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CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D.C. 20505

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OFFICE OF THE DIRECTOR

4 June 1971

BYE-6445-71

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

DEP. SEC. HAS SEEN

Dear Dave:

Over lunch the other day, when we were talking about the future of the near real time readout business, you mentioned the possibility that FROG costs might be more than anticipated. I have been concerned about this too and have wondered whether there were some less ambitious concepts for the Gambit film readout combination which would give us greater confidence in costs and schedule. With this in mind our people have come up with some suggestions as to what some of the possibilities might be. They are summarized in the attached paper. Since we are planning an EXCOM in July to review this business again anyway, wouldn't it be a good idea to have the Air Force study these kinds of alternatives so that we would be sure that we were selecting the best compromise possible between performance, cost, and early availability?

Sincerely,

Richard Helms
Director

Attachment: As Stated

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# SUMMARY OF ALTERNATE CONFIGURATIONS FOR THE FROG VEHICLE

REFERENCES: (1) Interim Near-Real-Time System - Vehicle and Operational Alternatives, dtd 1 June 1971, BYE-108930-71

(2) "60-Day Study" of Interim Crisis Reconnaissance Systems 29 January - 29 March '71, dtd April '71, BYE-15704-71 (done in support of the "Crisis Criteria Committee" activities)

The purpose of the review reported on in Reference (1) was to seek $G^3$ vehicle modifications for film readout which would not be as extensive as those required by the current FROG concept. Three such configurations are discussed in the reference papers along with some performance comparisons against the crises and surveillance requirements.

All three would require less modification to $G^3$ than "FROG" and would therefore probably lead to lower development cost and risk and higher confidence in meeting a 30 month development schedule. At the same time, all three would provide a substantially increased capability over the current mix of satellites for meeting crises related requirements. The table below indicates the $G^3$ vehicle subsystems which would either be new or extensively modified for the various configurations which are named FROG (a), (b), and (c).

| | FROG | | | |
|---|---|---|---|---|
| | "baseline" | (a) | (b) | (c) |
| Electrical Power | x | x | x | x |
| Propulsion | x | x | | |
| Attitude Control | x | x | | |
| Command Programmer | x | | | |
| Roll Joint | x | x | | |
| Film Transport System Platen | x | | | |
| Add Film Electronic Module (in place of RVs) | x | x | x | x |
| Add Data Link Module | x | x | x | x |

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SUBJECT: Summary of Alternate Configurations for the FROG Vehicle

In summary:

FROG (a)

Involves new propellant, altitude control, and electrical power systems. The RVs would be replaced with a film electronics module and a data link module. These changes and additions would be essentially the same as envisioned for the current FROG concept. However, FROG (a) could retain the same command programmer and the current $G^3$ film path up to the interface with the film electronics module. Although the film path would need to be modified to the extent necessary to allow operation over the altitude range 70 - 250 n.m. and 0 - $60^o$ obliquity range, the FROG dual film path would not be incorporated. Retaining the $G^3$ film path would probably lead to a significant reduction in the engineering requirements.

The vehicle would be operated for extended periods in a low altitude orbit in order to obtain enough high resolution imagery to allow a reduction in conventional $G^3$ launches to two per year. Because of this low altitude operation the vehicle design life would be 120 days.

The objective would be to have one vehicle on orbit at all times.

FROG (b)

The electrical power system would be changed to provide a 60 day design life capability. The propulsion and attitude control systems would not be modified and thus the life capability at low altitude would be 30 days.

Four vehicles per year in a low altitude orbit (30 day design life) would be scheduled to collect high quality imagery and they would be used to collect crisis relevant information if a crisis occurred while they were on orbit. Four vehicles per year in a high altitude orbit (150 n.m. circular, day design life) would be scheduled to supplement the low altitude vehicles and provide a vehicle on orbit at all times.

SUBJECT: Summary of Alternate Configurations for the FROG Vehicle

There would not be any conventional Gambit launches with this variation of the FROG System.

FROG (c)

The $G^3$ vehicle would be modified only as required to make it capable of on-pad standby at launch minus one or two days for up to sixty days. (The film electronics and data link modules would be incorporated in lieu of the RVs.)

The FROG System would replace the conventional Gambit vehicles and there would be four launches per year scheduled. Immediately after launch of a vehicle another vehicle would be counted down to R - one or two days and would then stand by until either a crisis occurred or the next scheduled launch.