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

3

THE NRO STAFF

November 21, 1966

MEMORANDUM FOR DR. FLAX

SUBJECT: GAMBIT CUBED Readout Briefing Paper

PROBLEM:

Establish NRO position on subject program prior to ExCom meeting of Wednesday, November 23, 1966.

BACKGROUND:

Colonel Allen, SAFSP conducted a variety of briefings to the DNRO and members of the intelligence community in September 1966.

The outcome of these briefings has been discouraging - in their meeting of November 17, 1966 the COMOR virtually tabled any action which might lead to an early USIB position on the requirement for readout in G<sup>3</sup>.

You will recall that we additionally anticipated support from DIA in response to Dr. Foster's (DDR&E) memorandum of September 16, 1966 to General Carroll (Tab A). General Carroll's official response is included in his memorandum of November 18, 1966 (Tab B).

Meanwhile, the funding which was approved on September 28, 1966 (WHIG 5738) consisting of \$2 Million to permit continuation of efforts at CBS and BTL thru October and November 1966 comes to completion on November 30, 1966 and the phasedown operation which is estimated to cost \$400,000 (also approved by WHIG 5738) will be initiated.

\$14.03 M funding is required to maintain this program in a state of health through September 30, 1967 which is picked as a convenient technical milestone and would conclude the full test of the integrated CBS/BTL engineering model:

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Of this \$14.03 M, \$9.15 M could be FY 1967 funds allocated as follows:

\$5.6 M - CBS  
3.3 M - BTL  
0.15 M - LMSC  
0.1 M - EKC

The remaining \$4.88 M could be FY 1968 funds allocated as follows:

\$2.5 M - CBS  
1.7 M - BTL  
0.54 M - LMSC  
0.14 M - EKC

These actions would preserve first launch date of a GAMBIT CUBED vehicle with readout in January 1969.

At the present time the entire program leading to 3 sets of G<sup>3</sup> flight hardware is expected to cost \$48.7 M plus \$8 M for a single ground station.

The continuing program study indicates desirability of minimum hardware change for the early flights of G<sup>3</sup> with readout. Those essential changes would involve:

- a. Removal of R/V section. Add read-out module
- b. Removal of APTC
- c. Change film speed drive for higher altitude (approx 206 nm)
- d. Wiring changes for power and commands
- e. Removal of BUSS
- f. Additional batteries within allowable weight to permit a life of 21 days.

(Note - this is a change from earlier discussions which would have added a power module to yield an IOC of 30 days)

ALTERNATIVES:

1. We could dig a little deeper into our "undecided fund" and continue the CBS-BTL effort for several more months at a rate of about \$1 M per month.

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BTL is restive and this may not be acceptable to their management; however, it gives the NRO an added two months to attempt to achieve a position of support from the USIB which we clearly do not now have.

2. We could press for ExCom approval to support the effort thru September 30, 1967 in expectation that the "need - achievement" will happily merge. This is one of these "you don't know it yet but you can't afford to be without it" cases, and requires the considerable prestige of the DNRO laid on the line.

This will keep the team going at full effort on G<sup>3</sup> and will guarantee early capability.

3. We can back off of this effort since the only real justification for going this present film on-board-process route was to provide an early capability to meet what was understood to be "urgent crisis reconnaissance needs."

If current trends indicate that this need is not justified, several things change:

- a. We probably lose BTL and should expect to have to find another data link contractor eventually.
- b. Engineering effort aimed at minimum changes to a GAMBIT CUBED is probably inappropriate.
- c. The effort should be clearly redirected toward a longer term effort and addressed to long life using the all-electronic readout module now in parallel development. This development would probably involve a major new satellite vehicle program and could not be expected to be reasonably defined for at least a year or two.



R. A. KOCH  
Captain, USN

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DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING  
WASHINGTON, D.C. 20301

MEMORANDUM FOR GENERAL CARROLL

SUBJECT: Assessment of New Technology for Intelligence Collection

In allocation of funds for Advanced Development, it is important for me to know whether the intelligence community has assessed all possible applications not only to existing collection requirements but also the development of new approaches to intelligence utilizing new technology. A particular matter at issue at the present time is the existing development of a direct readout system which can be used in conjunction with the G-3 system. The performance of the early development breadboard has been remarkably good, resulting in relatively little resolution degradation. This technology, including the readout and the data link is also applicable to other satellite and aircraft systems as well. The original exploratory development was carried on as partially responsive to a requirement of several years ago for a crisis management capability, to which this is well adapted. However, I believe the advanced development of this system, the procurement of operational gear and requirement to exercise this system in order for it to be useful will be difficult to justify if a crisis management situation at some unknown time in the future was its only justification.

*W. J. Lee*

Therefore, I would really appreciate your opinion and suggestions as to what current intelligence needs this type of system can satisfy and your view of what possible new concepts in intelligence collection

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could be developed given the availability of such technology. This might be an appropriate area for the participation of the Scientific Advisory Committee of DIA. My staff and Dr. Flax's staff will be very happy to supply any technical details or assistance required.

