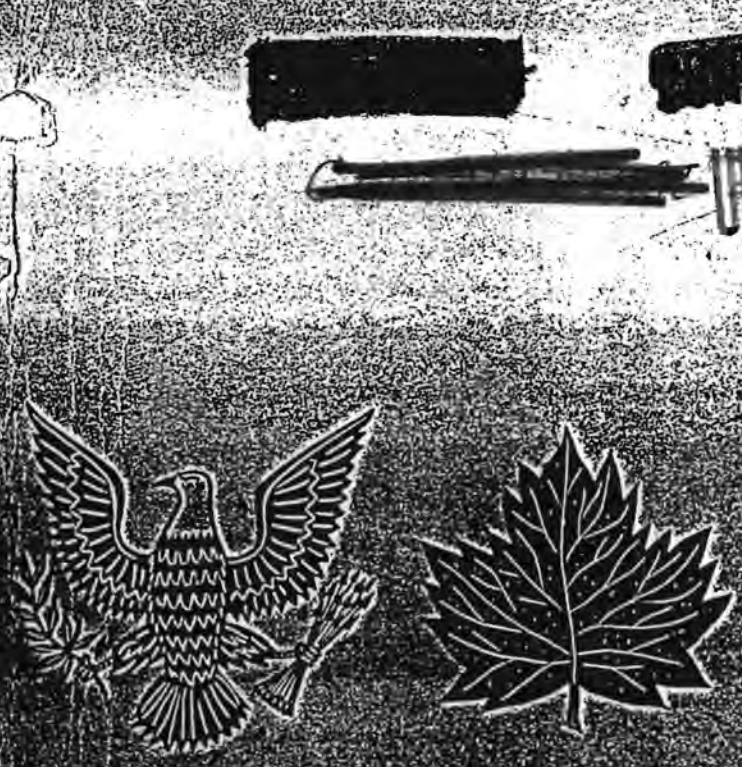
13840

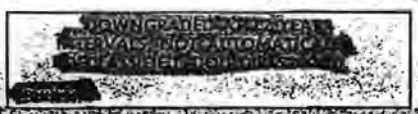


norad/conad

HISTORICAL SUMMARY

UNCLASSIFIED

JANUARY-JUNE 1962



DEC 14 2006

MEMORANDUM FOR HQ NORAD/USNORTHCOM/HO

FROM: HQ NORAD/J3

SUBJECT: Declassification Review of Histories

1. The NORAD/CONAD histories for the periods specified in your 30 October 2006 memo have been reviewed and are now declassified except for the following sections below. The justification for retaining the classification follows each description.

a. NORAD/CONAD Historical Summary, July—December 1958, page 65. Document still has information based on today's concepts tactics and objectives.

b. NORAD/CONAD Historical Summary, July—December 1958, pages 110-111. Document describes readiness conditions that are still valid today.

c. NORAD/CONAD Historical Summary, January—June 1959, pages 67-71. Document describes some current rules of engagement.

d. NORAD/CONAD Historical Summary, January—June 1959, pages 73 and 74. Document describes some current tactics and rules of engagement.

e. NORAD/CONAD Historical Summary, July—December 1959, pages 55-58. Document describes some current capabilities and procedures.

f. NORAD/CONAD Historical Summary, July—December 1959, pages 59-61. Document describes current rules of engagement.

g. NORAD/CONAD Historical Summary, January—June 1960, pages 37-39. Document describes readiness conditions that are still valid today.

h. NORAD/CONAD Historical Summary, January—June 1961, pages 23-26. Document describes some current tactics and rules of engagement and also could reveal information that would impact the application of state of the art technology.

i. NORAD/CONAD Historical Summary, January—June 1961, page 37. Document describes information that would impact the application of state of the art technology.

j. NORAD/CONAD Historical Summary, January—June 1962, pages 35 and 36. Document describes information that would seriously and demonstrably impair relations between the United States and a foreign government.

k. NORAD/CONAD Historical Summary, July—December 1962, pages 47 and 48. Document describes current tactics.

l. NORAD/CONAD Historical Summary, July—December 1963, pages 59 and 60. N/J3 does not have the authority to declassify these pages. Recommend deferring to NSA for resolution.

m. NORAD/CONAD Historical Summary, July—December 1963, pages 63-65. Document describes current capabilities and tactics.

n. NORAD/CONAD Historical Summary, January—June 1964, pages 57-

58. Document describes capabilities, limitations and deficiencies of warning systems.

o. CONAD Command History, 1968, pages 111 and 112. Document describes current limitations, tactics, and capabilities.

p. CONAD Command History, 1968, page 117. Document reveals current vulnerabilities of systems or projects relating to the national security.

q. CONAD Command History, 1968, pages 171-173. N/J3 doesn't have the technical expertise to evaluate the classification of Chapter VII, Communications. Please refer to N-NC/J6.

2. The POC for this review is Mr. Michael Allen, 4-3607.

BRETT D. CAIRNS
Major-General, CF
Director of Operations

File 15-2 SJ

NORTH AMERICAN AEROSPACE DEFENSE COMMAND
AND
UNITED STATES SPACE COMMAND

9 DEC 1997

NORAD/USSPACECOM
Office of the Joint Secretary
250 S. Peterson Blvd Ste 116
Peterson AFB CO 80914-3010

Mr. Hans M. Kristensen
6435 Hazel Avenue
Richmond, CA 94805

Dear Mr. Kristensen

This correspondence is in response to your most recent request of September 22 to review, declassify and release the NORAD/CONAD Historical Summary for the period January - June 1962.

For your information, Title 5 United States Code (U.S.C.)., Section 552, the Freedom of Information Act (FOIA), is a United States (US) statute and is only applicable to US agencies as defined in Title 5 U.S.C., sections 551 and 552. NORAD is a binational command established by Volume 33, United States Treaties (UST), page 1277, subject to control of both Canadian and US Government agencies as defined in the Act and consequently is not subject to the US FOIA.

However, it is our policy under NORAD Instruction 35-17, Processing Requests for NORAD Records, to release records or information where documents or information are not security classified or considered "NORAD Sensitive" and are cost efficient to provide. In this case, we are pleased to provide you with the attached declassified NORAD/CONAD Historical Summary Jan - Jun 62. The only items still considered security classified are page 35 and a continuing paragraph on page 36, which have been removed. We hope this historical summary helps you with your research efforts as a DoD Category Two (educational/news media) writer.

If you have any further questions and/or comments, please contact Major Jamie Robertson, Deputy Director of NORAD Public Affairs at (719) 554-5816 or Mr. Scott Johnson, Chief, Plans/Products Branch, at extension 3714.

Thank you for your continuing interest in the North American Aerospace Defense Command.

Sincerely

RODNEY S. LUSEY
Colonel, USA
Joint Secretary

Attachment:
NORAD/CONAD Historical Summary
January - June 1962 (less one page and a continuing paragraph)

cc:
NJ3
HO

FROM: N/J3 Security Manager 24 Sep 93

SUBJ: Public Information Request (Mr Robert Gates)

TO: PAX (Attn: S.W. Johnson)

1. A review for public release of several classified NORAD historical papers was conducted per your 25 Aug 93 ltr. The following historical papers were reviewed:

a. Air Defense of Alaska, 1940-1957, Hist Ref Paper #2 (S)
b. Fifteen Years of Air Defense, 1946-1961, Hist Ref Paper #3 (C)
c. NORAD's Quest for Nike Zeus and Long Range Interceptor, Hist Ref Paper #6 (S)
d. Seventeen Years of Air Defense, 1946-63, Hist Ref Paper 9 (S)
e. NORAD's Underground Combat Operations Center, 1956-66, Hist Ref Paper 12 (S)
f. 1962 NORAD History (2 parts), Jan-Jun 1962; Jul-Dec 1962 (S)

2. All of these historical papers are over 30 years old, marked classified, and are either without paragraph markings or downgrading instructions. AFR 205-1 states that cognizant authority within the Command has declassification authority. Dr Tom Fuller, NORAD Historian (HO), and Mr Mark Carlson, Freedom of Information Act Officer (N/SPJ2CM) are deemed as cognizant authority and assisted in the declassification process.

3. Dr Fuller's and Mr Carlson's findings are that all the documents, in their judgment, can be declassified with the following recommendations/comments:

Historical Reference Paper #2: (Carlson) Is unclassified.

Historical Reference Paper #5: (Carlson) Is unclassified.

Historical Reference Paper #6: (Carlson) Is unclassified but recommend USSPACECOM/J3 review the ASAT statements on page 20.

Historical Reference Paper #9: (Carlson) Is unclassified.

Historical Reference Paper #12: (Fuller) Most of the document talks about the old ENT Bldg and can be declassified. However, there are some descriptions concerning Cheyenne Mtn that should remain sensitive/classified. N/J3 Security Manager concurs. Recommend the document be declassified with the exception of those

pages (see document) that should be sanitized prior to public release.

1962 NORAD History (2 parts), Jan-Jun 1962; Jul-Dec 1962: (Carlson) The document can be unclassified with the following exceptions: cannot determine declassification for page 35, NSA System (Part 1), and for pages 47-48, NUDET/Bomb Alarm (Part II). Sanitize these pages prior to public release.

4. Our recommendation is to approve for public release those historical reference papers, except those recommendations/comments already mentioned, identified in para 1. HQ NORAD POC is Capt Bruder, J3OS, 4-3988.

ROBERT M. BRUDER, Capt, USAF
HQ NORAD J3 Security Manager

1st Ind, NORAD HO

Concur. NOTE: HO recommends PA verify above procedures are correct before final release of historical papers. Also, HO does not have declassification authority.

DR THOMAS FULLER
HQ NORAD Historian

2nd Ind, N/SPJ2CM

Concur.

MARK A. CARLSON
Freedom of Information Act (FOIA) Officer

MEMO FOR RECORD 12 Dec 97

SUBJ: NORAD/CONAD Historical Summary, Jan-Jun 62

Reference the map located between pages 35-36, "NORAD Missile Force," 1 July 1962. This page is actually a duplicate of a map at page 65 of the history. The map was previously declassified during the 1993 review.

JEROME E. SCHROEDER
Assistant Historian

NORTH AMERICAN AEROSPACE DEFENSE COMMAND
AND
UNITED STATES SPACE COMMAND

24 November 1997

MEMORANDUM FOR USSPACECOM/JS

FROM: JA

SUBJECT: Freedom of Information Act (FOIA) Request -Mr. Kristensen

1. I have reviewed the proposed response to Mr. Hans M. Kristensen's request for the historical summary from NORAD/CONAD for the period January - June 1962. I concur with the proposed response releasing all but "page 35 and a continuing paragraph on page 36." As an administrative note, the volume provided for our reivew contains a page between pages 34 and 36 which was a map on an unnumbered page. You may wish to ensure that this page is not page 35 and is unclassified before the file is dispatched. Upon verification that the document is unclassified, I recommend that the proposed letter be signed.

2. Please feel free to contact me at 4-9193 if you wish to discuss this matter further.

EDWARD J. MONAHAN, Lt Col, USAF
Assistant Staff Judge Advocate

NOTE:
Subject map (Part of page 35) was removed for further review by NSA and possibly other agencies
PAX

[redacted]

MEMORANDUM FROM
HQ NORAD/USSPACECOM
OFFICE OF HISTORY

16 Oct 97

MEMO TO HQ NORAD/PA (MR JOHNSON)

SUBJ: Review of NORAD/CONAD Jan-Jun 62 History

1. Mr. Kristensen requested a copy of the NORAD/CONAD Jan-Jun 62 history. This history, less page 35, was previously released to Mr. Robert Gates in Sep 93. I asked HQ NORAD/J3 staff to look at page 35 toward declassifying it. They responded that since it deal with the National Security Agency (NSA), that the NSA FOIA Office should review that page for declassification and release.

2. Recommend that the NORAD/CONAD Jan-Jun 62 history be released to Mr. Kristensen without page 35 of the history with an explanation that NSA must review page 35 for release.

JEROME E. SCHROEDER
Assistant Historian

5 Atch
1. Kristensen Ltr (U), 22 Sep 97
2. NJ3 Sec Mgr Ltr (U), 24 Sep 93 (C)
3. HQ NORAD/CONAD (U), Jan-Jun 62 History, ~~less~~ page 35, with S 36 and map
4. HQ NORAD/J3W Memo (U), 15 Oct 97
5. Page 35 (C), NORAD/CONAD Jan-Jun 62.
36 + map

THIS MEMORANDUM IS UNCLASSIFIED WHEN ATCH #5 IS WITHDRAWN

RELEASEABLE TO CANADA-U.S.

250 S. Peterson Blvd, Ste 116
Peterson AFB CO 80914-3160
Comm Voice: 719-554-5999,
Comm Fax: 719-554-5389
DSN: 692-XXXX

[redacted]

NORTH AMERICAN AEROSPACE DEFENSE COMMAND

15 OCT 1997

MEMORANDUM FOR HQ NORAD/USSPACECOM OFFICE OF HISTORY

FROM: N/J3W

SUBJECT: Review of Page 35, NORAD/CONAD Jan-Jun 62 History

1. We have reviewed the document and talked with the local National Security Agency (NSA) representative. He informed us that the proper office to perform the declassification review is NSA's office for Freedom of Information.

2. If you have any questions please contact TSgt Odenweller, N/J3W, 4-5480.

Charles M. Whitehurst

CHARLES M. WHITEHURST, Lt Col, USAF
Chief, Aerospace Warning Division

[redacted]

RELEASEABLE TO CANADA-U.S.

MEMORANDUM FROM HQ NORAD/USSPACECOM OFFICE OF HISTORY

07 Oct 97

MEMO FOR HQ NORAD/PA
HQ NORAD/J3E
IN TURN

SUBJ: Review of Page 35, NORAD/CONAD Jan-Jun 62 History

1. Back in Sep 93, the NORAD staff reviewed the NORAD/CONAD Jan-Jun 62 history in conjunction with a FOIA request. At that time, the NJ3 staff determined that the history was declassified except for page 35. We've received a request for the document from Mr. Kristensen dated 22 Sep 97. Request the appropriate J3 staff element review the attached page 35 to determine if it can be declassified. If it can be declassified, please indicate in the reply memorandum that the NORAD/CONAD Jan-Jun 62 history is declassified. If page 35 needs to remain classified, please indicate the reasons in the reply memorandum.

2. Please address any questions to the undersigned at 4-3385.

JEROME E. SCHROEDER
Assistant Historian

2 Atch
1. Kristensen Ltr (U), 22 Sep 97
2. Pg 35 (S), NORAD/CONAD Jan-Jun 62 History

This memo is unclas when atch 2 is withdrawn

250 S. Peterson Blvd, Ste 116
Peterson AFB CO 80914-3160
Comm Voice: 719-554-5999,
Comm Fax: 719-554-5389
DSN: 692-XXXX

[redacted]

RELEASEABLE TO CANADA-U.S.

[redacted]

NORTH AMERICAN AIR DEFENSE COMMAND and CONTINENTAL AIR DEFENSE COMMAND

HISTORICAL SUMMARY

JANUARY-JUNE 1962

1 NOVEMBER 1962

Directorate of Command History
Office of Information
Headquarters NORAD/CONAD

[redacted]

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 two-fold:

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 November 1962

John K. Gerhart

JOHN K. GERHART
General, USAF
Commander-in-Chief

[redacted]

CONTENTS

[redacted]

VI-blank

MAPS AND CHARTS

IX - blank

[redacted]

SUMMARY OF THE FORCES

(As of 1 July 1962)

MISSILE FORCE

Regular

2 BOMARC A Squadrons
4 BOMARC B Squadrons
3 BOMARC A & B Squadrons
Missiles Authorized - 210 A, 223 B
Missiles Assigned - 210 A, 165 B

139 Hercules Fire Units
Missiles Authorized - 1846

Army National Guard

69 Ajax Fire Units
Missiles Authorized - 1661

INTERCEPTOR FORCE

Regular

48 Fighter Interceptor Squadrons - 960 aircraft authorized, 1007 aircraft assigned

Squadrons:	17	11	14	1	5
	F-101	F-102	F-106	~~F-4D~~	CF-101

Augmentation

23 ADC/ANG - 575 aircraft
550-600 aircraft from Navy/Marines (24-33 Squadrons) as available
56 aircraft from TAC Regular Force as available (D-Day through D+30)

[redacted]

[redacted]

42 aircraft from TAC Regular Force as available (D-Day through D+5)
14 TAC/ANG Squadrons as available
75 aircraft from USAF ADC
20 aircraft from USAF ATC
12 aircraft from RCAF ADC
Aircraft from RCN Shearwater as available

SURVEILLANCE AND CONTROL

Surveillance

183 Prime Radar Sites
101 Gap Filler Radars
Distant Early Warning Line:
- Land based segment - 6 main, 28 intermediate and 23 auxiliary stations
- Aleutian segment - 1 main and 5 auxiliary stations
- Greenland segment - 4 auxiliary stations

Mid-Canada Line: 8 section control and 90 doppler detection stations
11 Picket Ship Stations authorized, 10 manned
11 AEW&C Stations authorized, 7 manned
Pacific Barrier and G-I-UK Barrier (under operational control of CINCPAC and CINCLANT)
- Pacific Barrier - average of $4\frac{1}{2}$ WV-2 aircraft on station; 2 DER stations (early warning secondary mission)
- G-I-UK Barrier - average of $1\frac{1}{2}$ aircraft on station; 1 DER on station

2 Ballistic Missile Early Warning Stations
1 Space Detection and Tracking System

Control

1 Combat Operations Center
1 NORAD ALCOP
8 NORAD Region Combat Centers (3 SAGE, 5 Manual)

[redacted]

[redacted]

25 NORAD Sector Direction Centers (21 SAGE, 4 Manual)
3 NORAD Sectors without direction centers
28 NORAD Control Centers
1 CONAD Control Center (Thule AB, Greenland)

MANPOWER

Authorized

NORAD and Components	-	145,760
ALCOM	-	3,418
Navy Barriers	-	6,964
National Guard	-	38,192
Total	-	194,334
Augmentation	-	14,352
GRAND TOTAL	-	208,686

[redacted]

[redacted]

CHAPTER 1
ORGANIZATION

REGION ORGANIZATION

ORGANIZATION OF THE ALASKAN NORAD/CONAD REGION HEADQUARTERS

The Alaskan NORAD/CONAD Region was established back in 1958 by NORAD general order and the Commander-in-Chief, Alaskan Command (a JCS unified commander) designated Commander of ANR. CINCAL delegated authority for operational control of the Alaskan air defense forces to the Commander, Alaskan Air Command. The latter used his staff to perform the planning and operating functions of ANR. In effect, thus, COMAAC was in the position of controlling the air defense forces of the other component commanders.

Because of the peculiar nature of the Alaskan area, i.e., being under a JCS unified commander, NORAD made no further effort to organize the Alaskan Region. Its region organizational plans, including the 1 April 1961 plan which was approved for implementation by the JCS, excluded ANR. The 1 April plan carried the statement that ANR was organized in accordance with the desires of CINCAL.

A report of an operational evaluation, made of ANR in October 1961, pointed out that joint planning required by ANR had not been accomplished to a degree comparable with other NORAD regions. It further pointed out that there was no ANR organization, per se, at the time of the evaluation. The report recommended that CINCAL, as Commander ANR, establish a region staff and that this staff, in conjunction with component staffs, perform the planning and operating functions for the air

[redacted]

[redacted]

defense of Alaska. The same recommendations made in person to CINCAL and COMAAC by NORAD personnel at this time were well received. ALCOM advised in November that establishment of an ANR headquarters was being studied based on CINCAL's approval of a concept for establishment.

The upshot was that on 19 January, ALCOM issued a plan for the organization of Alaskan NORAD/CONAD Region and it was put into effect on 1 February 1962. An ANR general order established the staff structure effective this date.

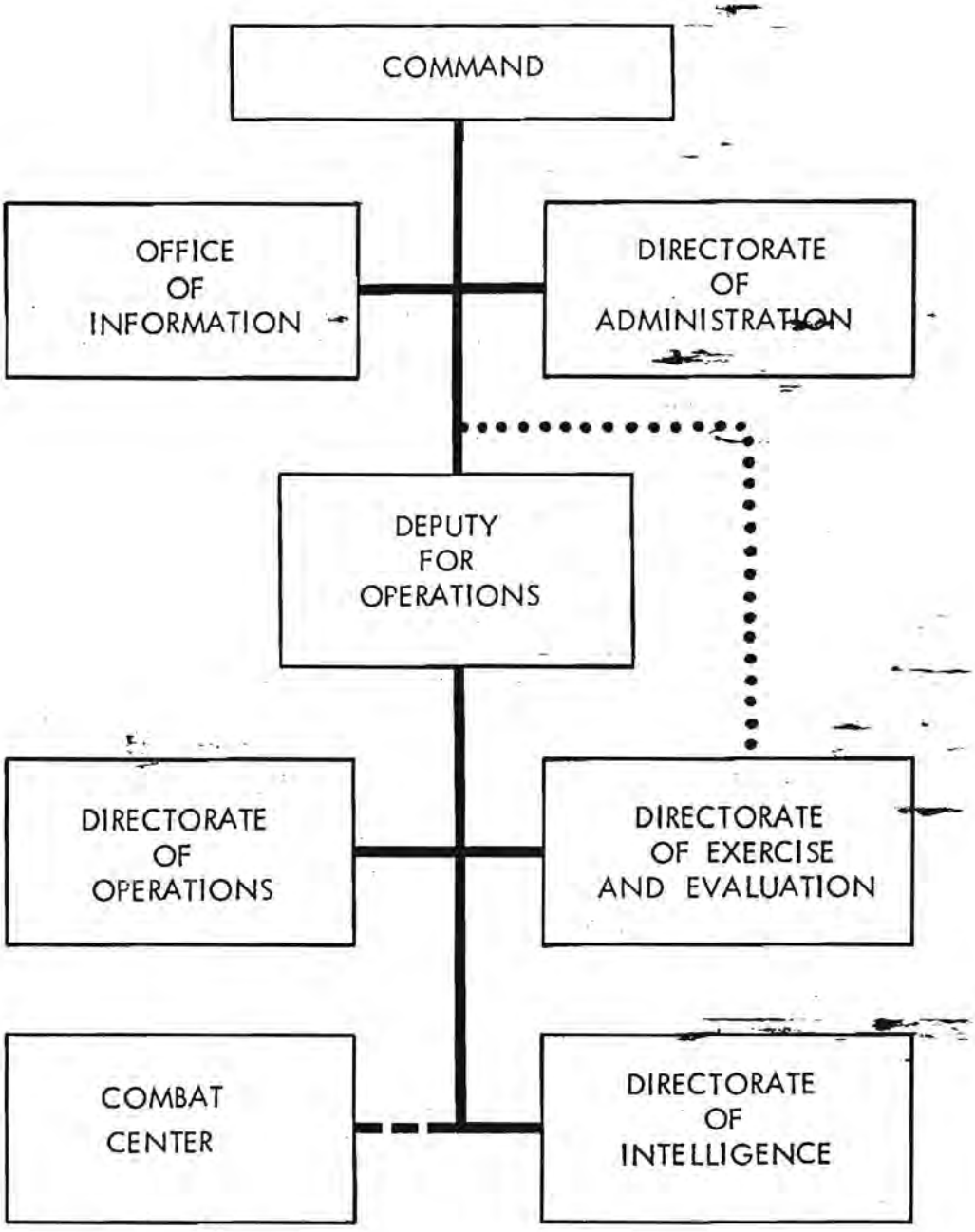
The NORAD region plan of 1 April 1961 was used as a guide to set up the ANR Headquarters structure (shown on the chart on the following page). ANR Headquarters staff totalled 32 (not including the Commander, i.e., CINCAL), consisting of 18 Air Force and 14 Army personnel. All positions, except that of the commander, were manned by personnel from AAC and U.S. Army Alaska, the component commands, in a dual capacity. However, the ALCOM plan provided that when desired by the component commander, certain of these personnel could be furnished from his resources on a primary duty basis.

