OFFICE OF THE SECRETARY OF DEFENSE

14 November 1968

MEMO FOR Mr. Nitze

Paul,

In accordance with your instruction, we are preparing an analysis of the [redacted] I plan to have this review delivered to you next Tuesday (November 19th). Please advise if this is not satisfactory. Unfortunately, I will be away at the time, as will Al Flax, but each of us will provide our contribution to Gardner Tucker before leaving, and he will be responsible for delivering it to you.

You will recall that Fred Hoffman indicated that [redacted] would be coming back to you on the HEXAGON issue. Accordingly, I have agreed with Hoffman to develop a common basis for analysis, and hopefully to be included in a common staff paper. The date for the second paper is not set. I leave this to [redacted]

BY [illegible]

cc Dr. Flax [redacted]

2 4

[redacted]

File 1968 Papers

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM

[redacted]

✓1) Commex Study of H

✓2) NIRB ~~Study~~ of H

✓3) My memo to Nitze re NIRB ~~Study~~ of H

✓4) CCRP memo from me to Helms & cover from Nitze to Helms

5) Please also provide an analysis of the BOB interpretation of "current requirements" and the degree to which they are met by G+C

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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

THE NRO STAFF

13 November 1968

MEMORANDUM FOR DR. FLAX

SUBJECT: Future NRP Satellite Imagery Systems

Purpose.

To provide an evaluation of the Bureau of the Budget (BOB) draft, see TAB A, regarding the choice of satellite imagery system mixes which will be operational during the period of FY 71 through FY 74.

Background.

USIB HEXAGON collection requirements are contained in USIB-D-41.14/294, dated 21 June 1966, see TAB B; USIB D-46.4/3, dated 5 January 1968, see TAB C; and USIB-D-46.4/13, dated 4 April 1968, see TAB D. These requirements statements are validated by the National Intelligence Resources Board assessment of the intelligence gain provided by the KH-9 over the KH-4 and KH-8, dated 22 July 1968, see TAB E.

The majority of data contained in the paper was obtained from these requirements documents and from statements of actual and estimated performance provided by CIA/OSP, SAFSP, and the DNRO Staff.

Alternatives.

The alternatives presented by the paper are:

ALTERNATIVE I	ALTERNATIVE II
Cancel HEXAGON	Buy 5 HEXAGON
Buy 7 CORONA	Buy 5 GAMBIT
Buy 6 GAMBIT	

~~CORONA/GAMBIT/HEXAGON~~

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Discussion.

This discussion is limited to a detailed inspection of the subject paper's interpretation of USIB requirements statements, an assessment of the validity of its interpretation of the USIB requirements, and a verification of NRP collection potential by the HEXAGON, GAMBIT, and CORONA systems as presented in the BOB position paper.

The BOB draft presents an accurate assessment of the latest USIB-approved surveillance and technical intelligence collection requirements and the satisfaction of these two requirements by a GAMBIT/CORONA and by a GAMBIT/HEXAGON system mix.

The BOB paper does not directly assess the GAMBIT/CORONA satisfaction, or lack of satisfaction, of the 2.5 to 3.5 foot ground resolution area search requirement. Nor does it address the interpretability trade-offs which occur between 3 and 5 foot ground resolution. Neither does it consider the operational trade-offs which occur in the GAMBIT/HEXAGON combination in the 1 to 5 foot resolution range. Furthermore, the paper questions the validity of the USIB high-resolution search requirement and attempts to evaluate the ability of the exploitation community to interpret this quality of imagery and then to produce usable intelligence from it.

An optimistic double-bucket GAMBIT operational capability is projected by the paper--it assumes all system design goals, including resolution improvement and life growth to 20 days, will be realized. Conversely, it questions HEXAGON's ability to meet the current system design specifications, e.g., the range of ground resolution is given as 2.7 feet at nadir to 8 feet at 60 degrees obliquity in the BOB paper, when CIA/OSP quotes 2.3 to 4.6 feet for the same camera positions with HEXAGON operating at its nominal mission perigee of 82 nautical miles.

The last major discrepancy is that the paper applies the degrading effects of cloud cover, haze at obliquity, and decline in resolution with obliquity to HEXAGON performance estimates, but it does not apply these natural phenomena to other photographic satellite collection systems. Additionally, the paper criticizes the fact that

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adjacent HEXAGON revolutions over a specified area of interest are displaced approximately 22.5 degrees in longitude, while all near-earth photographic satellites must observe this same physical law.

Recommendation.

In view of the requirement for 2.5 to 3.5 foot ground resolution for area search, it is recommended that the DNRO continue to pursue the projected GAMBIT and HEXAGON schedules.

RUSSELL A. BERG
Brigadier General, USAF
Director

Attachment
Detailed Analysis of
BOB Position Paper

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DETAILED ANALYSIS OF BOB POSITION PAPER

First Section: The Need for the HEXAGON Photographic Satellite.

Note 1, Page 1.	MOL ground swath width is 1.5 nautical miles.
Note 2, Page 1.	CORONA swath width averages 120 nautical miles in the Bloc and mission life is 18 days.
Note 3, Page 1.	HEXAGON resolution is expected to range between 2.3 and 4.6 feet.
Note 4, Page 3.	CORONA/GAMBIT does not meet high-resolution search requirements.
Note 5, Page 4.	Does not address additional surveillance requirements levied by USIB for HEXAGON. Tab B et al.
Note 6, Page 5.	Misstatement of HEXAGON resolution. See Note 3.
Note 7, Page 5.	But not at the specified high-resolution.
Note 8, Page 6.	Limitations of HEXAGON are equally degrading to CORONA and GAMBIT because all are subject to the same physical laws as the paper states in the next sentence. As presented in the paper, it is a gratuitous statement.
Note 9, Page 7.	Adjacent revolutions of 22.5 degrees longitude displacement is common to all near-earth orbits for photographic satellites.
Note 10, Page 7.	There is no stated requirement for this type of coverage but, if there were, HEXAGON would be the most effective collection system.

Note 11, Page 7. HEXAGON's variable sector scan should provide a significant increase in cloud-free photography.

Second Section: Issue: Termination of HEXAGON.

Note 12, Page 1. Incorrect resolution figures again. Slightly optimistic for GAMBIT and slightly pessimistic for HEXAGON.

Note 13, Page 3 Present and any proposed improved CORONA does not satisfy the 2.5 to 3.5 foot resolution search requirements.

Note 14, Page 5. This is an optimistic viewpoint of double-bucket GAMBIT and assumes that all proposed specification values are achieved or exceeded.

Note 15, Page 6. For the same 18-day period, HEXAGON would access the whole Moscow area eight or nine times, about a 50 percent increase.

Note 16, Page 7. Thoroughly concur.

Note 17, Page 7. This completely ignores that this HEXAGON resolution is a twofold improvement in ground resolution and hence a substantial improvement in imagery interpretability. It is noted by STAFF. that DORIAN also provides approximately a twofold increase in resolution.

Note 18, Page 7. HEXAGON resolution misstated again.

Note 19, Pages 9 thru 16. This entire section of the BOB paper refutes the validated requirements of the intelligence community, especially in the areas of Soviet and

Chinese force levels, violations of disarmament agreements, mobile ICBM target problems, and a general enhancement of our intelligence on a number of significant other problems.

OPTIONS	I	II	III	IV	V	Minimum Requirement
GAMBIT	4	4	3	3	4	
HEXAGON	4	3	3	4	2	
Percent Satisfaction HEXAGON Surveillance (64 Percent CCRP)	98	95	95	98	88	80 Percent
Percent Satisfaction GAMBIT Surveillance (36 Percent CCRP)	83	83	72	72	83	None Stated
Percent Satisfaction Overall Surveillance	92.5	90.7	86.8	88.6	86	None Stated
Percent Satisfaction Search, 6-Month	89	84	84	89	75	80 Percent
Percent Satisfaction Search, 12-Month	98	96	96	98	92	80 Percent

Assumes 18-day GAMBIT life and 30-day HEXAGON life.

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~~CORONA/GAMBIT/HEXAGON~~

COMIREX-D-11.1/2
1 July 1968

MEMORANDUM FOR: Committee on Imagery Requirements and Exploitation

SUBJECT : Assessment of the Intelligence Gain Provided by KH-9 over KH-4 and KH-8

REFERENCES :
a. USIB-D-41.14/294, COMOR-D-13/63, 21 June 1966
b. USIB-D-46.4/13, COMIREX-D-14.4/1, 27 March 1968, Memo to Holders of USIB-D-46.4/13, dated 4 April 1968, BYE-047-68/2
c. USIB-D-46.4/3, COMIREX-D-13.7/4, 5 January 1968

I have forwarded the subject paper (copy attached) to the Chairman, National Intelligence Resources Board, with the following note attached:

> "All members of COMIREX have reviewed and commented on earlier versions of this paper. Substantial changes were made incorporating their views and this version has the final coordination of the CIA member and the DIA member, who in turn reflected the views of the three military services. I believe that it reflects the main views of the intelligence community, but, if any additional small points emerge that would affect the substance of the paper, I will let you know."

William A. Tidwell
Chairman
Committee on Imagery Requirements and Exploitation

Attachment

Copies 2, 3	State TCO	13, 14	AFNIN TCO
4	DIA (Mr. Hughes)	15, 16	NSA TCO
5, 6, 7, 8	DIA TCO	17, 18, 19	SAFSS TCO
9, 10	OACSI TCO		
11, 12	ONI TCO		

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COMIREX-D-11.1/2

1 July 1968

MEMORANDUM FOR: Chairman, National Intelligence Resources Board

SUBJECT: Assessment of the Intelligence Gain Provided by KH-9 over KH-4 and KH-8

REFERENCES:

a. USIB-D-41.14/294, COMOR-D-13/63, 21 June 1966

b. USIB-D-46.4/13, COMIREX-D-14.4/1, 27 March 1968, Memo to Holders of USIB-D-46.4/13, dated 4 April 1968, BYE-047-68/2

c. USIB-D-46.4/3, COMIREX-D-13.7/4, 5 January 1968

1. COMIREX was requested to assess the significance of the intelligence to be derived by the KH-9 beyond that which could be obtained by the combined use of the KH-8 and KH-4 systems. In summary, it is evident that the KH-9 in combination with an improved KH-8 will provide highly significant intelligence information in support of national needs that cannot be obtained by the combined use of KH-4 and KH-8. Our judgment in this matter is based in large part on a consideration of anticipated needs for reconnaissance in the 1970-75 time frame.

2. Analysis of information derived from current satellite systems has been a significant factor in the determination of Bloc military capabilities and in the development of a sound intelligence basis for the formulation of U.S. national policy and the structuring and deployment of U.S. military forces and weapons systems. We find ourselves in a period in which our high resolution KH-8 system* is functioning reliably and is

* High resolution coverage in this paper is defined as photography with a resolution range of one to five feet.

permitting the production of a large and increasing volume of excellent quality intelligence. During this same period the KH-4 is producing improved resolution, although this improvement is still far short of the resolution that the KH-9 system is intended to provide. If these current satellite systems are judged against the currently approved collection requirements which were established in the context of current systems capabilities, it is clear that they have performed well and that they have the growth potential to meet a substantial future increase in the same type of requirement. The currently approved statements of requirements, however, have tended to stress intelligence needs for:

a. Search of large areas with medium resolution and wide swath to detect suspicious activities.

b. Follow up photography with high resolution, to identify the nature of the activity.

c. Surveillance coverage of large numbers of specific priority targets by high resolution, narrow swath photography.

In spite of the general adequacy of existing systems in meeting these stated requirements, unanswered intelligence problems exist and we anticipate that important problems will arise in the the future which could be better solved, or solved only, by a capability to examine closely, collectively, and nearly simultaneously the entirety of large geographic areas with high resolution coverage. Such a capability would support the assessment of the deployment and inter-relationship of complex military systems and forces. Up to the present time we have not developed detailed requirements for such a system because of the lack of a capability to acquire such imagery by satellite. We recognized the potential need for such a system, however, when we generated the requirement outlined in reference a. above.

3. It is particularly important to emphasize that our current requirements have been developed on the basis of current capabilities and those problems within the range of these capabilities.

Thus, these requirements have not taken into full account such changes in collection needs as might result from unexpected changes in the military situation or from a skillful effort to employ camouflage or an agreement involving arms control and disarmament inspection. In addition, the Department of Defense, particularly in support of the Unified and Specified Commands, has requirements for high resolution coverage of many areas needed for timely contingency planning. However, current capabilities and national priorities for satellite and airborne systems have generally prevented satisfaction of these requirements.

4. In view of the foregoing, our principal considerations pertinent to assessing the value of the KH-9 included but were not limited to:

a. The capabilities and limitations of current satellite systems,

b. The changing dynamics of intelligence requirements, and

c. The major requirements for photography in support of basic intelligence, scientific and technical intelligence, and mapping, charting, and geodesy.

5. Also considered were the increasing constraints being imposed or considered for various political, economic, or technical reasons on many intelligence collection resources. In the light of this trend, we believe that a satellite reconnaissance capability to cover broad areas with high resolution photography would help us to acquire information formerly collected by other means and in some instances substitute for the diminishing level of airborne reconnaissance being accomplished by high altitude strategic systems today.

6. The evidence supporting the judgments in paragraphs 1 and 2 above is considered in greater detail in annexes to this paper covering the following subjects:

Annex A - The Role of Resolution

Annex B - Quality and Quantity of High Resolution Surveillance

Annex C - Search for Unknown Targets

Annex D - Determination of Military Capabilities

Annex E - Support to Mapping, Charting, and Geodesy

Annex F - Additional Benefits to be derived from the KH-9

William A. Tidwell
Chairman
Committee on Imagery Requirements and Exploitation

Attachments

COMIREX-D-11.1/2
Annex A

The Role of Resolution

1. We have considered the range of intelligence problems which can be satisfied with photography of varying ground resolution, and the fact that the KH-4, KH-8, and KH-9 systems represent overlapping capabilities against some problems. In particular we have noted that the design specifications for the KH-9 system call for high resolution coverage 2.3 feet or better in the 140 mile center segment of the total access swath. This is contrasted to the 6 to 9 feet resolution provided at best across a swath of 115 miles by the KH-4B.

a. For some intelligence problems such as the detection of construction of new ICBM silos or of SA-5 complexes, medium resolution photography acquired by the KH-4 system meets minimum needs, and from a resolution standpoint, of course, would be met by photography from the KH-8 and KH-9 systems.

b. There are problems relating to military capabilities such as those related to tactical aviation, submarine operations, ground forces, and activities at missile support complexes, for which photography having better resolution than the KH-4 is needed, but which generally can be met satisfactorily with photography of about 2 1/2 to 3 foot resolution. Currently the KH-8 is the only satellite system being employed successfully against these particular problems.

c. On the other hand, there are other important target categories and problems for which photography, on the order of the best resolution of the KH-8, is needed and could not be met by the resolution of the KH-9. In general these relate to objects, or technical details of equipment or systems.

2. With respect to the criterion of ground resolution alone, and the question of the relative value of the three systems

in that regard, we judge that perhaps a third of our minimum needs could be met by the KH-4 alone and that 70 to 80 percent could be met by the KH-9 alone. In addition, 20 to 30 percent require the unique high resolution capabilities of the KH-8 and cannot be satisfied by the other two systems. We recognize the difficulties and uncertainties involved in any attempt to quantify this particular relationship; these judgments provide only orders of magnitude, not precise delineations.

3. The essential trade off between the KH-8 and KH-9 system and the one most difficult to measure, of course, is that while the KH-8 provides higher resolution photography of targets in a relatively smaller but nevertheless considerable number, the KH-9 with relatively poorer but nevertheless still high resolution offers a much larger volume of target coverage. At the same time the KH-9 is unaffected by the problems of target conflict in areas of high target density, which is one of the drawbacks of the KH-8 system.

4. If the KH-9 system were operating, it not only would replace the KH-4 in the latter's area coverage role, but would be able to meet a large number of the requirements now specified in the CCRP for the KH-8 system. KH-8 collection could be lessened correspondingly and concentrated more selectively on specialized target problems, particularly those relating to scientific and technical intelligence.

COMIREX-D-11.1/2
Annex B

Quality and Quantity of High Resolution Surveillance

1. On 4 April 1968 the United States Intelligence Board approved reference b which established minimum essential requirements for collection by high resolution photographic satellites. The requirement called for surveillance of a list of approximately 4,900 targets with a total effort amounting to about 4,200 gross target looks per year, about two-thirds of which were to be in stereo and the remaining one-third in mono. We have had time to analyze the KH-8 performance against this statement of requirements and find that with a few exceptions the system performs well against these stated objectives. During the past year, seven successful KH-8 missions produced over 5,500 complete target looks of which 2,800 were in stereo. It is emphasized that not all of these target looks were obtained of priority targets at the time necessary to enable them to contribute to meeting our surveillance requirements. Where requirements were not met for high priority target categories, many of the targets comprising these categories were so located geographically as to cause camera aiming conflicts. The main areas of important conflict are the Moscow and Leningrad complexes and the launch facilities at Tyuratam and Sary Shagan. During the past year, for example, because of our need to concentrate on the highest priority targets in these areas, a substantial number of targets of considerable importance but lesser immediate priority were not covered. The results of target coverage in these four areas during the past year are set out in the accompanying table.

5255 in NRO study
3757

	Total No. of Targets	No. of Times Covered						Additional Targets Partially Covered							Not Covered
		One	Two	Three	Four	Five	Six	One	Two	Three	Four	Five	Six	Seven	
MOSCOW	117	37	10	3	1			11	1						54
LENINGRAD	106	27	15	7	3	1	6	10	1						40
TYURATAM	41	13	13	4				0	3	1					7
SARY SHAGAN	35	7	3	3	2			3	0	0	0	1	1	1	14

Other target categories against which requirements were not met due to geographic competition were the MR/IRBM deployed sites situated along the western border of the USSR and ground forces and tactical fighter bases located in Eastern Europe and South China. The KH-9, by virtue of its wide swath and longer orbit life, could have obtained repetitive coverage of these complexes and areas and could have satisfied most of the high resolution requirements. This would have the effect of drastically reducing the number of targets requiring the high resolution coverage of the KH-8.

2. The experience with the KH-8 outlined above was based on single bucket KH-8s with 10-day missions. By 1970, the KH-8 is expected to be a double-bucket system with additional days on orbit which will provide opportunities to cover a substantial number of additional small-area targets. The improved KH-8 with more days on orbit consequently will have more opportunities for access to the regions of camera pointing conflict caused by proximity of high priority targets and therefore should reduce the number of lower priority targets that cannot be acquired because of such conflict. Its coverage, however, will continue to be limited to a narrow swath making it impossible to cover a large number of targets at any one time.

Annex C

Search for Unknown Targets

1. Although the Soviet Union may be approaching the end of its initial deployment of its major land-based ICBM systems, and the Communist Chinese apparently have not yet begun to deploy missiles, we continue to discover previously unknown installations in substantial numbers with our current satellite reconnaissance systems. During the past twelve months, we found over three hundred previously unknown installations, mostly new ICBM hard sites, surface-to-air deployed sites, and ground force installations. Of these, over two hundred were discovered by KH-4 and over one hundred by the KH-8.

Table 1

Targets first identified in KH-4 photography since 1 June 1967 that have been added to COMIREX high resolution baseline requirements:

ICBM Sites and Facilities	140
MRBM Sites and Facilities	1
SA-2 and SA-3	31
SA-5	17
Other Missile Related	11
Airfields	8
Nuclear Related	2
Naval	1
Other	8
TOTAL	219

Table 2

Targets first identified in KH-8 photography since 1 June 1967 that have been added to COMIREX surveillance requirements:

ICBM Sites and Facilities	44
SA-2, SA-3 Sites and Support	20
SA-5	2
Other Missile Related	7
Airfields	3
Naval	2
Ground Force	25
TOTAL	103

All would probably have been found eventually by the KH-4, but when they were found by the KH-8 a high resolution baseline was established and corresponding initial unambiguous interpretation as to function was provided simultaneously with their detection. On the other hand, many of the two hundred found by the KH-4 required subsequent programming for the KH-8 in order to derive details not available from the KH-4 coverage. If the newly discovered targets had been covered by the KH-9, their initial discovery might have been expedited. In most cases there would have been no delay in obtaining the unambiguous interpretation, and retargeting for KH-8 coverage probably would not have been required.

2. We expect that countries of the dynamic character of the Soviet Union and Communist China will continue to generate new specific reconnaissance targets of interest to the U.S. In particular we expect there would be a major new phase of target generation in the Soviet Union in the early 1970s as a result of technical progress in both offensive and defensive missile systems. We would also expect a Communist Chinese missile deployment program to occur at about the same time.

