This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

NATIONAL SPACE COUNCIL
EXECUTIVE OFFICE OF THE PRESIDENT
WASHINGTON, D.C. 20500

February 8, 1991

The Honorable Robert Dole
United States Senate
Washington, D.C. 20510

Dear Senator Dole:

The National Space Council, authorized by Congress in 1988, and established by President Bush's Executive Order on April 20, 1989, is responsible for advising and assisting the President on national space policy and strategy.

In signing the Executive Order, the President said that space is of vital importance to the nation's future and to the quality of life on earth. He asked Vice President Dan Quayle, the Chairman of the National Space Council, to lead the Council in keeping America first in space.

Working closely with Congress, the Space Council has made important progress during this past year. We have translated vision into goals and objectives and have established strategies to implement these goals.

The enclosed report describes the activity of the Council since its establishment. I hope you will find this information useful as we continue together to develop a solid foundation for the future of America's space program.

Sincerely,

Mark J. Albrecht
Executive Secretary

Enclosure

lead_286_018_all_A1b.pdf

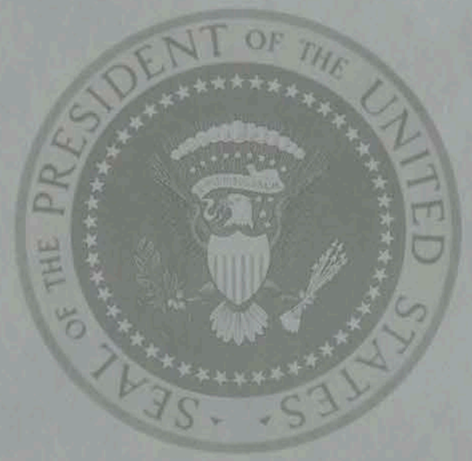
This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

NATIONAL SPACE COUNCIL

1990 Report to the President

lead_286_018_all_A1b.pdf

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu



lead_286_018_all_A1b.pdf

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

THE VICE PRESIDENT
WASHINGTON

JANUARY 4, 1991

Last year President Bush charged the National Space Council with nothing less than helping chart a course to a future marked by global prosperity, a robust and protected environment, and unprecedented scientific achievement.

He said that, "America's space program is what civilization needs." America, with its tremendous industrial and technological resources, is uniquely qualified for leadership in space. But more important, our success will be guaranteed by the American spirit — the same spirit that tamed the North American Continent and built enduring democracy.

The National Space Council's task is to bring coherence, continuity, and commitment to our efforts in space. The President asked us to lead America's national security, civil and commercial space resources in a cooperative effort to chart a prudent, but progressive path toward the future. He committed the Council to integrate the tremendous scientific, private-sector, and technological resources of our nation in a noble cause — harnessing the potential of space to benefit our great nation and serve all mankind.

As Chairman, I am pleased to report that the National Space Council has made important progress in the past year. We have translated vision into goals and established a conceptual foundation to mesh America's diverse government programs with private-sector space efforts into a coordinated thrust forward.

Our initial effort was to define the key elements of our national space strategy. These five areas are:

Developing space launch capability and supporting infrastructure as a national resource

A robust, reliable, available, and affordable launch capability is critical to success in space. We are engaged in reviewing current and needed capabilities to meet the nation's many objectives. This problem must be approached from a nation-wide perspective. It is already clear that our future fleet will consist of an appropriate mix of federal and commercial systems using both manned and unmanned vehicles. Diversity is important, so we are encouraging various private and state government enterprises as well as international efforts. Supporting the research and development of revolutionary new space transportation concepts such as the National Aerospace Plane and evolutionary ones such as the Advanced Launch System are important to a successful future in space.

Opening the frontiers of space

The President approved a major Space Exploration Initiative that builds on the successes and expertise built up in the Apollo, Skylab, Space Shuttle and Space Station Freedom programs by setting the goals of returning to the Moon to stay and exploring Mars. A comprehensive long-term program to study the universe is already in place, starting with the Hubble telescope, which, despite its difficulties, will soon give us a much deeper understanding of the universe. (Moreover, corrections will be made that will allow the telescope to reach its full design potential.) It includes three more Great Observatories in space. Our planetary exploration program continues to build on the spectacular successes of Voyager and Viking. Galileo is on its way to Jupiter, and Magellan is orbiting Venus. Spacecraft to explore a comet, Saturn and its moons are being built. We are committed to the use of government resources, in cooperation with the private sector, to encourage dramatic innovation in exploring space and to infuse every segment of our society with excitement over the prospects in space. Also important is the groundwork being laid by the Council for international cooperation, a natural extension of the cooperation already in place for Space Station Freedom and the majority of NASA programs over the last 30 years.

Using space to solve problems on Earth

Americans are highly dependent today on space systems for such commonplace functions as placing long-distance telephone calls and watching real time news events from across the globe on the television. But space also provides communication, navigation, and surveillance vital to our national security. Further, the world's ecological, climatic and energy crises— literally life threatening — cannot be solved without the success of efforts such as NASA's Mission to Planet Earth initiatives. The Council's review of Landsat data sales, and its subsequent decision to maintain federal funding, indicate the direction needed to ensure success in this important area.

Later, based on the understanding space will give us of the Earth, space can provide solutions to many of the problems we face. A prime example is the potential, in the future, for the provision of clean, limitless energy to Earth from space, using materials mined on the Moon.

Generating economic well-being and national competitiveness

America's industrial and technological leadership underpin our economic success and international competitiveness. The opportunities for everything from developing Earth-bound industrial capabilities based on space technology to creating new industries in space are likely to revolutionize America's economy. The Council is focusing on our commercial space policy to implement new ideas for cooperative efforts between various industries, the government, and civil institutions. Our goal is to ensure the consistent, predictable implementation of that policy. Among the promising avenues immediately at hand are such things as global cellular telephone systems; international high-definition television; unprecedented accuracy in aircraft and marine navigation; affordable position-location systems for small aircraft, boats, trucks, and even individuals; and direct broadcasting of both radio and television to millions of homes throughout the world. Furthermore, scientific ventures in space not only expand our knowledge and understanding of the universe, they lead also to the development of technologies and processes that impact directly on commercial progress.

Ensuring freedom to use space

Space, like the oceans, is a medium of travel, an as-yet unexploited repository of natural resources, and a strategically useful domain. To protect the freedom of space we must be able to do three things: First, we must be able to see and monitor all that occurs in space. Second, we must be able to alert and warn owners and operators of space systems that threats exist. Third, we must develop the capability to intervene to protect our and other nations' space assets.

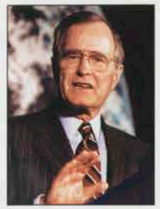
In conclusion, we have begun developing strategies for implementing a sound program of achievement in each of these five areas. Our efforts in each case are guided by our belief that a broadly-based, cooperative effort involving the national security, civil, and commercial space sectors is the only sure path to success. The National Space Council is seeking to infuse our space efforts with the same breadth that has always characterized our nation's greatest successes — whether in science, technology, or commerce.

The time has come to look beyond brief space encounters and to commit to a future where Americans and citizens of all nations will live and work in space. To ensure our institutions, strategies, and programs are on track we organized an outside advisory committee on the Future of the U.S. Space Program that gave us a no-holds-barred examination of our goals and objectives in space and how we plan to achieve them. The report clearly points out the need for fundamental changes in our civil space program. We will make changes. I am confident that the recommendations of the committee will form a solid foundation for America's space program for many years to come.

In the attached progress report, we have detailed our review of space policy and related issues in each of the areas described above and have identified the paths for pursuit of these goals. Necessarily, many of our actions are preliminary, but they demonstrate the Council's commitment to a rational, coherent program in space and recognize that we are now at the threshold of charting our future. We are committed to bringing the tremendous strengths of America's public and private sectors to bear on this frontier, rather than constraining or regulating them. We are committed to cooperation at every level and to making maximum use of every opportunity. This report tells how we have begun to implement these commitments.

Contents

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu



The National Space Council
1

Leadership in Space
3

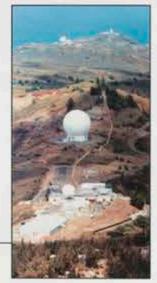
The National Space Council Planning Process
5

Key Elements of National Space Strategy
7

Developing a
Space Launch Capability
and Infrastructure as a
National Resource
9

Opening the Frontiers
of Space
15

Using Space to Solve
Problems on Earth
19



Generating
Economic Well-being
23

Ensuring Freedom to Use Space
for Exploration
and Development
27

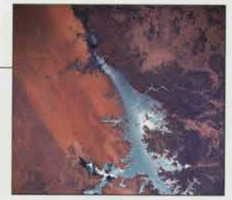
Current and Planned Activities
29

Commercial Space Policy
29

Space Transportation Policy
29

The Space Exploration Initiative
31

Mission to Planet Earth Policy
32



Summary and Conclusion
33

The National Space Council

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

The National Space Council is responsible for the coordination of U.S. space policies and strategies and for monitoring their implementation. It was created by an act of Congress in 1988 and was established by President Bush's Executive Order No. 12675 on April 20, 1989. In signing the Order, the President said that space is of vital importance to the nation's future and to the quality of life on Earth, and he charged the Council to keep America first in space.

The Council is chaired by Vice President Dan Quayle, who serves as the President's principal advisor on national space policy and strategy. Other members of the Council include:

- The Secretary of State
  James A. Baker, III
- The Secretary of the Treasury
  Nicholas F. Brady
- The Secretary of Defense
  Dick Cheney
- The Secretary of Commerce
  Robert A. Mosbacher
- The Secretary of Transportation
  Samuel K. Skinner
- The Secretary of Energy
  James D. Watkins
- The Director of the Office of Management and Budget
  Richard G. Darman
- The Chief of Staff to the President
  John H. Sununu
- The Assistant to the President for National Security Affairs
  Brent Scowcroft
- The Assistant to the President for Science and Technology
  D. Allan Bromley
- The Director of Central Intelligence
  William H. Webster
- The Administrator of the National Aeronautics and Space Administration
  Richard H. Truly

The Vice President invites the participation of the Chairman of the Joint Chiefs of Staff, the heads of other departments and agencies, and other senior officials in the Executive Office of the President when the topics under consideration by the Council so warrant.

