

The 2023-24 AIAA/Textron Aviation/Raytheon Design, Build, Fly Competition Flyoff was held at the Textron Aviation Employees' Flying Club in Wichita, KS on the weekend of April 18-21, 2024. This was the 28<sup>th</sup> year for the competition. Of the 149 proposals submitted and judged, 110 teams were invited to submit a formal report for the next phase of the competition. 107 teams submitted design reports to be judged, and 93 teams attended the flyoff (19 international teams). About 1100 students, faculty, and guests were present. This was a record year for the number of teams and students attending the flyoff. Of the 93 teams in attendance, 85 successfully completed tech inspection. The weather was just about perfect all weekend, which allowed for non-stop flying. Of the 236 official flight attempts, 156 resulted in a successful score with 65 teams achieving at least one successful flight score and 31 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 was exceptional.

The contest theme this year was Urban Air Mobility. The airplane was limited to a maximum of a 5 foot wingspan but had to be able to fit in a 2 ½ foot wide parking space. The airplanes were required to complete three flight missions, each taking off within 20 feet. The first mission was a Delivery Flight with a crew but no payload for three laps within five minutes. The second mission was a Medical Transport Flight with a crew, 2 EMTs, a patient on gurney and a Medical Supplies Cabinet with the score based on the weight of the Medical Supplies Cabinet and the time to fly three laps. The final mission was an Urban Taxi Flight with a crew and passengers with the scored based on the number of passengers, number of laps flown in 5 minutes and the capacity of the propulsion battery. Teams were also required to complete a ground mission demonstrating the efficiency of converting from the parking configuration to the medical transport configuration and then to the urban tax configuration. The total score is the product of the total mission score and design report score plus participation score. More details on the mission requirements can be found at the competition website: <a href="http://www.aiaa.org/dbf">http://www.aiaa.org/dbf</a>.

First Place went to Embry-Riddle Aeronautical University Daytona Beach, Second Place went to Georgia Institute of Technology and Third Place went to University of Washington Seattle. 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 93.60.

We owe our thanks for the success of the DBF competition to the efforts of many volunteers from Textron Aviation, Raytheon, 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, and to the AIAA Foundation for their financial support as well as our Gold sponsors this year – AeroVironment, General Atomics Aeronautical 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!!

