NRP A-4-b

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~

(S) NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

14 00060448D

THE NRO STAFF

July 18, 1968

MEMORANDUM FOR DR. FLAX

SUBJECT: Report to the President's FIAB on the NRP

We have attached for your review and approval the final draft of a report covering the activities of the NRP for the period January 1 to June 30, 1968.

We have prepared for your signature two letters of transmittal -- one to Mr. Coyne for the President's FIAB (Tab A) and one for Mr. Nitze as has been the custom (Tab B).

William R. Yost
WILLIAM R. YOST
Lt Colonel, USAF

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO________
COPY____ OF____ COPIES
PAGE____ OF____ PAGES

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~1ST~~ NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 19, 1968

Dear Pat:

The attached report to the President's FIAB covers our Program and activities during the period January 1 to June 30, 1968.

Alexander H. Flax

Attachments
BYE 13235-68
(Copies 1 and 2)

Mr. J. Patrick Coyne
The President's Foreign
Intelligence Advisory Board
Washington, D.C.

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO_____
COPY_____OF_____COPIES
PAGE_____OF_____PAGES

~~TOP SECRET~~

HANDLE VIA
BYEMAN
CONTROL SYSTEM

NATIONAL RECONNAISSANCE OFFICE
WASHINGTON, D.C.

OFFICE OF THE DIRECTOR

July 19, 1968

MEMORANDUM FOR THE DEPUTY SECRETARY OF DEFENSE

SUBJECT: Report to the President's Foreign Intelligence Advisory Board (President's FIAB)

Each six months, we submit to the President's Foreign Intelligence Advisory Board a report of NRP activities. The distribution of copies of the Report is limited to those for the FIAB and one for each of the members of the NRP Executive Committee.

We have just submitted the Report covering our activity during the period January 1 to June 30, 1968. Your copy of this Report is attached.

Alexander H. Flax

Alexander H. Flax

Attachment
BYE 13235-68
Copy 3

HANDLE VIA
BYEMAN
CONTROL SYSTEM

~~TOP SECRET~~
EXCLUDED FROM AUTOMATIC REGRADING
DOD DIRECTIVE 5200.10 DOES NOT APPLY

CONTROL NO_____
COPY_____ OF_____ COPIES
PAGE_____ OF_____ PAGES

V. RESEARCH AND DEVELOPMENT

This section describes the major research and development activities and significant study effort being conducted within the National Reconnaissance Program.

HEXAGON: The McDonnell-Douglas Corporation was announced in May 1968 as the contractor which had been selected to build the HEXAGON reentry vehicles. Work is proceeding under letter contracts, and it is expected that the negotiations for the definitive contract will be completed and the contract signed by November 1968.

Also in May, the ITEK Corporation was announced as the contractor which had been selected to build the HEXAGON Stellar and Terrain Camera. This announcement was made after a decision on May 20, 1968 that the HEXAGON system would incorporate a 12-inch focal length terrain and stellar camera subsystem. The first flight of this particular subsystem is now planned for the seventh vehicle; the initial six flights will operate with the primary mission camera only. Studies concerning the integration of the Stellar and Terrain Camera film into the recovery vehicles, and the mounting of the Stellar and Terrain Camera in the Satellite Basic Assembly are now underway.

The definitive contract for the Sensor Subsystem development

and first six units was signed in June 1968. The contractor's engineering personnel have moved into the new Perkin-Elmer facility, and the shop and test areas are now being checked out. The large thermal vacuum chamber has been pumped down during functional tests, and it is scheduled to be operational in January 1969. The complete Sensor Subsystem was reviewed in detail during a preliminary design review completed in February, and the contractor, Perkin-Elmer, was given the approval to proceed.

WESTON: The results of the definition phase of this program, reported previously, were analyzed during this reporting period. It was concluded that Hughes Aircraft Corporation would be the prime contractor for the system development and that certain elements of the system would be redefined to enhance system performance. Accordingly, a two month redefinition phase was initiated in April 1968.

AQ-12 (TAGBOARD) Drone Aircraft: The test flight program for the TAGBOARD drone was continued during this period.

On June 16 the first fully successful near-nominal range flight of the TAGBOARD since reorientation of the program from launching by an OXCART-type aircraft to a B-52 launching with rocket boost to cruising altitude and speed was accomplished. The launching was over the Pacific Missile Range and was without incident. The drone profile was approximately 400 nautical miles down range and then into a circular course around the tracking ship at a constant 3.25 Mach for a total distance of 2,824 miles. The entire flight was as programmed with the drone attaining an altitude of 91,000 feet even though it was in an almost

continuous turn. Preliminary instrumentation indicated sufficient fuel remained for an additional 300 miles. The total drone flight time was 90 minutes, 46 seconds.

As a result of deficiencies shown in previous flight tests, several modifications were made to improve the system reliability. The key difficulty that had been encountered was the failure of the ramjet engine to achieve stable cruise operation at the end of the rocket boost. The fixes to the inlet spike and modifications to control and initial operating limits which have been made and incorporated in the vehicle used in the June 16 flight have apparently solved these problems. The inlet spike change involved a substitution of metal for the radar-absorbing plastic used previously. The effect of this change on the radar cross section and vulnerability of the drone is currently being reevaluated.

Frequency Agility Efforts: In consonance with the requirement for directed coverage of specific [redacted] related radars, a special purpose module is being added to the STRAWMAN spacecraft. This add-on module will independently [redacted] capabilities of these radars, and will provide wide-band pre-detection signals to the STRAWMAN recorder for detailed analysis purposes.

In addition to the effort directed to these particular types of [redacted] radars, studies have been initiated to address the more general problem of intercept and data processing of [redacted] radar signals.

Film and Processing Developments: A new aerial negative film, which is comparable to the best current emulsion, 3404, has been developed. This new film, with a speed approximately twice that of 3404, should result in the extension of on-off camera limits at low sun angles and permit better systems resolutions with higher effective shutter speeds. The new film is classified as SO-230 on thin base and SO-205 on ultra-thin base.

A study of color processing methods and the application of various color materials for potential use in satellite reconnaissance systems has been completed. Significant results include:

a. the demonstration of a high degree of processing uniformity, previously unmatched in deep tank processing of wide-web color materials, through the use of special high temperature formulations and submerged spray agitation -- particularly significant in a search for a shorter processing cycle;

b. a possible method for extending the effective exposure latitude

of Ektachrome-type color films through interrupted processing adjustment with a viscous secondary developer.

Two new developments -- bi-spectral photography and ultra-thin base (UTB) film -- were evaluated on Mission 1103 (CORONA). Twenty-five satellite traverses across the Soviet Bloc were devoted to the bi-spectral mode of observation. Approximately 12, 600 feet of black and white film were exposed through a red filter on the forward camera and a green filter on the aft camera. The photography is viewed in a mode referred to as "bicolor," a pseudo color generated from only two colors of the spectrum. First reports of the intelligence value of the bicolor experiment are expected in mid-August.

The bi-spectral test was conducted to ascertain whether the characteristic yellow color of smoke, dust, and waste areas found at uranium ore concentration plants and nuclear production and test facilities was readily detectable. If successful, bi-spectral photography will enable more rapid resolution of existing uncertainies in our intelligence knowledge regarding the products and production rates of certain nuclear facilities and attempts to camouflage military installations.

The ultra-thin base (UTB) film evaluation was conducted to prove the operational capability and, thus, the increased efficiency of using

a film which is only two-thousandths of an inch thick. This enables the satellite to carry 50 percent more film per mission. A preliminary evaluation has adjudged this new film satisfactory with no degradation of photographic quality.