ANR continued under the command of CINCAL in his dual capacity. CINCAL was the only ALCOM officer on the region staff. The Vice Commander of the region was the Commander of Alaskan Air Command. The Deputy Commander was the senior Army officer present for duty and assigned to the staff of ANR in a dual capacity. The Deputy for Operations was an Air Force officer and the Assistant Deputy an Army officer. The remainder of the staff structure was also integrated with the senior officer, regardless of service, acting as chief. Since all personnel in the headquarters staff structure were U.S. nationals, they performed both NORAD and CONAD functions.

[redacted]

[redacted]

ALASKAN NORAD REGION HEADQUARTERS ORGANIZATION CHART



▬▬▬ OPERATIONAL CONTROL

••••••••• RESPONSIBLE TO COMMANDER, ANR, FOR EVALUATIONS

[redacted]

[redacted]

Because ANR was superimposed on the AAC structure and used its facilities, including the combat center, ANR Headquarters was collocated with AAC Headquarters. The AAC Director of the region combat center was responsible to the region Deputy for Operations for those functions of the combat center coming under the responsibility of the region commander.

In a special order dated 24 January, ALCOM transferred region functions performed by Headquarters ALCOM to the region headquarters effective 1 February. ALCOM orders and regulations on operation of the region were to remain in effect until superseded by region directives.

NNR TRANSITION TO SAGE

Current planning called for the Northern NORAD Region (NNR) and the Ottawa NORAD Sector to become SAGE-operational in July 1963. The changeover from a manual to a SAGE operation for both NNR and the Ottawa Sector was to begin about 1 September 1962. During the period of the changeover, both the Region and Sector Headquarters were to move from St. Hubert, Quebec, to North Bay, Ontario. While the move and the changeover to SAGE was in progress, NNR would continue to conduct its air defense operations from the manual combat center at St. Hubert.

Manpower problems connected with the shift were eliminated when NORAD got JCS approval in January 1962 for an additional 55 U.S. manpower spaces to provide the SAGE capability at North Bay in 1963. Soon after, in April, NNR suggested to NORAD a means for organization during the shift from one location to the other. NNR proposed it establish a Detachment 1 at North Bay to be composed of personnel coming in to fill the North Bay NNR and Ottawa Sector positions. This detachment would be responsible to the NNR

[redacted]

[redacted]

Commander. Detachment 1 would become Headquarters NNR when the two centers became SAGE operational. At this time, if necessary, an overlap manual capability could be provided by switching the designation "Detachment 1" to the manual combat center at St. Hubert.

NORAD approved the NNR proposal with minor modifications. Instead of one detachment at North Bay, NORAD wanted two: Detachment A to be composed of incoming region personnel; Detachment B of incoming sector personnel. When the units became SAGE operational, it would be a simple matter to redesignate Detachment A as Headquarters NNR (SAGE) and Detachment B as Headquarters Ottawa NORAD Sector (SAGE). In the meantime, both detachments would be directly responsible to NNR Headquarters at St. Hubert. NNR accepted NORAD's modification.

Because of the move of NNR Headquarters from St. Hubert to North Bay, there would be a precedent in NORAD region command organization. Up to this time, NORAD region commanders served in the dual capacity as component commanders also. In the case of NNR, the commander was also commander of the RCAF ADC. This arrangement was possible because RCAF ADC Headquarters and NNR Headquarters were both located at St. Hubert. But with the move of NNR Headquarters to North Bay, the RCAF saw a need for a separate NNR Commander. Accordingly, they asked NORAD to change its general orders designating the RCAF ADC commander the NNR commander. NORAD did so with General Order 39, dated 2 August 1962, and the RCAF assigned Air Vice Marshal James B. Harvey as commander of NNR effective 15 September 1962. Air Vice Marshal Harvey would thus become the first and only NORAD Region commander whose sole responsibility was to NORAD.

[redacted]

[redacted]

COLLOCATION OF ARADCOM/NORAD REGION HEADQUARTERS

NORAD policy called for the collocation of ARADCOM Region Headquarters with NORAD Region headquarters by 1965. By 1 August 1961, ARADCOM had readjusted its region boundaries to coincide with those of NORAD/CONAD and USAF ADC. This left NORAD/CONAD, USAF ADC and ARADCOM with six major subordinate commands each in the U.S., with common boundaries.

But by 1 August 1961 only two ARADCOM region headquarters had been collocated with NORAD region headquarters. The first to be collocated, the 7th ARADCOM Region Headquarters, had been collocated with the 25th NORAD/CONAD Region Headquarters at McChord AFB, Washington, since its establishment on 26 July 1960. The second, the 2d ARADCOM Region Headquarters, was moved from Fort Meade, Maryland, to Oklahoma City on 1 August 1961, where it joined company with the 32d NORAD/CONAD Region Headquarters.

This still left something like three and a half years to collocate the remaining four ARADCOM region headquarters. Before any more collocating was done, however, ARADCOM began reassessing the cost and operational factors involved. In its analysis, ARADCOM found that construction of the facilities needed by the region headquarters at their new locations would cost in the neighborhood of four million dollars, not including communications costs. Furthermore, ARADCOM decided that a relocation of the 1st and 5th ARADCOM Region Headquarters would seriously hamper the region commanders in carrying out their primary mission, that of insuring the combat readiness of their Nike fire units. In addition, ARADCOM stated they had been told informally by NORAD staff officers that NORAD Aerospace Control Centers were scheduled for activation in the 1968-1970 period which might cause major changes in NORAD region alignments. This would mean that

[redacted]

the collocation of the remaining four ARADCOM region headquarters would be good for only three or four years.

ARADCOM recommended, therefore, that of the remaining four ARADCOM region headquarters the 4th and 6th be collocated, but not the 1st and 5th. This would cost around two million dollars. NORAD, deciding the anticipated gains in NORAD operational effectiveness were outweighed by the cost, temporary nature, and attendant operational disadvantages of moving the 1st and 5th ARADCOM Region Headquarters, agreed to the ARADCOM proposal.

NORAD ALTERNATE COMMAND POST MANNING

On 30 January 1962, the 29th Region sent NORAD its proposed plan for manning the NORAD Alternate Command Post at Richards-Gebaur AFB, Missouri. The plan called for eight officers, 60 airmen, and one civilian, all to be provided by USAF ADC. NORAD approved the plan on 5 March 1962.

ADC came up with four officers and 60 airmen, then asked NORAD for help in providing the remaining four officers and one civilian. Pointing out that the alternate command post was a NORAD operation, ADC said it did not see why it should provide all the manpower. ADC asked NORAD to require other component forces to share the burden.

NORAD thereupon discussed the request with ARADCOM and NAVFORCONAD. NAVFORCONAD offered no assistance, but ARADCOM agreed to man the four remaining officer spaces. NORAD then discussed this with 29th Region, and learned that it still felt that ADC should provide all the manning. 29th Region also conveyed this feeling to ADC, whereupon ADC relented and agreed to man the remaining five spaces. In view of ADC's change of heart and the Region's insistence on 100% ADC

[redacted]

manning of the ALCOP, NORAD told ARADCOM it would not have to man the four spaces for which it had volunteered.

SECTOR ORGANIZATION

REASSIGNMENT OF BANGOR SECTOR TO NNR

Background. Originally, the Bangor NORAD/CONAD Sector was to be reassigned from the 26th Region to Northern NORAD Region (NNR) in January 1963. In December 1961, however, NORAD approved an NNR proposal to make the change on 1 August 1962. Accompanying this shift were a number of other changes:

1. The Bangor Sector would transfer from 26th Region to NNR on 1 August 1962.

2. The Fredericton Sector would be phased out and its area turned over to the Bangor Sector.

3. The Montreal Sector would be phased out and its area divided temporarily between the Bangor and Ottawa Sectors. The Ottawa Sector would take over the southern portion of the Montreal Sector assigned to the Bangor Sector when the Ottawa Sector became SAGE operational around the middle of 1963.

4. The Boston Sector would change over from a Model 8.1 to a Model 9.1 computer program and expand its boundaries accordingly. This would bring the Boston Sector's boundaries out to their final SAGE configuration.

5. The Goose Sector boundaries would be set at their final configuration.

6. The Sault Sainte Marie Sector boundary would be extended eastward to include the

[redacted]

[redacted]

North Bay BOMARC squadron. This eastward extension would be in effect only until the Ottawa Sector became SAGE operational around the middle of 1963.

Revisions to the Plan. In January, NNR objected to the boundaries outlined for the Goose and Sault Sainte Marie Sectors. Stating that the elimination of two Goose Radar sites (C-30 and C-31) had wiped out Goose Sector radar coverage of the area north of 60° North, NNR suggested that the Goose Sector's northern boundary be set at 60° North instead of the programmed 65° North. NNR suggested that the responsibility for the area in question be given to the Hudson Bay Sector.

In regard to the proposed eastern boundary of the Sault Sainte Marie Sector, NNR contended that the boundary should not be extended to include the North Bay BOMARC facility. The move to include North Bay in the Sault Sainte Marie Sector area, NNR said, was designed merely as an interim measure to provide an early operational capability for the North Bay BOMARC's and was unnecessary since NNR had already arranged with the 30th Region for interim control of the BOMARC's at North Bay.* Also, a formal boundary change placing North Bay under Sault Sainte Marie Sector control would result in placing the fighter interceptor squadron at North Bay under their control also, and the Sault Sainte Marie Sector did not have the capability to scramble, control, and recover fighters from that base. The 30th Region agreed with NNR on North Bay control.

The result was NORAD compromised on the Goose Sector northern boundary, setting it at 62° North, and dropped the proposal to extend the eastern boundary of the Sault Sainte Marie Sector to include North Bay.

---

* See page 5, Chapter Four.

[redacted]

[redacted]

Next came a change in the date of the Bangor Sector transfer to NNR from 1 August 1962 to 15 September 1962. As noted, the date had first been moved back from January 1963 to August 1962 to permit the early phase-out of the Fredericton Sector, which would permit personnel and communications facilities to be moved over to the phasing-in SAGE operation at North Bay.* For the same reason, the Montreal Sector phase-out was tied in with the complex of moves. Because of exercises taking place in the area during the period 1 August - 14 September, however, the NNR Commander asked that the effective date of the Bangor transfer be changed to 15 September.

NORAD agreed to the delay, but this caused another problem. The Bangor Sector reassignment, as mentioned above, was to include boundary changes made necessary by the changeover to the Model 9.1 computer program on 1 August. These boundary changes would partly involve the Boston Sector's expanding into the present Bangor Sector. This posed the question of whether the Boston Sector's Model 9.1 computer programming (and the consequent boundary change) should be delayed along with the transfer of the Bangor Sector, or go into effect on 1 August as planned. NORAD decided to go ahead with the Boston Sector Model 9.1 programming as scheduled, at least as far as possible without changing NNR and 26th Region boundaries. Since the discontinuance of the Fredericton and Montreal Sectors was also being delayed to 15 September to coincide with the transfer of the Bangor Sector, the Boston expansion would reduce the size of the Bangor Sector during the six weeks following 1 August. But NORAD considered this better than re-adapting the computers.

The transfer of the Bangor Sector to NNR jurisdiction and the accompanying change in boundaries

---

* See NNR Transition to SAGE.

[redacted]

gave rise to a question of Bangor and Boston CONAD Region assignments and boundaries. When the NORAD boundary changes went into effect on 15 September 1962 they would leave the northern part of Maine and the northern tip of New Hampshire within NNR's area of responsibility. They would also leave the southern tip of Nova Scotia in the Boston NORAD Sector's area of responsibility. Since CONAD boundaries had to end at the U.S.-Canadian border, Boston and Bangor CONAD Sector boundaries were left up in the air. NORAD met the situation by assigning to the Boston and Bangor CONAD Sectors all U.S. territory and all adjacent U.S. territorial waters and international waters contained within the Boston and Bangor NORAD Sectors.

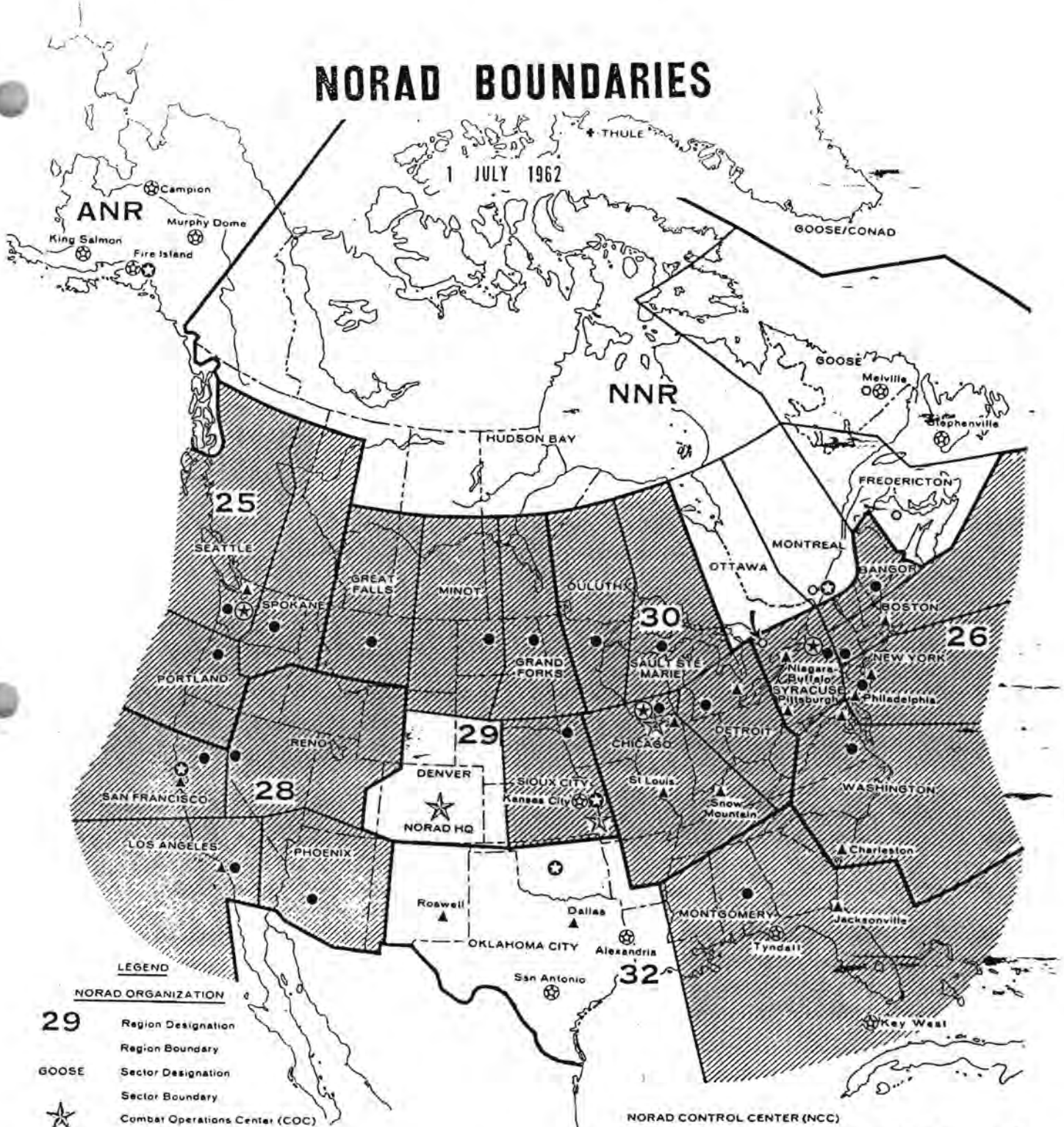
TRANSFER OF DYE SECTOR TO GOOSE NORAD/CONAD SECTOR

In February, the Goose NORAD Sector brought to the attention of CONAD and NNR a problem in connection with the exercise of operational control of DEW East. The latter was under the operational control of the Commander Goose CONAD Sector. However, Goose Sector pointed out that DEW East was, in effect, under the direct operational control of Dye Main. And since Dye Main was responsible directly to NNR rather than Goose, there was no effective way that the Goose CONAD Sector Commander could exercise operational control as required. To solve this, the Goose Commander asked that the Dye Sector be placed under the operational control of the Goose NORAD/CONAD Sector.

NNR agreed with the complaint and asked authority to place the Dye Sector, in its entirety, under the operational control of the Goose NORAD Sector. In April, NORAD approved NNR's request, but only for that portion of the Dye Sector which lay within NNR. This provided the Commander Goose CONAD Sector with a link at Dye Main (USAF officer) to exercise his DEW East responsibilities.

~~CONFIDENTIAL~~

NORAD BOUNDARIES



LEGEND

NORAD ORGANIZATION

- 29 — Region Designation
- Region Boundary
- GOOSE — Sector Designation
- Sector Boundary
- Combat Operations Center (COC)
- Alternate Command Post (ALCOP)
- Region Headquarters and Region Combat Center-SAGE (RCC-S)
- Region Headquarters and Region Combat Center-Manual (RCC-M)
- Sector Direction Center-SAGE (SDC-S)
- Sector Direction Center-Manual (SDC-M)

NORAD CONTROL CENTER (NCC)

[Name shown if not same as Sector (eg Alexandria)]

- Manual NCC
- Interim NCC (to be discontinued under the BUIC Plan)
- CONAD Control Center (CCC)
- Sector whose Sector Direction Center is SAGE (SDC-S)

~~CONFIDENTIAL~~

[redacted]

OTHER SECTOR CHANGES

Kansas City - Sioux City Sector. The Kansas City NORAD Sector, replaced by the Sioux City NORAD Sector, was officially relieved of all air defense responsibilities on 15 January 1962.

Detroit and Chicago Sector Boundaries. NORAD published general orders assigning the final programmed area of responsibility to the Detroit and Chicago NORAD/CONAD Sectors, effective 25 May 1962. Originally, the boundary change was to take place on 5 May, but it was held up by a delay in getting the Cincinnati BIRDIE system operational.

Goose Sector Headquarters Location. NORAD/CONAD general orders issued on 30 March 1960 had placed the Goose NORAD/CONAD Sector Headquarters at Melville Air Station, Labrador. On 13 June 1962, NORAD/CONAD issued general orders placing the Goose Sector Headquarters instead at nearby Goose Air Base, Labrador. The Goose Sector Headquarters had actually been collocated at Goose with the Goose Air Defense Sector Headquarters all the time, an arrangement that had facilitated the use of the dual staff principle.

Sector Designations. To avoid divulging or implying the capability of sectors in sector titles, NORAD issued a general order in June 1962 deleting the parenthetical designation (manual) from the Goose NORAD Sector title. By this time the parenthetical designations of all other non-SAGE sectors programmed for continuation had already been dropped. This left Ottawa Sector as the only non-SAGE sector still carrying its (manual) designation, a disparity that would be corrected when the Ottawa Sector converted to SAGE in 1963.

[redacted]

[redacted]

MANPOWER CHANGES

NORAD submitted its manpower requirements for Fiscal Year 1963 to the Joint Chiefs of Staff on 29 January 1962, requesting in the process an additional 37 people for NORAD/CONAD Headquarters. At the time of submission, NORAD was still evaluating a possible requirement for a Communications Status Center in the NORAD COC. Deciding the function was needed, NORAD supplemented its 29 January submission on 5 March with a request for five senior master sergeants to man the new center. This brought the NORAD Headquarters request total to 42 additional spaces.

In an effort to keep sporadic requests for additional manpower to a minimum, NORAD also included the NORAD-approved adjustments requested by the region commanders in the annual manpower submission to the JCS. These included 15 people for region/sector headquarters and 6 for the Goose Sector Headquarters (4 Canadian, 2 U.S.).

NORAD's final manpower requests had been scaled down considerably from those of the NORAD Headquarters staff sections and region/sector headquarters. NORAD Headquarters staff sections had asked for 56 spaces, as opposed to the 37 requested in the official submission to the JCS. NORAD region/sector headquarters requests were reduced by NORAD from 29 to 15, and the proposed manning for the Goose Sector Headquarters was dropped from 10 to 6 (RCAF Headquarters had originally suggested 4 Canadian and 6 U.S. spaces).

In spite of this, the JCS further reduced the additional requirements. Their reply of 23 April 1962 granted only 22 of the 42 spaces NORAD had asked for for its headquarters. The regions and sectors did better. The six spaces requested for the Goose Sector Headquarters were granted, and of the 15 other additional region/sector spaces requested by NORAD, 13 were granted. This made a

[redacted]

[redacted]

total of 41 spaces, but the net increase for NORAD over-all, was only 40 because one existing USMC colonel space was deleted (from the 26th Region).* Increases authorized by the JCS were primarily in operational functions, while those turned down were mainly administrative in nature. These changes were incorporated in the 1 July 1962 JTD.

The new authorizations added a total of five new RCAF spaces. In addition to the 4 RCAF spaces slated for the Goose Sector Headquarters, NORAD acquired an additional flight lieutenant for the 25th Region, as requested by the region. Furthermore, in a separate action, NORAD traded back to the RCAF its Canadian Civilian Defence Research Board physicist slot on the NORAD Headquarters staff for an RCAF flight lieutenant slot for J-5 (Directorate of M&O). The physicist position had been allotted to the discontinued Office of Chief Scientist and had been vacant for some time.

In the meantime, NORAD also had been thinking about approximately 10 more spaces it needed within the headquarters - 5 general-duty officers for the Combat Operations Center (COC) and five officers for a NORAD/ADC Joint Communications Center. As NORAD moved into the missile age, the command felt more and more a need to provide full-time senior representation in the COC, a ranking officer thoroughly familiar with all procedures, directives, and systems. An attempt had been made to meet the requirement on a roster basis, but this only pointed up the need for senior controllers working in the COC environment on a regular basis. NORAD stated its requirement as one Army Colonel, two Air Force Colonels, and one Navy Captain.

---

* Actually two USMC colonel spaces were deleted, including one from the 28th Region, but the latter was restored by the JCS after a NORAD protest until July 1963 when it was to become a USAF colonel space.

[redacted]

[redacted]

This same advance in weapons technology made CINCNORAD feel he needed full-time officers in the NORAD/ADC Joint Communications Center. The Communications Center was presently staffed entirely by USAF ADC personnel who were neither directly responsible nor responsive to CINCNORAD.

Mindful of JCS concern over the steadily increasing manpower requirements of joint headquarters, however, NORAD intended to obtain the spaces as far as possible from within its own resources. Deciding the spaces could best be obtained through a reorganization of the staff, NORAD launched early in 1962 a manpower and organizational review of the headquarters.

The headquarters JTD was screened and the manpower and organization review studied, then the major staff sections were approached in an attempt to locate the seven colonel or colonel-equivalent spaces for the COC. As a result, J-3 agreed to release one space, J-4 two spaces, J-5 three spaces, J-6 one space, and DCS/Programs one space. At the end of June, approval was being sought from the NORAD Chief of Staff to transfer the spaces to the COC.

The transfer of five spaces to the Joint Communications Center was expected to be a little more difficult to achieve, largely because it looked as if they would have to come from higher grade authorizations and hence would have to be forwarded to the JCS for approval.

NORAD Headquarters as of 30 June 1962 was authorized 699 spaces - 106 USA, 43 USN, 509 USAF, 39 RCAF, and 2 USMC. These figures did not include changes to the JTD going into effect on 1 July 1962 (i.e., an increase of 22 spaces).

