



2024-25 Design, Build, Fly Q&A #4



General Questions

1. Can a commercially available LiPo split-pack be used for a single propulsion system?

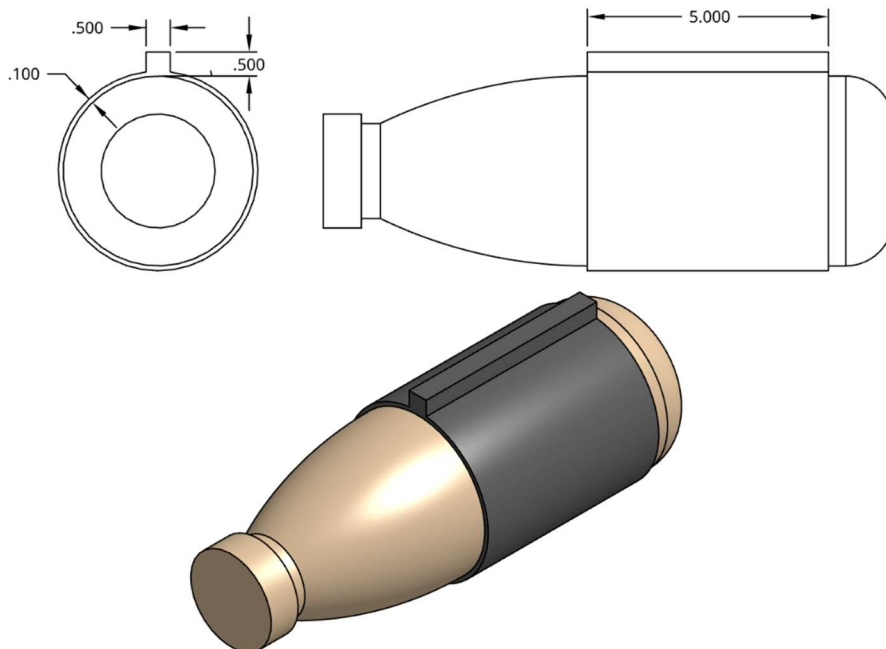


Answer: Yes, assuming that the configuration can be confirmed in Tech Inspection that it is connected to a single propulsion system.

2. I understand that we are not permitted to use a standard receiver for remote commands, but I wanted to confirm whether a Bluetooth-based solution would be an acceptable alternative?

Answer: Bluetooth uses radio frequency and therefore would be a radio controlled receiver in the X-1 test vehicle. The X-1 test vehicle cannot be commanded or controlled by ANY external commands or wireless technology.

3. Would the example configuration of the bottle adapter in the figure below be compliant with the rules as updated in Q&A#1, Q43?



Answer: Yes, this would meet the definition of the adapter as defined in the Q&A.

4. Can X-1 vehicle servos and sensors be all turned on before take-off? or must they be turn off during take-off?

Answer: The X-1 test vehicle may be powered on at any time.

5. Can there be multiple switches in parallel to turn on the radio control system for redundancy?

Answer: Yes.

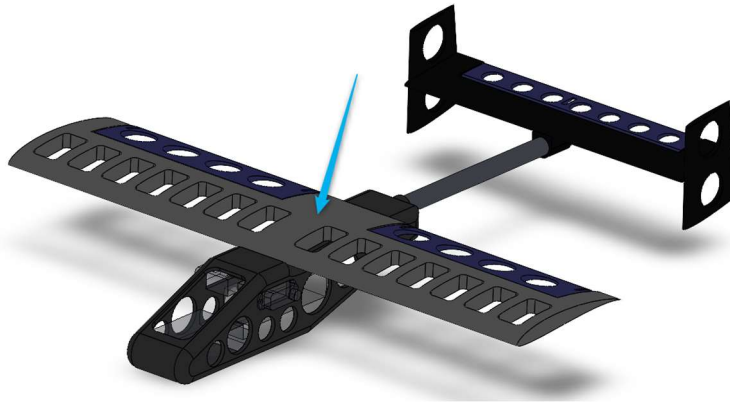
6. For the X-1 glider, can we use a single cell LiPo battery, that does not come with a connector or leads, and solder the connector and lead to the battery tabs ourselves?

Answer: Yes.

7. Is an elastic rubber band allowed as a form of securing the X-1 vehicle?

Answer: No.

8. If the wing is mounted flush on top of the fuselage like the example shown in the image below, is the section directly above the fuselage (denoted with the blue arrow) considered part of the wing and subject to said clearance rule, or part of the fuselage and exempt from the rule?



