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HEXAGON

BYE 108145-74

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24 OCT 1974

MEMORANDUM FOR: Comptroller, National Reconnaissance Office

SUBJECT : Revised HEXAGON Program FY 1975 Financial  
Program, FY 1976 Budget Recommendations  
and FY 1977-1980 Planning Guidance

1. The attached HEXAGON budgeting information is forwarded in accordance with NRO direction (BYE-13117-74). The information includes a brief program description, FY 1975 Financial Program and FY 1976 Budget Recommendations as well as FY 1977 through 1980 Planning Recommendations. Economic escalation factors are applied as directed.

2. We have re-examined the funding requirements for each of the HEXAGON Program line items. A FY 1975 reduction of \$520K in the HEXAGON software activity, reflected in line items III and V, was accomplished as a result of a decision to not proceed with the new HAMPER Program to support the extended life systems. This also results in a reduction in FY 1976 (four-quarter year) requirements for these items of \$536K. This decision also alleviates the requirement for corresponding changes to the [ ] TUNITY Software. A reduction in FY 1976 through 1980 requirements in line item I is realized as the result of a change to a different model computer at the WCPO.

[ ]  
Comptroller  
Directorate of  
Science and Technology

Attachment: a/s

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# (1) HEXAGON Description

HEXAGON is a photographic satellite search and surveillance system. The space vehicle, which includes the satellite basic assembly, the sensor subsystem and four (4) re-entry vehicles, is launched from Vandenberg Air Force Base with a Titan III-D booster.

The system is commanded and controlled through the worldwide tracking network. Recovery is by air snatch north of Hawaii. The planned launch rate is two per year through FY 1977 and one per year thereafter.

HEXAGON is designed to attain 20 million square miles of stereo coverage and a two to three foot resolution for a mission of 30 to 45 days. Payload weight is approximately 22,500 pounds, including about 1,750 pounds of film (208,000 feet of ultra thin base film). A high resolution, stereo, panoramic camera system capable of scanning a 120 degree sector is utilized.

The HEXAGON Program became operational in FY 1971, with eight highly successful missions accomplished to date.

The performance of the HEXAGON Program toward meeting desired goals has been excellent in that it has met all of the standing requirements for search and surveillance and has exceeded the design life on orbit. Mission life has gradually increased from 31 days for Mission 1201 to 105 days for Mission 1208. Future missions are planned for 105-150 days on orbit. The launch schedule has been revised by the NRO to reduce the launch rate from four to three to two and now to one launch per year (FY 1978) in anticipation of a high level of program performance.

The transfer of the HEXAGON Sensor Subsystem responsibility from the CIA to the Air Force on 1 July 1973 significantly reduced OD&E/CIA involvement in FY 1974. Notwithstanding the Sensor Subsystem program transfer to the Air Force, OD&E/CIA HEXAGON responsibilities will continue indefinitely in the areas of statistical prediction of performance against collection requirements, mission planning, computer rental and support and development of other computer software relating to the mission accomplishment programs and the area history file. In addition, the CIA will maintain a permanent representative of the HEXAGON postflight analysis team. This accounts for the continuing HEXAGON NRO fiscal requirements through FY 1980.

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## (2) FY 1975 Financial Program/FY 1976 Budget Recommendations

(\$ Millions)

SUMMARY

	<u>FY 1975</u>	<u>FY 1976</u>	<u>FY 1976 Transition Quarter</u>
I. COMPUTER OPERATIONS SUPPORT	.645	.680	.193
II. COMPUTER RENTAL	.945	.870	.218
III. OPERATIONAL SOFTWARE	.200	.186	.048
IV. MISSION SIMULATION	.050	.052	.014
V. STATISTICAL PREDICTION STUDIES	.030	-	-
VI. IMAGE EVALUATION DEVICES	<u>.300</u>	<u>.309</u>	<u>.080</u>
TOTAL	2.170	2.097	.553