[redacted]

CHAPTER 2
SURVEILLANCE SYSTEMS

MANNED BOMBER DETECTION SYSTEMS

GAP FILLER PROGRAM AND STATUS

Background. A program was established in October 1960 by USAF to modernize all existing SAGE gap filler sites and equip all programmed SAGE gap filler sites (a total of 182 -- 137 in the U.S. and 45 in Canada) with the AN/FPS-74. At other than new sites where this radar set was to be installed, the existing radar (AN/FPS-14 or AN/FPS-18) was to be converted to this radar with modification kits. A total of 12 non-SAGE gap filler sites, located in the interior of the U.S., were to have AN/FPS-18's, making an over-all total of 194 gap fillers.

But this program soon changed. For one thing, in order to provide a SAGE back-up (see Chapter Three), reorientation of the 416L System was necessary to get the funds. One of the cuts in 416L established by USAF in November 1961, and agreed to by NORAD and ADC, was fifty AN/FPS-74 modification kits from the FY 1962 buy.* By this time, the program had changed to a total of 170 FPS-74's and 15 FPS-18's. The latter had increased from 12 because of the addition of three gap fillers in the program for Florida.

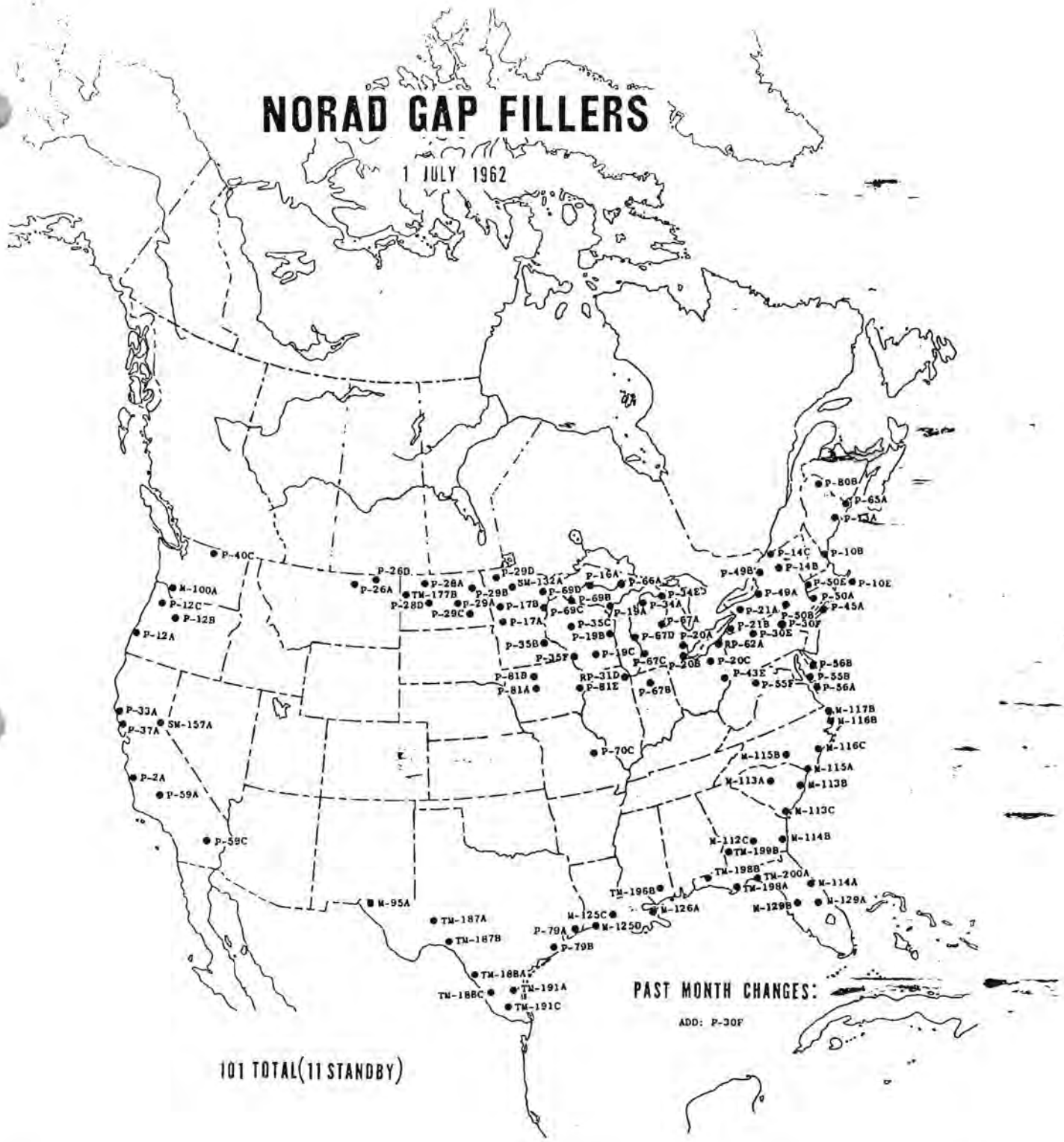
Status. After deletion of the FPS-74 modification kits and a number of other shifts, additions,

---

* See NORAD/CONAD Historical Summary, Jul-Dec 1961, pp. 26-33, for details.

NORAD GAP FILLERS

1 JULY 1962



PAST MONTH CHANGES:

ADD: P-30F

101 TOTAL(11 STANDBY)

and cuts, the program on 30 June 1962 was for a total of 174 gap fillers in the U.S. and Canada. This included 124 FPS-74's (45 for Canada and 79 for the U.S.) and 50 FPS-18's (for the U.S.). Thus, of the 174 sites, 129 would be in the U.S. There were 101 gap fillers (11 on standby) as of 1 July 1962, all FPS-18's or FPS-14's (and all in the U.S.). The first FPS-74's were scheduled for installation and operation in CY 1963.

As noted above, 45 gap fillers were programmed for Canada under the CADIN program. All were to be FPS-74's. Contracts for construction of 12 sites had been let by April; one site was to be built by the RCAF Construction Maintenance Unit, and contracts for the other sites were to be let before the end of May.

Program Re-evaluation. At mid-year, however, the gap filler program was again in need of re-evaluating and rescheduling. There was forecast a six month slippage in the FPS-74 program because of the inability of the contractor to produce equipment on schedule. It was felt that any further slippage, because of the contractor, could cause the contract to be given to a new contractor which would result in another year's delay, i.e., installation in 1964.

Then on 4 July, RCAF Headquarters indicated to NORAD that the gap filler program in Canada would be deferred because of financial stringencies and the current difficulties in the FPS-74 program. In a message to Air Marshal Slemon, Air Marshal Campbell, Chief of the Air Staff, RCAF, asked for confirmation that CINCNORAD agreed to this deferment.

NORAD replied that in its view there was no lessening of the need for a NORAD capability to meet the threat of a low level attack and, accordingly, the requirement for gap fillers remained firm. However, NORAD continued, it was understood

that because of financial stringencies, the deferment of the gap filler program was selected as the least undesirable means by which Canadian expenditures on NORAD could be reduced. Said NORAD, "This national decision is acknowledged by NORAD."

A few days later, USAF advised ADC and NORAD of a message just received from RCAF Headquarters stating its plan to defer the FPS-74 program for Canada until Canadian fiscal year 1964-1965.* USAF stated that the RCAF message explained that a Canadian Government decision to curtail expenditures necessitated examination of all programs. This one had been selected because the current slippage of six months, plus the Electronic Systems Division estimate of probable further indeterminate delays, made it a logical choice. RCAF said it would appreciate concurrence.

USAF told ADC and NORAD it agreed this was a logical selection and saw no alternative to concurrence. And further, USAF said that because of the difficulties in the FPS-74 program there was need to re-examine the total gap filler program. Additional delays could not be tolerated and an alternate course of action had to be developed in case more difficulties prevented the delivery schedule from being met.

AEW&C FORCE

Change in Employment Procedures. Considerable study was given to employment of the airborne early warning and control (AEW&C) force beginning in 1961 as a vital element in continuing an air defense capability against a follow-on manned bomber attack. The assumption was that an attack against the North American continent would consist of an initial ballistic missile attack

* This was modified at a conference in August to Canadian fiscal year 1963-64.

followed by a manned bomber attack.

Another problem to consider was what to do in the face of a tremendous drain on AEW&C resources because of the withdrawal of RC-121 aircraft for support of special projects. RC-121's were used to support Projects Discoverer and Samos. Three aircraft were taken for Project Blue Straw from February through June 1962. Seven planes went for ten days to Operation Stairstep, a TAC movement of aircraft to Europe. For air defense of the southern Florida area, a full-time AEW&C station had to be supported. And the ALRI (airborne long range inputs) retrofit and test programs resulted in further reduction of available aircraft.

In February, the JCS were advised by message of CINCNORAD's concern over what was termed "the increasing degradation of the early warning and surveillance radar coverage caused by the continuing reduction of available resources." Because of the many projects, the message said, the station manning capability was cut to less than six of the required eleven AEW&C stations (one off southern Florida, five off each coast). CINCNORAD urged that special projects be supported from other than air defense resources and that there be an early transfer and retrofit of Navy WV-2 aircraft for air defense (see below).

Along with this, NORAD called a conference with ADC and region representatives in February to find the best employment of AEW&C aircraft. A staff study prepared by NORAD on this problem in connection with the conference made a number of conclusions, among which were the following:

(1) The AEW&C aircraft do not contribute to the active air defense capability against a ballistic missile attack. However, they are required during a manned bomber attack.

[redacted]

(2) During peacetime, full AEW station manning is not required except for the "Southern Tip" station. Random manning of these stations is desirable.

(3) The AEW&C aircraft can be used to provide:

(a) Radar coverage
(b) Interceptor control
(c) Airborne ALCOP
(d) Communications links
(e) Reconnaissance
(f) Seaward extension of contiguous radar coverage

(4) These aircraft cannot be fully utilized unless they survive. A workable dispersal plan is needed to "save" these aircraft for use after the initial missile attack.

NORAD recommended discontinuance of the attempt to man all currently designated AEW&C stations on a day-to-day basis and that instead 30 percent of the stations be manned on a random basis.

This was the policy that was eventually established. On 11 July 1962, NORAD told the regions concerned that all primary AEW&C stations need not be manned continuously on a day-to-day basis, but that a capability had to be maintained to man all primary stations when required. NORAD directed that this concept be implemented as soon as possible and stated that primary stations, with the exception of the southern Florida station (which had to be manned full time), were to be manned on a rotating, random basis 30 percent of the time. The manning schedule was to be established by the region commander concerned. The regions were to have plans to man all primary stations when so ordered by CINCNORAD.

NORAD also directed the regions to develop plans to insure the survival of as many aircraft

[redacted]

as possible from an initial ballistic missile attack. NORAD suggested that a combination of standing alert, "flush" and rotation of aircraft to dispersal bases be used.

Transfer of WV-2's. Seven Navy WV-2's (radar-equipped Super Constellations) were transferred to the Air Force during the period April through June 1962. At mid-year, these aircraft were undergoing retrofit in California to the RC-121 configuration. When completed, during the period December 1962 through March 1963, these aircraft were to be assigned to ADC which would then send them to be ALRI equipped.

Seven of the current ADC RC-121's would be kept for manual operations, i.e., not equipped with ALRI. These seven planes would eventually be placed at McCoy AFB, Florida, for manning of the station off southern Florida.

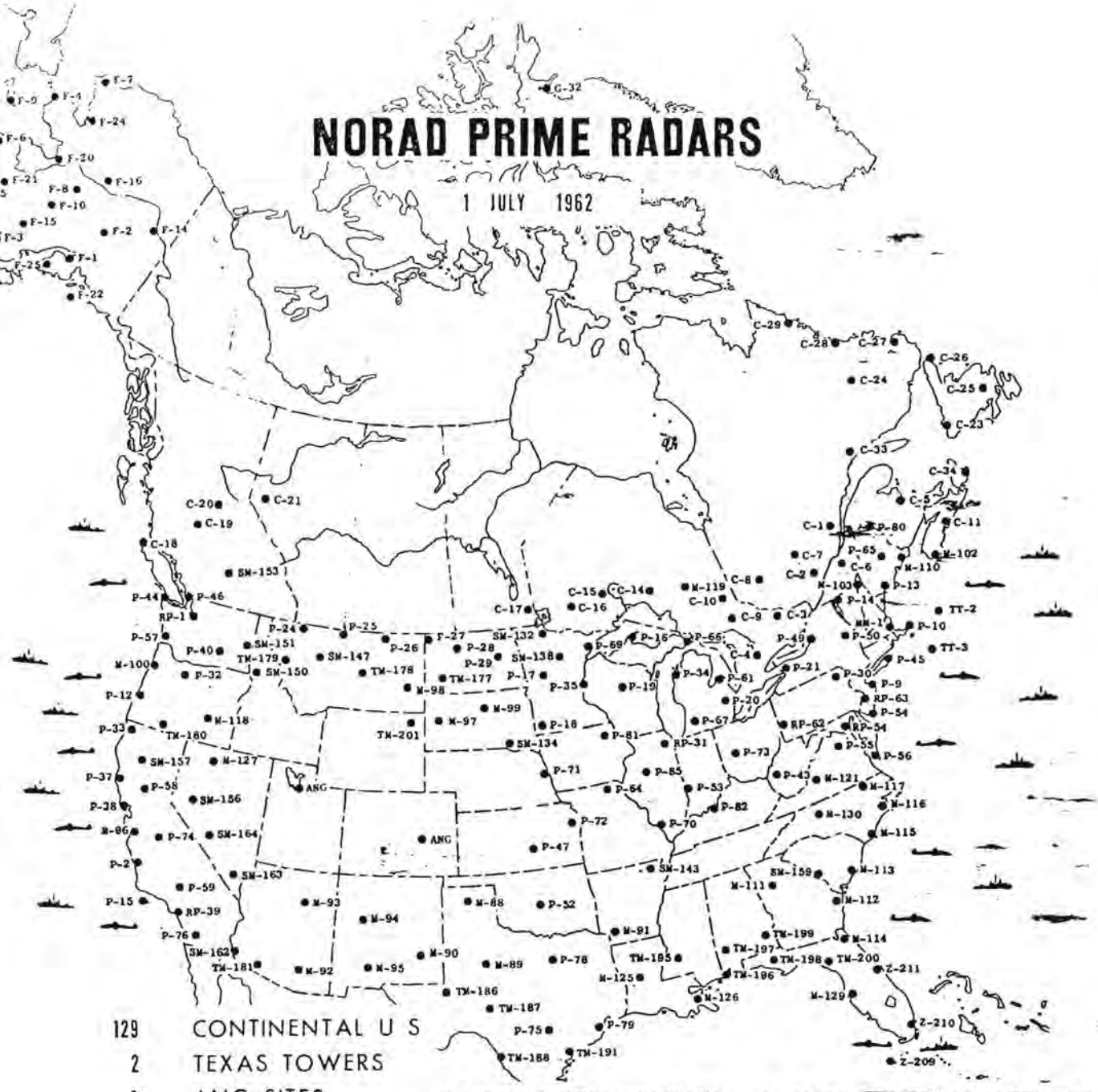
This station was being manned full time by a squadron, the 966th AEW&C Squadron, which, after activation and assignment to ADC, was assigned to the 551st AEW&C Wing for organization at McCoy AFB, 1 February 1962. Currently, aircraft for the squadron's use were being made available by rotating about seven planes from the East Coast. The strength of the East Coast force was partially made up by the transfer of four planes from the West Coast.

TEXAS TOWERS

Because of the collapse of Texas Tower Number 4 in January 1961, measures were established to evacuate the remaining two towers (Numbers 2 and 3) whenever severe storms threatened. The first evacuation of the towers was made on 19 September 1961 under the threat of Hurricane Esther. During the winter, from November to March, both towers were evacuated nine times. Tower 2 was unoccupied for

NORAD PRIME RADARS

1 JULY 1962



129	CONTINENTAL U S
2	TEXAS TOWERS
2	ANG SITES
18	ALASKA
31	CANADA
1	THULE
183	TOTAL

Of a total of 11 AEW&C aircraft stations authorized, 7 are manned - 4 on the East Coast and 3 on the West Coast.

Of a total of 11 picket ship stations authorized, 10 are manned - 5 off each coast.

Since 15 Feb, the picket ships off the East Coast have been deployed outboard of the AEW&C aircraft stations for test and evaluation of this deployment concept. The duration of the test period has not been determined.

11 USN PICKET SHIP STATIONS

11 USAF AEW&C STATIONS

[redacted]

a total of 43 days and Tower 3 for 35 days. It was estimated, on the basis of four years of weather data, that the towers would have to be evacuated one to two times per month during winter storms and in addition that the towers would be non-operational around twenty days per year because of hurricanes.

Evacuation was expensive and caused a degradation of surveillance. In January 1962, NORAD advised the JCS that AEW&C aircraft were stationed in the vicinity of the towers whenever they were evacuated. Primary AEW&C station manning had to be reduced to provide these aircraft.

The Texas Towers would not be necessary eventually, however, and would be phased out. The AEW&C aircraft in the off-shore force were to be operating with ALRI equipment soon. NORAD told ADC back in September that operational ALRI would duplicate the radar coverage capabilities of the towers with an automatic radar input to SAGE and a voice/digital relay of UHF communications. Because of this, NORAD said it planned to delete the requirement for the towers when ALRI became fully operational and had demonstrated reliable detection, tracking, and weapon control capabilities. In January 1962, NORAD told the JCS that when this stage was reached it planned to re-evaluate the tower requirement.

When this time would be reached was not certain. It was expected that enough ALRI-equipped aircraft would be available by October 1962 to permit an interim operational capability. Probably there would remain a requirement for the towers until sometime in 1963.

MID-CANADA LINE

Back in February 1961, NNR recommended that the Mid-Canada Line (MCL) be closed down when

[redacted]

[redacted]

radars installed under the CADIN program became operational. The western half of the line could be closed down by March 1962, NNR said. The date for closing the eastern half was more indefinite. NNR later changed its recommended date for closing the western half to March 1963 because of delays in radar operational dates. NORAD had agreed only to consider discontinuing the line when all the radars were operating.

In March 1962, the RCAF ADC Commander informed NORAD that a study of future requirements for the MCL had been completed by the RCAF. It had shown a continued inadequacy of low level coverage across Canada despite programmed CADIN improvements. In view of the facts found in this study, the AOC ADC said, it had been decided that the MCL would be maintained in operation for an indefinite period.

BALLISTIC MISSILE AND SPACE WEAPONS DETECTION SYSTEMS

BALLISTIC MISSILE EARLY WARNING SYSTEM

Status. BMEWS Site I, Thule, Greenland, had attained fully automatic operation with its detection radars on 31 January 1961. A tracking radar became operational at Site I on 31 December 1961. Site II, Clear, Alaska, became fully operational with its detection radars on 30 September 1961. No tracker was programmed for Site II.

The operational date for Site III, at Fylingdales, England, was being delayed by strikes and walkouts. Site III was originally scheduled to go into operation in March 1963. As construction fell 60 days behind schedule, though, the operational date was slipped 30 days. Later, further labor difficulties caused the operational date to slip more, and by mid-1962 it had fallen back to 22 June 1963.

[redacted]

[redacted]

BMEWS Gaps. At the beginning of 1962, NORAD recognized several deficiencies in the presently planned BMEWS system.* One of the most serious of these were the gaps in BMEWS that would permit the USSR to evade the net by firing extremely low-angle ICBM shots. Of the three primary holes in NORAD's missile defense (the second and third involving the submarine-launched ballistic missile and global range ballistic missile), NORAD considered the low-angle ICBM possibility the most threatening.

With low-angle ICBM shots, both surprise and effectiveness could be attained. With only slight reductions in effectiveness (lower accuracy being compensated for by high-yield warheads), the USSR could fire a ballistic missile from its own territory at a trajectory giving it a re-entry angle as low as 7°. Since BMEWS was designed and deployed to detect missiles with re-entry angles between 15° and 65° only, the missiles would slip right under the net. A great many soft SAC and air defense sites, as well as key industrial areas, were vulnerable to such an attack.

NORAD thus considered it highly important to plug these gaps. In May 1962, the command developed a program to fill the gaps between Sites I and II and Sites I and III, the latter being the more serious of the two. The program called for a gap-filler radar on the northern coast of Iceland to take care of the Sites I-III gap and a tracking radar at Site II to cover the Sites I-II gap. The program also called for the use of the Shemya radar in a manual mode to scan to the west of Site II. This program was forwarded to USAF and the Secretary of Defense for their consideration.

---

* For BMEWS rearward communications improvements, see section entitled NORAD/SAC Northern Area Communications Objectives Plan, this chapter, pages 43 to 45.

[redacted]

[redacted]

BMEWS Tracking Radars. The decision to ask for just one more tracking radar for BMEWS, and that as a gap-filler, represented a considerable change from NORAD's former position. Originally, NORAD wanted two trackers at each site and the USAF interim configuration for BMEWS, announced in May 1958, called for two tracking radars at both Thule and Clear. A year later, however, all four trackers were deferred. Then, in June 1960, DDR&E agreed to permit a tracker for Sites I and II as soon as the Air Force was satisfied the equipment was reliable. On 4 August 1960, USAF approved a tracker for Thule, but on 12 June 1961 ruled out the tracker for Clear.

Throughout these changes, NORAD had continued to urge two trackers for both stations. It based its requirement on expectations that the BMEWS would be subject to a great deal of background noise, thus reducing sensitivity and increasing the false report rate. NORAD also wanted trackers to increase the over-all system reliability.

By late 1961, however, NORAD found the two sites suffering from far less background noise than expected and reliability was meeting design objectives. Consequently, NORAD decided to re-evaluate its tracker requirement.

A study was launched in late 1961 that took into consideration such factors as probable Russian launch areas, missile inventories, launch capabilities, and probable target areas. It also considered the probable superiority of a tracking radar over a detection radar in an ECM environment. The study concluded that the need for a tracker at Clear was "extremely marginal." NORAD also concluded that a tracker would be needed at Clear in an ECM environment only in the unlikely event that the USSR launched its missiles in such a way as to avoid the trackers at Thule and Fylingdales completely. By mid-1962, therefore, the NORAD requirement for additional BMEWS trackers had shrunk to one at Site II, Clear, as a gap-filler.

[redacted]

BMEWS ECM Vulnerability. A second BMEWS deficiency facing NORAD at the beginning of 1962 was the vulnerability of the system to ECM. In October 1961, USAF had authorized $160,000 for "quick fixes" to give BMEWS a limited ability to recognize when it was being jammed. ESD presented to the USAF Systems Review Board and the Air Council in February a complete $45 million ECCM program that would give BMEWS some ability to operate in an ECM environment. The program was approved by USAF in March and sent to DOD for approval and funding. USAF directed AFSC to go ahead with the project in the meantime. The final program approved by USAF was for $43.5 million. Meanwhile, the "quick fixes" had been installed at Sites I and II.

BMEWS Range Deficiency. A BMEWS deficiency that was not headed toward solution by mid-1962 was one concerning range. The probability of BMEWS detecting objects at ranges beyond 1,500 nautical miles was low. This deficiency greatly increased the possibility that ballistic missiles launched from the southern part of the Soviet Union or launched at high angles would escape BMEWS detection. A request for equipment to correct this deficiency was included in the NORAD BMEWS improvement program submitted to USAF and DOD in the summer of 1962.

SPACE DETECTION AND TRACKING SYSTEM

Background. In memoranda dated 7 November 1960, the JCS directed CINCONAD to assume operational command and CINCNORAD to exercise operational control of the Space Detection and Tracking System (SPADATS). This system consisted at the time of the Air Force Spacetrack System and the Navy SPASUR (Space Surveillance) System.

