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CHRONOLOGY OF SIGNIFICANT EVENTS AND DECISIONS RELATING TO THE U. S. MISSILE AND EARTH SATELLITE DEVELOPMENT PROGRAMS

SUPPLEMENT III

1 NOVEMBER 1959 THROUGH 31 OCTOBER 1960

Historical Division
Joint Chiefs of Staff
29 December 1960

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10 Nov 59 [redacted]

(S) Memo, CINCNORAD to DDR&E, "Ballistic Missile Early Warning System (BMEWS) (U)," 10 Nov 59, Encl to (S) JCS 1899/531, same subj, 19 Nov 59, JMF 6820 (5 Aug 59).

11 Nov 59 [redacted]

(TS) CSAFM-520-59 to JCS, "ATLAS-TITAN ICBM Programs (U)," 16 Nov 59, Encl to (TS) JCS 1620/281, same subj, 23 Nov 59, JMF 4730 (16 Nov 59).

14 Nov 59 The National Bureau of Standards developed for NASA a load cell, a carefully precisioned steel block to measure the thrust of SATURN, the 1.5 million pound thrust rocket enginebeing developed for NASA. In order to successfully place a rocket in deep space orbit, the Bureau reported, its thrust should be known to within .001 percent of accuracy. The invention of the load cell would produce measurements at 0.1 percent of accuracy, still short of the desired accuracy.
NYT, 15 Nov 59, 31:1.

15 Nov 59 The Army announced last week the perfection of a powerful new electron tube that would enable the NIKE-ZEUS system to track an approaching ICBM at longer ranges and with greater accuracy than had been envisioned previously. The tube represented several breakthroughs of fundamental importance to the US antimissile missile system.
NYT, 15 Nov 59, IV 11:6.

16 Nov 59 The Army and NASA signed an agreement on the objectives and guidelines for the implementation of the President's decision to transfer a portion of ABMA, primarily the Development Operations Division, to NASA (see item of 21 Oct 59, supplement II). The agreement arranged for the transfer of personnel, facilities, and equipment;

suggested methods and procedures; and established general guidelines for timing the transfer. (The transfer plans were developed throughout November and December and were submitted to Congress by the President on 14 January 1960 - see item.)

(U) Agreement between DA & NASA on the Objectives and Guidelines for the Implementation of the Presidential Decision to Transfer a Portion of ABMA to NASA, 16 Nov 59, quoted in US House, "Transfer of DOD ABMA to NASA," (Hearings before the Committee on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pp. 30-31

17 Nov 59 The Department of Defense ordered that program management for MIDAS, the reconnaissance satellite program (see item of 26 Feb 60), and DISCOVERER, the basic military satellite research and development program, be transferred from ARPA to the Air Force.

(TS) Briefing Book, "Backup Material on Space for General Twining," n.d. JMF 8670 (23 Feb 60).

18 Nov 59 The Department of Defense announced the transfer of Project SATURN from ARPA to NASA. The project would continue under the Director, NASA, who would receive assistance from ARPA, the Air Force, and the Army Ballistic Missile Agency.

NYT, 19 Nov 59, 44:4.

18 Nov 59 The AEC announced the development of SNAP II, a 220-pound nuclear reactor to supply electricity for advanced space vehicles. SNAP II would be the smallest reactor ever built and would be used to operate radio transmitters and other equipment in reconnaissance, communications, and antimissile satellites.

NYT, 19 Nov 59, 1:8.

19 Nov 59 A delegation of Soviet scientists, in the US for the annual meeting of the American Rocket Society, met with officials of NASA to discuss "the desirability of the exchange of information and scientists looking toward a cooperative program for exploration of space." The delegates agreed that such cooperation should be carried out gradually. The Soviet delegates suggested the recently proposed UN conference on space as a useful forum for organizing concrete cooperative programs.

NYT, 20 Nov 59, 1:2.

20 Nov 59 Pending submission of a study by the JCS, the CJCS forwarded to the Secretary of Defense his comments on the need for an early warning against submarine-launched ballistic missiles. The Chairman stated that such a system, though desirable, was of limited value. To be effective any EW system must give a least 5 minutes warning to SAC air bases. Therefore, since the missiles traveled at a speed of 100 miles per minute, little benefit would be derived from even an instantaneous warning of a firing within 500 miles of the target. If one considered the time necessary to evaluate and transmit any warning, the critical radius became even larger. Also, all previously considered force requirements for such a system were restricted to the Atlantic coast. The Chairman felt that the cost of protecting the Pacific and Gulf coasts also should be considered before any final decisions were made.

(S) CM-430-59, "Early Warning Against Submarine-Launched Ballistic Missiles (U)," 20 Nov 59, CJCS 471.94.

20 Nov 59 ARPA announced the launching of DISCOVERER VIII and the successful ejection of the satellite's recovery capsule on its 15th orbital pass. Although nine aircraft and a surface ship tracked the capsule after ejection, signal contact was lost after a short time and no recovery was made.

(S) ARPA, "Military Space Projects Report of Progress for Quarter ending 31 Dec 59," 25 Jan 60, ODDR&E files.

26 Nov 59 NASA's attempt to launch an ATLAS-ABLE lunar probe failed owing to a malfunction during the boost stage.

(TS) Briefing Book, "Backup Material on Space for General Twining," n.d., JMF 8670 (23 Feb 60).

1 Dec 59 In a memorandum to the CJCS, the Director, DR&E, transmitted the November 1959 schedule of the DOD Space Vehicle Launch Schedule. The schedule included shots planned by the DOD and NASA through 1963, with all projections beyond FY 1960 subject to changes that might result from budget decisions. It listed 16 major space programs, their planned launching vehicles, range, and launching pad data. The November schedule included the following: 22 DISCOVERER launchings by November 1961; 13 SAMOS launchings between June 1960 and March 1962; 2 COURIER I launchings in 1960; 2 COURIER II in 1961 and 2 COURIER III in 1962; 4 STEER launchings in 1961; 4 TACKLE launchings in 1962; 7 tentative DECREE launchings in 1962-63; 3 TRANSIT launchings in 1960; 2 MIDAS in 1960 from the AMR and 8 from the PMR in 1960-61; 6 SATURN B launchings in 1961-63; 6 tentative CENTAUR launchings in 1961-62; 3 suborbital MERCURY launchings in 1960 and 9 orbital in 1961-62, 3 ABLE shots in 1959-60; 6 DELTA launchings from the AMR in 1960-61 and 6 from the PMR in 1961-62; 8 VEGA launchings in 1961-62; 2 SCOUT launchings in 1960; and 5 JUNO II launchings in 1960.

(S) Ltr, DDR&E, to CJCS, "Transmittal of DOD Space Vehicle Launch Schedule," 29 Dec 59, JMF 8670 (29 Dec 59)

3 Dec 59 In response to Secretary of Defense's request for JCS views on the NIKE-ZEUS weapon system (see item 15 Oct 59, supplement II), the CJCS reported that the JCS had been unable to agree on the place of the system in the US defense set-up and forwarded their divergent views. The CSA, supporting CINCNORAD's position, held that there was an urgent need to get an antiballistic-missile system into production with FY 1961 funds. The CNO opposed going into production on NIKE-ZEUS in FY 1960-61 because he felt that it did not yet promise a "truly and timely response to the anticipated threat." He recommended instead continued research and development for an effective and feasible antiballistic-missile system. The CSAF objected even more strongly, giving the opinion that despite its great cost (120 batteries est. $15 billion), the ZEUS did not offer an effective answer to the potential ICBM attack. In a separate memorandum to the Secretary of Defense, the CJCS added his belief that entry into production of the NIKE-ZEUS at this time would be premature, and that "a strong strategic offensive capability . . . appeared to offer a more effective response to potential ICBM attack." The research and development of several antiballistic-missile systems should continue under a high priority, he added, and if a breakthrough occured in any one of them, including NIKE-ZEUS, the DOD should be prepared to re-evaluate the problem and request supplemental appropriations for production.

(S) CM-437-59 to SecDef, "Production and Deployment of NIKE-ZEUS," 3 Dec 59; JSCM-499-59 to SecDef, same subj and date. Circ as (S) JCS 1620/284, JMF 4714 (15 Oct 49).

3 Dec 59 By an amendment to ARPA Order No. 9-60, responsibility for development work on the SAMOS project was transferred from ARPA to the Air Force. Further development work on the satellite was to be responsive to the reconnaissance requirements of all three military departments.

(S) Memo, Dir of ARPA to Sec AF, "Army, Navy Requirements for Development of Surveillance Satellite System," 21 Dec 59, JMF 8670 (21 Dec 59).

3 Dec 59 Responsibility for development work on the DISCOVERER and MIDAS Projects was transferred from ARPA to the Air Force.

(S) Amendment 8 to ARPA Order 48, 3 Dec 59 and Amendment 10 to ARPA Order 38, same date, ARPA files.

4 Dec 59 In a letter to the House Committee on Government Operations, the Secretary of the Air Force notified the Committee that he had established a special management study group headed by Dr. Clark B. Millikan to examine the role of the Space Technology Laboratories, Inc (STL), a wholly-owned subsidiary of the Thompson Ramo Woolridge Co.; the study group was also charged with the task of advising "as to the future relationship and scope thereof" between STL and the Air Force. (See item 29 Jan 60.)

(U) US House, "Organization and Management of Missile Programs" (Hearings before a Subcmte of the Cmte on Government Operations, 86th Cong, 2d sess; Wash 1960), pp. 82-83.

8 Dec 59 The JCS rescinded their request of 20 August 1959 that the Secretary of Defense notify the Chairman, Atomic Energy Commission, of the military requirement for the adoption of the XW-42 warhead for use in the GAR-9 air-to-surface missile. Since the development of the GAR-9 carrier was not provided for in the current budget, the request for the warhead had been deferred and the requirement for the missile was being restudied by the Air Force.

(S-RD) JCSM-510-59, "Deferment of XW-42/GAR 9 Development (C)," 8 Dec 59, derived from JCS 2012/163, 8 Dec 59, JMF 4713 (4 Aug 59).

8 Dec 59 The JCS informed the Secretary of Defense, in answer to his request that the JCS continue their review of advanced air-to-surface missiles (AASM), that they considered a research and development program for an AASM should be pursued, but that a decision on production should be deferred pending successful development and subsequent approval by the JCS. This evaluation was supported by WSEG Report No. 44, which substantiated the feasibility of developing the GAM-87 (SKYBOLT)--the Air Force's AASM--as an effective weapons system and established that it was comparable from a cost effectiveness standpoint with competitive weapons systems available in 1963-1964. (See item of 18 Mar 60.)

(S) JCSM 509-59, "Advanced Air-to-Surface Missiles (AASM) (U)," 8 Dec 59, derived from JCS 2012/162, 8 Dec 59, JMF 4711 (23 Nov 59).

10 Dec 59 [

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10 Dec 59 The Secretary of Defense informed the Chairman, JCS of his decision not to commit the NIKE-ZEUS to production at this time. His memorandum echoed the Chairman's statement of 3 December 1959 (see item).

(S) Memo, SecDef to CJCS, "Production and Deployment of the NIKE-ZEUS" 10 Dec 59, JMF 4714 (15 Oct 59).

12 Dec 59 The UN unanimously adopted a resolution establishing a Committee on the Peaceful Uses of Outer Space, consisting of 24 UN members. The Committee was instructed to 1) review and study practical and feasible programs in the

peaceful uses of outer space which could appropriately be undertaken under UN auspices including: a continuation of the outer space projects initiated in the framework of the IGY; organization of the mutual exchange and dissemination of information on outer space research; and encouragement of national research programs for the study of outer space; and 2) study the nature of legal problems which may arise from the exploration of outer space.

(U) Dept of State Bulletin, XLII (1 Feb 60), 68-69.

14 Dec 59 In a memorandum to the Secretary of Defense the JCS supported the request of CINCNORAD that certain equipment developed by the Army be provided NORAD to integrate Air Defense Artillery units into the SAGE system. Procurement of this equipment, the JCS concluded, would remove the military requirement for the development of Missile Master Jr. and SABRE.

(On 31 December 1959 the Secretary of Defense approved CINCNORAD's request.)

(S) JCSM-513-59 to SecDef, "Control Facilities for NORAD (U)," 14 Dec 59, derived from (S) JCS 1899/533, same subj and date; N/H of same, 6 Jan 60. All in JMF 9081/4500 (19 Jun 59).

15 Dec 59 The Marine Corps announced plans to test for possible purchase a new German antitank missile, the COBRA. This missile, 30 inches long and 4 inches in diameter, was guided by electric signals through a thin steel wire which unreeled behind the missile at a speed of 191 miles an hour.

NYT, 16 Dec 59, 19:3.

23 Dec 59 The JCS requested that the Secretary of Defense notify the Chairman, AEC, of the operational requirement for a nuclear warhead for the GAM 83B air-to-surface missile (the Air Force's adaptation of the Navy's BULLPUP). The XW-45 warhead, then under development for use with the LITTLE JOHN and TERRIER, the JCS concluded, could be adapted to meet the requirements of the GAM 83B. Expected operational date of the new weapon was January 1962.

(The Deputy Director, DR&E, forwarded the request to the Chairman, AEC, on 27 January 1960.)

(TS-RD) Memo, JCSM-530-59, "Requirement for a Nuclear Warhead for the GAM-83B Air-to-Surface Missile (C)," 23 Dec 59, derived from JCS 2012/164, 22 Dec 59; (S-RD) 2nd N/H of 2012/164, 5 Feb 60. All in JMF 4711 (14 Dec 59).

23 Dec 59 The JCS submitted to the Secretary of Defense their views on the draft statement of NSC 5918, "US Policy on Outer Space," prepared by the National Aeronautical and Space Council. The JCS approved the draft subject to several deletions and amendments in the section dealing with international control of outer space. The draft proposals (presented by the Department of State, NASA, and others), the JCS warned, could prejudge the issue of the use of outer space by the military component of the US. It was important, they continued, that any space policy recognize that US national security required provision for military activities in space. Any limitation on the military use of outer space must be considered as a part of general disarmament proposals; failure to do this would lead to piecemeal disarmament measures. Moreover, any attempt

to curtail the uses of outer space for military purposes, either unilaterally or by international agreement, without adequate inspection and control would aid Soviet military capabilities while restricting those of the US. (See item of 27 Jun 60.)

(S) JCSM 534-59 to SecDef, "US Policy on Outer Space (NSC 5918) (C)," 23 Dec 59, derived from JCS 2283/74, 23 Dec 59, JMF 8670 (17 Dec 59).

30 Dec 59 Secretary of Defense issued a revised charter for ARPA superseding the charter of 17 March 1959 (see item, supplement II). The major change in the new charter was tha ARPA would receive its assignments from Director, DR&E, not directly from Secretary of Defense. The following projects were on the ARPA docket as of 30 December 1959:

1) NOTUS - satellite communications system
2) DEFENDER - anti-missile-and-satellite defense system
3) PRINCIPIA - solid propellants
4) PONTUS - construction and power conversion materials
5) LONGSIGHT - advanced missile studies
6) (C) SHEPHERD - space surveillance system
7) TRIBE - space launching vehicles
8) TRANSIT - astro-geodetic navigation
9) VELA - high altitude and underground detection of nuclear explosions.

(C) DDD 5129.33 w/inclosures, "DOD Advanced Research Projects Agency," 30 Dec 59, JMF 5224 (59) (Permanent).

31 Dec 59 The quarterly report to the President on the ICBM and IRBI programs included the following information:

ATLAS

1) Eight missiles were successfully launched.
2) One missile maintained operationally ready by SAC at Vandenberg AFB since mid-October.
3) The steel strike caused some delay in the operational dates of ATLAS squadrons.

TITAN

1) Two of three TITAN firings were completely successful, one at a 4,330 n.m. range.

MINUTEMAN

1) Four full-thrust missiles test fired successfully.
2) Malmstrom AFB, Montana, selected as support base for first hardened and dispersed MINUTEMAN force.
3) Hill AFB, Utah, selected as support base for first mobile force.

THOR

1) Three of four THOR squadrons turned over to the RAF.
2) Fourteen missiles fired in R&D, training, and special mission flights.

JUPITER

1) Five successful R&D flight tests.
2) Deployment of JUPITER system to Italy begun.
3) US-Turkey JUPITER agreement signed 28 October 1959.

POLARIS

1) Six tactical missiles test fired--two successful and four partially successful.
2) Program on schedule.

(S) Rpt, ARPA, "Summary of ICBM and IRBM Programs for October, November, December 1959," 27 Feb 60, ODDR&E file:

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7 Jan 60 [

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7 Jan 60 In his annual State of the Union address to the Congress, the President referred to the US space program, which, he noted, was often mistakenly taken to be an integral part of defense research and development. He recited the present space activities of the US: global communication, reconnaissance, and weather satellites. Although the contributions made by these space programs were of present interest chiefly to the scientific community, he continued, they provided an important foundation for more extensive exploration of outer space. In the area of missile development, the President assured Congress that the present missile thrust capability of the US was fully adequate for defense requirements and that the US was pressing forward to larger rocket engines capable of placing heavy vehicles in outer space. The President included a progress report on two specific missile systems, the ATLAS and POLARIS, which he termed "a tribute to American scientists and engineers, who in the past 5 years telescoped time and technology to produce the ICBM, where America had nothing before."

