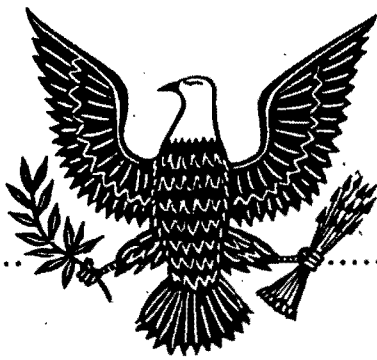


15,837



~~CONFIDENTIAL~~



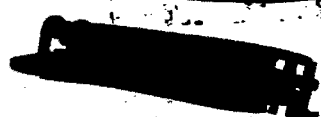
**norad/conad**

# HISTORICAL SUMMARY

( UNCLASSIFIED )

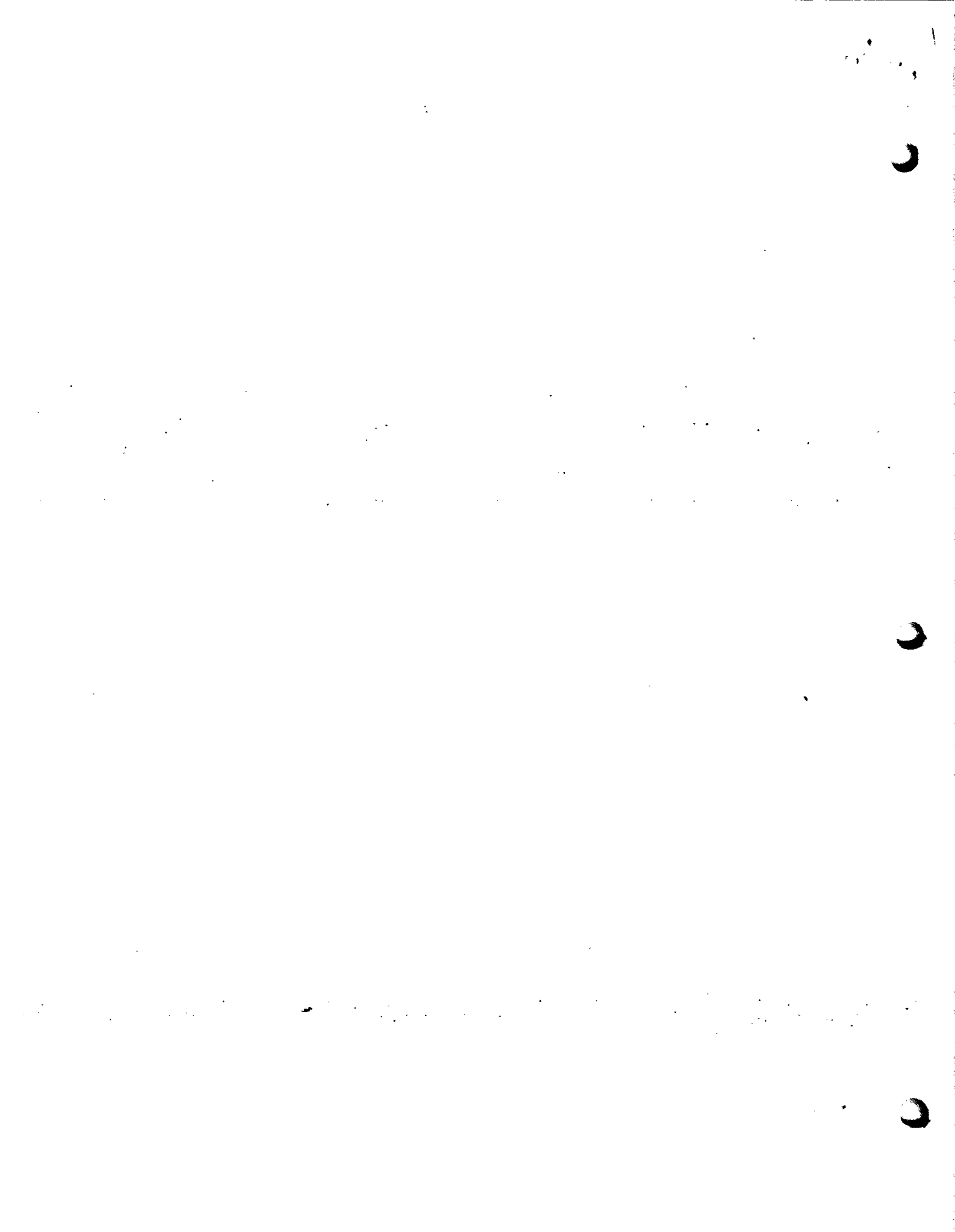
**JULY - DECEMBER 1960**

FF NO: 21487



~~SPECIAL HANDLING REQUIRED~~  
this document is releasable only  
to U.S. and Canadian Nationals.

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





## NORTH AMERICAN AEROSPACE DEFENSE COMMAND

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.

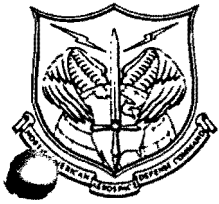
q. CONAD Command History, 1968, pages 171-173. N/J3 doesn't have the technical expertise to evaluate the classification of Chapter VII, Communications. Please refer to N-NC/J6.

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



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





**NORTH AMERICAN AEROSPACE DEFENSE COMMAND**

05 DEC 1998

MEMORANDUM FOR HQ NORAD/HO

FROM: HQ NORAD/J3

SUBJECT: History Declassification Review

1. A review of the Historical Summary, Jul-Dec 1960 (Tab 2) has been completed. One item is still considered classified:

ITEM 1: Pages 45-50, BMEWS, the paragraph that begins on page 45 with "(C) In January 1958 to the end of the paragraph on page 50...the JCS said." Classified CONFIDENTIAL.

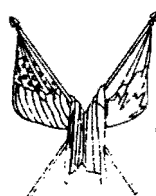
2. Recommend all other items, per Executive Order 12958, be downgraded to unclassified.

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

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

1 Attachment:

Historical Summary, Jul - Dec 1960

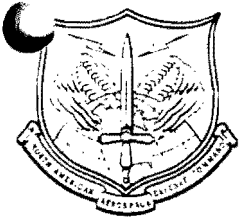






**SECRET**

This letter is Unclassified upon removal of attachments



**NORTH AMERICAN AEROSPACE DEFENSE COMMAND  
AND  
UNITED STATES NORTHERN COMMAND**



30 October 2006

MEMORANDUM FOR HQ NORAD/J3

FROM: HQ NORAD-USNORTHCOM/HO

SUBJECT: Declassification Review of Histories

1. HO requires the attached documents to be reviewed by 30 November 2006. Executive Order (E.O.) 12958, "Classified National Security Information," as amended by E.O. 13292 requires a review of classified documentation more than 25 years old. The attached documents have undergone prior declassification review, however, the E.O. requires that the still classified sections be reviewed again by the end of this calendar year, to prevent them from being automatically declassified.

2. The NORAD-USNORTHCOM History Office (HO) maintains NORAD, Continental Air Defense (CONAD), and Air/Aerospace Defense Command (ADCOM) histories, studies, and other documentation that fall into this category. In order to comply with the Executive Order, HO will forward these documents on a systematic basis to functional experts within the NORAD staff to complete this review.

3. During the review process, if any of the material within the documentation still requires protection, please mark those portions (e.g., words, phrases, sentences, paragraphs, pages) with red brackets([ ]). Justification must be rendered for any material that is determined to be exempt from the 25-year declassification process per E.O. 12958, as amended (E.O. 13292) Section 3.3 (b) -- An agency head may exempt from automatic declassification ... the release of which could be expected to:

-b(1) reveal the identify of a confidential human source, or a human intelligence source, or reveal information about the application of an intelligence source or method;

-b(2) reveal information that would assist in the development or use of weapons of mass destruction;

-b(3) reveal information that would impair U.S. cryptologic systems or activities;

-b(4) reveal information that would impair the application of state of the art technology within a U.S. weapon system;

-b(5) reveal actual U.S. military war plans that remain in effect;

**SECRET**

This letter is Unclassified upon removal of attachments



# SECRET

This letter is Unclassified upon removal of attachments

-b(6) reveal information, including foreign government information, that would seriously and demonstrably impair relations between the United States and a foreign government, or seriously and demonstrably undermine ongoing diplomatic activities of the United States;

-b(7) reveal information that would clearly and demonstrably impair the current ability of United States Government officials to protect the President, Vice President, and other protectees for whom protection services, in the interest of the national security, are authorized;

-b(8) reveal information that would seriously and demonstrably impair current national security emergency preparedness plans or reveal current vulnerabilities of systems, installations, infrastructures, or projects relating to the national security; or

-b(9) violate a statute, treaty, or international agreement.

4. Once the declassification review is complete, please prepare a memorandum for the director's / vice director's signature, i.e., the directorate's Original Classification Authority (OCA), which states:

- a. The CONAD/ADC/ADCOM/NORAD/USSPACECOM (as appropriate) history(ies) for the period(s) have been reviewed and are now declassified; or
- b. The CONAD/ADC/ADCOM/NORAD/USSPACECOM (as appropriate) history(ies) for the period(s) have been reviewed and are now declassified except for the following sections: \_\_\_\_\_. The justification for retaining the classification is (per paragraph 3).

5. Request the NJ3 staff review the attached documents per Executive Order 12958 and the instructions in paragraphs 2 and 3 above. HQ NORAD/HO POC is Patricia Goude at 4-5999. Please complete the review by 30 November 2006.



THOMAS FULLER  
Command Historian

## Attachments:

- a. NORAD/CONAD Historical Summary Jul 58 to Dec 58  
Pages: 57-59, 64-66, 68, 69, 76, 89 (CONFIDENTIAL); 110, 111 (SECRET)  
*pp 65 remains (C)  
pp 110 & 111 remain (S)  
pp. 57-59, 64, 66, 68, 69, 76, 89 (u)*
- b. NORAD/CONAD Historical Summary Jan 59 to June 59 - all pages remain (C)  
Pages: 67-71, 73, 74 (CONFIDENTIAL)
- c. NORAD/CONAD Historical Summary Jul 59 to Dec 59  
Pages: 55-65 (CONFIDENTIAL)  
*pp 55-59 (55-56 (C), 57-59 (S))  
pp. 59-61 remain (C)  
pp. 62-65 (u)*
- d. NORAD/CONAD Historical Summary Jan 60 to Jun 60  
Pages: 37-39 (CONFIDENTIAL)  
*pp 37-39 remain (C)*
- e. NORAD/CONAD Historical Summary Jul 60 to Dec 60  
Pages: 45-50 (CONFIDENTIAL)  
*pp. 45-50 (u)*

# SECRET

This letter is Unclassified upon removal of attachments



# SECRET

This letter is Unclassified upon removal of attachments

- f. NORAD/CONAD Historical Summary Jan 61 to June 61  
Pages: 20, 22-26, 28-32, 37-39 (CONFIDENTIAL) *pp 23-26 remain (c)  
p 37 remains (c) pp. 20, 22, 28-32  
38, 39 (c)*
- g. NORAD/CONAD Historical Summary Jul 61 to Dec 61  
Pages: 17, 18 (CONFIDENTIAL) *pp. 17 & 18 (u)*
- h. NORAD/CONAD Historical Summary Jan 62 to Jun 62  
Pages: 35, 36 (CONFIDENTIAL) *pp. 35 & 36 remain (c)*
- i. NORAD/CONAD Historical Summary Jul-Dec 62 / Apr 63  
Pages: 47, 48 (CONFIDENTIAL) *pp. 47 & 48 remain (c)*
- j. NORAD/CONAD Historical Summary Jul 63 to Dec 63  
Pages: 59, 60, 63-65 (SECRET) *pp. 59 & 60 - refer to NSA  
pp. 63-65 remain (s)*
- k. NORAD/CONAD Historical Summary Jan 64 to Jun 64  
Pages: 57, 58 (SECRET) *pp. 57 & 58 remain (s)*
- l. NORAD/CONAD Historical Summary Jan 68 to Dec 68  
Pages: 6-10, 43, 44, 67-70, 81-88, 93-96, 98-122, 147-154, 159-162, 171-174  
(CONFIDENTIAL/SECRET) *pp. 10, 43, 44, 67-70, 81-88, 93-96, 98-110, 113-116, 119-122  
147-154, 159-162, 174 (u)  
pp. 1 & 2 remain (s), 117 remains (s)  
pp. 171-173 refer to N-NC/5b*

# SECRET

This letter is Unclassified upon removal of attachments





# NORTH AMERICAN AEROSPACE DEFENSE COMMAND

~~CONFIDENTIAL~~

N/PAD RA JAF/PAX

09 Dec 96

MEMORANDUM FOR HQ NORAD/PA (MR JOHNSON)

FROM: HQ NORAD/HO

SUBJECT: History Declassification Review (NORAD/CONAD Jul-Dec 60)

1. The HQ NORAD/J3 staff has completed their review of the NORAD/CONAD Jul-Dec 60 and have recommended declassification of the document except for the paragraph on page 45 which starts "(C) In January 1958 . . ." through the the paragraph which starts "The JCS replied on 9 November . . ." which should remain Confidential/Rel CANUS.

2. This is the last of five histories Mr. Kristensen has asked for. Per previous conversations, it appears Mr. Kristensen may not be willing to pay the costs associated with his declassification/release request. If this is the case, we believe it would be beneficial to have JS provide release authority for those histories and history sections that NJ3 has deemed can be declassified and released. This would assist HO in its efforts to declassify materials over 25 years old in support of the new declassification Executive Order.

3. Please provide HO with a signed copy of JS declassification/release authority for its records. HQ NORAD/HO POC is the undersigned or Dr. Fuller, 4-5999/3385.

*J. Schroeder*

JEROME E. SCHROEDER  
Assistant Historian

2 Atch

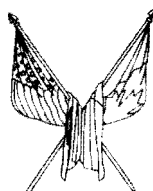
1. NORAD/J3 Memorandum (U), "History Declassification Review," 5 Dec 96.
2. NORAD/CONAD History (C/Rel CANUS), Jul-Dec 60.

**THIS MEMORANDUM MAY BE DOWNGRADED TO  
UNCLASSIFIED WHEN ATCH #2 IS WITHDRAWN**

**RELEASABLE TO CANADA/US**

~~CONFIDENTIAL~~

FOR THE COMMON DEFENCE



POUR LA DEFENSE COMMUNE

07/11

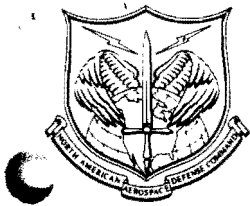
✓

○

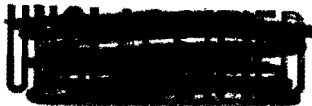
○

○





**NORTH AMERICAN AEROSPACE DEFENSE COMMAND**



05 DEC 1998

MEMORANDUM FOR HQ NORAD/HO

FROM: HQ NORAD/J3

SUBJECT: History Declassification Review

1. A review of the Historical Summary, Jul-Dec 1960 (Tab 2) has been completed. One item is still considered classified:

ITEM 1: Pages 45-50, BMEWS, the paragraph that begins on page 45 with "(C) In January 1958 to the end of the paragraph on page 50...the JCS said." Classified CONFIDENTIAL.

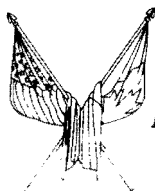
2. Recommend all other items, per Executive Order 12958, be downgraded to unclassified.

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

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

1 Attachment.  
Historical Summary, Jul - Dec 1960

**UNCLASSIFIED**



FOR THE COMMON DEFENCE

POUR LA DEFENSE COMMUNE

attn 1

10/10/10



## NORTH AMERICAN AEROSPACE DEFENSE COMMAND

22 APR 1997

MEMORANDUM FOR N/SPHO

FROM: N/J3

SUBJECT: Declassification Review of NORAD/CONAD Histories

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

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

b. NORAD/CONAD History, Jul-Dec 60: Document is downgraded to Unclassified except pages 45-50, topics "Background," Site 1, Thule, Greenland," Central Computer and Display Facility," Site 2, Clear, Alaska," Site 3, Fylingdales, England," and "Need for an Improved Warning System." Remains Confidential/Rel CANUS.

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

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

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

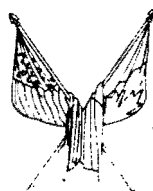
d. NORAD/CONAD History, Jan-Jun 65: Entire document is downgraded to Unclassified.

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

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

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

FOR THE COMMON DEFENCE



POUR LA DEFENSE COMMUNE





**NORTH AMERICAN AEROSPACE DEFENSE COMMAND  
AND  
UNITED STATES SPACE COMMAND**



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

11 4 APR 1997

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

Dear Mr. Kristensen

This correspondence is in response to your requests to review, declassify and release five separate NORAD/CONAD histories, each of which are over 30 years old.

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 33 United States Treaties, (UST) 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 five attached declassified NORAD/CONAD historical summaries. The only items still considered security classified were pages 45-50 of the Jul-Dec 60 history; pages 57 and 58 in the Jan-Jun 64 history; and pages 37, 38 and 39 in the Jan-Jun 60 history, which have been extracted and/or blocked-out accordingly. We hope these histories help 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 Robin Alford, Deputy Director of NORAD Public Affairs at (719) 554-5816 or Mr. Scott Johnson, Chief, Products/Plans Branch, at extension 3714.



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

Sincerely

  
ROBNEY S. LUSEY  
Colonel, USA  
Joint Secretary

5 Attachments:  
NORAD/CONAD Histories  
(less classified pages noted)

cc:  
NJ3  
HO



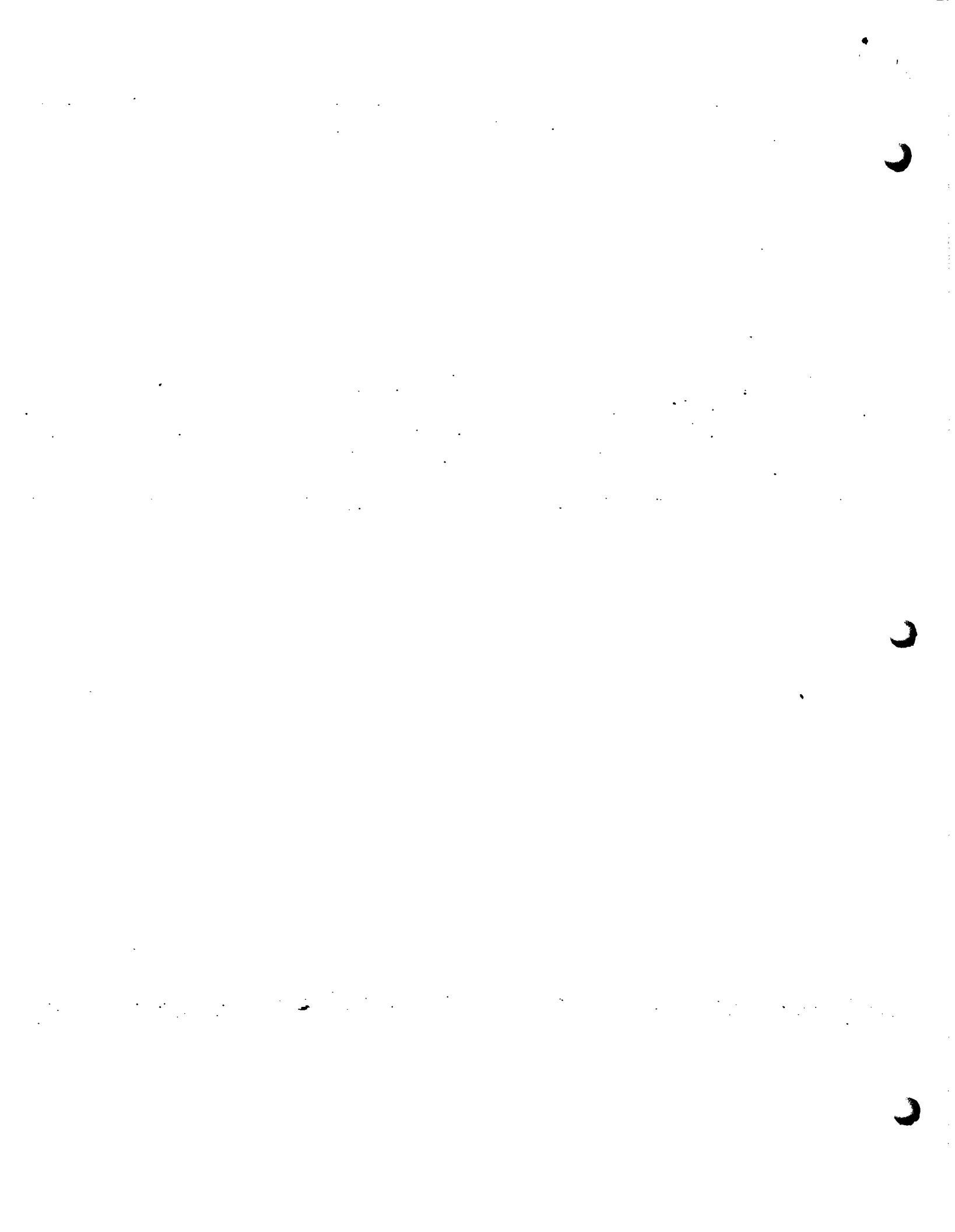


**NORTH AMERICAN AIR DEFENSE COMMAND and  
CONTINENTAL AIR DEFENSE COMMAND**

**HISTORICAL SUMMARY**

**JULY — DECEMBER 1960**

Directorate of Command History  
Office of Information  
Headquarters NORAD/CONAD



~~CONFIDENTIAL~~

## SECURITY NOTICE

### CLASSIFICATION

This document is classified SECRET in accordance with paragraph 10b (11), AFR 205-1, and Canadian Air Publication 425. It will be transported, stored, safeguarded, and accounted for as directed by AFR 205-1, AR 380-5, OPNAV Instruction 5510.1B, CAP 425, CAO 255-1, and CBCN 5101.

### WARNING

This document contains information affecting the defense of the United States and Canada within the meaning of the U. S. Espionage Laws, Title 18, U. S. C., sections 793 and 794, and Canadian Air Publication 425. The transmission or revelation of its contents in any manner to an unauthorized person is prohibited by law.

### CONDITIONS OF RELEASE

Information in this document is obtained from U. S. and Canadian Sources. It is furnished upon the conditions that:

It will not be released to other nations without specific permission from CINCNOAD. *(or other clas/declas authority)*

It will be used only for purposes of national security.

Individual or corporate rights originating in the information, whether patented or not, will be respected.

The information will be provided substantially the same degree of security afforded it by the Department of Defense of the United States and the Department of National Defence of Canada.

\*This page is marked SECRET in accordance with paragraph 34a, AFR 205-1. However, its actual classification is UNCLASSIFIED.

