[redacted] ~~SECRET~~

958

NORAD/CONAD

HISTORICAL SUMMARY

(Unclassified)

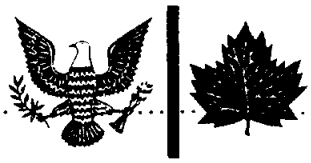
JANUARY-DECEMBER 1966

Classified by: Multiple Sources
Review: 1 December 1986

EX
Group 1

~~SECRET~~

NORAD—ADC Field Printing Ent AFB, Colorado



SECURITY NOTICE

1. This document is classified SECRET in accordance with paragraph 2-4, AFR 205-1, and CAP 425. It will be transported, stored, safeguarded, and accounted for as directed by AFR 205-1, AR 380-5, OPNAV Instruction 5510.1C, CAP 425, CAO 255-1, and CBCN 51-1.

2. This document is classified SECRET because it contains information which affects the national defense of the United States within the meaning of the Espionage Laws, Title 18 USC, Sections 793 and 794. The transmission or revelation of its contents in any manner to an unauthorized person is prohibited by law.

3. This document contains information affecting the national defence of Canada. The improper or unauthorized disclosure of this information is an offense under the Official Secrets Act.

4. This document contains information from documents developed in support of war plans for which the JCS and CDS are responsible by statute. Distribution or release of information contained herein to agencies not listed is prohibited.

5. Recipients of this document will afford it and its various parts a degree of classification and protection equivalent to, or greater than, that required by the originator.

6. This document will not be copied, photographed, or otherwise reproduced in whole or in part without the approval of this headquarters.

7. Destruction of this document will be accomplished in accordance with pertinent Service regulations and instructions.

~~SECRET~~

NORTH AMERICAN AIR DEFENSE COMMAND AND CONTINENTAL AIR DEFENSE COMMAND

HISTORICAL SUMMARY

JANUARY-DECEMBER 1966

1 MAY 1967

COMMAND HISTORY DIVISION

SECRETARY, JOINT STAFF

HEADQUARTERS NORAD/CONAD

~~SECRET~~

(This page is Unclassified)

DISTRIBUTION

Chief of Defence Staff	8
CINCLANT	1
CINCPAC	1
CINCSAC	1
CINCSTRIKE	1
CONARC	1
CF ADC	3
ARADCOM	3
USAF ADC	1
NORAD Regions (except NNR)	3 each
NNR	5
NORAD Divisions	1 each
Hq NORAD	39
	95

REDISTRIBUTED BY HQ NORAD

NHCR	1
NHDC	1
NAPA	1
NINT	1
NNPA	1
NOPS	1
NOOP	1
NOOP-S	1
NOEV	1
NOOA	1
NLOG	1
NPAP	1
NPPA	1
NPPP	1
NPSD	1
NPAM	1
NELC	1
NCOC	1
NHCP	1
NHMO	1
NHSV-H	19*

* Includes 12 copies for the JCS sent by separate submission. Distribution to the Services is made by the JCS.

FOREWORD

This historical summary is an annual report on the North American Air Defense Command and the Continental Air Defense Command. This summary brings together in a single document the background and progress of key activities of NORAD/CONAD. The purpose of this report is twofold:

First, it provides commanders and staffs a continuing reference and orientation guide to NORAD/CONAD activities.

Secondly, it preserves for all time the record of NORAD/CONAD activities.

1 May 1967

R. J. REEVES
General, USAF
Commander-in-Chief

(Reverse Side Blank)

CONTENTS

(Reverse Side Blank)

MAPS AND CHARTS

(Reverse Side Blank)

SUMMARY OF THE FORCES (AS OF 1 JANUARY 1967)

~~(S)~~ INTERCEPTOR FORCE

Regular:

33 Squadrons, 562 Aircraft

Type	F-101	F-102	F-104	F-106	CF-101
No.	15	1	1	13	3

Augmentation (Category I):

21 ANG Squadrons, 382 Aircraft

Type	F-89	F-102
No.	3	18

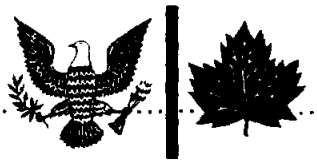
~~(S)~~ MISSILE FORCE

8 Bomarc B Squadrons - 230B Missiles, 230 Launchers
73 RA Hercules Fire Units, 48 ARNG Fire Units - 1953 Missiles, 1198 Launchers
8 RA Hawk Fire Units - 288 Missiles, 48 Launchers

~~(S)~~ SURVEILLANCE AND CONTROL

Surveillance:

Long Range Radars: 170
Gap Filler Radars: 88
ALRI Stations: 4 off East Coast (EC-121H acft.)
AEW&C Stations: 1 off Key West (EC-121Q acft.)
5 off West Coast (EC-121D acft.)
DEW Line
Continental Segment: 29 Stations
Aleutian Segment: 6 Stations



Greenland Segment: 4 Stations
G-I-UK Barrier (Under operational control of CINCLANT): 2 Iceland-based radars report through DYE Main
BMEWS: 3 Stations
SPADATS:
Space Defense Center
USN Space Surveillance System
USAF Spacetrack System
Canada - Baker-Nunn Camera (Cold Lake, Alta.)
NASA, Eastern Test Range, Western Test Range and Pacific Missile Range, data as available and/or upon request

NBC Systems:

Bomb Alarm System:
99 Instrumented Areas
12 Display Facilities
6 Master Control Centers
Nuclear Biological Chemical Warning and Reporting System (NBCWRS): Manual System

Control:

1 Combat Operations Center
1 Primary and 1 Secondary ALCOP
6 Region Combat Centers
16 Division Direction Centers
1 Division without a direction center (Hudson Bay)
31 NORAD Control Centers
2 Missile Masters
10 BIRDIE
2 FSQ-34
1 TSQ-38
5 TSQ-51

~~(S)~~ MANPOWER AUTHORIZATION

NORAD Headquarters: 937
NORAD Region and Division Headquarters: 990

CHAPTER I

MANPOWER AND ORGANIZATION

NORAD/CONAD HEADQUARTERS

JOINT MANPOWER PROGRAM

~~(C)~~ FY 1966 Requirements. NORAD's FY 1966 Joint Manpower Program had been submitted to the JCS in December 1964. On 23 September 1965, the JCS approved most of the requirements, bringing about an increase of 173 manning spaces for NORAD/CONAD Headquarters.* The 1 January 1965 JTD had shown a total of 762 spaces. The 1 July 1965 JTD, published on 4 October so that the JCS manpower decisions could be included, showed a total authorization of 935.

~~(C)~~ NORAD had asked for many additional spaces which the JCS did not approve, however. The JCS deferred 50 additional spaces requested for the Intelligence Data Handling System until more experience was gained in programming and operating the IDHS. (NORAD wanted 120 spaces for IDHS and 70 were approved.) Five additional spaces for the Current Intelligence and Indications Center were disapproved because the JCS felt these spaces duplicated a capability (Intelligence Watch Division) in the NCMC. Also, the JCS disapproved 44 U.S. spaces for the NORAD ALCOP at North Bay because of the Secretary of Defense decision to disapprove the ALCOP (see Chapter II).

*(U) For details of this approval, see NORAD/CONAD Historical Summary, Jul-Dec 1965, Chapter I.

~~(S)~~ On 17 December 1965, NORAD told the JCS that its requirements for 50 additional IDHS spaces and five CIIC spaces were still valid. NORAD said these spaces were essential for the NCMC to meet full operational capability by 30 June 1966 and asked that special consideration be given to these requirements. NORAD pointed out that the CIIC operational procedures had previously been reviewed and approved by the JCS and DOD. The IDHS spaces were for an around-the-clock, seven-day-a-week operation in direct support of the NCMC. NORAD said the 24-hour a day requirement had been verified by the Director of the Defense Intelligence Agency.

(U) In the meantime, in October 1965, NORAD manpower officials had learned informally from JCS representatives that the 55 spaces for IDHS and CIIC could not be approved for FY 1966. One reason for this was because the JCS were to make a management-manpower survey of NORAD Headquarters. Additional manpower requirements would have to wait on results of the survey.

(U) JCS Management-Manpower Survey. The JCS Management-Manpower Survey Team, headed by Brig. Gen. W. F. Winton, Jr., USA, visited NORAD/CONAD Headquarters from 17 January to 25 February 1966. Its purpose was to insure that the headquarters was organized and staffed to perform the mission in accordance with manpower guidelines set up by the JCS. The team examined the entire organizational structure, functional responsibilities, and each manpower space authorized.

(U) The results were given to NORAD on 25 February. The Survey Team recommended a realignment of functions, in some cases, and several organizational changes which included:

1. Renaming the Secretariat to Secretary, Joint Staff, and transferring to it three directorates: Administrative Services, Audio Visual Services, and Command History.

2. Transferring the Directorate of Administrative Services to the Secretariat and renaming DCS Personnel and Administration to DCS Personnel.

3. Renaming DCS Plans to DCS Plans and Programs and transferring to it the Directorate of Programs and Financial Affairs.

4. Transferring the Directorate of Manpower and Organization from DCS Plans to DCS Personnel. (On 1 April 1966, M&O was established as a separate directorate reporting directly to the Chief of Staff.)

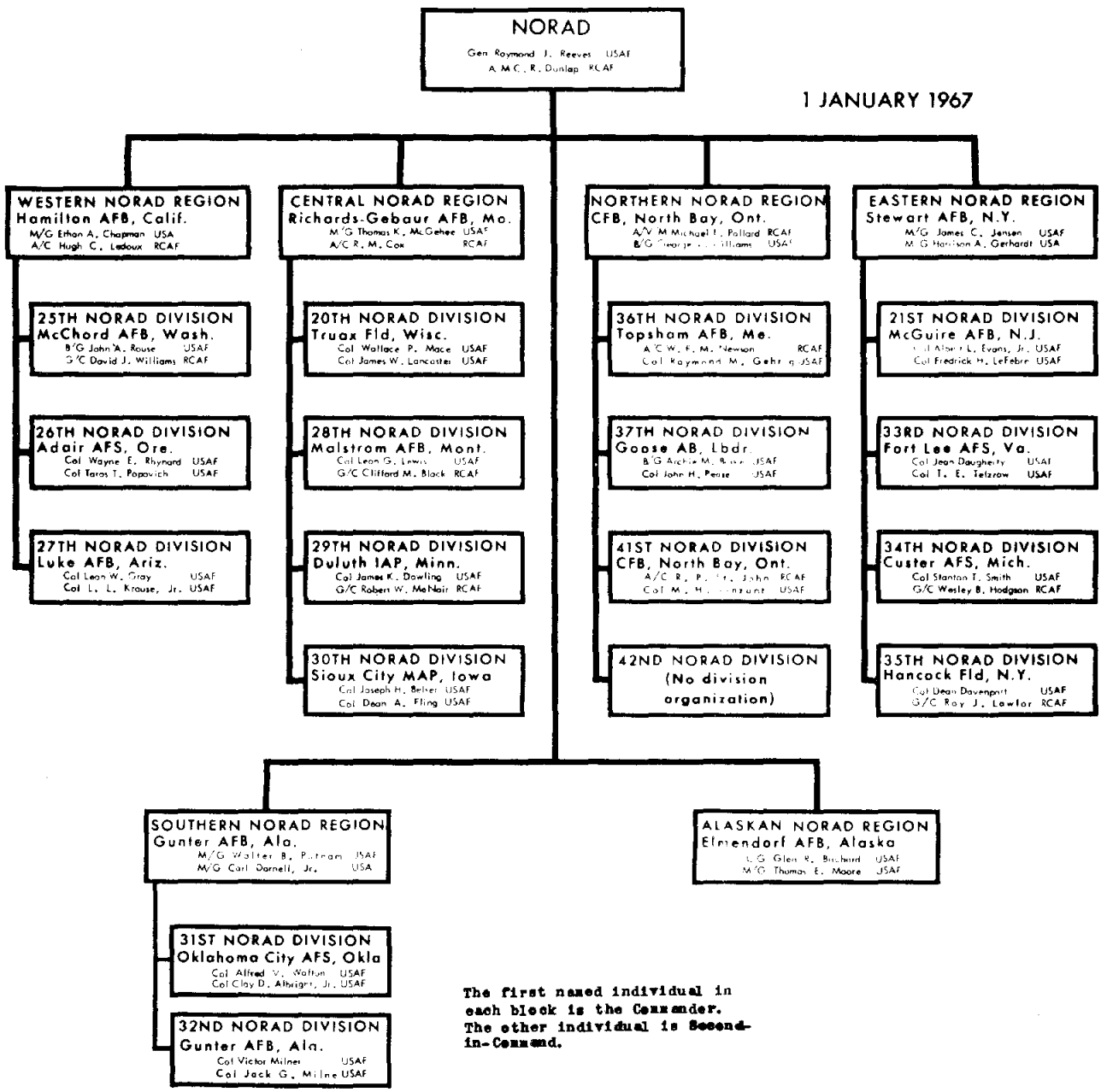
5. Eliminating DCS Programs as a separate element, renaming it (see 3 above), and transferring it to DCS Plans.

(U) Also, the Survey Team recommended repositioning some manpower spaces and reducing the number of spaces from 937 (two spaces had been added to the current JTD) to 916.

(U) NORAD's comments, sent to the JCS on 24 March, generally agreed -- except for reducing the total manpower spaces -- with the survey recommendations. With the exception noted in 4 above, the organizational changes went into effect on 1 April 1966. A decision on the manpower spaces was issued by the JCS on 16 September. This delayed publication of the 1 July 1966 JTD until 3 October. However, the number of spaces authorized for NORAD Headquarters remained at 937. By repositioning spaces within the headquarters, DCS Intelligence got 45 of the 50 additional spaces it wanted for IDHS. The number of spaces authorized for the CIIC increased from 7 to 16. The problem over duplication of functions between the CIIC and Intelligence Watch Division was solved by doing away with the IWD.

(U) FY 1969 Requirements. The NORAD Headquarters JTD for FY 1967, published 3 October 1966, was approved by the JCS to extend through FY 1968.

NORAD COMMANDERS



The first named individual in each block is the Commander. The other individual is Second-in-Command.

On 30 December 1966, NORAD sent its manpower program for FY 1969 to the JCS. No additional manning spaces were requested, but NORAD said it was making studies of manpower requirements for the NCOC and DCS Intelligence functions supporting the NCOC. NORAD stated that these studies, based on operating experience within the areas under study, might result later in a special manpower submission.

(U) Also, NORAD told the JCS that it was making manpower surveys of region and division headquarters (as the JCS Manpower Survey Team had directed). These surveys were being made in coordination with USAF ADC and ARADCOM. Recommendations requiring JCS approval were to be forwarded when the surveys were completed.

CHANGES IN MANPOWER RESPONSIBILITIES

(U) Another recommendation made by the JCS Management-Manpower Survey Team was to reassign from ADC to Headquarters Command, USAF, manpower accounting for USAF spaces in NORAD. Also it recommended that NORAD send its requests for personnel directly to USAF. Under current procedures, ADC had to account for and assign personnel to fill NORAD requests. In addition to creating problems for ADC, the Survey Team felt that a subordinate component of NORAD should not control the assignment of NORAD personnel. The proposed system would then be the same as that used for filling Army, Navy, and Marine Corps spaces in NORAD, and in other unified commands.

(U) NORAD, ADC, and USAF agreed with these recommendations. It was also agreed that, before accepting personnel who were to fill key dual-hatted (NORAD/ADC) assignments, NORAD was to coordinate with ADC. On 1 September 1966, all USAF spaces on the NORAD JTD (including regions and divisions) were transferred from ADC to Headquarters Command. On that same date, all USAF personnel in NORAD positions were assigned to the newly activated

1151st USAF Special Activity Squadron (Hq Command), Ent AFB. Detachment 1, 1151st, was activated at North Bay for Northern NORAD Region, and "operating locations" were formed at all other regions and divisions.

CONVERSION OF MILITARY POSITIONS

(U) In September 1965, the Secretary of Defense had directed that a program be started to determine where civilians might be substituted for military personnel throughout the Department of Defense. The initial phase of this program involved replacing some 75,000 military personnel with about 60,000 civilians. To do this, the JCS directed all unified commands to survey their officer and enlisted positions for possible conversion to civilian spaces.

(U) On 8 October 1965, CONAD replied that 50 military spaces in CONAD Headquarters could be converted to civilian spaces. CONAD proposed to convert these spaces in two phases over the first half of FY 1967. No region or sector (sectors were later renamed divisions) spaces were included because CONAD felt they were combat or combat-support and, therefore, should not be converted.

(U) In September 1966, the JCS asked the unified commands to report on the hiring status of civilians under the replacement program. NORAD replied on 15 November that it was impossible (and JCS personnel had informally agreed) to identify individual positions related to the replacement program. NORAD explained that it could not be done because of the changes in manning positions brought about by the JCS Management-Manpower Survey of NORAD Headquarters. All spaces on the current JTD, NORAD said, had been approved by the JCS and no additional military spaces were recommended for conversion. NORAD asked that the replacement program for its headquarters be considered completed.

CHANGE OF COMMANDERS

(U) On 31 July 1966, General Dean C. Strother, USAF, Commander-in-Chief of NORAD/CONAD since 1 April 1965, retired. He was succeeded by General Raymond J. Reeves, USAF, on 1 August 1966.

NNR HEADQUARTERS REORGANIZATION

(U) On 23 December 1965, Northern NORAD Region asked NORAD to approve a reorganization of NNR's headquarters. With NORAD's approval, the reorganization was made effective 1 January 1966. It was a change in the staff structure only, which cut the number of deputies from seven to three and converted the other deputates to directorates. The rank structure and total manpower spaces remained the same.

~~(C)~~ In June 1966, NORAD learned that another reorganization was being planned that would have a much greater impact. On 17 May, Canada's Minister of National Defence had decided to move the headquarters of the Canadian Forces Air Defence Command from St. Hubert, Que., and collocate it with NNR Headquarters at North Bay, Ont. This move, it was expected, would allow a 30 per cent cut in Canadian personnel with many positions dual-hatted. One notable such position would be that of a single commander heading up both commands.

(U) Collocation of the headquarters was to begin in September 1966 but, in the meantime, NORAD became concerned about further reorganization of NNR Headquarters. On 12 July, NORAD told NNR that collocation might bring about organization and manpower changes to NNR Headquarters before NORAD could examine such changes. NORAD said these changes might conflict with NORAD's own intentions of reorganizing NNR Headquarters to standardize it with other NORAD regions.

(U) NORAD found that its concern was justified when NNR, on 4 October, sent organization and manpower changes for NORAD's approval. Air Vice-Marshal M. E. Pollard, who had taken command of NNR and CF ADC, asked NORAD to revise NNR's JTD effective 1 January 1967. During review of the proposed changes, NORAD found there were several significant points. One of these was a proposal to delete the NNR Commander's position from the NORAD JTD. Another point was the deletion of 88 of the authorized 105 Canadian spaces from the JTD. These proposals, if approved, would considerably weaken NORAD's influence in NNR's Headquarters.

(U) On 21 December 1966, NORAD told NNR that it was withholding approval of the proposed JTD until NORAD made a manpower study, scheduled for February 1967, of NNR. NORAD said a CONAD study was being made of regions and divisions that might be applied to NORAD for standardizing organizations and using manpower spaces.

FY 1966 REORGANIZATION

~~(S)~~ Since late 1963, when the Secretary of Defense directed deletion of four SAGE direction centers in FY 1966 and two SAGE combat centers in FY 1968, planning had been underway by USAF ADC and NORAD to reorganize and reconfigure their structures to allow for these cuts. ARADCOM was also going to reorganize its structure in line with that of ADC and NORAD. There were, however, changes in the original deletion schedule. As finally planned, the two combat centers and two direction centers were to be closed by the end of FY 1966, and two direction centers were to be closed by the end of FY 1968.*

---

*~~(C)~~ Related to this deletion program, but approved by DOD in November 1964, was the closing of 16 radar sites over the fiscal years 1965, 1966, and 1967. There were also changes in this schedule; see Chapter IV.

redesignated its remaining sectors in the U.S. and Canada as numbered divisions. The 42d Division (Hudson Bay Sector) had no headquarters. In all, including Alaska and Canada, there were six regions and 17 divisions (see map following).

(U) NORAD's reorganization resulted in manpower savings to both the U.S. and Canada. Eighty-four U.S. spaces and 14 Canadian spaces were returned as surplus to NORAD's needs. New Joint Headquarters Tables of Distribution were issued on 1 April 1966, superseding JTD's dated 1 July 1965, for the following NORAD/CONAD regions and divisions:

Eastern Region - Stewart AFB, N.Y.
- 21st Division - McGuire AFB, N.J.
- 33d Division - Ft. Lee, Va.
- 34th Division - Custer AFS, Mich.
- 35th Division - Hancock Field, N.Y.

Central Region - Richards-Gebaur AFB, Mo.
- 20th Division - Truax Field, Wis.
- 28th Division - Malmstrom AFB, Mont.
- 29th Division - Duluth IAP, Minn.
- 30th Division - Sioux City AFS, Iowa

Western Region - Hamilton AFB, Calif.
- 25th Division - McChord AFB, Wash.
- 26th Division - Adair AFS, Ore.
- 27th Division - Luke AFB, Ariz.

Southern Region - Gunter AFB, Ala.
- 31st Division - Oklahoma City AFS, Okla.
- 32d Division - Gunter AFB, Ala.

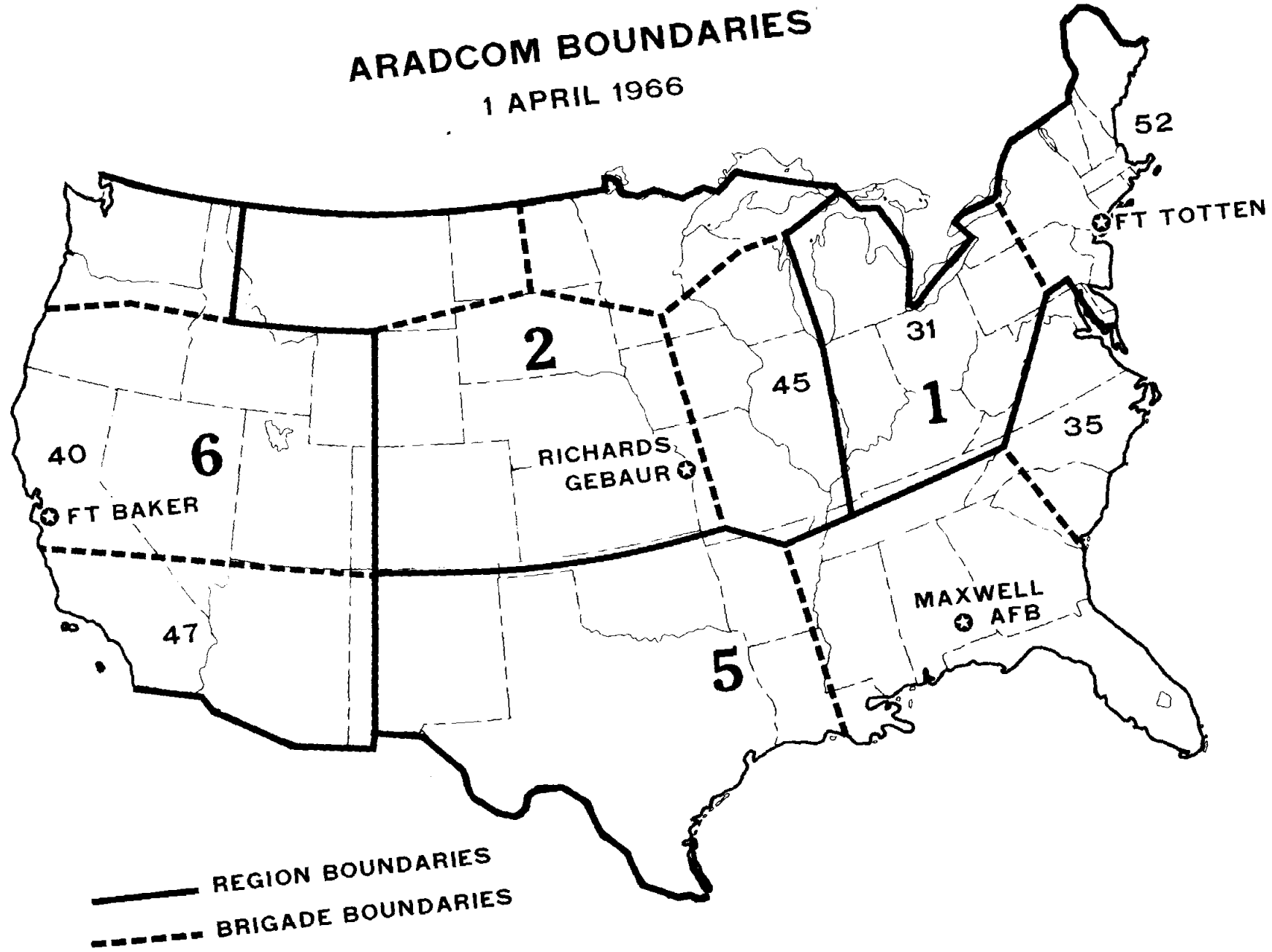
Northern Region - North Bay, Ont.
- 36th Division - Topsham AFS, Me.
- 37th Division - Goose AB, Lbdr.
- 41st Division - North Bay, Ont.

The FY 1966 actions were to start on 1 April and be completed by 30 June 1966.

(U) The air defense structures of ADC, NORAD, and ARADCOM were reorganized in the following broad outlines. On 1 April 1966, ADC closed the combat centers (and headquarters) at the 25th Air Division/ NORAD Region, McChord AFB, Wash., and the 30th Air Division/NORAD Region, Truax Field, Wis. At the same time, direction centers at the Los Angeles and Reno Sectors were closed. ADC reorganized its remaining air divisions (26th, 28th, 29th, and 73d) into four air forces. The 1st AF was established at Stewart AFB, the 4th at Hamilton AFB, the 10th at Richards-Gebaur AFB, and the 14th at Gunter AFB. ADC redesignated its city-named sectors as numbered air divisions but did not change the level or nature of their operation.

~~(S)~~ The combat centers at Hamilton AFB and Richards-Gebaur AFB, which had operated as Remote Combat Centers (Hamilton had remote input from Reno Sector and Richards-Gebaur from Sioux City Sector) were converted to standard combat centers. An AN/GSA-51 computer, less consoles, was installed at Hamilton and started initial operation on 1 April 1966. At Richards-Gebaur AFB, the AN/FSQ-7 computer there was modified to permit standard combat center operations on 1 April.

(U) NORAD's plans for reorganization and reconfiguration were published in Operation Order 334N-65, 1 October 1965. In accordance with this order, NORAD discontinued its 25th and 30th Regions and Los Angeles and Reno Sectors on 31 March 1966. On 1 April, NORAD realigned region and sector boundaries and reorganized the remaining 26th, 28th, 29th, and 32d Regions into four geographically-designated regions with headquarters at the same locations as the ADC air forces. The 26th NORAD Region was renamed the Eastern NORAD/CONAD Region, the 28th the Western Region, the 29th the Central Region, and the 32d the Southern Region. NORAD also



(U) ARADCOM planned to reorganize its five regions into a four-region structure which would have the same boundaries as the NORAD/CONAD Regions. (ARADCOM's northern boundary followed the international border and did not extend into Canada.) On 1 April 1966, the 7th Region, with headquarters at McChord AFB, was discontinued. At the same time, the 5th Region Headquarters at Ft. Sheridan, Ill., moved to Maxwell AFB. The reconfigured structure was as follows (see map): the 1st Region with headquarters at Ft. Totten, N.Y., the 2d at Richards-Gebaur AFB, the 5th at Maxwell AFB, and the 6th at Fort Baker, Calif.

(U) The reconfigured NORAD and ARADCOM region boundaries were identical except for one notable deviation. The 5th Region boundary line extended northeastward into the Eastern NORAD Region area and followed the line of the 33d NORAD Division. ARADCOM's Nike defenses in the 33d ND area, covering Washington, D.C. and Norfolk, Va., were transferred from the command of the 1st Region to that of the 5th Region to correct what ARADCOM termed a "serious imbalance" in the number of fire units and defenses assigned to these regions. Operational control of these two defenses was retained by the Eastern NORAD Region commander, however.

FY 1968 RECONFIGURATION

(U) As noted previously, two SAGE direction centers were to be closed in FY 1968. The DC's to be closed were at Truax Field, Wis., (20th NORAD Division), and McGuire AFB, N.J., (21st NORAD Division). NORAD Operation Plan 330N-66, 1 November 1966, called for closing these facilities on 1 June 1968. At that time, the areas of responsibility and forces of the 20th and 21st Divisions were to be taken over by the 30th and 35th Divisions, respectively.

~~(S)~~ In conjunction with the above changes, NORAD also planned a westward adjustment of the boundaries between the Central and the Northern NORAD Regions and, within these regions, a westward adjustment of the boundaries between the 29th and 41st Divisions and the 41st and 36th Divisions.* These changes would give these divisions, located in northeast U.S. and Canada, a better balance of radars and interceptors and, for increased survivability, two BUIC III BNCC's in each division.

*(U) NORAD's decision on where the boundary lines were to be drawn, which had been announced on 1 September 1966, came after careful consideration of counterproposals made by NNR and USAF ADC.

CHAPTER II

COMMAND AND CONTROL SYSTEMS

NORAD/CONAD PARTICIPATION IN THE DEVELOPMENT, ACQUISITION AND OPERATION OF COMMAND AND CONTROL SYSTEMS

BACKGROUND

(U) In October 1963, the Office of the Secretary of Defense issued a memorandum for ensuring that unified and specified commanders could achieve adequate influence over the development, acquisition, and operation of their command and control systems. This document included authority to establish operational requirements, participate in planning and design, review system documentation, attach the command's views to program change proposals, and identification of those elements that should be under the commander's direct command and control.

(U) JCS instructions for implementing the OSD memorandum were issued on 21 December 1963. These instructions also contained a request for a description of the command and control system and a listing of the major elements within the system that were felt to be under CINCNORAD's direct command and control. NORAD sent these subjects to the JCS in February 1964.

~~(S)~~ In a JCS memorandum issued 11 June 1965, the JCS defined CINCONAD's command and control system as consisting of the following elements: the Combat Operations Center, including the Space Defense Center; the ALCOP at Richards-Gebaur AFB;

certain equipments and the data base within these centers needed for command and control decisions; and certain specified communications, subject to some restrictions. The JCS said the OSD memo and JCS implementing instructions were to apply to the above named elements. On all other command and control elements of concern to CONAD, down to and including weapon systems, CONAD was to participate in the development process. Guidance specifying the responsibilities of the military services to establish procedures to enable NORAD/CONAD to discharge their responsibilities was issued by the Secretary of Defense on 8 June 1965.

(U) In the meantime, NORAD/CONAD were getting organized to handle these added responsibilities. A staff memorandum was issued on 1 July 1964 making DCS/Programs responsible for the review, control, and processing of PCP's. (After the reorganization of NORAD Headquarters on 1 April 1966, when DCS/Programs became the Directorate of Programs and Financial Affairs under DCS/Plans and Programs, a new staff memorandum (SM 27-1, 24 June 1966) made DCS/Plans and Programs responsible for the review, control, and processing of all DOD programming documents.) The policies and procedures for CONAD participation in the development and acquisition of command and control systems were laid down by CONAD in Policy Memorandum No. 1, 18 December 1964. The Directorate of Systems Development, DCS/Plans and Programs, was made responsible for preparing participation letters to the services on command and control systems and the command and control portion of weapon systems. DCS/Communications and Electronics was responsible for participation letters to the services and the Defense Communications Agency on communications supporting command and control systems.

(U) Until mid-1965, NORAD had played a significant role in the development and acquisition phases of several of its systems; for example, 425L (Combat Operations Center) and AN/GSQ-89 (SLBM Detection and Warning System). After that time, a more formal

program, in line with the JCS instructions of 11 June 1965 was evolving.

NIKE X SYSTEM

(U) NORAD issued Policy Memorandum No. 6, 16 August 1965, to establish the general principles and objectives for command and control of ballistic missile defense. It was to give guidance to all concerned and was to be used as a reference for NORAD review of integration and interface requirements of all service component ballistic missile defense command and control systems during development, acquisition, and operation.

~~(C)~~ On 8 September 1965, the first participation letter was sent by CONAD to the Army Chief of Staff. This letter concerned the Nike X Ballistic Missile Defense System and covered the degree of participation desired by CONAD. It also pointed out that NORAD interest extended to deployment and operation.

(U) Following an exchange of correspondence between the Army and CONAD, a meeting was held on 8 March 1966 at Redstone Arsenal, Ala., to discuss CONAD's participation in the development and acquisition of the command and control portion of Nike X. Representation at this meeting included CONAD, the Army, ARADCOM, and Nike X Project Office. It was agreed that CONAD could communicate directly with the NXPO on participation in development and acquisition matters. It was also agreed that a CONAD representative should be assigned as a working member of the NXPO at Redstone Arsenal. It was felt this would ensure proper CONAD participation.*

*(U) Lt. Col. Hubert S. Stees, Jr., USAF, after completing work with CONAD's Nike X Impact Study, was to be assigned to the NXPO.

NORAD/CONAD ARRANGEMENTS WITH USAF

(U) On 18 May 1966, CONAD sent letters to the Chief of Staff, USAF, the Chief of Staff, U.S. Army, and the Chief of Naval Operations saying that now was the appropriate time to set up specific arrangements for NORAD/CONAD participation in the development and acquisition of command and control systems. It also said these arrangements would be established through individual letters to the appropriate service and the NORAD/CONAD component command on each system that applied to NORAD/CONAD.

~~(S)~~ This arrangement was acceptable to the Army and the Navy. However, following an exchange of correspondence between CONAD and USAF and a meeting of their representatives on 30 August 1966, USAF recommended a different method for establishing NORAD/CONAD participation. On 19 October, in a letter to CONAD, USAF said that when CINCONAD's command and control systems (Combat Operations Center, ALCOP, etc.) were involved, CONAD should deal directly with USAF or the Air Force development agency. For these systems, CONAD would be considered a using command as specified in Air Force regulations and, therefore, participation letters would not be necessary. For other systems, either those interfacing directly with the COC and ALCOP or for those with CONAD operational requirements, USAF recommended that CONAD set up a regulatory document between it and ADC outlining the type and degree of participation CONAD wanted.

(U) CONAD examined USAF's proposal and found it to be a basis for working out an acceptable solution. Work was started on a NORAD/CONAD regulation to replace CONAD Policy Memorandum No. 1. This regulation was to be informative to Canadian Forces Air Defence Command and directive upon CONAD component commands.

