America's Ride to Space

2016 Payload Proposal Form

2016 will be a milestone year for the Student Rocket Launch Program as United Launch Alliance interns complete and launch the Future Heavy rocket, expected to be the largest sport rocket in the world!

Instructions

1 | Complete the information requested below in the space provided.

2 | If your school wants to participate in the 2016 launch event, please notify ULA (reference contact info below) as soon as possible.

3 | Submit your completed proposal form to ULA by Jan. 24, 2016.

4 | Proposal team leaders will be notified by Feb. 1, 2016, if their payload has been selected to fly on the ULA rocket.

5 | Chances of being awarded a payload spot on the rocket depend on the number of proposals submitted. Proposals will be judged on creativity, credibility and completeness.

6 | There is no cost to fly a payload on the rocket.

7 | A team may submit more than one proposal, but no team will be awarded more than one payload spot on the rocket unless there are more spots available than proposals received.

8 | This form may be expanded to multiple pages if required.

9 | ULA and Ball engineers are available to consult with the payload teams as required during the development of the payloads.

10 | Contact Info: Kyle Whitlow at kyle.a.whitlow@ulalaunch.com for more information.

Title/Name of your Payload Concept:

Team Leader (Name/School/Phone/e-mail):

Payload Concept Description: *Describe what your payload will be, how it will work, and what materials you will use Provide as much information as you know. It is OK to add sketches, photos, etc. if applicable.*

Team Description: *Describe who will work on the project with the team leader (i.e. 12th grade physics class, 10th grade shop class, etc.). Describe resources available to the team (i.e. work facility, tools, payload materials)*

Do one or more members of your team plan to attend the launch in person? ◯ Yes ◯ No ◯ Undecided

Sell Your Project/Team Here: *Tell us why you want to do this. Convince us that you can achieve your objectives. Tell us you will be dedicated to deliver a product that has a reasonable chance of working. Are there any unique discriminators that set your team apart?*

If your payload is not selected for a firm launch slot, will you build a payload for a backup slot? ◯ Yes ◯ No

We plan to launch 10 payloads built by K-12 teams. It is possible that one or more of these payloads may not be ready for launch by launch day. Therefore, in addition to awarding 10 firm launch slots, we may award two additional standby launch slots that may fly in 2016 if any of the firm payloads fail to show up ready for launch.

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Payload Requirements

1 | Payloads can be electrically and functionally active or passive, simple or complicated. They can be or do almost anything you can dream up.

2 | Payloads may not include animals, explosives, flammable liquids, bio-hazards or nuclear materials. Small pyrotechnics for device actuation are permissible.

3 | Payloads can be deployed or remain in the rocket (payload choice).

4 | Estimated maximum acceleration during flight (except at jettison) = 10 Gs. Estimated maximum acceleration during payload jettison = 100 Gs. In other words, make your payload sturdy. Use this test:

- Drop your payload from a height of 3 feet, onto a medium thickness carpeted floor, so it lands vertically on the end that will be near the ejection piston in the rocket. If it survives this drop test, it should survive the jettison/ejection event in flight.
- If your payload will not be jettisoned from the rocket, a drop test from 6 inches (in flight orientation) is sufficient.

5 | Each payload team will be provided a payload tube.
A payload tube is a phenolic-reinforced cardboard tube that matches the maximum dimensions specified for each payload. This is the largest possible tube that will fit inside your payload's compartment in the rocket. You should write the name and address of your team on the payload tube, but do not paint outside of the tube or it may not fit in its compartment. The payload tube can be used in several ways:

1 | as the outer structure of the payload, i.e. items can be installed inside or attached to the inside of payload tube;
2 | the payload tube can be split into two half shells (180 degrees each) that surround payload and protect it during jettison, then fall away from your payload after jettison,
3 | or you don't need to use the payload tube as part of your payload. In this case you should use it as a fit-check tube. If your payload fits in the payload tube, it will fit in the rocket.

6 | A parachute or other provision shall be used to ensure that payload does not descend at more than 20 mph.

7 | Parachutes or other recovery provisions must fit with the payload within the maximum allowable payload dimensions.

8 | Payloads installation in the rocket must be complete with no further access at least 90 minutes (preferably 120 minutes) prior to launch.
Lessons learned:

- Test your payload, if applicable, to ensure it has adequate battery life and/or memory;
- Test your payload to ensure it does not auto-power-off after 90 minutes or less of inactivity, darkness, quiet, etc.;
- Temperature of payload in the rocket prior to launch may reach 120 deg Fahrenheit or higher, depending on weather.

