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norad/conad

**HISTORICAL
SUMMARY**

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JANUARY — JUNE 1961

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~~UNCLASSIFIED AT 12 YEAR
INTERVALS, NOT AUTOMATICALLY
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See N13 Memo, 17 Jun 97

FF NO. *M-24200.F*



TWO BALLISTIC MISSILE AND SPACE DEFENSE

SPACE DETECTION AND TRACKING SYSTEM

NORAD/CONAD AUTHORITY AND RESPONSIBILITY

Assignment to NORAD/CONAD. On 10 October 1960, the Secretary of Defense told the Air Force and Navy that he had directed the JCS to assign operational control to NORAD and operational command to CONAD of the space detection and tracking system. For this reason, he was transferring responsibility for the two components of this system, Spacetrack and SPASUR, to the Air Force and Navy, respectively, from the Advanced Research Projects Agency.

In Memorandums dated 7 November 1960, the JCS directed CINCONAD to assume operational command and CINCNORAD to exercise operational control of the Space Detection and Tracking System. The assumption of this responsibility was made effective 26 November 1960 by CONAD/NORAD general orders.

The Secretary of Defense's memorandum had stated that operation and further development of these systems was to be in consonance with user requirements as defined by CINCONAD and the operational procedures as developed by CINCNORAD. Also, CINCONAD was to be responsible for integrating Spacetrack and SPASUR in the Space Detection and Tracking System (SPADATS).

Additional guidance was provided to NORAD by the JCS on 5 April 1961. They said that the assignment of SPADATS was not to be interpreted as restrictive to the two systems of which it currently consisted. It was expected, the JCS continued, that CINCNORAD would plan for and request operational control, and



CINCONAD operational command, of such additional military sensors or systems, or modifications thereto, that were necessary to perform the SPADATS mission as identified by CINCNORAD.

The JCS stated further that assignment of operational responsibility to CINCNORAD/CONAD of SPADATS was predicated on the concept that the central control facility would be manned and operated as an integral part of the existing NORAD COC. Present and future user requirements were to be submitted to the JCS for review, approval and transmission to the JCS.

NASA/DOD Agreement. Further guidance to NORAD's authority and responsibility was provided in a National Aeronautics and Space Administration and Department of Defense agreement concluded on 16 January 1961.

This agreement divided NASA/DOD responsibilities as follows. NASA was responsible for the direction and control of U. S.-sponsored space activities except those peculiar to, or primarily associated with, the development of weapons systems, military operations, or the defense of the U. S. DOD was responsible for space activities peculiar to, or primarily associated with, the development of weapons systems, military operations or the defense of the U. S.

The agreement stated that DOD had given CINCNORAD operational control of the military space detection and tracking. The central data collection and cataloging center to meet the DOD requirement was to be established within the NORAD COC. All information from BMEWS, SPASUR, MIDAS and other military surveillance equipment with initial detection and tracking capability was to be fed directly into the NORAD COC for processing and analysis.

The objective of the NORAD space detection and tracking system, the agreement stated, was to detect and to establish track on the first orbit of all satellites and space vehicles launched by foreign countries. The NORAD COC was to provide NASA, on request, information concerning satellites and space vehicles within its



catalog. The NORAD system would accept from NASA updated ephemeris and tracking information on vehicles covered within its system.

The DOD program would provide for augmentation of its space vehicle intelligence efforts, including electronic surveillance and examination of foreign space vehicles and improved photographic and other methods for determination of potential military capabilities of the foreign objects. This intelligence operation was to be coordinated with the NORAD system and, where appropriate, supply information directly in real time. Ultimately, the agreement said, the DOD program might be expanded to include counter weapon capability for neutralization of enemy military space objects.

NASA had assigned operational control of its data collection and dissemination to the control center at the Goddard Space Flight Center, Beltsville, Maryland. This center was to provide observation and/or updated data from its computer catalog to the NORAD COC. The latter was to provide timely data from its catalog to the Goddard Center.

