SECRET

DEPARTMENT OF THE AIR FORCE
OFFICE OF THE SECRETARY

MEMORANDUM

13 August 1970

Lt Col Sciotto, SS-4:

The attach is General King's reply to our message instructing him to proceed with working up a plan to extend G-3 to 30 days. Would appreciate your discussion and comment on their proposed increase in perigee altitude to accommodate no change in SPS (para 3d). How high can we afford to go? Also, the second part of the in-house effort will be comparative studies of mission duration vs inclination which I have been informed will be done by [redacted] Would you like to either participate in this or perhaps supply some ground rules with regard to targets, weather models, satisfactio etc?

25X1

ROBERT A. SCHOW
Major, CE, USA

Atch
CHARGE 3590
WHIG 0583

Handle via BYEMAN
Control System

SECRET

PRO A4/d(2)

~~TOP SECRET~~

14 August 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: GAMBIT Mission Life Extension

BACKGROUND

Subsequent to the last meeting of the ExCom, General Allen dispatched a message to General King requesting that an in-house study be initiated toward extending GAMBIT mission life to 30 days (TAB A). General King has replied with a study plan, ground rules, and a completion date (TAB B).

DISCUSSION

General King's approach is in general most acceptable. One ground rule, that which specifies no increase in secondary propulsion system (SPS) capability and an increase in perigee height for orbit maintenance, is subject to question. It is certainly not desirable to extend mission life at the expense of system resolution. It is possible that the trade off will be small versus the difficulties in increasing SPS, but both courses of action should be considered. The proposed message at the right suggests both options be developed.

It has been my recent impression that on the subject of GAMBIT improvements, SP tends to be somewhat conservative. This is understandable in view of the tight budget and the fact that it has shown steadily increasing value as a collector in its present configuration. The foreseeable SALT monitoring mission, the termination of VHR, the phase-in of HEXAGON, and the fact that an operational readout system is still some time off tend to emphasize the need to get the most from GAMBIT. The second paragraph of the proposed message is added by way of encouragement.

~~GAMBIT HEXAGON~~
Handle via BYEMAN
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Internal
1 2
1 2
008-14-004

RECOMMENDATION

It is recommended that the message to General King at the right be signed and dispatched.

ROBERT A. SCHOW, JR.
Major, CE, USA

Atchs
TAB A, WHIG 0583 (PROA 1 of 2)
TAB B, CHARGE 3590

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Pg A4d(2)

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DISTRIBUTION

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~~S E C R E T~~ 111411Z AUG 70 CITE CHARGE 3590.
WHIG
GAMBIT
FOR DR MCLUCAS FROM GENERAL KING
SUBJECT: GAMBIT MISSION LIFE EXTENSION

1. REFERENCE WHIG 0583, DATED 22 JULY 1970, SAME SUBJECT.
2. PROGRAM 110 IS PROCEEDING WITH STUDY TO IDENTIFY VEHICLE DESIGN OPTIONS TO ACHIEVE 30-DAY OPERATIONAL LIFE. THESE DESIGN OPTIONS INCLUDE RESPECTIVE ROM COSTS, EFFECTIVITY AND INCLINATION CAPABILITY. COSTS AND EFFECTIVITY WILL BE BEST ESTIMATE OF SP-14 AND NOT VERIFIED BY THE RESPECTIVE CONTRACTORS. SUBSEQUENT TO IDENTIFYING THE DESIGN OPTIONS, COMPARATIVE STUDIES WILL BE MADE ON INCLINATION VERSUS MISSION DURATION AS ONE OF THE INPUTS TO THE DESIGN SELECTION PROCESS.
3. THE STUDY IS PROCEEDING UNDER THE FOLLOWING GROUND RULES:
   A. A 30-DAY OPERATIONAL REQUIREMENT IMPLIES A 31-DAY VEHICLE LIFE.

