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Space Station

THE JOHNS HOPKINS UNIVERSITY
DEPARTMENT OF PHYSICS
HOMEWOOD CAMPUS
BALTIMORE, MARYLAND 21218

September 22, 1983

President Ronald Reagan
The White House
Washington DC 20550

Dear President Reagan:

I have read with great interest (in Lou Cannon's column) of your intention (I hope it's true!) of coming out strongly in support of NASA's plans for a manned space station. Your reason is said to be political. In my opinion that is the *only* reason for a manned space station, and it is a very important and deeply correct reason.

Your military and scientific (and financial!) advisors are giving you negative reactions to this idea, and from their *narrow* perspective they are correct. But from the wider perspective of the ultimate fate of this nation, your support for a manned space station is 100% the right thing to do. I enclose a brief summary of my reasoning on this which I wrote some time ago; it might interest you.

Yours sincerely,

Dick Henry

Richard C. Henry
Professor of Physics

RCH:jk

Enc.

P.S. no answer, please!.

Blind copy: Jay Keyworth

Henry

THE JOHNS HOPKINS UNIVERSITY
DEPARTMENT OF PHYSICS
HOMEWOOD CAMPUS
BALTIMORE, MARYLAND 21218

BALTIMORE, MD 21
PM
23 SEP
1983

George Keyworth
Director, Office of Science + Technology Policy
The White House
Washington DC 20500

K Take Home Thurs 3 Nov for reading MPF File JK hasseem

United States Senate

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
WASHINGTON, D.C. 20510

October 18, 1983

Dr. Victor H. Reis
Science Applications, Incorporated
1710 Goodridge Drive
McLean, Virginia 22102

Dear Dr. Reis:

The Subcommittee on Science, Technology and Space of the Committee on Commerce, Science and Transportation will conduct a hearing to examine the direction of the development of a civil space station.

Specifically, our Members are interested in your assessment of:

1. the uses of a space station;

2. alternative approaches that would satisfy the requirements of such a space station; and

3. the budgetary impact of a space station development.

The Subcommittee would like to have you testify at 9:00 a.m. on Tuesday, November 15, 1983, in Room SR-253, Russell Senate Office Building, on NASA's activities to develop a space station. Your oral testimony should not exceed 10 minutes. However, a more detailed statement may be submitted for the hearing record.

The Committee requires 75 copies of all statements. Ten of each should be submitted to the Subcommittee in Room SH-427, Hart Senate Building by Wednesday, November 9, 1983. The remaining copies should be brought to the hearing and presented to the Hearing Clerk of the Committee at least 15 minutes before the hearing begins.

If you have any questions regarding this hearing or the content of your testimony, please contact Pete Perkins of the Majority staff at (202) 224-1124, or Steve Flajser of the Minority staff at (202) 224-9351.

Sincerely,

SLADE GORTON
Chairman
Subcommittee on Science,
Technology, and Space

SG:ppj

Testimony to the Subcommittee on Science, Technology and Space
of the Committee on Commerce, Science and Transportation
United States Senate

Victor H. Reis

November 15, 1983

Mr. Chairman, there is no question that the decision on the space station will set the direction of our civil space program and our civilian space agency, NASA, for years to come. Because of its' importance, this decision should not be made without thorough investigation and debate. Thus, I applaud this hearing and greatly appreciate the opportunity to express my views.

The questions you asked in your invitation are simple and straightforward. What are the uses of a space station? Are there other ways to do the job; and what are the budgetary impacts? Beneath these questions, however, lies the more fundamental issues of what the U.S. civil space program is all about and what we expect from our space agency. I'll answer the easy ones first.

NASA's current long term concept for the space station includes a permanently manned station, a man-tended platform and associated free flying - but visitable - satellites. Appropriate constellations of platforms would be placed in both twenty eight-degree and polar orbits. The permanent manned station would be but the first major structure in this far-reaching space architecture, but in considering capabilities,

I believe you should consider the long range plan and not just the first step. If we assume the long range plan is successfully carried out, all the near earth missions - science, applications, technology, servicing, etc., can be done - and done well - under the space station umbrella.

On the other hand, with one exception, each and everyone of the missions can also be done - and done well - by a judicious combination of shuttle orbitors and satellites, if we extend the mission duration of the orbitors. (The one exception, of course, is in understanding on the effects of long time in space on human beings).

Further, it is my judgement that a program of orbitors and satellites would cost less - perhaps considerably less - than the equivalent space station program. I believe this is so because of two reasons. First the requirements for the wide variety of space missions are often so different that the potential savings from sharing platforms will often be more than wiped out by the additional cost of making them work on the same platform; and second, sharing space with human beings is always costly. Thus, whatever the budget for the space station - your third question -there is likely to be a lower budget that could get much the same space job done.

What it then boils down to is this: if you can do basically the same space station job with satellites and shuttle orbitors at a lower cost, are there any arguments for going ahead with the space station?

There is one. And if it is neither technical nor economic, it is a powerful argument nonetheless. It gets back to the fundamental question of what we as a nation want from our civil space program and from NASA.

Today's NASA was in large part put together to do the macroengineering project Apollo, the manned mission to the moon. Apollo was not a scientific experiment and it was not undertaken for economic return. It was a statement of national will in an era of intense international political competition. And it was successful - historically successful. NASA remains much the same organization today as in the days of Apollo. It is organized and staffed to carry out large, complex manned space macroengineering projects. The space station is just such a project and there is no other that fits the NASA mold quite so well. In short, the space station project will provide NASA the central focus and scale that it is organized to do.

The space station is not Apollo and cannot, in and of itself, yield the same historic impact and degree of political and psychic return. But it certainly will provide some, perhaps a lot, of these real but intangible benefits and it will retain for NASA a continued large measure of national and international political importance. On the other hand, rejection of the space station at this time will by no means be the end of NASA or our civilian space program, but it would certainly lead to a different NASA, one much removed from the legacy of Apollo and one, most likely with a lower political content.

To my way of thinking, Mr. Chairman, this is the fundamental issue of the space station decision: Is the additional cost of the space station worth maintaining NASA as a politically potent organization, one which can provide the nation with the potential for significant political and social benefit.

That is not an easy question to answer and it has far more to do with judgement - political judgement - than it does with technology or economics. NASA is an organization with a critical operational responsibility for our total national space program. The National Space Policy gave NASA more--not less--responsibility. And this responsibility is a heavy one; in science, in applications, in commercializaton and particularly in the maintenance of our national launch capability. Given these responsibilities, it is my personal judgment that the space station development and its concomitant high profile NASA is the right thing to do, if - and only if - it is not done at the expense of these other NASA missions and responsibilities.

If you give NASA the go ahead to the space station, then you must be prepared at the same time to provide NASA with the additional resources--funds and talent--to move down this path. If you don't provide the wherewithal then you run a serious risk of causing irrepairable harm to the national space program and to NASA.

The space program - and NASA - are in fact at a crossroads and what we decide to do about the space station - and how we decide to do it - will firmly and inevitably set the direction for the nation's future in space.

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release October 19, 1983

REMARKS OF THE PRESIDENT
AT NASA 25TH ANNIVERSARY CELEBRATION

Air and Space Museum

1:16 P.M. EDT

THE PRESIDENT: Thank you very much. Administrator Beggs, shuttle astronauts, NASA employees, ladies and gentlemen, thank you. I just said here a moment ago that music should have been being played first for all of them.

I had a joke about a sneak preview of "Bedtime for Bonzo," but I -- (laughter) -- I don't tell it.

Mr. Beggs, I think you have a hit here.

