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Declassified
per NJ3 Memo, 4Sep96

# NORAD/CONAD

# HISTORICAL SUMMARY

(Unclassified)

UNCLASSIFIED

JULY-DECEMBER 1965

[redacted]

[redacted]

[redacted]

N6-3803-9

[redacted]

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**NORTH AMERICAN AEROSPACE DEFENSE COMMAND**

22 APR 1997

MEMORANDUM FOR N/SPHO

FROM: N/J3

SUBJECT: Declassification Review of NORAD/CONAD Histories

1. The following NORAD/CONAD histories were reviewed for downgrading/declassification:

a. NORAD/CONAD History, Jan-Jun 60: Document is downgraded to Unclassified except for pages 37-39, topics "Uniform Readiness Questions," and "Alaskan Readiness Conditions." Remains Confidential/Rel CANUS.

b. NORAD/CONAD History, Jul-Dec 60: Document is downgraded to Unclassified except pages 45-50, topics "Background," Site I, Thule, Greenland," Central Computer and Display Facility," Site 2, Clear, Alaska," Site 3, Fylingdales, England," and "Need for an Improved Warning System." Remains Confidential/Rel CANUS.

c. NORAD/CONAD History, Jan-Jun 64: Document is downgraded to Unclassified except:

(1) Page 57, para entitled "Background on Tracker for Site II" through end of paragraph. Remains Secret/Rel CANUS.

(2) Page 57, last para starting with "*(S) BMEWS..." through end of para "...65 degrees." Remains Secret/Rel CANUS.

d. NORAD/CONAD History, Jan-Jun 65: Entire document is downgraded to Unclassified.

e. NORAD/CONAD History, Jul-Dec 65: Entire document is downgraded to Unclassified.

2. Please refer any questions to Maj Hodges, N/J3WS, 4-6920.

G. KEITH McDONALD
Major-General, CF
Director of Operations

[redacted]

**NORTH AMERICAN AEROSPACE DEFENSE COMMAND**

[redacted]

05 Sep 96

PAD

MEMORANDUM FOR HQ NORAD/PAX (MR JOHNSON)

FROM: HQ NORAD/HO

SUBJECT: History Declassification Review

1. References:

a. Ltr (U), Mr. Hans M. Christensen, re: NORAD/CONAD Jul-Dec 65 History Declassification, 14 May 96. (Atch #1)

b. SSS (U), HQ NORAD/PA, "Classification Review," 26 Jun 96. (Atch #2)

c. Memorandum (U), HQ NORAD/J3, "History Declassification Review [Jul-Dec 65]," 4 Sep 96. (Atch #3)

d. NORAD/CONAD History (S), Jul-Dec 65.

2. Per your request, the NORAD/J3 directorate has reviewed the NORAD/CONAD Jul-Dec 65 history and determined that "no items were found that are still considered classified." Based upon this review, J3 recommends (and HO agrees) that the entire document should be declassified and released by JS.

3. Time spent by J3 staff to conduct review: 3 hours. Time spent by HO to process/copy documents: 2 hours.

4. Please provide a copy of the signed JS declassification/release letter to NORAD/HO for retention. Please refer any questions to the undersigned or Dr. Fuller at 4-5999/3385. Thanks in advance for your assistance.

JEROME E. SCHROEDER
Asst Historian

4 Atch
1. Ltr (U), Mr. Hans M. Christensen, re: NORAD/CONAD Jul-Dec 65 History Declassification, 14 May 96.
2. SSS (U), HQ NORAD/PA, "Classification Review," 26 Jun 96.
3. Memorandum (U), HQ NORAD/J3, "History Declassification Review [Jul-Dec 65]," 4 Sep 96.
4. NORAD/CONAD History (S), Jul-Dec 65.

(U)

[redacted]

[redacted]

*FOR THE COMMON DEFENCE* *POUR LA DEFENSE COMMUNE*

[redacted]

[redacted]

[redacted]

[redacted]

**NORTH AMERICAN AEROSPACE DEFENSE COMMAND**

4 SEP 1996

MEMORANDUM FOR HQ NORAD/HO

FROM: HQ NORAD/J3

SUBJECT: History Declassification Review

1. A review of the Historical Summary, Jul-Dec 1965 (Tab 2) has been completed. No items were found that are still considered classified. ~~Recommend~~, Per Executive Order 12958, the entire document may be downgraded to unclassified.

2. Refer any questions to my Historical Officer, Major Hodges, N/J3WS at 4-6920.

G. KEITH McDONALD,
Major-General, CF
Director of Operations

1 Attachment:
Historical Summary, Jul-Dec 1965

Hans M. Kristensen
2315 Huidekoper PL., N.W.
Washington, D.C. 20007
Phone: 202-342-9422 / Fax: 202-965-5664
E-mail: hkristensen@igc.apc.org

10 May 1996

FOIA #: 96-49h

U.S. Army Center of Military History
Freedom of Information Act Request
FOIA: SPR/D
1099 14th Street, N.W.
Washington, D.C. 20005

Dear FOIA manager:

This is a request under the federal Freedom of Information Act, 6 USC 552, as amended. I request copies of the following:

* North American Defense Command and Continental Air Defense Command, Command Public Affairs Office, Directorate of Command History, "NORAD/CONAD History Summary, January-June 1965," 1966. Catalogued in U.S. Army Center of Military History as 7-6 AA Jan-Dec 65 (S). JUL 122 pages

Through this request, I am gathering information on subjects of current and ongoing interest to the public. As an author and consultant to non-profit organizations (e.g., Greenpeace International) and the mass media (e.g., Danish daily Jyllands-Posten), I have both the experience and ability to disseminate information to the general public. I am a co-author of the *Neptune Papers* monograph series, several in-depth studies and reports as well as numerous articles on military and foreign affairs issues, most of which draw heavily on original documents obtained under the Freedom of Information Act.

As an author and representative of the news media I understand I am only required to pay for the direct cost of duplication after the first 100 pages. However, FOIA permits the waiver of search and copy fees where the release of information will solely be used to contribute to public understanding of the operations of the government, and the request is non-commercial. I request therefore that any applicable fees be waived. If you decline to waive fees under this request or on appeal, I am willing to pay all reasonable costs for the processing of this request.

Even in the event the information requested is currently and properly classified, I request that you release all segregable portions (unclassified and for official use only) pending further review. I also ask that you exercise your discretion to disclose any records if, as DOD 5400.7-R states, "no governmental interest will be jeopardized by the release..." As you know, an agency cannot rely simply on the markings of a document to deny its release. In order that a document be withheld under Exemption 1, it must be reviewed and found to be in fact properly classified pursuant to both procedural and substantive criteria found in the Executive Order. This requires an actual, substantive review of the materials.

I appreciate very much your help in obtaining this information and look forward to hearing from you within 10 days, as the statute requires. If you have any questions regarding this request, please feel free to call me at 202/342-9422, or communicate via fax (202/965-5664) or E-mail at hkristensen@igc.apc.org. Thank you in advance for your assistance.

Sincerely,

Hans M. Kristensen.

atch 1 39

# Staff Summary Sheet

| | To | Action | Signature (Surname), Grade, Date | | To | Action | Signature (Surname), Grade, Date |
|---|---|---|---|---|---|---|---|
| 1 | HO | COORD | | 2 | NJ3 | COORD | |

| Grade and Surname of Action Officer | Symbol | Phone | Suspense Date |
|---|---|---|---|
| Mr. Johnson | PAX | 4-3714 | 30 Sept 96 |

| Subject | SSS Date |
|---|---|
| Classification Review | 26 June 1996 |

**Summary**

1. PURPOSE. To have HO research and NJ3 review five NORAD/CONAD Histories (all over 30 years old) for possible declassification and public release.

2. DISCUSSION. Mr. Hans M. Kristensen, an author from the Washington, D.C. area, submitted a request (Tab 1) for classification review and possible release of five NORAD/CONAD Histories.

3. History Office. Please research and provide copies of histories to NJ3 for classification review and possible downgrading for public release.

4. Director of NORAD Combat Operations. As one of the command classification/declassification authorities, please have a responsible individual(s) in your directorate (e.g. security manager, subject experts, etc.) review the histories (when provided by HO) page-by-page, line-by-line for possible downgrading and public release. Declassification review should be conducted using DOD Directive 5200.1 - Information Security Program, and applicable classification guides (if any) that would pertain to these particular histories. Again, these histories are over 30 years old and the information contained is quite probably obsolete and/or outdated.

RECOMMENDATION. NJ3 provide classification review and written comments to Mr. Johnson, plans/policy officer, (4-3714), not later than 31 July 96.

ROBIN A. ALFORD
Major, CF
Deputy Director of NORAD PA

Tab
Initial Request Package

atch 2

[redacted]

# NORTH AMERICAN AIR DEFENSE COMMAND AND CONTINENTAL AIR DEFENSE COMMAND

# HISTORICAL SUMMARY

JULY-DECEMBER 1965

1 MAY 1966

DIRECTORATE OF COMMAND HISTORY
SECRETARY, JOINT STAFF
HEADQUARTERS NORAD/CONAD

[redacted]

(This page is Unclassified)

## DISTRIBUTION

| | | |
|---|---|---|
| Chief of Defence Staff | 8 | |
| CINCLANT | 1 | |
| CINCPAC | 1 | |
| CINCSAC | 1 | |
| CINCSTRIKE | 1 | |
| CONARC | 1 | |
| RCAF ADC | 3 | |
| ARADCOM | 3 | |
| USAF ADC | 1 | |
| NORAD Regions (except NNR) | 3 | each |
| NNR | 5 | |
| NORAD Divisions | 1 | each |
| Hq NORAD | 41 | |
| | 100 | |

REDISTRIBUTED BY HQ NORAD

| | |
|---|---|
| NHCR | 1 |
| NHDC | 1 |
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| 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 |
| NHMO | 1 |
| NELC | 1 |
| NPAM | 1 |
| NCOC | 1 |
| NHCH | 22* |

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

# FOREWORD

This historical summary is one of a series of semiannual reports on the North American Air Defense Command and the Continental Air Defense Command. These summaries bring together in a single document the background and progress of key activities of NORAD/CONAD. The purpose of these reports is twofold:

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

Secondly, they preserve for all time the record of NORAD/CONAD activities.

1 May 1966

D. C. STROTHER
General, USAF
Commander-in-Chief



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# SUMMARY OF THE FORCES

## (AS OF 1 JANUARY 1966)

(U) (S) INTERCEPTOR FORCE

Regular:

38 Squadrons, 688 Aircraft

| Type | F-101 | F-102 | F-104 | F-106 | CF-101 |
|---|---|---|---|---|---|
| No. | 15 | 5 | 2 | 13 | 3 |

Augmentation (Category I):

21 ANG Squadrons, 380 Aircraft

| Type | F-89 | F-100 | F-102 |
|---|---|---|---|
| No. | 7 | 2 | 12 |

(U) (S) MISSILE FORCE

8 Bomarc B Squadrons - 238B Missiles, 238 Launchers
83 RA Hercules Fire Units, 48 ARNG Fire Units - 1977 Missiles, 1311 Launchers
8 RA Hawk Fire Units - 288 Missiles, 48 Launchers

(U) (S) SURVEILLANCE AND CONTROL

Surveillance:

Long Range Radars: 177
Gap Filler Radars: 89
ALRI Stations: 4 off East Coast (EC-121H acft.)
AEW&C Stations: 1 off Key West (EC-121D acft.)
5 off West Coast (EC-121D acft.)

DEW Line
Land Based 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; Tracker Radar (Prince Albert, Sask.) as required/as available.
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
NUDETS: Phase I System
Chemical and Biological Warning System: Interim Manual System

Control:

1 Combat Operations Center
1 Primary and 1 Secondary ALCOP
7 Region Combat Centers
1 Region without a combat center (32d)
18 Sector Direction Centers
1 Sector without a direction center (Hudson Bay)
32 NORAD Control Centers

1 CONAD Control Center
6 Missile Masters
18 BIRDIE
1 TSQ-38
2 FSQ-34

(U) MANPOWER AUTHORIZATION

NORAD Headquarters: 935
NORAD Region and Sector Headquarters: 1074

[redacted]

# CHAPTER I

# ORGANIZATION AND MANNING

## NORAD/CONAD HEADQUARTERS

### FY 1966 JOINT MANPOWER PROGRAM

(U) Requirements Submitted. NORAD's FY 1966 Joint Manpower Program was submitted on 22 December 1964 requesting additional spaces for added responsibilities in command and control; intelligence; and nuclear, biological and chemical defense. Most of the additional spaces were required for NORAD Headquarters, but included were spaces for the hardened NORAD ALCOP and for the NBC reporting system at region and sector headquarters. A downward revision to the requirements for the Space Defense Center (see Chapter II) was made on 12 May 1965 and for increased responsibilities in command and control systems on 8 June 1965, and a revision was made to the requirements for the Directorate of Computer Control on 1 June 1965.*

(U) JCS Action. In two messages on 23 October 1965, the JCS approved most of the requirements. The requirements for the Group III COC, including the Space Defense Center, were approved. Approval was also given for raising the rank of the Director of the COC from brigadier general to major general, the space to be made available from NORAD resources. NORAD had stated in June that it could provide a major general from current authorizations as a result of the planned region/sector reorganization.

---

* (U) For requirements of the original submission and changes thereto, see NORAD/CONAD Historical Summary, Jan-Jun 1965, pp. 1-3.

[redacted]
Group 3

[redacted]

(U) The JCS also approved fifteen additional spaces for the increased staff responsibilities in command and control systems and 57 more spaces for the Directorate of Computer Program Control (established 1 September 1964).* The latter requirement was for a total of 78 spaces. Six were made available from current resources and 15 immediately-required spaces were approved by the JCS on 21 January 1965. Finally, the JCS approved 15 spaces for the NBC reporting system requirement for FY 1966 and 21 spaces for FY 1967 for a total of 36 which had been asked by NORAD.

(U) The JCS deferred 50 additional spaces requested for the Intelligence Data Handling System until more experience was gained in programming and operating the IDHS. In all, NORAD wanted 120 spaces for the IDHS in the Directorate of Intelligence Computer Applications (established on 14 September 1964). Seventy of these were authorized (41 had been available and 29 of the most essential additional spaces required were approved by the JCS on 11 January 1965). Five additional spaces for the Current Intelligence and Indications Center were disapproved because the JCS felt that these spaces duplicated capability existing within the COC or the SDC. Finally, the JCS did not approve 44 U. S. spaces requested for the ALCOP at North Bay because of the Secretary of Defense decision to disapprove the ALCOP (see Chapter II).

---

* (U) In addition to the requirement for more spaces to handle increased responsibilities in command and control, NORAD had asked to raise the grade of the Director of Systems Development, DCS/Plans, from colonel to brigadier general. The JCS turned this down pending further experience with the command and control system.

[redacted]



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[redacted]

(S) Rejustification of the Intelligence Requirements. On 17 December 1965, NORAD told the JCS that its requirement for 50 additional spaces and five CIIC spaces was still valid but that 38 additional IDHS spaces would be enough for an interim period. NORAD stated that the spaces requested for both requirements were essential for the NCMC to meet full operational capability by 30 June 1966 and asked that special consideration be given these requirements. NORAD pointed out that the CIIC operational procedures had previously been reviewed and approved by the JCS and DOD. The additional IDHS spaces were to provide an around-the-clock, seven-day-a-week-operation in direct support of the NCMC. NORAD said it had asked the Defense Intelligence Agency to review its requirements and concepts. This had been done and the DIA Director had verified the 24-hour a day requirement.

(U) NORAD/CONAD Headquarters Total. The 1 July 1965 NORAD/CONAD Headquarters JTD, which was delayed until 4 October for publication so as to incorporate the JCS manpower decisions, showed a total authorization of 935. This was an increase of 173 over the 1 January 1965 JTD total of 762 for the headquarters.

CANADIAN SPACES REQUIRED FOR THE COC

(U) As noted above, NORAD received approval to raise the grade of the director of the COC from brigadier general to major general. The COC deputy position was an RCAF group captain position. Along with upgrading the director's position, NORAD wanted to raise the deputy's position to air commodore. On 7 July 1965, NORAD advised Canadian Forces Headquarters of this requirement. NORAD proposed to provide



[redacted]

[redacted]

# NORAD COMMANDERS

**1 JANUARY 1966**

**NORAD**
Gen D. C. Strother USAF
A/M C. R. Dunlap RCAF

**25th NORAD Region**
McChord AFB, Wash
M/G William E. Elder USAF
A/C George H. Elms RCAF

- Portland NORAD Sector
  Adair AFS, Ore.
  B/G Frank W. Gillespie USAF
  Col Tomas T. Popovich USAF
- Seattle NORAD Sector
  McChord AFB, Wash
  B/G John A Rouse USAF
  G/C David J. Williams RCAF

**26th NORAD Region**
Stewart AFB, N.Y.
M/G Gordon H. Austin USAF
M/G Harrison A. Gerhardt USA

- Boston NORAD Sector
  Hancock Fld, N.Y.
  Col Dean Davenport USAF
  G/C M. E. Doyle RCAF
- Detroit NORAD Sector
  Custer AFS, Mich.
  B/G George V. Williams USAF
  G/C Wesley B. Hodgson RCAF
- New York NORAD Sector
  McGuire AFB, N.J.
  Col Albert L. Evans, Jr. USAF
  Col Fredrick H. LeFebre, USAF
- Washington NORAD Sector
  Fort Lee, Va.
  B/G Oris B. Johnson USAF
  Col Benjamin S. Preston USAF

**28th NORAD Region**
Hamilton AFB, Calif.
M/G Andrew R. Lalli USA
M/G Carroll W. McColpin USAF

- Los Angeles NORAD Sector
  Norton AFB, Calif.
  Col Joseph Myers USAF
  Col M. A. Rogers USA
- Phoenix NORAD Sector
  Luke AFB, Ariz.
  Col Leon W. Gray USAF
  Col Eugene H. Callahan USAF
- Reno NORAD Sector
  Stead AFB, Nev.
  Col Hubert Zemke USAF
  Lt Col Kenneth P. Jorgensen USAF

**29th NORAD Region**
Richards-Gebaur AFB, Mo
M/G Thomas K. McGehee USAF
A/C R. M. Cox RCAF

- Great Falls NORAD Sector
  Malmstrom AFB, Mont.
  Col Leon G. Lewis USAF
  G/C Clifford M. Black RCAF
- Oklahoma City NORAD Sector
  Oklahoma City AFS, Oklahoma
  Col Edward S. E. Newbury USAF
  Col Clay D. Albright, Jr. USAF
- Sioux City NORAD Sector
  Sioux City Muni Aort, Iowa
  Col Joseph H. Belser USAF
  Col George L. Wells USAF

**30th NORAD Region**
Truax Field, Wisc.
M/G Frederick R. Terrell USAF
M/G Francis M. McGaldrick USA

- Chicago NORAD Sector
  Truax Field, Wisc.
  Col William S. Harrell USAF
  Col James W. Lancaster USAF
- Duluth NORAD Sector
  Duluth Muni Aprt, Minn
  Col James K. Dowling USAF
  G/C R. W. McNair RCAF

**32nd NORAD Region**
Gunter AFB, Ala.
M/G James B. Tipton USAF
B/G Livingston N. Taylor, Jr., USA

- Montgomery NORAD Sector
  Gunter AFB, Ala
  M/G James B. Tipton USAF
  Col Alfred V. Walton, USAF

**Alaskan NORAD Region**
Elmendorf AFB, Alaska
L/G Raymond J. Reeves USAF
M/G James C. Jensen USAF

**Northern NORAD Region**
RCAF Station North Bay, Ont.
A/V/M C. H. Greenway, RCAF
B/G Harrison R. Thyng USAF

- Bangor NORAD Sector
  Topsham AFB, Me.
  A/C W. F. M. Newson RCAF
  Col Gwen G. Atkinson USAF
- Goose NORAD Sector
  Goose AB, Labr.
  B/G Archie M. Burke USAF
  Col John H. Pease USAF
- Ottawa NORAD Sector
  RCAF Station North Bay, Ont.
  A/C C. G. Ruttan RCAF
  Col J. B. Cobb USAF
- Hudson Bay NORAD Sector
  (No Sector Organization)

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



(This page is Unclassified)

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the air commodore space by transferring this space on 1 September 1965 from the 30th NORAD Region which was to be discontinued on 1 April 1966. The currently-authorized group captain-space in the COC could be returned.

(U) NORAD also proposed to provide an additional wing commander space for Group III. This space would also be withdrawn from the 30th Region. NORAD wanted to transfer this space on 1 April 1966.

(U) Canadian Forces Headquarters concurred on 23 July 1965 with the transfer of the air commodore space and proposed to transfer A/C William Weiser. NORAD agreed with the latter. Canadian Forces Headquarters approved the transfer of the wing commander space on 17 January 1966.

(U) In the meantime, effective 1 September 1965, Major General Joseph L. Dickman was assigned as Director of the COC. The COC was removed from within the organizational structure of the DCS/Operations and established as a separate directorate on 1 October 1965. Effective 20 September, A/C Weiser was assigned as Deputy Director.

CONVERSION OF MILITARY POSITIONS TO CIVILIAN POSITIONS

(U) On 16 September 1965, the Secretary of Defense 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 the replacement of some 75,000 military personnel by about 60,000 civilians. To carry out this initial phase,

the JCS directed all unified commands to survey their currently-authorized officer and enlisted positions for possible conversion to civilian spaces.

(U) CONAD replied on 8 October with a proposal that 50 military spaces (43 enlisted, seven officer) in CONAD Headquarters could be converted to civilian spaces. The phasing proposed was for three officer spaces and 20 enlisted spaces in the first quarter of FY 1967 and the remainder in the second quarter of FY 1967. No region or sector spaces were included. It was CONAD's position that all military region and sector authorizations were combat or combat-support positions and therefore not susceptible to conversion.

DISESTABLISHMENT OF NAVFORCONAD

U

(S) Because of the phasing out of the Navy forces from the DEW Line extensions and the off-shore barriers (see Chapter IV), the JCS asked CONAD's comments on disestablishment of the Naval Forces, Continental Air Defense Command. CONAD agreed because there were no naval forces assigned to NAVFORCONAD and because of the elimination of advisory responsibilities on picket ship and barrier forces. There would be continued Navy participation at NORAD headquarters, regions and sectors and the only significant change would be in the administrative channels for NORAD Navy personnel. Liaison on matters concerning Navy ASW, augmentation forces and SPASUR would be handled by CONAD/NORAD with the commands concerned or the CNO.

(U) NAVFORCONAD was disestablished on 1 September 1965. On the same date, Naval Administrative Unit, CONAD, was established at

Ent AFB to provide administrative support of naval personnel at CONAD Headquarters.

(U) NAVFORCONAD had been established eleven years earlier, on 1 September 1954, on the same date as and as the naval component command of CONAD, under Rear Admiral Albert K. Morehouse. The last commander was Captain Hoyt D. Mann.

## FY 1966 REORGANIZATION

(U) In 1964, USAF submitted a PCP for a SAGE/BUIC follow-on system (see Chapter II). The PCP included phase-out of certain SAGE facilities. On 30 November 1964, the Secretary of Defense approved a SAGE/BUIC III plan and also provided for closing two combat centers in FY 1966, four direction centers by FY 1968, and certain radars.* A USAF PCP submitted in 1965 changed the proposal to phasing out two combat centers and two direction centers by the end of FY 1966 and the phasing out of two more direction centers by the end of FY 1968. The Secretary of Defense approved these proposals in a decision/guidance (Format B) dated 31 August 1965.