The National Space Council is supported by an Executive Secretary appointed by the President. The first Executive Secretary of the Council, Mark Albrecht, leads an eleven-member policy staff. The Council is further supported by a sub-cabinet-level interagency Policy Implementation and Review Committee (PIRC) composed of senior representatives of each member of the Space Council and chaired by the Space Council's Executive Secretary. Interagency working groups, chaired by Space Council staff, prepare policy studies, develop strategy alternatives, and provide advice and recommendations to the PIRC. The Administration's budget request for FY 1991 will support a dedicated Council Staff of fourteen and a Space Policy Advisory Board of private citizens, authorized by the Executive Order which established the Council.

lead_286_018_all_A1b.pdf

Vice President

Secretary of State

Secretary of the Treasury

Secretary of Defense

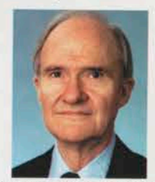
Secretary of Commerce

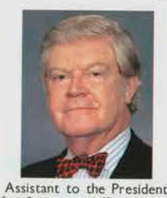
Secretary of Transportation

Secretary of Energy

Director of the Office of Management and Budget

Chief of Staff to the President


Assistant to the President for National Security Affairs


Assistant to the President for Science and Technology

Director of Central Intelligence

Administrator of NASA

Executive Secretary
Mark Albrecht

The National Space Council carries out activities to integrate and coordinate civil, commercial, and national security space activities and has taken major steps toward their implementation.

The Council's planning process consists of four phases:

- Define broad goals and objectives for the U.S. space program;
- Determine strategies to implement those goals and objectives;
- Monitor the implementation of these strategies; and
- Resolve specific issues that arise during the implementation process.

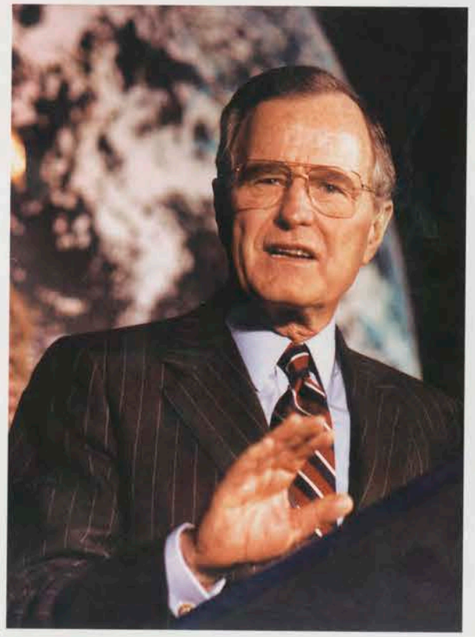
Page 6 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

"I believe that before Apollo celebrates the 50th anniversary of its landing on the Moon, the American flag should be placed on Mars."

Since signing the Executive Order that established the National Space Council, President Bush has made clear his resolve that this nation will lead the world in space. His landmark speech on July 20, 1989, the 20th anniversary of the Apollo Moon landing, established America's goals in space exploration: "... a long-range continuing commitment... first for the coming decade — Space Station Freedom — our critical next step in all our space endeavors. And next, for the new century — back to the Moon. Back to the future. And this time, back to stay. And then — a journey into tomorrow — a manned mission to Mars..."

The President reaffirmed his resolve in his speech at the University of Tennessee on February 2, 1990: "...first in space will mean first on Earth. And America intends to stay No. 1 ...Our goal: To place Americans on Mars — and do it within the working lifetimes of the scientists and engineers who will be recruited for the effort today..." A subsequent speech at Texas A&I University on May 11, 1990 put a firm date — 2019 — on his goal: "I believe that before Apollo celebrates the 50th anniversary of its landing on the Moon, the American flag should be placed on Mars."



lead_286_018_all_A1b.pdf

"Our future competitiveness will depend on advancing technology ...on educating our young people for excellence in math and science. The space program is a sound investment in ensuring that these key aspects of American competitiveness are there when we need them."

The Vice President, too, has demonstrated publicly his strong support for the President's space objectives. He enunciated U.S. National Space Strategy in a major address to the American Astronomical Society on January 10, 1990: "First, we intend to develop our space launch capability and its related infrastructure as a national resource ...Our second goal is to open the frontiers of space. This includes manned and unmanned programs. ...[Third,] the National Space Council is committed to intensifying our use of space to deal with problems on Earth. ...[Fourth,] we believe the exploration of space will enhance our economic well-being and our overall national competitiveness, ... and the final element of our strategy, of course, is ensuring that our space program contributes to our nation's security..."

Having defined the Space Council's planning process for implementing the President's goals in space, the Vice President laid before the American people his rationale for a strong and comprehensive civil space program. At the U.S. Space Foundation's Sixth National Space Symposium in Colorado Springs on April 10, 1990, he said "...in the next century space may be key to allowing us to satisfy our energy needs from space without damaging the environment; providing us with increased access to rare and essential metals and minerals; and allowing us to develop new information services which could further the revolution in communications which has already begun. And of course, in the next century, research in space could lead to new medicines or medical treatments of incalculable benefit to mankind..."

Three weeks later, at the Annual Meeting of the American Institute of Aeronautics and Astronautics in Washington, D.C. on May 1, 1990, the Vice President emphasized, "Our future competitiveness will depend on advancing technology...on educating our young people for excellence in math and science. The space program is a sound investment in ensuring that these key aspects of American competitiveness are there when we need them."

Page 7 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

National Space Council Planning Process

To guide national space activities and ensure an integrated national space program, the Space Council has designed a planning process consisting of four phases.

In its first year, the National Space Council made a strong start toward implementing this planning process and establishing essential strategies.

1

Establish broad goals and objectives for the U.S. space program.

The Council revised the 1988 National Space Policy and reissued it as Directive #1. This new policy was approved by President Bush on November 2, 1989. It provides the basic goals and overall policy guidance for the U.S. space program.

The new directive clarifies, strengthens, and streamlines policy in selected areas such as civil and commercial remote sensing, space transportation, space debris, federal subsidies of commercial space activities, and Space Station Freedom.

Most importantly, however, it revalidates the ongoing direction of U.S. space efforts and provides a broad policy framework to guide future U.S. space activities. It reaffirms the nation's commitment to the exploration and use of space in support of our national well-being and it recognizes that leadership requires American pre-eminence in areas of space activity critical to national security and to achieving our scientific, technical, economic, and foreign policy goals.

2

Establish strategies to implement these goals and objectives through an integrated nation-wide set of activities.

The Council formulated a Space Exploration Initiative. The President signed the implementing Policy Directive on February 13, 1990. He also signed a second policy directive to explore international cooperation in this initiative.

The Council is also currently formulating a space launch vehicle policy and a separate, but related policy on commercial uses of space.

3

Monitor the implementation of these strategies.

To monitor implementation of Presidential policies, the National Space Council establishes working groups consisting of representatives of Space Council member agencies as well as other affected departments and agencies. These working groups review progress toward accomplishing Space Council goals and implementing Presidential space decisions and policies. They then formulate position papers and issue papers to be forwarded to the full Space Council for information and action.

One example of Space Council implementation monitoring is the activity following the President's decision to explore possible international cooperation in our exploration initiative. In response, a working group was formed consisting of members from the involved departments and agencies and chaired by a Senior Space Council Staff Officer. This group meets frequently and has prepared agreed upon guidelines for discussions with potential international partners. As this dialogue develops in 1991, the working group will continue to monitor the discussions and forward status and decision memos to the Space Council.

4

Resolve specific program or policy issues arising from ambiguities or disagreements in implementing the strategies.

Several program issues that arose as a result of changing circumstances or policy ambiguities were resolved.

The Landsat remote sensing program—the Council recommended reinstating government funding because of the government's continuing need for Landsat data and the inability of the private sector to obtain sufficient business for commercial viability.

National Aerospace Plane policy—here the Council recommended focusing the program objectives on proving the requisite technologies, including a flight of a test aircraft; and continuing management of the program as a national enterprise.

The Council approved a U.S. Commercial Space Launch Policy providing important guidance for encouraging the competitiveness of private sector space activities. To achieve this goal the Council has specified a coordinated set of actions for the next ten years.

KEY ELEMENTS OF NATIONAL SPACE STRATEGY

Key Elements of National Space Strategy

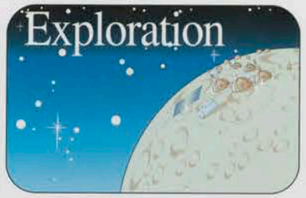
This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

The Space Council's approach for implementing U.S. national space policy divides all space activities into five areas, each of which may encompass civil, national security, and commercial activities conducted by NASA, DOD, DOE, DOT, other government agencies, or the private sector.

The space program serves multiple objectives: preserving the nation's security; creating economic opportunity; developing new and better technologies; attracting good students to engineering, math, and science; and exploring space for the benefit of mankind. The Council's approach is designed to achieve these objectives as an integrated national effort cutting across traditional lines of civil, national security, and commercial programs.

The five key elements of U.S. National Space Strategy are:

1 To develop U.S. space launch capability — our transportation to and from space — as a national resource: the space transportation infrastructure will be to the 21st century what the great highway and dam projects were to the 20th. We will ensure that this infrastructure provides assured access to space, sufficient to achieve all U.S. space goals.



2 To open the frontiers of space through both manned and unmanned exploration: we will build on the successes of Viking and Voyager and proceed to comprehensively explore the solar system with Magellan, Hubble, Ulysses, and other ambitious unmanned programs. The President's call to complete Space Station Freedom, return to the Moon to stay, and the journey to Mars has finally given a much needed focus to our manned efforts. New ideas will be synthesized into varied approaches to undertake these premier space flight missions of the future.

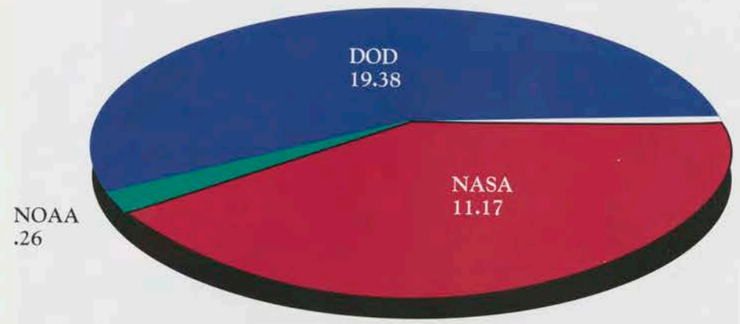
3 To intensify our use of space in solving problems here on Earth: we already use space systems to verify arms control treaties and to provide our defense forces with warning, communications, navigation, meteorology, and other functions vital to our national security. Satellite communication networks link peoples around the globe and contribute to the increasingly successful fight against repression and totalitarianism. Remote sensing from space contributes to a variety of land and ocean use applications and helps us understand, and potentially mitigate, the process of global climatic change.

