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# REPORT:

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ADVANCES IN COMMERCIAL AND GENERAL SPACE DEVELOPMENTS

## AAS ANNUAL MEETING DRAWS CROWD, GENERATES DISPUTES

The Twenty-Third Annual Meeting of the American Astronautical Society was held at the Airport Hilton Hotel in San Francisco October 18th-20th. Theme of the meeting was the Industrialization of Space.

Several hundred participants heard widely divergent opinions presented by technical professionals, writers, scientists, lawyers, psychologists and anthropologists.

A recurring argument concerned the necessity for government involvement with the space program. Several speakers drew attention to failures of government programs and intervention in the past on pragmatic and moral grounds, while others justified federal involvement on grounds of taxpayer/citizen benefits. Examples of the former position included Bob Poole, Jr. of the Space Freeport Project in his presentation "Hidden Perils in Government Support of Space Activities". Poole offered a historical overview of regulatory agencies such as the Interstate Commerce Commission and the Federal Communications Commission which were begun to foster development of their respective industries, but are now responsible for the strangulation of those same businesses, or the monopoly protection of the industries at the expense of the consumer.

On the other hand, Sherry Long De Mandel suggested that there are historical precedents for citizen benefit in government sponsorship of massive projects. In her paper "Two Lessons from the Past; An Analysis of Government's Role in Developing Super Economies", she offers examples of the establishment of large-scale irriga-

tion projects in ancient times as justification for government support of space settlement concepts.

Papers were presented by both Dr. T. Leary and also by Dr. Gerard O'Neill, and both drew large and enthusiastic crowds. O'Neill also spoke at an evening session arranged to provide conference participants an update on the latest information concerning his space settlement proposals (see p.2, Vol. 1, No. 1, Report). Several exhibits relating to space benefits and large space structures were displayed by Rockwell International, builder of the Shuttle Orbiter.

The conference was evenly divided between the technical questions of space industrialization and the political problems of how to go about the process of commercialization. A panel discussion moderated by Dr. George Morgenthaler of Martin Marietta Aerospace included Dr. Peter Glaser (originator of the Satellite Solar Power Station concept), Maxwell Hunter (director of Lockheed's contract effort on the Space Telescope for NASA), and Max Faget (NASA Johnson Space Flight Center) among others. In disparate and wide-ranging presentations panelists offered opinions which were often contradictory, from "Satellite Power Stations could be built now", to "... could never be built". The audience was also polarized on the issue, with spirited discussions following this presentation and nearly every other major session at the meeting.

Proceedings of the conference will be published in approximately three months, and audio tapes are available by writing AAS Conference, Box 7205, Menlo Park, California 94025. For Proceedings information contact Dr. Horace Jacobs, AAS Publication Office, Box 28130, San Diego, California 92128.

Next month:

Third party liability and inter-party insurance on the shuttle. Plus a special feature on the 28th IAF conference in Prague including how the Russians really want to regulate communications and earth observation satellites.

# The Foundation Institute REPORT:

## AAS Conference

Abstracted information from a few papers of note delivered at the recent American Astronautical Society meeting in San Francisco.

### SPACE INDUSTRIALIZATION, THE CHALLENGE TO PRIVATE ENTERPRISE CAPITALISM

Christian O. Basler, a New York City attorney, offered a new plan to accumulate necessary funds for high capital investment space activities. According to Basler, no existing private enterprise business structure is suited to the task of raising and managing the capital necessary for full-scale space industrialization. Existing companies cannot undertake the necessary research and development because of the effect it would have on their present earnings and because of antitrust problems, and a new conventionally organized company would be unable to raise the necessary capital. His paper analyzes these problems and proposes a new type of business structure, called a "staging company," as a solution. A staging company is a closed-end management investment company that converts to an operating company after its research and development have brought space industrialization to the point of full commitment. As an investment company it would accumulate capital and invest in the securities of companies likely to profit from space industrialization and would spend the income from its investment portfolio on research and development, to be contracted out, for the most part, to these same companies. The object of the research and development would ultimately be firm bids for the systems being developed. Until it has accumulated enough capital, through a series of public offerings and appreciation of its portfolio investments, to proceed with full-scale space industrialization, the investment company would spend only the income from its portfolio on research and development. The effects of a private enterprise approach on space community planning are also discussed.

### A FREE ENTERPRISE MODEL FOR THE OPERATION OF INDUSTRIAL FACILITIES IN SPACE.

In the early period of the industrial space age, the highest sustainable individual productivity will be essential if early projects are to be econo-

mically viable. How is this high level of productivity to be realized? In recent years, there has been a decline in industrial productivity amid labor tension and worsening economic conditions. The implications for the industrial space program are not promising. A paper by Thomas W. Sanders develops a model of the Free Enterprise system based upon recent research into the fundamental nature of human action. The model is then used to analyze the contractual relationships within the contemporary industrial system. The contractual relationships inherent in the Free Enterprise system are presented and compared with those of the contemporary system. It is concluded that the contemporary system exhibits inconsistencies which make its implementation counterproductive in the space environment. The Free Enterprise system is then seen as the superior system for the space application.