John S. Foster, Jr.

cc: Dr. Flax  
Mr. Harry Davis

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DEFENSE INTELLIGENCE AGENCY  
WASHINGTON, D. C. 20301

18 Nov 66

MEMORANDUM FOR DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING  
(ATTN: MR. JOHN S. FOSTER, JR.)

SUBJECT: Assessment of New Technology for Intelligence Collection

1. My memorandum of 28 September 1966 provided an interim reply to your request for an evaluation of the G-3 Readout system as it relates to the satisfaction of intelligence requirements. Since that time this subject has been carefully studied by selected members of my staff.
2. A continuing problem of priority importance is that of obtaining intelligence to support the National Military Command Authorities during periods of crisis and in the trans-post SIOP time frame. DIA has previously stated the requirement for a quick response, near real time readout satellite reconnaissance system as a matter of highest priority.\* The proposed G-3/RO system, though not meeting all the parameters set forth in that statement, will provide a unique high resolution readout capability which represents a most important breakthrough in providing the timely response so essential for intelligence in crisis situations. The more sophisticated systems which may respond to the total requirement appear to be in the 1972-75 time frame, therefore, the G-3/RO appears to be a logical and practical interim system in meeting this requirement. Nevertheless, crisis management alone is probably not sufficient justification for continued development especially from the standpoint of cost effectiveness.
3. Requirements for very high resolution photography such as that provided by the KH-8 system relate primarily to the needs for detailed technical data to support analysis of Sino-Soviet advanced weapon systems and technology. Analysis of intelligence needs for overhead photography expressed in terms of the essential elements of information (EEI) indicate that more than fifty percent of our current and projected surveillance requirements, worldwide, can be fulfilled by photography providing ground resolutions on the order of 3' on a side. This includes priority indications/warning targets as well as surveillance objectives. It is anticipated that the KH-9 system which is programmed to replace the KH-4 will provide the necessary resolution for surveillance as well as the wide swath which will cover far more targets per day than either the KH-7 or KH-8. The G-3/RO system which is predicted to have a comparable resolution to the KH-9 and a capability to photograph over 300 targets per day on a 30 day mission, can effectively augment the KH-9 in a surveillance role and provide for increased flexibility of collection activities because of the near real-time readout capability.

\*JCSM 937-63, 29 November 1963

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4. With regard to new concepts, the availability of the G-3/RO system, in addition to increased flexibility, suggests several highly valuable techniques to enhance our intelligence collection capabilities. Today our near real-time information on Sino-Soviet bloc activities is basically derived from SIGINT. Some of the most significant drawbacks of the SIGINT systems could well be counter-balanced by this new capability. Frequently it is difficult if not impossible to determine if activities detected are in fact occurring or are merely exercises; and activities conducted under complete or partial communications security may not be detected at all. Use of this new system in conjunction with other intelligence sources could provide timely validation of data used in the continuing process of the intelligence community to assess the posture of Communist nations, as well as other areas of concern. In connection with impending or actual special events of great interest in the scientific or technical areas use of the new technology will significantly enhance our collection capability not only because of the quick response but also for the timely guidance that may be provided for activation of other collection systems including the basic KH-8 system.

5. The unique capabilities of the KH-8 system were developed in response to the need for very high resolution photography. The EEI for technical data, though of high priority for collection, does not require, in most cases, a timely response greater than that provided for by currently programmed systems. Although the G-3/RO system would not be suitable in a direct substitution role, it may be able to satisfy a limited number of these requirements because of its capability to descend to lower altitudes thus improving the resulting resolution.

6. Reviewing the capabilities of the G-3/RO system, I would consider it complementary to the KH-8 and KH-9 for it will provide increased flexibility in operations and the opportunity for new and unique collection methods. Although it could not replace the KH-8 and KH-9 programs, the G-3/RO can effectively be phased in to provide an economical mix of vehicles in the schedule which would not exceed the number of launches planned for that time period. Details of an appropriate mix can be determined by direct coordination between NRO and the COMOR. I have provided a copy of this memorandum to the DIA Scientific Advisory Committee for information and requested further study of the new technology with a view to possible development of other new concepts for this system. I consider that the G-3/RO system can satisfy many timely intelligence requirements and provide a valuable addition to intelligence collection resources.

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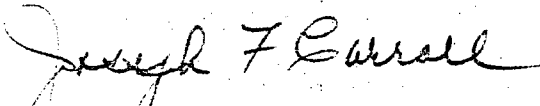
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7. In consideration of the factors mentioned above, it appears to me that employment of the G-3/RO system warrants serious consideration. However, since the National Reconnaissance Program is responsive directly and solely to the intelligence collection requirements and priorities established by the United States Intelligence Board, it is recommended that the NRO elicit USIB's views on this subject.



JOSEPH F. CARROLL  
Lieutenant General, USAF  
Director

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