(U) Dept of State Bulletin, XLII (25 Jan 60), 114-115

8 Jan 60 The JCS, after a request by the US representative to the NATO standing group (USREPSGN) for guidance on the establishment of a NATO MRBM requirement, forwarded split views to the Secretary of Defense. The CSA and CNO supported a SACEUR request to establish such a requirement, noting, however, that though SACEUR had asked for an IOC of 1963 he had specified neither the number of missiles needed nor the time phasing desired. They suggested that the requirement might be better satisfied with two separate missile systems rather than with one. The CSAF opposed approval of the requirement on three major grounds: 1) technical--the US did not have a missile suitable for the NATO requirement; 2) economic--the cost both to the US and to Europe might prove prohibitive; and 3) military --the range of SACEUR targets did not call for the application of a longer range weapon system. The CSAF recommended, therefore, that the US first choose which missile it would provide NATO before it committed itself to approving a requirement. He suggested that an extended-range PERSHING might be the logical choice. The Chairman supported the establishment of the requirement, emphasizing that this step did not commit the US to any particular quantities, types, or schedules. (See item 25 Jan 60.)

(TS-RD) JCSM-531-59 to SecDef, "Basic Military Requirement for an AEC Mid-Range Ballistic Missile Weapon System (U)," 8 Jan 60, derived from JCS 2305/24, 8 Jan 60; (TS-RD) CM-447-60 to SecDef, same subj and date. Reproduced in (TS-RD) JCS 2305/24, 8 Jan 60. All in JMF 9050/4720 (16 Oct 59).

12 Jan 60 In response to a request by the Secretary of Defense, the Defense Comptroller prepared a study of the cost of the strategic deterrent and continental air defense programs. The following were some of the significant figures (in $ million rounded):

	FY 59	FY 60	FY 61
Retaliatory	9,258	9,088	9,480
Continental Air Defense	4,737	4,054	3,914
Totals	13,995	13,142	13,394
Retaliatory			
POLARIS	1,056	980	952
ATLAS	646	962	1,014
TITAN	500	778	1,013
MINUTEMAN	183	342	438
THOR	331	91	-
JUPITER	229	73	-
SNARK	69	-	-
QUAIL	64	77	71
GOOSE	4	-	-
HOUNDDOG	201	222	173
GAM 77/87 ASM	-	-	10
DYNASOAR	30	35	58
(138A rocket powered ASM)	3	35	50
131 B-52 ASM	6	-	-
(465 LSAC Control System)	22	41	62
ALQ (ECM)	133	-	-
SAMOS	101	170	177
Continental Air Defense			
NIKE HERCULES	87	123	101
NIKE ZEUS	210	297	302
MISSILE MASTER	14	21	11
BOMARC	657	395	426
BMEWS	97	247	107
MIDAS	29	60	92
SAGE	288	304	243

(S) Rpt, "Preliminary Estimated Defense Program (U)," 15 Jan 60, App to (S) JCS 1800/239, 25 Jan 60, JMF 7000 (16 Nov 59) BP 2.

13 Jan 60 The Director, DR&E, informed the Subcommittee of the House Committee on Appropriations that any US military satellite program presently under consideration would be provided with adequate rocket thrust by existing ICBM's. The US, he added, could launch a 10,000-12,000 pound satellite into orbit at the present time. The Secretary of Defense added that other military space requirements would occur but not until manned space flight has been solved.

(U) US House, "DOD Appropriation for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 28, 29.

13 Jan 60 NASA announced its decision to use liquid hydrogen as the fuel for the upper stages of project SATURN, the US program to develop a superthrust rocket. By employing hydrogen rockets in the upper stages of SATURN the space agency felt it could double the rocket's payload capacity. Original plans for SATURN had called for a TITAN as the second stage and two or three CENTAURs as the third stage.

NYT, 14 Jan 60, 6:2.

13-15 Jan 60 The Secretary of Defense, testifying on the FY 1961 budget before the Subcommittee of the House Committee on Appropiations, reported the following developments in the US missile and related programs:

1) The MINUTEMAN ICBM was being continued under the highest priority and the money requested in the FY 1961 budget would provide for an initial production capability (see item 5 Nov 59). Moreover, the DOD planned to develop a railroad mobility for the solid-fuel missile.

2) The ICBM, particularly the ATLAS and TITAN, would take an increased proportion of the funds devoted to strategic weapons systems. Both were being continued, ATLAS because it provided the means of achieving an early ICBM operational capability, and TITAN because it offered certain operational advantages and greater growth potential. Except for the first several squadrons, all ATLAS and TITAN missiles would be dispersed in hardened underground sites.

3) In spite of failures in the BOMARC B program, four squadrons of BOMARC A and B, excluding the Canadian units, would be operational in FY 1960, and the whole system completed in CY 1963. The last money appropriated for BOMARC A was in the FY 1959 budget, the FY 1961 budget would provide for the procurement of 16 BOMARC B squadrons for deployment in the US and two squadrons in Canada (see item 2 Mar 60).

4) The provision of $300 million in the FY 1961 budget would make possible full-scale testing of the NIKE-ZEUS system. Such testing should give the DOD enough data to make a final decision on production. It was the only antimissile system that looked promising at the present and the information gained from testing NIKE-ZEUS would be of great value whether or not the antimissile missile ever went into production.

5) Although POLARIS had vital advantages over other IRBM and ICBM systems, the DOD was restricting itself to procuring FBM submarines at a "three-a-year" rate until POLARIS had been better tested.

6) The US could operate an air alert at any time, but a continuous alert would wear out the Air Force's capability. With the exception of CINCSAC, everyone in the DOD was satisfied with the present on-the-shelf capability and budget request (see item 2 Feb 60).

(U) US House, "DOD Appropriations for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 8, 9, 31, 57, 58, 72, 112, 157, 171

14 Jan 60 The President submitted two special messages to Congress calling for reorganization of certain space programs in an effort to clarify and expedite civil and military functions. In his first message he formally notified Congress of the transfer of the Development Operations Division of the Army Ballistic Missile Agency (the von Braun team) to NASA (see item 3 Feb 60). [The transfer would become effective 60 days from the date of the Presidential message unless vetoed by Congress.]

The second Presidential message challenged a basic concept of the 1958 space law by insisting that "a single civil-military program does not exist and is in fact unattainable." The President requested that the National Aeronautics and Space Act of 1958 be amended as follows:

1) Repeal provisions making the President directly responsible for development of a national space program and transfer this responsibility to NASA,

2) Abolish the National Aeronautics and Space Council, which has had the task of coordinating space programs of NASA and the DOD,

3) Eliminate the civil-military liaison committee, created by Congress to provide day-to-day coordination between the DOD and NASA, but continue to require that these agencies advise, consult, and keep each other informed; and

4) Authorize the President to assign responsibility for development of each new launching vehicle, regardless of its intended function, either to NASA or the DOD in order to safeguard against duplication of effort.

These proposed amendments reflected the President's effort to correct "the concept-which I believe to be incorrect--of a single comprehensive program of space activities embracing both civilian and military activities. (see items 10-16 Mar and 19 May 60.)

NYT, 15 Jan 60, 1:5.

15 Jan 60 The quarterly report to the President on the antiballistic missile program included the following information:

1) Work on the Ballistic Missile Early Warning System (BMEWS) was progressing satisfactorily. With construction work at Thule on schedule, and at Clear, Alaska, generally ahead of schedule, the decision had been made to advance the IOC to 30 June 1961

2) The third NIKE-ZEUS test missile had been flight-tested at White Sands Missile Range on 16 December 59. The test had been partially successful, a maximum velocity of 30,000 feet per second was attained in five seconds. A limited system test was scheduled for mid-CY 1961. No decision had yet been made to commit the NIKE-ZEUS to production, but an operational capability of three batteries could be achieved 48 months after production decision.

(S) Rpt, "Progress of ABM Weapons System Progress for 15 Oct 59-15 Jan 60," 23 Apr 60, ODDR&E files.

16 Jan 60 The International Committee on Space Research (COSPAR) adopted a series of resolutions intended to permit greater cooperation in observing space satellites. COSPAR recommended that when changes were made in radio

frequencies, satellite orbits, or opportunities for the observation of satellites, this information should be shared with the international science community as far in advance as possible through scientific radio channels. The future success of COSPAR in creating international scientific accord was brightened by the return of the Soviet representative, who until recently had been boycotting the committee.
AP, 16 Jan 60.

16 Jan 60 As part of its experimental series on bouncing radio signals over great areas and on measuring the drag in space on large, lightweight objects, NASA launched to an altitude of 250 miles an aluminum-coated balloon inflated to a diameter of 100 feet. The balloon was carried folded in the nose cone of a two-stage rocket and inflated in space.
NYT, 17 Jan 60, 20:3.

18 Jan 60 In his budget message to Congress the President noted that the JUPITER and THOR, the successfully developed, produced, and deployed IRBM's, had been reduced in importance by the increasing availability of the ATLAS. Therefore, said the President, the scope and size of these programs were being curtailed and no new funding was being requested for them in FY 1961
(U) "Budget Message of the President," 18 Jan 60, excerpt in US House, "DOD Appropriation for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 175, 183.

18 Jan 60 Testifying before the subcommittee of the House Committee on Appropriations the CNO stated:
1) The Navy's SPASUR, a space surveillance system, and TRANSIT, a satellite doppler navigation system, might be the first useful space systems placed in operation by this country. SPASUR was currently providing the fleets with information concerning existing satellites.
2) Because of its "high degree of invulnerability," and its carefully engineered combination of several recent major advances in technology, the POLARIS system was destined for a long, useful, military life. When the first POLARIS submarine was deployed and the US had a proven, highly successful missile weapon system in hand, the Navy anticipated that the POLARIS program would be considerably expanded in scope (see item 5 Oct 60).
(U) US House, "DOD Appropriation for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 2, pp. 38, 40, 41.

18 Jan 60 Testifying before the Subcommittee of the House Committee on Appropriations, the Secretary of the Navy stated:
1) Missile procurement for fleet combat use and training allowed for a "small improvement in the material readiness of the Navy." FY 1961 funds would provide for: continued production of the SPARROW III and the improved SIDEWINDER air-to-air missiles; the air-to-surface BULLPUP missile, and continued integration of ship-launched TALOS, TERRIER, and TARTAR missiles in consonance with the construction or conversion of missile ships.

2) Antisubmarine warfare, including ASW missiles, would continue as an area of major emphasis, carrying a priority second only to POLARIS. Guidance for the ASW program would be provided by the new Committee on Anti-Submarine Warfare with the Secretary as chairman.

(U) US House, DOD Appropriations for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess, Wash, 1960), pt 2, pp. 4, 8, 9.

21 Jan 60 The Soviet Union announced that it had fired a new and more powerful ICBM nearly 8,000 miles and that it had landed within 1 1/4 miles of its target. US Navy tracking ships confirmed the fact that a nose cone had fallen somewhere in the announced impact area in the central Pacific east of the Marshalls and southwest of Hawaii. According to the official Soviet statement, the rocket, being tested for use in launching heavy earth satellites and cosmic rockets to other planets, was fired precisely on time, flew exactly on course, and performed in all stages as planned. Although the source of the shot was not given, it was estimated to have originated somewhere between the Caspian and Aral Seas.

NYT, 22 Jan 60, 1:6.

22 Jan 60 Testifying before the Subcommittee of the House Committee on Appropriations on anti-ICBM missiles, the CSAF declared that NIKE-ZEUS was not ready for production. It would not "fill the bill," particularly against sophisticated missiles, since it had no built-in discriminatory capability. He believed, however, that research and development of the system should be continued.

(U) US House, "DOD Appropriations for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 2, pp. 233, 234.

25 Jan 60 NASA and the British Information Service announced that scientists of the US and UK had reached informal agreement on six experiments to be undertaken in the first joint US-UK earth satellite program. These included: ion and electron studies to measure electron temperature and concentration and ion mass spectrum; electron density measurements; solar radiation, and primary cosmic ray measurements. The launching vehicle for the satellite would probably be the four-stage SCOUT rocket, expected to be operational in 1960.

The decision to carry on joint experiments was based on a July 1959 agreement between the two nations to unite in a cooperative scientific program of space research.

(U) Dept of State Bulletin, vol XLII (22 Feb 60), 284.

25 Jan 60 The Deputy Secretary of Defense reported to the President ARPA's decision to phase out of the satellite tracking network the doppler system complex (DOPLOC).

The Army's DOPLOC and the Navy's SPASUR, two segments of project SHEPHERD, ARPA's ground-based space surveillance system, were both directed toward building an electronic fence to detect all "dark" or non-radiating satellites which passed over the US. After a technical review of both systems in the summer of 1959, ARPA decided that SPASUR offered the best solution and DOPLOC should be cancelled.

(S) ARPA Rpt, "Military Space Projects, Report of Progress for Quarter ending 31 Dec 59," 25 Jan 60, ODDR&E files; (TS) Briefing book, "Backup Material in Space for General Twining," 23 Feb 60, JMF 8670 (23 Feb 60); NYT, 15 Dec 59, 1:7.

25 Jan 60 The Secretary of Defense directed the CJCS to inform the US representative to the NATO standing group that the US approved SACEUR's Basic Military Requirement for an ACE MRBM system with the understanding that approval of a basic military requirement did not commit the US to subsequent action to meet this requirement. The Secretary made his decision after considering the split views of the JCS and the separate recommendation of the Chairman. (see items 8 Jan and 29 Feb 60.)

(TS) N/H of JCS 2305/24, 27 Jun 60, JMF 9050/4220 (16 Oct 59).

26 Jan 60 Testifying before the House Committee on Science and Astronautics, the Director, DR&E, explained ARPA's FY 1961 budget request of $215 million for the following projects: DEFENDER, a research and development experiment to obtain a technologically advanced defense against extra-atmosphere offense vehicles including ballistic missiles and space vehicles; PRINCIPIA, a research program to develop a more nearly optimum performance for solid propellants for missiles and space boosters; PONTUS, research aimed at realizing an advance in structural and power conversion materials; LONGSIGHT, a series of studies and system analyses to determine future military space requirements; SHEPHERD, a satellite detection system; and VELA, a project to provide an adequate method for global policing or surveillance of atomic weapons testing.

(U) US House, "Review of Space Program" (Hearings before Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, p. 98.

26 Jan 60 A progress report by ARPA on the military space program for the last quarter of 1959 listed the highlights of the program, including the successful launchings of DISCOVERERs VII and VIII (see items 7 Nov and 20 Nov 59); a summary of the progress in the DISCOVERER, SAMOS, MIDAS, TRANSIT, NOTUS, SHEPHERD, LONGSIGHT, TRIBE, and SATURN programs; a report on the status of funds for the various projects, a launch schedule (see item 1 Dec 59), and flight data on the two DISCOVERER launches. The report noted that it had been decided to phase DOPLOC out of the tracking network (see item 25 Jan 60); that projects DISCOVERER, MIDAS, and SAMOS had been transferred to the Air Force; and that SATURN was being turned over to NASA. Cumulative expenditures for all projects totaled $386.4 million, cumulative obligations $565.1 million, and the program for FY 1960 $433.2 million.

(S) ARPA Rpt, "Progress Report on Military Space Projects for Quarter ending 31 Dec 59, JMF 8670 (25 Jun 60).

26 Jan 60 Dr. Herbert F. York, the Director, DR&E, told the House Committee on Space and Astronautics that the DOD was directly concerned only with space activities that had direct military applications. He stressed that the objectives of the defense efforts in space were: (1) the development, production, and operation of space

systems where it could be demonstrated with reasonable certainty that the use of space flight would enhance the overall defense program; and (2) the development of components needed in space systems that could not be clearly defined at the moment, but that would emerge in the future.

Dr. York also stated that it was NASA's space programs, not those of the DOD that were designed to "overtake Russia." In terms of payload, he added, it would be at least five years before the US could catch up with the USSR.

(U) US House, "Review of the Space Program" (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 96, 131, 133.

26 Jan 60 [

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27 Jan 60 In conjunction with his presentation of NASA's FY 1961 $802 million budget request to the House Committee on Science and Astronautics, the Administrator of NASA testified that the Soviet Union continued to hold a substantial space lead in the eyes of the world. This lead, he said, was based primarily upon the possession

by the Soviets of one or more reliable launch vehicle systems having perhaps twice the thrust of US first-stage booster rockets. It was his opinion that, in all other aspects of space, the US had an equal capability.

Dr. Glennan also stated that the US could not expect to outscore the Soviets in this regard for a considerable period of time. Although the US should be able to equal present Soviet weight-lifting capabilities within 12 to 18 months with the ATLAS-AGENA B and ATLAS-CENTAUR systems US expectations of launching a superior system would not be realized until SATURN was ready in four or five years.

(U) US House, "Review of the Space Program" (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, pp 167-169.

