~~TOP SECRET~~

LIMITED DISTRIBUTION

10 JUN 1959

MEMORANDUM FOR THE RECORD

SUBJECT: Project CANES

1. On 2 June, [redacted] of ARPA and [redacted] of OSO/OSD briefed me on Project CANES, which is to replace Project TATTLETALE. They described steps being taken to kill TATTLETALE and establish a new project in order to limit knowledge of what was being done. They wish to secure DCI concurrence in the project in order that they could go forward to the President for permission to allocate the funds necessary for the building of two satellite packages and necessary modification of the TRANSIT vehicles to carry them. As the two firings were presently scheduled for March and May 1960, it was necessary to secure Presidential approval immediately in order that the necessary construction and conversion work could be done. 50X1

2. [redacted] stated that clearance into Project CANES would be done only on an absolute requirement to know and that the names of those cleared must be recorded in ARPA. I secured permission to clear the AD/SI, the DD/P, the DD/I, the DDCI and the DCI. 50X1

3. It was apparent that before going to the Director this proposal would have to be cleared with Mr. Bissell. Dr. Scoville and I met with Mr. Bissell at 4:30 on 3 June, briefed him on the proposal and discussed its possible implications for the Agency. Mr. Bissell agreed that he would look into the latter aspect and would advise the Director.

4. It was further agreed with Mr. Bissell that a written proposal to the DCI should come from ARPA via General Erskine's office. The following morning I transmitted this information to [redacted] at ARPA. 50X1

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SUBJECT: Project CANES

50X1

5. On 8 June, [redacted] of OSO/OSD and [redacted] of 50X1
ARPA delivered to me a Top Secret, Limited Distribution letter to the DCI describing the project in some detail and requesting DCI concurrence. During that day, both Mr. Bissell and Dr. Scoville had had an opportunity to discuss the matter generally with the DCI. At 4:30 I met with the DCI and went over the ARPA memorandum and General Erskine's covering letter with him. He approved the project and said that he would speak to General Erskine about it just before or just after the USIB meeting on 9 June. We agreed at that time that unless ARPA requested a written reply the matter would be handled verbally by General Erskine. I today received a call from [redacted] saying that the conversation did take 50X1
place yesterday between the DCI and General Erskine, that the DCI's concurrence in the Project had been noted by memorandum on the OSO copy of the correspondence, and that no written confirmation from CIA would be necessary. 50X1

[redacted]

Deputy Assistant Director for Collection
Scientific Intelligence

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

COVERING BRIEF

JUL 1 0 1959

TO: The Secretary of Defense

FROM: The Director, Advanced Research Projects Agency

Problem: To request approval of an electronic reconnaissance satellite project (CANES). ~~(TOP SECRET)~~

Background: In a memorandum to the Director, Advanced Research Projects Agency, dated March 9, 1959, the Assistant Secretary of the Navy (Material) forwarded a proposal to ARPA for a relatively inexpensive electronic reconnaissance satellite system, designated as Project TATTLETALE. The proposed Navy ferret system is designed to collect electronic intelligence (ELINT) in the 2600-3250 megacycle "S" band of frequencies from the interior and infrequently covered maritime regions of the Soviet Union. The acquisition of such information will furnish both the level of Soviet electronic activity in the "S" band and the general location of certain priority electronic equipments. Such data will fulfill a long standing national intelligence requirement.

Discussion: As presently proposed, the system consists of a 25-pound payload which may be incorporated as an integral unit in ARPA's navigation satellite program (Project TRANSIT), which already is being developed under a contract with the Navy's Bureau of Ordnance. The CANES package, to be carried "pickaback" in two navigation research satellites, will collect and relay data to portable receiving equipment at existing overseas ground intercept stations. Data processing will be accomplished locally at the National Technical Processing Center of the National Security Agency.

On the basis of a number of months of technical evaluation, the Countermeasures Branch of the Naval Research Laboratory, which will have responsibility for detailed CANES development, has indicated that "on shelf" equipments may be utilized and that no significant engineering problems are anticipated. The design criteria include solar batteries which, on the basis of the VANGUARD program, will provide a predicted life in excess of one year. This factor of utilizing demonstrated components and existing hardware

is attractive in that the SENTRY (now designated as Project SAMOS) reconnaissance system has certain features which have yet to be proven.

NRL believes it can develop the CANES unit in time for the first polar orbit launching of TRANSIT II A from Vandenberg Air Force Base in March, 1960, provided that early approval to proceed is obtained. A polar launching is required to obtain the desired 70-degree orbit coverage of the USSR. A second package will be available for TRANSIT II B, tentatively scheduled for launching in May, 1960.

Only two CANES units are planned, so that the project will be interim in nature and will terminate with the second flight. The tentative firing dates of March and May 1960 may be subject to change because of possible conflicts in the availability of launching pads at Vandenberg.

50X1

If the 400-mile TRANSIT orbit stabilizes as planned, it will not be necessary to trigger the CANES portion of the satellite for several weeks, or even months unless earlier collection of ELINT data is desired. Such a feature provides considerable tactical flexibility as to when and how often the package is used to acquire ELINT, and also enables selective or delayed use of the system in conjunction with other satellite reconnaissance systems such as SAMOS. In addition, the device could be triggered over the United States for R & D, or checkout purposes.

