



Textron Aviation
Raytheon Missile Systems
AIAA Foundation

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.aiaadb.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 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 – 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

Rank	Team		Mission Scores					Report	2019 DBF SCORE
	Queue #	Name	GM	M1	M2	M3	Total		
1	10	University of Ljubljana	0.77	1.00	2.00	20.00	23.77	86.83	2064.03
2	4	Georgia Institute of Technology	0.43	1.00	1.87	16.00	19.29	90.83	1752.26
3	7	FH JOANNEUM University of Applied Sciences	0.74	1.00	1.82	16.00	19.55	87.85	1717.90
4	1	University of Southern California	0.71	1.00	1.96	14.00	17.67	93.13	1645.66
5	12	VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE	0.69	1.00	1.68	13.00	16.37	86.53	1416.48
6	26	Embry-Riddle Aeronautical University Daytona Beach	0.13	1.00	1.72	12.00	14.84	80.52	1195.04
7	27	Massachusetts Institute of Technology	0.21	1.00	1.65	11.00	13.85	80.50	1115.14
8	15	Franklin W. Olin College of Engineering	0.42	1.00	1.54	10.00	12.95	85.00	1101.00
9	3	Khalifa University	0.28	1.00	1.61	9.00	11.90	91.55	1089.16
10	44	The University of California, Irvine	0.36	1.00	1.69	11.00	14.06	76.50	1075.53
11	5	Oregon State University	0.12	1.00	1.70	9.00	11.83	88.33	1044.76
12	57	Alfred University	0.08	1.00	1.64	11.00	13.72	73.83	1012.98
13	9	The University of Hong Kong	0.13	1.00	1.42	8.00	10.55	86.83	916.40
14	13	University of Maryland	0.20	1.00	1.46	8.00	10.66	85.67	913.43
15	38	Missouri University of Science and Technology	0.67	1.00	1.58	8.00	11.25	77.83	875.48
16	35	Cairo University	0.51	1.00	1.66	8.00	11.17	78.25	874.42
17	29	Arizona State University	0.36	1.00	1.61	7.00	9.97	80.40	801.79
18	72	University of South Alabama	0.39	1.00	1.70	8.00	11.09	69.27	768.14
19	61	The University of Texas at Austin	0.51	1.00	1.71	7.00	10.22	72.65	742.21
20	24	University of California, Los Angeles	0.40	1.00	1.46	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 Illinois Urbana-Champaign	0.30	1.00	1.45	6.00	8.75	79.93	699.05
23	43	University of Alaska Fairbanks	0.49	1.00	1.52	6.00	9.00	76.67	690.35
24	85	University of Maribor	0.22	1.00	1.49	8.00	10.72	63.50	680.41
25	49	Embry-Riddle Aeronautical University-Prescott,AZ	0.14	1.00	1.45	5.00	7.59	75.33	571.92
26	37	PES UNIVERSITY	0.55	1.00	1.49	4.00	7.05	77.87	548.63
27	34	Chulalongkorn University	0.24	1.00	1.64	4.00	6.88	78.57	540.58
28	2	Virginia Polytechnic Institute and State University	0.07	1.00	1.43	0.00	2.50	91.62	229.09
29	18	The Ohio State University	0.08	1.00	1.52	0.00	2.60	83.10	216.19
30	50	RWTH Aachen University	0.28	1.00	1.53	0.00	2.82	74.90	210.98
31	70	University of Nevada, Las Vegas	1.00	1.00	0.00	0.00	2.00	70.50	141.00
32	28	University of Nebraska-Lincoln	0.28	1.00	0.00	0.00	1.28	80.47	103.16
33	11	The University of Arizona	0.17	1.00	0.00	0.00	1.17	86.67	101.43
34	17	University of California, San Diego	0.19	1.00	0.00	0.00	1.19	84.40	100.02
35	19	Hong Kong University of Science and Technology	0.15	1.00	0.00	0.00	1.15	82.17	94.14
36	33	Institut Supérieur de l'Aéronautique et de l'Espace (ISAE-Supaero)	0.09	1.00	0.00	0.00	1.09	78.82	85.64
37	21	Case Western Reserve University	0.04	1.00	0.00	0.00	1.04	81.27	84.32
38	23	University of Colorado Boulder	0.00	1.00	0.00	0.00	1.00	80.97	80.97
39	80	The Pennsylvania State University	0.00	1.00	0.00	0.00	1.00	65.67	65.67
40	99	University of Notre Dame	0.09	1.00	0.00	0.00	1.09	46.33	50.67
41	45	Rashtreeya Vidyalaya College of Engineering	0.41	0.00	0.00	0.00	0.41	76.33	31.07
42	40	University of California, Merced	0.36	0.00	0.00	0.00	0.36	76.93	27.67
43	16	UNIVERSIDAD PONTIFICIA BOLIVARIANA	0.25	0.00	0.00	0.00	0.25	84.83	21.59
44	75	The Hong Kong Polytechnic University	0.26	0.00	0.00	0.00	0.26	68.23	17.45
45	77	The University of Texas at Dallas	0.23	0.00	0.00	0.00	0.23	67.23	15.67
46	25	West Virginia University	0.18	0.00	0.00	0.00	0.18	80.67	14.60
47	90	University of Pennsylvania	0.22	0.00	0.00	0.00	0.22	58.73	13.15
48	73	Peking University	0.18	0.00	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	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	0.00	0.00	0.12	56.32	6.80
57	22	University of Akron	0.08	0.00	0.00	0.00	0.08	81.00	6.78
58	59	Rensselaer Polytechnic Institute	0.09	0.00	0.00	0.00	0.09	73.50	6.66
59	54	University of Tennessee, Knoxville	0.07	0.00	0.00	0.00	0.07	74.30	5.07
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	0.04	0.00	0.00	0.00	0.04	73.53	3.31

2019 Design/Build Fly Competition Final Results (cont)

Rank	Team		Mission Scores					Report	2019 DBF SCORE
	Queue #	Name	GM	M1	M2	M3	Total		
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

Year	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
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

Team Locations

