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NOFORN/ORCON

The Director of the National Reconnaissance Office

REPORT TO THE COMMITTEE ON FOREIGN INTELLIGENCE

VOLUME I FY 1977–1982 PROGRAM

JULY 1976

~~Top Secret~~
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~~(S)~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

30 June 1976

MEMORANDUM FOR THE COMMITTEE ON FOREIGN INTELLIGENCE

Attached is Volume I of the Director's Report to the Committee on Foreign Intelligence. This volume presents the status of the National Reconnaissance Program as of 25 June 1976 and addresses decisions required by the CFI at the 14 July meeting.

Volume II will contain the Executive Summary and Recommended Program and will be distributed on 7 July.

J. W. Plummer

Attachment
Director's Report, Vol I

HEXAGON/GAMBIT/KENNEN/EARPOP/ [redacted]

[redacted]

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DIRECTOR'S REPORT

TO THE

COMMITTEE ON FOREIGN INTELLIGENCE

VOLUME I

FY 1977-1982 PROGRAM

14 JULY 1976

HEXAGON/GAMBIT/KENNEN/EARPOP/[redacted]

[redacted]

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PREFACE

The Director's Report includes highly sensitive information on a wide range of programs of highest national interest. As such, it is mandatory that essential security requirements for handling the report be maintained. The need-to-know principle must be strictly followed at all times. Safeguards must be applied to prevent access by persons who do not possess authorization for all requisite compartmented access.

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INTRODUCTION

This July 1976 NRO Director's Report to the Committee on Foreign Intelligence consists of two volumes. Volume I is the FY 1977-1982 Program and Volume II is the Executive Summary and Recommended Program.

Volume I contains brief status summaries of each program and describes other major NRO activities and support provided to the Department of Defense programs. The Special Reports Section contains summaries of the [redacted] ELINT Interaction Study, and ELINT Computer Optimization activities. Reports on the [redacted] Definition Study and the [redacted] will be separately distributed. The Financial Program is green tabbed for ease in location.

The final section of Volume I addresses the "Decisions Required" by the CFI. The July CFI must approve the FY 1977 funding level for each project and establish a preliminary program for the FY 1978 budget. As discussed in the May 1976 CFI meeting, the expected funding for the NRP in FY 1978 is not compatible with the projected needs to carry out the program as currently planned. Therefore, priorities must be established and choices made to establish an appropriate program which can then be recosted by the NRO for final adjustment and approval by the NRP CFI in November 1976.

IMAGING PROGRAMS

INTRODUCTION

Major program decisions concerning imaging systems are contingent upon initial KENNEN operation and community assessment of their success.

The current status of each imaging program is presented below. Community plans for the Post-KENNEN IOC Studies are discussed in the last part of this section.

PROGRAM STATUS

1. HEXAGON

The baseline HEXAGON program provides for the launch of one satellite vehicle during FY TQ, one during FY 77, two in FY 78 and then a reduction to one per year through late FY 81. Block III satellites beginning with Mission 1213, in early CY 77, will have a 150-day mission life capability and NAVigation PACkages (NAVPAC) provided GFE by DMA for precise orbital determination in support of MC&G requirements. Mission life capability will increase further to 180 days with Vehicle 15.

The most recent HEXAGON mission was completed on 30 March 1976. Much of this mission, 1211, was flown in mono as the result of a tachometer failure. The impact on mensuration and interpretability of this large amount of monoscopic coverage is still under study at this time by the EXSUBCOM and ICRS. All of the high priority special SS-7 and SS-8 USSR ICBM site collection was successfully accomplished by Mission 1211 and all sites were imaged cloud-free.

The launch of HEXAGON Mission 1212, the last of Block II, is scheduled during July 1976, with a planned lifetime of up to 150 days. The film load on Mission 1212 has been increased by five percent over previous missions by means of software changes.

As the Block III satellites' mission life capability increases to 180 days, the significance of film as the limiting factor will grow. Several efforts are underway to increase the usable film supply. Ultra Ultra Thin Base (UUTB) film has been successfully tested, and a full load of this material is under consideration for Mission 1214. A program

to provide a larger, more efficient film looper, the Simplified Modified Film Transport (SMFT) has been initiated for incorporation on Missions 1217 and 1218. The UUTB and SMFT combination will increase the net usable film supply up to 45 percent.

The Solid State Stellar camera program is on schedule. This program, funded by DMA, will culminate in a metric pan capability suitable for MC&G purposes in Vehicles 17 and 18.

2. GAMBIT

The baseline GAMBIT program provides two missions per year through FY 77 (Mission 4349) with a subsequent reduction to one per year through FY 82 (Mission 4354). Procurement of long-lead items for Mission 4355 is fund protected in FY 77 to permit the return of two vehicles per year in FY 80, if necessary. These funds will not be expended if KENNEN maintains the October 1976 launch date and has no major problems. No funds are currently protected for satellite procurement beyond Mission 4354.

GAMBIT Mission 4346 was launched on 22 March 1976. This mission attained a geometric mean resolution of 4.5 inches, the best to date. On 17 May 1976, the second reentry vehicle was successfully recovered after 56 days of operation, a new GAMBIT record.

The first operational utilization of two new experimental film types on Mission 4346 was highly successful. The new black and white emulsions differ from those normally used in that the molecules are cube-shaped and nearly uniform in size, thereby greatly reducing film grain noise. Initial evaluation of the returned film by photo-scientists indicated that the intended benefits were obtained. A more detailed and extensive evaluation in terms of the impact on photo-interpretation is underway at the National Photographic Interpretation Center.

The launch of GAMBIT Vehicle 47 is planned in September 1976. Vehicle 48, scheduled for March 1977, will incorporate extensive reliability and operational improvements, including the dual-platen camera, solar arrays, a new focus measuring system, and a 50 percent increase in mission life resulting in missions of up to 90 days.

3. KENNEN

The KENNEN baseline program provides for a single Imaging Satellite (I/S) on-orbit system [redacted] The launch of the first I/S is planned for October 1976. [redacted]

[redacted]

[redacted]