AN/FPS-85 RADAR

(U) In the meantime, on 16 December 1966, in accordance with Policy Memorandum No. 1, CONAD informed ADC by letter that CINCONAD wanted limited participation in Category II and III testing of the FPS-85 radar. It already had representation on ADC's FPS-85 Operations Working Group, but CONAD said it might take a more active role during tests of certain special operational functions such as Space Defense Center Backup or FPS-85/SPASUR integration. CONAD asked that it be given testing information -- schedules, programs, procedures, and reports -- as acquisition and activation of the radar proceeded.

NORAD HARDENED COMBAT OPERATIONS CENTER

STATUS SUMMARY

(U) The 425L System portion of the NORAD Cheyenne Mountain Complex (NCMC) achieved initial operational capability (IOC) on 1 January 1966. Operational responsibility was transferred from Air Force Systems Command to NORAD. Accepted system equipment and elements of the facility were transitioned to the Air Force Logistics Command and Air Defense Command. On 20 April 1966, the 425L System became fully operational. The Space Defense Center IOC date slipped from 15 March 1966 to early 1967.

~~(S)~~ By mid-1966, the major communications electronics systems were fully operational with the exception of the Automatic Digital Relay (ADR). Problems with the ADR lasted throughout 1966 but, by early 1967, most of them were solved. In January 1967, the ADR completed a successful ten day test. One other problem area had been the electronic solid state switch (ESS-1). The ESS, a telephone switching system, was to have been available before the NCOC became operational. An interim telephone system

was arranged until the ESS reached operational status during 1-3 July 1966.

~~(S)~~ A third Philco 212 computer was moved from L. G. Hanscom Field to Cheyenne Mountain in early January 1966. It achieved operational capability on 31 March, as scheduled. Also, the closed-circuit television system was accepted in March. It was used for the System Performance Demonstration (SPERD) and other testing.*

(U) Quarterly NCMC Implementation Progress Reports were required by the Secretary of Defense in a directive of September 1964. The ninth such report was issued on 31 December 1966. The main problem area listed in this report was the Space Defense Center's initial and full operational capability slippage to early 1967. The report pointed out that the slippage was due to "problems encountered in providing ADR program fixes for interface of the Space Defense Center with sensors."

NCMC FOLLOW-ON REQUIREMENTS

~~(C)~~ Follow-on requirements for the NCMC from FY 1967 through FY 1971 were submitted to the JCS in April 1965. Of these requirements, the Secretary of Defense issued guidance on 31 August 1965 identifying specific program elements for accomplishment in FY's 1967 and 1968. Because the money allocated for these improvements was $345,000 less than needed, NORAD made a list of items in their order of importance. NORAD sent ESD a priority list of improvements in November 1965 for FY's 1967 and 1968. All Follow-on improvements were re-submitted in the appropriate CY 1966 consolidated command, control and communications programs (CC^3P).

~~(S)~~ USAF sent these requirements to OSD on 15 April 1966. OSD action, on 15 September, programmed

*(U) For results of testing, see Chapter VIII.

$700,000 per year (FY's 1968 through 1973) for follow-on improvements. That figure, NORAD felt, fell far short of the amount needed. In a message to ADC on 30 September, which was to be used as the basis for a reclama, NORAD pointed out that proposed improvements for FY 1968 were based on operational experience and estimated to cost $4.820 million.

~~(S)~~ The reclama was unsuccessful, however. During a visit to the Pentagon in November 1966, NORAD officials learned from JCS and Air Staff representatives that they had been unable to support NORAD's program before OSD because of insufficient cost data. Furthermore, they indicated that a long range plan was needed for the NCMC. Such a plan would better enable USAF, JCS, and OSD to understand and support NORAD's future requirements.

(U) On 19 December 1966, NORAD submitted to the Cheyenne Mountain Complex Management Office (CMCMO) an updated list of follow-on improvements. This list was to be sent to ESD for inclusion in its CY 1967 C3P. NORAD said its requirements had been prepared in accordance with guidance from representatives of the JCS (JCCRG) and USAF.

NCMC SUPPORT

(U) Prior to IOC, the CMCMO had overall responsibility for supervision of activities of participating agencies for interface, integration, and installation within Cheyenne Mountain. After IOC, when ADC accepted systems and facilities from AFSC, ADC had prime responsibility for the systems and facilities accepted. The CMCMO continued responsibility for systems not operational at IOC until these systems reached IOC and were accepted by ADC.

(U) In November 1965, CINCNORAD told the ESD commander that he would like to see the organizational and functional identity of the CMCMO kept at least through FOC at which time its continuance

could be reviewed. CINCNORAD pointed out that the CMCMO was a DOD-recognized organization with special relations with IDHS, DCA-CONUS, and the District Engineer that would be hard to continue without the CMCMO.

(U) In early December 1965, the ESD commander said he shared CINCNORAD's views and that ESD intended to continue the CMCMO and would review with NORAD its further continuance at the time of FOC.

(U) On 4 May 1966, NORAD agreed to a proposal to gradually reduce during FY 1967 the number of ESD/MITRE personnel assigned to the CMCMO. This reduction would leave ten people (eight ESD and two MITRE), and NORAD said that would be enough to support its Combat Operations Center requirements. However, NORAD said it might ask for additional ESD/MITRE support if the implementation of present and future programs required it.

(U) In a letter to the ESD commander on 5 December 1966, NORAD requested additional support. NORAD said it was developing a ten year master plan for the orderly and efficient evolution of CINC-NORAD's command and control system. ESD support was needed, NORAD said, in the areas of operations and system analysis, system design, and equipment technology. On 15 December, ESD said specific tasks would be worked out with NORAD and then ESD would assess its capability to support NORAD needs.

NCOC MASTER PLAN

~~(S)~~ In June 1966, a NORAD ad hoc group completed work on a study that had lasted eight months. The purpose of this study was to examine the entire NORAD warning function to ensure that warning responsibilities of CINCNORAD/CINCONAD were being met in terms of the threat. One of the recommendations of this study was to study further the problem of integrating the various new and proposed

warning systems and developing solutions to the problems of display, internal and external dissemination of warning, and combined weighting of warning data.

(S) A follow-on study, called the NORAD Warning Integration Study, began an examination in August 1966 of the problems outlined above. The conceptual phase of the study, Phase I, ended on 15 November. Phase II, a study of the integration of warning information within the NORAD Combat Operations Center and the integration of that warning data which NORAD sent to external users, was to start in early 1967.

(U) However, Phase II was overtaken and incorporated into a much larger study which had been building in the background since late 1965. At that time, the JCS had said there was need for a "master" plan with the objectives, requirements, and justification for command and control for each of the unified and specified commands. Several months were required to work out the details of the JCS requirement.

(U) On 20 December 1966, NORAD started the development of a plan called the NCOC Master Plan. This plan was to describe CINCNORAD's command and control system for the period 1968-1978 and was to include incremental improvements, NCOC organization, World Wide Military Command and Control System interface requirements, warning integration, and the guidance to help define software and equipment requirements. The Directorate of Systems Development, DCS/Plans and Programs, was to direct the planning effort and an Executive Council was formed with representatives from various NORAD staff agencies and the component commands. ESD was to provide system engineering and technical assistance. Publication date for the NCOC Master Plan was tentatively set for November 1967.

SPACE DEFENSE CENTER BACKUP PLANS

~~(S)~~ In keeping with a DATOS Group recommendation, on 22 June 1965 the JCS directed CONAD to prepare a standby plan for use of the USAF AN/FPS-85 facility at Eglin AFB as a backup to the SDC, and an interim backup plan for use in the event of catastrophic failure prior to availability of the AN/FPS-85. An interim backup plan was submitted to the JCS in August 1965 and was approved on 12 October. This plan, 393C-65, was published on 15 November 1965. A draft plan for use of the AN/FPS-85 had also been submitted to the JCS in August 1965. This plan was approved on 21 October 1965. It was published as Operations Plan 392C-66 on 10 October 1966 and was to be implemented on the FOC date of the AN/FPS-85.

NORAD HARDENED ALCOP

BACKGROUND

~~(S)~~ In October 1960, the JCS had directed all unified and specified commands to have alternate command elements in hardened, dispersed or mobile facilities. Because the NORAD alternate command post at Richards-Gebaur AFB did not meet the standards, USAF suggested moving it to the hardened center at North Bay, Ont. NORAD agreed and asked that the ALCOP be set up initially in a manual mode because of the need to relocate operations as soon as possible. On 3 May 1963, the JCS approved the manual ALCOP at North Bay. The RCAF advised on 10 December 1963 of Canadian Cabinet approval on the understanding that installation could be done within the terms of the governmental agreement for NORAD. In August 1964, Canadian Forces Headquarters advised that the RCAF approved the design for the ALCOP as contained in the PSPP and that the RCAF was ready to negotiate implementation and cost sharing upon receipt of USAF design approval.

(S) NORAD's telecommunications requirements were approved by the JCS on 21 October 1964 and the DCA system plan was validated and sent to the Secretary of Defense by the JCS on 31 March 1965.

(S) On 9 June 1965, the Secretary of Defense disapproved the communications plan and the concept of a hardened ALCOP. To help in preparing a reclama, the JCS asked CONAD to see if there were ways to cut costs without sacrificing essential operational capabilities. CONAD replied on 12 July with proposals that would cut the U.S. original investment cost from $839,000 to about $119,000 and the U.S. annual recurring costs from $1.6 million to about $867,500 (in addition, there would be costs borne by Canada). CONAD pointed out that an ALCOP at North Bay would still have greater capability and survivability than the current ALCOP at a comparable annual recurring cost.

(S) Citing these reductions, a PCP was submitted to DOD on 21 August 1965. It requested $120,000 to establish the ALCOP at North Bay and it said that the facility would operate within the same annual operating costs as the current ALCOP. On 31 August, the Secretary of Defense issued a decision/guidance paper on the ALCOP. He did not provide communications funds or manpower for the ALCOP but said he would consider the establishment of an ALCOP at North Bay on receipt of a firm plan to transfer the current ALCOP to North Bay. On 8 October, the JCS asked NORAD to prepare a transfer plan within the following guidelines: initial investment not to exceed $120,000; U.S. annual operating costs comparable to those for the current ALCOP; and U.S. manning level at or below that of the current ALCOP.

DOD APPROVAL

(S) NORAD sent the JCS an ALCOP Basic Plan on 31 January 1966. This plan, dated 26 January, contained non-recurring costs for establishing the ALCOP and annual recurring costs for operating it.

Pending a U.S.-Canada agreement, it was assumed that the U.S. would pay two-thirds and Canada one-third of the annual recurring costs. For non-recurring costs, two alternatives were given. The first assumed that ALCOP facility modification costs would be borne by Canada and equipment and installation costs would be borne by the U.S. The second alternative assumed a 2/3 U.S., 1/3 Canada cost-sharing agreement. These costs for the U.S. portion were within the guidelines given by the JCS.*

~~(S)~~ The U.S. manning level for the North Bay ALCOP would also be lower than the current level for ALCOP functions at Richards-Gebaur. Currently, 72 spaces were required at Richards-Gebaur. For the North Bay ALCOP, NORAD proposed 48 U.S. spaces and 45 RCAF spaces.

~~(S)~~ In a memorandum dated 11 April 1966, the JCS approved the ALCOP Basic Plan and forwarded it to the Secretary of Defense. He approved it on 29 June 1966.

~~(S)~~ After the plan was approved, the JCS informed the Canadian Defence Staff that USAF was to act as the executive agent in preliminary funding and manpower negotiations. In September, Canadian Forces Headquarters asked CF ADC and Northern NORAD Region for comments on the ALCOP Plan. NNR's comments were contained in a plan it had made for implementing the ALCOP Plan. NNR sent its implementation plan to NORAD for comment. On 13 December, NORAD replied that it agreed with NNR's plan "providing the facility and communication circuits required for the intelligence functions are operational at the ALCOP at IOC date."

~~(S)~~ On 27 December 1966, NNR informed NORAD that CF ADC concurred with NORAD's position. In

*(U) For further details on cost figures, see NORAD/CONAD Historical Summary, Jul-Dec 1965, p. 23.

addition, CF ADC was going to recommend to Canadian Forces Headquarters the early approval of the ALCOP Plan so that construction, modifications, and installation of equipment could start as soon as possible.

~~(S)~~ Because of unanticipated events, one of which was the collocation of CF ADC and NNR Headquarters at North Bay, NORAD expected some slippage in transferring the ALCOP to North Bay.* On 21 December 1966, NORAD told ADC that firm dates for transferring the ALCOP could not be established at this time. NORAD said it had already asked USAF to postpone personnel programming actions and, now, it was asking ADC to ensure that the ALCOP was maintained at Richards-Gebaur until ALCOP responsibilities were transferred to North Bay.

SECONDARY ALCOP

~~(S)~~ The 30th NORAD Region was relieved of its secondary ALCOP functions on 1 February 1966, and the Region was discontinued on 1 April. The requirement for a secondary ALCOP was being studied by NORAD at the end of 1965. NORAD advised ADC that probably a secondary ALCOP would not be designated per se because of the nearing readiness of the hardened COC and the probability that DOD would approve moving the primary ALCOP to the hardened North Bay facility. NORAD did not designate a secondary ALCOP. Instead, it developed a scheme of succession to command among region commanders to cover the loss of both the NORAD COC and the primary ALCOP. The succession to CONAD command was published in ADNAC 300C-66, 2 May 1966. The succession to NORAD command was published in ADNAC 300N-67, 1 January 1967.

---

*(U) See Chapter I for discussion of CF ADC and NNR Headquarters at North Bay.

BACKUP INTERCEPT CONTROL SYSTEMS

BACKGROUND

~~(S)~~ As an outgrowth of a June 1961 directive from the Secretary of Defense for providing more system survivability, a SAGE backup system was approved by DOD in March 1962 for implementation in two phases. This backup system was termed BUIC (Backup Intercept Control). The first phase, BUIC I, was completed in 1962 and provided manual control using NCC's, NGCI's, and radar sites. The second phase, BUIC II, was to provide semiautomatic control at 34 NCC's originally, each of which was to have the AN/GSA-51 computer.

~~(S)~~ The search for a better and more survivable system continued. NORAD proposed a transportable system that it called TRACE. However, a Secretary of Defense-directed Air Force study, Continental Air Defense Study, 10 May 1963, recommended a fixed Improved BUIC system. An Air Force proposal for Improved BUIC was deferred without prejudice by the Secretary of Defense. NORAD and ADC proposed another system called PAGE. During a review of PAGE, DDR&E introduced a SAGE/BUIC III system concept. On 30 November 1964, the Secretary of Defense approved BUIC III.

~~(S)~~ BUIC III was essentially BUIC II with increased capabilities. DOD guidance provided for an interim deployment of 14 BUIC II's (13 operational and one training) in FY 1966-1967 and a phasing in of 19 BUIC III's in FY 1968-1969 replacing the BUIC II's. DOD guidance also directed the closing of two combat centers and four direction centers (see Chapter I). Two sector direction centers were to be closed on 1 April 1966. One of these was the Reno Sector which provided remote input to the 28th NORAD Region (renamed Western Region on 1 April 1966) combat center. The DOD guidance provided for keeping the Reno DC facility as a BUIC III to drive the 28th Region combat center.

~~(S)~~ In accordance with DOD instructions, USAF submitted a PCP for the SAGE/BUIC III program. The PCP, which included the ADC/NORAD position, proposed closing the Reno facility, installing an AN/GSA-51 computer at the 28th Region combat center, and a twentieth BUIC III at Fallon NAS, Nev., (Z-156). On 13 May 1965, by separate action, the Secretary of Defense approved the computer for the combat center. This was followed by issuance, on 31 August, of Secretary of Defense decision/guidance approving 19 BUIC III's instead of 20. Fallon was included in the program, but Waverly, Iowa (Z-81), was eliminated. USAF had said before it submitted the PCP that if the twentieth computer was not approved, Fallon would stay in the program and Waverly would be deleted. This was also the ADC/NORAD position, but both still wanted a twentieth BUIC III at Waverly for the critical Chicago-Omaha area.

~~(C)~~ On 18 August 1965, the Canadian Cabinet had approved BUIC III for two of the three sites proposed in Canada. These were C-5, St. Margarets, N.B., and C-8, Senneterre, Que. BUIC III for C-153, Kamloops, B.C., was not approved. The CADIN agreement was to be amended to extend its provisions to the BUIC III program. Site Z-40, Othello AFS, Wash., was substituted for C-153.

BUIC II STATUS

~~(S)~~ By 1 April 1966, all BUIC II sites were operational. Thirteen operational sites served as backup to 14 SAGE direction centers. There was also a training site at Z-198, Tyndall AFB, Fla. The first operational site, Z-10, North Truro, Mass., had become operational on 1 September 1965. By the end of 1965, three more sites, Z-16, Z-54, and Z-61, had become operational. On 1 March 1966, Z-27, Z-46, Z-56, Z-65, and Z-180, reached operational status. The remaining four sites, Z-25, Z-69, Z-76, and Z-156, became operational on 1 April 1966.

BUIC III STATUS

~~(S)~~ The Burroughs Company cost estimate for BUIC III was originally $27.8 million, but it exceeded the ESD planned cost by about $13 million. This resulted in ESD, MITRE, and Burroughs looking for ways to cut costs without reducing operational effectiveness of the BUIC III system. In November 1965, Burroughs presented a new proposal that would cost $15.6 million. This was still about $1.4 million over ESD's original estimated cost but was considered by ESD to be within acceptable limits. The contract for BUIC III hardware was signed by the Air Force and sent to Burroughs on 12 January 1966.

~~(S)~~ Planning called for BUIC III to become operational in the 1968-1969 period. During that time, a gradual phasing was to take place from BUIC II to BUIC III. The BUIC II training site at Z-198 was to be modified to permit training in BUIC III procedures and maintenance.

~~(S)~~ On 3 October 1966, NORAD sent a proposal to ADC that Z-198 be made a joint operations and training facility beginning in July 1967. NORAD said it appeared that both time and money could be saved and operational capability improved. ADC replied on 28 October that NORAD's proposal could not be done because it would create major program impacts. NORAD withdrew its proposal on 9 November.

AIR DEFENSE ARTILLERY DIRECTOR (ADAD) CONSOLES

~~(S)~~ ARADCOM stated a requirement for an ADAD data display console at ten BUIC III sites. The program called, however, for seven sites to have 11 data display consoles, one of which was to be an ADAD console. The remaining sites were to have ten consoles. On 10 September 1965, NORAD told ADC that ten BUIC III sites would have a requirement to coordinate with Army air defense weapons. NORAD asked that distribution of consoles be reviewed to provide the three additional consoles needed. NORAD

reaffirmed the requirement for ten ADAD consoles to ADC on 13 October.

~~(S)~~ On 10 January 1966, NORAD informed ADC that the requirements had changed as a result of the decision of the Secretary of Defense to inactivate 22 Nike Hercules batteries and shifts in ARADCOM site requirements. NORAD said ARADCOM had recently (15 December 1965) asked for three additional consoles, a total of 13, and that the matter was under study. NORAD gave its decision to ARADCOM on 10 February. NORAD said its position was that ADAD consoles were needed at eight sites (one console at each site) and one would be needed at Z-81, Waverly, if it was approved as the twentieth BUIC III site.

CO-MANNING OF BUIC II AND BUIC III SITES

~~(S)~~ On 9 December 1965, NORAD asked its regions for recommendations on co-manning BUIC sites which would assume control of both U.S. and Canadian tactical units under Mode III operations. NORAD listed ten sites that might require Canadian co-manning and the two Canadian sites that might need USAF co-manning. NORAD pointed out that it might not be possible to get additional Canadian and USAF authorizations so spaces were to be indicated that could be used to offset any recommended requirements. NORAD said it would develop a staff policy on co-manning after recommendations from the regions had been received.

(U) The regions' replies were sent to NORAD in January and February 1966. Their recommendations showed a variation in the number of BUIC sites to be co-manned and in the number of manpower spaces needed. They did agree on the need for co-manning, however. At the end of 1966, the matter was still being studied by NORAD.

AN/TSQ-51 FIRE DISTRIBUTION SYSTEM

~~(S)~~ In December 1963, DOD approved replacement of ARADCOM's Missile Masters, AN/FSG-1, with ten AN/TSQ-51 Fire Distribution Systems. This was a greater capacity system that would be more economical and more survivable than Missile Master. The Hughes Aircraft Company was awarded a contract for the AN/TSQ-51 in June 1964 for the production of ten systems to be delivered by December 1966.

~~(S)~~ Originally there had been ten Missile Masters. However, two were closed in 1963 and two more were closed in late 1964. This left ARADCOM, at the end of 1965, with six Missile Masters, 18 BIRDIE's, and one TSQ-38. NORAD wanted to replace the Missile Master and selected BIRDIE's with the AN/TSQ-51 and to replace the TSQ-38, being used at Key West, Fla., with a BIRDIE set when available.

~~(S)~~ By early October 1966, all of the nine systems scheduled for operational use had been delivered. By mid-December 1966, five had become operational at the following locations:

Area	Date
New York-Philadelphia	30 November
Chicago-Milwaukee	2 December
Washington-Baltimore	2 December
Detroit-Cleveland	7 December
Los Angeles	14 December

As a result, a total of four Missile Masters and two BIRDIE systems were deactivated at the above locations. The tenth AN/TSQ-51 system was delivered to Fort Bliss, Texas.

CHAPTER III

COMMUNICATIONS

AUTOMATIC VOICE NETWORK (AUTOVON)

~~(S)~~ By January 1963, NORAD and ADC had submitted requirements for some 70 automatic voice communications centers. Included were requirements for nine centers to serve NORAD regions, 18 centers for sectors, and some 43 centers for the remainder of the SAGE/BUIC system. In the meantime, the Defense Communications Agency (DCA), had developed a plan for a world-wide Automatic Voice Network (AUTOVON) as part of the Defense Communications System. The latter was being set up as the single long-haul system for all elements of the DOD. In May 1963, OSD approved the combining of the four Army SCAN (Switched Circuit Automatic Network) centers with the five existing NORAD/ADC centers to establish the first part of the CONUS AUTOVON. Combining of the SCAN-NORAD/ADC networks was completed on 20 April 1964.

~~(S)~~ By the end of 1964, ten centers were operating (the nine SCAN-NORAD/ADC centers and one at the GSA center at Faulkner, Md.). The FY 1967 DCA CONUS AUTOVON program consisted of 58 switches, 23,023 access lines, and 5,847 trunks. In 1965, the DCA CONUS program was expanded to a network of 65 switches, 24,986 access lines, and 10,358 trunks to be operating by 1970.*

---

*~~(S)~~ This program was not approved by the OSD until 7 Mar 1966.

~~(S)~~ The NORAD/ADC requirement could be met within the DCA program because of changes in the BUIC program and the reconfiguration of the NORAD organization. All of the AUTOVON centers were to ultimately use the electronic solid state switch, ESS-1, but because of deficiencies in the switch, DCA advised NORAD in May 1965 that it had decided not to accept the ESS-1 for AUTOVON until it could meet specifications. Delivery of the ESS-1 switches slipped to January 1966, then 1 April, and finally to 1 July 1966. Interim switches were used until actual cutover to the ESS-1 system on 1 July 1966.

~~(S)~~ NORAD had planned with ADC and DCA to integrate SAGE/BUIC into AUTOVON on a time-phased basis from 1 September 1965 to 1 January 1966, but subsequent difficulties delayed the SAGE/BUIC cutover to January 1966, and finally to July 1966. In May 1965, AT&T had developed a SAGE/BUIC traffic routing plan which DCA, ADC and NORAD reviewed and rejected in November 1965. They asked AT&T to come up with another plan before SAGE/BUIC services were switched into AUTOVON. AT&T was to place more emphasis on trunks specifically ordered for SAGE/BUIC and less on general purpose AUTOVON trunk groups. Also required were provisions for necessary adjustments to the general purpose AUTOVON trunking and SAGE/BUIC trunking after completion of the traffic routing plan.

(U) A new SAGE/BUIC routing plan was reviewed by ADC and NORAD during January 1966. They agreed the plan was a good one, except that route control digits severely limited its flexibility and survivability. ADC and NORAD informed DCA that the plan was acceptable if the route control digits were changed. The plan was changed and, on 25 February 1966, DCA told NORAD that SAGE/BUIC would cut over to AUTOVON beginning on 25 June with completion by 19 July 1966. The switchover was to be done without degradation to tactical capability provided NORAD and ADC did not conduct any exercises that

would deny AT&T access to the communications facilities affected by the switchover. ADC and NORAD agreed to this condition and, by 19 July 1966, the NORAD SAGE/BUIC tactical communications system was integrated into AUTOVON.

(U) On 19 July 1966, the network consisted of 27 inter-connected switch routes dispersed in non-target areas to survive nuclear attack. Eight additional switches were to come into the system in January 1967, followed by increments of two to eight switches approximately every six months thereafter until the ultimate configuration was reached in 1970. DCA planned to improve and enlarge AUTOVON to a total of 65 CONUS, nine Canadian, and 24 Overseas AUTOVON Switch Centers.*

AUTOVON ANALYSIS/TEST PLAN

~~(C)~~ On 23 February 1966, the JCS directed DCA, in conjunction with NORAD, to prepare an analysis/test plan for AUTOVON performance after SAGE/BUIC integration. The basic purpose of the test was to determine if AUTOVON would satisfy user requirements when degraded by general war. The military services and other unified and specified commands were to support DCA/NORAD in planning and execution of the analysis/test. Also, NORAD was to assist DCA with scenario for the test which DCA hoped to hold in November 1966.

~~(S)~~ At a conference on 25 May at DCA, NORAD proposed holding the test after the polygrid configuration was implemented in January 1967. NORAD felt that results of a November 1966 test would be misleading if they were applied to the 1967

*(U) The original date for the first Overseas AUTOVON cutover was 1 November 1966. This date slipped to 1 June 1967 and again to 1 November 1968. This last 17 months delay was caused by difficulties in testing.

configuration. DCA disagreed with this proposal in June 1966.

~~(S)~~ In July, NORAD still wanted to hold the test after January 1967. However on 29 July 1966 NORAD suggested to the JCS that, if a test was to be held in 1966, it should be combined with exercise High Heels V/Desk Top VIII in October 1966 to save both time and money. NORAD pointed out that call patterns could be collected throughout the entire exercise for a more realistic sampling rather than just a "busy hour" sampling as in the DCA proposal. NORAD's proposal was approved by the JCS in September 1966.

~~(C)~~ The JCS approved the DCA AUTOVON analysis/test plan on 24 September 1966, which DCA distributed on 28 September. The AUTOVON analysis/test was conducted during a five day period concurrent with part of exercise High Heels V/Desk Top VIII (12-24 October 1966). It involved all military and federal departments that were subscribers to the AUTOVON system. The accumulated test data was being analyzed at the end of 1966.

AUTOVON IN CANADA

(U) Expansion of AUTOVON to Canada was planned for meeting NORAD air defense requirements and, later, the requirements of other users. In February 1965, the Canadian Telephone Industry presented a proposal to Canadian Forces Headquarters for a network of nine switching centers. The proposal, sent to NORAD through USAF ADC, was agreed to on 5 May 1965 by NORAD and ADC.

~~(C)~~ Initially, the Canadian switches would be used for air defense communications only and, as such, would be part of the NORAD/ADC SAGE/BUIC portion of AUTOVON. Expansion was planned to include other Canadian military users and civilian government users. However, this would not delay the SAGE/BUIC system. At a meeting held in Ottawa in September, Canadian representatives stated that

SAGE/BUIC switches would be out to contract by December 1965. At a meeting held in October to review the Canadian SAGE/BUIC switching proposal, all representatives agreed that the USAF/RCAF Communications Working Agreement was satisfactory for air defense cost sharing. This agreement, which was based on and authorized by the CADIN agreement, provided a two-thirds U.S., and one-third Canada formula.

(U) The Canadian Government approved funding on 20 September 1965 for the switches, called the Canadian Switching Network (CSN). Requests for bids were issued to contractors on 5 November and contracts were signed on 7 April 1966 with the Bell Telephone Company and the Automatic-Electric Company. The first switch was scheduled for operation on 28 April 1968, with the last three due in January 1969. Because of slippage in the BUIC III schedule and the inability of the contractors to deliver on time, the last three switches slipped until July 1969. However, the first few were to be delivered on time.

~~(S)~~ In its funding approval, the Canadian Government had put stringent budget limitations on money for SAGE/BUIC switching. The thinking was to provide the best air defense capability possible within these budget limitations. On 13 January 1966, NORAD told Canadian Forces Headquarters that it concurred with these limitations as an interim policy, but wanted to keep open the future added requirement of providing the most survivable system possible. NORAD felt that if requirements were budgeted on an annual basis, then a survivable system might be attainable over a period of time.

(U) On 13 May 1966, Headquarters, Canadian Forces Communication System (CFCS), sent NORAD a proposal for the CSN implementation. NORAD reviewed the plan, paying special attention to BUIC III interim arrangements and time phasing, and concurred on 24 June 1966.

(U) In August 1966, DCA told NORAD that more Flash precedences would be required when the nine Canadian switches were integrated into AUTOVON. NORAD's preliminary studies indicated that approximately 1,600 more Flash precedences would be needed for SAGE/BUIC access lines when these lines were re-homed on the Canadian switches. Although Canadian AUTOVON was nearly two years away, NORAD wanted the question of how these Flash precedences would be validated settled early, in case it required inter-governmental agreement. NORAD stated a requirement for these additional Flash precedences to the JCS on 20 September 1966. Approval had not been received by the end of 1966.

(U) At a meeting at DCA on 14 September 1966, attended by representatives from DCA, ADC, CFCS, NORAD, and U.S. and Canadian telephone companies, four proposals were presented as policy guidelines for configuration and routing of Canadian/CONUS AUTOVON:

1. Subscribers would initially be SAGE/BUIC only.

2. Subscribers would be SAGE/BUIC plus a capability of connecting general purpose traffic if it was necessary.

3. Traffic would be routed so that CONUS to CONUS switch traffic would be contained south of the border.

4. Traffic would be routed to employ full polygrid concepts.

DCA wanted the other representatives to support proposals two and four, but the other representatives favored proposals one and three. The reasoning was that proposals two and four were outside the provisions of CADIN agreements. Also, present switches and trunking were sized to meet only SAGE/BUIC requirements and could not be expanded at this late date to meet the increased demand without missing

BUIC III service dates. NORAD felt the only course open was to implement the switched service in 1968-1969 as programmed for SAGE/BUIC only and expand to fully integrate into a single polygrid net as soon as agreements and facility expansion would permit.

PRECEDENCE REQUIREMENTS

~~(S)~~ Background. The Joint Uniform Communications Priority System had five levels of precedence: Flash Override, Flash, Immediate, Priority, and Routine. In the NORAD communications system there were over 8,000 circuits. The initial cutover to AUTOVON would add some 4,400 NORAD/ADC circuits to AUTOVON including the 550 NORAD/ADC circuits currently integrated in AUTOVON.

~~(S)~~ In its initial estimate of precedence requirements, NORAD stated a need for Flash precedence on over 4,000 of its total circuits. DCA sent a memorandum to the JCS in October 1965 stating concern over the impact of this number of Flashes on other users (non-NORAD). The solution recommended by DCA was to establish the NORAD system in AUTOVON as a segregated system (i.e., AUTOVON would provide the service, but the Flash precedence would not result in contention with non-NORAD users and vice versa).

~~(S)~~ On 27 October 1965, NORAD sent a message to the JCS explaining and justifying its requirements for Flashes. NORAD said that studies with ADC had lowered the Flash requirements to the lowest possible level. On 19 November 1965, NORAD submitted a requirement for nine Flash Overrides. These were to be used only for declaring DEFCON 1 or Air Defense Emergency. The JCS then asked NORAD for its specific Flash requirements.

~~(S)~~ Status. On 14 January 1966, NORAD sent its requirement to the JCS for 3,930 Flashes. This requirement included some 400 access lines with a Flash pre-emption level when the four level automatic

pre-emption feature in CONUS AUTOVON became operational in March 1966.* Also included, were additional access lines with a Flash pre-emption level during the period 25 June-18 July, when SAGE/BUIC was integrated into CONUS AUTOVON. On 4 March 1966, the JCS concurred in the NORAD Flash precedence requirements and approved 3,887 for NORAD/SAGE/BUIC capabilities and 52 for the world-wide capabilities, as well as ten Flash Override precedences. NORAD was also given wide latitude in deciding where to install these Flash circuits.

~~(C)~~ Meanwhile, in February 1966, DCA pointed out to the JCS that while AUTOVON was designed for a relatively high degree of survivability, giving an unduly high number of access lines an unrestricted Flash capability offered a possibility that even Flash calls might not obtain available trunks when the system became degraded. In order to alleviate this situation, on 4 March the JCS approved four measures proposed by DCA. They were:

1. Changes in the routing plan at certain switches to limit the destination switches open to NORAD subscribers.

2. Changes in AUTOVON "trunk hunting" procedures at the switches to provide for pre-emption on the most direct trunk group toward a given destination.

3. Limitations on some NORAD AUTOVON subscribers to prevent the use of the installed Flash precedence capability until certain operational contingencies occurred.

4. Constraints to limit SAGE/BUIC subscribers to calls within the SAGE/BUIC community of

*~~(S)~~ The AUTOVON Multi-Level Precedence System became operational on 14 March 1966.

interest and to prevent outside calls into this community. Further, the JCS felt that by mid-1968, the AUTOVON network would provide a high probability of call completion under network degradation, even without these four measures. They regarded these measures as a temporary expedient but said it might be desirable to retain them after 1968 to maintain a high grade of service.

(U) ADC advised NORAD on 27 October 1966 that, on 29 January 1967, the SAGE/BUIC network would have a total of 3,919 Flash access lines. This would saturate the JCS validated number of access lines using the precedence levels, and ADC requested that NORAD take action to get JCS validation for an increase of about 3,000 more access lines in the network to support the BUIC III/CADIN switching programs. NORAD asked ADC for more detailed information on location, function, service dates, etc., which ADC supplied on 19 December 1966.

~~(C)~~ On 29 December 1966, NORAD asked JCS to validate 2,822 additional Flash precedences in AUTOVON. Of these, 2,337 were in support of the BUIC III phaseover program and the rest were conversions of point-to-point circuits that had not been cut into AUTOVON in the June-December 1966 cutover.

SATELLITE COMMUNICATIONS

INTERIM/ADVANCED PROGRAMS

~~(S)~~ The Secretary of Defense had authorized an interim military communications satellite system for research and development and limited communications for the 1966-1967 time period. A follow-on system was also being planned. NORAD submitted requirements to the JCS for both systems in December 1964. In the interim system, the Initial Defense Communications Satellite Program (IDCSP), NORAD requested channels to Projects 437 and 505 and the Diyabakir, Turkey, site. In the follow-on system,

the Advanced Defense Communications Satellite Program (ADCSP), NORAD asked for 110 channels which included circuits to the national authorities, Canada, SPADATS sites, other unified commands, etc.

