



The Sundial

IOWA STATE UNIVERSITY SOLAR CAR RACING TEAM UPDATE

Volume 8, Issue 4, Winter-Spring 2005

www.prisum.iastate.edu

You're Invited!

by Justin Steinlage, Project Director

It has almost been two years since Team PrISUM's seventh solar car creation was released to the public, which means a couple of different things. First of all, it means that people that began working with Team PrISUM at the beginning of the Spectrum project are in the home stretch of their careers at Iowa State University. I, for one, am getting ready to begin my last summer as an undergraduate at ISU. It also means that another solar car, the eighth creation of Team PrISUM, is ready to be seen by the public for the first time; that is Fusion is going to be unveiled!

After two years of late nights at the garage, very few parties for members and literally thousands of man-hours, PrISUM Fusion is ready to be unveiled. Over the past several months Fusion has gone from thousands of individual components to a fully functioning, solar-powered race car. As you saw in the December issue of The Sundial, Fusion's chassis was

assembled to the point where it could be pushed around our parking lot. Since then, the



PrISUM Odyssey being unveiled almost 4 years ago. Odyssey was Team PrISUM's sixth solar raycer.

aero-body has been attached, 90% of the electrical system has been installed, and all mechanical systems have entered their 'ready for testing' stage.

What does all of that mean? It means that you are invited to see the white sheet lifted off of Fusion for the first time! On Saturday, April 16th, 2005, Team PrISUM will formally unveil it's eighth solar car creation, PrISUM Fusion. Fusion will be unveiled in the

Molecular Biology building Atrium on the Iowa State campus after a short ceremony beginning at 11:30 am. As you undoubtedly know, members of the team are extremely excited for this event, as many eat, drink and sleep solar car. We look forward to seeing you there, and please check our website, www.prisum.iastate.edu for more details and a map of the ISU campus with parking. If you have any questions, please do not hesitate to send us an email at solarcar@iastate.edu, or give us a call at 515-294-0899!

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Director's Note

by Justin Steinlage
Project Director

As the Fusion Project and my time here at ISU wind down, I look back and realize just how lucky I am. I came into Team PrISUm knowing very little, if anything, about engineering, teamwork, and building solar cars, but in my nearly four years at Iowa State I have been blessed with the opportunity of a lifetime. Not only have I learned the fundamentals of engineering in the classroom, but I have gotten the chance to build a solar car with a group of amazingly intelligent people while at the same time learning all of the skills essential to the survival of an engineer.

On top of it all, though we have had our share of problems, we have always been able to keep sight of the light at the end of the tunnel. Recurring sponsors of this team have repeatedly come through for us when we have most needed it. Whether it was Boeing with an extra cash boost this winter or an increase in support from the Iowa Energy Center last Fall, money has been tight but never absent. Combine the amazing support from our sponsors with the ability of team members to find the best deals for needed parts, and you end up with one of the most fortunate solar car Team Leaders - me!

So as this outstanding team begins the racing season this summer, I ask you to take the time to surf to our website to check up on team status during our qualifying event and races, and to look for Team PrISUm on the news. As we will continue to mention until the end of the project, we will be racing in the Formula Sun Grand Prix beginning May 18th, and finally in the North American Solar Challenge 2005 beginning July 17th. Thanks for your support, and look forward to seeing a successful racing season from Team PrISUm this summer!

Electrical Update

by Ryan Emerson, Strategy Leader

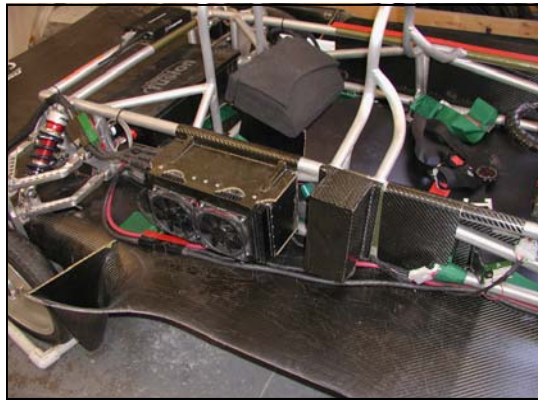
After a winter break of wiring, bundling, and zip-tying PrISUm Fusion sits on the ground wired and ready to hit the parking lots. In fact, Fusion has already driven under its own power for the first time, marking the beginning of testing for the Formula Sun Grand Prix this May. The pictures below show the final product. Don't worry if you can't see any wire as it is neatly tucked away.