The Secretary of Defense had directed in October 1960 that CINCONAD define the operation and

further development of SPADATS, and that NORAD develop SPADATS operational procedures. NORAD submitted its operational requirements to USAF in December 1960. CONAD obtained the requirements of all user organizations and submitted a composite requirements document to the JCS on 20 April 1961. The JCS approved the requirements with minor changes on 16 June and forwarded them to the Secretary of Defense.

In the meantime, the Air Force had prepared a detailed SPADATS development and funding plan. The plan called for a phased-array radar as a prime sensor for the SPADATS-Improved system, and the development of an electro-optical sensor to extend the surveillance range beyond that of conventional radar. It was turned down by DDR&E because of excessive cost (up to $1.5 billion).

In the fall of 1961, however, NORAD learned that $2.1 million had been approved for the development of an electro-optical system. Later, in November, $14 million was approved to start developing a phased-array radar and to start or continue work on other SPADATS-Improved R&D programs. An additional $16 million was promised for fiscal year 1963. The two year total was about the amount USAF had requested for SPADATS-Improved for fiscal year 1962.

SPADATS-Improved. By June 1962, two steps toward an improved SPADATS had been taken. By that time, contracts for developmental prototypes of both a long-range phased-array radar and a deep-space automatic electro-optical detection and tracking system had been signed. The equipment developed would be worked into the SPADATS operational system, with the expectation that additional equipment would be bought in the future.

The Bendix Corporation, on 2 April 1962, was awarded a contract to build the phased-array radar. Though the contract called for Bendix to build only

a single-face R&D model phased-array radar, the dates quoted by Bendix were about one year earlier than previously expected. Bendix promised a contractor turn-on within two years of the signing of the contract, and a turn-over to the Air Force a year later. This would put the radar in NORAD's hands around April 1965.

The Bendix radar would be the first major radar sensor specifically designed, oriented, and built for near-space surveillance. It would permit the detection and tracking of satellites orbiting at low inclination angles not covered by present full-time spacetrack sensors. It would also provide much better surveillance of satellites in higher inclination angles at altitudes below 2,000 nautical miles.

The first phased-array radar would be positioned in Florida. From there, it would have a nominal detection range of 3,200 nautical miles for a one-square-meter object. The system would track continually up to 50 random objects at one time without interrupting the search operation. Simultaneous tracking would be restricted to about 20 objects if all were near the radar's maximum range, however.

A contract negotiated with the Radio Corporation of America (RCA) was a start in covering the NORAD objectives for far-space surveillance. The contract, signed on 15 June 1962, called for RCA to develop a prototype of an automatic electro-optical deep space surveillance and tracking system. The prototype, to be built at Cloudcroft, New Mexico, would consist of one station. Construction was expected to be completed in 1964 and when completed the station would provide an altitude coverage in its area of from 3,000 to 300,000 miles. Just as the Bendix system would be the first major sensor designed from the start for near-space surveillance, the RCA system would be the first designed specifically for far-space surveillance.

[redacted]

Meanwhile, NORAD, through NADOP 64-73, had again stated its objectives for a SPADATS-Improved system. In the NADOP, NORAD said it wanted a system of sensors and computers giving surveillance coverage from 75 up to 20,000 nautical miles. It also asked for a North American Space Defense Zone subsystem by fiscal year 1968 that would provide coverage from 75 to at least 3,000 miles in altitude extending out about 3,000 nautical miles from the continent. The NADOP also asked for an early warning subsystem employing sensors in the Pacific and Indian Oceans.

Additional Sensors. Until an advanced electro-optical sensor system was developed for SPADATS, NORAD wanted the use of Baker-Nunn cameras to provide data on satellites and space vehicles. The Air Force, in support of Project Spacetrack, had procured five of the cameras for satellite tracking. These were placed in Chile, Canada, Norway, the Boston area (in storage), and at Edwards AFB. In 1961, the Director of Defense Research and Engineering had directed the transfer of these cameras to NASA. In December 1961, NORAD made a request to the JCS to have the Air Force keep those cameras not committed to foreign countries. NORAD felt that transfer to NASA would be detrimental to their use for SPADATS. NASA would agree only to provide data on a non-interference basis, was reluctant to operate the system on a classified basis except occasionally, and indicated that its support of the operation would continue only until July 1963.

In further justification of its position, NORAD told the JCS that conferees at a recent optical sensor conference had agreed that the Baker-Nunn cameras were the most advanced optical instrumentation currently available. Radar would be limited to a maximum height of 3,000 miles in the immediate future, NORAD continued, but the Baker-Nunn cameras could track a one square meter target to almost ten times that distance. Baker-

[redacted]

Nunn camera tracking accuracy exceeded that of radar. And, finally, NORAD said that Baker-Nunn cameras could be used in the tracking of lunar and interplanetary vehicles up to about 48 hours after launch.

The JCS agreed and asked the DDR&E, in January 1962, to reconsider its decision to transfer the cameras. The Air Force concurred with this request the JCS said. Actually, only three of the cameras were involved, for two, those in Chile and Canada, had been offered to those countries with no strings attached.

In March 1962, NORAD learned that DDR&E was considering leaving the three cameras not committed to foreign countries with the Air Force, with operational control to be delegated to NORAD. In considering the request, DDR&E asked where the cameras would be located. NORAD replied that it would keep the Edwards AFB camera at Edwards, move the Oslo camera to Bermuda, and move the Boston area camera to Samoa.

In the meantime, NORAD was investigating the possibility of getting some use out of the cameras given to Chile and Canada through soliciting the cooperation of those two countries. Negotiations had begun in January through NASA to transfer ownership of the Baker-Nunn camera at the Chilean National Astronomical Observatory officially to that institution. NORAD asked USAF to study the possibility of providing funding and technical support to the Chileans for operating the camera. The official transfer of the camera was held up, however, when it was learned that the Russians were going to send observers down to watch the Chileans work it and the camera still had not been transferred by June 1962.

The Canadian camera at Cold Lake, Alberta, was turned over to the RCAF, however, and the latter asked NORAD for details concerning the

[redacted]

kind of space object information it would like to receive. The RCAF also made arrangements with the DRB for use of the Prince Albert Radar Laboratory (PARL) for SPADATS. On 30 January, NORAD provided the RCAF with its detailed requirements for the Baker-Nunn camera at Cold Lake and the radar at Prince Albert. By the end of April, the RCAF was assigning additional people to Cold Lake to carry out the SPADATS mission and was setting up a communications system between NORAD and Cold Lake and PARL. By mid-year, the camera at Cold Lake was supplying data to the NORAD SPADATS Center.

In order to increase further its SPADATS coverage, NORAD in the fall of 1961 had asked also for operational control of the Shemya, Alaska, radar site; the Moorestown, New Jersey AN/FPS-49 radar site; and the Pincushion Pacific Island AN/FPS-62 radar site proposed for the Hawaiian Islands. The JCS, on 7 December 1961, confirmed the transfer of the Shemya radar from USAF Security Service to USAF ADC, previously arranged for by ADC with USAF. The JCS also said that the tracking radar for Shemya was installed and would be operational by 1 February 1962. The Moorestown radar, the JCS said, would provide data to SPADATS on a part-time basis and within a year would be improved to make it more responsive to SPADATS' needs. NORAD's bid for the Pincushion radar, however, was turned down by the JCS because the cost of its completion and deployment could not be justified by its value.

The Shemya radar facility was reassigned to USAF ADC on 2 February to function under the operational control of NORAD. In recognition of the ability of the Shemya facility to provide technical intelligence information on Soviet ICBM's, and the great need for that type of information, CONAD and the Air Force Chief of Intelligence worked out an arrangement whereby such information would be provided when possible and necessary.

[redacted]

[redacted]

UNCLASSIFIED

UNCLASSIFIED

[redacted]

Atch 2

MISSILE DEFENSE ALARM SYSTEM (MIDAS)

In the fall of 1961, the Secretary of Defense set up a MIDAS Ad Hoc Group, chaired by Dr. J. P. Ruina (Director of the Advanced Research Projects Agency), to study the MIDAS program. In December, the Ruina group issued the following conclusions:

a. MIDAS can probably be made effective against liquid fuel rockets, though this is not certain.

b. There is doubt that MIDAS can be made effective against solid fuel missiles in the next few years, if ever.

c. The present MIDAS design is so complicated that it probably will not be reliable enough to warrant deployment.

d. The system's need for more research and technological development rules out an early operational date.

e. MIDAS will not be available before 1966, and perhaps not even then.

Still, the Ruina group thought a MIDAS system would meet significant military and political needs. It thought, too, that it was probably possible to develop a re-designed, simplified MIDAS that would be effective against mass ICBM attacks. They recommended, therefore, the

[redacted]

designing, but not the fabricating, of a simplified MIDAS. They also recommended that an operational date not be established until the research and development program had inspired a proper degree of confidence.

Meanwhile, budget considerations forced the Office of the Secretary of the Air Force on 28 October to direct AFSC to defer the MIDAS program in favor of SAMOS. Fiscal year 1963 funds for MIDAS had been reduced from $185 million to $100 million, and the operational date re-established at 1966.

NORAD protested the decision and in December joined with SAC, ADC, and AFSC to descend on the USAF Air Council with a joint briefing on the operational requirement for MIDAS. The briefing stressed the need for an immediate go-ahead to achieve a late 1964 operational capability.

As a result of the briefing, AFSC was directed to prepare several plans for possible MIDAS development. AFSC prepared three plans and presented them to USAF Headquarters late in February. Plan A called for large funding in fiscal years 1963 and 1964 to achieve an operational status in late 1964, an advanced payload capability for detecting solid propellant boosters in mid-1966, and a worldwide detection capability in mid-1967. Plan B called for limited funding in fiscal year 1963, which would result in all operational dates slipping one year. Plan C suggested no operational date, but called for further research and development. This last plan supported the Ruina report.

USAF Headquarters accepted, in general, Plan C. NORAD, SAC, and USAF ADC reluctantly agreed with Plan C, providing Headquarters USAF would try for an operational date of mid-1965 and defend the operational and R&D funds needed in the fiscal year 1964 budget to meet this date.

[redacted]

[redacted]

While recognizing the technical problems involved, NORAD in NADOP 64-73 again stated its need for a MIDAS-type system. NORAD also recommended that the MIDAS-type system development be expanded to provide for detecting IRBM's launched from land, sea, air, or space, including the tracking of cold body missiles (after burnout).

SUBMARINE LAUNCHED BALLISTIC MISSILE DETECTION SYSTEM

NORAD submitted to the JCS on 24 February 1962 a qualitative requirement for an automatic early warning system against short to intermediate range missiles (ballistic or cruise types) that could be launched against the North American Continent. NORAD said in a letter accompanying this NQR that a lack of such capability presented an increasingly grave situation. Many key North American targets were within range of submarine-launched weapons.

NORAD said it knew of the research on modification of certain prime radars along the coasts as a means of overcoming this deficiency. Such warning would be minimal, however, NORAD pointed out, and would have to be supplemented by surveillance coverage at an earlier segment in the trajectory than provided by line-of-sight radar. One development NORAD was interested in was MADRE (Magnetic Drum Radar Equipment), over-the-horizon, radar.

In its NQR, NORAD proposed that there be an initial operational capability for early warning for submarine launched missiles of 500 nautical miles by the end of calendar year 1963, with a growth to 1500 nautical miles by the end of calendar year 1964, and up to 2500 nautical miles in early 1967.

NORAD put a requirement in its NADOP 64-73 for an SLBM detection system. In this, NORAD

[redacted]

recommended both the modification of selected AN/FPS-24 and AN/FPS-35 FD radars and the employment of MADRE. Both were required, NORAD stated, for the most effective warning against the SLBM. Modifications to eight existing radars were recommended. This would provide warning from all directions.

USAF's revised Specific Operational Requirement (SOR) 79, issued on 16 April 1962, included, as one of its purposes, the support of that portion of NADOP 64-73 which established a requirement for increasing the detection capability to include sea surface and/or submarine launched missiles. USAF's SOR stated a requirement for SLBM detection range to 1000 nautical miles by the end of 1965.

USAF advised on 28 June that the only proposed plan under consideration by it to meet this SOR requirement was modification of the AN/FPS-35. ADC was asked to provide an operational employment concept to AFSC, but USAF emphasized that development of an FPS-35 SLBM OEC was not to be construed as a decision to implement the program. No such decision had been made, USAF stated.

Sperry-Rand Corporation was testing, under Air Force contract, two AN/FPS-35 FD radars to determine the feasibility of these radars to detect SLBM's at ranges up to 1000 nautical miles. The tests were to be completed by 1 August 1962. ESD was then to evaluate these tests and a General Electric FPS-24 modification proposal. No implementation action was to be taken until ESD's evaluation had been completed.

NUDET AND B/C REPORTING SYSTEMS

NUDET REPORTING SYSTEM

Early in 1960, DOD instructed USAF to develop, procure and install an automatic nuclear detonation

[redacted]

reporting system. An Air Force development plan was approved by the Secretary of Defense for implementation in October 1960.

On 5 February 1962, the Air Force awarded a contract to General Electric for installation and testing of a prototype system and for development of the basic design for the final system. The prototype system, which had an interim operational capability date of February 1963, would provide coverage for the Washington-Norfolk area. Sensors were to be located at three sites: P-30, Benton AFS, Pennsylvania; M-121, Bedford AFS, Virginia; and P-56A, Temperanceville, Virginia. NORAD would be provided with a hard copy printout from the prototype system.

A final NUDET reporting system, covering the U.S. and southern Canada, had a tentative operational date of 1 July 1964.

BOMB ALARM SYSTEM

A bomb alarm system was developed for the Air Force by the Western Union Telegraph Company which would automatically report the time and location of nuclear detonations to Headquarters NORAD and other key military and civilian agencies. The system was to consist of sensors at 98 sites in the continental U.S. and at the BMEWS sites at Thule and Clear (3 sensors at each location for a total of 300 sensors).

The system was scheduled to be completed and operational on 28 March 1962. Installation was completed; however, USAF reported on 11 March that reliability of the system to date was so poor that command decisions could not be based on its readout. For this reason, a decision was made to delay operational acceptance pending improvement of system design and reliability and further testing.

[redacted]

[redacted]

When the system did become operational, CINCNORAD was to exercise operational control.* This had been approved by the JCS in September 1960.

BIOLOGICAL AND CHEMICAL RAPID WARNING SYSTEM

Interim System. NORAD submitted a requirement to the JCS in May 1961 for an automatic biological and chemical rapid warning system to be operational on or before 31 December 1963. In October 1961, the JCS notified CINCNORAD that his requirement had been approved, and that the Department of the Army had been assigned the responsibility for providing this system as soon as possible.

The JCS also stated that the system, in its entirety, could not be completed by the end of 1963; however, a modified system capable of providing "presumptive non-specific warning of biological attack" and of detecting nerve-type chemical agents could possibly be operational by that time.

The JCS directed the Chief of Staff, U.S. Army, in January 1962 to establish an interim system, pending availability of an automatic system, for the detection, identification and reporting of enemy employment of biological/chemical weapons in or adjacent to the CONUS, Alaska and the DEW Line and its extensions. CINCNORAD was to assume and exercise operational control over these systems as they became operational.

An informal meeting was held on 13-14 March at NORAD to discuss the Department of the Army's

* Tests were completed on 10 August and after evaluation of results, the system was declared operational on 1 September 1962.

[redacted]

plan to establish a BW/CW Interim Warning System for CINCNORAD. The interim system would be a manual one, dependent upon trained BW/CW teams, which would report information generated at the source by the most expeditious means to a NORAD control center. Once in the NORAD communications network, the responsibility for evaluation of reports would rest with CINCNORAD. Medical or Public Health Service facilities and laboratories would be used to determine the validity of enemy employment of biological and chemical agents; the range of enemy agents to be considered would be determined by intelligence reports and estimates of Soviet activity in this type of warfare.

In May, NORAD was advised that the Chemical Corps had completed its plan for the interim system and copies were being forwarded for comments. A briefing was held 8 June to review the Chemical Corps plan, which was found not suitable for the intended purpose. The Army directed the Chemical Corps to re-do the plan, coordinating its formulation closely with NORAD.

Automatic System. In May 1962, NORAD was advised that the Department of the Army had released FY-62 funds in the amount of $50,000 to the Chemical Corps to start the automatic system development program. The Chemical Corps contracting officer had been directed to prepare invitations to industry to bid for this program.

In compliance with JCS directive, Headquarters NORAD queried the Canadian Chiefs of Staff Committee on 24 May on Canada's desire to participate in the B/C Rapid Warning System Program. No reply had been received by mid-year.

NORAD/SAC NORTHERN AREA COMMUNICATIONS OBJECTIVES PLAN (NACOM)

In January 1960, the JCS asked NORAD to prepare, in coordination with SAC, a NORAD/SAC northern area communications plan for JCS consideration. A plan was prepared but not submitted. One reason was that NORAD was waiting for USAF action on improvements to main DEW Line communications. The plan was also delayed because of numerous revisions to air defense programs made in the spring of 1960. Also, it had to be revised because of a number of northern area communications improvements that came about in the meantime as a result of BMEWS and White Alice programs. Finally, further delay resulted from extensive coordination and the resulting additional revisions.

At any rate, the plan was finally issued in May 1962 and sent to the JCS. In a message to all regions and components in mid-July, NORAD advised that on 10 July the JCS approved the plan and forwarded it to the Defense Communications Agency (DCA) for action. DCA was to determine whether the requirements could be met within the defense communications system. For those which could not, the DCA was to prepare systems plans which would be sent to the JCS for review and approval.

A number of actions had already been taken to satisfy the objectives, according to the plan, which were listed in seven basic segments.

(1) Provision of a 24-channel tropospheric scatter radio system, such as the AN/FRC-47, from Thule, Greenland, to Station FOX (Hall Lake) on the DEW Line.

USAF had programmed and funded this system with FY 1962 and advanced FY 1963 funds. Construction requirements were in the FY 1963 military

[redacted]

construction program. The operational date was programmed for 1964.

(2) Lateral upgrading of the DEW Line communications from BAR Main (Barter Island) to DYE Main (Cape Dyer).

The current USAF Program Communications-Electronics Document (PC 64-1) stated that lateral DEW Line improvements had been deferred, but the Electronic Systems Division was writing a program for DEW Line lateral upgrading for FY 1963 and 1964 funding.

(3) Provision of a wideband high-quality voice capability from Station CAM (Cambridge Bay) on the DEW Line via PIN 3 (Lady Franklin Point) and Port Radium to Hay River (Northwest Territory).

Action was being taken to interest commercial communications companies in this venture. Using FY 1962 funds, a contract was planned to be signed by July 1962. A tentative operational date was February 1964.

(4) Expansion and upgrading of the present existing AN/FRC-47 tropospheric system (DEW Drop Communications) from the current capability of nine reliable channels to a full 24 reliable channel capacity.

USAF had concurred in an AFSC proposal for improvement. If the action proposed gave reliable communications, this requirement would be satisfied.

(5) Provision of a best-available, high-frequency single sideband (HF SSB) radio network to serve as backup to the existing BMEWS Rearward Communications System (RCS).

USAF ADC submitted this requirement through Air Force channels. An interim HF SSB facility for Thule was operational on an on-call basis. An

[redacted]

interim HF SSB facility for Clear was tentatively to be operational on 1 June 1962. Normal communications program action was being taken for the Fylingdales and ALCOP facilities.

(6) Provision of a full-period voice or full-period teletype circuit, should a voice circuit be impracticable, to serve as backup to the existing BMEWS RCS.

USAF ADC had submitted this requirement through Air Force channels and action had been taken to satisfy it. In December 1961, a Route "C" teletype circuit was established with Thule. In February 1962 a Route "C" voice circuit was established with Clear.

(7) Provision of a low-frequency point-to-point radio system to fill the immediate need for a long-range survivable national communications system.

A requirement for such a facility was contained in USAF Specific Operational Requirement No. 193, 29 September 1961. This SOR stated that an initial operational capability was required by August 1963 and a complete capability by July 1964. USAF also had advised that the three BMEWS sites would be provided with a transmit and receive capability.

[redacted]

CHAPTER 3

COMMAND AND CONTROL STRUCTURE

PRIMARY FACILITIES

NORAD UNDERGROUND COC

Status. By mid-year, the excavation for the underground facility, in Cheyenne Mountain south of Colorado Springs, was nearly completed. Besides clean-up and the installation of wire mesh, one item unfinished was tunneling for two radio adits. These adits were scheduled to be completed by October 1962. In all other aspects, the 425L project was progressing satisfactorily. The building design was expected to be completed by October and construction of the operations building to begin in December and to be completed in 13 months. Equipment testing was to start in the Burroughs Corporation Group II facility at Ent AFB in October and installation of equipment and additional testing to start in the underground facility in October 1963.* As of mid-year, the prospects were rated good that the operational date of December 1964 would be met.

425L Costs. Early in April, the 425L System Program Director, Colonel Carl A. Retzer, briefed ADC and NORAD stating that the total cost of the 425L System would be $105.9 million. However, the USAF directed ceiling was $65.9 million. On 18 April, Colonel Retzer briefed the Air Defense Panel at the Pentagon on the 425L cost. The Panel would not concur with the presentation and

---

* For an explanation of this Group II facility, see NORAD/CONAD Historical Summary, Jul-Dec 1961, pp. 40-42.

[redacted]

deferred endorsing it to any higher echelon until it was redone. Colonel Retzer was directed to prepare a presentation which would show two approaches: (A) a COC configuration with a $68.1 million funding ceiling (the cost estimated in a COC study date 1 August 1960), and (B) a COC configuration meeting user, operator, and SOR requirements that could be provided for less than $105.9 million.

Two studies were made by the SPO director in conjunction with NORAD and ADC staffs and the MITRE Corporation. The first was called SPO Plan "A" which provided a system costing $68.1 million. This plan was unacceptable to NORAD/ADC because it did not meet user/operator requirements. The SPO Plan "B," as eventually worked out and accepted by NORAD/ADC, would provide a system costing $81.8 million.

The latter plan was presented by Colonel Retzer to the Air Defense Panel on 17 May and the USAF Systems Review Board on 28 May. The Board approved the new configuration and costs.

BACK-UP FACILITIES

ALTERNATE COMMAND POST

Background. In December 1954, shortly after CONAD was formed, the Joint Eastern Air Defense Force at Stewart AFB, New York, was designated as the CONAD alternate command post. This was changed in May 1955 to the Joint Central Air Defense Force at Kansas City, Missouri. NORAD designated the Central CONAD Region (the new designation for the JCADF), Richards-Gebaur AFB, as its alternate command post in November 1957. NORAD issued a new plan in May 1959 designating the Central NORAD Region (same location) as its ALCOP. When CNR was discontinued on 1 January 1960 and the 33d NORAD Region took its place, the latter was designated as the NORAD ALCOP. Finally, the

[redacted]

33d Region was replaced at Richards-Gebaur AFB by the 29th NORAD Region on 1 July 1961 and the latter was designated as the NORAD ALCOP.

In October 1960, the JCS directed all unified and specified commands and the services to have, by 1 July 1961, pre-located alternate command elements in hardened, dispersed, or mobile facilities as deemed best fitted to insure survivability and exercise of command under conditions prevailing at the outset of general war. The JCS also directed that plans be prepared that included organization of the ALCOP element, terms of reference, and prelocation plans. In response, NORAD revised the ALCOP portion of its plan called "Air Defense of the North American Continent (ADNAC)," 1-60, in May 1961. In this portion, Annex G, "Continuity of Operations," NORAD included ALCOP organization, terms of reference, and a means for reconstitution of Headquarters NORAD at the ALCOP through a strategic alert cadre from NORAD. Also, in June 1961, NORAD and ADC prepared a plan for improving the ALCOP.

