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June 30, 1965

OFF SECY OF DEFENSE

Bob:

Here is the memorandum on MOL which covers the points that Din Land and I covered verbally with you last week. I have also attached a copy of a memorandum to the President which I hope to get to him tomorrow morning, and I would be happy to have your comments about it. The reason for my haste is the imminency of my trip to Korea which will keep me away until late July.

Don
Donald F. Hornig
Special Assistant for
Science and Technology

Attachments

Honorable Robert S. McNamara
Secretary of Defense
The Pentagon
Washington, D. C.

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Dr. M. M. Hall

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THE WHITE HOUSE
WASHINGTON

DORIAN

June 30, 1965

MEMORANDUM FOR

THE SECRETARY OF DEFENSE

I should like to pass on to you my current thinking in connection with the MOL program, based on the work of my special MOL Panel under the chairmanship of Dr. Edward M. Purcell and on discussions with Dr. Edwin H. Land.

Since the MOL proposal would build a full scale prototype of a manned high resolution photographic system, I should first address myself briefly to the question of the value that should be assigned to high resolution photography in general. I know of no way to make a quantitative assessment in this area. However, it seems to me that our experience in occasions of national crisis and at other times when certain critical questions could not be fully answered (except with a higher resolution than we have available) are sufficient to put very great value on the highest possible resolution. Thus, I would be willing to pay a great deal for a system which had this capability. At the same time, however, I must also note that there are other, perhaps equally urgent, intelligence requirements for quick response at times of crisis and low vulnerability for active war situations. These will not be satisfied by MOL. If there were a system filling these needs in competition with MOL, a choice between the two would be very difficult indeed. Although there is not now such a system, any expenditures that we may make on MOL should not be allowed to reduce the intensity of our future efforts to satisfy the still outstanding requirements.

With regard to the MOL proposal itself, the Air Force has done an exceedingly thorough analysis of both the manned and unmanned system alternatives for a high resolution optical reconnaissance system. It has, in my opinion, documented a persuasive argument that, for equal total weights and total volumes, the manned system does have an advantage over the unmanned system and can be expected to provide a higher average resolution at an earlier time than the unmanned system. I, therefore, would support approval of the MOL program. I would point

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out that we should expect difficult technical problems in building the mirrors necessary for such system, a capability yet to be demonstrated. However, I believe that this risk is acceptable.

It is important to emphasize that the conclusions about the relative merits of manned and unmanned systems assume the use of a technology about which we are reasonably confident. Although this is an appropriate assumption to make, we should recognize the possibility that the unmanned system falls short in this comparison because, for the very sophisticated type of system that we are discussing here, relatively little effort has been devoted to solving the problems inherent in automatic pattern recognition, image motion compensation and precise pointing to the accuracy required for this purpose. I am personally convinced that if sufficient competence, imagination and effort were devoted to the development of the necessary automatic subsystems, the margin that now exists in favor of the manned system could in time be largely eliminated.

I would also like to mention several additional factors which are pertinent to a discussion of manned vs. unmanned systems. First, although available evidence makes us reasonably confident that man is physiologically and psychologically capable of performing as required by MOL, this capability is still to be demonstrated, and it is possible that the flight tests will show that the manned system does not perform as well as predicted. Second, it seems reasonable to anticipate the possibilities that either public reaction against MOL as an invasion of privacy or international opposition to manned overflights may prevent the use of a manned system. Although both these risks seem acceptable from the financial standpoint and should not therefore prevent initiation of the development of the MOL, they are serious enough politically to warrant our taking action to provide for the eventuality that an unmanned, rather than manned, system will be required. In addition, it seems quite possible that from an operational standpoint, an unmanned system will eventually be desired to complement the manned system by performing the more routine reconnaissance missions or be available in special circumstances, such as, for example, in case of threats against the system by the other side.

For these reasons, I urge that you include as an integral part of the MOL program a major effort to develop those subsystems which would be

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necessary for a high resolution unmanned system, so that if the manned vehicle turns out to be unuseable, an unmanned system can be put into operation reasonably soon thereafter. I see no reason why an immediate effort on the critical automatic subsystems should perturb the progress of the MOL development program in its initial phases. However, a decision would have to be made rather early in the program about how the capability for the unmanned alternative would be carried forward. I recommend that this be done by building the MOL telescope-camera so that it can be operated in either the manned or the unmanned mode, using the same essential components of the optical system for each mode. Naturally, the consequences of this recommendation must be worked out in detail to determine whether it would entail an unreasonable increase in cost or a serious degradation of performance as compared to the other alternatives. I also recommend a study into the possibility of building an alternate module for that portion of the payload occupied by the Gemini-Living Module which would provide additional film, recovery capsules or propulsion for the system when used in the unmanned mode.

