

A&M student project could be used on future spacecraft

By Robert Stackhouse
THE BATTALION

Designed, produced and operated by a team of Texas A&M faculty and students, the experimental Star Nav I navigation system proved itself onboard the tragic 28th flight of the space shuttle Columbia.

Dubbed Star Nav I, the endeavor is part of an ongoing research project through A&M's Commercial Space Center for Engineering (CSCE) to produce an advanced navigation system for future spacecraft.

The purpose of the experiment was to prove navigation techniques that had been developed by researchers at A&M for star pattern identification, said Dr. John Junkins, a professor with A&M's aerospace engineering department.

"The purpose of identifying the stars is to be able to navigate the vehicle while precisely determining the direction it is pointing," Junkins said.

He said a device of this sort would determine a space vehicle's orientation in space — a sort of space compass.

While star navigation is no longer the primary method of modern orienteering, navigation by starlight is still a viable method of discerning direction in space.

"The overall purpose is to develop new technology for future spacecraft. The Star Nav system could be used for interplanetary travel, earth orbits, solar orbits —

wherever you can see the sky. You would have a method of automatically navigating by starlight," Junkins said.

The Star Nav system needed to be tested in an actual working environment to demonstrate its utility to members of the scientific community. Testing on board the Columbia was therefore a necessary step in its development.

"We had validated the technology on the ground, but it is different in terms of

acceptance of the technology if you haven't had a ride into space," Junkins said.

The Star Nav endeavor is a good opportunity for A&M students to gain some real-world experience, said Mike Jacox, project manager of Star Nav I and associate director of the CSCE.

"It was a group made up entirely of students running the experiment at (NASA's) mission control," Jacox said.

This is the first instance of a completely student-run space experiment he had heard of, he said.

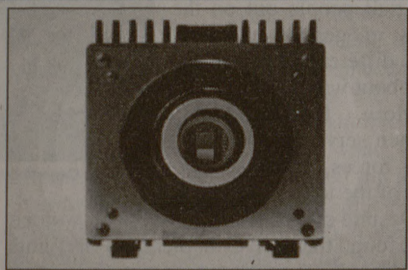
Maria Puente, an associate with CSCE, worked firsthand with NASA astronauts and mission controllers on the Star Nav project. Puente and her colleagues manipulated the star camera through a NASA-approved laptop linked to the shuttle communications relay.

"The unique thing about Star Nav is its 'lost in space' algorithm," Puente said.

The algorithm, known as LISA, was developed by Junkins and enables the star-tracker to compare camera images to star catalogs onboard the Star Nav to determine the vehicle's orientation.

Junkins said the experiment was successful, and was not set back, despite the fate of the Columbia.

"We were able to verify that our system worked. We had finished our experiments by Tuesday (Jan. 28). By and large, we achieved our goal before the disaster occurred," Junkins said.



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SOURCE: CSCE PHOTO: THE TEXAS A&M FOUNDATION

'Ignorosphere' could be key to shuttle re-entry breakup

By Matthew Fordahl
THE ASSOCIATED PRESS

SAN JOSE, Calif. — The space shuttle Columbia broke up in a mysterious area of the upper atmosphere once so little understood and difficult to study that scientists dubbed it the "ignorosphere."

The region is of particular interest not only because that's where the disintegration occurred but also because of a time-exposure image taken by an amateur astronomer showing a snake of purplish light corkscrewing through the shuttle's hot glowing trail as it crossed over California.

Former shuttle astronaut Tammy Jernigan collected the camera and the image from the photographer, who has requested anonymity while NASA analyzes the shot. It's not clear whether the flash is real, or an aberration of the camera.

The shuttle was traveling at 12,000 mph at an altitude of 39 miles as it disintegrated Feb. 1 in the searing heat of re-entry, for reasons still unknown. All seven astronauts were killed.

Columbia was crossing through the mesosphere, or middle atmosphere, which extends from about 30 to 50 miles above the surface. It's also called the ionosphere, because of the presence of free electrons — or ions.

"We're discovering the middle atmosphere has got a lot of electrical phenomena," said Walt Lyons, president of the FMA Research in Fort Collins, Colo. "The key message here is that there may be more things going on up there that we just don't understand or have no inkling of yet."

In a report published last year, NASA researchers said experts have "so far" concluded that the electromagnetic phenomena or ice crystals from the highest clouds are not known to pose a danger to shuttles on re-entry.

Moreover, conditions on Feb. 1 were not right for the most dangerous occurrences, though other experts caution that much remains unknown about this part of the atmosphere.

The region has been difficult to study, because it's too high for balloons and aircraft, yet it's too low and the air is too heavy for satellites, which would be unable to stay in orbit because of the drag, said Umran Inan, a physicist at Stanford University.

"You can't make local measurements with any regularity," he said. "You can have a single rocket shot through the region, but the phenomena are dynamic and change from place to place and time to time."

In the ionosphere, ultraviolet energy from the sun as well as cosmic rays from faraway stars separate electrons from atomic nuclei. The free electrons give the area a characteristic not unlike everyday metal, in that it can reflect electromagnetic energy.

These electrons also create strange electrical effects, with fanciful names like "elves," "sprites" and "blue jets." Until recently, they were largely dismissed as illusions, noticed only by bleary-eyed airline pilots.

All those phenomena are related to thunderstorms, which were not recorded in the area at the time of Columbia's descent.

The 2002 report by Kennedy researchers also noted some risk from "noctilucent" clouds, which are the highest clouds in the atmosphere.

"There may be more things going on up there that we just don't understand or have no inkling of yet."

— Walt Lyons
president, FMA Research

NEWS IN BRIEF

Ex-hacker Mitnick tastes own medicine

WASHINGTON (AP) — The world's best-known computer hacker suffered the indignity of having someone break into his new security consulting company's Web site.

Mitnick, whose federal probation on hacking charges ended a few weeks ago, acknowledged that this weekend's electronic break-in at Defensive Thinking Inc. of Los Angeles was actually the second time in weeks that hackers found a way into the computer running the firm's Web site.

Mitnick wrote in an e-mail to The Associated Press. "Actually, it's quite amusing. All the hackers out there figure if they can hack Kevin Mitnick's site, they're the king of the hill!"

Dude! You're busted for drug possession!

NEW YORK (AP) — Dude! The actor who gained fame and a cult following as the slacker "Steven" in commercials for Dell computers was arrested buying a small bag of marijuana, police have said.

Benjamin Curtis, a 22-year-old New York University drama student, awaited arraignment Monday on a misdemeanor drug possession charge.

Police said he was arrested Sunday night on the Lower East Side after officers on a drug detail spotted him buying a small bag of marijuana from Omar Mendez, 19. Mendez faces drug possession charges.

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