



NORTH AMERICAN AIR DEFENSE COMMAND



Historical Summary *January - June 1958*

Directorate of Command History
Office of Information Services
Headquarters North American Air Defense Command





NORTH AMERICAN AEROSPACE DEFENSE COMMAND

SEP 21 2006

MEMORANDUM FOR HQ NORAD/USNORTHCOM/HO

FROM: HQ NORAD J3

SUBJECT: Declassification Review of Histories

1. The CONAD/ADC/ADCOM/NORAD/USSPACECOM histories requested in your 19 May 06 memorandum have been reviewed and are now declassified except for the following sections (justification for retaining classification follows each description).

a. NORAD Historical Summary, Jan-Jun 1958, p. 56. N/J3 does not have the technical expertise to evaluate the classification level of the described communications architectures. Please refer this to N/NC J6 for evaluation.

b. NORAD/ADCOM Historical Summary, Jul-Dec 1959, p. 58. Document still contains information classified in CONPLAN 3310.

c. CONAD Command History, 1970, p. 78. Information classified per Ballistic Missile Early Warning System (BMEWS) Security Classification Guide (SCG).

d. CONAD Command History, 1971, p. 115. Information classified per BMEWS SCG.

e. History of Space Command/ADCOM/ADC, Jan-Dec 1982, pp. 25, 34. Document contains information still classified per the Defense Support Program SCG, and the BMEWS SCG.

f. History of Space Command/ADCOM, Jan-Dec 1984, p. 131. Please refer to N/NC J52 for declassification instructions.

g. History of Space Command/ADCOM, Jan-Dec 1984, p. 146. Information still indicates a potential vulnerability to National Defense.

h. History of NOARD, Jan-Dec 1986, p. 61. Document contains information classified in NI 10-4.

i. History of NORAD, 1990-91, p. 11. Source of the document is the National Defence Headquarters, Ottawa. Please refer to NDHQ for declassification instructions.

j. History of NORAD, 1990-91, p. 20, 29. Document contains information classified in CONPLAN 3310.

k. History of NORAD, 1990-91, p. 36. Please refer to SJTFHQ-N for declassification instructions.

l. History of NORAD, 1 Jan-31 Dec 1992, p. 69. Information still indicates a vulnerability and capabilities of adversary weapons systems.

m. History of NORAD, 1993-94, p. 97. Information classified per FPS 117 SCG and FPS 124 SCG.





NORTH AMERICAN AEROSPACE DEFENSE COMMAND

SEP 09 2005

MEMORANDUM FOR NORAD-NORTHCOM/HO

FROM: HQ NORAD/J3

SUBJECT: Declassification Review of Histories

1. The following historical document has been reviewed per Executive Order (E.O.) 12958, "Classified National Security Information" as amended by E.O. 13292, and NARA Classified National Security Information Directive No. 1, and is now declassified.
2. The document reviewed is NORAD/CONAD Historical Summary Jan 58 to Jun 58. Pages reviewed include: 29, 30, 33, 34, 35, 37-61, 88-90.
3. Our POC for this review is Major James Woodhead, NJ35W, 4-3566.


 DAVID J. SCOTT
 Colonel, USAF
 Vice Director of Operations

1 Attachment
Reviewed Document

~~THIS MEMORANDUM IS UNCLASSIFIED WHEN ATTACHMENTS ARE WITHDRAWN~~





NORTH AMERICAN AEROSPACE DEFENSE COMMAND

~~SECRET~~

RELEASEABLE TO CANADA-U.S.

MEMORANDUM FOR HQ NORAD/J3

23 April 1998

FROM: HQ NORAD/USSPACECOM/HO

SUBJECT: Declassification Review of Histories

1. Executive Order 12958 requires a review of classified documentation more than 25 years old. The NORAD/USSPACECOM History Office (HO) maintains NORAD and Continental Air Defense Command histories, studies, and other documentation that falls 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.

2. 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 ([]). Along with this, please provide the justification for retaining the security classification for these portions.

3. Once the declassification review is completed, please prepare a memorandum for the director's/vice director's signature which states:

a. The CONAD/ADC/ADCOM (as appropriate) history(ies) for the period(s) have been reviewed and are now declassified; or

b. The CONAD/ADC/ADCOM (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:

4. Request the NJ3 staff review the following documents per Executive Order 12958 and the instructions in paragraphs 2 and 3 above. Please complete the review by 29 May 98.

a. North American Air Defense Command, Historical Summary, January - Jun 1958

b. NORAD/CONAD, Historical Summary, July - December 1958

5. HQ NORAD/HO POC is the undersigned to Mr. Schroeder, 4-5999/3385.

THOMAS FULLER
Command Historian

2 Atch

1. North American Air Defense Command, Historical Summary, January - June 1958
2. NORAD/CONAD, Historical Summary, July - December 1958

THIS MEMORANDUM IS UNCLASSIFIED WHEN ATCHS 1 & 2 ARE WITHDRAWN

PLEASE TREAT ATCH #1 AS "~~SECRET~~" DURING THE REVIEW PROCESS

FOR THE COMMON DEFENSE ~~SECRET~~ POUR LA DEFENSE COMMUNE

~~SECRET~~

RELEASEABLE TO CANADA-U.S.



NORTH AMERICAN AEROSPACE DEFENSE COMMAND

~~SECRET~~
REFERRABLE TO CANADA-US

MEMORANDUM FOR HQ NORAD/USSPACECOM/HO

5 JUN 1993

FROM: HQ NORAD/J3

SUBJECT: Declassification Review of Histories

1. The North American Air Defense Command Historical Summary for the period of January to June 1958, has been reviewed and is now declassified except for the following pages: 29, 30, 33, 34, 35, 37, 38 and 39-61 inclusive. These pages should retain a classification of Confidential due to the details of radar coverage discussed therein. Pages 88, 89 and 90 should retain a classification of Secret as this information is so classified in CONPLAN 3310-96.

2. The NORAD /CONAD Historical Summary for the period of July to December 1958 has been reviewed and is now declassified except for the following pages: 57, 58, 59, 64, 65, 66, 69, 76, 81, 85 and 89 should retain a classification of Confidential and pages 110 and 111 should retain a classification of Secret as this information is so classified in CONPLAN 3310-96.

G. Keith McDonald

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

2 Attachments

1. North American Air Defense Command, History Summary, January – June 1958
2. NORAD/CONAD, Historical Summary, July – December 1958

THIS MEMORANDUM IS UNCLASSIFIED WHEN ATCHS 1 & 2 ARE WITHDRAWN

~~SECRET~~
REFERRABLE TO CANADA-US

FOR THE COMMON DEFENCE

POUR LA DEFENSE COMMUNE



SECURITY NOTICE

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 CINCNORAD.
- 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.

NORAD COMMANDERS

30 June 1958



E. E. PARTRIDGE
GEN USAF
COMMANDER-IN-CHIEF
NORAD



C. R. SLEMON
A/M, RCAF
DEP COMMANDER-IN-CHIEF
NORAD



L. E. WRAY
A/VM RCAF
AOC, RCAF, ADC



C. E. HART
LT GEN, USA
CG USARADCOM



W. F. RODEE
RADM, USN
COMNAVFORCONAD



J. H. ATKINSON
LT GEN, USAF
COMDR ADC



F. A. ARMSTRONG JR.
LT GEN, USAF
CINCAL

PREFACE

This historical summary is one of a series of semiannual reports on the North American Air Defense Command, published about 1 April and 1 October of each year. Its purpose is twofold. First, it provides a ready reference to NORAD 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 during this period.

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 was not included with this history.

Colorado Springs, Colorado
1 October 1958

L. H. Buss
Director of
Command History

CONTENTS

PREFACE

MAPS

TABLES

ONE -- NORAD AND CONAD MISSION AND ORGANIZATION

| | |
|------------------------------------------------------------|---|
| BACKGROUND..... | 1 |
| CANADIAN-U.S. AGREEMENT..... | 3 |
| TERMS OF REFERENCE FOR CONAD..... | 4 |
| NORAD POLICY GUIDANCE..... | 5 |
| NEW TERMS OF REFERENCE FOR CONAD..... | 6 |
| DEPARTMENT OF DEFENSE REORGANIZATION ACT OF 1958..... | 6 |
| ESTABLISHMENT OF NORAD REGIONS, DIVISIONS AND SECTORS..... | 7 |
| MOVE OF THE 64TH NORAD DIVISION HEADQUARTERS..... | 8 |

TWO -- COLLOCATION AND INTEGRATION OF ARMY-AIR FORCE FACILITIES

| | |
|---------------------------------------------------------------------------|----|
| COLLOCATION OF MISSILE MASTER AND ADDC's..... | 11 |
| Background..... | 11 |
| Change in Site Plans for Los Angeles, Philadelphia and Pittsburgh..... | 13 |

| | |
|----------------------------------------------------------------|----|
| SELECTION AND PROGRAMMING OF RADARS FOR JMDC's..... | 14 |
| Background..... | 14 |
| Radar Conference Decisions and Actions..... | 15 |
| JMDC Operational Dates..... | 18 |
| ARSR-1 MODIFICATIONS..... | 20 |
| COLLOCATION OF AADCP's AND ADDC's..... | 21 |
| Background..... | 21 |
| NORAD Study on Collocation of AADCP's and ADDC's..... | 22 |
| NORAD-ADC-ARADCOM Conferences on Collocation..... | 22 |
| Resume of Action on Each Site..... | 23 |
| Gelger Field..... | 23 |
| Dallas, Kansas City, St. Louis, and Minneapolis..... | 23 |
| Travis AFB, Savannah River, Sault Ste. Marie, and Seattle.... | 24 |
| San Francisco, Hanford, and Ellsworth AFB..... | 25 |
| Thule AFB, Greenland..... | 25 |
| COLLOCATION IN ALASKA..... | 26 |
| Background..... | 26 |
| Incompatibility of BADGE and MSG-4..... | 26 |
| AADCP-ADDC TELEVISION LINK..... | 27 |
| THREE -- STATUS OF THE RADAR SYSTEM: CONTINENTAL UNITED STATES | |
| USAF ADC LAND-BASED RADAR..... | 28 |
| General..... | 28 |
| Contiguous Radar System Operations Plan..... | 29 |
| AEW&C..... | 31 |
| Replacement for the RC-121..... | 32 |
| The Picket Ship Force..... | 33 |
| Lighter-Than-Air..... | 34 |
| RELOCATION OF ARADCOM AN/FPS-36 RADARS..... | 35 |
| NORAD Surveillance Policy..... | 36 |
| USAF ADC MASTER DIRECTION CENTER CONCEPT OF OPERATIONS..... | 39 |
| IDENTIFICATION..... | 40 |

| | |
|-----------------------------------------------------------------------|----|
| Planning for Southern Perimeter ADIZ's..... | 40 |
| Change in the Alaskan Coastal ADIZ..... | 43 |
| FOUR -- STATUS OF THE RADAR SYSTEM: OUTSIDE CONTINENTAL UNITED STATES | |
| PINE TREE LINE..... | 44 |
| ALASKA..... | 48 |
| Status..... | 48 |
| Radar Improvement Program..... | 49 |
| Gulkana Radar..... | 50 |
| DEWLINE..... | 51 |
| Operational Procedures..... | 51 |
| Communications..... | 52 |
| Change in Operational Control..... | 55 |
| The Early Warning Operations Working Group (EWOWG)..... | 55 |
| WESTERN EXTENSION AND THE PACIFIC BARRIER..... | 57 |
| EASTERN EXTENSION AND THE ATLANTIC BARRIER..... | 59 |
| FIVE -- STATUS OF THE COMBAT WEAPONS | |
| REGULAR FIGHTER-INTERCEPTOR FORCES..... | 63 |
| USAF ADC INTERCEPTOR FORCE..... | 63 |
| Status..... | 63 |
| Lag in Combat Potential..... | 64 |
| SAC Dispersal Project..... | 67 |
| F-104 Aircraft..... | 67 |
| 64TH AIR DIVISION..... | 68 |
| ALASKAN AIR COMMAND..... | 68 |
| Status..... | 68 |
| Program..... | 68 |
| RCAF AIR DEFENCE COMMAND..... | 70 |
| AUGMENTATION FORCES..... | 71 |

| | |
|--------------------------------------------------------|----|
| USAF Augmentation..... | 71 |
| Air National Guard..... | 71 |
| U. S. Navy..... | 72 |
| Canadian Augmentation Forces..... | 72 |
| REGULAR ARMY AIR DEFENSE WEAPONS STATUS..... | 72 |
| USARADCOM..... | 73 |
| ARMY NATIONAL GUARD..... | 75 |
| ALASKAN PROGRAM..... | 77 |
| PROPOSAL FOR RAPID MOBILIZATION OF RESERVE FORCES..... | 77 |

SIX -- OPERATIONAL REQUIREMENTS AND PROCEDURES

| | |
|----------------------------------------------------------|----|
| FIGHTER AIRCRAFT ALERT REQUIREMENTS..... | 79 |
| USAF ADC..... | 79 |
| USAF Augmentation Aircraft..... | 81 |
| Canadian Interceptors..... | 81 |
| 64th CONAD Division..... | 82 |
| Alaska..... | 83 |
| NORAD INCREASED READINESS..... | 85 |
| RULES OF ENGAGEMENT..... | 86 |
| CONAD Regulation 55-6..... | 86 |
| ALCOM Supplement No. 1..... | 87 |
| Canada's ASI 2/5..... | 87 |
| EMPLOYMENT OF MB-1 OVER CANADA..... | 88 |
| CANADIAN AIR RAID WARNING..... | 90 |
| NUCLEAR DETONATION REPORTING (NUDET)..... | 91 |
| ALERT NETWORK NUMBER 1..... | 91 |
| CONTROL OF ELECTROMAGNETIC RADIATIONS (CONELRAD)..... | 93 |
| OPERATIONAL LINES FROM SAC CONTROL TOWERS TO ADDC'S..... | 94 |
| ECCM..... | 95 |

SEVEN -- EXERCISES

| | |
|------------------------------------------------------------------|-----|
| EXERCISE FIR FLY..... | 97 |
| SIMULATED SUBMARINE-LAUNCHED MISSILE EXERCISE (OCEAN WAVES)..... | 99 |
| SAC-NORAD/COMAD ECM EXERCISES..... | 100 |
| WSEG ECM EVALUATION..... | 102 |

EIGHT -- DEFENSE AGAINST THE BALLISTIC MISSILE

| | |
|-------------------------------------------------------------|-----|
| ARMY-AIR FORCE RESPONSIBILITY IN ICBM DEFENSE..... | 104 |
| THE NIKE ZEUS PROGRAM..... | 104 |
| INTEGRATION OF ZEUS LOCAL ACQUISITION RADARS WITH SAGE..... | 105 |
| BALLISTIC MISSILE EARLY WARNING SYSTEM..... | 106 |
| NORAD COMPUTER-DISPLAY FACILITY..... | 108 |
| BMEWS-ZEUS COMPATIBILITY..... | 109 |
| LOCATION OF NORAD HEADQUARTERS COMPLEX..... | 110 |

APPENDIX

| | |
|------------------------------------------------------|-----|
| I - Canada - United States Agencies..... | 115 |
| II - USAF ADC ACW Stations..... | 124 |
| III - RCAF ADC ACW Stations..... | 130 |
| IV - 64th Air Division ACW Stations Operational..... | 132 |
| V - AAC ACW Stations Operational..... | 134 |
| VI - USAF ADC Fighter-Interceptor Squadrons..... | 135 |
| VII - RCAF ADC Fighter-Interceptor Squadrons..... | 138 |
| VIII - Key Personnel Headquarters NORAD..... | 140 |

MAPS

| | |
|------------------------------------------------------------------------------|----|
| NORAD Boundaries - 30 June 1958..... | 9 |
| Air Defense Warning System Outside CONUS - 30 June 1958..... | 46 |
| Alaskan ACW Stations..... | 48 |
| Northern Area Communications (Existing and Proposed)..... | 56 |
| Continental U. S. ADC Interceptor Deployment - 30 June 1958..... | 65 |
| Fighter-Interceptor Deployment Outside Continental U. S..... | 66 |
| USARAL - USARADCOM Battalions - 30 June 1958..... | 74 |
| Air Defense Command Alert No. 1 - Teletypewriter Network - July 1958..... | 92 |

TABLES

| NO. | | |
|-----|----------------------------------------------------------------------------------------|----|
| 1 | Status of NORAD Control Centers - 1 July 1958..... | 19 |
| 2 | Status of Continental United States Radar System..... | 28 |
| 3 | Status of The Radar Network Outside Continental United States..... | 45 |
| 4 | AAC Radar Improvement Program (AN/GPA-27) Construction and Installation Dates..... | 49 |
| 5 | Status of The Aleutian DEW Extension..... | 58 |
| 6 | Regular Fighter-Interceptor Forces..... | 62 |
| 7 | Interceptors and Crews..... | 63 |
| 8 | AAC Fighter-Interceptor and Crew Status..... | 68 |
| 9 | Augmentation Aircraft Totals Reported..... | 71 |
| 10 | Regular Army Air Defense Weapons Status..... | 73 |
| 11 | Comparison of Fighter Aircraft Alert Requirements (Normal Preparedness Condition)..... | 80 |
| 12 | Missile-Gun Alert Requirements (Normal Preparedness Condition)..... | 84 |

[REDACTED]

Chapter I

NORAD and CONAD Mission and Organization

BACKGROUND*

The Continental Air Defense Command was originally established on 1 September 1954 by the Joint Chiefs of Staff as a joint command. CONAD was charged with defending the continental United States against air attack and supporting other commands in their missions to the maximum extent possible. The U. S. Army Air Defense Command, USAF Air Defense Command, and the Naval Forces CONAD were named as components of CONAD.

CONAD did not have a separate staff, however. The USAF ADC Headquarters and staff were additionally designated as CONAD Headquarters and staff. This combined, two-hat arrangement was not effective. One problem, for example, was in distinguishing functions and command channels.

Because of this, the CONAD Commander-in-Chief, who was also the ADC Commander, General E. E. Partridge, urged separation of the two headquarters and establishment of CONAD as an independent organization. The components generally agreed and the matter was presented to the Joint Chiefs of Staff.

In the meantime, the JCS revised the Unified Command Plan, giving CONAD the additional responsibility of air defense of Alaska and the Northeast Area. In June 1956, the Secretary of Defense approved the revised plan and also a JCS recommendation for reorganization of CONAD which provided for separation from ADC.

* Because of many requests to this office for data on the establishment and missions of CONAD/NORAD, this history covers this background briefly. For additional information, see CONAD Historical Summary, July 1957, pp 1-7, and NORAD Historical Summary, December 1957, pp 1-10.

~~CONFIDENTIAL~~

~~SECRET~~
~~CONFIDENTIAL~~

2

New terms of reference were provided CONAD on 4 September 1956. These terms provided for enlargement of the CONAD mission according to the Revised Unified Command Plan and the change in organization recommended by the JCS.

On 17 September, a new staff structure for the separate CONAD Headquarters was established. General Partridge was relieved of command of ADC on this date and Lieutenant General Joseph H. Atkinson was named Commander of ADC. But it was not until 1 October 1956 that the CONAD staff was actually physically separated and began functioning separately.

CONAD's mission under the new terms was broadened by the addition of (1) responsibility for air defense of Alaska and the Northeast Area and (2) responsibility for assisting in the air defense of Canada and Mexico according to approved plans and agreements.

Meanwhile, integration of operational control of the air defense forces of Canada and the United States was being considered by the JCS and the Canadian Chiefs of Staff Committee. These two groups turned the problem over to the Joint Canadian-United States Military Study Group for examination. At the end of 1956, the MSG completed its work and recommended integration. It also presented the general requirements for integration.

The JCS approved the MSG report in February 1957, the U. S. Secretary of Defense approved it in March, and in May the CSC advised that it had completed action on the report and that the matter awaited governmental approval. On 1 August 1957, government approval of the setting up of an integrated command was announced jointly by Ottawa and Washington.

Following this announcement, General Partridge proposed to the Canadian and U. S. Chiefs of Staff that the CSC direct that effective 12 September, operational control over the RCAF ADC be assumed by the integrated headquarters in Colorado Springs. He would then designate the AOC ADC as the commander responsible to the integrated command for operational control of all Canadian and U. S. air defense forces in Canada. Lastly, he recommended the title North American Air Defense Command (NORAD) for the new integrated command.

On 3 September, the CSC approved these recommendations; the JCS approved on 6 September.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

3

This was the basis for the establishment of NORAD. On 6 September, CONAD advised all appropriate agencies that NORAD was to be established at Ent Air Force Base effective 0001 Zulu 12 September, that operational control over Canadian and U. S. forces in Canada would be assumed by CINCNORAD on this date, that the AOC ADC was responsible to CINCNORAD for exercising operational control in Canada, and that CINCNORAD would exercise operational control over all U. S. air defense forces in the U. S., Alaska, and Greenland in accordance with the terms of reference for CINCONAD.

Thus, establishment of NORAD can be dated from 12 September 1957, but it was established only by CONAD proclamation (which had the approval shown above of the CSC and JCS). NORAD had no terms of reference or approved manning document.

CANADIAN-U. S. AGREEMENT

A formal agreement on establishment of NORAD was reached by the governments of Canada and the United States with an exchange of notes on 12 May 1958. The Canadian note, signed by Norman Robertson, Canadian Ambassador, proposed certain principles for the organization and operation of NORAD. Included were the following: (1) CINCNORAD would be responsible to the CSC and JCS and would operate within an air defense concept approved by the two governments; (2) operational control was the power to direct, coordinate, and control the operational activities of forces assigned, attached or otherwise made available; (3) the appointment of CINCNORAD and his Deputy, who were not to be from the same country, was to be approved by both governments; (4) the North Atlantic Treaty Organization was to be kept informed of arrangements for North American air defense through the Canada-United States Regional Planning Group; and (5) NORAD was to be maintained for a period of ten years or such shorter period as agreed by both countries.

The U. S. note, signed also on 12 May by Assistant Secretary of State Christian A. Herter, stated that "my Government concurs in the principles set forth in your note. My Government further agrees with your proposal that your note and this reply shall constitute an agreement between the two Governments effective today."

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

4

TERMS OF REFERENCE FOR NORAD

Following this exchange of notes, the military chiefs of both countries approved new terms of reference for NORAD, which became effective 10 June 1958.

The terms gave NORAD the mission of defending the continental United States, Canada, and Alaska against air attack, and supporting other continental United States and Canadian commands. NORAD, established as an integrated (U. S.-Canada) command, was to include, as component commands, the Air Defence Command of Canada, U. S. Army Air Defense Command, U. S. Naval Forces CONAD, and USAF Air Defense Command. CINCNORAD was to be responsible to the U. S. JCS and the Canadian CSC and was to operate within an agreed Canada-U. S. concept of air defense and in accordance with agreed joint intelligence. Direct communication was authorized between CINC-NORAD and the CSC and JCS on matters of combined Canada-U. S. interest.

CINCNORAD was given operational control over the component commands and their assigned forces, the air defense forces in Alaska, and all other air defense forces made available by proper authority. Operational control was defined as the power of directing, coordinating, and controlling the operational activities of available forces. CINCNORAD was to exercise operational control of the Mid-Canada Line and the land-based portion of the DEW line through designated subordinate commanders. The seaward extensions of the early warning systems were to remain under CINCPAC and CINCLANT.

The responsibilities of component commanders under NORAD included the following: to command and provide for the administration, training, and support of their forces and place under the operational control of CINCNORAD, or his subordinate commanders, all units of their command having a combat capability; advise CINCNORAD on their respective service matters; coordinate on matters of mutual interest; and perform the detailed planning, programming, and siting for air defense units.

Commander-in-Chief, Alaskan Command was made responsible to CINCNORAD by the terms of reference for all air defense activities

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~

~~SECRET~~

5

in Alaska and was designated the NORAD commander responsible for exercising operational control of all air defense forces in Alaska.

NORAD POLICY GUIDANCE

On 3 July 1958, NORAD submitted for the approval of the CSC and JCS proposed policy guidance, pointing out that the "policies, plans and operational concepts of this command must be based on, and in accordance with, bilateral policy directives and strategic guidance from appropriate United States and Canadian authorities."

NORAD's proposed policy guidance was as follows:

a. The United States and Canada must maintain a defensive posture at all times adequate to deter Soviet aggression, or, in the event of war, to insure the survival of the United States and Canada as free nations. In this connection, the requirements for air defense should not be considered in isolation from, or, in competition with, the requirements for offensive forces, since it is only the proper combination of these capabilities that can achieve the stated objectives.

b. Further, to accomplish these objectives, the United States and Canada intend to achieve and to maintain at an appropriate state of readiness an effective integrated air defense system capable of detecting and destroying hostile forces approaching or operating over the North American continent in order to deny to the enemy the possibility of destroying a critical number of vital targets.

c. To this end, CINCNORAD should submit to the United States Joint Chiefs of Staff and Canadian Chiefs of Staff Committee studies, recommendations, and periodic long-range objective plans designed to accomplish the national objectives relative to air defense. In the event that budgetary, manpower, or other limitations preclude the approval of such recommendations or plans, the Joint Chiefs of Staff and Chiefs of Staff Committee will so inform CINCNORAD and request his further recommendations.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

NEW TERMS OF REFERENCE FOR CONAD

CONAD remained in existence to serve as a U. S. national command. A national command was needed, the JCS advised CINCONAD, to handle U. S. responsibilities outside of NORAD's area. In January 1958, the JCS sent proposed terms of reference to CONAD for comment. The terms proposed were as lengthy and detailed as those for NORAD even though the CONAD mission would be much smaller and simpler. Many of the functions and responsibilities were almost identical.

General Partridge advised the executive agent on 24 January that he felt the proposed terms "introduce unnecessary duplication and confusion into what should be a relatively simple arrangement with a clear division of tasks and responsibilities between CINCONAD and CINCONAD." He suggested that instead of these detailed terms he be issued a letter which defined the responsibilities of the U. S. national commander.

Despite this recommendation, the JCS put into effect their version of the CONAD terms on 10 June (the same date as for the NORAD terms).

CINCONAD was made responsible for defending U. S. installations in Greenland against air attack, assisting in the air defense of Mexico in accordance with approved plans and agreements, handling purely national matters pertaining to air defense, and supporting other commands in their missions.

DEPARTMENT OF DEFENSE REORGANIZATION ACT OF 1958

On 6 August 1958, the Department of Defense Reorganization Act of 1958 was signed by the President of the United States. CONAD was to be reorganized in accordance with the provisions of this act. It was impossible at the time of preparation of this historical report to determine the impact of this act on the structure and functions of CONAD and the authority of CINCONAD. It was obvious, however, that changes would be made. Therefore, the CONAD terms of reference, as discussed above, could not be considered final.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

7

An ad hoc committee was formed on 23 July 1958 at CONAD Headquarters to prepare a proposed plan for the reorganization of CONAD in accordance with the Defense Reorganization bill. The committee was made up of senior component command and CONAD officers (Brigadier General Arthur J. Pierce was chairman).

ESTABLISHMENT OF NORAD REGIONS, DIVISIONS AND SECTORS

On 5 August 1958, NORAD issued General Order 6 establishing NORAD regions and divisions in the United States, Canada and Alaska effective 10 June 1958 (the date of the terms of reference). In all, NORAD established five regions (Eastern, Central and Western in the United States; Northern in Canada; and the Alaskan Region) and twenty-three divisions.

At the time of establishment of these commands, no manning documents had been approved for NORAD units. Also, NORAD planned to begin a geographic reorganization as soon as a plan it was proposing was finalized (the NORAD plan was being coordinated at mid-year). In the meantime, however, interim arrangements had to be made for commanders and staffs and geographical areas of responsibility. For this reason, NORAD preceded its general order with a series of messages on 30 June to the commands concerned advising them of interim arrangements.

In the continental United States, the Eastern, Central and Western CONAD Regions and the CONAD divisions under these regions (16 in all) were designated as NORAD units. The headquarters, areas and commanders of the NORAD regions and divisions were the same as for the CONAD commands.* The USAF ADC commanders at each organization, who were also commanders of the CONAD units, were named commanders of the NORAD commands. NORAD also provided in its message on 30 June that the Air Defense Sectors (SAGE) were to be designated as NORAD sectors with no change in headquarters location.**

* The CONAD units were not disestablished by this action. They remained in existence awaiting decision on the final structure and authority of CONAD.

** CONAD had designated four SAGE sectors -- New York, Boston, Syracuse, and Washington -- as CONAD Sectors effective 1 April 1958.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~ SECRET

8

USAF ADC commanders were to be named NORAD Sector commanders.

The 64th CONAD Division was additionally designated as the 64th NORAD Division. The 64th CONAD Division was to stay in existence to handle CONAD matters. There was no change in commander or headquarters location (see the section following on the move of the headquarters).

The Northern NORAD Region covered the same geographical area as the RCAF Air Defence Command. The AOC ADC was named commander. NORAD's general order of 5 August, mentioned above, placed the 64th NORAD Division under the Northern Region. In addition, it established four more NORAD divisions in Canada (1st, 2nd, 3rd, and 5th), all of which were assigned to the Northern Region.

The Alaskan NORAD Region covered the Alaskan area of air defense responsibility. Commander-in-Chief Alaska, as the commander responsible to CINCNORAD for all air defense activities in Alaska, was commander of the Alaskan Region. Two divisions were established by NORAD's general order of 5 August, the 10th and 11th, and assigned to the Alaskan Region.

In regard to staffs, NORAD advised the Eastern, Central and Western NORAD Regions and the divisions and sectors within these regions, and the 64th NORAD Division that the component staffs of the designated commanders would have to perform NORAD tasks until manning documents were approved. NORAD advised the Northern NORAD Region commander that the staff of the RCAF ADC would have to be used for NORAD work until manning was approved.

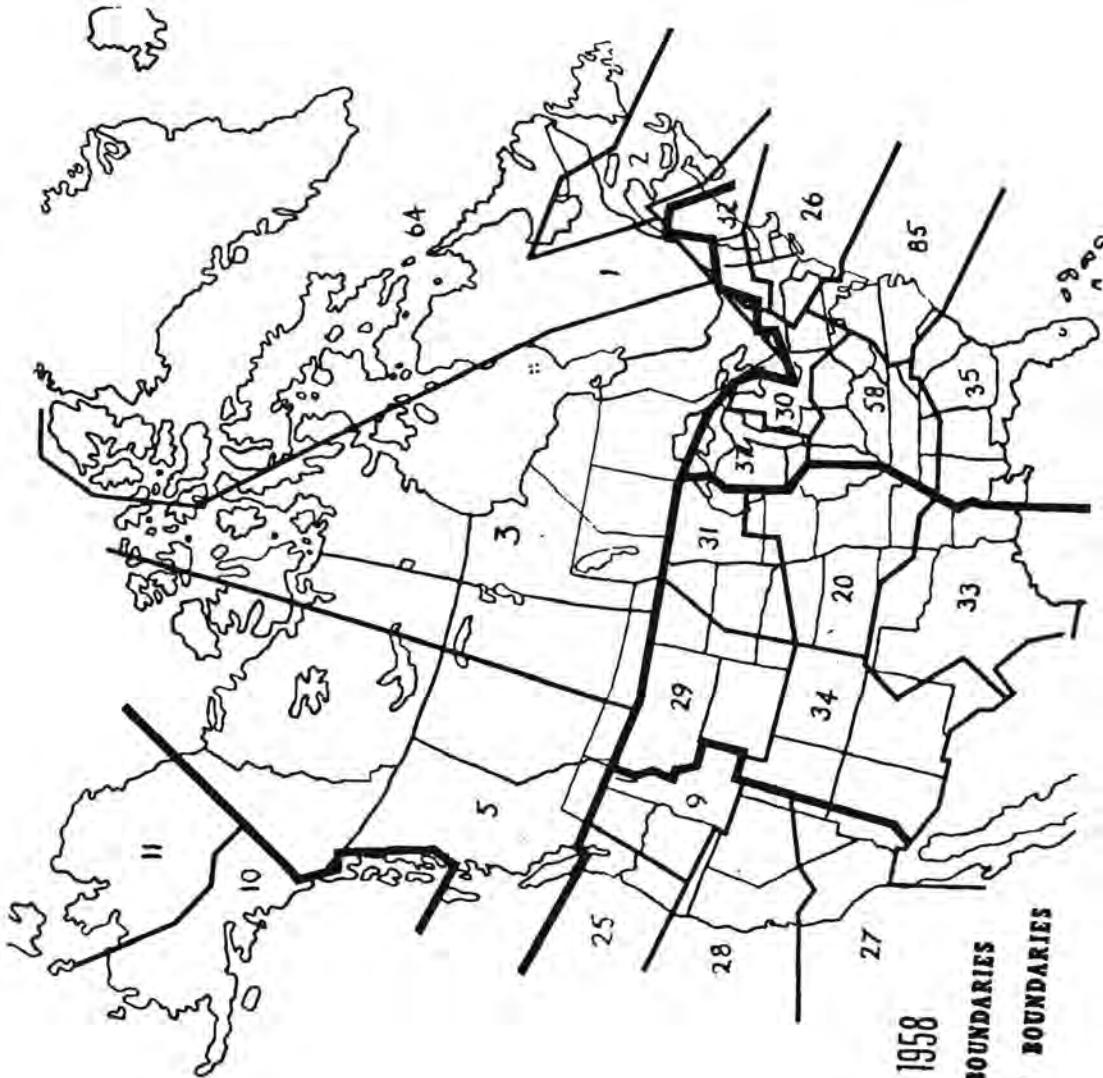
MOVE OF THE 64TH NORAD DIVISION HEADQUARTERS

USAF Headquarters announced in March 1958 its desire to shut down Pepperrell AFB for economy reasons and move its units elsewhere. To CONAD, USAF proposed two possibilities for relocation of the 64th Division Headquarters and the air defense control center (ADCC). One proposal was that both be moved to Ernest Harmon AFB. The other was to move only the 64th Headquarters to Harmon, leaving the ADCC at Pepperrell to be manned, operated and supported by the RCAF.

