



## 2022 Design, Build, Fly Competition Summary



The 2021-22 AIAA/Textron Aviation/Raytheon Technologies Design, Build, Fly Competition Flyoff was held at the Textron Aviation Employees' Flying Club in Wichita, KS on the weekend of April 21-24, 2022. This was the 26<sup>th</sup> year for the competition. Of the 127 proposals submitted and judged, 110 teams were invited to submit a formal report for the next phase of the competition. 97 teams submitted design reports to be judged, and 64 teams attended the flyoff (10 international), including one team who had not entered this year's competition but wanted to experience DBF in person in preparation for next year. About 750 students, faculty, and guests were present. Of the 64 teams in attendance, 58 successfully completed tech inspection. The weather was very windy on Friday and Saturday but just about perfect on Sunday, which allowed for non-stop flying and achieving what may be a record number of flight attempts in one day. Of the 152 official flight attempts, 87 resulted in a successful score with 40 teams achieving at least one successful flight score and 15 teams successfully completing all four missions (one ground and three flight). Even with a two year break for the fly-off due to COVID, the quality of the teams, their readiness to compete, and the execution of the flights was exceptional.

The contest theme this year was Humanitarian Mission. Each aircraft was limited to an 8 foot maximum dimension in any direction. The aircraft were required to complete three flight missions, each taking off within 25 feet. The first mission was a Deployment Flight with no payload for three laps within five minutes. The second mission was a Staging Flight to deliver vaccination components (30 ml syringes) with the score based on the number of syringes carried and flight time to complete three laps. The final mission was a Vaccine Delivery Flight which included deployment of environmentally sensitive vaccine vial packages. During this mission, ten minutes were provided to land and deploy a single package in a drop zone per lap with the score based on number of successful deployments without tripping a shock sensor on the package. Teams were also required to complete a timed ground mission demonstrating capability to carry all payloads and deploy packages one at a time. 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 Georgia Institute of Technology, Second Place went to Embry-Riddle Aeronautical University – Daytona Beach 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 FH JOANNEUM University of Applied Sciences with a score of 93.33.

We owe our thanks for the success of the DBF competition to the efforts of many volunteers from Textron Aviation, Raytheon Technologies, and the AIAA sponsoring technical committees: Applied Aerodynamics, Aircraft Design, Flight Test, and Design Engineering. These volunteers collectively set the rules, judge the proposals and reports, and execute the flyoff. Thanks also to the Premier Sponsors: Textron Aviation and Raytheon Technologies, and to the AIAA Foundation for their financial support as well as our Gold sponsors this year – AeroVironment, General Atomics Aeronautical, Mathworks, and Spirit AeroSystems. 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



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## 2022 Design/Build/Fly Competition Final Results