Annex D

Determination of Military Capabilities

Accurate and authoritative assessments of the nature and scope of the constantly changing military posture of potential enemies must be based upon current and comprehensive knowledge of force deployment, levels of activity in major military activity and training areas, and changes in the quantity and type of associated weapons and equipment. Broad area, high resolution, concurrent coverage of geographically separated installations which are part of the same target system is ideally suited for these problems. Repetitive coverage of large segments of the target system is also required to establish adequate confidence in our estimate of certain organizational and procedural aspects of the military target systems under review.

1. Ground Forces

a. The assessment of Bloc ground force capabilities is not only important currently but will continue to be an important problem in the post-1970 period. It is also representative of the demands for resolution and breadth of coverage typical of many other intelligence problems. Installations involved in Bloc ground force capabilities comprise 42 percent of all the high resolution targets contained in reference b. Minimum coverage requirements were generally met during the past twelve months by seven KH-8 missions with the exception of some of the categories located in western USSR, the Eastern European area, and South China--a number of which are of great current importance. The KH-4 obtained extensive coverage of these installations but even the resolution provided by its improved camera system was not sufficient to enable the installations to be unambiguously categorized as belonging to artillery, armor, or infantry. The resolution of about two and one-half feet forecast for the KH-9 is judged by photo

interpreters to be necessary to support accurate assessments of military capabilities.

b. In the preparation of the DIA/CIA reinforcement study, high resolution area coverage of several military districts was required. The KH-8 provided excellent selective coverage of important garrison areas but has not permitted the early establishment of a comprehensive high resolution base upon which to complete the assessments required. The absence of a high resolution area coverage system has limited our capability to judge the precise extent of Soviet ground force capabilities. In addition, concurrent high resolution coverage of Soviet ground force garrisons and activities might have permitted the confirmation of major movements of large Soviet units reflected by other types of intelligence, particularly COMINT. To accurately evaluate such movements, near simultaneous coverage is required of all installations in the new area of deployment as well as of the installation vacated.

c. The area coverage capability of the KH-9 would be great enough to obtain high quality high resolution coverage of extensive training and maneuver areas which could be used to deduce Soviet or Chinese ground force deployment doctrine and, above all, to allow comprehensive evaluations of operational capabilities, including reinforcement, support and mobilization.

d. In the assessment of Soviet ground force units which will continue into the period of the 1970s, it is suspected that many are maintained at cadre strength and are fully manned only during periods of limited duration. The ultimate validity and accuracy of our estimates of Soviet ground force capabilities is contingent upon information relating to the category classification and manning levels of the units involved. The availability of only selected KH-7 and KH-8 coverage has restricted our ability to estimate the manning status of certain units. We believe that this inability would be largely eliminated with acquisition of high resolution broad area concurrent coverage of units within specified military districts.

e. By mid-1970 we expect to have completed our initial assessment of nearly all Soviet and Chinese ground force installations. Thereafter we will be in a better position to deal with the dynamic aspects of military capabilities. We expect that by 1973 we will have produced Phase III Basic Support Exploitation reports on nearly all these installations. The KH-9 should permit us to support this production program and improve our ability to deal in a timely manner with dynamic factors such as manpower and equipment levels, reinforcement, and combat capabilities.

2. Soviet ICBM Deployment

Significant advances in the level of our understanding of Soviet systems, concepts and procedures for ICBM deployment as well as in the timeliness and confidence of our contributions on this subject to NIE's and other special studies, would be possible with the acquisition of high resolution, concurrent and broad area coverage of the 26 complexes and their logistical support networks. At the present time we are evaluating available information in preparation for NIE 11-8 and find that certain information is required if we are to judge the potentiality for Soviet expansion beyond the current 1000 plus silos completed or under construction. If we were to have high resolution, near simultaneous and repetitive coverage of all complex support facilities, we would be able to judge more confidently the storage and distribution of silo construction materials and the Soviet potential for expanding its ICBM deployment during the next 12 to 18 months. In the absence of such information, the range of our estimate will be broadened significantly.

3. Naval and Air Capabilities

In the continuing assessment and refinement of Bloc naval and air capabilities, knowledge of operating cycles, equipment changes, and deployment is required for an accurate and timely assessment of combat capabilities. In most cases, the validity of our

estimates in these areas is directly contingent upon the periodicity and simultaneity of our coverage and on the adequacy of detail provided. Consequently, we have depended upon other limited sources for a determination of "TO&E yardsticks," construction procedures and timing, and equipment changes. In the naval category, such information is required to determine the duration, nature and frequency of overhaul periods, the disposition and cycling of naval vessels from established bases, and the indices of activity from which can be estimated the lengths of time and relative effectiveness of units in commission and their capability for rapid deployment. The assessment of air capabilities requires comparable information.

4. Correlation of SIGINT and Photographic Data

SIGINT satellites do not provide precise locations for electronic emitters, but rather express locational accuracy within a radius of several miles. Establishment of precise locations, and determination of image-derivable characteristics of electronic emitters is dependent upon a high resolution coverage as most emitters are too small to be located, much less analyzed, on KH-4 coverage. Currently, less than one percent of all EOB sites and 1/2 percent of all sets, on a worldwide basis, have been identified through the KH-8 system. This lack of coverage is due to the limited swath width of the KH-8, the inability to provide accurate locations in order to point the KH-8 camera system and the competition for coverage posed by higher priority and more precisely located targets. Currently, there are many radars carried in the ELINT order of battle (EOB) which have not been seen on photography and therefore are not precisely located. Some radar sites may in fact not exist within the presently defined general area locations. ELINT order of battle may well continue to be an important problem to U.S. intelligence during the 1970 era. The resolution and swath provided by the KH-9 would enable a far more complete and meaningful correlation of photography and SIGINT information to produce a refined and more accurate EOB. At the least, this capability would permit greater utilization of the SIGINT input to EOB production. In addition, this should make it possible to reduce some of the SIGINT satellite effort now directed against the EOB problem.

5. Detection of Soviet Camouflage and Deception Efforts

During the past year, we have detected new and sophisticated Soviet efforts to camouflage specific targets or to experiment with camouflage and deception measures. While some of these efforts have been discernible in KH-4 photography, KH-8 coverage indicates that resolution far better than that provided by the KH-4 will be necessary to give us a high confidence in our ability to detect camouflage. We would expect that the KH-9 would significantly improve our chances of detecting a widespread and skillful camouflage program if the Soviets were to undertake such an activity.

6. Compilation of Regional Logistic and Transportation Studies

At various times in the past we have attempted to use photography from overhead sources to analyze rail, road, coastal, inland waterway and port traffic reflecting dynamic activities within large denied areas. We have found, however, that none of our sources has been able to provide photography with sufficient resolution and covering a sufficiently large area within a reasonable period of time to provide us with data for such analysis. The KH-9, with its broad swath and high resolution, would provide adequate coverage to permit us to attack a variety of these traffic analysis problems.

7. Current Intelligence and Warning/Indications

During the past year there were three crises in which current satellite photography would have been useful--the recent Soviet dispute with Czechoslovakia, the June Arab/Israeli war, and the PUEBLO incident. On the first two of these occasions a satellite was on orbit, but photo interpretation of the areas of interest was not possible for several days after the photography had been acquired. Moreover, because the mission on orbit during the Czech crisis was a KH-4, the resolution obtained did not contribute significantly to establishing whether Soviet ground forces had concentrated along the Czech border. In the case of the June war, KH-7 Mission 4038 photographed Israeli and Egyptian bases less that forty-eight hours prior to the hostilities,

but readout was not accomplished until after most of the fighting had concluded. No reconnaissance vehicle was on orbit when the North Korean crisis occurred. In order to obtain photographic coverage of that area, a special BLACK SHIELD mission was flown.

The performance against these three crises is illustrative of the lack of responsiveness of re-coverable satellites in crisis situations. The longer on-orbit life of the KH-9 and its multiple recovery packages are expected to provide greater possibilities of obtaining timely crisis coverage if the crisis were to occur while it was on orbit. Even so, three or more days would elapse before the photography would be available for interpretation. USIB has forwarded a recommendation for a solution to this problem to the NRO for study. See reference c.

While the KH-9 system will have only limited capabilities to deal with crisis situations in terms of timeliness of recovery and processing, it nevertheless combines two important elements--high resolution and general search capability. A common characteristic of the three crises mentioned above is that the community lacked specific information on precisely where to look, in order to observe critical events. In these and comparable future crisis situations, the ability to observe a broad geographic area at KH-9 resolution should enable one to identify with confidence significant events in a rapidly developing situation.

8. Support to Scientific and Technical Intelligence

For scientific and technical intelligence, the high resolution systems such as the KH-8 are required to provide the essential detail on foreign high-threat weapons and weapons systems and to assist in defining the technical capabilities of missiles, aircraft, naval nuclear, and ground systems. In addition to the primacy of the role played by the KH-8 in support of scientific and technical intelligence, the KH-9 would have a unique capability for obtaining valuable information on certain higher priority scientific and technical intelligence problems. For example, repetitive high resolution coverage of priority R&D facilities and test range construction is deemed essential. Included would be coverage of the entire Sary Shagan Complex during a suspect ABM test. Such coverage should provide sufficient detail to correlate

test activities and to assist in the formulation of systems concepts relating to the technical capabilities and limitations of the Soviet ABM. Similarly, at Lop Nor in China it is necessary to cover not only the current ground zero but also other installations in the area such as the main support base. Additional targets requiring similar repetitive "full area" high resolution coverage include the Moscow Defense Missile Complex, the Chinese Missile Test Rangehead, and the Tyuratam Rangehead. Such coverage would provide the basis for identification and correlation of major systems and components as well as the detection and correlation of activity (burns, tracks, scars, etc.). Such coverage also would provide the basis for earlier detection and identification of specific new weapons and weapons systems located at test ranges and production facilities.

9. Policing of Arms Control and Disarmament Agreements

There are at least four functions relating to the intelligence problem inherent in a possible arms control and disarmament agreement toward which high resolution satellite reconnaissance can contribute. These are:

a. Preparation of a comprehensive inventory of excluded items prior to scheduled reduction;

b. Confirmation that arms reduction is occurring at the rate agreed;

c. Identification of suspicious sites or buildings at which evasion might occur and which should be designated for on-site inspection; and

d. Detection of actual evasion attempts.

The high resolution, wide swath, and long on-orbit capabilities inherent in the KH-9 reconnaissance system undoubtedly would be extremely advantageous in preparing for and monitoring an arms agreement. Supporting this conclusion is a recently completed ACDA study which indicates that the search/surveillance capability of the KH-9 might make it possible to reduce greatly the number of on-site inspectors below

that required if the present KH-4/KH-8 mix were the only available satellite reconnaissance. Even so, there would still be occasions when the two and one-half to three foot resolution of the KH-9 would not provide sufficient detail to enable a determination that excluded types of equipment were in fact being withdrawn on schedule or, conversely, that they were not being re-introduced. In these cases ACDA believes that either KH-8 high resolution photography would be required or that on-site inspection would be needed. Should sources other than reconnaissance indicate that evasion were being attempted, the problem for reconnaissance would closely parallel the needs for warning/indications collection since it would be necessary to photograph the installations involved in alleged evasion before concealment of equipment could occur. Even if a KH-9 were on orbit, timely collection and readout of the alleged evasion site probably could not be effected. For this task, a reconnaissance system capable of responding in near real time would be needed.

10. Detection of a Mobile Land Based ICBM System

There are certain intelligence problems which may emerge in the 1970s for which a broad area high resolution coverage capability such as the KH-9 would provide the best and possibly the only opportunity to resolve. For example, if the USSR were to deploy an essentially mobile ballistic missile system which operated from a rail network, it would be extremely difficult to assess or evaluate it effectively on the basis of KH-4 and KH-8 coverage alone or in combination. The KH-4 resolution would be inadequate for this purpose. The KH-8, with its small field of view, is efficient only when programmed against a pre-selected point target.

COMIREX-D-11.1/2
Annex E

Support to Mapping, Charting, and Geodesy

1. We have been employing the KH-4 to obtain photography for high priority production of medium and small scale maps and charts world-wide and for a data bank to enable rapid response to urgent MC&G requirements in almost any contingency situation. The use of satellite photography has made it possible for the United States to obtain a strategic advantage never previously held by any country in the world, i.e., we have been producing accurate target materials (Series 200 charts) for our strike forces over the Sino-Soviet and are now undertaking production of accurate medium scale Joint Operations Graphics to cover almost any point on the earth's surface of potential military concern. This would bring obvious advantages in the event of military operations, and will provide an improved capability in those other areas of economic and engineering operations for which maps and charts are needed.

2. In addition to the medium and small scale maps and charts, however, the DoD has a strong requirement for the capability to produce a 1:50,000 series of large scale maps covering large portions of the world. These maps have the specific primary purpose of enabling the field Army artillery to obtain a first round hit using accurate map information to achieve surprise and forestall a severe loss in effectiveness, as well as the increased costs and delays inherent in the use of spotting artillery rounds. Also, we are advised that the DoD is considering other MC&G requirements which could not be met with existing systems, including even tighter positioning requirements for long-range missile and possibly tactical all-weather non-nuclear strike aircraft. In addition, there are applications in the fields of economics and engineering world-wide, domestic topo mapping of the U.S. and to support advanced weaponry that could be derived from improved satellite data.

3. In view of the value of accurate large scale map coverage, COMIREX expressed a requirement for the KH-9 system to provide geometric accuracy sufficient to enable the relative positioning accuracy necessary to support ground force artillery

techniques and similar demanding operations. Some of us hoped at the time this requirement was developed that it could be satisfied by the main camera in the KH-9 system. However, it was later clearly established that this was not possible. This in turn led to the planned development of the 12" stellar index camera which was approved after extensive study and review. To enable rapid response to an urgent requirement for accurate large scale maps, priority collection over contingency areas, somewhat comparable to the data bank concept approved for the KH-9, will be needed to permit the prompt or pre-planned geometric determinations of positioning and contouring which are so critical to mass production on an emergency basis. Part of the justification of the 12" SI is that mass production of large and medium scale maps and charts will be much more efficient and responsive as well as less expensive when using the product of the 12" SI camera. Where the KH-4 photography has been more efficient and less expensive in medium and small scale map production than using aircraft systems data, the KH-9 photography with its 12" SI will be even more efficient and economical. Moreover, it would make possible the production of accurate large scale maps, which could not be made from photography available from current satellite systems.

4. Those members of the intelligence community responsible for map and chart production have estimated that about 90 percent of the cultural and terrain detail needed in large scale maps can be obtained from the KH-4 photography. The main element that is missing in the KH-4 data is the geometric accuracy. The KH-9 system would provide both the geometric accuracy through the stellar index camera and the additional needed cultural and terrain detail from its main panoramic camera. If the KH-9 system, including the 12" SI camera were not flown, the U.S. would be faced with the alternative of considering a separate satellite photographic system capable of obtaining the required local geometry. While this presumably could be done as a separate project under the NRP, coverage would still be needed by panoramic systems to provide the critical fine details not available from the frame camera. The possibility of combining the 12" SI with a NASA Earth Resource Project has been mentioned. Not only do the established limitations on resolution for NASA projects preclude this as an alternative in meeting the more stringent MC&G detail requirements, but more significantly the incompatibility of mission objectives, production schedules, and

security factors weigh heavily against such a possibility. Clearly, the timing and details required for MC&G are much more nearly aligned with military necessities and general intelligence needs.

Annex F

Additional Benefits to be Derived from the KH-9

The KH-9, by providing both area coverage and high resolution, would answer some important future intelligence problems more expeditiously and more efficiently than can be done with present systems. Such problems include the following:

1. Line of Sight and Scatter Propagation Communications System

NSA reports that there is a growing need for exact locations and identification of line-of-sight and scatter communication installations in the Bloc in support of SIGINT collection planning. The current resolution of the KH-4 has proven generally inadequate to locate and identify unambiguously the elements of such systems. The interrelationships of these communication facilities with each other and with military, space, and civil installations is an important requirement. In the instances where new installations in these systems have been found under optimum conditions, the KH-4 resolution was such that re-targeting by KH-8 was necessary. As mentioned above, the resolution of the KH-9 photography, together with the broad swath width provided, would make it an ideal search vehicle for the initial discovery positive identification of unlocated installations and would diminish the necessity for re-targeting of most of them for KH-8.

2. Planning and Engineering

For a number of years the U.S. Army Corps of Engineers has been developing techniques to employ satellite photography to make preliminary engineering and economic assessments of foreign areas in support of the Department of Defense and the Agency for International Development. They have achieved such success that other agencies of the U.S. Government in Project ARGO undertook to analyze possible uses of satellite photography in problems of concern to those agencies. As a result of their analysis, they determined that KH-4 photography could be used to assist in population and crop estimates and possibly

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other scientific studies needed by the Departments of Agriculture, AID, and the Departments of Interior, Commerce, and Transportation. Throughout the work undertaken by the Army in Project APEX and in Project ARGO, it has been clear that the same objectives could be obtained more efficiently and with geater confidence from photography such as that which would be provided by the KH-9. It also appears likely that some of the objectives of the Corps of Engineers and the other agencies could be refined in the light of the improved resolution of the KH-9. Some of the same problems considered by the Army's Project APEX and Project ARGO are of considerable potential interest to the intelligence community. CIA is already working with the Department of Agriculture, for example, to test the feasibility of using satellite photography to estimate crop production in denied areas.

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~~IS~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 26, 1968

MEMORANDUM FOR THE DEPUTY SECRETARY OF DEFENSE

SUBJECT: Review of HEXAGON Requirements by the USIB Committee on Imagery Requirements and Exploitation (COMIREX)

On July 1, 1968, there was issued COMIREX Paper D-11.1/2 dealing with revalidation of the requirement for the HEXAGON system. The issuance of this paper was no doubt stimulated by the recent questions raised by the Bureau of the Budget (BOB) regarding the validity of the requirement for the HEXAGON system, although the question had been under internal consideration within the USIB and its committees before the BOB formally raised it.

The paper is apparently not intended for formal approval by the USIB at this time. It is addressed to the Chairman of the National Intelligence Resources Board (Adm. Taylor). However, many new or radically modified concepts regarding satellite photographic reconnaissance requirements are expressed in this paper, and for this reason it is worth noting the substance of its contents.

You may recall that the original USIB requirement which led to the HEXAGON system was not strictly a requirement for collection, but in contrast to virtually all other USIB requirements, in this case system characteristics were specified. Although we would now attempt to discourage (or perhaps even to reject) such an approach to requirements, and, in the current relationship between the USIB and the NRO, such a requirements statement would probably not be promulgated by the USIB, the requirement for HEXAGON has remained on record, with minor modifications, substantially as originally stated. An implied decision to proceed with the HEXAGON system was incorporated

in the DOD/CIA Agreement of August 11, 1965 (again a very unusual procedure) and subsequently this decision was ratified by the NRP ExCom in a final decision to proceed with full development.

The HEXAGON requirement, as originally stated, was for a system with at least the swath width of CORONA and the resolution of the older GAMBIT (KH-7). I believe, although I am not aware of an explicit statement on this point, that it was thought that HEXAGON would be capable of replacing both GAMBIT and CORONA for both the search and surveillance tasks. Subsequently, when the follow-on GAMBIT (KH-8) became operational, it was realized by the USIB that there were many surveillance targets which could not be adequately covered by a system with the resolution of the older GAMBIT (nominally 2.0-2.5 feet resolution at nadir). Therefore, the notion that HEXAGON could completely replace both GAMBIT and CORONA was quietly dropped. Instead, it was reasoned that HEXAGON could cover a large number of surveillance targets, thereby reducing the number of GAMBIT missions required annually. Because HEXAGON will not fly initially before October 1970 (FY 1971) and for some time after that will probably not be completely reliable, no numerical tradeoffs between GAMBIT and HEXAGON have been worked out as yet. The NRO has initiated the appropriate tradeoff studies; however, in our view, program and budget decisions on this issue will not be appropriate until the FY 1971 budget formulation cycle.

The most recent COMIREX paper on the justification for HEXAGON, in effect, presages a radical change in the statement of requirements for satellite photographic reconnaissance. This change (and it remains to be validated by the USIB) is indicated in the following sections taken verbatim from the COMIREX report:

"2. Analysis of information derived from current satellite systems has been a significant factor in the determination of Bloc military capabilities and in the development of a sound intelligence basis for the formulation of U. S. national policy and the structuring and deployment of U.S. military forces and weapons systems. We find ourselves in a period in which our high resolution KH-8 system* is functioning reliably and is permitting the production of a large and increasing volume of excellent quality intelligence. During this same period the KH-4 is producing improved resolution, although this improvement is still far short of the resolution that the KH-9 system is intended to provide. If these current satellite systems are judged against the currently approved collection requirements which were established in the context of current systems capabilities, it is clear that they have performed well and that they have the growth potential to meet a substantial future increase in the same type of requirement. The currently approved statements of requirements, however, have tended to stress intelligence needs for:

a. Search of large areas with medium resolution and wide swath to detect suspicious activities.

b. Follow up photography with high resolution, to identify the nature of the activity.

c. Surveillance coverage of large numbers of specific priority targets by high resolution, narrow swath photography.