Unclassified data was to be sent periodically in a routine fashion. Classified data was to be sent only upon a "need to know" request from NASA. On 13 February 1961, NORAD asked the Electronic Systems Division (formerly the Air Force Command and Control Development Division) at L. G. Hanscom Field, Massachusetts, to provide unclassified information to the Goddard Center. NORAD told ESD that classified information was to be sent only upon a need to know request from NASA and that NORAD reserved the right to release all information regarding the military significance of all objects of foreign origin in space whenever such action was indicated.

NORAD also drafted an agreement covering specific working arrangements with NASA and sent it to the latter for signature. NASA had not signed the agreement as of the end of June 1961.

Proposed Change in Terms of Reference. Because



of the added responsibility for existing and future military space detection and tracking systems, NORAD asked the JCS on 5 May 1961 for a change in its Terms of Reference. NORAD asked that its terms be amended to include specific responsibility for space defense. NORAD said this was needed to clarify the various directives and to enable it to provide user requirements and operational guidance to research and development agencies.

The JCS replied on 12 May that their initial reaction was that the existing NORAD terms, together with the guidance given by the memorandums in November and the message in April (discussed above), were broad enough to accommodate NORAD's request for an amendment without an immediate change. The JCS said, however, that the proposal would be considered further and they asked for specific word changes. The latter had not yet been provided at mid-year.

ESTABLISHMENT OF THE SPADATS CENTER

NORAD issued an integration plan for SPADATS, on 20 February 1961. This plan stated that integration of SPADATS was to be considered to be in two phases. Phase I was to be the period from that time until the NORAD COC at Colorado Springs achieved a computer capability for the central functions of the SPADATS. Phase II would begin when the NORAD SPADAT center was moved to Ent Air Force Base.

During the first phase, the plan provided, CINCNORAD would be responsible for space detection, tracking and identification and the furnishing of space object data as directed. A NORAD officer was to represent CINCNORAD at Hanscom Field, Bedford, Massachusetts. When a facility was available at the NORAD COC, the SPADAT Center was to be absorbed into the NORAD COC, with the center at Bedford acting in a back-up capacity. The Ent AFB facility was then to be used for NORAD space surveillance operations until such time as the programmed hardened COC became operational.



On 9 February 1961, USAF Headquarters directed ADC to rent a computer for installation at Ent AFB. ADC was also to provide communications from the Bedford center and the Navy SPASUR center. ADC was to assume full technical operating responsibility for the center operations of the SPADATS on 1 July 1961. USAF provided that ADC was to serve as its agent with CINCNORAD for this system.

Following the recommendation of the Air Force Command and Control Development Division (Electronic Systems Division), ADC directed the procurement of a Philco 2000 computer system (plus IBM peripheral equipment). It was decided to place the SPADATS center in Building P-1 which was adjacent to the current CCG building, Building 4. The former was redesignated Building 4 (East Wing). The project for the necessary work to convert the building was approved by USAF on 7 March and the work was begun on 13 March. The first floor of the building was to accommodate the computer and allied equipment. Located on the second floor was to be the SPADATS Operations Room, the SPADATS Director, the NORAD SPADAT Operations Officer, the 1st Aerospace Squadron Commander, and others.*

The Philco computer was moved into the building in April. On 12 June 1961, the SPADAT function performed by the USAF facility at Hanscom Field was assumed by the SPADAT center at Ent AFB. On 6 July, ADC advised USAF that the mission given ADC to establish a SPADAT center at Ent AFB and have it operational by 1 July had been accomplished.

In the meantime, NORAD issued a new integration plan on 27 March for Phase II of the integration of SPADATS. A phase III was now listed also which was to involve R&D improvements to the SPADATS to meet military requirements. This plan stated that the SPADAT Data Processing Room was functionally a part of the

* ADC established the 1st Aerospace Surveillance and Control Squadron (ADC) on 14 February 1961.



(u) NORAD COC. Its function was to receive satellite and space object data from sensors, to compute orbital parameters of satellites, and to generate satellite and space object bulletins and look-angle bulletins. The room was to be technically operated by USAF ADC under the operational control of CINCNORAD. The latter's representative on a continuous shift basis was the NORAD SPADAT Operations Officer.

