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Dear Subscriber:

Sparx Will Fly

A new company, the Sparx Corp., will compete with Landsat, SPOT and Space America in the field of commercial remote sensing. The company intends to use the West German SPAS shuttle pallet satellite, in combination with the Space Shuttle, to perform earth resources imaging. The SPAS imaging system will use a solid state "modular optoelectronic multispectral scanner" (MOMS) which has already been tested during the first SPAS flight on STS-7 in June.

The Sparx Corp. was formed by a consortium consisting of Comsat, which will handle marketing; Messerschmitt-Boelkow-Blohm (MBB), which will build the SPAS and MOMS and integrate them with the Shuttle; and the Stenbeck Group, a New York investment firm, which is financing the project. Chairman of the company is Klaus Heiss, formerly with Space Projects Co. (now called Space Enterprises, Inc.--see page 5). The company is located at 5500 CitiCorp, 153 E. 52nd St., New York, NY 10022, Tel.: (212) 355-3573.

The first commercial flight is scheduled for STS-17 in August of 1984, with two more market development flights scheduled for 1985. Sparx hopes to have the system in full operation by 1986, at a total cost of \$50-75 million.

On initial flights, the SPAS will remain in the shuttle cargo bay. Later, it could be deployed to orbit on its own for up to a year until recovered by the Shuttle on a later flight. The Sparx Corp. eventually hopes to operate a fleet of five to ten SPAS pallet satellites.

Polar orbits will be accessible when the Vandenberg Shuttle launch site opens. (a polar orbit is preferred for remote sensing missions because of the 100% earth coverage potential). Until then, missions will be flown out of the Kennedy Space Center. Although polar missions cannot be flown from KSC, the orbits which can be reached still permit coverage of a large portion of the earth.

Operating in conjunction with the Shuttle provides several market advantages. Unlike existing remote-sensing systems (launched into permanent, usually inaccessible orbits by expendable vehicles), a SPAS pallet satellite can be modified between missions to customize it for individual users. Obviously, repairs are possible too. (Landsat is repairable--but it's not easy (C.S.R., Aug. 1983, pp. 2-4)). Frequent servicing access to the satellite also allows the user to employ high-resolution film cameras along with the electronic imaging systems.

Data will be proprietary, unlike Landsat's, and will be available to both individual users and large data analysis groups. Some objections are expected from certain nations to these arrangements, but no serious showstoppers are anticipated.

Congress Continues Opposition to Remote Sensing Satellite Sale

Congress has expressed disapproval of the draft Request For Proposals issued in October by Commerce (this is the document mentioned in last month's issue). The major hitch seems to be the inclusion of the weather satellites in the deal, which Congress says will never go through. Possible foreign objections to the Landsat also figure, but are apparently secondary to the weather satellite issue.

The commercialization of the U.S. remote sensing system looks dead. As stated in the May, 1983 C.S.R., the weather satellites are considered by potential purchasers (correctly or not) as the major moneymaker in the satellite package. If they are pulled out of the proposal, an already unlikely deal becomes next to impossible. At any rate, Comsat, at one time the prime candidate to buy the system, has apparently decided to go its own way as indicated in the preceding article.

Intelsat/Comsat Fear Private Satellites

Intelsat is battling to prohibit private competition in international satellite communications. Intelsat, and its U.S. arm, Comsat Corp., are applying pressure to the Federal Communications Commission (FCC). The objective is to forestall approval of applications from private companies seeking to provide communications satellite services across the North Atlantic. Two companies, Orion Satellite Corp. (C.S.R., May 1983, p. 5) and International Satellite Inc. (ISI) have filed such applications.

Both companies claim that they are not direct Intelsat competitors. ISI claims its services will be complementary to Intelsat's, and Orion is not planning on offering common carrier services at all. Still, Intelsat is running scared...the FCC has members partial to private enterprise, and other agencies are so far neutral.

Intelsat's objections fall within familiar categories. One of these is that private organizations would skim off the "cream" of the communications business, leaving Intelsat, the "public service," to carry the unprofitable remainder. A corollary effect would be to force Intelsat to drop its policy of subsidizing unprofitable markets with rates garnered from the more lucrative ones. Developing countries would, according to this theory, be left without affordable communications services, victims of rapacious capitalism.

This hoary old wheeze has been trotted out by state monopolies since day one. Phone companies, postal services, railroads, bus lines, utilities, and a host of other entities insulated by cushions of regulations and trade laws have insisted that unshackling their particular segment of the market would result in disaster. They may be correct, but what they don't tell you is that the disaster is usually confined to the state monopoly, while customers and private competitors benefit.

