

The 2018 AIAA/Textron Aviation/Raytheon Missile Systems Design/Build/Fly Competition Flyoff was held at Cessna East Field in Wichita, KS on the weekend of April 19-22, 2018. This was the 22nd year for the competition. A total of 134 entries were received along with proposals with each entry. The 134 proposals were judged and 101 teams were invited to submit a formal report for the next phase of the competition. 91 teams submitted design reports to be judged, and 77 teams attended the flyoff (16 international), a new DBF record! About 750 students, faculty, and guests were present. The cold and rainy weather reduced the number of flying hours on Saturday, but we still had 245 flight attempts over the weekend. Of the 245 official flight attempts, 153 resulted in a successful score with 50 teams achieving at least one successful flight score and 24 teams successfully completing all three missions. The quality of the teams, their readiness to compete, and the execution of the flights continues to improve each year.

The contest theme this year was a Regional and Business Aircraft. The aircraft was required to fly a combination of passengers and payload as well as demonstrate the ability to conduct LRU replacement in the field. The first mission was a Staging Flight with no payload for three laps. Prior to attempting the second mission, each team was required to successfully complete the first mission and the ground mission. The ground mission consisted of replacing a randomly selected simple LRU followed by a complex LRU all within 8 minutes. The second mission was a Short Haul of Max Passengers with the passengers being a randomly selected distribution of five different sizes of bouncy balls and the score based on the # of passengers selected by each team divided by the time to fly three laps. The third mission was a Long Haul of Passengers and Payload where each team selected the number of passengers with at least 50% of the number carried in Mission 2 as well as payload blocks with the score being the product of the number of passengers times the total payload weight times the number of laps flown. The total score is the product of the total mission score and design report score divided by the RAC, which was empty weight times the wingspan. More details on the mission requirements can be found at the competition website: http://www.aiaadbf.org.

First Place went to the <u>Clarkson University</u>, Second Place went to <u>Virginia Polytechnic Institute and State University</u> and Third Place went to <u>Georgia Institute of Technology</u>. A full listing of the results is included below. The Best Paper Award, sponsored by the Design Engineering TC for the highest report score, went to University of Southern California with a score of 93.20.

We owe our thanks for the success of the DBF competition to the efforts of many volunteers from Textron Aviation, 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 Premier Sponsors: Raytheon Missile Systems and Textron Aviation, and also to the AIAA Foundation for their financial support as well as our Gold sponsors this year – Airbus, Aerovironment, Aurora Flight Sciences, General Atomics, Lockheed Martin, and MathWorks. Special thanks go to Textron Aviation 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.

Brian Richardet For the DBF Organizing Committee

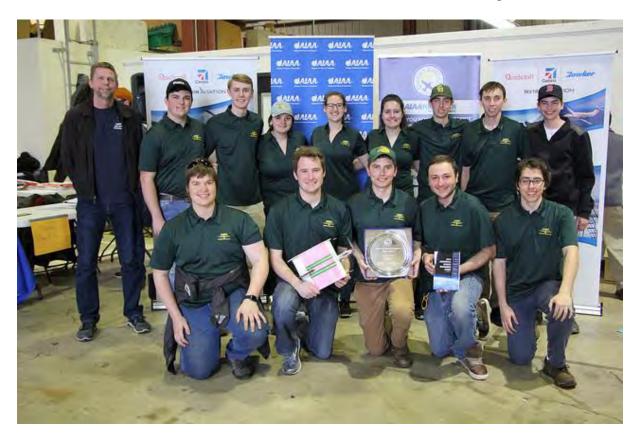
2018 Design/Build/Fly Competition Final Results