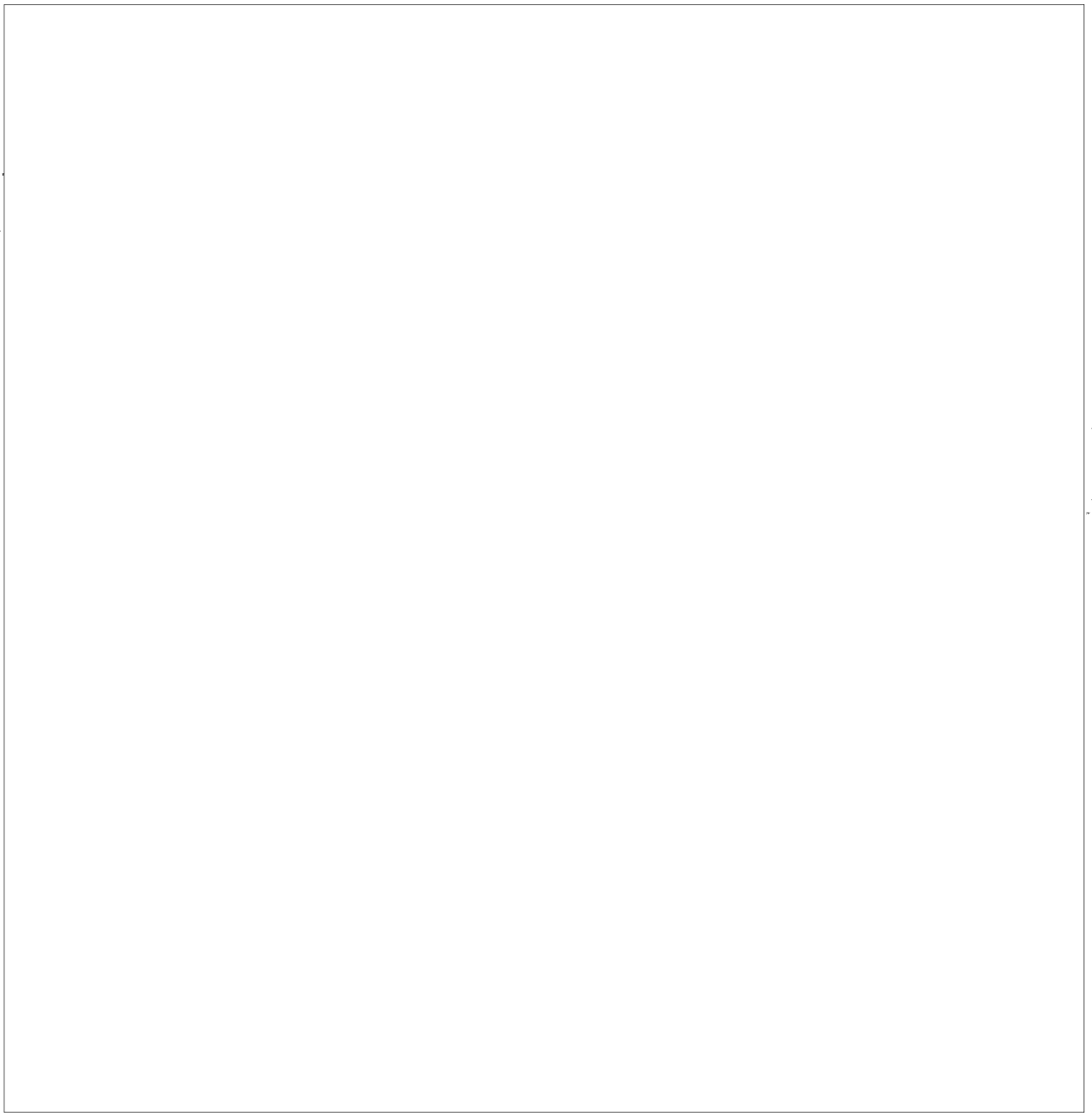
POPPY

The last of the POPPY series, POPPY 7, was launched on 14 December 1971 with all four payloads successfully deployed. POPPY 7 is currently expected to remain operational [redacted] Due to POPPY power system degradation, [redacted] the closure of certain ground stations, POPPY operations are continued on a

limited basis. These operations are being conducted at the

The POPPY program has a history dating back to 1962 when a two-satellite cluster POPPY ELINT mission was launched. Over the past 14 years, POPPY has provided routine ELINT coverage over many areas of the globe. In its early years, the system provided data to ground stations operated by all three Armed Services making it the first multi-Service operated system. During recent years, POPPY has routinely been one of the most significant sources of ocean surveillance data providing information on the deployment and activities of the Soviet Navy. Several hundred have been generated by POPPY each week. These reports have included numerous pieces of unique or highly significant information.

All of the POPPY spacecraft were designed and fabricated by the Naval Research Laboratory.



PROGRAM 989

The low-orbiting P-989 satellites augment the high altitude systems by performing ELINT and COMINT collection which is difficult or not practical to accomplish from synchronous or highly elliptical orbits. All payloads are carried to orbit as piggyback satellites by HEXAGON.

The baseline P-989 program supports the continued development of URSALA 3 and 4 and RAQUEL 1A. URSALA 3 is currently planned for launch with the HEXAGON mission in July 1976 as the replacement for URSALA 2. For planning purposes, URSALA 4 is the replacement for URSALA 3. RAQUEL 1A, a vehicle duplicating RAQUEL 1 collection capabilities, will be available in October 1977.

No new program starts are planned before FY 78, pending CFI review of the recommendations resulting from the ELINT Interaction Study. A summary of the ELINT Interaction Study conclusions and recommendations appear in the Special Reports Section.

The individual status of payloads currently on orbit is described in subsequent paragraphs.

- URSALA 1 (Mission 7338), an ELINT payload, was launched in July 1972. It has successfully performed as an EOB collector, providing location accuracy of emitters to within three nautical miles. It has detected and located communication links, thereby also functioning as a COMINT mapper over its frequency range of 2 to 12 GHz. The intelligence mission of this vehicle was terminated in December 1975 due to system anomalies and to save funds. The satellite was recalled in February 1976 in an effort to recover pulse collection after a partial failure of URSALA 2, and continues to provide some data.

- URSALA 2 (Mission 7342) was launched in November 1973 and is identical in capability to URSALA 1. The pulse receiver failed in February 1976 and the vehicle has been reoriented to optimize [redacted] in response to COMINT mapping requirements. URSALA 3 is scheduled for launch in July 1976 aboard HEXAGON Mission 1212.

- RAQUEL 1 (Mission 7341), an ELINT technical intelligence payload, was launched in October 1974, and is collecting [redacted]
It has experienced the loss of the 10 to 12 GHz band and failure of the [redacted] receiver, but operates very well in the pulsed and digital CW modes over the remainder of the frequency range.

- MABELI (Mission 7339), a technical intelligence payload, was placed in orbit in January 1972. It provides main beam collection for the large ABM radars. MABELI is restricted to 30 minutes of collection per day due to tape recorder limitations and Band 4 (1500-2500 MHz) is inoperative.

- TOPHAT 2 (Mission 7340) was launched in April 1974 to collect and map tropospheric-scatter communication signals. An anomaly in the fine-tuned receiver has apparently cleared

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OTHER MAJOR ACTIVITIES

OTHER MAJOR ACTIVITIES

VULNERABILITY

The vulnerability of NRP systems continues to be a major concern of the NRO. The recent COSMOS-814 one-revolution intercept test underscores both the Soviet interest in interferring with U.S. collection, and the susceptibility of our systems. It appears that the Soviets now have a range of capabilities to interfere with our systems that could serve them operationally in a variety of scenarios. Such techniques include electronic counter-measures, co-orbital interceptors, weapons grade lasers, the direct ascent GALOSH, and threats against ground components.

In contrast, NRO systems are configured to maximize collection in a non-hostile environment. Even the modest countermeasures of the past, which for imaging systems, included a backup in the pipeline, and bolt-on defensive kits, have now become unrealistic due to the long mission lives and low production rates of the new systems. This has resulted in a dynamic increase in U.S. dependence upon a few critical, high-cost vehicles which cannot be readily replaced.

Implementation of increased survivability measures will generally result in reduced intelligence collection capacity, and thus requires a reallocation of priority between maximum peacetime performance and improved assurance of collection in a hostile environment. The NRO continues to press for a reassessment of national policy regarding the survivability of critical systems and considers this a most urgent requirement.

Survivability is most economically achieved as an inherent goal of system architecture, rather than by redesign and retrofit. It is important that survivability requirements be well defined and included from the initial conceptual stages.

[redacted]

SPACE TRANSPORTATION SYSTEM (STS) TRANSITION

The NASA/STS development program is proceeding on schedule. The next significant milestone is the delivery of the first shuttle orbiter flight vehicle planned for 17 September 1976. The NRP/STS transition program is keyed to the NASA/STS schedule and is continuing with three major phases: exploitation/support studies, program interface studies, and design/transition efforts.

The exploitation/support studies are directed toward investigation of the use of the STS to accomplish NRP missions more effectively. These studies will be continued at $1M per year in support of all applicable NRO programs. FY 77 efforts will continue to explore two areas initiated this year: potential covert piggyback reconnaissance packages which might be carried routinely on Shuttle flights, and an examination of better ways to perform the NRP imaging missions in the STS era. The NRO will also initiate an investigation of the potential benefits of the Spacelab capability to support NRP R&D activities.

