

SOLAR EXPRESS

NOVEMBER PROGRESS - 1998

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Race Route Details Unveiled

by Russ Moerland, Strategy Team Leader

Sunrayce '99 is looming in the not-to-distant future and details of the race route are becoming increasingly important. The route has changed somewhat since it was originally announced in March '98. The race begins on June 20 in Washington, D.C. and ends June 30 in Orlando, FL. A description of the days go as follows:

Day 1: Washington D.C. to Charlottesville, VA.

This is a nice opening day of about 115 miles. The downside is that traffic getting out of D.C. will be a nightmare tempered only by the fact that the race starts on a Sunday.

Day 2: Charlottesville, VA to Raleigh, NC.

This day stretches some 195+ miles and extends into the foothills of the Appalachian Mountains. My opinion is that this will probably be one of the most difficult days due to its length and terrain. It will quickly separate the good teams from the not-so-good teams.

Day 3: Raleigh, N.C. to Charlotte, NC.

This leg of Sunrayce is short on road miles at about 125, but it ends at the Charlotte Motor Speedway. This could prove to be an interesting challenge, but one we will enjoy. Having the end of day site at CMS will be nearly as exciting as starting Sunrayce 97 from the Indianapolis Motor Speedway.

Day 4: Charlotte, NC to Clemson, SC.

This day is moderately long at 150 miles. Some of the terrain may cause some problems, but doesn't appear to be of great concern at this time.

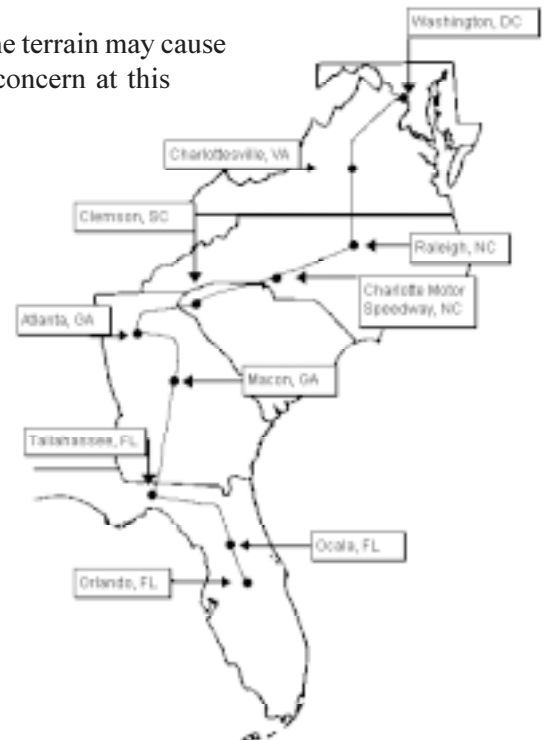
Day 5: Clemson, SC to Atlanta, GA.

This day is really short at 130 miles and will be the day before the rest day. The key to the day will be afternoon traffic as we enter the northern suburbs of Atlanta.

Day 6: Atlanta, GA to Macon, GA.

After spending the rest day in Atlanta recharging our batteries, this day will be mildly challenging. We start from Georgia Tech and making our way through the Atlanta rush hour traffic. The drive down to Macon is really nice with lots of great roads and high speed limits.

(continued on page 2)



Project Manager Memo

by *Jed Christiansen, Project Manager*

As you read this article, the University of Michigan Solar Car Team will have completed construction of our test chassis and be fully into the process of testing it. A test chassis is a critical step to a successful car. We will be able to prove our mechanical designs, and how they integrate with the electric drive portions of the final car. What we learn will be applied to final construction of our car, *MaizeBlaze*.

I would like to take some of this space to thank the incredibly hard-working members of our team. They have labored night and day to finish the test chassis. Their work, along with some great sponsors we've featured in this newsletter, have put us closer to our optimum schedule. The quality of design and construction that our team members have put into the car is amazing and should significantly raise the quality of our testing.