4 To foster our economic well-being: we will capitalize on the unique environment of space to investigate and produce new materials and medicines and develop clean and abundant energy for all. The resulting private investment will create jobs; boost the economy; and strengthen our science, engineering, and industrial base. Along the way, new commercial space markets will be created and existing industries will become stronger and more competitive in the world marketplace.

5 To ensure the freedom of space for exploration and development: there are currently numerous spacefaring nations, with many others on the way. Space will become to the future what oceans have always been — highways to discovery and commerce. But the sea lanes must be open to be usable, and as we know from past conflicts, they are subject to disruption. Thus, we must ensure the freedom to use space for exploration, development, and security for ourselves and all nations.

lead_286_018_all_A1b.pdf

The Council's strategy is designed to achieve these objectives as an integrated national effort cutting across traditional lines of civil, military and commercial programs.



Resources for Space

The total U.S. Government spending on space related activities is over $30 billion in fiscal year 1990. To put this in context, space spending is 2.5% of the almost $1.2 trillion federal budget. Put another way, federal space spending is only one half of one percent of our $5.5 trillion Gross National Product.

Most of the funds for space activities are divided between NASA and the Department of Defense as portrayed by the chart above. The chart on the right highlights the breakout of space expenditures according to the five elements of our U.S. Space Strategy. As can be seen, well over half of our space spending is directly devoted to solving problems on earth. The majority of the remainder of these funds is spent in developing our space launch infrastructure to place and operate these systems in space.

Page 9 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Developing Space Launch Capability and Infrastructure as a National Resource

The nation today has a substantial and diverse space launch capability, with human access to space provided by the Space Shuttle, and unmanned access by four families of expendable launch vehicles (ELVs). This "mixed fleet" is the result of a major shift in national space policy following the 1986 Challenger accident. The new policy provides encouragement to the young U.S. commercial space launch industry.

The Space Shuttle is currently the only U.S. launcher able to carry humans into space and is also our largest payload carrier to low Earth orbit. Further, it offers unique capabilities for the repair and recovery of payloads in space and the conduct of human-tended experiments. The current space policy limits its use to these functions which cannot be performed by other U.S. launchers.

Our ELVs are used for launches of civil, commercial, and national security payloads. Our nation's ELV history started out in the 1950s in support of our strategic defense needs and then progressed into meeting our nation's need for putting man into space. Upon completion of the Apollo missions and the emergence of the Shuttle, government transportation needs were to be shifted exclusively to the Shuttle, thereby phasing out ELV development and production for the government. In May 1983, the government endorsed and committed to facilitate the commercialization of U.S. ELVs. In February 1985, the President directed DOD to pursue an improved assured launch capability through procurement of a limited number of ELVs.

After the Shuttle accident, the President directed DOD to secure additional ELVs to maintain a balanced launch capability and the ELV production lines were resurrected in support of our national needs. Our current military ELV fleet carries many critical assets in support of our nation's communication, navigation, surveillance, and weather missions. There are two primary sites in which launch operations occur; Cape Canaveral (east coast operational center) and Vandenberg Air Force Base (west coast operational center). In support of these sites, critical launch and range infrastructure, such as ships, tracking sites, huge launch structures and their associated support equipment, and a city of support process buildings (including ELV and payload assembly, fuel storage, hospital, and fire stations) remain essential. These facilities not only meet our national needs, but also support the emerging U.S. commercial launch industry.

Commercial ELV business had its beginning in the mid 1980s. Arianespace and several U.S. companies began their quest for payloads in order to assist in supporting the expanding commercial satellite demand and the subsequent backlogs prior to the resumption of shuttle activity. Although the U.S. commercial launch industry is still in its infancy, it has already become competitive in the international launch service market.

The Space Shuttle—reusable manned access to space

lead_286_018_all_A1b.pdf

We are already embarked on what many scientists call the renaissance of scientific space exploration.

The existing commercial fleet, based on these government-developed vehicles, is now in the process of being supplemented by smaller entrepreneurial commercial launch and launch service providers. These new companies, which have had several flights, hope to establish a market niche for low-cost launches of small payloads.

Several state governments are looking beyond the provision of launch services to the development of commercial space-ports. Florida proposes using facilities at Cape San Blas and Cape Canaveral; Hawaii is examining the prospects for a spaceport to service small or medium launch vehicles; and Virginia is exploring the establishment of a commercial spaceport at the existing NASA launch facility on Wallops Island.

To meet the expected needs of civil, national security, and commercial space sectors, launch costs must drop significantly and the reliability, robustness, and lift capacity of our launch systems must increase. The Air Force and NASA are jointly pursuing research and technologies to support future decisions on an advanced launch system. The current focus of this program is on propulsion technologies and vehicle concepts, however, the propulsion technologies are being developed within the context of a potential family of launch vehicles which could be much less costly and more reliable than current systems.

The Delta Expendable Launch Vehicle—a commercial and government workhorse

Page 10 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Developing Space Launch Capability and Infrastructure as a National Resource

New Commercial Space Launch Policy

The Space Council recently completed a comprehensive review of commercial space launching which resulted in important new policy guidelines which will further encourage the growth of U.S. private sector space activities.

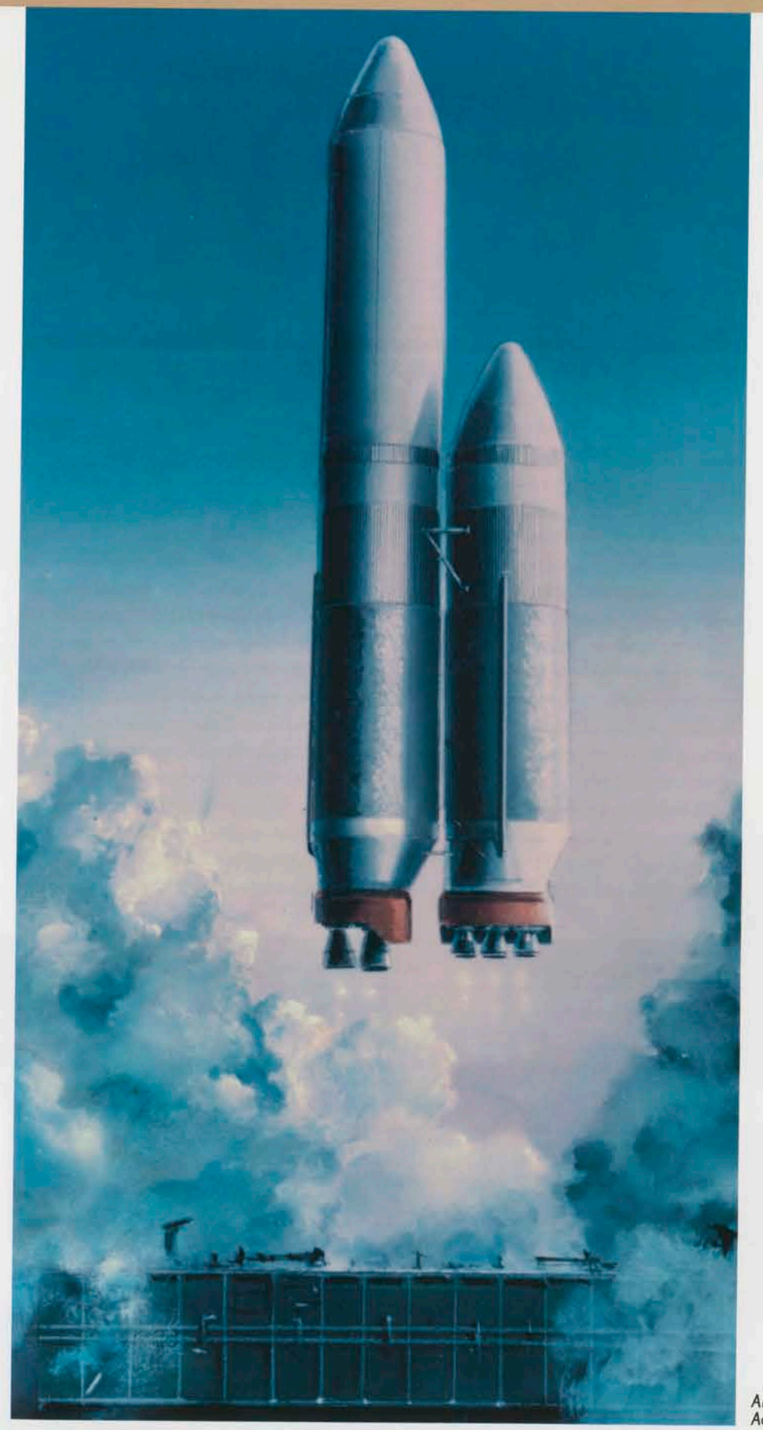
The commercial space launch policy recognizes the many benefits which a commercial space launch industry provides to the United States, to include indirect benefits to U.S. national security. It balances launch industry needs with important national security interests and with those of other industries and establishes the long-term goal of a free and fair market in which U.S. industry can compete.

The policy specifies a coordinated set of actions for the next ten years aimed at achieving this goal. The elements of the policy will:

- Encourage technical improvements by directing U.S. government agencies to actively consider commercial needs and factor them into decisions aimed at reducing the costs and increasing the responsiveness and reliability of American launch vehicles.
- Foster free and fair trade through negotiations with the European Space Agency and other launch providers.
- Provide a framework for dealing with non-market economy launch providers and for considering the participation of the Soviet Union in the Western market for space launch goods and services.
- Ensure that all agreements are structured in such a way as to be enforceable.
- Further U.S. missile non proliferation and technology transfer objectives.

The Titan launch vehicle

The Atlas Launch Vehicle



Artist's concept of the USAF/NASA Advanced Launch System

lead_286_018_all_A1b.pdf

Page 11 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Developing Space Launch Capability and Infrastructure as a National Resource

The National Aerospace Plane

In April 1989, the Secretary of Defense, in developing his revised budget, asked the National Space Council to review the NASP program.

The National Aerospace Plane (NASP) program was first announced by President Reagan in the January 1986 State of the Union address. Its objectives were to develop and demonstrate hypersonic and single-stage-to-orbit technologies. The program has significant potential for national security and for furthering U.S. competitiveness and aerospace industry leadership in the twenty-first century.

The program is structured in three phases: a preliminary technology and applications analysis, a technology development program, and then development and flight testing of one or two experimental flight vehicles, designated X-30. NASP has been jointly funded and managed by the DOD and NASA, who will have invested together approximately $800 million through the end of FY 1989. In addition to this government funding, U.S. aerospace corporations have invested a total of about $550 million in NASP technology to date and are planning to spend a total of about $750 million by the end of the program's technology development phase.

