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DEPARTMENT OF THE AIR FORCE
WASHINGTON

Noted by DCI.
4 OCT 1963

OFFICE OF THE UNDER SECRETARY

MEMORANDUM FOR The Director of Central Intelligence

SUBJECT: CORONA Improvements

- References:
- a. DNRO memo to DCI, Subj: Implementation of Purcell Panel Recommendations, dtd 11 Sep 63 [REDACTED]
 - b. [REDACTED] dtd 26 Aug 63

Subsequent to my direction to proceed with the several steps proposed to improve the CORONA project, our people have reviewed the proposed developments in more detail. It has become evident that some of the proposed steps would result in only marginal improvement, and that others are unlikely to result in improvement to this project at all. I have therefore amended my instructions, confining the CORONA improvement actions to the following items, for the present:

- a. Starting with J-5, each CORONA-J will have the titanium/invar material. However, since only one instrument has flown in this configuration, additional thermal data is required in order to assess fully the degree of improvement. In addition, the thermal conditions obtained on the J-2 flight indicate that a solution to the problems of large excursions in temperature may have been achieved by recent improvements in the passive temperature control system. If successful, these steps will allow the position of peak focus to be chosen, thus eliminating the resolution degradation resulting from the present practice of adjusting to less than peak focus in order to compensate for temperature fluctuations.
- b. The necessary liaison and engineering to test a Mauer IMC sensor has been initiated. It is possible that such a unit could somewhat reduce IMC errors due to yaw, although it is doubtful if much overall improvement can be expected.

CORONA
[REDACTED]
LANYARD

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c. A LANYARD yaw programmer will be incorporated into the Agena D on an early CORONA-J flight with a specific test sequence to determine its effect on image quality. If a reasonable improvement results from the test, yaw programmers will be incorporated into subsequent CORONA-J flights.

d. Our limited [REDACTED] flight experience indicates that the current Agena D stability may be completely adequate for the CORONA camera, and that improvement here may not result in noticeable improvement to CORONA results. Consequently, I am holding further effort toward the development of a vernier attitude control pending more conclusive evidence from later flights.

e. Development of the proposed Type IX programmer is being held in abeyance pending determination of future program operational concepts which would require this added capability.

f. After complete qualification of the CORONA-J configuration, we intend to change the average altitude over the areas of interest to a lower altitude, and to reduce the eccentricity of the orbit such that the variation in altitude over the area of interest will be reduced from present practice. This step is feasible in view of the increased accuracy obtainable with the BTL guidance in the Agena, and will contribute a definite improvement in the resulting photography since resolution varies directly with altitude.

g. We are initiating a specific, detailed quantitative analysis of a recent good quality CORONA mission with the intent of assessing quantitatively the separate contributions of various system elements and atmospheric seeing conditions to the final photographic quality realized. We hope to develop our analysis techniques so that the results of every mission can support our continuing improvement efforts.

2. There remains an open question as to what, if any, other steps should be taken. I believe that such determination should be based upon actual data from physical measurements and experimentation. To this end, I am reviewing the atmospheric research efforts that are already under way, and intend to examine other possibilities for acquiring factual data. The recent installation of a CORONA camera in a U-2 could possibly provide assistance in determining the effect of filters, exposure, and IMC (including yaw) error on this camera, and contribute to atmospheric attenuation information. Our final determination will, in the end,

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depend heavily on what we learn from [REDACTED] since the results of this entirely different system will afford independent correlation as to possible effects of the atmosphere.

Brockway McMillan

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Director
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