Sanders is owner-manager of International Investor's Research and Technology, P.O. Box 441, Pleasanton, California.

### ASSEMBLY IN SPACE OF LARGE COMMUNICATION STRUCTURES

Authors F. Zylius and R. Donovan of Rockwell International Space Division proposed an electronic mail satellite system. The paper presented a conceptual design for the necessary communication payload as well as comparing a variety of space construction concepts to assemble the mission hardware in earth orbit.

The mission payload is on the order of thirty thousand pounds. Comparative analyses included factors of cost, construction efficiency, productivity, and construction process duration. In general, conclusions favored the selection of Shuttle-based, non-automated fabrication and assembly for any foreseeable construction tasks in space, with the exception of Satellite Power Station structures.

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# The Foundation Institute REPORT:

## *Shuttle Main Engines Prepared for Test*

The Main Propulsion Test Article (MPTA) of the US Space Shuttle is shown in a September 27th NASA photo. The engine cluster will be fired in upcoming months to verify engine and propulsion system performance and compatibility with interfacing elements and subsystems.

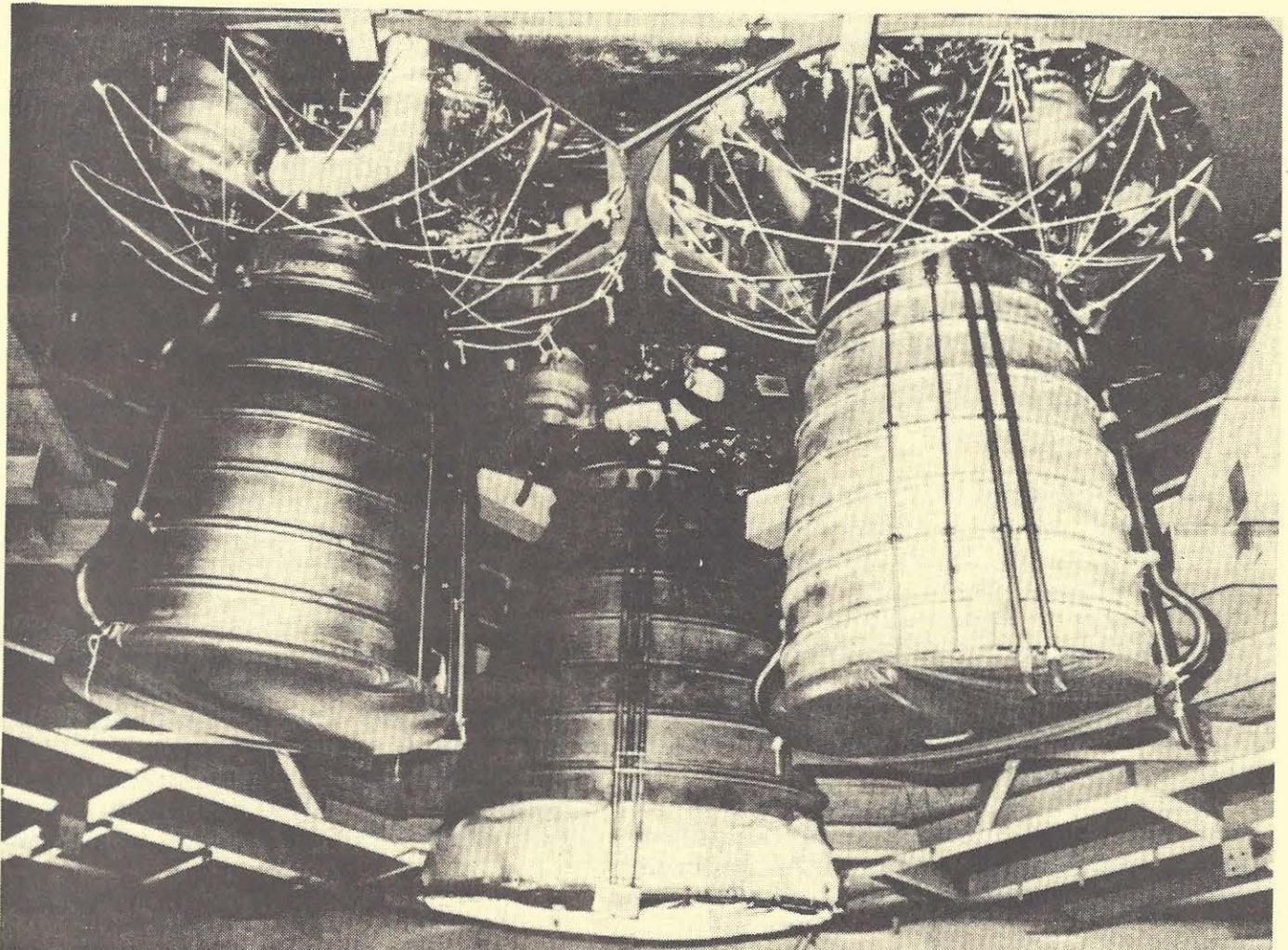
The test will consist of the three high-performance Space Shuttle Main Engines (SSME), a flight-weight external tank which will contain the test propellents and a flight-weight aft Shuttle fuselage.