(U) In order to make the cuts, it was necessary for ADC and NORAD to reorganize and reconfigure their structures. ARADCOM was also going to reorganize its structure in line with that of ADC and NORAD.

(U) As finally planned, two SAGE combat

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* (U) For background of planning since 1962, see NORAD/CONAD Historical Summary, Jan-Jun 1965, pp. 5-13.

centers, two direction centers and four radar squadrons were to be closed in FY 1966. These actions were to occur on 1 April and be completed by 30 June 1966. Additional radar squadrons were to be shut down by end FY 1967 and two more direction centers by end FY 1968.

(U) In broad outline, the structures of ADC, NORAD and ARADCOM would be changed as follows on 1 April 1966. To be phased out were the combat centers (and headquarters) at the 25th Air Division/NORAD Region, McChord AFB, Washington, and the 30th Air Division/NORAD Region, Truax AFB, Wisconsin, and the direction centers (and headquarters) at Los Angeles Sector, Norton AFB, California, and Reno Sector, Stead AFB, Nevada. ADC would reorganize its remaining 26th, 28th, 29th, and 73d Air Divisions into four air forces. The 4th would be at Hamilton AFB, the 10th at Richards-Gebaur AFB, the 1st at Stewart AFB, and the 14th at Gunter AFB. ADC would redesignate its sectors as numbered air divisions. This redesignation of sectors as divisions would not change the level or nature of their operation.

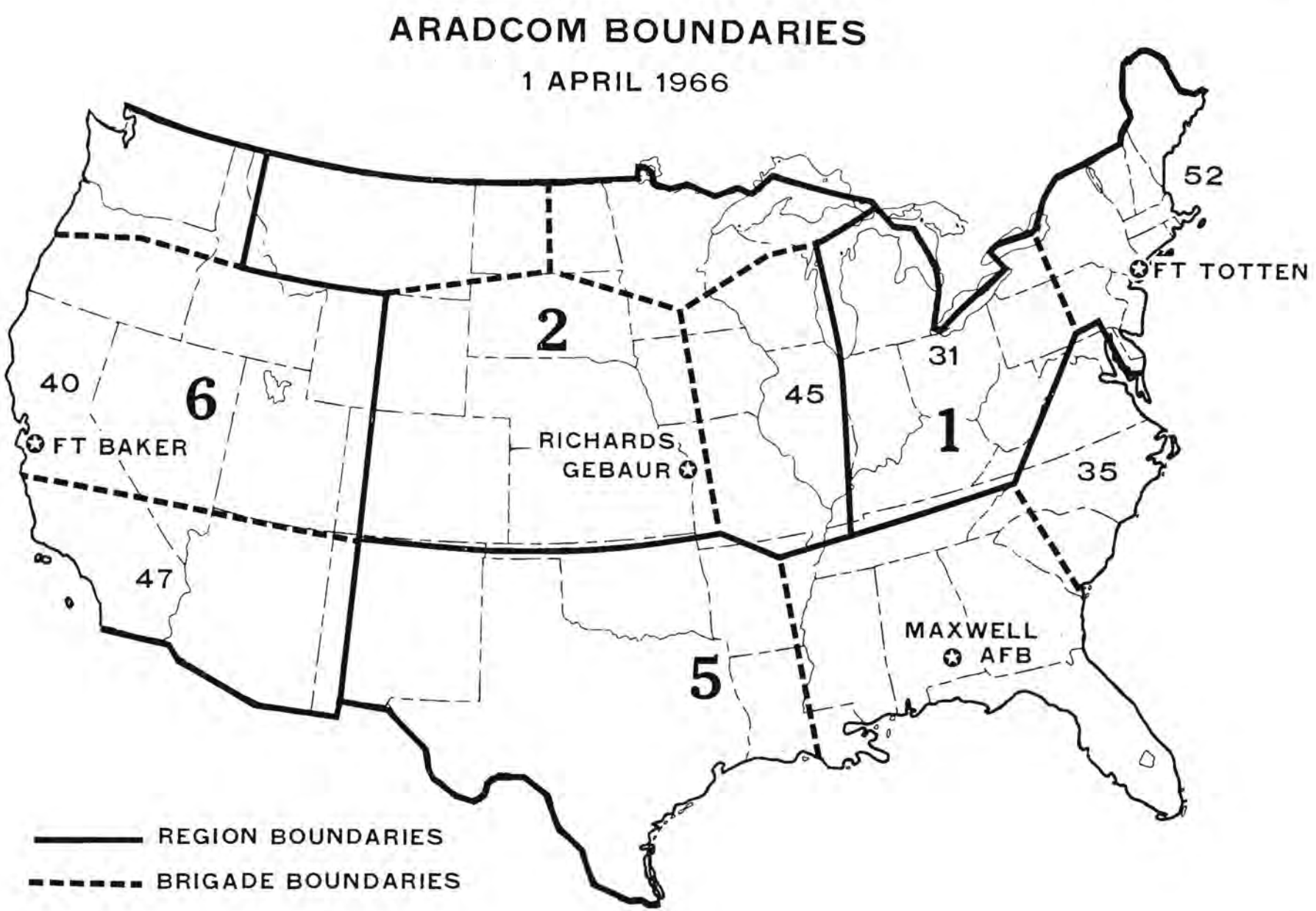
(S) The combat centers at Hamilton AFB and Richards-Gebaur AFB, which had operated as Remote Combat Centers (Hamilton had remote input from Reno Sector and Richards-Gebaur from Sioux City Sector), were to be converted to standard combat centers. An AN/GSA-51 computer (less consoles) was to be installed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

(U) NORAD issued a FY 1966 reorganization and reconfiguration operation order on 1 October 1965. With the discontinuance of the 25th and 30th Regions and Los Angeles and Reno Sectors on 1 April, NORAD would reorganize and reconfigure the remaining 28th, 29th, 26th, and 32d Regions into four geographically-designated regions with headquarters at the same locations as the ADC air forces. The 28th would become the Western NORAD/CONAD Region, the 29th the Central Region, the 26th the Eastern Region, and the 32d the Southern Region. NORAD would also redesignate its remaining sectors in the U. S. and Canada as numbered divisions. In all there would be six regions and 17 divisions (see map following). The Hudson Bay Sector (42d Division) had no headquarters. The 20th and 21st Divisions would be phased out during FY 1968.

(U) ARADCOM planned to discontinue one of its currently-existing five regions, the 7th at McChord AFB on 1 April 1966 and to reorganize into a four-region structure (shown on the map following). The 5th Region Headquarters at Ft. Sheridan, Illinois, was to move to Maxwell AFB, Alabama, at the same time. The reconfigured structure would be as follows. The 6th Region would be at Ft. Baker, California; the 2d at Richards-Gebaur AFB; the 1st at Stewart AFB; and the 5th at Maxwell AFB. The ARADCOM reorganization plan, which had been submitted in April 1965, was given final DA approval on 22 September 1965.

(U) NORAD advised the JCS on 28 October 1965 that the discontinuance of its units and other adjustments would provide 116 spaces of which 28 were required to augment remaining subordinate headquarters and three for NORAD Headquarters. The remaining 84 spaces would be

NORAD BOUNDARIES
1 APRIL 1966
ALASKAN NR
NORTHERN NR
CENTRAL NR
WESTERN NR
EASTERN NR
SOUTHERN NR
25 ND
26 ND
27 ND
28 ND
29 ND
30 ND
31 ND
20 ND
21 ND
32 ND
33 ND
34 ND
35 ND
36 ND
37 ND
41 ND
42 ND


ARADCOM BOUNDARIES
1 APRIL 1966
52
FT TOTTEN
2
31
40
6
45
1
FT BAKER
RICHARDS
GEBAUR
35
47
MAXWELL
AFB
5
REGION BOUNDARIES
BRIGADE BOUNDARIES

surplus to NORAD's requirements. The three spaces for NORAD Headquarters included the major general space for the COC director's position plus two secretarial positions for the director's office. The JCS approved NORAD's proposals on 8 December 1965.

(U) On 2 November 1965, NORAD advised Canadian Forces Headquarters that the discontinuance of two regions and deletion of one group captain space from NORAD Headquarters would make 43 RCAF spaces available of which 29 would be needed (20 for the expanded Western NORAD Region, seven for Northern NORAD Region, one for the Central Region, and one for NORAD Headquarters Group III). Fourteen spaces would be surplus. Canadian Forces Headquarters approved the changes on 17 January 1966. This completed all U. S. and Canadian manpower actions covering the reconfiguration.

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# CHAPTER II

# COMMAND AND CONTROL SYSTEMS

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

### BACKGROUND

(U) In a memorandum of 26 October 1963, the Office of the Secretary of Defense provided for ensuring that unified and specified commanders could achieve adequate influence over the development, acquisition and operation of their command and control systems. Authority provided included establishing operational requirements, participating in planning and design, reviewing system documentation, and attaching the command's views to program change proposals.

(U) Preliminary instructions for carrying out the OSD memorandum were issued by the JCS on 21 December 1963. The JCS asked for a description of the command and control system and identification of those parts of the command and control system considered directly and immediately responsive to CINCNORAD's command and control. These were provided in a two-part document on 6 February 1964. A staff memorandum on handling of command and control system program change proposals was issued on 1 July 1964 by DCS/Programs. The latter was established as the staff agency responsible for the review, control and processing of PCP's. 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. Fifteen additional manpower spaces were requested by NORAD for handling the increased responsibilities. These were approved by the JCS in October 1965 (see Chapter I).

[redacted]



[redacted]

[redacted]

JCS GUIDANCE AND IMPLEMENTATION

(U) Detailed guidance was issued by the JCS on 11 June 1965 which defined the degree of influence and participation of NORAD/CONAD in the development and acquisition of command and control systems and communications that supported the command and control systems. 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) The Directorate of Systems Development, DCS/Plans (J-5), was made responsible for determining the degree and manner in which participation was to be accomplished. This directorate was responsible for preparing participation letters to the services on command and control systems and the command and control portion of weapons 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) To establish the general principles and objectives for command and control of ballistic missile defense, NORAD issued Policy Memorandum No. 6, 16 August 1965. This was to provide guidance for 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) The first participation letter of some 22 planned was sent to the Army Chief of Staff on 8 September 1965. This letter, which concerned

[redacted]



[redacted]

the Nike X Ballistic Missile Defense System, covered the degree of participation desired by CONAD and stated that NORAD interest extended to deployment and operation. Following an exchange of correspondence between DA and CONAD, a meeting was arranged for 8-9 March between representatives of CONAD, ARADCOM, Department of the Army, and the Nike X Project Manager at Redstone Arsenal, Alabama, to define responsibilities and requirements.

## 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 as scheduled. 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.*

(U) The Space Defense Center IOC date was delayed, however, because of computer program errors and lack of computer time. At the end of the year, the IOC date, coinciding with completion of Category II testing, was expected to be achieved on 15 March 1966. The full operational capability date of 1 July 1966 was still considered possible and was not changed as of the end of 1965.

(U) The major communications electronics systems were fully operational with the exception of the electronic solid state switch (ESS-1) and the automatic digital relay (ADR). Lack of the ESS-1 would limit the use of specific hardened voice circuits and delay internal voice communications until about September 1966.

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* (U) The NCMC Turnover Plan, 15 September 1965, prepared by the CMCMO covered maintenance and equipment, operational, supply support, documentation and computer program turnover and the transition plan including the transition agreement between AFLC and AFSC.

The initial demonstration of the ESS-1 by Mountain States Telephone was scheduled for 1 April 1966 and testing was scheduled through May. Acceptance would depend on test results. ESS-1 actual service was estimated for 1 July 1966. An interim non-secure telephone system became operational on 1 October 1965. Two hardened spokes, the ring facility, and restoral were accepted by ADC on 15 September 1965. The routing of NORAD operational circuits through the hardened communications also began on this date. The final four hardened spokes were scheduled to be operational on 1 June 1966.

(U) Because of the expected slip to at least 1 July 1966 of the ESS-1, NORAD wrote to ADC on 26 November 1965 outlining the minimum requirements for achieving an acceptable measure of survivability by using the two hardened spokes and ring system. By year's end, a plan had been prepared for routing the most essential circuits on a priority basis through the spoke and ring complex.

(U) The third Philco 212 computer was to be moved from L. G. Hanscom Field to Cheyenne Mountain on 3 January 1966 and installed and checked out by 31 March. It was scheduled for integration in April. Installation of weather communications circuits and terminal equipment was completed on 1 December 1965. The DCA CONUS area control center was relocated into the NORAD CMC by 1 November 1965. Acceptance of the closed circuit television system was expected in January 1966. It was used for the SPERD (System Performance Demonstration) and other testing.

(U) 425L Category II testing by CMCMO/MITRE was completed on 15 December 1965 with a successful SPERD. From 14 through 16 December, a technical approval demonstration was held and its board findings were made part of the operational turnover agreement. The NORAD Category III Test Plan was published 1 December 1965. Category III testing of the 425L system was to begin under NORAD control on 1 January 1966.

(U) Quarterly NCMC Implementation Progress Reports were required by the Secretary of Defense in a directive of September 1964. The fifth such report was issued on 1 January 1966. Among the problem areas listed in this report was the IOC slip of the Space Defense Center. The report pointed out that the "496L DELTA-1 program gives every indication of progressively greater computer time requirements and may exceed NCMC capability." Other problem areas listed were delay of the ESS-1 and ADR, and diesel power failures, and air conditioning and humidity controls.

COC COMMAND RELATIONSHIPS

(U) The NCMC Task Force Study Report, 18 March 1964, recommended establishment of a separate battle staff organization for operation of the hardened COC. The organization included the director of the COC which, as noted in Chapter I, was made a major general position. On 1 September 1965, Major General Joseph L. Dickman was assigned as Director of the COC.

(U) The director of the COC was operationally responsible directly to CINCNORAD and was considered a DCS equivalent. On 1 October 1965, the COC was removed from within the organizational structure of the DCS/Operations and established as a separate directorate. The command relationships established were that the director of the COC was to report directly to CINCNORAD/CONAD for all tactical operational matters and to the Chief of Staff for all other matters.

NCMC SUPPORT

(U) The NCMC Implementation Committee made a study to see if the support for the NCMC after IOC would satisfy NORAD's interests. The committee recommended that the CMCMO identity be kept at least through FOC. 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, the former had prime responsibility for the systems and facilities accepted. The CMCMO continued responsibility for systems not operational at IOC until these systems reached ICC and were accepted by ADC.

(U) On 23 November 1965, CINCNORAD sent a letter to the ESD commander stating 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) The ESD commander replied on 3 December that he shared CINCNORAD's views and ESD intended to continue the CMCMO and would review with NORAD its further continuance at the time of FOC.

NCMC FOLLOW-ON IMPROVEMENTS

(U) Follow-on requirements for the NCMC from FY 1967 through FY 1971 were submitted to the JCS in April 1965. The Secretary of Defense Decision/Guidance (Format B), 31 August 1965, identified specific program elements for accomplishment in FY 1967 and 1968. The money allocated for FY 1967 and 1968 improvements was $345,000 less than needed, however, so NORAD established a list of items in their order of importance. On 24 November 1965, NORAD sent ESD a priority list of improvements for FY 1967 and 1968. All follow-on improvements were re-submitted in the appropriate CY 1966 consolidated command, control and communications programs ($CC^3P$).

SPACE DEFENSE CENTER

(U) Background. In February 1964, NORAD sent a description of its command and control system to the

JCS stating that it planned to strengthen its operational control of SPADATS through reorganization. The following month, the NORAD Cheyenne Mountain Task Force Study Report provided for carrying this out in its proposal for establishing a NORAD-manned Space Defense Center and consolidating control of space defense functions therein. As planned by NORAD, facilities and space were to be made available in the NCMC for an ADC-operated Spacetrack Center.

(U) In a paper dated 24 September 1964, the Secretary of Defense approved the Space Defense Center as proposed by NORAD and said that NORAD was to proceed with staffing, operating and maintaining the center. A Space Defense Center implementation plan was issued by NORAD/CONAD on 1 January 1965. NORAD's manpower requirements for the SDC, submitted in December 1964, were for a total of 103 spaces of which nine were currently available. All this was changed, however.

(U) In July 1964, an OSD working group, termed the DATOS (Detection and Tracking of Satellites) Group, was set up to review the DOD's space detection, surveillance and tracking systems. The Group's report, dated March 1965, stated that NORAD's manning plan for the SDC was not acceptable because of duplication and overlap of NORAD and ADC functions. The Group recommended that the JCS tell NORAD to handle manning as an integrated NORAD/ADC whole on the basis of current manning levels.

(U) The upshot was development of a plan for a single, integrated NORAD/ADC center manned with current authorizations. On 12 May 1965, NORAD asked the JCS to withdraw its original manpower proposal and submitted a new one. NORAD asked for 23 spaces on its JTD (19 Air Force, three Navy and one Army). No additional spaces were required, however, for all spaces would be provided from currently authorized resources. Included in the latter were the Army and and Navy spaces required. The additional Air Force

spaces would be gained from ADC. All Air Force spaces on the NORAD JTD would be dual hatted (NORAD/ADC).

STATUS

(U) The Space Defense Center was established as an integrated NORAD/ADC center on 3 September 1965. The manpower requirements for the Group III including the Space Defense Center were approved by the JCS in October 1965 (see Chapter I). The SDC initial operational capability date, originally set for 1 January 1966, was not met, however, because of computer program errors and lack of computer time. According to the 1 January 1966 issue of the NCMC Quarterly Implementation Progress Report, the IOC date was expected to be achieved on 15 March 1966. The report stated that completion of Category I testing slipped from 1 December 1965 to 30 January 1966. Category II testing would follow immediately with a 15 March 1966 end date. Overlapping Category III testing with Category II might permit Category III completion by 1 May 1966. Equal operational capability was scheduled for not later than 31 May 1966 and FOC by 1 July 1966. A new implementation plan was issued for the SDC on 1 December 1965, scheduling implementation in three phases.

SPACE DEFENSE CENTER BACKUP PLANS

(U) In keeping with a DATOS Group recommendation, on 22 June 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. A draft plan for use of the AN/FPS-85 was submitted to the JCS in August and was approved on 21 October. An interim backup plan was also submitted in August and approved by the JCS on 12 October. This plan, 393C-65, was published on 15 November 1965.

NORAD HARDENED ALCOP

BACKGROUND

(U) In October 1960, the JCS 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, Ontario. 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. The JCS approved the manual ALCOP at North Bay on 3 May 1963. 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.

(U) 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.

STATUS

(U) On 9 June 1965, the Secretary of Defense disapproved the communications plan for the ALCOP at North Bay and the concept of a hardened ALCOP. The JCS, in preparing a reclama, asked CONAD to re-examine the original investment and annual recurring costs to see if cuts could be made 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 $119,000 and the U.S. annual recurring costs from $1,649,100 to approximately $867,500 (in addition, there would be costs to be borne by Canada). CONAD

noted that there would still be provided a facility with greater capability and survivability than the current ALCOP at a comparable annual recurring cost.

(U) The JCS cited these reductions in a Format A submitted to DOD on 21 August 1965. A request was made for $120,000 to establish the ALCOP at North Bay and it was stated that the facility would operate within the same annual operating costs as the current ALCOP at Richards-Gebaur AFB. In a decision/guidance (Format B) paper dated 31 August 1965, the Secretary of Defense did not provide communications funds or manpower for the ALCOP but stated that 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 requested that NORAD prepare a firm transfer plan. The JCS said that the plan should reflect the following constraints: 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.

ALCOP BASIC PLAN

(U) An ALCOP Basic Plan was issued by NORAD on 26 January 1966 to meet the DOD/JCS requirements. In this plan, non-recurring costs for establishing the ALCOP and annual recurring costs for operating it were presented. Pending a U.S. - Canada agreement, it was assumed that a cost sharing agreement for annual recurring costs would provide that the U.S. would assume two-thirds and Canada one-third of the costs. For non-recurring costs, two alternatives were provided. 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.

Non-Recurring Costs:

| U.S. Share | | Canada Share | | Total |
|---|---|---|---|---|
| Alt. 1 | Alt. 2 | Alt. 1 | Alt. 2 | |
| $72,810 | $120,407 | $107,800 | $60,203 | $180,610 |

Annual Recurring Costs (including U.S. and Canadian manpower costs)*

| U.S. Share | Canada Share | Total |
|---|---|---|
| $769,544 | $520,877 | $1,290,421 |

The current recurring costs for the ALCOP at Richards-Gebaur AFB were $847,000 according to USAF Headquarters.

U
(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 for Richards-Gebaur. For the North Bay ALCOP, NORAD proposed 48 U. S. spaces and 45 RCAF spaces.

U
(S) The transfer of ALCOP functions from Richards-Gebaur to North Bay would require about 12 months from the time of U.S./Canadian funds release to IOC. The pacing factor in this phasing was the construction required to modify the North Bay facility. Equipment and communications installation and checkout could be done during construction.

U
* (S) Cost sharing was for communications only and did not include manpower.

ALCOP SYSTEM MANAGEMENT

(U) In August, the Air Force Systems Command directed the formal cancellation of its Electronic Systems Division's (ESD) ALCOP task. This was done on the premise that the Ground Electronics Engineering Installation Agency could do all the necessary engineering and installation of the ALCOP without ESD assistance. NORAD felt that the functions of a systems program office were also necessary and on 4 November asked AFSC to reconsider its position. AFSC replied on 22 November that should the ALCOP basic plan be approved, it was expected that the CMCMO or its successor would be tasked by AFSC (ESD) to provide systems management. AFSC said that for the interim period, the CMCMO director had been asked to provide an ESD point of contact for ALCOP matters.

SECONDARY ALCOP

(U) It was planned to relieve the 30th NORAD Region (scheduled for discontinuance on 1 April 1966) of its secondary ALCOP functions on 1 February 1966. At the end of 1965, the requirement for a secondary ALCOP was being studied by NORAD. 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. Staff thinking was to develop a scheme of succession to command among region commanders to cover the loss of both the NORAD COC and the primary ALCOP.

## BACKUP INTERCEPT CONTROL SYSTEMS

BACKGROUND

(U) As an outgrowth of a June 1961 directive from the Secretary of Defense having the purpose of providing more system survivability, a SAGE backup

system, termed BUIC (Backup Intercept Control), was approved by DOD in March 1962 for implementation in two phases. The first phase, or BUIC I, completed by the end of 1962, provided manual control using NCC's, NGCI's, and surveillance stations. The second phase, or BUIC II, program was to provide semi-automatic control at 34 NCC's originally, each of which was to have the AN/GSA-51 computer.

(U) To provide a more survivable system in place of the primary system, SAGE, and because BUIC II was limited, 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 PCP for Improved BUIC was deferred by the Secretary of Defense without prejudice. NORAD and ADC proposed another system called PAGE (Primary Automated Ground Environment). An Air Force PCP for PAGE was concurred in by the JCS, but OSD (DDR&E) introduced a SAGE/BUIC III system concept. On 30 November 1964, the Secretary of Defense approved BUIC III.

