



2022-23 Design, Build, Fly Q&A #2



General Questions

1. Does the shipping box have to actually be checked in by an airline, or does it only need to comply with the dimensions?

Answer: It does not need to be checked in by an airline.

2. Is this statement: “Propulsion power total stored energy cannot exceed 100 Watt-hours” referring to per propulsion system or overall propulsion? I.e. are all the propulsion systems on the airplane combined to store no more than 100 Watt-hours? Are we allowed twice the battery capacity if we use two motors?

Answer: Maximum allowable, total stored energy is 100 watt-hours, regardless of the number of propulsion systems implemented.

3. Are lithium-polymer high voltage batteries allowed? They are a high voltage variant of lithium-polymer batteries?

Answer: **Yes, but all manufacturer requirements for charging and use must be strictly followed.**

4. Can a battery be part of the mission 2 payload? Can an additional propulsion system be packed as part of the mission 2 payload?

Answer: No, payloads may not contain any stored energy.

5. Must the content in the shipping container remain the same starting Tech-Inspection? Aka, can we switch an antenna of a different length but not put both antennas in the container?

Answer: As clearly stated in the rules, teams are allowed up to 3 different length antennas AND all antennas must be carried inside the shipping box for all missions and tech inspection.

6. What constitutes a “ground rolling takeoff and landing”? Would either landing skids, or a combination of wheels and skids (in the style of early “taildragger” aircraft) be allowed?

Answer: Taking off from a stand still without any external assistance. It’s distinguished for a hand launch or launch using external assistance. Skids, tail-dragger configuration, etc, are up to each team to decide.

7. "All components of the airplane, payloads, and batteries must fit inside an airline checked baggage compliant shipping box" AND "All wing sections must fit inside the shipping box." Does this mean that we cannot divide the A/C into parts to be traveled with members on their luggage weight and then assembly the Parts in the hotel into the desired box with the specifications required?

Answer: The method of shipping and transporting components and materials to the competition is to be determined by each team. The requirements for fitting inside the shipping box only apply during the competition.

8. "Electronic Packages will be provided by each team and must have the following physical characteristics Size: 3.00 x 3.00 x 6.00 inches minimum dimensions" Can we make a Rectangular box of any material? Can we make it from wood and put sand inside it?

Answer: The electronics package materials and method of adding weight is up to each team to decide.

9. For each mission do we have to put the aircraft inside the shipping box?

Answer: As clearly stated in the rules, the aircraft and all components and batteries must be inside the shipping box when entering the staging area.

10. Can the aircraft configuration be changed between missions, if all the parts remain on the plane (i.e. can a part be used for one mission and then be manually stored on the plane?)

Answer: As clearly stated in the rules, the aircraft must be flown in the same configuration for all three missions.

Ground Mission

11. Do all of the test weights for the ground mission need to be included in the shipping box and do they count towards the 50lb limit?

Answer: The test weights are not required to be in the shipping box and do not count towards the 50 lb limit.

12. How can the test weights be applied for the GM? Do they need to be attached to the fuselage/wing or are they allowed to be placed on top of the wing?

Answer: The method of applying the test weight, including any attachment methods, is up to each team to decide.

13. The rules state: If structural failure or deformation occurs, ... the test is a failure. Could you specify what is meant with deformation – does buckling of the wing skin mean failure?

Answer: There are many types of deformation and generally speaking, if a permanent displacement or wrinkle in the wing skin occurs after weight are applied and removed, that would be a deformation and a failure. The Ground Mission judge will determine if deformation has occurred and his/her judgement is final.

14. Is there any restriction to what counts as a weight in ground mission (E.g. a human)?

Answer: The size, type, increment, materials, etc of the test weights is up to each team to decide, but they must be stand alone dead weights that are placed on the airplane by the crew member and then not touched until after the mission is complete, therefore, human applied weight is not allowed.

15. Can a tensioning system with a force gauge be used instead of weights in ground mission?

Answer: No, as clearly stated in the rules, the weights will be removed by the crew member and weighed and recorded at the completion of the mission.

16. Are there any limits to ground fixture design – e.g. can we use a scissor jack lift like fixture to change the height of the aircraft during the ground test?

Answer: Other than attaching to each wing tip using two fasteners, all design aspects of the test fixture is up to each team to determine.

17. The rules state that the aircraft has to be attached to the ground test fixture using only the two fasteners. Does this mean that the fasteners have to transmit all the force from the wing to the ground fixture, or can the antenna & ground fixture interface be designed so it supports part of the weight - e.g. the ground fixture has a ledge?

Answer: There is no requirement that the fasteners must carry the full load. Features in the interface for the test fixture and antenna mount are up to each team to determine.

18. The rules state that only the assembly crew member can touch the airplane and the payloads during ground mission. Can the pilot touch the test weights and ground fixture?

Answer: No, only the crew member.

19. Can the weights be suspended below the fuselage?

Answer: The method of applying the weights is up to each team to determine.

20. Is the tip of the wing allowed to rest on the ground mission platform at all during the loading, or does it have to just be the fasteners/hardware/whatever is holding the antenna? I.E. can any part of the wing besides the antenna securing method touch the platform?

Answer: Only the interface with the antenna mount can be used to attach the test fixture.

21. In the 2nd Q&A, question 8 about deformation, it says that wrinkles in wing skin can be considered deformation leading to mission failure. However, if a team uses Monokote there may be some wrinkling due to its material properties. Would wrinkling cause a failure of the ground mission? Is temporary wrinkling allowable?