* High resolution coverage in this paper is defined as photography with a resolution range of one to five feet.

In spite of the general adequacy of existing systems in meeting these stated requirements, unanswered intelligence problems exist and we anticipate that important problems will arise in the future which could be better solved, or solved only, by a capability to examine closely, collectively, and nearly simultaneously the entirety of large geographic areas with high resolution coverage. Such a capability would support the assessment of the deployment and inter-relationship of complex military systems and forces. Up to the present time we have not developed detailed requirements for such a system because of the lack of a capability to acquire such imagery by satellite. We recognized the potential need for such a system, however, when we generated the requirement outlined in reference a. above."

"3. It is particularly important to emphasize that our current requirements have been developed on the basis of current capabilities and those problems within the range of these capabilities. Thus, these requirements have not taken into full account such changes in collection needs as might result from unexpected changes in the military situation or from a skillful effort to employ camouflage or an agreement involving arms control and disarmament inspection. In addition, the Department of Defense, particularly in support of the Unified and Specified Commands, has requirements for high resolution coverage of many areas needed for timely contingency planning. However, current capabilities and national priorities for satellite and airborne systems have generally prevented satisfaction of these requirements."

Backup information supporting this new statement of requirements is included in the COMIREX paper and covers such short-comings of current KH-4 and KH-8 coverage as the following:

a. Inadequate high resolution coverage by the narrow swath widths available from KH-8 of areas with many targets with resulting camera aiming conflicts. Some examples given are the Moscow and Leningrad areas and the launch facilities at Tyuratam and Sary Shagan.

b. Inability, with the current combination of KH-4 (CORONA) and KH-8, to effect timely location of unknown targets needing relatively high resolution for positive identification. Currently many targets first found by KH-4 require subsequent targeting by KH-8 for identification (not surprising, since this is the current requirements and operations concept). Particularly noted was the need for higher resolution than KH-4 to identify ground force installations.

c. Inability to detect on a timely basis overall changes in foreign military postures. It is stated that such assessments require concurrent relatively high-resolution coverage of geographically separated installations which are part of the same target system. Examples cited are ground force postures in the Western USSR, the Eastern European area and South China. The following quotation with respect to these examples is significant, "The KH-4 obtained extensive coverage of these installations but even the resolution provided by its improved camera system was not sufficient to enable the installations to be unambiguously categorized as belonging to artillery, armor, or infantry." Among other examples of this kind cited were the Czechoslovakian, Arab/Israeli and Pueblo crises. The comments relate not only to the slowness of data return from satellites (which HEXAGON would not solve) but also to the deficiencies in KH-4 resolution as follows,

"...because the mission on orbit during the Czech crisis was a KH-4, the resolution obtained did not contribute significantly to establishing whether Soviet Ground Forces had concentrated along the Czech border."

d. The inadequacies of present systems to police arms control agreements with very limited on-site inspection (if any). Reference is made to a recent ACDA study which indicates that HEXAGON would greatly improve policing capability with minimum on-site inspection.

e. The need for a capability to detect a possible Soviet deployment of a mobile land-based ICBM system. It is noted that present operational procedures with KH-4 and KH-8 would be ineffective against such a system since KH-8 follow-up of KH-4 indications would usually not be possible, the missiles being capable of movement between such coverages.

These new statements of requirements undoubtedly have some validity but a careful assessment of the value of satisfying some or all of them is obviously in order. The results would affect decisions not only on whether the HEXAGON system development should proceed, but also the composition of the whole satellite reconnaissance program either with or without HEXAGON. I believe that there should be a strong DOD input to such an assessment. DIA, of course, contributes to the COMIREX position on such questions. However, it seems to me that the DOD contributions would be very much stronger and more useful if the study of satellite photographic reconnaissance requirements which you directed on January 26, 1968, were available. I again recommend that action be taken to expedite completion of this study.

Alexander H. Flax

Alexander H. Flax

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22 July 1968

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Project HEXAGON

1. The NIRB has carefully considerated the question of continuing or cancelling Project HEXAGON, and in particular has focused on the substantive intelligence value of the photographic products and costs associated with these two courses of action. The NIRB recommendation to you is contained in paragraph 5.

2. Comparative Capability: HEXAGON is intended to provide repetitive photo coverage over a swath width up to 287 n.m., with relatively high resolution photography at nadir--design goal of 2.3 feet. HEXAGON would completely replace the present CORONA search system which provides photography over a swath width of 113 n.m. with resolution of up to 7 feet at nadir. Upon HEXAGON operating reliably, a reduction would also be made in the number of the small area, very high resolution GAMBIT-3 surveillance missions to 4 or 5 each year. The target date of the first HEXAGON launch is October 1970.

3. Product: In terms of its value to national intelligence, HEXAGON, as compared with current search photography, would provide:

a. Significantly better intelligence on Soviet and Chinese force levels, particularly the ground forces. The combination of resolution and wider swath width of HEXAGON photography would enable our photo interpreters to identify most or nearly all of the visible equipment, such as armor, trucks, artillery, AAA, and associated radars, which may be located in relatively large areas within fairly short time periods. Finished intelligence based on this type of information has substantial relevance to U.S. force level and budgetary decisions;

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b. A "best" single source of information to verify Soviet adherence to or violation of any future U.S.-Soviet disarmament agreement;

c. Coverage of the expected Soviet mobile ICBM target problem; and

d. A general enhancement of our intelligence on a number of significant problems.

Conversely, it should also be noted that the flow of HEXAGON photography will result in severe pressures on the photo interpreters, even with planned maximum use of automation and new exploitation procedures, unless equally strong pressure is exerted to control the appetites of the consumers of photo interpretation.

4. Comparative Costs: D/NRO has provided the following cost estimates on the courses of action considered by the NIRB:

	Dollars in Million					
	68	69	70	71	72	73
Continue HEXAGON	475	437	418	337	294	287
Cancel HEXAGON with no CORONA improvement	475	316	297	271	265	265
Difference	0	121	121	66	29	22
Cumulative Difference						359

You will note that two-thirds of the difference falls in the current "budget crunch" years -- FY69 and FY70. On the other hand, it should be pointed out that the above cost estimates do not provide for the decrease in GAMBIT-3 launches to the planned 4 or 5 successful missions a year after HEXAGON becomes operational, so that the accumulated difference of $359 million over the six-year period should be significantly less, probably in the range of $260 to $300 million.

Not Correct
Successful is in quotations - Furthermore reduction to 4 successful in FY 72-73 and impacts at cost of 15.0M each year -

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The cost difference, if HEXAGON were cancelled and a program were begun substantially to upgrade CORONA, is as follows:

	68	69	70	71	72	73
Continue HEXAGON	475	437	418	337	294	287
Cancel HEXAGON, improve CORONA	475	316	331	295	297	297
Difference	0	121	87	42	-3	-10

Cumulative Difference 237

The "improved CORONA" referred to in the preceding cost table would be designed to upgrade CORONA photography to a resolution of approximately 4.5 feet. There is a consensus, however, that this improvement over the current best CORONA pictures of 7 feet would be marginal as compared with photography of 3.5 feet or better (HEXAGON design goal being 2.3 feet). Only at resolutions of around 3.5 feet and better and with large area coverage can such problems as Soviet ground force capabilities and the expected mobile ICBM target be pursued with a reasonably high degree of confidence. HEXAGON's improved capability for repetitive coverage and mission duration also are significant when compared with the improved CORONA, as well as the current CORONA search system.

5. The NIRB, after taking the above factors in account and recognizing the value of overhead photography to our current and projected national intelligence needs, particularly against Soviet and Chinese Communist military problems, unanimously recommends that HEXAGON development proceed as planned in the current National Reconnaissance Program.

Rufus Taylor
Vice Admiral, U. S. Navy
Chairman
National Intelligence Resources Board

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~~HEXAGON CORONA GAMBIT~~

CENTRAL INTELLIGENCE AGENCY
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30 JUL 1968

OFFICE OF THE DIRECTOR

HANDLE VIA BYEMAN-TALENT-
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The Honorable Paul H. Nitze
Deputy Secretary of Defense
Department of Defense
Washington, D. C.

Dear Paul:

The new National Intelligence Resources Board (NIRB) has taken a fresh look at the need to continue Project HEXAGON given the current budgetary situation. The Director, National Reconnaissance Office advised the NIRB about improvements which have been planned for both the CORONA and GAMBIT-3 systems and how they affect the quality of photographic coverage provided by these systems. NIRB also received an estimate of the degree to which the CORONA system might be further improved beyond these changes actually planned at this time. In addition, the D/NRO has provided estimates on the different cost trade-offs, assuming a decision were made to cancel HEXAGON in the near future vis-a-vis continuation of HEXAGON as currently programmed in the NRP. The USIB Committee on Imagery Requirements and Exploitation assessed the value of the intelligence which the HEXAGON photography is expected to provide in relation to that which would be obtained by the combined use of CORONA and GAMBIT-3.

After consideration of these analyses and other inputs, Vice Admiral Taylor, Mr. Hughes and Lt. General Carroll have unanimously recommended that we continue HEXAGON as currently programmed.

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I am impressed with the thoroughness, objectivity and cost consciousness with which the NIRB approached this subject, and I support their recommendation. There is attached a copy of the memorandum which summarizes the salient points and contains the NIRB recommendation.

In view of [redacted] letter of 25 July 1968 and HEXAGON Issue Paper, you may wish to send on to him a copy of this letter and the attached NIRB paper. The NIRB's study of HEXAGON is particularly pertinent and timely as it covers the same points as are raised in the HEXAGON Issue Paper.

Sincerely,

/s/ Richard Helms

Richard Helms
Director

Attachment: BYE#183-68

cc: Director, National Reconnaissance Office

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~~HEXAGON, CORONA, GAMBIT~~

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CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D. C. 20505

OFFICE OF DEPUTY DIRECTOR OF CENTRAL INTELLIGENCE

HANDLE VIA BYEMAN CHANNELS ONLY

17 June 1968

The Honorable Alexander H. Flax
Director, National Reconnaissance Office
The Pentagon
Washington, D. C.

Dear Al:

The National Intelligence Resources Board (NIRB) is undertaking for the Director of Central Intelligence a review of the anticipated contribution to substantive national intelligence needs of the HEXAGON in relation to CORONA and GAMBIT-3. As you know, Mr. Duckett and staff briefed the NIRB on 13 June regarding the general capabilities of HEXAGON.

I am also requesting the views of COMIREX as to the responsiveness to priority national intelligence requirements of the product which HEXAGON is expected to provide in relation to the products of CORONA and GAMBIT-3.

It is the intention of the NIRB not to go into technical matters or aspects which are within the province of program management. However, in order to develop recommendations which are useful to the DCI regarding the relative contribution to national intelligence of different activities and programs, the Board must take into account cost factors and changes in the productiveness of activities and programs which can reasonably be expected to occur.

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~~HEXAGON, CORONA, GAMBIT~~

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It would, therefore, be most helpful if you would identify for us the anticipated effect on the products of CORONA and GAMBIT-3 of currently-planned systems improvements which would take effect over the next several years, i.e., until HEXAGON is scheduled to become operational. I would, in addition, like to request your estimate of cost trade-offs of CORONA and GAMBIT-3 vis-a-vis HEXAGON in the time frame of the expected use of the three systems, both on the basis of the current program and on the assumption that a decision were made to cancel HEXAGON in the relatively near future.

We don't know how quickly we will need this information but would like to have it as soon as feasible in view of the current stirrings on this subject.

With warmest personal regards,

Sincerely,

Rufus Taylor
Vice Admiral, U. S. Navy
Deputy Director

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HANDLE VIA BYEMAN CONTROL SYSTEM

~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 16, 1968

Dear Ruf:

This memorandum is in response to your June 17, 1968, letter asking for data on the National Reconnaissance Program (NRP) photographic systems for the use of the National Intelligence Resources Board (NIRB). You asked for the anticipated effect on the products of CORONA and GAMBIT-3 of currently planned systems improvements which would take effect over the next several years and estimates of the cost trade-offs if the current program is continued and if a decision were made to cancel HEXAGON in the relatively near future.

GAMBIT

There are two changes planned for the GAMBIT-3 program. The first is the incorporation of a dual recovery capability effective approximately July 1969 (Vehicle 29) and a concurrent expansion of the vehicle orbital lifetime to 14 days. We hope to extend the orbital lifetime further to 18 days by Vehicle 33.

The dual recovery capsule will:

a. reduce the time between the time of exposure and the time the photography is delivered to the photo interpreter when compared with an extended life mission using a single recovery capsule;

b. permit limited reprogramming of the second portion of the mission based upon first portion results; and

c. keep the vehicle from being film limited at the longer mission lifetimes.

The increase in mission lifetime will do several things. It will:

a. increase the probability of successful coverage of high priority targets by providing more accesses to these targets. This is shown graphically in TAB A;

b. permit more of the lower priority targets in high density target areas to be covered; and

c. increase the total number of targets covered on each mission at an average rate of approximately 230 targets per each additional day.

The second GAMBIT-3 change is a lens modification which will be incorporated in Vehicle 31 (approximately October 1970). The improved lens will provide more uniform imagery across the entire field of view and will incorporate a change in focal length from the present 160 inches to 175 inches. TAB B is a graphic showing the expected resolution across the field of view as well as the reduction in field angle which is caused by the longer focal length. The scale factor will, of course, be reduced in proportion to the focal length. In addition to the redesigned lens, we will continue our quality control efforts to improve the performance of the present lens. As you know, the GAMBIT-3 performance goal is [redacted] The best we have done to date is 12 inches. However, we do expect that some improvement in resolution will result from our quality control efforts prior to Vehicle 31.

CORONA

The nominal CORONA mission is now 15 days duration. We plan to extend the J-1 and J-3 lifetime capabilities to 16 and 18 days, respectively, effective in the fall of 1968.

The percentage of cloud-free photography for CORONA missions varies from 58 to 83 percent for the current 15-day missions. The longer lifetime is expected to increase the percentages of cloud-free photography by 5 to 8 percent.

The CORONA J-1 payload is approximately 400 pounds lighter than the CORONA J-3 payload. We now take advantage of this difference by launching the Program 989 SIGINT satellites on the same booster as the J-1 payload. All of the J-1 payloads will be used up by July 1970, and we are therefore incorporating a change to the J-3 power supply to provide the weight margin required to launch the Program 989 satellite. This change is not primarily designed as an operational improvement to CORONA; however, as a secondary benefit, it is expected to permit extending the CORONA mission lifetimes up to 20 days. The change will only be made to the five missions carrying the Program 989 satellite and consists of removing approximately 500 pounds of batteries and replacing them with a 115 pound solar cell power supply.

The CORONA 24-inch lens has been redesigned to make it easier to manufacture. This lens is expected to provide more consistent performance, but this change must be considered as a quality control modification rather than a modification designed to enhance the system performance. The first of these lenses was flown on Mission 1103.

Although there may be some improvement in the area of operational techniques, there are no other approved hardware changes which are expected to have a significant impact upon the CORONA photographic product.

Present Program Costs

The cost estimates for the 1972-1975 time period are strongly influenced by the projected launch rates. These are, of course, subject to USIB adjustments, but for the purpose of this study, the following assumptions pertaining to the launch rates were made:

a. The CORONA launches will terminate as soon as the HEXAGON system is reliably producing intelligence information. Additional CORONA systems will have to be procured in July 1969 if the HEXAGON first launch slips beyond January 1971.

b. Four or five HEXAGON missions/year will be required. The HEXAGON system was designed so that one mission would satisfy the currently defined quarterly search and surveillance requirements. The five missions per year are in accordance with the presently planned launch schedule which is based upon the need for coverage every quarter with one "extra" system scheduled to be launched in sequence during the year to provide a margin to compensate for possible failures.

c. Four or five successful GAMBIT missions per year will be required with HEXAGON. This reflects both the longer GAMBIT orbital lifetime and the fact that the HEXAGON photography will satisfy some of the present GAMBIT surveillance requirements. The GAMBIT procurement and launch rate would be one more than the required successful missions per year in order to insure that the desired number of successful missions are accomplished.

Based upon the above assumptions, the program costs are projected as follows:

CORONA	FY 1969	FY 1970	FY 1971	
Launches	7	6	4	
Costs	49.4	31*	23*	
GAMBIT	FY 1969	FY 1970	FY 1971	FY 1972
Launches	8	7	7	6
Costs	178.5	182*	163*	149*

*It should be noted that FY 1970 and subsequent budgets have not yet been submitted and that these costs are subject to adjustment. Estimates herein are as reported in the latest FY DP (Five Year Defense Program) for FY 1970 and subsequent years.

HEXAGON	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972
Launches				4	5
Costs	207.3	209	205*	151*	145*

*The FY 1970 budget requests have not yet been submitted, and FY 1970-72 costs are subject to change.

Costs Assuming HEXAGON is Cancelled

The following assumptions pertaining to the launch rate were made:

a. Six CORONA missions per year, using the longer lifetime vehicle, will be required in order to maintain the present level of CORONA coverage. This compares with the seven per year presently programmed for FY 1969 and is the same as the six per year presently programmed for FY 1970. It is assumed that the present CORONA stand-by capability will be maintained.

b. If the HEXAGON system is cancelled, it may be desirable to consider CORONA system improvements such as longer focal length to obtain improved reconnaissance resolution and the incorporation of the 12-inch frame camera to satisfy the mapping requirements. Changes such as this are feasible but would require significant booster modifications to accommodate the increased weight as well as major changes to the payload as discussed below.

c. Six successful GAMBIT missions per year will be required. This is in line with the present planning for FY 1970, which reflects the effects of the extended orbital lifetime. The GAMBIT procurement and launch rate would therefore be seven per year to insure the six successful missions. However, depending on USIB requirements, it may later be possible to reduce the required number of successful GAMBIT missions to four or five if HEXAGON resolution is adequate to cover a sufficient number of surveillance targets.

d. The cancellation of HEXAGON will cause the TIII unit cost for other programs to be increased significantly.

Possible CORONA Improvement

If it is considered desirable to improve the CORONA resolution to a value approximately half way from the present CORONA results to the level expected from HEXAGON, we would probably select one of the approaches proposed by ITEK over a year ago. This proposal suggested that either a 32-inch focal length could be incorporated using the same design approach as the current J-3 configuration or a 40-inch focal length optical bar camera could be incorporated into the CORONA system.

The operational characteristics of these proposed camera improvements would be as follows:

	Enlarged J-3	Optical Bar
Focal Length	32 inches	40 inches
Scan Angle	70° or 90°	90° or 120°
Approximate Nadir Ground Resolution from Altitude of 85 NM	4.4 feet	4.6 feet

Other factors associated with pad and launch vehicle compatibility would obviously have to be considered in any selection between the two alternatives. Both designs would require a booster modification, and the costs are approximately equal. The number of launches would have to be increased to approximately 8/year to maintain the area coverage since the area coverage per mission would be reduced.

Mapping Considerations

The 12-inch focal length stellar index camera is now being designed for incorporation into the HEXAGON system to provide the capability to produce large scale maps. However, a final decision to incorporate this system in HEXAGON has not been made. If the HEXAGON program is cancelled, it is not clear at this time whether the 12-inch camera would be flown as a separate system or incorporated into the CORONA program. As an alternative, it would be possible to complete a separate five-shot program for the 12-inch camera for approximately $60 to $90 million. However, it is understood that a program limited to only five launches may not provide the repetitive coverage which is desirable for target updating and coverage of the residual areas which were cloud covered on the previous missions. This question is a requirements issue which would need separate study.

Incorporating the 12-inch camera into the CORONA program would require the use of the THORAD SR booster and a complete redesign of the CORONA payload section. The THORAD SR uses the THORAD core and three 137,000 pound thrust solid rockets in place of the present three 56,000 pound thrust solid rockets.

Incorporating both a resolution improvement and a 12-inch mapping camera into the CORONA program would require the use of Minuteman solid rockets as the zero stage booster. Each Minuteman rocket produces 210,000 pounds of thrust and would require active nozzle steering in order to keep the booster stable. This additional complexity represents a significant reliability hazard.