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<u>FY 1975</u> <u>Financial</u> <u>Program</u>	<u>FY 1976</u> <u>Budget</u> <u>Recommendation</u>	<u>FY 1976</u> <u>Transition</u> <u>Quarter Budget</u> <u>Recommendation</u>
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I. COMPUTER OPERATIONS SUPPORT

This item provides for contract personnel to program and operate the IBM 370/158 computer in Building 156 under the supervision of CIA managers and in support of various NRO programs being conducted in the general area. An agreement was reached with the SAFSP to continue the current level of support to HEXAGON contractors after the change in management responsibilities on 1 July 1973. The expansion of other NRO programs has necessitated increasing the level of support to a three shift operation.

.645	.680	.193
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II. COMPUTER RENTAL

This item covers the cost of the rental of the IBM 370/158 computer located in Building 156. This computer will continue to provide support at the current FY 1974 level to the HEXAGON contractors located in Building 156 and will also provide continuing support to other NRO programs located in the general area. The CIA will continue to provide management supervision in the operation and control of the computer center.

.945	.870	.218
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FY 1975 Financial Program	FY 1976 Budget Recommendation	FY 1976 Transition Quarter Budget Recommendation
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III. OPERATIONAL SOFTWARE

.200

.186

.048

This item provides for continued maintenance and minor modification of the HEXAGON mission planning software, the daily accomplishment file updating program and the mission status reporting programs. The costs presented reflect the termination of the HEXAGON long-life planning software development effort.

IV. MISSION SIMULATION

.050

.052

.014

The purpose of the effort funded under this item is the conduct of HEXAGON collection performance simulations when required in support of operational contingencies, mission planning and performance analysis studies.

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FY 1975 Financial Program	FY 1976 Budget Recommendation	FY 1976 Transition Quarter Budget Recommendation
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V. STATISTICAL PREDICTION STUDIES

.030

. This item provides for studies to develop and evaluate statistical prediction techniques toward the end of improving the HEXAGON mission planning process. These studies were terminated shortly after the decision was reached to reduce the HEXAGON launch rate to 1/year in FY 1978.

VI. IMAGE EVALUATION DEVICES

.300

.309

.080

This item deals with advanced image evaluation techniques and devices in support of the Air Force's postflight analysis activities. By joint agreement this task will be run by the CIA permanent member to the PFA. For FY 1975 this task includes continued development and analysis of the smear simulation techniques for both black and white and color film. Continued maintenance of the CRYSPER camera subsystem performance prediction program and the Visual Edge Matching Equipment and matrices is also included.

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## (3) FY 1977 through FY 1980 Planning Recommendations

Summary (\$ Millions)

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>Total</u>
I. COMPUTER OPERATIONS SUPPORT	.793	.784	.773	.813	3.163
II. COMPUTER RENTAL	.870	.877	.914	.914	3.575
III. OPERATIONAL SOFTWARE	.193	.199	.205	.211	.808
IV. MISSION SIMULATION	.054	.055	.057	.059	.225
V. STATISTICAL PREDICTION STUDIES	-	-	-	-	-
VI. IMAGE EVALUATION DEVICES	<u>.321</u>	<u>.331</u>	<u>.342</u>	<u>.352</u>	<u>1.346</u>
TOTAL	2.231	2.246	2.291	2.349	9.117

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(4) Economic Escalation Factors

All items except Statistical Prediction Studies are considered to be in the "Procurement" category and are projected according to instructions in BYE-12581-74 and BYE 13117-74.

Items I and II are projected using escalation factors developed by the WCPO in conjunction with associated contractors.

Items III, IV and VI are projected using DOD procurement escalation factors as follows:

FY 1976	Transition Quarter FY 1976	Revised FY 1977	Revised FY 1978	Revised FY 1979	Revised FY 1980
3.1	6.3	7.125	10.45	13.815	17.375

Statistical Prediction Studies, Item V, cease in FY 1975.

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