

THE
**COMMERCIAL
SPACE REPORT**



PUBLISHED MONTHLY

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Dear Subscriber:

April, 1982

I just returned from the L-5 Society's First Annual Conference on Space Development. I found the experience to be definitely worth the money and time. The hoped-for communications between professionals and enthusiasts appeared to be successful, with engineers mixing with students and "space cadets" to trade information and enthusiasm.

Much of the conference was, as expected, "preaching to the choir", with speeches primarily enthusiastic refrains of "let's get going on space". I for one found the excitement refreshing, and a good sign.

Another good sign was the preponderance of libertarian opinion among the attendees. This speaks well for future efforts involving private enterprise in space.

The conference was professionally set up, with none of the gross scheduling hang-ups often seen in such events. This was largely due to the efforts of the conference committee, which has handled similar affairs before. The programming, two parallel tracks of live programming along with a third track of films, was somewhat frustrating. However, although I was unable to attend some of the programming, certain segments did stand out. A few of those will be covered in this month's Report.

"High Frontier". In a segment entitled, "If This Goes On..." (many segment titles were based on titles of books or stories by Robert A. Heinlein, the guest of honor), Lt. General Daniel O. Graham (U.S. Army, Ret.) presented his "High Frontier" project. This project was the result of a seven-month study by Graham and his associates, and was sponsored by the Heritage Foundation. It is intended to combine military and civilian requirements to produce a consolidated effort to use space in the national interest.

The proposal concentrates primarily on military applications, that being where the money is right now. It involves a three-step program to defend against Soviet strategic weapons using inexpensive space systems. Most space defense systems are high-technology, involving directed energy weapons for the most part. General Graham submits that there are less complex and expensive steps that can be taken in the short term. They are as follows:

- 1) A point defense. Little detail was given in the presentation, but this would be a system designed to defend missile sites at or near the site itself. Some form of short-range projectile seems likely. Estimated cost and lead time: \$1 billion and two to three years.

2) First Generation Space Defense. This would be a network of 432 satellites, 300 miles up in 65 degree inclined orbits. These would be "bus" type vehicles using "off-the-shelf" technology. They would weigh about 5500 lbs. each, and contain 40 to 50 simple heat-seeking projectiles similar to anti-satellite weapons already under development. The warheads on these projectiles, if any, would be non-nuclear. These devices, communicating with each other to coordinate the defense, could intercept attacking missiles soon after launch. Cost and lead time: \$10 billion to \$15 billion and five or six years.

3) Second Generation Space Defense. This would be a \$5 billion, 10 to 12 year step involving the more traditional space defense concepts (directed energy weapons), and would be capable of destroying missiles in mid-flight.

These systems, combined, would form a "layered" defense capable of wiping out a considerable portion of any strategic attack. It is a simple system, which some people have called "technologically unesthetic" (that is, not gold-plated like defense systems "ought" to be). Gen. Graham proudly agrees, calling the concept "the sort of thing an infantryman might come up with". What this system does is defuses a first strike almost completely. Unable to wipe out the deterrent force of the United States in a single attack, an enemy would be vulnerable to retaliation. The only option is to build defensive systems of his own, and fast.

The beauty of this is that it generates an arms race, not of offensive weapons but of defensive weapons. The end result of an offensive arms race is a nuclear holocaust. The end result of a defensive arms race is--two invulnerable countries sitting and staring at each other. Mutual Assured Destruction becomes Mutual Assured Survival. Much healthier in the long run, and tends to obsolete the nuclear missile along the way.

"What's the best way to keep people from building more nuclear missiles?" asks Gen. Graham, "The best way is to show that they won't do you any good."

Such a system could close the "window of vulnerability" within two years, cost less than 200 MX missiles (which would not be needed), and enhance civilian space exploitation in the process.

The civilian benefits come from several "core technologies" that are required to properly develop the military system. These include a "space jeep", a small, one-man spacecraft capable of extended orbital operations to maintain and keep an eye on the defense system; a low-cost space transportation system (less than \$100.00/lb.); and an orbiting space station. All of these would be greatly useful to any commercial space operations.

This proposal has been submitted to the U.S. Government, and faces opposition from the entrenched Defense interests. I suggest that this plan deserves a hard look (anything that could reduce the Government budget and kill the idiotic "MAD" doctrine at the same time deserves a hard look!) and a fair hearing.

