TOP SECRET

15 June 1962

MEMORANDUM FOR The Chairman, The President's Foreign Intelligence Advisory Board

SUBJECT: (TS) Status of Satellite Reconnaissance Program

1. Inclosed herewith is a brief description and summary of the present status of currently programmed reconnaissance satellite launches through CY 1963.

2. It should be noted that all of the Board's recommendations of October 4, 1961, have been carried out. The two ARGON flights previously scheduled in the fall of 1961 were postponed and the vehicles and boosters utilized for additional CORONA flights during this period. As may be seen from the current schedule, the Thor/Agena system is being relied upon as the photographic reconnaissance workhorse while other newer systems are in their developmental phases. In addition to the twelve CORONA-M flights shown on the attached schedule, six additional payloads are being procured. An additional launch pad has been converted for Thor/Agena use, bringing the total to four. This additional launch capability, plus the additional CORONA-M payloads, and the interchangeability of CORONA-M and LANYARD payloads provides desirable flexibility and reserve capability to the overall effort.

3. The operation of the satellite reconnaissance program has been considerably enhanced by a new DOD security policy adopted in March 1962. With the discontinuance of all DOD satellite names and nicknames, and the discontinuance of press releases which reveal the mission of any specific launches, or the fact of specific recoveries of space capsules, the entire satellite reconnaissance effort has been placed under a protective umbrella. As time passes, sporadic public speculation will become more inaccurate, and the effective security will increase. This policy has also altered the political risk aspects of the CORONA program, and eliminated the basis for foreign charges of U. S. duplicity in the event of a CORONA capsule being recovered by a hostile country. Since the existence of U. S. satellite reconnaissance developments has been admitted publicly in connection with the

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old SAMOS project, and since no public cover story is required for any launches under the new policy, there is no basis for national embarrassment in the event of such an unfortunate accident; the capsule will not previously have been stated or inferred to have been launched for some other purpose. Continuation or revision of these procedures is dependent upon the outcome of the current review of the national space policy being conducted in response to NSAM 156.

4. In summary, every effort has been made to fly proven payloads at the maximum rate in order to obtain the earliest complete coverage, and to provide back-up to the early developmental flights of improved payloads. In addition to bringing these improved payloads along at the maximum development pace, steps have been taken to enhance the probability of their early success through provision of back-up development of critical components.

Signed
Joseph V. Charyk
Under Secretary of the Air Force

1 Incl
(TS) Summary of Satellite Reconnaissance Program, dtd 15 June 62

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(TS) SUMMARY OF SATELLITE RECONNAISSANCE PROGRAM

1. CORONA-M

The CORONA-M project is an extended version of the CORONA effort, consisting of two CORONA 24" focal length f3.5 panoramic cameras mounted at a 30° convergent angle for stereo. Capacity of each camera is 7600 ft of 70 mm thin-base film, covering 7.7 million square miles per flight. In addition, a 1.5" focal length framing camera is included, to enhance the use of the panoramic photography. The system utilizes the Thor/Agena vehicle and the recovery method is the same as previously used in the single-camera CORONA flights.

The first CORONA-M flight, launched in February 1962, resulted in a satisfactory mission, and subsequent operation has confirmed the high quality and dependability of this configuration. The small framing camera did not operate during the first two flights; however, the difficulties subsequently have been identified and corrected, and the framing camera operated throughout the full four-day mission which was launched on June 2, 1962. The recovery capsule from this flight was unfortunately lost due to an accident during the recovery. One of the booms on the recovery aircraft hit the capsule parachute during a recovery pass and the parachute collapsed, dropping the capsule into

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the ocean from an altitude of about 12,000 feet. The capsule sank shortly after impact.

In addition to the CORONA-M vehicles presently scheduled for flight (see schedule on last page), provisions have been made for six additional CORONA-M payloads. These extra payloads are interchangeable with ARGON and LANYARD payloads, and provide desirable reserve capability and flexibility for the overall satellite reconnaissance program.

A complete back-up recovery capability has been incorporated, including separate stabilization, command, and recovery maneuver provisions. This system has been completely checked out in flight, and the probability of recovery of CORONA-M (as well as LANYARD and ARGON) capsules has been substantially increased.

