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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25 D.C.

8 JUL 1964

REPLY TO ATTN OF: AFRDC

SUBJECT: MOL Experiments on Electromagnetic Signal Detection

TO: AFSC (MSF-1)

Reference is made to the telephone conversation on 6 July 1964 between Colonel R. K. Jacobson, AFSC, and Colonel K. W. Schultz of this Headquarters. The attached SAF-US memorandum Subject: MOL Experiments on Electromagnetic Signal Detection, is forwarded for your compliance. Request you notify the Assistant for Manned Orbiting Laboratory (AFRMO) as to the date you anticipate the revised work statement will be forwarded to this Headquarters.

James Ferguson

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SAF-US Memorandum

JAMES FERGUSON
Lieutenant General, USAF
DCS/Research & Development

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MSF 64-955
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DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE UNDER SECRETARY

ACTION
RMO
SUSPENSE DATE
INFO:
RDCE

July 2, 1964

MEMORANDUM FOR COLONEL SCHULTZ, ASSISTANT FOR MANNED ORBITING LABORATORY, AFRMO

SUBJECT: MOL Experiments on Electromagnetic Signal Detection

I am returning the attached statement of work for revision in accordance with the following comments.

One objective of the MOL is to provide for tests of man's contribution to military missions in space. It is a stated MOL policy that orbital tests will be conducted only when it is determined, from all necessary studies and tests short of orbital, that it is both desirable and necessary to perform tests in space. These rules apply to the detection, identification, recording, etc. of electromagnetic signals, and this policy provides an objective framework within which a pre-Phase I must be defined and accomplished.

The Study tasks should include the following steps:

1. A preliminary estimate made of man's potential contribution to the mission of signal detection, based on the best current data as to signal environment, man's capabilities, etc., and using such simulations as can be accomplished within the time and funds available.

2. A preliminary determination made that man's potential contribution warrants pursuit of the necessary experiments. Since this determination will be made by the Secretary of Defense prior to the approval of the initiation of Phase I, the determination must be supported by results of a substantive comparison of man's capabilities helped by automatic

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MSF 64-955 2 Jul 64

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equipment against purely automatic equipment. Such a comparison should make use of existing tests and simulations, existing hardware, and suitable extrapolations to denser signal environment.

3. A preliminary identification of the questions which must be settled by further experiment.

4. A preliminary identification of those experiments, short of orbital ones, which appear to be required.

5. Preliminary designs and statements of objectives for the necessary non-orbital experiments, and an evaluation of their feasibility.

6. A preliminary identification of the orbital experiments that are thought to be necessary, with a statement of the criteria to be applied in determining whether these are to be performed.

7. Preliminary designs, and statements of objectives, for the proposed orbital experiments, and evaluations of their feasibility.

8. Development of a plan for Phase I. This plan will provide for detailed planning during Phase I of experiments as identified above, and for conduct of such non-orbital experiments as are determined to be necessary and to be [illegible]le within the period of Phase I. Criteria and data are to be developed in Phase I which will apply to decisions, at the close of Phase I, about the further experiments, including orbital ones, that will or may be conducted during Phase II.

The proposed RFP addresses only the question of feasibility, not the desirability of orbital tests. It raises the issue of non-orbital experiments only incidentally. It does not directly face the problem of defining the necessary experiments, orbital or otherwise, or of establishing criteria or data upon which to base the decision to conduct

MSF64-955

orbital experiments. In particular, the matter of signal environment is crucial to such decisions; the RFP does not provide for a realistic estimate of this environment, or for giving the contractor information necessary to make such an estimate.

One promising area for a contribution by man has been completely overlooked. It may not be practical to explore this area with the same contractors that are involved with the issues discussed above, but the matter must be considered: One advantage of the benign space environment is that a very large antenna could be supported by a light structure, provided it could be erected and adjusted. Man's best contribution might be in erecting and adjusting such an antenna outside a vehicle in orbit. Both the value of such an antenna to the electromagnetic mission, and the feasibility of managing its construction, must be considered as the MOL program takes shape.

It is implicit within this guidance that a clear analysis and summary of "man's contribution" in this area must be defined, taking into account the relative performance of man versus unmanned systems, the worth of "man's contribution," relative costs, confidence of success, comparative risks, and the probability that most of the penalties of the life support system are borne by other experiments.

Pre-phase I studies must conform to the criteria set forth above. A new RFP, or new RFP's as necessary, should be prepared accordingly for my approval. Every effort will be made to expedite approval upon their submission.

Brockway McMillan

BROCKWAY McMILLAN
Under Secretary of the Air Force

Attachment
Statement of Work for
MOL Experiments

MSF 64-955