CONAD replied on 10 April that neither proposal was completely

~~CONFIDENTIAL~~ SECRET
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~



30 June 1958

— REGION BOUNDARIES
— DIVISION BOUNDARIES

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

10

satisfactory. Moving the ADCC to Harmon, CONAD stated, would save some money, but a considerable outlay of funds would be required for construction. CONAD said also that for the Northeast area it preferred a NORAD commander operating a NORAD subordinate headquarters at a Canadian installation. CONAD objected to the alternate proposal (leaving the ADCC at Pepperrell) because it did not believe that the RCAF would want to assume the cost of operating Pepperrell. The RCAF, CONAD felt, would probably prefer to move the ADCC and the NORAD Headquarters to St. Margarets. The latter was recommended by CONAD.

The 64th CONAD Division commander strongly objected to moving the ADCC to St. Margarets. His reasons were: (1) major construction would be required to provide for the 64th area operational responsibilities, (2) Off Island (Newfoundland) rearward communications were inadequate to provide St. Margarets the capability to function as an ADCC for the Northeast area, (3) USAF ADC would still require some sort of headquarters in the area to command and supervise USAF ADC units, (4) recent RCAF ADC decisions to accept SAGE would create new problems in the St. Margarets/64th area which had to be solved prior to acceptance of this proposal, and (5) the Thule, DEW east, and Iceland air defense areas would be most difficult to integrate into the St. Margarets sector. The 64th favored Harmon as did the USAF ADC.

Because of these recommendations and the USAF original proposal, CONAD advised the executive agent on 20 May that it was prepared to concur in moving the ADCC to Harmon. CONAD asked, however, that before any final decision was made that the matter be coordinated with the RCAF to confirm the statements of the 64th Division commander.

USAF requested confirmation on 29 May. On 3 June, the USAF Central Coordinating Staff in Canada advised that informal confirmation had been obtained and that the RCAF concurred that communications and SAGE problems prevented selection of St. Margarets. Harmon AFB would apparently get the ADCC.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

Chapter II

Collocation and Integration of Army-Air Force Facilities

COLLOCATION OF MISSILE MASTER AND ADDC's

Background. On 19 September 1956, CINCONAD proposed to the JCS the collocation and integration at ten locations of the Army's weapons control system, the AN/FSG-1 (Missile Master), and the Air Force's Air Defense Direction Centers (ADDC's).^{*} CONAD proposed the following areas for these: Washington-Baltimore, New York, Detroit, Niagara-Buffalo, Seattle, Boston, Chicago, Philadelphia, Los Angeles, and Pittsburgh.

Both the Army and Air Force accepted the CONAD proposal and on 30 October 1956 concurrence was given by the Office of the Secretary of Defense. CONAD outlined its preliminary plan for implementation to the JCS on 4 February 1957.

The CONAD plan provided that at three sites the Missile Master building was to be built next to the ADC equipment and operations building. The ADC operating positions were to be placed in a modified operations room of the Missile Master building together with the Army positions and equipment. The Air Force technical equipment was to remain in the ADC buildings. These sites were:

| <u>Defense Area</u> | <u>Site</u> |
|---------------------|----------------------------|
| New York | P-9, Highlands, N. J. |
| Detroit | P-20, Selfridge AFB, Mich. |
| Niagara-Buffalo | P-21, Lockport AFS, N. Y. |

^{*} For additional background, see CONAD Historical Summary, June 1957, pp 26-30, and NORAD Historical Summary, December 1957, pp 17-32. Part of the equipment at the ADDC's would be the pre-SAGE semiautomatic intercept system, the AN/GPA-37 Radar Course Directing Group.

~~SECRET~~ ~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

At six of the remaining sites, CONAD proposed that new facilities be built. CONAD proposed that the Missile Master building be enlarged sufficiently to hold the Air Force technical equipment and operating positions as well as the Army positions and equipment. These sites were:

| <u>Defense Area</u> | <u>Site</u> |
|---------------------|-----------------------------|
| Boston | Fort Heath, Mass. |
| Chicago | Arlington Hts., Ill. |
| Philadelphia | Gibbsboro, N. J. |
| Los Angeles | San Pedro Hill, Calif. |
| Pittsburgh | South Park Mil. Res., Penn. |
| Seattle | Fort Lawton, Wash. |

The tenth site was to be located at Fort George G. Meade, Maryland, under basically the same plan as for the above six. But this was to be left for a later date and treated independently as it was to be used initially for technical testing of the Missile Master.

On-site surveys were made by ADC and ARADCOM at the first three sites (Highlands, Selfridge and Lockport) and complete plans for these were submitted to CONAD on 30 April 1957. On 2 May, CONAD approved the technical and operational portions of the ADC-ARADCOM plans.

To support implementation, the Army and Air Force formed a Joint Collocation and Technical Steering Group in July 1957. At the first meeting of this group, on 18-19 July, a subcommittee presented design proposals which generally followed the CONAD plan. The joint operations room at Highlands, Selfridge and Lockport were to house the Air Force consoles, but not the Air Force technical equipment, which would be left in the existing ADC buildings. At the other six sites, a new and larger building was to be built to house all Army and Air Force operating and technical equipment.

On the basis of these design plans, the subcommittee estimated that the first site, Highlands, would become operational in July 1960, the last, Los Angeles, in April 1961. These dates were considered very late, however, and the group did not pass on the design plans.

~~SECRET~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

13

In order to reduce the construction time, NORAD recommended to the executive agent in September 1957 that the last six sites (Fort Meade not included) be built the same as the first three. Instead of one consolidated building, accommodating all equipment (as CONAD had proposed on 4 February), the operations building would be the currently designed Missile Master building modified to house all Army equipment, but only the Air Force operating consoles. The rest of the Air Force equipment would be housed in nearby buildings or annexes.

The Air Force replied in October that it agreed to this arrangement. On 15 November, NORAD learned that the Army and Air Force had agreed to locate all consoles in the joint operations room and also to put certain technical equipment in the Missile Master building. Other Air Force technical equipment was to be housed in a separate building.

In the meantime, surveys had been made by ADC and ARADCOM of the last six sites. On 31 October 1957, NORAD sent its approval of the site adaptation plans for these to the executive agent. Approval by the latter was stated in an indorsement dated 10 January 1958.

Change in Site Plans for Los Angeles, Philadelphia and Pittsburgh. Progress on three sites was held up because of land acquisition problems which necessitated reconsideration of the locations previously selected. These sites were San Pedro Hill (Los Angeles), Gibbsboro (Philadelphia), and South Park (Pittsburgh). After resurveying the areas and deciding to remote radars, a joint ADC-ARADCOM siting team agreed on 2 April 1958 on final site selection, facility requirements, and site layouts. In mid-May, adaptation plans for these sites were submitted to NORAD and on 23 May NORAD forwarded them to the executive agent with its approval.

Split sites were decided upon for Los Angeles and Philadelphia. For the Los Angeles area, the JMDC (joint manual direction center) was to be placed at Fort MacArthur and the radar at San Pedro Hill, remoted to the JMDC. For the Philadelphia area, the JMDC was to be placed at Pedricktown, New Jersey, the radar at Gibbsboro, remoted to the JMDC. For the Pittsburgh area, the site was moved from South Park to Oakdale, Pennsylvania. ADC and ARADCOM also included detailed plans for Fort Meade with the other plans submitted at this time.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~SECRET~~ ~~CONFIDENTIAL~~
~~SECRET~~

Because of this change in sites, a change in host agency responsibilities was requested by ADC and ARADCOM of their service departments. In July 1957, an agreement had been reached between Army and Air Force which made Air Force the host service at four locations: Highlands, Selfridge, Lockport, and Gibbsboro; Army the host at the other sites. The new arrangement requested at mid-1958 was that for the Los Angeles area, the Air Force would be host at San Pedro Hill, the Army at Fort MacArthur; for Philadelphia, the Air Force would remain host at Gibbsboro, with the Army being host at Pedricktown. The services had not approved this request at this writing.

SELECTION AND PROGRAMMING OF RADARS FOR JMDC's

Background. The Secretary of Defense memorandum of 30 October 1956, mentioned earlier, approving CONAD's proposal for collocation, and a memorandum of 28 January 1957, charged CINCONAD with responsibility for choosing the radars for the JMDC's. The choice of radar for each site was included in the joint ADC/ARADCOM plan for the ten sites approved by CONAD and sent to the executive agent on 2 May 1957. AN/FPS-7's were selected for Highlands, Lockport, and Fort Heath; AN/FPS-20's were chosen for the remaining seven sites.

This list did not remain firm very long, however. Both ARADCOM and ADC recommended changes in the above selection.

ARADCOM recommended that the AN/FPS-33, the radar designed for use with the Missile Master, be used at all ten sites. However, ADC objected to the AN/FPS-33 as having too limited a range in comparison with other radars. ADC was working with the Civil Aeronautics Administration on a program for joint usage of radar and recommended use of the CAA ARSR-1 radar at certain locations. ARADCOM opposed the ARSR-1, feeling that modifications required to make it compatible and negotiations between agencies would cause unacceptable delay. Further, ARADCOM felt that civilian operation of the radar that served Missile Master was undesirable. ARADCOM also objected to the AN/FPS-7, stating that it was incompatible with the Missile Master and that modifications were not feasible.

At any rate, ADC and CAA selected three sites where the ARSR-1 could be used jointly -- San Pedro Hill, Fort Heath (Boston), and Fort Lawton (Seattle) -- by the end of 1957. CONAD concurred with joint use at San Pedro on 20 August 1957 and at Fort Heath on 7

~~SECRET~~ ~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

October. And on 8 November, NORAD informed the executive agent that it agreed to the joint use of the ARSR-1, with amplitron and other necessary modifications, at all three sites and asked that the site adaptation plans be amended accordingly.

Up to this point, CONAD/NORAD had moved cautiously. In giving concurrence to joint use at San Pedro, CONAD had told ADC that approval was conditional pending evaluation of the ARSR-1.* Again in October ADC was advised that CONAD approval was subject to review and final decision.

In December 1957, NORAD received a report from an Army-Air Force group evaluating the radars concerned that supported the choice of radars (and the conclusion of ADC that the AN/FPS-33 should not be used). On 9 January 1958, NORAD repeated its selection of radars (changed by substitution of ARSR-1's) to the executive agent: (1) AN/FPS-7's at Highlands and Lockport, (2) AN/FPS-20's at Gibbsboro, Oakdale, Arlington Park, Selfridge, and Fort Meade, and (3) ARSR-1's (with modifications including the amplitron) at San Pedro Hill, Fort Lawton, and Fort Heath.** NORAD also said it would back replacement of any of these with frequency diversity radars, such as the AN/FPS-35.

Radar Conference Decisions and Actions. Following talks between General Partridge and ARADCOM's Commanding General, Lieutenant General Charles E. Hart, the former called a conference for a complete review of the JMDC radar plans. This conference, which

* In arranging with CAA for joint use of radars in the U. S. surveillance system, ADC had CONAD/NORAD backing and authority. ADC was made responsible for furnishing the surveillance system for the U. S. (not including Alaska). On at least five occasions, CONAD or NORAD had advised ADC of this responsibility: 19 September 1956, 25 January 1957, 8 February 1957, 10 June 1957, and 20 March 1958. On the latter date, NORAD issued a statement of policy on responsibility for the continental surveillance system in which ADC was assigned primary responsibility for furnishing surveillance radars for the U. S.

** With the amplitron modification, the designation of the radar would be changed to ARSR-1A.

~~CONFIDENTIAL~~
~~SECRET~~ ~~CONFIDENTIAL~~

16

was attended by CINCNORAD, the component commanders, and staff members of each, was held on 11 February 1958. At this meeting, it was decided that the past decisions of NORAD for establishment of JMDC's, selection of equipment, and joint use of radars by the Army, Air Force and CAA were still valid. But to speed up the program and to cut costs, the conferees agreed on a few alterations to the program.

To save money, the conferees decided to look into the possibility of remoting radar data at certain sites (such as Los Angeles and Philadelphia) to existing Army land where the JMDC could be built. A speed-up of operational dates was decided upon wherever possible, especially at Fort Meade. Because the Missile Master would be operational at Seattle in early 1959, it was decided to investigate the possibility of installing an AN/FPS-7 or of interim use of the AN/FPS-33. For the other sites scheduled for the ARSR-1, interim use of the AN/FPS-33 until the former radar was available was also to be considered.

The conferees agreed to ARADCOM's proposal to conduct tests with the Missile Master, AN/FPS-7, and AN/FPS-20 to determine modifications needed for optimum performance of the Missile Master.

USAF ADC recommended to CINCNORAD at the conference that the ARSR-1A be used at the Pittsburgh site (Oakdale). General Partidge said he would approve if ADC and ARADCOM agreed. ADC formally requested use of the ARSR-1A in place of the programmed AN/FPS-20 on 28 February 1958, stating that ARADCOM concurred with the request. NORAD approved and sent a request to the executive agent for a change in the plans.* USAF advised on 31 March that the plans were being amended accordingly.

Following the conference, on 14 March, NORAD issued a letter to ADC and ARADCOM directing actions to implement the decisions made. The aim of NORAD's instructions was to get the JMDC's operating as early as possible.

* NORAD approved the Pittsburgh ARSR-1 subject to the requirements established by USAF on 11 February 1958 for joint use of the ARSR-1 -- military-required modifications to the radar.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

17

NORAD told each component to (1) recommend advanced operational dates for the JMDC's and the desirability of using AN/FPS-33's on an interim basis at sites scheduled for the ARSR-1 until the latter radar was available, (2) coordinate with CAA on the installation of the ARSR-1 at JMDC sites, and (3) coordinate the Missile Master-AN/FPS-7-AN/FPS-20 compatibility tests.

ARADCOM was told to (1) advance Missile Master operational dates, with Highlands, Lockport, and Seattle to be given priority in that order, (2) advance the operational date of Fort Meade, and (3) take necessary Army action to facilitate installation of the ARSR-1's at the JMDC's. USAF ADC was directed to (1) put the first AN/FPS-7 at Highlands, the second at Lockport, and to study and report on use of this radar at Seattle; (2) take immediate action to install an AN/FPS-20 at Fort Meade; and (3) change the AN/FPS-20 schedule for Chicago, Detroit, and Philadelphia in accordance with ARADCOM's advanced Missile Master operational dates for these sites.

ADC replied on 24 April, ARADCOM on 30 April. The following is a summary of the actions and recommendations stated in their replies:

- Neither component recommended advanced operational dates for the NORAD JMDC's. ADC said that the radar operational dates might be pushed up, but that support facilities and manning could not. Both said that every effort would be made to prevent delay.

- ARADCOM said it had approved joint use of the ARSR-1 at the four sites provided that CAA agreed to the requirements established by USAF on 11 February for joint use of the ARSR-1, i.e., modifications to the radar (see the section following -- ARSR-1 Modifications). Also, ARADCOM had taken action to facilitate installation of CAA radars at Boston, Los Angeles, and Seattle. No military land was involved at the Pittsburgh site, so CAA had already taken action to install its radar.

- ADC stated that the first two AN/FPS-7's had been programmed for Highlands and Lockport, but recommended against changing the ARSR-1 scheduled for Seattle to an AN/FPS-7. The ARSR-1 would be operational by June 1958, ADC advised, earlier than the JMDC.

- ARADCOM recommended the use of the AN/FPS-33 at those sites where ADC was unable to provide a suitable radar in time to

~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~

meet the operational dates of the JMDC's. USAF ADC recommended that the AN/FPS-33 not be used at any site. Under the current radar program, ADC said, all of its radars would be installed at JMDC's eight months prior to the JMDC operational dates. Also, the ARSR-1 would be operating long before any JMDC. The CAA amplatron delivery schedule was as follows:

| <u>Site</u> | <u>Amplatron Delivery</u> | <u>Estimated JMDC* Operational Date</u> |
|-------------|---------------------------|-----------------------------------------|
| Boston | Oct 1960 | Oct 1960 |
| Pittsburgh | Dec 1960 | Dec 1960 |
| Seattle | Mar 1961 | Mar 1961 |
| Los Angeles | Apr 1961 | Apr 1961 |

In addition, ADC stated that CAA had advised that the AN/FPS-33 would not meet its operational requirements.

• ADC programmed an AN/FPS-20 for installation at Fort Meade in May 1960. ADC-ARADCOM agreement was reached on site adaptation plans for Fort Meade (these were submitted to NORAD in May 1958 and forwarded to the executive agent with NORAD's approval on 23 May).

• ARADCOM recommended that compatibility tests of the Missile Master and AN/FPS-7 and AN/FPS-20 be handled at service department level. ADC said that it would request the Joint Collocation and Technical Steering Group to set up a committee to coordinate the tests.

• Both components recommended remoting radar at the Philadelphia and Los Angeles sites.

JMDC Operational Dates. The status of NORAD JMDC's as of July 1958 is shown on the table on the opposite page. The operational dates shown were furnished by Department of the Army and forwarded by USAF on 15 January 1958. NORAD had objected to these dates, stating it felt that they reflected insufficient priority and that

* These dates were not included in the ADC reply. They were included here for comparison purposes.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

TABLE 1

STATUS OF NORAD CONTROL CENTERS - 1 JULY 1958

| Location | Est. BOD | M/M Ops Date | Radar Install. | FPS-6 (AF) Ops Date | GFA-37 Install. Date | NCC Ops Date | Host Agency | Site Plan Appvl. | Remarks |
|----------------------------------------------|-----------|--------------|---------------------------------------|-----------------------|----------------------|--------------|------------------|------------------|---------------------------------------------------------------|
| Highlands, N.Y. (P-9) | Jan 1960 | Mar 1960 | FPS-7 Mar 59 | In- stalled | **In- stalled | May 1960 | AF | 2 May 1957 | **To be moved from present installation into new ops building |
| Lockport (Buffalo) (P-21) | Jan 1960 | Apr 1960 | FPS-7 Mar 59 | Apr 58 | **In- stalled | June 1960 | AF | 2 May 1957 | |
| Selfridge (Detroit) (P-20) | Nov* 1959 | May 1960 | FPS-20 Oct 59 | Aug 58 | **In- stalled | July 1960 | AF | 2 May 1958 | *Completion Date Dec 59 |
| Ft. Heath, Mass (MM-1) | Nov 1959 | Aug 1960 | ARSR-1A Oct 60 ARSR-1 Mar 60 | Apr 60 (2) | Mar 60 | Oct 1960 | Army | 31 Oct 1957 | |
| Gibbsboro, N.J. (Philadelphia) (RP-63) | | Sept 1960 | FPS-20 Feb 60 | Not avail- able | Apr 60 | Nov 1960 | Army & *AF | May 58 | *Components recommended change to Army |
| Oakdale (Pittsburgh) (RP-62) | | Oct 1960 | ARSR-1A Dec 60 | May 60 (A2) | May 60 | Dec 1960 | Army | May 58 | |
| Arlington Hts. (Chicago) (RP-31) | ** | Nov 1960 | FPS-20 Apr 60 | Jul 60 (A2) | June 60 | Jan 1961 | Army | 31 Oct 1957 | **Est. of BOD is July 60. No directive issued. |
| Ft. Meade (RP-54) | | Dec 1957 | FPS-20 Mar 60 | Jun 60 | July 60 | Feb 1961 | Army | May 58 | |
| Ft. Lawton (Seattle) (RP-1) | July 1959 | Dec 1960 | ARSR-1A Mar 61 ARSR-1 Jul 60 | Sept 60 (A2) | Aug 60 | Mar 1961 | Army | 31 Oct 1957 | |
| San Ped. Hill (Los Angeles) (RP-39) | | Jan 1961 | ARSR-1A Apr 61 ARSR-1 Aug 60 | Oct 60 (T2) | Sept 60 | Apr 1961 | Army | 31 Oct 1957 | |

~~CONFIDENTIAL~~

operational requirements justified earlier availability of all ten sites. NORAD recommended higher priority to the extent that all ten would be operating by the end of calendar year 1960. Also, NORAD said that it believed Fort Meade could be operating by 1959.

USAF replied on 24 February 1958 that "economic considerations preclude significant speed up of this program." Air Force stated that every effort would be made to prevent delay and invited NORAD to send an observer to meetings of the Joint Collocation Steering Group. The testing at Fort Meade prevented use of this site for the time being, USAF said.

NORAD-ARADCOM-ADC efforts to advance the operational dates were discussed in the preceding section. At mid-1958, NORAD still planned to do everything possible to move the dates up. The NORAD plans, according to the NORAD Directorate of Systems, Communications and Electronics, were as follows. As soon as complete information on letting of contracts and construction completion was received, NORAD would ask Army and Air Force to advance the operational dates. As of July 1958, NORAD had estimated construction completion data on five sites: Highlands, Lockport, Selfridge, Fort Heath, and Fort Lawton. If this information remained firm, NORAD would recommend an operational date of October 1959 for Fort Lawton, early 1960 for the other four.

For these and other sites, ADC would be asked to adjust radar installation programming, and CAA to advance installation of amplifiers to the ARSR-1's, accordingly. This included requesting ADC to move up installation of the Fort Meade radar to early 1959. Finally, until firm dates were established, NORAD planned to hold in abeyance a decision on use of AN/FPS-33's.

ARSR-1 MODIFICATIONS

As noted earlier, on 8 November 1957, NORAD informed the executive agency that it had approved joint use of the ARSR-1, with amplifron and other necessary modifications, at three sites (Pittsburgh was added later). On 11 February 1958, USAF replied that it approved, provided that appropriate modifications were made to the radar upon initial installation and that ADC specify maintenance standards and schedules. CINCNORAD was to specify the rotation rate needed for SAGE Modes III and IV.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

21

NORAD directed ADC to take the actions required by USAF and to report back. Of primary importance among the modifications required was the amplitron. In March 1956, ADC advised that the amplitron would not be available at the time the ARSR-1's were installed at Fort Lawton, San Pedro Hill, and Fort Heath. But CAA stated that the amplitron would be installed in time to meet the JMDC operational dates.

An ECCM capability was another modification required. In December 1957, ADC had sent the requirements in this area to USAF. The latter had passed these on to the Air Research and Development Command. A technical and cost study was being made.

Other possible modifications being studied by ARDC and ADC to make the radar more suitable for air defense included a buffer amplifier, an azimuth change pulse generator for attachment to the antenna rotating machinery, radomes, a Mark X IFF beacon, and an antenna gear box modification to make the rotation rate compatible with SAGE and Missile Master.

The CAA-ADC Ground Rules for Joint Use of Radar, 16 November 1956, provided that ADC would pay for modifications or equipment required by it; CAA would pay for what it required. CAA had agreed that it, as well as ADC, required the amplitron and contracted for this modification with CAA funds.* The other modifications listed above were required only by the military, consequently they would have to be paid for by the military.

COLLOCATION OF AADCP's AND ADDC's**

Background. By the end of 1957, very little had been done to

* Both CAA and ADC required Instantaneous Sensitivity Time Control on ADC radars that were to be used jointly. ADC funded for this modification on all of its AN/FPS-20's.

** CONAD Regulation 21-1 stated that in order to provide for fully integrated control of all weapons within a specified geographical area, individual weapon control systems would be collocated and integrated at a CONAD Control Center whenever operationally and economically feasible. This concept of collocation was clarified by CINCONAD on 25 January 1957 when ARADCOM and ADC were informed that collocation and integration meant one and the same thing, i.e. the ADDC and AADCP located in the same building, with operating functions in a single operations room.

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~SECRET~~

~~CONFIDENTIAL~~

collocate and integrate AADCP's and ADDC's, not included in the ten Missile Master-ADDC sites, other than area studies. On 12 April 1957, CONAD had directed each of its region commanders to survey their areas and report on the feasibility of collocation. The Eastern Commander recommended collocation at Loring AFB, Sault Ste. Marie, and Savannah. The Western Commander recommended collocation of Geiger-Fairchild; the Central Commander did not recommend collocation at any sites. On 4 November 1957, NORAD told ADC and ARADCOM that it desired collocation of Geiger-Fairchild and directed that they study logistics feasibility.

NORAD Study on Collocation of AADCP's and ADDC's. NORAD completed a study on 21 November 1957 of the feasibility of integrating, as soon as possible, the operational functions of the AADCP and the ADDC. Currently, surveillance and identification information was transmitted from the ADDC to the AADCP and then to the missile batteries. According to the study, this resulted in unacceptable time delays, causing the battery commander to have untimely information and inaccurate portrayal of the air situation. This could be overcome by integrating the operational functions. NORAD proposed to do this by patching the existing communications networks from the batteries and radar sites directly to the ADDC. Certain AADCP personnel would be placed on duty at the ADDC.

NORAD saw these advantages accruing from such integration:

- a. Timely and accurate transmission of evaluated air intelligence.
- b. Better operational control provided to the NORAD Division Commander.
- c. Approximately three years of operational experience gained.
- d. The possibility of using some 70 per cent of the personnel currently assigned to the AADCP for other assignments.

NORAD-ADC-ARADCOM Conferences on Collocation. NORAD called a conference with ADC and ARADCOM for 10 January 1958 to discuss the above proposal. The conferees agreed, as a broad planning criteria, that the defense areas already approved by the JCS for collocation (the ten M/M-ADDC sites) and/or in which SAGE would become operational within two years should not be considered. This decision

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~ ~~CONFIDENTIAL~~

was made because it was believed that by the time funds were allocated for altering the communication networks, the work accomplished, and operational procedures established, there would not be enough time left to warrant changing the system.

Using this criteria, it was believed that integration could be accomplished in the following defense areas: Travis AFB, San Francisco, Fairchild AFB, Hanford, Seattle, Ellsworth AFB, Fort Meade, Savannah River (South Carolina), and Sault Ste. Marie (Michigan).

At the next meeting, on 25 January, ARADCOM asked that five new defenses which were to be built in 1959 (St. Louis, Kansas City, Cincinnati, Dallas, and Minneapolis-St. Paul), be considered for collocation. NORAD asked for a report from ADC and ARADCOM by 28 January. At a meeting on this date, it was agreed that collocation was possible at all, except Cincinnati. At this same meeting, both components agreed that collocation of Geiger-Fairchild was feasible.

Following this conference, on 24 February 1958, NORAD directed ADC and ARADCOM to report on the feasibility of integrating the four new ARADCOM defenses on which there had been informal agreement.

Resume of Action on Each Site. The component command recommendations and actions on the locations mentioned in the above conferences are discussed below by separate groups in accordance with the groupings of ADC-ARADCOM reports or action.

Geiger Field. As noted above, at the 28 January collocation conference, both components agreed on Geiger. Western Region forwarded a 9th CONAD Division plan for collocation on 14 February with a recommendation for approval. NORAD approved on 22 April, directing certain changes to the plan.

In the meantime, Western Region had appointed a commander for the joint center (Lieutenant Colonel M. Hunt, USAF) and a battle staff. A working organization had been developed and approved by NORAD and the component commands. After a brief delay caused by the necessity of moving Army communications equipment from Fairchild, operations of the joint center began at Geiger on 15 May 1958.

Dallas, Kansas City, St. Louis, and Minneapolis. On 4 April 1958, ADC and ARADCOM jointly concurred, with certain conditions attached, in collocating the AADCP's at the ADDC facilities shown below:

~~SECRET~~
~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~

24

ARADCOM Defense

Dallas-Fort Worth
Kansas City
St. Louis
Minneapolis-St. Paul

ADIC

Duncanville AFS, Texas
Olathe AFS, (Olathe NAS), Kansas
Belleville AFS, Illinois
Osceola, Wisconsin

The conditions attached to the concurrence of these two commands concerned locating the entire headquarters battery at the ADDC. ARADCOM's 4th Region had surveyed the sites and reported on 14 March 1958 that it had determined that collocation in each case was feasible. In its siting reports, 4th Region recommended locating the whole battalion headquarters at the ADDC. ARADCOM concurred and recommended collocation to CONAD on 20 March in the manner outlined by the 4th Region.

In the joint report of 4 April, ARADCOM stated that its concurrence was predicated on the assumption that if the entire headquarters battery could not be located at the ADDC site, it could be placed near enough so that personnel could commute without undue inconvenience. ARADCOM set, as a general guide, a distance that would not exceed ten minutes travel time by light military vehicle.

USAF ADC stated that its concurrence was applicable only to the operational element of the headquarters battery, i.e., the AADCP. ADC said it saw no requirement for the whole headquarters, but would not object if there was enough land and water, if the Army funded for all its own building, and if on-site location would obviate the necessity of buying additional land.

Both commands stated that despite this apparent disagreement they wished to comply with CINCNORAD's directive as quickly and completely as possible. For this reason, they directed ADC's Central Air Defense Force and ARADCOM's 4th Region to study the feasibility of locating the entire headquarters battery at each of the four ADDC sites and to report on a priority basis.

NORAD approved these recommendations on 22 April, asking that it be brought any logistics problems for resolution.

Travis AFB, Savannah River, Sault Ste. Marie, and Seattle.
On 14 February 1958, ARADCOM and ADC recommended that none of these defenses be collocated with their associated ADDC's for the following reasons. The AADCP at Travis AFB was being phased out. The San

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~ ~~CONFIDENTIAL~~

San Francisco AADCP was to be used to control an integrated San Francisco-Travis defense. Savannah River and Sault Ste. Marie had only one Skysweeper battalion each. The primary mission of these battalions was to be a part of the Strategic Army Corps with a readiness status for overseas shipment of M plus four days. In preparation for this mission, the commander had to gear his command post to the control of field type army training. Such an AADCP would not be desirable in the ADDC.

Seattle (Fort Lawton), as discussed previously, was to be a collocated Missile Master-ADDC center. As of July 1958, the JMDC was scheduled for operation in March 1961. However, NORAD was attempting to advance this date to October 1959. ADC and ARADCOM noted these facts and stated that interim collocation was not practicable in view of the short time remaining before the M/M-ADDC center was operating. Also, the AADCP and ADDC were fifty miles apart -- a distance considered excessive.

NORAD approved the recommendations on Travis AFB, Savannah River, and Sault Ste. Marie. But NORAD requested that the Seattle situation be reexamined for a solution for the interim period. NORAD stated, however, that if ARADCOM could get its Missile Master operating soon enough to allow the JMDC to begin operations in early 1960, it would not attempt interim AADCP-ADDC collocation.

NORAD had learned from ARADCOM by mid-year that contracts for construction of Missile Master facilities had been let in June for the Seattle site. A firm beneficial occupancy date had not been received. A NORAD recommendation to advance the operational date and a decision on interim collocation was still pending at mid-year.

San Francisco, Hanford, and Ellsworth AFB. On 6 June 1958, NORAD directed ADC and ARADCOM to make a feasibility study on collocating these defenses with their associated ADDC's.

Thule AFB, Greenland. Although not mentioned earlier, NORAD planned collocation of the Thule AADCP and ADDC. On 2 August 1957, CONAD had directed the two components to report on the feasibility of collocating the two. ADC replied on 12 September, recommending collocation in a new facility to be built near Thule AFB, with the radar remoted from Pingassuit Mountain. ARADCOM agreed that this was feasible. On 8 October, NORAD approved the ADC recommendation and directed implementation.

~~SECRET~~
~~SECRET~~
~~CONFIDENTIAL~~

The 64th Air Division submitted two plans for collocation to ADC, which were forwarded to NORAD on 21 April 1958. ADC concurred in the one called Plan B. This provided for a collocated AADCP/ADDC, a joint command post which would include the SAC commander, and operational and administrative space for the SAC wing.

NORAD approved Plan B on 30 June 1958, with certain changes, and directed ADC and ARADCOM to implement it as soon as possible.

COLLOCATION IN ALASKA

Background. CONAD had stated its requirement for collocation in Alaska to the JCS as follows:

A requirement exists for two Army Defense Control System sets (AN/MSG-4) in FY-1960. One system should be installed to control the fire of antiaircraft units in defense of the Ladd/Eielson bases (Fairbanks), and the other system to control antiaircraft units in defense of Elmendorf-Fort Richardson (Anchorage) and the IRBM sites at Willow Run and Hidden Lake. Each of the AN/MSG-4's will be interconnected with the BADGE system.

On 31 May 1957, CONAD approved Murphy Dome as recommended by the commanders of the Alaskan Air Command and U. S. Army, Alaska, for the Fairbanks area and recommended it to the JCS on 18 June 1957. On 16 October 1957, NORAD approved Fire Island, recommended by CINCAL, for the Anchorage area. The executive agent informed NORAD on 29 November 1957 that both sites had been approved.

Incompatibility of BADGE and MSG-4. CINCAL advised in October 1957 that possibly the BADGE and MSG-4 could not be used together. NORAD forwarded CINCAL's letter to the executive agent, pointing out that the concept of centralized control demanded compatibility of systems. On 5 December 1957, the executive agent advised that a Department of Defense-chaired group had been formed to evaluate the BADGE and MSG-4.

NORAD heard nothing more, however. On 14 May 1958, NORAD asked USAF for information on what the group had determined and when a joint direction center in Alaska could be expected to begin operating.