Saturday, December 12 will mark 190 days until the start of Sunrayce 99. We're approaching this date rapidly. Once we finish testing the test chassis, construction and assembly of *MaizeBlaze* will begin. If everything goes well, we will do final integration of *MaizeBlaze* by Spring Break in early March. It is our teams' goal to have at least 2500 miles of testing completed by the time Sunrayce 99 begins. That experience will prove critical to our final success.

I want to encourage all of you to please contact us with any questions, comments, or suggestions of things we can do or do better. We are always looking to improve ourselves and your input will be sincerely appreciated.

Race Route Breakdown

continued from Page 1

Day 7: Macon, GA to Tallahassee, FL.

This day is very monotonous and very long at almost 200 miles. The distance alone will be challenging. Traffic in and around Tallahassee may also present a problem.

Day 8: Tallahassee, FL to Ocala, FL.

This day will be nearly as monotonous as Day 7 with very flat terrain and about 200 miles to cover. The roads on this stretch are pretty good.

Day 9: Ocala, FL to Orlando, FL.

This is the shortest day of a very long race. At 81 miles it brings many surprises with hills one would not expect in the middle of Florida. Getting to the end of race site at the Epcot Center Parking Lot is very straight forward and relatively easy.

Overall, the race will cover some 1500 miles, crossing 5 states and going through some very large metropolitan areas. In general I think this will be a challenging race, which is good because if it weren't challenging we wouldn't have any fun racing it.

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**The University of Michigan
Solar Car Team would like to
wish you all Happy Holidays!**

Electrical Team Update

by Dave Jordan, Electrical Team Leader

The electrical team's "current" focus has been getting the test chassis' electrical system ready to roll, and it looks like we'll be right on schedule getting all finished up. By press time we'll be rolling down the road, finding out what works and what doesn't in our powertrain and bringing other systems online one by one. We are very excited to see how our systems will perform in actual simulated racing situations. A word of caution to our electrical hardware sponsors: I hope your tech support departments are ready, because as testing continues you can surely expect some calls from us!

In the meantime, all of the electrical system designs are being reviewed and produced for testing on the test chassis, and we will begin refining them as we decide how best to optimize our car/driver interaction, energy management, and all the "little details" that will help us come out on top in '99!

Mechanical Team Update

by Chris Ancona, Mechanical Team Leader

As the semester moves forward and with the start of the race growing closer and closer, the Mechanical Team works day and night to build the best car and team possible to bring the title of three-time National Champion to Ann Arbor.

To assure the best possible car, we are building a test chassis much like the one in the vehicle we will build for the race. This allows the team to learn manufacturing processes and assembly techniques, which is important since this car will be much different than our previous car, *Wolverine*. The test chassis also gives us an opportunity to test the design concepts we have spent the last year perfecting on paper and through computer analysis. We will put this chassis through a rigorous testing regimen to find and eliminate our weaknesses.

The test chassis is well on its way thanks to good teamwork and endless commitment from our sponsors. We have fabricated composite boards from fiber and core materials and assembled the structure. Components are being completed and assembled into the chassis. The University Test track is being cleaned and repaired so that the test vehicle can run on a track that can simulate what the race car will experience in normal road conditions. At the current pace, we are planning on having a fair amount of miles on the car before the holidays.



Team members posing for a picture after finishing a part layup for the test chassis.

Team members placing the Corex portion of the composite layup in the molds in preparation for placement in the composites oven.



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UNIVERSITY OF MICHIGAN SOLAR CAR TEAM

Ten Years Under the Sun

Buy-A-Cell Program

The University of Michigan Solar Car Team is celebrating ten years of successful racing with our fifth-generation car, *MaizeBlaze*. We will be competing in Sunrayce '99 across the East Coast in June 1999 and World Solar Challenge '99 across the Australian Outback in October of 1999.



To make a run for what could be our third national championship, we need your help! By "Buying" a Solar Cell for *MaizeBlaze's* solar array, you will be directly contributing to the success of our team. Your contribution also signifies your commitment to education and environmental objectives.

We hope that you will Buy-A-Cell and join the winning Michigan Solar Car Team tradition!

