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

THE NRO STAFF

1 September 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: HEXAGON Status

ISSUE

Should the HEXAGON 17 December 1970 launch date be slipped?

BACKGROUND

On 4 August 1970 approval was granted General King and Mr. Crowley to proceed toward meeting the scheduled launch date of 17 December 1970 (TAB A). Supporting rationale for this decision was provided in a memorandum to Dr. McLucas, dated 31 July 1970 (TAB B).

DISCUSSION

Several significant events have occurred subsequent to this decision which alter the above rationale and detrimentally influence the achievement of the scheduled launch date, regardless of a total resource effort and available funding. These are as follows:

a. Original plans identified P-1 as the first flight vehicle. P-1 was replaced by P-2 because of recurring malfunctions. P-2 was subject to sensor subsystem failure during low temperature thermal vacuum (TV) testing. The system was finally withdrawn from the chamber on 26 August 1970 for minor "black box" modifications and film resupply. Malfunctions are described at TAB C. The projected shipment date of SV-1 to SAFSP from Danbury is not earlier than 27 September (TAB D). Original schedule date was 15 September.

b. Unresolved tracking problems have occurred in the developmental model (SDV III) during tests at Sunnyvale (TAB D).

~~HEXAGON CORONA~~
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c. Realistic planning/programming for integrating simultaneous development model SDV III testing and SV-1 testing on the West Coast are becoming increasingly difficult because of major malfunctions and ensuing schedule delays. Even if no further major difficulties are encountered, confidence in systems reliability is low.

d. General King has advised that the Lockheed phase-up to a three-shift, eight-hour-a-day, seven-day week schedule to meet the launch schedule will cost $2.7M (TAB E). This phase-up was initially predicated on the 15 September delivery date for the SV-1 which has now slipped to not earlier than 27 September (TAB D). CHARGE has identified $2.85M in the HEXAGON program which is surplus and available for withdrawal (TAB F).

e. A slippage in the HEXAGON launch schedule would provide more time for deliveries, installation, test, and check-out of many of the supporting items for the processing, distribution, and exploitation of this collection system. While no insurmountable problems are envisioned at this time in achieving operational readiness by the mid-December launch date, there are certain critical items yet to be completed which are addressed at TAB G.

ALTERNATIVES

1. Continue to proceed toward the earliest possible launch date with resources committed as now planned, including anticipated approval of funding required for the Lockheed phase-up. If additional slips occur past 17 December, which is very likely, the Lockheed costs could increase substantially.

2. Determine if a more deliberate and realistic approach for launching HEXAGON can be developed which is consistent with the CORONA overlap period and can be accommodated within existing resources and funding.

NRO STAFF POSITION

Selection of Alternative 2 is considered appropriate at this time. The SAFSP and Program B offices should be requested to evaluate the feasibility of slipping the HEXAGON launch date. The proposed message at the right requests such an evaluation.

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RECOMMENDATION

That you approve the message at the right.

ROBERT K. GEIGER
Captain, USN

Atchs
TAB A, WHIG 0633 (PRO A6c)
TAB B, LHSM 31 Jul 70, HEX
TAB C, Memo/Sweeney, Failure
of HEX Sensor Subsystem During
Low Temp Thermal Vacuum Testing (PRO A6d2)
TAB D, Memo/Sweeney, HEX Status (PRO A6c)
TAB E, CHARGE 3921 (BAF D-4)
TAB F, CHARGE 3920 (BAF D-4)
TAB G, Memo/Record, Impact of
HEX Slip (FPP E-8)

Msg - WHIG 0784

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

OFFICE OF THE DEPUTY DIRECTOR

July 31, 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: HEXAGON

Background

On July 7, 1970, the first flight sensor subsystem two-camera assembly (P-1) suffered a catastrophic failure during the low-temperature test in Chamber A. On July 10, 1970, it was decided to substitute P-2 into the midsection of the first flight article. P-1 had been scheduled for a July 31 ship date whereas P-2 was scheduled to be shipped September 5.

