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DATE 6/22/87

May 19, 1967

MEMORANDUM FOR RECORD

SUBJECT: Presentation of Paper on Unmanned DORIAN System  
to Mr. Michaels

On 19 May I visited Mr. Bob Michaels, Staff Member of the House Appropriations Committee, to deliver upon his request a paper on an unmanned DORIAN system. I remained to answer any questions while he was reading it. Having read it, he raised the following questions:

1. How does a man get the information that he has obtained from on-board photographic processing to the ground without its being intercepted by the enemy? I described to him our secure voice system, as well as the differences between a digital and analog wideband readout system.

2. How can a man hope to be able to track and point better than a machine with the accuracies required for the MOL system? I explained to him our original concept of manual pointing and tracking. Then I described the contributions provided by the Image Velocity Sensor and the across-the-format IMC device. I also described our present low level of confidence in these devices and the methods by which man would be able to overcome failures. I also discussed the benefits of man's intelligence available in viewing alternate targets while the automatic system is operating properly.

3. How much time is available for picture taking per target, and does the astronaut have sufficient time to perform the tracking and pointing functions required? I stated that there are 18-20 seconds available on each target, depending on its location, and that we have done a large amount of simulation work to determine man's ability to point and track. We have found that 2-4 seconds are required for this function, depending on haze conditions. I also stated that simulations have shown that about 6 seconds are required for determining special activities at an alternate target location.

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Page 1 of 2 pages

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4. Upon my remarks that this program is moving already at a solid pace, which required commitments of large sums of money and any funding shortcomings have a serious and costly effect on highly complex contractor interactions, he asked how the system engineering function was performed. I briefly explained the roles of Aerospace Corporation and Douglas Corporation in systems integration.

After having studied the relative schedules of MOL and the wholly unmanned DORIAN program, Mr. Michaels summarized his feelings by stating that it was not worth saving a few hundred million dollars with the unmanned program for the price of all the uncertainties and the year-and-a-half delay in achieving our operational objectives. He concluded our conversation with the statement that although the Committee was trying very hard to find places to reduce the total appropriations requirement, the removal of man from MOL was not the way to do it; and, therefore, MOL would not be cut this year. He did not wish to retain a copy of our paper for his files.

  
MICHAEL I. YARYMOVYCH  
Technical Director  
MOL Program

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Referenced Paper

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May 19, 1967

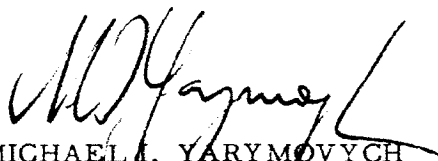
MEMORANDUM FOR RECORD

SUBJECT: Manned Versus Unmanned MOL Cost Comparisons

REFERENCE: Paper on "An Unmanned DORIAN System",  
dated May 16, 1967

As part of the preparation of a new estimate of costs and schedules on a wholly unmanned DORIAN system, the following estimates on costs have been made.

In the referenced paper, it is stated that total cost of the presently constituted bi-modal MOL Program is expected to be \$2.2 billion which is consistent with a recent congressional statement by Mr. McNamara. The corresponding cost of a wholly unmanned system, based on a 10-flight program, is stated at \$1.7 - \$1.8 billion. These figures are quoted for Phase II beginning with September 1, 1966. To arrive at a figure of approximately \$1.8 billion for the unmanned system, the basic MOL estimate of 14 April 1967 was used. It quoted a total of \$2.4 billion for a program with a 15-month extension from the baseline. Since this figure is a rough order of magnitude estimate and since the program is presently being redefined to a 12-month schedule slip, a \$2.2 billion figure would seem appropriate and the costs of its individual segments approximated by a 10% reduction from those which make up the \$2.4 billion. The specific cost figures used for the basic MOL and the unmanned programs are listed in Attachment #1. The estimates for the FY 68 requirements for the wholly unmanned system are listed in Attachment #2. They are based on a 1 July 1967 termination of the Douglas and McDonnell contracts and a new competition for an orbiting control vehicle.



MICHAEL I. YARYMOVYCH  
Technical Director  
MOL Program

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Page 1 of 1 page  
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Attachment 1

MANNED VS. UNMANNED MOL

COST COMPARISONS

From September 1966  
(Million Dollars)

	MOL (7 flights)	Unmanned DORIAN Program (10 flights)	Remarks
Experiments	338	378	Includes 10 payloads at \$8M
Mission Module	306	275	
Laboratory Vehicle	836	150	Costs to 1 July plus Termination @ \$43M
New OCV	---	450	\$250M plus 10 Vehicles @ \$20M
Gemini B	235	50	Costs to 1 July plus Termination @ 15
Titan III-M	332	390	Includes 10 Launch Vehicles at \$20M
Crew	12	---	
Test Operations	30	25	
Pre-MOL	3	---	
Aerospace	70	60	
Other	42	40	
<b>TOTAL</b>	<b>2204</b>	<b>1818</b>	

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Attachment 2

FY 68 REQUIREMENTS FOR  
UNMANNED DORIAN PROGRAM

Experiments	125	
Mission Module	50	
Laboratory Vehicle	45	Termination
New OCV	70	Competition & Start
Gemini B	15	Termination
Titan III-M	55	
Other	25	
TOTAL	385	

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