BENEFITS OF THE BUY-A-CELL PROGRAM

- CERTIFICATE WITH A MAP OF THE PLACEMENT OF YOUR SOLAR CELL ON *MAIZEBLAZE*
- SUBSCRIPTION TO SOLAR EXPRESS, THE SOLAR CAR TEAM NEWSLETTER
- RECOGNITION ON THE TEAM'S SUPPORT TRAILERS

We are also offering a special student's Buy-A-Cell package for \$25. Please call the Solar Car Team Office for more details.

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Name

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| | Qty. | Price |
|-------------------|------|-------|
| Solar Cell | | \$100 |

Total: _____

Payment by check only please.

SPONSOR SPOTLIGHT:

HILEX Corporation

by Chris Ancona, Mechanical Team Leader

This month we would like to recognize a sponsorship team that has allowed *MaizeBlaze* to have one of the lightest steering systems ever conceived in solar car racing. This team consists of **HI-LEX** and **Adwest Bowden**, which are wholly owned subsidiaries of TSK/Nippon cable. Nippon is the largest manufacture of control cables in the world serving the automotive, motorcycle, snowmobile, marine, industrial equipment, and many other industries all over the world. Adwest Bowden has contributed to *MaizeBlaze* by donating the newest and most efficient control cable technology ever seen in University of Michigan solar car racing.



*Chris Ancona with Robert Chrysler,
Chief Executive Officer of Hi-Lex.*



*The team at the
Hi-Lex Corporation
helping make
push-pull cables.*

Solar car racing becomes more competitive every year. The average speed for the winning team has increased by 8 MPH every year. The last two races have been won with a margin of victory under 20 minutes over a 9-day period. This means that we must improve our car substantially every year to keep ahead of the competition. The cables supplied by **HI-LEX** and **Adwest Bowden** have helped the team do just that; improve to get advantage. Through initial testing, the cables have proven themselves far superior to previous cable technology used on the vehicle *Maize&Blue*, which won a National Championship in 1993.

With good teamwork and dedicated sponsors like **HI-LEX** and **Adwest Bowden**, we will design and develop a vehicle that is capable of attaining the same status as *Maize&Blue*; a National Championship!

IN THE NEXT SOLAR EXPRESS

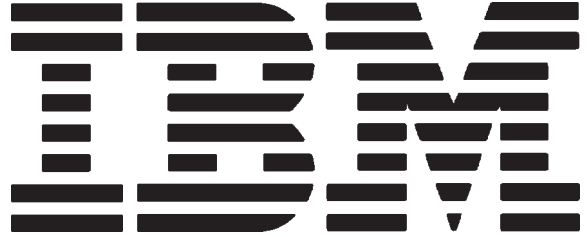
- PICTURES OF THE ROLLING TEST CHASSIS
- INTRODUCTION OF RACE CREW
- SPONSOR SPOTLIGHT : MSX AND CIBA
- AND LOTS MORE!



*This machine makes plastic tubing for one of
HI-LEX's components.*

MAIZEBLAZE

PLATINUM LEVEL



GOLD LEVEL

3M Automotive



DTE Energy



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Aero/Body Team Update

by Jason Kramb, Aero/Body Team Leader

During the past month, the Aero/Body team has been working hard to get the body molds ready for layups to start as soon as materials from Hexcell and Advanced Composites Group (ACG) arrive. The surface of the molds is looking very good, mostly due to the hard work and sanding time that the Aero/Body team has put into it. We did have some problems with cracks that were appearing in the surface. After some consultations with engineers at 3M the problem was quickly resolved and the cracks have all but disappeared.

In the mean time, many team members have been actively involved in getting the test chassis rolling and working on other Aero/Body areas. Designs of the ventilation system for the car are finished and molds for inlets and adapters will be machined very soon. The canopy design is also finished and is being sent to GE Plastics for molding and thermo-forming. The wheel well access doors have also been designed and the necessary parts are being ordered.

With the completion of the test chassis and the start of the race chassis just around the corner, all the design work will be finished as soon as possible.



Jason Kramb (right) and Joe Lambert (above) putting the finishing touches on the upper and lower body surface molds.

