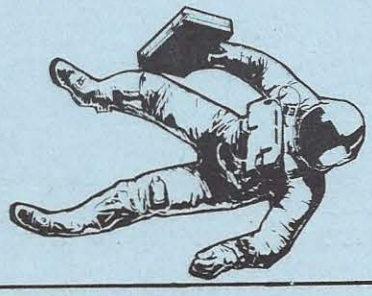
THE FOUNDATION
COMMERCIAL SPACE REPORT



PUBLISHED MONTHLY | Gary C. Hudson, Editor

Dear Subscriber: March

We'd like to start off this month by thanking all of you who have written us concerning our change in format and orientation. Amazingly enough, we haven't received any negative letters, though several of you have wondered if we were going to totally de-emphasize technology in favor of strategy and business discussions. The answer is no. Technology, after all is said and done, is what makes space industrialization possible.

But for the next two months we are going to disappoint those of you who would like to see what is new in the technical world of space industry. This month there will be a short discussion about a potentially profitable early space venture, and next month a guest commentary on the Viking Fund will appear. By the late spring however, several developments in certain technical areas will be discussed including new advances in transportation technology.

Several readers have asked us to suggest a strategy for early space development activities with the emphasis on the private sector. That is the planned subject of several of the summer issues of this newsletter. But this month we'd like to address a unique marketing opportunity in space industry which could serve as a model for private projects in general.

Space Resources

For a space industry to succeed it must have a product/idea to sell, the means to bring the product to market (both technical and financial) and a market in which to sell the product.

There has been a great deal of thinking about the use of extraterrestrial resources for use in space construction of powersats and settlements. But the market for the use of these resources does not as yet exist. Proponents of XT resources use in SPS or similar projects have to first sell the SPS or settlement project idea before they can even begin to talk about using lunar or asteroidal resources in their construction. This makes things difficult, to say the least. Selling SPS alone is a mind-boggling enough task and fraught with perils (see News Notes concerning cost of solar cells for earth application, for example).

Nearly all competent thinkers in the space industry field believe that we presently have the technology to obtain a wide variety of metals and other useful materials from XT resources. This means that we have part of one of the requirements mentioned in the paragraph above. The various products possible include nickel, cobalt and the platinum-group metals from Ni-Fe asteroids and titanium, aluminum and glass fiber from the moon. The cost of setting up a lunar mine has been estimated to be under ten billion dollars by Dave Crisswell of the Lunar and Planetary Institute, and we estimate it might be as low as a billion. Several industrial projects on earth already are in this price range

(the Alaska pipeline is worth about $12 billion in present dollars, the new proposed Trans-Canada pipeline would cost nearly $30 billion). Natural resources firms can obtain the amounts necessary to finance a lunar mine should they want to. But will they do it when the only use for the product of that mine is to build SPS's or space settlements? Given the questionable economics of either of those two projects, we don't think they will.

However, there is one more aspect of the requirements issue which needs to be mentioned. We have briefly established that there are products which can be produced from XT resources which have potential value; there are studies aplenty which say that we have the technology to get on with the job; we know that private industry can raise the needed capital if they are motivated to do so. What's left? The motivation - and that comes from the market. From the consumers.

Space construction is not a market at this time. Thus there is no constituency for XT products to be sold to consumers in space. The only real market, the only existing market, is on earth.

If we are to see XT resources become a billion dollar business in the next few decades we must turn our attention to the center of industrial activity in the solar system - earth. All of the products mentioned earlier are viable ones in earth markets. In fact, several are in rather short supply and manufacturers are in desperate need right now. Cobalt and titanium come quickly to mind...and the need for these and several other metals available from the moon or from asteroids will increase in the next two decades.

Until space industry proponents learn this lesson, and then communicate it to private firms with all the enthusiam that has gone into the selling of the SPS and settlement concepts, there will be no real progress in XT resources as a business. XT resources are not burdened by the SPS problems of potential environmental pollution, by opposition to centralized powerplants, by long delays in approvals and heavy energy regulation through DOE and state utility commissions. It is still possible to make a fortune in raw materials...and it is one possible way to make a fortune in space.

Sincerely,

Gary C. Hudson

NEWS NOTES:

SOLAR CELLS FOR 1 CENT A WATT?...Electronics, Feb. 28, 1980...A design study by Spire Corp., Bedford, Mass., claims that continuing development of ion-implantation and laser- or electron-beam-annealing techniques could cut costs of terrestrial solar cells to about 1 cent a watt. The United States Government target for economic development of solar cells is 50 cents a watt by 1985.