Under current planning concepts, the satellite will be triggered on a secret frequency from the [redacted] 50X1 50X1 It then will pass over the Soviet Union where it will be illuminated by high powered Soviet search radars such as the GAGE and TOKEN. One or more of the overseas ELINT ground facilities, such as those available in [redacted] 50X1 50X1 will be used for intercepting data from the satellite.

The possibility exists that the transmissions of the ELINT intercept may be monitored by the USSR. But while the Soviets may have knowledge that the satellite is obtaining information, it is NRL's opinion that it will be extremely difficult, if not almost impossible, to jam the package. Further, the signal transmitted from the vehicle will involve pulse modulation, and thus will have some "coding" features. Also, it is possible to make changes in the frequency for triggering and interception up to shortly before launch. In this connection, it is the view of the intelligence community that even passive collection devices may be detected. Nevertheless, intelligence feels that a reasonable risk of exposure is warranted in view of the urgently needed information which the system is intended to collect.

The estimated cost of the CANES package is $700,000, of which the Navy already has allocated $375,000. ARPA will furnish the remaining $325,000. The cost of processing intercepted ELINT data will be borne by the intelligence community.

ARPA will be responsible for over-all management of the project as an integral part of TRANSIT, with the Navy and the intelligence community in charge of development and such operations as are peculiar to the CANES package. The Air Force Ballistic Missile Division will be responsible for launching the parent navigation satellite and other development aspects inherent to the booster components.

The receipt of this proposal in ARPA raised a number of questions, some of which already have been answered. Primary among these problems was the possible compromise of the U.S. ability to fly the more sophisticated SAMOS reconnaissance satellites, presently slated for first launching in April, 1960; the value of the potential intelligence, and the technical feasibility of the proposal. In regard to the last question, it is ARPA's judgment that the CANES system has no unsurmountable development problems and that it will not interfere with present planning for the navigation satellite program.

With respect to problems in the intelligence area, the Assistant to the Secretary of Defense (Special Operations) has urged, on the basis of various intelligence recommendations such as one by the ELINT Committee of the USIB, that ARPA proceed with this proposal because it significantly could increase critical intelligence on Soviet defenses and technological development. The Director of Central Intelligence also has been advised of the project in a detailed memorandum, and has given his approval to proceeding with it.

In addition, the intelligence community feels that this proposal is a complement to, and not a substitute for SAMOS because of this system's simpler mechanism and different orbit. Also, intelligence believes that the information obtained from the interior and isolated areas of the USSR by the two CANES flights will be of considerable utility in appraising the electronic results of SAMOS. For example, the data obtained by CANES is estimated to cover a very broad area of several thousand square miles. This coverage will form a needed matrix for determining the general location and certain overall signal characteristics of the specific electronics equipments and sites which SAMOS is being programmed to collect. Furthermore, the proposed project offers a partial back-up for the SAMOS electronics payload in event that the latter system is delayed or restricted for technical or other reasons.

A completely covert program is planned for CANES in order to avoid political repercussions and undue publicity. Because of the fact that CANES will be developed and integrated into the navigation satellite entirely within Navy-controlled laboratories, it is believed that persons having access to this program during the planning phase can be restricted to a very limited number without difficulty.

Agreement has been reached with the Navy to use a galactic radiation experiment as an unclassified scientific cover. The experimental galactic package, which will be incorporated, in turn, as a pickaback unit within CANES, will itself collect scientific data for NRL. The tentative short title of the scientific unit will be GREB (Galactic Radiation Experiment Background).

Implementation: To date, preliminary planning for CANES has been coordinated by ARPA with the Under Secretary of the Navy, the Assistant to the Secretary of Defense (Special Operations), the Director of Central Intelligence, and the Director, National Security Agency, and selected members of their respective staffs.

In addition, ARPA has transmitted a memorandum which disapproved the Project TATTLETALE proposal to the Under Secretary of the Navy. The purpose of this action was to remove the name, TATTLETALE, which was suggestive of the real intent of the system and which had received wider discussion as a proposal than was believed justified for a sensitive intelligence project.

If the President approves of proceeding with the development and planning phases, ARPA will go ahead with the following actions on a strictly need-to-know basis:

1. Implement, with the Department of the Navy, arrangements for technical development and an appropriate cover plan for including CANES in the parent navigation satellite. Collaboration with NSA and other intelligence agencies will be effected as required.

2. Implement funding and related procedures with the Navy Department and the intelligence community.

3. Prior to launch, prepare correspondence for the Secretary of Defense in order to obtain White House approval to include the CANES unit in the navigation satellite.

The Department of the Navy and OSO/OSD will maintain lists of individuals within the Navy and intelligence community, respectively, having access to the real objective and planning for this project. A coordinated master list of cleared individuals will be maintained by ARPA.

Recommendation: That you sign the attached letter to the President (Tab A).

Roy Johnson

Letter is next in sequence — dated 18 Aug 59

~~TOP SECRET~~

THE SECRETARY OF DEFENSE
WASHINGTON

AUG 18 1959

Dear Mr. President:

We have re-examined, in the light of your questions, certain aspects of the CANES project sponsored by the Advanced Research Projects Agency and recently proposed for development approval by the Department of Defense.