Well, it does remind me of a story and I have to have something to start with. It was about a -- It's a true story, I understand, about a newspaper photographer out of a -- out in Los Angeles. He's called in by his editor and told of a fire that was raging out there in Palos Verdes. That's a hilly area south of Los Angeles, a lovely residential area. His assignment was to rush down to a small airport, board a waiting plane, get some pictures of the fire and be back in time for the afternoon edition.

Well, he raced down the freeway. He broke the law all the way. He got to the airport and drove his car to the end of the runway. And sure enough, there was a plane waiting with the engines all there reved up, ready to go. He got aboard and at about 5,000 feet, he began getting his camera out of the bag, told his -- the fellow flying the plane to get him over the fire so he could get his pictures and get back to the paper. And from the other side of the cockpit there was a deafening silence. And then he heard these words: "Aren't you the instructor?" (Laughter.)

I don't know. There must sometime have been some moments like that in what we've just seen.

Well, today we celebrate a 25th birthday. If it were the birthday of an individual, we would be marking an important milestone. At 25 a person begins to enter the most productive part of life, a time for which everything else has been just preparation for great achievements ahead.

And today this is also true for the National Aeronautics and Space Administration. NASA has accomplished so much. But on its 25th birthday, we celebrate our potential as well as our accomplishments.

Being here in the Air and Space Museum is a fitting environment for this commemoration. It offers us a perspective on how far we've come and should also help us catch a glimpse of the incredible possibilities that await us in the years ahead.

For 25 years NASA has been the focal point for an activity that is fundamental to the American character: Blazing the trail to an exciting new frontier.

Historically, we've always been a people willing to take risks and dream great dreams. We weren't the people who stayed on the shores of the Old World. Instead, we were the Italians, the Frenchmen, the Dutchmen, the men and women of every race, nationality, and religion who came here to push back the limits and in the process become Americans one and all.

A little over 200 years ago we embarked on the greatest experiment in human history with the founding of the first modern democracy. All of what we've accomplished can be traced to the energy, creativity that is unleashed when the human spirit is free. Americans have proven that there's no mountain too high, forest too thick, desert so vast, or problem so perplexing that it can serve as a barrier to the progress of free men and women.

Our forefathers and mothers spread across this continent. When they reached the western shore they didn't stop. Early in this century we built the Panama Canal and expanded the frontier of American commerce. Today that same spirit, the American spirit, is alive and well. There's no better example of it than that which is found in NASA.

It was 25 years ago when a 31-pound, cylinder-shaped satellite was launched -- Explorer One, the first American satellite. And later that year, NASA was formed to oversee our space efforts: to insure our leadership in aerospace science, to enhance cooperation with other nations in the peaceful application of space technology, to expand human knowledge of the atmosphere and space, and to puruse the practical benefits gained from these activities in order to improve the lot of mankind. Men and women of NASA: Well done.

Your accomplishments in these two and a half decades have already served your country and the people of this planet well. Today, we're reaping the returns that we've realized from our investment in space. And let me add, when the figures are put together we're not only getting our money's worth, our commitment to space has been one of the best investments we've ever made as a nation. (Applause.)

Communications satellites allow us cheaper and easier long-distance phone calls and live, worldwide television overseas -- and coverage worldwide. The value to our country created by this leap in communications is astronomical. Similarly, weather satellites are now a part of our daily routine. Countless lives are saved and property protected when weather emergencies are charted more accurately than ever before imagined. Navigation, search and rescue, and other such activities in the air and on the sea are aided by services that you've implanted in near space.

Through satellite "remote-sensing," we can find the location of new resources and better manage those we're already using. At one time, the only thing people could think of as a spinoff of our space effort was teflon pans. (Laughter.) In an era of "high tech," all of us are now aware of what the technological advances we've made mean to our way of life. Computers and electronics are now indispensible to American economic progress and well-being.

And how does one put a dollar value on world peace? Certainly, space technology has contributed enormously here as well. Our eyes-in-the-sky make us all a little safer. In the vital areas of arms control, it's opened new avenues to approach the issue of verification. These are all achievements to one degree or another that can be related to our commitment to exploring and utilizing space for the benefit of mankind.

Yet, there is something which I would like to add to the list, something that can never be taken for granted in a society as free and richly diverse as ours. We have holidays when we celebrate our freedom. But most of the time, we're on our own as independent individuals. And that is, after all, what American liberty is all about. But there are moments that bind us together, moments of sadness and happiness that make us more than a conglomeration of people living in proximity to each other. The death of President John F. Kennedy was one such moment. The sight of an American P.O.W. stepping off a plane in the Philippines after years of captivity, saluting the flag and hearing him proclaim, "God bless America," was another.

These experiences -- moments of unity -- build our national soul and character. Perhaps, NASA's greatest gifts have been the moments of greatness that you've allowed all of us to share. All of us, whether we were school teachers, actors, government employees, farmers, factory hands,

secretaries, or the cop on the beat, all of us were along on those early Mercury Missions. We were part of the NASA team launching probes into deep space to chart the unknown, to photograph the rings of Saturn and the surface of Mars. We were there and our hearts were filled with such pride when Neil Armstrong, an American, the first person to set foot on the moon, said, "One small step for man one giant leap for mankind." And we saluted right along with him when he planted Old Glory in the lunar soil.

NASA's done so much to galvanize our spirit as a people, to reassure us of our greatness and of our potential. In recent days the Space Shuttle has, as another NASA project before it -- or other projects before it, captured our hearts and imaginations. Modern day heroes like Sally Ride, Guy Bluford are emerging and inspiring new faith in our system and new hope for the future. I was honored a year ago to be on hand to welcome the Space Shuttle Columbia when it returned from its mission and landed in the California desert on Independence Day. That was a day I and millions of other Americans will never forget.

I have to just tell you: One moment there in which with all the science and all the things that we can be told about and see, one simple sentence to me in answer to a question of mine seemed to bring all the wonder of it. How many times in the airplane you've known when you're on the approach path and the airport is up there someplace ahead? And they hurried us up on the platform because they said it was time to get up there; the Shuttle was coming in. And they said it was on its approach. And I said, "Just where is it?" And they said, "Just over Honolulu." (Laughter.) The whole miracle was brought home to me right then.

The Space Shuttle, like your many other accomplishments, didn't just happen. It's the result of hard work and a vision of the future. The short-sighted were unable to understand. In fact, some individuals who would lead America today, led the fight against the Space Shuttle system a decade ago. What you've proven with the success of this new transportation system is that there's never a time when we can stop moving forward, when we can stop dreaming.

MORE

Right now we're putting together a National Space Strategy that will establish our priorities, guide and inspire our efforts in space for the next 25 years and beyond. It will embrace all three sectors of our space program -- civil, commercial and national security. The strategy should flow from the National Space Policy that I announced July 4th last year.

We're not just concerned about the next logical step in space. We're planning an entire road, a "High Road" if you will, that will provide us a vision of limitless hope and opportunity, that will spotlight the incredible potential waiting to be used for the betterment of humankind.

On this 25th anniversary, I would challenge you at NASA and the rest of America's space community: Let us aim for goals that will carry us well into the next century. Let us demonstrate to friends and adversaries alike that America's mission in space will be a quest for mankind's highest aspiration: opportunity for individuals, cooperation among nations and peace on Earth.

Your imagination and your ability to project into the future will open up new horizons and push back boundaries that limit our goals on this planet. The goals you set and your success in achieving them will have much to do with our children's prosperity and safety and will determine if America remains the great nation it is intended to be. Don't be afraid to remind the rest of us that once in a while being a leader in space is a very wonderful accomplishment. It has given us the where-with-all to share with others the fruits of our adventure. The American people know this and support it. And let's continue to ensure that this program belongs to the people. Our strategy must demonstrate to them that through challenging the unknown, and having the courage to aim high, their own hopes, dreams and aspirations will be fulfilled.

