

MAE 3153 Team Assignment 1
Spring 2023

Design, build, trim and fly a long duration paper airplane



Historical background: When Dick Rutan and Jeana Yeager landed at California's Edwards Air Force Base in the Rutan Voyager on December 23, 1986, they completed a historic flight that tested the limits of aircraft design and human endurance. The pair had left Edwards on December 14, having spent nine days and three minutes in the air during their nonstop, unrefueled flight around the world—the first of its kind. Along the way they nearly came to grief several times, as they grappled with exhaustion, mechanical problems, severe weather and even political considerations.

Dick's brother Burt had first sketched Voyager's design on a paper napkin at a Mojave, Calif., restaurant in 1981. Such an airplane—essentially a flying fuel tank—had been thought impossible.

[Reference link](#)

Requirements and Rules

You and your teammates are to design, build, trim and operate a paper airplane, to achieve maximum flight time, when launched from a seated position, in a room of limited size. Flight competition will occur in the SPW 201 classroom, starting at 3:30 pm, Tuesday, January 31.

The SPW 201 Classroom will be open and available for flight-testing, Monday, January 30, from 3:00 pm to 8:00 pm. We will configure the classroom by moving all tables and chairs away from the center of the room, leaving as much unobstructed space as possible in the center of the room. Of course we must also have space for everyone in our class to stand and watch. We will configure the classroom as close as possible to the competition configuration during flight testing on Monday afternoon.

Competition Rules

1. Your airplane may be constructed from only the following materials: a single 8 ½ by 11 inch sheet of standard copier/printer paper, tape, paperclips and ink. No other materials may be used.
2. You may not use tape to increase the planform area of the airplane by more than 1 square inch.
3. You may use as many paperclips as you like, or you may use pieces cut from paperclips (probably for balancing your airplane).
4. You may use the ink to decorate your airplane. If you are using a design created by someone else, you must have a reference or link prominently written on your aircraft (using ink).
5. You will be given 3 flight attempts. Three TA's will use their phone stop watches to measure your time on each flight. The average of those three times will be recorded as your score for that flight. Your longest flight time of the three will be used as your final score.
6. You are not required to launch the same airplane all three times. If you wish, you may have a different airplane for each launch. It is a good idea to have a backup airplane in case your primary plane is damaged.
7. The airplanes must be launched from a seated position, using the designated launch chair. The chair must be located on the floor of the classroom (it may not be elevated). ~~The launch chair location will be chosen by the instructors, and you may not move it.~~
8. The airplane may be launched by hand, or by a launch assist device. Flight time begins when the airplane no longer touches the hand or the launch device.
9. Each flight attempt ends when the airplane makes contact with anything in the room, including but not limited to: the floor, tables, chairs, columns, ceiling, light fixtures, walls, people, etc.
10. People in the room must not intentionally try to make contact with a flying airplane, but they are not required to move out of the way.
11. No person or device may interact with the airplane, using airflow or other no-touch methods to affect the flight of the airplane.
12. If you are unhappy about something that occurs during the competition, you must immediately notify the judges (Dr. Fisher and Dr. Delahoussaye). They will do their best to resolve the issue, and their decision is final.
13. You must bring a printed copy of the scoresheet, containing all team member names and ID's. You will give your team's scoresheet to the judges by 3:30 pm on the day of the competition.
14. The judges will use the scoresheets in random order to call your team to the launch position. You will not have advance notice. When your team is called, you must move to the launch position quickly.