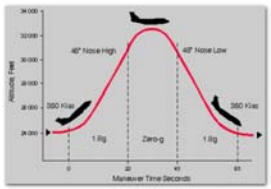
Utah State University

UTAH STATE UNIVERSITY GET AWAY SPECIAL RESEARCH TEAM

K-Bird

The KC-135a, or K-Bird, is an aircraft specially outfitted for parabolic flight. As it dives toward the ground those onboard experience weightlessness for 25 seconds. This aircraft has been used as a set for several movies such as *Apollo 13*, but students have the opportunity of flying on the K-Bird to perform microgravity experimentation.



The parabolic flight path of the K-Bird. The duration of each flight spans some 40 such parabolas.

Aside from the experimentation, students also enjoy a little free time.

Due to the potential nausea induced by the repeated shifts from 0-G to 2-G, the K-Bird is also referred to as the "Vomit Comet".

Outreach

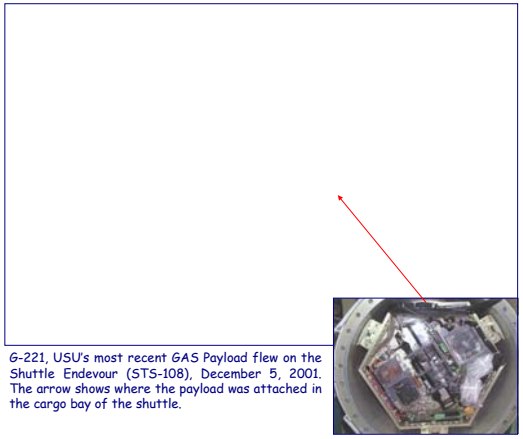
Outreach to elementary, middle, and high schools is an emphasis of Utah State University's Get Away Special Team.

Left and above, in one ongoing outreach project, called "Space Popcorn", elementary school students are given one bag of popcorn that flew in space with two bags that did not. They then perform scientific experiments to find out which bags are which. Above, Ed Galindo poses on the wing of the Discovery as Sho-Ban High School experiments are being integrated into the cargo bay. Left, a video shot from Box Elder High School's "Nucleic Boiling" experiment.

Get Away Special

G-001 on the Shuttle Columbia (STS-4), June 27, 1982.

On June 27, 1982, Utah State University launched the world's first Get Away Special, or GAS, payload. Since then, USU's Get Away Special Research Team has placed more experiments in space than any other educational institution in the world. As a matter of fact, they are only one payload behind NASA, and are currently working on two payloads.

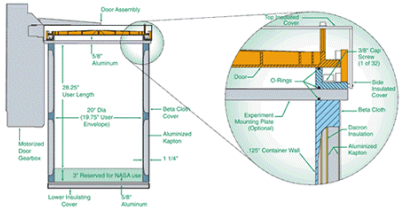


G-221, USU's most recent GAS Payload flew on the Shuttle Endevour (STS-108), December 5, 2001. The arrow shows where the payload was attached in the cargo bay of the shuttle.

After designing and building a payload of experiments, students fly to a NASA facility (usually Kennedy) to integrate their experiments on a shuttle. As part of this process, NASA engineers check to make sure the payload meets safety regulations. When the payload launches, students can fly to Florida and receive VIP passes to see the launch from up close. During integration and launch, students also take time to tour the facilities, often seeing things closed to the public. Below, G-200 students tour the Crawler. To the right, they pose near the launch pad.

Below, a picture taken by one of the GAS students of the Shuttle Endevour (STS-77), May 19, 1996. STS-77 carried G-200.

Get Away Special students design and build experiments they want to fly in space, instead of working on experiments for some one else. Their experiments are placed in GAS "cans" which are then in turn mounted in the cargo bay of a shuttle. GAS cans are roughly the size of a commercial garbage can, holding 5 cubic feet in volume. To the right is a cut-away view of a GAS can. To the top and right is a picture of GAS cans being mounted in a shuttle.



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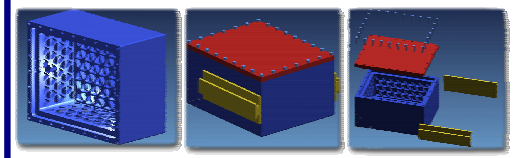
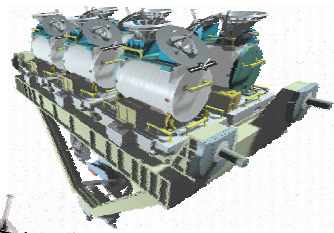
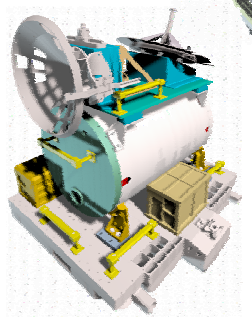
Current & Future Projects

Utah State's Get Away Special Research Team is the world's foremost undergraduate space research team. The team is constantly looking for ways to pioneer student research in space. Currently, they are working to help NASA develop the FAST (Flexible Alternative/Access to STation) program, which would allow students to place GAS-like payloads externally on the ISS (International Space Station). They are also working on another project, so new it is yet unnamed, that would allow students to place smaller experiments on the interior of the ISS. This latter group of experiments would be placed on a shuttle only hours before launch, and would be stored in the shuttle's middeck for the voyage to the ISS.



Above and across, a current team member, Jeff Duce, is modeling the containment structure designed for experiments that will be placed internally on the ISS. This model will be crafted from T6066 aluminum using a CNC mill.





The FAST concept design, to the left, adapts GAS systems for use on the ISS. FAST payloads would be grouped together on an ExPRESS pallet as shown above. The ExPRESS pallet would then be attached to the ISS externally as shown below and to the left, where the pallet is outlined in red. On the bottom right is a picture of the ISS with the area of attachment circled in red.