Copies of "High Frontier's" report are available for \$15.00. Write: High Frontier, Inc., 1010 Vermont Ave., N.W., Suite 1000, Washington, D.C. 20005. Phone: (202) 737-4979. I suggest that interested people (that's you, friend, standing on Ground Zero!) examine this and bring it to the attention of our legislators.

"Man Who Sold The Moon." This session covered private enterprise in space, and featured Gary Hudson as chairman, attorney Art Dula, and pilot David C. Koch.

Gary Hudson spoke on the ways in which government can help expand the role of private enterprise in space. The bulk of his remarks have already been covered in the policy statement printed in the Report in the last two months.

Art Dula spoke on some of the legal ramifications of space exploitation. He pointed out that it will be up to new and growing companies to accept the challenge of space, rather than the larger, existing corporations. Historically, he said, few industries have ever been involved in creating their replacements. Someone once asked him, "who are the companies on the Fortune 500 who will invest and be active in space?"

Dula replied, "about half of them."

"Which half?"

"The half that isn't in the Fortune 500 yet."

He also showed that legally, a treaty is superseded by a U.S. Federal Statute, so that correctly written statutes could nullify the existing unfavorable Space Treaties.

To emphasize the profitability of space, Dula showed a piece of a nickel-iron meteor he had acquired from a dealer elsewhere at the convention. It would, he said, assay out at \$150 to \$200 per ton delivered to any steel mill. (The dealer was selling the meteor samples for 30 cents a gram, or approximately \$272,000/ton. Rarity seems to be inflating the price of meteoric steel somewhat. It should be pointed out that at one time aluminum was so difficult to manufacture, in spite of the abundance of ore, that it was more expensive than gold.)

David Koch, an airline pilot, spoke on the American Society of Aerospace Pilots. This organization is dedicated toward insuring a role for the present group of air transport pilots in the operation of future space systems, primarily the Shuttle. To do this, the ASAP is creating a training program to phase pilots into space systems. The program will incorporate ground school, and eventually simulator training. Interested people can write to the ASAP at:

.10700 West Higgins Road, Suite 200, Rosemont, Ill. 60018 or call: (312) 297-8420. Cost of the ground school is expected to be \$600-\$1000 over three years.

Future Space Transportation. Chaired by Maxwell Hunter, this panel covered some aspects of near-future methods of space transportation.

Hunter went over the work he has done in this area, covering laser propulsion, gas-core nuclear systems, and others. I should point out that he has written an excellent book, Thrust Into Space, (1966, Holt, Rinehart and Winston) that is practically a primer for rocket propulsion. Unfortunately, it may be out of print. I made some effort at the conference to convince Hunter to update and republish it, and one can only hope.

R. E. Simberg, another panel member, covered concepts for cryogenic upper stages for the Space Shuttle.

The third panel member was Gary Hudson, who offered a list of

specifications for a commercially useful space vehicle. These included: Fully reusable single stage to orbit; cargo, tanker, or personnel versions using common systems; vertical takeoff and landing; and capable of orbital refueling.

There was far more information at the conference than I could cover in a single newsletter, or even several. It is hoped that someone will publish a proceedings--there were unfortunately few actual papers published. Any news in this regard will appear here.

Next year, the conference is planned for Houston, Texas, with Art Dula as chairman. As yet there is no more detailed information. I recommend it highly if it turns out as well as this one did.

Some news items:

Space Services Hires Executive. Space Services has hired Dr. James Ashton, former executive of General Dynamics Electric Boat Division in Groton, Conn., as president and chief operating officer. Ashton resigned from General Dynamics in a management dispute at the troubled nuclear submarine manufacturing facility.

In a related item, Space Services is looking closely at a launch site at the south tip of Hawaii in Ka'u. A spokesman for the firm said that a permit to survey the area is in the process of being approved. South Point, the southernmost section of the island of Hawaii, is the closest part of the United States to the equator.

JPL Resignation. Dr. Bruce Murray resigned as director of Jet Propulsion Laboratories, California Institute of Technology. Insiders see this as another sign that JPL is moving towards other projects besides planetary programs.

In the June, 1981 issue of the Report we disclosed the efforts of the Space Transportation Company of Princeton, N.J. to finance and operate the Space Shuttle. Next month we will have further updates on this project.

Until next time,

Sincerely,



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