



## ***Cessna Aircraft Company Raytheon Missile Systems AIAA Foundation***

The 2012 Cessna Aircraft Company/Raytheon Missile Systems/AIAA Design/Build/Fly Competition Flyoff was held at Cessna East Field in Wichita, KS on the weekend of April 13-15, 2012. This was the 16<sup>th</sup> year the competition was held. A total of 68 teams submitted written reports to be judged. At least 57 teams attended the flyoff, 54 of which completed the technical inspection. Approximately 500 students, faculty, and guests were present. Attendance was down this year due to a new rule limiting universities to a single team, however, the quality of the teams, their readiness to compete, and the execution of the flights was extremely high.

The primary design objectives for this year were performance based:

- Mission 1 was scored on the number of laps which could be flown in 4 minutes, so speed was important
- Mission 2 simulated carrying a specified passenger load for three laps, testing load-carrying ability.
- Mission 3 measured airplane time to climb with a two-liter water payload.

Total flight score was the sum of the three mission flight scores. As usual, the total score is the product of the flight score and written report score, divided by airplane empty weight. More details can be found at the competition website: <http://www.aiaadbf.org>

This year the flyoff was affected by significant weather events. Flights were suspended Saturday at 12:45PM by high winds, and when they did not subside by 2PM activities were terminated for the day. That night, a severe storm cell hit southeast Wichita and a tornado passed approximately  $\frac{1}{4}$  mile from Cessna East Field (see below). The hangar escaped damage – except for the food vendor trailer which was flipped – but downed power lines forced closure of the road to the site and prevented normal access. It was determined that the flyoff could not continue and a recovery plan was implemented to provide access through the main Cessna plant for teams to recover their property. We are all thankful that none of the teams experienced any property loss, and also that there weren't serious injuries to any of the Wichita population.

Despite this unprecedented weather event, two complete rotations through the flight queue were completed, and there were ten attempts at a third flight. By unanimous consensus of the DBF Organizing Committee, it was ruled that the winners of the competition would be based on the scores from the two complete rotations. This was considered the most fair, as the overwhelming majority of teams did not get an opportunity for a third attempt.

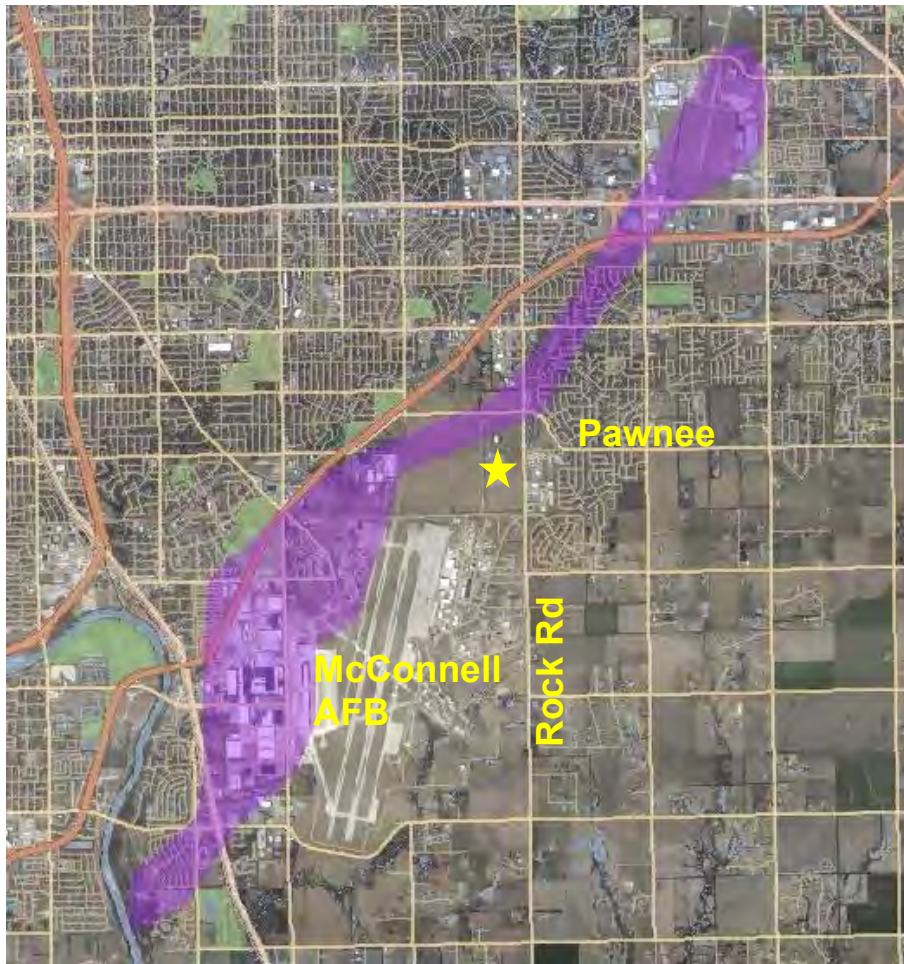
First place is awarded to San Jose State University: Team PhalanX, with the second highest report score, excellent flight scores, and second lowest RAC. Second place goes to University of California at Irvine: Angel of Attack, and third place to University of Colorado: H2Buffalo. It

