

The 2018-19 AIAA/Textron Aviation/Raytheon Missile Systems Design/Build/Fly Competition Flyoff was held at TIMPA Field in Tucson, AZ on the weekend of April 11-14, 2019. This was the 23rd year for the competition. Of the 138 proposals submitted and judged, 113 teams were invited to submit a formal report for the next phase of the competition. 104 teams submitted design reports to be judged, and 77 teams attended the flyoff (21 international). About 800 students, faculty, and guests were present. Of the 77 teams, 65 successfully completed tech inspection. The weather was mild and allowed for non-stop flying. Of the 255 official flight attempts, 93 resulted in a successful score with 38 teams achieving a successful flight score and 26 teams successfully completing all four missions (one ground and three flight). 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 Aircraft Carrier Operations. Each aircraft was required to have a 4 foot minimum wing span. To simulate the transition from the hanger to the flight deck, the aircraft were required to roll through a 3 foot x 2 foot box necessitating wing folding and locking mechanisms which had to operate remotely and without external assistance. The aircraft were required to complete three flight missions, each taking off from a 4 foot by 10 foot "carrier flight deck". The first mission was a Delivery Flight with no payload for three laps within five minutes. The second mission was a Reconnaissance Flight with the addition of a radome which was required to be fixed during take-off and landing but rotating during cruise. The final mission was an Attack Flight which included the dropping of foam "attack stores". During this mission, ten minutes were provided to complete as many laps as possible while dropping only one store per lap. Teams were also required to complete a timed ground mission demonstrating full carrier operations. As usual, the total score is the product of the total mission score and design report score. More details on the mission requirements can be found at the competition website: http://www.aiaadbf.org.

First Place went to the University of Ljubljana, Second Place went to the Georgia Institute of Technology and Third Place went to the FH JOANNEUM University of Applied Sciences. 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 the University of Southern California with a score of 93.13.

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 AlAA 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 AlAA Foundation for their financial support as well as our Gold sponsors this year – AeroVironment, Aurora Flight Sciences, General Atomics, Mathworks, and Honeywell Aerospace. Special thanks go to Raytheon Missile Systems 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.