2. [redacted] is a photographic area coverage system designed for 8-10 feet resolution. The sensor consists of two 36" focal length f4 panoramic cameras with a 23.4° stereo angle. Development was initiated in October 1960, and the first flight date was estimated as March 1962, at that time. The system was designed to obtain 9,000,000 square nautical miles of non-redundant stereo coverage during a five-day mission and to be recovered at Johnson Island from the water. The recovery vehicle is designed for land impact, but the debris problem dictates an ocean operation.

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This project is just entering the flight phase. Although some difficulties may be encountered in the first engineering flights, confidence is high that all objectives will be met at an early date.

The first flight was accomplished on 26 April 1962. It was delayed by electromagnetic interference problems which were found as the various parts of the system were mated for the first time in the missile assembly building at Vandenberg AFB. System operation on orbit was essentially nominal, except that the B (rearward looking) camera failed to transport film midway in the mission and the film cutter did not operate properly. The capsule was not recovered. The failure to recover was caused by design deficiencies in the placement of a solid ullage rocket on the Agena vehicle and in the response characteristics of the Agena control system. These deficiencies have been corrected for the second flight.

Significant changes since the fall of 1961 are:

a. A 19-launch follow-on procurement has been initiated, extending through 1964. 1040

[redacted]

c. Decision has been made to incorporate a small framing camera and a stellar camera as a part of the system. Two of the

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CORONA-M indexing cameras will be installed in each vehicle.

d. Joint Task Force 8 activities on Johnson Island have precluded use of the recovery facilities as planned. The first three flights are dependent for recovery upon helicopters based on the Navy PMR instrumentation ships.

e. Design changes are under study to allow land recovery as soon as possible. This study is to be completed in July, and it appears probable that land recovery can be made effective in late spring or early summer of 196[redacted]

[redacted]

3. [redacted] E-5)

Project [redacted] was the last integral system of the old SAMOS project. It was a 66" focal length, narrow-swath width (60 nm) recoverable system intended to obtain stereo photography of specific targets with 5 ft ground resolution. Due to progress made in other projects, and the relative complexity, high cost, and low future potential of this configuration, this effort was terminated. Two launches were made, one on 22 December 1961 and one on 7 March 1962, both of which were restricted to simplified modes of camera operation. In both cases, the cameras operated but the capsules were not recovered. Subsequently, the essential camera hardware has been incorporated into a new simplified Thor-boosted project called LANYARD, described below.

4. LANYARD

This project was initiated in March 1962 in order to obtain photography at an early date with resolution betwee[redacted]nd CORONA-M. The system consists of a greatly simplified version of the discontinued [redacted]-5) project, using the same 66" focal length optical system and some of the camera hardware already produced. The recovery system is the same as that used for CORONA-M. The launch vehicle is a Thor/Agena, with the Thor augmented by three XM-33 solid rocket boosters which will be dropped at about 60 seconds after launch. The vehicle will have a four-day life and should produce photography with a ground resolution of from 4.5 to 5.5 feet at altitudes of 110-130 nautical miles.

The five LANYARD payloads will be interchangeable with the additional CORONA-M and ARGON payloads which are available, affording considerable flexibility.

[redacted]

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[redacted]

6 [redacted]

This is a new project, the vehicle concept being an extension of that contemplated under Project [redacted] Project [redacted] as a paid design study by the Martin Marietta Company of a maneuverable re-entry vehicle (without concurrent payload design) of the M-1 shape first proposed by Eggers of the NASA. The [redacted] vehicle, to be developed by Martin, will employ a more efficient aerodynamic shape having a greater maneuvering capability than the M-1 shape. Th[redacted] equires the boost capability of the TITAN III with solid rocket assist and its schedule is, therefore, dependent upon the TITAN III availability.

Vehicle design and wind tunnel testing was started in February 1962. The vehicle designs under consideration would allow 600 to 800 miles cross range maneuverability.

Th[redacted] vehicle will allow greater payload weights (up to 9,000 lbs at 90 miles on a 5-day mission) than anything heretofore

contemplated. Particular attention is therefore being paid to multi-sensor payloads, and to interchangeable payloads. Currently, proposals are being evaluated for photographic sensors having high resolution as well as area coverage capability. [redacted] electronic reconnaissance sensor possibilities also will be investigated in detail in the next several months.