28 Jan 60 In testimony before the Subcommittee of the House Committee on Appropriations the Secretary of the Army summarized the Army's missile programs: there had been significant progress in the development of DAVY CROCKETT, a light-weight missile providing nuclear firepower for small tactical units; PERSHING was being pushed as a matter of priority to provide a solid-fuel, highly mobile successor to REDSTONE, CORPORAL would be replaced by the new solid propellant SERGEANT to increase the Army's short-range missile capability; there would be continued development of second-generation missiles for the division and battle group; HAWK would be continued through FY 1961 to provide a mobile defense system against aircraft and aerodynamically supported missiles at low altitudes; REDEYE, a light-weight guided missile with a shoulder-fired launcher, was being developed for low level defense against enemy tactical aircraft; and the Army was requesting that a decision be made and funds provided to place NIKE-ZEUS in production.

(U) US House, "DOD Appropriations for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 2, pp. 402, 403.

28 Jan 60 Dr. Hugh Dryden, Deputy Administrator of NASA, told the House Science and Astronautics Committee that a DX priority (the highest national priority) had been assigned to the SATURN launch vehicle system. The SATURN system was required, he said, to give the US the capability of advanced manned and unmanned space systems, and was the "key" to possible accomplishments in the period beyond the next few years. The same priority, he added, had been assigned to project MERCURY, the first step in the survival of man in space at satellite speeds and beyond. These were the only two space programs in NASA that had been given this priority. Dr. Dryden agreed with a committee member that it would be "a tragic blow" to the US space program and to US security if the target date on the MERCURY program should be delayed 3 to 5 years. Richard Horner, Associate Administrator of NASA, added that there wasn't any question that such a step would put the US further behind Russia in the space race.

(U) US House, "Review of the Space Program" (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 178, 182, 207, 217, 218.

28 Jan 60 The Associate Administrator, NASA, presented the House Committee on Science and Astronautics with NASA's 10-year plan for space exploration. The plan called for approximately 260 launchings at a cost of "possibly $12 to $15 billion". The NASA mission target dates were given as follows:

Calendar year	NASA mission target dates
1960----------	First launching of a meteorological satellite.
	First launching of a passive reflector communications satellite.
	First launching of a SCOUT vehicle.
	First launching of a THOR-DELTA vehicle.
	First launching of an ATLAS-AGENA-B vehicle (by the Department of Defense).
	First suborbital flight of an astronaut.
1961----------	First launching of a lunar impact vehicle.
	First launching of an ATLAS-CENTAUR vehicle.
	Attainment of manned space flight, project MERCURY.
1962----------	First launching to the vicinity of Venus and/or Mars.
1963----------	First launching of two-stage SATURN vehicle.
1963-1964-----	First launching of unmanned vehicle for controlled landing on the moon.
	First launching orbiting astronomical and radio astronomy observatory.
1964----------	First launching of unmanned lunar circumnavigation and return to earth vehicle.
	First reconnaissance of Mars and/or Venus by an unmanned vehicle.
1965-1967-----	First launching in a program leading to manned circumlunar flight and to permanent near-earth space station.
Beyond 1970---	Manned flight to the moon.

(U) US House, "Review of the Space Program" (Hearings before Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, 189. (U) Rpt of same Cmte, "Space, Missiles, and the Nation," p. 19.

29 Jan 60 In an address to the American Physical Society, the Special Assistant to the President for Science and Technology reported that ICBM capability was not necessarily dependent on high rocket-booster vehicles capable of sending multiton payloads into space. Because of the advanced nuclear weapons technology of the US, he explained, it was possible to deliver warheads of adequate yield in extremely compact missiles. "However, we cannot ignore," he continued, "the very real political implications of various spectacular accomplishments in outer space that have come to have symbolic meaning to the world at large. In regard to matching the USSR in rocket thrust, he concluded, "we must accept the technical reality that, despite a vigorous national effort to develop such boosters, there are limits on how quickly the gap can be closed and these limits are largely set by technological factors."

(U) Dept of State Bulletin, XLII (22 Feb 60), 277-278.

29 Jan 60 In a letter to the Secretary of the Air Force, Dr. Clark B. Millikan submitted the findings and recommendations of the Secretary of the Air Force Management Study Committee, created to examine the relationship of Space Technology Laboratories, Inc, to the Air Force (see item 4 Dec 59).

The committee found that in numbers of technical personnel employed, size and type of facilities, and expansion of its field of interest and activity, STL had grown far beyond what was originally contemplated, and it was the basis of widespread concern that an Air Force "arsenal" for the development and production of advanced weapons could result. This undefined growth and "uncertainty of purpose" was apparently beginning to affect adversely STL's ability to perform its essential functions with maximum effectiveness. Its continued operation, as currently constituted, could tend to restrict the free flow and competition of technical ideas, thereby denying to the Air Force fully effective access to available technical resources of the Nation.

The Committee recommended, among other things, a reorientation of the role and the mission assigned to STL in order to preserve its capacity to perform its essential functions and the assignment to industry and other agencies those functions which can be performed by them.

It was the belief of the Committee that the Air Force would require in the foreseeable future scientific and technical assistance in the following areas of the large ballistic missile and military space fields:

a. Advanced planning and evaluation of new ideas.
b. "Broad-brush," initial system design.
c. Technical evaluation of contractors' proposals.
d. Technical monitoring of program progress.

In order to have the requisite top level competence - this assistance must be furnished by a civilian contractor organization occupying a privileged and continuing position with the Air Force. It was necessary that this organization be "basically noncompetitive."

Finally, the Committee recommended that detailed planning and technical direction of specific projects should eventually be the responsibility of competitive industry, and that the Air Force should continue to develop its own " inhouse " capability to plan, analyze, and procure, weapons systems in the ballistic missile and military space areas (see items 6 May and 25 Jun 60.)

(U) US House, "Organization and Management of Missile Programs" (Hearings before a Subcmte of the Cmte on Govt Operations, 86th Cong, 2d sess; Wash, 60), pp. 87-88.

1 Feb 60 In testimony before the Subcommittee of the Senate Committee on Appropriations, the Secretary of Defense declared that the claim that the USSR was outdistancing the US in military power was simply not true. Though the Soviets might enjoy, at times, a "moderate numerical superiority" in missiles during the ensuing 3 years--a superiority that would probably reach its peak in 1962--they would gain no such superiority in deterrent power. As factors that counterbalanced the Soviet edge in missiles, the Secretary mentioned, among other things, US all-weather interceptors with air-to-air missiles, the NIKE-HERCULES and BOMARC ground-to-air missiles, the B-52 with HOUND DOG, the POLARIS, hardened and mobile ICBM's, BMEWS and other detection systems, and research and development of the NIKE-ZEUS antimissile missile. In short, the Secretary's testimony added up to a contention that retaliatory power was entirely adequate to deter aggression.

(U) US Sen, "DOD Appropriations for 1961," (Hearings before the Subcomte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 3-17.

2 Feb 60 The Secretary of the Army, in testimony before the Subcommittee of the Senate Committee on Appropriations, described an adequate and secure nuclear retaliatory capability as being of primary importance but stated that the possession of this capability by both East and West made its employment by either less likely. Among the weapons systems being developed and procured to augment the Army's fighting power, the Secretary mentioned: the PERSHING, transportable by CHINOOK helicopter and being groomed to succeed REDSTONE; the solid-propellant SERGEANT replacing, as fast as possible, the CORPORAL; improved HONEST JOHN, LITTLE JOHN, and LACROSSE missiles, NIKE with ECCM capabilities; HAWK; REDEYE; and NIKE-ZEUS.

(U) US Sen, "DOD Appropriation for 1961," (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 71-123.

2 Feb 60 During Senate Committee Hearings on "Missiles, Space, and Other Major Defense Matters" CINCSAC, General Power, reaffirmed an earlier public statement that:

> According to released data on nuclear effects, it would take an average of three missiles, in their current state of development, to give an aggressor a mathematical probability of 95 percent that he can destroy one given soft target, some 5,000 miles away. This means that, with only some 300 ballistic missiles, the Soviets could virtually wipe out our entire nuclear strike capability within a span of 30 minutes. To further heighten this threat, only about half of these missiles would have to be ICBM's. The rest could be smaller IRBM's which are considerably less expensive and easier to produce.

General Power also testified that the survivability of US strike forces in the face of a missile attack actually boiled down to "how much warning do we have?" The bulk of SAC's forces was built around a ground alert predicated on a 15-minute warning, which was sufficient to launch a retalitory attack against manned aircraft. But, continued CINCSAC, "there is no tactical warning in existence in the world today against ballistic missiles."

Therefore, SAC must configure its forces to survive without warning. General Power was not satisfied that there was enough being programmed and planned at the present time to take care of a continuous airborne alert, and he informed committee members that the 1961 budget had contained neither the percentage nor the dollar amount required to maintain the alert.

(U) US Sen, "Missiles, Space and Other Major Defense Matters" (Hearings before the Preparedness Subcmte of the Cmte on Armed Services, 86th Cong, 2d sess; Wash, 1960), pp. 13-16, 39-41.

3 Feb 60 The CSA revealed to the House Committee on Science and Astronautics some of the details in the President's transfer of the Army's Development Operations Division--the von Braun team--from ABMA to NASA (see item 21 Dec 59 supplement II). With the exception of 350 civilian personnel, who would remain to continue the Army's missile systems management capability, the 4,200 man team would be transferred on 1 July 1960. In addition, 815 supporting personnel from other Army organizations at Redstone Arsenal would go to NASA.

(U) US House, "Transfer of the DOD of the ABMA to NASA," (Hearings before the Cmte on Sciences and Astronautics, 86th Cong, 2d sess; Wash, 1960), pp. 4-5.

3 Feb 60 The Secretary of the Air Force, testifying before the House Committee on Science and Astronautics, corroborated the testimony of the Secretary of Defense (see item 1 Feb 60) to the effect that the US was militarily stronger than the USSR. Even in 1962, he said, when the USSR might enjoy a numerical missile lead, total US power would be preponderant. He agreed in principle with CINCSAC's views on continuous airborne alert but classed this as a possible future development. He also stated he was satisfied with the funds then available for the Air Force's four main space programs: SAMOS, MIDAS, DISCOVERER, and DYNASOAR.

(U) US House, "Review of the Space Program" (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pt 1, pp 430, 434, 435.

4 Feb 60 Testifying before a Senate Committee, General Maxwell B. Taylor, former CSA, stated, among other things, that:

(1) The placing of major reliance on weapons of massive destruction had lost all justification in view of Soviet progress in atomic weapons and long-range missiles.

(2) The trend of relative military strength between the US and the USSR was against the US; the manned bomber force was a dwindling asset; the US long-range missile force was limited in size, uncertain in reliability, and immobile upon exposed bases; the US had no antimissile defense in being or in sight; and there was no effective fallout protection for our civilian population.

(3) The foregoing conditions indicated a decline in our capability to deter deliberate general atomic war; and this decline had been accompanied by a continued neglect of the requirements of limited or nonatomic war despite the increasing probability of this form of challenge by the USSR.

(U) US Sen, "Missiles, Space, and Other Major Defense Matters" (Hearings before the Preparedness Subcmte of the Cmte on Armed Services in conj with the Cmte on Aeronautical and Space Sciences, 86th Cong, 2d sess; Wash, 1960) pp. 186, 187.

9 Feb 60

11 Feb 60 The Army announced that a supersonic HAWK missile intercepted and destroyed an HONEST JOHN, the first known "kill" of a supersonic ballistic missile by a US antimissile missile. The Army pointedly referred to the success as a "bullet-hits-bullet demonstration," which the New York Times interpreted as an answer to critical comments against the Army's antimissile missile program, in particular NIKE-ZEUS, often characterized as an attempt to hit a bullet with a bullet.

NYT, 12 Feb 60, 3:2.

13 Feb 60 The Director, DR&E, forwarded to NASA the JCS's "Requirements for Meteorological Satellites" for use as guidance by NASA and ARPA in the TIROS program (see item 1 Apr 60). After consultation with the US Weather Bureau, the JCS had listed the following objectives for the planned meteorological satellite: 1) provide data for improving weather analysis and forecasting on global basis, 2) provide weather observations in areas of operational concern in times of emergency; 3) improve the basic understanding of the atmosphere.

In addition, the JCS included a lengthy list of technical capabilities required of the satellite to meet the above qualifications.

(S) JCSM 517-59 to SecDef, "Requirements for Meteorological Satellites," 16 Dec 59, derived from JCS 2283/71, 14 Dec 59; 1st N/H of JCS 2282/71, 18 Feb 60. All in JMF 8670 (3 Dec 59).

15 Feb 60 In an exchange of notes, the US and UK agreed to the establishment of a ballistic missile early warning station in Fylingdales Moor, England. The station would be commanded and operated by the RAF and supplied with technical equipment by the US.

With a range of approximately 3,500 miles, the new radar station would provide speedy detection of missile

launchings over a large area of the Northern Hemisphere, the Associated Press reported. The station would be an addition to the BMEWS currently under development at Thule, Greenland, and Clear, Alaska.

(U) Dept of State Bulletin, XLII (7 Mar 60), 391-2; AP, 17 Feb 60.

15 Feb 60 In testimony before the Subcommittee of the Senate Committee on Appropriations, the Secretary of the Air Force reported the following developments in the Air Force missile program:

1) The TITAN program had capitalized on developments in both the ATLAS and IRBM, resulting in a more advanced vehicle than first planned. Moreover, TITAN's hardened facilities, also planned for later ATLAS squadrons, greatly improved its survivability, and the deterrant value of the ICBM force.

2) MINUTEMAN would radically reverse the increasing cost trend of modern weapons systems, both in terms of dollars and manpower.

3) Some difficulty had been encountered in the BOMARC B testing program: of six tests thus far, none had been completely successful. However, the difficulties were not regarded as insurmountable.

(U) US Sen, "DOD Appropriation for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960) pt 1, pp. 193-195.

16 Feb 60 Testifying before the House Committee on Science and Astronautics, the Secretary of the Army Wilber Brucker and the CSA stated that the NIKE-ZEUS program, "absolutely vital to our security," was a highest priority program, and had been so designated by the National Security Council. The $137 million authorized by Congress in the FY 1960 budget for the development of NIKE-ZEUS, however, had not been released to the Army by theDOD. Secretary Brucker reported, "On December 1 [1959], we were told that the $137 million will be placed in what is called a reserve for 1961. These were 1960 moneys . . . and we were told that they would be placed in the 1961 reserve funds and that no preproduction or production money would be made available to the Army."

(U) US House, "Review of the Space Program" (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960) pt 2, pp. 707, 708, 716.

19 Feb 60 The Air Force announced the launching of its new composite rocket, EXOS, a solid propellant HONEST JOHN-NIKE-YARDBIRD combination. Because of a malfunction during boost the vehicle flew only 68 of its scheduled 415 miles.

NYT, 20 Feb 60, 6:3.

25 Feb 60 The first stage of the PERSHING, the Army's mobile field ballistic missile, was successfully fired for the first time. When the missile became operational, the DOD reported, troops would be able to assemble it in a few minutes and fire it at targets in a 20 to 400 mile range.

NYT, 26 Feb 60, 2:6.

25 Feb 60 The US and Australia concluded an agreement on long-term cooperation in space exploration. Australia agreed to provide launching sites, firing facilities, and tracking stations for US space projects, and the US agreed to provide scientific equipment.

NYT, 26 Feb 60, 2:6.

26 Feb 60 The JCS informed the Secretary of Defense that at his request they had reviewed the paragraph in the Basic National Security Policy paper, 5906/1, relating to outer space (see item 5 Aug 59, supplement II) in light of the new statement of US policy on outer space approved by the President on 26 January 1960 (see item). The JCS agreed that paragraph 63 of NSC 5906/1 (still current basic US policy) was consistent with the new "US Policy on Outer Space" and did not require revision at this time.

(S) JCSM-69-60 to SecDef, "Basic National Security Policy," 20 Feb 60, derived from JCS 2101/378, 26 Feb 60, JMF 8670 (24 Feb 60).

26 Feb 60 The first MIDAS (Missile Defense Alarm Satellite) flight test vehicle was launched from the Atlantic Missile Range, but because of malfunctions occuring in the boost phase satellite orbit was not attained. The MIDAS program was aimed toward establishing a series of reconnaissance satellites in polar orbit. These would carry payloads consisting of infrared detection scanners capable of detecting emanations from ballistic missiles as the missiles rose above the atmosphere.

(S) Rpt, "Military Space Projects, Jan and Feb 1960," 11 Apr 60, ODDR&E files.

27 Feb 60 NASA rocketed a 100-foot "radio mirror" balloon into space and succeeded for the first time in bouncing a human voice off the aluminized surface of an orbiting satellite. This was the first step in the development of a passive communications satellite to reflect radio and TV broadcasts, NASA reported.

NYT, 28 Feb 60, 37:1.

29 Feb 60 The JCS transmitted their views to the Secretary of Defense on implementing the NATO requirement (see item 25 Jan 60) for a MRBM. Their recommendations called for the US to provide:

1. Financial assistance of about $100 million, excluding the cost of re-entry vehicles with their warheads.
2. Fifty complete missiles with their re-entry vehicles and warheads.
3. Enough technical and facilities assistance to enable NATO to develop a MRBM production capacity of its own.
4. MRBM nuclear warheads to meet agreed NATO requirements.
5. Additional MRBM nuclear warheads for agreed national requirements (i.e. above NATO requirements).