There are those who preach the doctrine of limited resources. They pessimistically suggest that we're on the way to depleting all of what we have and that slowly the condition of humankind will deteriorate into a Malthusian catastrophe.

This pessimism cuts across the grain of the American character. Our history has been not of accepting what is but striving and working with our sweat and our minds to create something better. By inventing and putting to use machines, we've improved our productivity and created enormous new wealth. By discovering medicines, we live longer. By improving our agriculture -- with a big help from industry and science -- our nutrition is improving.

In my lifetime, aviation has gone from those barnstorming pilots who landed their biplanes in pastures and took passengers aloft for 10 minutes at $10, to a massive industry that contributes so much to our national prosperity and way of life.

By the time a young person born in the same year as NASA reaches my age, our way of life may be as much tied to space as it is today tied to aviation. Private companies are already beginning to look to space. In this regard, the Space Shuttle Program could well be compared to the first transcontinental railroad. And when profit motive starts into play, hold on to your hats, the world is going to see what entrepreneurial genius is all about and what it means to see *America get going*.

The first 25 years of NASA opened a new era. Let us all rededicate ourselves today that NASA's next 25 years will ensure that this new chapter in history will be an American era.

I thank you for having me with you today. God bless you. And I understand that I'm to make the first slice in that cake. And if it will just emphasize how far we've come -- I remember when I was in the military as a reserve officer and we cut the cake with a cavalry saber. (Laughter.) (Applause.)

END 1:32 P.M. EDT

President Reagan on "What is a bold step?"

[Each numbered paragraph refers to a like-numbered, highlighted quote in the attached copy of President Reagan's October 19th speech.]

1) Is just a space station a worthy "bold goal" of a people who have taken risks and dreamed great dreams?

2) If our commitment to space has really been so good an investment, i.e. it's been really good seed corn, then why don't we invest as much as we can, i.e. plant as much seed as we can tend, rather than continue our timid investing/planting schedule?

3) Space is fundamental to "building our national soul and character", but how does building a mere space station, something even the Soviets have accomplished, do that?

4) If you're aiming for goals to carry you "well into the next century", then you don't fixate on a first step that's over by 1991... by NASA's own timetable. Period.

5) Again, this is cut and dried. Which goals we set our sights on will largely determine our future. Since we would never underestimate how great a nation we want to be, why underestimate the space goals that will help us get there?

6) A "space strategy" that's dominated by the first tactical step doesn't demonstrate "challenging the unknown" or "the courage to aim high", so it won't inspire the American people.

7) Does Beggs mean to say that just a space station and the cautious expansion of space "infrastructure" is a sufficient 25-year plan to "ensure that this new chapter ... will be an American era"?

NASA's input to the NSC's Space Strategy Study

THE U.S. CIVIL SPACE PROGRAM

Policy and Priorities

The President's National Space Policy reaffirms the national commitment to the exploration and exploitation of space in support of our national well-being. It establishes basic goals which are relevant to the civil space program and therefore guide NASA. These goals indicate that the U.S. civil space program will:

-- maintain U.S. space leadership;

-- obtain economic and scientific benefits through the exploitation of space;

-- expand U.S. private sector investment and involvement in civil space and space-related activities;

-- promote international cooperative activities in the national interest.

NASA believes that implementing the National Space Policy requires American preeminence in three priority areas of space activity: Manned Space Flight (including the Space Transportation System and a Space Station), Science and Applications, and Technology Development.

Space science is an intellectually rigorous activity. It seeks answers to questions mankind has asked since the beginning of time: for example, what is the origin and evolution of our solar system, and what is the nature of the universe? The Space Telescope and our planetary probes illustrate the space programs which contribute to our scientific understanding. Applications is the set of programs devoted to providing benefits of space systems directly to people here on Earth. Satellites for communications, weather forecasting and land remote sensing are examples of applications programs. Space technology is the foundation for the nation's program in space, both civil and military. It is undertaken in an atmosphere of partnership between government and industry, enabling sophisticated space systems to be conceived, built, operated and replaced with something better.

Manned space flight utilizes the unique capabilities of man in space. His ability to think and to adapt, and his skill at pattern recognition are unmatched by the machine. But the value of men in orbit extends beyond capability, for it is the human aspect of space flight that has captured the world's imagination. No better proof of this exists than the contrast between Apollo 16 and Luna 16, two missions to the moon. Both brought lunar samples back to earth. Both took place early in the 1970's. Both were successful. But one was manned and one

was not. The former, an American expedition of astronauts to the lunar highlands, captured the attention of the world while the latter, a Russian robotic sampler, made no impact other than on the surface of the Moon.

The Space Transportation System is the primary launch system for both national security and civil government missions, and thus it is NASA's highest priority to make the Space Shuttle fully operational and cost-effective. At the same time, NASA is convinced that the development of a permanently manned Space Station is the next logical step for the civil space program, that it is necessary to maintain U.S. leadership in space, and that it is the bridge from today's civil space capabilities to essentially all that lies ahead in space. NASA also believes that a Space Station will best satisfy many of the other goals of the National Space Policy. In particular, a Space Station would greatly enhance the opportunity for U.S. commercial entry into endeavors which exploit the unique characteristics of space.

NASA believes that the U.S. should undertake a Space Station as part of the nation's civil space program at any NASA budget level. However, to conduct the Space Station program effectively and to utilize the Space Station to its fullest, the level and pace of total NASA funding should be sufficient to maintain focused and vigorous efforts in all areas of the civil space program, in particular in the other priority areas of Science and Applications and Technology Development. In this context, it is important to make the historical note that NASA's budget, at its peak in the mid-1960's, exceeded $20 billion per year in today's dollars. After the Apollo program, NASA's budget sharpy declined and has remained relatively constant since the mid 1970's. Within this constant budget, NASA developed and is making the Space Shuttle operational. At the same time that expenditures for the civil space program have been dropping, expenditures for the national security space program have been rising -- and, in fact, have exceeded civil space expenditures since FY 1982. While this growth in national security programs is critical and inevitable, it is important that these programs not be conducted at the expense of the civil program.

The Future: The President has recently announced that the National Space Strategy will embrace all sectors -- civil, commercial and national security -- and will map out a path, a High Road, to capture the great potential of space for the betterment of mankind. NASA believes that a Space Station is required if we are to pursue this ambitious strategy. Today we have identified many promising commercial and scientific missions which would be conducted with continuous manned presence in space. Looking beyond the 1990's, NASA sees many options that may prove to be the logical and compelling steps beyond a Space Station. For example, the nation may wish

NASA clearly does not have a long-range plan for the Space Station!

further exploration and exploitation such as a manned mission to Mars, settlement of the Moon, or even harvesting precious resources from asteroids. The Space Station is the stepping stone. Without a commitment to this next step, we will not have the capability to expand our program in the visionary manner demanded by the High Road.

Manned Space Flight

Space Transportation System: The President's National Space Policy commits NASA to maintain world leadership in space flight cabability with a Space Transportation System (STS) able to meet appropriate national needs. Toward this goal, a strong, responsive, reliable, and cost-effective STS operation must be maintained. In fact, NASA's highest priority is to make the STS fully operational and cost-effective in providing routine access to space -- as indicated in the National Space Policy. This translates into adequate preparedness for the anticipated increase in demand on the STS from U.S. and foreign users and in the commensurate focusing of activities in the immediate future on the specific objectives of completing STS development, making each mission safe and successful, maintaining an operational launch schedule, reducing operational costs, and exploiting the inherent capabilities of the STS.