In April 1989, the Secretary of Defense, in developing his revised budget, asked the National Space Council to review the NASP program.

The Space Council conducted an interagency review which concluded that NASP will benefit civil, commercial and national security sectors, promote industrial competitiveness, and enhance U.S. space leadership. However, although the Council recognized the significant technical progress that has been made, it concluded that NASP remains a technically challenging program and that its technology is not yet sufficiently mature to support a decision to proceed with operational vehicle design and development.

Acting on the Council's recommendations, the President approved the following policy:

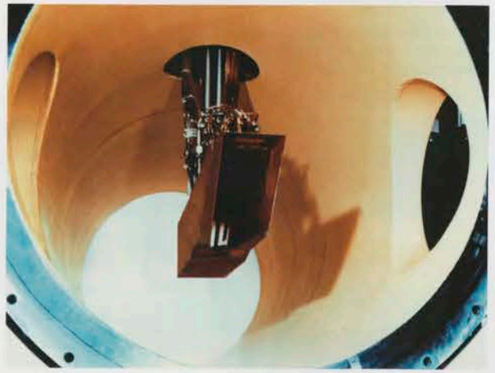
"The United States will continue the NASP program as a high-priority national effort to develop and demonstrate hypersonic technologies with the ultimate goal of single-stage-to-orbit. The government will complete the Phase II technology development program and plans to develop an experimental flight vehicle after completion of Phase II, if technically feasible. Performance of the experimental flight vehicle will be constrained to the minimum necessary to meet the highest priority research, as opposed to operational objectives. Unmanned as well as manned designs will be considered, and the program will be conducted in such a way as to minimize technical and cost uncertainty associated with the experimental vehicle."

The President also approved retention of an appropriate joint DOD/NASA management structure, and asked the Space Council to review the program again prior to initiation of vehicle development. These actions set the NASP program on a sound course consistent with national policy objectives. He also directed that NASP funding be increased to the levels necessary to meet the policy objectives.

Titanium composite material fabrication

Concept of the NASP experimental prototype

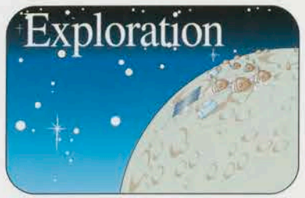
Supersonic combustion Ramjet Engine test



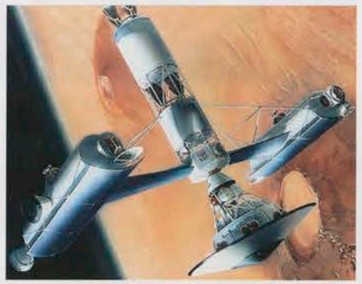
lead_286_018_all_A1b.pdf

Page 12 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu



The Space Exploration Initiative is the ultimate investment in America's future.



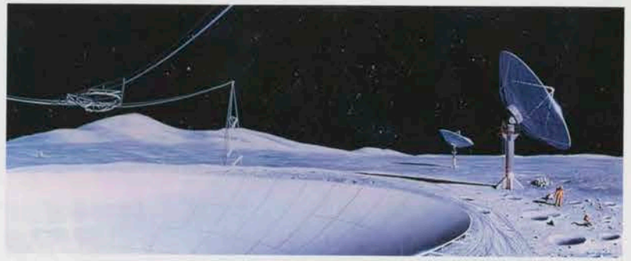
Above: One concept for a manned Mars spaceship, featuring artificial gravity, Center: Lunar Lander

Opening the Frontiers of Space

A view of Olympus Mons, Mars highest mountain, three times the height of Mount Everest

The Council recommended that so ambitious a program would require a systematic search for innovative concepts and new technologies having the potential to reduce costs, accelerate schedules, and reduce risk.

An artist's rendition of a large, man-tended radio telescope in a crater on the moon



The Space Exploration Initiative was a major activity of the Space Council during its first year. When President Bush announced his long-range goals for human exploration of the Moon and Mars on July 20, 1989, he asked the Space Council to develop a strategy for achieving these goals.

Various detailed programs for permanent settlement of the Moon and the human exploration of Mars have been proposed for over 20 years as logical extensions of the capabilities we developed for Apollo and subsequent Earth-orbit operations.

The President's July 20, 1989 announcement firmly established the nation's long-range goals in the human exploration of space: to proceed from Space Station Freedom to a permanent lunar presence in the next century, followed by a mission to Mars.

The Space Exploration Initiative is the ultimate investment in America's future. By responding to the human imperative to explore, we will reap benefits for ourselves and future generations akin to those of the voyages by Columbus and Magellan. We will increase our storehouse of knowledge about the planets, including our own, and about the nature of life itself. We will develop new technologies, many of which will have applications that will improve our lives on Earth. We will stimulate science and engineering education in this country by inspiring and motivating our young people. And we will be setting the stage for eventual permanent human habitats on other planets. Moreover, the Space Exploration Initiative will improve our competitive technological position in the world while enhancing our national pride and international prestige. But most importantly, the technological capabilities we develop, the new resources we discover, and the new industries we find in pursuit of these ambitious space-exploration goals will power American economic pre-eminence throughout the 21st century.

The Space Council was charged by the President to define an approach by which his space exploration goals could be best achieved, including an assessment of the possibilities for international cooperation.

The Council received suggestions for implementing the initiative from NASA, the Department of Energy and industry firms. The Council also benefitted from a review of these ideas by the National Research Council. All concluded that the President's goals were achievable, but the suggested approaches varied widely. The Council decided that so ambitious a program would require a systematic search for innovative concepts and new technologies having the potential to reduce costs, accelerate schedules, and reduce risk.

The Space Council therefore recommended to the President that such a search be conducted and that the Initiative first focus on technology development. The Council also concluded that at least several years should be devoted to defining two or more significantly different program architectures and developing and demonstrating technologies broadly applicable to space exploration. The President accepted the Council's recommendation and on February 16, 1990 it issued a policy directive to that effect.

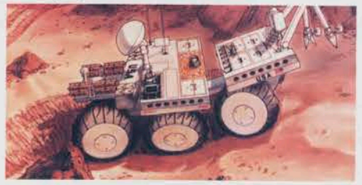
The decision also stated that the initiative be led by NASA and include a balanced program of robotic and manned exploration missions. To take maximum advantage of existing capabilities, however, the technological and systems expertise of other relevant agencies should be tapped. Therefore, the Departments of Defense and Energy will play significant roles in technology development and concept definition and will continue to work with NASA to develop the SEI.

To define our technology development and architecture development programs, the Space Council has chartered an Exploration Outreach and Synthesis activity. Throughout the summer of 1990 a number of government agencies, professional technical organizations, federally contracted research centers, and private citizens developed ideas on the technologies and approaches which could enable us to accomplish our exploration goals faster, cheaper and better.

The ideas collected by the Outreach effort are being reviewed and analyzed by a Synthesis Group chaired by Lieutenant General Tom Stafford (Ret.), former Apollo astronaut and distinguished space expert. This panel will report to the NASA Administrator and the Space Council in early 1991—recommending the alternative architectures and technology development course we should pursue over the next few years.

The Synthesis Group recommendations and the work to study the alternative architectures in the coming few years can shape the heart of our exploration effort. While we are not embarking on a costly development program now, these efforts will allow us to make informed decisions on how and when to proceed affordably and most effectively.

Concept for a Mars Rover



Concept for a commercial Lunar Outpost

lead_286_018_all_A1b.pdf
Page 13 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Opening the Frontiers of Space

The traditional focus of our nation's space science programs has been to observe and understand the universe by accumulating scientific knowledge of the planet Earth, the solar system, and the universe beyond.

A prime objective of our future plans is to open the space frontier. To create the scientific foundation essential for planning and conducting missions to the Moon, Mars and beyond, we must collect data on the surfaces of the Moon and Mars and develop a thorough understanding of the long-term effects of the space environment on human beings.

A particularly exciting facet of the Space Exploration Initiative is the opportunities it will offer to explore the surfaces of the Moon and Mars and use them for scientific purposes. The Moon, for example, might be an ideal location for next-generation space observatories.

We are already embarked on what many scientists call the renaissance of scientific space exploration. Beginning in May 1989 with the departure of the Magellan spacecraft to Venus, we have launched eight successful space science missions in the past two years. As of October 1990, three solar system exploration missions — Magellan, Galileo, and Ulysses — had begun. The Hubble Space Telescope was deployed. The Cosmic Background Explorer (COBE) had successfully examined the background radiation of the cosmos, collecting data that could change our theories about the universe's early history. And several space physics missions had been carried out. We plan to launch an average of five or more space science missions annually through 1996. During the next few years we will expand our knowledge of the universe more rapidly than at any other time in human history.

Space Station Freedom

Space Station Freedom is a major milestone in our planning for the future. This permanently occupied orbiting base will help to maintain U.S. space leadership into the 21st century. It will play a vital role in science, exploration, and space commercialization.

Freedom will provide a world-class multidisciplinary laboratory in space for life sciences and materials research which simply cannot be done on Earth. It will support instruments to look out at the universe and back at the Earth, including those which will help us understand the threats to Earth's global environment.

Freedom offers a unique facility for developing new technologies, products, and processes. Among the exciting possibilities are the development of new pharmaceutical methods and processes and treatments for serious diseases.

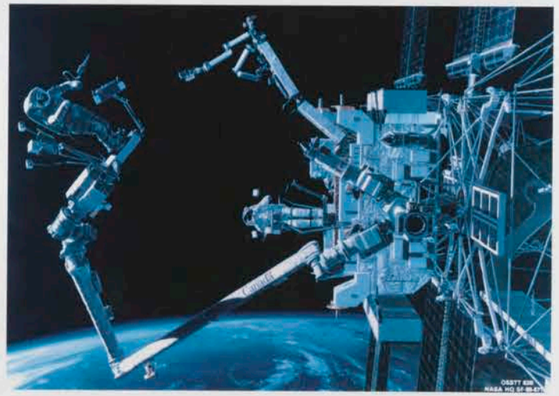
Research on Freedom will help prepare humans for the long-duration space missions of the Space Exploration Initiative.