A possible alternate to using the THORAD/Minuteman booster would be to change to the Titan IIIB. The use of the Titan IIIB for CORONA has been studied, but the preliminary investigation reveals a possible vibration problem. Cost estimates for this alternative are therefore not included as part of this study.

Cost Estimates

Based upon the above assumptions, the program costs are as projected in TAB B. A comparison of the costs associated with the two courses of action is itemized in TAB D. It must be emphasized that HEXAGON termination costs and CORONA improvement costs are quick and rough estimates, without benefit of discussions with contractors, and are subject to significant change. Also, the possible cost reductions associated with reducing the required number of successful GAMBIT launches from six to four or five have not been taken into account. We will shortly have available estimates of these reductions. However, such reductions would be strongly dependent on the extent to which USIB requirements for high resolution photography permitted coverage of a sufficient number of targets at HEXAGON resolution.

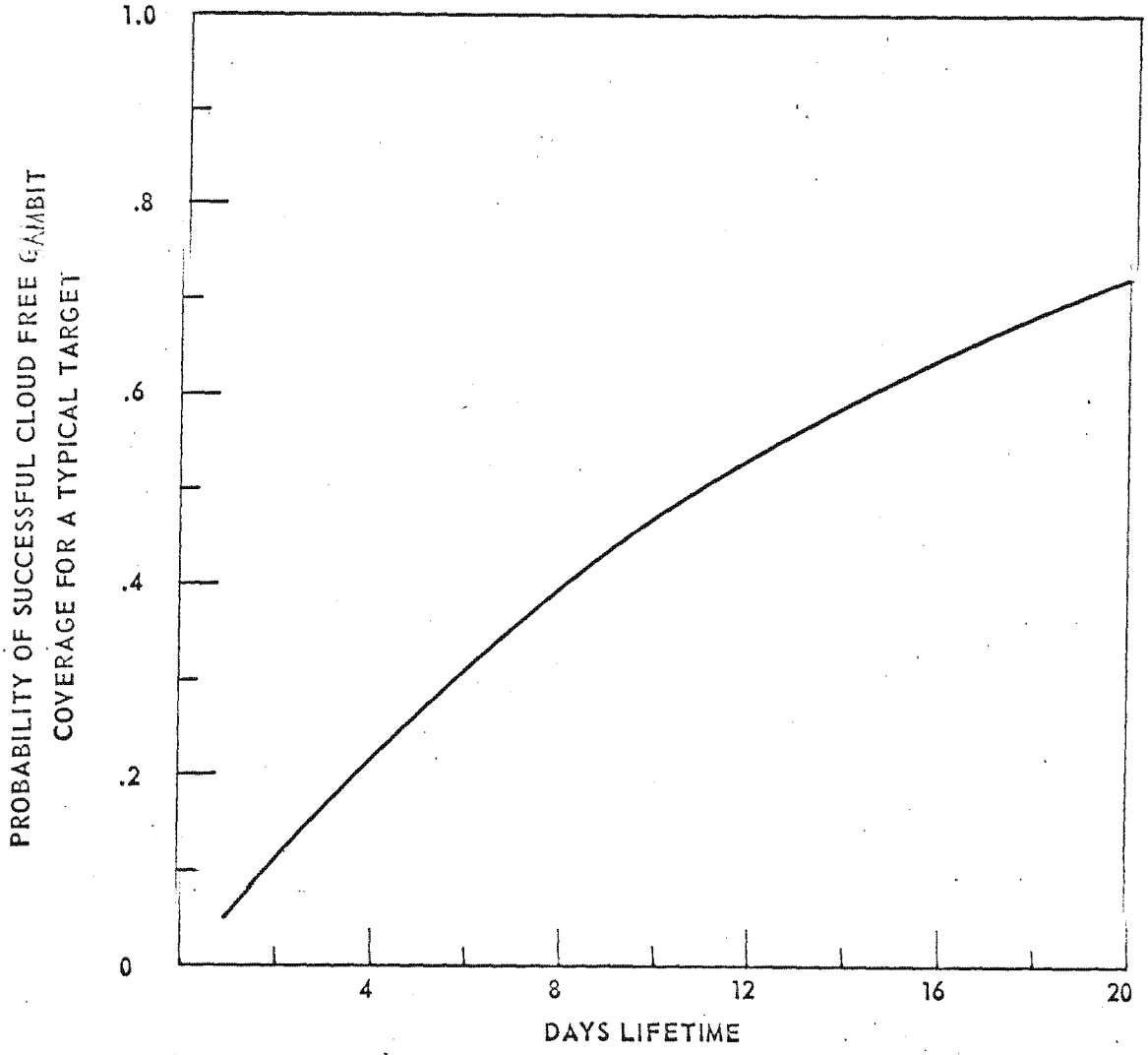
In considering resolution requirements, it is important to distinguish between nominal theoretical nadir (best) resolution and the average resolution to be expected in collected photography. For example, the theoretical nadir resolution of GAMBIT, if the specification performance goal is achieved, would be [redacted] Both these resolution figures would be further degraded by atmospheric, weather, and other operational factors of a statistical nature. I have asked the NRO Staff to prepare a technical paper defining and summarizing the relationships between the nominal nadir resolution and other resolution figures of operational significance for all NRP systems. This should help in clarifying some of the issues which arise between statements of collection requirements on the one hand and operational planning on the other.

I hope that the information provided herein in response to your request meets NIRB needs. The NRO Staff is prepared to provide further details at your request.

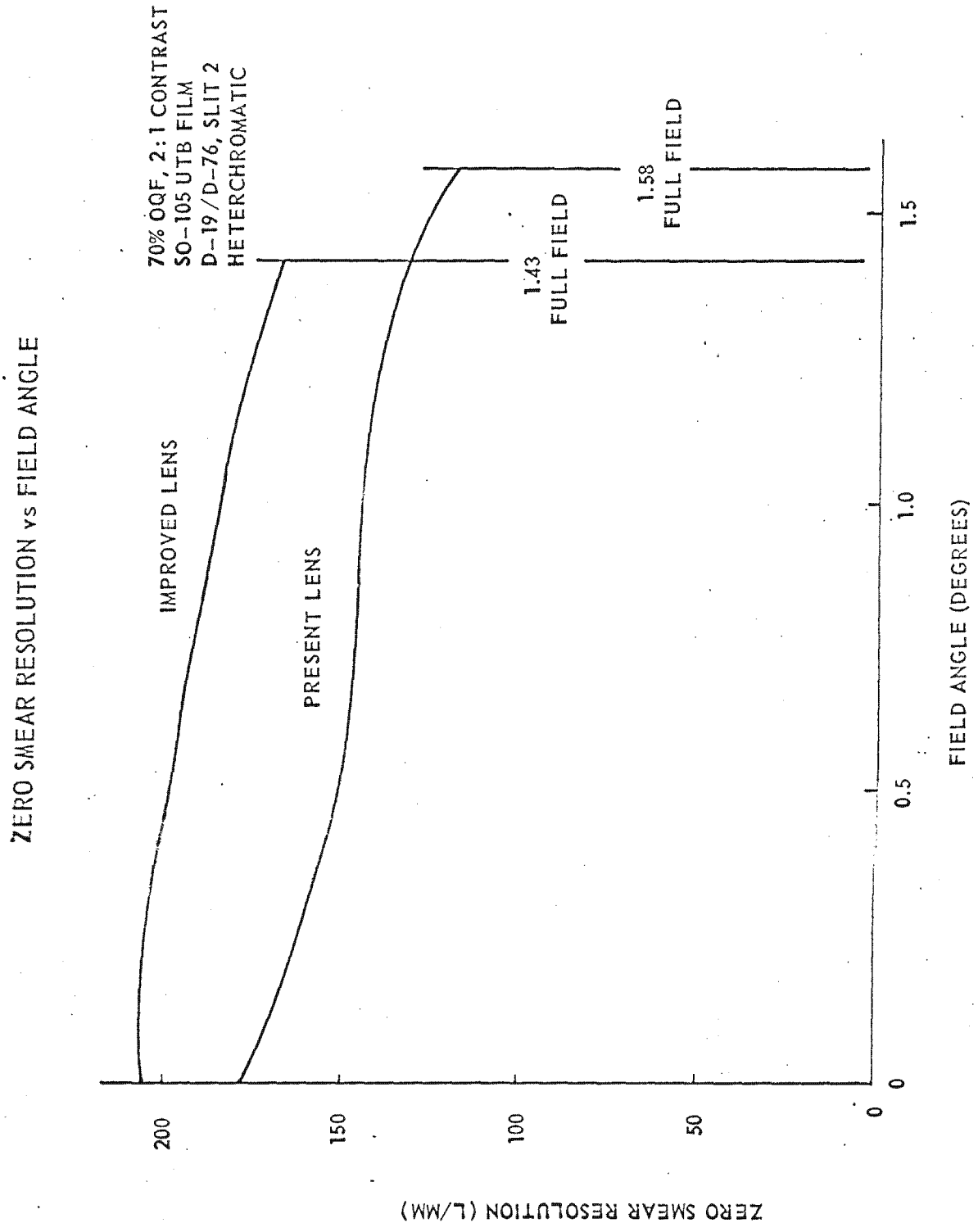
Sincerely,

Alexander H. Flax

Vice Admiral Rufus Taylor, U. S. Navy
~~Deputy Director, CIA~~



TAB A, BYE 13236/68



TAB B, BYE 13236/68

COSTS IF HEXAGON IS CANCELLED

(All costs are NRP internal rough estimates. No contacts have been made with the contractors.)

CORONA	FY 69	FY 70	FY 71	FY 72	FY 73
Launches	7	6	6	6	6
Costs ($12M/Launch Assumed)	84	72	72	72	72
Improvement to the CORONA Resolution					
Launches			1	8	8
Cost Increase		34	24	32	32
Incorporation of the 12-inch Camera in the CORONA Program					
Launches			1	6	6
Cost Increase	7.3	36.5	18	17	17
A Separate Program for the 12-inch Camera					
Launches			1	2	2
Cost Increase	7.3	22.5	16	24	24
Combined CORONA Resolution and 12-inch Camera Program					
Launches			1	8	8
Cost Increase	7.5	65	28	52	52
GAMBIT					
Launches	8	7	7	7	
Costs	178.5	154	182	163	

HEXAGON	FY 68	FY 69	FY 70
Incurred and Termination Costs	207.3	31	
Effect on Other Programs			
TIII		15	20
Total	207.3	46	20

TAB C
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COMPARATIVE COSTS FOR ALTERNATIVE COURSES OF ACTION

Case A: Continue HEXAGON

	FY 68	FY 69	FY 70	FY 71	FY 72	FY 73
HEXAGON	207	209	205*	151	145	138
GAMBIT	193	179	182*	163	149	149
CORONA	75	49	31*	23	—	—
Total	475	437	418	337	294	287

*FY 1970 through 1973 estimates are based on latest Five Year Defense Program figures and are subject to change.

Case B: Cancel HEXAGON

	FY 68	FY 69	FY 70	FY 71	FY 72	FY 73
HEXAGON	207**	31**				
Effect on Titan III Programs		15**	20**	20**	20**	20**
GAMBIT	193	179	182***	163***	149***	149***
CORONA	75	84****	72****	72****	72****	72****
Subtotal	475	309	274	255	241	241
CORONA Improvement			34**	24**	32**	32**
Separate 12-inch Program	—	7**	23**	16**	24**	24**
Total	475	316	331	295	297	297

**NRP internal rough estimates. Contractors have not been contacted.

***FY 1970 through 1973 estimates are based on latest FY DP and are subject to change.

****NRP internal rough estimates based on six launches per year.

TAB D
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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 23, 1968

MEMORANDUM FOR THE CHAIRMAN, UNITED STATES INTELLIGENCE BOARD

SUBJECT: GAMBIT Launch Schedules to Meet USIB High-Resolution Imagery Requirements

Attached is an analysis of the capability of the GAMBIT system to meet collection requirements for high-resolution satellite surveillance photography established in USIB-D-46.4/13, which you forwarded to the Deputy Secretary of Defense with your letter of April 4, 1968.

Our detailed computer studies of GAMBIT launch schedules to meet these collection requirements generally confirm the estimates which we provided to the USIB in the consultations which took place during the requirements formulation process. In general, we believe that these consultations were of considerable benefit to the NRO in planning and in assuring a fuller understanding of the USIB requirements. We recommend that such consultations continue as requirements change or collection system changes take place.

The USIB requirements statement includes collection against 5,255 targets divided into 143 categories, all in the USSR, Eastern Europe, China, and North Korea. We agree that intelligence requirements for high-resolution (KH-8) coverage outside the Communist Bloc countries can normally be satisfied without impacting on KH-8 coverage of the Bloc countries. Against these requirements, our detailed analyses of GAMBIT operations indicate the following effectiveness:

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Number of days on orbit per quarter	Average annual satisfaction of quarterly requirements
10	60%
15	87%
20	95%

It should be noted that these averages are over all target categories and over all four quarters. Thus, the degree of satisfaction of the requirements in specific target categories or in specific quarters (because of weather and sun angle variations) may be better or worse than these annual averages, as will be discussed below. The analytical results also indicated that an average of 64 percent of the coverage would be obtained in the stereoscopic mode rather than 69 percent required. However, current experience approximates to satisfying only about 50 percent of the stated requirements in the stereoscopic mode.

It follows from the above figures that eight successful missions of GAMBIT in the current configuration (10-day mission duration) are needed to achieve 95% average satisfaction of the USIB quarterly requirements. Reduction to seven completely successful missions rather than eight will not affect the annual averages of satisfaction of the quarterly requirements as much as it will affect particular quarters. The results of a reduction to seven missions depends on the quarter in which only one successful mission rather than two is flown as follows:

Quarter	Quarterly Satisfaction of Requirements (Average over target categories)	
	One mission	Two missions
1	56%	95%
2	65%	99%
3	80%	100%
4	50%	86%

These average computed figures for percent satisfaction of quarterly requirements are borne out by the results for GAMBIT missions 4313 and 4314 (2nd quarter) which achieved 97%. Since the GAMBIT system has a .9 reliability factor, eight flights scheduled would be expected to result in about seven successful missions. Scheduling will need to be carefully worked out to minimize the impact of any single mission failure on the satisfaction of quarterly collection requirements.

On the whole, the requirements for most target categories could be reasonably well satisfied by eight successful missions and, in most cases, acceptably satisfied by seven successful missions. However, the requirements for a few categories were found to be significantly undersatisfied in some quarterly periods. Examples are the following:

Target Category	No. of Targets	No. of Unique Targets required per Qtr.	Percent Quarterly Requirement Satisfaction			
			1st Qtr	2d Qtr	3d Qtr	4th Qtr
Ground Forces						
TAC troop installation (fixed)						
E. Germany (indigenous)	27	15	133%	33%	0	33%
Other European (indigenous)	325	15	94%	81%	59%	16%
Eastern Europe (Soviet Forces)	137	25	73%	88%	38%	34%
Western USSR	352	17½	212%	100%	57%	57%
Southern USSR	206	15	91%	73%	60%	17%
Missiles						
ICBM Test Facilities						
Plesetsk	16	6	60%	200%	20%	120%
Tyuratam	34	14	84%	92%	23%	7%

These cases, in which quarterly requirements are undersatisfied, are caused by long periods of high probability of cloud cover in some areas and by conflict for camera pointing priority between targets. In the spirit of the USIB requirements document, which stipulated that it was not intended that any single substantive intelligence priority be allowed to establish the size of the program, these particular cases of undersatisfaction of the requirement were not permitted to unduly influence the overall number of launches. Further, it should be kept in mind that both the requirements for sampling and the collection process are statistical in nature, so that actual results for particular target categories, which represent only a small fraction of the total targets, must be expected to show considerable random fluctuation from computed averages. In this connection, it should be noted that coverage problems arising from camera aiming conflicts in areas with dense concentrations of targets such as those in the Moscow, Leningrad, Tyuratam, and Sary Shagan areas, which were highlighted in Annex B, Table B-2 of COMIREX D-11.1/2, must be expected to continue under the planned GAMBIT program of seven successful launches per year.

In order to achieve with the GAMBIT system the degree of satisfaction of the USIB collection requirements indicated above, it will be necessary not only to schedule launch intervals to take maximum advantage of probable favorable weather conditions and high sun angles, but also to maintain rigorous procedures of daily record keeping during missions of target categories covered against verified weather in the target area and to guide subsequent day collection accordingly. Our analyses indicated that these procedures accounted for about an 8 percent increment in the collection effectiveness (i.e., the average figures given above would be about 8 percent lower if such procedures were not followed). We will continue to make every effort to improve operational procedures in order to obtain maximum collection effectiveness from GAMBIT missions.

Since, as indicated in your letter of April 4, 1968, the USIB, on the basis of preliminary NRO estimates of collection effectiveness, concluded that seven successful KH-8 missions

would satisfy the essential needs for high-resolution imagery, and since our more detailed analysis essentially confirmed preliminary estimates, we have now reoriented the FY 1969 GAMBIT launch schedule from the previously planned nine missions to the current plan for eight missions. Considering the demonstrated system reliability of 90 percent, this will result in an expectation of seven successful missions rather than the eight successful missions previously planned.

With respect to the FY 1970 program, careful consideration will need to be given to the improved GAMBIT system capabilities expected in this period, particularly the increase in orbital lifetime from 10 days to 14 to 16 days. The NRO is currently engaged in assessing in detail the implications of these improved collection capabilities with respect to the FY 1970 GAMBIT launch schedule to meet the USIB requirements statement for high-resolution imagery. We anticipate the need for intensive collaborative effort with COMIREX and the USIB in order to arrive at an agreed FY 1970 program.

Alexander H. Flax

Alexander H. Flax

Attachment
COMIREX Collection Requirements for Planning vs KH-8 System (USIB-D-46.4/13, 4 Apr 68) NRO Study dtd 2 July 68 (BYE 13006-68)

~~TS~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 23, 1968

MEMORANDUM FOR DEPUTY SECRETARY OF DEFENSE

SUBJECT: GAMBIT Launch Schedule Requirements

The attached reply to Dick Helms responds to his letter to you of April 4, 1968 which forwarded the latest revision of the USIB requirements for GAMBIT (KH-8) photographic coverage of the Soviet Bloc and China. (All other coverage is not counted in computing GAMBIT launch schedule requirements since there is no camera pointing conflict with Soviet Bloc and Chinese targets and GAMBIT is not film limited.)

The results of detailed NRO analyses, which have just been completed, confirm earlier estimates provided to the USIB as the basis for their requirements studies. On the average, 95% of the USIB quarterly collection requirements for all categories can be met over all quarters by two GAMBIT missions per quarter or eight successful missions per year. (The quarterly collection requirements control the launch requirements, annual collection requirements are more easily met.)

We had originally scheduled nine GAMBIT missions in FY 1969 to achieve a probable eight successful missions (demonstrated GAMBIT reliability is 90 percent). As a result of these studies and consultations with USIB, it has been decided that an acceptable level of satisfaction of requirements can be achieved with seven successful missions. If two missions are scheduled in each quarter, then depending on the quarter of the year which is affected by the GAMBIT malfunctions represented in the reliability figure, the probable degree of satisfaction of USIB requirements in that quarter will vary from as low as 50 percent to as high as 80 percent, failures in the winter quarter being much more serious than failures in the summer quarter. We are

BYE-13251/68 1WC C

currently adjusting the allocation of mission between quarters to make the effectiveness of the GAMBIT collection program as insensitive as possible to random malfunctions of the GAMBIT system.

Although the figure of 95% satisfaction of USIB quarterly requirements is impressive, it must be kept in mind that this is an average over 5,255 targets in 143 categories. Since each of these categories represents only a small fraction of the total target list, it must be expected that the degree of satisfaction of specific target category requirements in specific quarters will show considerable fluctuation from the figure of 95 percent averaged over all categories and all quarters. This is indeed the case and some of the categories which are expected to be undersatisfied are not unimportant ones. Some specific examples of probably undersatisfied requirements are given in the attached memorandum to Dick Helms; included in these examples are such categories as Soviet Ground Forces in Eastern Europe and the activities of the Tyuratam Missile Test Facilities. It must therefore be concluded that, in agreeing to a level of seven rather than eight successful missions in FY 1969, the USIB has recognized that their requirements statements (which are statistical in nature and, in any event, represent a consensus of judgments) could not be arrived at in isolation from economic factors. This reflects a healthy trend--whether it would be wise to press for further reductions in the level of USIB requirements for high-resolution satellite imagery is a delicate and difficult question. The DoD has a large stake in any such reductions both as the major consumer of intelligence and as the agency charged with overall management of the satellite collection resources. For that reason, I would again suggest that all possible measures be taken to expeditiously complete the study of DoD requirements for satellite photographic reconnaissance which you directed on January 26, 1968.