Comsat Corp. has added a new angle--the threat of the Communist conspiracy. The Soviet Union has a communications satellite organization called Intersputnik, which is a counterpart to Intelsat. At present, Intersputnik serves primarily Eastern bloc nations. According to Intelsat, allowing private competition into the international communications satellite arena could weaken Intelsat to the point where Intersputnik could grab many countries presently served by Intelsat.

This fear of Soviet competition shows the desperation of Intelsat's position. Few private companies in any consumer field from automobiles to zithers would credit the Soviet Union with the capability to compete with them at all, much less force them off the market. Although ahead of the pack in manned space experience, it is doubtful that the U.S.S.R. could be any kind of serious threat in a free market of global satellite communications...unless of course the organization which fears such competition is itself a large, cumbersome government bureaucracy.

OSC Market Questions

Orbital Systems Co. has changed its name to Orbital Sciences Co. Their address is now: 1951 Kidwell Drive, Suite 810, Vienna, VA 22180, Tel.: (703) 790-0340. The goal of the organization is the marketing of a Transfer Orbit Stage (TOS), derived from a UTC solid rocket motor, which can deliver payloads to geosynchronous and other high-energy orbits.

OSC has yet to announce any definite customers, and analysis does not reveal any obvious candidates. Early market studies focused on geosynchronous communications satellites, large direct broadcast satellites, MSATs (mobile communications satellites), military missions, planetary missions, and others. However, according to industry experts, much has changed since the initial market studies were done.

Intelsat VI, built by Hughes, will purchase solid motors directly from UTC, cutting OSC out of the deal.

The direct broadcast satellite (DBS) business is in turmoil. Twelve permits to operate satellites were issued by the FCC, which would have meant more than thirty payloads. However, the large DBS birds have been downsized and will use the PAM DII upper stage. Also, only one of these permit holders has been able to raise the money for a satellite (Comsat's STC contract with RCA). That spacecraft does not use a TOS. A low power DBS, which comes into service this year, uses existing satellites which have been and will continue to be launched on a PAM D.

Integral propulsion is the wave of the future. Of the three major satellite manufacturing companies (Hughes, Ford and RCA), both Hughes and Ford are building their own propulsion systems into their satellites. Often powered by liquid fueled engines, such satellites include the Hughes 393, 394 and 399, and the Ford "Super-sat" satellites. RCA is moving in the same direction.

Other customer prospects have been reduced over the past few years. European satellites are likely to be launched on Europe's own Ariane. The NASA/JPL MSAT payload, which had been mentioned as a possible TOS payload, seems stalled. Two private MSAT proposals are before the FCC. At least one will not require TOS, and the other probably won't either. If the government builds an MSAT, it will more than likely use the liquid-fueled Shuttle Centaur stage, now being developed by a joint NASA/Air Force operation. Military payloads will probably use either the IUS or the Centaur.

As for NASA planetary missions, TOS-compatible payloads may fall to the budget axe. In fact, the Mars Geoscience Climatology Orbiter, a prime TOS payload, stands threatened by NASA budget cuts requested by the Administration.

OSC intends to release information on customers before the end of the year. Hopefully the company has an ace up its sleeve, but if so, it is still well concealed.