PAGE 2 CHARGE 3590. ~~S E C R E T~~
   B. CONTRACTORS WILL BE INCENTIVIZED FO LONGER DURATION MISSION AS THEY ARE NOW FOR THE 20-DAY MISSION.
   C. NO INCREASE IN FILM LOAD.
   D. NO INCREASE IN SPS CAPABILITY. THE PERIGEE ALTITUDE WILL BE INCREASED SUFFICIENTLY TO ACCOMMODATE THE PRESENT SPS SYSTEM ON A 30-DAY MISSION.
   E. THE VEHICLE BUSS CAPABILITY WILL BE RETAINED.
4. PLANNED COMPLETION DATE FOR THE IN-HOUSE STUDY IS 2 OCTOBER 1970.

~~S E C R E T~~
BT

008-11-006

PRO A14-2(2)

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

THE NRO STAFF

14 August 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: GAMBIT Mission Life Extension

BACKGROUND

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~~GAMBIT HEXAGON~~
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08-14-010

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RECOMMENDATION

It is recommended that the message to General King at the right be signed and dispatched.

ROBERT A. SCHOW, JR.
Major, CE, USA

Atchs
TAB A, WHIG 0583 (PRO A-4-d(2)
TAB B, CHARGE 3590

This message would normally be dispatched at a lower level but Bill, understandably, would like you personal reassurance that the life extension is a useful enjoyment to consider expeditiously and carefully.

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PRM 4/d(2)

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

THE NRO STAFF

8 October 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: GAMBIT Mission Life Extension

BACKGROUND

Since July of this year, SAFSP has been conducting an in-house study to determine the best means for achieving a 30-day GAMBIT mission life. CHARGE 4527 (TAB A) forwards General King's conclusions and recommendations. Our messages which initiated the effort are at TABS B and C.

DISCUSSION

General King has recommended two configurations for extended life. The first configuration meets all desired characteristics, providing up to 32 days life with no increase in perigee height, i.e., no resolution penalty. It further has a bonus flexibility advantage in that batteries and vehicle life can be traded off against a wide range of inclinations (102-116 degrees), permitting considerable mission "tailoring" against collection needs, time of year, etc.

This configuration requires new ("Super" Magnum) batteries and major changes to the attitude control system (ACS) and secondary propulsion system (SPS). It would accordingly require some two years and about $5.6M to develop and about $1M recurring costs annually. The FY 71 increment would be about $2M. The preceding are rough estimates, and it was indicated that some $600K in contractor studies is required to fully define hardware and software aspects and establish firm costs and schedule.

General King recommends immediate implementation of the second configuration which is an earlier, lower cost, low risk option providing up to 27 days life. This configuration requires an increase in perigee altitude to 80-85 NM (vs 72 NM design) with some decrease in resolution. (It is appropriate to note that Mission 4328 was flown at about an 80-85

~~GAMBIT~~
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NM perigee to optimize Middle East coverage.) Development effort would be minimal, requiring only the substitution of "regular" magnum batteries for the current 1K batteries and hardware qualification for the extended life. The present ACS and SPS would be retained. About $503K would be required in FY 71 and $219K in FY 72 with an ultimate annual cost of $92K.

Configuration two is clearly to be selected at this time. It buys a substantial near term increase in performance at an affordable price. This should not exclude further GAMBIT improvement such as that afforded by configuration one; however, before making any material commitment to such a major development, we should at least accept General King's invitation to discuss his analysis in detail and fully understand the cost/performance trade offs. [redacted] has advised that we can afford the 27-day GAMBIT now. He suggested, however, that you may wish to consult the ExCom before proceeding with any follow-on effort, since GAMBIT mission life extension is not a budgeted item.

CONCLUSION

General King's recommendation to proceed immediately with the 27-day GAMBIT should be accepted. Commitment to any further development should be deferred pending more discussion and possible ExCom guidance.

RECOMMENDATION

It is recommended that the message at the right to General King be dispatched.

ROBERT A. SCHOW, JR.
Major, CE, USA

[redacted]

Atchs
TAB A, CHARGE 4527
TAB B, WHIG 0699
TAB C, WHIG 0583

HANDLE VIA BYEMAN CONTROL SYSTEM

15/Whig 0909

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