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## Strategies for Broadening Public Involvement in Space Developments

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### Rationale

There is widespread public interest in and goodwill toward the space program. For NASA's plans for the next 25 years to be achieved, this public reservoir of support needs to be tapped and channeled. NASA endeavors have to reach out beyond the scientific, technological, and aerospace communities to foster wider participation in space exploration and exploitation. To broaden NASA support and spread out the financing of space activities, we offer these recommendations for consideration.

### Economic

For anticipated space missions to be carried out, new sources of income and financial participation should be sought. NASA can no longer operate merely on the basis of annual Federal appropriations. A national commission of financial experts and venture capitalists might be established to analyze the alternatives, recommend to the President and Congress policies and procedures for the public sector, and propose space investments for the private sector. These are a few of the options to be analyzed:

- (1) A national or international lottery
- (2) A national bond issue

- (3) A stock investment plan
- (4) Limited partnership opportunities for space technology
- (5) Joint ventures by NASA with other national space agencies or with multinational corporations

### Political

To create a national consensus and ethos for space development in the next 25 years, NASA should exercise vigorous leadership on behalf of its intended missions. For this purpose, the following program is recommended to educate politicians, as well as the public, in the scope, necessity, and value of space plans.

NASA needs to decide among the alternative scenarios for space development up to 2010. A plan with specific goals, time targets, and estimated costs, including locations in space and required technology, should be summarized in a case for investment, which is then communicated to all NASA constituencies through a variety of modern media. Using the journalistic who, what, when, where, why, and how as a framework, this case could be put forth in publications, films, videos, and public presentations. To carry this message to the point where

public support is transformed into financial contributions, we recommend that NASA focus on the space station, a lunar base, and unmanned explorations, especially of Mars, for the next quarter century. Special briefing

workshops might be held for the members of the House and Senate and their staffs, the media, and business leaders. Emphasis should be on the commercial promise of space.

#### **Mars Rover Sample Return**

*Just as the Apollo lunar samples have been the cornerstones of our knowledge base for planning human habitation and exploitation of the Moon, so martian samples should greatly enhance our ability to plan for exploration of Mars. Analysis of martian rocks and soils would help determine what chemical resources (water-bearing minerals?) are available and what scientific questions human explorers should be prepared to investigate. Plans are currently being made to send robotic sample collectors to several spots on Mars. In this concept, a six-wheeled rover collects and packages samples and delivers them to the launch vehicle in the background which will return them to Earth. Each rover/launcher combination could probably provide about 5 kilograms (11 pounds) of samples. Sample returns from various sites on Mars could help select the sites that could be explored with the greatest benefit. In particular, knowledge about martian rocks and soils could help us prepare the tools and techniques to search for evidence of past life on Mars.*

Artist: Ken Hodges



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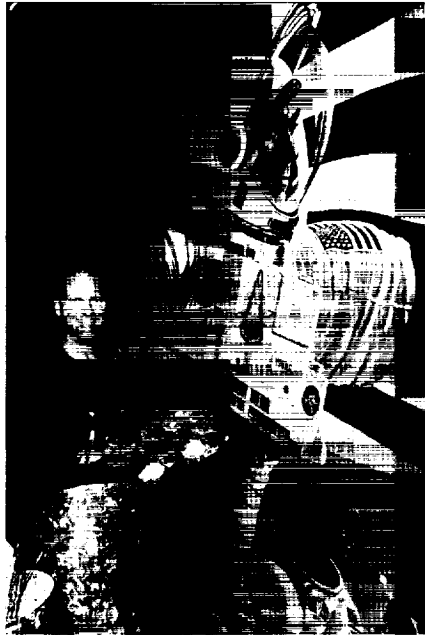
The following means or sources of assistance should be examined:

- (1) A White House conference on space enterprise, called by the President at the request of Congress, to consider how to implement the 1986 recommendations of the National Commission on Space. The provisions of the Space Settlements Act (H.R. 4218) might be added to the agenda for discussion. The proceedings could be televised by the Public Broadcasting System and later published in book form for wider dissemination.
- (2) A national convocation by NASA of all space organizations, associations, and societies to enlist

their support for the NASA plan and to obtain recommendations for private sector involvement in space developments. In addition to gathering their delegates (for example, in conjunction with a Shuttle launch), there might be a teleconference to include their memberships.

- (3) An artists' and writers' tour of space opportunities. Artists, dramatists, and film and television producers would be invited to visit key NASA installations and projects to examine the possibilities for collaboration on media projects about space themes, especially those dealing with human migration and communities on the high frontier.