In order to finish Fusion's electrical system, a new lithium-ion battery pack must be constructed. The 2003 pack has served us well but is beginning to show its age. In addition,

we have found a new battery cell that better will perform better considering the lower weight requirements for 2005. As our battery pack comes together, we would like to thank Alpha Wire for donating heat-shrink and wire, E. Jordan Brooks for bus bar, and Lighting Innovations for the use of an ultrasonic welder.

There has also been a lot of work put into the systems that don't go on the car itself. We have been busy creating computer software that will

log and display the telemetry data coming from the car, as well as computer simulations of the car itself. Our telemetry system allows us to monitor speed, voltage, currents, temperatures, and even blown fuses. Great care has been put into the interface so we can recognize change in readings more quickly. This will allow us to be more effective on the road to the finish line in July.



Fusion's main electrical system. As you can, or more appropriately can not see, wires are all wrapped and panels are all neatly covered.

In addition to our regular PC's, we will also have a handheld version of the telemetry console thanks to a donation from Intermec. Intermec donated two of their 700 series Pocket PC computers with wireless

connections which will be used to get quick measurements while working on the car. A big 'thank you' also is sent to Intermec.

In short, the electrical systems for PrISUm Fusion are coming together nicely, and we look forward to breaking them in on the roads this spring. Thank you everyone that has contributed to the electrical team, and look for updates as we approach the race this summer!

Leadership of Team PrISUm

Project Director—Justin Steinlage

Assistant Project Director/Treasurer—Kate Muhlbauer

Director of Systems Integration—Ryan Pfeiffer

Mechanical Systems—Joe Krueger & Ryan Ellis

Electrical Systems—Jared Leonard & Tom Noonan

Outreach and Safety —Kira Campos-Anderson & Chris Hassebroek

Strategy—Ryan Emerson

Fundraising—Amanda Helgeson

Mechanical Update

by Joe Krueger & Ryan Ellis, Co-Directors of Mechanical Systems

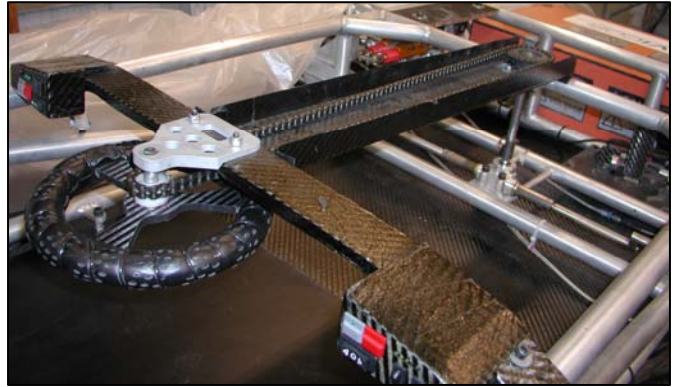
Welcome back to another edition of the Sundial and another update from your favorite mechanical team leaders! As the days go by, we are getting closer and closer to the final stage of this project, competition. Fortunately, we have already started to test Fusion without the solar array in the parking lot and have had no problems at all with the mechanical systems. These parking lot tests have served a dual purpose, including dynamic stability testing and driver training.

As many people leave at the end of each project, we have been training new drivers to handle Fusion through slalom, turning, and braking tests. As testing continues, we will move from the parking lot to the open road; so don't be surprised if you see us driving around Ames as well as the surrounding communities any time soon! During the rest of the testing phase for PrISUm Fusion we will be putting the car and drivers through rigorous testing to make sure Fusion is ready for Formula Sun Grand Prix, which is the track race in Topeka, Kansas this coming May, and the North American Solar Challenge this July.