With your concurrence, I sent the wire at Tab A asking for a review of plans. I asked for a preliminary review during my visit to SAFSP on July 27 - 29. The review was conducted July 27 with General King, [redacted], Colonel Buzard, Mr. Patterson, Colonel Sweeney and Captain Geiger.

Summary

1. The confidence in being able to launch on December 17, 1970, is low.

2. If the schedule is slipped by, say, three months, the confidence of being able to meet the new launch date is equally low.

3. Perkin-Elmer is ahead of schedule on its P-2 delivery plan--could possibly ship on August 26.

4. Lockheed could meet the launch if the midsection is delivered by September 15. To do

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that, Lockheed must phase up from a two-shift, ten-hour-a-day, six-day week to a three-shift, eight-hour-a-day, seven-day week. The estimated additional cost is $2M to $3M.

5. Perkin-Elmer must support Lockheed in the last phase by sending personnel on TDY. The added costs are estimated to be $300K for TDY from September 1 to January 31 plus $300K for overtime.

6. The following items can meet the launch date of December 17, 1970:

Software
Launch pad
Solid propellants
Transporter is overweight, but can be fixed.

7. Status of P-1: The plan for P-1 is to replace the A camera with one from P-4, replace the looper, and repair damaged parts. It is about one week behind P-2.

Conclusion

For the present, make plans to meet the launch date of December 17, 1970. In any case, it is too early to plan or schedule a slip.

Recommendation

I recommend you concur and approve the wire on the right.

WHIG 0633
4 Aug 70

Bob

F. Robert Naka

CONCURRENCE: MR Date: 3 Aug 70

Attachment
Tab A - WHIG 0601

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PRO A6C

31 August 1970

MEMORANDUM FOR COLONEL SWEENEY

SUBJECT: HEXAGON Status

Discussion with SP-7 and [redacted] today has revealed the following:

SDV III tests at Sunnyvale are stalled due to film tracking problems in the forward section. Alignment tests are in progress. Platen/focus movement problems have been resolved.

In Danbury platen and supply articulator/steerer assemblies from the SV-2 camera (originally scheduled for SV-1) have been installed in the "A" side of the SV-1 camera. If tracking tests are successful, in air system testing should begin on 2 September, following by the start of thermal-vacuum tests on 5 September. The projected ship date is now 27 September. The exact cause of the jam at 47° last week has still not been determined, however.

[redacted] indicated that Messrs. Crowley and Patterson intend to visit Dr. McLucas on Wednesday to discuss HEXAGON schedule and CORONA overlap. He indicated that the sensor subsystem project office now feels that they don't have a prayer of meeting the 17 December launch date.

As in the past, sensor subsystem problems appear to be primarily servo-electronic in nature. Perhaps it is an appropriate time to resurrect General Allen's suggestion that we ask [redacted] to assemble a group of experts to give the system a thorough review.

