

## Conestoga and Ariane: Ups and Downs of the Launch Business

The two rockets were launched less than half a day apart, one from little Matagorda Island on the Texas coast of the Gulf of Mexico, the other from Kourou, Guiana, along South America's northeastern Atlantic seaboard. Each soared into the air, arched hundreds of miles up and out over the waves, and splashed down into the water. But whereas one inspired cheers, glasses of champagne and optimism, the other brought consternation.

The Texas takeoff was that of Conestoga 1, a small booster based on the motor from a sounding rocket and developed and financed by Space Services Inc., a Houston-based company bent on launching satellites at low cost to oil companies and other potential customers. Technologically, the Sept. 9 flight's goal was simply to show that the rocket could get through a sub-orbital test run (it lasted about 10.5 minutes, as planned, and splashed down about 321 miles from the launch pad). But just as important to SSI was the demonstration that a private company could organize such a project, raise the money (57 investors have so far contributed about \$6 million), deal with the numerous required government licenses and permissions and in general take on a business that in the U.S. has so far been the sole province of the National Aeronautics and Space Administration. And according to mission director (and former astronaut) Donald K. "Deke" Slayton, "Everything looked perfect."

SSI plans to launch its first orbital payload — possibly a remote-sensing satellite or one to communicate with remote data-collection platforms on the ground — in September of 1984, using a multi-stage rocket. New technology, however, is not SSI's focus. For last week's flight, one contractor built the rocket, another provided the equipment for the launch site and tracking, while yet another served essentially as engineering overseer for the whole project. "What we're doing," says SSI public affairs director Charles Chafer, "is just combining existing stuff in a way that makes money."

At least that's the idea. SSI hopes to be able to offer such customers as exploration-oriented oil and mineral companies the ability to put a 500-pound satellite in a 500-mile-high orbit for \$3 million to \$5 million. If business warrants, in fact, the company has far loftier plans. "We're trying to put together a 'turn-key' system," says Chafer, "where we provide launch site, launch vehicle, satellite and maybe even a ground station — all for less than \$20 million."

Such plans did not just spring into being on the success of Conestoga 1, but Chafer acknowledges that success was a virtual

necessity to give SSI the credibility to begin competing for business with NASA's space shuttle and Europe's Ariane.

Still, not even the major players are yet home free. The shuttle's first operational launching (with two communications satellites as its first paying passengers) is not due until Nov. 11, though its managers are confident. And the first operational flight of Ariane—last week's other launching—was a disaster.

It was the fifth Ariane to be launched (its predecessors had been developmental missions, and a vibration problem that destroyed flight #2 had been worked out and dealt with), and it went exactly as planned . . . for 561 seconds. The first two stages had worked nominally, and the third had ignited on time, but suddenly the speed of its turbine dropped and the combustion-chamber pressure fell to zero. And instead of carrying its payloads (the MARECS-B maritime communications satellite and SIRIO-B, designed to distribute weather data and to help with an intercontinental program of synchronizing atomic clocks) into orbit, it carried them to the bottom of the Atlantic. A study of the failure is in progress. Ariane's next launch, carrying an astronomy satellite called EXOSAT, had been set for November. —J. Eberhart



Conestoga 1 rocket, privately built, funded and launched, on its Sept. 9 maiden flight.

Wide World

## Clearance confusion after DOD clampdown

In the aftermath of last month's Department of Defense action to halt the presentation of about 100 scientific papers at an international optical engineering symposium (SN: 9/4/82, p. 148), some researchers are confused about why certain topics were targeted and about what constitutes proper clearance procedures. They suggest that DOD should re-examine its review process.

One symposium participant, Robert M. Silva of VTI, Inc., in Dayton, Ohio, was not allowed to present three papers at sessions on scattering in optical materials. "I still have not heard from anybody why the papers were withdrawn," Silva told SCIENCE NEWS. "I'm in great sympathy with the administration in trying to keep information that could be beneficial to our potential adversaries, but at the same time it has to be done with a considerable amount of intelligence. Someone has to weigh who is being hurt."