Turning now to the impact of MOL on our programs and policies, there is an important question regarding the relationship of MOL to NASA programs. The Air Force has suggested, and it is certainly quite true, that in the living compartment to be developed for MOL certain NASA experiments could be conducted. However, I regard these experiments as relatively trivial when compared to the over-all NASA programs and to the major justification of the MOL itself. It seems to me, therefore, that it would be in the best interests of the military program, the peaceful image of the NASA programs, and good relationships between DOD and NASA if the MOL capability for non-military experiments were excluded from the initial program objectives and from such minimum public announcements about the program as may be necessary. Naturally, I do not mean this to preclude the eventual use of available space to the advantage of the over-all program, or to the future use by NASA of subsystems or modules developed by MOL as may be appropriate to NASA's program and as available from MOL.

Finally, I believe that very serious political questions arise from the MOL program. One is the concern, already mentioned above, that MOL as a manned military vehicle with potential observation capability may be

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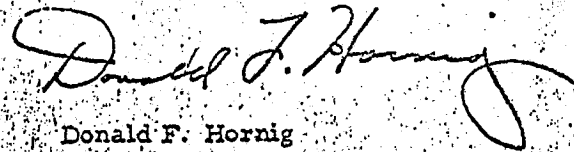
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objected to, and perhaps threatened, by the USSR. On the other hand, if acceptance is achieved, MOL could contribute to the recognition of manned observation and surveillance as a normal mode of international behavior.

Another, more serious, concern arises from the possibility that the mode of data recovery from the MOL, if detected by the intelligence of the other side and combined with inferences about observation devices, might be construed as demonstrating an active weapons system capability for the spacecraft. I therefore recommend that consideration at the highest level be given to questions such as these so that (a) our public statements about the MOL are carefully devised to maximize the likelihood of ultimate acceptance of the program, and (b) when the first manned flights are imminent we have, to the best of our ability, assessed the political risks involved and devised detailed responses for the various contingencies which may occur.

In summary, I would support the approval of the MOL provided plans are made to concurrently develop an unmanned operational capability for the system, and recommend the following actions: simultaneous initiation of a well supported program to develop the automatic subsystems necessary for unmanned operations, and a redesign of the MOL telescope-camera for dual mode operation. At the same time, I would urge you to continue to seek further systems which can satisfy the intelligence needs not met by MOL. I will be happy to give whatever assistance I can to you and to the Director of the NRO in forming plans for the MOL development and particularly for the automatic subsystem development.



Donald F. Hornig

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THE WHITE HOUSE
WASHINGTON

DRAFT #1

June 30, 1965

MEMORANDUM FOR

THE PRESIDENT

During the budget discussions last Fall, you decided to put \$150 million in the DOD budget for the proposed Manned Orbiting Laboratory (MOL) program, but to withhold release of the funds until further studies were conducted by the Air Force and the results reviewed by Mr. McNamara and myself. For my review, I used the services of the regularly established Space Panels of the PSAC, which have studied potential orbital experiments for a year or more, and an ad hoc MOL Panel to look at the special military proposals.

The Air Force studies and my review have now been completed. The currently proposed MOL program would build and flight test a full scale prototype of a manned high resolution photographic satellite. Operational missions could follow immediately after the last MOL flight in about 1970. I believe that the MOL program will provide a substantial increase to our reconnaissance capability by developing a system which could, for example, resolve so well that we could even discover the presence of human beings in our overflight photography.

I, therefore, recommend that we initiate development of the MOL and I have so informed Mr. McNamara by the attached memorandum.

If we go ahead with the development program, however, I believe we must prepare to assume serious political risks as we go into the flight tests themselves. We should give consideration at the highest level to the contingencies which may occur so that one day we are not caught by surprise by the intensity of the reaction abroad as we were when the U-2 was shot down over the USSR. It is true that unmanned satellite reconn-

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DRAFT #1

Assurance has been used and accepted by both sides. However, it is possible that manned satellite surveillance could be considered "overflight" with all its connotations. It is also possible that MOL will be construed by the USSR as a weapons system in space capable of launching bombs from orbit. We must certainly consider how likely it is that such an interpretation could be made, whether the leaders of the USSR could tolerate the existence of MOL if such an interpretation is made, and what their reaction might be. We should, perhaps, ask what our own response would be if the other side orbited a long-lived space station and announced that it was conducting military experiments. In this context it is worth noting that although we must maintain the highest possible security around the program, it will probably not be possible to conceal from the public press the fact that MOL is a manned program to perform undefined "military experiments" nor, because of the size of the recovery forces required for manned flights, will it be likely that we can conceal the flight tests when they are conducted.

On the other hand, manned activities in orbit have become somewhat routinely accepted over the past years, and it is possible that MOL will also achieve acceptance if introduced to the public in a careful manner. If so, the program may make a substantial contribution to the recognition of manned observation and surveillance as a normal mode of international behavior.

I, therefore, recommend that high level political oversight be given to the following problems:

- a. The extent to which the public should be informed about MOL and the method by which the program is introduced so that we establish, right from the start, a picture of MOL which will give it the best chance of gaining acceptance by the international community.
- b. The contingencies that might arise if the flights are not accepted, and the detailed plans for meeting those contingencies if they occur.

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Donald F. Hornig

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