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16 April 1958

MEMORANDUM FOR: GENERAL ANDREW J. GOODPASTER

Attached hereto is an outline of Project CORONA. This paper is the result of discussions with Mr. Roy Johnson and Admiral John Clark of ARPA; Mr. Richard Horner, Assistant Secretary of the Air Force for Research and Development; and General Osmund Ritland, Vice Commander, Air Force Ballistic Missile Division. It has been seen by Dr. James Killian.

The course of action proposed herein is satisfactory to these individuals and to their organizations, and is recommended by the Director of Central Intelligence.

/S/
RICHARD M. BISSELL, JR.
Special Assistant to the Director

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15 April 1958

PROJECT CORONA

1. Purpose: Project CORONA contemplates the covert development and subsequent operational use of a short-lived reconnaissance satellite from which, at the completion of its mission, a recoverable capsule containing exposed film is separated for return and pick up in a preselected ocean area. Prior to the initiation of this project, the development of such a system had been started by the Air Force as a part of Weapons System 117L but was officially cancelled early in March. Thus, CORONA involves the picking up and carrying through covertly of a program already undertaken together with technical modifications therein as indicated below.

2. Configuration: Taking advantage of arrangements already made by the Air Force, the basic vehicle for project CORONA will be a two-stage rocket consisting of the same second stage that is being built by Lockheed for WS-117L with a Thor booster as the first stage (in place of the Atlas booster which will be the first stage of the WS-117L vehicle). The payload will be a pod containing a twenty-four inch focal length camera and a recoverable capsule into which the exposed film feeds as the camera operates. Either the whole second stage of the vehicle, or possibly only the pod containing the payload, will be stabilized after it is in orbit and will serve as a platform from which the camera continuously looks downward to the earth and takes pictures by scanning at right angles to the path. This configuration is expected to yield a resolution of about twenty feet on the ground which should be sufficient to permit structures to be distinguished from one another and to allow the detection and identification of such major reconnaissance targets as missile sites under construction, previously unobserved communities, or other major installations in the areas hitherto inaccessible to reconnaissance such as the Soviet far north.

3. Program: It is proposed that twelve vehicles in the above configuration be produced. Although it has not yet been possible to establish a firm schedule of delivery dates, it appears probable that the first firing can be no later than June of 1959. It is tentatively planned to schedule firings initially at the rate of one a month but to achieve a faster rate, perhaps as high as two per month, as soon as possible. Assuming that this timing can be achieved,

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the twelve firings should be completed in the spring of 1960. It must be assumed that by no means all of these vehicles will be successfully orbited, operate without malfunction, and be recovered. At a later date it may be desirable to consider whether this program should be extended, with or without further technological improvement.

4. Modification of Earlier Plans: The configuration briefly described above differs from that contemplated in the program originally launched by the Air Force. The earlier plan called for spin stabilization of the pod containing the payload, a six inch focal length camera without image motion compensation, and a very short exposure time. Such a configuration could be available as much as six months sooner and would involve somewhat less technological risk (because of its reliance on a proven method of stabilization) than the one presently proposed. On the other hand, it would require the use of fast film which results in grainy photography and would yield a resolution of only sixty feet on the ground. To carry through the development of the original configuration and at the same time to undertake the development of the modified configuration in parallel would have obvious advantages but would add four or five million dollars to the total cost of the program and [redacted] complicate the problem of maintaining cover. [redacted] (a) that efforts should be concentrated on the development of the more sophisticated modified version and (b) that the earlier availability date of the original configuration does not justify the cost in terms of funds and effort of continuing its development in parallel with the modified configuration.