(U) BUIC III was essentially BUIC II with increased capabilities. The DOD guidance provided for an interim deployment of 14 BUIC II's (13 operational and one training) in FY 1966-1967 and a phase-in of 19 BUIC III's in FY 1968-1969 replacing the BUIC II's. Twelve SAGE direction centers were to be kept as the primary system. The DOD guidance also provided for phasing out 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, Stead AFB, Nevada, which provided remote input to the Hamilton AFB (28th Region) combat center. The DOD guidance provided for keeping the Reno DC facility as a BUIC III to drive the Hamilton center.

(U) USAF was directed to submit a PCP for the

SAGE/BUIC III program by 15 March 1965. The PCP, which included the ADC/NORAD position, proposed complete closing of the Reno facility, installation of an AN/GSA-51 at Hamilton, and a twentieth BUIC III at Fallon NAS, Nevada (Z-156). On 13 May 1965, by separate Format B, the Secretary of Defense approved a GSA-51 computer for Hamilton. But an OSD Format A review of the PCP recommended only 19 BUIC III's, including one at Fallon, but eliminating one for Waverly, Iowa (Z-81). USAF had stated prior to submitting the PCP that if the twentieth computer was not approved, Fallon would stay in the program and Waverly be deleted. This was also the ADC/NORAD position, but ADC and NORAD still wanted a twentieth BUIC III at Waverly for the critical Chicago-Omaha area.

STATUS

(U) On 31 August 1965, the Secretary of Defense decision/guidance (Format B) to the USAF command, control and communication program approved 19 BUIC III's instead of 20, 14 of which were to be operational in FY 1968 rather than 11 as proposed by USAF. The 19 sites in the program at the end of 1965 included Fallon (Z-156) as site 19. USAF submitted a reclama on the twentieth site, Z-81 (Waverly).

(U) Canadian Forces Headquarters advised that the Canadian Cabinet had approved on 18 August the installation of BUIC III at two of the three sites proposed in Canada. These were C-5, St. Margarets, N. B., and C-8, Senneterre, Quebec. 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, Washington, was substituted for C-153.

BUIC III HARDWARE COSTS

U
(S) A meeting was held in August at MITRE Corporation, Bedford, Mass., which included NORAD representation, to evaluate the Burroughs Company BUIC III proposal. The Burroughs cost estimate for BUIC III was $27.8 million which exceeded the ESD planned cost by approximately $13 million. ESD, MITRE and Burroughs met to determine cost cutting actions that could be taken without reducing the operational effectiveness of the BUIC III system. One method, resulting in substantial savings, was a new deployment schedule for BUIC III. Although the new schedule retained the original IOC, January 1968, and FOC, June 1969, it required a return to a manual back up configuration in the Portland and Phoenix Sectors for six months and ten months, respectively. As a result of these cost cutting actions, a new Burroughs proposal was presented at a second meeting in November with an estimated cost of $15.6 million. This was still approximately $1.4 million over the original estimated cost but was considered by ESD to be within acceptable bounds. The hardware letter contract was signed by the Air Force and sent to Burroughs on 12 January 1966 for signature.

AIR DEFENSE ARTILLERY DIRECTOR (ADAD) CONSOLES

U
(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 eleven 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 wrote to ADC that ten BUIC III NCC's would have a requirement to accomplish coordination with Army air defense weapons. NORAD asked that distribution of data display consoles be reviewed to provide the three additional consoles needed. NORAD reaffirmed the requirement for ten ADAD consoles on 13 October in response to an ADC letter pointing out certain

problems in distribution of consoles.

(U) By mid-November, ADC had identified two more consoles for this purpose. However, on 10 January 1966, NORAD told ADC that the requirements had changed as a result of the decision of the Secretary of Defense for inactivation of twenty-two Nike Hercules batteries and shifts in ARADCOM site requirements and that the matter was under study.

CO-MANNING OF BUIC II AND BUIC III SITES

(U) On 9 December 1965, NORAD asked its 25th, 26th, 29th, 30th and Northern NORAD Region commanders 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 RCAF 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 RCAF and USAF authorizations so spaces were to be indicated that could be used to offset any recommended requirements. NORAD's message resulted from a recommendation from the 25th Region to co-man the BUIC site at Blaine, Washington. The matter was to be studied after the replies had been received.

BUIC II PROGRESS

(U) There were to be 13 operational BUIC II sites to back up 14 SAGE DC's. There was also a training site at Z-198, Tyndall AFB, Florida. The first operational site, Z-10, North Truro, Massachusetts, became operational on 1 September 1965. As of 1 January 1966, three more sites had become operational. By this date, installation of the AN/GSA-51 computer had been nearly completed at the remaining sites. All BUIC II sites were scheduled to become operational by 1 April 1966.

## AN/TSQ-51 FIRE DISTRIBUTION SYSTEM

### BACKGROUND

(U) In December 1963, DOD approved replacement of ARADCOM's Missile Masters, AN/FSG-1, in FY 1966 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.

(U) Originally there had been ten Missile Masters. Two were phased out in September 1963, however, to meet DA-directed cuts to provide spaces for higher-priority projects. Two more were closed in late 1964. ARADCOM had at the end of 1964 six Missile Masters, 18 BIRDIE's and one TSQ-38. There was also an AN/MSQ-18 (Modified) system in Alaska. NORAD wanted to replace the Missile Master and selected BIRDIE's with the AN/TSQ-51 and to replace the AN/TSQ-38, being used in Florida, with a BIRDIE set when available. NORAD felt that since the MSQ-18 was tailored especially for Alaskan requirements, it should be kept as long as the Alaskan defenses remained unchanged.

### STATUS

(U) As scheduled at the end of 1965, the first system was to be delivered in May 1966 at Fort Bliss, Texas. The first operational system, system two, was to be placed in the Chicago-Milwaukee Defense with IOC scheduled for 1 September 1966.

# CHAPTER III

# COMMUNICATIONS

## AUTOMATIC VOICE NETWORK (AUTOVON)

(U) By January 1963, NORAD and ADC had submitted requirements for some 70 automatic voice communications switching centers. 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.

(U) 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 DCA program was established by 1965 at 65 switching centers in the CONUS to be operating by 1970. 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, none of which had come into use. Because of deficiencies in the latter, in May 1965, DCA advised NORAD that it had decided not to accept the ESS-1 for AUTOVON until it could meet specifications.

(U) NORAD and ADC had planned with DCA to integrate SAGE/BUIC into AUTOVON on a time-phased basis from 1 September 1965 to 1 January 1966. Subsequent difficulties delayed this cutover to January

1966 and then to July 1966. This cutover would involve the use of 14 interim number five cross-bar switches, which would make a total of 24 switching centers (the ten listed above plus these 14). The interim switches were to be replaced by the ESS-1 when the latter met the specifications.

PRECEDENCE REQUIREMENTS

U
(S) 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 noted above would add some 4,400 NORAD/ADC circuits to AUTOVON including the 550 NORAD/ADC circuits currently integrated in AUTOVON.

U
(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).

U
(S) On 27 October 1965, NORAD sent a message to the JCS explaining and justifying its requirement for Flashes. NORAD said that studies with ADC had lowered the Flash requirements to the lowest possible level. The JCS then asked NORAD for its specific requirements. On 14 January 1966, NORAD submitted a requirement for 3930 Flashes. Earlier, on 19 November 1965, NORAD had submitted a requirement for nine Flash Overrides. The latter would be used only for declaring DEFCON 1 or Air Defense Emergency.

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/ADC.

(U) 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. At a meeting held in October to review the Canadian SAGE/BUIC switching proposal, all representatives agreed 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. As of the end of CY 1965, the nine Canadian switches still had not been contracted for. They could be completed two years from award of contract.

NORAD ATTACK WARNING SYSTEM (NAWS)

SYSTEM REDESIGN AND TESTING

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

(U) In October 1965, the improved system was demonstrated by Bell Telephone Laboratory. ADC and AT&T representatives attending the demonstration reported that the equipment was satisfactory with minor exceptions and functioned as planned. 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) It was originally planned to run the test for a 30-day period following release of the equipment by the telephone company, scheduled for 1 December. Testing was delayed, however, to 10 December. On 1 January 1966, NORAD advised all concerned that because of problems being encountered, testing was to continue through 15 February unless stopped earlier by NORAD. The extension was necessary, NORAD explained, to give AT&T more time to demonstrate system reliability and capability and for NORAD to make a final decision on the system's acceptability. However, it was decided on 31 January 1966 to stop testing in the 32d Region locations to allow AT&T to complete installation of the system command wide.

(U) Termination of the test 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. Testing was to start as soon as AT&T finished its work on the initial NAWS configuration, set for late March.

NAWS AND AUTOVON

(U) The Secretary of Defense had tasked DCA to evaluate the possibility of integrating all DCS dedicated networks into AUTOVON/AUTODIN. Following from this, DCA told NORAD on 19 November 1965 that the NAWS was being studied by DCA for possible integration into these systems. DCA asked for information on NAWS and comments on the suitability of this integration.

(U) NORAD answered on 23 December stating that in view of its requirements for instant and reliable alerting signals, it did not seem feasible to integrate NAWS into AUTOVON/AUTODIN.

(U) In a separate message on 2 December, NORAD told DCA that it wished to review and comment on all networks, dedicated or otherwise, that supported the NORAD mission that were being considered for integration into AUTOVON or AUTODIN.

VLF/LF SYSTEMS

NORAD REQUIREMENTS

U
(S) Back in July 1963, NORAD had submitted its requirements to the JCS for VLF/LF communications. In August 1964, the JCS advised that 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. In August also, 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.

U
(S) The NORAD requirements, which had been revised downward a number of times, 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 currently under acquisition to meet USAF requirements. As a result of the August 1964 JCS directive, USAF told AFSC to prepare an augmentation to the 487L SPP. A USAF PCP (reviewed by NORAD in early 1965), stating the NORAD requirements, was sent to the JCS. The latter sent the USAF plan to DCA for review and to assure compatibility with all other VLF/LF networks.

STATUS

(U) (S) On 25 June 1965, the JCS told the Air Force that DCA had advised that the USAF plan did not have enough information. The JCS requested that USAF prepare an operations plan for use of the VLF/LF systems as an addendum to its aforementioned plan for submission to DCA for compatibility review with other service submissions. In turn, on 11 August 1965, USAF asked SAC, as the principal VLF/LF system user, to prepare with NORAD an operations plan.

(U) (S) Representatives of both headquarters prepared a plan at SAC Headquarters in September and it was submitted to USAF by SAC on 1 October. NORAD told USAF on the same date that this plan provided only for SAC and NORAD use and did not cover joint use of a VLF/LF facility with any other commander. NORAD said that it wished to be represented in all planning that involved the joint use of any NORAD VLF/LF facility with any other command.

(U) DCA combined all the requirements in a world-wide system plan. The JCS sent the DCA plan to NORAD in December for review. At the end of the year, the plan was being processed through the JCS.

ALASKAN AIR COMMAND REQUIREMENTS

(U) (S) NORAD's requirements for VLF/LF communications in Alaska were for one T/R station and two R/O stations. In April 1965, AAC had sent a qualitative operational requirement to USAF for a VLF/LF system.

In this, AAC stated a requirement for 18 T/R facilities in addition to the NORAD requirements. AAC sent a copy of the QOR to NORAD in July requesting the latter review it and comment to USAF.

(S) On 10 August 1965, NORAD pointed out to USAF that it had requested only a limited network largely because of economic considerations. NORAD said that in view of its stated requirements for ANR, "it would be difficult to support any additional NORAD requirements contained in the /AAC QOR/."

## SATELLITE COMMUNICATIONS

(S) The Secretary of Defense had authorized an interim military communications satellite system for research and development and limited communications for the 1966-67 time period. A final 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 final 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.

(S) NORAD submitted a Qualitative Requirement (NQR) for a Communications Satellite System, dated 11 January 1965, to the JCS and the Canadian Chief of Defence 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.

(S) In April 1965, ADC had recommended to NORAD that a change be made to the December 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.

(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.

(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. The original approval was for a satellite circuit from Project 505 to Hawaii and then by cable to NORAD. NORAD had requested a direct circuit to 505 for greater survivability and to provide a training ground during the IDCSP. Operation of the terminal was scheduled for February 1967.

## ALASKAN REGION COMMUNICATIONS SECURITY

(S) On 16 July 1965, the Alaskan Air Command sent NORAD a copy of a letter it sent to the USAF Security Service. This was in reply to a letter from the latter. AAC stated that it shared the Security Service's concern over the security vulnerability of the Alaskan communications system. 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. AAC saw several obstacles to getting

the equipment, one of which was the high cost. AAC estimated that to encrypt the four NCC's, ANRCC, and the Tell to NORAD would cost some seven million. In addition to bringing the matter to NORAD's attention through the means of this letter, the AAC commander discussed it with NORAD representatives during a staff visit in August.

(U) On 9 September, Alaskan NORAD Region asked NORAD for its guidance and support on this security program. ANR expressed the same concern as had AAC and advised that the latter intended to submit a programming action to encrypt the FYQ-9 circuits.

(U) NORAD sent ANR's request to the JCS on 23 November. NORAD said it could not justify a requirement to provide a partially secure means for the transmission of air defense data solely in Alaska. NORAD pointed out that its philosophy was that all means of communications must be totally secure. But, explained NORAD, when consideration was given to the cost, the 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.

(U) NORAD added that possibly the situation in Alaska was unique and there might be considerations other than air defense, such as SAC movements. These and other factors should be considered by higher authorities, NORAD felt.

(U) To both ANR and SAC, NORAD repeated its position and pointed out that it recognized there might be other factors to be considered than air defense. For this reason, NORAD explained, it had referred the matter to the JCS for review and action.

# CHAPTER IV

# MANNED BOMBER DETECTION SYSTEMS

## RADAR REDUCTIONS AND PLANNING

### PLANS TO OFFSET LOSS OF NAVY PICKET SHIPS AND BARRIER AIRCRAFT

(U) (S) Background. In December 1964, the Secretary of Defense approved a Navy proposal to phase out its radar-equipped picket ships for patrolling off both coasts of the U. S., and airborne early warning aircraft for extending the DEW Line across the sea west to Midway Island and east to the U. K. At that time, ten picket ship stations were manned (five off each coast). One other station, off the East Coast, was unmanned. Two stations were manned by Navy EC-121P aircraft on the Greenland-Iceland-United Kingdom (G-I-UK) Barrier. Four Navy EC-121C aircraft patrolled the Pacific Barrier.

(U) (S) CONAD had objected in June 1964 to a Navy proposal to phase out these forces. CONAD told the JCS that the loss of the barrier forces and picket ships would seriously weaken its capability to defend against the manned bomber threat. On 28 December 1964, after the decision to phase out the forces had been announced, CONAD again objected. It repeated to the JCS the effect the phase outs would have on defense against the manned bomber. CONAD asked the JCS to try to delay the phase outs until replacements, such as over-the-horizon (OTH) radar and the airborne warning and control system, were available.

(U) (S) CONAD's protestations were to no avail, however. Between 27 January and 30 June 1965, all of the picket ships were withdrawn from their stations. On 1 May 1965, flight operations ended

[redacted] Group 3



[redacted]

on the Pacific Barrier. Coverage on the G-I-UK airborne stations was reduced on 1 July and flight operations ended 1 September 1965.

(U) West Coast AEW&C Test. Shortly after the impending phase down was announced, NORAD began to look for ways to offset these losses. In December 1964, NORAD asked its regions and component commands to suggest ways to minimize the loss of Navy units. In January 1965, representatives of the 25th and 28th NORAD regions met to find out what effect this loss in radar coverage would have on them. They 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 to NORAD 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's 552d AEW&C Wing.

(U) After NORAD officials had studied all proposals and talked with representatives of ADC and the regions concerned, on 14 June 1965 NORAD directed the 25th and 28th regions to test three AEW&C employment options. These were the five-station plan in current use, a four-station plan, and a three-station plan, called Option I, II, and III, respectively. The test was named Samoset Union. Its objectives were to find the option giving the best defense capability, whether high-frequency single sideband was practical as primary communications, and if any extra equipment or modifications would be needed.

(U) Testing was held and the results and recommendations were sent to NORAD in late August 1965. Both regions said that Option II was best and should be adopted, but with some changes. These changes included adding one more station, for a total of five, and locating three stations farther seaward. Both regions also recommended using high-frequency single sideband radio. They wanted each AEW&C aircraft equipped with two SSB radio systems and SSB

radio for BUIC NCC seaward extension needs. It was found that Option II 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.

(U) On 28 December 1965, NORAD approved the use of Option II, as changed by the regions' recommendations. NORAD said that its employment study and the region test results "definitely indicated that the greatest air defense capability can be obtained from AEW&C aircraft if they are deployed outboard of current positions using an Option II employment concept." Under this concept, the four northernmost stations would be located about 385 nm off the West Coast -- about 215 nm farther seaward than they were currently located. NORAD also approved the following recommendations:

1. Continue testing to refine station locations and procedures;

2. Continue manning stations on a 30 per cent random basis;

3. Prepare to man all stations at DEFCON 3;

4. Retain inboard stations and UHF communications for backup;

5. Use AEW&C training stations for interceptor/controller training activities and consider aircraft on these stations as meeting readiness/alert requirements of NORAD Reg. 55-3;

[redacted]

6. Use SSB as primary communications with HF AM backup until one more SSB system could be put in each aircraft.*

Several minor problem areas, including BUIC NCC seaward communication needs, were marked for further study.

(U) NORAD asked for the earliest date that the new concept could be put into effect. On 21 January 1966, the 28th Air Division said the official date would be 1 March 1966. However, until that date, the 552d AEW&C Wing was authorized to man either the new primary stations or inboard training 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 |

U
(S) AEW&C/ALRI Alert Status Change. On 21 June 1965, NORAD had told those concerned that AEW&C/ALRI alert status requirements would be re-evaluated after the results of Samoset Union were known. Until a re-evaluation was made, NORAD said it was making the following interim changes effective 1 July 1965 under DEFCON 3 condition:

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U
* (S) USAF approved in October 1965 the diverting of SSB radio equipment from ALRI-equipped aircraft on the East Coast. This equipment was to be put in 25 EC-121D aircraft assigned to the West Coast and installation had started before the end of 1965.



[redacted]

1. Immediate preparations would be made to man all primary AEW&C/ALRI stations;

2. CINCNORAD or his Deputy would decide if all primary stations were to be manned.

U
(S) After the results of the AEW&C testing were evaluated, these changes were made permanent. On 5 January 1966, they were added to NORAD Reg. 55-3.

U
(S) Surveillance Augmentation from Navy Ships. During a visit to the 28th NORAD Region in July 1965, CINCNORAD was briefed on techniques for integrating Navy ships in contiguous waters into an early warning network. In August, NORAD asked for more details and an approximate starting date.

U
(S) The 28th Region answered on 31 August that it was coordinating with the Commander, Naval Defense Forces Eastern Pacific, on a plan for using the basic concepts that the radar picket ships had used. Under this plan, ships engaged in emergency deployment or dispersal during increased DEFCON's would pass early warning information on approaching hostile aircraft to seaward extension shore stations. This information would then be relayed to the appropriate direction center for manual inputs to the computer.

U
(S) The 28th Region also said that communications procedures had been exercised recently with the heavy cruiser, USS St. Paul, and results were excellent. It said that an implementation date could not be given, however, because more study, coordination, and tests would be needed before formal procedures could be set up. The region told NORAD that it felt these manual procedures were only an interim solution. "Automation of these procedures," it said, "would increase completeness of content, timeliness of submission, and better equip NORAD to fight the air battle." NORAD

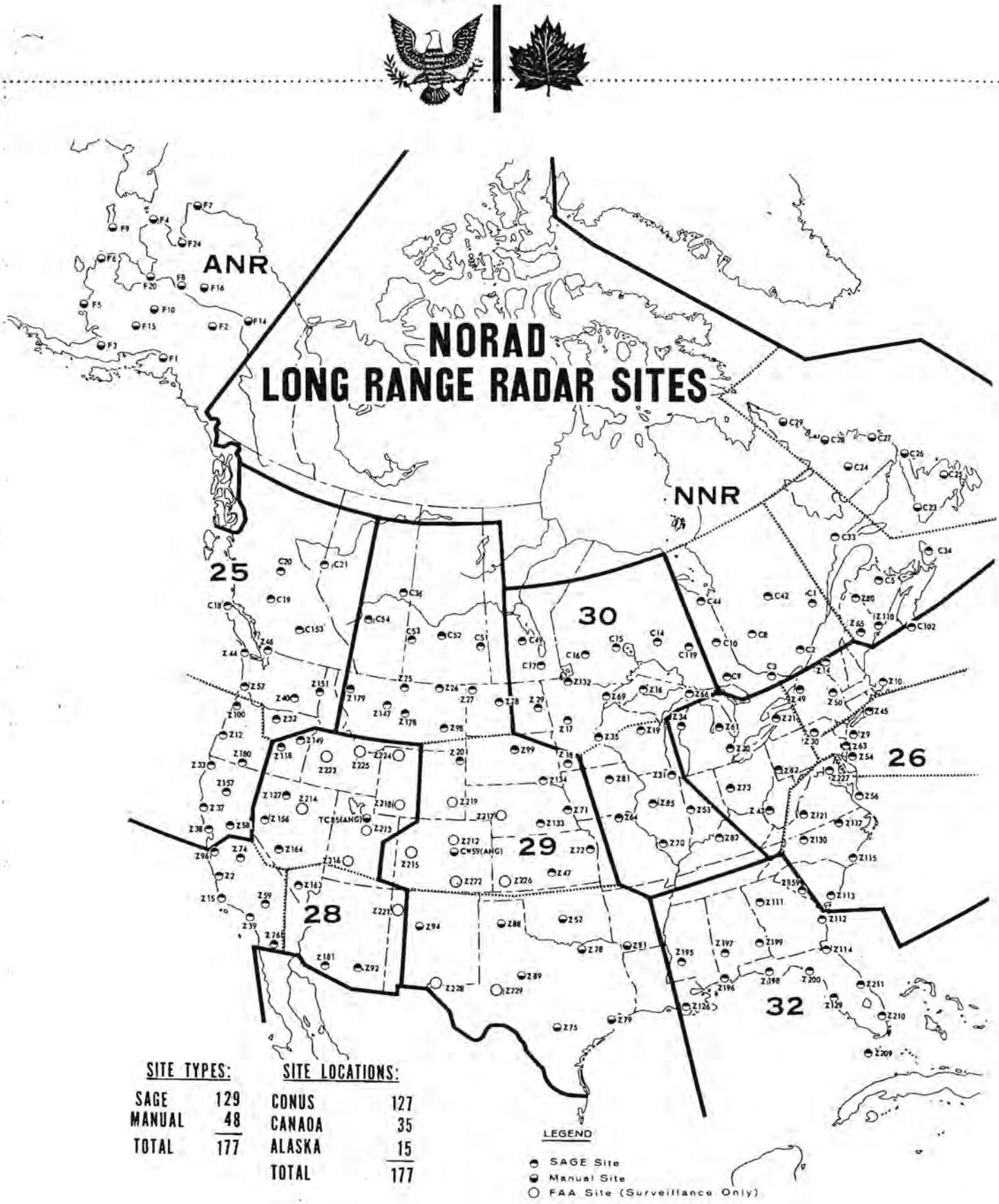
was to be kept informed of any progress.