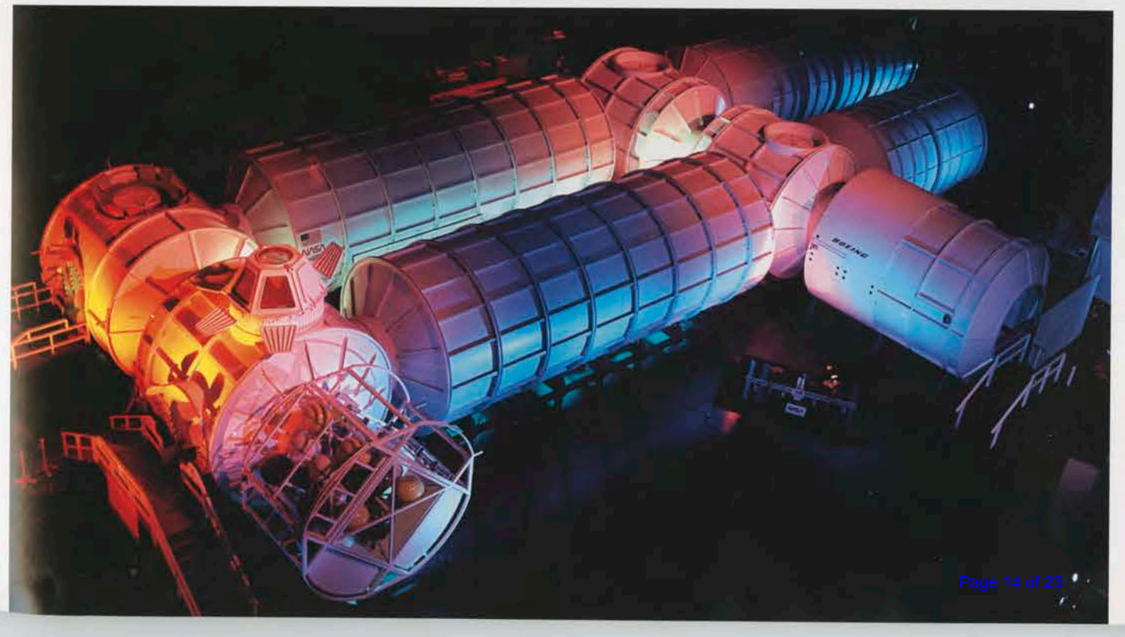
Freedom could also lead to further international cooperation with nearly one third of the initial investment in the station being borne by our partners in Europe, Japan, and Canada. The agreements signed by Freedom's participants form a possible framework on which to build forthcoming cooperative programs in mankind's exploration of space.

In summary, Freedom will be an important element in opening the frontiers of space, in attracting new private-sector users of space in such industries as advanced materials and medical products, and in forging closer bonds with our international partners.

Images of Venus from Magellan spacecraft

Freedom will be an important element in opening the frontiers of space, in attracting new private-sector users of space in such industries as advanced materials and medical products, and in forging closer bonds with our international partners.





Above Right: a view into the laboratory module of Space Station Freedom, Center: robots and crews will team up for assembly and servicing on Space Station Freedom, Below: the Space Station Freedom modular concept

lead_286_018_all_A1b.pdf

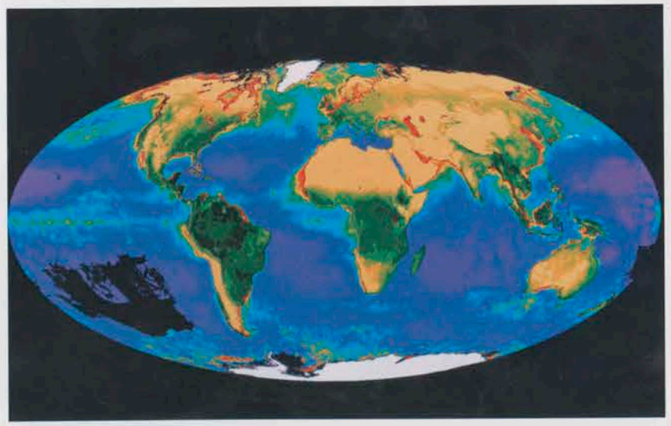
This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Using Space to Solve Problems on Earth

Space already meets many modern day needs. It has been used to improve the quality of life for Americans by creating new communications, navigation and other services that knit people and businesses more effectively than ever before; by observing the Earth from the unique vantage point of an orbiting satellite; by applying the results of space biomedical research; and by preserving the peace and security of the U.S. via satellites for surveillance, treaty verification, communications, and navigation. In the broader context our space efforts help people everywhere by fueling the world's economic engines; advancing human health through life sciences research; improving communications around the globe; and using the global perspective of space to observe and predict weather and ultimately to assess and ameliorate changes in our global environment.

Mission to Planet Earth

This facet of the use of space is of particular importance. In recent years we have become aware that human actions can affect the environment on a global scale. "Mission to Planet Earth" is a program that focuses our capabilities for satellite remote sensing to help us understand how the Earth works as an integrated system. Its centerpiece is the Earth Observing System (EOS), a fleet of satellites which will provide comprehensive, long-term observations of the whole Earth and its component parts. EOS is a particularly important issue for the National Space Council because it is an effort that cuts across many agencies, such as OSTP, NOAA, EPA, and NASA. The primary goal of these observations is to serve as the basis for developing and refining predictive models of our planet that can be used to formulate policies for reducing any negative effects of long-term changes in the Earth's environment. Because such policies could have major economic impacts, it is extremely important that the predictive models be as accurate and comprehensive as possible. The Space Council plans to build on a National Research Council (NRC) assessment to address the policy issues inherent in implementing the EOS satellite system and its ground support components.



lead_286_018_all_A1b.pdf

Space Medicine

Research conducted to ensure astronaut health and safety also benefits the health and well-being of people on Earth. Advances made in space medicine have been applied to detecting, diagnosing, preventing, and treating medical conditions everywhere. New and improved surgical techniques, devices, and medicines have also been developed as the result of space research. The biological and medical research needed for human space exploration will greatly expand our knowledge base and potential for medical breakthroughs for people on Earth.

Satellite Communications

Global communications initiated the world's commercial use of space. Improving and expanding on space-based communications capabilities and services have high priority on the Space Council agenda. Research for space missions is often applied to increase the capacity and flexibility of terrestrial telecommunications services such as live overseas television transmissions, trans-oceanic phone calls, and worldwide data networks. The Space Council is in the midst of a policy review to determine how the federal government can best foster an environment conducive to the growth of communications and other commercial space service industries.

Left: Global Biosphere, Bottom Right: Nile River, Top Right: artist's rendition of communications satellite
Right: the Strategic Defense Initiative will provide technology for strengthening deterrence–solving problems on earth

Page 15 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

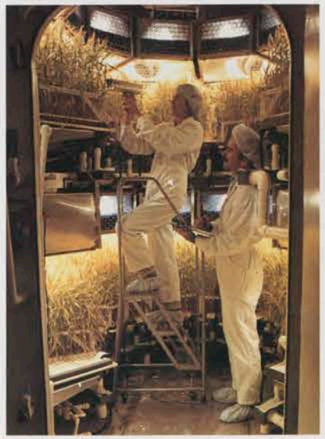
Using Space to Solve Problems on Earth

Satellite communications and navigation have become an integral part of every kind of military mission.

Microgravity Science

Microgravity research is aimed at attaining a structured understanding of gravity-dependent physical phenomena in areas such as materials science, combustion science, and biotechnology. Ultimately, microgravity research may lead to our improving solid-state electronics and semiconductors, developing new medicines and vaccines, creating metal alloys and composites having unique properties, and developing new instruments and laboratory techniques. The microgravity environment of the Shuttle and some suborbital vehicles are currently being used to make small research quantities of highly valuable materials during short duration flights. The space station would allow more extensive research. The Space Council has reviewed plans and directions in these programs to ensure that our policy provides the maximum opportunity for developing new industries and services.

Understanding how to grow food in a closed environment



The Landsat Policy Decision

One of the first tasks undertaken by the National Space Council was a review of the Landsat program.

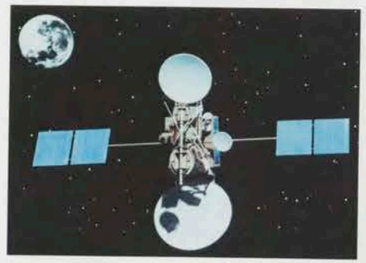
NASA pioneered civil Earth remote sensing with an Earth Resources Technology Satellite launched in 1972 (later renamed Landsat 1). Subsequent Landsats demonstrated this technology and its applications so successfully that it was declared to be operational, and program management was transferred from NASA to the Department of Commerce with the intent of effecting transition of the entire program to the private sector.

During the past few years, however, it became increasingly evident that privatizing Landsat would not be commercially feasible for a long time. Actual market experience discredited the unrealistic revenue expectations on which previous studies had been based. But since government planning was predicated on commercializing the entire program, this lack of near-term commercial viability threatened the continuity of Landsat data, which had become valuable to its users, many of which were U.S. Government agencies. The Space Council was asked to revisit existing government policy in light of current, more realistic projections of revenue growth and the importance of federal applications for Landsat data.

The Council's full interagency review revealed that government agencies, not the private sector, do indeed account for the great majority of Landsat data sales.

The Council found that Landsat is an important, but not critical, source of data for such civilian agency applications as environmental monitoring, global change research, economic intelligence, and law enforcement. The Landsat program is utilized by 12 nations (and the European Space Agency) which paid for and now uses Landsat ground stations.

lead_286_018_all_A1b.pdf



The federal agencies, in aggregate, believe that U.S. national interests are well served by a continuation of Landsat-type data.

Based on these findings, the Space Council recommended and the President approved the policy that, "The U.S. is committed to ensure the continuity of Landsat-type remote sensing data to meet civil, commercial, national security, and foreign policy needs." The President approved government funding for the continued operation of Landsat satellites 4 and 5 as well as funding to complete and launch satellite number 6 in 1992.

National Security

The national security space sector is a major provider and user of space systems across a wide range of applications. For example, the importance of space to national security was clear in support of our military operations in Panama and space systems continue to prove their value daily in support of Desert Shield. Although security considerations prohibit going into detail, the absolute necessity for and importance of space in safeguarding our national security must be unequivocably recognized.

Space Systems are a major source of missile early warning for the nation and its strategic forces and also support tactical operations worldwide. Satellite-derived information also forms the cornerstone of U.S./U.S.S.R. arms-control treaty monitoring, and contributes to global stability by reducing the possibility of surprise developments, thereby allowing time for crises to be averted.

Satellite communications and navigation have become an integral part of every kind of military mission. The worldwide coverage needs of military functions make them ideally suited for support by space systems. The navigation capability established for the military is also used routinely and widely in civil applications. Meteorological satellites provide critical weather information in support of world wide military operations. While this application is primarily defense-related, close coordination is maintained with civil weather satellite programs. As an example, the Defense Meteorological Satellite Program has proven invaluable in tracking hurricanes in both the Atlantic and the Pacific. Space may also be used in the future for defensive measures as in the case of ballistic missile defense.