~~CONFIDENTIAL~~

FF NO. NI-21487

SECRET

SECRET

SECRET

## PREFACE

This historical summary is one of a series of semiannual reports on the North American Air Defense Command and Continental Air Defense Command. Its purpose is two-fold. First, it provides a ready reference to NORAD and CONAD activities by bringing together in a single document the key data found in several hundred documents. Secondly, it records for all time the activities of NORAD and CONAD during the period of the report.

The source materials from which this history was written are on file in the historical office and are available for use by all authorized persons. For security reasons, a list of the documents is not included with this history.

Colorado Springs, Colorado  
1 May 1961

L. H. BUSS  
Director of Command  
History

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

~~CONFIDENTIAL~~



CONTENTS

PREFACE		v
PART ONE		
I	HIGHLIGHTS OF THE PERIOD	
II	SUMMARY OF NORAD FORCES	
PART TWO		
I	ORGANIZATION	
	NORAD/CONAD HEADQUARTERS	1
	REGIONS AND SECTORS	6
II	SURVEILLANCE SYSTEM - MANNED BOMBER DEFENSE	
	LAND-BASED RADAR	13
	CONTIGUOUS ZONE FORCE	18
	DEW LINE EXTENSIONS	22
	NUCLEAR DETONATION REPORTING	24
III	NORAD WEAPON FORCE	
	INTERCEPTOR FORCE	28
	MISSILE FORCE	34
	AUGMENTATION FORCE	37
IV	BALLISTIC MISSILE AND SPACE DEFENSE	
	SPACE DETECTION AND TRACKING SYSTEM	41

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



	MISSILE DEFENSE ALARM SYSTEM (MIDAS)	44
	BALLISTIC MISSILE EARLY WARNING SYSTEM	45
	NIKE ZEUS	50
V	OPERATIONAL POLICIES AND PROCEDURES	
	IDENTIFICATION AND AIR TRAFFIC CONTROL	54
	WARNING AND READINESS PROCEDURES	59
	TRAINING AND TESTS	64
	FALLOUT PROTECTION	65
VI	EXERCISE SKY SHIELD	
	BACKGROUND PLANNING	69
	DESCRIPTION OF THE EXERCISE	70
	EVALUATION OF SKY SHIELD	71
	NORAD REPORT TO THE JCS AND COSC	78
	REQUEST FOR A 1961 EXERCISE	79
	GLOSSARY OF ABBREVIATIONS	83
	INDEX	89

~~CONFIDENTIAL~~



1970

PART ONE

1970



1992

~~CONFIDENTIAL~~



ONE  
HIGHLIGHTS OF THE PERIOD

ORGANIZATION

(U) On 23 November 1960, the JCS answered a June 1960 request from CONAD to add 89 spaces to the headquarters staff. The JCS validated only 21 additional spaces, which included six to be used for a liaison team to Strategic Air Command Headquarters. The gain was offset by a five percent DOD-levied manpower cut which was to cost CONAD 31 spaces.

(U) On 15 July 1960, the ADC Command Surgeon assumed the CONAD Command Surgeon position as an additional duty to fulfill a JCS directive that CONAD Headquarters have a permanent medical staff authority.

(U) During this period, NORAD CONAD discontinued three of its sectors and added two for a net reduction of one. By 1 January 1961 there were 24 NORAD and 21 CONAD sectors. The two established were Great Falls on 1 September 1960 and Minot on 1 January 1961. Discontinued were Albuquerque on 15 September 1960 and Anchorage and Fairbanks on 25 October 1960. The latter two were discontinued as part of a realignment of command and control facilities in the Alaskan NORAD Region. On the same date the two sectors were discontinued, four control centers were established in Alaska.

(U) On 28 October 1960, NORAD sent a new plan to the JCS for the headquarters organization of six regions and 21 sectors. This replaced a February 1960 plan which had been outmoded because of changes in the planned subordinate structure. NORAD proposed an implementation date of 1 April 1961 for the new plan.

SURVEILLANCE

In October 1960, USAF provided NORAD with a new

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) gap-filler program for the U. S. and Canada calling for 200 radars by December 1963. 182 sites were to get an improved AN/FPS-18, redesignated the AN/FPS-74. The remaining 18 sites were to use the AN/FPS-18. Six of these sites, located in the Goose Sector, were to be deactivated when the Greenland-Iceland-United Kingdom Dew Extension became operational.

(U) In September 1960, the JCS assigned operational control of the USAF Bomb Alarm System to NORAD when the system became operational. It was to be installed in two phases. The first phase was expected to be operational by 15 September 1961 and would provide detectors for 97 target areas in the CONUS. A Phase II schedule had not been established.

(U) The Secretary of Defense approved a USAF development plan for an automatic nuclear detonation reporting system in October 1960. As planned, it was to be operational by 1 July 1962. It would provide NORAD with the means of getting data on time, location, yield, and height of nuclear explosions.

(U) The JCS approved in December 1960 discontinuing the Atlantic Barrier between Argentina and the Azores by 1 July 1961. On the same date, a jointly sponsored land-sea extension was to be established by USAF and the Navy. This extension would run from Cape Dyer, Baffin Island, across Greenland, to Iceland, then by water to the Faeroes, and then once again by water to Scotland.

(U) On 30 December 1960, the CNO proposed discontinuing the Pacific Barrier between Midway Island and the Aleutians by 1 March 1961 to offset FY 1962 budget limitations. NORAD told the CNO and JCS on 4 January 1961 that eliminating the barrier would cut warning time to the bone and some alternate means of getting early warning had to be set up.

#### WEAPONS

(U) USAF issued a new program for the U. S. interceptor force in December 1960. This called for 40 squadrons and 865 aircraft for the end of FY 1964.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) In December 1960, the RCAF advised NORAD that four of its nine CF-100 interceptor squadrons would be disbanded in 1961. The other five squadrons were to stay in existence and keep their aircraft at least until March 1963.

(U) USAF also issued a firm Bomarc program in December 1960. There were to be ten squadrons -- eight in the U. S. and two in Canada with 210 A missiles and 195 A launchers, and 252 B missiles and 244 B launchers.

(U) In December 1960, the JCS approved a September 1960 NORAD plan for a first-line augmentation force of 25 ANG squadrons. These squadrons were expected to assume a 24-hour alert commitment in July 1961.

By January 1961, agreement had been reached with Canada for using six of ten bases NORAD wanted for an interceptor recovery base program. Use of the recovery bases would allow U. S. interceptors to engage an enemy attack as far from target areas as possible.

#### SPACE AND BALLISTIC MISSILE DEFENSE

(U) On 26 November 1960, CINCNORAD assumed operational control and CINCONAD operational command of the Space Detection and Tracking System (SPADATS). SPADATS consisted of the Navy's Space Surveillance System (SPASUR) and the Air Force's Spacetrack. CINCONAD was responsible for integrating SPASUR and Spacetrack.

(U) BMEWS Site 1, Thule, Greenland, attained initial operational capability on 30 September 1960. The NORAD central computer and display facility and the SAC display facility also were placed into limited operation on this date.

#### POLICY, PROCEDURES AND EXERCISES

(U) During the last half of 1960, NORAD made arrangements with Canada to change identification procedures

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) and air defense identification zones. These changes were needed to meet the current threat and to take advantage of improvements in radar coverage. On 12 December 1960, NORAD concurred in a revised Canadian Air Navigation Order, which was to be published in early 1961 to reflect these changes.

(U) The flight following of all SAC tactical aircraft by the air defense system began on 15 December 1960. This was the result of Project Trail Smoke, a jointly sponsored FAA-USAF test with NORAD, ADC, and SAC participating. Project Trail Smoke proved that it was practical for the air defense system to flight-follow all SAC tactical aircraft. NORAD approved the Trail Smoke findings and ADC issued a directive on 24 November to implement the flight following.

(U) Trail Smoke also determined the feasibility of FAA using SAGE to provide flight advisory service to aircraft operating at 24,000 feet and above. On 14 December 1960, NORAD recommended the program to USAF with certain reservations.

(U) An air defense buffer zone along the U. S.-Mexican border in the Los Angeles Air Defense Sector (LAADS) was approved by NORAD on 6 December 1960. Negotiations with Mexico to establish an adequate ADIZ along the U. S.-Mexican border had failed. To cut down on the cost of policing the ADIZ in the LAADS against a rising number of unknown aircraft, the 28th NORAD Region proposed to NORAD that the buffer zone be set up.

(U) The Navy and Tactical Air Command (TAC) agreed to abide by SAC/NORAD training procedures when engaged in joint training with SAC aircraft. The Navy signed the agreement on 27 October 1960 and the USAF concurred on 4 November. NORAD published the Navy agreement on 16 December as an attachment to the basic SAC/NORAD regulation. TAC signed the agreement on 12 December, but it had not been published by NORAD by year's end.

(U) NORAD's Fallout Shelter Program was outlined in a directive to ADC and ARADCOM on 30 June 1960. These

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) two commands were asked to develop fallout shelter programs in accordance with NORAD's requirements. The requirement was to provide austere fallout protection for operational and support personnel, and equipment of a critical nature. NORAD stated that the minimum requirement was to provide a shielding capability against radioactivity. No blast or thermal protection would be provided other than that offered by the fallout shelter.

(U) On 10 September 1960, NORAD and SAC conducted a continent-wide air defense exercise named Sky Shield. The purpose was to train the air defense system against an attack on North America. During the six hours the exercise lasted, all non-exercise air traffic in Canada and the United States was grounded.

~~CONFIDENTIAL~~



TWO  
SUMMARY OF THE FORCES  
(As of 1 January 1961)

(U) MISSILE FORCE

Regular

107 Hercules Fire Units - 1273 Missiles  
166 Ajax Fire Units - 3729 Missiles  
5 Bomarc A Squadrons - 193 Missiles

Augmentation

6 Hercules Batteries (Provisional)

(U) INTERCEPTOR FORCE

Regular

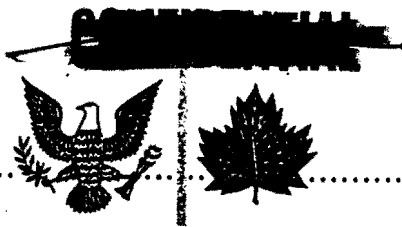
52 Fighter Interceptor Squadrons\* - 828 aircraft

Augmentation

550-600 Aircraft from Navy/Marines (29-33 Squadrons)  
296 Aircraft from IAC Regular Force  
94 Aircraft from ATC Regular Force  
59 Aircraft from USAF ADC Training Base  
38 Aircraft from RCAF ADC Training Bases  
Aircraft from the Royal Canadian Navy  
on an "as available" basis.  
38 Squadrons from ANG (ADC)  
22 Squadrons from ANG (TAC)

(U) \* One squadron had no aircraft. In all, 12 squadrons were not standing alert for one reason or another, such as conversion to new aircraft.





**SURVEILLANCE AND CONTROL**

(U) Surveillance

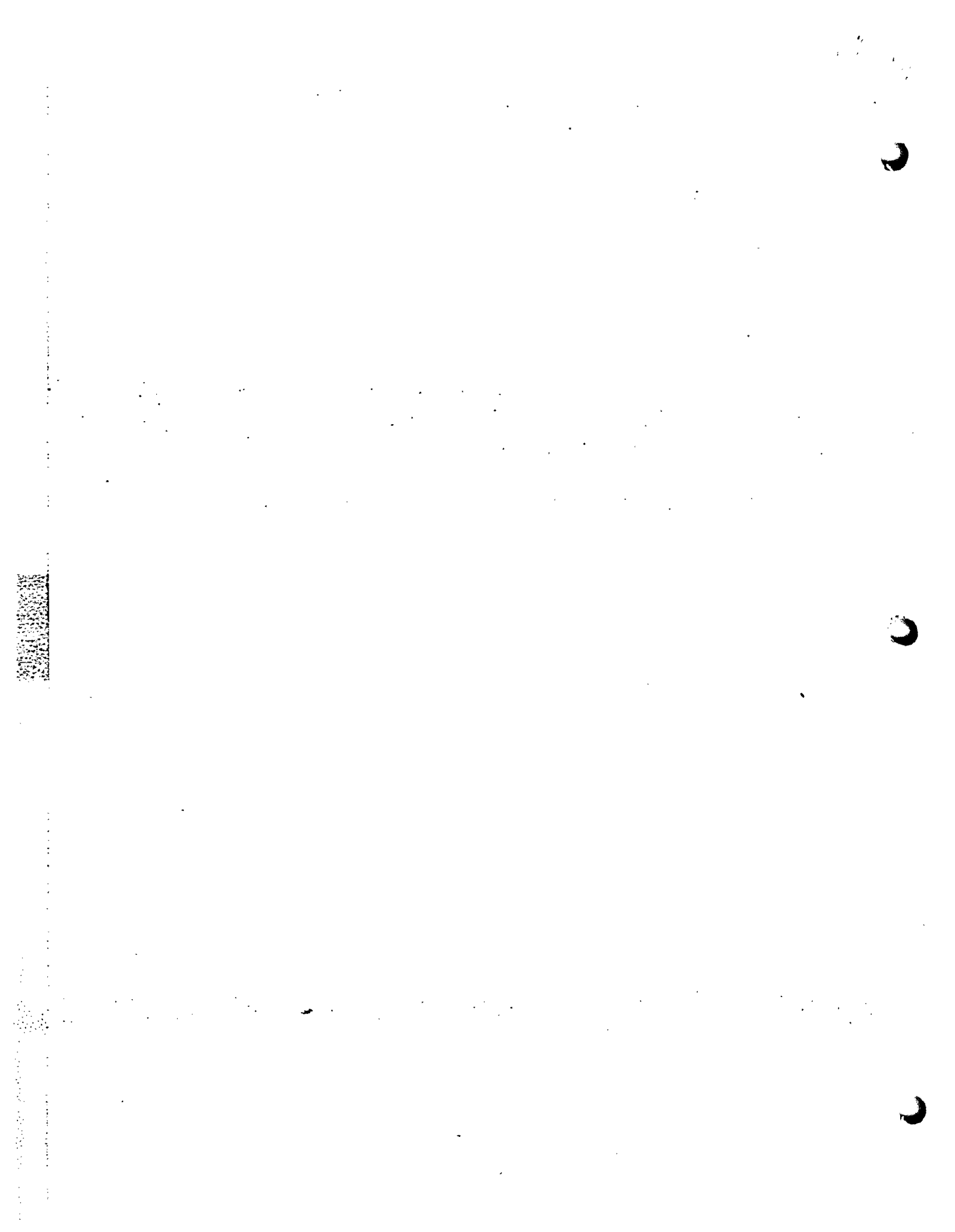
- 178 Prime Radars
- 108 Gap Filler Radars
- 63 Distant Early Warning Stations
- 98 Mid Canada Line Stations
- 10 Picket Ship Stations
- 7 Airborne Early Warning and Control Aircraft Stations
- 8 1/2 Barrier Aircraft Stations
- 3 Barrier Picket Stations
- 1 Ballistic Missile Early Warning Station
- 1 Space Detection and Tracking System

(U) Control

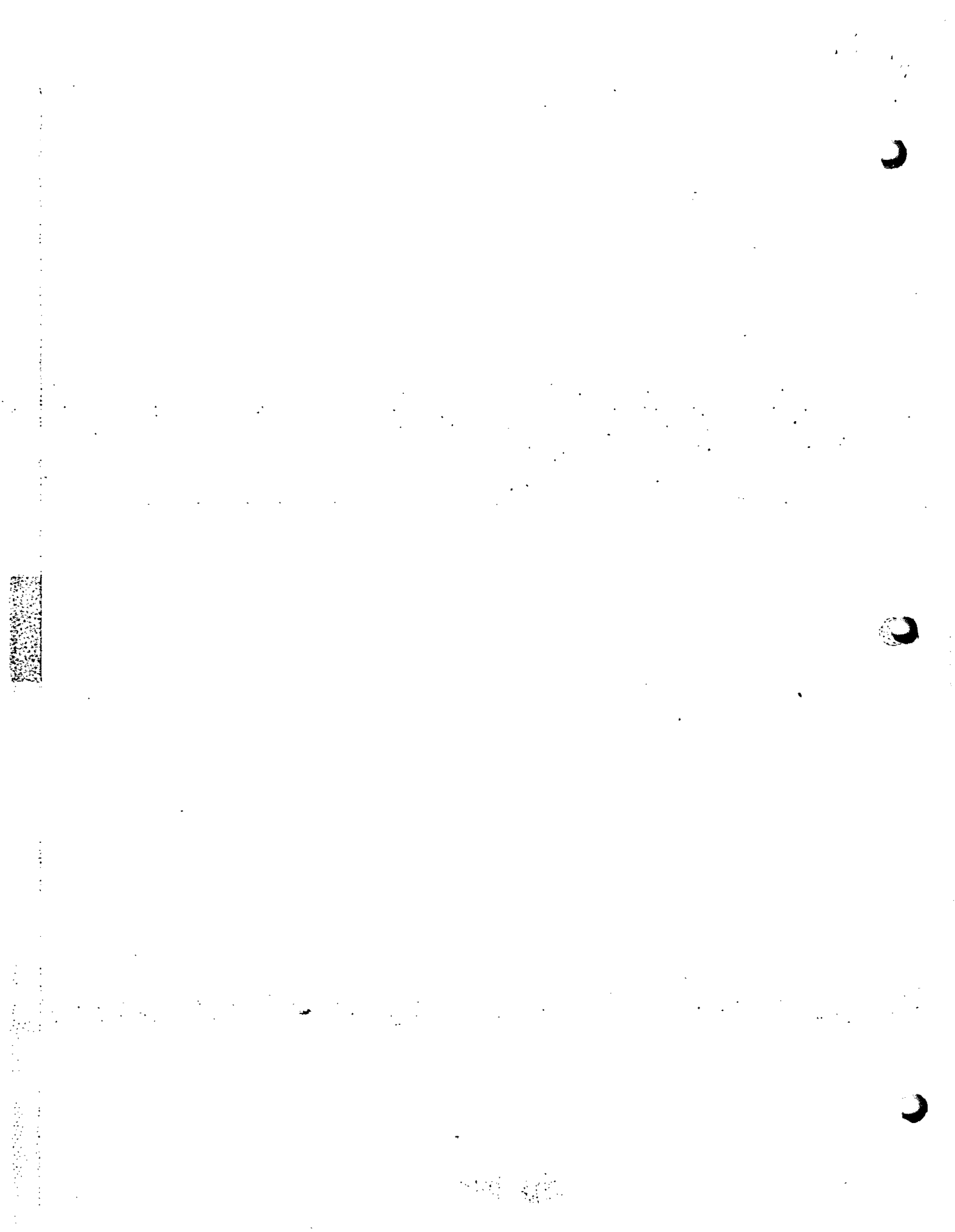
- 1 Combat Operations Center
- 3 SAGE Region Combat Centers
- 6 Manual Region Combat Centers
- 15 SAGE Sector Direction Centers
- 7 Manual Sector Direction Centers
- 35 Control Centers

(U) **AUTHORIZED MANPOWER**

- 159,321 - Total NORAD
- 87,576 - Augmentation Forces
- 7,626 - (Approx.) Naval Operating Personnel in CINCLANT/CINCPAC Barriers



PART TWO



~~CONFIDENTIAL~~



ONE  
ORGANIZATION

## NORAD/CONAD HEADQUARTERS

### HEADQUARTERS MANNING

(U) In June 1959, the Joint Chiefs of Staff approved, with certain changes, a CONAD-submitted plan for the organization of NORAD/CONAD Headquarters. Among the changes was a reduction in the number of personnel requested. CONAD had asked to add 521 spaces to the current authorization of 445 (which included 35 Canadians) to bring the total to 966. The JCS authorized an increase of fifty percent over the authorized strength of 445. This meant an increase of 223 to bring the total to 668. The JCS provided, however, that when appropriate, NORAD/CONAD should reexamine the organization and recommend modifications and adjusted personnel ceilings.

(U) On 27 June 1960, CONAD submitted a new joint table of distribution to the JCS for NORAD/CONAD Headquarters. A total of 89 additional spaces was requested. Because of downward adjustments in the current NORAD/CONAD authorization of ten spaces, to 658, this would mean a new total of 747 spaces. This was still 219 spaces below the original CONAD request of 966.

(U) While CONAD's new request was being considered, on 19 July, General Nathan F. Twining, Chairman of the JCS, wrote to General Kuter pointing out that the JCS were becoming increasingly concerned over the requirement for assignment of large numbers of senior officers. General Twining asked General Kuter to consider personally the staffing requirements of his headquarters and to review with his component commanders any areas of possible duplication between their staffs. Following this, General Kuter directed his headquarters and the component headquarters to review functions and manning. He also asked for personal comment from the component commanders.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) The review was completed and the results were forwarded on 12 September to the JCS. General Kuter stated in this letter that an exhaustive reevaluation of all functions and requirements had shown that the requirement for a total of 747 spaces in NORAD/CONAD Headquarters was fully justified.

(U) He explained that the NORAD/CONAD mission required a complete war-time staff for peacetime operations. There would be no time to augment the headquarters during emergencies or actual hostilities. This resulted in manpower requirements that were not found in other headquarters. Also, because the command was international, it was necessary that RCAF spaces be included in the NORAD totals.

(U) No duplication of effort had been found. General Kuter pointed out that the component and NORAD/CONAD Headquarters, all contributing to a single mission, used the same nomenclature and organizational elements. This was a sound and efficient practice. But, he said, this could create the impression that there was duplication at successive levels of command. He was satisfied, however, that lower levels of command extended the functions of similarly-named higher levels and did not duplicate them.

(U) A month after this review for the JCS, the Secretary of Defense ordered a five percent manpower reduction against all unified commands. On 12 October, the JCS informed CONAD that its manpower authorization was to be cut by 31 spaces (25 military and six civilian). The military spaces were to be cut by 30 June 1961, the civilian spaces by 31 December 1960. The total personnel reductions as of 31 December consisted of six civilian and 15 military spaces. Reduction of ten more military spaces by 30 June 1961 remained.

(U) On 23 November, the JCS answered CONAD's request for 89 more spaces, stating that a review of the requirements had validated 21 of these additional spaces. But six of these had already been approved on 2 September for a liaison team to Strategic Air Command Headquarters (see below). Therefore, this meant the addition of only 15

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



more spaces to the NORAD/CONAD Headquarters staff itself.

(U) Following this activity, on 10 December 1960, the Secretary of Defense wrote to General Kuter, stating that there were "two conditions which require that we overlook nothing in our efforts to meet our financial difficulties. The first of these is the tight budget situation, and the second the balance of payments problem." The Secretary said he would appreciate any recommendations of savings that could be made in such areas as installation activities and manpower spaces through consolidation or elimination.

(U) General Kuter replied that the manpower requirements of his headquarters had already been reduced by 24 percent from the original estimates. The component headquarters had been alert to the necessity of austere manning and had recently made an extensive study which resulted in a refinement of their organizations and manpower savings. Said General Kuter, "I believe that we have reached the bottom of the barrel under this line of approach." However, he continued, he believed that savings could be made through clarification of the channels of authority in the unified command structure and a realignment of functions and responsibilities between the unified and component commanders.