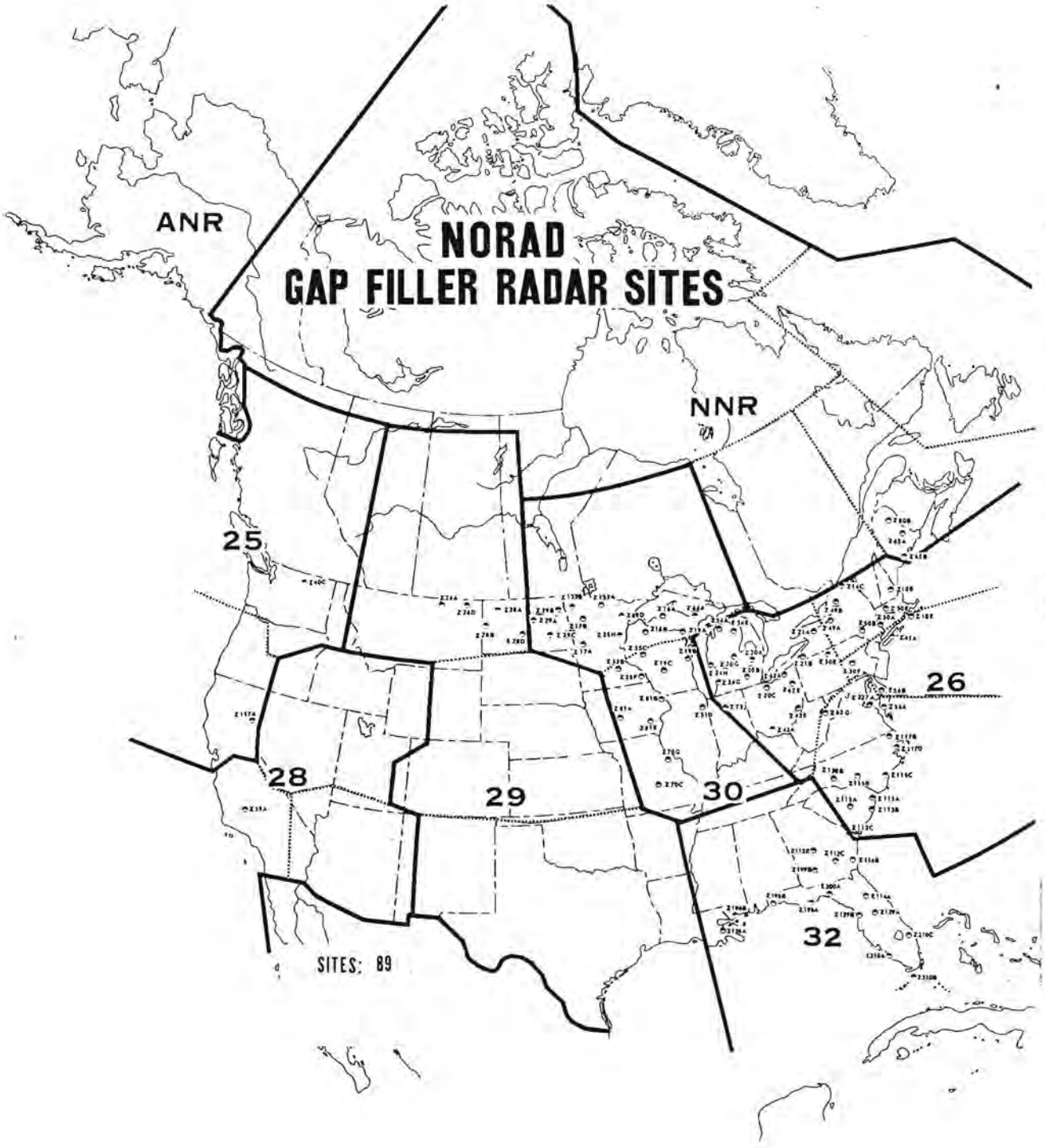
PHASE OUT OF PRIME RADAR SITES

U
(S) Background. NORAD had established criteria in March 1964 for selecting prime radar sites needed for a high quality surveillance system. These criteria were also to be used in picking out those sites that were not needed. Because radars would be chosen from the ADC, Canadian, and FAA radar inventories, the criteria would give a commonly understood and accepted basis for configuring the radar system.

U
(S) USAF had asked ADC for a list of radar sites needed through 1970 to meet military requirements for survivability and ECCM, for joint-use FAA/ADC needs, and for approved and proposed programs. USAF also wanted a list of sites that could be closed. Using NORAD's criteria, ADC prepared a list of sites. NORAD concurred with this list and the USAF Air Defense Panel approved in principle both the criteria and the list of radars. Sixteen ADC sites were listed as excess but seven of these were identified as being "conditionally required." These seven sites were to be kept to meet ARADCOM air defense needs and/or until certain FAA radars were integrated into the air defense system.

U
(S) In August 1964, USAF asked for a NORAD/ADC position on a draft PCP on the ground environment which included phasing out the 16 excess sites. This PCP listed six sites for closing in FY 1965, four sites in FY 1966, and six more in FY 1967. The PCP said these latter sites, except Z-74 which was to be taken over by FAA, would be closed if substitute FAA radars were tied into the air defense system. NORAD and ADC said they agreed with the site closings provided the contingency requirements were met before the phase outs.


NORAD
LONG RANGE RADAR SITES
ANR
NNR
25
30
26
29
28
32
SITE TYPES:
SAGE 129
MANUAL 48
TOTAL 177
SITE LOCATIONS:
CONUS 127
CANADA 35
ALASKA 15
TOTAL 177
LEGEND
SAGE Site
Manual Site
FAA Site (Surveillance Only)


NORAD
GAP FILLER RADAR SITES
ANR
NNR
25
26
28
29
30
32
SITES: 89

U
(S) DOD approved the phase out of the 16 prime sites and nine gap filler sites.* Also, USAF was directed to prepare a radar phase-down plan that satisfied NORAD plans for support of ARADCOM.

U
(S) As directed by USAF, ADC closed six prime sites in FY 1965: Z-150 on 15 December 1964; Z-13, Z-24, Z-55, Z-67, and Z-177 on 1 March 1965. Also to be closed were the following:

FY 1966

Z-9 Highlands AFS, New Jersey
Z-38 Mill Valley AFS, California
Z-53 Rockville AFS, Indiana
Z-57 Naselle AFS, Washington

FY 1967

Z-15 Lompoc AFS, California
Z-43 Guthrie AFS, West Virginia
Z-74 Madera AFS, California
Z-98 Miles City AFS, Montana
Z-127 Winnemucca AFS, Nevada
Z-149 Baker AFS, Oregon

(U) Status. Before the end of 1965, several changes were made to the phase-out schedule. These changes involved sites Z-9, Z-38, and Z-74.

U
(S) On 21 January 1965, ADC, with NORAD concurrence, asked USAF to extend the phase out date for Z-9 and Z-38 for six months (from FY 4/1966 to FY 2/1967). This was to satisfy ARADCOM needs for

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* (U) The nine gap filler sites closed on 1 April 1965.

search radars at these sites to support Nike fire control requirements. By the end of the extension period, ARADCOM planned to shift operations from Z-38 to SF-93 (San Rafael, Calif., Nike Site) and to take over Z-9 from the Air Force and remain there indefinitely.

(U) In February, USAF said the extension could be proposed to OSD. This would probably be approved, USAF said, if Z-74 and G-32 (at Thule, Greenland) were substituted for Z-9 and Z-38 and closed in FY 1966. NORAD and ADC agreed to this proposal. On 31 August 1965, the Secretary of Defense approved the retention of Z-9 and Z-38 for an additional six months. Site G-32 and Z-74 were to be closed in FY 1966.*

(U) Before the end of 1965 there was another change concerning Z-38. FAA had told ADC that Z-58 (a joint-use site) at Mather, California, had been dropped from its list of required radars. In April 1965, ADC asked USAF to phase out Z-58 instead of Z-38. Action on this proposal was held up because USAF was asking OSD at this time to approve a six-month extension for Z-38, as noted above.

(U) In further correspondence in September 1965, ADC pointed out to USAF the reasons for keeping Z-38. ADC said that ARADCOM now wanted to stay permanently at Z-38 rather than move to SF-93, and this would save more than $550,000 in Army funds. Furthermore, the site offered both ADC and ARADCOM a better operational capability. ADC recommended that USAF ask OSD to authorize phasing out Z-58 in place of Z-38.

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* (U) G-32 closed on 3 November 1965. The FAA was to assume control of Z-74 after ADC phased out the site at the end of FY 1966.

U
(S) On 20 December, USAF told ADC that OSD had approved the substitution and Z-58 was to be closed in FY 1967. The phase out schedule at the end of the year 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 |

U
(S) Another change was being planned for those radar sites scheduled to phase out in FY 1967. Except for Z-9 and Z-58, the five remaining sites were to be closed and replaced by five FAA sites. Planning called for the FAA sites to be data-tied to the air defense system before the ADC sites were closed. However, at a meeting of USAF, ADC, and FAA representatives in November 1965, 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. Based on FAA plans, its radar sites would be operational as follows:

| FAA Site | Date (FY) | To Replace |
|---|---|---|
| Z-214 Battle Mountain, Nev. | 1/1970 | Z-127 |
| Z-223 Boise, Idaho | 2/1970 | Z-149 |
| Z-224 Lovell, Wyo. | 3/1969 | Z-98 |
| Z-232 Lynch, Ky. | 2/1970 | Z-43 |
| Z-236 Paso Robles, Calif. | 3/1969 | Z-15 |

U
(S) ADC told USAF in December 1965 that delay of the FYQ-40's would require extending the phase-out date of the five ADC sites from the end of FY 1967 to the end of FY 1969. Also, as a basis for program change proposal action, ADC sent USAF a

detailed request for this extension on 12 January 1966.*

GROUND ENVIRONMENT PLANNING

(U) (S) ADC Plans. The DOD-directed reduction of the 16 radar sites also required ADC to dispose of 32 height-finder radars (two per prime site). In December 1964, ADC told USAF that some equipment, including height finders, at the phased-out sites would have to be retained and/or relocated. ADC said that NORAD/ADC working groups were preparing objectives and needs for combatting the manned bomber threat. Also, they were studying the equipment needed for FAA radar sites that were to be tied into the air defense system. ADC asked that all height finders be kept until these requirements were decided.

(U) USAF agreed to keeping the height finders from the FY 1965 phase outs temporarily on the sites but wanted a height finder study sent to it by 1 April 1965.

(U) (S) NORAD concurred with ADC's study and, on 1 April, it was sent to USAF. The study recommended installing height finders at selected FAA radar sites in the Denver/Salt Lake City area, and in New Mexico, Texas, Oklahoma, Arkansas, and Tennessee. The study said that equipment from the site phase outs, which included 25 FPS-6 type height finders, should be kept to meet the requirements of the study. ADC said the study was based on the concept of installing these radars and necessary communications at certain FAA sites to give a better weapons control capability. And with FAA planning to automate

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* (U) (S) This request was sent to USAF in ADC's Consolidated Command, Control and Communications Program, FY 1965-1972.

its new National Airspace System (NAS) centers and DOD/FAA agreements for a common surveillance system, ADC said the air defense capability could be improved at a minimum cost.

(U) (S) USAF replied on 16 April that the study did not have enough information to justify keeping the surplus equipment. Furthermore, USAF said, the decreasing bomber threat would make it hard to get money to enhance weapons control, "particularly in an area that had no such capability when a large bomber threat existed." USAF felt, however, that air defense surveillance could be improved in the Denver/Salt Lake area after FAA had automated its operations in that area. To support a proposal to DOD for improving the air defense system, USAF asked for a more detailed plan for height finders. Also, it wanted separate plans for an incremental approach to:

1. Replacing the capability lost from those sites scheduled to phase out in FY 1967 at adjacent FAA sites; and

2. Automating the air defense capability in the Oklahoma City Sector by integrating with FAA.

(U) (S) In May, ADC questioned USAF's decision not to keep the surplus equipment and said it was essential that the bomber defense system be improved. On 24 May, USAF said there was no need to keep the height finders from the FY 1965 phase outs, but that ADC's requirement for 25 height finders could be filled from several sources, including radars made surplus in the FY 1966/1967 base closures. USAF reminded ADC to send the detailed plans it had asked for previously so they could be used in preparing a PCP to improve the bomber defense system.

(U) In June 1965, a NORAD/ADC working group prepared height finder and communications requirements for the five FAA sites that were to replace ADC sites in FY 1967. ADC sent these requirements to the air divisions concerned for use in making site surveys. In December 1965, ADC was evaluating the site surveys.

(U) ADC sent a proposal to USAF on 12 January 1966 for automating the Oklahoma City Sector by integrating with FAA NAS facilities, and for automating and improving the air defense capability in other areas by integrating with NAS. This proposal was included as a separate item in ADC's Consolidated Command, Control and Communications Program, FY 1965-1972.

(U) NORAD Radar Coverage Criteria Studies. In March 1964, NORAD published coverage criteria for land based search radars. At that time, it was planned to also 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. NORAD was studying low level coverage requirements at the end of 1965.

(U) Radars in Goose NORAD Sector and Iceland. On 17 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. It wanted this evaluation, USAF said, 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. USAF said that the two radar sites in Iceland would no longer be a part of a radar network after the G-I-UK Line was phased out. Therefore, USAF stated that it looked as if their contribution to air defense would end with phase out of the interceptors in Iceland. However, the situation in Goose Sector

was different. USAF said there might be reasons for keeping some of the radars (Goose had six USAF and one Canadian) for surveillance and, because of the possibility that dispersal bases might be located there, for weapons control.

(U) (S) In May 1965, ADC asked for NORAD comments. On 14 June, NORAD recommended keeping the two radars in Iceland and two of the six USAF radars (C-23 Stephenville and C-24 Melville) in the Goose Sector after the interceptors there were phased out. NORAD justified keeping the Iceland radars because they gave early warning coverage. NORAD emphasized that only the airborne portion of the G-I-UK Line was phasing out. These land-based radars overlapped with other radars in Greenland and the Faroe Islands to form a continuous barrier and provided 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. However, it 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 and Ottawa Sectors.

(U) (S) The whole approach to the radar environment in the Goose Sector changed after mid-1965, however. On 12 August, ADC told NORAD that USAF was going to protest to the JCS and the Secretary of Defense the decision to phase down the interceptor force. Therefore, ADC said it could not support "any reduction in radars or withdrawing the interceptors from Goose until new systems such as AWAC/IMI are operational in the system." It asked NORAD to concur with telling USAF that all radars in Goose were needed.

(U) (S) NORAD re-emphasized on 31 August 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. But NORAD

pointed out 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. NORAD said if the interceptor forces remained in the Goose Sector, then the surveillance and control environment should not be changed. It concurred with advising USAF of this latter position.

## PASSIVE DETECTION AND TRACKING SYSTEM

### IMPROVEMENTS FOR TCU/ASTRA

(S) In March 1961, NORAD stated a requirement in its NADOP 1963-1967 for an automatic passive detection and tracking system that would quickly and accurately locate aircraft emitting ECM. This system would supplement active ECCM coverage for controlling weapons during periods of heavy ECM activity. Also, in 1961, USAF approved a program to give SAGE and BUIC a passive defense system. The program was divided into two phases. The first phase was to be a semi-automated system known as TCU/ASTRA.* Phase II was to give BUIC II 34 fully automated passive radar systems (AN/TLQ-8's) but, in July 1963, USAF cancelled this second phase.

(S) MITRE tested TCU/ASTRA in 1963 and found that the system was inadequate mainly because of its low tracking capability. ESD then proposed a modification program that would improve the system. NORAD and ADC told USAF in August 1963 that they would not agree with the cancellation of Phase II and repeated the need for it. However, NORAD said that if improvements to TCU/ASTRA gave an adequate capability, then it would reconsider its position.

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* (U) Threshold Control Unit/Azimuth Strobe Tracking

(U) (S) Installation of TCU/ASTRA in SAGE sectors, which had started in 1963, was finished by mid-June 1964. In February 1964, NORAD had concurred with an ADC request for the ESD-proposed modifications to bring TCU/ASTRA up to acceptable standards. This modification program called for three separate items: Swept Local Oscillator Receiver (SLOR); Semi-Automatic Range, Azimuth, and Height (SARAH); and Elevation Versus Integrated Log (EVIL).*

(U) (S) In March 1965, USAF sent OSD a program change proposal (PCP 65-4) which included the improvement program. USAF asked for $16.6 million from FY 1968 funds for this purpose. On 31 August, the Secretary of Defense disapproved USAF's request.

(U) However, there was hope that the improvements could still be gotten. Since mid-1965, ADC had been working on a USAF-directed study of ECM/ECCM objectives, requirements, and priorities for the period 1965-1975. ADC sent the study to USAF in late December 1965. One of its recommendations was to fund and implement the TCU/ASTRA improvement program immediately. ADC felt that its study might be the basis for getting this program approved.

PASSIVE DETECTION FOR NON-SAGE/BUIC AREAS

(U) (S) With TCU/ASTRA being installed in SAGE/BUIC areas, NORAD wanted to give its manually-operated areas a passive detection capability. This would give the manual areas the ability to detect, track, and control weapons against aircraft in an ECM environment.

(U) (S) On 20 April 1965, NORAD sent the JCS its NQR 3-65 (NORAD Qualitative Requirement for Passive Detection Capability in Non-Automated NORAD Ground Environmental Areas). NORAD asked the JCS to approve

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* (U) For more details on these improvements, see NORAD/CONAD Historical Summary, Jan-Jun 1964, p. 50.

it and to give development responsibility for the system to the appropriate service. In the NQR, NORAD 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 (Salt Lake City Surveillance Area), and the western half of the Sioux City NORAD Sector (Denver Surveillance Area). Also, 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.

(U) The JCS approved the NQR on 29 May 1965 and made USAF responsible for handling the requirement. In June, USAF asked its Air Force Systems Command to make a technical feasibility and cost effectiveness study of NORAD's requirement.

(U) On 6 August 1965, USAF told NORAD that AFSC had made a preliminary analysis. AFSC found that a manual passive detection system was feasible but the requirement could not be completely met by using existing equipment. AFSC said an engineering study should be made to find the most cost effective and operationally acceptable equipment. In regard to cost, AFSC said a limit should be set because there would be a direct relationship between cost and system capability. Also, it said that without a high priority the system could not be operational by 31 December 1966.

(U) USAF directed AFSC on 18 October to begin the proposed engineering study, including cost schedules and technical/operational advantages and disadvantages of the various system options available. USAF said it did not want to set a minimum or maximum cost for the system. In November 1965,

it was established that the system should be able to track a minimum of 12 jamming aircraft per NCC area.

## AIRBORNE WARNING AND CONTROL SYSTEM

### BACKGROUND

(U) In October 1962, ADC sent USAF a qualitative operational requirement for an Airborne Surveillance and Control System. The recommendation for such a system and Improved BUIC to replace SAGE was included in the report of an Air Force study, Continental Air Defense Study, 10 May 1963. USAF published SOR 206 for an Airborne Warning and Control System in June 1963, which included the requirements of the Tactical Air Command and ADC.

(U) NORAD also supported the need for AWACS. In its 1963 NADOP, 1965-1974, NORAD stated a requirement for deploying an advanced airborne radar on ten stations by FY 1969. In NADOP 1967-1976, 15 October 1965, NORAD said it needed 14 AWACS aircraft by end FY 1970, building up to 42 aircraft by end FY 1972. However, it said the final number of aircraft needed would depend on radar and airframe development. This latter NADOP described NORAD's objective to get

> . . . a highly flexible and survivable long-range detection, tracking, weapon control, communications, and battle management capability for employment of current and improved manned interceptors beyond, or in conjunction with, contiguous ground-based radar coverage at all altitudes, regardless of terrain features, in an ECM and nuclear environment.

(U) In support of its objective, NORAD sent a Qualitative Requirement for an AWACS (NQR 3-64),

16 November 1964, to the JCS. The NQR was generally compatible with SOR 206 except for the radar detection range. The SOR specified a 200 nm range. NORAD asked for a 400 nm range. On 18 December 1964, the JCS asked NORAD for a comparison of the military worth of a 400-mile detection range versus a 200 mile range.

(U) NORAD made an analysis and sent its findings to the JCS on 5 April 1965. NORAD said the results showed that the 400 nm range radar had several advantages over the shorter range radar. These advantages included a substantial increase in warning time and surveillance and control coverage; a better detecting and tracking capability against the small radar cross section air-to-surface missile threat; greater flexibility in deployment; and a better capability to deal with an evolving threat. Therefore, NORAD recommended that the JCS approve an AWACS having the greater range radar. NORAD pointed out, however, that its requirement should not prevent early development and use of an AWACS with a shorter range radar, as an interim capability, if the system would have the growth potential to meet NORAD's needs.

(U) In May, the JCS indicated that they supported AWACS but felt that specific radar detection range objectives should be delayed until more conclusive technical data on radar capabilities were available.

STATUS

(U) In July 1965, ADC sent changes that it was proposing to SOR 206 to NORAD for comment. One of the changes was to revise the radar detection range from 200 nm against a one square meter target to 280 nm against a four square meter target. NORAD told ADC on 16 August that it believed a better radar capability could be gotten. To

resolve the differences between the SOR and the NQR, NORAD proposed a joint review of the two documents to get an agreed NORAD/ADC position. No NORAD/ADC review was held; however, in late December 1965, ADC met with TAC and USAF representatives to revise the SOR.

(U) In the meantime, programs were underway that could lead to an operational system. The firms of Boeing, Douglas, and Lockheed were making system definition studies that were expected to be finished in the spring of 1966. A communications study of command and control interface was expected to be completed in mid-1966. And a radar development program, expected to last four years, was being conducted. It was expected that a System Program Office for AWACS would be set up under AFSC's Aeronautical Systems Division in March 1966.

# CHAPTER V

# BALLISTIC MISSILE AND SPACE WEAPONS DETECTION SYSTEMS

## SEA LAUNCHED BALLISTIC MISSILE DETECTION & WARNING SYSTEM

BACKGROUND

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

(U) USAF finished its study in July 1964 and found that SAGE FD modifications were too sophisticated and expensive for the current threat. It also found that they 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 should be met with an inexpensive modification to line-of-sight radars.

(U) NORAD concurred with the main conclusions of the study. On 31 July 1964, 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, longer-range threat, NORAD recommended approval of a CONUS backscatter OTH prototype with concurrent planning for a complete OTH system. In August 1964, NORAD called to the JCS' attention, as it had in 1962 and again in March 1964, the possibilities of OTH radar. NORAD told the JCS that an OTH radar system should be deployed, but it

wanted an interim capability based on modifications or use of current surveillance systems.

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(S) On 5 November 1964, DDR&E approved the interim line-of-sight system concept and made $20.2 million available for development. Using guidance provided by DDR&E, NORAD, AFSC, and the 416N SPO (416N was the system program designation), met to discuss system configuration. It was decided that first priority of SPO effort should be to modify FD radars. After that, the FPS-49 Spacetrack radar at Moorestown, N. J., and the FPS-85 phased-array radar at Eglin AFB, Fla., would get second and third priority, respectively.