First, the members of the U. S. Intelligence Board, representing CIA, the State Department, Defense, and the three military departments, subscribe, with one exception, to the view that the intelligence to be gained from the project is well worth its relatively modest cost. The CANES device would transmit signals from Soviet radars and other electronic equipment operating anywhere in the USSR, whereas now, from either ground-based or airborne receivers, only those radars established near the Soviet borders can be heard and identified. Even though other much more comprehensive programs for electronic intercept from satellites are planned, including one, the Air Force SAMOS, which is scheduled also to begin in 1960, the majority of the Intelligence Board members feel that this early try is useful to the development of this new field of intelligence collection. They consider that CANES does not duplicate the larger SAMOS project and will in fact provide additional intelligence. They further feel that the risk of detection of the project by the USSR is slight.

The opposed view by the Air Force is that this project is duplicative in coverage to the already programmed SAMOS project; and that this project, programmed to be lofted in TRANSIT II, is contemporaneous with SAMOS. TRANSIT II is scheduled to be fired in March 1960 and to remain aloft one year. SAMOS vehicles are to start in April 1960. Thus for eleven of its twelve months' life CANES parallels and duplicates SAMOS. If CANES does not succeed in TRANSIT II and is lofted by TRANSIT III it would be scheduled well after the beginning of SAMOS.

As to the scientific view of the project, the Defense Director of Research and Engineering considers that, while the technical advancement represented by CANES is not very great and would not warrant the expense of a separate launching, it is well worth the much smaller cost of being included as a package in an already approved vehicle.

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The possibility that the retransmitted signals from CANES would be detected and identified in the USSR has been examined with particular care. Detection by electronic search and intercept of the signals would require much more powerful and sensitive equipment than that normally used in intercept by this country, and even then the chances of hearing the briefly audible signals would be about one in a hundred. Unusual efforts are being made to hold knowledge of the project to a limited few, particularly the transmitting frequency to be employed. Administrative control will be vested exclusively in ARPA, and all construction, logistics, and operations in the project can be carried on exclusively within the Navy and within the National Security Agency. The Department of Defense considers, therefore, that detection would be extremely unlikely.

In the event, however, that the device was detected and its general purpose ascertained, the Secretary of State believes that its employment would be very unlikely to harm the United States' relations with the Soviet Union.

The Secretary of State thus recommends that the project be approved with the proviso that periods during which the device obtains and transmits data be subject to approval by the President on the recommendation of the Secretary of State.

The project is therefore submitted again for your approval. I should be glad to answer any further questions you may have.

With great respect, I am

Faithfully yours,

The President

The White House

~~TOP SECRET~~

Office Memorandum • UNITED STATES GOVERNMENT

TO : General Goodpaster

DATE: August 20, 1959

FROM : Dr. Kistiakowsky

SUBJECT: Project CANES

Since our last discussion of this matter, I had a briefing and two conversations with knowledgeable people. My present conclusion is that the project is of no overwhelming value, but may provide useful information, and since Project SAMOS will probably be delayed, this information will come at an opportune time. The project could not be embarrassing under the worst possible circumstances, i.e. some electronic breakdown, until the President issues a specific authorization, which could be postponed until the spring of 1960. When such authorization is given, the degree of conceivable embarrassment would be very slight, about commensurate to the value of information obtained, and is not likely to happen in any case.

The cost of the project apparently will be well below half a million, if the approval is given now, so that no air transportation of components is involved, etc. I understand these funds are available, but of course I can't be sure that it will not sprout new offshoots.

My present position is a recommendation to approve, but not a strong one. I do not think that failure to grant approval will hurt our interests seriously.

~~SECRET~~

TOP SECRET

THE SECRETARY OF DEFENSE
WASHINGTON

Dear Mr. President:

The Advanced Research Projects Agency, in conjunction with the Department of the Navy, proposes an interim electronic intelligence collection capability which can be accommodated in the Department of Defense's navigation satellite development program. This proposal, which employs existing electronics components and requires minimum additional research, has the capability to obtain critical intelligence on Soviet defenses and technological development in an inexpensive and reliable manner.

The system, tentatively designated as Project CANES, has been coordinated with the Director of Central Intelligence, who has expressed his approval. It provides for a collection capability at an earlier date than that provided in SENTRY (recently redesignated as Project SAMOS). The planning envisions a completely covert program, thus avoiding political repercussions and undue publicity. Further, the system has several operational safeguards to reduce interference and to provide considerable flexibility for decision as to its use.

The Department of Defense and the intelligence community believe that this proposal is a complement to, and not a substitute for the SAMOS satellite system, and that it offers an early opportunity to check assumptions relating to the latter system at very low cost. It also will provide a significant intelligence input.

The estimated cost of the proposal is $700,000, of which the Navy Department already has allocated $375,000. The Department of Defense is prepared to fund the remaining $325,000 from money available to ARPA.

Your approval to proceed with the technical development and planning is respectfully requested. It is, of course, understood that your approval will be required before the actual launching occurs.

Thomas S. Gates

Approved

TOP SECRET

~~TOP SECRET~~

August 24, 1959

MEMORANDUM FOR

THE SECRETARY OF DEFENSE

I hereby approve the project recommended in your memoranda to me of 13 July and 18 August for inclusion of an electronic intelligence device in each of two planned satellite firings.