Starstruck, Inc. Continues Test Program

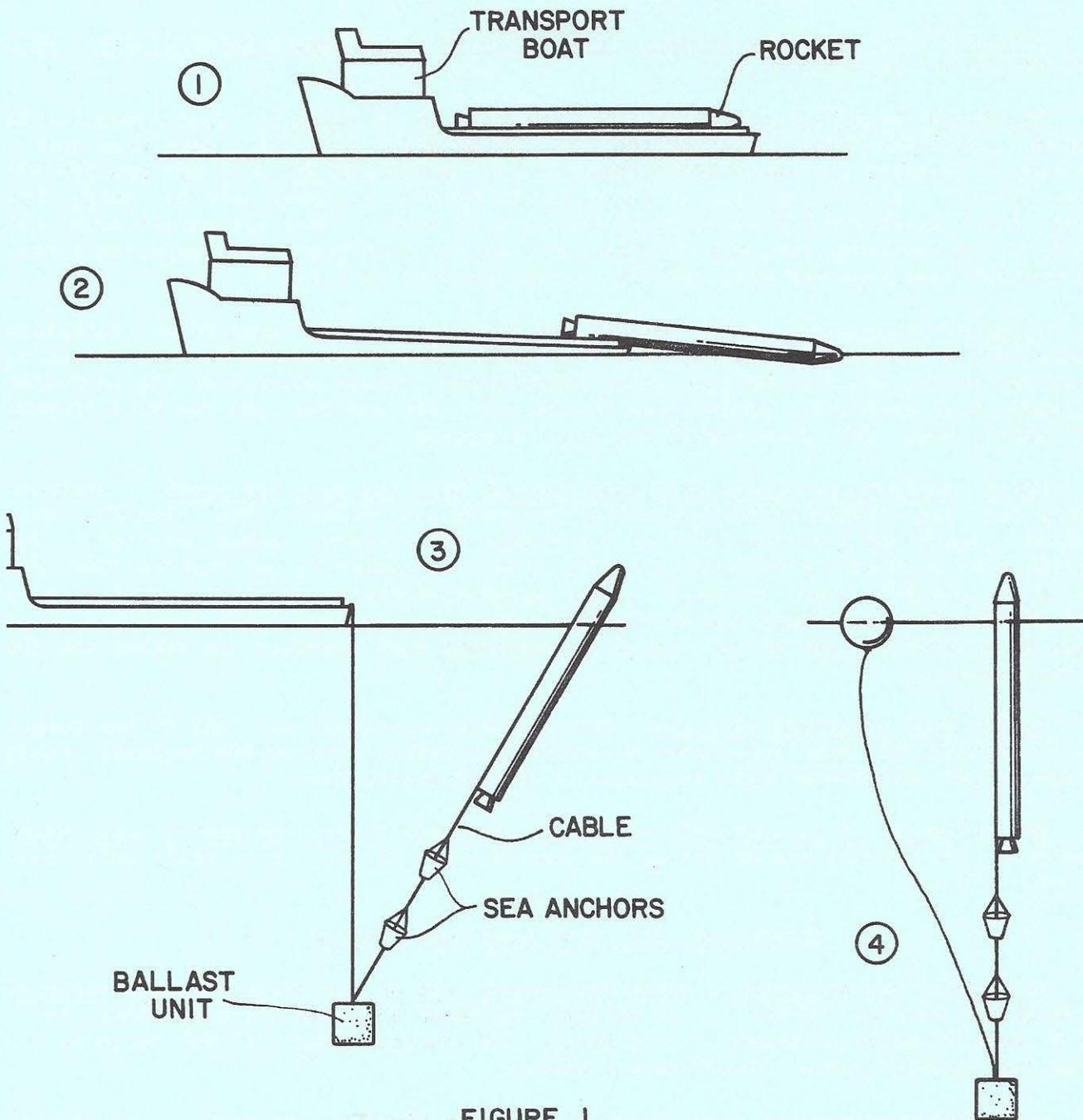
Starstruck has completed a water deployment test of its Dolphin launch vehicle. A weighted mock-up of the launch vehicle was taken aboard a transport boat to a point about 15 miles offshore of Long Beach, California, where it was deployed to check the Dolphin's water launching procedures.

The deployment process (See Figure 1) involves flooding the rear of the carrier craft to float the launch vehicle off into the water. A 9000 lb. ballast weight, attached by a long cable to the tail of the rocket, is then lowered to bring the rocket into a vertical position. Sea anchors attached along the ballast cable

dampen wave-induced motions of the rocket. The ballast assembly is jettisoned at the time of launch.

Tests included practice on deployment and recovery techniques. Some working electronics were incorporated into the mockup. This allowed the transport boat to move away from the floating rocket to a distance of about ten miles to check signal transmission characteristics.

The next static firing test of the 42" dia. motor is scheduled for Nov. 16. If all goes well, this will be the last static test before an actual suborbital launch attempt.



Space Transport Inc. Proposals

Mixed-mode, or dual-fuel rocket engines are the key to launch system concepts proposed by Robert J. Salkeld, president of Space Transport Inc., Topanga Canyon, CA. (C.S.R., Nov. 1982, p. 2). Salkeld envisions development of a mixed-mode rocket engine in the 250,000 lb. thrust range. Cost of this development is estimated at \$250-300 million.

A single-stage-to-orbit expendable booster is one application for such an engine. Another application would improve the launch performance of the Space Shuttle. Several mixed-mode engines, mounted on a special Shuttle external tank, could eliminate the need for the solid rocket boosters.

