CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

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27 MAY 1966

MEMORANDUM FOR: Director, National Reconnaissance Office

SUBJECT: F.Y. 1967 thru F.Y. 1972 Program Cost Estimates for CORONA, [redacted] and HEXAGON

REFERENCE: Your Memo, BYE-52260-66, dated 2 May 1966, Subject: Supplemental Guidance for F.Y. 1967 thru 1972 Program Cost Estimates

In accordance with reference, forwarded herewith are two copies of the program cost estimates for CORONA, [redacted] and HEXAGON, Fiscal Years 1967 thru 1972. Information copies of the CORONA and HEXAGON estimates have been sent to SAFSP.

HUNTINGTON D. SHELDON
Director of Reconnaissance, CIA

Attachments
as stated

2 May 66 for others, see BYE 0073 for FY 67
23 May BYE 0077
7 June BYE 0124
FY 68-72

BYE-0115-66/1
Copy No. 1

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CORONA

(In Millions)

FY 1967 BUDGET SUMMARY (OPTION I)

I.	Camera	$10.316
II.	Recovery Vehicles	8.320
III.	Payload Structures and Integration	21.081
IV.	Contingency	1.270
	Total CORONA, FY 1967 (Option I)	$40.987

FY 1967 BUDGET SUMMARY (OPTION II)

I.	Camera	$ 8.716
II.	Recovery Vehicles	6.820
III.	Payload Structures and Integration	19.265
IV.	Contingency	1.270
	Total CORONA, FY 1967 (Option II)	$36.071

CORONA - FY 1967

Project CORONA is a satellite photographic search and surveillance system with two (2) recoverable capsules for retrieval of exposed film. The payload portion including the Agena orbiting control vehicle, is launched into orbit by a thrust augmented THOR rocket. The camera system provides 16,000 feet of stereoscopic coverage averaging 10-foot resolution in quality. The system is presently undergoing an improvement program to provide the following:

(1) Higher thrust booster by use of the THORAD to carry additional weight.

(2) An orbit adjust system to provide longer life on orbit and fly lower orbits.

(3) Modification of cameras to provide for a constant rotating lens system to obtain higher cycle rates and less vibration.

(4) Camera modifications will be compatible with the use of ultra thin base film providing more coverage.

(5) Camera modifications for the recovery of geometry within the panoramic frame.

The above improvements should provide a system with a 14-day in lieu of 10-day on-orbit life and an increase in photographic resolution down to 7 feet.

The budget estimates are based on launch schedules which contemplate 38 launches during Fiscal years 67 through 69 under Option I and thirty two (32) launches during Fiscal years 67 through 70 under Option II. As of June 30, 1966, it is estimated that of the fifty (50) J-1 configured systems on contract, thirty-two (32) will have been launched leaving a balance of eighteen (18) units. In addition, there are thirteen (13) J-3 configured units on contract for delivery following the J-1's. This results in a total thirty-one (31) systems on contract for launch starting in FY 1967.

CORONA - FY 1967

In order to support launches through FY 1969 under Option I an additional quantity of seven (7) J-3 systems must be ordered. This provides for fourteen (14) launches in FY 1967 and twelve (12) launches each in FY 1968 and 1969. In view of reorder lead times of the various subsystems and to maintain four (4) complete systems as back-ups, orders must be placed for the seven (7) additional units in 1967.

In order to support launches through FY 1970 under Option II, one (1) additional J-3 system must be ordered. This will provide for ten (10) launches each in FY 1967, 1968, 1969, and two (2) launches in FY 1970. The additional J-3 system may be ordered in FY 1969.

The budget estimates for both FY 1967 and FY 1968 include funds for the development and procurement of Automatic Precision Altitude Determination System units for launch in FY 1967 and FY 1968.