In the coming weeks, we will be finishing up our show shell, which is the second body for our car that we were able to lay-up late last summer. Since the show shell will have no solar cells on it, we will be painting sponsor logos over the entire body. This shell is what will be used for a majority of our testing as well as the many outreach events that this car will be going to in its lifetime. The show shell will also be used during the inspection stage of Formula Sun Grand Prix in May, which will allow us to put as little wear and tear on the actual race cell with its fragile solar cells as possible before the race.

Finally, we would like to all of the sponsors that have helped to turn the mechanical and aerodynamic systems of Fusion into a reality. Without you, we wouldn't be able to see this project through to completion. Now without further delay, lets take a look at some pictures of Fusion's mechanical systems!

After months of hard work:



The race ready version of Fusion's steering system. This setup is very similar to what our last project used, only several machined and custom made parts make this system lighter and more user-friendly.



Fusion running the slalom in the Hilton Coliseum for the first time. Drivers reported significant improvement over Spectrum's handling performance during higher speed maneuvering.



Mech Team members Sarah and Hilda working on Fusion's show shell. Although the part looked acceptable coming out of the molds, we want to smooth out even the smallest defects on the show shell.

As promised, this issue we'd like to send a big thanks to everyone who has sponsored an Adopt-a-Tire...

Tire Identification:

Before we begin racing this summer we will mark each tire with its respective name. Above is our current supply of tires, which needs to be increased slightly before July. 47 race tires have been adopted as of now, which leaves 53 waiting for sponsorship. Looking for a way to help out? This could be for you! Simply send in your sponsorship, and we'll add your adopted tire to our roster!



Rayce Tire

Francine
Amy
Beth & Cathy
Elaine
Debbie
Leela
Ginger
Colette
Nicholette
Kristin
Liz
Lisa
Amber
Jessica
Vanessa
Jayne
Lynn & Lorrie
Laura
Gloria & Sybil
Holly
Kimberly
Nancy
Brianna
Jenny
Sara
Michelle

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Russell & Debbie Clegg
David & Brenda Helgeson
Creston Community School
Delores Maser
Doug & Lorrie Bacon
Paul & Bernice Exstrom
Vera Emerson
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Kendall Boyd
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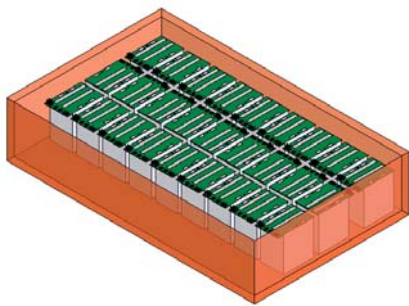
Jill
Erika & Emily
Shannon
Kathlene
Jeanne
Mary Lynn
Jean Ann
Bertha
Meghan
Betty
Lola
Angie
Annie
Julia
Alissa
Marcella & Avis

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Verneil & Donald Branstad
Donald Jayne
Puck Custom Enterprises
Andrew Shell
Mary McGregor James
Roger Glasnapp
Keith & Velma Mills
Kira Campos-Anderson
Harley & Betty Wilkinson
Butch & Debby Helgeson
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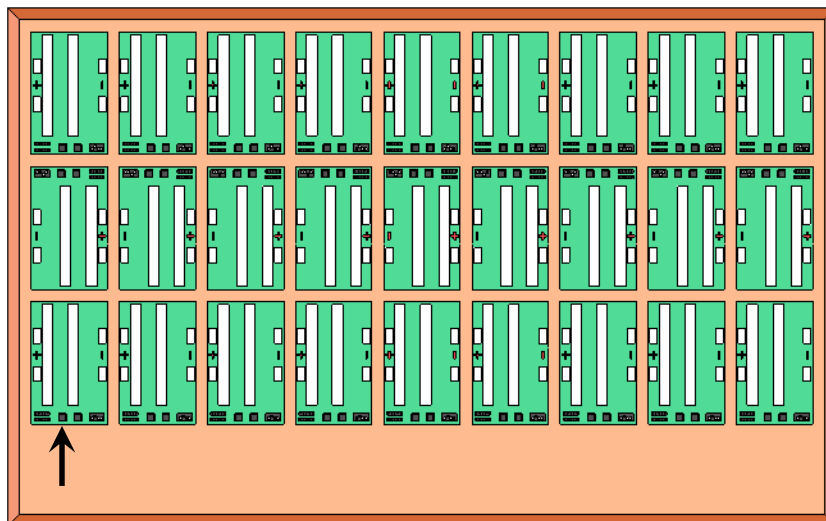