(u) NORAD MANNING OF THE SPADAT CENTER

(u) On 31 March 1961, NORAD made a request to the JCS for the additional manpower required as a result of the assignment of operational control of SPADATS.* A total of 60 spaces were requested: eight for the Deputy for Operations and 52 for the Deputy for Intelligence.

(u) NORAD explained to the JCS that the eight for Operations would provide personnel to establish a SPADAT Section Operations Division (COC). These personnel included six officers -- an Air Force lieutenant colonel and two Air Force captains, and a Navy commander and two Navy lieutenants. Also, there was to be an enlisted administrative specialist and a civilian stenographer. The chief of this section was to be responsible to the Chief of the Operations Division (COC) for insuring the effective exercise of operational control over the SPADAT System and associated sensors. The intelligence spaces were required to carry out the expanded intelligence activities to support the Phase II SPADAT operation plus the additional space intelligence functions to be assumed in consonance with the NASA/DOD agreement.

(u) On 4 May 1961, NORAD received a briefing from USAF ADC on plans to implement the SPADAT Center. NORAD

(u) * In March, NORAD stationed a representative, an Air Force lieutenant colonel, at L. G. Hanscom Field to represent CINCNORAD in exercising operational control of the SPADATS.





learned that ADC had neglected to make any provision for the placement, communications, or functioning of the NORAD SPADATS Officer. NORAD immediately asked for accommodations, pointing out that it was necessary for the NORAD SPADATS Operations Officer to be physically located at an appropriate location in the SPADATS Center.

Before this matter was settled, the JCS authorized, on 19 June 1961, an interim augmentation of the headquarters of 39 spaces for accomplishment of the SPADATS mission. The eight spaces for Operations were approved. For Intelligence, 31 of the 52 spaces requested were approved. The JCS stated, however, that it was recognized that a maturing SPADATS might warrant adjustments to these authorizations, so after some operating experience, recommendations for adjustments could be made.

The matter of accommodations for the NORAD SPADATS Operations Officer or the NORAD SPADATS Section had not been settled at mid-year. Office space had been provided on the second floor of Building 4 (East Wing) and a desk had been placed in the SPADATS Center for the NORAD SPADATS Officer. But the question of manning, location, and function for NORAD was still being discussed and studied.

REQUIREMENTS FOR IMPROVEMENT OF SPADATS

NORAD Requirements Document. When the Secretary of Defense transferred Spacetrack to the Air Force, he charged the latter with submitting a detailed development and funding plan for improvement of the national space surveillance system. This plan was to satisfy the requirements of the JCS and their designated operational command (CONAD) and have the coordination of the Army and Navy. On 10 November 1960, USAF asked NORAD to submit its operational requirements and to compile and submit the requirements of the military departments, the unified and specified commands, NASA, and the U. S. Intelligence Board. In

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addition, on 5 April 1961, as noted earlier, the JCS asked NORAD/CONAD to submit present and future user requirements.

(u) NORAD submitted its operational requirements to USAF on 2 December 1960. Then CONAD obtained the requirements of all other user agencies and prepared a composite requirements document which it submitted to the JCS on 20 April 1961.*

(u) The qualitative requirements submitted for an advanced system included the following.

(u) * The North American Air Defense Objectives Plan FY 1963-FY 1967, 31 March 1961, included objectives for an improved SPADATS. NORAD stated that an improved system required sensors with coverage to provide detection, tracking, and identification in sufficient time to permit the destruction or neutralization of a hostile space object prior to its accomplishing a hostile act on its first pass over the NORAD area. Accuracy of the sensor system must be sufficient, the plan stated, to utilize it as the environment for active space defense and satellite inspection systems. NORAD said that a single type of sensor would not accomplish the total requirement and that its plan included funds for a family of sensors geographically deployed to provide detection of all space objects launched on any orbital inclination during the first orbit. NORAD listed the following summary for SPADATS Improved:

	FY 63	FY 64	FY 65	FY 66	FY 67
SPASUR Sensors	5	5	5	5	5
Electronic Sensors	9	9	9	9	9
Optical Sensors	--	2	8	14	14
Advanced Radar	--	--	1	3	4

(u) In June, the JCS pointed out to NORAD that the Air Force was coordinating system development plans with the Army, Navy, and NORAD. Since this was still in process, the equipment and funding in NORAD's NADOP did not represent an agreed requirement.