(U) The latter views had been explained in an earlier letter to the Secretary of Defense in response to a query from the Secretary. General Kuter said he felt that there were two major areas that needed to be changed. First, there was the need to make the JCS, rather than the Services, responsible for developing combat doctrine, and for delegating this responsibility within their operational chain of command as appropriate. Secondly, there was the need to give the JCS the authorities and responsibilities they needed to permit their unified commanders to exercise operational control.

(U) It seemed apparent, General Kuter said, that, at least in his command, development of combat doctrine

~~CONFIDENTIAL~~



(U) for the accomplishment of a military function should rest with the organization charged with that function. CINCONAD was charged with responsibility for unified air defense of the U.S., but the development of doctrine for unified air defense was not his responsibility. Because of legislative and Department of Defense provisions, the Services were responsible for doctrine. They, in turn, delegated the preparation of doctrine to the component commands. This confused command channels for one thing. For another, it was almost impossible, or excessively costly, to integrate equipment or systems designed for unilaterally-developed doctrine to accomplish a unified mission.

(U) In regard to the second problem mentioned by General Kuter, he pointed out that almost every aspect of operational command involved money. It had proved impossible for CINCONAD, he said, to exercise the full operational command demanded of him by the JCS when the latter, as a corporate body, had not assumed the authority and responsibility for the money needed to make operational command effective.

(U) There were two miscellaneous headquarters staff matters during this six month period, one was a proposal that was turned down, the other was a directive that was put into effect. First, in December, the JCS asked for CINCNORAD's views on assignment to his staff of a political adviser. This had been proposed by the State Department. CINCNORAD replied that there did not seem to be justification for an adviser of this sort because NORAD did not have a large number of international problems or relations such as those of Pacific Command, for example. CINCNORAD stated that he preferred to rely on existing machinery (CINCNORAD to JCS to Secretary of Defense to State Department) "for handling our few problems with international implications."

(U) The second matter was assignment of a medical staff authority to the CONAD staff. In June, the JCS issued a memorandum that required a permanent medical staff authority in CONAD Headquarters to assure joint coordination and review of medical support plans and effective command coordination of medical operations. The JCS directive



~~CONFIDENTIAL~~



(U) suggested that this position might be filled by the staff surgeon of a component command as an additional duty. CONAD decided to appoint the USAF ADC Command Surgeon to this position. ADC concurred and, effective 15 July 1960, its command surgeon assumed the additional job of being CONAD Command Surgeon. The first revision of the CONAD staff structure after this, on 22 November 1960, included the command surgeon position.

#### NORAD LIAISON TEAM TO SAC HEADQUARTERS

CINCNORAD and CINCSAC had agreed on the need for exchanging liaison teams. The NORAD team was to handle such matters as bringing about a closer working relationship and better understanding between the offensive and defensive forces, and assisting in safe passage of SAC aircraft.

(U) As noted above, on 27 June 1960, NORAD submitted a proposed joint table of distribution for NORAD/CONAD asking for a total of 89 new spaces. Six of these 89 spaces were for USAF officers (two lieutenant colonels and four majors) for this liaison team. On 26 August, CINCNORAD urged the JCS to approve immediately the six spaces. There was now an additional requirement for liaison at SAC, he said. At a 24 August conference at Offutt AFB, a requirement had been established for permanent liaison from unified commands with the new Strategic Target Planning Agency. CINCNORAD said he would not require additional personnel for this new requirement, but would use the liaison team chief in a dual capacity. This required, however, that one of the lieutenant colonel grades asked for be raised to a colonel grade for the team chief position.

\*

(U) The JCS approved both requests on 2 September.

(U) \* The NORAD team chief reported to SAC Headquarters on 2 February 1961 and the other members were scheduled to arrive by 6 March 1961.

~~CONFIDENTIAL~~



## REGIONS AND SECTORS

### REGION REORGANIZATION

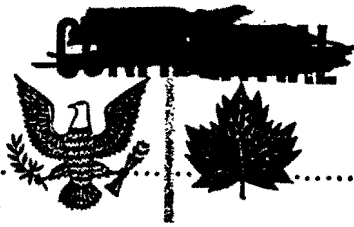
(U) Background. Since mid-1958, the NORAD/CONAD subordinate unit organizational structure had been undergoing extensive changes. These included the discontinuance of geographically-designated regions, discontinuance of divisions, establishment of numerically-designated regions and named-sectors, and realignment of region and sector boundaries. The purpose of these changes was to reorganize the structure to accommodate the semi-automatic ground environment (SAGE) system.

(U) The original plan of NORAD/CONAD was to establish a seven-region structure within the continental U. S. The reorganization actions taken by 1 July 1960 eliminated all NORAD/CONAD divisions and established seven regions on the U. S. mainland (there was also the Alaskan NORAD/CONAD Region and the Northern NORAD Region). The USAF Air Defense Command structure was undergoing a similar reorganization, and ADC had established seven SAGE divisions by 1 July 1960. The U. S. Army Air Defense Command also planned originally to establish a seven-region structure, but no changes from its five-region organization had been made as of 1 July 1960.

(U) In 1959, NORAD/CONAD and USAF ADC changed their organization plans when they adopted, and USAF approved, a plan to install improved SAGE computers at nine combat centers within the continental U. S. These were to be called Super Combat Centers. After reaching seven regions/divisions, they planned to go on to nine regions/divisions. However, the Super Combat Center program was cancelled by the Air Force in 1960 and the organizational plans had to again be revised.\*

---

\* See NORAD/CONAD Historical Summary, Jan-Jun 1960, pp 1-20, for a discussion of air defense program revisions during this time.



(U) A new organizational plan was developed by NORAD which would provide six regions within the continental U. S. (plus one in Canada and one in Alaska). Since as of 1 July 1960, there were already seven regions in the U. S., this meant that one region had to be discontinued. It was planned that the 33d Region, headquartered at Richards-Gebaur AFB, Missouri, would be discontinued on 1 July 1961 and its area divided between the 29th and 32d Regions. The location of the 29th Region Headquarters was to be changed to Richards-Gebaur AFB on 1 July 1961, and the 32d Region Headquarters was to be moved to Oklahoma City AFS on 1 August 1961.

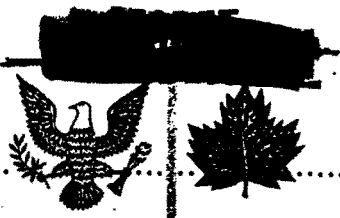
(U) In addition to the establishment of seven regions within the continental U. S., the reorganization actions taken by 1 July 1960 established five new sectors to make a total of 19 (there were also four sectors in Canada and two in Alaska). By 1 July 1960, 13 sectors were SAGE operational. Three SAGE combat centers, at the 25th, 26th, and 30th Regions, were also operating.

(U) NORAD/CONAD Organizational Changes and Status (1 July to 31 December 1960). As noted above, NORAD/CONAD established seven regions and USAF ADC seven SAGE divisions within the continental U. S. as of 1 July 1960. The last geographically-designated region to be discontinued was Western, whose area was divided between two NORAD/CONAD divisions, the 25th and 28th. Both were redesignated regions on this date. USAF ADC discontinued the last of its defense forces (Western) on 1 July and redesignated its 28th Air Division as a SAGE division.

(U) The U. S. Army Air Defense Command established its sixth region, the 7th Region USARADCOM, effective 26 July 1960, with headquarters at McCord AFB, Washington.

(U) By 1 January 1961, NORAD/CONAD had discontinued three sectors, Albuquerque on 15 September,\* and

(U) \* USAF ADC discontinued its Albuquerque Air Defense Sector on 1 November 1960.



(U) Anchorage and Fairbanks on 25 October. Two sectors were established, Great Falls on 1 September 1960 and Minot on 1 January 1961. This made a net reduction of one in the number of sectors in NORAD/CONAD from those in existence on 1 July 1960. As of 1 January 1961, there were 24 NORAD and 21 CONAD sectors. Fifteen of the sectors were SAGE operational.

#### PLAN FOR ORGANIZATION OF REGION AND SECTOR HEADQUARTERS

(U) In February 1960, a plan for the organization of NORAD/CONAD region headquarters was submitted to the JCS. It provided for the regions on the U. S. mainland only, and did not cover sectors except to state that it was assumed that the concepts and principles approved for regions would be applicable to sectors. Alaskan Region was left to the organization wishes of Commander-in-Chief Alaskan Command, and Northern NORAD Region was organized separately. NORAD proposed that the date for implementation of its plan be 1 July 1960.

(U) A month after the plan had been sent to the JCS, USAF Headquarters advised of reductions in programmed air defense equipment. Among these cuts was cancellation of the SAGE Super Combat Centers. Following this, as discussed earlier, NORAD changed its plan for boundaries and number of regions (Plan X). The organization was to drop from seven to six regions within the continental U. S.

(U) Because of this, the JCS returned the headquarters organization plan on 27 June 1960 and asked for a new one based on NORAD's planned new structure of six regions. They also asked that a sector headquarters plan be worked out and be included.

(U) A new plan, covering NORAD/CONAD regions and sectors in the continental U. S., was submitted on 28 October 1960. It provided for six regions and 21 sectors. Left out was the 33d Region, which had been in the previous plan, but which was to be discontinued on 1 July 1961. NORAD asked the JCS to approve an implementation date of 1 April 1961.



(u)

The revised plan called for less personnel for the regions than the February plan as a result of force and function reductions. The manpower requirement for the seven regions in the February plan was 479; in the October plan it was 356 for the six region headquarters. Of this total, 58 spaces were RCAF, the same number as in the February plan. For the 21 sectors within the continental U. S., the plan set a total manpower requirement of 358. But of these, the majority were RCAF spaces -- 273 of the total. Only 85 U. S. spaces were required.

(u)

However, the RCAF manpower requirement was again changed. In the next two months, NORAD reviewed the RCAF requirement and on 20 December, proposed a new set of figures to the RCAF Chief of the Air Staff. NORAD asked for a few more people than in the October plan. The latter set RCAF requirements at a total of 331 (58 for regions and 273 for sectors); NORAD's December proposal was for 346. Actually, this represented a reduction from what had been approved by the RCAF. The latter had approved manning for the ten-region Super Combat Center plan which called for 385 RCAF spaces. NORAD's December proposal, therefore, was lower by 39 spaces than this approved total.

(u)

NORAD pointed out that these 39 spaces (four officers and 35 airmen) were surplus. But NORAD suggested that two officers be assigned to NORAD Headquarters for the purpose of completing the assignment of a Canadian representative to each key staff section of the headquarters.

(u)

NORAD's organization plan submitted to the JCS in October carried the same dual-role, manpower-saving command arrangement as the previous plan. The region commander was to be a NORAD/CONAD commander, responsible to the NORAD/CONAD Commander-in-Chief. But he could be additionally designated as commander of his service component at the appropriate region. The deputy NORAD/CONAD region commander would always serve in a dual capacity. He would be the assigned commander of his service component as a primary duty and be designated deputy region commander as an additional duty.





(U) In those regions where a Canadian was to be the deputy commander, the Canadian deputy was to be known as the NORAD Vice Commander. He was to be over the dual-capacity deputy commander mentioned above.

(U) The February plan (the one that had been returned by the JCS) had provided that two of the seven regions, the 28th and 33d, would be commanded by Army officers. But now the 33d Region was to be dropped, as noted above, so the October plan provided for only six regions. Therefore, this plan provided that only the 28th Region was to be commanded by an Army officer. The other five regions within the continental U. S. were to be commanded by Air Force officers. The Northern NORAD Region was commanded by an RCAF officer and the Alaskan NORAD Region by a USAF officer.

#### HUDSON BAY SECTOR

(U) In the first six months of 1960, NORAD and Northern NORAD Region had agreed on and put into effect a realignment of Canada-U. S. border region boundaries and established a large surveillance area in the rest of Canada. This surveillance area was created out of territory that had formerly been within the 3d, 5th, and 64th NORAD Divisions' areas. The 5th (whose area was taken over by the 25th Region) had had an area running to the North Pole, the 3d Division had also continued to the North Pole, and the 64th had gone just short of the North Pole.

(U) But on NNR's suggestion, the boundaries were changed so that the 25th Region (the 5th and 25th combined) stopped at the 59th parallel, the northern border of the 29th and 30th Regions and the 3d Division ran along the 55th parallel, and the 64th Division northern border stopped at the 66th parallel. About the time that these boundaries were established, the 64th Division became the Goose Sector and the 3d Division the Ottawa Sector.

(U) NNR proposed that the large area of Canada remaining (the area north of these sectors and regions),



(U) which contained the Mid-Canada Line and the Canada portion of the DEW Line be designated as a surveillance area under the operational control of NNR. NORAD agreed and suggested that the new surveillance area be included within NNR's area without separate designation so as to avoid confusion. The Chief of the Air Staff and NNR concurred.

(U) In September 1960, the matter of this surveillance area came up again in a new context. The Chief of the Air Staff pointed out to NORAD that the SAGE reorganization in Canada would by 1964 eliminate one of the existing manual sectors and reshuffle boundaries so that there would be two SAGE sectors (Ottawa and Bangor) and one manual sector (Goose). That part of Canada north of the SAGE control area would appear to the uninitiated, he said, to be outside CINCNORAD's authority and responsibility. As one way of avoiding confusion, he suggested that an additional sector be established which would encompass all of the area of Canada north of these sector boundaries.

(U) NORAD sent its concurrence on 27 October, stating that it would publish a general order establishing the sector. NORAD said further that the general order would delegate authority to the NNR commander to designate a NORAD commander for the new sector and that this authority would be exercised at his discretion.

(U) NORAD's order established this new sector, the Hudson Bay NORAD Sector, effective 16 January 1961. The order gave NNR Headquarters as the sector address. This immediately resulted in confusion. NNR wired NORAD that mail was being received for this sector and since there was no commander, headquarters, or staff, this created confusion and a unnecessary workload. NNR's commander said he had no intention of appointing a commander or forming a separate headquarters for this sector. He asked that the address for this sector be deleted and that instructions be issued that no mail be sent to it.

(U) A second part of NNR's proposal in September 1960 was to keep the designation Northern NORAD Region for the Canadian region. NORAD had given all of its



(U) regions within the continental U. S. a numerical designation. And since July 1958, when NORAD issued its first SAGE geographic reorganization plan, NORAD had termed the Canadian SAGE region the 35th NORAD Region. The 35th was a number that USAF ADC and NORAD had used for one of their divisions before the start of the SAGE reorganization. The old 35th had its headquarters at Dobbins AFB, Georgia. In the reshuffle, on 15 November 1958, NORAD discontinued its 35th Division and ADC redesignated its 35th Air Division as the 32d Air Division (SAGE).

(U) At any rate, NORAD concurred on 27 October to keep the designation Northern NORAD Region.

#### ELIMINATION OF ALASKAN SECTORS

(U) On 15 May 1960, in keeping with NORAD's plan of redesignating divisions as regions or sectors, Alaskan NORAD Region's two divisions, the 10th and 11th, were redesignated as sectors. The 10th NORAD Division was redesignated the Anchorage NORAD Sector and the 11th NORAD Division the Fairbanks NORAD Sector.

(U) At mid-September, the Alaskan Command informed NORAD that because of the deactivation by the Alaskan Air Command of its 10th and 11th Air Divisions, it was necessary to realign the command and control facilities of the Alaskan NORAD Region. ALCOM said it wanted to establish a system whereby there would be centralized supervision by the Alaskan NORAD Region combat center and decentralized control and execution by four NORAD control centers (Fire Island, Murphny Dome, Campion, and King Salmon). Accordingly, ALCOM asked that the Anchorage and Fairbanks Sectors be discontinued and that authority be given to establish the control centers. NORAD approved both requests.

(U) The two sectors were discontinued by NORAD/CONAD effective 25 October 1960, and ALCOM established the four control centers this same date.



~~CONFIDENTIAL~~



TWO  
SURVEILLANCE SYSTEM-  
MANNED BOMBER DEFENSE

LAND-BASED RADAR

PRIME RADAR

(U) General Program. Following a series of revisions in air defense programs, \* Headquarters USAF provided general ground environment guidance on 9 June 1960. In regard to prime radar, USAF said that the entire high altitude detection program was to be completed no later than April 1964 for height finders and July 1964 for search radars. The quantities listed by USAF to complete this program (including seven sites for Canada in the CADIN program) were 93 frequency diversity search radars and 99 AN/FPS-26 height finders.

(U) Following receipt of this guidance, ADC prepared a plan which called for a total of 193 search radars (of which 93 would be FD's) and 308 height finders (of which 99 would be FD's). This plan was approved by NORAD on 15 December 1960.

(U) However, the SAGE (416L) Project Office drew up a system schedule, at USAF's request, which set slightly different totals: 188 search and 318 height finder radars. NORAD had not been given an opportunity to comment on this schedule.

(U) The program was obviously still uncertain at the end of the year. NORAD's program contained even a third set of figures.\*\* For one thing, both the ADC and SAGE

(U) \* For the history of program actions during the year June 1959-June 1960, see NORAD/CONAD Historical Summary, Jan-Jun 1960, pp 1-20.

(U) \*\* As of 1 January 1961, NORAD planners set the expected totals for prime radars at 187 search and 315 height finder radars. For all areas, including Alaska, NORAD set the totals at 205 search and 335 height finder radars.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(u) PO schedules carried 93 search and 99 height FD radars. NORAD's program had one less of each. An AN/FPS-27 for Cut Bank, Montana, had been deleted and an AN/FPS-26 for Ellsworth AFB, South Dakota, was dropped.

(u) Another provision that USAF laid down in June was that nineteen radars in the current system were to be closed down and seven others transferred to FAA. Seventeen of the radars were to be inactivated by the fourth quarter of FY 1961, the others a year later; the seven radars were to go to FAA in the first quarter of FY 1962. However, ADC got USAF's approval to keep four of the sites to be shut down and Canada would not agree to close another one (C-22, Redcliff, Newfoundland). On the other hand, ADC transferred to Air Training Command a site not previously considered. As of 1 January 1961, 12 sites had been shut down and one had been transferred for a drop of 13 altogether.

(u) Additional Radars for Eastern Mid-Canada Line. In May 1960, NNR proposed adding radar along the eastern section of the Mid-Canada Line. As first choice, NNR wanted to add two AN/FPS-24 frequency diversity radars at Winisk and Knob Lake. If this was not possible, it wanted to take two FPS-7's, part of five radars programmed for Western Canada in the CADIN program, and move them to the east. If neither proposal could be supported, NNR wanted FPS-20's deployed at Winisk, Knob Lake, and Great Whale.

(u) NORAD concurred in principle but would not commit itself until final decisions were made on the then indefinite interceptor and Bomarc programs. At mid-July, NORAD again agreed in principle to the need for additional radars along the eastern MCL. It might be possible, NORAD wrote, to deploy three FPS-20's from U. S. resources. NORAD said that it would support a requirement for the three FPS-20's if they could be justified on a cost/effectiveness basis and could be deployed without affecting the program for the five western radars.

(u) On 19 August 1960, NNR sent a study on the need [ ]

~~CONFIDENTIAL~~



(U) for the radars. Of the three suggested approaches to additional coverage, NNR said that use of two FPS-24's, as originally proposed, would be best. Next best would be three FPS-20's. Availability of RCAF personnel to maintain and operate new radars might be a critical factor, NNR continued. However if the requirement was stated and the Canadian Government agreed to it, the manpower could be found. The new radars might even result in a net military-civilian manpower saving to Canada, said NNR, for by the time they were installed the MCL would have no continuing value and could be abandoned.

(U) A requirement for three FPS-20's was being written into the NORAD Objectives Plan for 1963-1967.

#### GAP-FILLER RADAR

(U) General Program. In the general ground environment guidance issued by USAF in June 1960, mentioned above, USAF said it was tentatively maintaining a program of 93 new gap fillers (including 45 in CADIN), but this was being held in abeyance until the number required was resolved.

(U) NORAD issued new criteria for low altitude coverage later in June 1960. One point of this provided that coverage would be 180 nautical miles forward of Bomarc B bases rather than 230 nautical miles forward which USAF wanted. Another point in NORAD's criteria was that coverage would be provided above flyable terrain rather than simply above terrain.

(U) One matter to be settled was gap fillers for Canada. On 8 July 1960, at USAF's request, ADC submitted a gap-filler deployment plan. In it, ADC pointed out that RCAF had advised that probably another seven gap fillers (over the 45 in CADIN) would be needed to provide either the 180nm or 230nm Bomarc B forward coverage.

(U) On 4 August 1960, RCAF told USAF that Canada needed to know whether USAF's 230nm forward coverage criteria or NORAD's 180nm criteria would be used. Survey teams, RCAF said, were ready to go into the field. To avoid wasted





(U) effort, RCAF wanted confirmation of one or the other criteria. USAF replied that for siting purposes, NORAD's line should be used. But, USAF continued, if there was time, an estimate should be made on the number of gap fillers needed using the 230nm criteria.

(U) In September, RCAF told USAF that the survey teams had finished their work. The siting effort had been based on locating the 45 CADIN gap fillers under NORAD's criteria. There were enough gap fillers, said RCAF, to provide coverage in all but the northeast corner of NORAD's Priority Area One. An additional four to six gap fillers would be needed for this corner. RCAF said that it had been unable to survey using the USAF criteria. However, a cursory map study revealed that an additional six to eight gap fillers would be needed to meet USAF's criteria.

(U) Rather than risk prolonged negotiations to get additional gap fillers in the CADIN program, NORAD modified its requirement. On 22 September 1960, NORAD advised RCAF that the boundary line of Priority Area One was changed to cut off the northeast corner. Informally, NORAD learned that USAF too was willing to accept the 45 gap fillers in CADIN rather than to possibly delay the entire program by asking for additional radars.

(U) In the meantime, the question of what type and the overall number of gap fillers that would be in NORAD's surveillance system was being studied. The question of type had been raised by NORAD in June 1960. NORAD thought it might get more radars with the money available by improving current gap fillers by modification rather than by buying new FPS-63's to replace existing sets. NORAD asked USAF if it would study this and ADC backed the request in its gap-filler plan sent to USAF in July 1960.

(U) USAF directed ARDC to have the Air Force Command and Control Development Division (AFCCDD) to study the low altitude program and find the best way to meet NORAD's low level coverage needs.

(U) The AFCCDD study, completed with the help of MITRE

~~CONFIDENTIAL~~



(U) and others, was sent to USAF in August 1960. It recommended getting modified radars rather than the FPS-63. In October 1960 USAF agreed to this.

(U) Meanwhile, the ADC plan sent to USAF in July 1960, recommended deleting some radars, relocating others, and installing some 20 new gap fillers. For the U. S. only, to satisfy NORAD's gap-filler criteria, ADC stated that some 150 gap fillers would be needed. However, ADC continued; until further field surveys were conducted, nothing but the deletions (64 gap fillers) could be considered firm.