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

~~HEXAGON CORONA~~

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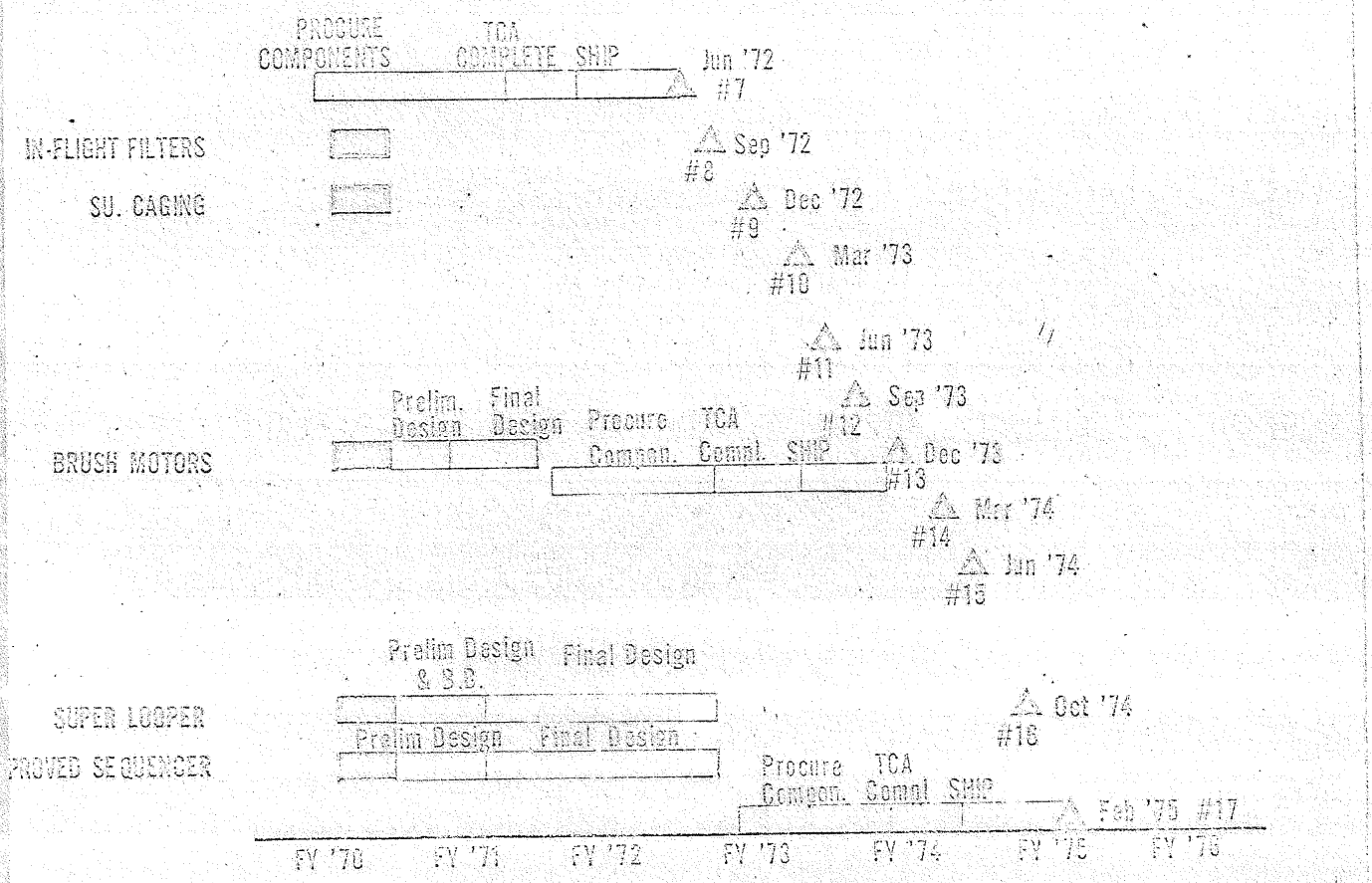

FY 1970 COSTS
SS IMPROVEMENTS STUDIES

o IN-FLIGHT CHANGEABLE FILTER	$153 K
o BRUSH MOTORS	70 K
o "SUPER LOOPER"	135 K
o IMPROVED SEQUENCER	85 K
o ELIMINATE SUPPLY CAGING	82 K
* TOTAL	$535 K

o WITHIN CURRENT $84.4 M FY 1970 FUNDS

PRO A6e

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

THE NRO STAFF

16 September 1970

MEMORANDUM FOR DR. McLUCAS

SUBJECT: HEXAGON Status

BACKGROUND

On 4 September you forwarded a message to General King and Mr. Crowley requesting a joint evaluation of HEXAGON status (TAB B). Their reply is at TAB A.

