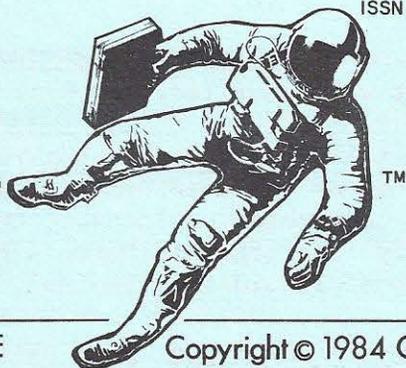


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Dear Subscriber:

Air Force Seeks Expendable Launcher To Supplement Space Shuttle

The Air Force will purchase commercial expendable launch vehicles (ELVs) to supplement the Space Shuttle for military payloads beginning in 1988. This "mixed fleet" approach reverses an earlier Air Force position which favored using only the Shuttle for Department of Defense (DOD) payloads.

Presently in the running are upgraded versions of the Titan 34D and Atlas launch vehicles, existing ELVs manufactured and marketed by Martin Marietta and General Dynamics/Convair, respectively. The Air Force has already issued study contracts to these companies, and a formal request for proposals will be issued in April. The actual contracts could be awarded by this summer.

The contractor would get an Air Force commitment to buy at least 10 vehicles, or two a year from 1988 through 1992. The funding required to develop the upgraded vehicles would come from the company rather than the government, allowing the Air Force to spread development costs (which would be amortized by the company through the ELV purchase price) over a five year period.

Launch costs for Titan or Atlas will run about \$130-\$150 million per flight. Development costs for the upgraded vehicles are expected to be about \$200 million for the Titan, and about \$400 million for the Atlas.

The mission requirement is delivery of 10,000 lbs. to geosynchronous orbit (GEO). This is equivalent to the capability of the Space Shuttle when combined with the General Dynamics Centaur G LOX/hydrogen upper stage. (Centaur G, already under development, is a version of Centaur modified for Space Shuttle military missions.)

Martin Marietta's Titan 34D upgrade would also use a Centaur stage to perform this mission. This Centaur would be a design combining the military features of the Centaur G with the expanded propellant capacity of the Centaur G-prime, a version of Centaur G intended for NASA planetary missions such as the Galileo Jupiter probe.

Changes would also be made to the Titan 34D rocket itself. The Titan 34D consists of a core vehicle with two large solid-fuel outboard boosters. The upgraded version would lengthen the core by 10 feet, and increase the length of the solid boosters to seven segments from the present five-and-a-half segments. A new, large fairing would enclose both the payload and the Centaur upper stage. The fairing could accommodate a payload 40 feet long and 14.5 feet in diameter.

Martin Marietta has some experience with the required Titan modifications. Existing versions of the Titan and Centaur have been used together before for NASA missions, notably the Viking launches to Mars, and launch facilities for such configurations are already in existence. A seven-segment solid motor was originally

built and tested for the Air Force's Manned Orbiting Laboratory project before that project was cancelled.

General Dynamics has not released extensive details on its Atlas proposal, but the company has been doing extensive work on expanded versions of Atlas-Centaur for heavy commercial payloads. One of these designs, the Atlas IIC-Centaur, could probably meet the Air Force's payload requirement. This vehicle would incorporate additional liquid-fuel engines, and add up to six solid-fuel strap-on boosters.

Several reasons for switching to the "mixed fleet" approach were given in testimony by Air Force Under Secretary Edward C. Aldridge, Jr. to the House Science and Technology Subcommittee on Space Science and Applications.

Launch lead times were cited as a major factor. ELVs insure a capability to launch or replace satellites on a shorter notice than is possible with the Shuttle (even though the DOD has priority on Shuttle launch slots). Typically, a Defense satellite must be replaced within weeks of failure, requiring DOD planners to estimate precisely satellite lifetimes so as to reserve a Shuttle launch for a replacement. If the old satellite outlasts its expected lifespan, DOD would either have to reschedule the replacement mission on the Shuttle's crowded manifest, or launch the replacement and shut down an operational satellite--either option being undesirable.

Another factor was the option of using unmanned vehicles for certain launches. During periods of military crisis, the risk factor involved in launching Defense payloads aboard a manned vehicle could become unacceptable.

Finally, the Air Force considers a Shuttle backup just plain prudent. Any technical or other problem with the Shuttle could leave DOD without any alternative for large payloads.

NASA has not been enthusiastic about the new Air Force policy. The agency has been extremely nervous about any turn of events that takes payloads away from the Shuttle, despite the fact that the Air Force plans only two launches per year using ELVs, while continuing to launch eight to ten payloads yearly on the Shuttle.

Some of the Air Force's reasons for using ELVs also apply to commercial users, particularly the one pertaining to lead time. This has not been lost on Shuttle supporters, which may account for their seeming overreaction to a relatively small chunk out of the Shuttle's payload manifest.

Shuttle backers also fear that ELVs may end up cheaper than the Shuttle, if the military purchases large numbers of them. After Aldridge's testimony during the hearings, Rep. Kenneth H. MacKay (D.-Fla.) stated his apprehension that the Shuttle could become a "dinosaur."

NASA is pushing an unmanned Shuttle-derived vehicle for the Air Force mission, citing greater payload capacity and capability of using existing Shuttle launch facilities. However, such a system would require considerably more development than either Titan- or Atlas-based vehicles, and could cost over a billion dollars.