CORONA

(In Millions)

FY 1967 Operating Requirement

Option I

I. Camera

A. ITEK - Balance of funds required to complete cameras on contract for J-1 through J-50 in the J-1 Configuration ---------- $2.610

B. ITEK - Funds required in FY 1967 for 13 J-3 constant rotating cameras presently on contract ------- 6.106

C. ITEK - Funds required to implement procurement of 7 additional J-3 camera systems for launch in FY 1969 ---------- 1.600

TOTAL Camera, FY 1967 ---------- $10.316

II. Recovery Vehicles

A. General Electric - Balance of funds required to complete SRV's on contract for J-1 through J-50 in the J-1 Configuration ---------- 1.663

B. General Electric - Funds required in FY 1967 to initiate procurement of 26 SRV's for the first 13 J-3 systems ---------- 5.157

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CORONA

(In Millions)

FY 1967
Operating
Requirement

Option I

C. Funds required in FY 1967 to implement procurement of 14 additional SRV's for 7 additional J-3 system launches in FY 1969 ----------$1.500

TOTAL Recovery Vehicles, FY 1967 ----------$8.320

III. Payload Structures and Integration

A. LMSC - Balance of funds required to complete structures and system integration of J-1 through J-50 payload systems in the J-1 Configuration ---------- 5.560

B. LMSC - Funds required in FY 1967 to implement procurement of 14 payload structures and integration for the J-3 Configuration ---------- 7.555

C. LMSC - Funds required in FY 1967 to initiate procurement of 7 additional J-3 payloads for launch in FY 1969 ---------- 1.816

D. LMSC - Funds required in FY 1967 to implement development and procurement of 10 APADS units for launch in FY 1967-68 ---------- 6.150

TOTAL Payload Structures and Integration, FY 1967 ----------$21.081

CORONA

(In Millions)

Option I

FY 1967
Operating
Requirement

IV. Contingency

A.	Estimated contingency funds for engineering changes, studies, analysis, and software changes attributable to the J-1 Configuration	$ .240
B.	Estimated contingency funds required for engineering changes, studies, analysis, and software changes attributable to the J-3 Configuration	1.030
	TOTAL Contingency, FY 1967	**$1.270**
	TOTAL CORONA, FY 1967 (Option I)	**$40.987**

CORONA

(In Millions)

Option II	FY 1967 Operating Requirement
I. Camera	
A. ITEK - Balance of funds required to complete cameras on contract for J-1 through J-50 in the J-1 Configuration	$2.610
B. ITEK - Funds required in FY 1967 for 13 J-3 constant rotating cameras presently on contract	6.106
TOTAL Camera, FY 1967	$8.716
II. Recovery Vehicles	
A. General Electric - Balance of funds required to complete SRV's on contract for J-1 through J-50 in the J-1 Configuration	1.663
B. General Electric - Funds required in FY 1967 to initiate procurement of 26 SRV's for the first 13 J-3 systems	5.157
TOTAL Recovery Vehicles, FY 1967	$6.820

CORONA

(In Millions)

Option II

FY 1967
Operating
Requirement

III. Payload Structures and Integration

A. LMSC - Balance of funds required to complete structures and system integration of J-1 through J-50 payload systems in the J-1 Configuration ---------- $5.560

B. LMSC - Funds required in FY 1967 to implement procurement of 13 payload structures and integration for the J-3 Configuration ---------- 7.555

C. LMSC - Funds required in FY 1967 to implement development and procurement of 10 APADS units for launch in FY 1967-68 ---------- 6.150

TOTAL Payload Structures and Integration, FY 1967 ---------- $19.265

CORONA

(In Millions)

Option II

FY 1967
Operating
Requirement

IV. Contingency

A. Estimated contingency funds for engineering changes, studies, analysis and software changes attributable to J-1 Configuration ---------$ .240

B. Estimated contingency funds required for engineering changes, studies, analysis and software changes attributable to the J-3 Configuration ---------- 1.030

TOTAL Contingency, FY 1967 ----------$ 1.270

TOTAL CORONA, FY 1967 (Option II) ----------$36.071

HEXAGON

(In Millions)

FY 1967 BUDGET SUMMARY (OPTION I)

I.	Sensor Subsystem	$ 29.7
II.	System Engineering	4.0
	Total HEXAGON FY 1967 (Option I)	$ 33.7

FY 1967 BUDGET SUMMARY (OPTION II)

I.	Sensor Subsystem	$ 27.5
II.	Systems Engineering	4.0
	Total HEXAGON FY 1967 (Option II)	$ 31.5

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HEXAGON - FY 1967

Project HEXAGON is a follow-on search and surveillance system to the CORONA Program. The HEXAGON system consists of a Launch Vehicle (TITAN IIID) and a Space Vehicle composed of a Sensor Subsystem, a Satellite Basic Assembly, and the necessary Recovery Vehicles.