The above assistance "should be consistent with" a total program of 300 operational missiles deployed by 1965 according to agreed NATO plans.

The JCS also recommended that the following conditions be attached to this assistance:

1. That the European countries provide all ground enviroment equipment.
2. That NATO missile requirements be met before national needs were considered.
3. That participating nations agree to maintain missile units under NATO control and according to NATO requirements.
4. That US-made MRBM nuclear warheads remain in US custody under conditions short of war. (See item 14 June 1960.)

(S) JCSM-70-60 to SecDef, "Medium Range Ballistic Missiles (MRBM's) for NATO (U)," 29 Feb 60, derived from JCS 2305/55, same subj, 24 Feb 60, JMF 9050/4720 (16 Oct 59).

2 Mar 60 In reply to a memorandum from the Secretary of Defense, dated 24 February 1960, in which their comments were requested on the effects of a proposed suspension of IRBM and ICBM flight tests, the JCS warned that the adoption of such a proposal would have "critical implications" for US security. The Secretary's memorandum had outlined a plan calling for: cessation of further IRBM and ICBM flight testing upon the installation of an agreed control system; all further "peaceful uses" testing of rockets to be conducted only as part of an internationally agreed program; limitations on the production and/or deployment of missiles and other long-range delivery systems such as airplanes and submarines after the installation of appropriate inspection measures; and finally, agreed reductions in existing arsenals. The Secretary had asked what the effect would be on the relative strengths of the US and Soviet bloc if this plan were adopted effective in 1962, 1963, or 1965.

Any judgment on this question, the JCS answered, must be approached with extreme caution. They could not now decide at what future date a production ban would be advantageous to the US, but a ban on flight tests of IRBM's and ICBM's before 1965 would be disadvantageous to the US "because of the impact upon our weapons systems development programs." (To illustrate, the memorandum cited the MINUTEMAN program, just underway; the POLARIS--including 2,500-mile range--research and development program, less than 40 percent complete; and the TITAN program, with only 7 of 98 test flights completed.) It would also be disadvantageous to agree to limit deployment of long-range delivery systems, continued the JCS, and reduction of these systems could not be considered apart from other disarmament measures.

The JCS requested that these comments serve as guidance for DOD advisors on the staff of the President's Special Science Advisor. Moreover, they requested that they be allowed to present comments on the Special Assistant's report now in preparation (see item 24 Mar 60).

(TS) JCSM-74-60 to SecDef, "U.S. Disarmament Policy (U)," 12 Mar 60, derived from (TS) JCS 1731/346, same subj and date; Memo, SecDef to CJCS, same subj, 24 Feb 60, encl to JCS 1731/342, 24 Feb 60. All in 3050 (1 Jan 60) sec 3.

2 Mar 60 The JCS informed the Commanders of Unified and Specified Commands of changes in forces previously programmed for assignment to their commands. These changes, dictated by the final development of the FY 1961 budget, included: 1) a reduction from 58 to 55 1/2 Army missile battalions, and the addition of 4 interceptor missile squadrons and 4 1/2 National Guard on-site missile battalions in CONAD; 2) an increase of 3 LACROSSE battalions in CINCEUR; and 3) the addition of 1 medium missile command and 1 TAC missile squadron in CINCPAC.

(S) SM-196-60, "Force Assigned to Unified and Specified Commands (U)," 2 Mar 60, derived from JCS 1800/330, 1 Mar 60, JMF 3410 (16 Dec 59) sec 2.

7 Mar 60 A Joint Intelligence Estimate of the Soviet threat to North America was issued by the JCS and the Canadian Chiefs of Staff.

The report contained new information including:

1) ICBM production: The Soviets would have 35 ICBM's on launchers by mid-1960, 140-200 by mid-1961, and 250-

350 by mid-1962. Moreover, Canadian intelligence sources reported in a separate estimate the probable development of an improved Soviet ICBM by 1965 (see item 9 Feb 60).

2) IRBM production: The USSR was capable of launching an IRBM attack on Alaska at the present with their 700-1,100 n.m. missiles. Present Soviet interest, however was concentrated on the 1,500-2,500 n.m. range IRBM. None of the latter had yet been test fired, and operational capability would lag 18-24 months beyond the first firing.

3) Space programs: During 1959 the Soviets launched no detected earth satellites. By 1962, however, they could produce an unmanned satellite system for military uses and by 1965, manned satellites. In a major scientific and technological feat, the report concluded, the Soviets had sent three space vehicles to the vicinity of the moon since mid-1958. These shots proved the advanced achievements of the USSR in the development of high-thrust engines, photography, and communications.

(TS) CANUS IE, "Soviet Threat to North America 1960-1970," 7 Mar 60, J-2 files.

8 Mar 60 — The JCS cancelled a major national SAGE/Missile Master Electronic Countermeasures (ECM) test scheduled for August 1960 because: the system would not be integrated and Electronic Counter Countermeasures--fixed before the spring of 1961; and the results of such a test would be of limited value. At the same time the JCS reaffirmed the importance of ECCM-fixed programs, encouraged CINCNORAD to continue his testing and exercises, and asked CINCSAC and WSEG to give support and technical assistance to CINCNORAD in this program.

(S) Memo, Dir, JS to JCS, "WSEG SAGE/Missile Master ECM Test (U)," JCS 222/182, 8 Mar 60, JMF 6800 (13 Jan 60) gp 2.

10-16 Mar 60 — The House Committee on Space and Astronautics conducted hearings on the proposal to amend the National Aeronautics and Space Act of 1958. The committee heard comments--some unfavorable--from officials of the DOD and NASA on the President's proposed changes (see item 14 Jan 60). Among the many witnesses who attacked the basic premise that the US should have separate civilian and military space programs of equal importance was William M. Holaday, the Chairman of the Civilian Military Liaison Committee. He strongly disapproved the divided responsibility approach and charged "that someone must be held responsible to see that there is some coordination and that we are effeciently utilizing our manpower and our equipment."

The Army's Chief of Research and Development also criticized the President's premise that the US should have separate "peaceful" and military space programs of equal importance. He charged that "it was completely naive to think that a space exploration program could be divorced from the problems of national defense." He agreed that space exploration for peaceful purposes should be pursued but stressed that it should be made subordinate to the military program. (See item 13 Sep 60.)

(U) US House, "To Amend the National Aeronautics and Space Act of 1958," (Hearings before the Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash 1960),pp. 89ff and 194ff.

11 Mar 60 NASA announced the successful launching of PIONEER V, the nation's second sun satellite. Weighing 94.8 pounds and measuring 26 inches in diameter, PIONEER V was the first satellite fired into a solar orbit inside the earth's. [Both PIONEER IV, launched 3 March 1959, and the Soviet's Mechta, launched 2 January 1959 (see items, supplement II) were in solar orbits outside the earth's path around the sun.] NASA expected the two solar-powered radios in PIONEER V to continue transmitting data on radiation, charged particle clouds, magnetic fields, and micrometeors at distances out to 50 million miles in space.
AP, 11 and 14 Mar 60; NYT, 14 Mar 60, 19:1.

16 Mar 60 The Western powers (Canada, France, Italy, the UK, and the US) submitted to the Ten Nation Disarmament Conference at Geneva* a three-phase disarmament proposal, which included the following sections on missiles and satellites

Phase I called for:

Prior notification to the International Disarmament Organization [which was to be set up by treaty] of proposed launching of space vehicles and the establishment of cooperative arrangements for communicating to the International Disarmament Organization data obtained from available tracking facilities.

In addition, joint studies would be undertaken immediately on the following subjects:

(1) Measures to assure compliance with an agreement that no nation shall place into orbit or station in outer space weapons of mass destruction, including provision for on-site inspection, . . .

(2) Measures to assure compliance with an agreement on prior notification of missile launchings according to predetermined and mutually agreed criteria, and on declarations to the International Disarmament Organization of locations of launching sites, and places of manufacture, of such missiles.

Phase 2 (to be undertaken upon completion of studies in phase 1) called for:

(1) The prohibition against placing into orbit or stationing in outer space vehicles capable of mass destruction to be effective immediately after the installation and effective operation of an agreed control system to verify this measure, . . .

(2) Prior notification to the International Disarmament Organization of proposed launchings of missiles according to predetermined and mutually agreed criteria, and declarations of locations of launching sites, and places of manufacture of such missiles, with agreed verification including on-site inspection of launching sites of such missiles.

* The Western proposal was released on 14 March but is referred to by the date it was tabled at Geneva, 16 March 1960.

Phase 3 (Specific measures toward arms reduction) called for:

(1) Measures to ensure the use of outer space for peaceful purposes only . . .

(2) Control of the production of agreed categories of military missiles and existing national stocks and their final elimination.
(U) Dept of State Bulletin, XLII (4 Apr 60), 511-513.

18 Mar 60 ✓ The President and the Prime Minister of the UK signed a memorandum providing for the deployment of SKYBOLT (air-to-surface missile) and POLARIS. The US was prepared to provide SKYBOLT missiles--minus warheads--to the UK on a reimbursable basis in order to extend the effective life of the UK Mark II V-bomber force. The UK on its part "agreed in principle to making the necessary arrangements for US POLARIS tenders in Scottish ports." Both countries also agreed that since the US was offering at the current NATO Defense Ministers meeting to make POLARIS missiles available to NATO, "it does not appear appropriate to consider a bilateral understanding on POLARIS until the problem of SACEUR's MRBM requirements has been satisfactorily disposed of in NATO."

(On 6 June 1960 the Secretary of Defense and the UK Minister of Defense further defined their countries' agreement on SKYBOLT. They agreed that if the missile were successfully developed by the US and could be adapted to the RAF bomber force, the UK as an initial commitment would purchase 100 missiles without warheads.)

(TS) Memorandum, Eisenhower and MacMillan, "SKYBOLT and POLARIS," 18 Mar 60, Encl to JCS 2116/167, 29 Apr 60, JMF 9163/5410 (19 Apr 60); (S) "Memorandum of Understanding," 6 Jun 60, App B to JCS 2116/172, 24 Jun 60, JMF 9163/5420 (2 May 60) sec 2.

19 Mar 60 The Senate Committee on Aeronautical and Space Science issued a report on radio frequency control in space telecommunications prepared by the Legislative Reference section of the Library of Congress. The report referred to the Space Act of 1958 in which the US declared its intention to assume leadership in international cooperative arrangements to ensure peaceful uses of outer space. The purpose of this study was to inform Congress on one aspect of international cooperation, the "unprecedented agreements on space telecommunications negotiated by the US delegation to the Geneva Radio Conference." (See item 10 Nov 59.)

(U) US Sen, "Radio Frequency Control in Space Telecommunications" (Rpt prep for Cmte on Astronautical and Space Science, 86th Cong, 2d sess; Wash, 1960).

21-22 Mar 60 In answer to a JCS request for comment, CINCONAD expressed strong objections to the current proposal to reduce the BOMARC program by over 90 per cent. The reduced program would result in the provision of just 400 BOMARC missiles, only half of which would be to his command, and only half of these missiles would be of the BOMARC B type. He reminded the JCS that his defense mission called for a family of weapons--the F-108, the BOMARC B, and NIKE. By subsequent "piece-meal" actions the F-108 had been cancelled, the NIKE program boiled down to 139 HERCULES

batteries, and the SAGE super-combat ground centers and their hardening deleted. All this had been done, CINCONAD commented, in the face of recent solid intelligence that the Soviets were developing supersonic bombers.

On 22 March 1960 CINCNORAD again commented on the proposal to reduce BOMARC B and requested "the preparation of public guidance which will temper the industrial, military, political and general impact in two countries." CINCNORAD reviewed problems inherent in the proposed reduction: 1) Canadian editorial opinion had consistentl fought the government's decision to stake its defenses on BOMARC. Failure to go ahead with BOMARC now would embarra the Canadian Government and give Canadian papers "ammu- nition with which to reestablish NORAD as an unwise or doubtful alliance of effort between the two countries." Moreover, the BOMARC reduction would establish an extremel high cost-per-weapon ratio, and when uncovered by the pres of both countries would revive the congressional, editoria and parliamentry criticism of the program. 2) Both the Secretary of the Air Force and CINCNORAD had publicly stated that the BOMARC program was vital to the defense of North America. The BOMARC reduction, he warned, would impair the credibility of both, especially in Congress. (See item of 23 March 60.)

(S) Msgs, CINCONAD to JCS, 21 Mar 60, AF-IN 50734; AF-IN 50827 (22 Mar 60). Both in JMF 9081/4500 (22 Dec 59

22 Mar 60 — The Secretary of Defense notified the Canadian Minister of Defense that the SAGE Super Combat Center program had been cancelled, but that the soft SAGE Combat Center/Direction Center program, with any necessary modifications required by the above cancellation, would be completed. At the same time he authorized the provision of a SAGE An/FSQ-7 computer for installation in a Canadian facility as a part of the CADIN program. The Secretary took this action at the recommendation of the JCS, who, in view of other high priority projects, had advised the cancellation of SAGE Super Combat Centers.

(S) JCSM-113-60, "SAGE Super Combat Centers (U)," 18 Mar 60, derived from JCS 1899/566 18 Mar 60; 2d N/H of JCS 1899/560 31 Mar 60. All in JMF 9081/4500 (22 Dec 59) sec 2.

22 Mar 60 — ARPA was given the assignment, code-named STRIVE, of helping to analyze the reliability of the TRANSIT and NOTUS satellite systems and certain SAMOS and MIDAS sub-systems.

(U) Encl to DDD 5129.33, "Project Assignment to ARPA, 22 Mar 60, JMF 5224 (59) (permanent).

23 Mar 60 — The JCS, accepting the views of CSAF, recommended to the Secretary of Defense the reduction of the BOMARC program "for the same general reasons as applied to SAGE." The CSAF had explained that although the Air Force agreed with CINCNORAD's operational requirements for BOMARC, it had to reduce the program in order to ensure sufficient funds for other high priority programs, with which BOMARC competed for available funds. The CSAF had concluded that it was necessary to take a calculated risk on BOMARC. In forwarding these views the JCS also summarized the objections of CINCNORAD (see item 21-22 Mar 60), but concluded by recommending the reduced program of 8 US and 2 Canadian BOMARC sites with a total of 210 "A" and 196 "B" missiles.

(On 2 April 60 the Acting Secretary of Defense approved the JCS recommendations.)

(S) JCSM 119-60, "BOMARC Program Reduction," 23 Mar 60, derived from JCS 1899/567, 23 Mar 60; (S) Memo, CSAFM 144-60 to JCS, 22 Mar 60; 1st N/h 1899/567, 6 Apr 60. All in JMF 9081/4500 (22 Dec 59) sec 2.

24 Mar 60

29 Mar 60

29 Mar 60 The Air Force submitted to the Subcommittee of the House Appropriations Committee a report on its reductions in the BOMARC program. The Air Force concluded that "the program oriented against the bomber threat was too costly and would be achieved too late in relation to the overall threat." Although the bomber threat would continue, the major danger through the 1960's would be the ICBM. Since BOMARC was not designed to cope with ICBM's the BOMARC program and its ground direction system, SAGE, had been reduced. The funds saved could be applied to achieving an effective defense against ballistic missiles two years earlier than anticipated.

The Air Force also reported that the BOMARC program had been reviewed in order to get as much operational capability as soon as possible for the money already invested. The Air Force discovered the most economical way of cutting off BOMARC was to accept the missiles already contracted for and deploy them in the northeastern United States defense area. This explained the FY 1961 budget request for the reduced BOMARC program.

(U) US House, "DOD Appropriations for 1961" (Hearings before the Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 7, p. 263. NYT, 25 Mar 60, 1:6.

31 Mar 60 The JCS informed the Secretary of Defense of their agreement with the DDR&E's proposal to revise the program for development of a communications satellite. The Director had proposed to: eliminate STEER and TACKLE (polar communication satellite programs) as individual efforts; expedite the development of DECREE (24-hour global satellite subsystem) as a principal objective; eliminate from the revised program any concurrent development of an operational capability; complete the two planned firings of COURIER (delayed repeater communication

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satellite); and provide, within the revised program, for mobile air-and sea-station experiments.

In view of the important operational requirement for improved communications in the polar region, the JCS recommended that the revised program should include the research and development necessary to extend communications by satellite relay to the polar regions. (See item 11 Apr 1960.)

(S) JCSM 131-60 to Sec Def, "Reorientation of Communications Satellites Research and Development Program (U)," 31 Mar 60, derived from JCS 2283/84, 29 Mar 60, JMF 8670 (14 Mar 60).

31 Mar 60 The quarterly report to the President on the ICBM and IRBM programs included the following information:

ATLAS

1. Seven ATLAS launched-- six successful, one exploded at lift-off.

2. ATLAS production on schedule and adequate for all needs.

TITAN

1. Three of five TITAN flights were 100 percent successful, two partially successful.

2. Development of the non-cryogenic TITAN system proceeding at a rapid pace.

MINUTEMAN

1. Two full-thrust missiles were successfully fired.

2. R&D facilities at the AMR essentially on schedule; only minor shortages caused by steel strike.

THOR

1. Estimated in the UK: [ ]

2. RAF 77th Strategic Missile Squadron successfully launched the third training missile on 2 March 1960 at Vandenberg AFB.