[redacted]

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SUPPORT TO DOD PROGRAMS

SUPPORT TO DOD PROGRAMS

TACTICAL APPLICATIONS

There is an expanding awareness of the NRP potential to assist the military commanders. This potential is recognized by the NSC Ad Hoc Panel on the Technological Evolution and Vulnerability of Space Systems, military commanders and the intelligence community. SAC is utilizing NRP ELINT and PHOTINT, synergistically, to update their SIOP penetration routes. The military departments and JCS are conducting evaluations of the NRP products' potential. The NRO is supportive of these evaluations.

While NRP expenditures in support of military evaluations are not large, the advisory support is considerable. The extensive Army Space Program is considering near-real-time battlefield exploitation of NRP SIGINT and PHOTINT systems. The Navy has focused on the command and control information fusion problem using all-source data and the Air Force has efforts underway to integrate data from conventional and satellite sources in order to provide more comprehensive intelligence data to commanders. All of these endeavors are monitored and assisted by the NRO within the purview of the NRP. The NRO is working with the Army to provide for appropriate tactical applications of NRP assets to the accomplishment of Army missions. Exercises which have included overhead systems products have been conducted by the Army to evaluate the potential of those systems to Service and joint commanders. These operations demonstrated that the intelligence provided is of significant value to field commanders.

The NRO works closely with the Army Space Program Office (ASPO) to coordinate those R&D aspects of the Army space program which involve NRP assets and to develop concepts for the tactical exploitation of NRO capabilities.

The NRO is working directly with the USAF Assistant for Tactical Information Management (AF/XOT) for the development of the best Air Force capability in tactical information systems. AF/XOT is the monitor and coordinator for the DCS/Plans and Operations on tactical information system matters and is the focal point for exchange of information between the Air Force and the DOD, NSA, DIA, other agencies and the other Services. Liaison with AF/XOT will include

development of special tests and exercises involving NRP assets.

Two examples of efforts that the NRO supports are:

1. NRO/DARPA/JCS Mobile/Airborne Command Center Advanced Technology Demonstration. The NRO, in collaboration with the Defense Advanced Research Projects Agency (DARPA) and the Joint Chiefs of Staff (JCS), is defining the technology necessary to support an airborne or mobile command center with data from reconnaissance satellites. This project was formerly called STAR. The effort to date has defined JCS minimum essential command center tasks and is developing a prototype van-mounted center capable of handling both near-real-time satellite ELINT and digital imagery data streams. Development of the technology necessary for operation of reconnaissance satellites in the event of destruction of mission ground stations is included in this modification. Although the mobile/airborne command center is being developed to meet JCS requirements, the technology will have a multiplicity of tactical applications.

2. Special Project BOLD EAGLE (SPBE). SPBE was a

[redacted]

DEFENSE DISSEMINATION PROGRAM

[redacted]

DEFENSE SUPPORT PROGRAM (DSP) AUGMENTATION

The [redacted] the DSP for the DOD warning mission in accordance with specific conditions designated by the CJCS and DNRO in an October 1973 memorandum of agreement.

The DSP Augmentation program is funded by the Air Force and is being implemented in the following sequential phases:

Phase 1: This phase (called JTAC) involves the modification of the MGS processing system to process automatically IR events and disseminate, within two minutes, launch event messages to the primary warning users (JCS, NORAD, SAC) through the DSP Data Distribution Center (DDC). The JTAC software, initially operational in August 1975, is being used to routinely report TI intercepts to the warning users.

[redacted]

AFSATCOM (SIOP COMMUNICATION PACKAGES)

[redacted]

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SPECIAL REPORTS

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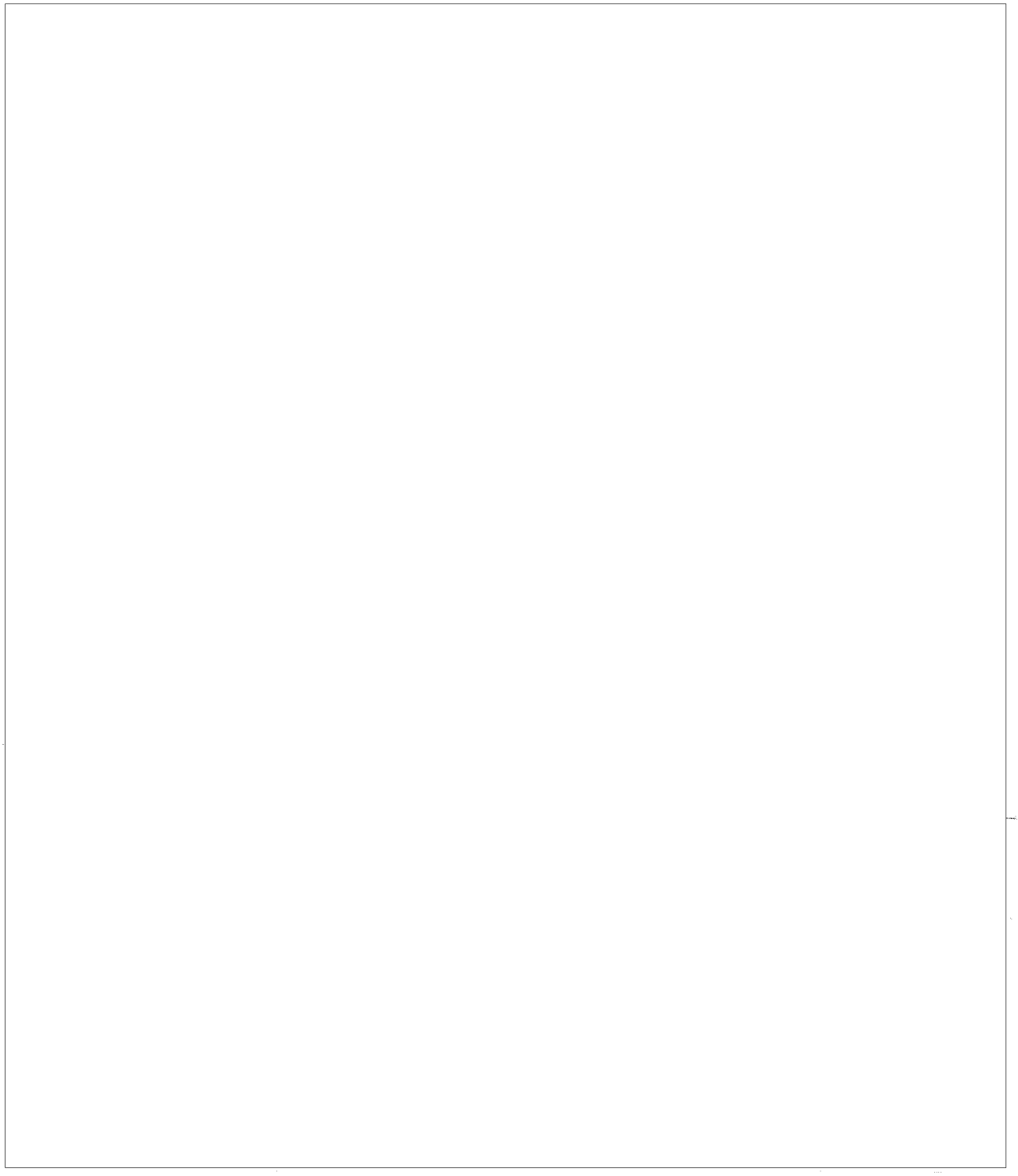
ELINT INTERACTION STUDY REPORT



ELINT COMPUTER OPTIMIZATION

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FY 1976 FINANCING: ($ Millions)

	NOA	TOA
Nov 74/Jan 75 ExCom Approval and FY 76 President's Budget:		
Nov/Dec 75 ExCom:		
Funds Available:		
FY 76 President's Budget		
FY 76 Congressional Reduction		
FY 75 Carryover		
Total Available		
Program Authorization:		
FY 76 Funds Available		
FY 76 HEXAGON Carryover to TQ		
Total Authorized Program		

Jul 76 CFI:

FY 76 Foreeast Obligations vs Authorized Program:	
Authorized Program (TOA)	
Current Forecast Obligations (See Note)	
Forecast Excess	
FY 76 Forecast Obligations vs Funds Available:	
FY 76 Appropriation (NOA)	
FY 75 Carryover to FY 76	
Prior Year Recoupments during FY 76 (See Note)	
Total	
FY 76 Forecast Obligations (See Note)	
Total FY 76 Funds Available for FY TQ Financing (See Note)	

NOTE: FY 76 actual obligations and prior year recoupments will not be finalized until late July; therefore, the noted items are subject to refinement for the November 1976 CFI.