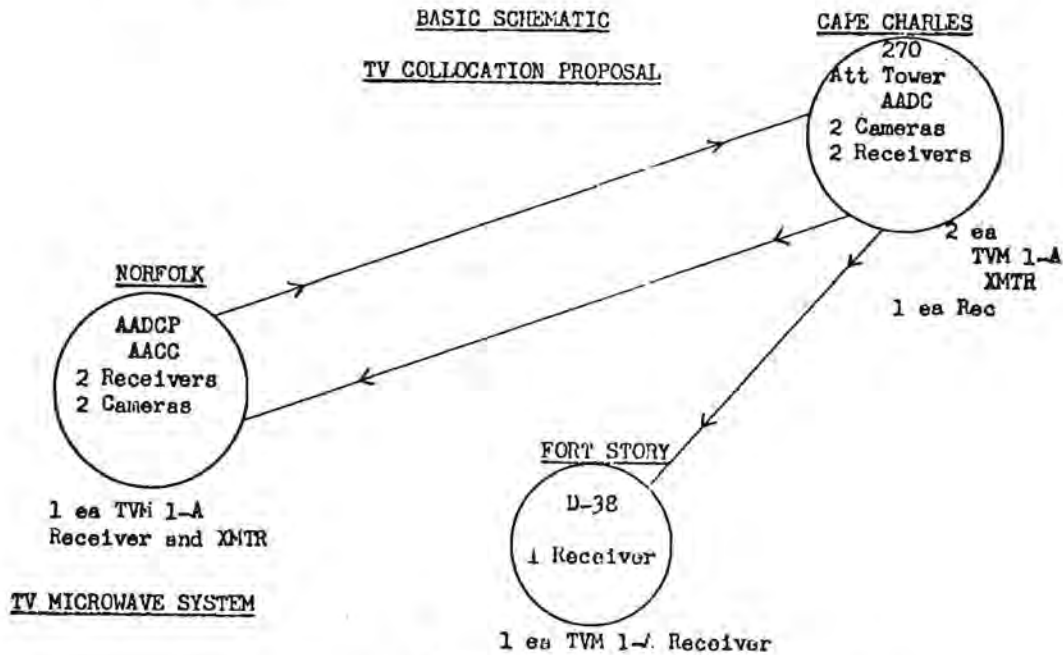
~~CONFIDENTIAL~~ ~~SECRET~~ ~~CONFIDENTIAL~~

AADCP-ADDC TELEVISION LINK

Early in 1957, the CONAD staff considered the possibility of providing television for exchange of data between AADCP's and ADDC's in areas where collocation was impractical. On 16 July 1957, CONAD requested ARADCOM to start a program to test closed circuit television between an AADCP and an ADDC to determine if it would provide enough increase in operational effectiveness to justify the cost. ARADCOM recommended that CONAD establish an operational requirement for such and get approval from the JCS. This was necessary in order to get Army funding and equipment.

On 29 November 1957, NORAD sent a requirement to the executive agent for closed circuit television in the Norfolk-Cape Charles area for testing purposes. The executive agent replied on 29 January 1958 that Department of the Army had concurred and had directed ARADCOM to submit the requirement to the Chief Signal Officer.

NORAD, ARADCOM and ADC representatives met on 30 January and decided that the overall supervision of the test would be exercised by NORAD, that ARADCOM would arrange for funds and equipment, and that ADC would provide Cape Charles personnel and facilities in support of the test. The test was started early in June and completed on 23 June. ADC and ARADCOM were to submit a final report on the test by 23 July.



~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
SECRET

Chapter III

Status of the Radar System: Continental United States

STATUS

General. As of 30 June 1958, USAF ADC had 171 operational land-based radar stations (of which 54 were gap-fillers) and one operational Texas Tower, and maintained nine AEW&C stations.* The U. S. Navy was maintaining ten picket ship stations and one AEW station. The table below gives a breakdown of these figures and a comparison of the December 1957 status with the June 1958 status.

TABLE 2

| PROGRAM | PROGRAMMED | | OPERATIONAL | | |
|-----------------------------|------------|--------|-------------|--------|---|
| | Dec 57 | Jun 58 | Dec 57 | Jun 58 | |
| Permanent Prog (P-sites) | 75 | 75 | 75 | 75 | |
| 1st Phase Mobile (M-sites) | 32 | 31 | 27 | 27 | |
| 2nd Phase Mobile (SM-sites) | 20 | 20 | 12 | 13 | |
| 3rd Phase Mobile (TM-sites) | 24 | 21 | 1 | 2 | |
| ZI Gap Fillers | 235 | 237 | 41 | 54 | |
| Texas Towers | 3 | 3 | 1 | 1 | |
| AEW&Con Stations* | East Coast | 5 | 5 | 4 | 4 |
| | West Coast | 5 | 5 | 3 | 5 |
| AEW Station* | East Coast | 1 | 1 | 1 | 1 |
| | West Coast | | | | |
| Picket Ship Stations | East Coast | 5 | 5 | 5 | 5 |
| | West Coast | 5 | 5 | 5 | 5 |

*Not all stations manned around the clock daily. See text under each heading.

* See Appendix 3 for list of ADC radars.

~~CONFIDENTIAL~~
SECRET
~~CONFIDENTIAL~~

Contiguous Radar System Operations Plan. The CONAD operations plan, issued in August 1957 (OPLAN 9-57), called for deployment of picket ships on stations located approximately 300 miles out to sea off both coasts at intervals of about 150 nautical miles. AEW&C stations were placed between the picket ship stations and the shore.

This deployment was not considered suitable by Eastern CONAD Region. The latter felt that interceptors could not be used to their maximum range. ECR proposed moving the AEW&C stations from inboard the picket ship line to some 140 miles seaward of the picket ships. This, ECR said, would extend the medium and low level early warning surveillance range and the medium and high altitude control capability sufficiently to permit employment of interceptors to the extent of their combat radii.

NAVFORCONAD also wanted to change the deployment plan. Because of budget cuts, the Navy could man only five stations off each coast. However, because new radars (SPS-17's) with greater altitude capability were being installed on the ships, NAVFORCONAD felt that the deployment could be reshuffled to provide greater coverage. NAVFORCONAD's plan: increase the lateral intervals between picket stations to 272 nautical miles on both coasts and on the East Coast move the ships from their current location from 100 to 300 miles further seaward.

NORAD studied both proposals in late 1957 and decided to have ECR test both recommended deployments. Test results had not been received by NORAD by the end of June 1958.

On the West Coast, Western CONAD Region had to depart from OPLAN 9-57 because of a reduction in flying hours. OPLAN 9-57 called for a total of five AEW&C stations. The flying hours available during the second quarter of FY-1958 allowed WCR to man only three stations. To provide coverage to more than one target complex, WCR obtained NORAD's permission to man alternate stations. Two of these (7A and 9A) were an extension of the picket ship line and provided early warning for the San Francisco, Los Angeles, and San Diego complexes. Additional flying time available was applied to a station established outboard of the picket line - 5A.

At this same time, the Air Force's Western Air Defense Force asked ADC to delete control from the AEW&C functions. Control capability of AEW&C aircraft was poor, WADF said. ADC replied that

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

Eastern Region was testing AEW&C performance on the seaward side of the picket ships which would include an evaluation of the control capability.

In January 1958, WADF again proposed deletion of the control function and also recommended that OPLAN 9-57 be revised to permanently locate AEW&C aircraft outboard of the picket ship line as an extension of that line. An operational readiness inspection had been held, WADF stated, that tested the concept of using AEW&C solely as early warning and surveillance and "for the first time during a major exercise, AEW&C aircraft contributed extensively to the success of the exercise." In the meantime, NORAD authorized WCR to continue to man AEW&C stations 7A, 9A, and 5A test.

In March, ADC informed WADF that temporary repositioning of the AEW&C aircraft on the outside of the picket line was satisfactory. Further tests were needed to support deleting the control function, however. ADC advised NORAD of its actions. The latter said it would withhold judgement until all tests were completed and then would join ADC and NAVFORCONAD to establish a firm employment and deployment policy.

Meanwhile, NAVFORCONAD submitted yet another proposal to change the contiguous system. A study conducted by its elements indicated that the system did not meet minimum air defense requirements for warning or intercept of potentially hostile aircraft. The deficiencies could be corrected, the letter continued, if its plan were adopted. Among the recommendations offered were: (1) positioning the picket ship, blimp, and AEW&C aircraft stations so as to provide equidistant coverage from bomb release lines (a point then being neglected); (2) varying the depth of target coverage in relation to target concentration and importance insofar as resources permitted; (3) utilizing AEW&C aircraft on two permanent stations on each coast (and if additional aircraft were available, using them outboard of the picket line); (4) scrambling interceptors based upon picket ship and AEW&C aircraft tracks prior to target entry into shore-based coverage; (5) commencing intercept engagements at the outer periphery of shore-based coverage; and (6) eliminating interceptor control requirements of AEW&C aircraft (a proposal also forwarded by CFWCR).

ADC reviewed the Navy proposal and agreed in general with the picket ship deployment. However, ADC would not commit itself on



~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~

the recommendations submitted for the RC-121 aircraft until after ECR submitted its test results.

NORAD requested that ADC and NAVFORCONAD submit a joint plan for the seaward extensions of the contiguous radar coverage system. The new plan was to be based on the following guidelines: (1) the concept of operations was to insure continuous tracking and intercept control from initial detection point; (2) the plan was to furnish an equidistant depth of coverage to specific target areas along a perimeter across all approach strike routes; and (3) RC-121D aircraft were to be used to cover the low altitude radar coverage gaps between the picket ships and the shore-based radars.

In the meantime, WADF made still another proposal for relocating the seaward elements. In May, WADF proposed to ADC that the picket stations be moved further seaward and the AEW&C aircraft be placed some 250 miles off the coast in the approximate position that the picket ships had been occupying. WADF asked permission to test the concept for a 30-day period.

ADC forwarded the request to NORAD, stating that it felt that since NORAD had already laid down certain criteria for the deployment of the seaward elements, no further experimentation should be conducted. ADC recommended further that both regions be directed to return all elements to the locations in OPLAN 9-57 until a new operations plan could be written.

NORAD was in partial agreement with ADC. On 2 June, it told CFWR that it could continue its current tests, but could not start any new tests. AEW&C aircraft were allowed to remain on stations 5A, 7A and 9A. NORAD told Eastern Region, whose testing program was nearly completed, to finish its tests.

Thus, NORAD had at least five different concepts presented for changing the contiguous system. Two of the proposals had been tested in the regions with only fair results and inconclusive evidence with which to support a new operations procedure. By 30 June 1958, NORAD, ADC, and NAVFORCONAD representatives were attempting to prepare a new operations plan.

AEW&C. ADC's Airborne Early Warning and Control force was composed of six tactical squadrons -- three at Otis AFB, Massachusetts, and three at McClellan AFB, California. The squadrons at .

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~

Otis were assigned to EADF's 551st AEW&C Wing, those at McClellan to WADF's 552d Wing. On 30 June 1958, the AEW&C aircraft fleet totalled 70 RC-121D's and seven RC-121C's with 33 operational. Available to man the fleet on this same date were 93 crews, of which 85 were combat ready.

As noted above, at the end of December 1957, a major problem facing both wings was obtaining sufficient flying hours to maintain the ten AEW&C aircraft stations (five on each coast) required by NORAD. A USAF-directed reduction in ADC's flying hour program had resulted in an approximate 40 per cent flying-hour cut for the AEW&C program. CINCNORAD protested the cut in flying hours, but little relief was provided. The two wings were able to man only six stations at the end of December 1957 between 16 and 24 hours daily.

In January 1958, USAF pointed out to NORAD that the actions taken by ADC were unavoidable. Congressional appropriations for flying hours were considerably less than had been requested by the services. This, in turn, forced the services to have their subordinate commands absorb the "lost time" in their flying hour program. ADC had been forced to choose between lowering its fighter-interceptor capability beyond an acceptable point or distributing the reduction to other programs. As it was, the fighter program had been cut some 15 per cent which was the maximum acceptable for flight safety and the extensive F-102 conversion program then in progress. In conclusion, USAF stated that it anticipated that during the third and fourth quarters of FY-1958, ADC would operate seven stations on a 24-hour basis.

By March 1958, however, the anticipated increase had not been achieved, only six stations were being manned. By June 1958, more stations were manned, but there was not yet full-time manning of all ten stations. On the East Coast, four stations were being maintained by the 551st Wing. Three were being manned full-time, the fourth was operated eight hours a day. In addition, ZW-1 (the Navy Airship Squadron) was manning station six on every odd numbered day of the month. On the West Coast, the number of stations being manned had risen to five; three stations were being manned full-time, the other two were being manned every other day as flying hours permitted.

Replacement for the RC-121. Little had been accomplished

~~CONFIDENTIAL~~
CONFIDENTIAL

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

toward development of an improved aircraft to eventually replace the RC-121, which even currently was considered inadequate. One reason was refusal of USAF to allocate funds for development of a suitable plane.

The latest proposal for a replacement had been Lockheed's CL-410 aircraft. It had been accepted by ADC, ARDC, and the USAF Air Staff as most nearly meeting the program needs, and USAF had been urged to procure the plane for 13 AEW&C squadrons. ADC representatives, attending a meeting held by the Air Defense Sub-Committee of the Air Weapons Board on 22 April 1958, agreed to trade 80 million dollars from F-106 and F-101 program funds to obtain FY-1959 funding for AEW&C aircraft. This action was followed on 6 May by a letter from Lieutenant General J. H. Atkinson, ADC Commander, to General Thomas White, USAF Chief of Staff, stressing the need for funding the AEW&C program even if it required reduction or elimination of the F-106 program.

General Partridge also took a strong stand in support of the program. In January 1958, he pointed out to the executive agency that the picket ships and AEW&C aircraft in the seaward extensions provided the first means of detecting enemy aircraft enroute to SAC bases and Fleet installations near the coastal areas. In May, General Partridge wired General White that he had been informed that no funds were provided in the FY-1959 budget for AEW&C aircraft. "This headquarters," he continued, "firmly believes that ...necessary funds.../for/ the AEW&C program should be obtained even though it is at the expense of the manned interceptor or of Strategic Air Command hardware."

The problem was still unsolved at mid-1958. Follow-on aircraft funding was still not included in the FY-1959 budget.

The Picket Ship Force. On 30 June 1958, the number of manned picket ship stations remained unchanged from the number on 31 December 1957. Ten picket stations (five on each coast) were being maintained around-the-clock. Four stations (three of them on the West Coast) were being manned by DER's, the remaining six by YAGR's.

In January 1958, the CNO informed the JCS that he wanted to reduce the contiguous operating force so as to provide forces for DEW barrier operations. The Navy program for FY-1959-62 called

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

for 16 YAGR's operating in the contiguous system. This would permit manning of eight contiguous picket stations. The CNO felt that the elimination of two stations would not materially effect the contiguous system. He considered that an increase in high altitude detection capability that was expected from the installation of EPS-17's would allow four stations on each coast to provide coverage equivalent to that being provided by the five stations. The coverage would still be compatible with that required by CADOP 56-66.

When informed of the proposed reduction, NORAD immediately protested. Writing to the JCS, NORAD stated that it did not consider the improved performance anticipated from the new radars sufficient to warrant reduction of the picket ship force.

In May, a compromise had been agreed upon by representatives of NORAD and the CNO. It was decided that one station would be dropped from East Coast operations, while on the West Coast five stations would be manned.

Lighter-Than-Air. Navy Airship Airborne Early Warning Squadron One (ZW-1) continued to man station six off the East Coast on a part-time basis during the first half of CY-1958. Originally, the Navy had also planned to man a station on the West Coast. However, at the end of 1957, NAVFORCONAD advised that the CNO had decided not to establish an LTA station or commission a ZW squadron for West Coast operations.

In 1958, ADC asked NORAD to confirm the Navy plans. It was planning to establish a Southern Perimeter ADIZ by the second quarter of FY-1959. And to make the surveillance and identification capability effective, ADC wanted to extend the zone into the South Atlantic and Gulf of Mexico areas. ADC pointed out that if follow-on AEW&C aircraft were available in 1962, the need for AEW blimps on both coasts would be eliminated. But the blimps could be used to advantage in the Gulf and South Atlantic area at that time.

NAVFORCONAD replied to ADC in June 1958 that the Navy was still not planning for West Coast operations. The AEW airship procurement program called for a total of only eight blimps. Four were to be ZPG-3W's, two of which would become available in late 1958. The other two would not become available for air defense



~~CONFIDENTIAL~~

UNCLASSIFIED

until completion of service evaluation trials expected to commence in late 1959 or early 1960. The remaining four blimps were to be the ZPG-2W type currently operating off the East Coast. In all, six airships would be assigned ZW-1 for use in the contiguous system. Two of the craft would remain as replacements for use when operational blimps were being overhauled.

In regard to Southern ADIZ operations, NAVFORCONAD stated that the Gulf area had not been considered. No support or operational facilities existed in that area for blimp type craft and no funds had been budgeted for future base construction.

RELOCATION OF ARADCOM AN/FPS-36 RADARS

ARADCOM advised CONAD on 14 October 1957 that the Army AN/FPS-36 radars were not properly sited in most cases to operate against low and very low approaching targets and that it wished to correct this by relocating some of the radars. CONAD concurrence was requested.

Following receipt of this letter, the Systems Directorate of NORAD's C&E section prepared an informal study on the subject. For the purpose of clarifying the story that follows, some of the observations in this study are presented here:

(1) CONAD has established the policy whereby both the area surveillance and gap filling needs of AA complexes are to be fulfilled by ADC provided radars.

(2) The ADC radar system does not now fulfill the specific AA defense complex needs.

(3) The majority of the AA defense complex needs can be fulfilled by the current ADC gap filler program; but no exact date can be specified for the fulfillment of all approved low altitude requirements in that there is no firm plan for realignment of the ADC gap filler program.

On 19 November 1957, General Partridge sent a memorandum to General Hart in which he stated that it was his desire that the FPS-36 equipment be used and that it be used at places recommended

~~SECRET~~

~~SECRET~~

UNCLASSIFIED

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

by the Army, but where it would contribute to the Air Force surveillance system. He also stated that the radars should be placed where they would benefit the Army, but that the final decision on locating the equipment would have to be coordinated with the division commanders concerned.

A NORAD-ADC-ARADCOM conference was held on 26 November 1957 at which it was decided that certain areas, proposed to receive relocated AN/FPS-36's, needed careful analysis because of the possibility that ADC or CAA planned radar for the same areas. The conferees agreed that ADC should be allowed to study the ARADCOM proposals before they were submitted to NORAD. And, on 27 November, NORAD sent a letter to both components implementing this procedure and requesting ARADCOM proposals as soon as possible.

In response to NORAD's instructions, ARADCOM furnished the proposed site locations for the 5th Army Air Defense Region to USAF ADC on 12 December 1957, and those of the 2d AARGN on 18 December. ADC forwarded the proposed 5th Region sites with its comments and a request for additional policy guidance to NORAD on 29 January 1958. Included in its lengthy comments was the opinion that seven of the 15 sites recommended by ARADCOM could be eliminated because they would overlap existing and/or programmed ADC radar coverage. ADC also added that with certain changes in siting, two other sites could be deleted.

NORAD Surveillance Policy. Because of the situation and the request from ADC for further policy guidance, NORAD decided that a general policy regulation needed to be issued on surveillance requirements based on all previous policy statements. But because action needed to be taken before a regulation could be published, it decided to issue a policy letter and follow it with a regulation. Such a letter was sent to all component commands on 20 March 1958.

As a general concept, NORAD stated that the siting of all radars used for surveillance purposes, regardless of the agency furnishing the radars, was to be carried out in such a manner as to provide the best possible overall surveillance system. NORAD assigned USAF ADC the primary responsibility for furnishing surveillance radars and associated communications in the U. S. But NORAD provided that although ADC had this responsibility, other agencies might be required to furnish surveillance radars. Ordinarily, this would be on an interim basis. ADC was also made the coordinating

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~ ~~CONFIDENTIAL~~

agency responsible to NORAD for the U. S. portion of the surveillance system. NORAD's instructions on coordinating activities included the following: (1) interim equipments were not to be sited where they would prevent construction of permanent facilities, (2) the output of interim surveillance radars was to be integrated into the parent master display facility, and (3) radars used on an interim basis for surveillance purposes were not to be modified for data link transmission.

On the basis of this letter, NORAD replied on 21 March to ADC on the relocation of AN/FPS-36's. NORAD stated that while ADC had been given primary responsibility for providing surveillance data for the U. S., if it could not provide this data to the agencies having a valid need on a timely basis, NORAD reserved the right to authorize interim radar installation by any NORAD agency. In keeping with this, NORAD approved ARADCOM's plans for deploying the AN/FPS-36's in the 5th AA Region.

NORAD's approval, however, was subject to certain restrictions which included the following:

- (1) The installations will be temporary in nature and will be made in such manner and specific location as to not prevent timely completion of construction of programmed ADC radars.
- (2) The deployment of an FPS-36 radar to any specific site will not be made if the USAF ADC radar which is programmed for that site will be operational within six months or the date of this correspondence.
- (3) USARADCOM is authorized to deploy and operate interim installations of FPS-36 radars to provide required coverage as specified herein until such time as USAF ADC radars can provide the approved coverage in the area concerned. At this juncture, the authorization to USARADCOM is to be considered as withdrawn.

~~SECRET~~

In the meantime, on 17 March 1958, D/A notified ARADCOM that the Army had enough funds for the relocation of the AN/FPS-36 at 11 sites and asked for relocation plans. On 24 April 1958, General Partridge sent a memorandum to Generals Atkinson and Hart, advising them of instructions he proposed to issue unless either had serious objections:

~~SECRET~~ ~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

(1) The AADCP's and ADDC's will be collocated in accordance with current plans and as rapidly as feasible.

(2) The FPS-36 is to be employed to its fullest capacity as a surveillance radar. It will be operated by Army personnel on a 24-hour-a-day basis and its output will be forwarded to an ADDC, as well as to the AADCP where such elements are not collocated.

(3) In regard to the above, appropriate arrangements will be made to insure that antiaircraft fire units receive the output of the surveillance system on a timely, continuous and accurate basis.

(4) Relocation sites for the FPS-36 will be submitted to USAF ADC for coordination for those sites that will augment the NORAD surveillance system. The USAF ADC has already agreed to accept the output of five of the eleven FPS-36 radars currently under discussion. The location of the remaining six and any other FPS-36 radars which ARADCOM feels should be relocated, but which duplicate or would not augment the existing NORAD surveillance system, will be arranged with the NORAD division commanders concerned.

Neither component commander objected.

These instructions were included in a letter to ADC, ARADCOM, and each CONAD region on 5 June 1958. NORAD noted in this letter that the completion of the programmed surveillance system in those areas where Nike defenses existed, the correction of possible technical deficiencies in radar coverage, and the provision of appropriate data handling means would eliminate the requirement for the AN/FPS-36 in the air defense system. However, existing sites would provide Nike defenses with the capability of autonomous operation (Mode IV) in the event of battle damage to the surveillance system. Therefore, NORAD said, until otherwise directed, the stand-by capability might be retained within the resources allotted to ARADCOM.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~UNCLASSIFIED~~

[REDACTED] [REDACTED]

USAF ADC MASTER DIRECTION CENTER
CONCEPT OF OPERATIONS

On 30 January 1958, USAF ADC proposed establishment of a master direction center concept of operations for its U. S. and 64th Air Division manual ACW system. ADC proposed to place it in effect as soon as possible and to continue it until the advent of SAGE. ADC's plan was to set up small operational complexes, each of which would have one master direction center (MDC) and up to five slave stations. Each complex would have the size and configuration to enable it to carry out all actions against a Mach Two target. The slave stations, which would report to the MDC, could be direction centers, surveillance stations, AEW&C planes, or picket ships. ADC said that its reason for wanting to make this change was that its long-standing concept of decentralized operations was outmoded by the introduction of high-speed jet bombers and was difficult to support with current funds and manpower.

NORAD approved ADC's plan on 20 February 1958, subject to the incorporation of certain recommendations. NORAD's recommendations included a change in the functions at the ADC and the MDC, the provision that all ADC's associated with an AADCP be designated as MDC's, and the addition of provisions for communications from MDC's to associated AADCP's. In addition, NORAD asked that all plans prepared by the air defense forces and 64th Air Division be submitted for approval prior to implementation.

ADC revised its plans accordingly, with one exception. ADC felt that all joint manual direction centers (see Chapter II) should be designated as MDC's, but objected to designating every ADC associated with an AADCP as an MDC. This would result, ADC stated, in complexes that would be too small to cope with high-speed targets and also in creating more MDC's than ADC could support. ADC requested permission to delete this provision. Army Air Defense Command agreed with ADC on 19 April in response to a query from NORAD.

Another request from ADC was that NORAD waive its requirement to review the detailed supporting plans from the field and receive instead information copies of plans approved by ADC. This would save a great amount of time.

~~CONFIDENTIAL~~~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

NORAD approved later. In regard to the latter request, NORAD stated that it had the right to disapprove plans that were not in consensus with its concepts.

As provided in the approved plan, the ADC would be responsible for the following functions: (1) surveillance display, (2) track establishment, (3) identification, (4) allocation of fighter-interceptor weapons, (5) scramble and recovery of fighters, (6) control of fighters, (7) coordination of tracks with adjacent radars and MDC's, and (8) reporting to a NORAD Division Control Center. Direction centers would be responsible for surveillance and control of weapons, be capable of scramble and recovery, report to an MDC, and coordinate tracks with adjacent radars. Surveillance stations would be responsible for surveillance and might have limited control capability, report to an MDC or DC, and coordinate tracks.

IDENTIFICATION

Planning for Southern Perimeter ADIZ's. On 27 September 1957, NORAD informed ADC that it considered imperative the establishment of an ADIZ along the entire southern border of the U. S. Intelligence estimates indicated that the Soviets could bypass the DEW and MCL systems and strike the southern border. And it was felt that the Soviets might choose to attack by a less desirable route rather than by direct penetration and face almost certain detection.

A review of the air defense capability along the southern boundary of the U. S. revealed that radar coverage as well as fighter-interceptor deployment was completely inadequate either for detection or identification. NORAD considered that at least three actions were necessary to solve this problem: (1) expedite installation of adequate radar facilities and place fighter squadrons along the entire southern boundary (to include the Gulf Coast area); (2) concurrent with the operation of radars and interceptor squadrons, establish an ADIZ across this area and enforce its requirements; and (3) at the time the southern perimeter ADIZ was established, reduce or eliminate the eastern and western ADIZ's. NORAD recommended further that, as interim procedures, ADC use mobile radars to close the gaps, obtain assistance from other commands and services, and investigate the possibility of rotating its own fighter squadrons from interior stations to the southern

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

UNCLASSIFIED

border. NORAD established a target date for implementing the ADIZ of 1 January 1958.

ADC replied that the ADIZ proposed was in accordance with its own planning and programming objectives. But it might not be able to take the interim measures recommended by NORAD due to monetary and manpower restrictions. Subsequently, ADC asked for and received NORAD's permission to extend the implementing date of the southern perimeter ADIZ from 1 January 1958 to approximately the second quarter of FY-1959. ADC did not want to set up an interim system with forces of other commands and services, for this would require it to re-program in order to get funds for such. By waiting, it could use mostly its own forces.

The plan proposed by ADC called for using radars already programmed for the system plus radar of the CAA and the U. S. Navy in Florida, moving part of its interior interceptor force to the southern border, and using ANG squadrons on 24-hour alert for an added identification capability. The proposed ADIZ would begin at the southern tip of the Pacific ADIZ, then proceed across Mexico to a point south of Brownsville, Texas, then across the Gulf of Mexico, enclosing the southern portion of Florida, and then to the southern portion of the Atlantic ADIZ.

NORAD approved the new deadline, as noted above, but stated that it could not accept any further delay. It also recommended that ADC continue an examination of other command and service facilities for possible use, even though it meant re-programming, so that the identification and surveillance gap along the border could be closed.

ADC presented the ADIZ proposal to USAF on 23 January 1958. The following actions were required, ADC stated, if penetrations from the southern approaches were to be detected and properly evaluated and an effective identification capability attained: (1) designation of a US/Mexican Border ADIZ (to include establishment of identification criteria and procedures for operation within the ADIZ, extending low altitude radar coverage south of the U.S.-Mexican border, obtaining overflight authority from Mexico so that unknowns could be intercepted in Mexican territory, and provision for timely flight plans and air movements data on aircraft penetrating and/or operating within the Mexican ADIZ toward the U.S.); (2) establishment of an ADIZ over the Gulf of Mexico and extension of surveillance and radar coverage into the Gulf; and (3) extension

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

UNCLASSIFIED

of the Atlantic ADIZ and designating an ADIZ over the Bahama Islands (British Territory).

The internal ADIZ's (Eastern and Western), already in operation, would continue in effect for an indefinite period after establishing the southern ADIZ. After the establishment of an ADIZ around the Florida Peninsula, these could be realigned or placed on stand-by status until an Air Defense Emergency was declared. Designation of the recommended ADIZ's would not enable ADC to achieve a fully effective surveillance and identification capability before the second quarter of FY-1959, but it would enable it to exploit any interim capability that was attained.

The ADC proposal differed in one important respect from that recommended by NORAD. The ADC plan called for a Mexican Border ADIZ using equipment located on U. S. territory which was scheduled to be operational in the near future. The NORAD proposal had been based on the requirements set forth in CADOP 56-66 which called for using six prime and 41 gap-filler radars located in Mexico. NORAD considered ADC's method the fastest, however. In March 1958, NORAD informed the executive agency that it approved and supported the ADIZ's as proposed by ADC and wanted them operational no later than the second quarter of FY-1959. It further recommended that the ADC proposal be used as a basis for negotiation with the Mexican Government.

In April, USAF replied that it would give the ADC proposal "prompt attention." However, USAF continued, it appeared doubtful that the second quarter FY-1959 deadline could be met in view of the requirement to conduct negotiations with foreign governments before the ADIZ's could be fully implemented.

By July 1958, ADC had initiated several actions to meet the ADIZ deadline. Negotiations with the Navy had begun to obtain surveillance information from its radar located at Key West, Florida; planning was being conducted to use inputs from the CAA long range radar in Florida; the ANG had been contacted and had agreed to have five of its interceptor squadrons assume a 24-hour alert on 1 October 1958 in the southern ADIZ area; and communications for passing flight plan information between the DC's with an identification responsibility and the appropriate CAA ARTCC's had been installed. However, ADC pointed out that five of its AC&W sites that would have a surveillance responsibility for portions of the southern

~~SECRET~~ ~~CONFIDENTIAL~~ ~~SECRET~~ ~~CONFIDENTIAL~~

UNCLASSIFIED

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

perimeter ADIZ would not become operational until 1 January 1959. The delay was caused by inadequate family housing. This would not delay designation of the ADIZ boundaries, ADC continued, but would leave some gaps in radar coverage.

Change in the Alaskan Coastal ADIZ. AAC requested USAF to take action to extend the outer boundaries of its coastal ADIZ to cover the Aleutian segment of the DEW Line. USAF directed ADC to formally request the CAA to extend the Alaskan ADIZ to cover this segment and to provide full-time AMIS service from Fairbanks and Anchorage to the DEW Line and the Aleutian Segment.

ADC forwarded the requests to NORAD. In June 1958, NORAD forwarded a formal request to the Executive Agency for the changes. NORAD stated that it approved the AAC proposal and requested that the proposal be presented to the SCAT Board for review as soon as possible. USAF was also requested to begin negotiations with CAA for the establishment of appropriate AMIS facilities for the Fairbanks and Anchorage ARTCC's with AAC designated as the funding agency.

~~(S)~~

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~
~~SECRET~~

UNCLASSIFIED

Chapter IV

Status of The Radar System: Outside Continental United States

PINETREE LINE

In Canada, there were a total of 32 operational heavy radar stations and six gap-filler radars as of 30 June 1958 (exclusive of the Mid-Canada Line and the DEW Line).^{*} Ten of the heavy radars and the six gap fillers were deployed along the East Coast in the 64th CONAD Division area of responsibility. The other 22 ran in a line from Nova Scotia to Vancouver Island.

USAF ADC manned nine of the heavy radars and the six gap fillers in the 64th Air Division, and eight of the remaining 22 heavy radars; Canada manned the other 15 radars which included one in the 64th Division area.

In April 1958, USAF ADC proposed to NORAD that CANADA assume the manning responsibility for the entire Pinetree line. It pointed out that USAF was in an "austere manning situation" and every effort was being made to reduce manpower requirements. A significant savings of personnel could be made if the RCAF ADC would accept manning responsibility for all Pinetree sites.

NORAD rejected the proposal, however, stating that the RCAF was already committed to the limit of its manpower. If it manned additional stations, other equally essential elements in the air defense system would have to be reduced. Cutting the number of USAF personnel manning radar units, "constitutes a reversal of the trend that must be maintained if the operational requirements for increased surveillance are to be met," NORAD stated. NORAD was already supporting a requirement for additional radars in Canada, which would require more personnel from both countries.

In 1955, USAF ADC had proposed installing 26 heavy radars in

* See Appendix 3 for RCAF/ADC radar stations and Appendix 4 for 64th Air Division radars.