7. ARGON

ARGON is a photographic project for geodetic and mapping purposes. It consists of a 3" focal length frame-type terrain camera of high geometric fidelity, supplemented by a 3" focal length stellar camera, both recording images on a single roll of 5" film. The terrain camera capacity is 6000 photographs (235 x 235 n. m. format) covering 166 million square miles in a four-day mission. Stereo is provided by overlap in the photographs. Expected positional accuracy obtainable from this photography (alone) is 750 feet, and expected contour accuracy is 1500 feet. The same basic Thor/Agena vehicle and recovery system is used for ARGON as for CORONA.

After four previous unsuccessful attempts, the May 1962 ARGON flight was successful. Results were useful but not as good as expected due to incorrect stellar exposure, and due to a terrain camera shutter malfunction during the latter part of the flight.

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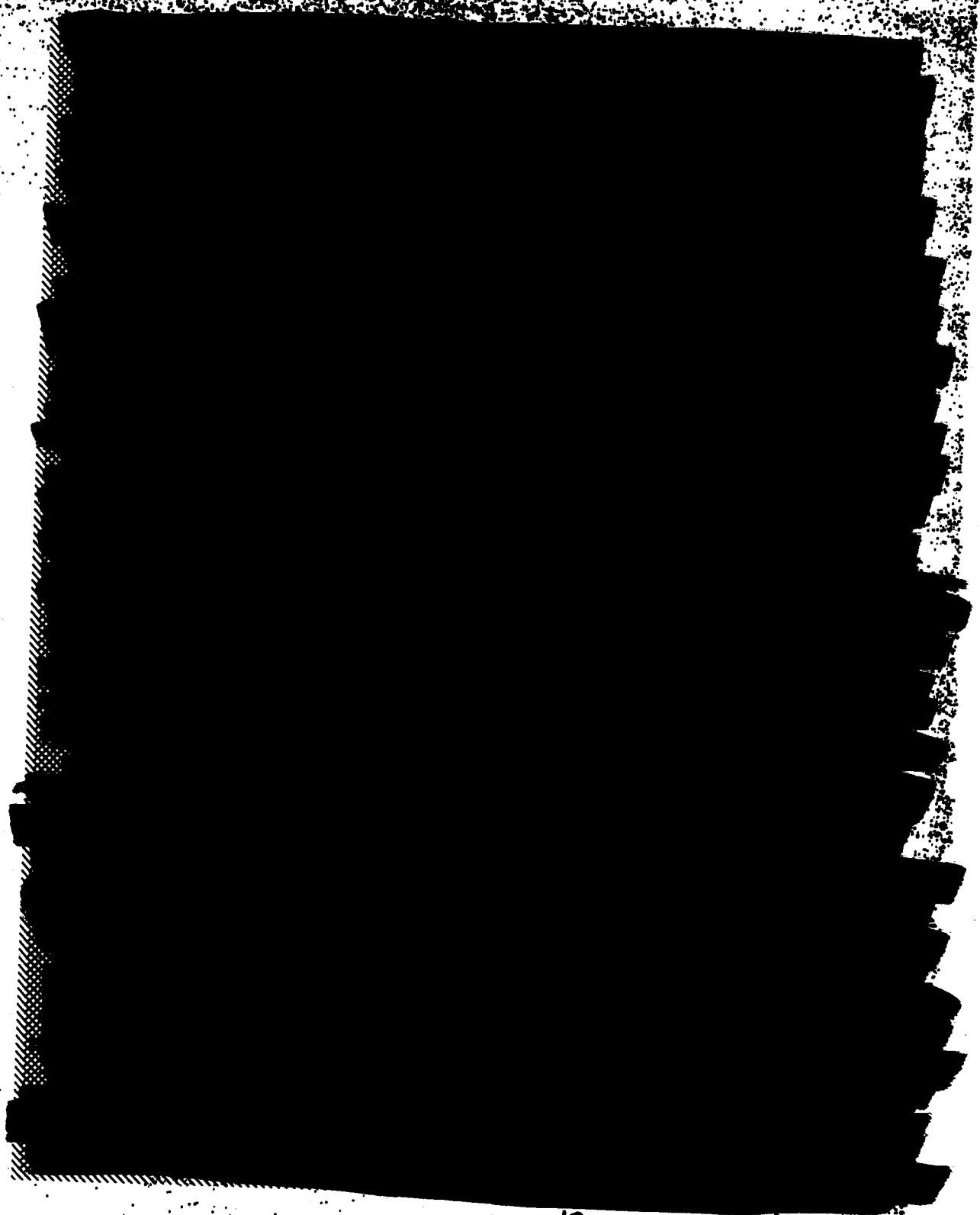
Since ARGON uses the same basic vehicle combination as the higher priority CORONA payload, there has been some competition between these two projects. Currently, no vehicles are available other than those shown on the schedule, and any change in the ARGON schedule must be at the expense of the CORONA-M schedule. As a result of steps taken last fall to schedule as many CORONA shots as possible, two ARGON flights were postponed, one until May 1962 and one until September 1962.