STATUS

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(S) Sites Selected. Requests for system proposals were sent to contractors in March 1965. By mid-1965, with NORAD representation, the SLBM Contractor Selection Board had evaluated proposals and 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 prime sites and to install one at Laredo AFB, Texas (Laredo would then be designated site Z-230). Radars were to be modified at the following sites:

| | |
|---|---|
| Z-37 | Point Arena 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 |

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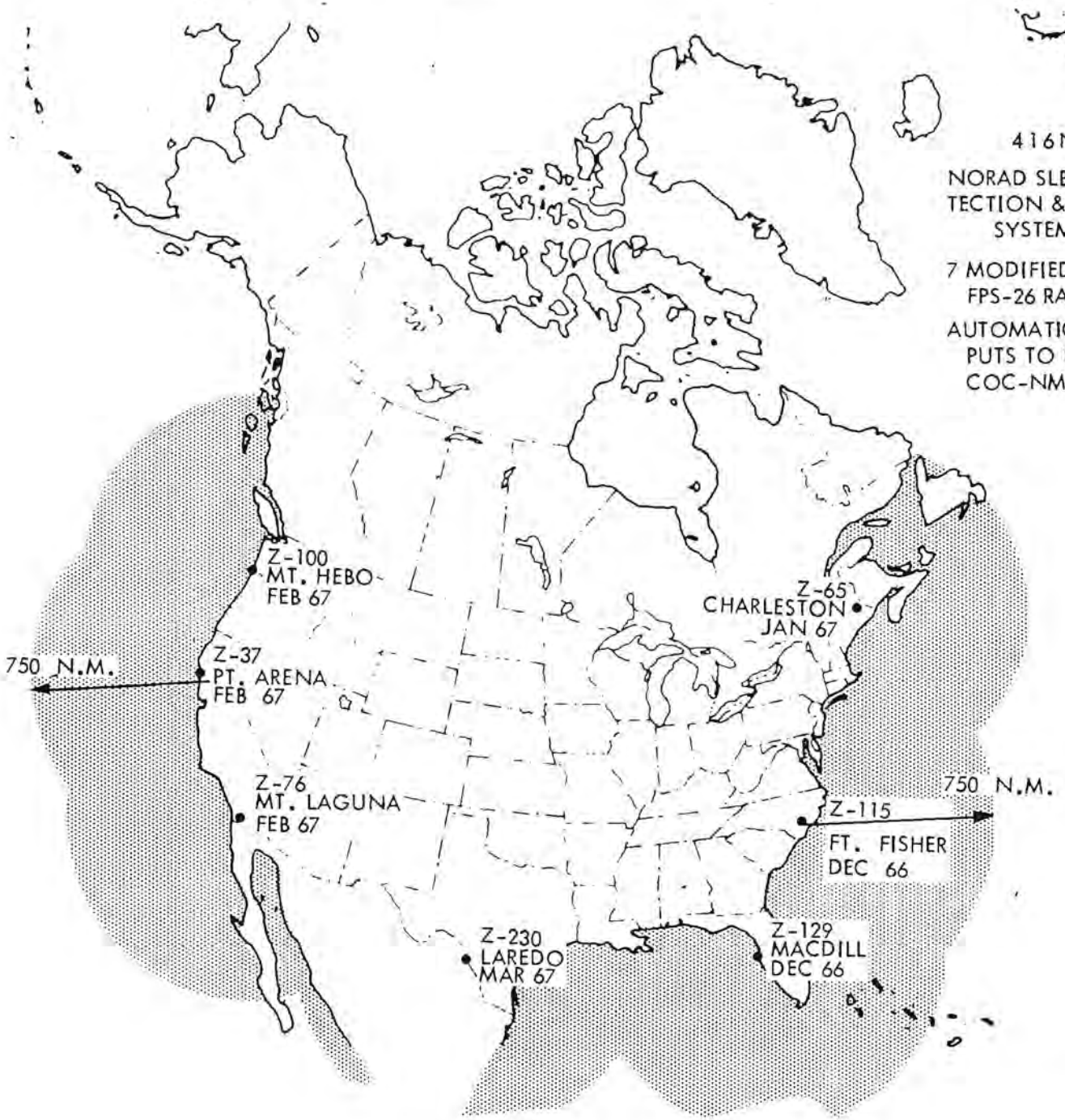
(S) It was expected that the system would be operational by the end of 1967. It was to be designated the AN/GSQ-89 and the modified radars were to be termed AN/FSS-7's. The radars were to give seaward coverage of about 750 nm and were to have three basic modes of operation: search, acquisition, and track. ADC described the method of operation in

these terms:

> The missile enters the beam and is detected in the search mode. Acting on command of the computer, the radar stops and returns to the designated target position and begins acquisition scan. The computer then directs the radar into the track mode. Tracking is maintained for 6 to 10 seconds, which is sufficient time to permit impact prediction which is at best within a 150 NM CEP. The radar then returns to search mode at the command of the computer. A warning and impact message is generated for transmission to the central processor at the Cheyenne Mountain Complex within 50 seconds from initial detection. At maximum detection range, this provides approximately 7 to 10 minutes of warning.

(U) On 9 December 1965, ESD awarded the contract for the system to AVCO. The system perforance specifications indicated that the FPS-85 at Eglin AFB would also be a part of the system and the FPS-49 at Moorestown would be available on an "on-call" basis.

(U) Loss in Radar Coverage. Because the FPS-26 radars would be diverted from SAGE, ADC foresaw an operational problem. On 24 November 1965, ADC pointed out to NORAD that after the radars were converted to SLBM detection and warning there would be some loss in height coverage to SAGE. ADC said these radars could be switched back to the SAGE mode at CINCNORAD's direction with some delay and coverage loss. To offset this loss, ADC suggested resiting the other height finder radar at each site or installing another one. However, ADC said it did not recommend either approach, except for Z-100, because of the cost involved. ADC asked NORAD if a more detailed study should be made with


416N
NORAD SLBM DE-
TECTION & WARN-
SYSTEM
7 MODIFIED AN/
FPS-26 RADARS
AUTOMATIC IN-
PUTS TO NORAD
COC-NMCC-SAC
Z-100
MT. HEBO
FEB 67
Z-65
CHARLESTON
JAN 67
750 N.M.
Z-37
PT. ARENA
FEB 67
Z-76
MT. LAGUNA
FEB 67
750 N.M.
Z-115
FT. FISHER
DEC 66
Z-230
LAREDO
MAR 67
Z-129
MACDILL
DEC 66

the aim of reducing or eliminating this loss in radar coverage.

(U) On 16 December, NORAD told ADC that it supported "the position that the use-option of the modified AN/FPS-26 radars will be based upon CINCNORAD's estimate of the priority of the threat against North America." NORAD said that after the system gave warning of SLBM launches it should be available for use against the manned bomber threat. In case of a simultaneous attack by bombers and SLBM's, NORAD said CINCNORAD would decide which threat the system would be used against. But NORAD felt that lack of height inputs to SAGE during critical periods would be unacceptable. For this reason, NORAD asked for site surveys at Z-37, Z-76, Z-100, and Z-129 to find out if it was practical to make up for this loss in coverage.

(U) Communications. In the meantime, the JCS were acting on NORAD's communications requirements for the SLBM detection and warning system. On 10 May 1965, NORAD had sent the JCS a request for dual full period dedicated data circuits for sending computer refined data from the sites to the COC. Voice and teletype circuits were to use existing military communication systems such as AUTOVON and AUTODIN. Valid warning data would be sent from the COC to SAC, the National Military Command Center, and the Alternate NMCC over BMEWS circuits.

(U) In December 1965, NORAD learned that the JCS had approved its 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 in the system.

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

BACKGROUND

(U) In July 1964, the Deputy Secretary of Defense directed that a study be made of all current and programmed DOD space detection, surveillance, tracking, and data processing equipment. An ad hoc group, known as the DATOS Study Group, was to examine these systems and then to recommend ways to reduce, consolidate, and allocate resources, and organize space systems so they would operate as a coordinated program. Members of the group were drawn from OSD. Other participants represented the JCS, DCA, DIA, NSA, the Services, and NORAD.

(U) NORAD appeared before the study group several times in 1964. At one meeting, NORAD gave 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 on 7 January 1965. The JCS wanted to include this new document (NQR 2-65) in their report to the study group.

TERM SPADATS OBSOLETE CPAM 13-1 REVISED 84

(U) NORAD sent to the JCS, along with the NQR for SPADATS, the requirements of all users of SPADATS data. NORAD told the JCS that most of the user requirements were being met except for one major item. This exception was the need to furnish space threat and situation warning before the first pass of a foreign spacecraft over all unified or specified command areas. NORAD said the implications of this requirement were particularly far-reaching in terms of surveillance coverage.

(U) On 6 February 1965, the JCS sent the NQR and user requirements to the study group. The JCS said they would comment on the NQR after making a thorough analysis. On 1 April, with minor modifications, the JCS sent their views to OSD supporting

NORAD's requirement. The JCS said they felt that foreign space activity was a limited but growing threat that must be watched carefully. Therefore, the JCS 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.

(U) In the meantime, in March 1965, the DATOS Group had finished its report and recommended disapproval of NQR 2-65. This was done, apparently, because of the study group's estimate of the space threat. The result was, on 5 May 1965, the Deputy Secretary of Defense disapproved the NQR and recommended to the JCS that it be revised. Also, he asked the JCS to review NORAD's mission in regard to deep space probes. The DATOS Report had noted that only intelligence agencies wanted data on such objects and this function required equipment that was not needed for other mission functions. He felt that, possibly, NORAD might be relieved of the responsibility to detect and track deep space probes.

(U) On 4 June, the JCS said they recognized that NQR 2-65 needed revising. But they said that the NQR would be sent back to NORAD after specific differences over it were settled between the JCS and OSD. Also, the JCS defended 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, they believed that justification might develop for detecting and tracking deep space probes. Under these circumstances, the JCS said that CINCNORAD should control the operation of the special sensors and they were against

putting an arbitrary altitude limit on SPADATS at this time.

STATUS

(U) The Deputy Secretary of Defense commented on the differences between the JCS and OSD on 20 July 1965. He felt that his comments settled the issues and 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. The Spacetrack radar at Moorestown and the cooperating radar at Trinidad were not to be closed until the FPS-85 at Eglin AFB proved its operational capability.*

3. 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.

4. 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.

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* (U) In further correspondence between OSD and the Air Force, it was decided to defer the final decision on closing the Moorestown and Trinidad radars.

(U) On 11 October 1965, the JCS asked NORAD to revise NQR 2-65. NORAD set up a working group to revise the document. Planning called for it to be reissued as soon as practicable.

## SATELLITE RECONNAISSANCE ADVANCE NOTICE

(U) Starting on 31 July 1965, NORAD was to advise unified and specified commanders of the launch of Soviet reconnaissance satellites so they could limit or prevent photographic reconnaissance of their forces. This project, called Satellite Reconnaissance Advance Notice (SATRAN), was developed jointly by DIA, the Foreign Technology Division, and NORAD. The commands concerned were given maps and overlays. By using data supplied by NORAD, commanders would be able to plot the track of a satellite over their areas and take defensive action, such as dispersal, camouflage, etc.

(U) However, one major drawback was the limitations of SPADATS. SPADATS could not give data on a real-time basis. "As a result," the director of the COC said in July 1965, "Soviet photographic reconnaissance of some of our forces can be accomplished before they can be alerted to the passage of a newly-launched reconnaissance satellite."

(U) On 18 November, NORAD sent instructions to its regions and told them to begin using SATRAN procedures not later than 15 December 1965. NORAD told the regions to consider taking defensive actions during both night and day flyovers.

## OTH FORWARD SCATTER MISSILE DETECTION SYSTEM

(U) In December 1964, USAF issued a System Program Directive authorizing the Air Force Systems Command to design, develop, and acquire an over-the-horizon forward scatter missile detection system.

This system, called 440L, was to partially satisfy NORAD's Qualitative Requirement for a Launch Detection System Over the Sino-Soviet Area (NQR 1-64) which had been sent to the JCS on 15 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.

(U) (S) On 1 July 1965, the 440L System Program Office was set up and assigned development responsibility for the forward scatter system -- a program (673A) that the Rome Air Development Center had been working on for some time.* The system 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 supply intelligence data on nuclear detonations and missiles in the research and development stage.

(U) (S) The system was made up of two transmitter sites in the Far East and five receiver sites and a data correlation center in Europe. In this configuration, system development testing was to detect Soviet missile launches from the test complexes at Kapustin Yar and Tyura Tam. 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. Missiles were to be detected by

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* (U) (S) Also, USAF gave authorization to integrate and coordinate the activities of the 440L System with the Army OTH radar program, Project Sugar Tree, for early warning.

observing "irregularities" on high frequency transmissions between sites on opposite sides of Soviet launch complexes. Also, certain receiver sites were to monitor and analyze signals from Soviet transmitters.

(U) The target dates for operation of 440L, were set at August 1967 for initial capability and August 1968 for full capability. In the meantime, system development data was to be sent to the NORAD COC and displayed in the Current Intelligence Indications Center. On 31 December 1965, a secured teletype circuit for reporting this data became operational from the correlation center at Aviano, Italy, to the data reduction center at Rome, N. Y., and from there to the COC.

## BALLISTIC MISSILE EARLY WARNING SYSTEM

### ECCM IMPROVEMENTS

(U) In September 1963, the Secretary of Defense approved a program, estimated to cost about $43 million, to give BMEWS the ability to recognize, analyze, and counter various types of ECM jamming. Work started on this program at that time when RCA was awarded a contract for a recognition and analysis item. These features were expected to be operational by July 1966.

(U) As a part of this program, DOD approved getting 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. Procurement of this item was to start after General Electric finished feasibility testing, 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.

(U) In September 1965, ADC told NORAD that before USAF would authorize funds to install the SLC, the need for it would have to be reaffirmed. ADC asked NORAD for recommendations on this matter. On 12 October 1965, after NORAD had evaluated General Electric's report and a Top Secret report from MITRE, it recommended to ADC that the SLC not be gotten at this 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.

(U) ADC suggested to USAF on 30 November that the need for the SLC be reviewed to insure that all technical and operational aspects were considered. ADC said the SLC was feasible, but there was some doubt about its cost effectiveness mainly because of its overall operational value. ADC said it believed a review by Headquarters USAF was essential

> . . . since a delicate balance exists between operational advantages which might accrue with the cancellor program installed and the sizeable sum of money (12-18 million dollars) that must be expended to install this feature.

BMEWS ALARM INPUTS TO SHAPE

(U) In April 1963, the JCS said that NORAD could report evaluated BMEWS data to SHAPE. This was to be done over a two-way voice circuit that became fully operational in October 1963 between the command posts of NORAD and SACEUR.

(U) On 21 July 1965, in a message to Lt. General H. B. Thatcher, ADC Commander, General R. M. Lee, SHAPE Deputy for Air, said that current procedures could delay, up to 15 minutes, informing SHAPE of vital early warning information. General Lee said that efforts to get the U.K. to relay

BMEWS data to SHAPE were unsuccessful because of restrictions in a U.S. - U.K. agreement. General Lee asked for assistance in getting immediate BMEWS inputs to SHAPE by revising the agreement.

(S) By 20 October, U.S. - U.K. agreement had been reached to let the U.K. Operations Centre pass BMEWS warning data to SHAPE. In November, a joint NORAD/ADC/RAF Fighter Command team briefed General Lee's staff on BMEWS operations. At this meeting it was decided that if communications were approved and available, initial operation could start in early 1966.

# CHAPTER VI

# NUCLEAR DETONATION AND B / C REPORTING SYSTEMS

## BIOLOGICAL AND CHEMICAL RAPID WARNING SYSTEM

### BACKGROUND

U (S) NORAD's requirement for an automatic biological and chemical rapid warning system was approved by the JCS in 1961. Later, the JCS expanded it from a system for NORAD to an over-all continental system. Because no automated system was developed yet, the JCS directed the Army to set up an interim manual system. The interim system became operational on 1 July 1964.

U (S) In July 1962, DDR&E directed the Army to make a complete study of an automatic system to further define and clarify the project. The study, made by General Electric, was evaluated by the Army Materiel Command. In October 1964, AMC sent its conclusions and recommendations to NORAD for comment. AMC had found that BC sensors were not developed enough to have a system responsive to NORAD's needs and there was not enough guidance for a totally responsive system. It recommended suspending the program until suitable sensors and proper guidance were developed and a complete evaluation was made of the over-all CONUS BC warning problem.

U (S) On 22 October 1964, NORAD said it generally concurred with the Army's analysis and evaluation of the study. But NORAD said that it still wanted a rapid warning system.

U (S) In March 1965, the JCS directed the Army to make an updated reappraisal of the requirement for a BC system through 1975. This re-evaluation was

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necessary, the JCS said, because technical, operational, and intelligence factors had changed since the requirement was established in 1961. NORAD and DIA were to assist in reappraising the requirement. As an input to this analysis, NORAD was to update its qualitative requirement.

SYSTEM REAPPRAISAL

(U) On 10 August 1965, NORAD sent a draft of its proposed NQR to the component commands for coordination. In the meantime, on 26 August, CONAD sent an interim qualitative requirement for an improved biological and chemical detection and warning system to the JCS and the Army. After the components had concurred with the requirement, NORAD published it as NQR 7-65, 25 October 1965.

(S) On 1 November, NORAD sent the NQR to the JCS and the Army and told them that it replaced the interim CONAD requirement. 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. However, the NQR pointed out that while all elements of the system would not likely be developed before 1975 an improved system could be gotten by upgrading the interim system in increments as development allowed. The NQR stated the need for research and development on sensors and research on design parameters for an automatic system. NORAD said the system would not be needed until the threat of strategic BC warfare justified it and the cost/effectiveness ratio was acceptable.

(S) By 15 November 1965, the Army's analysis was finished and the JCS sent it to DDR&E on 15 December. In early January 1966, the JCS told NORAD that guidance had been issued on developing the system. The JCS said there was a need for developing a system to rapidly detect a biological attack. However,

they said that because of the limited strategic threat there was no need for a nation-wide system to warn of a chemical attack. The Army was directed to set up a development program for biological sensors to support NORAD's requirement when research showed that rapid biological sensors were technically practical. The JCS said that 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.

## BOMB ALARM SYSTEM

### RECONFIGURATION STUDY

(U) In September 1964, ADC asked NORAD to review the Bomb Alarm System coverage and advise it of any changes that were needed. The system had been in operation for two years and covered 99 target areas. ADC felt that because there had been changes in the military structure and new developments throughout the U.S. there might be areas that should be given coverage. Furthermore, there might be some areas that were not likely targets and no longer needed coverage.

(U) NORAD said that Eielson AFB and Elmendorf AFB, both in Alaska, should be added to the BAS. Because the system could handle no more than 120 target areas, in February 1965 ADC asked USAF for guidance in fulfilling NORAD's requirement. ADC told USAF that it was aware of an ESD attack assessment work plan which included a recommendation to expand the BAS to cover about 20 additional target areas. It said the needs for Alaska might be in conflict with the target selection list being developed and wanted to prevent going beyond the capacity of the system.

(U) USAF replied on 29 April that it would not approve NORAD's requirement. It took this action, USAF told ADC, because a JCS ad hoc study group had been directed to make a target list using

all 120 units in the BAS. USAF said the list had been completed and the main purpose 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.

W (S) NORAD informed the JCS of USAF's action on 2 June 1965. NORAD reminded the JCS that they had assigned operational control of the BAS to CINCNORAD. NORAD asked the JCS to clarify 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 replied that it was making a study of all attack assessment systems including the BAS. Also, they said that the study was considering expanding the BAS to additional urban areas but it did not include the bases in Alaska.

W (S) In further correspondence in September 1965, the JCS said a study had been sent to DOD recommending the expansion of the system. Until DOD acted on the study's recommendation, no further action was to be taken on installing the BAS at the Alaska bases. Also, in September, the JCS directed DCA to give technical assistance to NORAD in reconfiguring the system to make it more responsive to attack assessment needs. By the end of 1965, DCA and USAF were coordinating on plans to satisfy the JCS directive.

BAS DISRUPTED BY POWER OUTAGE

W (S) On 9 November 1965, a major power failure in the northeastern area of the U. S. made 13 BAS sites in that area temporarily unable to report a nuclear explosion. Both NORAD and USAF asked ADC to look for ways to prevent this from happening again.

W (S) ADC reported on 1 December that the outage was not caused by power failure at the sites, as was suspected at first, but was caused by power failure at relay stations. ADC said it was discussing with Western

Union ways to give these relay stations backup power, and it would make recommendations for corrective action when the talks were finished.

## CANCELLATION OF NUCLEAR DETONATION DETECTION AND REPORTING SYSTEM

U (S) The Nuclear Detonation Detection and Reporting System (NUDETS 477L) was to have been put into use in two phases. Phase I became operational on 1 July 1964 in the Washington, D.C. area to serve the needs of the National Military Command System. Phase I also sent data inputs to the NORAD COC. Phase II was to satisfy NORAD's requirement for a nation-wide automated system.

U (S) However, Phase II underwent a period of study and NORAD learned in April 1965 that it had been cancelled. It was felt that current technology would not give an acceptable ratio between the effectiveness of the system and the cost involved.

U (S) On 31 August 1965, the Secretary of Defense issued guidance to end Phase I during FY 1966. On 21 September, ADC asked if it should move NUDETS equipment from the COC on Ent AFB to the COC in Cheyenne Mountain. NORAD replied on 7 October that the equipment should not be moved but could be disposed of after the system was ended or the COC on Ent AFB was closed, whichever happened first.

U (C) It was felt that ending Phase I would have very little effect on NORAD's ability to detect a nuclear explosion. The display equipment in the COC had been plagued with maintenance problems. Also, system testing showed that the data it gave was not reliable.

# CHAPTER VII

# WEAPONS

## STATUS SUMMARY

(S) The NORAD regular interceptor force decreased by three squadrons from 30 June 1965 to 31 December 1965, from 41 to 38. Three F-102 squadrons were removed from the NORAD force. By 1 January 1966, the total number of interceptor aircraft had dropped from 791 to 688. The number of ANG (Category 1) squadrons stayed at 21, but the number of aircraft fell from 408 to 380. The ANG continued its F-102 conversion with one squadron (196th) completing conversion in August 1965 and four others (116th, 134th, 118th and 152d) starting during this six-month period.

(S) NORAD concurred with an ADC proposal to gradually degrade the mission capability of interceptor units to be inactivated. The degradation process would begin 180 days before inactivation. This program, agreed upon on 10 September 1965, would permit ADC to maintain a high state of combat readiness in squadrons not scheduled for inactivation.

(S) The number of BOMARC missiles in the eight squadrons dropped from 240 to 238 by 1 January 1966 as a result of one evaluation launch and one missile transfer to the CEL Program. Eight RA Nike Hercules fire units at four SAC bases became non-operational on 22 December 1965 leaving a total of 83 RA fire units under NORAD control on 1 January 1966*. The total of

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* (U) These bases were Fairchild, Barksdale, Robins and Turner.

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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.

## INTERCEPTOR FORCE

### FIS DEACTIVATION AND MOVEMENT (REGULAR FORCE)

(U) During this six month period, three F-102 squadrons were removed from the NORAD force. One was deactivated, one was released from alert for movement, and one was released from alert for deactivation.

(U) The 482d FIS (Seymour-Johnson AFB, N. C.) was the second squadron to be deactivated under the December 1964 OSD-ordered interceptor force cuts (the 332d, Thule, Greenland was the first). The unit was released from regular alert 1 July 1965. It was relieved from its Key West commitment on 1 August 1965 by the 326th FIS (Richards-Gebaur AFB). The 482d was deactivated on 1 October 1965 with its aircraft slated for the Burlington ANG.

(U) On 24 September 1965, the 82d FIS at Travis AFB was permanently relieved of all alert requirements for a move to WESTPAC. The 460th FIS at Portland IAP was released from alert 24 December 1965 for deactivation in January 1966.