DISCUSSION

The short and long term review teams described appear well conceived toward achieving a fresh and more unbiased approach toward resolving current sensor subsystem difficulties and increasing overall confidence in the adequacy of the development and test program.

It is clear that a significant slip in HEXAGON exists. The level of effort and associated funding requirements are not well defined and need to be clarified. This is particularly important in view of the fact that no approval action has been taken with regard to the $2.7M previously identified as needed to support the Lockheed phase up (TAB C).

In view of the widespread preparatory effort in the user community, an announcement as to the change in HEXAGON schedule is appropriate.

CONCLUSION

An identifiable slip in the HEXAGON program exists. The program is being subjected to intensive short and long term review; exact schedule and funding aspects are being developed.

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RECOMMENDATION

It is recommended that the message reply to General King and Mr. Crowley and the memorandum to the USIB identifying the HEXAGON slip be dispatched.

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

Atchs
TAB A, PILOT 7104 (PRO A6c)
TAB B, WHIG 0784 (PRO A6c)
TAB C, CHARGE 3921 (BAF D4)

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PRO A6C

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SAFSS	A	1
Dr McLucas		
Dr Naka		
SS-1		✓
SS-2		✓
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SS-7A		
COMP	2	
SS-1/RF		✓
RD-2/RF		
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~~S E C R E T~~ 150003Z SEP 70 CITE PILOT 7104
WHIG INFO CHARGE
HEXAGON
WHIG ATTN. DR. J. MCLUCAS
FROM GEN. KING/MR. J. CROWLEY
SUBJECT: HEXAGON STATUS
REFERENCE: WHIG 0784 PRO A6C

1. IN COMPLIANCE WITH YOUR REQUEST IN THE REFERENCED MESSAGE WE HAVE ASSESSED THE POSITION OF THE HEXAGON PROGRAM WITH RESPECT TO EXISTING SCHEDULES. IT IS EVIDENT THAT PROBLEMS PRINCIPALLY ASSOCIATED WITH ACCEPTANCE TESTING OF THE SENSOR SUBSYSTEM WILL NOT PERMIT ACHIEVING A DECEMBER 1970 LAUNCH. SINCE THE CAUSE OF THE FILM TRACKING PROBLEM NOW BEING EXPERIENCED IN THE SENSOR TESTING HAS NOT BEE DEFINITELY ESTABLISHED AND CORRECTED, IT IS NOT POSSIBLE TO ESTABLISH A FIRM DATE AT THIS TIME. TO ASSURE THE EARLIEST CORRECTION OF THE EXISTING PROBLEM AND MINIMIZATION OF FUTURE PROBLEMS, THE FOLLOWING ACTIONS ARE PLANNED:

A. APPOINT A TEAM OF EXPERIENCED ENGINEERING PERSONNEL FROM SAFSP, AEROSPACE, LMSC, AND TRW (SETS) TO SERVE UNDER THE DIRECTION OF THE SSPO TO REVIEW THE SERVO AND TRACKING PROBLEMS WHICH HAVE

PAGE 2 PILOT 7104 ~~S E C R E T~~
BEEN ENCOUNTERED DURING VARIOUS STAGES OF SENSOR TESTING. THIS TEAM WILL RECOMMEND TO THE SSPO ACTIONS TO RESOLVE THE PRESENT TRACKING PROBLEM AND TO AVOID THE LIKELIHOOD OF SIMILAR FUTURE PROBLEMS. THE TEAM WILL START THEIR REVIEW ON 16 SEPTEMBER AND IT IS ANTICIPATED THAT THEY WILL COMPLETE THEIR REPORT BY 25 SEPTEMBER.