In addition to the three remaining scheduled launches, there are two additional ARGON payloads available as spares when and as vehicles become available.

[redacted]



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10. POPPY

Project POPPY is an electronic signal collection effort which is providing ELINT information through the use of an orbiting long-life signal repeater, reading out [redacted] The data are recorded in analogue form at the ground stations and returned to [redacted] for reduction.

The POPPY payload ball weighs approximately 100 pounds. It is flown at random, unstabilized attitude in a 500-mile orbit, and

[redacted]

Since 1960, five Scout-boosted launches of POPPY project devices have been attempted, of which only two have attained orbit. The first successful orbit was achieved in 1960, and provided data in the S-band for a period of more than six weeks. The second successful orbit was achieved in June 1961, and provided data in the [redacted]

Original planning provided for four launches during 1962, three of which would be launched using Scout boosters. Steps are being taken to provide for launch o[redacted]OPPY payload in November, using a Thor/Agena booster, in place of two of the Scout launches originally planned. [redacted]

It is anticipated that additional [redacted] launches will be accomplished during 1963.

11. [redacted]

[redacted]P-35) was initiated in August 1961, with the objective of

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providing daily cloud cover information of the area of interest in direct support of the forecasting activities which support the satellite reconnaissance program. The [redacted]ace vehicle weighs 100 pounds, and is spin stabilized in a 400-mile orbit. Expected useful life on orbit is 90 - 120 days. Through magnetic tape recording of a video image, vertical cloud cover pictures of about one-mile resolution will be provided to read-out stations at Vandenberg AFB and New Boston, N. H.

The firs[redacted]unch was accomplished on 23 May 1962 at PMR using the Scout booster. The launch countdown was extremely clean, with no problems encountered. After first stage separation and second stage ignition, the second stage exploded due to activation of the auto-destruct system. There is no previous history of this type failure with the Scout booster. Investigation is being continued although the exact cause has not been determined. The next payload is scheduled for launch on 7 July 1962.

Four launches are planned for this program. Exact scheduling of launches is dependent upon the orbital operational lifetime achieved by the preceding vehicle. After the first successful vehicle, subsequent vehicles will be launched only as required to assure continuous acquisition of target area cloud information with as little interruption as possible.

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LAUNCH SCHEDULE

As of 14 June, 1962

PHOTOGRAPHIC

		1962 J	J	A	S	O	N	D	1963 J	F	M	A	M	J	J	A	S	O	N	D
CORONA (Mural)	10-15' resolution	X	X	X																
	general search	X	X	X	X	X	X													
[redacted]	resolution [redacted] coverage	X	X	X	X	X	X	X	X			X	X	X	X	X	X		X	
LANYARD	5' resolution specific coverage								X		X	X	X	X						
[redacted]																				
ARGON	Geodetic coverage 350' resolution				X	X														

ELECTRONIC

		1962 J	J	A	S	O	N	D	1963 J	F	M	A	M	J	J	A	S	O	N	D
[redacted]																				
POPPY	Long-life, real time signal repeater						X													

WEATHER

		1962 J	J	A	S	O	N	D	1963 J	F	M	A	M	J	J	A	S	O	N	D
[redacted])	Weather coverage of area of interest		X				X			X										