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WHITE PAPER ON CRISIS RECONNAISSANCE

INTRODUCTION.

Within recent months high level concern has been expressed about the capability of the NRO satellite reconnaissance program to provide the responsiveness and flexibility required for crisis management. This concern is certainly justified when one considers the inherent limitations in the flexibility and capability of the projected program to meet potential special or crisis needs. A frequently recurring question which has surfaced as a result of this concern is "How can the NRO respond to crisis situations more effectively?" The purpose of this paper is to answer that question by outlining an approach which will provide a responsive, economical, and timely crisis reconnaissance capability. This approach is oriented towards providing an interim capability to fill the gap until a near-real-time system is ready.

BACKGROUND.

For many years there has been a community-wide interest in obtaining quick-return imagery, particularly from areas in crisis. Prior

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to July 1969, the NRO investigated a variety of approaches to this problem. The primary solutions resulted in providing two recovery vehicles for the photographic satellites and maintaining the CORONA on a one-day alert status. Neither the option of early recovery nor the quick reaction of CORONA were exercised, regardless of the crisis climate.

In July 1969, USIB approved intelligence requirements for a near-real-time (NRT) imagery satellite system which would have a multi-purpose mission to include crisis reporting. The long lead time solid state array system was tailored to this requirement, with the GAMBIT approaches under study as possible inexpensive alternatives.

In the summer of 1970, the Middle East crisis brought the issue of crisis response imagery into very critical focus. Dr. Kissinger requested Mr. Helms to determine how we could increase our photographic satellite coverage for special situations in other parts of the world. Mr. Cline of State (in a letter to Mr. Helms) expressed concern over the increasing lack of flexibility of the NRO satellite reconnaissance program and the 5-6 years lead time prior to availability of crisis imagery. This letter triggered a COMIREX study, "Outlook for Photographic Satellite Reconnaissance, FY-1971 and Beyond," and a DIA/SAC study, "Analysis of Potential Contributions to Intelligence Problems by Near-Real-Time Satellite Imagery

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Systems." Most recently, the COMIREX Ad Hoc Crisis Analysis Task Group has been formed to do an in-depth study of the needs for near-real-time imagery (to update and amplify the July 1969 NRT requirement), and to examine the needs for an interim crisis response satellite system. This group presented its interim report to COMIREX on 21 January 1971.

At this time, both State and DIA have formally recommended consideration of an interim NRT imagery system, and both the DIA/SAC and COMIREX work have combined to form the basis for modification to the July 1969 USIB NRT requirement which will soon be distributed. Following is a summary of the portions of the projected requirement which pertain to a crisis response capability.

a. Image Quality: Two to three-foot ground resolution distance (GRD). [redacted] twelve-inch GRD may be required for tactical utility. In some cases GRD up to 15 feet may be useful.)

b. Field of View: Ground coverage of 15,000 to 20,000 feet on a side (adequate for most installations). Area coverage of 85 x 50 nautical miles (sufficient for most key areas). Additionally, lines of communication having widths of approximately 5 nautical miles and varying lengths up to hundreds of nautical miles.

c. Continuity and Target Access: Capability to provide continuous daily access to crisis areas for periods of at least one month

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(critical periods examined thus far range from several days to two months). Desirable to have [redacted]

d. <u>Imagery Return Times:</u> (Imaging to viewing) Less than 12 hours desired. (In some cases times of one to several days would be acceptable.)

e. <u>Crisis Frequency:</u> From an analysis of critical situations occurring during the last several years, it appears that an average of approximately eight incidents per year might arise which would require crisis area imagery coverage.

<u>DISCUSSION</u>.

We have examined the crisis response problem at frequent intervals during the past several years. One fact that has been consistently evident is that quantity, responsiveness, timeliness, quality, and continuity are all essential ingredients in formulating and rating satisfaction of crisis intelligence needs. Our studies have indicated that no one single system can adequately emphasize all these ingredients because of technical trade-offs.

We believe your action should be as follows to satisfy the current crises needs. Initiate immediately, with ExCom's approval on 29 January, a two-pronged and parallel approach. First, optimize our existing resources

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for crisis use without interfering with the satisfaction of USIB standing requirements. Secondly, introduce an interim dedicated system which is optimized for the satisfaction of crisis requirements. These two parallel efforts are described below.

a. Existing Resources.

In the near term, a more favorable capability for crisis response can be achieved from available photo-satellite systems. The basis for this capability would be a somewhat accelerated launch schedule which would enhance crisis response by providing a collection capability well in excess of USIB standing requirements. With requirements satisfaction near 100 percent, early return of a film capsule for crisis imagery should be acceptable to the intelligence community.

Based on the estimated development time for an interim crisis response system of 20 to 24 months, the increased frequency of launches would extend from February 1971 through the end of June 1973. Based on present and currently projected procurement, five CORONA's, twelve GAMBIT's and eleven HEXAGON's should be available for launch in this timeframe. These figures reflect the CORONA's on hand, the GAMBIT's now scheduled, plus the pipeline vehicle, and the anticipated HEXAGON launch rate plus a pipeline which should result from the slip in the first

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launch from December 1970 to March/April 1971. Taking into account the planned increases in GAMBIT mission life, the above resources would yield 719 days on orbit, amounting to 81.5 percent of the calendar period. The average gap between missions would be six days. If HEXAGON can achieve its 45-day design life by the seventh launch (second block of procurement), the corresponding figures would be 779 days on orbit, 88.4 percent of the calendar period, and an average of less than four days between missions. An optimum launch schedule would require some additional analysis and would require continual update to reflect standing requirements satisfaction and contingencies.

b. Interim Crisis System.

Introduce a relatively inexpensive system which is designed to provide data return via an RF link. Such a system avoids the penalties associated with early return of the recovery vehicle while at the same time providing improved continuity and more rapid (daily) return of imagery.

A number of crisis reconnaissance designs have been proposed with a range of performance and cost figures. All proposals have in common the use of a panoramic camera system because of the need for an area coverage capability as typified by the Suez Cease Fire Zone situation.

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This class of system has been studied sufficiently to allow the NRO to proceed directly into system definition. A period of 60-90 days would be required to select the optimum configuration with consideration being given to various launch modes, such as HEXAGON piggyback, surplus MINUTEMAN, or aircraft. The resolution versus system complexity trade would also be examined during this period to arrive at a best resolution without unduly complicating the design. Following the 60 to 90 day period we would be prepared to start system acquisition. The system could be operational in 20 to 24 months from a go-ahead decision.

EVALUATION.

The Table at the attachment provides background data on the proposed actions. One can say with confidence that a system approach should approximate the optimum desired, but not necessarily achieve it because of the diminishing marginal returns associated with pressing for given increments of effectiveness. This leads to the conclusion that it is not possible to build a "low cost" crisis reconnaissance system that provides HEXAGON and better quality and substantial area coverage along with daily return of data. However, it is possible to trade-off some resolution and

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acquire a dedicated responsive system which allows prompt data return. Interaction of this data with that from other sources of intelligence (SIGINT, HUMINT, or open source materials) should provide the information base necessary for a confident assessment of the crisis situation. The SIGINT contribution should be significantly increased with the introduction of [redacted] By observing the table, it is evident that a considerable capability can be achieved by maximizing the days on-orbit with CORONA's, GAMBIT's, and HEXAGON's during the interim time it takes to acquire a crisis dedicated system.

One advantage of the dedicated system approach is the distinct possibility that the product derived could be disseminated as declassified data which appears to be much in demand during a crisis situation. Additionally, introduction of this system into the environment will exercise the decision making process prior to arrival of the near-real-time system.

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