2 ~~(S)~~ NORAD submitted an NQR for a Communications Satellite System, dated 11 January 1965, to the JCS and the Canadian Chief of Defense Staff. In the NQR, NORAD stated that an operational requirement existed for it to have access, on a high-priority basis, to the DOD communications satellite system being established, in order to improve the survivability of communications vital to the NORAD mission.

3 ~~(S)~~ In April 1965, ADC recommended to NORAD that a change be made to the December 1964 submissions to add requirements for the FPS-95, the AWACS, and Program 440L. By the end of 1965, requirements for some 52 channels for these had been drawn up but had not been submitted pending determination of firm transmitter site locations for Program 440L.

4 ~~(S)~~ In the meantime, the JCS had validated NORAD requirements in the IDCSP for circuits to serve Project 505 and Diyabakir, Turkey, but not for the 437 site. The latter was to be considered with the requirements in the ADCSP. The first satellites in the IDCSP were scheduled for launch about mid-1966.

5 ~~(S)~~ On 22 November 1965, the JCS approved installation of a communications satellite terminal to support the NORAD COC. The terminal would provide direct communications via satellite between the NORAD COC and Project 505 in the IDCSP. On 31 May 1966, USAF asked Air Force Logistics Command (AFLC) to conduct the engineering survey for the satellite terminal for NORAD. The site survey was conducted 4-6 October 1966. Due to the short lead time for the installation, an alternate location (Peterson Field, Colorado) was selected for interim operation of the terminal, while actions went on to relocate

the facility to a permanent site as soon as possible. Operation of the interim terminal was scheduled for February 1967, but later slipped to July 1967 because of SEA commitments.

6 (S) Meanwhile, NORAD had changed the IDCSP program to delete the Project 505 requirement when it was discontinued in July 1966. Instead, NORAD asked JCS to approve transfer of the Johnson Island terminal to Shemya, Alaska. The JCS approved the request on 29 August 1966.

7 (S) The other NORAD requirement in the IDCSP (Diyabakir - NORAD COC) was to be activated by the end of September 1967. The first part of 1967 was to be used for test and research with a full operational capability scheduled as soon as possible, after testing was completed.

8 (S) The first launch for the IDCSP placed seven satellites in orbit on 16 June 1966, but the second launch on 26 August 1966 failed and all of its satellites were lost. The third launch, which was successful on 18 January 1967, was to be followed by launch number four sometime between March and May 1967.

9 (S) DCA, the manager of the IDCSP and ADCSP, sent its plan for the ADCSP to the JCS during the first week of June 1966. The JCS approved it with only minor changes.

10 (S) On 26 August 1966, the JCS asked NORAD to update its communications satellite requirements. NORAD, on 28 November 1966, sent its requirements for 131 channels in the ADCSP. Additional channels were included for the AWACS/IMI requirements, although NORAD pointed out that these might better be satisfied by the planned Tactical Satellite Communications Program (TSCP). NORAD also indicated a potential requirement for communications supporting the Nike-X program.

(S) During the latter part of 1966, NORAD reviewed its 11 January 1965 NQR for a Communications Satellite System. NQR 3-66, for a Satellite Communications Capability, superseded it on 1 December 1966. In the latter, NORAD stated a need for a satellite system that would provide direct communications links between the NORAD COC and ALCOPs; higher, subordinate, and lateral command and control elements; sensors (world-wide) and weapons systems (AWACS, IMI, Space Defense System, BMEWS, Nike-X, Army Air Defense Systems); and the ground environment that supported the aerospace defense mission. As well, NORAD asked that additional communications links be provided by circuits within the satellite portion of the AUTOVON/AUTODIN system.

TACTICAL SATELLITE COMMUNICATIONS PROGRAM (TSCP)

(S) By April 1966, the JCS were preparing an over-all plan for a Tactical Satellite Communications Program (TSCP) so that research and development of the system could be started as soon as possible. The tactical satellite was being designed primarily for mobile users (man pack, vehicular, aircraft, shipboard terminals, etc.). The satellite would operate in the UHF range so that only modifications to existing mobile equipment would be required to operate with the satellite. It was to have features such as anti-jamming, multiple access, discreet address, and a security capability. The TSCP was scheduled for activation in the 1969-1973 period.

(S) After discussions with NORAD, ADC submitted tactical TSCP requirements in March 1966, as did many other agencies. In all, approximately 8,000 requirements were submitted to the JCS. NORAD/ADC requirements included satellite terminals for some SAGE/BUIC sites, all interceptor aircraft and AWACS.

(S) The currently operating communications satellites, and all research and development in that field were oriented toward near-equatorially orbiting satellites. Equatorial orbits did not provide sufficient coverage of the far northern or north

polar regions which were of interest to SAC, NORAD and some Naval operations. On 15 September 1966, SAC submitted a Required Operational Capability (ROC) to USAF for a SAC Tactical Communications Satellite System for northern latitudes coverage.

~~(S)~~ The JCS asked NORAD for its requirements or comments on 15 November. NORAD replied on 30 November 1966 that a northern area satellite communications capability would substantially improve the reliability and flexibility of its far north warning function as well as the command and control of remotely operating systems, such as AWACS/IMI. NORAD told the JCS that it wanted to participate in this program.

~~(S)~~ On 19 December 1966, the JCS validated the requirement for a northern satellite system and requested the tri-service Tactical Satellite Communications Executive Steering Group to give it consideration in its development of a military tactical system.

NORAD ATTACK WARNING SYSTEM (NAWS)

~~(C)~~ An attack warning system had been installed in 1964 by AT&T and was put into operation on 1 September 1964. From the start, however, the system had numerous malfunctions, caused by equipment failure or circuit difficulties, and on 1 October 1964 it was removed from use. The system was then redesigned to meet NORAD/ADC requirements.

(U) In October 1965, the improved system was demonstrated by Bell Telephone Laboratory and functioned as planned with only minor exceptions. During November 1965, NAWS equipment was installed for testing in the NCMC, 32d Region, Montgomery Sector, Oklahoma City Sector, five interceptor squadrons and one AEW&C squadron. It was planned that on the basis of this test a decision would be made on acceptance of the system.

(U) Testing began on 10 December 1965 and was to run for 30 days. On 7 January 1966, NORAD advised all concerned that because of problems being encountered, testing was to run through 15 February unless stopped earlier by NORAD. NORAD said the extension was necessary to give AT&T more time to demonstrate system reliability and for NORAD to make the final decision on the system's acceptability. However, it was later decided to stop testing in the 32d Region on 31 January 1966 to allow AT&T to complete installation of the system command wide.

(U) Termination of the testing did not constitute NORAD's acceptance of NAWS. Further testing in the 32d Region would have delayed AT&T which had the equipment ready and NORAD wanted a larger test area as the basis for making a decision on the system. Testing was planned for the 26th, 28th, 29th, and 32d Regions beginning with a one-day shakedown of the system and to run until 400 tests were completed.

(U) By 18 March 1966, AT&T had installed equipment at 61 locations, the total programmed for the initial NAWS configuration. These consisted of installations at the NCOC, four regions, 14 sectors and 42 combat alert centers. The final NAWS configuration would be attained when equipment was installed in the Alaskan and Northern regions.

(U) NORAD conducted preliminary shakedown tests 18-21 March. Formal reliability testing began 22 March and ran until 21 April. Results showed that only 42 messages had not been received out of 21,262 sent, for a 99.8 per cent success rate. This exceeded the 99.0 percentage required for acceptance, and NORAD accepted NAWS on 22 April 1966.

(U) Immediately after the formal acceptance testing, NORAD COC started a series of tests that lasted until the day before the system was declared operational on 20 May 1966. These latter tests were conducted to check the system daily and to

train personnel on system operation in accordance with NORADM 55-15, NORAD Attack and Warning, dated 1 April 1966.

~~(S)~~ NORAD planned to provide NNR and ANR with a NAWS capability by 22 July 1966 to complete the final NAWS configuration. However, because of commercial lead times and financial staffing at Canadian Forces Headquarters, target dates for NNR installation slipped to February 1967 and finally to June 1967.

~~(S)~~ Meanwhile, ANR was also having problems getting NAWS installed. Originally, just the ANR Combat Center and Elmendorf AFB were to get NAWS, but in June Eielson AFB was added to the list. ANR's scheduled installation date slipped to 2 November 1966 and finally to 2 March 1967. This delay was due to Alaskan Communications Region (ACR) difficulties in arranging procurement of the equipment using ADC funds. As well, certain extra technical information and test equipment was needed by ACR because the equipment in Alaska would be government owned and maintained rather than leased, as in other areas.

THE SURTAC COMMUNICATIONS SECURITY PLANNING
~~ALASKAN REGION COMMUNICATIONS SECURITY~~

~~(S)~~ In early 1965, USAF Security Service (USAFSS) expressed concern over the security vulnerability of the Alaskan communications system. In a letter to USAFSS and NORAD on 16 July 1965, the Alaskan Air Command said it shared this concern. AAC went on to say that its new AN/FYQ-9 Data Processing and Display System (accepted by AAC on 1 July 1965) made it possible to provide, for the first time, for security through the use of on-line encryption. To encrypt the four NCC's, ANRCC, and to install the transmission facilities to NORAD, AAC estimated it would cost some $7 million, and that was the biggest obstacle.

~~(S)~~ On 9 September 1965, ANR asked NORAD for guidance and support on this security program. ANR expressed the same concern as had AAC, and told NORAD that AAC intended to submit a programming action to encrypt the FYQ-9 circuits. NORAD said it could not justify a requirement to provide a partially secure means for the transmission of air defense data solely in Alaska. The reasoning was that when consideration was given to the cost, operational and technical limitations, and the various sources from which an enemy could gain information, this particular requirement could not be justified from an air defense standpoint. NORAD also pointed out that factors other than air defense, might have to be considered and, for this reason, it had referred the matter to the JCS on 23 November 1965.

~~(S)~~ On 3 May 1966, after discussion with the Defense Intelligence Agency (DIA), the JCS recommended that NORAD, in conjunction with SAC, AAC and other interested commanders study the problem of classified information on unprotected air defense communications. The JCS also gave guidelines along which the study could be conducted, and recommended that action be taken to secure air defense communications systems required by the study.

~~(S)~~ Meanwhile, in April 1966, AAC had asked Western Ground Electronics Engineering-Installation Agency Region (WGR) to make an engineering and costing survey for securing the FYQ-9 system in Alaska. WGR's 10 May 1966 survey was considered incomplete by AAC and it asked that another survey be done by 30 August 1966. WGR sent its second survey to AAC on 12 September. On 16 September 1966, ANR tasked AAC to take the necessary programming action to secure the Alaskan FYQ-9 system, and asked NORAD/ ADC for inputs with reference to the CONUS terminals. This was to form one consolidated Communications-Electronics Implementation Plan (CEIP) for the encryption of the entire system

~~(S)~~ The plan was to have information encrypted at five locations in Alaska and sent in consolidated form to Elmendorf. From Elmendorf, it would be forwarded to a pre-designated place in the CONUS, decrypted, and sent on through the Surveillance and Tactical Teletype Network (SURTAC) in the clear. The National Security Agency and USAFSS approved this method of operation on 23 November 1966. NORAD and ADC were still studying the possible requirement to secure the entire SURTAC system because of the kind of information that was passed over the network. However, nothing was to be done on this until a decision was made on a proposal to increase the capacity of the system to 1,050 words per minute. This latter proposal was being staffed by ADC for updating and costing at the end of 1966.

VLF/LF SYSTEMS

~~(S)~~ In July 1963, NORAD had submitted its requirements to the JCS for VLF/LF communications. In August 1964, the JCS said the services would prepare plans for their needs and for the unified commands they supported. The JCS tentatively validated the NORAD requirements and sent them to USAF. At this same time, the JCS outlined plans for the Minimum Essential Emergency Communications Net (MEECN) which would include receive-only stations for all unified and specified commanders and component commanders.

~~(S)~~ The NORAD requirements were for four transmit/receive stations and 31 receive only stations (which included three for the MEECN). The 487L Survivable Low Frequency Communications System was under acquisition to meet USAF requirements. As a result of the August 1964 directive, USAF told AFSC to prepare an augmentation to the 487L SPP. A USAF PCP stating the NORAD requirements was sent to the JCS in early 1965. The JCS sent the plan to DCA for review and to assure compatibility with all other VLF/LF networks.

~~(S)~~ In June 1965, DCA told the JCS that the USAF plan did not have enough information. The JCS asked USAF to prepare an operations plan for use of the VLF/LF systems as an addendum to the primary plan. On 11 August, USAF asked SAC as the principal user, to prepare an operations plan with NORAD. SAC and NORAD submitted an operations plan for SAC/NORAD use of a VLF/LF system on 1 October 1965. DCA then combined all the requirements in a world-wide system plan. The JCS sent the DCA plan to NORAD in December 1965 for review.

~~(S)~~ During the first part of 1966, the JCS processed the DCA plan, and it was not until 28 June 1966 that they recommended approval and funding to the OSD. This plan gave NORAD just eight receivers in the SAC network. The eight receivers were to be located at NORAD COC, the NORAD ALCOP, the CONAD ALCOP, the three BMEWS sites, Project 437, and the Alaskan NORAD Region Alternate Combat Operations Center.

~~(S)~~ NORAD felt that having only receivers at the BMEWS sites would serve no useful purpose and sent an alternate proposal to the JCS on 16 August 1966. In this proposal, NORAD recommended that the receivers allocated to the BMEWS sites be positioned in the Western, Eastern and Southern NORAD Regions instead. NORAD pointed out that this change would give each NORAD region a receiver capability in the SAC MEECN network.

~~(S)~~ In late September 1966, DCA sent the JCS a revised plan which included the changes recommended by NORAD in August. The JCS sent the plan on to NORAD on 7 October 1966 for coordination. At the end of the year, the plan was being processed through the JCS.

CHAPTER IV

MANNED BOMBER DETECTION SYSTEMS

NORAD RADAR CRITERIA

BACKGROUND

~~(S)~~ In March 1964, NORAD had published criteria for selecting land based prime radar sites that were to be kept in the radar network in the combat zone. This zone was defined as "Southern Canada, Continental U.S. and the ocean areas bordering the land mass." The criteria were developed to provide a commonly understood and accepted basis for configuring the radar system in this zone. In addition to outlining radar, passive detection, and radio coverage requirements, the criteria specified that radars would be picked from the USAF ADC, Canadian, and FAA radar inventory. Also, it said that only a minimum number of radars would be chosen to meet the coverage criteria, and that no more conventional military radars would be bought although existing and programmed radars could be modified and/or relocated. Each of the military radars that were not needed to meet the criteria were to be studied to determine the impact of their deletion.

(U) During the course of the study to determine prime site retention criteria, it was planned to later develop criteria for height finders and for low level coverage. On 17 November 1965, NORAD sent a draft of its height finder coverage criteria to the component commands for review and comment. At the end of 1965, NORAD was studying low level coverage requirements.

HEIGHT FINDER RADAR CRITERIA

~~(S)~~ After coordinating with the component

commands, NORAD sent on 4 April 1966 the final Height Finder Radar Coverage Criteria to the components for their information and guidance. However, the document said that the criteria did not apply to the DEW Line, 37th NORAD Division, Alaskan NORAD Region, Offshore radar, and ARADCOM radars.

~~(S)~~ The criteria were to be used to configure and effectively use the land based height finder radars in the combat zone. The combat zone -- the same as that described in the prime site criteria -- was divided into two areas. The periphery of the combat zone, except for the southern U.S. border, was called Area I. The interior of the combat zone, adjoining Area I on the north, east, and west and extending to the southern U.S. border, was called Area II.

~~(S)~~ The conclusions in the criteria document stated that height finders were required for weapon control and, further, that these radars must be able to give height data in either an active or passive ECCM mode on all targets that the search radars could detect and track. Height finder radars were to be deployed in this way:

1. Area I - Two height finders at each USAF/Canadian and FAA radar station that gave data to a semi-automatic command and control system.

2. Area II: -

a. Two height finders at each USAF radar station that gave data to a semi-automatic command and control system;

b. One height finder at each FAA radar station that gave data to a semi-automatic command and control system;

c. One height finder at each USAF radar station in a manual control division.

LOW LEVEL RADAR CRITERIA

(U) In mid-April 1966, NORAD sent draft criteria for low level radar coverage to the component commands for their comments. After coordination was completed, NORAD published on 5 August the Low Level Radar Criteria and sent the document to the NORAD Regions and component commands.

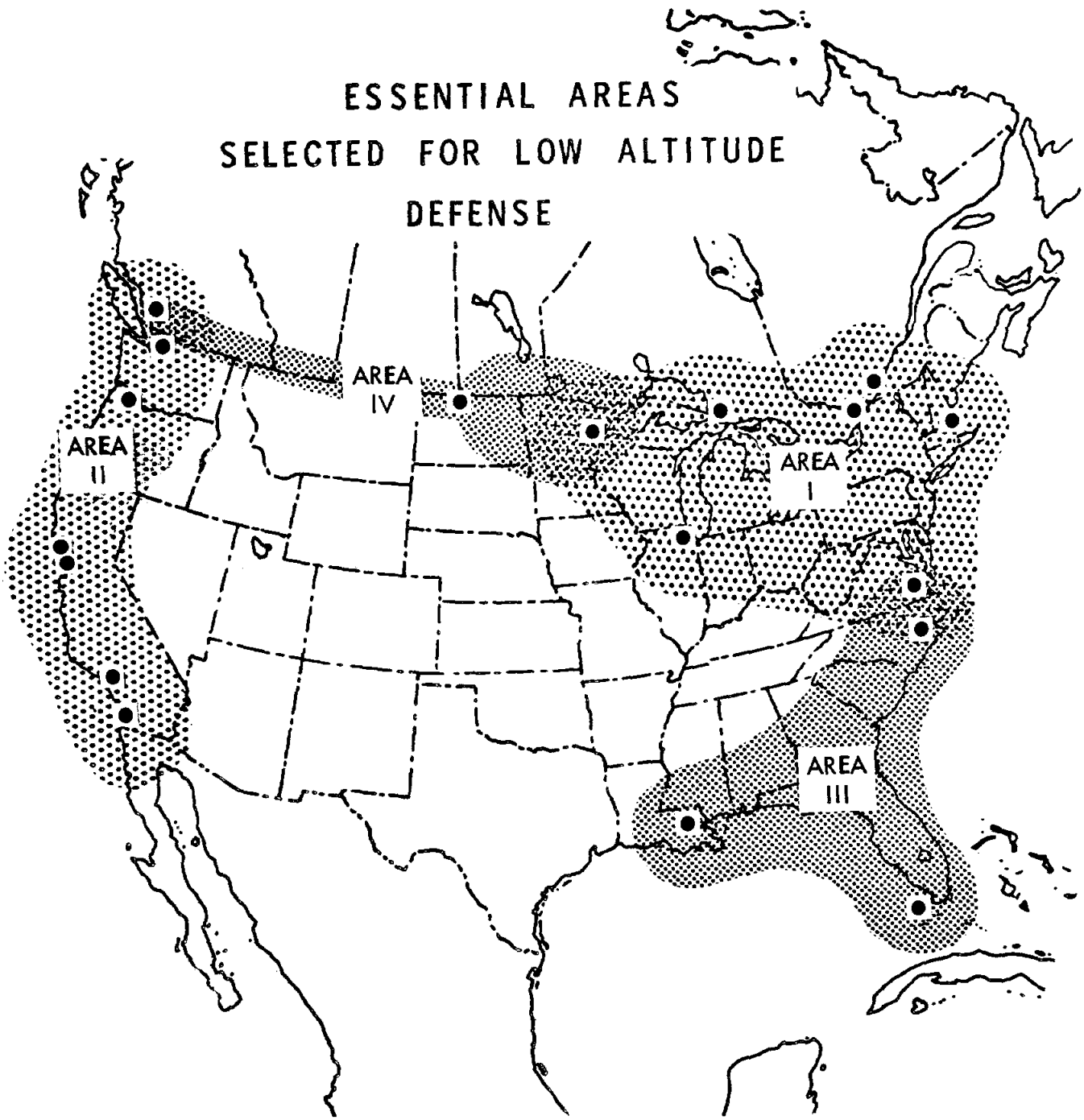
~~(S)~~ The criteria were to serve as a basis for arranging sensors to give radar coverage for the defense of selected essential target areas against sea launched cruise missiles, air-to-surface missiles, and manned bombers flying at low altitudes. The criteria applied only to the equipment and systems that would be in use during 1966 to 1971. For the period after 1971, NORAD planned to develop another set of low level criteria after the Nike X Impact Study was finished and FAA requirements for a joint DOD/FAA National Airspace System had been determined.

~~(S)~~ The criteria included requirements for detection and tracking, weapons control, electronic warfare, and sensor deployment. Sensors were to be located so they would give single coverage at altitudes of 1000 feet over water and flat terrain and 2000 feet over mountainous terrain in the following areas:

1. Area I (Northeast) - 140 nm outward from a theoretical line that covered the area from Duluth, Sault Sainte Marie, Ottawa, Montreal, Boston, Norfolk, and Chicago to Duluth.

2. Area II (West Coast) - 140 nm either side of a theoretical line connecting San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, and Vancouver.

3. Area III (Southeast) - 140 nm either side of a theoretical line along the coast from Wilmington, Key West, to New Orleans.



4. Area IV (Northwest) - 30 nm either side of a theoretical line from Vancouver to Minot and eastward 140 nm either side of a theoretical line to Duluth.

RADAR CLOSURES

PHASE OUT OF USAF ADC PRIME SITES

~~(S)~~ Background. In 1963, USAF had asked ADC for a list of radar sites needed through 1970 to meet military needs for survivability and ECCM, for joint-use ADC/FAA needs, and for approved and proposed programs. USAF also wanted a list of sites that could be closed. Using NORAD's prime radar retention criteria, ADC prepared a list of sites. In March 1964, NORAD concurred with the list of radars.

~~(S)~~ Sixteen radar sites were listed as excess but seven of these were identified as being "conditionally required." These seven sites were needed to meet ARADCOM air defense needs and/or until certain FAA radars were integrated into the air defense system. In August 1964, USAF asked for a NORAD/ADC position on a draft PCP which included phasing out the 16 sites. Six sites were listed for closing in FY 1965, four sites in FY 1966, and six more in FY 1967. The PCP said that five of these latter sites (in FY 1967) would be closed if substitute FAA radars were tied into the air defense system. NORAD and ADC agreed to the site closings provided the contingency requirements were met before the phase outs.

~~(S)~~ DOD approved the PCP in November 1964. As directed by USAF, ADC closed six prime sites in FY 1965. However, before the end of 1965, several changes were made in the FY 1966 and FY 1967 phase out schedule.* In December 1965, the phase out

*(U) For the details of these changes, see NORAD/CONAD Historical Summary, Jul-Dec 1965, pp. 47-50.

schedule was:

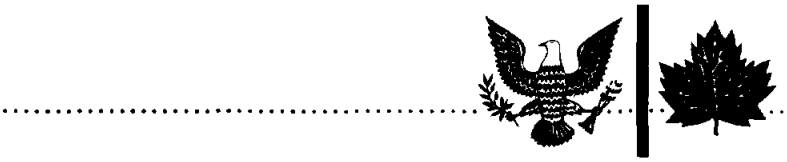
FY 1966	FY 1967
Z-53	Z-9
Z-57	Z-15
Z-74	Z-43
	Z-58
	Z-98
	Z-127
	Z-149

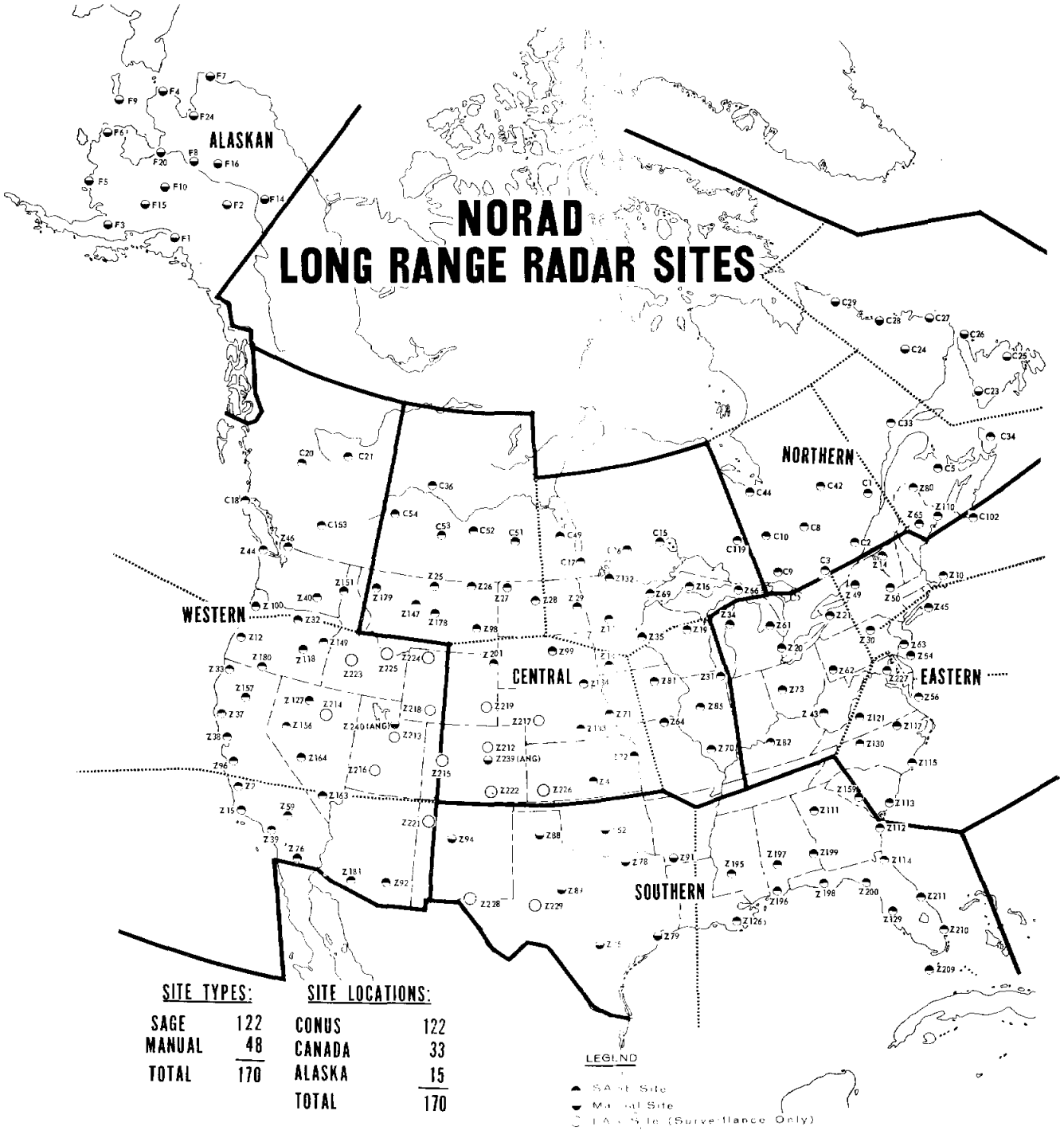
~~(S)~~ Except for Z-9 and Z-58, another change was being planned for those sites scheduled to phase out in FY 1967. The five remaining sites were to be closed and replaced by five FAA sites. However, as mentioned above, the FAA sites were to be data-tied to the air defense system before the ADC sites were closed. In November 1965, at a meeting of USAF, ADC, and FAA representatives, ADC learned that FAA's radar video data processors (AN/FYQ-40's) would not be available to link the FAA sites to the SAGE/BUIC system until FY 1969/1970.

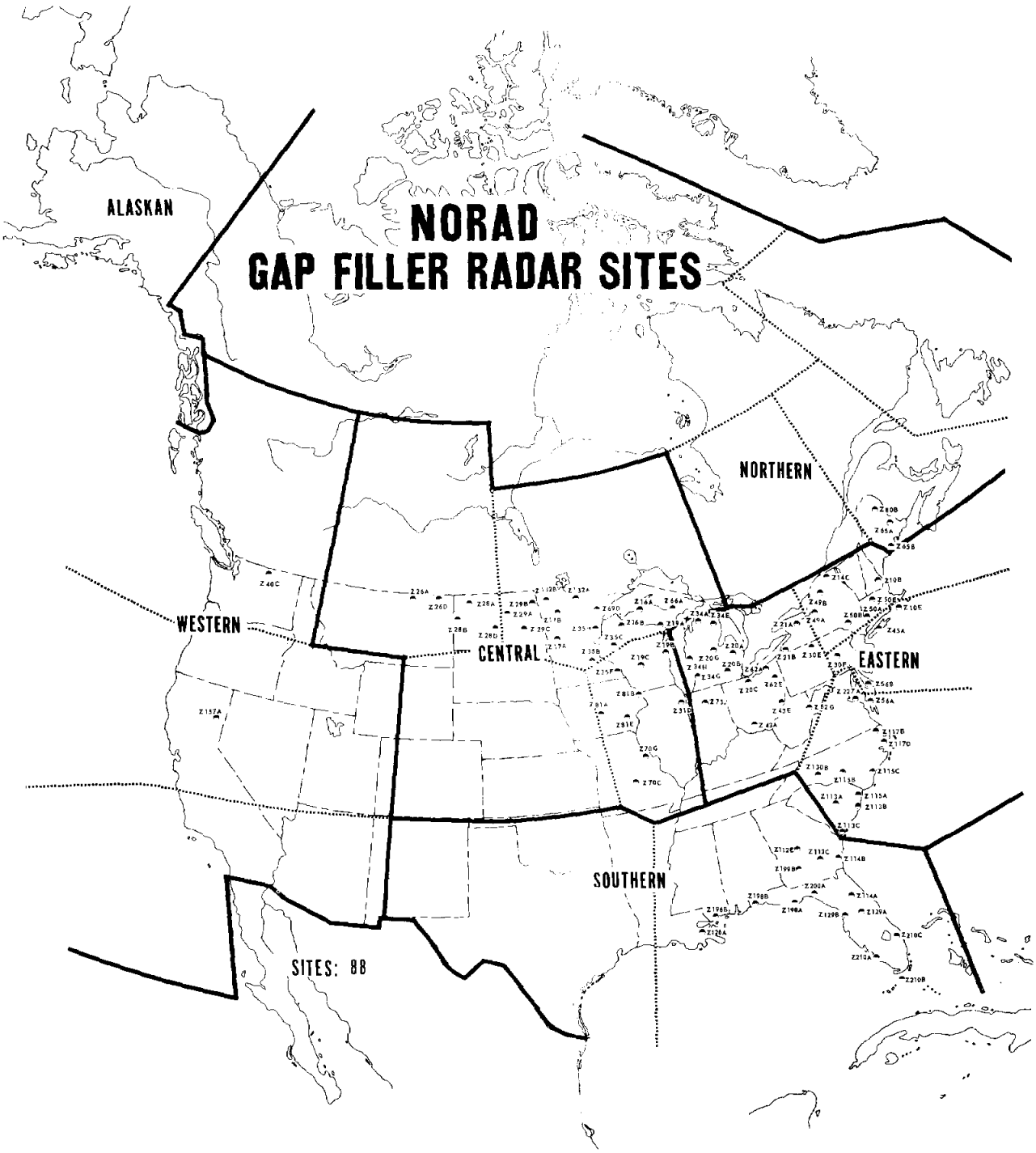
~~(S)~~ In December 1965, ADC told USAF that delay of the FYQ-40's would require extending the phase out date of the five ADC sites to the end of FY 1969.

(U) Status. The three sites that were to phase out in FY 1966 closed on schedule: Z-74 stopped operations on 9 March 1966; Z-53 and Z-57 stopped on 1 April. One site that was to close out in FY 1967, Z-9, ended operations on 1 April 1966. On 1 July, the Army took over Z-9 from USAF to support ARADCOM needs. Also, Z-58, scheduled to close in FY 1967, closed down on 1 July 1966.

~~(S)~~ On 9 November 1966, the Secretary of Defense approved a USAF request to extend the phase out date to FY 1969 for the five ADC sites which were scheduled to close at the end of FY 1967. These sites were extended through FY 1968 to FY 1969. At







the end of 1966 the phase out schedule was:

FY 1969

Z-15
Z-43
Z-98
Z-127
Z-149

~~(S)~~ On 20 December, ADC told NORAD that it wanted to delete one height finder radar at sites Z-43, Z-127, and Z-149, and two height finders at Z-98. NORAD concurred with this proposal on 3 January 1967 except for the deletion of both height finders at Z-98. NORAD said that one height finder must be kept at Z-98 to meet the requirements of the NORAD Height Finder Coverage Criteria.

CANADIAN RADAR CUTS

~~(S)~~ In March 1966, Canadian Forces Headquarters sent NORAD a study, dated 18 February 1966, that had been made of the Canadian air defense ground environment. The study was made by the Canadian Forces Air Defence Command (CF ADC) because of the deteriorating situation of personnel shortages in many critical career fields. Several methods were proposed for maintaining operational effectiveness including the closing down of three radar sites: C-14 Pagwa, Ontario; C-21 Beaverlodge, Alberta; and C-25 Gander, Newfoundland.

~~(S)~~ After the NORAD staff had reviewed the study, Air Marshal C. R. Dunlap, Deputy CINCNORAD, sent back NORAD's comments on 7 June. He said NORAD agreed with the proposals to save manpower but it did not agree with cutting out any radars. Furthermore, he stated that the loss of any Canadian radar site at this time without replacement radar coverage would degrade the operational effectiveness of the NORAD system. However, A/M Dunlap said if national considerations required closing the three sites then NORAD recommended closing them in this order: C-25;

C-19 Puntzi Mountain, British Columbia (instead of C-21); and C-14.*

~~(S)~~ On 6 July, Air Chief Marshal F. R. Miller, Chief of the Defence Staff, told A/M Dunlap that NORAD's request to substitute C-19 for C-21 was not acceptable.** A/C/M Miller said that manning had reached the point where immediate steps had to be taken to close radar units with marginal operational capabilities. He said that he would press for an early closure of C-14 and C-21. Canadian Forces Headquarters told CF ADC on 12 July 1966 that the sites could be closed and to arrange, in conjunction with NORAD, a closing date.

~~(C)~~ At this point, the U.S. State Department acted. It pointed out in a note to the Canadian Government that, in accordance with previous agreements, both governments had to agree on any radar station closures. Canada then assured the U.S. that the sites would not be closed in July 1966 as planned, but would wait until an acceptable solution was reached.