44
~~CONFIDENTIAL~~
~~SECRET~~

UNCLASSIFIED

UNCLASSIFIED

TABLE 3 STATUS OF THE RADAR NETWORK
OUTSIDE CONTINENTAL UNITED STATES

| PROGRAM | NUMBER SITES | UNDER CONSTRUCTION | OPERATIONAL | COMMENT |
|-------------------------------------------------------------------------------------------------------------|--------------|--------------------|-------------|--------------------------------------------------------|
| Pinetree (USAF funded) 31 December 1957 30 June 1958 | 23* 23* | | 23* 23* | *Includes G-32, Thule *Includes G-32, Thule |
| Pinetree (RCAF funded) 31 December 1957 30 June 1958 | 10 10 | | 10 10 | |
| Pinetree Gap Fillers (64th ADiv) 31 December 1957 30 June 1958 | 6 6 | | 5 6 | |
| 4th Phase (Canada) 31 December 1957 30 June 1958 | 18 23 | | | Program awaiting approval Program awaiting approval |
| 4th Phase Gap Fillers (Canada) 31 December 1957 30 June 1958 | 51 51 | | | Program awaiting approval Program awaiting approval |
| DEW Line 31 December 1957 30 June 1958 | 57 57 | | 57 57 | |
| Alaska (AAC) 31 December 1957 30 June 1958 | 18 18 | 5 1 | 13 17 | |
| Aleutian DEW Extension 31 December 1957 30 June 1958 | 6 6 | 6 6 | 0 0 | |
| Eastern DEW Extension (30 June 1958) 4 - 0 | | | | |
| Pacific Barrier (30 June 1958) 4 DER's and 4 AEW&C aircraft operating between Kodiak Island & Midway Island | | | | |
| Atlantic Barrier (30 June 1958) 4 DER's and 4 AEW&C aircraft operating between Argentina and the Azores | | | | |

54

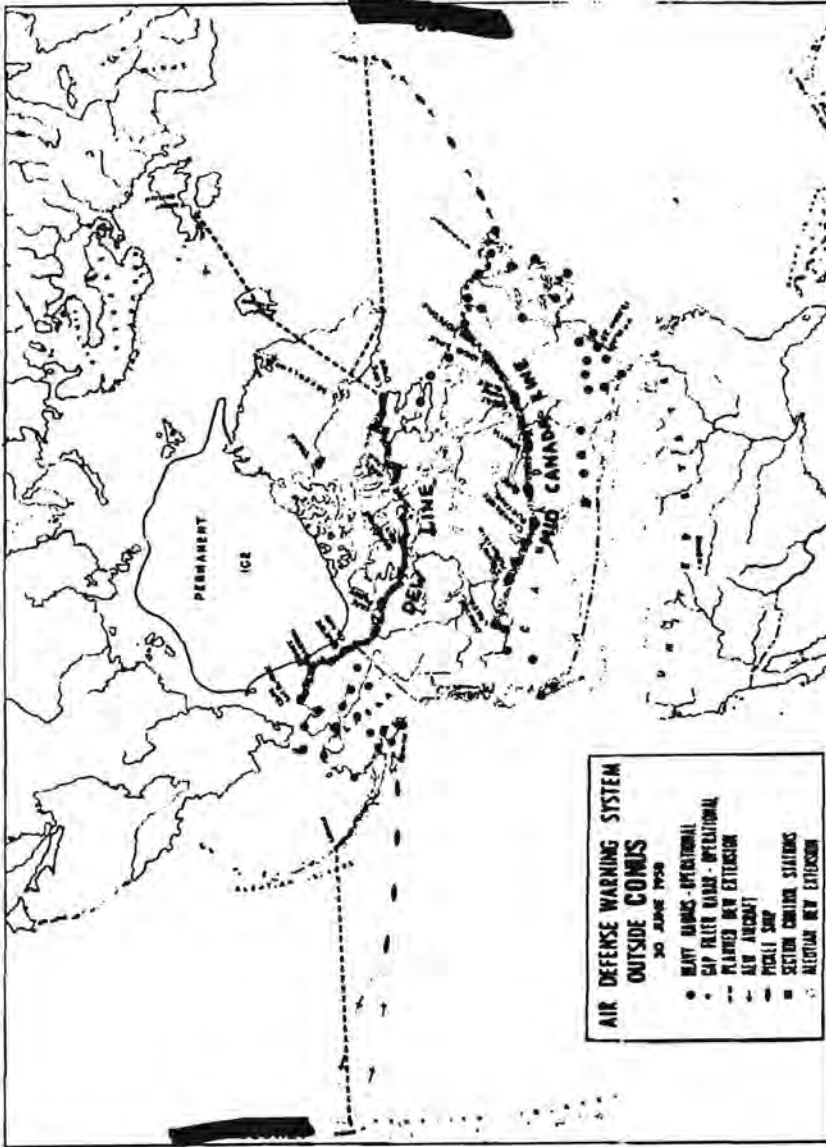
UNCLASSIFIED

~~CONFIDENTIAL~~ SECRET

46

~~CONFIDENTIAL~~

UNCLASSIFIED



~~(C)~~

~~CONFIDENTIAL~~ SECRET

UNCLASSIFIED

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
UNCLASSIFIED

47

Canada to extend the combat zone northward. For the next three years, the proposal remained under study at RCAF and USAF headquarters. At the end of 1957, the proposed extension program called for building 23 heavy radars (18 parallel to and just north of the Pinetree stations, and five heavy radars on the Mid-Canada Line). In addition, USAF ADC proposed 51 gap-fillers for Canadian territory as part of the Frequency Diversity (FD) program.

In early 1958, NORAD emphasized to USAF the need for extending the combat zone into Canada. NORAD pointed out that it strongly supported USAF ADC's proposals for the gap-fillers and the 23 prime radars. Stated NORAD, "we have been recommending the additional radars for the last three years with no evident results and failure to provide for this program immediately will result in a serious deficiency in our defenses against the manned bomber threat." NORAD recommended that USAF and the RCAF work together to iron out any remaining problems and that funds be provided to begin the program as soon as possible.

An executive agency reply in March 1958 offered little hope for quick completion of the extension. Fund limitations and relative priorities of other operational requirements, USAF stated, had interacted to prevent funding of the entire program. It was anticipated, however, that within present and planned funding, seven of the heavy radars would be approved for funding in FY-1960, with an operational date of FY-1963. The program might later be augmented depending upon the availability of funds. USAF stated that it would continue to consult with the RCAF on the matter.

In the meantime, RCAF ADC had also been searching for other methods to add to its radar coverage. The Department of Transport (DOT) planned to install 15 FPS-19-type heavy radars and four airport surveillance radars in Canada. In some cases, the DOT radars would cover areas already under surveillance by ADC sites, but in others, particularly the mid-west, DOT radars were programmed where coverage was virtually non-existent. In September 1957, RCAF ADC asked CONAD what it thought about using DOT radars, since portions of the tie-in would affect CONAD divisions.

CONAD agreed fully with the concept of maximum data exchange between DOT and ADC radars and also in using the DOT radars to supplement coverage where no air defense radars were available.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
UNCLASSIFIED

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

However, CONAD wanted to be certain that the operation of the DOT radars could be made responsive to air defense requirements. It asked the RCAF ADC and USAF ADC to jointly consider the matter.

USAF ADC agreed with the principle of using DOT radars to supplement the air defense system (a similar effort was being carried out between itself and the CAA). But it withheld complete approval until firm plans had been received on the Canadian extension program. If Operation Pillow -- the extension project -- were given the priority ADC desired, there would be little need for a tie-in with DOT radars. However, if it was determined that Operation Pillow was not going to be implemented soon, use of DOT radars would be considered. USAF ADC stated that if the DOT radars could be used for a two-year period prior to the operational date of the extension radars, joint usage was desirable. And ADC asked for a later meeting with RCAF ADC representatives to study the matter further.

ALASKA

Status. At the end of December 1957, the Alaskan radar network was scheduled to consist of two control centers (Iadd and Elmendorf) and 18 radar stations. Thirteen of the stations were operational and five were still under construction. The stations under construction were located at: Bethel, Kotzebue, Unalakleet, Fort Yukon, and Ohlson Mt. By 30 June 1958, four more stations had entered the active radar network, making a total of 17. Bethel (F-21), the remaining station, was expected to enter the network in August 1958. In addition, CINCAL had programmed an additional radar for Gulikana.



~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~SECRET~~ ~~CONFIDENTIAL~~

UNCLASSIFIED

Radar Improvement Program. The Alaskan stations were operating either the AN/FPS-3, the AN/CPS-6B, or the AN/FPS-8 radar at mid-1958.* However, new equipment was programmed to modify the AN/FPS-3's and to replace the AN/CPS-6B's. One program initially called for converting the AN/FPS-3's, which were installed at 13 sites, to the AN/FPS-20 by adding the AN/GPA-27. But because of a fund shortage, USAF deleted four AN/GPA-27 sets from this program, making it possible to convert only nine AN/FPS-3's.

An acceleration of the program had been sought by NORAD. ALCOM agreed and had taken what actions it could. On 28 February 1958, ALCOM advised that the greatest savings in time would result from using three Bendix installation teams rather than the two formerly planned. The AN/GPA-27 construction and installation dates as estimated by AAC were as follows:

| SITE | CONSTRUCTION COMPLETED | EQUIPMENT INSTALLED - COMPLETED |
|----------------------|------------------------|---------------------------------|
| F-15 Sparrevohn | 31 July 1958 | 14 October 1958 |
| F-16 Indian Mountain | 31 July 1958 | 7 October 1958 |
| F-3 King Salmon | 31 July 1958 | 2 September 1958 |
| F-8 Campion | 31 August 1958 | 21 October 1958 |
| F-10 Tatalina | 15 October 1958 | 18 November 1958 |
| F-5 Newenham | 31 October 1958 | 13 January 1959 |
| F-6 Romanzof | 31 October 1958 | 7 January 1959 |
| F-4 Wales (Tin City) | 31 October 1958 | 30 December 1958 |
| F-7 Lisburne | 31 October 1958 | 10 February 1959 |

The two AN/CPS-6B's in the Alaskan theater, one at Fire Island (F-1) and one at Murphy Dome (F-2), were to be replaced with AN/FPS-7's, according to the original plan, in FY-1958. USAF advised that these would be delayed until FY-1962, however, because of the fund shortage. CINCAL objected and appealed to NORAD for help in obtaining equipment suitable for use in the JMDC's to control high-performance weapons. In December 1957, it was decided to have ADC furnish AAC two AN/MPS-7's for the sites, subject to USAF approval.

* See Appendix 5 for a complete listing of Alaskan stations and their radar equipment and locations.

~~SECRET~~ ~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~
~~SECRET~~

UNCLASSIFIED

The latter approved in April 1958. To be moved were the AN/MPS-7 located at M-128, Kingman, Arizona, and the AN/MPS-7 allocated to ADC for future installation at SM-144, Union City, Tennessee. These sets were to be made into AN/FPS-20's by adding a AN/GPA-58 to each one. The radars were expected to become operational by the second quarter of FY-1959.

Obtaining the AN/MPS-7's from ADC solved one problem, but AAC also wanted two AN/FPS-6 height-finders at Fire Island and Murphy Dome by the first quarter of FY-1960. USAF informed AAC that one AN/FPS-6 could be made available for each site for operation by FY-1959. But a second height-finder for each would not become available until about the third quarter of FY-1961.

AAC appealed to CINCAL, stating that proper operation of the two JMDC's could not be accomplished unless dual height-finding facilities were available for the simultaneous control of manned interceptors and ground-to-air missiles on a continuous basis. CINCAL, in turn, laid the problem before NORAD. He stated that the slippage in the delivery date of the second set of AN/FPS-6's posed a serious problem. The delay would reduce the offensive capability of both stations for an extended period. And he proposed that NORAD request USAF to return to the original operational date (Second Quarter FY-1960).

NORAD was also concerned with the slippage and in July 1958 requested USAF to program a second height-finder for F-1 and F-2 even if it meant reprogramming equipment allocated for low priority ZI stations. "During a battle condition," NORAD wrote, "one height finder cannot provide the necessary height information on numerous hostile tracks."

Gulkana Radar. In January 1958, CINCAL reviewed the entire Alaskan ground environment system in an effort to discover any gaps in radar coverage. One place in particular stood out: Just east of Anchorage a gap existed in the radar screen from ground level to approximately 20,000 feet.

At one time, a radar site had been programmed for Gulkana to fill this void. But this project had been first deferred by USAF because of budgetary reasons and later deleted on the assumption that a direction center would be relocated on Mt. Susitna and would provide sufficient coverage. The location was later changed to

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

Fire Island. This left the entire Copper River Basin without radar surveillance and provided a natural route for low altitude surprise attacks from the east.

To correct this deficiency, CINCAL wanted to place an AN/FPS-8 at Gulkana. However, before he instructed AAC to install the radar, he wanted NORAD's concurrence. NCRAD concurred.

DEWLINE

At the end of CY-1957, there were deficiencies in the operation of the DEW Line. Although the line running from Cape Dyer, Baffin Island, to Cape Lisburne, Alaska, had been declared "fully operational", at least two major areas needed corrective action to bring them to the standard required by NORAD. These areas were operational procedures and communications. By mid-1958, as discussed below, remedial action had been taken but all problems had not been solved.

Operational Procedures. The establishment of identification facilities and procedures was one pressing problem at the end of 1957. DEWIZ information had not been published by DOT to implement an identification system for the Canadian portion of the line. Also, the DOT had failed to establish Air Movement Information Service (AMIS) facilities at Goose Bay, Labrador, and Edmonton, Alberta, Canada, to supply flight plan data to the DEW Main stations.

However in January 1958, the DOT provided the DEWIZ information for publication in radio facility charts. This was followed in April 1958 by the collection and dissemination by ADC of interim identification instructions.

Steps to establish AMIS's came slower. The facility at Edmonton became operational on 15 February, but it was 1 April before Goose Bay had its facility. This resulted in the two central sectors of the DEW Line being operated for six and one-half months and the two eastern sectors being operated for eight months without the basic flight plans necessary for identification. Establishment of the AMIS's and dissemination of identification procedures were two big steps toward making the line fully operational.

~~CONFIDENTIAL~~

UNCLASSIFIED

UNCLASSIFIED

There was still room for improvement in identification, however. As of June 1958, two separate and distinct identification zones using different criteria were in being. The need to establish a common identification zone for the entire line had been brought to the attention of USAF, NORAD, and AAC in 1957. At that time, all action had been held in abeyance pending the completion of a study by CUSSAT. The CUSSAT study had been completed and was in the hands of the Joint Military Study Group in Washington for review.

Communications. NORAD had been dissatisfied with the communications reliability of the DEW Line. Data received at the NORAD COC was found unreliable and at times unusable. The problems encountered apparently stemmed from two causes: poor rearward communications circuits leading back to existing NORAD communications facilities; and a lack of clear cut responsibility assigned to any of the companies concerned with DEW Line communications to monitor and correct outages. The unsatisfactory status of the rearward circuits could be corrected, NORAD felt, by installation of "repeat-back" equipment on the DEW ionospheric rearward telling circuits -- duplexing the radio portion of the circuits. Establishment of a central communications control point at Dawson Creek was also recommended.

An outstanding example of the poor rearward circuitry was the Barter Island-Anchorage (BAR-AGE-X) rearward FPIS circuit. This circuit was so poor that from 19 October until 31 December 1957 no operational traffic was passed over it. CINCAL asked for and received NORAD support to reinstall a VHF capability at Barter and AGE-X as a back-up for the FPIS system. At the end of December 1957, this proposal had been approved by USAF, but installation of the circuit was to be held in abeyance until it was determined that CINCAL and COMAAC had resources available for the project.

In January 1958, USAF reversed its position. The DEW/WHITE ALICE Project Office had reported that it would be impractical to reinstall the VHF system. This decision was based upon three considerations: (1) the availability of White Alice circuits to provide alternate routing; (2) the length of time required to install VHF equipment and antennas at the Barter Island station; and (3) the work already being performed by Western Electric to correct FPIS deficiencies. Although AAC protested the decision, USAF would not change its position.

UNCLASSIFIED

~~CONFIDENTIAL~~
~~SECRET~~

UNCLASSIFIED

By June 1958, repeat-back facilities had been installed on two of the four FPIS circuits (BAR-AGE-X and CAM-NEL-X). And WAT-X and BIR-X, the remaining circuits, were to be modified as soon as equipment was available to the RCAF. However, the BAR-AGE-X circuit was still not satisfactory. ADC had informed USAF of the condition in March 1958. USAF, in turn, requested the DEWPO to correct the problem.

In the meantime, as an alternate solution to the BAR-AGE-X problem, AAC had suggested using augmented White Alice circuitry. USAF approved the plan and directed AAC to provide four additional circuits from BAR through White Alice to Fairbanks, Alaska, and NORAD. Upon installation of these circuits, the BAR-AGE-X FPIS facility would become an alternate circuit.

USAF also requested ADC and the DEW/WHITE ALICE Project Office to evaluate the possibility of transmitting all traffic from all DEW main stations laterally to the end of the line and rearward by the White Alice and Pole Vault systems as primary routes. The FPIS systems would be left as alternates for telling to the MCL.

In regard to isolating trouble areas and restoring circuits running between NORAD and the DEW Line, a survey showed considerable improvement. This improvement had resulted from assigning the AT&T Denver Toll Test Center responsibility for monitoring communications along the line. The time required to spot and trouble-shoot an outage had also been reduced by installing monitor machines on the four DEW Line main circuits in Colorado Springs. Garbled messages had been reduced, but possibly this had resulted from better weather conditions rather than through improvement in machines or procedures. Periodic traffic surveys were also helping to reduce the number of one-time malfunctions. Lastly, the surveys indicated that FPTS and White Alice circuitry was more reliable than FPIS circuits. ADC felt that the improved procedures it had instituted were helping to obtain the best results from the FPIS circuits.

A third step taken to improve NORAD's communications with the DEW Line was planning toward command voice communications from AAC to the four western DEW main stations. This would provide the NORAD COC with direct voice communications to POW, BAR, PIN, and CAM similar to the existing link with FOX and DYE. AAC had sub-

~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

mitted this recommendation to NORAD in its proposed C-E plan. The plan was approved and AAC was instructed to proceed with the project after coordination with Federal Electric.

Efforts to improve the FPIS circuitry was but part of the over-all communications improvements sought by NORAD in the northern area. In December 1957, NORAD had made seven recommendations to the executive agent for improving communications: (1) improvement of White Alice to DEW communications; (2) augmentation of Alaskan long-line communications; (3) construction of alternate facilities to the Aleutian extension of the DEW Line (Project STRETCH-OUT); (4) establishment of a communications monitor and control point in the Dawson Creek area; (5) installation of repeat-back equipment to DEW rearward telling circuits; (6) improvement of POLE VAULT communications; and (7) support of a proposed FOX-CHURCHILL tropospheric system from the DEW to MCL.

USAF replied that five of the seven proposals had already been under consideration. Only proposals four and seven had not been worked on. Better communications from White Alice to the DEW Line were anticipated between Kotzebue and Lisburne since Western Electric had decided to employ a 36-channel quadruple diversity system between the two stations rather than a 12-channel system. This would provide a reliability equal to the remaining White Alice system and no further action was contemplated. The proposal for an alternate Tropospheric Scatter system between Fort Yukon and Barter Island had been re-evaluated by the contractor undertaking the Alaskan BMEWS project. It was decided that a more economical means of providing toll quality along the DEW should be sought. Augmentation of the Alaskan long-line facilities by a tropospheric scatter system between Boswell Bay and Skagway had also been evaluated and dropped. Current plans to install a submarine cable from Port Angeles, Washington, to Homer, Alaska, coupled with existent island waterway and Alcan communications were considered sufficient. Repeat-back equipment to the DEW rearward telling circuit was concurred in and would be accomplished by connecting southern terminals back to the reporting station using available equipment and channels. The establishment of a monitor and control point at Dawson was being held in abeyance pending further study by Western Electric. POLE VAULT facilities would be improved as part of the BMEWS requirement and funds for this purpose were contained in the FY-1959 budget estimates. As to the FOX-CHURCHILL tropo system, it had been planned as a part of BMEWS, but was later dropped because of fund shortages.

~~SECRET~~

~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

55

Change in Operational Control. On 17 January 1958, USAF informed ADC that responsibility for operational control of the Cape Lisburne-Cape Dyer segment was assigned to it effective 15 February. ADC was to assume this responsibility at the same time it undertook M&O contract administration.

Almost immediately NORAD protested the assignment of operational control to this uni-service agency. In a letter to the executive agency, NORAD stated that:

...it is essential that CINCNORAD exercise operational control over the land-based portion of warning systems that provide the means of alerting the North American forces. Operational control will be exercised through designated subordinate NORAD commanders. This command concurs in an assignment of responsibility to USAF Air Defense Command for management to include contract administration, technical control, manning and operation. USAF ADC will also be directed to prepare, for NORAD approval, standardized operational procedures for the entire DEW Line.

While awaiting a reply, NORAD outlined the functions required of ADC on the DEW Line. ADC was made responsible for: detection and identification of all air-breathing vehicles penetrating the DEWIZ, making certain that the vehicle was identified as friendly or hostile; providing differentiation between single and raid type formations crossing the DEWIZ; rapid transmission of information to and from the DEW Line to AAC, NORAD, and RCAF ADC; rapid transmission of "Noah's Ark" messages to SAC aircraft; and providing navigational assistance to friendly aircraft.

The matter of operational control was settled on 14 April 1958. USAF replied that, "CINCNORAD clearly has operational control of the Cape Lisburne-Cape Dyer portion of the DEW Line in the same manner as other air defense elements. In assigning the Air Force responsibility to the Air Defense Command, there was no intent to reduce CINCNORAD's (CONAD's) degree of operational control or the responsiveness of the system. The contrary is actually the fact."

The Early Warning Operations Working Group (EWOWG). The EWOWG had been established on 13 September 1955 to "...develop, as

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

~~CONFIDENTIAL~~



~~(S)~~

UNCLASSIFIED

~~CONFIDENTIAL~~

UNCLASSIFIED

expeditiously as possible, the detailed operations plan for the DEW System excluding the sea flanks." It had completed this action with the publication of the DEW-MCL Operations Plan of 1956, but had remained in existence monitoring various activities.

At its meeting in November 1957, the Group went on record for its dissolution. This recommendation was seconded by NORAD on 11 February 1958. Headquarters USAF stated that it too felt that the EWOWG should be abolished. However, ADC was preparing changes to the Joint RCAF-USAF Operations Plan that would include the Greenland Segment of the DEW Line. Following review of these recommendations by the EWOWG, and with the approval of the RCAF, the former would be dissolved and all planning responsibilities for the EW system would be assigned to NORAD.

WESTERN EXTENSION AND THE PACIFIC BARRIER

The plans for extending the early warning coverage in the Pacific called for a line running from Naknek to Umnak by land based radar and then by sea to Midway.

On 1 July 1958, the sea portion of the Pacific Barrier became operational with an operating force of four DER's and four AEW aircraft. The sea forces had been training for this role since 1 July 1957. On this latter date, a partial barrier force had been established by CINCPACFLT between Midway and Umnak, the planned barrier route.

The route of the Midway-Umnak barrier had been changed temporarily by January 1958, however. It was discovered that the Aleutian land-based segment of the DEW Line would not become operational before March 1959, so NORAD asked the CNO to readjust the sea barrier to cover the exposed area. In January, the CNO agreed to shift the barrier (as stated below) for the eight months needed for the land-based segment to become operational. When the Aleutian segment became operational, the line was to be shifted back between Midway and Umnak.

On 1 July 1958, a total of 13 DER's and 25 WV-2 aircraft were available for barrier operations. It was anticipated that the force would reach a total of 18 DER's by April 1959. The barrier forces were operating from Kodiak Island and Midway. The four DER

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

UNCLASSIFIED

~~SECRET~~

UNCLASSIFIED

stations were on a line running SSW toward Midway from a point some 200 nautical miles off Kodiak Island, with approximately 200 nautical miles between each station. The WV-2's operated out of Midway, flying out some 1250 nautical miles and then back in a racetrack pattern. The WV-2 pattern overlapped the DER line some 400 miles.

When the Aleutian segment became operational, the DER stations were to be shifted west and a total of five vessels maintained on station between Midway and Umanak. The aircraft would continue to fly a racetrack pattern out of Midway making contact with the land-based coverage at Umanak.

The Aleutian land-based segment called for a total of six AN/FPS-19 radar stations stretching between Nikolski on the west and King Salmon on the east. This project, codenamed STRETCH OUT, called for the construction of one main (master) station at Cold Bay and five lateral auxiliary stations at Driftwood Bay, Sarichef, Nikolski, Port Moller, and Port Heiden. Construction contracts for the stations had been awarded in March 1957 and work begun soon after. By December 1957, work on the six stations had to be stopped or reduced to a minimum because of adverse weather conditions and shortages of essential materials, however.

At Nikolski and Port Heiden, the contractors were able to resume construction in January 1958. It was March, however, before work was able to begin at the remaining four stations. Western Electric Company, the prime contractor, was unable to estimate the amount of delay that could be expected because of the construction delays although 31 March 1959 was still set as the operational deadline. The status of the sites as of 16 June 1958 was as shown below:

TABLE 5

| STATION | % COMPLETED (August 1957) | % COMPLETED (June 1958) |
|-------------|------------------------------|----------------------------|
| Driftwood | 12 | 52 |
| Sarichef | 20 | 76 |
| Nikolski | 17 | 97 |
| Port Moller | 26 | 84 |
| Cold Bay | 20 | 90 |
| Port Heiden | 30 | 93 |

~~SECRET~~

~~SECRET~~

UNCLASSIFIED

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

59

At least one of the problems existing at the end of 1957 had been solved. Lack of a contract for building a communications terminal at King Salmon that was needed to align and test the remaining stations had threatened the operational deadline. Construction at this site had begun during the week ending 17 May 1958. It was anticipated that the buildings would be ready for equipment installation in August 1958, with over-all completion in September.

A second communications problem -- that of providing alternate facilities -- remained. NORAD had recommended to the executive agency that an ionospheric scatter radio system be provided from the western terminus of STRETCH OUT to the mainland. This communications link would provide an alternate return to the Alaskan mainland in case the lateral tropospheric scatter from King Salmon to Umanak ever failed. Since the STRETCH OUT communications were subject to more hazards than other stations in the WHITE ALICE system, this would insure that NORAD would receive early warning regardless of the status of the main communications line. NORAD also proposed that the Navy FPIS facility at Adak be coordinated with the STRETCH OUT facilities, doubly insuring an alternate link.

These proposals were still under study in June 1958. The executive agency replied that it recognized the need for an alternate system and had instructed the DEWPO to study the matter. Coordination of the Navy and Air Force circuitry was also considered desirable. However, the latter proposal had to be considered further. In the meantime, NORAD or ADC should coordinate with CINCAL and AAC to evaluate the proposal further and recommend specific actions.

EASTERN EXTENSION AND THE ATLANTIC BARRIER

Only one of the two barrier locations planned for the DEW system in the Atlantic was operational. This was the Navy-sponsored sea barrier running between Argentia, Newfoundland, and the Azores. This barrier had begun full operations with four DER's and four AEW aircraft on 1 July 1957. The following month, a shortage of operating funds forced the Navy to reduce the number of aircraft on barrier patrol from four to two.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

UNCLASSIFIED

UNCLASSIFIED

NORAD protested to the JCS, stating that the loss of on-station time could not be accepted. "Early warning information provides the basic step for not only timely air defense actions, but also for retaliatory actions and others related to national survival," the letter continued. NORAD later stated that the enemy could, on a calculated basis, underfly the barrier between picket ships since low-level coverage over the 1300 mile line was provided by only two aircraft. NORAD asked that the CNO review the AEW program to insure continuous operation of at least four AEW aircraft on the barrier.

A reply was received in January 1958. NORAD was informed that the aircraft barrier force was to be increased from two to three planes in the third quarter of FY-1958, and to four planes in April 1958. On 30 April, the AEW force again consisted of four aircraft.

The second Atlantic DEW extension was that jointly sponsored by the Navy and USAF. Often referred to as the G-I-UK extension, the line was to run from Cape Dyer, Barfin Island, across Greenland, to Iceland, then by water to the Faeroes, and then once again by water to Scotland. USAF was building the land-based portion of the line from Cape Dyer across Greenland to Iceland. The Navy was to extend the line from Iceland to the UK.

An interim operational plan for the Greenland extension had been prepared by ADC and concurred in by NORAD. The operational concept for integrating the extension into the DEW system called for radars on Greenland to link with the proposed early warning line through Iceland to the UK and to join the Atlantic AEW line from Cape Farewell to the Azores. Operations on the line were to be identical with those of the main DEW system with a single exception. The extension would not have a low-level capability since no doppler aircraft alarm equipment was programmed. The stations were to be considered eastern auxiliary stations for the DYE Sector and be under the operational control of the Cape Dyer DEW Main station.

Four surveillance stations were planned for the Greenland extension, located at intervals of approximately 130 nautical miles along the 66th parallel. The stations were to start at Holsteinsborg (Qaqatoq) on the west coast and cross the ice-cap to Kulusuk Island. A fifth station at Kangek Island was to provide a link to the Azores barrier, provided the Navy decided to shift the Argentina end of the barrier to Cape Farewell. The Kulusuk station was to

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

61

connect either with a radar at Keflavik, Iceland (H-1) or with one located on the Straumes Peninsula in southwest Iceland (H-4). These locations were still tentative, however. Final site selection was to be determined after Western Electric Company had completed path loss tests scheduled from June through September on the tropospheric scatter equipment. The target data set for operation of the segment was 30 June 1961.

[REDACTED]

[REDACTED]
SECRET
[REDACTED]

UNCLASSIFIED

~~CONFIDENTIAL~~

Chapter V

Status of the Combat Weapons

REGULAR FIGHTER-INTERCEPTOR FORCES

As of 30 June 1958, there were a total of 73 fighter-interceptor squadrons in the North American air defense system. These squadrons were owned by three commands: USAF Air Defense Command had 61 squadrons (which included three in the 64th Air Division), RCAF Air Defense Command had nine squadrons, and Alaskan Air Command had three squadrons. Three of the USAF ADC squadrons had no aircraft or crews — leaving a total of 70 operational squadrons.

At the end of December 1957, there had been 86 regular interceptor squadrons, of which 12 had no aircraft or crews. This left a total of 74 operational squadrons or four more than at mid-1958.

The 70 operational squadrons were equipped with the following types of aircraft as of 30 June 1958.

| TYPE AIRCRAFT | NUMBER SQUADRONS | OWNING COMMAND |
|----------------|------------------|--------------------------------|
| F-102A | 22 | USAF ADC (incl 1 - 64th ADiv.) |
| | 2 | AAC |
| F-86L | 16 | USAF ADC |
| F-89J | 10 | USAF ADC (incl 1 - 64th ADiv.) |
| | 1 | AAC |
| F-104A/B | 2 | USAF ADC |
| F-89H | 2 | USAF ADC |
| F-89D/F-102A | 1 | USAF ADC |
| F-86L/F-102A | 1 | USAF ADC |
| F-86L/F-104A | 2 | USAF ADC |
| *F-102A/F-104A | 1 | USAF ADC |
| F-94C | 1 | USAF ADC |
| CF-100 Mk 5 | 9 | RCAF ADC |
| TOTAL | <u>70</u> | |

~~CONFIDENTIAL~~



USAF ADC F-104's from Hamilton AFB, California

TABLE 7 INTERCEPTORS AND CREWS

| COMMAND | DATE | INTERCEPTORS | | CREWS | |
|----------------------|-----------|--------------|-----------|-------|-----------|
| | | POSS | OPNLY RDY | ASGD | OPNLY RDY |
| USAF ADC (CONUS) | 31 Dec 57 | 1,381 | 801 | 1,782 | 975 |
| | 30 Jun 58 | 1,292 | 812 | 1,657 | 757 |
| 64th Air Division | 31 Dec 57 | 65 | 46 | 62 | 43 |
| | 30 Jun 58 | 60 | 44 | 64 | 57 |
| Alaskan Air Cmd | 31 Dec 57 | 73 | 32 | 86 | 76 |
| | 30 Jun 58 | 80 | 41 | 86 | 81 |
| HCAF ADC | 31 Dec 57 | 162 | 162 | 243 | 231 |
| | 30 Jun 58 | 162 | 162 | 225 | 225 |
| TOTALS | 31 Dec 57 | 1,681 | 1,041 | 2,173 | 1,325 |
| | 30 Jun 58 | 1,594 | 1,059 | 2,032 | 1,120 |

USAF ADC INTERCEPTOR FORCE*

Status. Thirteen squadrons were lost from the ADC inventory during the first six months of CY-1958. Twelve of these were in-activated:

* See Appendix 6 for a list of USAF ADC squadrons, aircraft, crews and bases.