(U) USAF approved, on 29 August, this criteria and deletion of 63 of the 64 gap fillers. As to the rest of the program, USAF said it had to make further study. Later, in September, USAF approved clarifying criteria sent in by ADC, and deletion of the other gap-filler recommended by ADC.

(U) The next month (October), USAF provided ADC and NORAD with an agreed-upon gap-filler program. There would be a total of 200 gap fillers. These 200 sets would be located as follows: 149 in the ZI, 45 in Canada, and six in the Northeast Area.

(U) Modification of existing sets rather than purchase of new sets was the scheme decided upon. Of the total number of radars in the program, 182 were to be modified AN/FPS-18's. These sets were to be redesignated AN/FPS-74's after modification. There would be 18 radars not modified, 12 in the ZI and six in Canada (in the Goose Sector). But the six in Canada were to be inactivated, if Canada approved, when the Greenland-Iceland-UK DEW extension became operational (June 1961), and the 12 ZI sites were in the interior Oklahoma City Sector. These would all have FPS-18's. New sites, 20 in the U. S. and 45 in Canada, would get factory-modified FPS-18's (FPS-74's); the other sites, 117 in the U. S., would have their equipment modified at the site.

(U) Proposal to Deactivate Goose Sector Gap Fillers. As stated above, six gap fillers were located in the Goose NORAD Sector. These six manual sites were the only manned gap fillers in the NORAD system.



(U) On 10 October 1960, USAF ADC recommended to NORAD that these six gap fillers be deactivated. ADC felt that the cost of manning and operating them (an annual operating cost of over \$2,000,000 and a total of 162 personnel) was not justified in relation to the coverage they provided.

(U) NORAD sent the proposal to NNR for comment, stating that it would approve ADC's recommendation unless there were serious objections from NNR. Without gap fillers, NORAD continued, there would still be contiguous cover upward from 3000 feet, except for a small gap between Hopedale and Cartwright. This gap closed at 5,000 feet. NORAD said that it would make this action effective concurrent with the operational date of the Greenland-Iceland-United Kingdom DEW extension -- 30 June 1961.

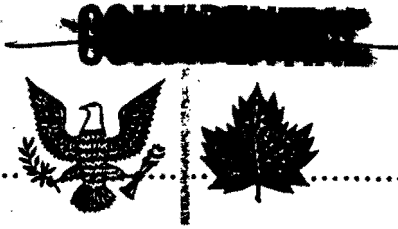
(U) On 14 December 1960, NNR replied that both it and the Goose Sector concurred, provided NORAD would accept 5,000 foot coverage for the area. NORAD agreed to this on 21 December.

#### CONTIGUOUS ZONE FORCE

##### AEW&C FORCE

(U) AN/APS-95 Program. The Airborne Early Warning and Control Aircraft from both the 551st and 552d Wings were being refitted with a new search radar, the AN/APS-95, in Lockheed's East and West coast plants. The first aircraft entered the depots in March 1960. By August, twelve planes had been equipped with the APS-95 -- eight on the West Coast, four on the East Coast. The East Coast program had fallen behind schedule and nine aircraft were tied up in the New York Lockheed plant because of a labor strike.

(U) Loss of the aircraft came at a bad time. The East Coast wing the 551st, had only 12 operational planes when the strike was called and they were doing double



(U) duty to man three and one-third stations. To offset the loss, the 26th Region advised NORAD in September that the wing would man only two and one-third stations.

(U) This reduced manning was unacceptable to NORAD. On 9 September, NORAD advised ADC and the 26th Region that the three highest priority stations on the East Coast had to be manned full-time. It was willing, NORAD continued, to accept temporary transfer of aircraft from the West Coast wing, the 552d, to bolster up the East Coast wing if this action were necessary to meet NORAD's requirements.

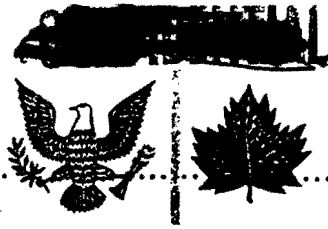
(U) The 26th Region replied that the transfer would not be necessary. Three stations could be manned with their own resources. It did ask, however, that NORAD allow the wing to move the stations closer to shore. NORAD replied that it would permit only temporary manning at alternate stations. If the move was to offset aircraft losses, it preferred transferring aircraft from the West Coast as previously suggested.

(U) The 551st Wing continued to man its permanent stations and tried to man three stations full-time, although it slipped below this level on occasion.

(U) Airborne Long Range Inputs Program. A second improvement program for the AEW&Con force was the Airborne Long Range Inputs (ALRI). This was to provide automatic inputs from the AEW&Con force to SAGE.

(U) NORAD had planned on both coasts getting ALRI. But in April 1960, USAF cut this down to only one wing (35 aircraft). NORAD chose the East Coast Wing, the 551st, to get the ALRI. At the time it cut back the number of aircraft to get ALRI equipment, USAF also reduced the number of special ground communications stations from ten to four. Accordingly, the ALRI plan had to be rewritten and a new phasing schedule for aircraft modification drawn up.

(U) The new plan was drawn up by ADC and sent to NORAD in August 1960. This provided that prototype ALRI aircraft models would be available in January and May 1961



(U) and the final aircraft in February 1962. Phase I testing of the ALRI was to begin in December 1960 and be completed in May 1961; Phase II tests were to begin in April 1961 and be completed in August 1961. The first ground station was to be operational in September 1961, the final one in January 1962.

(U) One item NORAD found inconsistent with its concept of operations was the lack of weapons directors to insure a manual intercept control capability on the ALRI aircraft. On 17 August 1960, NORAD told ADC the draft plan had been concurred in but it had to include a requirement for directors. After ALRI had been operational for about a year, the requirement for directors could be re-evaluated.

(U) ADC asked NORAD to reconsider, for it felt that directors were not necessary. But NORAD remained firm. It restated the requirement for directors on 23 September and again on 5 October. NORAD did say, however, that if personnel were not available within current ADC resources to provide one director per crew, that ADC should use some alternate means such as staff directors or cross training of other crew members. Until ALRI attained its designed 90 percent operational effectiveness, NORAD desired that a full manual control capability be kept.

(U) ADC's plan as issued in October 1960 carried the following paragraph.

In the event of hostilities, or if hostilities appear imminent, staff directors and other available personnel who have received Director training will be placed aboard the ALRI aircraft. This will provide a manual control capability in the event of failure of the automatic equipment.

(U) PICKET SHIP SLRI PROGRAM

In August 1960, MITRE furnished NORAD with a study





(U) on picket ship surface long range inputs (SLRI) program. An SLRI system, it concluded, was technically feasible and attainable. MITRE concluded that if cost was the determining factor, then only modification to the current system should be considered. Operating under current budget restrictions, it said, a SAGE-like capacity was unattainable.

(U) The biggest drawback in the current system, MITRE felt, was the time delay in reporting track information to the direction center. This could be cut down by using an Automatic Low Data Rate Input (ALDRI) subsystem at the SAGE DC, or by putting in a message composing device that would enable the ship's radar operator to punch quick track messages. One system that would offer this capability was the IBM transceiver equipment in use on Navy supply ships.

(U) Meanwhile, at a commander's conference in September 1960, Major General John D. Stevenson, 28th NORAD Region Commander, recommended to General Laurence S. Kuter, CINCNORAD, purchase of an ALDRI system described by MITRE. This system would provide automatic entry of teletype information into the FSQ-7 and FSQ-8 SAGE computers. It would replace part of the existing manual input subsystem, and provide for computer entry of all data currently entered via the computer punch card facilities.

(U) The 28th Region re-stated its need for ALDRI on 12 October 1960. NORAD replied that it had been advised that USAF would approve the ALDRI requirement. A prototype should be available, NORAD said, for ESS operation by 1 January 1961, with subsystem implementation in the 28th Region scheduled for June 1963.

(U) In the meantime, the IBM transceiver system recommended by MITRE was being considered also. This system would send IBM punched card data, in SAGE computer format, directly to the SAGE DC manual inputs room for insertion in the computer.

(U) A test of this system was sponsored by ADC in October 1960. It was carried out in the Washington Air

~~CONFIDENTIAL~~



(U) Defense Sector. The test directors reported that the time element (i.e., picket ship plot time to SAGE display time) could be cut from 5.9 minutes to an average of two minutes with the IBM system. Further, they felt that the system was far superior in reliability to the current teletype system. Both Washington Air Defense Sector and the picket ship squadron commanders concluded that the system should be adopted.

(U) The matter was still under study at year's end. However, ADC had sent the IBM Corporation a formal request for a system proposal. And COMNAVFORCONAD recommended to the CNO that the IBM data system receive full Navy support if it became a NORAD requirement.

(U) Meanwhile, NORAD began getting proposals from industry on an SLRI system. These were being considered at year's end. And NORAD was drafting a qualitative operational requirement for an SLRI system.

#### DEW LINE EXTENSIONS

##### BARRIERS

(U) Pacific. One part of NORAD's early warning chain was the Navy-operated barrier between Midway Island and the Aleutians. This barrier consisted of 4.5 aircraft stations and two search and air rescue navigation aid (SAR/NAVAID) stations. The latter two stations were manned by converted destroyers, called DER's, which had a secondary mission of providing early warning information.

(U) On 30 December 1960, the CNO asked for NORAD's comments on discontinuing the barrier entirely by 1 March 1961. This proposal was made as a means of offsetting FY 1962 budget limitations. NORAD protested on 4 January 1961. It pointed out to the CNO that discontinuing the barrier would cut reaction time to the bone. It would reduce warning time of an attack on West Coast targets by at least three hours. Further, if an attack

~~CONFIDENTIAL~~



(U) should come through the Vancouver-Alaska area, important targets to the north could be attacked with less than 30 minutes warning.

(U) NORAD told the CNO and JCS that it would not concur in discontinuing the barrier until long range radar became available to extend the west coast surveillance system into the Pacific area. But if the JCS decided to accept the CNO proposal, NORAD said that an alternate method of getting early warning data had to be set up. It suggested using the two SAR/NAVAID ships then on station, augmented by two more DER's, and putting a heavy radar on Midway Island.

(U) Atlantic. To be discontinued at mid-1961 was the Navy-operated barrier between Argentia and the Azores. This barrier was currently operating with four AEW aircraft. There was also a SAR/NAVAID station with one DER which had a secondary mission of early warning.

(U) In March 1960, NORAD had agreed to drop the barrier, once the Greenland-Iceland-United Kingdom barrier was set up. Later, in October 1960, ADC supported NORAD's position in a reply to a USAF query on the need for the barrier. Finally, in December 1960, the JCS approved the discontinuance of the barrier by 1 July 1961.

(U) G-I-UK EXTENSION

(U) At the same time this Argentia-Azores Barrier was to be discontinued, a land-sea extension -- the Greenland-Iceland-United Kingdom line -- was to be established. This was a two-service line that was to run from Cape Dyer, Baffin Island, across Greenland, to Iceland, then by water to the Faeroes, and then once again by water to Scotland.

(U) USAF was responsible for the land-based segment of the line from Cape Dyer across Greenland to Iceland. The Navy was to provide the airborne and waterborne portion from Greenland to the UK.

(U) The USAF segment, called DEW East, would consist of four surveillance sites, a contractor support facility'

~~CONFIDENTIAL~~



(U) at Sondrestrom, Greenland, and tropospheric scatter radio terminals at Cape Dyer and on the west coast of Iceland near Keflavik.

(U) The four surveillance stations would be equipped with AN/FPS-30 radars. The stations would report to the data center at the Cape Dyer Main station and would operate as eastern auxiliary stations of DEW Main. In case these primary lines went out, the radars were also tied to the Iceland Defense Force through a Navy operations control center on Iceland.

(U) Construction on DEW East had begun in July 1958 under the direction of Western Electric Company, prime contractor for this portion. In December 1960, Western Electric reported that it would meet the operational deadline of 30 June 1961 except for the communications link with Iceland. Efforts were being made to get the link ready also by 30 June.

(U) The operations plan for the line had been written by ADC in conjunction with CONAD, and published in March 1960. The Communications-Electronics Implementation Plan for the line had been sent to USAF in January 1960 and approved in October 1960.

(U) Plans for the Navy portion of the G-I-UK extension called for one AEW aircraft station between Greenland and Iceland, one DER between Iceland and the Faeroes, one DER station between the Faeroes and Scotland, and one AEW aircraft flying random patrols between Iceland and Scotland. These elements would report to an operations center set up by COMBARLANT at Keflavik, Iceland. This portion of the line was expected to become operational in July 1961.

#### NUCLEAR DETONATION REPORTING

##### NORAD NUDEF REPORTING SYSTEM

(U) Manual. In September 1959, the JCS made NORAD responsible for setting up and operating a nuclear

~~CONFIDENTIAL~~



(U) detonation reporting and fall-out warning system. The system was to report all detonations, other than test explosions, occurring in or adjacent to the U. S. And, subject to Canadian concurrence, NORAD's responsibility was also to include Canada.

(U) NORAD took over the CONAD manual system and decided to expand it for use until an automatic system could be put into operation. Requirements for the manual system were laid down in NORAD Operations Order 1-60, dated February 1960. The system was based on individual observations, supplemented where possible by instrumentation.

(U) Automatic. In 1959 and 1960, a number of meetings were held between representatives of NORAD, JCS, DOD, and other agencies on an automatic system. As a result, DOD instructed USAF to develop, procure and install an automatic system responsive to the needs of DOD and the Office of Civil and Defense Mobilization. The system was to be operational by 1 July 1962.

(U) By mid-1960, USAF had designated its Air Research and Development Command as action agency for the development. USAF also issued a revised Specific Operational Requirement (SOR No. 62, dated 24 June 1960) based on NORAD's parameters.

(U) On 12 August 1960, ARDC's Air Force Command and Control Development Division (AFCCDD) sent USAF a development plan for an automatic system. USAF sent the plan to the Secretary of Defense on 2 September 1960. The latter approved it for implementation in a memorandum to the Secretary of the Air Force dated 24 October 1960.

(U) The Secretary of Defense said that programming support of \$2 million in FY 1961 for research, development, test and evaluation seemed adequate to carry the project through the test and evaluation phase. Operational equipment, he continued, should be funded in the FY 1962 budget.

On 4 November 1960, NORAD urged USAF to implement

~~CONFIDENTIAL~~



(U) the NUDET system on a leased basis if necessary so that the 1 July 1962 target date could be met. But by year's end, no funds had been earmarked for the project.

(U) Meanwhile, in separate actions, NORAD laid down its requirements for boundary criteria for the target areas and the priority for installing the system. On 6 October, NORAD told Rome Air Development Center that the minimum desirable distance the system should observe and record basic NUDET source data was 30 nautical miles beyond the city boundaries of the 62 target complexes of USAF's SOR. This was followed on 16 November by a list of targets and the priority for installing equipment. Fifty-two U. S. and 12 Canadian target complexes were listed.

#### USAF BOMB ALARM SYSTEM

(U) A separate automatic system to report nuclear explosions was being developed by Western Union for USAF. There were to be detectors or sensors at selected target areas which would be interrogated from Bomb Alarm Control Centers. The control centers in turn would report to selected display centers. This system differed, however, from the automatic system wanted by NORAD. The USAF system would provide only the time of the explosion and the approximate location. NORAD wanted time, location, yield, and height of burst.

(U) Western Union was to install the USAF system in two phases. Initially, the first phase was for sensors at 99 target areas. This was later raised to 168 areas, but was dropped after that (see below). Also, there were to be six display centers in the first phase. This phase was to be operational by 1 May 1961. Phase II was to expand the system to the BMEWS sites at Thule, Greenland, and Clear, Alaska, and such sites in Canada as the Canadian Government wanted. No deadline was set for completing Phase II.

(U) On 8 August 1960, NORAD asked the JCS to assign CINCNOAD operational control of the USAF system. The system, said NORAD, would provide an automatic and more

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) reliable means of detecting nuclear explosions for selected targets to carry out NORAD's NUDET responsibility. Further, data from the system on intermediate range ballistic missiles might be the only notice NORAD would get of an attack. This IRBM information could be used with other data provided by BMEWS and MIDAS to carry out the early warning function. The system, NORAD said, would partially replace the current NORAD manual reporting system, and would be integrated with, or replaced by the NORAD automatic system.

(U) The JCS approved this recommendation in a memorandum dated 16 September 1960, assigning CINCNORAD operational control once the system became operational.

(U) NORAD then asked USAF to coordinate with NORAD on any revisions to the list of sites to be instrumented in Phase I and on selection of sites for Phase II. On 25 November, USAF sent NORAD a revised list of Phase I sites to be provided sensors. This list contained 97 sites (down from 168). It was learned unofficially that the cutback had been made because of a shortage of funds. NORAD endorsed this list on 6 January 1961. At the same time, NORAD endorsed Canadian participation and asked that it be advised of the status of negotiations with Canada.

(U) On 23 January 1961, NORAD issued an Operational Employment Concept for the Bomb Alarm System. This stated that sensor reports would be sent to display centers at seven key civilian and military locations. NORAD wanted another display center at its alternate command post, but this had not yet been approved.

(U) The schedule for the system, outlined in the OEC, called for the siting of sensors at 97 Phase I sites by 31 March 1961. The equipment was to be installed by 1 September 1961, and tested and operational by 15 September 1961.

~~CONFIDENTIAL~~



THREE  
NORAD WEAPON FORCE

INTERCEPTOR FORCE

PROGRAM

(u) General. USAF advised in early 1960 that it could not meet NORAD's proposed interceptor force because of financial, manpower, and other considerations. USAF proposed an interceptor force of 42 squadrons by FY 1963.

(u) Then in March 1960, USAF advised that it planned to cut the interceptor force down to 35 squadrons by FY 1964. But USAF promised that the interceptor force left would get better ECCM, communications, armament and low altitude capability.

(u) The program went through numerous revisions in the months following. The program of January 1961 for the U. S. interceptor force for the end of FY 1964 called for 17 F-101 squadrons totalling 354 aircraft, 14 F-106 squadrons totalling 270 aircraft, and nine F-102 squadrons totalling 241 aircraft, for an overall program of 40 squadrons and 865 aircraft. The F-102 squadrons included a 40-UE squadron in Alaska, a 33-UE squadron at Goose Bay, and a 12-UE squadron at Thule. CONUS-based F-102 squadrons had a UE of 26 aircraft. For the F-101 and F-106 squadrons, some would have a UE of 18 aircraft, others 24 aircraft. NORAD had hoped to keep the F-101 and F-106 squadron UE's at 24 aircraft, but USAF turned this down because of a shortage of aircraft.

(u) The program for the end of FY 1965 was for one less F-102 squadron of 26 aircraft. Thus the end FY

---

\*Alaska would actually have 47 F-102's. For explanation see page 33.



~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~



1965 program was for 39 squadrons with 839 aircraft.

(U) NORAD's program still called for nine RCAF squadrons in Canada. However, after issuing the program, it was learned that the RCAF planned to disband four of the nine squadrons currently operational. How many of the five remaining squadrons would be kept depended, in part, on whether they were to get U. S. F-101's. No decision on this had been made (see below).

(U) As noted above, USAF had told NORAD that if the interceptor force was reduced, the remaining squadrons would be modernized. And in June 1960, in a compromise DOD appropriations bill, Congress appropriated \$136 million for interceptor improvements. As of the end of 1960, no money had been obligated on improvements but certain new features were being looked into by ADC and NORAD. These included: infrared search and track system, redesigned antenna with larger dish, parametric amplifiers, anti-chaff, and rapid tuned magnetrons. All these features were wanted for the F-101's and F-106's. The F-102 squadrons were expected to get the infrared search and track system only.

(U) Advanced Long Range Interceptor. In September 1959, USAF announced that because of a limited budget it was cancelling the F-108 long range interceptor program except for the AN/FSG-18 fire control system and the GAR-9 missile. NORAD protested this cut strongly, but was unable to get USAF to reinstate the program.

(U) Later, further budget reductions made a good part of the entire air defense program uncertain. Then in June 1960, the Senate and House worked out a compromise DOD appropriations bill which included \$100 million to be used as USAF saw fit for more aircraft. Lieutenant General J. H. Atkinson, ADC Commander, recommended to USAF that these funds be used to buy additional F-106's. USAF replied that purchase of F-106's seemed unlikely, but that a final decision on the matter had not been made.

(U) Meanwhile, on 17 August, General Laurence S. Kuter, CINCNORAD, urged General Thomas D. White, USAF

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



7 (S) Chief of Staff, to spend the funds to reinstate the LRI program. General Kuter pointed out that intelligence indicated that the Soviets had in production a supersonic dash bomber comparable to the U. S. B-58 and B-70. Such bombers, carrying air-to-surface missiles, posed a threat, he said, with which current interceptors and air defense missiles could not cope. He concluded:

Of course additional funds in the FY 62 and subsequent budgets would have to follow to provide an operational F-108 force at the earliest possible date, but the hundred million will have bought at least one full year on a program which I believe will eventually be demanded and on a crash basis.

(U) General White's reply on 26 August 1960, repeated an earlier promise that developmental activity in the long range interceptor field would continue so long as there were no more budget cuts. He also said that it seemed likely that the budget might be increased and, if so, "rest assured that I will give every consideration to re-establishing a full scale long range interceptor program."

(U) General Kuter then turned to the Deputy Secretary of Defense, Mr. James Douglas, for support of an LRI against the Soviet threat. Mr. Douglas promised only that if the Soviets began full-scale production of advanced bombers and air-to-surface missiles, that the priorities that had been set in DOD would be reevaluated. Available resources and relative priorities, he continued, had not allowed funding for full development of a long-range interceptor. But current work on the AGS-18/GAR-9 fire control and missile components were in recognition of this need.

(U) In the meantime, ADC sent NORAD a draft of a proposed Qualitative Operational Requirement for a Long Range Advanced Piloted Interceptor System. This called for an interceptor with a maximum range of 1,500 nautical miles and a ceiling kill capability of 200 miles.

~~CONFIDENTIAL~~



(U) General Kuter was briefed on this system in November 1960 and concurred in ADC's approach. He made known, however, that he would support the F-108 for another year.

(U) USAF ADC

ADC's interceptor force went from 46 fighter-interceptor squadrons to 41 squadrons during the last six months of 1960 because of the inactivation of five squadrons.

(U)

SQUADRON	BASE	TYPE AIRCRAFT	EFFECTIVE DATE OF INACTIVATION
54th	Ellsworth	F-89J	25 December 1960
58th	Walker	F-89J	25 December 1960
61st	Truax	F-102A	25 July 1960
93d	Kirtland	F-86L	15 July 1960*
337th	Westover	F-104	15 July 1960*

(U) \* Both of these squadrons lost their aircraft in June 1960. However, authority to inactivate was not granted by USAF until the above date.

