EXECUTIVE OFFICE OF THE PRESIDENT
BUREAU OF THE BUDGET
WASHINGTON, D.C. 20503

FEB 13 1969

Honorable David Packard
Deputy Secretary of Defense
Washington, D. C.

Dear Dave:

I have made a preliminary review of the major programs in the Defense intelligence program area based on the earlier FY 1970 Budget decisions. I recommend that you give the items enclosed your special attention in our effort to reduce the FY 1970 Budget.

There are three large programs which have high potential savings. Papers are enclosed discussing the Manned Orbital Laboratory (MOL); the HEXAGON system; and reconnaissance drone procurement. In addition, there are five other items which I believe you should include in your review. They are being provided to your staff separately.

I would be happy to talk to you about these programs after you have finished your own review. My staff is available to work with your people in developing additional information on these items.

Sincerely,

Robert P. Mayo
Director

Enclosures

~~TOP SECRET UMBRA~~

THE RELATIVE VALUE OF THE MOL FOR
U.S. FORCE STRUCTURE DECISIONS

FEB 12 1969

Background

Since 1965-1966 when the decision was made to pursue the MOL for its intelligence value, the relative benefit and the cost of the MOL have changed very significantly. (1) The other operating photographic satellite which is competitive with the MOL, the GAMBIT-3, has improved significantly both in terms of resolution and in terms of days on orbit per mission. (2) Further improvements in the high resolution GAMBIT-3 are planned and would be possible at far less cost than the MOL. In addition to the improved alternative photographic capability to the MOL, there has been a very large expansion of development of SIGINT satellite effort to provide information about major Soviet and Chinese weapons systems, against which the MOL will also be primarily targeted and justified. (3)

In 1965, the estimated total cost of initial program of 7 launches (4 unmanned) was $1.5 billion. It is presently $3.2 billion. (1) The benefit or value of the MOL [redacted] photography, compared to that of the present [redacted] photography of the G-3 was seriously questioned by the DCI in May 1968 (BYE-1419/68a) (4) In December 1968, a Department of Defense evaluation group under DDR&E argued that MOL would enable some increased force effectiveness and permit U.S. to plan less conservative and

not clear

cy 2B

therefore less expensive forces (BYE-78445-68A). (5)

The issue:

Would the MOL's [redacted] design resolution, if eventually achieved, provide sufficiently important additional intelligence on Soviet and Chinese weapons systems that the benefit to U.S. force structure decisions would justify the very high cost of the MOL? (6) If the marginal value does not justify the increasing cost, the MOL program should be terminated, with FY 69 and FY 70 savings of about $800 M and a total saving of about $2 billion. A decision on the issue should address at least the following considerations:

(1) The marginal value of the MOL photography over the high resolution photography produced by the competitive GAMBIT-3. (7)

(2) The highly important SIGINT information on Soviet and Chinese missile systems [redacted]

(3) Whether the marginal improvement in information against a few targets, (9) produced by the MOL, would lead to higher confidence in our knowledge of enemy forces

and therefore less conservative (and therefore less expensive) U.S. force structure decisions, or whether the U.S. may well continue to rely heavily not only upon limited intelligence available but also upon estimates of what Soviet technology is reasonably capable of posing as a threat by the time the U.S. system is deployed.(10)

The issue is discussed below.

Discussion

There are serious questions about the value of MOL photography to U.S. decisions about size and design of U.S. forces for at least three reasons:

(1) [redacted](1) Yet perhaps the basic intelligence justification of MOL is that it will provide better information on such Soviet and Chinese strategic weapons. Some of those weapons' most important characteristics (such as accuracy) are more precisely and

[redacted]

often exclusively determined through SIGINT.(12) Other important information (such as numbers of missiles and deployment pattern), accessible through photography, is either quite adequately or more easily collectable with high resolution GAMBIT-3 [redacted] design resolution presently, to be improved to [redacted] in 1971) and with the search capability of the CORONA system.

(2) GAMBIT-Cubed (G-3), the presently operating high resolution photographic satellite will provide a resolution capability very close to that of the much more expensive MOL.(13) Beginning with G-3 vehicle #34 in 1971, a new lens (R-5) will be introduced that will have a design resolution improved from the present [redacted]

The improvements in the resolution and orbital life of the proficient G-3, not easily foreseen at the outset of the MOL development, make it highly questionable that the MOL's marginal improvement beyond an already impressive capability is worth the huge cost.(14)

The MOL is planned to have a 30-day and later a 45-day life. The G-3, beginning with vehicle #23 in July 1969, will have a capability to go to 18-20 days.

Even if the G-3's orbital life were not extended beyond 20 days with fuel cells or other changes, over a year it would be much cheaper to fly more G-3's than MOL's (15) (G-3 at [redacted] launch versus MOL at $120-150 M/launch (16). However, the G-3's orbital life might be extended beyond 20 days by a modification program which, although presumably not cheap, would still leave the G-3 much less costly than the MOL.

Presuming the [redacted] design resolution of the G-3 is adequate, the G-3 would, primarily because of its larger area coverage (20 sq. mi. vs. 1.3 sq. mi.), photograph as many and probably more targets per orbit as the MOL (17).