Budget estimates submitted in this document are for CIA costs associated with the Sensor Subsystem which provides for two panoramic cameras mounted for stereo imagery and includes all elements of the film path; all camera-peculiar electronics, and/or pneumatics necessary for operation of these elements in response to commands; power conversion components peculiar to the sensor subsystem; and a housing which establishes and controls the internal environment for the sensor and provides the structural support for all internal elements of the sensor subsystem.

The estimates hereby submitted are based on operational launch schedules as outlined in BYE-52260-66 of 2 May 1966.

It is to be further noted that the budget estimates herein are "R.O.M." in nature. Firm estimates will not be available until the latter part of July when proposals are received from prospective contractors. It is proposed to resubmit a revised estimate for the total program during August 1966.

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HEXAGON

(In Millions)

OPTION I		FY 1967 Operating Requirement
1. Sensor Subsystem Costs		
Non Recurring	$ 27.9	
Recurring	1.8	
TOTAL Sensor Subsystem, FY 1967		$ 29.7
2. Systems Engineering	4.0	
TOTAL System Engineering, FY 1967		4.0
TOTAL HEXAGON, FY 1967 (Option I)		$ 33.7

HEXAGON

(In Millions)

OPTION II		FY 1967 Operating Requirement
1. Sensor Subsystem Costs		
Non Recurring	$ 27.3	
Recurring	.2	
TOTAL Sensor Subsystem Costs, FY 1967		$ 27.5
2. Systems Engineering	4.0	
TOTAL Systems Engineering, FY 1967		4.0
TOTAL HEXAGON, FY 1967 (Option II)		$ 31.5

CORONA

(In Millions)

FY 1968 BUDGET SUMMARY (Option I)

I.	Camera Systems	$ 2.940
II.	Recovery Vehicles	1.029
III.	Payload Structures and Integration	12.069
IV.	Contingency	.650
	TOTAL CORONA, FY 1968 (Option I)	$16.688

FY 1968 BUDGET SUMMARY (Option II)

I.	Camera Systems	$ 1.448
II.	Recovery Vehicles	.377
III.	Payload Structures and Integration	10.412
IV.	Contingency	.650
	TOTAL CORONA, FY 1968 (Option II)	$12.887

CORONA - FY 1968

The CORONA Program will continue in operation during this fiscal year. Operational launches at the rate of one (1) per month under Option I and 10 per year under Option II are planned utilizing both the J-3 Configuration or Improved CORONA System and the J-1 Configuration. (See attached launch schedule.)

Procurement of follow-on systems for FY 1969 launches will also continue for a planned rate of one (1) per month under Option I and ten (10) per year under Option II.

CORONA

(In Millions)

FY 1968
Requirement

Option I

I. Camera

A. ITEK - Balance of funds required to complete the first 13 J-3 cameras presently on contract----------$ .940

B. ITEK - Funds required for continuation of the 7 follow-on J-3 cameras---------- 2.000

TOTAL Camera, FY 1968----------$2.940

II. Recovery Vehicles

A. General Electric - Funds required to complete 26 SRV's for the first 13 J-3 systems---------- .173

B. General Electric - Funds required for continuation of 14 SRV's for the 7 follow-on systems---------- .856

TOTAL Recovery Vehicles, FY 1968----------$1.029

III. Payload Structures and Integration

A. LMSC - Funds required to complete last of the J-1 systems---------- 1.026

B. LMSC - Funds required for continuation of the first 13 J-3 systems---------- 6.915

CORONA

(In Millions)