(U) On 10 November 1965, USAF issued authority for ADC to plan the discontinuance of Detachment 1, 59th FIS, at Ernest Harmon AFB, Newfoundland. The authority also called for the return of personnel and equipment to the parent unit at Goose AB, Labrador, not later than 1 April 1966. ADC confirmed, on 27 December 1965, that Detachment 1, 59th FIS, would be deactivated on 25 March 1966, with an operational cut off of 1 February 1966. ADC also said Ernest Harmon AFB, Newfoundland, would be closed by 1 January 1967.

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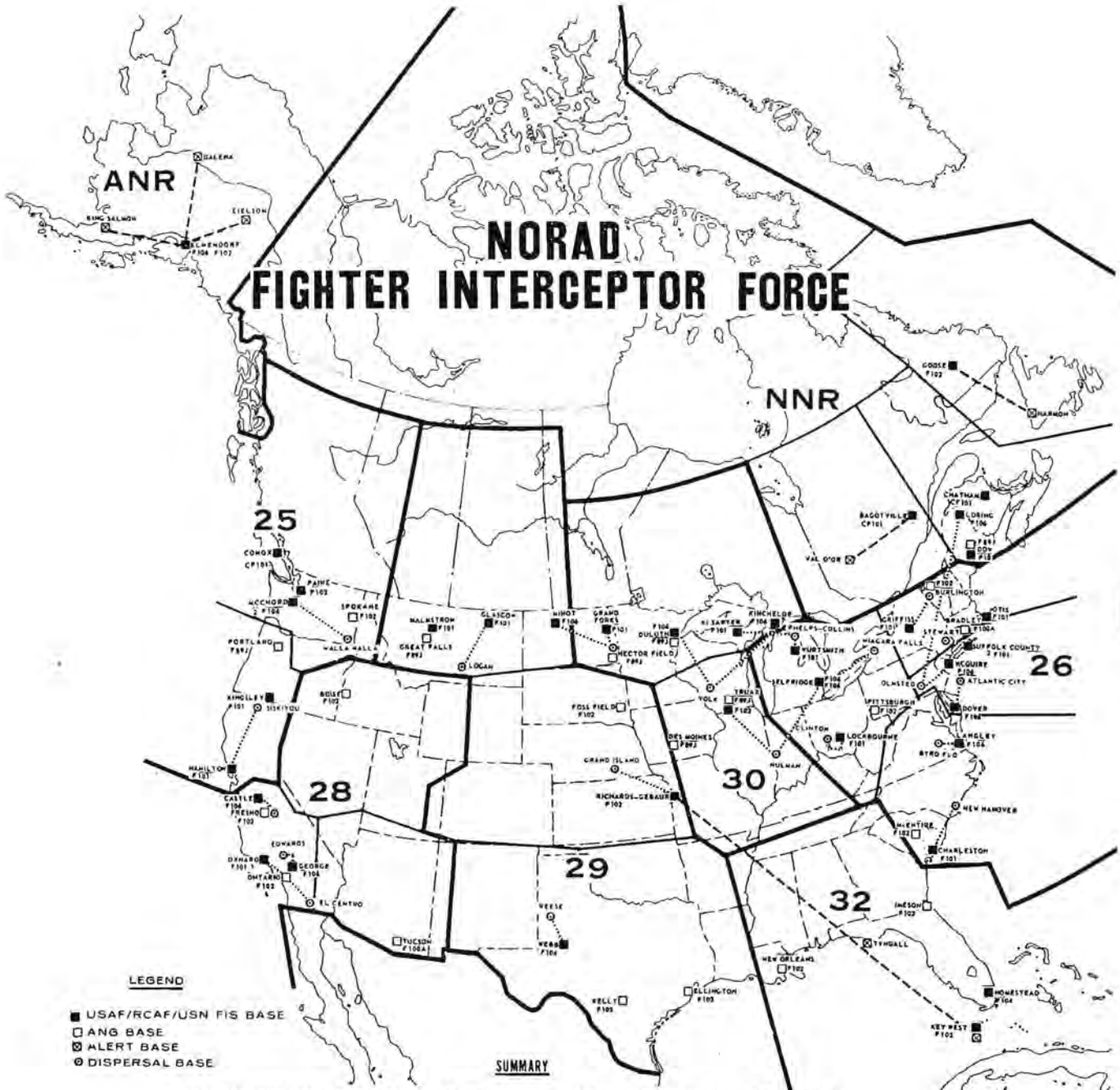


SUMMARY

REGULAR FIGHTER INTERCEPTOR FORCE

| | | |
|---|---|---|
| 13 | F-106 | SQDNS |
| 3 | CF-101 | SQDNS |
| 15 | F-101 | SQDNS |
| 5 | F-102 | SQDNS |
| 2 | F-104 | SQDNS |
| TOTAL 38 | | SQDNS |

ANG FIGHTER INTERCEPTOR FORCE

| | | |
|---|---|---|
| 12 | F-102 | SQDNS |
| 7 | F-89J | SQDNS |
| 2 | F-100A | SQDNS |
| TOTAL 21 | | SQDNS |



SECRET

UNCLASS

FUNDING FOR ANG NUCLEAR WEAPONS FACILITIES

(U) In a message to USAF on 13 December 1965, ADC said the NGB had advised them of major cuts in funds for construction of nuclear storage facilities at ADC/ANG locations. ADC asked USAF to help as much as possible in their proposed reclama, pointing out that getting an on-base nuclear capability for ANG units was vital. ADC also asked that action be initiated through JCS channels to get NORAD support.

(U) Early in January 1966, CINCNORAD, in a message to ADC, pointed out his need to know what the ANG F-102 capability would be as a result of the decision by DOD to cut the funds to support the F-102 nuclear program.

ANG F-102 CONVERSION

(U) On 1 August 1965, the 196th ANG FIS at Ontario, California, completed conversion to F-102's. This conversion was a milestone in ANG progress for with this change the last of the F-86's left the NORAD system. August 1965 also saw the 116th ANG FIS at Spokane, Wash., and the 134th ANG FIS at Burlington, Vermont, begin conversion to F-102's. The 118th FIS at Bradley Field, Connecticut, was relieved of alert on 29 October 1965 to convert to F-102's as was the 152d at Tucson, Arizona.

(U) On 13 July 1965, ADC and NGB prepared an F-102 conversion program for future 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 units as for regular ADC units. There were 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 receipt of the twelfth aircraft.* The program also made available the facilities at both Perrin AFB and Tyndall AFB throughout the conversion period. The National Guard Bureau assumed responsibility for the actual conduct of the conversion program. However, ADC was to provide personnel to the converting unit to help in ground and flying instruction.

(U) Early in January 1966, ADC submitted the following initial conversion schedule to NGB:

| UNIT (ANG) | AIRCRAFT FROM | CONVERSION DATE |
|---|---|---|
| 123 FIS Portland | 460 FIS Portland | 3/FY66 |
| 176 FIS Truax | 325 FIS Truax | 4/FY66 |
| 178 FIS Fargo | 64 FIS Paine | 4/FY66 |

(U) The 186 FIS (ANG) at Great Falls, Mont., would use extra ANG Configuration (Fig. 7) 7 F-102's to convert in the first quarter of FY 1967.** The Tucson and Bradley ANG Squadrons, which were converting at this time, were using PACAF Fig. 7 F-102 aircraft. The extra Fig. 7 F-102's would be distributed among other ANG Fig. 7 F-102 squadrons until they were needed at a later date.

IMPROVED INTERCEPTOR FOR ALASKA

(U) Background. In 1962, the JCS concurred with CINCAL's requirement to replace his F-102's with

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

** (U) Configuration 7 F-102's carry non-nuclear weapons and do not have the infrared fire control system modification.

an improved interceptor. The F-4C was considered the best replacement, but was not available immediately. Beginning in July 1963, eight F-106's from ADC were added to the Alaskan force. The 325th Fighter Wing, McChord AFB, Wash., and the 1st Fighter Wing, Selfridge AFB, Mich., shared the duty of sending the F-106 detachment to Alaska on a rotating basis. First, the detachment came from the 325th, then from the 1st, etc. This temporary deployment plan was called "White Shoes."

(U) 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) However, force guidance from the Secretary of Defense called for deletion of all F-102's from the regular force. ANR indicated that it would require 28 F-4C's to fulfill its air defense mission. CINCONAD backed ANR's requirements and added that the feasibility of providing the F-4C with a nuclear capability should be examined.

(S) December 1964 brought an order from OSD for interceptor force cuts which made the F-102 squadron in Alaska the last regular-force F-102 squadron to inactivate (fourth quarter of FY 1967).* White Shoes termination was planned for the same time as the arrival of the F-4C squadron in August 1965. In January 1965, ANR asked that NORAD change the White Shoes termination date to 1 September 1965 to allow for an overlap for change-over routine.

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

NORAD concurred and sent ANR's request to ADC in February 1965 for its comments and recommendations.

(S) Status. On 2 June 1965, the 325th Wing detachment of eight F-106's took over the Alaskan augmentation from the 1st Wing. At this time, the 317th FIS, Elmendorf AFB, had 44 F-102's. ADC said on 20 July 1965 that the F-4C squadron was to be in place no later than 15 September 1965. On this same date, USAF ordered a two-week overlap indoctrination period, with a termination date for project White Shoes of 30 September 1965.

(S) By 3 August 1965, AAC's 317th FIS, Elmendorf, had decreased to a total of 29 aircraft, with a UE of 26. NORAD, ADC and ANR had recommended that when the remaining F-102's were phased out of ANR (fourth quarter FY 1967), the F-4C squadron be increased to 28 aircraft. The USAF Air Staff were reviewing their recommendations at this time. Feasibility studies were also being made on modifications to the F-4C to give it a nuclear capability. The 389th TFS with 18 F-4C's was deployed to Elmendorf in September.

(S) On 9 September 1965, ADC was advised by USAF that over-riding Southeast Asia (SEA) operations necessitated temporary suspension of the TAC F-4C rotation to ANR in December 1965. USAF also approved continuation of F-106 rotation to AAC under the current White Shoes concept.

(S) In September 1965, ADC objected to USAF about the suspension of the F-4C rotation to AAC. It also pointed out the added workload placed on the 325th Fighter Wing at McChord and the 1st Fighter Wing at Selfridge AFB, Mich., with the decision to continue White Shoes indefinitely. ADC felt that if White Shoes were continued, the aircraft must be provided from some F-106 unit with no dispersal base. Another problem was that McChord and Selfridge, which had two squadrons each while supplying aircraft

for White Shoes, would reduce to one squadron apiece by the third quarter of FY 1967. The 498th FIS, McChord AFB, would move to Paine in October 1966, while the 71st FIS, Selfridge AFB, would move to Richards-Gebaur in the third quarter of FY 1967.

(S) (U) The conclusions of an ADC study dated 17 September 1965 were twofold. First, no one squadron could hold down the White Shoes Project and Phase III dispersal as well. Second, if Phase III dispersal was deferred while White Shoes went on, the Dispersed Operating Bases would not be fully used. The study recommended that a single squadron not programmed for a DOB be assigned to the White Shoes Project on the basis that this situation would hold good until MADPAC approval.* The second recommendation was that the 5th FIS (Minot, N. D.) be assigned White Shoes since it was under a Phase I dispersal operation until the fourth quarter of FY 1968.

(S) (U) In a message to USAF on 17 September 1965, AAC said that there was no change in their minimum force requirements:

1. An F-4C rotational squadron with a 26 UE squadron of F-102's or

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

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* (S) (U) ADC was refining a proposal for organization of a Mobile Air Defense Package (MADPAC). The concept was for an F-4C-equipped wing based at Richards-Gebaur with deployed aircraft on alert at Key West, Goose, Iceland and Alaska when required. Aircraft would be procured from the production line during February to June 1966. Tyndall would receive an allocation of the F-4C for the training mission.

(S) 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 keep this capability, AAC requested continued F-4C rotation through April 1966 if SEA commitments permitted it. Should the F-4C's be withdrawn to meet SEA requirements, AAC said it would require continuation of eight F-106's (White Shoes) and an additional 15 F-102's.

(S) By November 1965, the JCS had approved temporary suspension of F-4C aircraft rotation to ANR effective 15 December 1965 and had requested NORAD's views on providing interceptors from CONUS sources. ADC was reluctant to support AAC's additional 15 F-102 requirement, but if necessary it agreed that a maximum of eight F-102's could be provided. TAC's 389th TFS was removed from Elmendorf in December.

(S) In the meantime, in a message to the JCS on 15 November 1965, NORAD said it did not consider it feasible to allocate more F-102 aircraft to ALCOM from CONUS resources. NORAD explained that the proposed FIS reductions, overseas deployments, and the ANG interceptor conversion program during the next twelve months would seriously weaken CONUS defense. Due to this cut in over-all interceptor force capability, NORAD felt that it would not be prudent to deploy interceptor resources from a high priority area (CONUS) to a lower priority area (Alaska). 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 whole area of ANR interceptor forces (including Project White Shoes). Recommendations were to be made to USAF upon completion of the study.

SOUTHEAST ASIA DEPLOYMENT

(U) In a message to USAF on 27 August 1965, ADC supported a Southeast Asia (SEA) deployment of F-102's to Naha, Okinawa. ADC recommended use of Configuration 8 (Fig. 8) F-102's for air defense at Naha and possible air/ground operations in SEA and that deployment be on a rotational basis.* The deployment plan was first called Deuces Wild but was changed to Thirsty Camel in October 1965 when it was thought to have been compromised.

(U) To begin the operation, ADC ordered deployment of the 82d FIS from Travis AFB. ADC confirmed TDY rather than PCS for the SEA deployment and relieved the 82d from alert on 24 September 1965 to prepare for movement. The recommended UE was to have been 29 F-102's but ADC finalized the UE at 28 F-102's and one TF-102. Fig. 8 F-102's from the 82d FIS were to be supplemented by aircraft drawn from the 460th, 59th and 325th FIS's to make up the full 29 UE complement. OSD approval of Thirsty Camel came on 16 November 1965 and confirmed delivery of the first aircraft on 10 January 1966. The 28th aircraft was to be delivered on 10 February 1966 and the 82d FIS was to be operationally ready by 25 February 1966.

(U) The final decision on a deployment/rotation schedule was set out on 23 November 1965:

| | |
|---|---|
| 82d FIS | February 1966 to June 1966 |
| 64th FIS | June 1966 to November 1966 |
| 326th FIS | November 1966 to March 1967 |

(U) The 82d FIS was in place at Naha, Okinawa, on 25 February 1966 except for a few stragglers.

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* (U) Configuration 8 F-102's carry nuclear weapons and have the infrared fire control system modification.

NORAD INTERCEPTOR FORCE UE

(U) F-104's. In a message to ADC on 13 July 1965, NORAD disagreed with ADC's proposal to decrease the F-104's of the 331st FIS, Webb AFB, and 319th FIS, Homestead AFB, to a UE of 18. NORAD quoted ADC's message of 28 May 1965 to USAF pointing out that ADC had previously supported the 319th FIS at 24 UE even though this created a squadron of less than 18 UE at Webb AFB. At that time, ADC had cited the tactical location of the 319th FIS (to counter the Cuban threat) as justification for its position. NORAD supported retention of the full 24 UE authorization at Homestead. NORAD felt that operational requirements in the Southern Florida Area could best be satisfied with the F-104 force. NORAD recommended consolidation at Homestead AFB of the entire F-104 force. It felt that the movement of the F-104's at Webb AFB to Homestead AFB would increase the air defense potential in the Southern Florida Area and better satisfy NORAD operational requirements.

(U) F-106's. On 27 October 1965, ADC asked for NORAD's views on reduction of the number of F-106 squadrons as opposed to reduction of UE strength of selected squadrons. NORAD pointed out that the Program Force Guidance maintained all 13 F-106 squadrons through FY 1970 with a cut to 12 UE for selected squadrons starting in FY 1966 due to expected force attrition. NORAD said that indications were that most squadrons would have more than the 12 UE since the F-106 force was greater than that programmed so far. There actually appeared to be enough aircraft to permit keeping the 13 squadrons at full 18 UE through FY 1968. NORAD said that if the option to discontinue three F-106 squadrons was selected, the loss of six deployment bases (home and dispersal) would result. In view of the advantages in tactical employment and survivability to be gained from six additional bases, NORAD supported the option to maintain a 13-squadron F-106 force.

CANADA/U. S. NUCLEAR ARRANGEMENTS

U ~~(S)~~ On 10 August 1965, NORAD informed RCAF ADC that the President had approved the Canada/U. S. "Nuclear Arrangements" draft agreement on 10 July 1965. The President had also ordered the State Department to arrange for a formal signing. The JCS confirmed on this same date that interim procedures had been prepared and would be circulated.

U ~~(S)~~ In a message to CONAD and NORAD, the JCS said that the agreement with Canada on consultation and use of nuclear air defense weapons was signed on 17 September 1965. This same message authorized the issue of interim procedures for nuclear weapon release. CINCONAD was to prepare final procedures and forward them to the JCS for approval. Final NORAD procedures were to be coordinated with the Canadians prior to submission to the JCS. NORAD sent a message to all pertinent commands containing interim operating procedures for NORAD nuclear armed forces on 27 September 1965.

INTERCEPTOR DISPERSAL

BACKGROUND

U ~~(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 a hostile air-breathing threat. A dispersal base was a recovery or turnaround airfield, other than the home base, that was designated for the operation of dispersed interceptors. The operational capability of a dispersal base was defined as one of four phases, Phase I, II, III (Modified) and III. Phase I was a "turnaround only" capability progressing to Phase III that provided permanent dispersal facilities for a four-sortie nuclear capability for six aircraft on high alert.

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(S) USAF ADC's dispersal plan of January 1964 had listed 21 bases in the CONUS and nine in Canada as required. In July 1964, USAF advised that as a result of an OSD Force Guidance memo, only 17 of the 21 CONUS bases were approved in the FY 1964 MCP. The program was to develop sixteen bases to a Phase III capability and one to a Phase II capability.

(S) During late 1964, the dispersal requirement was re-appraised by both USAF and ADC. When the Secretary of Defense announced the interceptor force reduction in December 1964, ADC sent USAF a proposed dispersal alignment for FY 1966 through 1969. ADC said that under its future 20 squadron force, a minimum of 18 CONUS and two Canadian dispersal bases were required for "one squadron/one DOB" dispersal. USAF approved 17 CONUS bases and three Canadian bases for future negotiation with Canada on 7 January 1965.

(S) NORAD asked the JCS on 20 January 1965 to help reopen Canadian dispersal base negotiations at the earliest practical time. NORAD's view was that two of the approved CONUS bases were in probable target areas. NORAD wanted two more Canadian bases in eastern Canada negotiated for to replace these two CONUS bases.

(S) ADC agreed with NORAD's position and advised USAF. USAF replied that the requirement for five Canadian DOB's could not be met, but that four might get approval if ADC and NORAD joined USAF in this position. ADC and NORAD reluctantly agreed on 25 March 1965. They requested negotiations be started at once to use Namao, Cold Lake, Portage La Prairie, and Val D'Or as DOB's. 21 April brought authority from the Canadian Joint Staff in Washington for site surveys of the four proposed bases. ADC made the surveys and sent them to USAF in May 1965. USAF informed ADC on 1 July 1965 that the program was being coordinated through the Air Staff prior to presentation to the Secretary of Defense.



[redacted]

STATUS

U (S) CONUS. As of 1 January 1966, there were one Phase I, 18 Phase II, and two Phase III (Modified) dispersal bases. One DOB, Burlington, was dropped shortly after this time. In November 1965, ADC proposed to NORAD that the 49th FIS(Griffiss AFB) dispersal base be changed from Burlington to Niagara Falls. NORAD concurred on 2 December. USAF agreed on 8 January 1966.

U (S) Canadian Bases. In July 1965, USAF concurred with the four base locations, (Namao, Cold Lake, Portage La Prairie, and Val D'Or), construction costs, manpower figures, and nuclear weapons requirements in the NORAD proposal for Canadian dispersal bases. By 12 November 1965, the JCS had sent a paper to the Secretary of Defense concurring with NORAD's recommendations. The Secretary of Defense concurred in the JCS recognition of the need for the use of interceptor dispersal bases in Canada and asked for more information on new construction and rehabilitation, equipping and annual operating costs, and Canada/U. S. manpower considerations. The Secretary of Defense also requested alternative plans in the event Canada would not agree with the primary concept. The JCS proposed recommending that negotiations strive for nuclear weapons and U. S. support personnel at each of the Canadian DOB's.

U (S) In a message on 17 November 1965, NORAD concurred with the JCS proposal to negotiate for full Phase III permanent dispersal with nuclear weapons and U. S. support personnel at all of the Canadian dispersal bases.

POLICY CHANGES

U (S) In a message to ADC on 16 September 1965, NORAD proposed to alter dispersal policy. CINCNORAD would order dispersal of the interceptor force. Then, since region and sector commanders knew the status

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and capability of each DOB in their respective areas and would be aware of the tactical situation, they would be responsible for determining the numbers of additional interceptors to be dispersed from each squadron. NORAD felt that this change would do away with the overcrowding at the DOB's when many of them could accommodate just a limited number of interceptors.

(S) ADC reasoned that the change was realistic in view of the austere dispersal construction support approved by OSD (this was minimum support for peacetime permanent dispersal of one-third UE aircraft). ADC also said that the original FY 1964 MCP dispersal construction was nearing completion and USAF had said that no new requirements could be programmed using this package. New requirements would have to be included in the regular MCP cycle. ADC suggested that a re-evaluation of NORAD dispersal operational requirements might be appropriate. On 15 October 1965, ADC, in a letter to all air divisions, requested a complete re-evaluation of the current dispersal program.

(S) On 28 July 1965, NORAD indicated that all flush bases were being reviewed for deletion from or addition to the mandatory flush list for each fiscal year (1966 through 1970)*. The FY 1966 list was to be published as an amendment to the ADNAC (Annex E) after approval.

(S) In November 1965, ADC said that the NORAD ADNAC listed three fighter dispersal bases as flush bases (Byrd, Niagara and Fresno). This change, from non-flush to flush, ADC said, seriously lessened the

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advantages of continuous aircraft dispersal at the dispersal sites. ADC requested NORAD to re-evaluate the status of Niagara, Byrd and Fresno to determine the possibility of returning any of these bases to a non-flush category. In a message on 7 December 1965, NORAD indicated that it was re-studying the need to add dispersal bases to the mandatory flush list. NORAD also said that the three cited bases (Niagara, Byrd and Fresno) were to revert to their former status as non-flush bases until this problem was solved.

TRANSPORTATION FOR DISPERSAL

(U) Background. NORAD had been concerned about the adequacy of the 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 to the requirement because mobilization was involved. In July 1964, NORAD asked the JCS to consider substituting MATS or other regular Air Force airlift units stationed on or near ADC bases for the reserve units for dispersal airlift.

(S) The permanent Phase III DOB's were to be adequately stocked by late 1965. This fact, along with greater consideration being given to surface transportation, indicated that NORAD needs for dispersal airlift would be substantially cut. A NORAD study completed in December 1964 confirmed this. In January 1965, NORAD advised the JCS that it was studying the airlift problem with ADC and the findings would provide a basis for the plan that the JCS had asked for in October 1964.

