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DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045



15 June 1966

REPLY TO
ATTN OF:

SP-1

Studies of a "Wholly Unmanned" DORIAN System

Director, NRO (Dr. Flax)

Reference: WHIG 5063, 8 April 1966

RT DATA ENTERED
DATE 6/25/87
 MICROFICHED
DATE 6/26/87

1. The referenced message directed SAFSP to conduct (in-house and with two contractors) conceptual system studies of an unmanned reconnaissance satellite system utilizing the DORIAN optical sub-system. The system was to have at least 30 days on orbit and be configured to provide the same quality and quantity of reconnaissance-intelligence information as the MOL. Concurrently, General Schriever directed the MOL/SPO to develop a refined update of man's estimated ability to enhance the operational capability and cost effectiveness of the MOL baseline system, exploiting alternative manned payload concepts and exploring growth version potential. The results of these two efforts were presented to you and General Schriever on 7 June, and are here-with submitted in accordance with your instructions issued at that meeting.

2. Part I of the inclosed report was prepared by SAFSP in response to WHIG 5063, except for Appendix C which was prepared by the MOL SPO and is included for comparison and to show the range of variation in MOL SPO and SAFSP cost estimates, as discussed during the 7 June meeting. Parts II and III were prepared by the MOL SPO in response to General Schriever's direction previously noted. General Berg and I have mutually prepared this letter and agreed on the method of submission.

3. It is difficult to draw together direct comparisons of equivalent items in the inclosed data, due to a number of factors which are out-lined below.

a. Data Base: There is a considerable difference in program approaches. The SAFSP effort in Part I is the result of a 30-day



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pre-phase I study of the specific system considered herein, together with other closely related studies such as S-2, which have been in progress at varying levels of effort (some of which was funded at both contractors) for about two years. The SAFSP contractors and in-house approach resulted in an OCV designed specifically for the unmanned system. The MOL SPO configures an unmanned OCV on the basis of the MOL laboratory subsystems which would be required.

b. Cost Base: The MOL SPO cost estimates and the SAFSP cost estimates are obtained by a different procedure. The MOL SPO has "scrubbed down" the MOL contractors cost proposals, arriving at a lower SPO estimate of such costs. The SPO has then scaled this SPO estimate consistent with their estimate of the vehicle subsystems required for the wholly unmanned task. The SAFSP contractor cost estimates have been increased (by approximately 50% of the non-recurring costs) by SAFSP review, to cover more extensive engineering, testing, etc., considered necessary by SAFSP to obtain the specified performance.

c. Optimization: Except for the Mission Module, which is the same throughout, Part I pertains to a fully optimized unmanned system, whereas the MOL Program presently has as its basis a dual mode.

d. Degraded Mode: Although both the SAFSP unmanned approach and the present MOL Program both employ redundancy, the degree to which these systems can operate in a usable although degraded mode is not equivalent. As discussed in Parts II and III, the astronauts are expected to be able to maintain the on-orbit vehicle in a manual operating condition through many subsystem failures.

e. Reliability: There is not complete agreement between SAFSP and the MOL SPO on the predicted reliability of the unmanned system. SAFSP believes that full exploitation of the overall experience to date in unmanned systems, together with the degree of redundancy included in the SAFSP studies, and individual quality control testing of each vehicle can result in the high reliability noted in Part I. The MOL SPO believes that this reliability estimate is too high and is expected too soon.

f. Target Objectives and Coverage: In the unmanned mode all targets are pre-programmed. The same is true of the manned mode, except that the astronaut is expected to search out active indicators and supply special photographs of high intelligence value. In this manner, the manned operation could increase coverage of targets of special interest by a factor of three over the unmanned approach.

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g. Growth: While the SAFSP study did not examine any growth of the "wholly unmanned" system, it is considered to be limited. The manned version presently includes studies leading to such capabilities as ELINT, mobile targets, [REDACTED] tactical reconnaissance, multi-sensors, and, in addition, growth through the incorporation of a rendezvous capability.

h. The Utility of the Astronauts: Obviously, all contributions that only the astronauts can make will apply only to a manned system. Such potential includes all future growth involving structures assembled on-orbit, as well as rendezvous and re-supply. For these concepts, there is no unmanned equivalent.



JOHN L. MARTIN, JR
Brigadier General, USAF
Director

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1. BYE-67170-66, Sys Presentation, 7Jun66
2. BYE-67169-66, Effectiveness-Baseline, 14Jun66
3. TCS-32660-66, Analysis, 15Jun66
4. BYE-20450-66, 7Jun Briefing, 13Jun66

cc: Director, MOL
(General Schriever)

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