Silva and his company, together with researchers at Wright-Patterson Air Force Base, have developed an instrument for detecting flaws on "supersmooth" optical surfaces used in laser applications and for other purposes. Their work shows that standard procedures used in the optical industry for measuring, cleaning and test-

ing can destroy expensively prepared surfaces. This damage is amplified by methods for coating the surface and limits performance. Silva says that DOD, which purchases numerous optical systems, is unaware it is buying "junk." "The only way we have to get this message across is not through normal DOD channels, because the information just doesn't get around, but through symposia and information exchange meetings like the SPIE [Society of Photo-Optical Instrumentation Engineers] meetings," he says.

Silva first heard about the possibility of a problem after he arrived at the meeting in San Diego on Monday, Aug. 23. Then two days later, he discussed the papers with a DOD representative and found out that all previous clearances had been withdrawn. "Up to that time, we thought the papers had been cleared," Silva says. "So then I started making some phone calls and found out that all that I had heard previously was no longer valid."

Silva and his colleagues had presented papers on similar research at earlier conferences. This was the first time that a clearance had been withdrawn, he says. "So it was really a shock," Silva says, "and it was done from the standpoint of people who really didn't know what we were do-

ing. They just made a blanket withdrawal."

Silva summarizes the incident: "Basically, I thought that the whole thing hurt us a heck of a lot more than anybody else, us being the United States and DOD and people in this country who are interested in the kind of information we have." In a letter to SPIE executive director Joseph Yaver, Silva wrote, "We will obey, and want to, the directives of those at the head of our government, but please try to convey to them through the society that there must be a better understanding and more technically competent judgments made, lest they do, as they did in San Diego, incomparably more harm than the imagined good." He adds, "It was done in great haste, and I would hope that they work out a better mechanism, so we know in the future, when we get ready to present some of this information that's important to us, we can do it."

Government officials also reacted to the incident. George A. Keyworth II, presidential science adviser, said he thought the incident was "both unfortunate and ill-timed." He said, "The Defense Department decided to enforce a rule, on the books for some time but generally not enforced, that every paper written with their support had to be cleared formally."

A State Department official noted that only papers from individuals funded by DOD were affected. There was no attempt to review papers from "non-DOD types," he said. A State Department representative, with expertise in both the Department of Commerce's technological export regulations and DOD's areas of concern, attended the SPIE symposium "to ensure that everybody knew what the rules of the game were." The official suggested that DOD's action would not have been "nearly as dismal had there been a better clearance procedure."

Silva is taking his papers through the clearance procedure required by DOD regulations and hopes to present his information at a future meeting. Many of the withheld papers may yet be published by SPIE with the conference proceedings.

Several groups are studying the issue of scientific communication and national security. The National Academy of Sciences panel is set to issue its report at the end of September, several months ahead of schedule (SN: 3/20/82, p. 204; 3/27/82, p. 218). Members of the American Association for the Advancement of Science Committee on Scientific Freedom and Responsibility are concerned that the government is acting before the results of the studies and consultations with DOD are released. Eric Stover says the committee, of the groups working on the issue, has the most up-to-date information. The problem is understanding the extent of the threat and its implications. "We want to be sure before we react," he says. "I think there's going to be a reaffirmation that ... there may be a long-range threat to science."

—I. Peterson

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## Early signs of schizophrenia

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When a schizophrenic sires a child, the child has a one-in-seven chance of eventually becoming psychotic. These well-documented odds have left little doubt about the inheritability of this disabling thought disorder. Nevertheless, scientists have made little progress toward identifying which of these "high risk" children will become sick and which will not; nor have they been able to figure out what it is that, if passed on from parent to child, precipitates a full-blown psychosis. Now scientists have reported some preliminary findings that suggest that high risk children have a slight but fundamental cognitive deficit that could conceivably serve to predict the adult onset of schizophrenia.