The current STS fleet of four orbiters is capable of satisfying the nearer-term flight manifest. In order to maintain Space Shuttle Orbiter production capability and also to assure that Shuttle operations will continue in the face of minor problems, modifications or other periods of extended orbiter outages, the President has decided that the production of structural and component spares will continue. Should optimistic estimates of demand for Space Shuttle flights materialize and other conditions dictate, a future decision could be made to procure a fifth Shuttle orbiter. At the same time, NASA needs to plan for upgrades to R&D equipment and ground facilities to permit an increase in flight rate above 24 flights per year.

The National Space Policy makes clear that the STS is the primary space launch system for all national security and civil government missions. As the nation's Expendable Launch Vehicle programs are phased out, however, concerns have been expressed regarding assured launch capability, particularly in the event of some catastrophe in the Shuttle program or in times of crisis and conflict. The answer to these concerns lies within the STS. The Shuttle Solid Rocket Booster has the inherent capability to permit the timely development of unmanned Shuttle-derived launch vehicles. Such launch vehicles could provide performance levels to satisfy national requirments, could allow greater launch site flexibility, and could present cost- effective replacements for today's Deltas, Atlases and

Titans. Furthermore, this approach to providing assured launch capability is fully supportive of the President's commitment to the STS.

In order to maintain leadership in space, the U.S. must also be able to operate permanently and routinely -- that is, safely, successfully, on schedule, and economically -- in Earth orbits at low and geosynchronous altitudes and between orbits. This mandates the development of a permanent Space Station as a service center/transportation node in low Earth orbit as well as certain augmentations for the STS, such as orbital maneuvering and transfer vehicles, satellite services and crew/habitability systems, and tethered and free-flying unmanned platforms. These will enhance capabilities to support science, technology, commercial and operations activities; provide routine, economical and flexible access to all orbits; institute routine checkout, refueling, repairing and upgrading of spacecraft in orbit; capitalize on the STS as a space R&D test bed; and devise innovative STS uses and missions to reap the full benefit of the STS investment.

Space Station: There are critical reasons why a Space Station program can and should be started now. The Space Transportation System is approaching operational maturity and offers a unique and reliable means of achieving routine access to space. Also, the investment in technology will enable us to substantially benefit in the areas of productivity, economic return and international competitition. A Space Station will allow us to exploit fully the comercial potential of space. A Space Station would enable a field of new commercial activity --materials processing. A permanent facility would allow far greater flexibility and efficiency in the manufacturing, resupply, servicing, and return to earth of processed materials. Significant private capital already has been invested in initial materials space research. McDonnell Douglas is using the Space Shuttle to demonstrate the technical feasibility of biological separations research. A Space Station would boost such activity beyond the current preliminary stages by enabling venture capital to be risked for permanent space-based activity. A civil Space Station could also serve as a technology laboratory for national security needs.

The initial Space Station to be launched in the 1991 time frame would consist of a modular cluster in a low inclination orbit and would house a crew of 6-8 people. In addition to a living quarters module, the cluster would have a utility module to provide electrical power, thermal control, data processing and attitude control. It would also have a berthing and assembly module to allow tending by the Space Shuttle for crew rotation and resupply at 3-6 month intervals.

The work of the Space Station would be conducted in attached

operations modules and on associated unmanned platforms derived from Space Station elements. The operations modules would support scientific research and technology development requiring extensive human interaction; the co-orbiting and polar unmanned platforms would provide changeable payload accommodations for activities requiring minimum disturbance. During the 1990's the Space Station could evolve into an ever more capable system including several more platforms and space-based orbit transfer vehicles.

If the President approves the program, current plans are to intiate an extensive definition activity in FY 1985 and 1986 leading to the commencement of hardware development in FY 1987 with initial launch in 1991. NASA estimates that the cost of the definition and development activities through 1991 would be approximately $8.0 billion (1984 $).

Delaying the initiation of a Space Station would result in significant increases in the cost of operations as Space Shuttle missions became longer and more complex. Although it is possible to extend the capability of the Shuttle to a 20-30 day stay-time, the costs would be significant and the effectiveness considerably less than possible with a Space Station. One of the unique benefits of a Space Station is that of having a continuous human presence able routinely to operate, service and adjust payloads as mission needs dictate. This benefits of this characteristic are difficult to quantify but would clearly reduce the cost of building and operating spacecraft compared to today's technically restrictive and expensive environment.

Space Science and Applications

A healthy and diverse Space Science and Applications program is an essential part of achieving the goals established by the President's National Space Policy. Space Science and Applications activities are especially critical to obtaining scientific and economic benefits from space and to promoting a wide range of international cooperative efforts in space. These activities also provide highly visible and publicly exciting demonstrations of America's leadership in space, particularly in such areas as planetary exploration, communications, and remote sensing of the Earth from space.

Space Science and Applications achievements of the past 25 years have effectively supported the goals in the President's National Space Policy as well as those in the original National Aeronautics and Space Act. These activities have produced a scientific revolution in our knowledge of the Earth, its planetary neighbors, its environment in space, and the universe beyond it. Astonishing progress has been made in solving major scientific questions -- the nature of other planets, the operation of the Earth's dynamic weather and ocean systems, the nature and origin of the distant universe, the origin of life, and the adaptability of humans to the space environment. Many of these activities, such as the Viking landings on Mars and

the Voyager flybys of Jupiter and Saturn, have generated tremendous public interest and have visibly demonstrated America's leadership in space to the entire world.

At the same time, there have been similar breakthroughs in the use of space for technical and economic purposes -- communications, remote sensing of the Earth, processing of materials in space, and the planning and development of techniques to use the new capabilities of the Space Transportation System and the Space Station.

Despite the leadership position established in Space Science and Applications during the past 25 years, many challenges, both scientific and technological, are still to be met -- including new and unanswered scientific questions, problems of long-term human habitability in space, and the development of new technology for future scientific and applications needs. Further, our leadership position is now being seriously challenged, not only by the complexity of current scientific and technical problems but also by the expanding space activities of other nations, especially in such areas as planetary exploration, communications, remote sensing of the Earth, and long-term human operations is space.

In order to maintain our current leadership, to achieve the goals set by the National Space Policy, and to support future major national initiatives in space, our highest priority is to establish and maintain an active, diverse, balanced, and stable program of science and applications activities -- new missions, ground-based research, and new technology development.

As essential parts of developing such a long-term program to support the National Space Science Policy, NASA's immediate priorities include: re-establishment of a stable, active program of planetary exploration; development of a systematic program of Earth observations, including new missions: design and fabrication of instruments and experiments for use on the Space Transportation System and on the Space Station; establishment of long life orbiting observatories for astronomy; collection of critical biomedical data relative to long-term human residence in space; development of critical technology needed for the next generation of communications satellites; and the expansion of activities related to materials processing space.

Technology Development

Responsive to the National Space Policy, the NASA advanced technology program will provide the nation with a long-term leadership posture in technology development that will effectively serve commercial and civil space users, satisfy both the short and long-range goals of Space Station and its supporting infrastructure, and provide enabling technology to serve U.S. space exploration.

The commercial communications satellite industry will be provided with technology advances supporting development of large deployable antennas and reflectors, efficient linear amplifiers and low-noise receivers, and improved spacecraft capability and serviceability through subsystem integration.

Space Station technology options will be expanded by providing growth-adaptive capabilities such as an interconnected network of advanced data and communications; high-voltage power systems and associated thermal dissipation techniques; technology for the extension and enhancement of human capability, including closed loop-life support for long duration spaceflight; and autonomous operation of Space Station subsystems and payloads. Technology advances will enable a reusable, space-based Orbital Transfer Vehicle, staging base activities, and extended Shuttle engine life and durability.