Matt Angiulo
For the DBF Organizing Committee

2019 Design/Build/Fly Competition Final Results

| | Devil | | Team | | Mi | ission Sco | res | | Devent | 2019 DBF |
|--|-------|---------|--|------|------|------------|-------|-------|--------|----------|
| 2 | Rank | Queue # | Name | GM | M1 | M2 | М3 | Total | Report | SCORE |
| 1 | 1 | 10 | University of Ljubljana | 0.77 | 1.00 | 2.00 | 20.00 | 23.77 | 86.83 | 2064.03 |
| 1 | 2 | 4 | Georgia Institute of Technology | 0.43 | 1.00 | 1.87 | 16.00 | 19.29 | 90.83 | 1752.26 |
| 5 12 VERNMATA JUABAN TECHNOLOGICAL INSTITUTE 0.69 1.00 1.68 13.00 1.57 86.53 1.116.48 7.00 | 3 | 7 | FH JOANNEUM University of Applied Sciences | | | 1.82 | 16.00 | 19.55 | 87.85 | 1717.90 |
| Embry-Riddle Aeronautical University Daysona Beach | 4 | 1 | University of Southern California | 0.71 | 1.00 | 1.96 | 14.00 | 17.67 | 93.13 | 1645.66 |
| 7 27 Massachwests Institute of Technology | 5 | 12 | VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE | 0.69 | 1.00 | 1.68 | 13.00 | 16.37 | 86.53 | 1416.48 |
| 8 15 Franklin W. Olin College of Prigineering | 6 | 26 | Embry-Riddle Aeronautical University Daytona Beach | 0.13 | 1.00 | 1.72 | 12.00 | 14.84 | 80.52 | 1195.04 |
| 9 3 Mahlfa Lulwerstry 0.28 1.00 1.61 1.00 11.50 10.55 1089.15 1088.3 1044.76 1089.15 1089.3 1089.15 1088.3 1044.76 1089.15 1088.3 1044.76 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 1088.3 1089.15 | 7 | 27 | Massachusetts Institute of Technology | 0.21 | 1.00 | 1.65 | 11.00 | 13.85 | 80.50 | 1115.14 |
| 10 | 8 | 15 | Franklin W. Olin College of Engineering | 0.42 | 1.00 | 1.54 | 10.00 | 12.95 | 85.00 | 1101.00 |
| 11 5 Oregon State University 0.12 1.00 1.70 9.00 1.83 88.33 1044.76 | 9 | 3 | Khalifa University | 0.28 | 1.00 | 1.61 | 9.00 | 11.90 | 91.55 | 1089.16 |
| 12 57 Alfred University of Hong Kong 0.13 1.00 1.42 1.00 1.37 73.83 301.298 13 91 The University of Manyland 0.00 1.00 1.46 8.00 1.05 86.83 916.40 15 38 Missouri University of Science and Technology 0.67 1.00 1.66 8.00 1.15 77.83 375.48 16 35 Cairo University of Science and Technology 0.67 1.00 1.66 8.00 1.15 77.83 375.48 16 35 Cairo University of Science and Technology 0.67 1.00 1.66 8.00 11.17 78.25 374.42 17 29 Arizana State University 0.35 1.00 1.61 7.00 39.7 70.40 300.77 18 72 University of Science and Austin 0.51 1.00 1.70 8.00 1.00 69.27 768.14 19 61 The University of Texas at Austin 0.51 1.00 1.70 8.00 1.00 69.27 768.14 19 10 University of Identifyral, Son Angeles 0.12 1.00 1.45 6.00 8.86 80.80 715.93 21 20 California Polytechnic State University, San Luis Obispo 0.12 1.00 1.55 6.00 8.67 81.30 704.90 22 31 The University of Ilmilos University of Alaska Fairbanks 0.49 1.00 1.45 6.00 1.70 6.50 680.41 23 The University of Mirribor 0.22 1.00 1.45 6.00 1.70 6.50 680.41 24 St. University of Mirribor 0.22 1.00 1.45 6.00 1.70 6.50 680.41 25 49 Embry-Riddle Aeronautical University-Prescott, AZ 0.14 1.00 1.45 5.00 1.70 76.57 680.41 26 37 PES UNIVERSITY 0.24 1.00 1.45 6.00 1.70 76.75 680.41 27 34 Chullangkorn University 0.24 1.00 1.45 6.00 1.70 77.83 28 2 Virginia Polytechnic Institute and State University 0.05 1.00 1.00 0.00 2.00 2.00 2.00 29 18 The Ohio State University 0.05 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 30 50 Sm. State University of Science and Technology 0.15 1.00 0.00 0.00 0.00 0.00 0.00 0.00 30 50 Sm. State University of Science and Technology 0.15 1.00 0.00 0.00 0.00 0. | 10 | 44 | The University of California, Irvine | 0.36 | 1.00 | 1.69 | 11.00 | 14.06 | 76.50 | 1075.53 |
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| 48 73 Peking University 0.18 0.00 0.00 0.18 69.08 12.71 49 6 University of Oklahoma 0.13 0.00 0.00 0.00 0.13 87.93 11.76 50 67 University of Maryland, Baltimore County 0.14 0.00 0.00 0.00 0.14 70.87 9.83 51 8 New Mexico State University 0.11 0.00 0.00 0.00 0.11 87.77 9.53 52 14 Utah State University 0.10 0.00 0.00 0.00 0.10 85.33 8.87 53 74 Trine University of Singapore 0.12 0.00 0.00 0.00 0.12 68.70 8.20 54 66 National University of Singapore 0.11 0.00 0.00 0.00 0.11 71.40 7.79 55 65 University of Michigan 0.10 0.00 0.00 0.00 0.10 71.58 7.50 56 94 University of Kentucky (Paducah Campus) 0.12 0.00 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | | | |
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| 60 60 Rutgers, The State University of New Jersey 0.05 0.00 0.00 0.00 0.05 73.40 3.75 | | | · | | | | | | | |
| | | | | | | | | | | |
| | 61 | 58 | Stanford University | 0.03 | 0.00 | 0.00 | 0.00 | 0.03 | 73.53 | 3.31 |