Dick Helms' letter refers to the Bureau of the Budget proposal at the time of FY 1969 budget review that the GAMBIT launch schedule requirements be reviewed by an ad hoc committee composed of representatives of the Secretary of Defense, the

Bureau of the Budget, and the Director of Central Intelligence. You and Dick agreed that, if possible, the matter should be handled by the USIB in collaboration with the NRO. Actually, the Bureau of the Budget issue came about because they had already, in mid 1967, gotten wind of the USIB/NRO dialogue which dealt with the question of GAMBIT launch schedule. There is no doubt that the issue raised by the Bureau of the Budget highlighted the requirements question. Whether it changed the outcome of the USIB/NRO consultations can only be conjectured. In any event the outcome for FY 1969 is substantially that proposed for consideration in the USIB/NRO deliberations and taken up by the Bureau of the Budget, namely, reduction of the schedule by one mission.

In order to assure that ExCom considerations of the GAMBIT program in the FY 1970 budget for the NRP are based on more timely availability of requirements/launch schedule analyses, the attached letter to Dick Helms in effect asks him to assure the USIB/NRO consultations on the GAMBIT launch schedule are completed in time for such consideration. This is important, in spite of the just completed studies, because in FY 1970 the improved (double recovery bucket version) GAMBIT will provide orbital lifetimes of 14-16 days vice 10 days for the current version.

Alexander H. Flax

Attachment
Reply to Mr. Helms
(w 2 atchs: BYE 13252-68
& BYE 13006-68)

Alexander H. Flax

See next tab

THE DEPUTY SECRETARY OF DEFEN.
WASHINGTON, D. C. 20301

~~GAMBIT~~

July 29, 1968

Dear Dick:

The NRO has now completed a detailed analytical study of the capability of the GAMBIT system to satisfy to an acceptable degree the latest USIB statement of requirements for high-resolution imagery which you sent me with your letter of April 4, 1968. The results of this analysis essentially confirm the preliminary estimates provided to the USIB by the NRO. Accordingly, your recommendation that the GAMBIT launch schedule for FY 1969 be reduced by one mission has been implemented. Eight missions are now scheduled rather than the nine previously planned. With the 90 percent demonstrated reliability of the GAMBIT system, this should result in the required seven successful missions in FY 1969. More detailed information on the NRO analysis is contained in the attached memorandum to you from Al Flax.

I believe that continuing careful and orderly studies and analyses, of the type represented in these collaborative efforts of the USIB and the NRO, are extremely important if we are to meet our high-priority national intelligence needs in an efficient and economical manner. Therefore, in view of the improvements in GAMBIT system's effectiveness anticipated with the introduction of the double recovery bucket version to be introduced in FY 1970, I have asked Al Flax to assure that the NRO, in consultation with the USIB, completes the necessary studies of the FY 1970 launch schedule in time for inclusion in the FY 1970 budget estimates this fall.

Sincerely,

Paul

Attachment
Memo DNRO to Chmn, USIB
(BYE 13252-68)

Honorable Richard Helms
Director of Central Intelligence

Cy #1
Cy #16
BYE 078210-68

~~GAMBIT~~

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ExCom-M-1

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held 6 October 1965
Room 3E 928, The Pentagon

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Admiral William F. Raborn	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology
Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee, Ex Officio

Others Present

Mr. R. Helms, DDCI	Mr. H. Sheldon, CIA
Mr. J. Crowley, CIA	Colonel D. Carter, NRO Staff
Mr. L. Dirks, CIA	Dr. D. Steininger, PSAC
Dr. L. Lauderdale, CIA	

New Search System

1. Briefings. The Executive Committee was presented with a short review of the three camera systems under study for the satellite photographic search function and their contract status.

a. Mr. Dirks briefed on the Perkin-Elmer proposal. This contractor had been studying two systems but, on their recommendation, was now assigned to pursue only the system briefed at this meeting. They plan to have a proposal available by 15 November 1965.

b. Colonel Carter briefed on the Eastman Kodak and ITEK cameras, indicating that the EK camera contract was being terminated and the camera design transferred to ITEK for further study. He indicated that the ITEK contract will run through 31 December 1965 with an engineering model scheduled for 26 March 1966.

BYE-36907-65
Copy 6 of 10

Reference was made in the discussion to an NPIC study on the fall-off of quality in the extremities of obliquity. This study will be made available to the members.

2. Next Actions. Dr. Flax described his plan to establish a technical task group to be composed of representatives of the CIA and SAFSP under chairmanship of the NRO to prepare a statement of system operational requirements, to recommend the selection of a system configuration, to formulate plans for contractor selection, and to recommend a program plan including a schedule. This group will first be asked to assess the effort and time required to complete its tasks; the anticipated dates for completion of the task group activities will be made available to the ExCom within the next few weeks. He indicated that the instructions to the technical task force would have to take into account the fact that the studies and developmental work on the three camera concepts are in different stages. He also indicated that the group would be guided in its camera and contractor selection by instructions from the D/NRO.

3. Dr. Flax indicated that he planned also to establish a task group to define the project management structure. The terms of reference for this group, participants, and due date would likewise be available to the ExCom within two weeks.

4. ExCom Action. The Committee concurred in the actions indicated by Dr. Flax in paragraphs 2 and 3 above.

[redacted]

Addendum from the D/NRO

8. We have previously advised USIB and COMOR that four GAMBIT missions, in addition to the one scheduled in September, could be conducted by 1 January 1967. Special inspections of mission critical components and subsequent spacecraft testing to assure flight readiness have reduced the number of possible missions in this time period to two, in addition to the

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~~GAMBIT~~

ExCom-M-1

September one just successfully completed. These missions are scheduled for early November and early December. The other two spacecraft will be available during the first quarter of CY 1966 in addition to those now scheduled during that time.

James Q. Reber
Secretary
NRP Executive Committee

Copy 1 Mr. Vance
2-4 Adm. Raborn
5 Dr. Hornig
6,7 Dr. Flax
8-10 Mr. Reber

~~GAMBIT~~

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NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held 16 November 1965
Room 3E 928, The Pentagon

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Admiral William F. Raborn	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology
Mr. James Q. Reber	Acting Director, National Reconnaissance Office, Ex Officio

Others Present

Dr. John S. Foster, DDR&E	Mr. John A. Bross, CIA
General James T. Stewart	Mr. Huntington D. Sheldon, CIA
Director, NRO Staff	[redacted] CIA
[redacted]	
NRO Comptroller	

Review of the NRP Budget FY 1967

1. The method of approach for review of the budget was for [redacted] the Comptroller, to review the budget calling attention to problem areas, subsequent to which the letter from the Director of Central Intelligence to the Director, National Reconnaissance Office (16 November 1965, BYE-0345-65) was to be discussed.

2. Problem Areas Resolved. In the problem areas there was agreement to discuss certain ones further at a meeting next week (see paragraph 3). Other problem areas were settled as follows:

a. U-2 Buy. It was agreed to remove the $38.6 million which had been included in the NRP Budget for the possible purchase of new U-2s in FY 1967. In doing so the Committee felt that consideration for a new buy could wait some months, even as late as for the FY 1968 budget. If the situation changed and a U-2 buy became imperative, fund sources would have to be identified. Note was taken of the fact that the lead time on new U-2s is 12 to 14 months (at a rate of approximately one per month).

b. Satellite SIGINT. It was agreed to reduce the NRP figure of $48 million to $43 million as recommended by Dr. Foster. indicated this could be met by eliminating one FY 1968 launch. It was noted that satellite SIGINT collection is one field in which we have many uncertainties to be resolved, hopefully on completion of the USIB's current cost-effectiveness study which is being carried on by the Committee on Overhead Reconnaissance with the assistance of outside experts.

c. ISINGLASS. Mr. Vance felt strongly that $15 million was too much of a commitment for ISINGLASS. He felt that a much more modest scale of effort in the analytical field was in order until we see where it fits into our reconnaissance program, if it fits in at all. He further believed that money for this could come out of the General R&D funds, perhaps up to as much as $6 million. Dr. Hornig was reluctant to discontinue interest in the ISINGLASS but agreed that we first needed to see how and where it fitted in our program. Admiral Raborn proposed that the NRO should take on the job of defining where it fits. It was agreed that for the present budget Mr. Vance's approach should be followed although specific funds for FY 1966 and 1967 were not agreed to. Meanwhile, the NRO will, with the CIA, prepare for the ExCom an examination of whether the ISINGLASS concept has a place in the NRP.

A briefing on ISINGLASS will be provided to the ExCom in the near future in response to the request of Mr. Vance and Dr. Hornig.

d. Vulnerability. General Stewart noted in response to the DCI's memorandum that the NRO was initiating discussions with the CIA particularly in regard to joint preparation of threat models and associated analyses.

e. Advanced Cartographic Satellite System. There was agreement that the $13.7 million originally included for the above subject in the NRP Budget should be removed. It was noted that advanced technology on wide angle lenses (applicable to A/C or satellites) would be continued at a level of about $1.5 million in advanced development.

3. Problem Areas to be Resolved. The following problems were discussed inconclusively pending a meeting on them next week at which time further information will be provided as indicated:

a. OXCART. Discussion centered on the proposed DDR&E reduction of $10 million from the NRP Budget figure of $104 million. [redacted] explained the rationale he had used in reducing the original CIA OXCART figure of $127 million to $104 million and stated he believed that this was a justifiable figure. Questions raised by Dr. Foster with regard to the flying-hour program and the engine overhaul for all of the 11 OXCART aircraft in question appeared to be the critical factor in the matter of reduction. Information on these questions will be provided by CIA in concert with [redacted] at the next meeting.

Mr. Vance indicated that he wished to discuss separately with Mr. McNamara and Admiral Raborn the BoB proposal re disposition of the OXCART assets.

[redacted]

c. Countermeasures. Dr. Foster emphasized the importance of funds for this purpose and viewed it as a more critical item in the future success of our reconnaissance programs than perhaps some items of more general acceptance. If the $7.5 million is related to a limitation imposed by availability of manpower, he would agree to it. If not, he felt that perhaps this item should be increased. He agreed to look into this matter and to report at next week's meeting.

d. General R&D (Studies, Applied Research, etc.). After some discussion, Mr. Vance asked Dr. Hornig to discuss what he considered a fair percentage of the total NRP Budget to be devoted to R&D. The DNRO will comment at the next meeting more fully with regard to the plans for the use of the R&D funds and also on the question raised by the DCI with regard to assigning a fair share of the NRP R&D funds to CIA for mission-oriented research. The Committee agreed not to pursue a specific operational project on balloons at this time, but did not rule out conceptual studies and/or technology efforts at a modest level.

ExCom-M-1

New Search System

4. [redacted] reported that there might be an adverse view of the DoB on the New Search System. Mr. Vance requested Mr. Schulte of the DoB to furnish issue statements on any of the NRP programs as soon as possible.

Black Portion of the Air Force Budget

5. [redacted] presented a chart showing relationships of the black budget to the total Air Force budget, indicating certain trends. These trends show that in the missile procurement appropriation there is more than half of the total new obligating authority budget which Congressman Mahon cannot discuss with his full committee. He reported that in response to Dr. Brown's inquiry last year he had prepared a discussion paper examining potential areas for reducing the black budget. Mr. Vance said he would like to read the memorandum, as did Admiral Raborn, and indicated his concern about this matter. Admiral Raborn offered to provide assistance in talking informally with members of Congressman Mahon's committee if that were desired. Mr. Vance stated that after they have read the paper he wished to talk with Admiral Raborn further about the matter.

Briefing on G-3

6. Mr. Vance requested that in the near future a briefing on G-3 be presented to the ExCom.

DCI Letter

7. At the conclusion of the foregoing discussion and actions General Stewart reviewed the aforementioned letter of the DCI indicating paragraph by paragraph the way in which the foregoing discussion had related to his various points. In summary, all the matters were considered to have been responded to except for the items listed for treatment at next week's meeting and the following additional comments:

a. With regard to CORONA, since the new general search system will not be available as soon as anticipated last year, General Stewart pointed out that the KH-4 program will

have to extend into FY 1969 (the present program termination date has been assumed as end of FY 1968). He indicated that FY 1966 funds, previously allocated to the new general search system, and not now needed because of its late start, were tentatively reserved to buy four more CORONA systems to extend the program into FY 1969.

b. General Stewart indicated that the FY 1966 funds now being reserved for CORONA might instead have to be allocated to a buy of additional GAMBIT's for FY 1967 launch to provide for increased launches for China coverage as being considered by the Secretary of Defense. General Stewart indicated he would discuss this subject at the next ExCom.

James C. Reber
Secretary
NRP Executive Committee

Copy 1 Mr. Vance
2-4 Adm. Raborn
5 Dr. Hornig
6-8 Dr. Flax
9,10 Mr. Reber

November 18, 1965

MEMORANDUM FOR: Recipients of BYE-37025-65

Please destroy BYE-37025-65 and substitute the attached agenda therefor.

James Q. Reber

SECRET

AGENDA FOR NRO EXECUTIVE COMMITTEE

1400 Hours, Tuesday, 23 November 1965

Office of Deputy Secretary of Defense

Continuation of Budget Review

1.	OXCART	
	Consideration of the $10 million difference between the NRP and DDR&E recommendations	Mr. Sheldon
2.		Mr. Sheldon
3.	Countermeasures	
	Adequacy of the $7.5 million	Dr. Foster
4.	General R&D	
	Whether the percentage of R&D funds to the total is adequate for the NRP. Fuller expanation of the content of this category. Adequacy of the CIA portion.	Dr. Hornig Dr. Flax
5.	Schedule and Availability of Photographic Satellite Systems	
	Briefing and consideration of the schedule in light of needs for China	Gen. Stewart

/s/

James Q. Reber
Secretary
NRO Executive Committee

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SECRET

BYE-37025-65/1A

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~~CORONA/GAMBIT~~
~~IDEALIST/OXCART~~
~~EARPOP~~

ExCom-M-3

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held 23 November 1965
Room 3E 928, The Pentagon

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Admiral William F. Raborn	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology
Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee, Ex Officio

Others Present

Dr. John S. Foster, DDR&E
General James T. Stewart
Director, NRO Staff
[redacted]
NRO Comptroller
Mr. Huntington D. Sheldon, CIA
Mr. John A. Bross, CIA
Mr. John J. Crowley, CIA
[redacted] CIA
Dr. Donald Steininger, PSAC
Mr. William Thomas, BoB

Continuation of Budget Review

1. The Executive Committee continued its review of the budget from its meeting of 16 November (see ExCom-M-2). It dealt with the items remaining for consideration, taking into account the memorandum on the NRP Budget received from the Director of the Bureau of the Budget to Mr. Vance dated 20 November 1965 (BYE-38850-65).

2. OXCART. The ExCom heard further comments from Dr. Foster who proposed that something like four of the OXCART aircraft could be put on blocks pending an actual need. [redacted] explained that this would save approximately $2.4 million per aircraft. The ExCom, however, after hearing Mr. Sheldon's breakdown of the flying-hour program and the relation of engine overhaul to that program

BYE-37043-65
Copy 2

~~EARPOP~~
~~IDEALIST/OXCART~~
~~CORONA/GAMBIT~~
[redacted]

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~~T O P S E C R E T~~

and discussing line item costs in some detail, approved the NRP Budget proposal of $104.3 million for OXCART. In doing so the members believed that in the present international situation and at a time when the OXCART was on the verge of demonstrating its possible usefulness this was an untoward time to be making the proposed cut.

3. In the course of this decision, Dr. Foster raised the question of the interchangeability of the OXCART with the SR-71. Dr. Flax in response indicated that the two systems would ultimately be interchangeable in a technical sense but that the different operational concepts, one military and the other covert and civilian, dictated the present plans for operation. This was a matter of policy and not of resource allocation and management. Pilots could be transferred between the two aircraft with a minimum of transition instruction, but the aircraft were enough different structurally and in subsystems so that few economies in spares and logistic support would result from common operation except in the case of the engines. If policy considerations permitted, one change which would save some money would be the use of a common base. Further, he called attention to the fact that the SR-71 would not be fully operational for almost a year, so that no action could be contemplated with respect to interchangeability at this time.

[redacted]

5. Countermeasures. Dr. Foster, as he had at the last meeting, emphasized the importance of pushing ahead on the countermeasures problem because of its critical importance to the survivability of the aircraft in which we had invested considerable funds. Mr. Sheldon stated that he had looked into the question raised by Dr. Foster as to whether additional funds could be usefully employed to strengthen this program. He reported that the Agency felt that the total figure might be as much as $12 million but he felt that $2.5 million additional to the proposed $7.5 million, or a total of $10 million, would certainly provide enough funds within which useful additional research could be pursued.

6. The ExCom approved a figure of $10 million for countermeasures which was to be employed in research on advanced technology and not for the specific subsystems for the OXCART, SR-71, or U-2, but with the aim of bringing some of the more promising advanced techniques closer to operational use.

7. General R&D (Space-Oriented Applied Research). Dr. Hornig reported on the investigation he had made with regard to the percentage of total funds employed by NASA and the DoD in the general field of R&D. He stated that 16 percent of NASA's earlier budget had been R&D which was now reduced to 8 percent. The DoD general R&D budget ran about 3 percent. He said the question as related to the NRP is whether we are in a mature stage of development or building up a new technology. He felt that the R&D money in the present NRP Budget parallels the general DoD approach. Dr. Flax admitted that identification of general R&D funds was to some extent arbitrary but stated that he and [redacted] had arrived at a figure of about 5 percent for the NRP. Dr. Hornig inquired whether there was a director of R&D for the NRP comparable then to the role of Dr. Foster in the DoD. Dr. Flax replied that at the moment the NRP R&D was not centralized in a comparable way but there were several individuals who were watching this. He agreed to provide a briefing as Dr. Hornig requested on the R&D related to the NRP, including DoD white R&D which was related to NRP objectives.

8. [redacted] commented that, in reconsideration of his proposal of the previous week, $5.7 million be added to the DDR&E

proposal for the Advanced Development element; examination indicated that the funding should more properly be under Applied Research and that total then be $20.7 million. The ExCom approved $20.7 million for Applied Research. It was also agreed that in so approving, these funds were not being allocated in specific amounts by agency but rather would be allocated after specific R&D projects were submitted by the agencies and approved by the DNRO, taking into account the NRP needs.

9. Satellite Schedule. General Stewart briefed the ExCom on the present and near-future schedule of CORONA and GAMBIT capabilities in relation to the anticipated operational dates of the New Search System and G-3, taking into account the need for overlap between existing and upcoming systems, as well as the possible need for the eventual increase of the CORONA coverage.

10. General Stewart proposed that the procurement of six additional CORONA systems be considered for delivery in late FY 1968 and launch in FY 1969, noting that contractual action need not be taken at this time. Fund availabilities, near-future launches, and launch requirements will be reassessed before procurement is initiated.

11. General Stewart also proposed to buy six additional Gs beyond those now budgeted which would be delivered in the spring and summer of 1967. Funds for three of the six Gs can be made available from FY 1966, and the remaining three would be either an FY 1966 or 1967 problem. The Committee noted that this action pushed ahead the date on which a decision on any further GAMBIT buy must be made to not later than 1 August 1966.

12. U-2 Mods. [redacted] clarified the misunderstanding, as evidenced in the paragraph on DRAGON LADY in the letter from the Director, BoB with regard to the plans and funds for modification of SAC U-2s. $14.8 million was approved for DRAGON LADY.

[redacted]

~~T O P S E C R E T~~

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~~/CORONA/GAMBIT~~
~~IDEALIST/OXCART~~
~~EARPOP~~

ExCom-M-3

[redacted]

14. There was considerable discussion on the BoB proposal to apply $25 million of a revised $92 million for new general search in FY 1966 against FY 1967 new funds. [redacted] explained the $92 million as being a best estimate at this time. [redacted] requested that the $25 million not be frozen for new general search, and that, if less than $92 million were required for FY 1966, any difference be available for application to the additional GAMBIT and CORONA requirements, since the slowdown in planned development of the New General Search system would be reflected in the need for additional GAMBIT and CORONA vehicles. The ExCom agreed.

15. Action on Total NRP Budget. Mr. Vance requested Mr. Thomas to discuss the ExCom determinations with Mr. Schultze, and for Mr. Schultze to inform Mr. Vance whether there were still Bureau of the Budget issues.