~~CONFIDENTIAL~~

| | |
|------------------------|---------------------------|
| 42d Greater Pittsburgh | 97th Newcastle |
| 63d O'Hare | 324th Westover |
| 65th Richards-Gebaur | 354th McGhee-Tyson |
| 66th Oxnard | 432d Minneapolis-St. Paul |
| 74th Thule | 433d Minot |
| 96th Newcastle | 469th McGhee-Tyson |

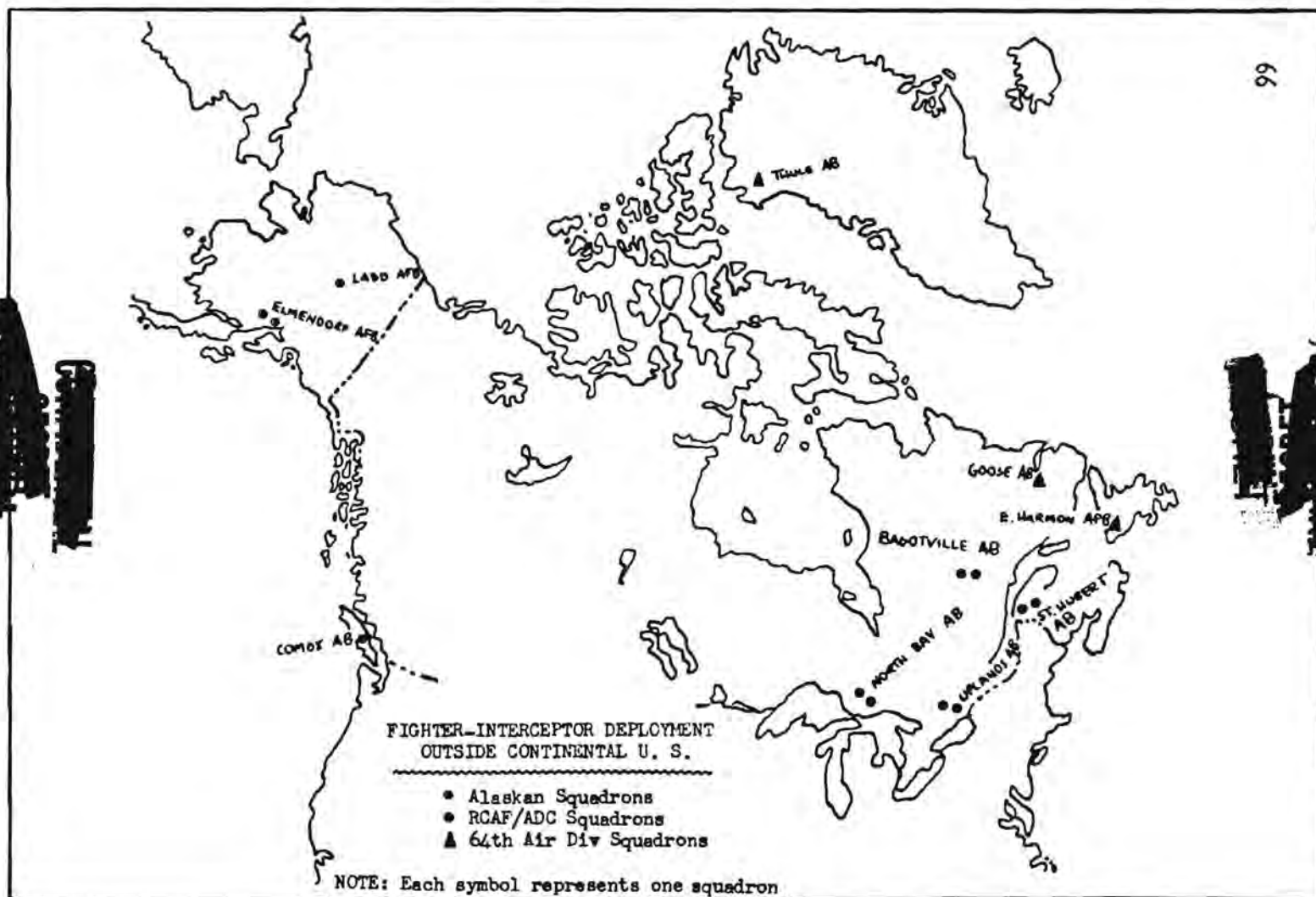
And the 497th at Geiger Field, Washington, was transferred to Spain on 20 June 1958.

As noted above, only 58 of the USAF ADC squadrons could be used for active air defense operations, for three -- the 46th, 484th, and 518th -- were without crews or planes. The 46th (Dover) was to be inactivated in the first quarter of FY-1959. The 518th (Kingsley) was to be equipped with F-101B's in the third quarter of FY-1959; and the 484th (K. I. Sawyer) was to be equipped with F-101B's in the first quarter of FY-1960.

Lag in Combat Potential. One problem causing a lag in combat potential was that some aircraft were being introduced into the inventory before they were truly operational. The pressure of tactical requirements had in some cases forced the introduction of aircraft that were not fully tested. This meant that the aircraft had to be returned to the factory or became inoperative awaiting retrofit and modification after reaching the field. Such was the case of the F-102A when first introduced at George AFB, California.

In January 1957, General Partridge had objected to this situation, stating that he expected any weapons allocated to air defense to be combat ready and capable of fulfilling its assigned mission when placed under the operational control of NORAD. However, since the aircraft were already assigned, it was decided to keep them in the system for as much use as possible. The policy adopted by NORAD at that time was for the converting units to be operationally ready 75 days after receipt of the fifteenth aircraft. This required that testing, converting, and alert commitments be met in a relatively short period.

In April 1958, the ADC Fighter-Interceptor Project Office at Eglin recommended that a new policy be adopted for the F-101 and F-106, which would soon be coming into the system. It proposed that the first squadron converting to a new aircraft be given an indefinite shutdown. The time would be used to provide uninterrupted



~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

67

environmental testing by the unit. A tentative period of nine to twelve months for testing was proposed.

Both ADC and NORAD concurred. It was felt that environmental testing by the first squadron would benefit future converting units and would result in an earlier effective combat capability. The squadron would be relieved from alert commitments, but it was anticipated that its aircraft could be used in an emergency.

SAC Dispersal Project. In January 1958, USAF informed ADC that extensive construction at some eight ADC bases to make them suitable for SAC dispersal operations was necessary. ADC immediately protested. It pointed out that the units could not be deployed to other locations and still maintain an operational status or fulfill the tactical needs of air defense. "It is recommended," ADC wrote, "that every consideration be given the possibility of planning construction phasing so as to allow operations to continue throughout the construction period."

NORAD was also concerned with this unilateral service action. At the end of January, NORAD told the executive agent that if modification of the runways closed the bases to air defense interceptor operations, the degradation of operational capability was unacceptable. It was recognized, NORAD continued, that SAC needed several bases at which to disperse its aircraft. However, NORAD did not approve any program that would cause a significant reduction, even temporarily, in air defense capability.

But USAF replied that construction for SAC dispersal had to be accomplished. It was fully aware that some mission degradation would result from the construction; however, such degradation would be kept to a minimum. To allow NORAD and ADC every chance to suggest ways and means of reducing this degradation, USAF would send officers from its headquarters and SAC headquarters to Colorado Springs to work out plans for continued operations during the building period.

On 14 February, representatives of the four commands met in Colorado Springs. They were unable to find a way to continue full operations at the bases, however. It was anticipated that seven of the eight bases scheduled for construction would have a limited defense capability during the remainder of CY-1958 and 1959.

F-104 Aircraft. The newest addition to the ADC weapons inventory was the F-104A. Three squadrons (the 83d, 56th, and 337th)

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

SECRET

were being equipped with this plane as of June 1958. A total of 52 aircraft and 38 crews were available. However, only 13 of the aircraft and none of the crews were operationally ready. The F-104 was superior to any aircraft in the system in speed, climb, and altitude characteristics and held a promise of giving NORAD a much greater defensive capability.

64TH AIR DIVISION

The 64th Air Division interceptor force (included above in the USAF ADC forces) was temporarily down to a strength of two squadrons as of 30 June 1958: the 59th at Goose Bay, equipped with F-89J's; and the 323rd at Harmon, equipped with F-102A's.

A third squadron, the 74th, which had been at Thule, was inactivated on 25 June 1958. It was to be replaced by the 327th from George AFB, California. Until this squadron arrived, the Thule alert was covered by the 59th Fighter Flight, using six aircraft (F-89D's) and crews gained from the inactivated unit.

ALASKAN AIR COMMAND

Status. As of 30 June 1958, AAC had three squadrons (the same level as on 31 December 1957) located, equipped and manned as shown below:

TABLE 8

| TYPE ACFT | AIRCRAFT | | CREWS | | BASE | SQUADRON |
|--------------|--------------|--------------|--------------|--------------|-----------|--------------|
| | NO. ASGD. | NO. C. R. | NO. ASGD. | NO. C. R. | | |
| F-102A | 52 | 35 | 58 | 58 | Elmendorf | 31st & 317th |
| F-89J | 28 | 16 | 28 | 23 | Ladd | 449th |

Program. AAC's 31st Fighter-Interceptor Squadron was to be inactivated in October 1958. No replacement was planned as of mid-1958. The F-89J aircraft in one of the remaining squadrons were to be replaced with F-101B's in FY-1962, according to the USAF program (thus leaving F-102's and F-101B's in Alaska).

SECRET

[REDACTED]
[REDACTED]
[REDACTED]

CINCAL proposed to USAF through NCRA (asking for NORAD's support at the same time) that instead, both of the remaining squadrons be re-equipped with F-106 aircraft. By having only one type aircraft, support and training would be simplified. CINCAL felt that the F-106 was superior to the F-101B in most respects and, since it would be available the same time, should be programmed. CINCAL proposed that the F-102's be replaced first, followed by the F-89J's. He also proposed that Alaska get F-106's earlier than USAF planned -- in calendar year 1960.

NORAD was not convinced that the F-106 was the best choice, however. Available information indicated that the two-engine, two-place F-101B was superior to the single-engine, single-place F-106, especially for operations in remote areas such as Alaska. Also, NORAD's data showed that the F-101B had greater range and therefore could be used to advantage as trailer aircraft against attacks headed for the U. S. or Canada and for policing the DEW line. For these reasons, NORAD asked CINCAL to reconsider his proposal.

CINCAL replied in April, pointing out that his information indicated that the F-106 was superior to the F-101B in most respects, including range, when both were carrying the MB-1. He stated also that he was not convinced that the role of Alaskan aircraft should be as "trailers" and DEW Line policing. Instead, he stated, the active air defense of Alaska should be identification of unknown tracks and the destruction of aircraft identified as hostile. Again he requested CINCNORAD to support the proposal.

In the meantime, NORAD had obtained the latest test results on the F-101B and the contractors proposal for extending the range of the F-106. This new information confirmed CINCAL's position. NORAD now agreed to support CINCAL's proposal and on 28 April informed USAF that it concurred in CINCAL's interceptor program.

USAF did not agree, however. It stated that the original program was sound. The program had been based on the following factors: (1) the F-101B and F-106A were generally comparable in performance, but the F-101B was superior in range and endurance which was important for Alaskan operations and (2) it was considered inadvisable to program follow-on aircraft of the two-place variety in view of training and logistical considerations. As for later programming, USAF planned to deploy one squadron of F-108 aircraft in the 1967 time-period as follow-on aircraft to the F-101 and F-102 squadrons.

[REDACTED]
[REDACTED]
SECRET
[REDACTED]

On 11 June 1958, NORAD again asked USAF to reconsider its decision. NORAD pointed out that the latest comparative performance data between the two aircraft did not indicate a serious difference. "Unless there are overriding considerations," NORAD continued, "it is requested that deployments planned for Alaska be reconsidered and programmed in support of CINCAL's position." USAF replied on 25 June that it was reconsidering the proposal and would advise NORAD of any future changes. USAF's answer was relayed to CINCAL.

Meanwhile, AAC was considering another program change. As mentioned above, the 31st Fighter Interceptor Squadron (F-102A's) was scheduled for inactivation in October 1958. This would leave the Alaskan theater with only two squadrons -- one with F-89J's and one with F-102A's. AAC felt that this reduction would leave its operating level too low. It proposed keeping the 31st's aircraft and some of its personnel to augment the remaining two squadrons and provide additional aircraft needed to maintain its advance bases (i.e., Galena, King Salmon).

NORAD was informed of the proposal in July 1958. Informal information in the headquarters indicated that AAC proposed to keep 13 F-102A's for the 317th at Elmendorf and 13 for the 449th at Ladd. In addition, approximately 300 of the 500 personnel in the 31st would be reassigned to the augmented units. AAC planned to keep these aircraft and crews under a flexible U. E. table set forth by USAF in June 1958. This flexible U. E. was defined as "...a unit without a fixed number of aircraft, but whose aircraft and personnel may vary in accordance with the unit's need for the total requested and the installation's capability to support same."

NORAD gave tentative support in principle to the plan by telephone, but requested more information for further study pending its final decision.

RCAF AIR DEFENCE COMMAND

As of 30 June 1958, operations in Canada were carried out from five bases by nine all-weather interceptor squadrons, each equipped with 20 aircraft. Two of the aircraft at each unit were CF-100 MK3D's, used for instrument training. The other 18 were CF-100 MK5 aircraft, used for operations. Four of the RCAF stations -- Uplands, St. Hubert, Bagotville, and North Bay -- had two squadrons each, while Comox had a single squadron.

AUGMENTATION FORCES

TABLE 9 AUGMENTATION AIRCRAFT TOTALS REPORTED

| | USAF | U.S. NAVY | ANG | RCAF ADC | RCN |
|-------------|-------|-----------|-------|-------------------------|-------------------|
| 31 Dec 1957 | 1,564 | 1,246 | 1,227 | Equiv. of two Sqdns. | 8 |
| 30 Jun 1958 | 1,530 | 965 | 1,091 | U/E of 91 | Acft as Avail. |

USAF Augmentation. Of the total force of 1,530 aircraft available on 30 June 1958, 825 belonged to TAC (467 were reported operationally ready) and 705 to ATC (268 were reported operationally ready). Of the ATC aircraft, 11 detachments of 16 aircraft each were to be deployed to augment weak areas, the remaining aircraft were to be used in place. The TAC aircraft were all to be employed in place.

Air National Guard. As of 30 June 1958, the ANG reported a total of 1,091 possessed aircraft, with 691 operationally ready. However, there were actually more aircraft than reported, for several squadrons were at summer camps and did not report. In all, there were 54 squadrons each with a U/E of 25 aircraft, or a total of 1,350 aircraft, that could possibly have been used in air defense.*

In May 1958, USAF proposed changing the mobilization assignments of ANG squadrons. ADC had a total of 55 squadrons assigned to it, 42 all-weather and 13 day fighter squadrons. Another 12 ANG day fighter squadrons had a mobilization assignment to TAC. USAF felt that all 25 day units could be most effectively employed if they were equipped, organized and trained as tactical fighter units and given a mobilization assignment to TAC. Both TAC and ADC approved the transfer.

NORAD also approved, stating that the ANG day fighters had a

* There were 55 squadrons with a mobilization assignment to ADC, but one squadron, in Puerto Rico, was not available at that time.

~~SECRET~~
~~CONFIDENTIAL~~

limited capability in an air defense role. And it felt that the 13 ADC-assigned units could best be utilized by TAC.

U. S. Navy. At the end of December 1957, the figures for Navy augmentation showed 1,246 Navy and Marine fighter aircraft. The total for 30 June 1958 was 965. The difference of 281 aircraft resulted from extensive conversion and normal deployment programs.

The 965 Navy and Marine planes were grouped into three categories: 403 Fleet aircraft, 410 Training aircraft, and 152 Reserve Training aircraft.

Canadian Augmentation Forces. The RCAF ADC had two sources for augmenting its regular fighter forces in an emergency. These were: ADC training stations at Chatham and Cold Lake and the Royal Canadian Navy (RCN). The Operational Training Unit at Chatham had a Unit Establishment (U/E) strength of 56 Mk 5 Sabre aircraft and an average of 36 experienced crews. The Cold Lake training station had a U/E of 45 CF100 Mk 4A aircraft and an average of 20 experienced crews. Upon declaration of an Air Defense Readiness, both base commanders were to bring the maximum number of aircraft to a combat ready state, man them with experienced staff crews or the most experienced crews available and await orders from the AOC ADC. The aircraft at Chatham were to operate from their home base, those at Cold Lake were to deploy upon orders from the AOC ADC.

The RCN forces were to consist of Banshee aircraft from the Atlantic Coast. These aircraft were to be provided on a "when available" basis for combat operations in the 2d Sector under the operational control of the sector commander.

REGULAR ARMY AIR DEFENSE WEAPONS STATUS

As of 30 June 1958, the number of Regular Army air defense missile and gun battalions totalled 63; ARADCOM had 61 (60 in the continental U. S. and one in Thule) and U. S. Army, Alaska had two. Of the battalions in the U. S., 58 were Nike (equivalent in fire power to 61) and two were Skysweeper.

~~SECRET~~
~~CONFIDENTIAL~~

TABLE 10

| CONTINENTAL UNITED STATES | | | | |
|---------------------------|------------------------|-----------|------------------------|-----------|
| | DECEMBER 1957 | | JUNE 1958 | |
| | NIKE BTRYS | SKY BTRYS | NIKE BTRYS | SKY BTRYS |
| AV NO ASOD | Ajax 244 Hercules 0 | 9 | Ajax 242 Hercules 2 | 6 |
| AV NO ON SITE | Ajax 244 Hercules 0 | 9 | Ajax 242 Hercules 2 | 6 |

| OUTSIDE CONTINENTAL UNITED STATES | | | | |
|-----------------------------------|-------------------------|--------|-----------|--------|
| AREA | DECEMBER 1957 | | JUNE 1958 | |
| | UNIT | WEAPON | UNIT | WEAPON |
| THULE | 549th Bn | 90 mm | 549th Bn | 90mm |
| | 428th Btry (L) | 75 mm* | | |
| | 429th Btry (L) | 75 mm* | | |
| | * Inactivated 15 May 58 | | | |
| ALASKA | 96th Bn | 120mm | 96th Bn | 120mm |
| | Ft Richardson | | | |
| | 502d Bn Ladd | 120mm | 502d Bn | 120mm |

USARADCOM

The U. S. Army Air Defense Command program objective for FY-1958 was to obtain 60 on-site Nike Ajax battalions and one on-site Nike Hercules battalion. As of 31 December 1957, ARADCOM had 58 Nike Ajax battalions (244 fire units) on site, which in fire power was considered by ARADCOM the equivalent of 61 battalions. By 1 July 1958, ARADCOM still had 58 battalions on site, but had converted the equivalent of one battalion (four batteries) to Nike Hercules. Of these Hercules batteries, all but one was operational on that date.

ARADCOM accomplished the above by converting one battery to Nike Hercules in each of four key defense areas: New York, Washington-Baltimore, Chicago, and Philadelphia. The one Hercules battery not yet operational on 1 July, which was located at Philadelphia, was expected to become operational in September 1958.

At the end of December 1957, USARADCOM's Regular Army on-site gun and Skysweeper battalions had been virtually eliminated. All of the active gun units had been dropped, leaving only three on-site Skysweeper units -- two at Savannah River and one at Sault Ste. Marie. On 15 February 1958, the 478th Skysweeper battalion at Savannah River was deactivated, leaving but two operational Skysweeper units by June 1958.

ARADCOM's Nike program called for 70 battalions (an addition of nine) by the end of FY-1959. The 70 battalions would include 43 Nike Ajax and 27 Nike Hercules. Of the 27 Hercules battalions programmed for FY-1959, 18 battalion equivalents (72 fire units) were to be formed by converting existing Ajax sites, the remaining nine would be activated in new defense areas (including one battalion in Greenland).

ARMY NATIONAL GUARD

Until October 1957, the Army National Guard Task Force Organization had been placed in two separate categories: (1) 101 firing batteries organized into 29 battalions with an active on-site status, and (2) 82 battalions with an M-Day assignment to ARADCOM.

In October 1957, the on-site gun mission of the 101 batteries was withdrawn by Department of the Army (D/A). By the end of CY-1957, D/A had established a new policy that provided for placing Army National Guard (ARNG) units in the on-site missile program. The units formerly used in the on-site gun program were to be reorganized as missile units and placed in a training status from which D/A expected that 22 battalion equivalents (88 batteries) would emerge by FY-1960 as Nike Ajax units. One unit -- the 720th from California -- had begun training by December 1957 for its future missile role.

In the first three months of 1958, D/A approved action by the Chief of the National Guard Bureau to reorganize 28 ARNG 90mm gun

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

battalions, with a total of 109 firing batteries, as Nike Ajax units. This total was to include units required in the D/A-approved FY-1959-60 force structure and ARADCOM's proposed deployment plan for the same period. The USARADCOM FY-1959-60 Nike Ajax program called for a total of 43 battalions, seven of which would be ARNG units in FY-1959. In FY-1960, another 15 ARNG units were to be added, making a total of 22.

The proposed on-site missile program brought up a need to revise the means to federalize ARNG units. Currently, ARADCOM had to await a Presidential Proclamation before it could use Guard units. ARADCOM felt that this would prove impractical for the missile units. The missile units were to go on-site beginning in FY-1959 and were to be integrated into the defense where they were deployed. To await Presidential call of Guard missile units, USARADCOM pointed out, would be far too slow to meet an attack with little or no warning.

To overcome this delay, ARADCOM proposed that the D/A sponsor legislation which would allow ARADCOM to order the Guard on-site missile units and their personnel into Federal Service when CINCNORAD ordered an increased alert and specifically requested Guard participation. This would pose no real hardship on the Guard, USARADCOM continued, since experience showed that an increased readiness condition was seldom imposed. Such legislation would also lessen the need for negotiating mutual agreements with the appropriate state authorities for alerting, assembling, manning, and ordering to fire of ARNG missile units pending orders placing them into Federal Service.

In November 1957, USARADCOM had recommended to D/A the elimination of the M-Day program (as noted above, 82 battalions had an M-Day assignment to ARADCOM). It pointed out that since its own gun program had been withdrawn from CONUS defense there was little reason to maintain a force whose mission called for augmenting or replacing active Army gun units. USARADCOM also was of the opinion that a gun-type defense was now obsolete. Therefore, retention of the National Guard units, equipped with guns, would not contribute sufficiently to the air defense effort to warrant the money and manpower needed.

As of 30 June 1958, the ARADCOM recommendation had not been acted upon. The program was still under consideration by the D/A,

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

DOD, and Congress as a small segment of their review of the overall military organization to determine appropriate force levels for the military structure.

ALASKAN PROGRAM

At mid-1958, Department of the Army plans for the Alaskan theater called for the conversion of both gun battalions to Nike Hercules in FY-1959. The first Nike unit was scheduled to arrive in September 1958, the second in October 1958. A total of nine batteries were programmed -- five for Eielson AFB, and four for Elmendorf. The units, with the exception of the fifth battery for Eielson, had an estimated operational date of February 1959. The fifth battery was expected to become operational early in FY-1961.

PROPOSAL FOR RAPID MOBILIZATION OF RESERVE FORCES

In April 1958, NORAD proposed to the executive agent that legislation be introduced that would permit immediate use of reserve forces in an emergency. Existing legislation permitted mobilization only after declaration of war or national emergency by Congress (for reserve components generally) or declaration of national emergency by the President (for the ready reserve). In the case of the latter, the President also had to give specific authorization for use.

This might take too much time. The speed with which an air attack could be launched on the continent and the increased emphasis being placed on employing reserve forces in the air defense effort, NORAD wrote, made immediate utilization an absolute necessity. To illustrate the weakness in current legislation, NORAD outlined the problems faced in using the Air National Guard. NORAD pointed out that 17 ANG interceptor squadrons were performing alert duty to supplement the ADC alert system. However, this required only two aircraft per squadron which represented some three per cent of the overall ANG strength. The remainder of the force could not be assembled and used until Congress or the President acted.

The Army National Guard missile on-site program was another facet of the problem. As noted previously, these missile units were scheduled to be integrated into the air defense system start-

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~SECRET~~

ing in FY-1959. By 1962, approximately 232 batteries were expected to be on-site, which would be about 42 per cent of the Army air defense units. And although the missile units would be organized into 30-minute and 3-hour alert units, they could not be committed in an air battle until after Congressional or Presidential authorization.

To remedy the situation, NORAD recommended that legislative action be taken to provide the Commanders of ADC and USARADCOM with the authority to assemble and use, in an active air battle, members and units of the Reserve forces prior to the declaration of a national emergency and Presidential authorization when in the opinion of CINCNORAD such action was required.

~~SECRET~~

[REDACTED]
[REDACTED]
[REDACTED]

Chapter VI

Operational Requirements and Procedures

FIGHTER AIRCRAFT ALERT REQUIREMENTS

As of 30 June 1958, there were no alert requirements common to all fighter units in the NORAD system. Alert requirements were established by directives in each area of the system. And the requirements varied considerably. For a comparison of fighter alert requirements under normal preparedness conditions, see the table on the following page. Below is a detailed statement of the requirements within each organization.

USAF ADC. Alert requirements for the USAF ADC interceptor force were established by CONAD Regulation 55-8, 1 March 1957, as amended (55-8A) on 3 June 1957.

This regulation provided CONAD Region commanders with alert minimums. Squadrons operating from bases which permitted interception of aircraft violating ADIZ's and which were under the scramble authority of a direction center having an identification responsibility were to be scheduled for alert. The region commanders were authorized to select squadrons within this area for alert duty.

Squadrons chosen to stand alert were to keep no less than two aircraft on five-minute alert, four on one-hour, and the remaining aircraft that could be operationally ready within three hours on three-hour or higher status. Commanders were to vary the alert pattern within the alert areas to prevent stereotype periods of alert, to keep duplication of ADIZ coverage to a minimum and to insure that a few squadrons in each area were not constantly on alert.

Also, region commanders were allowed to assign alert duty to squadrons outside the above areas for back-up or training purposes.

CONAD Region commanders could allow as many as 20 per cent of all in-commission fighter aircraft to be away on navigational flights, provided that the alert commitments up to and including one-hour had been met.

COMPARISON OF FIGHTER AIRCRAFT ALERT REQUIREMENTS
(NORMAL PREPAREDNESS CONDITION)

TABLE 11 (Figures are requirement for each unit maintaining alert*)

| AREA | 5 Min | 10 Min | 15 Min | 30 Min | One Hour | Three Hours | Comment |
|--------------------|--------|--------|-------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| CONUS USAF ADC | 2 acft | | | MB-1 equipped sqg only. 2 ac with 1 MB-1 ea or 1 with 2 MB- 1's | 4 acft (MB-1 equipped sqg 30% op rdy ac | Remaining acft operationally ready | Alert by squadron |
| Canada RCAF ADC | | 1 acft | | | 5 acft (Chatham - 4 acft) | Cold Lake only - 6 acft | Alert by sqdn/base. Rqmts at 2 sqdn bases doubled |
| Alaska | 2 acft | | 2 acft | | 4 acft (10th Div only) | Remaining acft operationally ready | Alert by division |
| Canada 64th Div | 2 acft | | 2 acft (after trng hrs) | | 8 acft during trng hrs 6 acft after trng hrs | Remaining acft operationally ready | Alert by base |
| Thule | 2 acft | | 2 acft (after trng hrs) | | 6 acft during trng hrs 4 acft after trng hrs | | |
| CONUS ANG | 2 acft | | | | 1 acft | | |
| CONUS USN | 2 acft | | | | | | |
| CONUS ATC | 2 acft | | | | | | |

* Not all squadrons of each organization were on alert; for specific requirements, see text under each heading.

Special alert requirements for the employment of the MB-1 were prescribed in 1957 (additional provisions were made in March 1958). The alert condition specified for normal preparedness required all MB-1-equipped squadrons to maintain two aircraft without MB-1's on five-minute, two aircraft armed with one MB-1 each or one aircraft armed with two MB-1's on 30 minute, and 30 per cent of the remaining operationally ready aircraft on one-hour alert status. But no aircraft could be scrambled with MB-1 weapons attached during a Normal Preparedness condition.

U. S. Augmentation Aircraft. At the end of December 1957, there were a total of 19 Air National Guard (ANG) fighter-interceptor squadrons standing alert in the United States. The alert squadrons on active air defense operations were to keep two planes on five-minute alert 14 hours per day. The normal schedule was one hour before sunrise to one hour after sunset. If this schedule went over 14 hours, an alternate was to be followed which stipulated that the aircraft were to begin one hour before sunrise and continue to 14 hours later.

To the above, provision was added for certain ANG units to stand alert 24 hours a day. ADC Operations Plan, 15 April 1958, stated that a 24-hour alert had been instituted to further increase the ADC identification capability and augment the regular interceptors in various locations. Selected units of the ANG were to provide two aircraft and aircrews for five-minute readiness 24-hours per day, 7 days a week. In addition, two aircraft and aircrews were to be designated for one-hour back-up. On 30 June 1958, the total number of ANG units standing the 14-hour alert was 16. And one unit -- the 124th at Fargo, North Dakota -- had begun standing the 24-hour alert.

Two additional units standing alert not covered by the CONAD regulation, were a Navy unit at San Diego and an Air Training Command unit at Perrin AFB, Texas. Both kept two aircraft on five-minute alert around-the-clock.

Canadian Interceptors. Alert commitments for the Canadian interceptor forces were stated by RCAF ADC Operations Plan 1/58, 1 January 1958. At four two-squadron bases (St. Hubert, Bagotville, Uplands, and North Bay), the normal alert required was that 24 hours per day there be two CF-100's on ten-minute readiness and ten on one-hour. At Comox, a single-squadron base, the requirements

were for one aircraft on ten-minute and five on one-hour. Over and above the ten-minute commitment, a minimum of six aircraft at two-squadron and three at one-squadron bases were to be kept loaded but unarmed.

A training base at Chatham was required to keep four Sabre aircraft on one-hour readiness from dawn to dusk. A second training station -- Cold Lake -- was to maintain six CF-100 aircraft at three-hour readiness.

The navy was to maintain a daylight alert with Navy Banshee aircraft as available at Shearwater, located outside of Halifax.

RCAF ADC station commanders were given some latitude in determining how the alert states were met. All aircraft except those on ten-minute readiness could be employed on squadron training. Scrambled aircraft were to be replaced by readiness aircraft allocated for training or held in reserve.

Readiness states were to be raised only if an Air Defense Readiness were announced. Stations commanders at the regular interceptor squadron bases were then to take immediate action to bring the maximum number of aircraft to a combat ready state, have all personnel, who could be contacted, report for duty as quickly as possible, and place the maximum number of aircraft and crews on the highest state of readiness that could be sustained. The station commanders at Cold Lake and Chatham were also to bring the maximum number of aircraft to a combat ready state.

64th CONAD Division. The alert requirements for Goose and Harmon, according to the 64th CONAD Division Air Defense Plan 1-57 as amended by change 1 dated 25 March 1958, were as follows. At both bases, during normal training hours, two aircraft were to be maintained on a five minute alert, eight aircraft on a one-hour status, and the remaining aircraft that were operationally ready (to include non-operationally ready-flyable) on a three-hour status. During non-training hours, the bases were to keep two aircraft at five minute readiness, two at 15 minute, six at one hour, and the remaining operationally ready (to include non-operationally ready-flyable) at three hours.

In the event of scrambles during normal training hours, the scrambled aircraft were to be replaced either by the operationally ready aircraft allocated for training or by the aircraft on one-

hour status. After normal hours, the armed aircraft were to be replaced by the 15-minute alert aircraft.

The Thule alert requirements, as stated by the above cited 64th Division plan, as amended, called for two aircraft on five-minute and six aircraft on one-hour status during normal training hours and two aircraft on five minute, two on 15 minute and four on one-hour alert after hours.

Alaska. AICOM Regulation 55-11, issued on 10 October, required that in a Normal Preparedness Condition the 10th Air Division keep a total of two aircraft on five-minute readiness, two on 15-minute, and four on one-hour. The remaining combat ready aircraft were to maintain a three-hour alert. The 11th Air Division was to maintain a total of two aircraft loaded with 2.75 FFAR and/or GARS on five-minute alert for identification missions, two aircraft loaded or ready for instant loading with, MB-1 rockets on 15-minute readiness, and the remaining combat ready aircraft on three-hour status. It should be noted that AICOM specified alert by division, not by base or squadron.

In an Increased Readiness condition, the 10th Air Division was to maintain four aircraft on five-minute, four on 15-minute, and the remaining combat ready aircraft on one-hour alert. For the 11th Air Division, two FFAR or GAR-loaded aircraft were to maintain a five-minute status, two aircraft loaded with MB-1 rockets were to be on one-hour alert, and the remaining combat ready aircraft on one-hour alert.

For an Air Defense Readiness condition, all combat ready aircraft of the 10th Air Division were to be placed on five-minute alert and maintained on that status until released. The 11th Air Division in an Air Defense Readiness was to keep all of its combat ready aircraft armed in accordance with the following weapons priority: first, MB-1; second, GARS, and third 2.75 FFAR's.

A new AICOM 55-11, issued on 11 February 1958, changed but a single requirement. During an Increased Readiness, the 11th Air Division was to maintain four MB-1 loaded aircraft on five-minute alert, the remaining combat ready aircraft were to be loaded with MB-1's as soon as possible and maintained on one-hour alert.

MISSILE-GUN ALERT REQUIREMENTS *
(NORMAL PREPAREDNESS CONDITION)

30 June 1958

TABLE 12

| AREA | FIRE UNITS | 10-Min. | 15-Min. | 30-Min. | One-Hr. | Three-Hr. |
|--------|------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------|-----------------------|
| CONUS | NIKE | | 25% at: Loring, Boston-Providence, Hartford-Bridgeport, Wash-Balt, New York, Phil, Norfolk, Travis, Hanford, Seattle, San Francisco, Los Angeles and Fairchild | 25% at: Niagara-Buffalo, Pitts., Cleveland, Detroit, Chicago, Milwaukee, and Ellsworth | | Remaining Operational |
| | 90-120mm | | | 25% | | Remaining Operational |
| | 75mm | | | 33 1/3% | | Remaining Operational |
| Thule | 90mm | 75% | | | 25% | |
| Alaska | 120mm | | | 50% | | Remaining Fire units |

- * Source: (1) CONUS-ARADCOM: ARADCOM Tactical Operating Procedures Guide, 24 Jan 1958. CONADP: 55-8, 1 Mar 1957.
(2) THULE: 64th CADD Air Defense Plan N. E. Area, 1 Jul 1957, Change 1, 25 Mar 1958.
(3) ALASKA: ALCOMR 55-11, 11 Feb 1958.

~~CONFIDENTIAL~~ ~~SECRET~~

NORAD INCREASED READINESS

Because of the Middle East crisis the executive agency directed CINCONAD on 15 July 1958 (at 1925Z) to assume an alert condition of Increased Readiness with its U. S. forces as prescribed by applicable portions of CONAD Regulation 55-3. The Increased Readiness state called for by the regulation was defined as follows: "Any degree of preparedness greater than Normal Preparedness but less than Air Defense Readiness whereby measures are instituted to provide increased air defense potential against an unknown or doubtful threat."