B. APPOINT A TEAM OF COMPETENT TECHNICAL PERSONNEL NOT DIRECTLY ASSOCIATED WITH THE HEXAGON PROGRAM FROM OSP, SAFSP, LMSC, TRW, AEROSPACE AND/OR OTHER CONTRACTORS TO PERFORM AN OVERALL SYSTEMS

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REVIEW TO ASSURE THAT THE TECHNICAL CONDUCT OF THE PROGRAM AT THE SENSOR CONTRACTOR'S PLANT AND THE INTEGRATION OF THE SENSOR WITH THE SPACE VEHICLE IS SATISFACTORY FOR ASSURING A RELIABLE, SPACE-QUALIFIED SYSTEM. THIS TEAM WILL BE HEADED BY [redacted], REPORTING DIRECTLY TO THE D/OSP.

C. APPLY MAXIMUM USEFUL EFFORT TOWARD ACHIEVING THE EARLIEST FIRST LAUNCH DATE. THIS WILL INCLUDE EXPEDITING OF THE INTEGRATED TESTING AND PAD CHECKOUT WITH THE DEVELOPMENT MODEL. SHORT TERM MILESTONES ARE BEING ESTABLISHED AND PROGRESS AGAINST THESE MILESTONES WILL BE REPORTED TO YOU WEEKLY BY TWX. MILESTONES WILL INCLUDE BOTH DEVELOPMENT AND FIRST FLIGHT SYSTEM SCHEDULES.

PAGE 3 PILOT 7104 ~~S E C R E T~~

2. ASSUMING THE FILM TRACKING PROBLEM IS EXPEDITIOUSLY AND SATISFACTORILY SOLVED AND THAT NO ADDITIONAL SIGNIFICANT PROBLEMS OCCUR, THE FIRST FLIGHT SYSTEM MIDSECTION SHOULD BE SHIPPED FOR MATING BY MID-OCTOBER. BASED UPON A 120-DAY INTEGRATION SCHEDULE AT LMSC AND CONSIDERING TIME LOST BY HOLIDAYS, THE FIRST FLIGHT LAUNCH SHOULD OCCUR IN MARCH 1971.

3. THE NEED TO MAINTAIN A HIGH LABOR EFFORT, IN COMPLETING THE ACCEPTANC TESTING OF THE SENSOR SUBSYSTEM AND IN SYSTEM INTEGRATION AT LMSC, OVER THE EXTENDED PERIOD OF TIME, WILL INVOLVE SOME FUNDING INCREASE. EVERY EFFORT WILL BE MADE TO MINIMIZE THE ADDITIONAL FUNDING REQUIRED BY RESTRICTING ANY ADDITIONAL REQUIREMENTS TO THAT WHICH IS CONSISTANT WITH THE PROBLEMS ENCOUNTERED IN THE DEVELOPMENT AND FIRST FLIGHT SYSTEMS. DEFERRAL OF FOLLOW-ON EFFORT IN FY 1971 IN LONG-LEAD ITEMS ASSOCIATED WITH THE SENSOR SUBSYSTEM, TO MAKE THE FOLLOW-ON PROCUREMENT SCHEDULE COMPATIBLE WITH CHANGE IN FIRST LAUNCH DATE, WILL PROVIDE SOME REDUCTION IN FOLLOW-ON PROCUREMENT COSTS IN FY 1971. COST CHANGE ESTIMATES ALLOCIATED WITH THIS SCHEDULE CHANGE WILL BE DEVELOPED FOR ALL CONTRACTORS.

~~S E C R E T~~

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

OFFICE OF THE DIRECTOR

September 18, 1970

MEMORANDUM FOR UNITED STATES INTELLIGENCE BOARD

SUBJECT: HEXAGON Status

Recent circumstances associated with the HEXAGON development program have led to the determination that the first launch date of December 1970 is no longer practical. The situation is currently under intensive review; however, a March 1971 first launch appears achievable and commensurate with the overlap afforded by the remaining CORONA inventory.

In view of the substantial preparatory effort in anticipation of HEXAGON within the user community, it is suggested that the above information be released as you deem appropriate.

John L. McLucas

~~CORONA HEXAGON~~

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