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DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE UNDER SECRETARY

July 2, 1964

MEMORANDUM FOR COLONEL SCHWITZ, ASSISTANT FOR MANNED
ORBITING LABORATORY, AFRLMO

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 substan-
tive comparison of man's capabilities helped by automatic

UNCLASSIFIED AT 12 YEAR INTERVALS;
OR AUTOMATICALLY DECLASSIFIED
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M41
2 Jul
1964
MSF 64-951

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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 feasible 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

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MSF 64-951

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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. X

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.

Signed

BROCKWAY McMILLAN
Under Secretary of the Air Force

Attachment
Statement of Work for
MOL Experiments

3

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MSF 64-951