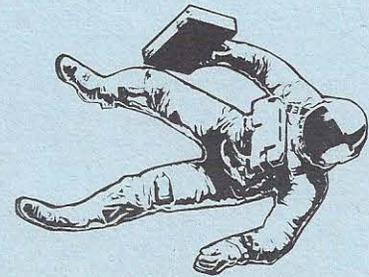


THE
**COMMERCIAL
SPACE REPORT**



PUBLISHED MONTHLY

Gary C. Hudson, Editor

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Dear Subscriber:

November, 1981

Space Van. Transpace Inc., created in 1967, has made several proposals for orbital transports which could be launched from a typical airport. One of these was an advanced-technology winged orbiter that was designed to launch from a standard runway. The orbiter, powered by cryogenic engines similar to the Space Shuttle Main Engine, would have been supported during its horizontal takeoff run by a large, rocket-powered sled mounted on a number of specially-designed tires. Now, Transpace Inc. has developed a concept for a smaller and much less expensive method for opening space to commercial payloads.

The system, presently called "Space Van", is a small, fully reusable, winged orbiter fueled by liquid oxygen and liquid hydrogen. It would be launched from the back of a modified 747 jet, much like the Space Shuttle Enterprise was dropped for its first simulated landing tests. Again like the Shuttle, the Space Van orbiter would perform its mission, then reenter and land on an airstrip. Small, reusable drop tanks (mounted on the orbiter under the wings) would be required to attain orbit. The orbiter would be approximately 70 feet long and 50 feet wide, most of that being liquid hydrogen tank. It would be powered by six Pratt and Whitney RL-10 rocket engines, an "off-the-shelf" LOX-hydrogen engine with reliability and performance proven on the General Dynamics Centaur stage. Payload would be approximately 2000 lbs. into low earth orbit. Unlike the Shuttle, protection against reentry heating would be accomplished by an all-metallic heat shield system.

According to Satellite Week (Oct. 19, 1981), development costs would be around \$500 million, with cost per flight of about \$250,000. (This includes \$87,000 allowance for recovery/return of investment.) Satellite Week is somewhat skeptical about the approach, but then the publication, although interested in the subject, is generally skeptical about prospects for success in most aspects of private space flight. Their claim is that "no real market has developed beyond that already committed to traditional launch vehicles for routine business in space." It should be pointed out that before the first commercial electronic hand calculator was put on the market, there was as yet no real market beyond that already committed to multi-million dollar computers for electronic aid in solving mathematical problems.

One hopes that Satellite Week, a publication aimed at a major group of potential launch vehicle customers and/or investors, will be more encouraging towards private efforts, since their opinion may affect the success of ventures like Transpace's. (More to the point

for them, a successful private space effort would probably allow lower satellite launch costs, an increase in satellite builders and designers, and a resulting increase in potential Satellite Week subscribers.)

OTRAG: Tsk, Tsk. As reported earlier, OTRAG split into two divisions, one of which will pursue commercial payloads under Frank Wukasch (at present, only sounding rockets), and the other which is staying in Libya under Lutz Kayser. It is apparently almost certain that the Libya faction is intending to build rockets with definite military purposes. According to sources, secret tests in the Libyan desert are proceeding intensively. A working guided missile cannot be far off, and it would be in the tender hands of Libyan ruler Muammar Qaddafi, who in some people's opinion should not be permitted to possess an overly sharpened pencil. What the Israelis will make of all this is not yet known, but judging by their brisk commentary on Iraq's nuclear research program it is likely that few companies will be willing to underwrite property insurance for the OTRAG/Libya test facilities.

Liquid strap-ons for Ariane? According to the Space Information Center News, (Oct. 14, 1981) CNES (the French Space Agency) is submitting to the ESA (European Space Agency) Council a proposal for development of an Ariane IV which will use liquid-fueled strap-on boosters rather than the solids used in present design plans. The boosters would use one Viking 5 engine each. The S.I.C. News headline claims "Ariane 4 Inspired by the Percheron Configuration". Percheron was designed by G.C.H. Inc. using pressure-fed liquid-fueled boost stages. Ariane IV is part of a program which plans to extend the capabilities of the existing Ariane launch system by various combinations of strap-on boosters, improved engines, lengthened tanks, and additional cryogenic stages. The most advanced of these systems, the Ariane V, could launch Hermes, a small, winged Shuttle-type orbiter.

Europe studying heavy launch vehicles. Also in the same issue of S.I.C. News it is reported that MBB and Dornier, two German aerospace industries, are separately investigating the possibilities of developing heavy launch vehicles in Europe. Capable of placing up to 60 tons into low earth orbit, the vehicles would be reusable ballistic systems resembling the concepts of Phil Bono, or early G.C.H. designs, taking off and landing vertically.