16. The NRP FY 1967 Budget resulting from the ExCom determinations is reflected in the attachment.

James Q. Reber
Secretary
NRP Executive Committee

Copy 1 Mr. Vance
2-4 Adm. Raborn
5 Dr. Hornig
6-8 Dr. Flax
9,10 Mr. Reber

Attachment
NRP FY 1967 Budget

BYE-37043-65

~~EARPOP~~
~~IDEALIST/OXCART~~
~~/CORONA/GAMBIT~~

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~~T O P S E C R E T~~

77

~~CORONA~~

Draft Memorandum

MEMORANDUM FOR: DIRECTOR OF RECONNAISSANCE, CIA
DIRECTOR OF SPECIAL PROJECTS, SAF

SUBJECT: CORONA Management Plan and Organizational Responsibilities

The purpose of this memorandum is to set forth the CORONA management arrangements and assignments of system responsibilities which were approved by the NRP Executive Committee on April 26, 1966.

There follow specific instructions and guidance on CORONA management and assignments of system/sub-system responsibilities.

PROGRAM MANAGEMENT:

The Director, SAFSP, is designated as the CORONA System Project Director (SPD). In addition, the SPD will direct and supervise the development and/or production of various sub-systems as defined herein. The Director, SAFSP, will establish a CORONA System Project Office (SPO) to discharge assigned functions and responsibilities, and will appoint a Deputy Director, SAFSP, for CORONA who will manage the day-to-day activities of the SPO.

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The Director of Reconnaissance, CIA, will direct and supervise the development and/or production of the CORONA Payload Sub-Assembly, as defined herein, reporting directly to the DNRO. The Director of Reconnaissance, CIA, will establish a CORONA Payload Sub-Assembly Project Office (PSAPO), and designate a Chief thereof, responsive and responsible through him to the DNRO for the total Payload Sub-Assembly development and production and to the SPD for overall system matters, as set forth below.

SPECIFIC SYSTEM RESPONSIBILITIES:

The Director, SAFSP, as SPD, is responsible for: overall system engineering (including master system specifications) and system integration (including major sub-system interface specifications); overall system master planning, programming, and budgeting; assembly and check-out of the system at the launch pad; launch and mission operations; capsule recovery and delivery of film to DNRO-designated processing facilities.

In addition, the SPD is responsible for: the thrust-assisted THOR and THORAD boosers; the AGENA booster/spacecraft; procurement of the DISIC; the acquisition and operation of system assembly

(excluding the LMSC-AP facility) and launch facilities; on-orbit command and control facilities; and capsule recovery forces and equipments.

The Director, PSAPO, is responsible through the Director of Reconnaissance, CIA, to the DNRO for the total Payload Sub-Assembly development, production (excludes procurement of the DISIC) and test; the provision of software support to the NRO Satellite Operations Center before, during, and after missions; operation of the LMSC-AP facility; and for adherence to master system specifications, interface specifications, and master project plans established by the SPD in accordance with the provisions of this management plan. By definition, the CORONA Payload Sub-Assembly includes the KH-4 cameras, the SI and/or DISIC, film transport mechanisms, the RV's, supporting structure and shell, and those other items normally installed and tested at the LMSC-AP facility.

In addition, the PSAPO is responsible to the SPD to assist and manage, as appropriate, those Payload Sub-Assembly system assembly and pre-launch activities at Vandenberg AFB, to certify at appropriate times that the Payload Sub-Assembly is ready, and

to act as the principal Payload Sub-Assembly assistant to the SPD during pre-mission planning, on-orbit operations, and post-mission analyses.

SAFSP/CIA-OSP RELATIONSHIPS:

It is not possible, at this time, to forecast any future engineering/performance trade-offs which may be made as detailed design and development of the J-3 CORONA proceed. The NRO objective in the CORONA Project is to acquire and operate the overall most effective search and surveillance satellite system possible within the constraints of time, technology, and available resources. The Payload Sub-Assembly contains the key element (i.e., the camera) of the system and, as such, its fundamental basic structural, dynamic, thermal, power, etc., requirements must be given proper weight in-determining overall system configuration and characteristics. When the necessity does arise for a trade-off between the Payload Sub-Assembly and another sub-system in terms of total system performance, the SPD will always attempt first to resolve the problem in such a way as to minimize the effect on the sensor. However, such resolutions of interface problems must always be tested to assure

that overall system performance is not seriously degraded. Thus, both the SPD and PSAPO must analyze in terms of total system effectiveness when considering interface and trade-off problems.

In this arrangement, the CORONA System Project Director (SPD) responsibilities will not include sub-system engineering, technical direction, or contract supervision for the Payload Sub-Assembly (except for DISIC procurement); the CIA will be responsible to the DNRO for these functions with respect to the Payload Sub-Assembly. The following discussion of the management relationships is intended to clarify the division of responsibilities:

1. As stated previously, the SPD will be responsible for overall system engineering and integration. In this capacity, he will also be responsible for all sub-system interfaces. In such matters, the Payload Sub-Assembly Project Office is expected to be responsive to appropriate direction from the SPD. However, the SPD, in the exercise of this interface responsibility, will give special consideration to the basic environmental requirements of the Payload Sub-Assembly as established in consultation with the CIA.

2. On the other hand, the SPD is not expected to

accomplish engineering (unless assistance is solicited) on technical matters pertaining solely to the Payload Sub-Assembly. SPD actions elsewhere in the system affecting interfaces with the Payload Sub-Assembly do require the concurrence of the PSAPO. Similarly, PSAPO actions which affect interfaces with other elements of the system do require the concurrence of the SPD.

3. The SPD is responsible for master planning, master programming, and overall budgeting; however, he is not authorized to alter program or budget estimates of the Payload Sub-Assembly Project Office. Conversely, the latter is expected to program and budget in accordance with the master schedules issued by the SPD. (Note: CIA-OSP will submit budget estimates in the normal manner direct to the DNRO; however, the SPD will also include payload sub-assembly schedules and budget estimates in the System Project Plan for information purposes).

The most significant area of SAFSP/CIA-OSP relationship is that pertaining to interface between the sensor sub-system and other system elements. I cannot emphasize too strongly the need for close daily rapport between the respective offices. Representatives of both offices are expected to attend all meetings on subjects having a possible interface impact. The SPD and PSAPO are expected to have <u>free and full access to all</u>

information and data pertaining to the system. This includes, as appropriate, access to contractor plants, engineering staffs and test facilities. However, supervision and technical direction of the contractor's activities will be solely by CIA-OSP for elements of the Payload Sub-Assembly and by SAFSP for other system elements. If either SAFSP or CIA-OSP infers a possible interface action pertaining to any action of the other, he is expected to so advise the other without delay. When a possible problem of this nature is raised, it is to be resolved without delay (if resolution in the field is not possible, the matter will be brought to my attention for decision).

Informal and direct communications between appropriate working personnel of both the SPO and PSAPO must be authorized and encouraged (when opposite project office personnel and contractor(s) are involved, there must be appropriate coordination with the Government Agency supervising each contractor(s)).

ON-ORBIT OPERATIONS:

The SPD will operate a CORONA Operations Command Post at the Satellite Test Center, Sunnyvale, continuously during a mission. The Payload Sub-Assembly Project Office will station appropriate Project Office and contractor representatives there as well as

at the LMSC-AP facility during missions. The Satellite Operations Center in the Pentagon will deal principally and directly with the CORONA Command Post and the LMSC-AP facility, as appropriate, during a mission.

The SPD is the final field authority during a mission operation from launch through recovery. The SPD is expected, in normal situations, to assign responsibility to the senior Payload Sub-Assembly Project Office representative on matters of payload sub-assembly readiness, on-orbit operation, analysis of technical difficulties, etc. The senior Payload Sub-Assembly Project Office representative, in turn, will provide Payload Sub-Assembly status reporting on an agreed-on regular basis or upon request of the SPD. However, when there are differences of opinion in the case of technical difficulties, and when in the judgment of the SPD that mission failure may be imminent, the operational decisions of the SPD shall always be overriding and final.

SECURITY:

In furtherance of the management responsibilities assigned herein, both the SPD and PSAPO are authorized to grant CORONA

clearances to Government employees and contractor personnel under their jurisdiction in accordance with established BYEMAN security policies and procedures. This authority is not further delegable. The SPD and PSAPO shall keep each other and higher authority informed on a continuing basis of current project access lists.

The SPD and PSAP shall each honor, without question, a need-to-know determination on the part of the other that a properly cleared person requires access to project information and/or data.

In order to insure consistency in the security practices of the SPO and PSAPO, a CORONA Security Guide will be prepared jointly by SAFSP and CIA-OSP and submitted to the DNRO for approval as soon as possible. Additional guidance on this matter will be issued.

AEROSPACE CORPORATION:

The SPD will utilize the services of Aerospace Corporation in a general systems engineering role. Aerospace Corporation employees supporting the SPO shall have free access to information and data at the Payload Sub-Assembly contractor(s), but

shall exercise no technical influence or judgments over matters internal to the Payload Sub-Assembly, and shall not be charged by the SPD with advising him on such matters.

The exchange of information contemplated herein will frequently require direct contact by appropriate Aerospace employees with contractor engineering staffs at the PSAPO contractor plants and test facilities. However, all such direct contacts must be prior-coordinated with the PSAPO. Such coordination is to be for purposes of informing the PSAPO and permitting full participation or monitoring of such direct contacts, but PSAPO should honor the requests of the SPD for any item of information or any required direct communication with contractors. The converse applies to the SPD with regard to similar PSAPO requests for direct contact with SPD contractors.

GENERAL GUIDANCE:

Despite good intentions on both sides, I am sure there will be differences in interpretation of this management directive, the question of whether or not a problem has interface implications, etc. When such an instance arises and cannot be settled in the field, I desire that the problem be called to my attention promptly for resolution.

~~CORONA~~

The successful implementation of this management arrangement will require the whole-hearted cooperation of both CIA and SAFSP. I enjoin each of you to insure that your respective subordinates put forth every effort in that vein.

Alexander H. Flax
Director
National Reconnaissance Office

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE ASSISTANT SECRETARY

Functions: NRO Exec Comte

MEMORANDUM

December 27, 1965

SEEN BY	
NAME & OFFICE SYMBOL	DATE

AHF

Dr. Flax,

I have checked out with [redacted] the suggestion of Ting Sheldon for revision of the last ExCom minute (see Sheldon's note attached) and unless you have objection propose to issue the attached memorandum to the ExCom, making the requested amendment to the minute.

trols

Jim Reber

ed to those persons
rojects;

Attachments (2)
TS 072-65
Memo for ExCom: "Requested Change in the Minute of 23 Nov 65"

OK

the United States within the meaning
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on, as well as its use in any manner
prejudicial to the interest of the United States or for the benefit of any foreign government to the detriment of the United States. It is to be seen only by personnel especially indoctrinated and authorized to receive information in the designated control chonnels. Its security must be maintained in accordance with regulations pertaining to the EMAN Control System.

TOP SECRET

GROUP 1
Excluded from automatic downgrading and declassification

~~TOP SECRET~~

14 December 1965

MEMORANDUM FOR: Deputy Director of National Reconnaissance

Dear Jim,

I have carefully reviewed the minutes which you forwarded covering the meeting of the Executive Committee on 23 November 1965, and have one suggestion to make, namely that paragraph 6 read as follows:

> "The ExCom approved a figure of $10 million for countermeasures. The funds are to be allocated on the basis of specific justifications with the particular aim of bringing some of the more promising advanced techniques closer to operational use."

Huntington D. Sheldon

TS #194729

Copy # 1

SAFE: TS 072-65

~~TOP SECRET~~

MEMORANDUM FOR: Executive Committee of the NRP

SUBJECT: Requested Change in the Minute of 23 November 1965 (ExCom-M-3)

Mr. Sheldon of CIA has suggested that paragraph 6 of the minutes of the ExCom meeting of 23 November 1965 be revised as follows:

> The ExCom approved a figure of $10 million for countermeasures. The funds are to be allocated on the basis of specific justifications with the particular aim of bringing some of the more promising advanced techniques closer to operational use.

The original paragraph 6 read as follows:

> The ExCom approved a figure of $10 million for countermeasures which was to be employed in research on advanced technology and not for the specific subsystems for the OXCART, SR-71, or U-2, but with the aim of bringing some of the more promising advanced techniques closer to operational use.

The proposed revision is as Mr. Sheldon remembers the ExCom action. The essential difference is that the proposed revision would not prohibit the use of the funds in question for specific subsystems for the OXCART, SR-71, or U-2 but would, if proposed, require specific justification.

If no objection is received from a member of the Executive Committee by close of business on 4 January 1966 the minutes will be considered amended as proposed by Mr. Sheldon.

James Q. Reber
Deputy Director
National Reconnaissance Office

2744

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FIVE FIVE SEVEN GUARD

~~T O P S E C R E T~~ 080211Z
WHIG CITE WORTH 0720.
CORONA
FOR DR FLAX FROM GENERAL MARTIN
DELIVERY AT 0800 FRIDAY 8 APRIL.
1. REFERENCE YOUR 4 APR MEMORANDUM ON CORONA MANAGEMENT (BYE-52216-66).
2. IN VIEW OF THE ESTABLISHED STATUS OF THE CORONA PROJECT (AS DISTINCT FROM THE INITIATION OF AN ENTIRELY NEW PROJECT) I BELIEVE THAT YOUR PROPOSED MEMORANDUM FOR THE NRP EXECUTIVE COMMITTEE IS A VERY REASONABLE APPROACH.
3. I INDORSE THE PROPOSAL AS A WHOLE, BUT REQUEST YOUR CONSIDERATION OF TWO CHANGES:

A. IF THE CORONA OPERATIONS COMMAND POST AT THE SATELLITE TEST CENTER IS TO FUNCTION EFFECTIVELY, IT SHOULD BE ADEQUATELY STAFFED DURING MISSIONS WITH ALL NECESSARY PERSONNEL AND REQUIRED INFORMATION AND BE THE ONLY POINT OF WEST COAST CONTACT FOR THE SATELLITE OPERATIONS CENTER DURING THE ACTUAL CONDUCT OF CORONA MISSIONS. THE PAYLOAD SUB-ASSEMBLY PROJECT OFFICE PERSONNEL AND CONTRACTORS REPRESENTATIVES STATIONED AT THE COMMAND POST SHOULD NORMALLY ACCOMPLISH THEIR FUNCTIONS AND ANALYSIS DURING CORONA MISSIONS IN THIS COMMAND POST, UTILIZING OTHER WEST COAST FACILITIES AS NECESSARY. I RECOMMEND THAT THE WORDING OF THE FIRST PARAGRAPH AT THE TOP OF PAGE SIX BE CHANGED TO MAKE THIS CLEAR BY DELETING THE LAST SENTENCE AND ADDING "ALL PAYLOAD FUNCTIONS AND ANALYSES WILL NORMALLY BE ACCOMPLISHED IN THE CORONA COMMAND POST DURING CORONA MISSION. THE SATELLITE OPERATIONS CENTER IN THE PENTAGON WILL NORMALLY DEAL PRINCIPALLY AND DIRECTLY WITH THE CORONA COMMAND POST AT THE STC DURING CORONA MISSIONS."

B. THE STRICT PROBIBITION OF THE SPD AND HIS SE/TD CONTRACTOR CONCERNING ENGINEERING IN THE PAYLOAD AREA IS NOT REALISTIC AND IS INCONSISTENT WITH THE SPD RESPONSIBILITY FOR OVERALL SYSTEMS ENGINEERING AND DEFINITION OF INTERFACES. I AGREE THAT NEITHER THE SPD NOR HIS SE/TD CONTRACTOR SHOULD GIVE ANY TECHNICAL DIRECTION OR INSTRUCTION TO THE PAYLOAD SUB-ASSEMBLY PROJECT OFFICE CONTRACTORS. I ALSO AGREE THAT THE SPD DIRECTION TO THE PAYLOAD SUB-ASSEMBLY PROJECT OFFICE WILL CONCERN ONLY OVERALL SYSTEM ENGINEERING, INTEGRATION (INCLUDING MASTER SYSTEM SPECIFICATIONS), OVERALL SYSTEM MASTER PLAN

Secret

NING, PROGRAMMING, AND BUDGETING, PREPARATION OF THE SYSTEM FOR LAUNCH, LAUNCH ACTIVITIES, MISSION OPERATIONS AND CAPSULE RECOVERIES, AS SPECIFIED IN THE THIRD PARAGRAPH ON PAGE FOUR. HOWEVER, THE DEFINITION OF INTERFACES REQUIRES ENGINEERING ANALYSIS OF ALL ASPECTS OF THE SYSTEM. THEREFORE, THE SPD AND HIS SE/TD CONTRACTOR SHOULD NOT BE PROHIBITED FROM MAKING ANY ENGINEERING ANALYSIS; THE RESTRICTION SHOULD BE ON DIRECTION WHICH MAY BE ISSUED, NOT ON ENGINEERING ANALYSES WHICH MAY BE MADE. I STRONGLY RECOMMEND THAT THE WORDING OF THE FOLLOWING REFERENCED PARTS BE CHANGED TO MAKE THIS CLEAR:

(1) REFERENCE LAST PARAGRAPH ON PAGE FOUR: DELETE "SYSTEMS ENGINEERING" FROM THE FIRST SENTENCE.

(2) REFERENCE SECOND PARAGRAPH ON PAGE FIVE: DELETE "AUTHORIZED NOR" FROM THE FIRST SENTENCE AND EXTEND THE SENTENCE BY ADDING "EXCEPT FOR THE PURPOSES OF OVERALL SYSTEMS ENGINEERING, INTEGRATION, AND THE DEFINITION OF INTERFACES."

(3) REFERENCE FOURTH PARAGRAPH ON PAGE SIX: DELETE ALL AFTER THE COMMA IN THE SECOND SENTENCE, AND SUBSTITUTE: "BUT SHALL EXERCISE TECHNICAL INFLUENCE OR JUDGEMENTS OVER MATTERS INTERNAL TO THE PAYLOAD SUB-ASSEMBLY ONLY IN PROVIDING RELATED ADVICE AND TECHNICAL SUPPORT TO THE SPD CONCERNING HIS ASSIGNED RESPONSIBILITIES FOR OVER-ALL SYSTEMS ENGINEERING, INTEGRATION, AND DEFINITION OF INTERFACES."

~~T O P S E C R E T~~

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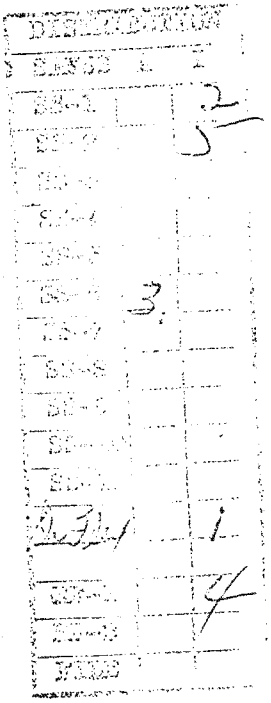

ExCom-M-4

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held 26 April 1966
Office of Deputy Secretary of Defense
Room 3E 928, The Pentagon

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Admiral William F. Raborn	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology
Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee Ex Officio

Others Present

Dr. John S. Foster, Jr.	DDR&E
Mr. Huntington D. Sheldon	CIA
Mr. John A. Bross	CIA
Mr. John J. Crowley	CIA
Dr. Donald Steininger	PSAC Staff
Brig. Gen. James T. Stewart	Director, NRO Staff

New Search and Surveillance Satellite System
Ref: BYE-52224-66 of 22 April 1966

1. Mr. Vance proposed at the outset that, after such discussion and briefing as was necessary, Admiral Raborn, Dr. Hornig, and he meet in Executive Session to make the decisions required. Admiral Raborn and Dr. Hornig agreed.

2. In introducing this item, Dr. Flax alluded to the reference paper which had been distributed. He said that he had nothing to add to it unless there were questions.

BYE-52306-66
Copy 6

3. Admiral Raborn made available a memorandum which indicated that he had only one major recommendation to make on the proposed management plan for the new system, namely, that the subsystem definition be modified to assign to CIA the responsibility for the structure which enclosed the sensor subsystem, as well as the responsibility for development, production, and integration of the stellar index camera. His note included specific language to accomplish the foregoing. He called upon Mr. Crowley to present the reasoning for the proposal. The essence of Mr. Crowley's briefing was that such an assignment of responsibility was critical in the following areas: optical, film path, structural dynamics, and thermal--the latter two being highly critical. He explained that the proposed modification of the subsystem definition would reduce the amount of interagency interface and thereby markedly improve the possibilities of satisfactory performance within the time limits of the program.