Rank	Team		Mission Scores					Report	2022 DBF SCORE
	Queue #	Name	GM	M1	M2	M3	Total		
1	9	Georgia Institute of Technology	0.52	1.00	1.54	2.89	5.95	88.48	526.59
2	17	Embry-Riddle Aeronautical University - Daytona Beach, FL	0.12	1.00	1.93	3.00	6.05	86.77	525.19
3	1	FH JOANNEUM University of Applied Sciences	0.32	1.00	1.55	2.56	5.43	93.33	506.32
4	21	University of Southern California	0.35	1.00	2.00	2.33	5.69	84.75	481.82
5	5	Virginia Tech	0.46	1.00	1.25	2.44	5.15	89.77	462.40
6	29	University of Kansas	0.47	1.00	1.22	2.56	5.25	81.97	430.01
7	7	Arizona State University	0.11	1.00	1.36	2.22	4.69	89.15	417.94
8	16	Embry-Riddle Aeronautical University: Prescott Campus	0.13	1.00	1.22	2.33	4.68	86.77	406.06
9	35	University of Washington, Seattle	0.12	1.00	1.29	2.67	5.07	79.70	404.14
10	27	The University of Akron	0.16	1.00	1.33	2.33	4.82	82.60	398.18
11	3	Washington University in St. Louis	0.11	1.00	1.09	2.22	4.42	90.00	398.12
12	31	University of California, Irvine	0.15	1.00	1.50	2.22	4.87	81.52	396.89
13	38	University of Texas at Austin	0.10	1.00	1.36	2.56	5.01	78.67	394.29
14	56	University of Oklahoma	0.37	1.00	1.42	2.33	5.12	72.23	369.94
15	41	Franklin W. Olin College of Engineering	0.08	1.00	1.18	2.11	4.38	78.17	342.11
16	6	University of California, Los Angeles	0.18	1.00	1.33	0.00	2.51	89.55	225.12
17	24	Universidad Pontificia Bolivariana	0.00	1.00	1.55	0.00	2.55	83.90	214.17
18	20	Western Michigan University	0.00	1.00	1.49	0.00	2.49	84.90	211.01
19	15	VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE	0.00	1.00	1.33	0.00	2.33	86.95	202.74
20	48	San Jose State University	0.07	1.00	1.19	0.00	2.26	76.27	172.63
21	36	University of Central Florida	0.00	1.00	1.19	0.00	2.19	78.83	172.39
22	42	The Pennsylvania State University	0.09	1.00	1.10	0.00	2.19	77.95	170.83
23	70	The University of South Alabama	0.00	1.00	1.49	0.00	2.49	63.33	157.73
24	68	New Mexico State University	0.17	1.00	1.07	0.00	2.24	63.53	142.49
25	66	Purdue University	1.00	1.00	0.00	0.00	2.00	64.67	129.34
26	34	The University of Tennessee - Knoxville	0.34	1.00	0.00	0.00	1.34	80.37	107.98
27	25	University of Florida	0.26	1.00	0.00	0.00	1.26	83.75	105.35
28	4	California Polytechnic State University, San Luis Obispo	0.13	1.00	0.00	0.00	1.13	89.97	101.45
29	53	Rutgers, The State University of New Jersey – New Brunswick	0.36	1.00	0.00	0.00	1.36	73.88	100.66
30	46	University of Alaska Fairbanks	0.19	1.00	0.00	0.00	1.19	76.93	91.73
31	39	Ghulam Ishaq Khan Institute of Engineering Sciences and Technology	0.17	1.00	0.00	0.00	1.17	78.57	91.57
32	2	Massachusetts Institute of Technology	0.00	1.00	0.00	0.00	1.00	91.33	91.33
33	26	Missouri University of Science and Technology	0.05	1.00	0.00	0.00	1.05	83.58	88.12
34	43	Cornell University	0.00	1.00	0.00	0.00	1.00	77.80	77.80
35	47	San Diego State University	0.00	1.00	0.00	0.00	1.00	76.35	76.35
36	83	Utah State University	0.30	1.00	0.00	0.00	1.30	54.37	70.70
37	63	Gebze Technical University	0.00	1.00	0.00	0.00	1.00	66.77	66.77
38	69	Trine University	0.00	1.00	0.00	0.00	1.00	63.37	63.37
39	77	University of Ljubljana	0.00	1.00	0.00	0.00	1.00	58.53	58.53
40	11	University of Notre Dame	0.53	0.00	0.00	0.00	0.53	87.93	46.50
41	12	Rensselaer Polytechnic Institute	0.46	0.00	0.00	0.00	0.46	87.53	40.35
42	92	John Brown University	0.00	1.00	0.00	0.00	1.00	40.33	40.33
43	10	University of Petroleum and Energy Studies	0.45	0.00	0.00	0.00	0.45	88.47	40.21
44	8	The Ohio State University	0.37	0.00	0.00	0.00	0.37	89.08	32.54
45	37	University of Maryland, College Park	0.40	0.00	0.00	0.00	0.40	78.75	31.70
46	51	North Dakota State University	0.41	0.00	0.00	0.00	0.41	74.00	30.38
47	49	Worcester Polytechnic Institute	0.15	0.00	0.00	0.00	0.15	75.77	11.02
48	64	Lehigh University	0.13	0.00	0.00	0.00	0.13	65.95	8.38
49	61	Rose-Hulman Institute of Technology	0.11	0.00	0.00	0.00	0.11	68.57	7.62
50	18	West Virginia University	0.08	0.00	0.00	0.00	0.08	86.42	7.13