Option I	FY 1968 Requirement
C. LMSC - Funds required for continuation of 7 follow-on J-3 systems	$2.357
D. LMSC - Funds required in FY 1968 to implement procurement of 10 APADS	1.771
TOTAL Payload Structures and Integration, FY 1968	$12.069
IV. Contingency	
Contingency for engineering changes, studies, analysis, and software changes for the J-3 system	.650
TOTAL Contingency, FY 1968	.650
TOTAL CORONA, FY 1968 (Option I)	$16.688

CORONA

(In Millions)

FY 1968
Requirement

Option II

I. Camera

A. ITEK - Balance of funds required to complete first 13 J-3 cameras presently on contract---------- $ .940

B. ITEK - Funds required to initiate procurement of one additional follow-on J-3 camera---------- .508

TOTAL Camera, FY 1968---------- $1.448

II. Recovery Vehicles

A. General Electric - Funds required to complete 26 SRV's for the first 13 J-3 systems---------- .173

B. General Electric - Funds required for continuation of 2 SRV's for 1 follow-on J-3 system-- .204

TOTAL Recovery Vehicles, FY 1968---------- $ .377

III. Payload Structures and Integration

A. LMSC - Funds required to complete last of the J-1 systems---------- 1.026

B. LMSC - Funds required for continuation of the first 13 J-3 systems---------- 6.915

CORONA

(In Millions)

Option II	FY 1968 Operating Requirement
C. LMSC - Funds required for continuation of 1 follow-on J-3 system	$ .700
D. LMSC - Funds required in FY 1968 to implement procurement of 10 APADS	1.771
TOTAL Payload Structures and Integration, FY 1968	$10.412
IV. Contingency	
Contingency for engineering changes, studies, analysis and software changes for the J-3 system	.650
TOTAL Contingency, FY 1968	.650
TOTAL CORONA, FY 1968 (Option II)	$12.887

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(In Millions)

FY 1968 BUDGET SUMMARY (OPTION I)

I.	Sensor Subsystem----------	$ 33.0
II.	Systems Engineering----------	5.0
	TOTAL HEXAGON, FY 1968 (Option I)--------	$ 38.0

FY 1968 BUDGET SUMMARY (OPTION II)

I.	Sensor Subsystem----------	$ 30.7
II.	Systems Engineering----------	5.0
	TOTAL HEXAGON, FY 1968 (Option II)------	$ 35.7

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HEXAGON - FY 1968

The HEXAGON program will be in the research and development phase with fabrication and qualification testing of the first flight vehicles being initiated. Long lead time items will be released to procurement for the production and operational phase. Manpower and funding requirements will be slightly higher than in FY 1967.

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HEXAGON

(In Millions)

OPTION I		FY 1968 Requirement
1. Sensor Subsystem Costs		
Non Recurring	$ 31.0	
Recurring	2.0	
TOTAL Sensor Subsystem, FY 1968		$ 33.0
2. Systems Engineering	5.0	
TOTAL Systems Engineering, FY 1968		5.0
TOTAL HEXAGON, FY 1968 (Option I)		$ 38.0

HEXAGON

(In Millions)

OPTION II		FY 1968 Requirement
1. Sensor Subsystem Costs		
Non Recurring	$ 30.3	
Recurring	.4	
TOTAL Sensor Subsystem, FY 1968		$ 30.7
2. Systems Engineering	5.0	
TOTAL Systems Engineering, FY 1968		5.0
TOTAL HEXAGON, FY 1968 (Option II)		$ 35.7

CORONA

(In Millions)

Fiscal Years 1969-1972

The CORONA Program under option one (1) will continue operational launches at the rate of one (1) per month through FY 1969 utilizing the J-3 Configuration.

The CORONA Program under option two (2) will continue operational launches at the rate of ten (10) per year through FY 1969 utilizing three (3) J-1 Configurations and seven (7) J-3 Configurations. Two (2) J-3 Configurations will be launched in FY 1970.

Beginning in FY 1970 the CORONA system search and surveillance mission will be replaced by a new search and surveillance photographic satellite system.