| | Team | | Report | Mission Scores | | | | RAC | 2018 DBF |
|------|-------|--|----------|----------------|------|------|------|--------|----------|
| Rank | Qeue# | Name | . Report | 1 | 2 | | | | SCORE |
| 1 | 2 | Clarkson University | 93.05 | 1.00 | 0.04 | 2.00 | 3.04 | 4.84 | 58.39 |
| 2 | 30 | Virginia Polytechnic Institute and State University | 81.10 | 1.00 | 0.04 | 2.00 | 3.04 | 10.40 | 23.75 |
| 3 | 6 | Georgia Institute of Technology | 89.87 | 1.00 | 0.05 | 2.00 | 3.05 | 16.53 | 16.57 |
| 4 | 5 | Faculty of Mechanical Engineering, University of Ljubljana | 90.67 | 1.00 | 0.26 | 2.02 | 3.28 | 19.85 | 14.98 |
| 5 | 54 | The University of Texas at Austin | 72.92 | 1.00 | 0.03 | 0.00 | 1.03 | 5.64 | 13.32 |
| 6 | 1 | University of Southern California | 93.20 | 1.00 | 0.04 | 0.00 | 1.04 | 7.81 | 12.41 |
| 7 | 29 | University of California, Irvine | 81.33 | 1.00 | 0.00 | 0.00 | 1.00 | 8.03 | 10.13 |
| 8 | 42 | Alfred University | 76.57 | 1.00 | 0.05 | 2.00 | 3.05 | 25.02 | 9.33 |
| 9 | 59 | Embry-Riddle Aeronautical University Daytona Beach | 69.92 | 1.00 | 0.16 | 2.01 | 3.17 | 28.71 | 7.73 |
| 10 | 40 | Pennsylvania State University | 77.10 | 1.00 | 0.04 | 2.00 | 3.04 | 32.10 | 7.31 |
| 11 | 50 | Franklin W. Olin College of Engineering | 73.52 | 1.00 | 0.05 | 2.00 | 3.05 | 36.00 | 6.22 |
| 12 | 18 | Wichita State University | 84.50 | 1.00 | 0.08 | 2.00 | 3.08 | 42.66 | 6.10 |
| 13 | 7 | University of Colorado Boulder | 89.40 | 1.00 | 0.04 | 2.00 | 3.05 | 53.28 | 5.11 |
| 14 | 3 | Oregon State University | 92.67 | 1.00 | 0.00 | 0.00 | 1.00 | 18.48 | 5.01 |
| 15 | 25 | Western Michigan University | 82.00 | 1.00 | 0.10 | 0.00 | 1.10 | 20.95 | 4.32 |
| 16 | 15 | FH JOANNEUM University of Applied Sciences Graz | 86.33 | 1.00 | 0.22 | 2.03 | 3.26 | 70.99 | 3.96 |
| 17 | 35 | University of Oklahoma | 78.87 | 1.00 | 0.00 | 0.00 | 1.00 | 23.66 | 3.33 |
| 18 | 22 | Utah State University | 84.00 | 1.00 | 0.15 | 2.04 | 3.19 | 80.72 | 3.31 |
| 19 | 16 | Chulalongkorn University | 85.73 | 1.00 | 0.24 | 0.00 | 1.24 | 41.25 | 2.57 |
| 20 | 55 | Khalifa University | 71.48 | 1.00 | 0.61 | 2.53 | 4.14 | 124.09 | 2.38 |
| 21 | 31 | Stanford University | 80.78 | 1.00 | 2.00 | 6.00 | 9.00 | 359.24 | 2.02 |
| 22 | 4 | Colorado School of Mines | 92.00 | 1.00 | 0.19 | 2.00 | 3.19 | 172.55 | 1.70 |
| 23 | 61 | Rochester Institute of Technology | 69.32 | 1.00 | 0.20 | 0.00 | 1.20 | 49.59 | 1.68 |
| 24 | 72 | Princeton University | 61.97 | 1.00 | 0.25 | 2.01 | 3.26 | 131.54 | 1.54 |
| 25 | 10 | Rashtreeya Vidyalaya College of Engineering | 88.80 | 1.00 | 0.13 | 0.00 | 1.13 | 73.31 | 1.37 |
| 26 | 34 | The Hong Kong University of Science and Technology | 79.42 | 1.00 | 0.40 | 0.00 | 1.40 | 83.39 | 1.33 |
| 27 | 47 | University of Tennessee, Knoxville | 74.80 | 1.00 | 0.20 | 2.02 | 3.21 | 189.15 | 1.27 |
| 28 | 12 | The Ohio State University | 86.77 | 1.00 | 0.09 | 0.00 | 1.09 | 79.85 | 1.18 |
| 29 | 51 | University of California, San Diego | 73.32 | 1.00 | 0.04 | 0.00 | 1.04 | 70.88 | 1.08 |
| 30 | 56 | University of Nebraska-Lincoln | 70.83 | 1.00 | 0.43 | 2.23 | 3.66 | 270.22 | 0.96 |
| 31 | 71 | University of Kansas | 62.20 | 1.00 | 0.63 | 2.10 | 3.73 | 246.00 | 0.94 |
| 32 | 79 | Rzeszow University of Technology | 49.40 | 1.00 | 0.00 | 0.00 | 1.00 | 56.56 | 0.87 |
| 33 | 57 | University of Turkish Aeronautical Association | 70.40 | 1.00 | 0.00 | 0.00 | 1.00 | 81.41 | 0.86 |
| 34 | 53 | Case Western Reserve University | 72.95 | 1.00 | 0.00 | 0.00 | 1.00 | 91.11 | 0.80 |
| 35 | 32 | Saint Louis University | 80.33 | 1.00 | 0.00 | 0.00 | 1.00 | 105.99 | 0.76 |
| 36 | 20 | University of Maryland | 84.38 | 1.00 | 0.05 | 0.00 | 1.05 | 120.26 | 0.73 |
| 37 | 43 | Rutgers University | 76.50 | 1.00 | 0.00 | 0.00 | 1.00 | 111.65 | 0.69 |
| 38 | 65 | Johns Hopkins University | 68.08 | 1.00 | 0.00 | 0.00 | 1.00 | 108.90 | 0.63 |
| 39 | 66 | University of Notre Dame | 67.67 | 1.00 | 0.55 | 2.27 | 3.82 | 435.12 | 0.59 |
| 40 | 37 | Ghulam Ishaq Khan Institute of Engineering Sciences and Technology | 77.78 | 1.00 | 0.00 | 0.00 | 1.00 | 140.04 | 0.56 |
| 41 | 38 | Arizona State University | 77.50 | 1.00 | 1.04 | 3.20 | 5.24 | 830.78 | 0.49 |
| 42 | 14 | Rensselaer Polytechnic Institute | 86.65 | 1.00 | 0.00 | 0.00 | 1.00 | 204.84 | 0.42 |
| 43 | 39 | Rose-Hulman Institute of Technology | 77.33 | 1.00 | 0.00 | 0.00 | 1.00 | 228.76 | 0.34 |
| 44 | 19 | University of Houston | 84.42 | 1.00 | 0.59 | 0.00 | 1.59 | 448.45 | 0.30 |
| 45 | 62 | Universidad de San Buenaventura Bogota | 68.83 | 1.00 | 0.34 | 2.02 | 3.36 | 967.18 | 0.24 |
| 46 | 78 | University of South Alabama | 52.00 | 1.00 | 0.10 | 2.00 | 3.11 | 763.04 | 0.21 |
| 47 | 36 | North Carolina State University | 78.17 | 1.00 | 1.11 | 0.00 | 2.11 | 944.40 | 0.17 |
| 48 | 68 | The University of Texas Rio Grande Valley | 66.00 | 1.00 | 0.00 | 0.00 | 1.00 | 535.69 | 0.12 |
| 49 | 87 | North Dakota State University | 10.83 | 1.00 | 0.04 | 2.01 | 3.05 | 279.46 | 0.12 |
| 50 | 8 | University of California, Los Angeles | 89.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