Remote sensing capability for earth resources, astrophysical, and planetary observation missions will be enhanced significantly through advances in multi-spectral systems, precision pointing, and on-board information processing techniques.

A vitally needed space flight research program to explore and validate advanced technologies, including dynamics and control of large space structures, cryogenic fluid management, power and thermal management, and space environment contamination effects, will be conducted in the unique space environment using the Shuttle and, later, on the Space Station and its associated platform elements.

Development and validation of high-leverage technologies will reduce the implementation risk of advanced technology for commercial and civil applications, thereby increasing the nation's progress in space, and will significantly enhance our international competitive position through more effective utilization of space for commercial and scientific purposes.

Supporting Efforts

Tracking and Data Acquisition: The strategy for maintaining vital communication links with space missions requires an augmented network and data facilities, and the initiation and development of the next generation telecommunications data relay satellite network. These developments would be initiated to support the full set of missions requiring tracking and data service including continuous communications for the Space Station. The new service would provide higher capacity, dedicated communications links simultaneously to a larger number of NASA missions requiring full time service in the 1990's. It would also provide direct beams to data processing and mission control centers located in the Continental U.S.

International Aspects of NASA Programs: For 25 years, NASA has been conducting successful international cooperative programs. Over a thousand cooperative projects ranging from joint development programs to data exchanges have been conducted with more than 100 nations. Congress mandated these activities in 1958, and the principle of international cooperation in space was endorsed in the President's National Space Policy.

International cooperation in space has demonstrably benefitted the U.S. Cooperation has shown the world that our national intentions in space are peaceful. Meaningful participation by our friends and allies in our programs creates an image of openness which very effectively counters attempts by the Soviets and others to cast suspicion on our space activities. International cooperation has historically proven to help the U.S. obtain international acceptance of U.S. space programs. Widespread support for programs such as remote sensing has developed over the years, despite early strong objections, because of the availability of the program to all nations. This general acceptance of U.S. activity in space has served to protect our freedom of action for all our desired routine uses of space, including civil, military and commercial uses. In addition, cooperation has helped to enhance and maintain close ties with our friends and allies.

International cooperation in space has provided more concrete benefits for the U.S., as well. Through these activities, the U.S. gains access to foreign resources. Sharing the cost of space activities either reduces the cost to the U.S. or allows the U.S. to do more. Cooperation also allows the U.S. access to foreign locations, such as the tracking stations NASA established around the world to communicate with its spacecraft, and more recently, contingency landing sites for the Space Shuttle. Through cooperative projects, the United States gains access to foreign scientific and technological expertise. Many countries now have large, sophisticated space programs and mature space capabilities from which the United States can benefit.

Most importantly, cooperation couples foreign space programs to the United States space program. Since other nations' expenditures for space programs are finite, funds used for cooperative programs with the United States are therefore not available for other space activities. Thus, cooperation can have the effect of diverting resources from potentially competing programs.

Space Commercialization

One of NASA's major goals is to expand opportunities for U.S. private sector involvement in civil space and space-related activities. When NASA was created twenty-five years ago, what are now our commercial space industries were not yet a gleam in anyone's eye. Since that time, entire new industries have been created by virtue of NASA's space research and development; the

space communications industry being a prime example. As NASA enters its next twenty-five years, industry's interest in commercial space activities continues to grow as new opportunities having commercialization potential become more evident. Areas for possible commercialization currently under discussion with industry include, for example, space production of disease-curing products, formation of extremely efficient crystals in space, and expendible launch vehicles and service activities in connection with the Shuttle, such as the preparation of payloads.

A high-level NASA Task Force is developing a NASA Commerical Space Policy and long-term plan designed to facilitate and accelerate the commercialization of space. This policy will incorporate specific incentives to help stimulate private investment in space ventures, as long as they are in the public interest and are consistent with national security concerns, treaties, and international agreements.

The policy being developed will be designed to effectively apply NASA's resources to help preserve the role of the U.S. as a leader in space science and technology, and their applications. NASA's support of commercial space ventures will be designed to reduce, to levels competitive with other investment opportunties, the institutional, technical, and financial risks which inhibit investment in space.

To reduce institutional risks, NASA is considering initiatives which:

- Accelerate decisions regarding potential NASA/private sector commercial space endeavor agreements.
- Integrate and process "normal" experimental, high-tech commercial payloads onto the Shuttle in less than 6 months.
- Solicit and encourage private sector development of space infrastructure hardware and services with private sector capital as an alternative to government procurement with government funds (possible exception: paramount public importance hardware.)
- Establish new institutional mechanisms to stimulate space commerical ventures by the non-aeropace, as well as the aerospace, community.
- Encourage the use of the NASA patent pool and the protection of private investor proprietary rights

To reduce technical risks, NASA is considering initiatives which:

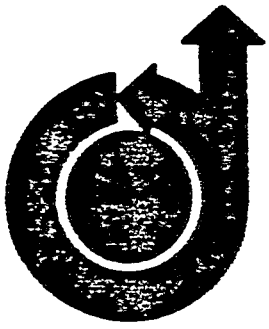
- Support additional research aimed at commercial application opportunities.

- o Systemize easy access to experimental facilities.
- o Establish a base of experimental data to expand dissemination of space technology information of potential commercial applications interest.
- o Support the commercial development of space facilities that will facilitate additional commercial space endeavors.

To reduce financial risks, NASA is considering initiatives which:

- o Continue to offer reduced rate transportation for high-tech, high pay-off commercial space products through demonstration of production feasibility.
- o Provide partial market assurances during the formative stages of new space businesses if the Government has a need for the product or service. The Government market assurances will leave significant private sector capital at risk.
- o Provide some form of exclusivity for new high-tech commerical space ventures.
- o Assist commercial space ventures in integrating their equipment with the Shuttle.

NASA is moving vigorously to expand private sector involvement and investment in space in a manner that will help maintain U.S. space leadership and bring significant benefits to the citizens of our Nation.



AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS
LOS ANGELES SECTION

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Los Angeles, California 90045
(213) 670-0684

November 3, 1983

Mr. Norman Augustine
President, Martin Marietta Denver Aerospace
P. O. Box 179, Mail No. 1000
Denver, CO 80201

Dear Norm:

The attached manifesto was drafted in response to an initiative from Dr. Buzz Aldrin. He is assembling key people under the leadership of Dr. George Mueller, to express support for President Reagan's call for a more imaginative space program.

Dr. Mueller is seeking a broad-based consensus, including former NASA administrators and center directors, leading space supportive organizations and possibly, many former astronauts.

The Executive Council of the Los Angeles Section endorsed the text of the manifesto and requested that I forward it to you.

We feel that the time is right to make such a commitment and request that if you concur, you forward it to the Board for the earliest possible endorsement by the AIAA.

Following such endorsement, Dr. Mueller should be notified, so that AIAA may be added to the list of signatory organizations.

Sincerely,

Bill Haynes

William E. Haynes
Vice Chairman, Public Affairs
Los Angeles Section, AIAA

cc: Jean Davis, Director Region VI
Alan Lovelace, V.P. Public Policy
Paul Fisher, V.P. Member Services

At the invitation of Buzz Aldrin, six people met with him in the board room of Systems Development Corporation.

The Hon. Robert Dornan attended as a former Congressman and representing the Political Action Committee of the High Frontier Project initiated by General Danny Graham.

Dr. Louis Friedman was present as Executive Secretary of the Planetary Society.

Mr. Robert Salkeld, the host, is a leading member of the SDC technical staff.

Bill Haynes participated as Vice Chairman, Public Affairs of the Los Angeles Section, AIAA.

Jim Ransom will report back to the L-5 Society on results of the meeting.

David Criswell flew up from San Diego to provide representation from the California Space Institute.