4. Prior to the adjournment of this question for consideration in Executive Session, Mr. Sheldon suggested that there be further discussion on possible difficulties which the CIA Security Office felt pertained to the procedure for handling security in the HEXAGON program. The specific point alluded to concerned the procedure whereby both the SAFSP and CIA Project Offices were authorized to grant HEXAGON clearances and each was bound to honor without question such need-to-know determination on the part of the other. Dr. Flax commented that his objective in this proposal was to eliminate the use of security as a means of frustrating the legitimate access to information, an objective with which the ExCom agreed. Mr. Sheldon and Dr. Flax will pursue this problem further.

5. Subsequent to the meeting of the three principals in Executive Session, the Deputy Secretary of Defense advised the DNRO that the Executive Committee had approved his HEXAGON program proposal as submitted.

CORONA Management

Ref: BYE-52268-66 of 22 April 1966

6. This item was approved with the understanding that the assignment of the DISIC procurement responsibility to the SAFSP would carry with it the instruction that there should be no change in the specifications without the concurrence of the CIA Payload Subassembly Project Office.

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(A)

~~CORONA~~

~~TS~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

F THE DIRECTOR

April 29, 1966

MEMORANDUM FOR: DIRECTOR OF RECONNAISSANCE, CIA
DIRECTOR OF SPECIAL PROJECTS, SAF

SUBJECT: Draft CORONA Management Directive

Reference is made to my April 29 message (WHIG 5225) to CIA and SAFSP.

Attached (Tab A) is a draft CORONA management directive in response to NRP ExCom approval of my April 22 memorandum on the same subject. Also attached for your information is a copy of that memorandum (Tab B).

Your suggested refinements, clarifications, additions and/or deletions to the draft CORONA management directive are invited. These suggestions, of course, should be consistent with the specifics and the intent of the management arrangements approved by the ExCom.

Please submit any comments not later than May 10. I plan to issue the CORONA Management Directive prior to May 15.

Signed

Alexander H. Flax

Attachments (2)

1. Sheldon
2. Gen Martin
3. ~~SS-1~~
4. SS-6
5. ~~RE-1~~ SS-7
6. RFK

~~CORONA~~

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FOR DR. FLAX FROM GEN MARTIN
1. REFERENCE 29 APRIL MEMORANDUM, SUBJECT "DRAFT CORONA MANAGEMENT DIRECTIVE" (BYE 52303-66).
2. I HAVE NO COMMENTS OTHER THAN THOSE PREVIOUSLY SUBMITTED ON YOUR MEMORANDUM TO NRP EXCON ON THIS SAME SUBJECT (WORTH 9112).
~~S E C R E T~~
CFN: 1022 DR FLAX GEN MARTIN 1 29 APRIL (BYE 52303-66) (WORTH 9112)
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WHIG CITE ADIC 9765
DR. FLAX FROM MR. SHELDON:
WE APPROVE YOUR DRAFT CORONA MANAGEMENT DIRECTIVE RECEIVED UNDER MEMO DATED APRIL 29, SUBJECT TO THE FOLLOWING RECOMMENDED CHANGE: PAGE 2, LINE 2 SHOULD READ "SUPERVISE THE DEVELOPMENT AND PRODUCTION OF THE CORONA". THIS CHANGE INVOLVES THE DELETION OF THE WORD "OR" IN THIS LINE.
~~S E C R E T~~
CFN 9765 DR FLAX MR SHELDON CORONA APRIL 29 PAGE 2 LINE 2 "OR"
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DEPARTMENT OF THE AIR FORCE
WASHINGTON

OFFICE OF THE SECRETARY

April 22, 1966

MEMORANDUM FOR THE NRP EXECUTIVE COMMITTEE

SUBJECT: CORONA Management

A problem of long standing in the NRO has been CORONA management. Although there appear to have been several attempts to resolve the problem of defining a set of management responsibilities acceptable to all parties in 1964 and 1965, none of these were successful in arriving at an agreed-upon solution.

The August 11, 1965 Agreement for the Reorganization of the National Reconnaissance Program (1965 NRP Agreement) provides general and specific guidelines for the management of NRP systems which constitute an authoritative basis for dealing with the CORONA problems. However, the need to avoid unnecessarily perturbing certain established practices and responsibilities now being exercised in the on-going CORONA program must also be recognized. Having taken both these factors into account, I now wish to recommend specific assignments of management responsibility and related program actions as described in this memorandum.

THE PROBLEM:

I have reviewed the available background on the CORONA management situation. There are several particular problems, all of which stem from the lack of clearly established and/or agreed-to management responsibilities and relationships. From my point of view the most serious problems are as follows:

1. Other than myself, there is no single person or NRP participant accepted by all concerned as clearly responsible for overall system engineering, definition and specifications, integration, a master project plan, overall system facilities, integrated funding requirements, and on-orbit operations.

2. Since mid-1964, LMSC has worked without benefit of signed contracts in two areas: (a) overall systems integration;

Vincent

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Page 1 of 7 Pages
Control No. BYE-52248-66

and (b) the qualification, test, and integration of an Improved Stellar-Index Camera (ISIC). (The latter task is essentially complete; the former is continuing).

3. The final phase of the CORONA Improvement Program has been extended somewhat because authorization has not yet been given to contract for all elements (specifically: integration of a modified ISIC--called the DISIC; internal modifications to the RV; and fabrication of larger diameter camera payload shells).

DISCUSSION:

The next several paragraphs provide a brief discussion of the problems cited above.

There were, in the past, and are, at present, widely divergent opinions on the necessity for a single CORONA Project Director in the field (on the premise that the program has been operating quite successfully for some time without anyone who was generally accepted as such). In my opinion, there is a need for a project director in any case and this need will be increased by planned actions in the CORONA program.

Up until this Summer, when the first THORAD booster/longer-life AGENA combination is launched, the NRO will have been operating, for more than two years, a mature system in which only relative minor changes have taken place. When the CORONA Improvement Program is completed in mid-1967, however, the system will feature a modified booster, modified AGENA, modified command system, new stellar-index camera, modified main cameras, and a new payload assembly structure. Implicit in these changes is the need for assigning responsibility to a single person for overall system engineering and integration as well as for definition of interface specifications.

In view of the above, I believe it is essential to have a single Project Director in the field (with proper definition, of course, of his responsibilities and authority in view of the joint-agency nature of the CORONA Project).

With regard to the two unsigned LMSC contracts, this situation apparently evolved because of the lack of well-defined technical and management responsibilities. For the same reason there has been an unresolved question as to whether SAFSP or CIA-OSP should hold the contract for the qualification testing and

integration of the DISIC in the new, larger diameter payload assembly structure (this work has not yet started).

I understand LMSC has expended Corporate funds in the amount of approximately $2 million since July 1964 on overall system integration matters and qualification testing/integration engineering on the ISIC (at about the time this latter task was essentially complete, a decision was made to use the DISIC in lieu of the ISIC). LMSC is awaiting uniform guidance from the government as to the approved contracting agency for the several tasks involved and as to the scope of the contracts. The solution to this problem will be straight-forward under the management assignments which I propose--namely, SAFSP or CIA-OSP will sign the pending contracts for the period from 1964 to the present date, and will, in accordance with assigned responsibilities, negotiate new contracts (or amend existing ones) for the work from this date forward.

Last, with regard to the deferral of authority to proceed on the remaining elements of the CORONA Improvement Program. These were not released when CORONA Improvement Program was originally approved. The deferred items were not pacing at that time and it was apparently expected the then imminent new NRP Agreement would provide more specific guidance on the assignment of CORONA responsibilities. Recently, to preclude further delay, I authorized CIA-OSP to contract with LMSC to initiate design engineering on the larger-diameter payload assembly structure.

MANAGEMENT ARRANGEMENTS:

In developing these proposed arrangements, a guiding principle has been that no serious consideration would be given to any management plan and/or rearrangement of responsibilities which would unduly disrupt the on-going program. Further, to the extent possible, the solutions were to be in accord with the specifics, as well as the spirit and intent, of the 1965 NRP Agreement. I believe that my proposed assignments of responsibility and related management actions are fully responsive to these criteria.

At present, CIA is clearly responsible to the DNRO for procurement of the KH-4 and SI cameras (the latter to be replaced by the DISIC), the RV's, the payload assembly structure, and the engineering integration of these elements into a Payload Sub-Assembly and

their test, operation and activities of the LMSC-AP facility, software support of the Satellite Operations Center before, during, and after missions, operation of the payload sub-assembly on-orbit, and diagnostic services. I recommend that these responsibilities continue essentially unchanged, with CIA assuming responsibility for integration of the DISIC, and the engineering, fabrication, qualification and production of the larger-diameter payload assembly structure.

SAFSP, on the other hand, is responsible for the boosters, the AGENA spacecraft, procurement of the DISIC, overall system integration in preparation for launch, launch services, on-orbit command and control, and recovery of the film capsules. I recommend that these responsibilities remain essentially unchanged. However, if a new RV or major modification to the present RV is ever undertaken (this excludes minor internal modifications to the present RV, peculiar to the CORONA cameras), I propose to assign this responsibility to SAFSP in line with the 1965 NRP Agreement and to insure maximum standardization among all RV's utilized in the NRP.

Additionally, I propose to designate the Director, SAFSP, as the overall CORONA System Project Director (SPD). The rationale for this assignment is that SAFSP is the NRO element best suited in terms of personnel, facilities, operational resources, experience and technical competence necessary to undertake this task. For example, under existing DOD arrangements wherein the Air Force assigns space elements either wholly to NRO (as in the case of the Space Systems Division's launch, on-orbit command and control facilities and capsule recovery forces), the Director, SAFSP is the only individual in the field who has the authority to direct all elements involved in the operation from launch through capsule recovery. As SPD, the Director, SAFSP, will be responsible to me for overall system engineering and integration (including master system specifications); overall system master planning, programming, and budgeting; preparation of the system for launch; launch activities; mission operations; and capsule recoveries.

In this arrangement, the CORONA System Project Director (SPD) responsibilities will not include sub-system engineering, technical direction, or contract supervision for the Payload Sub-Assembly; the CIA will be responsible to the DNRO for these functions with respect to the Payload Sub-Assembly. The following discussion of the management relationships is intended to clarify the division of responsibilities:

1. The SPD as the Project Director will serve as overall system engineer having the responsibilities stated above. As such he will be responsible for all sub-system interfaces. In such matters, the Payload Sub-Assembly Project Office is expected to be responsive to appropriate direction from the SPD. However, the SPD, in the exercise of his interface responsibility, will give special consideration to the basic environmental requirements of the payload sub-assembly as established in consultation with the CIA.

2. On the other hand, the SPD is not expected to accomplish engineering (unless assistance is solicited) on technical matters pertaining solely to the payload sub-assembly. SPD actions elsewhere in the system affecting interfaces with the Payload Sub-Assembly do require the concurrence of that Project Office. Similarly, any Payload Sub-Assembly Project Office actions which affect interfaces with other elements of the system do require the concurrence of the SPD.

3. The SPD is responsible for master planning, master programming, and overall budgeting; however, he is not authorized to alter program or budget estimates of the Payload Sub-Assembly Project Office. Conversely, the latter is expected to program and budget in accordance with the master schedules issued by the SPD. (Note: CIA-OSP will submit budget estimates in the normal manner direct to the DNRO; however, the SPD will also include payload sub-assembly schedules and budget estimates in the System Project Plan for information purposes).

The most significant area of SAFSP/CIA-OSP relationship is that pertaining to interface between the sensor sub-system and other system elements. I cannot emphasize too strongly the need for close daily rapport between the respective offices. Representatives of both offices are expected to attend all meetings on subjects having a possible interface impact. The SPD and Payload Sub-Assembly Project Office are expected to have free and full access to all information and data pertaining to the system. This includes, as appropriate, access to contractor plants, engineering staffs and test facilities. However, supervision and technical direction of the contractor's activities will be solely by CIA-OSP for all elements of the Payload Sub-Assembly and by SAFSP for other system elements. If either SAFSP or CIA-OSP infers a possible interface action pertaining to any action of the other,

he is expected to so advise the other without delay. When a possible problem of this nature is raised, it is to be resolved without delay (if resolution in the field is not possible, the matter will be brought to the attention of the DNRO for decision).

The SPD will operate a CORONA Operations Command Post at the Satellite Test Center, Sunnyvale, continuously during a mission. The Payload Sub-Assembly Project Office will station appropriate Project Office and contractor representatives there as well as at the LMSC-AP facility during missions. The Satellite Operations Center in the Pentagon will deal principally and directly with the CORONA Command Post and the LMSC-AP facility, as appropriate, during a mission.

The SPD is the final field authority during a mission operation from launch through recovery. The SPD is expected, in normal situations, to assign responsibility to the senior Payload Sub-Assembly Project Office representative on matters of payload sub-assembly readiness, on-orbit operation, analysis of technical difficulties, etc. The senior Payload Sub-Assembly Project Office representative, in turn, will provide Payload Sub-Assembly status reporting on an agreed-on regular basis or upon request of the SPD. However, when there are differences of opinion in the case of technical difficulties, and when in the judgment of the SPD that mission failure may be imminent, the operational decisions of the SPD shall always be overriding and final.

Both the SPD and Payload Sub-Assembly Project Office will be authorized to grant CORONA clearances to properly clearable persons under their jurisdiction, in accordance with established BYEMAN security policies. The SPD and PS-APO shall honor, without question, a need-to-know determination on the part of the other. Each shall keep the other advised on a continuing basis of current project access lists.

The SPD will utilize the services of Aerospace Corporation in a general systems engineering role. Aerospace Corporation employees supporting the SPO shall have free access to information and data at the payload sub-assembly contractor(s), but shall exercise no technical influence or judgments over matters internal to the Payload Sub-Assembly, and shall not be charged by the SPD with advising him on such matters.

Despite good intentions on the part of both SAFSP and CIA-CSP, I am sure there will be honest differences of opinion in interpretation of management responsibilities, whether or not a problem really has interface implications, etc. When such instances arise and cannot be settled in the field, the matter will be called to my attention and promptly resolved.

RECOMMENDATIONS:

With your concurrence, I will take the following actions:

1. Issue suitable management directives to SAFSP and CIA in accord with the preceding sections of this memorandum.

2. Direct CIA to sign the ISIC integration contract with LMSC from inception through completion so that LMSC may bill the Government for services already accomplished.

3. Direct CIA to negotiate a new contract (or amend an existing one) with LMSC for qualification testing and integration of the DISIC into the Payload Sub-Assembly.

4. Direct CIA to amend the Payload Sub-Assembly contracts such that appropriate personnel of SAFSP and the Aerospace Corporation may have free access to data and information.

5. Direct SAFSP to sign the system integration contract with LMSC from July 1964 through the current date so that LMSC may bill the Government for services already accomplished.

6. Direct SAFSP to negotiate a new contract with LMSC for system integration reflecting the assignments of responsibility described herein (the proposed work statement will be coordinated with CIA and approved by me prior to contract execution).

7. Authorize CIA to negotiate new contracts (or amend existing ones) for work on the remaining elements of the CORONA Improvement Program.

Alexander H. Flax

Alexander H. Flax
Director
National Reconnaissance Office

~~TOP SECRET~~

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~~TSI~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

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THE NRO STAFF

16 MAY 1966

MEMORANDUM FOR DR. FLAX

SUBJECT: CORONA Management Directive

1. Attached for your signature are memorandums for Mr. Sheldon and General Martin setting forth the CORONA management arrangements and assignments of system responsibility.

2. As you will recall, you sent a draft CORONA management memorandum to Mr. Sheldon and General Martin on 29 April, requesting their comments by 11 May (Tab A).

3. Mr. Sheldon's response suggested a minor editorial change on page 2 of the draft (Tab B).

4. General Martin's response indicated he had no comments other than those previously made on the draft of your CORONA memorandum to the ExCom. Copies of both messages are included as Tab C.

5. Also attached for your information is a copy of your memo to the ExCom (Tab D).

6. The attached memorandums to Mr. Sheldon and General Martin differ from the 29 April draft only by a few minor editorial changes plus Mr. Sheldon's specific recommended change. I recommend you sign them.

James T. Stewart
Brigadier General, USAF
Director

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PAGE 1 OF 1 PAGE

~~ISINGLASS~~/[redacted]~~GAMBIT~~
~~IDEALIST/OXCART~~

September 21, 1966

MEMORANDUM FOR THE NRP EXECUTIVE COMMITTEE

SUBJECT: Revision of ExCom-M-5

In accordance with BYE-52620-66, dated September 9, 1966, revised pages of the Executive Committee minutes are attached. Please substitute these revisions for pages 3 through 5 in your copy of the minutes.

James Q. Reber
Secretary
NRP Executive Committee

Attachment
Revised pages 3 - 5

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~~IDEALIST/OXCART~~
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CONTROL SYSTEMS JOINTLY

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~~ISINGLASS~~ [redacted] ~~GAMBIT~~
~~IDEALIST/OXCART~~

ExCom-M-5

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held 17 August 1966
Office of Deputy Secretary of Defense
Room 3E 928, The Pentagon
2:45 - 4:30 p.m.

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Mr. Richard Helms	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology

Others Present

Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee, Ex Officio
Dr. John S. Foster, Jr.	DDR&E
Mr. Huntington D. Sheldon	CIA
Mr. John A. Bross	CIA
[redacted]	CIA
Dr. Donald Steininger	PSAC Staff
Mr. C. William Fischer	BOB
[redacted]	NRO Comptroller
Brig. Gen. James T. Stewart	Director, NRO Staff

Review of 1967 NRO Financial Program

(Ref: BYE-52539-66, 15 August 1966)

On request of the Director, National Reconnaissance Office, the NRO Comptroller, [redacted] reviewed the proposed allocation of funds for 1967 with explanation

BYE-52630-66
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of the status of expenditures for 1966 with indications of under- and over-runs and amounts carried over from approved 1966 expenditures into 1967. In response to earlier ExCom desires, [redacted] charts showed a rough estimate of percentages allocated to R&D.

The Executive Committee addressed the special topics on which the DNRO had provided a brief (BYE-52613-66, dated 15 August), these being topics which had been singled out by the DNRO as requiring the Committee's especial attention. They are treated in turn below with the Committee's action indicated.

U-2R Program

Action: A buy of eight was authorized with the understanding that in approximately six months a decision and fund authorization will be required by the ExCom on whether to go for an additional eight or other number of aircraft.

[redacted]

ISINGLASS

Action: The DNRO will summarize for the ExCom his findings consequent upon his visit early in September to McDonnell Aircraft Corporation. The summary is to address not only the DNRO's present concerns relevant to the ISINGLASS proposal itself and the direction which we should go in the field of this technology but also the relationship between general technology which is white and this particular proposal. The DNRO will recommend to the ExCom for approval a course of action on this program.

ExCom-M-5
Revised

QRC Synchronous Satellite

Action: The ExCom agreed that the NRO should go ahead on development for the subject satellite and approved the program as presented subject to the availability of funds.

[redacted]

It was pointed out that satellite collection of COMINT is very likely to become of increasing importance. Dr. Flax indicated that this would be a step in that direction and an essential one. Dr. Foster emphasized the importance of our area of ignorance in COMINT for such communications as between Tyura Tam and Sary Shagan, particularly as it will relate to the ABM problem.

Readout

Action: The ExCom concurred in the DNRO's decision to carry the CBS and BTL teams until January unless an earlier decision is made to terminate the effort or to undertake system development. In the

ExCom-M-5
Revised

meantime, the Committee on Overhead Reconnaissance and the USIB will be consulted on their judgment of the usefulness of the proposal based upon the ground test which will be accomplished shortly. The ExCom recognized that both CIA and SAFSP are engaging in research looking toward more advanced readout systems but this proposed system used in conjunction with GAMBIT-CUBED appears to be the only prospect for early readout.

GAMBIT-CUBED (G-3)

Action: The ExCom agreed to go ahead with the addition of a second recovery vehicle for G-3 as well as other changes looking toward increased lifetime on orbit, taking note that these modifications are downstream, that they would have no impact on the operation of the system during the next two years, and that well-known technology is involved with very little risk to the reliability achieved previously by the system provided present quality controls and check-out practices are continued.

[redacted]

Summary Action on the 1967 NRO Financial Program

The allocation of funds for the 1967 NRO financial program as presented by [redacted] was approved as modified by the Executive Committee action on specific items indicated above.

GAMBIT and GAMBIT-CUBED Launches for FY 1967

The DCI questioned the need for the present schedule of a total of 21 GAMBIT and GAMBIT-CUBED launches in FY 1967.

ExCom-M-5
Revised

The DNRO reviewed the situation as of January 1966 at which time there were uncertainties with regard to the G-3 meeting its schedule and we had been faced by a succession of G failures. At that time the decision was made to take out additional insurance by a schedule of 15 GAMBIT's in CY 1966 and to continue the GAMBIT program into the first portion of FY 1968 to protect against possible development difficulties with G-3.