This approval highlights the need for a control organization within the Defense Department to provide effective and unified operational control and coordination of these and other satellite devices designed to serve operational purposes. I understand that you are studying this matter and I look forward to considering with you a plan for such an organization.

Dwight D. Eisenhower

~~TOP SECRET~~

~~TOP SECRET~~

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THE SECRETARY OF DEFENSE
WASHINGTON

April 27, 1960

Dear Mr. President:

By memorandum dated August 24, 1959, you approved the inclusion of an electronic intelligence collection device in each of two planned satellite firings. This memorandum was in response to Department of Defense memoranda dated July 13 and August 18, 1959 which furnished you with information concerning the proposed interim electronic capability (Project CANES) which was undertaken by the Advanced Research Projects Agency in conjunction with the Department of the Navy.

As was pointed out in my July 13, 1959 memorandum, the Department of Defense and the intelligence community believe that this system is a complement to, and not a substitute for the SAMOS (formerly known as SENTRY) satellite system. It is believed further that the information obtained from the interior and isolated areas of the USSR will be of considerable utility in appraising the electronic results of SAMOS.

The technical development of Project CANES has now been completed. While it was originally planned to loft this payload in April of this year on TRANSIT II (Navigational Satellite), slippage in that program has caused a delay. It is now proposed to loft Project CANES on TRANSIT IIA currently scheduled to be launched from the Atlantic Missile Range on May 18, 1960.

As you were previously advised, the system has several operational safeguards to reduce interference and to provide considerable flexibility for decision as to its use.

50X1

CANES will be read out at one or more of our currently established overseas ELINT ground facilities. For test purposes the system has the capability of being triggered and read out over U.S. territory. As pointed out in our August 18, 1959 memorandum, the possibility that the retransmitted signals from CANES can be detected and identified in the USSR has been examined with particular care. The Department of Defense considers that detection would be extremely unlikely.

Regraded to
by Letter 5/5/60

~~TOP SECRET~~

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To allow for an additional margin of safety, we propose, unless there are political objections and you instruct us to the contrary, that after TRANSIT IIA is launched on May 18, 1960, to wait until June 1, 1960 before testing the CANES transmitter. In the event there is a slippage in the May 18 date, we further propose to allow a period of 14 days to pass after launch before activating and testing CANES. It will be tested first over Hawaii for a 30-40 second period. Thereafter, if found to be operational, we further propose to activate the transmitter from time to time as intelligence requirements dictate, on a carefully thought-out basis. In no event will the transmitter be activated operationally before June 20, 1960.

This letter has been coordinated with and concurred in by the Director of Central Intelligence and the Department of State.

If you approve the actions proposed above, we will proceed accordingly.

With great respect, I am

Faithfully yours,

signed

D.E.

The President

The White House

May 5, 1960

Approved; with proviso that periods of activation over the Soviet Union are subject to further approval by the President.

Dwight D. Eisenhower

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~~TOP SECRET~~

~~T O P S E C R E T~~

PROJECT CANES AGREEMENT

I have been briefed concerning Project CANES and I certify that I fully understand the import of this briefing. I further certify that I am now knowledgeable in a highly classified area of the utmost importance to the security of the United States.

I understand that access to information concerning any aspect of this program is limited to a strict "need to know" basis and that approval for access thereto can only be given by responsible officials of the Advanced Research Projects Agency, the Office of the Special Assistant to the Secretary of Defense (Special Operations), and the Office of Naval Intelligence.

In view of the above, I do hereby agree and declare on my honor that I will not discuss with or disclose to any person, regardless of his official capacity, position or status, any information relating directly or indirectly to Project CANES, which comes to my attention, unless that person is authorized to receive, discuss, and/or handle same. I fully realize that the responsibility for determining that such authorization is valid and current rests solely with me.

I further understand and agree that this agreement is of a continuing nature and is binding upon me even in the event of a change in my status, wherein I would no longer have a "need to know".

Fully realizing the import of all of the above, I hereby accpt the responsibility to handle information concerning this project in accord with all security rules established.

Witness	Signature
Date	Organization
	Date

~~T O P S E C R E T~~

~~TOP SECRET~~

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THE SECRETARY OF DEFENSE
WASHINGTON

6

July 20, 1960

Dear Mr. President:

Under date of April 27, 1960 I advised you that the technical development of an electronic intelligence detection device (Project CANES) had been completed. In that same letter, I requested permission to test this project over U. S. territory and if successful, to activate the transmitter from time to time over the Soviet Union as intelligence requirements dictated.

Under date of May 5, 1960 you approved my request with the proviso that periods of activation over the Soviet Union were subject to further approval by you.

For your information, Project CANES was lofted on TRANSIT IIA (navigational satellite) on June 23, 1960. Project CANES was tested from a Hawaii site on July 6, 1960 and was successful in surveying "S" band radar sites on the West Coast of the United States.

With your permission, we would now like to initiate a series of tests over the Soviet Union. If you agree, we propose to trigger Project CANES on 12-15 passes over the Soviet Union during the course of a two- to four-weeks period of time. The passes used would be on a carefully selected basis which would give the optimum coverage necessary to obtain the best intelligence possible with maximum security to the project. It is planned further that after the completion of this phase, to leave Project CANES dormant until a complete analysis of the results can be made. The Central Intelligence Agency and Secretary of State Herter concur in this proposal.

