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D R A F T (15 February 1966)

17 February 1966

MEMORANDUM FOR: United States Intelligence Board

SUBJECT: Mapping, Charting, and Geodesy Requirements [redacted] 25X1

1. Mapping, charting, and geodesy is going through a revolutionary period as a result of:

a. Increasing U.S. needs for mapping, charting, and geodetic information in support of both existing and new weapons systems and other changing military requirements; and

b. The receipt of large quantities of data from the [redacted] programs that can be applied against these increasing requirements. 25X1A

c. The potential for achieving a significantly improved world-wide geodetic system made possible by the development of earth satellites for geodetic purposes.

d. Technological advances in utilization of satellite data.

The collection programs conducted to date have provided substantially complete coverage of the Sino-Soviet area and approximately nine million square miles of terrain outside of this area that can be used to produce maps and charts, but does not meet all mapping, charting, and geodesy requirements.

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In addition to this mapping and charting information, it is anticipated that the present geodetic type photography already collected, integrated with existing geodetic measurements, will permit by 1968 the refinement of geodetic locational data on targets to an accuracy of approximately

2. Against this background of both extensive and changing needs and the acquisition of large volumes of new data meeting part of the requirements, it is necessary to set forth a new statement of current and future requirements in support of mapping, charting, and geodesy for fulfillment by satellite collection systems. These requirements are directly related to U.S. military needs insofar as they can be predicted for the present through the 1970 period. The principal points of these new requirements are:

a. There is a need to provide improved coverage for medium and small scale maps and charts needed on a worldwide basis. While present and improved KH-4 data will go a long way toward these needs, it is limited in meeting all accuracy requirements. There is a good chance that improvements could be realized through incorporating geometric features, such as precise frame camera and reseaus in follow-on search systems. Then, coverage obtained for search purposes may go a long way toward meeting these MC&G requirements.

b. There is also a need to acquire improved photography and related data for the production of large scale maps for military purposes, and to provide the required high relative accuracy within regional areas, in order to support the operations of tactical missiles and artillery in largely hitherto unmapped portions of the world. Current requirements amount to about ten million square miles outside the Sino-Soviet area. Improved coverage obtained for search and medium and small mapping and charting purposes might possibly meet these needs. However, the increased accuracy required for large scale maps, and factors of both utilization and acquisition, point toward a thorough evaluation of using a separate system adapted from today's satellite technology.

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A solution to the problem of world-wide geodetic accuracy requires photo coverage of a large portion of the world outside of the Sino-Soviet area, in order to provide the necessary data to improve the World Geodetic System, as well as relating targets to the World Geodetic System. Current satellite photo programs integrated with overt programs cannot assure that both the position and elevation requirements can be met by 1970. However, photo coverage obtained by systems needed for mapping and charting may provide the solution.

d. Features shown on maps and charts can be identified, for the most part, from KH-4 satellite photography, but certain details and photo imagery such as is now required on large scale maps of Viet Nam, call for a resolution of [redacted] Follow-on systems should provide this detail.

e. Since map-chart production is a very time consuming process, it is urgent that an adequate data bank of photographic coverage and positioning information be obtained well in advance of military contingencies that may arise anywhere in the world. It will also be necessary to update this basic map coverage, varying with changes in manmade features and militarily important areas.

3. We are not familiar with all of the problems that may arise in connection with the design of advanced satellite reconnaissance systems, but we have discussed with representatives of the NRO a number of the design features that might be introduced for mapping, charting, and geodesy. A number of the technical needs can be accomplished in more than one way. These various technical points and possible solutions and trade-offs are discussed in greater detail in Annex A. This information is based primarily on the viewpoint of the utilization community, and is not intended to limit acquisition system development in any way. In the interest of minimizing time and resources, it is our hope that requirements can be fulfilled by general purpose reconnaissance systems provided that certain technical features or improvements can be incorporated in these systems. On the other hand, we recognize that unforeseen problems in system design may arise which would make it impossible, or at least not feasible, for a given reconnaissance system to satisfy both the requirements for intelligence reconnaissance and the requirements for mapping, charting, and geodesy. We have requested the NRO Staff to advise us at the earliest possible date if such a situation should arise, in order that we might consider our requirements and make appropriate recommendations in support of a separate system for certain mapping, charting, and geodesy requirements.

4. Recommendations:

a. USIB approve the requirements set forth in paragraph 3 of Annex A and forward this paper and Annex A to the NRO for their use in considering mapping, charting, and geodesy needs at an early point in the design of satellite reconnaissance systems, as soon as possible.

b. The NRO advise COMOR at the earliest feasible date of any considerations which would prevent the use of general purpose intelligence reconnaissance systems now in the design stage in fulfilling mapping, charting, and geodesy requirements.

Chairman
Committee on Overhead Reconnaissance