ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

DEPUTY DIRECTOR OF
DEFENSE RESEARCH AND ENGINEERING

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MEMORANDUM FOR THE UNDER SECRETARY OF THE AIR FORCE

SUBJECT: Future Cartographic Needs

In my discussion with members of the DoD concerning those future cartographic needs which can be satisfied by overhead reconnaissance, I have become convinced that some substantial advances over our present capability (using the ARGON program, or by means of the present CORONA camera and 1 1/2" SI camera) are needed to satisfy a number of outstanding defense needs, such as the ability to develop future ICBMs with CEPs of several hundred yards - needs which cannot be constrained, therefore, by cartographic or geodetic limitations.

In considering future possibilities in overhead reconnaissance programs to satisfy these needs, I believe that essentially five possibilities of some importance exist to improve our cartographic acquisitions.

The first of these is to accept the Army's long standing proposal to develop a mapping satellite with a framing camera of 12" (or more) focal length. I would prefer to avoid this development route if another acceptable solution can be found.

The second possibility is to proceed with the development of the 3" SI camera and the development of the reseau for the CORONA camera. I am still convinced that such a system is capable of meeting our prime needs in cartography, provided the camera programming can be adjusted to satisfy the prime mapping needs, and provided the reseau is successfully developed and operationally employed. Mr. McCone has, of course, objected in the past to programming of a CORONA system to satisfy anything but the high priority reconnaissance needs expressed by the USIB. There are two alternatives to this position - one of them being to re-examine the mission programming which currently covers, in many

instances, targets, which are inherently not very rapidly changing, at quite frequent intervals. Perhaps some fraction of the current film load can be programmed in other areas if the currently utilized coverage requirements and associated programming are diligently examined. Another possibility is by separate action to provide the required number of such systems, outside the inventory needed to satisfy the currently expressed reconnaissance coverage. Perhaps some four vehicles would be adequate to do this job. The missions for these vehicles would then, of course, be cartographic missions.

In any event, I would like to express to you my very strong interest in pushing forward with an experimental demonstration of the reseau as soon as possible, since the CORONA reseau/SI system promises major cartographic gains if successfully realized.

Possibility #3 is to explore the question, during the engineering study of adapting the CORONA system for OCV use, of making these vehicles the ones which also test the reseau; or of adding, if possible, a large framing camera to this system. In the latter case, of course, the availability of the large framing camera would be the limiting factor in the launch schedule, and launches of such vehicles would probably have to be delayed to a later date than required for just the basic CORONA OCV availability. By a larger framing camera, I am thinking of a camera with a focal length in the 8' to 12" range.

Possibility #4 is to add the 3" SI camera to either the present CORONA or to the present [redacted] assuming that both of these systems would be carried on into the future for a sufficiently long time to obtain an adequate amount of take with the 3" SI system. Unfortunately, it is my conclusion that the 3" SI system, either with a [redacted] or with a CORONA camera without a reseau, will not be adequate in quality of cartographic materials to meet our upcoming needs.

Possibility #5 is, during the development of the [redacted] to investigate the feasibility of putting into that OCV a large framing camera, again of perhaps 8" to 12" focal length, with this framing camera individually programmed to satisfy cartographic needs. This mixed system, as well

[redacted]

as the CORONA OCV system, might of course require either a re-entry vehicle bucket modification, or the addition of another bucket. However, this system, using an 8" to 12" focal length camera, would essentially meet cartographic needs as I currently assess them. The orbit altitude, of course, would be adjusted to satisfy the prime reconnaissance requirements and would, therefore, not be completely optimum for the cartographic aspects; but I believe, on balance, that it would be a satisfactory system for producing the required cartographic materials.

Of these alternatives, then, three are of particular interest, namely, the one that pushes ahead with the 3" SI camera, along with a prompt test and early operational employment of a CORONA camera with reseau, provided we could program the missions appropriately. Another possibility is to use the CORONA OCV developments in a somewhat expanded version, by either adding a large frame camera to that system, or by employing the reseau in the CORONA OCV systems, and to use these mixed systems as cartographic acquisition systems. The third possibility is to consider now the use of a larger frame camera [redacted] which, with independent programming, could acquire cartographic materials.

I would urge you to make the required engineering studies of the latter two systems, and to push forward as fast as possible with an expedited ground and flight demonstration of the basic CORONA camera with reseau.

I do not believe that we need to follow all three of these courses of action towards full operation, but I believe that it would be prudent to acquire enough engineering and development background to pursue the two major lines of technical thrust in the cartographic areas - one being to develop the CORONA camera with the reseau and the other, should we encounter unanticipated technical or schedule difficulties with the reseau, being to consider the possibility of riding a large framing camera piggy-back in the OCVs for either the CORONA system or the [redacted] with the frame camera independently programmed to meet cartographic needs.

When we have firmly established the nature of our proposed new general search/crisis management system, we should also have in hand a full understanding of the cartographic applications of that proposed system.

Signed

Eugene G. Fubini

cc: Mr. McCone

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