JUPITER

1. R&D firing program completed with the shots on 4 February 1960.

2. Failure rate of only 6.9 percent showed missile's reliability.

3. Met CEP requirement of 1,500 meters (.81 n.m.).

POLARIS

1. Eleven flight test vehicles launched; nine successful, two partially successful.

2. First fully-guided flight from the test ship demonstrated suitability of the missile to a submarine.

(S-RD) Rpt #47, "Progress of ICBM and IRBM Programs for January, February and March 1960," 27 May 60, ODDR&E files.

1 Apr 60 The US launched into orbit TIROS I (television and infrared observation satellite), the first satellite capable of providing detailed photographs of the earth's weather. The 270-pound satellite, containing two television cameras, was propelled into space by a three-stage THOR-ABLE rocket.
NYT, 2 Apr 60, 1:8.

1 Apr 60 [

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1 Apr 60 Amending a previous action, the NSC substituted the designation "SAMOS" for "SENTRY," the satellite-borne visual and ferret reconnaissance system.
(TS) NSC Action No. 2208, 1 Apr 60, (Approved by Pres 6 Apr 60).

7 Apr 60 At the NATO Defense Ministers' meeting in Paris, the Secretary of Defense offered two alternatives for meeting SACEUR's MRBM requirement for 1963/1965. Under alternative I, the one preferred by the US, the US would produce the missiles and sell them to NATO. Any US assistance would come from MAP funds only after SACEUR approval. Under alternative II, the US would provide technical assistance, technology, and certain components and critical items to help the Europeans develop their own MRBM production facilities. In either case, the Secretary pointed out, the US would provide the warhead and re-entry vehicle, which represented a substantial part of the cost of the whole program
In the ensuing discussion Secretary Gates remarked that, as with the other weapons of the NATO stockpile, warheads would remain under US custody and control.
(The US proposal was referred to the permanent NAC for further study.) (See items 24 Feb and 14 Jun 60.)
(S) Memo, ASD/ISA to CJCS et al, "NATO Defense Ministers' Meeting, Paris, 31 March-1 April 1960," 7 Apr 60, Circ as (S) JCS 2305/97 12 Apr 60, (S) JCS 2305/105, 25 Apr 60. All in JMF 9050/5410 (25 Mar 60).

7 Apr 60 The DOD established within the Office of the Director, DR&E, an Assistant Director (Ranges and Space Ground Support) to provide centralized supervision of all ground environment equipment and facilities for missiles and space development and for test programs. The new officer would make recommendations to DDR&E for the assignments of missile and space programs to the appropriate range and eliminate any duplications in ground environment support of space programs.
(U) DOD No. 5129.34, 7 Apr 60, R&RA (JCS).

11 Apr 60 In his report to the President on progress in the space program during January and February, the Deputy Secretary of Defense included the following information:
1) During February two DISCOVERERs and one MIDAS had been launched, but because of malfunctions during the boost phase, none of the launchings succeeded in placing vehicles in orbit.

2) Project NOTUS (communications satellite) was being redirected with emphasis placed on ultimate 24 hour global satellite communication systems. The medium orbit SAC POLAR satellite system (STEER and TACKLE) and the 24-hour system (DECREE) were being redeveloped to provide a revised system (ADVENT). The interim satellite communications system (COURIER) was proceeding as scheduled (see item 31 Mar 60).

3) SHEPHERD (tracking network) was being re-assessed for: (1) the requirement of SPASUR (dark satellite fence) system; (2) sensor elements requirements for the detection system; and (3) the national requirements for a Space Surveillance Control Center. This reassessment would be in cooperation with NASA.

(S) Rpt, "Military Space Projects, Report of Progress for January and February 1960," 11 Apr 60, ODDR&E files.

13 Apr 60 — The US shot into orbit a space lighthouse, TRANSIT I-B (I-A had failed to orbit), a 265-pound 26-inch spherical satellite and forerunner of a space navigation system that could revolutionize the art of navigation. Since the satellite, propelled by a THOR-ABLE-STAR rocket, did not achieve its planned 575-mile high orbit, it was expected to last only 16 months instead of the originally estimated 50 years.

NYT, 14 Apr 60, 1:4.

13 Apr 60 — The JCS informed CINCONAD that they had considered his objections in the reduction of NORAD forces and equipment (see item of 21-22 Mar 60), and advised the Secretary of Defense of CINCONAD's position on these matters. Nevertheless, added the JCS, they had recommended approval of a reduced BOMARC program (see item 23 Mar 60).

(S) Msg, JCS to CINCONAD, JCS 97531, 13 Apr 60, derived from JCS 1899/573, 13 Apr 60, JMF 9081/4500 (22 Dec 59).

15 Apr 60 — The quarterly report to the President on the antiballistic-missile progress included the following information:

1) Low-power radiation tests from the detection radar at Thule were begun on 10 April. Scheduled IOC for Thule was 30 September 1960.

2) The fourth and fifth NIKE-ZEUS test missiles were fired from White Sands with complete success. All firings had so far been of the unguided, winged version of NIKE-ZEUS. Beginning in July a redesigned ZEUS missile using the new Canard configuration would be fired with guidance package aboard.

(S) Rpt, "Progress of Anti-Ballistic Missile Weapon Support Program, 15 Jan - 15 Apr 60," 30 Jun 60, ODDR&E files.

15 Apr 60 — In an exchange of letters with the Special Assistant to the Secretary of State, the Assistant Secretary of Defense, ISA, discussed the foreign policy problem inherent in the chance landing of US space test vehicles on foreign territories. He informed the State Department that the DOD was formalizing a procedure to ensure notification of the Department of State when the range commander determined and advised the DDR&E that a space vehicle flight would involve such hazard to foreign territories. The DOD believed that this procedure would provide for safeguarding foreign territorial rights and provide the

coordination desired by the Department of State; it would at the same time leave primary responsibility for flight safety with the range commanders.

(C) Ltr, Asst SecState to ASD/ISA, 22 Dec 59 and (C) Ltr, ASD/ISA to Asst SecState, 15 Apr 60, Encls to JCS 2283/86, JMF 8670 (15 Apr 60).

27 Apr 60 The Air Force made available from fiscal 1959 and 1960 funds $29.7 million for project DYNASOAR (see item 9 Nov 59). Another $58 million was budgeted for FY 1961. The DYNASOAR, a manned vehicle boosted into space by a TITAN rocket, was expected to be ready for flight testing in September, 1964.

AP, 27 Apr 60.

29 Apr 60 The House Committee on Appropriations submitted a report on the DOD Appropriation Bill 1961. The committee supported the mixed force concept which, it believed, would continue to be basic to the US defense effort. The committee recognized, however, "that such a mixed force was a more expensive force and while supporting this concept urged that the number of weapons systems be limited by avoiding duplicating operational characteristics."

Commenting on the BOMARC program, the report stated:

"The BOMARC missile in its final configuration is at best highly controversial and as yet unproven, and tests have done nothing to justify confidence in the program. The Committee, therefore, has taken action which will eliminate financing of the BOMARC B missile except for $50 million for further developmental tests and evaluation if necessary. This decision has resulted in the elimination of the $40.4 million requested in the revised program in fiscal year 1961 and recovery of approximately $253.6 million of funds previously appropriated. These funds have been allocated by the Committee to other defense programs of a more essential nature."

(U) US House, Rpt No. 1561, Committee on Appropriations, "DOD Appropriations Bill, 1961," (86th Cong, 2d sess; Wash, 1960), pp. 5-7, 59.

3 May 60

Testifying before a subcommittee of the House Committee on Government Operations, the Deputy Secretary of Defense made the following remarks on the organization and management of US missile programs:

1) The interservice rivalry which had existed at the start of the satellite programs had been brought under control by the establishment of ARPA and the assignment of the satellite and other space programs to ARPA. Since then, the services have had a "clear" understanding of what their responsibilities would be in the principal satellite space programs.

2) Although ARPA was spending approximately $100 million a year to investigate various antimissile systems, the Army's NIKE-ZEUS project represented the major effort in this area.

3) There was no presently well-defined military requirement for booster rockets larger than the ICBM class. The DOD, however, could not predict the future of military space programs and therefore had a definite interest in the SATURN class rockets. But since the civilian space agency had a pressing need for such boosters, it was reasonable that NASA, not the DOD, should carry out the SATURN program.

(U) US House, "Organization and Management of Missile Programs" (Hearings before a Subcmte of the Cmte on Govt Operations, 86th Cong, 2d sess; Wash, 1960), pp. 8, 17, 21, 160.

3 May 60

4 May 60 The CSAF charged at a news conference that the POLARIS missile was more vulnerable to attack than its supporters contended. He believed the enemy could successfully blanket the operational area of FBM Submarines with aircraft, and, furthermore, Soviet submarines could trail the POLARIS submarine indefinitely.

NYT, 5 May 60, 17:8.

4 May 60 The OCB, in order to establish guidance with regard to public statements on reconnaissance satellites as ordered in paragraph 40 of "US Policy on Outer Space" (see item 26 Jan 60), recommended that the Departments of State and Defense, consulting with other agencies as appropriate, consider on an urgent basis the extent to which information obtained through the use of reconnaissance satellites could be applied to civil purposes.

On 18 May 1960 the Assistant Secretary of Defense (ISA), informed the JCS and others that the DDR&E would participate as the DOD representative in the proposed study.

(S) OCB, Guidelines on Reconnaissance Satellites, 4 May 60, JMF 8670 (4 May 60); (C) Memo, ASD/ISA to SecA, et.al., "OCB Document: Guidelines on Reconnaissance Satellites," 18 May 60, Encl to JCS 2283/91 2 Jun 60. All in JMF 8670 (18 May 60).

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5 May 60 [redacted]

6 May 60 In a prepared statement to the House Committee on Government Operations, the Undersecretary of the Air Force revealed the Air Force plan to establish a non-profit corporation to provide technical support to the ballistic missile and space programs of the Air Force (see item 29 Jan 60).

The plan called for the formation of a new non-profit corporation which would provide technical support to the Air Force's ballistic missile and space programs. Those functions appropriate to the new organization, which had previously been handled by Space Technology Laboratories, would be transferred to the new organization as expeditiously as possible. It was anticipated that a nucleus of personnel from Space Technology Laboratories would provide the initial technical skills required by the new corporation.

In order to avoid any possible disruption of the approved development plans, Space Technology Laboratories would retain detailed systems engineering and technical direction responsibility for Atlas, Titan, and Minuteman.

Functions to be assumed by the new corporation under Air Force program management included advanced systems analysis and planning, research and experimentation, initial systems engineering, initial technical direction, and technical monitoring in the field of ballistic missiles and space systems. In addition, the new corporation would provide technical staff assistance in the evaluation of ideas and proposals submitted by private industry.

The proposed non-profit corporation would work closely with the Air Force in long-range planning, systems analysis, and systems comparison studies. As technical adviser to the Air Force, the corporation would review ideas and concepts generated throughout the industry and Government in order to insure the proper interaction between military requirements and technical capabilities. (See item 25 Jun 60.)

(U) US House, "Organization and Management of Missile Programs" (Hearings before a Subcmte of the Cmte on Govt Operations, 86th Cong, 2d sess; Wash, 1960), p. 84.

9 May 60 — ARPA announced the transfer of the TRANSIT space navigation project to the Navy. (See item 22 Jun 60.)

(S) Amendment 17 to ARPA Order, 17 May 60, ARPA files.

12 May 60 — The JCS recommended that the Secretary of Defense oppose a French proposal for the controlled reduction of the means of delivery of nuclear weapons because the French plan would "eliminate the US deterrent before it had reckoned with Sino-Soviet conventional power." The JCS did not object to a controlled agreement to prohibit weapons-carrying space vehicles or to an international agreement on missile launchings in accordance with the Western Disarmament Plan of 16 March 1960 (see item); they did object, however, to those measures of the French proposal that differed in principle, conditions, or timing from the plan of 16 March 1960. (See item 27 May 60.)

(S) JCSM-203-60 to SecDef, "French Proposal of 11 May 1960 for Control of Means of Delivery for Nuclear Weapons (U)," 12 May 60, reproduced in (S) JCS 1731/380, "Control of Nuclear Delivery Systems," 12 May 60, JMF 3050 (1 Jan 60) sec 8.

15 May 60 — The Soviet Union propelled into a 200-mile orbit around the earth a 10,000-pound space ship, including, according to the Soviet announcement, a dummy space man and all the necessary equipment for a manned flight. The Soviets planned to separate the 5,500 pound pressurized cabin from the rest of the sputnik, but announced they would make no attempt at re-entry or recovery of the capsule. Coinciding with the opening of the summit conference in Paris, the shot anticipated similar experiments planned by the US.

NYT, 16 May 60, 1:4.

19 May 60 — The House Committee on Science and Astronautics issued a report on the President's proposed amendments to the National Aeronuatics and Space Act of 1958 (see item 14 Jan 60) in which it recommended the President's proposals be passed without amendment.

(U) US House, Rpt No. 1633, Committee on Science and Astronautics, "Amending the National Aeronautics and Space Act of 1958," 19 May 60 (86th Cong 2d sess; Wash, 1960), p. 1.

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20 May 60 The US shot an ATLAS "D" ICBM a distance of 9,000 miles, the longest flight of a missile--Soviet or US--to date. The ATLAS, carrying a nose cone of 1 1/2 tons, blasted off from Cape Canaveral and, traveling at a top speed of 17,000 miles an hour, landed in the Indian Ocean southeast of the Cape of Good Hope 52 minutes later.

NYT, 21 May 60, 1:1.

20 May 60 The Representative of the UK Chiefs of Staff forwarded to the JCS for their comments a study on the military implications of defining limits in space. The study examined the factors involved in defining limits in space and the possible effects of such limits on the military interests of the UK. It concluded: 1) some degree of risk was implicit in any definition of the lower limit of space, and the US might have strong military reasons against such a definition at the present time; 2) the UK saw no military disadvantage in arbitrarily defining the lower limit of outer space at about 20,000 n.m., and if communications-electronics and meteorological satellites were internationally classified as "peaceful," at 2,500 n.m.; 3) any proposal restricting the military use of space between the upper limit of territorial sovereignty and the lower limit of space must be resisted and any agreement banning military uses of outer space should be subject to an effective control organization to prevent clandestine nuclear tests; and 4) the advantages to the UK and the West of being able to overfly the USSR and China at heights of 15 to 20 miles outweighed the disadvantages of the USSR's being able to overfly the West. (See item 31 Aug 1960.)

(TS) Memo, Representative of the UK Chiefs of Staff to JCS, "Military Implications of Defining Limits in Space," 20 May 60. Encl to JCS 2283/90, 27 May 60, JMF 8670 (20 May 60).

24 May 60 The US launched MIDAS II, a 5,000-pound missile warning satellite, into orbit that avoided the USSR but passed over Communist China, Tibet, and North Viet Nam. MIDAS, designed to give early warning of surprise missile attacks, used its infrared sensors to detect the heat radiated by a missile engine's exhausts.

NYT, 25 May 60, 1:8.

24 May 60 [

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27 May 60 The JCS advised the Secretary of Defense that it would be militarily undesirable to agree to a pre-launch inspection of missile payloads except as part of a general test ban treaty. If a general treaty were concluded, the JCS reasoned, US missile testing would stop. In the meantime it would be unwise to allow the Soviets to inspect our payloads, since it was in the fields of warhead sophistication and missile guidance technique that the US was considered to be significantly ahead of the USSR. If pre-launch inspection of payloads was judged essential to the detection of high altitude tests, the JCS had no objection to including it in a general test ban agreement.

(S) JCSM-225-60, "Pre-launch Inspection of Missile Payloads as a System to Monitor a Ban on High Altitude Nuclear Testing," 27 May 60, derived from JCS 1731/386, same subj and date, JMF 3050 (1 Jan 60) sec 8.

1 Jun 60 In a memorandum to the Secretary of Defense the Assistant Director, DR&E, transmitted the June schedule of the DOD Space Vehicle Launch Schedule. The schedule listed approximately 16 programs and revealed the following substantial changes in proposed firings published in the November schedule (see item 1 Dec 59): deletion of the VEGA program (see item 11 Jun 60), introduction of the LUNAR ORBIT and AGENA B programs, and a substantial increase in proposed MERCURY launchings, now scheduled for 10 suborbital and 12 orbital launchings by September, 1962.

(S) Ltr, Asst Dir, DR&E, to SecDef, "Transmittal of DOD Space Vehicle Launch Schedule," 1 Jan 60, JMF 8670 (29 Jun 60).

1 Jun 60 Citing the results of a coordination conference at SHAPE on 11-14 April 1960 as proof of the ineptness and futility of the coordination method in strategic attack planning, CINCSAC urgently requested centralized direction of detailed atomic strike planning in the fields of targeting, timing, and weight of effort. (See item 19 Aug 60.)

(S) Ltr, CINCSAC to CJCS, "Unity of Command," 1 Jun 60, CJCS 471.94, Chairman's files.