FY 19TQ FINANCING: ($ Millions)

	NOA	TOA
Nov 74/Jan 75 ExCom Approval and FY TQ President's Budget:		
Nov/Dec 75 ExCom:		
Funds Available:		
FYTQ President's Budget		
FYTQ Congressional Reduction		
Total Available		
Program Authorization:		
FYTQ Funds Available		
FY 76 HEXAGON Carryover to TQ		
Total Authorized Program		
Jul 76 CFI:		
FYTQ Forecast Obligations vs Authroized Program:		
Authorized Program (TOA)		
Current Forecast Obligations		
Forecast Excess		
FY TQ Forecast Obligations vs Funds Available:		
FYTQ Appropriation (NOA)		
Forecast FY 76 Carryover to FYTQ		
Total		
FYTQ Forecast Obligations		
Forecast FYTQ Funds Available for FY 77 Financing		

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FY 1977 FINANCING: ($ Millions)

	NOA	TOA
November/December 1975 EXCOM:		
FY 77 President's Budget		
July 76 CFI		
FY 77 President's Budget		
Forecast FYTQ Carryover to FY 77		
Total Funds Available for FYTQ		
FY 77 Funds Available in excess of Nov/Dec 75 EXCOM Approved TOA		

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JUNE 76 HAC ACTION TO FY 77 NRP PROGRAM: ($ Millions)

	HAC ACTION	NRP APPEAL
President's Budget:		
HAC ACTION:		
Use of Prior Year Funds		
Reduction in Fund Protection		
Partial Deletion of December Add-On		
Reduction in Mission Support		
Reduction in R&D Support		
Recognition of T-IIIC Reprogramming Action		
Subtotal		
HAC RECOMMENDED PROGRAM		
NRP APPEAL		
NRP REQUESTED PROGRAM		

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HEXAGON: ($ in Millions)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FROM DEC 75 B/L
DEC 75							
Veh 13-18	138.8	123.6	101.1	83.1	63.0		
Follow-on (19-20)	-	36.3	96.4	111.2	115.0		
Total	138.8	159.9	197.5	194.3	178.0		

JUL 75

REVISED BASELINE - Provides for the launch of one vehicle in FY 77, two in FY 78 and one per year thru FY 81. Fund protects for a follow-on buy of two vehicles to cover FY 82-83. A six month backup capability is planned for the one per year schedule (the first vehicle of the follow-on buy excepted).

Veh 13-18	140.0	136.0	110.8	87.7	66.4	20.9	
Follow-on (19-20)	-	27.3	78.9	94.9	92.9	97.0	
Total	140.0	163.3	189.7	182.6	159.3	117.9	
Change from Dec 75 B/L	+1.2	+3.4	-7.8	-11.7	-18.7	-	-33.6

ALTERNATE 1 - Modifies the revised baseline by delaying the follow-on procurement by three months with a subsequent three month slip of Vehicle 19 availability.

Veh 13-18	140.0	136.0	110.8	87.7	66.4	20.9	
Follow-on (19-20)	-	7.1	79.3	96.6	92.9	110.8	
Total	140.0	143.1	190.1	184.3	159.3	131.7	
Change from Dec 75 B/L	+1.2	-16.8	-7.4	-10.0	-18.7	-	-51.7

ALTERNATE 2 - Stretches the baseline vehicles (16-18) in order to delay the follow-on procurement until FY 79.

Veh 13-18	140.0	136.0	130.0	91.2	86.0	53.9	
Follow-on (19-20)	-	-	30.0	82.5	95.7	93.8	
Total	140.0	136.0	160.0	173.7	181.7	147.7	
Change from Dec 75 B/L	+1.2	-23.9	-37.5	-20.6	+3.7	-	-77.1

HEXAGON: (Cont'd)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	TOTAL
ADDENDA							
NAVPAC Integration - (DMA Funded) Test and integrate NAVPAC system and mesa accelerometer into the specified HEXAGON vehicles.							
Veh 16	0.3	0.3	-	-	-	-	0.6
Veh 16-18	0.4	0.6	0.3	0.1	0.1	-	1.5
Veh 19-20	-	-	0.2	0.2	0.7	0.2	1.3
S-CUBED - (DMA Funded). Develop, test and integrate a metric capability into the baseline sensor subsystem to support MC&G requirements. Effective with Vehicle 17 .							
	8.9	4.4	2.3	2.0	2.0	2.0	21.6
BLOCK V Vehicles (21-23) - Provides for fund protection related to a procurement following the currently protected follow-on procurement.							
	-	-	-	22.4	59.8	96.6	178.8

GAMBIT: ($ in Millions)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FROM DEC 75 B/L
DEC 75							
BASELINE PROGRAM: Stretches from the current two per year mission rate to one per year in FY 78 (after Vehicle 49). Funds identified in FY 77 to continue long lead for protection of follow-on procurement, if required. Based on KENNEN schedule and performance, DNRO will approve the obligation of these funds. No funds are included for follow-on acquisition.							
Veh 47 - 54	122.8	115.8	103.8	95.0	73.0		
Long Lead	9.5						
Follow-on	-	-	-	-	-	-	
Total	132.3	115.8	103.8	95.0	73.0	-	
JUL 76							
REVISED BASELINE - Stretches from the current two per year mission rate to one per year in FY 78 (after Vehicle 49). Funds identified in FY 77 to continue long lead for protection of follow-on procurement, if required. Based on KENNEN schedule and performance, DNRO will approve the obligation of these funds. No funds are included for follow-on acquisition.							
Veh 47-54	113.9	95.4	88.2	68.0	50.8	37.2	
Long Lead	9.5	-	-	-	-	-	
Follow-on	-	-	-	-	-	-	
Total	123.4	95.4	88.2	68.0	50.8	37.2	
Change from Dec 75 B/L	-8.9	-20.4	-15.6	-27.0	-22.2	-	-94.1
ALTERNATIVE 1 - Revises the current baseline by maintaining a two mission per year rate through FY 85.							
Veh 47-54	113.9	91.3	71.4	42.9	22.3	23.5	
Long Lead	9.5	-	-	-	-	-	
Veh 55-59	-	89.6	115.1	108.4	95.8	56.5	
Veh 60-65	-	-	14.9	52.4	107.9	120.4	
Total	123.4	180.9	201.4	203.7	226.0	200.4	
Change from Dec 75 B/L	-8.9	+65.1	+97.6	+108.7	+153.0	-	+415.5
ALTERNATIVE 2 - Extends the current baseline to FY 85							
Veh 47-54	113.9	95.4	88.2	68.0	50.8	37.2	
Long Lead	9.5	-	-	-	-	-	
Veh 55-57	-	15.1	12.6	41.5	77.0	81.4	
Total	123.4	110.5	100.8	109.5	127.8	118.6	
Change from Dec 75 B/L	-8.9	-5.3	-3.0	+14.5	+54.8	-	+52.1

