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NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

DIRE

OPTIONS/COMPETITION 20 APR 1971

GOB

MEMORANDUM FOR MR. PACKARD
MR. HELMS
DR. DAVID

SUBJECT: ExCom Meeting

At the January 29, 1971 NRP ExCom meeting, you requested that higher confidence technical, budget and schedule data be acquired on several interim photographic systems for possible use during periods of crises. These data are incorporated in the attached report for your consideration prior to the April 23, 1971 ExCom. Also, relevant data on the EOI and [redacted] issues are included in the report for your review since they will be agenda items.

In addition, I plan to provide a verbal status report on [redacted] and HEXAGON at the meeting.

John L. McLucas

Attachment
Issues for Special
ExCom Meeting

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HEXAGON

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ISSUE: Should the NRO acquire an interim system with improved imagery response time prior to EOI? If so, what is the desired system approach and what is to be the funding source?

Summary:

Since the January ExCom, the NRO field organizations have mounted an extensive investigation and evaluation of interim system concepts. Simultaneously, the United States Intelligence Board has directed an extensive effort in defining the interim system intelligence requirements against which the system concepts could be evaluated. As the interim system intelligence requirements took shape, it became evident that there were no "quickie" cheap system concepts which could satisfy the requirements.

The NRO analysis of system capabilities versus requirements did lead to two rather obvious conceptual choices. One choice is to select one of the special purpose systems conceived especially for the interim quick response task and to develop it as an addition to the current NRP photo-satellite mix. [redacted] appears to be the best choice if this course is chosen. In this case, the costs of the new system are entirely additive and the system would be obsoleted with the introduction of a near-real-time system. The other choice is to develop an interim system which also satisfies the near-real-time requirements. The most promising concept which falls into this category is the Film Readout GAMBIT

(FROG). It has the advantage of being based on an existing system which allows us to forecast both costs and performance with a high degree of confidence. It has sufficient excess performance to permit a reduction in the number of GAMBIT and HEXAGON missions required and yet, being a GAMBIT variant, it increases the overall GAMBIT production base. This provides off-setting costs after IOC which make the FROG concept attractive on a long term basis. In the near term, however, it is one of the more expensive interim concepts evaluated.

Viewed as a near-real-time system, FROG provides essentially the same performance as EOI and provides it earlier at a significantly lower cost. However, the EOI appears to have several attractive features which no film-based system can match and is generally thought to be the imagery reconnaissance technique of the future. The EOI technology program has progressed well. System definition is underway with three contractors.. The FY-1972 budget was prepared to cover a possible system development go-ahead decision around the end of CY-1971. Other options were felt to be less expensive and hence would easily be accommodated within FY-1972 budget totals.

The interim system issue is interwoven with the EOI issue in that we cannot, within our present budget, afford to initiate development of both systems unless other NRP

program funding is significantly adjusted. The issue before ExCom then, is whether to initiate development of an interim system (probably [redacted] and proceed with system definition of EOI, leading to an early system go-ahead, or whether to keep EOI technology going at a reasonable level and initiate development of an "interim" system (probably FROG) which stands a good chance of fulfilling our requirements for the indefinite future. If the first option [redacted] is taken, money for [redacted] development can be provided within the existing budget by deferring initiation of EOI system development for about a year. If the second option (FROG) is taken, money for FROG development will delay system development of EOI for two years. After such a delay it might appear desirable to delay further until FROG results and their impact were evaluated. This would lead to an overall delay of three to four years. EOI technology would be continued at about the present rate.

Background:

At the January Special ExCom meeting, there was considerable discussion of interim systems. It was agreed that a hard look be taken at various approaches including "more of what we already have," GAMBIT and CORONA 6 PACKS, Film Readout GAMBIT and [redacted] As a result, CIA/OSP and SAFSP were asked to prepare developmental and programmatic data on the systems specifically mentioned at ExCom and on other appropriate concepts. The NRO field organizations in turn initiated contractor studies in some cases and in others undertook the effort in-house.

Description of Interim System Candidates:

The interim systems considered following the January 1971 ExCom meeting are listed and described below. Systems specifically mentioned at the meeting are marked with an asterisk. The others are variants of those mentioned or the result of additional proposals.

* Increased Number of HEXAGONS and GAMBITS

The concept of an increased number of existing systems envisions an improved posture for crisis response by providing for a photo reconnaissance satellite on orbit continuously. This approach provides an overall collection capability well in excess of standing requirements. No system modifications unique to the crisis response role would be accomplished. Six HEXAGONs and six GAMBITs annually with the current mission durations of thirty days and twenty days respectively would yield 300 photo-satellite days on orbit initially. An early increase in HEXAGON mission life to 45 days appears reasonable and present development will produce 27-day GAMBITs next year followed by up to 32-day missions by early 1974, comfortably exceeding a 360 days on-orbit goal.