# 2022 Design, Build, Fly Competition Summary



## 2022 Design/Build Fly Competition Final Results (cont)

Rank	Team		Mission Scores					Report	2022 DBF SCORE
	Queue #	Name	GM	M1	M2	M3	Total		
51	97	University at Buffalo	0.07	0.00	0.00	0.00	0.07	0.00	0.00
52	13	North Carolina State University	0.00	0.00	0.00	0.00	0.00	87.33	0.00
53	14	National University of Singapore	0.00	0.00	0.00	0.00	0.00	87.23	0.00
54	19	Dayananda Sagar College of Engineering	0.00	0.00	0.00	0.00	0.00	86.25	0.00
55	22	University of Michigan -- Ann Arbor	0.00	0.00	0.00	0.00	0.00	84.50	0.00
56	23	Cairo University	0.00	0.00	0.00	0.00	0.00	84.22	0.00
57	28	George Washington University	0.00	0.00	0.00	0.00	0.00	82.15	0.00
58	30	The University of Hong Kong	0.00	0.00	0.00	0.00	0.00	81.83	0.00
59	32	YILDIZ TECHNICAL UNIVERSITY	0.00	0.00	0.00	0.00	0.00	81.22	0.00
60	33	University of California, San Diego	0.00	0.00	0.00	0.00	0.00	80.77	0.00
61	40	Case Western Reserve University	0.00	0.00	0.00	0.00	0.00	78.37	0.00
62	44	Military Technical College	0.00	0.00	0.00	0.00	0.00	77.50	0.00
63	45	Wentworth Institute of Technology	0.00	0.00	0.00	0.00	0.00	77.42	0.00
64	50	State University of New York at Binghamton	0.00	0.00	0.00	0.00	0.00	75.17	0.00
65	52	Military Institute of Science and Technology	0.00	0.00	0.00	0.00	0.00	73.92	0.00
66	54	Clarkson University	0.00	0.00	0.00	0.00	0.00	72.87	0.00
67	55	University of California, Merced	0.00	0.00	0.00	0.00	0.00	72.35	0.00
68	57	Brigham Young University Provo	0.00	0.00	0.00	0.00	0.00	72.03	0.00
69	58	University of Colorado Boulder	0.00	0.00	0.00	0.00	0.00	71.43	0.00
70	59	The Hong Kong University of Science and Technology	0.00	0.00	0.00	0.00	0.00	70.90	0.00
71	60	Tribhuvan University, Institute of Engineering, Pulchowk Campus	0.00	0.00	0.00	0.00	0.00	69.92	0.00
72	62	University of Illinois Urbana-Champaign	0.00	0.00	0.00	0.00	0.00	68.53	0.00
73	65	The University of Alabama	0.00	0.00	0.00	0.00	0.00	65.40	0.00
74	67	University of New South Wales	0.00	0.00	0.00	0.00	0.00	64.25	0.00
75	71	Columbia University in the City of New York	0.00	0.00	0.00	0.00	0.00	61.47	0.00
76	72	University of Maryland, Baltimore County	0.00	0.00	0.00	0.00	0.00	61.07	0.00
77	73	Florida Institute of Technology	0.00	0.00	0.00	0.00	0.00	61.00	0.00
78	74	University of Massachusetts Amherst	0.00	0.00	0.00	0.00	0.00	58.83	0.00
79	75	Texas Tech University	0.00	0.00	0.00	0.00	0.00	58.83	0.00
80	76	University of Massachusetts Lowell	0.00	0.00	0.00	0.00	0.00	58.60	0.00
81	78	Oregon State University	0.00	0.00	0.00	0.00	0.00	56.10	0.00
82	79	Syracuse University	0.00	0.00	0.00	0.00	0.00	55.83	0.00
83	80	Johns Hopkins University	0.00	0.00	0.00	0.00	0.00	55.48	0.00
84	81	Manhattan College	0.00	0.00	0.00	0.00	0.00	55.15	0.00
85	82	Kent State University	0.00	0.00	0.00	0.00	0.00	54.67	0.00
86	84	Rowan University	0.00	0.00	0.00	0.00	0.00	51.48	0.00
87	85	Youngstown State University	0.00	0.00	0.00	0.00	0.00	50.13	0.00
88	86	Ankara Yıldırım Beyazıt University	0.00	0.00	0.00	0.00	0.00	49.37	0.00
89	87	Birla Institute of Technology and Science, Pilani K.K. Birla Goa Campus	0.00	0.00	0.00	0.00	0.00	48.85	0.00
90	88	University of Tennessee at Chattanooga	0.00	0.00	0.00	0.00	0.00	47.75	0.00
91	89	Texas A&M University	0.00	0.00	0.00	0.00	0.00	44.07	0.00
92	90	University of Missouri-Columbia	0.00	0.00	0.00	0.00	0.00	42.00	0.00
93	91	Alfred University	0.00	0.00	0.00	0.00	0.00	41.33	0.00
94	93	University of Arkansas - Fayetteville	0.00	0.00	0.00	0.00	0.00	38.45	0.00
95	94	The City College of New York (CCNY) of the City University of New York	0.00	0.00	0.00	0.00	0.00	35.77	0.00
96	95	Villanova University	0.00	0.00	0.00	0.00	0.00	27.97	0.00
97	96	New York University Tandon School of Engineering	0.00	0.00	0.00	0.00	0.00	25.67	0.00