Long Term Impacts

In the next century, our Planet's resources will be increasingly taxed. Growing demands for energy, raw material and finished products cannot be met without serious environmental impact. While no one can accurately predict how space can help provide for earthly needs, space holds significant promise for new sources of energy, material and products. As we come to understand the complex interplay of man-made and natural effects on the environment, space may play the crucial role in correcting damage which has already occurred and prevent future problems. Space might provide unlimited, clean sources of energy. Resources and manufacturing in space may be provided without environmental damage. We might even be able to intervene to correct environmental problems from space.

Above Right: Washington, D.C. as seen from Landsat, Above Left: Astronaut "Pinky" Nelson tending a crystal growth experiment Above: Large communications satellites link all nations across the globe, Right: Satellite ground terminals are the gateways for the global village

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Generating Economic Well-Being

Creating New Industrial Capability and Jobs

The emergence of a separate, non-governmental commercial space sector, whose importance is explicitly recognized by the National Space Policy, holds the promise of generating enormous benefits for the nation. Already, according to the latest edition of U.S. Industrial Outlook, 1990, "...commercial space sector revenues are expected to increase to $3.3 billion in 1990 from $2.6 billion in 1989...The underlying rate of growth is 10%, and most of the revenues are generated by satellite-related activity. New satellite services for business are expanding rapidly... All areas of space commerce are facing increased international competition."

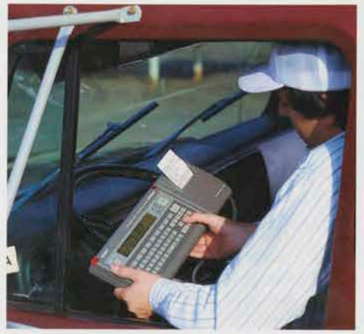
Opportunities for commercial enterprises exist in:

- ground-based infrastructure support
- commercial launch services
- space insurance
- space law
- telecommunications satellites (construction and operation)
- remote sensing satellites (satellite development and data analysis)
- position location satellites
- materials research and processing in space
- space-based industrial facilities
- payload processing services
- spaceport safety management
- financing services
- commercially developed launch facilities

Of these, the space communications industries are the most mature and fastest growing. 1990 revenues from all sectors of the international satellite communications market were estimated to be in excess of $5 billion. Although the international arena is increasingly competitive, U.S. satellite manufacturers continue to produce the majority of the world's communications satellites, exports of which are estimated at $1 billion this year alone. Ground station equipment and terminals for sending and receiving satellite signals is the fastest growing satellite-related industry and shipments are expected to increase to $850 million in 1990 from $750 million in 1989. The United States is a net exporter of satellites, which have among the highest "value added" of all products built domestically.

One of the most promising developments in space communications is the "lightsat". Using new technologies in sensors, electronics, and computers, a lightsat weighing a few hundred pounds or less might do the job at much less cost. Such satellites might also be launched on a new generation of small launch vehicles. The United States leads the world in developing lightsats and small launch vehicles.

The real benefit of space to the economy will be in the creation of new technologies, new products, and new services.



Geostar navigation system in truck cab

lead_286_018_all_A1b.pdf

Utilization of Space Technology

The second largest commercial space sector is in spacecraft launch services. For the period of 1990-1993, the Department of Transportation's Office of Commercial Space Transportation — which licenses and promotes commercial space transportation activities — estimates that the U.S. launch service industry will generate $640 million in 1990, with annual revenues of at least $450 million expected over the next several years. Known commercial launch contracts from 1990 through 1995 currently exceed $1.9 billion, and $1.4 billion are for customers other than the U.S. Government. One major U.S. launch supplier estimates that approximately 20,000 prime contractor and major subcontractor jobs are affected by U.S. commercial space transportation activities. In addition, U.S. commercial space launch companies report that they have invested over $700 million to date.

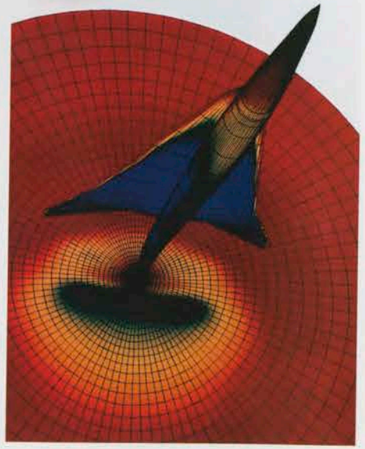
The government contributes to the space economy by being a customer for private-sector goods and services. Because of their often unique or demanding requirements, government purchases can stimulate expansion of the market and the industry, thus creating jobs and generating revenue. An excellent current example of this practice is government purchasing of commercial launch services.

For the long-term no one can predict which industries will emerge from our space efforts. However, we might get our energy from space, find and extract resources, manufacture medical products and treatments to cure dreaded diseases, and produce materials using the unique attributes of space. There is also significant potential for the development and use of space technology for non-space commercial uses. We are on the threshold of a second great era of exploration — the expansion of human presence into the solar system.

As with the great age of exploration which began 500 years ago, we cannot imagine completely the scientific and industrial riches and benefits we will find.

The real benefit of space to the economy will be in the creation of new technologies, new products, and new services. For example, hundreds of companies are currently investigating ideas for new space-related commercial enterprises through NASA's 16 Centers for the Commercial Development of Space (CCDS). These consortia of government, academia, and industry focus market-driven research on those technologies most viable for commercial development.

Right: a perfect crystal grown in space of mercuric iodide, Center: crystal growth in process Far Right: super computer aircraft imaging



Page 17 of 28

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Generating Economic Well-Being

Strengthening the Industry Base

The National Space Council is conducting a comprehensive policy review to develop guidelines to most effectively encourage federal government efforts to support commercial space sector activities. The goal of these guidelines is to minimize unfair competition between the government and the emerging commercial space sector and to encourage an environment conducive to the ultimate development of new commercial, nongovernment-dependent space markets.

At the same time, these guidelines are intended to encourage innovative efforts by agencies, such as NASA, to continue developing innovative working agreements with the private sector to share costs and risks and give the commercial space sector, as appropriate, access to government facilities and other capabilities. Also, the Centers for the Commercial Development of Space program is a growing and dynamic initiative which currently involves 56 universities and 189 companies, and helps move emerging technologies from the laboratory to the marketplace by leveraging a broad industry base to develop product-oriented technologies. This experience and emphasis on innovation should enable U.S. firms to compete more effectively with their foreign counterparts. A healthy business environment is encouraged through a consistent and predictable regulatory program managed by the Department of Transportation's Office of Commercial Space Transportation.

Technology Development

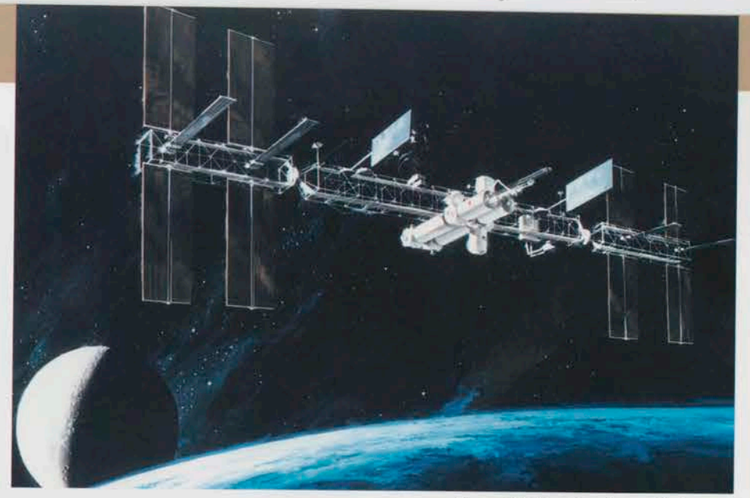
A sound technology base is the fundamental element upon which commercial markets, and, ultimately, new industries, are built. Although the goal of federal space policy is to build a commercial space sector which is not dependent on government support, the government can be very effective in helping to build the requisite technology base.

This role was recognized in the National Space Council's Commercial Space Launch Policy which directs government agencies to "actively consider" private sector needs when making decisions on improvements in launch infrastructure and increasing reliability and responsiveness of space launch vehicles.

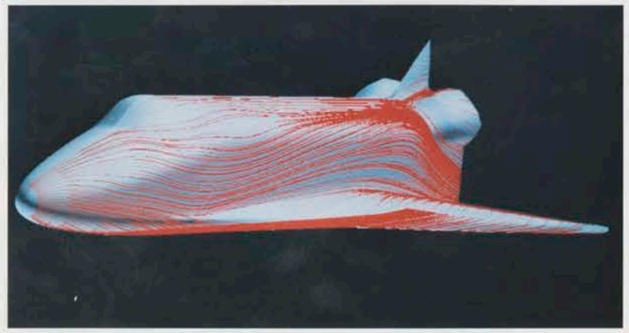
NASA is developing technology for direct commercial application in several areas. For example, the Office of Commercial Programs is sponsoring research into commercial remote sensing technology at the John C. Stennis Space Center.

The Office of Commercial Programs is also proposing an innovative project called the Commercial Experiment Transporter (COMET) which is designed to stimulate the growth of a commercial space sector able to prepare, launch and retrieve small space payloads developed by the various Centers for the Commercial Development of Space.

The Department of Defense also operates an extensive science and technology complex which significantly contributes to space technology development. For example, the Defense Advanced Research Projects Agency played a major role in providing seed funding, developmental assistance, and contracts for launch services which led to the successful April 1990 launch of the Pegasus launch vehicle.



Space Station Freedom will be a laboratory for technologies and products useful on Earth



Left: supercomputers allow design of advanced aircraft with less wind tunnel testing, Right: Close-up photo of thermal barrier coating for advanced engines

lead_286_018_all_A1b.pdf

Page 18 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Ensuring Freedom to Use Space for Exploration and Development

We already know that space will play an increasing— if not dominant role in the global 21st century economy. While we hope and will work strenuously for a safer world and safer outer space environment, the very fact that space is an economic wellspring makes it a potential area for confrontations. The best way to avoid those confrontations is to have the means to prevent them, and if they occur, have the ability to deny an aggressor the fruits of his aggression. For these reasons, we must have the means to protect assets of ours and other nations.

To protect the freedom of space we need to be able to do three things.

First, we must be able to see and monitor all that occurs in space. While we have long-standing needs and systems to track objects in space — the United States now tracks over 7000 objects in space —we will need substantial improvements in these capabilities in the years ahead.