(U) The ADC interceptor force also continued to convert to newer types of aircraft. By 1 January 1961, ADC had 17 F-101 and 14 F-106 squadrons. It also had nine F-102A squadrons and one of its squadrons had no aircraft.

(U) Along with the new aircraft had come equipment, maintenance, and training problems. For example, aircraft from one F-106 base had trouble being turned around at another F-106 base because the aircraft MA-1 electrical systems were not standard. Problems in the F-101 squadrons were caused by lack of spare parts and ground support equipment. F-101 squadrons also had had difficulty in getting training time because of problems with the launch rail system.

~~CONFIDENTIAL~~



(U) Much progress with the F-101 had been made by the end of 1960. The aircraft had completed a modification program which corrected the launch rail system. More and better ground support equipment had become available and support personnel had become more familiar with the equipment. In June 1960, only five of the 16 F-101 squadrons had attained a C-1 combat capability rating (defined in Air Force Regulation 55-83). By December, ten of the 17 F-101 squadrons had reached this level.

(U) To improve the F-106's, a modification program named "Wild Goose" had been set up. This program provided communications and navigation fixes, an improved fire control system, and time division data link improvement.

(U) Only the communications and navigation fixes had been provided by year's end. The modification program for the fire control system was to begin on 16 January 1961 and was to be completed by 31 May 1961. The time division data link modifications were to begin on 1 June 1961 and were to be completed by 31 August 1961.

(U) An improvement program also got under way during 1960 for the F-102's. This program, called the Configuration 7/GAR-11, would improve the fire control system of the F-102 and provide the aircraft a nuclear weapons launch capability.

(U) The program got underway in September 1960, and was scheduled for completion by 30 September 1961. Work on the system was being done at the Ogden and Mobile Air Materiel Depots.

#### RCAF ADC

(U) Since 1959, NORAD had stated a requirement for F-101's in Canada. But a final decision on providing Canada with new interceptors, F-101's or any other type, had not been reached by the end of 1960.

(U) Meanwhile, the RCAF advised that it was going to phase out ADC's CF-100 aircraft (currently in nine

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~



(U) squadrons) by FY 1964. Then, RCAF decided not only to phase out the aircraft from part of its air defense squadrons, but also to disband some squadrons. In December 1960, the RCAF advised that four CF-100 squadrons -- two at St Hubert, and one each at North Bay and Uplands -- were to be disbanded. RCAF later said that the first squadron would disband on 1 May 1961, a second on 1 June, the third on 1 August and the last on 1 October. The remaining five squadrons were to keep their CF-100's at least until 31 March 1963.

#### ALASKAN AIR COMMAND

(U) On 1 January 1961, the Alaskan Air Command had one interceptor squadron, the 317th with F-102's at Elmendorf, one less squadron than had been available in July 1960. The squadron at Ladd AFB, the 449th, had been inactivated on 25 August.

(U) CINCAL wanted to augment the 317th with 15 additional F-102's. NORAD supported the AAC proposal on 13 May and again on 26 May 1960. But USAF approved only seven more aircraft for a total UE of 40 F-102's.

(U) Later, USAF advised NORAD that AAC still wanted seven more F-102's, or a total of 47 F-102's. NORAD replied that it supported the AAC request. Subsequently, USAF told AAC that the squadron could have the seven additional F-102's, but without a change in ground support equipment and personnel.

#### NAVY VFAW-3

(U) One of NORAD's interceptor squadrons was a Navy unit at NAS North Island, California, (VFAW-3), equipped with F4D's. Since no plans had been made to provide this squadron with a nuclear capability and since NORAD wanted all interceptors assigned to air defense nuclear capable, it was agreed that the unit would be dropped.

(U) The 15th Fighter Interceptor Squadron, currently

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~



(U) at Davis-Monthan AFB, Arizona, was to move to March AFB, California in FY 1962 to assume the mission in the San Francisco-San Diego area. But the planned move in FY 1962 had to be cancelled due to runway construction at March AFB. It was found that the base would not be ready until the third quarter of FY 1963.

(U) On 29 September 1960, ADC asked for NORAD's permission to delay the move of the 15th FIS until the base was ready. NORAD, in turn, asked the JCS to keep VFAW-3 at North Island until the 15th arrived at March. The CNO agreed to this if funding for the unit did not become a problem.

(U) NORAD advised ADC of the CNO answer on 1 November 1960 and approved delaying the move of the 15th FIS.

#### MISSILE FORCE

(U) BOMARC

(U) Guidance on the Bomarc B program was received from USAF in July and August 1960 and issued in a USAF/ADC Operational Employment Plan, dated 30 November 1960. Of the eight squadrons programmed for the U. S., two would be A squadrons, three would be B squadrons, and three squadrons would be equipped with a combination of A's and B's. Both Canadian squadrons were to be equipped with B models. As of January 1961, the total program for the U. S. and Canada was 210 A missiles and 195 A launchers and 252 B missiles and 244 B launchers.

(U) All eight U. S. squadrons had been activated. Four of these were operational at mid-1960, and a fifth became operational in the last six months of 1960. The newest operational unit was the 22d Air Defense Missile Squadron (Bomarc), Langley AFB, Virginia, which achieved this status on 1 October 1960.

(U) All five operational squadrons were equipped with the A model at year's end. But, three of the five, as

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~



(U) told above, were also to get the B model and become A/B units. These three were the squadrons at McGuire, Otis, and Langley. The squadrons at Dow and Suffolk would keep their A's. The squadrons at Kincheloe, Duluth, and Niagara, were to get B's initially and were to become operational in CY 1961. The squadron at Niagara, in addition to the normal complement of B equipment (i.e., 28 launchers and 29 missiles) would also get 20 more missiles/launchers in CY 1962.\*

(U) NIKE AJAX AND HERCULES

(U) General. During the last six months of 1960, the Nike inventory decreased by one unit from 274 to 273. Nike Hercules made a net gain of five units bringing its total to 107, but Nike Ajax lost six units reducing its total to 166, as of 1 January 1961.

(U) Hercules units gained seven new operational units. These were: two each at Barksdale AFB, Louisiana, and Dallas-Fort Worth; one each at Robins AFB, Georgia, and Turner AFB, Georgia; and one at Eielson AFB in Alaska which became operational on 15 December 1960. However, two units were inactivated, one each at Hanford and Ellsworth on 23 December 1960. Thus, the net inventory increase was only five.

(U) \* Operational Dates for the B squadrons were as follows:

Kincheloe	37th	1 June 1961
Duluth	74th	1 August 1961
Langley	22nd (A model also)	1 October 1961
Niagara	35th	1 December 1961
	(Augmented)	1 September 1962
Otis	26th (A model also)	1 September 1962
McGuire	46th (A model also)	1 November 1962
North Bay		1 March 1962
LaMacaza		1 December 1962

~~CONFIDENTIAL~~



(u) The six Nike Ajax units were inactivated on 23 December 1960 -- three each at Hanford and Ellsworth.\*

(u) Although the Nike inventory decreased by one unit during the last six months of 1960, there was a gain in the number of operational units in the inventory. All of the 273 Nike units in the inventory on 1 January 1961 were operational. Only 270 had been operational (four fire units at Thule, Greenland had been temporarily non-operational at mid-1960) on 1 July 1960.

(u) The Ajax force was manned both by Regular Army troops and by National Guard personnel. On 1 July 1960, the Army National Guard was manning 52 batteries in the CONUS defenses. These batteries were being manned by 23 ARNG battalions in 11 defenses. By 1 January 1961, the ARNG had assumed the manning responsibility for 16 more batteries, or a total of 68. The ARNG had 28 battalions manning these batteries in 14 defenses. Eventually, all Ajax units were to be manned by the National Guard.

(u) The Ajax/Hercules program on 1 January 1961 called for a total force of 215 fire units by the end of FY 1962. Of these 215, 76 would be Ajax units manned by the ARNG, the other 139 would be Hercules units manned by Regular Army personnel.

(u) Thule, Greenland. The Air Force decided to pull its interceptors out of Thule and so it was decided to withdraw the Nike Hercules unit from Thule. CONAD relieved the 7th Artillery Group of its air defense alert requirement as of 29 April 1960 and the group began to prepare to move out. Almost immediately, however, the JCS began a restudy of the matter of U. S. defenses at Thule and

(u) \* ARADCOM actually inactivated ten Nike battalions consisting of 35 fire units. However, of these 35, only eight were lost to NORAD. The rest were either transferred to the Guard, or redesignated and reallocated to other defenses.

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~



(U) directed no further withdrawal action. In June, it was decided to keep the radar and Nike units currently there and to put in an interceptor unit. Three of the four Hercules fire units regained their operational status in July and the fourth in August.

(U) After it was decided to keep Hercules units at Thule, ARADCOM sent to CONAD a study proposing that the Thule defense be reduced from four to two batteries. ARADCOM said that the two batteries would provide an acceptable degree of defense. Further, it pointed out that two of the sites might be affected by the radiation from the BMEWS radar.

(U) NORAD replied that it agreed in principle that two batteries could provide a minimum defense. However, NORAD said it did not feel that ARADCOM's study offered grounds on which to challenge the JCS decision. But, NORAD continued, if it was found that radiation from the BMEWS site would make two of the Hercules units ineffective, this would justify recommending redeployment.

(U) It was later determined that the radiation from BMEWS would not affect the Hercules sites.

#### AUGMENTATION FORCE

(U) On 7 January 1960, NORAD had submitted to the JCS a plan for making the augmentation force a realistic contributor to air defense. NORAD's plan was to get away from the old idea of using every unit simply because it was available. What was wanted was a quality rather than a quantity force, and a force as compatible as possible with the control system.

(U) NORAD divided the augmentation force in its plan into three Categories. These were: (1) non-regular units responsive to NORAD control 24-hours a day; (2) back-up units responsive to NORAD control during emergencies; and (3) units not required.

(U) In April 1960, the JCS advised that they had found

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) the categories and standards of NORAD's plan sound, but in light of program changes the plan should be re-done and resubmitted. Also, the JCS pointed out that some Category I units NORAD listed did not match the definition. These either had to be dropped or the definition changed.

(U) Prior to re-doing the plan, NORAD advised the JCS that it had revised the definition of two of its three categories and made the other changes suggested by the JCS. Category I forces were changed to "non-regular or regular forces not assigned to NORAD, responsive to NORAD control twenty-four hours a day." Category III was changed from units not required to War Reserve Forces. NORAD pointed out that it had not arrived at a final structure simply because it had not known what the regular force structure would be due to the cut backs in air defense programs. However, now that this problem was settled, some concrete recommendations could be made.

(U) A new NORAD augmentation plan was sent to the JCS on 21 September 1960. It contained the Category I force structure only. NORAD asked for 25 Category I ANG squadrons. All other ANG squadrons (both TAC and ADC) that might be made available and that had an air defense capability would be kept in the War Reserve Category. Insofar as possible, it continued, the Category I force should be a nuclear-equipped force.

(U) NORAD said further that it was studying the NGB capability to man, operate and support Aircraft Control and Warning Squadrons cut from the regular force and AC&W squadrons in the SAGE area that might be operated by the Guard to release regular Air Force personnel. Later, after further study, NORAD determined that the cut-back in surveillance was less than expected and the need for the Guard to man AC&W units was dropped.

(U) The JCS approved, with minor changes, NORAD's Category I force on 1 December 1960. The approved plan provided that nine aircrews per squadron would be furnished to support the 24-hour alert. The JCS also promised a nuclear-capable force, insofar as practicable,

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) once they received definite NORAD requirements on what was wanted. The approved force consisted of nine F-89J squadrons, six F-102A squadrons, four F-86L squadrons, and three squadrons each of F-104's, and F-100A's.

(U) The above force had been changed slightly from that asked for by NORAD. A squadron at Ontario, California was substituted for one at Lincoln, Nebraska. A Tucson squadron replaced a squadron NORAD wanted at El Paso, and a squadron in Des Moines, Iowa, was to be in the force rather than one at St Louis. The approved force structure differed too in that there was one less F-89J squadron and one more F-86L squadron than asked for.

(U) On 14 December, NORAD told ADC to see that all plans and programs reflected the approved force and that the squadrons had a capability to assume a 24-hour alert status as soon as practicable (later set at 1 July 1961). NORAD said that it understood that other ADC ANG squadrons earmarked for a mission change in the future would keep an air defense mission until then. These squadrons would be considered Category II augmentation until ADC advised otherwise. The final Category II and III structure had not been laid down by NORAD by the end of 1960.

(U) As told earlier, NORAD wanted a nuclear capability for the Category I force. The JCS, in approving this force, stated that they considered this desirable also. But, they continued, final resolution of the nuclear question awaited recommendations from CINCNORAD and CINCONAD.

(U) NORAD/CONAD had already been working with ADC to get action started on plans for the custody, handling, and storage of nuclear weapons for the ANG units. ADC had approached USAF but the latter would promise nothing until CINCONAD's specific needs were made known. ADC advised NORAD of USAF's answer on 9 December. It asked that NORAD re-state its needs and suggested that these requirements include:

(U) All ADC and ANG F-102 aircraft to be

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~



- (U) capable of carrying GAR-11 weapons and all ANG F-89J to utilize the MB-1 as primary armament.
- (U) Additional procurement of Modification (GAR-11) kits for ADC F-102 squadrons not presently scheduled for same.
- (U) Additional programming for GAR-11 production to include ANG F-102 inventory.
- (U) Programming for GAR-11 storage facilities at all ANG F-102 bases and MB-1 storage at F-89J bases.
- (U) USAF policy to implement the above.
- (U) On 21 December 1960, NORAD re-stated its nuclear requirements for the Category I force which followed essentially the ADC suggestions. NORAD asked that a plan to achieve these ends be accomplished and forwarded as soon as possible.

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



FOUR  
BALLISTIC MISSILE AND SPACE DEFENSE

SPACE DETECTION AND TRACKING SYSTEM

BACKGROUND

(U) Following the launching of Sputnik I on 4 October 1957, the Air Force's Missile Test Center at Patrick AFB, Florida, set up a project to observe and collect data on satellites. Data collection was expanded shortly thereafter to other Air Research and Development Command (ARDC) centers and information funneled to a filter center at the Air Force Cambridge Research Center. The satellite observation program was later formalized under the name Project Spacetrack.

(U) In January 1959, the Advanced Research Projects Agency (ARPA) directed ARDC to build and operate a research and development interim National Space Surveillance Control Center (NSSCC) at Hanscom Field, Bedford, Massachusetts. By 1960, the NSSCC was receiving inputs from numerous sources including radar in Turkey and at Shemya, the ARDC Laredo test site radars, Baker-Nunn cameras, and the Navy-operated Space Surveillance system.

(U) Meanwhile, the Defense Department was giving thought to the possibility of unannounced launchings of non-radiating satellites. In February 1958, the Naval Research Laboratory devised a concept for a system for this purpose. A proposal based on this concept was made to ARPA, which, in June 1958, directed this laboratory to develop the first phase of such a system. This became the Space Surveillance System (SPASUR).

(U) This system consisted of two complexes of three stations each in a line across the southern U. S. Each complex had one transmitter station and two receiver stations. The receiver stations were spaced

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



about 280 miles from the transmitter, one to the west and one to the east. The eastern complex became operational in November 1958, the western in February 1959. Each receiving station fed data to an operations center at the Naval Weapons Laboratory at Dahlgren, Virginia.

(U) NORAD had for some time urged that it be given operational control of the National Space Surveillance Control Center. In letters in November 1958, May 1959, April 1960, and June 1960, NORAD reaffirmed its requirement and urged JCS action. In the June 1960 letter, NORAD asked for assignment of operational control of Spacetrack, and in an amendment dated 15 July, added the SPASUR system.

#### ASSIGNMENT TO NORAD/CONAD

(U) On 10 October 1960, the Secretary of Defense sent memorandums to the Secretaries of the Air Force and the Navy stating that he had directed the JCS to assign operational control to NORAD and operational command to CONAD of the space detection and tracking system. Because of this, the Secretary said he was transferring responsibility for the two components of this system, Spacetrack and SPASUR, to the Air Force and Navy, respectively, from the ARPA. Operation and further development of these two systems, the Secretary's memo stated, was to be in consonance with user requirements as defined by CINCONAD and the operational procedures as developed by CINCNORAD. Also, CINCONAD was to be responsible for integrating Spacetrack and SPASUR in the Space Detection and Tracking System (SPADATS).

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

Earlier, at the end of October, the Air Force had

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



informed ADC of the transfer of Spacetrack to the Air Force. USAF said that it would assign the National Space Surveillance Control Center to ADC upon attainment of operational status. USAF designated ADC as the operational planning agency for the Air Force for those elements of the SPADATS (Spacetrack and the NSSCC) operated by Air Force activities. ADC was to represent the Air Force in all relationships with CINCONAD/CINCNORAD.

(U) On 10 November, USAF advised CINCONAD that the Air Force had been charged by the Secretary of Defense with submitting a detailed development and funding plan for improvement of the national space surveillance system. USAF asked that all user requirements be forwarded through ADC as soon as possible. Also, USAF asked for CINCNORAD's operational requirements and procedures for inclusion in the Air Force plan.

(U) An initial NORAD plan was prepared by 2 December: NORAD Requirements for a Space Detection and Tracking System - Improved. USAF designated the Air Force Command and Control Development Division as the agency to prepare the development plan. A meeting between all interested agencies was held at Hanscom Field, Massachusetts, on 6-7 December to get action started toward preparation of the development plan. It was decided to accept the NORAD requirements document as the basis for the preparation of a preliminary draft of the development plan. The aim was to get the plan to the Department of Defense by late April.

(U) At the end of the year, NORAD was preparing an integration plan for the SPADATS. NORAD planned to integrate SPADATS in two phases. Phase I was the period from the time of assumption of operational responsibility until the NORAD combat operations center had a computer capability to handle the central functions of the SPADATS. Phase II was to begin when the NORAD SPADAT center was moved from Hanscom Field to Ent Air Force Base. During the first phase, a NORAD officer was to represent the Commander-in-Chief at Hanscom Field. His title was to be "Director of the NORAD SPADAT Center." The commander of the Navy SPASUR was to

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~  
CONFIDENTIAL



report to the Director of the NORAD SPADAT center.

(U) On 9 February 1961, USAF Headquarters instructed ADC to rent a computer for the SPADATS for installation at Ent AFB by 1 April 1961. ADC was to assume technical operating responsibility for NSSCC operations of the SPADATS on 1 July 1961. The center, operated by ADC, was to be under NORAD operational control and CONAD operational command.

#### MISSILE DEFENSE ALARM SYSTEM (MIDAS)

(U) Back in April 1958, NORAD recommended that an infrared sensing system under development be accelerated and be put into production as soon as feasible. Again in December 1958, NORAD urged that development of this system be treated as a matter of the highest urgency. NORAD reaffirmed the requirement in March 1959 in a letter to the JCS and sought reassignment of operational control. Lastly, in June 1960, NORAD reiterated its requirement for the system now called MIDAS and for assignment of operational responsibility.

(U) MIDAS was for a time under the Advanced Research Projects Agency, but in November 1959 was transferred to the Air Force. When MIDAS was transferred, the Secretary of Defense directed the Air Force to prepare an operational plan for it. In December 1960, NORAD learned informally that a preliminary Air Force operations plan had been approved by the JCS and sent to the Secretary of Defense.

(U) Shortly after the first of the new year, the Air Force advised NORAD that on 16 January 1961 the Secretary of Defense had informed the Air Force of his approval of this plan. It provided, USAF continued, that MIDAS, when developed, would be assigned to ADC. Upon assignment, MIDAS would be operated by ADC under the operational control of CINCNORAD and operational command of CINCONAD.

~~CONFIDENTIAL~~  
CONFIDENTIAL



~~CONFIDENTIAL~~

UNCLASSIFIED



BALLISTIC MISSILE EARLY WARNING SYSTEM

(C) (u) BACKGROUND

(u) In January 1958, the Secretary of Defense authorized the Air Force to implement a ballistic missile early warning system of three stations -- one each in Alaska, Greenland, and the British Isles -- and a ZI central computer and display facility and connecting communications. But in May 1958, USAF announced that the British Isles station was to be deferred. Also, to meet a fund ceiling, a reduced or interim configuration was necessary for the other two stations. This interim configuration would provide four detection radars (AN/FPS-50) and two tracking radars (AN/FPS-49) at Thule, Greenland, site number 1; three detection radars and two trackers at Clear, Alaska, site number 2; and three trackers only at the British Isles site, site number 3. In addition to the radars, each site was to get the required data processing equipment.

(u) (C) Following this, in May 1959, USAF cut back even further on the configuration for Sites 1 and 2 by deferring the tracking radars.

(u) (C) The U. K. site implementation deferral was lifted the following September when the Office of Defense Research and Engineering authorized the Air Force to proceed.

(u) (C) A decision was made on the equipment for an interim BMEWS central computer and display facility at NORAD Headquarters in October 1959. USAF had authorized implementation of a facility in March 1959, but had cancelled it at mid-year. A configuration recommended by the BMEWS Project Office was approved for implementation by the Office of the Director of Defense Research and Engineering in September 1959. USAF then approved a descriptive specification prepared by the BMEWS Project Office. It included Fenske, Federick and Miller Company Iconorama display equipment, Radio Corporation of America data processing equipment and other electronic hardware needed to complete the interim

still classified  
Conf.  
per NJ30  
memo  
9 Dec 96

~~CONFIDENTIAL~~

UNCLASSIFIED



facility. No new construction was authorized other than modification of the current COC building. And only a simplex data processing facility was approved.

~~(S)~~(u)

SITE I, THULE, GREENLAND

At midnight on 30 September 1960, this site attained initial operational capability (IOC). On the same date, IOC was achieved for the central computer and display facility at NORAD Headquarters and the display facility at SAC Headquarters.

~~(S)~~(u)

The IOC period was a "shakedown" period for testing, checkout, and training prior to reaching operational capability scheduled for 1 January 1961. During this IOC period, all the detection radars were operated at full power. A simplex missile impact predictor (MIP) computer was used. The data was transmitted manually to Colorado Springs over one two-way voice link and one two-way teletype circuit.

*File changed  
10/1/61*

~~(S)~~(u)

After the IOC was attained, trouble spots appeared. One of these was an excessively high false alarm rate. It was found that these false alarms were caused by noise interference from such local sources as cranes and floor waxers, returns from the moon, and equipment malfunction. Because of these deficiencies, operational capability, or the conversion to fully automatic operations, was delayed from 1 January to 31 January 1961.

~~(S)~~(u)

During the IOC period, numerous modifications (including circuit changes) were made to eliminate sources of false reports. Also, fixes were provided to minimize or eliminate false reports from local noises and from moon returns. Finally, changes were made to the missile impact predictor program at Thule and to the display information processor at NORAD.

(u)\* For an excellent explanation of BMEWS threat evaluation and associated matters, see: (U) A Nontechnical Discussion of Threat Evaluation in the BMEWS, by Roy E. Donegon, NORAD Operations Analysis, Feb 1961 (classified Secret).