**DBF** Organizing Committee



BY TEXTRON AVIATION

### 2024 Design/Build/Fly Competition Final Results

RankQueue #NameP15Embry-Riddle Aeronautical University Daytona Beach324Georgia Institute of Technology338University of Washington Seattle343Virginia Polytechnic Institute and State University3513FH Joanneum3633The University of Akron376University of Notre Dame3818Embry-Riddle Aeronautical University - Prescott3926University of Michigan31016The University of Sydney31152Rensselaer Polytechnic Institute31217Rutgers, The State University of New Jersey - New Brunswick31341The Pennsylvania State University31424University of Science and Technology31535University of Oklahoma31642The Hong Kong Polytechnic University31722The University of Science and Technology31722The Hong Kong Polytechnic University32048Auburn University at Auburn32149University at Auburn32225Utah State University32377The University of California, Irvine3	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.11         1           1.00         1           0.21         1           1.13         1           1.14         1           0.14         1           0.14         1           0.14         1           0.14         1           0.14         1           0.14         1           0.14         1           0.15         1           0.15         1           0.16         1           0.13         1           0.13         1           0.12         1           0.16         1           0.12         1           0.14         1	100         1           000         1	n2         n2           1.90         1.71           2.00         1.71           2.00         1.71           1.69         1.71           1.45         1.46           1.18         1.52           1.58         1.40           1.22         1.08           1.56         1.21           1.13         1.16           1.07         1.17	M3           3.00           2.07           2.59           2.36           2.55           2.71           2.41           2.33           2.32           2.38           2.83           2.16           2.29           2.25           2.30           2.30           2.30           2.31	Total           6.01           5.78           5.79           5.18           5.14           5.31           4.90           5.04           5.12           4.93           5.21           4.70           4.93           4.60           4.62           4.67           4.48	Score           90.62           90.67           89.40           91.20           87.37           83.33           89.70           86.28           84.42           86.97           79.57           86.83           81.58           84.67           83.28           81.55           84.87	Score 547.96 527.34 521.02 475.46 452.07 445.54 442.67 437.93 435.63 431.40 417.22 410.72 405.44 392.34 387.67 383.99
24Georgia Institute of Technology338University of Washington Seattle343Virginia Polytechnic Institute and State University3513FH Joanneum3633The University of Akron376University of Notre Dame3818Embry-Riddle Aeronautical University - Prescott3926University of Michigan31016The University of Sydney31152Rensselaer Polytechnic Institute31217Rutgers, The State University of New Jersey - New Brunswick31341The Pennsylvania State University31424University of Massachusetts, Amherst31535University of Science and Technology31722The Hong Kong Polytechnic University31837The Hong Kong Polytechnic University32048Auburn University at Auburn32149University at Auburn32225Utah State University3	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	.00         1           .021         1           .021         1           .013         1           .014         1           .014         1           .014         1           .014         1           .014         1           .014         1           .014         1           .014         1           .014         1           .014         1           .015         1           .016         1           .013         1           .019         1           .022         1           .022         1           .022         1           .016         1           .016         1           .012         1           .034         1	1         00         1           00         