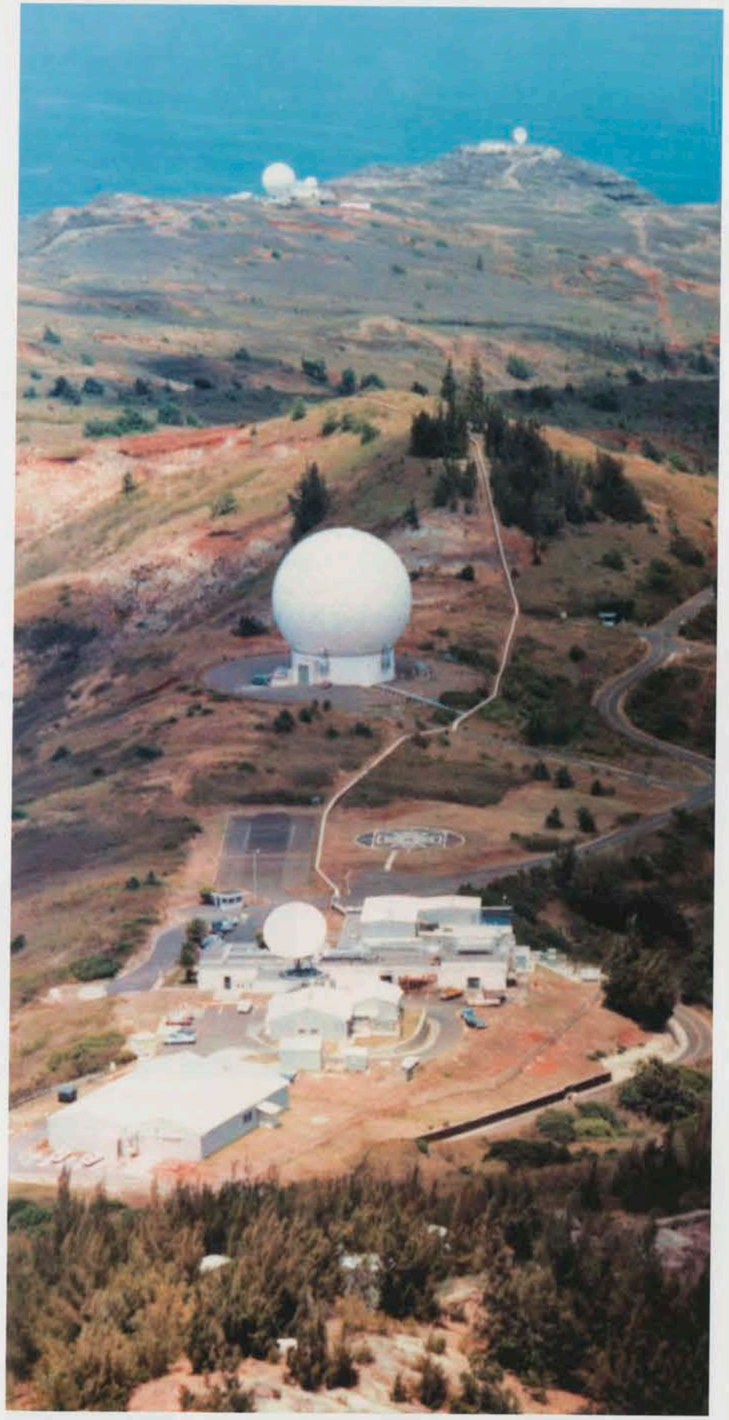
Second, we must develop the capability to protect our nation's space assets. This protection may take the form of passive measures to enhance the survivability of critical space systems and to warn of attacks upon space assets. In that regard, we must be able to alert and warn owners and operators of space systems that threats exist. This means we must improve our technical abilities to quickly and reliably characterize the purposes of space activities, and we must be able to communicate warnings rapidly to those who can mitigate developing threats.

Third, we must develop the capability to intervene to protect our space and terrestrial (land, maritime, and air) operations that may be threatened by enemy space assets. We must be able to employ active measures, e.g., antisatellite systems, to stop an aggressor before he can use his space systems to threaten objects or people in space or on the earth.

Access to space can be denied by many means, including antisatellite attacks on space systems and sabotage of ground segments. The Soviet Union has an operational antisatellite system deployed. The U.S. has advanced technology applicable to antisatellite weapons and research programs.

The Defense Satellite Communication System provides global command and control information to U.S. forces deployed worldwide

Command Centers operate 24 hours a day to assess air and space activities around the globe



Worldwide ground radars are the mainstay for detecting and tracking satellites

Space is very much like the ocean: freedom of traverse is necessary for international commerce and in some instances vital to the national security of some nations. As has happened on the seas in the past, some nations may choose in future conflicts to deny potential adversaries the use of space.

lead_286_018_all_A1b.pdf

Page 19 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Current and Planned Activities

The purpose of the Council's review is to define policy and strategic alternatives for the U.S. commercial space launch industry.

Results of the Council's analysis will be incorporated in a comprehensive space launch strategy to guide future government actions.

Commercial Space Policy

In March 1990, the Council assembled an interagency working group to review the implementation of commercial space policy. The purpose of the review is to assess the status of the emerging commercial space markets; to see how well the National Space Policy was working in this area; and, where appropriate, to develop additional policy and implementation guidelines.

The policy review will develop a working definition of commercial space activities; identify the various ways in which the government interacts with the commercial space sector (e.g., purchase of goods and services, transfer of technology, research and development, advocate free and fair trade) and seek to develop policy guidelines within which agencies would respond to commercial space sector initiatives. Such a policy framework would greatly increase the level of certainty and predictability associated with the private sector's interaction with the government.

The goal of this interagency assessment of commercial space, the most comprehensive ever undertaken, is to ensure that the government takes appropriate steps necessary to create an environment conducive to the formation of new space markets and industries, rather than merely expanding the commercial sector's capacity to supply government needs.

Space Transportation Policy

The National Space Policy identifies access to space as a key element in all U.S. space activities. It states that U.S. space transportation systems must provide a balanced, robust, and flexible capability with sufficient resiliency to allow continued operations despite failures in any single system. The policy identifies the following goals for the nation's space transportation infrastructure:

(1) to achieve and maintain safe and reliable access to and from space and transportation within it;

(2) to use both piloted and unmanned launch and recovery systems in a manner which exploits the unique attributes of each;

(3) to encourage the development and use of private-sector space transportation as much as possible (President Bush recently announced the National Transportation Policy which encourages the use of commercial space transportation services for government space missions to the fullest extent possible); and

(4) to reduce the costs of space transportation and related services.

The National Space Council is conducting a review to see how effectively these provisions of the U.S. policy are being implemented, and is also developing a comprehensive national space launch strategy. The review is being conducted in three phases:

Phase I will:

- Describe current and planned launch capabilities (e.g. performance, capacity, adequacy of infrastructure support, resilience to launch failure, etc.)
- Identify space launch needs, separating: 1) firm requirements associated with continued operation of existing space programs and other funded programs 2) projected needs for programs or missions which are under consideration but have not yet been approved or funded, and 3) projections of commercial launch needs.
- Compare current and planned space launch capabilities with these space launch needs and identify mismatches, if any.

Phase 2 will identify and analyze alternative government actions to resolve mismatches and meet U.S. space launch objectives, such as:

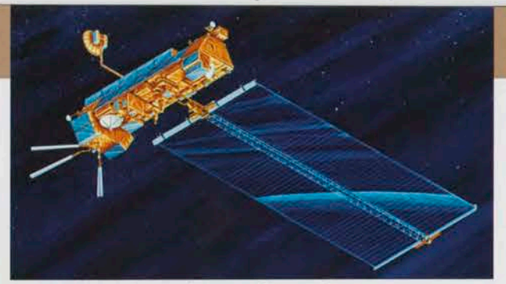
- Additional policy guidance, if needed.
- Development and acquisition of new systems or infrastructure.
- Investments in research and technology, including the government's role, if any, in development of technology for commercial application.
- Investments in advanced ("leapfrog") technologies which offer the potential for large improvements in cost, performance or reliability.
- Modifications to procedures which might reduce launch costs or increase launch capacity.

Phase 3 will assess all combinations of these policies, procedures and investments, including appropriate revisions in agency management structures or in the current assignment of space launch roles and missions. Results of the Council's analysis will be incorporated in a comprehensive space launch strategy to guide future government actions.

Pegasus being launched

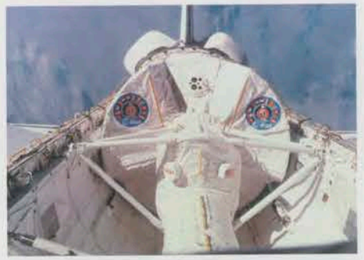
Left to Right: The Space Shuttle, The McDonald Douglas Delta, Orbital Sciences Pegasus, Sounding Rocket for Research, The General Dynamics Atlas, The Martin Marrietta Titan Above Right: Artist"s conception of the USAF/NASA Advanced Launch Vehicle

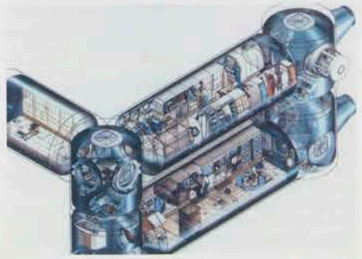
This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu



The Earth Observing System—the window into the environment

The Space Exploration Initiative





Left from top: Space lab module being serviced, Shuttle bay showing international space lab module, artist's rendition of materials processing module in shuttle bay, space station module interior, Above: Canadian robotic arm

The Space Council's activities in this Initiative were described in some detail earlier. The Council believes SEI is central to our future in space, and will maintain a continuing dialogue with the Congress, NASA, universities, industry, and federal laboratories on their activities dealing with this initiative.

International Cooperation

The Council explored the feasibility of international cooperation in the Space Exploration Initiative in parallel with establishment of a program policy. This interagency review examined past experience in U.S./foreign space program collaboration, capabilities of foreign spacefaring nations, the benefits and risks of international cooperation, and various options for the President to consider in deciding on the U.S. approach.

The Council concluded that the Space Exploration Initiative will be of profound significance to all mankind; and that international cooperation in this endeavor is feasible and could offer significant benefits to the United States.

Acting on the recommendations of the Vice President and the National Space Council, the President announced on March 30, 1990, that:

- The United States will take a sequential and orderly approach to decisions on involving specific countries consistent with decisions made on the overall Space Exploration Initiative.
- The United States will seek an exploratory dialogue with Europe, Canada, Japan, the Soviet Union, and other nations, as appropriate, on international cooperation on the Initiative.
- The exploratory dialogue will focus solely on conceptual possibilities for cooperation.
- The dialogue will be based on guidelines expeditiously prepared by the National Space Council, and will be consistent with the National Space Policy.
- The National Space Council will ensure interagency coordination and review during the development of international cooperation on the Initiative, and provide recommendations to the President as appropriate.