The ExCom was advised that the DNRO had instructed General Martin to be prepared to cancel as many as four G's in FY 1967 on short notice if it were determined that they were not necessary. The members, particularly the DCI, viewed such a possibility as an encouraging step in introducing flexibility in the launch schedules to keep them in line with the intelligence requirements.

Question of Continuation of TAGBOARD

The DCI raised the question of whether in view of the recent TAGBOARD accident it was desirable to continue the program.

The DNRO reviewed the situation surrounding the accident which had been preceded by three successful launches and reported that Kelly Johnson would need at least another month to study the problem including the possible use of a rocket boosted TAGBOARD from a B-52 instead of the present Mach 3 launch aircraft. Dr. Flax said he was looking at the total program in terms of cost, recognizing that there was a need for at least two more carrier aircraft if the TAGBOARD were to be used operationally. He proposed, and the ExCom concurred, that he report his findings to the ExCom as soon as that is possible. In the light of this report, the ExCom will examine the question of the future course of action on this program.

James Q. Reber
Secretary
NRP Executive Committee

BYEMAN

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM

October 11, 1966

DR. BROWN

This is the NRP budget paper as submitted to Cy Vance. Because of his recent indisposition and the pressure of other items, he has not been able to discuss it with me yet.

I have also provided a copy to Johnny Foster, but have received no comment from him.

Alexander H. Flax
Assistant Secretary
Research and Development

Attachment

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~~EXCART/TAGBOARD/IDEALIST~~
~~CORONA/HEXAGON/GAMBIT~~
~~DORIAN~~

HANDLE VIA BYEMAN CONTROL SYSTEM

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ExCom-M-6

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held November 23, 1966
Office of Deputy Secretary of Defense
Room 3E 928, The Pentagon
2:30 p.m. - 4 p.m.

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Mr. Richard Helms	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology

Others Present

Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee, Ex Officio
Dr. John S. Foster, Jr.	DDR&E
Mr. Robert N. Anthony	Asst. Sec. Def. (Comptroller)
Vice Adm. Rufus Taylor	DDCI
Mr. Huntington D. Sheldon	CIA
Mr. Carl Duckett	CIA
[redacted]	CIA
Dr. Donald Steininger	PSAC Staff
Mr. Harry Rowen	BOB
Mr. C. William Fischer	BOB
[redacted]	NRO Comptroller
Maj. Gen. James T. Stewart	Director, NRO Staff

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~~CORONA/HEXAGON/GAMBIT~~
~~EXCART/TAGBOARD/IDEALIST~~

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ExCom-M-6

Consideration of the 1968 Budget
(Ref: BYE-52772-66, Nov 7, 1966)

The Executive Committee proceeded to consider the 1968 budget as presented item by item by [redacted] NRO Comptroller, from his budget charts presented at the meeting. The actions listed below follow the order of presentation.

A-12 (CXCART)

Action: Consideration was postponed in view of the fact that the study on advanced reconnaissance aircraft requested by the Bureau of the Budget will not be available until Friday, November 25.

Proposed Purchase of Eight U-2Rs

Action: It was agreed to approve the purchase of four additional U-2Rs (making a total of twelve) with due consideration given to keeping a "hot" production line open through June 1969. A study of the effect of relocation of U-2s from Edwards AFB to a SAC base will be undertaken and reported to the Executive Committee as soon as possible.

Comment: Mr. Rowen felt that the eight U-2Rs already being purchased should be adequate, taking into account the low rate of utilization of the present U-2 fleet and the limited prospect of the use of the present or new U-2 over heavily defended denied areas.

Consideration was given to attrition rates as presented by [redacted] and their effects on the fleet status at various points through 1969. Discussion also included a weighing of the contingency capability role of the U-2, the economic aspects of a stretch out of the purchase, and the effect of co-locating the Edwards U-2s with the SAC U-2s.

TAGBOARD

Action: Final consideration of this item was postponed pending Dr. Hornig's having available a paper which the D/NRO had prepared on utilizing the B-52 as the mother plane for TAGBOARD.

Comment: Mr. Rowen questioned the cost effectiveness of the TAGBOARD [redacted] Dr. Hornig expressed his feeling that the Executive Committee needed a paper discussing the subject of vulnerability. Dr. Flax commented on this problem, noting that a prediction of the air defense capabilities in a given instance based on what is known about a given country's present capabilities is not good enough since we don't know when or from whom the country may receive additional capabilities. Additionally, a brief paper on [redacted] SR-71, and TAGBOARD vulnerability to the S- and C-Band SA-2 will be provided the ExCom within a few days.

CORONA and HEXAGON

Action: The CORONA and HEXAGON portions of the budget were approved.

GAMBIT and GAMBIT-Cubed

Action: For purposes of the President's budget, these items were approved. However, and within two to three weeks, in order to proceed with GAMBIT-Cubed follow-on contractual actions, the DCI agreed to provide requirements from the USIB (the effort is already underway) which could guide future procurement and launch scheduling.

Comment: In the discussion of this item, Mr. Sheldon indicated that there is a need for re-study of requirements and of resolution levels essential to intelligence. Mr. Sheldon indicated concern regarding the number of G^3 vehicles to be procured in the next major increment since he felt the near-future launch rate was too high and questioned the need for any GAMBIT-Cubed capability after the HEXAGON was available. Commenting on the suggestion of stretching out the launching of the G^3s in the immediate future, Dr. Flax emphasized the importance of the next six months in eliminating troubles identified from planned launches through engineering changes incorporated in future manufacturing. He cited shortcomings experienced in the second G^3 in terms of meeting the specified goals for that

capability even though the mission was nominally successful and produced a level of resolution equivalent to that of GAMBIT. He felt that certainly by June and perhaps earlier all major inadequacies would have been identified and corrected and a fair prediction of reliability would be possible.

Mr. Vance stated that he was willing to go for a lesser number of launches than currently proposed but that he would need to be assured by Mr. Helms that such number would meet the requirements. There was a brief discussion on the possible cost avoidances through early termination of the GAMBIT program; however, Mr. Vance and Dr. Hornig were reluctant to cancel the G program until the G^3 is fully qualified.

SIGINT

Action: Approved as presented recognizing the probability of the need for additional funds for collection against the ABM/AES problem, alternative possibilities for which are now under urgent study by the NRO.

Comment: In this discussion of the SIGINT satellite program it was explained that the number of different capabilities in use was a reflection both of an effort to respond to USIB requirements and also of the fact that it is not possible at this time to collect against all of the requirements through a single collection vehicle. It was noted that Dr. Land's PSAC Panel is entering upon a review of NRP SIGINT efforts and also a DOD/CIA group is reviewing the total United States effort in the SIGINT field.

RESEARCH & DEVELOPMENT PROGRAMS

Action: The Committee approved the programs as presented except as noted in the next item.

GAMBIT-Cubed Readout

Action: The Committee disapproved the development of a readout capability for the GAMBIT-Cubed system.

Comment: In consideration of this question, reference was made to the fact that at the last meeting of the ExCom action on this proposal had been deferred pending a judgment from the USIB on the relative importance and urgency of proceeding on this proposal to be functioning by 1970. Mr. Sheldon said that this subject requires more study and that, lacking such study, a firm judgment on the requirement at this time is not possible. Dr. Flax noted that the absence of a firm requirement also directly affected the development of any new and more advanced readout capability. Any system, including that for the MOL, would require development of a wideband data link which would also be required for the development of a radar system in which Dr. Foster had expressed great interest.

MISSION SUPPORT PROGRAMS

Action: Approved as presented.

Comment: In regard to the flight test item on vulnerability, Dr. Hornig emphasized that the ExCom should review the test plan before testing occurred. The ExCom accepted the BOB suggestion that $7,450K be budgeted for flight test, with the understanding that these funds will be placed in reserve and released only if the current study shows that the flight test is feasible both technically and politically.

James Q. Reber
Secretary
NRP Executive Committee

THE WHITE HOUSE

WASHINGTON

October 11, 1966

MEMORANDUM FOR

Executive Committee
National Reconnaissance Program

The purpose of this memorandum is to raise for your consideration questions about NASA's development and use of optical telescopes for conducting astronomy in space. Until recently our attention has focused on the various earth sensing experiments that NASA has considered for its future program. For these experiments the recent action of the NSAM 156 Ad Hoc Committee has, I believe, identified a policy which seems to be a practical one to follow for the next few years or so. I see little likelihood of extraordinary pressure on NASA from the earth resource scientists which would make the implementation of this policy difficult.

In contrast, I think that we face a very different situation in connection with NASA's [illegible] telescopes for astronomy, a question which is not explicitly [illegible] the Ad Hoc Committee report. There are [illegible] for my concern.

First, although the scientists interested in earth resources are not [illegible] accustomed to working with high precision optical instruments [illegible] probably will not be greatly offended by a restriction which limits NASA's study of such devices, the astronomers have pioneered and traditionally dominated this technology. They would no doubt inquire very deeply and vocally into the reasons for any restrictions to their activities.

Second, while it seems very unlikely that the earth scientists can justify the need for especially high resolution sensors, there is no doubt that the astronomers can take advantage of every added capability that can be made available.

Third, it has not yet been demonstrated that sensing from earth orbit [illegible] way to satisfy the [illegible] for earth resource surveys, nor the [illegible] usefulness of such surveys been established. On

the other hand, a consensus seems to be developing in the scientific community that astronomy ranks with the search for planetary life as offering the greatest possibilities for exciting and significant new information.

Finally, I think these represent more than just an academic problem. Last year the Space Science Board, in a very comprehensive report on directions of future space research, recommended that telescopes of 40-inch aperture or larger be included in the near-term post-Apollo programs. Furthermore, it appears that the PSAC Space Science and Space Technology Panels, as a result of their joint study of the future NASA programs, will recommend that a 40-inch telescope be orbited by 1970. This, combined with the fact that a great deal of national attention is being given to the programs NASA might pursue in the post-Apollo period, makes it very likely that NASA will be under pressure from the scientific community to consider design studies for large telescopes within the next year.

I raise the issue now because I think we should be ready with a well-thought-out plan when the problem arises. If we intend to restrict NASA from going into this area, we ought to devise now a plausible rationale for public consumption. If we plan to let NASA go ahead, we should decide on the limits of this permission and on how much of existing components, facilities, and contractor experience should be made available from the NRP. In addition, as a somewhat separate related question, we should take note of the fact that MOL can, and no doubt will, take astronomical measurements when it is not busy with its primary mission, and consider how we might get this information to the astronomers.

The NSC 156 Ad Hoc Committee is an appropriate forum in which to resolve these questions, and when NASA begins to have problems with restrictions, it may raise the issue there. However, before that happens, I suggest that the NRP Executive Committee review the various aspects of the situation to determine whether in fact there will be a restriction on NASA and what that restriction might be, and then to discuss ways to meet the various problems that may result. For the latter discussion, we might invite the participation of Dr. Seamans.

As a starting point, I would like to recommend that at the next Committee meeting, Dr. Flax discuss for us his recommendation on what restrictions, if any, should be imposed on NASA in connection with its future astronomy programs.

Donald F. Hornig
Special Assistant to the President
for Science and Technology

To: The Honorable Cyrus R. Vance
The Honorable Richard Helms
The Honorable Alexander Flax

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~~IDEALIST/OXCART/TAGBOARD~~
~~GAMBIT/EARPOP~~ [redacted]

ExCom-M-7

NRP EXECUTIVE COMMITTEE

Minutes of Meeting Held December 16, 1966
Office of Deputy Secretary of Defense
Room 3E 928, The Pentagon
2:30 p.m. - 3:15 p.m.

Members Present

Mr. Cyrus R. Vance	Deputy Secretary of Defense
Mr. Richard Helms	Director of Central Intelligence
Dr. Donald F. Hornig	Special Assistant to the President for Science and Technology

Others Present

Dr. Alexander H. Flax	Director, National Reconnaissance Office, Ex Officio
Mr. James Q. Reber	Secretary, NRP Executive Committee, Ex Officio
Dr. John S. Foster, Jr.	DDR&E
Vice Adm. Rufus Taylor	DDCI
Mr. John A. Bross	CIA
Mr. Carl E. Duckett	CIA
[redacted]	CIA
Dr. Donald Steininger	PSAC Staff
Mr. Harry Rowen	BOB
Mr. C. William Fischer	BOB
[redacted]	NRO Comptroller
Maj. Gen. James T. Stewart	Director, NRO Staff

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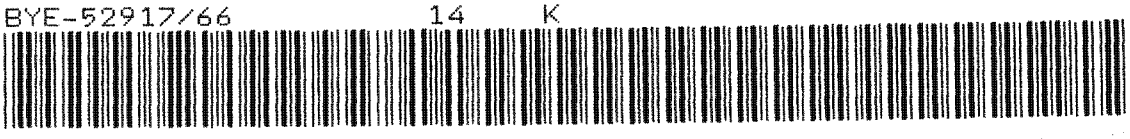

~~GAMBIT/EARPOP~~ [redacted]
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~~IDEALIST/OXCART/TAGBOARD~~
~~GAMBIT/EARPOP/~~

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ExCom-M-7

Proposed Purchase of U-2Rs

Action: The Executive Committee reconsidered its action on the above subject taken at the meeting of November 23 (see ExCom-M-6), namely to procure four additional U-2Rs (total: twelve) but to extend the delivery schedule for the total twelve to preserve a "warm plant" option. Such extension was found to be infeasible. The ExCom determined that the procurement of four additional U-2Rs on the delivery schedule proposed by Lockheed (twelfth article to be delivered in November or December 1968) would be budgeted in FY 1968 at $10.2 million.

TAGBOARD Program Reorientation

Action: Approved the reorientation of the TAGBOARD program as outlined in the memorandum from the DNRO to the members (see BYE-52821-66 on the above subject, dated 28 November 1966). Approved the use of funds as budgeted in FY 1967 and approved the proposed budget of $31.6 million in FY 1968.

Comment: Dr. Hornig and Dr. Flax briefly discussed the vulnerability study which the DNRO provided the ExCom (see BYE-52881-66, dated December 5, 1966). Dr. Flax mentioned his recent action in establishing a CIA/DOD task group to examine the vulnerability of various aircraft reconnaissance systems (OXCART, SR-71, U-2, drones, etc.) against identical Soviet defensive systems and environments and thus provide comparable data.

Dr. Hornig said that he was uncertain regarding the circumstances and the targets against which TAGBOARD might be employed. Mr. Helms recognized this uncertainty but said that, pending a more careful scrutiny of the requirements situation, he would agree to reorient the program.

~~GAMBIT/EARPOP~~
~~IDEALIST/OXCART/TAGBOARD~~

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Mr. Rowen and Mr. Fischer proposed a possible one year deferral in the TAGBOARD program. Mr. Fischer pointed out that this phase of reorientation provided an opportune time to examine in depth the requirement for TAGBOARD without serious jeopardy to the future availability of the system for use in an intense reaction environment (probably China in the early 1970s). In response to a question from Mr. Vance, Mr. Rowen was uncertain whether the Bureau of the Budget would make an issue of this ExCom action to the President in the FY 1968 budget considerations.

GAMBIT-Cubed Procurement

Action: Agreed to procure 14 systems in the upcoming G-3 buy; this buy is expected to provide reasonable reserves.

ABM/AES SIGINT Requirement

Action: Approved the actions proposed by the DNRO as summarized in his memorandum of December 15, 1966, (see BYE 52887-66) which included reprogramming of funds from a reserve for readout for FY 1967 and the funds for FY 1968, except that $5.6 million of the $10.6 million for FY 1968 would be provided by Mr. Vance from emergency funds if necessary, with the FY 1968 budget to include a net add of $5 million.

Comment: Dr. Flax in presenting the proposed actions indicated that they represented the total actions which could be foreseen at this time as possible and relevant to meeting the DCI's statement of need for an answer to the ABM/AES SIGINT problem within 12 months. He indicated that the probability of success would be greatly increased if intelligence from any other source could aid in the identification of signals already collected or to be collected. This would not only markedly affect the configuration and tasking of SIGINT packages currently deployable but would also aid in the expeditious readout of vast quantities of SIGINT data collected and collectable. Dr. Flax

also indicated that studies are in progress with regard to the programs that might be applicable in the one- to two-year time frame which will almost certainly include the use of synchronous satellites.

All members of the ExCom and Mr. Rowen of the BOB emphasized the urgency and priority of the requirement. Dr. Hornig and Mr. Rowen urged a vigorous attack on the problem by all collection resources which Mr. Helms and Mr. Bross assured is already underway.

Dr. Hornig stated that he wished to assure that all collection efforts were being looked at in an integrated way and that no possibility was being overlooked. Mr. Vance stated that he would have [redacted], who is responsible for NSA, meet with NRO and CIA representatives to coordinate a thoroughly overall review.

James Q. Reber

James Q. Reber
Secretary
NRP Executive Committee

[redacted]

1. Mr. Vance
2. DS-1
3. DS-2
4. [redacted]
5. DF

September 20, 1966

MEMORANDUM FOR THE DEPUTY SECRETARY OF DEFENSE

SUBJECT: NRO Budget for FY 1968

Attached is a summary of my FY-68 budget proposals for the NRO along with NRO Comptroller comments covering significant factors affecting each item.

I would appreciate your approval, modification or other guidance as soon as possible. We are using these figures as budget entries in the appropriate budget submittals. We should be getting tentative decisions to program directors for comment and reclamas, and to members of the ExCom for approval.

The major open decision items affecting the budget are:

	(thousands)
Procurement of 8 additional A-2Rs	$19,700
Development of Readout System (Advance Development)	29,200
[redacted] (Decision to proceed with conversion for B-52 launch)	31,600
Procurement of vulnerability reduction devices	7,500
	$88,000

In addition, the budget has been significantly increased by cost increases in on-going programs and initiation of new programs as follows:

[redacted]

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All of these items also affected the FY-67 obligations but were accommodated by FY-66 fund carryovers as described at the last [redacted] meeting.

Signed

Alexander H. Flax

Attachments
Summary of FY 66 budget
and Comptroller comments

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~~OXCART IDEALIST~~ [redacted] ~~HEXAGON CORONA EARPOP~~

~~(S)~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

June 26, 1967

MEMORANDUM FOR THE DEPUTY SECRETARY OF DEFENSE

SUBJECT: FY-1968 Obligation and Expenditure Indications for the NRP

In accordance with your request, an initial reassessment of NRP FY-1968 obligations and expenditures for the NRP has been made to determine the extent of possible obligation and expenditure reductions in elements of the program as well as any additional fund requirements which have been identified or are foreseen. The possibility of slipping major development programs, such as [redacted] or HEXAGON, which are already under way (and in which substantial increase in program cost would result from program slip) has been considered only to the extent that technical considerations in the HEXAGON programs dictate changes in the schedule. In cases involving program options which have not yet been completely assessed, the cost figures cannot be regarded as firm. However, the figures used are best current estimates for each program.

Obligations:

In the aircraft programs, in relation to the program approved by the Ex Com for the FY-1968 President's Budget, we expect that the programs will now cost about $30 million less than budgeted, primarily due to a reduction in cost of the OXCART program of about $25 million. My recent memorandum to you on the CIA OXCART program options indicated that the deployment coverage would cost about an additional $4 million. Therefore under option one, we would have about $26 million available for other purposes. OXCART option one, to delay initial phaseout actions, would require about $2 million additional. OXCART option two, to continue the program indefinitely, would instead require an additional $47 million in FY-1968. Accordingly, if this option were chosen, we would require an increase in funding of the Aircraft programs of about $17 million above the President's Budget.

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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DEPUTY DIRECTOR

April 10, 1967

MEMORANDUM FOR [redacted]
GENERAL BERG?

SUBJECT: The Next NRP Executive Committee Meeting

Bearing in mind Dr. Flax's comments this afternoon with regard to the Davis Committee recommendations and specifically the studies, may I remind you that I am personally under the injunction from Dr. Flax to see to it that the materials for the ExCom are made available in sufficient time to permit study by the ExCom members and their advisers. There was dissatisfaction with the timing with which facts were made available for the ExCom meetings last December.

I, therefore, beseech earnestly the cooperation of you two gentlemen and your staffs toward this end, realizing that none of us can control the speed with which Dr. Flax approves any papers for release to the ExCom.

Jim
James Q. Reber

Jim.
I understand exactly what you would like to have done. If I, or my office, are aware of Dr. Flax's timing, it'll be "Johnny-on-the-spot." Bear in mind that other than Tom Wolfe, the staff has not been on board this study. I imagine when Dr. Flax releases - he & Harry Davis will do the releasing - If we are privy to the timing - it shall be done
Russ

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