00         00         00           100         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         00         1           000         1         0         1           000         1         0         1           000         1         0         0	L.71 2.00 L.69 L.45 L.46 L.18 L.52 L.58 L.40 L.22 L.08 L.22 L.08 L.21 L.13 L.16 L.07	2.07 2.59 2.36 2.55 2.71 2.41 2.33 2.32 2.38 2.38 2.83 2.16 2.29 2.25 2.30 2.30 2.19	5.78 5.79 5.18 5.14 5.31 4.90 5.04 5.12 4.93 5.21 4.70 4.93 4.60 4.62 4.67	90.67 89.40 91.20 87.37 83.33 89.70 86.28 84.42 86.97 79.57 86.83 81.58 84.67 83.28 84.55	527.34 521.02 475.46 452.07 445.54 442.67 437.93 435.63 431.40 417.22 410.72 405.44 392.34 387.67 383.99
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22   25   Utah State University   3	0			l.11	2.21	4.66	80.23	376.95
				L.23	2.24	4.67	80.05	376.67
72 77 The University of California Invine				L.18	2.10	4.39	84.50	373.81
				L.06	2.41	5.01	70.17	354.47
24     39     University of New South Wales     3				L.01	2.09	4.28	82.13	354.40
25         66         University of Illinois Urbana-Champaign         3				l.11	2.20	4.58	75.38	347.89
26 45 Birla Institute of Technology and Science, Pilani, K.K. Birla Goa Campus 3				L.04	2.01	4.21	80.67	342.30
27 70 RWTH-Aachen 3				L.08	2.17	4.38	72.70	321.65
28         68         California State Polytechnic University, Pomona         3				L.07	2.08	4.29	73.38	317.83
29     78     North Dakota State University     3				L.06	2.14	4.42	67.37	300.45
30         28         University of Massachusetts Lowell         3           24         26         Daug Malleourse Institute of Tachandary University         3				L.01	0.00	2.84	83.97	241.18
31         96         Royal Melbourne Institute of Technology University         3           32         1         University of Southern California         3				L.14	2.26	4.80	48.78	237.31
32     1     University of Southern California     3       33     33     33     33				L.08	0.00	2.41	93.60	228.83
33         23         Stanford University         3           34         9         Massachusetts Institute of Technology         3				L.38	0.00	2.60	84.67	222.77
				l.25 l.00	0.00	2.42 4.13	88.90 50.70	218.04 212.51
35         94         The University of Memphis         3           36         29         University at Buffalo         3				L.00 L.45	0.00	2.49	83.92	212.51
3029Oniversity at Bullato333760University of Texas at Austin3				l.45	0.00	2.49	77.13	204.07
37     60     Oniversity of reads at Austin     3       38     34     Colorado State University     3				L.21 L.31	0.00	2.01	83.30	204.07
38     34     Colorado state oniversity     3       39     15     Universidad Pontificia Bolivariana     3				L.31 L.09	0.00	2.41	87.00	205.80
3913Onversidad Formitica Bolivariana334032The University of Hong Kong3				L.18	0.00	2.28	83.73	195.12
4052The oniversity of Hong Kong534131University of Kansas3				l.18 l.15	0.00	2.29	83.87	195.12
41     51     Oniversity of Relises     3       42     55     University of Texas at Dallas     3				L.24	0.00	2.29	78.67	194.95
4253Oniversity of reads at Datas334359Case Western Reserve University3				L.24	0.00	2.40	77.17	191.85
44     36     Missouri University of Science and Technology     3				L.09	0.00	2.23	83.23	188.69
4553Columbia University3				L.03	0.00	2.25	79.28	181.83
45     55     contract on the strip     55       46     44     Iowa State University     3				L.02	0.00	2.17	80.92	178.95
47     80     San Diego State University     3				L.26	0.00	2.40	65.10	159.36
48         93         New Mexico State University - Main Campus         3				L.00	0.00	2.31	51.08	121.10
49         56         Khalifa University of Science, Technology and Research         3				).00	0.00	1.31	78.67	106.12
50         19         West Virginia University         3				).00	0.00	1.16	85.93	102.71
51         12         University Of Maryland, College Park         3				).00	0.00	1.14	87.70	102.68
52     46     Clarkson University     3				).00	0.00	1.21	80.50	100.51
53         20         Purdue University, Main Campus         3				).00	0.00	1.10	85.77	97.51
54         50         Western Michigan University         3				).00	0.00	1.17	79.82	96.70