Answer: It is recognized that wrinkling in a Monokote skin can occur for reasons not associated with structural deformation or failure. At the judge's discretion, a wrinkle that appears during load application and removal may be cause for further investigation into a permanent deformation of the wing structure.

Payloads

22. Can the payload edges be rounded/filletted while maintaining the stipulated height, width & length of the payload box?

Answer: No, unless the box is larger than the minimum dimensions and the rounds/fillet are outside the minimum dimensions.

23. Does the area around the antenna (above the adapter) have to be unobstructed within a certain radius?

Answer: There can be no obstruction or alteration to the antenna above the adapter.

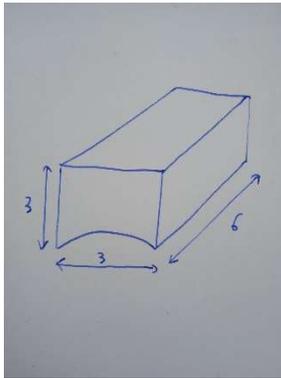
24. Are the PVC pipes allowed to be extended using means of external supports?

Answer: The antennas are fixed in the vertical position at all times and no external supports are allowed.

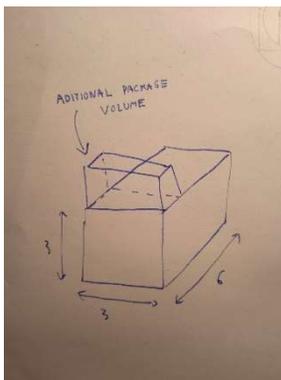
25. Are there any constraints regarding the density of the electronics package?

Answer: No.

26. Does the Electronics Package have to be shaped like a box (With the dimensions 3x3x6 inch), or does it only have to occupy the dimensions of that box - can its shape be other than a box.



In case the Electronic Package minimum dimensional requirements are an actual box shape (without any holes or indentations), does this mean that (if minimum requirements are met) additional volume can be added to the package in any shape, as in the picture below, or does it always have to be shaped like a box?

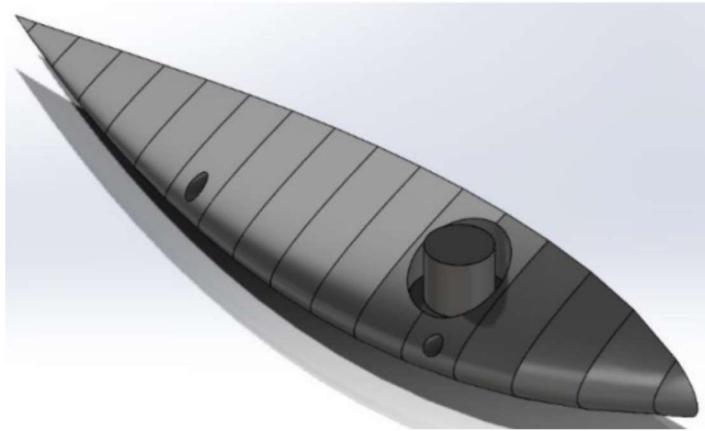


Answer: The Electronics Package must be a minimum of 3.00 x 3.00 x 6.00 inches. The first picture above will not be allowed. If it is made to these dimensions, it must be a rectangular box. A package that is larger than these dimensions can be of a shape of the teams choosing as long as the minimum dimensions are met in the form of a rectangular box. Keep in mind that the minimum dimensions must be verified during tech inspection and if the shape makes it difficult for the inspector to easily confirm, the package will not be allowed.

27. Are there any constraints as to how the electronics package we design is mounted inside the aircraft? (other than it must be [fully] enclosed within?) For instance, could bolts be screwed through an aircraft panel and into the package during the aircraft assembly and payload installation phase before a flight attempt? Could a binding like zip ties be installed to mount the package during assembly, then cut and removed for the weighing after the flight?

Answer: The method of mounting and safely securing the payload is up to each team and will be approved during tech inspection. Any hardware used to attach and secure the payload will not be part of the post mission weight.

28. In the Q&A #1 document, question 7 answer, it is stated “[the adapter] cannot be a wing extension with lift capability.” Our design is a continuation of the airfoil, designed not to generate lift, but to minimize drag. Is our design, shown below, in violation of the question 7 answer?



Answer: The adapter can be a natural extension and close-out of the airfoil wing tip.

29. Does the antenna need to be perpendicular to the ground (90 degrees from the ground) or perpendicular to the wing (90 degrees from the wing)? We are wondering how including wing dihedral would affect how the antenna would need to be mounted?

Can you please elaborate on the orientation of the antenna? Is it to be oriented normal to the wing's chord? Is there any other acceptable orientation relative to the chord?

Answer: The antenna must be vertical with reference to the ground, fore/aft and left/right, regardless of wing configuration or orientation, while the aircraft is in a level flight orientation.

Power

30. Can we recharge the batteries fully after each mission?

Answer: Yes.

31. We have a limit on propulsion batteries(100 W-hr.) but we can add as many batteries as we want for other actuators and controllers?

Answer: There is no limit on the number of non-propulsion batteries. LiPo batteries are limited to the FAA limit of 100 watt-hours.

32. Are we allowed to use a separate battery for communication even if it surpasses the 100 Watt-hrs battery limitation for the propulsion system?

Answer: Non-propulsion batteries as defined in the rules are not part of the 100 watt-hour propulsion limit. If LiPo batteries are used, each battery pack is limited as defined in the rules.