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~~TSI~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

27 January 1969

MEMORANDUM FOR COLONEL ALLEN

SUBJECT: Trip Report 14-17 January 1969

PURPOSE

The primary purpose of this trip was to attend the HEXAGON Design Review meeting on 15 January 1969. Additional meetings included:

a. Discussion of NPIC Attitude Requirement and letter on the same subject from Mr. Patterson to Colonel Buzard.

b. Discussion of the Program impact of Doppler and the proposed change of DMU rockets with the CORONA Project Office.

c. To attend an Interface and Scheduling meeting for the Doppler Beacon incorporation into the CORONA System.

PERSONNEL VISITED

Major Johnson - SP

[redacted]

Colonel Buzard - SP
Mr. Miles Johnson - LMSC

DISCUSSION

During the afternoon of 14 January, the NPIC requirement for 5 minute attitude was discussed with Major Johnson. Backup and reference papers mentioned along with Mr. Patterson's letter to Colonel [redacted] were given to Major Johnson. During the

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discussion of these papers, it was pointed out that they were being mis-quoted and mis-used in context of Mr. Patterson's letter. It was also agreed that Colonel Buzard would not answer Mr. Patterson's letter but would include it in the package which he owes Dr. Flax on this same general subject. Major Johnson was also shown my proposed memorandum to Dr. Flax on this subject, which you and General Berg agreed should not be presented to Dr. Flax until we received Colonel Buzard's analysis on the impact of this requirement on the HEXAGON program. It is hoped that with this wealth of background and policy information available to Colonel Buzard's people, a sufficiently detailed analysis would be forthcoming to put this item to bed once and for all.

The discussions with Colonel [redacted] on the penalties associated with the inclusion of the Doppler in the CORONA system, commencing with Mission 1110 scheduled for March 1970, boiled down to the following fact: inclination is limited to the nominal 81½° and altitude of perigee must be maintained at about 85 nmi in order to insure a 20 day mission. Since these are the parameters normally selected for the CORONA missions, there appears to be no serious penalty. Subsequent discussions in SOC indicate they intend to fly all CORONA missions at these normal parameters. However, the AP has started a campaign to reduce perigee to 80 nmi. This would produce a maximum resolution and scale from the CORONA system but the gains are extremely marginal over those obtained presently. In any event, should an 80 nmi perigee be desired, the CORONA system, with a 400lb P-11, is not capable of a 20 day mission and, therefore, it could be argued that the Doppler is costing us one to two days life. However, if one wanted to be completely honest, it is the P-11 at 400lbs, not the Doppler Beacon at 15lbs., which causes the problem because even without the Doppler Beacon the CORONA system is not capable of 20 day life carrying a P-11 subsatellite. The whole discussion of Doppler penalties has been brought up by the fact that the AP has reported to Hq CIA that there is a significant loss in life to the CORONA mission if the Doppler is carried. It is my opinion that the Agency is trying to make a mountain out of a mole hill for parochial reasons and it is hoped that Colonel [redacted] presentation to the COMIREX Committee during their visit to SP on 3-4 February 1969 will put this problem in its proper perspective. If this fails, I feel certain we will be called upon to make some detailed explanations to COMIREX on the price to be paid for flying the Doppler Beacon.