GAMBIT: (Cont'd)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FROM DEC 75 B/L
ALTERNATIVE 3 - Terminates the current program after the completion of the mission of Vehicle 50.							
Veh 47-50	113.9	95.4	10.0				
Long Lead	9.5	-	-				
Total	123.4	95.4	10.0	0	0	0	
Change from Dec 75 B/L	-8.9	-20.4	-93.8	-95.0	-73.0	-	-291.1

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P-989: ($ in Millions). (And SIGINT Experiment)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FROM DEC 75 B/L
DEC 75							
BASELINE PROGRAM - Provides for the continued procurement of RAQUEL 1A initiated in FY 76. Identifies funds for a future program based on current ELINT Interaction Studies. Also includes the SIGINT Experiment.							
RAQUEL 1A	4.9	0.6	-	-	-		
SAT X	-	14.0	16.9	17.9	18.1		
SIGINT Expt	2.1	2.6	2.0	1.0	-		
Ops & Spt	10.3	12.1	10.0	10.9	12.0		
Total	17.3	29.3	28.9	29.8	30.1		
JUL 76							
REVISED BASELINE - Provides for the procurement of RAQUEL 1A and emphasizes the operational ELINT and search capabilities of a low orbiting ELINT collector. Includes the SIGINT Experiment (26-42 GHz).							
RAQUEL 1A	4.9	0.6	-	-	-	-	
URSALA 4	-	2.7	-	-	-	-	
SAT 1	-	-	12.4	9.1	4.6	-	
SAT 2	-	-	-	9.4	17.0	6.0	
SAT 3	-	-	-	-	-	10.9	
SIGINT Expt.	2.1	2.6	2.0	1.0	-	-	
Ops & Spt	10.3	13.1	14.2	11.0	12.0	13.1	
Total	17.3	19.0	28.6	30.5	33.6	30.0	
Change from Dec 75 B/L	0	-10.3	-0.3	+0.7	+3.5	-	-6.4
ALTERNATIVE 1 - Provides for the procurement of URSALA and RAQUEL type vehicles to support a yearly launch of alternating type vehicles. Includes the SIGINT Experiment (26-42 GHz).							
RAQUEL 1A	4.9	0.6	-	-	-	-	
URSALA 4	-	2.7	-	-	-	-	
RAQUEL 1B	1.9	14.8	4.3	-	-	-	
URSALA 4A	-	7.5	16.0	5.3	-	-	
RAQUEL 1C	-	-	2.5	19.5	5.6	-	
URSALA 4B	-	-	-	8.5	18.0	6.0	
SIGINT Expt.	2.1	2.6	2.0	1.0	-	-	
Ops & Spt.	10.4	12.1	14.3	12.3	13.5	14.6	
Total	19.3	40.3	39.1	46.6	37.1	20.6	
Change from Dec 75 B/L	+2.0	+11.0	+10.2	+16.8	+7.0	-	+47.0

P-989: (Cont'd)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	TOTAL
ADDENDA							
MULTIMISSION MIX - Identifies funds for a multimission low orbiting system designed [redacted]							
NRP	-	-	3.0	5.0	25.0	50.0	83.0
NSA	-	-	-	8.0	10.0	7.0	25.0
Total	-	-	3.0	13.0	35.0	57.0	108.0
ADDITIONAL MODIFICATION TO URSALA 4(Revised B/L Program) - Provides limited frequency extension from 2-12 GHz to 4-18 GHz (7.3M) and technical ELINT capabilities using RAQUEL technology (3.4M).							
NRP	-	10.3	-	-	-	-	10.3
NSA	-	0.4	-	-	-	-	0.4
Total	-	10.7	-	-	-	-	10.7
[redacted]							
NRP	-	2.0	4.0	-	-	-	6.0
SHARED COSTS - For visibility, the funds required by the NRP to meet NSA requirements are identified here. Also identified is the current status of the NRP requirements vice NSA's current financial plan.							
NSA Revised B/L	5.5	6.4	7.6	7.8	7.8	8.5	
Status	+1.2	+1.5	+2.3	+1.9	+1.4	+1.6	
Change to NSA Revised B/L For Alternative 1	-	+0.5	+2.1	+2.9	+3.1	+2.8	

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HEXAGON
DECISIONS REQUIRED

BACKGROUND:

The baseline approved by the November 1975 ExCom, stretched the HEXAGON program to 180-day gaps in coverage (Vehicles 15 through 18) between 180-day missions. The current baseline program also plans for Vehicles 19 and 20 with contract go-ahead in July 1978. The May 1976 CFI requested that alternatives to the HEXAGON baseline program (through Vehicle 18) be developed such that fund protection for Block IV (Vehicles 19 and 20) is delayed from FY 78 to FY 79. This would provide an assumed overlap with the KENNEN availability based on current planning.

DECISIONS REQUIRED:

- SHOULD FUNDING PROTECTION FOR HEXAGON VEHICLES 19 AND 20 BE SLIPPED FROM FY 78 TO FY 79?

REVISED BASELINE:

Funding protection is established in the program for a follow-on procurement of two more vehicles to satisfy broad area search and surveillance imaging requirements through 1984.

ALTERNATIVES:

Alternative 1: Slip fund protection for Vehicles 19 and 20 from FY 78 to FY 79 by delaying contract go-ahead from July 1978 to October 1978. The three-month program stretch would introduce a nine-month gap in HEXAGON coverage between 18 and 19. Performance of certain studies and long-lead item procurement still will be required in FY 78, but production contracts would not be started until FY 79.

Alternative 2: Stretch the HEXAGON program (Vehicles 16 through 20) to provide coverage at 18-month intervals through mid-1983. Follow-on vehicles would not be required prior to 1984; therefore, the corresponding procurement and funding of Block IV slips to FY 79.

DISCUSSION

The baseline program reduces the HEXAGON launch rate to one per year in 1979, based on the following projected capabilities, each of which is considered low-risk, and all of which were recommended in the 1975 Search Performance Study (SPS).

[redacted]

B. 180-day life on orbit for HEXAGON Vehicle 15 and subsequent vehicles.

[redacted]

Alternative 1 can be expected to result in a nine-month gap between missions 18 and 19. It is unlikely that the added risk of significant undiscovered activity in denied areas can be quantified, but it will exist.

Alternative 2 would result in a gap of ten months between HEXAGON missions 15 and 16, increasing to 12 months between missions 16 and 17 and succeeding missions. This schedule would result in a significant shortfall against recommendations of the Search Performance Study (SPS). Additionally, such an extended launch schedule for the highly complex HEXAGON program would reduce the system's reliability due to lowered skill levels, long storage times, and numerous retest requirements. Additional evaluation is required to insure that this alternative is viable.