A larger number of G-3 launches per year would have the advantage of shorter gaps between collection missions during a year (18).

Finally, if there is a significant risk that the permissive environment for satellite reconnaissance, observed by the U.S. and U.S.S.R., might be jeopardized by manned satellite reconnaissance over the U.S.S.R. or other countries, the G-3's unmanned nature would be an advantage over the MOL (19).

The competing capability of the high resolution G-3 can be seen through the following table:

	Cost/Launch	Design resolution	Orbital life	Targets per day (approx.)	Swath width on ground
G-3	[redacted]	[redacted]	20+ days	330 -400	5 n.m.
MOL	$120-150 M		30-45 days	Not available	1.5 n.m.

(3) U.S. strategic forces (Minuteman, Poseidon, B-52's) are designed and sized upon conservative, high confidence assumptions that would probably not be significantly affected by MOL photography. This is because of (a) the conservative nature of U.S. calculations for providing U.S. an assured destruction, second strike capability (e.g., consideration of worst case Soviet first strike on U.S.) and/or (b) because of the limited value of photography, better than G-3, compared to SIGINT in measuring important parameters of Soviet and Chinese missile threats to U.S. capabilities.

Assured destruction is the principal criterion or minimum objective upon which U.S. strategic forces are designed and sized. This criterion required that, under very pessimistic assumptions about Soviet weapons and tactics, the U.S. can with high confidence kill 20% to 25% of the Russian population after a surprise first strike on our strategic

offensive forces by the Soviets. Of course, the assured destruction calculations take into account Soviet ABM capabilities, presently observed and prospectively possible.

The U.S. has already--by its commitment to Poseidon and Minuteman III--built substantial hedges into U.S. forces against greater than expected Soviet ABM. A recent study by Systems Analysis in OSD concludes that "very large increases can be tolerated in projected Soviet forces, especially their ABM's, before major new outlays on U.S. strategic forces would be required" (p.3, B-77827-69). (22)

Because of the unavoidable leadtime (e.g., 5 years) from design to deployment of U.S. strategic weapons, even with somewhat improved intelligence on presently observable R&D or deployed targets in the U.S.S.R., the U.S. must take into account what the Soviets could do, for example to improve their ABM or introduce MIRV's on a wide scale, within the expected state-of-the-art and resource limitations. (23)

These educated quesses about future Soviet capability will continue to be an important input to U.S. force structure decisions and, if high confidence in assured destruction is to be maintained, then only marginally improved photography on present Soviet or Chinese weapons

or equipment will not lead the U.S. to neglect worst case possibilities in the future. (23)

The Soviet forces which influence the U.S. calculations about weapons needed to provide assured destruction are:

(1) ballistic missiles (land and sea based)

(2) ABM defenses

(3) Air defenses

(4) Antisubmarine warfare capability

An examination of the major threat related characteristics or parameters of the above Soviet forces indicates that either:

(1) present and improved photography (G-3 and CORONA/HEX) is adequate to determine or measure the parameter, or

(2) photography of even [redacted] will not measure the parameter because, not being an Xray, photography by its nature only records external features. (e.g., [redacted], or

(3) MOL photography would make a significant but not essential or major contribution to the determination or measurement of a threat-related parameter, or (24)

(4) SIGINT (ELINT, COMINT), RADINT, or HUMINT can provide the only or by far the most precise measurement of the threat parameter in question (e.g., radar signal characteristics).

Using these 4 conclusions, the following table illustrates how the 4 conclusions relate to specific major threat-related characteristics of Soviet ballistic missiles and ABM system:

Weapon System	Threat Parameter	G-3/HEX adequate	Not amenable to even [redacted] Photog.	MOL contr. significant	SIGINT, RADIN or HUMINT only or best source
Ballistic Missiles and ABM Missiles	Number of launchers/silos of MRVs or MIRVs	X	X		X
	Accuracy (CEP)		X		X
	Reliability		X		X
	Warhead and yield		X		X
	Vulnerability of RV				X
	Silo			?	X
ABM System Radars				?	X
Air Defense Radars: Ground and downward looking Air/ Borne warning and fire control radars	Numbers Discrimination & traffic handling capacity, range, etc.	X	X		X
Intercept Missile (e.g., SA-5)	Numbers	X			
	Missile characteristics (e.g., fire power, reaction time, max. alt.)		X		X

The analysis above indicates that, given the availability of G-3 and CORONA/HEXAGON, the MOL would not have significant

additional value for U.S. force structure decisions in part because of the low likelihood that some components would be exposed (e.g., chaff, RV) as a target of opportunity for MOL. It is noteworthy, for example, that the U.S. has never seen with high confidence a GALOSH (presumably ABM) missile outside of its cannister. (2) MIRVs, decoys, chaff, etc., are almost always under windshields when boosters are on test pads. MOL would not make a major contribution to strategic threat analysis for another reason: important information (e.g., precise radar characteristics, weapons yield, accuracy, refire rates, operational doctrine) is collectable only through SIGINT, RADINT, or HUMINT.