The Space Council has now convened a working group on the guidelines for exploratory dialogue.

Mission to Planet Earth Policy

Concern about environmental change is high in people's minds throughout the world. To respond to this concern, U.S. scientific agencies have begun the U.S. Global Change Research Program (USGCRP), whose objective is to understand, model, and predict changes in our planet's environment. The predictive models developed by the USGCRP can form a basis for policies to mitigate harmful environmental changes and prevent future problems from developing. A critical element of this program is NASA's Mission to Planet Earth (MPE).

MPE's objective is to collect the data needed for the USGCRP's climate models. The program includes both small satellites (known as Earth Probes) and large Earth Observing System (EOS) satellites, as well as suborbital observation techniques. EOS currently plans for six satellites over 15 years, with two in orbit at any given time, to be launched starting in the late 1990s. In addition to the two U.S. EOS satellites and replacements, the European Space Agency and the Japanese will each launch one environmental monitoring satellite and follow-on replacements.

EOS represents a major commitment of resources over 20 years. It will be the largest scientific program ever undertaken by NASA. EOS is a 1991 new start.

Because of the central role played by EOS in the USGCRP, the National Space Council has begun an in-depth study of the program. The objective of this study is to ensure that EOS and other space-data collection and analysis systems will provide the USGCRP with the most timely and cost-effective support possible. The Space Council tasked the National Research Council to respond to the following questions:

(1) Does EOS collect the environmental parameters that are reflected in the USGCRP research priority framework?

(2) EOS is premised on the assumption that it is essential to collect data on various environmental parameters simultaneously. How important is data simultaneity to the ultimate utility of the data? Can the requirements for simultaneity be applied more narrowly than proposed?

(3) Depending on the outcome on the question of simultaneity, are the EOS platforms, as currently configured, the optimum means for collecting this data, or are there better alternatives that are more cost-effective or timely? These alternatives could include, for example, smaller multiple platforms flying in formation or additional near-term precursor missions that are capable of flying subsets or preliminary versions of EOS instruments.

(4) Does the proposed EOS Data Information System represent the appropriate approach to support the long-term data collection and monitoring effort? (EOS will produce a data flow at least ten times larger than any previous space or ground system).

The National Research Council has provided its input on these questions. The Council endorsed the EOS program, indicating it was responsive to the USGCRP research priorities. The NRC also agreed with the need to collect certain data simultaneously, and supported the requirement for at least one large observing platform. Finally, the Council assessed and endorsed the proposed EOS Data Information System approach. The Committee on Earth and Environmental Science (CEES), a part of the Federal Coordinating Committee on Science, Engineering and Technology (FCCSET), is examining the NRC report on the EOS program in the context of the total USGCRP.

EOS represents a major commitment of resources over 20 years. It will be the largest scientific program ever undertaken.

lead_286_018_all_A1b.pdf

Page 21 of 23

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu

Summary and Conclusion

The National Space Council is evaluating alternative strategies for using space to benefit mankind. Council activities have focused on validating, expanding and articulating the National Space Strategy and extending its guidance to specific opportunities throughout the space community.

Our efforts are guided by several specific principles. First, the United States plans to develop and pursue its opportunities in space. Space exploration and the application of space technologies is as much an imperative for the continued development of the nation as was exploration of the continent by our forefathers. America's future is inevitably and irrevocably linked to our efforts in space. This reality underlies the Council's sense of urgency in approaching its tasks.

Second, one of the greatest strengths of this nation is its ability to meld the efforts of its technological, industrial, academic, and governmental institutions toward a common cause. The Council's policies and plans for space capitalize on this strength by seeking to map a course that harnesses the innovative, creative and analytic prowess of all American institutions. Consequently, the Council treats each goal, each objective, and each initiative as a joint undertaking.

Finally, the Council's actions recognize that what is needed is not leadership in space per se, but leadership in using space to address important human concerns. Space offers unlimited potential for improvement in almost every area of human endeavor; such as in medicine, where microgravity may offer new and undreamed of pharmaceuticals and cures; in industry, where productivity may be increased and made more affordable; and in national security, where space capabilities allow us to verify arms treaty provisions and counter threats to the nation's well-being. Space also offers tremendous potential for new sources of needed materials and clean, unlimited energy.

The excitement and challenge of the space program, both manned and robotic, can be a powerful motivator for young people to enter science, engineering, and technology fields. This was clearly shown during the Apollo moon program, when advanced degrees in these fields rose dramatically in response to the program's investments. The Space Council plans to continue to emphasize education as an integral part of the space program.

The President and Vice President have given America a clear vision of a bright, prosperous future. It is a vision based on the unlimited potential of space to benefit mankind; but one that can be realized only if all Americans commit themselves to U.S. leadership of a global campaign to explore space, understand and appreciate it, and harness it in service to mankind.

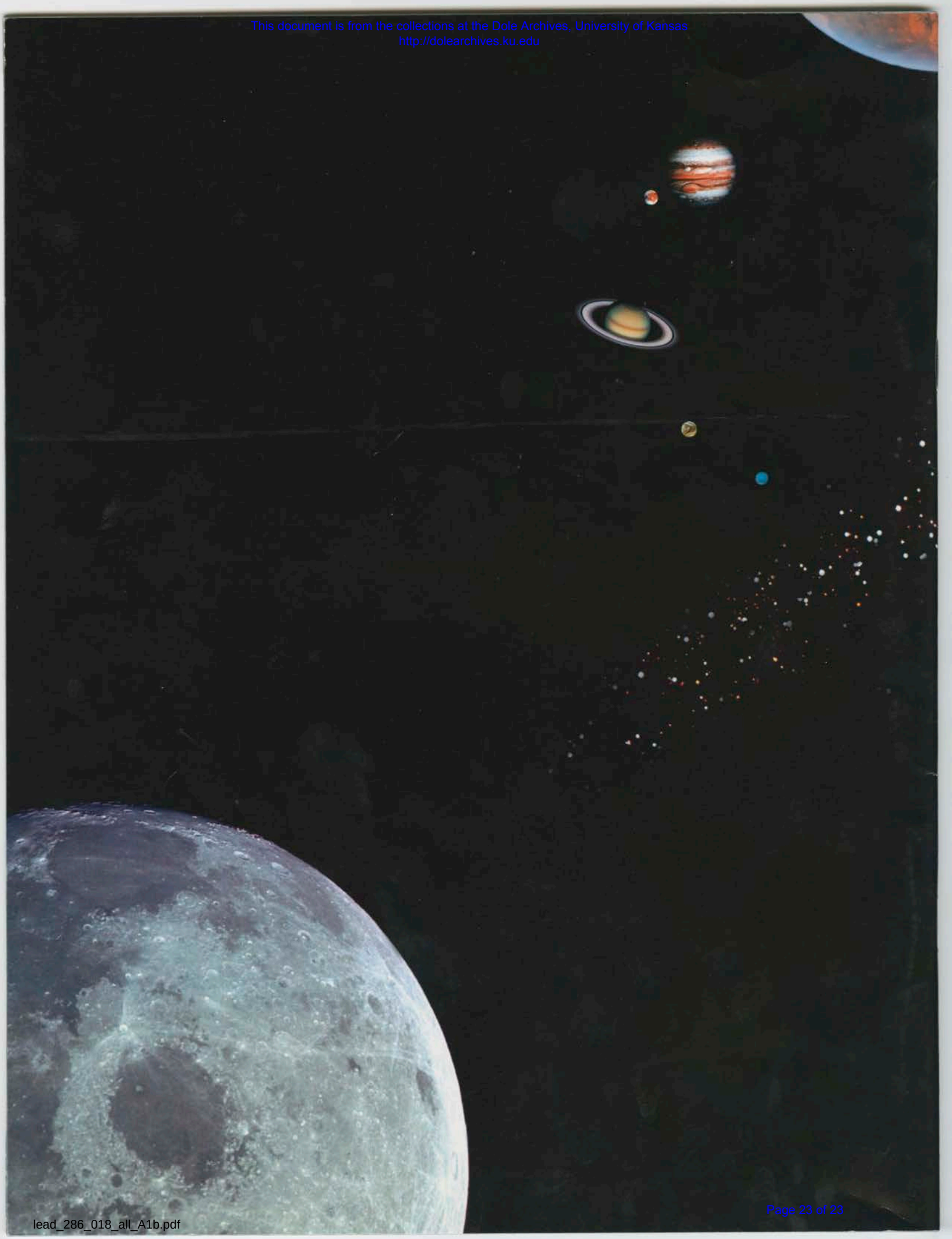
Today, America is faced with tremendous, all-pervasive challenges — in medicine, in energy, in industrial competitiveness, in national security, in the environment, and elsewhere. How well we meet these challenges will determine how we and all citizens of the world live in the future. The real questions that confront us are whether we appreciate their urgency, whether we understand the potential of space in meeting them, and, understanding that potential, whether we as a nation are willing to make the major commitments necessary to engage in the exploration of space with the dedication and seriousness that these challenges demand.

Fortunately, America and the world now have new opportunities to consider and act on these challenges. The relaxation in world tensions and the resulting spirit of cooperation permeating all of Europe, extending even to the Soviet Union, offer unprecedented opportunities for realigning our nation's scientific and technical resources toward space and for achieving true cooperation among nations. Surely now is the time to capitalize on these opportunities.

It is with these thoughts in mind that the National Space Council has undertaken its efforts during the past year. While the Council recognizes the urgent need for increased commitment in space, it also appreciates the unrelenting need to put our national and international space activities on a sound footing once and for all. Only such a foundation can effect an efficient transition from a space effort geared toward research to one that applies the potential of space to solve mankind's problems and assure our nation's future.

To begin the process of establishing that sound footing, the council implemented its charter by setting up a plan that identified four phases: setting broad goals and objectives for America in space, establishing strategies for achieving those goals and objectives, monitoring the implementation of those strategies, and resolving specific program or policy issues.

To undertake these functions we articulated America's space strategy as a set of critical elements for attaining the benefits space offers. In the preceding pages we have defined these major elements and outlined the various investigations we have conducted or are in the process of undertaking. The sole purpose of all our activities is to determine where we are and where we must go to take maximum advantage of the opportunities offered by space exploration and exploitation.

lead_286_018_all_A1b.pdf

This document is from the collections at the Dole Archives, University of Kansas
http://dolearchives.ku.edu