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THE SECRETARY OF DEFENSE  
WASHINGTON

**DRAFT**  
**APRIL 17**

*Dr. Molless has seen*

MEMORANDUM FOR THE PRESIDENT

SUBJECT: MOL

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I recommend that we reorient the Manned Orbiting Laboratory (MOL) as follows. We should continue to develop the very high resolution camera system as part of an unmanned, covert satellite system in the National Reconnaissance Program. We should cancel all elements of the overt Manned Orbiting Laboratory Program and announce that we are doing this partly to conserve funds, partly because the program has slipped 2 1/2 years since first started, and partly because we can now pursue many of the original objectives with less expensive, unmanned systems. If we redirect in this way, we will save at least \$350 million of the \$525 million now budgeted for MOL in FY 70, and \$400 million more in the FY 71-74 period.

Before the March reduction in the DoD budget, the MOL Program included development of both manned and unmanned versions, with emphasis on the manned version. At that time, we revised the program to include four manned reconnaissance flights of 30 days or more duration. This program deferred further development of the unmanned version but retained the option of later converting it to an unmanned configuration.

I have just reviewed in detail the following program options:

1. The previous MOL Program which included both manned and unmanned versions (the unmanned capability has never been publicly announced).
2. Our revised MOL Program of proceeding at this time with only the manned version.

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3. A satellite system, optimized to be unmanned, using the MOL camera and maintaining the present development pace.
4. An optimized unmanned system proceeding at a slower development pace.
5. Cancellation of all activity.

We also considered two other options but rejected these as much too expensive in the long run. One of these would slow down the present manned program to a sustaining level in order to reduce FY 70 costs. The other would proceed first with the unmanned version of MOL and maintain the option for subsequent development of a manned system. Another argument against this latter option is that a major motivation for including the man has been his contribution in checking out the system.

The following table compares the schedules and remaining costs of the five options that should be considered. Sunken cost to date is about \$1200M.

<u>Option</u>	<u>First Operational Launch</u>	<u>One-time R&amp;D Costs to Go</u>	<u>Cost per Launch</u>	<u>FY 70</u>
Previous MOL (manned and unmanned)	Early CY 72	\$1175M	\$130-140M (110M Unmanned)	\$576M
Present MOL (manned only)	Mid CY72	\$1050M	\$130-140M	\$525M
Optimized Unmanned (present pace)	Fall CY 72	\$600M	\$70M	\$260-275M
Optimized unmanned (slower pace)	Early CY73	\$650M	\$70M	\$150-175M
Cancel all	--	\$25M*	--	--

\*Termination costs which could not be covered by presently available MOL funds.

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The cost of the unmanned system, both one-time and recurring, are lower because this system does not need to provide life-support systems for the astronauts. Instead, the film would be retrieved with reentry capsules as is done with other photographic satellites. The unmanned system would use the TITAN III-D booster and launch pad being developed for HEXAGON instead of the more expensive MOL/TITAN III-M facility. It probably would also use the HEXAGON spacecraft which has been kept compatible with the MOL camera and payload.

A manned MOL system would have certain advantages in both development and operation. In order to achieve [REDACTED] resolution, a number of critical camera functions must be performed with great precision. We are more confident that these can be performed by the astronauts than by automatic systems we are developing. Such functions include:

1. Pointing the camera at a target with an accuracy of better than 2000 feet.
2. Tracking the target with the camera in order to eliminate smear in photographs.
3. Aligning and focusing the optical system on-orbit.

If all the automatic devices meet their specifications, the very best resolution of the manned and unmanned systems will be nearly the same (approximately [REDACTED]). The manned system will always average about 10 percent better resolution at the aiming point, since accurate pointing is a simple task for the astronauts (the resolution degrades somewhat from the center of the picture toward the extremities). There is no question of the technical feasibility of these automatic devices; however, specified performance may simply take longer to achieve reliably. We are confident we will achieve at least some [REDACTED] photography during the first flights.

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The astronauts have additional advantages during operational flights. They can adapt the reconnaissance to weather and activity observed on the ground. Since the camera only covers a circle on the ground about 1 1/2 miles in diameter per photograph, and since the satellite is moving at a rate of four miles a second, the system can only photograph a few installations on one pass over an area such as Moscow or a large missile test range. The astronauts could observe through separate viewing telescopes which priority targets are cloud-free and which ones have activity of unusual intelligence value. Additionally, the astronauts could visually reconnoiter ground targets, could selectively choose either color or black and white film, [REDACTED]

In summary, the astronauts in a manned system would increase the likelihood that we will get very high resolution sooner, that we would photograph some important targets in a more timely manner, and that we would have additional flexibility not practical in an unmanned system.