At 2100Z on 15 July, this "Increased Readiness" condition was placed in effect by NORAD. The directive was levied not only on the U. S. forces of NORAD, but also the Canadian RCAF ADC. Since the provisions of the CONAD Regulation were not applicable to the Canadian element, the RCAF ADC arbitrarily doubled its normal alert commitment to carry out the desired condition of preparedness. At the same time, NORAD headquarters was placed on "Increased Intelligence Watch."

On 15 July, NORAD stepped up the alert for its U. S. forces as follows. Squadrons equipped with MB-1 armament were to maintain a minimum of two aircraft per squadron on 15-minute alert, 50 per cent of the remaining operationally ready aircraft on one-hour, and the rest on a three-hour status. Non MB-1-equipped squadrons were to place four interceptors per squadron on five-minute status, and 50 per cent of the remaining operationally ready aircraft on one-hour alert. All surface-to-air units were directed to place 50 per cent of their forces on 15-minute preparedness and the remaining 50 per cent on a one-hour status.

NORAD reduced somewhat the interceptor alert requirement on 22 July in an effort to allow the component commands to continue normal training. On 24 July 1958, NORAD informed the forces that the "Increased Readiness" condition was not to hamper normal training and test requirements.

On 26 July, the alert minimums were lowered even further and on 1 August NORAD directed a return to a "Normal Preparedness" condition. The Increased Intelligence Watch was continued at NORAD headquarters until 11 August 1958.

~~CONFIDENTIAL~~

[REDACTED]
[REDACTED]
SECRET
[REDACTED]

RULES OF ENGAGEMENT

As of 1 July 1958, there were no NORAD regulations on rules of engagement. The engagement rules were still contained in four separate directives: (1) CONAD Regulation 55-6, issued on 13 May 1957; (2) ALCOM Supplement No. 1 to CONADR 55-6, issued on 27 February 1958; (3) RCAF ADC Air Staff Instructions 2/5, dated 15 June 1957; and (4) provisional Thule Rules of Engagement, dated 22 March 1957. The provisions of each directive can be found in NORAD Historical Summary, July-December 1957. Changes made in any of these between 1 January and 30 June 1958 are discussed below.

CONAD Regulation 55-6. Originally, this regulation defined a hostile act as employing weapons against ground, water, or air targets (other than on recognized weapons ranges); dropping parachutists unless an aircraft was obviously in distress; or opening bomb bay doors or other indications that the aircraft might attack when approaching a vital target area.

In May 1958, Western CONAD Region pointed out a weak area in the definitions of a hostile act uncovered in an incident in the 27th Air Division. A B-47 was declared unknown and intercepted, and then was observed opening its bomb bay doors prior to crossing Los Angeles. By the provisions of 55-6, the B-47 should have been declared hostile and destroyed. Fortunately, however, the interceptor pilot remembered the provisions of CONAD 55-3 which provided that opening bomb bay doors was to be considered a hostile act only after declaration of an Air Defense Emergency or Warning Yellow or Red. The actions of the bomber, CFWR continued, were standard practice for SAC aircraft on radar bomb scoring runs. And when the aircraft was known to be friendly, the practice was not dangerous. However, in cases such as the one in the 27th, the aircraft could possibly be declared hostile and shot down.

To prevent shooting down friendly bombers, Western Region felt there were two courses of action open: each SAC aircraft could be required to contact an ACW squadron before beginning its run, or the regulation could be revised. The first appeared unworkable since it would create an excessive workload on both SAC and ADC. Western recommended revising the regulation.

[REDACTED]
[REDACTED]
[REDACTED]

On 28 May 1958, NORAD issued a message stating that both parts of 55-3 and 55-6 pertaining to opening bomb bay doors were revised as follows: "Subsequent to a CINCONAD declaration of an Air Defense Readiness or higher condition of alert, opening bomb bay doors or other operation of the aircraft indicating bombs may be released or missiles fired when aircraft is approaching a vital target area will constitute a hostile act."

ALCOM Supplement No. 1. ALCOM Supplement No. 1 was a modification of CONAD Regulation 55-6, tailored to fit the needs of the Alaskan theater. On 27 February 1958, the supplement was re-issued with only one change.

Previously, ALCOM had provided that Russian aircraft operating within the Alaskan Coastal ADIZ prior to the declaration of a state of war and bearing military insignia, were not to be considered hostile unless they committed a hostile act. The supplement issued on 27 February dropped this provision entirely.

Canada's ASI 2/5. The Canadian rules of engagement had provided for using a system of visual signals, such as aircraft movements and coded light flashes, to identify an unknown after intercept. But in October 1957, the RCAF ADC informed NORAD that it had suspended its visual signal provision. The reasons for its actions were three-fold: (1) it was believed impractical to use the system in a high-speed, high-altitude environment, (2) the meaning of the signals was unknown to civil aviators since the system had not received national or international promulgation by civil aviation authorities, and (3) it was considered highly desirable to adopt signals that could be used on a continent-wide basis.

RCAF ADC did not want to drop the idea entirely, however. It believed that a signal system suitable for a high-speed, high altitude environment was a prime requisite for effective operation of the air defense system. ADC felt the need would become even more acute once commercial jet-transport operations began. It pointed out that a few such transports, penetrating the system as unknowns during a period of international tension, might be designated as hostiles because only a very limited time would be available to determine that the unknowns were friendly aircraft whose flight plans were lost or delayed. With an effective signal system, the aircraft could be directed to land.

[REDACTED]

UNCLASSIFIED

NORAD replied that "If it is decided that signalling of intercepted aircraft is feasible and practicable in air defense operations, it is proposed to include it in...Procedures for Air Defense Identification."

Subsequently, the subject was discussed with RCAF officials in Colorado Springs. It was decided that since upon implementation of SCATER, commercial planes would be in contact with CAA or DOT facilities and the latter would ground or divert all non-essential traffic, the situation described would be unlikely. On 3 June 1958, the RCAF ADC wired NORAD that it had amended its ASI 2/5 to delete all reference to signals.

EMPLOYMENT OF MB-1 OVER CANADA

Authorization to use the MB-1 in operations over Canadian territory had been provided in a memorandum from the Canadian ambassador to the U. S. Secretary of State, dated 19 February 1957. This memorandum allowed the U. S. to use MB-1's over Canada under conditions of Air Defense Warning Yellow or Red in an area bordering the Great Lakes and extending northward to about 50 degrees North Latitude. This was a temporary arrangement due to expire on 1 July 1957.

An exchange of notes between the Canadian and U. S. governments on 27 June 1957 extended overflight authority until 1 July 1958. However, certain restrictions on use of atomic weapons were added to the original agreement. Aircraft armed with the MB-1 could be scrambled and employed against known hostile aircraft only. And the MB-1 could not be fired below 5,000 feet.

In the meantime, NORAD objected to the geographical limitations. In October 1957, it pointed out to Chief of the Air Staff, RCAF, that when the original agreement was negotiated, USAF MB-1 aircraft were confined to the territory bordering the Great Lakes. By late 1957, however, MB-1 aircraft were deployed throughout the U. S. and Alaska. Consequently, NORAD wanted authority to operate in the territory bordering the entire length of the boundary. MB-1 aircraft, NORAD continued, would be flown only after the declaration of a state of Air Defense Readiness and would enter Canadian air space only in the event of a Yellow or Red warning.

~~SECRET~~

[REDACTED]

UNCLASSIFIED

~~SECRET~~ ~~SECRET~~ ~~SECRET~~

UNCLASSIFIED

In addition, NORAD stated that it needed approval to arm the squadron at Goose Bay with the MB-1. This would allow better defense of the important northern base which was extremely vulnerable to air attack because of its isolated location. The control of the squadron would be exercised by the RCAF ADC, as agreed upon between NORAD and Canada.

On 27 November, certain operating restrictions were removed, but the geographical restrictions remained. Over-flight and employment was still restricted to periods of CONAD Air Defense Warning Yellow or Red.

In April 1958, NORAD again requested revisions to the MB-1 employment policy. It pointed out to USAF that the geographical restriction precluded overflight of Canada by Alaskan-based aircraft and did not allow U. S.-based aircraft to operate at maximum range utilizing RCAF forward recovery bases in an emergency.*

NORAD also asked that the agreement be changed to authorize overflight of Canada with MB-1-armed aircraft from bases in the U. S. and Alaska during an Air Defense Readiness. NORAD stated that it was revising its readiness provisions and that a new regulation would establish three conditions: Normal Readiness, Increased Readiness, and Air Defense Readiness, with the latter condition being the highest state of NORAD preparedness. The next step would be the transition from peace to war accomplished by the official declaration of an Air Defense Emergency with the imminence of attack indicated by Warning Yellow or Red. Air Defense Readiness was to be declared by CINCNORAD, Deputy CINCNORAD, or his appointed representatives in the NORAD COC. And the initial Air Defense Emergency Warning Red or Yellow would be declared only by CINCNORAD, or Deputy CINCNORAD.

USAF replied that these recommendations were being considered in discussions of atomic cooperation matters with the RCAF. It also stated that any new agreement would eliminate reference to the MB-1 and use atomic air defense rockets to preclude complications in later long term agreements.

* Alaskan Command issued a regulation on 10 October 1957 calling for use of the MB-1 over Canadian territory, which was subsequently rescinded.

~~SECRET~~

~~SECRET~~ ~~SECRET~~ ~~SECRET~~

UNCLASSIFIED

CONFIDENTIAL

CONFIDENTIAL

UNCLASSIFIED

Meanwhile, USAF continued working on removing the geographical restriction. This was partially accomplished on 12 May 1958. The basic agreement was revised to extend the authorized overflight area to 54 degrees North Latitude and longitudinally to the full extent of Canadian territory including the coastal CADIZ.

In the meantime, NORAD had become concerned with the fact that the original agreement was to expire on 30 June 1958. NORAD asked the executive agent to obtain an extension to the end of FY-1959. Elimination of all geographical restrictions was also asked.

In June 1958, USAF informed NORAD that a draft agreement for long-term rights to overfly Canada with the MB-1 was in the final stages of negotiations. The proposed agreement would remove all geographical restrictions during a period of Air Defense Readiness. Pending conclusion of the new agreement, it had obtained a one year extension of the 27 June 1957 agreement.

CANADIAN AIR RAID WARNING

Air Staff Instruction 2/14 and Air Staff Instruction 2/13, December 1956, were revised on 30 April 1958.

The revised ASI 2/14 provided for three degrees of warnings: Air Raid Warning Red, attack by hostile aircraft imminent (using the criteria of ASI 2/5 for a hostile); Air Raid Warning Yellow, attack by hostile aircraft probable; and Air Raid Warning White, attack improbable.

For an initial attack, only the AOC ADC or his appointed representative could declare an Air Raid Warning Red or Yellow. If the first air defense warning Yellow was not declared by AOC ADC or his representative for all divisions and sectors, the division and sector commanders not included were to declare warning Yellow for their areas. If the first air defense warning Red was not declared for all areas, commanders not included were to declare an air defense warning of at least Yellow for their areas. Following a declaration of warning Red for any area, commanders were authorized to alter their state of air defense warning between Yellow and Red at their own discretion depending upon the air defense situation prevailing in or adjacent to their sectors. Air Defense Warning White could not be issued except by the AOC or his deputy.

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

UNCLASSIFIED

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

But subsequent to the White, division and sector commanders could continue to prescribe warnings until their authority was withdrawn by the AOC ADC.

The second directive (2/13) established the responsibility and procedures for initiating the transition of ADC's air defense system from day-to-day peacetime readiness status to a maximum state of preparedness before the beginning of hostilities. This transition would be initiated with the declaration of the only one advanced preparedness condition -- Air Defence Readiness. The Air Defence Readiness state could be declared only by the AOC ADC or his appointed representative.

NUCLEAR DETONATION REPORTING (NUDET)

Interim procedures for reporting nuclear detonations on the North American continent to Headquarters NORAD were established by letter instructions on 8 March and 12 June 1957. The provisions of these letters were rescinded on 17 April 1958 and all agencies were instructed to follow the provisions of NORAD Manual 55-1 -- NORAD Combat Surveillance and Tactical Action Reporting Procedures.

The manual required that NORAD forces report all nuclear and thermonuclear explosions occurring in or adjacent to the United States, Alaska, and the Canadian areas as a result of enemy action. The system was to remain in effect until an adequate remote reading Indirect Bomb Detonation Detection System became available.

Reports were to be forwarded immediately to appropriate air defense agencies. All NUDET reports were to be sent over normal surveillance reporting circuitry when received by an air defense agency. Duplication in the reporting of detonations was to be eliminated by the filter centers, DC's, and CC's, which were to screen and evaluate the reports before forwarding to NORAD headquarters.

UNCLASS

ALERT NETWORK NUMBER 1

On 1 July 1958, a new Alert # 1 network was placed in operation (the old network was to remain in operation as a back-up until 1 August 1958). The new network connected NORAD on 1 July 1958

UNCLASS

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

93

with 33 stations that required air defense alert and warning information. This included such agencies as major commands, air divisions, regions, and the USAF Command Post. Only 29 of the stations operating on 1 July were both transmit and receive stations, the other four (TAC Headquarters, Sandia Base, ADCC (Blue Ridge Summit), and the Presidio of San Francisco) were receive-only stations.

An advantage of the new system was that it gave NORAD the ability to tell which stations received its alert messages and which did not. The new TTY circuits had a built-in automatic sequential authenticator that furnished this information. Previously, NORAD had no knowledge of the effectiveness of its alerting system unless the COC personnel telephoned each individual receiving station. The new system also had two master stations -- NORAD Headquarters and the ALCOP at Richards-Gebaur AFB. This feature permitted the ALCOP to assume operations of the network and carry on with the alert procedures should NORAD become a war casualty. Finally, the new system cut the time required to send and authenticate from approximately eight or nine minutes to about one and one-half minutes.

There were other features of the new network that were not so satisfactory, however. NORAD had submitted a list of requirements to ADC which would provide the COC with greater flexibility in the operational use of the alert net. The new system did not have a break-in feature that would permit the COC to take control of the network at any time and transmit over it. If some other station happened to be sending, the COC had to wait until the station finished transmitting and all authentications received before it could send. Another feature lacking on the new system was selective calling. NORAD wanted the network modified so that the NORAD COC could call any single station or combination of stations and so that the Region COC's could call the NORAD COC and all divisions in their areas.

unclass

CONTROL OF ELECTROMAGNETIC RADIATIONS (CONELRAD)

In January 1958, the Executive Agency informed NORAD that there was considerable opposition to CONELRAD outside the Department of Defense (DOD). It was the contention of that opposition that the use of thermonuclear weapons and sophisticated weapons delivery systems invalidated the military CONELRAD requirement. ADC, the Executive Agency continued, had stated that the CONAD-ADC position

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

was that the military requirement was still valid. USAF wished to know whether NORAD still considered the CONELRAD requirement valid. NORAD replied that CONELRAD was a necessary requirement "for the foreseeable future."

In regard to future CONELRAD requirements, NORAD stated that in a national emergency all radiating devices which did not directly contribute to the defense effort and necessary national operations, should shut down so as to reduce interference with missile tracking and control, fighter-interceptor control, early warning, and defense communications.

Shortly after NORAD had stated its position, DOD, FCC and FCDA signed a new memorandum of agreement on CONELRAD. This memorandum established the separate responsibilities and functions of each agency in controlling electromagnetic radiations in an emergency. At mid-1958, the DOD was working on a new CONELRAD plan.

OPERATIONAL LINES FROM SAC CONTROL TOWERS TO ADDC's

A review by NORAD of the procedures for safeguarding Strategic Air Command aircraft aborting within Nike missile range of SAC take-off bases turned up a problem. NORAD felt that existing procedures did not give SAC planes returning to their bases sufficient protection from being fired on by the Nike defense unit. On 21 January 1958, NORAD instructed the regions to study the feasibility of running a direct line from the SAC control towers to the nearby AADCP's. This would give the Nike defense commander immediate knowledge of the abort and the direction the returning plane would take.

Both Eastern and Central Region agreed on the need for such a line, but both recommended that the line terminate at the ADDC instead of the AADCP. Their objections to termination at the AADCP were similar: (1) it would divide the identification function between the AADCP and the ADDC and the latter had primary responsibility for identification, and (2) it would divide the operational control of NIKE batteries, which should remain in the NORAD chain. Western Region stated that it had no requirement for such a circuit.

NORAD agreed with Eastern and Central and on 2 June directed the establishment of a direct land-line circuit between ADDC's and

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

SAC facilities. At the ADDC's, the circuits were to terminate at the AMIS; at SAC bases, they were to terminate in the form of a loop circuit to include the control tower, base operations, and the wing control center. Also, NORAD stated that special air-to-ground communications procedures between an aircraft and a DC might be necessary and that this should be worked out at the operating level.

ECCM

In early 1958, RCAF ADC informed NORAD that it was considering establishing an Electronic Warfare Unit to provide simulated operational conditions for training its aircrews and fighter controllers in ECM and ECCM. However, before planning progressed further, it needed information on NORAD's planned activity and ECM-ECCM standards. This information was immediately provided. NORAD also stated that following approval of its terms of reference, it planned to invite the RCAF ADC to appoint members to the NORAD Electronic Warfare Committee. This committee had as its function exchanging ECCM information, formulating ECCM policies, and coordinating the ECCM program within the NORAD components. Finally, NORAD forwarded a copy of the manning documents being used by the Radar Evaluation Flights in the U. S. as a guide for the new unit.

On 1 April 1958, the RCAF ADC Electronic Warfare unit began operations with three C-119's and one CF-100 at RCAF Station St. Hubert.

NORAD attempted to strengthen its own ECCM program on 24 April when it sent a request to the Executive Agency for more modern ECM aircraft for training. It pointed out that the NORAD ECCM training requirements could not be met by any command or combination of commands in existence. The SAC-ADC training missions and the ADC radar evaluation flights were valuable, but neither met the NORAD requirements in quantity or quality. Further, it appeared that as programmed ECM and ECCM equipment and techniques (including the FD plan) came into the NORAD ground environment, the training program would get even weaker. The SAC aircraft would have to remain in their EWP ECM configuration and might not have the capability for jamming the broad frequency bands, while the ADC radar flights would be using outdated equipment and aircraft to provide training.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

"For USAF ADC, RCAF/ADC, USARADCOM and U. S. Navy Defense Forces of NORAD to realize an effective ECM/ECCM training program," NORAD stated, "it is imperative that a training force be established within the NORAD operational structure which will fulfill current defense and future frequency diversity radar programs." NORAD recommended that USAF give further reconsideration to equipping the USAF ADC radar evaluation flights with high-speed, high-performance aircraft, such as the B-47, the turbo-prop C-131, or the Lockheed CL-329 Jetstar.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

Chapter VII

Exercises

EXERCISE FIR FLY

In order to evaluate the capability of each air defense element to carry out its function and the capability of the entire system, NORAD planned a two-phase exercise. The first phase was to test the first three functions of the system -- detection, interception, and identification. Phase II was to test destruction, using drones as targets.*

Phase I planning had been completed by December 1957. Naval planes, operating from both carrier and shore bases, were to join SAC faker aircraft in penetrating the 28th CONAD Division area on 10 January. This phase would provide NORAD with an opportunity to evaluate tactical actions against saturation attacks of short duration.

Preparation for Phase II had run into a serious snag, however. No suitable target drone could be found that would provide realistic firing tests. At one time, NORAD had planned to use a Navy Regulus I missile. However, during tests conducted on the west coast, this missile could not be adequately carried by the surveillance system.

The search for a target drone continued even as tests of the Regulus were being run. ARADCOM, ADC and USAF were asked to help, but a suitable drone was not turned up. Therefore, NORAD cancelled Phase II.

Phase I was run as scheduled. On 10 January, 12 SAC B-47's and 25 Navy fighters were launched as strike waves at various altitudes (50 feet to 50,000 feet) and speeds (150 - 680 knots). Nine of the SAC planes were detected and tracked, with 13 MA's

* For background on the planning, see CONAD/NORAD Historical Summary July-December 1957, pp 91-92.

91
~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

(mission accomplished) reported by the interceptor force. Only four of the Navy attackers were continuously detected and tracked, with nine fighter MA's accomplished. One problem, which held down the MA rate, was that Army air defense units were kept on a "Weapons Tight" status by the 28th Division during the exercise. Another shortcoming was poor use of combat air patrol. In a summary of the exercise, Commander Eugene C. Smith, Chief of the NORAD Training and Exercise Branch, stated that "it appeared that the defense system successfully defended against conventional attacks...but was unsuccessful...against not too frequently practiced, though realistic, type attacks."

Two items of interest for future exercises were brought to NORAD's attention. First, the 28th Division and Western Region recommended relocating portions of the contiguous system further seaward to take advantage of greater detection and control capability. This would permit joining the air battle as far as possible from the target area and would permit more effective long-range utilization of such aircraft as the F-89J. NORAD had already considered relocating the seaward elements, but ultimately decided against it.

Second, the field units considered Navy fighter aircraft to be unrealistic targets for testing the air defense facilities. This complaint stemmed from the fact that the aircraft used IFF, which provided considerable detection range and tracking continuity without the use of normal discrimination techniques such as lobe selection, MTI, video gain and range slew. Use of IFF by friendly and faker forces caused identification confusion when both interceptors and targets were in the same area since they all presented the same return on the ground radar scopes. NORAD recognized that the use of IFF by faker aircraft was not fully realistic. But it felt that the factors of speeds, altitudes, tactics, target approaches, distances penetrated, and targets overcame this unrealistic aspect.

As noted above, shortly after NORAD discovered that a drone would not be available it cancelled Phase II. NORAD asked USAF ADC to place more emphasis on improving radar performance against high-speed targets of small reflectivity, such as Soviet cruise-type missiles.

ADC replied that the basic USAF documents guiding development and improvement of ground environment (COR's 79 and 97) specified a

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

capability to detect targets of small radar cross-section, based on the cruise-type missile threat. Also, theoretical performance of proposed and programmed equipments for the future inventory indicated that these specifications would be met. ADC had gone further, however.

On 23 January 1958, it asked ARDC to verify the ability of the programmed FD radars to detect cruise-type missiles. And Lincoln Laboratory and the 4620th ADW were preparing an exercise to determine the capability of the AN/FPS-20 and AN/FPS-31 to operate against small targets in a SAGE sector. Eastern Region was also to assist in the test. Exercise results had not been determined at the end of June.

SIMULATED SUBMARINE-LAUNCHED
MISSILE EXERCISE (OCEAN WAVES)

Another exercise planned in 1957 and carried out in 1958 was OCEAN WAVES. The objectives of this exercise were to determine air defense system capabilities against simulated submarine-launched missiles and to obtain training. It was run on 3 March 1958.*

Five carrier-based aircraft in three separate waves attacked the industrial, population, and military complexes of Norfolk, Virginia, which was defended by forces of the 85th CONAD Division. Wave I consisted of two F-4D Navy fighters that climbed to 50,000 feet, flew at maximum speed to the target area, and made a verticle dive attack. Wave II aircraft flew a ballistic flight profile (i. e., made a constant climb to 50,000 feet midway between the carrier and the target and then a constant descent on the target). The third wave was a single A-3D conducting a low level attack at 500 feet from ship to shore.

Waves I and II were detected, tracked, and declared destroyed.** Wave III escaped detection however, which emphasized that the low level attack posed a serious threat against the defense system.

* For background see CONAD/NORAD Historical Summary July-December 1957, pp 91-92.

** Wave II was detected and tracked by the AA defense only.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

Also on the debit side of the ledger were the following: poor use of height-finding equipment; unsatisfactory detection, tracking and intercept control by AEW&C aircraft; and a low number of MA's achieved by CAP interceptors resulting from poor employment by direction center controllers.

To correct these deficiencies, NORAD recommended that: (1) direction centers emphasize training in fighter tactics, particularly as they applied to air augmentation units; (2) more emphasis (including increased training) be given to picket ship control of fighters; and (3) greater use be made of CAP and seaward interception tactics.

The exercise objectives were achieved, however. And in its evaluation of the exercise, NORAD found many satisfactory aspects: the YAGR USS SKYWATCHER, using recently acquired SPB-17 radar equipment, was able to make long-range initial detections, and forward-told to its prime shore-based radar excellently; acquisition, tracking, and simulated destruction by Army air defense units at maximum weapons range was outstanding; and the tactics of employing fighter-interceptors on airborne station (CAP) and engaging faker tracks as far seaward as possible within the contiguous cover were determined to be sound. NORAD considered the training received from these exercises to be invaluable and wanted future missions of a similar scope.

According to an exercise observer report, the results of OCEAN WAVES indicated that the air defense system had the capability to detect, track and intercept small, high-speed targets to an acceptable degree. Just prior to the exercise, representative elements of the system had failed to track a "clean" Regulus I missile. But in OCEAN WAVES, similar elements were tracking F-4D aircraft with a DB (Decibel) rating of a -14 which compared favorably with the Regulus I (DB of approximately -20) under controlled conditions. No significant differences in the test pattern existed and the phenomena could not be explained.

SAC-NORAD/CONAD ECM EXERCISES

April 1957 marked the start of a series of monthly ECM exercises between SAC-CONAD forces. These monthly exercises were designed to provide training to both commands. For CONAD, the missions

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~SECRET~~
~~SECRET~~
~~SECRET~~

provided system ECM training and evaluation. SAC was able to test its offensive tactics against a realistic defense. And, as an added bonus, USAF ADC and RCAF ADC were provided training in counter-acting ECM.

Nine months of testing had been completed by December 1957. In this period, it was determined that the missions were most valuable from a training and experience viewpoint. The exercises provided excellent evaluation of certain portions of the air defense system. But certain other portions were not so well tested. For one thing, SAC was unable to effectively jam S-band radars operating above 3250 megacycles. This precluded thorough evaluation of Army Nike unit effectiveness. Also, in November 1957, SAC pulled its only ECM wing (the 376th Bomb Wing) out of the tests. This made it necessary for bomb wings to provide the ECM on the test missions. This restricted ECM training because the bomb wings had only limited ECM equipment and experience.

The exercises were stopped completely in February 1958, however, following a collision between a SAC B-47 and an ADC F-86. Investigation revealed that established training procedures had not been followed. But SAC refused, on 5 February, to permit further fighter attacks against its aircraft. This prevented any possibility of further ECM exercise activity of a realistic nature which included fighter-bomber affiliation.

NORAD immediately tried to lift the restriction, pointing out to SAC that the training procedures had been used for many years and that there had been thousands of uneventful fighter attacks. SAC felt differently, however. Its investigation of training procedures revealed deficiencies. SAC would not remove its restriction until these were eliminated.

By April, SAC's restriction on training were being felt by the components. RCAF ADC wrote CINCNORAD that: "Canadian air defence effectiveness is deteriorating through lack of practice attacks against SAC aircraft. Request your headquarters press for resumption of practice intercepts...." One month later, AAC asked USAF to hold in abeyance an ORI scheduled for its 11th Air Division because "restrictive measures...would completely prohibit testing and evaluating the primary mission of detection, surveillance, and interception of penetrating aircraft...."

On 13 May, USAF asked SAC, USAF ADC and NORAD to mutually re-

~~SECRET~~
~~SECRET~~
~~SECRET~~

~~CONFIDENTIAL~~
~~SECRET~~
~~SECRET~~

solve the fighter-bomber training problems by 30 June 1958. SAC redrafted its training regulation (51-) and stated that the procedures of the regulation would have to be tested before a final decision was reached. The procedures were to be tested during Weapons System Evaluation Group tests starting on 1 July. On 9 June, USAF extended the resolution deadline to 31 July.

NORAD would not accept the SAC regulation as a solution to the exercise-training problem, however.* The revised regulation contained too many restrictive provisions. NORAD felt that exercises and training carried out accordingly would be of negligible value.

SAC's air forces (2nd, 8th, and 15th) joined NORAD in protesting the lack of realism in exercises conducted under the restrictive procedures. The three air forces recommended cancellation of NORAD's upcoming exercise, "Top Hand", unless realistic procedures were used.

In the meantime, members of the NORAD staff met with Tactical Air Command officials in an effort to work out a training program with their forces. One joint exercise (Black Angel) had already been run with TAC forces and the latter appeared the best source until the SAC problem was resolved. The meeting proved successful and plans were being made at mid-1958 for joint TAC-NORAD exercises.

WSEG ECM EVALUATION

As noted above, NORAD was interested in obtaining both quantitative and qualitative data from the ECM exercises. In 1957, the NORAD operations analysts designed a test that would provide the desired data. The design had been submitted to SAC for approval in December 1957. SAC agreed to the proposed tests, but it had previous commitments to the Weapons System Evaluation Group (WSEG) and could not participate at that time.

* USAF ADC felt it could not afford to lose any additional training time and on 30 May, agreed to abide by the provisions of 51-6 until NORAD and SAC agreed upon a final solution.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

In the meantime, the JCS directed the WSEG to evaluate the effectiveness of electronics countermeasures. The directive specified that the evaluation was to: (1) consider ECM effectiveness against all major weapon systems employing electromagnetic radiations; (2) give first priority to the system for the defense of the continental United States; and (3) provide an evaluation of two time periods -- the time of testing and, through extrapolation, a period three years in advance. In preparing its test plan, WSEG was to consult with the chiefs of the services who were to support the test efforts.

The first WSEG tests were begun in February 1958 against the Nike installations at Fort Bliss. These were followed in March and April by tests in the Claysburg, Pennsylvania, area. These preliminary tests were not for evaluation, however. They were used to help WSEG prepare a test design for use in later exercises.

The WSEG evaluation plan called for seven penetration tests against the 37th CONAD Division beginning in August and ending in December 1958. The WSEG tests were similar in scope to those proposed by NORAD and agreed to by SAC, therefore, both commands felt that they should wait until the WSEG evaluation was completed before attempting additional exercises of their own.

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~

Chapter VIII

Defense Against the Ballistic Missile

ARMY-AIR FORCE RESPONSIBILITY IN ICBM DEFENSE

In January 1958, the Secretary of Defense provided general direction to Army-Air Force development effort in ICBM defense. The Army was directed to continue development of the Nike Zeus program, confining its efforts to the missile and launch system and the acquisition, tracking, and computer components required for an integrated missile system. The Air Force was to continue development effort on the portion of its WIZARD program that pertained to early warning radars, tracking and acquisition radars, communications links between the early warning radars and SAGE, and the data processing components required to form an integrated system.

THE NIKE ZEUS PROGRAM

On 14 February 1958, the Department of the Army provided guidance to appropriate Army agencies on the Nike Zeus effort. DA advised that the Secretary of Defense had directed the Army to continue development of the Nike Zeus as a matter of urgency, but that no decision had been made on an accelerated program proposed by the Army. Therefore, the Army would continue development of the system at a maximum rate consistent with available funds. However, it would continue to plan for early implementation of the accelerated program. DA directed that there be the highest degree of coordination with Air Force agencies working in related fields.

The accelerated program referred to called for three operational batteries by December 1961, thirty by December 1962, and additional batteries thereafter at the rate of seven per quarter. Currently, 116 Zeus batteries were planned. On 1 March 1958, the JCS advised CONAD that this program had been submitted and requested a proposed deployment plan based on the accelerated program.

~~CONFIDENTIAL~~
104
~~CONFIDENTIAL~~
~~SECRET~~

~~SECRET~~

Studies made at CONAD Headquarters showed that Nike Zeus deployment had to be considered together with all air defense objectives and therefore would be included in the North American Air Defense Objectives Plan 1958-1968 (NADOP 58-68). Because of this, CONAD asked, on 23 April, to defer submitting a deployment plan until proposals for NADOP 58-68 were firm.

The JCS approved CONAD's proposal early in May. But the JCS asked that a deployment plan for the first 16 Zeus batteries be submitted as soon as possible. This had not been completed by 30 June 1958.

INTEGRATION OF ZEUS LOCAL ACQUISITION RADARS WITH SAGE

Investigation by NORAD of the effect of the Zeus system on the air defense system revealed that there would be great duplication of high altitude coverage by the Zeus local acquisition radars and the USAF ADC frequency diversity radars. If optimum coverage were achieved, NORAD discovered, exactly the same geographical locations would be involved in many cases. This obviously would result in a great waste of money, effort and time. According to current information, 91 local acquisition radars would be required for the 116 Zeus batteries (one radar could feed more than one battery).

Because of this situation, NORAD recommended to the executive agent on 5 June 1958 that the Defense Department study the feasibility and desirability of integrating the local acquisition radars with the SAGE system. In support of its recommendation, NORAD stated that:

Based on tentative Zeus deployment plans, it appears that approximately 75 per cent of the Zeus Local Acquisition Radars could be located at the sites of existing USAF ADC prime radars and serve the requirements of air defense against both the air-supported and ballistic missile threat. If the marriage of the LAR program of the Zeus anti-missile system to the SAGE surveillance network is technically feasible, so doing will prove most beneficial to the electronics ground environment through the air defense system. The economic sav-

~~SECRET~~

~~SECRET~~
~~SECRET~~
~~SECRET~~

106

ings alone would represent a significant portion of the air defense budget of the Department of the Army and Air Force.

NORAD made the same recommendation to the Army Chief of Staff and requested DA support of integration of local acquisition radars with SAGE.

BALLISTIC MISSILE EARLY WARNING SYSTEM

On 14 January 1958, a memorandum from the Office of the Secretary of Defense authorized the Air Force to proceed immediately with development of a ballistic missile early warning system.* The system authorized and planned at that time was for three radar stations, one each in Alaska, Greenland, and Scotland, and a ZI computer central and display facility and interconnecting communications.