should also be noted that Colorado and Irvine were the only two teams to complete all three missions, even though the third score ultimately was not used. This is a testament to their readiness to fly and to their final execution of the missions. Finally, special mention goes to Wichita State University for the highest report score at 96.50 (WSU also had the low RAC at 1.72 lb). The complete standings are listed in the table below.

We owe our thanks for the success of the DBF competition to the efforts of many volunteers from Cessna Aircraft, the Raytheon Missile Systems, and the AIAA sponsoring technical committees (Applied Aerodynamics, Aircraft Design, Flight Test, and Design Engineering). These volunteers collectively set the rules for the contest, publicize the event, gather entries, judge the written reports, and organize the flyoff. Thanks also go to the Corporate Sponsors: Cessna Aircraft, Raytheon Missile Systems, and the AIAA Foundation for their financial support. Special thanks go to Cessna Aircraft for hosting the flyoff this year.

Finally, this event would not be nearly as successful without the hard work and enthusiasm from all the students and advisors. If it weren't for you, we wouldn't keep doing it.

David Levy  
For the DBF Governing Committee



**Path of Tornado near 2012 DBF Competition Site, 4/14/2012**

## 2012 AIAA Design/Build/Fly Competition Final Results

| Place | Team # | University   | Report Score | M 1  | M 2  | M 3  | Flight Score | RAC  | Final Score |
|-------|--------|--|--------------|------|------|------|--------------|------|-------------|
| 1     | 3      | San Jose State University Team PhalanX               | 94.00        | 2.17 | 2.16 | 0.00 | 4.33         | 1.74 | 308.34      |
| 2     | 9      | University of California at Irvine Angel of Attack   | 90.50        | 2.00 | 1.99 | 0.00 | 3.99         | 3.74 | 186.76      |
| 3     | 12     | University of Colorado H2Buffalo                     | 90.00        | 1.67 | 2.01 | 0.00 | 3.67         | 3.48 | 177.16      |
| 4     | 6      | Istanbul Technical University ATA                    | 91.95        | 1.67 | 1.97 | 0.00 | 3.64         | 4.00 | 167.41      |
| 5     | 15     | University of Oklahoma Crimson Skies                 | 88.00        | 2.00 | 1.94 | 0.00 | 3.94         | 4.58 | 162.15      |
| 6     | 18     | Cornell Evil Dr Porkchop                             | 85.00        | 1.67 | 1.98 | 0.00 | 3.64         | 3.98 | 155.30      |
| 7     | 1      | Wichita State University WSU DBF                     | 96.50        | 1.83 | 0.00 | 0.00 | 1.83         | 1.72 | 134.90      |
| 8     | 45     | University of Illinois at Chicago                    | 72.00        | 2.00 | 1.93 | 0.00 | 3.93         | 4.86 | 128.32      |
| 9     | 37     | West Virginia University WVU Gold                    | 76.50        | 2.00 | 1.89 | 0.00 | 3.89         | 5.74 | 124.18      |
| 10    | 48     | Technion Spitwater                                   | 70.75        | 2.00 | 1.91 | 0.00 | 3.91         | 5.22 | 121.14      |
| 11    | 10     | The University of Texas-Austin BEVO                  | 90.38        | 1.83 | 0.00 | 0.00 | 1.83         | 2.60 | 102.76      |
| 12    | 8      | MIT Aquarium Falcon                                  | 91.00        | 2.00 | 0.00 | 0.00 | 2.00         | 3.18 | 102.06      |
| 13    | 2      | Cal Poly SLO   | 95.50        | 2.00 | 0.00 | 0.00 | 2.00         | 3.52 | 101.80      |
| 14    | 7      | Virginia Tech Maroon Monsoon                         | 91.00        | 1.83 | 0.00 | 0.00 | 1.83         | 2.96 | 96.97       |