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## First Place – Georgia Institute of Technology



## Second Place – Embry-Riddle Aeronautical University – Daytona Beach





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## Third Place – FH JOANNEUM University of Applied Sciences





# 2022 Design, Build, Fly Competition Summary

Boehercraft

Cessna

Zawker

TEXTRON AVIATION

Raytheon  
Missiles & Defense

AIAA  
FOUNDATION

## Past Winners

Year	Team
2022	Georgia Institute of Technology
2021	Dayananda Sagar College of Engineering
2020	University of Southern California
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 Institute of Technology
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

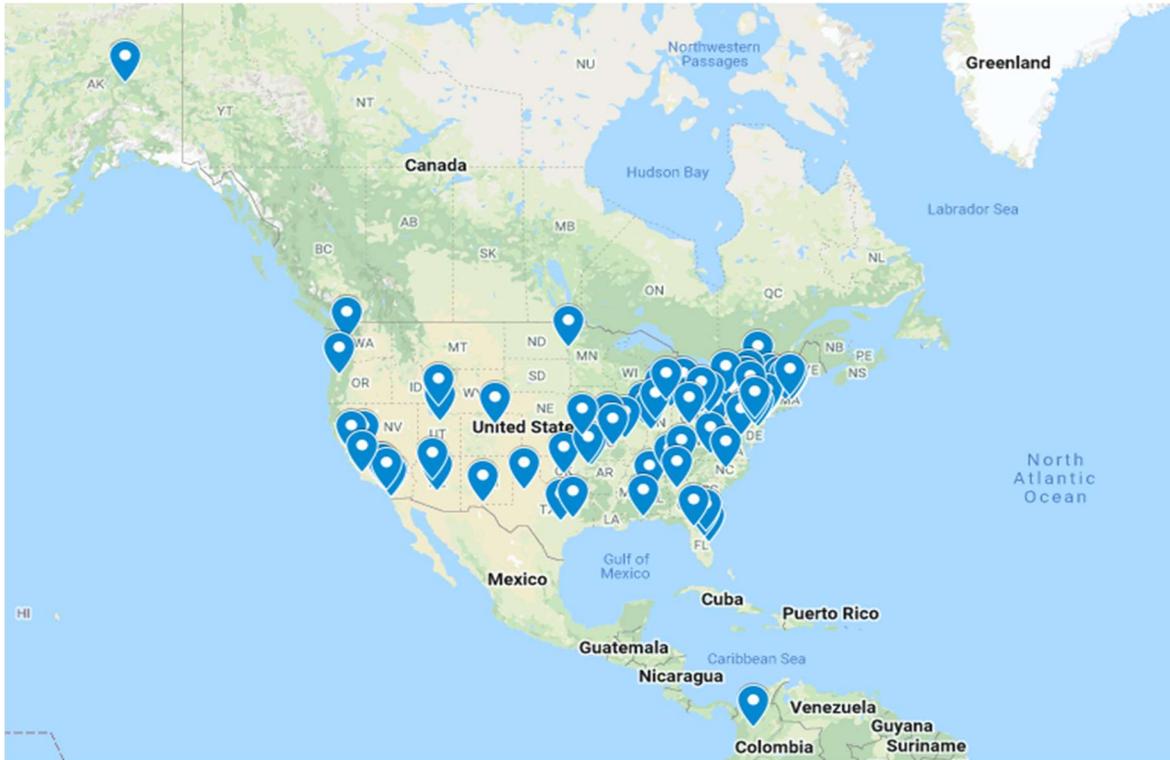


# 2022 Design, Build, Fly Competition Summary



## Team Locations

### The Americas



### International