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**An Artists' and Writers' Tour of Space Opportunities**

*Robert McCall, NASA-commissioned artist, touches up the middle of a giant mural at the Johnson Space Center's Teague Auditorium. That mural is seen in the background as tourists consider the lunar module test article. Perhaps other artists and writers, including film and video producers, could tour NASA installations to get content for their visualizations of life on the "high frontier." Indeed, Dennis Davidson, art director for the LaJolla summer study and this publication, has made such a tour of the Johnson Space Center with his colleagues in the International Association of Astronomical Artists.*

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- (4) A global space congress on the future of humankind in space, possibly under the auspices of the United Nations or an appropriate international agency. The International Space Year 1992 might be a good opportunity to focus papers and discussions on the kind of space culture we wish to create on the high frontier and whether a global space agency should be formed by the end of this century.

We assume that the proceedings of all the above events would be recorded and published for wider distribution, especially by satellite video.

### **Institutional**

In order to widen institutional support beyond space scientists and engineers, these steps might be considered to enlist professionals and academics in the process of planning space communities:

- (1) A university presidents' conference might be held to announce new NASA strategies to strengthen the synergy between the agency and the academic community. For example,

as a replacement for the summer study approach, NASA might provide grants for specific research it needs to have undertaken on space technology, management, culture, health, and community development. The purpose of this new grant or contract program would be to involve more academic disciplines, such as behavioral and health sciences, in space planning and to foster doctoral level studies and publications that focus on space systems and communities as well as on space technology. Schools of education and human services, for example, might be asked to analyze curriculum changes related to space age developments.

- (2) NASA should also reach out to international and national trade associations and professional societies to involve them in space planning. They could be encouraged to conduct conferences, field trips, and even action research on the applications of their fields to space development. For example, medical organizations could examine space health technology and needs.

Similarly, architectural and construction firms, hotel groups, and travel agents could undertake studies of space tourism. Teachers' organizations might focus on space studies for

elementary and secondary schools. With imagination, whole new constituencies could be created in this manner, ranging from law to dentistry.



#### **Action Research on Space Health Technology**

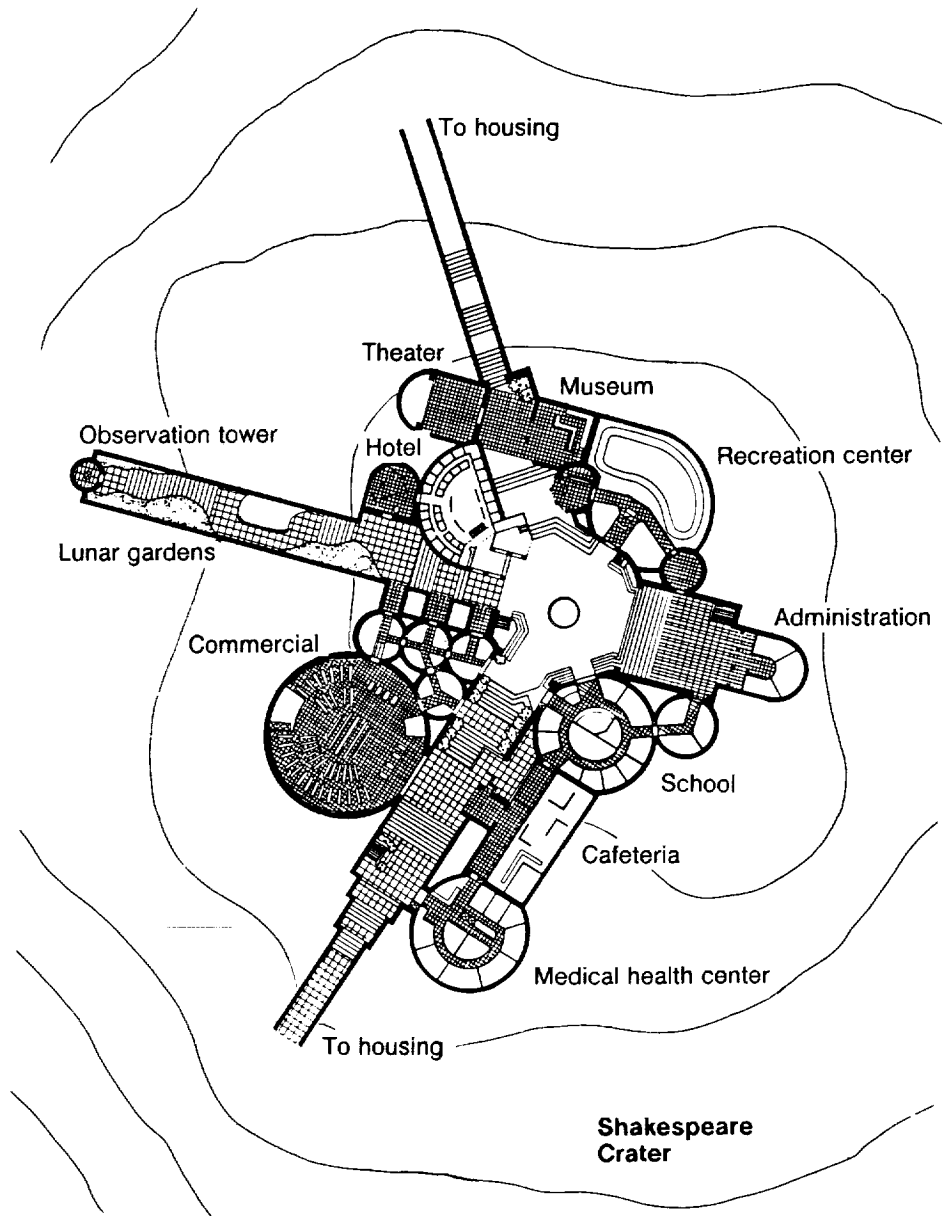
*Skylab astronaut Joseph P. Kerwin, M.D., serves as a test subject for the Lower Body Negative Pressure Experiment. Astronaut Paul J. Weitz, Skylab 2 pilot and experiment monitor, assists with the blood pressure cuff while Kerwin is in the lower body negative pressure device. The purpose of the experiment, which measures blood pressure, heart rate, the heart's electrical activity, body temperature, leg volume changes, and body weight as well as the pressure produced by the device, is to determine cardiovascular adaptation during a mission in weightlessness, to predict the degree of orthostatic intolerance to be expected upon return to Earth's gravity, and to estimate the ameliorative effect of the device. Such action research is supported by health experts and technology producers on the ground.*