Strategic Alert Cadre. An up-dated ADNAC, 1-61, was issued in August 1961, including a new Annex G. The portions of the latter on communications and the strategic alert cadre were revised in April 1962 and on the concept of operations in July 1962.

Instructions to and the composition of the strategic alert cadre were issued by NORAD in February 1962. As provided at this time, personnel designated for this cadre were to be kept on an up-to-date list by the deputies concerned and forwarded to the COC. The latter was to furnish the DCS/Personnel and Administration a current roster and any changes. The decision to activate the cadre was to be made by CINCNORAD. Notification to assemble was to be made by the Director of the NORAD COC.

[redacted]

After notification, according to the revised portions of Annex G, ADNAC 1-61, cadre members were to proceed to Peterson Field and assemble in the visitors lounge. The DCS/P&A was to verify the presence of all members who would then be flown to the ALCOP. Upon arrival, they were to proceed in accordance with the 29th Region Commander's instructions. Sixteen officers comprised the cadre, fifteen from NORAD staff sections and one from NAVFORCONAD.

ALCOP Improvement. As noted, to improve the ALCOP at Richards-Gebaur AFB, NORAD and ADC prepared a plan in June 1961 which called for automation of the ALCOP function by modification of the training facility AN/FSQ-7 at Kansas City. USAF did not concur with this proposal, however, feeling that the ALCOP did not meet the requirements of the JCS directive contained in their October 1960 message for an adequate hardened, dispersed, or mobile facility.

NORAD disagreed with the USAF view and reaffirmed its requirement to ADC for forwarding to USAF to modernize the ALCOP at the 29th Region. NORAD said in a letter in February 1962 that it believed that this facility met the JCS requirement from the standpoint of being dispersed from the primary COC and also it was not collocated with a SAC facility or other high-priority target.

USAF stated in a message to ADC on 15 May, however, that because of the questionable survivability of the Richards-Gebaur facility, it had begun a study to provide a more suitable alternate capability. USAF suggested the use of the hardened North Bay, Ontario, DC/CC and asked ADC to consider this with NORAD. Both ADC and NORAD supported this approach and ADC so advised USAF.

USAF then queried RCAF Headquarters for its views and asked for approval in principle. USAF

told ADC early in July that no further action would be taken until the RCAF response was received and until NORAD and ADC made recommendations on a MITRE Corporation study. The latter was a study underway on Survivable NORAD Emergency Capabilities (called SNOCAP).

In the meantime, the 29th NORAD Region asked and received permission to collocate the ALCOP and the Region remote combat center in what was formerly the SAGE direction center building at Richards-Gebaur AFB. The Region RCC was to be located in the weapons room, the ALCOP in the command post. The two activities were to operate separately, each with its own personnel and communications facilities. This was made effective 1 August 1962, the date that the 29th Region RCC achieved a SAGE capability as a remoted function of the modified AN/FSQ-7 at Sioux City AFS, Iowa (Sioux City Sector, SDC-22).

Secondary ALCOP. As a further effort to assure continuity of command and control, on 10 April 1962, NORAD designated the 30th NORAD Region, Truax Field, Wisconsin, as its secondary ALCOP. NORAD advised that the secondary ALCOP would not be provided with the same surveillance, display or communications facilities possessed by the ALCOP. But a manual plot capability would be established to provide an air situation display should takeover from the ALCOP become necessary. Selected files were to be prepositioned and maintained. The July 1962 change to Annex G, ADNAC 1-61, included establishment of this secondary ALCOP.

BACKUP INTERCEPTOR CONTROL (BUIC)

Background. In a memorandum sent by the Secretary of Defense to the JCS in June 1961, the Secretary stated that USAF and DOD studies had agreed that the peacetime and pre-battle advantages of the SAGE system should be retained. But

[redacted]

these studies had agreed that a missile attack on SAGE and other vital elements of the current system could destroy NORAD's ability to carry out its mission. Accordingly, he directed that further SAGE air battle augmentation be stopped and the money saved and subsequent funding be used to provide a survivable backup control system.*

Thus, two actions were necessary: provision of a backup control system and, to get the funds, reorientation of the 416L System (the USAF forces and facilities that provided aircraft control and warning for the North American continent). In September 1961, the Secretary of Defense approved, for planning purposes, the Air Force FY 1963 budget submittal for 416L. And he directed the system to be reoriented to the maximum feasible within these budget limits to survive ICBM attack and to defend against relatively small bomber raids (200-bombers or less) after an ICBM attack by provision of backup control.

On 1 November 1961, USAF advised that the backup project would be implemented in two phases. Phase I would be a manual operational mode similar to the old manual type operation that existed prior to SAGE. Phase II would provide equipment for semiautomatic control at selected radar sites. A maximum of 34 automated control sites had been authorized. The capital investment for Phase II was to be kept to approximately 98 million dollars.**

---

* See NORAD/CONAD Historical Summary, Jul-Dec 1961, for further background and details.

**Facilities deleted from the 416L program for backup funding were five FPS-27's, 26 FPS-26's, 50 FPS-74 modification kits, 39 FRA-37's, SARAH, ALDRI, and the 32d Region combat center display.

[redacted]

[redacted]

NORAD wanted 70 automated NORAD Control Centers (NCC's) and a much larger capability (up to 40 simultaneous intercepts and 160 surveillance tracks) than the USAF program provided. But because of fund limitations, the USAF program stuck. In January 1962, USAF told NORAD that the computer specifications would initially call for a netting of five stations, ten SI and 40 track capability. USAF said, however, that there could be a modular design to permit possible future expansion. Of the 34 automated NCC's, four were to be in Canada.

Implementation of Phase I (Manual). NORAD initiated action on the Mode III Phase I on 19 January 1962. NORAD requested USAF ADC to take action to implement the Phase I system as it applied to ADC's area of responsibility. Implementing instructions were sent by ADC to its divisions on 20 January. RCAF ADC was asked by NORAD to support the backup configuration under parameters discussed on 10-11 January at L. G. Hanscom Field. This answered an RCAF message which requested a formal statement of requirement for a backup system from CINCNORAD. RCAF ADC had pointed out that at Hanscom, agreement in principle had been given to a Phase I configuration. But before any definite programming action could be taken by the RCAF, the latter had to have this statement from CINCNORAD. However, as of July 1962, the extent of RCAF participation in Phase I was still under study at RCAF Headquarters/government level.

NORAD's implementing message stated that communications were to be initially based on a point-to-point requirement. However, NORAD said, a study was being initiated by Western Electric Air Defense Engineering Services to use switching centers for both SAGE and the backup system. If switched communications proved to be survivable, adequate and reliable, NORAD would support a change to switching centers (see below).

[redacted]

[redacted]

On 15 February, NORAD provided further guidance for implementation and operations under Phase I by issuing Operation Plan 1-62, BUIC System (Modes III and IV, Phase I Manual). This plan included all the sites involved in Phase I and the priorities. It stated that Phase I would be fully implemented during CY 1962. NORAD's plan listed 27 prime NCC's and 39 NGCI's (NORAD Ground Control Intercept Station) under Phase I.*

Phase II. The JCS advised NORAD in March that on the 13th, the Secretary of Defense approved the two-phased reorientation of the 416L program and the cancellation of procurement actions of approximately $93 million of P-800 funds in the 416L program. He directed implementation of Phase I as soon as possible and gave authority to proceed on Phase II assuming that approximately 34 NCC's would be implemented at a total cost of not over $100 million. The initial procurement was to be limited to equipment for 17 NCC's.

NORAD laid down deployment priorities for NCC's in Phase II in a reply to USAF ADC on 27 April 1962. ADC had submitted a priority list for NORAD's approval before forwarding to USAF. ADC's priority was for one computer in each air defense sector before starting to put in any alternate NCC's. NORAD made a number of changes and sent back a new list of priorities, stating that its list was to be supported by all agencies. NORAD said its changes were based on vulnerability of NORAD direction centers collocated with SAC bases, the decision (reached at the L. G. Hanscom Field meeting in January) to install the first eight sets in the U.S., and the semiautomatic operations

---

* NGCI's would assist the NCC in control of Air Force weapons. In event the NCC was inoperative, the NGCI would assume control of the Air Force weapons and be required to coordinate target engagement with Nike fire units, if applicable.

[redacted]

[redacted]

at sites designated to control BOMARC's during Mode III.

NORAD did not want to spread out the initial buy of computers, one to a sector, but to concentrate equipment in the BOMARC, Northeast, area. As noted above, the JCS memorandum in March had stated that the initial procurement would be for equipment for 17 NCC's. The same memorandum had asked for NORAD plans concerning strengthening northern perimeter defenses including redeployment and dispersal of a portion of the existing BOMARC squadrons. NORAD had recommended, in reply, that BOMARC's be dispersed in the Northeast and not be redeployed to the Northern tier.

Therefore, NORAD told ADC, the first 16 BUIC sites to become operational had to be in support of these weapons since manual control of BOMARC's was not considered feasible. The remaining sites, not controlling BOMARC's, were given priorities commensurate with the threat and vital areas left to be defended. NORAD said it realized that Phase I (manual) operations would have to satisfy the backup capability in all other sectors until enough sets were available. NORAD concluded that if BOMARC's were to be dispersed along the Northern tier before BUIC facilities were programmed to become operational in these sectors, the priorities for the NCC's would be reviewed.

USAF issued a revised Specific Operational Requirement (SOR) 79 on 16 April 1962. This SOR, "Continental Air Defense Control and Warning System," included support of that portion of the NADOP 64-73 which established a requirement for increasing the survivability of the current continental aircraft control and warning system. Specifically, it provided for the BUIC System. It stated that the solid state BUIC computer would have the capability to process periodically (approximately a 15-second period) a minimum of 40 aircraft tracks to include the conduct of 10

[redacted]

simultaneous intercepts. It also provided that the computer program would be modular in its sub-units. The SOR stated that the improvements specified would be fully implemented by the end of 1965. The latter was similar to NADOP 64-73 which stated that the 34 automated NCC's would be operational in fiscal year 1964-65.

The Air Force announced at the end of June the selection of the Burroughs Corporation as the source of the BUIC system. A contract for the first increment of BUIC was expected to be negotiated in the near future. Four NORAD representatives were on the evaluation group supporting the Source Selection Board as full voting members. This was the first time NORAD representatives participated thusly in the selection of USAF-procured equipment.

Mode "X" Communications. In January 1962, the Western Electric Air Defense Engineering Services proposed a system of switched communications for all SAGE backup. WE ADES proposed to leave in only one of the existing SAGE routes on a full period point-to-point service and convert all backup routes and circuits to an automatic switching system. This switched system would then serve as backup to SAGE Mode I and also provide communications for Mode II and Mode III (both Phase I and Phase II). Initially (for Phase I), it would be for voice primarily.

On 12 February, NORAD wrote to the Chief of the Air Staff, RCAF, and to USAF ADC to indicate NORAD's interest and to stimulate command support in this proposal. NORAD said that the concept was consistent with the principle of the NORAD Switching Plan currently being implemented in the first phase by ADC. This was the plan approved in July 1961 by the JCS to provide nine switching centers in the first phase serving NORAD regions for operation by September 1963 and eighteen more switching centers in the second phase to extend

the service to sectors and other defense units for completion by the operational date of 425L.

The WE ADES proposal was therefore, NORAD said, in effect an extension of this plan below region and sector level to serve all elements of the active air defense system. The feasibility of obtaining greater communications flexibility, essentially within current leased communications budgets, merited investigation. ADC was asked for various feasibility assessments for review.

The RCAF was asked to make a study to parallel that taking place in the U.S. to determine the feasibility of applying this concept. RCAF replied that to carry out such a study it would have to convene the representatives of various independent telephone companies to insure complete coverage of the CADIN area. NORAD agreed that this method of making the study would be most satisfactory, but recommended a delay until NORAD could assess American Telephone and Telegraph Company proposals. USAF ADC had replied to NORAD's February letter that AT&T studies were currently underway and their proposals were expected by June. The RCAF agreed. NORAD had not been able to evaluate the proposals and reply to RCAF Headquarters by mid-year.

Future of Missile Master. NORAD advised ARADCOM in December 1961 that DOD approval of 34 semiautomatic NCC's would, in the fiscal year 1964 time period, eliminate the NCC function from the ten existing Army Missile Master (AN/FSG-1) stations.* The purpose of these automated NCC's, NORAD said, was to provide a backup to the soft

* An account of the Missile Master program may be found in NORAD/CONAD Historical Summaries from July 1956 to December 1959.

SAGE direction centers and so would be in non-target areas. Since the ten Missile Masters were located within primary ICBM target areas, the NCC concept eliminated these existing Missile Master locations as future NCC's.

Thus, NORAD continued, there was now a question of keeping the Missile Masters in their vulnerable locations or of moving them. ARADCOM's views were requested.

ARADCOM replied that it had furnished a draft to NORAD on NADOP 64-73 which proposed inactivation of the Missile Masters that would control less than nine fire units when the Ajax phase-out was complete. Replacement would be with a more compact fire coordination system in a more survivable location.

NORAD pointed out in answer that since ARADCOM's reply, staff coordination had resulted in a proposal to phase out all Missile Masters. However, this was contingent upon a replacement semiautomatic fire coordination system.

In the meantime, NORAD's Phase I (Mode III) Plan, issued on 15 February, placed the collocated Missile Master NCC's (M/NCC), plus the BIRDIE NCC at San Francisco (P-38), in an interim category.* It stated that they would be interim NCC's until such time as the designated prime NCC for the complex could assume NCC responsibilities. The NCC function of the M/NCC's would then be phased out.

---

* BIRDIE (Battery Integration and Radar Display Equipment), AN/GSG-5 was for large defenses and AN/GSG-6 for small defenses. This equipment was selected in 1959 for employment in non-Missile Master defenses.

[redacted]

NADOP 64-73 proposed to replace the Missile Master systems gradually with a BIRDIE-type system located at more survivable sites. Dependent upon availability of survivable communications, NADOP continued, consideration could be given to collocating these BIRDIE-type equipments with selected NCC's.

The requirements and plans were being studied by the Army and ARADCOM at mid-year.

COMMUNICATIONS

COMMAND AND CONTROL TELECOMMUNICATIONS REQUIREMENTS*

NORAD submitted to the JCS on 22 May 1962 four requirements to meet its near future needs with off-the-shelf items in the general areas of increasing survivability and reliability of NORAD communications. These were as follows:

(1) NORAD ALCOP By-pass Route. NORAD requested that its ALCOP be tied into the Kansas City by-pass route at LaCygne, Missouri, by placing a micro-wave link between Richards-Gebaur AFB and LaCygne.

(2) Automatic Ballistic Missile Attack Warning System.** NORAD requested a system, either manually or automatically activated by alarms from BMEWS, Bomb Alarm, NUDET, and MIDAS, to provide warning of a ballistic missile attack from the NORAD COC to all subordinate units down to the lowest combat element.

---

* For Mode "X" Communications, see pages 55-56.

** See also Chapter Five, pages 89-90.

[redacted]

(3) NORAD Diversity Routing for NORAD Environment. NORAD requested a minimum of two geographically separated routes for voice, data and teletype circuits between NORAD and its ALCOP; NORAD and its regions; NORAD and the region ALCOP's; NORAD ALCOP and the regions and the region ALCOP's; and NORAD and the JCS, SAC, and RCAF.

(4) Status Indication and Automatic Transfer of NORAD Circuits. NORAD requested a modification of existing voice circuits between the COC and the ALCOP to all regions and region ALCOP's to permit automatic transfer of these circuits from a destroyed or inoperative COC to the ALCOP or to a region ALCOP should the region combat center be destroyed or inoperative.

No approval had been received from the JCS by mid-year.

[redacted]

CHAPTER 4
WEAPONS

MANNED BOMBER WEAPONS SYSTEMS

INTERCEPTOR FORCES

Regular Force. During the first half of 1962 the NORAD regular interceptor force remained at 48 squadrons. The assigned aircraft strength was down from 1,053 to 1,007.

Air National Guard. The Air National Guard squadrons, which provided first-line augmentation for the regular forces, were down from 25 to 23 squadrons. Five squadrons were equipped with F-86's, nine with F-89's, three with F-100's, and six with F-102's. Authorized strength was 575 aircraft.

The 158th FIS, Travis Airport, Georgia, and the 103rd FIS, Philadelphia, were dropped from the NORAD first-line augmentation inventory in April 1962 when they began converting to air transport. These two squadrons had not been on 24-hour alert since January because of preparation for the change in role. As programmed, there would be only 23 ANG squadrons on 24-hour alert until the first quarter FY 1963 when the number would return to 25 squadrons and remain at that level through FY 1966.

Also during April, the 124th FIS, Des Moines, Iowa, converted from F-86L to F-89J aircraft.

Canadian Conversion to CF-101's. During the first half of 1962, one more Canadian squadron, the 414 AW(F) Squadron, became operational with CF-101 aircraft. This completed the conversion

[redacted]

[redacted]

NORAD INTERCEPTOR FORCE

1 JULY 1962

LEGEND

■ USAF/RCAF/USN FIS BASE

□ ANG BASE

◙ USAF/ANG BASE

★ ALERT BASE

REGULAR INTERCEPTOR FORCE

17 F-101 SQDNS
11 F-102 SQDNS
14 F-106 SQDNS
1 F4D SQDN
5 CF-101 SQDNS

48 SQDNS

ANG INTERCEPTOR FORCE

5 F-86 SQDNS
9 F-89 SQDNS
3 F-100 SQDNS
6 F-102 SQDNS

23 SQDNS

[redacted]

[redacted]

from CF-100's to CF-101's of four of the five programmed squadrons. The remaining squadron, the 409th, was to complete conversion training by October. Three of the squadrons were located at Uplands, Ontario; one was at Namao, Alberta.

This was only a temporary deployment pending completion of support facilities and runway construction. The 414th was scheduled to move to North Bay, Ontario, in September, and the 416th to Bagotville, Quebec, in July and then to Chatham, N.B., at the end of the year. The 425th at Namao was to move to Bagotville in July and continue its primary role of conversion training for RCAF crews until October. This squadron would not fulfill alert requirements until the conversion training program was completed. It would be available, however, as an augmentation squadron upon declaration of DEFCON Four.

Requirement for Additional Canadian Interceptors. In line with the concept of initiating the air battle as far from the target areas as possible, NORAD required an increase in Canadian squadrons from five to nine and an increase in UE from 12 to 18 aircraft.

Reduction of F-102 Aircraft at Thule. Because of the critical shortage of F-102 aircraft, USAF ADC studied the possibility of reducing the number of aircraft at Thule from twelve to six. NORAD's opinion was asked on 31 May 1962.

ADC concluded that a detachment of six aircraft could not adequately fulfill the Thule air defense mission of defending U.S. installations in Greenland, as outlined in CONAD Operations Order 1-61. The study noted, however, that because of the limited radar coverage at Thule, no adequate air defense could be achieved in any case, regardless of the size of the fighter force.

Although reduced to six aircraft, ADC would have the 332nd FIS at Thule continue its identity

[redacted]

[redacted]

as a squadron under the operational control of the Goose CONAD Commander, rather than as an attachment to the 59th FIS at Goose Bay.

NORAD's reply on 11 June 1962 stated that the JCS had directed, on 17 June 1960, that a fighter interceptor unit of not more than 12 aircraft be maintained at Thule. But NORAD expressed no objections to the cut provided USAF obtain JCS concurrence and that a minimum of two aircraft on five-minute alert be maintained.

BOMARC FORCES

Status. NORAD's BOMARC force on 30 June 1962 consisted of nine squadrons: two with A missiles, four with B missiles, and three with a mixture of A and B missiles. All were located in the eastern part of the continent. During this period, the force had increased by one on 1 March 1962 when the first Canadian BOMARC squadron, 446 SAM Squadron, North Bay, Ontario, became operational. The 447 SAM Squadron, LaMacaza, Quebec, was programmed to become operational by 1 December 1962. This would complete the ten-squadron BOMARC program except for additional BOMARC B launchers and missiles at Otis and McGuire Air Force Bases.

Agreement for Operational Control of 446 SAM Squadron. An agreement between the Commanders of NNR and 30th NORAD Region, on 9 March 1962, gave interim operational control of the 446 SAM Squadron to the 30th NR until the Ottawa NORAD SAGE Sector became operational. Tactical control and employment of missiles were assigned by the 30th Region to the Sault Ste Marie NORAD Sector.

NIKE FORCES

Regular Force. NORAD's Nike Hercules force remained at 139 fire units with an authorized

[redacted]

missile strength of 1846. This program had been completed in November 1961 when the Regular Army force completed conversion from Nike Ajax to Hercules. The FY 1963 Budget provided for an increase from 12 to 18 missiles per fire unit. This program was to get underway in the third quarter of FY 1963.

A program was also in swing to increase the capability of the Hercules. This was the HIPAR (High-Powered Acquisition Radar) Hercules improvement kit. Out of a programmed 66 HIPAR's, 25 had been installed and were operating by mid-year. Included in the program were ECCM improvement kits. Sixty-seven had been installed out of a program of 139 kits.

Army National Guard. The Army National Guard currently manned 69 Nike Ajax fire units as opposed to 76 at the end of 1961. On 16 May 1962, seven ARNG fire units in the Washington-Baltimore area were relieved of their NORAD mission. Following their training, the personnel from these units were to take over four RA Nike Hercules sites in this area. The operational ready date was set for 14 December 1962. Eight more Ajax units were to be phased out of the ARNG in July. These changes were the beginning of a program to transfer 48 of the 139 Hercules sites to the ARNG. It was to be completed in FY 1965.

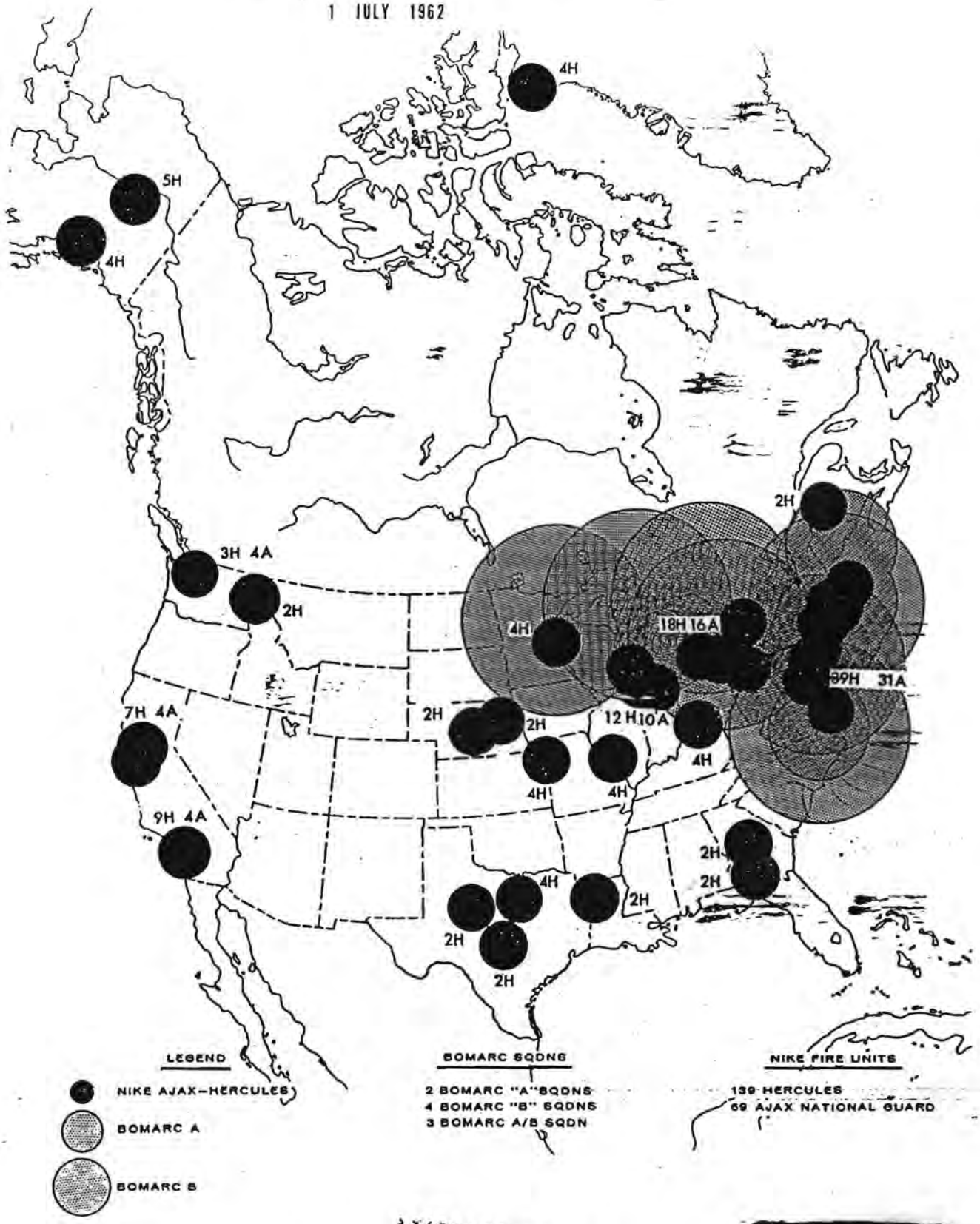
Manning of Hercules Units. In connection with this program, ARADCOM asked for NORAD's concurrence in a proposal to man more than half the Hercules fire units in six defenses with ARNG. This was contrary to previous policy which set 50% National Guard manning of Hercules units as the limit in any one defense.

