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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

THE NRO STAFF

3 May 1976

MEMORANDUM FOR ~~MR. PLUMMER~~ RAR
DR. COOK CWC

SUBJECT: ASD(I) Action on HEXAGON Star Sensor - Metric Pan System

The ASD(I) Staff and the NRO Staff have been working closely on the issue of the continuing validity of the requirement for a HEXAGON Metric Pan System. The culmination of this effort was [redacted] letter to the JCS (TAB A) indicating his intent to cancel the program. The letter was based on his staff's point paper at TAB B. (b)(3)

Admiral Cramer's rebuttal to the ASD(I) letter is at TAB C. We are awaiting the JCS reply and ASD(I)'s final decision, expected by 4 May 1976.

We are in agreement with the ASD(I) action. The HEXAGON Star Sensor program is in good shape technically, but we certainly want to continue only if that is the best way to meet the DMA/JCS needs. General Kulpa has indicated that a fiscal decision early in May will be required to avoid impact on the star sensor program.

I believe that the ASD(I)-NRO coordination and cooperation in working this issue has been especially effective.

Rosenberg

ROBERT A. ROSENBERG
Colonel, USAF
Acting Director

Attachments

HEXAGON

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OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

INTELLIGENCE

26 APR 1976

MEMORANDUM FOR THE DIRECTOR, J-5 (Plans and Policy), OJCS

SUBJECT: Contingency Mapping by the HEXAGON Photographic Satellite

I have reviewed the various options available for providing metric mapping capability for the Satellite Mapping Program beyond 1980. It is our expectation that by 1980 we will have acquired enough metric photography to permit DMA to map the entire Sino Soviet area, priority 1 and 2 areas, to a mid-1980's accuracy objective for the conceptual MX missile.

Recent success in a mathematical model that permits generation of a Continental Control Network (CCN) makes the HEXAGON main panoramic camera photography useful. Obtaining islands of metric control throughout third world areas will permit utilization of main camera HEXAGON photography to generate high resolution data bases for systems such as PAVE STRIKE. The Sino Soviet area has enough islands of control today such that the dedicated mapping camera on HEXAGON vehicles 13, 14, 15 and 16 can be used to obtain islands of control in a number of anticipated third world hot spot areas. These areas can then be photographed later with the main pan camera and processed for large area products utilizing the CCN technique.

Much of the priority 3, 4 and 5 area is non-denied territory and other means of establishing islands of metric control are possible. In the upcoming Global Positioning Satellite (GPS) era, the backpack receiver offers potential for control when timeliness or access is not a factor.

Given existing budgetary constraints on intelligence and intelligence related resources, in my view, the contingency capability in priority 3, 4 and 5 areas provided by the HEXAGON basic pan camera is sufficient. I have

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(b)(1)
(b)(3)

HEXAGON

therefore tentatively decided not to fund an initiative to obtain a metric capability on HEXAGON satellites 17 and beyond. I intend, however, to [redacted] (b)(1) (b)(3)

I would appreciate any comments you may have on this proposed course of action. Due to schedule constraints, comments must be received by 3 May 1976.

[redacted] (b)(3)
Principal Deputy

Copies to:
Dr. Currie (DDR&E)
Mr. Plummer (DNRO)
VADM Cramer (DMA)

BYE 65964-76

[redacted] HEXAGON (b)(1) (b)(3)

Issue: Satellite Mapping

Why are we here?

Decision meeting on the DMA Mapping System on HEXAGON Satellite Vehicles 17 and 18, 1500 Wednesday, 21 April, in [redacted] office. (b)(3)

What is the Issue?

Should we spend the $24.2M on the Metric Pan System (MPS) to provide a metric mapping capability into 1981 and 1982?

What do we mean by metric?

.. Capability to fix a reference datum relative to the world geodetic grid system within the photography to a certain accuracy.

What surfaced this issue?

Success. At the end of the Satellite vehicle 16 mission the HEXAGON system will have acquired enough metric photography to permit us, in conjunction with photography from the main panoramic camera, to map the entire Sino Soviet area to a mid 1980's accuracy objective for the conceptual MX missile.

Why then do we have an issue?

This success revelation is recent, i.e., new data. It comes about because of a mathematical model concept which permits the utilization of photography from all HEXAGON missions to be used for mapping.

Vice Admiral Cramer , of course, is aware of the new capability and has reviewed the situation. He has urged continuation (TAB "A") principally for flexibility, in Priority 3, 4, and 5 areas. These areas are presently priority 3, 4, and 5 relative to collection guidance to satisfy current requirements. Requirements in the 1980's for these areas may change.

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[redacted] (b)(1) (b)(3)

Explain flexibility.

The solid state stellar (S^3) camera added to the main camera adds stars for precise attitude and thus metric accuracy. All pan photography then is metric. The vast majority of exposure is in Sino Soviet area and not needed for mapping, charting and geodesy. Film shot outside the block will then contribute to Priority 3, 4, and 5 area shortfall, approximately 15M square miles of area. DMA has approximately 7500 feet of film per vehicle for their utilization, which for missions 17 and 18 would reduce the shortfall by approximately 10 to 15 percent. However, if a third world hotspot should flare up while HEXAGON is on orbit, DMA would acquire film as the intelligence community tasked for coverage in the hotspot area.

Is HEXAGON film without S^3 useful?

Yes, very useful. If control points exist in an area from the mapping camera from flights through vehicle 16, then the CCN can be used to produce large area charts and data bases. If no control exists, by collection of triple overlap, non-metric photography can be used to produce metric results.

What is the probability of control points in 3, 4, and 5 areas?

Fairly good. The Sino Soviet area basically has enough control today. Therefore, anticipated third world hotspots can be shot today, through 1980, with the Metric Camera System (MCS) for purposes of control. These areas can be shot later with the main pan camera and processed for large area products with the CCN. Much of 3, 4, and 5 is also non-denied territory and other means of control are possible. In the era of the Global Positioning Satellite (GPS), the backpack receiver offers potential for control when timeliness or access are not a factor.

Why then does Vice Admiral Cramer wish to continue MPS?

It can be seen that some limited flexibility over a-priori planning is available with MPS when HEXAGON is flying. However, this additional flexibility hardly seems worth $24.2M. DMA, however, sees more HEXAGONS in the future. They believe vehicles 19 and 20 will be flown and possibly more The recurring cost for an S^3 is about $.3M. Therefore, the longer term flexibility seems to be worth the gamble to DMA.

(b)(1)
(b)(3)

[redacted] The CCN was also thought to be a tremendous production impact, but recently has been determined to require 6 percent more resources than would metric HEXAGON (6 percent more of a product area that is 6 percent of the total O&M). These areas have been rigorously pursued with the cooperation of DMA personnel (TABS "B" and "C"). (b)(1) (b)(3)

[redacted]

Concerning the impact on area products, [redacted] A large area surveillance capability is totally dependent on the future of the HEXAGON program. At present, it appears HEXAGON will be terminated, it's just a question of when. The search requirement is also being strongly examined. [redacted] (b)(1) (b)(3)

[redacted]

How can I help?

Vice Admiral Cramer is anxious to discuss the issue with you. Perhaps, he can relate his desire relative to purchase of contingency capability. Based upon our understanding of the problem and circumstances, the point paper at TAB "D" reflects our recommendation. The relative worth of contingency capability is a value judgment. Vice Admiral Cramer has placed a higher worth than we.

[redacted] (b)(1) (b)(3)