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**Artemis, a Senior Architectural Design Project**

The hub of a lunar settlement is laid out in Shakespeare Crater. Vera Rodriguez designed this part of a 21st century community for 3000 inhabitants. She and five other students (Carol Haywood, Ruby Macias, Jorge Maldonado, Larry Ratcliff, and Kerry Steen) in the architecture program at the University of Texas at San Antonio researched, developed, and designed the lunar community as a senior design project under the direction of Dr. Richard Tangum. They were assisted in their research by NASA employees at the Johnson Space Center.

Although designed for the well-being, comfort, and enjoyment of lunar inhabitants, many facilities, such as the observation tower, museum (featuring the history of the lunar settlement), library (in the center of the school), and theater would be of interest to visitors staying in the 100-room hotel, which is expected to be one of the largest profit-making parts of the lunar establishment.



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#### **Space Studies**

*A teacher helps students try on space helmets at an exhibit at the Johnson Space Center. Teacher organizations might be involved in the planning of space communities, thereby enlarging NASA's constituency beyond scientists and engineers. Indeed, Pat Sumi, a teacher in the Gifted and Talented Program of the San Diego Unified School District, involved herself in the 1984 summer study of space resources.*



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## **International**

To build on those results of the foregoing efforts that have international dimensions, NASA should seek specific joint endeavor agreements with counterpart space agencies and their governments in Japan, Europe, the U.S.S.R., and such Third World countries as China and India. Regional economic associations or multinational corporations (some of which are headquartered in the Third World) might prove suitable for such partnerships. To proceed with this globalization of the space program might require some changes within NASA, such as

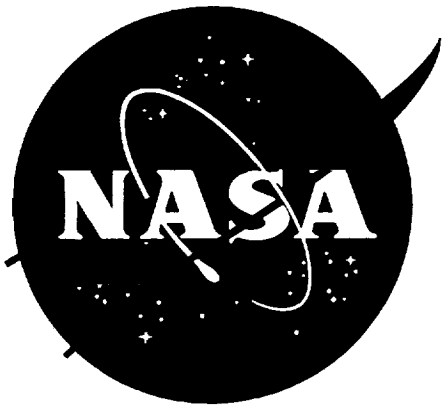
- (1) Creating in NASA headquarters a structure for this purpose with representation in all NASA centers
- (2) Recruiting and training specialists with cross-cultural negotiation and communication skills who can effectively manage such international projects
- (3) Identifying ventures in which the complexity of the technology or financing makes an international partner desirable

## **Managerial**

To meet the challenge of a postindustrial society and work culture, NASA needs to plan change in its structure, organizational models, and management policies. We recommend that a task force be established to examine the matters of organizational renewal and development of a metaindustrial work culture. Examples of the issues that might be addressed by this group, with the counsel of external consultants, are

- (1) Modernizing and decentralizing operational centers and mission control
- (2) Developing a macromanagement approach to large-scale programs, such as building a space station or a lunar base
- (3) Fostering a more autonomous, innovative, and entrepreneurial spirit or culture within NASA

Thus can NASA and its management transform itself!



### **NASA Transformed**

*In 1975 the official symbol of the National Aeronautics and Space Administration changed from the insignia on the left to the logo on the right. Though many NASA employees feel affection for the old "meatball" and its symbolism (and the official seal of the agency still bears a resemblance to it), even the most conservative can recognize in the new "worm" a positive change of image. The serif type and boundedness of the old circular symbol have changed to the uniform lines of the new, more open symbol and the vertical thrust of its uncrossed A's. This new image represents a streamlined purposefulness in NASA, an organization in the vertical business of launching space enterprises. Many of the participants in the 1984 summer study at LaJolla advocated more than symbolic renewal for NASA, to energize the organization as it moves out into the solar system.*