CORONA (Option I)

(In Millions)

Fiscal Years 1969-1972

Items	FY 1969	FY 1970	FY 1971	FY 1972
I. CORONA Satellite Search and Surveillance System				
A. Itek - funding required for completion of follow-on 7 J-3 cameras	$ .656	-0-	-0-	-0-
B. General Electric - funding required for completion of 14 follow-on J-3 SRV's	.500	-0-	-0-	-0-
C. LMSC - funding required for completion of first 13 J-3 systems	.600	-0-	-0-	-0-
D. LMSC - funding required for continuation of follow-on 7 J-3 systems	1.000	-0-	-0-	-0-
TOTALS (Option I)	$2.756	-0-	-0-	-0-

CORONA (Option II)

(In Millions)

Fiscal Years 1969-1972

Items	FY 1969	FY 1970	FY 1971	FY 1972
I. CORONA Satellite Search and Surveillance System				
A. ITEK - funding required for completion of 1 follow-on J-3 camera	$ .100	-0-	-0-	-0-
B. LMSC - Funding required for completion of first 13 J-3 systems	.600	-0-	-0-	-0-
C. LMSC - Funding required for continuation of the follow-on J-3 system	.040	-0-	-0-	-0-
TOTALS, (Option II)	$ .740	-0-	-0-	-0-

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HEXAGON

(In Millions)

Fiscal Years 1969-1972

The HEXAGON Program under Option I will launch four (4) vehicles in FY 1969 and then continue at the rate of six (6) per year through FY 1973. Under Option II, two (2) vehicles will be launched in FY 1969 and then will continue through FY 1973 at the rate of six (6) vehicles per year as under Option I.

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HEXAGON

(In Millions)

Fiscal Years 1969-1972

OPTION I

		1969	1970	1971	1972
1.	Sensor Subsystem Costs				
	Non Recurring	$ 19.7	-0-	-0-	-0-
	Recurring	11.7	25.0	18.2	18.0
2.	Systems Engineering	5.0	4.0	4.0	4.0
	TOTAL HEXAGON (Option I)	36.4	29.0	22.2	22.0

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HEXAGON

(In Millions)

Fiscal Years 1969-1972

OPTION II

		1969	1970	1971	1972
1.	Sensor Subsystem Costs				
	Non Recurring---------- $	21.0	-0-	-0-	-0-
	Recurring---------- $	8.3	25.0	18.2	18.0
2.	Systems Engineering----------	5.0	4.0	4.0	4.0
	TOTAL HEXAGON (Option II) ------- $	34.3	29.0	22.2	22.0

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CORONA (Option I)

LAUNCH SCHEDULE

FY	J	A	S	O	N	D	J	F	M	A	M	J
1967 Flight	J-36	J-32	J-37	J-38	J-35	J-39	J-40	J-41	J-92	J-43	J-44	J-46
Reserves	4	5	J-34 4	5	5	4	4	4	5	4	J-45 2	2
1968 Flight	CR-1	J-47	J-48	CR-2	J-49	CR-3	J-50	CR-4	CR-5	CR-6	CR-7	CR-8
Reserves	3	4	4	4	4	4	4	4	4	4	4	4
1969 Flight	CR-9	CR-10	CR-11	CR-12	CR-13	CR-14	CR-15	CR-16	CR-17	CR-18	CR-19	QR-2
Reserves	4	4	4	4	4	4	4	4	3	2	1	0
1970 Flight												
Reserves												

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CORONA (Option II)

LAUNCH SCHEDULE

FY	J	A	S	O	N	D	J	F	M	A	M	J
1967 Flight Reserves	J-36 5	J-32 5	J-37 5	J-38 6	J-34 6	J-35 6			J-39 8	J-40 7	J-41 6	J-42 6
1968 Flight Reserves	CR-1 7	J-43 8	J-44 8	CR-2 8	J-45 8	CR-3 8			J-46 10	CR-4 10	J-47 10	CR-5 10
1969 Flight Reserves	J-48 10	CR-6 9	J-49 8	CR-7 7	J-50 6	CR-8 5			CR-9 5	CR-10 4	CR-11 3	CR-12 2
1970 Flight Reserves	CR-13 1	QR-2 0										

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