DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON 25, D. C.

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CONTROL SYSTEMS JOINTLY

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9 AUG 1965

Mr. James E. Webb
Administrator
National Aeronautics and
Space Administration
Washington, D. C. - 20546

Dear Jim:

The draft of the Memorandum to the President on the MOL, revised in accordance with the plan agreed to at the Space Council meeting of July 9, is attached for your concurrence or comments. The documents referred to in the memorandum, namely the policy paper on public information and a proposed statement to the press, were sent to you earlier for your consideration.

I will appreciate your review of the enclosed memorandum as soon as is convenient.

Sincerely yours,

Harold

Harold Brown

BY E-5636-65

1 Enclosure

cc: Dr. Robert C. Seamans

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DRAFT

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Manned Orbiting Laboratory

Your FY 1966 budget request to Congress included, and the Congress is in the process of appropriating, $150 million for the Manned Orbiting Laboratory (MOL), which was initiated in December of 1963 when the DYNASOAR Program was terminated. When these funds were budgeted in December of 1964, I indicated that I would defer their release until such time as the studies of the nature and value of the program, then underway, were satisfactorily completed.

These studies have now been completed. Based upon a thorough review of the conclusions I recommend the following:

1. Approval of the MOL for full-scale development to begin during FY 1966. The release of the $150 M in the FY 66 budget and the initiation of contract definition will begin the full-scale development. I plan to request $330 million for the support of the program in Fiscal Year 1967, plus about $70 million for the related manned and unmanned optical development.

2. That the MOL program proceed toward the following objectives:

a. Semi-operational use beginning in late 1968 to secure photographs of [redacted] resolutions of significant targets. This is approximately [redacted] better than the best satellite photography we are now obtaining, and approximately [redacted] better than

the best expected U-2 photographs or the G3 satellite system, now under development, from which we expect photographs in about 15 months.

b. Development of high-resolution optical technology and systems for either manned or unmanned use. This technology will provide the [redacted] resolution for manned operation of MOL, and be aimed at ultimately even better resolution [redacted]. It will also be aimed at bringing unmanned capabilities closer to those of a manned system. A parallel development of camera and spacecraft systems for unmanned operation will be carried on.

c. Provide a facility for the development, test and use of other potential military applications such as SIGINT collection, radar observation and ocean surveillance, as the utility and feasibility of such applications become established.

d. Provide an experimental program for determination of man's utility in assembling large structures, and in adjusting, maintaining and processing the output from complex military equipment in space.

3. That the MOL program be operated within the guidelines of our existing national policy and within the carefully-ordered security environment which already exists for military space programs. This environment helps to avoid provocation in the international arena, and to forestall initiation of international action that might prevent the United States from using satellites for reconnaissance. A paper discussing the policy in this respect concurred in by _____ _____, is attached.

4. To support this objective, that we maintain a firm position to ensure that the public information programs associated with MOL are kept modest and low key and that the publicly announced mission of the MOL continues to be expressed solely as "the investigation and development of orbital capabilities, manned and unmanned, associated with national defense." A press release is attached.

I have the concurrence of _____, _____, _____ on the above recommendations. I have not sought or received concurrence on the parts of the paper other than the recommendations.

I am proposing a development program of six launchings, one unmanned and five manned. The first manned launching would take place late in Calendar Year 1968, and the last early in 1970. The total cost for this program is now estimated at $1.5 billion, including the optical sensor programs, for both a manned and a parallel unmanned capability.

The payload vehicle for these launchings consists of the basic two-man MOL module and the GEMINI B recovery capsule which has figured in previous Department of Defense studies. It is proposed to launch into polar orbits from the Western Test Range, using the TITAN IIIC booster. Some ETR launches may also be included. Orbital operations of 30 days' duration are planned.

The primary emphasis in the six-flight program will be placed on the development, demonstration and use of optical reconnaissance systems of very high resolution, including a manned system producing resolutions of [redacted] on the ground.

The Director of Central Intelligence indicates "It is in the interest of the U.S. to obtain the highest resolution of photographic coverage feasible over those areas of intelligence interest designated by USIB, provided that such highest resolution will of course have to be weighed against the relative factors of cost, time, and relative importance of intelligence which could be obtained in an optimum balance of these considerations."

I believe that there is a vital national need for reconnaissance photography at a resolution of [redacted] The first and obvious need is for technical intelligence. There is also a clear need, particularly during times of crisis, for high resolution photography of tactical objectives. Closely related to these applications is the potential use of high resolution photography to assist in the policing of arms control agreements.