Ilene: Difficult to read here, race tire Ilene is shown to the left, mounted and ready to race on PrISUm Spectrum in July of 2003. Team PrISUm logs the performance of every race tire used.

... and also to our current Adopt-a-Battery sponsors!



Battery Locator: Battery modules can be identified from looking at the schematic at the right. Modules are labeled from left to right, bottom to top, beginning at the arrow to the right, in the order of adoption shown below.



Battery Module

Ihlefeld
Rollstin
Hempstead
Krueger
Thatcher
Allen
Ihlefeld 2

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Allen & Marie Ihlefeld
Larry & Judy Rollstin
Mr. Jean Hempstead
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Wilson
Diane
Rollstin 2
Helgeson
Olson
Clegg
Beth
Burns
Cox

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Gary & Diane Allen
Larry & Judy Rollstin
David & Brenda Helgeson
Olson Aluminum Castings
Randall & Linda Clegg
A. Beth Helgeson
John & Haley Burns
Ronald Cox

Fundraising Update

by *Amanda Helgeson, Fundraising Director*

With summer quickly approaching, all of us are getting very excited. Soon we'll be able to ditch the winter coats, pull out the shorts and sandals, and hit the road with Fusion! Until then, we have a lot of work to do, both in and out of the garage.

In the garage, we're working hard to build a fantastic solar car. Outside of the garage, we're trying to finance it. Given an unlimited budget, we would have the best of everything and we could spend all day just working on the car. Since we're just students and have to live in the real world, we have to work hard to make our dreams a reality.

We're still working very hard to fundraise the rest of the money we need to take Fusion from Texas up to Canada. We have been sending letters to family and friends, some of us have been asking individuals we live or work with, and some of us have been using large events, such as the ISU career fair, to let people know about us and our

needs. To sweeten sponsorships, we're still giving away free t-shirts with our adopt-a-program.

The response from our recent fundraising efforts has been good, but we still need more funding, nearly \$20,000, to compete this summer. Many people have been renewing their adopt-a-program sponsorships, which has helped out a great deal. If you haven't yet, we would like you to consider doing so now. Without the support of our family, friends, and sponsors, Team PRISUM would not exist.

I'd like to take this chance to thank everyone who has given anything to this project. So many of you work hard to get us what we need, so in return we are working incredibly hard for all of you. As this project comes together the hard work is definitely beginning to show. We can't wait to get the car out on the streets and show off our efforts, but until then we'll just keep working, and thank you all again; we couldn't have done any of this without your support.

Team PrISUm Thanks the Current Sponsors of PrISUm Fusion!

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3M

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Puck Custom Enterprises
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Mary McGregor James
Roger Glasnapp
Keith & Velma Mills
Kira Campos-Anderson
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Duane Krueger
Chris Hassebroek

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G.C. Hynos
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Brian & Marie Cooper
Mr. & Mrs. Jeff Emerson

Dear Supporters:

Thank you once again for your amazing support of our project. With your help we have been able to bring Fusion to life! With only three months of the current project left, we ask you to once again consider supporting us in our journey to rayce with the sun. And finally, make sure to check up on us this May as we race in the Formula Sun Grand Prix 2005!

Sincerely,
Justin Steinlage
Project Director, Team PrISUM