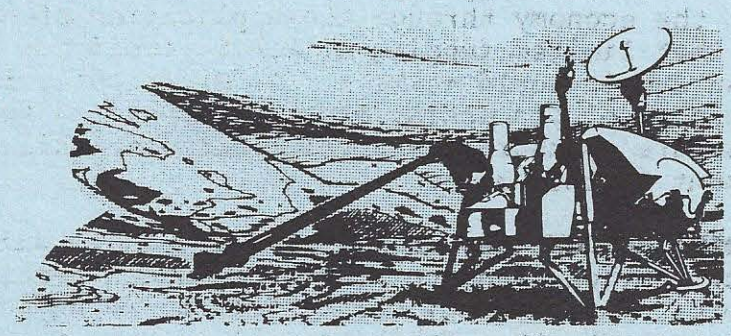
MANANA, MANANA...NASA headquarters...The first Space Shuttle orbital launch has been postponed until at least March, 1981. Problems cited include tile trouble, propulsion mishaps, and poor management.

ARIANE FOR U.S. MILITARY COMMUNICATIONS PAYLOADS?...Washington D.C...An administration source has told the Commercial Space Report that the United States may be using the Ariane to launch low-security military communications satellite payloads. The Shuttle schedule is cited as a primary reason for looking to alternate launch methods.

O'NEILL RESERVES JUDGEMENT ON MOON TREATY...Princeton...Gerard O'Neill has refrained from commenting so far on the Lunar Treaty. According to O'Neill, the Space Studies Institute is gathering information and evaluating comments received by the Institute. Such comments might be addressed to: Space Studies Institute, P.O. Box 82, Princeton, N.J. 08540

COMSAT LOOKING FOR COMMERCIAL MARKETEER...Comsat Corp. is planning on a possible launch of a direct broadcast communications satellite. This

WANT TO EXPLORE MARS?



The Viking spacecraft is exploring Mars, and for as little as $1 million of private funding, its robot intelligence can provide a wealth of information on which to base further explorations, and perhaps solve the riddles of Earth's weather.

Private funding is the key, and in an era of rampaging inflation and competing budget pressures, the sharing of costs between the government and private sources is desirable as a means to greatly increase the scope of explorations such as Viking. NASA intends to bring back Viking's valuable data through 1990, and a fund has been established by the San Francisco Section of the American Astronautical Society to help share this responsibility, and directly fund both private and government research into the mysteries of Mars on a year to year basis through the mechanism of a trust fund. By contributing to the Viking Fund, you can show your support for these programs, as well as help set a precedent for private funding of such space activities. The Viking Fund has as its goal the raising of $1 million for Viking operations by July 20, 1980.

And not to be overlooked in an election year are the political implications of such a graphic demonstration of public interest in the space program. Privately raising $1 million for a space project would be a tremendous signal to Washington D.C. of the public willingness to support space activities. The time for talking is over; it is literally time to "put your money where your mouth is," and unequivocally demonstrate your support for the space program.

If you want to explore Mars and support your space program, do not delay in making your contribution. Donations (minimum amount $1 — made payable to the Viking Fund) should be mailed to: THE VIKING FUND, P.O. BOX 7205, MENLO PARK, CALIFORNIA 94025. All contributions are tax deductible, and all contributors will receive acknowledgement of their gift, and regular up-dates on the Fund's and Viking's progress. Also, all contributors will receive an invitation to the dedication of the Fund to NASA, in Washington D.C., during July 1980.

will allow the direct broadcast of television into a home receiver unit. Discussions are going on between Comsat and Sears as to possible cooperation on marketing of receiver systems.

EARTHPORT PROGRESS...Washington, D.C...Efforts by the International Division of the Sabre Foundation to create international economic zones for technical development grew stronger during 1979. More than 140 individuals are now involved in the project, and 14 nations have thus far expressed interest in the approach. The Sabre Foundation and its allied organizations, the Free Zone Authority and the World Space Center have created proposals and reports detailing the economics, management, architecture and organization of Earthport. Meetings have been held with officials worldwide to discuss the concept, and legal work is under way to begin the procedures which will hopefully lead to the eventual creation of a free trade center as a beginning step towards free trade in space.

BIG DUMB BOOSTER IN FUTURE...New York...Issue 17 of Future Life contains a short article on the Foundation design of the Big Dumb Booster unmanned launch vehicle.

GAO BACKS SPACE MATERIALS PROCESSING...Washington D.C...The General Accounting Office believes that materials processing in space "is an example of a federally supported research effort that...could ultimately benefit the economy through the application of new knowledge". The GAO stated that limited funding of M.P.S. could put the United States at a disadvantage in world markets. As an example, it was pointed out that a large number of processing experiments slated for the initial Shuttle launches are sponsored by foreign nations, while the U.S. has a limited commitment in this area.

AIAA ANNUAL MEETING...Baltimore...The American Institute for Aeronautics and Astronautics plans to hold it's annual meeting this year in Baltimore. The meeting, called "Global Technology 2000" will run from May 6th through 8th. Exhibits will be open to the public from the 9th to the 11th. Among the many promising sessions at the conference will be ones on Future Flight Systems (including papers on orbital and solar system spaceships and interstellar flight), Orbital Systems 2000, Solar Power Satellites, and a U.S Presidental Candidates Forum. Freeman Dyson will chair the Plenary Session entitled "Twenty-First Century Expectations" which will focus on Space Science, Energy Systems, Air Transport, Space Transport and Defense Systems.

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