The engine development program has been plagued with problems and test accidents, including fires in the engine turbopumps. However, NASA officials point out the problems of the SSME are not as severe as were encountered during the development of the J-2 rocket engine for the Apollo/Saturn project. Among the problems encountered are bearing overheating and seal leakage. The most recent

fire on the test stand occurred in September.

Six Research and Development engines are being manufactured. Four are delivered and have been tested at the National Space Testing Laboratory (NSTL) in Mississippi. Test of the MPTA is scheduled for December, 1977.

In other Space Shuttle news, it has been reported that NASA is considering use of the structural test Orbiter airframe as a candidate for modification to a flight-worthy vehicle. Using information derived from the B-1 program, NASA officials believe the test article, originally designed only for ground studies, can be modified to serve as the second Orbiter to fly in space. This position was to be held by Orbiter 101, which has just concluded flight testing at the Dryden Flight Research Center. Under the new plan, 101 would be the fifth flight Orbiter, thus saving a significant amount of NASA development dollars.



# The Foundation Institute REPORT:

*Contributed perspective from Arthur M. Dula, member International Institute of Space Law and Space Law Committee of the American Bar Association.*

## PATENT AND TRADE SECRET LAW IN SPACE

Federal patent and trade secret law will apply to manufacturing and research done in U.S. registry space objects, but NASA has the power to inspect all private payloads and, at the Administrator's discretion, to make privately funded research results publicly available.

Space manufacturing will depend on research and development done in a space environment to produce new and profitable products. Patents and trade secrets can protect these inventions. What is the basis of space patent law and what specific laws and regulations now exist that affect business?

Present space law is largely derived from a small group of multinational treaties. These treaties interact with and become part of national law. The basic Treaty of Principles, which was signed by the U.S. in 1967, provides (in part) that:

- (1) The state of "registry" retains jurisdiction over an object launched into space.
- (2) States bear "international responsibility" for "national activities" in space. "Launching" states are strictly liable for any damage a space object causes on earth.
- (3) Activities of "non-governmental entities," i.e. corporations, partnerships, citizens, etc., "shall require authorization and continuing supervision" by the "appropriate" state.

Unless NASA negotiates a contrary international agreement all space objects it launches are enrolled on a U.S. register maintained by the State department. "Jurisdiction" is defined as a court's power to declare and enforce law, this 1967 treaty implies that U.S. registry of a space object subjects the object to U.S. law as interpreted by U.S. courts. Specifically, Federal patent law and the Space Act of 1958 extend to all space objects of U.S. registry.

The National Aeronautics and Space Act of 1958 gives NASA authority to provide launch services routinely and on a reimbursable basis. Only NASA is empowered by statute to offer such

### CAVEAT

Space law is complex and its effect on national laws is subtle. This column must be short and simple. Its purpose is to explain space law in **general**. Please send specific questions and Mr. Dula will reply in detail.

launch services. NASA interprets international and federal law to require that it authorize and continually supervise activities of U.S. companies in space. This is clearly correct of NASA launches the payload. NASA may, however, have treaty authority to supervise space activities of U.S. companies even if a company launches from a foreign launch site on a foreign booster.

The Space Act also allows NASA's Administrator to issue rules and regulations to implement all powers vested in NASA by law. NASA has adopted regulations which must be met before it will launch a privately funded space object. The regulations pertinent to patent and data rights provide:

- (a) NASA will not acquire rights to inventions, patents or proprietary data privately funded by a user, or arising out of activities for which a user has reimbursed NASA under the policies set forth herein. However, in certain instances *in which the NASA Administrator has determined that activities may have a significant impact on the public health, safety or welfare*, NASA may obtain assurances from the user that the results will be made available to the public on terms and conditions reasonable under the circumstances.
- (b) The user will be required to furnish NASA with sufficient information to verify peaceful purposes and to insure Shuttle safety and NASA's and the U.S. Government's continued compliance with law and the Government's obligations. (*Federal Register, Jan. 21, 1977*).

