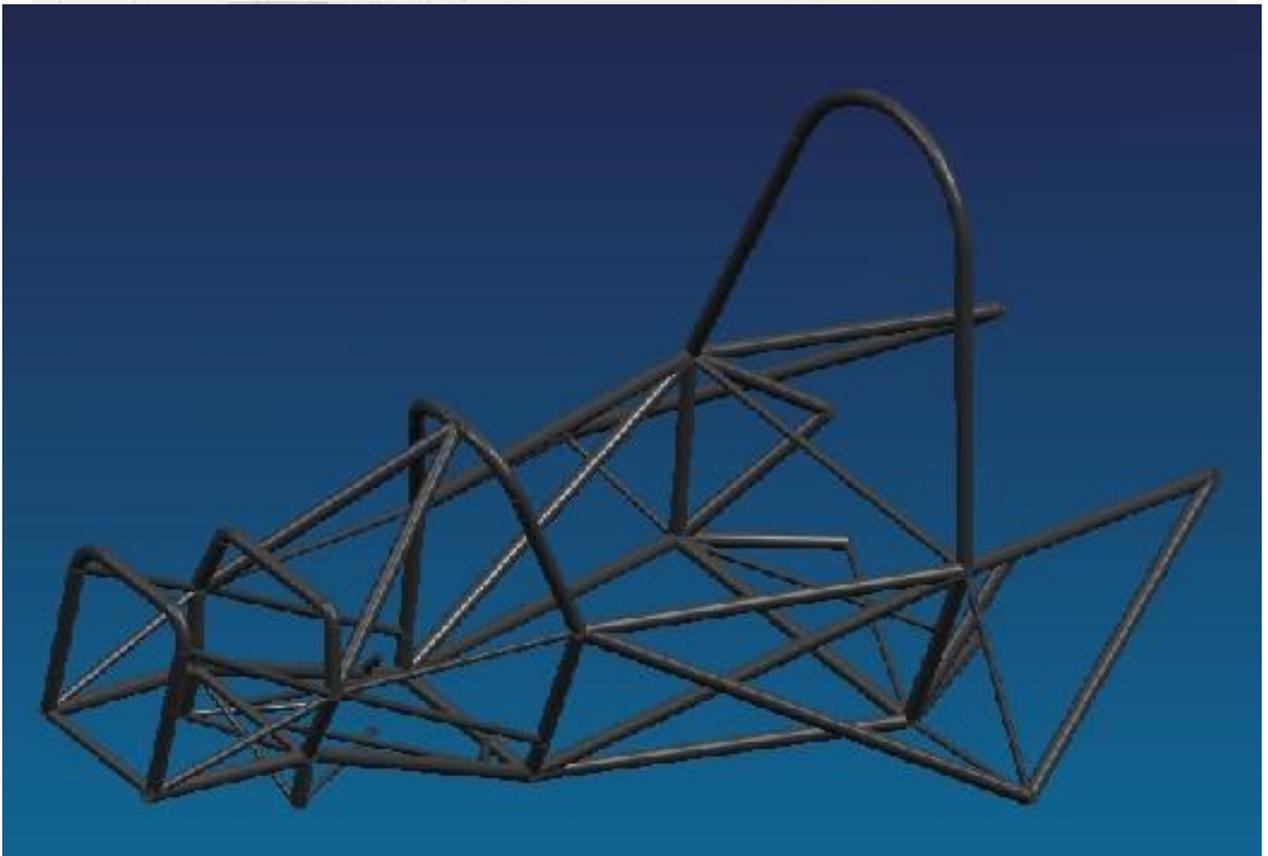
Also shown opposite is the custom designed steering rack. To be manufactured from hardened alloy steel it weighs 30% less than the 2002 rack. Furthermore a complete redesign of the mounting bushes has meant the manufacturing requirements of the design have been reduced markedly.

The final picture shows the wing pressure distribution across the surfaces of the first rear wing design iteration. Using this and other data has allowed the team to tune the profile to give the improved lift/drag characteristics. Not surprisingly the rear wing design was close to optimum and only slight changes have been made, however the front wing is significantly modified reflecting a greater understanding of wing performance in ground effect.



## *Unigraphics Progress Model*

To provide a visual idea of the teams construction progress, each month the Unigraphics 3D car model will be gradually unveiled as new components are constructed. As can be seen the only completed component is the front chassis. Many more parts are underway so stay tuned for the next issue when the car will begin to take shape.



## *Sponsor Feature - Huntsman Composites*



## **HUNTSMAN** *Composites*

Huntsman Composites have joined the Formula SAE team as a supplier of high performance composite materials to use in the manufacture of our wings and bodywork. Huntsman stock all the product necessary to manufacture any composite component. Among these products are carbon and glass fibre, resin (epoxy and polyester), and core cell (Divinycell) which have been supplied to the team. As can be seen on the left these products have been used extensively in the manufacture of the wing moulds. They will also feature heavily on the carbon fibre finished product.

Huntsman Composites are the place to visit for all your composite needs. The team are excited about having Huntsman on board as our official composite material supplier. We extend our gratitude to you.

## *Sponsor Feature - J & R Aerospace*



**J & R AEROSPACE PTY LTD**

J & R Aerospace manufacture a wide range of aircraft components, numbering over 400 types of standard replacement parts and a wide range of repair schemes. The company also has the capability to manufacture specific singular components at competitive prices.

On request, J & R have manufactured specific parts for war birds, historic aircraft, vintage cars, trucks, buses, boats and aircraft tools. J & R have a well equipped manufacturing facility comprising a wide range of standard machines through to the latest technology in computer numerical controlled (CNC) machines operated by highly skilled staff ready for action. Each member of the company is trained to ensure all are involved in the maintenance of an effective quality control system. J + R are supporting the team by supplying aircraft grade steel for use in our suspension components. Without their support the components would be heavier and less efficient. Thankyou J + R.