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If you approve the proposed actions, we will proceed accordingly.

With great respect, I am

Faithfully yours,

The President

The White House

Approved: /s/ D.E.

July 25, 1960

28 July 60

[redacted] will check by phone with State, CIA and me before each "turn-on" —

D.

50X1

~~TOP SECRET~~

THE SECRETARY OF DEFENSE
WASHINGTON

August 18, 1960

Dear Mr. President:

A summary of progress on the Military Space Projects during March, April, and May 1960 is attached.

During the subsequent period to date, the following events of interest have occurred.

DISCOVERER XIII was launched from Vandenberg Air Force Base and successfully placed into orbit on 10 August 1960. On 11 August, a highly-instrumented data capsule was ejected from the satellite on its 17th orbital pass and was retrieved from the water in the Pacific Ocean recovery area by a helicopter from an on-station recovery ship. Tracking stations reported continuous bearings on the capsule during its half-hour descent and aircraft reported visual sighting of the capsule in the water. Cloud cover apparently prevented airborne recovery. This is our first successful recovery of a data capsule from an orbiting satellite.

DISCOVERER XII was launched from Vandenberg Air Force Base on 29 June. The powered flight trajectories of the THOR booster and AGENA second-stage vehicles were normal. A malfunction, however, apparently occurred in the horizon scanner which resulted in a pitch down attitude and caused the satellite vehicle to re-enter the atmosphere.

[redacted]

The SAMOS and MIDAS Projects are, in general, on schedule and are progressing satisfactorily.

TRANSIT 2A was launched into orbit from the Atlantic Missile Range on 22 June using the THOR-ABLE STAR launching vehicle combination. The TRANSIT 2A satellite carried a Naval Research Laboratory radiation satellite as a pick-a-back package. In-orbit separation of the two payloads was successfully accomplished. This is the first time that two satellite payloads have been placed into orbit by one launching vehicle. All experiments in the satellites are functioning properly and extremely useful data are being obtained for further development of the satellite navigational system.

With great respect, I am

Faithfully yours,

Signed
THOMAS S. GATES

Attachment

The President

The White House

~~SECRET~~

SEC DEF CONT NO. S-736

SUMMARY

DISCOVERER PROJECT (Research and Development Satellites)

DISCOVERER XI was launched from Vandenberg Air Force Base on 15 April. The powered flight trajectory of the THOR-AGENA launching vehicle and orbital injection were excellent. All program objectives were attained with the exception of capsule recovery. Successful recovery was prevented by capsule ejection on a higher than nominal re-entry trajectory. Intensive testing of recovery system components has been initiated to provide maximum probability of successful recovery on future flights.

All AGENA "A" vehicles and the first AGENA "B" vehicle were delivered during March.

The construction contract for the Vandenberg Air Force Base propellant storage and disposal facility was awarded in April with completion scheduled for September. The conversion of launch pad 5 at Vandenberg Air Force Base to AGENA "B" capability has been started.

SAMOS PROJECT (Reconnaissance Satellites)

Systems checks of the second-stage AGENA vehicle for the first SAMOS flight in September are nearing completion with delivery to Santa Cruz Test Base scheduled for June. The vehicle will be the first of three to carry a dual visual-ferret payload.

Subsystem testing of the first visual (photographic) payload has been completed successfully and payload AGENA capability established. The optical glass for two of the 66-inch, f/5 lenses for the visual recovery system (E-5) payload has been delivered from West Germany.

Subsystem tests of the first two ferret reconnaissance system payloads were completed in March. The first electromagnetic ferret payload was aligned with the visual component test payload and the dual package was installed in the AGENA vehicle. Systems testing of the complete installation was started in March.

The missile assembly building at Vandenberg Air Force Base was completed during March 1960. Construction was started on the technical support and laboratory buildings.

At Point Arguello, launch pad 1 was completed in March and launch pad 2 was completed in May. The construction contract for the launch technical support buildings was awarded in April.

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MIDAS PROJECT (Very Early Warning Satellites)

The second MIDAS flight test vehicle was launched successfully from the Atlantic Missile Range on 24 May. Orbital performance was outstanding. A total of thirty minutes readout time was recorded during the first two passes.

Preliminary planning and design work was authorized in support of two additional MIDAS flights using THOR/AGENA vehicles obtained from the DISCOVERER Program.

A study is being made of the feasibility of extending MIDAS operational system capability to provide world-wide coverage.

Procurement has been authorized for a third Programmable Integrated Control Equipment (PICE) unit as part of the interim MIDAS equipment at the New Boston, New Hampshire tracking station. This unit will be similar to the PICE units at the Satellite Test Center and at Vandenberg Air Force Base.

Construction of the Vandenberg Air Force Base data acquisition and processing building was essentially complete in May and ready for installation of technical equipment.

TRANSIT PROJECT (Navigation Satellites)

TRANSIT 1B was launched into orbit on 13 April 1960 by a THOR-ABLE STAR vehicle from the Atlantic Missile Range. TRANSIT tracking operations and analysis of telemetered data indicate that the operation of all equipment is normal.