~~(S)~~ On 9 August, representatives from Canadian Forces Headquarters, NORAD, CF ADC, and USAF ADC met to find a solution that could serve as the basis for government-to-government negotiations. The main purpose of the meeting was to decide if C-19 should be closed instead of C-21. After the operational considerations were evaluated, all agreed to the NORAD position to retain C-21. In a message to the JCS and Canadian Forces Headquarters on 10 August,

---

*(U) For action on C-25 see p. 64.

**~~(S)~~ The Canadians felt that frequency diversity radars at C-19 were more valuable to air defense than early warning coverage provided by C-21.

NORAD told them of the results of the meeting but also reminded them that NORAD was against closing down any radars that would lessen operational effectiveness.

~~(S)~~ Canadian Forces Headquarters announced on 30 September that C-14 and C-19 could be closed as soon as practicable. On that same day, these sites stopped operations.

GROUND ENVIRONMENT STUDIES

CANADIAN STUDY

~~(S)~~ As previously mentioned, the Canadian Forces Air Defence Command published on 18 February 1966 a study of its air defense ground environment. Because of the worsening shortage of personnel in many critical career fields, the study had two main purposes. The first of these was to set reasonable workloads and methods of operation for CF ADC's rapidly decreasing manpower. The second purpose, as stated in the study, was to get "modifications in the Air Defence system activities which will fulfill the Canadian commitments under the current NORAD agreement, and at the same time permit a reduction of assigned forces."

~~(S)~~ The study had several proposals as possible ways to save manpower and money. One of these proposals, as noted previously, resulted in closing down radar stations C-14 and C-19. Other proposals were concerned with relocating support services, development of plans to use travelling maintenance teams, and for a full study of the joint use of Department of Transport and Department of National Defence radars. This latter suggestion, the study felt, should be given top priority as a long term way to make considerable savings in personnel and money with a minimum degradation to the ground environment.

~~(S)~~ NORAD's comments on this study were sent

to Canadian Forces Headquarters on 7 June 1966. While it did not agree with the radar closures, NORAD urged that additional study be given to the other proposals. NORAD particularly favored the DOT/DND radar joint-use concept and recommended immediate planning for an early implementation.

~~(C)~~ Also, in line with manpower and money savings, CF ADC suggested to NORAD on 26 August 1966 that now might be an appropriate time to examine the readiness state requirements. CF ADC felt such an examination was necessary because readiness requirements set the workload for both weapons bases and radar units. NORAD agreed to meet with CF ADC and study the matter.

(U) Representatives of NORAD, Canadian Forces Headquarters, CF ADC, and USAF ADC met at NORAD Headquarters on 25 October. However, this meeting consisted of only informal discussions on air defense matters of mutual concern. No formal recommendations came from the meeting. It was planned to meet again in early 1967.

37TH NORAD DIVISION AND ICELAND

~~(S)~~ Background. In March 1965, USAF asked ADC to evaluate the need for radars in Goose Sector and Iceland in light of the programmed phase out of manned interceptors in those areas in 1967. USAF said this evaluation was necessary because further reduction in the air defense system could be expected and it had to be ready to justify keeping needed facilities and/or recommend closing facilities no longer required. In May 1965, ADC asked for NORAD comments.

~~(S)~~ NORAD replied on 14 June and recommended keeping the two radars in Iceland and two of the six USAF radars (C-23 Stephenville and C-24 Melville) in Goose Sector after the interceptors were phased out. NORAD said the radars in Iceland should be kept because they gave early warning coverage and overlapped with other radars in Greenland and the Faroe

Islands to form a continuous barrier and a bomber holdback line. Regarding Goose Sector, NORAD said there were no current plans for either deploying interceptors there after FY 1967 or for dispersal bases. But NORAD said that keeping C-23 and C-24, in conjunction with the Canadian radar at C-25 Gander, gave increased kill potential to interceptors deployed in the Bangor Sector and Ottawa Sector.

~~(S)~~ On 12 August 1965, ADC told NORAD that USAF was going to protest the decision to phase down the interceptor force. Therefore, ADC said it could not support closing any radars or withdrawing the interceptors from Goose until new systems such as AWACS/IMI were operational in the system. ADC asked NORAD to concur with telling USAF that all radars in Goose were needed.

~~(S)~~ On 31 August, NORAD concurred with telling USAF that if the interceptor forces remained in the Goose Sector, then the surveillance and control environment should not be changed. NORAD pointed out its position of the last several years, namely, that it was against reducing the operational capability of the air defense environment before new systems, such as AWACS, were acquired and proven. However, NORAD said that its evaluation of the Goose Sector had shown that if the interceptors were withdrawn and the bases were not used for dispersal, there were no operational requirements for keeping all of the radars.

~~(S)~~ Status. On 11 May 1966, NORAD commented on an unofficial ADC study which evaluated the need for radars and interceptors in the 37th NORAD Division/37th Air Division (Goose Sector was renamed on 1 April, see Chapter I) and Iceland. ADC's study recommended the deployment of interceptors to Goose Air Base regardless of the number of squadrons left in ADC, and the continued operation of the seven radar sites (six USAF, one Canadian).

~~(S)~~ NORAD, however, did not agree with this

approach. NORAD told ADC that, in view of the programmed cuts in interceptor forces, it did not recommend deploying interceptors to Goose AB.* NORAD again noted its position, first stated on 14 June 1965, on the need for radars in that area. (At that time, NORAD had said that after the interceptors were gone, radar needs could be satisfied by keeping three -- C-23, C-24, and C-25 -- of the seven radars.**)

~~(S)~~ NORAD's planning for the eventual radar configuration in the 37th ND was based on the assumption that interceptors would not be assigned or available to that area. On 30 September 1966, NORAD asked NRR for proposals on the future configuration of command and control and radar facilities. NORAD said it was thinking about reducing the mission of the 37th ND to surveillance and identification by flight plan. Some of the radar sites could then be closed, NORAD said, and the rest could possibly be data-tied to the 36th ND. NNR agreed with NORAD's thinking. On 7 December 1966, NNR sent NORAD a study

---

*(U) For details on the rationale behind NORAD's recommendation, see Chapter VII.

**~~(S)~~ On four different occasions (14 June and 1 July 1965, 11 May and 13 June 1966), NORAD had said that C-25 should remain operational. However, on 7 June 1966, NORAD said that, of the three radars Canada was thinking about closing, C-25 should be closed first. NORAD staff officers said there was no conflict between the two NORAD positions on C-25. The rationale for keeping C-25 was based on its value to the 37th ND area. But C-25 was the only Canadian manually operated site in the NORAD system. When its value was compared with all of the other Canadian SAGE-tied radars, C-25 was less important. The site was not closed but its mission was reduced on 1 November which made savings in manpower and money.

and recommendations for the reconfiguration of the 37th ND. This study was based on the idea that interceptors would be withdrawn at the end of 1966. The withdrawal of interceptors was not to be the case, however.

~~(S)~~—USAF ADC's commander, Lt. Gen. Herbert B. Thatcher, wrote to CINCONAD on 10 November 1966 urging support for deploying interceptors to Goose AB and keeping all of the radars in operation. The main function of this force, General Thatcher said,

> . . . would be one of pre-air battle effect. It would serve to complicate enemy targeting and attack routing, enhance air sovereignty and ID capability, and provide training for radar site personnel. Further, it would strengthen our position politically by providing additional assurance to our Canadian friends.

~~(S)~~ These reasons had been considered before, but on 12 December NORAD changed its position. In a letter to General Thatcher, CINCNORAD, General R. J. Reeves, said he concurred at this time in retaining facilities at Goose AB to support a detachment of six interceptors. Except for a reduction in control capability, the ground enironment was to remain intact. General Reeves said he had talked recently with representatives of both the Permanent Joint Board on Defense and the JCS, and they supported keeping the facilities in the 37th ND at this time.

PASSIVE DETECTION FOR NON-SAGE/BUIC AREAS

BACKGROUND

~~(S)~~—In April 1965, NORAD sent NQR 3-65 to the JCS for approval. This document was titled "NORAD Qualitative Requirement for Passive Detection Capability in Non-Automated NORAD Ground Environmental

Areas." NORAD wanted its manually-operated areas to have the ability to detect, track and control weapons against aircraft in an ECM environment. NORAD, in the NQR, said it wanted a manual passive detection system put in five areas by 31 December 1966. These areas were the Alaskan NORAD Region, the Goose NORAD Sector, the Oklahoma City Sector, the eastern half of the Reno NORAD Sector, and the western half of the Sioux City NORAD Sector.

~~(S)~~ NORAD said the system was to equip long range radars with devices to find the true strobe azimuths of jamming aircraft. Strobe data would then be sent to a triangulation center where it would be used to find and track jamming aircraft. Tracking data would then be relayed to agencies controlling weapons.

~~(S)~~ The JCS approved the NQR on 29 May 1965 and made USAF responsible for handling the requirement. In June 1965, USAF asked its Air Force Systems Command to make studies of NORAD's requirement. In August 1965, USAF told NORAD that AFSC had made a preliminary analysis and that a system was feasible, but the requirement could not be completely met by using existing equipment. Also, AFSC had said further studies should be made and that without a high priority the system could not be operational by 31 December 1966.

~~(S)~~ In October 1965, USAF directed AFSC to begin an engineering study, including cost schedules and technical/operational advantages and disadvantages of the various system options available.

STATUS

~~(S)~~ Apparently, the system was not assigned a high priority. Because of other commitments, AFSC delayed starting the engineering study until July 1966. However, by 15 September AFSC's Electronic Systems Division and MITRE had worked out tentative techniques and equipment. They felt that tests should be made to verify and, at the same time, validate their conclusions and recommendations for a system. Tests

were held at radar sites in the 37th NORAD Division (formerly Goose Sector) during November 1966.

(C) There was one development, however, which would probably keep a manual PD system from being used within the CONUS. ADC suggested that the manual PD system for the manual areas in CONUS no longer be considered in ESD's engineering study because plans were underway to tie radars in those areas to an automated National Airspace System (NAS). On 2 December 1966, ESD asked NORAD and ADC to study the problem and advise whether the manual areas in the CONUS should be dropped from the ESD study. ESD said if NORAD and ADC decided that TCU/ASTRA (the semi-automated PD system in SAGE/BUIC areas) should be put in those areas, then the requirement should be included in the NAS integration study.

(S) On 14 December, NORAD told ESD that it agreed with ADC's suggestion to omit from the study those manual areas being considered for the NAS. However, NORAD said that air defense radars to be tied into the NAS must have passive detection capability and asked ESD to include in its study report data on passive detection for those areas that might become a part of the NAS.

WEST COAST AEW&C EMPLOYMENT

BACKGROUND

(S) After the Secretary of Defense had approved in December 1964, the phase out of the Navy's radar picket ships, NORAD asked the NORAD regions concerned to suggest ways to offset this loss in off-shore radar coverage. In January 1965, the NORAD Regions (25th and 28th) on the West Coast estimated that they would lose three hours in threat warning time and 40 minutes in tactical warning. To give more warning time, it was suggested that a new AEW&C employment concept be adopted. At that time, there were five seaward airborne stations off the West Coast manned

by USAF ADC's 552d AEW&C Wing.

~~(S)~~ In June 1965, NORAD directed the 25th and 28th regions to test three AEW&C employment options. The test was named Samoset Union. Its objectives were to find the option giving the best defense capability, whether high-frequency single sideband radio was practical as primary communications, and if any extra equipment or modifications would be needed.

~~(S)~~ Test results and recommendations were sent to NORAD in August 1965. The regions recommended using five stations but locating them farther seaward. They also recommended using high-frequency single sideband radio. This method of employment, it was found, gave extended tracking continuity, about 45 to 50 minutes of tactical warning, and increased both the interceptor control area and the limits of the air battle area.

~~(S)~~ This employment was approved by NORAD on 28 December 1965. NORAD was convinced that the five-station plan, with aircraft located farther seaward than they were currently located, gave the best air defense capability. Also NORAD's approval included further testing to refine station locations and procedures, manning stations on a 30 per cent random basis, and HF SSB as primary communications.

STATUS

~~(S)~~ On 26 January 1966, the 28th NORAD Region said the new employment concept would go into effect 1 March 1966. Until that date, however, the 552d AEW&C Wing was authorized to man either the new primary stations or inboard training stations. Also, one augmentation station (designated Station 35) was set up to the south of the other stations.

The new primary stations and their locations were:

Station	Location
1	50 00N - 136 00W
3	45 25N - 132 25W
5	40 30N - 131 50W
7	35 50N - 130 00W
9	31 50N - 125 50W

~~(S)~~ NORAD concurred on 24 February 1966 with the station locations and the 1 March implementation date. Revisions to the AEW&C employment concept were published in Change #4, dated 7 February 1966, to NORAD Operation Order 300N-65.

CHAPTER V

BALLISTIC MISSILE AND SPACE WEAPONS DETECTION SYSTEMS

SEA LAUNCHED BALLISTIC MISSILE DETECTION & WARNING SYSTEM

BACKGROUND

~~(S)~~ In 1964, DOD had deferred a program to modify certain SAGE FD radars that would give NORAD an off-shore missile attack warning system. At that time, USAF and the Navy were directed to make studies of over-the-horizon (OTH) radar for use in such a system. These studies were then to be used by DDR&E for evaluation of OTH radar versus a line-of-sight system.

~~(S)~~ The USAF study, finished in July 1964, found that the SAGE FD modifications were too sophisticated and expensive for the current threat. Furthermore, it found that the modifications were inadequate for both cruise missiles and the future threat. The study concluded that while serious consideration should be given to getting an OTH prototype, the current threat (short range missiles) should be met with an inexpensive modification to line-of-sight radars.

~~(S)~~ On 31 July 1964, NORAD concurred with the main conclusions of the study. NORAD recommended to USAF that funds for an austere interim system be limited to the minimum needed to insure warning for SAC. For the future threat (long range SLBM's), NORAD recommended approval of a CONUS backscatter OTH prototype with concurrent planning for a complete OTH system. Also, NORAD told the JCS in

August 1964 that it wanted an interim SLBM detection and warning capability based on modifications or use of current surveillance systems. And NORAD once again, as it had in February 1962 and in March 1964, pointed out to the JCS the possibilities of OTH radar. NORAD told the JCS that an OTH radar system should be deployed.

~~(S)~~ DDR&E approved the interim line-of-sight system concept on 5 November 1964 and made $20.2 million available for development. The SLBM Contractor Selection Board, with NORAD representation, recommended the selection of the AVCO Corporation. In July 1965, DDR&E approved AVCO's plan to modify FPS-26 height finder radars at six sites and to install one at Laredo AFB, Texas (Laredo would then be designated site Z-230).

~~(S)~~ The system, expected to be operational about March 1968, was to give seaward coverage of about 750 nm. The modified radars were to be termed AN/FSS-7's and the system was to be designated the AN/GSQ-89. These radars were to continue giving inputs to SAGE but they could only be used in one mode (SAGE or SLBM) at a time. NORAD's position on using these radars was that after the system gave warning of SLBM launches it should be available to SAGE for use against the manned bomber threat. In case of a simultaneous attack by bombers and SLBM's, CINCNORAD would decide which threat the system would be used against.

~~(S)~~ ESD awarded the contract for the system to AVCO on 9 December 1965. At that time, it was planned to have the FPS-85 phased-array radar at Eglin AFB and the FPS-49 Spacetrack radar at Moorestown, N.J., available for SLBM surveillance on an "on-call" basis. Later, however, the FPS-49 was dropped from further consideration, and the FPS-85 was to have the capability to operate in the SLBM mode simultaneously with the surveillance and tracking modes.

~~(S)~~ In the meantime, the JCS were acting on NORAD's communications requirements for the system. In May 1965, NORAD had sent a request to the JCS for dual full period dedicated data circuits for sending computer refined data from the sites to the NORAD COC. Voice and teletype circuits were to use existing military communication systems such as AUTOVON and AUTODIN. From the NCOC, valid warning data would be sent to SAC, the National Military Command Center, and the Alternate NMCC over BMEWS circuits.

~~(S)~~ NORAD learned in December 1965 that the JCS had approved its communications request and had recommended that CINCLANT and CINCPAC be included as users of the system. The JCS asked USAF to coordinate with NORAD and DCA for including NORAD and Navy communications needs.

STATUS

~~(S)~~ SLBM Sensor Sites. In December 1966, NORAD learned that USAF had approved substituting site Z-38, Mill Valley AFS, Calif., for Z-37, Point Arena AFS, Calif., as a sensor site in the SLBM Detection and Warning System. It was felt this change would give better coverage. The system was to be made up of radars at the following sites:

Z-38	Mill Valley AFS, California
Z-65	Charleston AFS, Maine
Z-76	Mount Laguna AFS, California
Z-100	Mount Hebo AFS, Oregon
Z-115	Fort Fisher AFS, N. Carolina
Z-129	MacDill AFB, Florida
Z-230	Laredo AFB, Texas

~~(C)~~ Missile Warning Information and Displays. At a meeting in May 1966, called by the Joint Command and Control Requirements Group (JCS), it was decided that the Philco 212 computer in the NORAD COC would serve as the only source of SLBM data to all users. Also, this computer was to serve as the sole source of BMEWS data sent to the Alternate NMCC, and as a

backup to the BMEWS Display Information Processor (DIP) which supplied BMEWS data to SAC, the NMCC, and the Air Force Command Post.

~~(S)~~ However, at another meeting of the same group on 7 July 1966, NORAD proposed that the BMEWS DIP be modified by adding a memory core and input/output devices to let it serve all users as the primary display processor for both BMEWS and SLBM warning data. The Philco 212 would still serve as a backup to the DIP. These changes would also permit the DIP to process warning data from the OTH Forward Scatter Missile Detection System (440L). NORAD based its proposal on the DIP's five and a half years of demonstrated reliability.

~~(S)~~ On 13 July 1966, the JCS approved NORAD's proposal. NORAD asked ADC on 21 July to cooperate in evaluating the contractor proposal for putting the SLBM program in the DIP. And, if technically feasible, have the DIP drive all user SLBM displays. In addition, NORAD asked ADC to modify the DIP so that it could satisfy the needs of all users of BMEWS data.

(U) The displays for showing SLBM missile warning information were also discussed at the 7 July meeting. It was decided to make an engineering study to find a suitable display for the NORAD COC. USAF was to ask its Air Force Systems Command to start work on getting displays for the NCOC, SAC, and the NMCC.

~~(C)~~ The engineering study resulted in a new design for the current BMEWS threat summary display -- because of space limitations in the NCOC -- and a design for a SLBM system display. The Director, and Deputy Director, of the NCOC approved these designs.

~~(S)~~ Communications. On 25 May 1966, NORAD told ADC that an ESD Communications Engineering Plan for the SLBM system was not acceptable. The reason for this rejection, NORAD said, was because the plan did not include NORAD's requirement for Forward

Error Detection and Correction equipment. NORAD said the system must have a built-in ability not only to recognize data errors but to get the correct data in real time. ADC was asked to have the plan changed to include this requirement. Also, NORAD asked ADC to investigate the possibility of using AUTOVON for the SLBM system's communications.

OTH RADAR FOR SLBM DETECTION

(S) In February 1962, when NORAD first sent its requirement (NQR) to the JCS for an SLBM detection and warning system, NORAD had pointed out its interest in MADRE, over-the-horizon, back-scatter radar. NORAD said that prime radars along the coasts would give only minimal warning and these radars would have to be supplemented by surveillance coverage at an earlier segment in the missile trajectory. NORAD felt this long range coverage might be provided by MADRE radar. In NADOP 1964-1973, 1 March 1962, NORAD recommended using both SAGE radars and a MADRE-type system, if the predicted capabilities of these systems were verified, for SLBM warning. As noted previously, a system using SAGE radars for SLBM warning was approved in July 1965 and was being built.

(S) However, NORAD remained concerned about the long range threat, that is, missiles the U.S.S.R. could launch from submarines beyond the 750 nm coverage of the SAGE radars. In letters to the JCS on 16 March 1964 and 11 August 1964, NORAD urged research and development of OTH radar and asked to have a prototype OTH radar installed and tested at a site in the CONUS. Also, in NADOP 1966-1975, 1 October 1964, NORAD said it required a launch detection capability against a 2000 nm SLBM. It needed, NORAD said, a two-site backscatter system covering East and West coasts to give long range SLBM/MRBM warning by the end of FY 1969. The next NADOP, 1967-1976, 15 October 1965, stated the same requirement except that NORAD said it wanted the OTH system by the end of FY 1970.

(S) In support of NADOP 1967-1976, and its own objectives, ADC sent USAF, on 18 March 1966, a qualitative operational requirement (QOR) for a long range SLBM over-the-horizon detection and warning system. ADC said, in the QOR, that such a system should reach initial operation by 1969 and become fully operational by 1970. Also, ADC said its requirement could be met by deploying backscatter OTH radars in the CONUS of the FPS-95 type.

(S) In April 1965, DDR&E had approved a program for a prototype FPS-95 to be installed at an overseas location. This radar, a MADRE-type, OTH single hop, backscatter radar, was to be used to collect intelligence on missile launches and air traffic in the U.S.S.R. However, the program was held up because of high costs and lack of a site.

(S) On 1 November 1966, NORAD told the JCS that it was interested in the FPS-95 because this radar program appeared to be a good way to solve part of the problem of detecting SLBM's. But, NORAD said it was concerned about the delay in research and development. This program, NORAD stated, could influence the NORAD surveillance posture of the 1970's and, for this reason, urged the JCS to support the R&D backscatter program so that an early evaluation for defense could be made. Also, NORAD said that, if a suitable overseas site could not be gotten, "it appears to be in the best interest of all concerned to consider reorienting the program to use a suitable site in North America."

OTH FORWARD SCATTER MISSILE DETECTION SYSTEM

BACKGROUND

(S) In December 1964, USAF authorized its Air Force Systems Command to design, develop, and acquire an over-the-horizon forward scatter missile detection system. The system, called 440L, was to

complement and/or backup BMEWS and give missile launch and attack warning in semi-automated real time to the NORAD COC. Also, the system was to give intelligence data on nuclear detonations and missiles in the research and development stage.

~~(S)~~ This OTH forward scatter system was to partially satisfy a NORAD requirement (NQR 1-64) for a system to detect missile launches over the Sino-Soviet area. NORAD's requirement had been sent to the JCS in January 1964. At that time, CINCNORAD told the JCS that a serious situation existed because BMEWS was unable to detect all ballistic missiles (those in a south polar trajectory) that could be launched from the Sino-Soviet area to hit North America.

~~(S)~~ The system had been under development for some time by the Rome Air Development Center. On 1 July 1965, when the 440L System Program Office was set up, the system consisted of two transmitter sites in the Far East and five receiver sites and a data correlation center in Europe. It was believed that the system would be expanded to three transmitter sites, 10 receiver sites, and two data correlation centers. The complete 440L System, using two different detection methods, was expected to detect missiles launched in either north or south trajectories.

~~(S)~~ Data collected during the development of the system was to be displayed in the NORAD Current Intelligence Indications Center. A secure teletype circuit for reporting this data became operational on 31 December 1965.

STATUS

~~(S)~~ In April 1966, USAF directed AFSC to revise the 440L site plan. The system was to be made up of 10 sites: four transmitter sites in the Far East and six receiver sites in Europe. The initial operational date was set for FY 1968. ADC was to

be assigned responsibility for operating the system.

~~(C)~~ However, early in October 1966, NORAD learned that DOD had deferred $13.2 million in 440L production funds. It was expected that this action would delay the initial operation of the system one year. USAF was planning to object to this fund deferral.

~~(S)~~ In the meantime, on 11 July 1966 NORAD sent its display requirements for 440L to ADC. NORAD asked ADC to start action on the requirements and to keep it informed of plans and schedules.

DOD SPACE DETECTION, SURVEILLANCE, TRACKING, AND DATA PROCESSING STUDY

BACKGROUND

(U) In July 1964, the Deputy Secretary of Defense directed an ad hoc group, known as the Detection and Tracking of Satellites (DATOS) Study Group, to make a study of all current and programmed DOD space detection, surveillance, tracking, and data processing equipment. The study was made to recommend ways to reduce, consolidate, and allocate resources, and organize space systems so they would operate as a coordinated program.

~~(S)~~ NORAD contributed to the study by giving a description of SPADATS equipment and operation and the latest requirements for improving the system. Also, NORAD updated its April 1961 requirement document for an improved SPADATS and sent it to the JCS in January 1965. The JCS wanted to include this new document (NQR 2-65) in their report to the study group.

~~(S)~~ NORAD pointed out to the JCS, in the letter accompanying the NQR, that there was one major deficiency in the system. The system lacked the ability to give space threat and situation warning before the first pass of a foreign space-

craft over all unified or specified command areas. NORAD said the implications of this requirement were particularly far-reaching in terms of surveillance coverage.

~~(S)~~ The JCS supported, with minor changes, NORAD's requirement. The JCS told OSD that foreign space activity was a limited but growing threat that must be watched carefully. Therefore, they supported NORAD's mission of space surveillance and recommended approving the NQR for planning purposes. They also recommended that priority research and development effort be given to determining the mission of foreign space objects. However, they felt that tracking a foreign space object and finding out its mission before it passed over a SPADATS user's area was a long range objective rather than a near-term requirement.

~~(S)~~ Based on a recommendation in the DATOS Report, published in March 1965, the Deputy Secretary of Defense disapproved NQR 2-65 on 5 May 1965 and recommended to the JCS that the NQR be revised. Also, he asked the JCS to review NORAD's mission regarding deep space probes. He felt that, possibly, NORAD might be relieved of the responsibility to detect and track deep space probes.

~~(S)~~ On 4 June 1965, the JCS said the NQR would be sent back to NORAD for revision after specific differences over it were settled between the JCS and OSD. Also, the JCS upheld NORAD's mission regarding deep space probes. They said there was an insufficient military requirement for data on these objects at the present time to justify buying special equipment. However, the JCS believed that justification might develop and, under those circumstances, they said that CINCNORAD should control the operation of the special sensors. The JCS said they were against putting an arbitrary altitude limit on SPADATS at that time.

~~(S)~~ On 20 July 1965, the Deputy Secretary of Defense commented on the differences between the

JCS and OSD. He felt that the issues were settled and his comments could be used to revise the NQR. His comments included the following guidance:

1. There was to be no altitude limit put on the NORAD space mission. However, coverage requirements were to be limited to the needs of specific weapon systems.

2. No further action would be taken by DOD on research programs and operations aimed at determining the mission of space objects until after a group studying the problem made its recommendations. It was believed that there was enough emphasis on research and development in this area.

3. The specific requirements for detecting and tracking space objects should be changed.* Emphasis was to be placed on an adequate research and development program aimed at getting a better capability, quickly and economically, when it was needed.

~~(S)~~ The JCS asked NORAD on 11 October 1965 to revise NQR 2-65.

REVISED NQR APPROVED

(U) NORAD revised the NQR and sent it to the JCS on 8 April 1966. The document was reissued as NQR 2-66 (NORAD Qualitative Requirement for a Space Detection and Tracking System, 22 April 1966). NORAD asked the JCS to approve the NQR so it could serve as the basis for future plans and requirements.

~~(S)~~ The new NQR put first emphasis, the same as the disapproved NQR had, on finding out the

*(U) For detailed SPADATS requirements in NQR 2-65 see NORAD/CONAD Historical Summary, Jul-Dec 1964, pp. 59-62.

mission of newly launched foreign spacecraft during the first circuit. The new NQR linked mission assessment to step-by-step improvements to SPADATS as technology advanced and space activity increased.

(U) In May, the JCS approved NQR 2-66 and sent it to OSD with a recommendation that it be approved for planning purposes. On 4 June 1966, OSD approved it.

SPACE DETECTION AND TRACKING SYSTEM

NQR 2-66

~~(S)~~ As discussed above, NORAD revised its qualitative requirement for improving the SPADAT System and reissued the document on 22 April 1966 as NQR 2-66. It was approved by the JCS in May and by OSD on 4 June 1966. This document supported NORAD's objectives as stated in NADOP 1967-1976, 15 October 1965. The NADOP had pointed out the shortcomings in SPADATS. The system could not detect all space objects on their first revolution, and detection could vary from a few minutes to several hours after launch. Besides being inadequate for support of space defense weapons, SPADATS was limited in its ability to detect de-orbiting objects and could not determine the mission of space objects.

~~(S)~~ To correct these limitations, the NADOP had recommended deployment of appropriate sensors to detect, track, and determine the mission of all satellites during the first revolution, and to give observations on lunar and deep space vehicles. It also recommended deployment of a launch detection system by the end of FY 1969 for surveillance of the Sino-Soviet land area. Such a system would give early warning of Soviet launch activity, alert SPADATS sensors, and allow the best use of sensor data. Furthermore, the NADOP recommended using other sensor systems, such as Nike X radars, to complement and/or augment SPADATS.

~~(S)~~ The recommendations in the NADOP, noted above, were supported in the basic considerations in the NQR for improving SPADATS. The detailed qualitative requirements, subject to the limitations of technology, priorities, and money, included:

1. Altitude Coverage: By 1970, capability to detect and track space objects should be provided by selected optical sensors to permit observation at the altitudes of synchronous circular orbits. Selected radar sensors should provide detection and tracking to the maximum altitudes attainable with present technology and available funds. Selected radar sensors should be modified to provide observation of decaying or re-entering space objects down to 70 nm altitude. Beyond 1970, a satellite detection altitude and tracking capability during the first circuit is required to provide accurate tracking data by selected sensors on space objects in synchronous orbits, near circular orbits and in highly elliptical orbits particularly in the vicinity of the apogee where orbital changes are likely to occur.

2. Target Size: Planned improvement should be directed toward a dispersed network of sensors employing technically feasible differing portions of the frequency spectrum such as radar, optics and IR as well as others that may become feasible in the future. In combination these sensors should provide by 1970, a system capability for early detection and tracking of space objects with apparent radar cross section of one square meter, at ranges consistent with the altitude coverage required above. Beyond 1970, the combined system capability should keep pace with the threat and the requirement for support of U.S. space

activities.

3. Detection Probability: The goal for probability of detecting a foreign spacecraft prior to its first pass over the NORAD area of responsibility should be as near 100 per cent as possible. The probability of detecting a foreign spacecraft prior to completion of its first circuit may be slightly less, unless that circuit passes over the NORAD area of responsibility. By 1970 such detection probabilities should be developed for all satellites on inclinations of 25 to 120 degrees. Beyond 1970, the capability to achieve these detection probabilities should be expanded incrementally to include satellite inclinations from 0 to 180 degrees.

4. Catalog Accuracy: Based on time of arrival at a point in the orbital plane, and using 6,000 nm altitude as a point of reference, the SPADATS catalog should have enough accuracy to ensure that the identity of special interest satellites is not confused. The goal for correlation of catalog elements with satellite observations from selected sensors should be as near to 100 per cent as possible before 1970. Beyond 1970, catalog accuracies should keep pace with user requirements.

5. Weapons Support: By 1970, target position prediction accuracies (one Sigma) of $\pm$ one nautical mile along track, $\pm$ one half nautical mile cross track and $\pm$ one half nautical mile radially are required, computed within four hours of target selection

or detection, whichever is later. These accuracies are required out to the maximum ranges of non-homing interceptors which may be developed. Beyond 1970, target position prediction accuracies within reaction time constraints should be capable of growth consistent with the support of space defense weapons systems.

6. Space Population: The projected space object population by 1970 is 5,000. The SPADAT System should be improved to provide detection, tracking and weapon support within specified accuracies in this environment by 1970. Design of the improvements should anticipate continuing growth in space activities beyond 1970.

~~(S)~~ On 21 September 1966, General R. J. Reeves, CINCNORAD, in a letter to the Chairman of the Joint Chiefs of Staff, said it appeared that nearly all major improvements proposed by NORAD in NADOP 1967-1976 would be deferred or disapproved. "Unless this trend is reversed," General Reeves said, "NORAD's capabilities will continue to be unsatisfactory." He noted that there were grave risks in almost complete reliance on strategic retaliatory forces for the defense of North America. In this regard, General Reeves pointed out that since 1 January 1966, the Soviets had launched 10 space objects which SPADATS had not been able to detect on the first revolution. He said he was convinced that the potential military threat from space must be recognized and urged the JCS to support NORAD's objectives in the forthcoming NADOP 1969-1976 (published 1 November 1966) for improving SPADATS.

CANADIAN PARTICIPATION IN SPADATS

~~(S)~~ Background. In February 1965, Canadian Forces Headquarters told NORAD that it was making a study to assess "whether there is a place for a space surveillance role in the Canadian participation in NORAD." Over the past few years, two Canadian

sensors had been giving data to SPADATS: an RCAF-operated Baker-Nunn Camera at Cold Lake, Alberta, and the Defence Research Board's Prince Albert Radar Laboratory in Saskatchewan. Canadian Forces Headquarters asked for NORAD's views on the value of these sensors to SPADATS.

~~(S)~~ In March 1965, NORAD assured Canadian Forces Headquarters that Canada's sensors were valuable to SPADATS and pointed out each sensor's contributions. However, each sensor had its shortcomings. NORAD said that data from the Canadian camera was not equal to data received from the four USAF ADC cameras. Performance could be improved, NORAD said, by modifying the camera, adding some new equipment, giving personnel formal training, and moving the camera about 30 miles from the Primrose Missile Range to the Canadian Station at Cold Lake. Also, NORAD said the lack of secure communications at Prince Albert limited the radar's participation in many projects.

~~(S)~~ Besides information on these sensors, Canadian Forces Headquarters wanted to know the importance of space surveillance in the current defense posture, particularly the value of SPADATS in countering the threat as stated in NADOP 1966-1975. NORAD answered that the threat was an anticipated one that could materialize in 1969. The threat could be large yield nuclear warheads in orbit around the earth. Hence, to keep pace with the threat, all new space objects had to be watched to find their characteristics and mission. Also, NORAD said SPADATS facilities would be needed in any counter-satellite system.

~~(S)~~ Status. On 27 January 1966, Canadian Forces Headquarters told NORAD that the Defence Council had approved renovating and modifying the Baker-Nunn Camera and buying new equipment to bring the

camera up to the operating level of the USAF cameras.* Also, Canadian Forces Headquarters said the Defence Research Board was losing interest in the Prince Albert radar and a new study was being made to find out whether the Prince Albert radar should become a full time SPADATS sensor. Until this study was finished, no decision would be made on relocating the camera or getting secure and reliable communications. A visit to NORAD was proposed for members of the study group to discuss the Prince Albert radar.