A mixed-mode rocket engine utilizes three propellants instead of the two propellants burned in a typical liquid-fueled rocket engine. The mixed-mode engine begins at launch by burning liquid oxygen and a low-energy, high-density hydrocarbon fuel such as RP-1, RP-5 or propane. Later on in the boost phase, this same engine switches over to a combination of LOX and liquid hydrogen, a high-energy, low-density fuel.

Mixed-mode systems balance propellant density against propellant performance. The higher-density LOX/hydrocarbon propellant combination requires less than a third of the tank volume that LOX/hydrogen would occupy. Smaller tanks lead to lower overall structure weights than would be required by a system using only LOX/hydrogen. Although the average specific impulse of the mixed-mode engine is less than that of a pure LOX/hydrogen system, this is alleviated to some degree by using the low-performance fuel during the early atmospheric stages of the flight, and the high-performance fuel later on, when the engine is in vacuum and can make best use of its higher specific impulse.

Salkeld, who originated the mixed-mode concept, found that a proper proportioning of propellants and burn sequences in a dual-fuel system would result in a more efficient vehicle than one which used either hydrocarbon or hydrogen fuel alone. Single-stage-to-orbit vehicles become feasible without having to resort to the highly advanced structural designs and exotic, lightweight materials required for the huge fuel tanks used by vehicles burning only LOX and hydrogen.

Engines for mixed-mode vehicles have been designed by aerospace companies, including Aerojet Liquid Rocket Co. and Rockwell Intl.'s Rocketdyne division. At one time, such engines were even suggested for the Space Shuttle Main Engine.

The mixed-mode concept is a major feature of the Phoenix launch vehicle proposed by Pacific American Launch Systems. The present configuration of the Phoenix single-stage-to-orbit vehicle would use 24 small engines, burning LOX, propane and hydrogen, with a thrust of about 18,500 lbs. each.

Space Projects Update

Space Projects, Inc., is now called Space Enterprises, Inc. The company, originally called the Space Transportation Co., is still engaged in efforts to commercialize Shuttle orbiters under the management of William Sword & Co. The Prudential Insurance Co. is no longer officially connected with Space Enterprises.

New Expendable Launch Vehicle (ELV) Bill

Rep. D. Akaka (D-Hawaii) has reintroduced a bill for licensing commercial ELVs. The bill, HR 3942, is basically a rehash of a similar bill introduced in January, HR 1011 (C.S.R., Feb. 1983, p. 1-2). The House Science and Technology space science subcommittee has scheduled hearings for Nov. 10.

Ariane 7 Successful

Ariane 7 launched a 4000 lb. communications satellite into orbit Oct. 18. The Intelsat 5 F7 satellite, the heaviest payload carried thus far on an Ariane, was inserted into a geosynchronous transfer orbit. The next two flights, scheduled for January and March, 1984, will also carry Intelsat 5 satellites.

Articles of Interest in Other Publications

An article on private space transportation companies appeared in the Oct., 1983 issue of Geo magazine. Written by Junius Ellis, it is accompanied by photographs of the leading figures in the field of private space transportation.

(Note: the "Articles of Interest" feature seen above will appear periodically to point out items on space development in publications not normally associated with the subject of space. Suggestions in this area from readers would be welcomed.)

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Notices to Subscribers

Address Changes: Please keep us informed of any address changes. Issues returned marked "no forwarding address" cause problems for everyone concerned.

Recommended Periodicals List: The purpose of the Commercial Space Report is to briefly highlight events dealing with private enterprise in space, with emphasis on space transportation. It is not (and isn't intended to be) an all-inclusive publication on space in general, or even on all facets of commercial space specifically. In fact, with the recent explosive expansion of private space activity, no single publication can really do justice to all the available information.

There are, however, a number of periodicals (including this one) that can, between them, give the reader highly detailed and extensive coverage of the subject of space development and exploitation. We are compiling such a list and will publish it in the near future along with a short analysis of each publication.

Readers are encouraged to send in information on publications which may possibly be added to the existing list. Send a sample if possible. Please restrict submissions to nationally distributed periodicals.

Until next time,

Jean 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 the exploration and exploitation of space.

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Address all correspondence to: Commercial Space Report, P.O. Box 60547, Sunnyvale, CA 94088. Editor: Tom A. Brosz. Tel: (415) 965-8666. Comments, ideas, or requests for information are welcomed, as are any items which may be of interest to our readers. Unless otherwise noted, contents are ©1983 by The Commercial Space Report and may not be reproduced in any form without written permission. The opinions contained in the Report are those of the writer or writers, and do not necessarily reflect those of any organization or company.