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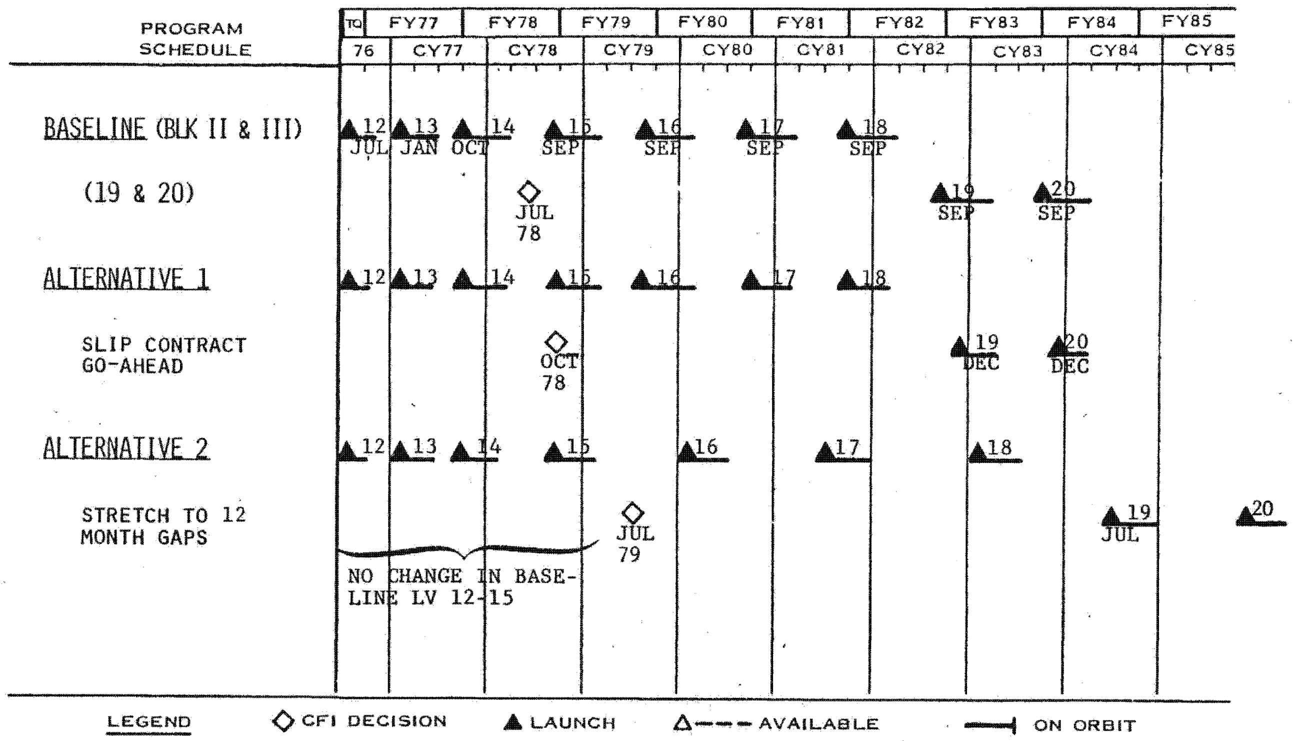
HEXAGON



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HEXAGON: ($ in Millions)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FR(DEC 75 B/1
DEC 75							
Veh 13-18	138.8	123.6	101.1	83.1	63.0		
Follow-on (19-20)	-	36.3	96.4	111.2	115.0		
Total	138.8	159.9	197.5	194.3	178.0		
JUL 75							
Veh 13-18	140.0	136.0	110.8	87.7	66.4	20.9	
Follow-on (19-20)	-	27.3	78.9	94.9	92.9	97.0	
Total	140.0	163.3	189.7	182.6	159.3	117.9	
Change from Dec 75 B/L	+1.2	+3.4	-7.8	-11.7	-18.7	-	-33.6
ALTERNATE 1							
Veh 13-18	140.0	136.0	110.8	87.7	66.4	20.9	
Follow-on (19-20)	-	7.1	79.3	96.6	92.9	110.8	
Total	140.0	143.1	190.1	184.3	159.3	131.7	
Change from Dec 75 B/L	+1.2	-16.8	-7.4	-10.0	-18.7	-	-51.7
ALTERNATE 2							
Veh 13-18	140.0	136.0	130.0	91.2	86.0	53.9	
Follow-on (19-20)	-	-	30.0	82.5	95.7	93.8	
Total	140.0	136.0	160.0	173.7	181.7	147.7	
Change from Dec 75 B/L	+1.2	-23.9	-37.5	-20.6	+3.7	-	-77.1

REVISED BASELINE - Provides for the launch of one vehicle in FY 77, two in FY 78 and one per year thru FY 81. Fund protects for a follow-on buy of two vehicles to cover FY 82-83. A six month backup capability is planned for the one per year schedule (the first vehicle of the follow-on buy excepted).

ALTERNATE 1 - Modifies the revised baseline by delaying the follow-on procurement by three months with a subsequent three month slip of Vehicle 19 availability.

ALTERNATE 2 - Stretches the baseline vehicles (16-18) in order to delay the follow-on procurement until FY 79.

HEXAGON: (Cont'd)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	TOTAL
ADDENDA							
NAVPAC Integration - (DMA Funded) Test and integrate NAVPAC system and mesa accelerometer into the specified HEXAGON vehicles.							
Veh 16	0.3	0.3	-	-	-	-	0.6
Veh 16-18	0.4	0.6	0.3	0.1	0.1	-	1.5
Veh 19-20	-	-	0.2	0.2	0.7	0.2	1.3
S-CUBED - (DMA Funded). Develop, test and integrate a metric capability into the baseline sensor subsystem to support MC&G requirements. Effective with Vehicle 17 .							
	8.9	4.4	2.3	2.0	2.0	2.0	21.6
BLOCK V Vehicles (21-23) - Provides for fund protection related to a procurement following the currently protected follow-on procurement.							
	-	-	-	22.4	59.8	96.6	178.8

KENNEN
DECISIONS REQUIRED

BACKGROUND:

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PROGRAM 989
DECISIONS REQUIRED

BACKGROUND:

The ELINT Interaction Study (EIS) recommended that a P-989 program plan be developed which continues the P-989 program and supports the start of a low-orbit satellite system. It also states that the number and type of P-989 satellites should be reviewed and adjusted in consideration of future ELINT requirements changes. The plan calls for the P-989 replacement program to continue to provide capabilities

An ExCom decision, 24 December 1975, established fund protection in FY 77 and subsequent years to permit acquisition of one of two experiments currently under study. The EHF ELINT search experiment covers the 26-42 GHz frequency range; the other is a low power COMINT and spread spectrum search and collection mission. These experiments have been proposed as pallet payloads on future HEXAGON missions.

DECISIONS REQUIRED:

- SHOULD THE NEXT P-989 VEHICLE BE DELAYED IN PROCUREMENT FROM FY 78 TO FY 79?

- CONFIRMATION OF THE EHF SEARCH EXPERIMENT AS THE SELECTED ALTERNATIVE.

BASELINE:

The baseline program provides for two satellites, URSALA 4 and RAQUEL 1A and another P-989 type satellite to be procured in FY 78. The baseline also supports

REVISED BASELINE:

The revised baseline is a re-costed baseline program with the procurement of the next satellite after FY 78 when program funding is adequate to support only one satellite on orbit. This satellite should exploit the unique capabilities offerable by P-989

ALTERNATIVES:

Alternative 1: This alternative is the same as the baseline through URSALA 4 and RAQUEL 1A. The design of future P-989 vehicles will be identical to URSALA 4 and RAQUEL 1A. Launches, one per HEXAGON mission, will alternate between URSALA 4 and RAQUEL 1A type satellites.

DISCUSSION:

The revised baseline program reflects some of the findings, conclusions and recommendations of the ELINT Interaction Study, others are addressed as addenda items. This study recommends that the P-989 program continue while study efforts continue toward the definition of a new low orbiting satellite system. In view of funding constraints, the next P-989 vehicle procurement would be initiated in FY 79.

Alternative 1 maintains an on-orbit capability supporting both operational and technical intelligence requirements in the 2 to 18 GHz frequency range. By alternating the launches, one per year, between URSALA 4 (2-12 GHz) and RAQUEL 1A (4-18 GHz) type satellites, an improved probability of coverage is realized. The increased number of satellites required under this launch philosophy is responsible for the majority of the increase in costs over the revised baseline. The mission ground station costs will increase for operations and maintenance, but major software development to support new satellite designs would be terminated.

