



Soaring 220 feet above the intersection of I-70 & I-75 and seen by thousands of vehicles daily, this 120 foot wingspan monument to the Wright Flyer will symbolize Dayton, Ohio throughout the world.

# The Wright Icon News

Bringing an Icon to Dayton - The Birthplace of Aviation

Today's Modern Aerospace Hub - Tomorrow's Aviation Leader

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## UD Wind Tunnel Project Complete!

On April 27<sup>th</sup> our University of Dayton aeronautical engineering team (seniors Komahan Boopathy, Kramer Doyle, Emily Getter, and Venkat Madhav Kotha) gave the formal outbriefing and report on their wind tunnel study of our monument to Steve Brown's engineering committee. Overcoming the loss of several weeks of wind tunnel availability at the end of the project, they worked straight through their last weekend of availability and completed the testing!

The purpose of this project was to evaluate the lift and drag forces that will be generated by wind on the Flyer model 240' in the air. (The design must be able to accommodate those forces without fatigue, damage, or failure.) To that end, the UD team constructed two 18" tunnel models to mount in their 30" wind

tunnel and executed a test that allowed them to estimate the vertical forces that will be encountered by the Flyer on its pedestal. By comparing these estimated forces with the current design loads being used by our structural engineer, Shell & Meyer Associates, Inc., we hoped to gain a measure of confidence that those design loads are suitable.

The team used both models, one with

See [UD Project](#) on page 3

### INSIDE THIS ISSUE

- 1 UD Project Complete!
- 1 NASA Glenn Will Help
- 2 Join Wig at NAHF
- 3 Ruhs Retire From Board
- 4 Board Member Spotlight



Both 18" wind tunnel models - solid wing and perforated wing - used in UD wind tunnel test project

## NASA Glenn Will Help

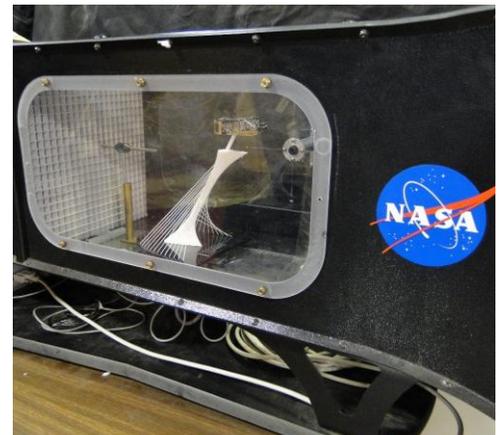
On June 5<sup>th</sup>, Chuck Stevens, George Mongon and Curt Nelson traveled to Cleveland to meet with representatives of NASA's Glenn Research Center. On an earlier visit in March (see the April 2012 newsletter) the Wright Image Group had discussed with Dr. Joe Shaw and Dr. Tom Benson the possibilities of obtaining NASA assistance with additional wind tunnel work that will be required to complete preliminary monument design. After that initial meeting Shaw and Benson secured the support of the Center Director, and subsequently the support of Charles Bolden, NASA's Administrator, to do whatever they could to help out, staying within the bounds of NASA policies. The most significant aspect of that support was authority for Benson and Shaw to contribute their time, when practical, without a separate charge code. Considering the technical knowledge, experience, and statewide contacts of those two gentlemen, that is huge!

Over and above what has been done by UD, NASA Glenn has unique resources to bring to bear on the Wright Monument's other design issues - including a 9' x 15' (0-140 knots) wind tunnel - the biggest in Ohio. They are also developing high speed photography in the wind tunnel as a source of data for flexure and loads. Then there is the Icing Branch which could provide invaluable assistance in coping with ice accumulation on the monument - potentially a major hazard.

See [NASA Glenn](#) on page 2

NASA Glenn from page 1

Benson said there are opportunities to schedule NASA's wind tunnel within the next year, and after two hours of discussion, a plan emerged. We will undertake two tasks this summer leading to that ultimate wind tunnel test. First, student interns under Tom Benson's supervision will utilize our current desk top model in NASA's 18" x 18" wind tunnel for some initial "explorations." While not a major effort, this will place the stamp of a NASA wind tunnel test on our monument. And in a parallel effort, Joe Shaw will pursue the use of "computational fluid dynamics" (CFD) to provide baseline data for validation in the wind tunnel. (CFD is a branch of fluid mechanics that uses numerical methods and algorithms with three dimensional computer models to analyze air flow around the model and the forces generated – similar to what's done in a wind tunnel.)



*Desktop model in NASA's 18" x 18" wind tunnel*

Shaw will utilize his contacts within the Ohio University system to see if any schools are capable and interested in implementing, as a student project, our monument's 3D model on CFD software and then running it on their computers. If successful, the WIG would need much less of that expensive wind tunnel time than otherwise. While there will be no formal agreement between NASA and the WIG, we plan to sign a letter of agreement spelling out the general roles of each party in this endeavor.

No funding for this effort will be available this year under the Space Act – something we earlier thought might be possible. But with the assistance of such formidable allies in NASA, we are confident other doors will open!

## Join WIG at the NAHF Enshrinement

The National Aviation Hall of Fame will hold its 50<sup>th</sup> Annual Enshrinement Dinner and Ceremony Saturday, October 6<sup>th</sup> at the Dayton Convention Center. As most of you know, Dayton almost lost this "Oscar Night for Aviation" in 2012, and possibly future years, to another competing city, but the community, including the National Aviation Heritage Alliance (of which WIG is a member) stepped up to the challenge and agreed to do more to support it. The Wright Image Group did our part, guaranteeing to fill two tables at the event by soliciting our members to purchase seats. We have met and surpassed that goal by filling three tables, but we would like to have more of our members there and there is still plenty of room for more! We can have as many tables as we can fill! They will all be grouped together and decorated with our own centerpieces.