The following table compares the performance of the manned system, a system optimized to be unmanned, and what we expect from GAMBIT, our current best high resolution system:

System	Best Resolution	Days on Orbit	Priority Targets/Day	Cost/Launch	Cost/Significant Target
Manned	[REDACTED]	42	95	\$130-140M	\$35K
Unmanned	[REDACTED]	45	80	\$70M	\$19K
GAMBIT	[REDACTED]	20	90	[REDACTED]	[REDACTED]

As you can see, after we have written off development costs, the cost of the unmanned system and the GAMBIT system are roughly comparable for significant targets, and the resolution of the unmanned system is much better.

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I believe that it is important that we pursue a very high resolution system either through the manned MOL system or a system optimized to be unmanned. This resolution will provide many critical fine details which will allow us to determine a number of performance characteristics of emerging Sino-Soviet weapons systems well in advance of any operational tests, field deployment [REDACTED]

[REDACTED] If we achieve an agreement on arms limitation, the resolution will greatly increase our confidence that the agreements are being observed or it will probably indicate suspicious activity.

Despite the implicit value of a manned military space program, and the anticipated earlier reliability and greater flexibility of the MOL reconnaissance system, I reluctantly conclude that we should pursue an optimized unmanned configuration. For the past year and a half, the MOL development has been at the stage where annual investments over half a billion dollars must be made to realize progress. An unmanned development would reduce FY 70 expenditures by at least \$350 million and FY 71-74 costs by perhaps \$400 million more. The lower cost of this unmanned very high resolution system and the deployment of HEXAGON might allow us to phase out the GAMBIT system once the two new systems achieve their desired performance and reliability levels.

If we proceed at our current development pace with a system optimized to be unmanned, we should achieve a first launch by the fall of 1972. Slowing down somewhat may delay first launch by six months or so, but will reduce development risks and allow us to further refine the technical design of the unmanned system. Accordingly, I recommend the slower pace.

If we do pursue the unmanned option I have recommended, a number of contractors will have to lay off personnel. I have listed below the major contractors, their role in the program, and the probable lay-offs which would result. One consequence is that overhead costs on other Defense contracts will be increased.

There are currently four major contractors working on MOL:

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1. McDonnell-Douglas in Huntington Beach is developing the basic spacecraft and in St. Louis is developing the Gemini B astronaut recovery system. Respectively, 4300 people and 1200 people lay-offs.
2. Martin in Denver and several associate contractors are developing the TITAN III-M booster. 2600 people lay-off.
3. General Electric in Valley Forge, Pennsylvania is developing the camera controls needed for both manned and unmanned systems. 1000 people lay-off.
4. Eastman Kodak in Rochester, New York is developing the camera and optics. This is a covert activity. 300 people lay-off.

Additionally, perhaps 2500 1st-tier Sub-contractors in various areas of the country would be terminated. In all, about 12,000 people would be laid off. The greatest impact probably would be on McDonnell-Douglas in California and General Electric in Valley Forge where there is little other Air Force or NASA work to take up the slack.

The estimated savings of an unmanned system assume a decision on 1 May. Currently, we are spending \$45 M per month on the MOL program. If we delay the decision, the savings erode at a rate of about \$1.25 million per day.

Since the unmanned option is a public termination of MOL and either cancels or reduces several major Government contracts, some public announcement would be needed. There would be two broad options;

1. Announce that the entire program has been terminated and that savings will be about \$500 million in FY 70. Under this option, we would need to hide the \$150 million or more in other FY 70 budget elements.

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2. Announce that the manned component of MOL has been terminated but that we will retain a program and perform a number of experiments in unmanned systems. In this case, we would announce the actual saving of roughly \$350 million in FY 70.

If you approve my proposal to proceed toward an unmanned satellite system using the MOL camera, in order to protect the security of the National Reconnaissance Program, I recommend that we announce termination of the MOL Program and announce savings close to \$500 M in Fiscal Year 1970 (simultaneously, we must increase other elements of the DoD budget \$150-175 M to fund the covert development of the unmanned system).

Just prior to or coincident with a press release, I would advise the Chairmen of the appropriate Committees, and our Legislative Liaison people should notify the Congressmen from the States most seriously affected. The press release, which can be made from either the White House or my office, should make the following points:

1. We have terminated the MOL Program with savings close to \$500 M in the forthcoming Fiscal Year.
2. We have terminated because of delays and cost increases in the program and because, in the meantime, technology has given us the option of achieving many of our objectives with lower cost, unmanned systems.
3. We will conduct some of the experiments planned for MOL in other unmanned Defense spacecraft that we have or are developing.

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