2 Jun 60 In a letter to the Secretary General of the UN, the Soviet representative presented his country's latest proposals for a general disarmament treaty. On the subject of missiles and space vehicles the Soviets proposed that:

1) the total destruction of all strategic and operational tactical rockets and self-propelled missiles be a part of a first stage of total disarmament.

2) from the very beginning of the first stage the launching into orbit or the placing in outer space of special devices be prohibited.

3) rockets should be launched exclusively for peaceful purposes in accordance with predetermined and agreed criteria and subject to agreed verification measures, including on-the-spot inspection of the launching sites for such rockets.

4) all missile launching installations be destroyed with the exception of those retained for the launching of rockets for peaceful purposes.

(U) Ltr, Soviet Representative to the UN to Secretary General UN, 2 Jun 60, quoted in the NYT, 3 Jun 60, 6:1-8.

9 Jun 60 WSEG reported to the JCS that the proposed installation of POLARIS missiles on cruisers would result in a strategic offensive system that was less desirable than the POLARIS submarine. The essential reason for this conclusion, WSEG reported, was the greater vulnerability of the cruiser to enemy attack. The report concluded, however, that the POLARIS cruiser system would "complicate the Soviet antiballistic missile capability to the same degree as the FBM submarine." (See item 9 Oct 60.)

(TS-RD) WSEG Report No. 47, "Evaluation of the POLARIS Cruiser System," 1 Jun 60, App to JCS 1620/299, 13 Jun 60, JMF 4720 (9 Jun 60).

10 Jun 60 The DOD formally set forth the functions of the Scientific Advisory Committee for Ballistic Missiles. This Committee, composed of not more than 20 members appointed by the Secretary of Defense from the scientific community, was to act as the senior technical advisory group to the DOD for ballistic missile systems including space subsystems.

(U) DDD No. 5129.35, 10 Jun 60, R&RA (JCS).

11 Jun 60 The Comptroller General reported the loss of $16 million because of the duplicate development by NASA and the Air Force of a second stage rocket for lunar probes. Parallel construction had gone on for a year before NASA discovered that its $18 million ATLAS-VEGA project had been duplicated by the Air Force's ATLAS-AGENA B and abandoned its program on 12 December 1959.

The Comptroller's report blamed the cumbersome decision-making machinery in the US space program and the lack of communication between the Air Force and NASA for the duplication. He added that even without the duplication, the VEGA project would have resulted in waste because NASA had neglected to schedule test launchings. By the time tests could have been scheduled and carried out the new CENTAUR vehicle would have superseded VEGA.

NYT, 12 Jun 60, 28:1; 12 Dec 59, 2:4.

14 Jun 60 In a memorandum to the Secretary of Defense summarizing the position of the JCS on MRBM's for NATO, the CJCS reiterated the position of the JCS in support of US assistance to the NATO MRBM program (see item 29 Feb 60), their support of SACEUR's requirement for 300 MRBM's by 1965, their recommendations for bilateral MRBM arrangements with France and their recommendations for the provision of additional missiles to those nations that insisted on a supra-NATO capability. The Chairman reminded the Secretary that the JCS hadnot specified that POLARIS was the only missile to be considered.

(S) CM-550-60 to SecDef, "MRBM's for NATO (U)," 14 Jun 60. Circulated as JCS 2305/143, same subj, 20 Jun 60, JMF 9050/4720 (16 Oct 59).

15 Jun 60 The OCB issued an operations plan for outer space setting forth agency programs, courses of action, responsibilities, and timing considerations for carrying out national policy on outer space (see item 26 Jan 60). The plan included those programs which were current or planned for the immediate future: sounding rockets, earth satellites and other space vehicles, their relationshp to the exploration and use of outer space, and their political and psychological significance. The plan did not consider the subject of ballistic missiles.

(S) OCB, "Operations Plan for Outer Space," 15 Jun 60, JMF 8670 (15 Jun 60).

16 Jun 60 The Secretary of Defense reaffirmed the decisions on the organization of space programs made by his predecessor on 18 September 1959 (see item, supplement II). He emphasized that the establishment of a joint military organization for control over operational space systems appeared neither necessary nor desirable at this time.

(C) Memo, SecDef to SecA, et al, "Coordination of Satellite and Space Vehicle Operation," 16 Jun 60, JMF 8670 (22 Apr 59) sec 2.

19 Jun 60 The Army announced the first known interception and destruction of one guided ballistic missile by another as its solid fuel NIKE HERCULES destroyed a CORPORAL. The Army credited the development of new radars for HERCULES's improved accuracy.

NYT, 11 Jun 60, 5:4.

21 Jun 60 The Navy announced the development of ASROC, its newest antisubmarine missile. An integrated weapon system, ASROC consisted of four major parts--underwater sonar, electronic fire-control computers, an eight-missile launcher, and the missile, either a homing torpedo or depth charge. The missile had an effective range of six miles.

AP, 21 Jun 60.

22 Jun 60 TRANSIT 2A (navigation satellite) was launched into orbit from the AMR and for the first time placed a two-payload package--carried pick-a-back fashion--into space. All satellite and ground station systems were performing satisfactorily.

The objective of the TRANSIT system was to provide an accurate and reliable means of precisely fixing the position of surface craft, submarines, and possibly aircraft on an all-weather global basis.

(S) Rept, "Military Space Projects, Report of Progress for March-April-May 1960," 16 Aug 60, ODDR&E files.

25 Jun 60 The Air Force announced the formation of the Aerospace Corporation, a multimillion-dollar civilian organization to manage the engineering, research, and development aspects of the Air Force missile and space programs. The new corporation would assume the role previously performed under contract by Space Technology Laboratories (see item of 6 May 60). Initially, the new corporation would manage DISCOVERER, MIDAS, and SAMOS satellite programs. Space Technology Laboratories would continue to manage the ATLAS, TITAN, and MINUTEMAN ICBM programs which were considered too far advanced to be easily transferable.

Aerospace was incorporated in California with no capital stock. It would operate initially under a $5 million Air Force "drawing account."

NYT, 26 Jun 60, 1:4.

26 Jun 60 General Electric announced that it would produce the French wire-guided SS-10 and SS-11 antitank missiles for the US Army. Both lightweight and portable, the SS-10 was designed for use by infantry, fired either from fixed positions or from light vehicles. The SS-11, also lightweight but with a greater range, would be launched from vehicles, helicopters, and other aircraft.

NYT, 27 Jun 60, 19:2.

27 Jun 60 The US presented a revised version of the Western powers general disarmament program (see item 16 Mar 60) to the Ten-Nation Committee meeting at Geneva. The new version incorporated several changes including:

1) "In the course of negotiating such a Treaty, arrange for and conduct the necessary technical studies to work out effective control arrangements for measures to be carried out in the program. . . . Among the early studies shall be a technical examination of the measures necessary to verify control over, reduction and elimination of agreed categories of nuclear delivery systems, including missiles, aircraft, surface ships, submarines and artillery."

2) As part of Stage One: "a. prior notification to the International Disarmament Control Organization of all proposed launchings of space vehicles and missiles and their planned tracks; b. the establishment of a zone of aerial and ground inspection in agreed areas including the U.S. and U.S.S.R.; c. exchange of observers on a reciprocal basis at agreed military bases, domestic and foreign."

3) The exclusion of any reference to measures to ensure the use of outer space for peaceful purposes only (see item 23 Dec 59).

(U) Dept of State Bulletin, XLIII (18 Jul 60), 90-92.

29 Jun 60 DISCOVERER XII was launched from Vandenberg AFB, but malfunctions, apparently occuring in the horizon scanner, resulted in a pitch-down attitude and caused the satellite to re-enter the atmosphere.

(S) Rpt, "Military Space Project, Report of Progress for March-April-May 1960," 16 Aug 60, ODDR&E files.

30 Jun 60 The quarterly report to the President on the ICBM and IRBM programs included the following information:

ATLAS

1) Eight flights flown, six very successfully.
2) First ATLAS launch from horizontal storage by a SAC crew 22 April 1960.
3) Five operational launchers transferred to SAC.

TITAN

1) Six completely successful R&D flights launched.
2) Seven missiles delivered (one more than scheduled).
3) Construction of sites satisfactory

MINUTEMAN

1) Seventh and eighth test launches successful; all objectives met six months ahead of schedule.

THOR

1) [redacted] THORS mated with warheads.
2) Fourth RAF training launch successful 23 June 1960.

DOE (b)(3)

JUPITER

1) Program increased by 1 missile (to 93).
2) [redacted]

DOE (b)(3)

POLARIS

1) Nine flight test vehicles launched. Seven were successful--including one that demonstrated the compatibility of the missile with the integrated shipborne system--and two were partially successful.

(S-RD) Rpt No. 48, "Progress of ICBM and IRBM Programs April, May, and June 1960," 16 Sep 60, ODDR&E files.

30 Jun 60 The JCS, in commenting upon a State Department position paper on outer space, declared that the US should maintain the position that it was not prepared to consider, at this time, extension of major restrictions on outer space activity beyond that which had already been proproposed by the Western Five Powers. In the face of an increasing need for timely and continuous intelligence information, it would be premature to propose sharing or internationalizing our achievements in satellite reconnaissance, the JCS said. They were not opposed to the Western Five Power proposals for joint studies leading toward elimination of weapons satellites, and they foresaw, under a condition of general disarmament, a reduced need for observation satellites too. But meanwhile, the US must recognize its need for vigilance and hence for observation satellites.

In a detailed appendix defending their position the Chiefs mentioned the imcompleteness of the US programs, the ineffectiveness of international operation compared to US operation, and the greater need of the US than of the Communist bloc for the reconnaissance satellite method of intelligence gathering.

(S) JCSM-271-60 to SecDef, "State Department Position Paper, 'Outer Space: Reconnaissance Satellites' (U)," 30 Jun 60, derived from JCS 1731/397, 27 Jun 60, JMF 3050 (1 Jan 60) sec 13.

1 Jul 60 Congress approved an appropriation of $915 million for NASA for FY 1961. The total included the original administration request for $802 million plus an additional $113 million added by President Eisenhower, most of which was earmarked for work on a super-booster rocket program.
NYT, 2 Jul 60, 6:1; AP, 9 Mar 60.

5 Jul 60 The House Committee on Science and Astronautics issued a report on its hearings (20 Jan through 7 Mar 60 - see items). The report summarized the many volumes of testimony by officials of NASA, the DOD, other executive agencies, and private industry. It concluded that since "meaningful space exploration is becoming a major component in the stature accorded the big powers by the 20th century international community," the US space program would assume equal importance with US defense, foreign trade policy, and mutual assistance as a prime force in world affairs. The committee believed therefore that the US must emphasize and accelerate space research as a necessary element of continued world leadership. Among the many recommendations of the committee were the following:
1) sufficient care should be taken by the Secretary of Defense to insure that the evils that come with overcentralization did not occur in DDR&E; 2) NASA's F-1 program to develop a 1 1/2 million-pound thrust single-chamber rocket engine supplying a backup power plant to SATURN should be expedited, and more important, the cluster engine (the NOVA concept--see item 6 Feb 60) should be expedited; 3) a high priority program should be undertaken to place a manned expedition on the moon in this decade; and 4) the Air Force's project ORION, a method of space propulsion based on a system in which a series of small nuclear explosions would create propulsion for huge space platforms, should be administered by NASA. (The report noted that the Air Force had saved the project from termination by transferring $1 to 2 million from another project.)
(U) US House Rpt No. 2092, Cmte on Science and Astronautics, "Space, Missiles, and the Nation," (86th Cong, 2d sess; Wash, 1960), pp. 53-55.

5 Jul 60 ✓ The House Science and Astronautics Committee issued a report on its space and missile hearings (see item 5 Jul 60). The committee, with some dissenting opinion, agreed that the withholding of $137 million of preproduction funds from the NIKE-ZEUS program was unreasonable and tended to set a "dubious precedent" in defense spending. NIKE-ZEUS, said the committee, had progressed further in research and development than "certain other missile systems" that had been approved for production, it was without competitors as a defense against ICBM's, and its tests had encouraged the belief that it could accomplish the assigned mission.
(U) US House, Rpt No. 2092, Cmte on Science and Astronautics, "Space, Missiles, and the Nation," (86th Cong, 2d sess, Wash, 1960), p. 60.

5 Jul 60 The House Committee on Science and Astronautics issued a report "to delineate in lay language, and in terms which will be meaningful to those who have not followed the American space program closely, the reasons for this great investment and the probable returns." The report

was concerned with the military, economic, scientific and technological, social, and political values of outer space exploration, which, the committee estimated, would cost the US between $30 and $50 billion in the 1960's.

(U) US House, Rpt No. 2091, Cmte on Science and Astronautics, "Practical Values of Space Exploration," (86th Cong, 2d sess; Wash, 1960).

7 Jul 60 — The President signed the $39,996,608,000 defense appropriations bill for FY 1961. The DOD budget, presented to the Subcommittee of the House Committee on Appropriations on 13 January 1960, had requested $39.3 billion, including $3.8 billion in new obligational authority and $3.4 billion in expenditures for missile procurement. The DOD budget had also requested $3.9 billion in new obligational authority and $3.9 billion in expenditures for research, development, test, and evaluation programs. The missile procurement estimate was based on planned force levels as follows: Army--three Field Artillery missile groups (heavy) (REDSTONE), five Army Missile Commands, 82-1/4 air defense guided missile battalions, and 26 separate surface-to-surface missile battalions; Navy--six POLARIS-firing submarines, the first nuclear-powered cruiser armed with air-defense guided missiles, 16 guided missile destroyers and frigates, and the introduction of DAVY CROCKETT, HAWK, and BULLPUP missiles in the Fleet Marine and Naval air forces; Air Force--first few TITAN ICBM's operational, first BMEWS station, and an "on-the-shelf" airborne alert.

The final DOD appropriation bill provided $661.6 million more than the President requested, including a $241 million increase in POLARIS and $50 million for anti-submarine warfare. The $294 million requested for BOMARC B was cut by the House, but $244 million of the total was restored by the Senate.

The funds provided for in the 1961 appropriation raised the total expenditure for missile weapons systems since World War II to $38.3 billion.

(U) US House, "DOD Appropriations for 1961," (Hearings before a Subcmte of the Cmte on App, 86th Cong, 2d sess; Wash, 1960), pt 1, pp. 21, 180-189; NYT, 19 Jan 60, 2:4; 8 Jul 60, 18:5.

8 Jul 60 — The Air Force announced that a BOMARC B had streaked 120 miles over the Gulf of Mexico and successfully intercepted a supersonic missile.

NYT, 9 Jul 60, 42:3.

8 Jul 60 — In response to a request for his views on whether a seaborne deployment would satisfy the Allied Command Europe (ACE) requirement for MRBM's, SACEUR stated that he did not consider it prudent to rely on seaborne deployment exclusively or even largely. He considered ACE's requirement could best be met by a deployment of both land- and sea-based missiles available in 1963, supplemented in 1965 or earlier by an improved third-generation missile designed specially for ACE. SACEUR doubted that any existing deployment scheme could resolve the basic political issues (manning, ownership, financing, etc.). (See items 1 Sep and 25 Oct 60.)

(TS) Msg, SACEUR to ASD/ISA, ALO 657, 8 Jul 60. Circulated as App to (TS) JCS 2305/196, "MRBM's for NATO (U)," 16 Aug 60, JMF 9050/4720 (5 Aug 60).

13 Jul 60 — The Air Force issued a contract for the development of MISTRAM (missile trajectory measurement system) to measure with hitherto unequaled precision the flight of rockets and missiles. MISTRAM was designed to transmit missile velocity and position information to control centers in less than one-tenth of a second.
NYT, 13 Jul 60, 71:1.

15 Jul 60 — The quarterly report to the President on the anti-ballistic-missile program included the following information: 1) the BMEWS system was progressing satisfactorily with the Thule site scheduled for operations on 30 September; 2) two tests of the Army's NIKE-ZEUS underground launch cells had been conducted at White Sands, and negotiations had begun with the Air Force for furnishing the required ATLAS target missiles; and 3) the JUPITER target program had been cancelled.
(S) Rpt, "Progress of Anti-Ballistic Missile Weapons System Programs, 16 April-15 July 1960," 3 Oct 60, ODDR&E files.

20 Jul 60 — The Navy announced the first successful firing of its POLARIS missile from a submerged submarine, the USS George Washington. On this flight the missile flew 1,000 n.m.
NYT, 21 Jul 60, 1:1.

22 Jul 60 — The JCS informed CINCSAC that his request for the establishment by 1 November 1960 of an airborne alert operation on the basis of one sortie daily by each of the 29 combat-ready heavy bomber squadrons would interfere with current preparations for a one-eighth "on-the-shelf" airborne alert capability in SAC by 1 April 1961. The JCS recognized, however, that the current rate of six sorties per day was inadequate to maintain a level of proficiency high enough to permit, should it be required, the launching of an optimum airborne alert operation. Therefore, they requested CINCSAC recommend the daily level required to achieve and sustain the necessary level of proficiency. (See item of 25 August 1960.)
(S) Msg, JCS to CINCSAC, "Airborne Alert Operations (U)," JCS 980399, 22 Jul 60, derived from JCS 1899/591, same subj and date, JMF 3340 (23 Jun 60).