Please join us! Call 937-276-2963 to reserve your seats at our Wright Image Group tables. We will invoice you for the total cost of your seats at \$150 each (\$85 of which is tax deductible), collect your payment, and forward the names of all our attendees and their payments to the NAHF by September 1<sup>st</sup>. The NAHF will send acknowledgement and invitation cards directly to you. Seating is available by advance reservation only, so don't delay.

The Welcome Reception is from 6:00 – 7:00 p.m. in the atrium. The dinner and ceremony are in the main ballroom from 7:00 – 10:00 p.m. The event is black tie (dark suit optional).

### [UD Project](#) from page 1

solid wings and the other with perforated wings, tested at different orientations and pitch angles in the tunnel to provide data on lift and drag generated by the wind from all directions around the Flyer. They encountered some technical issues (primarily due to scaling) not uncommon with this type of work, but were successful in obtaining some solid results. One of the most important is confirmation that the perforated wing will produce much lower forces than the solid wing. Our architect, Steve Brown, has been looking at perforated materials for some time now, and this supports his earlier decision. Of course, with this limited capability test setup, the primary focus was only on the vertical forces generated by the model.

In January of this year Shell & Meyer proposed raising the basic design wind speed (from 90 to 115 mph) as specified by an imminent new version of the applicable standard (ASCE 7-10). At the request of the WIG Design & Engineering Committee, however, they raised it more (to 172 mph), enough to achieve the committee-requested ultimate design wind load of 220 mph. (This wind velocity would be classified as an EF-5 tornado – an F-4 under the old classification system.) Forces on the Flyer at that wind speed would be between 102.6 lbs/ft<sup>2</sup> downward and 94.0 lbs/ft<sup>2</sup> upward. When scaled down to compare with wind tunnel results, these forces average about 18.3 lbs/ft<sup>2</sup>, which compares very favorably to the vertical force Shell & Meyer is using as a design criterion of 22.2 lbs/ft<sup>2</sup>. This means that the design load we are using is greater than those loads demonstrated in the UD Wind Tunnel. As Dick Meyer puts it, he is "...very comfortable proceeding with further design based on those loads."

Naturally, as design and testing proceed, there is always the possibility of unanticipated problems that will affect design. And we still have more work to do on estimating torsion and bending forces on that critical attachment point between the Flyer and its pedestal. Meanwhile, we are confident that our design is adequately conservative for this stage of development.

## Ruhs Assume Emeritus Status



Bob and Sally Ruh, members of the Wright Image Group Board of Directors since its inception in 2006, retired from active service on the Board in May 2012 to become Directors Emeritus. Both of them worked hard during their years of service to the WIG, coordinating presentations throughout the community to build support for the project, enlisting the support of friends and neighbors, and bolstering our morale with their good cheer and faithful work. Since December 2011, Sally served as Secretary of the Board and did an outstanding job with minutes and other documentation.

We will miss them terribly, but understand their wishes to assume a less demanding role. All the best to you, Bob and Sally. And from all of us, "Thank You!"

### Important Note to Members:

**In line with the new dues and donations policies established last year, the WIG has sent letters to all members who have paid a cumulative \$150 or more in dues over the years, and to all donors who have contributed cumulatively at least \$150. These letters acknowledge that level of support and advise the recipients that they have been awarded "permanent membership," obviating the need for any further dues payments. If you have met that threshold and have not received a letter, please call us at 937-276-2963 so we can rectify the error.**

**The Board reserves the right to modify the current annual dues rates and the permanent membership threshold in the future as appropriate.**

To join, make a donation, or get information explaining the different contribution and recognition levels, write to us at:

Monument  
1605 N. Main St  
Dayton, OH 45405

Annual Membership Dues\*

1 year - \$20  
2 years - \$35  
3 years - \$50

\*Applicable to Individuals, Families or Businesses

**Board Member Spotlight**



**Alex & Shayna Kolodesh**

Shayna is a native Daytonian and graduate of Miami University. She and her husband Alex run Singer Properties, a local commercial real estate development company. After completing her undergraduate degree in 1993, she moved to Chicago to pursue a career in furniture and interior design. In 1995, following her father's death and her mother taking ill, she returned to Dayton to take over the family business of real estate development. Faced with multiple business and life decisions, and with no particular training in business, law, or real estate she quickly learned to listen a lot and look for assistance in finding the answers to her many questions. She was fortunate that her father's vision and intellect led to his acquisition of strategically located parcels of land, making it easier to eventually develop them. Shayna and Alex work together to develop and manage the various properties in their portfolio while raising their two children. They primarily focus on projects in Troy and Butler Township, the future home of the iconic Wright Flyer Monument.

Singer Properties has committed to the Wright Image Group to provide the land at the southwest corner of I-70/75 upon which the monument will be built.

Expected Donation Pledge  
Payment Schedule

\$ Up to \$1000 - 1 month  
1001 to \$2500 - 3 months  
\$2501 to \$5000 - 6 months  
\$5001 to \$10,000 - 12 months  
\$10,001 to \$50,000 - 18 months  
\$50,001 to \$100,000 - 24 months  
Over \$100,000 - Negotiable

**Make checks payable to:**

**Aviation Heritage Foundation, Inc.**

With the following comment  
on the "For" line:

"Restricted for WIG"

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\*Directors Emeritus

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