(U) Members of NORAD and the study group met in early March 1966. After studying the problems involved, NORAD decided that there was not enough justification to make the radar a full time SPADATS sensor. The result was the Canadians decided to close the Prince Albert radar and it stopped inputs to SPADATS on 1 July 1966. Research was to continue at the site until about March 1967.

~~(S)~~ In the meantime, on 27 May 1966, Canadian Forces Headquarters informed NORAD of its plans to improve the Baker-Nunn Camera and its facilities. In addition to updating the camera, it was to be

---

*(U) USAF was improving its Baker-Nunn Camera system by adding an improved timing system and equipment to make on-site precision measurement of Baker-Nunn film. The new timing system would increase the prediction accuracy of a satellite's position in space by a factor of 20. This accuracy would be gotten by having two or more sites photograph a satellite simultaneously. However the system would lose this accuracy if the Cold Lake camera could not take part because the most important simultaneous observations would come from Edwards AFB and Cold Lake.

moved to a better site closer to Cold Lake and put in a new building. Communications were to be improved by adding voice and teletype circuits between the NORAD Space Defense Center and the camera site. The Canadian camera was exchanged at McClellan AFB (SMAMA) for an updated one in mid-December 1966. The new camera was to be installed during January 1967.

BALLISTIC MISSILE EARLY WARNING SYSTEM

SITE II TRACKING RADAR

~~(S)~~ One of the improvements that NORAD wanted for BMEWS was to fill the low-angle gaps for detecting missiles with re-entry angles of less than 15 degrees. To fill the gap between Site I (Thule) and Site II (Clear), NORAD wanted a tracking radar at Site II. To fill the gap between Site I and Site III (Fylingdales), NORAD wanted a radar either in Iceland or Greenland.

~~(S)~~ Finally, after the problem was studied and then re-studied, the Secretary of Defense approved in September 1963 a DDR&E recommendation to cancel the requirement for a gap filler between sites I and III. However, he approved the installation of a tracker at Site II.

~~(S)~~ Requests for bids were sent to industry in May 1964. Specifications called for an FPS-92 radar -- an improved version of the FPS-49 -- that would, in addition to filling the gap between sites I and II, provide credibility and serve as a backup to the detection radars at Site II and furnish information on satellites. At that time, the FPS-92 was expected to be operational in mid-1966.

~~(S)~~ The Radio Corporation of America installed the radar and on 1 July 1966 it reached initial operational capability (IOC). On 15 September, the radar was put in full operational capability (FOC) status.

SATELLITE TRACKING

~~(S)~~ Since April 1962, an additional mission of BMEWS had been to give, within the system's capability, information and data on space objects to SPADATS. Since that time, BMEWS had provided a vast amount of data to SPADATS, mainly by the FPS-49 tracking radar at Site I, Thule. To improve the quality of the data and to get inputs from the whole system, efforts were made to get modifications to the system and to use tracking radars at the other BMEWS sites in a space-tracking role.

~~(S)~~ Originally, the specifications for the FPS-92 tracker at Site II, Clear (see above), had included a pulse compression feature. However, this feature was disapproved by DOD. Pulse compression was to give the radar:

1. Greater range resolution for the ability to differentiate and get data on objects that were very close together.

2. Improved range accuracy for getting more precise data for orbital computations.

3. Increased signal-to-noise ratio for detecting smaller objects at longer ranges.

~~(S)~~ USAF ADC took reclama action in April 1965 on this matter and proposed that pulse compression be added to the radar by a modification program. ADC used the intelligence gathering requirement of NORAD for the main justification. On 14 February 1966, USAF approved a modification program. At the same time, USAF tentatively approved $1.5 million of FY 1968 funds to do the job. At year's end the program was awaiting approval by the Secretary of Defense.

~~(S)~~ Also, NORAD approved, in early August 1966, an ADC request to extend the tracker coverage at Site I in a clockwise arc to 180 degrees. This gave the BMEWS tracker a small amount of additional

satellite tracking capability without degrading its primary mission. Efforts were also underway by both NORAD and ADC to increase the space-tracking capabilities at Site III.

ECCM CAPABILITY

~~(S)~~ In 1962, equipment had been installed at Sites I and II to give them a limited ability to recognize when their radars were being jammed. However, BMEWS still lacked the ability to operate in an ECM environment. This limitation was to be corrected by a $43.3 million program, submitted by USAF to DOD in March 1962, for improved ECM recognition and analysis fixes as well as active ECCM fixes. After some delay due to rising cost estimates, the Secretary of Defense in September 1963 approved the $43.3 million program. This program called for:

1. Doppler Filter Display and Blanking

2. Narrow Band Frequency Shift (to give manual control over the "moon fix")

3. Wide Band Frequency Shift

4. ECM Monitor

5. Central Data Processor Expansion

6. Polarization Selection (to give selective blanking)

7. Side Lobe Cancellors (see below)

~~(S)~~ Work on the program started in 1963 and by mid-1966 testing of the equipment at the sites had started. Testing was done at Site II in June and July, at Site I in August, and at Site III in September 1966. Except for problems with the Automatic Doppler Filter Gating equipment at Sites I and III, the tests were successful.

It was expected that by January 1967, except for the ADFG at Site III, BMEWS could take action against certain types of ECM interference.

SIDE LOBE FEATURE CANCELLED

~~(S)~~ As previously mentioned, DOD had approved in September 1963 an ECCM program for BMEWS. One item in this program was the side lobe cancellor (SLC) -- a device to insure that BMEWS could detect a raid during noise jamming. It was to be installed on detection radars at Sites I and II. The SLC was to be bought after feasibility testing was finished, if the results were satisfactory. General Electric's report of the testing, dated July 1965, indicated that the technique was technically feasible and that design goals had been met.

~~(S)~~ In September 1965, ADC told NORAD that the need for the SLC would have to be reaffirmed before USAF would authorize the money to buy it. ADC asked NORAD for recommendations on this matter. NORAD evaluated GE's report and a Top Secret report from MITRE on the SLC and on 12 October 1965 NORAD recommended against buying the SLC at that time. NORAD said that the gain to the BMEWS mission by adding the SLC did not justify the cost. Furthermore, NORAD said that under the present concept of operations hostile ECM detected by BMEWS gave definite warning.

~~(S)~~ On 30 November 1965, ADC informed USAF that there was some doubt about the SLC cost effectiveness mainly because of its overall operational value. ADC suggested that USAF review the SLC program to be sure that all technical as well as operational aspects were considered. USAF replied in January 1966 and asked ADC to comment on the operational value of putting the SLC at Site I. Once again ADC asked for NORAD comments.

~~(S)~~ NORAD told ADC on 23 February 1966 that it did not support putting the SLC at Site I and repeated its position of 12 October 1965. On 14

April 1966, USAF cancelled the SLC saying that the program could not be defended operationally or from a cost effectiveness standpoint. But USAF told ADC that action would be taken in the future to get the SLC at Site I, if it was needed.

CHAPTER VI

NUCLEAR DETONATION DETECTION AND B / C REPORTING SYSTEMS

NUCLEAR BIOLOGICAL CHEMICAL WARNING AND REPORTING SYSTEM

BACKGROUND

~~(S)~~ The NORAD Nuclear Biological Chemical (NBC) Warning and Reporting System, established on 1 January 1966, was made by combining two separate manual systems which had originally been set up on an interim basis until automated systems were ready. The first of these manual systems was the Nuclear Detonation and Radioactive Fall-out Reporting System. NORAD had taken over responsibility for this system from CONAD on 1 September 1959. The second system was the Biological/Chemical Interim Warning System. It became operational on 1 July 1964. The follow-on automated systems ran into technological and cost problems, however.

~~(S)~~ An automated Nuclear Detonation Detection and Reporting System (NUDETS 477L) was to have been put into use in two phases. Phase I, the prototype system, was in operation in the Baltimore-Washington, D.C. area and reported data to the NORAD COC for about 20 months (1 July 1964 to 27 February 1966). Ultimately, a nation-wide system (Phase II) was to be able to detect a nuclear detonation and give burst data (height, yield, location) needed for attack assessment, fall-out warning, and damage assessment. But, planning for a nation-wide system was cancelled in the first quarter of 1965. One main reason for dropping the system was

because it was felt that current technology would not give an acceptable ratio between the effectiveness of the system and the cost involved. Also, testing of the prototype Phase I system showed that the data it gave was not reliable.

~~(S)~~ Although the JCS had approved NORAD's requirement in 1961 for an automated biological and chemical rapid warning system, the main problems here were that BC sensors were not advanced enough to get a system responsive to NORAD's needs and there was not enough guidance for an over-all continental system. The Army, responsible for developing the system, in 1964 recommended suspending the program until suitable sensors and proper guidance were developed and a complete evaluation was made of the CONUS BC warning problem. NORAD agreed, generally, with this approach but said that it still wanted an automated system.

~~(S)~~ In March 1965, the JCS directed the Army to make an updated reappraisal of the requirement for a BC system through 1975. The JCS said this action was necessary because technical, operational, and intelligence factors had changed since the requirement was established. NORAD and the Defense Intelligence Agency helped to make this reappraisal. As an input to this analysis, NORAD updated its requirement and published it as the NORAD Qualitative Requirement for an Improved Biological and Chemical Detection Warning System (NQR 7-65), 25 October 1965.

~~(S)~~ In the NQR, NORAD upheld the need for a rapid warning system, but said that because of the state of sensor development, as forecast over the next 10 years, such a system could not be set up at the present time. The NQR pointed out, however, that while all elements of the system would not likely be developed before 1975, an improved system could be gotten by upgrading the interim manual system in increments as development allowed. The NQR stated the need for research and development on sensors and research on design parameters for an automated system. NORAD said the automated system would not be needed until the threat from

strategic BC weapons justified it and the cost/effectiveness ratio was acceptable.

~~(S)~~ On 15 December 1965, the JCS sent the Army's reappraisal to DDR&E. In January 1966, the JCS told NORAD that guidance had been issued on developing the system. The JCS said that because of the limited strategic threat there was no need for a nation-wide system to warn of a chemical attack. They said, though, there was a need for developing a system to rapidly detect a biological attack. The Army was directed to set up a development program for biological sensors to support NORAD's requirement when research showed that such sensors were technically practical. The JCS said NQR 7-65 was to be used as broad guidance in the development effort. Also, CINCNORAD was to advise the JCS of any important change in the BC threat to North America.

STATUS

(U) As noted above, the NBC Warning and Reporting System was set up on 1 January 1966. The operation orders, for the two manual systems that were combined to make the NBCWR System, were replaced by a single document: NORAD Operation Order 303N-66, 26 November 1965. This order said the system was to detect, identify, and report all nuclear detonations (except tests) and the enemy use of biological/chemical weapons and the resulting contamination in or adjacent to the CONUS, Alaska, the DEW Line and its extensions. The system was to evaluate the reported data and send out appropriate warning reports.

(U) Procedures and techniques for collecting and reporting data were published in NORAD Manual 55-10, 17 January 1966. Detection and warning teams were to make observations and report data on NBC activity to reporting stations. In turn, these reports were to be relayed through the NORAD communications system to the NORAD COC. Data from

these reports would be evaluated and, if appropriate, warning reports would be voice-told to the JCS and other headquarters.

BOMB ALARM SYSTEM

RECONFIGURATION STUDY

(U) Another system for detecting nuclear detonations, developed by the Western Union Telegraph Company, was the Bomb Alarm System. This system was designed to automatically report nuclear explosions to the NORAD COC and other key military and civilian agencies. The BAS became operational on 1 September 1962 with sensors at 97 locations in the CONUS and at the BMEWS sites at Thule and Clear.

(U) In September 1964, USAF ADC asked NORAD to review the BAS coverage and advise whether any changes were needed. ADC felt that because of changes in both the military structure and urban/industrial areas there might be areas that should be given coverage. Also, there might be some areas that no longer needed coverage.

~~(S)~~ NORAD said it wanted Eielson AFB and Elmendorf AFB, both in Alaska, added to the BAS. In April 1965, USAF said it would not approve NORAD's requirement because a JCS study group had already prepared a list of sites which would use the entire capacity of the BAS (120 sites). The purpose behind this planning, USAF said, was for the system to indicate the ratio of an attack among urban, industrial, and military targets instead of the current purpose of notifying that an attack had occurred.

~~(S)~~ NORAD referred the problem to the JCS on 2 June 1965, reminding them that they had given operational control of the BAS to CINCNORAD. NORAD asked whether it was compatible with current concepts to put the BAS at the Alaska bases and if

action should continue on the matter. On 8 June, the JCS said a study was being made of all attack assessment systems including the BAS. They said the study group was thinking about expanding the system but it did not include Alaska.

~~(S)~~ The JCS study group found that the BAS, if set up properly, was one of the few potential sensor systems that might give valid information on the weight and nature of an attack under all but the most severe of general war attack conditions. The JCS sent a study to DOD recommending expansion of the BAS, and at about the same time, September 1965, asked the Defense Communications Agency to give NORAD technical assistance to reconfigure the system, expanding it to design capacity. To help give NORAD this aid, DCA asked USAF to prepare a plan to reconfigure and improve the BAS. The system, in addition to its warning functions, was to give attack assessment to the National Military Command System.

~~(S)~~ On 7 March 1966, DCA asked for NORAD's recommendations on the plan USAF had prepared which called for expanding the system to 120 sites. Comments were sent to DCA on 14 June recommending against expansion but for relocating a number of sites.

~~(S)~~ The JCS held a meeting at the Pentagon on 13 June 1966, which included representatives from NORAD, USAF, and DCA, to review a USAF Program Change Request for reconfiguring and expanding the system. The JCS felt that the rationale and basis for the list of sites had to be reviewed. They found there was not enough justification to expand the BAS to its capacity because 34 sites were at military bases which were either scheduled to close or had lost some importance as targets. A revised BAS site list was drawn up which included 34 sites (20 military and 14 urban/industrial) to replace those noted above. The total number of sites was to be 100.

~~(S)~~ NORAD agreed with the proposal to reconfigure the system except that it wanted two sites put in Canada and one more site in Alaska. (Eielson AFB, a SAC base, had already been added to the latest list of sites.) On 27 July 1966, NORAD recommended to DCA that two high priority military centers, Canadian Forces Headquarters and North Bay, both in Ontario, be substituted for the urban/industrial centers of Louisville, Ky., and Bridgeport, Conn. Also, NORAD recommended substituting Elmendorf AFB for Dallas, Texas.*

~~(S)~~ DCA changed the list of sites according to NORAD's recommendations and then asked USAF on 26 August to prepare a revised plan to reconfigure and improve the BAS using the new list. The system was to serve as an attack assessment means for the National Military Command System and was to be done in a way consistent with NORAD's recommendations. The system was also to remain as a warning system for NORAD. The USAF plan for modifying the BAS was to include a proposed schedule and cost data, and was to be coordinated with the JCS, DCA, and NORAD, USAF directed ADC to make this plan.

BACKUP POWER FACILITIES

~~(S)~~ Both NORAD and USAF were concerned about a major power failure in the northeastern area of the U.S. in November 1965 because it had made 13 Bomb Alarm System sites temporarily unable to report a nuclear explosion. They asked ADC to look for ways to prevent this from happening again.

~~(S)~~ ADC investigated and found that the BAS

---

*~~(S)~~ Louisville, Bridgeport, and Dallas were ranked lowest in priority of the 14 U/I replacement sites.

outage was not caused by power failure at the sites, as was thought at first, but was caused by power failure at relay stations. ADC talked with Western Union about ways to give these relay stations backup power. Acceptable solutions to the problem resulted. In March 1966, NORAD learned that the company was starting a program to give all major relay stations diesel generator backup power. Also, Western Union proposed to give, at its own expense, backup power for one sensor (of three sensors) at each site in the system. NORAD concurred with this latter proposal on 16 September 1966.

CHAPTER VII

WEAPONS

STATUS SUMMARY

~~(S)~~ The NORAD regular interceptor force decreased by five squadrons (38 to 33) during 1966. Four F-102 squadrons and one F-104 squadron were removed from the NORAD force. By 1 January 1967, the total number of interceptor aircraft had dropped from 688 to 562. The number of ANG (Category 1) squadrons stayed at 21, but the number of aircraft rose from 380 to 382. There were 18 F-102 squadrons with 329 aircraft and three F-89J squadrons with 53 aircraft. The ANG continued its F-102 conversion program and at the end of 1966 there were just three squadrons that had not begun conversion.*

~~(S)~~ The number of BOMARC missiles in the eight squadrons dropped from 238 to 230 as a result of eight evaluation launches under the BOMARC B Combat Evaluation Launch (CEL) Program.** Ten Regular Army Nike Hercules fire units at four SAC bases were inactivated on 1 March 1966, leaving 73

---

*(U) For further rationale on F-102 Conversion, see p.116.

**(U) For further explanation of the 1966 CEL Program see p.137. For a description of the complete CEL Program, see NORAD/CONAD Historical Summary, Jul-Dec 1964, pp. 77-80.

RA fire units under NORAD control. The total of eight RA Hawk fire control units with 48 launchers and 288 missiles did not change, and the Army National Guard total of Nike Hercules fire units remained at 48.

REGULAR INTERCEPTOR FORCE

FIS INACTIVATION AND MOVEMENT

~~(S)~~ During 1966, four F-102 squadrons and one F-104 squadron were removed from the NORAD force. One F-102 squadron was released from alert for movement to Southeast Asia (SEA) and three were released from alert for inactivation. The F-104 squadron was released from alert for inactivation.

~~(S)~~ The 325th FIS, Truax Field, Wis., and the 64th FIS, Paine Field, Wash., were released from alert on 11 and 25 March 1966, respectively. The 325th was inactivated on 25 June 1966. The 64th was in position in SEA by 10 June 1966.* The 398th FIS (F-106's) moved to Paine Field on 15 June 1966 to replace the 64th.

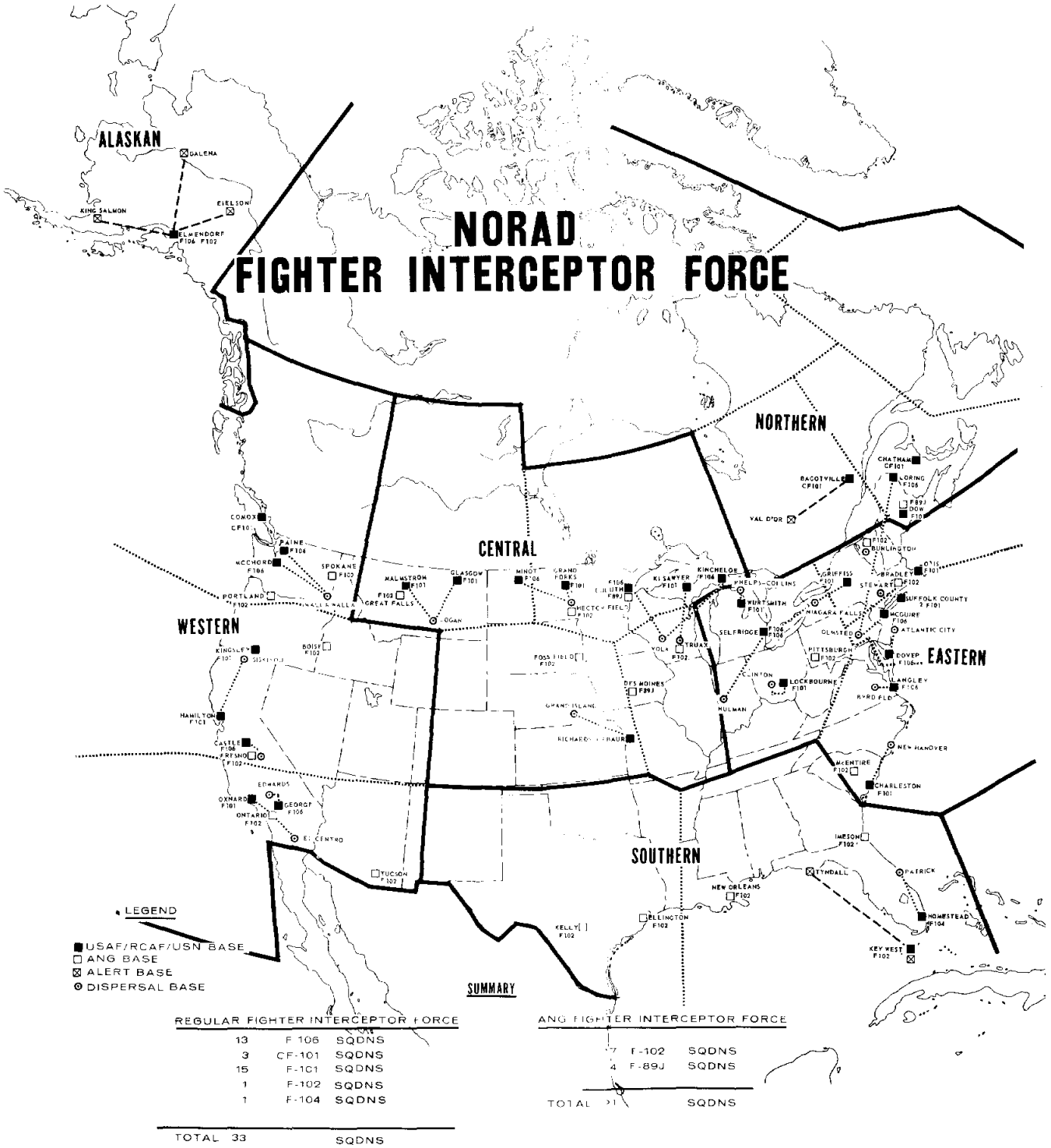
~~(S)~~ The 326th FIS, Richards-Gebaur AFB, Mo., and the 59th FIS, Goose Bay, Labrador, were relieved of alert duties on 10 and 17 November 1966, respectively, and both were inactivated on 2 January 1967.** With the inactivation of the 326th, USAF directed, on 16 November 1966, that the 71st FIS, Selfridge AFB, Mich., move to Richards-Gebaur AFB, during FY 3/1967. Although the effective date of

---

*(U) For details on SEA deployments see p.101.

**(U) For further rationale on the 59th FIS, Goose Bay, see p.103.

NORAD
FIGHTER INTERCEPTOR FORCE



SUMMARY

REGULAR FIGHTER INTERCEPTOR FORCE

13	F-106	SQDNS
3	CF-101	SQDNS
15	F-101	SQDNS
1	F-102	SQDNS
1	F-104	SQDNS
TOTAL 33		SQDNS

ANG FIGHTER INTERCEPTOR FORCE

7	F-102	SQDNS
4	F-89J	SQDNS
TOTAL 21		SQDNS

the 71st move was to be 16 January 1967, the unit was relieved of alert on 18 November 1966. The 71st still provided an identification function at Selfridge AFB through 14 December 1966, and assumed the same function at Richards-Gebaur AFB on 15 December 1966.

~~(S)~~ The 331st FIS (F-104's), Webb AFB, Texas, was originally scheduled for inactivation in FY 1/1968. However, the schedule was changed so that it was relieved of alert duties on 31 December 1966 in preparation for inactivation on 1 March 1967. The F-104's from the 331st were to go to the 4760th Combat Crew Training Squadron. The 4760th was to be organized at Webb AFB on 1 March 1967 and assigned to the Fourteenth Air Force.

SOUTHEAST ASIA DEPLOYMENTS

~~(S)~~ Background. In August 1965, USAF decided to deploy F-102's to Naha, Okinawa, for air defense and possible air/ground operations in Southeast Asia (SEA). The plan named "Thirsty Camel," called for deployment on a rotational basis with Configuration Eight (Fig 8) F-102's. On 24 September 1965, the 82d FIS, Travis AFB, was relieved of alert to prepare for TDY to Naha. The UE was set at 28 Fig 8 F-102's and one TF-102, with delivery of the first aircraft scheduled for 10 January 1966. The 82d was in position at Naha on 25 February 1966.

~~(S)~~ Status. On 8 March 1966, USAF notified ADC that two additional F-102 squadrons would be deployed to the western Pacific during June 1966 and the TDY of the 82d FIS at Naha, Okinawa, would be changed to PCS status. ADC selected the 64th FIS, Paine Field, Wash., and the 325th FIS, Truax Field, Wis., for this deployment. In a message to USAF on 11 March 1966, ADC stated that because of the large percentage of the remaining F-102 force being modified for deployment to the western Pacific, it was necessary to reduce the UE of the squadrons involved. ADC recommended reducing the 64th and the 325th FIS's to 18 UE on 15 March

1966. Also, in order to provide aircraft, personnel and equipment for deployment of these squadrons, ADC recommended that the 59th FIS, Goose Bay, be reduced to 26 UE on 15 March 1966. NORAD concurred with these recommendations. The reasoning was that this reduction in UE would enable the squadrons to maintain a higher rate of combat effective interceptors. On 15 March 1966, OSD approved the proposed deployment program which resulted in the following actions:*

1. The 64th FIS (18 UE) moved PCS from Paine Field to Southeast Asia in June 1966.

2. The 82d FIS (26 UE), Naha, Okinawa, was changed from TDY to PCS in June 1966.

3. The 498th FIS (which reduced from 18 to 12 UE F-106's in April 1966) moved from McChord AFB to Paine Field on 15 June 1966, to replace the 64th FIS.

~~(S)~~ USAF authorized reduction to 18 UE for the 64th and 325th FIS's on 16 March 1966, and pointed out that the reduction of the 59th FIS to 26 UE was an agreed Air Staff position that had not yet been addressed by OSD. USAF also stated that to provide additional resources for active force deployments, as well as ANG conversions, other F-102 reductions were being considered.

~~(S)~~ In a message to ADC, USAFE, PACAF, CINCPAC, CINCUER and NORAD on 11 April 1966, USAF pointed out that the extension of F-102 units had created problems in aircrew and maintenance manning for

---

*~~(S)~~ This approval included moving the 325th to Japan but on 2 June 1966 OSD reversed its decision. Instead, the squadron was inactivated on 25 June 1966.

active units as well as airframe and AGE shortages for the ANG F-102 conversion program. The Air Staff had studied the reduction of all F-102 units, and had proposed the following:

1. ADC, 59th FIS from 33 to 18 UE.

2. USAFE, all F-102 units to 18 UE.

3. PACAF, 82d FIS from 26 to 18 UE (only if 325th FIS deployed to Misawa.)

This action would reduce to 18 UE all F-102 squadrons not committed to maintenance of alert posture away from their home stations. USAF stated that in view of the "in house" nature of its Air Staff study, and the fact that formal program changes had not yet been requested from OSD, comments on the impacts of its proposal were solicited from ADC, CINCPAC, CINCEUR, and NORAD at the earliest possible date. All commands concurred with the proposal and, on 22 July 1966, USAF reduced 59th FIS from 33 to 18 UE, and 325th FIS from 26 to 18 UE.

NORTHEAST AREA INTERCEPTOR ACTIVITIES

~~(S)~~ Goose Bay. In December 1964, OSD had set the CONUS interceptor force level at 20 squadrons by FY 1970. The 59th FIS, Goose AB, Labrador, was scheduled at that time for inactivation in the last quarter of FY 1967. ADC felt, however, that the current capabilities of Goose Sector should be kept until AWACS/IMI were available.

~~(S)~~ Through most of the next two years, 1965 and 1966, ADC stressed the point to USAF and NORAD that it wanted to keep interceptors at Goose Bay. In April 1966, ADC asked NORAD to support a proposal to retain a squadron at Goose Bay after the 59th phased out. NORAD replied that it supported this proposal as long as the overall interceptor force stayed at 29 squadrons, but said it could not

support it if the force was cut to 20 squadrons.

~~(S)~~ NORAD gave its comments, on 11 May 1966, on an unofficial study by ADC that recommended keeping interceptors at Goose Bay regardless of the total number of squadrons. NORAD said it could not support ADC's position for two reasons. The first was the programmed cut of interceptor force strength. The second was that Soviet bombers could bypass the northeast area with ease. For these reasons, NORAD said it could not recommend deploying interceptors to Goose Bay after July 1967.

~~(S)~~ To give added impetus to a USAF reclama of the programmed 20 squadron force, ADC asked NORAD for assistance.* On 23 August 1966, ADC asked for support for its original position of keeping interceptors at Goose AB until AWACS/IMI were available. If the reclama was approved, ADC wanted to station F-101's there. If it was disapproved, ADC wanted regular or intermittent deployment of a detachment of F-106's. ADC felt the greatest value of keeping interceptors at Goose Bay would be to complicate Soviet targeting, restrict route options, as well as performing identification and sovereignty functions and intercept training for radar site personnel. On 6 September, NORAD told ADC that it could not support permanent deployment because of the reasons given previously. However, NORAD said it had no objections to intermittent deployment of small units of CONUS-based interceptors for training radar intercept personnel.

~~(S)~~ While ADC was working to keep some kind of an interceptor force in Goose Sector, the 59th FIS was being readied for inactivation. Detachment #1 of the 59th, Ernest Harmon AFB, Newfoundland, was relieved of alert on 1 February and inactivated on

---

*~~(S)~~ ADC had started reclama action and recommended a 29 FIS force for end FY 1969.

25 March 1966. Personnel and equipment returned to the 59th at Goose AB. By August 1966, the UE of the 59th had been cut from 33 to 18 aircraft, at ADC's request, to make more F-102's and equipment available for other deployments and ANG conversions.

~~(S)~~ On 11 November 1966, the inactivation of the 59th was changed from June 1967 to January 1967. On 4 November, the JCS had asked NORAD for comments on early inactivation of the 59th. NORAD said it had no objections but pointed out that such action had to be coordinated with Canada. The 59th was released from alert on 17 November to prepare for inactivation.*

~~(S)~~ In the meantime, on 10 November, Lt. Gen. Herbert B. Thatcher, ADC Commander, sent CINCONAD a letter pointing out that on several occasions he had told USAF he was concerned over the reductions at Goose Bay. He said OSD had disapproved the USAF reclama to retain the nine F-101 squadrons. Now, General Thatcher wanted to deploy a detachment of CONUS-based interceptors to Goose Bay. This force would have the main function of pre-air battle effect. He noted the reasons given previously by ADC for keeping interceptors at Goose. But, in addition, he also said it would "strengthen our position politically by providing additional assurance to our Canadian friends."

~~(S)~~ After talking with representatives of the Permanent Joint Board on Defense and the JCS, General R. J. Reeves, CINCNORAD, concurred on 12 December 1966 with keeping facilities at Goose Bay for a detachment of six interceptors.

---

*~~(S)~~ On 1 January 1967, 59th personnel were assigned to TAC's 75th Tactical Reconnaissance Wing, Bergstrom AFB, Texas. F-102's were transferred to the ANG.

~~(S)~~ ADC arranged to send six F-106's and crews from the 27th FIS, Loring AFB, Maine. The deployment was called "College Goose." The interceptors were to remain under Northern NORAD Region's operational control. Armament, initially, would be conventional missiles, but was to be changed to a nuclear up-load capability as soon as a permanent detachment was established. Detachment 2, 27th FIS, was to be in-place on 7 January 1967 but was slipped 10 days to permit State Department coordination with the Canadian government.

~~(S)~~ Iceland. On 23 August 1966, ADC in a letter to NORAD, pointed out that the 57th FIS at Keflavik, Iceland, was programmed to be inactivated in FY 1/1968, but it might be extended to FY 3/1968. ADC recommended that the 57th be extended indefinitely, and asked for NORAD's concurrence. On 6 September, NORAD said it did not object to indefinite extension of the 57th as long as this caused no further reduction in CONAD forces. NORAD also pointed out the statement it had made to the JCS on 21 December 1965:

> . . . an acceptable alternative to retaining the existing Iceland interceptor forces would be the rotation of aircraft to Iceland to perform the interceptor mission, provided the forces so employed were not from those programmed for CONAD subsequent to FY 4/1967.

~~(S)~~ CINCLANT wanted the 57th supplied with enough F-102's to maintain a C-1 status. This squadron was used to identify unknown aircraft and shipping in the Iceland area and CINCLANT wanted to retain this capability. ADC agreed and reassigned two F-102 aircraft to the 57th on 6 October 1966. ADC's objective was to maintain at least 10 F-102's in Iceland.

~~(S)~~ In October 1966, OSD approved extension of the 57th through FY 3/1968.

KEY WEST ALERT

~~(S)~~ On 13 March 1965, USAF had pointed out to ADC that the inactivation of the 482d FIS in FY 2/1966 would cause the Key West air defense mission to be assigned to another unit or agency. USAF said ADC could continue the mission, but suggested some alternatives. Possibly, the Navy or TAC could take over the mission.* USAF wanted ADC's views and recommendations coordinated with NORAD, with specific comments on the suitability of the F-4C in this role.

~~(S)~~ ADC replied to USAF on 10 April proposing that the 4756th Air Defense Wing, Tyndall AFB, take over the mission on 1 September 1965. Eight additional F-102 aircraft would be assigned to Tyndall AFB so that six F-102's could be deployed to Key West to accomplish that mission. ADC told USAF that NORAD believed TAC or Navy aircraft, including the F-4C, were unsuitable since they possessed no air-to-air nuclear capability for advanced CONAD contingency operations.

~~(S)~~ USAF was thinking along other lines, however. On 25 May 1965, USAF said it did not agree that the mission required a nuclear capability or that its performance by F-102's was essential. Furthermore, it did not believe that OSD would approve additional manpower and funds to support the mission during FY 1966. But, USAF wanted to know what temporary means ADC had to meet the requirement during FY 1966, assuming resources could be made available to the 4756th in FY 1967. ADC

---

*~~(S)~~ U.S. Navy and Marine interceptors that had held NORAD alert in Key West during the Cuban crisis were withdrawn by 15 June 1963. A detachment of six F-102's from the 482d FIS, Seymour-Johnson AFB, N. C., took over the mission on that date.

answered that it would use the 326th FIS, Richards-Gebaur AFB, as an interim solution.

~~(S)~~ On 12 August 1965, USAF sent a PCP to OSD asking for deployment of six F-102's to Key West effective 1 August. The 326th, which had assumed the alert at Key West on 1 August, would have this commitment until the 4756th ADW assumed it on 1 July 1966. This PCP also asked for an increase of 131 manpower spaces for the 326th, 365 spaces for the 4756th, and funds. OSD issued a decision/guidance paper on 1 September 1965, substantially approving the PCP.

~~(S)~~ On 1 July 1966, the 326th was released from the Key West alert and the 4756th assumed the responsibility.