The OSD memorandum established priority one for the Greenland station, two for the Alaskan station, and three for the Scotland station. In regard to the Greenland site, the OSD memorandum stated that radars with scanning antennae should be installed with the objective of providing an operational capability by the end of calendar year 1959. The necessary local display, computer, and communications links to NORAD should be provided; and an expedited development program for tracking radars should be started immediately, with installation as soon as the Air Force considered that appropriate designs were available. The objective of the latter was to provide additional capability at the Greenland site before

* This would be Phase I of USAF Weapons System 224A. Phase II of this system was an active system. USAF issued a preliminary operational concept for Phase II on 18 April 1958, which, it said, was for the purpose of providing guidance for preparation of planning documents. USAF described Phase II as a system capable of missile detection, acquisition, tracking, control and destruction or neutralization. The capability for destruction or neutralization would be provided by interceptor missiles. The system would be manned, equipped and operated by the USAF ADC and by the designated Canadian command under the operational control of CINCNORAD.

~~SECRET~~
~~SECRET~~
~~SECRET~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

there were enough satellite vehicles to confuse the initial early warning system.

USAF informed ADC of its responsibilities for the BMEWS on 4 February 1958. ADC was to participate in site selection, preparing operations plans, and determining organization of the system; in planning for supervision of initial contractor operation of the system; in planning for eventual ADC manning and operation of the system; and in planning for personnel training. USAF emphasized that this was to be an all-out program. This "system has been directed by the President, has the same national priority as the ballistic missile and satellite programs and is being placed on the Department of Defense master urgency list."

Despite the latter, the BMEWS program ebbed and flowed. On 20 March 1958, USAF advised that OSD authorization permitted the Air Force to proceed only with a radar station at Thule, Greenland, to include scanning radars, computer and display as required at this site, and communications to NORAD. Until further notice, USAF said, obligation of funds had to be limited to this effort. Tracking radars would be continued in development, however.

On 10 May 1958, USAF announced a partial restoration of the program. The Secretary of Defense had directed the Air Force to proceed with implementation on a two-station (Greenland and Alaska) basis. Planning for the Scotland station was to continue, but implementation was indefinitely deferred. The two station system was to be funded within a total of \$822 million over a four year period. USAF set operational dates for planning purposes as follows: Thule scanners - September 1960, trackers - September 1961; Alaska scanners - September 1961, trackers - December 1961. The Greenland site was to be at Thule. The Alaskan site was not selected, but was tentatively to be placed in the Fairbanks area. The NORAD computer-display facility was to be phased in to meet operational requirements.

* In January 1958, the Air Force selected the Radio Corporation of America as prime contractor for design, development and construction of the radar gear, on-site communications and for the central computer in the U. S. Western Electric was chosen as prime contractor for BMEWS communications. The system was to meet the requirements of GOR 156, 7 November 1957.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

NORAD COMPUTER-DISPLAY FACILITY

On 10 June 1958, USAF outlined to the Ballistic Missile Project Office in New York, with an information copy to NORAD, preliminary guidelines for establishment of the NORAD central facility. The central facility for NORAD was to service NORAD, USAF ADC, and ARADCOM. BMEWS displays should not be technically integrated with other NORAD COC displays, but should be collocated within the NORAD COC. The BMEWS minimum display should provide for display of warning, impact prediction, and status of major items of equipment at the forward sites. Provisions should be made for take-off of all useful data to give to other users, such as SAC, FCDA, and JCS. USAF asked NORAD to recommend the method and type of presentation, in addition to the above, and to coordinate with other users to determine take-off provisions.

NORAD replied that it agreed that the BMEWS display should not necessarily be technically integrated with the air-breathing threat displays. But NORAD felt that the growth potential should be such that data on the IREB threat from the active defense system should be technically integrated into the BMEWS display, especially for the Atlantic and Pacific extensions. NORAD said that its concept for BMEWS operations had been given to ADC for forwarding to USAF. ADC was obtaining from other users their data requirements which would be coordinated with NORAD.

The NORAD concept referred to was a preliminary outline furnished to ADC on 11 June 1958. NORAD stated in this outline that it assumed that the BMEWS data would be sent directly to at least one point in the U. S., the NORAD COC. NORAD looked at the ZI portion of the BMEWS not only as an integral portion of the system, but as the heart of the entire ballistic missile defense system. As such, the NORAD COC should receive data from the BMEWS and all other sources, such as the active Ballistic Missile Defense System and satellites.

The operation of the entire AICBM system must be founded, NORAD stated, upon the premise that practically all tactical decisions would have been made in advance. Thus, certain portions of the data had to flow without interruption to the ultimate users.

~~CONFIDENTIAL~~

~~SECRET~~

~~CONFIDENTIAL~~

This would require that the NORAD COC have an electronic computer and a high-speed automatic communication switching facility designed to handle a large volume of outgoing data.

On 30 June 1958, a second paper, NORAD BMEWS and AICEM System Display, was sent to ADC, the purpose of which was to provide additional guidance. In this paper, NORAD provided a more detailed list of indications or data needed to be put into the central facility. NORAD listed the indications necessary during the progression of events from initial detection to engagement and results. An important point brought out was the need for a systems approach to the whole computer-display problem. NORAD emphasized that the BMEWS could not be considered as a self-contained entity separate from the Nike-Zeus, or vice versa.

BMEWS-ZEUS COMPATIBILITY

NORAD was concerned that the BMEWS and Zeus programs were proceeding independently and not being meshed into a total system. In February 1958, NORAD expressed its views on this to USAF:

It is imperative that the BMEWS detection and tracking system be designed and built to be capable of feeding processed data to the Zeus system and that this system be capable of accepting such data for acquisition and launching the anti-ICBM missile. Failure of these systems to mesh will undoubtedly result in delays as are now being experienced in the SAGE-Missile Master program. In the ICBM era, such delays will be intolerable.

USAF replied in March that BMEWS had to be compatible with any active system (although designed to go with the active portion of the WIZARD system) to be employed. The Secretary of Defense was expected to make a decision soon that would clearly delineate the responsibilities of the Army and Air Force in the entire program. In the meantime, every action possible would be taken, USAF said, to insure compatibility and integration of all portions of the ballistic missile defense system.

Again on 7 July 1958, NORAD urged the closest coordination so as to insure compatibility of the two systems. NORAD pointed out

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

that it had informal information that certain technical parameters "may already be independently at the decision stage without regard to mutual compatibility. This is a matter of the gravest concern to NORAD."

LOCATION OF NORAD HEADQUARTERS COMPLEX

The requirement for a ballistic missile defense system display facility at NORAD Headquarters brought renewed action on a long-felt need for a new command post. As stated by General Partridge in a letter to the JCS and CSC on 3 July 1958:

It has been recognized for several years that the facilities at Ent are quite inadequate both from a point of view of availability of floor space as well as security. The Combat Operations Center is a concrete block building of extremely light construction and is exposed to the traffic on the adjacent street so that a man with a bazooka passing in a car could put the establishment out of commission.

Back on 7 February 1958, USAF asked NORAD for a decision on the location of the central computer and display facility. NORAD replied on 14 February that its first choice was integration with a new NORAD COC underground in the Colorado Springs area. On 3 March, General Partridge advised the JCS that he considered that NORAD and component command headquarters had to be collocated and adjacent to the COC for rapid assembly of battle staff and joint planning functions. General Partridge also stated that the COC had to be hardened to withstand several hundred pounds per square inch overpressure and accompanying earth shock from a thermonuclear blast. The location should be away from other prime targets and convenient to diversified communication routes. However, he asked that a decision be deferred pending completion of a RAND Corporation study of possible locations.

On 23 April, General Partridge informed the JCS that RAND had concluded that location in the Colorado Springs area, with the COC in a readily accessible granite mountain formation, offered the best solution at the most reasonable cost.

Earlier, NORAD had recommended informally that the COC be placed underground in either the Rampart Range area north of Colorado Springs or in Cheyenne Mountain south of Colorado Springs.

~~CONFIDENTIAL~~
~~SECRET~~
~~CONFIDENTIAL~~

~~SECRET~~

Along with the latter, NORAD recommended moving the headquarters to the Army's Fort Carson, also located south of Colorado Springs. The Army provided, on 19 May, an interim reply to NORAD's proposal to move the headquarters to Fort Carson. The Army could provide NORAD with administrative support, but it could not foresee the availability of any permanent-type buildings for troop housing and headquarters space. Temporary-type buildings could be made available, however. Permanent buildings would have to be built by the Air Force as executive agent, DA stated.

In the meantime, USAF concluded that the best location for NORAD was Lowry AFB, Denver, Colorado (which would have quarters vacant because of the move of the Air Force Academy from Lowry to its permanent campus near Colorado Springs).

On 30 June, the JCS asked CINCNORAD for formal recommendations and justifications for a new headquarters location. Cost estimates were to be included. Criteria were provided for use by NORAD, which were not to be intended to be restrictive, the JCS stated. These criteria were:

(1) The location of the headquarters should be determined by the optimum location for the hardened COC.

(2) The COC, wherever located, will be a prime target. Consequently, the site should be selected, as far as practicable, remote from other key facilities so, if attacked, a minimum "bonus effect" to enemy would result.

(3) The structure should be designed for an overpressure of not more than 200 pounds per square inch.

(4) The conventional administrative headquarters should be located convenient to the COC site.

NORAD made a preliminary reply to the JCS on 31 July. NORAD recommended that the headquarters complex be located in the Colorado Springs area, with either the Air Force Academy site or Fort Carson preferred as the location. Before a firm choice could be made, NORAD said, a detailed survey of the rock formations on the nearby mountains had to be made and also the extent of support which could be given the headquarters by the respective services had to be compared.

~~SECRET~~



A P P E N D I X



~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

APPENDIX ONE

CANADA-UNITED STATES AGENCIES

- PJBD PERMANENT JOINT BOARD ON DEFENSE, CANADA-UNITED STATES
- MCC CANADA-UNITED STATES MILITARY COOPERATION COMMITTEE
- CUSRPO CANADA-UNITED STATES REGIONAL PLANNING GROUP
- MEG CANADA-UNITED STATES MILITARY STUDY GROUP
- CUSSAT CANADA-UNITED STATES SCIENTIFIC ADVISORY TEAM
- CCS-C USAF CENTRAL COORDINATING STAFF - CANADA
- UNITED STATES-CANADA JOINT CABINET COMMITTEE ON DEFENSE

~~CONFIDENTIAL~~
~~CONFIDENTIAL~~
~~CONFIDENTIAL~~

~~SECRET~~

PERMANENT JOINT BOARD ON DEFENSE, CANADA-UNITED STATES (PJBD)

The PJBD is a combined Canada-U.S. agency, the U.S. military section of which is jointly staffed and responsible to the Office of the Secretary of Defense and is also a part-time committee of the Joint Chiefs of Staff. The military membership functions as a part-time committee, the members being furnished by the Services. In addition to military representatives, PJBD has a chairman appointed by the President and a representative from the Department of State to handle the government-to-government matters that may arise as a result of PJBD deliberations. One of the military members acts as steering member and maintains an office for the chairman. He is provided two permanently assigned officers to assist in this responsibility. Meetings take place at various locations, primarily in the U.S. and Canada.

Responsibilities. 1. The Board was created by the President of the United States and the Prime Minister of Canada in 1940 and has no formal charter or terms of reference other than a press release, which states:

It will consider in the broad sense the defense of the north half of the Western Hemisphere.

2. The duties of the Office of the Steering Member, U.S. Section follow: a. Maintaining a central office of record for the U.S. Section, PJBD. b. Facilitating Canadian-U.S. liaison on matters within the cognizance of the PJBD. c. Facilitating coordination between the U.S. Services. d. Keeping in close touch with Canadian-U.S. relations.

MEMBERS - UNITED STATES SECTION

30 June 1958

Dr. John A. Hannah, Chairman, Pres., Michigan State University
 Mr. Kenneth A. Byrns, Department of State
 M/Gen Thomas C. Darcy, USAF, USAF & Steering & Coordinating Member, Mil. Representation, U.S.
 M/Gen John C. Oakes, U.S. Army Member
 Rear Adm. W. F. Peterson, U.S. Navy Member
 Mr. James P. Parker, Department of State, Secretary, U.S. Sec.

ASSISTANTS TO MEMBERS OF U.S. SECTION

| | |
|------------------------------|---------------------------|
| Col. J. M. Churchill, USA | Asst to USA Member |
| Capt. H. T. Johnson, USN | Asst to USN Member |
| L/Col D. F. Montgomery, USAF | Asst to USAF Member |
| Mr. James P. Parker | Asst to State Dept Member |
| Col. N. P. Ward, III, USA | Exec to Steering Member |
| Col. T. J. Dayharsh, USAF | Exec to Steering Member |

~~SECRET~~

~~SECRET~~
~~CONFIDENTIAL~~

MEMBERS - CANADIAN SECTION

- General the Honorable A.G.L. McNaughton, Canadian Army (Ret), Canadian Chairman
- Mr. Paul Trembley, Dept of External Affairs Member (Acting)
- Rear Adm. Ernest P. Tisdall, Canadian Navy Member
- AVM Douglas M. Smith, Canadian Air Member
- M/Gen Jean V. Allard, Canadian Army Member
- Mr. James McCardle, Dept of External Affairs, Secretary, Canadian Section.

ASSISTANTS TO MEMBERS OF CANADIAN SECTION

- | | |
|-----------------------------------|-----------------------------------------|
| Cdr. John C. Smyth, RCN | Asst to RCN Member |
| Col. R. L. Houston, Canadian Army | Asst to Canadian Army Member |
| Group Capt. M. Lipton, RCAF | Asst to RCAF Member |
| Mr. J. McCardle | Asst to Dept of External Affairs Member |

CANADA-UNITED STATES MILITARY COOPERATION COMMITTEE (MCC)

The MCC is a combined Canada-U.S. agency, the U.S. Section of which is jointly staffed and is a committee of the Joint Chiefs of Staff. The U.S. members are temporarily assigned, having primary duties in the planning sections of the Services. One additional officer is provided by the Air Force with permanent assignment as Secretary of the Committee, and is attached to the Joint Chiefs of Staff Secretariat.

The central office is located in Washington, as are all U.S. members. Meetings take place at various locations within the U.S. or Canada.

Responsibilities. The Canada-United States Military Cooperation Committee is charged with the following:

1. Preparation and continued revision of the Canada-United States Basic Security Plan.
2. Growing out of the above are numerous matters contingent upon military planning which are negotiated through the MCC if they are military in nature as contrasted with political problems.
3. Plans, reports and recommendations developed by the MCC are submitted to the U.S. Joint Chiefs of Staff and the Canadian Chiefs of Staff Committee for approval.
4. The U.S. Section, MCC, is authorized to:
a. Request the JCS, Service and governmental agencies and activities for information and assistance which may be required in connection with its functions, and, reciprocally, will furnish information and assistance to such agencies in conformance with established policies of the JCS.
b. Establish, with

~~SECRET~~
~~CONFIDENTIAL~~

the cooperation of other agencies of the Services and the interested Executive Departments of the Government of the U.S., subcommittees for the preparation of the plans, reports, studies, or estimates as required.

5. Passage of military operating requirements.

UNITED STATES SECTION

30 June 1958

Members

Colonel V. P. Mock, USA
 Captain H. T. Johnson
 Colonel J. A. Dunning

United States Chairman
 United States Navy
 United States Air Force

Deputies

Lt Col W. W. Anderson
 Commander J. C. Doyle
 Lt Col D. F. Montgomery

United States Army
 United States Navy
 United States Air Force

Secretary

Major Melvin J. Spaur

United States Air Force

CANADIAN SECTION

Colonel R. L. Houston, Canadian Army
 Captain J. A. Charles
 Group Captain M. Lipton

Canadian Chairman
 Royal Canadian Navy
 Royal Canadian Air Force

Deputies

Lt Commander P. H. Grady
 Major A. B. French
 Sq Leader J. A. Arnott

Royal Canadian Navy
 Canadian Army
 Royal Canadian Air Force

Secretary

Major J. C. Newlands

Canadian Army

CANADA-UNITED STATES REGIONAL PLANNING GROUP (CUSRPG)

CUSRPG is a combined Canada-U.S. agency which as an entity is responsible to NATO. It is the one remaining Regional Planning Group of the North Atlantic Treaty Organization. The U.S. members consist of the Service chiefs who meet with the Canadian Service chiefs as the highest committee to form policy and guidance to the Regional Planning Committee. The U.S. members of the Planning Committee are temporarily assigned, having primary duties in the planning sections of the Services. The members of the Planning Committee are the same individuals as those on MCC. The

REGIONAL PLANNING COMMITTEE (RPO)

Col R. L. Houston, Can. Army, 3/C M. Lipton, RCAF
 Canadian Chairman Capt J. A. Charlton

Assistant Members

L/Cdr P. H. Grady, RCN S/Ldr J. A. Arnott, RCAF
 Maj A. B. French, Can. Army

Secretary

Major J. C. Newlands

Canadian Army

CANADA-UNITED STATES MILITARY STUDY GROUP (MSG)

The Military Study Group was formed to study those aspects of the North American Air Defense System in general, and the Early Warning System in particular, which are of mutual concern to the two countries. The U.S. Section is jointly staffed with representatives from the Services and certain interested commands. A United States Scientific Advisory Team and a State Department representative are provided.

Responsibilities. 1. The U.S. Section, Military Study Group, is to study those aspects of the North American Air Defense System in general and the Early Warning System in particular, which are of mutual concern to the two countries.

2. Make appropriate recommendations. In Canada, these are made directly to the Chiefs of Staff Committee; in the U.S., through the Executive Agency of the Department of the Air Force to the Joint Chiefs of Staff.

3. Meetings will be held as directed by higher authority or when either chairman considers it expedient.

4. As the above responsibilities may involve a study of a wide range of subjects related to the Air Defense of North America which may need collaboration of other government agencies, civil and military, the chairman of the U.S. Section is empowered to delegate work of a detailed nature to ad hoc committees.

UNITED STATES SECTION30 June 1958

Major General T. C. Darcy, USAF (Chairman)
 Major General John C. Oakes, USA
 Rear Admiral W. F. Petersen, USN
 Brigadier General Charles G. Dunn, USA
 Captain H. T. Johnson, USN

~~CONFIDENTIAL~~~~SECRET~~

Captain C. D. Simonsen, USN
 Colonel L. A. Green, USAF
 Colonel G. S. Weart, USAF
 Mr. Kenneth Byrns, Department of State
 Major Melvin J. Spaur, USAF (Secretary)

CANADIAN SECTION

Air Vice Marshal D. M. Smith, RCAF (Chairman)
 Commodore A. G. Boulton, RCN
 Brigadier G. C. Leech, Canadian Army
 Air Commodore M. D. Lister, RCAF
 Group Captain R. F. Turnbull, RCAF
 Dr. W. Petrie, Defence Research Board
 Squadron Leader J. A. Arnott, RCAF (Secretary)

OBSERVERS

Brigadier R. P. Rothschild, Canadian Army
 Mr. J. J. McCardle, Dept of External Affairs
 Group Captain W. Weiser, RCAF

CANADA-UNITED STATES SCIENTIFIC ADVISORY TEAM (CUSSAT)

The Canada-United States Scientific Advisory Team (CUSSAT) advises the MSG. The primary task of CUSSAT is to carry out such operational research and other scientific studies as are assigned by the MSG.

CUSSAT Members

Canadian Section

Dr. W. Petrie, Chairman
 Operational Research Gp, DRB

United States Section

Mr. John Everett, WSEG, Chairman

The remainder of the membership of CUSSAT is not formally constituted, but is filled at the direction of the Chairman with scientists specializing in the particular problem under consideration by the Team. Such representation usually includes personnel from USN, USAF ADC, Hq USAF, etc.

~~SECRET~~

~~CONFIDENTIAL~~

USAF CENTRAL COORDINATING STAFF - CANADA (CCS-C)

The CCS-C operates in accordance with the policies, programs, and requirements established by the Chief of Staff, USAF.

The staff coordinates and monitors USAF activities in Canada, excluding intelligence and diplomatic functions of the U.S. Air Attache, Canada, and acts as the principal liaison agent.

Functions

1. Establish and maintain liaison with USAF activities and Canadian military Services and governmental agencies which have an interest in USAF programs in Canada.
2. Promote and perpetuate the friendly and harmonious relationships that prevail between defense agencies of the Canadian government and the USAF.
3. In coordination with major air commands, be responsible for policy matters relative to administrative procedures required to implement agreed USAF programs in Canada. The Chief, CCS-C, will insure that coordination and liaison for such programs are conceived and proceed in accordance with agreements and/or arrangements by submitting recommendations to the appropriate USAF commanders or by action through the Chief of Staff, USAF. The Chief, CCS-C, also will provide support, assistance, and guidance to USAF activities in Canada as requested by them, or as directed by the Chief of Staff, USAF.
4. Absorb functions performed by the United States Air Attache, Canada, which are subordinate to his primary mission and are the responsibility of the CCS-C.
5. Upon request, represent USAF commanders in matters relating to the implementation of USAF programs in Canada.
6. Inform the Chief of Staff, USAF, and the appropriate USAF commanders of Canadian plans, policies, or actions that have a present or potential bearing on the execution of USAF programs in Canada.
7. Conduct a continuing study to determine which USAF offices in Canada may be eliminated, condensed, or absorbed by either the CCS-C or other USAF offices in Canada. The CCS-C will recommend to the Chief of Staff, USAF, the economies which may be realized.
8. Inform the Chief of Staff, USAF, when political problems arise in connection with service-to-service relations.
9. Insure that appropriate diplomatic and/or service level clearance has been received by the USAF activity concerned before any project requiring such clearance is initiated.

~~SECRET~~ ~~CONFIDENTIAL~~

UNITED STATES-CANADA JOINT CABINET COMMITTEE ON DEFENSE

Formed by the President of the United States and the Prime Minister of Canada on 10 July 1958.

Purpose: To strengthen civilian control over continental defense. The committee will make defense policy recommendations to the President and Prime Minister. It will also supervise the three existing joint defense committees and NORAD.

PERMANENT MEMBERS

United States

U. S. Secretary of State
U. S. Secretary of Defense
U. S. Secretary of Treasury

Canada

Minister of External Affairs
Minister of National Defence
Minister of Finance

Other cabinet members from both countries will participate from time to time.

Date of first meeting has not been established.

~~SECRET~~ ~~CONFIDENTIAL~~

APPENDIX TWO

USAF ADC AGW STATIONS

Data as of 30 June 1958

| Div | Site No. | Location | Sq. | Search | Height |
|-------|--------------------|-------------------------|------------------------|----------|-----------|
| 9th | P-6 | Curlew AFS, Wash. | 638 | FPS-3(A) | FPS-6(A) |
| | P-11 | Yaak AFS, Mont. | 680 | FPS-3(A) | FPS-6 |
| | | | | GPS-3 | |
| | P-11A | Porthill, Ida. | 680 | FPS-14 | --- |
| | P-11B | Eureka, Mont. | 680 | FPS-14 | --- |
| | P-32 | Condon AFS, Ore. | 636 | FPS-3(A) | FPS-6 |
| | P-40 | Othello AFS, Wash. | 637 | FPS-3(A) | FPS-6 |
| | P-60 | Colville AFS, Wash. | 760 | FPS-20 | FPS-6 |
| | | | | | FPS-6(A) |
| | | M-118 | Burns AFS, Ore. | 634 | MPS-7(A) |
| | SM-151 | Mica Peak AFS, Wash. | 823 | FPS-20 | MPS-14(A) |
| 20th | P-47 | Hutchinson AFS, Kans. | 793 | FPS-10 | FPS-6A |
| | P-64 | Kirksville AFS, Mo. | 790 | FPS-10 | FPS-6A |
| | P-68 | Fordland AFS, Mo. | 797 | FPS-3(A) | FPS-4(A) |
| | P-70 | Belleville AFS, Ill. | 798 | FPS-3(A) | FPS-4(A) |
| | P-71 | Omaha AFS, Nebr. | 789 | FPS-3(A) | FPS-6(A) |
| | P-72 | Olathe AFS, Kans. | 738 | FPS-20 | FPS-6A |
| | P-77 | Bartlesville AFS, Okla. | 796 | FPS-10 | FPS-6 |
| | P-77A | Ottawa, Okla. | 796 | FPS-14 | --- |
| | P-77D | Winfield, Kans. | 796 | FPS-14 | --- |
| | P-81 | Waverly AFS, Iowa | 788 | FPS-10 | FPS-6A(A) |
| | P-85 | Hanna City AFS, Ill. | 791 | FPS-20 | FPS-4 |
| | | | | | FPS-6A |
| | | SM-143 | Walnut Ridge AFS, Ark. | 725 | MPS-11 |
| 25th | P-1 | McChord AFB, Wash. | 635 | GPS-6B | FPS-6(A) |
| | P-12 | North Bend AFS, Ore. | 761 | FPS-3(A) | FPS-6 |
| | | | | GPS-3 | |
| | P-12A | Port Orford, Ore. | 761 | FPS-14 | --- |
| | P-44 | Makah AFS, Wash. | 758 | FPS-3(A) | FPS-6 |
| | | | | GPS-3 | |
| | P-46 | Blaine AFS, Wash. | 757 | FPS-10 | FPS-6 |
| | P-57 | Naselle AFS, Wash. | 759 | FPS-20 | FPS-6 |
| M-100 | Mt. Hebo AFS, Ore. | 689 | MPS-11(A) | FPS-6(A) | |
| | | | GPS-3(A) | | |

~~CONFIDENTIAL~~

| Div | Site No. | Location | Sq. | Search | Height | |
|---------|----------|-------------------------|----------------------------|-----------------|----------------------|----------|
| 26th | P-9 | Highlands AFS, N.J. | 646 | CPS-6B GPS-3 | FPS-6 | |
| | P-9A | Gibbsboro, N.J. | 646 | FPS-14 | --- | |
| | P-10 | North Truro, Mass. | 762 | CPS-6B GPS-3 | FPS-6(A) FPS-6(A) | |
| | P-10A | Westboro, Mass. | 762 | FPS-14 | --- | |
| | P-10B | Ft. Dearborn, N.H. | 762 | FPS-14 | --- | |
| | P-30 | Benton AFS, Pa. | 648 | CPS-6B | FPS-6(A) FPS-6(A) | |
| | P-30E | Ulysses, Pa. | 648 | FPS-14 | --- | |
| | P-45 | Montauk AFS, N.Y. | 773 | FPS-20 | FPS-6(A) FPS-6(A) | |
| | P-45A | Manorville, N.Y. | 773 | FPS-14 | --- | |
| | P-45B | Chilmark, Mass. | 773 | FPS-14 | --- | |
| | P-50 | Saratoga AFS, N.Y. | 656 | FPS-20 | FPS-6(A) FPS-6(A) | |
| | P-50A | New Preston, Conn. | 656 | FPS-14 | --- | |
| | P-50E | New Salem, Mass. | 656 | FPS-14 | --- | |
| | P-54 | Palermo AFS, N.J. | 770 | FPS-20 | FPS-6 FPS-6 | |
| | 27th | P-2 | Cambria AFS, Calif. | 775 | FPS-3 GPS-3 | FPS-6 |
| | | P-15 | Santa Rosa Is. AFS, Cal. | 669 | FPS-10 GPS-3 | MPS-14 |
| | | P-39 | San Clemente Is. AFS, Cal. | 670 | FPS-3 GPS-3(A) | FPS-6 |
| | | P-59 | Boron AFS, Calif. | 750 | FPS-10 | FPS-6 |
| | | P-76 | Mt. Laguna AFS, Calif. | 751 | FPS-3(A) GPS-3(A) | FPS-6(A) |
| P-76A | | Tecate, Calif. | 751 | FPS-14 | --- | |
| P-76D | | Coyote Wells, Calif. | 751 | FPS-14 | --- | |
| SM-162 | | Vincent AFB, Ariz. | 864 | MPS-7 | MPS-14 | |
| SM-162A | | Tacna, Ariz. | 864 | FPS-14 | --- | |
| SM-163 | | Las Vegas AFS, Nev. | 865 | FPS-3A(A) | MPS-14 | |
| 28th | | P-33 | Klamath AFS, Calif. | 777 | FPS-20 | FPS-6 |
| | P-33A | Capetown, Calif. | 777 | FPS-14 | --- | |
| | P-37 | Pt. Arena AFS, Calif. | 776 | FPS-20 GPS-3 | FPS-6 | |
| | P-37A | Laytonville, Calif. | 776 | FPS-14 | --- | |
| | P-38 | Mill Valley AFS, Calif. | 666 | CPS-6B GPS-3 | FPS-6 | |
| | P-58 | Mather AFB, Calif. | 668 | CPS-6B | FPS-6 | |
| | P-74 | Madera AFS, Calif. | 774 | FPS-3 | FPS-6 | |
| | M-96 | Almaden, Calif. | 682 | FPS-20 | MPS-14 | |
| | M-127 | Winnemucca AFS, Nev. | 658 | FPS-3(A) | FPS-6A(A) | |
| | SM-156 | Fallon, Nev. | 858 | MPS-7 | MPS-14 | |