Buzz initiated the discussion by stating the case for ~~unifying the efforts of all the~~ a consensus statement supported by various space advocacy groups. He gave the example of Queen Isabella of Spain who is remembered for pawning her jewels in order to finance Columbus' voyages, and said there are many modern counterparts who would be equally willing to contribute to the space effort in order to be participants in history.

In the discussion that followed, all of us tended to defend individual viewpoints and emphasize differences instead of seeking out our areas of agreement. Lou Friedman was adamant in expressing his dislike of military space activities and Bob Dornan was eloquent in his defense of the use of space to protect our freedom.

The futility of that agrument was recognized and replaced by discussion of the need for an open-ended commitment to space exploration and use. The Apollo program, significant as it was, was dead-ended. The space station, if it is an end in iteself, would be equally limited.

Lou Friedman felt we can't issue a statement that says everything about going into space is good.

He expressed his opinion that the most fundamental questions before us is whether humans can and should function off the earth permanently.

Bob Salkeld said the Soviets are committed to establishing a human permanent human exploration and presence ~~off~~ beyond the Earth.

While the desireability of international participation in this initiative was acknowledged, Buzz expressed the fear that if we waited for that, "John Hodge will have his space station."

While the importance of Office of Technology Assessment support was also acknowledged, Jim Ransom recalled that OTA support didn't do much to help space industrialization.

Bob Salkeld reported that a space station is viewed in some quarters as a NASA "WPA program" and Lou responded "as is the Shuttle", going on to say that the Shuttle can cause some potentially near-term projects to be delayed until the 1990's.

Dave Criswell suggested that a Lunar base could produce propellants and thereby could recoup lost time in the long run.

Jim Ransom focused attention on the broad technical capabilities which will be developed as an out-growth of the space based defense initiative now being implemented; that it will lead to the development of all of the things we want, if it is properly cultivated.

Buzz asked Lou what we could do to get Carl Sagan's support? Lou replied that he would prefer to have no space program at all rather than provide any support to General Graham's proposals.

Bob Salkeld referred to C. P. Snow's "Two Cultures" thesis and asked how we can bring ~~the~~ ~~two~~ cultures together at the National Research Council, but that we cannot agree on the military aspects.

the "learning" and "doing"

Lou expressed the opinion that they could together at the National Academy of Sciences and

Dave Criswell said we have one culture: a ground-based culture. What we need to do is to start building a creative space-based culture.

Bill Haynes said that no disarmament treaty has ever been successful. Lou disagreed, citing the ABM Treaty and the treaty barring nuclear weapons in space. Bill Haynes and Jim Ransom recalled the evidence of Soviet violation of the former and that it would take a war to find out whether the latter is being complied with.

Buzz asked Lou what Planetary ~~Society~~ Society publications our ~~manifesto~~ statement could appear in? Lou discussed publication deadlines and said a special mailing to the membership was possible, but would be costly. Buzz expressed interest in polling the membership. Lou said no demographic survey of the membership exists. The Planetary Society has its next board meeting on the 10th of November which Lou feels is too soon to obtain action on the manifesto.

In the discussion which followed, suggestions included approaching ABC Nightline, talking to Dr. Keyworth (who has been "outflanked" on the space station subject) and influencing the upcoming Congressional debate on Space Station. It was agreed that by then it may well be too late to capitalize on the initiative embodied in the President's statements of the 19th of September.

Lou Friedman expressed the opinion that the Soviets are planning a Diemos/Phobos rendezvous in about 1990, ~~and~~ Bob Salkeld ~~spoke of a series of dialectics~~ referred again to the CP Snow partial analogy with reference to "doing vs. learning" and then stated there additional dialectics:

1. Weapons vs. Arms Control
2. Government vs. Private
3. National vs. International

~~4. Doing vs. Learning~~

Dave Criswell suggested another: Rat Hole vs. Permanent!

Buzz asked Bob Salkeld whether he thought Dr. George Mueller, who will retire as President and Chairman of SDC at the end of the year, would accept the leadership of such an initiative as we have discussed today? Bob felt that ~~he would definitely be interested~~ it would be worthwhile to approach Dr. Mueller on this subject.

Buzz suggested that we should seek the support of former NASA administrators and prominent NASA Center directors, as well as former astronauts.

The draft ~~"manifesto"~~ statement provided by Bill Haynes was distributed and read, and Jim Ransom and Bob Salkeld were invited to submit their own versions.

Lou Friedman said that he would report the gist of our conversations to Carl and Bruce and that although some mystery remains, he feels that he understands our basic objective.

The meeting ended with Buzz and Bob Salkeld prepared to approach Dr. Mueller to invite him to assume leadership, and to contact other space supportive organizations and leaders through him.

The objective is to provide President Reagan with a testimonial from as many space organizations and leaders as possible, ~~by the end of November~~ in time to influence his expected policy statement.

TESTIMONY OF DR. BUZZ ALDRIN
BEFORE THE
HOUSE ARMED SERVICES COMMITTEE
NOVEMBER 10, 1983

Mr. Chm. Dist. Colleagues

THANK YOU FOR THE OPPORTUNITY TO TESTIFY IN SUPPORT OF H.R. 3073.

AS YOU PROBABLY KNOW, I HAVE PLAYED SOME PART IN U.S. SPACE EFFORTS. and I hope to make increasing contributions from a more base

I REMAIN INTENSELY INTERESTED IN THE FULL EXPLOITATION OF OUR SPACE TECHNOLOGY FOR BOTH THE SECURITY AND CONTINUED PROSPERITY OF THE UNITED STATES AND THE FREE WORLD. IT IS FOR THIS REASON THAT I HAVE BEEN CLOSELY ASSOCIATED WITH, AND HIGHLY SUPPORTIVE OF THE EFFORTS OF HIGH FRONTIER. IT IS ALSO THE REASON I AM PLEASED TO HAVE THE CHANCE TO SUPPORT MR. KRAMER'S BILL.

THE BILL BEFORE YOU WOULD, I believe, TAKE THE VITAL ORGANIZATIONAL AND POLICY STEPS REQUIRED TO ENSURE PROMPT AND EFFECTIVE USE OF U.S. SPACE TECHNOLOGY ADVANTAGES FOR THE PROTECTION OF PEOPLE FROM THE AWESOME THREAT OF NUCLEAR WEAPONS. THAT, IN AND OF ITSELF, IS A GOAL WORTH ACHIEVING. BUT I WILL LEAVE TESTIMONY TO THAT EFFECT TO MY COLLEAGUE, GENERAL GRAHAM.

I WISH TO MAKE SOME POINTS ABOUT OTHER USES OF SPACE AND THEIR RELATIONSHIP TO THIS BILL. SPACE REPRESENTS AN UNLIMITED SOURCE OF MATERIALS AND ENERGY. IT IS ALSO A UNIQUE ENVIRONMENT IN WHICH PRODUCTS THAT CANNOT BE MANUFACTURED PROFITABLY ON EARTH CAN BE CREATED IN QUANTITY. THAT FACT WAS DEMONSTRATED BY THE PHARMACEUTICAL EXTRACTION EXPERIMENTS CONDUCTED ON THE FOURTH FLIGHT OF THE SHUTTLE COLUMBIA. THUS SPACE HOLDS ~~THE~~ A KEY TO ECONOMIC GROWTH AND ENRICHMENT OF LIFE ON EARTH FOR FREE SOCIETIES.

THESE, OF COURSE, ARE NON-MILITARY ASPECTS OF U.S. SPACE-RELATED OPPORTUNITIES. HOW, THEN, DO THE MILITARY APPLICATIONS OF THIS BILL APPLY?