Answer: In the example shown, the wing aero profile extends across the top of the fuselage and is therefore subject to the 0.25 inch clearance rule. If the release mechanism connects to the wing, it must extend a minimum of 0.25 inches away from the fuselage to be compliant.

9. If a threaded fastener is used to connect the pylon to the wing mount, is it classified as a permanent fastener and subject to the appropriate safety requirements (locking device required)? Or is it just treated as an access panel latch (positive mechanical latching method required)?

Answer: The pylons, once installed for flight missions, are considered a permanent feature of the airplane potentially carrying high loads and are therefore subject to the permanent fastener locking requirements.

10. Would a valid method of verifying the volume of a beverage bottle with the label removed be by bringing an identical bottle which still has the label on it which we do not intend to fly with?

Answer: As stated in Q&A#1, Q2, it is up to each team to prove their bottle is compliant. It will be up to the tech inspector to decide if a team has sufficiently demonstrated the bottles are compliant. The Q&A will not be used to pre-approve how a team demonstrates compliance.

11. Will the fuel tanks be at maximum weight for Ground Mission? The original rules document says that they may be empty, but question #41 from Q&A #1 says they must be the maximum weight declared at tech inspection?

Answer: The response in Q&A#1, Q41 was incorrect regarding the fuel tanks and the Ground Mission. The requirement is hereby corrected AND includes the internal tank, if implemented, which is part of the GM. **For the Ground Mission, the external and internal (if implemented) fuel tanks may be empty for this mission.**

12. For the glider drop mechanism to be defined as internal (and therefore non-removable), must it be inside a bomb bay with a door? That is to say, are having a removable drop mechanism or having a bomb bay with a door the only two permissible options?

In the answer to Q&A #1 question 49, it is stated that "if the release mechanism is external to the fuselage, it must be absent for M1 and installed as part of the timed mission for GM." Would this only be applicable to components of the release mechanism external to the fuselage (in the airstream as with the pylons) or every component whose purpose is to hold and release the X-1 glider?

Answer: An internal release mechanism requires a permanently attached bomb bay door for access. For clarification, the release mechanism is considered a "system" in the airplane and not made up of components. If any part of the release mechanism is external, then the release mechanism is external. This and other options and requirements for mounting the release mechanism are further defined within this Q&A#3.

13. The rules state that for Ground Mission, "blocks cannot exceed the height of the airplane fuselage from the ground while resting on its landing gear" but our fuselage rests at an angle. Will this height be defined as the height of the fuselage when it is parallel to the ground (and resting only on its main gear) or sitting at an angle (on its main gear and tail wheel). If it is the latter, at what point along the fuselage will the "height be measured to: point A, point B, or some other point? (see image below)?



Answer: The rules clearly state "while resting on its landing gear", which means ALL gear and contact points (in the case a rear tail skid is used in place of a wheel). In the example provided, the maximum height of the blocks cannot exceed point "A".

14. Are we allowed to secure the plane onto the blocks with tape or some other adhesive, or must they rest on the blocks without additionally being secured?

Answer: How the airplane is secured to the blocks is up to each team to determine.

15. The rules state that decorations or paint may be added to the beverage bottles if they do not alter the external shape of the bottle. If decorations are added that involve light sanding of the surface and nothing more, is this still maintaining the general external shape of the bottle and therefore permissible?

Answer: Prep of the bottle for painting or other decorations is acceptable, but as always, if the amount of prep appears to have altered the external shape of the bottle at the discretion of the tech inspector, it may not be allowed.

16. Can the pylons be attached to the fuselage?

Answer: Yes, subject to the same rules for wing mounted pylons.

17. If we plan to use a twin-engine (dual propulsion) setup, do both fuses together need to remain at or below a combined rating of 100 amps, or is each fuse individually permitted up to 100 amps?

Answer: Each individual arming fuse is limited to 100 amps.

18. Can the control surfaces of the X-1 glider be activated or moved prior to deployment?

Answer: Yes. The RC controller cannot command the glider control surfaces directly, only send a signal to the airplane. The airplane then may autonomously interface with the glider to actuate the control surfaces.

19. Are alternative glider light sources besides strobes/LEDs allowed? For instance, could something such as a light bulb follow the rules of allowable light sources for a glider?

Answer: The rules require "...flashing lights or strobes...". It is up to each team to determine the type of light source to implement that can clearly be seen by the flight line judge.

20. Are barometers allowed on the main aircraft for the pilot to determine the exact altitude for the X-1 vehicle deployment. Unfortunately, the response in question #27 in Q&A1 describes how the flight judges will determine if the aircraft is between desire deployment range (200 – 400ft) and signal us for X-1 deployment?