The third attempt to perform a TRANSIT-on-DISCOVERER experiment was successful in the launching of DISCOVERER XI satellite into orbit on 15 April. The TRANSIT equipment is performing well.

All seven TRANSIT receiving stations began tracking TRANSIT 1B satellite from the time of its launch. These stations also began tracking TRANSIT-on-DISCOVERER with the launch of DISCOVERER XI. The tracking stations have been giving excellent performance.

NOTUS PROJECT (Communications Satellites)

The two launchings for COURIER, the delayed repeater satellite, originally scheduled for 19 July and 1 September 1960 were rescheduled for 16 August and 4 October because of needed modifications in the second stage of the THOR-ABLE STAR launch vehicle.

Development and testing of the two COURIER satellite vehicles and of the equipment at the two ground stations at Puerto Rico and Fort Monmouth, New Jersey are proceeding satisfactorily on schedule.

~~SECRET~~

The three previous programs, STEER, TACKLE and DECREE, were modified into a single research and development program, ADVENT, for an instantaneous repeater satellite in a 24-hour synchronous (hovering) equatorial orbit.

The research and development phases and the determination of management responsibilities for ADVENT are undergoing study.

SHEPHERD PROJECT (Tracking Network)

The space surveillance (SPASUR) system operated continuously and successfully acquired, observed, monitored and collected data on all earth satellites within its range.

The National Space Surveillance Control Center (SPACETRACK) collated the data collected, computed satellite orbits, issued orbital predictions and catalogued all space objects reported.

Among the satellite observations was that of SPUTNIK IV launched by the Soviet Union on 15 May. On 18 May, the SPASUR network confirmed that an attempt had been made to change the orbit of SPUTNIK IV so that its payload would re-enter the earth's atmosphere. Because of some malfunction, velocity was added instead of subtracted, and eight pieces of the original SPUTNIK IV are in orbit. All of these objects have been tracked by the space surveillance network.

A centrally located 500 kw transmitter has been authorized that will fill the present detection gap between the two existing surveillance complexes.

~~TOP SECRET~~

THE SECRETARY OF DEFENSE
WASHINGTON

SPECIAL HANDLING REQUIRED
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October 12, 1960

Dear Mr. President:

As you know, with your permission, Project CANES, an electronic intelligence detection device, was successfully launched on TRANSIT IIA on June 22, 1960.

The initial performance of this Project has proven the capability of this system. It has been triggered on 23 different passes and a preliminary analysis indicates large quantities of useful and interesting data. This material is being studied in order to develop processing and analytical techniques. There is no apparent duplication in this effort with other collection systems in the ELINT field.

Since September 26, 1960, efforts to trigger Project CANES have been unsuccessful even though the radiation portion of the experiment continues to operate.

In order to continue and complete ELINT coverage and collection, the Department of the Navy has now proposed that a similar device to Project CANES be launched. This can be accomplished on a TRANSIT vehicle which can be scheduled for launch on November 29, 1960. The Department of State and the Central Intelligence Agency concur with the Navy's proposal. If you approve, a proper unclassified scientific cover experiment will be developed to be included with this follow-on to Project CANES. The same security procedures used in Project CANES will be followed in this Project. It will be handled in a completely covert manner and limited to a strict "need to know" basis.

~~TOP SECRET~~

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17 Oct 60

Your approval to proceed with the development and planning of this follow-on project is respectfully requested. It is, of course, understood that your approval will be required before the actual launching occurs.

With great respect, I am

Faithfully yours,

Signed

(Thomas S. Gates)

The President

The White House

APPROVED: DWIGHT D. EISENHOWER October 17, 1960

~~TOP SECRET~~ - LIMITED DISTRIBUTION

13 October 1960

PROJECT CANES

INTRODUCTION

The Project CANES satellite was successfully launched into orbit 22 June 1960. For a period of 3 months, until the intelligence channel died after 21 September 1960, NRL conducted a series of experimental missions, collecting a multitude of "S"-band signals from [redacted]-Soviet Bloc countries. (Although other bands could have been chosen for this R&D experiment, Project CANES covered "S"-band because the majority of [redacted]-Soviet radars is concentrated in this part of the spectrum.) During this time, twenty-two selected missions, grouped into specific phases, were successfully interrogated and recorded. 50X1 50X1

CURRENT STATUS

On 20 September 1960, orbit 1282 was interrogated and the satellite failed to respond. However, during the two following programmed orbits, the ELINT system was successfully turned on. On 28 September, on orbit [redacted] which commenced the next programmed series of interrogations, the satellite failed to respond to command. 50X1

An "all out" effort was made "around the clock" for a period of two weeks by a team of some ten experts to effect interrogation. These efforts were unsuccessful, in spite of the incremental variations of each of the interrogation signal frequency parameters and utilizing all other possible permutations and combinations in interrogation.

The ELINT data system consists of an electronic complex of some thirty-two transistor circuits. The failure of any one of these units would render the satellite inactive. Complete temperature, shock, vibration and vacuum tests were run on all components in the satellite and their reliability established as carefully as possible prior to launch.

The identification of the specific component which failed has not been possible. Little is known of the environment in which the satellite components operate, but the higher radiation levels and impact with micrometeorites are two suspected causes of failure in most satellite systems.