(S) Status. NORAD still wanted regular force airlift instead of reserve and prepared a draft annex to the ADNAC 300N-65 outlining a plan for MATS and ADC organic airlift instead of the TAC reserve units. In July 1965, NORAD sent the draft to ADC and on 11 August 1965 the latter concurred except for

a few minor recommended changes. In September and October 1965, NORAD re-organized the draft annex to the ADNAC 300N-65 and sent it to the JCS on 24 November 1965. NORAD had found that increased use of surface transportation could be made to support NORAD interceptor dispersal operations. This determination, coupled with the changes in force structure, cut the augmentation airlift requirement from the current total of 151 C-119/C-123 aircraft loads to 85 such aircraft sorties by the first quarter of FY 1967.

~~(S)~~ The proposed annex tasked the MATS Commander for augmentation airlift to support the NORAD dispersal operation. The implementation date of 1 July 1966 was based on the assumption that all bases designated to support continuous dispersal of up to one-third of the aircraft of selected fighter interceptor squadrons would have achieved their operational capability prior to that date.

IMPROVED MANNED INTERCEPTOR

U ~~(S)~~ One of the most important issues in the anti-bomber defense area was the deployment of a new manned interceptor.* A USAF Program Change Proposal (#65-66) was submitted to OSD on 12 August 1965 proposing an increase of $21.6 million in RDT&E funds for FY 1966 and a total obligational authorization for FY 1967 of $205.6 million for continued development and limited procurement of the F-12. The force structure was not proposed at this time. The program was slated to deliver one aircraft a month, starting in FY 1969, to provide an IOC in FY 1969 or early FY 1970.

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

(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 U. S. forces and three squadrons (12 UE) for Canadian forces during the FY 1969-70 period. The 1967-76 NADOP also recommended a gradual phase-out of century-series fighters, keeping the best aircraft until the IMI force achieved desired operational capability.

(S) USAF, in a message to SAC, NORAD, and ADC on 26 November 1965, proposed a meeting of the Designated Systems Management Group at USAF on 1 December 1965. USAF indicated that it hoped for a unified position from these commands to wholeheartedly support the Secretary of the Air Force in his position to keep the option to produce and deploy the F-12.

(S) The USAF PCP (#65-66) on the F-12 was disapproved on 11 December 1965.

(U) In his statement on strategic defensive forces, before the Senate Subcommittee on DOD appropriations on the FY 1967-71 defense program and 1967 defense budget, the Secretary of Defense said he proposed to continue the YF-12A flight test program with the three aircraft available. The allocation was $23 million to the YF-12A program in the current fiscal year, plus $5 million for the F-12 program for certain improvements in the ASG-18/AIM-47 fire control and missile system*. The Secretary of Defense also indicated that the allocation for FY 1967 would be $20 million for the YF-12A test program and $10 million for continuing the F-12 program.

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* (U) The ASG-18/AIM-47 system could be used on either the F-12 or the F-111 interceptor.

MISSILE FORCE

BOMARC CIM-10B

(S) The NORAD Bomarc inventory was cut by two missiles during the first half of FY 1966 as a result of the Combat Evaluation Launch (CEL) Program.* By 1 January 1966, NORAD had seven squadrons with 28 missiles each and an eighth, the 35th ADMS, Niagara AFMS, with 42 missiles.

(S) In a message to ADC and NORAD on 3 December 1965, USAF said that OSD had approved USAF PCP #65-157 on 29 November 1965. This PCP had requested authority and funding for regular RCAF participation in the Bomarc B CEL Program. NORAD said on 6 December 1965 that each of the eight Bomarc Squadrons would process and fire one missile each year under the current program. NORAD also indicated that the next 15 missiles committed to firing would come from the Niagara Bomarc squadron. At the conclusion of the phase, Niagara would have the same number of missiles (28) as the other seven squadrons. Thereafter, a gradual reduction of each Bomarc squadron was anticipated.

NIKE HERCULES REDEPLOYMENT

(S) Background. NORAD had recommended the redeployment of 18 Hercules units from nine soft SAC bases and four units from Thule AFB since 1962. NORAD proposed that the 22 units be redeployed to unprotected urban/industrial areas.

(S) A CONAD study of the redeployment question, on 24 March 1965, confirmed NORAD's position, as well as suggesting new sites, numbers of fire units and

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* (U) For a description of the CEL Program, see NORAD/CONAD Historical Summary, July-December 1964, pp. 77-80.

[redacted]

programmed time periods. The four units from Thule were withdrawn from NORAD operation by 1 June 1965 with their future disposition not decided. During May 1965, the JCS studied an Army proposal to delete the 22 Hercules units from the Five Year Force Structure and Financial Plan during FY 1966. At this same time, the JCS requested any additional comments from CINCONAD. CINCONAD confirmed the position that the 22 Hercules units be kept and redeployed as recommended in the March 1965 study.

(S) On 27 May 1965, the JCS recommended to the Secretary of Defense that eight Hercules units be used for USARSTRIKE and Guam requirements and that the remaining 14 units be deactivated in FY 1966. Adoption of this course of action would remove all 22 units from the NORAD terminal defense force.

(S) Status. In August 1965, NORAD reaffirmed its position as well as pointing out that it desired to resite five batteries in the Washington-Baltimore defense area to enhance the defenses of hardened command and control centers in that area.

(S) However, the Secretary of Defense decided to inactivate all 22 fire units. On 8 December 1965, the Secretary of Defense announced plans to consolidate, reduce, or discontinue certain Department of Defense activities to produce additional annual savings. Part of these plans included the inactivation of the following Nike Hercules defenses:

| | |
|---|---|
| 3rd quarter FY 1966 | Barksdale AFB Defense |
| | Fairchild AFB Defense |
| | Turner AFB Defense |
| | Robins AFB Defense |
| 4th quarter FY 1966 | Loring AFB Defense |
| | Lincoln-Offutt AFB Defense |
| | Dyess AFB Defense |
| | Bergstrom AFB Defense |



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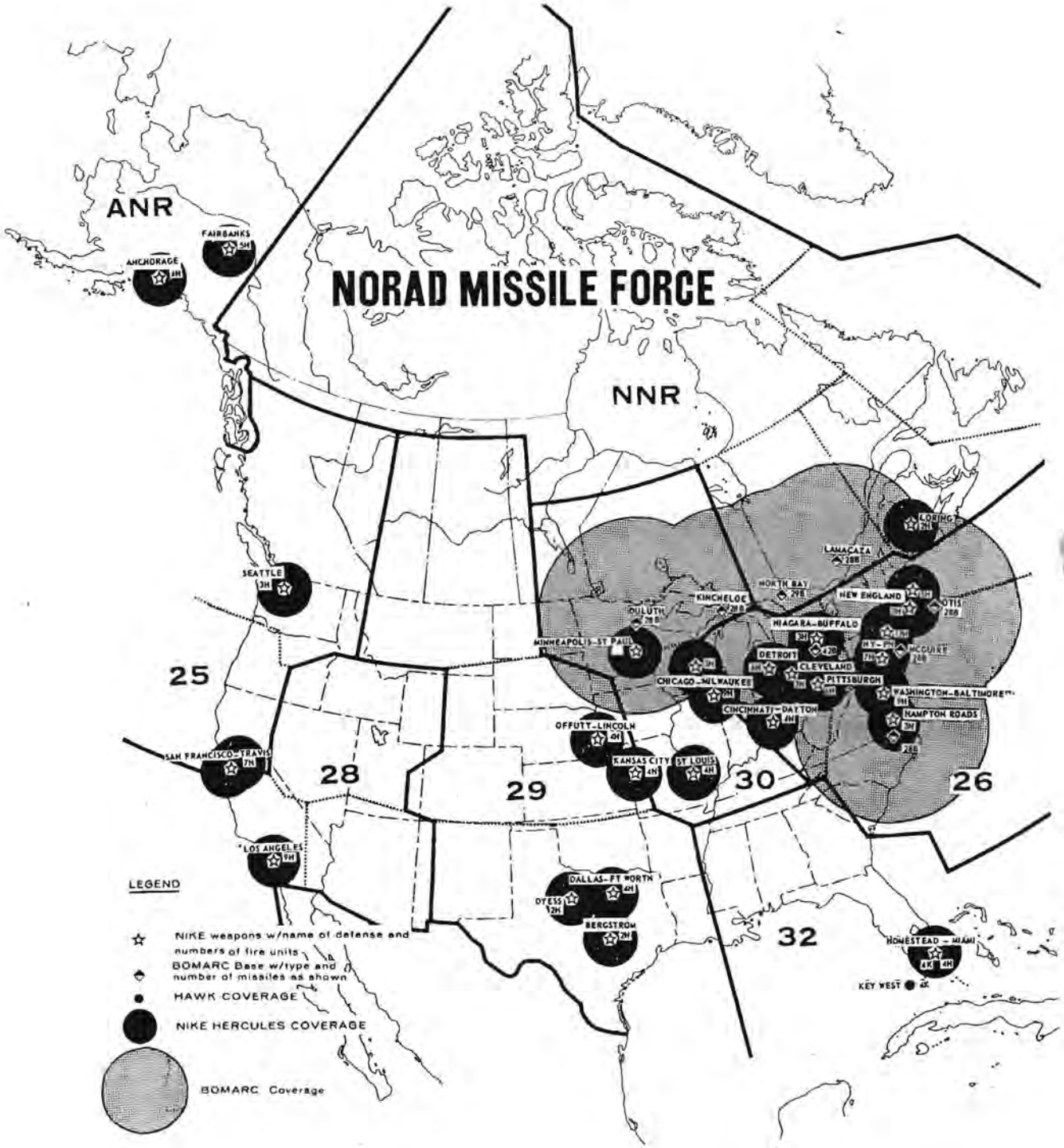
NORAD MISSILE FORCE
ANR
NNR
25
28
29
30
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32
FAIRBANKS 5H
ANCHORAGE 4H
SEATTLE 3H
SAN FRANCISCO-TRAVIS 7H
LOS ANGELES 9H
DULUTH 2B
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CHICAGO-MILWAUKEE 9H
DETROIT 4H
CLEVELAND 7H
PITTSBURGH 5H
KINCHELOE 28B
NORTH BAY 29B
LAMACAZA 28B
LORING 21H
NEW ENGLAND 24H
OTIS 26B
NIAGARA-BUFFALO 3H
NY-2H 7H
MCGUIRE 7H
WASHINGTON-BALTIMORE 9H
HAMPTON ROADS 3H
28B
CINCINNATI-DAYTON 4H
OFFUTT-LINCOLN 4H
KANSAS CITY 4H
ST LOUIS 4H
DALLAS-FT WORTH 4H
DYESS 2H
BERGSTROM 2H
HOMESTEAD-MIAMI 4K 4H
KEY WEST 4K
LEGEND
NIKE weapons w/name of defense and numbers of fire units
BOMARC Base w/type and number of missiles as shown
HAWK COVERAGE
NIKE HERCULES COVERAGE
BOMARC Coverage

[redacted]

(S) There were two fire units at each of these bases except for Lincoln-Offutt AFB Defense where there were four, making a total of 18 fire units. The four units which had been withdrawn from Thule in June 1965 were also permanently deleted from NORAD's inventory.

(S) In a message to NORAD on 15 December 1965, ARADCOM set out the following dates for the units to be declared non-operational:

22 December 1965 for units to be inactivated 3rd quarter FY 1966.

1 March 1966 for units to be inactivated 4th quarter FY 1966.*

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* (S) The original non-operational date for these units was 1 April 1966, but was moved up by NORAD on 28 February 1966.



[redacted]

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# CHAPTER VIII

# TRAINING AND PROCEDURES

## 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. It 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 had rejected the QOR because of the high cost. In 1964, ARADCOM submitted a Qualitative Military Requirement (QMR) for a simulator system to the Department of 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 effort. ARADCOM, ADC and NORAD met in January 1965 and tentatively agreed on a position on the simulator system. After this meeting, NORAD worked to produce 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 in exercises and hurriedly submitted a Quick Reaction Capability (QRC) request for three prototype ECM simulators to USAF on 19 April 1965. ADC expanded this QRC request to a full QOR for ECCM Evaluator/Trainers on 4 May 1965 which USAF sent on to the JCS. NORAD's supposedly joint NQR 4-65 for

[redacted]



[redacted]

simulators was sent to the JCS on 10 May 1965.

(S) On 23 June 1965, the JCS said that 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) Status. At USAF's request, NORAD hosted a conference of interested agencies on 5-6 August 1965. During this conference, Air Force Systems Command (AFSC) requested the Army and Air Force to participate in engineer meetings at Wright-Patterson AFB, Ohio, during the 31 August - 2 September 1965 period to examine more closely the technical and cost requirements of a joint device. The feeling after these conferences by the Army and Air Force was that they both had a valid, urgent requirement for an ECCM Simulator/Evaluator system. In a message to USAF on 21 September 1965, ADC recommended that the Air Force proceed with a prototype and development program and that prior to production, the Air Force and Army again examine the feasibility of joint production and procurement.

(S) The feeling by both the Army and Air Force was that it was possible, but not suitable, to develop a joint single item of equipment. They felt that savings in both time and costs would result if separate, but coordinated, development was pursued.

(S) On 11 January 1966, USAF ordered AFSC to proceed with ADC's QOR. USAF also recommended compression of the proposed schedule and that the Department of the Army and NORAD be given an opportunity to review the trainer specifications in the preliminary and final stages.

## 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

[redacted]

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 stated that the Canadian SCATANA plan was ready for publication and dissemination. NORAD pointed out the desirability of having the two national plans implemented simultaneously. The JCS replied on 5 August 1965 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. The DOD Committee estimated that barring unforeseen coordinating delays, the plan should be approved by 15 September and published by 15 October 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, dated November 1965, was signed by the Department of National Defence/Department of Transport during this month and also had an effective date of 1 April 1966. NORAD Regulation 55-2, entitled "Security Control of Air Traffic and Air Navigation Aids," was in publication during February and March 1966 with both plans attached. The classified annexes (A & B) were to be distributed under separate cover.

## IDENTIFICATION, FRIEND OR FOE MARK XII PROGRAM

### BACKGROUND

(S) For electronic identification, NORAD used certain operational procedures in conjunction with the Mark X IFF/SIF equipment. However, this system had proven to be inadequate in

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



[redacted]

full scale exercises. Security of the identification codes could not be maintained and in any air battle there was risk of destroying friendly aircraft. A more secure system was needed to increase NORAD's ability to provide safe passage to the SAC Emergency War Order aircraft and to identify other essential traffic during hostilities.

(S) NORAD had asked the JCS for implementation of a new crypto-secure system, the Mark XII IFF. In April 1963, the JCS approved the requirement and sent their views to the Secretary of Defense. After talks with NORAD representatives, the JCS set out a priority schedule in July 1963. By September 1963, it had been ascertained through joint service testing that:

1. The Mark XII IFF system was highly reliable in distinguishing friendly aircraft from unknown aircraft.

2. It was a crypto-secure system.

3. It was compatible with the civilian system (FAA beacon system).

4. It was not an entirely new system, but was additive to the Mark X system.

5. It had an automatic erasure system as a prevention to compromise.

Late in 1963, the JCS said that acquisition of the Mark XII system was to be included in the AIMS program and named USAF as executive agent.* At this time the Secretary of Defense deferred Mark XII procurement funds until 1966.

---

* (C) AIMS stood for A - ATCRBS (Air Traffic Control Radar Beacon System), I - IFF/SIF Mark X, M - Mark XII IFF, S - System.

(S) Early in October 1964, CINCNORAD and CINCSAC again asserted to the JCS the pressing need for the Mark XII IFF. In their reclama, the JCS urged the Secretary of Defense to authorize implementation of the Mark XII program in FY 1966 as identified in existing service PCP's. The Secretary agreed and said that austere funding could be expected in FY 1966. The Secretary also requested revised PCP's by 1 November 1964 reflecting the overall program through the 1970 time frame. These PCP's (64-157 for ATCRBS and 64-158 for the Mark XII IFF) were prepared immediately by the DOD-appointed executive agent for the Mark XII IFF system within USAF Headquarters and submitted to OSD on 10 December 1964. Partial funding for FY 1966 was approved by DOD for both these PCP's in December 1964.

(S) A NORAD/ADC AIMS Working Group was formed for a February meeting and met again in April 1965. From this latter meeting, an Operations Concept was prepared and priorities were set up for the ground station implementation of the Mark XII system. In April 1965, NORAD sent the Working Group's recommendation to ADC which sent it to USAF and the AIMS System Program Office on 3 May 1965. The Working Group said the main consideration was safe passage for SAC bombers and returning tankers during battle so that installation priority for ground equipment must be oriented around the most heavily-travelled SAC routes. This meant first priority to Northeast U.S. and adjacent Canada, followed by the Southeast, West Coast, North Central and South Central U.S.

(S) NORAD sent the implementation plans for the Mark XII IFF in the U.S. to the Canadian Chief of Defence Staff (CDS) on 6 May 1965. Because Canadian perimeter radar sites were in key positions to identify aircraft approaching North America, NORAD pointed out the desirability of equipping these sites with Mark XII IFF. NORAD asked what Canadian

[redacted]

intentions were on support of Mark XII IFF in Canada. On 31 May 1965, the Canadian CDS said that future plans included possible re-equipping of Canadian radar sites with the Mark XII and that funds had been included in the Integrated Defence Program.

4.(S) Current Developments. In September 1965, ADC reaffirmed its air-to-air Mark XII requirements. Based on a fourth quarter FY 1968 posture, ADC felt that the following would require air-to-air Mark XII interrogation and processing equipment:

| Present Aircraft | Number of Aircraft |
|---|---|
| F-106A | 186 |
| F-106B | 44 |
| F-101B | 191 |
| F-101F | 28 |

| Requested Aircraft | Number of Aircraft |
|---|---|
| F-4 | 85 |
| F-12 | 216 |

4.(S) The 85 F-4's would require an interim Mark X capability until the Mark XII system became available. The air-to-air interrogation part of the Mark XII system would be used to supplement control systems in degraded environments. When used by itself, Mark XII would provide the primary method of identifying friendly aircraft.

(S) Based upon present and future requirements for weapons control, for flight-following and peace time identification, the ALRI, AEW&C and AWAC aircraft required the ability to interrogate and process both Mark X and Mark XII. These facilities had to be incorporated into these aircraft to provide accurate and timely data to the ground environment or to interceptors under their control.



[redacted]

(S) By 1 January 1966, notwithstanding its statement of intent in its letter of 31 May 1965, Canadian Forces Headquarters had not yet requested funds from the Defence Council for the Mark XII IFF system. The reason was that the design for the ground interrogation equipment was not finalized and no reasonably-firm cost estimates were available on which to base a funding request. The interface problems for the insertion of Mark XII into the SAGE/BUIC environment were not yet fully determined, so it was not necessary to finalize the ground equipment design. Advantage was taken of this delay to continue development and refinement of the design of the ground equipment.

(S) The JCS sent a letter to the Canadian Defence Liaison Staff in Washington on 2 November 1965 listing Canadian radar sites in a proposed order of priority for installation of Mark XII IFF ground interrogators. The priorities followed NORAD recommendations and listed 29 Canadian sites, including those in Bangor NORAD Sector, but excluding those in Goose NORAD Sector. This same letter listed proposed Mark XII program milestones:

| Aircraft | Proposed Mark XII Fitting Dates |
|---|---|
| F-106 | 1st Qtr. FY 69 - 4th Qtr. FY 69 |
| F-101 | 2nd Qtr. FY 69 - 1st Qtr. FY 70 |
| EC-121 | 3rd Qtr. FY 69 - 2nd Qtr. FY 70 |
| F-104 | 3rd Qtr. FY 69 - 2nd Qtr. FY 70 |
| F-102A | 4th Qtr. FY 69 - 3rd Qtr. FY 71 |
| TF-102A | 4th Qtr. FY 69 - 3rd Qtr. FY 71 |

| Ground | Proposed Mark XII Fitting Dates |
|---|---|
| AN/FST-2 Sites | 3rd Qtr. FY 69 - 1st Qtr. FY 70 |
| USAF/FAA Sites | 3rd Qtr. FY 69 - 2nd Qtr. FY 70 |
| Manual Sites | 2nd Qtr. FY 70 - 3rd Qtr. FY 70 |

(S) On 10 December 1965, NORAD, ADC and ESD (Electronic Systems Division) met to determine progress on the air-by-ground interrogator. A refurbished version of the 1960 interrogator was to be delivered to ESD for engineering testing in February 1966. ESD was to issue a complete test plan and schedule in January 1966.

(S) The AIMS Systems Project Office was to let a contract the latter part of December 1965 for testing of AIMS for vulnerability to jamming. This authorization was to cover both Mark X and Mark XII IFF systems.