F-101/F-106 PROGRAMMED FORCE ADJUSTMENT

~~(S)~~ NORAD, ADC and USAF felt that a greater number of interceptor squadrons should be retained through FY 1969 than the programmed FY 1969 force of 20 squadrons. For this reason, Program Change Request (PCR) 66-57 was prepared and submitted to OSD.* This PCR asked for retention of nine F-101 squadrons through FY 1969 for a force of 29 squadrons. OSD disapproved the PCR on 3 August 1966. USAF presented a reclama, but this too, was disapproved by OSD on 13 December 1966. Meanwhile, USAF had prepared a counter proposal in the form of PCR 66-61. It was signed by the Secretary of the Air Force on 18 November 1966 and sent to OSD. OSD approved the FY 1968 portion of the PCR on 22 November 1966. A further decision on the FY 1969

---

*(U) Program Change Request (PCR) was formerly Program Change Proposal (PCP).

portion was expected early in 1967. Following is a summary of the PCR:

1. Currently programmed:

	End FY67	End FY68	End FY69
F-101 Sqdns	15	11	6
F-104 Sqdns	1	1	1
F-106 Sqdns	13	13	13

UE aircraft end FY 1969:

6 F-101 Sqdns at 18 UE		108
1 F-104 Sqdn at 22 UE		22
13 F-106 Sqdns (8 at 18 UE)		
(5 at 12 UE)		204
	Total	334

2. Proposed Force:

	End FY67	End FY68	End FY69
F-101 Sqdns	15	13	9
F-104 Sqdns	1	1	1
F-106 Sqdns	13	11	10

UE aircraft end FY 1969:

9 F-101 Sqdns at 18 UE		162
1 F-104 Sqdn at 22 UE		22
10 F-106 Sqdns (6 at 18 UE)		
(4 at 24 UE)		204
	Total	388

~~(S)~~ The FY 1968 approved portion was:

1. Retain two of four F-101 squadrons scheduled for inactivation.

2. Inactivate two F-106 squadrons.

3. Increase two F-106 squadrons to 24 UE.

4. Retain one F-106 squadron at 18 UE instead of reducing it to 12 UE.

This was an increase in the FY 1968 program of 36 F-101's and a decrease of six F-106's.

INTERCEPTOR DEPLOYMENT TO ALASKA

~~(S)~~ Background. In 1962, CINCAL stated a requirement to replace his F-102's with an improved interceptor. The JCS concurred, and although the F-4 was considered the best replacement, it was not immediately available. To enhance Alaska's interceptor capability, eight F-106's from ADC were added to the Alaskan force in July 1963. The 325th Fighter Wing, McChord AFB, Wash., and the 1st Fighter Wing, Selfridge AFB, Mich., shared the duty of sending a detachment to Alaska on a rotating basis. This temporary deployment plan was called "White Shoes."

~~(S)~~ In June 1964, a USAF study group concluded that an F-102/F-4C combination would best serve the air defense mission in Alaska. The JCS directed continuation of White Shoes until the first quarter of FY 1966 when the F-106's would be replaced by a rotational TAC squadron of 18 F-4C aircraft. The F-102 squadron was to be cut from 44 to 26 aircraft at that time.

~~(S)~~ Shortly after, force guidance from the Secretary of Defense called for deletion of all F-102's from the regular force. This prompted ANR to state a requirement for 28 F-4C's. CONAD backed this requirement and added that the feasibility of providing the F-4C with a nuclear capability should be examined.

~~(S)~~ In December 1964, OSD ordered interceptor force cuts making the F-102 squadron in Alaska the last regular-force F-102 squadron to inactivate (fourth quarter of FY 1967)* White Shoes termination

*(U) See "PLANNED FORCE REDUCTION," NORAD/CONAD Historical Summary, Jul-Dec 1964, p. 68.

was planned for the same time as the arrival of the F-4C squadron in August 1965. In February 1965, NORAD concurred with an ANR request to extend the White Shoes termination date to 1 September 1965 to allow an overlap for change-over routine, and sent the request on to ADC.

~~(S)~~ On 20 July 1965, ADC confirmed that the F-4C squadron would be in place 15 September 1965, and USAF ordered a two-week overlap indoctrination period with a termination date for White Shoes of 30 September 1965.

~~(S)~~ During August 1965, 317th FIS, Elmendorf AFB had decreased to 26 UE. As well, NORAD, ADC and ANR had recommended increasing the F-4C squadron to 28 aircraft when the remaining F-102's were phased out of ANR. The 389th TFS, with 18 F-4C's, deployed to Elmendorf in September, just as USAF advised ADC that over-riding SEA operations would cause temporary suspension of the TAC F-4C rotation to ANR in December 1965. At the same time USAF approved continuation of White Shoes.

~~(S)~~ In September, ADC objected to USAF, to no avail, over the suspension of F-4C rotation and pointed out the added workload on the 325th FW and the 1st FW with the indefinite continuation of White Shoes. A study by ADC had concluded that no one squadron could hold down White Shoes and Phase III dispersal as well, and if Phase III dispersal was deferred while White Shoes went on, the Dispersed Operating Bases would not be fully used. The study proposed that a single squadron not programmed for a DOB be assigned the White Shoes project.

~~(S)~~ During September 1965, AAC confirmed its minimum force requirements:

1. An F-4C rotational squadron to supplement a 26 UE F-102 squadron, or

2. Retention of the 40 UE F-102's and continuation of White Shoes.

AAC also pointed out that with the F-4C squadron in Alaska, it had an operational winter capability from its forward sites not available before with the F-102's and project White Shoes. To retain this capability, AAC requested continued F-4C rotation through April 1966. Should the F-4C's be withdrawn to meet SEA requirements, AAC said it would require continuation of White Shoes and an additional 15 F-102's. In December, TAC's F-4C's were withdrawn from Alaska.

~~(S)~~ ADC did not support AAC's request for an additional 15 F-102's, but agreed to provide a maximum of eight F-102's should circumstances make it necessary. In the meantime, the JCS had requested NORAD's views on providing interceptors from CONUS sources. NORAD stated on 15 November that it did not consider it feasible to allocate more F-102 aircraft to ALCOM from CONUS resources because of proposed FIS reductions, overseas deployments and the ANG interceptor conversion program. Instead, NORAD supported temporary continuation of White Shoes to support cold war operations and to provide an intercept capability against Soviet ELINT flights over Alaskan airspace.

~~(S)~~ At the end of December 1965, ADC and NORAD were jointly studying the subject of ANR interceptor forces. Recommendations were to be made to USAF upon completion of the study.

~~(S)~~ Status. The 1st Fighter Wing took over White Shoes on 30 December 1965. In a message to NORAD on 4 January 1966, the 26th NORAD Region Commander stated that White Shoes placed an undesirable workload on the 1st FW. He explained that with no increase in aircrews, the 1st FW would be required to provide a total of 14 aircraft and aircrews on alert at two bases rather than the 12 required if all aircraft remained at the home station. He said this situation might cause a deterioration in combat effectiveness. In addition, he pointed out that aircrew and aircraft became critically low during

White Shoes rotation periods and had to be considered in determining the alert which could be supported and still conduct essential flying training. He recommended that the aircraft on White Shoes be considered in determining the number of aircraft kept on alert at the home base.

~~(S)~~ On 11 January 1966, NORAD replied that there were many factors, including White Shoes deployment, which contributed to an undesirable workload in meeting the required alert commitment. However, NORAD wanted to make no changes. It pointed out that the region commander could adjust the alert commitment, under the provisions of NORAD Regulation 55-3 (Atch. 3, para. 10) when circumstances required it.

~~(S)~~ On 18 January 1966, ADC also expressed concern over the apparent inequity of alert computation for units supporting the White Shoes deployment and proposed a change to NORADR 55-3. ADC suggested limiting the number of aircraft on home base alert, which, when added to the deployed alert aircraft, would amount to no more than one-third of the unit's total aircraft. NORAD repeated its position that adequate latitude was provided region commanders in adjusting alert. NORAD also said it was conducting a comprehensive study on survivable alert including the overall alert concept and goal, as well as the inequities and problem areas in NORADR 55-3.

~~(S)~~ A review by NORAD on computation of home base alert for units tasked with White Shoes provided a temporary change. In a message to all regions on 11 May 1966, NORAD said that until the White Shoes commitment was resumed by a TAC F-4 rotational squadron, F-106 aircraft deployed to Alaska would be considered in computing the number of aircraft on home base alert.*

*(U) This change was made permanent on 30 September 1966 when NORAD published a revised NORADR 55-3.

(S) In the meantime, on 18 April 1966, ADC outlined to AAC and NORAD a new concept for the support of White Shoes effective 4 May 1966. Essentially, this concept required two F-106 squadrons to share the White Shoes commitment (four aircraft each), rotating every four months. NORAD agreed that the new concept appeared to be a satisfactory and equitable solution to the White Shoes support problem. NORAD felt that a single squadron could not meet the White Shoes commitment and still maintain a combat capability at home base, and that some alert relief for the tasked squadrons would be necessary. However, with approximately 14 aircraft remaining at each home base, they would provide NORAD with only a slightly degraded combat capability at these locations. NORAD concluded that in view of its cold war responsibility in Alaska and the continued Soviet overflight activity, it was essential to support the White Shoes deployment. And, furthermore, that the ADC concept of support would do the job with the least impact on the remaining F-106 capability.

(S) The 317th FIS, Elmendorf, was originally programmed for inactivation in FY 4/1967. On 21 June 1966, USAF told AAC and ADC to take no further action on this proposed inactivation until notified. USAF said that through informal discussions with OSD the 317th FIS would probably be extended until the mission could be assumed by a TAC squadron. On 5 August 1966, the Secretary of Defense approved extending the 317th FIS to FY 1/1969, with the UE to remain at 26 F-102's.

REVISED ALERT REQUIREMENTS

(S) At JCS direction, NORAD had developed an interceptor survivability concept in 1961 that provided for increased survivability through home-base alert and permanent dispersal. A goal of one-third of the interceptor force was established as meeting the survivability requirement. From 1962 through 1964, NORAD had been aware that the one-third home-base alert goal was not being met. It had varied

from 22 to 28 per cent, caused primarily by a shortage of aircrew required to meet all alert and training and UE aircraft shortage due to retrofit and modification programs. Also, the permanent one-third dispersal program had been set back by force reductions and political and monetary considerations.

~~(S)~~ During 1965 and early 1966, ADC and several NORAD regions had expressed concern over apparent inequities in alert computation, and suggested that NORAD revise NORADR 55-3. NORAD, however, had started studying the whole area of survivable alert at the beginning of 1965. The subject remained under study until June 1966 when it was presented to both CINCNORAD and ADC's Commander. The main recommendation was to eliminate DEFCON 5 survivable alert and assign a greater survivable force when an increased state of alert was declared (DEFCON 4). If this proposal was approved, the study group felt most of the chronic ills that had been plaguing the system would be cured.

~~(S)~~ The ADC Commander objected to the proposal on 7 June 1966, so NORAD restudied the subject. On 28 June 1966, NORAD proposed a revision to NORADR 55-3 that did not change either the current readiness concept or the one-third alert goal for fully combat ready squadrons. However, there were some significant changes made. These changes were:

1. A survivable state of alert was added under which interceptors could be on the ground or airborne and need not be armed.

2. A unit had no alert responsibility when it held a C-4 rating.

3. ALFA alert requirement was changed from a percentage to a specific number of aircraft

based on UE authorization.* The number of aircraft required for alert was tied to unit C-status, which recognized factors limiting a unit's capability to provide alert aircraft.

4. Interceptors on ALFA alert could be used for flying training either conventionally armed or unarmed. This latitude was permitted by the increased nuclear armament available and upload capability at dispersed operating bases.

~~(S)~~ NORAD's study was viewed favorably when it was coordinated with the component commands. On 26 August 1966, NORAD notified all concerned to implement the new changes on 1 September 1966. The revised NORADR 55-3 was published on 30 September 1966.

ANG INTERCEPTOR FORCE

CONVERSION TO F-102's

~~(S)~~ Background. The last of the F-86's left the NORAD system on 1 August 1965 when the 196th ANG FIS at Ontario, Calif., started conversion to F-102's. Several other ANG units began conversion to F-102's during this period, and by 1 January 1966, there were 21 ANG Squadrons made up of 380 aircraft. There were 12 F-102 squadrons, two F-100 squadrons and seven F-89J squadrons in Category I augmentation. (Not all of the 12 F-102 Squadrons had completed conversion by 1 January 1966).

---

*~~(S)~~ ALFA alert status was normally associated with DEFCONS 5 and 4. ALFA gave the best balance between the requirements for immediate readiness and training. It provided a survivable force of interceptors and surface-to-air missiles for peacetime policing of NORAD airspace.

~~(S)~~ On 13 July 1965, ADC and the National Guard Bureau (NGB) prepared a program for future F-102 conversions. The program covered unit conversion, aircraft conversion dates, and aircrew and ground crew training schedules. The program also established identical training standards for ANG and regular ADC units. The program had two objectives. The first was to assist the ANG unit to complete conversion within 90 days after getting the twelfth operational aircraft. The second was to attain at least a C-2 rating within 120 days after getting the twelfth aircraft.* The program also made available the facilities at both Perrin AFB and Tyndall AFB throughout the conversion period. The NGB assumed responsibility for the conversion program. However, ADC was to provide personnel to the converting unit to help in ground and flying instructions.

~~(S)~~ Status. On 10 January 1966, ADC sent the following initial F-102 conversion schedule to the NGB:

ANG Unit	Aircraft From	Date
123 FIS Portland	460 FIS Portland	FY 3/66
176 FIS Truax	325 FIS Truax	FY 4/66
178 FIS Fargo	64 FIS Paine	FY 4/66

~~(S)~~ ADC also recommended the continued conversion of the Tucson and Bradley ANG squadrons with PACAF Configuration Seven (Fig 7) F-102 aircraft until Fig 8 F-102's were available.** The extra Fig 7 F-102's from the 460th, 325th, and 64th FIS's were

*~~(S)~~ A C-2 rating is a slightly degraded, but fully combat ready status.

**~~(S)~~ Fig 8 F-102's carried nuclear weapons and had the infrared fire control system. Fig 7 F-102's did not have these capabilities.

distributed among other ANG Fig 7 F-102 squadrons until needed at a later date.

~~(S)~~ All agencies interested in the ANG F-102 conversion program met during the first week of February 1966. USAF, NGB, ADC, SAAMA, OOAMA, OCAMA and NORAD were represented.* It was agreed there would be no problem with F-102 availability except for the shortage of Fig 8 TF-102 aircraft needed by converting ANG units. This shortage was to be closely monitored and Fig 7 aircraft were to be used during the transition phase of training.

~~(S)~~ There were several chronic problem areas pointed out at the meeting, as well as indications of some newer problem areas. They were:

1. Southeast Asia - The planned formation of a squadron in Japan, the extension of a squadron at Clark AFB, and the movement of more F-102 squadrons to SEA, would withdraw two squadrons of Fig 8 F-102's from the ANG conversion program. As well, these moves would drastically reduce the supply of spares and support equipment that had been slated for the ANG.

2. Aerospace Ground Equipment - The major impact of the SEA situation had been the loss of support equipment from approximately three squadrons. ADC had attempted to alleviate this shortage by reducing the 26 UE F-102 squadrons to 18 UE, by retaining compatible F-89J ground equipment after conversion to F-102's, and by attempting to get some surplus AGE when the 4756th Air Defense Wing, Tyndall AFB, Fla., converted to all Fig 8 F-102's. Also, ADC had suggested that USAF move or release F/TF-102 aircraft assigned to AFLC and AFSC. ADC hoped for release of

*(U) SAAMA- San Antonio Air Materiel Area, OOAMA - Ogden Air Materiel Area, OCAMA - Oklahoma City Air Materiel Area.

critical support equipment if the F-102's assigned to these two commands were centrally relocated, or if the two commands might possibly use some other aircraft.

3. ANG Construction Program - The December 1965 OSD reductions of ANG construction funds, and the restriction on the release of the FY 1965 and FY 1966 funds, limited the number of ANG bases capable of nuclear storage to ten and those with alert hangar facilities to five. ADC wanted to place nuclear capable F-102's at ANG bases having nuclear storage facilities.

4. MADPAC - ADC had presented a proposal to USAF for a Mobile Air Defense Package (MADPAC) to provide a highly mobile world-wide air defense team of F-4C's and AEW&C aircraft (the interceptors would be additive to the required CONUS forces). However, F-102's were to be used until F-4C's were available. The concept was for an F-4C equipped wing based at Richards-Gebaur AFB, with aircraft deployed to Key West, Goose Bay, Iceland, and Alaska when required. A decision was required on this proposal as soon as possible so that if it was disapproved or delayed, any additional F-102 aircraft could be made available to the ANG.

5. F-101 Program - F-101's were programmed to begin leaving the active inventory in FY 1968. ADC wanted to retain nine F-101 squadrons for a total force of 29 squadrons at the end of FY 1969 rather than the programmed force of 20 squadrons. ADC and the NGB said if this was approved the F-101's would remain in the active inventory. However, if it was disapproved, an ANG F-101 PCR would be initiated to have the ANG convert to the more advanced F-101's. This would allow the NGB to use its "two man resources." (By "two man resources," the NGB referred to the pilot and radar intercept officer then in five F-89J units.)

~~(S)~~ The participants of the 2 February 1966 meeting decided on the following courses of action:

1. Continue the conversion of the 176th FIS, Truax, Wis., in the F-102 during FY 4/1966.

2. Maintain the five F-89J units, currently scheduled for FY 1967 conversion to F-102's until the decision on the F-101's had been made.

3. Transfer the Paine Fig 8 F-102 aircraft to the ANG pending the final outcome of the ADC MADPAC proposal. These aircraft would be distributed among the present ANG Fig 8 F-102 squadrons. If MADPAC was approved using F-102 aircraft, those aircraft previously assigned to Paine would be returned to ADC.

~~(S)~~ On 12 March 1966, the NGB sent a message to ADC stating a reluctance to continue with the conversion of the 176th FIS, Truax, Wis., because of AGE shortage and the non-availability of Fig 8 F-102's. ADC recommended, on 21 March, continued conversion and urged the NGB to start converting the 176th FIS to Fig 7 aircraft until USAF program changes were finalized. The NGB reluctantly agreed and the 176th was released from its alert commitment for conversion on 31 March 1966. As well, the 152d FIS, Tucson, Ariz., was released from alert on 1 May 1966 for F-102 conversion.

~~(S)~~ When OSD decided to inactivate the 325th FIS, Truax, Wis., on 25 June 1966, ADC proposed to release ten Fig 8 F-102 aircraft to the ANG. This let the 176th convert to Fig 8 aircraft much sooner than had been expected. Efforts were continuing at this time to collect Fig 7 AGE and aircraft for the Fargo and the Great Falls conversions.

~~(S)~~ Another meeting on the ANG F-102 Conversion Program was held at San Antonio Air Materiel Area, (SAAMA), Kelly AFB, Texas, on 12 July 1966. Discussion centered on the severe shortage of AGE,

existing and forecast. A SAAMA study of the projected cost of nine AGE shortages indicated $3.6 million and a nine to 12 month lead time for most of the items. In view of the length of time the AGE would be used, the need to return converting units to an alert posture as soon as possible, and the uncertain availability of AGE from USAF units, the NGB recommended buying the required AGE. From this meeting came the recommendation to buy AGE items that could not be identified and committed to the program to meet ADC conversion requirements of operational capability within 90 days after the conversion date. Funding was to be resolved by USAF.

~~(S)~~ Apparently, thinking changed on converting the F-89J units to F-101's. The meeting resulted in a recommendation to convert the remaining F-89J units to F-102's.* Both the 178th and the 186th FIS's started during the last half of 1966, but had not completed conversion by the end of 1966. The last F-89J units were to convert as follows:

UNIT	DATE
179 FIS, Duluth	15 January 1967
124 FIS, Des Moines	15 April 1967
132 FIS, Dow AFB	30 June 1967

~~(S)~~ During 1966, there were six ANG squadrons

---

*~~(S)~~ The other two F-89J units, 123d and 176th FIS's had started conversion during the first half of 1966. At year's end, the 123d was completed but the 176th was still in the process.

that had completed conversion to F-102 aircraft. They were:

116 FIS, Spokane, IAP, Wash.
118 FIS, Bradley Field, Conn.
123 FIS, Portland IAP, Ore.
134 FIS, Burlington MAP, Vt.
194 FIS, Fresno AFB, Cal.
196 FIS, Ontario AFB, Cal.

These conversions gave NORAD fourteen operational F-102, and three operational F-89J ANG squadrons.

FUNDING FOR NUCLEAR WEAPONS FACILITIES

~~(S)~~ On 13 December 1965, ADC told USAF that the NGB had been advised of major cuts in funds for construction of nuclear storage facilities at ADC/ANG bases. ADC asked for USAF assistance in its proposed reclama because getting on-base nuclear capability for ANG units was vital. On 7 March 1966, ADC requested NORAD support through JCS channels to get OSD approval for construction of ANG facilities. CINCNORAD, in a letter to the JCS on 21 March 1966, expressed his concern over the recent OSD decision regarding construction for ANG air defense units. CINCNORAD restated his support for nuclear armament for all assigned interceptors, including those provided by the ANG. He further stated it was vital that ANG units be provided the facilities to ensure their combat effectiveness, and asked that the JCS support the NGB in obtaining approval and funding for its program.

~~(S)~~ Shortly after this time, USAF asked ADC to amplify the justification for the National Guard construction program. On 28 April 1966, ADC sent USAF the arguments supporting the ANG program. ADC stated that the overall degradation to the ANG F-102 performance, by failing to construct the required facilities, could vary from six per cent to as high as 30 per cent, and that any figure in this range had to be considered substantial.

ADDITIONAL ANG MISSION EVALUATION

~~(S)~~ On 19 July 1966, the Deputy for Reserve and ROTC Affairs, USAF, submitted a memorandum to CSAF that said in part:

> I would appreciate an evaluation of the desirability and feasibility of transferring additional fighter interceptor missions to the ANG. . . . Manning authorizations, manning resources, optimal length of crew tours, response times, sortie rates, and costs are among the factors to be considered.

USAF set up a working group to conduct an evaluation and asked ADC to participate. NORAD was asked to submit its views to ADC before the first meeting.

~~(S)~~ In a letter to ADC on 12 August 1966, NORAD said it would not support transfer of additional interceptor units to the ANG. NORAD's reasoning was that even though Category I ANG units under NORAD operational control contributed substantially to the overall air defense potential, this contribution was an addition and backup to the regular ADC interceptor force. As well, NORAD stressed the many restrictions and limitations in the peacetime use of reserve forces that were not compatible with NORAD's air defense mission. Some of these restrictions and limitations were round-the-clock unit responsiveness, evaluation/exercise participation, and the peacetime control of nuclear weapons.

INTERCEPTOR DISPERSAL

DISPERSED OPERATING BASES

~~(S)~~ The NORAD ADNAC 300N-65 stated that interceptors would be deployed to predesignated dispersal

bases to enhance their survivability and/or as a tactical deployment to initiate early attacks against enemy aircraft. A dispersal base was a recovery or turnaround airfield, other than the home base. The operational capability of a dispersal base was defined as one of four phases: Phase I, Phase II, Phase III (Modified), and Phase III. Phase I was a "turnaround only" capability progressing to Phase III which provided permanent dispersal facilities for a four sortie nuclear capability for six aircraft on high alert.

~~(S)~~ USAF ADC's dispersal plan of January 1964, had listed a requirement for 21 bases in CONUS and nine in Canada. In July 1965, as a result of OSD action, only 17 of the 21 CONUS bases were approved. The program was to develop 16 bases to Phase III and one to a Phase II capability.

~~(S)~~ Dispersal requirements were reappraised by both USAF and ADC during late 1964. When the Secretary of Defense announced the interceptor force cuts in December 1964, ADC sent USAF a proposed dispersal alignment for FY 1966 through 1969. ADC said it needed a minimum of 18 CONUS and two Canadian DOB's for "one squadron/one DOB" dispersal under its future 20 squadron force. In January 1965, USAF approved 17 CONUS bases, and three Canadian Bases were to be negotiated for with Canada.

~~(S)~~ At the end of 1965, there were two Phase III(M), 18 Phase II, and one Phase I dispersal bases in CONUS. During 1966, there were several minor fluctuations in the total number of DOB's, with a gradual build-up from Phase II to Phase III(M). As of 1 January 1967, there were 12 Phase III(M), six Phase II, and one Phase I dispersal bases in CONUS. The following chart shows the monthly status of each CONUS DOB from 1 January 1966 to 1 January 1967.

BASE*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
Siskiyou	II	II	II	II	II	II	II	III	III	III	III	III	III
Walla Walla	II	II	II	II	II	II	II	III	III	III	III	III	III
Stewart	II	II	II	II	II	II	II	II	II	II	II	II	II
Byrd Field	II	III	III	III	III	III	III	III	III	III	III	III	III
Burlington**	II	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
Niagara Falls	II	II	II	II	II	III	III	III	III	III	III	II	III
Clinton	III	II	II	II	II	II	II	II	II	II	II	II	II
Hulman	II	II	II	II	II	II	II	II	II	II	II	II	II
Atlantic City	II	II	II	II	II	II	II	II	II	II	III	III	III
New Hanover	II	II	III	III	III	III	III	III	III	III	III	III	III
Phelps-Collins	II	II	II	II	II	II	II	II	II	II	II	II	II
Olmsted	II	II	II	II	II	II	II	II	II	II	II	II	II
Edwards	III	III	III	III	III	III	III	III	III	III	III	III	III
El Centro	II	II	II	II	II	II	II	II	III	III	III	III	III
Fresno	II	II	II	II	II	III	III	III	III	III	III	III	III
Hector	I	I	I	I	I	I	I	I	I	I	I	I	I
Logan	II	II	III	III	III	III	III	III	III	III	III	III	III
Grand Island***	II	II	II	II	II	II	II	II	II	II	III	NIL	NIL
Reese****	II	II	II	II	II	II	II	II	I	I	I	I	NIL
Volk	II	II	II	II	II	II	II	II	III	III	III	III	III
Patrick	II	II	II	II	II	II	II	II	II	II	II	II	II
Truax	NIL	NIL	NIL	II	II	II	II	II	II	II	II	II	III

*~~(S)~~ The DOBs listed as being in a Phase III state were actually in a Phase III (Modified) state, except for Byrd Field in February 1966. At that time Byrd Field was in a full Phase III state.

**~~(S)~~ The DOB for 49th FIS, Griffiss AFB, was changed from Burlington to Niagara Falls on 8 January 1966.

***~~(S)~~ The Grand Island DOB was dropped from the DOB list when 326th FIS, Richards-Gebaur AFB, inactivated. The 71st FIS, Richards-Gebaur AFB, was to complete an ICI before it would be listed again.

****~~(S)~~ The Reese AFB DOB reduced to Phase I because of a shortage of personnel. It was dropped from the DOB list when the 331st FIS, Webb AFB, inactivated.

USAF STUDY ON DOB's

~~(S)~~ On 21 October 1966, the Assistant Secretary of Defense asked USAF to study the whole subject of DOB's. The Assistant Secretary said permanent, self-contained units, such as detachments at DOB's were costly in terms of personnel, equipment and operating expenses, and put a heavy burden on the parent squadrons. He listed three alternatives:

1. Let the ANG support the requirement.

2. Reduce the size of the detachments to the minimum number of personnel necessary to guard and maintain the ground equipment and weapons.

3. Prestock, at dispersal bases, only bulky items of AGE and POL.

For alternatives two and three during alerts, personnel and some equipment would have to be transported to the DOB's by airlift or surface transportation. The study was to be completed by 31 January 1967, including a cost and personnel summary.

~~(S)~~ USAF staffed the study and asked ADC and NORAD for an input. ADC and NORAD sent the following statement to the study group:

> In planning DOB's, the goal is to have four interceptors continuously dispersed at each of these bases and to have sufficient nuclear weapons and POL prepositioned to support four wartime sorties per aircraft for two-thirds of the squadron UE, (48 wartime sorties for an 18 UE squadron).

On 9 November 1966, NORAD told the JCS that any degradation of DOB capabilities would limit the effectiveness of NORAD forces. NORAD requested a copy of the USAF Study Report so that it could make comments before any decision was reached.

CANADIAN DISPERSAL

~~(S)~~ Background. In December 1964, ADC had stated that a minimum of 18 CONUS and two Canadian DOB's were required for "one squadron/one DOB" dispersal under its future 20 squadron force. USAF approved on 7 January 1965, 17 CONUS and three Canadian bases for future negotiation with Canada. NORAD asked the JCS to help open Canadian dispersal bases negotiations as soon as possible. NORAD felt that two of the CONUS bases were in probable target areas and it wanted two more Canadian bases in Eastern Canada as replacements.

~~(S)~~ ADC agreed with NORAD and advised USAF. USAF stated that the requirement for five Canadian DOB's could not be met, but that four might get approval. ADC and NORAD reluctantly agreed to this proposal on 25 March 1965, and requested negotiations be started to use Namao, Cold Lake, Portage La Prairie, and Val D'Or. With Canada's approval, on 21 April 1965, ADC made site surveys of these bases and sent the results to USAF in May 1965.

~~(S)~~ In July 1965, USAF concurred in the four Canadian DOB locations, construction costs, manpower figures and nuclear weapons requirements. Also, the JCS agreed with NORAD's recommendations and sent them to OSD in November 1965. The Secretary of Defense concurred in the need for DOB's in Canada, but requested more information on new construction and rehabilitation, equipping and annual operating costs, and Canada/U.S. manpower considerations. As well, the Secretary of Defense asked for alternative plans in the event Canada would not agree with the concept of full one-third survivable dispersal with USAF support personnel and nuclear weapons at each base.

~~(S)~~ On 17 November 1965, NORAD concurred with the JCS when it restated the concept as a primary requirement to the OSD. In answer to the OSD request for alternative basing concepts, the JCS gave

three options. Option one was acceptable, but undesirable, and options two and three were unacceptable. These options were:

1. U.S. support personnel at each base, but no nuclear weapons.

2. No nuclear weapons or U.S. support personnel but an agreement to airlift the nuclear weapons and support personnel to the DOB's at DEFCON 1 or at CINCNORAD's discretion and authorized by U.S.-Canadian governments.

3. No U.S. support personnel or nuclear weapons at the DOB's with the dispersal aircraft being supported by Canadians.

~~(S)~~ Status. On 1 June 1966, because of the delay in obtaining approval for dispersal of USAF interceptors to Canadian bases, NORAD informed the JCS of its deep concern in this matter. NORAD pointed out that because of the phase out of squadrons, reductions in UE, collocation of interceptor squadrons with SAC units or command and control facilities, and the steadily increasing Russian ICBM inventory, a significant portion of its interceptors and weapons could be destroyed in a surprise ICBM attack. In case of such an attack, NORAD said, DOB's had been set up in CONUS to enhance the survivability of the interceptors, weapons, and support; however, approval for the Canadian DOB's remained under informal consideration at U.S. and Canadian governmental levels. NORAD pointed out that the Canadian DOB's would provide better tactical locations than either their home bases or DOB's in CONUS. NORAD said further delays would be inconsistent with the effective accomplishment of the NORAD mission, and asked that consultations with Canada be expedited.

~~(S)~~ The JCS shared NORAD's concern and reaffirmed to the Secretary of Defense the need for Canadian DOB's. The Secretary of Defense concurred

and forwarded proposed instructions to be used in obtaining a government-to-government agreement. On 21 June 1966, the State Department and DOD representatives agreed on the instructions and sent them to the U.S. Ambassador in Canada.

~~(S)~~ In September 1966, NORAD discussed the Canadian DOB's with representatives from Canadian Forces Headquarters. The latter were pessimistic about the Canadian government approving continuous peacetime dispersal of USAF interceptors with nuclear weapons in storage at Canadian bases and suggested that NORAD consider a lesser requirement such as dispersal without nuclear weapons. By 5 October, NORAD had reviewed its dispersal objective and still wanted USAF interceptors with nuclear storage at the four Canadian bases. However, if this was not acceptable to Canada, NORAD wanted a Phase II dispersal at Namao, Cold Lake, and Portage La Prairie as an initial step, hopefully toward the achievement of full dispersal. Also, since Val D'Or had nuclear weapons storage, NORAD wanted full Phase III dispersal at that base.

~~(S)~~ At a meeting at Canadian Forces Headquarters on 29 November 1966, NORAD presented an extensive briefing to Canadian External Affairs personnel on various aspects of the interceptor dispersal problem. This Canadian group was to inform the Canadian Cabinet which would then determine if the Canadian government wished to enter into negotiations with the U.S. It was decided that the External Affairs group would present NORAD's position that these bases were essential to NORAD operations. In the event negotiations were refused by the Canadian government, then alternative plans would be initiated by Canadian Forces Headquarters.

TRANSPORTATION FOR DISPERSAL

~~(S)~~ Background. For some time NORAD had been concerned about airlift support for the interceptor dispersal program. ADC had only nine C-54's and 27

C-123's assigned. The major airlift support was to be provided by 154 C-119's from four TAC reserve wings. NORAD and ADC agreed that the reserve wings were not responsive enough because mobilization was involved. In July 1964, NORAD asked the JCS to consider replacing these units with MATS or other regular Air Force airlift units stationed on or near ADC bases. In turn, the JCS asked NORAD to propose a plan.

~~(S)~~ After coordinating with ADC, on 24 November 1965 NORAD sent its draft plan to the JCS. This plan, which would be published as an annex to ADNAC 300N-65, tasked MATS to support NORAD dispersal with augmentation airlift. By proposing to use more surface transportation, coupled with the reduction in interceptor force strength and prestocked dispersal bases, NORAD cut the augmentation airlift requirement from 151 C-119/C-123 aircraft loads to 85 such sorties by the first quarter of FY 1967. NORAD wanted this plan to begin on 1 July 1966.

~~(S)~~ Status. On 21 July 1966, the JCS approved the proposed annex, subject to minor changes recommended by the JCS and the Canadian Defense Staff. The JCS tasked the Commander, Military Airlift Command (MAC), to provide augmentation airlift effective 1 July 1966 to support NORAD during interceptor dispersal operations and associated training exercises.* Direct coordination for planning between NORAD, ADC and MAC was also authorized. Accordingly, at a joint planning conference held at NORAD during 22-26 August 1966, MAC recommended a mix of 23 C-141's, one C-130, and one C-124 aircraft flying multiple sorties and closing at all dispersal bases by dispersal time plus 12 hours. NORAD accepted this recommendation.

*(U) Military Air Transport Service (MATS), was renamed Military Airlift Command (MAC).

(S) Annex U, NORAD Operations Order 300N-65, Dispersal Transportation, was published 30 August 1966. This annex incorporated those changes required by JCS and CFHQ, and outlined specific procedures and responsibilities for NORAD, USAF ADC and MAC.

(S) Also, at the planning conference in August, it had been recommended that a plan be made for using ANG and Air Reserve forces in a backup role for NORAD dispersal should the primary plan not suffice. It was possible that MAC aircraft could be almost totally committed to world-wide tasks which would prevent their use for NORAD dispersal. MAC agreed to study this requirement.

