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MEMORANDUM FOR: Director of Central Intelligence
THROUGH: Deputy Director of Central Intelligence
SUBJECT: Review of the Geodetic Satellite Mapping Proposals of Dr. Fubini

1. The following memorandum gives a brief technical background on the CORONA reseau proposal made by Fubini and attempts to distill the significance of Fubini's subsequent correspondence on the subject as a basis for action you may elect to take in the NRO EXCOM.
2. Background: Satellites for geodetic mapping have been a major source of conflict between the Army and the Air Force over the past six years. SAMOS had a geodetic payload (E-4) which was constructed but not flown. The Army/CIA ARGON system has been flown six times successfully out of 12 tries and has provided the majority of our controlled reference mapping information. The Army has pushed for a new mapping system in COMOR and elsewhere with superior capabilities. They are specifically interested in a system with 12"-18" focal length. The Air Force has been pushing to modify the CORONA system so as to meet its own needs for mapping information. This recurring contest is the starting point for the present discussion.
3. The Reseau Approach: A reseau is nothing more than a grid which is etched on the lens system of a satellite camera. The image of this grid is imprinted on the film at the time of exposure and provides a calibrated reference system for locating objects in the photography. This reference survives warping or distortion in the processing cycle.

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CORONA photography does not now have this overprinted grid system, and complicated rectification and calibration is required to produce precision maps from normal search photography. It is particularly important to have a grid reference system if panoramic pictures are to be used for map-making, although fiducial marks are applied at the edge of the format in the ARGON framing camera for precisely the same purpose.

4. In his first letter, Fubini solicits your approval of a conservative approach which would test whether a reseau grid could be included in the present CORONA payloads, stating that we should not go to the expense of developing a fellow-on ARGON payload if this would suffice. He also pointed out that the DOD mapping community was not of one mind as to the requirement for up-graded mapping photography.

5. The DCI letter of 6 October to Fubini calls attention to the importance of good mapping information but points out that the mapping mission must at no time take precedence over the intelligence mission or compete with it for funds and launches. You went on to point out that the activity must proceed as a research and development project and should not use basic CORONA vehicles for its exploration.

6. Fubini's most recent memorandum of 20 October on "Future Cartographic Needs" to McMillan discusses the option of accepting the Army's longstanding proposal to develop a mapping satellite with a framing camera of 12" or to develop a reseau for the CORONA camera and a 3" stellar index camera. He declares himself in favor of the CORONA route and reminds McMillan of your enjoiner. He then discusses a number of ways in which an add-on capability could be implemented to upgrade our mapping information including the use of the orbital control vehicle for CORONA, modification of the [redacted] system by the addition of a stellar index camera, or re-engineering of the basic [redacted] design. After this discourse, he comes back to the CORONA modification and urges McMillan to get on with ground and flight demonstrations of the basic CORONA camera with reseau.

7. Fubini has taken a good deal upon himself in this arena, although it must be said that a relative vacuum in the system existed at the time of his entry. It is my impression that valid COMOR requirements for improved mapping systems went aground in the same package as the long range requirements for new satellite systems. I would recommend that you hold up direction of specific engineering solutions to this problem pending the clarification of the intelligence requirements via COMOZ and USIB. Once we are clear as to the genuine mapping requirements for the future, I believe that a specific development decision can be made rather quickly by you and Mr. Vance.

ALBERT D. WHEELON
Deputy Director
for
Science and Technology

cc: DDCI

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