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# GLOSSARY

# GLOSSARY OF ABBREVIATIONS

| | |
|---|---|
| AAC | Alaskan Air Command |
| ADAD | Air Defense Artillery Director |
| ADCSP | Advanced Defense Communications Satellite Program |
| ADMS | Air Defense Missile Squadron |
| ADNAC | Air Defense North American Continent |
| ADR | Automatic Digital Relay |
| AEW&C | Airborne Early Warning and Control |
| AFLC | Air Force Logistics Command |
| AFSC | Air Force Systems Command |
| ALCOP | Alternate Command Post |
| ALRI | Airborne Long Range Input |
| ANG | Air National Guard |
| ANRCC | Alaskan NORAD Region Combat Center |
| AUTODIN | Automatic Digital Network |
| AUTOVON | Automatic Voice Network |
| AWACS | Airborne Warning and Control System |
| BAS | Bomb Alarm System |
| BUIC | Backup Intercept Control |
| CADIN | Continental Air Defense Integration North |
| CDS | Chief of Defence Staff (Canada) |
| CEL | Combat Evaluation Launch |
| CEP | Circular Error Probability |
| CMCMO | Cheyenne Mountain Complex Management Office |
| CONUS | Continental United States |
| DA | Department of the Army |
| DATOS | Detection and Tracking of Satellites |
| DC | Direction Center |
| DCA | Defense Communications Agency |
| DDR&E | Director Defense Research and Engineering |
| DEW | Distant Early Warning |
| DIA | Defense Intelligence Agency |
| DOB | Dispersed Operating Base |

| | |
|---|---|
| ECCM | Electronic Counter Countermeasures |
| ECM | Electronic Countermeasures |
| ESD | Electronic Systems Division |
| ESS | Electronic Solid State |
| FD | Frequency Diversity |
| FIS | Fighter Interceptor Squadron |
| FOC | Full Operational Capability |
| G-I-UK | Greenland-Iceland-United Kingdom |
| IAP | International Airport |
| IDCSP | Initial Defense Communications Satellite Program |
| IDHS | Intelligence Data Handling System |
| IFF | Identification Friend or Foe |
| IMI | Improved Manned Interceptor |
| IOC | Initial Operational Capability |
| JTD | Joint Table of Distribution |
| MADPAC | Mobile Air Defense Package |
| MEECN | Minimum Essential Emergency Communications Net |
| MITRE | Massachusetts Institute of Technology, Research and Engineering (Corporation) |
| NADOP | NORAD Objectives Plan |
| NAS | National Airspace System |
| NAVFORCONAD | Naval Forces Continental Air Defense Command |
| NAWS | NORAD Attack Warning System |
| NBC | Nuclear, Biological, and Chemical |
| NCC | NORAD Control Center |
| NCMC | NORAD Cheyenne Mountain Complex |
| NGB | National Guard Bureau |
| NGCI | NORAD Ground Control Intercept (Station) |
| NM | Nautical Mile |
| NMCC | National Military Command Center |
| NQR | NORAD Qualitative Requirement |

| | |
|---|---|
| OSD | Office of the Secretary of Defense |
| OTH | Over-the-Horizon |
| PCP | Program Change Proposal |
| PSPP | Proposed System Package Program |
| QMR | Qualitative Military Requirement |
| QOR | Qualitative Operational Requirement |
| QRC | Quick Reaction Capability |
| RA | Regular Army |
| RAF | Royal Air Force |
| RDT&E | Research, Development, Testing, and Evaluation |
| SACEUR | Supreme Allied Commander Europe |
| SAGE | Semi-automatic Ground Environment |
| SATRAN | Satellite Reconnaissance Advance Notice |
| SCAN | Switched Circuit Automatic Network |
| SCATANA | Security Control of Air Traffic and Air Navigation Aids |
| SDC | Space Defense Center |
| SEA | Southeast Asia |
| SHAPE | Supreme Headquarters Allied Powers in Europe |
| SIF | Selective Identification Feature |
| SLBM | Sea Launched Ballistic Missile |
| SLC | Side Lobe Cancellor |
| SPADATS | Space Detection and Tracking System |
| SPASUR | Space Surveillance |
| SPERD | System Performance Demonstration |
| SPO | System Program Office |
| SPP | System Package Program |
| SSB | Single Sideband |
| TCU/ASTRA | Threshold Control Unit/Azimuth Strobe Tracking |
| U.K. | United Kingdom |
| VLF/LF | Very Low Frequency/Low Frequency |



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# REFERENCE NOTES

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## REFERENCES

### Chapter One


1. Msg., JCS to NORAD, JCS 2347, 23 Sep 1965 (3); Msg., JCS to NORAD, JCS 2348, 23 Sep 1965 (3).

2. NORAD to JCS, "(U) NORAD Intelligence Manpower Requirement for NCOC," 17 Dec 1965 (3X51).

3. NORAD to CFH, "(U) NORAD Manpower Requirements," 7 Jul 1965 (3X4X51).

4. Msg., CFH to NORAD, XPK442, 23 Jul 1965 (3X51).

5. Msg., NORAD to CFH, NPMO 028, 28 Jul 1965 (3X4).

6. Msg., CFH to NORAD, XFBC1508, 17 Jan 1966 (4X3X51).

7. NORAD GO 34, 1 Sep 1965; CONAD GO 12, 1 Sep 1965.

8. NORAD Diary, 24 Sep 1965; NORAD GO 39, 1 Oct 1965; CONAD GO 16, 1 Oct 1965.

9. NORAD GO 39, 1 Oct 1965.

10. Msg., JCS to CONAD, JCS 2631, 25 Sep 1965 (3).

11. CONAD to JCS, "(U) Utilization of Uniformed Military Personnel," 8 Oct 1965 (3X4).

12. SecNav Notice 5450, 27 Jul 1965 (7).

13. NORAD Op Order 334N-65, FY66 Reorganization, 1 Oct 1965 (656).

14. DF, NGAM to Staff, "(U) 416L Facilities - Cost Reductions," 13 Aug 1965 (4X58X302.1).

15. Msg., ARADCOM to Rgns,ADGCR345, 2 Sep 65 (6.5X4); Interview with Col. J. O. Herstad,ADGC, 3 Feb 1965.

16. NORAD to JCS, "(U) NORAD Reorganization/Reconfiguration - FY66," 28 Oct 1965 (4).

17. Msg., JCS to NORAD, JCS 8105, 8 Dec 1965 (3X4).

18. NORAD to CFH, "(U) NORAD Reorganization/Reconfiguration - FY66," 2 Nov 1965 (3X4).

19. Msg., CFH to NORAD, XFBC1508, 17 Jan 1966 (4X3X51).

20. NPMO, Wkly Act Rpt, 24 Jan 1966.

## CHAPTER II

1. NPSD Fact Book, 31 Dec 1965.

3. NCOC, Quarterly Report of NCMC Implementation Progress, 1 Jan 1966 (51).

4. Ibid.

5. Mins of NCMC Communications Phasing Meeting, 13 Dec 1965, incl to NORAD to ADC, "(U) NCMC Comm Phasing Committee Meeting," 27 Dec 1965 (51X57).

6. Ibid.

7. Ibid.

8. Ibid.

9. NORAD Diary, 22 Sep 1965 (51).

10. NCOC, Memo for Ass't C/S, "(U) NCMC Support Responsibilities," 12 Nov 1965 (51).

11. NORAD to ESD, 23 Nov 1965 (51).

12. ESD to NORAD, 3 Dec 1965 (51).

13. NPSD Fact Book, 31 Dec 1965.

14. Ibid.

15. Msg, JCS to CONAD, JCS 3842, 12 October 1965 (51X228).

17. NPAP toC/S, "(U) SNOCAP," 28 Sep 1965 (51.2); Memo, NPSD to NPAP, "(U) SNOCAP," 13 Oct 1965 (51.2).

18. NPSD Fact Book, ALCOP, 31 Dec 1965.

19. Msg., JCS to CONAD, JCS 3620, 8 Oct 1965 (51.2), (Released to NORAD, NPSD, Wkly Act Rpt, 15 Oct 1965).

20. AFSC to ESD, "(U) Project SNOCAP," 18 Aug 1965 (51.2).

21. NORAD to AFSC, "(U) Project SNOCAP System Management," 4 Nov 1965 (51.2).

22. AFSC to NORAD, "(U) Project SNOCAP System Management," 22 Nov 1965 (51.2).

23. Msg., NORAD to 30th NR, NOOP-E X12-421, 14 Jan 1966 (51.2).

24. NORAD to ADC, "(U) Designation of Secondary ALCOP for Hq NORAD," 9 Nov 1965 (51.2).

25. Memo, NPSD-C to NPSD, "(U) USAF PCP's," 9 Aug 1965 (54.1X657).

26. Ibid.

27. NGFA Summary, Sec/Def Decision/Guidance (Format B) on Command, Control and Communications Programs, 31 Aug 1965 (50).

28. Msg., CANFORCEHED to NORAD, XSCA 247, 15 Sep 1965 (54.1).

29. DF, NEEC-S to NEEC, "(U) BUIC III Evaluation Group Meeting," 26 Aug 1965 (54.1); Memo, NPSD to NPAP, "(U) Trip Report - BUIC III, Contractor Proposal Evaluation," 27 Aug 1965 (54.1).

30. Memo, NPSD-C to NPSD, "(U) BUIC III," 12 Nov 1965 (54.1).

31. Ibid.

32. NPSD Fact Book, ALCOP, 11 Jan 1966.

33. DF, NPSD-C to NPSD, "(U) Trip Report - BUIC III, Contractor Proposal Evaluation," 23 Aug 1965 (54.1).

34. Ibid.

35. NORAD to ADC, "(U) Distribution of BUIC III Data Display Consoles," 10 Sep 1965 (54.1).

36. NORAD to ADC, "(U) Distribution of BUIC III Data Display Consoles," 13 Oct 1965 (54.1); ADC to NORAD, "(U) Distribution of BUIC III Data Display Consoles," 23 Sep 1965 (54.1).

37. Memo, NPSD-C to NPSD, "(U) BUIC III," 12 Nov 1965 (54.1).

38. NORAD to ADC, "(U) AADCP/BUIC III Data Ties," 10 Jan 1966 (54.1X54.3).

39. Msg., NORAD to Rgns, NPMO 039, 9 Dec 1965 (4X54.1).

40. NPAP Memo to C/S, "(U) Co-Manning - BUIC II, BUIC III Sites," 9 Dec 1965 (54.1X4).

41. NORAD Command Reference Book, 15 Nov 1965.

42. NEEC, Wkly Act Rpt., 11 Feb 1966.

43. ESD to Dist., "(U) BUIC II Master Schedule," 7 Oct 1965 (54.1).

44. NPSD Fact Book, 31 Dec 1965.

## CHAPTER III

1. Interview with Lt Col B. K. Cook, NECO-S, 16 Mar 1966.

2. Msg., NORAD to JCS, NECO-S 254, 27 Oct 1965 (57).

3. NECO, Wkly Act Rpt, 14 Jan 1966.

4. As in Note 1.

5. NECO-S, M/R, "(U) Canadian Autovon Meeting," 7 Oct 1965 (57).

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

7. Msg., NORAD to AIG 952, NOOP-E 11-515, 19 Nov 1965 (251).

8. Msg., 32d Rgn to OCS, et. al., 32NOPS-D, 5 Nov 1965 (251); DF, NOPS to NCOC, "(U) NORAD Attack Warning System (NAWS) Test Project," 23 Nov 1965 (251X57).

9. Memo for Col Baril from NECO-S, "(U) NAWS Tests," 20 Dec 1965 (251X57).

10. Msg., NORAD to 32d Rgn et.al., NOOP-E 1-102, 1 Jan 1966 (251X57).

11. NOOP-E, Wkly Act Rpt, 4 Feb 1966.

12. NOOP-E, Wkly Act Rpt, 18 Feb 1966.

13. Interview with Maj G. R. Beck, NOOP-E, 10 Mar 1966.

14. DCA to NORAD, "(U) Review of Dedicated Networks in the DCS for Integration into AUTOVON/AUTODIN," 19 Nov 1965 (57X251).

15. NORAD to DCA, "(U) Review of Dedicated Networks . . .," 23 Dec 1965 (251X57).

16. Msg., NORAD to DCA, NECO-S 280, 2 Dec 1965 (57).

17. Msg., NORAD to USAF, NECO-R X-201, 13 Oct 1965 (57).

18. Msg., NORAD to USAF, NECO-R X-163, 10 Aug 1965 (57X55).

19. Ibid.

20. Interview with Lt Col S. M. Sullivan, NECO-R, 11 Mar 1965.

21. NECO, Wkly Act Rpt, 26 Nov 1965.

22. AAC to USAFSS, "(U) Air Defense Communications in Alaska," 16 Jul 1965 (57).

23. DF, NOPS to NELC, "(U) Air Defense Communications in Alaska," 30 Aug 1965 (57X55).

24. ANR to NORAD, "(U) Air Defense Communications in Alaska," 9 Sep 1965 (57).

25. NORAD to JCS, "(U) Air Defense Communications in Alaska," 23 Nov 1965 (55X57).

26. Msg., NORAD to ANR, NOOP-E X11-388, 30 Nov 1965 (57X55); Msg., NORAD to SAC, NOOP-E X11-385, 1 Dec 1965 (57X55).

## CHAPTER IV

1. NORAD Forces Summary, 1 Sep 1965, p. 2-1 (718).

2. 25NR to NORAD, et al., "(U) Testing of AEW&C Employment Concepts," 26 Aug 1965 (302.12); 28NR to NORAD, "(U) Testing of AEW and C Employment Concepts (Project Samoset Union)," 27 Aug 1965 (302.12).

3. NORAD to 25NR, et al., "(U) Implementation of Revised AEW&C Employment Concepts," 28 Dec 1965 (302.12); Msg., ADC to SMAMA, ADLPW 03493, 15 Oct 1965 (302.12); Msg., CSAF to ADC, AFRDQRD 88489, 27 Oct 1965 (302.12).

4. Msg., 28 AD to LAADS, et al., 28OTN-E 45010, 21 Jan 1966 (302.12).

5. Msg., NORAD to 28NR, NOOP-E X8-327, 18 Aug 1965 (302.12X302.11).

6. Msg., 28NR to NORAD, 28NRPP 48022, 31 Aug 1965 (302.12).

7. Ibid.

8. ARADCOM to ADC, 1st Ind, 18 Jan 1965, to ADC, "(U) Air Defense Ground Environment," 7 Jan 1965 (54.1X302.1); Memo, Ulacia to Prewitt, "(U) Height Finder/Gap Filler Assets Due to FY 1965, FY 66, and FY 67 Prime Site Deletions," 5 Jan 1965 (302.1X202).

9. ADC-V24 Report, 30 Sep 1965, p. 2 (302.1); Ibid., 30 Nov 1965, p. 1.

10. Msg., ADC to CSAF, ADLPC-A 02945, 3 Sep 1965 (302.1); Msg., ADC to CSAF, ADLPC-A 03032, 13 Sep 1965 (302.1).

11. Msg., CSAF to ADC, AFOAPDA 79282, 20 Dec 1965 (302.1).

12. Interview with Major John Ruszczyk, ADLPC, 16 Feb 1966.

13. Ibid.

14. Ibid.

15. Ibid.

16. NORAD to ADC, "(U) Height Finder Radar Coverage Criteria," 17 Nov 1965 (302.1); NPPP, Wkly Act Rpt, 22 Nov 1965.

17. USAF to ADC, "(U) Evaluation of Control Environment," 17 Mar 1965 (302.1).

18. NORAD to ADC, "(U) Evaluation of Control Environment," 14 Jun 1965 (302.1).

19. ADC to NORAD, "(U) Evaluation of Control Environment," 12 Aug 1965 (302.1X402).

20. NORAD to ADC, "(U) Evaluation of Control Environment," 31 Aug 1965 (302.1X403).

21. DF, NOOP-C to NOOP, "(U) ECM/ECCM Budget Reductions," 30 Sep 1965 (150).

22. Ibid.; Memo, Wise to Chief of Staff, "(U) Air Defense Command Electronic Warfare Study Report," 11 Feb 1966 (150).

23. USAF to NORAD, "(U) NQR 3-65," 6 Aug 1965, with attachment, AFSC to USAF, "(U) Preliminary Analysis of NQR 3-65," 27 Jul 1965 (150).

24. Msg., CSAF to AFSC, AFRDQRD 86394, 18 Oct 1965 (302.1X150); Msg., CSAF to AFSC, AFRDQRD 92007, 12 Nov 1965 (150X302.1).

25. NPSD, Fact Book (Item 15, 11 Jan 1966).

26. NORAD to JCS, "(U) NQR for an Airborne Warning and Control System (AWACS)," 5 Apr 1965 (302.2).

27. DF, NOOP to NOPS, "(U) Proposed Changes to SOR No. 206," 9 Aug 1965 (302.2).

28. NORAD to ADC, "(U) Comments on Proposed Changes to SOR 206," 16 Aug 1965 (302.2); Interview with Major J. C. Hinkle, NPSD, 28 Feb 1966.

29. NPSD, Fact Book (Item 15, 11 Jan 1966).

## CHAPTER V

1. DF, NELC to NOPS, "(U) SLBM," 17 Aug 1965 (233).

2. ADC to 25AD, et al., "(U) SLBM Detection and Warning System (416N)," 18 Oct 1965 (233).

3. NPSD, Wkly Act Rpt, 10 Dec 1965; ESD to ADC, "(U) SLBM D&W System," 13 Dec 1965 (233).

4. ADC to NORAD, "(U) SLBM Detection and Warning System (416N)," 24 Nov 1965 (233).

5. NORAD to ADC, "(U) SLBM Detection and Warning System (416N), 16 Dec 1965 (233).

6. NECO, Wkly Act Rpt, 17 Dec 1965.

7. Memo, Wise to Chief of Staff, "(U) Requirements for Space Surveillance," 26 Oct 1965 (228).

8. Ibid.

9. Ibid.

10. Ibid.

11. NPSD, Fact Book, 1 Jan 1966.

12. Memo, Stocking to CINCNORAD, et al., "(U) Satellite Reconnaissance Advance Notice (SATRAN)," 30 Jul 1965 (228X101).

13. Ibid.

14. NORAD to 25NR, et al., "(U) SATRAN," 18 Nov 1965 (228X150X102).

15. (U) System Package Program for 440L Scatter OTH Radar, 15 May 1965 (226.1B); NORAD to JCS, "(U) NORAD Qualitative Requirement for a Launch Detection System," 15 Jan 1964 (230).

16. SPP as in note 15; (U) NORAD Command Reference Book, p. 3-4, 15 Nov 1965 (701B).

17. As in note 16.

18. Reference Book, as in note 16; NORAD to ADC "(U) 673/440L Over-the-Horizon Detection System," 28 Oct 1965 (226.1); Msg., NET to NORAD, "(U) 440L Event Reporting," 31 Dec 1965 (226.1).

19. ADC to NORAD, "(U) Sidelobe Cancellation for BMEWS Detection Radars," undated (21-22 Sep 1965), (226X150).

20. Ibid.; NORAD to ADC, "(U) Side Lobe Cancellation for Detection Radars," 12 Oct 1965 (226).

21. ADC to USAF, "(U) Multiple Side Lobe Cancellation at BMEWS Sites I and II," 30 Nov 1965 (226X150).

22. Msg., SACEUR to ADC, SH37549, 21 Jul 1965 (226).

23. Msg., MOD AIR to UKNMR SHAPE, 20 Oct 1965 (226); Memo, "(U) Notes on the SHAPE/SHOC/HQFC/USAF Meeting at SHAPE Paris on the 9th, 10th and 11th November 1965," 17 Nov 1965 (226).

## CHAPTER VI

1. NORAD to ADC, et al., "(U) NQR for an Improved Chemical and Biological (CB) Detection and Warning System," 10 Aug 1965 (250); CONAD to JCS, DA, "(U) CONAD Qualitative Requirement for an Improved Biological and Chemical Detection and Warning System," 26 Aug 1965 (250).

2. NORAD to JCS, DA, "(U) NORAD Qualitative Requirement for an Improved Biological and Chemical Detection and Warning System," 1 Nov 1965 (250).

3. NPSD, Fact Book, 11 Jan 1966.

4. ADC to NORAD, "(U) Bomb Alarm System 210A," 21 Sep 1964 (250).

5. Msg., ADC to CSAF, ADOAC-CO 00643, 26 Feb 1965 (250).

6. Msg., CSAF to ADC, AFXOPXP 68245, 29 Apr 1965 (250).

7. Msg., NORAD to JCS, NOOP-E X5-256, 2 Jun 1965 (250); Msg., JCS to NORAD, 003559, 8 Jun 1965 (250).

8. Msg., JCS to NORAD, 2182, 21 Sep 1965 (250); DCA to CSAF, "(U) Reconfiguring and Expanding the Bomb Alarm System," 27 Sep 1965 (250).

9. DF, NOOP to NOPS, "(U) Bomb Alarm System," 15 Nov 1965 (250); Msg., CSAF to ADC, AFOCC 94552, 26 Nov 1965 (250); NORAD to ADC, "(U) Bomb Alarm System," 29 Nov 1965 (250).

10. Msg., ADC to CSAF, ADOAC-CO 04068, 1 Dec 1965 (250).

11. Secretary of Defense Decision/Guidance (Format B) on Command, Control & Communications Program, 31 Aug 1965 (50); ADC to NORAD, "(U) NUDETS System 477L," 21 Sep 1965 (250); NORAD to ADC, "(U) NUDETS System 477L," 7 Oct 1965 (250).

12. Memo, "(U) Nuclear Detonation Detection and Reporting System, 477L Phase I (NUDETS (PhaseI))," 30 Sep 1965 (250).

CHAPTER VII


1. ADC, Special Order G-71, 13 Aug 1965.

2. Msg., NORAD to 25NR, NOOP-O X9-363, 4 Oct 1965 (403).

3. Msg., 25NR to NORAD, 25NOOP-O 50882, 6 Dec 1965 (403).

4. Msg., ADC to NORAD, ADOOP-P 56410, 28 Dec 1965 (403X420).

5. USAF ADC Programmed Action Directive 65-32, 27 Dec 1965.

6. Msg., ADC to USAF, ADODC-A 04252, 13 Dec 1965 (430.3).

7. Msg., NORAD to ADC, NOOP-O X12-420, 4 Jan 1966 (430.3).

8. NORAD Forces Summary, 1 August 1965.

9. NORAD Forces Summary, 1 September 1965.

10. Msg., ADC to NGB, ADODC 00096, 10 Jan 1966 (430.3).

11. Msg., ADC to AAC, ADODC 02454, 20 Jul 1965 (402).

12. Memo, NPPP-PL to DCS/Plans, "(U) Fact Sheet on Alaska," 3 August 1965 (55X403).

13. Msg., ADC to 25AD, ADCCS 02991, 9 Sep 1965 (402).

14. D/F, NOPS to NHCS, 23 Sep 1965, "(U) Rotational F-4C Squadron Commitment to CINCAL," (402).

15. ADC Study, "(U) Study on Assignment of White Shoes," 17 Sep 1965 (402).

16. Msg., AAC to USAF, ADLXP-3 50021, 17 Sep 1965 (402).

17. Msg., NORAD to JCS, NOOP-O X11-383, 15 Nov 1965 (403X402).

18. Msg., ADC to USAF, ADC VC 02865, 27 Aug 1965 (420).

19. Msg., ADC to 25AD, ADODC 03188, 23 Sep 1965 (402).

20. Msg., ADC to 25AD, ADDCS 03134, 20 Sep 1965 (403).

21. Msg., ADC to 25AD, ADOOP-P 03954, 23 Nov 1965 (403X420).

22. Msg., NORAD to ADC, NOOP-O X7-294, 13 Jul 1965 (403).

23. D/F, NOOP to NOPS, "(U) Programmed Interceptor Squadron UE," 1 Nov 1965 (403).

24. NORAD to ADC, "(U) Programmed Interceptor Squadron UE," 3 Nov 1965 (402X403).

25. Msg., NORAD to CANAIRDEF, NOOP-O X8-325, 10 Aug 1965 (655).

26. Msg., JCS to CONAD/NORAD, JCS 2486, 24 Sep 1965 (410X412X420).

27. Msg., NORAD to JCS, NOOP-O X8-320, 27 Sep 1965 (410X420X512).

28. NORAD to JCS, "(U) Dispersal Bases in Canada," 20 Jul 1965 (420).

29. Msg., JCS to NORAD, JCS 6194, 12 Nov 1965 (420).

30. D/F, NOOP to NOPS, 28 July 1965 (420).

31. Msg., ADC to NORAD, ADODC 04006, 27 Nov 1965 (420).

32. Msg., NORAD to ADC, NOOP-O X12-405, 7 Dec 1965 (420).

33. Msg., USAF to NORAD, AFCVSD 94585, 26 Nov 1965 (403).

34. Msg., USAF to ADC, AFXOPFN 76183, 3 Dec 1965 (503).

35. D/F NOPS to NHCS, "(U) RCAF Participation in the Bomarc B Combat Evaluation Launch Program," 6 Dec 1965 (512X503).

36. NORAD Draft Paper, "(U) Nike Hercules Deployment," 15 Aug 1965 (502).

37. Msg., SecDef to CONAD, DEF 8112, 8 Dec 1965 (503X651).

38. Msg., ARADCOM to NORAD, DA744118, 15 Dec 1965 (502X503).


## CHAPTER VIII


1. Msg., ADC to CSAF, ADOTT-C 03152, 21 Sep 1965 (151).

2. Msg., USAF to AFSC, AFPTRD 83085, 11 Jan 1966 (151X54.1X58).

3. Interview with Major Keyser, NOOP, 9 Mar 1966.

4. Msg., ADC to ADC Aeronautical Defense System Office, Wright-Patterson AFB, ADLPC-E 02925, 2 Sep 1965 (200X403X302.12).

5. NEEC, Wkly Act Rpt, 22 October 1965.

6. USAF to CDLS (Wash), "(C) Mark XII in Canada," 2 Nov 1965 (200).

7. NEEC, Wkly Act Rpt, 17 Dec 1965.

8. NEEC, Wkly Act Rpt, 23 Dec 1965.

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