5. Administration: CORONA is being carried out under the authority of the Advanced Research Projects Agency and the Central Intelligence Agency with the support and participation of the U.S. Air Force. ARPA has authorized, and will exercise general technical supervision over, the development of the vehicle. Detailed supervision of vehicle development is being performed by the Air Force Ballistic Missile Division acting as agent for ARPA. The Ballistic Missile Division is responsible also for the provision of necessary ground facilities, which are in any case required for the WS-117L program. CIA is participating in supervision of the technical development, especially as applied to the actual reconnaissance equipment, is undertaking all procurement that must be handled covertly, and has general responsibility for cover and for the maintenance of security. In the operational phase actual missile launchings will be carried out at Cooke Air Force Base by technical

staffs of the companies concerned. Tracking will be carried out from stations being established by the Ballistic Missile Division. Recovery will be accomplished by a Navy task force. The line of command for these field activities of launching, tracking, and recovery will be through the Ballistic Missile Division. Subject to approval by the appropriate political authorities, the general schedule of launchings will be determined by the availability of vehicles and launching facilities. Specific timing within this schedule will be determined so far as possible on the basis of weather prevailing over target areas. For both cover and control purposes, weather will be reported through an already existing CIA channel and firing dates will be selected by the Central Intelligence Agency.

6. Cover and Security: As noted above the initial step taken to place this undertaking on a truly covert basis was the cancellation of the program already started by the Air Force as a part of its WS-117L development. The cover and security arrangements already made or contemplated are as follows:

a. [redacted]

b. Since actual missile firings attract public attention, a cover explanation will be required during the operational phase to explain plausibly the dozen or more launchings that will take place and the recovery operations which will be carried out by the Navy and will involve considerable numbers of Naval personnel. [redacted]

[redacted]

c. [redacted]

d. [redacted]

7. Procurement: Of the total procurement required for CORONA, as large a proportion as possible will be handled relatively overtly as a part of the WS-117L and other programs. In accordance with this general plan, both the Thor booster, which is produced by Douglas for a number of military application, and the Lockheed second stage vehicle, which (as noted above) is

being developed for WS-117L, will be procured by the Air Force. The Thor boosters will be allocated from a group of deliveries already earmarked for certain miscellaneous Air Force programs (including re-entry tests and biomedical programs). The second stage vehicles will be allocated from production already scheduled for the WS-117L program. Only the pods containing reconnaissance equipment and the recoverable film cassettes will be procured covertly by the Central Intelligence Agency. Production of only the covert items will be compartmented in the several companies. The responsibility for systems integration and final assembly will rest with Lockheed. Arrangements are being made which will permit Lockheed's production, testing, and the bulk of its check-out activities to be compartmented and securely carried out up to the moment when the reconnaissance pod is substituted for a biomedical or instrumented nose cone payload.

8. Financing: The total cost of the program herein outlined, assuming that it will be limited to twelve vehicles, is estimated at approximately [redacted]

a. Of this amount, covert procurement of the payload would account for approximately seven million dollars as follows:

Recoverable Capsules Cameras Payload Pod and assembly costs	[redacted]
TOTAL	7.0 million dollars

It is proposed that these costs be financed by the Central Intelligence Agency, subject to obtaining the funds from the Agency's reserve.

b. The largest part of the [redacted] total represents the cost of the Thor boosters and the Lockheed second stage vehicles. A rather arbitrary allowance of [redacted] per completed vehicle has been included for these items which therefore account for [redacted] dollars of the total. Since these will be procured in connection with other programs, as noted above, they will be financed in the same way as these other programs. For the most part they will be financed by ARPA through the Air Force as elements of the WS-117L and biomedical programs. There is some question, however, concerning the allocation of the cost of

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Thor boosters. In any case the whole cost of the basic vehicles will be funded within presently approved programs.

c. In addition to the foregoing costs for development and procurement of hardware there will be significant operational costs. Moreover certain ground facilities, including especially two new launching pads at Cooke AFB and certain tracking facilities, will be built sooner than they would otherwise be needed. It would be difficult to make a meaningful estimate of costs of this character properly chargeable to CORONA and no such estimate has been attempted. The ground facilities required for CORONA would in any case be needed for WS-117L. Certain operational costs may properly be treated as developmental costs for WS-117L and certain operational costs (for example part of the cost of search and recovery) are not truly additional costs since they represent the use of military resources already in being. These costs must in any event be charged to other programs for reasons of cover and will be absorbed by these programs.

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Richard M. Bissell, jr [redacted] (15 Apr 58)

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