Answer: Sensors on the airplane to provide feedback to the pilot through the RC controller are allowed. However, in this instance, the flight line judge is the only valid source to determine if the airplane is at the correct altitude as clearly stated in the rules and Q&A. Sensors on the airplane of unknown calibration and accuracy will never be allowed to overrule the flight line judge.

21. When implementing clamps with the bottle adapter, may the clamps be installed prior to ground mission or staging?

Answer: If a team chooses to implement an adapter and the adapter used clamps to secure the bottle to the adapter, the adapter and clamps will have to be attached to the bottle prior to entering the staging box or starting the ground mission.

22. If clamps are implemented with the bottle adapter, would they contribute towards the total fuel tank weight?

If a team chooses to implement an adapter, it will be part of the total weight of the fuel tank?

Does the adapter that can be permanently attached to the bottles count towards the mass of the bottles in M2? Or will they have to be removable to be weighed?

Answer: Yes, the adapter and clamps will be part of the total fuel tank weight.

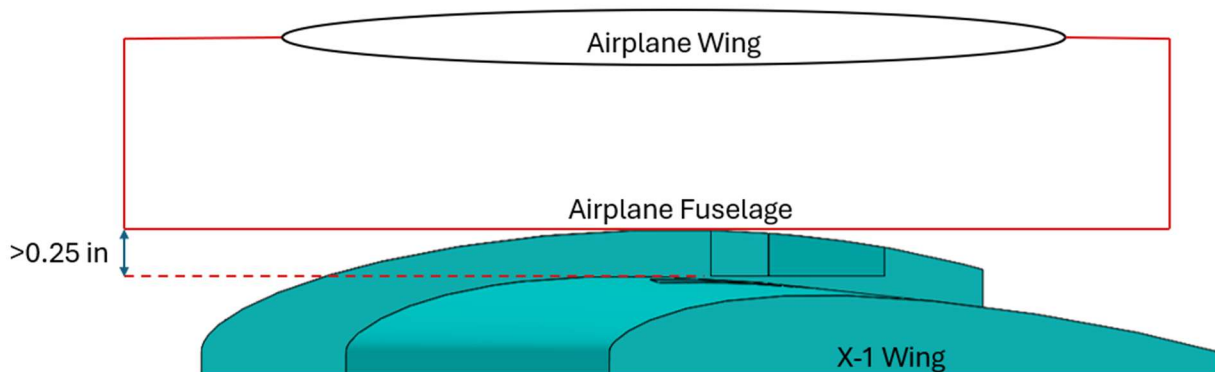
23. The first paragraph of Q&A #3 states that holes up to 0.25 inches in diameter are permitted in the wing for attaching the pylons to structures internal to the wing, and that holes up to 0.25 inches in diameter are permitted in the fuselage for attaching the X-1 release mechanism to structures internal to the fuselage. Can these small holes be polygonal in shape, as long as the area of each hole is less than or equal to the area of a hole 0.25 inches in diameter?

Answer: The holes may be of any shape as long as the holes fits completely inside of a 0.25 inch diameter, not having the same area as a 0.25 inch diameter hole.

24. Q&A #2, Q43 allows an adapter to be attached to each external fuel tank bottle, that can be no more than 0.50 inches wide and 0.50 inches high, and may be no longer than 5.00 inches. Can multiple adapters be attached to each bottle, as long as the width (along the long axis of the bottle) of each adapter is less than 0.50 inches, and the total length of all adapters on a single bottle does not exceed 5.00 inches? Is the “length” of the adapter measured along the long axis of the bottle?

Answer: Multiple adapters are allowed but all adapters must be fit within a 5.00 inch length (example, two adapters 2.00 inches long must be located with no more than 1.00 inch in between).

25. If the X-1 glider is a flying wing model, with a centre hub that is raised at least 0.25 inches from the X-1 wings, and the centre hub is the side of the X-1 that is touching the main aircraft's fuselage. Does this satisfy the minimum 0.25 inch rule between any part of the airplane fuselage, wings or outer surface and the X-1 vehicle wings? A diagram has been included below for clarification.



Answer: Specific designs are not approved in Q&A as stated in the FAQ. In this example, the center hub could be interpreted in tech inspection as a rib or other feature of the wing and may be deemed to violate the 0.25 inch clearance requirement. A feature on top of the X-1 wing at the interface to the release mechanism only that spaces the wing 0.25 inches from the airplane fuselage or the release mechanism extending 0.25 inches from the bottom of the airplane fuselage would be a better choice.