Psychiatrist David Friedman and his colleagues at the New York State Psychiatric Institute have studied two samples of high risk children and controls using what are called "evoked potentials" — the measurement of brain electrical activity immediately following a specific sensory stimulus. Friedman asked his subjects to respond to a particular sound, and using an electroencephalogram he studied their brain activity at 300 milliseconds following the stimulus. As reported in the latest *SCHIZOPHRENIA BULLETIN*, he found that the high risk children showed significantly less brain activity than did normal controls.

Late brain activity (that occurring at 300 milliseconds or more following a stimulus) is associated with a particular stage of information processing that involves the organization and consolidation of information in preparation for decisionmaking, according to Friedman. This measurement is taken primarily from the parietal lobe of the cortex—the "association cortex"—which is involved in the advanced stages of information processing, suggesting that high risk children may have an inherited neuronal deficit in this area of the brain.

Friedman is cautious about interpreting his data. He says that it is possible—even likely—that children at highest risk for psychosis also have deficits in the very early stages of information processing. And he also points out that the cognitive deficit is characteristic of high risk children as a group; it is not yet apparent whether or not such a deficit will identify a sub-group of high risk children who are destined to become adult schizophrenics. He is following his subjects, some of whom are now approaching adulthood, to see if individual cognitive differences are associated with subsequent mental illness. But he does emphasize that the same deficit has been identified in adult schizophrenics; the evoked potential research is rigged to tap a very basic intellectual process, one that, if askew, could lead to a host of

problems with learning and routine day-to-day decisionmaking.

The ultimate goal of high risk research is to develop preventive interventions for those who carry schizophrenic genes. But even if such a precise marker of schizophrenic risk can be found, it would at this stage be of limited practical usefulness. Scientists know virtually nothing about how such a subtle difference in normally functioning children could be linked to the development of schizophrenia, which is characterized not only by disorganized thinking but also by delusions, hallucinations, and emotional flatness. It is not even clear whether the disorder follows a natural course of development or whether it is triggered by environmental stress.

Identifying an early marker might, however, lead to a better understanding of how schizophrenia unfolds. One hypothesis, according to Rochester University psychiatrist Rue Cromwell, is that schizophrenics, when they fail to process relevant information in the environment, process irrelevant information instead. He notes that adult schizophrenics have also shown a deficit in the earlier stages of information processing (about 100 milliseconds following a stimulus), when the brain is processing the intensity level of the stimulus; some schizophrenics do not seem able to judge and reduce the intensity of sensory stimulation, and as a result their brains may be overwhelmed by environmental stimuli. Cromwell is studying the prevalence of this early cognitive deficit in schizophrenics and their relatives to see if and how it is passed from parent to child.

—W. Herbert

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## Spanish panda birth

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As the National Zoo in Washington gave up hope of a newborn panda this year, the Madrid zoo got a pleasant surprise—panda twins. The zoo officials had not been certain that their 7-year-old panda was pregnant after artificial insemination with sperm from Chia-Chia, the male panda living at the London Zoo. The smaller of the twins, weighing about 2 ounces, was placed in an incubator and given round-the-clock care, but it soon died of respiratory failure. The mother panda is caring for the first-born and larger (about 3 ounces) of the twins, which the zoo reports is developing normally.

The official 24-hour birth watch of the National Zoo's Ling-Ling (SN: 9/4/82, p. 150) ended Sept. 7, and the panda building was opened to the public once again two days later. Because Ling-Ling still is showing some signs of what zoo officials are now certain is a false pregnancy, an unofficial watch of three to six hours each night is expected to continue for a few weeks. Ling-Ling had been artificially inseminated with sperm from both the Washington zoo's panda Tsing-Tsing and the London panda Chia-Chia. □