22 Jul 60 — NASA announced the successful firing of a new research rocket, IRIS, designed to study cosmic rays, radiation, and other phenomena in the upper ranges of the earth's atmosphere. Classed as a sounding rocket, the 20 foot-long IRIS was capable of carrying a 100 pound payload to a height of 200 miles by means of its single-stage, solid propellant rocket engine. The new rocket used a slow burning fuel in order to conserve much of its thrust for higher altitudes.
Originally sponsored by the Navy, IRIS had been under the direction of NASA since May 1959.
AP, 22 Jul 60.

24 Jul 60 — NASA announced that it had begun a series of policy studies to: "1) determine the economic potentials for commercial exploitation of space and define the proper relationship between Government and industry in the utilization of space, and 2) determine the proper organization within the Government to coordinate and control practical uses of space."

In explaining NASA's announcement, the New York Times referred to the broad policy questions concerning subsidies, licensing, regulation, and private versus public development of space controversies facing the civilian space agency. The newspaper interpreted these studies as a step by NASA towards revising US space law, only two years old but already outmoded.
NYT, 25 Jul 60, 1:5.

27 Jul 60 — In a letter to the Secretary of Defense the Secretary of the Navy wholeheartedly concurred with the CNO's requirement for the development of a POLARIS missile with a 2,300 n.m. range, operational no later than 1965. The Secretary of the Navy requested the special allocation of funds from the Secretary of Defense for this purpose. The Navy was increasingly concerned over reports of stepped-up Soviet ASW development and believed that a POLARIS missile with an assured range of 2,300 n.m. would increase greatly the system's operation flexibility and assure the maintenance of the POLARIS threat in the face of any possible Soviet "counter action." In order to assure operational status for the new weapon by April 1965, he said, accelerated research and development must begin no later than 1 August 1960.
(S) Ltr, SecN to SecDef, "Extended Range POLARIS Missile System, request for," 27 Jul 60, JMF 4720 (27 Jul 60).

1 Aug 60 [

1 Aug 60 In a memorandum to the JCS, the Acting Secretary of Defense stated that he had received requests and proposals from various sources for new missiles in the 1,000-1,500 n.m. range. Anxious to avoid a repetition of the JUPITER-THOR duplication, the Acting Secretary wanted an assessment by the JCS, in collaboration with DDR&E, of existing and proposed MRBM systems to determine which system would best meet requirements. The JCS were to consider especially the degree and kind of mobility; range, accuracy, and growth desired; deployment dates and numbers; types of targets and warheads; and the special requirements for logistic support and communication. The Secretary asked the JCS to disregard the initially approved NATO requirement (see items 29 Feb and 9 Aug 60), since he considered that the US was committed to supplying POLARIS to NATO, at least in limited numbers. He also directed them to consider the question of MRBM's without regard to roles and missions. (See item of 29 Sep 60.)

(S) Memo, Actg SecDef to JCS, "Mid-Range Ballistic Missile (MRBM)," 1 Aug 60. Circulated as (S) JCS 1620/300, same subj, 2 Aug 60, JMF 4720 (1 Aug 60).

8 Aug 60 In reply to a note from the Soviet Government dated 16 July 1960 the US defended its right to deploy IRBMs to NATO. The Soviets had condemned the reported deployment of POLARIS missiles to Germany, alleging that this would place in the hands of the West German armed forces, "the leading figures of which do not conceal their revanchist inclinations," the weapons of atomic war. The Soviets threatened counter-measures in the face of this missile threat.

The US replied that any steps taken by NATO to provide MRBMs for defense of the Treaty area would be taken in accordance with agreed NATO defense plans. The US also defended the policies of the Federal German Republic as "legitimate defense requirements entirely within the 15-nation NATO." It reminded the USSR of its repeated threats to use rockets in pursuance of its policies, particularly in respect to the smaller nations.

(U) Dept of State Bulletin, XLIII (29 Aug 60), 347-9.

9 Aug 60 In a letter attempting to clarify the issue of the MRBM requirement for NATO, SACEUR assured the Secretary of State that it was not his purpose to use the MRBM "to inject ourselves into a strategic role beyond the responsibilities which we already have." In order to meet the NATO MRBM requirement in 1963, he went on, NATO could adapt an existing weapon, probably POLARIS. This would

account for about half of the stated initial requirement of 300 missiles. The remainder should be filled by a specially designed third generation missile, lighter, more flexible, with a range of 1,200 to 1,500 n.m. and a warhead of perhaps 100, 200, or 500 KT. Because of political and technical difficulties, it might prove necessary to assign five POLARIS submarines to SACEUR in order to meet 1963 goals. The rest of the POLARIS requirement could be met by land-based or water-borne versions; the next-generation missile, though, should be generally land-based. SACEUR closed by urging early action, both to speed procurement of the weapon and to offset the feeling "in some quarters" that "we are living in a vacuum in which the United States cannot exercise the responsibilities of leadership." (See item 1 Sep 60.)

(TS) Ltr, SACEUR to SecState, "MRBM for NATO," 9 Aug 60, CJCS 471.94, Chairman's files.

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10 Aug 60 DISCOVERER XIII was successfully launched from Vandenberg AFB, and on the next day a data capsule was successfully recovered for the first time. The capsule was ejected from the satellite during its 17th orbital pass and was recovered by helicopter in the Pacific Ocean recovery area. Tracking stations reported continuous bearings on the capsule during its half-hour descent, but cloud cover apparently prevented airborne recovery.

(S) Rpt, "Military Space Projects, Report of Progress for March-April-May 1960," 16 Aug 60, ODDR&E files.

12 Aug 60 NASA successfully launched into orbit ECHO I, a balloon communications satellite. The largest man-made object ever placed into orbit (measuring 100 feet in diameter and weighing 136 pounds), ECHO was launched to test the feasibility of relaying voice messages across oceans and continents by satellite and providing an all-weather communications system.

NYT, 13 Aug 60, 1:8.

16 Aug 60 Western and some Communist bloc scientists convened in Stockholm to establish an International Academy of Astronautics and an Institute of Space Law. The Soviets refused to participate, stating that there were already enough international bodies for cooperation in solving problems of space exploration, and that space law was properly a subject for UN consideration.

NYT, 16 Aug 60, 7:3.

16 Aug 60 [redacted]

17 Aug 60 The OCB discussed the international relations aspects of project NEEDLES and established guidance for the continuation of the program. This Air Force project was designed to place into orbit 2,000 miles above the earth a number of very small dipoles, fine hair-like metallic filaments, to serve as reflecting elements for three cm microwave communications. It was scheduled for launching in January-February 1961. Thirty days after launching, the OCB reported, about one billion of these filaments were expected to form a belt around the earth 20-30 miles

in diameter with a separation between filaments of 500-1,000 feet and a life expectancy in space of one to two years.

After examining the possible technical and political impact of NEEDLES on US and foreign opinion, particularly the opportunities it would afford Soviet propaganda organs, the OCB suggested the following measures:

1) Explain as much of the project to as large a scientific, international political, and foreign audience as possible previous to its launching, making clear that only after analysis of the results of this experiment would decisions be made concerning further experimentation.

2) Consider international participation in the experiment.

3) Seek to emphasize the project's scientific objective and deemphasize any possible military applications. This would include using civilian scientists as spokesmen and the Space Science Board of the National Academy of Science in a consultant capacity.

4) Change the project's name to avoid inducing fear or anxiety.

(S) OCB, "International Relations Aspects of Project NEEDLES Experiment," 17 Aug 60, JMF 8670 (17 Aug 60).

18 Aug 60 — The JCS informed CINCAL that they had decided not to deploy second generation missiles to the Alaskan Command at this time. The JCS felt that this deployment was not justified because of the reductions that would have to be imposed on offensive forces of other commands. Further, the JCS declared, final decision on the deployment of any future offensive forces must include consideration of the limited forces available and the value to the US of maintaining some of these forces in Allied territory. "When the considerations above permit," declared the JCS, "additional offensive forces will be deployed to Alaska." (See item 16 Jan 59, supplement II.)

(TS) SM-791-60, JCS to CINCAL, "Deployment of Second-Generation Missiles to Alaska (U)," 18 Aug 60, derived from JCS 2019/516, same date, JMF 4720 (4 Aug 60).

18 Aug 60 — In a report submitted to the Secretary of Defense on the status of the national security programs, the JCS included the following information on the US missile program:

1) The nuclear retaliatory force included: one ATLAS complex operational, and two full squadrons with increased levels of hardening and increased number of missiles programmed to become operational before the end of CY 1960; research and development of TITAN and MINUTEMAN progressing satisfactorily, the former to become operational by the end of CY 1961, the latter during FY 1963; two squadrons of MATADOR operational in the Pacific and a total of one squadron of MATADOR and two of MACE deployed in Europe and the Middle East; the REGULUS operational in five submarines and two cruisers, with nine submarines equipped with the REGULUS radar guidance system (TROUNCE), two FBM submarines operational by the end of CY 1960, four more in CY 1961. Also included in the nuclear retaliatory capability program were the HONEST JOHN, LACROSSE, REDSTONE, and CORPORAL battalions deployed with army and marine units. In addition, solid propellant missiles PERSHING and SERGEANT were in development, the former to be operational in FY 1963.

2) Continental defense included: 57 1/2 NIKE battalions-27 1/2 battalions of NIKE-HERCULES and 30 battalions of NIKE AJAX (being phased out of the regular army into the National Guard program)-and four squadrons of BOMARC missiles operational.

3) Programs developed for highly mobile and deployed ready forces included: the DAVY CROCKETT, to be issued to army units in FY 1961, the TERRIER, operational on seven cruisers; SIDEWINDER and SPARROW III, standard equipment on all carrier fighters; and BULLPUP, a close-air-support guided missile being placed on light attack aircraft.

4) Missile programs for NATO included: the completion of all THOR sites and the installation of [ ] THOR missiles; the JUPITER program [in Italy] to be completed in FY 1961; NIKE, HONEST JOHN, TERRIER, and TARTAR battalions and batteries during FY 1960 deployed to nine NATO nations. (All NATO countries, with the exception of France, had signed agreements pertaining to the production of the HAWK.)

(TS) JCSM-366-60, "Status of National Security Programs on June 1960 (U)," 18 Aug 60, derived from JCS 2101/396, 16 Aug 60, JMF 3001 (14 Jul 60).

19 Aug 60 — The Air Force announced the successful recovery of the orbiting DISCOVERER XIV's 84-pound space capsule by an aircraft. DISCOVERER XIV was launched on 18 August, and ejected its capsule on its 17th orbital pass.

NYT, 19 Aug 60, 1:8; 20 Aug 60, 1:1

19 Aug 60 — With the approval of the Secretary of Defense, the JCS promulgated a National Strategic Targeting and Attack policy to provide guidance "for the optimum employment of appropriate US atomic delivery forces in the Bloc." This policy statement also created a special planning group charged with the task of developing the National Strategic Target List (NSTL) and a Single Integrated Operational Plan (SIOP).

CINCSAC was designated as Director of Strategic Target Planning for the JCS with a representative of each of the unified and specified commanders assigned as members of the planning group.

(TS) JCS, "NST & Attack Policy (U)," 19 Aug 60; (TS) SM 809-60 to CINCSAC, "Director of Strategic Target Planning (U)," 19 Aug 1960; (TS) SM 810-60 to DSTP et. al., "Implementation of Strategic Targeting and Attack Policy," 19 Aug 60; JCSM-372-60 to SecDef, "Target Coordination and Associated Problems (U)," 22 Aug 60, Encls A, B, C, and D to JCS 2056/165, "Target Coordination and Associated Problems (U)," 22 Aug 60. All in JMF 3205 (17 Aug 59) sec 6.

20 Aug 60 — The USSR announced the successful retrieval of a space capsule containing two dogs. The five-ton space ship, launched on 20 August, jettisoned its space capsule on its 20th orbital pass at a height of 200 miles. The animals were under constant television surveillance, TASS reported.

NYT, 21 Aug 60, 1:8.

25 Aug 60 The JCS approved CINCSAC's recommendation for maintaining airborne alert training operations at the rate of 29 sorties per day (one per each 15 UE strategic wing). They agreed with CINCSAC that this would constitute a desirable and realistic program for attaining and maintaining a satisfactory capability in the B-52 force to conduct airborne alert operations when required.

(S) Msg, JCS to CINCSAC, DA 981918, 25 Aug 60, derived from JCS 1899/597, 25 Aug 60, JMF 3340 (23 Jun 60).

25 Aug 60 In a letter to the JCS CINCNORAD raised certain questions about the Air Force's project NEEDLES (see item 17 Aug 60). Although he had learned of it informally, CINCNORAD believed the experiment might have a "fundamental impact on Air Defense." He was prepared to participate in all studies concerning the project, especially reviews of its feasibility and desirability. CINCNORAD asked:

1) Was it wise to place any particles in orbit, thus endangering MIDAS by possible high-velocity collisions?

2) Would NEEDLES suggest to the Soviets a possible means of limiting trackers and scanners in BMEWS?

3) Would not NEEDLES be construed as a military project and exploited by the Soviets for propaganda purposes?

4) Would not project NEEDLES aliminate or reduce potential future benefits to the US from the surprise introduction of such "needles" into space? (As of 31 October 1960 the JCS had not replied to CINCNORAD.)

(S) Ltr, CINCNORAD to JCS, "Project NEEDLES (U)," 25 Aug 60. Encl to JCS 2283/101, 1 Sep 60. JMF 8670 (25 Aug 60).

31 Aug 60 In response to the UK Chiefs of Staff request for comment on their study on defining outer space (see item 20 May 60) the JCS indicated their reluctance to support any agreement which would tend to define limits in space or to ban or limit military operations in space. Too little was known, they agreed, about space environment, and any definition of space limits might well result in unrealistic, unworkable, or impracticable limitations on space operations, or in binding conditions that would prove inimical to the interests of the West. Moreover, the military consideration of outer space "must" include consideration of the operation of manned military space vehicles. Finally, said the JCS, any definition of outer space should not necessarily ban military vehicles from operation in that medium. (See item 25 Oct 60.)

(TS) SM-855-60, "Military Implications of Defining Limits on Space (U)," 31 Aug 60, derived from JCS 2283/95, 4 Aug 60, JMF 8670 (20 May 60).

1 Sep 60 In response to a request by the Assistant Secretary of Defense, ISA, for their views on providing five POLARIS submarines to SACEUR as the first element of his MRBM force (see item 9 Aug 60), the JCS recommended that a decision on FBM deployment be made within the context of JSOP-66 rather than separately. The JCS also stated that any submarines provided to ACE should be assigned first to USCINCEUR earmarked for SACEUR, and employed in accordance with the National Strategic Targeting and Attack Policy.

(S) JCSM-391-60 to SecDef, "MRBM's for NATO (U)," 1 Sep 60, derived from JCS 2305/203, same subj and date, JMF 9050/4720 (5 Aug 60).

13 Sep 60 DISCOVERER XV was successfully launched, but due to the abnormally fast consumption of control gas, the capsule--ejected on the 17th pass--landed 900 miles south of the intended impact point. Recovery of the capsule was prevented by a storm, the Air Force reported.

(S) Rpt, "Military Space Projects, Report of Progress for June-July-August 1960," 20 Oct 60, ODDR&E files.

13 Sep 60 The creation of the Aeronautics and Astronautics Coordinating Board to coordinate the nation's expanding space program was announced. Under the co-chairmanship of the DDR&E and the Deputy Director of NASA, the Board was charged with reviewing all space planning to avoid duplication, to identify problems needing solution, and to insure the steady exchange of information. The individual board members, recruited from the DOD and NASA, would also serve as chairmen of individual panels which would study problems and recommend possible solutions to the board.

AP, 13 Sep 60.

15 Sep 60 The Chairman, JCS, criticized a draft of the President's General Assembly speech as a drastic departure from the 27 June 1960 disarmament proposals (see item). Among his specific objections were: 1) the President's proposal calling on nations not to engage in military activities on celestial bodies; this would lead to an uncontrolled ban and could establish a dangerous precedent; it could also lead to additional unwelcome UN resolutions. 2) the President's proposal asking for an urgent study of the control of nuclear delivery systems; this proposal, presented out of the context of the 27 June program, tended to resemble too closely the Soviet proposal to place control of nuclear delivery systems in stage one.

(In its final form the President's speech modified proposal (1) above to say "warlike activities" instead of "military activities" and eliminated proposal (2) above.) (See item 22 Sep 60.)

(S) Memo, CJCS to Pres, "Arms Control Proposals and Your Speech at the United Nations, 22 September 1960," 15 Sep 60, CJCS 388.3 (Disarmament), Chairman's files.

15 Sep 60 The Acting Secretary of Defense ordered the Air Force to assume direct responsibility for the reconnaissance satellite programs. (See item 5 Oct 60.)

(U) Memo, Act SecDef to SecAF, "Reconnaissance Satellite Program (U)," 15 Sep 60. Encl to JCS 2283/104, 19 Sep 60.