(S) In a message to NORAD on 14 September 1966, MAC said it had coordinated with the Continental Air Command (CAC) for using Air Force Reserve C-124 squadrons in a backup plan, as well as having considered the use of ANG C-97 and C-121 aircraft. This plan (MAC OPLAN 300 ALFA), using Reserve units, was sent to NORAD and CAC in October 1966. NORAD approved this plan, subject to minor changes, on 29 November 1966. CAC was still coordinating the plan at the end of December 1966.

REVISION OF PHASE III(M) REQUIREMENTS

(S) During January and February 1966, ADC was informed by several Air Division commanders that it would be impossible to meet the proposed operational dates for some of the Dispersed Operating Bases due to factors beyond their control. Some of these factors were that key operational facilities were not ready, slippage in the arrival of personnel, and no funds programmed for TDY assistance.

(S) ADC studied the situation and found that heavy withdrawals of skilled personnel in certain key AFSC's for assignment to SEA were having a significant impact on the dispersal program. In view of this, ADC felt that it was necessary to revise the dispersal posture. On 2 March 1966, ADC revised Phase III(M) dispersal requirements, and amended ADC OPLAN 20-65 on 1 April 1966.

~~(S)~~ Here follows a comparison of the revised Phase III(M) and full Phase III capabilities:*

	PHASE III (M)	PHASE III
Weapons	1/2 Sqn allocation of both primary and secondary at DOB (Primary weapons for 48 sorties)	Same
Turnaround Capability	2 aircraft in 15 minutes	6 aircraft in 15 minutes
Alert Aircraft at DOB	2	4
Total War Sorties to be Launched, Recovered and turned around, using PCS detachment Personnel	24	24
Fuel	48 sorties	48 sorties
Initial Weapons Loading Capability	4 aircraft in two hours after BMEWS warning	6 aircraft in two hours after notification
Flying Training of 1 Hour alert aircraft	No flying. Alert aircraft remain loaded	Auth. IAW NORADR 55-3 and ADC OPLAN 20-65 at discretion of commanders concerned
Exercises	Limited duration. No longer than 12 hours without strategic warning augmentation	Periodic. Usually during NORAD evaluations, ORIs and Division exercises

*(U) See Change #3 to Appendix 2, Annex B, ADC OPLAN 20-65, 1 April 1966, for a complete listing of Phase III(M) capabilities.

~~(S)~~ This revision saved about 19 personnel in critical skills for each DOB. Air Force and Division commanders were to establish a Phase III(M) capability at certain DOB's as soon as minimum Phase III(M) personnel, equipment, and facility requirements were met and an Initial Capability Inspection (ICI) satisfactorily completed. Full Phase III capability was to be established at DOB's only after ADC had determined whether personnel manning had stabilized at an acceptable level in critical skills both at home and at dispersed bases.

~~(S)~~ On 7 April 1966, NORAD authorized all regions to deviate from alert/dispersal requirements at those DOB's and home bases where USAF ADC personnel resources were inadequate to support a full Phase III operation.

INTERCEPTOR IMPROVEMENT PROGRAM (IIP)

(S) During the late 1950's the capacity of the Soviet airborne ECM (jamming) systems increased steadily. The ECCM features on the NORAD interceptors became more and more inadequate. In 1960, when USAF was forced to reduce the planned interceptor force, a compromise was made to modernize the current interceptors. Accordingly, the Air Force contracted Hughes Aircraft Company to develop a number of modifications which would improve primarily the ECCM capabilities of the F-101, F-102, and F-106.

~~(S)~~ The ECCM improvements were divided into two blocks for installation. The Block I IIP installation included the Infrared Search and Track System for the F-101, F-102, and the F-106, as well as Anti-Chaff Circuitry and Silent Lobing Antennas for the F-101 and F-106. The Block I IIP was completed in December 1964. The Block II IIP installation included Pulse-to-Pulse Frequency Shift (rapid tuning) radars, and Parametric Amplifiers for the F-101 and F-106. The Block II IIP was completed in December 1966.

IMPROVED MANNED INTERCEPTOR

BACKGROUND

~~(S)~~ One of the most important issues in the anti-bomber defense was the deployment of an Improved Manned Interceptor (IMI).* Development of the IMI concept began in 1959 upon cancellation of the F-108 program. Subsequently, NORAD continually identified a need for the IMI in the annual NADOP and stated its requirements in NQR 4-64, Improved Manned Interceptor, dated 4 December 1964.**

~~(S)~~ In NADOP 1967-76, dated 15 October 1965, NORAD recommended that funds be provided for the initial production of the F-12 in FY 1967 and for 12 squadrons (18 UE) for the U.S. forces and three squadrons (12 UE) for the Canadian forces during the FY 1969-1970 period. The NADOP also recommended the gradual phase out of century series fighters, keeping the best aircraft until the IMI force reached the desired operational capability.

~~(S)~~ USAF was also interested in getting the F-12. In August 1965, USAF asked OSD to increase the RDT&E funds for FY 1966 and for $205.6 million in FY 1967 for continued development and limited procurement of the F-12. In his statement on the 1967 defense budget, the Secretary of Defense said he would allocate $10 million for continuing the F-12 program. During November and December 1965, USAF asked SAC, NORAD, and ADC to back the Secretary

---

*(U) See Historical Reference Paper #6, "NORAD's Quest for NIKE Zeus and a Long-Range Interceptor," 1 July 1962.

**(U) The term "Improved Manned Interceptor" (IMI is a euphemism originally intended to refer to the Lockheed F-12 (A-11) aircraft. There are currently three principle aircraft; the Lockheed F-12, the Convair F-111 and the McDonnell F-4 contending for the IMI role.

of the Air Force in his position to keep the option to produce and deploy the F-12. However, USAF's PCP (#65-66) was disapproved on 11 December 1965.

STATUS

~~(S)~~ NORAD conducted a series of war games to determine the effectiveness of various F-12 force levels. An analysis indicated that a total inventory of 112 F-12 aircraft was enough to counter the bomber threat after 1970. Shortly afterwards, a USAF study called "Blue Lance" resulted in findings that were very similar to NORAD's. In each study, the number of F-12's required to meet comparable threats was essentially the same.

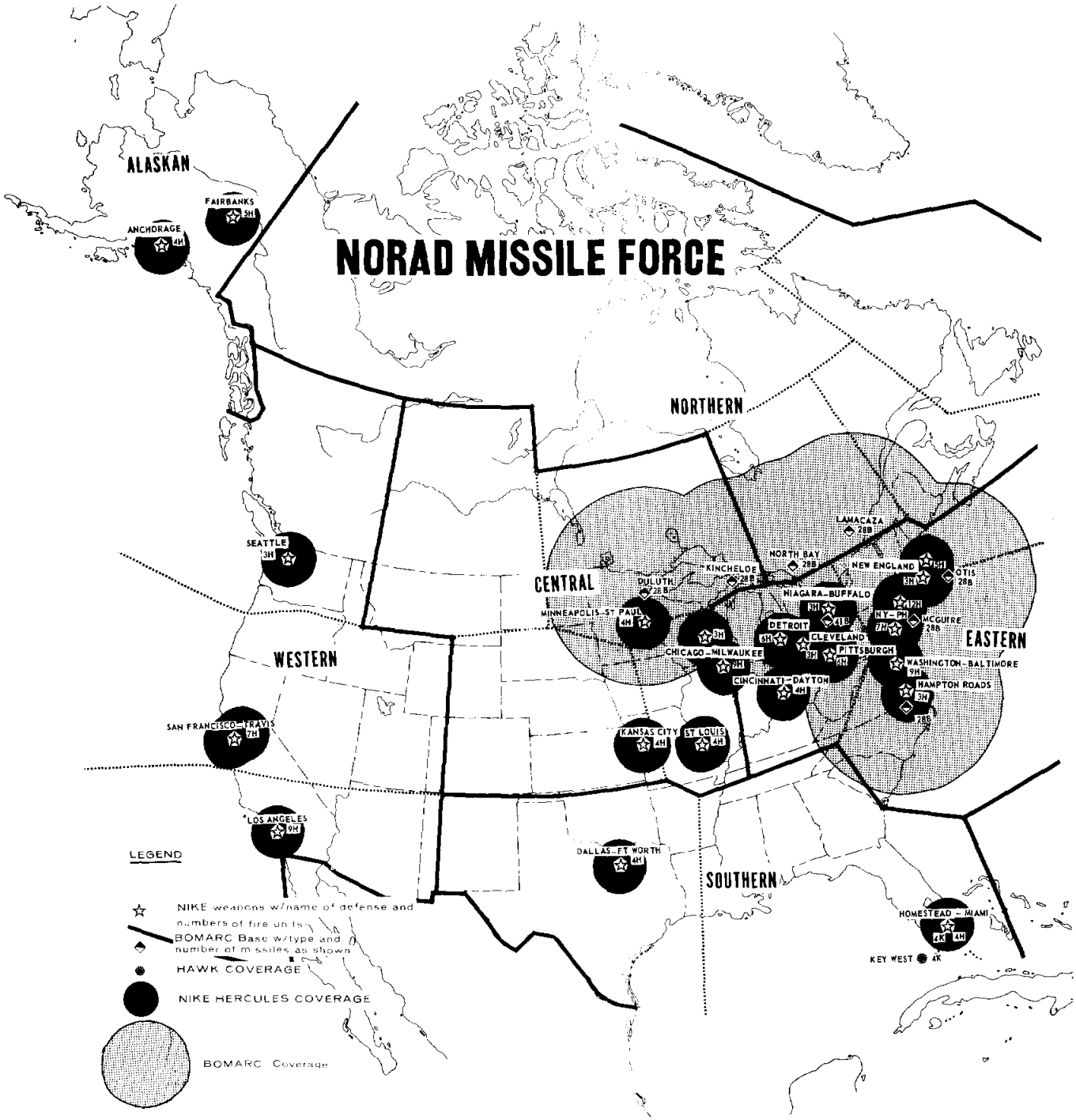
~~(S)~~ On 18 March 1966, CINCNORAD informed the JCS of a new force requirement for 112 F-12's by FY 1976. USAF ADC agreed with CINCNORAD's requirement, but said there might be a need for a more rapid buildup before 1976. ADC based this on the fact that the CANUS threat did not take into account the possibility of the Soviets developing and deploying follow-on supersonic bombers.

~~(S)~~ In NADOP 1969-76, 1 November 1966, NORAD recommended buying the F-12 for deployment starting in 1972, building up to 112 aircraft by FY 1976 for CONUS defense, and two squadrons totaling 30 aircraft for Canada. NORAD recommended keeping the F-101 squadrons as outlined in the required force (phasing out the last three squadrons in FY 1974). NORAD also wanted eight squadrons of F-4's, starting in FY 1969, to augment the existing forces and to replace the F-101's and F-106's in the regular force. This would permit modernization of the ANG with the F-106.

MISSILE FORCE

BOMARC CIM-10B

~~(S)~~ In November 1965, OSD had approved a USAF request for regular Canadian participation in the



BOMARC B Combat Evaluation Launch (CEL) Program.* The program allowed each of the eight BOMARC squadrons (6 U.S./2 Canadian) to process and fire one missile each year. The first 15 missiles to be fired under the CEL Program were to come from the Niagara BOMARC Squadron. This reduction would bring the Niagara Squadron down to the same level as the other squadrons (28 missiles). At the conclusion of this phase, a gradual reduction in the missiles of each BOMARC squadron was anticipated.

~~(S)~~ 447 SAM Squadron, LaMacaza, Que., was scheduled for a launch on 15 March 1966. However, due to three consecutive missile range safety destruct system failures, which prevented missile destruction after intercept, launches were suspended. On 14 February, ADC set up a new launch schedule. This schedule was based on the Ogden Air Materiel Area (OOAMA) being able to come up with a new destruct system in time for the first launch on 26 April 1966.

~~(S)~~ When the 22 ADMS, Langley AFB, was unable to perform the scheduled launch on 26 April 1966, because of a conflict with an upcoming NORAD ORI of the 26th Air Division, the 446 SAM Squadron, North Bay, Ontario, was scheduled to conduct its launch instead. A new destruct system was ready by the end of March and the launch was carried out on 26 April 1966 successfully. Also, the 447 SAM Squadron was scheduled for a launch on 21 June 1966, but the mission was aborted due to telemetry malfunctions. It was re-scheduled for 28 June 1966, and was successful at that time.

~~(S)~~ On 18 July 1966, ADC discontinued using QF-104 drones for these launches because they were

---

*(U) For a description of this program see NORAD/CONAD Historical Summary, Jul-Dec 1964, pp. 77-80.

in short supply and were needed for higher priority projects. This shortage was a result of the improved accuracy of the BOMARC B, to the extent that direct hits had resulted in the loss of several targets on the last few launches.

NIKE HERCULES

~~(S)~~ Since 1962, NORAD had recommended the redeployment of 18 NIKE Hercules units from nine soft SAC bases and four units from Thule AB.* NORAD proposed moving the 22 units to unprotected urban/industrial areas. In May 1965, the Army proposed to delete the 22 Hercules units during FY 1966. At that same time, the JCS recommended to the Secretary of Defense that eight Hercules units be used for USARSTRIKE and Guam requirements and that the rest be inactivated in FY 1966. However, on 8 December 1965, the Secretary of Defense decided to inactivate all 22 units.**

~~(S)~~ On 22 December 1965, the NIKE Hercules fire units (eight total) defending Barksdale, Fairchild, Turner and Robbins AFB's were removed from operational status. On 1 March 1966, the fire units (10 total) defending Loring, Dyess, Bergstrom and Lincoln-Offutt AFB's were removed from operational status.

~~(S)~~ Early in November 1966, ARADCOM was directed by the Army to make a comprehensive review of its NIKE Hercules defenses. This study, which was requested by the Secretary of Defense, was to be reviewed by the JCS prior to submission to DOD. The study was to include recommendations on identification of

---

*(U) For a detailed background, see NORAD/CONAD Historical Summary Jan-Jun 1964, pp. 67-71.

**~~(C)~~ Four units from Thule AB were inactivated 1 June 1965, but their eventual disposition was not decided until 8 December.

sites for deletion, improvement of siting, and other operational adjustments.

~~(S)~~ On 30 November 1966, ARADCOM asked for NORAD war gaming assistance for the study. Two area defense war games were conducted on 20 December, with four to six additional games to be carried out in early 1967. The Army wanted the study by 15 March 1967.

NIKE X

~~(S)~~ Since 1958, NORAD had stated a requirement for Nike-Zeus -- an active Anti-Intercontinental Ballistic Missile System -- in each of its annual objectives plans as one of its primary objectives. From 1960 on, the requirement was NORAD's first priority. However, the Zeus program never advanced beyond the research and development (R&D) stage and the initial employment date of 1962, slipped to 1967.

~~(S)~~ The FY 1963 Army budget provided funds for development of a prototype ZMAR (Zeus Multi-purpose Array Radar), and funds to initiate R&D on SPRINT (the high performance quick reacting missile). At the end of 1962, OSD proposed to cancel further development of the basic Zeus system and proceed with R&D of ZMAR and SPRINT. The JCS rejected the proposal with the concurrence of the Army, Navy, and USAF, although USAF also recommended deferring deployment of the Zeus until its capability was proven by more testing.

~~(S)~~ During 1963, NORAD's most urgent requirement, which still was to obtain an active defense against the ballistic missile threat, was not fulfilled. The prospect of deploying an operational AICBM system in the near future had brightened little over the years, and passive defense measures, such as warning and very limited hardening, were the only operational realities. The road to an AICBM system was mired by technical uncertainties and prohibitive costs.

~~(S)~~ Thinking changed from trying to get a system for launch or mid-course destruction to gaining a terminal destruction capability. In FY 1964, the NIKE Zeus program was replaced by Nike X. The Army's Nike X development plan dated 30 September 1963, was presented to the Secretary of Defense on 6 November 1963. The basic Nike X system consisted of Surveillance Array Radars (SAR's), Multi-function Phased Array Radars (MAR's) Missile Site Radars (MSR's), data processing equipment, and Sprint and Zeus missiles. Initially, deployments developed were designed for a concept of several defended areas. Sophistication of deployment options depended on the size and importance of the area to be defended.

~~(S)~~ By improving the Zeus missile capability and substituting a Tactical Multi-function Array Radar (TACMAR) for the MAR, a less expensive deployment option called the Light Attack Defense Option (LADO), was completed while growth potential to the full Nike X system was retained. A PCP for the LADO was presented to DOD in June 1965 to get preproduction funds in the FY 1967 budget. The Secretary of Defense then asked for an Army LADO deployment proposal.

~~(S)~~ Meanwhile, NORAD published NQR 6-65, 15 July 1965, for a Terminal Ballistic Missile Defense System. In the NQR, NORAD stated that Nike X could fulfill this role. The Army made a Nike X deployment study (DEPEX) and presented a LADO deployment proposal to the Secretary of Defense on 8 October 1965. However, it was disapproved by DOD in January 1966, and the deployment decision was postponed for another year.

~~(S)~~ The Army went ahead with several other deployment studies called Nike X Studies for 1966 (short title: X-66). The studies developed four basic types of deployments for the United States and three each for NATO and Japan. The four CONUS

deployments included:

1. A defense against an early Chinese Communist threat.

2. A defense against a more sophisticated Chinese Communist threat.

3. A defense capable of major damage limiting against the Soviet threat.

4. Hardsite defense of strategic offensive missile forces. (The hardsite defense requirement was later reassigned to a joint Army-Air Force study group).

~~(S)~~ On 9 May 1966, the JCS directed CINCONAD to find out what effects Nike X would have on other military systems. To make this study in the manner prescribed by the JCS, CINCONAD established the CONAD Nike X Impact Task Force (CXTF) on 26 May 1966. Approximately sixty military and civilian specialists were assigned to the CXTF. Maj. Gen. A. G. Salisbury, USAF, replaced Maj. Gen. F. R. Terrell, USAF, on 15 August as Director of the Task Force. The study was to be completed in February 1967.

CHAPTER VIII

TRAINING AND PROCEDURES

OPERATIONAL EVALUATIONS

NORAD ALCOP

~~(S)~~ The capability of the Central NORAD Region Combat Center, at Richards-Gebaur AFB, to perform the NORAD Alternate Command Post mission was assessed in conjunction with Phase I of the MUTE XXI Operational Evaluation of the region on 10-11 October 1966.* In the event that Headquarters NORAD, including its COC and Battle Staff Support Center, were destroyed, damaged, or isolated as a result of enemy attack, natural disaster, or accident, the ALCOP would be activated. The Commander of Central NORAD Region, as Alternate NORAD Commander, would then immediately assume operational control of all NORAD forces.

~~(S)~~ In this evaluation exercise, the CNR Combat Center Battle Staff and associated supporting systems and facilities performed the NORAD ALCOP function satisfactorily. The CNR Commander and the ALCOP staff were provided enough information to effectively monitor all essential elements of the NORAD defense systems. Continuity of control of all NORAD forces was maintained in the recognition, transition, activation, and assumption of operational control by the ALCOP.

---

*~~(S)~~ The NORAD COC was evaluated during Desk Top VIII, Part III, 26 March 1966. See p.145.

NORAD REGIONS

~~(S)~~ The NORAD operational evaluation program was introduced in March 1959 to improve the operational readiness and combat effectiveness of the air defense forces. The design and conduct of NORAD operational evaluations had changed over the years with NORAD trying to depart from a stereotyped exercise to evaluate more areas of interest and to inject a greater degree of realism into the exercise for all levels of command and control. Also, NORAD wanted to duplicate, as realistically as possible, the various options of the threat with the available faker strike force. The exercises were based on special intelligence reports prepared from the NORIP. NORAD attempted to duplicate with live aircraft, the number of bombers, overflights, low levels, Submarine Launched Cruise Missiles (SLCM's) and Air-to-Surface Missile (ASM) carriers indicated as the threat against a particular region. The ICBM, MRBM and SLBM threats were simulated by scripted inputs with accompanying nuclear detonation and battle damage information.

~~(S)~~ Strike approaches into a region and tactics were very carefully planned to insure the best possible use of each type aircraft on each individual strike route. Faker aircraft used were SAC B-52's USAF ADC B-57's T-33's, F-100's CF ADC CF-100's and T-33's. Electronic Countermeasures (ECM) were planned to simulate the Soviet threat. With programmed equipment modifications and the improved ability to obtain frequency clearances, the ECM capability was expected to improve greatly in future exercises. Also, NORAD expected that future exercises would contain new innovations in design and evaluation concepts.

~~(S)~~ During 1966, NORAD conducted five region evaluations. The first, called Mute XVII, was held

in the 32d Region on 27-28 January.* After the NORAD reorganization on 1 April, four other operational evaluations were made: Eastern Region on 22 April (Mute XVIII); Alaskan Region on 9-10 June (Mute XIX); Western Region on 17-18 August (Mute XX); and Central Region on 10-11 October (Mute XXI).**

EXERCISES

DESK TOP VIII/HIGH HEELS V

~~(S)~~ To maintain an integrated and effective force, NORAD had a continuing requirement for exercising the entire command and control, warning and communications system. The Command Post Exercise (CPX) Desk Top VIII was designed to meet this need for FY 1966. Desk Top VIII was a four-part, one-strike war exercise. Each part lasted eight days and had three phases. The first, or pre-battle phase, was a simulated intelligence buildup with a corresponding progressive increase of readiness throughout NORAD over a period of from several days to several hours. Phase II, the air-battle phase, consisted of a single, large-scale, simulated attack against the North American continent, and was based on estimates of Soviet Bloc tactics, materiel and capabilities. The third, or post-battle phase, involving all NORAD elements, began when each region's area was clear of enemy activity. Battle damage was assessed, force deployment reviewed and actions taken to prepare defensive forces for future operations. The reconstitution of forces was not complete in a region until all reports had been submitted to NORAD.

---

*~~(S)~~ Mute was the nickname used to identify NORAD operational evaluation exercises. These evaluations were conducted for each region approximately every 15 months.

**(U) For details on the NORAD reorganization on 1 April 1966, see Chapter I.

~~(S)~~ There were two general objectives laid down for Desk Top VIII. The first was to exercise region to region and region to headquarters interaction with particular reference to the redeployment of forces. The second was to exercise procedures of command and control.

~~(S)~~ During Desk Top VIII, Part I, from 8-16 November 1965, the general objectives of the exercise were met. Particular emphasis had been placed on exercising the Battle Staff Support Centers, and results from this area indicated complete success.

~~(S)~~ Desk Top VIII, Part II, lasted from 8-15 December 1965. Results proved that general objectives had been met. Two regions had experienced heavy degradation due to ICBM and SLBM targeting of radar sites and primary and secondary air bases, which left them little capability to conduct a realistic air battle. However, the simulated damage and communication outages gave an opportunity to exercise interceptor dispersal procedures and associated support elements.

~~(S)~~ Part III of Desk Top VIII was conducted 8-15 February 1966. An operational evaluation of the underground NORAD Combat Operations Center (Group III) took place on 15 February 1966 in conjunction with Part III. The results pointed out that Part III had provided an excellent training environment under stress conditions. However, the NCOC operational evaluation was hindered by repeated, prolonged computer failures. The Group III NCOC did not have an operational capability equal to the Group I (the above-ground operational COC) at that time, so a second evaluation was arranged for 26 March 1966.

~~(S)~~ This second operational evaluation had two objectives. First, to evaluate the capability of the Group III NCOC (less the Space Defense Center) to provide specialist support to CINCNORAD in the areas of intelligence, operations, missile warning, logistics and damage analysis, communications and electronics, electronic countermeasures reporting

and information displays. Secondly, to evaluate the capability of the Group III NCOC to provide the NORAD ALCOP with sufficient preparatory information for the assumption of NORAD command.

~~(S)~~ Desk Top VIII, Part III, was repeated, lasting from 19-26 March. There was a seven-day intelligence buildup with the air battle/post battle phase lasting for eight hours on 26 March. The exercise covered all of the NORAD command, control, warning and communications systems and proved to be an excellent base for determining the Group III COC capability. In all areas evaluated, the Group III NCOC demonstrated an operational capability at least equal to the Group I facility.

~~(S)~~ During 12-24 October 1966, the Joint Chiefs of Staff conducted a large-scale command post exercise called High Heels V. NORAD ran Part IV of Desk Top VIII concurrent with and as an integral part of High Heels V. This was the first time these exercises were ever held at the same time. The thinking was to conduct a NORAD-wide CPX in conjunction with a JCS world-wide CPX to enable commanders at all echelons to exercise plans and procedures for air defense under conditions up to and during general war operations. It was planned to make this merger permanent if this first effort was successful.

~~(S)~~ The exercises had the same key inputs and simulated defense conditions. A basic politico-military situation was developed through a chain of incidents that escalated into general war. Exercise results proved that NORAD forces provided reaslistic support to the JCS and national authorities. Results also showed realistic exercise of agreements, plans, and procedures that required coordination with other CINC's and between NORAD component commands or NORAD regions and other commands of the separate military services and/or appropriate federal agencies.

~~(S)~~ NORAD found that concurrent play of High Heels and Desk Top had little effect at lower (division) levels. Though results showed a tendency of prolonged

periods of inactivity during the exercise, NORAD felt that the benefits of a merger far outweighed the disadvantages.

TOP RUNG

~~(S)~~ Beginning in September 1960, NORAD had conducted three consecutive annual large-scale exercises called Sky Shield. The primary purpose of these was to exercise the entire air defense system against a mass attack on the North American Continent, within an ECM environment. To permit unrestricted use of ECM, all non-participating civil and military traffic in Canada and the U.S. was grounded during the exercises. SAC furnished most of the attacking force. NORAD had planned to run Sky Shield IV in August or September 1963, but SAC did not want to participate. SAC preferred the SAC/NORAD program for region exercises which, it said, gave its crews better training and was more realistic than Sky Shield.* The JCS agreed with SAC and cancelled Sky Shield IV. The original annual exercise plan had been for one command-wide, large-scale exercise (Sky Shield), and three semi-large-scale exercises named Top Rung. When Sky Shield IV was cancelled, an additional Top Rung exercise was substituted. Since that time, Sky Shields have not been held, but Top Rungs have been conducted quarterly instead.

(U) During 1966, Top Rungs were NORAD/SAC exercises for giving maximum air defense training in an ECM environment to the entire NORAD system within an exercise area. As well, they were used to examine and improve specific aspects of air defense operations. In providing a strike force of between 85 and 90 aircraft, SAC's primary objective was to exercise and evaluate penetration tactics and equipment.

*(U) See NORAD/CONAD Historical Summary, Jan-Jun 1963, pp. 72-74, for more detail.

~~(S)~~ Four Top Rung exercises were conducted during 1966: Top Rung XI on 3-4 February for what is now Central NORAD Region; Top Rung XII on 6 May for Western and Alaskan Regions; Top Rung XIII on 5 August for Eastern and Northern Regions; and Top Rung XIV on 4 November for Central and Southern Regions.

SNOW TIME

~~(S)~~ Background. NORAD and SAC signed a Joint Test Agreement on 6 October 1960 for ECM/ECCM testing. This agreement established policies and procedures for operational testing of weapons systems of both commands. It was agreed that SAC would initiate action to get funds for the ECM equipment, and NORAD would take action to get funds for the data collection and analysis facilities. NORAD sent funding letters to ADC and ARADCOM on 10 March 1961 for future ECM/ECCM testing after the completion of the Deep River program.* ARADCOM supported the NORAD requirement but ADC disagreed with it. However, ADC said it would ask for funds if NORAD strongly supported the follow-on evaluation program. At a funding meeting on 1 May 1961, NORAD said it wanted the follow-on effort as well as ADC support of the program. ADC then forwarded the NORAD requirement to USAF on 5 June 1961, with recommendations for funding.

~~(S)~~ A SAC/NORAD Coordinating Conference was held at NORAD on 8-10 August 1961. Agreements were established between the two commands on a test directive and a plan that would determine the effectiveness of the air defense system under various modes of operation, tactical situations and ECM conditions. About this time, a nickname was given

*~~(S)~~ Deep River was a series of tests conducted in 1960 and 1961 on SAGE/Missile Master Integration and SAC/NORAD ECM/ECCM capabilities.

to the proposed SAC/NORAD Operational Weapons Tests Involving Military Electronics, and it was called SNOW TIME. During the latter part of September 1961, USAF approved funding for the SAC ECM equipment, and proposed delivery by July 1962. Meanwhile, USAF funding for NORAD follow-on testing was still being processed.

~~(S)~~ In October 1961, SAC and ARADCOM restated to both ADC and USAF that SNOW TIME was essential to get vitally needed data for area defense tactics and degradation factors. ADC was still somewhat reluctantly backing NORAD's testing requirement, so NORAD and ARADCOM met with ADC on 12 December 1961 to discuss and resolve command differences. NORAD agreed to drop its concept of testing for one of training, exercise and evaluation. As agreed at the meeting, SAC, ADC, and ARADCOM gave NORAD their detailed requirements, and NORAD was to establish the framework of the future program around them.

~~(S)~~ Progress slowed down during the first half of 1962 because of disagreement over manpower and funding requirements. Finally, SAC agreed to submit the manpower and funding requirements for the SNOW TIME effort while ADC was to provide the air defense environment and qualified manpower to fill the spaces requested by SAC. In June 1962, SAC, supported by NORAD, asked USAF for funds and manpower for the SNOW TIME program.

~~(S)~~ SAC, ADC, ARADCOM and NORAD met in July 1962, to establish an in-house instrumentation and data collection capability for SAC and ADC, and to develop estimates for funds and personnel. The results of this meeting indicated that technical instrumentation and sophisticated data collection would be necessary. SAC revised the funding requirement to include this task and submitted it to USAF. In line with the above meeting, and with a view to reducing the contracted analysis effort to a minimum, and thus the overall costs of the SNOW TIME program, SAC and NORAD made an evaluation of certain aspects of exercise Double Eagle, on 19 July 1962, and Sky

Shield, on 2 September 1962. By this effort, they hoped to pinpoint problem areas inherent in an in-house analysis of large scale evaluations. This small evaluation effort proved to be invaluable in preparing the SNOW TIME test plan.

~~(S)~~ The SNOW TIME Exercise Plan, written jointly by SAC and NORAD and coordinated with ADC and ARADCOM, was approved by USAF in June 1963. The Joint Operations Task Force (JOTF), which was to coordinate the whole SNOW TIME effort, was established on 1 July 1963. SAC and NORAD were jointly responsible for the management of SNOW TIME. The JOTF was responsible for the design and conduct of specific missions, while the executive agency for policy was the Joint Policy Committee (JPC).* In August, representatives from SAC, ADC, ARADCOM and NORAD met with the JOTF and the JPC to prepare SNOW TIME Operation Order 1-64. SNOW TIME I was planned for the 26th Region on 13 September 1963, but was cancelled due to poor weather. However, SNOW TIME II was conducted in the 30th Region on 25 October 1963.

~~(S)~~ NORAD wanted to evaluate the ECCM Standard Operating Procedures (SOP's) that were in use throughout the command and proposed that SNOW TIME III and the evaluation portion of Top Rung II be designed to provide penetrations in which essentially identical profiles and ECM tactics and procedures were used. The idea was to allow free use of ECCM fixes and techniques during SNOW TIME III, and deny the use of the fixes and techniques during Top Rung II. A comparison of the results would then permit an evaluation of NORAD's ECCM SOP's. NORAD's request was approved by the JOTF and this procedure was added to the exercises on a permanent basis.

---

*(U) SAC, ADC, ARADCOM, and NORAD were represented on both the JOTF and JPC.

~~(S)~~ In the first few exercises, realism was degraded by flight safety restrictions and by the incompatibility between SAC ECM configurations and the NORAD radar environment. Special measures were taken to alleviate most of these deficiencies. Problems in maintaining positive target control (PTC) were solved by devising and testing new procedures in the PTC area.* Tests were conducted during SNOW TIME VI and VII on 1 May and 5 June 1964 with results proving that targets could be positively controlled. This allowed the use of interceptors during SNOW TIME.

~~(S)~~ Status. Four SNOW TIME exercises, XVI through XIX, were planned for 1966. SNOW TIME XVI, scheduled for 18 March in the Duluth NORAD Sector and Chicago-Milwaukee area, was cancelled due to weather. SNOW TIME XVII was conducted in Western NORAD Region on 2 June. In the latter, NORAD wanted maximum intercepts throughout the 26th and 27th NORAD Divisions to evaluate the BUIC II system in an ECM environment, and to investigate air defense artillery effectiveness in NORAD Modes I and IVB. The penetration force consisted of 28 SAC bombers. Penetration tactics satisfied SAC and NORAD objectives in the two divisions, while ARADCOM's objectives were satisfied by a penetration of the San Francisco and Los Angeles defenses.

~~(S)~~ SNOW TIME XVIII was conducted 9 September in Eastern NORAD Region. NORAD scheduled maximum intercept activity throughout the test area and a concentrated ECM effort against FPS-27 radars. At the same time, an ALRI effectiveness test in an ECM environment was made. ARADCOM's objectives were satisfied by a penetration of the Hampton Roads and Washington-Baltimore defenses.

*(U) For background on the Positive Target Control Program, see NORAD/CONAD Historical Summary, Jul-Dec 1964, pp. 84-91.

(U) SNOW TIME XIX was run on 1 December 1966. Preliminary reports indicated that all objectives were met.

~~(C)~~ During October 1966, the JOTF conducted a study on the whole SNOW TIME area. Revisions to the SNOW TIME Exercise Plan, reflecting the results of this study, were sent to SAC, ADC, ARADCOM and NORAD on 23 November 1966 for approval.

~~(S)~~ The Joint Policy Committee met on 21 December 1966 and revised two areas of SNOW TIME and Top Rung exercises. First, it revised the concept for scheduling and planning the two missions, which increased the role of the JOTF in this area. Secondly, a new numbering system for SNOW TIME/Top Rung missions was approved. This system was based on the fiscal year, number of the particular SNOW TIME or Top Rung exercises during that year, and the training area in which the missions took place.

SNOW TIME ANALYSIS

~~(S)~~ SNOW TIME reports were compiled after each exercise by the JOTF. In these reports, the JOTF pointed out that SNOW TIME results did not represent the offensive capability of SAC's forces or the defensive capability of NORAD and its components. Data in the reports were summarized for the participating commands in the format they desired.

~~(S)~~ From its inception, NORAD and SAC planning for SNOW TIME tests had looked forward to getting "cause and effect" analysis by using mobile instrumentation vans. This was not realized through SNOW TIME XIX. Partial analysis had been completed by NORAD on the data from the first 12 exercises, while only manual screening took place on exercises XIII to XIX. SAC and NORAD had proposed that instrumentation vans could be sent to selected long range radar sites within the sector being tested to provide video tape recording capability, spectrum analyzers, and certain other types of recorders. These vans were to give a real time record of actions and playback

capability. All data collected was to be designed for machine manipulation.