BY TEXTRON AVIATION

### 2024 Design/Build Fly Competition Final Results (cont)

_		Team	Participation		М	ission Scor	es		Report	2024 DBF
Rank	Queue #	Name	P	GM	M1	M2	M3	Total	Score	Score
55	67	Trine University	3	0.25	1.00	0.00	0.00	1.25	74.93	96.70
56	2	University of Ljubljana	3	0.00	1.00	0.00	0.00	1.00	91.33	94.33
57	47	University of Florida	3	0.13	1.00	0.00	0.00	1.13	80.25	93.99
58	101	University of Missouri - Kansas City	3	0.25	1.00	1.00	0.00	2.26	33.67	79.01
59	90	California State University, Long Beach	3	0.29	1.00	0.00	0.00	1.29	56.75	76.28
60	92	University of Kentucky-Paducah	3	0.18	1.00	0.00	0.00	1.18	55.78	68.91
61	86	Worcester Polytechnic Institute	3	0.06	1.00	0.00	0.00	1.06	59.47	66.27
62	95	University of Central Florida	3	0.21	1.00	0.00	0.00	1.21	48.83	61.95
63	99	Lehigh University	3	0.24	1.00	0.00	0.00	1.24	35.67	47.38
64	11	Wentworth Institute of Technology	3	0.44	0.00	0.00	0.00	0.44	88.18	42.02
65	10	University of Missouri - Columbia	3	0.35	0.00	0.00	0.00	0.35	88.52	34.02
66	105	University of Maryland, Baltimore County	3	0.09	1.00	0.00	0.00	1.09	25.72	30.99
67	106	Johns Hopkins University	3	0.09	1.00	0.00	0.00	1.09	24.80	30.12
68	89	Alfred University	3	0.44	0.00	0.00	0.00	0.44	57.17	28.38
69	30	National University of Singapore	3	0.25	0.00	0.00	0.00	0.25	83.90	23.93
70	62	The University of Adelaide	3	0.27	0.00	0.00	0.00	0.27	76.50	23.50
71	61	Military Institute of Science and Technology	2	0.23	0.00	0.00	0.00	0.23	76.93	19.37
72	7	VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE, MUMBAI	2	0.19	0.00	0.00	0.00	0.19	89.43	18.66
73	21	Cornell University	3	0.16	0.00	0.00	0.00	0.16	85.72	16.53
74	65	UC San Diego	3	0.13	0.00	0.00	0.00	0.13	75.72	12.53
75	14	Dayananda Sagar College of Engineering	3	0.11	0.00	0.00	0.00	0.11	87.10	12.16
76	75	Institut supérieur de l'aéronautique et de l'espace	3	0.12	0.00	0.00	0.00	0.12	71.00	11.58
77	51	University of Alabama at Birmingham	3	0.09	0.00	0.00	0.00	0.09	79.73	10.42
78	97	Illinois Institute of Technology	2	0.12	0.00	0.00	0.00	0.12	47.87	7.93
79	104	University of Nebraska-Lincoln	3	0.13	0.00	0.00	0.00	0.13	27.47	6.62
80	54	CUNY City College of New York	3	0.04	0.00	0.00	0.00	0.04	78.85	6.10
81	43	The Ohio State University	3	0.00	0.00	0.00	0.00	0.00	81.03	3.00
82	57	Texas A&M University	3	0.00	0.00	0.00	0.00	0.00	78.45	3.00
83	64	University of West Florida Pensacola Campus	3	0.00	0.00	0.00	0.00	0.00	75.97	3.00
84	87	Arizona State University Tempe	3	0.00	0.00	0.00	0.00	0.00	57.40	3.00
85	88	University of Houston	3	0.00	0.00	0.00	0.00	0.00	57.20	3.00
86	58	Clemson University	2	0.00	0.00	0.00	0.00	0.00	77.57	2.00
87	69	University of Arkansas	1	0.00	0.00	0.00	0.00	0.00	73.25	1.00
88	71	The Cooper Union for the Advancement for Science and Art	1	0.00	0.00	0.00	0.00	0.00	72.33	1.00
89	72	Kent State University	1	0.00	0.00	0.00	0.00	0.00	72.12	1.00
90	76	Atilim University	1	0.00	0.00	0.00	0.00	0.00	70.33	1.00
91	83	University of Connecticut Storrs	1	0.00	0.00	0.00	0.00	0.00	61.92	1.00
92	84	Texas Tech University	1	0.00	0.00	0.00	0.00	0.00	61.10	1.00
93	85	Colorado School of Mines	1	0.00	0.00	0.00	0.00	0.00	59.82	1.00
94	38	Tribhuvan University	0	0.00	0.00	0.00	0.00	0.00	82.70	0.00
95	40	The University of Alabama Tuscaloosa	0	0.00	0.00	0.00	0.00	0.00	81.98	0.00
96	63	Yıldız Teknik Üniversitesi	0	0.00	0.00	0.00	0.00	0.00	76.17	0.00
97	73	Ain Shams University	0	0.00	0.00	0.00	0.00	0.00	71.70	0.00
98	74	Cairo University	0	0.00	0.00	0.00	0.00	0.00	71.68	0.00
99	79	University of Texas at El Paso	0	0.00	0.00	0.00	0.00	0.00	67.00	0.00
100	81	University of Colorado Boulder	0	0.00	0.00	0.00	0.00	0.00	64.77	0.00
101	82	Rochester Institute of Technology	0	0.00	0.00	0.00	0.00	0.00	62.78	0.00
102	91	University of Georgia	0	0.00	0.00	0.00	0.00	0.00	56.67	0.00
103	98	University of California, Merced	0	0.00	0.00	0.00	0.00	0.00	43.13	0.00
104	100	Vellore Institute of Technology - Vellore	0	0.00	0.00	0.00	0.00	0.00	34.42	0.00
105	102	University of Minnesota - Twin Cities	0	0.00	0.00	0.00	0.00	0.00	32.93	0.00
106	103	University of Nevada, Las Vegas	0	0.00	0.00	0.00	0.00	0.00	29.05	0.00
107	107	University of Pennsylvania	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00



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



**Second Place – Georgia Institute of Technology** 





## Third Place – University of Washington Seattle







# 2024 Design, Build, Fly Competition Summary









## **Past Winners**

Year	Team
2024	Embry-Riddle Aeronautical University Daytona Beach
2023	RWTH Aachen University
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



## **Team Locations**

**The Americas** 



International