NORAD concurred in ARADCOM's revised plan on 11 January 1962 with the understanding that the ARNG Hercules fire units would maintain maximum effectiveness during conversion and an advanced

[redacted]

NORAD MISSILE FORCE

1 JULY 1962



[redacted]

state of alert identical to the RA units.

Hercules in SLBM Defense Role. Because NORAD did not have the means to combat a submarine-launched missile threat, it recommended modifying the Nike Hercules system to provide a limited capability against short-range ballistic missiles. NORAD wanted all the Hercules deployed along coastal areas, which were equipped with HIPAR, modified to assume an SLBM defense role. However, NORAD stipulated in NADOP 64-73 that this added role must not degrade the Hercules capability against the air-supported threat.

In consonance with this requirement, the Department of the Army was authorized to modify seven Nike Hercules complexes on both coasts to provide an SLBM intercept capability. In this connection, USAF had asked ADC and NORAD to prepare an OEP for modification of the AN/FPS-35 radar to provide 1,000-mile detection and warning against SLBM's by end of CY 1965 (see pp. 38-39). The OEP was to consider provision of acquisition data to the Hercules complexes.

LONG RANGE INTERCEPTOR

Background. From its establishment, NORAD had expressed a need for a long range interceptor and included the F-108 in its objectives plans from the time the first one was issued in December 1958. The requirement was based on a continuing manned bomber threat to North America over the foreseeable future with increasingly higher performance bombers and weapons systems.

Notwithstanding NORAD's pleas and JCS support, the main part of the USAF F-108 program was cancelled in September 1959. However, in recognition of the requirement for an LRIX, it was decided to continue development of the ASG-18 fire control system and the GAR-9 air-to-air missile

on a reduced basis. They were the heart of the LRIX concept. Funding continued each year and currently $24 million was being spent on the R&D for these two systems for FY 1963. Although the prospect of reviving the F-108 grew dimmer as time passed, the idea of using the ASG-18/GAR-9 in an existing airframe remained a bright spot on the LRIX horizon (see below).

NORAD continued to support the F-108, per se, until March 1961 when it issued NADOP 63-67. NORAD then asked for an improved interceptor over the F-108. The Commander-in-Chief stated that, "Since the last NADOP was published we have positive evidence of Soviet development and test of a supersonic bomber..." This NADOP called for a weapon that would have "a quick reaction time and possess sufficient speed and range to engage the enemy far out over the northlands of Canada and the waters bordering the North American continent." NORAD asked for two squadrons of the LRIX by 1966 and six by 1967.

Current Efforts to Get a Long Range Interceptor. In its current objectives plan, NADOP 64-73 issued on 1 March 1962, NORAD stated a requirement for two long range interceptors. The first, called an Improved Manned Interceptor (IMI), was needed "to compensate for the attrition and obsolescence of current USAF interceptors." No requirement was stated for additional USAF aircraft of current types. The IMI was to incorporate the maximum state-of-the-art available in the 1966 time period. It was to be a Mach 3, 1,000-mile radius-of-action, interceptor and have a capability beyond the ASG-18 fire control system. The plan envisaged 12 squadrons by 1968 (UE of 18 aircraft).

The second long range interceptor NORAD wanted was called the Advanced Manned Interceptor (AMI). The requirement was stated for vigorous R&D to provide an AMI against the future manned bomber threat. The characteristics of the AMI

[redacted]

were (1) ability to operate with a lesser degree of close control, (2) a sophisticated fire control system (infrared capability out to 800 nm and radar of 500 nm), (3) employ a 500 nm weapon (effective from ground up to 200 nm), (4) operate at a sustained speed of Mach 3, 4.5 dash at altitudes of 90,000 to 100,000 feet. NADOP 64-73 recommended 16 squadrons (UE of 18 aircraft) -- 13 squadrons for the U.S. and 3 for Canada -- during the latter period of the plan.

Events during the first half of 1962 continued to give NORAD some hope that its long sought-after need would eventually be satisfied, at least to some degree. On 19 March, the JCS told NORAD they had been directed by the Secretary of Defense to "devise plans to strengthen northern perimeter defenses, which will provide additional protection to hardened ICBM bases, considering the following:

> ....Additional augmentation of the interceptor forces at dispersed bases by limited procurement of advanced interceptor configurations of existing airframes giving emphasis to range and endurance, low altitude and long range fire control capabilities....

NORAD was to prepare plans to implement the above.

In the plans submitted to the JCS on 16 April, NORAD said: "Within the limitations of utilizing an existing airframe, the A-3J modified to carry the ASG-18/GAR-9 system appears to come closer to meeting our current operational requirements than any other existing airframe." NORAD's plan called for eight A-3J squadrons to provide area defense along the northern perimeter. It emphasized that this number would be only a modicum of the requirement to defend the entire NORAD area, however.

NORAD's plan went on to compare the A-3J with the IMI described in NADOP 64-73. A major

[redacted]

difference was in speed. The A-3J would have a cruise speed of Mach 0.9 and would be limited to a dash speed of 1.6 (when configured with the ASG-18 and GAR-9). On the other hand, the IMI would be Mach 3 throughout. Moreover, the state-of-the-art would enable production of the IMI by 1967 as compared to 1965 for the A-3J.

NORAD learned that USAF was planning on directing AFSC to go to industry with a study contract on a comparison of AMI versus IMI and Eagle Aerie.* In the meantime, USAF and ADC each prepared independent studies on the relative capabilities of the IMI and the A-3J. The USAF study, which also included the F-110 and the TF-X (F-111), was presented to the DOD in late June. USAF was strongly backing the IMI.

MISSILE DISPERSAL AND DEPLOYMENT PLANS

In March 1962, when the JCS asked NORAD for plans to strengthen northern perimeter defenses for additional protection to hardened ICBM bases, as well as deployment of an LRIX (see above), the plans were to consider:

a. Deployment of additional Nike Hercules batteries from forces now assigned for training purposes. Installations costs are not to exceed $10 or $15 million.

---

* The Aerie concept was using a large, long range aircraft (such as a modified KC-135) carrying something like 30 high speed missiles (Eagle Mach 3), which could be launched rapidly and directed against different targets. The Aerie could provide its own radar cover or accept and display information from the ground environment, and operate from airfields on a tenant basis with minimum support.

b. Redeployment and dispersal of a portion of the existing BOMARC squadrons. Installation costs are not to exceed $40 million....

NORAD's plans, submitted in April, called for placing eight Nike Hercules fire units from training stocks in defense of the Lowry AFB Titan I complex. NORAD considered the Lowry Titan complex to be the most important for it contained two squadrons, whereas all others had only one. Moreover, incidental protection would be provided for the NORAD COC and the Denver population.

For BOMARC, within the $40 million limitation, NORAD recommended withdrawing 56 B missiles from six present locations and dispersing them along the Northern Tier from Malmstrom AFB to Grand Forks AFB, in flights of seven missiles each. However, NORAD considered a reduction of the presently thinly scattered BOMARC defenses in the eastern part of the U.S. unwarranted. Rather, it preferred BOMARC dispersal as recommended in NADOP 64-73. This plan would disperse the programmed BOMARC B's in increments of seven launchers each to 21 separate sites located approximately 50 miles from the presently established sites. No dispersal was contemplated for BOMARC A's.

INTERCEPTOR DISPERSAL PLANS

The JCS directed NORAD in June 1961 to develop plans to increase the survivability of the air defense system against a ballistic missile attack, combined with a follow-on bomber attack. The plans were also to include provision for interceptor dispersal.

NORAD outlined its requirements to USAF ADC in July, and asked ADC to prepare an interceptor dispersal plan. Accordingly, ADC issued Operations

Plan 20-61, on 30 November 1961, entitled Fighter Dispersal/Increased Alert Plan.* Headquarters USAF reviewed the plan and recommended dispersal of one-third of the fighter interceptor force, which resulted in a revised ADC Operations Plan 20-62, issued 1 May 1962.

Phase I now provided for one-third of all units on a 15-minute or less alert at home base, a two-hour turnaround capability at 26 dispersal bases, and a one-sortie capability per aircraft dispersed with original armament. Phase II provided for one-third of all units on 15-minute or less alert at home base, a two-hour turnaround capability at designated dispersal bases, and a two-sortie capability per aircraft dispersed (one conventional armament reload) during a 24-hour period. Phase III provided for two aircraft on five-minute alert at home base, four to six aircraft (based on 18 or 24 UE) on 15-minute alert at designated dispersal bases, and an eight-sortie capability per aircraft dispersed (nuclear reloading) during a five-day period. In the event that strategic warning was received (12 hours), ADC Operations Plan 20-62 required dispersal of an additional one-third of the interceptor force with enough personnel and equipment to support a four-sortie capability per total dispersed aircraft for Phases I and II, and an eight-sortie capability per additionally dispersed aircraft for Phase III.

ADC Operations Plan 20-62 was approved by NORAD and awaited final approval by USAF. In the meantime, $1.2 million had been allocated by USAF for an interim Phase I dispersal plan. Interim Phase I was a 24-hour capability for recovery, turnaround, and relaunch at selected dispersal

---

* See NORAD/CONAD Historical Summary, Jul-Dec 1961, pp. 49 and 50.

[redacted]

bases for all Category I interceptor units within two hours of missile attack warning.* Fourteen of these dispersal bases had this capability at mid-year.

A survey of Canadian dispersal bases was underway by ADC and the results were to be submitted to USAF for completion of final arrangements and agreements as necessary. NORAD also had a requirement for USN dispersal bases which had been sent to the Navy.

INCREASED ALERT POSTURE

NORAD/CONAD Regulation 55-3, "Defense Readiness Conditions, States of Alert, Alert Requirements and Air Defense Warnings," was revised on 9 March 1962. The revised regulation provided for greater numbers of weapons on a normal readiness status to enhance weapons survivability. It brought the regulation in line with DOD concepts for weapons dispersal and survivability under a ballistic missile attack.

The revision provided that the minimum alert requirements for normal readiness status (DEFCON 5, ALPHA) would be as follows. Interceptor squadrons were to maintain two aircraft on five-minute alert and one-third of the aircraft possessed on 15-minute alert. The rest of the combat-ready aircraft were to be on three-hour alert status. Nike Hercules fire units (manned by RA) were to have 25% of their combat-ready fire units on 15-minute alert status and 50% on 30-minute, except where there were only two fire units in a defense and then it was to be 50% on 15-minute alert. The remainder of the fire units were to be on three-hour alert. Nike Ajax fire units (manned

---

* Category I were regular force interceptor units collocated on SAC bases.

[redacted]

[redacted]

by ARNG) were to have 25% of their combat-ready fire units on 15-minute alert until mobilized. The remainder would be on three-hour alert. There was no change in the BOMARC two-minute alert status.

LONG RANGE AIRBORNE PASSIVE HOMING SYSTEM

A NORAD Qualitative Requirement for a Long Range Airborne Passive Homing System (LRAPH), dated 1 November 1961, was sent to USAF ADC for implementation. The LRAPH System would comprise a broad band receiver, antenna and display equipment to provide relative azimuth and height of the hostile aircraft jamming the ground environment. The receiver would be tuned within the basic NORAD radar frequency bands. The LRAPH system was directed to the basic purpose -- killing the jamming aircraft -- as opposed to the ground environment intermediate purpose of tracking the jamming aircraft.

On 26 April 1962, USAF directed AFSC to begin prototype development of the NORAD LRAPH System for F-101, F-102, and F-106 interceptors. For this program, USAF provided $475,000 QRC funds (FY 62). It was to be achieved in two phases. The first phase was to start in January 1963 and last for about one year. This phase would include a redesigned antenna, anti-chaff, and IR search and track modifications. The second phase was to start about one year later. It was to include parametric amplifiers and rapid tuning (pulse-to-pulse frequency shifting).

USAF was also taking separate action to provide funds for a LRAPH System development for the BOMARC B missile.

[redacted]

[redacted]

BALLISTIC MISSILE AND SPACE WEAPONS DEFENSE SYSTEMS*

NIKE ZEUS

Background. Since 1958, NORAD had put a requirement for Nike Zeus, as one of its primary objectives, in each of its annual objectives plans. From 1960 on, the requirement for an active AICBM system was placed in first priority in NORAD objectives plans. However, the Zeus program never advanced beyond the R&D stage and the initial employment date, which NORAD had first aimed for in its objectives -- 1962, had currently slipped to 1967.

Status of Zeus Program at Mid-Year. During the first half of 1962, Nike Zeus remained in a research, development and testing stage. It was still the only AICBM system available and continued to be NORAD's first priority requirement.

NADOP 64-73 called for two Zeus defense centers and eight fire units at four firing sites by FY 1967, and 31 centers and 75 fire units at 55 firing sites by 1970. In the foreword, CINCNORAD said:

> An analysis using war gaming techniques was made to determine the effectiveness of the NORAD defense capability over the time period of the plan, if programmed aerospace defense forces should remain at the levels provided by current funding. The results clearly point out that the defense capability of this continent will be intolerable after 1964. ... To close this growing gap between Soviet offensive missile capability and North American defenses we must have a

---

* See page 66 for Nike Hercules SLBM modification.

[redacted]

> family of weapons ranging from an area defense system to a terminal system. The only AICBM system now available is NIKE-ZEUS and we emphasize, as our first priority, its early deployment. Concurrently, we urge that increased emphasis be given an R&D program to provide an advanced ballistic missile defense system which has an area defense capability ....

In the meantime, the Army proposed an evolutionary process for the development of the Nike Zeus system. It was approved by the Secretary of the Army and was to be submitted to the DOD. The evolution covered three phases and was intended to improve both the radar and missile capabilities. The first phase was the configuration currently in effect at Kwajalein with a prototype at White Sands Proving Grounds. The second phase was to include radar improvements and utilization of a "sprint" missile capable of acceleration tolerances up to 160 G's. It was expected that this missile would be capable of intercepting ballistic missile warheads in the vicinity of 70,000 to 90,000 feet. The third phase of the evolution was to provide a phased-array type of radar capable of acquiring a target, discriminating between target and decoys, calculating slant range, tracking the target, and guiding the missile to the target. It was expected that this capability would be realized in the 1969-1970 period.

INTERIM SATELLITE INTERCEPT CAPABILITY

On 27 April 1962, the Secretary of Defense approved an Army recommendation to develop an interim satellite intercept capability by modifying the Zeus Kwajalein facility by May 1963. The development was to parallel the current and future AICBM program, but was to be accomplished on a non-interference basis.

[redacted]

The system was to have intercept capability for satellites of 200 nautical miles altitude, acquisition and track of satellites of at least two square meter cross sectional areas at ranges to 1,000 nautical miles, and multi-pass capability. Fifteen million dollars was allocated from emergency OSD funds during FY 1963 to provide for this capability at Kwajalein.

According to the NORAD Deputy Chief of Staff for Plans and Policy, the end result of this program would be the potential to demonstrate an operational intercept capability against satellites from 100 to 200 nautical miles altitude should the political situation indicate such a demonstration to be desirable.

MANNED MANEUVERABLE AEROSPACE DEFENSE SYSTEM

Another requirement which NORAD stated in NADOP 64-73, dated 1 March 1962, was for a defense weapon system to counter space vehicles up to an altitude of at least 20,000 nautical miles. In particular, NORAD was interested in the DYNASOAR R&D project and recommended that the capabilities of manned space vehicles be fully investigated and exploited.

In follow-up action, on 6 June 1962, NORAD recommended to the JCS that the DYNASOAR program be broadened to include study of those areas essential to the achievement of an operational aerospace defense system.

[redacted]

[redacted]

CHAPTER 5

OPERATIONAL POLICIES AND PROCEDURES

TRAINING AND EVALUATION

ECM TRAINING

Background. One of NORAD's major problems was its inability to provide adequate electronic warfare training for its forces. Needed was an airborne electronic jamming system. A NORAD Qualitative Requirement (NQR) was sent to USAF ADC in June 1961 for submission to Headquarters USAF. The NQR called for the development of ECM pods with interchangeable jammers to cover all ten frequency bands used by NORAD forces. They were to be self-contained, detachable pods capable of being carried by any faker target aircraft, including UE interceptors.

USAF ADC concurred in the NQR and, along with it, submitted its own ECM/ECCM requirements to Headquarters USAF in July 1961. However, ADC's individual needs differed somewhat from NORAD's. For example, ADC did not want UE interceptors modified for ECM pods and assigned faker target roles.

USAF Program. On 24 March 1962, Headquarters USAF advised NORAD and ADC that it "recognizes the world wide deficiencies in air defense system ECM training capabilities which preclude exercise of possessed ECCM equipments on a frequent and regular basis." To alleviate this situation, USAF said, an Operational Support Requirement (OSR) for air defense system ECM training equipments was being prepared. Its purpose was to align developmental effort with training requirements on a priority basis and to provide a single reference

[redacted]

[redacted]

source to document and control future requirements.

To this end, USAF was realigning current ECM modification programs. A program to modify the century series aircraft and T-33's with the ALQ-31 ECM Training Pod was cancelled. A program to equip ADC, AAC, and PACAF B-57 ECM target force aircraft with three-phase engine-driven 20 KVA constant speed alternators and wiring was approved and funded. Finally, three hundred QRC-160 X-, S-, and L-band training pods for ADC, AAC, PACAF, USAFE, and ATC were funded by USAF to provide initial minimum squadron training capability. For purposes of uniform worldwide distribution, allotments were to be made according to UE squadron strengths.

ADC and AAC were to get 260 QRC-160-type jamming pods. Currently, seven million dollars were allocated for FY-1963 procurement of approximately 200 pods. These pods would provide capability against two (X-band and middle S-band) of the ten NORAD radar frequency bands. To satisfy the whole NORAD requirement, USAF ADC would have to initiate separate QRC action for development of pod jamming equipment for the remaining radar frequency bands.

The proposed USAF OSR was passed to NORAD on 14 June 1962 for review and comment. NORAD generally concurred in the OSR and made a number of recommendations to USAF to bring it in line with the NQR submitted in July of the previous year.

Earlier in the year, USAF authorized $50,000 of FY 1962 funds to evaluate a proposed monopulse Melpar X-band automatic jamming technique. NORAD had recommended procurement for investigation, under the QRC program, of certain items of equipment to fulfill its ECM pod requirement. The Melpar funding satisfied one of NORAD's requests.

This proposed system, if proved effective, would have a number of advantages over existing

[redacted]

ECM techniques; e.g., it would require a simple ECM receiver and jamming would be done on frequencies separated from those transmitted by the radar. It would be applicable to NORAD's pod requirement against mono-pulse tracking radars and have broad application to various weapons systems against a wide variety of threats.

LOW LEVEL INTERCEPT TRAINING

Another of NORAD's major problems was the limited low-level capability of the air defense weapons system. This deficiency, revealed by war game analysis, was critical in light of the estimate that at least 30% of the Soviet bombers could make low-level attacks.

In recognition of this weakness, NORAD had been seeking ways to develop a low-level intercept capability. Budget limitations prevented the development of elaborate ground environment and improved weapons systems, so NORAD sought improvement with existing equipment. Sky Shield and Sioux Arrow exercises confirmed that the present system had the potential to counter low-level attacks through new or modified tactics and techniques and emphasis on related training.

This approach was passed to USAF ADC in July 1961 with the proposal to start a low-level intercept training program with SAC. NORAD noted that ARADCOM and SAC, with NORAD assistance, had developed an extensive low-altitude training program. This program, which had received FAA approval in principle, was to be expanded to include exercise of the ground environment and interceptors.

USAF ADC's reply of August was strongly in support of using low-level SAC bombers. ADC was currently emphasizing low-level training within its own means. This had resulted in a slight increase in capability, particularly in aircrew

proficiency. The USAF Interceptor Improvement Program, presently in progress, would also increase interceptor low-level capability. However, ADC asserted that "the main limiting factor in the attainment of a significant low-level capability is the limited capability of the ground environment to adequately track low level targets."*

NORAD approached SAC in August with a proposal for a joint low-level interceptor/bomber training program. SAC agreed to the need and recommended a conference with NORAD, FAA, and DOT.

The conference was held at Headquarters NORAD on 6-7 February 1962. Out of it came a test directive prepared jointly by NORAD and SAC. It was signed by NORAD and forwarded to SAC on 26 March 1962 for approval.

OPERATIONAL EVALUATION OF NORAD FORCES

Background. The NORAD operational evaluation program was first introduced in March 1959. Its purpose was to evaluate the capability of the NORAD regions to perform their missions in accordance with policies and procedures prescribed by CINCNORAD. In each evaluation, the best faker strike forces available were employed to simulate the NORAD estimate of the threat. Following an evaluation exercise, a report on the results was sent to the region commander to initiate corrective measures on observed deficiencies. In this way, NORAD improved the operational readiness and combat effectiveness of air defense forces assigned or available.

---

* Current service programs were gradually improving the low-altitude radar coverage.

Program. Since the start of the program, NORAD had conducted 14 operational evaluations. Each NORAD region had been evaluated at least once, except NNR which was to be evaluated during Sky Shield III in September 1962. In the first half of 1962, one region was evaluated, the 32nd, on 8 and 9 February. During FY 1963, NORAD planned seven evaluations, including five regions, the COC and the ALCOP.

NORAD/USAF ADC Agreement. On 13 April 1962, NORAD and USAF ADC signed an agreement on a division of responsibilities in planning and executing NORAD operational evaluation exercises. This agreement was later expanded to include all forces providing faker aircraft in NORAD evaluation exercises -- CINCSAC, CINCLANT, and RCAF ADC, as well as FAA and DOT. Appropriate addenda to the original NORAD/ADC agreement was sent out to these commands for their approval on 2 July.