(U) In 1963, SAC tried to get the vans but was turned down by USAF because of lack of funds. However, SAC continued to justify funding for these devices. In 1965, SAC asked that FY 1966 funding for the vans be included in those for SAC testing under the Air Force Weapons Effectiveness Testing (AFWET) program. SAC asked for $1.9 million to buy the vans, data processing equipment and radar interfacing equipment. Again, it was not funded by USAF.

(U) Also, in May 1965, ADC's QRC for an instrumentation van for its Defense Systems Evaluation Squadron was turned down by USAF, with the recommendation that it be resubmitted as a Qualitative Operational Requirement (QOR). In July 1965, NORAD tried to add emphasis to SAC's efforts by pointing out the many similarities between the SNOW TIME vans and ADC's radar evaluation van, and proposed that an ADC/NORAD position be sent to USAF. In August, ADC said it fully supported the SAC/NORAD requirement, but wanted a separate van fot its own use because of data collection and deployment differences. ADC sent a QOR to USAF in November 1965 for a mobile instrumentation van for radar evaluation but it did not specifically support SNOW TIME requirements.*

(U) On 11 February 1966, ADC and SAC submitted their test requirements for the FY 1967 AFWET program. Included was the SNOW TIME requirement for instrumentation and data processing support. To support these requirements, NORAD sent messages to the JCS and USAF on 21 February, strongly recommending their assistance and approval. In the

*(U) The Air Staff was completing a feasibility study on ADC's QOR at the end of 1966.

messages, NORAD said there was an immediate need for a minimum of five mobile vans to collect data from the basic type radars in the SAGE/BUIC environment. NORAD said SNOW TIME tests were the only means available to test the SAGE/BUIC system against a realistic ECM threat.*

~~(S)~~ USAF told NORAD, on 8 March 1966, it had asked the Electronic Compatibility Analysis Center (ECAC) to see if ECAC could support the SNOW TIME program. By 23 April 1966, ECAC developed proposals for the analysis of SNOW TIME/Top Rung data. The proposals involved extensive analysis and computer data processing operations, some of which would have to be done by the combat commands. Also, ECAC said it was necessary to establish SAC/ADC/NORAD requirements and analysis capabilities before it would agree to a supporting role.

~~(S)~~ At a meeting at USAF on 17-18 May 1966, it was determined that NORAD did not have the capability to support the ECAC system model. However, it was agreed that the instrumentation, data reduction and analysis effort required for the model was an urgent requirement. USAF directed AFSC to study the situation to determine the design specifications. This study began in June 1966, but was plagued with delays because of higher priority projects for AFSC and ECAC. At the end of 1966, the study was still not completed.

~~(C)~~ During the latter part of 1966, NORAD reviewed its general objectives in the SNOW TIME Plan and its analysis procedures. NORAD planned

---

*(U) To help in its continuing effort to obtain instrumentation and data processing support for SNOW TIME, NORAD began work on an NQR in February 1966. However, it was not completed by the end of 1966.

a change in test design to get an effectiveness comparison of the principal defense functions (detection, tracking, etc.) as ECM and defense procedures were varied. Areas of degradation were to be pointed out, and an indication of a limited overall defense capability would be given. ADC agreed to give NORAD computer assistance for the detailed analysis of SNOW TIME data beginning in April 1967. NORAD planned to analyze all SNOW TIME exercises eventually, and then compile the results.

ECM SIMULATOR/EVALUATOR SYSTEM

~~(S)~~ With the phase out of the SAC EB-47 ECM force (fourth quarter FY 1965) that had provided most of NORAD's ECCM training, NORAD's concern increased about facilities for ECCM training and evaluation of its forces. NORAD was left with the Active Countermeasures Trainer which was originally designed for the manual radar system, not the automated (SAGE/BUIC) radar environment.

~~(S)~~ ADC had submitted a Qualitative Operational Requirement (QOR) for an ECM simulator in 1963. USAF rejected it because of the high cost. In 1964, ARADCOM submitted a Qualitative Military Requirement (QMR) for a simulator system to the Army. The QMR was returned in November 1964 for additional justification and re-costing.

~~(S)~~ NORAD felt that any system sought by USAF should be compatible with the ARADCOM version. ARADCOM, ADC and NORAD met in January 1965 and tentatively agreed on a position on the simulator system. After this meeting, NORAD worked on an NQR for an ECM Simulator/Evaluator system stressing a combined service approach to joint training through simulation methods. Meanwhile, ADC became greatly concerned with the decreasing numbers of aircraft available for ECCM training and submitted a request for three prototype ECM simulators to USAF on 19 April 1965. ADC expanded this request to a full QOR

for ECCM Evaluator/Trainers on 4 May 1965, which USAF sent on to the JCS. NORAD sent its joint NQR 4-65 for simulators to the JCS on 10 May 1965.

~~(S)~~ On 23 June 1965, the JCS said they wanted the NORAD NQR jointly examined by the Army and Air Force to see if a single simulator/evaluator could be developed that would meet NORAD specifications.

~~(S)~~ At USAF's request NORAD held a conference on 5-6 August 1965. During this conference, the Air Force Systems Command asked the Army and Air Force to participate in engineering meetings at Wright-Patterson AFB to examine more closely the technical and cost requirements of a joint device. After these meetings, the Army and Air Force felt they both had a valid, urgent requirement for an ECCM Simulator/Evaluator system. They believed it was possible, but not suitable to develop a joint single item of equipment. Also, savings in both time and money would result if separate, but coordinated, development was pursued. On 21 September 1965, ADC recommended to USAF that the Air Force proceed with a prototype and development program. Before starting production ADC said the Air Force and Army should again examine the feasibility of joint production and procurement.

~~(S)~~ On 11 January 1966, USAF told AFSC to proceed with development. USAF also recommended compression of the proposed schedule and that the Army and NORAD be given an opportunity to review the trainer specifications in the preliminary and final stages. Request for proposals on development and testing of two prototype simulators were mailed to 36 interested contractors. Of the eight contractors that responded, three were selected to compete in final contract negotiation. The R&D contract was to be awarded in early January 1967.

SCATANA PLAN

(U) On 29 January 1965, NORAD sent a final draft Security Control of Air Traffic and Air

Navigation Aids (SCATANA) plan to the JCS for approval and promulgation.* A Canadian draft plan had progressed also and both plans were expected to be put in force by mid-1965.

(U) On 28 July 1965, NORAD asked the JCS for information on the current status of the final draft plan. NORAD said the Canadian SCATANA Plan was about ready for publication and pointed out the desirability of having the two national plans implemented simultaneously. The JCS replied on 5 August that in accordance with their recommendations, OSD had coordinated the plan with FCC. The JCS also said the DOD Advisory Committee on Federal Aviation forwarded the draft plan and FCC comments to the FAA for coordination on 29 July 1965.

(U) The U.S. plan was signed by DOD/FAA/FCC in September 1965, with an effective date of 1 April 1966. The Canadian plan was signed by the Department of National Defence/Department of Transport in November 1965 and also had an effective date of 1 April 1966. NORAD Regulation 55-2, "Security Control of Air Traffic and Air Navigation Aids," dated 1 April 1966, was distributed in early April 1966. The classified annexes (A & B) had been distributed on 21 March 1966.

---

*(U) For complete background on SCATER/SCATANA, see NORAD/CONAD Historical Summary, Jul-Dec 1964, pp. 83-84.

GLOSSARY

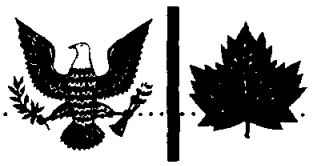
(Reverse Side Blank)

GLOSSARY OF ABBREVIATIONS

AAC	Alaskan Air Command
A/C/M	Air Chief Marshal
ACR	Alaskan Communications Region
ADAD	Air Defense Artillery Director
ADCSP	Advanced Defense Communications Satellite Program
ADFG	Automatic Doppler Filter Gating
ADMS	Air Defense Missile Squadron
ADNAC	Air Defense North American Continent
ADR	Automatic Digital Relay
ADW	Air Defense Wing
AEW&C	Airborne Early Warning and Control
AFLC	Air Force Logistics Command
AFSC	Air Force Systems Command
AFWET	Air Force Weapons Effectiveness Testing
AGE	Aerospace Ground Equipment
AICBM	Anti-Intercontinental Ballistic Missile
ALCOP	Alternate Command Post
ALCOM	Alaskan Command
ALRI	Airborne Long Range Input
A/M	Air Marshal
ANG	Air National Guard
ANR	Alaskan NORAD Region
ARNG	Army National Guard
ASM	Air-to-Surface Missile
AUTODIN	Automatic Digital Network
AUTOVON	Automatic Voice Network
AWACS	Airborne Warning and Control System
BAS	Bomb Alarm System
BIRDIE	Battery Integration and Radar Display Equipment
BMEWS	Ballistic Missile Early Warning System
BNCC	BUIC NORAD Control Center
BUIC	Back-up Intercept(or) Control
CAC	Continental Air Command
CADIN	Continental Air Defense Integration North
CANUS	Canada and United States
CC^3P	Consolidated Command Control and Communications Programs

CEIP	Communications-Electronics Implementation Plan
CEL	Combat Evaluation Launch
CF ADC	Canadian Forces Air Defense Command
CFHQ	Canadian Forces Headquarters
CFCS	Canadian Forces Communications System
CIIC	Current Intelligence Indications Center
CMCMO	Cheyenne Mountain Complex Management Office
CNR	Central NORAD Region
COC	Combat Operations Center
CONUS	Continental United States
CPX	Command Post Exercise
CSN	Canadian Switching Network
CXTF	CONAD NIKE X Impact Task Force
DATOS	Detection and Tracking of Satellites
DC	Direction Center
DCA	Defense Communications Agency
DCS	Defense Communication Service; Defense Communications System
DCS/. . .	Deputy Chief of Staff/. . .
DDR&E	Director Defense Research and Engineering
DEFCON	Defense Readiness Condition
DEPEX	NIKE X Deployment Study
DIA	Defense Intelligence Agency
DIP	Display Information Processor
DND	Department of National Defence (Canada)
DOB	Dispersed Operating Base
DOT	Department of Transport (Canada)
ECAC	Electronic Compatibility Analysis Center
ECCM	Electronic Counter Countermeasures
ECM	Electronic Countermeasures
ELINT	Electronic Intelligence
ENR	Eastern NORAD Region
ESD	Electronic Systems Division
ESS	Electronic Solid State Switch
FAA	Federal Aviation Agency
FCC	Federal Communications Commission
FD	Frequency Diversity
FIS	Fighter Interceptor Squadron
FOC	Full Operational Capability

FW	Fighter Wing
HF	High Frequency
IAP	International Airport
ICBM	Intercontinental Ballistic Missile
ICI	Initial Capability Inspection
ID	Identification
IDCSP	Interim Defense Communications Satellite Program
IDHS	Intelligence Data Handling System
IIP	Interceptor Improvement Program
IMI	Improved Manned Interceptor
IOC	Initial Operational Capability
IR	Infrared
IWD	Intelligence Watch Division
JOTF	Joint Operations Task Force
JPC	Joint Policy Committee
JTD	Joint Table of Distribution
LADO	Light Attack Defense Option
MAC	Military Airlift Command
MADPAC	Mobile Air Defense Package
MADRE	Magnetic Drum Receiving Equipment
MAR	Multi-Function Phased Array Radar
MATS	Military Air Transport Service (now MAC)
MEECN	Minimum Essential Emergency Communications Net
MITRE	Massachusetts Institute of Technology Research and Engineering (Corporation)
M&O	Manpower and Organization
MRBM	Medium Range Ballistic Missile
MSR	Missile Site Radar
NADOP	North American Air Defense Objectives Plan
NAS	National Airspace System
NAWS	NORAD Attack Warning System
NBC	Nuclear, Biological and Chemical
NBCWRS	Nuclear Biological Chemical Warning and Reporting System
NCC	NORAD Control Center
NCMC	NORAD Cheyenne Mountain Complex



NCOC	NORAD Combat Operations Center
ND	NORAD Division
NGB	National Guard Bureau
NGCI	NORAD Ground Control Intercept (station)
NMCC	National Military Command Center
NNR	Northern NORAD Region
NORIP	NORAD Intelligence for Planning
NQR	NORAD Qualitative Requirement
NUDETS	Nuclear Detonation Detection and Reporting System (477L)
NXPO	NIKE X Project Office
OPLAN	Operation Plan
ORI	Operational Readiness Inspection
OSD	Office of the Secretary of Defense
OTH	Over the Horizon
PAGE	Primary Automated Ground Environment
PCP	Program Change Proposal
PCR	Program Change Request
PD	Passive Defense
POL	Petroleum, Oil and Lubricants
PM	Policy Memorandum
PSPP	Proposed System Package Program
PTC	Positive Target Control
QOR	Qualitative Operational Requirement
QMR	Qualitative Military Requirement
QRC	Quick Reaction Capability
RA	Regular Army
R&D	Research and Development
ROTC	Reserve Officers Training Corps
SAGE	Semi-Automatic Ground Environment
SAR	Surveillance Array Radars
SCAN	Switched Circuit Automatic Network
SCATANA	Security Control of Air Traffic and Air Navigation Aids
SDC	Space Defense Center
SEA	Southeast Asia
SLBM	Submarine Launched Ballistic Missile
SLC	Side Lobe Cancellor
SLCM	Submarine Launched Cruise Missile

SM	Staff Memorandum
SNOW TIME	Code name for SAC/NORAD Operational Weapons Tests Involving Military Electronics
SOP	Standard Operating Procedure
SPADATS	Space Detection and Tracking System (NORAD)
SPASUR	Space Surveillance (Navy)
SPERD	System Performance Demonstration
SPO	System Project Office
SSB	Single Side Band
SURTAC	Surveillance and Tactical Teletype Network
TACMAR	Tactical Multi-Function Phased Array Radar
TCU/ASTRA	Threshold Control Unit/Azimuth Strobe Tracking
TFS	Tactical Fighter Squadron
TRACE	Transportable Automated Control Environment
TSCP	Tactical Satellite Communication Program
UE	Unit Equipment
USAFSS	United States Air Force Security Service
VLF/LF	Very Low Frequency/Low Frequency
WGR	Western Ground Electronic Engineering Installation Agency Region (AFLC)
ZMAR	Zeus Multi-Function Phased Array Radar

(Reverse Side Blank)

INDEX

(Reverse Side Blank)

INDEX

REFERENCES

(Reverse Side Blank)

REFERENCES

Chapter One

1. Msg., JCS to NORAD, JCS 009476, 21 Apr 1 (3 X 51).

2. M/R, NPSD-C, "(U) NORAD/ADC Planning for Single Integrated Space Defense Center (20 May 1965 (51).

3. Msg., NORAD to JCS, NPMO X019, 12 May 19 (3 X 51).

4. NORAD to JCS, "(U) Request for Manpower Authorizations," 8 Jun 1965 (3).

5. Msg., JCS to NORAD, JCS 003991, 21 Jan 6 (3 X 51).

6. NORAD to JCS, "(U) Priority Request for power Authorizations," 1 Jun 1965 (3).

7. NPMO, Wkly Act Rpt, 14 Jun 1965.

8. NORAD to JCS, "(U) Request for Manpower Authorizations," 8 Jun 1965 (3).

9. NORAD to CDS, "(U) NORAD Manpower Requi 7 Jul 1965 (3 X 51).

10. Wkly Act Rpt, NPMO, 2 Aug 1965.

11. NORAD to SAC, "(U) NORAD Liaison Office Assigned to Hqs SAC," 8 Feb 1965 (3); 1 (SAC to NORAD, "(U) NORAD Liaison Offic to Headquarters SAC," 20 Feb 1965), NOR 4 Mar 65 (3); NOOP, Wkly Act Rpt, 14 Ju

Researcher Beware

All documents referenced here are dated 1965. This is a 1966 history of CONAD/NORAD. Note there are no footnote numbers in the text. I believe these citations have no relevance to the text. Why they were inserted is a mystery.

R. Kipp

12. ADC to CONAD, "(U) ADC Reorganization" 17 Mar 1965 (5).

13. DF, NPAP to Staff, "(U) ADC Reorganization/ Reconfiguration," 23 Mar 1965 (5); Briefing, F/L R. Ford, NPMO, 8 Apr 1965.

14. Briefing, F/L R. Ford, NPMO, 8 Apr 1965; NOOP, Draft, NORAD Op Order 334N-65, "(U) FY 66 Reorganization and Reconfiguration of NORAD," 1 Sep 1965 (656).

15. NORAD to Regns, "(U) FY 1966 Combat Center and Direction Center Phase Outs," 14 Apr 1965 (4 X 54).

16. USARADCOM to DA, "(U) ARADCOM Reconfiguration," 7 Apr 1965 (6).

17. Interview with Col J. O. Herstad, ADGC, 19 Aug 1965.

18. Msg., JCS to NORAD, JCS 006759, 10 Mar 1965 (4 X 3).

19. Msg., NORAD to JCS, NPMO X-15, 30 Mar 1965 (3 X 4).

20. Interview with Maj E. W. Claridge, NPMO, 19 Aug 1965.

21. Msg., NORAD to 25th, 26th, 29th, 30th and Northern Regions, NPMO 061, 30 Sep 1964 (4).

22. Msg., NORAD to 25th, 26th, 29th, and 30th Regions, NPMO 004, 28 Jan 1965 (4); Msg., NORAD to NNR, NPMO 003, 28 Jan 1965 (4).

Chapter Two

1. NOPS, (U) Quarterly Report of NCMC Implementation Progress, 30 Jun 65 (51).

2. NORAD to Sec Def, "(U) Quarterly Report of NCMC Implementation Progress," 7 Jul 1965 (51).

3. Msg., USAF to ADC, AFOCCCB 63181, 13 Apr 1965 (51 X 57).

4. NORAD to JCS, "(U) Data Processing Requirements for Cheyenne Mountain," 12 Feb 1965 (51).

5. Msg., CSAF to AFSC, ADC, AFRDDD 97269, 24 Mar 1965 (51).

6. NPSD, Wkly Act Rpt, 9 Apr 1965.

7. Quarterly Report of the NCMC Implementation Progress, NOPS, 30 Jun 1965 (51).

8. ADC to NORAD, "(U) NORAD Space Defense Center Implementation Plan," 15 Dec 1964 (51).

9. NORAD to ADC, "(U) NORAD/CONAD Space Defense Center Implementation Plan," 12 Jan 1965 (228 X 51).

10. OSD, (U) Report of the Ad Hoc Working Group on DOD Space Detection, Surveillance, Tracking and Data Processing, March 1965.

11. Ibid., xix.

12. NORAD to ADC, "(U) NORAD/CONAD Space Defense Center Design," 3 Mar 1965 (51 X 228).

13. Msg., JCS to NORAD, JCS 009476, 21 Apr 1965 (51).

14. Msg., NORAD to JCS, NPSD X048, 12 May 1965 (51); Msg., NORAD to JCS, NPMO X019, 12 May 1965 (51).

15. Msg., JCS to NORAD, JCS 004173, 26 Jan 1965 (51.2).

16. Ibid.

17. NPSD, Wkly Act Rpt, 5 Mar 1965.

18. NECO, Wkly Act Rpt, 2 Apr 1965.

19. NPSD, Wkly Act Rpt, 18 Jun 1965; NORAD to USAF ADC, "(U) NORAD ALCOP," 21 Jul 1965 (51.2).

20. Msg., AAC to USAF, ALG 00173, 2 Jul 1965 (55).

21. ADC to NORAD, "(U) Air Defense Ground Environment," 25 Jan 65, w/1 atch, ltr ADC 21 Jan 65 (54.1 X 302.1); Memo for Gen Latta, "(U) Air Defense Ground Environment, BUIC III," 26 Jan 1965 (54.1 X 302.1).

22. Msg., USAF to ADC, AFOXPN 93115, 10 Mar 1965 (54.1).

23. Msg., ADC to CCDSO, ADLPC 01342, 19 Apr 1965 (54.1).

24. Interview with Maj W. D. Balser, ADLPC, 27 Aug 1965.

25. Msg., 28 NR to NORAD, et al, 28NRPP 48000, 24 Jun 1965 (52).

Chapter Three

1. NECO, Wkly Act Rpt, 19 Mar 1965.

2. ADC to AT&T, "(U) AT&T's Proposal for Switching SAGE/BUIC Services," 22 Mar 1965 (57 X 54.1 X 58).

3. NECO, Wkly Act Rpt, 9 Apr 1965.

4. Msg., DCA to NORAD, DCA 350/2139, 3 May 1965 (57).

5. Interview with Lt Col K. J. Sarchet, NECO, 9 Sep 1965.

6. Ibid.

7. NECO, Wkly Act Rpt, 12 Mar 1965.

8. NECO, Wkly Act Rpt, 9 Apr 1965.

9. ADC to CFH, "(U) NORAD/ADC Switching CADIN Area," 5 May 1965 (57).

10. NORAD to ADC, "(U) Alert Warning System (NAWS)," 12 Apr 1965 (251).

11. AT&T to ADC, 18 May 1965, Atch to ADC to NORAD, "(U) NORAD Alert Warning System (NAWS)," 26 May 1965 (251).

12. 1st Ind (ADC to NORAD, 26 May 1965 (251)), NORAD to ADC, 8 Jun 1965 (251).

13. NORAD to ADC, "(U) NORAD Alert Warning System (NAWS)," 16 Apr 1965.

14. Msg., ADC to USAF, ADOAC-CE 02258, 2 Jul 1965 (251).

15. NORAD to ESD, "(U) NORAD Survivable Low Frequency Communications System," 9 Apr 1965 (57).

16. NECO, Wkly Act Rpt, 4 Jun 1965.

17. NORAD Qual Rqmt for Communications Satellite System, (U), 11 Jan 1965 (57).

18. NECO, Wkly Act Rpt, 19 Mar 1965.

19. NECO, Wkly Act Rpt, 2 Jul 1965.

20. ADC to NORAD, "(U) COMSAT Requirements," 26 Apr 1965 (57).

Chapter Four

1. ADC to NORAD, "(U) Seaward Extension of DEW Line and Contiguous Barriers," 30 Dec 1964 (302.12 X 307).

2. Memo, Maj, Ulacia to Col. Prewitt, "(U) Loss of BARPAC, GIUK, and Picket Ships," 30 Mar 1965 (302.1 X 307); USAF to ADC," (U) Evaluation of Control Environment," 17 Mar 1965 (302.1).

3. DF, NOPS to NAPA, et al., "(U) Phase-Out of Navy AEW&C Aircraft and Picket Ships on Barriers and Seaward Extensions," 30 Jun 1965 (307 X 302.12); Msg., CINCPACFLT to NORAD, "(U) Navy AEW Aircraft and Picket Ships," 16 Feb 1965 (307 X 302.12).

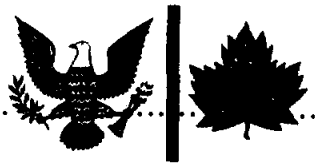
4. Msg., NORAD to AIG 952, et al., NNPA 016, 19 Feb 1965 (307 X 302.12).

5. Msg., NORAD to AIG 952, et al., NOOP-E X12-464, 23 Dec 1964 (302.12 X 307); Msg., 28 NR to NORAD, 28NROP-P X0029, 22 Jan 1965 (302.12).

6. NORAD to 25 NR, et al., "(U) Testing of AEW&C Employment Concepts," 14 Jun 1965 (302.12)

7. NORAD to ADC, "(U) ALRI Capabilities," 2 Jun 1965 (302.12); Msg NORAD to AIG 952, et al., NOOP-E X6-274, 21 Jun 1965 (302.12).

8. Msg., as in n.7.



9. ADC Control & Warning Equipment Report (ADC-V24), 31 Mar 1965, p. 9 (302.1).

10. NPSD, Wkly Act Rpt, 12 Feb 1965.

11. Msg., CSAF to ADC, AFXOPN 84215, 9 Feb 1965 (54.1 X 302.1).

12. Msg., ADC to CSAF, ADLDC 00562, 19 Feb 1965 (302.1 X 54.1).

13. Memo, Col. Prewitt to Gen. Latta, "(U) Phase-out of Long Range Radars," 23 Apr 1965 (302.1); Msg., ADC to 25 AD, ADLPC-A 02315, 9 July 1965 (302.1).

14. NEEC, Wkly Act Rpt, 21 May 1965.

15. ADC Control & Warning Equipment Report (ADC-V24), 28 Feb 1965, p. 1; 31 Mar 1965, p.1; and 30 Jun 1965, p. i (302.1).

16. Msg., ADC to Det 8, 4608 SPT Sq, ADOTT-C 00459, 11 Feb 1965 (302.1).

17. Msg., CSAF to ADC, AFXOPN 95671, 18 Mar 1965 (302.1).

18. ADC Control & Warning Equipment Report (ADC-V24), 31 Mar 1965, p. 2 (302.1).

19. Msg., ADC to CSAF, ADLPC 03911, 10 Dec 1964 (250 X 302.1).

20. Msg., CSAF to ADC, AFSSSCD 81555, 29 Jan 1965 (302.1).

21. ADC to USAF, "(U) Height Finder Requirements Study," 1 Apr 1965 (302.1).

22. Ibid.

23. USAF to ADC, "(U) Height Finder Requirement Study," 16 Apr 1965 (302.1 X 202).

24. Ibid.

25. Ibid.

26. ADC to USAF, "(U) Height Finder Requirements Study," 10 May 1965 (302.1 X 202).

27. USAF to ADC, "(U) Height Finder Requirements Study," 24 May 1965 (302.1 X 202).

28. Msg., ADC to CSAF, ADLPC 02238, 1 Jul 1965 (302.1).

29. ADC to NORAD, "(U) Height Finder Requirements Study," 29 Apr 1965 (302.1 X 202).

30. Msg., CANFORCEHED to NORAD, XSA3, 3 Mar 1965 (308).

31. Msg., NORAD to CANFORCEHED, NOOP-E X-3-156, 5 Mar 1965 (308).

32. CANFORCEHED to NORAD, "(U) Mid-Canada Line," 29 Mar 1965 (308); Msg., CANFORCEHED to CANCOMDGEN, XDIS887, 1 Apr 1965 (308).

33. Msg., NNR to NORAD, et al., NRPPR 12, 5 Apr 1965 (308).

34. ADC to NORAD, "(U) DEW Line Contingency Operations," 22 Apr 1965 (306).

35. ADC to USAF, "(U) DEW Line Contingency Operations," 2 Jun 1965 (306).

36. NORAD to ARADCOM, et al., "(U) NQR for Passive Detection and Tracking Capability in Non-Automated Environmental Areas," 16 Feb 1965 (150); DF, NPAP to NASV, NHCS, "(U) NQR for Passive Detection Capability in Non-Automated NORAD Environmental Areas," 23 Mar 1965 (302.1 X 150).

37. NORAD to JCS, "(U) Passive Detection and Tracking Capability in Non-Automated NORAD Ground Environmental Areas," 30 Mar 1965 (302.1 X 150).

38. USAF to AFSC, "NORAD QOR for a Passive Detection Capability in Non-Automated NORAD Ground Environment Areas NQR 3-65," (U) 14 Jun 1965 (302.1 X 150).

Chapter Five

1. Interview with Capt. J. F. Robinson, NPSD, 16 Sep 1965.

2. NORAD to JCS, "(U) Sea-Launched Ballistic Missile (SLBM) Line-of-Sight Radar Communications Support System," 10 May 1965 (233 X 57).

3. Ibid.

4. Memo, Gen. Wise to C/S, "(U) Brief on JCS action on NORAD Space Surveillance Requirements," 18 Feb 1965 (228); NPSD, Wkly Act Rpt, 9 Apr 1965.

5. NPSD, Wkly Act Rpt, 7 May 1965.

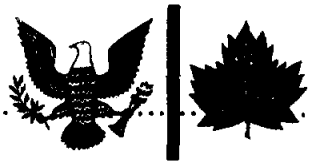
6. NPSD, Wkly Act Rpt, 11 Jun 1965

7. NPSD, Wkly Act Rpt, 23 Jul 1965.

8. CANFORCEHED to NORAD, "(U) SPADATS Program: Baker-Nunn Camera, Cold Lake - PARL, Prince Albert," 18 Feb 1965 (228).

9. Ibid.

10. NORAD to CANFORCEHED, "(U) Canadian Participation in Space Surveillance," 12 Mar 1965 (228).



11. Ibid.

12. Ibid.

13. Msg., CANAIRDEF to CANFORCEHED, T114, 16 Jun 1965 (228).

14. Msg., DCA to CSA, et al., DCA 314.2/2349, 17 May 1965 (226 X 57); New York Times, 11 Apr 1965, E 7.

15. Msg., ADC to DCA, ADOAC-CO 01548, 5 May 1965 (226 X 57).

16. ADC to DCA, "(U) BMEWS Communications Test Via EARLY BIRD," 22 Jun 1965 (226).

17. Interview with Lt Col G. E. Anderson, NOOP-S, 22 Sep 1965.

Chapter Six

1. JCSM 153-65 (This document was released by CONAD to NORAD on 8 March 1965 by Lt Col Cundiff, NIPO).

2. DF, NPSD-E to NPSD, "(U) Trip Report," 28 May 1965 (250).

3. Ibid.

4. NPSD, Wkly Act Rpt, 30 Apr 1965; Msg., CSAF to ADC, AFOCCB 79847, 16 Sep 1965.

Chapter Seven

1. NORAD Forces Summary, 1 Jun 1965, p. 3-7 (718B).

2. NORAD Forces Summary, 1 Jul 1965, p. 3-7 (718B).

3. Msg., ADC to CSAF, ADODC 01880, 28 May 1965 (420).

4. As in N. 2.

5. Ibid.

6. Interview with Maj. R. R. Safford, NOOP, 17 Aug 1965.

7. Interview with Lt Col R. Dow, NOOP, 13 Aug 1965.

8. NORAD Forces Summary, 1 April 1965, p. 3-12 (718B).

9. As in n. 1.

10. As in n. 2.

11. Msg., ADC to NORAD, ADOOP-W1 01064, 30 Mar 1965 (403).

12. ADC SO G-44, 12 May 1965 (420).

13. Interview with W/C J. H. Gillmore, NOOP, 13 Aug 1965.

14. NORAD/CONAD Historical Summary, July-December 1964, p. 72.

15. As in n. 6.

16. ADC to NORAD, "(U) ANG F-102 Conversion Program," 17 March 1965 (430.3).

17. ADC to NORAD, "(U) ANG Air Defense Alert Program FY 66," 21 Jun 1965 (430.3).

18. Interview with W/C J. H. Gillmore, NOOP, 19 Aug 1965.

19. Ibid.

20. Msg., ADC to USAF, ADLDC 00621, 25 Feb 1965 (420).

21. Msg., NORAD to USAF, NPPP X002, 1 Mar 1965 (420).

22. Msg., USAF to NORAD, AFXOPM 92332, 8 Mar 1965 (420).

23. Msg., ADC to USAF, ADLDC 01006, 25 Mar 65 (402).

24. Msg., NORAD to USAF, NPPP X006, 25 Mar 65 (402).

25. Msg., USAF to ADC, AFXOPN 65603, 21 Apr 1965 (420).

26. Msg., ADC to USAF, ADLPP 02321, 8 Jul 1965 (420).

27. Ibid.

28. Msg., USAF to ADC, AFOAPD 86130, 12 Jul 1965 (420).

29. As in note 18.

30. DF, NLOG to NOPS, NPPP, "(U) Augmentation Airlift to Support Dispersal," 22 Dec 1964 (420).

31. NORAD to ADC, "(U) Transportation Requirement to Support Dispersal," 9 Feb 1965 (520).

32. NORAD to JCS, "(U) NORAD Airlift Requirements," 28 Jan 1965 (420).

33. ADC to NORAD, 1st Ind to letter in Note 31, 18 May 1965 (420).

34. Interview with W/C J. H. Gillmore, NOOP, 23 Aug 1965.

35. Interview with Maj. W. R. McIver, NLOL, 23 Aug 1965.

36. NORAD to ADC, "(U) Transportation Requirements to Support Dispersal," 14 Jul 1965 (420).

37. As in n. 35.

38. Msg., ADC to USAF, ADOOP-WM 00840, 15 Mar 1965 (503); Msg., ADC to USAF, ADOOP-WM 01252, 13 April 1965 (503);Msg, 4751 AIRDEFSQ to USAF, 475100P-FT 11001, 19 Jun 1965 (512); Msg., ADC to 73AIRDIV, ADOOP-WM 02240, 30 Jun 1965 (512).

42. As in n. 7.

43. DF, NPPP to NPPA, "(U) NIKE Hercules Redeployment," 8 Jan 1965 (502).

44. Interview with Lt Col L. E. Martin, NPPP, 18 Aug 1965.

45. Ibid.

46. Memo, Wise to C/S., "(U) Disposition of NIKE Hercules Units," 14 Jun 1965 (503).

Chapter Eight

1. NOOP, Wkly Act Rpt, 12 Mar 1965.

2. Ibid.

3. Interview with Maj J. T. Manning, ADLPW, 27 Aug 1965.

4. Interview with Lt Col R. J. Yeasley, NOOP, 25 Aug 1965.

5. Ibid.

6. Memo, Wise to C/S, "(U) NORAD Qualitative Requirement for an Aerospace System Simulator/Evaluator," 15 Jul 1965 (151).

7. NORAD to JCS, "(U) NORAD Qualitative Requirement for an Aerospace System Simulator/Evaluator," 12 May 1965 (151).

8. As in Note 6.

9. Msg., USAF to NORAD, AFPTRD 86137, 12 July 1965 (151).

10. Msg., NORAD to USAF and DA, NPSD-E 071, 22 Jul 1965, (151).

11. ADC to NORAD, "(U) AIMS Working Group Meeting," 8 Apr 1965 (200).

12. ADC to NORAD, "(U) MK XII IFF Installation Priority Rationale," 3 May 1965 (201).

13. NORAD to ADC, "(U) MK XII IFF Installation Priority Rationale," 22 Apr 1965 (200).

14. NORAD to ADC, "(U) Concept of Operations, MK XII IFF," 22 Apr 1965 (200).

15. NORAD to ADC, "(U) DOD AIMS SPP Coordination," 4 Jun 1965 (201).

16. NORAD to CDS, "(U) MARK XII IFF," 6 May 1965 (200).

17. CDS to NORAD, "(U) MARK XII IFF," 31 May 1965 (200).