FIRST, IT SHOULD COME AS NO GREAT REVELATION TO THIS COMMITTEE THAT ECONOMIC AND MILITARY STRENGTH ARE INSEPARABLE ISSUES IN A FREE SOCIETY. DICTATORSHIPS CAN IMPOVERISH THEIR NATIONS TO ENSURE MILITARY STRENGTH; WE CANNOT. THEREFORE, WE MUST SEEK WAYS TO ENSURE OUR NATIONAL SECURITY WHICH WILL ALSO ADD TO OUR ECONOMIC WELL-BEING. AN EFFECTIVE, WELL DIRECTED, AND INNOVATIVE SPACE-BASED DEFENSE IS JUST SUCH A SOLUTION.

IT IS A FACT, PERHAPS NOT AS WELL KNOWN AS IT SHOULD BE, THAT THE U.S. SPACE EFFORT HAS RETURNED TO THE GENERAL ECONOMY AT LEAST SIX DOLLARS FOR EVERY ONE TAXPAYER DOLLAR INVESTED; SOME SAY THE RATIO IS AS HIGH AS 14 TO 1. WHY? BECAUSE THE SPACE EFFORT STIMULATES THE HIGH TECH SECTOR OF THE ECONOMY, AND THIS IS THE MOST IMPORTANT GROWTH SECTOR OF A MODERN ECONOMY.

SOME MIGHT WISH THAT THE ENORMOUS NON-MILITARY POTENTIAL OF SPACE COULD BE TAPPED WITHOUT INVOLVEMENT OF THE MILITARY. THIS MAY BE A PIOUS THOUGHT, BUT NOT A REALISTIC ONE. THE REALITY IS THAT THE SAME CORE TECHNOLOGY THAT SUPPORTS MILITARY USAGE OF SPACE SUPPORTS PEACEFUL USAGE. THEY ARE TECHNICALLY INSEPARABLE.

WHEN BRITANNIA RULED THE WAVES, THERE WAS NO WAY THAT THE GREAT BRITISH MARINE TECHNOLOGY COULD CREATE A BETTER MERCHANT SHIP WITHOUT CREATING A BETTER MAN-OF-WAR. IN OUR OWN AVIATION INDUSTRY, WE CANNOT PRODUCE A BETTER MILITARY AIRCRAFT WITHOUT PROVIDING TECHNOLOGY FOR BETTER CIVIL AIRCRAFT. IN MY VIEW, MILITARY AND NON-MILITARY USAGES OF SPACE WILL PROCEED TOGETHER OR NOT PROCEED WELL. MILITARY USE OF SPACE

IS NOT ONLY TECHNICALLY INEVITABLE, IT IS ALREADY AN HISTORICAL FACT. SINCE TODAY SPACE OFFERS THE OPPORTUNITY FOR THE UNITED STATES TO COUNTER THE AWESOME THREAT OF NUCLEAR WAR WITH NON NUCLEAR SPACE WEAPONS, WE SHOULD BE GRATEFUL FOR IT, NOT APPREHENSIVE.

THERE IS ONE ASPECT OF THE INDUSTRIAL, NON-MILITARY, USAGE OF SPACE THAT I WOULD LIKE TO EXPAND ON. THAT IS THE POSSIBILITY FOR COLLECTING SOLAR ENERGY IN SPACE AND BEAMING IT BACK TO ENERGY-DEFICIENT AREAS ON EARTH.

THE NATURAL PROPERTIES OF THE MOON AND THE GEOMETRY OF THE EARTH MOON SYSTEM MAKE FEASIBLE A LUNAR POWERED SYSTEM (LPS) CAPABLE OF PROVIDING A LARGE, REGULAR FLOW OF SOLAR POWER TO EARTH, WITH ALREADY AVAILABLE KNOWLEDGE AND STATE OF THE ART TECHNOLOGY. IT WOULD CERTAINLY BE A VERY LARGE ENGINEERING AND INDUSTRIAL UNDERTAKING, BUT WE SHOULD NOT HAVE TO

DEPEND ON FUTURE AND UNPREDICTABLE BREAKTHROUGHS. WE MAY REASONABLY EXPECT THAT ESTABLISHING LARGE SUPPLIES OF ELECTRICAL POWER ON THE MOON WOULD STRONGLY ENHANCE THE LONG RANGE POSSIBILITY FOR GROWTH OF PRODUCTIVE OPERATIONS ON THE MOON, AND IN CISLUNAR AND OUTER SPACE AND WOULD STRENGTHEN THE NATURAL WILL NECESSARY TO MAKE SUCH CONCEPTS A REALITY. I ALSO ANTICIPATE THAT THIS EFFORT WOULD CONSIDERABLY WIDEN THE RANGE OF PRODUCTIVE SPACE SCIENCE AND PLANETARY PROGRAMS WHICH CAN BE SERIOUSLY CONSIDERED BY THE U.S.

ALTHOUGH THERE IS NO INTENTION OF EXPLOITING THE MOON FOR MILITARY PURPOSES, THE INTER-RELATIONSHIP OF CIVIL AND MILITARY CAPABILITIES IS UNAVOIDABLE.

HAVING ESTABLISHED A FOOTHOLD ON THE MOON, WE WILL ALSO HAVE CREATED A CAPABILITY TO TRAVEL TO AND THROUGH THE LUNAR NEIGHBORHOOD, INCLUDING THE LAGRANGE POINTS KNOWN AS L-4 AND L-5. RECENT EVENTS HAVE AGAIN SHOWN THE SIGNIFICANCE OF TERRITORIAL CHOKE POINTS SUCH AS GRENADA AND THE STRAIGHTS OF HORMUS TO COMMERCE AND TO THE PROTECTION OF THE SEA LANES.

THE LAGRANGE POINTS OFFER SPACEFARERS A HOLDING POINT REQUIRING MINIMAL ENGINEERING EITHER TO REMAIN OR TO DEPART FOR ANOTHER LOCATION. THEY CAN BECOME KEY ASSETS IN FUTURE SPACE COMMERCE; ASSETS WHICH WILL BECOME ACCESSIBLE IN THE PROCESS OF ESTABLISHING A PERMANENT PRESENCE ON THE MOON. THAT PRESENCE WILL ALSO PROVIDE IMMEDIATE ACCESS TO ANOTHER RESULT WITH STRATEGIC IMPORTANCE; THE LUNAR SURFACE MATERIAL ITSELF. EVEN WITHOUT ENHANCEMENT, THE LUNAR ROCK AND DUST CAN BE USED TO SHIELD DEFENSIVE SYSTEMS IN LOW EARTH ORBIT. THIS WAS A CONCLUSION OF THE FLETCHER COMMITTEE, WHICH IS STUDYING IMPLEMENTATION OF THE PRESIDENT'S DIRECTIVE, "ELIMINATING THE THREAT FROM BALLISTIC MISSILES."

SUCH PROTECTIVE MASKS WOULD BE PROHIBITIVELY EXPENSIVE IF IT HAD TO BE BROUGHT UP FROM THE EARTH'S SURFACE. IT WOULD REQUIRE A SMALL FRACTION OF THE ENERGY TO TRAVEL FROM LOW EARTH ORBIT FROM THE SURFACE OF THE MOON.

THEREFORE, THE MOON CAN SERVE TO PROVIDE THE MATERIALS THAT MAKE DEFENSE AGAINST DEFENSIVE MISSILES A VIABLE CONCEPT.