| 15    | 21     | Georgia Tech   | 84.00        | 1.83 | 0.00 | 0.00 | 1.83         | 2.56 | 96.25       |
| 16    | 42     | University of Southern California PoSceidon          | 73.50        | 2.17 | 0.00 | 0.00 | 2.17         | 2.76 | 95.86       |
| 17    | 22     | University of Ljubljana Edvard Rusjan Slovenian Team | 83.75        | 2.17 | 0.00 | 0.00 | 2.17         | 3.60 | 95.64       |
| 18    | 5      | Purdue University                                    | 93.50        | 2.17 | 0.00 | 0.00 | 2.17         | 4.62 | 94.25       |
| 19    | 59     | Penn State University Hurricane                      | 58.00        | 1.83 | 1.90 | 0.00 | 3.73         | 5.50 | 92.26       |
| 20    | 4      | University of Notre Dame                             | 94.00        | 2.00 | 0.00 | 0.00 | 2.00         | 4.90 | 84.93       |
| 21    | 23     | Johns Hopkins University                             | 83.50        | 1.83 | 0.00 | 0.00 | 1.83         | 3.48 | 82.06       |
| 22    | 14     | University of California Los Angeles Jet Bruin       | 88.50        | 1.67 | 0.00 | 0.00 | 1.67         | 3.24 | 81.94       |
| 23    | 26     | Middle East Technical University Nymph Noir          | 82.00        | 1.50 | 0.00 | 0.00 | 1.50         | 2.58 | 76.58       |
| 24    | 61     | University of Central Florida Aeroknightical         | 52.50        | 1.83 | 1.84 | 0.00 | 3.68         | 6.96 | 73.17       |
| 25    | 43     | San Diego State University Mini Monty                | 73.00        | 1.83 | 0.00 | 0.00 | 1.83         | 3.38 | 72.80       |
| 26    | 46     | La Sapienza Sapienza Flight Team                     | 71.00        | 1.50 | 0.00 | 0.00 | 1.50         | 2.22 | 71.48       |
| 27    | 13     | Auburn University                                    | 89.50        | 1.83 | 0.00 | 0.00 | 1.83         | 6.02 | 66.88       |
| 28    | 35     | Daniel Webster College Significant Figures           | 77.00        | 1.83 | 0.00 | 0.00 | 1.83         | 4.56 | 66.11       |
| 29    | 47     | Rensselaer Polytechnic Institute Redhawks            | 71.00        | 1.67 | 0.00 | 0.00 | 1.67         | 4.06 | 58.73       |
| 30    | 32     | Arizona State University Air Devils                  | 78.25        | 1.67 | 0.00 | 0.00 | 1.67         | 6.02 | 53.15       |
| 31    | 24     | University of Arizona                                | 83.00        | 1.50 | 0.00 | 0.00 | 1.50         | 7.12 | 46.66       |
| 32    | 36     | The University of Alabama High Tide                  | 77.00        | 1.67 | 0.00 | 0.00 | 1.67         | 7.82 | 45.89       |
| 33    | 41     | Monroe Community College Flying Tribunes             | 74.00        | 1.33 | 0.00 | 0.00 | 1.33         | 4.94 | 44.39       |
| 34    | 39     | University of Arkansas Swine Flew                    | 74.50        | 1.50 | 0.00 | 0.00 | 1.50         | 6.34 | 44.38       |
| 35    | 55     | Western Michigan University Pegasus                  | 64.25        | 1.67 | 0.00 | 0.00 | 1.67         | 6.12 | 43.29       |
| 36    | 28     | Turkish Air Force Academy Scorpion Team              | 80.00        | 1.50 | 0.00 | 0.00 | 1.50         | 8.02 | 42.37       |
| 37    | 44     | North Dakota State University Bison Bombers          | 72.00        | 1.33 | 0.00 | 0.00 | 1.33         | 6.36 | 38.07       |
| 38    | 31     | University at Buffalo                                | 79.00        | 1.17 | 0.00 | 0.00 | 1.17         | 8.78 | 31.10       |
| 39    | 63     | New Mexico State NMSU 3.0 TFW                        | 49.25        | 1.33 | 0.00 | 0.00 | 1.33         | 8.24 | 22.88       |