(u)  
(e) Early in January 1961, meetings were held by the BMEWS System Program Office at NORAD and SAC. It was decided that a detailed series of tests would be run by 30 January. There were independent tests at the Thule site and at NORAD and SAC, followed by a 72-hour operability test of all three combined, using automatic rearward data transmission. Satisfactory warning time was shown using simulated mass-raid tapes, and no false reports were generated during the test period. Authorization to begin fully automatic operation, effective 2400 hours GMT 31 January, was issued.

(e)(u) It was noted above that tracking radars were deferred for Thule and Clear in May 1959. A year later, in June 1960, the Director of Defense Research and Engineering concurred with a recommendation to provide one tracking radar at each of these sites when the Air Force was satisfied that the equipment showed a satisfactory reliability. On 4 August 1960, USAF advised the Air Materiel Command and other agencies that it approved immediate implementation of a tracking radar at Thule, Site 1. In October, USAF authorized the diversion of the first tracker off the assembly line from Site 3 to Site 1. The IOC for this radar was set for 30 September 1961; operational capability for 30 November 1961.

*still classified conf.*

(e)(u)  
CENTRAL COMPUTER AND DISPLAY FACILITY

(u) On 30 September 1960, in conjunction with Site 1, a manual initial operational capability was achieved at the central computer and display facility (CC&DF) at NORAD. The threat summary and status displays were operational, but the Icororama launch area and impact area displays were not operational. This initial operational capability at the CC&DF meant that there was a capability for manually activating the threat summary and status displays using data received by voice or teletype from Thule. This data was recorded and appropriate alarm levels were determined in the NORAD COC. Information was sent from the CC&DF to the SAC BMEWS display by voice link.



~~(S)~~(u)

This SAC display also was put into a status of initial operational capability on 30 September. As at NORAD, this capability did not include the launch and impact displays. It consisted of manual insertion of threat summary and equipment status information received by voice from the CC&DF.

(u) ~~(S)~~

Along with the Thule site, tests were made of the NORAD and SAC facilities in the automatic mode of operation in January and the decision was made to continue this operation effective 31 January 1960. There were still deficiencies in the displays at NORAD and SAC and these were being worked on. Automatic operation meant that there was automatic processing of data received from the rearward communications links. The display information processor (DIP) automatically computed the alarm level and activated the displays. The information read out of the DIP was automatically sent to the SAC BMEWS display via the SAC data transmitter.

(u) ~~(S)~~

There were also to be BMEWS display facilities in the Pentagon and in a Joint Operations Center at Ottawa for the Canadian Chiefs of Staff.

(u) ~~(S)~~

A teletype link to the Royal Air Force Fighter Command Headquarters at RAF Station Sturmore, England, was activated on 30 September 1960 to send BMEWS data from the CC&DF. Provision of information from Sites 1 and 2 had been requested by the British Air Ministry early in 1960. USAF and NORAD concurred. NORAD said it felt that data should be provided by teletype or other means until the BMEWS site 3 became operational and display facilities were available in England. At that time, alarm level data and changes thereto would be automatically transmitted to site 3.

~~(S)~~(u)

SITE 2, CLEAR, ALASKA

(u)

This site was scheduled to attain initial operational capability on 30 June 1961 and operational capability on 30 September 1961. A major step was achieved on 1 January 1961 with the accomplishment of scheduled initial radiation.

*Handwritten notes:*  
SAC display  
conf.

~~CONFIDENTIAL~~

UNCLASSIFIED



(u) As discussed earlier, tracking radars were deferred from the interim configuration for Thule and Clear in May 1959. But in June 1960, the Director of Defense Research and Engineering concurred with a recommendation to provide a single tracking radar at Sites 1 and 2. On 4 August 1960, USAF approved immediate implementation of a tracker for Thule, but said that fund limitations would delay a tracking radar for Clear.

(u) Later, NORAD heard that there was no plan to implement a tracker at Clear and on 16 January 1961 wrote USAF Air Defense Command asking about this. NORAD said it had informally heard that the Clear tracker had been disapproved by USAF's Air Weapons Board. A tracker was essential for both Clear and Thule, NORAD said, and therefore, NORAD wanted to know "what concrete actions are being taken by Headquarters USAF to meet the OSD-approved requirements to provide a tracker at Clear."

(u) SITE 3, FYLINGDALES, ENGLAND

(u) Site 3 would have a dual requirement: it would provide warning of an IRBM attack on the United Kingdom and of an ICBM attack on Canada and the continental U. S. The Communications Electronics Implementation Plan for this site described its location as being at Fylingdales in Yorkshire on the northeastern coast of England approximately eight miles south of the town of Whitby. The site was to be connected by a rearward communication system with an RAF central display and warning facility and with U. S. display facilities. Operational capability for this station was set for April 1963. It was to be operated jointly by ADC/RAF personnel and maintained by RAF.

(u) NEED FOR AN IMPROVED WARNING SYSTEM

(u) On 10 October 1960, NORAD told the JCS that it considered necessary the improvement of the current ICBM warning system because of the possibility of non-optimum ICBM trajectory attacks against the U. S. and the constantly improving Russian ICBM program. Non-optimum

Shel  
Classified  
copy

~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED



(u)

ICBM trajectory attacks had been covered in a USAF intelligence briefing earlier at NORAD Headquarters. In regard to such attacks, NORAD said it was concerned that either a low angle trajectory might be used to pass below the currently-designed BMEWS coverage or that the long way around approach across Antarctica might be used. NORAD stated that an improved and expanded warning system should be able to detect and identify non-optimum ICBM trajectory attacks at the maximum possible distance and earliest possible time and also report objects approaching from any direction.

*Handwritten notes:*  
get classified  
cont

(u) The JCS replied on 9 November that the collection and analysis of information on the Soviet missile program was currently given the highest priority by the intelligence community. Estimates of improvements in Soviet capability with terminal guidance and the low angle technique would result from studies currently in progress. The results would be given to NORAD as they became available. These results might indicate a need to reevaluate the ICBM warning system as currently planned, the JCS said.

NIKE ZEUS

(u) The 1962-1966 NORAD Objectives Plan (NADOP 62-66), submitted in March 1960, stated a requirement for Zeus deployment at seven locations by FY 1966 and at 27 locations by FY 1969. The plan stated a requirement for initial operational capability (IOC) in FY 1966 (two years later than the previous NADOP 61-65 because of delays in getting the system into production) and an ultimate goal of 70 fire units by the end of FY 1969, providing defense for 27 defense complexes.

(u) NORAD stated in its plan that Zeus was "the only active defense system which can be deployed to counter the enemy ICBM threat by 1965." Further, said NORAD, Zeus would also provide an effective defense against submarine-launched missiles.

The force deployment listed for Zeus was based

Declassified per  
14 Dec 2006 memo

~~CONFIDENTIAL~~

UNCLASSIFIED



upon initial production funds becoming available in FY 1962, and a 48-month lead time between the obligation of these funds and the IOC. NORAD pointed out that the IOC could be advanced by providing pre-production or production funds in FY 1960 or FY 1961. This advance would significantly improve NORAD's deterrent and defense posture.

(U) But production funds were not forthcoming. And Zeus rocked along in the research and development stage.

(U) In October 1960, the Army set up an Ad Hoc Advisory Committee chaired by Mr. Richard S. Morse, Department of Army Director of Research and Development, to determine the feasibility of getting an interim Zeus program. Other members of the committee included such men as Dr. J. P. Ruina, Assistant Director of Defense Research and Engineering (OSD), and Dr. Hector Skifter, Consultant to the Special Assistant to the President for Science and Technology.

(U) The committee held its first meeting on 26 October. It concluded that an early interim Zeus production and deployment program was desirable. The program would result in a saving of time and would probably reduce costs for any follow-on program by lessening refit requirements. Further, the program would allow more realistic planning for future programs.

(U) The committee asked NORAD and ARADCOM to assist in its study. Representatives from ARADCOM and NORAD met with the committee on 10 November, and NORAD agreed to furnish deployment guidance for Zeus. NORAD's deployment concept was sent to ARADCOM on 15 November 1960, for forwarding to the Committee.

(U) This deployment was based on the Army committee assumed production figure of four fire units per year for three years. NORAD recommended deploying the first year's production to the New York and Washington-Baltimore areas. The east coast was selected to give protection against submarine-launched missiles, and to protect the important New York area and the nation's



capital. The West Coast and the mid-west would get the second year's production, with two fire units at Los Angeles and the Chicago/Milwaukee areas. The final year's production would be deployed at San Francisco and Boston (each with one fire unit), and New York (two fire units).

(U) After getting NORAD's recommended deployment and cost data from the Department of the Army, the committee worked out a plan for an early interim Zeus program. It recommended to the Army that:

(U) a program for the production of NIKE ZEUS batteries at the rate of four per year be immediately initiated and funds in addition to those presently programmed be provided in accordance with the attached cost estimate and equipment listing....

(U) the units produced be deployed in defense of the North American Continent in consonance with anti-missile defense plans of NORAD

(U) the presently approved NIKE ZEUS research and development program be continued with the primary objectives of determining the system effectiveness against various types of threats and of improving this effectiveness at the maximum rate consistent with the state of the art (FY 62 level-\$272 million).

(U) The Committee recommendations were included in a memorandum to the Secretary of the Army for forwarding to the Secretary of Defense. This draft memorandum concurred in the committee report, with minor exceptions, and stated:

The minimum program I consider appropriate under the concept...would result in production and deployment



~~CONFIDENTIAL~~



at a yearly rate of 4 batteries, 2 defense centers, and 200 missiles. For the present, I do not recommend any total number of units to be produced at this rate. I feel that the ultimate program size and production rate should be based in part on the lessons learned in the limited program, but must meet the approved requirement for defense of our vital centers.

(U) NORAD later learned informally that the Secretary of Army memorandum had been sent to the Secretary of Defense in December 1960.

(U) CINCNORAD then, on 14 December, told the JCS that he had reviewed the Army memorandum and the Ad Hoc Advisory Committee report and "view their recommendations as an initial step toward early production and deployment of the ZEUS system in support of which NORAD has long been on the record with the JCS." He said further that he supported the committee recommendations but reaffirmed the military requirement for a system of larger scope as set forth in NADOP 62-66.

(U) The JCS replied that they had not yet seen the papers but that CINCNORAD's views would be given appropriate consideration in their reply to the Secretary of Defense.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



FIVE  
OPERATIONAL POLICIES AND PROCEDURES

IDENTIFICATION AND AIR TRAFFIC CONTROL

NORAD DIRECTIVE ON IDENTIFICATION

(U) Prior to September 1960, no NORAD/CONAD Regulation had been issued on identification of air traffic. However, on 16 July 1959, NORAD had approved for use in the U. S., USAF ADC Regulation 55-12, as modified by NORAD instructions, pending issuance of its own regulation. In addition, it had approved Northern NORAD Region Regulation 55-6, dated 25 April 1959, for identification procedures in Canada.

(U) A draft of a proposed NORAD/CONAD Regulation on identification was forwarded on 15 October 1959 to JCS, RCAF, and NNR for concurrence. Only minor changes were made to the draft, and the JCS approved the regulation on 22 July 1960. Accordingly, NORAD/CONAD published Regulation 55-14, dated 19 September 1960, "Identification of Air Traffic." The regulation established policies, procedures, responsibilities, and the methods and criteria for identifying airborne objects within the NORAD/CONAD system.

IDENTIFICATION PROCEDURES IN CANADA

(U) A proposed Air Navigation Order, Series V, No. 14, "Security Control of Air Traffic," was, except for minor changes, concurred in by NORAD on 12 December 1960, and submitted through RCAF Headquarters to the Department of Transport for publication in April 1961. It included some changes in identification zone boundaries, modified flight planning and reporting procedures to reduce interference with normal aircraft operations, and included a section covering the regulations for aircraft operating when Canada's Emergency Security Control of Air Traffic plan was put into effect.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) The speed criterion exempting aircraft from complying with Domestic and Coastal CADIZ and Distant Early Warning Identification Zone regulations was increased from 150 knots to 180 knots. This revision was based on a reevaluation of the air breathing threat. Current threat aircraft were unable to operate at speeds as low as 200 knots when carrying a war payload. But to provide a safe margin, and for ease of measuring speeds on the radar scopes, the minimum speed was reduced from 200 knots to 180 knots. The order also changed the altitude criteria for the no flight plan requirement by eliminating the 4,000-foot restriction. Finally, the identification zone time and distance tolerances were standardized, i.e., Domestic CADIZ/MIDIZ at plus or minus five minutes of the estimated time over the point of penetration and ten miles from the estimated point of penetration, and Coastal CADIZ/DEWIZ at five minutes and twenty miles.

#### IDENTIFICATION ALONG THE U. S.-MEXICAN BORDER

(U) Since 1957, NORAD/CONAD had been seeking to improve its identification capability along the U. S.-Mexican border. All efforts had been stymied, however, because agreement could not be reached with Mexico on setting up an identification zone with some depth over Mexican territory and getting timely flight plan and air movements data.

(U) The existing zone, the Southern Border ADIZ, had been set up in December 1955 and was just a thin line running along the common border. The means of getting flight plans and air movements data were less than adequate, also.

(U) Flight plans were sent from Mexico over various airline radio teletypes to the U. S. Federal Aviation Agency Air Movements Identification Sections in Miami, Florida, Los Angeles, California, and Brownsville, Texas. The plans were then screened and sent to concerned radar sites. But by the time this procedure was carried out, the jets were already in range of the air defense radars and labeled "unknowns."

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) A second border identification problem concerned traffic that came within range of the radars and seemed about to cross the border. Just when it appeared that these flights would have to be intercepted, they landed at border towns on the Mexican side.

(U) An ADIZ in depth had been proposed to the Mexican Government in 1958 and again in 1959, but nothing resulted. Until an adequate ADIZ was established, compromise solutions had to be adopted. One such, proposed by the 28th Region, was accepted by NORAD and put into effect in 1960.

(U) The 28th told NORAD in November 1960 that the percentage of unknown traffic that began in the Southern Border ADIZ area of the Los Angeles Air Defense Sector (LAADS) and faded before intercept was rising. It had jumped from nine percent of the sector's total southern border unknowns in 1959 to 39 percent in 1960.

(U) Some of the causes were an increase in the number of high-speed aircraft that, while taking-off and landing at Tijuana, Mexicali, and Nogales, crossed the border while flying the traffic pattern; mistakes by AC&W personnel and aircrews; and atmospheric conditions that made it look to the radar as if the aircraft had crossed the border.

(U) The 28th said that it had let the LAADS set up a buffer zone 15 nautical miles wide on both sides of the border and running parallel to it. All tracks starting in the buffer zone were classified friendly. Tracks starting in Mexico and south of the zone were labeled "pending" and were carried as such as long as they stayed south of or in the zone. Setting up the zone, the 28th said, cut down the number of interceptor scrambles to identify civilian traffic and cut the cost of policing the ADIZ. The region pointed out that it did not feel that an attack would start within 15 miles of the border because the area was under constant surveillance both by radar and visual means. But, just in case, upon declaration of an Air Defense Emergency the zone would be abolished.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) NORAD approved this procedure on 6 December 1960.

#### FLIGHT FOLLOWING SAC AIRCRAFT

(U) In 1958, NORAD directed that all SAC tactical aircraft be continuously flight followed by the air defense system. The requirement for this was established in "SAC/NORAD Memorandum of Agreement for Emergency Air Traffic Control and Identification," dated July 1958. After an unsuccessful effort in early 1959, the whole-sale flight following of SAC aircraft was abandoned, and the service was limited almost entirely to SAC Emergency War Order traffic and SAC "Specials." However, the flight following requirement was not dropped and on 23 June 1959, NORAD directed ADC to recommend an area where a flight following test program could be held.

(U) ADC completed a study on the proposed SAC flight following tests and submitted its conclusions to NORAD on 17 November 1959. ADC concluded that there was a requirement to maintain continuous flight following during normal readiness if NORAD were to insure the safe passage of SAC's forces during emergencies or actual hostilities. Development of such a program, it continued, would enhance the overall air defense system. On 17 December 1959, NORAD concurred in the proposed SAC flight following tests, and said it would support any actions necessary to implement the program.

(U) Accordingly, a two-part test project, known as Trail Smoke, was set up in the 30th Air Division (SAGE) area and the immediate adjacent manual areas of the 32d and 33d Air Divisions. This project was a jointly sponsored FAA-USAF test with NORAD, ADC, and SAC, participating. Besides flight following, an aim of the test was to find out if it was feasible for FAA to use SAGE to provide a flight advisory service to aircraft operating at flight level 240 (24,000 feet) and above.

(U) The flight-following portion of Trail Smoke took place between 1 March 1960 and 1 September 1960 and the

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) final report was submitted 1 November 1960. The conclusion of the report was that the flight following of SAC tactical aircraft was feasible and would not impair the primary air defense mission. However, some manual direction centers would have to make special manning arrangements when flight following was held during live or large scale training exercises. These special arrangements involved the use of off-duty personnel which in effect increased working hours.

(U) NORAD concurred in this portion of Trail Smoke, and ADC issued a directive on 24 November to implement the flight following of all SAC tactical air traffic while operating within the air defense system. The first group of 19 SAC bases or units to receive flight following service were phased into the program starting on 15 December 1960; the remaining bases were to be phased in on 1 January and 1 February 1961.

#### RADAR ADVISORY SERVICE

(U) As previously stated, the Trail Smoke tests were also to determine the feasibility of FAA using SAGE facilities to provide a flight advisory service to aircraft operating at flight level 240 and above. This project represented a part of the effort in support of an agreement between the FAA and DOD to work toward the joint use of air traffic control and air defense facilities and elimination of unnecessary duplication.\* Specifically, the flight advisory portion of Trail Smoke had generated from a study made by the Air Defense Systems Integration Division (ADSID).\*\* The flight

(U) \* For background, see NORAD/CONAD Historical Summary, Jan-Jun 1959, pp 21-25.

(U) \*\* ADSID Study, The Feasibility of Using ADC Radars and SAGE for Air Traffic Control, dated 27 August 1959. ADSID was later redesignated AFCCDD (Air Force Command and Control Development Division).

~~CONFIDENTIAL~~



(U) advisory tests took place at the same time as the flight following tests, but lasted only from 4 April 1960 to 30 June 1960. They were confined to the Chicago and Detroit Air Defense Sectors and were primarily the responsibility of FAA.

(U) The main conclusion of the FAA test report was that it was feasible to provide radar advisory service from the SAGE Direction Centers. However, the report stated that modifications to the existing air defense systems were necessary to provide this capability.

(U) On 14 December 1960, NORAD wrote to Headquarters USAF, concurring in the FAA report. However, NORAD made clear that the proposed radar advisory program using the SAGE DCs must not degrade the air defense mission. NORAD further stipulated that prior to the implementation of the program, agreement had to be reached between USAF and FAA on operational concepts, equipment configuration, computer program modifications, communications requirements, and funding responsibilities.

### WARNING AND READINESS PROCEDURES

#### READINESS AND WARNING NETWORK

(U) A new regulation 55-12, "Air Defense Warning System For North American Continent," was issued by NORAD/CONAD on 14 September 1960. It changed the name of the Alert No. 1 Network to Readiness and Warning Network, changed the term "division" to "region" in keeping with the NORAD/CONAD reorganization, and added implementation and termination of CONELRAD via the readiness and warning networks.

(U) Although not reflected in the revised Regulation 55-12, a major change in the Military Air Defense Warning Network (MADW) was taking place. The Federal Aviation Agency agreed to assume the function of passing MADW information to the Air Force and Air National Guard bases. This was another venture by FAA and DOD to combine some

~~CONFIDENTIAL~~



(U) of their functions as previously agreed.\* The handling of MADW messages, formerly the responsibility of the Air Force Military Flight Services Centers (MFSC's), was to be taken over by the FAA Air Route Traffic Control Centers in phases. Phase I was to start 15 December 1960 with Lowry and Wright-Patterson MFSC's. But it was necessary to defer the transfer until 1 January 1961, for the ARTC's were not ready. Phase II was scheduled for 15 February 1961, and was to include Carswell, Hamilton, Maxwell, and Olmstead MFSC areas.

#### ALASKAN ATTACK WARNING SYSTEM

(U) A "Memorandum of Understanding" between the Office of Civil and Defense Mobilization and NORAD was included in NORAD Regulation 55-23 on 19 February 1960. Under the terms of the understanding, OCDM was responsible for disseminating civil air raid warnings over its National Warning System (NAWAS). However, the Alaska Civil Defense Warning System was not tied into the NAWAS. The OCDM therefore recommended that a supplement to the current Memorandum of Understanding be signed to insure that the civilian warning mission in the State of Alaska was accomplished in accordance with existing laws and directives.

(U) Accordingly, the OCDM and NORAD prepared a draft agreement and sent it to the Commander, Alaskan NORAD Region, Lieutenant General Frank A. Armstrong, Jr., on 3 November 1960. General Armstrong signed the agreement on 18 November. General Laurence S. Kuter, CINCNORAD, signed it in concurrence, since he was the co-signer of the original memorandum, on 4 January 1961. And Mr. Leo A. Hoegh, OCDM Director, added his signature on 18 January 1961.

(U) \* Department of Defense-Department of Commerce Agreement, dated 9 January 1958.

~~CONFIDENTIAL~~





## CANADIAN ATTACK WARNING SYSTEM

(U) In 1959, the Canadian Army took over responsibility for the Canadian attack warning system. To meet this responsibility, the Army proposed to NORAD the setting up of Army warning staffs in the NORAD COC at Colorado Springs and at certain NORAD Region Headquarters.

(U) Because space in the NORAD COC was limited and facilities at Ent were already saturated, NORAD asked that the Army re-examine its requirement. Afterward, Air Marshal C. Roy Slemon, Deputy CINCNORAD, met with the COSC and a decision was made to restudy the subject of placing a separate staff at Ent. Later, NORAD learned that there were to be display facilities in a joint operations center at Ottawa for the COSC which could be used for the Army's mission. On 11 October 1960, Air Marshal Slemon wrote the Executive Agent for NORAD that NORAD was willing to have a Canadian Army officer attached to NORAD Headquarters in a liaison capacity, if and when the COSC so directed, until the COSC's display became operational.

(U) NORAD had agreed in June 1960 to the Canadian Army plan to establish a Regional Warning Information Center in the 25th Region. The first officer for this center arrived in October 1960 and by year's end the center had been set up. A plan to establish warning centers in the 29th and 30th Regions was approved by NORAD on 13 September 1960. At the same time, NORAD authorized direct coordination between the Canadian Army and the commanders of the 29th and 30th Regions. The role and functions of these two centers were to be the same as for the center in the 25th Region.

