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DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING  
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JAN 4 1965

MEMORANDUM FOR UNDER SECRETARY OF THE AIR FORCE

**SUBJECT: Manned Orbiting Laboratory**

- References:**
- a. Memo for DDR&E frm UnSecAF; Subj: MOL Prog. dtd Sept. 18, 1964
  - b. Memo for DDR&E frm UnSecAF; Subj: MOL Prog. dtd Nov. 23, 1964
  - c. Memo for UnSecAF frm ASD(R&E); Subj: Gemini B Cost dtd Dec. 24, 1964

1. The Secretary of Defense has changed the priority of the objectives of the MOL program to provide more emphasis to developments that may lead to operational systems. The following primary objectives listed in order of priority are now established as a guide to planning.

a. Development of technology contributing to improved military observational capability for manned or unmanned operation. This may include intermediate steps toward operational systems.

b. Development and demonstration of manned assembly and service of large structures in orbit with potential military applications such as telescopes or radio antennae. This will interact strongly with (a).

c. Other manned military experimentation, including the programs given special study by the Air Force during the past year.

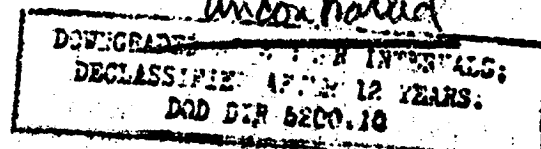
2. Consideration should also be given, in close cooperation with NASA, to the following additional national objectives:

a. Basic scientific and general technological manned experimentation.

b. Development and demonstration of manned assembly and service of large non-military structures in orbit such as astronomical telescopes and radio antennae.

c. Biological responses of man in orbit for 30 days or more.

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3. Although it is recognized that the objectives of paragraphs 1 and 2 have been studied in developing the MOL plans, I would like to assure that the primary objectives as stated in paragraph 1 can be implemented effectively by the MOL program and that the results expected are commensurate with the estimated costs.

4. Therefore, I request that the Air Force define an experimental military program to meet objectives (a) and (b) of paragraph 1 above, and determine the essential vehicle characteristics to meet these objectives. This study should be conducted in the same rigorous detail that characterized the studies of objective (c) of paragraph 1 above made by the Air Force during the past year.

5. The Air Force is requested to assess carefully the proposed specifications of the GEMINI B plus laboratory configuration, employing the launch capabilities of the TITAN IIC, against the needs defined in accordance with paragraph 4.

6. In addition, the Air Force is requested to examine approved configurations of the APOLLO system to determine the extent to which any of these could meet the needs defined in accordance with paragraph 4 in a more efficient, less costly or more timely fashion.

7. Since the assessment of APOLLO capabilities will require consideration of the interaction of the laboratory vehicle with the proposed experiments, NASA is being requested to provide to the Air Force, as soon as possible, information concerning the configurations of the APOLLO system currently being studied by NASA to meet NASA program objectives. Based on this information and prior Air Force studies, the Air Force is requested to provide to NASA the needs defined in accordance with paragraph 4 to the detail necessary to enable NASA to identify specific configurations of the APOLLO system applicable to DOD objectives. NASA, with DOD cooperation, will then make this identification in at least preliminary form by April 30, 1965. These specific configurations of the APOLLO system will then be further examined by the Air Force.

8. The Air Force should also define, in cooperation with NASA, significant experiments directed to the objectives of paragraph 2. The impact of these experiments on the configuration and cost of the vehicle required to meet the objectives of paragraph 1 above should be defined, and considered in determining the nature of the part of the MOL program whose purpose is as listed in paragraph 2.

9. I would like to review the results of the work described in paragraphs 4 through 8 to assure that the results expected from the MOL program are commensurate with the estimated costs before release of the FY 1966 funds to the Air Force. It is requested that this review be submitted by May 15, 1965.

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10. I believe a re-examination is desirable of the unmanned flights previously proposed by the Air Force. In particular, the unmanned flight program should:

- a. Make effective use of the TITAN II R&D flights.
- b. Provide for steps toward qualification of components of the MOL system.
- c. Contribute to the unmanned operational objectives of the MOL program including the test of experimental payloads toward this end.

11. To preserve the option for proceeding with the MOL on an orderly basis, the DOD will employ the FY 1965 MOL funds for work on Pre-Phase I and Phase IA studies and for the work on TITAN III and GEMINI B necessary for launches of unmanned payloads using the boosters in the presently approved TITAN III research and development program. Funds for proceeding with Phase IB (narrowing of PDP to two contractors) and Phase II (full-scale development) for the manned flight development program are included in the 1966 estimates and will not be released until a decision is made to proceed as indicated above.

12. It is requested that the Air Force fund with industry three preliminary design studies of MOL configurations employing TITAN IIC plus GEMINI B to meet the objectives of paragraph 1. The laboratory configurations should include provisions for:

- a. Testing concepts of assembly of large optical devices in space.
- b. Servicing large optical space systems.
- c. Testing concepts of assembly and service of large radio telescopes in space.
- d. Testing high resolution surveillance radar concepts.
- e. Manned experimentation facilities.

The purpose of these studies is to help to provide the Air Force the cost and technical information required by paragraphs 4 and 5 above.

13. The Air Force is requested to choose 3 contractors for the studies of paragraph 12 who are qualified to build the laboratory module whether the approach finally selected is:

- a. TITAN IIC plus GEMINI B and lab module.

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or b. SATURN IB plus APOLLO CSM with lab module in place of the LEM adapter section.

The choice of contractors should be based upon:

- a. Grasp of problem.
- b. Management and technical resources.
- c. Integration experience.
- d. Facility availability.

14. It is the intent of DOD that the final contractor will be selected from the three study contractors, without further competition from industry.

Since the decision to proceed with Phase IB and II will be made on the basis explained earlier, and the possibility therefore exists that the DOD will elect not to proceed into Phase IB and II, the study work of the contractors in response to Air Force work statements should be fully funded.

After the implications of the changes discussed above have been studied, I would like to be briefed in detail on the approach the Air Force plans to follow together with a preliminary program plan which you can support as being suitable to the expanded MOL objectives. A suggested briefing date is January 15. The decision ~~on the release of deferred funding~~ can be made following this briefing.

*Harold Brown*  
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