## 2012 AIAA Design/Build/Fly Competition Final Results (Cont'd)

| Place | Team # | University  | Report Score | M 1  | M 2  | M 3  | Flight Score | RAC | Final Score           |
|-------|--------|---|--------------|------|------|------|--------------|-----|-----------------------|
| 40    | 11     | Embry-Riddle Aeronautical University Phoenix  | 90.00        | 0.00 | 0.00 | 0.00 | 0.00         | 70  | Flight Attempt        |
| 41    | 19     | Anadolu University Kasif-2  | 84.25        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 42    | 30     | Rose-Hulman Aeolus  | 79.50        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 43    | 33     | University of Florida SLUF  | 78.00        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 44    | 38     | University of Nebraska-Lincoln  | 75.50        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 45    | 50     | CASE WESTERN RESERVE UNIVERSITY   | 69.50        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 46    | 53     | Khalifa University KUSTAR Team  | 67.75        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 47    | 54     | New Mexico Tech Flying Miners   | 67.00        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 48    | 57     | University of Alaska Fairbanks Polar Thunder  | 60.66        | 0.00 | 0.00 | 0.00 | 0.00         | 70  |                       |
| 49    | 16     | Erciyes University AirErciyes2 Team   | 86.70        | 0.00 | 0.00 | 0.00 | 0.00         | 80  | Completed Tech        |
| 50    | 17     | Washington State University Stall & Fall  | 86.00        | 0.00 | 0.00 | 0.00 | 0.00         | 80  |                       |
| 51    | 27     | UCSD TLARXII  | 80.05        | 0.00 | 0.00 | 0.00 | 0.00         | 80  |                       |
| 52    | 29     | Columbia University   | 79.50        | 0.00 | 0.00 | 0.00 | 0.00         | 80  |                       |
| 53    | 52     | TOBB University of Economics and Technology Hezarfen 2 Team                         | 68.36        | 0.00 | 0.00 | 0.00 | 0.00         | 80  |                       |
| 54    | 62     | Ghulam Ishaq Khan Institute Of engineering sciences and Technology Pakistan Avrocar | 52.00        | 0.00 | 0.00 | 0.00 | 0.00         | 80  |                       |
| 55    | 34     | University of Alabama in Huntsville Charging for Flight                             | 77.63        | 0.00 | 0.00 | 0.00 | 0.00         | 90  | Partial Tech          |
| 56    | 64     | University of Massachusetts Lowell River Hawk                                       | 48.25        | 0.00 | 0.00 | 0.00 | 0.00         | 90  |                       |
| 57    | 65     | University of Miami Flying Shalala  | 46.50        | 0.00 | 0.00 | 0.00 | 0.00         | 90  |                       |
| 58    | 20     | CCNY FlyingBeaver   | 84.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 | Did not Attend Flyoff |
| 59    | 25     | Duke University   | 82.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 60    | 40     | Concordia University The Stinger  | 74.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 61    | 49     | NATIONAL INSTITUTE OF TECHNOLOGY JAMSHEDPUR TEAM PHOENIX                            | 69.50        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 62    | 51     | Syracuse University Team Flying Orange  | 68.70        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 63    | 56     | Chulalongkorn University Team Knight Hawk   | 63.50        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 64    | 58     | University of Maryland  | 59.50        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 65    | 60     | Ohio State University   | 57.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 66    | 66     | Indian Institute for Aeronautical Engineering & Information Technology The Falcons  | 40.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 67    | 67     | University of New Hampshire Wildcats  | 30.00        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |
| 68    | 68     | Lehigh University   | 22.75        | 0.00 | 0.00 | 0.00 | 0.00         | 100 |                       |



***First Place Winner: San Jose State University: Team PhalanX.***



***Second Place Winner: University of California at Irvine: Angel of Attack.***



***Third Place Winner: University of Colorado: H2Buffalo.***