## SHAPE/NORAD EXCHANGE OF EARLY WARNING INFORMATION

(U) NORAD and SHAPE agreed in 1959 that setting up communication between their commands to exchange early warning information was essential. SHAPE felt that a semi-automatic data transmission system (called Link III), which it proposed using for its internal communication network, would satisfy the requirement. However,

~~CONFIDENTIAL~~



(U) NORAD wanted a full-time voice circuit to permit the exchange of unclassified, evaluated, tactical information, and NORAD made known this requirement to the JCS. It stated that a teletype circuit would not have the capability for rapid elaboration on doubtful information passed. Later SHAPE supported the voice circuit.

(U) On 6 October 1960, the JCS said that they had reviewed the requirement and asked CINCNORAD and Commander-in-Chief Europe to comment on the following proposals:

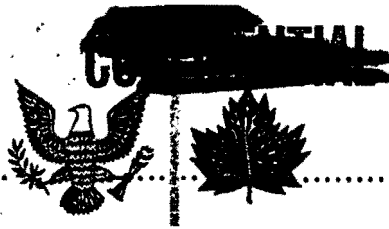
(U) (a) That the establishment of a SHAPE-NORAD early warning information circuit would be incomplete if it did not include CINCLANT, in view of his geographical location between SHAPE and NORAD

(U) (b) That a SHAPE-NORAD circuit if established should include the US JCS Joint War Room as an addressee

(U) (c) That a high-quality, full-time teletype circuit would fulfill the requirement

(U) CINCEUR replied to the JCS on 25 October 1960, stating that the operational requirement for an improved means of early warning data exchange with NORAD was NATO in nature, and therefore the final comment by the Supreme Allied Command Europe could be provided only on a NATO basis. CINCEUR agreed to include CINCLANT in the network, but with the understanding that this would imply the provision of early warning coverage in the Greenland-Iceland-Faeroe Area, and coordination of early warning plans for this area. CINCEUR advised against including the JCS Joint War Room on the grounds that this might create a funding problem in NATO. As regards the high-quality teletype circuit to fulfill the requirement, CINCEUR referred

~~CONFIDENTIAL~~



(U) to the June 1960 meeting between SHAPE and NORAD where SHAPE supported NORAD's requirement for a voice circuit.

(U) NORAD replied on 14 October 1960. First, NORAD restated the voice circuit requirement and its opposition to the teletype circuit. Secondly, it said that including CINCLANT as an addressee did not seem appropriate in view of the purely air defense purpose of this circuitry. Finally, NORAD said that there was no objection to the JCS Joint War Room inclusion if the use of the circuit was restricted to tactical information and the circuit gave CINCNORAD uninterrupted voice communication with SHAPE.

#### (U) U. S. CONELRAD ALERTING SYSTEM

For two years prior to 1960, USAF and the Federal Communications Commission had been studying the problem of how to get the widest dissemination and the fastest means of passing CONELRAD alerts from NORAD to non-government radio facilities. The current system was a limited terminal telephone relay system. It had proved unsatisfactory for it was subject to false alarms, it provided no written record of CONELRAD directions, and it was too slow in alerting the broadcast stations. As a result of the study, the decision had been made to use the Associated Press and United Press International teletype wire service to initiate and stop CONELRAD alerts.\* A contract to provide for the use of these wire facilities was signed on 21 November 1960, by USAF, FCC, Associated Press, and United Press International.

(U) Control circuits direct from the NORAD COC to the AP and UPI radio-press system had been ordered, and the system was scheduled to be implemented by June 1961. Automatic selective switching equipment would temporarily

---

\* For background on CONELRAD see NORAD/CONAD Historical Summary, July-December 1959, pp 46-49, and January-June 1960, pp 44.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) interrupt the normal radio-press teletype networks and combine them into one nationwide alerting system. Upon receipt of a declaration of a CONELRAD alert from CINCNORAD, all AM, FM, and TV broadcast stations, which subscribed to one of the radio-press services, would begin operations under CONELRAD rules.

### TRAINING AND TESTS

#### NORAD/SAC JOINT TEST AGREEMENT

(U) A joint test agreement was signed on 6 October 1960 by General Laurence S. Kuter, CINCNORAD, and General Thomas S. Powers, CINCSAC. Its purpose was to "establish policy and procedures for the operational testing of weapon systems, tactics, and techniques of both commands to improve their offensive and defensive capabilities." It was provided that plans resulting from this agreement would be designed to include as many test requirements of both commands as possible, in order to conserve resources. The agreement was drawn up at the August 1960 conference between SAC representatives and the NORAD SAGE/Missile Master Test Group.

#### JOINT SERVICE AGREEMENTS ON INTERCEPT PROCEDURES

(U) On 26 February 1960, SAC and NORAD issued a joint regulation (SAC/NORAD Regulation 51-6) for the conduct of joint training. The need for the regulation grew out of a mid-air collision between a bomber and a fighter during training. An accident investigation board found that everyone concerned in joint training was not thoroughly briefed on and did not follow the procedures in training regulations. NORAD and SAC decided to publish a joint training regulation and make sure that everyone was familiar with its contents. Not only would this made for better, but also for safer, training.

(U) The next step was to get the Tactical Air Command and the Navy to adopt the joint procedures. To this end,

~~CONFIDENTIAL~~



(U) representatives of NORAD and SAC met with Navy representatives in September 1960. The Navy agreed to adopt the SAC/NORAD regulation, but asked that certain terms be amplified in a letter of agreement to be exchanged between the Navy and the Air Force. A joint agreement was signed by the CNO on 27 October 1960, and concurred in by USAF on 4 November 1960. NORAD published the agreement on 16 December 1960 as an attachment to the basic regulation.

(U) NORAD then approached TAC to seek an agreement. At a conference at Headquarters NORAD on 12 December 1960, TAC agreed to follow the provisions of the regulation. Another agreement amplifying terminology was drawn up and signed by representatives from TAC, SAC, and NORAD. This agreement was to be confirmed by the three headquarters and NORAD was to publish it as an attachment to the basic regulation.

#### FALLOUT PROTECTION

(U) In November 1959, the JCS issued a fallout shelter construction policy, which included a requirement to categorize facilities and weapons systems and to establish priorities for protective construction projects. The JCS placed on the services and the commanders of commands established by the Secretary of Defense, the responsibility to implement the policy.

(U) On the basis of the policy, NORAD established objectives for fallout protection in its 1962-1966 Objectives Plan (NADOP 62-66), dated 31 March 1960. NORAD included initial funding estimates for the major weapons and control systems. NORAD's plan would require construction or modification of facilities "to ensure air defense personnel protection from radioactive fallout."

(U) NORAD's Fallout Shelter Program was outlined in a directive to ADC and ARADCOM on 30 June 1960. Information copies only were sent to NAVFORCONAD and RCAF ADC. USAF ADC was instructed to advise the augmentation forces of the program. NORAD stated that its objective was to provide austere fallout protection for operational



(5)

and support personnel, and equipment of a critical nature. NORAD asked for comments, stating that these preliminary concepts were subject to revision. From its studies NORAD had established the following minimums for personnel fallout shelters.

Accommodation for 60 persons.

Allow entry for all occupants within five minutes after arrival at shelter.

(6)

Withstand blast overpressure of 30-35 PSI at no appreciable increase in cost.

Reduce fallout radiation intensity by a factor of about 10,000 as compared to exposure on the surface.

Sustain 60 persons for 14 days providing minimal accommodation and rations.

NORAD told ADC and ARADCOM to compute their program costs for the following elements in the priority listed:

ADC	ARADCOM
1. Supersonic, atomic capable fighter interceptors	1. Hercules
2. Bomarc B	2. Operational command and control facilities
3. Bomarc A	3. National Guard Ajax
4. Subsonic, atomic capable fighter interceptors	4. Regular Army Ajax

(5)

~~CONFIDENTIAL~~



ADC	ARADCOM
5. Supersonic, non-atomic-capable fighter interceptor squadrons	
6. Subsonic, non-atomic-capable fighter interceptor squadrons	
7. Operational command and control facilities	

(U)

(U)

ADC replied on 15 August that the NORAD Fallout Shelter Program appeared to be an excellent and relatively inexpensive approach for protection of combat forces under fallout conditions. It stated that as soon as funds were made available, it would allocate them on the following priorities:

(U)

(U)

- (a) Aircrews
- (b) Ground support personnel directly associated with turnaround of combat aircraft
- (c) SAGE CC's and DC's
- (d) Air Defense Missile Squadrons operational areas
- (e) ACWRON operational areas
- (f) Selected command and control activities.

ADC also said that, in conformance with USAF policy, it had instructed all divisions to include fallout basements in their FY 1962 military construction programs.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) USAF stated in a policy letter, dated 15 June 1960, to all air force commands, that basements of selected buildings were to be included in all fallout programs. USAF said that a basement below grade level afforded 100 times the fallout protection of the second floor.

(U) ARADCOM, in its reply of 19 July 1960, stated that it had submitted the NORAD concepts on fallout protection construction to the Department of the Army. As a result, DA, on 8 July had requested ARADCOM to designate a NIKE-HERCULES site to be used as a test site to apply NORAD concepts with some modification. ARADCOM said it had selected site New York 25, an improved NIKE-HERCULES unit, for the test operation. NORAD was to be kept advised on the progress of this project.

(U) ARADCOM also stated that shelters accommodating 60 persons were too large for NIKE sites. Rather, two thirty-man shelters would be required, one each in the launch area and the integrated fire control area. The sixty-man shelter, however, would be applicable to the Missile Master, and at Group, Brigade, and Region Headquarters. Finally, ARADCOM said that current Army requirements were for three-day stockage of shelters, whereas NORAD's plan was for 14 days.

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~



SIX  
EXERCISE SKY SHIELD

BACKGROUND PLANNING

REQUEST FOR AN EXERCISE

(U) Prior to Exercise Sky Shield, run in September 1960, there had not been a large-scale live exercise since September 1958 when Exercise Top Hand was held. The exercise planned for 1959, Sky Hawk, had been cancelled.

(U) Following the cancellation of Sky Hawk, CINCNORAD had asked the JCS to approve a similar exercise for 1960. At a meeting of Canadian and U. S. Ministers at Camp David, Maryland, on 7 November 1959, it was agreed that an exercise should be held in the next fiscal year. The JCS then told NORAD and Strategic Air Command, on 20 November 1959, to proceed with planning for an exercise similar to Sky Hawk.

(U) The JCS directed that the Federal Aviation Agency and the Canadian Department of Transport be asked to participate in all stages of planning because of the proposed grounding of air traffic. Also, the JCS said not to inform the civilian air transport and pilot organizations until the exercise had been approved by both governments. Finally, they directed NORAD to appoint two separate briefing teams, each with SAC representation, to present plans for the exercise simultaneously in Ottawa and Washington.

APPROVAL OF SKY SHIELD

(U) On 28 June 1960, the JCS informed NORAD that Canadian-U. S. governmental approval for Sky Shield had been received. The JCS issued a directive, dated 20 July, to NORAD and SAC to conduct Sky Shield on 10 September 1960 during 0600 to 1200 hours GMT. The directive

~~CONFIDENTIAL~~



(U) stated that FAA and DOT would ground all aircraft not participating in the exercise for a six-hour period in Canada, the continental U. S., and Alaska, and within an area extending approximately 150 miles seaward.

(U) On 1 August 1960, NORAD issued Operations Order 6-60, Sky Shield. It stated that the primary mission of Sky Shield was to exercise the entire NORAD system against a realistic attack conducted within an ECM environment. In addition, the order directed that certain portions of the NORAD system be analysed and evaluated.

#### DESCRIPTION OF THE EXERCISE

##### STRIKE FORCES

(U) As scheduled, Exercise Sky Shield took place on 10 September 1960 between the hours of 0600 and 1200 GMT. The SAC strike force, mostly B-47's and B-52's, totalled 310 aircraft. This included 30 EWO safe passage flights in the Chicago and Syracuse areas which became strike, sorties on the return flights. Altogether there were 150 sorties flown at low altitude and 150 at high altitude against the air defense system. Supplementing the strike force, ADC had 10 B-57's simulating SAC Quail decoys in the San Francisco area. Also, there were two B-58's and two U-2's. These four special attack aircraft augmented the SAC strike force on a "no notice" basis.

(U) Strikes for the most part began outside the radar periphery of the North American Continent. The high altitude strikes were duplicated by low altitude strikes, with flight plans arranged so that both were within the defended areas at about the same time. Strikes were heavily concentrated in the northeast, north central and west coast areas of the United States. All strike aircraft used ECM against the NORAD system.



### FRIENDLY FORCES

(U) A total of 1129 fighter scrambles were made against the strike force during Sky Shield. Of these, 730 attempted engagements. The remainder were used in combat air patrols and trailer activities. Of the 730 attempted engagements, 344 were successful. However, this ratio was not considered a true indication of the defense posture because of restrictions imposed in the exercise.

(U) The missile simulated engagements totalled 52 Bomarc's, 254 Hercules, and 96 Ajax. Of these engagements, 38 Bomarc's, 245 Hercules and 90 Ajax were successful.

### EVALUATION OF SKY SHIELD

#### NORAD ANALYSIS

(U) General. As noted above, selected portions of the air defense system were to be analysed. The NORAD Directorate of Operations Analysis undertook to analyse the capability of the ground environment network to detect and track bombers flying at very low altitudes. It also analysed the capability of the DEW Line, the Ocean Barriers, and the MCL to detect and report aircraft. Its findings were published in Technical Memorandum No. 12, (U) Analysis of Exercise Sky Shield, dated November 1960.

(U) The NORAD analysis report stated that Sky Shield did not provide a good opportunity to evaluate the capability of the radar warning lines. It said that the emphasis on training, safety requirements, and other considerations, compromised Sky Shield's usefulness as a test. For example, during Sky Shield the warning lines were penetrated by cells containing up to four aircraft each, rather than by individual aircraft penetrating at random points along the lines. Most of

~~CONFIDENTIAL~~



(U) the barrier penetrations favored detection by the lines and were at altitudes between 35,000 to 40,000 feet, rather than at very high or low altitudes. Similarly, low altitude flights within the defended area were not as low as an enemy would be expected to fly. Detection was also favored by the fact that some flights descended to low altitude after entering radar coverage.

(U) On the other hand, the use of ECM in various quantities very likely added to the difficulties in low altitude surveillance. There were too many variables, the report emphasized, which limited the value of the analytical results. The results set out below were therefore subject to that qualification.

(U) Detection and Tracking of Low Altitude Missions.  
The low altitude missions were flown by single aircraft at altitudes down to 1000 feet above the water or 1500 feet over terrain. For the purpose of NORAD's analysis, any mission or portion of a mission flown below 5000 feet above terrain was considered to be low altitude. Also, the low-altitude analysis was limited to the missions flown through the SAGE sectors.

(U) A total of 89 bombers flew low altitude missions in the SAGE sectors. Of these, 80 initially entered radar coverage at low altitude. The remaining nine penetrated at high altitude and descended. The latter were detected, but only 49 of the other 80 aircraft were detected. This made an average detection for the 89 low-level aircraft of 55 percent.

(U) The 89 missions flew a total distance of 21,000 nautical miles within radar coverage. The SAGE system generated tracks totalling 6,300 nautical miles. Thus, 30 percent of the distance flown in radar coverage at low altitude resulted in tracking. The 49 aircraft which were detected flew a total distance of 10,400 nautical miles within radar coverage. These flights were tracked 61 percent of the distance flown.

(U) Relating the SAGE tracking capability to the control of interceptor weapons, the report concluded that

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) no more than 25 percent of the flights tracked at low altitude in Sky Shield could have been successfully intercepted.

(U) DEW Line. During the exercise, 34 SAC aircraft in nine cells crossed the DEW Line. Some of these cells were flown in such a manner as to present well-separated single aircraft tracks, while others were flown as groups of three or four aircraft. The nine cells were detected and seven were reported to the NORAD COC. However, the DEW Line stations underestimated the total raid by six aircraft. Thus, only 28 aircraft were tracked, of which 20 were reported to NORAD. In addition to the live Faker aircraft, ten single tracks were simulated. Reports on five of these tracks did not reach the NORAD COC. The low reporting rate of tracks from the DEW Line to NORAD COC was due to a teleprinter-tape break-down in one sector.

(U) DEW Line Barriers. Two cells containing four B-52 aircraft each, were scheduled to penetrate the Pacific Barrier. One cell crossed the northern portion of the barrier at high altitude. The second cell, at low altitude, approached from the east, but turned away before actually crossing the barrier. Only two of the low-flying aircraft flew close enough to the barrier radars for detection. The four aircraft which crossed the barrier at high altitude, and one of the low-flying aircraft, were detected and reported to the NORAD COC.

(U) The Atlantic Barrier was penetrated at high altitude by four cells containing a total of 15 B-52's. All four cells were detected and reported to the NORAD COC.

(U) Mid-Canada Line. Sixteen cells of aircraft penetrated the MCL during the exercise. The total number of aircraft which penetrated southbound was 66. Two cells of seven aircraft were used as "spoofers" raids crossing the MCL several times; all other cells crossed once. These tactics led to a total of 81 southbound crossings by single aircraft and 21 crossings by the 16 cells. Detections were made on each of the 21 cell crossings. Of the 81 single aircraft crossings,

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



(U) the MCL reported 69 to the NORAD COC. The analysis report attributed this deficiency to inaccuracies in the GEOREF (Geographical Reference) system. Also, the report pointed out that the MCL stations failed to recognize the "spoofer" tactics.

(U) Conclusions. On the basis of the above data, the NORAD Operations Analysts concluded in their report that:

(U) Nearly one-half of the flights at low altitude escaped detection and those which were detected were tracked only approximately 60% of the time they were within radar coverage.

(U) Based on evidence obtained from the Sioux Arrow missions, it is estimated that not more than one-fourth of the Sky Shield low altitude missions would have been successfully intercepted if interceptions had been attempted.

(U) The DEW Line, the MCL and the Ocean Barriers are virtually certain of detecting raids of the size presented by Sky Shield and afford a high probability of detecting much smaller raids.

(U) Raid recognition, however, may be seriously handicapped by the failure to report track data from the DEW Line and the MCL to the NORAD COC.

(U) The MCL did not provide an accurate assessment of the "spoofer" tactics and, in fact, did not recognize them as "spoofer" tactics. Therefore any assessments of the character of the enemy raid or of enemy intentions made

~~CONFIDENTIAL~~



(U) on the basis of MCL data should be viewed with considerable caution.

#### ARADCOM ANALYSIS

(U) ARADCOM placed observers at two Missile Master sites (Fort Heath, Massachusetts, and Highlands, New Jersey). In the vicinity of these sites, SAC flew 16 low-level flights of which twelve were detected by SAGE. Only on these was the information passed to the Missile Master. All twelve flights were acquired and tracked by the defense battery radars. "Lock-ons" and "kills" were made by the batteries on all targets designated "fakers."

(U) The ARADCOM observers could not determine whether the four flights not passed by SAGE were detected and tracked by the ADA radars. The ADA radars tracked several aircraft, but the tracks could not be correlated to the four SAC flights.

(U) Of the twelve flights acquired and tracked, only five were below 5,000 feet and none was below 3,000 feet at the time of "kill." ARADCOM felt, therefore, that the exercise was not an adequate test of the ability of the ADA radars to detect and track low-flying aircraft. One other conclusion of ARADCOM's was that the exercise indicated an ability of Missile Master and ADA units to detect and track targets passed down by SAGE.

#### ADC ANALYSIS

(U) The effectiveness of safe passage procedures were analysed by ADC. The results were published in Operations Analysis Technical Memorandum No. 27, SAC Safe Passage in Exercise Sky Shield.

(U) Thirty SAC safe passage aircraft were scheduled in six cells of five aircraft each. Twenty-nine aircraft flew. All cells were tracked adequately, but the SAGE system could not accurately determine the size of the

~~CONFIDENTIAL~~



(U) cells. There were three scheduled aborts and the air defense system had no difficulty either tracking or identifying all three aircraft. The safe passage traffic was identified by flight plan correlation, use of Mark X SIF, and by accepting handover of a track with a given identity to maintain track continuity.

(U) The report concluded that, although the 29 SAC aircraft had been given safe passage during Sky Shield, a much larger number departing during a real attack might cause confusion in the air defense system and SAC might not receive safe passage. The ADC report concluded that SAC and NORAD personnel were inexperienced in the use of the Mark X SIF Mode-Code identification procedures. It also cited incorrect track assessments and faulty procedures in passing SAC take-off information through the air defense system. To insure safe passage, the report recommended more training and improved procedures.

#### ECM ANALYSIS

(U) SAC ECM jamming and chaff covered all the air defense frequencies during Sky Shield except those used for safety and emergency procedures. ECM activity was stopped one hour before the end of the exercise to clear the air of chaff and to regain control of all radar and communications frequencies. Nearly all of the radar facilities, both air and ground, and many of the communications facilities were jammed at different times during the exercise.

(U) The first signs of ECM were the appearance of jamming strobes on the displays of the DEW Line radars. This jamming intensified as the aircraft moved in, but by triangulating the strobes from adjacent sites it was possible to follow hostile tracks. As regards the barrier, the NORAD analysts reported that there was no evidence that ECM affected the detection capability of the barrier radars.

(U) In other reports, it was pointed out that although ECM activity within the contiguous cover was not as intense as had been anticipated, it caused a general

~~CONFIDENTIAL~~





(U) degradation of the system. By using ECCM fixes, where these were available, anti-jamming techniques, and by programming off radars in the SAGE system which were overloaded, a continuous picture of the attack was maintained, however.

(U) Communications jamming of VHF/UHF control frequencies in the manual areas resulted in several voice-controlled intercepts being missed. In the SAGE areas, this counter-measure was relatively ineffective against data-link controlled interceptors.

(U) Chaff was the most effective single counter measure against the SAGE environment, particularly when employed as a shield for low-level attacks. More than once the low-level attacks were obscured until they were inside the bomb-release-line. In some areas, the chaff so degraded the SAGE automatic tracking capability that manual tracking procedures had to be used.

(U) Both chaff and ECM significantly degraded the operation of the gap-filler radars.

#### CRITICISM OF THE EXERCISE

(U) Region Criticism. The consensus of the region commanders was that Sky Shield was successful and provided realistic training. However, there were areas the regions felt could be improved in future large-scale exercises. For example, the regions thought NORAD should provide them with an intelligence build-up which would normally be expected before an attack. In this way, they could have been better organized and have patterned their defenses beforehand to meet a particular situation. NORAD said that future exercises would have a realistic intelligence build-up.

(U) Many regions were disappointed in the quality and amount of ECM, in view of the excellent opportunity afforded by Sky Shield. They said more ECM activity was required to test and develop ECCM tactics. NORAD replied that it would strive for more realistic ECM in



(U) future exercises. Further, NORAD was preparing a directive describing joint ECM/ECCM training objectives.

(U) Another common observation was that Sky Shield did not employ the augmentation forces to any extent. Very few of the ANG interceptor squadrons participated, mainly because they had neither the equipment nor training for night interception (Sky Shield took place almost entirely during darkness).