ADDENDA

Addendum 1 - Multimission Mix: Addendum 1 applies to the baseline program. It provides for fund protection in FY 79, 80, 81 and 82 to support transition of P-989 to a multi-mission ELINT satellite designed [redacted] This would be a low-orbit satellite designed to perform operational ELINT, general search, EOB update and technical ELINT missions. The following features would be considered and could be included in each satellite.

[redacted]

- Process operational ELINT data on-board the satellite in real time

- Relay processed operational ELINT data in real time to field users

[redacted]

- Store technical ELINT data on-board for later readout

- Cover the frequency range 2-42 GHz

- Provide both main beam and sidelobe collection capability

- Routinely locate emitters to two nautical miles, 95 percent confidence, or better

- Have secure uplinks and downlinks

- Use spacecraft developed and flown by other programs with payload and antenna designs developed by SAFSP

By defining a new low-orbit ELINT satellite and the [redacted] cost-effective tradeoffs can be made to take maximum advantage of demonstrated low-orbit technology.

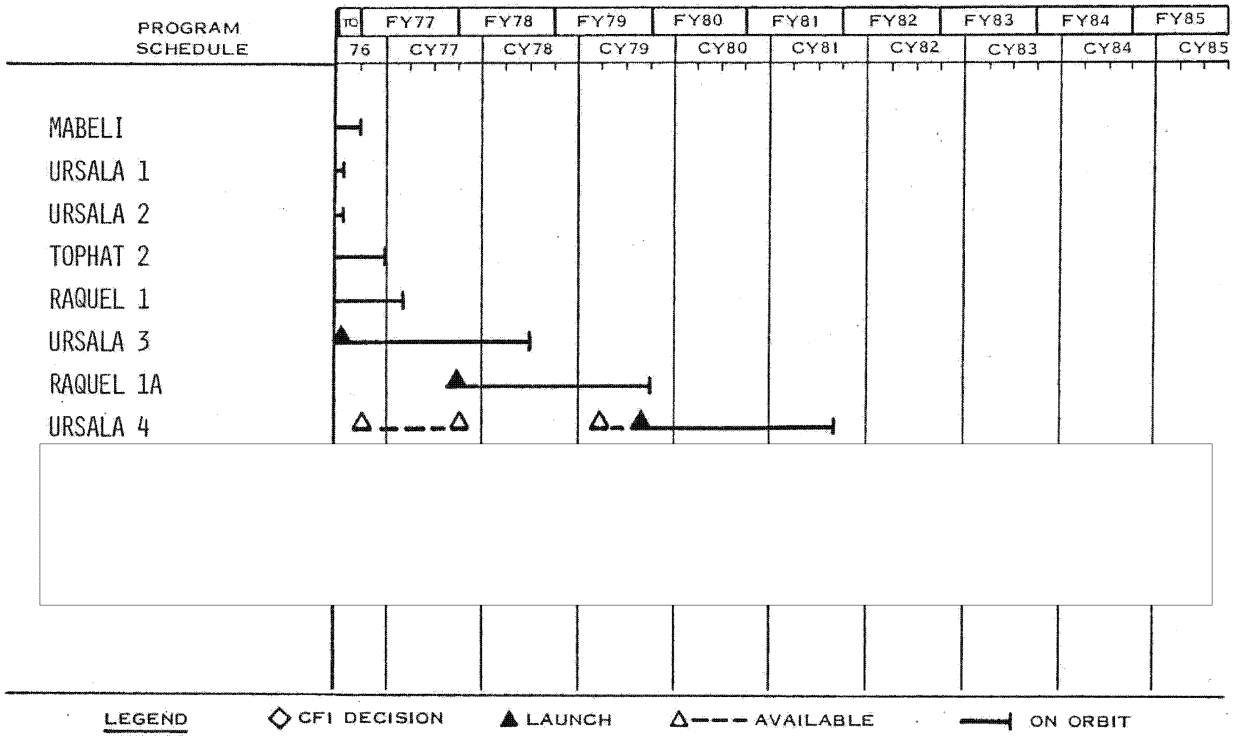
This addendum continues the definition study included in the baseline and provides for the design, development, fabrication, test and launch of a new satellite. Major decision milestones for this addendum would be [redacted]

Addendum 2 - URSALA 4 Pre-Detection Recorder: Addendum 2 applies to the baseline program only. It calls for a modification to URSALA 4 to provide [redacted] pre-detection recorder capability. This modification would utilize existing RAQUEL technology in its design.

Addendum 3: Addendum 3 applies to the baseline program. It provides funds to change the URSALA 4 frequency range from 2-12 GHz to 4-18 GHz to prevent a gap in search and EOB capability above 12 GHz after the termination of RAQUEL 1A in the fall of 1979.

PROGRAM 989

BASELINE AND REVISED BASELINE



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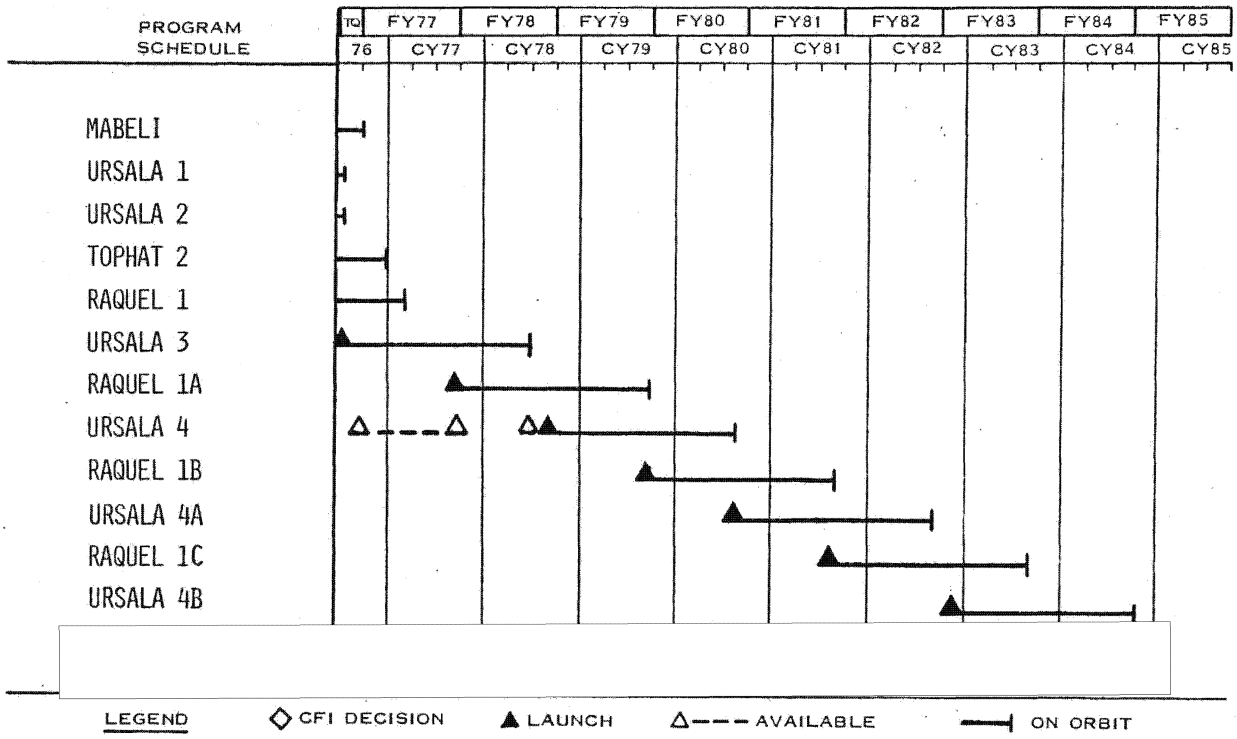
PROGRAM 989