You will remember that in the crisis of 1962 we exerted our reconnaissance capabilities to the utmost to acquire pictures having the detail and the credibility that were necessary to verify and to convince others of the nature of the military activity in Cuba. In

other situations, it may be important to accomplish these same ends without the provocation of visible overflights.

If we had [redacted] resolution capability today, it would be of great value in assessing such problems as the hardness of Soviet missile silos and the nature of various possible Soviet anti-missile deployments. Examples of its use in the future are:

a. Estimation of the operating depth for which Soviet and Chinese submarines are designed.

b. Estimation of the use and capability of Chinese plants that may be employed for nuclear weapons production.

c. Assessment of Chinese (as well as other countries) development of weapons delivery capability by detailed examination of missile and aircraft plants and rocket engine test activity.

I expect the six-flight program to give us

a. Operational intelligence collection at [redacted] resolution [redacted]

b. Knowledge of the nature and value of critical contributions of man to photographic reconnaissance and to other military-related space missions; and of the specific differences, in an engineering sense, between manned and unmanned systems of large size and very high resolution.

c. The optical technology and designs for systems which, if manned, can give resolution better than [redacted]

As a result of our studies, which have included comparative examination of manned and unmanned systems, I am convinced that development of a manned system can reach the high-performance goals sooner and with a higher probability of initial success than a development based on an unmanned configuration.

The presence of a man in the spacecraft will contribute accuracy to pointing and tracking of objects for observation, will improve selection and transmission of data, simplify film handling and improve camera adjustment and maintenance. Our studies indicate that these practical contributions have as good probability of improving resolution, reliability, and useability of the data enough to justify the increased cost in vehicle weight and safety requirements of having a man there.

Dr. Hornig has recommended that we proceed in parallel with the development of a back-up system, unmanned but fitting the same spacecraft design with a performance goal of [redacted] under best conditions. This we concur in. The program will carry in parallel a similar optical system for unmanned use, using the same booster and similar spacecraft, with equipment added for unmanned operation. It may well be that during the course of the experimental efforts, which will use and greatly profit from manned flight operation, techniques will be devised which will allow unmanned operations, with modified

sensors and control mechanisms, of similar performance and comparable cost-effectiveness. This parallel development will also provide a useful backup in case international political problems jeopardize manned operation.

The Director of the Bureau of the Budget believes that the development cost of the manned system will exceed that of an unmanned system by $800 million dollars. He questions whether the value of the additional resolution [redacted] is worth the additional costs and the possible international political risks. He believes that unmanned systems can approach the capabilities of manned, given enough time and effort, and recommends proceeding with the development of an unmanned system only at this time.

However, our studies indicate:

a. That the difference in cost of developing a high resolution [redacted] unmanned system and a manned system that should produce results [redacted] probably lies between $300 and $400 million. The difference in cost per flight test is compensated by the larger number of flight tests needed to prove out an unmanned system.

b. That there is no design for an unmanned system which could provide the same resolution as, and thus be directly competitive with, the manned system.

c. That in the practical situations that are likely to occur in flight, the quality achievable with the manned system adjusted in flight by a skilled operator is likely to be [redacted] better than the photograph taken by the unmanned system at the perspective (obliquity) necessary for good technical use.

d. That the number of high resolution flights required to obtain coverage of given areas, even at the [redacted] resolution, is substantially less for the manned approach. This difference in productivity is a result of the capability of the man to select targets of highest interest, select alternate targets in case of cloud coverage, center targets in the field of view, adjust for relative motion to improve quality and take repeated photographs of areas where interest is very high (erected missile, for example). The difference in number of flights could be expected to pay for the difference in development costs in about 20 operational flights of the manned system (2 or 3 years).

Finally, we can reconsider this matter after the FY 1966 - 67 program has been carried out and if such a decision appears indicated, shift to the unmanned program which will be carried in parallel. The amount of risk involved is about $150 million dollars.

The plan for MOL as proposed by the Department of Defense is specifically to meet defense needs. Provision has been made for including experiments and technology of special relevance to certain

military needs other than reconnaissance. Preliminary study has been made to determine what general scientific needs could be included. On the basis of further DoD-NASA cooperative studies NASA will determine which of its scientific or general technological experiments should be carried out using the MOL capability on the basis of non-interference with defense priority objectives.

My judgment is that we should now proceed to acquire the benefits of an experimental manned system. I believe that the combination of the specific manned reconnaissance development, which I believe fills a national need for photography [redacted] resolution, and the other more general purposes discussed above is worth the cost of the development and semi-operational launches. I request your approval of this program.

Robert S. McNamara