(U) The regions complained also that the Sky Shield ground rules imposed too severe limitations which reduced training benefits. But NORAD replied that the ground rules were necessary for safety.

(U) The regions also pointed up the lack of flight plan information on faker aircraft. They claimed that SAC aircraft had not adhered to programmed flight plans to permit positive correlation. This resulted in "unknowns" which necessitated scrambles and diversions of fighters that could have been used against known fakers. They also emphasized the extreme flight hazards caused by SAC's digression from the pre-planned mission profiles.

(U) SAC Criticism. Although entirely satisfied with the manner in which Sky Shield was planned and conducted, SAC told NORAD on 5 October 1960 that it had received very little benefit from this type of exercise. It said that Sky Shield sorties resulted in a loss of training for SAC. SAC recommended that large-scale exercises be discontinued and that a program of small-scale missions be designed, concentrating on one or two NORAD regions at a time.

#### NORAD REPORT TO THE JCS AND COSC

(U) The Commander-in-Chief NORAD, General Laurence S. Kuter briefed the JCS and the Canadian COSC on 18 and 19 October, 1960 on the results of Exercise Sky Shield. He stated that the exercise had been successful in achieving NORAD's aim to train the air defense system..



(U) He emphasized that the main obstacle to making it a realistic air battle had been removed with the grounding of all non-exercise air traffic. However, he stated that the many restrictions imposed on the exercise in the interest of flight safety and the leaving out of nuclear detonations and other battle damage to get maximum training, served to distort many of the results. Thus, he emphasized that any conclusions drawn from the exercise were subject to a great many qualifications.

(U) He stated it would take some time to determine remedies to the problems revealed in Sky Shield. Of major concern was the limited capability of the system to detect, track, and intercept low-level attacks. The solution, he felt, was not only in improvement of the ground environment, but in changes in the airborne weapon system.

#### REQUEST FOR A 1961 EXERCISE

(U) At the conclusion of his briefing to the JCS on 18 October 1960, the Commander-in-Chief recommended that an exercise similar to Sky Shield be conducted on an annual basis. The Secretary of Defense and the JCS gave immediate verbal approval for a large-scale exercise for 1961.

(U) NORAD followed this up with a letter to the JCS on 7 December requesting formal approval to proceed with the planning for an exercise to be run during the third quarter of 1961. NORAD recommended that the JCS take action necessary to get joint United States-Canadian governmental approval.

10

11

12

13

GLOSSARY OF ABBREVIATIONS



## GLOSSARY OF ABBREVIATIONS

ACWRON	Aircraft Control and Warning Squadron
ADA	Artillery Defense Area
ADC	Air Defense Command
ADIZ	Air Defense Identification Zone
ADSID	Air Defense Systems Integration Division
AEW	Airborne Early Warning
AEW&Con	Airborne Early Warning and Control
AFB	Air Force Base
AFCCDD	Air Force Command and Control Develop- ment Division
ALCOM	Alaskan Command
ALDRI	Automatic Low Data Rate Input
ALRI	Airborne Long Range Input
AM	Amplitude Modulation
AMC	Air Materiel Command
ANG	Air National Guard
AOC	Air Officer Commanding
AP	Associated Press
ARADCOM	Army Air Defense Command
ARDC	Air Research and Development Command
ARNG	Army National Guard
ARPA	Advanced Research Projects Agency
ARTCC	Air Route Traffic Control Center
ASM	Air to Surface Missile
ATC	Air Training Command
BMEWS	Ballistic Missile Early Warning System
CAA	Civil Aeronautics Administration
CADIN	Continental Air Defense Integration, North
CADIZ	Canadian Air Defense Identification Zone
CC	Control Center
CC&DF	Central Computer and Display Facility
CEIP	Communications Electronics Implementa- tion Plan

CINCEUR	Commander-in-Chief, Europe
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
CNO	Chief of Naval Operations
COC	Combat Operations Center
COMBARLANT	Commander Barrier Atlantic
CONAD	Continental Air Defense Command
CONELRAD	Control of Electromagnetic Radiation
CONUS	Continental United States
COSC	Chiefs of Staff Committee
DA	Department of the Army
DER	Destroyer Escort Radar
DEW	Distant Early Warning
DEWIZ	Distant Early Warning Identification Zone
DIP	Display Information Processor
DOD	Department of Defense
DOT	Department of Transport
ECCM	Electronic Counter Countermeasure
ECM	Electronic Countermeasure
ESS	Experimental SAGE Subsector
EWO	Emergency War Order
FAA	Federal Aviation Agency
FD	Frequency Diversity
FM	Frequency Modulation
FY	Fiscal Year
GEOREF	Geographical Reference
G-I-UK	Greenland-Iceland-United Kingdom
IBM	International Business Machine
ICBM	Intercontinental Ballistic Missile



IOC	Initial Operational Capability
IRBM	Intermediate Range Ballistic Missile
JCS	Joint Chiefs of Staff
LAADS	Los Angeles Air Defense Sector
LRI	Long Range Interceptor
M&O	Manpower and Organization
MADRE	Magnetic Drum Radar Equipment
MADW	Military Air Defense Warning
MCL	Mid-Canada Line
MFSC	Military Flight Service Center
MIDAS	Missile Defense Alarm System
MIDIZ	Mid-Canada Line Identification Zone
MIP	Missile Impact Predictor
NADOP	North American Air Defense Object- ives Plan
NATO	North Atlantic Treaty Organization
NAVFORCONAD	Naval Forces Continental Air Defense Command
NAWAS	National Warning System
NGB	National Guard Bureau
NM	Nautical Miles
NNR	Northern NORAD Region
NORAD	North American Air Defense Command
NORADR	North American Air Defense Command Regulation
NSSCC	National Space Surveillance Control Center
NUDET	Nuclear Detonation
OCDM	Office of Civil and Defense Mobilization
OEC	Operational Employment Concept
OSD	Office of the Secretary of Defense
RCAF	Royal Canadian Air Force
RCAF ADC	Royal Canadian Air Force Air Defence Command

SAC	Strategic Air Command
SAGE	Semi-Automatic Ground Environment
SAGE DC	Semi-Automatic Ground Environment Di- rection Center
SAR/NAVAID	Search Air Rescue/Navigational Aid
SHAPE	Supreme Headquarters Allied Powers Europe
SLOE	Special List of Equipment
SLRI	Surface Long Range Inputs
SOR	Specific Operational Requirement
SPADATS	Space Detection and Tracking System
SPASUR	Space Surveillance
TAC	Tactical Air Command
TV	Television
UE	Unit Equipment
UHF	Ultra High Frequency
UPI	United Press International
U. S.	United States
USAF	United States Air Force
USAF ADC	United States Air Force Air Defense Command
USARADCOM	United States Army Air Defense Command
VHF	Very High Frequency
ZI	Zone of the Interior
ZULU	Greenwich Mean Time

INDEX



~~CONFIDENTIAL~~



INDEX

- ADC Command Surgeon: appointed  
CONAD Command Surgeon, 5
- ADIZ's: Mexican border, 55, 56;  
proposed criteria for, 55
- Advanced Research Projects  
Agency: directs ARDC to set up  
NSSCC, 41; directs Naval Re-  
search Laboratory to develop  
SPASUR, 41; transfer of re-  
sponsibility of Spacetrack and  
SPASUR from, 42
- Agreements: Alaskan/OCDM warning,  
60; between USAF, FCC, UPI and  
AP on CONELRAD, 63, 64; inter-  
cept procedures, 64, 65; NORAD/  
SAC joint test, 64; SAC/NORAD on  
air traffic control and  
identification, 57
- Airborne Early Warning and Control  
Aircraft: ALRI modification of,  
19, 20; improvement program for,  
18, 19
- Air Defense Warning System:  
changes to, 59, 60; for Alaska,  
60; for Canada, 61
- Air Force Command and Control De-  
velopment Division: designated  
to prepare SPADATS development  
plan, 43; develops plan for NUDET  
system, 25; studies low-altitude  
radar program, 16, 17
- Air National Guard Augmentation  
Force: JCS approval of NORAD  
plan for, 38; NORAD plan for,  
37-40; nuclear policy for, 39,  
40
- Air Navigation Order: changes  
proposed by NORAD to, 54
- Air Traffic Control: flight  
following SAC aircraft, 57, 58;  
radar advisory service, 58, 59
- Air Training Command: transfer  
of radar to, 14
- AJAX: Guard manning of, 36;  
program for, 36; status of, 35
- Alaskan Command: discontinues  
sectors, 8, 12; establishes con-  
trol centers in, 12
- Alaskan Sectors: elimination of,  
12
- Albuquerque Sector: discontin-  
ued, 7
- Anchorage and Fairbanks Sectors:  
discontinued, 8, 12
- Armstrong, Jr. F. A., Lt Gen:  
signs OCDM Memorandum of  
Understanding, 60
- Army Ad Hoc Committee: meetings  
of, 51, 52; recommendations on  
Zeus by, 52; set up, 51
- Army Air Defense Command: anal-  
ysis of Sky Shield, 75; estab-  
lishes 7th Region of, 7; pro-  
poses reducing Thule Hercules  
unit, 37

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



Associated Press: agrees to provide CONELRAD alerting, 63

Atkinson, J. H., Lt Gen: recommends buying additional F-106's, 29

Augmentation Forces: (See also, Air National Guard Augmentation Force): JCS approval of NORAD plans for, 38; NORAD plan for, 37-40

Ballistic Missile Early Warning System (BMEWS): (See also, Thule): background on, 45, 46; central computer and display facility for, 47, 48; operational capability of, 46-49; Site 1, status of, 46, 47; Site 2, status of, 48; Site 3, plans for, 49; tests of, 46-48

Bomarc: program for, 34, 35; status of, 34

Bomb Alarm System: background on, 26; NORAD assigned operational control of, 26, 27

Center, Regional Warning Information: plans for at 29th and 30th Regions, 61; proposals for by Canada, 61; set up at 25th Region, 61

Chief of Naval Operations: agrees to adopt SAC/NORAD training regulation, 65; proposes discontinuance of Pacific Barrier, 22; reply on VFAW-3, 34

CINCEUR: reply on SHAPE/NORAD early warning, 62, 63

Clear, Alaska: BMEWS site at, 48, 49

CONAD Command Surgeon: appointment of, 4, 5

CONELRAD: U. S. alerting system for, 63, 64

Contiguous System: aircraft improvement program for, 18-20; picket ship improvement, proposals for, 20, 21; problems in, 18, 19

COSC: briefed by CINCNORAD on Sky Shield, 78, 79; briefed by Deputy CINCNORAD on warning system, 61; ICONORAMA in Joint Operations Center for, 48

Defense Research and Engineering Office of: approves BMEWS configuration, 45; concurs with recommendation for trackers at Clear and Thule, 47, 49; lifts UK site deferral, 45

Department of Transport: participation in planning Sky Shield, 69; publication of air navigation order, 54

Douglas, James, Mr: attitude on LRI, 30

Ent AFB: NSSCC Center proposed for, 42

Exercise: Sky Shield, 69

F-101 Interceptor: conversion and training problems of, 31, 32; program for, 28; for Canada, 29, 32

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~



F-102 Interceptor: improvement program for, 32; program for, 28; USAF approval for Alaska of, 33

F-106 Interceptor: conversion problems of, 31, 32; modification program for, 32; program for, 28

F-108 Interceptor: NORAD request for, 29-31

Fairbanks and Anchorage Sectors: discontinued, 8, 12

Fallout Protection: ADC policy on, 67, 68; ARADCOM policy on, 68; NORAD program for, 65-67

Federal Aviation Agency: agrees to pass MADW information, 59, 60; participation in planning Sky Shield, 69; participation in Project Trail Smoke by, 57-59; proposed use of SAGE facilities by, 58, 59

Federal Communications Commission: signs agreement on CONELRAD alerting system, 63

Fylingdales, England: BMEWS site at, 49

Gap-Filler Radars: general program for, 15-17; proposal to deactivate Goose Sector, 17, 18; proposed modification of, 17; USAF plan for, 17

Goose CONAD/NORAD Sector: proposal to deactivate gap-fillers of, 17, 18

Great Falls Sector: established, 8

Greenland-Iceland-United Kingdom Barrier: plans for, 23, 24

Hercules: for Thule, 36, 37; program for, 36, 37; status of, 35, 36

Hoegh, L. A.; Mr: signs OCDM/NORAD Memorandum of Understanding, 60

Hudson Bay Sector: creation of, 10-12

IBM: transceiver system test of, 21, 22

ICBM: need for improved warning against, 49, 50

Identification: (See also, ADIZ's): NORAD directive on, 54; procedures in Canada, 54, 55; U. S.-Mexico, 55-57

Interceptors: (See also, F-101, F-102, F-106, and F-108): AAC, status of, 33; general program for, 28, 29; inactivation of five squadrons, 31; Navy VFAW-3, 33, 34; NORAD proposal for, 29, 30; RCAF ADC, status of, 32; USAF ADC, status of, 31

Joint Chiefs of Staff: approves Air Force MIDAS plans, 44; approves CONAD Headquarters organization plan, 1; approves NORAD augmentation plan, 38, 39; assigns operational control of USAF Bomb Alarm System to NORAD,

~~CONFIDENTIAL~~



27; informs CONAD of manpower reduction, 2; issues fallout shelter construction policy, 65; issues requirement for medical officer on CONAD staff, 4, 5; memorandums on Spacetrack, 42; requests for SHAPE/NORAD early warning information, 61, 62; validates manpower spaces for CONAD, 2, 5

Kuter, L. S., General: comments on manpower savings, 3; reports to the JCS and COSC on Sky Shield, 78, 79; request for LRI, 29, 30; reviews functions and manning of CONAD/NORAD and component commands, 1, 2; signs Alaska/OCDM warning agreement, 60; signs NORAD/SAC joint test agreement, 64; views on the JCS and unified command responsibilities, 3, 4

Mexico: identification along the border of, 55-57

MIDAS: Air Force plans for, 44; background on, 44

Mid-Canada Line: proposal for additional radars on, 14, 15; tested in Sky Shield, 73, 74

Minot Sector: established, 8

MITRE: assists in low-altitude program study, 15, 16; study on picket ship SLRI program, 20, 21

Naval Research Laboratory: develop concept for SPASUR, 41

Naval Weapons Laboratory: operations center for SPASUR at, 42

Nike: Ajax and Hercules, status of, 35, 36; Ajax and Hercules, program for, 36; Guard manning of Ajax, 36; Thule units, status of, 36, 37; ZEUS proposal for, 52, 53

NORAD Liaison Team: establishment of, 2, 5; JCS approves spaces for, 5; NORAD requests spaces for, 5

Northern NORAD Region: concurs in deletion of Goose Sector gap fillers, 18; keeps designation of, 11, 12; proposes adding radars to MCL, 14, 15; NORAD sets up surveillance area in, 10, 11

NUDET: automatic reporting system for, 25, 26; manual system for, 24, 25; NORAD request for automatic system for, 25, 26; USAF Bomb Alarm System for reporting, 26, 27

OCDM: Memorandum of Understanding with NORAD, 60

Picket Ships: proposed SLRI for, 20-22

Plans: Air Force operations plan for MIDAS, 44; ADC ALRI, 19, 20; ADC CEIP for G-I-UK extension, 24; ADC gap-filler deployment, 15-17; NORAD augmentation, 38; NORAD organization for region/sector, 8, 9; NORAD SPADATS, 43; USAF/ADC OEP for Bomarc, 34; USAF NUDET development, 25

Project Trail Smoke: flight



~~CONFIDENTIAL~~



advisory test in, 58, 59; flight following test in, 57, 58

Radars: (See also, Gap-Filler Radars and MCL): for MCL, 14, 15; general program for, 13, 14; inactivation of, 14

RCAF: asks for gap-filler siting criteria, 15, 16; interceptor squadron reduction by, 32, 33; manpower spaces for NORAD regions and sectors, 9

Regions of CONAD/NORAD: background on, 6, 7; establishment of, 8; new headquarters plan for, 8, 10; the discontinuance of three, 9

SAGE (416L) Project Office: radar schedule of, 13

Sea Barriers: CNO proposal to discontinue Pacific, 22; JCS approval to discontinue Atlantic, 23; NORAD protests discontinuance of Pacific, 22, 23; plans for G-I-UK, 23, 24; status of, 22, 23; tested in Sky Shield, 73

Secretary of Defense: approves Air Force MIDAS plan, 44; approves plans for automatic NUDET system, 25; assigns control of Spacetrack to NORAD/CONAD, 42; orders manpower reduction, 2; recommends savings in manpower and installations, 3

Sectors of CONAD/NORAD: (See also, Alaskan Command, Anchorage and Fairbanks Sectors, Hudson Bay Sector, and Minot Sector): manpower requirement for, 9, 10;

new headquarters organization plan for, 8; reduction in, 8; status of, 8

SHAPE: exchange of early warning information with NORAD, 61-63

Sky Hawk: cancellation of, 69

Sky Shield: approval of, 69, 70; background on, 69; criticism of, 77, 78; description of, 71; evaluation of, 71-77; NORAD report on, 78, 79

Slemon, C. R., Air Marshal: briefs COSC, 61

Spacetrack: assignment of operational command to CONAD of, 42; assignment of operational control to NORAD of, 42; background on, 41; description of, 41

SPADATS: assignment of control to CONAD/NORAD, 42, 43; background on, 41; description of, 41, 42

SPASUR: assignment of control to CONAD/NORAD, 42; background of, 41; description of, 41, 42

Stevenson, J. D., Maj Gen: recommends purchase of ALDRI subsystem, 21

Strategic Air Command: criticism of Sky Shield by, 78; flight following for, 57, 58; joint regulation on training with NORAD, 64; joint test agreement with NORAD, 64; NORAD liaison team to, 2, 5

~~CONFIDENTIAL~~



Strategic Target Planning Agency:  
NORAD liaison with, 5

Tactical Air Command: agrees to  
adopt SAC/NORAD training regula-  
tion, 65

Tests: NORAD/SAC agreement on,  
64; of BMEWS, 46, 48; Project  
Trail Smoke, 57-59

Thule, Greenland: aircraft squad-  
ron for, 28, 36, 37; BMEWS site  
at, 46, 47; Hercules units at,  
36, 37

Twining, N. F., General: concern  
over personnel, 1

United Press International: to  
provide CONELRAD alerting, 63

USAF: advises of reduction in pro-  
grammed air defense equipment, 8;  
approves gap-filler criteria, 17;  
asks for NORAD's SPADATS require-  
ments, 43; cancels Super Combat

Center program, 6; designates  
ADC as operational planning  
agency for elements of SPADATS,  
43; directs study of low-alti-  
tude radar program, 16; instructs  
ADC to rent computer for Ent  
SPADATS center, 44; interceptor  
program of, 28, 29; radar program  
of, 13, 15

Western Electric Company: report  
on Greenland segment of G-I-UK  
extension, 24

Western Union: USAF Bomb Alarm  
System, proposals of, 26, 27

White, T. D., General: views on  
LRI, 30

ZEUS: Army Ad Hoc Advisory Com-  
mittee on, 51, 52; NORAD objec-  
tives for, 50, 51

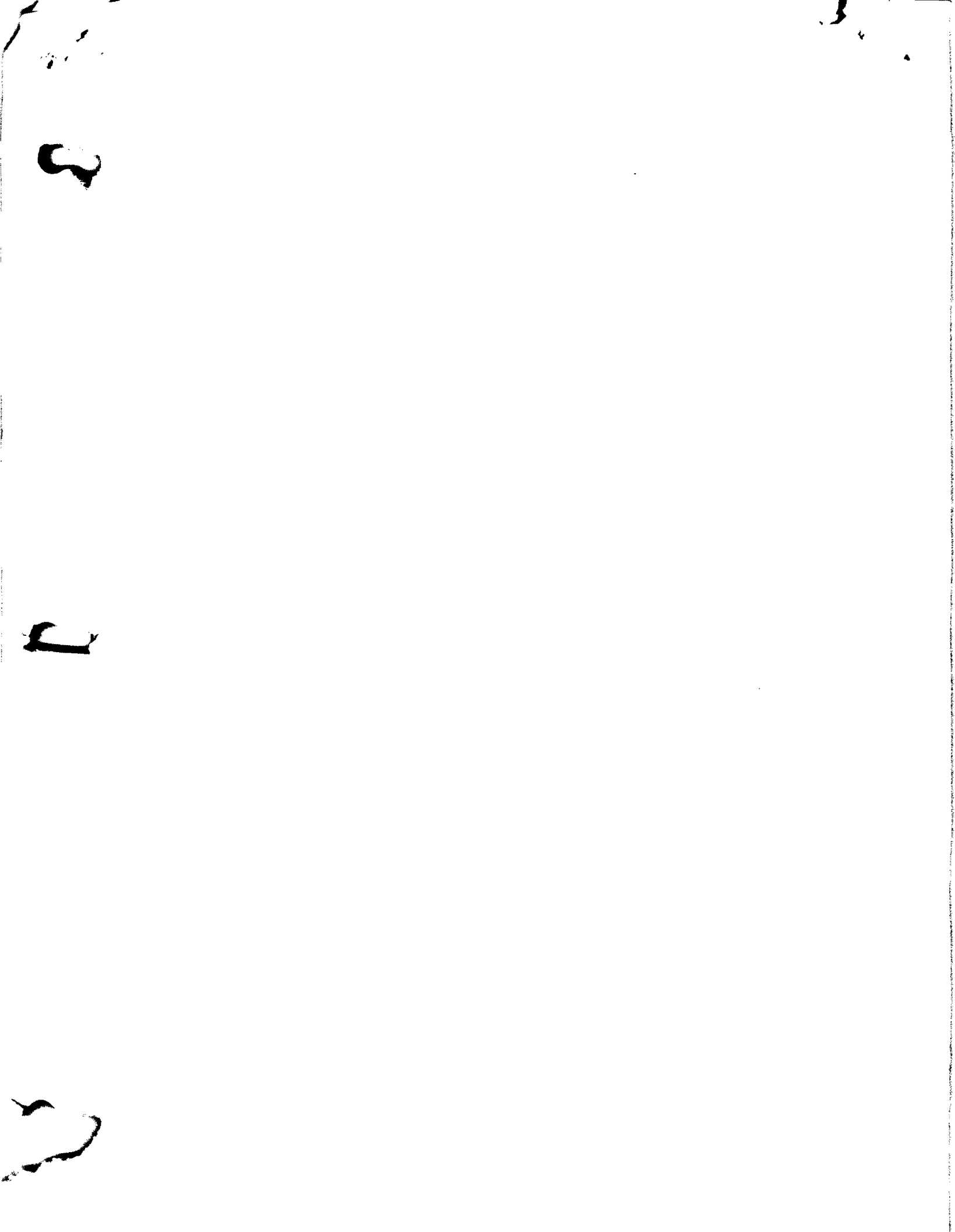


10/10/10

1

2

3



[REDACTED]

CONFIDENTIAL

CONFIDENTIAL

[REDACTED]