ALTERNATIVE 1



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P-989: ($ in Millions). (And SIGINT Experiment)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	CHANGE FROM DEC 75 B/L
DEC 75							
BASELINE PROGRAM - Provides for the continued procurement of RAQUEL 1A initiated in FY 76. Identifies funds for a future program based on current ELINT Interaction Studies. Also includes the SIGINT Experiment.							
RAQUEL 1A	4.9	0.6	-	-	-		
SAT X	-	14.0	16.9	17.9	18.1		
SIGINT Expt	2.1	2.6	2.0	1.0	-		
Ops & Spt	10.3	12.1	10.0	10.9	12.0		
Total	17.3	29.3	28.9	29.8	30.1		
JUL 76							
REVISED BASELINE - Provides for the procurement of RAQUEL 1A and emphasizes the operational ELINT and search capabilities of a low orbiting ELINT collector. Includes the SIGINT Experiment (26-42 GHz).							
RAQUEL 1A	4.9	0.6	-	-	-	-	
URSALA 4	-	2.7	-	-	-		
SIGINT Expt.	2.1	2.6	2.0	1.0	-	-	
Ops & Spt	10.3	13.1	14.2	11.0	12.0	13.1	
Total	17.3	19.0	28.6	30.5	33.6	30.0	
Change from Dec 75 B/L	0	-10.3	-0.3	+0.7	+3.5	-	-6.4
ALTERNATIVE 1 - Provides for the procurement of URSALA and RAQUEL type vehicles to support a yearly launch of alternating type vehicles. Includes the SIGINT Experiment (26-42 GHz).							
RAQUEL 1A	4.9	0.6	-	-	-	-	
URSALA 4	-	2.7	-	-	-	-	
RAQUEL 1B	1.9	14.8	4.3	-	-	-	
URSALA 4A	-	7.5	16.0	5.3	-	-	
RAQUEL 1C	-	-	2.5	19.5	5.6	-	
URSALA 4B	-	-	-	8.5	18.0	6.0	
SIGINT Expt.	2.1	2.6	2.0	1.0	-	-	
Ops & Spt.	10.4	12.1	14.3	12.3	13.5	14.6	
Total	19.3	40.3	39.1	46.6	37.1	20.6	
Change from Dec 75 B/L	+2.0	+11.0	+10.2	+16.8	+7.0	-	+47.0

P-989: (Cont'd)

	FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	TOTAL
ADDENDA -							
MULTIMISSION MIX - Identifies funds for a multimission low orbiting system designed to [redacted]							
NRP	-	-	3.0	5.0	25.0	50.0	83.0
NSA	-	-	-	8.0	10.0	7.0	25.0
Total	-	-	3.0	13.0	35.0	57.0	108.0
ADDITIONAL MODIFICATION TO URSALA 4(Revised B/L Program) - Provides limited frequency extension from 2-12 GHz to 4-18 GHz (7.3M) and technical ELINT capabilities using RAQUEL technology (3.4M).							
NRP	-	10.3	-	-	-	-	10.3
NSA	-	0.4	-	-	-	-	0.4
Total	-	10.7	-	-	-	-	10.7
[redacted]							
NRP	-	2.0	4.0	-	-	-	6.0
SHARED COSTS - For visibility, the funds required by the NRP to meet NSA requirements are identified here. Also identified is the current status of the NRP requirements vice NSA's current financial plan.							
NSA Revised B/L	5.5	6.4	7.6	7.8	7.8	8.5	
Status	+1.2	+1.5	+2.3	+1.9	+1.4	+1.6	
Change to NSA Revised B/L For Alternative 1	-	+0.5	+2.1	+2.9	+3.1	+2.8	

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HF OVERHEAD COLLECTION DECISIONS REQUIRED

BACKGROUND:

On 25 September 1975, the House Appropriations Committee requested that the NRO study and report to the Committee on the possibility of using SIGINT satellites in lieu of, or as a supplement to, the modernization program of NSA, and the cost effectiveness of such a program.

At the 4 May meeting on the NRP, the CFI endorsed the NRO/NSA HF study activity which was due for completion in July. NSA was requested to consider other alternatives for HF collection for presentation at the July meeting. The CFI directed that no additional NRO efforts should be planned beyond July, pending CFI review.

A separately distributed document entitled "Alternative Plans for Collection of HF Data" presents a feasibility investigation of HF signal collection by satellite and the NSA evaluation of all candidate HF collection alternatives. The NRO proposes that the NRO/NSA feasibility report, which is included as an annex to the document constitute the reply to the House Appropriations Committee.

DECISIONS REQUIRED:

- IS THE REPORT ON THE FEASIBILITY OF HF COLLECTION BY SATELLITE (ANNEX TO "ALTERNATIVE PLANS FOR COLLECTION OF HF DATA") APPROVED FOR SUBMITTAL TO THE HOUSE APPROPRIATIONS COMMITTEE?

- SHOULD THE FEASIBILITY OF HF COLLECTION FROM SPACE CONTINUE TO BE INVESTIGATED BY THE NRO AND NSA?

BASELINE:

In accordance with direction from the 4 May meeting, no further effort is currently approved. TAB A is not included.

DISCUSSION:

The feasibility report distributed as an annex to the document "Alternative Plans for Collection of HF Data" recommends continuation of propagation and application studies at a low level, and exploration of methods of remoting HF. An HF experiment cannot be justified at this time.

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SPACE TRANSPORTATION SYSTEM DECISIONS REQUIRED

BACKGROUND:

The NRO policy for transitioning NRP spacecraft from expendable launch vehicles to the Space Transportation System (STS) is to accomplish the Shuttle transition as early as is practical without degrading mission accomplishment, while maintaining the security of the NRP and considering the overall cost-effective operation of the programs. The initial NRP/STS transition plan developed within these objective guidelines was approved by the NRO ExCom in July 1975. Since initial approval, the plan has been updated to incorporate significant changes which have been made in the NRO spacecraft programs and the results of Shuttle transition studies. The planning effort remains, by necessity, keyed to the achievement of NASA and DoD STS-related programs.

DECISIONS REQUIRED:

WHAT SHOULD THE FY 78 LEVEL OF EFFORT BE FOR SHUTTLE TRANSITION?

REVISED BASELINE:

DISCUSSION:

In accordance with the national decision to proceed with the STS, the NRO is continuing to plan for transition. Transition planning must be flexible and dynamic because of continuing changes in the vehicle design and deployment strategies of NRO spacecraft systems, and also because the NRO will be only one of many users of the STS. The present NRP/STS transition plan provides for as early a transition as is compatible with the NASA/STS development program without incurring unacceptable risks to the NRP and reduces transition costs by incoporating independent program redesign wherever this is feasible.

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ELV BACKUP - LINE ITEM DESCRIPTIONS FOR DECISION PACKAGE COST BREAKOUTS

EXPENDABLE LAUNCH VEHICLE (ELV) BACKUP

ELV Backup Hardware	Provides for the first T-34D backup booster for the NRP (procured in FY 79) and the conversion of the TIIIB booster (orginally for [redacted] to a T-34D for a 2nd backup.
Contract Sharing Loss	This line represents the NRP share (67%) of the estimated contract cost increases that will be experienced in conjunction with the last booster buy. It funds sustaining production to complete the last boosters. This was usually shared on a follow-on contract.
Backup Launch Capability	Provides for launch pad services and sustaining engineering for the T-34D backup booster.