B.I.S. Symposium. These heavy lift launch concepts were discussed along with other topics at an Annual Symposium held by the British Interplanetary Society's Space Technology Committee in April. The symposium was titled, "Space Transportation Systems for the 1990's". Along with heavy lift booster ideas, presentations were made on the previously mentioned expansion plans for Ariane. Other concepts covered included winged spaceplanes capable of airport operations, the need for advanced engines (approx. 800 sec. specific impulse), and a possible manned Mars mission using non-nuclear technology. The proceedings are covered in more detail in the B.I.S. publication Spaceflight (October, 1981)

"On Gossamer Wings..." In another meeting, to be held November 17, the B.I.S. Space Technology Committee will review a different new idea. Some French CNES engineers have raised the possibility of organizing a race to the moon by solar sail. Around three unmanned sail-probes could be launched by an advanced Ariane rocket. A kick motor would put the sails in high enough orbit to avoid any atmospheric drag, and release them. After separation and deployment, they would head independently for the moon. The finish line would be denoted by lunar occultation.

Similar to the solar sail races featured in Arthur C. Clarke's short story, "The Wind From The Sun", (except for being unmanned) the cost of the total operation could amount to several millions of dollars. However, a preliminary survey indicates costs to be in a range similar to those incurred by maintaining a team of cars for Grand Prix racing. This may make the "sunjammers" available for commercial sponsorship. It has been pointed out that the large sails could be easily seen from the earth with the naked eye or binoculars during the long period of time (perhaps months) it would take to reach the moon. This popular impact would seem to make the concept ideal for commercial advertising. If the races became a popular sport, with large sums of money involved for manufacturers and sponsors, the result would likely be a rapid improvement in the technology of solar sailing. A similar effect already takes place in the automobile industry, where new developments from racing cars are often used to improve the designs of commercial automobiles. In this industry, the benefits of these new developments often far outweigh the fuel and other costs involved in automobile racing. It is probable that the same will be true for solar sail racing.

This idea is only one of a number of methods that have been suggested to utilize the vast commercial potential of existing or near-future space systems to help finance space research until true commercial systems evolve. This is distinct from selling space services or products, such as communications satellites or micro-gravity-grown crystals. This is selling the romance and excitement of space itself.

In this time of shrinking budgets, it is imperative for the present space program that other sources of funds be found before the public trough runs dry. Aside from the standard libertarian objections to using taxpayer money to fund space explorations, (space-flight is not one of the proper functions of a government) there is the more practical point that funding by commercial exploitation is probably far more lucrative. It has often been pointed out that the American public spends more on (lipstick, pizza, marijuana, pick one) than the total NASA budget.

Somebody in Washington is missing the boat. Imagine what could be done commercially with a single Space Shuttle flight. What would someone pay for a logo painted on the tailfin? Or a 30-second commercial filmed in real zero-G? Project Magellan, mentioned in last month's Report, is another example of this approach. And what of the future? How about a polished lunar rock set in a ring (Project Harvest Moon)? A coin forged from asteroidal steel? A stamp that had been to the moon? (I thought that was a great idea, and ought to have

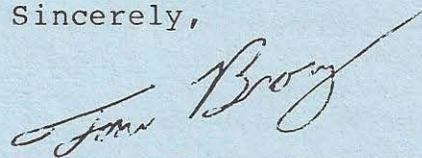
been allowed, if not encouraged.) Come on, NASA! You could have charged that beer company good money to have their truck photographed next to the Shuttle instead of making a stink about it. There is nothing in the NASA charter specifically prohibiting supporting itself commercially. How much money could the starving space program make if it was freed to do so? And why not do so? Is it remotely possible that, in spite of NASA's champagne engineering methods, that public funding could be completely dispensed with? It would be highly instructive for the government to ask the advertising industry and others some of these questions. It could lead to some loosening of the policy straps on NASA preventing it from engaging in these highly profitable activities. If scientists are worried about the commercial "stigma", there are examples where industries have managed some separation of the non-commercial from the commercial while benefiting from each. Look at the Olympics and professional sports. There's plenty of space for both.

Here it is important that I point out that advocating allowing the space program to finance itself commercially is not the same as advocating granting it any kind of legal monopoly (like the U.S. Postal Service and first class mail), or allowing it to use public funding to unfairly compete with purely private space activity. Although commercializing NASA would be a load off the taxpayers, restricting competition would be a disaster, and careful watch would have to be kept to avoid creating a "socialized" space industry.

Soviet battle station in orbit? Aviation Week and Space Technology reported recently that the Soviet Union has placed a "satellite killer" into a permanent orbit. This would be a system that would use conventional technology (guided interceptors as opposed to some type of energy weapon) to destroy multiple U.S. spacecraft. The United States Defense Dept. says that this claim is not true. Final word here is not yet in. To date, all confirmed tests of killer satellites have been tests involving temporary orbits -- one or two revolutions around the earth. This is important since this has allowed detection of anti-satellite tests by watching for launches. It was assumed that such a test attempt would have to take place soon after the launch.

Until next time...

Sincerely,



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