2019 Design/Build Fly Competition Final Results (cont)

| David | | Team | | Mi | ssion Sco | res | | Damant | 2019 DBF |
|-------|---------|--|------|------|-----------|------|-------|--------|----------|
| Rank | Queue # | Name | GM | M1 | M2 | M3 | Total | Report | SCORE |
| 62 | 30 | Western Michigan University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 80.13 | 0.00 |
| 63 | 32 | University of Minnesota - Twin Cities | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 79.08 | 0.00 |
| 64 | 36 | Washington University in St. Louis | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 78.13 | 0.00 |
| 65 | 39 | University at Buffalo | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 77.60 | 0.00 |
| 66 | 41 | University of Glasgow | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 76.75 | 0.00 |
| 67 | 42 | University of Kansas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 76.67 | 0.00 |
| 68 | 46 | University of Florida | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 76.07 | 0.00 |
| 69 | 47 | San Jose State University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 75.83 | 0.00 |
| 70 | 48 | Cornell University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 75.35 | 0.00 |
| 71 | 51 | Tsinghua University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 74.80 | 0.00 |
| 72 | 52 | The University of New South Wales | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 74.73 | 0.00 |
| 73 | 53 | Colorado School of Mines | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 74.38 | 0.00 |
| 74 | 55 | Columbia University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 74.03 | 0.00 |
| 75 | 56 | Iowa State University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 74.00 | 0.00 |
| 76 | 62 | University of Massachusetts Lowell | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 72.50 | 0.00 |
| 77 | 63 | Auburn University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 72.25 | 0.00 |
| 78 | 64 | Florida Institute of Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 72.00 | 0.00 |
| 79 | 68 | Texas A&M University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 70.87 | 0.00 |
| 80 | 69 | Wentworth Institute of Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 70.50 | 0.00 |
| 81 | 71 | Purdue University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 69.70 | 0.00 |
| 82 | 76 | Necmettin Erbakan University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 68.00 | 0.00 |
| 83 | 78 | Johns Hopkins University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 66.08 | 0.00 |
| 84 | 79 | San Diego State University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65.83 | 0.00 |
| 85 | 81 | University of Central Florida | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65.45 | 0.00 |
| 86 | 82 | University of Petroleum and Energy Studies | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 64.93 | 0.00 |
| 87 | 83 | Wichita State University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 64.67 | 0.00 |
| 88 | 84 | Istanbul Technical University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 64.17 | 0.00 |
| 89 | 86 | Lehigh University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 63.13 | 0.00 |
| 90 | 87 | Military Institute of Science & Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 62.75 | 0.00 |
| 91 | 88 | Rowan University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 62.67 | 0.00 |
| 92 | 89 | Colorado State University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 61.67 | 0.00 |
| 93 | 91 | University of Washington | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.22 | 0.00 |
| 94 | 92 | Illinois Institute of Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 56.62 | 0.00 |
| 95 | 93 | Ghulam Ishaq Khan Institute of Engineering Sciences and Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 56.42 | 0.00 |
| 96 | 95 | Yildiz Technical University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 54.00 | 0.00 |
| 97 | 96 | University of Arkansas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 52.40 | 0.00 |
| 98 | 97 | The George Washington University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 51.58 | 0.00 |
| 99 | 98 | University of Massachusetts Amherst | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 51.33 | 0.00 |
| 100 | 100 | Uludag University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.37 | 0.00 |
| 101 | 101 | New Mexico Institute of Mining and Technology | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.92 | 0.00 |
| 102 | 102 | Saint Louis University | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 43.83 | 0.00 |
| 103 | 103 | University of Tennessee at Chattanooga | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 37.98 | 0.00 |
| 104 | 104 | Higher Colleges of Technology, Al Ain Women's College | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.57 | 0.00 |

First Place - University of Ljubljana



Second Place - Georgia Tech



Third Place -FH JOANNEUM University of Applied Sciences





Past Winners

| Team 2019 University of Ljubljana 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 |
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| 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 |
| 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 |
| 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 |
| 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 |
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| 2007 Massachusetts Institute of Technology |
| 2006 Oklahoma State University Team Black |
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| 2003 San Diego State University |
| 2002 University of California San Diego |
| 2001 Oklahoma State University Team Orange |
| 2000 Utah State University |
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Team Locations

