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DRAFT/H.Barfield/fp/13 June 67

MEMORANDUM FOR DR. FOSTER

SUBJECT: Questions on MOL

The purpose of this memorandum is to answer a question on MOL which you posed on 1 June as well as a second closely related question.

Question 1: How much could we possibly save in MOL if we were to have only unmanned flights for the first year?

Question 2: What would the program be if a decision is made now to go unmanned for all flights?

In answering these questions it is assumed that the primary concern is the FY 1968 funding level. Attached is a table of FY 1968 fund requirements for three cases. Case I is the present compact 12 month schedule which calls for first unmanned launch in December 1970. Case II assumes that the first two all up MOL launches would be flown in the unmanned configuration, followed by the three manned flights later in the program. Case III assumes that all manned flight considerations would be dropped from the present program.

Answer to Question 1: Referring to the attached table, an increase in cost would be expected in FY 1968 by flying unmanned first and maintaining the December 1970 launch date. Although not shown the total program cost would increase also since a major rescheduling is involved.

The most important consideration, however, is that man would not be present in early flights to assist in development of the desired capability - [REDACTED] resolution photography for reconnaissance purposes." This would

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most certainly degrade the MOL program by increasing the risk of developing the capability in only five flights. An unmanned program would normally take 6 - 10 flights to achieve the same operational capability.

The FY 1968 costs increase primarily because efforts would increase by about \$20 Million in the support module area. This increase covers the film transport, data return vehicles, the support module design and integration effort, and a backup design for the image motion compensation subsystem. Of course this would be offset in part by reductions in life support, target simulation, tracking scopes, and manned display and control features. The GEMINI B, TITAN IIIM and other support would not be expected to change since the GEMINI B qualification and launch vehicle development flights would be needed as now scheduled to provide program confidence.

Answer to Question 2: Deleting the manned configuration from MOL would require about 10 flights to demonstrate the required [redacted] resolution capability. These are the flights it is estimated would be needed for reliably flight qualifying the system. Although the first all up flight would occur on the same schedule as the present program, December 1970, the demonstrated operational capability of [redacted] reconnaissance photography would be delayed almost two years. A \$105 Million reduction in FY 1968 costs might be possible as shown for Case III of the attached table. It should be noted that the total program cost for an unmanned MOL involving 10 flights should be approximately \$400 Million less than the present program based on past studies. However, it must be remembered that \$135 Million has already been spent on the present MOL Program Definition (Phase I). A major change in scope such as is involved in this Case III would require repeating the program definition phase. Thus, the net saving by deleting the manned

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configuration from MOL is probably \$200 Million at most. (This difference might evaporate after another program definition phase).

Referring to Case III on the attachment, a new orbital control vehicle (OVC) is included and the Laboratory Vehicle is terminated as is GEMINI B. Total effort on the optics (Experiments) and Mission Module in FY 1968 is estimated to be only slightly less with reorientation as required to match the new OVC. TITAN IIIM and other costs remain the same. For Case III a 60 day on orbit capability would probably be desired so that the operational coverage of the unmanned vehicle would approach that of the manned MOL. This would impose additional reliability testing during development.

In summary, flying the unmanned MOL configuration first would not reduce FY 1968 costs, would increase total cost, increase technical risks, and probably delay the demonstration of the required operational reconnaissance capability.

Deleting the manned configuration from MOL completely would save perhaps \$100 Million in FY 1968 but at a delay of almost two years in demonstration of a useful [REDACTED] resolution. Total program costs this far into the MOL program might not be reduced significantly, because additional GAMBIT 3 systems would be required to provide high resolution photo coverage for an additional year.

At this point in time there is real doubt that any program can be constructed that will achieve the required capability -- manned or unmanned -- more economically than MOL, regardless of when the required capability is desired.

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TABLE

FY 1968 Funding -- \$ Millions

- I - Compact 12
- II - Unmanned first, manned flights follow
- III - Unmanned completely

	<u>Case I</u>	<u>Case II</u>	<u>Case III</u>
Experiments	110	115	115
Mission Module	70	70	60
Lab. Vehicle	175	180	45
New OCV	---	---	75
GEMINI B	54	54	11
TITAN IIIM	44	44	44
Other	<u>27</u>	<u>26</u>	<u>25</u>
TOTAL	480	489	375
POTENTIAL SAVINGS	0	-9	105

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