IDENTIFICATION AND AIR TRAFFIC CONTROL

AIR DEFENSE AND AIR TRAFFIC CONTROL INTEGRATION

Background. In 1956, USAF had established the policy of integrating common air defense and air traffic control functions. ADC was designated as the implementing agency. In January 1958, the Secretaries of Commerce and Defense signed an agreement calling for joint use of facilities to avoid duplication and provide an air traffic control system compatible with the nation's defense requirements in peace and war. Subsequently, both FAA and DOD reaffirmed the policy of functional integration to the maximum degree possible. Accordingly, a number of radars were currently in joint use in the FAA ARTC's and SAGE network. Also, studies and test projects for further integration were carried out.

[redacted]

At the direction of the President in March 1961, the FAA conducted studies to improve the air traffic control system. As a result of these studies, the President directed the FAA Administrator in November "to utilize those elements of the air defense system which you believe can be advantageously used in meeting air traffic control requirements... and to consult with the Secretary of Defense and those responsible for the air defense system...."*

Northern Tier Integration Plan. By early 1962, DOD and FAA had agreed to use the SAGE DC's at Great Falls, Minot, and Grand Forks for air traffic control. The DOD was to continue to maintain a SAGE system air defense capability, as well as develop with FAA procedures and techniques for the integration of air defense and air traffic control functions. The FAA would in effect use the DC's as ARTC's. The SAGE computers were to be modified to provide the ATC functions, but without degrading the air defense mission. Modification and construction were to start during the latter part of the year.

A formal DOD/FAA agreement on the joint use of the Northern Tier DC's was signed on 23 July 1962. The agreement was to be in effect for not less than five years. After three years of operation, a phaseout by either party would be based upon a notification of two years unless mutually agreed.

INTEGRATION OF CANADIAN-U.S. PLANS FOR SCATER

Background. NORAD had been trying to integrate Canadian and U.S. plans for SCATER (Security

---

* See NORAD/CONAD Historical Summary, Jul-Dec 1961, pp. 56-59.

[redacted]

Control of Air Traffic and Electromagnetic Radiations). However, legal problems had prevented development of a common NORAD SCATER plan. NORAD then adopted the approach of setting out its requirements and asking the FAA and DOD, and the DOT and DND in Canada, to make their own agreements covering plans and procedures for SCATER. Finally in May 1961, NORAD submitted its requirements plan for SCATER to FAA and RCAF.

NORAD SCATER Requirements. The NORAD SCATER Document covered control of all aeronautical communications, since this was required by Executive Order 10312 and by public law. But the Canadian position was that control of all aeronautical communications would restrict civil defense communication with the public during an attack. Thus, RCAF approval of the NORAD Document, on 29 January 1962, was subject to the deletion of all reference to aeronautical communications. The RCAF stated it understood that control of aeronautical communications might no longer apply in the U.S. If so, the RCAF continued, it was possible to amend the NORAD Requirements Document so as to achieve standard application by both Canadian and U.S. agencies. Also, the RCAF recommended changing the title of the document from SCATER to SCATANA (Security Control of Air Traffic and Air Navigational Aids).

As it turned out, the following day, on 30 January, the JCS advised NORAD that the DOD was revising CONELRAD so that control of aeronautical communications would apply only to government emitters providing navigational aids.* Hence, NORAD told the RCAF it would withhold publication of its SCATER requirements pending final action on the U.S. CONELRAD revision. Then, control of

---

* See section this chapter on CONELRAD, p. 86.

aeronautical communications could be deleted from the document and the title changed to SCATANA, as suggested by the RCAF.

CANADIAN PRIORITIES FOR MOVEMENT OF CIVIL AND MILITARY AIRCRAFT

NORAD had another problem closely allied to SCATER -- to develop a common Canadian-U.S. list of priorities for movement of aircraft during national emergency. The DOD and FAA had agreed in 1959 to a system of priorities for the U.S. that had been established by the JCS at NORAD's request. After using these priorities for a short time, it became apparent that a compatible Canada-U.S. system was essential for cross-border operations. To this end, during 1961, NORAD negotiated with the RCAF and DOT to set up a compatible priority list.

In January 1962, the RCAF informed NORAD that Category Three peacetime priorities would be published. Later, on 14 May, the RCAF said that U.S. Categories One and Two had been accepted for Canada, subject to Category One being expanded to include the Prime Minister and President. The RCAF anticipated that there might be a requirement for certain very senior government officials to move by air in the early stages of a national emergency.

NORAD concurred in the recommendation, but thought the priority for high-ranking government officials should be raised to Category One, Priority One. The JCS were asked to consider changing the U.S. priorities accordingly.

IFF MARK XII

In December 1960, NORAD asked the JCS for a limited implementation of the IFF Mark XII system. NORAD's earlier bid for the full system lost out

in the 1960 program reductions. The system was needed to increase NORAD's capability to provide safe passage to the SAC EWO force and to identify other essential traffic during hostilities. The present Mark X SIF had proved inadequate in NORAD full-scale exercises, although some strides had been made in improving procedures.

SAC gave support to the IFF Mark XII system proposed by NORAD, in July 1961, following satisfactory test results. However, SAC was reluctant to place the Mark XII program in funding competition with other programs designed to increase SAC's operational capability.

The IFF Mark XII system was still in the R&D stage and as of 1 April 1962, $24.5 million had been spent on the program. However, USAF stated in its Program Communications 64-1 that it had no intention of pursuing the research program any further.

The JCS, on 17 January 1962, directed NORAD and SAC to provide additional information to substantiate the requirement and to establish a joint SAC/NORAD position on the need for the Mark XII. The JCS said that a Joint Staff/Joint Services Working Group had been unable to formulate an agreed recommendation to the JCS for implementation of the program. Moreover, none of the military services had included Mark XII in budget programs through FY 1962 or budget proposals for FY 1963. In fact, the Air Force long range plans did not include Mark XII implementation. SAC and ADC had placed other funding requirements in higher priority for approved and future program money. Thus, the low priority afforded Mark XII in budget programming did not support the urgency of the requirement to justify the JCS taking extraordinary measures. In short, the JCS needed more supporting data to proceed further.

On 16 April, NORAD and SAC sent a joint reply to the JCS. They recommended earliest implementation

of the IFF Mark XII. This submission stressed the limited identification capability of the ground environment in a degraded condition following an initial ICBM attack. As to funding, they asserted that Mark XII was a joint service responsibility and should not compete with other programs which were of single service or single command interest. Thus, the cost should be shared proportionately by each service.

WARNING AND READINESS

CONELRAD

In July 1959, NORAD recommended to the JCS that the CONELRAD plans published back in 1952 be reviewed and brought up to date. Then in March 1961, the JCS directed NORAD to prepare a CONELRAD plan for the CONUS. Later, however, they told NORAD to defer submission of the plan since they had decided to re-evaluate the CONELRAD requirement. In the meantime, they asked for NORAD's evaluation.

In NORAD's view, the importance of CONELRAD was diminishing because guidance systems of modern weapons were relying less on navigational aids operating in the low-frequency spectrum. In addition, NORAD pointed out that CONELRAD had some drawbacks for civil defense, for restrictions to broadcasting stations would result in the public receiving less attack warning information.

On 30 January 1962, the JCS advised that they had forwarded the following recommendation to the Secretary of Defense on 26 June 1961: "That the military requirement for CONELRAD be applied only to those emitters installed, operated and maintained by agencies of the government, including the military services, for the sole purpose of providing aids to navigation and that all other CONELRAD restrictions now imposed be cancelled so

that defense and military communications capabilities can be enhanced."

The JCS said that the Secretary of Defense had approved their recommendation on 3 August and the revised military requirement for CONELRAD was passed to the Chairman, U.S. Section, Military Co-operation Committee (MCC) with the request that COSC approval be solicited. Subsequently, the MCC referred the matter to the Permanent Joint Board on Defense.

This resulted in Canadian government approval of the revised CONELRAD requirement in early 1962.

The JCS informed NORAD on 12 June 1962 that they no longer required the CONELRAD plan requested the previous year. They said that a DOD directive identifying remaining military and civil requirements for the control of electromagnetic radiations of non-military government transmitters was currently under preparation. When approved, this directive would define responsibilities and functions within DOD for the remaining CONELRAD activities. The JCS expected that the Permanent DOD/FCC Advisory Committee, currently chaired by NORAD, would be reorganized to provide the full co-ordination essential to the modified CONELRAD requirements and that the chairmanship of the committee would be reassigned to the Defense Communications Agency.

CANADIAN ATTACK WARNING SYSTEM

Background. In 1959, the Canadian Army took over the National Survival Attack Warning System. A Regional Warning Information Center (RWIC) was set up at NNR Headquarters. The following year, RWIC's were established at the 25th, 29th, and 30th NR's. Procedures were set up to insure effective warning to the Canadian public of impending attack and the exchange of nuclear detonation

[redacted]

and radiation fallout reports between NORAD and the Canadian Army. Also, attack warning information was passed manually from the NORAD COC to the Federal Warning Center (FWC) in Ottawa. A Canadian Army Liaison Officer was established at Headquarters NORAD in August 1961.

Current Status. The FWC was relocated to the Canadian Army Signal System, Carp, Ontario, and began operation on 16 March 1962. The Canadian Army Regional Warning Information Center, at NNR St. Hubert, Quebec, assumed the role of alternate FWC.

In 1961, the COSC approved the purchase of ICONORAMA display equipment for the FWC to receive automatic inputs from the NORAD COC. This equipment was operating by the end of January 1962. Thus, the Canadian Army received surveillance data simultaneously with the JCS and SAC. Also, a two-way, full-time telephone connecting the NORAD tactical switchboard to the FWC was installed in March.

In addition, the Canadian Army procured a message composer capable of forward-telling not only air-breathing surveillance, but also missile, NUDET, vessel-sighting, communications outages and ECM information. NORAD proposed, and the Canadian Army agreed, to substitute this for the present NORAD composer and use it as the manual back-up system for the NORAD ICONORAMA display. Accordingly, modifications were being made to the Pentagon and SAC systems. Installation was to be completed in August.

NORAD ALERTING SYSTEM

NORAD had a requirement to replace the existing readiness and warning teletype network, Alert Net Number One, with an improved voice alerting system. The network and associated equipment was

[redacted]

designed and developed for an air breathing threat. Even under the most favorable conditions, it took more than three minutes to alert the NORAD system and other agencies concerned. This was not acceptable to NORAD in light of the ICBM threat with only 20 minutes warning provided. The proposed voice alerting system would provide alerting in less than thirty seconds, including acknowledgment.

NORAD started action in March 1961 to get a voice alerting system. A submission was made to the JCS in September. By the end of the year, NORAD's requirement was approved in part by the JCS and implementation of the system was started the beginning of 1962.

However, USAF advised NORAD, on 15 April 1962, that NORAD's requirements for leased communications services would exceed the Air Force's financial plan for FY 1963 by $4 million, of which the voice alerting system would take $1.0 million. Thus, further justification was required to obtain OSD approval for release of funds for the voice alerting system. Accordingly, on 16 May, NORAD restated the requirement to the JCS and included supporting technical data.

As matters stood at mid-year, the tentative operational date for the NORAD voice alerting system was 7 December 1962.

AUTOMATIC BALLISTIC MISSILE ATTACK WARNING SYSTEM (ABMAWS)

NORAD began taking steps in October 1961 to develop an automatic ballistic missile attack warning system. The ultimate system envisioned by NORAD was one that would be triggered automatically by the BMEWS, NUDETS, Bomb Warning, or MIDAS systems into giving instant warning of a ballistic missile attack to all NORAD combat units, using existing circuits. Units to be warned would include regions, sectors, fighter squadrons, BOMARC

squadrons, radar and ACW squadrons, and Nike units. NORAD asked ADC to work up a study of the feasibility of providing such a system.

While this system was being developed, NORAD set up an interim manual system using the existing readiness and warning network (Alert 1). The warning would be sent by pre-cut teletype messages from the COC to the regions. The regions then would fan out the warning to their sectors and subordinate units. This interim system was known as Phase I (of 4 phases).

Phase II, also manual, was an improvement over Phase I in that it called for additional teletype equipment to permit the storage of a pre-cut message tape so the message could be dispatched instantly. USAF ADC was also asked to provide the auxiliary teletype equipment needed.

Meanwhile, ADC had turned the problem of the development of the automatic system (Phases III and IV) over to the American Telephone and Telegraph Company (AT&T), and they produced a communications plan on 3 March 1962. The plan showed the system to be technically feasible. Furthermore, ADC stated that funds were available to buy the system. AT&T estimated the system would cost $23,000 to install and $26,000 per month to rent. There would be no termination charge.

NORAD accepted the AT&T plan in principle and gave ADC detailed requirements to be worked into the plan. AT&T presented another plan in June 1962 recognizing these requirements, but no further action had been taken by NORAD by mid-year. In the meantime, NORAD had gone into Phase II of its interim manual system, installing equipment in the COC containing a stored pre-cut message tape of a warning that could be dispatched instantly.

[redacted]

DEFENSE READINESS CONDITIONS IN ALASKA

On 26 January 1962, the Commander-in-Chief Alaskan Command asked CINCNORAD for authority to declare Defense Readiness Conditions (DEFCON's) for the Alaskan NORAD Region. Under the existing regulation, ANR reacted only to a DEFCON declared by CINCNORAD/CINCONAD. Because of the proximity of Alaska to the USSR, it was possible that CINCAL might precede CINCNORAD in going to a higher condition of readiness. CINCAL reasoned that if ANR could be brought up at the same time as Alaskan Air Command, it would reduce confusion as well as improve the capability of the air defense forces to deploy in a timely and orderly manner.

NORAD concurred and gained approval from the JCS and COSC. NORAD Regulation 55-3 was amended on 22 May 1962. The Alaskan NORAD/CONAD Region Command would now assume the DEFCON declared by either CINCNORAD/CINCONAD or CINCAL, whichever was higher. However, the revision stipulated that authority to overfly Canada with nuclear-armed aircraft was prohibited unless CINCNORAD declared DEFCON I or Air Defense Emergency.

CHANGES IN DEW LINE PROCEDURES

Northern NORAD Region recommended three changes in DEW line procedures in February 1962 on data handling and forward telling procedures:

a. A detection station, before forwarding to the data center the zero-zero (initial) track detected in an adjacent subsector, contact the console operator of the adjacent station to determine whether the track was under surveillance so as to eliminate duplicate track telling and subsequent cease tell action by the Data Center Controller.

[redacted]

b. Adjacent radar operators accept a cease tell from each other after coordinating their video display so as to eliminate duplicate telling.

c. A time summary reporting procedure for density traffic telling.

On 10 May, NORAD advised NNR, Alaskan NORAD Region, and USAF ADC that it concurred with the first two recommendations (a and b), subject to the comments of ANR and ADC. NORAD said it agreed with the basic principles of a summary reporting procedures, but changed the format to a "DEWSUM" report for compatibility with ICONORAMA at the NORAD COC and SAGE at the regions. ADC and ANR agreed with the a and b changes. ANR required normal reporting, however, and the summary reporting was not to be used in its operations. Mass raid reporting was being tested in the Canadian portion of the DEW Line at mid-year and a conference was scheduled for late July to work out firm procedures.

MID-CANADA LINE PROCEDURES

NORAD issued a new manual on operation of the MCL (55-7) on 4 January 1962. It described the method of identification, operating procedures, data handling, and communications.

NNR requested, in May, a change in the procedures for the purpose of recognizing spoofing tactics. NNR pointed out that because only north to south traffic was reported, any time a target aircraft reversed its heading, recrossed the line northbound, and then recrossed in a southerly heading again, there was difficulty in recognizing the threat. To solve this problem was simple: report northbound as well as southbound traffic under certain conditions.

NORAD approved the proposal for use during future region evaluations and special exercises prior to establishing a firm operational procedure. NORAD established that at "cocked pistol," MCL commanders would initiate telling of northbound as well as southbound penetrations and if target maneuvers were made within range of MCL detection equipment and spoofing tactics were identified by the MCL commander, he was to advise the NORAD sector to whom he reported and begin telling northbound and southbound traffic.

94-blank

GLOSSARY

GLOSSARY OF ABBREVIATIONS

AAC	Alaskan Air Command
ABMAWS	Automatic Ballistic Missile Attack Warning System
ADC	Air Defense Command
ADIZ	Air Defense Identification Zone
ADNAC	Air Defense of the North American Continent
AEW	Airborne Early Warning
AEW&C	Airborne Early Warning and Control
AFB	Air Force Base
AFS	Air Force Station
AFSC	Air Force Systems Command
AICBM	Anti-Intercontinental Ballistic Missile
ALCOM	Alaskan Command
ALCOP	Alternate Command Post
ALRI	Airborne Long Range Input
AMI	Advanced Manned Interceptor
ANG	Air National Guard
ANR	Alaskan NORAD Region
AOC	Air Officer Commanding
ARADCOM	Army Air Defense Command
ARNG	Army National Guard
ARPA	Advanced Research Projects Agency
ARTC	Air Route Traffic Control
ASM	Air to Surface Missile
ATC	Air Training Command
AT&T	American Telephone and Telegraph Company
AW	All Weather
B/C	Biological and Chemical
BIRDIE	Battery Integration and Radar Display Equipment
BMEWS	Ballistic Missile Early Warning System
BUIC	Back Up Interceptor Control
CADIN	Continental Air Defense Integration North

CC	Control Center
C&E	Communications and Electronics
CINCAL	Commander-in-Chief, Alaskan Command
CINCLANT	Commander-in-Chief, Atlantic
CINCNORAD	Commander-in-Chief, North American Air Defense Command
CINCONAD	Commander-in-Chief, Continental Air Defense Command
CINCSAC	Commander-in-Chief, Strategic Air Command
COC	Combat Operations Center
COMAAC	Commander, Alaskan Air Command
CONAD	Continental Air Defense Command
CONELRAD	Control of Electromagnetic Radiation
COSC	Chiefs of Staff Committee
DC	Direction Center
DCA	Defense Communications Agency
DDR&E	Director of Defense Research and Engineering
DEFCON	Defense Readiness Condition
DEW	Distant Early Warning
DND	Department of National Defence
DOD	Department of Defense
DOT	Department of Transport
DRB	Defence Research Board
ECCM	Electronic Counter Countermeasures
ECM	Electronic Countermeasures
ESD	Electronic Systems Division
EWO	Emergency War Order
F	Fighter
FAA	Federal Aviation Agency
FD	Frequency Diversity
FIS	Fighter Interceptor Squadron
FWC	Federal Warning Center
FY	Fiscal Year
G-I-UK	Greenland-Iceland-United Kingdom
HF	High Frequency
HIPAR	High-Powered Acquisition Radar

ICBM	Intercontinental Ballistic Missile
IFF	Identification Friend or Foe
IMI	Improved Manned Interceptor
JCS	Joint Chiefs of Staff
JTD	Joint Table of Distribution
LRIX	Long Range Interceptor
MADRE	Magnetic Drum Radar Equipment
M&O	Manpower and Organization
MCC	Military Cooperation Committee
MCL	Mid-Canada Line
MIDAS	Missile Defense Alarm System
NADOP	North American Air Defense Objectives Plan
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVFORCONAD	Naval Forces Continental Air Defense Command
NCC	NORAD Control Center
NG	National Guard
NM	Nautical Miles
NNR	Northern NORAD Region
NORAD	North American Air Defense Command
NQR	NORAD Qualitative Requirement
NSA	National Security Agency
NUDET	Nuclear Detonation
OEC	Operational Employment Concept
OEP	Operational Employment Plan
OSD	Office of the Secretary of Defense
OSR	Operational Support Requirement
PACAF	Pacific Air Forces
PARL	Prince Albert Radar Laboratory
QRC	Quick Reaction Capability
R&D	Research and Development
RA	Regular Army
RCA	Radio Corporation of America

RCAF	Royal Canadian Air Force
RWIC	Regional Warning Information Center
SAC	Strategic Air Command
SAGE	Semi-Automatic Ground Environment
SAM	Surface to Air Missile
SCATANA	Security Control of Air Traffic and Air Navigational Aids
SCATER	Security Control of Air Traffic and Electromagnetic Radiations
SIF	Selective Identification Feature
SLBM	Submarine Launched Ballistic Missile
SOR	Specific Operational Requirement
SPADATS	Space Detection and Tracking System
SPO	Special Project Officer
UE	Unit Equipment
USA	United States Army
USAF	United States Air Force
USAFE	United States Air Forces in Europe
USMC	United States Marine Corps
USN	United States Navy
VHF	Very High Frequency
WE ADES	Western Electric Air Defense Engineering Services
ZI	Zone of the Interior

INDEX

102-6 Cavile

[redacted]

INDEX

[redacted]

DISTRIBUTION

COSC	1	
CNS, RCN	1	
CGS, Canadian Army	1	
CAS, RCAF	5	
CINCLANT	1	
CINCPAC	1	
CINCSAC	1	
CINCSTRIKE	1	
RCAF ADC	3	
ARADCOM	3	
NAVFORCONAD	2	
USAF ADC	1	
NORAD Regions	3	each
NORAD Sectors	1	each
Hq NORAD	40	
TOTAL	110	

REDISTRIBUTED BY HQ NORAD

NHCR	1
NAPA	1
NINT	1
NNFO	1
NOPS	1
NOOP	1
NOEV	1
NOST	1
NOCC	1
NOOA	1
NLOG	1
NPAP	1
NPPA	1
NPPP	1
NPMO	1
NPSD	1
NELC	1
NEEC	1
NECO	1
NGAM	1
NGPM	1
NNCH	19*

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

[redacted]

January - June 1962

REFERENCES

CHAPTER I

1. ALCOM, Plan for the Organization of the Alaskan NORAD/CONAD Region Headquarters, 19 Jun 62 (Doc 1, ANR Hist Rpt, Jan-Jun 62).

2. ALCOM Special Order G-5, 24 Jan 62 (Doc 2, ANR Hist Rpt, Jan-Jun 62).

3. NNR to NORAD, "Northern NORAD Region Organization - September 1962 to July 1963," 13 Apr 62 (4).

4. Ibid.; See also NORAD/CONAD Historical Summary, Jul-Dec 61, p. 5.

5. See Footnote 3.

6. Ibid.; NORAD to NNR, "Northern NORAD Region Organization, Sep 62 - Jul 63," 14 May 62 (4).

7. Msg, NNR to NORAD, NRCS32, 22 May 62 (4).

8. ARADCOM to NORAD, "Collocation of ARADCOM and NORAD Region Headquarters," 8 Mar 62 (6.5).

9. Ibid.

10. 1st Ind (ARADCOM to NORAD, "Collocation of ARADCOM and NORAD Region Headquarters," 8 Mar 62), NORAD to ARADCOM, n.d. (6.5).

11. ADC to NORAD, "ALCOP Manning Requirements," 23 May 62 (51.2 X 3).

12. Ibid.

13. NORAD to USAF ADC, "ALCOP Manning Requirements," 8 Jan 62 (51.2 X 3).

14. Msg, NORAD to NNR, NOOP-E-X010, 9 Jan 62 (4); Msg, NNR to 26th NR, NRNS2, 9 Jan 62 (4); Msg, NNR to NORAD, NRDP42, 30 Mar 62 (4).

NORAD

N2- 30989

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

Group 3

[redacted]

15. Msg, NNR to NORAD, NRCR35, 11 Jan 62 (4).

16. Ibid.

17. Msg, 30th NR to NORAD, 30-NOOP-3/N-122-62, 13 Jan 62 (4).

18. Msg, NNR to NORAD, NRDP6, 24 Jan 62 (4).

19. Msg, NORAD to NNR, NOOP-E X-297, 5 Jun 62; Msg, NNR to NORAD, NRCS14, 13 Feb 62 (4); Memo, Capt Barnhill, 18 Jun 62 (4).