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2. Control Center: An operation control center will be employed to provide for control of all system elements. The center will house a computer complex of appropriate capacity which is expandable; and which is compatible with associated inputs and outputs.

3. Communications: A highly reliable

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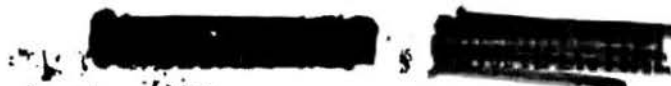


automatic communications subsystem must be provided to support the SPADATS (Improved).

NORAD also listed requirements for an interim system capability required by 1964. The requirements for all elements except the sensor system were the same. For the latter the requirements included the following.

USAF ADC Recommendations for Improvement. ADC sent USAF a list of recommendations on 12 June 1961 for sensors currently being operated by the USAF or NASA which were needed by the SPADATS in order to perform its mission. ADC said it had analyzed the SPADATS mission versus its capability. The preliminary conclusions were that the SPADATS had to rely on agencies and equipment not under the operational control of NORAD to adequately perform its mission.

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ADC recommended the following:

- a. Retention of the AN/FPS-49 at Moorestown, New Jersey, for completion of BMEWS testing and for ultimate integration into the SPADATS.*
- b. Continuation for SPADATS of the current agreement between the Hanscom Center and the Trinidad, B. W. I., Experimental Site, operated by the Rome Air Development Center.**
- c. Assurance that any future disposition of USAF-controlled Baker-Nunn cameras include the stipulation that data would be supplied to the SPADATS center in accordance with requirements listed by ADC.
- d. Deferral of assignment of the mission for the PINCUSHION AN/FPS-62 radar until 1 July 1961 pending recommendations from ADC.

SPASUR Low-Altitude Improvement. In April 1961, the commanding officer of the Navy SPASUR system wrote to inform NORAD of a requirement for improvement of the low altitude coverage of the SPASUR system. This was submitted in accordance with a directive in NORAD's February integration plan that recommendations be submitted for improvement of system operation.

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NORAD told the SPASUR commanding officer on 2 May that it had asked for an improved capability in a plan submitted to the JCS on 20 April (discussed above). Also, the Navy had submitted a proposal for six gap filler sites, which would provide complete coverage over the continental U. S. to the Defense Department. A Navy Department representative had informed NORAD that if this was approved by DOD, the Navy would implement the program with FY 1962 funds.

Out of this came a request from ADC that it be given assignment of the Shemya radar and that NORAD be given operational control. ADC said that fulfillment of the Security Service mission would not be jeopardized. NORAD advised the JCS on 19 April that it concurred with the ADC proposal.

NORAD also gave

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assurance that the USAF security mission would not be jeopardized.

The matter had not been settled at mid-year, however, as to whether or not ADC would get the Shemya facility.

BALLISTIC MISSILE EARLY WARNING SYSTEM

GENERAL STATUS

The Ballistic Missile Early Warning System (BMEWS) achieved a two-site detection capability on 30 June 1961 with the attainment of an initial operational capability (IOC) at the Clear, Alaska, site, as scheduled. Clear's detection capability was achieved by the use of all sectors of the detection radar working in conjunction with a simplex missile impact predictor (MIP) set. Warning information was read out of the simplex computer and manually transmitted to the central computer and display facility (CC&DF) at the NORAD COC via rearward communications voice and/or teletype links. The information was manually inserted into the BMEWS display at the CC&DF.

Operational capability (OC) was scheduled to be reached at the Clear site on 30 September 1961. At that time, all sectors of the radar would be working with a duplex MIP computer. Warning information would be automatically transmitted to the CC&DF via the rearward communications links.

At the Thule, Greenland, site, IOC was attained on 30 September 1960 and fully automatic operation was begun on 31 January 1961. Along with the Thule site, IOC was achieved for the CC&DF at NORAD Headquarters and the display facility at SAC Headquarters on 30 September 1960. Similarly, automatic operation was begun on 31 January. A BMEWS display facility at the Pentagon was scheduled to attain operational capability on 7 November 1961.