9 | If a payload plans to transmit radio frequency (RF) signals, such transmissions shall be coordinated in advance with ULA. Due to possible interference with rocket system electronics, payloads may not transmit RF signals until after the payload has been ejected from rocket.

10 | To request an exception to any of these requirements, please contact ULA to discuss alternate options or waivers.

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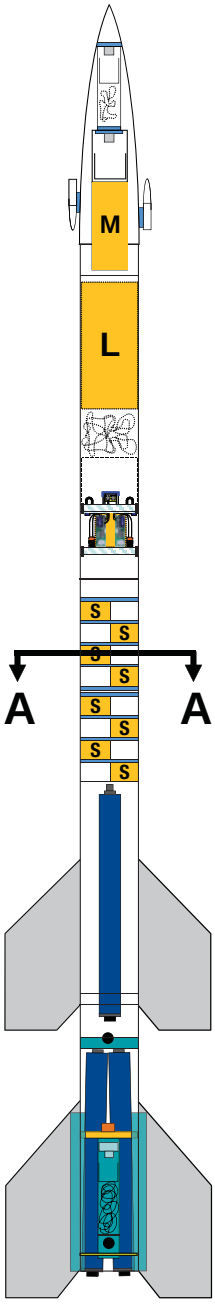
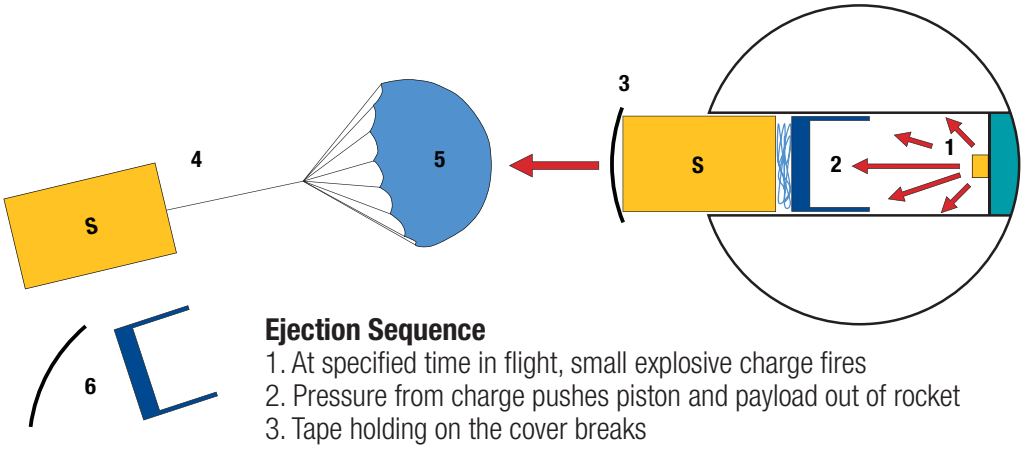
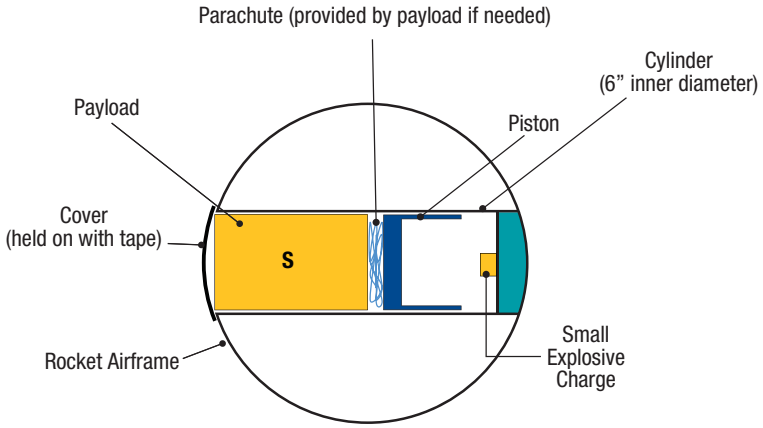
Ejection Sequence



Class S Payload
Dimensions: 15" Long x 6" Dia
Mass Limit: 4 lbs
Available: 10
Please note the size is different than in previous years.



Ejection Sequence
1. At specified time in flight, small explosive charge fires
2. Pressure from charge pushes piston and payload out of rocket
3. Tape holding on the cover breaks
4. Payload flies free of rocket
5. Parachute deploys
6. Piston and cover free fall to ground



Section View A-A
Student Payload
Installed in Rocket

Note: Future rocket shown. Future Heavy small payload dispenser design is similar.