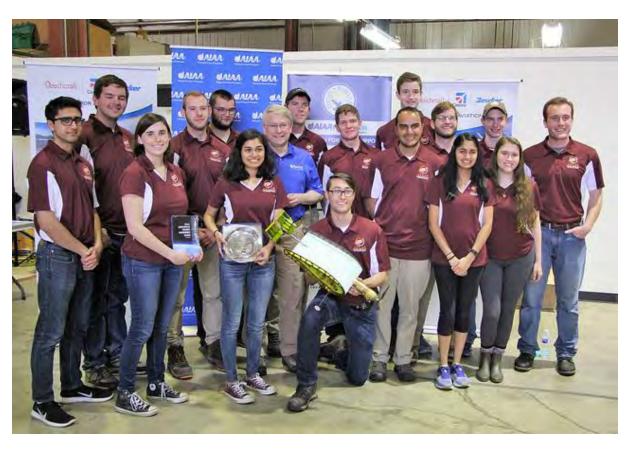
2018 Design/Build Fly Competition Final Results (cont)

| David | Team | | Report | Mission Scores | | | | RAC | 2018 DBF |
|-------|-------|---|--------|----------------|------|------|-------|---------|----------|
| Rank | Qeue# | Name | | 1 | 2 | 3 | Total | | SCORE |
| 51 | 9 | Cornell University | 88.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 52 | 11 | Massachusetts Institute of Technology | 87.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 53 | 13 | University of Michigan | 86.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 54 | 17 | Auburn University | 85.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 55 | 21 | Lehigh University | 84.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 56 | 23 | University at Buffalo | 83.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 57 | 24 | University of Massachusetts Lowell | 83.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 58 | 26 | University of Alaska Fairbanks | 81.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 59 | 27 | Rice University | 81.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 60 | 28 | University of Florida | 81.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 61 | 33 | West Virginia University | 79.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 62 | 41 | University of Glasgow | 76.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 63 | 44 | Rowan University | 76.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 45 | Washington University in St. Louis | 75.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 65 | 46 | University of Minnesota Twin Cities | 74.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 66 | 48 | Embry-Riddle Aeronautical University Prescott Campus | 74.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 67 | 49 | University of Miami | 74.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 68 | 52 | Manhattan College | 73.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 58 | University of Pennsylvania | 70.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 | 60 | University of Arizona | 69.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 63 | University of Arkansas | 68.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 72 | 64 | Iowa State University | 68.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 67 | SRM UNIVERSITY | 67.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 74 | 69 | Rhodes College | 63.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 75 | 70 | University of Illinois at Urbana-Champaign | 63.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 76 | 73 | Purdue University | 61.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 77 | 74 | Florida Institute of Technology | 58.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 78 | 75 | University of Petroleum and Energy Studies | 58.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 76 | University Of Illinois at Chicago | 55.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 77 | Illinois Institute of Technology | 53.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 81 | 80 | Yildiz Technical University | 47.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 81 | Nanyang Technological University, Singapore | 47.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 83 | 82 | Cairo University | 47.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 84 | 83 | University of Georgia | 46.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 84 | Ohio University | 43.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 86 | 85 | University of Maryland, Baltimore County | 40.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 87 | 86 | The University of Sydney | 34.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 88 | 88 | Military Technical College | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1371.08 | 0.00 |
| 89 | 89 | National Defense University Turkish Air Force Academy | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 90 | 90 | Uludag University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 91 | 91 | Sarhad University Of Information Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