* CORONA 6-PACK

The CORONA 6-PACK is based on an initial concept of the present AGENA vehicle and J-3 24-inch focal length camera system and six scaled down MARK VB reentry vehicles. A refurbished ATLAS booster would be used to accommodate the added payload weight and support a quick launch reaction time (8-12 hours). This system could be operational in 24 months but would not achieve the 3-5 foot resolution requirement. An improved 36-inch focal length camera meeting resolution requirements could be incorporated with only moderate structural changes and could be operational in 29 months. The plan shown envisions initial operation in 24 months from go-ahead with six systems using the J-3 camera followed by a phase-in of the improved camera 18 months later.

[redacted]

* GAMBIT 6-PACK

The GAMBIT 6-PACK concept is based on the use of the existing GAMBIT system modified to employ six smaller reentry vehicles of Lockheed design. Five of the RV's would be used to return film from the prime camera, the sixth being used for the Astro Position Terrain Camera film and tape recorder return. The additional payload weight with the GAMBIT Titan IIIB booster would result in an inclination penalty versus the standard GAMBIT (88 vs 110 degrees). There is the possibility that this could be off-set by minor booster modification. Six GAMBIT 6-PACKS annually are envisioned to satisfy standing surveillance requirements and provide added collection capability for crisis response.

GAMBIT 3-PACK

The GAMBIT 3-PACK was an offshoot of the GAMBIT 6-PACK effort and is a more straightforward, less complex and perhaps less expensive approach. The configuration would consist of the current GAMBIT system but with three rather than the present two MARK V reentry vehicles. The inclination penalty from increased payload weight as compared to the standard GAMBIT (93 vs 110 degrees) is less than that of the 6-PACK and the development of a smaller bucket would not be required. Like the 6-PACK, six missions per year would be required to satisfy standing requirements and provide added capability for crisis response. Fewer RV's would be available for more frequent data return, however (18 versus 30).

HEXAGON VARIANT

One HEXAGON concept was submitted and others are possible. The concept provided envisions the HEXAGON vehicle modified to replace one of four reentry vehicles with a module containing eight MARK V RV's and extending the mission lifetime to about 120 days. A possible mission profile would involve HEXAGON search/surveillance collection against standing requirements

were also examined; but the resolution requirement dictated a 60-inch focal length, F/4.3 optical system which in turn requires the 1600-pound spacecraft.

[redacted]

* FILM READOUT GAMBIT (FROG)

Film Readout GAMBIT is based on the existing GAMBIT spacecraft and booster, the 175-inch focal length R-5 lens and the minimum modifications necessary to provide longer life and a quick response readout capability. Readout is accomplished by laser scanning film which has been developed on board. The resulting analog video signal is transmitted directly to a ground station where it can be reconstructed into hard copy or retransmitted via communication satellite to Washington, D. C. for reconstruction of the hard copy.

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THE WHITE HOUSE

WASHINGTON

PRESIDENT'S FOREIGN INTELLIGENCE ADVISORY BOARD

June 17, 1971

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Dear Dave:

In the course of its regular June meeting, the PFIAB met with the President on 4 June. One item raised with the President falls within the purview of EXCOM, and I think it may be useful for me to fill you in.

Dr. Land is concerned that a decision to purchase a film readout GAMBIT (FROG) to meet the crisis coverage requirement may, because of a budget squeeze, seriously delay or even defer development of ZAMAN.

In presenting this matter to the President, Dr. Land pointed out that quantum advances in the development of our overhead reconnaissance capabilities have only been possible with strong Presidential backing because the financial risks were more than the bureaucracy could or should assume. Dr. Land characterized FROG as a cautious step, and ZAMAN as a quantum jump which would give the U. S. an unquestioned technological lead in this field.

Dr. Land was supported by Dr. Baker, who stated that neither he nor Dr. Land were as much concerned about immediate planning as they were over the potential loss of the long-term commitment to ZAMAN.

Quite clearly neither I nor, for that matter, most members of the Board, are technically qualified to debate the advantages of one system versus the other. But, in view of budgetary cutbacks, the reservations raised by Dr. Land with respect to our ability to have both appear deserving of careful study.

Sincerely,

George W. Anderson, Jr.
Admiral, USN (Ret.)
Chairman

Honorable David Packard
Deputy Secretary of Defense
The Pentagon - Room 3E928
Washington, D. C.

GAMBIT-ZAMAN

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