Future systems will incorporate the choice of two interrogation receivers in the satellite. Further component reliability studies for satellite employment are proceeding in laboratories throughout the United States and the results of these studies will be incorporated in future units.

Though little chance of successful interrogation exists, a programmed effort will be made to continue to effect turn-on by a field unit.

A detailed study of the interdependence of the circuitry in the satellite is now being made, to insure improved reliability of future units and, barring complete failure of certain critical components, the predicted minimum life of one year should be realized.

ACCOMPLISHMENTS

The CANES "S"-band ELINT satellite, developed and instrumented as a simple, compact and economical (cost approximately one million dollars) intelligence collection platform by a Navy in-House team, demonstrated the feasibility of utilizing known techniques and employing existing service sites and personnel to collect vital ELINT data.

Successful interrogation and collection of extremely valuable electronic intelligence was obtained over the [redacted] Soviet Bloc countries. The intelligence collected by the ELINT portion of the satellite was unique in its vast geographic scope and produced more "S"-band ELINT coverage than any other ELINT collection effort to date. 50X1

Project CANES has demonstrated that the "S"-band radiation environment existing deep inside Soviet [redacted] territory can be determined by a satellite platform more effectively than by any other means now known. This method of collection virtually has no limitation in area or time in which it can be used. 50X1

By providing some of the actual ELINT material for study, Project CANES has performed a valuable service in pointing out the problems that will be encountered in the future for which analysis techniques and instrumentation must be designed.

In the unclassified cover for the CANES satellite, the solar radiation portion, which is still operating, a major scientific breakthrough in the analysis of the Van Allen Belt radiations was achieved. It is anticipated this portion of the satellite will continue to collect vital radiation data for some months.

ELECTRONIC INTELLIGENCE RESULTS

The following summarizes results of analysis thus far conducted on Sino-Soviet radar signals received:

1. Verification that Soviet radars are powerful and extremely numerous in "S"-band.

2. Detection of a new, apparently fixed-beam radar for the first time.

13 October 1960

3. Ability to intercept and identify unique radars previously detected.

4. Ability to detect and identify Soviet [redacted]

5. Interception and identification of many radars of known types throughout the world.

6. Greater Soviet use of new type [redacted] radars.

7. Ability to detect both beams of Soviet [redacted] radars.

Future analysis of the signal data should develop the following information:

1. Presence or absence and basic characteristics of any new [redacted] Soviet Bloc [redacted] high-power radars.

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2. Utilization of known [redacted] Soviet radar types as a function of the following:

a. Time of day:

b. Day in the week:

c. Location made within a 50-mile radius in many cases.

[redacted]

4. Radar activity in remote Asiatic and European areas of the [redacted] not previously covered by any other collection platform.

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5. Detection of new powerful types of radar in peripheral [redacted]

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It is envisioned that refinements in future satellite analysis techniques and read-out equipment ultimately will provide a complete and timely picture, on a continuing basis, of the [redacted] radar defense system, in the same manner as current weather information is promulgated. The intelligence value of such data is obvious in evaluating the strength and weaknesses of the [redacted] defense system.

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Noted by Mr. Gray

THE SECRETARY OF DEFENSE

WASHINGTON

OCT 24 1960

Dear Mr. President:

A summary of progress on the Military Space Projects during June, July, and August 1960 is attached.

A brief review of some events of interest that have occurred subsequently is included in this letter.

DISCOVERER XV was launched from Vandenberg Air Force Base and successfully placed into orbit on 13 September 1960. On the 17th pass, the capsule was separated but, because of an abnormally fast consumption of control gas, the capsule landed in the water some 900 miles south of the intended impact point. Recovery was prevented by a storm. Launch of DISCOVERER XVI is planned during the last week in October 1960.

The launch of the first SAMOS reconnaissance vehicle on 11 October 1960 was unsuccessful as orbit was not achieved. ATLAS booster performance was normal, but, as a result of loss of control gas pressure during launch, the second-stage AGENA vehicle performed abnormally. The next launch of a SAMOS vehicle is scheduled during November 1960.

The TRANSIT 2A navigation satellite, launched into orbit 22 June is performing well. All satellite and ground station systems are performing satisfactorily.

COURIER 1B was launched successfully into a satisfactory near-circular orbit of approximately 635 nautical miles altitude on 4 October 1960. This is the first active delayed repeater communications satellite to be placed into orbit for research and development purposes. All functions of instrumentation are operating satisfactorily.

With great respect, I am

Faithfully yours,

Signed
THOMAS S. GATES

Attachment

The President

The White House

~~SECRET~~

SEC DEF CONT NO. S-901

SUMMARY

June, July, August 1960

DISCOVERER PROJECT (Research and Development Satellites)

DISCOVERER XIII and XIV were launched into polar orbits on the 10th and 18th of August, respectively. After orbiting the earth for over 26 hours both capsules were recovered. DISCOVERER XIII was recovered from the sea and DISCOVERER XIV was snatched from the air by an Air Force C-119. These events marked the first time in history man-made objects which had been in orbit around the earth were returned and recovered.