20. Msg, NORAD to NNR, NOOP-E X-092, 13 Feb 62 (4); Msg, NNR to NORAD, NRCS10, 26 Feb 62 (4); Msg, NORAD to NNR, NOOP-E X-113, 7 Mar 62 (4); DF, NPAP to NHCS, "Proposed NORAD and CONAD General Orders," 19 Jun 62 (4).

21. DF, CPMO to COOP, "Bangor NORAD/CONAD Sector," 29 May 62 (4).

22. Msg, Goose NORAD Sector to CONAD, GNCCR 896, 19 Feb 62 (307).

23. NNR to NORAD, "Operational Control of DEW East," 14 Mar 62 (307).

24. Wkly Act Report, NOOP-E, 13 Apr 62; DF, NOOP to NOPS, "Operational Control of DEW East," 4 Apr 62 (307).

25. Msg, DCADS to NORAD, KCCCR0672, 15 Jan 62 (4); Memo, Col R. H. Brady to Brig Gen Daly, "Discontinuance of Omaha NORAD/CONAD Control Centers," 10 Jan 62 (4); NORAD and CONAD GO's 2, 16 Feb 62.

26. DF, NPAP to NRCS, "Proposed NORAD and CONAD General Orders," 2 May 62 (4); DF, NPAP to NHCS, "NORAD/CONAD General Orders," about 24 May 62 (4); NORAD GO 20, 31 May 62.

27. Memo for Record, Capt Barnhill, NPMO, 29 May 62 (4); DF, NPAP to NRCS, "Proposed NORAD and CONAD General Orders," 13 Jun 62 (4).

28. DF, NPAP to NNCH, "Proposed NORAD and CONAD General Orders," 13 Jun 62 (4)

29. NORAD to JCS, "NORAD Manpower Requirements for FY 63," 29 Jan 62 (3); NPMO Memo, Lt Col Joachim to Maj Gen Wise, "J-Staff Manpower Requirements Not Included in the Annual Submission to the JCS," 8 Mar 62 (3).

30. See footnote 29.

31. NORAD to JCS, "NORAD Manpower Requirements for FY 1963," 29 Jan 62 (3); NORAD to CAS, RCAF, "NORAD Regional and Sector Organization," 12 Feb 62 (4).

32. Msg, NORAD to 25th NR, NPMO 006, 19 Mar 62 (4).

33. Memo, NPMO to Chief of Staff, "Joint Headquarters Table of Distribution, North American Air Defense Command, 1 July 62," 14 May 62 (3).

34. NORAD Paper, "Reorganization of Certain Staff Elements of Hq NORAD/CONAD," n.d. (3); NORAD to JCS, "Reorganization of Certain Major Staff Elements of Headquarters NORAD/CONAD," 10 May 62 (3).

35. NORAD to JCS, "Reorganization of Certain Major Staff Elements of Headquarters NORAD/CONAD," 10 May 62 (3).

36. Ibid.; Memo, NORAD Chief of Staff to Staff, "Review of the NORAD Headquarters Organization and Manning," 21 Mar 62 (3); Memo, Lt Col Joachim to Maj Gen Wise, "J-Staff Manpower Requirements not included in the Annual Submission to the JCS," 8 Mar 62 (3 X 57).

37. Msg, NORAD to Director, Joint Staff, JCS, NPMO X007, 17 Apr 62 (3); DF, NPAP to NHCS, "High Priority Manpower Requirement - Assistant Directors, COC," 1 Jun 62 (3).

38. Memo, Col R. H. Brady to Maj Gen Wise, "Trip Report," 25 May 62 (3).

39. DF, NPAP to NHCS, "High Priority Manpower Requirement - Assistant Directors, COC," 1 Jun 62 (3).

40. Memo, Lt Col Joachim, 27 Jun 62 (3).

41. DF, NPMO to NGAM, "Manpower Authorizations of Forces Available to CINCNORAD," 22 Jun 62 (3).

CHAPTER II

1. ADC V-24 Control and Warning Equipment Report, 31 Nov 61.

2. Interview with Maj S. E. Aites, NEEC-E, 2 Aug 62.

3. ADC V-24 Control and Warning Equipment Report, 30 Jun 62.

4. RCAF ADC Programme and Requirement Summary, 1 Sep 62 (706B).

5. DF, NEEC-E to NEEC, "Trip Report Re 416L System Phasing Group Meeting," 19 Jun 62 (302.1).

6. Msg, CANAIRHED to NORAD, CAS 192, 4 Jul 62 (302.1).

7. Msg, NORAD to CANAIRHED, NPPP-PLX008, 6 Jul 62 (302.1).

8. Msg, USAF to ADC, NORAD, AFOOP-DE 66069, 13 Jul 62 (305).

9. Msg, NORAD to CJCS, NOOP-E X-093, 21 Feb 62 (302.12).

10. Ibid.

11. Staff Study, Incl to NORAD to ADC, 25th, 26th, 28th, and 32d Regions, "AEW&C Conference," 9 Feb 62 (302.12).

12. NORAD to 26th, 32d, and 28th Regions, "Employment of Seaward Extension Elements," 11 Jul 62 (302.12).

13. Interview with Lt Col G. A. Riddler, Jr., NOOP-E, 24 Jul 62.

14. ADC SO G-3, 8 Jan 62; Msg, ADC to 26th AD, ADCMO-F-3, 10 Jan 62 (302.12).

15. DF, NOPS to NHCS, "Texas Tower Evacuations," 1 Mar 62 (302.12).

16. Msg, NORAD to JCS, NOOP-E X-046, 29 Jan 62 (302.12).

17. NORAD to ADC, "Texas Towers," 21 Sep 61 (307).

18. Wkly Act Rept, NPSD, 29 Jun 62; Memo, DCS/C&E to Maj Gen Low, "Current ALRI Status," 24 Apr 62 (302.12).

19. RCAF ADC to NORAD, "RCAF Policy on the MCL," 7 Mar 62 (308).

20. NNR to NORAD, "MCL Operations - Recognition of Spoofing Tactics," 4 May 62 (308).

21. Msg, NORAD to NNR, NOOP-E X-251, 11 May 62 (308).

22. ADC to NORAD, "BMEWS Site III Operational Date," 2 Apr 62 (226); Wkly Act Rept, NOOP, 10 Aug 62.

23. Msg, NORAD to JCS, NPPP-PL X002, 2 Mar 62 (226).

24. Ibid.; NORAD Command Reference Book, Jun 62.

25. NORAD Command Reference Book, Jun 62.

26. Ibid.; Wkly Act Rept, NEEC, 6 Apr 61; DF, NOOA to NELC, "Briefing on AN/FPS-49," 20 Apr 62 (226).

27. NORAD Command Reference Book, Jun 62; Wkly Act Repts, NPSD, 5 Mar 62, and NEEC, 20 Jul 62.

31. NORAD Command Reference Book, Jun 62; ADC to NORAD, "Reduced Radar Cross Section Detection and Tracking," 2 Apr 62 (226).

32. Wkly Act Rept, NELC, 12 Jun 62.

33. Ibid.; Wkly Act Rept, NEEC, 6 Apr 62; Wkly Act Rept, NPSD, 9 Apr 62.

34. Wkly Act Rept, NELC, 12 Jun 62.

35. Ibid.

36. NORAD Command Reference Book, Jun 62; Interview with Lt Col J. D. Langstaff, NOOP-E, 14 Aug 62.

37. NORAD Command Reference Book, Jun 62.

38. Msg, NORAD to JCS, NOOP-E X-156, 2 Apr 62 (228).

39. NORAD Hist Sum, Jul-Dec 61; Msg, Space Track R&D Facility, to AFSC, ESSXS 08-1-018, 11 Jan 62 (228); Interview with Lt Col J. D. Langstaff, NOOP-E, 14 Aug 62.

40. Msg, Space Track R&D Facility to AFSC, ESSXS 08-1-018, 11 Jan 62 (228); Msg, JCS to NORAD, JCS 3608, 13 Mar 62 (228); Interview with Lt Col J. D. Langstaff, NOOP-E, 14 Aug 62.

41. Msg, JCS to NORAD, JCS 3608, 13 Mar 62 (228); Msg, NORAD to JCS, NOOP-E X-156, 2 Apr 62 (228).

42. Msg, Space Track R&D Facility to AFSC, ESSXS 08-1-018, 11 Jan 62 (228); Msg, CONAD to COFS USAF, COOP-E X-058, 13 Jan 62 (228); Interview with Lt Col J. D. Langstaff, NOOP-E, 14 Aug 62.

43. Wkly Act Rept, NOOP, 26 Apr 62; Msg, CANAIRHED to USAF ADC, DCOM2273, 30 Apr 62 (228); DF, NOOP to NOPS, "NORAD Requirements from RCAF Sensors," 12 Mar 62 (228); NORAD to CAS RCAF, NORAD SPADATS Requirements for RCAF Sensors," 30 Jan 62 (228); Interview with Lt Col J. D. Langstaff, NOOP-E, 14 Aug 62.

44. Msg, CONAD to COFS USAF, COCC-50 X021, 16 Mar 62; Msg, CONAD to COFS USAF, COCC-SD X029, 4 Apr 62 (228).

45. Msg, NSA to USAF COFS, NSA R3/2-62, 8 Jan 62. (228)

46. Ibid.; Msg, USAF to USAFSS, AFCIN-1C 93910, 18 Jan 62 (228).

47. Msg, USAF to NSA, AFCIN-1C 75661, 23 Apr 62 (228).

48. NORAD Command Reference Book, Jun 62, pp. 4-5.

49. DF, NPAP to NAPA, "DOD MIDAS Task Group, Conclusions and Recommendations," 3 Jan 62. (227)

50. Ibid.

51. NORAD Command Reference Book, Jun 62, pp. 4-5.

52. Ibid.

53. Ibid.; Wkly Act Rept, NPSD, 5 Mar 62.

54. NORAD Command Reference Book, Jun 62, pp. 4-5.

55. NORAD to JCS, "NORAD Requirement for an Off-Shore Missile Attack Warning System," 24 Feb 62 (233).

56. Msg, USAF to ADC, AFORQ 61937, 28 Jun 62 (233).

57. Memo, "Status Report on Follow Actions for Implementing NADOP 64-73," NPPP, 10 May 62 (657).

58. Memorandum for the Record, S/L F. P. Boyczuk, NECO-F, 18 Jun 62 (250).

59. Memorandum for Col Baril from NECO-F, "Bomb Alarm System Status," 1 May 62 (250).

60. Ibid.; Msg, USAF to ADC, AFOAC-SC 68506, 11 Mar 62 (250).

61. Memo for Gen Kuter, NPAP, "Biological and Chemical Rapid Warning System," 25 Jan 62 (250).

62. Wkly Act Rept, NPSD, 22 Jan 62.

63. Memo for Col Dyke, NPSD-R, "BW/CW Interim Warning System," 19 Mar 62 (250).

64. Wkly Act Rept, NPSD, 4 Jun 62.

65. Memo for the Record, "CBW System Meeting," 8 Jun 62 (250); Wkly Act Rept, NPSD, 11 Jun 62.

66. Wkly Act Rept, NPSD, 4 Jun 62.

67. Wkly Act Rept, NPSD, 28 May 62.

68. Msg, NORAD to CANAIRHED, et al, NECO-P 272, 17 Jul 62 (57).

69. NORAD/SAC Northern Area Communications Objectives Plan (NACOM), May 62 (57B).

CHAPTER III

1. Wkly Act Rept, NPSD, 22 Jun 62; 3d NORAD C&E Conf, 10 Jul 62, 1 Aug 62 (675).
2. 3d C&E Conf, 10-11 Jul, 1 Aug 62 (675).
3. Ibid.
4. Msg, ADC CCDSO to ADC, ADSP 4-234-E, 6 Apr 62 (51).
5. Msg, USAF to AFSC, AFORQ 81216, 20 Apr 62 (51).
6. Wkly Act Rept, NPSD, 4 Jun 62.
7. NORAD to Dist, "NORAD Strategic Alert Cadre Composition and Instructions," 27 Feb 62 (51.2).
8. NORAD Command Reference Book, 1 Jan 62, p. 12.
9. NORAD to ADC, "Reaffirmation of NORAD ALCOP Requirements, 1961-1965," 28 Feb 62 (51.2).
10. Msg, USAF to ADC, AFOOP 88516, 15 May 62 (51.2).
11. Wkly Act Rept, NPSD, 15 Jun 62; Msg, USAF to ADC, AFOOP-DE 65209, 11 Jul 62 (51.2).
12. Wkly Act Rept, NOOP-E, 8 Mar 62; 29th NR to NORAD, "29th Region Command and Control Responsibilities," 13 Nov 61 (258); Msg, 29th NR to NORAD, 29NOCC-C 0467, 17 Jul 62 (51.2).
13. Msg, NORAD to 30th NR, NOOP-E X-194, 10 Apr 62 (51.2).

SECRET

14. Msg, NORAD to USAF ADC, CANAIRDEF, NOOP-E X-029, 19 Jan 62 (54.1 X 58).

15. Msg, CANAIRDEF to NORAD, CES 2503, 18 Jan 62 (54.1 X 58).

16. Msg, CANAIRDEF to USAF ADC, CES98, 6 Jul 62 (54.1).

17. ADC to NORAD, "Priority NCC's for Phase II BUIC," 25 Apr 62 (54.1).

18. 1st Ind (ADC to NORAD, "Priority of NCC's for Phase II BUIC," 25 Apr 62), NORAD to ADC, 27 Apr 62 (54.1).

19. Wkly Act Rept, NPSD, 29 Jun 62.

20. DF, NEEC-E to NELC, "Trip Report Re BUIC Bidders Conference," 19 Apr 62 (54.1); Interview with Maj S. F. Aites, NEEC-E, 2 Aug 62.

21. NORAD to ADC, "Switched Communications for SAGE Back-Up," 12 Feb 62 (58 X 57); Wkly Act Rept, NECO, 16 Feb 62.

22. Msg, NORAD to USAF, JCS, NPSD-A X025, 7 Mar 62 (51.2 X 58 X 57); NORAD DCS/C&E Activities Letter, 19 Sep 61.

23. RCAF to NORAD, "Switched Communications for SAGE Back-up," 6 Mar 62 (57 X 58 X 54.1).

24. NORAD to RCAF, "Switched Communications for SAGE Back-up," 27 Apr 62 (57 X 58 X 54.1).

25. ADC to NORAD, "Switched Communications for SAGE Back-up," 28 Feb 62 (57 X 58).

26. Wkly Act Rept, NELC, 12 Jun 62.

27. NORAD to ARADCOM, "Future of Missile Master," 28 Dec 61 (54.3).

SECRET

28. 1st Ind (NORAD to ARADCOM, "Future of M/M," 28 Dec 61), ARADCOM to NORAD, 10 Jan 62.

29. NORAD to ARADCOM, "Future of Missile Master," 2 Feb 62 (54.3).

CHAPTER IV

1. NORAD Program Progress Report, 1 Jul 62 (718).

2. NORAD Program Progress Reports (Monthly) 1 Jan 62 through 1 Jul 62; NORAD Program Summary, 1 Jan 62 (670).

3. NNR Historical Report, 1 Jan - 30 Jun 62; Msg, RCAF ADC to NNR, A24, 25 May 62 (403).

4. NADOP 64-73, 1 Mar 62 (657).

5. ADC to NORAD, "(U) Thule Alert," 31 May 62, w/1 Atch, Ltr to ADCCS, same subject, 11 May 62, also w/1 Atch (403).

6. NORAD to ADC, "(U) Thule Alert," 11 Jun 62 (403).

7. NORAD Program Progress Reports, 1 Mar and 1 Jul 62 (718).

8. NNR Historical Summary, Jan-Jun 62.

9. NADOP 64-73, 1 Mar 62 (657); NORAD Program Progress Report, 1 Jul 62 (718); NORAD Program Summary, 1 Jan 62 (670); Interviews with Lt Col N. E. Cole, NOOP-O and Lt Col W. Gause, NGPM, 30 Aug 62.

10. NORAD Program Progress Report, 1 Jul 62; Wkly Act Rept, NOOP-O, 25 May 62 (745).

11. NORAD to ARADCOM, "National Guard Conversion to Hercules (U)," 11 Jan 62 (503); Wkly Act Rept, NPPP, 12 Jan 62 (747); Interview with Lt Col Thornton, NPPP, 18 Jul 62.

12. NADOP 64-73, 1 Mar 62 (657).

13. Msg, USAF to ADC and NORAD, AFORQ 61937, 28 Jun 62 (233).

14. NADOP 63-67, 31 Mar 61 (657).

15. NADOP 64-73, 1 Mar 62 (657).

16. Ibid.

17. JCS to NORAD, "Continental Air Defense," 19 Mar 62 (657).

18. NORAD to JCS, "Defense of Northern Perimeter and ICBM Sites (U)," 16 Apr 62 (657).

19. Status Report on Follow-up Actions for Implementing NADOP 64-73 (U), NPPP, 10 May 62. (657).

20. Interview with Cdr A. M. Gill, NPPP, 14 Aug 62.

21. JCS to NORAD, "Continental Air Defense," 19 Mar 62 (657).

22. NORAD to JCS, "Defense of Northern Perimeter and ICBM Sites (U)," 16 Apr 62 (657); NADOP 64-73, 1 Mar 62 (657).

23. DF, NOOP to NOPS, "Fighter Interceptor Dispersal Plans (U)," 2 Jul 62 (420).

24. NORAD to USAF ADC, CAS RCAF, ANR and ARADCOM, "(U) Revision of NORAD/CONADR 55-3, 21 Nov 61 (251).

25. NORAD/CONADR 55-3, "Defense Readiness Condition, States of Alert, Alert Requirements and Air Defense Warnings," 9 Mar 62 (251).

26. (U) NORAD Qualitative Requirement for Long-Range Airborne Passive Homing System (LRAPH), 1 Nov 1961 (150).

27. NORAD Command Reference Book (701); DF, NPSD-O to NPSD, "Trip Report to ASD, AFSC, and Hq USAF, 28 and 29 May 1962," 6 Jun 62 (403); Status Report on Follow-up Actions for Implementing NADOP 64-73 (U), NPPP, 10 May 1962 (657).

28. NADOP 64-73, 1 Mar 62 (657).

29. Wkly Act Rept, NEEC, 22 Jun 62 (748); Interview with Lt Col D. W. Pettigrew, NPSD-B, 31 Aug 62.

30. Memo for Gen Kuter, NPSD-B, "Interim Satellite Intercept Capability," 3 May 62 (232).

31. NORAD to JCS, "Manned Maneuverable Aerospace Defense System (U)," 6 Jun 62 (232).

CHAPTER V

1. Msg, USAF to ADC, NORAD et al, AFORQ-AD 72887, 23 Mar 62 (150).

2. Ibid.

3. Interview with Maj W. H. Hogan, NPSD, 3 Aug 62.

4. USAF to ADC, NORAD et al, "(U) Operational Support Requirement for Air Defense Systems Electronic Countermeasures (ECM)," 14 Jun 62 (150).

5. NORAD to USAF, "(U) USAF Proposed Operational Support Requirement for Air Defense Systems Electronic Countermeasures (ECM)," 18 Jul 62 (150).

6. Msg, AFSC to ASD, SCSEI-2-1-8, 2 Jan 62 (150).

7. Wkly Act Rept, NPPP, 5 Jan 62 (747).

8. Msg, ASD to AFSC, ASNPVDI-20-10-115, 20 Oct 61 (313).

9. NORAD to USAF ADC, "(U) Development of Low-Altitude Intercept Capability," 13 Jul 61 (420).

10. USAF ADC to NORAD, "(U) Development of Low Altitude Intercept Capability," 2 Aug 61 (420).

11. SAC to NORAD, "SAC/NORAD Low Level Intercept Training (Proposal)," 16 Dec 1961 (420).

12. NORAD to SAC, "NORAD/SAC Test Directive," 26 Mar 62 w/1 atch (420).

13. NORAD Operational Evaluation Report on 32d NORAD Region, Feb 62 (600); Interview with W/C E. J. Greenway, NOEV, 10 Aug 62.

14. Joint Agreement on Responsibilities in Planning NORAD Operational Evaluation Exercises, 13 Apr 62 (600).

15. Ltrs from NORAD to CINCSAC, CINCPAC, CINCLANT, RCAF ADC, FAA and NORAD, "Responsibilities in Planning NORAD Operational Evaluation Exercises," w/2 atchs, 2 Jul 62 (600).

16. Interview with Lt Col M. C. Morphew, Jr., NOOP-E, 27 Aug 62.

17. RCAF to NORAD, "NORAD Requirements for Security Control of Air Traffic and Electromagnetic Radiation," 29 Jan 62 (254).

18. NORAD to RCAF, "NORAD Requirements for Security Control of Air Traffic and Electromagnetic Radiations," 15 Feb 62 (254).

19. RCAF to NORAD, "Priorities for Air Movement of Aircraft," 14 May 62 (254); NORAD Command Reference Book (701); Msg, NORAD to NNR, NOOP-E 206, 12 Jul 62 (254).

[redacted]

20. NORAD Command Reference Book, p. 59 (701).

21. JCS to NORAD and SAC, "IFF Mark XII Implementation (U)," 17 Jan 62 (201).

22. DF, NOPS to NHCS, "(U) IFF Mark XII Implementation," 2 Apr 62 (201); NORAD through SAC to JCS, "(U) IFF Mark XII Implementation," 16 Apr 62 (201).

23. Msg, JCS to NORAD, JCS 3078, 30 Jan 62 (253).

24. Ibid.

25. Journal of Discussions and Decisions of the Permanent Joint Board on Defense, Canada-United States, 30 April-3 May 62, p. 21 (655).

26. Msg, JCS to NORAD, JCS 4978, 12 Jun 62 (253).

27. Msg, SOPS 115P1, Canadian Army to Western Command, et al, 17 Mar 62 (251).

28. Interview with Col R. E. Nourse, Canadian Army Liaison Officer, NORAD, 8 Aug 62.

29. NORAD to USAF ADC, "NORAD Voice Alerting System," 4 Jan 62 (251).

30. Msg, USAF to NORAD, AFOAC-SC 79233, 15 Apr 62 (251).

31. NORAD to JCS, "(U) NORAD Command Alerting System Telecommunications Requirement," 16 May 62 (251).

32. ADC to NORAD, "NORAD Voice Alerting System," 18 Jun 62 (251).

33. AT&T to ADC, 3 Mar 62 (250); ADC ADLDC to NORAD, "Automatic Ballistic Missile Attack Warning System," about 18 Mar 62 (251).

[redacted]

34. 1st Ind (ADC ADLDC to NORAD, "Automatic Ballistic Missile Attack Warning System," 23 Mar 62) NORAD NECO-F to ADC, 6 Apr 62 (251); Interview, Bartlett with Lt Col F. C. Swan, NECO, 10 Aug 62.

35. Msg, CINCAL to CINCNORAD, "OPN 0075," 26 Jan 62 (251).

36. Msg, CINCNORAD to Comdr ANR, NOOP-O X-218, 22 May 62 (251).

37. NNR to NORAD, "DEW Line Surveillance Procedures - NNR Recommendations for Changes," 14 Feb 62 (306).

38. NORAD to ANR, "DEW Line Surveillance Procedures," 10 May 62 (306); NORAD to NNR, "DEW Line Surveillance Procedures," 10 May 62 (306).

39. Msg, NORAD to NNR, NOOP-E 322, 19 Jul 62 (306).

40. NNR to NORAD, "MCL Operations - Recognition of Spoofing Tactics," 4 May 62 (308).

41. Msg, NORAD to NNR, NOOP-E X251, 11 May 62 (308).