Aldridge pointed out that ELV's could improve the Shuttle's commercial appeal, since chances of DOD "bumping" a commercial payload for its own use would be reduced. This did not put NASA at ease, especially when Air Force plans were mentioned to use 56 surplus Titan 2 ICBMs to provide launch-on-demand capability for smaller Defense payloads.

The Air Force contract should have a positive influence on commercial space. It will keep ELV production lines open, and, as mentioned, may eventually reduce per-item ELV costs not only for the Air Force, but for the private customer as well.

DOT Now Official As Commercial Space Transportation Agency

The Department of Transportation entered the field of space transportation as President Reagan signed an Executive Order designating it as the lead Federal agency for the commercialization of space launch vehicles (C.S.R., Dec. 1983, p. 1).

An Office of Commercial Space Transportation will be established in the Office of the Secretary which will serve as a single contact point within government for industry to obtain the licenses required for private rocket launches.

An interagency group will assist DOT in streamlining licensing procedures. Membership includes representatives of the Departments of State, Defense, and Commerce, along with the Federal Communications Commission and NASA.

Jennifer Lynn Dorn will be Director of the Office of Commercial Space Transportation, and will work closely with an advisory committee composed of industry representatives. Originally Special Assistant to the Secretary, Dorn served as Acting Director during the planning stages for the new office.

Updates on Space Transportation Companies

Starstruck, Inc.:

Starstruck will make another attempt to launch its "Dolphin" rocket later in March. The refurbished D-2 vehicle will incorporate some improvements which were originally designated for the D-3. The company hopes to arrange for a launch point somewhat closer to land to avoid the 400-mile round trip needed on the last attempt.

Orbital Sciences, Inc.:

OSC is still seeking a firm customer for its Transfer Orbit Stage (TOS). This is becoming critical, since industry sources state that Shearson/American Express (the broker for the \$50 million limited partnership offered last December for TOS financing (C.S.R., Dec. 1983, p. 4)) has apparently refused to release funds raised until and unless a customer can be found.

OSC is working on an apogee and maneuvering system (AMS) to complement the TOS. A liquid-fueled upper stage, it could place up to 1,300 lbs. into geosynchronous orbit by itself, and 6,500 lbs. in tandem with the TOS. The AMS could also be used to move payloads between low orbits as well.

Space Services, Inc. and Space Vector Corp.:

Space Vector Corp. is presently handling development and marketing of the Conestoga II orbital launch vehicle. Space Vector (19631 Prairie St., Northridge, CA 91324) is the company which was contracted by Space Services, Inc. (SSI) to build the Conestoga I suborbital rocket. SSI, seeking additional financing, has not funded Conestoga II work since May, 1983. SSI will likely resume Conestoga responsibility should new money become available.

Conestoga II would place about 300 lbs. into geosynchronous orbit at a cost of \$7-8 million (1984 dollars). Capabilities also include 100 lbs. into polar orbit, or about 2000 lbs. into low earth orbit.

Space Vector is also seeking funds for continued Conestoga development, and has several prospects (as yet unnamed) including a U.S. customer who may come up with the first \$7.5 million launch price. Space Vector's parent company, City Investing Company of New York City, has so far declined to finance the project.

Sparx Loses Partner

Communications Satellite Corp. (Comsat) has withdrawn from Sparx, a joint venture formed to utilize the Messerschmitt-Boelkow-Blohm (MBB) SPAS shuttle pallet satellite as a remote-sensing platform (C.S.R., Nov. 1983, p. 1). The partnership includes MBB and the Stenbeck Group, who plan to continue the project once a U.S. partner can be found to replace Comsat.

Reasons for Comsat's withdrawal include losses from Satellite Business Systems (a venture in which it shares ownership with IBM and Aetna Life & Casualty), and government delays in legislation required to operate a remote sensing system.

NASA To Cooperate In Private Industrial Space Facility Project

NASA and Space Industries, Inc. have signed a Memorandum of Understanding to explore the feasibility of a commercial orbiting structure called the Industrial Space Facility (ISF).

The ISF is Space Industries' concept for an automated space station which would be launched by the Shuttle and serviced several times a year by regular Shuttle flights (C.S.R., Jan. 1984, p. 5). Unlike most automated space platforms, the ISF incorporates pressurized areas which could be entered by personnel during servicing visits while the ISF is docked to the Shuttle. The ISF could also be docked to a larger space station.

The facility is designed specifically for materials processing applications, including pharmaceuticals, new semiconductor and metallurgical products, and other microgravity enhanced processes.

Lost Satellites to Increase Insurance Rates

Contrary to rumor, Lloyd's of London is not yet a parking lot. However, there will be repercussions in the insurance business from the loss last month of the two communications satellites launched from the Shuttle, the Westar 6 and the Palapa B-2. Depending on the insurance underwriter you ask, rates could increase anywhere from 30% to 200%, with the lower figure being more likely.

Space launches are so expensive, that they may eventually become uninsurable. Loss of the two satellites is estimated at \$190 million, and it doesn't take a lot of claims like that before the space insurance business is broke. Without insurance, customers will not touch a space endeavor with a ten foot pole, and without customers, the same will go for investors.

Until next time,

Tom Brosz

The Commercial Space Report (C.S.R.) is published monthly, and endeavors to report and analyze developments in the field of private initiatives in space transportation and exploitation.

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