SUCH MACROENGINEERING PROJECTS ARE BEST UNDERTAKEN BY CONSORTIUMS OF PRIVATE COMPANIES, OF COURSE AIDED AND ABETTED BY GOVERNMENT. THEY WILL REQUIRE VERY LARGE CAPITAL INVESTMENTS. AND THESE INVESTMENTS ARE UNLIKELY TO MATERIALIZE UNLESS THERE IS REASONABLE ASSURANCE THAT THESE PEACEFUL ENDEAVORS WILL BE SECURE FROM INTERFERENCE OR DESTRUCTION BY HOSTILE FORCES. THIS MEANS THAT ON THE HIGH FRONTIER OF SPACE, AS ON EVERY OTHER FRONTIER IN HISTORY, THE MILITARY IS A NECESSITY.

MR. KRAMER'S BILL IS, THEREFORE, ALSO A NECESSITY.

~~THANK YOU~~.

3rd Opport.
Intl Police Force

Laser Powerd A/C Mirror GEO
Hi Alt Stat. Comm Relays
Mil. ~ Comm Transp

D R A F T
Dick Johnson
11/14/83

POLICY CONSIDERATIONS

MANNED LUNAR RESEARCH BASE
(Lunar Research Colony)

I. Main Thrust of MLRB

1. Research (not colonization, not manufacturing, etc.)

   - o Astrophysics
   - o Solar Physics
   - o Lunar Geology
   - o Resource Exploration
   - o Space Plasma Physics
   - o Biology
   - o Physiology
   - o Etc.

2. Isolated Research Colony Experience

   - o Analogous to isolated Polar Research Bases in Antarctica
   - o Higher personal risks are acceptable

II. International Aspects

1. Other countries (of U.S. choosing) can participate (even small countries)

2. Major costs could be shared with E.C. and Japan (Economic Summit topic?)

III. Space Transfer Station

1. A specific design goal would be established for a Space Transfer Station.

2. The Space Transfer Station could have "add-ons" if industry wanted to foot the bill (or most of it) for commercial development reasons.

IV. U.S. Leadership Reasons

1. This would be a "High Road."

   a. It would leap-frog the Russian Space Station efforts.

   b. It would have high visibility for "free world" capabilities. (One could not look at the moon without thinking of man's presence there. Nightly news would include regular items from the moon.)

V. Other Considerations

1. Can build on previous experience and capabilities (STS, Apollo, etc.)

2. Not a crash program (10-15 years). Large funding spike is not necessary. (Russians do not have the the capabilities.)

3. Can be expanded into larger colony if appropriate downstream.

VI. Issue of Return on the Investment

1. Science

   o Highly questionable

2. Leadership Role in Space Technologies

   o May be reasonable

3. Free-world Leadership Role

   o Acceptable

A VISIONARY SPACE STRATEGY

Some years ago, a U.S. President faced a strikingly similar issue to the one before you today. He was being asked to continue a natural, evolutionary progression in America's development in outer space and approve a "next step": a manned, earth-orbiting space station.

Luckily for us, he reached beyond the realm of the "easy" and set a bold goal for America: landing a man on the Moon and returning him safely to the Earth. In so doing, John F. Kennedy demonstrated what George Will since termed "the Virtues of Boldness," virtues all-too-lacking among many of Kennedy's successors.

Kennedy's instincts compelled him to set America's sights on a strategic goal, rather than a tactical objective, because "that goal will serve to organize and measure the best of our energies and skills."

George Will best articulated Kennedy's differences with his less visionary advisors who thought, correctly, "that a space program would be useful for developing important hardware, but a moon shot would be unnecessary. Kennedy thought . . . [that] hardware matters, but intangibles do too. A moon landing became central to Kennedy's space program because to him, the program was only secondarily

about scientific or military benefits. It was primarily about politics, in a grand sense: it was about defining and shaping the nation's spirit and confounding its enemies."

In precisely that mold, you face two fundamentally different questions today. Those who believe that building and managing hardware is America's highest destiny in space ask "What is the next logical step for NASA?" On the other hand, those who think space is a new frontier of freedom for America that offers her people hope and opportunity for the future would rather ask "What are America's goals in space for the next 25 years?"

As you decide which question offers -- indeed, demands -- a true challenge of our nation and people, it's critical to remember that our national mood has changed tremendously during the past three years. Rather than the negative, defeatist outlook of the Limits to Growth adherents, Americans today are expansively optimistic. We are aggressively responding to international competition and demanding better exploitation of our technological superiority. A space program that calls only for a bureaucratic "next step" would be a wet blanket on the renewed optimism of the American people, and a slap in the face to those individuals and corporations committed to improving U.S. economic competitiveness and technological leadership.

Instead, let us look to a future in space that offers a vision of true hope and opportunity for all Americans, indeed for all those peoples of the world who look to us as a beacon of freedom. Let's ensure, not just permit, the fullest participation of American industry so that the vitality of free enterprise sparks our national space effort. Let's fully exploit the capabilities of the Space Shuttle, which truly is the beginning of a "Transcontinental Railroad" into space. But most of all, let's set bold and challenging goals for NASA, including a permanent settlement of free humans on another celestial body, Earth's Moon.

At the start of our administration, after the first space shuttle flight, the "space station" was proposed as the "next logical step" for NASA to pursue.

In fact, the space station concept has been an option for the U.S. space program for over 20 years. It's original conceivers -- most of whom proposed it as part of the Apollo program — thought of it as a gateway to further space exploration and exploitation, not as a goal in and of itself.

And that's the way we should look at "space station" today. We need to ask ourselves "what are the steps we should take to maintain and enhance clear U.S. leadership in space exploration and exploitation?" [and ergo address fundamental goals of this administration]

As we ask that question, it's critical to note the major change in our national mood during the past 3 years. Rather than the negative, defeatist outlook of the Limits to Growth adherents, Americans today are expansively optimistic. Our attitude is one of agressive response to international competition and a concommittant focus on better exploitation of our technological superiority.

The space program, in addition to its important scientific, commercial, and military value, is truly the symbol of our ingenuity and frontier spirit. It is indeed the essence of our people in this new climate of optimism.

Weak Version Second page advocates Lunar Base

TALKING POINTS WITH PRESIDENT REAGAN

- The time has come to take a bold visionary step in our space program.
- A step to demonstrate America #1 - The U.S. has the vision, the determination and the talent to lead the rest of the world.
- Let me make one thing clear - The present NASA Space Station does not capture this spirit at all!
  a) The U.S. Space Station would be built after a Soviet version!
  b) The industrial applications of the SS are non- existent!
  c) The NASA Space Station is not a Space Program it is a Space Project. It is a means without a visionary goal, unlike the Saturn II rocket which was a means to the goal of reaching the moon.
- The U.S. needs a truly visionary (25 yr) goal. For example:
  a) Lunar base
  b) Manned exploration of Mars
  c) Series of unmanned planetary probes
- Once a truly visionary goal is established, the means--which might include some form of a Space Station--can be determined.
- Need to determine this goal:
  a) from a concensus
  b) before next election
- Propose formation of a Vice Presidential, bipartisan commission to identify the next major goal in space.

Strong Version

TALKING POINTS WITH PRESIDENT REAGAN

- The time has come to take a bold visionary step in our space program.
- A step to demonstrate America #1 - The U.S. has the vision, the determination and the talent to lead the rest of the world.
- Let me make one thing clear - The present NASA Space Station does not capture this spirit at all!
  a) The U.S. Space Station would be built after a Soviet version!
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  c) The NASA Space Station is not a Space Program it is a Space Project. It is a means without a visionary goal, unlike the Saturn II rocket which was a means to the goal of reaching the moon.
- The U.S. needs a truly visionary (25 yr) goal.
- Our proposed visionary goal is the establishment of a Lunar base.
  a) This would be a symbol of American scientific and technological preeminence. It would inspire the nation and a new generation of scientists and engineers.
  b) The Lunar base would meet all the major purposes of the Space Program - exploration, scientific advancement and technological achievement.