Extensive recovery system component system drop tests were conducted at Holloman Air Force Base, New Mexico. The capsules containing diagnostic payloads were carried by balloons to 100,000 feet altitude and released. They then went through a normal ejection sequence while the payload transmitted valuable data to the ground station. A full-scale mockup of a biomedical capsule designed to maintain a chimpanzee in orbit for two days was completed in June.

Van type telemetry readout and recording equipment has been installed on Christmas Island to monitor all orbital passes within range of the station and record all telemetry data during re-entry.

SAMOS PROJECT (Reconnaissance Satellites)

The AGENA "A" vehicle for the first SAMOS flight completed system tests at Vandenberg Air Force Base on 17 August. The ATLAS booster flight readiness firing was successfully completed on 23 August. The launch of this vehicle is scheduled for 11 October. The two remaining AGENA "A" vehicles are in the modification and checkout phases in the systems test area. The premating of major components for the first AGENA "B" vehicle was completed on 23 August. Delivery of the XLR-81Ba-9 engine was made in mid-August.

Checkout and testing of the visual (photographic) and ferret (electromagnetic) first flight payloads is proceeding on schedule at Vandenberg Air Force Base. Final assembly of the visual (photographic) with steerable reconnaissance payload for the fourth SAMOS flight was completed during August. A thermal model of the visual (photographic) high resolution, steerable, recoverable (E-5) payload was completed during August, with delivery programmed for early September. A mid-February 1961 date has been established for delivery of the first E-5 flight payload.

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Installation of the visual reconnaissance system operating console, the second set of visual reconnaissance ground construction electronics equipment and two primary record cameras in the Vandenberg Air Force Base data acquisition and processing building was completed in July. Installation of the UHF (ultra high frequency) equipment and the Model 1604 computer at this station was also completed.

Construction of all launch facilities for the first SAMOS flight is complete, and support equipment checkout is proceeding at a rate compatible with the 11 October scheduled launch date.

MIDAS PROJECT (Very Early Warning Satellites)

In July, the Air Force Ballistic Missile Committee authorized two MIDAS flights using THOR/AGENA "B" vehicles from the DISCOVERER Program. These flights will carry a background radiometer rather than an infrared missile detection payload. The vehicles are scheduled to be launched in November and December.

Assembly of the AGENA "B" vehicle for the third MIDAS flight is proceeding on schedule. This will be the first MIDAS vehicle to utilize the full dual-burn capability of the AGENA engine. A definitive contract for the advanced infrared detection payload is being developed by Aerojet-General.

A government-to-government agreement is being drafted for the United Kingdom readout station in anticipation of approval of the MIDAS operational program. Authorization has been granted to proceed with the establishment of the Southeast Africa station. Construction of the Donnelly Flats, Alaska, technical facilities is proceeding on schedule.

TRANSIT PROJECT (Navigation Satellites)

TRANSIT 2A satellite was successfully launched into orbit about the earth on 22 June 1960 by a THOR-ABLE STAR launching vehicle at Cape Canaveral, Florida. Telemetered and tracking data received indicate that all components of the satellite are functioning normally.

TRANSIT 2A carried pick-a-back fashion an auxiliary satellite, GREB to determine effects of the ionosphere in a study of solar radiation. Separation of the satellite successfully occurred at time of injection into orbit.

From the tracking data of TRANSIT 2A, excellent orbits have been determined and studies of geodetic problems are continuing with favorable results.

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Analysis of the excellent data received from the TRANSIT 1B satellite, which was launched 13 April 1960, is being made in developing procedures for predicting accurate orbits for 30 to 90 days ahead. Also with the TRANSIT 1B data, active investigation of the gravitational field of the earth and geodetic studies are being pursued.

Detailed design of TRANSIT 3A is virtually complete, and fabrication of the satellite is in progress.

NOTUS PROJECT (Communications Satellite)

The two launchings for COURIER, the delayed repeater satellite, originally scheduled for 19 July and 1 September 1960 were rescheduled for 16 August and 4 October because of needed modifications in the second stage of the THOR-ABLE STAR launch vehicle. The launching of COURIER 1A on 18 August was unsuccessful. (COURIER 1B was launched successfully into a satisfactory near-circular orbit of approximately 635 nautical miles altitude on 4 October. This is the first active delayed repeater communications satellite to be placed into orbit for research and development purposes. All functions of instrumentation have been tested and are operating perfectly).

The technical scope of the ADVENT Project, was defined as a 5-year research and development program. Ten launches are programmed from the Atlantic Missile Range. Contracts for ground station, tracking, and microwave communications equipment have been awarded.

On 15 September, the over-all technical and management responsibility for the COURIER and ADVENT Projects was transferred from the Advanced Research Projects Agency to the Department of the Army.

[redacted] 50X1

Work continued on improvements in the space surveillance (SPASUR) system. A contract for the 500-kw control transmitter is in negotiation. Proposals for associated transmitter antenna are being evaluated. Work continued on the automatic digital data processing and alert system for all receiving stations. Completion of this work is scheduled for the spring of 1961.

A conceptual design plan for a permanent National Space Surveillance Control Center is being evaluated. This plan completes the research effort for the SPACETRACK Project.

The two 40-foot tracking antennas under development were considered to be of greater use for intelligence purposes than for space programs and were transferred from the [redacted] Project. 50X1