The patent and data rights policy section of the Space Transportation System User's Handbook (July 1977), however, deletes all mention of the administrator and does not state any required standard, i.e. it deletes the portion of the above regulation printed in italics. This indicates the administrator can waive NASA's right to require public release of research results prior to launch.

*Continued on Page 6.*

# The Foundation Institute REPORT:

## news notes...

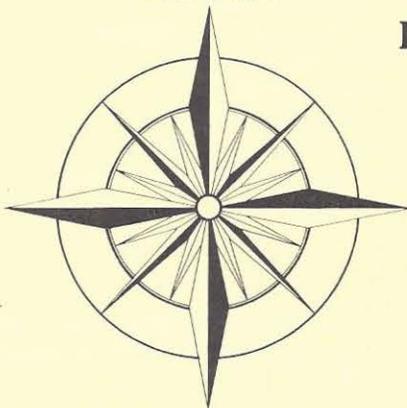
IAF MEETING...Prague...Heavy security characterized the International Astronautical Federation meeting in Prague, Czechoslovakia. A Report observer was prohibited from photographing attendees...The question of resolution of earth resources satellite cameras was raised by the Argentina delegate to the International Space Law meeting at the IAF. A proposal to limit resolution to 50 meters was reluctantly endorsed by Academician Dr. V. S. Vereshchetin, principal USSR space law spokesman. V. D. Bordunov commented "Some lawyers, especially American ones, are advocating...the establishment of complete freedom of action with respect to distribution of remote sensing data. In real life such conditions are favorable only to big monopolies because they open up the possibility of using the achievements of this space activity in the monopoly's selfish interests..."

SATELLITE COMMUNICATIONS...Colorado...New magazine, devoted to rapidly growing field of space communication systems began publishing with a sample October issue. Named Satellite Communications, with Dr. Delbert D. Smith (Report, Vol. 1, No. 1, pages 4-5) as editor, the first regular issue of the 70 page color publication is slated for January, 1978. Subscriptions are \$10 a year, and should be ordered from 1900 West Yale, Englewood, Colorado 80110, in care of the magazine title.

AIAA PUBLICATIONS...New York... American Institute of Aeronautics and Astronautics is offering for sale three new publications: Space Manufacturing Facilities (\$19.50)(Proceedings of the 1975 Princeton Conference on Space Settlements); Space-A Resource for Earth (\$8.50) (illustrated book on space applications); and Materials Sciences in Space with Application to Space Processing, Edited by Leo Steg (\$20.00 members, \$35.00 list). Bankamericard/VISA and Master Charge accepted.

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## news notes...

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INTERSTELLAR TRAVEL BIBLIOGRAPHY...  
Dr. Robert L. Forward has published the April 1977 Updated Version of his Bibliography of Interstellar Travel and Communication as Hughes Research Report 512. Copies are available by writing Dr. Forward at Hughes Research Laboratories, Exploratory Studies Department, 3011 Malibu Canyon Road, Malibu, California 90265.

Continued from Page 4.

I recommend you consider taking at least the following actions to protect your investment in space:

1. Negotiate a comprehensive trade secret agreement covering your payload with NASA that provides:
  - (a) for non-disclosure among NASA employees except as actually required for launch approval;
  - (b) that records be kept of all such required disclosures together with written reasons justifying the disclosures; and
  - (c) that NASA must return all your documents without making copies after your payload has been approved. (What they don't know they can't leak.)
2. Execute individual trade secret agreements with each company and NASA employee who must have access to your payload. Strictly restrict such access. Recite that wrongful disclosure will result in personal liability.
3. Obtain an agreement, from NASA's Administrator, in advance of launch, that your research or manufacturing is specifically *not* one of the "certain instances" that requires public disclosure of results.

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Capabilities include theoretical research and study, systems research and development of services and products. A high level of effort is presently being expended in astronautics, especially the commercial utilization of outer space and the need for economical space transportation.

The Institute has a permanent and consulting staff of professionals to call upon including engineers, designers, scientists, communications experts, management specialists and the like. Corporate headquarters is presently in St. Paul, Minnesota.

**THE FOUNDATION INSTITUTE REPORT** is a concentrated effort to report all areas of private and industrial initiatives in the development of space. We hope it will stimulate ideas by raising questions and offering innovative concepts contributed by acknowledged leaders in the field.

If you have any comments, ideas or requests for information or articles, we encourage you to contact us. The **REPORT** is published monthly, and has a subscription price of \$10/year.

**THE FOUNDATION INSTITUTE** Telephone:  
85 East Geranium Avenue (612) 489-4466  
St. Paul, Minnesota 55117 489-6067

**Staff:**

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