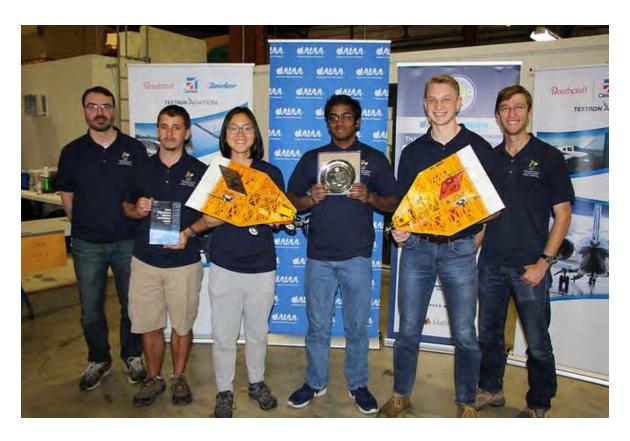
First Place - Clarkson University

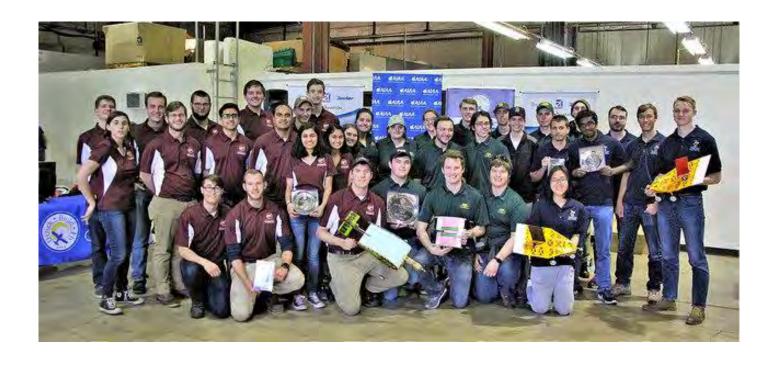


Second Place - Virginia Tech



Third Place - Georgia Tech



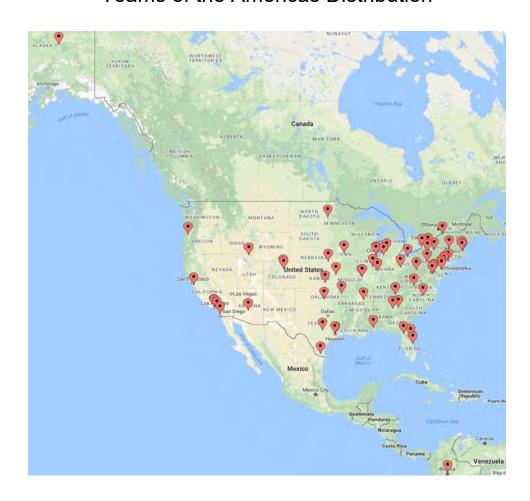


Past Winners

| Year | Team |
|------|--|
| 2018 | Clarkson University |
| 2017 | University of Southern California |
| 2016 | San Jose State University |
| 2015 | University of Ljubljana |
| 2014 | University of Southern California |
| 2013 | University of California Irvine |
| 2012 | San Jose State University |
| 2011 | Georgia Tech University |
| 2010 | Oklahoma State University Team Orange |
| 2009 | Oklahoma State University Team Black |
| 2008 | Oklahoma State University Team Black |
| 2007 | Massachusetts Institute of Technology |
| 2006 | Oklahoma State University Team Black |
| 2005 | Oklahoma State University Team Black |
| 2004 | Oklahoma State University Team Black |
| 2003 | San Diego State University |
| 2002 | University of California San Diego |
| 2001 | Oklahoma State University Team Orange |
| 2000 | Utah State University |
| 1999 | Utah State University |
| 1998 | University of Southern California |
| 1997 | University of Illinois at Urbana-Champaign |



Teams of the Americas Distribution



International Teams Distribution