15 Sep 60 The Chairman, JCS, recommended that the Secretary of Defense assign operational control of the US space detection and tracking system to CINCNORAD. The Chairman's memorandum accompanied the divergent opinions of the Chiefs, two of whom (CSA and CNO) felt that CINCONAD should retain operational control and the other (CSAF) that control should be passed to CINCNORAD. The CSA and CNO held reservations about assigning to an international commander control of a system performing functions crucial to US intelligence and R&D efforts. The CSAF argued that all air defense systems, some of which were already operating under NORAD, must be under the control of a single commander. Furthermore, he considered it would be a breach of faith with the Canadians should CINCNORAD be denied the assignment. In supporting the Air Force view, the Chairman stated that the advantages to be gained by US retention of exclusive control would have to outweigh the effects of a possible affront to the Canadians. The Chairman listed several additional arguments for assigning control to CINCNORAD. (See item 7 Oct 60.)

(S) JCSM-402-60 to SecDef, "Assignment of Operational Control of the Space Detection and Tracking System (U)," 15 Sep 60, derived from JCS 2283/103, 15 Sep 60; (S) CM-604-60 to SecDef, same subj and date, reproduced in same paper. All in JMF 9081/8670 (21 May 59) sec 2.

15 Sep 60 In a study on various early warning (EW) systems in the 1960-1970 period, WSEG concluded, among other things, that:

1) Interim BMEWS should provide CONUS with a reliable 10- to 30-minute warning against a surprise short-way-around ICBM attack from the USSR.

2) Should either an infrared (IR) satellite EW system or a reliable, long-range over-the-horizon radar system prove feasible, it could provide tactical early warning against a long- or short-way-around missile attack.

3) A tactical EW system against SLBM's could be devised to provide warning times varying from 0 to 15 minutes.

4) Many types of countermeasures against EW systems were technically feasible but those that might prevent missile detection appeared difficult to implement and seemed to offer small chance of hiding an attack.

5) A combination of EW and retaliatory action appeared technically and economically feasible, but depended upon factors not considered by the report.

(TS) WSEG Rpt No. 50, 1st vol, "Technical and Operational Aspects of Tactical Early Warning Against ICBM and SLBM Attack," 15 Sep 60. App to Encl to JCS 1620/304, same subj, 23 Sep 60, JMF 6820 (22 Sep 60).

22 Sep 60 In a speech to the UN General Assembly, President Eisenhower said that the opportunity to control the future of outer space must not be lost. He proposed that:

1) We agree that celestial bodies are not subject to national appropriation by any claims of sovereignty.

2) We agree that the nations of the world shall not engage in warlike activities on these bodies.

3) We agree, subject to appropriate verification, that no nation will put into oribt or station in outer space weapons of mass destruction. All launchings of space craft should be verified in advance by the United Nations.

4) We press forward with a program of international cooperation for constructive peaceful uses of outer space under the United Nations.

The President also said that the development of missiles made measures to curtail the danger of war by miscalculation vital. The key to this problem, he said, was the willingness of individual countries to submit to effective inspection.

(U) Dept of State Bulletin, XLIII (10 Oct 60), 554-555.

24 Sep 60 CINCLANT expressed his concern to the JCS over the lack of a comprehensive surveillance system and an effective anti-satellite operation to deny enemy surveillance. A space vehicle surveillance system, he stated, would provide reliable reconnaissance information on which to base effective force deployments, particularly in his vast geographical area, in which he operated with limited forces and austere budgets. Moreover, the needs and capabilities of the USSR would soon lead it to a reconnaissance system of its own, thus imposing on the US the further need of developing a weapon for the destruction of such enemy systems. Since he believed these space needs were being sacrificed in current research programs, he urged the JCS to review the allocation of the national effort in space research and development.

(S) Ltr, CINCLANT to JCS, "Requirements for Space Systems (U)," 24 Sep 60. Encl to JCS 2283/106, 28 Sep 60, JMF 8670, 24 Sep 60.

29 Sep 60 In response to the Secretary of Defense's request for an assessment of the requirements for an MRBM (see item 1 Aug 60), the JCS recommended the development as early as possible of a small, flexible, land-based system of third generation missiles, adaptable to surface ships as well as fixed-hard sites. They predicted that such a system could be developed and made operational by 1965. In view of the system's importance to SACEUR, the JCS recommended that NATO reaction to the acceptance of such a system be secured.

(In arriving at their recommendations the JCS had considered the statements and views of SACEUR, CINCPAC, CINCLANT, CINCAL, CINCSAC, and DDR&E; and they had rejected the proposals of the Army (an extended-range Pershing), the Navy (a land-based POLARIS), and the Air Force (a tactical ballistic missile).)

(S-RD) JCSM-440-60 to SecDef, "Mid-Range Ballistic Missile (MRBM) Requirements (U)," 29 Sep 60, derived from (S-RD) JCS 1620/305, same subj, 28 Sep 60, JMF 4720 (1 Aug 60).

29 Sep 60 The Director of WSEG contracted to IDA a study of alternative seaborne missile systems that might become available in the 1965-1970 period. The study, to be ready for DDR&E by 1 March 1961, was to include a consideration of the technical and operational feasibility of the system, its probable cost and performance, a comparison of its cost effectiveness with contemporary strategic systems, its special operational problems, and its strategic implications. IDA was specifically asked to consider missiles with ranges of 5,000 miles and over--substantially above what POLARIS would achieve by 1965-1970.

(S) Ltr, WSEG to IDA, "Task Order No. SD-35-757," 29 Sep 60, JMF 5222 (29 Sep 60).

30 Sep 60 The DOD announced that an additional $107 million would be added to the POLARIS program and $33.8 million to the SAMOS program from the funds added to the DOD FY 1961 budget by Congress (see item 7 Jul 60). The DOD stated that the increases were dictated by technological developments.

NYT, 1 Oct 60, 1:1.

30 Sep 60 The quarterly report to the President on the ICBM and IRBM programs included the following information:

ATLAS

1) Ten missiles launched during the quarter, including accurate flights of 6,350 and 7,863 n.m.
2) Significant milestone passed with success of ARMA initial guidance system on Series D.
3) First complete Strategic Missile Squadron (6 launchers and 15 crews), the 564th, at Warren AFB, turned over to SAC.
4) Operational date of 565th and 566th squadrons delayed from 1960 to March 1961.

TITAN

1) Six flights conducted; testing progressing satisfactorily.

MINUTEMAN

1) Progress compatible with first scheduled launch.

THOR

1) RAF authorized mating all THORS with warheads.
2) [redacted]

JUPITER

1) Eighty-seven, of 93 programmed, delivered.
2) [redacted]

POLARIS

1) Eighteen flight tests of the A1 (1,200 n.m.) conducted; 12 successful and six partially so.
2) Construction started on five submarines provided for in FY 1961 budget.
3) Development of A3 (2,500 n.m.) approved by the Secretary of Defense, and funds allocated.

(S) Rpt No. 49, "Summary of ICBM and IRBM Programs for July, August, September 1960," 10 Nov 60, ODDR&E files.

4 Oct 60 The House Committee on Science and Astronautics submitted a report on its special investigation of "some of the reasons for interest in space medicine, the facilities and talents existing for pursuing this work, and the alternative ways of harnessing this ability to meet national goals." After surveying the present status of the science of bioastronautics, "the life science," the report concluded that:

1) If manned travel and major discoveries in space were to be realized, research and development in the life sciences needed to be emphasized to the same degree as the work in space vehicles. Particular attention must be paid to long lead time aspects of life science work if the US was to benefit fully from its new, powerful space vehicles such as SATURN, NOVA, and ROVER.

2) The executive branch must carry out the necessary expansion of US bioastronautic facilities and ensure that duplication did not occur in the many organizations working in the field. Recognizing the particular responsibility NASA had for taking the initiative in this field, the Committee at the same time suggested the formation of an interdepartmental coordinating committee to investigate problems in life sciences and propose solutions.

(U) US House, "Life Sciences and Space" (Rpt by Cmte on Science and Astronautics, 86th Cong, 2d sess; Wash, 1960), pp. 1-16.

4 Oct 60 NASA announced the first successful firing of the SCOUT rocket, described as a "work horse," for the launching of small scientific satellites. On its first flight the four stage rocket travelled 3,500 miles high and 5,800 miles down the AMR.

NYT, 5 Oct 60, 1:1.

4 Oct 60 The 500-pound COURIER communications satellite was successfully launched into orbit and began transmitting messages. Launched by a THOR-ABLE-STAR rocket, the satellite, 51 inches in diameter, employed approximately 20,000 solar cells to generate power for its transmitters.

NYT, 5 Oct 60, 1:1.

4 Oct 60 COURIER 1B was launched into a satisfactory near-circular orbit of approximately 635 n.m. altitude. This was the first active delayed-repeater communications satellite to be placed into orbit for research and development purposes. (See item 31 Mar 60.)

(S) Rpt, "Military Space Projects, Report of Progress for June-July-August 1960," 20 Oct 60, ODDR&E files.

4 Oct 60 The Secretary of Defense requested the JCS to advise him on the military desirability and feasibility of placing MINUTEMAN missiles on merchant ships. (As of 31 Oct 60 the JCS had made no response to this request.)

(U) Memo, SecDef to CJCS, "Feasibility of Placing MINUTEMAN on Merchant Ships," 4 Oct 60. Encl to JCS 1620/307, 7 Oct 60, JMF 4730 (4 Oct 60).

5 Oct 60 The Secretary of the Air Force asked the Secretary of Defense for approval and funding to let contracts for the reconnaissance satellite program.

(TS) Memo, Acting SecDef to SecAF, "Reconnaissance Satellite Program (U)," 15 Sep 60. Encl to JCS 2283/104, 19 Sep 60; (TS) Memo, SecAF to SecDef, "Alternate Reconnaissance Systems (S)," 5 Oct 60. Encl to JCS 2283/108. All in JMF 8670 (15 Sep 60).

5 Oct 60

7 Oct 60 The Secretary of Defense, after considering the split views of the JCS (see item 15 Sep 60), directed the CJCS to assign operational control of the space satellite tracking and detection systems (SPASUR and SPACETRACK) to CINCNORAD.

(C) Memo, SecDef to CJCS, "Assignment of Operational Control of the Space Detection and Tracking System," 7 Oct 60, JMF 9081/8670 (21 May 59) sec 2.

9 Oct 60 The CNO submitted to the Secretary of the Navy his views on the installation of POLARIS missiles on the cruiser USS Long Beach. (The decision on POLARIS missiles for surface vessels was still under consideration by the JCS, see item 9 Jun 60.) He defended the military usefulness of POLARIS on the ship, presenting the traditional arguments for a naval missile capability--long operational life of the vessel, high survivability, and the substantial increase in US retaliatory capability.

(S) Memo, CNO to SecN, "POLARIS Missile Installation in the USS Long Beach (U)," Nav Ser 00321P60, 9 Oct 60. Encl to JCS 1620/311, 16 Nov 60, JMF 4720 (9 Oct 60).

10 Oct 60 CINCNORAD asked the JCS, in view of the expanding Soviet ICBM threat, to re-examine the existing BMEWS to ensure that all projects leading to the completion of a full-coverage ICBM warning system be assigned the highest priority. He was especially concerned about the limited coverage (15° to 65° angle of elevation; from the north only) of the BMEWS and its vulnerability to ICBM attack the long-way-around, i.e., from the south. An improved system, he said, should not only provide early and accurate information but also be able to report an attack coming from any direction and to determine general launch points of the vehicles themselves.

(On 14 October the matter was referred to J-5 for study.)

(S) Ltr, CINCNORAD to JCS, "(U) ICBM Early Warning Requirements," 10 Oct 60. Circulated as (S) JCS 2283/109, same subj, 14 Oct 60, JMF 1820 (10 Oct 60).

11 Oct 60 Owing to a malfunction of the second-stage AGENA vehicle, the first launching of the SAMOS (reconnaissance) satellite was unsuccessful. The SAMOS project envisioned the creation of a polar orbiting satellite system to collect and process visual (photographic) and ferret (electromagnetic) data. It was expected to acquire a great amount of technical intelligence regarding enemy military and industrial strength. (See item 9 Aug 60.)

(S) Rpt, "Military Space Projects, Report of Progress for June, July, August 1960," 20 Oct 60, ODDR&E files.

12 Oct 60 NASA offered to launch, at cost, communications satellites developed by private companies. To assist private industry in developing a communications network, the

Administrator of NASA also offered to support "technically promising private proposals on a cost-reimbursable basis" by making vehicles, launching and tracking facilities, and technical services available also at cost.
NYT, 13 Oct 60, 1:7.

14 Oct 60 — The Air Force announced the allocation of $270,900,000 for the quantity production of BOMARC B. Over $263 million of the amount was a carry-over from the FY 1960 budget.
NYT, 15 Oct 60, 47:1.

17 Oct 60 — In a memorandum to the Secretary of Defense on the question of nuclear sharing with NATO allies, the JCS objected to certain features of the Bowie Report, a State Department study on nuclear weapons sharing prepared for the NSC, including the report's suggestions for multinational manning, ownership, and financing. Mixed manning of NATO's nuclear weapons, they said, was impracticable and, should the concept be extended, could lead to restrictions on the independent action of other US forces in NATO. The JCS were also critical of multilateral ownership and financing of MRBM forces which if interpreted to mean common ownership, they said, might reduce the effectiveness of these forces and might create an issue within the NAC over the use of these forces. (See item 25 Oct 60.)
(TS) JCSM-467-60 to SecDef, "Nuclear Sharing (U)," 17 Oct 60, JMF 4610 (23 Aug 60) sec 2.

25 Oct 60 — NASA ordered the completion of feasibility studies for project APOLLO, an advanced 3-man space ship project. The FY 1961 budget earmarked $1 million for preliminary work on this project; flight tests were scheduled for 1962 and lunar probes for 1968-70.
NYT, 26 Oct 60, 22:3.

25 Oct 60 — The JCS forwarded their views on a US draft position paper on the subject of MRBM's for NATO. They objected unanimously to a paragraph in the draft on the operational control of NATO's MRBM forces. The JCS believed it was most important to retain the US "flexibility" of national decision. They also had misgivings about the proposal for multilateral financing, ownership, and manning. The CSAF, referring to a previous JCS position (see item 17 Oct 60), called mixed manning operationally impracticable as well as dangerous in its implications for other US forces committed to NATO. On the question of missile deployment, however, the JCS were split: the CSA and CSAF supported SACEUR's view that seaborne deployment alone would not be adequate (see item 8 Jul 60); the CNO, however, contended that for availability, cost-effectiveness and security the seaborne deployment of POLARIS was desirable during the period under consideration. Concerning financing, the CNO felt that the NATO program should be an addition to US programs but the CSAF argued that this would not be necessary if the US retained unilateral control over its NATO contribution. Finally, the CSA and CSAF wanted it made clear that no particular missile had been chosen for land deployment to Europe. (See item 8 Jul 60.) (On 15 November 1960, after the Secretary of Defense--in the absence of JCS agreement--had decided to offer POLARIS to NATO, the JCS approved POLARIS for the

sea-based portion of the NATO MRBM requirement, and stated that systems to meet the land-based requirement, including adaptations of POLARIS, were "under study.")
(S) JCSM-478-60 to SecDef, "MRBMs for NATO," 25 Oct 60; (S) SM-1184-60 to USREPSGN, same subj, 15 Nov 60; (S) Briefing Sheet for CJCS, same subj, for mtg of 9 Nov 60. All in JMF 9050/4720 (27 Sep 60).

25 Oct 60 — In a memorandum to the Representative of the UK Chiefs of Staff, the JCS reiterated their reluctance "to support any interpretation of any space activity which would tend to define the lower limits of outer space." (See item 31 Aug 60.) This memorandum was prompted by the UK Chiefs of Staff query of 24 October 1960 which asked whether an announcement purportedly planned by the State Department that a SAMOS Satellite was "orbiting in outer space," could be construed as a US definition of the lower limits of outer space.
(S) SM-1104-60, "Lower Limits of Outer Space (U)," 25 Oct 60, JMF 8670 (20 May 60).

26 Oct 60 — DISCOVERER XVI was launched from Vandenberg AFB, but the second-stage AGENA engine failed to ignite and the missile impacted 600 n.m. down range.
(TS) USAF Rpt, "Weekly Summary of Significant Missile Flights," 28 Oct 60, ODDR&E files.

31 Oct 60 — The weekly summaries of missile firings for October reported the following: 1) ATLAS--four firings, two successful; 2) TITAN--one successful firing over 5,337 n.m.; 3) THOR--one successful firing conducted by a UK launching team; 4) JUPITER--successfully fired 926 n.m. with a 1 n.m. CEP; and 5) POLARIS--two successful missile configuration firings from flat pads, one using the new Grand Turk Missile Impact Locating System.
(S) Navy Weekly Summary, 10 Oct 60; Air Force Weekly Summaries, Oct 1960, ODDR&E files.

31 Oct 60 — The Secretary of Defense directed that consideration of the MIDAS satellite plan be independent of any support relationship with the SAMOS preliminary operations plan.
(S) Memo, Asst VCSAF to All Holders, "Change No. 1 to Preliminary Operation Plan for MIDAS," AFOOS-SA, 14 Nov 60, JMF 8670 (22 Apr 59) sec 2.