The other item discussed with Colonel [redacted] was the need for an improved DMU rocket system which is being touted by AP. The cost associated with this improvement is $120K minimum. Colonel [redacted] feels it is more like $140-150K. The new rocket system would consist of 12 3,000 lb. rockets in lieu of the present 12 2,000 lbs. As you can see from the attached documentation, the cost appears to far outweigh the advantages of further playing with the CORONA system. The present system is satisfactory and while it does not contain all the flexibility of a new system, it has worked exceedingly well. Past history indicates that the dispersion in the location of perigee has not exceeded 12° which is actually the 50% probability value for this dispersion and that only if you design the system against 90% probability, and experience dispersion as great as 28-29°, is there any pay-off for the new DMU system. Should a 90% dispersion occur, it is possible that the new system could achieve a mean frame altitude of about 4 miles lower than the current capability. The net result is improved scale and resolution in the noise level of the system. The one thing it might be possible to do with the new DMU system would be to fly a split mission which would start by launching at 85-87 mile altitude of perigee and then subsequent to separation of the P-11 and recovery of the first bucket, reduce altitude of perigee to 80 nmi for the remainder of the mission, and this appears to be the major argument being expounded for this system by AP. Colonel [redacted] feels as I do that the additional cost between $120K and $150K which could be amortized over 9 vehicles at best, makes the proposal non-cost effective when compared with marginal gains to be had in the system performance.

The HEXAGON Status Review was conducted at Lockheed. All major subsystems are now either under contract or in the throes of final negotiations. In fact, the only subsystem not having a firm contract but still in negotiation stages, is the RV for the SI camera system. One encouraging note reported is that the total weight of the SBA is now 9,862 lbs. This is 39 lbs less than reported in December. Another area which has shown remarkable progress is the interface between SBA and the Sensor Subsystem. As of now, all ICDs except 3 are signed and these 3 are in the final negotiation stage. Another area of marked improvement is that the first mid-section has been delivered to Perkin-Elmer. The delivery of this unit was about two weeks late, but this slippage can apparently be overcome.

McDonnell-Douglas, the RV contractor, reported the only discouraging news - they are now on strike. Looks as though the strike may last two to three weeks. What the impact will be on the HEXAGON program is not known at this time. There were no development problems or scheduling problems reported during the meeting which would indicate a slippage from the planned October 1970 launch date for the HEXAGON system. One gets the feeling there may be some but as of now no one is reporting it.

One item of interest - Perkin-Elmer reported that the command generation testing with the sensor subsystem has commenced and the software was being provided for this by the sensor subsystem program office. It would appear that as long as one adheres to the Agency's concept of HEXAGON software, and as long as they continue to write this software, the command generation functions will not cause a delay in the initial launch.

The interface meeting between Navy, APL technicians, Lockheed and the Program Office, went exceedingly well, and most of the people associated with this effort are old hands and have worked together on similar projects dating back to the early DISCOVERER days.

During this meeting it was agreed that the AGENA specifications and qualifications of items to be flown would be furnished to APL during the week of 20 January 1969. Package mock ups to include mounting brackets would be fabricated by APL and a meeting will be held during the week of 4 February 1969 at Lockheed to select actual position on the conical rack for the Doppler Beacon components. Navy indicated that they would be hard pressed to meet a delivery date of 1 July 1969 for the first flight unit which is required at this time so that this system may be integrated and tested along with the vehicle in its normal vehicle testing. In order to achieve the March 1970 launch, it was agreed that a prototype or non-flight unit could be used for these earlier tests but the flight unit would have to be ready by 1 October 1969. The undersigned pointed out to Mr. Joe Kay, representative from Navy Air Systems Command, that should a prototype be needed, he would have to figure out how to fund it since our funding only covers four flight units and it is our understanding from the discussions with Navy and DIA in August and September, that there would be no problem in

delivery of these flight units, provided a 4-6 months lead time would be assured. While the undersigned did not state it as a fact, the impression was clearly drawn that the NRO would not fund such prototypes or qualification units. Mr. Kay agreed that with proper emphasis from Hq Navy, there would be no problem in meeting the July delivery date for the first flight unit. However, he would check into the matter further. APL indicated that the maximum weight for the beacon, packaged similarly to that used in the GEOS satellite, will be 15 lbs. This packaging appears to be entirely feasible and every effort will be made to keep from changing. The inclusion of the Doppler Beacon will impact the CORONA power system, telemetry system, and command system to some extent. While this impact is minimal, in all cases, it will require time and careful consideration.

WILLIAM E. WILLIAMSON
LtColonel, U.S.A.