~~CONFIDENTIAL~~

| Div | Site No. | Location | Search | Height |
|----------------|----------|------------------------|----------------------|----------------------|
| 28th (cont) | SM-157 | Red Bluff AFS, Calif | MPS-11 | FPS-6 |
| | SM-164 | Tonopah AFS, Nev. | MPS-7 | FPS-6(A) |
| 29th | P-24 | Cut Bank AFS, Mont. | FPS-20 | --- |
| | P-24A | Browning, Mont. | FPS-14 | --- |
| | P-24C | Sweetgrass, Mont. | FPS-14 | --- |
| | P-25 | Havre AFS, Mont. | FPS-3(A) GPS-3(A) | FPS-6(A) |
| | P-25A | Galeta, Mont. | FPS-14 | --- |
| | P-25B | Hogeland, Mont. | FPS-14 | --- |
| | P-26 | Opheim AFS, Mont. | FPS-3(A) GPS-3(A) | FPS-6(A) |
| | P-26A | Whitewater, Mont. | FPS-14 | --- |
| | P-26D | Whitetail, Mont. | FPS-14 | --- |
| | P-27 | Fortuna AFS, N.D. | FPS-20 | FPS-6(A) |
| | P-28 | Minot AFS, N.D. | FPS-3(A) GPS-3(A) | FPS-6(A) FPS-4(A) |
| | P-28A | Niobe, N.D. | FPS-14 | --- |
| | M-97 | Ellsworth AFB, S.D. | MPS-7(A) | MPS-14(A) |
| | M-98 | Miles City AFS, Mont. | MPS-7(A) | MPS-14(A) |
| | SM-147 | Malmstrom AFB, Mont. | FPS-20 | FPS-6(A) |
| | 30th | P-20 | Selfridge AFB, Mich. | CPS-6B |
| P-20A | | Burnside, Mich. | FPS-14 | --- |
| P-21 | | Lockport AFS, N.Y. | CPS-6B | FPS-6(A) FPS-6(A) |
| P-21A | | Brockport, N.Y. | FPS-14 | --- |
| P-21B | | Charlotte Center, N.Y. | FPS-14 | --- |
| P-61 | | Port Austin AFS, Mich. | FPS-20 | FPS-6 |
| P-62 | | Brookfield AFS, Ohio | FPS-3(A) | FPS-6(A) FPS-4 |
| P-62B | | Lewisville, Ohio | FPS-14 | --- |
| P-63 | | Claysburg AFS, Pa. | FPS-20 | FPS-6(A) FPS-6(A) |
| P-67 | | Custer AFS, Mich. | FPS-20 | FPS-4 |
| P-67A | | Midland, Mich. | FPS-14 | --- |
| 31st | P-17 | Wadena AFS, Minn. | FPS-20 | FPS-6(A) |
| | P-18 | Chandler AFS, Minn. | FPS-20 | FPS-6(A) |
| | P-29 | Finley AFS, N.D. | FPS-20 | FPS-6(A) FPS-4(A) |
| | P-29A | Sheyenne, N.D. | FPS-14 | --- |
| | P-29B | Grafton, N.D. | FPS-14 | --- |
| | P-35 | Osceola AFS, Wis. | CPS-6B | --- |
| | P-35B | Northfield, Minn | FPS-14 | --- |
| | P-69 | Finland AFS, Minn. | FPS-20 | FPS-6(A) |
| | P-69C | Askov, Minn. | FPS-14 | --- |
| | M-99 | Gettysburg AFS, S.D. | MPS-7(A) | MPS-14(A) |

| Div | Site No. | Location | Sq. | Search | Height |
|----------------|-----------------------|-------------------------------|------------|------------|------------|
| 31st (cont) | SM-138 | Grand Rapids, Minn. | 707 | FPS-3A(A) | FPS-6(A) |
| | SM-139 | Willmar AFS, Minn. | 721 | FPS-8(A) | --- |
| | C-16 | Sioux Lookout AS, Ont. Can. | 915 | FPS-3(A) | TPS-502(A) |
| | | | | FPS-502(A) | --- |
| | C-17 | Beausejour AS, Manitoba, Can. | 916 | FPS-3(A) | TPS-502(A) |
| | | | FPS-502(A) | --- | |
| 32nd | P-13 | Brunswick AFS, Me. | 654 | CPS-6B | FPS-6(A) |
| | | | | GPS-3(A) | FPS-6(A) |
| | P-13A | Sedgwick, Me. | 654 | FPS-14 | --- |
| | P-14 | St Albans AFS, Vt. | 764 | CPS-6B | FPS-6(A) |
| | | | | | FPS-6(A) |
| | P-14C | Bangor, N.Y. | 764 | FPS-18 | --- |
| | P-49 | Watertown AFS, N.Y. | 655 | FPS-20 | FPS-6(A) |
| | | | | | FPS-6(A) |
| | P-49A | Suttons Corner, N.Y. | 655 | FPS-14 | --- |
| | P-49B | Oswegatchie, N.Y. | 655 | FPS-18 | --- |
| | P-65 | Charleston AFS, Me. | 765 | FPS-20 | FPS-6(A) |
| | | | | | FPS-6(A) |
| | P-80 | Caswell AFS, Me. | 766 | FPS-10 | FPS-6(A) |
| | | | | GPS-3(A) | |
| | M-103 | North Concord AFS, Vt. | 911 | MPS-11A | MPS-14(A) |
| | | | | FPS-6A(A) | |
| M-110 | Bucks Harbor AFS, Me. | 907 | MPS-11(A) | --- | |
| 33rd | P-52 | Oklahoma City AFS, Okla. | 746 | FPS-10 | FPS-6(A) |
| | P-75 | Lackland AFB, Tex. | 741 | FPS-3 | FPS-4 |
| | P-78 | Duncanville AFS, Tex. | 745 | FPS-10 | FPS-6 |
| | P-79 | Ellington AFB, Tex. | 747 | FPS-10 | FPS-6 |
| | | | | GPS-3 | |
| | M-88 | Amarillo AFB, Tex. | 688 | MPS-7 | TPS-10D |
| | M-89 | Sweetwater AFS, Tex. | 683 | MPS-11 | TPS-10D |
| | M-91 | Texarkana AFS, Ark. | 703 | FPS-20 | MPS-14 |
| | M-125 | England AFB, La. | 653 | MPS-7 | MPS-14 |
| | | | | | |
| 34th | P-7 | Continental Divide AFS, N.M. | 769 | FPS-3(A) | FPS-6 |
| | P-8 | Tierra Amarilla AFS, N.M. | 767 | FPS-3(A) | FPS-6 |
| | P-51 | Moriarity AFS, N.M. | 768 | FPS-20 | FPS-6 |
| | M-90 | Walker AFB, N.M. | 686 | MPS-7 | MPS-14 |
| | M-90A | Orla, Tex. | 686 | FPS-14 | --- |
| | M-92 | Mt. Lemmon AFS, Ariz. | 684 | MPS-7(A) | MPS-14(A) |
| | M-93 | Winslow AFS, Ariz. | 904 | MPS-11(A) | --- |
| | M-94 | West Mesa AFS, N.M. | 687 | MPS-7 | MPS-14 |
| | M-95 | Las Cruces AFS, N.M. | 685 | MPS-7 | MPS-14 |
| | M-95A | El Paso, Tex. | 685 | FPS-14 | --- |
| | M-95B | Columbus, N.M. | 685 | FPS-14 | --- |
| | TM-186 | Pyote AFS, Tex. | 697 | FPS-3A | FPS-6 |

| Div | Site No. | Location | St. | Search | Height |
|--------|------------------------|----------------------------|------------|------------|----------|
| 35th | M-111 | Marietta AFS, Ga. | 908 | MPS-11 | MPS-8 |
| | M-111B | Barnesville, Ga. | 908 | FPS-18 | --- |
| | M-112 | Bunter AFB, Ga. | 702 | MPS-7 | TPS-10D |
| | | | | CPS-3 | MPS-14 |
| | M-112A | Parris Island MS, S.C. | 702 | FPS-14 | --- |
| | M-112C | Alma, Ga. | 702 | FPS-14 | --- |
| | M-113 | No. Charleston AFS, S.C. | 792 | MPS-7 | MPS-8 |
| | | | | CPS-3 | MPS-14 |
| | M-113B | Georgetown, S.C. | 792 | FPS-14 | --- |
| | M-126 | Houma NAS, La. | 657 | MPS-7 | MPS-14 |
| | | | | | TPS-10D |
| | M-126A | New Orleans, La. | 657 | FPS-14 | --- |
| | M-129 | MacDill AFB, Fla. | 660 | MPS-7 | MPS-14 |
| | | | | CPS-3 | |
| | SM-159 | Aiken AFS, S.C. | 861 | FPS-3A | TPS-10D |
| TM-198 | Tyndall AFB, Fla. | 678 | FPS-20 | MPS-14 | |
| | | | | FPS-6 | |
| | | | | FPS-6A | |
| 37th | P-16 | Calumet AFS, Mich. | 665 | FPS-20 | FPS-6(A) |
| | P-19 | Antigo AFS, Wis. | 676 | FPS-20 | FPS-6(A) |
| | | | | | FPS-4 |
| | P-31 | Williams Bay AFB, Wis. | 755 | CPS-6B | FPS-6(A) |
| | P-34 | Empire AFS, Mich. | 752 | CPS-6B | FPS-6(A) |
| | | | | | FPS-6(A) |
| | P-34A | Petoskey, Mich. | 752 | FPS-14 | --- |
| | P-66 | Sault Ste Marie AFS, Mich. | 753 | FPS-20 | FPS-6(A) |
| C-14 | Pagwa River, Ont. Can. | 913 | FPS-20 | FPS-6(A) | |
| | | | FPS-502(A) | TPS-502(A) | |
| C-15 | Armstrong, Ont. Can. | 914 | FPS-3(A) | TPS-502(A) | |
| | | | FPS-502(A) | --- | |
| 58th | P-42 | Lake City AFS, Tenn. | 663 | FPS-10 | FPS-6 |
| | P-43 | Guthrie AFS, W. Va. | 783 | FPS-20 | FPS-6 |
| | P-53 | Rockville AFS, Ind. | 782 | FPS-10 | FPS-6 |
| | | | | | FPS-6 |
| | P-73 | Bellefontaine AFS, Ohio | 664 | FPS-20 | FPS-6 |
| | | | | | FPS-6A |
| | P-82 | Snow Mtn. AFS, Ky. | 784 | FPS-20 | FPS-6 |
| SM-145 | Joelton AFS, Tenn. | 799 | MPS-11 | TPS-10D | |
| | | | | FPS-6A | |
| SM-165 | Flintstone AFS, Ga. | 867 | MPS-11 | FPS-6 | |
| 85th | P-55 | Manassas AFS, Va. | 647 | FPS-3 | FPS-6 |
| | P-55B | Hermanville, Md. | 647 | FPS-14 | --- |
| | P-55D | Hanover, Pa. | 647 | FPS-14 | --- |

~~CONFIDENTIAL~~
~~SECRET~~

| Div | Site No. | Location | Sq. | Search | Height |
|--------|----------|--------------------------|-----|---------|--------|
| 85th | P-55F | Thomas, W. Va. | 647 | FPS-14 | --- |
| (cont) | P-56 | Cape Charles AFS, Va. | 771 | FPS-3 | FPS-6 |
| | | | | GPS-3 | FPS-6 |
| | P-56A | Temperanceville, Va. | 771 | FPS-14 | --- |
| | P-56B | Bethany Beach, Del. | 771 | FPS-14 | --- |
| | P-56C | Elizabeth City, N.C. | 771 | FPS-14 | --- |
| | M-115 | Fort Fisher AFS, N.C. | 701 | MPS-7 | MPS-14 |
| | | | | GPS-3 | |
| | M-115A | Myrtle Beach, S.C. | 701 | FPS-14 | --- |
| | M-117 | Roanoke Rapids AFS, N.C. | 632 | MPS-11A | FPS-6 |
| | | | | | FPS-6A |
| | M-121 | Bedford AFS, Va. | 649 | MPS-7 | FPS-6 |
| | | | | MPS-11 | FPS-6 |
| | M-130 | Winston Salem AFS, N.C. | 810 | MPS-11 | FPS-6A |

Definition of Symbols Used:

- A Modification of basic equipment
- (A) Arctic Tower/Radome

SOURCE: ADC ACW Status Report (RCS: AF-V20) and ADC Program Resume, 30 June 1958.

~~CONFIDENTIAL~~
~~SECRET~~

APPENDIX THREE

RCAF ADC ACW STATIONS

Data as of 30 June 1958

| SITE | LOCATION | UNIT | RADAR | FUNCTION | SECTOR |
|-------|---------------|------------|-----------------------------------------------|----------|-------------|
| C-1 | Mont Apica | 12 ACW Sq | CPS-6B EW Kit CPS-6B | GCI | 1 ADCC |
| C-2 | Lac St. Denis | 1 ADCC | | ADCC | |
| C-2 | Lac St. Denis | 11 ACW Sq | CPS-6B CPS-6B | GCI | 1 ADCC |
| C-3 | Foymount | 32 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 3 ADCC |
| C-4 | Edgar | 3 ADCC | | ADCC | |
| C-4 | Edgar | 31 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 3 ADCC |
| C-5 | St. Margarets | 2 ADCC | | ADCC | |
| C-5 | St. Margarets | 21 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 2 ADCC |
| C-6 | St. Sylvestre | 13 ACW Sq | CPS-6B EW Kit CPS-6B TPS-502 | GCI | 1 ADCC |
| C-7 | Parent | 14 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 1 ADCC |
| C-8 | Senneterre | 34 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 3 ADCC |
| C-9 | Falconbridge | 33 ACW Sq | FPS-3 FPS-6 TPS-501 | GCI | 3 ADCC |
| C-10* | Ramore | 912 ACW Sq | FPS-3 TPS-502 FPS-502 | GCI | 3 ADCC |
| C-11 | Beaver Bank | 22 ACW Sq | CPS-6B EW Kit CPS-6B FPS-502 TPS-502 | GCI | 2 ADCC |
| C-11* | Pagwa | 913 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 37 Air Div. |

SECRET

| SITE | LOCATION | UNIT | RADAR | FUNCTION | SECTOR |
|-------|---------------|------------|-------------------------------|----------|-------------|
| C-15* | Armstrong | 914 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 37 Air Div. |
| C-16* | Sioux Lookout | 915 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 31 Air Div. |
| C-17* | Beausejour | 916 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 31 Air Div. |
| C-18 | Holberg | 53 ACW Sq | FPS-3 | GCI | 5 Air Div. |
| C-19* | Puntzi Mt. | 917 ACW Sq | FPS-3 TPS-502 FPS-502 | GCI | 5 Air Div. |
| C-20* | Baldy Hughes | 918 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 5 Air Div. |
| C-21* | Saskatoon Mt. | 919 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 5 Air Div. |
| C-33 | Moisie | 211 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 2 ADCC |
| C-34 | Sydney | 221 ACW Sq | FPS-3 TPS-502 FPS-502 | EW | 2 ADCC |
| C-35 | Comox | 51 ACW Sq | FPS-502 TPS-502 TPS-502 | EW | 5 Air Div. |
| | Vancouver | 5 AD COC | | ADCC | |
| | St. Hubert | COC | | COC | |

* USAF Manned

SOURCE: RCAF ADC Air Defence Command Data and Progress Book, 1 April 1958,
W/1 change, 1 May 1958
USAF ADC, ACW Status Report (2-AF-V20), 30 June 1958

[REDACTED]

SECRET

[REDACTED]

APPENDIX FOUR

64TH AIR DIVISION ACW STATIONS OPERATIONAL
 Data as of 30 June 1958)

| SITE | LOCATION | SQ | SEARCH | HEIGHT | FUNCTION |
|--------|----------------------|------|------------------------|------------|----------|
| MCC-16 | St. Johns, Nfld | Hq | -- | -- | CC |
| C-22 | Red Cliff, Nfld | 642 | CPS-6B FPS-502(A) | TPS-502(A) | EW/GCI |
| C-22B | Elliston Ridge, Nfld | 642 | FPS-14 | --- | GF |
| C-23 | Stephenville, Nfld | 640 | CPS-6B FPS-502(A) | TPS-502(A) | DC |
| C-24 | Melville, Labr | 641 | CPS-6B FPS-502(A) | TPS-502(A) | DC |
| C-25 | Gander, Nfld | 228* | FPS-3(A) FPS-502(A) | TPS-502(A) | EW/GCI |
| C-26 | St. Anthony, Nfld | 921 | FPS-3(A) FPS-502(A) | TPS-502(A) | EW/GCI |
| C-26A | Fox Harbour, Labr | 921 | FPS-14(A) | --- | GF |
| C-26B | La Scie, Nfld | 921 | FPS-14(A) | --- | GF |
| C-27 | Cartwright, Labr | 922 | FPS-3A FPS-502(A) | TPS-502(A) | EW/GCI |
| C-27A | Cut Throat Is., Labr | 922 | FPS-14(A) | --- | GF |
| C-27B | Spotted Isle, Labr | 922 | FPS-14(A) | --- | GF |
| C-28 | Hopedale, Labr | 923 | FPS-3(A) FPS-502(A) | TPS-502(A) | EW/GCI |
| C-28A | Cape Makkovik, Labr | 923 | FPS-14(A) | --- | GF |
| C-29 | Saglek, Labr | 924 | FPS-3(A) FPS-502(A) | TPS-502(A) | EW/GCI |
| C-30 | Resolution Is. NWT | 920 | FPS-3(A) FPS-502(A) | TPS-502(A) | EW/GCI |

* Manned by RCAF ADC

~~SECRET~~ ~~SECRET~~

| SITE | LOCATION | SQ | SEARCH | HEIGHT | FUNCTION |
|------|-----------------|-----|------------------------|----------------------|----------|
| C-31 | Baffin Is., NWT | 926 | FPS-3(A) FPS-502(A) | FPS-502(A) | EW/GCI |
| G-32 | Thule AB, Grnld | 931 | FPS-20 | FPS-6(A) FPS-4(A) | DC |

SOURCE: ADC ACW Status Report (RCS: AF-V20) and ADC ACW Program Resume, 30 Jun 1958

~~SECRET~~ ~~SECRET~~

APPENDIX FIVE

AAC ACW STATIONS OPERATIONAL
(Data as of 31 July 1958)

| SITE | LOCATION | SQ | PRIMARY SEARCH | PRIMARY HEIGHT | FUNCTION |
|------|----------------------|------|----------------|----------------|----------|
| F-1 | Fire Island AFS | 626 | CPS-6B(A) | CPS-6B(A) | DC |
| F-3 | King Salmon Aprt. | 705 | FPS-3(A) | FPS-6(A) | DC |
| F-5 | Cape Newenham AFS | 794 | FPS-3(A) | --- | EW |
| F-6 | Cape Romanzof AFS | 795 | FPS-3(A) | --- | EW |
| F-15 | Sparrevohn AFS | 719 | FPS-3(A) | FPS-6(A) | GCI |
| F-22 | Middleton Island AFS | 720 | FPS-3(A) | FPS-6(A) | GCI |
| F-25 | Ohlson Mountain AFS | 937 | FPS-3(A) | FPS-6(A) | GCI |
| F-16 | Indian Mountain AFS | 708 | FPS-3(A) | FPS-6(A) | GCI |
| F-2 | Murphy Dome AFS | 744 | --- | --- | DC |
| F-4 | Tin City AFS | 710 | FPS-3(A) | --- | EW |
| F-7 | Cape Lisburne AFS | 711 | FPS-3(A) | --- | EW |
| F-8 | Campion AFS | 743 | FPS-3(A) | FPS-6(A) | DC |
| F-9 | Northeast Cape AFS | 712 | FPS-3(A) | --- | EW |
| F-10 | Tatalina AFS | 717 | FPS-3(A) | FPS-6(A) | GCI |
| F-14 | Fort Yukon AFS | 709 | FPS-3(A) | FPS-6(A) | GCI |
| F-20 | Unalakleet AFS | 718 | FPS-8(A) | FPS-4(A) | GCI |
| F-24 | Kotzebue AFS | 748 | FPS-8(A) | FPS-4(A) | GCI |
| F-11 | Elmendorf AFB | 10AD | --- | --- | CC |
| F-12 | Ladd AFB | 11AD | --- | --- | CC |

SOURCE: AAC Quarterly ACW Status Report, RCS: 1-AF-V20, 31 July 1958

APPENDIX SIX

USAF ADC FIGHTER-INTERCEPTOR SQUADRONS

As of 30 June 1958

| Air Div | Sqdn | Location | Base Asgmt | Type Acft | Acft | | Crews | |
|---------------------------|---------|-----------------------------|------------|--------------------------------------|------------------------------|---------|-------|---------|
| | | | | | Asgd | Opr Rdy | Asgd | Opr Rdy |
| EASTERN AIR DEFENSE FORCE | | | | | | | | |
| 26th | 2 | Suffolk | ADC | F-102A | 16 | 8 | 31 | 2 |
| | 5 | Suffolk | ADC | F-102A | 15 | 8 | 33 | 0 |
| | 46 | Dover | MATS | F-94C | —Preparing for inactivation— | | | |
| | 49 | Hanscom | ARDC | F-86L | 28 | 17 | 35 | 8 |
| | 58 | Otis | ADC | F-89J | 3 | 0 | 3 | 1 |
| | *58 | Vincent | ADC | F-89J | 22 | 19 | 24 | 14 |
| | 60 | Otis | ADC | F-94C | 20 | 13 | 31 | 22 |
| | 98 | Dover | MATS | F-89J | 27 | 20 | 37 | 23 |
| | 330 | Stewart | ADC | F-86L | 28 | 20 | 34 | 26 |
| | 331 | Stewart | ADC | F-86L | 28 | 20 | 25 | 0 |
| | 332 | McGuire | MATS | F-102A | 25 | 18 | 34 | 26 |
| | 337 | Westover | SAC | F-86L | 5 | 1 | 15 | 0 |
| | 337 | Westover | SAC | F-104A | 24 | 8 | 15 | 0 |
| | 337 | Westover | SAC | F-104B | 2 | 0 | 0 | 0 |
| 539 | McGuire | MATS | F-86L | 23 | 8 | 33 | 0 | |
| 30th | 47 | Niagara | ADC | F-102A | 13 | 6 | 31 | 14 |
| | 71 | Selfridge | ADC | F-86L | 23 | 21 | 29 | 28 |
| | 86 | Youngstown | ADC | F-102A | 10 | 4 | 30 | 0 |
| | 94 | Selfridge | ADC | F-86L | 24 | 23 | 31 | 23 |
| | 445 | Wurtsmith | ADC | F-89J | 26 | 14 | 29 | 21 |
| | 18 | Wurtsmith | ADC | F-102A | 24 | 13 | 33 | 0 |
| 32nd | 27 | Griffis | AMC | F-102A | 16 | 14 | 34 | 1 |
| | 37 | Ethan-Allen (Burlington) | ADC | F-102A | 21 | 11 | 26 | 0 |
| | 75 | Presque Isle | ADC | F-89H | 21 | 17 | 31 | 13 |
| | 465 | Griffis | AMC | F-89J | 25 | 21 | 31 | 26 |
| 35th | 444 | Charleston | MATS | F-86L | 26 | 23 | 31 | 29 |
| | 76 | McCoy | SAC | F-89H | 19 | 16 | 33 | 23 |
| 37th | 62 | O'Hare | ADC | F-86L | 27 | 9 | 32 | 26 |
| | 325 | Truax | ADC | F-102A | 24 | 19 | 32 | 3 |
| | 61 | Truax | ADC | F-102A | 25 | 19 | 33 | 0 |
| | 438 | Kinross | ADC | F-102A | 2 | 0 | 0 | 0 |
| | *438 | K.I. Sawyer | ADC | F-102A | 23 | 16 | 36 | 19 |
| | 484 | K.I. Sawyer | ADC | No aircraft and/or aircrews assigned | | | | |

SECRET

| Air Div | Sqdn | Location | Base Asgmt | Type Acft | Acft | | Crews | |
|---------|------|-----------------|------------|-----------|------|---------|-------|---------|
| | | | | | Asgd | Opr Rdy | Asgd | Opr Rdy |
| 58th | 56 | Wright-Patt | AMC | F-86L | 18 | 9 | 35 | 23 |
| | 56 | Wright-Patt | AMC | F-104A | 2 | 0 | 0 | 0 |
| | 87 | Lockbourne | SAC | F-86L | 27 | 22 | 37 | 34 |
| | 319 | Bunker Hill | SAC | F-89J | 26 | 19 | 30 | 0 |
| 85th | 48 | Langley | TAC | F-102A | 9 | 2 | 26 | 1 |
| | 95 | Andrews | Hq Com | F-102A | 15 | 10 | 29 | 0 |
| | 482 | Seymour-Johnson | TAC | F-102A | 2 | 0 | 0 | 0 |
| | *482 | Tyndall | ADC | F-102A | 17 | 17 | 20 | 0 |

CENTRAL AIR DEFENSE FORCE

| | | | | | | | | |
|------|------|-----------------|------|--------|----|----|----|----|
| 20th | 13 | Sioux City | ADC | F-86L | 28 | 15 | 33 | 28 |
| | 14 | Sioux City | ADC | F-86L | 28 | 15 | 33 | 28 |
| | 85 | Scott | MATS | F-86L | 0 | 0 | 0 | 0 |
| | *85 | Vincent | ADC | F-86L | 23 | 20 | 32 | 30 |
| | 326 | Richards-Gebaur | ADC | F-102A | 16 | 10 | 26 | 23 |
| 29th | 29 | Malstrom | SAC | F-89J | 26 | 12 | 34 | 0 |
| | 54 | Ellsworth | SAC | F-89J | 28 | 15 | 35 | 0 |
| 31st | 11 | Duluth | ADC | F-102A | 4 | 0 | 0 | 0 |
| | *11 | Tyndall | ADC | F-102A | 20 | 7 | 27 | 22 |
| 33rd | None | | | | | | | |
| 34th | 15 | Davis-Monthan | SAC | F-86L | 27 | 16 | 28 | 22 |
| | 93 | Kirtland | ARDC | F-86L | 28 | 19 | 30 | 19 |

WESTERN AIR DEFENSE FORCE

| | | | | | | | | |
|------|-----|----------|------|--------|-------------------------------------|----|----|----|
| 9th | 322 | Larson | MATS | F-86L | 27 | 24 | 27 | 22 |
| | 497 | Geiger | ADC | F-86D | --unit reassigned as of 20 June '58 | | | |
| | 498 | Geiger | ADC | F-102A | 28 | 15 | 32 | 21 |
| | 538 | Larson | MATS | F-86L | 11 | 10 | 24 | 21 |
| 25th | 64 | McChord | ADC | F-102A | 22 | 14 | 30 | 24 |
| | 318 | McChord | ADC | F-102A | 23 | 15 | 29 | 10 |
| | 321 | Paine | ADC | F-89J | 28 | 17 | 25 | 11 |
| | 460 | Portland | ADC | F-89D | 6 | 6 | 28 | 20 |
| | 460 | Portland | ADC | F-102A | 7 | 1 | 0 | 0 |
| 27th | 327 | George | TAC | F-102A | -- deployed to Thula -- | | | |
| | 329 | George | TAC | F-102A | 25 | 19 | 34 | 3 |
| | 437 | Oxnard | ADC | F-89J | 23 | 17 | 26 | 24 |
| 28th | 82 | Travis | MATS | F-102A | 15 | 10 | 23 | 0 |
| | 83 | Hamilton | ADC | F-104A | 20 | 4 | 23 | 0 |
| | 83 | Hamilton | ADC | F-104B | 3 | 1 | 0 | 0 |

SECRET

| Air Div | Sqdn | Location | Base Asgmt | Type Acft | Acft | | Crews | |
|---------|--------|----------|------------|-----------------------------------------|------|---------|-------|---------|
| | | | | | Asgd | Opr Rdy | Asgd | Opr Rdy |
| 28th | 84 | Hsmilton | ADC | F-89J | 25 | 18 | 34 | 16 |
| | 456 | Castle | SAC | F-86L | 11 | 8 | 24 | 7 |
| | 456 | Castle | SAC | F-102A | 5 | 2 | 6 | 0 |
| | -- 518 | Kingsley | ADC | -- No aircraft and/or aircrews assigned | | | | |

64th AIR DIVISION (DEFENSE)

| | | | | | | | | |
|------|-----|-----------|-----|-----------------------------------------|----|----|----|----|
| 64th | 59 | Goose Bay | SAC | F-89J | 27 | 18 | 30 | 28 |
| | *59 | Thule | SAC | F-89D | 6 | 5 | 6 | 6 |
| | 74 | Thule | SAC | F-89D -- Inactivated on 25 June 1958 -- | | | | |
| | 323 | Harmon | SAC | F-102A | 25 | 20 | 28 | 23 |

* Fighter Flights away from home base.

SOURCE: RCS 1-AF-VII, 30 June 1958

SECRET [REDACTED]

[REDACTED]

APPENDIX SEVEN

RCAF ADC FIGHTER-INTERCEPTOR SQUADRONS

1 May 1958

| Air Div/ADCC | Sqdn | Location | Type Acft | Aircraft | | Crews | |
|-----------------|-------|------------|--------------|----------|------|-------|------|
| | | | | *Estab | Asgd | Estab | Asgd |
| 1 ADCC | 416 | St. Hubert | CF100 | 2 | 2 | 25 | 25 |
| | | | MK 3D | | | | |
| | CF100 | 18 | 18 | | | | |
| | 425 | St. Hubert | CF100 | 2 | 2 | 25 | 25 |
| MK 3D | | | | | | | |
| CF100 | | | 18 | 18 | | | |
| | 413 | Bagotville | CF100 | 2 | 2 | 25 | 25 |
| MK 3D | | | | | | | |
| CF100 | | | 18 | 18 | | | |
| 3 ADCC | 410 | Uplands | CF100 | 2 | 2 | 25 | 25 |
| | | | MK 3D | | | | |
| | | | CF100 | 18 | 18 | | |
| | 428 | Uplands | CF100 | 2 | 2 | 25 | 25 |
| MK 3D | | | | | | | |
| CF100 | | | 18 | 18 | | | |
| | 414 | North Bay | CF100 | 2 | 2 | 25 | 25 |
| MK 3D | | | | | | | |
| CF100 | | | 18 | 18 | | | |
| | 433 | North Bay | CF100 | 2 | 2 | 25 | 25 |
| MK 3D | | | | | | | |
| CF100 | | | 18 | 18 | | | |
| | | | MK5 | | | | |

| Air Div/ADCC | Sqdn | Location | Type Acft | Aircraft | | Crews | |
|------------------|------|----------|-----------|----------|------|-------|------|
| | | | | *Estab | Asgd | Estab | Asgd |
| 5th Air Division | 409 | Comox | CF100 | 2 | 2 | 25 | 25 |
| | | | MK 3D | | | | |
| | | | CF100 | 18 | 18 | | |
| | | | MK5 | | | | |

* Authorized

SOURCE: ADC, Air Defence Command Data and Program Book, 1 April 1958, with Change 1, 1 May 1958

~~SECRET~~

APPENDIX EIGHT

KEY PERSONNEL - HEADQUARTERS NORAD

30 June 1958

| | |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Commander-in-Chief General E. E. Partridge, USAF | DCS/Plans and Operations Maj. Gen. H. T. Alness, USAF |
| Deputy Commander-in-Chief Air Marshal G. R. Slemon, RCAF | Asst. DCS/P&O Brig. Gen. T. V. Stayton, USA Capt. E. Tatom, USN |
| Chief of Staff Maj. Gen. M. S. Carter, USA | Director/Plans and Requirements Brig. Gen. A. J. Pierce, USAF |
| Asst. Chief of Staff, (Secretariat) Col. C. H. Scott, Jr., USAF | Asst. Director Col. W. H. Murray, USA G/C G. S. Austin, RCAF Col. J. F. Kirkendall, USAF |
| Executive Assistant to CINCPACD Col. H. Zemke, USAF | Ch, Systems Coordination Division Capt. G. W. Snider, USN |
| Director of Administration Lt. Col. E. W. Metzger, Jr., USAF | Ch, Policy and Plans Division Col. R. T. Carlisle, USAF |
| Director of Audio-Visual Svs. Lt. Col. R. A. Bassler, USAF | Director of Operations Col. I. R. Seibert, USMC - (Acting) |
| Director of Protocol Maj. J. J. Costello, USAF | Asst. Director (Vacant) |
| Deputy Director of Protocol Maj. G. Minietta, USA | Ch, Training and Exercise Division Cdr. E. G. Smith, USN |
| Command Information Services Officer Col. A. B. Oldfield, USAF | Ch, Tactics and Techniques Division Lt. Col. V. E. Matteson, USA |
| Asst. Command Info. Svs. Officer Lt. Col. C. E. Towne, USA | Director of Operational Evaluation Capt. N. H. Head, USN |
| Chief, Special Projects Branch Cdr. J. R. English, USN | Director of Combat Operations Center Col. H. W. Shoup, USAF |
| Chief, Press Branch Maj. S. A. West, USAF | Asst. Director Cdr. J. W. Lawyer Lt. Col. L. H. Tyree |
| Chief, Radio/TV Branch Maj. M. S. Azzolina, USAF | Plans and Evaluation Officer Maj. J. A. Reding, USAF |
| Director of Command History Mr. L. H. Buss | |

Director of Combat Ops. Center (contd.)

| | |
|---------------------------------------------------------------------|-----------------------------------------------------------------------|
| Ch, Combat Reporting Center Capt. K. O. Butler, USAF | Ch, Operational Rqmts. Division Lt. Col. F. W. H. Wehner, Jr, USAF |
| Director of Plans Analysis Col. E. H. Callahan, USAF | Director of Systems Lt. Col. J. A. Gahr, USA (Acting) |
| Executive Officer Lt. Col. K. K. Howenstine, USAF | Ch, Electronics Division Lt. Col. G. P. Williams, USAF |
| Ch, Feasibility Division Col. O. K. Marshall, USA | Ch, Communications Division Lt. Col. J. A. Gahr, USA |
| Ch, War Gaming Division Cdr. H. R. Nylund, USN | DCS/Intelligence Brig. Gen. R. Taylor, 3d, USAF |
| Director of Operations Analysis Mr. R. H. Blythe, Jr. | Asst. DCS/I Capt. J. E. Lang, USN |
| Asst. Director (Vacant) | Special Asst. to DCS/I (Vacant) |
| Ch, Electronics Division Mr. R. E. Donegon, Jr. | Executive Lt. Col. E. C. Rowe, USAF |
| Ch, Ident. & Raid Rec. Div. Mr. H. A. Schuck | Director Collection and Dissemination Col. J. D. Hand, USA |
| Ch, Interceptor & Missile Division Mr. E. C. Helfrich | Ch, Collection Service Division Maj. F. A. Sooy, USAF |
| Ch, Systems Analysis Division Mr. R. S. Thackeray | Ch, Publication & Dissemination Div Maj. E. J. Pokropos, USAF |
| DCS/Communications and Electronics Brig. Gen. F. F. Uhrhane, USA | Director of Research and Estimate Col. M. R. Graham, USAF |
| Asst. DCS/C&E Col. P. H. Long, USAF | Asst. Director Lt. Col. A. J. Roman, USA |
| Director of Electronics Warfare Col. O. W. Miller, USAF | Ch, Estimates Division Lt. Col. J. M. Mooneyham, USAF |
| Ch, Electronics Warfare Division Lt. Col. M. E. Wardell, USAF | Ch, Technical Division Lt. Col. J. N. Young, USAF |
| Ch, Emission Control Division (Vacant) | Ch, Military Capabilities Division Lt. Col. T. S. Ryan, USAF |
| Director of Plans and Requirements Lt. Col. D. G. Roath, USAF | Director of Operational Intelligence Col. J. F. Setchell, USAF |
| Ch, Plans and Policy Division Lt. Col. D. G. Roath, USAF | Asst. Director Cdr. T. C. Schaible, USN |

Dir. of Operational Intelligence (contd.)

Ch, Intelligence Watch Division
Lt. Col. W. F. Zeller, USAF

Ch, Combat Intelligence Division
Lt. Col. C. E. Becker, USAF

Ch, Procedures Branch
Maj. A. B. Harper, USAF

Ch, Systems Analysis Branch
Capt. F. C. Allen, USAF

HEADQUARTERS AIR DEFENSE COMMAND

COMMANDER

Lt. Gen. J. H. Atkinson

HEADQUARTERS ARMY AIR DEFENSE COMMAND

COMMANDING GENERAL

Lt. Gen. C. E. Hart

HEADQUARTERS NAVAL FORCES CONAD

COMMANDER

Rear Adm W. F. Rodee

HEADQUARTERS RCAF AIR DEFENCE COMMAND

COMMANDER

Air Vice Marshal L. E. Wray

RCAF SUPPORT UNIT

COMMANDING OFFICER

Group Captain G. S. Austin

DISTRIBUTION

| | NO. COPIES |
|--------------------------------------------------|------------|
| HEADQUARTERS NORAD | |
| NOHCR..... | 1 |
| NOHDC..... | 1 |
| NOHCS..... | 1 |
| NOSEC..... | 1 |
| SCIENTIFIC CONSULTANT..... | 1 |
| NOOPO..... | 10 |
| NOELC..... | 5 |
| NOINT..... | 5 |
| NONFO-H..... | 33 |
| COMPONENT COMMANDS | |
| RCAF ADC (ATTN: Camp Commandant)..... | 3 |
| USARADCOM..... | 3 |
| NAVFORCONAD..... | 3 |
| USAF ADC..... | 3 |
| FIELD | |
| Comdr <u>Each</u> NORAD Region..... | 5 (25) |
| Comdr <u>Each</u> NORAD Division..... | 3 (57) |
| EXTERNAL | |
| Joint Chiefs of Staff (ATTN: Historical Section) | 2 |
| Ch/Air Staff RCAF..... | 1 |
| C/S U. S. Army..... | 1 |
| CNO..... | 3 |
| C/S USAF..... | 1 |
| TOTAL DISTRIBUTION..... | 160 |